This Addendum is issued prior to receipt of bids for the information of all bidders for the purposes of advising bidders of additions, deletions, revisions and clarifications to the bidding documents. The following modifications, changes, additions, and/or deletions to the Specifications and/or Drawings, as prepared by ROBBIE CONLEY, ARCHITECT, 596 Glassboro Road, Woodbury Heights, NJ 08097, dated, June 19, 2020 for the construction of the new Emergency Services Complex located at 656 Washington Avenue, Township of Washington, NJ 07676 are hereby made a part of and are incorporated into the Contract Documents thereof and are binding upon all parties concerned as if originally included therein. All other terms as outlined in the original "Invitation for Proposals" will remain in force.

Proposals will be received at the Office of the Township Clerk, 350 Hudson Avenue, Room 202 – 2nd Floor, Twp. of Washington, NJ 07676 on August 25, 2020 at 2:00 (PM) local time, at which time they will be publicly opened and read aloud shortly thereafter.

CLARIFICATIONS

ITEM NO. C-1

The goal of the sheet pile is to have 12 feet embedment below the finished grade. The actual depth will depend on refusal. It will be acceptable to have embedment depth of at least 9 feet below finished grade. Refer to the attached sketches for worst cases for different finished grades and top elevations. Sheet piles should be installed 1 foot clear of the property line.

ITEM NO. C-2

Sheet piles below graded are to be coated with coal tar epoxy-polyamide paint that conforms to SSPC-Paint No. 16. Steel + 1'-0" above grade may be uncoated.

ITEM NO. C-3

Timber facing on steel sheet piles shall be treated white oak, 6" x 8" nominal x 8' lengths, with joints staggered.

ITEM NO. C-4

It is intended that the Energy Recovery Ventilator is interlocked with Kitchen Exhaust Fan, KEF-1, to provide make-up air.

a. In "Unoccupied Mode", the bypass damper shall be open to allow exhaust air from the room to be used as return air for GFU-10A/10B.
b. In "Occupied Mode" as set by the local controller, bypass damper shall close and ERV shall run to provide pre-conditioned outside air to GFU-10A/10B; airflows of supply fan and exhaust fan shall be matched (1,600 cfm).
c. If kitchen exhaust fan, KEF-1, shall energize, the control signal shall override the 0-10V signal from the local controller/BMS and increase the supply fan to its maximum design capacity of 3,000 cfm to furnish additional make-up air for operation of the fan. GFU-10A/10B shall continue to run to maintain room setpoint. Motor-operated dampers for room return ducts at each gas furnace shall close.

Exhaust fans EF-1 and EF-2 shall run continuously.
Exhaust fan EF-3 interlock to local lighting circuit.
Exhaust fan EF-4 shall run continuously.
Exhaust fans EF-5 and EF-6 are energized via Hand-Off-Auto motor-starters. In the "Auto" mode, the fan shall be energize by a rise-in-temp thermostat or carbon monoxide/nitrogen dioxide detectors furnished and installed by electrical contractor

ITEM NO. C-5
Fire alarm calculations and shop drawings shall be furnished by Division 21 fire alarm contractor

ITEM NO. C-6
All steel beams, SB-2 in openings with brick shall be W8x24 with ½" steel plate welded to underside to carry brick across openings.

SPECIFICATIONS
ITEM NO. S-1
Delete Specifications Sections 101423, "Panel Signage" and 101423.16, "Room Identification Panel Signage" and replace with new Section 101423R, "Panel Signage" (enclosed).

ITEM NO. S-2
Add Specifications Section 237200, "Energy Recovery Units" (enclosed).

ITEM NO. S-3
Delete Specifications Page 000000-2 and replace with new Page 000000-2 (enclosed).

ITEM NO. S-4
Delete Specifications Page 000000-4and replace with new Page 000000-4 (enclosed).

ITEM NO. S-5
Specifications Page 134823-5, Line 8. Delete last word, "Lower", and replace with "Washington".

ITEM NO. S-6
Specification Section 22 42 00
Page 6, line 15. REVISE Shower Head Type to "Handheld". Basis-of-design shall be a Symmons S-9603-PLR with Temptrol Pressure Balancing Shower Valve. DELETE Temperature Indicator.
DELETE PARA 2.7 "Shower Receptors". All showers shall be pre-fab, domed units.
Para 2.11, page 11, ADD "folding transfer seat and grab bars". Basis-of-design: Freedom Showers 38-1/2" X 37-1/8" ADA transfer shower, Model APF3838BF1PRRF(L)(R) (depending on handing). Coordinate handing with architectural floor plans.

ITEM NO. S-7
Specification Section 22 13 16:
DELETE references to "ABS" and "Cellular Core".

ITEM NO. S-8

Specification Section 224200:

Para 2.10A CTL's disregard Section 2.10A.1,2, & 3. For lavatories shown in rooms 104, 209, & 210, furnish and install ZURN Z6950-XL-S-W1-TMV-HW6 faucet, single hole with undercounter thermostatic mixing valve and hard-wired power convertor. Circuit to local GFCI power circuit. For lavatories show in rooms 122, 123, 217, and 218 furnish and install KOHLER K-15199-4NDRA-CP single handle center set faucets with pop-up drain.

DRAWINGS

ITEM NO. D-1

Drawing A-4: Height of lettering (signage) as shown on Detail 1/A-4 to be 8". See Specifications Section 101419 for additional information.

ITEM NO. D-2

Drawing S-3: In all cases, note indicating, "Trusses by Others" shall read, "All trusses are by Contractor, to be designed by a licensed NJ Engineer".

ITEM NO. D-3

Drawing M0.4

"Add-on Coil Schedule" does not contain information for GFU-4, GFU-9 and (2) GFU-10. The contractor is to furnish and install cooling coils that match condensing units for each system and are AHRI compliant.

Provide 2" filter racks for all gas furnaces.

ITEM NO. D-4

Drawing M1.2

Outside air louver above General Office/Radio Room is an 18x18 Ruskin ELF6350DMP louver. Custom color by architect.

10" duct from GFU-5 shall terminate into an 18x12 Ruskin 6350DMP outside air louver above Maintenance 128.

Denlar Kitchen Hood exhaust fan shall run through ceiling of first floor and terminate at rear exterior wall with wall fan; not roof as noted on plan.

ITEM NO. D-5

Drawing M2.2

Extend 14x12 return air duct to GFU-10A and connect. GFU-10A & GFU-10B shall be controlled via a single thermostat. Provide balancing and motor-operated damper for return air duct.

Increase duct size from ERV-1 to GFU-10A and GFU-10B to 16" diameter.

ITEM NO. D-6

Drawing M2.2

Rename "KEF-6" as "EF-6".

ITEM NO. D-7
Drawing P0.1
DELETE note in "Plumbing Notes" stating "PVC piping shall not be used". PVC piping is permitted for sanitary waste & vent piping per Specification Section 22 13 16.
DELETE requirement in "Plumbing Notes" para 9. Testing B. for videoscoping.
REVISE trench drain specification for fixture "TD" to Zurn 886 with ductile iron slotted grate – Class C, made in USA or equal by ACO Drain.
ADD two (2) type "WH", referenced below.

ITEM NO. D-8
Drawing P2.1A
ADD (1) non-freeze wall hydrant outside of Turn-out Gear 111. Connect to domestic water mains with ¾" CW service with shutoff valve.

ITEM NO. D-9
Drawing P2.1B
ADD (1) non-freeze wall hydrant outside of Maintenance 128. Connect to domestic water mains with ¾" CW service with shutoff valve.

ITEM NO. D-10
Drawing E1.1
ADD manual pull station at main door entrance and Stair 4.

ITEM NO. D-11
Drawing E1.2
ADD elevator control smoke detector at lower landing of elevator.

ITEM NO. D-12
Drawing E2.1
ADD fire alarm strobe only device in Men's Locker/Shower 218 and Women's Locker/Shower 217.
ADD fire alarm horn strobe device in Men's Bunk 220 and Women's Bunk 219.
ADD combination carbon monoxide/smoke detector in Men's Bunk 220 and Women's Bunk 219.
ADD fire alarm horn strobe to Corridor 222.

ITEM NO. D-13
Drawing E2.2
ADD two (2) fire alarm horn strobes to Corridor 206.
ADD smoke detector for elevator lobby at Corridor 206.
ADD fire alarm strobe only in Men's 209 and Women's 210.
ADD dual input monitor module for Ansul system and control relay module for KEF-1.
ADD fire alarm horn strobe in Kitchen 215
ADD four (4) fire alarm horn strobes in Lounge 214.
ADD duct detector for ERV-1 supply air stream.

ADD manual pull station at each stairwell entrance (total: 2)
ADD smoke and heat detector at top of elevator shaft.

ITEM NO. D-14
Drawing E3.2
ADD two (2) type "D1" in Storage RM 114 with occupancy sensor switch and circuit to E1-27.
ADD three (3) 3-way switches for lighting control in Training Room 118.

ITEM NO. D-15
Drawing E4.1
ADD label "EM2" to exit sign in Officers 207.
ADD label "EM1.2" to exit sign in Conference 203.
RELOCATE "EM1" South on plan in elevator lobby of Corridor 206.

ITEM NO. D-16
Drawing E5.0
DELETE Fixture Type "X" from Light Fixture Schedule.
See revised light fixture schedule attached.
Note the following quantity revisions:

a. EM1: increased to 14 (+1)
b. EM1.2: decreased to 3 (-4)
c. P4: increase to 4 (+2) due to max LED tape length

ITEM NO. D-17
DELETE Drawing E5.0 and replace with the enclosed "TWP_WASHINGTON MEP-E5.0—R1.pdf"

ITEM NO. D-18
Sheet E1.1 REVISE wiring feeding Engine Bay cord reels to 10/3.

ITEM NO. D-19
Sheet E5.1 REVISE circuits F1-24, 35, 37, 39, 41 to 30A/1P breakers.

ITEM NO. D-20
Sheet E1.1:
Furnish and install (3) 20A circuits for emergency generator battery charging, heater, and controls. Circuit to Panel FM-33, 35, & 37
Furnish and install power junction boxes to electric hand dryers as follows:

- T.R. 104: FM-32
- Women's Locker 122: FM-34
- Men's Locker 123: FM-36

ITEM NO. D-21
Sheet E2.1
Furnish and install power junction boxes to electric hand dryers as follows:

- Men's 209: FM-38
- Women's 210: FM-40
- Women's Locker 217: FM-41
- Men's Locker 218: FM-42

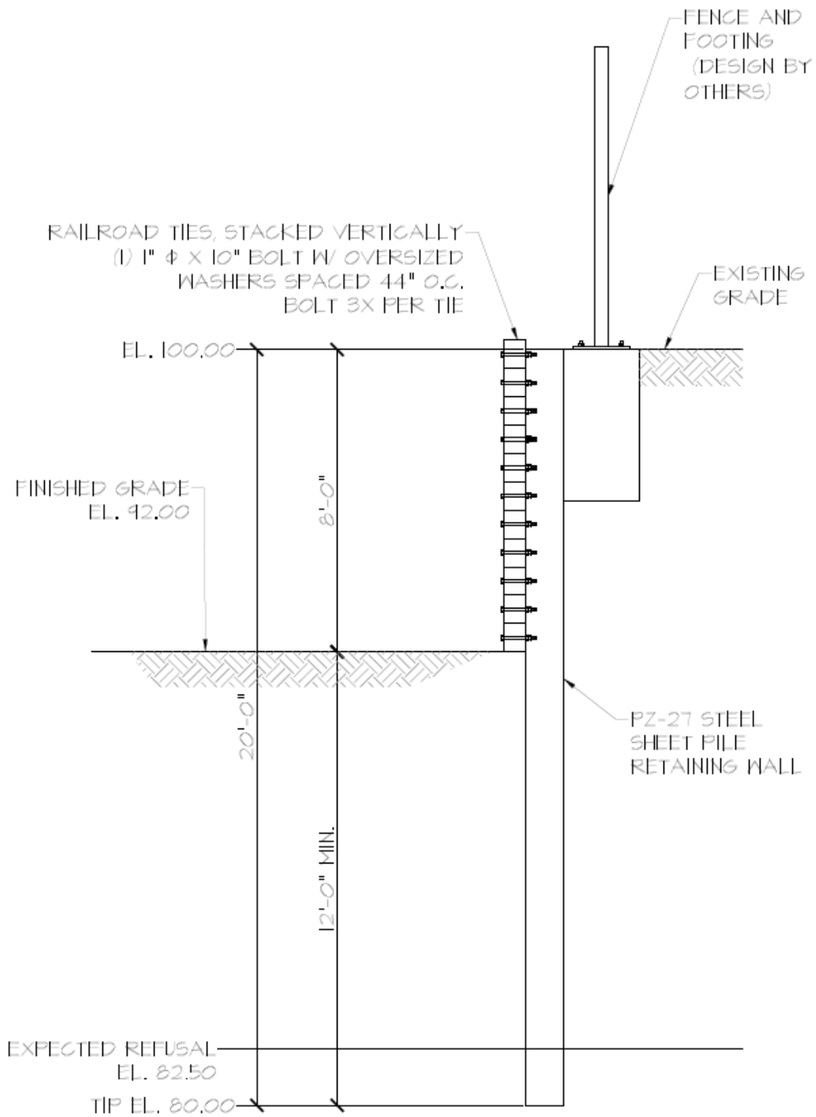
ITEM NO. D-22
Sheet E5.1
Increase panel "FM" to 60 circuits and furnish spares for the balance of circuits.

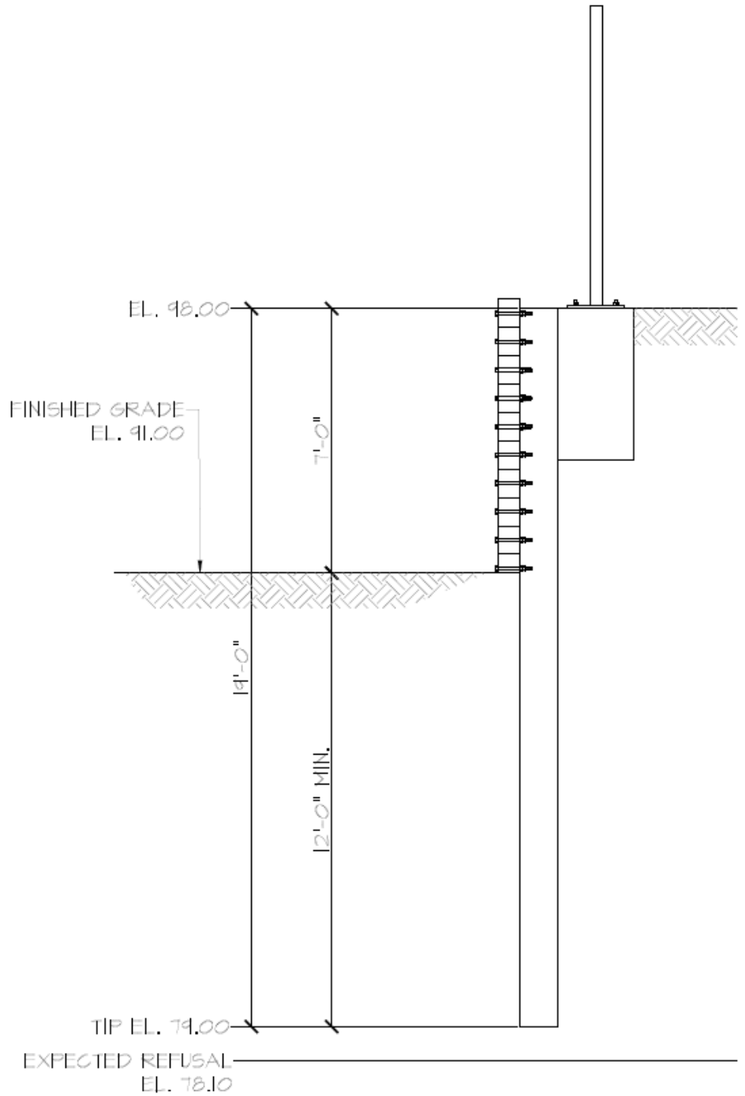
ITEM NO. D-23
Sheet E5.2
Increase panel "P2" to 72 circuits and furnish spares for the balance of circuits.

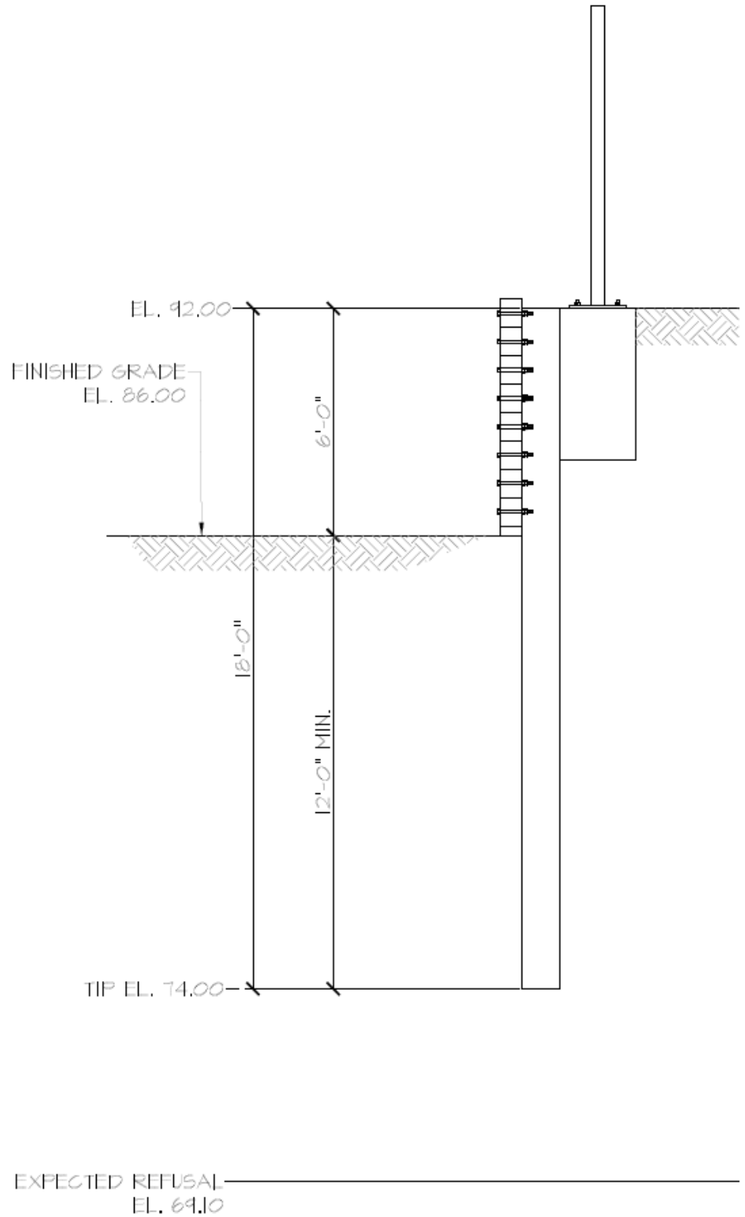
ITEM NO. D-24
DELETE Sheet S-2, and replace with new (enclosed).

ITEM NO. D-25
DELETE Sheet S-3, and replace with new (enclosed).

END OF DOCUMENT


FENCE AND FOOTING (DESIGN BY OTHERS)
RAILROAD TIES, STACKED VERTICALLY (1) 1" Φ X 10" BOLT W/ OVERSIZED WASHERS SPACED 44" O.C. BOLT 3X PER TIE
EXISTING GRADE
EL. 100.00
FINISHED GRADE EL. 92.00
8'-0"
20'-0"
12'-0" MIN.
PZ-27 STEEL SHEET PILE RETAINING WALL
EXPECTED REFUSAL EL. 82.50
TIP EL. 80.00


EL. 98.00
FINISHED GRADE EL. 91.00
7'-0"
14'-0"
12'-0" MIN.
TIP EL. 79.00
EXPECTED REFUSAL EL. 78.10


EL. 92.00
FINISHED GRADE EL. 86.00
6'-0"
18'-0"
12'-0" MIN.
TIP EL. 74.00
EXPECTED REFUSAL EL. 69.10

DIVISION 10 – SPECIALTIES
SECTION 101423 - PANEL SIGNAGE

GENERAL

SUMMARY

Section Includes:

Illuminated panel signs.

Room-identification signs.

DEFINITIONS

Accessible: In accordance with the accessibility standard.

Illuminated: Illuminated by lighting source integrally constructed as part of the sign unit.

COORDINATION

Furnish templates for placement of sign-anchorage devices embedded in permanent construction by other installers.

Furnish templates for placement of electrical service embedded in permanent construction by other installers.

ACTION SUBMITTALS

Product Data: For each type of product.

Shop Drawings: For panel signs.

Include fabrication and installation details and attachments to other work.

Show sign mounting heights, locations of supplementary supports to be provided by others, and accessories.

Show message list, typestyles, graphic elements, and layout for each sign at least half size.

Show locations of electrical service connections.

Include diagrams for power, signal, and control wiring.

Sign Schedule: Use same designations specified or indicated on Drawings or in a sign schedule.

Delegated-Design Submittal: For signs indicated in "Performance Requirements" Article.

Include structural analysis calculations for signs indicated to comply with design loads; signed and sealed by the qualified professional engineer responsible for their preparation.

CLOSEOUT SUBMITTALS

Maintenance Data: For signs to include in maintenance manuals.

QUALITY ASSURANCE

Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

FIELD CONDITIONS

Field Measurements: Verify locations of anchorage devices and electrical service embedded in permanent construction by other installers by field measurements before fabrication, and indicate measurements on Shop Drawings.

WARRANTY

Special Warranty: Manufacturer agrees to repair or replace components of signs that fail in materials or workmanship within specified warranty period.

Failures include, but are not limited to, the following:

Deterioration of finishes beyond normal weathering.

Deterioration of embedded graphic image.

Separation or delamination of sheet materials and components.

Warranty Period: Five years from date of Substantial Completion.

PRODUCTS

PERFORMANCE REQUIREMENTS

Delegated Design: Engage a qualified professional engineer, to design sign structure and anchorage of illuminated panel sign type(s) to withstand design loads as indicated on Drawings.

Generally retain "Thermal Movements" Paragraph below for exterior signs.

Thermal Movements: For exterior signs, allow for thermal movements from ambient and surface temperature changes.

Differential values in "Temperature Change" Subparagraph below (for aluminum in particular) are suitable for most of the U.S.

Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

Accessibility Standard: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines for Buildings and Facilities and ICC A117.1 for signs.

Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

SIGNS

Panel Sign: Sign with smooth, uniform surfaces; with message and characters having uniform faces, sharp corners, and precisely formed lines and profiles; and as follows:

Basis-of-Design Product: Indicated on Drawings.

Illuminated Panel Sign: Backlighted construction with LED lighting including transformers, insulators, and other accessories for operability, with provision for servicing and concealing connections to building electrical system. Use tight or sealed joint construction to prevent

unintentional light leakage. Space lamps apart from each other and away from sign surfaces as needed to illuminate evenly.

Power: As indicated on electrical Drawings.

Weeps: Provide weep holes to drain water at lowest part of exterior signs. Equip weeps with permanent baffles to block light leakage without inhibiting drainage.

Laminated Aluminum-Sheet Sign: Aluminum sheet laminated to both sides of acrylic core sheet with painted edges.

Composite-Sheet Thickness: Manufacturer's standard for size of sign.

Surface-Applied Graphics: Applied vinyl film.

Sign-Panel Perimeter: Finish edges smooth.

Edge Condition, Vertical Edges.

Corner Condition in Elevation: As indicated.

Frame: Entire perimeter.

Material: Aluminum.

Frame Depth: As indicated.

Profile: Rounded.

Corner Condition in Elevation: Rounded to radius indicated.

Finish and Color: As selected by Architect from manufacturer's full range.

Mounting: As indicated Projecting from wall

Surface Finish and Applied Graphics:

Baked-Enamel or Powder-Coat Finish and Graphics: Manufacturer's standard, in color as selected by Architect from manufacturer's full range.

Overcoat: Manufacturer's standard baked-on clear coating.

Text and Typeface: Typeface as selected by Architect from manufacturer's full range, and. Finish raised characters to contrast with background color, and finish Braille to match background color.

Flatness Tolerance: Sign panel shall remain flat or uniformly curved under installed conditions as indicated and within a tolerance of plus or minus 1/16 inch measured diagonally from corner to corner.

Room-Identification Sign As noted on Room Finish Schedule: Sign with smooth, uniform surfaces; with message and characters having uniform faces, sharp corners, and precisely formed lines and profiles; and as follows:

Laminated-Sheet Sign: Photopolymer face sheet with raised graphics laminated over subsurface graphics to acrylic backing sheet to produce composite sheet.

Size: 4” x 6” or manufacturers’ closest standard size or as required by code.
Composite-Sheet Thickness: Manufacturer's standard for size of sign.

Subsurface Graphics: Slide-in changeable insert.

Color(s): As selected by Architect from manufacturer's full range.

Sign-Panel Perimeter: Finish edges smooth.

Edge Condition: Beveled.

Corner Condition in Elevation: Square.

Frame: Aluminum.

Profile: Square.

Corner Condition in Elevation: Square.

Finish and Color: As selected by Architect from manufacturer's full range.

Mounting: Manufacturer's standard method for substrates indicated with

Text and Typeface: Accessible raised characters and Braille, typeface as selected by Architect from manufacturer's full range, and. Finish raised characters to contrast with background color, and finish Braille to match background color.

PANEL-SIGN MATERIALS

Aluminum Sheet and Plate: ASTM B 209, alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated.

Aluminum Extrusions: ASTM B 221, alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated.

Acrylic Sheet: ASTM D 4802, category as standard with manufacturer for each sign, Type UVF (UV filtering).

Vinyl Film: UV-resistant vinyl film of nominal thickness indicated, with pressure-sensitive, permanent adhesive on back; die cut to form characters or images as indicated and suitable for exterior applications.

Paints and Coatings for Sheet Materials: Inks, dyes, and paints that are recommended by manufacturer for optimum adherence to surface and are UV and water resistant for colors and exposure indicated.

ACCESSORIES

Fasteners and Anchors: Manufacturer's standard as required for secure anchorage of signage, noncorrosive and compatible with each material joined, and complying with the following:

Use concealed fasteners and anchors unless indicated to be exposed.

Retain "Inserts" Subparagraph below only for signs that require installation of anchorage devices embedded in permanent construction by other installers.

Inserts: Furnish inserts to be set by other trades into concrete or masonry work.

FABRICATION

General: Provide manufacturer's standard sign assemblies according to requirements indicated.

Preassemble signs and assemblies in the shop to greatest extent possible. Disassemble signs and assemblies only as necessary for shipping and handling limitations. Clearly mark units for reassembly and installation; apply markings in locations concealed from view after final assembly.

Mill joints to a tight, hairline fit. Form assemblies and joints exposed to weather to resist water penetration and retention.

Comply with AWS for recommended practices in welding and brazing. Provide welds and brazes behind finished surfaces without distorting or discoloring exposed side. Clean exposed welded and brazed connections of flux, and dress exposed and contact surfaces.

Conceal connections if possible; otherwise, locate connections where they are inconspicuous.

Internally brace signs for stability and for securing fasteners.

Provide rebates, lugs, and brackets necessary to assemble components and to attach to existing work. Drill and tap for required fasteners. Use concealed fasteners where possible; use exposed fasteners that match sign finish.

Subsurface-Engraved Graphics: Reverse engrave back face of clear face-sheet material. Fill resulting copy with manufacturer's standard enamel. Apply opaque manufacturer's standard background color coating over enamel-filled copy.

Signs with Changeable Message Capability: Fabricate signs to allow insertion of changeable messages as follows:

For snap-in changeable inserts beneath removable face sheet, furnish one suction or other device to assist in removing face sheet. Furnish initial changeable insert. Subsequent changeable inserts are by Owner.

For slide-in changeable inserts, fabricate slot without burrs or constrictions that inhibit function. Furnish initial changeable insert. Subsequent changeable inserts are by Owner.

For frame to hold changeable sign panel, fabricate frame without burrs or constrictions that inhibit function. Furnish initial sign panel. Subsequent changeable sign panels are by Owner.

GENERAL FINISH REQUIREMENTS

Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

Directional Finishes: Run grain with long dimension of each piece and perpendicular to long dimension of finished trim or border surface unless otherwise indicated.

Organic, Anodic, and Chemically Produced Finishes: Apply to formed metal after fabrication but before applying contrasting polished finishes on raised features unless otherwise indicated.

ALUMINUM FINISHES

Clear Anodic Finish: AAMA 611, Class I, 0.018 mm or thicker.

Baked-Enamel or Powder-Coat Finish: AAMA 2603 except with a minimum dry film thickness of 1.5 mils. Comply with coating manufacturer's written instructions for cleaning, conversion coating, and applying and baking finish.

EXECUTION

EXAMINATION

Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of signage work.

Verify that sign-support surfaces are within tolerances to accommodate signs without gaps or irregularities between backs of signs and support surfaces unless otherwise indicated.

Verify that electrical service is correctly sized and located to accommodate signs.

Proceed with installation only after unsatisfactory conditions have been corrected.

INSTALLATION

General: Install signs using mounting methods indicated and according to manufacturer's written instructions.

Install signs level, plumb, true to line, and at locations and heights indicated, with sign surfaces free of distortion and other defects in appearance.

Install signs so they do not protrude or obstruct according to the accessibility standard.

Before installation, verify that sign surfaces are clean and free of materials or debris that would impair installation.

Room-Identification Signs and Other Accessible Signage: Install in locations on walls, according to accessibility standard.

ADJUSTING AND CLEANING

Remove and replace damaged or deformed signs and signs that do not comply with specified requirements. Replace signs with damaged or deteriorated finishes or components that cannot be successfully repaired by finish touchup or similar minor repair procedures.

Remove temporary protective coverings and strippable films as signs are installed.

On completion of installation, clean exposed surfaces of signs according to manufacturer's written instructions, and touch up minor nicks and abrasions in finish. Maintain signs in a clean condition during construction and protect from damage until acceptance by Owner.

END OF SECTION 101423

PART 1 - GENERAL

1.1 SUMMARY

- This section includes Air-to-Air Energy Recovery Ventilators for indoor installation.
- Within this document, these units may be referred to as Energy Recovery Ventilator (ERV) for brevity.

1.2 RELATED

Drawing and general provisions of the contract, including General Requirements Division 01, Division 23, Division 23 Specifications Sections, and common work requirements for HVAC apply to work specified in this section.

- Section 23 09 00: Controls and Instrumentation

1.3 SUBMITTALS

- Product data: For each type or model of Energy Recovery Ventilator, include the following:
    - Unit performance data for both Supply Air and Exhaust Air, with system operating conditions indicated.
    - Enthalpy plate performance data for both summer and winter operation.
    - Motor ratings and unit electrical characteristics.
    - Dimensioned drawings for each type of installation, showing isometric and plan views, to include location of attached ductwork and service clearance requirements.
    - Estimated gross weight of each installed unit.
    - Filter types, quantities, and sizes
    - Installation, Operating and Maintenance manual (IOM) for each model.
- Shop Drawings: For air-to-air energy recovery ventilators, include plans, elevations, sections, details, and attachments to other work.
    - Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
    - Wiring Diagrams: For power, signal, and control wiring.
- Operation and maintenance data for air-to-air energy recovery ventilator

1.4 QUALITY ASSURANCE

- Source Limitations: Obtain Air-to-Air Energy Recovery Ventilator with all appurtenant components or accessories from a single manufacturer.
- For the actual fabrication, installation, and testing of work under this section, use only thoroughly trained and experienced workers completely familiar with the items required and with the manufacturer's current recommended methods of installation.
- The ERV core shall be warranted to be free of manufacturing defects and to retain its functional characteristics, under circumstances of normal use, for a period of ten (10) years from the date of purchase. The balance-of-unit shall be warranted to be free of manufacturing defects and to retain its functional characteristics, under circumstances of normal use, for a period of two (2) years from the date of installation.
- Manufacturer shall be able to provide evidence of independent testing of the core by Underwriters Laboratory (UL), verifying a maximum flame spread index (FSI) of 25 and a maximum smoke developed index (SDI) of 50 thereby meeting NFPA90A and NFPA 90B requirements for materials in a compartment handling air intended for circulation through a duct system. The method of test shall be UL Standard 723.
- Certifications:
    - The energy recovery cores used in these products shall be third party Certified by AHRI under its Standard 1060 for Energy Recovery Ventilators. AHRI published certifications shall confirm manufacturer’s published performance for airflow, static pressure, temperature and total effectiveness, purge air (OACF) and exhaust air leakage (EATR). Products that are not currently AHRI certified will not be accepted. OACF shall be no more than 1.02 and EATR shall be at 0% against balanced airflow.
    - Entire unit shall be listed under UL 1812 Standard for Ducted Air to Air Heat Exchangers and comply with CSA Standard 22.2.
- Every unit to be factory tested prior to shipping: Motor Dielectric Voltage-Withstand Bench Test, Unit Dielectric Voltage-Withstand Test, Continuity of Internal Control Circuits Test, Unit Amperage Test

1.5 COORDINATION

- Coordinate size and location of all building penetrations required for installation of each Energy Recovery Ventilator and associated plumbing and electrical systems.
- Coordinate sequencing of construction for associated plumbing, HVAC, electrical supply.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

- Available Manufacturers: Subject to compliance with specifications contained within this document, manufacturers offering products that may be incorporated into the work include, but are not limited to:
    - Loren Cook
    - Greenheck
    - RenewAire
- Manufacturer should be in business for minimum 10 years manufacturing energy recovery ventilators.

2.2 MANUFACTURED UNITS

- Air-to-Air Energy Recovery Ventilators shall be fully assembled at the factory and consist of a fixed-plate cross-flow heat exchanger with no moving parts, an insulated [single][double] wall [G90 galvanized][painted] 20-gauge steel cabinet, motorized outside air intake damper, filter assemblies for both intake and exhaust air, enthalpy core, supply air blower assembly, motorized exhaust air damper, exhaust air blower assembly and electrical control box with all specified components and internal accessories factory installed and tested and prepared for single-point high voltage connection. Entire unit with the exception of field-installed components shall be assembled and test operated at the factory.

2.3 CABINET

- Materials: Formed [single][double] wall insulated metal cabinet, fabricated to permit access to internal components for maintenance.
- Outside casing: 20 gauge, galvanized (G90) steel meeting ASTM A653 for components that do not receive a painted finish. [Painted components as supplied by the factory shall have polyester urethane paint on 20 gauge G90 galvanized steel.]
- Access doors shall be hinged with airtight closed cell foam gaskets. Door pressure taps, with captive plugs, shall be provided for cross-core pressure measurement allowing for accurate airflow measurement.
- Unit shall have factory-installed duct flanges on all duct openings.

- Cabinet Insulation: Unit walls and doors shall be insulated with 1 inch, 4 pound density, foil/scrim faced, high density fiberglass board insulation, providing a cleanable surface and eliminating the possibility of exposing the fresh air to glass fibers, and with a minimum R-value of 4.3 (hr-ft^2-°F/BTU).

- Enthalpy core: Energy recovery core shall be of the total enthalpy type, capable of transferring both sensible and latent energy between airstreams. Latent energy transfer shall be accomplished by direct water vapor transfer from one airstream to the other, without exposing transfer media in succeeding cycles directly to the exhaust air and then to the fresh air. No condensate drains shall be allowed. The energy recovery core shall be designed and constructed to permit cleaning and removal for servicing. The energy recovery core shall have a ten year warranty. Performance criteria are to be as specified in AHRI Standard 1060.

- Control center / connections: Energy Recovery Ventilator shall have an electrical control center where all high and low voltage connections are made. Control center shall be constructed to permit single-point high voltage power supply connections to the fused disconnect.

- Passive Frost Control: The ERV core shall perform without condensing or frosting under normal operating conditions (defined as outside temperatures above -10ºF and inside relative humidity below 40%). Occasional more extreme conditions shall not affect the usual function, performance or durability of the core. No condensate drains will be allowed.

- Motorized Isolation Damper(s): Exhaust Air and Fresh Air motorized damper(s) of an AMCA Class I leakage type shall be factory installed.

2.4 BLOWER SECTION

- Blower section construction, Supply Air and Exhaust Air: Blower assemblies consist of a 208-230V 3 Phase 60 HZ, TEFC motor, and a direct driven forward-curved blower.

- Blower assemblies: Shall be statically and dynamically balanced and designed for continuous operation at maximum rated fan speed and horsepower.

2.5 MOTORS

- Blower motors shall be Premium Efficiency, EISA compliant for energy efficiency. The blower motors shall be totally enclosed (TEFC) and be shall be supplied with factory installed motor starters.

2.6 UNIT CONTROLS

- Fan control: Onboard VFDs both airstreams.

- Bypass economizer control: Differential enthalpy control, 2 position dampers with 100% airflow through the core or 100% airflow bypassing the core.
- Sensors: Dirty filter monitor for both airstreams.
- Timeclock: Digital Time Clock [wall mount][mouting in outdoor, enclosed NEMA 3R enclosure], with up to 8 on/off cycles per day or 50 per week, 24VAC power, witrh battery backup protection of program settings against power failure to energize unit
- Motion (Occupancy) Sensor: Passive infrared sensor for [wall][ceiling] mounting with adjustable time-off delay to 30 minutes, 24VAC power to energize unit
- Carbon Dioxide: Adjustable control from 600 - 2000 PPM for [wall][duct] mounting with digital display
- Factory-installed microprocessor controller and sensors, Premium ERV controls that:
    - Comply with requirements in Division 23 Section "Sequence of Operations for HVAC Controls"
    - Has factory-installed hardware and software to enable the building automation interface via [Modbus][BACnet] to monitor, control, and display status and alarms
    - The microprocessor controller shall be capable of operating at temperatures between -20F to 160F
    - The microprocessor controller shall be a DIN rail mounting type
    - Factory-installed microprocessor controller shall come with backlit display that allows menu-driven display for navigation and control of unit
    - The microprocessor controller shall have the ability to communicate with the BMS via Modbus RTU/TCP and BACnet MSTP/IP
    - The microprocessor controller shall have integrated ethernet interface and a web server for displaying unit parameters
    - The microprocessor shall have near field communication (NFC) capability for android devices
    - The microprocessor controller shall have an internal programmable time clock that will allow the user to add up to different occupancy schedules and add holidays
    - The microprocessor control shall be capable of integral diagnostics
    - The microprocessor control shall be capable of IP or SI unit display

- The microprocessor controller shall have a battery powered clock
- The microprocessor controller shall at a minimum offer the ability for three modes of determining occupancy: a dry contact, the internal time clock or the BMS
- A remote user terminal to allow for remote monitoring and adjustment of parameters, allowing ease of control access without going outdoors or into the mechanical room if desired by the user
- The microprocessor controller shall have at a minimum (10) universal inputs/outputs (AI, DI, AO) and have (6) six relay outputs (DO)
- The microprocessor controller shall have an integrated fieldbus port
- The microprocessor controller shall have the capability for I/O expansion
- The microprocessor controller shall have a micro USB port to load the application program, the unit parameters, saving logs, etc.
- The sensors that will be required for control are:
  - (2) Temperature sensor for fresh air and exhaust air
  - (2) Temperature and humidity sensor for outside air, return air
  - (2) Differential pressure sensors for filter alarms
  - [(2) Differential pressure sensors for measuring pressure drop across energy recovery core and for determining airflow in both airstreams]
  - (2) Adjustable current switches
  - Field-installed duct or room CO2 sensor
  - Field-installed room pressurization sensor
- The microprocessor controller shall have the capability to monitor the unit conditions for alarm conditions. Upon detecting an alarm, the microprocessor controller shall have the capability to record the alarm description, time, date, available temperatures, and unit status for user review. A digital output shall be reserved for remote alarm indication. Alarms to be also communicated via BMS as applicable. Provide the following alarm functions:
  - Outside air temperature sensor alarm
  - Outside air humidity sensor alarm

- Return air temperature sensor alarm
- Return air humidity sensor alarm
- Fresh air sensor alarm
- Exhaust air sensor alarm
- Dirty filter alarm

- Display the following on the face of microprocessor controller:
  - Unit on
  - Unit economizer/bypass mode
  - Outdoor air temperature
  - Outdoor air humidity
  - Return air temperature
  - Return air humidity
  - Supply air temperature
  - Unit on/off
  - Fan on/off
  - Damper status
  - Alarm digital display
- The microprocessor controller shall have factory pre-programmed multiple operating sequences for control of the ERV. Factory default settings shall be fully adjustable in the field. Available factory pre-programmed sequences on operations are:

SEQUENCE OF OPERATIONS

DDC CONTROLLER:

- Controller with integral LCD readout for changing set points and monitoring unit operation.
- Provided with required sensors and programming.
- Factory programmed, mounted, and tested.
- Integral USB and Ethernet ports for updating programs and retrieving log files.

BMS INTERFACE:

- BACnet IP

GENERAL OPERATION

POWER UP:

- When the unit main disconnect is closed a delay of 10 seconds (adjustable) occurs for the controller to come online.

ERV UNIT START COMMAND:

- An input signal is required to enable the unit operation. The unit will be commanded on by:
    - BMS command
    - Enable via controller display
- All types of input that are enabled must be true before the unit will start.
    - The exhaust fan starts after a 3 second delay (adjustable). The exhaust fan will not start until the damper actuator end switch closes.
    - The supply fan starts after a 6 second delay (adjustable). The supply fan will not start until the damper actuator end switch closes.
    - The supply fan, exhaust fan, economizer are controlled based on the chosen unit operating modes and air conditions.

ERV UNIT STOP COMMAND (OR DE-ENERGIZED):

- The unit can then be commanded off by:
    - BMS command
    - Disable via controller display
- Supply fan and exhaust fan are de-energized.
- All dampers are unpowered and spring return to their default position after a 10 second delay (adjustable).

SUPPLY FAN OPERATION:

- The supply fan speed will be controlled for:
    - When commanded “ON”, the fan shall run to match exhaust fan CFM (1,600 cfm). When the kitchen exhaust fan is energized, the supply fan VFD shall go to 100% operation to supply make-up air via the air handler system. The return-side motor-operated dampers at each air handler shall close allowing 100% pre-conditioned air through the air handlers.

- The unit will attempt to start the supply fan when the supply fan delay timer expires. When the supply fan starts the supply fan adjustable current switch should close and remain closed until the fan is turned off.

SUPPLY FAN STATUS:

After a delay of 90 seconds (adjustable) from supply fan start signal, if the supply fan current switch is still open the supply fan alarm should be set to true and [heating], [cooling] operation shall be prohibited. The supply fan status shall be set to true only when the supply fan output is on and supply fan current switch is closed. The supply fan status shall be false in all other circumstances.

SUPPLY AIR FLOW CONTROL OPTION:

The controller will adjust the supply fan VFD command to maintain the supply air flow rate at a set point. The supply air flow rate set point is entered and adjusted from the unit controller display or provided by the BMS. The minimum and maximum values for supply air flow rate set point are unit dependent. An adjustable PI (proportional & integral) loop will compare the measured supply air flow to the air flow rate set point and adjust the fan speed. If the measured supply air flow rate varies from the desired air flow rate by more than 10% (adjustable) for more than 60 seconds (adjustable) a supply air flow rate alarm will be set to true. This supply fan operation mode can be used to provide a constant supply air flow rate as the unit filters become loaded.

EXHAUST FAN OPERATION:

- The exhaust fan will operate at a constant speed.

- The unit will attempt to start the exhaust fan when the exhaust fan delay timer expires. When the exhaust fan starts the exhaust fan adjustable current switch should close and remain closed until the fan is turned off.

EXHAUST FAN STATUS:

After a delay of 90 seconds (adjustable) from exhaust fan start signal, if exhaust fan current switch is still open the exhaust fan alarm should be set to true. The exhaust fan status shall be set to true only when the exhaust fan output is on and exhaust fan current switch is closed. The exhaust fan status shall be false in all other circumstances.

FIXED FAN SPEED OPTION:

The analog voltage command to the exhaust fan VFD can be set from the unit controller display [or provided by the BMS]. The adjustable range of 0% to 100% correspond to the minimum and maximum fan operating speed (0 VDC minimum to 10 VDC maximum, adjustable). This exhaust fan operation mode can be used to field balance the exhaust air flow rate.

ECONOMIZER (BYPASS) OPERATION:

During normal operation the bypass damper shall remain closed and the face damper open to allow full energy recovery. During economizer operation the bypass damper will be open and the face damper will close to bypass the core. The economizer state can be controlled by temperature or enthalpy.

TEMPERATURE:

- The economizer will be locked out when:
  - The outside air temperature is less than the economizer adjustable low lockout.
  - The outside air temperature is greater than the economizer adjustable high lockout.

ENTHALPY:

- The economizer will be locked out when:
  - The outside air enthalpy is greater than return air enthalpy.
  - The outside air temperature is less than the economizer field adjustable low lockout.

2.7 FILTER SECTION

- ERV shall have 2" thick MERV 13 disposable pleated filters located in the outdoor air and exhaust airstreams. All filters shall be accessible from the exterior of the unit.

PART 3 – EXECUTION

3.1 EXAMINATION

- Prior to start of installation, examine area and conditions to verify correct location for compliance with installation tolerances and other conditions affecting unit performance. See unit IOM.
- Examine roughing-in of plumbing, electrical and HVAC services to verify actual location and compliance with unit requirements. See unit IOM.
- Proceed with installation only after all unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- Installation shall be accomplished in accordance with these written specifications, project drawings, manufacturer’s installation instructions as documented in manufacturer’s IOM, Best Practices and all applicable building codes.
- Install unit with clearances for service and maintenance.

3.3 CONNECTIONS

In all cases, industry Best Practices shall be incorporated. Connections are to be made subject to the installation requirements shown above.

- Duct installation and connection requirements are specified in Division 23 of this document.

- Electrical installation requirements are specified in Division 26 of this document.

3.4 FIELD QUALITY CONTROL

- Contractor to inspect field assembled components and equipment installation, to include electrical and piping connections. Report results to Architect/Engineer in writing. Inspection must include a complete startup checklist to include (as a minimum) the following: Completed Start-Up Checklists as found in manufacturer's IOM. Insert any other requirements here.

3.5 START-UP SERVICE

- Contractor to perform startup service. Clean entire unit, comb coil fins as necessary, and install clean filters. Verify water source for compliance with manufacturer's requirements for flow and temperature. Measure and record electrical values for voltage and amperage. Refer to Division 23 "Testing, Adjusting and Balancing" and comply with provisions therein.

3.6 DEMONSTRATION AND TRAINING

- Contractor to train owner's maintenance personnel to adjust, operate and maintain the entire Make-Up Air unit. Refer to Division 01 Section Closeout Procedures and Demonstration and Training.

END OF SECTION

Section 076200 SHEET METAL FLASHING AND TRIM
Section 077253 SNOW GUARDS
Section 079200 JOINT SEALANTS

DIVISION 08 – OPENINGS

Section 081213 HOLLOW METAL FRAMES
Section 081416 FLUSH WOOD DOORS
Section 081613 FIBERGLASS REINFORCED POLYESTER (FRP) DOORS AND ALUMINUM FRAMES
Section 083600 SECTIONAL DOORS
Section 085213 ALUMINUM CLAD WOOD WINDOWS
Section 085413 FIBERGLASS WINDOWS
Section 087100 DOOR HARDWARE
Section 088000 GLAZING

DIVISION 09 – FINISHES

Section 092900 GYPSUM BOARD
Section 093013 CERAMIC TILING
Section 095113 ACOUSTICAL PANEL CEILINGS
Section 096513 RESILIENT BASE AND ACCESSORIES
Section 096723 RESINOUS FLOORING
Section 096813 CARPET TILES
Section 097720 FIBERGLASS REINFORCED WALL PANELS
Section 099113 EXTERIOR PAINTING
Section 099123 INTERIOR PAINTING
Section 099300 STAINING AND TRANSPARENT FINISHES
Section 099600 HIGH-PERFORMANCE COATINGS

DIVISION 10 – SPECIALTIES

Section 101416 PLAQUES
Section 101419 DIMENSIONAL LETTER SIGNAGE
Section 101423 PANEL SIGNAGE - Replaced with new
Section 101423.16 ROOM-IDENTIFICATION PANEL SIGNAGE - Deleted
Section 102113.19 PLASTIC TOILET COMPARTMENTS
Section 102600 WALL AND DOOR PROTECTION
Section 102800 TOILET, BATH, AND LAUNDRY ACCESSORIES
Section 103400 CUPOLA
Section 104413 FIRE PROTECTION CABINETS
Section 105113 METAL VENTED WARDROBE LOCKERS
Section 107516 GROUND-SET FLAGPOLES
Section 109990 BACK LIGHTED FLUSH MOUNTED CLOCKS

DIVISION 11 – EQUIPMENT

Section 113100 RESIDENTIAL APPLIANCES

Section 236313 AIR-COOLED REFRIGERANT CONDENSERS
Section 238200 CONVECTION HEATING AND COOLING UNITS
Section 238216 AIR COILS
Section 237200 ENERGY RECOVERY UNITS

DIVISION 25– INTEGRATED AUTOMATION

Not Used

DIVISION 26 – ELECTRICAL

Section 260500 COMMON WORK RESULTS FOR ELECTRICAL
Section 260519 LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES
Section 260526 GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS
Section 260529 HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS
Section 260533 RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS
Section 260553 IDENTIFICATION FOR ELECTRICAL SYSTEMS
Section 262400 SWITCHBOARDS AND PANELBOARDS
Section 262416 PANELBOARDS
Section 262700 LOW-VOLTAGE DISTRIBUTION EQUIPMENT
Section 262726 WIRING DEVICES
Section 262800 LOW-VOLTAGE CIRCUIT PROTECTIVE DEVICES
Section 262816 ENCLOSED SWITCHES AND CIRCUIT BREAKERS
Section 263200 PACKAGED ENGINE GENERATORS
Section 263213.13 DIESEL-ENGINE GENERATOR SETS
Section 265000 LIGHTING
Section 265100 INTERIOR LIGHTING

DIVISION 27 – COMMUNICATIONS

Not Used

DIVISION 28 – ELECTRONIC SAFETY AND SECURITY

Section 284620 FIRE ALARM

DIVISION 31 – EARTHWORK

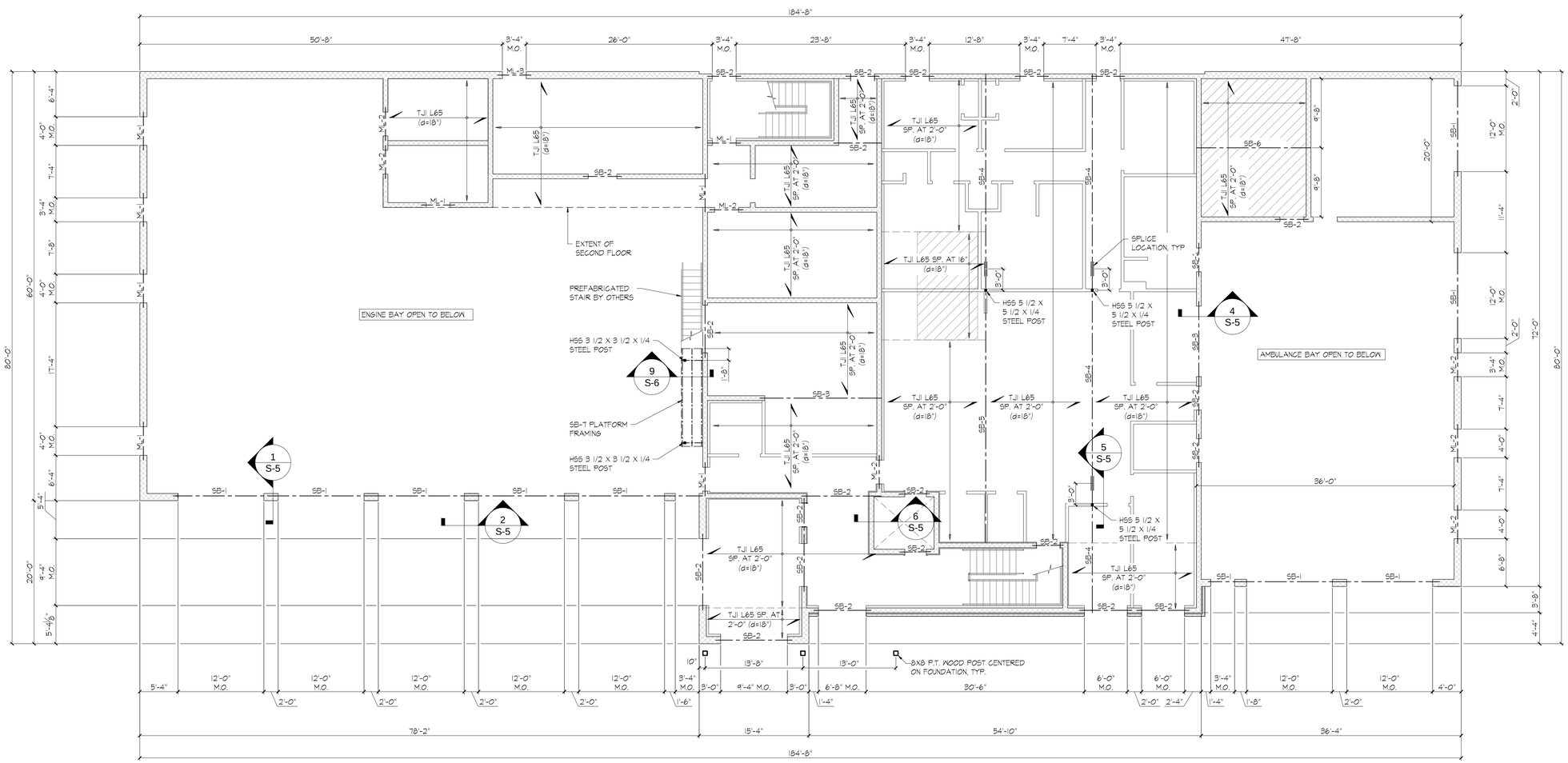
Section 312100 EARTH WORK
Section 316216.13 STEEL SHEET PILES

DIVISION 32 – EXTERIOR IMPROVEMENTS

Section 321313 CONCRETE PAVING

DIVISION 33 – UTILITIES

Not Used



LEGEND

CMU	-	CONCRETE MASONRY UNIT
CONC.	-	CONCRETE
EMBED.	-	EMBEDMENT
E.W.	-	EACH WAY
FTG.	-	FOOTING
H.D.G.	-	HOT DIPPED GALVANIZED
HORIZ.	-	HORIZONTAL
MAX.	-	MAXIMUM
MIN.	-	MINIMUM
M.O.	-	MASONRY OPENING
PSI	-	POUNDS PER SQUARE INCH
P.T.	-	PRESSURE TREATED
REINF.	-	REINFORCED
SP.	-	SPACING
STD. HK.	-	STANDARD HOOK
TYP.	-	TYPICAL
U.N.O.	-	UNLESS NOTED OTHERWISE
VERT.	-	VERTICAL

STEEL BEAMS	
I.D.	BEAM
SB-1	W10x26
SB-2	W8X24
SB-3	W12x26
SB-4	W16x40
SB-5	W18X50
SB-6	W10X30
SB-7	W6X15

NOTE:
3/8" X 7 1/2" H.D.G. CONTINUOUS STEEL PLATE W/ 5/8" DIA. X 3" H.D.G. WELDED SHEAR STUDS SP. AT 48" MAX. AT EACH SB-2 WHERE BRICK OR CMU IS PRESENT.

MASONRY LINTELS				
I.D.	WIDTH (IN)	DEPTH (IN)	REINFORCEMENT	BOTTOM CLEAR COVER (IN)
ML-1	8	8	2 - #5	1 1/2
ML-2	12	8	2 - #5	1 1/2

- AREA RATED FOR 250 PSF LIVE LOAD DESIGNATED FOR HEAVY STORAGE. ALL OTHER AREAS OF SECOND FLOOR ARE RATED FOR A MAXIMUM OF 100 PSF LIVE LOAD.

SECOND FLOOR FRAMING

OVER FIRST FLOOR PLAN SCALE: 1/8" = 1'-0"

SCALE: 1/8" = 1'-0"

4' 0 4' 8' 16'

SCALE IN INCHES

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ARH ASSOCIATES certificate of authorization NJ no. 24GA27973300, DE no. 2167

HEATHER B SABETTA
PROFESSIONAL ENGINEER
NEW JERSEY LICENSE No. 54567

SHEET TITLE: SECOND FLOOR FRAMING PLAN

PROJECT
TOWNSHIP OF WASHINGTON
EMERGENCY SERVICES COMPLEX
656 WASHINGTON AVENUE
TWP. OF WASHINGTON, NJ 07676

OWNER
TOWNSHIP OF WASHINGTON
350 HUDSON AVENUE
TWP. OF WASHINGTON, NJ 07676

CONTRACTOR SHALL CHECK AND VERIFY ALL CONDITIONS AND DIMENSIONS AT THE SITE BEFORE PROCEEDING WITH WORK.

REVISIONS

DESCRIPTION	DATE

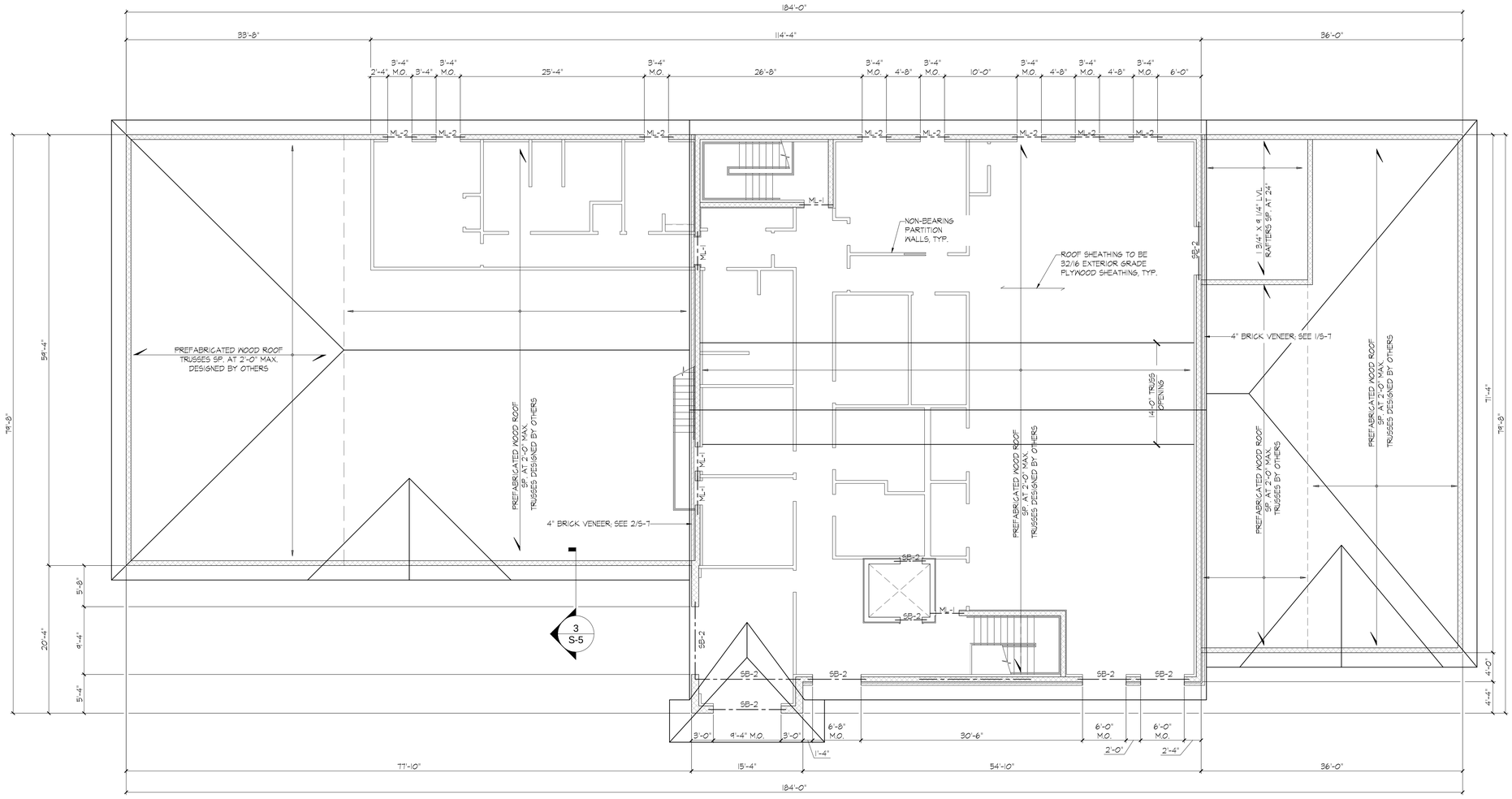
ISSUE DATE: JULY 06, 2020
DRAWN: XXX CHKD: RJC

DWG. NO. S-2
23 of 67

PROJECT NO. 18053

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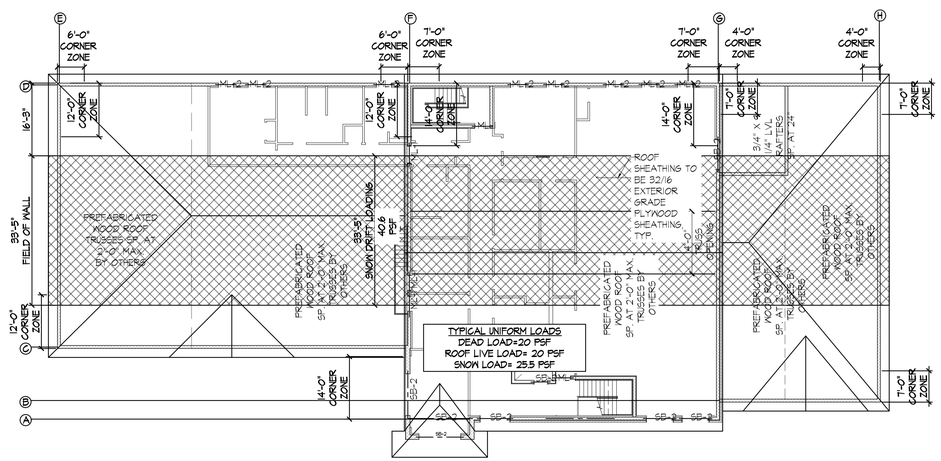
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ROOF FRAMING

OVER SECOND FLOOR PLAN SCALE: 1/8" = 1'-0"

LEGEND		
CMU	-	CONCRETE MASONRY UNIT
CONC.	-	CONCRETE
EMBED.	-	EMBEDMENT
E.W.	-	EACH WAY
FTG.	-	FOOTING
H.D.G.	-	HOT DIPPED GALVANIZED
HORIZ.	-	HORIZONTAL
MAX.	-	MAXIMUM
MIN.	-	MINIMUM
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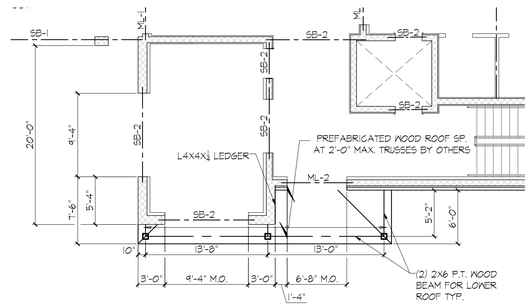
ROOF LOADING DIAGRAM

SCALE: 1/16" = 1'-0"

WIND LOADING							
WALL LINE I.D.	LENGTH OF CORNER ZONE (FT)	CORNER ZONE		FIELD OF WALL		IN-PLANE SHEAR (LB/FT)	NOTES
		UPLIFT (LB/FT)	OUT-OF-PLANE SHEAR (LB/FT)	UPLIFT (LB/FT)	OUT-OF-PLANE SHEAR (LB/FT)		
A	6	-135	185	-90	140	50	FOR ADMIN BLDG. LOWER ROOF
A	14	-35	320	62	250	50	FOR ADMIN BLDG. UPPER ROOF
B	7	-185	260	-90	450	50	FOR AMBULANCE BAY
C	12	0	231	85	153	50	FOR ENGINE BAY
D	SEE DWG.	MATCH WALLS A, B & C FOR BUILDING TYPE					
E	6	0	231	0	153	50	FOR ENGINE BAY
F	6	0	231	0	153	50	FOR ENGINE BAY
F	7	0	185	0	140	50	FOR ADMIN BLDG.
G	7	0	185	0	140	50	FOR ADMIN BLDG.
G	4	0	260	0	450	50	FOR AMBULANCE BAY
H	4	0	260	0	450	50	FOR AMBULANCE BAY

NOTE: UPLIFT LOADING BASED ON LOAD COMBINATION .6DL+.6WL

NOTE: POSITIVE NUMBER MEANS DOWNWARD FORCE FOR UPLIFT



PARTIAL ROOF FRAMING

OVER FRIST FLOOR PLAN SCALE: 1/8" = 1'-0"

SCALE: 1/8" = 1'-0"

4' 0 4' 8' 16'

SCALE IN INCHES

SCALE: 1/16" = 1'-0"

8' 0 8' 16' 32'

SCALE IN INCHES

ARH ASSOCIATES
certificate of authorization
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Heather Sabetta
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N.J. LIC. NO. 21AC00069700 NCARB CERT. NO. 52314 PA. LIC. NO. AX0042651

SHEET TITLE: ROOF FRAMING PLAN

PROJECT: TOWNSHIP OF WASHINGTON
EMERGENCY SERVICES COMPLEX
656 WASHINGTON AVENUE
TWP. OF WASHINGTON, NJ 07676

OWNER: TOWNSHIP OF WASHINGTON
350 HUDSON AVENUE
TWP. OF WASHINGTON, NJ 07676

CONTRACTOR SHALL CHECK AND VERIFY ALL CONDITIONS AND DIMENSIONS AT THE SITE BEFORE PROCEEDING WITH WORK.

REVISIONS

DESCRIPTION	DATE

ISSUE DATE: JULY 06, 2020

DRAWN: XXX CHK'D: RJC

DWG. NO. S-3

24 of 67

PROJECT NO: 18053

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FILE PATH: C:\Users\jmorris\Desktop\Revit Files\18053_SB-2020_cjmorris.rvt
PRINTED & TIME: August 19, 2020 7:39 pm

Branch Panel: EM

Location:
Supply From:
Mounting: Surface
Enclosure: Type 1

Volts: 120/208 Wye
Phases: 3
Wires: 4

A.I.C. Rating:
Mains Type:
Mains Rating: 200 A
MCB Rating:

Notes:

CKT	Circuit Description	Wire Size	Trip	Poles	A		B		C		Poles	Trip	Wire Size	Circuit Description	CKT
1	CU-4	2-#6, 1-#6, 1-#10	50 A	2	3.4 kVA	1.7 kVA					2	25 A	2-#10, 1-#10, 1-#10	CU-3	2
3	--	--	--	--			3.4 kVA	1.7 kVA			--	--	--	--	4
5	CU-5	2-#8, 1-#8, 1-#10	40 A	2					2.5 kVA	0.4 kVA	1	20 A	1-#12, 1-#12, 1-#12	TELEDATA BOARD	6
7	--	--	--	--	2.5 kVA	9.0 kVA					3	100 A	3-#1, 1-#1, 1-#8	E1 SUBPANEL	8
9	EF-6	3-#12, 1-#12, 1-#12	20 A	3			0.0 kVA	5.6 kVA			--	--	--	--	10
11	--	--	--	--					0.0 kVA	8.9 kVA	--	--	--	--	12
13	--	--	--	--	0.0 kVA	0.0 kVA					1	20 A	--	SPARE	14
15	30A CORD REEL EMS SIDE BAY	1-#10, 1-#10, 1-#10	30 A	1			0.2 kVA	0.0 kVA			1	20 A	--	SPARE	16
17	GFU-3	1-#12, 1-#12, 1-#12	20 A	1					0.0 kVA	0.0 kVA	1	20 A	--	SPARE	18
19	EXTERIOR LTG	1-#12, 1-#12, 1-#12	20 A	1	0.3 kVA	0.0 kVA					1	20 A	--	SPARE	20
21	CONV PWR	1-#12, 1-#12, 1-#12	20 A	1			0.4 kVA	0.0 kVA			1	20 A	--	SPARE	22
23	EMS SIGNAGE VIA PHOTOCELL & TIMECLOCK	1-#12, 1-#12, 1-#12	20 A	1					1.0 kVA	0.0 kVA	1	20 A	--	SPARE	24
25	Power	1-#12, 1-#12, 1-#12	20 A	1	1.4 kVA	0.0 kVA					--	--	--	SPACE	26
27	SPACE	--	--	--			0.0 kVA	0.0 kVA			--	--	--	SPACE	28
29	SPACE	--	--	--					0.0 kVA	0.0 kVA	--	--	--	SPACE	30
31	SPACE	--	--	--	0.0 kVA	0.0 kVA					--	--	--	SPACE	32
33	SPACE	--	--	--			0.0 kVA	0.0 kVA			--	--	--	SPACE	34
35	SPACE	--	--	--					0.0 kVA	0.0 kVA	--	--	--	SPACE	36
37	SPACE	--	--	--	0.0 kVA	0.0 kVA					--	--	--	SPACE	38
39	SPACE	--	--	--			0.0 kVA	0.0 kVA			--	--	--	SPACE	40
41	SPACE	--	--	--					0.0 kVA	0.0 kVA	--	--	--	SPACE	42
			Total Load:		17.9 kVA		11 kVA		13 kVA						
			Total Amps:		151 A		93 A		108 A						

Legend:

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals	
HVAC	15062 VA	100.00%	15062 VA		
Lighting	2223 VA	125.00%	2779 VA	**Total Conn. Load:**	41866 VA
Lighting - Exterior	300 VA	125.00%	375 VA	**Total Est. Demand:**	35853 VA
Motor	3800 VA	65.00%	2470 VA	**Total Conn. Current:**	116 A
Other	0 VA	0.00%	0 VA	**Total Est. Demand Current:**	100 A
Power	1000 VA	65.00%	650 VA		
Receptacle	19780 VA	75.28%	14890 VA		

Notes:

Branch Panel: E1

Location:
Supply From: EM
Mounting: Surface
Enclosure: Type 1

Volts: 120/208 Wye
Phases: 3
Wires: 4

A.I.C. Rating: 42,000
Mains Type:
Mains Rating: 100 A
MCB Rating:

Notes:

CKT	Circuit Description	Wire Size	Trip	Poles	A		B		C		Poles	Trip	Wire Size	Circuit Description	CKT
1	WOMEN'S BUNK PWR	1-#12, 1-#12, 1-#12	20 A	1	0.9 kVA	0.7 kVA					1	20 A	1-#12, 1-#12, 1-#12	MEN'S BUNK PWR	2
3	QUIET ROOM PWR	1-#12, 1-#12, 1-#12	20 A	1			1.1 kVA	0.4 kVA			1	20 A	1-#12, 1-#12, 1-#12	GAS DRYER	4
5	MAINTENANCE PWR 2	1-#12, 1-#12, 1-#12	20 A	1					0.9 kVA	0.5 kVA	1	20 A	1-#12, 1-#12, 1-#12	LRG EQUIP. STORAGE PWR	6
7	STORAGE AND TRAINING RM PWR	1-#12, 1-#12, 1-#12	20 A	1	0.7 kVA	1.1 kVA					1	20 A	1-#12, 1-#12, 1-#12	CAPTAIN PWR	8
9	RADIO RM PWR	1-#12, 1-#12, 1-#12	20 A	1			0.7 kVA	0.7 kVA			1	20 A	1-#12, 1-#12, 1-#12	STORAGE PWR 3	10
11	MED STORAGE PWR	1-#12, 1-#12, 1-#12	20 A	1					0.9 kVA	0.9 kVA	1	20 A	1-#12, 1-#12, 1-#12	AMBULANCE BAY PWR 1	12
13	AMBULANCE BAY PWR 2	1-#12, 1-#12, 1-#12	20 A	1	0.7 kVA	0.4 kVA					1	20 A	1-#12, 1-#12, 1-#12	LCOKER ROOM PWR 1	14
15	LOCKER ROOM PWR 2	1-#12, 1-#12, 1-#12	20 A	1			0.4 kVA	0.4 kVA			1	20 A	1-#12, 1-#12, 1-#12	INFRARED HEATER PWR	16
17	STORAGE RM PWR	1-#12, 1-#12, 1-#12	20 A	1					0.5 kVA	0.7 kVA	1	20 A	1-#12, 1-#12, 1-#12	HALL PWR	18
19	WASHER PWR 2	1-#12, 1-#12, 1-#12	20 A	1	1.2 kVA	0.7 kVA					1	20 A	1-#12, 1-#12, 1-#12	RADIO RM PWR	20
21	LAUNDRY CKT	1-#12, 1-#12, 1-#12	20 A	1			0.5 kVA	0.6 kVA			1	20 A	1-#12, 1-#12, 1-#12	Motor	22
23	BAY LIGHTING	1-#8, 1-#8, 1-#8	20 A	1					2.2 kVA	0.6 kVA	1	20 A	1-#12, 1-#12, 1-#12	Motor	24
25						0.6 kVA					1	20 A	1-#12, 1-#12, 1-#12	EMS BAY 3 JACK PWR	26
27								0.6 kVA			1	20 A	1-#12, 1-#12, 1-#12	EMS BAY 4 JACK PWR	28
29	MED STORAGE PWR	1-#12, 1-#12, 1-#12	20 A	1					1.4 kVA						30
31	MED STORAGE PWR	1-#12, 1-#12, 1-#12	20 A	1	1.4 kVA										32
33	AMBULANCE BAY CORD REELS	1-#10, 1-#10, 1-#10	30 A	1			0.2 kVA	0.0 kVA			1	20 A	--	SPARE	34
35	AMBULANCE BAY CORD REELS	1-#10, 1-#10, 1-#10	30 A	1					0.2 kVA	0.0 kVA	1	20 A	--	SPARE	36
37	LOUNGE TV PWR	1-#12, 1-#12, 1-#12	20 A	1	0.5 kVA	0.0 kVA					1	20 A	--	SPARE	38
39								0.0 kVA			1	20 A	--	SPARE	40
41										0.0 kVA	1	20 A	--	SPARE	42
			Total Load:		9.0 kVA		6 kVA		9 kVA						
			Total Amps:		79 A		46 A		79 A						

Legend:

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals	
Lighting	2223 VA	125.00%	2779 VA		
Motor	2400 VA	65.00%	1560 VA	**Total Conn. Load:**	23503 VA
Other	0 VA	0.00%	0 VA	**Total Est. Demand:**	18779 VA
Receptacle	18880 VA	76.48%	14440 VA	**Total Conn. Current:**	65 A
				Total Est. Demand Current:	52 A

Notes:

1

LIGHT SWITCH SCHEDULE

QTY	DESCRIPTION	MANUFACTURER	MODEL
11	3-WAY DIMMER, DECORA	LEVITON	DDMX1-BLZ
6	3-WAY SWITCH	LEVITON	
16	1000W DIMMER SWITCH	LEVITON	DDMX1-BLZ
11	DUAL TECHNOLOGY OCCUPANCY SWITCH, PASSIVE INFRARED AND ULTRASONIC	LEVITON	OSSMT-GDW
14	SINGLE POLE SWITCH	LEVITON	

RECEPTACLE DEVICE SCHEDULE

QTY	DESCRIPTION	MANUFACTURER	MODEL
8			
38	BLACK DEVICE WITH STAINLESS STEEL FACEPLATE	LEVITON	G5262-B
3	DUPLEX RECEPTACLE, BLACK, DECORA WITH STAINLESS COVERPLATE	LEVITON	16242-B
136	DUPLEX RECEPTACLE, WHITE, DECORA WITH WHITE COVERPLATE	LEVITON	16242-W
62	GFCI PROTECTED DEVICE, WHITE, WITH WHITE COVERPLATE AND GFCI LABEL	LEVITON	G5262-W
18	QUADPLEX DECORA DEVICES WITH 2-GANG COVERPLATE	LEVITON	16242-W

LIGHT FIXTURE SCHEDULE

QTY	TAG	Description	MANUFACTURER	MODEL	LAMP	WATTS	VOLTAGE
26	A1	2'x2', 4000K, 80 CRI, 120V FLAT PANEL LED	COOPER	22FP4240C	LED	39 VA	120
149	C1	6" RECESSED DOWNLIGHT, WARMDIM TECHNOLOGY, CLEAR ALZAK CONE, WHITE TRIM RING	JUNO	IC22LED G4 09LM 90CRI MVOLT ZT1 + 27 CWH	LED	12 VA	120
8	C2	4" RECESSED DOWNLIGHT, 900 LUMENS, FROSTED LENS WITH WHITE TRIM RING	JUNO	IC2LED G4 09LM 30K + 12 WWH	LED	10 VA	120
55	D1	4 FT LED WRAPAROUND, 4000 LUMEN OUTPUT, 4000K	METALUX	4WNLED-LD4-40SL-F-UNV-L840-CD 1-U	LED	36 VA	120
6	D2	1x4 LED FLAT PANEL, SURFACE MOUNTED, 4000K	METALUX	14FPSL1SCT3	LED	30 VA	120
14	EM1	COMBINATION EXIT SIGN AND LIGHT, EDGE-LIT, SELF-POWERED	EXIT LIGHT CO.	COMBOELR-R	LED		120
3	EM1.2	EDGE-LIT EXIT SIGN, SURFACE WALL-MOUNTED, BRUSHED ALUMINUM FINISH, ANGULAR TRIM-PLATE	EMERGI-LITE	LXN1NRC-A	LED	2 VA	120
8	EM2	LED EDGE-LIT EXIT SIGN, COMBINATION FIXTURE, SELF-POWERED, RED FACE. WHITE HOUSING	EMERGI-LITE	WPR612M1R2LB_	LED	26 VA	120
8	EM3	CONTRACTOR SELECT LED TWIN-HEAD UNIT	EXIT LIGHT CO.	EL-2	LED	10 VA	120
8	EM4	TWIN LAMP WEATHERPROOF EMERGENCY EGRESS FIXTURE	EXIT LIGHT CO.	RHB-WPL	LED	10 VA	120
9	H1	WALL-MOUNTED AREA LIGHT, LED	BBIER	BB-LD-75W-AR-B-C	LED	100 VA	120
6	H2	WALL MOUNT EXTERNAL LUMINAIRE, QUARTER SPHERE, BLACK FINISH	MCGRAW-EDISON	ISSAF800 LED E1 T2 BK	LED	44 VA	120
9	H3	GLASS WALLPACK, BLACK HOUSING, 4000K, 6170 LUMENS	HUBBELL OUTDOOR LIGHTING	WGH-110L-4K-U-M	LED	54 VA	120
4	H4	LED GRADE-MOUNTED FLOODLIGHT, LED, 4000K, 1965 LUMENS, MEDIUM DISTRIBUTION	HUBBELL OUTDOOR LIGHTING	BUL-1L4K-U	LED	21 VA	120
4	P4	INVISILED PRO 3 24V LED TAPE LIGHT WITH REMOTE DIMMING POWER SUPPLY, INSTALL IN 45 ANGLED ALUMINUM CHANNEL	WAC LIGHTING	LED-TE24 30 1x40, WT + LED-T-CH2 + PS24DC-96R-PI	LED TAPE	5 VA	120
7	S1	LOW BAY LINEAR ASYMMETRIC DISTRIBUTION, GARAGE DOOR LIGHTERS	METALUX	8LBLED-LD4-10-ASYMF-UNV-840-C D2-U	LED	91 VA	120
21	S2	8' LED HIGH BAY, 18000 LUMENS, 4 DRIVERS, 4000K	METALUX	8ILED-LD5-22-W-UNV-L840-CD4-U	LED	157 VA	120
13	S3	8' LED HIGH BAY, 18000 LUMENS, 4 DRIVERS, 4000K	METALUX	8ILED-LD5-22-W-UNV-L840-CD4-U	LED	157 VA	120
7	W1	STAIRWELL LIGHTING FIXTURE, OCCUPANCY SENSOR, BATTERY BACKUP, 4000K	REMPHOS LIGHTING	RPT-P-LIVC-G2-4FT-20L-840-FWFC -OCC-R-S1	LED	30 VA	120
6	W4	CONTEMPORARY VANITY CYLINDER LIGHT, 3500K, BRUSHED NICKEL	LITHONIA	FMVCCL 48IN MVOLT 35K 90CRI BZ	LED	34 VA	120
1	WS	Ellis 24 Wall Sconce	TECH LIGHTING	700BCELI24C-LED930	LED	24 VA	120
2	Z	SEALED, GASKETED LED SURFACE MOUNTED FIXTURE, ELEVATOR PIT, 5000K	LITHONIA	FEM LED 48	LED	28 VA	120

Robbie Conley Architect, LLC
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(856)-845-7500 FAX:(856)-853-0528
N.J. LIC. NO. 21AC00069700 NCARB CERT. NO. 55314 PA. LIC. NO. AX0042454

THESE PLANS ARE INSTRUMENTS OF SERVICE AND ARE NOT TO BE USED FOR ANY PURPOSE OTHER THAN THE CONSTRUCTION OF THIS PROJECT WITHOUT THE EXPRESS WRITTEN CONSENT OF THE ARCHITECT

SHEET TITLE: ELECTRICAL SCHEDULES

WACHTER ENGINEERING
124 South White Street
Pitman, New Jersey 08071
(856) 589-0500

PROJECT: TOWNSHIP OF WASHINGTON
EMERGENCY SERVICES COMPLEX
656 WASHINGTON AVENUE
TWP. OF WASHINGTON, NJ 07676

OWNER: TOWNSHIP OF WASHINGTON
350 HUDSON AVENUE
TWP. OF WASHINGTON, NJ 07676

CONTRACTOR SHALL CHECK AND VERIFY ALL CONDITIONS AND DIMENSIONS AT THE SITE BEFORE PROCEEDING WITH WORK.

REVISIONS

TAG	DESCRIPTION	DATE
1	ADDENDUM #2	08.10.20

ISSUE DATE: 06/19/2020
XXX RJC

E5.0

PROJECT NO. 18053 ____ OF ____

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This Addendum is issued prior to receipt of bids for the information of all bidders for the purposes of advising bidders of additions, deletions, revisions and clarifications to the bidding documents. The following modifications, changes, additions, and/or deletions to the Specifications and/or Drawings, as prepared by ROBBIE CONLEY, ARCHITECT, 596 Glassboro Road, Woodbury Heights, NJ 08097, dated, June 19, 2020 for the construction of the new Emergency Services Complex located at 656 Washington Avenue, Township of Washington, NJ 07676 are hereby made a part of and are incorporated into the Contract Documents thereof and are binding upon all parties concerned as if originally included therein. All other terms as outlined in the original "Invitation for Proposals" will remain in force.

CLARIFICATIONS

ITEM NO. C-1

All bidders must submit, as part of the bid submission, documentation of compliance with Prevailing Wage Rates for the State of NJ

ITEM NO. C-2

The Project is "essential" with respect the Governor's mandates regarding COVID-19 guidelines. Contractor shall be responsible to follow all requirements pursuant thereto.

ITEM NO. C-3

For the Kitchen, Room 215, all sinks, stove, hood and S.S. wall panels are part of the Contract. All other Kitchen Equipment shall be removed from the existing Firehouse and re-installed by Contractor.

ITEM NO. C-4

Lockers in Room 111 are to be provided by Owner and installed by Contractor. Lockers in Rooms 122, 123, 217 and 218 are part of the Contract.

ITEM NO. C-5

Window Type "J" is fiberglass to be installed in Corridor 122.

ITEM NO. C-6

Electrical

1. ALL lighting shall be circuited to panel "P2" unless otherwise denoted in this addendum.
2. Provide (2) timeclocks for Panel "FM" and "EM" to control signage and exterior lighting via lighting contactors.
3. Provide 18/2 shielded plenum cable and (2) Cat 5e plenum-rated cables to each data port at gas-furnace mechanical equipment in a daisy-chain format.

ITEM NO. C-7

Elevator shall use a "soft-start" controller, to minimize its impact to the generator.

ITEM NO. C-8
Traffic Control is the responsibility of the Contractor any time while the Contractor is working in the roadway. Police Traffic Directors should be anticipated during these times.

ITEM NO. C-9
The Contractor will need to coordinate the installation of the generator with the demolition of the existing building.

SPECIFICATIONS
ITEM NO. S-1
Delete Sheet 000000-2 from the Project Manual and replace with new Sheet 000000-2, accompanying this Addendum

ITEM NO. S-2
Insert Specifications Section 097720 into the Project Manual (accompanying this Addendum).

DRAWINGS
ITEM NO. D-1
Delete drawing TS-1 and replace with attached, sheet 18053 WT-ESC-TS-1

ITEM NO. D-2
Delete drawing A2 and replace with attached, sheet 18053 WT-ESC-A2

ITEM NO. D-3
Delete drawing A18 and replace with attached, sheet 18053 WT-ESC-A18

ITEM NO. D-4
Sheet M0.4: Add Infra-red Heater Schedule. Units shall be based on Roberts Gordon CTH2V model.

a. IRH-1 CTH2V -175 50’ long
b. IRH-2 CTH2V -80 30’ long
c. IRH-3 CTH2V -80 20’ long
d. IRH-4 CTH2V -80 20’ long
e. IRH-5 CTH2V -80 20’ long
f. IRH-6 CTH2V -125 40’ long
g. IRH-7 CTH2V -80 30’ long
h. For all units, furnish vent cap with flex duct to outside air intake. Multiple units shall terminate into 8” type-B vent per manufacturer’s instructions. Control via 120V multi-unit thermostat. Suspend units @ 15’-9” AFF with chain and S-hooks.

ITEM NO. D-5
Sheet P1.2B

1. In Kitchen 215, ADD the following:
    a. Triple-bowl sink:
        i. Regency 600S3162018G 16”x20”x12” bowls with Left and Right 18” drainboards with stainless steel leg upgrade, twist handle waste valve, and T&S 8” wall-mount mixing faucet with 12” swing nozzle and 44” flexible SS gooseneck hose. Model B-0133-ADF120B.

    b. Pre-wash sink adjacent to triple-bowl sink:
        i. Advance Tabco 16”x20” with 18” right hand drainboard, model FC-1-1620-18R with T&S 5F-8WLX08 wall mounted faucet with 8-1/8” swing spout, 5.2 gpm laminar flow.

ITEM NO. D-6

Sheet E0.1

1. Elevator shall be a 20 hp machine-room less type elevator. Power shall be provided to elevator via Elevator control disconnect switch to provide fire alarm/shunt trip capability. Conductors shall be (3) #3 Cu + (1) #6 Cu GRD in 1-1/4” C. Elevator shall be fed from Panel “FM” via 175A CB.
2. DELETE reference to “Delay Transition Switch” associated with ATS#1.
3. REVISE emergency generator rating to 500 kW from 350 kW. Furnish 72 hr fuel tank and Class 3 sound enclosure per specification.
4. REVISE ATS#3 to 400A rating.
5. REVISE fused disconnect at hot trough to 400A. REVISE associated feeders to (4) #500 MCM Cu + (1) #3 Cu GRD IN 4” C.
6. REVISE ATS #1 to 230A and associated breaker in generator to 225A. REVISE associated fused disconnect to 225A. REVISE feeders to (4) #4/0 Cu + (1) #4 Cu GRD in 2-1/2” C.

ITEM NO. D-7

Sheet E1.1

1. Note “1” on plans: “ELECTRICAL CONTRACTOR TO INSTALL ELECTRONIC EYES, END SWITCHES, AND REMOTE OPERATORS FOR GARAGE DOORS”
2. Note “2” on plan: “INSTALL 2- NEW 3-BUTTON SWITCHES FOR EACH GARAGE DOOR”
3. Locate one remote door operator for each garage door in Radio Room at direction of Owner. Second shall be located adjacent to the door.
4. Circuit receptacle shown at “SOFFIT” to FM-34 via Wifi enabled switch.

ITEM NO. D-8

Sheet E1.2

1. Provide 175A elevator disconnect with integral shunt trip in Storage Room 114. Feed to Panel FM and circuit to FM-35,37,39.

2. Note “1” on plans: “ELECTRICAL CONTRACTOR TO INSTALL ELECTRONIC EYES, END SWITCHES, AND REMOTE OPERATORS FOR GARAGE DOORS”
3. Note “2” on plan: “INSTALL NEW 3-BUTTON SWITCH FOR EACH GARAGE DOOR”

ITEM NO. D-9

Sheet E2.1

1. Circuit ceiling-mounted receptacles for infrared heaters to FM-32.
2. Circuit GFU-6 to P2-15 via 20A/1p breaker and #12 MC cable.

ITEM NO. D-10

Sheet E2.2

1. Circuit ceiling-mounted receptacles for infrared heaters to E1-16.
2. Revise junction box for signage power above EMS squad bays to EM-23.

ITEM NO. D-11

Sheet E3.2

1. Circuit type “H2” above door to Entry 135 and door to Ambulance Bays 130 to P2-36 via photocell on/off control.
2. Add (2) type “H3” to front of Ambulance Squad Bays and (3) type “H3” to side of Ambulance Squad Bays – one (1) above each door and one centered in remaining wall space to front of building. Circuit to EM-14 via relay in Radio Room.

ITEM NO. D-12

Sheet E4.1

1. Provide relay for each bunk room to allow lighting to energize from 24V alarm signal from Radio Room.
2. 50% of Fire Squad Bay lighting shall circuit to FM-31 energize via 120V lighting contactor from Radio Room (provision for future BAS) and occupancy/daylighting control sensor (Leviton RCD30-C01 or equal). Remaining 50% shall circuit to P2-42 via daylighting control in Squad Bay. Provide (3) additional OSC-20M0W
3. Type “S1” fixtures at squad bay doors shall circuit to FM-31 via lighting contactor controlled via timeclock.
4. Circuit two (2) type “H3” fixtures on side of building to F1-34 with type “H3” fixtures on front of building.
5. Provide 120V 20A/1p circuit from circuit F1-40 to feed receptacle for illuminated cupola and remote controller. Use #10 MC cable.

ITEM NO. D-13

Sheet E4.2

1. Circuit “H1” fixtures to lighting contactor via timeclock for exterior lighting.
2. Circuit “S3” fixtures to panel “P2” via occupancy/daylighting control in Squad Bay (Leviton RCD30-C01 or equal).

APPENDIX
DRAWINGS
ITEM NO. AD-1
Delete drawing WT-110-SP / GDP and replace with attached, sheet WT-110-GDP(7-23-20)

ITEM NO. AD-2
Delete drawing WT-110-SP / SE and replace with attached, sheet WT-110-SE (7-23-20)

END OF DOCUMENT

Section 076200 SHEET METAL FLASHING AND TRIM
Section 077253 SNOW GUARDS
Section 079200 JOINT SEALANTS

DIVISION 08 – OPENINGS

Section 081213 HOLLOW METAL FRAMES
Section 081416 FLUSH WOOD DOORS
Section 081613 FIBERGLASS REINFORCED POLYESTER (FRP) DOORS AND ALUMINUM FRAMES
Section 083600 SECTIONAL DOORS
Section 085213 ALUMINUM CLAD WOOD WINDOWS
Section 085413 FIBERGLASS WINDOWS
Section 087100 DOOR HARDWARE
Section 088000 GLAZING

DIVISION 09 – FINISHES

Section 092900 GYPSUM BOARD
Section 093013 CERAMIC TILING
Section 095113 ACOUSTICAL PANEL CEILINGS
Section 096513 RESILIENT BASE AND ACCESSORIES
Section 096723 RESINOUS FLOORING
Section 096813 CARPET TILES
Section 097720 *FIBERGLASS REINFORCED WALL PANELS*
Section 099113 EXTERIOR PAINTING
Section 099123 INTERIOR PAINTING
Section 099300 STAINING AND TRANSPARENT FINISHES
Section 099600 HIGH-PERFORMANCE COATINGS

DIVISION 10 – SPECIALTIES

Section 101416 PLAQUES
Section 101419 DIMENSIONAL LETTER SIGNAGE
Section 101423 PANEL SIGNAGE
Section 101423.16 ROOM-IDENTIFICATION PANEL SIGNAGE
Section 102113.19 PLASTIC TOILET COMPARTMENTS
Section 102600 WALL AND DOOR PROTECTION
Section 102800 TOILET, BATH, AND LAUNDRY ACCESSORIES
Section 103400 CUPOLA
Section 104413 FIRE PROTECTION CABINETS
Section 105113 METAL VENTED WARDROBE LOCKERS
Section 107516 GROUND-SET FLAGPOLES
Section 109990 BACK LIGHTED FLUSH MOUNTED CLOCKS

DIVISION 11 – EQUIPMENT

Section 113100 RESIDENTIAL APPLIANCES

DIVISION 09 – FINISHES
SECTION 097720 –FIBERGLASS REINFORCED WALL PANELS

GENERAL

SUMMARY

Section Includes: Prefinished polyester glass reinforced plastic sheets and adhered to unfinished gypsum wallboard.
PVC trim.
PVC Wall base.

REFERENCES

American Society for Testing and Materials: Standard Specifications (ASTM)
ASTM D 256 - Izod Impact Strengths (ft #/in)
ASTM D 570 - Water Absorption (%)
ASTM D 638 - Tensile Strengths (psi) & Tensile Modulus (psi)
ASTM D 790 - Flexural Strengths (psi) & Flexural Modulus (psi)
ASTM D 2583- Barcol Hardness
ASTM D 5319 - Standard Specification for Glass-Fiber Reinforced Polyester Wall and Ceiling Panels.
ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials.

SUBMITTALS

Product Data: Submit sufficient manufacturer's data to indicate compliance with these specifications, including:
Preparation instructions and recommendations.
Storage and handling requirements and recommendations.
Installation methods.
Shop Drawings: Submit elevations of each wall showing location of paneling and trim members with respect to all discontinuities in the wall elevation.
Selection Samples: Submit manufacturer’s standard color pattern selection samples representing manufacturer's full range of available colors and patterns.
Samples for Verification: Submit appropriate section of panel for each finish selected indicating the color, texture, and pattern required.
Submit complete with specified applied finish.
For selected patterns show complete pattern repeat.
Exposed Molding and Trim: Provide samples of each type, finish, and color.
Manufacturers Material Safety Data Sheets (MSDS) for adhesives, sealants and other pertinent materials prior to their delivery to the site.

QUALITY ASSURANCE

Conform to building code requirements for interior finish for smoke and flame spread requirements as tested in accordance with:
ASTM E 84 (Method of test for surface burning characteristics of building Materials)

DELIVERY, STORAGE AND HANDLING

Deliver materials factory packaged on strong pallets.
Store panels and trim lying flat, under cover and protected from the elements. Allow panels to acclimate to room temperature (range of 60 to 75°F) for 48 hours prior to installation.

PROJECT CONDITIONS

Environmental Limitations: Building are to be fully enclosed prior to installation with sufficient heat (70°) and ventilation consistent with good working conditions for finish work

During installation and for not less than 48 hours before, maintain an ambient temperature and relative humidity within limits required by type of adhesive used and recommendation of adhesive manufacturer.
Provide ventilation to disperse fumes during application of adhesive as recommended by the adhesive manufacturer.

WARRANTY
Furnish one year guarantee against defects in material and workmanship.

PRODUCTS

ACCEPTABLE MANUFACTURER
Marlite; Standard FRP
Crane Composites: Glasboard
Nudo FiberLite

PANELS
Fiberglass reinforced thermosetting polyester resin panel sheets complying with ASTM D 5319.
Dimensions:
Thickness – 0.090 “(2.29mm) nominal
Width - 4'-0” (1.22m) nominal
Length –8’-0” or as noted
Tolerance:
Length and Width: +/-1/8 “(3.175mm)
Square - Not to exceed 1/8“ for 8 foot (2.4m) panels or 5/32 “ (3.96mm) for 10 foot (2.4m) panels
Properties: Resistant to rot, corrosion, staining, denting, peeling, and splintering.
Flexural Strength - 1.0×10^4 psi per ASTM D 790. (7.0 kilogram-force/square millimeter)
Flexural Modulus - 3.1×10^5 psi per ASTM D 790. (217.9 kilogram-force/square millimeter)
Tensile Strength - 7.0×10^3 psi per ASTM D 638. (4.9 kilogram-force/square millimeter)
Tensile Modulus - 1.6×10^5 psi per ASTM D 638. (112.5 kilogram-force/square millimeter)
Water Absorption - 0.72% per ASTM D 570.
Barcol Hardness (scratch resistance) of 35 55 as per ASTM D 2583.
Izod Impact Strength of 72 ft. lbs./in ASTM D 256
Back Surface: Smooth. Imperfections which do not affect functional properties are not cause for rejection.
Front Finish: As selected by Architect from Manufacturers Full options
Color: As selected by Architect from Manufacturers full line of Colors.
Surface: Pebbled
Fire Rating Class C (III) Fire Rating.

BASE
Manufacturers Base Molding for 0.090” (2.29mm) thick FRP Panels
Color: As selected by Architect from Manufacturers full line of Colors.
Profiles:
M 612 FRP Base Molding, 10’ length
M 651 Inside Corner
M 660 Outside Corner
M 620 LH End Cap
M 625 RH End Cap

MOLDINGS
PVC Trim: Thin-wall semi-rigid extruded PVC.
M 350 Inside Corner, 8’ length
M 360 Outside Corner, 8’ length
M 365 Division, 8’ length
M 370 Edge, 8’ length
V 177 135° Inside Corner 8’ length
V 179 135° Outside Corner 8’ length
Color: Match Panels

ACCESSORIES
Fasteners: Non-staining nylon drive rivets.
Match panel colors.
Length to suit project conditions.
Adhesive: Either of the following construction adhesives complying with ASTM C 557.
FRP Adhesive - Water- resistant, non-flammable adhesive.
Construction Adhesive - Flexible, water-resistant, solvent based adhesive, formulated for fast, easy application.
Titebond Advanced Polymer Panel Adhesive – VOC compliant, non-flammable, environmentally safe adhesive.

EXECUTION

PREPARATION
Examine backup surfaces to determine that corners are plumb and straight, surfaces are smooth, uniform, clean and free from foreign matter, nails countersunk, joints and cracks filled flush and smooth with the adjoining surface.
Verify that stud spacing does not exceed 24” (61cm) on-center.
Repair defects prior to installation.
Level wall surfaces to panel manufacturer’s requirements. Remove protrusions and fill indentations.

INSTALLATION
Comply with manufacturer's recommended procedures and installation sequence.
Cut sheets to meet supports allowing 1/8” (3 mm) clearance for every 8 foot (2.4m) of panel.
Cut and drill with carbide tipped saw blades or drill bits, or cut with shears.
Pre-drill fastener holes 1/8” (3mm) oversize with high speed drill bit.
Space at 8” (200mm) maximum on center at perimeter, approximately 1” from panel edge.
Space at in field in rows 16’ (40.64cm) on center, with fasteners spaced at 12” (30.48 cm) maximum on center.
Apply panels to board substrate, above base, vertically oriented with seams plumb and pattern aligned with adjoining panels.
Install panels with manufacturer's recommended gap for panel field and corner joints.
Adhesive trowel and application method to conform to adhesive manufacturer’s recommendations.
Drive fasteners for snug fit. Do not over-tighten.
Apply panel moldings to all panel edges using silicone sealant providing for required clearances.
All moldings must provide for a minimum 1/8 “ (3mm) of panel expansion at joints and edges, to insure proper installation.
Apply sealant to all moldings, channels and joints between the system and different materials to assure watertight installation.

CLEANING

Remove excess sealant from panels and moldings. Wipe panel down using a damp cloth and mild soap solution or cleaner.

Refer to manufacturer's specific cleaning recommendations Do not use abrasive cleaners.

END OF SECTION 097720

PROPOSED NEW BUILDING FOR:

TOWNSHIP OF WASHINGTON EMERGENCY SERVICES COMPLEX

656 WASHINGTON AVENUE
TOWNSHIP OF WASHINGTON, NJ 07676

FOR:

TOWNSHIP OF WASHINGTON

350 HUDSON AVENUE
TWP. OF WASHINGTON, NJ 07676
BERGEN COUNTY

BUILDING CODE INFORMATION

TOWNSHIP OF WASHINGTON
EMERGENCY SERVICES COMPLEX

NJ UNIFORM CONSTRUCTION CODE
INCORPORATING THE INTERNATIONAL BUILDING CODE as amended
2018 EDITION

THIS BUILDING IS A PROPOSED NEW 2-STORY FIREHOUSE STRUCTURE, WITH SINGLE STORY GARAGE BAYS ON EITHER SIDE HOUSING FIRE DEPARTMENT AND AMBULANCE SQUAD APPARATUS. THIS BUILDING IS CLASSIFIED AS A NON-SEPARATED MIXED USE, INCLUDED AN S-2 USE, B USE AND R-2 USE. THIS BUILDING WILL BE FULLY EQUIPPED WITH AN AUTOMATIC SPRINKLER SYSTEM PER N.F.P.A. 13.	CRITERION/DESIGNATION	IBC REFERENCE
CHAPTER 03 - USE AND OCCUPANCY CLASSIFICATION		
OCCUPANCY CLASSIFICATION	S-2: LOW-HAZARD STORAGE	SECT: 311.3
	B: BUSINESS	SECT: 304.1
	A-3: ASSEMBLY	SECT: 303.4
	R-2: RESIDENTIAL	SECT: 310.3
CHAPTER 04 - SPECIAL DETAIL REQUIREMENTS BASED ON USE AND OCCUPANCY		
CHAPTER 05 - GENERAL BUILDING HEIGHTS AND AREAS		
PROPOSED — BUILDING AREA	**PROPOSED**	
FIRST FLOOR	12,729 S.F.	
MEZZANINE	6,533 S.F.	
BUILDING HEIGHT	2 STORY / 47 FT	
CONST. TYPE V-B — CLASS A-3 OCCUPANCY -MOST RESTRICTIVE	**ALLOWABLE W/O MODIFICATIONS**	**ALLOWABLE WITH MODIFICATIONS**	
BUILDING AREA	24,000 SF	N/A	TABLE 506.2
BUILDING HEIGHT	2 STORIES / 60 FT	N/A	TABLE 504.3, TABLE 504.4
MODIFICATIONS TO ALLOWABLE HEIGHT AND BUILDING AREA UNNECESSARY	PROPOSED IS WITHIN ALL ALLOWABLES		TABLE 504.3 AND 504.4
CHAPTER 06 - TYPES OF CONSTRUCTION		
CONSTRUCTION CLASSIFICATION - TYPE VB	FIRE RATING IN HOURS	
STRUCTURAL FRAME INCLUDING COLUMNS, GIRDERS, TRUSSES	0	TABLE 601
BEARING WALL		
EXTERIOR	0	TABLE 601
INTERIOR	0	TABLE 601
NON-BEARING WALLS AND PARTITONS EXTERIOR	0	TABLE 601
NON-BEARING WALLS AND PARTITIONS INTERIOR	0	TABLE 601
FLOOR CONSTRUCTION INCLUDING SUPPORTING BEAMS AND JOISTS	0	TABLE 601
ROOF CONSTRUCTION INCLUDING SUPPORTING BEAMS AND JOISTS	0	TABLE 601
CHAPTER 10 - MEANS OF EGRESS		
OCCUPANT LOAD		
S-2 OCCUPANCY (PARKING GARAGES USED)	200 SF / PERSON	TABLE 1004.5
B OCCUPANCY	150 SF / PERSON	TABLE 1004.5
A-3 OCCUPANCY - (UNCONCENTRATED)	15 SF NET / PERSON	TABLE 1004.5
R-2 OCCUPANCY	200 SF / PERSON	TABLE 1004.5
MINIMUM REQUIRED EGRESS WIDTH WITH AUTOMATIC FIRE SUPPRESSION		
STAIRWAYS	0.3 INCHES / OCCUPANT LOAD	SECT 1005.3.1
OTHER	0.2 INCHES / OCCUPANT LOAD	SECT 1005.3.2
MINIMUM NUMBER OF ACCESSIBLE EGRESS ROUTES PER FLOOR	2	SECT. 1006.2.1
ELEVATORS	PROVIDED	PUBLIC BUILDING
DOORWAYS	MIN. 32" CLEAR OPG.	SECT. 1010.1.1
STAIRWAY WIDTH	MIN. 44"	SECT. 1011.2
STAIRWAY RISER AND TREAD	7 MAX :11 MINIMUM	SECT. 1011.5
LANDING WIDTH	44 INCHES MINIMUM	SECTS. 1010.1.6 AND 1011.6
VERTICAL RISE BETWEEN LANDINGS	MAXIMUM 12'-0"	SECT. 1011.8
MINIMUM NUMBER OF EGRESS REQUIRED	2	SECT 1006.2.1
REMOTENESS OF EXIT ACCESS STAIRWAYS OR RAMPS	MINIMUM 38' APART	SECT. 1007.1.1
EXIT TRAVEL DISTANCE WITH AUTOMATIC FIRE SUPPRESSION	250 FT MAX.	TABLE 1017.2
CORRIDOR FIRE-RATED CONSTRUCTION	0 HR	TABLE 1020.1
CORRIDOR WIDTH	44 INCHES MIN.	TABLE 1020.2
DEAD END CORRIDOR WITH AUTOMATIC FIRE SUPPRESSION	20 FT	SECT. 1020.4
VERTICAL SHAFTS INCLUDING STAIRWAYS AND ELEVATORS FIRE-RATED CONSTRUCTION	1 HOUR	SECT. 713.4
EXIT DISCHARGE - STAIRWAYS MUST DISCHARGE TO AN UNOBSTRUCTED PATH OF TRAVEL TO AN EXTERIOR EXIT DOOR	AT GRADE OR SHALL PROVIDE A DIRECT PATH OF EGRESS TRAVEL TO GRADE.	SECT. 1028
CHAPTER 11 - ACCESSIBILITY		
BUILDING MUST BE ACCESSIBLE		ICC/ANSI A117.1 2009 EDITION

CODE ANALYSIS
<NJ UCC 2018 >

USE GROUP — NON-SEPERATED MIXED USE

S2	ENGINE & SQUAD BAYS	8,762	SF
B	BUSINESS AREAS	4,967	SF
A3	MEETING/TRAINING ROOM	2,184	SF
R2	BUNK ROOMS	710	SF
	ACCESSORY	2,639	SF
TOTAL PROPOSED SQUARE FOOTAGE		19,262 S.F.	
TOTAL PROPOSED CUBIC FOOTAGE		282,430 C.F.	
CONSTRUCTION TYPE		V-B	

OCCUPANCY LOAD

S2	STORAGE	@ 200 GROSS	44	OCCUPANTS
A3	ASSEMBLY	@ 15 NET	95	OCCUPANTS
B	BUSINESS	@ 150 GROSS	34	OCCUPANTS
R2	RESIDENTIAL - BUNK ROOMS	@ 200 GROSS	4	OCCUPANTS
TOTAL BUILDING OCCUPANCY			177	OCCUPANTS

BUILDING TO BE FULLY EQUIPPED WITH AN AUTOMATIC SPRINKLER SYSTEM PER N.F.P.A. 13

SCHEDULE OF DRAWINGS

SHEET NO.	DESCRIPTION	DATE	SHEET NO.	DESCRIPTION	DATE	SHEET NO.	DESCRIPTION	DATE
TS-1	TITLE SHEET & NOTES & CODE REVIEW		M0.3	HVAC SCHEDULES		E3.1	ELECTRICAL LIGHTING PLAN - FIRST FLOOR WEST SIDE	
BF-1	BARRIER-FREE NOTES		M0.4	HVAC SCHEDULES		E3.2	ELECTRICAL LIGHTING PLAN - FIRST FLOOR EAST SIDE	
BF-2	BARRIER-FREE NOTES		M1.1	FIRST FLOOR HVAC FLOOR PLAN-WEST SIDE		E4.1	ELECTRICAL LIGHTING PLAN - SECOND FLOOR WEST SIDE	
A-1	FIRST FLOOR PLAN /PARTITION TYPES		M1.2	FIRST FLOOR HVAC FLOOR PLAN-EAST SIDE		E4.2	ELECTRICAL LIGHTING PLAN - SECOND FLOOR EAST SIDE	
A-2	SECOND FLOOR PLAN		M2.1	SECOND FLOOR HVAC FLOOR PLAN-WEST SIDE		E5.0	ELECTRICAL SCHEDULES	
A-3	ROOF PLAN		M2.2	SECOND FLOOR HVAC FLOOR PLAN-EAST SIDE		E5.1	ELECTRICAL SCHEDULES	
A-4	ELEVATIONS, DETAILS		M3.0	HVAC DETAILS		E5.2	ELECTRICAL SCHEDULES	
A-5	ELEVATIONS, DETAILS		KES1	KITCHEN HOOD DETAILS				
A-6	WALL SECTIONS		KES2	KITCHEN HOOD DETAILS				
A-7	WALL SECTIONS		KES3	KITCHEN HOOD DETAILS			APPENDIX "A" -- CIVIL DRAWINGS	
A-8	WALL SECTIONS		KES4	KITCHEN HOOD DETAILS		XXXXX	NAME	
A-9	WALL SECTIONS		P0.1	PLUMBING DETAILS				
A-10	WALL SECTIONS		P0.2	PLUMBING DETAILS				
A-11	WALL SECTIONS		P1.1A	FIRST FLOOR SANITARY PLUMBING-WEST SIDE				
A-12	ENLARGED FLOOR PLANS, ELEVATIONS		P1.1B	FIRST FLOOR SANITARY PLUMBING-EAST SIDE				
A-13	ENL. FLOOR PLANS, ELEVATIONS, SECTIONS, MISC. DETAILS		P1.2A	SECOND FLOOR SANITARY PLUMBING-WEST SIDE				
A-14	ENLARGED STAIR PLANS & DIAGRAMS		P1.2B	SECOND FLOOR SANITARY PLUMBING-EAST SIDE				
A-15	STAIR & ELEVATOR DETAILS		P2.1A	FIRST FLOOR PLUMBING FLOOR PLAN-WEST SIDE				
A-16	SCHEDULES		P2.1B	FIRST FLOOR PLUMBING FLOOR PLAN-EAST SIDE				
A-17	PANEL ELEVATIONS & PROFILES		P2.2A	SECOND FLOOR PLUMBING FLOOR PLAN-WEST SIDE				
A-18	WINDOW TYPES & DETAILS		P2.2B	SECOND FLOOR PLUMBING FLOOR PLAN-EAST SIDE				
S-1	FOUNDATION PLAN		P3.0	PLUMBING RISERS				
S-2	SECOND FLOOR FRAMING PLAN		P3.1	PLUMBING RISERS				
S-3	ROOF FRAMING PLAN		P3.2	PLUMBING RISERS				
S-4	DETAILS		E0.1	ELECTRICAL DETAILS				
S-5	DETAILS		E0.2	ELECTRICAL SITE PLAN				
S-6	DETAILS		E1.1	FIRST FLOOR POWER & SYSTEMS PLAN-WEST SIDE				
S-7	BRICK RELIEVING ANGLES & SHEET PILE RETAINING WALL		E1.2	FIRST FLOOR POWER & SYSTEMS PLAN-EAST SIDE				
M0.1	MECHANICAL DETAILS		E2.1	SECOND FLOOR POWER & SYSTEMS PLAN-WEST SIDE				
M0.2	MECHANICAL DETAILS		E2.2	SECOND FLOOR POWER & SYSTEMS PLAN-EAST SIDE				

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N.J. LIC. NO. 21AC00069700 NCARB CERT. NO. 52314 PA. LIC. NO. AX004265L

Ac-14159 NJ

SHEET TITLE: TITLE SHEET CODE INFORMATION

LICENSED ARCHITECTS:
ROBBIE J. CONLEY, AIA, RP PA: RA016342B
NJ: AC-21AC00069700 FL: AR100412
DE: SS-0008149
JOHN S. DESCANO, AIA, RP
NJ: AC-21AC00069700 PA: RA016342B

PROJECT: TOWNSHIP OF WASHINGTON EMERGENCY SERVICES COMPLEX 656 WASHINGTON AVENUE TWP. OF WASHINGTON, NJ 07676

OWNER: TOWNSHIP OF WASHINGTON 350 HUDSON AVENUE TWP. OF WASHINGTON, NJ 07676

CONTRACTOR SHALL CHECK AND VERIFY ALL CONDITIONS AND DIMENSIONS AT THE SITE BEFORE PROCEEDING WITH WORK.

REVISIONS

DESCRIPTION	DATE
REVISED--ADDENDUM #1	7/24/2020

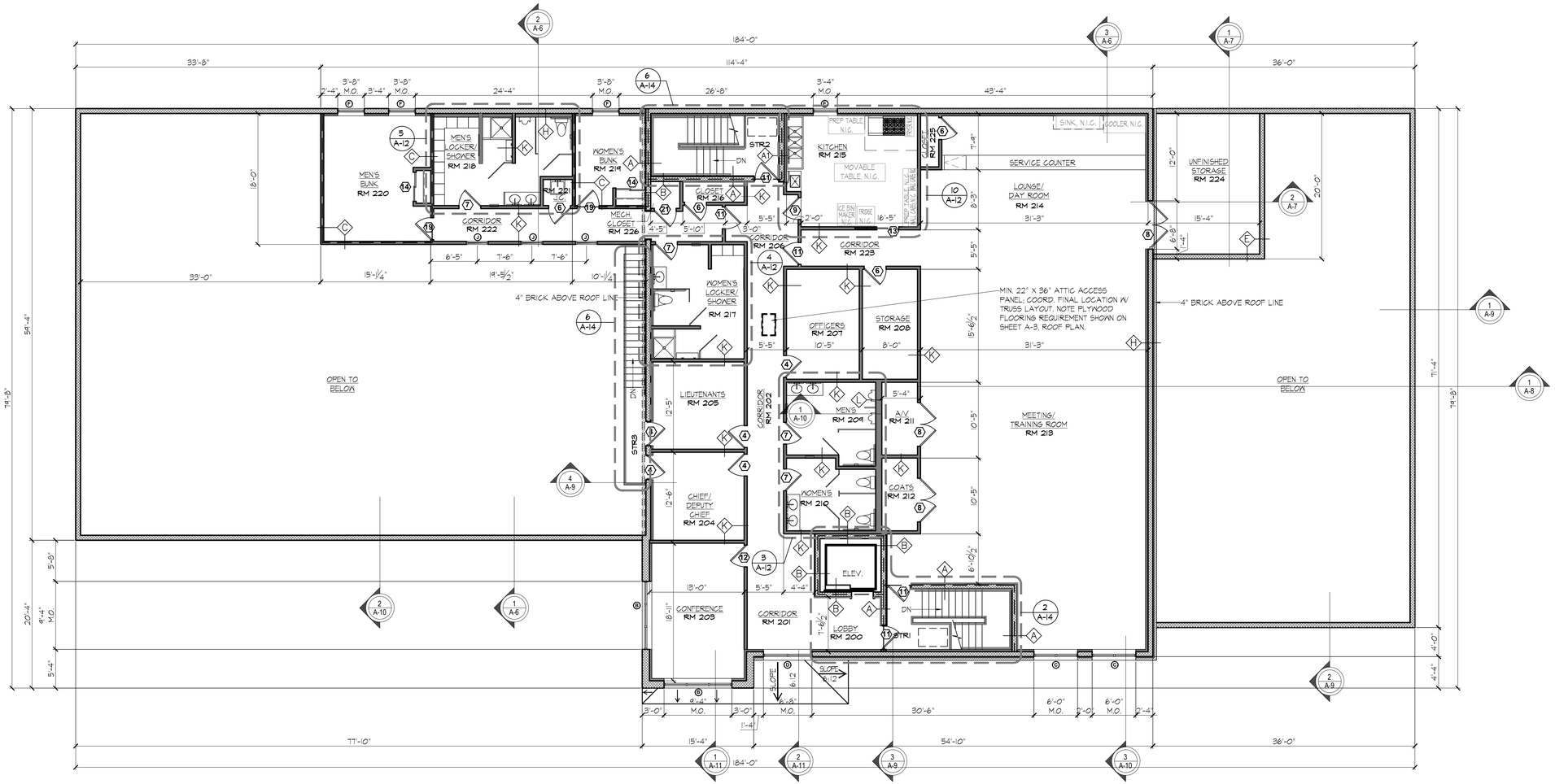
ISSUE DATE: JUNE 19, 2020
DRAWN: JSD CHKD: RJC

DWG. NO.: **TS-1**
1 OF 67

PROJECT NO.: 18053

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PRINT DATE & TIME: JUL 24, 2020 - 12:48 pm



1 / A-2 SECOND FLOOR PLAN

SCALE: 1/8"=1'-0"

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SHEET TITLE: SECOND FLOOR PLAN

LICENSED ARCHITECTS:
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NJ: 21AC00060700 — FL: AR100412
DE: SS-0008149
JOHN S. DESCANO, AIA, PP — PA:
NJ: A-21235 — FL: 0084361

PROJECT
TOWNSHIP OF WASHINGTON
EMERGENCY SERVICES COMPLEX
656 WASHINGTON AVENUE
TWP. OF WASHINGTON, NJ 07676

OWNER
TOWNSHIP OF WASHINGTON
350 HUDSON AVENUE
TWP. OF WASHINGTON, NJ 07676

CONTRACTOR SHALL CHECK AND VERIFY ALL CONDITIONS AND DIMENSIONS AT THE SITE BEFORE PROCEEDING WITH WORK.

REVISIONS DESCRIPTION	DATE
REVISED-ADDENDUM #1	7/24/2020

ISSUE DATE: JUNE 19, 2020
DRAWN: SAL CHKD: RJC

DWG. NO. **A-2**

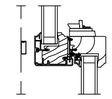
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PROJECT NO. 18053

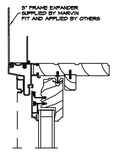
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A1-14159 NJ

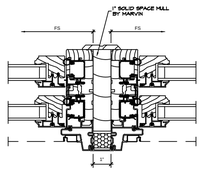
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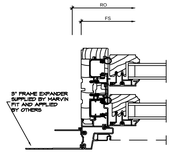
Checkrail
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UDH-Head
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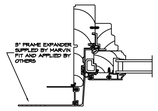
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UDH-Jamb
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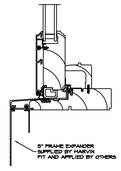
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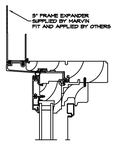
UCAP-Jamb @ Type G&H
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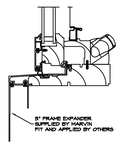
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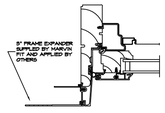
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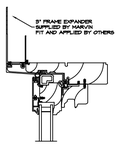
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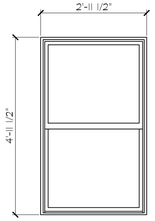
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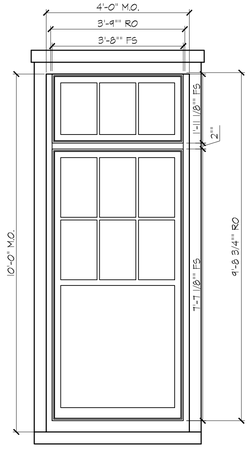
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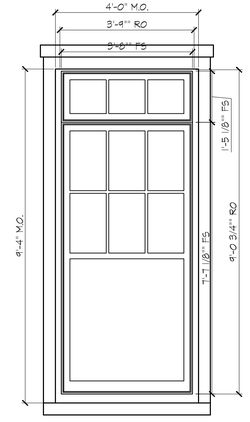
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J
FIBERGLASS
DOUBLE-HUNG
ESDH3050

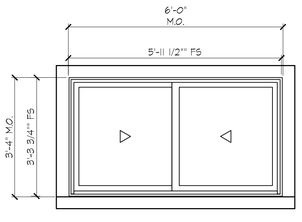


G
STATIONARY UNIT
W/ TRANSOM
UCAP/UCAP
WITH 2" SOLID MULL

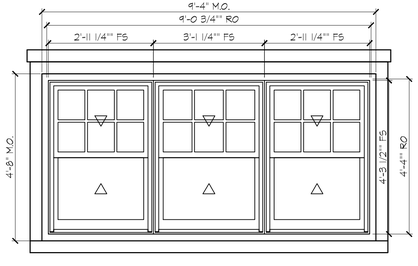


H
STATIONARY UNIT
W/ TRANSOM
UCAP/UCAP

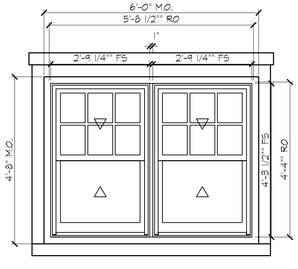
2 A-18 DOUBLE HUNG WINDOW DETAILS
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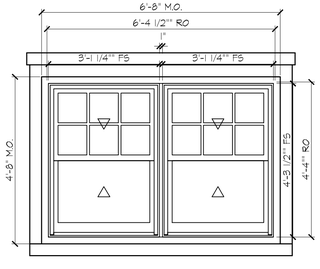
A
INTERIOR GLIDER UNIT
UGL-XX



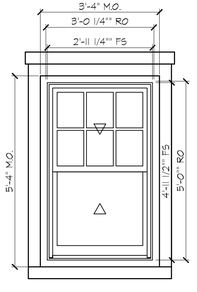
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DOUBLE HUNG UNIT
UDHG2-3A 3022/3222/3022



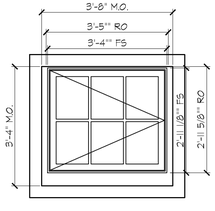
C
DOUBLE HUNG UNIT
UDHG2-2822-2A
WITH 1" SOLID MULL



D
DOUBLE HUNG UNIT
UDHG2-3222-2A
WITH 1" SOLID MULL



E
DOUBLE HUNG UNIT
UDHG2-3026



F
CASEMENT UNIT
UCA4036 - EGRESS

1 A-18 WINDOW TYPES
SCALE: 1/2"=1'-0"

3 A-18 CASEMENT WINDOW DETAILS
SCALE: 3"=1'-0"

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N.J. LIC. NO. 21AC00069700 NCARB CERT. NO. 52314 PA. LIC. NO. AX0042651

SHEET TITLE:
WINDOW TYPES
AND DETAILS

LICENSED ARCHITECTS:
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NCARB CERT. NO. 52314 NJ: 21AC00069700
DE: 55-0008149 FL: AR100412
JOHN S. DESCANO, AIA, RP
NJ: A-21235 U-08436

PROJECT
TOWNSHIP OF WASHINGTON
EMERGENCY SERVICES COMPLEX
656 WASHINGTON AVENUE
TWP. OF WASHINGTON, NJ 07676

OWNER
TOWNSHIP OF WASHINGTON
350 HUDSON AVENUE
TWP. OF WASHINGTON, NJ 07676

CONTRACTOR SHALL CHECK AND VERIFY ALL CONDITIONS AND DIMENSIONS AT THE SITE BEFORE PROCEEDING WITH WORK.

REVISIONS DESCRIPTION	DATE
REVISED-ADDENDUM #1	7/24/2020

ISSUE DATE:
JUNE 19, 2019
DRAWN: JMS CHKD: RJC

DWG. NO.
A-18
21 OF 67

PROJECT NO.
18053

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PRINT DATE & TIME: JUL 23, 2020 - 12:41 pm
FILE PATH: A:\Robbie Conley Architect, LLC\Projects\2019\18053 Township of Washington New Building\Revit\18053_Township of Washington New Building_Revit_2020.rvt
FILE NAME: 18053 Working.dwg

McKINLEY AVENUE
50' R.O.W.

N

Tax Block 3104 Tax Lot 9 N/F Jesse & Samantha R. Dembowski

Tax Block 3104 Tax Lot 13 N/F Johnny & Courtney Rojas

Tax Block 3104 Tax Lot 15 N/F Geoffrey & Katherine Adnams

Tax Block 3104 Tax Lot 18 N/F Paul Cerreto & Kallie Knebl

Tax Block 3104 Tax Lot 21 N/F Richard & Helen Giesberg

Tax Block 3104 Tax Lot 24 N/F Dawn McKinley

Tax Block 3104 Tax Lot 28 N/F Andrew & Gabrielle Donohue

Tax Block 3104 Tax Lot 31 N/F Todd Pearl

Tax Block 3104 Tax Lot 33 N/F William & Robin Tecchio

Tax Block 3104 Tax Lot 58 N/F Township Of Washington

Tax Block 3104 Tax Lot 60 N/F Township of Washington

Tax Block 3104 Tax Lot 48 N/F Township Of Washington

Tax Block 3104 Tax Lot 44 N/F Township Of Washington

Tax Block 3104 Tax Lot 42 N/F Brian M. & Ezra Beekman

Tax Block 3104 Tax Lot 38 N/F Richard Alam

Tax Block 3201 Tax Lot 2 N/F The Washington Commons

Tax Block 3201 Tax Lot 5 N/F Bi Xian Zhang

Tax Block 3201 Tax Lot 6 N/F Michael J. & Janet Avella

Tax Block 3201 Tax Lot 7 N/F John & Lynn Pistono

Iron Pin Found

1 Story Frame Garage

2 Story Frame Dwelling Hse. No. 638

SHEET PILING RETAINING WALL (SEE STRUCTURAL PLANS) TO BE CONSTRUCTED ONE FOOT FROM THE PROPERTY LINE

S65°30'00"E 250.00'

N24°30'00"E 100.00'

N65°30'00"W 250.00'

S24°30'00"W 100.00'

PROPOSED F.F. ELEV. 91.00

PROPOSED F.F. ELEV. 85.66

TW86.00/TP88.00
BW86.00

PROPOSED KEYSTONE RETAINING WALL SEE DETAILS ON SHEET 10 OF 14

PROP. CULTEC 150XLHD 6 CHBRS., 11.25'x22.75' BOS.:80.50; BOC.:81.00 TOC.:82.54; TOS.:83.04

OUTLET STR. RIM 84.50 WEIR 82.25/W2' 4" ORIFICE 80.92 INV 80.94 INV 80.90

TW84.20/TP86.20
BW83.50±

STORM MH. RIM 82.95 INV 80.23 INV 79.95 INV 79.90±(EXIST.)

MEET EXISTING TRAFFIC LINES TO MAINTAIN (TYP.)

CENTER LINE 50' PER MAP No. 66-R-7

N66°16'00"W 23'

24" SWL 45° @ 6' O.C. (TYP.)

R50'

R600'

4" DSYL

6" DWL

WASHINGTON AVENUE
50' R.O.W.

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

NO.	DATE	DESCRIPTION	SURVEYED BY	DRAWN BY	DESIGNED BY	CHECKED BY
2	7.23.2020	REVISED AS PER CONTRACTOR'S RFI		LS	LS	JLM
1	7.21.2020	REVISED AS PER BERGEN COUNTY PB.'S COMMENTS		LS	LS	JLM

BOSWELL ENGINEERING
ENGINEERS – SURVEYORS – PLANNERS – SCIENTISTS
330 PHILLIPS AVENUE, SOUTH HACKENSACK, N.J. 07606
TEL: (201) 641-0770 • FAX: (201) 641-1831
N.J. CERTIFICATE OF AUTHORIZATION No. 24GA27958000

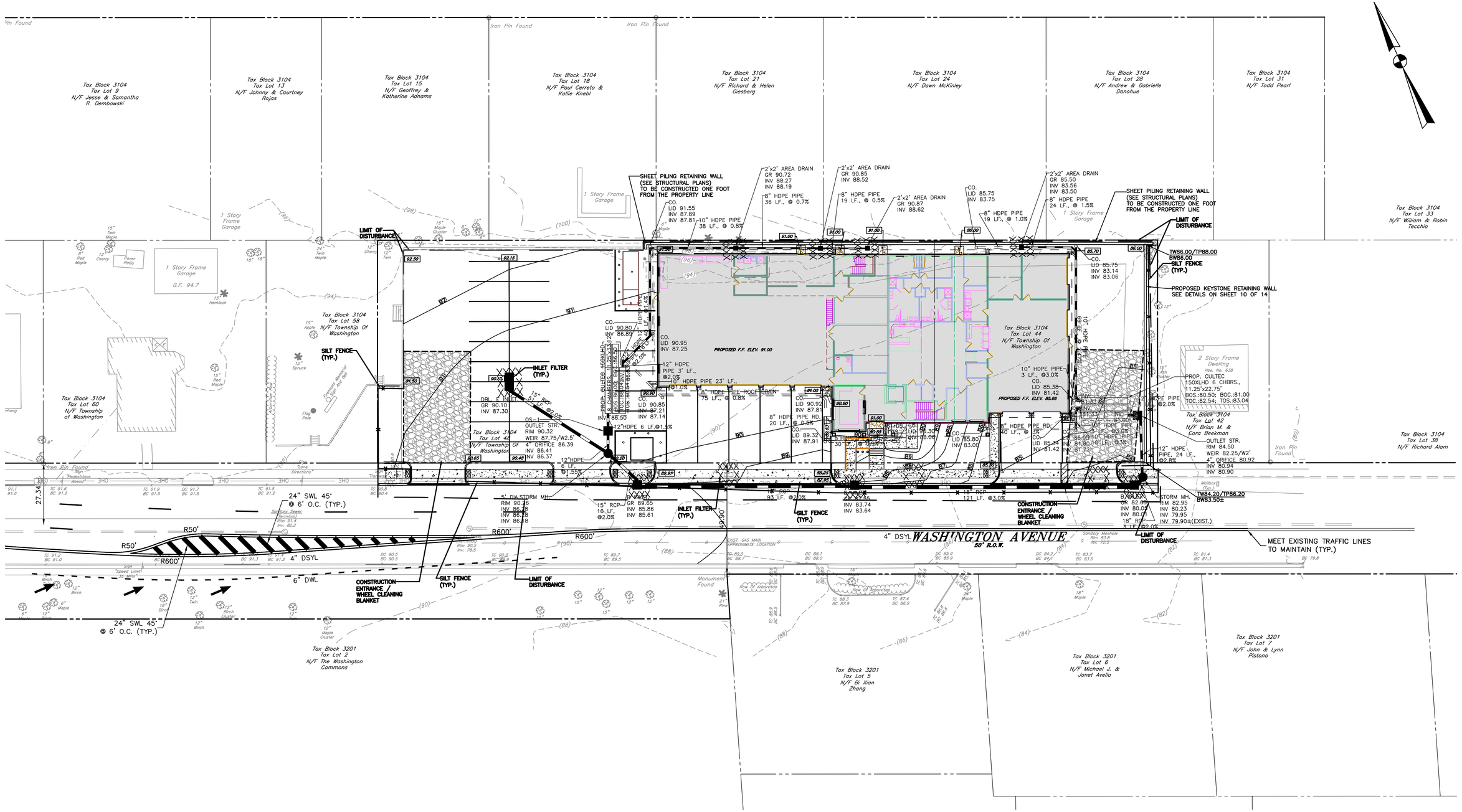
STEPHEN T. BOSWELL
PROFESSIONAL ENGINEER N.J. LIC. 34680

JEFFREY L. MORRIS
PROFESSIONAL ENGINEER N.J. LIC. 30979

EMERGENCY SERVICES COMPLEX
656 WASHINGTON AVENUE
GRADING AND DRAINAGE PLAN
LOTS 44 AND 48 BLOCK 3104
WASHINGTON TOWNSHIP
BERGEN COUNTY NEW JERSEY

SURVEYED BY	DESIGNED BY	SCALE:	JOB NO.	DATE
DRAWN BY GK.T.	CHECKED BY J.L.M.	1"=20'	WT-110	07.06.2020

DRAWING NO. WT-110-SP/GDP SHEET 5 OF 14



NO.	DATE	DESCRIPTION	SURVEYED BY	DRAWN BY	DESIGNED BY	CHECKED BY
1	7.23.2020	REVISED AS PER CONTRACTOR'S RFI		LS	LS	JLM

BOSWELL ENGINEERING
ENGINEERS – SURVEYORS – PLANNERS – SCIENTISTS
330 PHILLIPS AVENUE, SOUTH HACKENSACK, N.J. 07606
TEL: (201) 641-0770 • FAX: (201) 641-1831
N.J. CERTIFICATE OF AUTHORIZATION No. 24GA27958000

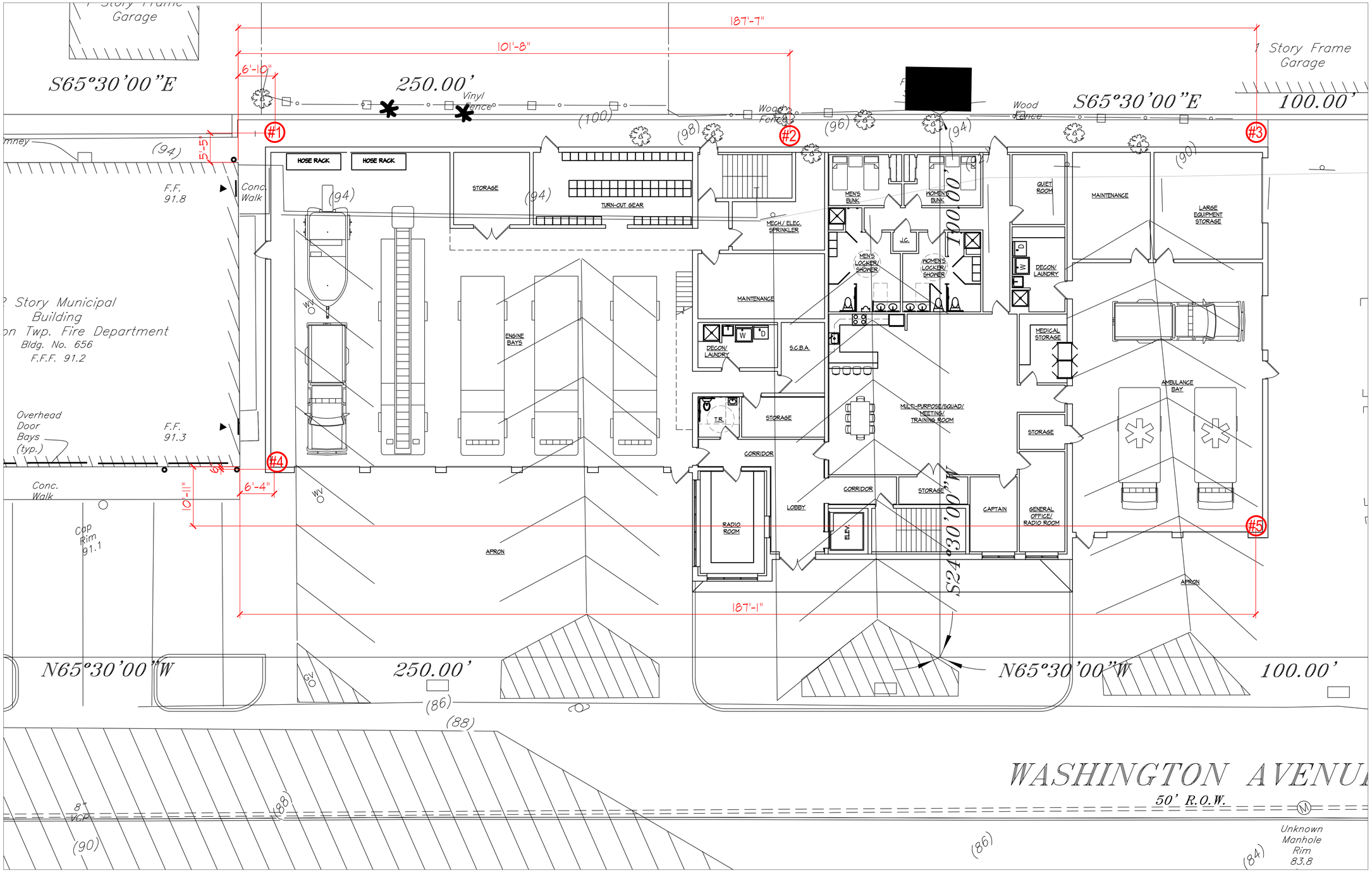
STEPHEN T. BOSWELL
PROFESSIONAL ENGINEER N.J. LIC. 34680

JEFFREY L. MORRIS
PROFESSIONAL ENGINEER N.J. LIC. 30979

EMERGENCY SERVICES COMPLEX
656 WASHINGTON AVENUE
SOIL EROSION AND SEDIMENT CONTROL PLAN
LOTS 44 AND 48 BLOCK 3104
WASHINGTON TOWNSHIP
BERGEN COUNTY NEW JERSEY

SURVEYED BY / DRAWN BY	DESIGNED BY / CHECKED BY	SCALE	JOB NO.	DATE
GK.T.	J.L.M. / J.L.M.	1"=20'	WT-110	07.06.2020

DRAWING NO. WT-110-SP/SE SHEET 8 OF 14



Robbie Conley Architect, LLC
596 Glassboro Road
Woodbury Heights, New Jersey, 08097
(856)-845-7500 FAX:(856)-853-0528
N.J. LIC. NO. 21AC00069700 NCARB CERT. NO. 52314 PA. LIC. NO. AX004265L

AL-14159 NJ

SHEET TITLE: CONCEPTUAL FLOOR PLAN

PROJECT
XXXXXXXXXXXXXXXXXX
XXXXXXXXXXXXXXXXXX
XXXXXXXXXXXXXXXXXX
XXXXXXXXXXXXXXXXXX

OWNER
XXXXXXXXXXXXXXXXXX
XXXXXXXXXXXXXXXXXX
XXXXXXXXXXXXXXXXXX
XXXXXXXXXXXXXXXXXX

CONTRACTOR SHALL CHECK AND VERIFY ALL CONDITIONS AND DIMENSIONS AT THE SITE BEFORE PROCEEDING WITH WORK.

REVISIONS

DESCRIPTION	DATE

ISSUE DATE: APR. 11, 2018
DRAWN: JSD CHKD:RJC

DWG. NO. **A-1** _X_ OF _X_

PROJECT NO. 18053

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Melick-Tully
& Associates

A Division of GZA



SOILS AND FOUNDATION INVESTIGATION

PROPOSED FIRE/EMS BUILDING
TOWNSHIP OF WASHINGTON
656 Washington Avenue
Township of Washington, Bergen County
New Jersey

June 19, 2019
File No. 26.0091784.00

PREPARED FOR:
Robbie Conley Architect, LLC
596 Glassboro Road
Woodbury Heights, New Jersey

Melick-Tully & Associates, a Division of GZA
117 Canal Road | South Bound Brook, NJ 08880
732-356-3400

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Melick-Tully
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A Division of GZA

GEOTECHNICAL
ENVIRONMENTAL
ECOLOGICAL
WATER
CONSTRUCTION MANAGEMENT

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Eugene M. Gallagher, Jr., P.E., *Principal*
Robert E. Schwankert, P.E., *Principal*
Mark R. Denno, P.E., *Principal*
Christopher P. Tansey P.E., *Associate Principal*
Todd E. Horowitz, P.E., *Associate Principal*

June 19, 2019
File No. 26.0091784.00

Robbie Conley Architect, LLC
596 Glassboro Road
Woodbury Heights, New Jersey 08097

Attention: Mr. John Descano
Project Manager

Report
Soils and Foundation Investigation
Proposed Fire/EMS Building
Township of Washington, Bergen County, New Jersey
Township of Washington

Introduction

This report presents the results of a soils and foundation investigation performed by Melick-Tully and Associates, a Division of GZA GeoEnvironmental, Inc. (MTA) for a proposed Fire/EMS Building which may be constructed at 656 Washington Avenue in the Township of Washington, Bergen County, New Jersey. The approximate location of the site is shown on the Site Location Map, Plate 1. Our services were provided in general accordance with our proposal dated April 8, 2019.

Proposed Construction

Plans provided to us indicate the proposed construction would consist of a one to two-story Firehouse/EMS building. The center of the building will be two stories and will contain several storage rooms, maintenance rooms, a lobby, etc., while the ends of the building will contain bays for fire and EMS trucks and will be one-story. The plans indicate that the first floor will encompass 12,690 square feet in area, while the second floor will be 6,227 square feet. The

building will be of slab-on-grade construction. A first floor elevation was not provided, but it is expected that only minor cuts/fills, if any, will be required to reach the proposed grades.

Purpose and Scope of Work

The purpose of our services was to:

1) explore the subsurface soil and groundwater conditions within accessible portions of the proposed building;

2) estimate the relevant geotechnical engineering properties of the encountered materials;

3) evaluate the site foundation requirements considering the anticipated construction and encountered subsurface conditions;

4) recommend an appropriate type of foundation for support of the proposed building, and provide geotechnical-related foundation design and installation criteria, including an estimate of the Site Class as defined by the International Building Code 2015, New Jersey Edition, for seismic design purposes;

5) provide recommendations for the support and need for subdrainage of the ground level floor slab;

6) estimate the post-construction settlements of the recommended floor and foundation systems; and

7) discuss appropriate earthwork considerations consistent with the proposed construction and encountered subsurface conditions.

To accomplish these purposes, a subsurface investigation program consisting of five supervised borings was performed. Prior to our arrival on-site, your firm provided a plan identifying desired boring locations. The borings were performed as close as possible to the requested locations and advanced using truck-mounted drilling equipment. The borings extended to depths ranging from approximately 10 to 21 feet below grade where auger and/or spoon refusal atop cobbles and/or boulders was encountered at each location.

All field work was performed under the direct technical observation of a representative from MTA. Our field representative located the explorations in the field using tape measurements from existing surface features shown on the plans provided to us, maintained continuous logs of the explorations as the work proceeded, and

supervised the soil sampling operations. Soil samples suitable for identification purposes were extracted from the borings at closely spaced intervals in general accordance with the procedures of the Standard Penetration Test. Upon completion of the drilling, the boreholes were backfilled with the spoils generated during the drilling, and asphalt cold patch was placed at the ground surface at each location.

The approximate locations of the explorations performed for this study are shown on the Plot Plan, Plate 2. Detailed descriptions of the subsurface conditions encountered are presented on the individual Logs of Borings, Plates 3A through 3E. The soil samples obtained from the borings were visually classified in general accordance with the Unified Soil Classification System shown on Plate 4.

All soil samples were brought to our office where they were further examined in our soil mechanics laboratory, and selected samples were subjected to geotechnical laboratory testing consisting of natural moisture content determinations (ASTM D-2216) and mechanical grain-size analyses (ASTM D-6913-04) to aid in their engineering classification and evaluation. The results of the moisture content tests are indicated on the individual exploration logs, while the results of the grain-size analyses are shown on the Gradation Curves, Plate 5.

The results of our field exploration and laboratory testing programs have provided the basis for our engineering analyses and design recommendations. The following discussions of our findings and recommendations are subject to the limitations attached as an Appendix to this report.

Site Conditions

Site Features: There is an existing two-story municipal building (fire house) located within the north/central portion of the property. The plans show the ground floor at Elevation +91.2 feet and the second floor at Elevation +107.8 feet. Asphalt pavement is present to the south, east and west of the building. Retaining walls about 2 to 3 feet in height are present along the northern and western portions of the property. The walls consist of railroad

ties on the western side of the property and modular blocks on the northern portion of the property. Based on our visual observations, the asphalt appeared to be in fair to good condition with only minor cracks observed throughout the parking lot.

The overall topography in the area slopes down from the north to the south. Spot elevations shown on the existing site survey plan indicates that the grades within the existing parking lot are relatively level and typically range from around Elevation +88 feet to +92 feet. Top of wall elevations that are shown on the plan range from Elevation +93 feet to +95 feet.

Subsurface Conditions: The subsurface conditions encountered in the explorations performed for this study consisted of the following generalized strata, presented in order of increasing depth:

1) Asphalt: The borings were performed in the existing pavement area and encountered 2 to 4 inches of asphalt at the ground surface. The asphalt was underlain by approximately 4 to 10 inches of crushed stone.

2) Fill: A thin layer of fill was encountered beneath the asphalt and crushed stone in Borings 1 and 4. The fill consisted of silty sand with gravel and was generally estimated to be medium dense in relative density. The fill extended to about 1.5 feet beneath the existing surface grades.

3) Silty Sands: The surficial materials and/or fill were underlain by medium dense to very dense silty sand containing varying amounts of gravel, cobbles and boulders that extended to the completion depths of the borings. Auger refusal atop cobbles/boulders was encountered in Boring 1, while split spoon sampler refusal was encountered atop cobbles/boulders in Borings 2 and 3.

Groundwater was encountered in Borings 3 through 5 upon completion of the borings at depths ranging from about 14 to 17 feet below the existing ground surface. Boring 3 was left open for five hours, and the groundwater level rose 1 foot from 17 feet below the ground surface to a depth of approximately 16 feet. Groundwater levels may vary on a seasonal basis.

Findings and Recommendations

General: Based on the results of our study, it is our opinion that:

1) Following the site preparation activities outlined in this report, the proposed Fire/EMS building can be supported by conventional shallow spread foundations that derive their support from the natural silty sandy soils, or controlled fill installed atop the natural soils. Foundations that are established atop these materials can be designed for maximum allowable net bearing pressures of up to 4,000 pounds per square foot. These soils would also provide adequate support of the proposed floor slab.

2) A thin layer of fill was encountered in two of the borings (B-1 and B-4) completed for this study. It is possible that additional fill could be located elsewhere throughout the footprint of the proposed building. If fill is encountered, the fill would require further evaluation at the time of construction by a representative of MTA to evaluate whether the fill could be recompacted and remain in-place beneath the limits of the proposed building, or require complete removal and replacement.

3) Groundwater was encountered in three of the explorations performed for this study at depths ranging from 13 to 17 feet below the surface levels. We have not been provided with proposed grades, but it is expected that only minor cuts will be required to reach the proposed grades. The plans indicate that an elevator will be constructed, and it is anticipated that the elevator pit will require the deepest excavation within the limits of the proposed building. The contractor should be required to control all/any seepage encountered during the earthwork activities and should be required to provide all dewatering necessary to maintain relatively dry excavations. Control of surface runoff should also be provided to prevent inundation of subgrades and flooding of excavations.

4) Excavated silty sands (both fill and natural) would be considered suitable for reuse as fill or backfill provided they are at or conditioned to moisture contents that would allow compaction to the required densities and cobbles greater than 4 inches and boulders are culled. Should deleterious materials be encountered in the fill, they would need to be segregated prior to reuse.

The following sections of this report present further discussion of each of these items.

Site Preparation and Earthwork

The initial site preparation activities should include the removal of all surface features within the limits of the proposed construction. The existing asphalt should be removed from within and up to 5 feet outside the limits of the building footprint. Asphalt can potentially be reused below future pavement areas provided it is crushed to an appropriate gradation for reuse as fill. Asphalt millings would not count as a direct substitute for DGA. Asphalt cannot be reused within the building limits. Any utilities that are within the limits of the new building should be

removed or rerouted beyond the limits of the proposed building, and the resultant excavations backfilled with controlled compacted fill to the planned subgrade levels. The existing retaining walls and any shrubs in the landscaped areas above the wall would also require removal.

Following these activities, a series of shallow test pits should be excavated throughout the building footprint to evaluate the thickness and nature of the existing fill. No more than 2 feet of fill should remain in-place, and this determination should be made by MTA at the time of construction. Variables such as thickness of the fill, presence of deleterious materials and moisture levels would need to be further evaluated at the time of construction.

Following removal of the surficial materials, any excavations required to reach the proposed subgrade elevations, and prior to fil placement in areas to be raised, the exposed subgrades which are expected to consist of silty sandy fill or natural soils, should be proofrolled with at least 10 passes of a heavy, self-propelled vibratory compactor with a static drum weight of 12,000 pounds under the observation of our representative. Any subgrade soils that cannot be compacted to a dense and unyielding condition should be excavated to the surface of the underlying dense soils and replaced with controlled compacted fill. In-situ moisture content testing of the near surface materials indicates that the natural soils are generally at moisture contents that would permit compaction to a dense and stable condition. Conditions can vary between the explored locations. It may be possible that some overexcavation may be required to achieve a stable subgrade, if the soils are exposed to wet weather or moisture contents of in-place soils, exceeding the moisture contents of the tested samples.

It is expected that the on-site excavated soils will consist of either fill, or natural silty sandy soils with inclusions of gravel, cobbles and boulders. These materials would generally be suitable for reuse as fill or backfill provided they can be moisture conditioned to within the limits needed to permit compaction and cobbles greater than 4 inches, and boulders are culled. The in-situ moisture contents of the upper several feet of soil typically ranged from around 5 to 14 percent which is generally within to slightly above the limits to permit compaction to the required

density. Therefore, some moisture conditioning comprised of aeration and drying may be required prior to their reuse. Special handling of cobbles and/or boulders may be required.

Imported fill, if required in structural areas, should consist of uncontaminated, relatively well-graded granular soils containing less than 15 percent by weight of material passing a U.S. Standard No. 200 sieve and having a maximum particle size of 4 inches. Documentation of the environmental quality of the imported fill should include written certification from the fill supplier stating that the fill is uncontaminated, virgin material.

All controlled compacted fill placed in structural areas should be spread in horizontal layers of no more than 12 inches in loose thickness and uniformly compacted to at least 95 percent of its maximum dry density as determined by the ASTM D-1557 test procedure using heavy self-propelled vibratory compaction equipment having a static drum weight of at least 12,000 pounds. Backfill soils placed in confined excavations such as for utilities or foundation excavations should be spread in thinner layers and compacted to the same degree using portable vibratory compaction equipment. All controlled compacted fill should be moisture conditioned as necessary to achieve moisture contents that will permit compaction to the required densities.

We recommend that all site excavations be performed in accordance with the current OSHA Excavation Regulations, as well as in accordance with any other locally applicable guidelines. Based on the results of the borings, we believe that the fill and the natural silty sands would be considered Type “C” soils as defined by the current OSHA excavation regulations.

Groundwater was encountered in 3 of the borings at depths of around 13 to 16 feet below grade. We have not been provided with grading information, but it is anticipated that only minor cuts would be required throughout must of the building with the exception of the elevator shaft and pit, which will likely require a deeper cut. We recommend that the contract documents require the contractor to provide any dewatering necessary and

maintain open excavations in dry conditions at all times during construction. Control of surface runoff and maintaining pitch at the surface will prevent inundation of excavations and help to reduce the potential for disturbance to the prepared subgrades.

Shallow Foundation Design Criteria: It is our recommendation that following the site preparation procedures outlined in this report, the proposed building could be established atop conventional spread foundations. Foundations that are established atop the natural soils, or controlled fill installed atop the natural soils could be designed to impose a maximum allowable net bearing pressure of up to 4,000 psf. All foundations should extend to a depth of at least 3 feet below the adjacent finished exterior grades to provide protection from frost penetration.

It is our opinion that foundations designed and installed in accordance with our recommendations would experience post construction settlements of about 1/2 of 1 inch.

Floor Slab Design Criteria: Following the previously described site preparation procedures, the floor slab could be supported by the recompacted fill after further evaluation by MTA, the undisturbed natural soils, or controlled fill. We recommend that a minimum 4 inch thick layer of porous fill consisting of clean 3/4 inch stone be placed beneath the slab to provide a capillary break between the subgrade soils and the bottom of the concrete, and to help provide a stable working base during construction.

Estimated post-construction settlements of slabs supported by materials prepared in accordance with our recommendations are expected to be on the order of 1/2 of 1 inch, or less.

Seismic Design Criteria: Based on the results of our explorations and our review of the regional geology, it is our opinion that seismic design of the proposed building could be based on Site Class “C” as defined in the International Building Code 2015, New Jersey Edition.

Future Work

MTA should be provided with a copy of the Grading Plan to either confirm or revise the recommendations outlined in this report. In addition, we recommend that a series of shallow test pits be excavated throughout the proposed building footprint at the time of construction to determine whether the existing fill could remain in-place beneath the floor slab or will require removal and replacement.

Please contact us if you have any questions regarding this report.

The following Plates and Appendix are attached and complete this report:

Plate 1 - Site Location Map
Plate 2 - Plot Plan
Plates 3A through 3E - Logs of Borings
Plate 4 - Unified Soil Classification System
Plate 5 - Gradation Curves
Appendix - Limitations

Very truly yours,

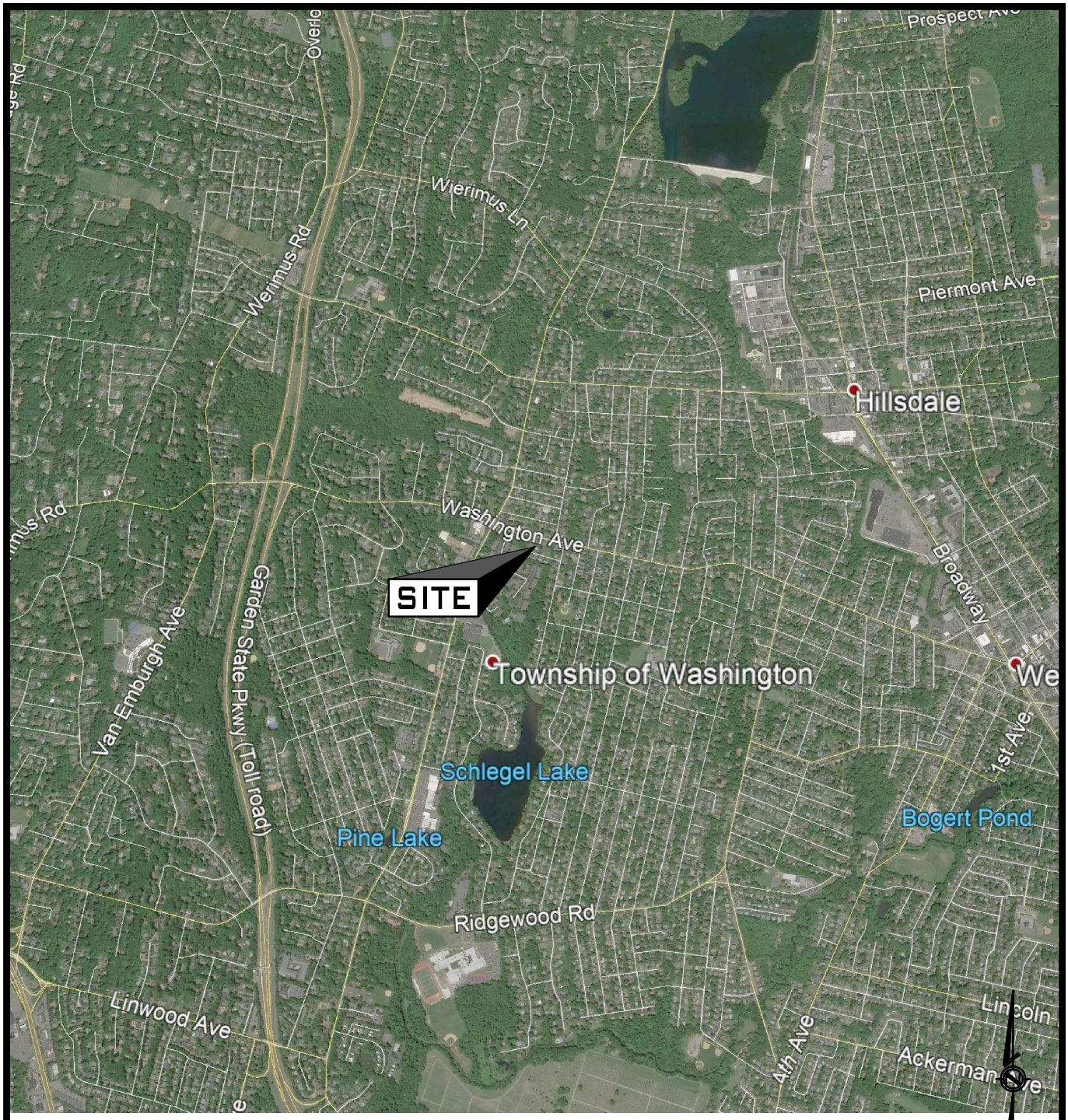
MELICK-TULLY and ASSOCIATES,
a Division of GZA GeoEnvironmental, Inc.

Kimberly A. Tully, P.E.
Senior Project Manager

Christopher P. Tansey, P.E.
Associate Principal

Mark R. Denno, P.E.
Consultant/Reviewer

KAT:MRD/pm



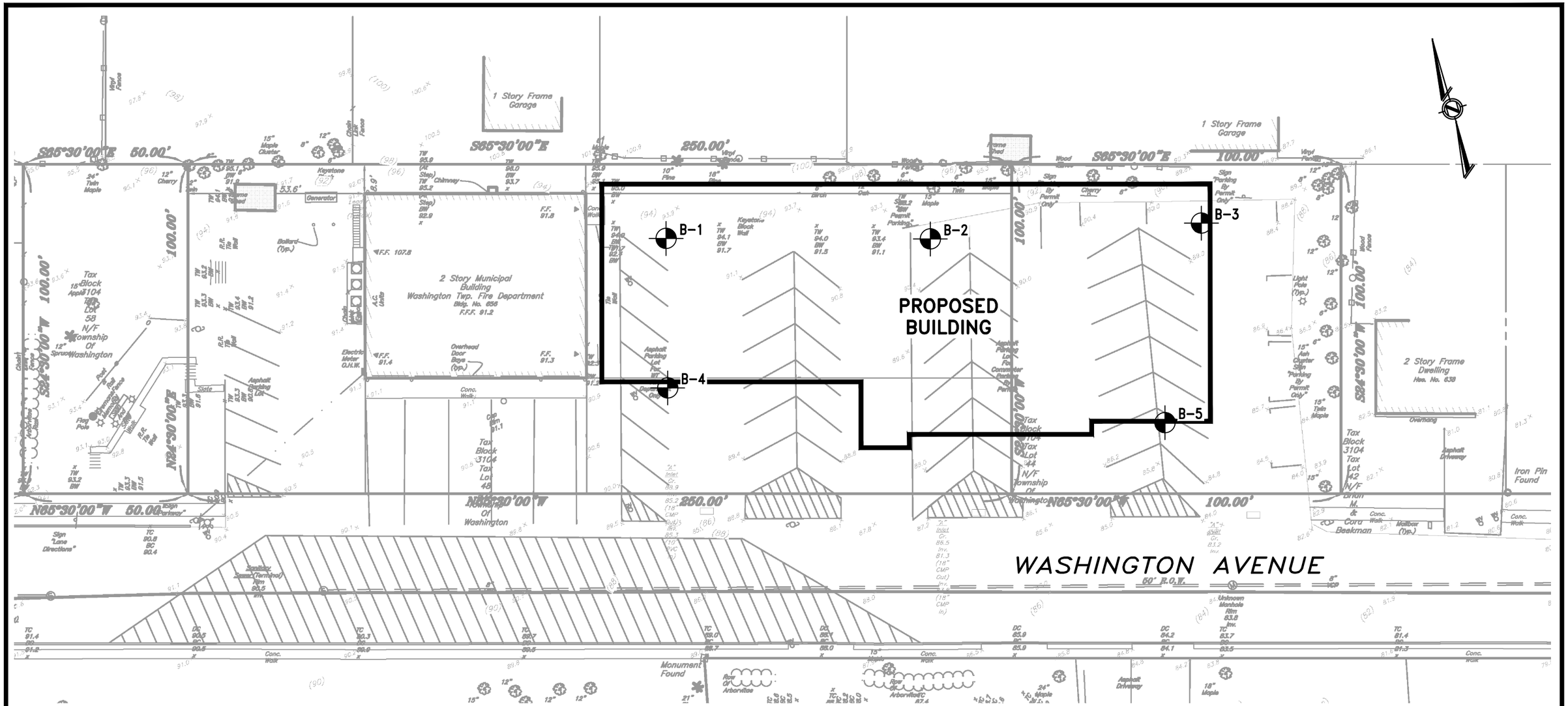
Aerial Photo courtesy of Google Earth Pro

MELICK–TULLY AND ASSOCIATES
A Division of GZA
Geotechnical Engineers & Environmental Consultants
117 Canal Road
South Bound Brook, New Jersey 08880
(732) 356-3400

SITE LOCATION MAP

FIRE AND EMS BUILDING
TOWNSHIP OF WASHINGTON, NEW JERSEY
ROBBIE CONLEY ARCHITECT, LLC

JOB NO.	FILE NO.	DR. BY	CHK. BY	DATE	SCALE	PLATE
26.0091784.00	–	VJD	KT	6/6/19	1"=2,000'	1


B-1
B-2
B-3
B-4
B-5
PROPOSED BUILDING
1 Story Frame Garage
2 Story Municipal Building
Washington Twp. Fire Department
Bldg. No. 656
F.F.F. 91.2
1 Story Frame Garage
2 Story Frame Dwelling
Hse. No. 638
Tax Block 3104 Tax Lot 58 N/F Township Of Washington
Tax Block 3104 Tax Lot 45 N/F Township Of Washington
Tax Block 3104 Tax Lot 42 N/F Dinah M. & Cora Beekman
S85°30'00"E 50.00'
S85°30'00"E 250.00'
S85°30'00"E 100.00'
N85°30'00"W 50.00'
N85°30'00"W 250.00'
N85°30'00"W 100.00'
N4°30'00"E 100.00'
S4°30'00"W 100.00'
S4°30'00"E 100.00'
WASHINGTON AVENUE
60' R.O.W.
Iron Pin Found
Monument Found
Asphalt Driveway
Mailbox (Typ.)
Overhead Door Bays (Typ.)
Generator
Electric Meter O.H.W.
Bollard (Typ.)
Sign "Parking By Permit Only"
Sign "Permit Parking"
Sign "Lane Directions"
Conc. Walk
Asphalt Parking Lot
Keystone Block Wall
Chain Link Fence
Vinyl Fence
Wood Fence
Stone Wall
Overhang
Sanitary Sewer (Terminal) Rim 89.5 Inv.
Row Of Arborvitae
Rim 87.4
Inv. 83.2 (12" CMP Out)
Inv. 81.3 (12" CMP In)
Unknown Manhole Rim 83.8 Inv.
Inv. 86.5
Inv. 83.2
Inv.
F.F. 91.8
F.F. 107.8
F.F. 91.4
F.F. 91.3
Chimney
Light Pole (Typ.)
Fire Pole
Flag Pole
Post
Utility Pole
Sign
Shed
Tree
Shrub
Stake
Hedge
Cap Elev. 91.1
Inlet Elev. 88.9
Inlet Elev. 85.2
Inlet Elev. 87.2
Inlet Elev. 83.2
Inlet Elev. 86.1
Inlet Elev. 85.6
Inlet Elev. 84.0
Inlet Elev. 82.9
Inlet Elev. 82.6
Inlet Elev. 81.2
Inlet Elev. 80.6
Inlet Elev. 80.5
Inlet Elev. 79.
Inlet Elev. 81.3
Inlet Elev. 81.6
Inlet Elev. 82.1
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Inlet Elev. 90.5
Inlet Elev. 90.7
Inlet Elev. 91.1
Inlet Elev. 91.2
Inlet Elev. 91.4
Inlet Elev. 91.6
Inlet Elev. 91.7
Inlet Elev. 92.0
Inlet Elev. 92.3
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Inlet Elev. 93.1
Inlet Elev. 93.3
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Inlet Elev. 93.7
Inlet Elev. 93.8
Inlet Elev. 94.1
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Inlet Elev. 94.5
Inlet Elev. 94.6
Inlet Elev. 94.7
Inlet Elev. 94.8
Inlet Elev. 95.0
Inlet Elev. 95.1
Inlet Elev. 95.2
Inlet Elev. 95.3
Inlet Elev. 95.4
Inlet Elev. 95.5
Inlet Elev. 95.6
Inlet Elev. 95.7
Inlet Elev. 95.8
Inlet Elev. 96.0
Inlet Elev. 96.1
Inlet Elev. 96.2
Inlet Elev. 96.3
Inlet Elev. 96.4
Inlet Elev. 96.5
Inlet Elev. 96.6
Inlet Elev. 96.7
Inlet Elev. 96.8
Inlet Elev. 96.9
Inlet Elev. 97.0
Inlet Elev. 97.1
Inlet Elev. 97.2
Inlet Elev.

LOG OF BORING

BORING NO. 1

COMPLETION DATE: 6/1/19 | SURFACE ELEVATION: +92.5 ft. (±) | WATER LEVEL: *

JOB NUMBER: 26.0091784.00 | READING DATE: 6/1/19

DEPTH	SAMPLES	N-VALUE	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
					3" Asphalt over 5" stone	
	S1A		4.7		FILL - Brown fine to coarse sand, some silt, some fine to coarse gravel (moist)(medium dense)	
	S1B	35	6.9		Brown fine to medium sand, and silt, trace fine to coarse gravel (moist)(dense)	
	S2	45			- grading with cobbles and boulders @ 4'	
5				SM		5
	S3	42				
10	S4	100/0"			- auger refusal @ 10'	10
					Boring completed @ 10'	
					*Groundwater not encountered	
15						15
20						20
25						25

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH
2. INDICATES THE NUMBER OF BLOWS TO ADVANCE A 2" OD SAMPLER A DISTANCE OF 12 INCHES USING A 140 POUND WEIGHT FALLING 30 INCHES

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: KAT/pm 6/19

Sheet: 1 of 1 PLATE: 3A

MELICK-TULLY AND ASSOCIATES,
a Division of GZA GeoEnvironmental, Inc.

LOG OF BORING

BORING NO. 2

COMPLETION DATE: 6/1/19 | SURFACE ELEVATION: +93 ft. (±) | WATER LEVEL: *

JOB NUMBER: 26.0091784.00 | READING DATE: 6/1/19

DEPTH	SAMPLES	N-VALUE	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
					4" Asphalt over 10" stone	
	S1	43	8.2		Brown fine to medium sand, some silt, some fine to coarse gravel (moist)(dense)	
	S2	69	5.2		- grading (very dense)	
5	S3	62				5
				SM		
10	S4	118			- grading with cobbles	10
15	S5	100/5"				15
					Boring completed @ 15.9'	
					*Groundwater not encountered	
20						20
25						25

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH
2. INDICATES THE NUMBER OF BLOWS TO ADVANCE A 2" OD SAMPLER A DISTANCE OF 12 INCHES USING A 140 POUND WEIGHT FALLING 30 INCHES

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: KAT/pm 6/19

Sheet: 1 of 1 PLATE: 3B

MELICK-TULLY AND ASSOCIATES,
a Division of GZA GeoEnvironmental, Inc.

LOG OF BORING

BORING NO. 3

COMPLETION DATE: 6/1/19 | SURFACE ELEVATION: +90 ft. (±) | WATER LEVEL: 16'

JOB NUMBER: 26.0091784.00 | READING DATE: 6/1/19

DEPTH	SAMPLES	N-VALUE	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
					2" Asphalt over 6" stone	
	S1	44	7.6	SM	Brown fine to medium sand, little silt, some fine to coarse gravel (moist)(dense)	
	S2	21			- grading (medium dense)	
5	S3	14				5
	S4	30			- grading red-brown (dense)	
10	S5	23			- grading (medium dense)	10
	S6	79				
				SM	Brown fine to medium sand, some silt, some fine to coarse gravel, with cobbles (moist)(very dense)	
15	S7	45			- grading (wet)(dense)	15
	S8	38				
20	S9	100/5"			- grading (very dense)	20
					Boring completed @ 20.9'	
					Groundwater encountered @ 17' @ 9:15	
					Borehole left open during day.	
					Groundwater measured @ 16' at 2:30	
25						25

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH
2. INDICATES THE NUMBER OF BLOWS TO ADVANCE A 2" OD SAMPLER A DISTANCE OF 12 INCHES USING A 140 POUND WEIGHT FALLING 30 INCHES

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: KAT/pm 6/19

Sheet: 1 of 1 PLATE: 3C

MELICK-TULLY AND ASSOCIATES,
a Division of GZA GeoEnvironmental, Inc.

LOG OF BORING

BORING NO. 4

COMPLETION DATE: 6/1/19 | SURFACE ELEVATION: +91 ft. (±) | WATER LEVEL: 14'

JOB NUMBER: 26.0091784.00 | READING DATE: 6/1/19

DEPTH	SAMPLES	N-VALUE	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
					2" Asphalt over 4" stone	
	S1A		6.1		FILL - Red-brown fine to medium sand, some silt, little fine to	
	S1B	60	5.9		coarse gravel (moist)(medium dense)	
					Brown fine to coarse sand, some silt, little fine to coarse gravel (moist)(very dense)	
	S2	53	8.3			
5					- grading with cobbles (dense)	5
	S3	31				
	S4	61		SM	- grading (very dense)	
10						10
	S5	46			- grading (dense)	
15						15
	S6	100			- grading (very dense)	
					Boring completed @ 16.5'	
					Groundwater encountered @ 14'	
20						20
25						25

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH
2. INDICATES THE NUMBER OF BLOWS TO ADVANCE A 2" OD SAMPLER A DISTANCE OF 12 INCHES USING A 140 POUND WEIGHT FALLING 30 INCHES

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: KAT/pm 6/19

Sheet: 1 of 1 PLATE: 3D

MELICK-TULLY AND ASSOCIATES,
a Division of GZA GeoEnvironmental, Inc.

LOG OF BORING

BORING NO. 5

COMPLETION DATE: 6/1/19 | SURFACE ELEVATION: +86 ft. (±) | WATER LEVEL: 14'

JOB NUMBER: 26.0091784.00 | READING DATE: 6/1/19

DEPTH	SAMPLES	N-VALUE	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
					2" Asphalt over 4" stone	
	S1	30	13.9		Brown fine to medium sand, and silt, some fine to coarse gravel (moist)(medium dense to dense)	
	S2	40	14.2		- grading red-brown, trace fine gravel	
5	S3	27				5
	S4	31			- grading with cobbles	
				SM		
10	S5	28				10
	S6	43				
15	S7	21				15
	S8	82				
					- grading (very dense)	
20					Boring completed @ 18.7'	20
					Groundwater encountered @ 14'	
25						25

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH
2. INDICATES THE NUMBER OF BLOWS TO ADVANCE A 2" OD SAMPLER A DISTANCE OF 12 INCHES USING A 140 POUND WEIGHT FALLING 30 INCHES

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: KAT/pm 6/19

Sheet: 1 of 1 PLATE: 3E

MELICK-TULLY AND ASSOCIATES,
a Division of GZA GeoEnvironmental, Inc.

MAJOR DIVISIONS			LETTER SYMBOL	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS More than 50% of material is LARGER than No. 200 Sieve	GRAVEL & GRAVELLY SOILS More than 50% of coarse fraction RETAINED on No. 4 Sieve	CLEAN GRAVELS (Little or no fines)	GW	Well-graded gravels, gravel-sand mixtures, little or no fines.
			GP	Poorly-graded gravels, gravel-sand mixtures, little or no fines.
		GRAVELS WITH FINES (Appreciable amount of fines)	GM	Silty gravels, gravel-sand-silt mixtures.
			GC	Clayey gravels, gravel-sand-clay mixtures.
	SAND AND SANDY SOILS More than 50% of coarse fraction PASSING a No. 4 Sieve	CLEAN SAND (Little or no fines)	SW	Well-graded sands, gravelly sands, little or no fines.
			SP	Poorly-graded sands, gravelly sands, little or no fines.
		SANDS WITH FINES (Appreciable amount of fines)	SM	Silty sands, sand-silt mixtures.
			SC	Clayey sands, sand-clay mixtures.
FINE GRAINED SOILS More than 50% of material is SMALLER than No. 200 Sieve	SILTS AND CLAYS	Liquid limit LESS than 50	ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.
			OL	Organic silts and organic silty clays of low plasticity.
	SILTS AND CLAYS	Liquid limit GREATER than 50	MH	Inorganic silts, micaceous or diatomaceous fine sand or silty soils.
			CH	Inorganic clays of high plasticity, fat clays.
			OH	Organic clays of medium to high plasticity, organic silts.
HIGHLY ORGANIC SOILS			PT	Peat, humus, swamp soils with high organic contents.

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS.

GRADATION*	COMPACTNESS* sand and/or gravel	CONSISTENCY* clay and/or silt
% Finer by Weight	Relative Density	Range of Shearing Strength in Pounds per Square Foot

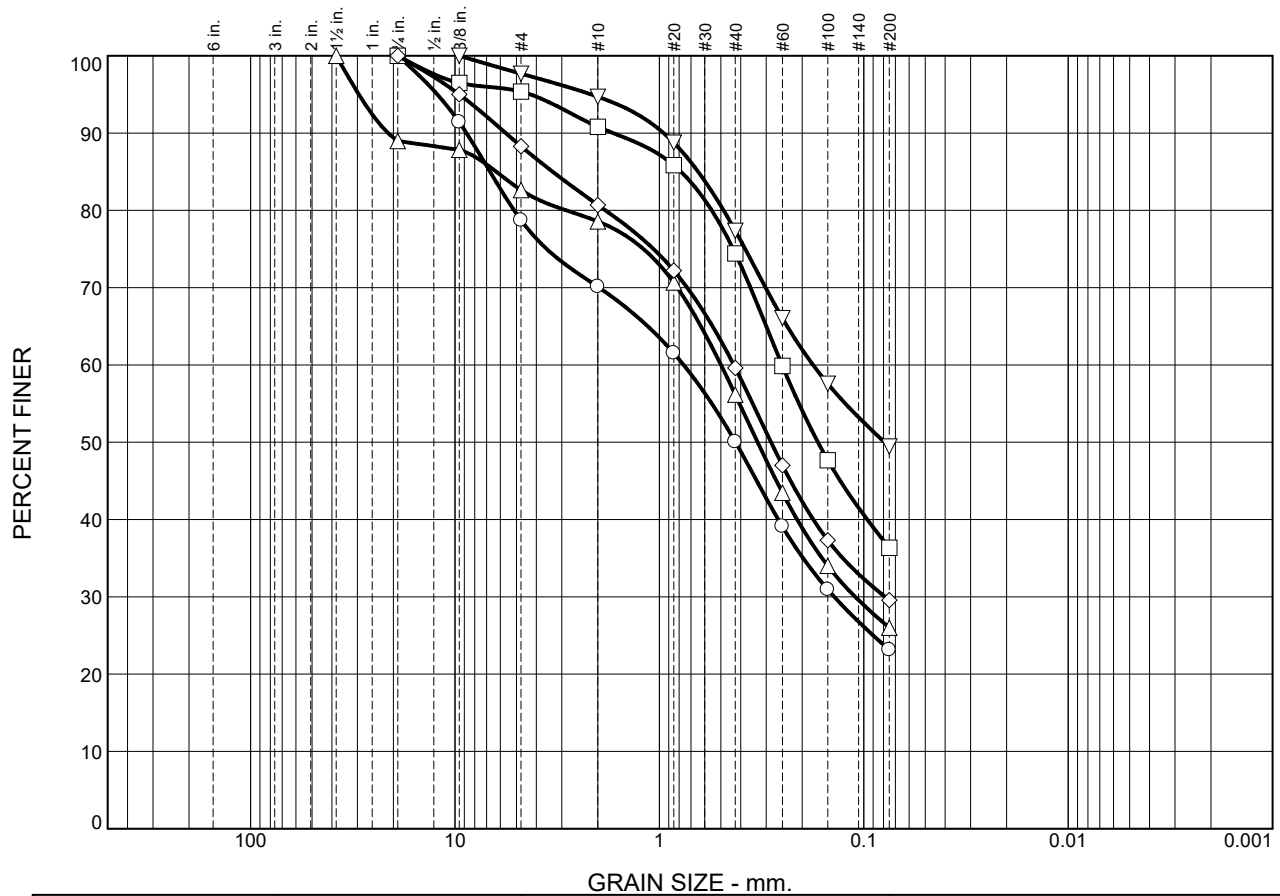
Trace	0% to 10%	Loose	0% to 40%	Very Soft	less than 250
Little	10% to 20%	Medium Dense	40% to 70%	Soft	250 to 500
Some	20% to 35%	Dense	70% to 90%	Medium	500 to 1000
And	35% to 50%	Very Dense	90% to 100%	Stiff	1000 to 2000
				Very Stiff	2000 to 4000
				Hard	Greater than 4000

**Values are from laboratory or field test data, where applicable. When no testing was performed, values are estimated.*

UNIFIED SOIL CLASSIFICATION SYSTEM

SOIL CLASSIFICATION CHART

Gradation Curve(s)



	% Cobbles	% Gravel		% Sand			% Fines
		Coarse	Fine	Coarse	Medium	Fine	
○	0.0	0.0	21.3	8.6	20.1	26.9	23.1
□	0.0	0.0	4.6	4.6	16.4	38.1	36.3
△	0.0	11.0	6.4	4.0	22.5	30.1	26.0
◇	0.0	0.0	11.7	7.6	21.1	30.0	29.6
▽	0.0	0.0	2.3	3.0	17.3	28.0	49.4

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	B-1	S-1A	1-3	Fine to coarse Sand, some Silt, some fine Gravel. (MC=4.7%)	Fill
□	B-1	S-1B	1-3	Fine to medium Sand, and Silt, trace fine Gravel. (MC=6.9%)	SM
△	B-4	S-1A	1-3	Fine to medium Sand, some Silt, little f-c Gravel. (MC=6.1%)	Fill
◇	B-4	S-1B	1-3	Fine to coarse Sand, some Silt, little fine Gravel. (MC=5.9%)	SM
▽	B-5	S-2	3-5	Fine to medium Sand, and Silt, trace fine Gravel. (MC=14.2%)	SM

Melick-Tully & Associates
a Division of GZA GeoEnvironmental, Inc.
South Bound Brook, NJ

Client: Township of Washington
Project: EMS/Fire Building, Township of Washington, NJ
Project No.: 26.0091784.00 **Plate** 5

APPENDIX - Limitations

APPENDIX

Limitations

A. Subsurface Information

Locations: The locations of the explorations were approximately determined by tape measurement from existing surface features. Elevations of the explorations were approximately determined by interpolation between spot elevations shown on plans provided to us by the architect. The locations and elevations of the explorations should be considered accurate only to the degree implied by the method used.

Interface of Strata: The stratification lines shown on the individual logs of the subsurface explorations represent the approximate boundaries between soil types, and the transitions may be gradual.

Field Logs/Final Logs: A field log was prepared for each exploration by a member of our staff. The field log contains factual information and interpretation of the soil conditions between samples. Our recommendations are based on the final logs as shown in this report and the information contained therein, and not on the field logs. The final logs represent our interpretation of the contents of the field logs, and the results of the laboratory observations and/or tests of the field samples.

Water Levels: Water level readings have been made in the explorations at times and under conditions stated on the individual logs. These data have been reviewed and interpretations made in the text of this report. However, it must be noted that fluctuations in the level of the groundwater will occur due to variations in rainfall, temperature, and other factors.

Pollution/Contamination: Unless specifically indicated to the contrary in this report, the scope of our services was limited only to investigation and evaluation of the geotechnical engineering aspects of the site conditions, and did not include any consideration of potential site pollution or contamination resulting from the presence of chemicals, metals, radioactive elements, etc. This report offers no facts or opinions related to potential pollution/contamination of the site.

Environmental Considerations: Unless specifically indicated to the contrary in this report, this report does not address environmental considerations which may affect the site development, e.g., wetlands determinations, flora and fauna, wildlife, etc. The conclusions and recommendations of this report are not intended to supersede any environmental conditions which should be reflected in the site planning.

B. Applicability of Report

This report has been prepared in accordance with generally accepted soils and foundation engineering practices for the exclusive use of The Township of Washington for specific application to the design of the proposed Fire/EMS Building. No other warranty, expressed or implied, is made.

This report may be referred to in the project specifications for general information purposes only, but should not be used as the technical specifications for the work, as it was prepared for design purposes exclusively.

C. Reinterpretation of Recommendations

Change in Location or Nature of Facilities: In the event that any changes in the nature, design or location of the building are planned, the conclusions and recommendations contained in this report shall not be considered valid unless the changes are reviewed and conclusions of this report modified or verified in writing.

Changed Conditions During Construction: The analyses and recommendations submitted in this report are based in part upon the data obtained from five widely-spaced test borings performed for this study. The nature and extent of variations between the explorations may not become evident until construction. If variations then appear evident, it will be necessary to reevaluate the recommendations of this report.

Changes in State-of-the-Art: The conclusions and recommendations contained in this report are based upon the applicable standards of our profession at the time this report was prepared.

D. Use of Report by Prospective Bidders

This soil and foundation engineering report was prepared for the project by Melick-Tully and Associates, a Division of GZA GeoEnvironmental, Inc. (MTA) for design purposes and may not be sufficient to prepare an accurate bid. Contractors utilizing the information in the report should do so with the express understanding that its scope was developed to address design considerations. Prospective bidders should obtain the owner's permission to perform whatever additional explorations or data gathering they deem necessary to prepare their bid accurately.

E. Construction Observation

We recommend that MTA be retained to provide on-site soils engineering services during the earthwork construction and foundation phases of the work. This is to observe compliance with the design concepts and to allow changes in the event that subsurface conditions differ from those anticipated prior to the start of construction.

This Addendum is issued prior to receipt of bids for the information of all bidders for the purposes of advising bidders of additions, deletions, revisions and clarifications to the bidding documents. The following modifications, changes, additions, and/or deletions to the Specifications and/or Drawings, as prepared by ROBBIE CONLEY, ARCHITECT, 596 Glassboro Road, Woodbury Heights, NJ 08097, dated, June 19, 2020 for the construction of the new Emergency Services Complex located at 656 Washington Avenue, Township of Washington, NJ 07676 are hereby made a part of and are incorporated into the Contract Documents thereof and are binding upon all parties concerned as if originally included therein. All other terms as outlined in the original “Invitation for Proposals” will remain in force.

Notice is hereby given that the Township of Washington, Bergen County, 350 Hudson Avenue, Twp. of Washington, NJ 07676 Extends the Bid Date for receipt of proposals for a single contract for the construction of a New Emergency Services Complex to be located at 656 Washington Avenue, Twp. of Washington, NJ 07676.

Proposals will now be received at the Office of the Township Clerk, 350 Hudson Avenue, Room 202 – 2nd Floor, Twp. of Washington, NJ 07676 on August 25, 2020 at 2:00 (PM) local time, at which time they will be publicly opened and read aloud shortly thereafter.

END OF DOCUMENT

This Clarification is issued prior to receipt of bids for the information of all bidders for the purposes clarifications to the bidding documents. The following clarifications to the Specifications and/or Drawings, as prepared by ROBBIE CONLEY, ARCHITECT, 596 Glassboro Road, Woodbury Heights, NJ 08097, dated June 19, 2020 for the construction of a New Emergency Services Complex to be located at 656 Washington Avenue, Twp. of Washington, NJ 07676 are hereby made a part of and are incorporated into the Contract Documents thereof and are binding upon all parties concerned as if originally included therein.

CLARIFICATIONS

ITEM NO. S-1

See Attached Specification Divisions 21, 22, 23, 26, & 28 which were inadvertently left off some of the discs.

END OF DOCUMENT

This Clarification is issued prior to receipt of bids for the information of all bidders for the purposes clarifications to the bidding documents. The following clarifications to the Specifications and/or Drawings, as prepared by ROBBIE CONLEY, ARCHITECT, 596 Glassboro Road, Woodbury Heights, NJ 08097, dated June 19, 2020 for the construction of a New Emergency Services Complex to be located at 656 Washington Avenue, Twp. of Washington, NJ 07676 are hereby made a part of and are incorporated into the Contract Documents thereof and are binding upon all parties concerned as if originally included therein.

CLARIFICATIONS

ITEM NO. C-1

Toilet Rooms and Kitchen Rm119 Shall be solid Surface Countertops, Offices, Laundry and Storage areas shall be Plastic Laminated Countertops. All Cabinetry shall be plastic laminate.

ITEM NO. C-2

Toilet Rooms and Kitchen Rm119 Shall be solid Surface Countertops, Offices, Laundry and Storage areas shall be Plastic Laminated Countertops. All Cabinetry shall be plastic laminate.

ITEM NO. C-3

Replace Clarification No. 1 notice issued July 14, 2020 with the attached Revised July 27, 2020

END OF DOCUMENT

DESIGN DEVELOPMENT PROCESS FOR:
TOWNSHIP OF WASHINGTON EMERGENCY SERVICES COMPLEX





BY:

ROBBIE CONLEY ARCHITECT, LLC.

LOCATION AND EXPERIENCE

LOCATION:

Robbie Conley Architect, LLC.
596 Glassboro Road
Woodbury Heights, NJ 08097

EXPERIENCE:

- **Fire Service**: 35 Years
- **Architecture**: 30 Years
- **Chief of Woodbury Heights Fire Dept.**: 10 Years
- **Councilman**: 3 Years
- **Mayor of Woodbury Heights**: 4 Years
- Substantial Experience in Public Work, EMS & Fire

NEEDS ASSESSMENT SUMMARY – FIRE & AMBULANCE

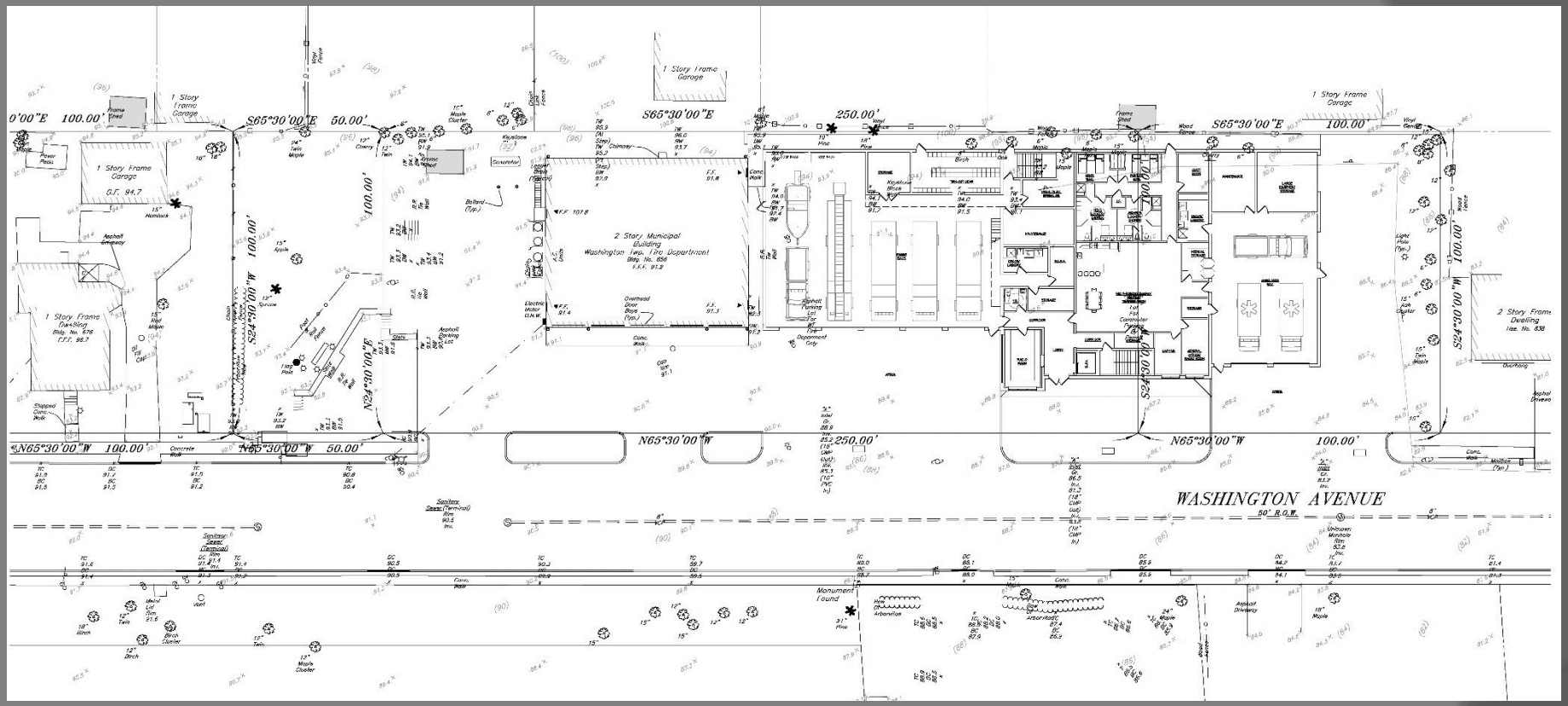
Township of Washington
Fire/Ambulance Building
NEEDS ASSESSMENT

SUMMARY

Operations		5,734	
Circulation	10%	573	
Total		**6,307**	**SF**
House		4,843	
Circulation	10%	484	
Total		**5,327**	**SF**
Administration		3,101	
Circulation	10%	310	
Total		**3,411**	**SF**
TOTAL		**15,045**	**SF**
Ambulance		4,812	
Circulation	10%	481	
Total		**5,293**	**SF**
TOTAL FIRE & AMBULANCE		**20,338**	**SF**

ROBBIE CONLEY ARCHITECT, LLC.

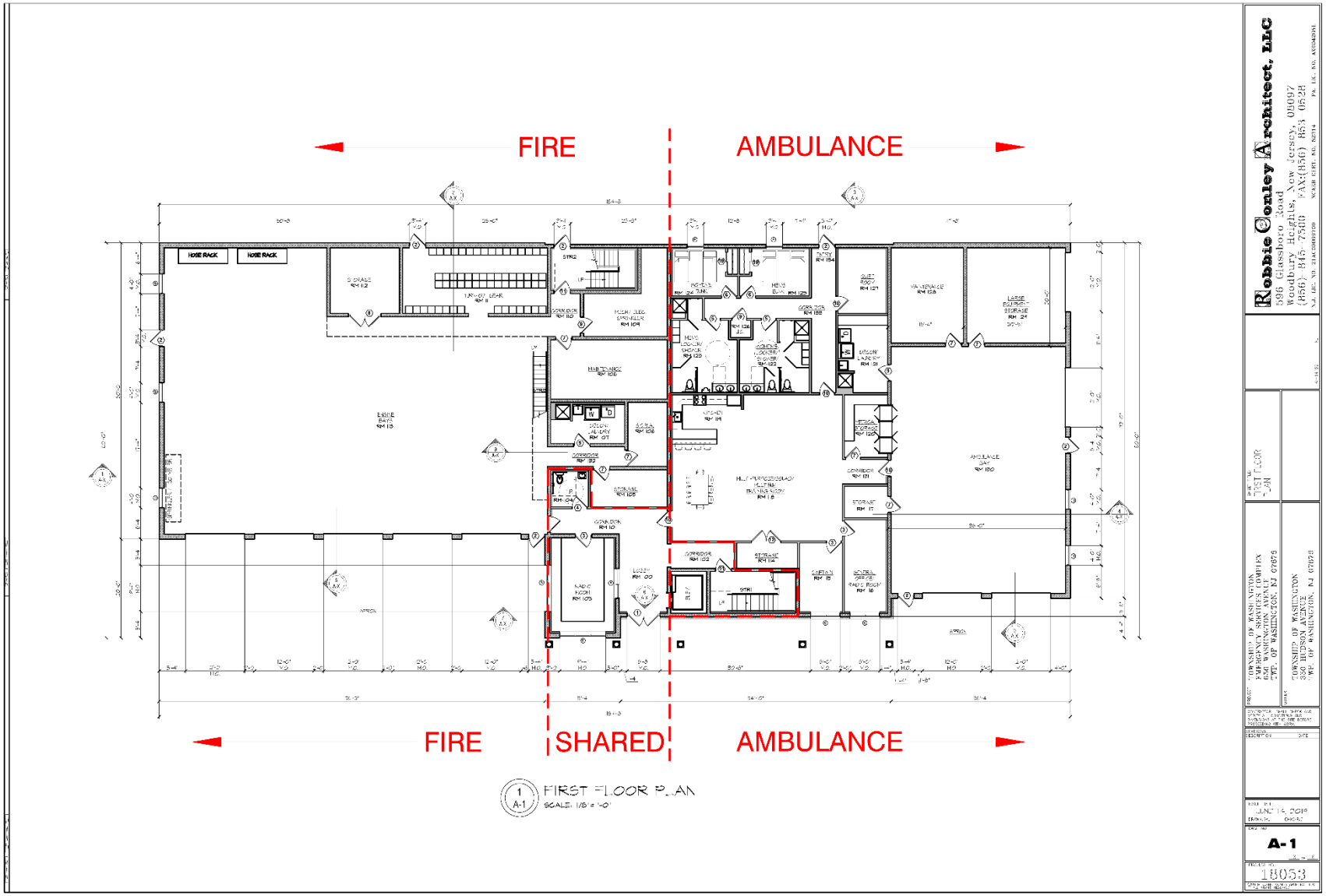
CONCEPTUAL SITE PLAN



SITE DESIGN TO BE COMPLETED BY TOWNSHIP CIVIL ENGINEER.
COORDINATION WITH ENGINEER HAS COMMENCED.

ROBBIE CONLEY ARCHITECT, LLC.

ARCHITECTURAL 1ST FLOOR PLAN



Robbie Conley Architect, LLC
506 Glassboro Road
Woodbury Heights, New Jersey 08097
(856) 845-7500 FAX(856) 853 0528

TOWNSHIP OF WASHINGTON
FIRE/AMBULANCE COMPLEX
650 WASHINGTON AVENUE
TWP. OF WASHINGTON, NJ 07675

1ST FLOOR PLAN

JUNE 14, 2019

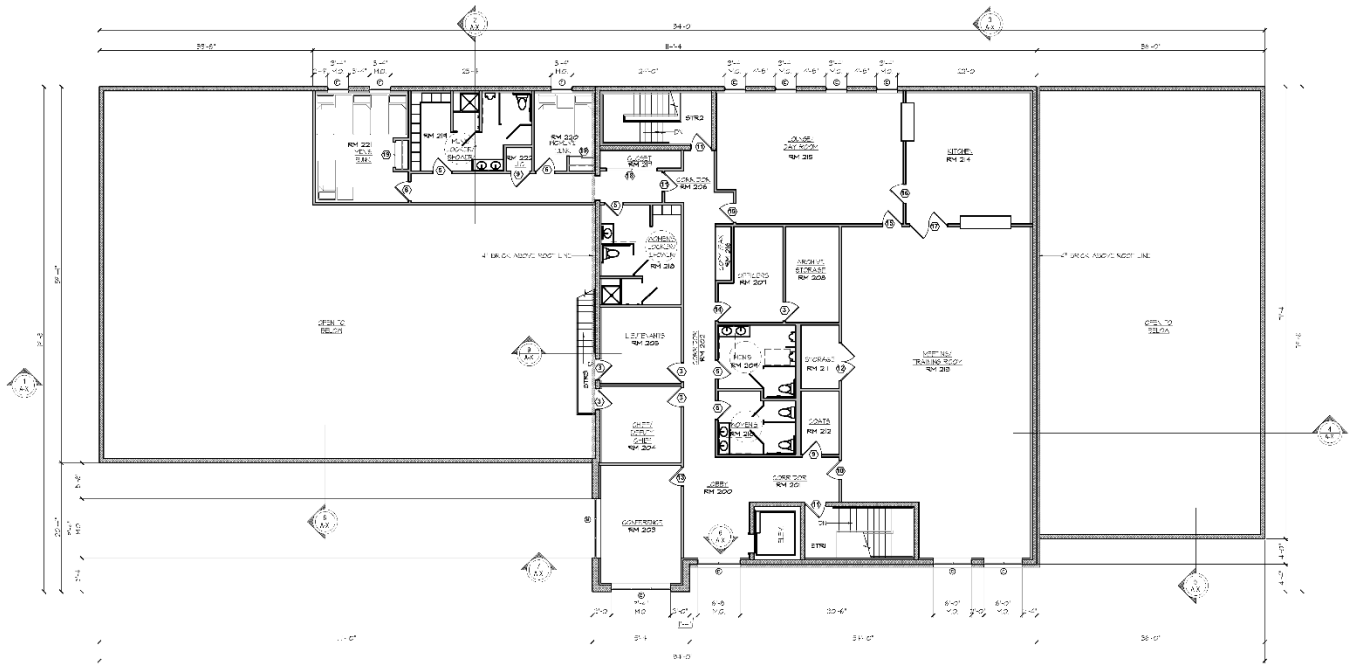
A-1

18053

ROBBIE CONLEY ARCHITECT, LLC.

ARCHITECTURAL 2ND FLOOR PLAN

ALL FIRE



1 A-2 SECOND FLOOR PLAN
SCALE: 1/8" = 1'-0"

1 A-2 ROOF PLAN
SCALE: 1/8"=1'-0"

Robbie Conley Architect, LLC
506 Glassboro Road
Woodbury Heights, New Jersey 08097
(856) 845-7500 FAX(856) 853 0528

SECOND FLOOR PLAN

TOWNSHIP OF WASHINGTON
FIRE HOUSE RENOVATIONS
656 WASHINGTON AVENUE
TWP. OF WASHINGTON, NJ 07675

TOWNSHIP OF WASHINGTON
656 WASHINGTON AVENUE
TWP. OF WASHINGTON, NJ 07675

JUNE 14, 2019

A-2

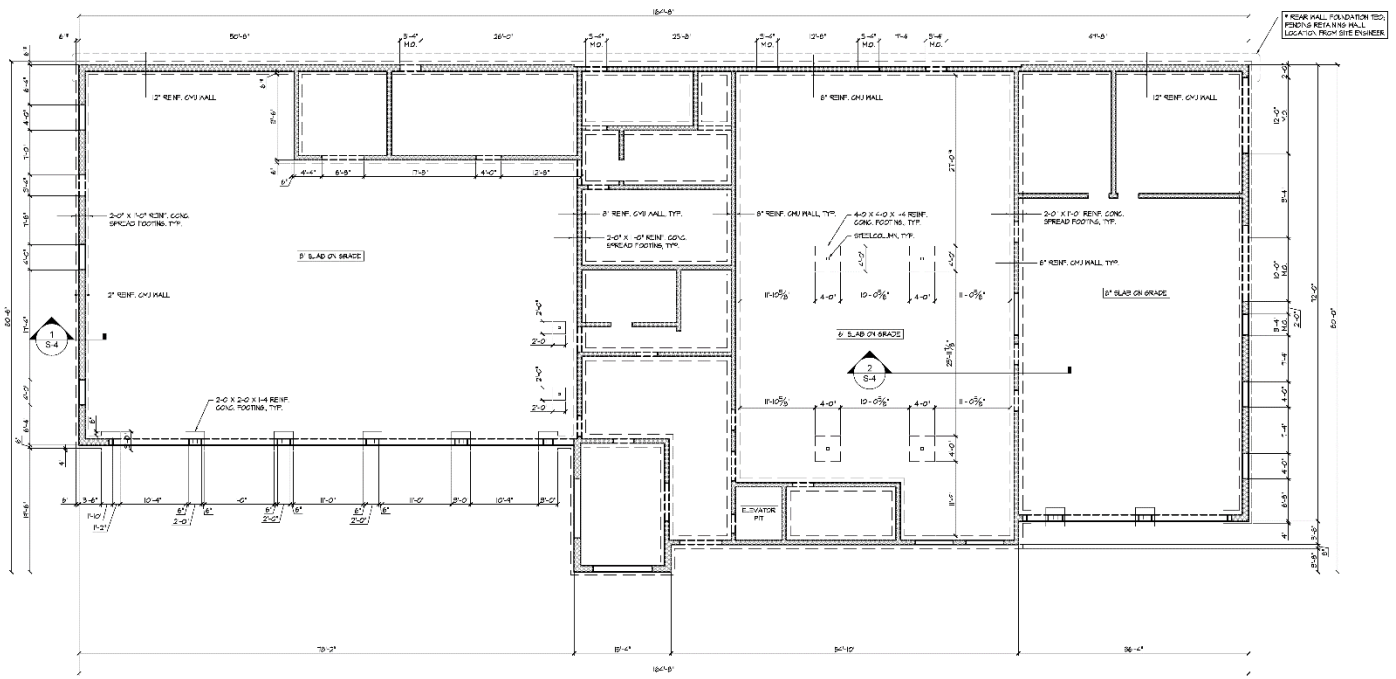
18053

ROBBIE CONLEY ARCHITECT, LLC.

SQUARE FOOTAGES

First Floor Fire	6,976 SQ. FT.
First Floor Ambulance	5,712 SQ. FT.
First Floor TOTAL	12,688 SQ. FT.
Second Floor Fire	6,242 SQ. FT.
Second Floor Ambulance	0 SQ. FT.
Second Floor TOTAL	6,242 SQ. FT.
TOTAL ALL FLOORS	18,930 SQ. FT.
FIRE TOTAL	13,218 SQ. FT.
AMBULANCE TOTAL	5,712 SQ. FT.

STRUCTURAL FOUNDATION PLAN



LEGEND

TYP. - TYPICAL
SP. - SPACING
CONC. - CONCRETE
REINF. - REINFORCEMENT
CMU - CONCRETE MASONRY UNIT
P.T. - PRESSURE TREATED

1 S-1 FOUNDATION & GROUND FLOOR PLAN
SCALE: 1/8"=1'-0"

Robbie Conley Architect, LLC
696 Glassboro Road
Woodbury Heights, New Jersey 08097
(856) 845-7500 FAX (856) 853-0525

TOWNSHIP OF WASHINGTON
DEPARTMENT OF PUBLIC WORKS
656 WASHINGTON AVENUE
TWP. WASHINGTON, NEW JERSEY 08080

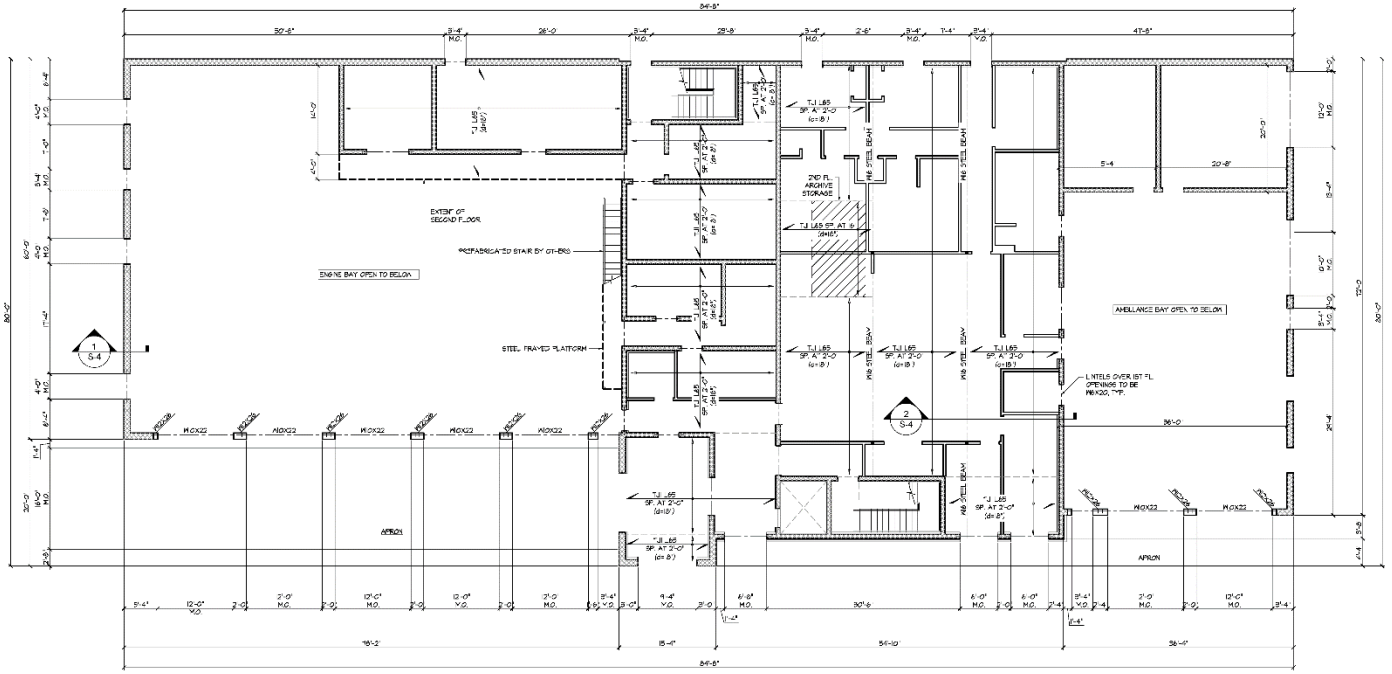
TOWNSHIP OF WASHINGTON
DEPARTMENT OF PUBLIC WORKS
656 WASHINGTON AVENUE
TWP. WASHINGTON, NEW JERSEY 08080

S-1

18053

ROBBIE CONLEY ARCHITECT, LLC.

STRUCTURAL SECOND FLOOR FRAMING PLAN



1 S-2 SECOND FLOOR FRAMING
OVER FIRST FLOOR PLAN SCALE: 1/8"=1'-0"

Robbie Conley Architect, LLC
698 Chesapeake Road
Woodbury Heights, New Jersey 08097
(856) 845-7500 FAX(856) 853-0525

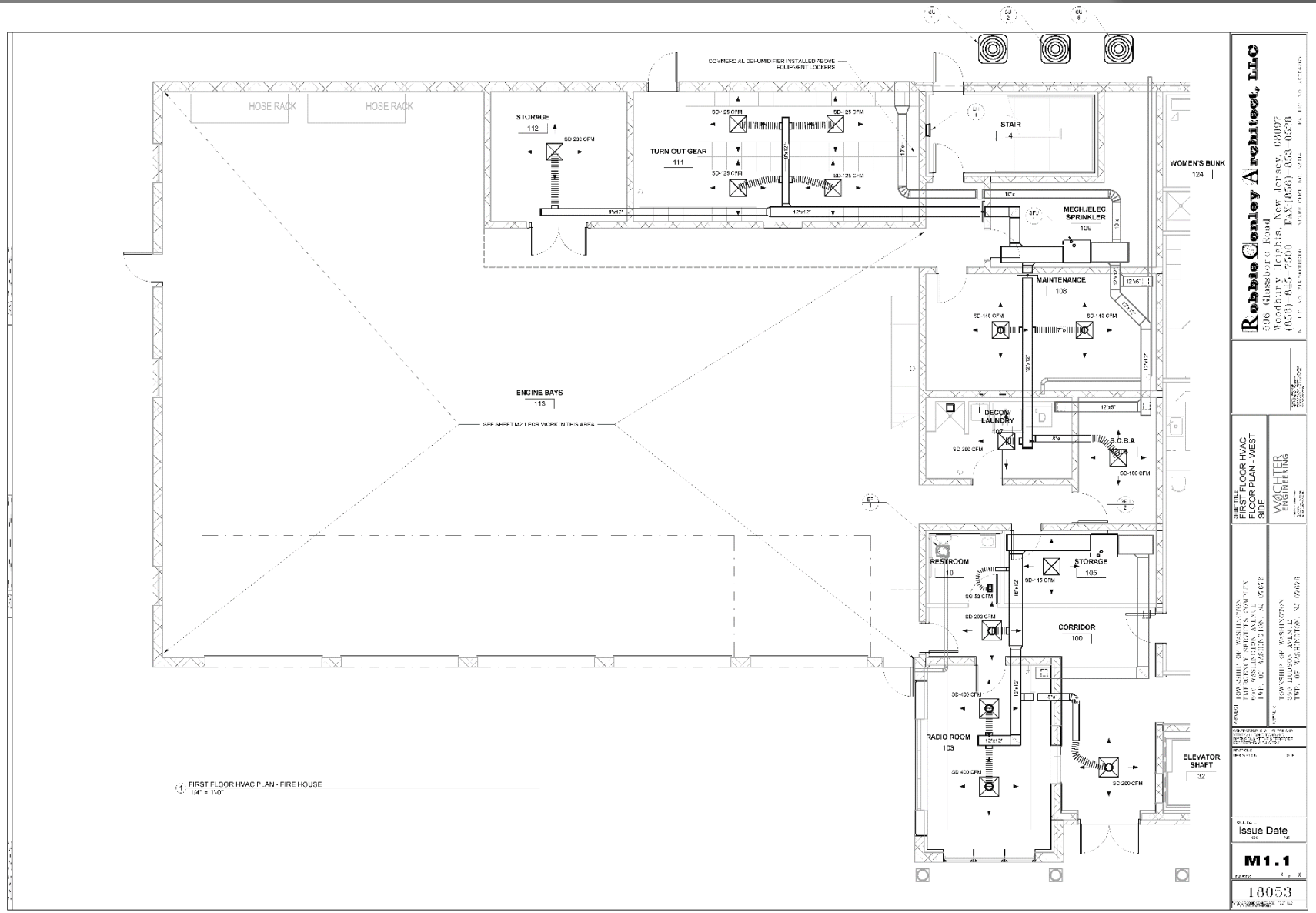
TOWNSHIP OF WASHINGTON
DEPARTMENT OF PUBLIC WORKS
600 WASHINGTON AVENUE
TAX MAP 40 PARCEL 1
TOWNSHIP OF WASHINGTON
GLOUCESTER COUNTY, NEW JERSEY
TAX MAP 40 PARCEL 1
600 WASHINGTON AVENUE
TOWNSHIP OF WASHINGTON, NJ 08096

ISSUE DATE
MAY 2019

S-2

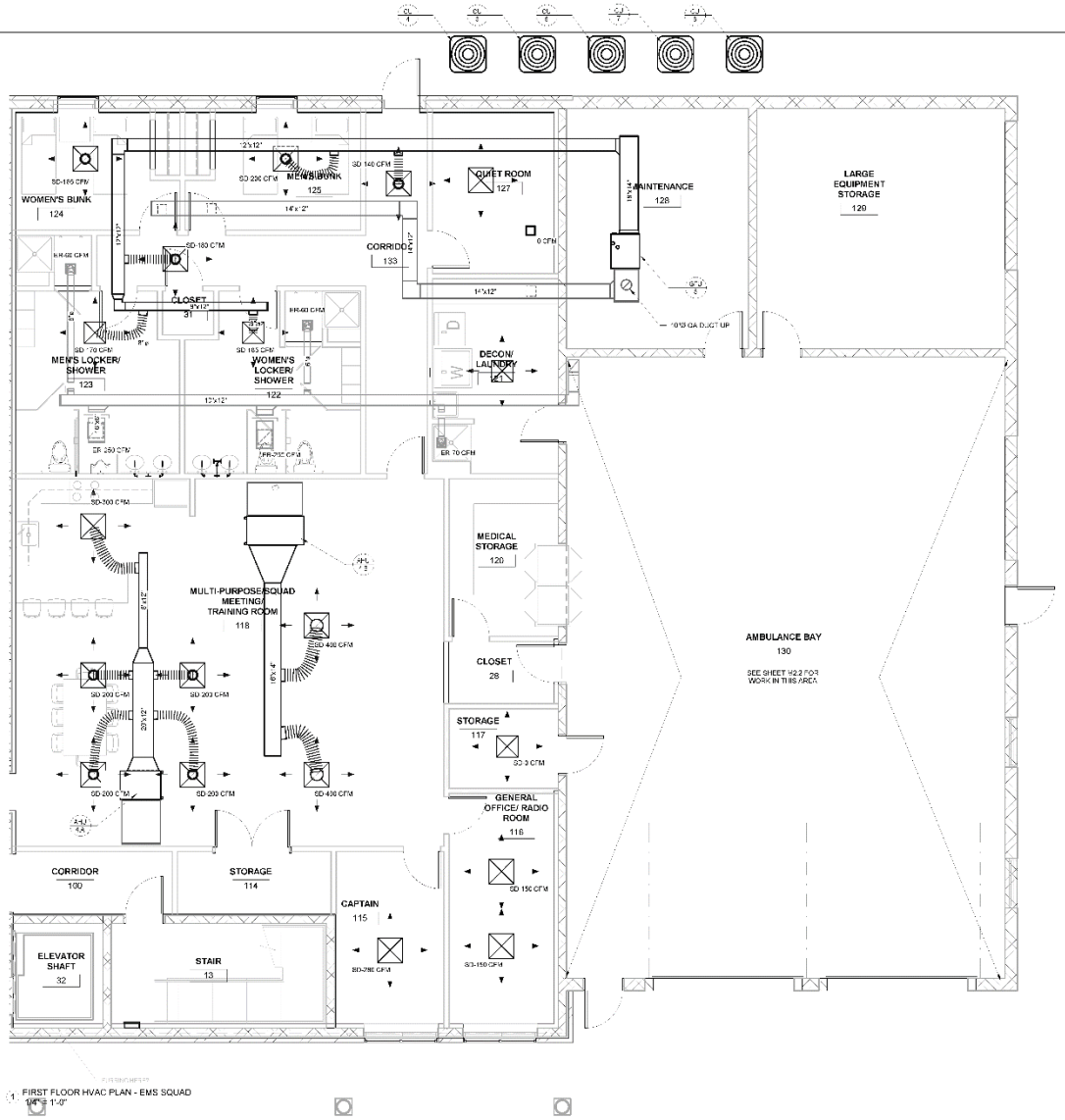
18053

MECHANICAL 1ST FLOOR PLAN – LEFT SIDE



ROBBIE CONLEY ARCHITECT, LLC.

MECHANICAL 1ST FLOOR PLAN – RIGHT SIDE



Robbie Conley Architect, LLC
506 Glassboro Road
Woodbury Heights, New Jersey, 08097
(856) 845-7500 FAX:(856) 853-0528

FIRST FLOOR HVAC FLOOR PLAN - EAST SIDE

WICHTER ENGINEERING

TOWNSHIP OF WASHINGTON
EMS AGENCY SHARING CONTRACT
BLDG. WASHINGTON AVENUE, NJ 08078
BLDG. ADDRESS: WASHINGTON, NJ 08078

TOWNSHIP OF WASHINGTON
350 HUDSON AVENUE
TWP. OF WASHINGTON, NJ 07676

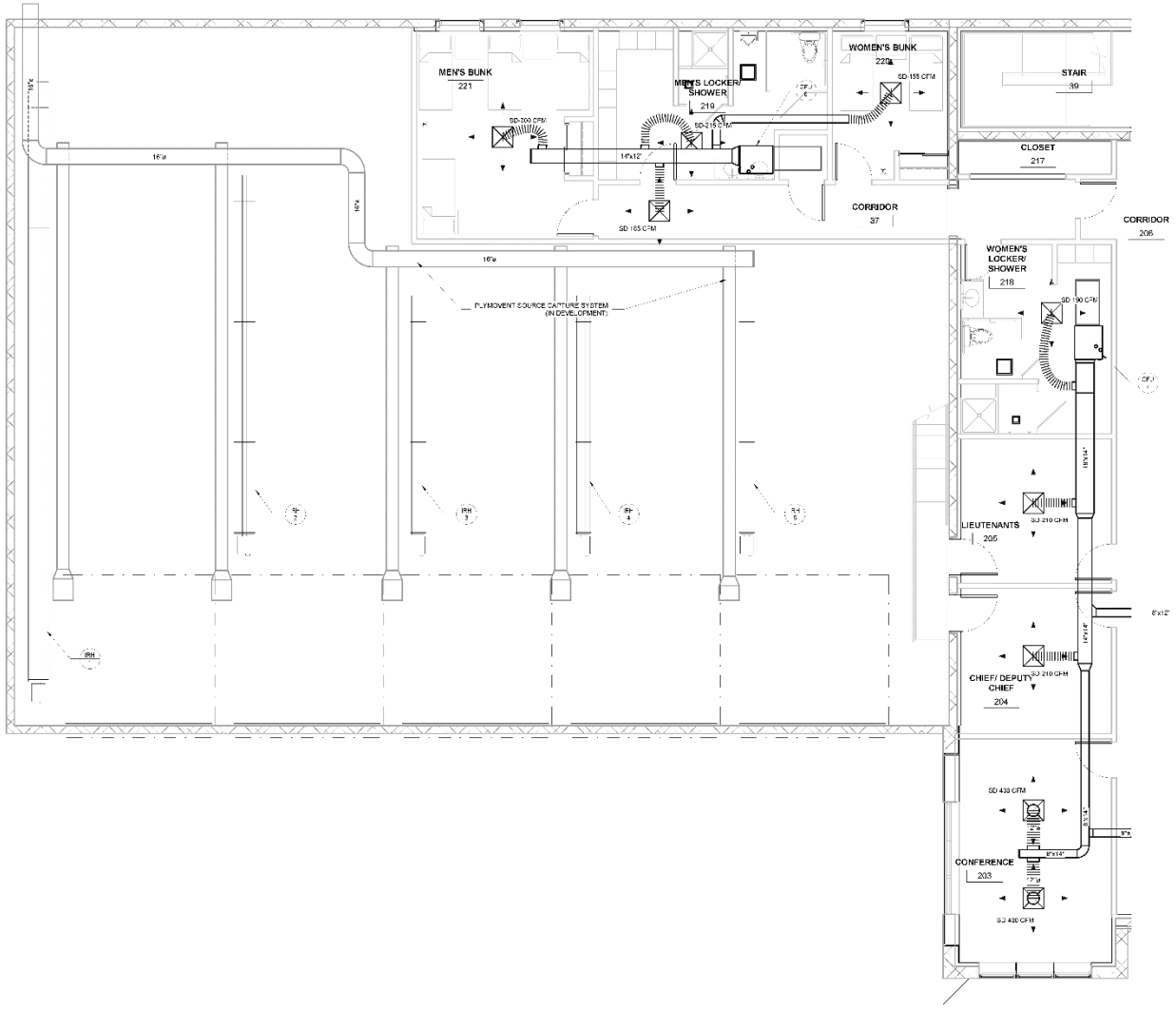
Issue Date

M1.2

18053

ROBBIE CONLEY ARCHITECT, LLC.

MECHANICAL 2ND FLOOR PLAN – LEFT SIDE



Robbie Conley Architect, LLC
506 Glassboro Road
Woodbury Heights, New Jersey, 08097
(856) 845 7600 FAX:(856) 853 0526

SECOND FLOOR HVAC FLOOR PLAN- WEST SIDE

WACHTER ENGINEERING

TOWNSHIP OF WASHINGTON
350 EGG HARBOR ROAD
TWP. OF WASHINGTON, NJ 08076

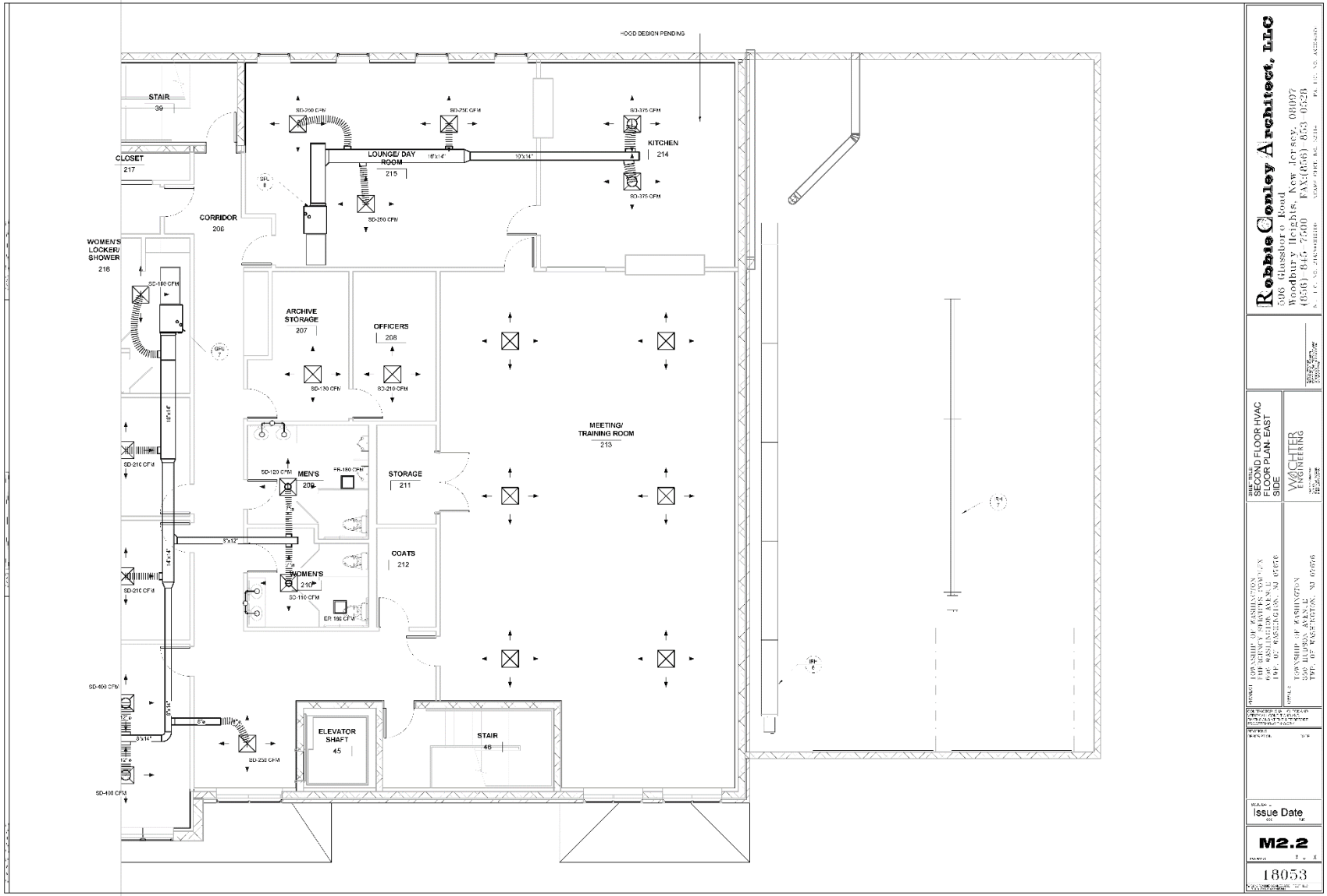
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M2.1

18053

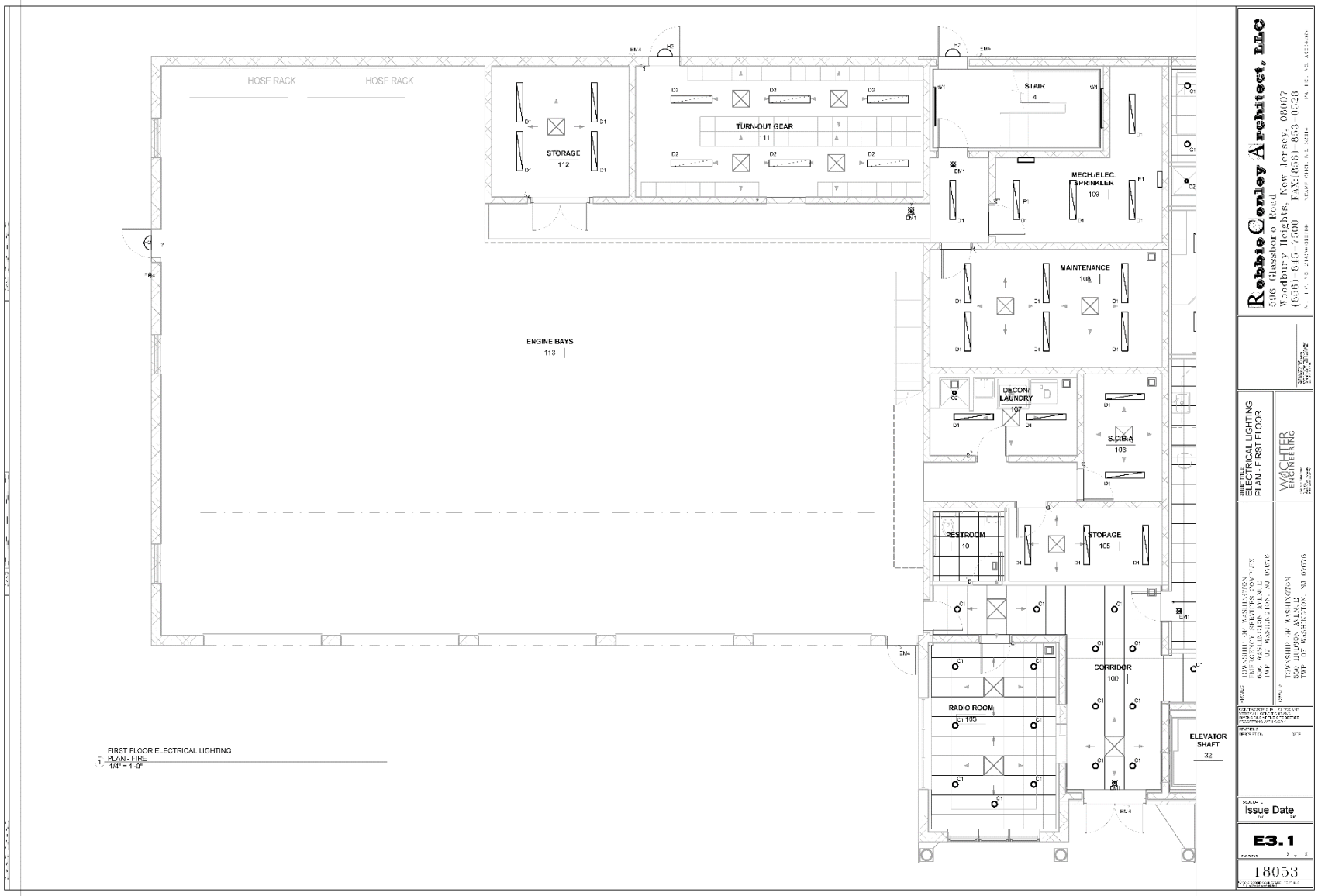
ROBBIE CONLEY ARCHITECT, LLC.

MECHANICAL 2ND FLOOR PLAN – RIGHT SIDE



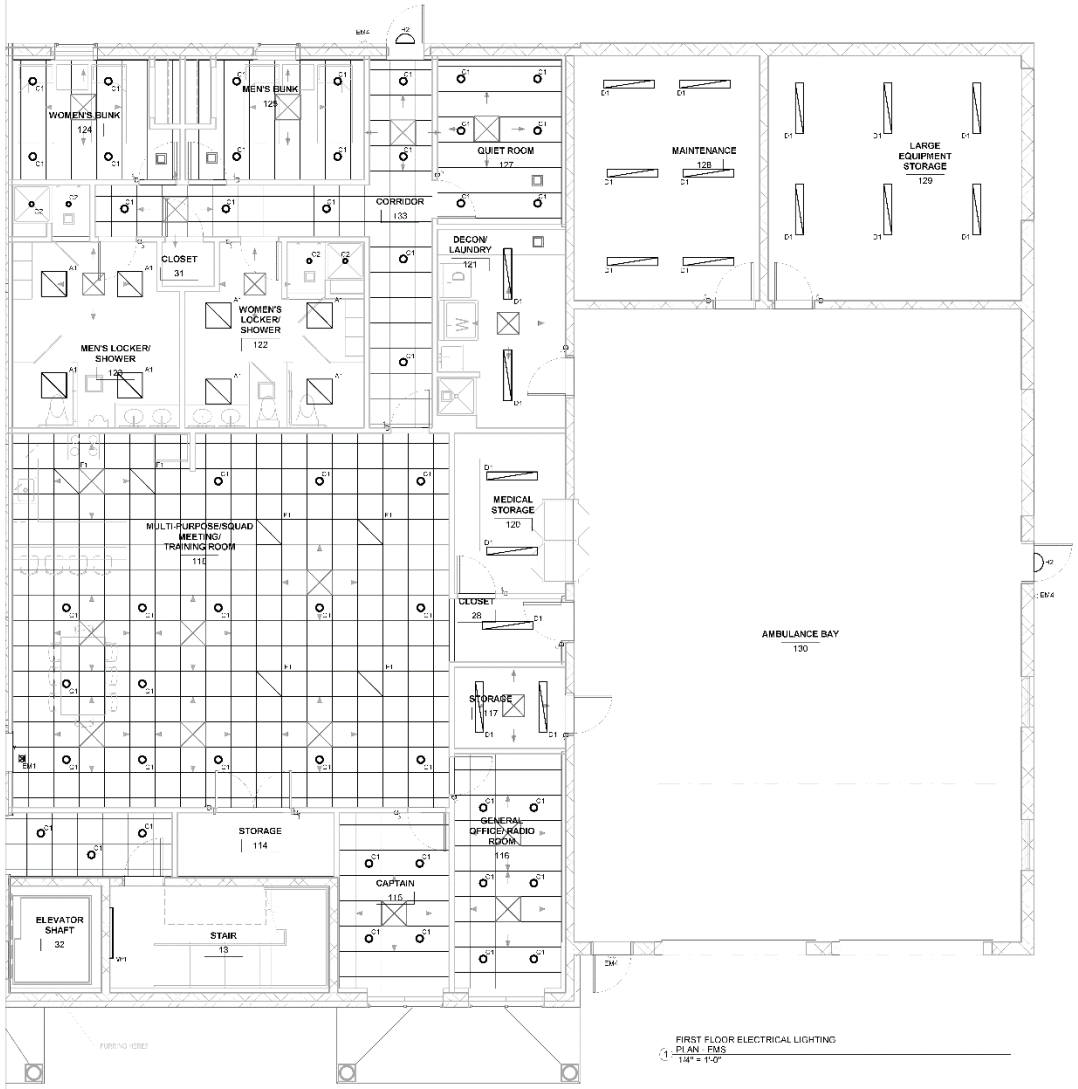
ROBBIE CONLEY ARCHITECT, LLC.

ELECTRICAL 1ST FLOOR LIGHTING PLAN – LEFT SIDE



ROBBIE CONLEY ARCHITECT, LLC.

ELECTRICAL 1ST FLOOR LIGHTING PLAN – RIGHT SIDE



Robbie Conley Architect, LLC
506 Glassboro Road
Woodbury Heights, New Jersey, 08097
(856) 845 7600 FAX:(856) 853 0526

ELECTRICAL LIGHTING PLAN - FIRST FLOOR - EMS

WÄCHTER ENGINEERING

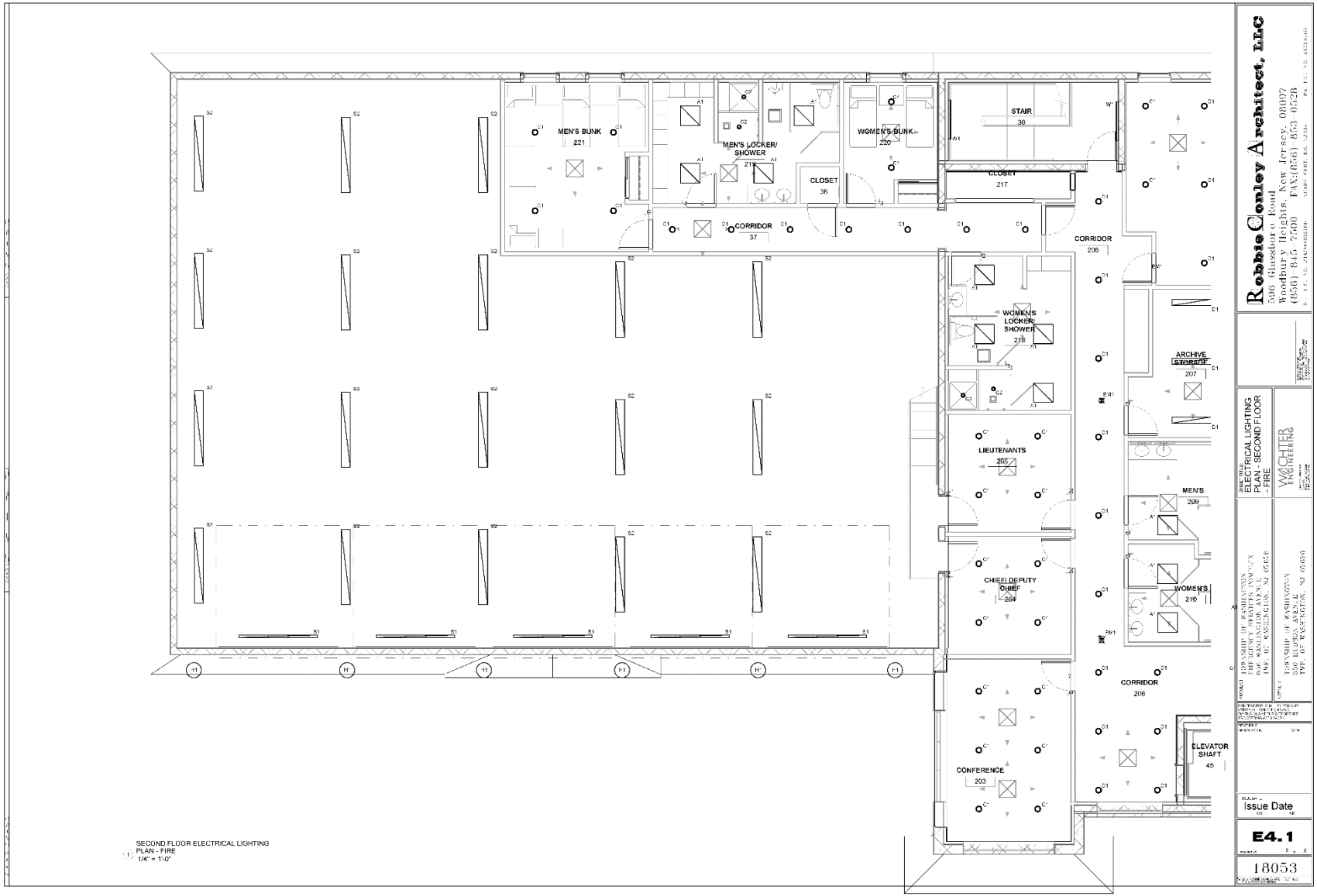
Issue Date

E3.2

18053

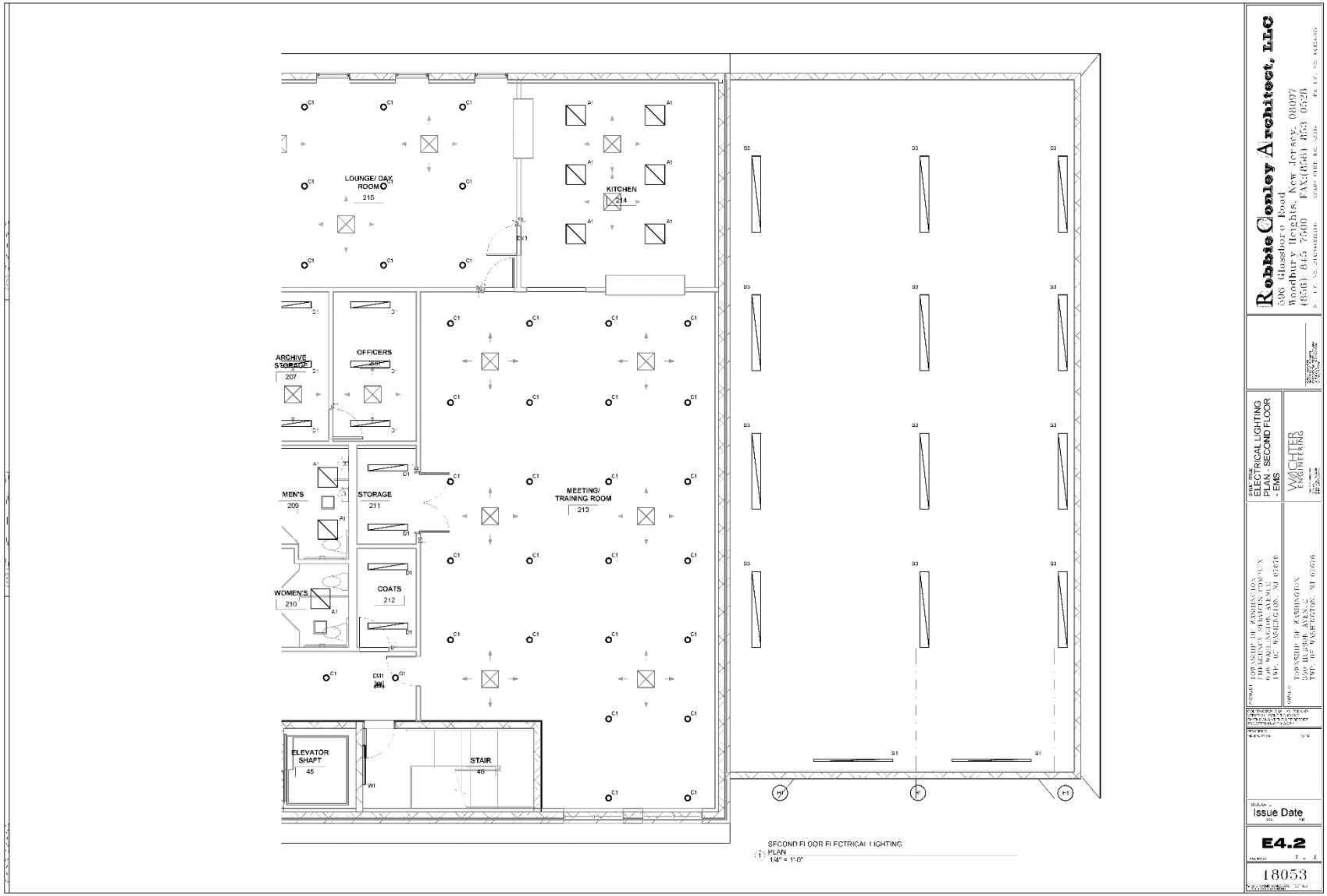
ROBBIE CONLEY ARCHITECT, LLC.

ELECTRICAL 2ND FLOOR LIGHTING PLAN – LEFT SIDE



ROBBIE CONLEY ARCHITECT, LLC.

ELECTRICAL 2ND FLOOR LIGHTING PLAN – RIGHT SIDE



ROBBIE CONLEY ARCHITECT, LLC.

ELEVATIONS



1 A-4 ELEVATION "A"
SCALE: 1/8"=1'-0"



1 A-4 ELEVATION "B"
SCALE: 1/8"=1'-0"

Robbie Conley Architect, LLC
598 Glassboro Road
Woodbury Heights, New Jersey 08097
(856) 845-7560 FAX:(856) 853-0628

TOWNSHIP OF WASHINGTON
EMERGENCY SERVICES COMPLEX
688 WASHINGTON AVENUE
TOWNSHIP OF WASHINGTON, NJ 07676

TOWNSHIP OF WASHINGTON
EMERGENCY SERVICES COMPLEX
688 WASHINGTON AVENUE
TOWNSHIP OF WASHINGTON, NJ 07676

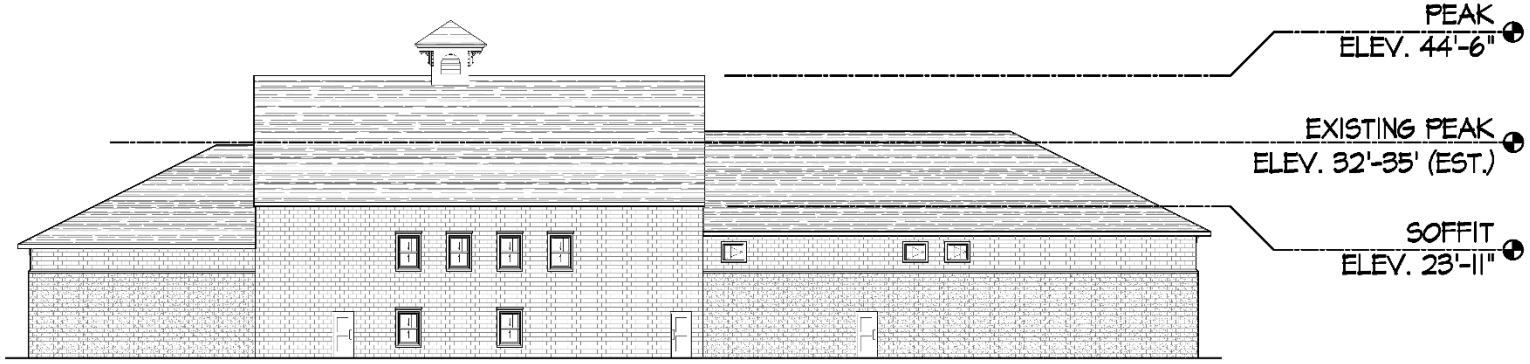
JUNE 14, 2019

A-4

18053

ROBBIE CONLEY ARCHITECT, LLC.

ELEVATIONS



1 A-5 ELEVATION "C"
SCALE: 1/8"=1'-0"



1 A-5 ELEVATION "D"
SCALE: 1/8"=1'-0"

Robbie Conley Architect, LLC
598 Glassboro Road
Woodbury Heights, New Jersey, 08097
(856) 845-7600 FAX:(856) 845-0524

JUNE 14, 2019

A-5

18053

ROBBIE CONLEY ARCHITECT, LLC.

DESIGN DEVELOPMENT – COST ESTIMATE

Project Cost Estimate

1	Building Cost New					
	18,930	SF	$130	Arch	$2,460,900
	18,930	SF	$75	MEP	$1,419,750
	18,930	SF	$45	Struct.	$851,850
	Total Cost		$250		$4,732,500
2	Site Work (no environmental remediation)				$200,000
3	Demolition				$48,000
4	Diesel Exhaust				$63,000
5	Specialized Equipment				$20,000
6	Emergency Generator (To Be Provided by Grant)				$65,000
				Total Construction Cost	$5,128,500
7	Professional Fees				$415,000.00
8	Legal, Reproduction				$25,642.50
9	10% Contingency				$512,850
				Total Project Cost	**$6,081,993**

PROJECT MANUAL FOR:

New Emergency Services Complex

656 Washington Avenue
Township of Washington, NJ 07676

FOR:

Township of Washington

350 Hudson Avenue
Township of Washington, NJ 07676

PROJECT NO.: 18053

DATE: June 19, 2020

Robbie Conley, Architect LLC.
596 Glassboro Road, Woodbury Heights, New Jersey, 08097
Phone: (856) 845-7500
Fax: (856) 853-0528

PROJECT MANUAL FOR:

New Emergency Services Complex

656 Washington Avenue
Township of Washington, NJ 07676

FOR:

Township of Washington

350 Hudson Avenue
Township of Washington, NJ 07676

PROJECT NO.: 18053

DATE: June 19, 2020

Robbie Conley, Architect LLC.
596 Glassboro Road, Woodbury Heights, New Jersey, 08097
Phone: (856) 845-7500
Fax: (856) 853-0528

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Not Used

APPENDIX A –

TECHNICAL SPECIFICATIONS
BOSWELL ENGINEERING

DOCUMENT SUBMISSION CHECKLIST

The following is a list of documents you will be required to provide during the bid process. Those documents in "**bold lettering"** are required to be submitted with the sealed bid package and **failure to do so will result in rejection of the entire bid.** All other documents listed in the Bid Submittal Package should be completed and returned in the sealed bid.

____ Ownership Disclosure pursuant to N.J.S.A.52:24.2
____ Acknowledgement of Addenda to Bid
____ Disclosure of Investment Activities in Iran required PL 2012, c.25
____ Bid Guarantee as required by NJSA 40A:11-21
____ Certificate from a Surety Company, required by NJSA 40A:11-22
____ Bid Proposal Sheet completed and signed
____ Listing of Subcontractors as required by NJSA 40A:11-16
____ Copy of Bidder and Subcontractors Business Registration Certificate
____ Copy of Bidder and Subcontractors Public Works Registration Certificate
____ Mandatory Equal Employment Opportunity Language
____ Affirmative Action Compliance Notice
____ Americans with Disabilities Act of 1990
____ Non-Collusion Affidavit
____ Request For Prevailing Wage Determination
____ Bid Proposal Sheet completed and signed

The undersigned authorized representative hereby acknowledges that the above listed requirements have been submitted.

Company: _____

Name and Title: _____

Signature: _____

DIVISION 00 - BIDDING AND CONTRACT REQUIREMENTS
SECTION 00100 -INVITATION FOR PROPOSALS

Notice is hereby given that the Township of Washington, Bergen County, 350 Hudson Avenue, Twp. of Washington, NJ 07676 invites proposals for a single contract for the construction of a New Emergency Services Complex to be located at 656 Washington Avenue, Twp. of Washington, NJ 07676.

Proposals will be received at the Office of the Township Clerk, 350 Hudson Avenue, Room 202 – 2nd Floor, Twp. of Washington, NJ 07676 on August 5, 2020 at 2:00 (PM) local time, at which time they will be publicly opened and read aloud shortly thereafter.

All bidders shall attend, either in person or by representative, a pre-bid conference to be held July 14, 2020, at 656 Washington Avenue, Twp. of Washington, NJ 07676 at 1:00 (PM) local time. Attendance at the Prebid is highly suggested.

Bidders shall file bid security detailed in the Supplementary Instructions to Bidders contained in the Contract Documents.

The Successful bidder will be required to furnish a Performance Bond and Labor and Material Payment Bond in the amount of 100 percent of the contract price. Each bidder will be required to furnish additional evidence of performance security with each bid pursuant to N.J.S.A. 40A-11-16.

Pursuant to P.L. 1975, C.127 as amended, the Contractor agrees to comply with all provisions.

Pursuant to Chapter 33 of the New Jersey Laws of 1977, each bidder must submit with his bid, a Public Disclosure Information Statement.

Bidders may obtain copies of Drawings, Project Manual/Specifications and Bidding Documents for this project after July 1, 2020, at the offices of the Architect, ROBBIE CONLEY, ARCHITECT, 596 Glassboro Road, Woodbury Heights, NJ 08097 upon Payment of For a Disk Electronic Documents; **Fifty** Dollars ($50.00) for the first set. Additional sets may be purchased at the rate of **Fifty** Dollars ($50.00) per additional disk, Paper Documents; T**hree Hundred Fifty** Dollars ($350.00) for the first set. Additional sets may be purchased at the rate of **Three Hundred Fifty** Dollars ($350.00) per additional set.

Checks shall be payable to the Architect, ROBBIE CONLEY, ARCHITECT, 596 Glassboro Road, Woodbury Heights, NJ 08097.

Bid forms, contract forms, drawings, project manual/specifications are on file and may be examined at the offices of the Township Clerk and the Architect.

No bid may be withdrawn for a period of 60 days after the opening of bids.

The Owner reserves the right to waive any informalities in any bid or bids, to reject any or all bids, and to accept such bid or bids and to make such awards as may be in the Owner's best interest and in accordance with the law.

END OF SECTION 00100

DIVISION 00 - BIDDING AND CONTRACT REQUIREMENTS
SECTION 00200 - INSTRUCTIONS TO BIDDERS

The following Instructions to Bidders, AIA Document A701, 1997 Edition, pages one (1) through six (6) inclusive, and the Supplemental Instructions to Bidders constitute the Instructions to Bidders for all of the work of the Contract and are hereby specifically made a part of the Contract Documents.

END OF SECTION 00200

AIA® Document A701™ – 2018

Instructions to Bidders

for the following Project:
(Name, location, and detailed description)

Township of Washington Emergency Services Complex
656 Washington Ave, Township of Washington, NJ 07676
New Fire and EMS 2 story building

THE OWNER:
(Name, legal status, address, and other information)

Township of Washington
350 Hudson Avenue
Township of Washington, NJ 07676

THE ARCHITECT:
(Name, legal status, address, and other information)

Robbie Conley Architect, LLC., Limited Liability Company
596 Glassboro Road
Woodbury Heights, NJ 08097
Telephone Number: 856-845-7500
Fax Number: 856-853-0528

TABLE OF ARTICLES

1 DEFINITIONS

2 BIDDER'S REPRESENTATIONS

3 BIDDING DOCUMENTS

4 BIDDING PROCEDURES

5 CONSIDERATION OF BIDS

6 POST-BID INFORMATION

7 PERFORMANCE BOND AND PAYMENT BOND

8 ENUMERATION OF THE PROPOSED CONTRACT DOCUMENTS

ADDITIONS AND DELETIONS:
The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

FEDERAL, STATE, AND LOCAL LAWS MAY IMPOSE REQUIREMENTS ON PUBLIC PROCUREMENT CONTRACTS. CONSULT LOCAL AUTHORITIES OR AN ATTORNEY TO VERIFY REQUIREMENTS APPLICABLE TO THIS PROCUREMENT BEFORE COMPLETING THIS FORM.

It is intended that AIA Document G612™–2017, Owner's Instructions to the Architect, Parts A and B will be completed prior to using this document.

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User Notes: (811742289)

ARTICLE 1 DEFINITIONS

§ 1.1 Bidding Documents include the Bidding Requirements and the Proposed Contract Documents. The Bidding Requirements consist of the advertisement or invitation to bid, Instructions to Bidders, supplementary instructions to bidders, the bid form, and any other bidding forms. The Proposed Contract Documents consist of the unexecuted form of Agreement between the Owner and Contractor and that Agreement's Exhibits, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, all Addenda, and all other documents enumerated in Article 8 of these Instructions.

§ 1.2 Definitions set forth in the General Conditions of the Contract for Construction, or in other Proposed Contract Documents apply to the Bidding Documents.

§ 1.3 Addenda are written or graphic instruments issued by the Architect, which, by additions, deletions, clarifications, or corrections, modify or interpret the Bidding Documents.

§ 1.4 A Bid is a complete and properly executed proposal to do the Work for the sums stipulated therein, submitted in accordance with the Bidding Documents.

§ 1.5 The Base Bid is the sum stated in the Bid for which the Bidder offers to perform the Work described in the Bidding Documents, to which Work may be added or deleted by sums stated in Alternate Bids.

§ 1.6 An Alternate Bid (or Alternate) is an amount stated in the Bid to be added to or deducted from, or that does not change, the Base Bid if the corresponding change in the Work, as described in the Bidding Documents, is accepted.

§ 1.7 A Unit Price is an amount stated in the Bid as a price per unit of measurement for materials, equipment, or services, or a portion of the Work, as described in the Bidding Documents.

§ 1.8 A Bidder is a person or entity who submits a Bid and who meets the requirements set forth in the Bidding Documents.

§ 1.9 A Sub-bidder is a person or entity who submits a bid to a Bidder for materials, equipment, or labor for a portion of the Work.

ARTICLE 2 BIDDER'S REPRESENTATIONS

§ 2.1 By submitting a Bid, the Bidder represents that:

- **.1** the Bidder has read and understands the Bidding Documents;
- **.2** the Bidder understands how the Bidding Documents relate to other portions of the Project, if any, being bid concurrently or presently under construction;
- **.3** the Bid complies with the Bidding Documents;
- **.4** the Bidder has visited the site, become familiar with local conditions under which the Work is to be performed, and has correlated the Bidder's observations with the requirements of the Proposed Contract Documents;
- **.5** the Bid is based upon the materials, equipment, and systems required by the Bidding Documents without exception; and
- **.6** the Bidder has read and understands the provisions for liquidated damages, if any, set forth in the form of Agreement between the Owner and Contractor.

ARTICLE 3 BIDDING DOCUMENTS

§ 3.1 Distribution

§ 3.1.1 Bidders shall obtain complete Bidding Documents, as indicated below, from the issuing office designated in the advertisement or invitation to bid, for the deposit sum, if any, stated therein.
(Indicate how, such as by email, website, host site/platform, paper copy, or other method Bidders shall obtain Bidding Documents.)

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User Notes: (811742289)

§ 3.1.2 Any required deposit shall be refunded to Bidders who submit a bona fide Bid and return the paper Bidding Documents in good condition within ten days after receipt of Bids. The cost to replace missing or damaged paper documents will be deducted from the deposit. A Bidder receiving a Contract award may retain the paper Bidding Documents, and the Bidder's deposit will be refunded.

§ 3.1.3 Bidding Documents will not be issued directly to Sub-bidders unless specifically offered in the advertisement or invitation to bid, or in supplementary instructions to bidders.

§ 3.1.4 Bidders shall use complete Bidding Documents in preparing Bids. Neither the Owner nor Architect assumes responsibility for errors or misinterpretations resulting from the use of incomplete Bidding Documents.

§ 3.1.5 The Bidding Documents will be available for the sole purpose of obtaining Bids on the Work. No license or grant of use is conferred by distribution of the Bidding Documents.

§ 3.2 Modification or Interpretation of Bidding Documents

§ 3.2.1 The Bidder shall carefully study the Bidding Documents, shall examine the site and local conditions, and shall notify the Architect of errors, inconsistencies, or ambiguities discovered and request clarification or interpretation pursuant to Section 3.2.2.

§ 3.2.2 Requests for clarification or interpretation of the Bidding Documents shall be submitted by the Bidder in writing and shall be received by the Architect at least seven days prior to the date for receipt of Bids.
(Indicate how, such as by email, website, host site/platform, paper copy, or other method Bidders shall submit requests for clarification and interpretation.)

§ 3.2.3 Modifications and interpretations of the Bidding Documents shall be made by Addendum. Modifications and interpretations of the Bidding Documents made in any other manner shall not be binding, and Bidders shall not rely upon them.

§ 3.3 Substitutions

§ 3.3.1 The materials, products, and equipment described in the Bidding Documents establish a standard of required function, dimension, appearance, and quality to be met by any proposed substitution.

§ 3.3.2 Substitution Process

§ 3.3.2.1 Written requests for substitutions shall be received by the Architect at least ten days prior to the date for receipt of Bids. Requests shall be submitted in the same manner as that established for submitting clarifications and interpretations in Section 3.2.2.

§ 3.3.2.2 Bidders shall submit substitution requests on a Substitution Request Form if one is provided in the Bidding Documents.

§ 3.3.2.3 If a Substitution Request Form is not provided, requests shall include (1) the name of the material or equipment specified in the Bidding Documents; (2) the reason for the requested substitution; (3) a complete description of the proposed substitution including the name of the material or equipment proposed as the substitute, performance and test data, and relevant drawings; and (4) any other information necessary for an evaluation. The request shall include a statement setting forth changes in other materials, equipment, or other portions of the Work, including changes in the work of other contracts or the impact on any Project Certifications (such as LEED), that will result from incorporation of the proposed substitution.

§ 3.3.3 The burden of proof of the merit of the proposed substitution is upon the proposer. The Architect's decision of approval or disapproval of a proposed substitution shall be final.

§ 3.3.4 If the Architect approves a proposed substitution prior to receipt of Bids, such approval shall be set forth in an Addendum. Approvals made in any other manner shall not be binding, and Bidders shall not rely upon them.

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§ 3.3.5 No substitutions will be considered after the Contract award unless specifically provided for in the Contract Documents.

§ 3.4 Addenda

§ 3.4.1 Addenda will be transmitted to Bidders known by the issuing office to have received complete Bidding Documents.

(Indicate how, such as by email, website, host site/platform, paper copy, or other method Addenda will be transmitted.)

§ 3.4.2 Addenda will be available where Bidding Documents are on file.

§ 3.4.3 Addenda will be issued no later than four days prior to the date for receipt of Bids, except an Addendum withdrawing the request for Bids or one which includes postponement of the date for receipt of Bids.

§ 3.4.4 Prior to submitting a Bid, each Bidder shall ascertain that the Bidder has received all Addenda issued, and the Bidder shall acknowledge their receipt in the Bid.

ARTICLE 4 BIDDING PROCEDURES

§ 4.1 Preparation of Bids

§ 4.1.1 Bids shall be submitted on the forms included with or identified in the Bidding Documents.

§ 4.1.2 All blanks on the bid form shall be legibly executed. Paper bid forms shall be executed in a non-erasable medium.

§ 4.1.3 Sums shall be expressed in both words and numbers, unless noted otherwise on the bid form. In case of discrepancy, the amount entered in words shall govern.

§ 4.1.4 Edits to entries made on paper bid forms must be initialed by the signer of the Bid.

§ 4.1.5 All requested Alternates shall be bid. If no change in the Base Bid is required, enter "No Change" or as required by the bid form.

§ 4.1.6 Where two or more Bids for designated portions of the Work have been requested, the Bidder may, without forfeiture of the bid security, state the Bidder's refusal to accept award of less than the combination of Bids stipulated by the Bidder. The Bidder shall neither make additional stipulations on the bid form nor qualify the Bid in any other manner.

§ 4.1.7 Each copy of the Bid shall state the legal name and legal status of the Bidder. As part of the documentation submitted with the Bid, the Bidder shall provide evidence of its legal authority to perform the Work in the jurisdiction where the Project is located. Each copy of the Bid shall be signed by the person or persons legally authorized to bind the Bidder to a contract. A Bid by a corporation shall further name the state of incorporation and have the corporate seal affixed. A Bid submitted by an agent shall have a current power of attorney attached, certifying the agent's authority to bind the Bidder.

§ 4.1.8 A Bidder shall incur all costs associated with the preparation of its Bid.

§ 4.2 Bid Security

§ 4.2.1 Each Bid shall be accompanied by the following bid security:

(Insert the form and amount of bid security.)

§ 4.2.2 The Bidder pledges to enter into a Contract with the Owner on the terms stated in the Bid and shall, if required, furnish bonds covering the faithful performance of the Contract and payment of all obligations arising thereunder. Should the Bidder refuse to enter into such Contract or fail to furnish such bonds if required, the amount of the bid security shall be forfeited to the Owner as liquidated damages, not as a penalty. In the event the Owner fails to comply with Section 6.2, the amount of the bid security shall not be forfeited to the Owner.

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§ 4.2.3 If a surety bond is required as bid security, it shall be written on AIA Document A310™, Bid Bond, unless otherwise provided in the Bidding Documents. The attorney-in-fact who executes the bond on behalf of the surety shall affix to the bond a certified and current copy of an acceptable power of attorney. The Bidder shall provide surety bonds from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located.

§ 4.2.4 The Owner will have the right to retain the bid security of Bidders to whom an award is being considered until (a) the Contract has been executed and bonds, if required, have been furnished; (b) the specified time has elapsed so that Bids may be withdrawn; or (c) all Bids have been rejected. However, if no Contract has been awarded or a Bidder has not been notified of the acceptance of its Bid, a Bidder may, beginning days after the opening of Bids, withdraw its Bid and request the return of its bid security.

§ 4.3 Submission of Bids

§ 4.3.1 A Bidder shall submit its Bid as indicated below:
(Indicate how, such as by website, host site/platform, paper copy, or other method Bidders shall submit their Bid.)

§ 4.3.2 Paper copies of the Bid, the bid security, and any other documents required to be submitted with the Bid shall be enclosed in a sealed opaque envelope. The envelope shall be addressed to the party receiving the Bids and shall be identified with the Project name, the Bidder's name and address, and, if applicable, the designated portion of the Work for which the Bid is submitted. If the Bid is sent by mail, the sealed envelope shall be enclosed in a separate mailing envelope with the notation "SEALED BID ENCLOSED" on the face thereof.

§ 4.3.3 Bids shall be submitted by the date and time and at the place indicated in the invitation to bid. Bids submitted after the date and time for receipt of Bids, or at an incorrect place, will not be accepted.

§ 4.3.4 The Bidder shall assume full responsibility for timely delivery at the location designated for receipt of Bids.

§ 4.3.5 A Bid submitted by any method other than as provided in this Section 4.3 will not be accepted.

§ 4.4 Modification or Withdrawal of Bid

§ 4.4.1 Prior to the date and time designated for receipt of Bids, a Bidder may submit a new Bid to replace a Bid previously submitted, or withdraw its Bid entirely, by notice to the party designated to receive the Bids. Such notice shall be received and duly recorded by the receiving party on or before the date and time set for receipt of Bids. The receiving party shall verify that replaced or withdrawn Bids are removed from the other submitted Bids and not considered. Notice of submission of a replacement Bid or withdrawal of a Bid shall be worded so as not to reveal the amount of the original Bid.

§ 4.4.2 Withdrawn Bids may be resubmitted up to the date and time designated for the receipt of Bids in the same format as that established in Section 4.3, provided they fully conform with these Instructions to Bidders. Bid security shall be in an amount sufficient for the Bid as resubmitted.

§ 4.4.3 After the date and time designated for receipt of Bids, a Bidder who discovers that it made a clerical error in its Bid shall notify the Architect of such error within two days, or pursuant to a timeframe specified by the law of the jurisdiction where the Project is located, requesting withdrawal of its Bid. Upon providing evidence of such error to the reasonable satisfaction of the Architect, the Bid shall be withdrawn and not resubmitted. If a Bid is withdrawn pursuant to this Section 4.4.3, the bid security will be attended to as follows:
(State the terms and conditions, such as Bid rank, for returning or retaining the bid security.)

ARTICLE 5 CONSIDERATION OF BIDS

§ 5.1 Opening of Bids

If stipulated in an advertisement or invitation to bid, or when otherwise required by law, Bids properly identified and received within the specified time limits will be publicly opened and read aloud. A summary of the Bids may be made available to Bidders.

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§ 5.2 Rejection of Bids
Unless otherwise prohibited by law, the Owner shall have the right to reject any or all Bids.

§ 5.3 Acceptance of Bid (Award)
§ 5.3.1 It is the intent of the Owner to award a Contract to the lowest responsive and responsible Bidder, provided the Bid has been submitted in accordance with the requirements of the Bidding Documents. Unless otherwise prohibited by law, the Owner shall have the right to waive informalities and irregularities in a Bid received and to accept the Bid which, in the Owner's judgment, is in the Owner's best interests.

§ 5.3.2 Unless otherwise prohibited by law, the Owner shall have the right to accept Alternates in any order or combination, unless otherwise specifically provided in the Bidding Documents, and to determine the lowest responsive and responsible Bidder on the basis of the sum of the Base Bid and Alternates accepted.

ARTICLE 6 POST-BID INFORMATION

§ 6.1 Contractor's Qualification Statement
Bidders to whom award of a Contract is under consideration shall submit to the Architect, upon request and within the timeframe specified by the Architect, a properly executed AIA Document A305™, Contractor's Qualification Statement, unless such a Statement has been previously required and submitted for this Bid.

§ 6.2 Owner's Financial Capability
A Bidder to whom award of a Contract is under consideration may request in writing, fourteen days prior to the expiration of the time for withdrawal of Bids, that the Owner furnish to the Bidder reasonable evidence that financial arrangements have been made to fulfill the Owner's obligations under the Contract. The Owner shall then furnish such reasonable evidence to the Bidder no later than seven days prior to the expiration of the time for withdrawal of Bids. Unless such reasonable evidence is furnished within the allotted time, the Bidder will not be required to execute the Agreement between the Owner and Contractor.

§ 6.3 Submittals
§ 6.3.1 After notification of selection for the award of the Contract, the Bidder shall, as soon as practicable or as stipulated in the Bidding Documents, submit in writing to the Owner through the Architect:

.1 a designation of the Work to be performed with the Bidder's own forces;
.2 names of the principal products and systems proposed for the Work and the manufacturers and suppliers of each; and
.3 names of persons or entities (including those who are to furnish materials or equipment fabricated to a special design) proposed for the principal portions of the Work.

§ 6.3.2 The Bidder will be required to establish to the satisfaction of the Architect and Owner the reliability and responsibility of the persons or entities proposed to furnish and perform the Work described in the Bidding Documents.

§ 6.3.3 Prior to the execution of the Contract, the Architect will notify the Bidder if either the Owner or Architect, after due investigation, has reasonable objection to a person or entity proposed by the Bidder. If the Owner or Architect has reasonable objection to a proposed person or entity, the Bidder may, at the Bidder's option, withdraw the Bid or submit an acceptable substitute person or entity. The Bidder may also submit any required adjustment in the Base Bid or Alternate Bid to account for the difference in cost occasioned by such substitution. The Owner may accept the adjusted bid price or disqualify the Bidder. In the event of either withdrawal or disqualification, bid security will not be forfeited.

§ 6.3.4 Persons and entities proposed by the Bidder and to whom the Owner and Architect have made no reasonable objection must be used on the Work for which they were proposed and shall not be changed except with the written consent of the Owner and Architect.

ARTICLE 7 PERFORMANCE BOND AND PAYMENT BOND

§ 7.1 Bond Requirements
§ 7.1.1 If stipulated in the Bidding Documents, the Bidder shall furnish bonds covering the faithful performance of the Contract and payment of all obligations arising thereunder.

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§ 7.1.2 If the furnishing of such bonds is stipulated in the Bidding Documents, the cost shall be included in the Bid. If the furnishing of such bonds is required after receipt of bids and before execution of the Contract, the cost of such bonds shall be added to the Bid in determining the Contract Sum.

§ 7.1.3 The Bidder shall provide surety bonds from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located.

§ 7.1.4 Unless otherwise indicated below, the Penal Sum of the Payment and Performance Bonds shall be the amount of the Contract Sum.
(If Payment or Performance Bonds are to be in an amount other than 100% of the Contract Sum, indicate the dollar amount or percentage of the Contract Sum.)

§ 7.2 Time of Delivery and Form of Bonds
§ 7.2.1 The Bidder shall deliver the required bonds to the Owner not later than three days following the date of execution of the Contract. If the Work is to commence sooner in response to a letter of intent, the Bidder shall, prior to commencement of the Work, submit evidence satisfactory to the Owner that such bonds will be furnished and delivered in accordance with this Section 7.2.1.

§ 7.2.2 Unless otherwise provided, the bonds shall be written on AIA Document A312, Performance Bond and Payment Bond.

§ 7.2.3 The bonds shall be dated on or after the date of the Contract.

§ 7.2.4 The Bidder shall require the attorney-in-fact who executes the required bonds on behalf of the surety to affix to the bond a certified and current copy of the power of attorney.

ARTICLE 8 ENUMERATION OF THE PROPOSED CONTRACT DOCUMENTS
§ 8.1 Copies of the proposed Contract Documents have been made available to the Bidder and consist of the following documents:

.1 AIA Document A101™–2017, Standard Form of Agreement Between Owner and Contractor, unless otherwise stated below.
(Insert the complete AIA Document number, including year, and Document title.)

.2 AIA Document A101™–2017, Exhibit A, Insurance and Bonds, unless otherwise stated below.
(Insert the complete AIA Document number, including year, and Document title.)

N/A

.3 AIA Document A201™–2017, General Conditions of the Contract for Construction, unless otherwise stated below.
(Insert the complete AIA Document number, including year, and Document title.)

Including Supplemental General Conditions Section 00410 of the Project Manual

.4 AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, dated as indicated below:
(Insert the date of the E203-2013.)

N/A

.5 Drawings

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Number	Title	Date
See Section 00600 of the Project Manual		

.6 Specifications

Section	Title	Date	Pages
See Index of the Project Manual			

.7 Addenda:

Number	Date	Pages
As listed by Contractor on the Form of Proposal		

.8 Other Exhibits:
(Check all boxes that apply and include appropriate information identifying the exhibit where required.)

[ ] AIA Document E204™–2017, Sustainable Projects Exhibit, dated as indicated below:
(Insert the date of the E204-2017.)

N/A

[ ] The Sustainability Plan:

Title	Date	Pages
N/A		

[ ] Supplementary and other Conditions of the Contract:

Document	Title	Date	Pages
See Project Manual			

.9 Other documents listed below:
(List here any additional documents that are intended to form part of the Proposed Contract Documents.)

The Project Manual all Appendices, Addenda, and Clarifications shall be included as part of the Contract Documents.

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DIVISION 00 - BIDDING AND CONTRACT REQUIREMENTS
SECTION 00300 - REQUIRED FORMS

REQUIRED FORMS

The following forms are included, unless otherwise noted, only for the convenience of the Bidder, and are not to be used or detached from the Project Manual:

A guarantee to accompany the bid pursuant to section 21 of P.L.1971, c.198 (bid bond) (C.40A:11-21);
A certificate from a surety company pursuant to section 22 of P.L.1971, c.198 (consent of surety) (C.40A:11-22);
A statement of corporate ownership pursuant to section 1 of P.L.1977, c.33 (C.52:25-24.2);
A listing of subcontractors pursuant to section 16 of P.L.1971, c.198 (C.40A:11-16);
A document provided by the contracting agent in the bid plans, specifications, or bid proposal documents for the bidder to acknowledge the bidder's receipt of any notice or revisions or addenda to the advertisement or bid documents. (N.J.S.A. 40A:11-23.1a)
Disclosure of Investment Activities in Iran (P.L. 2012, c.25).
Mandatory Americans With Disabilities Act
Non-Collusion Affidavit
Bidder and Subcontractors Business Registration Certificates
Affirmative Action Compliance Notice
Bidder and Subcontractors Public Works Contractor Registration Certificates
Acknowledgment of Mandatory Equal Employment Opportunity Language For Construction Contracts
Request For Prevailing Wage Determination
Bid Proposal Sheet completed and signed
Ability Questionnaire/Experience – Equipment
State of New Jersey Debarred List Affidavit

Separate Bid Forms

Attention is directed to the fact that this Project Manual includes a complete set of bidding and contract forms. These are for the convenience of the bidders and are not to be detached from the Project Manual, filled out, or executed. Separate copies of bid forms are furnished for that purpose in quadruplicate, three to be submitted with the Bid, and one to be retained by the Bidder for his records.

All forms or papers required to be submitted with bids shall be signed, witnessed, and/or sworn to.

FORM OF PROPOSAL

For: New Emergency Services Complex

To: Township of Washington
350 Hudson Avenue
Twp. of Washington, NJ 07676

The undersigned, having familiarized themselves with the local conditions affecting the cost of the work and with the Project Manual (including Invitation for Proposals, Instructions to Bidders, Supplemental Instructions to Bidders, this Bid, the form of Bid Bond, the form of Agreement, the Form of Performance and Maintenance Bonds, the General Conditions, the Supplementary General Conditions, the Technical Specifications; and the Drawings and Addenda thereto, if any, as prepared by Robbie Conley Architect, LLC., 596 Glassboro Road, Woodbury Heights, New Jersey 08097, dated January 31, 2020 hereby proposes to furnish all labor, materials, equipment, and services required to construct and complete all work as required in the Contract Documents.

SINGLE CONTRACT

For the sum of _____ Dollars

$_____.

In submitting this Bid, I have received and included in this Bid, the following Addenda:

Addendum No.	Dated
_____	_____
_____	_____
_____	_____

(In accordance with N.J.S.A. 40A:11-23.1a)

FORM IN COMPLIANCE WITH NJSA 40:11-16

We the _____ hereby submit our list of proposed sub-contractors in accordance with N.J.S.A 40A:11-16:

(Structural Contractor)

(Plumbing Contractor)

(HVAC - Mechanical Contractor)

(Electrical Contractor)

_____(Other)

Signed By: _____
(Legal Name of Firm or Partnership) (Date)

(Business Address)

(Name of Owner or Partner)

(Name of Owner or Partner)

(Signature)

The undersigned hereby certifies that he has full authority to make the Proposal and does further declare that he or they are the only person or persons interested in this Proposal and has not entered into any collusion in preparing the Proposal. Prior to the execution or award of agreement, the successful bidder will complete and sign a non-collusion affidavit.

BIDDER'S AFFIDAVIT

STATE OF _____

COUNTY OF _____

_____ being duly sworn, deposes and says that they reside at _____

_____

and that they are the _____
(Give Title)

of _____
(Name of Organization)

who signed the above Proposal of Bid, that they were duly authorized to sign, that the Bid is the true offer of the Bidder, that the seal attached is the seal of the Bidder and that all declarations and statements contained in the Bid are true to the best of his knowledge and belief.

They further depose that they have submitted herewith a list of names and addresses of all stockholders and/or partners owning a 10 percent or greater interest in compliance with P.L. 1977, Chapter 33, effective March 8, 1977.

_____
Affiant

Subscribed and Sworn before me
this _____ day of _____, 20____

_____(Seal)

(Notary Public)

_____
(Commission expiration date)

Affidavit of Compliance on Contractor's Employee Benefits

(Contractor must complete. Sign and notarize this form and submit with bid package)

We the _____ hereby acknowledge compliance with Contractor's Employee Benefits.

I hereby certify that the following company provides the following health plan and pension plan.

Name of Company _____

Health Plan and Group # _____

Name of Pension Plan _____

Furthermore, I certify that _____ currently employs individuals who are attending, or who have completed an apprenticeship program for skilled labor.

Additionally, I certify that any subcontractors that perform work for my company under the terms of this contract also shall provide the above items for their employees.

Signed By: _____
(Legal Name of Firm or Partnership) (Date)

(Business Address)

Signed and Sealed
Before me on
_____, 20__

_____
(Name of Owner or Partner) Notary

(Name of Owner or Partner)

(Signature)

The undersigned acknowledges that there will be no cost to the Owner pertaining to the submission of this Proposal and the Owner has the right to reject any or all bids.

The undersigned agrees that no bid will be withdrawn within sixty (60) days except as may be permitted by the Owner in accordance with N.J.S.A. 40A:11-23.3, and that the Owner shall be permitted to accept this Proposal within sixty (60) days of bid date.

If bid is made by an unincorporated firm or partnership, it shall be signed in firm or partnership name and all members of the firm in their individual names.

_____ _____
Legal Name of Firm or Partnership Date

_____ _____
Business Address Attest

_____
Business Telephone Number

_____
Name of Owner or Partner

_____
Name of Owner or Partner

_____
Name of Owner or Partner

If bid is made by a corporation, let the President or other head officer sign and attach the corporate seal to be attested by the Secretary.

_____ _____
Legal Name of Corporation Date

_____ _____
Business Address Attest
Signature of Secretary

By _____
Signature of Officer

BID BOND

KNOW ALL MEN BY THESE PRESENTS, that we, the undersigned,

_____ as Principal, and _____ as Surety, are hereby held and firmly bound unto the Township of Washington in the penal sum of not less than ten percent of the bid amount to a maximum of $20,000.00 for the payment of which, well and truly to be made, we hereby jointly and severally bind ourselves, our heirs, executors, administrators, successors and assigns.

Signed this _____ day of _____, 20_____

The condition of the above obligation is such that whereas the Principal has submitted to the Township of Washington a certain Bid, attached hereto, and made a part of hereof, to enter into a contract in writing for _____

_____

NOW THEREFORE,

A) If said Bid shall be rejected, or, in the alternate,

B) if said Bid shall be accepted and the Principal shall execute and deliver a contract in the form of contract to be prepared by the Township Attorney (properly completed in accordance with said Bid) and shall furnish a bond for his faithful performance of said Contract, and shall in all other respects perform the agreement created by the acceptance of the said Bid,

Then, this obligation shall be void, otherwise the same shall remain in force and effect; it being expressly understood that all claims hereunder shall, in no event, exceed the penal amount of this obligation as herein stated.

The Surety, for value received, hereby stipulates and agrees that the obligations of said Surety and its bond shall be in no way impaired or affected by any extension of the time within which the Principal may accept such Bid; and said Surety does hereby waive notice of any such extension.

IN WITNESS WHEREOF, the Principal and Surety have set their hands and seals, and such of them as are corporations having their corporate seals to be hereto affixed and these presents to be signed by their proper corporate officers, the day and year first set forth above.

Principal: _____ (LS.)

Surety: _____ By: _____

.

FORM OF AGREEMENT

The following Form of Agreement Between Owner and Contractor, AIA Document A101, 2017 Edition, pages one (1) through eight (8) inclusive, where a stipulated sum forms the basis of payment, shall be the required form of contract and is herewith specifically made a part of the Contract Documents.

AIA® Document A101® – 2017

Standard Form of Agreement Between Owner and Contractor where the basis of payment is a Stipulated Sum

AGREEMENT made as of the XX day of Month in the year Two Thousand Twenty
(In words, indicate day, month and year.)

BETWEEN the Owner:
(Name, legal status, address and other information)

Township of Washington
350 Hudson Avenue
Township of Washington, NJ 07676

and the Contractor:
(Name, legal status, address and other information)

for the following Project:
(Name, location and detailed description)

Township of Washington Emergency Services Complex
656 Washington Ave, Township of Washington, NJ 07676
New Fire and EMS 2 story building

The Architect:
(Name, legal status, address and other information)

Robbie Conley Architect, LLC., Limited Liability Company
596 Glassboro Road
Woodbury Heights, NJ 08097
Telephone Number: 856-845-7500
Fax Number: 856-853-0528

The Owner and Contractor agree as follows.

ADDITIONS AND DELETIONS:
The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

The parties should complete A101®–2017, Exhibit A, Insurance and Bonds, contemporaneously with this Agreement. AIA Document A201®–2017, General Conditions of the Contract for Construction, is adopted in this document by reference. Do not use with other general conditions unless this document is modified.

ELECTRONIC COPYING of any portion of this AIA® Document to another electronic file is prohibited and constitutes a violation of copyright laws as set forth in the footer of this document.

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TABLE OF ARTICLES

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2 THE WORK OF THIS CONTRACT

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8 MISCELLANEOUS PROVISIONS

9 ENUMERATION OF CONTRACT DOCUMENTS

EXHIBIT A INSURANCE AND BONDS

ARTICLE 1 THE CONTRACT DOCUMENTS

The Contract Documents consist of this Agreement, Conditions of the Contract (General, Supplementary, and other Conditions), Drawings, Specifications, Addenda issued prior to execution of this Agreement, other documents listed in this Agreement, and Modifications issued after execution of this Agreement, all of which form the Contract, and are as fully a part of the Contract as if attached to this Agreement or repeated herein. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. An enumeration of the Contract Documents, other than a Modification, appears in Article 9.

ARTICLE 2 THE WORK OF THIS CONTRACT

The Contractor shall fully execute the Work described in the Contract Documents, except as specifically indicated in the Contract Documents to be the responsibility of others.

ARTICLE 3 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION

§ 3.1 The date of commencement of the Work shall be:
(Check one of the following boxes.)

[ ] The date of this Agreement.

[ ] A date set forth in a notice to proceed issued by the Owner.

[X] Established as follows:
(Insert a date or a means to determine the date of commencement of the Work.)

The work shall commence no later than September 1, 2020

If a date of commencement of the Work is not selected, then the date of commencement shall be the date of this Agreement.

§ 3.2 The Contract Time shall be measured from the date of commencement of the Work.

§ 3.3 Substantial Completion

§ 3.3.1 Subject to adjustments of the Contract Time as provided in the Contract Documents, the Contractor shall achieve Substantial Completion of the entire Work:
(Check one of the following boxes and complete the necessary information.)

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[ ] Not later than ( ) calendar days from the date of commencement of the Work.

[X] By the following date: October 18, 2021

§ 3.3.2 Subject to adjustments of the Contract Time as provided in the Contract Documents, if portions of the Work are to be completed prior to Substantial Completion of the entire Work, the Contractor shall achieve Substantial Completion of such portions by the following dates:

Portion of Work	Substantial Completion Date

§ 3.3.3 If the Contractor fails to achieve Substantial Completion as provided in this Section 3.3, liquidated damages, if any, shall be assessed as set forth in Section 4.5.

ARTICLE 4 CONTRACT SUM

§ 4.1 The Owner shall pay the Contractor the Contract Sum in current funds for the Contractor's performance of the Contract. The Contract Sum shall be ($), subject to additions and deductions as provided in the Contract Documents.

§ 4.2 Alternates

§ 4.2.1 Alternates, if any, included in the Contract Sum:

Item	Price

§ 4.2.2 Subject to the conditions noted below, the following alternates may be accepted by the Owner following execution of this Agreement. Upon acceptance, the Owner shall issue a Modification to this Agreement.
(Insert below each alternate and the conditions that must be met for the Owner to accept the alternate.)

Item	Price	Conditions for Acceptance

§ 4.3 Allowances, if any, included in the Contract Sum:
(Identify each allowance.)

Item	Price

§ 4.4 Unit prices, if any:
(Identify the item and state the unit price and quantity limitations, if any, to which the unit price will be applicable.)

Item	Units and Limitations	Price per Unit ($0.00)

§ 4.5 Liquidated damages, if any:
(Insert terms and conditions for liquidated damages, if any.)

If the contractor fails to complete fully, entirely and in conformity with the provisions of this contract the project and every part and appurtenance thereof within the times stated above, the contractor shall and hereby agrees to pay the owner for each and every calendar day that he is in default on time to complete the work, the amount of three hundred fifty dollars ($350.00) per day, which said amount per day is agreed to by the parties hereto to be liquidated damages not a penalty.

§ 4.6 Other:
(Insert provisions for bonus or other incentives, if any, that might result in a change to the Contract Sum.)

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ARTICLE 5 PAYMENTS

§ 5.1 Progress Payments

§ 5.1.1 Based upon Applications for Payment submitted to the Architect by the Contractor and Certificates for Payment issued by the Architect, the Owner shall make progress payments on account of the Contract Sum to the Contractor as provided below and elsewhere in the Contract Documents.

§ 5.1.2 The period covered by each Application for Payment shall be one calendar month ending on the last day of the month, or as follows:

§ 5.1.3 Provided that an Application for Payment is received by the Architect not later than the last day of a month, the Owner shall make payment of the amount certified to the Contractor not later than the 28th day of the following month. If an Application for Payment is received by the Architect after the application date fixed above, payment of the amount certified shall be made by the Owner not later than forty-five (45) days after the Architect receives the Application for Payment.
(Federal, state or local laws may require payment within a certain period of time.)

§ 5.1.4 Each Application for Payment shall be based on the most recent schedule of values submitted by the Contractor in accordance with the Contract Documents. The schedule of values shall allocate the entire Contract Sum among the various portions of the Work. The schedule of values shall be prepared in such form, and supported by such data to substantiate its accuracy, as the Architect may require. This schedule of values shall be used as a basis for reviewing the Contractor's Applications for Payment.

§ 5.1.5 Applications for Payment shall show the percentage of completion of each portion of the Work as of the end of the period covered by the Application for Payment.

§ 5.1.6 In accordance with AIA Document A201™–2017, General Conditions of the Contract for Construction, and subject to other provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:

§ 5.1.6.1 The amount of each progress payment shall first include:

.1 That portion of the Contract Sum properly allocable to completed Work;

.2 That portion of the Contract Sum properly allocable to materials and equipment delivered and suitably stored at the site for subsequent incorporation in the completed construction, or, if approved in advance by the Owner, suitably stored off the site at a location agreed upon in writing; and

.3 That portion of Construction Change Directives that the Architect determines, in the Architect's professional judgment, to be reasonably justified.

§ 5.1.6.2 The amount of each progress payment shall then be reduced by:

.1 The aggregate of any amounts previously paid by the Owner;

.2 The amount, if any, for Work that remains uncorrected and for which the Architect has previously withheld a Certificate for Payment as provided in Article 9 of AIA Document A201–2017;

.3 Any amount for which the Contractor does not intend to pay a Subcontractor or material supplier, unless the Work has been performed by others the Contractor intends to pay;

.4 For Work performed or defects discovered since the last payment application, any amount for which the Architect may withhold payment, or nullify a Certificate of Payment in whole or in part, as provided in Article 9 of AIA Document A201–2017; and

.5 Retainage withheld pursuant to Section 5.1.7.

§ 5.1.7 Retainage

§ 5.1.7.1 For each progress payment made prior to Substantial Completion of the Work, the Owner may withhold the following amount, as retainage, from the payment otherwise due:
(Insert a percentage or amount to be withheld as retainage from each Application for Payment. The amount of retainage may be limited by governing law.)

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Take that portion of the Contract Sum properly allocable to completed Work as determined by multiplying the percentage completion of each portion of the Work by the share of the total Contract sum allocated to that portion of the Work in the Schedule of Values, less retainage of **Two** percent (**2%**) of the amount due the contractor until **fifty** percent (50%) of the contract is completed. When the contract is **fifty** (**50%**) completed, one-half of the amount retained by the contracting body shall be returned to the contractor: Provided, that the architect approves the application for payment: And provided further, that the contractor is making satisfactory progress and there is no specific cause for greater withholding. The sum or sums withheld by the owner from the contractor after the contract is **fifty** percent (**50%)** completed shall not exceed **Two** percent (**2%**) of the value of completed work on monthly progress payment requests: Provided, however, that in the event a dispute arises between the owner and any prime contractor, which is based upon increased costs claimed by one prime contractor occasioned by delays or other actions of another prime contractor, additional retainage in the sum of **one and one-half times** the amount of any possible liability may be withheld until such time as a final resolution is agreed to by all parties directly or indirectly involved, unless the contractor causing the additional claim furnished a bond satisfactory to the owner to indemnify such owner against the claim. However, all such moneys retained by the owner may be withheld from the contractor until substantial completion of the contract. Pending final determination of cost to the Owner of changes in the work, amounts not in dispute may be included as provided in Sub-paragraph 7.3.7. of the General Conditions even though the Contract Sum has not yet been adjusted by Change Order

§ 5.1.7.1.1 The following items are not subject to retainage:
(Insert any items not subject to the withholding of retainage, such as general conditions, insurance, etc.)

N/A

§ 5.1.7.2 Reduction or limitation of retainage, if any, shall be as follows:
(If the retainage established in Section 5.1.7.1 is to be modified prior to Substantial Completion of the entire Work, including modifications for Substantial Completion of portions of the Work as provided in Section 3.3.2, insert provisions for such modifications.)

Refer to 5.1.7.1

§ 5.1.7.3 Except as set forth in this Section 5.1.7.3, upon Substantial Completion of the Work, the Contractor may submit an Application for Payment that includes the retainage withheld from prior Applications for Payment pursuant to this Section 5.1.7. The Application for Payment submitted at Substantial Completion shall not include retainage as follows:
(Insert any other conditions for release of retainage upon Substantial Completion.)

§ 5.1.8 If final completion of the Work is materially delayed through no fault of the Contractor, the Owner shall pay the Contractor any additional amounts in accordance with Article 9 of AIA Document A201–2017.

§ 5.1.9 Except with the Owner's prior approval, the Contractor shall not make advance payments to suppliers for materials or equipment which have not been delivered and stored at the site.

§ 5.2 Final Payment

§ 5.2.1 Final payment, constituting the entire unpaid balance of the Contract Sum, shall be made by the Owner to the Contractor when

.1 the Contractor has fully performed the Contract except for the Contractor's responsibility to correct Work as provided in Article 12 of AIA Document A201–2017, and to satisfy other requirements, if any, which extend beyond final payment; and

.2 a final Certificate for Payment has been issued by the Architect.

§ 5.2.2 The Owner's final payment to the Contractor shall be made no later than 30 days after the issuance of the Architect's final Certificate for Payment, or as follows:

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§ 5.3 Interest
Payments due and unpaid under the Contract shall bear interest from the date payment is due at the rate stated below, or in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.
(Insert rate of interest agreed upon, if any.)

Zero % 0

ARTICLE 6 DISPUTE RESOLUTION

§ 6.1 Initial Decision Maker
The Architect will serve as the Initial Decision Maker pursuant to Article 15 of AIA Document A201–2017, unless the parties appoint below another individual, not a party to this Agreement, to serve as the Initial Decision Maker.
(If the parties mutually agree, insert the name, address and other contact information of the Initial Decision Maker, if other than the Architect.)

§ 6.2 Binding Dispute Resolution
For any Claim subject to, but not resolved by, mediation pursuant to Article 15 of AIA Document A201–2017, the method of binding dispute resolution shall be as follows:
(Check the appropriate box.)

[ ] Arbitration pursuant to Section 15.4 of AIA Document A201–2017

[X] Litigation in a court of competent jurisdiction

[ ] Other *(Specify)*

If the Owner and Contractor do not select a method of binding dispute resolution, or do not subsequently agree in writing to a binding dispute resolution method other than litigation, Claims will be resolved by litigation in a court of competent jurisdiction.

ARTICLE 7 TERMINATION OR SUSPENSION

§ 7.1 The Contract may be terminated by the Owner or the Contractor as provided in Article 14 of AIA Document A201–2017.

§ 7.1.1 If the Contract is terminated for the Owner's convenience in accordance with Article 14 of AIA Document A201–2017, then the Owner shall pay the Contractor a termination fee as follows:
(Insert the amount of, or method for determining, the fee, if any, payable to the Contractor following a termination for the Owner's convenience.)

§ 7.2 The Work may be suspended by the Owner as provided in Article 14 of AIA Document A201–2017.

ARTICLE 8 MISCELLANEOUS PROVISIONS

§ 8.1 Where reference is made in this Agreement to a provision of AIA Document A201–2017 or another Contract Document, the reference refers to that provision as amended or supplemented by other provisions of the Contract Documents.

§ 8.2 The Owner's representative:
(Name, address, email address, and other information)

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Robert Tovo
350 Hudson Avenue
Township of Washington, NJ 07676
Email Address: rtovo@twpofwashington.us

§ 8.3 The Contractor's representative:
(Name, address, email address, and other information)

§ 8.4 Neither the Owner's nor the Contractor's representative shall be changed without ten days' prior notice to the other party.

§ 8.5 Insurance and Bonds

§ 8.5.1 The Contractor shall purchase and maintain insurance and provide bonds as set forth in Article 11 of AIA Document A201™–2017.
(State bonding requirements, if any, and limits of liability for insurance required in Article 11 of AIA Document A201-2017.)

Type of insurance or bond	Limit of liability or bond amount ($0.00)
See Project Manual Section 00410 Article 11; pages 00410-43 through 00410-46	

(Paragraphs deleted)

§ 8.7 Other provisions:

N/A

ARTICLE 9 ENUMERATION OF CONTRACT DOCUMENTS

§ 9.1 This Agreement is comprised of the following documents:

.1 AIA Document A101™–2017, Standard Form of Agreement Between Owner and Contractor

(Paragraphs deleted)

.3 AIA Document A201™–2017, General Conditions of the Contract for Construction

.5 Drawings

Number	Title	Date
See Index in Project Manual		

.6 Specifications

Section	Title	Date	Pages
See Index in Project Manual			

.7 Addenda, if any:

Number	Date	Pages

Portions of Addenda relating to bidding or proposal requirements are not part of the Contract

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Documents unless the bidding or proposal requirements are also enumerated in this Article 9.

.8 Other Exhibits:
(Check all boxes that apply and include appropriate information identifying the exhibit where required.)

[ ] AIA Document E204™–2017, Sustainable Projects Exhibit, dated as indicated below:
(Insert the date of the E204-2017 incorporated into this Agreement.)

[ ] The Sustainability Plan:

Title	Date	Pages

[X] Supplementary and other Conditions of the Contract:

Document	Title	Date	Pages
See Index in Project Manual			

.9 Other documents, if any, listed below:
(List here any additional documents that are intended to form part of the Contract Documents. AIA Document A201™–2017 provides that the advertisement or invitation to bid, Instructions to Bidders, sample forms, the Contractor's bid or proposal, portions of Addenda relating to bidding or proposal requirements, and other information furnished by the Owner in anticipation of receiving bids or proposals, are not part of the Contract Documents unless enumerated in this Agreement. Any such documents should be listed here only if intended to be part of the Contract Documents.)

See Index in Project Manual

This Agreement entered into as of the day and year first written above.

OWNER *(Signature)*	**CONTRACTOR** *(Signature)*
Robert Tovo, Business Administrator	
(Printed name and title)	*(Printed name and title)*

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The following New Jersey Statutory Form of Performance Bond and Maintenance Bond, pages one (1) through five (5) inclusive, constitute the bonding requirements for all the work of the Contract and are hereby specifically made a part of the Contract Documents.

NEW JERSEY STATUTORY FORM OF PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS, that we, the undersigned
_____
_____as
Principal, and _____
as Surety, a corporation of the State of _____ duly authorized to do business in the State of New Jersey, having an office at_____
_____, are hereby held and firmly bound unto _____
in the penal sum of _____dollars ($_____) for the payment of which well and truly to be made, we hereby jointly and severally bind ourselves, our heirs, executors, administrators, successors, and assigns.

Signed this _____ day of _____, 20___.

The condition of the above obligation is such that whereas, the above-named Principal did on the _____ day of _____, 20___, enter into a Contract with
_____
which said Contract is made a part of this bond the same as though set forth herein.

NOW, if the said Principal shall well and faithfully do and perform the things agreed by to be done and performed according to the terms of said Contract, and shall pay all lawful claims of subcontractor, material men, laborers, persons, firms, or corporations for labor performed or materials, provisions, provender or other supplies or teams, fuels, oils, implements, or machinery finished, used or consumed in the carrying forward, performing, or completing of said Contract, we agreeing and assenting that this undertaking shall be for the benefit of any subcontractor, material men, laborer, person, firm, or corporation having a just claim, as well as for the Obligee herein; then this obligation shall be void; otherwise, the same shall remain in full force and effect; it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall in no event exceed the penal amount of this obligation as herein stated.

The said Surety hereby stipulates and agrees that no modifications, omissions, or additions in or to the terms of the said Contract or in to the Plans and Specifications therefore shall in any way affect the obligation of said Surety on its bond.

Provided further, that no final settlement between the Owner and the Contractor shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied, and provided further, in the event that the principal defaults or otherwise fails to perform or finish the work as set forth under the contract for any reason whatsoever, it shall be the unqualified obligation of the Surety to complete the contract, or cause it to be completed in accordance with its terms following receipt of notice from the Owner of such default; and provided further, that no advance, premature, excessive or delayed payment or payments by the Owner shall in anyway affect the obligation of the Surety on this bond; and, provided further, that no payments made to the principal, nor partial nor entire use or occupancy of the work by Owner shall be an acceptance of any work or materials not in accordance with this contract and the surety shall be equally bound to the same extent as the principal.

This bond is given in compliance with the requirements of the statutes of the State of New Jersey in respect to bonds of Contractors on public works, Revised Statutes of New Jersey, 1937, Sections 2A:44-143-147, and amendments thereto; and liability hereunder is limited as in said Statutes provided.

SIGNED, SEALED, AND DELIVERED
IN THE PRESENCE OF

By: _____

_____ _____

_____ _____
Witness as to Surety

By: _____
Attorney-in-Fact

Countersigned at _____

By: _____This _____ day of _____, 20___

MAINTENANCE SURETY BOND

We, _____, having offices at _____ __, ___ ____, as principal, and _____, having offices at _____, _____, a corporation duly licensed to transact a surety business in the State of New Jersey, as surety, are indebted to the municipality of _____ in the county of _____ __, obligee, in the sum of $_____, for which payment we bind ourselves and our respective heirs, legal representatives, successors, and assigns, jointly and severally.
On _____ (date), principal was granted approval by the _____ (approving authority) of the _____ of _____ for _____ (include reference to specific job and resolution of approval).

This bond shall become effective upon approval or acceptance of the improvements by the governing body, as certified by the resolution of the governing body, which is, or shall be, attached hereto and made a part hereof. The improvements subject to this bond are as follows: _____. The certification of the cost of such improvements by the municipal engineer is attached hereto and made a part hereof.

Pursuant to municipal ordinance, adopted under authority of the Municipal Land Use Law (N.J.S.A. 40:55D-1 et seq.), the principal, as a condition of approval or acceptance of improvements, hereby furnishes this maintenance bond in the amount of $_____ (not to exceed 15 percent of the cost of the improvements as certified by the municipal engineer), written by _____, a surety licensed in the State of New Jersey, guarantying full and faithful compliance with all terms and conditions of the approval. The bond shall continue in effect for a period of two years (2) from the date of approval or acceptance of the said improvements.

This bond shall remain in full force and effect until released by resolution of the municipal governing body.

This bond is issued subject to the following expressed conditions:
1. This bond shall not be subject to cancellation either by the principal or by the surety for any reason until the end of the period for which it is required to be maintained.

2. The aggregate liability of the surety under this bond shall not exceed the sum set forth above.

3. In the event that the improvements subject to this bond exhibit any defects in functioning, materials or quality of work, the municipal governing body may, at its option, and upon at least 30 days prior written notice to the principal and to the surety by personal delivery or by certified or registered mail or courier, declare the principal to be in default and, in the event that the surety fails or refuses to perform the necessary corrective work, claim payment under this bond for the cost of any work required for the proper correction of any such defects in the said improvements. In the event that any action is brought against the principal under this bond, written notice of such action shall be given to the surety by the municipality by personal delivery or by registered or certified mail or courier at the same time.

4. The surety shall have the right to repair any defects in functioning, materials or quality of work and, to that end, to do such corrective work as may be necessary in accordance with the terms and conditions of the original approval, either with its own employees or in conjunction with the principal or another

contractor; provided, however, that as an alternative to performing such maintenance or corrective work it may, in its sole discretion, make a monetary settlement with the municipality.

5. This bond shall inure to the benefit of the municipality only and no other party shall acquire any rights hereunder.

Date: _____ Witness/Attest Principal _____

_____ Witness/Attest:

, Surety _____

ACKNOWLEDGMENT OF PRINCIPAL, IF A CORPORATION

State of _____)
) SS
County of _____)

On this _____ day of _____, 20 ___, before me personally came and appeared_____ to me known, who, being by me duly sworn, did depose and say that he resides at _____ that he is the _____ of _____ the corporation described in and which executed the foregoing instrument; that he knows the seal of said corporation; that one of the impressions affixed to said instrument is an impression of such seal; that it was so affixed by order of the Directors of said corporation, and that he signed his name thereto by like order.

(SEAL) _____

ACKNOWLEDGMENT OF PRINCIPAL, IF A PARTNERSHIP

State of _____)
) SS
County of _____)

On this _____ day of _____. 20 ___, before me personally came and appeared _____to be known to be one of the members of the firm of _____ described in and who executed the foregoing instrument and he acknowledged to me that he executed the same as and for the act and deed of said firm.

(SEAL) _____

ACKNOWLEDGMENT OF PRINCIPAL, IF AN INDIVIDUAL

State of _____)
) SS
County of _____)

On this _____ day of _____, 20 ___, before me personally came and appeared _____ to be known to me to be the person described in, and who executed the foregoing instrument and acknowledged that he executed the same.

(SEAL) _____

The rate of premium on this bond is $ _____ per thousand.

The total amount of premium charged is $ _____.

(The above is to filled in by Surety Company.)
(Power of Attorney of person signing
for the Surety Company must be attached.)

CONSENT OF SURETY

N.J.S.A. 40A:11-22 provides in pertinent part that where a contracting unit requires a performance bond, the contracting unit must require from all bidders, a certificate from a surety company licensed to do business in the State of New Jersey stating that the surety company will provide the Contractor with a performance bond.

If a performance bond and/or payment bond will be required from a successful bidder on this project, then consequently, all bidders shall submit, with their bid, a certificate in substantially the following form.

TO: (ADDRESS)

RE: _____
(Contractor)

_____
(Project Description)

This is to certify that the _____
(Surety Company)

will provide to the Township of Washington, a performance bond and a payment bond in the event that said
(Contractor)

_____ is awarded a contract for the above project.
(Contract)

_____
(Authorized Agent of Surety Company)

**CERTIFICATE OF SURETY MUST BE SIGNED BY AN AUTHORIZED AGENT OR REPRESENTATIVE OF A SURETY COMPANY AND NOT THE INDIVIDUAL OR COMPANY SUBMITTING THE BID.

The following Public Disclosure Information as required by Chapter 33 of the New Jersey Laws of 1977 are hereby specifically made a part of the Contract Documents.

STOCKHOLDER DISCLOSURE CERTIFICATION

NEW JERSEY PUBLIC LAW 1977, CHAPTER 33 REQUIRES EACH CORPORATION OR PARTNERSHIP SUBMITTING A BID TO ANY GOVERNMENTAL AGENCY TO ACCOMPANY THAT BID WITH A STATEMENT OF OWNERSHIP LISTING THE NAME AND ADDRESS AND PERCENTAGE OWNERSHIP OF EACH INDIVIDUAL OWNING TEN PERCENT (10%) OR MORE OF THE CORPORATION OR PARTNERSHIP. THIS FORM OR AN APPROPRIATE LISTING ON THE BIDDERS LETTERHEAD CONTAINING SIMILAR INFORMATION, MUST BE INCLUDED IN THE BIDDERS PROPOSAL WHEN THE BID IS ORIGINALLY SUBMITTED.

OWNERSHIP STATEMENT – PER PL 1977 CHAPTER 33

_____

(NAME OF CORPORATION OR PARTNERSHIP) PRINT

_____

(ADDRESS OF RECORD) PRINT

ADDRESS		PERCENT OWNED
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

IF ONE OR MORE SUCH STOCKHOLDER OR PARTNER IS ITSELF A CORPORATION OR IS A PARTNERSHIP, THE STOCKHOLDERS HOLDING TEN PERCENT (10%) OR MORE OF THAT CORPORATION'S STOCK OR THE INDIVIDUAL PARTNERS OWNING TEN PERCENT (10%) OR GREATER INTEREST IN THAT PARTNERSHIP MUST BE LISTED ON A SUPPLEMENTAL SHEET ON THE BIDDER'S LETTERHEAD.

THE FULL NAMES AND RESIDENCES OF ALL PERSONS INTERESTED IN THIS BID AS PRINCIPALS ARE AS FOLLOWS:

_____	_____
_____	_____
_____	_____

CONTRACTOR'S LEGAL STATUS:_____

(CORPORATION LIMITED LIABILITY CORPORATION, SUBCHAPTERS COOPERATIVE, PARTNERSHIP, LIMITED LIABILITY PARTNERSHIP, JOINT VENTURE, OR INDIVIDUAL OPERATING UNDER A TRADE NAME.)

I CERTIFY THAT THE FOREGOING INFORMATION IS CORRECT.

_____

SIGNATURE TITLE

SUBSCRIBED AND SWORN TO

BEFORE ME THIS_____DAY

OF_____, 20____.

_____

NOTARY PUBLIC OF

MY COMMISSION EXPIRES ' 20

NON-COLLUSION AFFIDAVIT

STATE OF NEW JERSEY:

COUNTY OF _____:

I, _____, of full age, being duly sworn according to law, upon my oath, deposes and says:

I certify that I am _____.
Of the firm _____.

The bidder making this proposal for the above named project, and that I executed the said proposal with full authority to do so; that said bidder has not, directly or indirectly entered into any agreement, participated in any collusion, or otherwise taken any action in restraint of free, competitive bidding in connection with the above named project; and that all statements contained in said proposal and in the Affidavit are true and correct, and made with full knowledge that the _____ relies upon the truth of the statements contained in said proposal in the statements in this Affidavit in awarding the contract for the said project.

I further warrant that no person or selling agency has been employed to solicit or secure such contract upon an agreement or understanding for a commission, percentage, brokerage or contingent fee, except bona fide employees or bona fide established commercial or selling agencies maintained by (*N.J.S.A.* 52:34-25)

_____
(NAME OF THE CONTRACTOR)

_____
(SIGNATURE OF CONTRACTOR)

_____
(NAME OF AFFIANT)

_____
(SIGNNATURE OF AFFIANT)

Subscribed and sworn to
Before me this _____ Day of
_____ 20_____.
Notary Public of

My Commission Expires _____, 20_____.

INDEMNITY AND HOLD HARMLESS AGREEMENT

_____ (Contractor, Individual, Group) agrees to indemnify and hold harmless the Township of Washington, and/or the Bergen County Municipal Joint Insurance Fund, and their agents and employees, from and against all claims, damages, losses, and expenses, including reasonable attorney's fees in case it shall be necessary to file action, arising out of performance of the work herein, which is (1) for bodily injury, illness or death, or for property damage, including loss of use, and (2) caused in whole or in part by _____ (Contractor) negligent act or omission, or that of subcontractor, or that of anyone employed by them or for whose acts contractor or subcontractor may be liable. This indemnification and agreement shall apply in all instances whether the Township of Washington and/or the Bergen County Municipal Joint Insurance Fund is made a direct party to the initial action or claim or is subsequently made a party to the action by third-party in-pleading or is made a party to a collateral action arising, in whole or in part, from any of the issues emanating from the original cause of action or claim.

_____
Contractor, Individual, Group

_____
Date

Subscribed and sworn to
Before me this _____ Day of
_____ 20___

Notary Public of

My Commission Expires _____, 20___.

STATE OF NEW JERSEY DEBARRED LIST AFFADAVIT

STATE OF _____:

COUNTY OF _____: ss

I, _____ of the City/Town of _____

in the County of _____ and the State of _____ being of full age and duly sown according to law on my oath depose and say that:

I am _____, an officer of the firm of

_____, the bidder making the Proposal for the above work, and that I executed the said Proposal with full authority to do so; that said bidder at the time of making of this bid is not included on the State of New Jersey, Treasurer's List of Debarred, Suspended and Disqualified Bidders; and that all statements contained in said Proposal and in this affidavit are true and correct, and made with the

full knowledge that the _____, as the Owner relies upon the truth of the statements contained in said Proposal and in the statements contained in this affidavit in awarding the contract for said work.

The undersigned further warrants that should the name making this bid appear on the State Treasurer's List of Debarred, Suspended and Disqualified Bidders at anytime prior to, and during the life of this Contract including Guarantee Period, that the Local Governing Unit shall be immediately notified by the signatory of this Eligibility Affidavit.

The undersigned understands that the firm making the bid as Contractor is subject to disbarment, suspension and/or disqualification in contracting with the State of New Jersey, if the Contractor pursuant to *N.J.A.C.* 7:1-5.2, commits any of the acts listed therein, and is determined according to applicable law and regulation.

_____
(Name of Contractor)

_____
(Name and Title of Affidavit)

Subscribed and sworn to
Before me this _____ Day of
_____ 20_____.
Notary Public of

My Commission Expires _____, 20_____.

ABILITY QUESTIONNAIRE

If a Corporation, check here: _____ If a partnership, check here: _____

Date of Organization _____ State whether partnership
Is general or limited: _____

If a Sole Proprietor, check here: _____

Name and address of partners:

President: _____

Vice-President: _____

Secretary: _____

Treasurer: _____

EXPERIENCE AND EQUIPMENT

How many years has your organization been in business under your present business name? _____

How many years has your organization been in business as a general contractor under your present business name? _____

How many years experience in this type of equipment has your organization had? _____

Who were the last five public and private sector organizations you have worked for?

Names, Address and Telephones of reference for items listed above:

Name and Address	Telephone Number

Any other references: _____

_____

EXHIBIT B

MANDATORY EQUAL EMPLOYMENT OPPORTUNITY LANGUAGE
N.J.S.A. 10:5-31 et seq. (P.L. 1975, C. 127)
N.J.A.C. 17:27

CONSTRUCTION CONTRACTS

During the performance of this contract, the contractor agrees as follows:

The contractor or subcontractor, where applicable, will not discriminate against any employee or applicant for employment because of age, race, creed, color, national origin, ancestry, marital status, affectional or sexual orientation, gender identity or expression, disability, nationality or sex. Except with respect to affectional or sexual orientation and gender identity or expression, the contractor will take affirmative action to ensure that such applicants are recruited and employed, and that employees are treated during employment, without regard to their age, race, creed, color, national origin, ancestry, marital status, affectional or sexual orientation, gender identity or expression, disability, nationality or sex. Such action shall include, but not be limited to the following: employment, up grading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided by the Public Agency Compliance Officer setting forth provisions of this nondiscrimination clause.

The contractor or subcontractor, where applicable will, in all solicitations or advertisements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive consideration for employment without regard to age, race, creed, color, national origin, ancestry, marital status, affectional or sexual orientation, gender identity or expression, disability, nationality or sex.

The contractor or subcontractor, where applicable, will send to each labor union or representative of workers with which it has a collective bargaining agreement or other contract or understanding, a notice, to be provided by the agency contracting officer advising the labor union or workers' representative of the contractor's commitments under this act and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

The contractor or subcontractor, where applicable, agrees to comply with any regulations promulgated by the Treasurer, pursuant to N.J.S.A. 10:5-31 et seq., as amended and supplemented from time to time and the Americans with Disabilities Act.

When hiring or scheduling workers in each construction trade, the contractor or subcontractor agrees to make good faith efforts to employ minority and women workers in each construction trade consistent with the applicable employment goal prescribed by N.J.A.C. l7:27 7.3; provided, however, that the Division may, in its discretion, exempt a contractor or subcontractor from compliance with the good faith procedures prescribed by the following provisions, A, B and C, as long as the Division is satisfied that the contractor or subcontractor is employing workers provided by a union which provides evidence, in accordance with standards prescribed by the Division, that its percentage of active "card carrying" members who are minority and women workers is equal to or greater than the

applicable employment goal established in accordance with N.J.A.C. l7:27 7.3. The contractor or subcontractor agrees that a good faith effort shall include compliance with the following procedures:

(A) If the contractor or subcontractor has a referral agreement or arrangement with a union for a construction trade, the contractor or subcontractor shall, within three business days of the contract award, seek assurances from the union that it will cooperate with the contractor or subcontractor as it fulfills its affirmative action obligations under this contract and in accordance with the rules promulgated by the Treasurer pursuant to N.J.S.A. 10:5-31 et. seq., as supplemented and amended from time to time and the Americans with Disabilities Act. If the contractor or subcontractor is unable to obtain said assurances from the construction trade union at least five business days prior to the commencement of construction work, the contractor or subcontractor agrees to attempt to hire or schedule minority and women workers directly, consistent with the applicable employment goal. If the contractor's or subcontractor's prior experience with a construction trade union, regardless of whether the union has provided said assurances, indicates a significant possibility that the trade union will not refer sufficient minority and women workers consistent with the applicable employment goal, the contractor or subcontractor agrees to be prepared to hire or schedule minority and women workers directly, consistent with the applicable employment goal, by complying with the hiring or scheduling procedures prescribed under (B) below; and the contractor or subcontractor further agrees to take said action immediately if it determines or is so notified by the Division that the union is not referring minority and women workers consistent with the applicable employment goal.

(B) If the hiring or scheduling of a workforce consistent with the employment goal has not or cannot be achieved for each construction trade by adhering to the procedures of (A) above, or if the contractor does not have a referral agreement or arrangement with a union for a construction trade, the contractor or subcontractor agrees to take the following actions consistent with the applicable county employment goals:

(l) To notify the public agency compliance officer, the Division, and minority and women referral organizations listed by the Division pursuant to N.J.A.C. 17:27-5.3, of its workforce needs, and request referral of minority and women workers;

(2) To notify any minority and women workers who have been listed with it as awaiting available vacancies;

(3) Prior to commencement of work, to request that the local construction trade union refer minority and women workers to fill job openings, provided the contractor or subcontractor has a referral agreement or arrangement with a union for the construction trade;

(4) To leave standing requests for additional referral to minority and women workers with the local construction trade union, provided the contractor or subcontractor has a referral agreement or arrangement with a union for the construction trade, the State Training and Employment Service and other approved referral sources in the area until such time as the workforce is consistent with the employment goal;

(5) If it is necessary to lay off some of the workers in a given trade on the construction site, to assure, consistent with the applicable State and Federal statutes and court decisions, that sufficient minority and women employees remain on the site consistent with the employment goal; and to employ any minority and women workers laid off by the contractor on any other construction site on which its

workforce composition is not consistent with an employment goal established pursuant to rules implementing N.J.S.A. 10:5-31 et. seq.;

(6) To adhere to the following procedure when minority and women workers apply or are referred to the contractor or subcontractor:

(i) If said individuals have never previously received any document or certification signifying a level of qualification lower than that required in order to perform the work of the construction trade, the contractor or subcontractor shall determine the qualifications of such individuals and if the contractor's or subcontractor's workforce in each construction trade is not consistent with the applicable employment goal, it shall hire or schedule those individuals who satisfy appropriate qualification standards. However, a contractor or subcontractor shall determine that the individual at least possesses the requisite skills, and experience recognized by a union, apprentice program or a referral agency, provided the referral agency is acceptable to the Division. If necessary, the contractor or subcontractor shall hire or schedule minority and women workers who qualify as trainees pursuant to these rules. All of the requirements, however, are limited by the provisions of (C) below.

(ii) If the contractor's or subcontractor's workforce is consistent with the applicable employment goal, the name of any interested women or minority individual shall be maintained on a waiting list for the first consideration, in the event the contractor's or subcontractor's workforce is no longer consistent with the applicable employment goal.

(iii) If, for any reason, said contractor or subcontractor determines that a minority individual or a woman is not qualified or if the individual qualifies as an advanced trainee or apprentice, the contractor or subcontractor shall inform the individual in writing of the reasons for the determination, maintain a copy of the determination in its files, and send a copy to the public agency compliance officer and to the Division.

(7) To keep a complete and accurate record of all requests made for the referral of workers in any trade covered by the contract, on forms made available by the Division and submitted promptly to the Division upon request.

(C) The contractor or subcontractor agrees that nothing contained in (B) above shall preclude the contractor or subcontractor from complying with the union hiring hall or apprenticeship policies in any applicable collective bargaining agreement or union hiring hall arrangement, and, where required by custom or agreement, it shall send journeymen and trainees to the union for referral, or to the apprenticeship program for admission, pursuant to such agreement or arrangement. However, where the practices of a union or apprenticeship program will result in the exclusion of minorities and women or the failure to refer minorities and women consistent with the county employment goal, the contractor or subcontractor shall consider for employment persons referred pursuant to (B) above without regard to such agreement or arrangement; provided further, however, that the contractor or subcontractor shall not be required to employ women and minority advanced trainees and trainees in numbers which result in the employment of advanced trainees and trainees as a percentage of the total workforce for the construction trade, which percentage significantly exceeds the apprentice to journey worker ratio specified in the applicable collective bargaining agreement, or in the absence of a collective bargaining agreement, exceeds the ratio established by practice in the area for said construction trade. Also, the contractor or subcontractor agrees that, in implementing the procedures of (B) above, it shall, where applicable, employ minority and women workers residing within the geographical jurisdiction of the union.

After notification of award, but prior to signing a construction contract, the contractor shall submit to the public agency compliance officer and theDivision an initial project workforce report (Form AA 201) provided to the public agency by the Division for distribution to and completion by the contractor, in accordance with N.J.A.C. 17:27-7. The contractor also agrees to submit a copy of the Monthly Project Workforce Report once a month thereafter for the duration of this contract to the Division and to the public agency compliance officer.

The contractor agrees to cooperate with the public agency in the payment of budgeted funds, as is necessary, for on the job and/or off the job programs for outreach and training of minorities and women.

(D) The contractor and its subcontractors shall furnish such reports or other documents to the Division of Contract Compliance & EEO as may be requested by the Division from time to time in order to carry out the purposes of these regulations, and public agencies shall furnish such information as may be requested by the Division of Contract Compliance & EEO for conducting a compliance investigation pursuant to Subchapter l0 of the Administrative Code (NJAC 17:27).

AFFIRMATIVE ACTION REGULATIONS
P.L. 1975, C. 127 (*N.J.A.C.* 17:27)

If awarded a contract, all procurement and service contractors will be required to comply with the requirements of P.L. 1975, c. 127 (*N.J.A.C.* 17:27). Within seven (7) days after receipt of the notification of intent to award the contract or receipt of the contract, whichever is sooner, the contractor should present one of the following to the Purchasing Agent or Municipal Administrator.

1. A photocopy of valid letter from the U.S. Department of Labor that the contractor has an existing federally approved or sanctioned Affirmative Action Plan (good for one year from date of the letter).

   OR

2. A photocopy of their approved Certificate of Employee Information Report.

   OR

3. An Affirmative Action Employee Information Report (Form AA302)

   OR

4. All successful construction contractors must submit within three (3) days of the signing of the contract an Initial Project Manning Report (AA201) for any contract award that meets or exceeds the Public Agency Bidding Threshold (17,500.00).

NO FIRM MAY BE ISSUED A CONTRACT UNLESS IT COMPLIES WITH THE AFFIRMATIVE ACTION REGULATIONS OF P.L. 1975, C. 127

The following question must be answered by all bidders:

1. Do you have a federally approved or sanctioned Affirmative Action program?
   YES _____ NO _____
   If yes, please submit a copy of such approval.

2. Do you have a State Certificate of Employment Information Report Approval?
   YES _____ NO _____
   If yes, please submit a copy of such certificate

The undersigned contractor certifies that he is aware of the commitment to comply with the requirements of P.L. 1975, c. 127 and agrees to furnish the required documentation pursuant to the law.

COMPANY: _____ SIGNATURE: _____

TITLE: _____

NOTE:
NO CONTRACT CAN BE AWARDED WITHOUT THE SUBMISSION OF ONE OF THE ABOVE ITEMS FOR PROOF OF AFFIRMATIVE ACTION PLAN, COMPLETED AND SUBMITTED TO THE DEPARTMENT OF PURCHASING

A CONTRACTOR'S BID MUST BE REJECTED AS NON-REPSONSIVE IF A CONTRACTOR FAILS TO COMPLY WITH THE REQUIREMENTS OF P.L. 1975, C. 127, WITHIN THE TIME FRAME.

AMERICANS WITH DISABILITIES ACT

The Contractor and the Township of Washington (hereinafter "owner") do hereby agree that the provisions of Title II of the Americans With Disabilities Act of 1990 (the "ACT") (42 *U.S.C.* §127101 *et. seq.*), which prohibits discrimination on the basis of disability by public entities in all services, programs, and activities provided or made available by public entities, and the rules and regulations promulgated pursuant thereunto, are made a part of this contract. In providing any aid, benefit, or service on behalf of the owner pursuant to the contract, the Contractor agrees that the performance shall be in strict compliance with the Act. In the event that the Contractor, its agents, servants, and employees, or subcontractors violate or are alleged to have violated the Act during the performance of this contract, the contractor shall defend the owner in any action or administrative proceeding commenced pursuant to this Act. The Contractor shall indemnify, protect, and hold harmless, the owner, its agents, servants, and employees from and against any and all suits, claims, losses, demands, or damages, of whatever kind or nature arising out of or claimed to arise out of the alleged violation. The Contractor shall, at its own expense, appear, defend, and pay any and all charges for legal services and any and all costs and other expenses arising from such action administrative proceeding or incurred in connection therewith. In any and all complaints brought pursuant to the owner grievance procedure, the Contractor agrees to abide by any decision of the owner which is rendered pursuant to said grievance procedure. If any action of administrative proceeding results in an award of damages against the owner or if the owner incurs any expense to cure violation of the ADA which had been brought pursuant of it grievance procedure, the Contractor shall satisfy and discharge the same at its own expense.

The owner shall, as soon as practicable after a claim has been made against it, give written notice thereof to the Contractor along with full and complete particulars of the claim. If any action or administrative proceedings is brought against the owner or any of its agents, servants, and employees, the owner shall expeditiously forward to the Contractor every demand, complaint, notice, summons, pleading, or other process received by the owner or its representative.

It is expressly agreed and understood that any approval by the owner of the services provided by the Contractor pursuant to this contract will not relieve the contractor of the obligation to comply with the Act and to defend, indemnify, protect, and hold harmless, the owner pursuant to this paragraph.

It is further agreed and understood that the owner assumes no obligation to indemnify or hold harmless the Contractor, its agent, servants, employees and subcontractors for any claim which may arise out of their performance of this Agreement. Furthermore, the Contractor expressly understands and agrees that the provisions of this indemnification clause shall in no way limit the Contractor's obligations assumed in this Agreement, nor shall they be construed to relieve the Contractor from any liability, nor preclude the owner from taking any other actions available to it under other provisions of the Agreement or otherwise by law.

The Following Disclosure of Investment Activities in Iran Shall be completed by the Contractor and Included with the Bid.

END OF SECTION 00300

TOWNSHIP OF WASHINGTON, BERGEN COUNTY

DISCLOSURE OF INVESTMENT ACTIVITIES IN IRAN

NAME OF CONTRACTOR/BIDDER _____

PART 1: CERTIFICATION

CONTRACTORS/BIDDERS **MUST COMPLETE** PART 1 BY CHECKING **EITHER BOX.**

FAILURE TO CHECK ONE OF THE BOXES WILL RENDER THE PROPOSAL NON-RESPONSIVE.

Pursuant to Public Law 2012, c. 25, any person or entity that submits a bid or proposal or otherwise proposes to enter into or renew a contract must complete the certification below to attest, under penalty of perjury, that neither the person or entity, nor any of its parents, subsidiaries, or affiliates, is identified on the Department of Treasury's Chapter 25 list as a person or entity engaging in investment activities in Iran. The Chapter 25 list is included in this certification and can also be found on the State of New Jersey, Department of Treasury, Division of Purchase and Property website at http://www.state.nj.us/treasury/purchase/pdf/Chapter25List.pdf. Contractors/Bidders **must** review this list prior to completing the below certification. **FAILURE TO COMPLETE THE CERTIFICATION WILL RENDER A CONTRACTOR'S/BIDDER'S PROPOSAL NON-RESPONSIVE.** If the New Jersey Director of the Division of Purchase and Property finds a person or entity to be in violation of law, it shall take action as may be appropriate and provided by law, rule or contract, including but not limited to, imposing sanctions, seeking compliance, recovering damages, declaring the party in default and seeking debarment or suspension of the party.

PLEASE CHECK THE APPROPRIATE BOX:

☐ **I certify, pursuant to Public Law 2012, c. 25, that neither the contractor/bidder listed above nor any of the contractor's/bidder's parents, subsidiaries, or affiliates is listed** on the N.J. Department of the Treasury's list of entities determined to be engaged in prohibited activities in Iran pursuant to P.L. 2012, c. 25 ("Chapter 25 List"). I further certify that I am the person listed above, or I am an officer or representative of the entity listed above and I am authorized to make this certification on its behalf. **I will skip Part 2 and sign and complete the Certification below.**

OR

☐ **I am unable to certify as above because the contractor/bidder and/or one or more of its parents, subsidiaries, or affiliates is listed on the Department's Chapter 25 list. I will provide a detailed, accurate and precise description of the activities in Part 2 below and sign and complete the Certification below.** Failure to provide such will result in the proposal being rendered as non-responsive and appropriate penalties, fines and/or sanctions will be assessed as provided by law.

PART 2: PLEASE PROVIDE FURTHER INFORMATION RELATED TO INVESTMENT ACTIVITIES IN IRAN

You must provide a detailed, accurate and precise description of the activities of the bidding person/entity, or one of its parents, subsidiaries or affiliates, engaging in the investment activities in Iran outlined above by completing the requested information below. Please provide thorough answers to each question. If you need to make additional entries, provide the requested information on a separate sheet.

Name _____Relationship to Contractor/Bidder _____

Description of Activities _____

_____

Duration of Engagement _____ Anticipated Cessation Date _____

Contractor/Bidder Contact Name _____ Contact Phone Number _____

Certification: I being duly sworn upon my oath, hereby represent and state that the foregoing information and any attachments thereto to the best of my knowledge are true and complete. I attest that I am authorized to execute this certification on behalf of the above referenced person or entity. I acknowledge that the Township of Washington is relying on the information contained herein and thereby acknowledge that I am under a continuing obligation from the date of this certification through the completion of any contracts with the Township to notify the Township in writing of any changes to the answers of information contained herein. I acknowledge that I am aware that it is a criminal offense to make a false statement or misrepresentation in this certification, and if I do so, I recognize that I am subject to criminal prosecution under the law and that it will also constitute a material breach of my agreement(s) with Township of Washington and that the Township at its option may declare any contract(s) resulting from this certification void and unenforceable.

FULL NAME (print): _____ **SIGNATURE** _____

TITLE: _____ **DATE** _____

State of New Jersey

PHILIP D. MURPHY
Governor

SHEILA Y. OLIVER
Lt. Governor

DEPARTMENT OF THE TREASURY
DIVISION OF PURCHASE AND PROPERTY
OFFICE OF THE DIRECTOR
33 WEST STATE STREET
P. O. BOX 039
TRENTON, NEW JERSEY 08625-0039
https://www.njstart.gov
Telephone (609) 292-4886 / Facsimile (609) 984-2575

ELIZABETH MAHER MUOIO
State Treasurer

MAURICE A. GRIFFIN
Acting Director

The following list represents entities determined, based on credible information available to the public, to be engaged in prohibited activities in Iran pursuant to P.L. 2012, c. 25 ("Chapter 25"):

1.	Amona
2.	Bank Markazi Iran (Central Bank of Iran)
3.	Bank Mellat
4.	Bank Melli Iran
5.	Bank Saderat PLC
6.	Bank Sepah
7.	Bank Tejarat
8.	Belaz
9.	Belneftekhim (Belorusneft)
10.	China International United Petroleum & Chemicals Co., Ltd. (Unipec)
11.	China National Offshore Oil Corporation (CNOOC)
12.	China National Petroleum Corporation (CNPC)
13.	China National United Oil Corporation (ChinaOil)
14.	China Petroleum & Chemical Corporation (Sinopec)
15.	China Precision Machinery Import-Export Corp. (CPMIEC)
16.	Grimley Smith Associates

17.	Indian Oil Corporation
18.	Kingdream PLC
19.	Naftiran Intertrade Company (NICO)
20.	National Iranian Tanker Company (NITC)
21.	Oil and Natural Gas Corporation (ONGC)
22.	Oil India Limited
23.	Persia International Bank
24.	Petroleos de Venezuela (PDVSA Petróleo, SA)
25.	PetroChina Company, Ltd.
26.	Sameh Afzar Tajak Co. (SATCO)
27.	Shandong Fin Cnc Machine Company, Ltd.
28.	Sinohydro Co., Ltd.
29.	SKS Ventures
30.	Som Petrol AS
31.	Zhuhai Zhenrong Company

List Date: January 31, 2019

Notice to Bidders

(BUSINESS REGISTRATION CERTIFICATE)

Pursuant to C57.Laws of 2004, which expands the state contractor business program to local government contracts, including purchase orders (PO) and vouchers, all contractors for goods, services, and Construction and their affiliates must collect State use tax.

Venders are responsible for: (1) obtaining a NJ Dept. of Treasury Business Registration Certificate prior to the time the bid or request for proposal is submitted. This requirement is also applicable to all subcontractors. A copy of the Bidder's and all subcontractor(s)' Business Registration Certificates shall be provided with the bid or prior to the execution of the contract.

Public Works Contractor Registration Act Mandated by N.J.S.A. 34:11-56.48;

Anyone interested in bidding on or engaging in any contract (or part thereof) for public work which is subject to the provisions of the Prevailing Wage Act must register with the Division of Wage and Hour Compliance as required by the Public Works Contractor Registration Act (PWCRA) P.L. 1999, c.238-N.J.S.A. 34:11-56.48 et seq. which establishes a unified procedure for the registration of contractors and subcontractors engaged in public works building projects. Contractors as well as all subcontractors will be required to provide a copy of their certificate at time of bidding.

END OF SECTION 00310

DIVISION 00 - BIDDING AND CONTRACT REQUIREMENTS
SECTION 00400 - GENERAL CONDITIONS

The following General Conditions of the Contract for Construction, AIA Document A201, 2017 Edition, pages one (1) through thirty-eight (38) inclusive, and the Supplemental General Conditions constitute the General Conditions of all of the work of the Contract and are hereby specifically made a part of the Contract Documents.

END OF SECTION 00400

AIA® Document A201® – 2017

General Conditions of the Contract for Construction

for the following PROJECT:
(Name and location or address)

Township of Washington Emergency Services Complex
656 Washington Ave, Township of Washington, NJ 07676

THE OWNER:
(Name, legal status and address)

Township of Washington
350 Hudson Avenue
Township of Washington, NJ 07676

THE ARCHITECT:
(Name, legal status and address)

Robbie Conley Architect, LLC., Limited Liability Company
596 Glassboro Road
Woodbury Heights, NJ 08097

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ADDITIONS AND DELETIONS:
The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

For guidance in modifying this document to include supplementary conditions, see AIA Document A503™, Guide for Supplementary Conditions.

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ARTICLE 1 GENERAL PROVISIONS

§ 1.1 Basic Definitions

§ 1.1.1 The Contract Documents

The Contract Documents are enumerated in the Agreement between the Owner and Contractor (hereinafter the Agreement) and consist of the Agreement, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Addenda issued prior to execution of the Contract, other documents listed in the Agreement, and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive, or (4) a written order for a minor change in the Work issued by the Architect. Unless specifically enumerated in the Agreement, the Contract Documents do not include the advertisement or invitation to bid, Instructions to Bidders, sample forms, other information furnished by the Owner in anticipation of receiving bids or proposals, the Contractor's bid or proposal, or portions of Addenda relating to bidding or proposal requirements.

§ 1.1.2 The Contract

The Contract Documents form the Contract for Construction. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. The Contract may be amended or modified only by a Modification. The Contract Documents shall not be construed to create a contractual relationship of any kind (1) between the Contractor and the Architect or the Architect's consultants, (2) between the Owner and a Subcontractor or a Sub-subcontractor, (3) between the Owner and the Architect or the Architect's consultants, or (4) between any persons or entities other than the Owner and the Contractor. The Architect shall, however, be entitled to performance and enforcement of obligations under the Contract intended to facilitate performance of the Architect's duties.

§ 1.1.3 The Work

The term "Work" means the construction and services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment, and services provided or to be provided by the Contractor to fulfill the Contractor's obligations. The Work may constitute the whole or a part of the Project.

§ 1.1.4 The Project

The Project is the total construction of which the Work performed under the Contract Documents may be the whole or a part and which may include construction by the Owner and by Separate Contractors.

§ 1.1.5 The Drawings

The Drawings are the graphic and pictorial portions of the Contract Documents showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules, and diagrams.

§ 1.1.6 The Specifications

The Specifications are that portion of the Contract Documents consisting of the written requirements for materials, equipment, systems, standards and workmanship for the Work, and performance of related services.

§ 1.1.7 Instruments of Service

Instruments of Service are representations, in any medium of expression now known or later developed, of the tangible and intangible creative work performed by the Architect and the Architect's consultants under their respective professional services agreements. Instruments of Service may include, without limitation, studies, surveys, models, sketches, drawings, specifications, and other similar materials.

§ 1.1.8 Initial Decision Maker

The Initial Decision Maker is the person identified in the Agreement to render initial decisions on Claims in accordance with Section 15.2. The Initial Decision Maker shall not show partiality to the Owner or Contractor and shall not be liable for results of interpretations or decisions rendered in good faith.

§ 1.2 Correlation and Intent of the Contract Documents

§ 1.2.1 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all; performance by the Contractor shall be required only to the extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results.

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§ 1.2.1.1 The invalidity of any provision of the Contract Documents shall not invalidate the Contract or its remaining provisions. If it is determined that any provision of the Contract Documents violates any law, or is otherwise invalid or unenforceable, then that provision shall be revised to the extent necessary to make that provision legal and enforceable. In such case the Contract Documents shall be construed, to the fullest extent permitted by law, to give effect to the parties' intentions and purposes in executing the Contract.

§ 1.2.2 Organization of the Specifications into divisions, sections and articles, and arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade.

§ 1.2.3 Unless otherwise stated in the Contract Documents, words that have well-known technical or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings.

§ 1.3 Capitalization

Terms capitalized in these General Conditions include those that are (1) specifically defined, (2) the titles of numbered articles, or (3) the titles of other documents published by the American Institute of Architects.

§ 1.4 Interpretation

In the interest of brevity the Contract Documents frequently omit modifying words such as "all" and "any" and articles such as "the" and "an," but the fact that a modifier or an article is absent from one statement and appears in another is not intended to affect the interpretation of either statement.

§ 1.5 Ownership and Use of Drawings, Specifications, and Other Instruments of Service

§ 1.5.1 The Architect and the Architect's consultants shall be deemed the authors and owners of their respective Instruments of Service, including the Drawings and Specifications, and retain all common law, statutory, and other reserved rights in their Instruments of Service, including copyrights. The Contractor, Subcontractors, Sub-subcontractors, and suppliers shall not own or claim a copyright in the Instruments of Service. Submittal or distribution to meet official regulatory requirements or for other purposes in connection with the Project is not to be construed as publication in derogation of the Architect's or Architect's consultants' reserved rights.

§ 1.5.2 The Contractor, Subcontractors, Sub-subcontractors, and suppliers are authorized to use and reproduce the Instruments of Service provided to them, subject to any protocols established pursuant to Sections 1.7 and 1.8, solely and exclusively for execution of the Work. All copies made under this authorization shall bear the copyright notice, if any, shown on the Instruments of Service. The Contractor, Subcontractors, Sub-subcontractors, and suppliers may not use the Instruments of Service on other projects or for additions to the Project outside the scope of the Work without the specific written consent of the Owner, Architect, and the Architect's consultants.

§ 1.6 Notice

§ 1.6.1 Except as otherwise provided in Section 1.6.2, where the Contract Documents require one party to notify or give notice to the other party, such notice shall be provided in writing to the designated representative of the party to whom the notice is addressed and shall be deemed to have been duly served if delivered in person, by mail, by courier, or by electronic transmission if a method for electronic transmission is set forth in the Agreement.

§ 1.6.2 Notice of Claims as provided in Section 15.1.3 shall be provided in writing and shall be deemed to have been duly served only if delivered to the designated representative of the party to whom the notice is addressed by certified or registered mail, or by courier providing proof of delivery.

§ 1.7 Digital Data Use and Transmission

The parties shall agree upon protocols governing the transmission and use of Instruments of Service or any other information or documentation in digital form. The parties will use AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, to establish the protocols for the development, use, transmission, and exchange of digital data.

§ 1.8 Building Information Models Use and Reliance

Any use of, or reliance on, all or a portion of a building information model without agreement to protocols governing the use of, and reliance on, the information contained in the model and without having those protocols set forth in AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, and the requisite AIA Document

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G202™–2013, Project Building Information Modeling Protocol Form, shall be at the using or relying party's sole risk and without liability to the other party and its contractors or consultants, the authors of, or contributors to, the building information model, and each of their agents and employees.

ARTICLE 2 OWNER

§ 2.1 General

§ 2.1.1 The Owner is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Owner shall designate in writing a representative who shall have express authority to bind the Owner with respect to all matters requiring the Owner's approval or authorization. Except as otherwise provided in Section 4.2.1, the Architect does not have such authority. The term "Owner" means the Owner or the Owner's authorized representative.

§ 2.1.2 The Owner shall furnish to the Contractor, within fifteen days after receipt of a written request, information necessary and relevant for the Contractor to evaluate, give notice of, or enforce mechanic's lien rights. Such information shall include a correct statement of the record legal title to the property on which the Project is located, usually referred to as the site, and the Owner's interest therein.

§ 2.2 Evidence of the Owner's Financial Arrangements

§ 2.2.1 Prior to commencement of the Work and upon written request by the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract. The Contractor shall have no obligation to commence the Work until the Owner provides such evidence. If commencement of the Work is delayed under this Section 2.2.1, the Contract Time shall be extended appropriately.

§ 2.2.2 Following commencement of the Work and upon written request by the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract only if (1) the Owner fails to make payments to the Contractor as the Contract Documents require; (2) the Contractor identifies in writing a reasonable concern regarding the Owner's ability to make payment when due; or (3) a change in the Work materially changes the Contract Sum. If the Owner fails to provide such evidence, as required, within fourteen days of the Contractor's request, the Contractor may immediately stop the Work and, in that event, shall notify the Owner that the Work has stopped. However, if the request is made because a change in the Work materially changes the Contract Sum under (3) above, the Contractor may immediately stop only that portion of the Work affected by the change until reasonable evidence is provided. If the Work is stopped under this Section 2.2.2, the Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shutdown, delay and start-up, plus interest as provided in the Contract Documents.

§ 2.2.3 After the Owner furnishes evidence of financial arrangements under this Section 2.2, the Owner shall not materially vary such financial arrangements without prior notice to the Contractor.

§ 2.2.4 Where the Owner has designated information furnished under this Section 2.2 as "confidential," the Contractor shall keep the information confidential and shall not disclose it to any other person. However, the Contractor may disclose "confidential" information, after seven (7) days' notice to the Owner, where disclosure is required by law, including a subpoena or other form of compulsory legal process issued by a court or governmental entity, or by court or arbitrator(s) order. The Contractor may also disclose "confidential" information to its employees, consultants, sureties, Subcontractors and their employees, Sub-subcontractors, and others who need to know the content of such information solely and exclusively for the Project and who agree to maintain the confidentiality of such information.

§ 2.3 Information and Services Required of the Owner

§ 2.3.1 Except for permits and fees that are the responsibility of the Contractor under the Contract Documents, including those required under Section 3.7.1, the Owner shall secure and pay for necessary approvals, easements, assessments and charges required for construction, use or occupancy of permanent structures or for permanent changes in existing facilities.

§ 2.3.2 The Owner shall retain an architect lawfully licensed to practice architecture, or an entity lawfully practicing architecture, in the jurisdiction where the Project is located. That person or entity is identified as the Architect in the Agreement and is referred to throughout the Contract Documents as if singular in number.

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§ 2.3.3 If the employment of the Architect terminates, the Owner shall employ a successor to whom the Contractor has no reasonable objection and whose status under the Contract Documents shall be that of the Architect.

§ 2.3.4 The Owner shall furnish surveys describing physical characteristics, legal limitations and utility locations for the site of the Project, and a legal description of the site. The Contractor shall be entitled to rely on the accuracy of information furnished by the Owner but shall exercise proper precautions relating to the safe performance of the Work.

§ 2.3.5 The Owner shall furnish information or services required of the Owner by the Contract Documents with reasonable promptness. The Owner shall also furnish any other information or services under the Owner's control and relevant to the Contractor's performance of the Work with reasonable promptness after receiving the Contractor's written request for such information or services.

§ 2.3.6 Unless otherwise provided in the Contract Documents, the Owner shall furnish to the Contractor one copy of the Contract Documents for purposes of making reproductions pursuant to Section 1.5.2.

§ 2.4 Owner's Right to Stop the Work

If the Contractor fails to correct Work that is not in accordance with the requirements of the Contract Documents as required by Section 12.2 or repeatedly fails to carry out Work in accordance with the Contract Documents, the Owner may issue a written order to the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, the right of the Owner to stop the Work shall not give rise to a duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity, except to the extent required by Section 6.1.3.

§ 2.5 Owner's Right to Carry Out the Work

If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a ten-day period after receipt of notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may, without prejudice to other remedies the Owner may have, correct such default or neglect. Such action by the Owner and amounts charged to the Contractor are both subject to prior approval of the Architect and the Architect may, pursuant to Section 9.5.1, withhold or nullify a Certificate for Payment in whole or in part, to the extent reasonably necessary to reimburse the Owner for the reasonable cost of correcting such deficiencies, including Owner's expenses and compensation for the Architect's additional services made necessary by such default, neglect, or failure. If current and future payments are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner. If the Contractor disagrees with the actions of the Owner or the Architect, or the amounts claimed as costs to the Owner, the Contractor may file a Claim pursuant to Article 15.

ARTICLE 3 CONTRACTOR

§ 3.1 General

§ 3.1.1 The Contractor is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Contractor shall be lawfully licensed, if required in the jurisdiction where the Project is located. The Contractor shall designate in writing a representative who shall have express authority to bind the Contractor with respect to all matters under this Contract. The term "Contractor" means the Contractor or the Contractor's authorized representative.

§ 3.1.2 The Contractor shall perform the Work in accordance with the Contract Documents.

§ 3.1.3 The Contractor shall not be relieved of its obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Architect in the Architect's administration of the Contract, or by tests, inspections or approvals required or performed by persons or entities other than the Contractor.

§ 3.2 Review of Contract Documents and Field Conditions by Contractor

§ 3.2.1 Execution of the Contract by the Contractor is a representation that the Contractor has visited the site, become generally familiar with local conditions under which the Work is to be performed, and correlated personal observations with requirements of the Contract Documents.

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§ 3.2.2 Because the Contract Documents are complementary, the Contractor shall, before starting each portion of the Work, carefully study and compare the various Contract Documents relative to that portion of the Work, as well as the information furnished by the Owner pursuant to Section 2.3.4, shall take field measurements of any existing conditions related to that portion of the Work, and shall observe any conditions at the site affecting it. These obligations are for the purpose of facilitating coordination and construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, the Contractor shall promptly report to the Architect any errors, inconsistencies or omissions discovered by or made known to the Contractor as a request for information in such form as the Architect may require. It is recognized that the Contractor's review is made in the Contractor's capacity as a contractor and not as a licensed design professional, unless otherwise specifically provided in the Contract Documents.

§ 3.2.3 The Contractor is not required to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, but the Contractor shall promptly report to the Architect any nonconformity discovered by or made known to the Contractor as a request for information in such form as the Architect may require.

§ 3.2.4 If the Contractor believes that additional cost or time is involved because of clarifications or instructions the Architect issues in response to the Contractor's notices or requests for information pursuant to Sections 3.2.2 or 3.2.3, the Contractor shall submit Claims as provided in Article 15. If the Contractor fails to perform the obligations of Sections 3.2.2 or 3.2.3, the Contractor shall pay such costs and damages to the Owner, subject to Section 15.1.7, as would have been avoided if the Contractor had performed such obligations. If the Contractor performs those obligations, the Contractor shall not be liable to the Owner or Architect for damages resulting from errors, inconsistencies or omissions in the Contract Documents, for differences between field measurements or conditions and the Contract Documents, or for nonconformities of the Contract Documents to applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities.

§ 3.3 Supervision and Construction Procedures

§ 3.3.1 The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for, and have control over, construction means, methods, techniques, sequences, and procedures, and for coordinating all portions of the Work under the Contract. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences, or procedures, the Contractor shall evaluate the jobsite safety thereof and shall be solely responsible for the jobsite safety of such means, methods, techniques, sequences, or procedures. If the Contractor determines that such means, methods, techniques, sequences or procedures may not be safe, the Contractor shall give timely notice to the Owner and Architect, and shall propose alternative means, methods, techniques, sequences, or procedures. The Architect shall evaluate the proposed alternative solely for conformance with the design intent for the completed construction. Unless the Architect objects to the Contractor's proposed alternative, the Contractor shall perform the Work using its alternative means, methods, techniques, sequences, or procedures.

§ 3.3.2 The Contractor shall be responsible to the Owner for acts and omissions of the Contractor's employees, Subcontractors and their agents and employees, and other persons or entities performing portions of the Work for, or on behalf of, the Contractor or any of its Subcontractors.

§ 3.3.3 The Contractor shall be responsible for inspection of portions of Work already performed to determine that such portions are in proper condition to receive subsequent Work.

§ 3.4 Labor and Materials

§ 3.4.1 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work.

§ 3.4.2 Except in the case of minor changes in the Work approved by the Architect in accordance with Section 3.12.8 or ordered by the Architect in accordance with Section 7.4, the Contractor may make substitutions only with the consent of the Owner, after evaluation by the Architect and in accordance with a Change Order or Construction Change Directive.

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§ 3.4.3 The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Work. The Contractor shall not permit employment of unfit persons or persons not properly skilled in tasks assigned to them.

§ 3.5 Warranty

§ 3.5.1 The Contractor warrants to the Owner and Architect that materials and equipment furnished under the Contract will be of good quality and new unless the Contract Documents require or permit otherwise. The Contractor further warrants that the Work will conform to the requirements of the Contract Documents and will be free from defects, except for those inherent in the quality of the Work the Contract Documents require or permit. Work, materials, or equipment not conforming to these requirements may be considered defective. The Contractor's warranty excludes remedy for damage or defect caused by abuse, alterations to the Work not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear and normal usage. If required by the Architect, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

§ 3.5.2 All material, equipment, or other special warranties required by the Contract Documents shall be issued in the name of the Owner, or shall be transferable to the Owner, and shall commence in accordance with Section 9.8.4.

§ 3.6 Taxes

The Contractor shall pay sales, consumer, use and similar taxes for the Work provided by the Contractor that are legally enacted when bids are received or negotiations concluded, whether or not yet effective or merely scheduled to go into effect.

§ 3.7 Permits, Fees, Notices and Compliance with Laws

§ 3.7.1 Unless otherwise provided in the Contract Documents, the Contractor shall secure and pay for the building permit as well as for other permits, fees, licenses, and inspections by government agencies necessary for proper execution and completion of the Work that are customarily secured after execution of the Contract and legally required at the time bids are received or negotiations concluded.

§ 3.7.2 The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities applicable to performance of the Work.

§ 3.7.3 If the Contractor performs Work knowing it to be contrary to applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, the Contractor shall assume appropriate responsibility for such Work and shall bear the costs attributable to correction.

§ 3.7.4 Concealed or Unknown Conditions

If the Contractor encounters conditions at the site that are (1) subsurface or otherwise concealed physical conditions that differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature that differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, the Contractor shall promptly provide notice to the Owner and the Architect before conditions are disturbed and in no event later than 14 days after first observance of the conditions. The Architect will promptly investigate such conditions and, if the Architect determines that they differ materially and cause an increase or decrease in the Contractor's cost of, or time required for, performance of any part of the Work, will recommend that an equitable adjustment be made in the Contract Sum or Contract Time, or both. If the Architect determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Architect shall promptly notify the Owner and Contractor, stating the reasons. If either party disputes the Architect's determination or recommendation, that party may submit a Claim as provided in Article 15.

§ 3.7.5 If, in the course of the Work, the Contractor encounters human remains or recognizes the existence of burial markers, archaeological sites or wetlands not indicated in the Contract Documents, the Contractor shall immediately suspend any operations that would affect them and shall notify the Owner and Architect. Upon receipt of such notice, the Owner shall promptly take any action necessary to obtain governmental authorization required to resume the operations. The Contractor shall continue to suspend such operations until otherwise instructed by the Owner but shall continue with all other operations that do not affect those remains or features. Requests for adjustments in the Contract Sum and Contract Time arising from the existence of such remains or features may be made as provided in Article 15.

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§ 3.8 Allowances

§ 3.8.1 The Contractor shall include in the Contract Sum all allowances stated in the Contract Documents. Items covered by allowances shall be supplied for such amounts and by such persons or entities as the Owner may direct, but the Contractor shall not be required to employ persons or entities to whom the Contractor has reasonable objection.

§ 3.8.2 Unless otherwise provided in the Contract Documents,

- **.1** allowances shall cover the cost to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts;
- **.2** Contractor's costs for unloading and handling at the site, labor, installation costs, overhead, profit, and other expenses contemplated for stated allowance amounts shall be included in the Contract Sum but not in the allowances; and
- **.3** whenever costs are more than or less than allowances, the Contract Sum shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect (1) the difference between actual costs and the allowances under Section 3.8.2.1 and (2) changes in Contractor's costs under Section 3.8.2.2.

§ 3.8.3 Materials and equipment under an allowance shall be selected by the Owner with reasonable promptness.

§ 3.9 Superintendent

§ 3.9.1 The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the Project site during performance of the Work. The superintendent shall represent the Contractor, and communications given to the superintendent shall be as binding as if given to the Contractor.

§ 3.9.2 The Contractor, as soon as practicable after award of the Contract, shall notify the Owner and Architect of the name and qualifications of a proposed superintendent. Within 14 days of receipt of the information, the Architect may notify the Contractor, stating whether the Owner or the Architect (1) has reasonable objection to the proposed superintendent or (2) requires additional time for review. Failure of the Architect to provide notice within the 14-day period shall constitute notice of no reasonable objection.

§ 3.9.3 The Contractor shall not employ a proposed superintendent to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not change the superintendent without the Owner's consent, which shall not unreasonably be withheld or delayed.

§ 3.10 Contractor's Construction and Submittal Schedules

§ 3.10.1 The Contractor, promptly after being awarded the Contract, shall submit for the Owner's and Architect's information a Contractor's construction schedule for the Work. The schedule shall contain detail appropriate for the Project, including (1) the date of commencement of the Work, interim schedule milestone dates, and the date of Substantial Completion; (2) an apportionment of the Work by construction activity; and (3) the time required for completion of each portion of the Work. The schedule shall provide for the orderly progression of the Work to completion and shall not exceed time limits current under the Contract Documents. The schedule shall be revised at appropriate intervals as required by the conditions of the Work and Project.

§ 3.10.2 The Contractor, promptly after being awarded the Contract and thereafter as necessary to maintain a current submittal schedule, shall submit a submittal schedule for the Architect's approval. The Architect's approval shall not be unreasonably delayed or withheld. The submittal schedule shall (1) be coordinated with the Contractor's construction schedule, and (2) allow the Architect reasonable time to review submittals. If the Contractor fails to submit a submittal schedule, or fails to provide submittals in accordance with the approved submittal schedule, the Contractor shall not be entitled to any increase in Contract Sum or extension of Contract Time based on the time required for review of submittals.

§ 3.10.3 The Contractor shall perform the Work in general accordance with the most recent schedules submitted to the Owner and Architect.

§ 3.11 Documents and Samples at the Site

The Contractor shall make available, at the Project site, the Contract Documents, including Change Orders, Construction Change Directives, and other Modifications, in good order and marked currently to indicate field changes and selections made during construction, and the approved Shop Drawings, Product Data, Samples, and similar required submittals. These shall be in electronic form or paper copy, available to the Architect and Owner, and

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delivered to the Architect for submittal to the Owner upon completion of the Work as a record of the Work as constructed.

§ 3.12 Shop Drawings, Product Data and Samples

§ 3.12.1 Shop Drawings are drawings, diagrams, schedules, and other data specially prepared for the Work by the Contractor or a Subcontractor, Sub-subcontractor, manufacturer, supplier, or distributor to illustrate some portion of the Work.

§ 3.12.2 Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams, and other information furnished by the Contractor to illustrate materials or equipment for some portion of the Work.

§ 3.12.3 Samples are physical examples that illustrate materials, equipment, or workmanship, and establish standards by which the Work will be judged.

§ 3.12.4 Shop Drawings, Product Data, Samples, and similar submittals are not Contract Documents. Their purpose is to demonstrate how the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents for those portions of the Work for which the Contract Documents require submittals. Review by the Architect is subject to the limitations of Section 4.2.7. Informational submittals upon which the Architect is not expected to take responsive action may be so identified in the Contract Documents. Submittals that are not required by the Contract Documents may be returned by the Architect without action.

§ 3.12.5 The Contractor shall review for compliance with the Contract Documents, approve, and submit to the Architect, Shop Drawings, Product Data, Samples, and similar submittals required by the Contract Documents, in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the Owner or of Separate Contractors.

§ 3.12.6 By submitting Shop Drawings, Product Data, Samples, and similar submittals, the Contractor represents to the Owner and Architect that the Contractor has (1) reviewed and approved them, (2) determined and verified materials, field measurements and field construction criteria related thereto, or will do so, and (3) checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.

§ 3.12.7 The Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, Product Data, Samples, or similar submittals, until the respective submittal has been approved by the Architect.

§ 3.12.8 The Work shall be in accordance with approved submittals except that the Contractor shall not be relieved of responsibility for deviations from the requirements of the Contract Documents by the Architect's approval of Shop Drawings, Product Data, Samples, or similar submittals, unless the Contractor has specifically notified the Architect of such deviation at the time of submittal and (1) the Architect has given written approval to the specific deviation as a minor change in the Work, or (2) a Change Order or Construction Change Directive has been issued authorizing the deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples, or similar submittals, by the Architect's approval thereof.

§ 3.12.9 The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data, Samples, or similar submittals, to revisions other than those requested by the Architect on previous submittals. In the absence of such notice, the Architect's approval of a resubmission shall not apply to such revisions.

§ 3.12.10 The Contractor shall not be required to provide professional services that constitute the practice of architecture or engineering unless such services are specifically required by the Contract Documents for a portion of the Work or unless the Contractor needs to provide such services in order to carry out the Contractor's responsibilities for construction means, methods, techniques, sequences, and procedures. The Contractor shall not be required to provide professional services in violation of applicable law.

§ 3.12.10.1 If professional design services or certifications by a design professional related to systems, materials, or equipment are specifically required of the Contractor by the Contract Documents, the Owner and the Architect will

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specify all performance and design criteria that such services must satisfy. The Contractor shall be entitled to rely upon the adequacy and accuracy of the performance and design criteria provided in the Contract Documents. The Contractor shall cause such services or certifications to be provided by an appropriately licensed design professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings, and other submittals prepared by such professional. Shop Drawings, and other submittals related to the Work, designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to the Architect. The Owner and the Architect shall be entitled to rely upon the adequacy and accuracy of the services, certifications, and approvals performed or provided by such design professionals, provided the Owner and Architect have specified to the Contractor the performance and design criteria that such services must satisfy. Pursuant to this Section 3.12.10, the Architect will review and approve or take other appropriate action on submittals only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents.

§ 3.12.10.2 If the Contract Documents require the Contractor's design professional to certify that the Work has been performed in accordance with the design criteria, the Contractor shall furnish such certifications to the Architect at the time and in the form specified by the Architect.

§ 3.13 Use of Site

The Contractor shall confine operations at the site to areas permitted by applicable laws, statutes, ordinances, codes, rules and regulations, lawful orders of public authorities, and the Contract Documents and shall not unreasonably encumber the site with materials or equipment.

§ 3.14 Cutting and Patching

§ 3.14.1 The Contractor shall be responsible for cutting, fitting, or patching required to complete the Work or to make its parts fit together properly. All areas requiring cutting, fitting, or patching shall be restored to the condition existing prior to the cutting, fitting, or patching, unless otherwise required by the Contract Documents.

§ 3.14.2 The Contractor shall not damage or endanger a portion of the Work or fully or partially completed construction of the Owner or Separate Contractors by cutting, patching, or otherwise altering such construction, or by excavation. The Contractor shall not cut or otherwise alter construction by the Owner or a Separate Contractor except with written consent of the Owner and of the Separate Contractor. Consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold, from the Owner or a Separate Contractor, its consent to cutting or otherwise altering the Work.

§ 3.15 Cleaning Up

§ 3.15.1 The Contractor shall keep the premises and surrounding area free from accumulation of waste materials and rubbish caused by operations under the Contract. At completion of the Work, the Contractor shall remove waste materials, rubbish, the Contractor's tools, construction equipment, machinery, and surplus materials from and about the Project.

§ 3.15.2 If the Contractor fails to clean up as provided in the Contract Documents, the Owner may do so and the Owner shall be entitled to reimbursement from the Contractor.

§ 3.16 Access to Work

The Contractor shall provide the Owner and Architect with access to the Work in preparation and progress wherever located.

§ 3.17 Royalties, Patents and Copyrights

The Contractor shall pay all royalties and license fees. The Contractor shall defend suits or claims for infringement of copyrights and patent rights and shall hold the Owner and Architect harmless from loss on account thereof, but shall not be responsible for defense or loss when a particular design, process, or product of a particular manufacturer or manufacturers is required by the Contract Documents, or where the copyright violations are contained in Drawings, Specifications, or other documents prepared by the Owner or Architect. However, if an infringement of a copyright or patent is discovered by, or made known to, the Contractor, the Contractor shall be responsible for the loss unless the information is promptly furnished to the Architect.

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§ 3.18 Indemnification

§ 3.18.1 To the fullest extent permitted by law, the Contractor shall indemnify and hold harmless the Owner, Architect, Architect's consultants, and agents and employees of any of them from and against claims, damages, losses, and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work, provided that such claim, damage, loss, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), but only to the extent caused by the negligent acts or omissions of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss, or expense is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity that would otherwise exist as to a party or person described in this Section 3.18.

§ 3.18.2 In claims against any person or entity indemnified under this Section 3.18 by an employee of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, the indemnification obligation under Section 3.18.1 shall not be limited by a limitation on amount or type of damages, compensation, or benefits payable by or for the Contractor or a Subcontractor under workers' compensation acts, disability benefit acts, or other employee benefit acts.

ARTICLE 4 ARCHITECT

§ 4.1 General

§ 4.1.1 The Architect is the person or entity retained by the Owner pursuant to Section 2.3.2 and identified as such in the Agreement.

§ 4.1.2 Duties, responsibilities, and limitations of authority of the Architect as set forth in the Contract Documents shall not be restricted, modified, or extended without written consent of the Owner, Contractor, and Architect. Consent shall not be unreasonably withheld.

§ 4.2 Administration of the Contract

§ 4.2.1 The Architect will provide administration of the Contract as described in the Contract Documents and will be an Owner's representative during construction until the date the Architect issues the final Certificate for Payment. The Architect will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents.

§ 4.2.2 The Architect will visit the site at intervals appropriate to the stage of construction, or as otherwise agreed with the Owner, to become generally familiar with the progress and quality of the portion of the Work completed, and to determine in general if the Work observed is being performed in a manner indicating that the Work, when fully completed, will be in accordance with the Contract Documents. However, the Architect will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. The Architect will not have control over, charge of, or responsibility for the construction means, methods, techniques, sequences or procedures, or for the safety precautions and programs in connection with the Work, since these are solely the Contractor's rights and responsibilities under the Contract Documents.

§ 4.2.3 On the basis of the site visits, the Architect will keep the Owner reasonably informed about the progress and quality of the portion of the Work completed, and promptly report to the Owner (1) known deviations from the Contract Documents, (2) known deviations from the most recent construction schedule submitted by the Contractor, and (3) defects and deficiencies observed in the Work. The Architect will not be responsible for the Contractor's failure to perform the Work in accordance with the requirements of the Contract Documents. The Architect will not have control over or charge of, and will not be responsible for acts or omissions of, the Contractor, Subcontractors, or their agents or employees, or any other persons or entities performing portions of the Work.

§ 4.2.4 Communications

The Owner and Contractor shall include the Architect in all communications that relate to or affect the Architect's services or professional responsibilities. The Owner shall promptly notify the Architect of the substance of any direct communications between the Owner and the Contractor otherwise relating to the Project. Communications by and with the Architect's consultants shall be through the Architect. Communications by and with Subcontractors and suppliers shall be through the Contractor. Communications by and with Separate Contractors shall be through the Owner. The Contract Documents may specify other communication protocols.

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§ 4.2.5 Based on the Architect's evaluations of the Contractor's Applications for Payment, the Architect will review and certify the amounts due the Contractor and will issue Certificates for Payment in such amounts.

§ 4.2.6 The Architect has authority to reject Work that does not conform to the Contract Documents. Whenever the Architect considers it necessary or advisable, the Architect will have authority to require inspection or testing of the Work in accordance with Sections 13.4.2 and 13.4.3, whether or not the Work is fabricated, installed or completed. However, neither this authority of the Architect nor a decision made in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Architect to the Contractor, Subcontractors, suppliers, their agents or employees, or other persons or entities performing portions of the Work.

§ 4.2.7 The Architect will review and approve, or take other appropriate action upon, the Contractor's submittals such as Shop Drawings, Product Data, and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Architect's action will be taken in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness while allowing sufficient time in the Architect's professional judgment to permit adequate review. Review of such submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Architect's review of the Contractor's submittals shall not relieve the Contractor of the obligations under Sections 3.3, 3.5, and 3.12. The Architect's review shall not constitute approval of safety precautions or of any construction means, methods, techniques, sequences, or procedures. The Architect's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

§ 4.2.8 The Architect will prepare Change Orders and Construction Change Directives, and may order minor changes in the Work as provided in Section 7.4. The Architect will investigate and make determinations and recommendations regarding concealed and unknown conditions as provided in Section 3.7.4.

§ 4.2.9 The Architect will conduct inspections to determine the date or dates of Substantial Completion and the date of final completion; issue Certificates of Substantial Completion pursuant to Section 9.8; receive and forward to the Owner, for the Owner's review and records, written warranties and related documents required by the Contract and assembled by the Contractor pursuant to Section 9.10; and issue a final Certificate for Payment pursuant to Section 9.10.

§ 4.2.10 If the Owner and Architect agree, the Architect will provide one or more Project representatives to assist in carrying out the Architect's responsibilities at the site. The Owner shall notify the Contractor of any change in the duties, responsibilities and limitations of authority of the Project representatives.

§ 4.2.11 The Architect will interpret and decide matters concerning performance under, and requirements of, the Contract Documents on written request of either the Owner or Contractor. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness.

§ 4.2.12 Interpretations and decisions of the Architect will be consistent with the intent of, and reasonably inferable from, the Contract Documents and will be in writing or in the form of drawings. When making such interpretations and decisions, the Architect will endeavor to secure faithful performance by both Owner and Contractor, will not show partiality to either, and will not be liable for results of interpretations or decisions rendered in good faith.

§ 4.2.13 The Architect's decisions on matters relating to aesthetic effect will be final if consistent with the intent expressed in the Contract Documents.

§ 4.2.14 The Architect will review and respond to requests for information about the Contract Documents. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If appropriate, the Architect will prepare and issue supplemental Drawings and Specifications in response to the requests for information.

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ARTICLE 5 SUBCONTRACTORS

§ 5.1 Definitions

§ 5.1.1 A Subcontractor is a person or entity who has a direct contract with the Contractor to perform a portion of the Work at the site. The term "Subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Subcontractor or an authorized representative of the Subcontractor. The term "Subcontractor" does not include a Separate Contractor or the subcontractors of a Separate Contractor.

§ 5.1.2 A Sub-subcontractor is a person or entity who has a direct or indirect contract with a Subcontractor to perform a portion of the Work at the site. The term "Sub-subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Sub-subcontractor or an authorized representative of the Sub-subcontractor.

§ 5.2 Award of Subcontracts and Other Contracts for Portions of the Work

§ 5.2.1 Unless otherwise stated in the Contract Documents, the Contractor, as soon as practicable after award of the Contract, shall notify the Owner and Architect of the persons or entities proposed for each principal portion of the Work, including those who are to furnish materials or equipment fabricated to a special design. Within 14 days of receipt of the information, the Architect may notify the Contractor whether the Owner or the Architect (1) has reasonable objection to any such proposed person or entity or (2) requires additional time for review. Failure of the Architect to provide notice within the 14-day period shall constitute notice of no reasonable objection.

§ 5.2.2 The Contractor shall not contract with a proposed person or entity to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not be required to contract with anyone to whom the Contractor has made reasonable objection.

§ 5.2.3 If the Owner or Architect has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner or Architect has no reasonable objection. If the proposed but rejected Subcontractor was reasonably capable of performing the Work, the Contract Sum and Contract Time shall be increased or decreased by the difference, if any, occasioned by such change, and an appropriate Change Order shall be issued before commencement of the substitute Subcontractor's Work. However, no increase in the Contract Sum or Contract Time shall be allowed for such change unless the Contractor has acted promptly and responsively in submitting names as required.

§ 5.2.4 The Contractor shall not substitute a Subcontractor, person, or entity for one previously selected if the Owner or Architect makes reasonable objection to such substitution.

§ 5.3 Subcontractual Relations

By appropriate written agreement, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities, including the responsibility for safety of the Subcontractor's Work that the Contractor, by these Contract Documents, assumes toward the Owner and Architect. Each subcontract agreement shall preserve and protect the rights of the Owner and Architect under the Contract Documents with respect to the Work to be performed by the Subcontractor so that subcontracting thereof will not prejudice such rights, and shall allow to the Subcontractor, unless specifically provided otherwise in the subcontract agreement, the benefit of all rights, remedies, and redress against the Contractor that the Contractor, by the Contract Documents, has against the Owner. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with Sub-subcontractors. The Contractor shall make available to each proposed Subcontractor, prior to the execution of the subcontract agreement, copies of the Contract Documents to which the Subcontractor will be bound, and, upon written request of the Subcontractor, identify to the Subcontractor terms and conditions of the proposed subcontract agreement that may be at variance with the Contract Documents. Subcontractors will similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors.

§ 5.4 Contingent Assignment of Subcontracts

§ 5.4.1 Each subcontract agreement for a portion of the Work is assigned by the Contractor to the Owner, provided that

- **.1** assignment is effective only after termination of the Contract by the Owner for cause pursuant to Section 14.2 and only for those subcontract agreements that the Owner accepts by notifying the Subcontractor and Contractor; and
- **.2** assignment is subject to the prior rights of the surety, if any, obligated under bond relating to the Contract.

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When the Owner accepts the assignment of a subcontract agreement, the Owner assumes the Contractor's rights and obligations under the subcontract.

§ 5.4.2 Upon such assignment, if the Work has been suspended for more than 30 days, the Subcontractor's compensation shall be equitably adjusted for increases in cost resulting from the suspension.

§ 5.4.3 Upon assignment to the Owner under this Section 5.4, the Owner may further assign the subcontract to a successor contractor or other entity. If the Owner assigns the subcontract to a successor contractor or other entity, the Owner shall nevertheless remain legally responsible for all of the successor contractor's obligations under the subcontract.

ARTICLE 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

§ 6.1 Owner's Right to Perform Construction and to Award Separate Contracts

§ 6.1.1 The term "Separate Contractor(s)" shall mean other contractors retained by the Owner under separate agreements. The Owner reserves the right to perform construction or operations related to the Project with the Owner's own forces, and with Separate Contractors retained under Conditions of the Contract substantially similar to those of this Contract, including those provisions of the Conditions of the Contract related to insurance and waiver of subrogation.

§ 6.1.2 When separate contracts are awarded for different portions of the Project or other construction or operations on the site, the term "Contractor" in the Contract Documents in each case shall mean the Contractor who executes each separate Owner-Contractor Agreement.

§ 6.1.3 The Owner shall provide for coordination of the activities of the Owner's own forces and of each Separate Contractor with the Work of the Contractor, who shall cooperate with them. The Contractor shall participate with any Separate Contractors and the Owner in reviewing their construction schedules. The Contractor shall make any revisions to its construction schedule deemed necessary after a joint review and mutual agreement. The construction schedules shall then constitute the schedules to be used by the Contractor, Separate Contractors, and the Owner until subsequently revised.

§ 6.1.4 Unless otherwise provided in the Contract Documents, when the Owner performs construction or operations related to the Project with the Owner's own forces or with Separate Contractors, the Owner or its Separate Contractors shall have the same obligations and rights that the Contractor has under the Conditions of the Contract, including, without excluding others, those stated in Article 3, this Article 6, and Articles 10, 11, and 12.

§ 6.2 Mutual Responsibility

§ 6.2.1 The Contractor shall afford the Owner and Separate Contractors reasonable opportunity for introduction and storage of their materials and equipment and performance of their activities, and shall connect and coordinate the Contractor's construction and operations with theirs as required by the Contract Documents.

§ 6.2.2 If part of the Contractor's Work depends for proper execution or results upon construction or operations by the Owner or a Separate Contractor, the Contractor shall, prior to proceeding with that portion of the Work, promptly notify the Architect of apparent discrepancies or defects in the construction or operations by the Owner or Separate Contractor that would render it unsuitable for proper execution and results of the Contractor's Work. Failure of the Contractor to notify the Architect of apparent discrepancies or defects prior to proceeding with the Work shall constitute an acknowledgment that the Owner's or Separate Contractor's completed or partially completed construction is fit and proper to receive the Contractor's Work. The Contractor shall not be responsible for discrepancies or defects in the construction or operations by the Owner or Separate Contractor that are not apparent.

§ 6.2.3 The Contractor shall reimburse the Owner for costs the Owner incurs that are payable to a Separate Contractor because of the Contractor's delays, improperly timed activities or defective construction. The Owner shall be responsible to the Contractor for costs the Contractor incurs because of a Separate Contractor's delays, improperly timed activities, damage to the Work or defective construction.

§ 6.2.4 The Contractor shall promptly remedy damage that the Contractor wrongfully causes to completed or partially completed construction or to property of the Owner or Separate Contractor as provided in Section 10.2.5.

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§ 6.2.5 The Owner and each Separate Contractor shall have the same responsibilities for cutting and patching as are described for the Contractor in Section 3.14.

§ 6.3 Owner's Right to Clean Up

If a dispute arises among the Contractor, Separate Contractors, and the Owner as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish, the Owner may clean up and the Architect will allocate the cost among those responsible.

ARTICLE 7 CHANGES IN THE WORK

§ 7.1 General

§ 7.1.1 Changes in the Work may be accomplished after execution of the Contract, and without invalidating the Contract, by Change Order, Construction Change Directive or order for a minor change in the Work, subject to the limitations stated in this Article 7 and elsewhere in the Contract Documents.

§ 7.1.2 A Change Order shall be based upon agreement among the Owner, Contractor, and Architect. A Construction Change Directive requires agreement by the Owner and Architect and may or may not be agreed to by the Contractor. An order for a minor change in the Work may be issued by the Architect alone.

§ 7.1.3 Changes in the Work shall be performed under applicable provisions of the Contract Documents. The Contractor shall proceed promptly with changes in the Work, unless otherwise provided in the Change Order, Construction Change Directive, or order for a minor change in the Work.

§ 7.2 Change Orders

§ 7.2.1 A Change Order is a written instrument prepared by the Architect and signed by the Owner, Contractor, and Architect stating their agreement upon all of the following:

- **.1** The change in the Work;
- **.2** The amount of the adjustment, if any, in the Contract Sum; and
- **.3** The extent of the adjustment, if any, in the Contract Time.

§ 7.3 Construction Change Directives

§ 7.3.1 A Construction Change Directive is a written order prepared by the Architect and signed by the Owner and Architect, directing a change in the Work prior to agreement on adjustment, if any, in the Contract Sum or Contract Time, or both. The Owner may by Construction Change Directive, without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions, or other revisions, the Contract Sum and Contract Time being adjusted accordingly.

§ 7.3.2 A Construction Change Directive shall be used in the absence of total agreement on the terms of a Change Order.

§ 7.3.3 If the Construction Change Directive provides for an adjustment to the Contract Sum, the adjustment shall be based on one of the following methods:

- **.1** Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;
- **.2** Unit prices stated in the Contract Documents or subsequently agreed upon;
- **.3** Cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or
- **.4** As provided in Section 7.3.4.

§ 7.3.4 If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the Architect shall determine the adjustment on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in case of an increase in the Contract Sum, an amount for overhead and profit as set forth in the Agreement, or if no such amount is set forth in the Agreement, a reasonable amount. In such case, and also under Section 7.3.3.3, the Contractor shall keep and present, in such form as the Architect may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this Section 7.3.4 shall be limited to the following:

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.1 Costs of labor, including applicable payroll taxes, fringe benefits required by agreement or custom, workers' compensation insurance, and other employee costs approved by the Architect;

.2 Costs of materials, supplies, and equipment, including cost of transportation, whether incorporated or consumed;

.3 Rental costs of machinery and equipment, exclusive of hand tools, whether rented from the Contractor or others;

.4 Costs of premiums for all bonds and insurance, permit fees, and sales, use, or similar taxes, directly related to the change; and

.5 Costs of supervision and field office personnel directly attributable to the change.

§ 7.3.5 If the Contractor disagrees with the adjustment in the Contract Time, the Contractor may make a Claim in accordance with applicable provisions of Article 15.

§ 7.3.6 Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved and advise the Architect of the Contractor's agreement or disagreement with the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the Contract Sum or Contract Time.

§ 7.3.7 A Construction Change Directive signed by the Contractor indicates the Contractor's agreement therewith, including adjustment in Contract Sum and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order.

§ 7.3.8 The amount of credit to be allowed by the Contractor to the Owner for a deletion or change that results in a net decrease in the Contract Sum shall be actual net cost as confirmed by the Architect. When both additions and credits covering related Work or substitutions are involved in a change, the allowance for overhead and profit shall be figured on the basis of net increase, if any, with respect to that change.

§ 7.3.9 Pending final determination of the total cost of a Construction Change Directive to the Owner, the Contractor may request payment for Work completed under the Construction Change Directive in Applications for Payment. The Architect will make an interim determination for purposes of monthly certification for payment for those costs and certify for payment the amount that the Architect determines, in the Architect's professional judgment, to be reasonably justified. The Architect's interim determination of cost shall adjust the Contract Sum on the same basis as a Change Order, subject to the right of either party to disagree and assert a Claim in accordance with Article 15.

§ 7.3.10 When the Owner and Contractor agree with a determination made by the Architect concerning the adjustments in the Contract Sum and Contract Time, or otherwise reach agreement upon the adjustments, such agreement shall be effective immediately and the Architect will prepare a Change Order. Change Orders may be issued for all or any part of a Construction Change Directive.

§ 7.4 Minor Changes in the Work

The Architect may order minor changes in the Work that are consistent with the intent of the Contract Documents and do not involve an adjustment in the Contract Sum or an extension of the Contract Time. The Architect's order for minor changes shall be in writing. If the Contractor believes that the proposed minor change in the Work will affect the Contract Sum or Contract Time, the Contractor shall notify the Architect and shall not proceed to implement the change in the Work. If the Contractor performs the Work set forth in the Architect's order for a minor change without prior notice to the Architect that such change will affect the Contract Sum or Contract Time, the Contractor waives any adjustment to the Contract Sum or extension of the Contract Time.

ARTICLE 8 TIME

§ 8.1 Definitions

§ 8.1.1 Unless otherwise provided, Contract Time is the period of time, including authorized adjustments, allotted in the Contract Documents for Substantial Completion of the Work.

§ 8.1.2 The date of commencement of the Work is the date established in the Agreement.

§ 8.1.3 The date of Substantial Completion is the date certified by the Architect in accordance with Section 9.8.

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§ 8.1.4 The term "day" as used in the Contract Documents shall mean calendar day unless otherwise specifically defined.

§ 8.2 Progress and Completion

§ 8.2.1 Time limits stated in the Contract Documents are of the essence of the Contract. By executing the Agreement, the Contractor confirms that the Contract Time is a reasonable period for performing the Work.

§ 8.2.2 The Contractor shall not knowingly, except by agreement or instruction of the Owner in writing, commence the Work prior to the effective date of insurance required to be furnished by the Contractor and Owner.

§ 8.2.3 The Contractor shall proceed expeditiously with adequate forces and shall achieve Substantial Completion within the Contract Time.

§ 8.3 Delays and Extensions of Time

§ 8.3.1 If the Contractor is delayed at any time in the commencement or progress of the Work by (1) an act or neglect of the Owner or Architect, of an employee of either, or of a Separate Contractor; (2) by changes ordered in the Work; (3) by labor disputes, fire, unusual delay in deliveries, unavoidable casualties, adverse weather conditions documented in accordance with Section 15.1.6.2, or other causes beyond the Contractor's control; (4) by delay authorized by the Owner pending mediation and binding dispute resolution; or (5) by other causes that the Contractor asserts, and the Architect determines, justify delay, then the Contract Time shall be extended for such reasonable time as the Architect may determine.

§ 8.3.2 Claims relating to time shall be made in accordance with applicable provisions of Article 15.

§ 8.3.3 This Section 8.3 does not preclude recovery of damages for delay by either party under other provisions of the Contract Documents.

ARTICLE 9 PAYMENTS AND COMPLETION

§ 9.1 Contract Sum

§ 9.1.1 The Contract Sum is stated in the Agreement and, including authorized adjustments, is the total amount payable by the Owner to the Contractor for performance of the Work under the Contract Documents.

§ 9.1.2 If unit prices are stated in the Contract Documents or subsequently agreed upon, and if quantities originally contemplated are materially changed so that application of such unit prices to the actual quantities causes substantial inequity to the Owner or Contractor, the applicable unit prices shall be equitably adjusted.

§ 9.2 Schedule of Values

Where the Contract is based on a stipulated sum or Guaranteed Maximum Price, the Contractor shall submit a schedule of values to the Architect before the first Application for Payment, allocating the entire Contract Sum to the various portions of the Work. The schedule of values shall be prepared in the form, and supported by the data to substantiate its accuracy, required by the Architect. This schedule, unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's Applications for Payment. Any changes to the schedule of values shall be submitted to the Architect and supported by such data to substantiate its accuracy as the Architect may require, and unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's subsequent Applications for Payment.

§ 9.3 Applications for Payment

§ 9.3.1 At least ten days before the date established for each progress payment, the Contractor shall submit to the Architect an itemized Application for Payment prepared in accordance with the schedule of values, if required under Section 9.2, for completed portions of the Work. The application shall be notarized, if required, and supported by all data substantiating the Contractor's right to payment that the Owner or Architect require, such as copies of requisitions, and releases and waivers of liens from Subcontractors and suppliers, and shall reflect retainage if provided for in the Contract Documents.

§ 9.3.1.1 As provided in Section 7.3.9, such applications may include requests for payment on account of changes in the Work that have been properly authorized by Construction Change Directives, or by interim determinations of the Architect, but not yet included in Change Orders.

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§ 9.3.1.2 Applications for Payment shall not include requests for payment for portions of the Work for which the Contractor does not intend to pay a Subcontractor or supplier, unless such Work has been performed by others whom the Contractor intends to pay.

§ 9.3.2 Unless otherwise provided in the Contract Documents, payments shall be made on account of materials and equipment delivered and suitably stored at the site for subsequent incorporation in the Work. If approved in advance by the Owner, payment may similarly be made for materials and equipment suitably stored off the site at a location agreed upon in writing. Payment for materials and equipment stored on or off the site shall be conditioned upon compliance by the Contractor with procedures satisfactory to the Owner to establish the Owner's title to such materials and equipment or otherwise protect the Owner's interest, and shall include the costs of applicable insurance, storage, and transportation to the site, for such materials and equipment stored off the site.

§ 9.3.3 The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment. The Contractor further warrants that upon submittal of an Application for Payment all Work for which Certificates for Payment have been previously issued and payments received from the Owner shall, to the best of the Contractor's knowledge, information, and belief, be free and clear of liens, claims, security interests, or encumbrances, in favor of the Contractor, Subcontractors, suppliers, or other persons or entities that provided labor, materials, and equipment relating to the Work.

§ 9.4 Certificates for Payment

§ 9.4.1 The Architect will, within seven days after receipt of the Contractor's Application for Payment, either (1) issue to the Owner a Certificate for Payment in the full amount of the Application for Payment, with a copy to the Contractor; or (2) issue to the Owner a Certificate for Payment for such amount as the Architect determines is properly due, and notify the Contractor and Owner of the Architect's reasons for withholding certification in part as provided in Section 9.5.1; or (3) withhold certification of the entire Application for Payment, and notify the Contractor and Owner of the Architect's reason for withholding certification in whole as provided in Section 9.5.1.

§ 9.4.2 The issuance of a Certificate for Payment will constitute a representation by the Architect to the Owner, based on the Architect's evaluation of the Work and the data in the Application for Payment, that, to the best of the Architect's knowledge, information, and belief, the Work has progressed to the point indicated, the quality of the Work is in accordance with the Contract Documents, and that the Contractor is entitled to payment in the amount certified. The foregoing representations are subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to results of subsequent tests and inspections, to correction of minor deviations from the Contract Documents prior to completion, and to specific qualifications expressed by the Architect. However, the issuance of a Certificate for Payment will not be a representation that the Architect has (1) made exhaustive or continuous on-site inspections to check the quality or quantity of the Work; (2) reviewed construction means, methods, techniques, sequences, or procedures; (3) reviewed copies of requisitions received from Subcontractors and suppliers and other data requested by the Owner to substantiate the Contractor's right to payment; or (4) made examination to ascertain how or for what purpose the Contractor has used money previously paid on account of the Contract Sum.

§ 9.5 Decisions to Withhold Certification

§ 9.5.1 The Architect may withhold a Certificate for Payment in whole or in part, to the extent reasonably necessary to protect the Owner, if in the Architect's opinion the representations to the Owner required by Section 9.4.2 cannot be made. If the Architect is unable to certify payment in the amount of the Application, the Architect will notify the Contractor and Owner as provided in Section 9.4.1. If the Contractor and Architect cannot agree on a revised amount, the Architect will promptly issue a Certificate for Payment for the amount for which the Architect is able to make such representations to the Owner. The Architect may also withhold a Certificate for Payment or, because of subsequently discovered evidence, may nullify the whole or a part of a Certificate for Payment previously issued, to such extent as may be necessary in the Architect's opinion to protect the Owner from loss for which the Contractor is responsible, including loss resulting from acts and omissions described in Section 3.3.2, because of

- **.1** defective Work not remedied;
- **.2** third party claims filed or reasonable evidence indicating probable filing of such claims, unless security acceptable to the Owner is provided by the Contractor;
- **.3** failure of the Contractor to make payments properly to Subcontractors or suppliers for labor, materials or equipment;

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.4 reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;
.5 damage to the Owner or a Separate Contractor;
.6 reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay; or
.7 repeated failure to carry out the Work in accordance with the Contract Documents.

§ 9.5.2 When either party disputes the Architect's decision regarding a Certificate for Payment under Section 9.5.1, in whole or in part, that party may submit a Claim in accordance with Article 15.

§ 9.5.3 When the reasons for withholding certification are removed, certification will be made for amounts previously withheld.

§ 9.5.4 If the Architect withholds certification for payment under Section 9.5.1.3, the Owner may, at its sole option, issue joint checks to the Contractor and to any Subcontractor or supplier to whom the Contractor failed to make payment for Work properly performed or material or equipment suitably delivered. If the Owner makes payments by joint check, the Owner shall notify the Architect and the Contractor shall reflect such payment on its next Application for Payment.

§ 9.6 Progress Payments

§ 9.6.1 After the Architect has issued a Certificate for Payment, the Owner shall make payment in the manner and within the time provided in the Contract Documents, and shall so notify the Architect.

§ 9.6.2 The Contractor shall pay each Subcontractor, no later than seven days after receipt of payment from the Owner, the amount to which the Subcontractor is entitled, reflecting percentages actually retained from payments to the Contractor on account of the Subcontractor's portion of the Work. The Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to make payments to Sub-subcontractors in a similar manner.

§ 9.6.3 The Architect will, on request, furnish to a Subcontractor, if practicable, information regarding percentages of completion or amounts applied for by the Contractor and action taken thereon by the Architect and Owner on account of portions of the Work done by such Subcontractor.

§ 9.6.4 The Owner has the right to request written evidence from the Contractor that the Contractor has properly paid Subcontractors and suppliers amounts paid by the Owner to the Contractor for subcontracted Work. If the Contractor fails to furnish such evidence within seven days, the Owner shall have the right to contact Subcontractors and suppliers to ascertain whether they have been properly paid. Neither the Owner nor Architect shall have an obligation to pay, or to see to the payment of money to, a Subcontractor or supplier, except as may otherwise be required by law.

§ 9.6.5 The Contractor's payments to suppliers shall be treated in a manner similar to that provided in Sections 9.6.2, 9.6.3 and 9.6.4.

§ 9.6.6 A Certificate for Payment, a progress payment, or partial or entire use or occupancy of the Project by the Owner shall not constitute acceptance of Work not in accordance with the Contract Documents.

§ 9.6.7 Unless the Contractor provides the Owner with a payment bond in the full penal sum of the Contract Sum, payments received by the Contractor for Work properly performed by Subcontractors or provided by suppliers shall be held by the Contractor for those Subcontractors or suppliers who performed Work or furnished materials, or both, under contract with the Contractor for which payment was made by the Owner. Nothing contained herein shall require money to be placed in a separate account and not commingled with money of the Contractor, create any fiduciary liability or tort liability on the part of the Contractor for breach of trust, or entitle any person or entity to an award of punitive damages against the Contractor for breach of the requirements of this provision.

§ 9.6.8 Provided the Owner has fulfilled its payment obligations under the Contract Documents, the Contractor shall defend and indemnify the Owner from all loss, liability, damage or expense, including reasonable attorney's fees and litigation expenses, arising out of any lien claim or other claim for payment by any Subcontractor or supplier of any tier. Upon receipt of notice of a lien claim or other claim for payment, the Owner shall notify the Contractor. If approved by the applicable court, when required, the Contractor may substitute a surety bond for the property against which the lien or other claim for payment has been asserted.

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§ 9.7 Failure of Payment

If the Architect does not issue a Certificate for Payment, through no fault of the Contractor, within seven days after receipt of the Contractor's Application for Payment, or if the Owner does not pay the Contractor within seven days after the date established in the Contract Documents, the amount certified by the Architect or awarded by binding dispute resolution, then the Contractor may, upon seven additional days' notice to the Owner and Architect, stop the Work until payment of the amount owing has been received. The Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shutdown, delay and start-up, plus interest as provided for in the Contract Documents.

§ 9.8 Substantial Completion

§ 9.8.1 Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use.

§ 9.8.2 When the Contractor considers that the Work, or a portion thereof which the Owner agrees to accept separately, is substantially complete, the Contractor shall prepare and submit to the Architect a comprehensive list of items to be completed or corrected prior to final payment. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

§ 9.8.3 Upon receipt of the Contractor's list, the Architect will make an inspection to determine whether the Work or designated portion thereof is substantially complete. If the Architect's inspection discloses any item, whether or not included on the Contractor's list, which is not sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work or designated portion thereof for its intended use, the Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification by the Architect. In such case, the Contractor shall then submit a request for another inspection by the Architect to determine Substantial Completion.

§ 9.8.4 When the Work or designated portion thereof is substantially complete, the Architect will prepare a Certificate of Substantial Completion that shall establish the date of Substantial Completion; establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance; and fix the time within which the Contractor shall finish all items on the list accompanying the Certificate. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion.

§ 9.8.5 The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in the Certificate. Upon such acceptance, and consent of surety if any, the Owner shall make payment of retainage applying to the Work or designated portion thereof. Such payment shall be adjusted for Work that is incomplete or not in accordance with the requirements of the Contract Documents.

§ 9.9 Partial Occupancy or Use

§ 9.9.1 The Owner may occupy or use any completed or partially completed portion of the Work at any stage when such portion is designated by separate agreement with the Contractor, provided such occupancy or use is consented to by the insurer and authorized by public authorities having jurisdiction over the Project. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the Owner and Contractor have accepted in writing the responsibilities assigned to each of them for payments, retainage, if any, security, maintenance, heat, utilities, damage to the Work and insurance, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents. When the Contractor considers a portion substantially complete, the Contractor shall prepare and submit a list to the Architect as provided under Section 9.8.2. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld. The stage of the progress of the Work shall be determined by written agreement between the Owner and Contractor or, if no agreement is reached, by decision of the Architect.

§ 9.9.2 Immediately prior to such partial occupancy or use, the Owner, Contractor, and Architect shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work.

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§ 9.9.3 Unless otherwise agreed upon, partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the Contract Documents.

§ 9.10 Final Completion and Final Payment

§ 9.10.1 Upon receipt of the Contractor's notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Architect will promptly make such inspection. When the Architect finds the Work acceptable under the Contract Documents and the Contract fully performed, the Architect will promptly issue a final Certificate for Payment stating that to the best of the Architect's knowledge, information and belief, and on the basis of the Architect's on-site visits and inspections, the Work has been completed in accordance with the Contract Documents and that the entire balance found to be due the Contractor and noted in the final Certificate is due and payable. The Architect's final Certificate for Payment will constitute a further representation that conditions listed in Section 9.10.2 as precedent to the Contractor's being entitled to final payment have been fulfilled.

§ 9.10.2 Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Architect (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner's property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied, (2) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect, (3) a written statement that the Contractor knows of no reason that the insurance will not be renewable to cover the period required by the Contract Documents, (4) consent of surety, if any, to final payment, (5) documentation of any special warranties, such as manufacturers' warranties or specific Subcontractor warranties, and (6) if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts and releases and waivers of liens, claims, security interests, or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien, claim, security interest, or encumbrance. If a lien, claim, security interest, or encumbrance remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging the lien, claim, security interest, or encumbrance, including all costs and reasonable attorneys' fees.

§ 9.10.3 If, after Substantial Completion of the Work, final completion thereof is materially delayed through no fault of the Contractor or by issuance of Change Orders affecting final completion, and the Architect so confirms, the Owner shall, upon application by the Contractor and certification by the Architect, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed, corrected, and accepted. If the remaining balance for Work not fully completed or corrected is less than retainage stipulated in the Contract Documents, and if bonds have been furnished, the written consent of the surety to payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the Contractor to the Architect prior to certification of such payment. Such payment shall be made under terms and conditions governing final payment, except that it shall not constitute a waiver of Claims.

§ 9.10.4 The making of final payment shall constitute a waiver of Claims by the Owner except those arising from

- **.1** liens, Claims, security interests, or encumbrances arising out of the Contract and unsettled;
- **.2** failure of the Work to comply with the requirements of the Contract Documents;
- **.3** terms of special warranties required by the Contract Documents; or
- **.4** audits performed by the Owner, if permitted by the Contract Documents, after final payment.

§ 9.10.5 Acceptance of final payment by the Contractor, a Subcontractor, or a supplier, shall constitute a waiver of claims by that payee except those previously made in writing and identified by that payee as unsettled at the time of final Application for Payment.

ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

§ 10.1 Safety Precautions and Programs

The Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the performance of the Contract.

§ 10.2 Safety of Persons and Property

§ 10.2.1 The Contractor shall take reasonable precautions for safety of, and shall provide reasonable protection to prevent damage, injury, or loss to

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.1 employees on the Work and other persons who may be affected thereby;
.2 the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody, or control of the Contractor, a Subcontractor, or a Sub-subcontractor; and
.3 other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures, and utilities not designated for removal, relocation, or replacement in the course of construction.

§ 10.2.2 The Contractor shall comply with, and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities, bearing on safety of persons or property or their protection from damage, injury, or loss.

§ 10.2.3 The Contractor shall implement, erect, and maintain, as required by existing conditions and performance of the Contract, reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards; promulgating safety regulations; and notifying the owners and users of adjacent sites and utilities of the safeguards.

§ 10.2.4 When use or storage of explosives or other hazardous materials or equipment, or unusual methods are necessary for execution of the Work, the Contractor shall exercise utmost care and carry on such activities under supervision of properly qualified personnel.

§ 10.2.5 The Contractor shall promptly remedy damage and loss (other than damage or loss insured under property insurance required by the Contract Documents) to property referred to in Sections 10.2.1.2 and 10.2.1.3 caused in whole or in part by the Contractor, a Subcontractor, a Sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable and for which the Contractor is responsible under Sections 10.2.1.2 and 10.2.1.3. The Contractor may make a Claim for the cost to remedy the damage or loss to the extent such damage or loss is attributable to acts or omissions of the Owner or Architect or anyone directly or indirectly employed by either of them, or by anyone for whose acts either of them may be liable, and not attributable to the fault or negligence of the Contractor. The foregoing obligations of the Contractor are in addition to the Contractor's obligations under Section 3.18.

§ 10.2.6 The Contractor shall designate a responsible member of the Contractor's organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's superintendent unless otherwise designated by the Contractor in writing to the Owner and Architect.

§ 10.2.7 The Contractor shall not permit any part of the construction or site to be loaded so as to cause damage or create an unsafe condition.

§ 10.2.8 Injury or Damage to Person or Property

If either party suffers injury or damage to person or property because of an act or omission of the other party, or of others for whose acts such party is legally responsible, notice of the injury or damage, whether or not insured, shall be given to the other party within a reasonable time not exceeding 21 days after discovery. The notice shall provide sufficient detail to enable the other party to investigate the matter.

§ 10.3 Hazardous Materials and Substances

§ 10.3.1 The Contractor is responsible for compliance with any requirements included in the Contract Documents regarding hazardous materials or substances. If the Contractor encounters a hazardous material or substance not addressed in the Contract Documents and if reasonable precautions will be inadequate to prevent foreseeable bodily injury or death to persons resulting from a material or substance, including but not limited to asbestos or polychlorinated biphenyl (PCB), encountered on the site by the Contractor, the Contractor shall, upon recognizing the condition, immediately stop Work in the affected area and notify the Owner and Architect of the condition.

§ 10.3.2 Upon receipt of the Contractor's notice, the Owner shall obtain the services of a licensed laboratory to verify the presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to be present, to cause it to be rendered harmless. Unless otherwise required by the Contract Documents, the Owner shall furnish in writing to the Contractor and Architect the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of the material or substance or who are to perform the task of removal or safe containment of the material or substance. The Contractor and the Architect will

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promptly reply to the Owner in writing stating whether or not either has reasonable objection to the persons or entities proposed by the Owner. If either the Contractor or Architect has an objection to a person or entity proposed by the Owner, the Owner shall propose another to whom the Contractor and the Architect have no reasonable objection. When the material or substance has been rendered harmless, Work in the affected area shall resume upon written agreement of the Owner and Contractor. By Change Order, the Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable additional costs of shutdown, delay, and start-up.

§ 10.3.3 To the fullest extent permitted by law, the Owner shall indemnify and hold harmless the Contractor, Subcontractors, Architect, Architect's consultants, and agents and employees of any of them from and against claims, damages, losses, and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work in the affected area if in fact the material or substance presents the risk of bodily injury or death as described in Section 10.3.1 and has not been rendered harmless, provided that such claim, damage, loss, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), except to the extent that such damage, loss, or expense is due to the fault or negligence of the party seeking indemnity.

§ 10.3.4 The Owner shall not be responsible under this Section 10.3 for hazardous materials or substances the Contractor brings to the site unless such materials or substances are required by the Contract Documents. The Owner shall be responsible for hazardous materials or substances required by the Contract Documents, except to the extent of the Contractor's fault or negligence in the use and handling of such materials or substances.

§ 10.3.5 The Contractor shall reimburse the Owner for the cost and expense the Owner incurs (1) for remediation of hazardous materials or substances the Contractor brings to the site and negligently handles, or (2) where the Contractor fails to perform its obligations under Section 10.3.1, except to the extent that the cost and expense are due to the Owner's fault or negligence.

§ 10.3.6 If, without negligence on the part of the Contractor, the Contractor is held liable by a government agency for the cost of remediation of a hazardous material or substance solely by reason of performing Work as required by the Contract Documents, the Owner shall reimburse the Contractor for all cost and expense thereby incurred.

§ 10.4 Emergencies

In an emergency affecting safety of persons or property, the Contractor shall act, at the Contractor's discretion, to prevent threatened damage, injury, or loss. Additional compensation or extension of time claimed by the Contractor on account of an emergency shall be determined as provided in Article 15 and Article 7.

ARTICLE 11 INSURANCE AND BONDS

§ 11.1 Contractor's Insurance and Bonds

§ 11.1.1 The Contractor shall purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the Agreement or elsewhere in the Contract Documents. The Contractor shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located. The Owner, Architect, and Architect's consultants shall be named as additional insureds under the Contractor's commercial general liability policy or as otherwise described in the Contract Documents.

§ 11.1.2 The Contractor shall provide surety bonds of the types, for such penal sums, and subject to such terms and conditions as required by the Contract Documents. The Contractor shall purchase and maintain the required bonds from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located.

§ 11.1.3 Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under the Contract, the Contractor shall promptly furnish a copy of the bonds or shall authorize a copy to be furnished.

§ 11.1.4 Notice of Cancellation or Expiration of Contractor's Required Insurance. Within three (3) business days of the date the Contractor becomes aware of an impending or actual cancellation or expiration of any insurance required by the Contract Documents, the Contractor shall provide notice to the Owner of such impending or actual cancellation or

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expiration. Upon receipt of notice from the Contractor, the Owner shall, unless the lapse in coverage arises from an act or omission of the Owner, have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by the Contractor. The furnishing of notice by the Contractor shall not relieve the Contractor of any contractual obligation to provide any required coverage.

§ 11.2 Owner's Insurance

§ 11.2.1 The Owner shall purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the Agreement or elsewhere in the Contract Documents. The Owner shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located.

§ 11.2.2 Failure to Purchase Required Property Insurance. If the Owner fails to purchase and maintain the required property insurance, with all of the coverages and in the amounts described in the Agreement or elsewhere in the Contract Documents, the Owner shall inform the Contractor in writing prior to commencement of the Work. Upon receipt of notice from the Owner, the Contractor may delay commencement of the Work and may obtain insurance that will protect the interests of the Contractor, Subcontractors, and Sub-Subcontractors in the Work. When the failure to provide coverage has been cured or resolved, the Contract Sum and Contract Time shall be equitably adjusted. In the event the Owner fails to procure coverage, the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent the loss to the Owner would have been covered by the insurance to have been procured by the Owner. The cost of the insurance shall be charged to the Owner by a Change Order. If the Owner does not provide written notice, and the Contractor is damaged by the failure or neglect of the Owner to purchase or maintain the required insurance, the Owner shall reimburse the Contractor for all reasonable costs and damages attributable thereto.

§ 11.2.3 Notice of Cancellation or Expiration of Owner's Required Property Insurance. Within three (3) business days of the date the Owner becomes aware of an impending or actual cancellation or expiration of any property insurance required by the Contract Documents, the Owner shall provide notice to the Contractor of such impending or actual cancellation or expiration. Unless the lapse in coverage arises from an act or omission of the Contractor: (1) the Contractor, upon receipt of notice from the Owner, shall have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by either the Owner or the Contractor; (2) the Contract Time and Contract Sum shall be equitably adjusted; and (3) the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent any loss to the Owner would have been covered by the insurance had it not expired or been cancelled. If the Contractor purchases replacement coverage, the cost of the insurance shall be charged to the Owner by an appropriate Change Order. The furnishing of notice by the Owner shall not relieve the Owner of any contractual obligation to provide required insurance.

§ 11.3 Waivers of Subrogation

§ 11.3.1 The Owner and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents, and employees, each of the other; (2) the Architect and Architect's consultants; and (3) Separate Contractors, if any, and any of their subcontractors, sub-subcontractors, agents, and employees, for damages caused by fire, or other causes of loss, to the extent those losses are covered by property insurance required by the Agreement or other property insurance applicable to the Project, except such rights as they have to proceeds of such insurance. The Owner or Contractor, as appropriate, shall require similar written waivers in favor of the individuals and entities identified above from the Architect, Architect's consultants, Separate Contractors, subcontractors, and sub-subcontractors. The policies of insurance purchased and maintained by each person or entity agreeing to waive claims pursuant to this section 11.3.1 shall not prohibit this waiver of subrogation. This waiver of subrogation shall be effective as to a person or entity (1) even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, (2) even though that person or entity did not pay the insurance premium directly or indirectly, or (3) whether or not the person or entity had an insurable interest in the damaged property.

§ 11.3.2 If during the Project construction period the Owner insures properties, real or personal or both, at or adjacent to the site by property insurance under policies separate from those insuring the Project, or if after final payment property insurance is to be provided on the completed Project through a policy or policies other than those insuring the Project during the construction period, to the extent permissible by such policies, the Owner waives all rights in accordance with the terms of Section 11.3.1 for damages caused by fire or other causes of loss covered by this separate property insurance.

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§ 11.4 Loss of Use, Business Interruption, and Delay in Completion Insurance
The Owner, at the Owner's option, may purchase and maintain insurance that will protect the Owner against loss of use of the Owner's property, or the inability to conduct normal operations, due to fire or other causes of loss. The Owner waives all rights of action against the Contractor and Architect for loss of use of the Owner's property, due to fire or other hazards however caused.

§11.5 Adjustment and Settlement of Insured Loss
§ 11.5.1 A loss insured under the property insurance required by the Agreement shall be adjusted by the Owner as fiduciary and made payable to the Owner as fiduciary for the insureds, as their interests may appear, subject to requirements of any applicable mortgagee clause and of Section 11.5.2. The Owner shall pay the Architect and Contractor their just shares of insurance proceeds received by the Owner, and by appropriate agreements the Architect and Contractor shall make payments to their consultants and Subcontractors in similar manner.

§ 11.5.2 Prior to settlement of an insured loss, the Owner shall notify the Contractor of the terms of the proposed settlement as well as the proposed allocation of the insurance proceeds. The Contractor shall have 14 days from receipt of notice to object to the proposed settlement or allocation of the proceeds. If the Contractor does not object, the Owner shall settle the loss and the Contractor shall be bound by the settlement and allocation. Upon receipt, the Owner shall deposit the insurance proceeds in a separate account and make the appropriate distributions. Thereafter, if no other agreement is made or the Owner does not terminate the Contract for convenience, the Owner and Contractor shall execute a Change Order for reconstruction of the damaged or destroyed Work in the amount allocated for that purpose. If the Contractor timely objects to either the terms of the proposed settlement or the allocation of the proceeds, the Owner may proceed to settle the insured loss, and any dispute between the Owner and Contractor arising out of the settlement or allocation of the proceeds shall be resolved pursuant to Article 15. Pending resolution of any dispute, the Owner may issue a Construction Change Directive for the reconstruction of the damaged or destroyed Work.

ARTICLE 12 UNCOVERING AND CORRECTION OF WORK

§ 12.1 Uncovering of Work
§ 12.1.1 If a portion of the Work is covered contrary to the Architect's request or to requirements specifically expressed in the Contract Documents, it must, if requested in writing by the Architect, be uncovered for the Architect's examination and be replaced at the Contractor's expense without change in the Contract Time.

§ 12.1.2 If a portion of the Work has been covered that the Architect has not specifically requested to examine prior to its being covered, the Architect may request to see such Work and it shall be uncovered by the Contractor. If such Work is in accordance with the Contract Documents, the Contractor shall be entitled to an equitable adjustment to the Contract Sum and Contract Time as may be appropriate. If such Work is not in accordance with the Contract Documents, the costs of uncovering the Work, and the cost of correction, shall be at the Contractor's expense.

§ 12.2 Correction of Work
§ 12.2.1 Before Substantial Completion
The Contractor shall promptly correct Work rejected by the Architect or failing to conform to the requirements of the Contract Documents, discovered before Substantial Completion and whether or not fabricated, installed or completed. Costs of correcting such rejected Work, including additional testing and inspections, the cost of uncovering and replacement, and compensation for the Architect's services and expenses made necessary thereby, shall be at the Contractor's expense.

§ 12.2.2 After Substantial Completion
§ 12.2.2.1 In addition to the Contractor's obligations under Section 3.5, if, within one year after the date of Substantial Completion of the Work or designated portion thereof or after the date for commencement of warranties established under Section 9.9.1, or by terms of any applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of notice from the Owner to do so, unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition. During the one-year period for correction of Work, if the Owner fails to notify the Contractor and give the Contractor an opportunity to make the correction, the Owner waives the rights to require correction by the Contractor and to make a claim for breach of warranty. If the Contractor fails to correct nonconforming Work within a reasonable time during

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that period after receipt of notice from the Owner or Architect, the Owner may correct it in accordance with Section 2.5.

§ 12.2.2.2 The one-year period for correction of Work shall be extended with respect to portions of Work first performed after Substantial Completion by the period of time between Substantial Completion and the actual completion of that portion of the Work.

§ 12.2.2.3 The one-year period for correction of Work shall not be extended by corrective Work performed by the Contractor pursuant to this Section 12.2.

§ 12.2.3 The Contractor shall remove from the site portions of the Work that are not in accordance with the requirements of the Contract Documents and are neither corrected by the Contractor nor accepted by the Owner.

§ 12.2.4 The Contractor shall bear the cost of correcting destroyed or damaged construction of the Owner or Separate Contractors, whether completed or partially completed, caused by the Contractor's correction or removal of Work that is not in accordance with the requirements of the Contract Documents.

§ 12.2.5 Nothing contained in this Section 12.2 shall be construed to establish a period of limitation with respect to other obligations the Contractor has under the Contract Documents. Establishment of the one-year period for correction of Work as described in Section 12.2.2 relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations other than specifically to correct the Work.

§ 12.3 Acceptance of Nonconforming Work

If the Owner prefers to accept Work that is not in accordance with the requirements of the Contract Documents, the Owner may do so instead of requiring its removal and correction, in which case the Contract Sum will be reduced as appropriate and equitable. Such adjustment shall be effected whether or not final payment has been made.

ARTICLE 13 MISCELLANEOUS PROVISIONS

§ 13.1 Governing Law

The Contract shall be governed by the law of the place where the Project is located, excluding that jurisdiction's choice of law rules. If the parties have selected arbitration as the method of binding dispute resolution, the Federal Arbitration Act shall govern Section 15.4.

§ 13.2 Successors and Assigns

§ 13.2.1 The Owner and Contractor respectively bind themselves, their partners, successors, assigns, and legal representatives to covenants, agreements, and obligations contained in the Contract Documents. Except as provided in Section 13.2.2, neither party to the Contract shall assign the Contract as a whole without written consent of the other. If either party attempts to make an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.

§ 13.2.2 The Owner may, without consent of the Contractor, assign the Contract to a lender providing construction financing for the Project, if the lender assumes the Owner's rights and obligations under the Contract Documents. The Contractor shall execute all consents reasonably required to facilitate the assignment.

§ 13.3 Rights and Remedies

§ 13.3.1 Duties and obligations imposed by the Contract Documents and rights and remedies available thereunder shall be in addition to and not a limitation of duties, obligations, rights, and remedies otherwise imposed or available by law.

§ 13.3.2 No action or failure to act by the Owner, Architect, or Contractor shall constitute a waiver of a right or duty afforded them under the Contract, nor shall such action or failure to act constitute approval of or acquiescence in a breach thereunder, except as may be specifically agreed upon in writing.

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§ 13.4 Tests and Inspections

§ 13.4.1 Tests, inspections, and approvals of portions of the Work shall be made as required by the Contract Documents and by applicable laws, statutes, ordinances, codes, rules, and regulations or lawful orders of public authorities. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections, and approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections, and approvals. The Contractor shall give the Architect timely notice of when and where tests and inspections are to be made so that the Architect may be present for such procedures. The Owner shall bear costs of tests, inspections, or approvals that do not become requirements until after bids are received or negotiations concluded. The Owner shall directly arrange and pay for tests, inspections, or approvals where building codes or applicable laws or regulations so require.

§ 13.4.2 If the Architect, Owner, or public authorities having jurisdiction determine that portions of the Work require additional testing, inspection, or approval not included under Section 13.4.1, the Architect will, upon written authorization from the Owner, instruct the Contractor to make arrangements for such additional testing, inspection, or approval, by an entity acceptable to the Owner, and the Contractor shall give timely notice to the Architect of when and where tests and inspections are to be made so that the Architect may be present for such procedures. Such costs, except as provided in Section 13.4.3, shall be at the Owner's expense.

§ 13.4.3 If procedures for testing, inspection, or approval under Sections 13.4.1 and 13.4.2 reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, all costs made necessary by such failure, including those of repeated procedures and compensation for the Architect's services and expenses, shall be at the Contractor's expense.

§ 13.4.4 Required certificates of testing, inspection, or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and promptly delivered to the Architect.

§ 13.4.5 If the Architect is to observe tests, inspections, or approvals required by the Contract Documents, the Architect will do so promptly and, where practicable, at the normal place of testing.

§ 13.4.6 Tests or inspections conducted pursuant to the Contract Documents shall be made promptly to avoid unreasonable delay in the Work.

§ 13.5 Interest

Payments due and unpaid under the Contract Documents shall bear interest from the date payment is due at the rate the parties agree upon in writing or, in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.

ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

§ 14.1 Termination by the Contractor

§ 14.1.1 The Contractor may terminate the Contract if the Work is stopped for a period of 30 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, for any of the following reasons:

- **.1** Issuance of an order of a court or other public authority having jurisdiction that requires all Work to be stopped;
- **.2** An act of government, such as a declaration of national emergency, that requires all Work to be stopped;
- **.3** Because the Architect has not issued a Certificate for Payment and has not notified the Contractor of the reason for withholding certification as provided in Section 9.4.1, or because the Owner has not made payment on a Certificate for Payment within the time stated in the Contract Documents; or
- **.4** The Owner has failed to furnish to the Contractor reasonable evidence as required by Section 2.2.

§ 14.1.2 The Contractor may terminate the Contract if, through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, repeated suspensions, delays, or interruptions of the entire Work by the Owner as described in Section 14.3, constitute in the aggregate more than 100 percent of the total number of days scheduled for completion, or 120 days in any 365-day period, whichever is less.

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§ 14.1.3 If one of the reasons described in Section 14.1.1 or 14.1.2 exists, the Contractor may, upon seven days' notice to the Owner and Architect, terminate the Contract and recover from the Owner payment for Work executed, as well as reasonable overhead and profit on Work not executed, and costs incurred by reason of such termination.

§ 14.1.4 If the Work is stopped for a period of 60 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, or their agents or employees or any other persons or entities performing portions of the Work because the Owner has repeatedly failed to fulfill the Owner's obligations under the Contract Documents with respect to matters important to the progress of the Work, the Contractor may, upon seven additional days' notice to the Owner and the Architect, terminate the Contract and recover from the Owner as provided in Section 14.1.3.

§ 14.2 Termination by the Owner for Cause

§ 14.2.1 The Owner may terminate the Contract if the Contractor

- **.1** repeatedly refuses or fails to supply enough properly skilled workers or proper materials;
- **.2** fails to make payment to Subcontractors or suppliers in accordance with the respective agreements between the Contractor and the Subcontractors or suppliers;
- **.3** repeatedly disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority; or
- **.4** otherwise is guilty of substantial breach of a provision of the Contract Documents.

§ 14.2.2 When any of the reasons described in Section 14.2.1 exist, and upon certification by the Architect that sufficient cause exists to justify such action, the Owner may, without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor's surety, if any, seven days' notice, terminate employment of the Contractor and may, subject to any prior rights of the surety:

- **.1** Exclude the Contractor from the site and take possession of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor;
- **.2** Accept assignment of subcontracts pursuant to Section 5.4; and
- **.3** Finish the Work by whatever reasonable method the Owner may deem expedient. Upon written request of the Contractor, the Owner shall furnish to the Contractor a detailed accounting of the costs incurred by the Owner in finishing the Work.

§ 14.2.3 When the Owner terminates the Contract for one of the reasons stated in Section 14.2.1, the Contractor shall not be entitled to receive further payment until the Work is finished.

§ 14.2.4 If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, including compensation for the Architect's services and expenses made necessary thereby, and other damages incurred by the Owner and not expressly waived, such excess shall be paid to the Contractor. If such costs and damages exceed the unpaid balance, the Contractor shall pay the difference to the Owner. The amount to be paid to the Contractor or Owner, as the case may be, shall be certified by the Initial Decision Maker, upon application, and this obligation for payment shall survive termination of the Contract.

§ 14.3 Suspension by the Owner for Convenience

§ 14.3.1 The Owner may, without cause, order the Contractor in writing to suspend, delay or interrupt the Work, in whole or in part for such period of time as the Owner may determine.

§ 14.3.2 The Contract Sum and Contract Time shall be adjusted for increases in the cost and time caused by suspension, delay, or interruption under Section 14.3.1. Adjustment of the Contract Sum shall include profit. No adjustment shall be made to the extent

- **.1** that performance is, was, or would have been, so suspended, delayed, or interrupted, by another cause for which the Contractor is responsible; or
- **.2** that an equitable adjustment is made or denied under another provision of the Contract.

§ 14.4 Termination by the Owner for Convenience

§ 14.4.1 The Owner may, at any time, terminate the Contract for the Owner's convenience and without cause.

§ 14.4.2 Upon receipt of notice from the Owner of such termination for the Owner's convenience, the Contractor shall

- **.1** cease operations as directed by the Owner in the notice;

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.2 take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and

.3 except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.

§ 14.4.3 In case of such termination for the Owner's convenience, the Owner shall pay the Contractor for Work properly executed; costs incurred by reason of the termination, including costs attributable to termination of Subcontracts; and the termination fee, if any, set forth in the Agreement.

ARTICLE 15 CLAIMS AND DISPUTES

§ 15.1 Claims

§ 15.1.1 Definition

A Claim is a demand or assertion by one of the parties seeking, as a matter of right, payment of money, a change in the Contract Time, or other relief with respect to the terms of the Contract. The term "Claim" also includes other disputes and matters in question between the Owner and Contractor arising out of or relating to the Contract. The responsibility to substantiate Claims shall rest with the party making the Claim. This Section 15.1.1 does not require the Owner to file a Claim in order to impose liquidated damages in accordance with the Contract Documents.

§ 15.1.2 Time Limits on Claims

The Owner and Contractor shall commence all Claims and causes of action against the other and arising out of or related to the Contract, whether in contract, tort, breach of warranty or otherwise, in accordance with the requirements of the binding dispute resolution method selected in the Agreement and within the period specified by applicable law, but in any case not more than 10 years after the date of Substantial Completion of the Work. The Owner and Contractor waive all Claims and causes of action not commenced in accordance with this Section 15.1.2.

§ 15.1.3 Notice of Claims

§ 15.1.3.1 Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered prior to expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by notice to the other party and to the Initial Decision Maker with a copy sent to the Architect, if the Architect is not serving as the Initial Decision Maker. Claims by either party under this Section 15.1.3.1 shall be initiated within 21 days after occurrence of the event giving rise to such Claim or within 21 days after the claimant first recognizes the condition giving rise to the Claim, whichever is later.

§ 15.1.3.2 Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by notice to the other party. In such event, no decision by the Initial Decision Maker is required.

§ 15.1.4 Continuing Contract Performance

§ 15.1.4.1 Pending final resolution of a Claim, except as otherwise agreed in writing or as provided in Section 9.7 and Article 14, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments in accordance with the Contract Documents.

§ 15.1.4.2 The Contract Sum and Contract Time shall be adjusted in accordance with the Initial Decision Maker's decision, subject to the right of either party to proceed in accordance with this Article 15. The Architect will issue Certificates for Payment in accordance with the decision of the Initial Decision Maker.

§ 15.1.5 Claims for Additional Cost

If the Contractor wishes to make a Claim for an increase in the Contract Sum, notice as provided in Section 15.1.3 shall be given before proceeding to execute the portion of the Work that is the subject of the Claim. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Section 10.4.

§ 15.1.6 Claims for Additional Time

§ 15.1.6.1 If the Contractor wishes to make a Claim for an increase in the Contract Time, notice as provided in Section 15.1.3 shall be given. The Contractor's Claim shall include an estimate of cost and of probable effect of delay on progress of the Work. In the case of a continuing delay, only one Claim is necessary.

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§ 15.1.6.2 If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions were abnormal for the period of time, could not have been reasonably anticipated, and had an adverse effect on the scheduled construction.

§ 15.1.7 Waiver of Claims for Consequential Damages

The Contractor and Owner waive Claims against each other for consequential damages arising out of or relating to this Contract. This mutual waiver includes

.1 damages incurred by the Owner for rental expenses, for losses of use, income, profit, financing, business and reputation, and for loss of management or employee productivity or of the services of such persons; and

.2 damages incurred by the Contractor for principal office expenses including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of profit, except anticipated profit arising directly from the Work.

This mutual waiver is applicable, without limitation, to all consequential damages due to either party's termination in accordance with Article 14. Nothing contained in this Section 15.1.7 shall be deemed to preclude assessment of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents.

§ 15.2 Initial Decision

§ 15.2.1 Claims, excluding those where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2 or arising under Sections 10.3, 10.4, and 11.5, shall be referred to the Initial Decision Maker for initial decision. The Architect will serve as the Initial Decision Maker, unless otherwise indicated in the Agreement. Except for those Claims excluded by this Section 15.2.1, an initial decision shall be required as a condition precedent to mediation of any Claim. If an initial decision has not been rendered within 30 days after the Claim has been referred to the Initial Decision Maker, the party asserting the Claim may demand mediation and binding dispute resolution without a decision having been rendered. Unless the Initial Decision Maker and all affected parties agree, the Initial Decision Maker will not decide disputes between the Contractor and persons or entities other than the Owner.

§ 15.2.2 The Initial Decision Maker will review Claims and within ten days of the receipt of a Claim take one or more of the following actions: (1) request additional supporting data from the claimant or a response with supporting data from the other party, (2) reject the Claim in whole or in part, (3) approve the Claim, (4) suggest a compromise, or (5) advise the parties that the Initial Decision Maker is unable to resolve the Claim if the Initial Decision Maker lacks sufficient information to evaluate the merits of the Claim or if the Initial Decision Maker concludes that, in the Initial Decision Maker's sole discretion, it would be inappropriate for the Initial Decision Maker to resolve the Claim.

§ 15.2.3 In evaluating Claims, the Initial Decision Maker may, but shall not be obligated to, consult with or seek information from either party or from persons with special knowledge or expertise who may assist the Initial Decision Maker in rendering a decision. The Initial Decision Maker may request the Owner to authorize retention of such persons at the Owner's expense.

§ 15.2.4 If the Initial Decision Maker requests a party to provide a response to a Claim or to furnish additional supporting data, such party shall respond, within ten days after receipt of the request, and shall either (1) provide a response on the requested supporting data, (2) advise the Initial Decision Maker when the response or supporting data will be furnished, or (3) advise the Initial Decision Maker that no supporting data will be furnished. Upon receipt of the response or supporting data, if any, the Initial Decision Maker will either reject or approve the Claim in whole or in part.

§ 15.2.5 The Initial Decision Maker will render an initial decision approving or rejecting the Claim, or indicating that the Initial Decision Maker is unable to resolve the Claim. This initial decision shall (1) be in writing; (2) state the reasons therefor; and (3) notify the parties and the Architect, if the Architect is not serving as the Initial Decision Maker, of any change in the Contract Sum or Contract Time or both. The initial decision shall be final and binding on the parties but subject to mediation and, if the parties fail to resolve their dispute through mediation, to binding dispute resolution.

§ 15.2.6 Either party may file for mediation of an initial decision at any time, subject to the terms of Section 15.2.6.1.

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§ 15.2.6.1 Either party may, within 30 days from the date of receipt of an initial decision, demand in writing that the other party file for mediation. If such a demand is made and the party receiving the demand fails to file for mediation within 30 days after receipt thereof, then both parties waive their rights to mediate or pursue binding dispute resolution proceedings with respect to the initial decision.

§ 15.2.7 In the event of a Claim against the Contractor, the Owner may, but is not obligated to, notify the surety, if any, of the nature and amount of the Claim. If the Claim relates to a possibility of a Contractor's default, the Owner may, but is not obligated to, notify the surety and request the surety's assistance in resolving the controversy.

§ 15.2.8 If a Claim relates to or is the subject of a mechanic's lien, the party asserting such Claim may proceed in accordance with applicable law to comply with the lien notice or filing deadlines.

§ 15.3 Mediation

§ 15.3.1 Claims, disputes, or other matters in controversy arising out of or related to the Contract, except those waived as provided for in Sections 9.10.4, 9.10.5, and 15.1.7, shall be subject to mediation as a condition precedent to binding dispute resolution.

§ 15.3.2 The parties shall endeavor to resolve their Claims by mediation which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Mediation Procedures in effect on the date of the Agreement. A request for mediation shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the mediation. The request may be made concurrently with the filing of binding dispute resolution proceedings but, in such event, mediation shall proceed in advance of binding dispute resolution proceedings, which shall be stayed pending mediation for a period of 60 days from the date of filing, unless stayed for a longer period by agreement of the parties or court order. If an arbitration is stayed pursuant to this Section 15.3.2, the parties may nonetheless proceed to the selection of the arbitrator(s) and agree upon a schedule for later proceedings.

§ 15.3.3 Either party may, within 30 days from the date that mediation has been concluded without resolution of the dispute or 60 days after mediation has been demanded without resolution of the dispute, demand in writing that the other party file for binding dispute resolution. If such a demand is made and the party receiving the demand fails to file for binding dispute resolution within 60 days after receipt thereof, then both parties waive their rights to binding dispute resolution proceedings with respect to the initial decision.

§ 15.3.4 The parties shall share the mediator's fee and any filing fees equally. The mediation shall be held in the place where the Project is located, unless another location is mutually agreed upon. Agreements reached in mediation shall be enforceable as settlement agreements in any court having jurisdiction thereof.

§ 15.4 Arbitration

§ 15.4.1 If the parties have selected arbitration as the method for binding dispute resolution in the Agreement, any Claim subject to, but not resolved by, mediation shall be subject to arbitration which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Arbitration Rules in effect on the date of the Agreement. The Arbitration shall be conducted in the place where the Project is located, unless another location is mutually agreed upon. A demand for arbitration shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the arbitration. The party filing a notice of demand for arbitration must assert in the demand all Claims then known to that party on which arbitration is permitted to be demanded.

§ 15.4.1.1 A demand for arbitration shall be made no earlier than concurrently with the filing of a request for mediation, but in no event shall it be made after the date when the institution of legal or equitable proceedings based on the Claim would be barred by the applicable statute of limitations. For statute of limitations purposes, receipt of a written demand for arbitration by the person or entity administering the arbitration shall constitute the institution of legal or equitable proceedings based on the Claim.

§ 15.4.2 The award rendered by the arbitrator or arbitrators shall be final, and judgment may be entered upon it in accordance with applicable law in any court having jurisdiction thereof.

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§ 15.4.3 The foregoing agreement to arbitrate and other agreements to arbitrate with an additional person or entity duly consented to by parties to the Agreement, shall be specifically enforceable under applicable law in any court having jurisdiction thereof.

§ 15.4.4 Consolidation or Joinder

§ 15.4.4.1 Subject to the rules of the American Arbitration Association or other applicable arbitration rules, either party may consolidate an arbitration conducted under this Agreement with any other arbitration to which it is a party provided that (1) the arbitration agreement governing the other arbitration permits consolidation, (2) the arbitrations to be consolidated substantially involve common questions of law or fact, and (3) the arbitrations employ materially similar procedural rules and methods for selecting arbitrator(s).

§ 15.4.4.2 Subject to the rules of the American Arbitration Association or other applicable arbitration rules, either party may include by joinder persons or entities substantially involved in a common question of law or fact whose presence is required if complete relief is to be accorded in arbitration, provided that the party sought to be joined consents in writing to such joinder. Consent to arbitration involving an additional person or entity shall not constitute consent to arbitration of any claim, dispute or other matter in question not described in the written consent.

§ 15.4.4.3 The Owner and Contractor grant to any person or entity made a party to an arbitration conducted under this Section 15.4, whether by joinder or consolidation, the same rights of joinder and consolidation as those of the Owner and Contractor under this Agreement.

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DIVISION 00 - BIDDING AND CONTRACT REQUIREMENTS
SECTION 00410 - SUPPLEMENTAL GENERAL CONDITIONS

SUPPLEMENTAL GENERAL CONDITIONS amend and supplement the printed form of General Conditions of the Contract for General Construction, American Institute of Architects (AIA) Document No. A201 - 2017 Edition, as follows:

ARTICLE 1 GENERAL PROVISIONS

Para. 1.1 – BASIC DEFINITIONS

1.1.1 Delete entirely and substitute the following: The Contract Documents are enumerated in the Agreement between the Owner and Contractor (hereinafter the Agreement) and consist of the Agreement, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Addenda issued prior to execution of the Contract, other documents listed in the Agreement and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive or (4) a written order for a minor change in the Work issued by the Architect. The Contract Documents shall include the Bidding Requirements, including, but not limited to: Advertisement or Invitation to Bid, Instructions to Bidders, the Contractor's Bid Proposal Form and other bidding forms, Addenda or portions of the Addenda relating to any Bidding Documents. The Contract Documents shall apply to all Prime Contractors for the Project and each Prime Contractor is responsible for the content of all.

1.1.2.1 – Add new subparagraph: The Contractor acknowledges and warrants that it has closely examined all of the Contract Documents, that they are suitable and sufficient to enable the Contractor to complete the Work in a timely manner for the Contract Sum, and that they include all Work, whether or not shown or described, which reasonably may be inferred to be required or useful for the completion of the Work in full compliance with all applicable codes, laws, ordinances and regulations and that questions regarding the bid documents and any interpretation(s) regarding same have been asked by the contractor, in the form and manner required in the instructions to bidders.

1.1.3.1 – Add new subparagraph: The Work shall include the obligation of the Contractor to visit the site of the Project before submitting a bid. Such site visit shall be for the purpose of familiarizing the Contractor with the conditions as they exist and the character of the operations to be carried on under the Contract Documents, including all existing site conditions, access to the site, physical characteristics of the site and surrounding areas.

1.1.3.2 – Add new subparagraph: Nothing in these General Conditions shall be interpreted as imposing on either the Owner or Architect, or their respective agents, employees, officers, directors or consultants, any duty, obligation or authority with respect to any items that are not intended to be incorporated into the completed project, including but not limited to shoring, scaffolding, hoists, temporary weatherproofing, or any temporary facility or temporary activity, since these are the sole responsibility of the Contractor.

1.1.5.1 – Add new subparagraph: The Drawings are diagrammatical and show the general arrangement and extent of the Work; exact locations and arrangements of parts shall be determined as the Work progresses and shall be subject to the Architect's approval.

1. No extra compensation will be allowed due to discrepancies between actual dimensions and those indicated.

2. The right is reserved by the Architect to make any reasonable change in location of equipment, ductwork, and piping prior to roughing in without involving additional expense to the Owner.
3. Contractor shall coordinate his Work with the Work of others and shall be responsible for the coordination work, so that interference between mechanical, electrical and other work and architectural and structural work does not occur.
4. Contractor shall furnish and install supports, hangers, offsets, bends, turns, and the like in connection with this Work to avoid interference with work of other Contractors, to conceal Work where required, and to secure necessary clearance and access for operation and maintenance without involving additional expense to the Owner.

1.1.9 – Add new subparagraph: Final Completion: The date the Contract has been fully performed, all the Work has been completed and a final Certificate for Payment approved by the Owner has been issued by the Architect.

1.1.10 - Add new subparagraph: Or Approved Equal and Equal To: Shall mean products by manufacturers other than those specified in the Contract Documents which the Contractor may submit for those specified in the Contract Documents and which may be incorporated in the Work after review and acceptance by the Architect and acceptance by the Owner.

Para. 1.2 – CORRELATION AND INTENT OF THE CONTRACT DOCUMENTS

1.2.1.2 – Add new subparagraph: The general character of the detail work is shown on the drawings but minor modifications may be made in large scale details. Where the word "similar" occurs on the drawings it shall be used in its general sense and not as meaning identical, and all details shall be worked out in relation to their location and their connection to other parts of the work.

1. Where on any drawings a portion of the work is drawn out and the remainder is indicated in outline, the parts drawn out shall apply also to other like portions of the work.
2. Where detail is indicated by starting only, such detail shall be continued throughout the courses or parts in which it occurs and shall also apply to all other similar parts in the work unless otherwise indicated.
3. Explanatory notes shall take precedence over conflicting drawn note indications. Large scale drawings shall take precedence over small scale drawings. Figured dimensions shall take precedence over scaled measurements. Schedules take precedence over details. Computed dimensions take precedence over scaled dimensions. The more expensive or greater quantity shall prevail. Should contradictions be found, the Architect shall determine which indication is correct.
4. Any discrepancies or questions as to the application of, and interpretations related to 1.2.1.1, shall be referred to the Architect for adjustment before any work affected thereby has been performed.

1.2.1.3 – Add new subparagraph: During the course of the work, should any ambiguities or discrepancies be found in the Specifications or on the Drawings; or should there be found any discrepancies between the Drawings and Specifications to which the Contractor has failed to call attention before submitting his bid, then the Architect will interpret the intent of the Drawings and Specifications; and the Contractor hereby agrees to abide by the Architect's interpretation and to carry out the work in accordance with the decision of the Architect with no additional cost to the Owner.

1.2.1.4 – Add new subparagraph: It is expressly stipulated that neither the Drawings nor the Specifications shall take precedence over the other, and it is further stipulated that the Architect may interpret or construe the Drawings and Specifications so as to secure in all cases the result most consistent with the needs and requirements of the work. In the event of such ambiguity or discrepancy subject to any Architect's interpretation, the Contractor shall comply with the more stringent requirement, and supply the better quality and/or greater quantity of work.

1.2.2.1 – Add new subparagraph: The various materials and products specified in the specifications by name or description are given to establish a standard of quality and of cost for bid purposes. It is not the intent to limit the acceptance to any one material or product specified, but rather to name or describe it as the absolute minimum standard that is desired and acceptable, all determinations as to equality of a proposed product or material shall be at the discretion of the Architect and/or the Owner.

1. A material or product of lesser quality will not be acceptable.
2. Where "Basis of Design" products or manufacturer's names are used, whether or not followed by the words "or approved equal," they shall be subject to approved equals and authorized only by the Architect and/or the Owner.

1.2.2.2 – Add new subparagraph: Substitutions lowering performance, quality, method of assembly or installation, or in general not in keeping with details and specifications, will not be permitted. Refer to substitution procedure indicated elsewhere in the Contract Documents.

1.2.2.3 – Add new subparagraph: It is understood when a bid for any product or material is submitted, the bidder is aware of specified requirements and all materials or products within his bid are equal or better than such specified items.

1.2.2.4 – Add new subparagraph: In addition to the Specifications, it shall be understood that details on Drawings shall become part of the Specification in determining the required "standard of quality."

1.2.2.5 – Add new subparagraph: If a conflict occurs between Drawing details and Specifications, bidder during bidding process and/or Contractor shall bring such conflicts to the attention of the Architect in accordance with applicable requirements indicated elsewhere in other sections of Contract Documents.

1.2.4 – Add new subparagraph: In case of discrepancies between the Contract Documents, the Architect shall be notified before any affected work is started. Where discrepancies occur in the Contract Documents, the most stringent determination, as interpreted by the Architect, shall be implemented, and at a no additional cost to the Owner.

1.2.5 - Add new subparagraph: Execution of the Contract by the Contractor is a representation that said Contract Documents are full and complete, are sufficient to have enabled the Contractor to determine the cost of the Work therein to enter into the Contract and that the Contract Documents are sufficient to enable it to construct the Work outlined therein, and otherwise to fulfill all its obligations hereunder, including, but not limited to, Contractor's obligation to construct the Work for an amount not in excess of the Contract Sum on or before the date(s) of Substantial Completion established in the Agreement. The Contractor further acknowledges and declares that it has visited and examined the site, examined all physical, legal, and other conditions affecting the Work and is fully familiar with all of the conditions thereon and thereunder affecting the same. In connection therewith, Contractor specifically represents and warrants to Owner that it has, by careful examination, satisfied itself as to: (1) the nature, location and character of the Project and the site, including, without limitation, the surface

and subsurface conditions of the site and all structures and obstructions thereon and thereunder, both natural and man-made, and all surface and subsurface water conditions of the site and the surrounding area; (2) the nature, location, and character of the general area in which the Project is located, including without limitation, its climatic conditions, available labor supply and labor costs, and available equipment supply and equipment costs; and (3) the quality and quantity of all materials, supplies, tools, equipment, labor, and professional services necessary to complete the Work in the manner and within the cost and time frame required by the Contract Documents. In connection with the foregoing, and having carefully examined all Contract Documents, as aforesaid, and having visited the site, the Contractor acknowledges and declares that it has no knowledge of any discrepancies, omissions, ambiguities, or conflicts in said Contract Documents and that if it becomes aware of any such discrepancies, omissions, ambiguities, or conflicts, it will promptly notify Owner and Architect of such fact.

1.2.6 - Add new subparagraph: The Contract Documents include all items necessary for the proper execution and completion of the Work by the Contractor. The Work shall consist of all items specifically included in the Contract Documents as well as all additional items of work which are reasonably inferable from that which is specified in order to complete the Work in accordance with the Contract Documents. The Contract Documents are complementary, and what is required by any one Contract Document shall be as binding as if required by all. Any differences between the requirements of the Drawings and the Specifications or any differences noted within the Drawings themselves or within the Specifications themselves have been referred to the Owner and Architect by Contractor prior to the submission of bids and have been clarified by an Addendum issued to all bidders.

If any such differences or conflicts were not called to the Owner's and Architect's attention prior to submission of bids, the Architect shall decide which of the conflicting requirements will govern based upon the most stringent of the requirements, and, subject to the approval of the Owner, the Contractor shall perform the Work at no additional cost and/or time to the Owner in accordance with the Architect's decision. Work not covered in the Contract Documents will not be required unless it is consistent therewith and is reasonable inferred therefrom as being necessary to produce the intended results. The term "reasonably inferred" includes work necessary to provide work indicated or specified; that is: furnish and install, complete, in place and ready for use.

1.2.7 - Add new subparagraph: When more than one material, brand, or process is specified for a particular item of Work, the choice shall be the Contractor's. If the Contractor wishes to use a material, brand, or process which is not the first specified in the Contract Documents, the Contractor shall notify the Architect and Owner of their intention to use said material, brand, or process in accordance with Item 3.3.5.3 of Section 00210, page 2. If Contractor does not submit notice of intent to use a material, brand, or process which is not listed first in the Contract Documents in accordance with the referenced Section, said material, brand, or process will be considered a substitution. Approval by Architect and/or Owner of materials, suppliers, processes, or Subcontractors does not imply a waiver of any Contract requirements including, without limitation, Contractor's warranty.

1.2.8 - Add new subparagraph: In all cases, the details, drawings, and specifications shall be checked with existing conditions and with work in place, and variations, if any, shall be referred by the Contractor to the Architect for adjustment, as the Contractor will be responsible for the fit or work in place.

1.2.9 - Add new subparagraph: When a profile, section or other finished condition is shown, furring or other method of obtaining such finished conditions shall be provided. The drawings may show work fully drawn out or only a portion thereof, the remainder being in outline. The drawn out portions apply to other like or similar places.

1.2.10 - Add new subparagraph: Where it is required in the specifications that materials, products, processes, equipment, or the like be installed or applied in accordance with manufacturers' instructions, directions, or specifications, or words to this effect, it shall be construed to mean that said application or installation shall be in strict accordance with printed material concerned for use under conditions similar to those at the job site. Three copies of such instructions shall be furnished to the Architect and his written approval thereof obtained before work is begun.

1.2.11 - Add new subparagraph: Any material specified by reference to the number, symbol, or title of a Commercial Standard, Federal Specification, ASTM Specification, trade association standard, or other similar standards, shall comply with the requirements in the latest revision thereof and any amendments or supplements thereto in effect one month prior to the date on which bids are opened and read, except as limited to type, class, or grade, or modified in such reference. The standards referred to, except as modified in the specifications, shall have full force and effect as though printed in the specifications. The Architect will furnish upon request information as to how copies of the standards referred to may be obtained.

1.2.12 - Add new subparagraph: The Contract Documents shall be signed by the Owner and Contractor. If either the Owner or Contractor or both do not sign all the Contract Documents, the Architect shall identify such unsigned Documents upon request. The Agreement shall be signed in not less than quadruplicate by the Owner and Contractor.

1.2.13.1 - Add new subparagraph: The term "reasonably inferable" includes work necessary to "provide" work indicated or specified, as defined in section: Definitions and Standards; that is: furnish and install, complete, in place and ready for use.

1.2.13.2 - Add new subparagraph: Details referenced to portions of the Work shall apply to other like portions of the Work not otherwise detailed.

1.2.13.3 - Add new subparagraph: The Contractor shall request, from the Architect/Engineer's, an interpretation of apparent discrepancies, conflicts, or omissions in the Specifications and Drawings. Subcontractors shall forward such requests through the Contractor. Such requests, and the Architect/Engineer's interpretation, shall be in written form; other forms of communications shall be used to expedite resolution of concerns, but will not be binding.

1.7 – Delete in its entirety and substitute the following:

1.7 – Transmission of Data in Digital Form

If parties intend to transmit Instruments of Service or any other information or documentation in digital form, they shall endeavor to establish necessary protocols governing such transmissions, unless otherwise already provided in the Agreement or the Contract Documents.

1.8 – Delete in its entirety.

ARTICLE 2 OWNER

Para. 2.1 - GENERAL

2.1.2 Delete in its entirety.

Para. 2.2 - INFORMATION AND SERVICES REQUIRED OF THE OWNER

2.2.1 Delete in its entirety.

2.2.2 Delete in its entirety.

2.2.3 Delete in its entirety.

2.2.4 Delete in its entirety.

2.2.5 Add new subparagraph: The Contractor will be furnished three (3) copies of all drawings and specifications. Any additional copies will be furnished upon request at the cost of reproduction.

Para. 2.4 – OWNER'S RIGHT TO STOP THE WORK Delete entirely and substitute the following:

If the Contractor fails to correct Work that is not in accordance with the requirements of the Contract Documents as required by Section 12.2 or repeatedly fails to carry out Work in accordance with the Contract Documents, , or fails or refuses to provide a sufficient amount of properly supervised and coordinated labor, materials, or equipment so as to be able to complete the Work within the Contract Time or fails to remove and discharge (within ten days) any lien filed upon Owner's property by anyone claiming by, through, or under Contractor, or disregards the instructions of Architect or Owner when based on the requirements of the Contract Documents, the Owner may issue a written order to the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, the right of the Owner to stop the Work shall not give rise to a duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity, except to the extent required by Section 6.1.3.

Para. 2.5 - OWNER'S RIGHT TO CARRY OUT THE WORK

2.5 - Delete the last sentence.

2.5 - In the next to the last sentence ADD "and/or its surety" after "the Contractor" and before "shall pay"

ARTICLE 3 CONTRACTOR

Para.3.2 - REVIEW OF CONTRACT DOCUMENTS AND FIELD CONDITIONS BY CONTRACTOR

3.2.1 Delete in its entirety and replace with the following:
Execution of the Contract by the Contractor is a representation that the Contractor has visited the site, become generally familiar with local conditions under which the Work is to be performed and correlated personal observations with requirements of the Contract Documents.

1. If the Contractor requires clarification of the intent of the Contract Documents after award, the Contractor shall be responsible to issue a type written request for information (RFI) to the Architect utilizing the Architect's sample form via acceptable methods set forth in Article 4.2.
2. All RFI's shall clearly identify the Architect's project number, the construction company's name, author's name, date issued, address, phone numbers, facsimile number and the addressee of the communication.
3. RFI's shall be sequentially identified and numbered when issued to the Architect with the following prefix for each trade and shall be logged accordingly:
   S - Structural Work (ex. S1, S2, etc.)
   P/FP - Plumbing / Fire Protection Work
   H - Heating, Ventilating and Air Conditioning Work (HVAC)
   E - Electrical / Information Technology Work
   G - General Construction Work
4. RFI's involving structural, plumbing/fire protection, HVAC or electrical Work shall be addressed and issued to the Architect and simultaneously issued directly to the respective Consulting Engineer.

Add Subparagraph 3.2.1.1 as follows:

If any errors, inconsistencies, or omissions in Contract Documents are recognized or reasonably should have been recognized by the Contractor, any member of its organization, or any of its Subcontractors, the Contractor shall be responsible for notifying the Architect in writing of such error, inconsistency, or omission before proceeding with the Work. The Architect will take such notice under advisement and within a reasonable time commensurate with job progress render a decision. If Contractor fails to give such notice and proceeds with such Work, it shall correct any such errors, inconsistencies, or omissions at no additional cost to the Owner.

3.2.2 Delete entirely and substitute the following: In addition to and not in derogation of Contractor's duties under Paragraph 1.5.2 and 1.5.3, the Contractor shall carefully study and compare the Contract Documents with each other and shall at once report to the Architect errors, inconsistencies or omissions discovered. If the Contractor performs any construction activity involving an error, inconsistency or omission in the Contract Documents that the Contractor recognized or reasonably should have recognized without such notice to the Architect, the Contractor shall assume complete responsibility for such performance and shall bear the full amount of the attributable costs for correction. It is recognized that the Contractor’s review is made in the Contractor’s capacity as a contractor and not as a licensed design professional, unless otherwise specifically provided in the Contract Documents. However any design errors or omissions noted by the Contractor during this review shall be reported promptly to the Architect.

3.2.2.1 - Add new subparagraph: Conditions Precedent – Notice

1. Notice of any alleged Conflict that has been reasonably identified prior to submitting a Bid shall be provided to the Architect immediately in order that the Architect in its discretion, may issue an Addendum.
2. A Bidder's failure to do so constitutes an absolute waiver of any Conflict that may thereafter be asserted with respect thereto, and shall bar any recovery regard such Conflict.

3. If any errors, inconsistencies or omissions appear in the drawings, specifications or other Contract Documents, which should reasonably have been discovered and concerning which interpretation had not been obtained from the Architect during the Bidding Period, the Contractor shall within ten (10) days after receiving written "Notice of Award" notify the Architect in writing of such error, inconsistency or omission. In the event the Contractor fails to give such notice, Contractor and its Surety will indemnify Owner for the costs of any such errors, inconsistencies or omissions and the cost of rectifying same including attorney's fees. Interpretation of this procedure after the ten-day period will be made by the Architect and his decision will be final. By Submission of a bid, the Contractor acknowledges that the Contract Documents are full and complete, are sufficient to have enabled it to determine the cost of the Work and that the Drawings, the Specifications and all addenda are sufficient to enable the Contractor to construct the Work outlined therein in accordance with applicable laws, statutes, ordinances, building codes and regulations, and otherwise to fulfill all of its obligations under the Contract Documents.
4. Contractor acknowledges, except as to any reported error, inconsistencies or omissions, and to concealed or unknown conditions defined in elsewhere, by executing the Agreement, the Contractor represents the following:
    1. The Contract Documents are sufficiently complete and detailed for the Contractor to perform the Work and comply with all requirements of the Contract Documents.
    2. The Work required by the Contract Documents, including, without limitation, all construction details, construction means, methods, procedures, and techniques necessary to perform the Work, use of materials, selection of equipment, and requirements of products by manufacturers are consistent with;
        1. good and sound practices within the construction industry;
        2. generally prevailing and accepted industry standards applicable to Work;
        3. requirements of any warranties applicable to the Work; and
        4. all laws, ordinances, regulations, rules, and orders which bear upon the Contractor's performance of the Work
    3. The Contractor has read, understands and accepts the Contract Documents and its bid was made in accordance with them.
    4. The Contract Sum is based upon the products, materials, systems and equipment required by the Contract Documents without exception. Where the Contract Documents list one or more manufacturer or brand name products, materials, systems and equipment as acceptable, the Contract sum is, in each instance, based upon one of the listed manufacturers or brand name products, materials, systems, and equipment, or, if the contract Sum is based upon the substitution of an "or equal" manufacturer or product, material, system or equipment, the Contractor has in each such instance sought and received the Architect's approval for the substitution either:
        1. prior to the Bid in accordance Architect's Addenda;
        2. after commencement of the Work, under in conformance with substitution procedure elsewhere in the Contract Documents.
5. The Contract Sum is firm and all inclusive, and no escalation is contemplated for any reason whatsoever.

1. The Contract Sum includes any and all costs associated with completion by those dates and times, including any and all costs associated with out-of-sequence work, come-back work, stand-by work, stacking of trades, coordination with the schedules and work of separate Contractors, allowing sufficient time, work and storage areas, and site access for separate Contractors to timely progress and complete their work, overtime, expediting and acceleration that may be required to complete the work by those dates and times.
2. The Contractor has reviewed the completion dates and times, and Milestone Dates set forth in the Contract Documents, agrees that such dates and times are reasonable and commits to achieve them.

6. The Contractor shall satisfy itself as to the accuracy of all dimensions and locations. In all cases of interconnection of its work with existing or other work, it shall verify at the site, all dimensions relating to such existing or other work. Any errors due to the Contractor's failure to verify all such locations or dimensions shall be promptly rectified by the Contractor without any additional cost to the Owner.

3.2.4 In the second sentence ADD "and/or its surety" after "the Contractor" and before "shall pay"

3.2.5 Add new subparagraph: The Contractor shall give the Architect timely notice of any additional instructions required to define the work in greater detail, or to permit the proper progress of the work. He shall not proceed with any work not clearly and consistently defined in the Contract Documents, but shall request additional instructions from the Architect as provided above. If the Contractor proceeds with such work without obtaining further instructions, he shall correct any work incorrectly done at his own expense.

Para. 3.3 - SUPERVISION AND CONSTRUCTION PROCEDURES

3.3.1 At the end of the paragraph, add the following:

1. At any time within the construction period, the Owner or Architect shall have the right to require the replacement of the Contractor's Project Manager, Superintendent, or Foreman.
2. The Owner or Architect shall have the authority to direct the Contractor to assign additional supervisory personnel to ensure compliance with the Contract schedule and qualify requirements at no addition to the contract price.
3. When more than one major phase is being constructed at different locations on the project site, supervision must be assigned to each phase when work of that contract is being performed. When performing construction work to maintain the progress schedule requires extended hours, multiple shifts, and additional work days, adequate supervision shall be required for each Contractor during these times. The competence level and ability of supervisory personnel must be adequate to perform the construction activities involved and shall be in accordance with requirements indicated elsewhere in the Contract Documents.

3.3.4 Add new subparagraph: Contractor shall lay out his own work and be responsible for all lines, elevations and measurements of the building, and other work executed by him under the Contract. He/She must exercise proper precaution to verify the figures shown on the drawings before laying out the work and will be held responsible for any errors resulting from his failure to exercise such precaution.

1. Contractors whose failure to perform his/her Work or whose negligence in performing his/her Work, negatively impacts other Contractors' work shall be responsible for damages incurred by the other Contractors that are necessary to maintain the project schedules, all as is more fully set forth in the further provisions of the Contract Documents including, without limitation, Article 6.2.5 of the General Conditions.

3.3.5 Add new subparagraph: Reference to particular construction means, methods, techniques, sequences or procedures, or implication that such are to be used to perform the work, indicates only that the operations selected by the Contractor shall produce at least the quality of work implied by the operations specified. The actual determination of whether or not the described operations may be safely and suitably employed on the work shall be the responsibility of the Contractor.
Any loss, damage or liability, or cost of correcting defective work arising from the construction operations shall be borne by the Contractor.

3.3.6 Add new paragraph: The Contractor shall be responsible to assign a full-time on-site superintendent to the project. This superintendent shall be named in section 7.5 of the contract for construction as the contractor's representative and shall have authority to make all decisions pertaining to all WORK.

The Owner shall have the right to review any proposed Superintendent's qualifications and have the right to accept or reject such proposed superintendent.
The Owner shall have the right, upon proper notice, to have any superintendent replaced at no additional cost to the Owner.

3.3.7 - Add new paragraph: The Contractor, when requested by the Architect, shall meet with representative of the Architect at all times and furnish all information requested; he shall allow the Architect to inspect the work at all times. Neither the Owner nor the Architect shall be liable to the Contractor for extra compensation or damages for interference or delays on account of any such meetings, information, or inspections so requested or other acts of the Architect done in good faith and within the scope of their employment by the Owner.

In addition the Contractor is entrusted with the oversight, management control, and general direction of this project to insure that all contract completion dates are met. In the event that there are any delays caused to any Subcontractor on this project, liability shall lie with the Contractor and not with the Owner.

3.3.8 - Add new paragraph: The Contractor has the responsibility to ensure that all material suppliers and Subcontractors, their agents, and employees adhere to the Contract Documents, and that they order materials on time, taking into account the current market and delivery conditions and that they provide materials on time. The Contractor shall coordinate its Work with that of all others on the Project including deliveries, storage, installations, and construction utilities. The Contractor shall be responsible for the space requirements, locations, and routing of its equipment. In areas and locations where the proper and most effective space requirements, locations and routing cannot be made as indicated, the Contractor shall meet with all others involved, before installation, to plan the most effective and efficient method of overall installation.

Para. 3.4 - LABOR AND MATERIALS

3.4.1 Add new sentence: It shall be Contractor's sole responsibility to provide sufficient labor and workforces to properly execute and complete the work within the timeframe contemplated within this Contract for the completion of said work.

3.4.2.1 Add new subparagraph: STANDARD OF QUALITY: The various materials and products specified in the specifications by name or description are given to establish a standard of quality and of cost for bid purposes.

1. It is not the intent to limit the Contractor to any one material or product specified but rather to described as the minimum standard.
2. When proprietary names are used as the “Basis of Design”, for specified products or equipment, they shall be followed by the words “or approved equal in quality necessary to meet the specifications,” unless otherwise indicated elsewhere in the Contact Documents.

3.4.2.2 Add new subparagraph: The Architect will evaluate alternatives and substitutions and shall be the sole judge of whether the alternatives, (substitutions), are acceptable or not.

1. The burden of proving the alternatives, (substitutions), are equal, or better, to the specified product is that of the Contractor.
2. Contractor shall submit request for substitution in accordance with substitution procedures indicated elsewhere in the Contract Documents.
3. Any alternative names or products which do not meet the specifications will not be accepted.

3.4.3 Add new sentence: This provision shall include all persons on the site controlled directly or indirectly by the Contractor.

3.4.4 Add new subparagraph: Directions, specifications, and recommendations by manufacturers for installation, handling, storage, adjustment, and operation of their materials or equipment shall be complied with; but the Contractor shall nonetheless have the responsibility for determining whether such directions, specifications, and recommendations may safely and suitable be employed in the work and of notifying the Architect in advance in writing of any deviation or modification necessary for installation safety or proper operation of item.

3.4.5 Add new subparagraph: The Contractor shall take all necessary steps to ensure labor harmony in the Project. Perform work in accordance with local labor regulations; no extra payment shall be due for doing work under this provision, or for delays or damages for failure to observe such requirements.

The Contractor and Owner shall agree upon a schedule for the progress of the Work (hereinafter "Progress Schedule") within fifteen (15) days of the Notice to Proceed, which schedule shall designate the commencement date and date of substantial completion for the Work. The Progress Schedule shall be binding, time being of the essence."

3.4.6 Add new subparagraph: The Contractor must provide suitable storage facilities at the site for the proper protection and safe storage of his materials. Such storage facilities must be approved in advance in writing by the Architect.

3.4.7 Add new subparagraph: All materials delivered to the premises which are to form a part of the work are to be considered the property of the Owner and must not be removed without the Architect's consent; but the Contractor shall remove all surplus materials upon completion of each phase of the work and as directed by the Architect.

3.4.8 Add new subparagraph: When any room is used as a shop, storeroom, etc., during the progress of the work, the Contractor making use of the space will be responsible for any repairs, patching, or cleaning arising from such use. Prior approval of Architect for use of such areas is mandatory.

3.4.9 Add new subparagraph: The Contractor will be held to be thoroughly familiar with all conditions affecting labor in the locale of the Project, including, but not limited to, trade jurisdictions and agreements, incentive and premium time, pay, procurement, living and commuting conditions. Contractor shall assume responsibility for costs resulting from his failure to verify conditions affecting his labor.

3.4.10 Add new subparagraph: Contractor shall be responsible for labor peace on the Project and shall at all times make its best efforts and judgment as an experienced contractor to adopt and implement policies and practices designed to avoid work stoppages, slowdowns, disputes, or strikes where reasonably possible and practical under the circumstances, and shall at all times maintain Project-wide labor harmony. Except as specifically provided in Subparagraph 8.3.1, Contractor shall be liable to Owner for all damages suffered by Owner occurring as a result of work stoppages, slowdowns, disputes, or strikes.

3.4.11 Add new subparagraph: Not later than seven (7) days from the Notice to Proceed, the Contractor shall provide a list showing the name of the manufacturer proposed to be used for each of the products identified in the Specifications Divisions 1-16, and the installing Subcontractor's name.

3.4.12 Add new subparagraph: Wherever practical or required to obtain a full warranty, except as otherwise specified, the material or product of one manufacturer shall be used throughout the Work for each specified purpose.

3.4.13 Add new subparagraph: All manufactured articles, materials, and equipment shall be applied, installed, connected, erected, used, cleaned, and conditioned in strict accordance with the manufacturer’s directions. Should discrepancies arise between these instructions and the Specifications, the Contractor shall request, in writing, clarification from the Architect.

Para. 3.5 - WARRANTY

3.5.1 In line 2, add: "and of recent manufacture" after the word "new."

3.5.1 In line 5, add: “including substitutions not properly approved or authorized,” after the word requirements and before the word may.

3.5.3 Add new subparagraph: The Contractor represents that all manufacturer and supplier warranties shall run directly to or be specifically assignable to the Owner. The Contractor warrants that all portions of the work that will be covered by a manufacturer’s or supplier’s warranty shall be performed in such a manner so as to preserve all rights under such warranties. The Contractor hereby assigns to the Owner effective upon the termination of this contract all manufacturer’s and supplier’s

warranties relating to the Work, and the Contractor shall upon request of the Owner, execute any document reasonably requested by Owner to effectuate such assignment. If the Owner attempts to enforce a claim based upon a manufacturer's or suppliers warranty and such manufacturer or supplier refuses to honor such warranty based in whole or in part on a claim of defective installation by the Contractor, the Contractor shall be responsible for any resulting loss or damages incurred by the Owner as a result of the manufacturer's or supplier's refusal to honor such warranty. The Contractor's obligations under this Subparagraph 3.5.2 shall survive the expiration or earlier termination of the Contract. The warranty period for all work of each Contractor shall be two (2) years from the date of final inspection and acceptance by the Owner unless otherwise specified.

Para. 3.6 – TAXES

3.6.1 Add new subparagraph: The Owner is exempt from all taxes including Federal Excise Tax, fuel tax, transportation taxes and State Sales or Use Tax. The Contractor shall pay all social security taxes, unemployment insurance, contributions, or other taxes measured by wages of employees, attributable to, or performing the Work.

3.6.2 Add new subparagraph: Municipal authorities are exempt organizations under the provisions of the New Jersey Sales and Use Tax Act, Public Laws of 1966, C.30, 43, 132, 140 and are not required to pay sales tax. The Contractor shall be responsible to notify his subcontractors and suppliers. No allowance will be made by the Owner for any such taxes paid by the Contractor or his subcontractors and suppliers due to the Contractor's failure to file for appropriate exemptions, if applicable.

Para. 3.7 - PERMITS, FEES, NOTICES, AND COMPLIANCE WITH LAWS

3.7.1 Delete entirely and substitute with: The Contractor shall be required to secure permits or government approvals necessary for the proper execution and completion of the work. The Contractor shall obtain business licenses required by the State, County and/or City and shall give all notices and comply with all laws, ordinances, rules, regulations and orders of any public authority bearing on the performance of the work.

1. It shall be the obligation of the Contractor to review the Contract Documents and to determine and to notify the Owner and Architect of any discrepancy between building codes and regulations of which the Contractor has knowledge or should be reasonably able to determine.
2. The Contractor shall not violate any zoning, setback or other requirements of applicable laws, codes and ordinances, building codes, rules or regulations, the Contractor promptly shall notify the Architect, in writing, and necessary changes shall be accomplished by appropriate Modification.

3.7.1.2 Add new subparagraph: The required Building Permit or Permits, including other permits, licenses, and inspections by government agencies necessary for proper execution and completion of the Work that are customarily secured after execution of the Contract and legally required at the time bids are received or negotiations concluded, shall be secured by the Contractor for his trade; or by the Prime Contractor in charge of the Work when the Contract combines more than one trade under a Single Contract. This shall include permits required for the Construction Trailer.

3.7.1.3 Add new subparagraph: The Owner shall be responsible to pay for all permit applications, either directly or as a reimbursement to the Contractor.

3.7.2.1 Add new subparagraph: Subject to the other terms and conditions of these General Conditions, it is not the Contractor's responsibility to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, building codes, and rules and regulations. However, if the Contractor observes that portions of the Contract Documents are at variance therewith, the Contractor shall promptly notify the Architect and Owner in writing, and necessary changes shall be accomplished by appropriate Modification.

3.7.2.2 Add new subparagraph: The Contractor shall comply with all regulations of the Uniform Construction Code of the State of New Jersey and any of its amendments as they are made official.

3.7.2.3 Add new subparagraph: Any standard, code, guide, regulation, or specification referred to in the Contract Documents shall refer to the latest edition or amendment thereto of said standard, etc., as of the date of the Contract, except where a specific edition is noted.

3.7.3 Delete “the costs attributable to correction” in the last sentence and replace with “all costs attributable to the correction thereof or related thereto, including all fines and penalties.

3.7.4 Delete this paragraph in its entirety and replace with the following: "If conditions are encountered at the site which are (1) subsurface or otherwise concealed physical conditions which differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature which differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, then notice by the observing party shall be given to the Architect promptly before conditions are disturbed and in no event later than five (5) calendar days after first observance of the conditions. The Architect will promptly investigate such conditions and, if they differ materially, the Contract Time shall be equitably adjusted by Change Order. In no event shall the Contractor be entitled to, or shall the Contractor claim any additional costs or compensation for concealed conditions.

Para. 3.8 – ALLOWANCES

3.8.2 Delete bullet point (2) in its entirety.

Para. 3.9 – SUPERINTENDENT

3.9.1 In line 1 after assistants add “,acceptable to the Owner and Architect,” and before who shall.

3.9.4 Add new subparagraph: A superintendent for the contractor shall be required for the overall project and a Foreman shall be required at each project site. The number of necessary Assistants to the superintendent shall be the areas where work is in progress shall be adequately supervised by the Contractor's superintendent or one of his assistants. If, in the Architect, Engineer, or Construction Manager’s opinion, the quality or progress of the work are adversely affected by lack of adequate supervision, the Contractor shall be required to increase the number of supervisory personnel at no increase in the Contract sum.

Para. 3.10 – CONTRACTOR'S CONSTRUCTION AND SUBMITTAL SCHEDULES

3.10.1 At the end of the paragraph add the following:

1. Within fifteen (15) days after the date of the notice to proceed, the Contractor shall submit to the Architect, on forms supplied by the Architect, a critical path method (CPM) with arrow network diagram Progress Schedule upon which shall be indicated the dates for starting and the dates for completion of all contracts and all divisions of the work in a manner which will coincide with Time for Completion. Contractor's Construction Schedule shall be in accordance with requirements indicated elsewhere in the Contract Documents.
2. The Contractor shall cooperate and consult with other Prime Contractors during the construction of this Project in the event that this Contract/Project requires other Prime Contractors. The Contractor shall schedule and execute his/her Work so as to avoid delay to other Prime Contractors. The Contractor is financially responsible to the other Prime Contractors for delay caused by him/her to other Prime Contractors on the Project, who are intended to, and shall be, third party beneficiaries of the Contractor's promise herein above stated in accordance with the further provisions of the Contract Documents, including, without limitation, Article 6.2.5 of the General Conditions. If, contrary to the foregoing, another Prime Contractor shall assert a claim, or file an action, directly against the Owner on account of delay for which the Contractor is allegedly responsible, the Contractor and its Surety shall indemnify and hold harmless the Owner and Architect for all such claims, losses or delays of any kind made by another Prime Contractor; provided, however, that this indemnity obligation is for the sole and exclusive benefit of the Owner and Architect and shall not be applied to the benefit of any Prime Contractor.
3. The Contractor shall immediately, after being awarded the contract, prepare and submit to the Architect, a submittal schedule which will be reviewed by the Architect for the orderliness of the submittals by the Contractor. This schedule shall be provided to the Architect for approval by the Architect within (14) fourteen days of receipt of contract by the Contractor. The schedule shall be coordinated with the Project's Construction Schedule and shall allow the Architect reasonable time to review submittals.

3.10.4 Add new subparagraph: The General Construction Work Contractor (and/or the assigned lead Contractor) shall be the Scheduling Coordinator and shall perform all the duties, and assume all of the responsibilities, of the Scheduling Coordinator as set forth in the Contract Documents, and shall in addition to the requirements of other sections of the Contract Documents.

1. If the General Construction Work Contractor fails to perform its duties as the Scheduling Coordinator adequately or to the Owner's satisfaction, the Owner may, in addition to its other rights and remedies, appoint a substitute Scheduling Coordinator who shall act in the place and with the authority of the original Scheduling Coordinator. In that event, the Owner may, in its sole discretion, choose one of the separate prime contractors or an independent consultant as the substitute Scheduling Coordinator. The cost and expense incurred by the Owner to engage such substitute scheduling Coordinator shall be charged to and borne by the General Construction Work Contractor and its Surety.
2. The Contractor's failure to cooperate and participate with the Owner and separate Prime Contractors, if any, in the development and review of construction schedules as provided in this Article 3.10 shall be a material breach of its obligations, entitling the

Owner to exercise all rights and remedies under the Contract Documents and applicable law.

1. In no event shall any revision to any construction schedule constitute the basis for an adjustment in the Contract time or the Contract Sum unless such adjustment is agreed to by the Owner, the Architect and achieved by a Change Order.
2. Float shall belong to the Project, and all "float time" belongs exclusively to Owner and may be used as the Owner, in its sole discretion, determines.

3.10.5 Add new subparagraph: The Contractor shall cooperate with the Owner in providing schedule updates and notification notices which may impact the Owner's operations. The Contractor will coordinate with the Owner to provide school bus companies, trash hauling companies, and others with the proposed construction schedules, anticipated detours, and durations.

3.10.6 Add new subparagraph: The Contractor shall work his forces overtime at his expense if required to maintain the Progress Schedule established.

3.10.7 Add new subparagraph: The Contractor shall make proper assignments of employees in order to preclude labor, jurisdiction, or like dispute and if such disputes arise, to do all things necessary to effect a prompt settlement thereof including reference of such disputes to labor representatives or other established construction industry agencies for resolution, and be bound by their decisions.

3.10.8 Add new subparagraph: The Contractor shall perform the work in accordance with the most recent schedule submitted to the Architect. In the event the Contractor fails to perform work in accordance with the schedule, at the Architect's request, the Contractor shall provide a recovery schedule, reflecting the Contractor's commitment to complete the work in accordance with the contract documents, including but not limited to double shifts, overtime, evening and weekend work, at the Contractor's expense. Nothing contained herein shall be construed so as to prevent the Owner from resorting to its contractual remedies, including but not limited to assessment of liquidated damages, withholding of certification of payment, and termination due to Contractor's failure to perform work in accordance with the schedule.

Para. 3.12 - SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES

3.12.3.1 Add new subparagraph: All submittals shall be marked with the Division and Section number. All submittals will be shipped or delivered to the Architect's office; no job site deliveries will be accepted. (3) three color charts will be submitted for all color charts, no black and white copies will be excepted.

3.12.5 Add new sentence: Submittals which are not marked as reviewed for compliance with the Contract Documents and approved by the Contractor may be returned by the Architect without action.

3.12.7 Add new sentence: Such work shall be in accordance with approved shop drawings.

3.12.10 Add new sentence: The Contractor shall bear full responsibility for any and all costs incurred by the Owner, including architectural fees and attorney's fees in connection with any and all deviations to the Contractors' submittals which were not approved by the Architect.

3.12.11 Add new subparagraph: Informational submittals upon which the Architect is not expected to take responsive action may be so identified in the Contract Documents.

3.12.12 Add new subparagraph: Failure to submit shop drawings in ample time for checking, approval, and resubmission (if required) shall not affect the agreed completion date, if any.

3.12.13 Add new subparagraph: Detailed requirements are specified in the Division 1 Section 01000 relating to "Submittals, Samples, Coordination Drawings, Progress Photographs, and Shop Drawings"

3.12.14 Add new subparagraph: All shop drawings are to include manufacturer's data. All shop drawings and samples are to be submitted by the Contractor to the Architect for review. Each sheet of the shop drawings shall identify the project, contractor, subcontractor, and fabricator or manufacturer and the date of the drawings. All shop drawings shall be numbered in consecutive sequence and each sheet shall indicate the total number of sheets in the set.

3.12.15 Add new subparagraph: All substitutions or deviations from plans and specification must be clearly noted as such on all shop drawings. Contractor shall identify, coordinate and pay for any additional requirements as a result of substitutions, deviations, etc., including necessary change orders. In addition, substitution submittals shall be made no later than 30 days after Notice to Proceed in order to provide time for comparison review. All submittals after 30 days shall be in strict accordance with the basis of design / specified products.

3.12.16 Add new subparagraph: The Contractor is entitled to a maximum of two reviews of each submittal. Subsequent reviews will result in a credit change order to the Owner for the professionals' time required to review these additional submittals.

3.12.17 Add new subparagraph: Work performed contrary to the procedures set forth in this Article 3.12 shall be at the sole risk and expense of the Contractor. All shop drawings used for fabrication and creation shall be those reviewed by the Architect, without change. If change is found to be necessary on any previously reviewed submittal or shop drawing, product date, or sample, it shall be resubmitted with such changes clearly marked for further review.

Para.3.13 - USE OF SITE

3.13.1 Add new subparagraph: The Contractor shall use only specifically assigned areas for storage of materials and construction operations unless other areas are authorized by the Owner. Such areas will be identified after award of Contract by Owner. Comply with local municipal regulations regarding use of and parking on public streets.

3.13.2 Add new subparagraph: The Contractor shall repair streets, drives, curbs, sidewalks, and the existing improvements where disturbed by construction operations and leave them in as good a condition after completion of the work as before operations started.

3.13.3 Add new subparagraph: The Contractor shall not erect any sign without permission of the Architect and Owner.

3.13.4 Add new subparagraph: Only materials and equipment which are to be used directly in the Work shall be brought to and stored on the Project site by the Contractor. After equipment is no longer required for the Work, it shall be promptly removed from the Project site. Protection of construction materials and equipment stored at the Project site from weather, theft, damage and all other adversity is solely the responsibility of the Contractor.

3.13.5 Add new subparagraph: Contractor shall ensure that the Work, at all times, is performed in a manner that affords reasonable access, both vehicular and pedestrian, to the site of the Work and all adjacent areas. The Work shall be performed, to the fullest extent reasonably possible, in such a manner that public areas adjacent to the site of the Work shall be free from all debris, building materials and equipment likely to cause hazardous conditions. Without limitation of any provision of the Contract Documents, Contractor shall use its best efforts to minimize any interference with the occupancy or beneficial use of (1) any areas and buildings adjacent to the site of the Work or (2) the Building in the event of partial occupancy, as more specifically described in Paragraph 9.9.

3.13.6 Add new subparagraph: Without prior approval of the Owner, the Contractor shall not permit any workers to use any existing facilities at the Project site, including without limitation, lavatories, toilets, entrances and parking areas other than those designated by the Owner. Without limitation of any other provision of the Contract Documents, the Contractor shall use its best efforts to comply with all rules and regulations promulgated by the Owner in connection with the use and occupancy of the Project site and the Building, as amended from time to time.

The Contractor shall immediately notify the Owner in writing if during the performance of the Work, the Contractor finds compliance with any portion of such rules and regulations to be impracticable, setting forth the problems of such and suggest alternatives through which the same results can be achieved. The Owner may, in the Owner's sole discretion, adopt such suggestions, develop new alternatives or require compliance with the existing requirement of the rules and regulations. The Contractor shall also comply with all insurance requirements and collective bargaining agreements applicable to use and occupancy of the Project site and the Building.

3.13.7 Add new subparagraph: Location and weights of all equipment and materials and the Contractor intends to place on the slab shall be submitted to the Architect for review.

3.13.8 Add new subparagraph: The General Contractor shall provide a temporary construction fence whether shown on the contract documents or not as required to separate the area or area's under construction from the Owners area or areas used by the public. The temporary fencing shall be approved by the Owner prior to installation. Fence shall be 6' high and have vinyl privacy fabric obstructing views into the construction area.

PARA. 3.15 - CLEANING-UP

3.15.3 Add new subparagraph: Each Contractor shall perform all daily clean up and removal of debris from the site including that of his subcontractors. Each Prime Contractor shall maintain an adequate supply of laborers to accomplish daily clean up and removal of debris from the site and work areas. No debris will be allowed to accumulate in or around the building including masonry debris. This building site must be maintained free of all litter, dirt, dust and debris on a daily basis. The Owner's Team may stop all work and require all personnel on site to clean up. No accumulation of flammable material is permitted. Prior to installation of finishes the floors will be swept or vacuumed and kept free of dust and dirt until turned over to the Owner.

3.15.4 Add new subparagraph: Cleaning and debris removal may be considered a safety concern by judgment of the Owner or his agents and as such the work may be stopped to provide time and labor for immediate clean up.

3.15.5 Add new subparagraph: Final Clean-Up: The Contractor has the responsibility for the final clean-up and policing of the entire site after other contractors have removed their own waste materials, rubbish, equipment, tools and plant. In addition thereto, the General Construction Contractor shall have a professional cleaning company perform the following immediately prior to the Architect's inspection for Substantial Completion:

1. Removal of all manufacturer's temporary labels from materials, equipment and fixtures.
2. Removal of all stains from glass and mirrors; wash, polish, inside and outside.
3. Removal of marks, stains, finger prints, other soil, dust, dirt, from painted, decorated, or stained woodwork, plaster or plasterboard, metal, acoustic tile, and equipment surfaces.
4. Remove spots, paint, soil, from resilient flooring.
5. Remove temporary floor protections; clean, strip and provide three (3) coats of wax on new VCT floors or otherwise treat as directed by the material manufacturer's recommendation, all finished floors. Final vacuum all carpet.
6. Clean all interior finished surfaces, including doors and window frames, and hardware required to have a polished finish, of oil, stains, dust, dirt, paint, and the like; leave without finger prints, blemishes.
7. Final site clean-up shall extend beyond the Contract Limit Lines as reasonably required to insure the complete removal of all construction debris from the entire site, including staging areas.

Para. 3.16 ACCESS TO THE WORK

3.16.1 - Add new sub-paragraph: The Contractor shall promptly notify the Architect and Owner of the presence of hazardous conditions at the site, including the start of hazardous operations or the discovery or exposure of hazardous substances.

3.16.2 Add new subparagraph: Contractor shall be responsible for snow plowing and snow removal as required to maintain access/egress to within the construction area.

3.16.3 Add new subparagraph: Contractor shall keep only necessary equipment on site and shall cooperate with the Owner regarding location of stored material.

3.16.4 Add new subparagraph: Where the erection of steel is required, The Contractor is to maintain reasonable access to site for structural steel erection including crane, steel deliveries, etc. Structural Steel Contractor will be responsible to coordinate requirements with the Contractor a minimum of 21 days prior to deliveries.

Para. 3.18 - INDEMNIFICATION

Delete Paragraphs 3.18.1 in its entirety and substitute the following:

3.18.1 To the fullest extent permitted by law, the Contractor shall indemnify and hold harmless the Owner, Architect, Architect's Consultants, and officials, officers, agents and employees of any of them from and against all claims, damages, and expenses, including, but not limited to attorney's fees, arising out of or in any way related to the performance of the Work. This indemnification agreement in favor of the Owner shall be applicable and the Owner, its agents, officials, officers, servants and employees, shall be indemnified so long as there is not determination by a court of competent jurisdiction or arbitrators that the bodily injury, sickness, disease or death or damage or damage to or destruction of the property which is the alleged basis of the claim, was caused by the sole negligence of the Owner, its agents, officials, officers, servants or employees. The Contractor agrees that pursuant to this indemnification provision, it will pay the attorney's fees, expenses, judgements and settlements made by or on behalf of the Owner, its servants, officials, officers, agents or employees, arising out of claims related to the project unless and until there should be a finding by a court of competent jurisdiction or arbitrators that the damages alleged were caused by the sole negligence or fault of the Owner, its agents, officials, officers, servants or employees.

This indemnification agreement in favor of the Architect, the Architect's Consultants, and their agents and employees, shall be applicable to the Architect, the Architect's Consultants, and their agents, servants and employees, who shall be indemnified completely so long as there is no determination by a court of competent jurisdiction or arbitrators that the bodily injury, sickness, disease or death or damages or destruction of property which is the alleged basis of the claim, was caused by the sole negligence of the Architect, the Architect's Consultants, their agents, servants or employees. The Contractor agrees that pursuant to this indemnification provision, it will pay the attorney's fees, expenses, judgments and settlements made by or on behalf of the Architect, its servants, agents or Consultants, arising out of claims related to the project unless and until there should be a finding by a court of competent jurisdiction or arbitrators that the damages alleged were caused by the sole negligence or fault of the Architect, its agents, servants or consultants.

1. Contractor, for itself, its successors and assigns, agrees to indemnify and save Owner, the individual members (past, present and future), its successors, assigns, employees, agent, Architects, Engineers, harmless from, and against any and all claims, demands, damages, actions or causes of action by any party, together with any and all losses, costs or expenses in connection therewith or related thereto, including, but not limited to, attorney fees and costs of suit, for bodily injuries, death or property damage arising out of or in any way related to the work performed, or to be performed under this Contract. Contractor and its successors and assigns agree to indemnify the Owner, its individual members (past, present and future), its successors, assigns, employees, agents, Architects, and Engineers against all fines, penalties or losses incurred for, including, but not limited to, attorney fees and costs of suit, or by reason of the violation by Contractor in the performance of this Contract, or any ordinance, regulation, rule of law of any political subdivision or duly constituted public authority. Without limiting the foregoing, the Contractor, at the request of Owner, its individual members (past and present), its successors, assigns, employees, agents, Architects, or Engineers, agrees to defend at the Contractor's expense any suit or proceeding brought against Owner, its individual members (past, present and future), its successors, assigns, employees, agents, Architect, Engineers due to, or arising out of the work performed by the Contractor.
2. The Contractor assumes the entire risk, responsibility, and liability for any and all damage or injury of every kind and nature whatsoever (including death resulting therefrom) to all persons, whether employees of the Contractor or otherwise, and to all property (including the Work itself) caused by, resulting from, arising out of or occurring in connection with the execution of the Work, or in preparation for the Work, or any extension, modification, or amendment to the Work

by the Change Order or otherwise. To the fullest extent permitted by law, the Contractor and its Surety shall indemnify and save harmless the Owner, the , the Architect, the Architect's consultants, and agents and employees of any of them (herein collectively called the Indemnitees) from and against any and all liability, loss, damages, interest, judgments, and liens growing out of, and any and all costs and expenses (including, but not limited to, counsel fees and disbursements) arising out of, relating to or incurred in connection with the Work including, any and all claims, demands, suits, actions, or proceedings which may be made or brought against any of the Indemnitees for or in relation to any breach of the Contract for Construction or any violation of the laws, statutes, ordinances, rules, regulations, or executive orders relating to or in any way affecting the performance or breach of the Contract for Construction, whether or not such injuries to persons or damages to property are due or claimed to be due, in whole or in part, to any negligence of the Contractor or its employees, agents, subcontractors, or materialmen, excepting only such injuries and/or damages as are the result of the sole gross negligence of the Owner, or Architect.

Contractor does hereby further covenant, promise and agree to and with the Municipality that it will, at its sole cost and expense, assume the defense of and indemnify and keep indemnified and save harmless the Municipality, each member of the Governing Body, and all of the officers, agents and employees of the Municipality, from and against the claims of all materialmen, all employees and all subcontractors of the Contractor, and all claims, demands, detriment, liability, suits, actions, losses, damages, costs and expenses of any kind, character, name or description, resulting from or arising out of the performance of the contract or the doing of any work, or furnishing and delivering of any machinery, tools, plants, equipment, supplies, materials, or labor provided for herein or therein, or resulting from or arising out of, or brought for or on account or by reason of, any injuries or damages to any person or persons or property, by or from the Contractor any of its operations, or its negligence or carelessness in the performance of the work, or in safeguarding the work, or from improper materials, implements or appliances used, or by or on account of any act of omission, neglect or misconduct of the Contractor, or its agents, servants or employees, or by or on account of any claims or amounts recovered for any infringement or patent, trademark or copyright, or by or from any claims arising or recovered, under any law, ordinance, regulation, order or judgment, including court costs and attorneys' fees incurred in the defense of any litigation instituted by any such party, to which the Municipality, its officials, agents or employees, may be made a party; and further, that it will obtain all releases, discharges or other instruments that may be required by the Municipality to release the Municipality, its officials, agents and employees from any and all claims, demands, detriment, liabilities, suits, actions, losses, damages, costs and expenses of any kind, character, name or description, resulting from or arising out of the performance of this Contract or the furnishing and delivering of any materials, equipment or supplies hereunder.
The whole, or so much of the monies due under and by virtue of the Contract as shall be considered necessary by the Municipality, may at the option of the Municipality be retained until all suits or claims or demands for damages as aforesaid shall have been settled and evidence to that effect furnished to the satisfaction of the Municipality.

3.18.3 Add new sub-paragraph: The obligation of the Contractor under Paragraph 3.18.1 above shall not extend to the liability of the Architect, the Architect's Consultants, and agents and employees and any of them arising out of (1) the preparation or approval of maps, drawings, opinions, reports, surveys, Change Orders, designs or specifications provided that such preparation or approval is the primary cause of the injury or damage, or (2) the giving of or the failure to give directions or instructions by the

Architect, the Architect's Consultants, and agents and employees of any of them provided such giving or failure to give is the primary cause of the injury or damage.

This limitation upon the obligation of the Contractor to indemnify the Architect, the Architect's Consultants, and agents and employees of any of them, shall not be applicable unless and until there is a determination by a court of competent jurisdiction or arbitrators that the preparation or approval of maps, drawings, opinions, reports, surveys, change orders, designs or specifications, or the giving of or the failure to give directions or instructions by the Architect, the Architect's Consultants, and the agents and employees of any of them, is the primary cause of the injury or damage.

3.19 Re-Design (Add new paragraph)

3.19.1 Add new subparagraph: If the Contractor makes, or causes to be made, due to approval of substitute equipment or otherwise, any substantial change in the form, type, system and details of construction from those shown on the Drawings, he shall pay for all costs arising from such changes. Through a credit change order, The Contractor shall reimburse the Owner for all Architectural and Engineering fees required to check the adequacy of such changes. Any changes or departures from the construction and details shown shall be made only after written approval from the Architect.

3.19.2 Add new subparagraph: The Contractor represents and warrants the following to the Owner (in addition to the other representations and warranties contained in the Contract Documents), as an inducement to the Owner to execute the Owner-Contractor Agreement, which representations and warranties shall survive the execution and delivery of the Owner-Contractor Agreement and the final completion of the Work

1. that he/she is authorized to do business in the State, County, and / or City where construction will take place at the Project and is properly licensed by all necessary governmental and public authorities having jurisdiction over him/her and over the Work and the site of the Project;
2. that he/she is familiar with all Federal, State, Municipal and Department laws, ordinances and regulations, which may in any way affect the work of those employed herein, including but not limited to any special acts relating to the work or to the project of which it is a part;
3. that such temporary and permanent work required by the Contract Documents as is to be done by him/her, can be satisfactorily constructed and used for the purposes for which it is intended;
4. that he/she is familiar with local trade jurisdictional practices at the site of the project;
5. that he/she has carefully examined the plans; the specifications and the site of the work, and that from his own investigations, he/she has satisfied himself/herself as to the nature and location of the work, the character, quality and quantity of the surface and subsurface materials likely to be encountered, the character of equipment and other facilities needed for the performance of the work, and the general local conditions, and all other materials which may in any way affect the work or his/her performance;
6. that he/she has determined what local ordinances, if any, will affect his work. He/She has checked for any County, City, Borough, or Township rules or regulations applicable to the area in which the Project is being constructed and in addition, for any rules or regulations of other organizations having jurisdiction, such as chambers-of-commerce, planning commission, industries, or utility companies who have jurisdiction over property on which the Work will be performed. Any costs of compliance with local controls are

included in the prices bid, even if documents of such local controlling agencies are not listed specifically in the Contract Documents.

ARTICLE 4 ARCHITECT

Para. 4.2 - ADMINISTRATION OF THE CONTRACT

4.2.4 Delete entirely and substitute with: Except as otherwise provided in the Contract Documents or when direct communications have been specially authorized, the Owner and Contractor shall communicate with each other through the Architect about matters arising out of or relating to the Contract. Communications by and with the Architect's consultants shall be through the Architect. Communications by and with Subcontractors and material suppliers shall be through the Contractor. Communications by and with Separate Contractors shall be through the Owner.

4.2.4.1 Add new subparagraph:

1. All project communication shall be in typewritten 8 1/2 " by 11" form and shall be transmitted via one of the following methods.
    1. Via first class mail delivered through the U.S. Postal Service.
    2. Via electronic facsimile with receipt confirmation.
    3. Via overnight or common carrier (U.P.S., Fed-X, DHL, etc.)
2. Notice of proposed changes. The Architect shall notify the contractor of all proposed changes to the Contract Documents, after award of Contract, via type written Bulletin, or, in the case of minor changes in the work, via other written instrument (letter or facsimile). The Contractor shall submit a proposal to increase or decrease the contract sum for approval prior to commencing with the Work Change unless there is no change in Contract Sum or time.

4.2.6 Add new sentence: Any such rejection of work shall not relieve the Contractor of the responsibility for maintaining protection of the work and the Owner's property. The Contractor shall provide the means necessary to protect the work until accepted by the Owner.

4.2.12 Delete second sentence.

4.2.14 Add new sentence: Requests for Information shall be made in writing, in a format prescribed by the Architect.

4.2.14.1 Add new subparagraph: All requests for information shall be submitted by the Contractor and shall only be submitted on the Request for Information form provided by the Architect. The Contractor shall clearly and concisely set forth the issue for which the clarification or interpretation is sought and why a response is needed from the Architect. In the Request for Information, the Contractor shall set forth an interpretation or understanding of the requirement along with reasons why such an understanding was reached.

4.2.14.2 Add new subparagraph: The Contractor shall bear all costs associated with the Request for Information including but not limited to architectural fees where such information is available to the contractor from a careful study and comparison of the Contract Documents, field conditions, other Owner-provided information, Contractor prepared coordination drawings, or prior Project correspondence or documentation.

4.2.14.3 Add new subparagraph: The Architect will review all Requests for Information to determine whether they are Requests for Information with the meaning of this term. If the Architect determines that the document is not a Request for Information, it will be returned to the Contractor, unreviewed as to content, for resubmittal on the proper form and in the proper manner.

4.2.14.4 Add new subparagraph: Responses to Requests for Information shall be issued with reasonable promptness after receipt of the request from the Contractor, unless the Architect determines that a longer time is necessary to provide an adequate response. If a longer time is determine to be necessary, the Architect will within five (5) working days of receipt of the request, notify the contractor of the anticipated response time. The Contractor shall not be entitled to any time extension due to the time it takes the Architect to respond to the Request for Information provided that the Architect responds within reasonable promptness.

4.2.14.5 Add new subparagraph: Responses from the Architect will not change any requirement in the Contract Documents. In the event the Contractor believes that a response to a Request for Information will cause a change to the requirements of the Contract Documents, the Contractor shall immediately give written notice to the Owner stating that the Contractor considers the response to be a Change Order. Failure to give such written notice immediately shall waive the Contractor’s right to seek additional time or cost under these General Conditions.

4.2.15 Add new subparagraph: Reference in the technical provisions of the specifications to standard specifications and test methods, including those of the American Society for Testing and Materials, the American Iron and Steel Institute, the American National Standards Institute, the American Society of Mechanical Engineers, the American Society of Heating, Refrigeration and Air Conditioning Engineers, the Factory Mutual System, the National Fire Protection Association, Federal Specifications, and other similar nationally recognized technical societies and agencies shall refer to the editions and revisions current with the date of the Contract Documents.

4.2.16 Add new subparagraph: The Architect's decision with respect to proposed substitutions of material or equipment specified by trade name shall be final. The Architect reserves the right to waive specifications and to accept a proposed substitution which in his opinion is superior to the material or product specified, or to limit the specification to the product specified.

4.2.17 Add new subparagraph: Approval of substitutions shall not relieve the Contractor of responsibility for adequate fulfillment of all the various parts of the work, nor from specified guarantees and maintenance. Modification of adjacent or connecting work required due to any substitution approval shall be provided as part of the substitution.

4.2.18 Add new subparagraph: Insofar as practicable, except as otherwise specified or shown, the material or product of one manufacturer shall be used throughout the work for each specified purpose.

4.2.19 Add new subparagraph: Manufactured articles, materials and equipment shall be applied, installed, connected, erected, used, cleaned and conditioned in strict accordance with the manufacturer's directions. Should such directions conflict with the Specifications, the Contractor shall request clarification from the Architect before proceeding.

ARTICLE 5 SUBCONTRACTORS

Para. 5.2 - AWARD OF SUBCONTRACTS AND OTHER CONTRACTS FOR PORTIONS OF THE WORK

5.2.1 Delete from the first line “as soon as practicable” and replace with “within 15 days”.

5.2.1.1 Add new subparagraph: Identification of Subcontractors required by N.J.S.A. 40A:11-16 shall be provided with the bid specifications in accordance with that statute. The list of proposed subcontractors shall include a description of the materials and equipment each proposes to furnish and install in the work. The description shall be in sufficient detail to allow the Architect to determine general conformance to Contract requirements. Approval of the submittals required under the Article shall not relieve the Contractor from conformance to the Contract Requirements.

5.2.1.2 Add new subparagraph: In accordance with Chapter 150, Laws of 1963: Subcontractors appearing on the Commissioner of Labor and Industry’s current list of sub-contractors who have failed to pay prevailing wages, will be automatically rejected.

5.2.2.1 Add new subparagraph: The Architect will promptly reply in writing to the Contractor stating whether the Owner or Architect, after due investigation, has reasonable objection to any such proposal. If adequate data on any proposed manufacturer or installer is not available, the Architect may state that action will be deferred until the Contractor provides further data. Failure of the Owner or Architect to reply promptly shall not constitute a waiver of any of the requirements of the Contract Documents, and all products furnished by the listed manufacturer must conform to such requirements.

5.2.3 Delete paragraph in its entirety and add the following: "If the Owner or Architect has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner or Architect has no reasonable objection. It shall be clearly understood and agreed to that the Contractor shall do so solely at the Contractor's expense, and that the Contract time and sum shall not be increased."

Pars. 5.3 - SUBCONTRACTUAL RELATIONS

5.3.1 Add new subparagraph: The Contractor shall be fully responsible for coordinating and expediting the work of all subcontractors, and shall employ the necessary and qualified personnel to produce the required quality of labor and materials and to prevent delays in the progress of the Work. Each trade shall be afforded all reasonable opportunities for the installation of its work and for the storage and handling of its materials. The Contractor shall ensure that all work, including incidental work is performed by personnel skilled in the particular trade involved.

The names of all subcontractors and material suppliers shall be submitted for approval to Architect and Owner not later fifteen (15) days after the date of the Award of Contract unless otherwise authorized by the Architect.

1. The list of proposed subcontractors shall include a description of the materials and equipment each proposes to furnish and install in the work.
2. The description shall be in sufficient detail to allow the Architect to determine general conformance to Contract requirements.
3. Approval of the submittals required under this Article shall not relieve the Contractor from conformance to Contract requirements.

4 If the Architect and/or the Owner make reasonable objection to a subcontractor, Contractor shall substitute a subcontractor reasonably acceptable to the Architect and the Owner at no additional cost.

5.3.2 Add new subparagraph: The Contractor shall obligate each subcontractor specifically to comply with the New Jersey Plan of Affirmative Action to avoid discriminatory practice in employment.

5.3.3 Add new subparagraph: The Contractor shall obligate each subcontractor to comply with the applicable prevailing wage schedule of the Department of Labor of the State of New Jersey.

ARTICLE 7 - CHANGES IN WORK

Para. 7.1 – GENERAL

7.1.1.1 - Add new subparagraph: A field directive or field order shall not be recognized as having any impact upon the Contract Sum or the Contract Time and the Contractor shall have no claim therefor unless it shall, prior to complying with same and in no event no later than five (5) working days from the date such direction or order was given, submit to the Owner for the Owner's approval its change proposal.

7.1.1.2 - Add new subparagraph: When submitting its change proposal, the Contractor shall include and set forth in clear and precise detail breakdowns of labor and materials for all trades involved and the estimated impact on the construction schedule. The Contractor shall furnish spreadsheets from which the breakdowns were prepared, plus spreadsheets if requested of any Subcontractors.

7.1.2 Add to the end of the subparagraph: “Neither this Contract nor the Work to be performed hereunder can be changed by oral agreement. No course of conduct or dealings between the parties, nor express or implied acceptance of alterations or additions to the Work and no claims that the Owner has been unjustly enriched by any alteration or addition to the Work, whether there is, in fact, any unjust enrichment to the Work, shall be the basis for any alleged implied agreement by the Owner to the change, any alleged waiver of the Owner's right under this Contract or any increase in any amounts due under the Contract or any or a change in any time period provided for in the Contract Documents.”

7.1.4 - Add new subparagraph: A directive or order from the Owner or Architect, other than a Change Order, a Construction Change Directive or any order for a minor change pursuant to this Article 7, shall not be recognized as having any impact on the Contract Sum or the Contract Time and the Contractor shall have no claim therefor. If the Contractor believes that a directive or order would require it to perform work not required by the Contract Documents, the Contractor shall so inform the Owner or Architect in writing prior to complying with the same and in no event any later than five (5) working days from the day such direction or order was given, and shall submit to the Owner or Architect for their approval its change proposal.

7.1.5 - Add new subparagraph: “If any change in the Work, including a substitution of manufacturers, materials or products, is proposed by the Contractor, after the execution of the Contract, the Owner shall be compensated by the Contractor for the Architect’s additional services and expenses, for reviewing and evaluating such changes and/or substitution requests, whether or not accepted by the Owner. In such case, an appropriate Change Order shall be issued, deducting from payments then or thereafter due the Contractor, the cost of the Architect’s additional services and expenses.” Any

product substitutions are obviously a cost savings effort on the part of the contractor's buy-out process; any substituted product will automatically result in a credit of $350.00 minimum to the owner. If any more "substantial" substitutions are made increased owner credit values will be established based upon the value of components specified, requested for substitution and as mutually agreed upon between the architect and contractor.

Para. 7.2 - CHANGE ORDERS

7.2.2 Add new subparagraph: All changes in the work shall be approved before the start of any work through written consent of the Owner in accordance with the procedure above. Changes not approved in writing by the Owner in advance shall not be recognized as a valid claim at a later date, except where the Owner agrees in writing that the change shall be started, subject to an equitable price adjustment at a later date in the interest of job progress.

The Contractor's overhead and profit on changes, where allowed, shall be determined as a percentage of the actual or estimated cost of such changes, but in no case shall the percentage exceed the following:

.1 For any extra work or portion thereof performed by the Contractor, the cost to the Owner shall include the cost of the extra work plus a maximum allowance of ten percent (10%) for overhead and profit.

.2 For any extra work or portion thereof performed by a Subcontractor(s), the cost to the Owner shall include the cost of the extra work to the Subcontractor plus a maximum allowance of ten percent (10%) for overhead and profit, plus the Prime Contractor's overhead and profit not to exceed five percent (5%) of the Subcontractor's cost.

Among items considered as overhead are engineering costs, costs for shop drawing and change order review, salaries of managers, superintendents, technical engineers, timekeepers, clerks and other office personnel, and costs of small tools, and home office expenses.

Additionally, it shall be clearly understood and agreed to, that all change orders shall include all impact, ripple, or delay costs associated with the execution of that work, and that the Contractor shall not be entitled to any additional compensation or extensions of time due to multiple changes, delays, or causes beyond their control or due to execution of that work.

7.2.3 Add new subparagraph: Any change in work authorized in writing by the Owner or Architect that will require a change in the cost of the work, whether an additive or deductive change in cost, shall show a complete cost breakdown of labor, material, equipment and insurance, and appropriate overhead and profit.

7.2.4 Add new subparagraph: When a Change Order involves both additions and deletions in material, the net quantity is to be determined and the appropriate overhead and profit is to be applied to the net quantity.

7.2.5 Add new subparagraph: When a Change Order involves deletions in materials and labor, the amount of the credit will be equal to the line item on the Schedule of Values or a unit of the value if only a portion of the value is being deleted.

7.2.6 Add new subparagraph: When any change in the Work, regardless of the reason therefore, requires or is alleged to require an adjustment in Contract Time, such request for time adjustment shall be submitted by the Contractor as part of the change proposal. Any Change Order approved by the Owner and for which payment is accepted by the Contractor, in which no adjustment in Contract Time is stipulated, shall be understood to mean that no such adjustment is required by reason of the change, and any and all rights of the Contractor or any subsequent request for adjustment of Contract Time by reason of the change is waived.

7.2.7 Add new subparagraph: Request by the Contractor for adjustment of the Contract Amount regardless of the reason therefore, shall be submitted to the Owner, Architect or Construction Manager with itemized labor and material quantities and unit prices to permit proper evaluation of the request. A submission by the Contractor containing unsubstantiated lump sum requests for adjustment of the Contract Amount will not be considered by the Owner or Architect. The Owner and Architect will not be liable for any delay incurred by reason of the Contractor's failure to submit satisfactory justification and back-up with any request for adjustment to the Contract Amount.

7.2.8 Add new subparagraph: Agreement on any Change Order shall constitute a final settlement of all matters relating to the change in the initial Work which is the subject to the Change Order, including, but not limited to, all direct or indirect costs associated with such change and any and all adjustment to the Contract Sum and the Construction Schedule. The Contractor will not be entitled to any compensation for additional work or delays in the Construction Schedule not included in the Change Order.

7.2.9 Add new subparagraph: Methods used in determining adjustments to the Contract Sum include those listed in Subparagraph 7.3.7.1 but in no case shall exceed 15% total for all work.

7.2.10 Add new subparagraph: Change Orders shall include all costs, including cost of preparation of the change order, all impact and ripple costs associated with modifications or delays to the work an assessment of the amount and impact of any perceived potential delays, and all costs associated with modifications to other work.

.1 The Prime Contractor shall furnish all necessary documentation to support the additional cost, including but not limited to the following:

.1 Copy of subcontractor's proposal.

.2 Complete breakdown for all costs for labor and material.

.3 Complete breakdown of related costs.

.4 Other information as may be requested by the Architect.

7.2.11 Add new subparagraph: The overall cost of the Change Order shall be inclusive and once accepted by the Owner it shall be considered full and final.

7.2.12 Add new subparagraph: No additional time will be granted to the Contractor for an order for a minor change in Work unless each individual change totals more than $100,000.

7.3.6.1 Add new subparagraph: For any extra work or portion thereof performed by the Contractor, the cost to the Owner shall include the cost of the extra work plus a maximum allowance of fifteen percent (15%) for overhead and profit.

.1 For any extra work or portion thereof performed by a Subcontractor(s), the cost to the Owner shall include the cost of the extra work plus a maximum allowance of fifteen percent (15%) for overhead and profit.

.2 For any extra work or portion thereof performed by a Subcontractor(s), the cost to the Owner shall include the cost of the extra work to the Subcontractor plus a maximum allowance of ten percent (10%) for overhead and profit, plus the Prime Contractor's overhead and profit not to exceed five percent (5%) of the Subcontractor's cost.

.3 Cost of bonds and insurance shall be included as part of the overhead and profit.

7.3.6.2 Add new subparagraph: Change Order shall include all costs, including cost of preparation of the change order, all impact and ripple costs associated with modifications or delays to the work an assessment of the amount and impact of any perceived potential delays, and all costs associated with modifications to other work.

.1 The Prime Contractor shall furnish all necessary documentation to support the additional cost, including but not limited to the following:

.1 Copy of subcontractor's proposal.

.2 Complete breakdown for all costs for labor and material.

.3 Complete breakdown of related costs.

.4 Other information as may be requested by the Architect.

7.3.6.3 Add new subparagraph: The overall cost of the Change Order shall be inclusive and once accepted by the Owner it shall be considered full and final.

7.3.6.4 Add new subparagraph: No additional time will be granted to the Contractor for an order of minor change to the work unless each individual change totals more than $100,000.

7.3.6.5 Add new subparagraph: Where they apply, unit prices for additions or deductions as stated in the Contract Documents shall always be used as the basis for determining the cost or credit to the Owner for any changes made no matter what the overall method is used for such determination.

7.3.11 Add new subparagraph: If the Contractor claims that certain work constitutes an addition, deletion, or change to the Work, the Contractor shall so notify the Owner and Architect at least (14) fourteen days before proceeding with such Work, or else any claim by the Contractor for any adjustment to the Contract Sum or the Contract Time on account thereon shall be deemed waived.

.1 If the Contractor gives timely notice and the Owner directs the Contractor to proceed with such disputed work as part of its Work or as a minor change in the Work, the Contractor shall promptly proceed with such disputed work, subject to later resolution in accord with the requirements of the Contract Documents.

.2 In that event, the Contractor shall present, at the end of each day that the Contractor performed the disputed work a summary of the day’s costs attributable to the disputed work, including labor hours and material costs, for verification by the Owner, and Architect.

.3 Only the costs as verified by the Owner and Architect shall be used in computing any increase in costs for the purposes of the adjustment to the Contract Sum, should it later be determined that the Contractor is entitled to such adjustment.

.4 Upon request, the Contractor shall provide to the Owner, and Architect full supporting documentation for all costs claimed.

.5 If and to the extent that the Contractor fails to submit such summary each day, its claim for an adjustment to the Contract Sum shall be deemed waived.

7.5 Add new subparagraph: Right to Audit The Owner shall have the right to appoint an auditor to audit and review the Contractor's financial books and records of account in connection with any claim by the Contractor, Change Order, or Construction Change Directive.

ARTICLE 8 - TIME

Para. 8.1.5 Add the following Definition and subparagraphs.

It is expressly understood and agreed by and between the Contractor and the Owner, that the Contract Time prescribed herein is a reasonable time for the completion of the Work, taking into consideration the average climactic range and the usual industrial and labor conditions prevailing in the locality of the project.

Notice to Proceed

Written Notice to Proceed shall be deemed to have been duly served to the Contractor upon at least one (1) of the following occurrences:

(a) A written purchase order issued by the Owner to the Contractor;
(b) A written Notice to Proceed issued by the Owner or the Architect to the Contractor;
(c) A Notice of Intention to accept his proposal, issued by the Owner or the Architect, accompanied by Agreements for execution by the Contractor.
(d) Executed Agreements between the Owner and the Contractor properly completed with Performance and Payment Bonds, and Certificates of Insurance.

In no case, however, shall the Contractor commence on-site work or construction without proper and fully executed Performance and Payment Bonds and Certificates of Insurance.

Para. 8.2 - PROGRESS AND COMPLETION

8.2.2 Delete "knowingly" in line 1.

8.2.3 Add the following: "The contractor shall give the Architect (7) seven days notice of Substantial Completion, after which the Architect will verify Substantial Competition and perform the punch list. The contractor shall have all punch list items completed within (30) thirty days of reaching Substantial Completion. If for any reason the Contractor fails to complete the punch list in this time, any and all additional architectural fees will be deducted from the remaining contract value.

Contractor agrees to increase manpower, increase work hours, and to increase equipment necessary to maintain the Project Construction Schedule, and when also requested by the Architect and the Owner, and shall be without additional cost or charge to the Owner. Should it become apparent from the current Schedule that the Work will not be completed within the Contract Time, the Contractor agrees that he will, as necessary, take some or all of the following actions at no additional cost to the Owner to improve the progress of the Project:

8.2.3.1 Add new subparagraph: Increase manpower in such quantities and crafts as will substantially eliminate, in the judgment of the Architect, the backlog of Work;

8.2.3.2 Add new subparagraph: Increase the number of working hours per shift, shifts per working day, working days per week, the amount of equipment, or any combination of the foregoing, sufficiently to substantially eliminate, in the judgment of the Architect, the backlog of Work; and/or

8.2.3.3 Add new subparagraph: Reschedule activities to achieve maximum practical concurrence of accomplishment of activities;

8.2.3.4 Add new subparagraph: The Architect may require the Contractor to suggest revisions to the Schedule in writing demonstrating his program and proposed plan to make up the delay to ensure completion of the Work within the Contract Time. If the Architect finds the proposed plan not acceptable, the Architect may require the Contractor to take any of the actions set forth in this Article without additional cost to the Owner to make up the lag in scheduled progress.

8.2.3.5 Add new subparagraph: Should the Contractor fail to achieve Substantial Completion in accordance with the date established in the Contract Documents, the Contractor shall reimburse the Owner for all professional fees plus expenses incurred by the Owner for additional services require of the Architect, Engineer, and Owner's Attorney resulting from the failed performance by the Contractor to meet the Contract Substantial Completion Date.

8.2.4 Add new subparagraph: "The Contractor shall be responsible for the preparation of a complete and comprehensive progress schedule giving the dates of beginning and completion of the various divisions of the Work. The Contractor shall be charged with the duty of coordinating the work of all sub-contractors involved. He shall advise them when the work at the site will be ready for their installations and cooperate with each to expedite the work.

The Contractor shall prepare and furnish to the Architect and Owner six (6) copies of the completed agreed-upon progress schedule, within fifteen (15) days after receipt of the executed copy of his Agreement, for the Owner and Architect's information.

By submitting his proposal, the Contractor will be deemed to have agreed that the completion date stated in his proposal provides a reasonable time for performance of the work hereunder, taking into consideration the average climatic range and usual industrial and labor conditions prevailing in the locality of the Project."

8.2.5 Add new subparagraph: Work shall commence within ten (10) days of the issuance by Owner of a Notice to Proceed and shall proceed uninterrupted to Final Completion. The Contractor acknowledges and recognizes that the Owner is entitled to full and beneficial occupancy and use of all or part of the completed Work in accordance with the Milestone Dates set forth in other sections of the Contract Documents, as per approved Schedule, and that the Owner has made arrangements to discharge its public obligations based upon the Contractor's achieving Substantial Completion of all of the Work within the Contract Time. The Contractor further acknowledges and agrees that if the Contractor fails to complete substantially or cause the Substantial Completion of any portion of the Work as required by the Project Construction Schedule and/or within the Contract Time, the Owner will sustain extensive damages and serious loss as a result of such failure. The exact amount of such damages will be extremely difficult to ascertain. Therefore, the Owner and the Contractor agrees as set forth below.

.1 If the Contractor fails to achieve partial completion within the requirements of the Milestone Dates or the approved Schedule or to achieve Substantial Completion of all or part of the Work when and as required by the Project Construction Schedule and/or within the Contract Time, the

Owner shall be entitled to retain or recover from the Contractor and its Surety, as liquidated damages and not as a penalty, the amounts indicated in other sections of the Contract Documents and commencing upon the first day following expiration of the Project Construction Schedule and/or the Contract Time, as the case may be, and continuing until the actual Date of Substantial Completion.

Para.. 8.3 - DELAYS AND EXTENSIONS OF TIME

8.3.1.1 Add new subparagraph:

.1 Any direct claim against Owner for delay costs caused by another Prime Contractor shall be subject to the provisions of Article 8.3.3.

8.3.2.1 Add new subparagraph: Any claim for extension of time shall be made in writing to the Architect not more than five (5) days after the commencement of the delay, otherwise, it shall be waived. The Contractor shall provide an estimate of the probable effect of such delay on the progress of the work. No claim made beyond the five (5) days shall be considered valid.

8.3.2.2 Add new subparagraph: The Contractor agrees that if any delay in the Contractor's works unnecessarily delays the work of any other Contractor or Contractors, the Contractor shall in that case pay, or reimburse the Owner through a credit change order, all costs and expenses incurred by such parties due to such delays and hereby authorizes the Owner to deduct the amount of such costs and expenses from any moneys due or to become due the Contractor under this Contract. The Architect shall be responsible for ascertaining whether the Contractor is responsible for delaying any of the work of any other Contractor. The Architect's decision shall be final.

8.3.2.3 Add new subparagraph: Notwithstanding anything to the contrary in the Contract Documents, any extension of the Contract Time, to the extent permitted under Paragraph 8.3.1., shall be the sole remedy of the Contractor for any (1) delay in the commencement, prosecution or completion of the Work, (2) hindrance or obstruction in the performance of the Work, (3) loss of productivity or (4) other similar claims (collectively referred to in this Paragraph 8.3.3. as "delays"), whether or not such delays are foreseeable, unless a delay is caused by acts of the Owner constituting active interference with the Contractor's performance of the Work and only to the extent such acts continue after the Contractor furnishes the Owner with written notice of such interference. In no event shall the Contractor be entitled to any compensation or recovery of any damages in connection with any delay including without limitation consequential damages, lost opportunity cost, impact damages or other similar remuneration. The Owner's exercise of any of its rights or remedies under the Contract Documents (including without limitation ordering changes in the Work or directing suspension, rescheduling or correction of the Work) regardless of the extent or frequency of the Owner's exercise of such rights or remedies shall not be construed as an act of interference with the Contractor's performance of the Work. This Section 8.3 does not preclude recovery of damages for delay by either party under other provisions of the Contract Documents.

8.3.2.4 Add new subparagraph: The Contractor agrees that the Owner can deduct from the Contract Sum, any wages paid by the Owner to any Inspector or Architect or other professional necessarily employed by the Owner for any number of days in excess of the number of days allowed in the specifications for completion of work.

8.3.2.5 Add new subparagraph: Where the cause of delay is due to weather conditions, an extension of time shall be granted only for unusually severe weather, as determined by reference to historical data.

8.3.3 Delete paragraph in its entirety and add the following: "No payment or compensation or claim for damages shall be made by the Owner to the Contractor as compensation for damages for any delays or hindrances from any cause whatsoever in the progress of the Work, notwithstanding whether such delays be avoidable or unavoidable. The Contractor's sole remedy for delays shall be an extension of time only, pursuant to and only in accordance with this Paragraph 8.3, such extension to be a period equivalent to the time lost by reason of and all of the aforesaid causes. In no event shall the Owner or Architect be held responsible for any loss or damage or increased costs sustained by the Contractor through any delays caused by the Owner, or Architect or any other Prime Contractor. If, contrary to the foregoing provision, the Contractor commences a direct action against the Owner or Architect seeking to recover delay costs and fails to substantially prevail in its claim that the Owner was the cause of the alleged delay, the Contractor shall reimburse the Owner, and the Architect as the case may be for any attorneys' fees, professional fees and all other costs and expenses incurred by them associated with analyzing, defending or otherwise opposing any such action; provided, however, that where the delay alleged by the Contractor arises from acts, omissions, or default of another Prime Contractor or another other Prime's Subcontractors and suppliers, then the provisions of Subparagraph 8.3.1 shall apply.

.1 Where the cause of delay is due to weather conditions, extension of time shall be granted only for unusually severe weather, as determined by reference to historical data. "

8.3.4 Add new subparagraph: The Contractor agrees that the Owner can deduct from the Contract Sum, any wages paid by the Owner to any Inspector or Architect or other professional necessarily employed by the Owner for any number of days in excess of the number of days allowed in the specifications for completion of work.

8.3.5 Add new subparagraph: The Contractor is required to submit at any construction conference considering any claim and at any proceeding considering an extension of time, and in all subsequent administrative proceedings, all files, records, and the documents of whatever kind pertaining to the Contractor's performance of the project work, the job budget, the summary of all supporting data worksheets and other documents prepared in connection with the submittal of the Contractor's successful bid.

8.3.6 Add new subparagraph: The Owner may suspend the whole or any part of the work, if it shall deem it for the best interest of the Owner to do so, without compensation to the Contractor for such suspension other than extending the time for completion of the work as much as it may have been delayed by such suspension. During such suspension, all materials delivered to but not placed in the work, shall be neatly piled by the Contractor so as not to obstruct public travel, or shall be removed from the line of work at the direction of the Owner and, unless the materials are moved by the Contractor upon such direction, the materials shall be removed by the Owner and expense thereof will be charged to the Contractor.

ARTICLE 9 PAYMENTS AND COMPLETION

Para. 9.2-SCHEDULE OF VALUES

9.2.1 Add: the schedule of values shall be submitted on the AIA G702- most recent form.

9.2.2 Add new subparagraph: Contractor must provide draft copies of the Schedule of Values, within fifteen (15) days from Notice to Proceed. Submit two (2) copies to the Architect.

.1 Schedule of Values shall include cost of work at each Building and for each Project and shall include Architect's Special Project Number. Schedule of values shall

include materials and installation and in accordance with each specification section as listed in the Specification Index, as shown on drawings and /or as directed by the Architect. Contractor shall include separate line items for the following:

.1 Bonds,
.2 Insurance,
.3 Mobilization,
.4 General Conditions,
.5 Contractor Construction Schedule
.6 Submittals, (Product Data, Samples and Shop Drawings),
.7 As-built drawings, and similar requirements as per section for Closeout Documents,
.8 Punch list items, and Closeout Documents as per section for Closeout Documents,
.9 Final Cleaning.
.10 Other items as directed by the Architect.

.2 Contractor shall enclose with Schedule of Values copies of invoices and/or cancelled checks from bonding and insurance agents for the required cost of the coverage for the project being billed.

Para. 9.3 APPLICATIONS FOR PAYMENT

9.3.1 In the first (1st) line change "ten days" to read "fifteen (15) business days."

9.3.1 Add new sentence: The application for payment shall be on approved AIA G702 forms and shall be accompanied by a partial waiver of liens from the Contractor and, if requested, from any Subcontractors, in a form acceptable to Owner and Architect.

9.3.2 Add new sentence: "The Contractor shall assume responsibility to protect all such materials from loss or damage at no cost to the Owner until Substantial Completion, whether or not they have been paid for by the Owner. The Contractor shall be held responsible for the cost of repairing or replacing any materials that are damaged or missing."

9.3.2.1 Add new subparagraph: To encourage early purchase, Owner may pay for stored materials and equipment, at their sole discretion. The following procedures must be followed in order to obtain payment.

.1 A certificate of insurance naming the Owner as loss beneficiary for the full dollar amount representing the materials stored.
.2 A consent of surety in the amount being requisitioned, said surety being the bonding company of the prime contractor.
.3 Materials to be stored in warehouse must be inspected by the Architect/Engineer and Contractor will not receive extra compensation for storage costs.
.4 Any time and traveling expenses for the Construction Inspector to visit and inspect equipment stored will be borne by the contractor making the off-site storage request.
.5 Payment invoices for materials stored off site shall be so noted.
.6 After the receipt of the above, the Construction Inspector will endorse same and forward to the Owner for their approval.
.7 Payment invoices not following the above format will be rejected in total.

.8 There will be no storage space available in existing buildings. Space in new building may be used for storage only if approved in writing by Architect/Engineer and all contractors having work in the area.

.9 The Contractor will be paid for stored materials no more than the actual or replacement value of the materials. The Contractor will furnish vendors price lists, priced inventories or other documentation to support claims for payment of materials stored on or off site.

9.3.4 Add new subparagraph: The Owner reserves the right to settle any disputed mechanic's or materialmen's lien claim by payments to the lien claimant or by such other means as the Owner, in its sole discretion, determines is the most economical or advantageous method of settling the dispute. The Contractor shall promptly reimburse the Owner, upon demand, for any payments so made.

Para. 9.4 CERTIFICATES FOR PAYMENT

9.4.1 In the first (1st) line change "seven days" to read " fifteen (15) business days."

9.4.2 In second (2nd) line Add "and inspection" after "evaluation" .

Para. 9.5 DECISIONS TO WITHHOLD CERTIFICATION

9.5.1.6 - Delete "and" and add "or" in line 1.

9.5.1.7 - Delete "repeated."

9.5.1.8 Add new subparagraph: Failure of mechanical trades or electrical trades Subcontractors to comply with mandatory requirements for maintaining record drawings. The Contractor shall be required to check record drawings each month. Written confirmation that the record drawings are up-to-date shall be required by the Architect before approval of the Contractor's monthly payment requisition will be considered.

9.5.1.9 Add new subparagraph: Avoidable delay in the progress of the Work.

9.5.1.10 Add new subparagraph: deliberate delay in the submission for approval of names of subcontractors, materialmen, sources of supply, product data, shop drawings and samples; or

9.5.1.11 Add new subparagraph: otherwise failing to comply with the requirements of the Contract Documents.

9.5.5 Add new subparagraph:

.1 If the Contractor disputes any determination by the Architect with regard to any Certificate of Payment, the Contractor nevertheless expeditiously shall continue to prosecute the Work.

.2 The failure of the Owner to retain any percentage payable to the Contractor or any change in or variation of the time, method or condition of payments to the Contractor shall not release or discharge to any extent whatsoever the Surety upon any bond given by Contractor hereunder. The Owner shall have the right, but not the duty, to disregard any schedule of items and costs that the Contractor may have furnished and defer or

withhold in whole or in part any payment if it appears to the Owner, in its sole discretion, that the balance available in the Contract Sum as adjusted and less retained percentages, may be insufficient to complete the Work.

.3 Notwithstanding any provision of any law to the contrary, the Contractor agrees that the time and conditions for payment under the Contract for Construction shall be as stated in the Contract for Construction and in the Contract Documents. The Contractor specifically agrees that Owner's failure to give, or timely give, notice of:

.1 any error in an invoice or application for payment submitted by the Contractor for payment; or

.2 any deficiency or non-compliance with the Contract Documents with respect to any Work for which payment is requested, shall not waive or limit any of the Owner's rights or defenses under the Contract for Construction and the Contract Documents, or require the Owner to make a payment in advance of the time, or in an amount greater than, as provided by the Contract for Construction.

.4 The Contractor shall make payments to its subcontractors in accordance with the provisions of any applicable law governing the time, conditions, or requirements for payment to its Subcontractors, and shall comply with the provisions of any such law.

.1 The Contractor will pay its Subcontractors no later than (15) fifteen days after receipt of a payment from the Owner which includes payment for the work of any such Subcontractors.

.2 The Contractor shall require its Subcontractors, by appropriate agreement, to pay their subcontractors and suppliers (of any tier) within the same time.

.3 The Contractor (and its Surety) shall at its sole cost and expense, assume the defense of and indemnify and keep indemnified and save harmless the Owner, each member of the Governing Body, and all of the officers, agents and employees of the Owner, from and against any and all claims arising out of or in any way related to Contractor's failure to comply with these requirements.

Para. 9.6 PROGRESS PAYMENTS

9.6.1 Add the following at the end of the subparagraph:

Notwithstanding certification by the Architect, the Owner may refuse to make payment based on any default by the Contractor including, but not limited to those defaults set forth in subparagraphs 9.5.1 through 9.5.1.8. The Owner shall not be deemed in default by reason of withholding payment while any of such defaults by the Contractor remain uncured.

Para 9.7 - FAILURE OF PAYMENT

9.7 - In the first (1st) line, change "seven days" to read "twenty-one (21) business days."

In the second (2nd) line, after "Owner does not," add ", for reasons other than a default of the Contract, including but not limited to those defaults set forth in Subparagraphs 9.5.1.1 through 9.5.1.8", change "seven days" to read "twenty-one (21) days."
In line 3 and 4 delete "binding dispute resolution" and substitute "Court of Law"

In the fourth (4th) line, change “seven additional days” to read “fourteen (14) additional business days.”

Delete the last sentence.

9.7.1 Add new subparagraph: If the Owner is entitled to any reimbursement or payment from the Contractor under or pursuant to the Contract Documents, such payment shall be made promptly upon demand by the Owner. Unless otherwise stated in the Contract Documents, if the Contractor fails to promptly make any payment due the Owner, or the Owner incurs any expenses to cure any default of the Contractor, the Owner shall have an absolute right to offset such amount against the Contract Sum and may, in the Owner’s sole discretion, elect either to: (1) deduct an amount equal to that which the Owner is entitled from any payment due the Contractor, or (2) issue a written notice to the Contractor reducing the Contract Sum by an amount equal to that which the Owner is entitled.

9.8 SUBSTANTIAL COMPLETION

9.8.1 - Modify as follows: Line 1, after "thereof," add "(which the Owner agrees to accept separately)"; and add at the end of the subparagraph: "The Work will not be considered substantially complete until all project systems included in the Work are operational as designed and scheduled, all designated or required inspections, certifications, permits, approvals, licenses and other documents from any governmental authority having jurisdiction thereof necessary for the beneficial use and occupancy Project are received, designated instruction of Owner's personnel has been completed, and all final finishes within the Contract are in place. In general, the only remaining Work shall be minor in nature, so that the Owner can occupy the building on that date and the completion of the Work by the Contractor would not materially interfere or hamper the Owner's (or those claiming by, through or under the Owner) normal operations. Contractor recognizes that normal operations requires the use and occupancy of the Work by students and faculty without interruption and that any punchlist or corrective work shall be done at times when the Work is not so occupied. As a further condition of substantial completion acceptance, the Contractor shall certify that all remaining Work will be completed within thirty (30) consecutive calendar days or as agreed upon following the date of substantial completion.

9.8.1.1 Add new subparagraph:

.1 Owner's beneficial occupancy must be approved by all governing authorities having jurisdiction and by issuance of a temporary or permanent "Certificate of Occupancy" and in accordance with all applicable Codes and Regulations.

.2 Substantial Completion occurs when each of the following conditions precedent has occurred:

.1 the Work has been sufficiently completed in accordance with Contract Documents so that the Owner obtains beneficial use and occupancy of the Work;

.2 certificates of occupancy and any other permits, approvals, licenses, and other documents from any governmental authority having jurisdiction thereof necessary for the beneficial occupancy of the Project have been received by the Owner; and

.3 the Architect has issued a certificate of Substantial Completion. The date of Substantial Completion is the date certified by the Architect in accord with the Contract Documents, and shall follow the Contractor’s

Notification for Substantial Completion inspection and the Architect's inspection of the Project.

9.8.2 Delete paragraph in its entirety and add the following: "Unless otherwise indicated in the Contract Documents, no later than (30) thirty calendar days, prior to the date scheduled for Substantial Completion, the Contractor shall prepare and submit to the Architect, and Owner a comprehensive punchlist of items remaining to be completed or corrected.

.1 No later than (15) fifteen calendar days prior to date scheduled for Substantial Completion the Contractor, Owner, and Architect shall attend a preliminary punch list meeting on-site to review the punchlist provided by the Contractor and note any additional items requiring completion or correction.

.2 No later than (10) ten calendar days prior to date scheduled for Substantial Completion the Architect, and/or Owner may add additional items requiring completion or correction.

.3 The Contractor shall immediately proceed with the Work required by the punchlist and shall complete and correct items on or added thereto by the date scheduled for Substantial Completion.

.4 When the Contractor determines that the Work has reached Substantial Completion, or when the Owner, Architect, so determine and direct the Contractor to do so, the Contractor shall request the Architect's final inspection to determine Substantial Completion, shall prepare and submit to the Architect, and Owner its final Application for Payment submitted in compliance with the requirements of the Contract Documents and shall thoroughly reinspect the Work and prepare and submit to the Architect, and Owner a comprehensive final punchlist of any and all items remaining to be completed or corrected (whether or not included on any previous punchlists).

.1 Within (14) fourteen calendar days after receipt of the Contractor's request and final punchlist, the Architect will inspect the Work to determine whether Substantial Completion has occurred.

.2 If the Architect determines that Substantial Completion has not occurred, it shall advise the Contractor and the Owner of the reasons for their determination, and the Contractor shall continue with the Work and request another inspection for Substantial Completion and submit another final punchlist after the concerns of the Architect have been addressed.

.1 The fees and expenses incurred by the Owner for services of the Architect as a result of any additional re-inspections of the Work, shall be paid directly or reimbursed to the Owner by the Contractor or its Surety.

.3 When the Architect determines after an inspection under this paragraph that Substantial Completion has occurred, the Architect shall:

.1 add to the Contractor's final punchlist any additional items which they discover which also need to be completed or corrected;

.2 determine and certify the amount required to complete each items on the punchlist, basing such determination and certification upon the amount the Owner would have to expend or incur to complete each such item if the Contractor failed to do so; and

.3 prepare and issue a Certificate of Substantial Completion, which shall establish the date of Substantial Completion.

.4 The Contractor shall proceed promptly to complete and correct items on the final punchlist within (30) thirty calendar days of the date of Substantial Completion or prior date established for final completion in other sections of the Contract Documents.

.5 Upon completion of correction of the punchlist items, the Contractor shall submit to the Architect a copy of the punchlist document, with each item individually initialed, indicating the Contractor's addressing of each item on a line-by-line or point-by-point basis.

.6 The failure of any items to appear on any punchlist shall not constitute an acceptance of any Work not in accord with the Contract Documents nor relieve the Contractor or its Surety of responsibility with respect thereto.

.7 Warranties required by the Contract Documents shall commence on the approved date of Substantial Completion of the Work for the entire project unless otherwise provided in the Certificate of Substantial Completion.

.8. The Architect shall submit the Certificate of Substantial Completion to the Owner and Contractor. If not completed within this time, Owner may proceed to finish the Work as otherwise provided in this Agreement."

9.8.2.1 - Add new subparagraph: The Architect's Certificate of Substantial Completion shall be subject to the Owner's final approval.

9.9.1 Delete paragraph in its entirety and add the following: "The Owner reserves the right to require the Contractor to so organize his Work that portions of the Work will be complete and ready for occupancy before the entire completion of the Project. The Owner reserves the right to take possession and occupy any portion of the Work prior to the completion of the entire Work without waiving any of the provisions or requirements of the Contract, particularly in regard to time of completion, acceptance of the Work, protection and responsibility and insurance."

9.9.2 Delete paragraph in its entirety and add the following: "Prior to such occupancy, however, the Architect, a representative of the Owner, and the Contractor shall fully inspect the portions of the Work to be occupied, preparing a complete Punch List. Upon occupancy the Owner shall assume responsibility for damage to the Work and to any items not on the Punch List when such damage is due to greater than normal wear and when used for the purpose intended. The Owner shall not assume responsibility for improper or defective workmanship or materials."

9.9.3 Delete paragraph in its entirety and add the following: "The occupancy of any portion of the Work shall not constitute acceptance of any Work, except as hereinafter stated, nor does it waive the Owner's right to liquidated damages because Final Acceptance of the Work shall be for the whole Work only and not in part."

9.9.4 Add new subparagraph: As portions of the Project are completed, and occupied, Contractor shall ensure the continuing construction activity will not unreasonably interfere with the use, occupancy and quiet enjoyment of the completed portions thereof.

.1 The Contractor agrees to coordinate the Work with the Architect and the Owner in order to minimize disturbance to occupied portions of the structure.

.2 In the event performances or scheduled events by the Owner are conducted in close proximity to the Work in progress, the Contractor agrees to cease all work which may disturb the Owner's occupants at the site. Use and occupancy by the Owner prior to Work acceptance does not relieve Contractor of his responsibility to maintain all

insurance and bonds required of the Contractor under the Contract until the entire work is completed and accepted by the Owner.

9.9.5 Add new subparagraph: Occupancy by the Owner shall not be deemed to constitute a waiver of existing claims on behalf of the Owner or Contractor against each other.

9.10 FINAL COMPLETION AND FINAL PAYMENT

9.10.1 Add the following at the end of the subparagraph: All warranties and guarantees required pursuant to the Contract Documents shall be assembled and delivered by the Contractor to the Owner as part of the final application for payment. The final Certificate for Payment will not be issued by the Architect until all warranties and guarantees have been received and accepted by the Owner.

9.10.1.1 - Add new subparagraph: The Architect's Certificate of Final Completion shall be subject to the Owner's final approval.

9.10.2 Add the following conditions before final payment is due under the Contract Documents:

(7) evidence of compliance with all requirements of the Contract Documents: notices, certificates, affidavits, other requirements to complete obligations under the Contract Documents: including but not limited to: (a) instruction of Owner's representatives in the operation of mechanical, electrical, plumbing and other systems; (b) delivery of keys to Owner with keying schedule: master, sub-master and special keys; (c) delivery to Architect of Contractor's General Warranty and each written warranty and assignment thereof prepared in duplicate, certificates of inspections, and bonds for Architect's review and delivery to Owner; (d) delivery to Architect a printed or typewritten operating, servicing, maintenance and cleaning instructions for all Work; parts lists and special tools for mechanical and electrical Work, in approval form; (e) delivery to the Architect of specified Project record documents; (f) delivery to Owner of a Final Waiver of Liens (AIA Document G-706 or other form satisfactory to Owner), covering all Work including that of all Subcontractors, vendors, labor, materials and services, executed by an authorized officer and duly notarized. In addition to the foregoing, all other submissions required by other articles and paragraphs of the Specifications including final construction schedule shall be submitted to the Architect before approval of final payment.

9.10.6 Add new subparagraph:

.1 If more than one inspection for Final Completion is required, the Contractor will be billed and responsible for the professional fees and services of the Architect through a credit change order to the Owner.

.2 Following Substantial Completion, in the event the Contractor or its subcontractor fails to complete the list of items of the Work instructed by the Architect to be corrected or completed within fourteen (14) days after the date of receipt of Certificate of Substantial Completion, the Owner may

.1 exercise any available remedies to correct or complete deficient work or retain a third party to correct or complete such work at the cost of the defaulting contractor; and

.2 retain and deduct from any payments or retention otherwise due to the defaulting contractor any fees and expenses for services required to be provided by the Architect more than twenty-one (21) days after the Date of Substantial Completion.

DIVISION 00 - BIDDING AND CONTRACT REQUIREMENTS
SECTION 00410 - SUPPLEMENTAL GENERAL CONDITIONS

ARTICLE 10 - PROTECTION OF PERSONS AND PROPERTY

Para 10.2 - SAFETY OF PERSONS AND PROPERTY

10.2.3 In the second to last line after "utilities" add the following: "consistent with applicable laws, statutes, ordinances, codes, rules and regulations and lawful orders of public authorities, and prevailing industry practice."

10.2.6 Add new sentence: The Contractor shall immediately report all accidents, injuries, or health hazards to the Owner, or his designated representative, in writing. This shall not obviate any mandatory reporting under the provisions of the Occupational Safety and Health Administration Act of 1970.

10.2.9 - Add new subparagraph: Contractor shall comply with all regulations required by the Federal Occupational Safety and Health Act (OSHA).

10.2.10 - Add new subparagraph: The Contractor shall conform to all applicable New Jersey Department of Environmental Protection regulations.

10.2.10.1 Add new subparagraph: The Contractor shall protect all materials and equipment for which he/she is responsible, which is stored at the Project Site for incorporation in the work, or which has been incorporated into the work. He/she shall replace at his/her expense all such materials and equipment which may be lost, stolen or damaged, whether or not such materials or equipment have been entirely or partially paid for by the Owner.

10.2.11 - Add new subparagraph: Contractors must comply with Construction and Environmental Standards contained in Federal and State Regulations and other applicable laws.

10.2.12 - Add new subparagraph: It is the Contractor's responsibility to determine the existence of potentially hazardous materials, including lead, and to protect his workmen and the work area.

10.2.13 - Add new subparagraph: The Contractor shall provide and maintain in good operating condition suitable and adequate fire protection equipment, and shall comply with all reasonable recommendations regarding fire protection made by the representatives of the fire insurance company carrying insurance on the Work or by the local fire chief or fire marshal. The area within the site limits under the Contractor's control shall be kept orderly and clean, and all combustible rubbish shall be promptly removed from the site.

10.2.14 - Add new subparagraph: The Contractor shall remove snow or ice which may accumulate on the site within areas under his control which might result in damage or delay.

10.2.15 - Add new subparagraph: The Contractor shall take all precautions necessary to prevent loss or damage caused by vandalism, theft, burglary, pilferage, or unexplained disappearance of property of the Owner and Contractor, whether or not forming part of the Work, located within those areas of the Project to which the Contractor has access. Whenever unattended, including nights and weekends, mobile equipment and operable machinery shall be kept locked and made inoperable and immovable.

10.2.16 - Add new subparagraph: Neither the Owner nor the Architect shall be responsible for providing a safe working place for the Contractor, the Subcontractors or their employees, or any individual responsible to them for the work.

10.2.17 - Add new subparagraph: The Contractor shall conform to requirements of OSHA, the Construction Safety Code of the State Department of Labor and those of the AGC Manual. The requirements of the New Jersey and Local Building Construction Codes shall apply where there are equal to or more restrictive than the requirements of the Federal Act.

10.2.18 - Add new subparagraph: When all or a portion of the Work is suspended for any reason, the Contractor shall securely fasten down all coverings and protect the Work as necessary from injury or any cause.

10.2.19 - Add new subparagraph: The Contractor shall promptly report in writing to the Owner and Architect all accidents arising out of or in connection with the Work which caused death, personal injury or property damage giving full details and statements of any witnesses.

10.2.20 - Add new subparagraph: Contractor is required to follow and enforce the work rules set forth below. Failure to comply with or enforce any of these rules will be grounds for suspension and/or termination of this Contract:

(1) No use of alcoholic beverages prior to or during working hours. Anyone found impaired at any time will be escorted from the Project site.

(2) No use of illegal drugs or prescription medications which could induce drowsiness or otherwise impair perception or performance. Use of illegal drugs may result in prosecution to the fullest extent of the law. Any warning associated with use of prescription drugs must be complied with, particularly warning against operation of machinery and equipment.

(3) No horseplay or rough-housing will be allowed.

(4) No sexual, racial, or ethnic harassment, or similar conduct will be tolerated.

(5) All employees shall use proper sanitation habits including use of toilet facilities and garbage cans.

(6) All employees shall dress in clothing appropriate for the work they are to perform. All personnel are to wear hardhats, safety shoes, glasses, gloves, masks or respirators, noise protection devices, and other protective clothing and equipment as required by OSHA standards.

(7) All equipment is to be properly stored and/or secured at the end of the work day or if it is to remain idle for greater than one hour.

(8) All personnel are to be made aware of the availability of Material Safety Data Sheets for materials used at the Project site. This information is available from the Contractor using the product. The Contractor shall maintain a copy of all MSDS forms at the construction site office for all personnel to review.

Para 10.3 – HAZARDOUS MATERIALS AND SUBSTANCES

10.3.4 After the word fault in the last line, add the word ", misuse" before "or negligence".

Para. 10.4 - EMERGENCIES

10.4.2 Add new subparagraph: "The Contractor shall furnish to the Owner and Architect, in writing, the names, addresses, and telephone numbers of appropriate managerial personnel of the organization to be contacted in the event of an out-of-hours emergency."

Para. 10.5 – Add new paragraph - DAMAGES TO OTHERS

10.5.1 Add new subparagraph: The Contractor shall be responsible for all damage to persons or property, caused or alleged to have been caused by or incident to the execution of this Work, and shall defend suits or claims arising or incidental to the Work without expense or annoyance to the Owner or the Architect; the Owner having the right to retain out of any payment sufficient money to settle any such claims.

10.5.2 Add new subparagraph: Should the Contractor, its workmen, Subcontractor, materials, tools or equipment cause damage to the building, property, materials, or equipment of others, such shall be repaired or replaced to the satisfaction of the Architect by the party originally furnishing or installing it; such replacing or repairing being done under the direction of the Architect and the cost of the damage being paid by the Contractor causing the damage. All guarantees or warrantees voided by such damage shall be reinstated in full upon repair or replacement, the cost of such being paid by the Contractor causing the damage.

ARTICLE 11 – INSURANCE AND BONDS

Delete Article 11 in its entirety and substitute the following:

11.1 CONTRACTOR'S LIABILITY INSURANCE

11.1.1 The Contractor shall provide and maintain at his own expense and without expense to the Owner, until final acceptance of the work covered by the Contract, insurance as will protect him from claims imposed by law and of the kinds and in the amounts hereinafter provided, covering all operations under the Owner-Contractor Agreement whether performed by him or by subcontractors or by anyone directly or indirectly employed by any of them or anyone for whose acts anyone of them may be liable. All Certificates of Insurance required hereunder shall be submitted to the Owner within ten (10) days of notification of award of the Contract, but in no event later than the commencement of work under the Contract.

11.1.2 Workmen's Compensation: A policy covering the workers compensation, disability benefit and other similar employee benefit obligations of the Contractor, as required by the State of New Jersey, covering all operations under the Owner-Contractor Agreement.

11.1.3 Liability Insurance: A policy covering claims for damages because of bodily injury, occupational sickness or disease or death of his employees and all other persons, and claims insured by usual

personal injury liability coverage, including claims arising out of the ownership, maintenance, or use of any motor vehicle. Each policy with limits of not less than $1,000,000 per occurrence and $2,000,000 aggregate.

11.1.3.1 Business Auto Liability Insurance or its equivalent with a minimum limit of $500,000 per person, per accident, property damage and includes coverage for all of the following; liability arising out of the ownership, maintenance or use of any auto, auto non-ownership and hired car coverage, and uninsured/underinsured motorist coverage at a limit no less than statutory limits.

11.1.4 Property Damage Liability: A policy covering claims for damages because of injury or to destruction of tangible property, including claims arising out of the ownership, maintenance, or use of any motor vehicle, including the loss of use resulting therefrom. Each policy with limits of not less than $1,000,000 per occurrence and $2,000,000 aggregate. Policies of the following types shall be furnished:

(a) Contractor's Liability Insurance issued to and covering the liability for damages imposed by law upon the Contractor with respect to all work performed by him under the Owner-Contractor Agreement.

(b) The Contractor's Liability Insurance issued to and covering the liability for damages imposed by law upon each subcontractor with respect to all work performed by said subcontractor under the Owner-Contractor Agreement.

(c) Certificates of Insurance acceptable to the Owner shall be filed with the Owner prior to commencement of the work, These Certificates shall contain a provision that coverage afforded under the policies will not be cancelled until at least thirty days prior written notice has been given to the Owner.

11.1.5 Umbrella Liability Policy: Contractor shall carry Umbrella Liability Insurance in a limit not less than $1,000,000 each occurrence and annual aggregate. No such Umbrella Liability Insurance policy shall be more restrictive than the coverage provided for under the above-described primary policies. Any such Umbrella Liability Insurance policy shall contain a clause stating that, in the event the primary coverage is impaired or exhausted, such policy shall take effect (drop down) and act as primary coverage until the exhaustion of its limits.

11.1.6 Unless otherwise provided for, the Owner and Architect shall be named as additional insured on all required policies with the exception of Workmen's Compensation.

11.1.7 The Contractor shall give prompt written notice to the Owner of any and all claims or notification of claims with values in excess of ten percent (10%), either individually or in the aggregate, of the limits of liability under the policies set forth in Article 11.

11.1.8 All policies maintained by the Contractor hereunder shall be issued by an insurance company licensed to do business in the State of New Jersey, and rated no less than “A” by A.M. Best. The Contractor shall submit with the insurance documents a copy of the Certificate of Authority for each named provider, as evidence the Insurance Company is registered to do business in the State of New Jersey. All Insurance submitted by the awarded contractor is subject to approval by the Township of Washington and must remain in full force during the contract. The Contractor shall take no action on the contract until approval of the insurance is given by the Township.

11.1.9 All insurance policies subject to cancellation, non-renewal, or material reduction in coverage shall be endorsed to provide written notice to the Township and Architect no less than thirty (30) days prior. The phases “endeavor to” and “…but failure to mail such notice shall impose no obligation or liability of any kind upon the insurer, its agents or representatives” are to be eliminated from the cancelation provisions of the standard ACORD certificates of insurance.

11.1.10 No acceptance and/or approval of any insurance by the Township shall be construed as relieving or excusing the Contractor or the contractor’s surety from any liability or obligation imposed upon either or both of them by the provisions of this contract.

11.1.11 The contractor must disclose any policy or coverage with deductibles of $5,000.00 or more.

11.1.12 Bidder shall indemnify and hold harmless the Township, the Mayor, Council, Business Administrator, employees, and professionals under contract from and against all claims, suits, or actions, and damages, or costs of every name and description to which the Township may be subjected or put by reason of injury to the person or property of another, or the property of the Township, resulting from negligent acts or omissions on the part of the contractor, or in the performance of the work under the contract.

11.2 OWNER’S LIABILITY INSURANCE

The Owner shall be responsible for purchasing and maintaining the Owner’s usual liability insurance.

11.3 PROPERTY INSURANCE

11.3.1 Unless otherwise provided, the Owner shall purchase and maintain, in a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located, property insurance written on a builder’s risk “all-risk” or equivalent policy form in the amount of the initial Contract Sum, plus value of subsequent Contract Modifications and cost of materials supplied or installed by others, comprising total value for the entire Project at the site on a replacement costs basis without optional deductibles. Such property insurance shall be maintained, unless otherwise provided in the Contract Documents or otherwise agreed in writing by all persons and entities who are beneficiaries of such insurance, until final payment has been made as provided in Section 9.10 or until no person or entity other than the Owner has an insurable interest in the property required by this Section 11.3 to be covered, whichever is later. This insurance does not cover any tools owned by mechanics; any tools, equipment, scaffolding, staging towers, and other property owned or rented by the Contractor, the capital value of which is not included in the cost of the work."

11.3.1.1 Property insurance shall be on an “all-risk,” “comprehensive,” or equivalent policy form and shall include, without limitation, insurance against the perils of fire (with extended coverage) and physical loss or damage including, without duplication of coverage, theft, vandalism, malicious mischief, collapse, earthquake, flood, windstorm, falsework, testing and startup, temporary buildings and debris is removal including demolition occasioned by enforcement of any applicable legal requirements, and shall cover reasonable compensation for Architect’s and Contractor’s services and expenses required as a result of such insured loss.

11.3.2 The fact that the Owner is furnishing Property Insurance shall not be interpreted to relieve the Contractor of his obligation to complete the work without additional cost to the Owner beyond the Contract amount, except as provided in Paragraph 11.3.12 above.

11.3.3 The Contractor shall carry such additional insurance he deems necessary to protect himself against hazards not covered by the Owner's Property Insurance, including coverage for theft, collapse, water damage, materials and equipment stored on the site, and for materials and equipment stored off site, and against loss of owned or rented capital equipment and tools owned by mechanics or any tools, equipment, scaffolding, staging, towers and forms owned or rented by the Contractor, the capital value of which is not included in the cost of the work. Owner's "All Risk" Insurance does not cover theft of material unless installed and made an integral part of the building. It is understood and agreed that all risk of such loss shall be assumed by the Contractor.

11.4 PERFORMANCE BOND AND PAYMENT BOND

11.4.1 The Owner shall have the right to require the Contractor to furnish bonds covering faithful performance of the Contract and payment of obligations arising thereunder as stipulated in bidding requirements or specifically required in the Contract Documents on the date of execution of the Contract.

11.4.2 Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under the Contract, the Contractor shall promptly furnish a copy of the bonds or shall authorize a copy to be furnished.

ARTICLE 12 - UNCOVERING AND CORRECTION OF WORK

Para.12.1 UNCOVERING OF WORK

12.1.1 Add “or Contract Sum” at the end of the subparagraph.

Para 12.2 CORRECTION OF WORK

12.2.1 Add the following at the end of the subparagraph: If prior to the date of Substantial Completion the Contractor, a subcontractor or anyone for whom either is responsible, uses or damages any portion of the Work, including without limitation, mechanical, electrical, plumbing and other building systems, machinery, equipment or other mechanical device, the Contractor shall cause each such item to be restored to "like new condition" at no expense to the Owner.

12.2.2.1 In the first and seventh lines change “one year” to “two years”.

12.2.2.1 Add new sentence: The Contractor shall bear all costs of correcting any and all Work not complying with this warranty, and the Contractor and its Surety shall indemnify the Owner for all costs, expenses, losses, and/or damages incurred by the Owner, including attorneys’ fees, additional testing and inspections and compensation for the services and expenses of the Architect made necessary thereby. This warranty is in addition to any other warranty or remedy provided elsewhere in the Contract Documents and shall survive the expiration of any such other warranty, acceptance of a final payment for the Work, and the termination of the Contract for Construction.

12.2.2.2 In the first line change “one year” to “two years”.

12.2.2.3 In the first line change “one year” to “two years”.

12.2.4 In the first sentence, revise to read "...the Contractor, or his Surety, shall pay..."; add to the end, “The appropriate reduction shall be an amount equal to the entire cost of replacing the work performed with work originally specified and intended.”

12.2.5 In the second line change “one-year” to “two-year”.

Para. 12.3 ACCEPTANCE OF NONCONFORMING WORK

12.3.1 Add the following language: This subparagraph relates exclusively to the knowing acceptance of nonconforming work by the Owner. It has no applicability to work accepted by the Owner or Architect without the knowledge that such work fails to conform to the requirements of the Contract Documents.

12.3.1.1 Add new subparagraph: The Contractor and its Surety guarantee to make good, repair and/or correct, at no cost or expense to the Owner, any and all latent defects hereafter discovered, provided only that notice in writing, shall be given by the Owner to the contractor within two years of the discovery of such defects.

.1 This obligation shall survive the termination of any or all other obligation or obligations under the contract Documents and it is agreed by the Contractor and its Surety that in the event the Owner is required to bring suit under this provision against the Contractor or its Surety to enforce this obligation, the contractor and its Surety hereby waive any defense of the status of limitations.

ARTICLE 13 - MISCELLANEOUS PROVISIONS

Para. 13.1 - GOVERNING LAW

13.1.1 Add new subparagraph: Contractor must comply with codes, ordinances, rules, regulations, orders and other legal requirements of public authorities, utility companies, National Board of Fire Underwriters, and others which bear on performance of Work. Contractor shall deliver to the Owner certificates and other required legal evidence and proof of compliance with the above.

13.1.2 Add new subparagraph: "All applicable provisions of governing laws shall take precedence over any provision of the Contract Documents which conflict with the governing law. Such precedence shall be limited to the conflicting provisions and in no way shall invalidate the remaining provisions of the Contract."

13.4.3 Add new sentence: The Contractor also agrees that the cost of testing services required for the convenience of the Contractor in his scheduling and performance of the Work, and the cost of testing services related to remedial operations performed to correct deficiencies in the Work, shall be borne by the Contractor.

Para. 13.5 - INTEREST

13.5 Delete paragraph 13.5 in its entirety and replace with the following: “Unless otherwise required by the Contract Documents and related documents, the Owner will pay no interest whatsoever on any payments due.”

13.6 - Add new subparagraph: In the event of the appointment of a trustee and/or receiver or any similar occurrence affecting the management of the account of the Contractor pertaining to the Work, it shall be the obligation of the Contractor, its representatives, receivers, sureties, or successors in interest to continue the progress of the Work without delay and specifically to make timely payment to Subcontractors and Suppliers of all amounts that are lawfully due them and to provide the Owner and all Subcontractors and Suppliers whose work may be affected with timely notice of the status of receivership, bankruptcy, etc., and the status of their individual accounts.

13.7 - Add new subparagraph: Contractor shall save and keep Owner and Owner's property free from all mechanic's and materialmen's liens, stock notices, notices of intention and all other liens and claims, legal or equitable, arising out of Contractor's work hereunder. In the event any such lien or claim is filed by anyone claiming by, through or under Contractor, Contractor shall remove and discharge same within 10 days of the filing thereof.

13.8 - Add new subparagraph: Regularly scheduled job meetings shall be held at a location and time convenient to the Owner's representatives, the Architect and the Contractor. The Contractor shall attend such meetings, or be represented by a person in authority who can speak for and make decisions for the Contractor.

ARTICLE 14 - TERMINATION OR SUSPENSION OF THE CONTRACT

Para. 14.1 TERMINATION BY CONTRACTOR

14.1.1 Delete entirely.

14.1.2 Delete entirely.

14.1.3 Delete entirely.

Para.14.2 TERMINATION BY THE OWNER FOR CAUSE

14.2.1.4 - Delete in its entirety and add: “Disregards the instructions of Architect or Owner (when such instructions are based on the requirements of the Contract Documents);"

14.2.1.5 - Add new subparagraph: Is adjudged bankrupt or insolvent, or makes a general assignment for the benefit of Contractor's creditors, or a trustee or a receiver is appointed for Contractor or for any of its property, or files a petition to take advantage of any debtor's act, or to recognize under bankruptcy or similar laws; or

14.2.1.6 - Add new subparagraph: Breaches any warranty made by the Contractor under or pursuant to the Contact Documents.

14.2.1.7 - Add new subparagraph: Fails to furnish the Owner with assurances satisfactory to the Owner evidencing the Contractor's ability to complete the Work in compliance with the requirements of the Contract Documents.

14.2.1.8 - Add new subparagraph: Fails after the commencement of the Work to proceed continuously with the construction and completion of the work for more than 10 days except as permitted under the Contract Documents.

14.2.1.9 - Add new subparagraph: Otherwise does not fully comply with the Contract Documents.

14.2.1.10 - Add new subparagraph: the bankruptcy or insolvency of a general assignment for the benefit of creditors by Contractor or by any of Contractor's principals, partners, officers, or directors; or

14.2.1.11 - Add new subparagraph: the indictment or government seizure of assets of Contractor or any of Contractor's principals, partners, officers, or directors.

14.2.4 Delete paragraph in its entirety and replace with the following: "If the costs of finishing the Work, including compensation for the services of any consultants and the Architect's services and expenses made necessary thereby, and the other costs and expenses identified hereinafter, exceed the unpaid balance of the Contract Sum, the contractor and its Surety shall pay the difference to the Owner upon demand. The costs of finishing the Work include, without limitation, all reasonable attorney's fees, additional title costs, insurance, additional interest because of any delay in completing the Work, and all other direct and indirect consequential costs, including, without limitation, Liquidated Damages for untimely completion as specified in the Contract Documents, incurred by the Owner by reason of, or arising from, or relating to the termination of the Contractor as stated herein."

Para. 14.4 - TERMINATION BY THE OWNER FOR CONVENIENCE

14.4.1 Add the following: "The Owner may, without cause, terminate the Contract if the Owner, at its sole discretion, determines that such termination is in the Owner's best interest. In the event that the Owner terminates the Contract for its convenience, then the Contractor shall be entitled to compensation for the work performed prior to termination, including the Contractor's cost plus reasonable allowance for overhead and profit."

14.4.2 Add the following: "In the event that the Owner wrongfully terminates this Contract under the provisions of Paragraph 14.2, then its termination shall be deemed a termination for convenience in accordance with the terms of Paragraph 14.4.1."

14.4.3 Delete paragraph in its entirety and replace with the following: In case of such termination for the Owner's convenience, the Contractor shall be entitled to Owner payment for Work performed as of the date of termination in accordance with the contract Documents. The Contractor shall, as a condition of receiving the payments referred to herein, execute and deliver all such papers, turn over all plans, documents and files of whatsoever nature required by the Owner, and take all such steps, including the legal assignment of its contractual rights, as the Owner may require for the purpose of fully vesting in the Owner the rights and benefits of the Contractor. The Contractor warrants that it will enter into no subcontracts or other agreements that would adversely impact the Owner's rights or increase the Owner's obligations under this paragraph. In no event shall the Owner be liable to the Contractor for lost or anticipated profits or consequential damages, or for any amount in excess of the compensation

due to the Contractor in accord with the Contract Documents for the Work performed as of the date of termination. The warranty and indemnity obligations of the Contractor and Surety shall survive and continue, notwithstanding any termination pursuant to this paragraph, with respect to the Work performed as of the date of termination.

14.4.4 Add new subparagraph: If the Owner wrongfully terminates the Contract for Construction for cause, the termination shall be deemed to have been one for convenience under this Article 14.4, and the Contractor shall receive from the Owner only the compensation to which the Contractor is entitled under Subparagraph 14.4.3.

ARTICLE 15 - CLAIMS AND DISPUTES

Para. 15.1.2 TIME LIMITS ON CLAIMS

15.1.2 - Delete in its entirety and replace with the following: "Issues involving the applicable statute of limitations and statute of repose shall be governed by New Jersey Law."

15.1.2.1 Add new subparagraph: No act or omission by the Owner or Architect, or by anyone acting on behalf of either shall be deemed or construed as a waiver or limitation of any right or remedy under the Contract Documents, or as an admission, acceptance, or approval with respect to any breach of the Contract for Construction or failure to comply with the Contract Documents by the Contractor, unless the Owner expressly agrees, in writing.

15.1.2.2 Add new subparagraph: The Owner’s exercise, or failure to exercise, any rights, claims or remedies it may have arising out of or relating to the Contract documents shall not release, prejudice, or discharge the Owner’s other rights and remedies, nor shall it give rise to any right, claim, remedy or defense by any other person, including the Contractor, its Surety, any Subcontractor, or any other person or entity.

15.1.2.3 Add new subparagraph: Whenever possible, each provision of the Contract Documents shall be interpreted in a manner as to be effective and valid under applicable law, If, however, any provision of the Contract Documents, or portion thereof, is prohibited or found invalid by law, only such invalid provision or portion thereof shall be ineffective, and shall not invalidate or affect the remaining provision of the Contract Documents or valid portions of such provision, which shall be deemed severable. Further, if any provision of this Contract is deemed inconsistent with applicable law, applicable law shall control.

15.1.3.1 Delete "21 days" where occurs, and replace with "five (5) calendar days".

Delete "either party" and replace with "Contractor".

15.1.3.3 Add new subparagraph: The Owner has the responsibility to make a claim as promptly as is reasonably possible after recognizing or receiving notice of a condition which gives the basis for such a claim, after recognizing or receiving notice of a condition which give reason for a claim.

15.1.3.4 Add new subparagraph: The Contractor must provide notice of a claim prior to the submission of a payment requisition, not later than the submission of the second payment requisition following the date the Contractor knew or should have known of the condition giving rise to the claim.

Para.15.2 INITIAL DECISION

15.2.6.1 Delete in its entirety.

Para. 15.3 MEDIATION

15.3.1 Delete in its entirety.

15.3.2 Modify the first sentence to read: The parties may mutually agree to resolve their Claims by mediation, which…

In the second to last line delete “an arbitration” and replace with “a binding dispute resolution proceeding”

Para. 15.4 ARBITRATION

Delete Section 15.4 in its entirety and replace with the following:

All claims and disputes and other matters in question between the Contractor and the Owner arising out of or relating to the Contract Documents or a breach thereof with regard to the Architect's decision, shall be decided through suit in New Jersey Superior Court. The Contractor shall carry on all work and maintain its progress during such suit and the Owner shall continue to make payments not related to the dispute of the Contractor in accordance with Contract Documents.

Arbitration shall be available as an alternative dispute mechanism at the discretion of the Owner and upon the mutual consent of all parties. If arbitration is mutually agreed upon, the provisions of Articles 15.4.1 through 15.4.3 shall apply.

ARTICLE 16 - SUBSURFACE INFORMATION

Add the Following:

16.1 Data on subsurface conditions is available and included in the contract documents as an appendix. It is expressly understood that the Owner will not be responsible for interpretations, conclusions, or assumptions drawn by Contractor. There is existing soil boring information. Contractor shall be responsible for the cost of all excavating, cutting and filling, removal of unacceptable soil, additional soil borings, compaction and the testing necessary for the performance of this work. Contractor shall assume all risks for excavation under this project.

ARTICLE 17 - GROUNDBREAKING CEREMONY

Add the Following:

17.1 The General Contractor shall provide Three (3) chromium-plated shovels for use at the groundbreaking ceremony. Each shovel shall be properly engraved with the name of the Owner, the date of ceremony, name of building, the Architect, and the Contractor, as directed by the Architect.

END OF SECTION 00410

DIVISION 00 - BIDDING AND CONTRACT REQUIREMENTS
SECTION 00600 - SCHEDULE OF DRAWINGS

SCHEDULE OF DRAWINGS

The Drawings, accompanying the Project Manual/Specifications, which form a part of the Contract, and upon which all Proposals shall be based are listed as follows:

Drawing No.	Title
TS-1	TITLE SHEET AND NOTES
BF-1	BARRIER FREE NOTES
BF-2	BARRIER FREE NOTES
A-1	FIRST FLOORPLAN/PARTITION NOTES
A-2	SECOND FLOOR PLAN
A-3	ROOFPLAN
A-4	ELEVATITION DETAILS
A-5	ELEVATITION DETAILS
A-6	WALL SECTIONS
A-7	WALL SECTIONS
A-8	WALL SECTIONS
A-9	WALL SECTIONS
A-10	WALL SECTIONS
A-12	ENLARGED FLOOR PLANS, ELEVATIONS
A-13	ENLARGED FLOOR PLAN/ELEVATIONS, SECTIONS, MISC., DETAILS
A-14	ENLARGED STAIR PLANS & DIAGRAMS
A-15	STAIR & ELEVATOR DETAILS
A-16	SCHEDULES
A-17	PANEL ELEVATIONS & DTAILS
A-18	WINDOW TYPES & DETAILS
S-1	FOUNDATION PLAN
S-2	SECOND FLOOR FRAMING PLAN
S-3	ROOF FRAMING PLAN
S-4	DETAILS
S-5	DETAILS
S-5	DETAILS
S-6	DETAILS
S-7	BRICK RELIEVING ANGLES & SHEET PILE RETAING WALL

DIVISION 00 - BIDDING AND CONTRACT REQUIREMENTS
SECTION 00600 - SCHEDULE OF DRAWINGS

M0.1	MECHANICAL DETAIL
M0-2	MECHANICAL DETAILS
M-0.3	HVAC SCHEDULES
M-04	HVAC SCHEDULES
M1.1	FIRST FLOOR
M-1.2	FIRST FLOOR PLAN EAST SIDE
M2.1	SECOND FLOOR HVAC PLAN - WEST SIDE
M2.2	SECOND FLOOR HVAC FLOOR PLAN - EAST SIDE
M-3.0	HVAC DETAILS
KES1	KITCHEN HOOD DETAILS
KES2	KITCHEN HOOD DETAILS
KS3	KITCHEN HOOD DETAILS
KES4	KITCHEN HOOD DETAILS
P0.1	PLUMBING DETAILS
P0.2	PLIMBING DETAILS
P1.1A	FIRST FLOOR SANITARY PLUMBING - WEST SIDE
Pl-.1B	FIRST FLOOR SANITARY PLIMBING - EAST SIDE
P1.2A	SECOND FLOOR SANITARY PLUMBING - WEST SIDE
P-1.2B	SECOND FLOOR SANITARY PLUMBING - EAST SIDE
P2-1A	FIRST FLOOR PLUMBING FLOOR PLAN - WEST SIDE
P-2.1	FIRST FLOOR PLUMBING PLAN - EAST SIDE
P-2A	SECOND FLOOR PLUMBING PLAN WEST SIDE
P2.2B	SECOND FLOOR PLAN - EAST SIDE
P-3.0	PLUMBING RISERS
P-3.0	PLUMBING RISERS
P-3.2	PLUMBING RISERS
E-0.1	ELECTRICAL DETAILS
E-0.2	ELECTRICAL DETAILS
E1.1	FIRST FLOOR POWER & SYSTEMS PLAN - WEST SIDE
E1.2	FIRST FLOOR POWER & SYSTEMS PLAN – EAST SIDE
E-2.1	SECOND FLOOR POWER & SYSTEMS PLAN – WESTSIDE
E2.2	SECOND FLOOR POWER & SYSTEMS PLAN – EAST SIDE
E3.1	ELECTRICAL LIGHTING PLAN – FIRST FLOOR - WEST SIDE
E3.2	ELECTRICAL LIGHTING PLAN – FIRST FLOOR – EAST SIDE
E4.1	ELECTRICAL LIGHTING PLAN – SECOND FLOOR – WEST SIDE
E4.2	ELECTRICAL LIGHTING PLAN – SECOND FLOOR – EAST SIDE
E5.0	ELECTRICAL SCHEDULES
E5.1	ELECTRICAL SCHEDULES
E5.2	ELECTRICAL SCHEDULES

APPENDIX “A” CIVIL SPECIFICATIONS

END OF SECTION 00600

SCOPE OF PROJECT

The work required by the Contract Documents includes, but is not limited to, the furnishing of all labor, materials, equipment, and services necessary to complete the New Emergency Services Complex located at 656 Washington Avenue, Twp. of Washington, NJ 07676, in accordance with Drawings and Project Manual dated June 19, 2020 prepared by ROBBIE CONLEY ARCHITECT, LLC., 596 Glassboro Road, Woodbury Heights, NJ 08097, and such addenda as may be issued prior to the due date for bids. Contractor shall be knowledgeable of all applicable codes and shall only use materials approved for such use in applicable codes and standards.

TIME OF COMPLETION

Inasmuch as the time provisions of this Contract relating to performance and completion of the work are for the purpose of enabling the Owner to proceed with occupancy in accordance with a predetermined program, such provisions are the essence of this Contract.

The Contractor, at his expense, shall supply sufficient manpower, perform work on an overtime basis as necessary, and pay such premiums as may be necessary to ensure the timely delivery of required materials so that schedules can be met.

The work shall commence no later than September 1, 2020 and shall be substantially completed no later than October 18, 2021

The date designated for Substantial Completion is based on the Contractor's receipt of Notice to Proceed on or before August 17, 2020 and is also contingent upon the Contractor properly and completely executing and returning Owner/Contractor Agreement, Bonds and Certificates of Insurance.

Failure of Contractor to properly and completely execute and return all of the above documents in a timely manner will not be a reason to extend the date of Substantial Completion.

For each day's delay by the in Contractor in receiving his Notice to Proceed beyond the above date, a corresponding number of calendar days shall be added to the date designated for Substantial Completion, however in no event will the Contractor be entitled to an increase in the Contract Sum.

It shall be the responsibility of the Contractor to coordinate his work so that the work may be completed in the allotted time.

If the Contractor fails to complete fully, entirely, and in conformity with the provisions of this Contract, the Project and every part and appurtenance thereof within the time stated above, or within such provisions of this Contract, then the Contractor shall and hereby agrees to pay the Owner for each and every calendar day that he is in default on time to complete the work, the amount of three hundred fifty dollars ($350.00) per day which said amount per day is agreed to by the parties hereto, to be liquidated damages, not a penalty.

Said liquidated damages in the full amount herein stated may be assessed against the Contractor to the extent he is responsible for such delay as determined by the Owner. The Owner shall recover said liquidated damages by collecting the amount thereof out of any monies due or that may become

due the Contractor, and if said monies be insufficient to cover said damages, then the Contractor or his Surety shall pay the amount due.

In addition to the amount designated as liquidated damages, the Contractor shall and hereby agrees to pay the Owner, compensation for the Architect's additional services and expenses made necessary during the period for which liquidated damages are assessed.

The Contractor and Sub-contractors shall coordinate their work with adjacent work and cooperate with other trades so as to facilitate general progress of the work. Each trade shall afford other trades every reasonable opportunity for installation of their work and for storage of their materials.

JOB MEETINGS

The Contractor or his authorized representative shall be required to attend Job Meetings. Job Meetings will be held at the job site upon notice from the Architect. Attendance and minutes of the meeting will be kept and copies sent to all concerned with the project. The Contractor shall provide accommodations for the meetings, as required by the Project Manual.

SAMPLES

In addition to those samples required by the Specifications, the Architect shall have the prerogative to request samples of any items to be incorporated into the work at no additional cost to the Owner.

COORDINATION DRAWINGS

Coordination drawings shall be prepared as composite drawings, including plans and sections, drawn at a scale not less than 3/8" = 1', for the purpose of clearly showing how the work of each trade is to be installed in relation to each other.

Before the submission of shop drawings to the Architect for approval, the Contractor shall prepare all of the drawings necessary, including plans and sections, at a scale 3/8"=1', indicating all proposed HVAC piping and ductwork for each floor and in the mechanical/electrical/boiler room. Drawings will indicate locations of all HVAC air devices, such as diffusers, grilles, etc., located in ceilings, walls and floors. Air devices in ceilings will be located in relationship to other ceiling devices by referring to lighting plans, fire protection sprinkler plans, etc., and will be suitably detailed for use by the Contractor to prepare shop drawings in the form of reflected ceiling plans. Piping and ductwork shall be located with dimensions.

The Contractor, shall indicate the locations of all proposed lighting fixtures, conduit runs, and other electrical equipment and associated items.

The Contractor shall indicate locations of all proposed piping, and other plumbing equipment associated items.

Any conflicts that cannot be resolved and/or any deviations from the original design, shall be brought to the Architect's attention by the Contractor. After the coordination drawings have been finalized, they shall be signed off as approved by the Contractor, and prints of the coordination drawings shall be made by the Contractor and distributed. One (1) set of prints shall also be forwarded to the Architect for record only.

If any work is installed prior to the completion of the coordination drawings, all necessary changes to correct any conflict in that work will be made by the Contractor at his cost.

Following the completion and distribution of the coordination drawings, the Contractor shall prepare shop drawings as required for submission to the Architect for approval.

PROGRESS PHOTOGRAPHS

The Contractor shall submit to the Architect, a minimum of (4) four different views of the project in digital or hard copy format each month during active construction operations.

SHOP DRAWINGS

The Contractor shall review, stamp with his approval, and submit, with reasonable promptness and in orderly sequence so as to cause no delay in the Work or in the Work of any other Contractor, all shop drawings and samples required by the Contract Documents or as may be subsequently requested by the Architect as covered by Modifications. Contractor's approval stamp shall conform exactly to the form and content of the example shown herein and shall appear only on all shop drawing submissions.

No modifications and/or additions to this stamp shall be permitted.

SAMPLE:

> This shop drawing or sample has been reviewed by (Name of Contractor) and approved with respect to the means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incidental thereto. (Name of Contractor) also warrants that this shop drawing or sample complies with contract
>
> By
>
> Date

Shop drawings and samples shall be properly identified, as the Architect may require. At the time of submission, the Contractor shall inform the Architect in writing of any deviation in the shop drawings or samples from the requirements of the Contract Documents.

When submitting shop drawings or product data, the Contractor shall indicate on the transmittal, the corresponding specification section number for that submission. If the transmittal indicates multiple submissions, then each submission must be identified with its corresponding specification section number on the transmittal.

By approving and submitting shop drawings and samples, the Contractor thereby represents that he has determined and verified all field measurements, field construction criteria, materials, catalog numbers and similar data or will do so, and the he has checked and coordinated each shop drawing and sample with the requirements of the Work and of the Contract Documents.

All shop drawings, schedules, etc. shall be submitted digitally or in hard copy format to the Architect. When providing items in hard copy, Contractor shall submit a total of six (6) original copies of all information in full color, all to be marked with the Contractor's stamp of review. Digital copies shall also be required to be marked with the Contractor's stamp of review. If submissions do not have said stamp, it will be reason for rejection.

Correction and classification (No Exceptions Taken, Make Corrections Noted, Revise and Resubmit or Rejected) will be marked on the hard or digital copies by the Architect and returned to the contractor.

If the submission is returned "Revise and Resubmit" or "Rejected", the original submission shall be corrected and a new submission shall be submitted for final approval.

All submissions, which are not digital shall be submitted in six (6) copies to the Architect. Items such as color charts shall be submitted in hard copy. Any color selections will not be chosen by digital submission. Any color or sample submissions must be submitted to the Architect in six (6) hard copy originals.

In addition to those shop drawings required by the Specifications, the Architect shall have the prerogative to request shop drawings for any item or assembly to be incorporated into the work at no additional cost to the Owner.

SURVEYS AND LAYOUT OF THE WORK

All lines and levels necessary for the erection of the building shall be established, certified and maintained by a licensed surveyor who shall be employed by the Contractor. The Contractor shall carefully check all levels and conditions and shall call attention, in writing to any discrepancies, before proceeding with the work.

The surveyor shall layout footings and/or foundations in strict accordance with the Drawings. He shall locate all intersections and all building lines and check all elevations, levels, and lines.

The Contractor is cautioned that no work, including temporary buildings, shall be installed so as to project beyond the Owner's given property lines.

When footings and foundations have been completed or carried to design elevation, the Contractor shall furnish to the Architect, triplicate copies of certificates of survey attesting that all footings and/or foundations have been accurately installed to lines and levels required in accordance with the Contract Documents. The Contractor shall not proceed with further work until he has been notified, in writing, that the survey has been approved.

No vouchers shall be approved or monies paid for any footing and/or foundations until said survey has been approved by the Architect.

CUTTING AND PATCHING

In addition to the requirements of the General Conditions of the Contract, all cutting and patching required in connection with this project, except as otherwise specifically indicated in the Contract Documents, shall be done by each trade requiring same under the supervision of the Contractor, using mechanics of the specific trade involved who are experienced in their respective lines of work. All patching shall match adjacent finish. Cutting shall be done with great care so as not to leave unsightly surfaces which may not be entirely concealed by plates, escutcheons, or normal concealing construction. If such unsightly conditions occur through the fault of the Contractor, he shall be required at his own expense to replace the damaged surfaces.

SECURITY/PROTECTION PROVISIONS

The types of temporary security and protection provisions required include, but not by way of limitation, barricades, fences, warning signs, and similar provisions intended to minimize property losses, personal injuries and claims for damages at project site, in coordination with activities and in a manner to achieve 24-hour, 7-day-per-week effectiveness.

The Owner assumes no responsibility for security/protection provisions.

END OF SECTION 01000

DIVISION 01 - GENERAL REQUIREMENTS
SECTION 01040 – WAGE RATES

Pursuant to Chapter 150 of the New Jersey Laws of 1963, the wage rates determined for this project shall constitute the wage rate requirements for all of the work of the Contract and are hereby specifically made a part of the Contract Documents.

The Schedule of Applicable Wage Rates, for this project, are available to bidders at http://lwd.dol.state.nj.us/labor/wagehour/wagerate/prevailing_wage_determinations.html where it may be reviewed by all bidders.

It is each Bidders Responsibility to obtain and utilize the correct Wage Determination for the Project.

END OF SECTION 01040

DIVISION 01 - GENERAL REQUIREMENTS
SECTION 01510 - TEMPORARY FACILITIES AND CONTROLS

TEMPORARY ENCLOSURES

All temporary work shall be designed and installed so that the work can be conveniently erected without building-in any of the temporary work. Temporary work shall be changed, rebuilt, and adjusted as needed to suit the conditions of the work and the work of subcontractors. Such temporary work shall be removed from the project by the Contractor on or before completion of the work and when no longer required.

The Contractor shall provide and hang temporary doors and shall construct temporary enclosures so that the entire project may be secured from the exterior by locks and keys as soon as possible. He shall keep and maintain such temporary doors and temporary enclosures in good order and repair. He shall provide keys for the use of the Owner's representatives. These requirements shall include all other door openings to streets, roof, driveways, and other places until they are secured with permanent construction.

Should the glazing of exterior windows not be performed at such times and in such order as is required to fully protect the building against the elements, the Contractor shall furnish and set, for the window openings, substantial temporary enclosures. Such temporary enclosures shall be firmly secured and maintained at all times, in good, proper, and sound condition, sufficient to protect the building from damage and surfaces from staining.

Roof openings shall be temporarily and adequately covered, made, and kept watertight by the Contractor until permanent construction at such openings has been installed.

Whenever weather conditions require or whenever directed, the Contractor shall provide tarpaulin curtains, coverings, wind breaks, and other protection to exposed masonry during the construction of exterior walls.

TEMPORARY TOILET FACILITIES

The Contractor shall provide and maintain temporary toilet facilities for the duration of the project for the use of all persons engaged in the work. Facilities shall be weather tight, have proper ventilation, and be approved by the Department of Health. Locate in an approved location and kept in constant sanitary condition.

Toilet facilities in the existing building may not be used only.

TEMPORARY WATER

Water from the Owner's existing water system shall be used for temporary water and the Owner shall pay water service use charges. The Contractor shall provide the means of distributing temporary water during the construction period, until permanent service is in use.

TEMPORARY LIGHT AND POWER

The Contractor shall provide a weatherproof, grounded temporary electric power service and distribution system of sufficient size, capacity, and power characteristics to accommodate performance of work during the construction period, including temporary lighting, consisting of not less than one 200-watt incandescent lamp per 1,000 square feet of floor area, uniformly distributed,

for general construction lighting, or illumination of a similar nature. In corridors and similar traffic areas provide one 100-watt incandescent lamp at every 50 feet. In stairways and at ladder runs, provide one lamp per story, located to illuminate each landing and flight. Install service and grounding in compliance with the National Electric Code. Include necessary meters, transformers, overload protected disconnect and main distribution switchgear. Connect temporary service to the local electric power company main in the manner directed by company officials. The Contractor shall pay for all electric power service use charges, whether metered or otherwise, for electricity used by all entities authorized to be at or to perform work at the project site.

TEMPORARY HEAT

Before building is enclosed, the Contractor shall be responsible for temporary heat in areas requiring heat for satisfactory working conditions. Self-contained portable oil-fired heaters, if used, shall be vented to the outside of the building and may be used only in areas where finished work has not been started.

Once building is enclosed, heating shall be maintained whenever the outdoor temperature is 55 degrees F. or lower on a 24-hour basis. The system or method of heating shall be capable of maintaining 55 degrees F. inside at 0 degrees F. outside temperature. The permanent heating system will not be used for supplying temporary heat.

The Contractor shall maintain temporary heating equipment and pay for all costs, including fuel.

PUMPING AND DRAINAGE

The Contractor shall construct and maintain a complete temporary drainage system, if necessary, and shall do all pumping necessary to keep excavations, building, and site free from water during the progress of the work.

Water shall be drained not only from the general excavations, but also from all pits and trenches, so that there will be no accumulation of water.

Pumping shall be done in a manner to avoid endangering footings, planting, and surrounding property.

TEMPORARY FACILITIES EQUIPMENT

Use only equipment meeting the approval of local authorities, utility companies, OSHA, and the Architect.

TEMPORARY STAIRS, LADDERS, RAMPS

The Contractor shall furnish, erect, and maintain equipment such as temporary stairs, ladders, ramps, scaffold, runways, chutes and the like, as required for the proper execution of work.

All apparatus, equipment, and construction used for temporary stairs, ladders, and ramps shall be in strict compliance with the local laws and ordinances, and as required by the Department of Labor & Industry and OSHA.

FIELD OFFICE

The Contractor shall provide a field office of not less than 250 square feet floor area with adequate office space for field office personnel plus one spare work station for incidental use of subcontractor's personnel, suitably finished, furnished, heated, lighted and air conditioned. Include separate space for project meetings with table(s) not less than 4'x 12', and seating for not less than 20 persons; cover main walls with tack-board material for posting of notices, progress schedule and similar information. Provide shelf space adequate for storage of approved samples. Furnish office with one 36" x 96" plan table and plan rack to hold two (2) complete sets of working drawings and shop drawings. Office shall be furnished with private sanitary facilities.

The Contractor shall provide and maintain a telephone. The telephone service shall be available until the full completion of the work and shall be paid for by the persons making such calls.

Subcontractors may maintain such offices and/or storage facilities on the site, as may be necessary, in the proper conduct of the work. These shall be located so as to cause no interference to any work to be performed on the site. The Architect shall be consulted with regard to location.

Upon completion of the work, or as directed by the Architect, the Contractor shall remove from the site, all such temporary structures and facilities placed thereon by him, and shall leave the premises in the condition required by the Contract.

AID TO THE INJURED

The Contractor shall keep ready, in the field office, a full complement of first aid equipment for the use of any person whosoever may be injured on the project. He shall post the names and telephone numbers of hospital, ambulance service, physicians, and police for ready reference.

PROJECT SIGN

The Contractor shall furnish, erect, and maintain a painted sign, 4' x 8', giving project title, Architect's, Engineer's, and Contractor's names and addresses. Sign layout and design shall be provided by the Architect. Sign to be located where directed by the Architect.

Subject to prior approval of the Architect as to size, design, type, and location, and to local regulations, the Contractor may erect temporary signs for purposes of identification and controlling traffic. The Contractor shall furnish, erect, and maintain such signs as may be required by the safety regulations or as necessary to safeguard life and property.

PROTECTION OF EXISTING PREMISES

The Contractor shall provide the necessary fences, barricades, guards, or other such protection, as may be required, to protect the existing building(s), new construction, walks, trees, etc. against damage of any kind.

The Contractor shall comply with recognized standards and code requirements for erection of substantial, structurally adequate barricades where needed to prevent accidents and losses. Paint with appropriate colors, graphics and warning signs to inform personnel at the site and the public, of

the hazard being protected against. Provide lighting where appropriate and needed for recognition of the facility, including flashing red lights where appropriate.

Existing (concealed or exposed) soil lines, drains, water and gas pipes, electrical conduits and wires, or similar utilities of every description, which are damaged or disturbed due the performance of the work of this Contract, shall be repaired or replaced to their original condition, all at the Contractor's expense.

The Contractor shall remove such temporary protection when no longer required.

END OF SECTION 01510

GUARANTEE/WARRANTY

The Contractor shall guarantee the entire work against faulty materials, equipment, the workmanship for a period of not less than two (2) full years after acceptance by the Owner of the entire work.

Upon completion of all work under this Contract, the Contractor shall deliver to the Architect his written guarantee, made out to the Owner, in form satisfactory to the Architect, guaranteeing (and he does so guarantee) all of the work under the Contract to be free from faulty materials and workmanship in every particular, and against injury from proper and usual wear, and agreeing (and he does hereby agree) to replace or re-execute, without cost to the Owner, such work as may be found to be improper or imperfect and to make good all damage caused to either work or materials due to such required replacement or re-execution. The guarantee shall be made to cover (and does cover) a period of two (2) years from date of acceptance by the Owner of all work under the Contract, or for longer period where so stipulated under the various sections of the Specifications. Neither the Final Certificate for Payment nor any provision in the Contract shall relieve the Contractor of responsibility for neglect or faulty materials or workmanship during the period covered by the guarantee.

In case of work performed by subcontractors and where guarantees are required, the Contractor shall secure warranties from said subcontractors, addressed to and in favor of the Owner and deliver copies of same to Architect upon completion of work. Delivery of said guarantees shall not relieve Contractor from any obligation assumed under any provisions of the Contract.

Should any defects develop in aforesaid work within the specified periods due to faults in materials and/or workmanship, the Contractor shall make repairs and do necessary work to correct defective work as directed. He shall execute such repairs and corrective work, including costs of making good other work damaged by or otherwise affected by making of repairs or corrective work, without extra cost to the Owner, at entire cost to the Contractor, within five (5) days after written notice to the Contractor by the Owner.

In case the Contractor fails to do work so ordered, the Owner may have work done and charge cost thereof against monies retained as provided for in the Agreement. If said retained monies are insufficient to pay such cost, or if no money is available, Contractor and his Sureties agree to pay Owner cost of such work.

Nothing herein intends or implies that the guarantee will apply to work which has been abused or neglected by the Owner or his successor in interest.

REMOVAL OF DEBRIS

In addition to the requirements of the General Conditions of the Contract, the following requirements shall apply:

Rubbish shall be lowered by way of chutes, taken down on hoists, or lowered in receptacles. Under no circumstances shall any rubbish or waste be dropped or thrown from one level to another inside or outside the building.

All trash is to be disposed of in a legal manner. No burning will be permitted.

If the Contractor elects to utilize a dumpster for the removal and storage of trash and debris, the location of such dumpster shall be approved by the Owner. All dumpsters shall be maintained as to not allow any spillage of materials. It shall be the Contractor's responsibility to secure the dumpster from vandalism and weather, and shall be responsible for all permits.

Upon completion of work or as directed by the Architect, the Contractor shall remove from the site any such dumpster, and shall leave the premises in the condition as before work or better.

RECORD ("AS-BUILT") DRAWINGS

During the progress of the work, the Contractor shall keep an accurate record of all deviations, changes and corrections from the layouts shown on the drawings, entered daily on a set of prints of the drawings which are kept at the job site.

At the completion of the work, and prior to final payment, the Contractor shall transfer all deviations, changes and corrections to a set of transparencies, mark all transparencies with the words 'AS-BUILT' above the title block and the date, and submit all transparencies, whether altered or not, to the Owner, along with the Contractor's certification as to the accuracy of the information.

The Contractor's certification shall consist of a letter stating that to the best of the Contractor's knowledge, the "as-built" information furnished by the Contractor, represents all deviations, changes and corrections, including final locations of all underground service lines.

The final location of all underground service lines shall be clearly shown and located by dimension as to depth from finished grades and by offset dimension in feet and inches to permanent surface improvements such as buildings, walls, etc.

Copies of Architect's drawings shall be obtained from the Architect and paid for by the Contractor.

OPERATION AND MAINTENANCE DATA

At the time of Substantial Completion, the Contractor shall submit to the Architect all operating instructions, equipment, manuals, keys, keying schedule, guarantees, bonds, etc. required by the Project Manual.

Furnish all manufacturers' literature relating to equipment and materials. Provide cuts, wiring diagrams, instruction sheets, and all other information pertaining to same that would be useful to the Owner in operation and maintenance of equipment and materials.

The Contractor, his sub-contractors, or their representatives are to instruct the Owner's operating personnel in the proper use, care and emergency repair of all mechanical systems or equipment at the time of completion and before final acceptance of the work by the Owner. The Contractor shall call particular attention to safety measures, which should be followed during operation.

FINAL PAYMENT

Before final payment can be approved, the following items must be properly executed and submitted to the Architect by the Contractor:

Letter indicating that all punch list items have been completed. (Final determination of completeness will be made by Architect.)

Record (as-built) drawings, noted as “As-Built Drawings”, dated, signed, and certified by Contractor.

Operation and maintenance manuals.

G706, Contractor’s Affidavit of Payment Debts and Claims, G706A Contractor's Affidavit of Release of Liens, and G707 Consent of Surety Company to Final Payment.

Special or extended warranties, if applicable.

Letter certifying to best of the Contractor's belief and knowledge, that no materials installed in this project contain asbestos or other known toxic or hazardous materials.

Copies of all permit inspections, reports, Certificates of Occupancy and other required inspections, which were issued and/or obtained during the work.

Letter certifying that all specified maintenance stock has been turned over to the Owner. Letter must indicate which items the Owner has received.

The contractor is required to submit three copies of the above listed close-out requirements.

END OF SECTION 01710

DIVISION 02 – EXISTING CONDITIONS
SECTION 024116 - STRUCTURE DEMOLITION

GENERAL

SUMMARY

Section Includes:

- Demolition and removal of buildings and site improvements.
- Removing below-grade construction.
- Disconnecting, capping or sealing, and abandoning in-place site utilities.

DEFINITIONS

Remove: Detach items from existing construction and dispose of them off-site unless indicated to be salvaged.

Remove and Salvage: Detach items from existing construction, in a manner to prevent damage, and store. Include fasteners or brackets needed for reattachment elsewhere.

MATERIALS OWNERSHIP

Unless otherwise indicated, demolition waste becomes property of Contractor.

Historic items, relics, antiques, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, and other items of interest or value to Owner that may be uncovered during demolition remain the property of Owner.

- Carefully salvage in a manner to prevent damage and promptly return to Owner.

PREINSTALLATION MEETINGS

Predemolition Conference: Conduct conference at Project site.

- Inspect and discuss condition of construction to be demolished.
- Review structural load limitations of existing structures.
- Review and finalize building demolition schedule and verify availability of demolition personnel, equipment, and facilities needed to make progress and avoid delays.
- Review and finalize protection requirements.
- Review procedures for noise control and dust control.
- Review procedures for protection of adjacent buildings.
- Review items to be salvaged and returned to Owner.

INFORMATIONAL SUBMITTALS

Proposed Protection Measures: Submit report, including Drawings, that indicates the measures proposed for protecting individuals and property , for environmental protection , for dust control and , for noise control. Indicate proposed locations and construction of barriers.

- Adjacent Buildings: Detail special measures proposed to protect adjacent buildings to remain including means of egress from those buildings.

Schedule of Building Demolition Activities: Indicate the following:

- Detailed sequence of demolition work, with starting and ending dates for each activity.
- Temporary interruption of utility services.
- Shutoff and capping or re-routing of utility services.

Predemolition Photographs or Video: Show existing conditions of adjoining construction and site improvements, including finish surfaces, that might be misconstrued as damage caused by salvage and demolition operations. Submit before the Work begins.

CLOSEOUT SUBMITTALS

Inventory: Submit a list of items that have been removed and salvaged.

QUALITY ASSURANCE

FIELD CONDITIONS

Buildings to be demolished will be vacated and their use discontinued before start of the Work.

Buildings immediately adjacent to demolition area will be occupied. Conduct building demolition so operations of occupied buildings will not be disrupted.

- Provide not less than 72 hours' notice of activities that will affect operations of adjacent occupied buildings.
- Maintain access to existing walkways, exits, and other facilities used by occupants of adjacent buildings.
    - Do not close or obstruct walkways, exits, or other facilities used by occupants of adjacent buildings without written permission from authorities having jurisdiction.

Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.

Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.

- Hazardous materials will be removed by Owner before start of the Work.
- If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Hazardous materials will be removed by Owner under a separate contract.

On-site storage or sale of removed items or materials is not permitted.

COORDINATION

Arrange demolition schedule so as not to interfere with operations of adjacent occupied buildings.

PRODUCTS

PERFORMANCE REQUIREMENTS

Regulatory Requirements: Comply with governing EPA notification regulations before beginning demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

Standards: Comply with ANSI/ASSE A10.6 and NFPA 241.

SOIL MATERIALS

Satisfactory Soils: Comply with requirements in Project Manual.

EXECUTION

EXAMINATION

Verify that utilities have been disconnected and capped before starting demolition operations.

Review Project Record Documents of existing construction or other existing condition and hazardous material information provided by Owner. Owner does not guarantee that existing conditions are same as those indicated in Project Record Documents.

Perform an engineering survey of condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during building demolition operations.

Verify that hazardous materials have been remediated before proceeding with building demolition operations.

Inventory and record the condition of items to be removed and salvaged.

PREPARATION

Refrigerant: Before starting demolition, remove refrigerant from mechanical equipment according to 40 CFR 82 and regulations of authorities having jurisdiction.

UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

Existing Utilities to be Disconnected: Locate, identify, disconnect, and seal or cap off utilities serving buildings and structures to be demolished.

Arrange to shut off utilities with utility companies.

If removal, relocation, or abandonment of utility services will affect adjacent occupied buildings, then provide temporary utilities that bypass buildings and structures to be demolished and that maintain continuity of service to other buildings and structures.

Cut off pipe or conduit a minimum of 24 inches below grade. Cap, valve, or plug and seal remaining portion of pipe or conduit after bypassing according to requirements of authorities having jurisdiction.

Do not start demolition work until utility disconnecting and sealing have been completed and verified in writing.

PROTECTION

Existing Facilities: Protect adjacent walkways, loading docks, building entries, and other building facilities during demolition operations. Maintain exits from existing buildings.

Temporary Shoring: Provide and maintain interior and exterior shoring, bracing, or structural support to preserve stability and prevent unexpected movement or collapse of construction being demolished.

Strengthen or add new supports when required during progress of demolition.

Existing Utilities to Remain: Maintain utility services to remain and protect from damage during demolition operations.

Do not interrupt existing utilities serving adjacent occupied or operating facilities unless authorized in writing by Owner and authorities having jurisdiction.
Provide temporary services during interruptions to existing utilities, as acceptable to Owner and authorities having jurisdiction.
Provide at least 72 hours' notice to occupants of affected buildings if shutdown of service is required during changeover.

Temporary Protection: Erect temporary protection, such as walks, fences, railings, canopies, and covered passageways, where required by authorities having jurisdiction and as indicated. Comply with requirements in Section 015000 "Temporary Facilities and Controls."

Protect adjacent buildings and facilities from damage due to demolition activities.
Protect existing site improvements, appurtenances, and landscaping to remain.
Erect a plainly visible fence around drip line of individual trees or around perimeter drip line of groups of trees to remain.
Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
Provide protection to ensure safe passage of people around building demolition area and to and from occupied portions of adjacent buildings and structures.
Protect walls, windows, roofs, and other adjacent exterior construction that are to remain and that are exposed to building demolition operations.
Erect and maintain dustproof partitions and temporary enclosures to limit dust, noise, and dirt migration to occupied portions of adjacent buildings.

Remove temporary barriers and protections where hazards no longer exist. Where open excavations or other hazardous conditions remain, leave temporary barriers and protections in place.

DEMOLITION, GENERAL

General: Demolish indicated buildings and site improvements completely. Use methods required to complete the Work within limitations of governing regulations and as follows:

Do not use cutting torches until work area is cleared of flammable materials. Maintain portable fire-suppression devices during flame-cutting operations.
Maintain fire watch during and for at least 12 hours after flame-cutting operations.
Maintain adequate ventilation when using cutting torches.
Locate building demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.

Site Access and Temporary Controls: Conduct building demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

Do not close or obstruct streets, walks, walkways, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed trafficways if required by authorities having jurisdiction.
Use water mist and other suitable methods to limit spread of dust and dirt. Comply with governing environmental-protection regulations. Do not use water when it may damage adjacent construction or create hazardous or objectionable conditions, such as ice, flooding, and pollution.

Explosives: Use of explosives is not permitted.

DEMOLITION BY MECHANICAL MEANS

Proceed with demolition of structural framing members systematically, from higher to lower level. Complete building demolition operations above each floor or tier before disturbing supporting members on the next lower level.

Remove debris from elevated portions of the building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.

Remove structural framing members and lower to ground by method suitable to minimize ground impact and dust generation.

Salvage: Items to be removed and salvaged are indicated on Drawings.

Below-Grade Construction: Demolish foundation walls and other below-grade construction.

Remove below-grade construction, including basements, foundation walls, and footings, completely.

Existing Utilities: Abandon existing utilities and below-grade utility structures. Cut utilities flush with grade.

DISPOSAL OF DEMOLISHED MATERIALS

Remove demolition waste materials from Project site and dispose of them in an EPA-approved construction and demolition waste landfill acceptable to authorities having jurisdiction.

Do not allow demolished materials to accumulate on-site.

Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

Do not burn demolished materials.

CLEANING

Clean adjacent structures and improvements of dust, dirt, and debris caused by building demolition operations. Return adjacent areas to condition existing before building demolition operations began.

Clean roadways of debris caused by debris transport.

END OF SECTION 024116

DIVISION 03 – CONCRETE
SECTION 033000 - CAST-IN-PLACE CONCRETE

GENERAL

SUMMARY

Section includes cast-in-place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes.

DEFINITIONS

Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash, slag cement, other pozzolans, and silica fume; materials subject to compliance with requirements.

W/C Ratio: The ratio by weight of water to cementitious materials.

PREINSTALLATION MEETINGS

Pre-installation Conference: Conduct conference at Project site.

Before submitting design mixtures, review concrete design mixture and examine procedures for ensuring quality of concrete materials. Require representatives of each entity directly concerned with cast-in-place concrete to attend, including the following:

Contractor's superintendent.
Independent testing agency responsible for concrete design mixtures.
Ready-mix concrete manufacturer.
Concrete Subcontractor.

Review special inspection and testing and inspecting agency procedures for field quality control, concrete finishes and finishing, cold- and hot-weather concreting procedures, curing procedures, construction contraction and isolation joints, and joint-filler strips, semi-rigid joint fillers, vapor-retarder installation, anchor rod and anchorage device installation tolerances, steel reinforcement installation, concrete repair procedures, and concrete protection.

ACTION SUBMITTALS

Product Data: For each type of product.

Design Mixtures: For each concrete mixture. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments. Indicate amounts of mixing water to be withheld for later addition at Project site.

Steel Reinforcement Shop Drawings: Placing Drawings that detail fabrication, bending, and placement. Include bar sizes, lengths, material, grade, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, splices and laps, mechanical connections, tie spacing, hoop spacing, and supports for concrete reinforcement.

Construction Joint Layout: Indicate proposed construction joints required to construct the structure. Location of construction joints is subject to approval of the Architect.
Samples: For waterstops vapor retarder.

INFORMATIONAL SUBMITTALS

Welding certificates.

Material Test Reports: For the following, from a qualified testing agency:

Aggregates: Include service record data indicating absence of deleterious expansion of concrete due to alkali aggregate reactivity.

Formwork Shop Drawings: Prepared by or under the supervision of a qualified professional engineer, detailing fabrication, assembly, and support of formwork.

Field quality-control reports.

Minutes of pre-installation conference.

QUALITY ASSURANCE

Installer Qualifications: A qualified installer who employs on Project personnel qualified as ACI-certified Flatwork Technician and Finisher and a supervisor who is an ACI-certified Concrete Flatwork Technician.

Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."

Testing Agency Qualifications: An independent agency, acceptable to authorities having jurisdiction, qualified according to ASTM C 1077 and ASTM E 329 for testing indicated.

Personnel conducting field tests shall be qualified as ACI Concrete Field-Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.

PRECONSTRUCTION TESTING

Preconstruction Testing Service: Engage a qualified testing agency to perform preconstruction testing on concrete mixtures.

DELIVERY, STORAGE, AND HANDLING

Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage.
Waterstops: Store waterstops under cover to protect from moisture, sunlight, dirt, oil, and other contaminants.

FIELD CONDITIONS

Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.

When average high and low temperature is expected to fall below 40 deg F (4.4 deg C) for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 301 (ACI 301M).

Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.

Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.

Hot-Weather Placement: Comply with ACI 301 (ACI 301M) and as follows:

Maintain concrete temperature below 90 deg F (32 deg C) at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.

Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

PRODUCTS

CONCRETE, GENERAL

ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:

ACI 301 (ACI 301M).
ACI 117 (ACI 117M).

FORM-FACING MATERIALS

Smooth-Formed Finished Concrete: Form-facing panels that provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.

Plywood, metal, or other approved panel materials.

Exterior-grade plywood panels, suitable for concrete forms, complying with DOC PS 1, and as follows:

Rough-Formed Finished Concrete: Plywood, lumber, metal, or another approved material. Provide lumber dressed on at least two edges and one side for tight fit.

Form-Release Agent: Commercially formulated form-release agent that does not bond with, stain, or adversely affect concrete surfaces and does not impair subsequent treatments of concrete surfaces.

Formulate form-release agent with rust inhibitor for steel form-facing materials.

Form Ties: Factory-fabricated, removable or snap-off glass-fiber-reinforced plastic or metal form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.

STEEL REINFORCEMENT

Recycled Content of Steel Products: Postconsumer recycled content plus one-half of pre-consumer recycled content not less than 25 percent.

Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), deformed.

Low-Alloy-Steel Reinforcing Bars: ASTM A 706/A 706M, deformed.

Steel Bar Mats: ASTM A 184/A 184M, fabricated from ASTM A 615/A 615M, Grade 60 (Grade 420), deformed bars, assembled with clips.

Plain-Steel Wire: ASTM A 1064/A 1064M, galvanized.

Deformed-Steel Wire: ASTM A 1064/A 1064M.

REINFORCEMENT ACCESSORIES

Joint Dowel Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), plain-steel bars, cut true to length with ends square and free of burrs.

Epoxy-Coated Joint Dowel Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), plain-steel bars, ASTM A 775/A 775M epoxy coated.

Epoxy Repair Coating: Liquid, two-part, epoxy repair coating; compatible with epoxy coating on reinforcement and complying with ASTM A 775/A 775M.

Zinc Repair Material: ASTM A 780/A 780M.

Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded-wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice," of greater compressive strength than concrete and as follows:

For concrete surfaces exposed to view, where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected steel wire or CRSI Class 2 stainless-steel bar supports.

CONCRETE MATERIALS

Additional Concrete Footings: Furnish and install thirty (30) yards of 3,500 psi concrete footings 3'- 0" x 1'- 0" with four (4) #4 reinforcing bars, long way, and #4 reinforcing bars at 2'- 0" on center, short way, and include footing excavation 3'- 0" deep and backfilling of footing excavation, where directed by Architect.

Regional Materials: Concrete shall be manufactured within 500 miles (800 km) of Project site from aggregates and cementitious materials that have been extracted, harvested, or recovered, as well as manufactured, within 500 miles (800 km) of Project site.

Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from single source, and obtain admixtures from single source from single manufacturer.

Cementitious Materials:

Portland Cement: ASTM C 150/C 150M, Type I, white.
Fly Ash: ASTM C 618, Class F.

Blended Hydraulic Cement: ASTM C 595/C 595M, Type IS, portland blast-furnace slag cement.

Normal-Weight Aggregates: ASTM C 33/C 33M, Class 3S coarse aggregate or better, graded. Provide aggregates from a single source with documented service record data of at least 10 years' satisfactory service in similar applications and service conditions using similar aggregates and cementitious materials.

Maximum Coarse-Aggregate Size: 3/4 inch (19 mm) nominal.

Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.

Chemical Admixtures: Certified by manufacturer to be compatible with other admixtures and that do not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.

Water-Reducing Admixture: ASTM C 494/C 494M, Type A.

Retarding Admixture: ASTM C 494/C 494M, Type B.

Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.

High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.

High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.

Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.

Set-Accelerating Corrosion-Inhibiting Admixture: Commercially formulated, anodic inhibitor or mixed cathodic and anodic inhibitor; capable of forming a protective barrier and minimizing chloride reactions with steel reinforcement in concrete and complying with ASTM C 494/C 494M, Type C.

Non-Set-Accelerating Corrosion-Inhibiting Admixture: Commercially formulated, non-set-accelerating, anodic inhibitor or mixed cathodic and anodic inhibitor; capable of forming a protective barrier and minimizing chloride reactions with steel reinforcement in concrete.

Water: ASTM C 94/C 94M and potable.

WATERSTOPS

Flexible Rubber Waterstops: CE CRD-C 513, with factory-installed metal eyelets, for embedding in concrete to prevent passage of fluids through joints. Factory fabricate corners, intersections, and directional changes.

Profile: Flat dumbbell with center bulb.

Dimensions: 4 inches by 3/16 inch thick (100 mm by 4.75 mm thick); non-tapered.

VAPOR RETARDERS

Sheet Vapor Retarder: Polyethylene sheet, ASTM D 4397, not less than 10 mils (0.25 mm) thick.

CURING MATERIALS

Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.

Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. (305 g/sq. m) when dry.

Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.

Water: Potable.

Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, dissipating.

RELATED MATERIALS

Expansion- and Isolation-Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber.

Semi-rigid Joint Filler: Two-component, semi-rigid, 100 percent solids, epoxy resin with a Type A shore durometer hardness of 80 according to ASTM D 2240.

Bonding Agent: ASTM C 1059/C 1059M, Type II, non-redispersible, acrylic emulsion or styrene butadiene.

Epoxy Bonding Adhesive: ASTM C 881, two-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class suitable for application temperature and of grade to suit requirements, and as follows:

Types I and II, non-load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.

REPAIR MATERIALS

Repair Underlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/8 inch (3.2 mm) and that can be feathered at edges to match adjacent floor elevations.

Cement Binder: ASTM C 150/C 150M, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.

Primer: Product of underlayment manufacturer recommended for substrate, conditions, and application.

Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch (3.2 to 6 mm) or coarse sand as recommended by underlayment manufacturer.

Compressive Strength: Not less than 4100 psi (29 MPa) at 28 days when tested according to ASTM C 109/C 109M.

Repair Overlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/4 inch (6.4 mm) and that can be filled in over a scarified surface to match adjacent floor elevations.

Cement Binder: ASTM C 150/C 150M, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.

Primer: Product of topping manufacturer recommended for substrate, conditions, and application.
Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch (3.2 to 6 mm) or coarse sand as recommended by topping manufacturer.

Compressive Strength: Not less than 5000 psi (34.5 MPa) at 28 days when tested according to ASTM C 109/C 109M.

CONCRETE MIXTURES, GENERAL

Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301 (ACI 301M).

Use a qualified independent testing agency for preparing and reporting proposed mixture designs based on laboratory trial mixtures.

Cementitious Materials: Use fly ash, pozzolan, slag cement, and silica fume as needed to reduce the total amount of portland cement, which would otherwise be used, by not less than 40 percent.

Fly Ash: 25 percent.

Combined Fly Ash and Pozzolan: 25 percent.

Combined Fly Ash or Pozzolan and Slag Cement: 50 percent Portland cement minimum, with fly ash or pozzolan not exceeding 25 percent.

Silica Fume: 10 percent.

Combined Fly Ash, Pozzolans, and Silica Fume: 35 percent with fly ash or pozzolans not exceeding 25 percent and silica fume not exceeding 10 percent.

Combined Fly Ash or Pozzolans, Slag Cement, and Silica Fume: 50 percent with fly ash or pozzolans not exceeding 25 percent and silica fume not exceeding 10 percent.

Limit water-soluble, chloride-ion content in hardened concrete to 0.06 percent by weight of cement.
Admixtures: Use admixtures according to manufacturer's written instructions.

Use water-reducing, high-range water-reducing, admixture in concrete, as required, for placement and workability.

Use water-reducing and -retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.

Use water-reducing admixture in pumped concrete, concrete for heavy-use industrial slabs and parking structure slabs, concrete required to be watertight, and concrete with a w/c ratio below 0.50.

Use corrosion-inhibiting admixture in concrete mixtures where indicated.

Color Pigment: Add color pigment to concrete mixture according to manufacturer's written instructions and to result in hardened concrete color consistent with approved mockup.

CONCRETE MIXTURES FOR BUILDING ELEMENTS

Footings: Normal-weight concrete.

Minimum Compressive Strength: 3000 psi (20.7 MPa) at 28 days.

Maximum W/C Ratio: 0.45.

Slump Limit: 8 inches (200 mm) for concrete with verified slump of 2 to 4 inches (50 to 100 mm) before adding high-range water-reducing admixture or plasticizing admixture, plus or minus 1 inch (25 mm).

Air Content: 6 percent, plus or minus 1.5 percent at point of delivery for3/4-inch (19-mm) nominal maximum aggregate size.

Foundation Walls: Normal-weight concrete.

Minimum Compressive Strength: 4000 psi (27.6 MPa) at 28 days.

Maximum W/C Ratio: 0.45.

Slump Limit: 4 inches (100 mm) 8 inches (200 mm) for concrete with verified slump of 2 to 4 inches (50 to 100 mm) before adding high-range water-reducing admixture or plasticizing admixture, plus or minus 1 inch (25 mm).

Air Content: 6 percent, plus or minus 1.5 percent at point of delivery for3/4-inch (19-mm) nominal maximum aggregate size.

Slabs-on-Grade: Normal-weight concrete.

Minimum Compressive Strength: 3500 psi (24.1 MPa) at 28 days.

Maximum W/C Ratio: 0.45.

Minimum Cementitious Materials Content: 470 lb/cu. yd. (279 kg/cu. m).

Slump Limit: 4 inches (100 mm), plus or minus 1 inch (25 mm).

Air Content: 6 percent, plus or minus 1.5 percent at point of delivery for3/4-inch (19-mm) nominal maximum aggregate size.

Air Content: Do not allow air content of trowel-finished floors to exceed 3 percent.

Concrete Toppings: Normal-weight concrete.

Minimum Compressive Strength: 4000 psi (27.6 MPa) at 28 days.

Minimum Cementitious Materials Content: 470 lb/cu. yd. (279 kg/cu. m).

Slump Limit: 4 inches (100 mm), plus or minus 1 inch (25 mm).

Air Content: 6 percent, plus or minus 1.5 percent at point of delivery for3/4-inch (19-mm) nominal maximum aggregate size.

Air Content: Do not allow air content of trowel-finished toppings to exceed 3 percent.

FABRICATING REINFORCEMENT

Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

CONCRETE MIXING

Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M, and furnish batch ticket information.

When air temperature is between 85 and 90 deg F (30 and 32 deg C), reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F (32 deg C), reduce mixing and delivery time to 60 minutes.

Project-Site Mixing: Measure, batch, and mix concrete materials and concrete according to ASTM C 94/C 94M. Mix concrete materials in appropriate drum-type batch machine mixer.

For mixer capacity of 1 cu. yd. (0.76 cu. m) or smaller, continue mixing at least 1-1/2 minutes, but not more than 5 minutes after ingredients are in mixer, before any part of batch is released.

For mixer capacity larger than 1 cu. yd. (0.76 cu. m), increase mixing time by 15 seconds for each additional 1 cu. yd. (0.76 cu. m).

Provide batch ticket for each batch discharged and used in the Work, indicating Project identification name and number, date, mixture type, mixture time, quantity, and amount of water added. Record approximate location of final deposit in structure.

EXECUTION

FORMWORK INSTALLATION

Design, erect, shore, brace, and maintain formwork, according to ACI 301 (ACI 301M), to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.
Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117 (ACI 117M).

Limit concrete surface irregularities, designated by ACI 347 as abrupt or gradual, as follows:

Class A, 1/8 inch (3.2 mm) for smooth-formed finished surfaces.

Construct forms tight enough to prevent loss of concrete mortar.

Construct forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast-concrete surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical.

Install keyways, reglets, recesses, and the like, for easy removal.

Do not use rust-stained steel form-facing material.

Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds.

Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.

Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the Work. Determine sizes and locations from trades providing such items.

Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.

Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.

Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

EMBEDDED ITEM INSTALLATION

Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC 303.

Install reglets to receive waterproofing and to receive through-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, shelf angles, and other conditions.

Install dovetail anchor slots in concrete structures as indicated.

REMOVING AND REUSING FORMS

General: Formwork for sides of beams, walls, columns, and similar parts of the Work that does not support weight of concrete may be removed after cumulatively curing at not less than 50 deg F (10 deg C) for 24 hours after placing concrete. Concrete has to be hard enough to not be damaged by form-removal operations, and curing and protection operations need to be maintained.

VAPOR-RETARDER INSTALLATION

Sheet Vapor Retarders: Place, protect, and repair sheet vapor retarder according to ASTM E 1643 and manufacturer's written instructions.

Lap joints 6 inches (150 mm) and seal with manufacturer's recommended tape.

Bituminous Vapor Retarders: Place, protect, and repair bituminous vapor retarder according to manufacturer's written instructions.

STEEL REINFORCEMENT INSTALLATION

General: Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.

Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.

Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that reduce bond to concrete.

Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcing bars.

Weld reinforcing bars according to AWS D1.4/D 1.4M, where indicated.

Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.

Install welded-wire reinforcement in longest practicable lengths on bar supports spaced to minimize sagging. Lap edges and ends of adjoining sheets at least one mesh spacing. Offset laps of adjoining sheet widths to prevent continuous laps in either direction. Lace overlaps with wire.

Epoxy-Coated Reinforcement: Repair cut and damaged epoxy coatings with epoxy repair coating according to ASTM D 3963/D 3963M. Use epoxy-coated steel wire ties to fasten epoxy-coated steel reinforcement.

Zinc-Coated Reinforcement: Repair cut and damaged zinc coatings with zinc repair material according to ASTM A 780/A 780M. Use galvanized-steel wire ties to fasten zinc-coated steel reinforcement.

JOINTS

General: Construct joints true to line with faces perpendicular to surface plane of concrete.
Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect.

Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints unless otherwise indicated. Do not continue reinforcement through sides of strip placements of floors and slabs.

Form keyed joints as indicated. Embed keys at least 1-1/2 inches (38 mm) into concrete.

Locate joints for beams, slabs, joists, and girders in the middle third of spans. Offset joints in girders a minimum distance of twice the beam width from a beam-girder intersection.

Locate horizontal joints in walls and columns at underside of floors, slabs, beams, and girders and at the top of footings or floor slabs.

Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.

Use epoxy-bonding adhesive at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.

Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of concrete thickness as follows:

Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint to a radius of 1/8 inch (3.2 mm). Repeat grooving of contraction joints after applying surface finishes. Eliminate groover tool marks on concrete surfaces.

Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch-(3.2-mm-)wide joints into concrete when cutting action does not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.
Isolation Joints in Slabs-on-Grade: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.

Extend joint-filler strips full width and depth of joint, terminating flush with finished concrete surface unless otherwise indicated.

Terminate full-width joint-filler strips not less than 1/2 inch (13 mm) or more than 1 inch (25 mm) below finished concrete surface where joint sealants, specified in Section 079200 "Joint Sealants," are indicated.

Install joint-filler strips in lengths as long as practicable. Where more than one length is required, lace or clip sections together.

Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or asphalt coat one-half of dowel length to prevent concrete bonding to one side of joint.

WATERSTOP INSTALLATION

Flexible Waterstops: Install in construction joints and at other joints indicated to form a continuous diaphragm. Install in longest lengths practicable. Support and protect exposed waterstops during progress of the Work. Field fabricate joints in waterstops according to manufacturer's written instructions.

Self-Expanding Strip Waterstops: Install in construction joints and at other locations indicated, according to manufacturer's written instructions, adhesive bonding, mechanically fastening, and firmly pressing into place. Install in longest lengths practicable.

CONCRETE PLACEMENT

Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections are completed.

Do not add water to concrete during delivery, at Project site, or during placement unless approved by Architect.

Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301 (ACI 301M).

Do not add water to concrete after adding high-range water-reducing admixtures to mixture.
Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete is placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.

Deposit concrete in horizontal layers of depth not to exceed formwork design pressures and in a manner to avoid inclined construction joints.

Consolidate placed concrete with mechanical vibrating equipment according to ACI 301 (ACI 301M).
Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches (150 mm) into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.

Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.

Consolidate concrete during placement operations, so concrete is thoroughly worked around reinforcement and other embedded items and into corners.

Maintain reinforcement in position on chairs during concrete placement.

Screed slab surfaces with a straightedge and strike off to correct elevations.

Slope surfaces uniformly to drains where required.

Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface. Do not further disturb slab surfaces before starting finishing operations.

FINISHING FORMED SURFACES

Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defects repaired and patched. Remove fins and other projections that exceed specified limits on formed-surface irregularities.

Apply to concrete surfaces not exposed to public view.

Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defects. Remove fins and other projections that exceed specified limits on formed-surface irregularities.

Apply to concrete surfaces exposed to public view, to receive a rubbed finish, or to be covered with a coating or covering material applied directly to concrete.

Rubbed Finish: Apply the following to smooth-formed-finished as-cast concrete where indicated:

Smooth-Rubbed Finish: Not later than one day after form removal, moisten concrete surfaces and rub with carborundum brick or another abrasive until producing a uniform color and texture. Do not apply cement grout other than that created by the rubbing process.

Grout-Cleaned Finish: Wet concrete surfaces and apply grout of a consistency of thick paint to coat surfaces and fill small holes. Mix 1 part portland cement to 1-1/2 parts fine sand with a 1:1 mixture of bonding admixture and water. Add white portland cement in amounts determined by trial patches, so color of dry grout matches adjacent surfaces. Scrub grout into voids and remove excess grout. When grout whitens, rub surface with clean burlap and keep surface damp by fog spray for at least 36 hours.

Cork-Floated Finish: Wet concrete surfaces and apply a stiff grout. Mix 1 part portland cement and 1 part fine sand with a 1:1 mixture of bonding agent and water. Add white portland cement in amounts determined by trial patches, so color of dry grout matches adjacent surfaces. Compress grout into voids by grinding surface. In a swirling motion, finish surface with a cork float.

Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed

surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces unless otherwise indicated.

FINISHING FLOORS AND SLABS

General: Comply with ACI 302.1R recommendations for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.

Scratch Finish: While still plastic, texture concrete surface that has been screeded and bull-floated or darbied. Use stiff brushes, brooms, or rakes to produce a profile amplitude of 1/4 inch (6 mm) in one direction.
Apply scratch finish to surfaces, to receive concrete floor toppings, to receive mortar setting beds for bonded cementitious floor finishes,

Float Finish: Consolidate surface with power-driven floats or by hand floating if area is small or inaccessible to power-driven floats. Restraighten, cut down high spots, and fill low spots. Repeat float passes and restraightening until surface is left with a uniform, smooth, granular texture.

Apply float finish to surfaces, to receive trowel finish,

Trowel Finish: After applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel. Continue troweling passes and restraighten until surface is free of trowel marks and uniform in texture and appearance. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.

Apply a trowel finish to surfaces, exposed to view, to be covered with resilient flooring, carpet, ceramic or quarry tile set over a cleavage membrane, paint, or another thin-film-finish coating system,.

Finish surfaces to the following tolerances, according to ASTM E 1155 (ASTM E 1155M), for a randomly trafficked floor surface:

Specified overall values of flatness, F(F) 25; and of levelness, F(L) 20; with minimum local values of flatness, F(F) 17; and of levelness, F(L) 15.

Specified overall values of flatness, F(F) 35; and of levelness, F(L) 25; with minimum local values of flatness, F(F) 24; and of levelness, F(L) 17; for slabs-on-grade.

Specified overall values of flatness, F(F) 30; and of levelness, F(L) 20; with minimum local values of flatness, F(F) 24; and of levelness, F(L) 15; for suspended slabs.

Specified overall values of flatness, F(F) 45; and of levelness, F(L) 35; with minimum local values of flatness, F(F) 30; and of levelness, F(L) 24.

Finish and measure surface, so gap at any point between concrete surface and an unleveled, freestanding, 10-ft.-(3.05-m-)long straightedge resting on two high spots and placed anywhere on the surface does not exceed1/8 inch (3.2 mm).

Trowel and Fine-Broom Finish: Apply a first trowel finish to surfaces where ceramic or quarry tile is to be installed by either thickset or thinset method. While concrete is still plastic, slightly scarify surface with a fine broom.

Comply with flatness and levelness tolerances for trowel-finished floor surfaces.

Broom Finish: Apply a broom finish to exterior concrete platforms, steps, ramps, and elsewhere as indicated.

Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route. Coordinate required final finish with Architect before application.

MISCELLANEOUS CONCRETE ITEM INSTALLATION

Filling In: Fill in holes and openings left in concrete structures after work of other trades is in place unless otherwise indicated. Mix, place, and cure concrete, as specified, to blend with in-place construction. Provide other miscellaneous concrete filling indicated or required to complete the Work.
Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and by steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.

Equipment Bases and Foundations:

Coordinate sizes and locations of concrete bases with actual equipment provided.

Construct concrete bases 4 inches((100 mm)) high unless otherwise indicated, and extend base not less than 6 inches (150 mm) in each direction beyond the maximum dimensions of supported equipment unless otherwise indicated or unless required for seismic anchor support.

Minimum Compressive Strength: 3000 psi (20.7 MPa) at 28 days.

Install dowel rods to connect concrete base to concrete floor. Unless otherwise indicated, install dowel rods on 18-inch (450-mm) centers around the full perimeter of concrete base.

For supported equipment, install epoxy-coated anchor bolts that extend through concrete base and anchor into structural concrete substrate.

Prior to pouring concrete, place and secure anchorage devices. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

Cast anchor-bolt insert into bases. Install anchor bolts to elevations required for proper attachment to supported equipment.

Steel Pan Stairs: Provide concrete fill for steel pan stair treads, landings, and associated items. Cast-in inserts and accessories as shown on Drawings. Screed, tamp, and trowel finish concrete surfaces.

CONCRETE PROTECTING AND CURING

General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 301 (ACI 301M) for hot-weather protection during curing.

Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h (1 kg/sq. m x h) before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.

Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces. If forms remain during curing period, moist cure after loosening forms. If removing forms before end of curing period, continue curing for remainder of curing period.
Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings, and other surfaces.
Cure concrete according to ACI 308.1, by one or a combination of the following methods:

Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:

Water.
Continuous water-fog spray.
Absorptive cover, water saturated, and kept continuously wet. Cover concrete surfaces and edges with 12-inch (300-mm) lap over adjacent absorptive covers.

JOINT FILLING

Prepare, clean, and install joint filler according to manufacturer's written instructions.

Defer joint filling until concrete has aged at least one month(s). Do not fill joints until construction traffic has permanently ceased.

Remove dirt, debris, saw cuttings, curing compounds, and sealers from joints; leave contact faces of joints clean and dry.

Install semirigid joint filler full depth in saw-cut joints and at least 2 inches (50 mm) deep in formed joints. Overfill joint and trim joint filler flush with top of joint after hardening.

CONCRETE SURFACE REPAIRS

Defective Concrete: Repair and patch defective areas when approved by Architect. Remove and replace concrete that cannot be repaired and patched to Architect's approval.

Patching Mortar: Mix dry-pack patching mortar, consisting of 1 part portland cement to 2-1/2 parts fine aggregate passing a No. 16 (1.18-mm) sieve, using only enough water for handling and placing.

Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycombs, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.

Immediately after form removal, cut out honeycombs, rock pockets, and voids more than 1/2 inch (13 mm) in any dimension to solid concrete. Limit cut depth to 3/4 inch (19 mm). Make edges of cuts perpendicular to concrete surface. Clean, dampen with water, and brush-coat holes and voids with bonding agent. Fill and compact with patching mortar before bonding agent has dried. Fill form-tie voids with patching mortar or cone plugs secured in place with bonding agent.

Repair defects on surfaces exposed to view by blending white Portland cement and standard portland cement so that, when dry, patching mortar matches surrounding color. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching. Compact mortar in place and strike off slightly higher than surrounding surface.

Repair defects on concealed formed surfaces that affect concrete's durability and structural performance as determined by Architect.
Repairing Unformed Surfaces: Test unformed surfaces, such as floors and slabs, for finish and verify surface tolerances specified for each surface. Correct low and high areas. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.

Repair finished surfaces containing defects. Surface defects include spalls, popouts, honeycombs, rock pockets, crazing and cracks in excess of 0.01 inch (0.25 mm) wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width, and other objectionable conditions. After concrete has cured at least 14 days, correct high areas by grinding.

Correct localized low areas during or immediately after completing surface finishing operations by cutting out low areas and replacing with patching mortar. Finish repaired areas to blend into adjacent concrete.

Correct other low areas scheduled to receive floor coverings with a repair underlayment. Prepare, mix, and apply repair underlayment and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface. Feather edges to match adjacent floor elevations.
Correct other low areas scheduled to remain exposed with a repair topping. Cut out low areas to ensure a minimum repair topping depth of 1/4 inch (6 mm) to match adjacent floor elevations. Prepare, mix, and apply repair topping and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.

Repair defective areas, except random cracks and single holes 1 inch (25 mm) or less in diameter, by cutting out and replacing with fresh concrete. Remove defective areas with clean, square cuts and expose steel reinforcement with at least a 3/4-inch (19-mm) clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding agent. Mix patching concrete of same materials and mixture as original concrete, except without coarse aggregate. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.
Repair random cracks and single holes 1 inch (25 mm) or less in diameter with patching mortar. Groove top of cracks and cut out holes to sound concrete and clean off dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding agent. Place patching mortar before bonding agent has dried. Compact patching mortar and finish to match adjacent concrete. Keep patched area continuously moist for at least 72 hours.

Perform structural repairs of concrete, subject to Architect's approval, using epoxy adhesive and patching mortar.

Repair materials and installation not specified above may be used, subject to Architect's approval.

FIELD QUALITY CONTROL

Special Inspections: Owner will engage a qualified testing and inspecting agency to perform field tests and inspections and prepare test reports.

Testing Agency: Engage a qualified testing and inspecting agency to perform tests and inspections and to submit reports.

Inspections:

Steel reinforcement placement.
Steel reinforcement welding.
Headed bolts and studs.
Verification of use of required design mixture.
Concrete placement, including conveying and depositing.
Curing procedures and maintenance of curing temperature.
Verification of concrete strength before removal of shores and forms from beams and slabs.

Concrete Tests: Testing of composite samples of fresh concrete obtained according to ASTM C 172/C 172M shall be performed according to the following requirements:

Testing Frequency: Obtain one composite sample for each day's pour of each concrete mixture exceeding 5 cu. yd. (4 cu. m), but less than 25 cu. yd. (19 cu. m), plus one set for each additional 50 cu. yd. (38 cu. m) or fraction thereof.

Testing Frequency: Obtain at least one composite sample for each 100 cu. yd. (76 cu. m) or fraction thereof of each concrete mixture placed each day.

When frequency of testing provides fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.

Slump: ASTM C 143/C 143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.

Air Content: ASTM C 231/C 231M, pressure method, for normal-weight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
Concrete Temperature: ASTM C 1064/C 1064M; one test hourly when air temperature is 40 deg F (4.4 deg C) and below or 80 deg F (27 deg C) and above, and one test for each composite sample.

Unit Weight: ASTM C 567/C 567M, fresh unit weight of structural lightweight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.

Compression Test Specimens: ASTM C 31/C 31M.

Cast and laboratory cure two sets of two standard cylinder specimens for each composite sample.

Cast and field cure two sets of two standard cylinder specimens for each composite sample.

Compressive-Strength Tests: ASTM C 39/C 39M; test one set of two laboratory-cured specimens at 7 days and one set of two specimens at 28 days.

Test one set of two field-cured specimens at 7 days and one set of two specimens at 28 days.

A compressive-strength test shall be the average compressive strength from a set of two specimens obtained from same composite sample and tested at age indicated.

When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, Contractor shall evaluate operations and provide corrective procedures for protecting and curing in-place concrete.
Strength of each concrete mixture will be satisfactory if every average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi (3.4 MPa).

Test results shall be reported in writing to Architect, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.

Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.

Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42/C 42M or by other methods as directed by Architect.

Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

Correct deficiencies in the Work that test reports and inspections indicate do not comply with the Contract Documents.

Measure floor and slab flatness and levelness according to ASTM E 1155 (ASTM E 1155M) within 24 hours of finishing.

PROTECTION OF LIQUID FLOOR TREATMENTS

Protect liquid floor treatment from damage and wear during the remainder of construction period. Use protective methods and materials, including temporary covering, recommended in writing by liquid floor treatments installer.

END OF SECTION 033000

DIVISION 04 – MASONRY
SECTION 042000 - UNIT MASONRY

GENERAL

SUMMARY

Section Includes:

Concrete masonry units.
Decorative concrete masonry units.
Building (common) brick.
Mortar and grout.
Steel reinforcing bars.
Masonry-joint reinforcement.
Ties and anchors.
Embedded flashing.
Miscellaneous masonry accessories.
Masonry-cell fill.

Products Installed but not Furnished under This Section:

Cast-stone trim in unit masonry.
Steel lintels in unit masonry.
Steel shelf angles for supporting unit masonry.

DEFINITIONS

CMU(s): Concrete masonry unit(s).

Reinforced Masonry: Masonry containing reinforcing steel in grouted cells.

PREINSTALLATION MEETINGS

Preinstallation Conference: Conduct conference at Project site.

ACTION SUBMITTALS

Product Data: For each type of product.

Shop Drawings: For the following:

Masonry Units: Show sizes, profiles, coursing, and locations of special shapes.

Reinforcing Steel: Detail bending, lap lengths, and placement of unit masonry reinforcing bars. Comply with ACI 315. Show elevations of reinforced walls.

Fabricated Flashing: Detail corner units, end-dam units, and other special applications.
Samples for Initial Selection:

Decorative CMUs, in the form of small-scale units.

Clay face brick, in the form of straps of five or more bricks.

Colored mortar.

Weep holes/cavity vents.

Samples for Verification: For each type and color of the following:

Exposed Decorative CMUs.

Clay face brick, in the form of straps of five or more bricks.

Special brick shapes.

Pigmented and colored-aggregate mortar. Make Samples using same sand and mortar ingredients to be used on Project.

Weep holes and cavity vents.

Accessories embedded in masonry.

INFORMATIONAL SUBMITTALS

List of Materials Used in Constructing Mockups: List generic product names together with manufacturers, manufacturers' product names, model numbers, lot numbers, batch numbers, source of supply, and other information as required to identify materials used. Include mix proportions for mortar and grout and source of aggregates.

Submittal is for information only. Receipt of list does not constitute approval of deviations from the Contract Documents unless such deviations are specifically brought to the attention of Architect and approved in writing.

Qualification Data: For testing agency.

Material Certificates: For each type and size of the following:

Masonry units.

Include material test reports substantiating compliance with requirements.

For brick, include size-variation data verifying that actual range of sizes falls within specified tolerances.

For exposed brick, include test report for efflorescence according to ASTM C 67.

For masonry units used in structural masonry, include data and calculations establishing average net-area compressive strength of units.

Integral water repellant used in CMUs.

Cementitious materials. Include name of manufacturer, brand name, and type.

Mortar admixtures.

Preblended, dry mortar mixes. Include description of type and proportions of ingredients.

Grout mixes. Include description of type and proportions of ingredients.

Reinforcing bars.

Joint reinforcement.

Anchors, ties, and metal accessories.

Mix Designs: For each type of mortar and grout. Include description of type and proportions of ingredients.

Include test reports for mortar mixes required to comply with property specification. Test according to ASTM C 109/C 109M for compressive strength, ASTM C 1506 for water retention, and ASTM C 91/C 91M for air content.

Include test reports, according to ASTM C 1019, for grout mixes required to comply with compressive strength requirement.

Statement of Compressive Strength of Masonry: For each combination of masonry unit type and mortar type, provide statement of average net-area compressive strength of masonry units, mortar type, and resulting net-area compressive strength of masonry determined according to TMS 602/ACI 530.1/ASCE 6.

Cold-Weather and Hot-Weather Procedures: Detailed description of methods, materials, and equipment to be used to comply with requirements.

QUALITY ASSURANCE

Testing Agency Qualifications: Qualified according to ASTM C 1093 for testing indicated.
Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.

Build mockup of typical wall area as shown on Drawings.

Build mockups for each type of exposed unit masonry construction in sizes approximately60 inches (1500 mm) long by72 inches (1800 mm) high by full thickness, including face and backup wythes and accessories.

Include a sealant-filled joint at least 16 inches (400 mm) long in exterior wall mockup.

Include lower corner of window opening, framed with stone trim, at upper corner of exterior wall mockup. Make opening approximately 12 inches (300 mm) wide by 16 inches (400 mm) high.

Include through-wall flashing installed for a 24-inch (600-mm) length in corner of exterior wall mockup approximately 16 inches (400 mm) down from top of mockup, with a 12-inch (300-mm) length of flashing left exposed to view (omit masonry above half of flashing).

Include metal studs, sheathing, water-resistive barrier, veneer anchors, flashing, cavity drainage material, and weep holes in exterior masonry-veneer wall mockup.

Include clay face brick on one face of interior unit masonry wall mockup.

Clean one-half of exposed faces of mockups with masonry cleaner as indicated.

Protect accepted mockups from the elements with weather-resistant membrane.

Approval of mockups is for color, texture, and blending of masonry units; relationship of mortar and sealant colors to masonry unit colors; tooling of joints; and aesthetic qualities of workmanship.

Approval of mockups is also for other material and construction qualities specifically approved by Architect in writing.

Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.

Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

DELIVERY, STORAGE, AND HANDLING

Store masonry units on elevated platforms in a dry location. If units are not stored in an enclosed location, cover tops and sides of stacks with waterproof sheeting, securely tied. If units become wet, do not install until they are dry.

Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.

Store aggregates where grading and other required characteristics can be maintained and contamination avoided.

Deliver preblended, dry mortar mix in moisture-resistant containers. Store preblended, dry mortar mix in delivery containers on elevated platforms in a dry location or in covered weatherproof dispensing silos.

Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

FIELD CONDITIONS

Protection of Masonry: During construction, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed masonry when construction is not in progress.

Extend cover a minimum of 24 inches (600 mm) down both sides of walls, and hold cover securely in place.

Where one wythe of multiwythe masonry walls is completed in advance of other wythes, secure cover a minimum of 24 inches (600 mm) down face next to unconstructed wythe, and hold cover in place.

Do not apply uniform floor or roof loads for at least 12 hours and concentrated loads for at least three days after building masonry walls or columns.

Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Immediately remove grout, mortar, and soil that come in contact with such masonry.

Protect base of walls from rain-splashed mud and from mortar splatter by spreading coverings on ground and over wall surface.

Protect sills, ledges, and projections from mortar droppings.

Protect surfaces of window and door frames, as well as similar products with painted and integral finishes, from mortar droppings.

Turn scaffold boards near the wall on edge at the end of each day to prevent rain from splashing mortar and dirt onto completed masonry.

Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Remove and replace unit masonry damaged by frost or by freezing conditions. Comply with cold-weather construction requirements contained in TMS 602/ACI 530.1/ASCE 6.

Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40 deg F (4 deg C) and higher and will remain so until masonry has dried, but not less than seven days after completing cleaning.

Hot-Weather Requirements: Comply with hot-weather construction requirements contained in TMS 602/ACI 530.1/ASCE 6.

PRODUCTS

MANUFACTURERS

Source Limitations for Masonry Units: Obtain exposed masonry units of a uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from single source from single manufacturer for each product required.

Source Limitations for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from single manufacturer for each cementitious component and from single source or producer for each aggregate.

PERFORMANCE REQUIREMENTS

Provide structural unit masonry that develops indicated net-area compressive strengths at 28 days. Determine net-area compressive strength of masonry from average net-area compressive strengths of masonry units and mortar types (unit-strength method) according to TMS 602/ACI 530.1/ASCE 6.

Determine net-area compressive strength of masonry by testing masonry prisms according to ASTM C 1314.

UNIT MASONRY, GENERAL

Masonry Standard: Comply with TMS 602/ACI 530.1/ASCE 6, except as modified by requirements in the Contract Documents.

Defective Units: Referenced masonry unit standards may allow a certain percentage of units to contain chips, cracks, or other defects exceeding limits stated. Do not use units where such defects are exposed in the completed Work and will be within 20 feet (6 m) vertically and horizontally of a walking surface.

Fire-Resistance Ratings: Comply with requirements for fire-resistance-rated assembly designs indicated.

Where fire-resistance-rated construction is indicated, units shall be listed and labeled by a qualified testing agency acceptable to authorities having jurisdiction.

CONCRETE MASONRY UNITS

Shapes: Provide shapes indicated and as follows, with exposed surfaces matching exposed faces of adjacent units unless otherwise indicated.

Provide special shapes for lintels, corners, jambs, sashes, movement joints, headers, bonding, and other special conditions.

Provide bullnose units for outside corners unless otherwise indicated.

Integral Water Repellent: Provide units made with integral water repellent for exposed units and where indicated.

Integral Water Repellent: Liquid polymeric, integral water-repellent admixture that does not reduce flexural bond strength. Units made with integral water repellent, when tested according to ASTM E 514/E 514M as a wall assembly made with mortar containing integral water-repellent manufacturer's mortar additive, with test period extended to 24 hours, shall show no visible water or leaks on the back of test specimen.

Products subject to compliance with requirements, provide one of the following:

E P Henry Corporation
Fizzano Brothers Concrete Products Inc.
Clayton Block

Insulated CMUs: Where indicated, units shall contain rigid, specially shaped, cellular thermal insulation units complying with ASTM C 578, Type I, designed for installing in cores of masonry units.

CMUs: ASTM C 90.

Density Classification: Normal weight.

Size (Width): Manufactured to dimensions 3/8 inch (10 mm) less than nominal dimensions.
Exposed Faces: Provide color and texture matching the range represented by Architect's sample.

Decorative CMUs: ASTM C 90.

Density Classification: Normal weight.

Size (Width): Manufactured to dimensions specified in "CMUs" Paragraph.

Pattern and Texture:

Standard pattern, split-face finish.

Colors: As selected by Architect from manufacturer's full range.

Special Aggregate: Provide units made with aggregate matching aggregate in Architect's sample.

BRICK

Regional Materials: Brick shall be manufactured within 500 miles (800 km) of Project site from materials that have been extracted, harvested, or recovered, as well as manufactured, within 500 miles (800 km) of Project site.

General: Provide shapes indicated and as follows, with exposed surfaces matching finish and color of exposed faces of adjacent units:

For ends of sills and caps and for similar applications that would otherwise expose unfinished brick surfaces, provide units without cores or frogs and with exposed surfaces finished.

Provide special shapes for applications where stretcher units cannot accommodate special conditions, including those at corners, movement joints, bond beams, sashes, and lintels.

Provide special shapes for applications requiring brick of size, form, color, and texture on exposed surfaces that cannot be produced by sawing.

Provide special shapes for applications where shapes produced by sawing would result in sawed surfaces being exposed to view.

Clay Face Brick: Facing brick complying with ASTM C 216.

Products subject to compliance with requirements, provide the following:
Grade: MW or SW.
Type: FBX.
Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 3350 psi (23.10 MPa).
Initial Rate of Absorption: Less than 30 g/30 sq. in. (30 g/194 sq. cm) per minute when tested according to ASTM C 67.
Efflorescence: Provide brick that has been tested according to ASTM C 67 and is rated "not effloresced."

Surface Coating: Brick with colors or textures produced by application of coatings shall withstand 50 cycles of freezing and thawing according to ASTM C 67 with no observable difference in the applied finish when viewed from 10 feet (3 m).
Size (Actual Dimensions): 3-5/8 inches (92 mm) wide by 2-1/4 inches (57 mm) high by 7-5/8 inches (194 mm) long.
Application: Use where brick is exposed unless otherwise indicated.
Provide face brick matching color range, texture, and size of existing adjacent brickwork.

Building (Common) Brick: ASTM C 62, Grade NW, MW, or SW.

Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 2100 psi (14.48 MPa).

Size (Actual Dimensions): 3-5/8 inches (92 mm) wide by 2-1/4 inches (57 mm) high by 7-5/8 inches (194 mm) long.

Application: Use where brick is indicated for concealed locations. Face brick complying with requirements for grade, compressive strength, and size indicated for building brick may be substituted for building brick.

Products subject to compliance with requirements, provide the following:
Glen- Gery York Series Allington Modular
Glen- Gery Royal Manor Series Sandford Modular

Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 3350 psi (23.10 MPa).

Efflorescence: Provide brick that has been tested according to ASTM C 67 and is rated "not effloresced."

Surface Coating: Brick with colors or textures produced by application of coatings shall withstand 50 cycles of freezing and thawing according to ASTM C 67 with no observable difference in the applied finish when viewed from 10 feet (3 m).

Provide hollow brick matching color range, texture, and size of existing adjacent brickwork.

Color and Texture: As selected by Architect.

MORTAR AND GROUT MATERIALS

Regional Materials: Aggregate for mortar and grout, cement, and lime shall be extracted, harvested, or recovered, as well as manufactured, within 500 miles (800 km) of Project site.

Portland Cement: ASTM C 150/C 150M, Type I or II, except Type III may be used for cold-weather construction. Provide natural color or white cement as required to produce mortar color indicated. Alkali content shall not be more than 0.1 percent when tested according to ASTM C 114.

Hydrated Lime: ASTM C 207, Type S.

Portland Cement-Lime Mix: Packaged blend of portland cement and hydrated lime containing no other ingredients.

Masonry Cement: ASTM C 91/C 91M.

Mortar Cement: ASTM C 1329/C 1329M.

Mortar Pigments: Natural and synthetic iron oxides and chromium oxides, compounded for use in mortar mixes and complying with ASTM C 979/C 979M. Use only pigments with a record of satisfactory performance in masonry mortar.

Colored Cement Products: Packaged blend made from portland cement and hydrated lime and mortar pigments, all complying with specified requirements, and containing no other ingredients.

Formulate blend as required to produce color indicated or, if not indicated, as selected from manufacturer's standard colors.

Pigments shall not exceed 10 percent of portland cement by weight.

Pigments shall not exceed 5 percent of masonry cement or mortar cement by weight.

Aggregate for Mortar: ASTM C 144.

For mortar that is exposed to view, use washed aggregate consisting of natural sand or crushed stone. For joints less than 1/4 inch (6 mm) thick, use aggregate graded with 100 percent passing the No. 16 (1.18-mm) sieve.

White-Mortar Aggregates: Natural white sand or crushed white stone.

Colored-Mortar Aggregates: Natural sand or crushed stone of color necessary to produce required mortar color.

Aggregate for Grout: ASTM C 404.

Epoxy Pointing Mortar: ASTM C 395, epoxy-resin-based material formulated for use as pointing mortar for glazed or pre-faced masonry units (and approved for such use by manufacturer of units); in color indicated or, if not otherwise indicated, as selected by Architect from manufacturer's colors.

Cold-Weather Admixture: Nonchloride, noncorrosive, accelerating admixture complying with ASTM C 494/C 494M, Type C, and recommended by manufacturer for use in masonry mortar of composition indicated.

Water-Repellent Admixture: Liquid water-repellent mortar admixture intended for use with CMUs containing integral water repellent from same manufacturer.

Water: Potable.

REINFORCEMENT

Uncoated-Steel Reinforcing Bars: ASTM A 615/A 615M or ASTM A 996/A 996M, Grade 60 (Grade 420).

Reinforcing Bar Positioners: Wire units designed to fit into mortar bed joints spanning masonry unit cells and to hold reinforcing bars in center of cells. Units are formed from 0.148-inch (3.77-mm) steel wire, hot-dip galvanized after fabrication. Provide units designed for number of bars indicated.

Masonry-Joint Reinforcement, General: ASTM A 951/A 951M.

Interior Walls: Hot-dip galvanized carbon steel.

Exterior Walls: Stainless steel.

Wire Size for Side Rods: 0.187-inch (4.76-mm) diameter.

Wire Size for Cross Rods: 0.187-inch (4.76-mm) diameter.

Wire Size for Veneer Ties: 0.187-inch (4.76-mm) diameter.

Spacing of Cross Rods, Tabs, and Cross Ties: Not more than 16 inches (407 mm) o.c.

Provide in lengths of not less than 10 feet (3 m), with prefabricated corner and tee units.

Masonry-Joint Reinforcement for Single-Wythe Masonry: Ladder or truss type with single pair of side rods.

Masonry-Joint Reinforcement for Multiwythe Masonry:

Ladder type with one side rod at each face shell of hollow masonry units more than 4 inches (100 mm) wide, plustwo side rods at each wythe of masonry 4 inches (100 mm) wide or less.

Tab type, either ladder or truss design, with one side rod at each face shell of backing wythe and with rectangular tabs sized to extend at least halfway through facing wythe, but with at least 5/8-inch (16-mm) cover on outside face.

Adjustable (two-piece) type, either ladder or truss design, with one side rod at each face shell of backing wythe and with separate adjustable ties with pintle-and-eye connections having a maximum horizontal play of 1/16 inch (1.5 mm) and maximum vertical adjustment of 1-1/4 inches (32 mm). Size ties to extend at least halfway through facing wythe but with at least 5/8-inch (16-mm) cover on outside face. Ties have hooks or clips to engage a continuous horizontal wire in the facing wythe.

Masonry-Joint Reinforcement for Veneers Anchored with Seismic Masonry-Veneer Anchors: Single 0.187-inch-(4.76-mm-) diameter, stainless-steel continuous wire.

TIES AND ANCHORS

General: Ties and anchors shall extend at least 1-1/2 inches (38 mm) into veneer but with at least a 5/8-inch (16-mm) cover on outside face.

Materials: Provide ties and anchors specified in this article that are made from materials that comply with the following unless otherwise indicated:

Stainless-Steel Wire: ASTM A 580/A 580M, Type 316.

Galvanized-Steel Sheet: ASTM A 653/A 653M, Commercial Steel, G60 (Z180) zinc coating.

Steel Sheet, Galvanized after Fabrication: ASTM A 1008/A 1008M, Commercial Steel, with ASTM A 153/A 153M, Class B coating.

Stainless-Steel Sheet: ASTM A 240/A 240M or ASTM A 666, Type 316.

Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.

Stainless-Steel Bars: ASTM A 276 or ASTM A 666, Type 304.

Corrugated-Metal Ties: Metal strips not less than 7/8 inch (22 mm) wide with corrugations having a wavelength of 0.3 to 0.5 inch (7.6 to 12.7 mm) and an amplitude of 0.06 to 0.10 inch (1.5 to 2.5 mm) made from0.060-inch-(1.52-mm-)thick steel sheet, galvanized after fabrication0.062-inch-(1.59 mm-)thick, stainless-steel sheet.

Individual Wire Ties: Rectangular units with closed ends and not less than 4 inches (100 mm) wide.

Z-shaped ties with ends bent 90 degrees to provide hooks not less than 2 inches (50 mm) long may be used for masonry constructed from solid units.

Where wythes are of different materials, use adjustable ties with pintle-and-eye connections having a maximum adjustment of 1-1/4 inches (32 mm).

Wire: Fabricate from1/4-inch-(6.35-mm-) diameter, stainless-steel wire. Mill-galvanized wire ties may be used in interior walls unless otherwise indicated.

Partition Top Anchors: 0.105-inch-(2.66-mm-)thick metal plate with a 3/8-inch-(9.5-mm-)diameter metal rod 6 inches (152 mm) long welded to plate and with closed-end plastic tube fitted over rod that allows rod to move in and out of tube. Fabricate from stainless steel.

Rigid Anchors: Fabricate from steel bars 1-1/2 inches (38 mm) wide by 1/4 inch (6.35 mm) thick by 24 inches (610 mm) long, with ends turned up 2 inches (51 mm) or with cross pins unless otherwise indicated.

Corrosion Protection: Hot-dip galvanized to comply with ASTM A 153/A 153M.

Adjustable Masonry-Veneer Anchors:

General: Provide anchors that allow vertical adjustment but resist a 100-lbf (445-N) load in both tension and compression perpendicular to plane of wall without deforming or developing play in excess of 1/16 inch (1.5 mm).

Fabricate sheet metal anchor sections and other sheet metal parts from0.109-inch-(2.78-mm-)thick, stainless-steel sheet.

Fabricate wire ties from0.25-inch-(6.35-mm-) diameter, stainless-steel wire unless otherwise indicated. Contractor's Option: Unless otherwise indicated, provide any of the adjustable masonry-veneer anchors specified.

Screw-Attached, Masonry-Veneer Anchors: Wire tie and a rib-stiffened, sheet metal anchor section with screw holes top and bottom, with a projecting vertical tab having a slotted hole for inserting wire tie.

Screw-Attached, Masonry-Veneer Anchors: Wire tie and a rib-stiffened, sheet metal anchor section with screw holes top and bottom, with projecting tabs having holes for inserting vertical legs of wire tie formed to fit anchor section.

Seismic Masonry-Veneer Anchors: Connector section and rib-stiffened, sheet metal anchor section with screw holes top and bottom, with projecting tabs having slotted holes for inserting vertical leg of connector section. Connector section consists of a rib-stiffened, sheet metal bent plate with down-turned leg designed to fit in anchor section slot and with integral tabs designed to engage continuous wire.

Stainless-Steel Drill Screws for Steel Studs: ASTM C 954 except manufactured with hex washer head and neoprene or EPDM washer, No. 10 (4.83-mm) diameter by length required to penetrate steel stud flange with not less than three exposed threads; either made from Type 410 stainless steel or made with a carbon-steel drill point and 300 Series stainless-steel shank.

EMBEDDED FLASHING MATERIALS

Metal Flashing: Provide metal flashing complying with SMACNA's "Architectural Sheet Metal Manual" and as follows:

Stainless Steel: ASTM A 240/A 240M or ASTM A 666, Type 304, 0.016 inch (0.40 mm) thick.

Fabricate continuous flashings in sections 96 inches (2400 mm) long minimum, but not exceeding 12 feet (3.7 m). Provide splice plates at joints of formed, smooth metal flashing.

Fabricate through-wall metal flashing embedded in masonry from stainless steel, with ribs at 3-inch (76-mm) intervals along length of flashing to provide an integral mortar bond.
Fabricate through-wall flashing with snaplock receiver on exterior face where indicated to receive counterflashing.

Fabricate through-wall flashing with drip edge unless otherwise indicated. Fabricate by extending flashing 1/2 inch (13 mm) out from wall, with outer edge bent down 30 degrees and hemmed.

Fabricate through-wall flashing with sealant stop unless otherwise indicated. Fabricate by bending metal back on itself 3/4 inch (19 mm) at exterior face of wall and down into joint 1/4 inch (6 mm) to form a stop for retaining sealant backer rod.

Fabricate metal drip edges and sealant stops for ribbed metal flashing from plain metal flashing of same metal as ribbed flashing and extending at least 3 inches (76 mm) into wall with hemmed inner

edge to receive ribbed flashing and form a hooked seam. Form hem on upper surface of metal so that completed seam sheds water.

Fabricate metal drip edges from stainless steel. Extend at least 3 inches (76 mm) into wall and 1/2 inch (13 mm) out from wall, with outer edge bent down 30 degrees and hemmed.

Fabricate metal sealant stops from stainless steel. Extend at least 3 inches (76 mm) into wall and out to exterior face of wall. At exterior face of wall, bend metal back on itself for 3/4 inch (19 mm) and down into joint 1/4 inch (6 mm) to form a stop for retaining sealant backer rod.

Fabricate metal expansion-joint strips from stainless steel to shapes indicated.

Solder metal items at corners.

Application: Unless otherwise indicated, use the following:

Where flashing is indicated to receive counterflashing, use metal flashing.

Where flashing is indicated to be turned down at or beyond the wall face, use metal flashing.

Where flashing is partly exposed and is indicated to terminate at the wall face, use metal flashing with a sealant stop.

Where flashing is fully concealed, use metal flashing.

Single-Wythe CMU Flashing System: System of CMU cell flashing pans and interlocking CMU web covers made from UV-resistant, high-density polyethylene. Cell flashing pans have integral weep spouts designed to be built into mortar bed joints and that extend into the cell to prevent clogging with mortar.

Solder and Sealants for Sheet Metal Flashings:

Solder for Stainless Steel: ASTM B 32, Grade Sn96, with acid flux of type recommended by stainless-steel sheet manufacturer.

Elastomeric Sealant: ASTM C 920, chemically curing silicone sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and remain watertight.
Adhesives, Primers, and Seam Tapes for Flashings: Flashing manufacturer's standard products or products recommended by flashing manufacturer for bonding flashing sheets to each other and to substrates.

Termination Bars for Flexible Flashing: Stainless-steel sheet 0.019 inch by 1-1/2 inches (0.48 mm by 38 mm) with a 3/8 inch (10-mm) sealant flange at top.

MISCELLANEOUS MASONRY ACCESSORIES

Compressible Filler: Premolded filler strips complying with ASTM D 1056, Grade 2A1; compressible up to 35 percent; of width and thickness indicated; formulated from neoprene, urethane, or PVC.

Preformed Control-Joint Gaskets: Made from styrene-butadiene-rubber compound, complying with ASTM D 2000, Designation M2AA-805 or PVC, complying with ASTM D 2287, Type PVC-65406 and designed to fit standard sash block and to maintain lateral stability in masonry wall; size and configuration as indicated.

Bond-Breaker Strips: Asphalt-saturated felt complying with ASTM D 226/D 226M, Type I (No. 15 asphalt felt).

Weep/Cavity Vent Products: Use one of the following unless otherwise indicated:

Wicking Material: Absorbent rope, made from cotton or UV-resistant synthetic fiber, 1/4 to 3/8 inch (6 to 10 mm) in diameter, in length required to produce 2-inch (50-mm) exposure on exterior and 18 inches (450 mm) in cavity. Use only for weeps.

Round Plastic Weep/Vent Tubing: Medium-density polyethylene, 3/8-inch (9-mm) OD by 4 inches (100 mm) long.

Rectangular Plastic Weep/Vent Tubing: Clear butyrate, 3/8 by 1-1/2 by 3-1/2 inches (9 by 38 by 89 mm) long.

Cellular Plastic Weep/Vent: One-piece, flexible extrusion made from UV-resistant polypropylene copolymer, full height and width of head joint and depth 1/8 inch (3 mm) less than depth of outer wythe, in color selected from manufacturer's standard.

Mesh Weep/Vent: Free-draining mesh; made from polyethylene strands, full height and width of head joint and depth 1/8 inch (3 mm) less than depth of outer wythe; in color selected from manufacturer's standard.

Aluminum Weep Hole/Vent: Units made from sheet aluminum, designed to fit into a head joint and consisting of a vertical channel, with louvers stamped in web and with a top flap to keep mortar out of the head joint; factory primed and painted before installation to comply with Section 099113 "Exterior Painting" in color selected by Architect.

Cavity Drainage Material: Free-draining mesh, made from polymer strands that will not degrade within the wall cavity.

Configuration: Provide one of the following:

Strips, full depth of cavity and 10 inches (250 mm) high, with dovetail-shaped notches 7 inches (175 mm) deep that prevent clogging with mortar droppings.

Strips, not less than 3/4 inch (19 mm) thick and 10 inches (250 mm) high, with dimpled surface designed to catch mortar droppings and prevent weep holes from clogging with mortar.

Sheets or strips, full depth of cavity and installed to full height of cavity.

Sheets or strips not less than 3/4 inch (19 mm) thick and installed to full height of cavity, with additional strips 4 inches (100 mm) high at weep holes and thick enough to fill entire depth of cavity and prevent weep holes from clogging with mortar.

MASONRY-CELL FILL

Loose-Fill Insulation: Perlite complying with ASTM C 549, Type II (surface treated for water repellency and limited moisture absorption) or Type IV (surface treated for water repellency and to limit dust generation).

Lightweight-Aggregate Fill: ASTM C 331/C 331M.

MASONRY CLEANERS

Proprietary Acidic Cleaner: Manufacturer's standard-strength cleaner designed for removing mortar/grout stains, efflorescence, and other new construction stains from new masonry without discoloring or damaging masonry surfaces. Use product expressly approved for intended use by cleaner manufacturer and manufacturer of masonry units being cleaned.

MORTAR AND GROUT MIXES

General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures unless otherwise indicated.

Do not use calcium chloride in mortar or grout.

Use portland cement-lime, masonry cement, or mortar cement mortar unless otherwise indicated.

For exterior masonry, use portland cement-lime, masonry cement, or mortar cement mortar.

For reinforced masonry, use portland cement-lime, masonry cement, or mortar cement mortar.

Add cold-weather admixture (if used) at same rate for all mortar that will be exposed to view, regardless of weather conditions, to ensure that mortar color is consistent.

Preblended, Dry Mortar Mix: Furnish dry mortar ingredients in form of a preblended mix. Measure quantities by weight to ensure accurate proportions, and thoroughly blend ingredients before delivering to Project site.

Mortar for Unit Masonry: Comply with ASTM C 270, Proportion Specification. Provide the following types of mortar for applications stated unless another type is indicated or needed to provide required compressive strength of masonry.
For masonry below grade or in contact with earth, use Type M.

For reinforced masonry, use Type M.

For mortar parge coats, use Type S or Type N.

For exterior, above-grade, load-bearing and nonload-bearing walls and parapet walls; for interior load-bearing walls; for interior nonload-bearing partitions; and for other applications where another type is not indicated, use Type N.

For interior nonload-bearing partitions, Type O may be used instead of Type N.

Pigmented Mortar: Use colored cement product or select and proportion pigments with other ingredients to produce color required. Do not add pigments to colored cement products.

Pigments shall not exceed 10 percent of portland cement by weight.

Pigments shall not exceed 5 percent of masonry cement or mortar cement by weight.

Mix to match Architect's sample.

Application: Use pigmented mortar for exposed mortar joints with the following units:

Decorative CMUs.
Clay face brick.
Hollow brick.
Cast-stone trim units.

Colored-Aggregate Mortar: Produce required mortar color by using colored aggregates and natural color or white cement as necessary to produce required mortar color.

Mix to match Architect's sample.

Application: Use colored-aggregate mortar for exposed mortar joints with the following units:

Decorative CMUs.
Clay face brick.
Hollow brick.
Cast-stone trim units.

Grout for Unit Masonry: Comply with ASTM C 476.

Use grout of type indicated or, if not otherwise indicated, of type (fine or coarse) that will comply with TMS 602/ACI 530.1/ASCE 6 for dimensions of grout spaces and pour height.

Proportion grout in accordance with ASTM C 476, Table 1 or paragraph 4.2.2 for specified 28-day compressive strength indicated, but not less than 2000 psi (14 MPa).

Provide grout with a slump of 8 to 11 inches (200 to 280 mm) as measured according to ASTM C 143/C 143M.

EXECUTION

EXAMINATION

Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.

Verify that foundations are within tolerances specified.

Verify that reinforcing dowels are properly placed.

Verify that substrates are free of substances that impair mortar bond.

Before installation, examine rough-in and built-in construction for piping systems to verify actual locations of piping connections.

Proceed with installation only after unsatisfactory conditions have been corrected.

INSTALLATION, GENERAL

Thickness: Build cavity and composite walls and other masonry construction to full thickness shown. Build single-wythe walls to actual widths of masonry units, using units of widths indicated.

Build chases and recesses to accommodate items specified in this and other Sections.

Leave openings for equipment to be installed before completing masonry. After installing equipment, complete masonry to match construction immediately adjacent to opening.

Use full-size units without cutting if possible. If cutting is required to provide a continuous pattern or to fit adjoining construction, cut units with motor-driven saws; provide clean, sharp, unchipped edges. Allow units to dry before laying unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.

Select and arrange units for exposed unit masonry to produce a uniform blend of colors and textures. Mix units from several pallets or cubes as they are placed.

Matching Existing Masonry: Match coursing, bonding, color, and texture of existing masonry.

Wetting of Brick: Wet brick before laying if initial rate of absorption exceeds 30 g/30 sq. in. (30 g/194 sq. cm) per minute when tested according to ASTM C 67. Allow units to absorb water so they are damp but not wet at time of laying.

TOLERANCES

Dimensions and Locations of Elements:

For dimensions in cross section or elevation, do not vary by more than plus 1/2 inch (12 mm) or minus 1/4 inch (6 mm).

For location of elements in plan, do not vary from that indicated by more than plus or minus 1/2 inch (12 mm).

For location of elements in elevation, do not vary from that indicated by more than plus or minus 1/4 inch (6 mm) in a story height or 1/2 inch (12 mm) total.

Lines and Levels:

For bed joints and top surfaces of bearing walls, do not vary from level by more than 1/4 inch in 10 feet (6 mm in 3 m), or 1/2-inch (12-mm) maximum.

For conspicuous horizontal lines, such as lintels, sills, parapets, and reveals, do not vary from level by more than 1/8 inch in 10 feet (3 mm in 3 m), 1/4 inch in 20 feet (6 mm in 6 m), or 1/2-inch (12-mm) maximum.

For vertical lines and surfaces, do not vary from plumb by more than 1/4 inch in 10 feet (6 mm in 3 m), 3/8 inch in 20 feet (9 mm in 6 m), or 1/2-inch (12-mm) maximum.

For conspicuous vertical lines, such as external corners, door jambs, reveals, and expansion and control joints, do not vary from plumb by more than 1/8 inch in 10 feet (3 mm in 3 m), 1/4 inch in 20 feet (6 mm in 6 m), or 1/2-inch (12-mm) maximum.

For lines and surfaces, do not vary from straight by more than 1/4 inch in 10 feet (6 mm in 3 m), 3/8 inch in 20 feet (9 mm in 6 m), or 1/2-inch (12-mm) maximum.

For vertical alignment of exposed head joints, do not vary from plumb by more than 1/4 inch in 10 feet((6 mm in 3 m),) or 1/2-inch (12-mm) maximum.

For faces of adjacent exposed masonry units, do not vary from flush alignment by more than 1/16 inch (1.5 mm) except due to warpage of masonry units within tolerances specified for warpage of units.

Joints:

For bed joints, do not vary from thickness indicated by more than plus or minus 1/8 inch (3 mm), with a maximum thickness limited to 1/2 inch (12 mm).

For exposed bed joints, do not vary from bed-joint thickness of adjacent courses by more than 1/8 inch (3 mm).

For head and collar joints, do not vary from thickness indicated by more than plus 3/8 inch (9 mm) or minus 1/4 inch (6 mm).

For exposed head joints, do not vary from thickness indicated by more than plus or minus 1/8 inch (3 mm). Do not vary from adjacent bed-joint and head-joint thicknesses by more than 1/8 inch (3 mm). For exposed bed joints and head joints of stacked bond, do not vary from a straight line by more than 1/16 inch (1.5 mm) from one masonry unit to the next.

LAYING MASONRY WALLS

Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thicknesses and for accurate location of openings, movement-type joints, returns, and offsets. Avoid using less-than-half-size units, particularly at corners, jambs, and, where possible, at other locations.
Bond Pattern for Exposed Masonry: Unless otherwise indicated, lay exposed masonry in running bond; do not use units with less-than-nominal 4-inch (100-mm) horizontal face dimensions at corners or jambs.

Lay concealed masonry with all units in a wythe in running bond or bonded by lapping not less than 4 inches (100 mm). Bond and interlock each course of each wythe at corners. Do not use units with less-than-nominal 4-inch (100-mm) horizontal face dimensions at corners or jambs.

Stopping and Resuming Work: Stop work by stepping back units in each course from those in course below; do not tooth. When resuming work, clean masonry surfaces that are to receive mortar, remove loose masonry units and mortar, and wet brick if required before laying fresh masonry.
Built-in Work: As construction progresses, build in items specified in this and other Sections. Fill in solidly with masonry around built-in items.

Fill space between steel frames and masonry solidly with mortar unless otherwise indicated.
Where built-in items are to be embedded in cores of hollow masonry units, place a layer of metal lath, wire mesh, or plastic mesh in the joint below, and rod mortar or grout into core.
Fill cores in hollow CMUs with grout 24 inches (600 mm) under bearing plates, beams, lintels, posts, and similar items unless otherwise indicated.

Build nonload-bearing interior partitions full height of story to underside of solid floor or roof structure above unless otherwise indicated.

Install compressible filler in joint between top of partition and underside of structure above.
Fasten partition top anchors to structure above and build into top of partition. Grout cells of CMUs solidly around plastic tubes of anchors and push tubes down into grout to provide 1/2-inch (13-mm) clearance between end of anchor rod and end of tube. Space anchors 48 inches (1200 mm) o.c. unless otherwise indicated.

Wedge nonload-bearing partitions against structure above with small pieces of tile, slate, or metal. Fill joint with mortar after dead-load deflection of structure above approaches final position.
At fire-rated partitions, treat joint between top of partition and underside of structure above to comply with Section 078443 "Joint Firestopping."

MORTAR BEDDING AND JOINTING

Lay hollow brick and CMUs as follows:

Bed face shells in mortar and make head joints of depth equal to bed joints.

Bed webs in mortar in all courses of piers, columns, and pilasters.

Bed webs in mortar in grouted masonry, including starting course on footings.

Fully bed entire units, including areas under cells, at starting course on footings where cells are not grouted.
Fully bed units and fill cells with mortar at anchors and ties as needed to fully embed anchors and ties in mortar.

Lay solid masonry units and hollow brick with completely filled bed and head joints; butter ends with sufficient mortar to fill head joints and shove into place. Do not deeply furrow bed joints or slush head joints.

Set cast-stone trim units in full bed of mortar with full vertical joints. Fill dowel, anchor, and similar holes.

Clean soiled surfaces with fiber brush and soap powder and rinse thoroughly with clear water.

Allow cleaned surfaces to dry before setting.

Wet joint surfaces thoroughly before applying mortar.

Rake out mortar joints for pointing with sealant.

Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness unless otherwise indicated.

Cut joints flush for masonry walls to receive plaster or other direct-applied finishes (other than paint) unless otherwise indicated.

Cut joints flush where indicated to receive air barriers unless otherwise indicated.

COMPOSITE MASONRY

Bond wythes of composite masonry together using one of the following methods:

Individual Metal Ties: Provide ties as shown installed in horizontal joints, but not less than one metal tie for2.67 sq. ft. (0.25 sq. m) of wall area spaced not to exceed16 inches (406 mm) o.c. horizontally and 16 inches (406 mm) o.c. vertically. Stagger ties in alternate courses. Provide additional ties within 12 inches (305 mm) of openings and space not more than 36 inches (914 mm) apart around perimeter of openings. At intersecting and abutting walls, provide ties at no more than 24 inches (610 mm) o.c. vertically.

Where bed joints of wythes do not align, use adjustable-type (two-piece-type) ties.

Masonry-Joint Reinforcement: Installed in horizontal mortar joints.

Where bed joints of both wythes align, use ladder-type reinforcement extending across both wythes.

Where bed joints of wythes do not align, use adjustable-type (two-piece-type) reinforcement with continuous horizontal wire in facing wythe attached to ties.

Header Bonding: Provide masonry unit headers extending not less than 3 inches (76 mm) into each wythe. Space headers not more than 8 inches (203 mm) clear horizontally and 16 inches (406 mm) clear vertically.

Bond wythes of composite masonry together using bonding system indicated on Drawings.

Collar Joints: Solidly fill collar joints by parging face of first wythe that is laid and shoving units of other wythe into place.

Corners: Provide interlocking masonry unit bond in each wythe and course at corners unless otherwise indicated.

Provide continuity with masonry-joint reinforcement at corners by using prefabricated L-shaped units as well as masonry bonding.

Intersecting and Abutting Walls: Unless vertical expansion or control joints are shown at juncture, bond walls together as follows:

Provide continuity with masonry-joint reinforcement by using prefabricated T-shaped units.

CAVITY WALLS

Bond wythes of cavity walls together using one of the following methods:

Individual Metal Ties: Provide ties as shown installed in horizontal joints, but not less than one metal tie for2.67 sq. ft. (0.25 sq. m) of wall area spaced not to exceed24 inches (610 mm) o.c. horizontally and 16 inches (406 mm) o.c. vertically. Stagger ties in alternate courses. Provide additional ties within 12 inches (305 mm) of openings and space not more than 36 inches (915 mm) apart around perimeter of openings. At intersecting and abutting walls, provide ties at no more than 24 inches (610 mm) o.c. vertically.

Where bed joints of wythes do not align, use adjustable-type (two-piece-type) ties.
Where one wythe is of clay masonry and the other of concrete masonry, use adjustable-type (two-piece-type) ties to allow for differential movement regardless of whether bed joints align.

Masonry-Joint Reinforcement: Installed in horizontal mortar joints.

Where bed joints of both wythes align, use ladder-type reinforcement extending across both wythes.

Where bed joints of wythes do not align, use adjustable-type (two-piece-type) reinforcement with continuous horizontal wire in facing wythe attached to ties.

Where one wythe is of clay masonry and the other of concrete masonry, use adjustable-type (two-piece-type) reinforcement with continuous horizontal wire in facing wythe attached to ties to allow for differential movement regardless of whether bed joints align.

Header Bonding: Provide masonry unit headers extending not less than 3 inches (76 mm) into each wythe. Space headers not more than 8 inches (203 mm) clear horizontally and 16 inches (406 mm) clear vertically.

Masonry-Veneer Anchors: Comply with requirements for anchoring masonry veneers.

Bond wythes of cavity walls together using bonding system indicated on Drawings.

Keep cavities clean of mortar droppings and other materials during construction. Bevel beds away from cavity, to minimize mortar protrusions into cavity. Do not attempt to trowel or remove mortar fins protruding into cavity.

Parge cavity face of backup wythe in a single coat approximately 3/8 inch (10 mm) thick. Trowel face of parge coat smooth.

Installing Cavity Wall Insulation: Place small dabs of adhesive, spaced approximately 12 inches (300 mm) o.c. both ways, on inside face of insulation boards, or attach with plastic fasteners designed for this purpose. Fit courses of insulation between wall ties and other confining obstructions in cavity, with

edges butted tightly both ways. Press units firmly against inside wythe of masonry or other construction as shown.

Fill cracks and open gaps in insulation with crack sealer compatible with insulation and masonry.

ANCHORED MASONRY VENEERS

Anchor masonry veneers to concrete and masonry backup with seismic masonry-veneer anchors to comply with the following requirements:

Fasten screw-attached and seismic anchors through sheathing to wall framing and to concrete and masonry backup with metal fasteners of type indicated. Use two fasteners unless anchor design only uses one fastener.

Embed connector sections and continuous wire in masonry joints.

Locate anchor sections to allow maximum vertical differential movement of ties up and down.

Space anchors as indicated, but not more than 18 inches (458 mm) o.c. vertically and 24 inches (610 mm) o.c. horizontally, with not less than one anchor for each 2 sq. ft. (0.2 sq. m) of wall area. Install additional anchors within 12 inches (305 mm) of openings and at intervals, not exceeding 8 inches (203 mm), around perimeter.

Space anchors as indicated, but not more than 16 inches (406 mm) o.c. vertically and 25 inches (635 mm) o.c. horizontally, with not less than one anchor for each 2.67 sq. ft. (0.25 sq. m) of wall area. Install additional anchors within 12 inches (305 mm) of openings and at intervals, not exceeding 36 inches (914 mm), around perimeter.

Space anchors as indicated, but not more than 18 inches (458 mm) o.c. vertically and horizontally. Install additional anchors within 12 inches (305 mm) of openings and at intervals, not exceeding 24 inches (610 mm), around perimeter.

Provide not less than1 inch (25 mm) of airspace between back of masonry veneer and face of sheathing.

Keep airspace clean of mortar droppings and other materials during construction. Bevel beds away from airspace, to minimize mortar protrusions into airspace. Do not attempt to trowel or remove mortar fins protruding into airspace.

MASONRY-CELL FILL

Pour loose-fill insulation into cavities to fill void spaces. Maintain inspection ports to show presence of fill at extremities of each pour area. Close the ports after filling has been confirmed. Limit the fall of fill to one story high, but not more than 20 feet (6 m).

Install molded-polystyrene insulation units into masonry unit cells before laying units.

MASONRY-JOINT REINFORCEMENT

General: Install entire length of longitudinal side rods in mortar with a minimum cover of 5/8 inch (16 mm) on exterior side of walls, 1/2 inch (13 mm) elsewhere. Lap reinforcement a minimum of 6 inches (150 mm).

Space reinforcement not more than 16 inches (406 mm) o.c.

Space reinforcement not more than 8 inches (203 mm) o.c. in foundation walls and parapet walls.

Provide reinforcement not more than 8 inches (203 mm) above and below wall openings and extending 12 inches (305 mm) beyond openings in addition to continuous reinforcement.

Interrupt joint reinforcement at control and expansion joints unless otherwise indicated.

Provide continuity at wall intersections by using prefabricated T-shaped units.

Provide continuity at corners by using prefabricated L-shaped units.

Cut and bend reinforcing units as directed by manufacturer for continuity at corners, returns, offsets, column fireproofing, pipe enclosures, and other special conditions.

ANCHORING MASONRY TO STRUCTURAL STEEL AND CONCRETE

Anchor masonry to structural steel and concrete, where masonry abuts or faces structural steel or concrete, to comply with the following:

Provide an open space not less than 1/2 inch (13 mm) wide between masonry and structural steel or concrete unless otherwise indicated. Keep open space free of mortar and other rigid materials.

Anchor masonry with anchors embedded in masonry joints and attached to structure.

Space anchors as indicated, but not more than 24 inches (610 mm) o.c. vertically and 36 inches (915 mm) o.c. horizontally.

CONTROL AND EXPANSION JOINTS

General: Install control- and expansion-joint materials in unit masonry as masonry progresses. Do not allow materials to span control and expansion joints without provision to allow for in-plane wall or partition movement.

Form control joints in concrete masonryusing one of the following methods:

Fit bond-breaker strips into hollow contour in ends of CMUs on one side of control joint. Fill resultant core with grout, and rake out joints in exposed faces for application of sealant.

Install preformed control-joint gaskets designed to fit standard sash block.

Install interlocking units designed for control joints. Install bond-breaker strips at joint. Keep head joints free and clear of mortar, or rake out joint for application of sealant.

Install temporary foam-plastic filler in head joints, and remove filler when unit masonry is complete for application of sealant.

Form expansion joints in brick as follows:

Build flanges of metal expansion strips into masonry. Lap each joint 4 inches (100 mm) in direction of water flow. Seal joints below grade and at junctures with horizontal expansion joints if any.

Build flanges of factory-fabricated, expansion-joint units into masonry.

Build in compressible joint fillers where indicated.

Form open joint full depth of brick wythe and of width indicated, but not less than 3/8 inch (10 mm) for installation of sealant and backer rod specified in Section 079200 "Joint Sealants."

Provide horizontal, pressure-relieving joints by either leaving an airspace or inserting a compressible filler of width required for installing sealant and backer rod specified in Section 079200 "Joint Sealants," but not less than 3/8 inch (10 mm).

Locate horizontal, pressure-relieving joints beneath shelf angles supporting masonry.

LINTELS

Install steel lintels where indicated.

Provide loose steel lintels where shown and where openings of more than 12 inches (305 mm) for brick-size units and 24 inches (610 mm) for block-size units are shown without structural steel or other supporting lintels.

Provide minimum bearing of 8 inches (200 mm) at each jamb unless otherwise indicated.

FLASHING, WEEP HOLES, AND CAVITY VENTS

General: Install embedded flashing and weep holes in masonry at shelf angles, lintels, ledges, other obstructions to downward flow of water in wall, and where indicated. Install cavity vents at shelf angles, ledges, and other obstructions to upward flow of air in cavities, and where indicated.

Install flashing as follows unless otherwise indicated:

Prepare masonry surfaces so they are smooth and free from projections that could puncture flashing. Where flashing is within mortar joint, place through-wall flashing on sloping bed of mortar and cover with mortar. Before covering with mortar, seal penetrations in flashing with adhesive, sealant, or tape.

At multiwythe masonry walls, including cavity walls, extend flashing through outer wythe, turned up a minimum of 4 inches (100 mm), and through inner wythe to within 1/2 inch (13 mm) of the interior face of wall in exposed masonry. Where interior face of wall is to receive furring or framing, carry flashing completely through inner wythe and turn flashing up approximately 2 inches (50 mm) on interior face.

At masonry-veneer walls, extend flashing through veneer, across airspace behind veneer, and up face of sheathing at least 8 inches (200 mm); with upper edge tucked under water-resistive barrier, lapping at least 4 inches (100 mm).
At lintels and shelf angles, extend flashing a minimum of 6 inches (150 mm) into masonry at each end.
At heads and sills, extend flashing 6 inches (150 mm) at ends and turn up not less than 2 inches (50 mm) to form end dams.
Interlock end joints of ribbed sheet metal flashing by overlapping ribs not less than 1-1/2 inches (38 mm) or as recommended by flashing manufacturer, and seal lap with elastomeric sealant complying with requirements in Section 079200 "Joint Sealants" for application indicated.

Install metal drip edges and sealant stops with ribbed sheet metal flashing by interlocking hemmed edges to form hooked seam. Seal seam with elastomeric sealant complying with requirements in Section 079200 "Joint Sealants" for application indicated.

Install metal drip edges beneath flexible flashing at exterior face of wall. Stop flexible flashing 1/2 inch (13 mm) back from outside face of wall, and adhere flexible flashing to top of metal drip edge.

Install metal flashing termination beneath flexible flashing at exterior face of wall. Stop flexible flashing 1/2 inch (13 mm) back from outside face of wall, and adhere flexible flashing to top of metal flashing termination.
Cut flexible flashing off flush with face of wall after masonry wall construction is completed.

Install single-wythe CMU flashing system in bed joints of CMU walls where indicated to comply with manufacturer's written instructions. Install CMU cell pans with upturned edges located below face shells and webs of CMUs above and with weep spouts aligned with face of wall. Install CMU web covers so that they cover upturned edges of CMU cell pans at CMU webs and extend from face shell to face shell.

Install reglets and nailers for flashing and other related construction where they are shown to be built into masonry.

Install weep holes in exterior wythes and veneers in head joints of first course of masonry immediately above embedded flashing.

Use specified weep/cavity vent products to form weep holes.

Use wicking material to form weep holes above flashing under brick sills. Turn wicking down at lip of sill to be as inconspicuous as possible.

Space weep holes 24 inches (600 mm) o.c. unless otherwise indicated.

Space weep holes formed from plastic tubing or wicking material 16 inches (400 mm) o.c.
Cover cavity side of weep holes with plastic insect screening at cavities insulated with loose-fill insulation.

Trim wicking material flush with outside face of wall after mortar has set.

Place pea gravel in cavities as soon as practical to a height equal to height of first course above top of flashing, but not less than 2 inches (50 mm), to maintain drainage.

Fill cavities full height by placing pea gravel in cavities as masonry is laid, so that at any point, masonry does not extend more than 24 inches (600 mm) above top of pea gravel.

Place cavity drainage material in cavities to comply with configuration requirements for cavity drainage material in "Miscellaneous Masonry Accessories" Article.

Install cavity vents in head joints in exterior wythes at spacing indicated. Use specified weep/cavity vent products to form cavity vents.

Close cavities off vertically and horizontally with blocking in manner indicated. Install through-wall flashing and weep holes above horizontal blocking.

REINFORCED UNIT MASONRY INSTALLATION

Temporary Formwork and Shores: Construct formwork and shores as needed to support reinforced masonry elements during construction.

Construct formwork to provide shape, line, and dimensions of completed masonry as indicated. Make forms sufficiently tight to prevent leakage of mortar and grout. Brace, tie, and support forms to maintain position and shape during construction and curing of reinforced masonry.

Do not remove forms and shores until reinforced masonry members have hardened sufficiently to carry their own weight and that of other loads that may be placed on them during construction.

Placing Reinforcement: Comply with requirements in TMS 602/ACI 530.1/ASCE 6.

Grouting: Do not place grout until entire height of masonry to be grouted has attained enough strength to resist grout pressure.

Comply with requirements in TMS 602/ACI 530.1/ASCE 6 for cleanouts and for grout placement, including minimum grout space and maximum pour height.

Limit height of vertical grout pours to not more than 60 inches (1520 mm).

FIELD QUALITY CONTROL

Testing and Inspecting: Contractor shall engage special inspectors to perform tests and inspections and prepare reports. Allow inspectors access to scaffolding and work areas as needed to perform tests and inspections. Retesting of materials that fail to comply with specified requirements shall be done at Contractor's expense.

Inspections: Special inspections according to Level B in TMS 402/ACI 530/ASCE 5.

Begin masonry construction only after inspectors have verified proportions of site-prepared mortar.

Place grout only after inspectors have verified compliance of grout spaces and of grades, sizes, and locations of reinforcement.

Place grout only after inspectors have verified proportions of site-prepared grout.

Testing Prior to Construction: One set of tests.

Testing Frequency: One set of tests for each 5000 sq. ft. (464 sq. m) of wall area or portion thereof.

Clay Masonry Unit Test: For each type of unit provided, according to ASTM C 67 for compressive strength.

Concrete Masonry Unit Test: For each type of unit provided, according to ASTM C 140 for compressive strength.

Mortar Aggregate Ratio Test (Proportion Specification): For each mix provided, according to ASTM C 780.

Mortar Test (Property Specification): For each mix provided, according to ASTM C 780. Test mortar for mortar air content and compressive strength.

Grout Test (Compressive Strength): For each mix provided, according to ASTM C 1019.

Prism Test: For each type of construction provided, according to ASTM C 1314 at 7 days and at 28 days.

PARGING

Parge exterior faces of below-grade masonry walls, where indicated, in two uniform coats to a total thickness of 3/4 inch (19 mm). Dampen wall before applying first coat, and scarify first coat to ensure full bond to subsequent coat.

Use a steel-trowel finish to produce a smooth, flat, dense surface with a maximum surface variation of 1/8 inch per foot (3 mm per 300 mm). Form a wash at top of parging and a cove at bottom. Damp-cure parging for at least 24 hours and protect parging until cured.

REPAIRING, POINTING, AND CLEANING

Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or that do not match adjoining units. Install new units to match adjoining units; install in fresh mortar, pointed to eliminate evidence of replacement.

Pointing: During the tooling of joints, enlarge voids and holes, except weep holes, and completely fill with mortar. Point up joints, including corners, openings, and adjacent construction, to provide a neat, uniform appearance. Prepare joints for sealant application, where indicated.

In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.

Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:

Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.

Test cleaning methods on sample wall panel; leave one-half of panel uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of masonry.

Protect adjacent stone and nonmasonry surfaces from contact with cleaner by covering them with liquid strippable masking agent or polyethylene film and waterproof masking tape.

Wet wall surfaces with water before applying cleaners; remove cleaners promptly by rinsing surfaces thoroughly with clear water.

Clean brick by bucket-and-brush hand-cleaning method described in BIA Technical Notes 20.

Clean concrete masonry by applicable cleaning methods indicated in NCMA TEK 8-4A.

Clean masonry with a proprietary acidic cleaner applied according to manufacturer's written instructions.

Clean stone trim to comply with stone supplier's written instructions.

Clean limestone units to comply with recommendations in ILI's "Indiana Limestone Handbook."

MASONRY WASTE DISPOSAL

Salvageable Materials: Unless otherwise indicated, excess masonry materials are Contractor's property. At completion of unit masonry work, remove from Project site.

Waste Disposal as Fill Material: Dispose of clean masonry waste, including excess or soil-contaminated sand, waste mortar, and broken masonry units, by crushing and mixing with fill material as fill is placed.

Crush masonry waste to less than 4 inches (100 mm) in each dimension.

Mix masonry waste with at least two parts of specified fill material for each part of masonry waste. Fill material is specified in Section 312000 "Earth Moving."

Do not dispose of masonry waste as fill within 18 inches (450 mm) of finished grade.

Masonry Waste Recycling: Return broken CMUs not used as fill to manufacturer for recycling.

Excess Masonry Waste: Remove excess clean masonry waste that cannot be used as fill, as described above or recycled, and other masonry waste, and legally dispose of off Owner's property.

END OF SECTION 042000

DIVISION 04 – MASONRY
SECTION 047200 - CAST STONE MASONRY

1 GENERAL

2 SUMMARY

3 Section Includes:

4 Cast-stone trim

5 Window sills.

6 Lintels.

7 Belt courses.

8 Water tables.

9 Medallions.

10 ACTION SUBMITTALS

11 Product Data: For each type of product.

12 For cast-stone units, include construction details, material descriptions, dimensions of individual
13 components and profiles, and finishes.

14 Shop Drawings: Show fabrication and installation details for cast-stone units. Include
15 dimensions, details of reinforcement and anchorages if any, and indication of finished faces.

16 Include building elevations showing layout of units and locations of joints and anchors.

17 Samples for Verification:

18 For each color and texture of cast stone required, 10 inches square in size.

19 For each trim shape required, 10 inches in length.

20 Full-Size Samples: For each color texture and shape of cast-stone unit required.

21 Make available for Architect's review at Project site.

22 Make Samples from materials to be used for units used on Project.

23 Approved Samples may be installed in the Work.

24 INFORMATIONAL SUBMITTALS

25 Qualification Data: For manufacturer and testing agency.

DIVISION 04 – MASONRY
SECTION 047200 - CAST STONE MASONRY

Include copies of material test reports for completed projects, indicating compliance of cast stone with ASTM C 1364.

Material Test Reports: For each mix required to produce cast stone, based on testing according to ASTM C 1364 , including test for resistance to freezing and thawing.

Provide test reports based on testing within previous two years.

QUALITY ASSURANCE

Manufacturer Qualifications: A qualified manufacturer of cast-stone units similar to those indicated for this Project, that has sufficient production capacity to manufacture required units, and is a plant certified by the Cast Stone Institute the Architectural Precast Association or the Precast/Prestressed Concrete Institute for Group A, Category AT.

Testing Agency Qualifications: Qualified according to ASTM E 329 for testing indicated.

Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

Build mockup of typical wall area.

DELIVERY, STORAGE, AND HANDLING

Coordinate delivery of cast stone with unit masonry work to avoid delaying the Work and to minimize the need for on-site storage.

Pack, handle, and ship cast-stone units in suitable packs or pallets.

Lift with wide-belt slings; do not use wire rope or ropes that might cause staining. Move cast-stone units if required, using dollies with wood supports.

Store cast-stone units on wood skids or pallets with nonstaining, waterproof covers, securely tied. Arrange to distribute weight evenly and to prevent damage to units. Ventilate under covers to prevent condensation.

PRODUCTS

MANUFACTURERS

Source Limitations for Cast Stone: Obtain cast-stone units from single source from single manufacturer.

Source Limitations for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color, from one manufacturer for each cementitious component and from one source or producer for each aggregate.

CAST-STONE MATERIALS

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SECTION 047200 - CAST STONE MASONRY

Portland Cement: ASTM C 150/C 150M, Type I or Type III, containing not more than 0.60 percent total alkali when tested according to ASTM C 114. Provide natural color or white cement as required to produce cast-stone color indicated.

Coarse Aggregates: Granite, quartz, or limestone complying with ASTM C 33/C 33M; gradation and colors as needed to produce required cast-stone textures and colors.

Fine Aggregates: Natural sand or crushed stone complying with ASTM C 33/C 33M, gradation and colors as needed to produce required cast-stone textures and colors.

Color Pigment: ASTM C 979/C 979M, synthetic mineral-oxide pigments or colored water-reducing admixtures; color stable, free of carbon black, nonfading, and resistant to lime and other alkalis.

Reinforcement: Deformed steel bars complying with ASTM A 615/A 615M, Grade 60. Use galvanized or epoxy-coated reinforcement when covered with less than 1-1/2 inches of cast-stone material.

Epoxy Coating: ASTM A 775/A 775M.

Embedded Anchors and Other Inserts: Fabricated from stainless steel complying with ASTM A 240/A 240M, ASTM A 276, or ASTM A 666, Type 304 .

CAST-STONE UNITS

Manufacturers: Subject to compliance with requirements, provide products by one of the following:

Rockcast, Buffstone GP-A - Diener Brick Company 732-297-8600

Cast-Stone Units: Comply with ASTM C 1364.

Units shall be manufactured using the vibrant dry tamp wet-cast method.

Units shall be resistant to freezing and thawing as determined by laboratory testing according to ASTM C 666/C 666M, Procedure A, as modified by ASTM C 1364.

Fabricate units with sharp arris and accurately reproduced details, with indicated texture on all exposed surfaces unless otherwise indicated.

Slope exposed horizontal surfaces 1:12 to drain unless otherwise indicated.

Provide raised fillets at backs of sills and at ends indicated to be built into jambs.

Provide drips on projecting elements unless otherwise indicated.

Fabrication Tolerances:

Variation in Cross Section: Do not vary from indicated dimensions by more than 1/8 inch.

Variation in Length: Do not vary from indicated dimensions by more than 1/360 of the length of unit or 1/8 inch, whichever is greater, but in no case by more than 1/4 inch.

Warp, Bow, and Twist: Not to exceed 1/360 of the length of unit or 1/8 inch, whichever is greater.

Location of Grooves, False Joints, Holes, Anchorages, and Similar Features: Do not vary from indicated position by more than 1/8 inch on formed surfaces of units and 3/8 inch on unformed surfaces.

Cure Units as Follows:

Cure units in enclosed, moist curing room at 95 to 100 percent relative humidity and temperature of 100 deg F for 12 hours or 70 deg F for 16 hours.

Keep units damp and continue curing to comply with one of the following:

No fewer than eight days at mean daily temperature of 45 deg F or above.

Acid etch units after curing to remove cement film from surfaces to be exposed to view.

Colors and Textures: As selected by Architect from manufacturer's full range.

ACCESSORIES

Anchors: Type and size indicated, fabricated from Type 304 stainless steel complying with ASTM A 240/A 240M, ASTM A 276, or ASTM A 666 .

Dowels: 1/2-inch- diameter round bars, fabricated from Type 304 stainless steel complying with ASTM A 240/A 240M, ASTM A 276, or ASTM A 666 .

MORTAR MIXES

Comply with requirements in Section 042000 "Unit Masonry" for mortar mixes.

SOURCE QUALITY CONTROL

Engage a qualified independent testing agency to sample and test cast-stone units according to ASTM C 1364.

Include one test for resistance to freezing and thawing.

EXECUTION

EXAMINATION

Examine substrates and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

Proceed with installation only after unsatisfactory conditions have been corrected.

DIVISION 04 – MASONRY
SECTION 047200 - CAST STONE MASONRY

SETTING CAST STONE IN MORTAR

Install cast-stone units to comply with requirements in Section 042000 "Unit Masonry."

Set cast stone as indicated on Drawings. Set units accurately in locations indicated, with edges and faces aligned according to established relationships and indicated tolerances.

Install anchors, supports, fasteners, and other attachments indicated or necessary to secure units in place.

Coordinate installation of cast stone with installation of flashing specified in other Sections.

Wet joint surfaces thoroughly before applying mortar or setting in mortar.

Set units in full bed of mortar with full head joints unless otherwise indicated.

Set units with joints 3/8 to 1/2 inch wide unless otherwise indicated.

Build anchors and ties into mortar joints as units are set.

Fill dowel holes and anchor slots with mortar.

Fill collar joints solid as units are set.

Build concealed flashing into mortar joints as units are set.

Keep head joints in copings and between other units with exposed horizontal surfaces open to receive sealant.

Keep joints at shelf angles open to receive sealant.

Rake out joints for pointing with mortar to depths of not less than 3/4 inch. Rake joints to uniform depths with square bottoms and clean sides. Scrub faces of units to remove excess mortar as joints are raked.

Point mortar joints by placing and compacting mortar in layers not greater than 3/8 inch. Compact each layer thoroughly and allow it to become thumbprint hard before applying next layer.

Tool exposed joints slightly concave when thumbprint hard. Use a smooth plastic jointer larger than joint thickness.

Rake out joints for pointing with sealant to depths of not less than 3/4 inch. Scrub faces of units to remove excess mortar as joints are raked.

Point joints with sealant to comply with applicable requirements in Section 079200 "Joint Sealants."

Prime cast-stone surfaces to receive sealant and install compressible backer rod in joints before applying sealant unless otherwise indicated.

Provide sealant joints at head joints of copings and other horizontal surfaces; at expansion, control, and pressure-relieving joints; and at locations indicated.

Keep joints free of mortar and other rigid materials.

Build in compressible foam-plastic joint fillers where indicated.

Form joint of width indicated, but not less than 3/8 inch .

Prime cast-stone surfaces to receive sealant and install compressible backer rod in joints before applying sealant unless otherwise indicated.

Prepare and apply sealant of type and at locations indicated to comply with applicable requirements in Section 079200 "Joint Sealants."

INSTALLATION TOLERANCES

Variation from Plumb: Do not exceed 1/8 inch in 10 feet, 1/4 inch in 20 feet, or 1/2 inch maximum.

Variation from Level: Do not exceed 1/8 inch in 10 feet, 1/4 inch in 20 feet, or 1/2 inch maximum.

Variation in Joint Width: Do not vary joint thickness more than 1/8 inch in 36 inches or one-fourth of nominal joint width, whichever is less.

Variation in Plane between Adjacent Surfaces (Lipping): Do not vary from flush alignment with adjacent units or adjacent surfaces indicated to be flush with units by more than 1/16 inch, except where variation is due to warpage of units within tolerances specified.

ADJUSTING AND CLEANING

Remove and replace stained and otherwise damaged units and units not matching approved Samples. Cast stone may be repaired if methods and results are approved by Architect.

Replace units in a manner that results in cast stone matching approved Samples, complying with other requirements, and showing no evidence of replacement.

In-Progress Cleaning: Clean cast stone as work progresses.

Remove mortar fins and smears before tooling joints.

Remove excess sealant immediately, including spills, smears, and spatter.

Final Cleaning: After mortar is thoroughly set and cured, clean exposed cast stone as follows:

Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.

Test cleaning methods on sample; leave one sample uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of cast stone.

Protect adjacent surfaces from contact with cleaner by covering them with liquid strippable masking agent or polyethylene film and waterproof masking tape.

Wet surfaces with water before applying cleaners; remove cleaners promptly by rinsing thoroughly with clear water.

Clean cast stone by bucket-and-brush hand-cleaning method described in BIA Technical Notes 20.

Clean cast stone with proprietary acidic cleaner applied according to manufacturer's written instructions.

END OF SECTION 047200

DIVISION 05 -METALS
SECTION 051223 – STRUCTURAL STEEL FOR BUILDINGS

GENERAL

DESCRIPTION

Scope of Work

This Section includes fabrication, delivery, unload and storage in locations directed and erect all structural steel work, as shown on drawings and specified, including schedules, notes, and details showing size and location of members, typical connections, and types of steel required.

SUBMITTALS

Submit for review, complete shop drawings for all work under this subdivision, including schedules, notes, and details showing size and location of members, typical connections, and types of steel required.

Test reports conducted on shop and field bolted and welded connections. Include data on type(s) of test conducted and test results.

QUALITY ASSURANCE

Codes and standards: Comply with applicable provisions of the latest issue of the following:

American Institute of Steel Construction (AISC) "Code of Standard Practice for Steel Buildings and Bridges"

Structural Welding Code (AWS D1.1)

Steel Structures Painting Council (SSPC)

Qualifications for welding work: Qualify welding procedures and welding operations in accordance with AWS "Qualification" requirements.

Welders to have current certificates, if re-certification of welders is required, re-testing will be Contractor's responsibility.

DELIVERY, STORAGE, AND HANDLING

Deliver materials to site at such intervals to ensure uninterrupted progress or work. Store on site only in authorized locations.

Deliver anchor bolts and anchorage devices, which are to be embedded in cast-in-place concrete or masonry, in ample time to not to delay work.

Store materials to permit easy access for inspection and identification. Keep steel members off ground. Protect steel members and packaged materials from exposure to the weather.

PRODUCTS

MATERIALS

Misc. structural shapes, plates, etc: ASTM A 36

Structural beams: ASTM A992 GR.50 (Wide Flange)- Refer to structural drawings.

Steel Tube Columns: ASTM A500

Plates and Shapes: A36 (Plates, Angles)

Anchor bolts: F1554, Gr. 55, hooked type, with nuts and washers.

High strength threaded fasteners: Heavy hexagon structural bolts, heavy hexagon nuts, and hardened washers, complying with ASTM A325.

Electrodes for welding: Comply with AWS Code. Use E70XX electrodes.

Grout: non-shrink, non-metallic, flowable or plastic with minimum of 7,000 psi at 28 days in accordance with CRD-C 621, Army Corps of Engineers.

MISCELLANEOUS MATERIALS

Additional Steel Beams: Furnish and install eight (8) 12W x 35, each thirty (30) feet long, for fabrication and installation as directed by the Architect. Prior to delivery, Architect will instruct contractor to cut beams into various lengths up to 6 0" long, with each length punched for bolted connections, and provided with clips, for connecting to other structural members

FABRICATION

Fabricate items of structural steel in accordance with AISC Specifications and as indicated on final shop drawings. Properly mark-match materials for field assembly. Fabricate for delivery sequence that will expedite erection and minimize field handling of materials.

Work shall be executed by skilled workmen under experienced supervision.

Connections: Weld or bolt shop connections.

Bolt field connections with high-strength bolts, except where welded connections are indicated.

Field verify all existing dimensions and elevations prior to fabrication.

High strength bolted construction: Install high strength threaded fasteners in accordance with AISC "Specifications for Structural Joints Using ASTM A 325 Bolts". Use bearing type bolts with threads included in shear plane.

Welded construction: Comply with AWS Code for procedures, appearance, and quality of welds, and methods used in correcting welding work.

Holes for other work: Provide holes required for securing other work to structural steel framing and for passage of other work through steel framing members, as shown on final shop drawings.

SHOP PAINTING

General: Shop paint all structural steel, except anchor bolts and surfaces to be field welded, and members specified to be hot dipped galvanized.

Paint all members after fabrication, except where surfaces would be inaccessible for surface prep and painting.

Apply paint in sufficient volume or coats to provide a minimum dry film thickness of 3 but not more than 5 mils.

Surface preparation: Clean steel in accordance with Steel Structures Painting Council (SSPC - SP3 Power Tool Cleaning).

SOURCE QUALITY CONTROL

General: Materials and fabrication procedures are subject to inspections at tests in mill, shop, and field, conducted by a qualified inspection agency. Such inspections and tests will not relieve Contractor of responsibility for providing materials and fabrication procedures in compliance with specified requirements.

Promptly remove and replace materials or fabricated components that do not comply.

EXECUTION

ERECTION

Must conform to the applicable provisions of AISC specifications.

Temporary planking: Provide temporary planking and working platforms as necessary to effectively complete work.

Setting bases and bearing plates: Clean concrete and masonry bearing surfaces of bond-reducing materials and roughen to improve bond to surfaces. Clean bottom surface of base and bearing plates.

Set loose and attached base plates and bearing plates for structural members on leveling nuts. Do not use wedges of shims.

Field assembly: Set structural frame accurately to lines and elevations indicated. Align and adjust various members forming part of complete frame or structure before permanently fastening. Clean bearing surfaces and other surfaces that will be in permanent contact before assembly. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.

All bolts, including anchor bolts, shall have enough projection to expose not less than 1-1/2 threads after nuts are tightened. Level and plumb individual members of structure within specified AISC tolerances.

If steel is damaged or does not fit-up, Contractor shall submit proposed corrective measures for review by Engineer.

Do not enlarge unfair holes in members by burning or by using drift pins. Drill or ream holes that must be enlarged to accommodate next larger fastener, where possible.

The use of a gas-cutting torch in field for correcting fabrication errors in primary structural members will not be permitted.

Immediately after erection, clean field welds, bolted connections, and abraded areas where shop coat was damaged. Spot and prime areas using same material as used for shop coat.

Set all members so that, in their final location, level, plumbness and alignment are within the tolerances prescribed by AISC Code.

QUALITY CONTROL

An independent testing and inspection agency shall be retained to inspect structural steel members high strength bolted connections and welded connections.

Testing agency shall conduct and interpret tests, state in each report whether test specimens comply with requirements, and specifically state any deviations therefrom. Submit 3 copies of each report to Owner's representative.

Provide access for testing agency to places where structural steel work is begin fabricated or produced so that required inspection and testing can be accomplished.

Minimum required testing:

Visually inspect all structural steel beams, columns, etc.

Visually inspect all bolted and welded connections.

Test all beam or column splices.

Test a representative sample of all full or partial penetration welds.

Correct deficiencies in structural steel work that inspections have indicated to be not in compliance with requirements. Perform additional tests, at Contractor's expenses, as necessary to reconfirm any noncompliance of original work and to show compliance of corrected work.

FINAL CLEANUP

All temporary guys, braces, falsework, cribbing, rubbish and other debris are to be removed upon completion of erection.

END OF SECTION 051223

DIVISION 05 – METALS
SECTION 055113 - METAL PAN STAIRS

GENERAL

SUMMARY

Section Includes:

Preassembled steel stairs with concrete-filled treads.

Steel tube railings and guards attached to metal stairs.

Steel tube handrails attached to walls adjacent to metal stairs.

COORDINATION

Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written instructions to ensure that shop primers and topcoats are compatible with one another.

Coordinate installation of anchorages for metal stairs , railings, and guards.

Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, blocking for attachment of wall-mounted handrails, and items with integral anchors, that are to be embedded in concrete or masonry.

Deliver such items to Project site in time for installation.

Coordinate locations of hanger rods and struts with other work so they do not encroach on required stair width and are within fire-resistance-rated stair enclosure.

Schedule installation of railings and guards so wall attachments are made only to completed walls.

Do not support railings and guards temporarily by any means that do not satisfy structural performance requirements.

ACTION SUBMITTALS

Shop Drawings:

Include plans, elevations, sections, details, and attachments to other work.

Indicate sizes of metal sections, thickness of metals, profiles, holes, and field joints.

Include plan at each level.

Indicate locations of anchors, weld plates, and blocking for attachment of wall-mounted handrails.

Delegated-Design Submittal: For stairs, railings and guards, , including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

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SECTION 055113 - METAL PAN STAIRS

INFORMATIONAL SUBMITTALS

Qualification Data: For professional engineer's experience with providing delegated-design engineering services of the kind indicated, including documentation that engineer is licensed in the State in which Project is located.

Welding certificates.

Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers, certifying that shop primers are compatible with topcoats.

QUALITY ASSURANCE

Installer Qualifications: Fabricator of products.

Welding Qualifications: Qualify procedures and personnel according to the following:

AWS D1.1/D1.1M, "Structural Welding Code - Steel."

AWS D1.3/D1.3M, "Structural Welding Code - Sheet Steel."

DELIVERY, STORAGE, AND HANDLING

Store materials to permit easy access for inspection and identification.

Keep steel members off ground and spaced by using pallets, dunnage, or other supports and spacers.

Protect steel members and packaged materials from corrosion and deterioration.

Do not store materials on structure in a manner that might cause distortion, damage, or overload to members or supporting structures.

Repair or replace damaged materials or structures as directed.

PRODUCTS

PERFORMANCE REQUIREMENTS

Delegated Design: Engage a qualified professional engineer, to design stairs, railings and guards, , including attachment to building construction.

Structural Performance of Stairs: Metal stairs shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:

Uniform Load: 100 lbf/sq. ft..

Concentrated Load: 300 lbf applied on an area of 4 sq. in..

Uniform and concentrated loads need not be assumed to act concurrently.

DIVISION 05 – METALS
SECTION 055113 - METAL PAN STAIRS

Stair Framing: Capable of withstanding stresses resulting from railing and guard loads in addition to loads specified above.

Limit deflection of treads, platforms, and framing members to L/360 or 1/4 inch, whichever is less.

METALS

Metal Surfaces: Provide materials with smooth, flat surfaces unless otherwise indicated. For components exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.

Steel Plates, Shapes, and Bars: ASTM A36/A36M.

Steel Pipe for Railings and Guards: ASTM A53/A53M, Type F or Type S, Grade A, Standard Weight (Schedule 40), unless another grade and weight are required by structural loads.

Provide galvanized finish for installations.

FASTENERS

General: Provide Type 304 stainless steel fasteners for exterior use and zinc-plated fasteners with coating complying with ASTM B633 or ASTM F1941/F1941M, Class Fe/Zn 5 where built into exterior walls.

Select fasteners for type, grade, and class required.

Fasteners for Anchoring Railings and Guards to Other Construction: Select fasteners of type, grade, and class required to produce connections suitable for anchoring railings and guards to other types of construction indicated and capable of withstanding design loads.

Bolts and Nuts: Regular hexagon-head bolts, ASTM A307, Grade A; with hex nuts, ASTM A563; and, where indicated, flat washers.

Anchor Bolts: ASTM F1554, Grade 36, of dimensions indicated; with nuts, ASTM A563; and, where indicated, flat washers.

Provide mechanically deposited or hot-dip, zinc-coated anchor bolts for stairs indicated to be galvanized .

Post-Installed Anchors: Torque-controlled expansion anchors capable of sustaining, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing according to ASTM E488/E488M, conducted by a qualified independent testing agency.

Material for Interior Locations: Carbon-steel components zinc plated to comply with ASTM B633 or ASTM F1941/F1941M, Class Fe/Zn 5, unless otherwise indicated.

MISCELLANEOUS MATERIALS

Handrail Wall Brackets: Cast stainless steel, center of rail 3-1/8 inches from face of wall.

DIVISION 05 – METALS
SECTION 055113 - METAL PAN STAIRS

Manufacturers: Subject to compliance with requirements, provide products by one of the following:

Blum, Julius & Co., Inc.

The Wagner Companies., R&B Wagner, Inc.

Welding Electrodes: Comply with AWS requirements.

Shop Primers: Provide primers that comply with Specifications.

Galvanizing Repair Paint: High-zinc-dust-content paint complying with SSPC-Paint 20 and compatible with paints specified to be used over it.

Prefilled Concrete Treads:

Concrete Materials and Properties: Comply with requirements in Section 033000 "Cast-in-Place Concrete" for normal-weight, air-entrained, ready-mix concrete with minimum 28-day compressive strength of 3000 psi and maximum aggregate size of 1/2 inch unless otherwise indicated.

Reinforcement Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening welded-wire reinforcement in place.

Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice," of greater compressive strength than concrete.

For galvanized reinforcement, use galvanized wire or dielectric-polymer-coated wire bar supports.

FABRICATION, GENERAL

Provide complete stair assemblies, including metal framing, hangers, struts, railings and guards, clips, brackets, bearing plates, and other components necessary to support and anchor stairs and platforms on supporting structure.

Join components by welding unless otherwise indicated.

Use connections that maintain structural value of joined pieces.

Assemble stairs , railings, and guards in shop to greatest extent possible.

Disassemble units only as necessary for shipping and handling limitations.

Clearly mark units for reassembly and coordinated installation.

Cut, drill, and punch metals cleanly and accurately.

Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated.

Remove sharp or rough areas on exposed surfaces.

Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.

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Form exposed work with accurate angles and surfaces and straight edges.

Weld connections to comply with the following:

Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.

Obtain fusion without undercut or overlap.

Remove welding flux immediately.

Weld exposed corners and seams continuously unless otherwise indicated.

At exposed connections, finish exposed welds to comply with NOMMA's "Voluntary Joint Finish Standards" for Finish #1 - No evidence of welded joint .

Form exposed connections with hairline joints, flush and smooth, using concealed fasteners where possible.

Where exposed fasteners are required, use Phillips flat-head (countersunk) screws or bolts unless otherwise indicated.

Locate joints where least conspicuous.

Fabricate joints that will be exposed to weather in a manner to exclude water.

Provide weep holes where water may accumulate internally.

FABRICATION OF STEEL-FRAMED STAIRS

NAAMM Stair Standard: Comply with NAAMM AMP 510, "Metal Stairs Manual," for Architectural Class, unless more stringent requirements are indicated.

Stair Framing:

Fabricate stringers of steel plates or steel channels or steel rectangular tubes .

Stringer Size: As required to comply with "Performance Requirements" Article .

Provide closures for exposed ends of channel and rectangular tube stringers.

Finish: Galvanized.

Construct platforms of steel plate or channel or rectangular tube headers and miscellaneous framing members as required to comply with "Performance Requirements" Article .

Provide closures for exposed ends of channel and rectangular tube framing.

Finish: Shop primed Galvanized.

Weld stringers to headers; weld framing members to stringers and headers.

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Where masonry walls support metal stairs, provide temporary supporting struts designed for erecting steel stair components before installing masonry.

Metal Pan Stairs: Form risers, subtread pans, and subplatforms to configurations shown from steel sheet of thickness needed to comply with performance requirements, but not less than 0.067 inch.

Steel Sheet: Galvanized-steel sheet.

Attach risers and subtreads to stringers with brackets made of steel angles or bars. Weld brackets to stringers and attach metal pans to brackets by welding, riveting, or bolting.

Shape metal pans to include nosing integral with riser.

Provide subplatforms of configuration indicated or, if not indicated, the same as subtreads. Weld subplatforms to platform framing.

Smooth Soffit Construction: Construct subplatforms with flat metal under surfaces to produce smooth soffits.

FABRICATION OF STAIR RAILINGS AND GUARDS

Fabricate railings and guards to comply with requirements indicated for design, dimensions, details, finish, and member sizes, including wall thickness of member, post spacings, wall bracket spacing, and anchorage, but not less than that needed to withstand indicated loads.

Rails and Posts: 1-5/8-inch- diameter top and bottom rails and 1-1/2-inch-round posts.

Picket Infill: 1/2-inch- round pickets spaced to prohibit the passage of a 4-inch diameter sphere.

Welded Connections: Fabricate railings and guards with welded connections.

Fabricate connections that are exposed to weather in a manner that excludes water.

Provide weep holes where water may accumulate internally.

Cope components at connections to provide close fit, or use fittings designed for this purpose.

Weld all around at connections, including at fittings.

Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.

Obtain fusion without undercut or overlap.

Remove flux immediately.

Finish welds to comply with NOMMA's "Voluntary Joint Finish Standards" for Finish #1 - No evidence of a welded joint as shown in NAAMM AMP 521.

Form changes in direction of railings and guards as follows:

By bending or by inserting prefabricated elbow fittings.

For changes in direction made by bending, use jigs to produce uniform curvature for each repetitive configuration required. Maintain cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of components.

Close exposed ends of railing and guard members with prefabricated end fittings.

Provide wall returns at ends of wall-mounted handrails unless otherwise indicated.

Connect posts to stair framing by direct welding unless otherwise indicated.

Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, end closures, flanges, miscellaneous fittings, and anchors for interconnecting components and for attaching to other work.

Furnish inserts and other anchorage devices for connecting to concrete or masonry work.

For galvanized railings and guards, provide galvanized fittings, brackets, fasteners, sleeves, and other ferrous-metal components.

Provide type of bracket with flange tapped for concealed anchorage to threaded hanger bolt and that provides 1-1/2-inch clearance from inside face of handrail to finished wall surface.

Fillers: Provide fillers made from steel plate, or other suitably crush-resistant material, where needed to transfer wall bracket loads through wall finishes to structural supports.

Size fillers to suit wall finish thicknesses and to produce adequate bearing area to prevent bracket rotation and overstressing of substrate.

FINISHES

Finish metal stairs after assembly.

Galvanizing: Hot-dip galvanize items as indicated to comply with ASTM A153/A153M for steel and iron hardware and with ASTM A123/A123M for other steel and iron products.

Do not quench or apply post-galvanizing treatments that might interfere with paint adhesion.

Fill vent and drain holes that are exposed in the finished Work, unless indicated to remain as weep holes, by plugging with zinc solder and filing off smooth.

Apply shop primer to uncoated surfaces of metal stair components, except those with galvanized finishes and those to be embedded in concrete or masonry unless otherwise indicated. Comply with SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting.

EXECUTION

EXAMINATION

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SECTION 055113 - METAL PAN STAIRS

Verify elevations of floors, bearing surfaces and locations of bearing plates, and other embedments for compliance with requirements.

For wall-mounted railings, verify locations of concealed reinforcement within gypsum board and plaster assemblies.

Proceed with installation only after unsatisfactory conditions have been corrected.

INSTALLATION OF METAL PAN STAIRS

Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing metal stairs to in-place construction.

Include threaded fasteners for concrete and masonry inserts, through-bolts, lag bolts, and other connectors.

Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal stairs. Set units accurately in location, alignment, and elevation, measured from established lines and levels and free of rack.

Install metal stairs by welding stair framing to steel structure or to weld plates cast into concrete unless otherwise indicated.

Grouted Baseplates: Clean concrete- and masonry-bearing surfaces of bond-reducing materials, and roughen surfaces prior to setting plates.

Clean bottom surface of plates.

Set plates for structural members on wedges, shims, or setting nuts.

Tighten anchor bolts after supported members have been positioned and plumbed.

Do not remove wedges or shims but, if protruding, cut off flush with edge of plate before packing with grout.

Promptly pack grout solidly between bearing surfaces and plates so no voids remain.

Neatly finish exposed surfaces; protect grout and allow to cure.

Comply with manufacturer's written installation instructions for shrinkage-resistant grouts.

Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.

Fit exposed connections accurately together to form hairline joints.

Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations.

Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.

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Comply with requirements for welding in "Fabrication, General" Article.

Place and finish concrete fill for treads and platforms to comply with Section 033000 "Cast-in-Place Concrete."

INSTALLATION OF RAILINGS AND GUARDS

Adjust railing and guard systems before anchoring to ensure matching alignment at abutting joints with tight, hairline joints.

Space posts at spacing indicated or, if not indicated, as required by design loads.

Plumb posts in each direction, within a tolerance of 1/16 inch in 3 feet.

Align rails and guards so variations from level for horizontal members and variations from parallel with rake of stairs for sloping members do not exceed 1/4 inch in 12 feet.

Secure posts, rail ends, and guard ends to building construction as follows:

Anchor posts to steel by welding to steel supporting members.

Anchor handrail and guard ends to concrete and masonry with steel round flanges welded to rail and guard ends and anchored with post-installed anchors and bolts.

Attach handrails to wall with wall brackets.

Locate brackets as indicated or, if not indicated, at spacing required to support structural loads.

Secure wall brackets to building construction as required to comply with performance requirements.

For concrete and solid masonry anchorage, use drilled-in expansion shields and hanger or lag bolts.

For hollow masonry anchorage, use toggle bolts.

REPAIR

Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A780/A780M.

END OF SECTION 055113

SECTION 061000 - ROUGH CARPENTRY

GENERAL

SUMMARY

Section Includes:

Framing with dimension lumber.

Wood blocking and nailers.

Wood furring and grounds.

Wood sleepers.

Utility shelving.

Plywood backing panels.

DEFINITIONS

Boards or Strips: Lumber of less than 2 inches nominal size in least dimension.

Dimension Lumber: Lumber of 2 inches nominal size or greater but less than 5 inches nominal size in least dimension.

Exposed Framing: Framing not concealed by other construction.

OSB: Oriented strand board.

Timber: Lumber of 5 inches nominal size or greater in least dimension.

ACTION SUBMITTALS

Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.

Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.

Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Include physical properties of treated materials based on testing by a qualified independent testing agency.

For fire-retardant treatments, include physical properties of treated lumber both before and after exposure to elevated temperatures, based on testing by a qualified independent testing agency according to ASTM D5664.

For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.

DELIVERY, STORAGE, AND HANDLING

Stack wood products flat with spacers beneath and between each bundle to provide air circulation. Protect wood products from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

PRODUCTS

WOOD PRODUCTS, GENERAL

Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, comply with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Grade lumber by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.

Factory mark each piece of lumber with grade stamp of grading agency.

For exposed lumber indicated to receive a stained or natural finish, mark grade stamp on end or back of each piece .

Dress lumber, S4S, unless otherwise indicated.

Maximum Moisture Content of Lumber: 15 percent for 2-inch nominal thickness or less; 19 percent for more than 2-inch nominal thickness unless otherwise indicated.

Engineered Wood Products: Acceptable to authorities having jurisdiction and for which current model code research or evaluation reports exist that show compliance with building code in effect for Project.

Allowable design stresses, as published by manufacturer, shall meet or exceed those indicated. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency.

WOOD-PRESERVATIVE-TREATED LUMBER

Preservative Treatment by Pressure Process: AWPA U1; Use Category UC2 for interior construction not in contact with ground, Use Category UC3b for exterior construction not in contact with ground, and Use Category UC4a for items in contact with ground.

Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium. Do not use inorganic boron (SBX) for sill plates.

For exposed items indicated to receive a stained or natural finish, chemical formulations shall not require incising, contain colorants, bleed through, or otherwise adversely affect finishes.

Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or that does not comply with requirements for untreated material.

Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.

For exposed lumber indicated to receive a stained or natural finish, omit marking and provide certificates of treatment compliance issued by inspection agency.

Application: Treat items indicated on Drawings, and the following:

Wood sills, sleepers, blocking, furring, stripping, and similar concealed members in contact with masonry or concrete.

Wood floor plates that are installed over concrete slabs-on-grade.

DIMENSION LUMBER FRAMING

Non-Load-Bearing Interior Partitions: Construction or No. 2 grade.

Application: All interior partitions .

Species:

Hem-fir; WCLIB, or WWPA.

Ceiling Joists: Construction or No. 2 grade.

Species:

Hem-fir; WCLIB or WWPA.

Joists, Rafters, and Other Framing Not Listed Above: Select Structural grade.

Species:

Hem-fir; WCLIB or WWPA.

MISCELLANEOUS LUMBER

General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:

Blocking.

Nailers.

Furring.

Grounds.

Utility shelving.

Dimension Lumber Items: Construction or No. 2 grade lumber of any species.

Utility Shelving: Lumber with 15 percent maximum moisture content of the following species and grades:

Eastern white pine, Idaho white, lodgepole, ponderosa, or sugar pine; Premium or No. 2 Common (Sterling) grade; NeLMA, NLGA, WCLIB, or WWPA.

Concealed Boards: 15 percent maximum moisture content and the following species and grades:

Hem-fir or hem-fir (north); Construction or No. 2 Common grade; NLGA, WCLIB, or WWPA.

For blocking not used for attachment of other construction, Utility, Stud, or No. 3 grade lumber of any species may be used provided that it is cut and selected to eliminate defects that will interfere with its attachment and purpose.

For blocking and nailers used for attachment of other construction, select and cut lumber to eliminate knots and other defects that will interfere with attachment of other work.

For furring strips, select boards with no knots capable of producing bent-over nails and damage to paneling.

PLYWOOD BACKING PANELS

Equipment Backing Panels: Plywood, DOC PS 1, Exterior, A-C , in thickness indicated or, if not indicated, not less than 3/4-inch nominal thickness.

FASTENERS

General: Fasteners shall be of size and type indicated and shall comply with requirements specified in this article for material and manufacture.

Where rough carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners of Type 304 stainless steel.

Nails, Brads, and Staples: ASTM F1667.

Power-Driven Fasteners: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.

Post-Installed Anchors: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC01 or ICC-ES AC308 as appropriate for the substrate.

Material: Stainless steel with bolts and nuts complying with ASTM F593 and ASTM F594, Alloy Group 1 or 2.

METAL FRAMING ANCHORS

Manufacturers: Subject to compliance with requirements, provide products by one of the following:

KC Metals Products, Inc.

Simpson Strong-Tie Co., Inc.

USP Structural Connectors.

Allowable design loads, as published by manufacturer, shall meet or exceed those indicated . Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency. Framing anchors shall be punched for fasteners adequate to withstand same loads as framing anchors.

Galvanized-Steel Sheet: Hot-dip, zinc-coated steel sheet complying with ASTM A653/A653M, G60 coating designation.

Use for interior locations unless otherwise indicated.

Joist Hangers: U-shaped joist hangers with 2-inch- long seat and 1-1/4-inch- wide nailing flanges at least 85 percent of joist depth.

Thickness: 0.062 inch .

Joist Ties: Flat straps, with holes for fasteners, for tying joists together over supports.

Width: 1-1/4 inches .

Thickness: 0.062 inch .

Length: 16 inches .

Rafter Tie-Downs (Hurricane or Seismic Ties): Bent strap tie for fastening rafters or roof trusses to wall studs below, 2-1/4 inches wide by 0.062 inch thick. Tie fits over top of rafter or truss and fastens to both sides of rafter or truss, face of top plates, and side of stud below.

MISCELLANEOUS MATERIALS

Adhesives for Gluing Furring and Sleepers to Concrete or Masonry: Formulation complying with ASTM D3498 that is approved for use indicated by adhesive manufacturer.

EXECUTION

INSTALLATION, GENERAL

Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.

Framing with Engineered Wood Products: Install engineered wood products to comply with manufacturer's written instructions.

Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry accurately to other construction. Locate furring, nailers, blocking, grounds, and similar supports to comply with requirements for attaching other construction.

Install plywood backing panels by fastening to studs; coordinate locations with utilities requiring backing panels. Install fire-retardant-treated plywood backing panels with classification marking of testing agency exposed to view.

Install shear wall panels to comply with manufacturer's written instructions.

Install metal framing anchors to comply with manufacturer's written instructions. Install fasteners through each fastener hole.

Install sill sealer gasket to form continuous seal between sill plates and foundation walls.

Do not splice structural members between supports unless otherwise indicated.

Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.

Provide metal clips for fastening gypsum board or lath at corners and intersections where framing or blocking does not provide a surface for fastening edges of panels. Space clips not more than 16 inches o.c.

Provide fire blocking in furred spaces, stud spaces, and other concealed cavities as indicated and as follows:

Fire block furred spaces of walls, at each floor level, at ceiling, and at not more than 96 inches o.c. with solid wood blocking or noncombustible materials accurately fitted to close furred spaces.

Fire block concealed spaces of wood-framed walls and partitions at each floor level, at ceiling line of top story, and at not more than 96 inches o.c. Where fire blocking is not inherent in framing system used, provide closely fitted solid wood blocks of same width as framing members and 2-inch nominal thickness.

Fire block concealed spaces between floor sleepers with same material as sleepers to limit concealed spaces to not more than 100 sq. ft. and to solidly fill space below partitions.

Fire block concealed spaces behind combustible cornices and exterior trim at not more than 20 feet o.c.

Sort and select lumber so that natural characteristics do not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.

Comply with AWPA M4 for applying field treatment to cut surfaces of preservative-treated lumber.

Use inorganic boron for items that are continuously protected from liquid water.

Use copper naphthenate for items not continuously protected from liquid water.

Where wood-preservative-treated lumber is installed adjacent to metal decking, install continuous flexible flashing separator between wood and metal decking.

Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:

Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code (IBC).

ICC-ES evaluation report for fastener.

Use steel common nails unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood. Drive nails snug but do not countersink nail heads unless otherwise indicated.

INSTALLATION OF WOOD BLOCKING AND NAILERS

Install where required for screeding or attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.

Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces unless otherwise indicated.

Provide permanent grounds of dressed, pressure-preservative-treated, key-beveled lumber not less than 1-1/2 inches wide and of thickness required to bring face of ground to exact thickness of finish material. Remove temporary grounds when no longer required.

INSTALLATION OF WOOD FURRING

Install level and plumb with closure strips at edges and openings. Shim with wood as required for tolerance of finish work.

Furring to Receive Gypsum Board : Install 1-by-2-inch nominal- size furring vertically at 16 inches o.c.

INSTALLATION OF WALL AND PARTITION FRAMING

General: Provide single bottom plate and double top plates using members of 2-inch nominal thickness whose widths equal that of studs, except single top plate may be used for non-load-bearing partitions. Fasten plates to supporting construction unless otherwise indicated.

For exterior walls, provide 2-by-4-inch nominal- size wood studs spaced 16 inches o.c. unless otherwise indicated.

For interior partitions and walls, provide 2-by-4-inch nominal- size wood studs spaced 16 inches o.c. unless otherwise indicated.

Provide continuous horizontal blocking at midheight of partitions more than 96 inches high, using members of 2-inch nominal thickness and of same width as wall or partitions.

Construct corners and intersections with three or more studs.

Frame openings with multiple studs and headers. Provide nailed header members of thickness equal to width of studs. Support headers on jamb studs.

For non-load-bearing partitions, provide double-jamb studs and headers not less than 10-inch nominal depth for openings 48 inches and less in width, 10-inch nominal depth for openings 48 to 72 inches in width, 12-inch nominal depth for openings 72 to 120 inches in width, and not less than 12-inch nominal depth for openings 10 to 12 feet in width.

For load-bearing walls, provide double-jamb studs for openings 60 inches and less in width, and triple-jamb studs for wider openings. Provide headers of depth indicated.

INSTALLATION OF FLOOR JOIST FRAMING

General: Install floor joists with crown edge up and support ends of each member with not less than 1-1/2 inches of bearing on wood or metal, or 3 inches on masonry. Attach floor joists as follows:

Where supported on wood members, by toe nailing or by using metal framing anchors.

Where framed into wood supporting members, by using wood ledgers as indicated or, if not indicated, by using metal joist hangers.

Frame openings with headers and trimmers supported by metal joist hangers; double headers and trimmers where span of header exceeds 48 inches.

Do not notch in middle third of joists; limit notches to one-sixth depth of joist, one-third at ends. Do not bore holes larger than one-third depth of joist; do not locate closer than 2 inches from top or bottom.

Provide solid blocking of 2-inch nominal thickness by depth of joist at ends of joists unless nailed to header or band.

Lap members framing from opposite sides of beams, girders, or partitions not less than 4 inches or securely tie opposing members together. Provide solid blocking of 2-inch nominal thickness by depth of joist over supports.

Anchor members paralleling masonry with 1/4-by-1-1/4-inch metal strap anchors spaced not more than 96 inches o.c., extending over and fastening to three joists. Embed anchors at least 4 inches into grouted masonry with ends bent at right angles and extending 4 inches beyond bend.

Provide solid blocking between joists under jamb studs for openings.

Under non-load-bearing partitions, provide double joists separated by solid blocking equal to depth of studs above.

Provide triple joists separated as above, under partitions receiving ceramic tile and similar heavy finishes or fixtures.

Provide bridging of type indicated below, at intervals of 96 inches o.c., between joists.

Diagonal wood bridging formed from bevel-cut, 1-by-3-inch nominal- size lumber, double-crossed and nailed at both ends to joists.

Steel bridging installed to comply with bridging manufacturer's written instructions.

INSTALLATION OF CEILING JOIST AND RAFTER FRAMING

Ceiling Joists: Install with crown edge up and complying with requirements specified above for floor joists. Face nail to ends of parallel rafters.

Where ceiling joists are at right angles to rafters, provide additional short joists parallel to rafters from wall plate to first joist; nail to ends of rafters and to top plate, and nail to first joist or anchor with framing anchors or metal straps. Provide 1-by-8-inch nominal- size or 2-by-4-inch nominal- size stringers spaced 48 inches o.c. crosswise over main ceiling joists.

Rafters: Notch to fit exterior wall plates and use metal framing anchors. Double rafters to form headers and trimmers at openings in roof framing, if any, and support with metal hangers. Where rafters abut at ridge, place directly opposite each other and nail to ridge member or use metal ridge hangers.

At valleys, provide double-valley rafters of size indicated or, if not indicated, of same thickness as regular rafters and 2 inches deeper. Bevel ends of jack rafters for full bearing against valley rafters.

At hips, provide hip rafter of size indicated or, if not indicated, of same thickness as regular rafters and 2 inches deeper. Bevel ends of jack rafters for full bearing against hip rafter.

Provide collar beams (ties) as indicated or, if not indicated, provide 1-by-6-inch nominal- size boards between every third pair of rafters, but not more than 48 inches o.c. Locate below ridge member, at third point of rafter span. Cut ends to fit roof slope and nail to rafters.

Provide special framing as indicated for eaves, overhangs, dormers, and similar conditions if any.

PROTECTION

Protect wood that has been treated with inorganic boron (SBX) from weather. If, despite protection, inorganic boron-treated wood becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

Protect rough carpentry from weather. If, despite protection, rough carpentry becomes wet , apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

END OF SECTION 061000

DIVISION 06 – WOOD, PLASTICS, AND COMPOSITES
SECTION 061600 – SHEATHING

SECTION 061600 - SHEATHING

GENERAL

SUMMARY

Section Includes:

Roof sheathing.

Subflooring.

Underlayment.

ACTION SUBMITTALS

Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.

Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated plywood complies with requirements. Indicate type of preservative used and net amount of preservative retained.

For products receiving waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.

QUALITY ASSURANCE

DELIVERY, STORAGE, AND HANDLING

Stack panels flat with spacers beneath and between each bundle to provide air circulation. Protect sheathing from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

PRODUCTS

WOOD PANEL PRODUCTS

Thickness: As needed to comply with requirements specified, but not less than thickness indicated.

Factory mark panels to indicate compliance with applicable standard.

FIRE-RETARDANT-TREATED PLYWOOD

ROOF SHEATHING

Plywood Sheathing: , Exterior sheathing.

Span Rating: Not less than 40/20 .

Nominal Thickness: Not less than 5/8 inch. .

SUBFLOORING AND UNDERLAYMENT

Plywood Subflooring: , Exposure 1, Structural I single-floor panels or sheathing.

Span Rating: Not less than 32 48 or 40/20 .

Nominal Thickness: Not less than 23/32 inch .

Underlayment: Provide underlayment in nominal thicknesses indicated or, if not indicated, not less than 1/4 inch over smooth subfloors and not less than 3/8 inch over board or uneven subfloors.

Plywood Underlayment for Resilient Flooring: DOC PS 1, Exposure 1 Underlayment with fully sanded face.

FASTENERS

General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.

For roof and wall sheathing, provide fasteners with hot-dip zinc coating complying with ASTM A153/A153M .

Nails, Brads, and Staples: ASTM F1667.

Power-Driven Fasteners: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.

Screws for Fastening Sheathing to Wood Framing: ASTM C1002.

Screws for Fastening Composite Nail Base Insulated Roof Sheathing to Metal Roof Deck: Steel drill screws, in type and length recommended by sheathing manufacturer for thickness of sheathing to be attached, with organic-polymer or other corrosion-protective coating having a salt-spray resistance of more than 800 hours according to ASTM B117. Provide washers or plates if recommended by sheathing manufacturer.

MISCELLANEOUS MATERIALS

Adhesives for Field Gluing Panels to Wood Framing: Formulation complying with ASTM D3498 that is approved for use with type of construction panel indicated by manufacturers of both adhesives and panels.

EXECUTION

INSTALLATION, GENERAL

Do not use materials with defects that impair quality of sheathing or pieces that are too small to use with minimum number of joints or optimum joint arrangement. Arrange joints so that pieces do not span between fewer than three support members.

Cut panels at penetrations, edges, and other obstructions of work; fit tightly against abutting construction unless otherwise indicated.

Securely attach to substrate by fastening as indicated, complying with the following:

Table 2304.9.1, "Fastening Schedule," in the ICC's International Building Code.

ICC-ES evaluation report for fastener.

Use common wire nails unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections. Install fasteners without splitting wood.

Coordinate roof sheathing installation with flashing and joint-sealant installation so these materials are installed in sequence and manner that prevent exterior moisture from passing through completed assembly.

Do not bridge building expansion joints; cut and space edges of panels to match spacing of structural support elements.

Coordinate sheathing installation with installation of materials installed over sheathing so sheathing is not exposed to precipitation or left exposed at end of the workday when rain is forecast.

WOOD STRUCTURAL PANEL INSTALLATION

General: Comply with applicable recommendations in APA Form No. E30, "Engineered Wood Construction Guide," for types of structural-use panels and applications indicated.

Fastening Methods: Fasten panels as indicated below:

Combination Subfloor-Underlayment:

Glue and nail to wood framing.

Screw to cold-formed metal framing.

Space panels 1/8 inch apart at edges and ends.

Subflooring:

Glue and nail to wood framing.

Screw to cold-formed metal framing.

Space panels 1/8 inch apart at edges and ends.

Wall and Roof Sheathing:

Nail to wood framing. Apply a continuous bead of glue to framing members at edges of wall sheathing panels.

Screw to cold-formed metal framing.

Space panels 1/8 inch apart at edges and ends.

Underlayment:

Nail to subflooring.

Space panels 1/32 inch apart at edges and ends.

Fill and sand edge joints of underlayment receiving resilient flooring immediately before installing flooring.

END OF SECTION 061600

DIVISION 06 – WOOD, PLASTICS, AND COMPOSITES
SECTION 061733 – WOOD I-JOISTS

GENERAL

SCOPE

This work includes the complete furnishings and installation of all wood I-joists as shown on the drawings herein specified and necessary to complete the work.

CODE APPROVALS

These products shall be designed and manufactured to the standards set forth in the ICC Evaluation Service, Inc. report ESR-1153.

DESIGN

PRODUCTS

Products shall be designed to fit the dimensions and loads indicated on the plans.

DESIGN CALCULATIONS

Member calculations shall be prepared by manufacturer.

SUBMITTALS

DRAWINGS

Drawings showing layout and detail necessary for determining fit and placement in the building shall be provided by manufacturer.

PRODUCTION

Fabrication and/or cutting shall not proceed until the architect and/or engineer have approved the submittal package.

PRODUCTS

MATERIALS

Flange members, web members and adhesives shall conform to the provisions of the ICC ES ESR-1153.

FABRICATION

Wood I-joists shall be manufactured by approved manufacturer in a plant listed in the reports referred to above and under the supervision of an approved third-party inspection agency.

TOLERANCES (DRY MATERIAL)

Depth:	± 1/16”
Flange Width:	±1/16”

IDENTIFICATION

Each of the joists shall be identified by a stamp indicating the joist series and ICC ES evaluation report number, manufacturer's name, plant number and the independent inspection agency’s logo.

EXECUTION

INSTALLATION

Wood I-joists, if stored prior to installation, shall be stored in a vertical position and protected from the weather. They shall be handled with care so they are not damaged. Wood I-joists are to be installed in accordance with the plans and any Manufacturer drawings and installation suggestions. Temporary construction loads that cause stresses beyond design limits are not permitted. Safety bracing is to be provided by the installer to keep the joists straight and plumb as required and to assure adequate lateral support for the individual wood I-joists and the entire system until the sheathing material has been applied.

The contractor may give notification to the manufacturer prior to installation of wood I-joists to review and discuss product installation guidelines.

PERFORMANCE STANDARDS

Products shall be proven by testing and evaluation in accordance with the provisions of ASTM D-5055.

FIRE RATING/SOUND RATINGS

Fire and sound ratings are to be established in accordance with assemblies as detailed in ICC ES ESR-1153.

WARRANTY

The products delivered shall be free from manufacturing errors or defects in workmanship and material. The products, when correctly installed and maintained, shall be warranted to perform as designed for the normal and expected life of the building.

MANUFACTURER

Due to the customized detailing and engineering characteristics of the roof and/or floor framing assembly, it is a requirement that TJI® joists be used in the base bid.

The specification is based on Trus Joist engineered wood products. No alternatives, modifications or substitutions are allowed unless the General Contractor and Sub-Contractors submits in writing for such requests to the Project Engineer for approval, no later than two weeks prior to bid. Alternate products must have a current ICC-ES code evaluation report with listed design

properties equivalent or greater than specified products. Substantiating calculations shall be submitted. All floor performance, fire endurance, holes, tapered cuts and notching shall be justified for alternate. Contract shall reflect any price changes. The engineer of record shall be reimbursed for any review time.

END OF SECTION 061733

DIVISION 06 – WOOD, PLASTICS, AND COMPOSITES
SECTION 061753 – SHOP FABRICATED WOOD TRUSSES

GENERAL

SUMMARY

SECTION INCLUDES:

Wood roof trusses.

Wood girder trusses.

Wood truss bracing.

Metal truss accessories.

RELATED REQUIREMENTS

Section 061000 "Rough Carpentry" for roof sheathing.

DEFINITIONS

Metal-Plate-Connected Wood Trusses: Planar structural units consisting of metal-plate connected members fabricated from dimension lumber and cut and assembled before delivery to Project site.

ACTION SUBMITTALS

Shop Drawings: Show fabrication and installation details for trusses.

Show location, pitch, span, camber, configuration, and spacing for each type of truss required.

Indicate sizes, stress grades, and species of lumber.

Indicate locations of permanent bracing required to prevent buckling of individual truss members due to design loads.

Indicate locations, sizes, and materials for permanent bracing required to prevent buckling of individual truss members due to design loads.

Indicate type, size, material, finish, design values, orientation, and location of metal connector plates.

Show splice details and bearing details.

Delegated-Design Submittal: For metal-plate-connected wood trusses indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

INFORMATIONAL SUBMITTALS

Material Certificates: For dimension lumber specified to comply with minimum specific gravity. Indicate species and grade selected for each use and specific gravity.

Product Certificates: For metal-plate-connected wood trusses, signed by officer of truss fabricating firm.

Evaluation Reports: For the following, from ICC-ES:

Wood-preservative-treated lumber.

Fire-retardant-treated wood.

Metal-plate connectors.

Metal truss accessories.

QUALITY ASSURANCE

Metal Connector-Plate Manufacturer Qualifications: A manufacturer that is a member of TPI and that complies with quality-control procedures in TPI 1 for manufacture of connector plates.

Manufacturer's responsibilities include providing professional engineering services needed to assume engineering responsibility.

Engineering Responsibility: Preparation of Shop Drawings and comprehensive engineering analysis by a qualified professional engineer.

Fabricator Qualifications: Shop that participates in a recognized quality-assurance program that complies with quality-control procedures in TPI 1 and that involves third-party inspection by an independent testing and inspecting agency acceptable to Architect and authorities having jurisdiction.

Testing Agency Qualifications: For testing agency providing classification marking for fire retardant treated material, an inspection agency acceptable to authorities having jurisdiction that periodically performs inspections to verify that the material bearing the classification marking is representative of the material tested.

DELIVERY, STORAGE, AND HANDLING

Handle and store trusses to comply with recommendations in TPI BCSI, "Building Component Safety Information: Guide to Good Practice for Handling, Installing, Restraining, & Bracing Metal Plate Connected Wood Trusses."

Store trusses flat, off of ground, and adequately supported to prevent lateral bending.

Protect trusses from weather by covering with waterproof sheeting, securely anchored.

Provide for air circulation around stacks and under coverings.

Inspect trusses showing discoloration, corrosion, or other evidence of deterioration. Discard and replace trusses that are damaged or defective.

PRODUCTS

PERFORMANCE REQUIREMENTS

Delegated Design: Engage a qualified professional engineer to design metal-plate-connected wood trusses.

Structural Performance: Provide metal-plate-connected wood trusses capable of withstanding design loads within limits and under conditions indicated. Comply with requirements in TPI 1 unless more stringent requirements are specified below.

Design Loads: As indicated on drawings.

Maximum Deflection Under Design Loads:

Roof Trusses: Vertical deflection of 1/360 of span for live and snow loads and 1/240 of span for total loads.

Comply with applicable requirements and recommendations of the following publications:

TPI 1, "National Design Standard for Metal Plate Connected Wood Truss Construction."

TPI DSB, "Recommended Design Specification for Temporary Bracing of Metal Plate Connected Wood Trusses."

TPI BCSI, "Building Component Safety Information: Guide to Good Practice for Handling, Installing, Restraining, & Bracing Metal Plate Connected Wood Trusses."

Wood Structural Design Standard: Comply with applicable requirements in AF&PA's "National Design Specifications for Wood Construction" and its "Supplement."

DIMENSION LUMBER

Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.

Factory mark each piece of lumber with grade stamp of grading agency.

For exposed lumber indicated to receive a stained or natural finish, omit grade stamp and provide certificates of grade compliance issued by grading agency.

Provide dressed lumber, S4S.

Provide dry lumber with 19 percent maximum moisture content at time of dressing.

Minimum Chord Size for Roof Trusses: 2 by 6 inches nominal for both top and bottom chords

Permanent Bracing: Provide wood bracing that complies with requirements for miscellaneous lumber in Section 061000 "Rough Carpentry."

WOOD PRESERVATIVE TREATED LUMBER

Preservative Treatment by Pressure Process: AWPA U1; Use Category UC2 for interior construction not in contact with the ground, Use Category UC3b for exterior construction not in contact with the ground, and Use Category UC4a for items in contact with the ground.

Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.

For exposed trusses indicated to receive a stained or natural finish, use chemical formulations that do not require incising, contain colorants, bleed through, or otherwise adversely affect finishes.

Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or does not comply with requirements for untreated material.

METAL CONNECTOR PLATES

Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

Alpine Engineered Products, Inc.; an ITW company.

Cherokee Metal Products, Inc.; Masengill Machinery Company.

CompuTrus, Inc.

Eagle Metal Products.

Jager Building Systems, Inc.; a Tembec/SGF Rexfor company.

MiTek Industries, Inc.; a subsidiary of Berkshire Hathaway Inc.

Robbins Engineering, Inc.

Truswal Systems Corporation; an ITW company

Source Limitations: Obtain metal connector plates from single manufacturer.

General: Fabricate connector plates to comply with TPI 1.

Hot-Dip Galvanized-Steel Sheet: ASTM A 653/A 653M; Structural Steel (SS), high-strength low-alloy steel Type A (HSLAS Type A), or high-strength low-alloy steel Type B (HSLAS Type B); G60 coating designation; and not less than 0.036 inch thick.

Use for interior locations unless otherwise indicated.

Hot-Dip Heavy-Galvanized-Steel Sheet: ASTM A 653/A 653M; Structural Steel (SS), highstrength low-alloy steel Type A (HSLAS Type A), or high-strength low-alloy steel Type B (HSLAS Type B); G185 coating designation; and not less than 0.036 inch thick.

Use for wood-preservative-treated lumber and where indicated.

FASTENERS

General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.

Provide fasteners for use with metal framing anchors that comply with written recommendations of metal framing manufacturer.

Nails, Brads, and Staples: ASTM F 1667.

METAL FRAMING ANCHORS AND ACCESSORIES

Manufacturers: Subject to compliance with requirements, provide products by the following:

Simpson Strong-Tie Co., Inc. or accepted equivalent

Allowable Design Loads: Provide products with allowable design loads, as published by manufacturer, that meet or exceed those indicated. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency.

Galvanized-Steel Sheet: Hot-dip, zinc-coated steel sheet complying with ASTM A 653/A 653M, G60 coating designation.

Use for interior locations unless otherwise indicated.

Hot-Dip Heavy-Galvanized-Steel Sheet: ASTM A 653/A 653M; Structural Steel (SS), highstrength low-alloy steel Type A (HSLAS Type A), or high-strength low-alloy steel Type B (HSLAS Type B); G185 coating designation; and not less than 0.036 inch thick.

Use for wood-preservative-treated lumber and where indicated.

Truss Tie-Downs (Hurricane or Seismic Ties): As indicated

MISCELLANEOUS MATERIALS

Galvanizing Repair Paint: SSPC-Paint 20, with dry film containing a minimum of 94 percent zinc dust by weight.

FABRICATION

Cut truss members to accurate lengths, angles, and sizes to produce close-fitting joints.

Fabricate metal connector plates to sizes, configurations, thicknesses, and anchorage details required to withstand design loads for types of joint designs indicated.

Assemble truss members in design configuration indicated; use jigs or other means to ensure uniformity and accuracy of assembly with joints closely fitted to comply with tolerances in TPI 1. Position members to produce design camber indicated.

Fabricate wood trusses within manufacturing tolerances in TPI 1.

Connect truss members by metal connector plates located and securely embedded simultaneously in both sides of wood members by air or hydraulic press.

SOURCE QUALITY CONTROL

Special Inspections: Owner will engage a qualified special inspector to perform special inspections.

Provide special inspector with access to fabricator's documentation of detailed fabrication and quality-control procedures that provide a basis for inspection control of the workmanship and the fabricator's ability to conform to approved construction documents and referenced standards.

Provide special inspector with access to places where wood trusses are being fabricated to perform inspections.

Correct deficiencies in Work that special inspections indicate does not comply with the Contract Documents.

EXECUTION

INSTALLATION

Install wood trusses only after supporting construction is in place and is braced and secured.

If trusses are delivered to Project site in more than one piece, assemble trusses before installing.

Hoist trusses in place by lifting equipment suited to sizes and types of trusses required, exercising care not to damage truss members or joints by out-of-plane bending or other causes.

Install and brace trusses according to TPI recommendations and as indicated.

Install trusses plumb, square, and true to line and securely fasten to supporting construction.

Space trusses as indicated; adjust and align trusses in location before permanently fastening.

Anchor trusses securely at bearing points; use metal truss tie-downs or floor truss hangers as applicable. Install fasteners through each fastener hole in metal framing anchors according to manufacturer's fastening schedules and written instructions.

Securely connect each truss ply required for forming built-up girder trusses.

Anchor trusses to girder trusses as indicated.

Install and fasten permanent bracing during truss erection and before construction loads are applied. Anchor ends of permanent bracing where terminating at walls or beams.

Install bracing to comply with Section 061000 "Rough Carpentry."

Install and fasten strongback bracing vertically against vertical web of parallel-chord floor trusses at centers indicated.

Install wood trusses within installation tolerances in TPI 1

Do not alter trusses in field. Do not cut, drill, notch, or remove truss members.

Replace wood trusses that are damaged or do not meet requirements.

Damaged trusses may be repaired according to truss repair details signed and sealed by the qualified professional engineer responsible for truss design, when approved by Architect.

REPAIRS AND PROTECTION

Protect wood that has been treated with inorganic boron (SBX) from weather. If, despite protection, inorganic boron-treated wood becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

Protect wood trusses from weather. If, despite protection, wood trusses become wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPAregistered label.

Repair damaged galvanized coatings on exposed surfaces with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.

Protective Coating: Clean and prepare exposed surfaces of metal connector plates. Brush apply primer, when part of coating system, and one coat of protective coating.

Apply materials to provide minimum dry film thickness recommended by coating system manufacturer.

END SECTION 061753

GENERAL

SUMMARY

Section Includes:

Exterior cellular PVC trim.

ACTION SUBMITTALS

Product Data: For each type of process and factory-fabricated product. Indicate component materials, dimensions, profiles, textures, and colors and include construction and application details.

Include copies of warranties from chemical-treatment manufacturers for each type of treatment.

Samples for Verification:

For each species and cut of lumber and panel products, with 1/2 of exposed surface finished; 50 sq. in. (300 sq. cm) for lumber and 8 by 10 inches (200 by 250 mm) for panels.

For cellular PVC trim, with 1/2 of exposed surface finished; 50 sq. in. (300 sq. cm).

QUALITY ASSURANCE

Testing Agency Qualifications: For testing agency providing classification marking for fire-retardant-treated material, an inspection agency acceptable to authorities having jurisdiction that periodically performs inspections to verify that the material bearing the classification marking is representative of the material tested.

DELIVERY, STORAGE, AND HANDLING

Stack lumber, plywood, and other panels flat with spacers between each bundle to provide air circulation. Protect materials from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

FIELD CONDITIONS

Weather Limitations: Proceed with installation only when existing and forecast weather conditions permit work to be performed and at least one coat of specified finish can be applied without exposure to rain, snow, or dampness.

Do not install finish carpentry materials that are wet, moisture damaged, or mold damaged.

Indications that materials are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.

Indications that materials are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

WARRANTY

Manufacturer's Warranty for Cellular PVC Trim: Manufacturer agrees to repair or replace trim that fails due to defects in manufacturing within specified warranty period. Failures include, but are not limited to, deterioration, delamination, and excessive swelling from moisture.

Warranty Period: 25 years from date of Substantial Completion.

Manufacturer's Warranty for Columns: Manufacturer agrees to repair or replace columns that fail in materials or workmanship within specified warranty period.

PRODUCTS

MATERIALS, GENERAL

Factory mark each piece of lumber with grade stamp of inspection agency indicating grade, species, moisture content at time of surfacing, and mill.

For exposed lumber, mark grade stamp on end or back of each piece.

EXTERIOR TRIM

Cellular PVC Trim: Extruded, expanded PVC with a small-cell microstructure, recommended by manufacturer for exterior use, made from UV- and heat-stabilized, rigid material.

Products: Subject to compliance with requirements,:

Density: Not less than 31 lb/cu. ft. (500 kg/cu. m).

Heat Deflection Temperature: Not less than 130 deg F (54 deg C), according to ASTM D 648.

Coefficient of Thermal Expansion: Not more than 4.5 x 10H-5hinches/inch x deg F (8.1 x 10H-5hmm/mm x deg C).

Water Absorption: Not more than 1 percent, according to ASTM D 570.

Flame-Spread Index: 75 or less, according to ASTM E 84.

MISCELLANEOUS MATERIALS

Fasteners for Exterior Finish Carpentry: Provide nails or screws, in sufficient length to penetrate not less than 1-1/2 inches (38 mm) into wood substrate.

For prefinished items, provide matching prefinished aluminum fasteners where face fastening is required.

For applications not otherwise indicated, provide stainless-steel fasteners.

Adhesive for Cellular PVC Trim: Product recommended by trim manufacturer.

Sealants: Latex, complying with ASTM C 834 Type OP, Grade NF and with applicable requirements in Section 079200 "Joint Sealants," recommended by sealant manufacturer and manufacturer of substrates for intended application.

FABRICATION

Back out or kerf backs of standing and running trim wider than 5 inches (125 mm), except members with ends exposed in finished work.

Ease edges of lumber less than 1 inch (25 mm) in nominal thickness to 1/16-inch (1.5-mm) radius and edges of lumber 1 inch (25 mm) or more in nominal thickness to 1/8-inch (3-mm) radius.

EXECUTION

EXAMINATION

Examine substrates, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance.

Examine finish carpentry materials before installation. Reject materials that are wet, moisture damaged, and mold damaged.

Proceed with installation only after unsatisfactory conditions have been corrected.

PREPARATION

Clean substrates of projections and substances detrimental to application.

Prime lumber and moldings to be painted, including both faces and edges, unless factory primed. Cut to required lengths and prime ends. Comply with requirements in Section 099113 "Exterior Painting."

INSTALLATION, GENERAL

Do not use materials that are unsound, warped, improperly treated or finished, inadequately seasoned, or too small to fabricate with proper jointing arrangements.

Do not use manufactured units with defective surfaces, sizes, or patterns.

Install exterior finish carpentry level, plumb, true, and aligned with adjacent materials. Use concealed shims where necessary for alignment.

Scribe and cut exterior finish carpentry to fit adjoining work. Refinish and seal cuts as recommended by manufacturer.

Install to tolerance of 1/8 inch in 96 inches (3 mm in 2438 mm) for level and plumb. Install adjoining exterior finish carpentry with 1/32-inch (0.8-mm) maximum offset for flush installation and 1/16-inch (1.5-mm) maximum offset for reveal installation.

Coordinate exterior finish carpentry with materials and systems in or adjacent to it. Provide cutouts for mechanical and electrical items that penetrate exterior finish carpentry.

STANDING AND RUNNING TRIM INSTALLATION

Install flat-grain lumber with bark side exposed to weather.

Install cellular PVC trim to comply with manufacturer's written instructions.

Install trim with minimum number of joints practical, using full-length pieces from maximum lengths of lumber available. Do not use pieces less than 24 inches (610 mm) long except where necessary.

Use scarf joints for end-to-end joints.

Stagger end joints in adjacent and related members.

Fit exterior joints to exclude water. Cope at returns and miter at corners to produce tight-fitting joints with full-surface contact throughout length of joint. Plane backs of casings to provide uniform thickness across joints, where necessary for alignment.

Where face fastening is unavoidable, countersink fasteners, fill surface flush, and sand unless otherwise indicated.

ADJUSTING

Replace exterior finish carpentry that is damaged or does not comply with requirements. Exterior finish carpentry may be repaired or refinished if work complies with requirements and shows no evidence of repair or refinishing. Adjust joinery for uniform appearance.

CLEANING

Clean exterior finish carpentry on exposed and semiexposed surfaces. Touch up factory-applied finishes to restore damaged or soiled areas.

PROTECTION

Protect installed products from damage from weather and other causes during construction.

Remove and replace finish carpentry materials that are wet, moisture damaged, and mold damaged. Indications that materials are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.

Indications that materials are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION 062013

DIVISION 06 – WOOD, PLASTICS, AND COMPOSITES
SECTION 062023 - INTERIOR FINISH CARPENTRY

GENERAL

SUMMARY

Section Includes:

Interior trim.

Shelving.

DEFINITIONS

PVC: Polyvinyl chloride.

ACTION SUBMITTALS

Product Data: For each type of process and factory-fabricated product. Indicate component materials, dimensions, profiles, textures, and colors and include construction and application details.

Include data for wood-preservative treatment from chemical-treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained. Include chemical-treatment manufacturer's written instructions for finishing treated material.

For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced before shipment to Project site to levels specified.

Samples for Initial Selection: For each type of product involving selection of colors, profiles, or textures.

DELIVERY, STORAGE, AND HANDLING

Stack lumber, plywood, and other panels flat with spacers between each bundle to provide air circulation.

Protect materials from weather by covering with waterproof sheeting, securely anchored.

Provide for air circulation around stacks and under coverings.

Deliver interior finish carpentry materials only when environmental conditions comply with requirements specified for installation areas. If interior finish carpentry materials must be stored in other than installation areas, store only where environmental conditions comply with requirements specified for installation areas.

FIELD CONDITIONS

Environmental Limitations: Do not deliver or install interior finish carpentry materials until building is enclosed and weatherproof, wet-work in space is completed and nominally dry, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.

Do not install finish carpentry materials that are wet, moisture damaged, or mold damaged.

Indications that materials are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.

Indications that materials are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

PRODUCTS

MATERIALS, GENERAL

Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, comply with applicable rules of any rules-writing agency certified by the American Lumber Standard Committee's (ALSC) Board of Review. Grade lumber by an agency certified by the ALSC's Board of Review to inspect and grade lumber under the rules indicated.

Factory mark each piece of lumber with grade stamp of grading agency.

For exposed lumber, mark grade stamp on end or back of each piece.

Softwood Plywood: DOC PS 1.

Hardboard: ANSI A135.4.

WOOD-PRESERVATIVE-TREATED MATERIALS

Preservative Treatment by Pressure Process: AWPA U1; Use Category UC1 .

Kiln dry lumber and plywood after treatment to a maximum moisture content of 19 and 18 percent, respectively.

Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.

For exposed items indicated to receive transparent finish, do not use chemical formulations that contain colorants or that bleed through or otherwise adversely affect finishes.

Do not use material that is warped or does not comply with requirements for untreated material.

Mark lumber with treatment-quality mark of an inspection agency approved by the ALSC's Board of Review.

For exposed lumber indicated to receive a stained or natural finish, mark end or back of each piece .

Mark plywood with appropriate classification marking of an inspection agency acceptable to authorities having jurisdiction.

For exposed plywood indicated to receive a stained or natural finish, mark back of each piece.

Application: All interior lumber and plywood .

INTERIOR TRIM

Hardwood Lumber Trim for Transparent Finish (Stain or Clear Finish):

Species and Grade: Red oak ; NHLA Clear .

Maximum Moisture Content: 10 percent.

Finger Jointing: Not allowed.

Gluing for Width: Not allowed .

Veneered Material: Not allowed .

Face Surface: Surfaced (smooth) .

Matching: Selected for compatible grain and color.

Lumber Trim for Opaque Finish (Painted Finish):

Species and Grade:

Idaho white, lodgepole, ponderosa, radiata, or sugar pine; NLGA or WWPA 1 Common (Colonial) .

Eastern white, Idaho white, lodgepole, ponderosa, radiata, or sugar pine; NeLMA, NLGA, or WWPA Finish or 1 Common (Colonial) .

Maximum Moisture Content for Softwoods: 15 percent with at least 85 percent of shipment at 12 percent or less.

Maximum Moisture Content for Hardwoods: 10 percent.

Finger Jointing: Not allowed.

Face Surface: Surfaced (smooth) .

SHELVING AND CLOTHES RODS

Standards for Adjustable Shelf Supports: BHMA A156.9, B04071; powder-coat-finished steel.

Adjustable Shelf Supports: BHMA A156.9, B04081 or B04091; powder-coat-finished steel.

MISCELLANEOUS MATERIALS

Fasteners for Interior Finish Carpentry: Nails, screws, and other anchoring devices of type, size, material, and finish required for application indicated to provide secure attachment, concealed where possible.

Glue: Aliphatic-resin, polyurethane, or resorcinol wood glue recommended by manufacturer for general carpentry use.

Installation Adhesive for Foam-Plastic Moldings: Product recommended for indicated use by foam-plastic molding manufacturer.

Multipurpose Construction Adhesive: Formulation, complying with ASTM D3498, that is recommended for indicated use by adhesive manufacturer.

FABRICATION

Back out or kerf backs of the following members, except those with ends exposed in finished work:

Interior standing and running trim, except shoe and crown molds.

Ease edges of lumber less than 1 inch in nominal thickness to 1/16-inch radius and edges of lumber 1 inch or more in nominal thickness to 1/8-inch radius.

EXECUTION

EXAMINATION

Examine substrates, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

Examine finish carpentry materials before installation. Reject materials that are wet, moisture damaged, and mold damaged.

Proceed with installation only after unsatisfactory conditions have been corrected.

PREPARATION

Clean substrates of projections and substances detrimental to application.

Before installing interior finish carpentry, condition materials to average prevailing humidity in installation areas for a minimum of 24 hours unless longer conditioning is recommended by manufacturer.

INSTALLATION, GENERAL

Do not use materials that are unsound; warped; improperly treated or finished; inadequately seasoned; too small to fabricate with proper jointing arrangements; or with defective surfaces, sizes, or patterns.

Install interior finish carpentry level, plumb, true, and aligned with adjacent materials.

Use concealed shims where necessary for alignment.

Scribe and cut interior finish carpentry to fit adjoining work. Refinish and seal cuts as recommended by manufacturer.

Where face fastening is unavoidable, countersink fasteners, fill surface flush, and sand unless otherwise indicated.

Install to tolerance of 1/8 inch in 96 inches for level and plumb. Install adjoining interior finish carpentry with 1/32-inch maximum offset for flush installation and 1/16-inch maximum offset for reveal installation.

Coordinate interior finish carpentry with materials and systems in or adjacent to it. Provide cutouts for mechanical and electrical items that penetrate interior finish carpentry.

INSTALLATION OF STANDING AND RUNNING TRIM

Install trim with minimum number of joints as is practical, using full-length pieces from maximum lengths of lumber available.

Do not use pieces less than 24 inches long, except where necessary.

Stagger joints in adjacent and related standing and running trim.

Cope at returns, miter at outside corners, and cope at inside corners to produce tight-fitting joints with full-surface contact throughout length of joint.

Use scarf joints for end-to-end joints.

Plane backs of casings to provide uniform thickness across joints where necessary for alignment.

Match color and grain pattern of trim for transparent finish (stain or clear finish) across joints.

Install trim after gypsum-board joint finishing operations are completed.

Install without splitting; drill pilot holes before fastening where necessary to prevent splitting.

Fasten to prevent movement or warping.

Countersink fastener heads on exposed carpentry work and fill holes.

INSTALLATION OF SHELVING AND CLOTHES RODS

Cut shelf cleats at ends of shelves about 1/2 inch less than width of shelves and sand exposed ends smooth.

Install shelf cleats by fastening to framing or backing with finish nails or trim screws, set below face and filled.

Space fasteners not more than 16 inches o.c. Use two fasteners at each framing member or fastener location for cleats 4 inches nominal in width and wider.

Apply a bead of multipurpose construction adhesive to back of shelf cleats before installing.

Remove adhesive that is squeezed out after fastening shelf cleats in place.

Install shelf brackets according to manufacturer's written instructions, spaced not more than 32 inches o.c. Fasten to framing members, blocking, or metal backing, or use toggle bolts or hollow wall anchors.

Install standards for adjustable shelf supports according to manufacturer's written instructions. Fasten to framing members, blocking, or metal backing, or use toggle bolts or hollow wall anchors. Space fasteners not more than 12 inches o.c.

Install standards for adjustable shelf brackets according to manufacturer's written instructions, spaced not more than 36 inches o.c. and within 6 inches of ends of shelves. Fasten to framing members, blocking, or metal backing, or use toggle bolts or hollow wall anchors.

Cut shelves to neatly fit openings with only enough gap to allow shelves to be removed and reinstalled.

Install shelves, fully seated on cleats, brackets, and supports.

Fasten shelves to cleats with finish nails or trim screws, set flush.

Fasten shelves to brackets to comply with bracket manufacturer's written instructions.

Install rod flanges for rods as indicated.

Fasten to shelf cleats, framing members, blocking, or metal backing, or use toggle bolts or hollow wall anchors.

Install rods in rod flanges.

ADJUSTING

Replace interior finish carpentry that is damaged or does not comply with requirements.

Interior finish carpentry may be repaired or refinished if work complies with requirements and shows no evidence of repair or refinishing.

Adjust joinery for uniform appearance.

CLEANING

Clean interior finish carpentry on exposed and semiexposed surfaces.

Restore damaged or soiled areas and touch up factory-applied finishes if any.

PROTECTION

Protect installed products from damage from weather and other causes during construction.

Remove and replace finish carpentry materials that are wet, moisture damaged, and mold damaged.

Indications that materials are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.

Indications that materials are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION 062023

DIVISION 07 - THERMAL AND MOISTURE PROTECTION
SECTION 072100 - THERMAL INSULATION

GENERAL

SUMMARY

Section Includes:

Molded (expanded) polystyrene foam-plastic board insulation.

Glass-fiber blanket insulation.

Mineral-wool blanket insulation.

Spray-applied cellulosic insulation.

ACTION SUBMITTALS

Product Data: For the following:

Molded (expanded) polystyrene foam-plastic board insulation.

Glass-fiber blanket insulation.

Mineral-wool blanket insulation.

Spray-applied cellulosic insulation.

INFORMATIONAL SUBMITTALS

DELIVERY, STORAGE, AND HANDLING

Protect insulation materials from physical damage and from deterioration due to moisture, soiling, and other sources. Store inside and in a dry location. Comply with manufacturer's written instructions for handling, storing, and protecting during installation.

Protect foam-plastic board insulation as follows:

Do not expose to sunlight except to necessary extent for period of installation and concealment.

Protect against ignition at all times. Do not deliver foam-plastic board materials to Project site until just before installation time.

Quickly complete installation and concealment of foam-plastic board insulation in each area of construction.

PRODUCTS

MOLDED (EXPANDED) POLYSTYRENE FOAM-PLASTIC BOARD INSULATION

Molded (Expanded) Polystyrene Board Insulation, Type XV : ASTM C578, Type XV, 60-psi minimum compressive strength.

Products: Subject to compliance with requirements, provide one of the following:

ACH Foam Technologies, Inc.; Foam-Control Plus+

Atlas Molded Products; a Division of Atlas Roofing Corporation.

Plymouth Foam, Inc.

Labeling: Provide identification of mark indicating R-value of each piece of insulation 12 inches and wider in width.

GLASS-FIBER BLANKET INSULATION

Glass-Fiber Blanket Insulation, Unfaced : ASTM C665, Type I; passing ASTM E136 for combustion characteristics.

Products: Subject to compliance with requirements, provide one of the following:

CertainTeed Insulation.

Johns Manville; a Berkshire Hathaway company; Formaldehyde-free™ Unfaced thermal and acoustical batts.

Knauf Insulation.

Flame-Spread Index: Not more than 25 when tested in accordance with ASTM E84.

Smoke-Developed Index: Not more than 50 when tested in accordance with ASTM E84.

Labeling: Provide identification of mark indicating R-value of each piece of insulation 12 inches and wider in width.

Glass-Fiber Blanket Insulation, Polypropylene-Scrim-Kraft Faced : ASTM C665, Type II (nonreflective faced), Class A (faced surface with a flame-spread index of 25 or less); Category 1 (membrane is a vapor barrier).

Manufacturers: Subject to compliance with requirements, provide products by one of the following:

CertainTeed Insulation.

Johns Manville; a Berkshire Hathaway company.

Knauf Insulation.

Owens Corning.

Labeling: Provide identification of mark indicating R-value of each piece of insulation 12 inches and wider in width.

MINERAL-WOOL BLANKET INSULATION

Mineral-Wool Blanket Insulation, Unfaced : ASTM C665, Type IA (blankets without membrane facing); consisting of fibers; passing ASTM E136 for combustion characteristics.

Manufacturers: Subject to compliance with requirements, provide products by one of the following:

Johns Manville; a Berkshire Hathaway company.

Rockwool International.

Thermafiber, Inc.; an Owens Corning company.

Flame-Spread Index: Not more than 25 when tested in accordance with ASTM E84.

Smoke-Developed Index: Not more than 50 when tested in accordance with ASTM E84.

Labeling: Provide identification of mark indicating R-value of each piece of insulation 12 inches and wider in width.

SPRAY-APPLIED CELLULOSIC INSULATION

Self-Supported, Spray-Applied Cellulosic Insulation: ASTM C1149, Type I (materials applied with liquid adhesive; suitable for either exposed or enclosed applications), chemically treated for flame-resistance, processing, and handling characteristics.

Manufacturers: Subject to compliance with requirements, provide products by one of the following:

GreenFiber.

Hamilton Manufacturing Inc.

International Cellulose Corp.

ACCESSORIES

Insulation for Miscellaneous Voids:

Spray Polyurethane Foam Insulation: ASTM C1029, Type II, closed cell, with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, per ASTM E84.

Adhesive for Bonding Insulation: Product compatible with insulation and air and water barrier materials, and with demonstrated capability to bond insulation securely to substrates without damaging insulation and substrates.

Eave Ventilation Troughs: Preformed, rigid fiberboard or plastic sheets designed and sized to fit between roof framing members and to provide ventilation between insulated attic spaces and vented eaves.

EXECUTION

PREPARATION

Clean substrates of substances that are harmful to insulation, including removing projections capable of puncturing insulation or vapor retarders, or that interfere with insulation attachment.

INSTALLATION, GENERAL

Comply with insulation manufacturer's written instructions applicable to products and applications.

Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed to ice, rain, or snow at any time.

Install insulation with manufacturer's R-value label exposed after insulation is installed.

Extend insulation to envelop entire area to be insulated. Fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.

Provide sizes to fit applications and selected from manufacturer's standard thicknesses, widths, and lengths. Apply single layer of insulation units unless multiple layers are otherwise shown or required to make up total thickness or to achieve R-value.

INSTALLATION OF SLAB INSULATION

On vertical slab edge and foundation surfaces, set insulation units using manufacturer's recommended adhesive according to manufacturer's written instructions.

If not otherwise indicated, extend insulation a minimum of 24 inches below exterior grade line.

On horizontal surfaces, loosely lay insulation units according to manufacturer's written instructions. Stagger end joints and tightly abut insulation units.

If not otherwise indicated, extend insulation a minimum of 36 inches in from exterior walls.

INSTALLATION OF FOUNDATION WALL INSULATION

Butt panels together for tight fit.

Anchor Installation: Install board insulation on concrete substrates by adhesively attached, spindle-type insulation anchors as follows:

Fasten insulation anchors to concrete substrates with insulation anchor adhesive according to anchor manufacturer's written instructions.

Space anchors according to insulation manufacturer's written instructions for insulation type, thickness, and application.

Apply insulation standoffs to each spindle to create cavity width indicated on Drawings between concrete substrate and insulation.

After adhesive has dried, install board insulation by pressing insulation into position over spindles and securing it tightly in place with insulation-retaining washers, taking care not to compress insulation.

Where insulation will not be covered by other building materials, apply capped washers to tips of spindles.

INSTALLATION OF CAVITY-WALL INSULATION

Foam-Plastic Board Insulation: Install pads of adhesive spaced approximately 24 inches o.c. both ways on inside face and as recommended by manufacturer.

Fit courses of insulation between wall ties and other obstructions, with edges butted tightly in both directions, and with faces flush.

Press units firmly against inside substrates.

Supplement adhesive attachment of insulation by securing boards with two-piece wall ties designed for this purpose.

Cellular-Glass Board Insulation: Install with closely fitting joints using serrated trowel attachment method according to manufacturer's written instructions.

Mineral-Wool Board Insulation: Install insulation fasteners 4 inches from each corner of board insulation, at center of board, and as recommended by manufacturer.

Fit courses of insulation between masonry wall ties and other obstructions, with edges butted tightly in both directions, and with faces flush.

Press units firmly against inside substrates.

INSTALLATION OF INSULATION IN FRAMED CONSTRUCTION

Blanket Insulation: Install in cavities formed by framing members according to the following requirements:

Use insulation widths and lengths that fill the cavities formed by framing members. If more than one length is required to fill the cavities, provide lengths that will produce a snug fit between ends.

Place insulation in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.

Maintain 3-inch clearance of insulation around recessed lighting fixtures not rated for or protected from contact with insulation.

Attics: Install eave ventilation troughs between roof framing members in insulated attic spaces at vented eaves.

For wood-framed construction, install blankets according to ASTM C1320 and as follows:

With faced blankets having stapling flanges, lap blanket flange over flange of adjacent blanket to maintain continuity of vapor retarder once finish material is installed over it.

Vapor-Retarder-Faced Blankets: Tape joints and ruptures in vapor-retarder facings, and seal each continuous area of insulation to ensure airtight installation.

Exterior Walls: Set units with facing placed toward interior of construction .

Interior Walls: Set units with facing placed toward areas of high humidity .

Miscellaneous Voids: Install insulation in miscellaneous voids and cavity spaces where required to prevent gaps in insulation using the following materials:

Glass-Fiber Insulation: Compact to approximately 40 percent of normal maximum volume equaling a density of approximately 2.5 lb/cu. ft..

Spray Polyurethane Insulation: Apply according to manufacturer's written instructions.

PROTECTION

Protect installed insulation from damage due to harmful weather exposures, physical abuse, and other causes.

Provide temporary coverings or enclosures where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

END OF SECTION 072100

DIVISION 07 - THERMAL AND MOISTURE PROTECTION
SECTION 073100- ASPHALT SHINGLES

GENERAL

SECTION INCLUDES

Asphalt roofing shingles.

Leak barrier and roof deck protection.

Metal flashing associated with shingle roofing.

Attic ventilation.

REFERENCES

American Society for Testing and Materials (ASTM) - Annual Book of ASTM Standards

ASTM A 653/A 653M - Standard Specification for Steel Sheet, Zinc Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

ASTM B 209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.

ASTM B 370 - Standard Specification for Copper Sheet and Strip for Building Construction.

ASTM D 3018 - Standard Specification for Class A Asphalt Shingles Surfaced with Mineral Granules.

ASTM D 3161 - Standard Test Method for Wind-Resistance of Asphalt Shingles (Fan- Induced Method).

ASTM D 3462 – Standard Specification for Asphalt Shingles Made From Glass Felt and Surfaced with Mineral Granules.

ASTM D 4586 - Standard Specification for Asphalt Roof Cement, Asbestos-Free.

ASTM D 7158 - Standard Test Method for Wind-Resistance of Sealed Asphalt Shingles (Uplift Force/Uplift Resistance Method).

Underwriters Laboratories (UL) - Roofing Systems and Materials Guide (TFWZ.R21)

UL 790 - Tests for Fire Resistance of Roof Covering Materials.

UL 997 - Wind Resistance of Prepared Roof Covering Materials.

UL 2218 – Impact Resistance of Prepared Roof Coverings Materials.

Asphalt Roofing Manufacturers Association (ARMA)

Sheet Metal and Air Conditioning Contractors National Association, 1nc. (SMACNA) - Architectural Sheet Metal Manual.

National Roofing Contractors Association (NRCA)

American Society of Civil Engineers (ASCE).

ASCE 7 - Minimum Design Loads for Buildings and Other Structures.

U.S. Green Building Council (USGBC)

DEFINITIONS

Roofing Terminology: Refer to ASTM D1079 and the glossary of the National Roofing Contractors Association (NRCA) Roofing and Waterproofing Manual for definitions of roofing terms related to this section.

SUBMITTALS

Submit copies of product data sheets, detail drawings and samples for each type of roofing product.

QUALITY ASSURANCE

Manufacturer Qualifications: Provide all primary roofing products, including shingles, underlayment, leak barrier, and ventilation, by a single manufacturer.

Installer Qualifications: Installer must be approved for installation of all roofing products to be installed under this section.

REGULATORY REQUIREMENTS

Provide a roofing system achieving an Underwriters Laboratories (UL) Class A fire classification.

Install all roofing products in accordance with all federal, state and local building codes.

All work shall be performed in a manner consistent with current OSHA guidelines.

PREINSTALLATION MEETING

A Preinstallation meeting shall take place prior to the start of the installation.

Timing: The meeting shall take place at the start of the roofing installation, no more than 2 weeks into the roofing project. Meeting to be called for by manufacturer’s certified contractor. Meeting’s mandatory attendees shall include the certified contractor and the manufacturer’s representative. Non-mandatory attendees shall include the owner’s representative, architect, and the general contractor’s representative. Certified contractor and manufacturer’s representative shall review all pertinent requirements for the project, including but not limited to, scheduling, weather considerations, project duration, and requirements for the specified warranty.

DELIVERY, STORAGE, AND HANDLING

Store all products in manufacturer's unopened, labeled packaging until they are ready for installation.

Store products in a covered, ventilated area, at temperature not more than 110 degrees F (43 degrees C); do not store near steam pipes, radiators, or in direct sunlight.

Store bundles on a flat surface. Maximum stacking height shall not exceed Manufacturer’s recommendations. Store all rolls on end.

Store and dispose of solvent-based materials in accordance with all federal, state and local regulations.

WEATHER CONDITIONS

Proceed with work only when existing and forecasted weather conditions will permit work to be performed in accordance with Manufacturer’s recommendations

WARRANTY

Provide to the owner a Warranty covering:

Roofs installed by a Manufacturer Certified Contractor only.

Manufacturing defects: 100% coverage for materials and labor for 40 years with the first 20 years non- prorated.

Workmanship errors: 100% coverage for workmanship errors for 20 years.

Full roof installations using the following:

You must use MANUFACTURER'S APPROVED Roof Deck Protection.

You must use eligible MANUFACTURER'S APPROVED Leak Barrier in valleys and around dormers, sidewalls, firewalls, chimneys, plumbing vents, and skylights. Leak barriers must be used at all eaves at least 24" inside warm wall.

You must use MANUFACTURER'S APPROVED pre-cut starter strip products (only those with factory applied adhesive) at the eaves. Note: To obtain bonus wind coverage, you must use MANUFACTURER'S APPROVED pre cut starter strip products (with factory applied adhesive) at the eaves and rakes and you must install each shingle using 6 nails. You must cement the starter strip in and nail along the rake.

You must use eligible MANUFACTURER'S APPROVED ventilation with adequate intake ventilation. adequate ventilation should meet the following requirements:

Minimum net free ventilation area of 1 sq ft per 150 sq ft of ceiling area is required. When intake vents are located at the eaves and exhaust vents are located near the roof's peak (in a properly balanced system) for maximum air flow, ventilation may be reduced to 1 sq ft per 300 sq ft.

You must use eligible MANUFACTURER'S APPROVED roofing shingles.

You must use MANUFACTURER'S APPROVED Ridge Cap Shingles or shingles that correspond to the shingle product you are installing.

New metal flashings must be installed. Metal drip edge must be used at eaves and at rake edges.

In addition to the requirements listed above, installer must register and pay for this warranty. On projects that total more than 250 squares, the permanent Warranty will be issued only if the project passes Manufacturer's final inspection.

PRODUCTS

MANUFACTURERS

GAF

Owens Corning

Certainteed

SHINGLES

Heavyweight, granule surfaced, self sealing asphalt shingle with a strong fiberglass reinforced core and Stain protection, which prevents pronounced discoloration from blue-green algae through formulation/unique blends of granules. Dovetail cut tabs and bold shadow line provide a slate appearance with a 7 ½ inch exposure. UL 790 Class A rated with UL 997 Wind Resistance Label; ASTM D 7158, Class H; ASTM D 3161, Type 1; ASTM D 3018, Type 1; ASTM D 3462; CSA A123.5-98; ICC Report Approval.

Color: As selected from manufacturers' full range.

HIP AND RIDGE SHINGLES

High profile self sealing hip and ridge cap shingle matching the color of selected roof shingle. Each bundle covers approx. 20 lineal feet (6.10m). Premium Ridge Cap Shingles.

Distinctive self sealing hip and ridge cap shingle complementing the color of selected roof shingle. Each bundle covers approx. 25 lineal feet (7.62mm) with a 6 2/3 inch (169mm) exposure.

STARTER STRIP

Self sealing starter shingle designed for premium roof shingles. Each bundle covers approx. 100 lineal feet (30.48m) for English and metric shingles or 50 lineal feet (15.24m) for oversized shingles.

LEAK BARRIER

Self-adhering, self sealing, bituminous leak barrier surfaced with a smooth polyethylene film. Approved by UL, Dade County, ICC, State of Florida and Texas Department of Insurance. Each Roll contains approx. 200 sq ft. (18.6 sq.m.), 36" X 66.7' (0.9m x 20.3m), and 60 mils thick.

SHINGLE UNDERLAYMENT

Superior quality, water repellant, non-asphaltic underlayment. UV stabilized polypropylene construction. Meets or exceeds ASTM D226 and D4869. Each roll contains approximately 10 squares (1003 sq. ft.) of material and is 54" x 223'.

ROOFING CEMENT

Roof Cement: Asphalt Plastic Roofing Cement meeting the requirements of ASTM D 4586, Type I or II

ATTIC VENTILATION

Ridge Vents

Rigid plastic ridge ventilator designed to allow the passage of hot air out of attics. For use in conjunction with eave/ soffit intake ventilation products. Provides 18.0 sq inches (11613 sq.mm/m) in NFVA per lineal foot. Each package contains 40 lineal feet (12.19m) of vent.

NAILS

Standard round wire, zinc-coated steel or aluminum; 10 to 12 gauge, smooth, barbed or deformed shank, with heads 3/8 inch (9mm) to 7/16 inch (11mm) in diameter. Length must be sufficient to penetrate into solid wood at least 3/4 inch (19mm) or through plywood or oriented strand board by at least 1/8 inch (3.18mm).

METAL FLASHING

0.032-inch (0.8mm) aluminum sheet, complying with ASTM B 209. PART III EXECUTION

EXAMINATION

Do not begin installation until the roof deck has been properly prepared.

If roof deck preparation is the responsibility of another installer, notify the architect or building owner of unsatisfactory preparation before proceeding.

PREPARATION

Clean deck surfaces thoroughly prior to installation of eaves protection membrane and underlayment.

At areas that receive eaves protection membrane, fill knotholes and cracks with latex filler.

Install crickets on the upslope side of all chimneys in the north, any chimney wider than 24” (610mm), and on all roofs steeper than 6/12.

INSTALLATION OF UNDERLAYMENTS

General:

Install using methods recommended by manufacturer, in accordance with local building codes. When local codes and application instructions are in conflict, the more stringent requirements shall take precedence.

Eaves:

Install eaves edge metal flashing tight with fascia boards; lap joints 2 inches (51mm) and seal with plastic cement or high-quality urethane sealant; nail at the top of the flange.

Install leak barrier up the slope from eaves edge a full 36 inches (914mm) or to at least 24 inches (610 mm) beyond the interior “warm wall”. Lap ends 6 inches (152mm) and bond.

Valleys:

Install eaves protection membrane at least 36 (914mm) inches wide and centered on the valley. Lap ends 6 inches (152mm) and seal.

Hips and Ridges:

Install leak barrier along entire lengths, position the leak barrier so that the ridge slots will not be covered.

Roof Deck:

Install one layer of roof deck protection over the entire area not protected by leak barrier at the eaves or valley. Install sheets horizontally so water sheds and nail in place.

Lap horizontal edges at least 2 inches (51mm) and at least 2 inches (51mm) over eaves protection membrane.

Lap ends at least 4 inches (102 mm). Stagger end laps of each layer at least 36 inches (914 mm).

Lap roof deck protection over leak barrier in valley at least 6 inches (152mm).

Penetrations:

Vent pipes: Install a 24 inch (610 mm) square piece of eaves protection membrane lapping over roof deck underlayment; seal tightly to pipe.

Vertical walls: Install eaves protection membrane extending at least 6 inches (152mm) up the wall and 12 inches (305mm) on to the roof surface. Lap the membrane over the roof deck underlayment.

Chimneys: Install eaves protection membrane around entire chimney extending at least 6 inches (152mm) up the wall and 12 inches (305mm) on to the roof surface. Lap the membrane over the roof deck underlayment.

Rake Edges: Install metal edge flashing over eaves protection membrane and roof deck underlayment; set tight to rake boards; lap joints at least 2 inches (51mm) and seal with plastic cement; secure with nails.

INSTALLATION OF SHINGLES

General:

Install in accordance with Manufacturer’s instructions and local building codes. When local codes and application instructions are in conflict, the more stringent requirements shall take precedence.

Minimize breakage of shingles by avoiding dropping bundles on edge, by separating shingles carefully (not by "breaking" over ridge or bundles), and by taking extra precautions in temperatures below 40 degrees F (4 degrees C).

Handle carefully in hot weather to avoid scuffing the surfacing or damaging the shingle edges.

Placement and Nailing:

Beginning with the starter strip, trim shingles so that they “nest” within the shingle located beneath it. This procedure will yield a first course that is typically 3” (76mm) to 4” (102mm) rather than a fully exposed shingle.

For maximum wind resistance along rakes, install any manufacturer approved starter strip containing sealant or cement shingles to underlayment and each other in a 4" (102mm) width of asphalt plastic roof cement.

Laterally, offset the new shingles from the existing keyways, to avoid waves or depressions caused by excessive dips in the roofing materials.

Using the bottom of the tab on existing shingles, align subsequent courses.

*Note: DO NOT install standard sized shingles (5” exposure) over metric (5 5/8” exposure) shingles, as it will overexpose the shingles and reveal the nails. Use standard alignment methods to assure proper shingle placement.

Secure with 4, 5, or 6 nails per shingle per Manufacturer’s instructions or local codes.

Placement of nails varies based on the type of shingle specified. Consult the application instructions for the specified shingle for details.

Nails must be driven flush with the shingle surface. Do not overdrive or under drive the nails.

Shingle offset varies based on the type of shingle specified. Consult the application instructions for the specified shingle for details.

Valleys

Install valleys using the "closed cut valley" method:

Run the first course of shingles from the higher roof slope across the valley at least 12 inches (305mm).

Run succeeding courses of shingles from the lower roof slope across the valley at least 12 inches (305mm) and nail not closer than 6 inches (152mm) to center of valley.

Run shingles from the upper roof slope into the valley and trim 2 inches (51mm) from the center line.

Penetrations

All Penetrations are to be flashed according to Manufacturer, ARMA and NRCA application instructions and construction details.

INSTALLATION OF ATTIC VENTILATION

General

Ventilation must meet or exceed current F.H.A., H.U.D. and local code requirements.

Ridge / Soffit ventilation

Install ridge vent along the entire length of ridges:

Cut continuous vent slots through the sheathing, stopping 6 inches (152mm) from each end of the ridge.

On roofs without ridge board, make a slot 1 inch (25mm) wide, on either side of the peak (2” (51mm) overall).

On roofs with ridge board, make two slots 1-3/4 inches (44.5mm) wide, one on each side of the peak (3 ½” (89mm) overall).

Install ridge vent material along the full length of the ridge, including uncut areas.

Butt ends of ridge vent material and join using roofing cement.

Install eaves vents in sufficient quantity to equal or exceed the ridge vent area.

PROTECTION

Protect installed products from foot traffic until completion of the project.

Any roof areas that are not completed by the end of the workday are to be protected from moisture and contaminants.

END OF SECTION 073100

DIVISION 07 – THERMAL AND MOISTURE PROTECTION
SECTION 076200 – SHEET METAL FLASHING AND TRIM

GENERAL

SUMMARY

Section Includes:

Manufactured reglets with counterflashing.

Formed roof-drainage sheet metal fabrications.

Formed low-slope roof sheet metal fabrications.

Formed steep-slope roof sheet metal fabrications.

COORDINATION

Coordinate sheet metal flashing and trim layout and seams with sizes and locations of penetrations to be flashed, and joints and seams in adjacent materials.

Coordinate sheet metal flashing and trim installation with adjoining roofing and wall materials, joints, and seams to provide leakproof, secure, and noncorrosive installation.

ACTION SUBMITTALS

Product Data: For each type of product.

Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each manufactured product and accessory.

Samples for Initial Selection: For each type of sheet metal and accessory indicated with factory-applied finishes.

INFORMATIONAL SUBMITTALS

Product Certificates: For each type of coping and roof edge flashing that is SPRI ES-1 tested and FM Approvals approved.

CLOSEOUT SUBMITTALS

Maintenance Data: For sheet metal flashing and trim, and its accessories, to include in maintenance manuals.

QUALITY ASSURANCE

Fabricator Qualifications: Employs skilled workers who custom fabricate sheet metal flashing and trim similar to that required for this Project and whose products have a record of successful in-service performance.

For copings and roof edge flashings that are SPRI ES-1 tested, shop shall be listed as able to fabricate required details as tested and approved.

DELIVERY, STORAGE, AND HANDLING

Do not store sheet metal flashing and trim materials in contact with other materials that might cause staining, denting, or other surface damage. Store sheet metal flashing and trim materials away from uncured concrete and masonry.

Protect strippable protective covering on sheet metal flashing and trim from exposure to sunlight and high humidity, except to extent necessary for period of sheet metal flashing and trim installation.

PRODUCTS

PERFORMANCE REQUIREMENTS

General: Sheet metal flashing and trim assemblies shall withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Completed sheet metal flashing and trim shall not rattle, leak, or loosen, and shall remain watertight.

Sheet Metal Standard for Flashing and Trim: Comply with NRCA's "The NRCA Roofing Manual" and SMACNA's "Architectural Sheet Metal Manual" requirements for dimensions and profiles shown unless more stringent requirements are indicated.

Sheet Metal Standard for Copper: Comply with CDA's "Copper in Architecture Handbook." Conform to dimensions and profiles shown unless more stringent requirements are indicated.

SPRI Wind Design Standard: Manufacture and install copings roof edge flashings tested according to SPRI ES-1 and capable of resisting the following design pressure:

Thermal Movements: Allow for thermal movements from ambient and surface temperature changes to prevent buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

Temperature Change: 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

SHEET METALS

General: Protect mechanical and other finishes on exposed surfaces from damage by applying strippable, temporary protective film before shipping.

Aluminum Sheet: ASTM B 209 (ASTM B 209M), alloy as standard with manufacturer for finish required, with temper as required to suit forming operations and performance required; with smooth, flat surface.

Exposed Coil-Coated Finish:

Three-Coat Fluoropolymer: AAMA 620. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in both color coat and clear topcoat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

Color: As selected by Architect from manufacturer's full range.

Concealed Finish: Pretreat with manufacturer's standard white or light-colored acrylic or polyester backer finish, consisting of prime coat and wash coat with minimum total dry film thickness of 0.5 mil (0.013 mm).

Stainless-Steel Sheet: ASTM A 240/A 240M or ASTM A 666, Type 304, dead soft, fully annealed; with smooth, flat surface.

Finish: 2B (bright, cold rolled).

MISCELLANEOUS MATERIALS

General: Provide materials and types of fasteners, solder, protective coatings, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation and as recommended by manufacturer of primary sheet metal or manufactured item unless otherwise indicated.

Fasteners: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads and recommended by manufacturer of primary sheet metal or manufactured item.

General: Blind fasteners or self-drilling screws, gasketed, with hex-washer head.

Exposed Fasteners: Heads matching color of sheet metal using plastic caps or factory-applied coating. Provide metal-backed EPDM or PVC sealing washers under heads of exposed fasteners bearing on weather side of metal.

Blind Fasteners: High-strength aluminum or stainless-steel rivets suitable for metal being fastened.
Spikes and Ferrules: Same material as gutter; with spike with ferrule matching internal gutter width.
Fasteners for Aluminum Sheet: Aluminum or Series 300 stainless steel.

Fasteners for Stainless-Steel Sheet: Series 300 stainless steel.

Solder:

For Stainless Steel: ASTM B 32, Grade Sn60, with acid flux of type recommended by stainless-steel sheet manufacturer.

Sealant Tape: Pressure-sensitive, 100 percent solids, polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch (13 mm) wide and 1/8 inch (3 mm) thick.

Elastomeric Sealant: ASTM C 920, elastomericsilicone polymer sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.

Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for hooked-type expansion joints with limited movement.

Epoxy Seam Sealer: Two-part, noncorrosive, aluminum seam-cementing compound, recommended by aluminum manufacturer for exterior nonmoving joints, including riveted joints.

Bituminous Coating: Cold-applied asphalt emulsion according to ASTM D 1187.

Asphalt Roofing Cement: ASTM D 4586, asbestos free, of consistency required for application.

MANUFACTURED SHEET METAL FLASHING AND TRIM

Reglets: Units of type, material, and profile required, formed to provide secure interlocking of separate reglet and counterflashing pieces, and compatible with flashing indicated with factory-mitered and -welded corners and junctions and with interlocking counterflashing on exterior face, of same metal as reglet.

Manufacturers: Subject to compliance with requirements, provide products by one of the following:
Material: Stainless steel, 0.019 inch (0.48 mm) thick.

Masonry Type: Provide with offset top flange for embedment in masonry mortar joint.

Accessories:

Counterflashing Wind-Restraint Clips: Provide clips to be installed before counterflashing to prevent wind uplift of counterflashing's lower edge.

Finish: With manufacturer's standard color coating.

FABRICATION, GENERAL

General: Custom fabricate sheet metal flashing and trim to comply with details shown and recommendations in cited sheet metal standard that apply to design, dimensions, geometry, metal thickness, and other characteristics of item required. Fabricate sheet metal flashing and trim in shop to greatest extent possible.

Fabricate sheet metal flashing and trim in thickness or weight needed to comply with performance requirements, but not less than that specified for each application and metal.

Obtain field measurements for accurate fit before shop fabrication.

Form sheet metal flashing and trim to fit substrates without excessive oil canning, buckling, and tool marks; true to line, levels, and slopes; and with exposed edges folded back to form hems.

Conceal fasteners and expansion provisions where possible. Do not use exposed fasteners on faces exposed to view.

Fabrication Tolerances: Fabricate sheet metal flashing and trim that is capable of installation to a tolerance of 1/4 inch in 20 feet (6 mm in 6 m) on slope and location lines indicated on Drawings and within 1/8-inch (3-mm) offset of adjoining faces and of alignment of matching profiles.

Fabrication Tolerances: Fabricate sheet metal flashing and trim that is capable of installation to tolerances specified in MCA's "Guide Specification for Residential Metal Roofing."

Expansion Provisions: Form metal for thermal expansion of exposed flashing and trim.

Form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with butyl sealant concealed within joints.

Use lapped expansion joints only where indicated on Drawings.

Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.

Fabricate cleats and attachment devices of sizes as recommended by cited sheet metal standard for application, but not less than thickness of metal being secured.

Seams: Fabricate nonmoving seams with flat-lock seams. Tin edges to be seamed, form seams, and solder.

Do not use graphite pencils to mark metal surfaces.

ROOF-DRAINAGE SHEET METAL FABRICATIONS

Hanging Gutters: Fabricate to cross section required, complete with end pieces, outlet tubes, and other accessories as required. Fabricate in minimum 96-inch-(2400-mm-)long sections. Furnish flat-stock gutter brackets and flat-stock gutter spacers and straps fabricated from same metal as gutters, of size recommended by cited sheet metal standard but with thickness not less than twice the gutter thickness dimension indicated on Drawings. Fabricate expansion joints, expansion-joint covers, gutter bead reinforcing bars, and gutter accessories from same metal as gutters. Shop fabricate interior and exterior corners.

Gutter Profile: Style K according to cited sheet metal standard.

Expansion Joints: Built in.

Accessories: Wire-ball downspout strainer.

Gutters with Girth up to 15 Inches (380 mm): Fabricate from the following materials:

Aluminum: 0.032 inch (0.81 mm) thick.

Downspouts: Fabricate rectangular downspouts to dimensions indicated, complete with mitered elbows. Furnish with metal hangers from same material as downspouts and anchors. Shop fabricate elbows.

Manufactured Hanger Style: Fig 1-34A according to SMACNA's "Architectural Sheet Metal Manual."
Parapet Scuppers: Fabricate scuppers to dimensions required, with closure flange trim to exterior, 4-inch-(100-mm-)wide wall flanges to interior, and base extending 4 inches (100 mm) beyond cant or tapered strip into field of roof. Fabricate from the following materials:

Aluminum: 0.032 inch (0.81 mm) thick.

Conductor Heads: Fabricate conductor heads with flanged back and stiffened top edge and of dimensions and shape required, complete with outlet tubes, exterior flange trim, and built-in overflows. Fabricate from the following materials:

Aluminum: 0.032 inch (0.81 mm) thick.

LOW-SLOPE ROOF SHEET METAL FABRICATIONS

Copings: Fabricate in minimum 96-inch-(2400-mm-)long, but not exceeding 12-foot-(3.6-m-) long, sections. Fabricate joint plates of same thickness as copings. Furnish with continuous cleats to support edge of external leg and drill elongated holes for fasteners on interior leg. Miter corners, solder or weld watertight. Shop fabricate interior and exterior corners.

Coping Profile: Fig 3-4A according to SMACNA's "Architectural Sheet Metal Manual."

Joint Style: Butted with expansion space and 6-inch-(150-mm-)wide, concealed backup plate.

Fabricate from the Following Materials:

Aluminum: 0.050 inch (1.27 mm) thick.

Counterflashing: Shop fabricate interior and exterior corners. Fabricate from the following materials:
Aluminum: 0.032 inch (0.81 mm) thick.

Roof-Penetration Flashing: Fabricate from the following materials:

Stainless Steel: 0.019 inch (0.48 mm) thick.

STEEP-SLOPE ROOF SHEET METAL FABRICATIONS

Apron, Step, Cricket, and Backer Flashing: Fabricate from the following materials:

Aluminum: 0.032 inch (0.81 mm) thick.

Valley Flashing: Fabricate from the following materials:

Stainless Steel: 0.019 inch (0.48 mm) thick.

Drip Edges: Fabricate from the following materials:

Aluminum: 0.032 inch (0.81 mm) thick.

Eave, Rake, Ridge, and Hip Flashing: Fabricate from the following materials:

Aluminum: 0.032 inch (0.81 mm) thick.

Counterflashing: Shop fabricate interior and exterior corners. Fabricate from the following materials:

Aluminum: 0.032 inch (0.81 mm) thick.

Roof-Penetration Flashing: Fabricate from the following materials:

Stainless Steel: 0.019 inch (0.48 mm) thick.

EXECUTION

EXAMINATION

Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, substrate, and other conditions affecting performance of the Work.

Verify compliance with requirements for installation tolerances of substrates.

Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.

Verify that air- or water-resistant barriers have been installed over sheathing or backing substrate to prevent air infiltration or water penetration.

Proceed with installation only after unsatisfactory conditions have been corrected.

INSTALLATION, GENERAL

General: Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement. Use fasteners, solder, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.

Install sheet metal flashing and trim true to line, levels, and slopes. Provide uniform, neat seams with minimum exposure of solder, welds, and sealant.

Install sheet metal flashing and trim to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.

Space cleats not more than 12 inches (300 mm) apart. Attach each cleat with at least two fasteners. Bend tabs over fasteners.

Install exposed sheet metal flashing and trim with limited oil canning, and free of buckling and tool marks.

Torch cutting of sheet metal flashing and trim is not permitted.

Do not use graphite pencils to mark metal surfaces.

Metal Protection: Where dissimilar metals contact each other, or where metal contacts pressure-treated wood or other corrosive substrates, protect against galvanic action or corrosion by painting contact surfaces with bituminous coating or by other permanent separation as recommended by sheet metal manufacturer or cited sheet metal standard.

Coat concealed side of uncoated-aluminum and stainless-steel sheet metal flashing and trim with bituminous coating where flashing and trim contact wood, ferrous metal, or cementitious construction.
Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at maximum of 10 feet (3 m) with no joints within 24 inches (600 mm) of corner or intersection. Form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with sealant concealed within joints.

Use lapped expansion joints only where indicated on Drawings.

Fasteners: Use fastener sizes that penetrate substrate not less than recommended by fastener manufacturer to achieve maximum pull-out resistance.

Conceal fasteners and expansion provisions where possible in exposed work and locate to minimize possibility of leakage. Cover and seal fasteners and anchors as required for a tight installation.

Seal joints as required for watertight construction.

Use sealant-filled joints unless otherwise indicated. Embed hooked flanges of joint members not less than 1 inch (25 mm) into sealant. Form joints to completely conceal sealant. When ambient temperature at time of installation is between 40 and 70 deg F (4 and 21 deg C), set joint members for 50 percent movement each way. Adjust setting proportionately for installation at higher ambient temperatures. Do not install sealant-type joints at temperatures below 40 deg F (4 deg C). Prepare joints and apply sealants to comply with requirements in Section 079200 "Joint Sealants."

Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pre-tin edges of sheets with solder to width of 1-1/2 inches (38 mm); however, reduce pre-tinning where pre-tinned surface would show in completed Work.

Do not solder metallic-coated steel and aluminum sheet.

Do not use torches for soldering.

Heat surfaces to receive solder, and flow solder into joint. Fill joint completely. Completely remove flux and spatter from exposed surfaces.

Stainless-Steel Soldering: Tin edges of uncoated sheets, using solder for stainless steel and acid flux. Promptly remove acid flux residue from metal after tinning and soldering. Comply with solder manufacturer's recommended methods for cleaning and neutralization.

Copper Soldering: Tin edges of uncoated sheets, using solder for copper.

Copper-Clad Stainless-Steel Soldering: Tin edges of uncoated sheets, using solder for copper-clad stainless steel.

Rivets: Rivet joints in uncoated aluminum where necessary for strength.

ROOF-DRAINAGE SYSTEM INSTALLATION

General: Install sheet metal roof-drainage items to produce complete roof-drainage system according to cited sheet metal standard unless otherwise indicated. Coordinate installation of roof perimeter flashing with installation of roof-drainage system.

Hanging Gutters: Join sections with riveted and soldered joints or joints sealed with sealant. Provide for thermal expansion. Attach gutters at eave or fascia to firmly anchor them in position. Provide end closures and seal watertight with sealant. Slope to downspouts.

Fasten gutter spacers to front and back of gutter.

Anchor and loosely lock back edge of gutter to continuous cleat eave or apron flashing.

Anchor back of gutter that extends onto roof deck with cleats spaced not more than 24 inches (600 mm) apart.

Anchor gutter with gutter brackets spaced not more than30 inches (760 mm) apart to roof deck, unless otherwise indicated, and loosely lock to front gutter bead.

Anchor gutter with spikes and ferrules spaced not more than30 inches (760 mm) apart.

Install gutter with expansion joints at locations indicated, but not exceeding, 50 feet (15.24 m) apart. Install expansion-joint caps.

Downspouts: Join sections with 1-1/2-inch (38-mm) telescoping joints.

Provide hangers with fasteners designed to hold downspouts securely to walls. Locate hangers at top and bottom and at approximately 60 inches (1500 mm) o.c.

Provide elbows at base of downspout to direct water away from building.

Connect downspouts to underground drainage system.

Parapet Scuppers: Continuously support scupper, set to correct elevation, and seal flanges to interior wall face, over cants or tapered edge strips, and under roofing membrane.

Anchor scupper closure trim flange to exterior wall and solder or seal with elastomeric sealant to scupper.

Loosely lock front edge of scupper with conductor head.

Solder or seal with elastomeric sealant exterior wall scupper flanges into back of conductor head.

Conductor Heads: Anchor securely to wall, with elevation of conductor head rim at minimum of 1 inch (25 mm) below scupper or gutter discharge.

ROOF FLASHING INSTALLATION

General: Install sheet metal flashing and trim to comply with performance requirements, sheet metal manufacturer's written installation instructions, and cited sheet metal standard. Provide concealed fasteners where possible, and set units true to line, levels, and slopes. Install work with laps, joints, and seams that are permanently watertight and weather resistant.

Roof Edge Flashing: Anchor to resist uplift and outward forces according to recommendations in cited sheet metal standard unless otherwise indicated. Interlock bottom edge of roof edge flashing with continuous cleat anchored to substrate at staggered 3-inch (75-mm) centers.

Copings: Anchor to resist uplift and outward forces according to recommendations in cited sheet metal standard unless otherwise indicated.

Interlock exterior bottom edge of coping with continuous cleat anchored to substrate at 24-inch (600-mm) centers.

Anchor interior leg of coping with washers and screw fasteners through slotted holes at 24-inch (600-mm) centers.

Pipe or Post Counterflashing: Install counterflashing umbrella with close-fitting collar with top edge flared for elastomeric sealant, extending minimum of 4 inches (100 mm) over base flashing. Install stainless-steel draw band and tighten.

Counterflashing: Coordinate installation of counterflashing with installation of base flashing. Insert counterflashing in reglets or receivers and fit tightly to base flashing. Extend counterflashing 4 inches (100 mm) over base flashing. Lap counterflashing joints minimum of 4 inches (100 mm). Secure in waterproof manner by means of interlocking folded seam or blind rivets and sealant anchor and washer at 36-inch (910-mm) centers unless otherwise indicated.

Roof-Penetration Flashing: Coordinate installation of roof-penetration flashing with installation of roofing and other items penetrating roof. Seal with elastomeric sealant and clamp flashing to pipes that penetrate roof.

ERECTION TOLERANCES

Installation Tolerances: Shim and align sheet metal flashing and trim within installed tolerance of 1/4 inch in 20 feet (6 mm in 6 m) on slope and location lines indicated on Drawings and within 1/8-inch (3-mm) offset of adjoining faces and of alignment of matching profiles.

Installation Tolerances: Shim and align sheet metal flashing and trim within installed tolerances specified in MCA's "Guide Specification for Residential Metal Roofing."

CLEANING AND PROTECTION

Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering. Clean and neutralize flux materials. Clean off excess solder.

Clean off excess sealants.

Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed unless otherwise indicated in manufacturer's written installation instructions. On completion of sheet metal flashing and trim installation, remove unused materials and clean finished surfaces as recommended by sheet metal flashing and trim manufacturer. Maintain sheet metal flashing and trim in clean condition during construction.

Replace sheet metal flashing and trim that have been damaged or that have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 076200

DIVISION 07 - THERMAL AND MOISTURE PROTECTION
SECTION 077100 - ROOF SPECIALTIES

GENERAL

SUMMARY

Section Includes:

Roof-edge specialties.

Roof-edge drainage systems.

ACTION SUBMITTALS

Product Data: For each type of product.

Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

Samples for Initial Selection: For each type of roof specialty indicated with factory-applied color finishes.

INFORMATIONAL SUBMITTALS

Sample Warranty: For manufacturer's special warranty.

CLOSEOUT SUBMITTALS

Maintenance Data: For roofing specialties to include in maintenance manuals.

QUALITY ASSURANCE

Manufacturer Qualifications: A qualified manufacturer offering products meeting requirements that are FM Approvals listed for specified class and SPRI ES-1 tested to specified design pressure.

Source Limitations: Obtain roof specialties approved by manufacturer providing roofing-system warranty. .

DELIVERY, STORAGE, AND HANDLING

Do not store roof specialties in contact with other materials that might cause staining, denting, or other surface damage. Store roof specialties away from uncured concrete and masonry.

Protect strippable protective covering on roof specialties from exposure to sunlight and high humidity, except to extent necessary for the period of roof-specialty installation.

FIELD CONDITIONS

Field Measurements: Verify profiles and tolerances of roof-specialty substrates by field measurements before fabrication, and indicate measurements on Shop Drawings.

Coordination: Coordinate roof specialties with flashing, trim, and construction of parapets, roof deck, roof and wall panels, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

WARRANTY

Roofing-System Warranty: Roof specialties are included in warranty provisions. "."

Special Warranty on Painted Finishes: Manufacturer agrees to repair finish or replace roof specialties that show evidence of deterioration of factory-applied finishes within specified warranty period.

Fluoropolymer Finish: Deterioration includes, but is not limited to, the following:

Color fading more than 5 Delta E units when tested according to ASTM D2244.

Chalking in excess of a No. 8 rating when tested according to ASTM D4214.

Cracking, checking, peeling, or failure of paint to adhere to bare metal.

Finish Warranty Period: 20 years from date of Substantial Completion.

PRODUCTS

PERFORMANCE REQUIREMENTS

General Performance: Roof specialties shall withstand exposure to weather and resist thermally induced movement without failure, rattling, leaking, or fastener disengagement due to defective manufacture, fabrication, installation, or other defects in construction.

SPRI Wind Design Standard: Manufacture and install roof-edge specialties tested according to SPRI ES-1 and capable of resisting the following design pressures:

Design Pressure: As indicated on Drawings .

Thermal Movements: Allow for thermal movements from ambient and surface temperature changes to prevent buckling, opening of joints, hole elongation, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Provide clips that resist rotation and avoid shear stress as a result of thermal movements. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

Temperature Change (Range): 120 deg F , ambient; 180 deg F , material surfaces.

ROOF-EDGE SPECIALTIES

Roof-Edge Fascia: Manufactured, two-piece, roof-edge fascia consisting of snap-on metal fascia cover in section lengths not exceeding 12 feet and a continuous metal receiver with integral drip-edge cleat to engage fascia cover . Provide matching corner units.

Formed Aluminum Sheet Fascia Covers: Aluminum sheet, 0.063 inch thick .

Surface: Smooth, flat finish.

Finish: Three-coat fluoropolymer .

Color: Black .

ROOF-EDGE DRAINAGE SYSTEMS

Manufacturers: Subject to compliance with requirements, provide products by one of the following:

ATAS International, Inc.

Cheney Flashing Company.

Drexel Metals.

Gutters: Manufactured in uniform section lengths not exceeding 12 feet , with matching corner units, ends, outlet tubes, and other accessories. Elevate back edge at least 1 inch above front edge. Furnish flat-stock gutter straps, gutter brackets, expansion joints, and expansion-joint covers fabricated from same metal as gutters.

Aluminum Sheet: 0.063 inch thick.

Gutter Profile: Half-round highback according to SMACNA's "Architectural Sheet Metal Manual."

Corners: Factory mitered and continuously welded .

Gutter Supports: Manufacturer's standard supports as selected by Architect with finish matching the gutters.

Gutter Accessories: Continuous screened leaf guard with sheet metal frame Wire ball downspout strainer Bullnose ends for half-round gutter .

Downspouts: Corrugated round complete with machine-crimped elbows, manufactured from the following exposed metal. Furnish with metal hangers, from same material as downspouts, and anchors.

Extruded Aluminum: 0.125 inch thick.

Conductor Heads: Manufactured conductor heads, each with flanged back and stiffened top edge, and of dimensions and shape indicated, complete with outlet tube that nests into upper end of downspout , exterior flange trim, and built-in overflow.

Formed Aluminum: 0.032 inch thick.

Zinc-Coated Steel Finish: Three-coat fluoropolymer .

Color: Black .

Aluminum Finish: Three-coat fluoropolymer .

Color: Black .

MATERIALS

Aluminum Sheet: ASTM B209, alloy as standard with manufacturer for finish required, with temper to suit forming operations and performance required.

Aluminum Extrusions: ASTM B221, alloy and temper recommended by manufacturer for type of use and finish indicated, finished as follows:

Stainless Steel Sheet: ASTM A240/A240M or ASTM A666, Type 304.

MISCELLANEOUS MATERIALS

Fasteners: Manufacturer's recommended fasteners, suitable for application and designed to meet performance requirements. Furnish the following unless otherwise indicated:

Exposed Penetrating Fasteners: Gasketed screws with hex washer heads matching color of sheet metal.

Fasteners for Aluminum: Aluminum or Series 300 stainless steel.

Fasteners for Stainless Steel Sheet: Series 300 stainless steel.

Fasteners for Zinc-Coated (Galvanized) Steel Sheet: Series 300 stainless steel or hot-dip zinc-coated steel according to ASTM A153/A153M or ASTM F2329.

Elastomeric Sealant: ASTM C920, elastomeric silicone polymer sealant of type, grade, class, and use classifications required by roofing-specialty manufacturer for each application.

FINISHES

Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

Appearance of Finished Work: Noticeable variations in same piece are unacceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

Coil-Coated Galvanized-Steel Sheet Finishes:

High-Performance Organic Finish: Prepare, pretreat, and apply coating to exposed metal surfaces to comply with ASTM A755/A755M and coating and resin manufacturers' written instructions.

Three-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent polyvinylidene fluoride (PVDF) resin by weight in both color coat and clear topcoat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions for seacoast and severe environments.

Coil-Coated Aluminum Sheet Finishes:

High-Performance Organic Finish: Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

Three-Coat Fluoropolymer: AAMA 2605. Fluoropolymer finish containing not less than 70 percent polyvinylidene fluoride (PVDF) resin by weight in both color coat and clear topcoat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions for seacoast and severe environments.

Aluminum Extrusion Finishes:

High-Performance Organic Finish: Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

Three-Coat Fluoropolymer: AAMA 2605. Fluoropolymer finish containing not less than 70 percent polyvinylidene fluoride (PVDF) resin by weight in both color coat and clear topcoat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

EXECUTION

EXAMINATION

Examine substrates, areas, and conditions, with Installer present, to verify actual locations, dimensions, and other conditions affecting performance of the Work.

Examine walls, roof edges, and parapets for suitable conditions for roof specialties.

Verify that substrate is sound, dry, smooth, clean, sloped for drainage where applicable, and securely anchored.

Proceed with installation only after unsatisfactory conditions have been corrected.

INSTALLATION, GENERAL

Install roof specialties according to manufacturer's written instructions. Anchor roof specialties securely in place, with provisions for thermal and structural movement. Use fasteners, solder, protective coatings, separators, underlayments, sealants, and other miscellaneous items as required to complete roof-specialty systems.

Install roof specialties level, plumb, true to line and elevation; with limited oil-canning and without warping, jogs in alignment, buckling, or tool marks.

Provide uniform, neat seams with minimum exposure of solder and sealant.

Install roof specialties to fit substrates and to result in weathertight performance. Verify shapes and dimensions of surfaces to be covered before manufacture.

Torch cutting of roof specialties is not permitted.

Do not use graphite pencils to mark metal surfaces.

Metal Protection: Protect metals against galvanic action by separating dissimilar metals from contact with each other or with corrosive substrates by painting contact surfaces with bituminous coating or by other permanent separation as recommended by manufacturer.

Coat concealed side of uncoated aluminum and stainless steel roof specialties with bituminous coating where in contact with wood, ferrous metal, or cementitious construction.

Bed flanges in thick coat of asphalt roofing cement where required by manufacturers of roof specialties for waterproof performance.

Expansion Provisions: Allow for thermal expansion of exposed roof specialties.

Space movement joints at a maximum of 12 feet with no joints within 18 inches of corners or intersections unless otherwise indicated on Drawings.

When ambient temperature at time of installation is between 40 and 70 deg F, set joint members for 50 percent movement each way. Adjust setting proportionately for installation at higher ambient temperatures.

Fastener Sizes: Use fasteners of sizes that penetrate substrate not less than recommended by fastener manufacturer to achieve maximum pull-out resistance .

Seal concealed joints with butyl sealant as required by roofing-specialty manufacturer.

Seal joints as required for weathertight construction. Place sealant to be completely concealed in joint. Do not install sealants at temperatures below 40 deg F.

Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pre-tin edges of sheets to be soldered to a width of 1-1/2 inches; however, reduce pre-tinning where pre-tinned surface would show in completed Work. Tin edges of uncoated copper sheets using solder for copper. Do not use torches for soldering. Heat surfaces to receive solder and flow solder into joint. Fill joint completely. Completely remove flux and spatter from exposed surfaces.

INSTALLATION OF ROOF-EDGE SPECIALITIES

Install cleats, cants, and other anchoring and attachment accessories and devices with concealed fasteners.

Anchor roof edgings with manufacturer's required devices, fasteners, and fastener spacing to meet performance requirements.

INSTALLATION OF ROOF-EDGE DRAINAGE-SYSTEM

Install components to produce a complete roof-edge drainage system according to manufacturer's written instructions. Coordinate installation of roof perimeter flashing with installation of roof-edge drainage system.

Gutters: Join and seal gutter lengths. Allow for thermal expansion. Attach gutters to firmly anchored gutter supports spaced not more than 24 inches apart. Attach ends with rivets and seal with sealant to make watertight. Slope to downspouts.

Install gutter with expansion joints at locations indicated but not exceeding 50 feet apart. Install expansion-joint caps.

Install continuous leaf guards on gutters with noncorrosive fasteners, removable for cleaning gutters.

Downspouts: Join sections with manufacturer's standard telescoping joints. Provide hangers with fasteners designed to hold downspouts securely to walls and 1 inch away from walls; locate fasteners at top and bottom and at approximately 60 inches o.c.

Connect downspouts to underground drainage system indicated.

Conductor Heads: Anchor securely to wall with elevation of conductor top edge 1 inch below gutter discharge.

CLEANING AND PROTECTION

Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.

Clean and neutralize flux materials. Clean off excess solder and sealants.

Remove temporary protective coverings and strippable films as roof specialties are installed. On completion of installation, clean finished surfaces, including removing unused fasteners, metal filings, pop rivet stems, and pieces of flashing. Maintain roof specialties in a clean condition during construction.

Replace roof specialties that have been damaged or that cannot be successfully repaired by finish touchup or similar minor repair procedures.

END OF SECTION 077100

DIVISION 07 - THERMAL AND MOISTURE PROTECTION
SECTION 077253 - SNOW GUARDS

GENERAL

SUMMARY

Section Includes:

Pad-type, flat-mounted metal snow guards.

ACTION SUBMITTALS

Product Data: For each type of product, include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

Shop Drawings: Include roof plans showing layouts and attachment details of snow guards.

Samples:

Pad-Type Snow Guards: Full-size unit with installation hardware.

For units with factory-applied finishes, submit manufacturer's standard color selections .

Delegated-Design Submittal: For snow guards, include analysis reports signed and sealed by the qualified professional engineer responsible for their preparation.

Include calculation of number and location of snow guards.

INFORMATIONAL SUBMITTALS

FIELD CONDITIONS

Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit adhesive-mounted snow guards to be installed, and adhesive cured, according to adhesive manufacturer's written instructions.

PRODUCTS

PERFORMANCE REQUIREMENTS

Delegated Design: Engage a qualified professional engineer to design snow guards, including attachment to roofing material and roof deck, as applicable for attachment method, based on the following:

Roof snow load.

Snow drifting

Roof slope.

Roof type.

Roof dimensions.

Roofing substrate type and thickness.

Snow guard type.

Snow guard fastening method and strength.

Snow guard spacing.

Coefficient of Friction Between Snow and Roof Surface: 0.

Factor of Safety: 3 .

Performance Requirements: Provide snow guards that withstand exposure to weather and resist thermally induced movement without failure, rattling, or fastener disengagement due to defective manufacture, fabrication, installation, or other defects in construction.

Temperature Change: 120 deg F , ambient; 180 deg F , material surfaces .

Structural Performance: Snow guards shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated.

Snow Loads: As indicated on Drawings .

PAD-TYPE SNOW GUARDS

Pad-Type, Flat-Mounted Metal Snow Guards:

Manufacturers: Subject to compliance with requirements, provide products by one of the following:

Alpine SnowGuards, a division of Vermont Slate & Copper Services, Inc.

Berger Building Products, Inc.

TRA Snow and Sun, Inc.

Material:

ASTM B26/B26M cast aluminum.

Attachment: Manufacturer's tested system, capable of resisting design loads.

EXECUTION

EXAMINATION

Examine substrates and conditions, with Installer present, for compliance with requirements for installation tolerances, snow guard attachment, and other conditions affecting performance of the Work.

Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.

Proceed with installation only after unsatisfactory conditions have been corrected.

PREPARATION

Clean and prepare substrates for bonding snow guards.

Prime substrates according to snow guard manufacturer's written instructions.

INSTALLATION

Install snow guards according to manufacturer's written instructions.

Space rows as recommended by manufacturer.

Attachment for Asphalt Shingle Roofing:

Pad-Type, Flat-Mounted Snow Guards: Mechanically anchored through each factory-prepared hole with fasteners concealed by the shingles.

END OF SECTION 077253

DIVISION 07 - THERMAL AND MOISTURE PROTECTION
SECTION 079200 - JOINT SEALANTS

GENERAL

SUMMARY

Section Includes:

Nonstaining silicone joint sealants.

Mildew-resistant joint sealants.

Butyl joint sealants.

ACTION SUBMITTALS

Product Data: For each joint-sealant product.

Samples for Initial Selection: Manufacturer's color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.

Joint-Sealant Schedule: Include the following information:

Joint-sealant application, joint location, and designation.

Joint-sealant manufacturer and product name.

Joint-sealant formulation.

Joint-sealant color.

INFORMATIONAL SUBMITTALS

Qualification Data: For qualified testing agency.

Preconstruction Field-Adhesion-Test Reports: Indicate which sealants and joint preparation methods resulted in optimum adhesion to joint substrates based on testing specified in "Preconstruction Testing" Article.

Field-Adhesion-Test Reports: For each sealant application tested.

Sample Warranties: For special warranties.

QUALITY ASSURANCE

Installer Qualifications: An authorized representative who is trained and approved by manufacturer.

Mockups: Install sealant in mockups of assemblies specified in other Sections that are indicated to receive joint sealants specified in this Section. Use materials and installation methods specified in this Section.

PRECONSTRUCTION TESTING

Preconstruction Field-Adhesion Testing: Before installing sealants, field test their adhesion to Project joint substrates as follows:

Locate test joints where indicated on Project or, if not indicated, as directed by Architect.

Conduct field tests for each kind of sealant and joint substrate.

Notify Architect seven days in advance of dates and times when test joints will be erected.

Arrange for tests to take place with joint-sealant manufacturer's technical representative present.

Test Method: Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1.1 in ASTM C 1193 or Method A, Tail Procedure, in ASTM C 1521.

For joints with dissimilar substrates, verify adhesion to each substrate separately; extend cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.

Report whether sealant failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each kind of product and joint substrate. For sealants that fail adhesively, retest until satisfactory adhesion is obtained.

Evaluation of Preconstruction Field-Adhesion-Test Results: Sealants not evidencing adhesive failure from testing, in absence of other indications of noncompliance with requirements, will be considered satisfactory. Do not use sealants that fail to adhere to joint substrates during testing.

FIELD CONDITIONS

Do not proceed with installation of joint sealants under the following conditions:

When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 40 deg F .

When joint substrates are wet.

Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.

Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

WARRANTY

Special Installer's Warranty: Installer agrees to repair or replace joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.

Warranty Period: Two years from date of Substantial Completion.

Special Manufacturer's Warranty: Manufacturer agrees to furnish joint sealants to repair or replace those joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.

Warranty Period: Five years from date of Substantial Completion.

Special warranties specified in this article exclude deterioration or failure of joint sealants from the following:

Movement of the structure caused by stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression.

Disintegration of joint substrates from causes exceeding design specifications.

Mechanical damage caused by individuals, tools, or other outside agents.

Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

PRODUCTS

JOINT SEALANTS, GENERAL

Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience.

Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

NONSTAINING SILICONE JOINT SEALANTS

Nonstaining Joint Sealants: No staining of substrates when tested according to ASTM C 1248.

Silicone, Nonstaining, S, NS, 100/50, T, NT: Nonstaining, single-component, nonsag, plus 100 percent and minus 50 percent movement capability, traffic- and nontraffic-use, neutral-curing silicone joint sealant; ASTM C 920, Type S, Grade NS, Class 100/50, Uses T and NT.

Manufacturers: Subject to compliance with requirements, provide products by the following:

The Dow Chemical Company.

MILDEW-RESISTANT JOINT SEALANTS

Mildew-Resistant Joint Sealants: Formulated for prolonged exposure to humidity with fungicide to prevent mold and mildew growth.

Silicone, Mildew Resistant, Acid Curing, S, NS, 25, NT: Mildew-resistant, single-component, nonsag, plus 25 percent and minus 25 percent movement capability, nontraffic-use, acid-curing silicone joint sealant; ASTM C 920, Type S, Grade NS, Class 25, Use NT.

Manufacturers: Subject to compliance with requirements, provide products by one of the following:

Pecora Corporation.

The Dow Chemical Company.

Tremco Incorporated.

BUTYL JOINT SEALANTS

Butyl-Rubber-Based Joint Sealants: ASTM C 1311.

Manufacturers: Subject to compliance with requirements, provide products by one of the following:

Bostik, Inc.

Pecora Corporation.

JOINT-SEALANT BACKING

Sealant Backing Material, General: Nonstaining; compatible with joint substrates, sealants, primers, and other joint fillers; and approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

Manufacturers: Subject to compliance with requirements, provide products by one of the following:

Adfast.

BASF Corporation.

Construction Foam Products; a division of Nomaco, Inc.

Cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin) Type O (open-cell material) Type B (bicellular material with a surface skin) or any of the preceding types, as approved in writing by joint-sealant manufacturer for joint application indicated, and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.

MISCELLANEOUS MATERIALS

Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.

EXECUTION

EXAMINATION

Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting performance of the Work.

Proceed with installation only after unsatisfactory conditions have been corrected.

PREPARATION

Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:

Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.

Clean porous joint substrate surfaces by brushing, grinding, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint substrates include the following:

Concrete.

Masonry.

.

Remove laitance and form-release agents from concrete.

Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous joint substrates include the following:

Metal.

Glass.

Porcelain enamel.

Glazed surfaces of ceramic tile.

.

Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

INSTALLATION OF JOINT SEALANTS

General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.

Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

Install sealant backings of kind indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.

Do not leave gaps between ends of sealant backings.

Do not stretch, twist, puncture, or tear sealant backings.

Remove absorbent sealant backings that have become wet before sealant application, and replace them with dry materials.

Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.

Install sealants using proven techniques that comply with the following and at the same time backings are installed:

Place sealants so they directly contact and fully wet joint substrates.

Completely fill recesses in each joint configuration.

Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.

Remove excess sealant from surfaces adjacent to joints.

Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.

Provide concave joint profile per Figure 8A in ASTM C 1193 unless otherwise indicated.

FIELD QUALITY CONTROL

Field-Adhesion Testing: Field test joint-sealant adhesion to joint substrates as follows:

Extent of Testing: Test completed and cured sealant joints as follows:

Perform 10 tests for the first 1000 feet of joint length for each kind of sealant and joint substrate.

Perform one test for each 1000 feet of joint length thereafter or one test per each floor per elevation.

Test Method: Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1 in ASTM C 1193 or Method A, Tail Procedure, in ASTM C 1521.

For joints with dissimilar substrates, verify adhesion to each substrate separately; extend cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.

Inspect tested joints and report on the following:

Whether sealants filled joint cavities and are free of voids.

Whether sealant dimensions and configurations comply with specified requirements.

Whether sealants in joints connected to pulled-out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each kind of product and joint substrate. Compare these results to determine if adhesion complies with sealant manufacturer's field-adhesion hand-pull test criteria.

Record test results in a field-adhesion-test log. Include dates when sealants were installed, names of persons who installed sealants, test dates, test locations, whether joints were primed, adhesion results and percent elongations, sealant material, sealant configuration, and sealant dimensions.

Repair sealants pulled from test area by applying new sealants following same procedures used originally to seal joints. Ensure that original sealant surfaces are clean and that new sealant contacts original sealant.

Evaluation of Field-Adhesion-Test Results: Sealants not evidencing adhesive failure from testing or noncompliance with other indicated requirements will be considered satisfactory. Remove sealants that fail to adhere to joint substrates during testing or to comply with other requirements. Retest failed applications until test results prove sealants comply with indicated requirements.

CLEANING

Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

PROTECTION

Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out, remove, and repair damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

JOINT-SEALANT SCHEDULE

Joint-Sealant Application: Exterior joints in horizontal traffic surfaces.

Joint Locations:

Control and expansion joints in brick pavers.

Isolation and contraction joints in cast-in-place concrete slabs.

Joints between different materials listed above.

.

Joint Sealant: Urethane, M, P, 50, T, NT .

Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors .

Joint-Sealant Application: Exterior joints in vertical surfaces and horizontal nontraffic surfaces.

Joint Locations:

Control and expansion joints in unit masonry.

Joints between different materials listed above.

Perimeter joints between materials listed above and frames of doors windows and louvers.

Control and expansion joints in ceilings and other overhead surfaces.

.

Joint Sealant: Silicone, nonstaining, S, NS, 50, NT .

Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors .

Joint-Sealant Application: Interior joints in horizontal traffic surfaces.

Joint Locations:

Isolation joints in cast-in-place concrete slabs.

.

Joint Sealant: Urethane, S, P, 25, T, NT .

Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors .

Joint-Sealant Application: Interior joints in vertical surfaces and horizontal nontraffic surfaces.

Joint Locations:

Control and expansion joints on exposed interior surfaces of exterior walls.

Vertical joints on exposed surfaces of unit masonry walls .

.

Joint Sealant: Urethane, S, NS, 25, NT .

Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors .

Joint-Sealant Application: Mildew-resistant interior joints in vertical surfaces and horizontal nontraffic surfaces.

Joint Locations:

1 Joints between plumbing fixtures and adjoining walls, floors, and counters.

2 Tile control and expansion joints where indicated.

3 .

4 Joint Sealant: Silicone, mildew resistant, acid curing, S, NS, 25, NT .

5 Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors .

6 END OF SECTION 079200
7

DIVISION 08 - OPENINGS
SECTION 081213 - HOLLOW METAL FRAMES

GENERAL

SUMMARY

Section Includes:

Interior standard steel frames.

Borrowed lites.

DEFINITIONS

Minimum Thickness: Minimum thickness of base metal without coatings according to NAAMM-HMMA 803 or SDI A250.8.

COORDINATION

Coordinate anchorage installation for hollow-metal frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors. Deliver such items to Project site in time for installation.

Coordinate requirements for installation of door hardware, electrified door hardware, and access control and security systems.

ACTION SUBMITTALS

Product Data: For each type of product.

Include construction details, material descriptions, and finishes.

Shop Drawings: Include the following:

Elevations of each frame type.

Frame details for each frame type, including dimensioned profiles and metal thicknesses.

Locations of reinforcement and preparations for hardware.

Details of each different wall opening condition.

Details of electrical raceway and preparation for electrified hardware, access control systems, and security systems.

Details of anchorages, joints, field splices, and connections.

Details of accessories.

Details of moldings, removable stops, and glazing.

Product Schedule: For hollow-metal frames, prepared by or under the supervision of supplier, using same reference numbers for details and openings as those on Drawings. Coordinate with final door hardware schedule.

INFORMATIONAL SUBMITTALS

DELIVERY, STORAGE, AND HANDLING

Deliver hollow-metal frames palletized, packaged, or crated to provide protection during transit and Project-site storage. Do not use nonvented plastic.

Provide additional protection to prevent damage to factory-finished units.

Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.

Store hollow-metal frames vertically under cover at Project site with head up. Place on minimum 4-inch- high wood blocking. Provide minimum 1/4-inch space between each stacked door to permit air circulation.

PRODUCTS

MANUFACTURERS

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Manufacturers: Subject to compliance with requirements, provide products by one of the following:

Ceco Door; ASSA ABLOY.

Pioneer Industries.

Steelcraft; an Allegion brand.

Manufacturers: Subject to compliance with requirements, provide products by one of the following:

Ceco Door; ASSA ABLOY.

Pioneer Industries.

Steelcraft; an Allegion brand.

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PERFORMANCE REQUIREMENTS

STANDARD STEEL FRAMES

Construct hollow-metal frames to comply with standards indicated for materials, fabrication, hardware locations, hardware reinforcement, tolerances, and clearances, and as specified.

Interior Frames: SDI A250.8. At locations indicated in the Door and Frame Schedule .

Materials: Metallic-coated steel sheet, minimum thickness of 0.067 inch .

Frames: Fabricated from same thickness material as adjacent door frame.

Construction: Full profile welded.

Exposed Finish: Prime .

FRAME ANCHORS

Jamb Anchors:

Type: Anchors of minimum size and type required by applicable door and frame standard, and suitable for performance level indicated.

Quantity: Minimum of three anchors per jamb, with one additional anchor for frames with no floor anchor. Provide one additional anchor for each 24 inches of frame height above 7 feet .

Postinstalled Expansion Anchor: Minimum 3/8-inch- diameter bolts with expansion shields or inserts, with manufacturer's standard pipe spacer.

Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor.

Material: ASTM A 879/A 879M, Commercial Steel (CS), 04Z coating designation; mill phosphatized.

For anchors built into exterior walls, steel sheet complying with ASTM A 1008/A 1008M or ASTM A 1011/A 1011M; hot-dip galvanized according to ASTM A 153/A 153M, Class B.

MATERIALS

Recycled Content of Steel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.

Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B; suitable for exposed applications.

Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, Commercial Steel (CS), Type B; free of scale, pitting, or surface defects; pickled and oiled.

Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B.

Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A 153/A 153M.

FABRICATION

Hollow-Metal Frames: Fabricate in one piece except where handling and shipping limitations require multiple sections. Where frames are fabricated in sections, provide alignment plates or angles at each joint, fabricated of metal of same or greater thickness as frames.

Frames: Provide closed tubular members with no visible face seams or joints, fabricated from same material as door frame. Fasten members at crossings and to jambs by welding.

Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.

Door Silencers: Except on weather-stripped frames, drill stops to receive door silencers as follows. Keep holes clear during construction.

Single-Door Frames: Drill stop in strike jamb to receive three door silencers.

Double-Door Frames: Drill stop in head jamb to receive two door silencers.

Terminated Stops: Terminate stops 6 inches above finish floor with a 45 -degree angle cut, and close open end of stop with steel sheet closure. Cover opening in extension of frame with welded-steel filler plate, with welds ground smooth and flush with frame.

Hardware Preparation: Factory prepare hollow-metal frames to receive templated mortised hardware, and electrical wiring; include cutouts, reinforcement, mortising, drilling, and tapping according to SDI A250.6, the Door Hardware Schedule, and templates.

Reinforce frames to receive nontemplated, mortised, and surface-mounted door hardware.

Comply with BHMA A156.115 for preparing hollow-metal frames for hardware.

STEEL FINISHES

Prime Finish: Clean, pretreat, and apply manufacturer's standard primer.

Shop Primer: Manufacturer's standard, fast-curing, lead- and chromate-free primer complying with SDI A250.10; recommended by primer manufacturer for substrate; compatible with substrate and field-applied coatings despite prolonged exposure.

Factory Finish: Clean, pretreat, and apply manufacturer's standard two-coat, baked-on finish consisting of prime coat and thermosetting topcoat, complying with SDI A250.3.

Color and Gloss: As selected by Architect from manufacturer's full range .

EXECUTION

PREPARATION

Remove welded-in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces. Touch up factory-applied finishes where spreaders are removed.

Drill and tap frames to receive nontemplated, mortised, and surface-mounted door hardware.

INSTALLATION

General: Install hollow-metal frames plumb, rigid, properly aligned, and securely fastened in place. Comply with approved Shop Drawings and with manufacturer's written instructions. Comply with SDI A250.11 NAAMM-HMMA 840.

Set frames accurately in position; plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces without damage to completed Work.

Where frames are fabricated in sections, field splice at approved locations by welding face joint continuously; grind, fill, dress, and make splice smooth, flush, and invisible on exposed faces. Touch-up finishes.

Install frames with removable stops located on secure side of opening.

Fire-Rated Openings: Install frames according to NFPA 80.

Floor Anchors: Secure with postinstalled expansion anchors.

Floor anchors may be set with power-actuated fasteners instead of postinstalled expansion anchors if so indicated and approved on Shop Drawings.

Solidly pack mineral-fiber insulation inside frames.

Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with grout or mortar.

In-Place Concrete or Masonry Construction: Secure frames in place with postinstalled expansion anchors. Countersink anchors, and fill and make smooth, flush, and invisible on exposed faces.

Installation Tolerances: Adjust hollow-metal frames to the following tolerances:

Squareness: Plus or minus 1/16 inch , measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.

Alignment: Plus or minus 1/16 inch , measured at jambs on a horizontal line parallel to plane of wall.

Twist: Plus or minus 1/16 inch , measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.

Plumbness: Plus or minus 1/16 inch , measured at jambs at floor.

Glazing: Comply with installation requirements in Section 088000 "Glazing" and with hollow-metal manufacturer's written instructions.

CLEANING AND TOUCHUP

Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible air-drying, rust-inhibitive primer.

Metallic-Coated Surface Touchup: Clean abraded areas and repair with galvanizing repair paint according to manufacturer's written instructions.

Factory-Finish Touchup: Clean abraded areas and repair with same material used for factory finish according to manufacturer's written instructions.

Touchup Painting: Cleaning and touchup painting of abraded areas of paint are specified in painting Sections.

END OF SECTION 081213

DIVISION 08 - OPENINGS
SECTION 081416 - FLUSH WOOD DOORS

1 GENERAL

2 SUMMARY

3 Section Includes:

4 Five-ply flush wood veneer-faced doors for transparent finish.

5 Factory finishing flush wood doors.

6 Factory fitting flush wood doors to frames and factory machining for hardware.

7 ACTION SUBMITTALS

8 Product Data: For each type of product, including the following:

9 Door core materials and construction.

10 Door edge construction

11 Door face type and characteristics.

12 Door louvers.

13 Door trim for openings.

14 Door frame construction.

15 Factory-machining criteria.

16 Factory- finishing specifications.

17 Samples for Initial Selection: For factory-finished doors .

18 INFORMATIONAL SUBMITTALS

19 Sample Warranty: For special warranty.

20 CLOSEOUT SUBMITTALS

21 Special warranties.

22 Quality Standard Compliance Certificates: AWI Quality Certification Program certificates.

23 QUALITY ASSURANCE

24 Manufacturer's Certification: Licensed participant in AWI's Quality Certification Program .

25 DELIVERY, STORAGE, AND HANDLING

26 Comply with requirements of referenced standard and manufacturer's written instructions.

Package doors individually in cardboard cartons, and wrap bundles of doors in plastic sheeting.

Mark each door on top and bottom rail with opening number used on Shop Drawings.

FIELD CONDITIONS

Environmental Limitations: Do not deliver or install doors until building is enclosed and weathertight, wet work is complete, and HVAC system is operating and maintaining temperature between 60 and 90 deg F and relative humidity between 25 and 55 percent during remainder of construction period.

WARRANTY

Special Warranty: Manufacturer agrees to repair or replace doors that fail in materials or workmanship within specified warranty period.

Failures include, but are not limited to, the following:

Delamination of veneer.

Warping (bow, cup, or twist) more than 1/4 inch in a 42-by-84-inch section.

Telegraphing of core construction in face veneers exceeding 0.01 inch in a 3-inch span.

Warranty shall also include installation and finishing that may be required due to repair or replacement of defective doors.

Warranty Period for Solid-Core Interior Doors: Life of installation.

PRODUCTS

MANUFACTURERS

Source Limitations: Obtain flush wood doors from single manufacturer.

PERFORMANCE REQUIREMENTS

FLUSH WOOD DOORS, GENERAL

Quality Standard: In addition to requirements specified, comply with AWI/AWMAC/WI's "Architectural Woodwork Standards."

Provide labels and certificates from AWI certification program indicating that doors comply with requirements of grades specified.

The Contract Documents contain requirements that are more stringent than the referenced quality standard. Comply with the Contract Documents in addition to those of the referenced quality standard.

SOLID-CORE FIVE-PLY FLUSH WOOD VENEER-FACED DOORS FOR TRANSPARENT FINISH

Interior Doors :

DIVISION 08 - OPENINGS
SECTION 081416 - FLUSH WOOD DOORS

Manufacturers: Subject to compliance with requirements, provide products by one of the following:

Lambton Doors.

Oshkosh Door Company.

VT Industries Inc.

Performance Grade: ANSI/WDMA I.S. 1A Extra Heavy Duty .

Performance Grade:

ANSI/WDMA I.S. 1A Extra Heavy Duty: .

ANSI/WDMA I.S. 1A Grade: Premium .

Faces: Single-ply wood veneer not less than 1/50 inch thick.

Species: Red oak .

Cut: Plain sliced (flat sliced) .

Match between Veneer Leaves: Book match.

Assembly of Veneer Leaves on Door Faces: Center-balance match.

Pair and Set Match: Provide for doors hung in same opening.

Room Match: Match door faces within each separate room or area of building. Corridor-door faces do not need to match where they are separated by 10 feet or more.

Room Match: Provide door faces of compatible color and grain within each separate room or area of building.

Exposed Vertical and Top Edges: Same species as faces - Architectural Woodwork Standards edge Type A .

Mineral-Core Doors: At hinge stiles, provide laminated-edge construction with improved screw-holding capability and split resistance. Comply with specified requirements for exposed edges.

Screw-Holding Capability: 550 lbf in accordance with WDMA T.M. 10.

Core for Non-Fire-Rated Doors:

ANSI A208.1, Grade LD-1 particleboard.

Blocking: Provide wood blocking in particleboard-core doors as needed to eliminate through-bolting hardware.

Provide doors with glued-wood-stave or WDMA I.S. 10 structural-composite-lumbercores instead of particleboard cores for doors scheduled to receive exit devices.

Glued wood stave.

WDMA I.S. 10 structural composite lumber.

Screw Withdrawal, Door Face: 550 lbf .

Screw Withdrawal, Vertical Door Edge: 550 lbf .

Either glued wood stave or WDMA I.S. 10 structural composite lumber.

Construction: Five plies, hot-pressed bonded (vertical and horizontal edging is bonded to core), with entire unit abrasive planed before veneering.

LIGHT FRAMES AND LOUVERS

Wood Beads for Light Openings in Wood Doors: Provide manufacturer's standard wood beads unless otherwise indicated.

Wood Species: Same species as door faces .

Profile: Manufacturer's standard shape.

At wood-core doors with 20-minute fire-protection ratings, provide wood beads and metal glazing clips approved for such use.

Wood Louvers: Door manufacturer's standard solid-wood louvers unless otherwise indicated.

Wood Species: Same species as door faces .

Profile: Flat .

FABRICATION

Factory fit doors to suit frame-opening sizes indicated.

Comply with clearance requirements of referenced quality standard for fitting unless otherwise indicated.

Comply with NFPA 80 requirements for fire-rated doors.

Factory machine doors for hardware that is not surface applied.

Locate hardware to comply with DHI-WDHS-3.

Comply with final hardware schedules, door frame Shop Drawings, ANSI/BHMA-156.115-W, and hardware templates.

Coordinate with hardware mortises in metal frames, to verify dimensions and alignment before factory machining.

For doors scheduled to receive electrified locksets, provide factory-installed raceway and wiring to accommodate specified hardware.

Openings: Factory cut and trim openings through doors.

Light Openings: Trim openings with moldings of material and profile indicated.

Glazing: Factory install glazing in doors indicated to be factory finished. Comply with applicable requirements in Section 088000 "Glazing."

Louvers: Factory install louvers in prepared openings.

FACTORY FINISHING

Comply with referenced quality standard for factory finishing.

Complete fabrication, including fitting doors for openings and machining for hardware that is not surface applied, before finishing.

Finish faces, all four edges, edges of cutouts, and mortises.

Stains and fillers may be omitted on top and bottom edges, edges of cutouts, and mortises.

Factory finish doors.

Transparent Finish:

 ANSI/WDMA I.S. 1A Grade: Premium .

Finish: ANSI/WDMA I.S. 1A TR-4 Conversion Varnish.

Finish: ANSI/WDMA I.S. 1A TR-6 Catalyzed Polyurethane.

Staining: As selected by Architect from manufacturer's full range .

Effect: Open-grain finish .

Sheen: Semigloss.

EXECUTION

EXAMINATION

Examine doors and installed door frames, with Installer present, before hanging doors.

Verify that installed frames comply with indicated requirements for type, size, location, and swing characteristics and have been installed with level heads and plumb jambs.

Reject doors with defects.

Proceed with installation only after unsatisfactory conditions have been corrected.

INSTALLATION

Hardware: For installation, see Section 087100 "Door Hardware."

Install doors to comply with manufacturer's written instructions and referenced quality standard, and as indicated.

Job-Fitted Doors:

Align and fit doors in frames with uniform clearances and bevels as indicated below.

Do not trim stiles and rails in excess of limits set by manufacturer or permitted for fire-rated doors.

Machine doors for hardware.

Seal edges of doors, edges of cutouts, and mortises after fitting and machining.

Clearances:

Provide 1/8 inch at heads, jambs, and between pairs of doors.

Provide 1/8 inch from bottom of door to top of decorative floor finish or covering unless otherwise indicated on Drawings.

Where threshold is shown or scheduled, provide1/4 inch from bottom of door to top of threshold unless otherwise indicated.

Comply with NFPA 80 for fire-rated doors.

Bevel non-fire-rated doors 1/8 inch in 2 inches at lock and hinge edges.

Bevel fire-rated doors 1/8 inch in 2 inches at lock edge; trim stiles and rails only to extent permitted by labeling agency.

Factory-Fitted Doors: Align in frames for uniform clearance at each edge.

Factory-Finished Doors: Restore finish before installation if fitting or machining is required at Project site.

ADJUSTING

Operation: Rehang or replace doors that do not swing or operate freely.

Finished Doors: Replace doors that are damaged or that do not comply with requirements. Doors may be repaired or refinished if Work complies with requirements and shows no evidence of repair or refinishing.

END OF SECTION 081416

DIVISION 08 - OPENINGS
SECTION 081613 – FIBERGLASS REINFORCED POLYESTER (FRP) DOORS AND ALUMINUM FRAMES

GENERAL

SUMMARY

Section Includes:

Fiberglass reinforced polyester doors.

Aluminum frames for fiberglass reinforced polyester doors.

hardware.

Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.

ANSI/BHMA A156.115 - Hardware Preparation in Steel Doors and Frames.

ASTM B 209 - Aluminum and Aluminum-Alloy Sheet and Plate.

ASTM B 221 - Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.

ASTM D 256 - Determining the Pendulum Impact Resistance of Notched Specimens of Plastics.

ASTM D 543 - Evaluating the Resistance of Plastics to Chemical Reagents.

ASTM D 1308 - Effect of Household Chemicals on Clear and Pigmented Organic Finishes.

ASTM D 2126 - Response of Rigid Cellular Plastics to Thermal and Humid Aging.

ASTM D 6670-01 - Standard Practice for Full-Scale Chamber Determination of Volatile Organic Emissions from Indoor Materials/Products.

ASTM E 84 - Surface Burning Characteristics of Building Materials.

SUBMITTALS

Product Data: For each type of product indicated. Include construction details, material descriptions, components, hardware reinforcements, profiles, and finishes.

Templates: Door hardware supplier is to furnish templates, template reference number and/or physical hardware to the door and frame supplier in order to prepare the doors and frames to receive the finish hardware items.

Shop Drawings: Include the following:

1 Elevations of each door design.

2 Details of doors.

3 Locations of reinforcement and preparations for hardware.

4 Details of each different wall opening condition.

5 Details of accessories.

6 Details of preparations for power, signal, and control systems.

7 Samples for Verification:

8 Samples are only required by request of the architect.

9 QUALITY ASSURANCE

10 Source Limitations: Obtain doors and frames through one source from a single manufacturer
11 wherever possible.

12 Pre-Installation Conference: Conduct conference in compliance with requirements Project Manual
13 with attendance by representatives of Supplier, Installer, and Contractor to review proper methods

and procedures for installing doors and frames and to verify installation of electrical knockout boxes and conduit at frames with electrified or access control hardware.

DELIVERY, STORAGE, AND HANDLING

Deliver work palletized, wrapped, or crated to provide protection during transit and Project-site storage. Do not use non-vented plastic.

Store materials under cover at Project site in accordance with the manufacturer’s instructions. Do not store in a manner that traps excess humidity.

Provide minimum 1/4-inch (6-mm) space between each stacked door to permit air circulation. Door and frames to be stacked in a vertical upright position.

PROJECT CONDITIONS

Field Measurements: Verify actual dimensions of openings by field measurements before fabrication.

COORDINATION

Coordinate installation of anchorages for door frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors. Deliver such items to Project site in time for installation.

WARRANTY

Provide manufacturer's written warranty against defects in materials and workmanship upon final completion and acceptance of Work in this section. Warranty period is ten years.

PRODUCTS

MANUFACTURERS

Manufacturers: Subject to compliance with requirements, provide products by one of the following:

CECO Door Products.

Special-Lite.

FRP Architectural Doors Inc.

Tiger Door.

MATERIALS

Aluminum: 6063-T6 hardened aluminum alloy.

Fiberglass Reinforced Plastic Sheet: Thickness of .120” with the finish color for the full thickness of the sheet.

Glazing: Comply with requirements in Division 08 Section, "Glazing."

FIBERGLASS REINFORCED POLYESTER DOORS

General: Provide 1-3/4 inch doors of type and design indicated, not less than thickness indicated; fabricated without visible joints or seams on exposed faces unless otherwise indicated.

Design: As indicated on the drawings.

Core Construction: Five pound density foam-in-place polyurethane core.

Stiles and Rails: Extruded aluminum with mitered corners. Provide 3/8” diameter tie rods top and bottom.

Faces: Fiberglass reinforced plastic sheets of .120” thickness with a pebble texture.

Surface Applied Hardware Reinforcements: Fabricate according to ANSI/SDI A250.6.

ALUMINUM FRAMES

General: Provide frames from extruded tube backer with an applied stop.

Fabricate frames with butted ends.

Fabricate frames with corner brackets for secure fastening.

Stops are to be screw applied and include gasketing.

Surface Applied Hardware Reinforcements: Fabricate according to ANSI/SDI A250.6.

FABRICATION

General: Fabricate work to be rigid and free of defects. Accurately form to required sizes and profiles.

Fiberglass Reinforced Polyester Doors:

Glazed Lites: Factory cut openings in doors with applied flush aluminum trim kit to fit.

Top Caps: Close tops of doors flush with aluminum top caps.

Aluminum Frames: Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.

Surface Hardware Preparation: Factory prepare work to receive template mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to the Door Hardware Schedule and templates furnished as specified in Division 08 Section, "Door Hardware."

Locate hardware as indicated, or if not indicated, according to ANSI/SDI A250.8.

Reinforce doors to receive non-template, mortised and surface-mounted door hardware.

Comply with applicable requirements in ANSI/SDI A250.6 and ANSI/DHI A115 Series specifications for preparation of work for hardware.

FINISHES

FRP Door finish shall be:

Red.

Aluminum finish for stiles and rails, light kits, and door frames shall be:

Black.

EXECUTION

EXAMINATION

Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

Proceed with installation only after unsatisfactory conditions have been corrected.

PREPARATION

Prior to installation, check openings for squareness, alignment, twist, and plumbness.

Drill and tap doors and frames to receive non-template, mortised, and surface-mounted door hardware.

INSTALLATION

General: Install work plumb, rigid, properly aligned, and securely fastened in place; comply with Drawings and manufacturer's written instructions.

Aluminum Frames: Install aluminum frames of size and profile indicated.

Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set. Shim as necessary to comply with installation tolerances.

Floor Anchors: Provide floor anchors for each jamb, and secure with post-installed expansion anchors.

Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with appropriate mortar.

Fiberglass Reinforced Polyester Doors: Fit doors accurately in frames, within clearances specified below. Shim as necessary.

Non-Fire-Rated Doors:

Jambs and Head: 1/8 inch (3 mm) plus or minus 1/16 inch (1.6 mm).

Between Edges of Pairs of Doors: 1/8 inch (3 mm) plus or minus 1/16 inch (1.6 mm).

Between Bottom of Door and Top of Finish Floor (No Threshold): Maximum 3/4 inch (19 mm).

Glazing: Comply with installation requirements in Division 08 Section "Glazing" and with door manufacturer's written instructions.

ADJUSTING AND CLEANING

Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including stainless steel work that is warped, bowed, or otherwise unacceptable.

Remove grout and other bonding material from stainless steel work immediately after installation.

Remove stains and materials that will have and adverse affect on the doors and frames and restore slight blemishes in accordance with manufacturer’s instructions to match original finish.

END OF SECTION 081613

DIVISION 08 – OPENINGS
SECTION 083600 – SECTIONAL OVERHEAD DOORS

GENERAL

SECTION INCLUDES

Glazed Aluminum Sectional Overhead Doors

Electric Operators and Controls.

Operating Hardware, tracks, and support.

REFERENCES

ANSI/DASMA 102 - American National Standard Specifications for Sectional Overhead Type Doors.

DESIGN / PERFORMANCE REQUIREMENTS

Wind Loads: Design and size components to withstand loads caused by pressure and suction of wind acting normal to plane of wall as calculated in accordance with applicable code.

Design pressure as required for location of installation, unless otherwise noted on the drawings.

Wiring Connections: Requirements for electrical characteristics.

115 volts, single phase, 60 Hz.

Single-Source Responsibility: Provide doors, tracks, motors, and accessories from one manufacturer for each type of door. Provide secondary components from source acceptable to manufacturer of primary components.

SUBMITTALS

Product Data: Manufacturer's data sheets on each product to be used, including:

Preparation instructions and recommendations.

Storage and handling requirements and recommendations.

Installation methods.

Shop Drawings: Indicate plans and elevations including opening dimensions and required tolerances, connection details, anchorage spacing, hardware locations, and installation details.

Manufacturer's Certificates: Certify products meet or exceed specified requirements.

Operation and Maintenance Data.

QUALITY ASSURANCE

Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum five years documented experience.

Installer Qualifications: Authorized representative of the manufacturer with minimum five years documented experience.

Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories, Inc. acceptable to authority having jurisdiction as suitable for purpose specified.

DELIVERY, STORAGE, AND HANDLING

Store products in manufacturer's unopened labeled packaging until ready for installation.

Protect materials from exposure to moisture until ready for installation.

Store materials in a dry, ventilated weathertight location.

PROJECT CONDITIONS

Pre-Installation Conference: Convene a pre-installation conference just prior to commencement of field operations, to establish procedures to maintain optimum working conditions and to coordinate this work with related and adjacent work.

PRODUCTS

MANUFACTURERS

Acceptable Manufacturers:

Overhead Door Corp

Fimbel Doors

Raynor Doors

GLAZED ALUMINUM SECTIONAL OVERHEAD DOORS

Glazed Sectional Overhead Doors:

Door Assembly: Stile and rail assembly secured with 1/4 inch (6 mm) diameter through rods.

Panel Thickness: 1-3/4 inches (44 mm).

Center Stile Width: 2-11/16 inches (68 mm)

End Stile Width: 3-5/16 inches (84 mm)

Intermediate Rail Pair Width: 3-11/16 inches (94 mm).

Top Rail Width:

2-3/8 inches (60 mm).

3-3/4 inches (95 mm).

Bottom Rail Width:

3-3/4 inches (95 mm).

4-1/2 inches (114 mm).

Aluminum Panels: 0.050 inch (1.3 mm) thick, aluminum.

Stiles and Rails: 6063 - T6 aluminum.

Springs:

100,000 cycles.

Glazing:

1/2 inch (12.5 mm) Clear Lexan Insulated glazing.

Finish and Color:

Powder Coating Finish: Color as selected by Architect from manufacturer’s full line of Colors.

Windload Design: Provide to meet the Design/Performance requirements specified.

Hardware: Galvanized steel hinges and fixtures. Ball bearing rollers with hardened steel races.

Weather-stripping:

Flexible bulb-type strip at bottom section.

Flexible Jamb seals.

Flexible Header seal.

Track: Provide track as recommended by manufacturer to suit loading required and clearances available.

Manual Operation: Chain hoist.

Electric Motor Operation: Provide UL listed electric operator, size and type as recommended by manufacturer to move door in either direction at not less than 2/3 foot nor more than 1 foot per

second. Operator shall meet UL325/2010 requirements for continuous monitoring of safety devices.

Entrapment Protection: Required for momentary contact, includes radio control operation.

Pneumatic sensing edge up to 18 feet (5.5 m) wide. Constant contact only complying with UL 325/2010.

Photoelectric sensors monitored to meet UL 325/2010.

Operator Controls:

Push-button operated control stations with open, close, and stop buttons.

Surface mounting.

Exterior location.

Special Operation:

Radio control operation.

Door timer operation.

EXECUTION

EXAMINATION

Do not begin installation until openings have been properly prepared.

Verify wall openings are ready to receive work and opening dimensions and tolerances are within specified limits.

Verify electric power is available and of correct characteristics.

Notify Architect of unsatisfactory preparation before proceeding.

PREPARATION

Clean surfaces thoroughly prior to installation.

Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

INSTALLATION

Install overhead doors and track in accordance with approved shop drawings and the manufacturer’s printed instructions.

Coordinate installation with adjacent work to ensure proper clearances and allow for maintenance.

Anchor assembly to wall construction and building framing without distortion or stress.

Securely brace door tracks suspended from structure. Secure tracks to structural members only.

Fit and align door assembly including hardware.

Coordinate installation of electrical service. Complete power and control wiring from disconnect to unit components.

CLEANING AND ADJUSTING

Adjust door assembly to smooth operation and in full contact with weather-stripping.

Clean doors, frames and glass.

Remove temporary labels and visible markings.

PROTECTION

Do not permit construction traffic through overhead door openings after adjustment and cleaning.

Protect installed products until completion of project.

Touch-up, damaged coatings and finishes and repair minor damage before Substantial Completion.

END OF SECTION 083600

DIVISION 08 – OPENINGS
SECTION 085213- ALUMINUM CLAD WOOD WINDOWS

Part 1 General

Section Includes

Ultimate Double Hung G2 window complete with hardware, glazing, certified mulls, weather strip, insect screen, simulated divided lite, jamb extension, and standard or specified anchors, trim, attachments, and accessories

Ultimate Casement Crank Out: Operators, Stationary and Picture units complete with hardware, glazing, weather strip, insect screen, removable screen, simulated divided lite, jamb extension, and standard or specified anchors, trim and attachments

Ultimate Glider Window complete with hardware, glazing, weather strip, jamb extension, and standard or specified anchors, trim and attachments

References

American Society for Testing Materials (ASTM):

E 283: Standard Test method for Rate of Air Leakage through Exterior Windows, Curtain Walls and Doors

E 330: Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls and Door by Uniform Static Air Pressure Difference

E 547: Standard Test Method for Water Penetration of Exterior Windows, Curtain Walls and Doors by Cyclic Static Air Pressure Differential

E 2112: Standard Practice for Installation of Exterior Windows, Doors and Skylights

E2068: Standard Test Method for Determination of Operating Force of Sliding Windows and Doors

E 2190: Specification for Sealed Insulated Glass Units

C 1036: Standard Specification for Flat Glass

E 1996: Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors and Storm Shutters Impacted by Windborne Debris in Hurricanes
E 1886: Standard Test method for Performance of Exterior Windows, curtain Walls, and Storm Shutters Impacted by Missile(s) and Exposed to Cyclic Pressure Differentials
F 2090-17: Standard Specifications for Windows Fall Prevention Devices with Emergency Escape (egress) Release Mechanisms
F 2090-10: Standard Specifications for Windows Fall Prevention Devices with Emergency Escape (egress) Release Mechanisms

American Architectural Manufacturer’s Association/Window and Door Manufacturer’s Association (AAMA/WDMA/CSA):

AAMA/WDMA/CSA 101/I.S.2/A440-05 Standard/Specification for window, skylights and doors

AAMA/WDMA/CSA 101/I.S.2/A440-08, NAFS – North American Fenestration Standard/Specification for Windows, Doors and Skylights

AAMA/WDMA/CSA 101/I.S.2/A440-11, NAFS 2011 – Northern American Fenestration Standard/Specification for Windows, Doors and Skylights

WDMA I.S.4: Industry Standard for Water Repellant Preservative Treatment for Millwork

Window and Door Manufacturer's Association (WDMA): 101/I.S.2 WDMA Hallmark Certification Program

Sealed Insulating Glass Manufacturer's Association/Insulating Glass Certification Council (SIGMA/IGCC)

American Architectural Manufacturer's Association (AAMA): 2605: Voluntary Specification for High Performance Organic Coatings on Architectural Extrusions and Panels

National Fenestration Rating Council (NFRC):

101: Procedure for Determining Fenestration Product thermal Properties

200: Procedure for Determining Solar Heat Gain Coefficients at Normal Incidence

System Description

Design and Performance Requirements:

Product	Air Test to PSF	Water Tested to psf	Structural Tested to psf	Certification Rating	Design Pressure	Overall Width		Overall Height	
						in	mm	in	mm
Ultimate Double Hung G2 (4040)	1.57	7.5	75	LC-PG50	DP50	45 1/4	(1149)	87 1/2	(2223)

Product	Air Tested to psf	Water Tested to psf	Structural Tested to psf	Certification Rating	Design Pressure (DP)	Max Overall Width	Max Overall Height
Ultimate Casement Full Frame	1.57	7.5	75	CW-PG50-C	50	36"	96-1/8"
Ultimate Casement Picture (Full Frame)	1.57	7.5	75	CW-PG50-FW	50	64"	96-1/8"
Product	Air Tested to psf	Water Tested to psf	Structural Tested to psf	Certification Rating	Design Pressure (DP)	Max Overall Width	Max Overall Height
Ultimate Glider 6046 XX	1.57	7.5	75	LC-PG50-HS	50	71 1/2"	53 1/2"

Submittals

Shop Drawings:

Product Data:

Samples:

Submit corner section

Include glazing system, quality of construction and specified finish

Quality Control Submittals: Certificates: submit manufacturer's certification indicating compliance with specified performance and design requirement .

Quality Assurance

Requirements: consult local code for IBC [International Building Code] and IRC [International Residential Code] adoption year and pertinent revisions for information on:

Egress, emergency escape and rescue requirements

Basement window requirements

Windows fall prevention and/or window opening control device requirements

Delivery

Deliver in original packaging and protect from weather

Storage and Handling

Prime and seal wood surfaces, including to be concealed by wall construction, if more than thirty (30) days will expire between delivery and installation

Store window units in an upright position in a clean and dry storage area above ground to protect from weather under provision of Section 01660

Warranty

Complete and current warranty information is available at marvin.com/warranty. The following summary is subject to the terms, condition, limitations and exclusions set forth in the Manufacturer's Limited Warranty and Products in Coastal Environments Limited Warranty Supplement:

Clear insulating glass with stainless steel spacers is warranted against seal failure caused by manufacturing defects and resulting in visible obstruction through the glass for twenty (20) years from the original date of purchase. Glass is warranted against stress cracks caused by manufacturing defects from ten (10) years from the original date of purchase.

Standard exterior aluminum cladding finish is warranted against manufacturing defects resulting in chalk, fade and loss of adhesion (peel) per the American Architectural Manufacturer's Association (AAMA) Specification 2605-11 Section 8.4 and 8.9 for twenty (20) years from the original date of purchase.

Hardware and other non-glass components are warranted to be free from manufacturing defects for ten (10) years from the original date of purchase.

Part 2 Products

Manufactured Units

Basis of Design Description: Ultimate Double Hung G2 as manufactured by Marvin, Warroad, Minnesota.

Frame Description

Interior: Non Finger-Jointed Pine or finger-jointed core with non finger-jointed Pine veneer

Kiln-dried to moisture content no greater than 12 percent at the time of fabrication

Water repellant, preservative treated in accordance with ANSI/WDMA I.S.4.

Frame exterior aluminum clad with 0.050” (1.3mm) thick extruded aluminum

Frame thickness: 11/16” (17mm) head and jambs

Frame depth: Frame depth had an overall 5 21/32” jamb (144mm). 4 9/16” (116mm) jamb depth from the nailing fin plane to the interior face of the frame for new construction.

Sill assembly including the sill liner: 2 7/32” (56mm)

Sash Description

Interior: Non Finger-Jointed Pine or finger-jointed core with non finger-jointed Pine veneer

Kiln-dried to moisture content no greater than 12 percent at the time of fabrication

Water repellant preservative treated with accordance with WDMA I.S.4.

Sash exterior aluminum clad with 0.050” (1.3mm) thick extruded aluminum

Sash thickness: 1 3/4” (44mm). Corner slot and tenoned.

Operable sash tilt to interior for cleaning or removal

Sash Options:

Standard: Equal Sash

Exterior Cope Profile: Putty

Interior Sash Sticking

Standard: Ogee

Glazing

Select quality complying with ASTM C1036. Insulating glass SIGMA/IGCC certified to performance level CBA when tested in accordance with ASTM E2190.

Glazing method: Insulating glass

Glazing seal: Silicone bedding on interior and exterior

Glass Type: Low E2 with Argon

Certified Mulling

Directional mull limits: 1 High (can be 2 or more units wide in an assembly)

Max mullion span is 71 ½" (1816mm); max tributary width 45 ¼" (1149mm)

CUDH NG 2.0 to CUDH NG 2.0 only

Finish

Exterior: Aluminum clad. Fluoropolymer modified acrylic topcoat applied over primer. Meets AAMA 2605 requirements.

Aluminum clad color options: Stone White

Interior Finish options:

Bare

Hardware

Locking system that provides locking, unlocking, balancing, and tilting of the sash members

Lock Actuator Assembly

Material

Zinc die-cast

Available finishes: Satin Nickel

Design Feature and Components

To unlock unit, turn the handle 135°

Lock automatically locks when both sash are closed.

To tilt the bottom sash for wash mode, the bottom sash must be unlocked and raised a few inches; push the button on top of the lock handle and rotate the handle 180°

To tilt the top sash for wash mode, the bottom sash must be tilted and/or removed from the frame; lower the top sash to a good working height, retract the tilt latches on the top rail and tilt sash inward out of the frame

Latches

Bottom sash latch

Material

Bolt: Glass-filled nylon

Latch housing: Acetal

Sash latch reinforcement: Stainless steel

Top sash tilt latch

Material

Bolt: Glass-filled nylon

Latch housing: Glass-filled nylon

Latches accommodate travel of sash in frame, and tilting into wash-mode
Color: Beige Strike Assembly
Material
Zinc die-cast strike plate and injection-molded Acetal housing and button
Available finishes: Satin Nickel
Strike assembly accommodates locking/unlocking
Balance System (balance system determined by sash weight)
Block & tackle balances
Hybrid spiral balances
Weather Strip
Operating units:
Jambs: Foam-filled bulb
Header: Continuous dual leaf
Bottom rail and check rail: Hollow bulb
Stationary units:
Jambs: Foam for picture units; foam-filled bulb for transom unit
Header and bottom rail: Hollow bulb
Jamb Extension
Jamb extensions are available for various wall thickness factory-applied up to a 14” (356mm) wide
Finish: Match interior frame finish
Insect Screen
Factory-installed full screen
Screen Mesh: Charcoal Fiberglass
Aluminum frame finish:
Color: Matches exterior aluminum clad color
Simulated Divided Lites (SDL)
7/8” (22mm) wide with internal spacer bar
Exterior muntins: 0.050” (1.3mm) thick extruded aluminum
Interior muntins: Pine
Muntins adhere to glass with closed-cell copolymer acrylic foam tape
Exterior sticking: Putty
Interior Sticking:
Standard: Ogee

Patterns: Rectangular

Finish – exterior matches exterior aluminum clad colors, interior matches interior wood species and color

Accessories and Trim

Installation Accessories:

Factory-installed vinyl nailing/drip cap

Installation brackets: 6 3/8” (162mm), 9 3/8” (283mm), 15 3/8” (390mm)

Aluminum Extrusions:

Aluminum clad Extrusion: A109 – 3” Frame Expander

Finish: Fluoropolymer modified acrylic topcoat applied over primer. Meets AAMA 2605 requirements

Basis of Design Description: Factory-assembled Ultimate Casement (stationary or picture units) as manufactured by Marvin Windows and Doors, Warroad, Minnesota.

Frame Description

Interior: Non Finger-Jointed Pine or finger-jointed core with non finger-jointed Pine veneer

Kiln-dried to moisture content no greater than twelve (12) percent at the time of fabrication

Water repellant preservative treated in accordance with WDMA I.S.4.

Frame exterior aluminum clad with 0.050 inch (1.3mm) thick extruded aluminum

Frame thickness: 1 3/16” (30mm)

Frame depths for full frame units have an overall 5 21/32” jamb (144mm). 4 9/16” (116mm) jamb depth from the nailing fin plane to the interior face of the frame for new construction.

Sash Description

Interior: Non Finger-Jointed Pine or finger-jointed core with non finger-jointed Pine veneer

Kiln-dried to moisture content no greater than twelve (12) percent at the time of fabrication

Water repellant preservative treated with accordance with WDMA I.S.4

Sash exterior aluminum clad with 0.050” (1.3mm) thick extruded aluminum

Sash thickness: 1 5/8” (41mm) and 1 7/8” (48mm) for full frame units.

Stiles and Rails: 2 1/16” (52mm)

Sash Option: Optional tall bottom rail: 3 9/16” (90mm)

Interior Sash Sticking

Standard is: Ogee

Glazing

Select quality complying with ASTM C 1036. Insulating glass SIGMA/IGCC certified to performance level CBA when tested in accordance with ASTM E 2190

Glazing method: Insulating glass

Glazing seal: Silicone bedding at interior and exterior

Insulating glass will be altitude adjusted with capillary tubes for higher elevations. Argon gas is not available for elevations that require capillary tubes

Glass Type: Low E2 with Argon,

Finish

Exterior: Aluminum clad. Fluoropolymer modified acrylic topcoat applied over primer. Meets or exceeds AAMA 2605 requirements.

Aluminum clad color options: Stone White

Custom colors: Contact your Marvin representative

Interior Finish options:

Bare

Hardware

Casement operating hardware:

Locks: Multi-point sequential concealed locking system in the jamb opposite the hinge side for casement units. Lock handles are removable, non-handed and are available in the same finishes as the handles. Standard tie bars, cams and keepers – steel coated with E-Gard ™. Keeper features a roller for reduce average lock force and does not easily disengage with the cam even under severe loading. Stainless steel packages are available for coastal application.

Handles: Standard operating handle is a folding handle, zinc painted with the standard folding cover being molded plastic. Available colors: Satin Nickel (plated)

Hinges: One at the sill to bottom rail, one at the head jamb to top rail. Hinges are steel coated with E-Gard™. Hinge track is stainless steel. Unit with a frame OM of 20 inches (508mm) and greater use an 18 inch (457mm) wash/egress hinge to allow the sash to slide across the frame opening which causes the sash exterior to rotate towards the user for easy wash ability. Units under a frame OM of 20 inches (508mm)width use a standard 2 bar hinge which will position the sash when fully open to 90degrees for the user to wash but does not include the feature of sliding the sash across the opening and rotating the exterior towards the user.

Weather Strip

Weather strip at the frame is a hollow-foamed material bent around 90 degree corner to allow for seamless corner joints

Color: Beige

Sash weather strip bulb shaped glass filled material

Color: White

Jamb Extension

Jamb extensions are available for various wall thickness factory-applied up to a 12 (305mm) wide

Finish: Match interior frame finish

Insect Screen

Crank Out

Aluminum frame finish is available in Satin Taupe

Screen mesh: Charcoal Fiberglass

Simulated Divided Lites (SDL)

7/8” (22mm) wide and 1 15/16” (49mm) wide with internal spacer bar

Exterior muntins: 0.055” (1.4mm) thick extruded aluminum

Interior muntins: Pine

Muntins adhere to glass with closed-cell copolymer acrylic foam tape

Sticking:

Standard: Ogee

Patterns: Rectangular

Finish – exterior matches exterior aluminum clad colors, interior matches’ interior wood species and color

Accessories and Trim

Installation Accessories:

Factory-installed vinyl nailing/drip cap

Installation brackets: 6 3/8” (162mm), 9 3/8” (283mm), 15 3/8” (390mm)

Aluminum Extrusions:

Profile: A109 – 3” frame expander

Finish: Fluoropolymer modified acrylic topcoat applied over primer. Meets or exceeds AAMA 2605 requirements.

Basis of Design Description: Factory-assembled Ultimate Glider horizontally sliding window manufactured by Marvin, Warroad, Minnesota.

Frame Description

Interior: Non Finger-Jointed Pine or finger-jointed core with non finger-jointed Pine veneer

Kiln-dried to moisture content no greater than 12 percent at the time of fabrication

Water repellant, preservative treated in accordance with ANSI/WDMA I.S.4.

Frame exterior aluminum clad with 0.050” (1.3mm) thick extruded aluminum

Frame thickness: 1 21/32” (42mm)

Frame depth: The overall frame depth is 5 21/32” (144mm). The depth from the inside of nailing fin to inside face of jamb is 4 9/16” (116mm)

Sill: 1 7/16” (37mm)

Available configurations: CUGL (XO, OX, XX, OXXO)

With an XX operation, there is a beige or white vinyl sash track exposed on exterior sill

Sash Description

Interior: Non Finger-Jointed Pine or finger-jointed core with non finger-jointed Pine veneer

Kiln-dried to moisture content no greater than twelve (12) percent at the time of fabrication

Water repellant preservative treated with accordance with WDMA I.S.4.

Sash exterior aluminum clad with 0.050” (1.3mm) thick extruded aluminum

Sash thickness: 1 9/16” (40mm)

Operable sash tilt to interior for cleaning or removal

Interior Sash Sticking

Standard is: Ogee

XO and OX configurations contain a stationary sash and operating sash that moves horizontally

XX configuration contains two operating sash that both move horizontally

Glazing

Select quality complying with ASTM C1036. Insulating glass SIGMA/IGCC certified to performance level CBA when tested in accordance with ASTM E2190.

Glazing method: Insulating glass

Glazing seal: Silicone bedding at interior and tap glazing on exterior

Insulating glass will be altitude adjusted with capillary tubes for higher elevations. Argon gas is not available for elevations that require capillary tubes

Glass Type: Low E2 with argon

Finish

Exterior: Aluminum clad. Fluoropolymer modified acrylic topcoat applied over primer. Meets AAMA 2605 requirements.

Aluminum clad color options: Stone White

Interior Finish options:

Bare

Hardware

One die cast zinc handle activates one or two latches, depending on the unit height, into one or two keepers on the secondary sash. The bottom of the lock handle is inset approximately 5” (127mm) from the bottom of the sill into the meeting stile of primary sash and is used to feature a secondary handle field applied on secondary sash to assist in operation.

A single handle actuation multi-point lock system and sash retainer bar for tilting or removing the sash to the interior

The lock handle is inset into the meeting stile and is made of die cast zinc

Default finish: Satin Taupe

Optional finishes: Satin Nickel

Weather Strip

All weather strip is an easily removed bulb type available in 3 colors; White, Beige, and Black. The color is the weather strip will depend on the aluminum cladding color or interior color selection.

Sill track: Determined by interior color selection (white or beige)

Jamb: Determined by interior color selection (white or beige)

Sill cover, head jamb cover, jamb cover: Determined by aluminum clad color

Head Jamb: Determined by interior color selection (white or beige)

Jamb Extension

Jamb extensions are available for various wall thickness factory-applied up to a 12” (305mm) wide

Finish: Match interior frame finish

Accessories and Trim

Installation Accessories:

Factory-installed vinyl nailing/drip cap

Installation brackets: 6 3/8” (162mm), 9 3/8” (283mm), 15 3/8” (390mm)

Masonry brackets: 6” (152mm), 10” (254mm)Part 3 Execution

Examination

Verification of Condition: Before installation, verify openings are plumb, square and of proper dimensions. Report frame defects or unsuitable conditions to the General Contractor before proceeding.

Acceptance of Condition: Beginning of installation confirms acceptance of existing conditions.

Installation

Assemble and install window/door unit(s) according to manufacturer’s instruction and reviewed shop drawing.

Install sealant and related backing materials at perimeter of unit or assembly in accordance Specifications. Do not use expansive foam sealant.

Install accessory items as required.

Use finish nails to apply wood trim and mouldings.

Other Manufacturer’s acceptable, subject to compliance with requirements:

Kolbe & Kolbe

Loewen

Field Quality Control

Remove visible labels and adhesive residue according to manufacturer's instruction.

Unless otherwise specified, air leakage resistance tests shall be conducted at a uniform static pressure of 75 Pa (~1.57 psf). The maximum allowable rate of air leakage shall not exceed 2.3 L/sm^2 (~0.45 cfm/ft^2).

Unless otherwise specified, water penetration resistance testing shall be conducted per AAMA 502 and ASTM E1105 at 2/3 of the fenestration products design pressure (DP) rating using "Procedure B" – cyclic static air pressure difference. Water penetration shall be defined in accordance with the test method(s) applied.

Manufacturer or Supplier shall attend a preinstallation meeting, at least one other visit during installation and the installation close out meeting. Architect shall be notified of date and time of all visits.

Cleaning

Remove visible labels and adhesive residue according to manufacturer's instruction.

Leave windows and glass in a clean condition. Final cleaning as required in Section 01 74 00.

Protecting Installed Construction

Protecting windows from damage by chemicals, solvents, paint or other construction operations that may cause damage.

End of Section

DIVISION 08 – OPENINGS
SECTION 085413 – FIBERGLASS WINDOWS

1 General

2 Section Includes

3 Essential® Double Hung window complete with hardware, glazing, weather strip, standard or
4 specified anchors.

5 References

6 American Society for Testing and Materials (ASTM):

7 C1036: Standard Specification for Flat Glass.

8 E90-09: Standard Test Method for Laboratory Measurement of airborne Sound Transmission Loss of
9 Building Partitions and Elements.

10 E 283: Standard Test Method for Rate of Air Leakage through Exterior Windows, Curtain Walls and
11 Doors.

12 E 330: Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls, and
13 Door by Uniform Static Air Pressure Difference.

14 E 547: Standard Test Method for Water Penetration of Exterior Windows, Curtain Walls, and Doors
15 by Cyclic Static Air Pressure Differential.

16 E 2190: Standard Specification for Insulating Glass Unit Performance Evaluation.

17 F 2090-17: Standard Specification for Window Fall Prevention Devices with Emergency Escape
18 (Egress) Release Mechanisms.

19 E 2068: Standard Test Method to Determine the Operating and Breakaway Forces of Sliding
20 Windows and Doors.

21 Insulating Glass Manufacturer’s Alliance/Insulating Glass Certification Council (IGMA/IGCC)

22 American Architectural Manufacturer’s Association/Window and Door Manufacturer’s
23 Association/Canadian Standards Association (AAMA/WDMA/CSA):

24 AAMA/WDMA/CSA 101/I.S.2/A440-08: Standard/Specification for windows and unit skylights.

25 AAMA/WDMA/CSA 101/I.S.2/A440-11: Standard/Specification for windows and unit skylights.

26

27 AAMA 450-10: Voluntary Performance Rating Method for Mulled Fenestration Assemblies

28 Window and Door Manufacturer’s Association (WDMA): Hallmark Certification Program.

American Architectural Manufacturer's Association (AAMA): 624-10: Voluntary Specification, Performance Requirements and Test Procedures for Organic Coatings on Fiber Reinforced Thermoset Profiles.

National Fenestration Rating Council (NFRC):

100: Procedures for Determining Fenestration Product U-factors

200: Procedure for Determining Fenestration Product Solar Heat Gain Coefficients and Visible Trasmittance at Normal Incidence.

System Description

Design and Performance Requirements:

Product	Air Tested to PSF	Water Tested to psf	Design Pressure (DP)	Certification Rating	Max Overall Width		Max Overall Height	
					in	mm	in	mm
Essential Double Hung	1.57	7.5	50	LC-PG50-H	29 1/2	(749)	59 1/2	(1511)
Essential Double Hung	1.57	6.0	40	LC-PG40-H	29 1/2	(749)	77 1/2	(1969)
Essential Double Hung	1.57	7.5	50	LC-PG50-H	35 1/2	(902)	59 1/2	(1511)
Essential Double Hung	1.57	6.0	40	LC-PG40-H	35 1/2	(902)	77 1/2	(1969)
Essential Double Hung	1.57	6.0	40	LC-PG40-H	41 1/2	(1054)	65 1/2	(1664)
Essential Double Hung	1.57	7.5	50	LC-PG50-H	47 1/2	(1207)	47 1/2	(1207)
Essential Double Hung	1.57	6.0	40	LC-PG40-H	47 1/2	(1207)	59 1/2	(1511)
Essential Double Hung	1.57	4.5	30	LC-PG30-H	47 1/2	(1207)	77 1/2	(1969)

Submittals

Shop Drawings: Submit shop drawings.

Product Data: Submit catalog data.

Samples:

Submit corner section under provision of section 01 33 23

Specified performance and design requirements Quality Control Submittals: Certificates: submit manufacturer's certification indicating compliance with specified performance and design requirement.

Quality Assurance

Requirements: consult local code for IBC [International Building Code] and IRC [International Residential Code] adoption year and pertinent revisions for information on:

Egress, emergency escape and rescue requirements

Basement window requirements

Delivery

Comply with provisions of Project Manual

Deliver in original packaging and protect from weather

Storage and Handling

Store window units in an upright position in a clean and dry storage area above ground to protect from weather

Warranty

The following limited warranty is subject to conditions and exclusions. There are certain conditions or applications over which Marvin has no control. Defect or problems as a result of such conditions or applications are not the responsibility of Marvin. For a more complete description of the Marvin limited warranty, refer to the Complete and current warranty information is available at marvin.com/warranty.

Clear insulating glass with stainless steel spacers is warranted against seal failure caused by manufacturing defects and resulting in visible obstruction through the glass for twenty (20) years from the original date of purchase. Glass is warranted against stress cracks caused by manufacturing defects from ten (10) years from the original date of purchase.

Hardware another non-glass components are warranted to be free from manufacturing defects for ten (10) years from the original date of purchase.

Part 2 Products

Manufactured Units

Description: Essential® Double Hung as manufactured by Marvin Windows and Doors; Roanoke, Virginia.

Frame Description

Interior: Pultruded reinforced fiberglass (Ultrex®), 0.070 inch (2mm) thick

Frame width: 3 3/32 inches (79mm)

Jamb depth: 2 inches (51mm)

Sash Description

Pultruded reinforced fiberglass (Ultrex®), 0.077 inch (2mm) thick.

Composite sash thickness: 15/16 inch (24mm)

Sash Options:

Operating sash tilt to interior for cleaning or removal

Glazing

Select quality complying with ASTM C 1036. Insulating glass SIGMA/IGCC when tested in accordance with ASTM E 2190. STC/OITC ratings are tested to the stated performance level in accordance with ASTM E 90-09.

Glazing Method: Insulating glass

Glass Type: LowE2 withArgon gas

Glazing Seal: Silicone bedding at exterior and a glazing boot to interior

Perimeter Spacer: Default color is mill finish (stainless).

Finish

Exterior: Ultrex with a cross-head extruded acrylic organic coating system. Meets AAMA 624-10 requirements.

Interior: Ultrex with a cross-head extruded acrylic organic coating system.

Color: Stone White exterior with Stone White interior

Hardware

Balance System:

Coil spring block and tackle with nylon cord, glass filled nylon shoe and zinc locking mechanism

Sash Lock:

Zinc die cast contoured sash lift

Standard Color: White

Two (2) locks installed on units with a rough opening width greater than 30 inches

Top and Bottom Tilt Latches: Ergonomic tilt latches attached to the upper corners of the top and bottom sash for easy tilting and sash removal

Top Sash Tilt Latch Colors: White

Bottom Sash Tilt Latch Colors: White

Weather Strip

At Sill: Combination foam filled bulb – Color: Beige

At Bottom Sash: Combination foam filled bulb – Color: Beige

At Top Sash: Combination hollow vinyl bulb – Color:

At Interlock: Rigid ABS with flexible hollow bulb – Top Sash Cover Color: Beige

Accessories and Trim

Installation Accessories:

Factory-installed vinyl nailing fin/drip cap at head, sill and jamb.

Part 3 Execution

Examination

Verification of Condition: Before installation, verify openings are plumb, square and of proper dimensions as required. Report frame defects or unsuitable conditions to the General Contractor before proceeding.

Acceptance of Condition: Beginning installation confirms acceptance of existing conditions.

Installation

Assemble and install window/door unit(s) according to manufacturer's instruction and reviewed shop drawing.

Install sealant and related backing materials at perimeter of unit or assembly in accordance with Project Manual. Do not use expansive foam sealant.

Install accessory items as required.

Use finish nails to apply wood trim and mouldings.

Field Quality Control

Remove visible labels and adhesive residue according to manufacturer's instruction.

Unless otherwise specified, air leakage resistance tests shall be conducted at a uniform static pressure of 75 Pa (~1.57 psf). The maximum allowable rate of air leakage shall not exceed 2.3 L/sm^2 (~0.45 cfm/ft^2).

Unless otherwise specified, water penetration resistance testing shall be conducted per AAMA 502 and ASTM E1105 at 2/3 of the fenestration products design pressure (DP) rating using "Procedure B" – cyclic static air pressure difference. Water penetration shall be defined in accordance with the test method(s) applied.

Cleaning

Remove visible labels and adhesive residue according to manufacturer's instruction.

Leave windows and glass in a clean condition. Final cleaning as required in Section 01 74 00.

Protecting Installed Construction

Protecting windows from damage by chemicals, solvents, paint or other construction operations that may cause damage.

End of Section

DIVISION 08 – OPENINGS
SECTION 087100 – DOOR HARDWARE

GENERAL

RELATED DOCUMENTS

Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

SUMMARY

This Section includes commercial door hardware for the following:

Swinging doors.

Other doors to the extent indicated.

Door hardware includes, but is not necessarily limited to, the following:

Mechanical door hardware.

Electromechanical door hardware.

Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.

ANSI A117.1 - Accessible and Usable Buildings and Facilities.
ICC/IBC - International Building Code.
NFPA 70 - National Electrical Code.
NFPA 80 - Fire Doors and Windows.
NFPA 101 - Life Safety Code.
NFPA 105 - Installation of Smoke Door Assemblies.
State Building Codes, Local Amendments.
Standards: All hardware specified herein shall comply with the following industry standards:
ANSI/BHMA Certified Product Standards - A156 Series
UL10C – Positive Pressure Fire Tests of Door Assemblies

SUBMITTALS

Product Data: Manufacturer's product data sheets including installation details, material descriptions, dimensions of individual components and profiles, operational descriptions and finishes.

Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.

Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule."

Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening. Organize door hardware sets in same

order as in the Door Hardware Sets at the end of Part 3. Submittals that do not follow the same format and order as the Door Hardware Sets will be rejected and subject to resubmission.

Content: Include the following information:

Type, style, function, size, label, hand, and finish of each door hardware item.

Manufacturer of each item.

Fastenings and other pertinent information.

Location of door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.

Explanation of abbreviations, symbols, and codes contained in schedule.

Mounting locations for door hardware.

Door and frame sizes and materials.

Warranty information for each product.

Submittal Sequence: Submit the final Door Hardware Schedule at earliest possible date, particularly where approval of the Door Hardware Schedule must precede fabrication of other work that is critical in the Project construction schedule. Include Product Data, Samples, Shop Drawings of other work affected by door hardware, and other information essential to the coordinated review of the Door Hardware Schedule.

Shop Drawings: Details of electrified access control hardware indicating the following:

Wiring Diagrams: Upon receipt of approved schedules, submit detailed system wiring diagrams for power, signaling, monitoring, communication, and control of the access control system electrified hardware. Differentiate between manufacturer-installed and field-installed wiring. Include the following:

Elevation diagram of each unique access controlled opening showing location and interconnection of major system components with respect to their placement in the respective door openings.

Complete (risers, point-to-point) access control system block wiring diagrams.

Wiring instructions for each electronic component scheduled herein.

Electrical Coordination: Coordinate with related sections the voltages and wiring details required at electrically controlled and operated hardware openings.

Proof of Certification: Provide copy of manufacturer(s) official certification or accreditation document indicating proof of status as a qualified installer of Windstorm assemblies.

Keying Schedule: After a keying meeting with the owner has taken place prepare a separate keying schedule detailing final instructions. Submit the keying schedule in electronic format. Include keying system explanation, door numbers, key set symbols, hardware set numbers and special instructions.

Owner must approve submitted keying schedule prior to the ordering of permanent cylinders/cores.

Informational Submittals:

Product Test Reports: Indicating compliance with cycle testing requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified independent testing agency.

Operating and Maintenance Manuals: Provide manufacturers operating and maintenance manuals for each item comprising the complete door hardware installation in quantity as required in Division 01, Closeout Submittals.

QUALITY ASSURANCE

Manufacturers Qualifications: Engage qualified manufacturers with a minimum 5 years of documented experience in producing hardware and equipment similar to that indicated for this Project and that have a proven record of successful in-service performance.

Installer Qualifications: A minimum 3 years documented experience installing both standard and electrified door hardware similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

Door Hardware Supplier Qualifications: Experienced commercial door hardware distributors with a minimum 5 years documented experience supplying both mechanical and electromechanical hardware installations comparable in material, design, and extent to that indicated for this Project. Supplier recognized as a factory direct distributor by the manufacturers of the primary materials with a warehousing facility in Project's vicinity. Supplier to have on staff a certified Architectural Hardware Consultant (AHC) available during the course of the Work to consult with Contractor, Architect, and Owner concerning both standard and electromechanical door hardware and keying.

Source Limitations: Obtain each type and variety of door hardware specified in this section from a single source unless otherwise indicated.

Electrified modifications or enhancements made to a source manufacturer's product line by a secondary or third party source will not be accepted.

Provide electromechanical door hardware from the same manufacturer as mechanical door hardware, unless otherwise indicated.

Each unit to bear third party permanent label demonstrating compliance with the referenced standards.
Keying Conference: Conduct conference to comply with requirements in Division 01 Section "Project Meetings." Keying conference to incorporate the following criteria into the final keying schedule document:

Function of building, purpose of each area and degree of security required.

Plans for existing and future key system expansion.

Requirements for key control storage and software.

Installation of permanent keys, cylinder cores and software.

Address and requirements for delivery of keys.

Pre-Submittal Conference: Conduct coordination conference in compliance with requirements in Division 01 Section "Project Meetings" with attendance by representatives of Supplier(s), Installer(s), and Contractor(s) to review proper methods and the procedures for receiving, handling, and installing door hardware.

Prior to installation of door hardware, conduct a project specific training meeting to instruct the installing contractors' personnel on the proper installation and adjustment of their respective products. Product training to be attended by installers of door hardware (including electromechanical hardware) for aluminum, hollow metal and wood doors. Training will include the use of installation manuals, hardware schedules, templates and physical product samples as required.

Inspect and discuss electrical roughing-in, power supply connections, and other preparatory work performed by other trades.

Review sequence of operation narratives for each unique access controlled opening.

Review and finalize construction schedule and verify availability of materials.

Review the required inspecting, testing, commissioning, and demonstration procedures
At completion of installation, provide written documentation that components were applied to manufacturer's instructions and recommendations and according to approved schedule.

DELIVERY, STORAGE, AND HANDLING

Inventory door hardware on receipt and provide secure lock-up and shelving for door hardware delivered to Project site. Do not store electronic access control hardware, software or accessories at Project site without prior authorization.

Tag each item or package separately with identification related to the final Door Hardware Schedule, and include basic installation instructions with each item or package.

Deliver, as applicable, permanent keys, cylinders, cores, access control credentials, software and related accessories directly to Owner via registered mail or overnight package service. Instructions for delivery to the Owner shall be established at the "Keying Conference".

COORDINATION

Templates: Obtain and distribute to the parties involved templates for doors, frames, and other work specified to be factory prepared for installing standard and electrified hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing hardware to comply with indicated requirements.

Door Hardware and Electrical Connections: Coordinate the layout and installation of scheduled electrified door hardware and related access control equipment with required connections to source power junction boxes, low voltage power supplies, detection and monitoring hardware, and fire and detection alarm systems.

Door and Frame Preparation: Doors and corresponding frames are to be prepared, reinforced and pre-wired (if applicable) to receive the installation of the specified electrified, monitoring, signaling and access control system hardware without additional in-field modifications.

WARRANTY

General Warranty: Reference Division 01, General Requirements. Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

Warranty Period: Written warranty, executed by manufacturer(s), agreeing to repair or replace components of standard and electrified door hardware that fails in materials or workmanship within specified warranty period after final acceptance by the Owner. Failures include, but are not limited to, the following:

Structural failures including excessive deflection, cracking, or breakage.

Faulty operation of the hardware.

Deterioration of metals, metal finishes, and other materials beyond normal weathering.

Electrical component defects and failures within the systems operation.

Standard Warranty Period: One year from date of Substantial Completion, unless otherwise indicated.

Special Warranty Periods:

Ten years for mortise locks and latches.

Five years for exit hardware.

Twenty five years for manual surface door closer bodies.

Two years for electromechanical door hardware.

MAINTENANCE SERVICE

Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.

PRODUCTS

SCHEDULED DOOR HARDWARE

General: Provide door hardware for each door to comply with requirements in Door Hardware Sets and each referenced section that products are to be supplied under.

Designations: Requirements for quantity, item, size, finish or color, grade, function, and other distinctive qualities of each type of door hardware are indicated in the Door Hardware Sets at the end of Part 3. Products are identified by using door hardware designations, as follows:

Named Manufacturer's Products: Product designation and manufacturer are listed for each door hardware type required for the purpose of establishing requirements. Manufacturers' names are abbreviated in the Door Hardware Schedule.

Substitutions: Requests for substitution and product approval for inclusive mechanical and electromechanical door hardware in compliance with the specifications must be submitted in writing and in accordance with the procedures and time frames outlined in Division 01, Substitution Procedures. Approval of requests is at the discretion of the architect, owner, and their designated consultants.

HANGING DEVICES

Hinges: ANSI/BHMA A156.1 certified butt hinges with number of hinge knuckles as specified in the Door Hardware Sets.

Quantity: Provide the following hinge quantity, unless otherwise indicated:

Two Hinges: For doors with heights up to 60 inches.

Three Hinges: For doors with heights 61 to 90 inches.

Four Hinges: For doors with heights 91 to 120 inches.

For doors with heights more than 120 inches, provide 4 hinges, plus 1 hinge for every 30 inches of door height greater than 120 inches.

Hinge Size: Provide the following, unless otherwise indicated, with hinge widths sized for door thickness and clearances required:

Widths up to 3’0”: 4-1/2” standard or heavy weight as specified.

Sizes from 3’1” to 4’0”: 5” standard or heavy weight as specified.

Hinge Weight and Base Material: Unless otherwise indicated, provide the following:

Exterior Doors: Heavy weight, non-ferrous, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate standard weight.

Interior Doors: Standard weight, steel, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate heavy weight.

Hinge Options: Comply with the following where indicated in the Hardware Sets or on Drawings:

Non-removable Pins: Provide set screw in hinge barrel that, when tightened into a groove in hinge pin, prevents removal of pin while door is closed; for the all out-swinging lockable doors.

Acceptable Manufacturers:

Bommer Industries (BO).
Hager Companies (HA).
McKinney Products (MK).

Continuous Geared Hinges: ANSI/BHMA A156.26 Grade 1-600 certified continuous geared hinge. with minimum 0.120-inch thick extruded 6060 T6 aluminum alloy hinge leaves and a minimum overall width of 4 inches. Hinges are non-handed, reversible and fabricated to template screw locations. Factory trim hinges to suit door height and prepare for electrical cut-outs.

Acceptable Manufacturers:

Bommer Industries (BO).
McKinney Products (MK).
Pemko Manufacturing (PE).

Sliding and Folding Door Hardware: Hardware is to be of type and design as specified and should comply with ANSI/BHMA A156.14.

Bi-folding Door Hardware: Rated for door panels weighing up to 125 lb.

Acceptable Manufacturers:

Hager Companies (HA).
Johnson Hardware (JO).
Pemko Manufacturing (PE).

POWER TRANSFER DEVICES

Concealed Quick Connect Electric Power Transfers: Provide concealed wiring pathway housing mortised into the door and frame for low voltage electrified door hardware. Furnish with Molex™ standardized plug connectors and sufficient number of concealed wires (up to 12) to accommodate the electrified functions specified in the Door Hardware Sets. Connectors plug directly to through-door wiring harnesses for connection to electric locking devices and power supplies. Wire nut connections are not acceptable.

Acceptable Manufacturers:

Pemko Manufacturing (PE) – EL-CEPT Series.
Securitron (SU) - EL-CEPT Series.
DOOR OPERATING TRIM

Flush Bolts and Surface Bolts: ANSI/BHMA A156.3 and A156.16, Grade 1, certified.

Manual flush bolts to be furnished with top rod of sufficient length to allow bolt location approximately six feet from the floor.

Furnish dust proof strikes for bottom bolts.

Surface bolts to be minimum 8” in length and U.L. listed for labeled fire doors and U.L. listed for windstorm components where applicable.

Provide related accessories (mounting brackets, strikes, coordinators, etc.) as required for appropriate installation and operation.

Acceptable Manufacturers:

Door Controls International (DC).
Rockwood Manufacturing (RO).
Trimco (TC).

Door Push Plates and Pulls: ANS/BHMA A156.6 certified door pushes and pulls of type and design specified in the Hardware Sets. Coordinate and provide proper width and height as required where conflicting hardware dictates.

Push/Pull Plates: Minimum .050 inch thick, size as indicated in hardware sets, with beveled edges, secured with exposed screws unless otherwise indicated.

Offset Pull Design: Size, shape, and material as indicated in the hardware sets. Minimum clearance of 2 1/2-inches from face of door and offset of 90 degrees unless otherwise indicated.

Fasteners: Provide manufacturer's designated fastener type as indicated in Hardware Sets.

Acceptable Manufacturers:

Burns Manufacturing (BU).
Rockwood Manufacturing (RO).
Trimco (TC).

CYLINDERS AND KEYING

General: Cylinder manufacturer to have minimum (10) years experience designing secured master key systems and have on record a published security keying system policy.

Source Limitations: Obtain each type of keyed cylinder and keys from the same source manufacturer as locksets and exit devices, unless otherwise indicated.

Cylinders: Original manufacturer cylinders complying with the following:

Mortise Type: Threaded cylinders with rings and cams to suit hardware application.

Rim Type: Cylinders with back plate, flat-type vertical or horizontal tailpiece, and raised trim ring.

Bored-Lock Type: Cylinders with tailpieces to suit locks.

Mortise and rim cylinder collars to be solid and recessed to allow the cylinder face to be flush and be free spinning with matching finishes.

Keyway: Manufacturer’s Standard.

Permanent Cores: Manufacturer's standard; finish face to match lockset; complying with the following:

Removable Cores: Core insert, removable by use of a special key, and for use with only the core manufacturer's cylinder and door hardware. Provide removable core (small or large format) as specified in Hardware Sets.

Patented Cylinders: ANSI/BHMA A156.5, Grade 1, certified cylinders employing a utility patented and restricted keyway requiring the use of patented controlled keys. Provide bump resistant, fixed core cylinders as standard with solid recessed cylinder collars. Cylinders are to be factory keyed where permanent keying records will be established and maintained.

Provide a 6 pin multi-level master key system comprised of patented controlled keys and security and high security cylinders operated by one (1) key of the highest level. Geographical exclusivity to be provided for all security and high security cylinders and UL437 certification where specified.

Level 2 Cylinders: Provide utility patented controlled keyway and side bar locking incorporating unique angled bottom pins for geographical exclusivity. Cylinders constructed to provide protection against bumping and picking.

Acceptable Manufacturers:

Sargent Manufacturing (SA) - Degree Series.
Corbin Russwin (RU) – Access 3 Series.

Keying System: Each type of lock and cylinders to be factory keyed.

Conduct specified "Keying Conference" to define and document keying system instructions and requirements.

Furnish factory cut, nickel-silver large bow permanently inscribed with a visual key control number as directed by Owner.

New System: Key locks to a new key system as directed by the Owner.

Key Quantity: Provide the following minimum number of keys:

Change Keys per Cylinder: Two (2)

Master Keys (per Master Key Level/Group): Five (5).

Construction Keys (where required): Ten (10).

Construction Keying: Provide construction master keyed cylinders.

Key Registration List (Bitting List):

Provide keying transcript list to Owner's representative in the proper format for importing into key control software.

Provide transcript list in writing or electronic file as directed by the Owner.

Key Control Cabinet: Provide a key control system including envelopes, labels, and tags with self-locking key clips, receipt forms, 3-way visible card index, temporary markers, permanent markers, and standard metal cabinet. Key control cabinet shall have expansion capacity of 150% of the number of locks required for the project.

Acceptable Manufacturers:

Lund Equipment (LU).
MMF Industries (MM).
Telkee (TK).

Key Control Software: Provide one network version of "Key Wizard" branded key management software package that includes one year of technical support and upgrades to software at no charge. Provide factory key system formatted for importing into “Key Wizard” software.

MECHANICAL LOCKS AND LATCHING DEVICES

Mortise Locksets, Grade 1 (Heavy Duty): ANSI/BHMA A156.13, Series 1000, Operational Grade 1 certified. Locksets are to be manufactured with a corrosion resistant steel case and be field-reversible for handing without disassembly of the lock body.

Acceptable Manufacturers:

Schlage Allegion- Ad-Series
Corbin Russwin Hardware (RU) – ML2000 Series.
Sargent Manufacturing (SA) – 8200 Series.

INTEGRATED WIEGAND OUTPUT LOCKING DEVICES – MULTI-CLASS READER

Integrated Wiegand Output Multi-Class Mortise Locks: Wiegand output ANSI A156.13, Grade 1, mortise lockset with integrated card reader, request-to-exit signaling, door position status switch, and latchbolt monitoring in one complete unit. Hard wired, solenoid driven locking/unlocking control of the lever handle trim, 3/4" deadlocking anti-friction latch, and 1" case-hardened steel deadbolt. Lock is U.L listed and labeled for use on up to 3 hour fire rated openings. Available with or without keyed high security cylinder override.

Open architecture, hard wired platform supports centralized control of locking units with new or existing Wiegand compatible access control systems. Latchbolt monitoring and door position switch act in conjunction to report door-in-frame (DPS) and door latched (door closed and latched) conditions.

Integrated reader supports the following credentials:

125kHz proximity credentials: HID, AWID, Indala, and EM4102.

13.56 MHz proximity credentials: HID iClass, HID iClass SE, SE for MIFARE Classic, DESFire EV1.
12VDC external power supply required for reader and lock, with optional 24VDC lock solenoid. Fail safe or fail secure options.

Energy Efficient Design: Provide lock bodies which have a holding current draw of 15mA maximum, and can operate on either 12 or 24 volts. Locks are to be field configurable for fail safe or fail secure operation.

Support end-of-line resistors contained within the lock case.

Installation requires only one cable run from the lock to the access control panel without requirements for additional proprietary lock panel interface boards or modules.

Installation to include manufacturer's access control panel interface board or module where required for Wiegand output protocol.

Acceptable Manufacturers:

Schlage Allegion- Ad-Series
Corbin Russwin (RU) – ML2000 SE-LP10 Series.
Sargent Manufacturing (SA) – M1 8200 Series.

AUXILIARY LOCKS

Mortise Deadlocks, Small Case: ANSI/BHMA A156.5, Grade 1, certified small case mortise type deadlocks constructed of heavy gauge wrought corrosion resistant steel. Steel or stainless steel bolts with a 1" throw and hardened steel roller pins. Deadlocks to be products of the same source manufacturer and keyway as other specified locksets.

Acceptable Manufacturers:

Schlage Allegion- Ad-Series
Corbin Russwin Hardware (RU) - DL4100 Series.
Sargent Manufacturing (SA) - 4870 Series.

LOCK AND LATCH STRIKES

Strikes: Provide manufacturer's standard strike with strike box for each latch or lock bolt, with curved lip extended to protect frame, finished to match door hardware set, unless otherwise indicated, and as follows:

Flat-Lip Strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.

Extra-Long-Lip Strikes: For locks used on frames with applied wood casing trim.

Aluminum-Frame Strike Box: Provide manufacturer's special strike box fabricated for aluminum framing.

Double-lipped strikes: For locks at double acting doors. Furnish with retractable stop for rescue hardware applications.

Standards: Comply with the following:

Strikes for Mortise Locks and Latches: BHMA A156.13.
Strikes for Bored Locks and Latches: BHMA A156.2.
Strikes for Auxiliary Deadlocks: BHMA A156.5.
Dustproof Strikes: BHMA A156.16.

CONVENTIONAL EXIT DEVICES

General Requirements: All exit devices specified herein shall meet or exceed the following criteria:

At doors not requiring a fire rating, provide devices complying with NFPA 101 and listed and labeled for "Panic Hardware" according to UL305. Provide proper fasteners as required by manufacturer including sex nuts and bolts at openings specified in the Hardware Sets.

Where exit devices are required on fire rated doors, provide devices complying with NFPA 80 and with UL labeling indicating "Fire Exit Hardware". Provide devices with the proper fasteners for installation as tested and listed by UL. Consult manufacturer’s catalog and template book for specific requirements. Except on fire rated doors, provide exit devices with hex key dogging device to hold the pushbar and latch in a retracted position. Provide optional keyed cylinder dogging on devices where specified in Hardware Sets.

Devices must fit flat against the door face with no gap that permits unauthorized dogging of the push bar. The addition of filler strips is required in any case where the door light extends behind the device as in a full glass configuration.

Electromechanical Options: Subject to same compliance standards and requirements as mechanical exit devices, electrified devices to be of type and design as specified in hardware sets. Include any specific controllers when conventional power supplies are not sufficient to provide the proper inrush current.

Lever Operating Trim: Where exit devices require lever trim, furnish manufacturer's heavy duty escutcheon trim with threaded studs for thru-bolts.

Lock Trim Design: As indicated in Hardware Sets, provide finishes and designs to match that of the specified locksets.

Where function of exit device requires a cylinder, provide a cylinder (Rim or Mortise) as specified in Hardware Sets.

Vertical Rod Exit Devices: Where surface or concealed vertical rod exit devices are used at interior openings, provide as less bottom rod (LBR) unless otherwise indicated. Provide dust proof strikes where thermal pins are required to project into the floor.

Narrow Stile Applications: At doors constructed with narrow stiles, or as specified in Hardware Sets, provide devices designed for maximum 2” wide stiles.

Dummy Push Bar: Nonfunctioning push bar matching functional push bar.

Rail Sizing: Provide exit device rails factory sized for proper door width application.

Through Bolt Installation: For exit devices and trim as indicated in Door Hardware Sets.

Conventional Push Rail Exit Devices (Heavy Duty): ANSI/BHMA A156.3, Grade 1 certified panic and fire exit hardware devices furnished in the functions specified in the Hardware Sets. Exit device latch to be stainless steel, pullman type, with deadlock feature.

Acceptable Manufacturers:

Schlage Allegion- Ad-Series
Corbin Russwin Hardware (RU) - ED4000 / ED5000 Series.
Sargent Manufacturing (SA) - 80 Series.
Von Duprin (VD) – 98/99 Series.

INTEGRATED WIEGAND OUTPUT EXIT DEVICES – MULTI-CLASS READER

Integrated Wiegand Output Multi-Class Exit Hardware: Wiegand output ANSI 156.3 Grade 1 rim, mortise, and vertical rod exit device hardware with integrated proximity card reader, latchbolt and touchbar monitoring, and request-to-exit signaling, in one complete unit. Hard wired, solenoid driven locking/unlocking control of the lever handle exit trim with 3/4" throw latch bolt. U.L listed and labeled for either panic or "fire exit hardware" for use on up to 3 hour fire rated openings. Available with or without keyed high security cylinder override.

Open architecture, hard wired platform supports centralized control of locking units with new or existing Wiegand compatible access control systems. Inside push bar (request-to-exit) signaling and door position (open/closed status) monitoring (via separately connected DPS).

Integrated reader supports the following credentials:

125kHz proximity credentials: HID, AWID, Indala, and EM4102.

13.56 MHz proximity credentials: HID iClass, HID iClass SE, SE for MIFARE Classic, DESFire EV1.

12VDC external power supply required for reader. 24VDC required for solenoid operated exit trim. Fail safe or fail secure options.

Installation requires only one cable run from the exit hardware to the access control panel without requirements for additional proprietary lock panel interface boards or modules.

Competitor Alternates Allowed Option>Installation to include manufacturer's access control panel interface board or module where required for Wiegand output protocol.

Acceptable Manufacturers:

Schlage Allegion- Ad-Series
Corbin Russwin (RU) – ED5000 SE-LP10 Series.
Sargent Manufacturing (SA) – M1 80 Series.

DOOR CLOSERS

All door closers specified herein shall meet or exceed the following criteria:

General: Door closers to be from one manufacturer, matching in design and style, with the same type door preparations and templates regardless of application or spring size. Closers to be non-handed with full sized covers including installation and adjusting information on inside of cover.

Standards: Closers to comply with UL-10C for Positive Pressure Fire Test and be U.L. listed for use of fire rated doors.

Cycle Testing: Provide closers which have surpassed 15 million cycles in a test witnessed and verified by UL.

Size of Units: Comply with manufacturer's written recommendations for sizing of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Where closers are indicated for doors required to be accessible to the physically handicapped, provide units complying with ANSI ICC/A117.1.

Closer Arms: Provide heavy duty, forged steel closer arms unless otherwise indicated in Hardware Sets.

Closers shall not be installed on exterior or corridor side of doors; where possible install closers on door for optimum aesthetics.

Closer Accessories: Provide door closer accessories including custom templates, special mounting brackets, spacers and drop plates, and through-bolt and security type fasteners as required for proper installation.

Door Closers, Surface Mounted (Heavy Duty): ANSI/BHMA A156.4, Grade 1 surface mounted, heavy duty door closers with complete spring power adjustment, sizes 1 thru 6; and fully operational adjustable according to door size, frequency of use, and opening force. Closers to be rack and pinion type, one piece cast iron or aluminum alloy body construction, with adjustable backcheck and separate non-critical valves for closing sweep and latch speed control. Provide non-handed units standard.

Acceptable Manufacturers:

Schlage Allegion- Ad-Series
Corbin Russwin Hardware (RU) – DC6000 Series.
Sargent Manufacturing (SA) - 351 Series.
Norton Door Controls (NO) - 7500 Series.

ARCHITECTURAL TRIM

Door Protective Trim

General: Door protective trim units to be of type and design as specified below or in the Hardware Sets. Size: Fabricate protection plates (kick, armor, or mop) not more than 2" less than door width (LDW) on stop side of single doors and 1” LDW on stop side of pairs of doors, and not more than 1" less than door width on pull side. Coordinate and provide proper width and height as required where conflicting hardware dictates. Height to be as specified in the Hardware Sets.

Protection Plates: ANSI/BHMA A156.6 certified protection plates (kick, armor, or mop), fabricated from the following:

Stainless Steel: 300 grade, 050-inch thick.

Options and fasteners: Provide manufacturer's designated fastener type as specified in the Hardware Sets. Provide countersunk screw holes.

Acceptable Manufacturers:

Burns Manufacturing (BU).
Rockwood Manufacturing (RO).
Trimco (TC).

DOOR STOPS AND HOLDERS

General: Door stops and holders to be of type and design as specified below or in the Hardware Sets.

Door Stops and Bumpers: ANSI/BHMA A156.16, Grade 1 certified door stops and wall bumpers. Provide wall bumpers, either convex or concave types with anchorage as indicated, unless floor or other types of door stops are specified in Hardware Sets. Do not mount floor stops where they will impede traffic. Where floor or wall bumpers are not appropriate, provide overhead type stops and holders.

Acceptable Manufacturers:

Burns Manufacturing (BU).
Rockwood Manufacturing (RO).
Trimco (TC).

Overhead Door Stops and Holders: ANSI/BHMA A156.6, Grade 1 certified overhead stops and holders to be surface or concealed types as indicated in Hardware Sets. Track, slide, arm and jamb bracket to be constructed of extruded bronze and shock absorber spring of heavy tempered steel. Provide non-handed design with mounting brackets as required for proper operation and function.

Acceptable Manufacturers:

Rixson Door Controls (RF).
Rockwood Manufacturing (RO).
Sargent Manufacturing (SA).

ARCHITECTURAL SEALS

General: Thresholds, weatherstripping, and gasket seals to be of type and design as specified below or in the Hardware Sets. Provide continuous weatherstrip gasketing on exterior doors and provide smoke, light, or sound gasketing on interior doors where indicated. At exterior applications provide non-corrosive fasteners and elsewhere where indicated.

Smoke Labeled Gasketing: Assemblies complying with NFPA 105 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for smoke control ratings indicated, based on testing according to UL 1784.

Provide smoke labeled perimeter gasketing at all smoke labeled openings.

Fire Labeled Gasketing: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to UL-10C.

Provide intumescent seals as indicated to meet UL10C Standard for Positive Pressure Fire Tests of Door Assemblies, and UBC 7-2, Fire Tests of Door Assemblies.

Sound-Rated Gasketing: Assemblies that are listed and labeled by a testing and inspecting agency, for sound ratings indicated.

Replaceable Seal Strips: Provide only those units where resilient or flexible seal strips are easily replaceable and readily available from stocks maintained by manufacturer.

Acceptable Manufacturers:

National Guard Products (NG).
Pemko Manufacturing (PE).
Reese Enterprises, Inc. (RE).

ELECTRONIC ACCESSORIES

Door Position Switches: Door position magnetic reed contact switches specifically designed for use in commercial door applications. On recessed models the contact and magnetic housing snap-lock into a 1" diameter hole. Surface mounted models include wide gap distance design complete with armored flex cabling. Provide SPDT, N/O switches with optional Rare Earth Magnet installation on steel doors with flush top channels.

Acceptable Manufacturers:

Schlage Allegion- Ad-Series
Sargent Manufacturing (SA) – 3280 Series.
Security Door Controls (SD) - DPS Series.
Securitron (SU) - DPS Series.

Power Supplies: Provide Nationally Recognized Testing Laboratory Listed 12VDC or 24VDC (field selectable) filtered and regulated power supplies. Include battery backup option with integral battery charging capability in addition to operating the DC load in event of line voltage failure. Provide the least number of units, at the appropriate amperage level, sufficient to exceed the required total draw for the specified electrified hardware and access control equipment.

Acceptable Manufacturers:

Schlage Allegion- Ad-Series
Corbin Russwin Hardware (RU) – 782.
Securitron (SU) - BPS Series.
Von Duprin (VD) – PS Series.

FABRICATION

Fasteners: Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. Provide screws according to manufacturers recognized installation standards for application intended.

FINISHES

Standard: Designations used in the Hardware Sets and elsewhere indicate hardware finishes complying with ANSI/BHMA A156.18, including coordination with traditional U.S. finishes indicated by certain manufacturers for their products.

Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware.

Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

EXECUTION

EXAMINATION

Examine scheduled openings, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.

Notify architect of any discrepancies or conflicts between the door schedule, door types, drawings and scheduled hardware. Proceed only after such discrepancies or conflicts have been resolved in writing.

PREPARATION

Hollow Metal Doors and Frames: Comply with ANSI/DHI A115 series.

Wood Doors: Comply with ANSI/DHI A115-W series.

INSTALLATION

Install each item of mechanical and electromechanical hardware and access control equipment to comply with manufacturer's written instructions and according to specifications.

Installers are to be trained and certified by the manufacturer on the proper installation and adjustment of fire, life safety, and security products including: hanging devices; locking devices; closing devices; and seals.

Mounting Heights: Mount door hardware units at heights indicated in following applicable publications, unless specifically indicated or required to comply with governing regulations:

Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."

Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors."

Where indicated to comply with accessibility requirements, comply with ANSI A117.1 "Accessibility Guidelines for Buildings and Facilities."

Provide blocking in drywall partitions where wall stops or other wall mounted hardware is located. Retrofitting: Install door hardware to comply with manufacturer's published templates and written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in Division 9 Sections. Do not install surface-mounted items until finishes have been completed on substrates involved.

Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 7 Section "Joint Sealants."

Storage: Provide a secure lock up for hardware delivered to the project but not yet installed. Control the handling and installation of hardware items so that the completion of the work will not be delayed by hardware losses before and after installation.

FIELD QUALITY CONTROL

Field Inspection: Supplier will perform a final inspection of installed door hardware and state in report whether work complies with or deviates from requirements, including whether door hardware is properly installed, operating and adjusted.

ADJUSTING

Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

CLEANING AND PROTECTION

Protect all hardware stored on construction site in a covered and dry place. Protect exposed hardware installed on doors during the construction phase. Install any and all hardware at the latest possible time frame.

Clean adjacent surfaces soiled by door hardware installation.

Clean operating items as necessary to restore proper finish. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of owner occupancy.

DEMONSTRATION

Instruct Owner's maintenance personnel to adjust, operate, and maintain mechanical and electromechanical door hardware.

DOOR HARDWARE SETS

The hardware sets represent the design intent and direction of the owner and architect. They are a guideline only and should not be considered a detailed hardware schedule. Discrepancies, conflicting hardware and missing items should be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application and functionality.

Manufacturer's Abbreviations:

1. MK - McKinney
2. PE - Pemko
3. RO - Rockwood
4. SA - Sargent
5. RF - Rixson
6. NO - Norton
7. OT - By Others
8. SU - Securitron
9. LU - Lund Equipment Co., Inc.

Hardware Schedule

Set: 1.0

Doors: 100 (12)

2	Continuous Hinge w/PT	CFM SLF-HD1 PT x Length Required		PE
1	Exit Device	16 55 56 AD8610	US32D	SA
1	Access Control CVR	DG260 16 56-M1-AD-8610 106	US32D	SA
3	Core	DG2 6300	US15	SA
2	Pull	RM202 Mtg-Type 12XHD	US32D	RO
2	Door Closer	CPS7500	600 x 689	NO
1	Threshold	273x224AFGT MSES25SS x Length Required		PE
1	Gasketing	Provided by Frame Supplier		OT
2	Sweep	3452CNB x Length Required		PE
2	Electric Power Transfer	EL-CEPT		SU
3	Door Wire Harness	QC-C3**** x Length / Type as Required)		MK
2	Frame Wire Harness	QC-C1500P		MK
1	Position Switch	DPS-M / W-BK		SU
1	Power Supply	BPS (Size & Type as Required)		SU

Notes:
Electronic Operation: Free egress at all times. Presenting valid credential to card reader, incorporated in exit device trim, retracts latch bolts allowing entry. Entry also possible via key override. Request to exit switches, incorporated in exit device push pads, signal an authorized egress. Door position switches, incorporated in exit device trim for active leaf and auxiliary for inactive leaf, monitor doors status. Fail Secure.

Set: 2.0

Doors: S1-1A (14)

1	Continuous Hinge w/PT	CFM SLF-HD1 PT x Length Required		PE
1	Access Control Rim Exit	DG260 16 M1-8876-12V-BIPS ETL	US32D	SA
1	Core	DG2 6300	US15	SA
1	Door Closer	CPS7500	689	NO
1	Kick Plate	K1050 10" high 4BE CSK	US32D	RO
1	Threshold	273x224AFGT MSES25SS x Length Required		PE
1	Gasketing	Provided by Frame Supplier		OT
1	Sweep	3452CNB x Length Required		PE
1	Electric Power Transfer	EL-CEPT		SU
1	Door Wire Harness	QC-C3**** x Length / Type as Required)		MK
1	Frame Wire Harness	QC-C1500P		MK
1	Position Switch	DPS-M / W-BK		SU
1	Card Reader	Provided by Security Supplier		OT
1	Alarm	PZ1		SU
1	Power Supply	BPS (Size & Type as Required)		SU

Notes:
Electronic Operation:
Ingress: Presenting valid credential to card reader, incorporated in trim, releases lever allowing entry. Entry also possible via key override. Door position switch, incorporated in exit device push pad, monitors door status. Fail Secure.
Egress: Free egress at all times. Presenting valid credential to wall mounted card reader, provided by security supplier, temporarily deactivates auxiliary door position switch allowing egress without activating audible alarm. Egressing without first presenting valid credential to card reader activates audible alarm.

Set: 3.0

Doors: 113 (13)

1	Continuous Hinge w/PT	CFM SLF-HD1 PT x Length Required		PE
1	Access Control Mort Lock	DG260 M1-82271-12V-BIPS LNL	US26D	SA
1	Core	DG2 6300	US15	SA

1	Door Closer	CPS7500	600 x 689	NO
1	Threshold	273x224AFGT MSES25SS x Length Required		PE
1	Gasketing	Provided by Frame Supplier		OT
1	Sweep	3452CNB x Length Required		PE
1	Electric Power Transfer	EL-CEPT		SU
1	Door Wire Harness	QC-C3**** x Length / Type as Required)		MK
1	Frame Wire Harness	QC-C1500P		MK
1	Power Supply	BPS (Size & Type as Required)		SU

Notes:

Electronic Operation: Free egress at all times. Presenting valid credential to card reader, incorporated in lockset, releases lever allowing entry. Entry also possible via key override. Request to exit switch, incorporated in lockset, signals an authorized egress. Door position switch, incorporated in lockset, monitors door status. Fail Secure.

Set: 4.0

Doors: 119 (15), 137 (16)

2	Hinge (heavy weight)	T4A3786 NRP	US26D	MK
1	Hinge (heavy weight)	T4A3786 NRP QC12	US26D	MK
1	Access Control Rim Exit	DG260 16 M1-8876-12V-BIPS ETL	US32D	SA
1	Core	DG2 6300	US15	SA
1	Door Closer	PR7500	689	NO
1	Kick Plate	K1050 10" high 4BE CSK	US32D	RO
1	Door Stop	403 (or) 441CU (As Required Per Condition)	US26D	RO
3	Silencer	608 (or) 609 (As Required)		RO
1	Door Wire Harness	QC-C3**** x Length / Type as Required)		MK
1	Frame Wire Harness	QC-C1500P		MK
1	Power Supply	BPS (Size & Type as Required)		SU

Notes:
Electronic Operation: Free egress at all times. Presenting valid credential to card reader, incorporated in lockset, releases lever allowing entry. Entry also possible via key override. Request to exit switch, incorporated in trim, signals an authorized egress. Door position switch, incorporated in exit device push pad, monitors door status. Fail Secure.

Set: 5.0

Doors: 107 (29)

2	Hinge (heavy weight)	T4A3786 NRP	US26D	MK
1	Hinge (heavy weight)	T4A3786 NRP QC12	US26D	MK
1	Access Control Rim Exit	DG260 16 M1-8876-12V-BIPS ETL	US32D	SA
1	Core	DG2 6300	US15	SA
1	Door Closer	CLP7500	689	NO
1	Kick Plate	K1050 10" high 4BE CSK	US32D	RO
1	Door Stop	403 (or) 441CU (As Required Per Condition)	US26D	RO
1	Door Wire Harness	QC-C3**** x Length / Type as Required)		MK
1	Frame Wire Harness	QC-C1500P		MK
1	Power Supply	BPS (Size & Type as Required)		SU

Notes:
Electronic Operation: Free egress at all times. Presenting valid credential to card reader, incorporated in lockset, releases lever allowing entry. Entry also possible via key override. Request to exit switch, incorporated in trim, signals an authorized egress. Door position switch, incorporated in exit device push pad, monitors door status. Fail Secure.

Set: 6.0

Doors: 120 (18), 124 (18)

2	Hinge (heavy weight)	T4A3786 NRP	US26D	MK
1	Hinge (heavy weight)	T4A3786 NRP QC12	US26D	MK
1	Access Control Rim Exit	DG260 16 M1-8876-12V-BIPS ETL	US32D	SA
1	Core	DG2 6300	US15	SA
1	Door Closer	CLP7500	689	NO
1	Kick Plate	K1050 10" high 4BE CSK	US32D	RO
1	Door Stop	403 (or) 441CU (As Required Per Condition)	US26D	RO
1	Door Wire Harness	QC-C3**** x Length / Type as Required)		MK
1	Frame Wire Harness	QC-C1500P		MK
1	Position Switch	DPS-M / W-BK		SU
1	Card Reader	Provided by Security Supplier		OT
1	Alarm	PZ1		SU
1	Power Supply	BPS (Size & Type as Required)		SU

Notes:
Electronic Operation:
Ingress: Presenting valid credential to card reader, incorporated in trim, releases lever allowing entry.

Entry also possible via key override. Door position switch, incorporated in exit device push pad, monitors door status. Fail Secure.
Egress: Free egress at all times. Presenting valid credential to wall mounted card reader, provided by security supplier, temporarily deactivates auxiliary door position switch allowing egress without activating audible alarm. Egressing without first presenting valid credential to card reader activates audible alarm.

Set: 7.0

Doors: 218 (31)

2	Hinge (heavy weight)	T4A3786 NRP	US26D	MK
1	Hinge (heavy weight)	T4A3786 NRP QC12	US26D	MK
1	Access Control Rim Exit	DG260 12 M1-8876-12V-BIPS ETL	US32D	SA
1	Core	DG2 6300	US15	SA
1	Door Closer	CLP7500	689	NO
1	Kick Plate	K1050 10" high 4BE CSK	US32D	RO
1	Gasketing	S88D (Head & Jambs)		PE
1	Door Wire Harness	QC-C3**** x Length / Type as Required)		MK
1	Frame Wire Harness	QC-C1500P		MK
1	Power Supply	BPS (Size & Type as Required)		SU

Notes:
Electronic Operation: Free egress at all times. Presenting valid credential to card reader, incorporated in lockset, releases lever allowing entry. Entry also possible via key override. Request to exit switch, incorporated in trim, signals an authorized egress. Door position switch, incorporated in exit device push pad, monitors door status. Fail Secure.

Set: 8.0

Doors: S1-2 (32), S2-B (32)

1	Continuous Hinge w/PT	CFM HD1 PT x Length Required		PE
1	Exit Device	DG260 12 M1-8875-24V-BIPS ETL	US32D	SA
1	Core	DG2 6300	US15	SA
1	Door Closer	7500	689	NO
1	Kick Plate	K1050 10" high 4BE CSK	US32D	RO
1	Door Stop	403 (or) 441CU (As Required Per Condition)	US26D	RO
1	Gasketing	S88D (Head & Jambs)		PE
1	Electric Power Transfer	EL-CEPT		SU
1	Door Wire Harness	QC-C3**** x Length / Type as Required)		MK
1	Frame Wire Harness	QC-C1500P		MK
1	Power Supply	BPS (Size & Type as Required)		SU

Notes:
Electronic Operation: Free egress at all times. Presenting valid credential to card reader, incorporated in trim. unlocks lever allowing entry. Entry also possible via key override. Request to exit switch, incorporated in exit device push pad, signals an authorized egress. Door position switch monitors door status. Fail Safe. Integrate with fire alarm system to unlock exit device trim upon alarm activation. Also integrate with fire command panel to allow for unlocking of exit device trim via remote signal.

Set: 9.0

Doors: S1-B (32)

1	Continuous Hinge w/PT	CFM HD1 PT x Length Required		PE
1	Exit Device	12 54 8815 ETL	US32D	SA
1	Door Closer	7500	689	NO
1	Kick Plate	K1050 10" high 4BE CSK	US32D	RO
1	Door Stop	403 (or) 441CU (As Required Per Condition)	US26D	RO
1	Gasketing	S88D (Head & Jambs)		PE
1	Electric Power Transfer	EL-CEPT		SU
1	Door Wire Harness	QC-C3**** x Length / Type as Required)		MK
1	Frame Wire Harness	QC-C1500P		MK
1	Position Switch	DPS-M / W-BK		SU
1	Card Reader	Provided by Security Supplier		OT
1	Alarm	PZ1		SU
1	Power Supply	BPS (Size & Type as Required)		SU

Notes:
Electronic Operation:
Ingress: Signal switch in exit device trim temporarily deactivates door position switch allowing entry without activating audible alarm.
Egress: Free egress at all times. Presenting valid credential to wall mounted card reader, provided by security supplier, temporarily deactivates auxiliary door position switch allowing egress without activating audible alarm. Egressing without first presenting valid credential to card reader activates audible alarm.

Set: 10.0

Doors: S2-1A (3), S2-1B (3)

3	Hinge (heavy weight)	T4A3786 NRP	US26D	MK
1	Exit Device	DG260 12 8813 ETL	US32D	SA
1	Core	DG2 6300	US15	SA
1	Door Closer	PR7500	689	NO

1	Kick Plate	K1050 10" high 4BE CSK	US32D	RO
1	Door Stop	403 (or) 441CU (As Required Per Condition)	US26D	RO
1	Gasketing	S88D (Head & Jambs)		PE

Set: 11.0

Doors: 136 (28), B13 (31)

3	Hinge (heavy weight)	T4A3786 NRP	US26D	MK
1	Exit Device	DG260 12 8813 ETL	US32D	SA
1	Core	DG2 6300	US15	SA
1	Door Closer	CLP7500	689	NO
1	Kick Plate	K1050 10" high 4BE CSK	US32D	RO
1	Gasketing	S88D (Head & Jambs)		PE

Set: 12.0

Doors: S2-2 (32)

1	Continuous Hinge	CFM_HD1 x Length Required		PE
1	Exit Device	12 8815 ETL	US32D	SA
1	Door Closer	7500	689	NO
1	Kick Plate	K1050 10" high 4BE CSK	US32D	RO
1	Door Stop	403 (or) 441CU (As Required Per Condition)	US26D	RO
1	Gasketing	S88D (Head & Jambs)		PE

Set: 13.0

Doors: 104 (33), 108 (17), 203 (25), 204 (17), 205 (17), 206 (17), 210 (26), 220A (17), 220B (17), 221 (27), B08 (34), B09 (8), B14 (2), B17 (2)

2	Hinge (heavy weight)	T4A3786	US26D	MK
1	Hinge (heavy weight)	T4A3786 QC12	US26D	MK
1	Access Control Mort Lock	DG260 M1-82271-12V-BIPS LNL	US26D	SA
1	Core	DG2 6300	US15	SA
1	Door Closer	7500	689	NO
1	Kick Plate	K1050 10" high 4BE CSK	US32D	RO
1	Door Stop	403 (or) 441CU (As Required Per Condition)	US26D	RO
3	Silencer	608 (or) 609 (As Required)		RO
1	Door Wire Harness	QC-C3**** x Length / Type as Required)		MK
1	Frame Wire Harness	QC-C1500P		MK

1 Power Supply	BPS (Size & Type as Required)		SU

Notes:
Electronic Operation: Free egress at all times. Presenting valid credential to card reader, incorporated in lockset trim, unlocks lever allowing entry. Entry also possible via key override. Request to exit switch, incorporated in inside lever, signals an authorized egress. Door position switch, incorporated in lockset, monitors door status. Fail Secure.

Set: 14.0

Doors: 103 (33), 121 (35), B04 (39)

2 Hinge (heavy weight)	T4A3786	US26D	MK
1 Hinge (heavy weight)	T4A3786 QC12	US26D	MK
1 Access Control Mort Lock	DG260 M1-82271-12V-BIPS LNL	US26D	SA
1 Core	DG2 6300	US15	SA
1 Door Closer	7500	689	NO
1 Kick Plate	K1050 10" high 4BE CSK	US32D	RO
1 Door Stop	403 (or) 441CU (As Required Per Condition)	US26D	RO
3 Silencer	608 (or) 609 (As Required)		RO
1 Door Wire Harness	QC-C3**** x Length / Type as Required)		MK
1 Frame Wire Harness	QC-C1500P		MK
1 Position Switch	DPS-M / W-BK		SU
1 Card Reader	Provided by Security Supplier		OT
1 Power Supply	BPS (Size & Type as Required)		SU

Notes:
Electronic Operation:
Ingress: Presenting valid credential to card reader, incorporated in lockset trim, unlocks lever allowing entry. Entry also possible via key override. Door position switch, incorporated in lockset, monitors door status. Fail Secure.
Egress: Free egress at all times. Presenting valid credential to wall mounted card reader, provided by security supplier, temporarily deactivates auxiliary door position switch allowing egress without activating audible alarm. Egressing without first presenting valid credential to card reader activates audible alarm.

Set: 15.0

Doors: 127B (20)

2 Hinge (heavy weight)	T4A3786	US26D	MK
1 Hinge (heavy weight)	T4A3786 QC12	US26D	MK
1 Access Control Mort Lock	DG260 M1-82271-12V-BIPS LNL	US26D	SA
1 Core	DG2 6300	US15	SA

1	Door Closer	7500	689	NO
1	Kick Plate	K1050 10" high 4BE CSK	US32D	RO
1	Door Stop	403 (or) 441CU (As Required Per Condition)	US26D	RO
1	Threshold	171A x Length Required MS25SS		PE
1	Gasketing	S88D (Head & Jambs)		PE
3	Silencer	608 (or) 609 (As Required)		RO
1	Door Wire Harness	QC-C3**** x Length / Type as Required)		MK
1	Frame Wire Harness	QC-C1500P		MK
1	Position Switch	DPS-M / W-BK		SU
1	Card Reader	Provided by Security Supplier		OT
1	Power Supply	BPS (Size & Type as Required)		SU

Notes:
Electronic Operation:
Ingress: Presenting valid credential to card reader, incorporated in lockset trim, unlocks lever allowing entry. Entry also possible via key override. Door position switch, incorporated in lockset, monitors door status. Fail Secure.
Egress: Free egress at all times. Presenting valid credential to wall mounted card reader, provided by security supplier, temporarily deactivates auxiliary door position switch allowing egress without activating audible alarm. Egressing without first presenting valid credential to card reader activates audible alarm.

Set: 16.0

Doors: 101 (43), 216 (43), B07 (42), B20 (44)

2	Hinge (heavy weight)	T4A3786	US26D	MK
1	Hinge (heavy weight)	T4A3786 QC12	US26D	MK
1	Access Control Mort Lock	DG260 M1-82271-12V-BIPS LNL	US26D	SA
1	Core	DG2 6300	US15	SA
1	Door Closer	7500	689	NO
1	Kick Plate	K1050 10" high 4BE CSK	US32D	RO
1	Mop Plate	K1050 6" high 4BE CSK	US32D	RO
1	Door Stop	403 (or) 441CU (As Required Per Condition)	US26D	RO
3	Silencer	608 (or) 609 (As Required)		RO
1	Door Wire Harness	QC-C3**** x Length / Type as Required)		MK
1	Frame Wire Harness	QC-C1500P		MK
1	Power Supply	BPS (Size & Type as Required)		SU

Notes:
Electronic Operation: Free egress at all times. Presenting valid credential to card reader, incorporated in lockset trim, unlocks lever allowing entry. Entry also possible via key override. Request to exit

switch, incorporated in inside lever, signals an authorized egress. Door position switch, incorporated in lockset, monitors door status. Fail Secure.

Set: 17.0

Doors: B05 (11)

2	Hinge (heavy weight)	T4A3786 NRP	US26D	MK
1	Hinge (heavy weight)	T4A3786 NRP QC12	US26D	MK
1	Access Control Mort Lock	DG260 M1-82271-12V-BIPS LNL	US26D	SA
1	Core	DG2 6300	US15	SA
1	Door Closer	CLP7500	689	NO
1	Kick Plate	K1050 10" high 4BE CSK	US32D	RO
3	Silencer	608 (or) 609 (As Required)		RO
1	Door Wire Harness	QC-C3**** x Length / Type as Required)		MK
1	Frame Wire Harness	QC-C1500P		MK
1	Power Supply	BPS (Size & Type as Required)		SU

Notes:
Electronic Operation: Free egress at all times. Presenting valid credential to card reader, incorporated in lockset trim, unlocks lever allowing entry. Entry also possible via key override. Request to exit switch, incorporated in inside lever, signals an authorized egress. Door position switch, incorporated in lockset, monitors door status. Fail Secure.

Set: 18.0

Doors: 102A (30)

2	Hinge (heavy weight)	T4A3786	US26D	MK
1	Hinge (heavy weight)	T4A3786 QC12	US26D	MK
1	Access Control Mort Lock	DG260 M1-82271-12V-BIPS LNL	US26D	SA
1	Core	DG2 6300	US15	SA
1	Door Closer	CLP7500	689	NO
1	Kick Plate	K1050 10" high 4BE CSK	US32D	RO
3	Silencer	608 (or) 609 (As Required)		RO
1	Door Wire Harness	QC-C3**** x Length / Type as Required)		MK
1	Frame Wire Harness	QC-C1500P		MK
1	Position Switch	DPS-M / W-BK		SU
1	Card Reader	Provided by Security Supplier		OT
1	Power Supply	BPS (Size & Type as Required)		SU

Notes:
Electronic Operation:
Ingress: Presenting valid credential to card reader, incorporated in lockset trim, unlocks lever allowing

entry. Entry also possible via key override. Door position switch, incorporated in lockset, monitors door status. Fail Secure.
Egress: Free egress at all times. Presenting valid credential to wall mounted card reader, provided by security supplier, temporarily deactivates auxiliary door position switch allowing egress without activating audible alarm. Egressing without first presenting valid credential to card reader activates audible alarm.

Set: 19.0

Doors: 105 (38), B02 (5)

2	Hinge (heavy weight)	T4A3786	US26D	MK
1	Hinge (heavy weight)	T4A3786 QC12	US26D	MK
1	Access Control Mort Lock	DG260 M1-82271-12V-BIPS LNL	US26D	SA
1	Core	DG2 6300	US15	SA
1	Surface Overhead Stop	10-X36	630	RF
1	Door Closer	7500	689	NO
1	Drop Plate	7786OH	689	NO
1	Kick Plate	K1050 10" high 4BE CSK	US32D	RO
3	Silencer	608 (or) 609 (As Required)		RO
1	Door Wire Harness	QC-C3**** x Length / Type as Required)		MK
1	Frame Wire Harness	QC-C1500P		MK
1	Power Supply	BPS (Size & Type as Required)		SU

Notes:
Electronic Operation: Free egress at all times. Presenting valid credential to card reader, incorporated in lockset trim, unlocks lever allowing entry. Entry also possible via key override. Request to exit switch, incorporated in inside lever, signals an authorized egress. Door position switch, incorporated in lockset, monitors door status. Fail Secure.

Set: 20.0

Doors: 211 (26), 214 (26), B15 (40)

2	Hinge (heavy weight)	T4A3786	US26D	MK
1	Hinge (heavy weight)	T4A3786 QC12	US26D	MK
1	Access Control Mort Lock	DG260 M1-82271-12V-BIPS LNL	US26D	SA
1	Core	DG2 6300	US15	SA
1	Door Closer	7500	689	NO
1	Kick Plate	K1050 10" high 4BE CSK	US32D	RO
1	Door Stop	403 (or) 441CU (As Required Per Condition)	US26D	RO
1	Gasketing	S88D (Head & Jambs)		PE
1	Door Wire Harness	QC-C3**** x Length / Type as Required)		MK

1 Frame Wire Harness	QC-C1500P		MK
1 Power Supply	BPS (Size & Type as Required)		SU

Notes:
Electronic Operation: Free egress at all times. Presenting valid credential to card reader, incorporated in lockset trim, unlocks lever allowing entry. Entry also possible via key override. Request to exit switch, incorporated in inside lever, signals an authorized egress. Door position switch, incorporated in lockset, monitors door status. Fail Secure.

Set: 21.0

Doors: B21 (1)

2 Hinge (heavy weight)	T4A3786 NRP	US26D	MK
1 Hinge (heavy weight)	T4A3786 NRP QC12	US26D	MK
1 Access Control Mort Lock	DG260 M1-82271-12V-BIPS LNL	US26D	SA
1 Core	DG2 6300	US15	SA
1 Door Closer	CLP7500	689	NO
1 Kick Plate	K1050 10" high 4BE CSK	US32D	RO
1 Gasketing	S88D (Head & Jambs)		PE
1 Door Wire Harness	QC-C3**** x Length / Type as Required)		MK
1 Frame Wire Harness	QC-C1500P		MK
1 Power Supply	BPS (Size & Type as Required)		SU

Notes:
Electronic Operation: Free egress at all times. Presenting valid credential to card reader, incorporated in lockset trim, unlocks lever allowing entry. Entry also possible via key override. Request to exit switch, incorporated in inside lever, signals an authorized egress. Door position switch, incorporated in lockset, monitors door status. Fail Secure.

Set: 22.0

Doors: B23 (9)

3 Hinge	TA2714 NRP	US26D	MK
1 Storeroom Lock	DG260 8204 LNL	US26D	SA
1 Core	DG2 6300	US15	SA
1 Door Stop	403 (or) 441CU (As Required Per Condition)	US26D	RO
3 Silencer	608 (or) 609 (As Required)		RO

Set: 23.0

Doors: 115 (37), 116 (7), B03 (11), B06 (11)

3	Hinge	TA2714 NRP	US26D	MK
1	Storeroom Lock	DG260 8204 LNL	US26D	SA
1	Core	DG2 6300	US15	SA
1	Surface Overhead Stop	10-X36	630	RF
3	Silencer	608 (or) 609 (As Required)		RO

Set: 24.0
Doors: 126 (21)

3	Hinge	TA2714 NRP	US26D	MK
1	Storeroom Lock	DG260 8204 LNL	US26D	SA
1	Core	DG2 6300	US15	SA
1	Surface Overhead Stop	10-X36	630	RF
1	Threshold	171A x Length Required MS25SS		PE
1	Gasketing	Provided by Frame Supplier		OT

Set: 25.0
Doors: B11 (5)

3	Hinge (heavy weight)	T4A3786	US26D	MK
1	Storeroom Lock	DG260 8204 LNL	US26D	SA
1	Core	DG2 6300	US15	SA
1	Door Closer	7500	689	NO
1	Kick Plate	K1050 10" high 4BE CSK	US32D	RO
1	Door Stop	403 (or) 441CU (As Required Per Condition)	US26D	RO
3	Silencer	608 (or) 609 (As Required)		RO

Set: 26.0
Doors: 208 (10), 212 (46)

3	Hinge (heavy weight)	T4A3786 NRP	US26D	MK
1	Storeroom Lock	DG260 8204 LNL	US26D	SA
1	Core	DG2 6300	US15	SA
1	Door Closer	CLP7500	689	NO
1	Kick Plate	K1050 10" high 4BE CSK	US32D	RO
1	Gasketing	S88D (Head & Jambs)		PE

Set: 27.0
Doors: 125 (22)

6	Hinge	TA2714 NRP	US26D	MK
1	Dust Proof Strike	570	US26D	RO
2	Manual Flush Bolt	555 / 557 (As Required)	US26D	RO
1	Storeroom Lock	DG260 8204 LNL	US26D	SA
1	Core	DG2 6300	US15	SA
2	Door Stop	403 (or) 441CU (As Required Per Condition)	US26D	RO
1	Threshold	171A x Length Required MS25SS		PE
2	Silencer	608 (or) 609 (As Required)		RO

Set: 28.0

Doors: 111 (41), 112 (41)

3	Hinge	TA2714 NRP	US26D	MK
1	Classroom Lock	DG260 8237 LNL	US26D	SA
1	Core	DG2 6300	US15	SA
1	Door Stop	403 (or) 441CU (As Required Per Condition)	US26D	RO
3	Silencer	608 (or) 609 (As Required)		RO

Set: 29.0

Doors: 109A (17), 109B (17), 110A (17), 110B (17), 122 (38), 123 (35), 127A (35), 128 (34), 134 (19), 201A (17), 201B (17), 201C (45), 207 (17)

3	Hinge	TA2714	US26D	MK
1	Classroom Lock	DG260 8237 LNL	US26D	SA
1	Core	DG2 6300	US15	SA
1	Door Stop	403 (or) 441CU (As Required Per Condition)	US26D	RO
3	Silencer	608 (or) 609 (As Required)		RO

Set: 30.0

Doors: 102B (36)

3	Hinge	TA2714 NRP	US26D	MK
1	Classroom Lock	DG260 8237 LNL	US26D	SA
1	Core	DG2 6300	US15	SA
1	Surface Overhead Stop	10-X36	630	RF
3	Silencer	608 (or) 609 (As Required)		RO

Set: 31.0

Doors: B12 (7), B18 (6)

3	Hinge (heavy weight)	T4A3786	US26D	MK
1	Storeroom Lock	DG260 8204 LNL	US26D	SA
1	Core	DG2 6300	US15	SA
1	Door Closer	7500	689	NO
1	Kick Plate	K1050 10" high 4BE CSK	US32D	RO
1	Door Stop	403 (or) 441CU (As Required Per Condition)	US26D	RO
3	Silencer	608 (or) 609 (As Required)		RO

Set: 32.0

Doors: 117 (43), 118 (43), 215 (43)

3	Hinge	TA2714	US26D	MK
1	Privacy Set	49 8265 LNL	US26D	SA
1	Mop Plate	K1050 6" high 4BE CSK	US32D	RO
1	Door Stop	403 (or) 441CU (As Required Per Condition)	US26D	RO
1	Gasketing	S88D (Head & Jambs)		PE
1	Coat Hook	RM801	US26D	RO

Set: 33.0

Doors: B10 (43)

3	Hinge (heavy weight)	T4A3786	US26D	MK
1	Mortise Deadlock	DG260 4877	US26D	SA
1	Core	DG2 6300	US15	SA
1	Push Plate	70C	US32D	RO
1	Pull Plate	110x70C	US32D	RO
1	Surface Overhead Stop	10-X36	630	RF
1	Door Closer	7500	689	NO
1	Drop Plate	7786OH	689	NO
1	Kick Plate	K1050 10" high 4BE CSK	US32D	RO
1	Mop Plate	K1050 6" high 4BE CSK	US32D	RO
3	Silencer	608 (or) 609 (As Required)		RO

Set: 34.0

Doors: B24 (4)

1	Bypass Door Hardware	HBP200A x Length Required		PE

1	Pull	856	US26D	RO

Set: 35.0

Doors: 129 (24), 130 (24), 132 (24), 135 (23)

1		All Hardware Provided By Door Supplier		OT

Set: 36.0

Doors: MISC

2	Hinge (heavy weight)	T4A3786 NRP QC12	US26D	MK
1	Continuous Hinge w/PT	CFM HD1 PT x Length Required		PE
1	Software	KW-SS1		SA
1	Crimp Tool	QC-R003		MK
1	Test Unit	WT1		SA
2	Electric Power Transfer	EL-CEPT		SU
3	Door Wire Harness	QC-C3**** x Length / Type as Required)		MK
3	Frame Wire Harness	QC-C1500P		MK
2	Position Switch	DPS-M / W-BK		SU
1	Key Cabinet	1200 Series (size & type required)		LU

Notes:
Intallation tools and Owner's component stock for electronic access control / Key Cabinet / Key Management Software

END OF SECTION 087100

DIVISION 08 - OPENINGS
SECTION 088000 – GLAZING

GENERAL

SUMMARY

Section includes:

Glass for windows doors interior borrowed lites storefront framing.

Glazing sealants and accessories.

Unless otherwise indicated, all glass and glazing types, either below finish grade or up to 35 feet above finish grade at building, shall be the following:

One Inch Sealed Heat Strengthened Insulated Units (Consisting of 1/4" heat strengthened exterior pane, 1/2" air space, 1/4" Low E clear float (annealed) interior pane): All glass exposed to weather, with a maximum light size up to 120 square feet.

One Inch Sealed Fully Tempered Insulated Glass (Consisting of 1/4" tempered exterior pane, 1/2" air space, 1/4" Low E tempered interior pane): All glazing in exterior hazardous locations, defined as glazing located where the possibility of human impact exists, including, but not limited to glazing in doors, sidelights within 24 inches arc of the edge of a closed door; all glazing having a bottom edge less than 18 inches above the walking surface, a top edge more than 36 inches above a walking surface more than 9 square feet in area and having a walking surface within 36 inches horizontally, exposed to weather, with a maximum light size up to 120 square feet.

One Inch Sealed Insulated Laminated Glass (consisting of 1/4 inch heat strengthened exterior pane, 1/2 inch air space, 1/4 inch Low E laminated interior pane): All glazing sloped more than 15 degrees from vertical with a maximum light size up to 120 square feet.

One Quarter Inch Fully Tempered Glass: All glazing in hazardous interior locations, defined as glazing located where the possibility of human impact exists, including, but not limited to glazing in doors, sidelights within 24 inches arc of the edge of a closed door; all glazing having a bottom edge less than 18 inches above the walking surface, a top edge more than 36 inches above a walking surface more than 9 square feet in area and having a walking surface within 36 inches horizontally, and all interior glazing at pass through windows, with a maximum light size up to 120 square feet.

Fire Rated Glass, thickness as required for rating needed: All glazing in fire rated doors and partitions.

One Quarter Inch Clear Float Glass (Annealed): All other interior glazing and mirrors not included above with a maximum light size up to 120 square feet.

DEFINITIONS

Glass Manufacturers: Firms that produce primary glass, fabricated glass, or both, as defined in referenced glazing publications.

Glass Thicknesses: Indicated by thickness designations in millimeters according to ASTM C 1036.

IBC: International Building Code.

Interspace: Space between lites of an insulating-glass unit.

COORDINATION

Coordinate glazing channel dimensions to provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances.

ACTION SUBMITTALS

Product Data: For each type of product.

Glass Samples: For each type of the following products; 12 inches square.

Tinted glass.

Coated glass.

Insulating glass.

Glazing Schedule: List glass types and thicknesses for each size opening and location. Use same designations indicated on Drawings.

Delegated-Design Submittal: For glass indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

INFORMATIONAL SUBMITTALS

Product Certificates: For glass.

Preconstruction adhesion and compatibility test report.

QUALITY ASSURANCE

Manufacturer Qualifications for Insulating-Glass Units with Sputter-Coated, Low-E Coatings: A qualified insulating-glass manufacturer who is approved and certified by coated-glass manufacturer.

Installer Qualifications: A qualified installer who employs glass installers for this Project who are certified under the National Glass Association's Certified Glass Installer Program.

DELIVERY, STORAGE, AND HANDLING

Protect glazing materials according to manufacturer's written instructions. Prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.

FIELD CONDITIONS

Environmental Limitations: Do not proceed with glazing when ambient and substrate temperature conditions are outside limits permitted by glazing material manufacturers and when glazing channel substrates are wet from rain, frost, condensation, or other causes.

WARRANTY

Manufacturer's Special Warranty for Coated-Glass Products: Manufacturer agrees to replace coated-glass units that deteriorate within specified warranty period. Deterioration of coated glass is defined as defects developed from normal use that are not attributed to glass breakage or to maintaining and cleaning coated glass contrary to manufacturer's written instructions. Defects include peeling, cracking, and other indications of deterioration in coating.

Warranty Period: 10 years from date of Substantial Completion.

Manufacturer's Special Warranty for Insulating Glass: Manufacturer agrees to replace insulating-glass units that deteriorate within specified warranty period. Deterioration of insulating glass is defined as failure of hermetic seal under normal use that is not attributed to glass breakage or to maintaining and cleaning insulating glass contrary to manufacturer's written instructions. Evidence of failure is the obstruction of vision by dust, moisture, or film on interior surfaces of glass.

Warranty Period: 10 years from date of Substantial Completion.

PRODUCTS

PERFORMANCE REQUIREMENTS

General: Installed glazing systems shall withstand normal thermal movement and wind and impact loads (where applicable) without failure, including loss or glass breakage attributable to the following: defective manufacture, fabrication, or installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; or other defects in construction.

Delegated Design: Engage a qualified professional engineer to design glazing.

Structural Performance: Glazing shall withstand the following design loads within limits and under conditions indicated determined according to the IBC and ASTM E 1300.

Design Wind Pressures: Determine design wind pressures applicable to Project according to ASCE/SEI 7, based on heights above grade indicated on Drawings.

Wind Design Data: As indicated on Drawings.

Basic Wind Speed: 110 mph.

Importance Factor: 1.5.

Exposure Category: B.

Maximum Lateral Deflection: For glass supported on all four edges, limit center-of-glass deflection at design wind pressure to not more than 1/50 times the short-side length or 1 inch , whichever is less.

Differential Shading: Design glass to resist thermal stresses induced by differential shading within individual glass lites.

Windborne-Debris-Impact Resistance: Exterior glazing shall comply with basic-protection testing requirements in ASTM E 1996 forWind Zone 2 when tested according to ASTM E 1886. Test specimens shall be no smaller in width and length than glazing indicated for use on Project and shall be installed in same manner as glazing indicated for use on Project.

Large-Missile Test: For glazing located within 30 feet of grade.

Small-Missile Test: For glazing located more than 30 feet above grade.

Safety Glazing: Where safety glazing is indicated, provide glazing that complies with 16 CFR 1201, Category II.

Thermal and Optical Performance Properties: Provide glass with performance properties specified, as indicated in manufacturer's published test data, based on procedures indicated below:

For monolithic-glass lites, properties are based on units with lites of thickness indicated.

For insulating-glass units, properties are based on units of thickness indicated for overall unit and for each lite.

U-Factors: Center-of-glazing values, according to NFRC 100 and based on LBL's WINDOW 5.2 computer program, expressed as Btu/sq. ft. x h x deg F .

Solar Heat-Gain Coefficient and Visible Transmittance: Center-of-glazing values, according to NFRC 200 and based on LBL's WINDOW 5.2 computer program.

Visible Reflectance: Center-of-glazing values, according to NFRC 300.

GLASS PRODUCTS, GENERAL

Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below unless more stringent requirements are indicated. See these publications for glazing terms not otherwise defined in this Section or in referenced standards.

GANA Publications: "Laminated Glazing Reference Manual" and "Glazing Manual."

IGMA Publication for Insulating Glass: SIGMA TM-3000, "North American Glazing Guidelines for Sealed Insulating Glass Units for Commercial and Residential Use."

Safety Glazing Labeling: Where safety glazing is indicated, permanently mark glazing with certification label of, the SGCC or another certification agency acceptable to authorities having jurisdiction, or manufacturer. Label shall indicate manufacturer's name, type of glass, thickness, and safety glazing standard with which glass complies.

Insulating-Glass Certification Program: Permanently marked either on spacers or on at least one component lite of units with appropriate certification label of IGCC.

Thickness: Where glass thickness is indicated, it is a minimum. Provide glass that complies with performance requirements and is not less than the thickness indicated.

Thickness of Tinted Glass: Provide same thickness for each tint color indicated throughout Project.

Strength: Where annealed float glass is indicated, provide annealed float glass, heat-strengthened float glass, or fully tempered float glass as needed to comply with "Performance Requirements" Article. Where heat-strengthened float glass is indicated, provide heat-strengthened float glass or fully tempered float glass as needed to comply with "Performance Requirements" Article. Where fully tempered float glass is indicated, provide fully tempered float glass.

GLASS PRODUCTS

Clear Annealed Float Glass: ASTM C 1036, Type I, Class 1 (clear), Quality-Q3.

Tinted Annealed Float Glass: ASTM C 1036, Type I, Class 2 (tinted), Quality-Q3.

Fully Tempered Float Glass: ASTM C 1048, Kind FT (fully tempered), Condition A (uncoated) unless otherwise indicated, Type I, Class 1 (clear) or Class 2 (tinted) as indicated, Quality-Q3.

Fabrication Process: By horizontal (roller-hearth) process with roll-wave distortion parallel to bottom edge of glass as installed unless otherwise indicated.

Heat-Strengthened Float Glass: ASTM C 1048, Kind HS (heat strengthened), Type I, Condition A (uncoated) unless otherwise indicated, Type I, Class 1 (clear) or Class 2 (tinted) as indicated, Quality-Q3.

Fabrication Process: By horizontal (roller-hearth) process with roll-wave distortion parallel to bottom edge of glass as installed unless otherwise indicated.

Pyrolytic-Coated, Low-Maintenance Glass: Clear float glass with a coating on first surface having both photocatalytic and hydrophilic properties that act to loosen dirt and to cause water to sheet evenly over the glass instead of beading.

INSULATING GLASS

Insulating-Glass Units: Factory-assembled units consisting of sealed lites of glass separated by a dehydrated interspace, qualified according to ASTM E 2190.

Sealing System: Dual seal, with manufacturer's standard primary and secondary sealants.

Spacer: Manufacturer's standard spacer material and construction.

Desiccant: Molecular sieve or silica gel, or a blend of both.

MISCELLANEOUS GLAZING MATERIALS

General: Provide products of material, size, and shape complying with referenced glazing standard, with requirements of manufacturers of glass and other glazing materials for application indicated, and with a proven record of compatibility with surfaces contacted in installation.

Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.

Setting Blocks: Elastomeric material with a Shore, Type A durometer hardness of 85, plus or minus 5.

Spacers: Elastomeric blocks or continuous extrusions of hardness required by glass manufacturer to maintain glass lites in place for installation indicated.

Edge Blocks: Elastomeric material of hardness needed to limit glass lateral movement (side walking).

FABRICATION OF GLAZING UNITS

Fabricate glazing units in sizes required to fit openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with written instructions of product manufacturer and referenced glazing publications, to comply with system performance requirements.

Allow for thermal movements from ambient and surface temperature changes acting on glass framing members and glazing components.

Temperature Change: 120 deg F , ambient; 180 deg F , material surfaces.

Clean-cut or flat-grind vertical edges of butt-glazed monolithic lites to produce square edges with slight chamfers at junctions of edges and faces.

Grind smooth and polish exposed glass edges and corners.

EXECUTION

EXAMINATION

Examine framing, glazing channels, and stops, with Installer present, for compliance with the following:

Manufacturing and installation tolerances, including those for size, squareness, and offsets at corners.

Presence and functioning of weep systems.

Minimum required face and edge clearances.

Effective sealing between joints of glass-framing members.

Proceed with installation only after unsatisfactory conditions have been corrected.

PREPARATION

Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings not firmly bonded to substrates.

Examine glazing units to locate exterior and interior surfaces. Label or mark units as needed so that exterior and interior surfaces are readily identifiable. Do not use materials that leave visible marks in the completed Work.

GLAZING, GENERAL

Comply with combined written instructions of manufacturers of glass, sealants, gaskets, and other glazing materials, unless more stringent requirements are indicated, including those in referenced glazing publications.

Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass includes glass with edge damage or other imperfections that, when installed, could weaken glass, impair performance, or impair appearance.

Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction testing.

Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.

Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.

Provide spacers for glass lites where length plus width is larger than 50 inches .

Locate spacers directly opposite each other on both inside and outside faces of glass. Install correct size and spacing to preserve required face clearances, unless gaskets and glazing tapes are used that have demonstrated ability to maintain required face clearances and to comply with system performance requirements.

Provide 1/8-inch minimum bite of spacers on glass and use thickness equal to sealant width. With glazing tape, use thickness slightly less than final compressed thickness of tape.

Provide edge blocking where indicated or needed to prevent glass lites from moving sideways in glazing channel, as recommended in writing by glass manufacturer and according to requirements in referenced glazing publications.

Set glass lites in each series with uniform pattern, draw, bow, and similar characteristics.

Set glass lites with proper orientation so that coatings face exterior or interior as specified.

Where wedge-shaped gaskets are driven into one side of channel to pressurize sealant or gasket on opposite side, provide adequate anchorage so gasket cannot walk out when installation is subjected to movement.

Square cut wedge-shaped gaskets at corners and install gaskets in a manner recommended by gasket manufacturer to prevent corners from pulling away; seal corner joints and butt joints with sealant recommended by gasket manufacturer.

GASKET GLAZING (DRY)

Cut compression gaskets to lengths recommended by gasket manufacturer to fit openings exactly, with allowance for stretch during installation.

Insert soft compression gasket between glass and frame or fixed stop so it is securely in place with joints miter cut and bonded together at corners.

Installation with Drive-in Wedge Gaskets: Center glass lites in openings on setting blocks, and press firmly against soft compression gasket by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.

Installation with Pressure-Glazing Stops: Center glass lites in openings on setting blocks, and press firmly against soft compression gasket. Install dense compression gaskets and pressure-glazing stops, applying pressure uniformly to compression gaskets. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.

Install gaskets so they protrude past face of glazing stops.

CLEANING AND PROTECTION

Immediately after installation remove nonpermanent labels and clean surfaces.

Protect glass from contact with contaminating substances resulting from construction operations. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for buildup of dirt, scum, alkaline deposits, or stains.

If, despite such protection, contaminating substances do come into contact with glass, remove substances immediately as recommended in writing by glass manufacturer. Remove and replace glass that cannot be cleaned without damage to coatings.

Remove and replace glass that is damaged during construction period.

Wash glass on both exposed surfaces not more than four days before date scheduled for inspections that establish date of Substantial Completion. Wash glass as recommended in writing by glass manufacturer.

END OF SECTION 088000

DIVISION 09 - FINISHES
SECTION 092900 - GYPSUM BOARD

GENERAL

SUMMARY

Section Includes:

Interior gypsum board.

Tile backing panels.

ACTION SUBMITTALS

Product Data: For the following:

Gypsum wallboard.

Gypsum ceiling board.

Mold-resistant gypsum board.

Cementitious backer units.

Interior trim.

Joint treatment materials.

Sound-attenuation blankets.

DELIVERY, STORAGE AND HANDLING

Store materials inside under cover and keep them dry and protected against weather, condensation, direct sunlight, construction traffic, and other potential causes of damage. Stack panels flat and supported on risers on a flat platform to prevent sagging.

FIELD CONDITIONS

Environmental Limitations: Comply with ASTM C840 requirements or gypsum board manufacturer's written instructions, whichever are more stringent.

Do not install paper-faced gypsum panels until installation areas are enclosed and conditioned.

Do not install panels that are wet, moisture damaged, and mold damaged.

Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.

Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

DIVISION 09 - FINISHES
SECTION 092900 - GYPSUM BOARD

PRODUCTS

GYPSUM BOARD, GENERAL

Size: Provide maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.

INTERIOR GYPSUM BOARD

Gypsum Wallboard: ASTM C1396/C1396M.

Manufacturers: Subject to compliance with requirements, provide products by one of the following:

Georgia-Pacific Gypsum LLC.

National Gypsum Company.

USG Corporation.

Thickness: 5/8 inch.

Long Edges: Tapered .

Gypsum Ceiling Board: ASTM C1396/C1396M.

Manufacturers: Subject to compliance with requirements, provide products by one of the following:

Georgia-Pacific Gypsum LLC.

National Gypsum Company.

USG Corporation.

Thickness: 5/8 inch.

Long Edges: Tapered.

Mold-Resistant Gypsum Board: ASTM C1396/C1396M. With moisture- and mold-resistant core and paper surfaces.

Manufacturers: Subject to compliance with requirements, provide products by one of the following:

Georgia-Pacific Gypsum LLC.

National Gypsum Company.

USG Corporation.

Core: 5/8 inch , Type X.

Long Edges: Tapered.

Mold Resistance: ASTM D3273, score of 10 as rated according to ASTM D3274.

SPECIALTY GYPSUM BOARD

TILE BACKING PANELS

Cementitious Backer Units: ANSI A118.9 and ASTM C1288 or ASTM C1325, with manufacturer's standard edges.

Manufacturers: Subject to compliance with requirements, provide products by one of the following:

James Hardie Building Products, Inc.

National Gypsum Company.

USG Corporation.

Thickness: 5/8 inch .

Mold Resistance: ASTM D3273, score of 10 as rated according to ASTM D3274.

TRIM ACCESSORIES

Interior Trim: ASTM C1047.

Material: Galvanized or aluminum-coated steel sheet or rolled zinc .

Shapes:

Cornerbead.

LC-Bead: J-shaped; exposed long flange receives joint compound.

Base-of-Wall Galvanized Moisture Barrier Trim: Galvanized-steel sheet, 2 inches high.

Base-of-Wall PVC Moisture Barrier Trim: Extruded PVC, 1/2 inch high.

JOINT TREATMENT MATERIALS

General: Comply with ASTM C475/C475M.

Joint Tape:

Interior Gypsum Board: Paper.

Tile Backing Panels: As recommended by panel manufacturer.

Joint Compound for Interior Gypsum Board: For each coat, use formulation that is compatible with other compounds applied on previous or for successive coats.

Prefilling: At open joints , rounded or beveled panel edges, and damaged surface areas, use setting-type taping compound.

Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use drying-type, all-purpose compound.

Use setting-type compound for installing paper-faced metal trim accessories.

Fill Coat: For second coat, use setting-type, sandable topping compound.

Finish Coat: For third coat, use setting-type, sandable topping compound.

Skim Coat: For final coat of Level 5 finish, use setting-type, sandable topping compound .

Joint Compound for Tile Backing Panels:

Cementitious Backer Units: As recommended by backer unit manufacturer.

.

AUXILIARY MATERIALS

Provide auxiliary materials that comply with referenced installation standards and manufacturer's written instructions.

Steel Drill Screws: ASTM C1002 unless otherwise indicated.

Use screws complying with ASTM C954 for fastening panels to steel members from 0.033 to 0.112 inch thick.

For fastening cementitious backer units, use screws of type and size recommended by panel manufacturer.

EXECUTION

EXAMINATION

Examine areas and substrates including welded hollow-metal frames and support framing, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.

Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.

Proceed with installation only after unsatisfactory conditions have been corrected.

INSTALLATION AND FINISHING OF PANELS, GENERAL

Comply with ASTM C840.

Install ceiling panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.

Install panels with face side out. Butt panels together for a light contact at edges and ends with not more than 1/16 inch of open space between panels. Do not force into place.

Locate edge and end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.

Form control and expansion joints with space between edges of adjoining gypsum panels.

Cover both faces of support framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases braced internally.

Unless concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. in area.

Fit gypsum panels around ducts, pipes, and conduits.

Where partitions intersect structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by structural members; allow 1/4- to 3/8-inch- wide joints to install sealant.

Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments. Provide 1/4- to 1/2-inch- wide spaces at these locations and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.

Attachment to Steel Framing: Attach panels so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.

Wood Framing: Install gypsum panels over wood framing, with floating internal corner construction. Do not attach gypsum panels across the flat grain of wide-dimension lumber, including floor joists and headers. Float gypsum panels over these members or provide control joints to counteract wood shrinkage.

Install sound attenuation blankets before installing gypsum panels unless blankets are readily installed after panels have been installed on one side.

INSTALLATION OF INTERIOR GYPSUM BOARD

Install interior gypsum board in the following locations:

Wallboard Type: Vertical surfaces unless otherwise indicated.

Ceiling Type: Ceiling surfaces.

Mold-Resistant Type: In all damp locations .

Single-Layer Application:

On ceilings, apply gypsum panels before wall/partition board application to greatest extent possible and at right angles to framing unless otherwise indicated.

On partitions/walls, apply gypsum panels vertically (parallel to framing) unless otherwise indicated or required by fire-resistance-rated assembly, and minimize end joints.

Stagger abutting end joints not less than one framing member in alternate courses of panels.

Fastening Methods: Apply gypsum panels to supports with steel drill screws.

INSTALLATION OF TILE BACKING PANELS

Cementitious Backer Units: ANSI A108.11, at locations indicated to receive tile.

Where tile backing panels abut other types of panels in same plane, shim surfaces to produce a uniform plane across panel surfaces.

INSTALLATION OF TRIM ACCESSORIES

General: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.

Control Joints: Install control joints according to ASTM C840 and in specific locations approved by Architect for visual effect.

Interior Trim: Install in the following locations:

Cornerbead: Use at outside corners unless otherwise indicated.

LC-Bead: Use at exposed panel edges .

FINISHING GYPSUM BOARD

General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.

Prefill open joints , rounded or beveled edges, and damaged surface areas.

Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.

Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C840:

Level 1: Ceiling plenum areas, concealed areas, and where indicated.

Level 2: Panels that are substrate for tile .

Level 5: In all exposed areas .

Cementitious Backer Units: Finish according to manufacturer's written instructions.

PROTECTION

Protect adjacent surfaces from drywall compound and promptly remove from floors and other non-drywall surfaces. Repair surfaces stained, marred, or otherwise damaged during drywall application.

Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.

Remove and replace panels that are wet, moisture damaged, and mold damaged.

Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.

Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION 092900

DIVISION 09 - FINISHES
SECTION 093013 - CERAMIC TILING

GENERAL

SUMMARY

Section Includes:

Glazed wall tile.

Waterproof membrane.

DEFINITIONS

General: Definitions in the ANSI A108 series of tile installation standards and in ANSI A137.1 apply to Work of this Section unless otherwise specified.

ANSI A108 Series: ANSI A108.01, ANSI A108.02, ANSI A108.1A, ANSI A108.1B, ANSI A108.1C, ANSI A108.4, ANSI A108.5, ANSI A108.6, ANSI A108.8, ANSI A108.9, ANSI A108.10, ANSI A108.11, ANSI A108.12, ANSI A108.13, ANSI A108.14, ANSI A108.15, ANSI A108.16, and ANSI A108.17, which are contained in its "Specifications for Installation of Ceramic Tile."

Face Size: Actual tile size, excluding spacer lugs.

Module Size: Actual tile size plus joint width indicated.

ACTION SUBMITTALS

Product Data: For each type of product.

Samples for Initial Selection: For tile, grout, and accessories involving color selection.

INFORMATIONAL SUBMITTALS

Qualification Data: For Installer.

MAINTENANCE MATERIAL SUBMITTALS

Furnish extra materials that match and are from same production runs as products installed and that are packaged with protective covering for storage and identified with labels describing contents.

Tile and Trim Units: Furnish quantity of full-size units equal to 3 percent of amount installed for each type, composition, color, pattern, and size indicated.

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Grout: Furnish quantity of grout equal to 3 percent of amount installed for each type, composition, and color indicated.

QUALITY ASSURANCE

Installer Qualifications:

Installer is a Five-Star member of the National Tile Contractors Association or a Trowel of Excellence member of the Tile Contractors' Association of America.

Installer's supervisor for Project holds the International Masonry Institute's Foreman Certification.

Installer employs only Ceramic Tile Education Foundation Certified Installers or installers recognized by the U.S. Department of Labor as Journeyman Tile Layers for Project.

Installer employs at least one installer for Project that has completed the Advanced Certification for Tile Installers (ACT) certification for installation of mud walls gauged porcelain tile/gauged porcelain tile panels and slabs and large format tile.

DELIVERY, STORAGE, AND HANDLING

Deliver and store packaged materials in original containers with seals unbroken and labels intact until time of use. Comply with requirements in ANSI A137.1 for labeling tile packages.

Store tile and cementitious materials on elevated platforms, under cover, and in a dry location.

Store aggregates where grading and other required characteristics can be maintained and contamination can be avoided.

Store liquid materials in unopened containers and protected from freezing.

FIELD CONDITIONS

Environmental Limitations: Do not install tile until construction in spaces is complete and ambient temperature and humidity conditions are maintained at the levels indicated in referenced standards and manufacturer's written instructions.

PRODUCTS

MANUFACTURERS

Source Limitations for Tile: Obtain tile of each type and color or finish from single source or producer.

Obtain tile of each type and color or finish from same production run and of consistent quality in appearance and physical properties for each contiguous area.

Source Limitations for Setting and Grouting Materials: Obtain ingredients of a uniform quality for each mortar, adhesive, and grout component from single manufacturer and each aggregate from single source or producer.

Obtain setting and grouting materials, except for unmodified Portland cement and aggregate, from single manufacturer.

Obtain waterproof membrane and crack isolation membrane, except for sheet products, from manufacturer of setting and grouting materials.

Source Limitations for Other Products: Obtain each of the following products specified in this Section from a single manufacturer:

Stone thresholds.

Waterproof membrane.

Crack isolation membrane.

Cementitious backer units.

Metal edge strips.

PRODUCTS, GENERAL

ANSI Ceramic Tile Standard: Provide tile that complies with ANSI A137.1 for types, compositions, and other characteristics indicated.

Provide tile complying with Standard grade requirements.

ANSI Standards for Tile Installation Materials: Provide materials complying with ANSI A108.02, ANSI standards referenced in other Part 2 articles, ANSI standards referenced by TCNA installation methods specified in tile installation schedules, and other requirements specified.

Factory Blending: For tile exhibiting color variations within ranges, blend tile in factory and package so tile units taken from one package show same range in colors as those taken from other packages and match approved Samples.

Mounting: For factory-mounted tile, provide back- or edge-mounted tile assemblies as standard with manufacturer unless otherwise indicated.

Where tile is indicated for installation in wet areas, do not use back- or edge-mounted tile assemblies unless tile manufacturer specifies in writing that this type of mounting is suitable for installation indicated and has a record of successful in-service performance.

TILE PRODUCTS

Ceramic Tile Type: Glazed wall tile.

Manufacturers: Subject to compliance with requirements, provide products by one of the following:

American Marazzi Tile, Inc.

American Olean; a division of Dal-Tile Corporation.

Daltile.

Module Size: 6 by 4-1/4 inches .

Face Size Variation: Rectified.

Thickness: 5/16 inch.

Face: Plain with modified square edges or cushion edges .

Finish: Bright, opaque glaze.

Tile Color and Pattern: As selected by Architect from manufacturer's full range .

Up to three (3) colors per room per type and size of tile.

Grout Color: As selected by Architect from manufacturer's full range .

Mounting: Factory, back mounted.

Trim Units: Coordinated with sizes and coursing of adjoining flat tile where applicable and matching characteristics of adjoining flat tile. Provide shapes as follows, selected from manufacturer's standard shapes:

Base for Portland Cement Mortar Installations: Coved, module size 6 by 3-3/4 inches .

Base for Thinset Mortar Installations: Straight, module size .

Wainscot Cap for Portland Cement Mortar Installations: Bullnose cap, module size 6 by 2 inches .

Wainscot Cap for Thinset Mortar Installations: Surface bullnose, module size .

Wainscot Cap for Flush Conditions: Regular flat tile for conditions where tile wainscot is shown flush with wall surface above it, same size as adjoining flat tile.

External Corners for Portland Cement Mortar Installations: Bullnose shape with radius of at least 3/4 inch unless otherwise indicated.

External Corners for Thinset Mortar Installations: Surface bullnose, same size as adjoining flat tile.

Internal Corners: Field-butted square corners. For coved base and cap use angle pieces designed to fit with stretcher shapes.

WATERPROOF MEMBRANE

General: Manufacturer's standard product , selected from the following, that complies with ANSI A118.10 and is recommended by the manufacturer for the application indicated. Include reinforcement and accessories recommended by manufacturer.

Manufacturers: Subject to compliance with requirements, provide products by one of the following:

Basis of Design: Schluter Kerdi-DS System Including waterproof membrane, preformed corners, adhesives, pipe seals, and sealants for a completely bonded system.

GROUT MATERIALS

Sand-Portland Cement Grout: ANSI A108.10, consisting of white or gray cement and white or colored aggregate as required to produce color indicated.

Standard Cement Grout: ANSI A118.6.

Water-Cleanable Epoxy Grout: ANSI A118.3 , with a VOC content of 65 g/L or less.

Manufacturers: Subject to compliance with requirements, provide products by one of the following:

Bostik, Inc.

LATICRETE SUPERCAP, LLC.

MAPEI Corporation.

Provide product capable of withstanding continuous and intermittent exposure to temperatures of up to 140 and 212 deg F, respectively, and certified by manufacturer for intended use.

Grout for Pregrouted Tile Sheets: Same product used in factory to pregrout tile sheets.

MISCELLANEOUS MATERIALS

Trowelable Underlayments and Patching Compounds: Latex-modified, portland cement-based formulation provided or approved by manufacturer of tile-setting materials for installations indicated.

Tile Cleaner: A neutral cleaner capable of removing soil and residue without harming tile and grout surfaces, specifically approved for materials and installations indicated by tile and grout manufacturers.

MIXING MORTARS AND GROUT

Mix mortars and grouts to comply with referenced standards and mortar and grout manufacturers' written instructions.

Add materials, water, and additives in accurate proportions.

Obtain and use type of mixing equipment, mixer speeds, mixing containers, mixing time, and other procedures to produce mortars and grouts of uniform quality with optimum performance characteristics for installations indicated.

EXECUTION

EXAMINATION

Examine substrates, areas, and conditions where tile will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

Verify that substrates for setting tile are firm; dry; clean; free of coatings that are incompatible with tile-setting materials, including curing compounds and other substances that contain soap, wax, oil, or silicone; and comply with flatness tolerances required by ANSI A108.01 for installations indicated.

Verify that installation of grounds, anchors, recessed frames, electrical and mechanical units of work, and similar items located in or behind tile has been completed.

Verify that joints and cracks in tile substrates are coordinated with tile joint locations; if not coordinated, adjust joint locations in consultation with Architect.

Proceed with installation only after unsatisfactory conditions have been corrected.

PREPARATION

Fill cracks, holes, and depressions in concrete substrates for tile floors installed with with trowelable leveling and patching compound specifically recommended by tile-setting material manufacturer.

Where indicated, prepare substrates to receive waterproof membrane by applying a reinforced mortar bed that complies with ANSI A108.1A and is sloped 1/4 inch per foot toward drains.

Blending: For tile exhibiting color variations, verify that tile has been factory blended and packaged so tile units taken from one package show same range of colors as those taken from other packages and match approved Samples. If not factory blended, either return to manufacturer or blend tiles at Project site before installing.

INSTALLATION OF CERAMIC TILE

Comply with TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation" for TCNA installation methods specified in tile installation schedules. Comply with parts of the ANSI A108 series "Specifications for Installation of Ceramic Tile" that are referenced in TCNA installation methods, specified in tile installation schedules, and apply to types of setting and grouting materials used.

Extend tile work into recesses and under or behind equipment and fixtures to form complete covering without interruptions unless otherwise indicated. Terminate work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.

Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces. Carefully grind cut edges of tile abutting trim, finish, or built-in items for straight aligned joints. Fit tile closely to electrical outlets, piping, fixtures, and other penetrations so plates, collars, or covers overlap tile.

Provide manufacturer's standard trim shapes where necessary to eliminate exposed tile edges.

Where accent tile differs in thickness from field tile, vary setting-bed thickness so that tiles are flush.

Jointing Pattern: Lay tile in running bond pattern unless otherwise indicated. Lay out tile work and center tile fields in both directions in each space or on each wall area. Lay out tile work to minimize the use of pieces that are less than half of a tile. Provide uniform joint widths unless otherwise indicated.

For tile mounted in sheets, make joints between tile sheets same width as joints within tile sheets so joints between sheets are not apparent in finished work.

Where adjoining tiles on floor, base, walls, or trim are specified or indicated to be same size, align joints.

Where tiles are specified or indicated to be whole integer multiples of adjoining tiles on floor, base, walls, or trim, align joints unless otherwise indicated.

Joint Widths: Unless otherwise indicated, install tile with the following joint widths:

Glazed Wall Tile: 1/8 inch .

Lay out tile wainscots to dimensions indicated or to next full tile beyond dimensions indicated.

Expansion Joints: Provide expansion joints and other sealant-filled joints, including control, contraction, and isolation joints, where indicated. Form joints during installation of setting materials, mortar beds, and tile. Do not saw-cut joints after installing tiles.

Where joints occur in concrete substrates, locate joints in tile surfaces directly above them.

INSTALLATION OF TILE BACKING PANEL

Install panels and treat joints according to ANSI A108.11 and manufacturer's written instructions for type of application indicated. Use modified dry-set mortar for bonding material unless otherwise directed in manufacturer's written instructions.

INSTALLATION OF WATERPROOF MEMBRANE

Install waterproof membrane to comply with ANSI A108.13 and manufacturer's written instructions to produce waterproof membrane of uniform thickness that is bonded securely to substrate.

Allow waterproof membrane to cure and verify by testing that it is watertight before installing tile or setting materials over it.

ADJUSTING AND CLEANING

Remove and replace tile that is damaged or that does not match adjoining tile. Provide new matching units, installed as specified and in a manner to eliminate evidence of replacement.

Cleaning: On completion of placement and grouting, clean all ceramic tile surfaces so they are free of foreign matter.

Remove grout residue from tile as soon as possible.

Clean grout smears and haze from tile according to tile and grout manufacturer's written instructions but no sooner than 10 days after installation. Use only cleaners recommended by tile and grout manufacturers and only after determining that cleaners are safe to use by testing on samples of tile and other surfaces to be cleaned. Protect metal surfaces and plumbing fixtures from effects of cleaning. Flush surfaces with clean water before and after cleaning.

PROTECTION

Protect installed tile work with kraft paper or other heavy covering during construction period to prevent staining, damage, and wear. If recommended by tile manufacturer, apply coat of neutral protective cleaner to completed tile walls and floors.

Before final inspection, remove protective coverings and rinse neutral protective cleaner from tile surfaces.

INTERIOR CERAMIC TILE INSTALLATION SCHEDULE

Interior Wall Installations, Masonry or Concrete:

Ceramic Tile Installation : TCNA W211 and ANSI A108.1A ; cement mortar bed (thickset) bonded to substrate.

Ceramic Tile Type: Glazed Wall Tile .

Bond Coat for Wet-Set Method: Improved modified dry-set mortar.

Bond Coat for Cured-Bed Method: Improved modified dry-set mortar.

Grout: Water-cleanable epoxy grout.

Interior Wall Installations, Wood or Metal Studs or Furring:

Ceramic Tile Installation : TCNA W221 and ANSI A108.1A ; cement mortar bed (thickset) on solid backing.

Ceramic Tile Type: Glazed Wall Tile .

Bond Coat for Wet-Set Method: mortar.

Bond Coat for Cured-Bed Method: mortar.

Grout: Water-cleanable epoxy grout.

Shower Receptor and Wall Installations:

Ceramic Tile Installation : TCNA B415; water-cleanable, tile-setting epoxy on waterproof membrane over cementitious backer units or fiber-cement backer board .

Ceramic Tile Type: Glazed Wall Tile .

Thinset Mortar: Improved modified dry-set mortar.

Grout: Water-cleanable epoxy grout.

END OF SECTION 093013

DIVISION 09 - FINISHES
SECTION 095113 - ACOUSTICAL PANEL CEILINGS

GENERAL

SUMMARY

Section includes acoustical panels and exposed suspension systems for ceilings.

Products furnished, but not installed under this Section, include anchors, clips, and other ceiling attachment devices to be cast in concrete.

ACTION SUBMITTALS

Product Data: For each type of product.

Samples for Initial Selection: For components with factory-applied color finishes.

INFORMATIONAL SUBMITTALS

Coordination Drawings: Reflected ceiling plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:

Suspended ceiling components.

Structural members to which suspension systems will be attached.

Size and location of initial access modules for acoustical panels.

Items penetrating finished ceiling including the following:

Lighting fixtures.

Air outlets and inlets.

Speakers.

Sprinklers.

Access panels.

Perimeter moldings.

Qualification Data: For testing agency.

Product Test Reports: For each acoustical panel ceiling, for tests performed by manufacturer and witnessed by a qualified testing agency.

CLOSEOUT SUBMITTALS

Maintenance Data: For finishes to include in maintenance manuals.

MAINTENANCE MATERIAL SUBMITTALS

Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

Acoustical Ceiling Panels: Full-size panels equal to 2 percent of quantity installed.

Suspension-System Components: Quantity of each exposed component equal to 2 percent of quantity installed.

Hold-Down Clips: Equal to 2 percent of quantity installed.

QUALITY ASSURANCE

Testing Agency Qualifications: Qualified according to NVLAP for testing indicated.

DELIVERY, STORAGE, AND HANDLING

Deliver acoustical panels, suspension-system components, and accessories to Project site in original, unopened packages and store them in a fully enclosed, conditioned space where they will be protected against damage from moisture, humidity, temperature extremes, direct sunlight, surface contamination, and other causes.

Before installing acoustical panels, permit them to reach room temperature and a stabilized moisture content.

Handle acoustical panels carefully to avoid chipping edges or damaging units in any way.

FIELD CONDITIONS
Environmental Limitations: Do not install acoustical panel ceilings until spaces are enclosed and weatherproof, wet work in spaces is complete and dry, work above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.
Pressurized Plenums: Operate ventilation system for not less than 48 hours before beginning acoustical panel ceiling installation.

PRODUCTS

PERFORMANCE REQUIREMENTS
Seismic Performance: Acoustical ceiling shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.
Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
Flame-Spread Index: Comply with ASTM E 1264 for Class A materials.
Smoke-Developed Index: 50 or less.

ACOUSTICAL PANELS, GENERAL
Source Limitations:
Acoustical Ceiling Panel: Obtain each type from single source from single manufacturer.
Suspension System: Obtain each type from single source from single manufacturer.
Source Limitations: Obtain each type of acoustical ceiling panel and supporting suspension system from single source from single manufacturer.
Glass-Fiber-Based Panels: Made with binder containing no urea formaldehyde.
Acoustical Panel Standard: Provide manufacturer's standard panels of configuration indicated that comply with ASTM E 1264 classifications as designated by types, patterns, acoustical ratings, and light reflectances unless otherwise indicated.
Mounting Method for Measuring NRC: Type E-400; plenum mounting in which face of test specimen is 15-3/4 inches away from test surface according to ASTM E 795.
Acoustical Panel Colors and Patterns: Match appearance characteristics indicated for each product type.
Where appearance characteristics of acoustical panels are indicated by referencing pattern designations in ASTM E 1264 and not manufacturers' proprietary product designations, provide products selected by Architect from each manufacturer's full range that comply with requirements indicated for type, pattern, color, light reflectance, acoustical performance, edge detail, and size.

ACOUSTICAL PANELS
Manufacturers: Subject to compliance with requirements, provide products by one of the following:

Armstrong World Industries, Inc.
CertainTeed Corp.
USG Interiors, Inc.; Subsidiary of USG Corporation.

Classification: Provide panels complying with ASTM E 1264 for type, form, and pattern as follows:
Type and Form: Type III, mineral base with painted finish; Form 1, nodular.
Pattern: CE (perforated, small holes and lightly textured).
Color: White.
LR: Not less than 0.65.

NRC: Not less than 0.10.
CAC: Not less than 20.
AC: Not less than 170.
Edge/Joint Detail: Reveal sized to fit flange of exposed suspension-system members.
Thickness: 5/8 inch.
Thickness: 7/16 inch.
Modular Size: 24 by 24 inches 24 by 48 inches As indicated on Drawings.
24 by24 shall be foil back units.

METAL SUSPENSION SYSTEMS, GENERAL
Metal Suspension-System Standard: Provide manufacturer's standard direct-hung metal suspension systems of types, structural classifications, and finishes indicated that comply with applicable requirements in ASTM C 635/C 635M.
High-Humidity Finish: Comply with ASTM C 635/C 635M requirements for "Coating Classification for Severe Environment Performance" where high-humidity finishes are indicated.
Attachment Devices: Size for five times the design load indicated in ASTM C 635/C 635M, Table 1, "Direct Hung," unless otherwise indicated. Comply with seismic design requirements.
Anchors in Concrete: Anchors of type and material indicated below, with holes or loops for attaching hangers of type indicated and with capability to sustain, without failure, a load equal to five times that imposed by ceiling construction, as determined by testing according to ASTM E 488 or ASTM E 1512 as applicable, conducted by a qualified testing and inspecting agency.
Corrosion Protection: Carbon-steel components zinc plated to comply with ASTM B 633, Class Fe/Zn 5 (0.005 mm) for Class SC 1 service condition.
Corrosion Protection: Stainless-steel components complying with ASTM F 593 and ASTM F 594, Group 1 Alloy 304 or 316 for bolts; Alloy 304 or 316 for anchor.
Corrosion Protection: Components fabricated from nickel-copper-alloy rods complying with ASTM B 164 for UNS No. N04400 alloy.
Wire Hangers, Braces, and Ties: Provide wires complying with the following requirements:
Zinc-Coated, Carbon-Steel Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper.
Stainless-Steel Wire: ASTM A 580/A 580M, Type 304, nonmagnetic.
Nickel-Copper-Alloy Wire: ASTM B 164, nickel-copper-alloy UNS No. N04400.
Size: Select wire diameter so its stress at three times hanger design load (ASTM C 635/C 635M, Table 1, "Direct Hung") will be less than yield stress of wire, but provide not less than 0.135-inch-diameter wire.
Seismic Stabilizer Bars: Manufacturer's standard perimeter stabilizers designed to accommodate seismic forces.
Seismic Struts: Manufacturer's standard compression struts designed to accommodate seismic forces.
Seismic Clips: Manufacturer's standard seismic clips designed and spaced to secure acoustical panels in place.
Hold-Down Clips: Where indicated, provide manufacturer's standard hold-down clips spaced 24 inches o.c. on all cross tees.

METAL SUSPENSION SYSTEM
Manufacturers: Subject to compliance with requirements, provide products by one of the following:

Armstrong World Industries, Inc.
CertainTeed Corp.
USG Interiors, Inc.; Subsidiary of USG Corporation.

Narrow-Face, Capped, Double-Web, Steel Suspension System: Main and cross runners roll formed from cold-rolled steel sheet; prepainted, electrolytically zinc coated, or hot-dip galvanized according to ASTM A 653/A 653M, not less than G30 coating designation; with prefinished 9/16-inch- wide metal caps on flanges.
Structural Classification: Heavy-duty system.
End Condition of Cross Runners: Override (stepped) or butt-edge type.
Face Design: Flat, flush.
Cap Material: Steel or aluminum cold-rolled sheet.
Cap Finish: Painted white.

EXECUTION

EXAMINATION

Examine substrates, areas, and conditions, including structural framing to which acoustical panel ceilings attach or abut, with Installer present, for compliance with requirements specified in this and other Sections that affect ceiling installation and anchorage and with requirements for installation tolerances and other conditions affecting performance of acoustical panel ceilings.
Examine acoustical panels before installation. Reject acoustical panels that are wet, moisture damaged, or mold damaged.
Proceed with installation only after unsatisfactory conditions have been corrected.

PREPARATION

Measure each ceiling area and establish layout of acoustical panels to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width panels at borders, and comply with layout shown on reflected ceiling plans.

INSTALLATION

General: Install acoustical panel ceilings to comply with ASTM C 636/C 636M and seismic design requirements indicated, according to manufacturer's written instructions and CISCA's "Ceiling Systems Handbook."
Suspend ceiling hangers from building's structural members and as follows:
Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structure or of ceiling suspension system.
Splay hangers only where requiredto miss obstructions; offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with location of hangers at spacings required to support standard suspension-system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices.
Secure wire hangers to ceiling-suspension members and to supports above with a minimum of three tight turns. Connect hangers directly either to structures or to inserts, eye screws, or other devices that are secure and appropriate for substrate and that will not deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.
When steel framing does not permit installation of hanger wires at spacing required, install carrying channels or other supplemental support for attachment of hanger wires.
Do not attach hangers to steel deck tabs.
Do not attach hangers to steel roof deck. Attach hangers to structural members.
Space hangers not more than 48 inches o.c. along each member supported directly from hangers unless otherwise indicated; provide hangers not more than 8 inches from ends of each member.

Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards and publications.
Secure bracing wires to ceiling suspension members and to supports with a minimum of four tight turns. Suspend bracing from building's structural members as required for hangers, without attaching to permanent metal forms, steel deck, or steel deck tabs. Fasten bracing wires into concrete with cast-in-place or postinstalled anchors.
Install edge moldings and trim of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical panels.
Screw attach moldings to substrate at intervals not more than 16 inches o.c. and not more than 3 inches from ends, leveling with ceiling suspension system to a tolerance of 1/8 inch in 12 feet . Miter corners accurately and connect securely.
Do not use exposed fasteners, including pop rivets, on moldings and trim.
Install suspension-system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.
Install acoustical panels with undamaged edges and fit accurately into suspension-system runners and edge moldings. Scribe and cut panels at borders and penetrations to provide a neat, precise fit.
Arrange directionally patterned acoustical panels as follows:
As indicated on reflected ceiling plans.
Install panels with pattern running in one direction parallel to long axis of space.
Install panels in a basket-weave pattern.
For square-edged panels, install panels with edges fully hidden from view by flanges of suspension-system runners and moldings.
For reveal-edged panels on suspension-system runners, install panels with bottom of reveal in firm contact with top surface of runner flanges.
For reveal-edged panels on suspension-system members with box-shaped flanges, install panels with reveal surfaces in firm contact with suspension-system surfaces and panel faces flush with bottom face of runners.
Paint cut edges of panel remaining exposed after installation; match color of exposed panel surfaces using coating recommended in writing for this purpose by acoustical panel manufacturer.
Install hold-down clips in areas indicated, in areas required by authorities having jurisdiction, and for fire-resistance ratings; space as recommended by panel manufacturer's written instructions unless otherwise indicated.

FIELD QUALITY CONTROL
Special Inspections: Engage a qualified special inspector to perform the following special inspections:
Compliance of seismic design.
Testing Agency: Engage a qualified testing agency to perform tests and inspections and prepare test reports.
Acoustical panel ceiling hangers and anchors and fasteners will be considered defective if they do not pass tests and inspections.
Prepare test and inspection reports.

CLEANING
Clean exposed surfaces of acoustical panel ceilings, including trim, edge moldings, and suspension-system members. Comply with manufacturer's written instructions for cleaning and touchup of minor finish damage. Remove and replace ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION 095113

DIVISION 09 - FINISHES
SECTION 096513 - RESILIENT BASE AND ACCESSORIES

GENERAL

SUMMARY

Section Includes:

Rubber stair accessories.

ACTION SUBMITTALS

Product Data: For each type of product.

Samples for Initial Selection: For each type of product indicated.

MAINTENANCE MATERIAL SUBMITTALS

Furnish extra materials , from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

Furnish not less than 10 linear feet for every 500 linear feet or fraction thereof, of each type, color, pattern, and size of resilient product installed.

QUALITY ASSURANCE

Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.

Coordinate mockups in this Section with mockups specified in other Sections.

Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.

Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

DELIVERY, STORAGE, AND HANDLING

Store resilient products and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F or more than 90 deg F.

FIELD CONDITIONS

Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F or more than 95 deg F , in spaces to receive resilient products during the following periods:

48 hours before installation.

During installation.

48 hours after installation.

After installation and until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F or more than 95 deg F .

Install resilient products after other finishing operations, including painting, have been completed.

PRODUCTS

PERFORMANCE REQUIREMENTS

RUBBER STAIR ACCESSORIES

Fire-Test-Response Characteristics: As determined by testing identical products according to ASTM E 648 or NFPA 253 by a qualified testing agency.

Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.

Manufacturers: Subject to compliance with requirements, provide products by one of the following:

Burke Mercer Flooring Products; a division of Burke Industries Inc.

Flexco.

Johnsonite; a Tarkett company.

Roppe Corporation, USA.

Stair Treads: ASTM F 2169.

Type: TS (rubber, vulcanized thermoset) .

Class: 2 (pattern; embossed, grooved, or ribbed).

Group: 2 (with contrasting color for the visually impaired).

Nosing Style: Square, adjustable to cover angles between 60 and 90 degrees .

Nosing Height: Coordinate with stairs fabricator .

Thickness: 1/4 inch and tapered to back edge .

Size: Lengths and depths to fit each stair tread in one piece .

Integral Risers: Smooth, flat; in height that fully covers substrate.

Stringers: Height and length after cutting to fit risers and treads and to cover stair stringers, produced by same manufacturer as treads, and recommended by manufacturer for installation with treads.

Thickness: 0.125 inch .

Landing Tile: Matching treads; produced by same manufacturer as treads and recommended by manufacturer for installation with treads .

Locations: Provide rubber stair accessories in areas indicated .

Colors and Patterns: as chosen by Architect from Manufacturer's full line of colors .

INSTALLATION MATERIALS

Trowelable Leveling and Patching Compounds: Latex-modified, portland-cement-based or blended hydraulic-cement-based formulation provided or approved by resilient-product manufacturer for applications indicated.

Adhesives: Water-resistant type recommended by resilient-product manufacturer for resilient products and substrate conditions indicated.

Stair-Tread Nose Filler: Two-part epoxy compound recommended by resilient stair-tread manufacturer to fill nosing substrates that do not conform to tread contours.

EXECUTION

EXAMINATION

Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of resilient products.

Proceed with installation only after unsatisfactory conditions have been corrected.

Installation of resilient products indicates acceptance of surfaces and conditions.

PREPARATION

Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products.

Concrete Substrates for Resilient Stair Accessories: Prepare horizontal surfaces according to ASTM F 710.

Verify that substrates are dry and free of curing compounds, sealers, and hardeners.

Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.

Alkalinity and Adhesion Testing: Perform tests recommended by manufacturer. Proceed with installation only after substrate alkalinity falls within range on pH scale recommended by manufacturer in writing, but not less than 5 or more than 9 pH.

Moisture Testing: Perform tests so that each test area does not exceed 200 sq. ft. , and perform no fewer than three tests in each installation area and with test areas evenly spaced in installation areas.

Anhydrous Calcium Chloride Test: ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. in 24 hours.

Relative Humidity Test: Using in-situ probes, ASTM F 2170. Proceed with installation only after substrates have a maximum 75 percent relative humidity level measurement.

Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.

Do not install resilient products until materials are the same temperature as space where they are to be installed.

At least 48 hours in advance of installation, move resilient products and installation materials into spaces where they will be installed.

Immediately before installation, sweep and vacuum clean substrates to be covered by resilient products.

RESILIENT BASE INSTALLATION

Comply with manufacturer's written instructions for installing resilient base.

Apply resilient base to walls, columns, pilasters, casework and cabinets in toe spaces, and other permanent fixtures in rooms and areas where base is required.

Install resilient base in lengths as long as practical without gaps at seams and with tops of adjacent pieces aligned.

Tightly adhere resilient base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.

Do not stretch resilient base during installation.

On masonry surfaces or other similar irregular substrates, fill voids along top edge of resilient base with manufacturer's recommended adhesive filler material.

Preformed Corners: Install preformed corners before installing straight pieces.

RESILIENT ACCESSORY INSTALLATION

Comply with manufacturer's written instructions for installing resilient accessories.

Resilient Stair Accessories:

Use stair-tread-nose filler to fill nosing substrates that do not conform to tread contours.

Tightly adhere to substrates throughout length of each piece.

For treads installed as separate, equal-length units, install to produce a flush joint between units.

Resilient Molding Accessories: Butt to adjacent materials and tightly adhere to substrates throughout length of each piece. Install reducer strips at edges of floor covering that would otherwise be exposed.

CLEANING AND PROTECTION

Comply with manufacturer's written instructions for cleaning and protecting resilient products.

Perform the following operations immediately after completing resilient-product installation:

Remove adhesive and other blemishes from surfaces.

Sweep and vacuum horizontal surfaces thoroughly.

Damp-mop horizontal surfaces to remove marks and soil.

Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.

Cover resilient products subject to wear and foot traffic until Substantial Completion.

END OF SECTION 096513

DIVISION 09 – FINISHES
SECTION 096723 - RESINOUS FLOORING

1 GENERAL

2 SUMMARY

3 Section includes resinous flooring systems.

4 PREINSTALLATION MEETINGS

5 Preinstallation Conference: Conduct conference at Project site.

6 ACTION SUBMITTALS

7 Product Data: For each type of product. Include manufacturer's technical data, application instructions, and
8 recommendations for each resinous flooring component required.

9 Samples for Initial Selection: For each type of exposed finish required.

10 INFORMATIONAL SUBMITTALS

11 Installer Certificates: Signed by manufacturer certifying that installers comply with specified requirements.

12 Material Certificates: For each resinous flooring component, from manufacturer.

13 Material Test Reports: For each resinous flooring system, by a qualified testing agency.

14 CLOSEOUT SUBMITTALS

15 Maintenance Data: For resinous flooring to include in maintenance manuals.

16 QUALITY ASSURANCE

17 Installer Qualifications: An authorized representative who is trained and approved by manufacturer.

18 Engage an installer who is certified in writing by resinous flooring manufacturer as qualified to apply resinous
19 flooring systems indicated.

20 DELIVERY, STORAGE, AND HANDLING

21 Deliver materials in original packages and containers, with seals unbroken, bearing manufacturer's labels
22 indicating brand name and directions for storage and mixing with other components.

23 FIELD CONDITIONS

24 Environmental Limitations: Comply with resinous flooring manufacturer's written instructions for substrate
25 temperature, ambient temperature, moisture, ventilation, and other conditions affecting resinous flooring
26 application.

27 Lighting: Provide permanent lighting or, if permanent lighting is not in place, simulate permanent lighting
28 conditions during resinous flooring application.

Close spaces to traffic during resinous flooring application and for 24 hours after application unless manufacturer recommends a longer period.

PRODUCTS

PERORMANCE REQUIREMENTS

Flammability: Self-extinguishing according to ASTM D 635.

MANUFACTURERS

Source Limitations: Obtain primary resinous flooring materials, including primers, resins, hardening agents, grouting coats, and topcoats, from single source from single manufacturer. Obtain secondary materials, including patching and fill material, joint sealant, and repair materials, of type and from manufacturer recommended in writing by manufacturer of primary materials.

RESINOUS FLOORING

Resinous Flooring System: Abrasion-, impact-, and chemical-resistant, aggregate-filled, and resin-based monolithic floor surfacing designed to produce a seamless floor and integral cove base.

System Characteristics:

Color and Pattern: As selected by Architect from manufacturer's full range.

Wearing Surface: Textured for slip resistance.

Overall System Thickness: 1/4 inch.

Primer: Type recommended by resinous flooring manufacturer for substrate and resinous flooring system indicated.

Formulation Description: 100 percent solids.

Patching and Fill Material: Resinous product of or approved by resinous flooring manufacturer and recommended by manufacturer for application indicated.

Body Coats:

Resin: Epoxy.

Formulation Description: 100 percent solids.

Type: Clear.

Application Method: Self-leveling slurry with broadcast aggregates.

Number of Coats: Two.

Thickness of Coats: 1/16 inch.

Aggregates: Manufacturer's standard.

Topcoats: Sealing or finish coats.

Resin: Epoxy.

Formulation Description: 100 percent solids.

Type: Clear.

Number of Coats: Two.

Thickness of Coats: 1/16 inch.

Finish: Gloss.

System Physical Properties: Provide resinous flooring system with the following minimum physical property requirements when tested according to test methods indicated:

Compressive Strength: 10,000 psi minimum according to ASTM C 579.

Tensile Strength: 2,500psi minimum according to ASTM C 307.

Flexural Modulus of Elasticity: 4,500psi minimum according to ASTM C 580.

Resistance to Elevated Temperature: No slip or flow of more than 1/16 inch according to MIL-D-3134J.

Abrasion Resistance: 70-90mgs lost maximum weight loss according to ASTM D 4060.

Hardness: 70/60, Shore D according to ASTM D 2240.

EXECUTION

PREPARATION

Prepare and clean substrates according to resinous flooring manufacturer's written instructions for substrate indicated. Provide clean, dry substrate for resinous flooring application.

Concrete Substrates: Provide sound concrete surfaces free of laitance, glaze, efflorescence, curing compounds, form-release agents, dust, dirt, grease, oil, and other contaminants incompatible with resinous flooring.

Roughen concrete substrates as follows:

Comply with ASTM C 811 requirements unless manufacturer's written instructions are more stringent.

Repair damaged and deteriorated concrete according to resinous flooring manufacturer's written instructions.

Patching and Filling: Use patching and fill material to fill holes and depressions in substrates according to manufacturer's written instructions.

Control Joint Treatment: Treat control joints and other nonmoving substrate cracks to prevent cracks from reflecting through resinous flooring according to manufacturer's written instructions.

Resinous Materials: Mix components and prepare materials according to resinous flooring manufacturer's written instructions.

APPLICATION

Apply components of resinous flooring system according to manufacturer's written instructions to produce a uniform, monolithic wearing surface of thickness indicated.

Coordinate application of components to provide optimum adhesion of resinous flooring system to substrate, and optimum intercoat adhesion.

Cure resinous flooring components according to manufacturer's written instructions. Prevent contamination during application and curing processes.

Expansion and Isolation Joint Treatment: At substrate expansion and isolation joints, comply with resinous flooring manufacturer's written instructions.

Primer: Apply primer over prepared substrate at manufacturer's recommended spreading rate.

Integral Cove Base: Apply cove base mix to wall surfaces before applying flooring. Apply according to manufacturer's written instructions and details, including those for taping, mixing, priming, troweling, sanding, and topcoating of cove base. Round internal and external corners.

Integral Cove Base: 4 inches high.

Self-Leveling Body Coats: Apply self-leveling slurry body coats in thickness indicated for flooring system.

Aggregates: Broadcast aggregates at rate recommended by manufacturer and, after resin is cured, remove excess aggregates to provide surface texture indicated.

Topcoats: Apply topcoats in number indicated for flooring system and at spreading rates recommended in writing by manufacturer and to produce wearing surface indicated.

PROTECTION

Protect resinous flooring from damage and wear during the remainder of construction period. Use protective methods and materials, including temporary covering, recommended in writing by resinous flooring manufacturer.

END OF SECTION 096723

DIVISION 09 – FINISHES
SECTION 096813 - TILE CARPETING

1 GENERAL

2 SUMMARY

3 Section Includes:

4 Modular carpet tile.

5 PREINSTALLATION MEETINGS

6 Preinstallation Conference: Conduct conference at Project site.

7 Review methods and procedures related to carpet tile installation including, but not limited to, the
8 following:

9 Review delivery, storage, and handling procedures.

10 Review ambient conditions and ventilation procedures.

11 Review subfloor preparation procedures.

12 ACTION SUBMITTALS

13 Product Data: For each type of product.

14 Include manufacturer's written data on physical characteristics, durability, and fade resistance.

15 Include manufacturer's written installation recommendations for each type of substrate.

16 Samples for Initial Selection: For each type of carpet tile.

17 Include Samples of exposed edge, transition, and other accessory stripping involving color or finish
18 selection.

19 INFORMATIONAL SUBMITTALS

20 Qualification Data: For Installer.

21 Sample Warranty: For special warranty.

22 CLOSEOUT SUBMITTALS

23 Maintenance Data: For carpet tiles to include in maintenance manuals. Include the following:

24 Methods for maintaining carpet tile, including cleaning and stain-removal products and procedures
25 and manufacturer's recommended maintenance schedule.

26 Precautions for cleaning materials and methods that could be detrimental to carpet tile.

27 MAINTENANCE MATERIAL SUBMITTALS

Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

Carpet Tile: Full-size units equal to 10 percent of amount installed for each type indicated, but not less than 10 sq. yd..

QUALITY ASSURANCE

Installer Qualifications: An experienced installer who is certified by the International Certified Floorcovering Installers Association at the Master II certification level.

DELIVERY, STORAGE, AND HANDLING

Comply with the Carpet and Rug Institute's CRI 104.

FIELD CONDITIONS

Comply with the Carpet and Rug Institute's CRI 104 for temperature, humidity, and ventilation limitations.

Environmental Limitations: Do not deliver or install carpet tiles until spaces are enclosed and weathertight, wet-work in spaces is complete and dry, and ambient temperature and humidity conditions are maintained at levels planned for building occupants during the remainder of the construction period.

Do not install carpet tiles over concrete slabs until slabs have cured and are sufficiently dry to bond with adhesive and concrete slabs have pH range recommended by carpet tile manufacturer.

Where demountable partitions or other items are indicated for installation on top of carpet tiles, install carpet tiles before installing these items.

WARRANTY

Special Warranty for Carpet Tiles: Manufacturer agrees to repair or replace components of carpet tile installation that fail in materials or workmanship within specified warranty period.

Warranty does not include deterioration or failure of carpet tile due to unusual traffic, failure of substrate, vandalism, or abuse.

Failures include, but are not limited to, the following:

More than 10 percent edge raveling, snags, and runs.

Dimensional instability.

Excess static discharge.

Loss of tuft-bind strength.

Loss of face fiber.

Delamination.

Warranty Period: 15 years from date of Substantial Completion.

PRODUCTS

CARPET TILE

Basis-of-Design Product: Subject to compliance with requirements, provide :

Bentley Prince Street, Inc.

After Dark Affirma II Hard back Tile

Color: As selected by Architect from manufacturer's full range .

Pattern: As selected by Architect from Manufacturere's .

Fiber Content: 100 percent nylon 6, 6 .

Pile Characteristic: Tufted Textured Loop pile.

Density: 6,978 oz/cu.yd .

Pile Thickness: .185 for finished carpet tile according to ASTM D6859.

Stitches: 10.5/in .

Total Weight: 64 oz/sq.yd for finished carpet tile.

Primary Backing/Backcoating: Manufacturer's standard composite materials .

Secondary Backing: Manufacturer's standard material .

Size: 18 by 36 inches .

Applied Treatments:

Soil-Resistance Treatment: Manufacturer's standard treatment .

Performance Characteristics:

Appearance Retention Rating: Heavy traffic, 3.0 minimum according to ASTM D7330.

Critical Radiant Flux Classification: Not less than 0.45 W/sq. cm according to NFPA 253.

Dry Breaking Strength: Not less than 100 lbf according to ASTM D2646.

Tuft Bind: Not less than 6.2 lbf according to ASTM D1335.

Delamination: Not less than 4 lbf/in. according to ASTM D3936.

Dimensional Tolerance: Within 1/32 inch of specified size dimensions, as determined by physical measurement.

Dimensional Stability: 0.2 percent or less according to ISO 2551 (Aachen Test).

Colorfastness to Crocking: Not less than 4, wet and dry, according to AATCC 165.

Colorfastness to Light: Not less than 4 after 40 AFU (AATCC fading units) according to AATCC 16, Option E.

Electrostatic Propensity: Less than 3.5 kV according to AATCC 134.

INSTALLATION ACCESSORIES

Trowelable Leveling and Patching Compounds: Latex-modified, hydraulic-cement-based formulation provided or recommended by carpet tile manufacturer.

Adhesives: Water-resistant, mildew-resistant, nonstaining, pressure-sensitive type to suit products and subfloor conditions indicated, that comply with flammability requirements for installed carpet tile, and are recommended by carpet tile manufacturer for releasable installation.

Metal Edge/Transition Strips: Extruded aluminum with mill finish of profile and width shown, of height required to protect exposed edge of carpet, and of maximum lengths to minimize running joints.

EXECUTION

EXAMINATION

Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for maximum moisture content, alkalinity range, installation tolerances, and other conditions affecting carpet tile performance.

Examine carpet tile for type, color, pattern, and potential defects.

Concrete Slabs: Verify that finishes comply with requirements specified in Section 033000 "Cast-in-Place Concrete" and that surfaces are free of cracks, ridges, depressions, scale, and foreign deposits.

Moisture Testing: Perform tests so that each test area does not exceed 200 sq. ft. , and perform no fewer than three tests in each installation area and with test areas evenly spaced in installation areas.

Anhydrous Calcium Chloride Test: ASTM F1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. in 24 hours.

Relative Humidity Test: Using in situ probes, ASTM F2170. Proceed with installation only after substrates have a maximum 75 percent relative humidity level measurement.

Perform additional moisture tests recommended in writing by adhesive and carpet tile manufacturers. Proceed with installation only after substrates pass testing.

Proceed with installation only after unsatisfactory conditions have been corrected.

PREPARATION

General: Comply with the Carpet and Rug Institute's CRI 104 and with carpet tile manufacturer's written installation instructions for preparing substrates indicated to receive carpet tile.

Use trowelable leveling and patching compounds, according to manufacturer's written instructions, to fill cracks, holes, depressions, and protrusions in substrates. Fill or level cracks, holes and depressions 1/8 inch wide or wider, and protrusions more than 1/32 inch unless more stringent requirements are required by manufacturer's written instructions.

Concrete Substrates: Remove coatings, including curing compounds, and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, without using solvents. Use mechanical methods recommended in writing by adhesive and carpet tile manufacturers.

Metal Substrates: Clean grease, oil, soil and rust, and prime if recommended in writing by adhesive manufacturer. Rough sand painted metal surfaces and remove loose paint. Sand aluminum surfaces, to remove metal oxides, immediately before applying adhesive.

Broom and vacuum clean substrates to be covered immediately before installing carpet tile.

INSTALLATION

General: Comply with the Carpet and Rug Institute's CRI 104, Section 10, "Carpet Tile," and with carpet tile manufacturer's written installation instructions.

Installation Method: As recommended in writing by carpet tile manufacturer .

Maintain dye-lot integrity. Do not mix dye lots in same area.

Maintain pile-direction patterns recommended in writing by carpet tile manufacturer.

Cut and fit carpet tile to butt tightly to vertical surfaces, permanent fixtures, and built-in furniture including cabinets, pipes, outlets, edgings, thresholds, and nosings. Bind or seal cut edges as recommended by carpet tile manufacturer.

Extend carpet tile into toe spaces, door reveals, closets, open-bottomed obstructions, removable flanges, alcoves, and similar openings.

Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on carpet tile as marked on subfloor. Use nonpermanent, nonstaining marking device.

Install pattern parallel to walls and borders.

Access Flooring: Stagger joints of carpet tiles so carpet tile grid is offset from access flooring panel grid. Do not fill seams of access flooring panels with carpet adhesive; keep seams free of adhesive.

CLEANING AND PROTECTION

Perform the following operations immediately after installing carpet tile:

Remove excess adhesive and other surface blemishes using cleaner recommended by carpet tile manufacturer.

Remove yarns that protrude from carpet tile surface.

Vacuum carpet tile using commercial machine with face-beater element.

Protect installed carpet tile to comply with the Carpet and Rug Institute's CRI 104, Section 13.7.

Protect carpet tile against damage from construction operations and placement of equipment and fixtures during the remainder of construction period. Use protection methods indicated or recommended in writing by carpet tile manufacturer.

END OF SECTION 096813

DIVISION 09 - FINISHES
SECTION 099113 - EXTERIOR PAINTING

GENERAL

SUMMARY

Section includes surface preparation and the application of paint systems on exterior substrates.

Steel and iron.

Galvanized metal.

Wood.

Plastic.

DEFINITIONS

MPI Gloss Level 1: Not more than five units at 60 degrees and 10 units at 85 degrees, according to ASTM D 523.

MPI Gloss Level 3: 10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.

MPI Gloss Level 4: 20 to 35 units at 60 degrees and not less than 35 units at 85 degrees, according to ASTM D 523.

MPI Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D 523.

MPI Gloss Level 6: 70 to 85 units at 60 degrees, according to ASTM D 523.

MPI Gloss Level 7: More than 85 units at 60 degrees, according to ASTM D 523.

ACTION SUBMITTALS

Product Data: For each type of product. Include preparation requirements and application instructions.

Include printout of current "MPI Approved Products List" for each product category specified, with the proposed product highlighted.

Indicate VOC content.

Samples for Initial Selection: For each type of topcoat product.

Product List: Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules. Include color designations.

MAINTENANCE MATERIAL SUBMITTALS

Furnish extra materials , from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

Paint: 5 percent, but not less than 1 gal. of each material and color applied.

QUALITY ASSURANCE

DELIVERY, STORAGE, AND HANDLING

Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F.

Maintain containers in clean condition, free of foreign materials and residue.

Remove rags and waste from storage areas daily.

FIELD CONDITIONS

Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F.

Do not apply paints in snow, rain, fog, or mist; when relative humidity exceeds 85 percent; at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.

PRODUCTS

MANUFACTURERS

Manufacturers: Subject to compliance with requirements, provide products by one of the following:

Benjamin Moore & Co.

PPG Paints.

Sherwin-Williams Company (The).

Products: Subject to compliance with requirements, provide one of the products listed in the Exterior Painting Schedule for the paint category indicated.

PAINT, GENERAL

MPI Standards: Products shall comply with MPI standards indicated and shall be listed in its "MPI Approved Products Lists."

Material Compatibility:

Materials for use within each paint system shall be compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.

For each coat in a paint system, products shall be recommended in writing by topcoat manufacturers for use in paint system and on substrate indicated.

Colors: As selected by Architect from manufacturer's full range .

Thirty percent of surface area will be painted with deep tones.

SOURCE QUALITY CONTROL

Testing of Paint Materials: Owner reserves the right to invoke the following procedure:

Owner will engage the services of a qualified testing agency to sample paint materials. Contractor will be notified in advance and may be present when samples are taken. If paint materials have already been delivered to Project site, samples may be taken at Project site. Samples will be identified, sealed, and certified by testing agency.

Testing agency will perform tests for compliance with product requirements.

Owner may direct Contractor to stop applying paints if test results show materials being used do not comply with product requirements. Contractor shall remove noncomplying paint materials from Project site, pay for testing, and repaint surfaces painted with rejected materials. Contractor will be required to remove rejected materials from previously painted surfaces if, on repainting with complying materials, the two paints are incompatible.

EXECUTION

EXAMINATION

Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:

Concrete: 12 percent.

Masonry (Clay and CMUs): 12 percent.

Wood: 15 percent.

Gypsum Board: 12 percent.

Exterior Gypsum Board Substrates: Verify that finishing compound is sanded smooth.

Verify suitability of substrates, including surface conditions and compatibility, with existing finishes and primers.

Proceed with coating application only after unsatisfactory conditions have been corrected.

Application of coating indicates acceptance of surfaces and conditions.

PREPARATION

Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates and paint systems indicated.

Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.

After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection.

Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.

Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.

Steel Substrates: Remove rust, loose mill scale, and shop primer if any. Clean using methods recommended in writing by paint manufacturer .

SSPC-SP 3.

Shop-Primed Steel Substrates: Clean field welds, bolted connections, and areas where shop paint is abraded. Paint exposed areas with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-primed surfaces.

Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.

Wood Substrates:

Scrape and clean knots. Before applying primer, apply coat of knot sealer recommended in writing by topcoat manufacturer for exterior use in paint system indicated.

Sand surfaces that will be exposed to view, and dust off.

Prime edges, ends, faces, undersides, and backsides of wood.

After priming, fill holes and imperfections in the finish surfaces with putty or plastic wood filler. Sand smooth when dried.

Plastic Trim Fabrication Substrates: Remove dust, dirt, and other foreign material that might impair bond of paints to substrates.

APPLICATION

Apply paints according to manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual."

Use applicators and techniques suited for paint and substrate indicated.

Paint surfaces behind movable items same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed items with prime coat only.

Paint both sides and edges of exterior doors and entire exposed surface of exterior door frames.

Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.

Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers.

Tint undercoats same color as topcoat, but tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Provide sufficient difference in shade of undercoats to distinguish each separate coat.

If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.

Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

Painting Fire Suppression, Plumbing, HVAC, Electrical, Communication, and Electronic Safety and Security Work:

Paint the following work where exposed to view:

Uninsulated metal piping.

Uninsulated plastic piping.

Pipe hangers and supports.

Metal conduit.

Plastic conduit.

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CLEANING AND PROTECTION

At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.

After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.

At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

EXTERIOR PAINTING SCHEDULE

Steel and Iron Substrates:

Water-Based Light Industrial Coating System MPI EXT 5.1C :

Prime Coat: Primer, zinc rich, inorganic , MPI #19.

Prime Coat: Shop primer specified in Section where substrate is specified.

Intermediate Coat: Light industrial coating, exterior, water based, matching topcoat.

Topcoat: Light industrial coating, exterior, water based, semi-gloss (MPI Gloss Level 5) , MPI #163.

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Aluminum Paint System:

Prime Coat: Primer, alkyd, anti-corrosive, for metal , MPI #79.

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Prime Coat: Shop primer specified in Section where substrate is specified.

Intermediate Coat: Aluminum paint, matching topcoat.

Topcoat: Aluminum paint , MPI #1.

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Galvanized-Metal Substrates:

Latex System MPI EXT 5.3H:

Prime Coat: Primer, galvanized, water based , MPI #134.

.

Intermediate Coat: Latex, exterior, matching topcoat.

Topcoat: Latex, exterior, semi-gloss (MPI Gloss Level 5) , MPI #11.

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Wood Substrates: Wood trim Architectural woodwork and wood fences.

Latex over Latex Primer System:

Prime Coat: Primer, latex for exterior wood , MPI #6.

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Intermediate Coat: Latex, exterior, matching topcoat.

Topcoat: Latex, exterior, semi-gloss (MPI Gloss Level 5) , MPI #11.

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Plastic Trim Fabrication Substrates:

Latex System MPI EXT 6.8A:

Prime Coat: Primer, bonding, solvent based , MPI #69.

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Intermediate Coat: Latex, exterior, matching topcoat.

Topcoat: Latex, exterior, semi-gloss (MPI Gloss Level 5) , MPI #11.

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END OF SECTION 099113

DIVISION 09 - FINISHES
SECTION 099123 - INTERIOR PAINTING

GENERAL

SUMMARY

Section includes surface preparation and the application of paint systems on interior substrates.

Concrete masonry units (CMUs).

Steel and iron.

Galvanized metal.

Wood.

Gypsum board.

DEFINITIONS

MPI Gloss Level 1: Not more than five units at 60 degrees and 10 units at 85 degrees, according to ASTM D 523.

MPI Gloss Level 2: Not more than 10 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.

MPI Gloss Level 3: 10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.

MPI Gloss Level 4: 20 to 35 units at 60 degrees and not less than 35 units at 85 degrees, according to ASTM D 523.

MPI Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D 523.

MPI Gloss Level 6: 70 to 85 units at 60 degrees, according to ASTM D 523.

MPI Gloss Level 7: More than 85 units at 60 degrees, according to ASTM D 523.

ACTION SUBMITTALS

Product Data: For each type of product. Include preparation requirements and application instructions.

Include Printout of current "MPI Approved Products List" for each product category specified, with the proposed product highlighted.

Indicate VOC content.

Samples for Initial Selection: For each type of topcoat product.

Product List: Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules. Include color designations.

MAINTENANCE MATERIAL SUBMITTALS

Furnish extra materials , from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

Paint: 5 percent, but not less than 1 gal. of each material and color applied.

QUALITY ASSURANCE

DELIVERY, STORAGE, AND HANDLING

Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F.

Maintain containers in clean condition, free of foreign materials and residue.

Remove rags and waste from storage areas daily.

FIELD CONDITIONS

Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F.

Do not apply paints when relative humidity exceeds 85 percent; at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.

PRODUCTS

MANUFACTURERS

Manufacturers: Subject to compliance with requirements, provide products by one of the following:

Benjamin Moore & Co.

PPG Paints.

Sherwin-Williams Company (The).

Products: Subject to compliance with requirements, provide one of the products listed in the Interior Painting Schedule for the paint category indicated.

PAINT, GENERAL

MPI Standards: Products shall comply with MPI standards indicated and shall be listed in its "MPI Approved Products Lists."

Material Compatibility:

Materials for use within each paint system shall be compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.

For each coat in a paint system, products shall be recommended in writing by topcoat manufacturers for use in paint system and on substrate indicated.

Colors: As selected by Architect from manufacturer's full range .

Thirty percent of surface area will be painted with deep tones.

SOURCE QUALITY CONTROL

EXECUTION

EXAMINATION

Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:

Concrete: 12 percent.

Wood: 15 percent.

Gypsum Board: 12 percent.

Gypsum Board Substrates: Verify that finishing compound is sanded smooth.

Verify suitability of substrates, including surface conditions and compatibility, with existing finishes and primers.

Proceed with coating application only after unsatisfactory conditions have been corrected.

Application of coating indicates acceptance of surfaces and conditions.

PREPARATION

Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates and paint systems indicated.

Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.

After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.

Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.

Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.

Masonry Substrates: Remove efflorescence and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces or mortar joints exceeds that permitted in manufacturer's written instructions.

Steel Substrates: Remove rust, loose mill scale, and shop primer, if any. Clean using methods recommended in writing by paint manufacturer .

SSPC-SP 3.

SSPC-SP 11.

Shop-Primed Steel Substrates: Clean field welds, bolted connections, and areas where shop paint is abraded. Paint exposed areas with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-primed surfaces.

Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.

Wood Substrates:

Scrape and clean knots, and apply coat of knot sealer before applying primer.

Sand surfaces that will be exposed to view, and dust off.

Prime edges, ends, faces, undersides, and backsides of wood.

After priming, fill holes and imperfections in the finish surfaces with putty or plastic wood filler. Sand smooth when dried.

APPLICATION

Apply paints according to manufacturer's written instructions and to recommendations in "MPI Manual."

Use applicators and techniques suited for paint and substrate indicated.

Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed equipment or furniture with prime coat only.

Paint front and backsides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.

Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.

Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers.

Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Tint undercoats to match color of topcoat, but provide sufficient difference in shade of undercoats to distinguish each separate coat.

If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.

Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

Painting Fire Suppression, Plumbing, HVAC, Electrical, Communication, and Electronic Safety and Security Work:

Paint the following work where exposed in equipment rooms:

Uninsulated metal piping.

Uninsulated plastic piping.

Pipe hangers and supports.

Metal conduit.

Plastic conduit.

.

Paint the following work where exposed in occupied spaces:

Uninsulated metal piping.

Uninsulated plastic piping.

Pipe hangers and supports.

Metal conduit.

Plastic conduit.

.

CLEANING AND PROTECTION

At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.

After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.

At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

INTERIOR PAINTING SCHEDULE

Steel Substrates:

Latex System, Alkyd Primer :

Prime Coat: Primer, alkyd, quick dry, for metal , MPI #76.

Intermediate Coat: Latex, interior, matching topcoat.

Topcoat: Latex, interior, gloss (MPI Gloss Level 6, except minimum gloss of 65 units at 60 degrees) , MPI #114.

Aluminum Paint System MPI INT 5.1MM:

Intermediate Coat: Aluminum paint, matching topcoat.

Topcoat: Aluminum paint , MPI #1.

Galvanized-Metal Substrates:

Latex System :

Intermediate Coat: Latex, interior, matching topcoat.

Topcoat: Latex, interior, semi-gloss (MPI Gloss Level 5) , MPI #54.

Wood Substrates: Wood trim Architectural woodwork .

Latex over Latex Primer System MPI INT 6.3T:

Prime Coat: Primer, latex, for interior wood , MPI #39.

Intermediate Coat: Latex, interior, matching topcoat.

Topcoat: Latex, interior, semi-gloss (MPI Gloss Level 5) , MPI #54.

Gypsum Board Substrates:

Latex over Latex Sealer System MPI INT 9.2A:

Prime Coat: Latex, interior, matching topcoat.

Intermediate Coat: Latex, interior, matching topcoat.

Topcoat: Latex, interior, semi-gloss (MPI Gloss Level 5) , MPI #54.

END OF SECTION 099123

DIVISION 09 - FINISHES
SECTION 099300 - STAINING AND TRANSPARENT FINISHING

GENERAL

SUMMARY

Section includes surface preparation and application of wood stains and transparent finishes .

Interior Substrates:

Dressed lumber (finish carpentry or woodwork).

Wood-based panel products.

DEFINITIONS

MPI Gloss Level 1: Not more than 5 units at 60 degrees and 10 units at 85 degrees, according to ASTM D 523.

MPI Gloss Level 4: 20 to 35 units at 60 degrees and not less than 35 units at 85 degrees, according to ASTM D 523.

MPI Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D 523.

MPI Gloss Level 6: 70 to 85 units at 60 degrees, according to ASTM D 523.

MPI Gloss Level 7: More than 85 units at 60 degrees, according to ASTM D 523.

ACTION SUBMITTALS

Product Data: For each type of product. Include preparation requirements and application instructions.

Include printout of current "MPI Approved Products List" for each product category specified, with the proposed product highlighted.

Indicate VOC content.

Samples for Initial Selection: For each type of product.

Samples for Verification: For each type of finish system and in each color and gloss of finish required.

Submit Samples on representative samples of actual wood substrates, 8 inches square or 8 inches long.

Apply coats on Samples in steps to show each coat required for system.

Label each coat of each Sample.

Label each Sample for location and application area.

Product List: Cross-reference to finish system and locations of application areas. Use same designations indicated on Drawings and in schedules. Include color designations.

MAINTENANCE MATERIAL SUBMITTALS

Furnish extra materials , from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

Stains and Transparent Finishes: 5 percent, but not less than 1 gal. of each material and color applied.

QUALITY ASSURANCE

DELIVERY, STORAGE, AND HANDLING

Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F.

Maintain containers in clean condition, free of foreign materials and residue.

Remove rags and waste from storage areas daily.

FIELD CONDITIONS

Apply finishes only when temperature of surfaces to be finished and ambient air temperatures are between 50 and 95 deg F.

Do not apply finishes when relative humidity exceeds 85 percent, at temperatures less than 5 deg F above the dew point, or to damp or wet surfaces.

Do not apply exterior finishes in snow, rain, fog, or mist.

PRODUCTS

MANUFACTURERS

Manufacturers: Subject to compliance with requirements, provide products by one of the following:

Sherwin-Williams Company (The).

Zinsser; Rust-Oleum Corporation.

Minwax

Products: Subject to compliance with requirements, provide one of the products listed in wood finish systems schedules for the product category indicated.

MATERIALS, GENERAL

MPI Standards: Products shall comply with MPI standards indicated and shall be listed in its "MPI Approved Products List."

Material Compatibility:

Materials for use within each paint system shall be compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.

For each coat in a paint system, products shall be recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.

Stain Colors: As selected by Architect from manufacturer's full range .

EXECUTION

EXAMINATION

Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

Maximum Moisture Content of Interior Wood Substrates: 13 percent, when measured with an electronic moisture meter.

Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.

Proceed with finish application only after unsatisfactory conditions have been corrected.

Beginning finish application constitutes Contractor's acceptance of substrates and conditions.

PREPARATION

Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates indicated.

Remove hardware, covers, plates, and similar items already in place that are removable. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and finishing.

After completing finishing operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.

Clean and prepare surfaces to be finished according to manufacturer's written instructions for each substrate condition and as specified.

Remove dust, dirt, oil, and grease by washing with a detergent solution; rinse thoroughly with clean water and allow to dry. Remove grade stamps and pencil marks by sanding lightly. Remove loose wood fibers by brushing.

Remove mildew by scrubbing with a commercial wash formulated for mildew removal and as recommended by stain manufacturer.

Interior Wood Substrates:

Scrape and clean knots, and apply coat of knot sealer before applying primer.

Apply wood filler paste to open-grain woods, as defined in "MPI Architectural Painting Specification Manual," to produce smooth, glasslike finish.

Sand surfaces exposed to view and dust off.

After priming, fill holes and imperfections in the finish surfaces with putty or plastic wood filler. Sand smooth when dry.

APPLICATION

Apply finishes according to manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual."

Use applicators and techniques suited for finish and substrate indicated.

Finish surfaces behind movable equipment and furniture same as similar exposed surfaces.

Do not apply finishes over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.

Apply finishes to produce surface films without cloudiness, holidays, lap marks, brush marks, runs, ropiness, or other surface imperfections.

CLEANING AND PROTECTION

At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.

After completing finish application, clean spattered surfaces. Remove spattered materials by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

Protect work of other trades against damage from finish application. Correct damage by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.

At completion of construction activities of other trades, touch up and restore damaged or defaced finished wood surfaces.

INTERIOR WOOD -FINISH-SYSTEM SCHEDULE

Wood Substrates: Wood trim architectural woodwork .

Water-Based Varnish over Stain System MPI INT 6.3W:

Stain Coat: Stain, semitransparent, for interior wood , MPI #90.

First Intermediate Coat: Water-based varnish matching topcoat.

Second Intermediate Coat: Water-based varnish matching topcoat.

Topcoat: Varnish, water based, clear, semi-gloss (MPI Gloss Level 5) , MPI #129.

END OF SECTION 099300

DIVISION 09 - FINISHES
SECTION 099600 - HIGH-PERFORMANCE COATINGS

GENERAL

SUMMARY

Section includes surface preparation and the application of high-performance coating systems

Interior Substrates:

Concrete, surfaces.

Concrete masonry units (CMUs).

DEFINITIONS

MPI Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D 523.

MPI Gloss Level 6: 70 to 85 units at 60 degrees, according to ASTM D 523.

MPI Gloss Level 7: More than 85 units at 60 degrees, according to ASTM D 523.

ACTION SUBMITTALS

Product Data: For each type of product. Include preparation requirements and application instructions.

Include printout of current "MPI Approved Products List" for each product category specified, with the proposed product highlighted.

Indicate VOC content.

Samples for Initial Selection: For each type of topcoat product indicated.

Product List: Cross-reference to coating system and locations of application areas. Use same designations indicated on Drawings and in schedules. Include color designations.

MAINTENANCE MATERIAL SUBMITTALS

Furnish extra materials , from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

Coatings: 5 percent, but not less than 1 gal. of each material and color applied.

QUALITY ASSURANCE

DELIVERY, STORAGE, AND HANDLING

Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F.

Maintain containers in clean condition, free of foreign materials and residue.

Remove rags and waste from storage areas daily.

FIELD CONDITIONS

Apply coatings only when temperature of surfaces to be coated and ambient air temperatures are between 50 and 95 deg F.

Do not apply coatings when relative humidity exceeds 85 percent; at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.

Do not apply exterior coatings in snow, rain, fog, or mist.

PRODUCTS

MANUFACTURERS

Manufacturers: Subject to compliance with requirements, provide products by one of the following:

Benjamin Moore & Co.

PPG Paints.

Sherwin-Williams Company (The).

Products: Subject to compliance with requirements, provide one of the products listed in the Exterior High-Performance Coating Schedule or Interior High-Performance Coating Schedule for the coating category indicated.

HIGH-PERFORMANCE COATINGS, GENERAL

MPI Standards: Products shall comply with MPI standards indicated and shall be listed in its "MPI Approved Products Lists."

Material Compatibility:

Materials for use within each paint system shall be compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.

For each coat in a paint system, products shall be recommended in writing by topcoat manufacturers for use in paint system and on substrate indicated.

Products shall be of same manufacturer for each coat in a coating system.

Colors: As selected by Architect from manufacturer's full range .

EXECUTION

EXAMINATION

Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:

Concrete: 12 percent.

Fiber-Cement Board: 12 percent.

Masonry (Clay and CMUs): 12 percent.

Wood: 15 percent.

Verify suitability of substrates, including surface conditions and compatibility, with existing finishes and primers.

Proceed with coating application only after unsatisfactory conditions have been corrected.

Application of coating indicates acceptance of surfaces and conditions.

PREPARATION

Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates and coating systems indicated.

Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.

After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.

Clean substrates of substances that could impair bond of coatings, including dust, dirt, oil, grease, and incompatible paints and encapsulants.

Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce coating systems indicated.

Concrete Substrates: Remove release agents, curing compounds, efflorescence, and chalk. Do not coat surfaces if moisture content or alkalinity of surfaces to be coated exceeds that permitted in manufacturer's written instructions.

Clean surfaces with pressurized water. Use pressure range of 1500 to 4000 psi at 6 to 12 inches.

Abrasive blast clean surfaces to comply with SSPC-SP 7/NACE No. 4.

Masonry Substrates: Remove efflorescence and chalk. Do not coat surfaces if moisture content, alkalinity of surfaces, or alkalinity of mortar joints exceeds that permitted in manufacturer's written instructions.

Clean surfaces with pressurized water. Use pressure range of 100 to 600 psi at 6 to 12 inches.

Aluminum Substrates: Remove loose surface oxidation.

APPLICATION

Apply high-performance coatings according to manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual."

Use applicators and techniques suited for coating and substrate indicated.

Coat surfaces behind movable equipment and furniture same as similar exposed surfaces. Before final installation, coat surfaces behind permanently fixed equipment or furniture with prime coat only.

Coat backsides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.

Do not apply coatings over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.

Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of the same material are to be applied. Tint undercoats to match color of finish coat, but provide sufficient difference in shade of undercoats to distinguish each separate coat.

If undercoats or other conditions show through final coat, apply additional coats until cured film has a uniform coating finish, color, and appearance.

Apply coatings to produce surface films without cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections. Produce sharp glass lines and color breaks.

CLEANING AND PROTECTION

At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.

After completing coating application, clean spattered surfaces. Remove spattered coatings by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

Protect work of other trades against damage from coating operation. Correct damage to work of other trades by cleaning, repairing, replacing, and recoating, as approved by Architect, and leave in an undamaged condition.

At completion of construction activities of other trades, touch up and restore damaged or defaced coated surfaces.

INTERIOR HIGH-PERFORMANCE COATING SCHEDULE

CMU Substrates:

Epoxy System MPI INT 4.2F :

Block Filler: Block filler, latex, interior/exterior , MPI #4.

Intermediate Coat: Epoxy, matching topcoat.

Topcoat: Epoxy, gloss , MPI #77.

END OF SECTION 099600

DIVISION 10 – SPECIALTIES
SECTION 101416 – PLAQUES

GENERAL

SUMMARY

Section includes plaques.

DEFINITIONS

Accessible: In accordance with the accessibility standard.

ACTION SUBMITTALS

Product Data: For each type of product.

Shop Drawings: For plaques.

Include fabrication and installation details and attachments to other work.

Show plaque mounting heights, locations of supplementary supports to be provided by others, and accessories.

Show message list, typestyles, graphic elements, and layout for each plaque at least half size.

INFORMATIONAL SUBMITTALS

Sample Warranty: For special warranty.

CLOSEOUT SUBMITTALS

Maintenance Data: For plaques to include in maintenance manuals.

QUALITY ASSURANCE

Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

WARRANTY

Special Warranty: Manufacturer agrees to repair or replace components of plaques that fail in materials or workmanship within specified warranty period.

Failures include, but are not limited to, the following:

Deterioration of finishes beyond normal weathering.

Deterioration of embedded graphic image.

Warranty Period: Five years from date of Substantial Completion.

PRODUCTS

PERFORMANCE REQUIREMENTS

Accessibility Standard: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines for Buildings and Facilities for signs.

PLAQUES

Cast Plaque: Plaque with background texture, border, and characters having uniform faces, sharp corners, and precisely formed lines and profiles; and as follows:

Manufacturers: Subject to compliance with requirements, provide products by one of the following:
Plaque Material: Cast bronze.

Plaque Thickness: 0.50 inch (12.7 mm).

Finishes:

Baked-Enamel or Powder-Coat Finish: Manufacturer's standard, in color as selected by Architect from manufacturer's full range.

Overcoat: Manufacturer's standard baked-on clear coating.

Background Texture: Leatherette.

Integrally Cast Border Style: Double-raised line border.

Mounting: Concealed studs.

Text and Typeface: Cast Bronze Plaque: Bronze plaque shall be 20” – 30” and shall contain the following:

All characters shall be helvetica:

1” – 75 characters
1/2” – 100 characters
1/4” – 250 characters
Maltese Cross
Star of Life

MATERIALS

Aluminum Extrusions: ASTM B 221 (ASTM B 221M), alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated.

Bronze Castings: ASTM B 584, alloy recommended by manufacturer and finisher for finish indicated.
ACCESSORIES

Fasteners and Anchors: Manufacturer's standard as required for secure anchorage of plaques, noncorrosive and compatible with each material joined, and complying with the following:

Use concealed fasteners and anchors unless indicated to be exposed.

For exterior exposure, furnish nonferrous-metal, stainless-steel, hot-dip galvanized, devices unless otherwise indicated.

Exposed Metal-Fastener Components, General:

Fabricated from same basic metal and finish of fastened metal unless otherwise indicated.
Plaque Mounting Fasteners:

Concealed Studs: Concealed (blind), threaded studs welded or brazed to back of plaque, screwed into back of plaque, or screwed into tapped lugs cast integrally into back of plaque, unless otherwise indicated.

FABRICATION

General: Provide manufacturer's standard plaques according to requirements indicated.

Preassemble plaques in the shop to greatest extent possible. Disassemble plaques only as necessary for shipping and handling limitations. Clearly mark units for reassembly and installation; apply markings in locations concealed from view after final assembly.

Mill joints to a tight, hairline fit. Form assemblies and joints exposed to weather to resist water penetration and retention.

Comply with AWS for recommended practices in welding and brazing. Provide welds and brazes behind finished surfaces without distorting or discoloring exposed side. Clean exposed welded and brazed connections of flux, and dress exposed and contact surfaces.

Conceal connections if possible; otherwise, locate connections where they are inconspicuous.

Provide rebates, lugs, and brackets necessary to assemble components and to attach to existing work. Drill and tap for required fasteners. Use concealed fasteners where possible; use exposed fasteners that match plaque finish.

Castings: Fabricate castings free of warp, cracks, blowholes, pits, scale, sand holes, and other defects that impair appearance or strength. Grind, wire brush, sandblast, and buff castings to remove seams, gate marks, casting flash, and other casting marks before finishing.

GENERAL FINISH REQUIREMENTS

Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

Organic, Anodic, and Chemically Produced Finishes: Apply to formed metal after fabrication but before applying contrasting polished finishes on raised features unless otherwise indicated.

ALUMINUM FINISHES

Baked-Enamel or Powder-Coat Finish: AAMA 2603 except with a minimum dry film thickness of 1.5 mils (0.04 mm). Comply with coating manufacturer's written instructions for cleaning, conversion coating, and applying and baking finish.

EXECUTION

EXAMINATION

Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of plaque work.

Verify that plaque-support surfaces are within tolerances to accommodate plaques without gaps or irregularities between backs of plaques and support surfaces unless otherwise indicated.

Proceed with installation only after unsatisfactory conditions have been corrected.

INSTALLATION

General: Install plaques using mounting methods indicated and according to manufacturer's written instructions.

Install plaques level, plumb, true to line, and at locations and heights indicated, with plaque surfaces free of distortion and other defects in appearance.

Install plaques so they do not protrude or obstruct according to the accessibility standard.

Before installation, verify that plaque surfaces are clean and free of materials or debris that would impair installation.

Corrosion Protection: Coat concealed surfaces of exterior aluminum in contact with grout, concrete, masonry, wood, or dissimilar metals, with a heavy coat of bituminous paint.

Mounting Methods:

Concealed Studs: Using a template, drill holes in substrate aligning with studs on back of plaque. Remove loose debris from hole and substrate surface.

Masonry Substrates: Fill holes with adhesive. Leave recess space in hole for displaced adhesive. Place plaque in position and push until flush to surface, embedding studs in holes. Temporarily support plaque in position until adhesive fully sets.

ADJUSTING AND CLEANING

Remove and replace damaged or deformed plaques and plaques that do not comply with specified requirements. Replace plaques with damaged or deteriorated finishes or components that cannot be successfully repaired by finish touchup or similar minor repair procedures.

Remove temporary protective coverings and strippable films as plaques are installed.

On completion of installation, clean exposed surfaces of plaques according to manufacturer's written instructions, and touch up minor nicks and abrasions in finish. Maintain plaques in a clean condition during construction and protect from damage until acceptance by Owner.

END OF SECTION 101416

DIVISION 10 - SPECIALTIES
SECTION 101419 - DIMENSIONAL LETTER SIGNAGE

GENERAL

SUMMARY
Section Includes:
Molded-plastic dimensional characters.

ACTION SUBMITTALS
Product Data: For each type of product.
Samples for Initial Selection: For each type of sign assembly, exposed component, and exposed finish.
Include representative Samples of available typestyles and graphic symbols.
Sign Schedule: Use same designations specified or indicated on Drawings or in a sign schedule.

INFORMATIONAL SUBMITTALS
Qualification Data: For Installer and manufacturer.
Sample Warranty: For special warranty.

CLOSEOUT SUBMITTALS
Maintenance Data: For signs to include in maintenance manuals.

QUALITY ASSURANCE
Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

WARRANTY
Special Warranty: Manufacturer agrees to repair or replace components of signs that fail in materials or workmanship within specified warranty period.
Failures include, but are not limited to, the following:
Deterioration of finishes beyond normal weathering.
Separation or delamination of sheet materials and components.
Warranty Period: Five years from date of Substantial Completion.

PRODUCTS

PERFORMANCE REQUIREMENTS
Thermal Movements: For exterior fabricated channel dimensional characters, allow for thermal movements from ambient and surface temperature changes.
Temperature Change: 120 deg F , ambient; 180 deg F , material surfaces.

DIMENSIONAL CHARACTERS
Molded-Plastic Characters: Injection molded characters having uniform faces and profiles, and as follows:
Manufacturers: Subject to compliance with requirements, provide products by one of the following:

ACE Sign Systems, Inc.
Gemini Incorporated.
Metallic Arts.

Color: Manufacturer's standard integral color process, in color as selected by Architect from manufacturer's full range.

ACCESSORIES

Fasteners and Anchors: Manufacturer's standard as required for secure anchorage of signage, noncorrosive and compatible with each material joined, and complying with the following:

Use concealed fasteners and anchors unless indicated to be exposed.

FABRICATION

General: Provide manufacturer's standard sign assemblies according to requirements indicated.

Preassemble signs and assemblies in the shop to greatest extent possible. Disassemble signs and assemblies only as necessary for shipping and handling limitations. Clearly mark units for reassembly and installation; apply markings in locations concealed from view after final assembly.

Mill joints to a tight, hairline fit. Form assemblies and joints exposed to weather to resist water penetration and retention.

Comply with AWS for recommended practices in welding and brazing. Provide welds and brazes behind finished surfaces without distorting or discoloring exposed side. Clean exposed welded and brazed connections of flux, and dress exposed and contact surfaces.

Conceal connections if possible; otherwise, locate connections where they are inconspicuous.

Internally brace signs for stability and for securing fasteners.

Provide rebates, lugs, and brackets necessary to assemble components and to attach to existing work.

Drill and tap for required fasteners. Use concealed fasteners where possible; use exposed fasteners that match sign finish.

GENERAL FINISH REQUIREMENTS

Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

Organic, Anodic, and Chemically Produced Finishes: Apply to formed metal after fabrication but before applying contrasting polished finishes on raised features unless otherwise indicated.

EXECUTION

EXAMINATION

Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of signage work.

Verify that sign-support surfaces are within tolerances to accommodate signs without gaps or irregularities between backs of signs and support surfaces unless otherwise indicated.

Proceed with installation only after unsatisfactory conditions have been corrected.

INSTALLATION

General: Install signs using mounting methods indicated and according to manufacturer's written instructions.

Install signs level, plumb, true to line, and at locations and heights indicated, with sign surfaces free of distortion and other defects in appearance.

Before installation, verify that sign surfaces are clean and free of materials or debris that would impair installation.

Corrosion Protection: Coat concealed surfaces of exterior aluminum in contact with grout, concrete, masonry, wood, or dissimilar metals, with a heavy coat of bituminous paint.

ADJUSTING AND CLEANING

Remove and replace damaged or deformed characters and signs that do not comply with specified requirements. Replace characters with damaged or deteriorated finishes or components that cannot be successfully repaired by finish touchup or similar minor repair procedures.
Remove temporary protective coverings and strippable films as signs are installed.
On completion of installation, clean exposed surfaces of signs according to manufacturer's written instructions, and touch up minor nicks and abrasions in finish. Maintain signs in a clean condition during construction and protect from damage until acceptance by Owner.

END OF SECTION 101419

DIVISION 10 – SPECIALTIES
SECTION 101423.16 - ROOM-IDENTIFICATION PANEL SIGNAGE

1 GENERAL

2 SUMMARY

3 Section includes room-identification signs that are directly attached to the building.

4 DEFINITIONS

5 Accessible: In accordance with the accessibility standard.

6 COORDINATION

7 Furnish templates for placement of sign-anchorage devices embedded in permanent construction by
8 other installers.

9 ACTION SUBMITTALS

10 Product Data: For each type of product.

11 Samples for Initial Selection: For each type of sign assembly, exposed component, and exposed
12 finish.

13 Include representative Samples of available typestyles and graphic symbols.

14 Product Schedule: For room-identification signs. Use same designations indicated on Drawings or
15 specified.

16 INFORMATIONAL SUBMITTALS

17 Sample Warranty: For special warranty.

18 CLOSEOUT SUBMITTALS

19 Maintenance Data: For signs to include in maintenance manuals.

20 MAINTENANCE MATERIAL SUBMITTALS

21 Furnish extra materials , from the same product run, that match products installed and that are
22 packaged with protective covering for storage and identified with labels describing contents.

23 Variable Component Materials: 12 replaceable text inserts and interchangeable characters (letters,
24 numbers, and graphic elements) of each type.

25 Tools: One set(s) of specialty tools for assembling signs and replacing variable sign components.

26 QUALITY ASSURANCE

27 FIELD CONDITIONS

Field Measurements: Verify locations of anchorage devices embedded in permanent construction by other installers by field measurements before fabrication, and indicate measurements on Shop Drawings.

WARRANTY

Special Warranty: Manufacturer agrees to repair or replace components of signs that fail in materials or workmanship within specified warranty period.

Failures include, but are not limited to, the following:

Deterioration of finishes beyond normal weathering.

Deterioration of embedded graphic image.

Separation or delamination of sheet materials and components.

Warranty Period: Five years from date of Substantial Completion.

PRODUCTS

PERFORMANCE REQUIREMENTS

Accessibility Standard: Comply with applicable provisions in the USDOJ's "2010 ADA Standards for Accessible Design" and ICC A117.1 .

ROOM-IDENTIFICATION SIGNS

Room-Identification Sign : Sign with smooth, uniform surfaces; with message and characters having uniform faces, sharp corners, and precisely formed lines and profiles; and as follows:

Manufacturers: Subject to compliance with requirements, provide products by one of the following:

APCO Graphics, Inc.

ASI Sign Systems, Inc.

Vista System.

Laminated-Sheet Sign: Photopolymer face sheet with raised graphics laminated over subsurface graphics to acrylic backing sheet to produce composite sheet.

Composite-Sheet Thickness: Manufacturer's standard for size of sign .

Surface-Applied Graphics: Applied vinyl film .

Color(s): As selected by Architect from manufacturer's full range .

Sign-Panel Perimeter: Finish edges smooth.

Edge Condition at Horizontal Edges : Beveled .

Corner Condition in Elevation: Square .

Frame: to hold changeable sign panel .

Material: Aluminum .

Frame Depth: Convex-curved frame to receive removable face sheet and changeable subsurface graphics .

Profile: Rounded .

Corner Condition in Elevation: Square .

Finish and Color: Mill .

Mounting: Manufacturer's standard method for substrates indicated with concealed anchors .

Text and Typeface: typeface as selected by Architect from manufacturer's full range and . Finish raised characters to contrast with background color, and finish Braille to match background color.

SIGN MATERIALS

Aluminum Sheet and Plate: ASTM B 209, alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated.

Aluminum Extrusions: ASTM B 221, alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated.

Acrylic Sheet: ASTM D 4802, category as standard with manufacturer for each sign, Type UVF (UV filtering).

Vinyl Film: UV-resistant vinyl film with pressure-sensitive, permanent adhesive; die cut to form characters or images as indicated on Drawings.

Paints and Coatings for Sheet Materials: Inks, dyes, and paints that are recommended by manufacturer for optimum adherence to surface and are UV and water resistant for colors and exposure indicated.

ACCESSORIES

Fasteners and Anchors: Manufacturer's standard as required for secure anchorage of signs, noncorrosive and compatible with each material joined, and complying with the following:

Use concealed fasteners and anchors unless indicated to be exposed.

FABRICATION

General: Provide manufacturer's standard sign assemblies according to requirements indicated.

Preassemble signs and assemblies in the shop to greatest extent possible. Disassemble signs and assemblies only as necessary for shipping and handling limitations. Clearly mark units for reassembly and installation; apply markings in locations concealed from view after final assembly.

Mill joints to a tight, hairline fit. Form assemblies and joints exposed to weather to resist water penetration and retention.

Conceal connections if possible; otherwise, locate connections where they are inconspicuous.

Provide rabbets, lugs, and tabs necessary to assemble components and to attach to existing work. Drill and tap for required fasteners. Use concealed fasteners where possible; use exposed fasteners that match sign finish.

Signs with Changeable Message Capability: Fabricate signs to allow insertion of changeable messages as follows:

For snap-in changeable inserts beneath removable face sheet, furnish one suction or other device to assist in removing face sheet. Furnish initial changeable insert. Furnish two blank inserts for each sign for Owner's use .

For slide-in changeable inserts, fabricate slot without burrs or constrictions that inhibit function. Furnish initial changeable insert. Furnish two blank inserts for each sign for Owner's use .

For frame to hold changeable sign panel, fabricate frame without burrs or constrictions that inhibit function. Furnish initial sign panel. .

GENERAL FINISH REQUIREMENTS

Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

ALUMINUM FINISHES

Clear Anodic Finish: AAMA 611, Class I, 0.018 mm or thicker.

EXECUTION

INSTALLATION

General: Install signs using mounting methods indicated and according to manufacturer's written instructions.

Install signs level, plumb, true to line, and at locations and heights indicated, with sign surfaces free of distortion and other defects in appearance.

Install signs so they do not protrude or obstruct according to the accessibility standard.

Before installation, verify that sign surfaces are clean and free of materials or debris that would impair installation.

Accessibility: Install signs in locations on walls and according to the accessibility standard .

Mounting Methods:

Through Fasteners: Drill holes in substrate using predrilled holes in sign as template. Countersink holes in sign if required. Place sign in position and flush to surface. Install through fasteners and tighten.

ADJUSTING AND CLEANING

Remove and replace damaged or deformed signs and signs that do not comply with specified requirements. Replace signs with damaged or deteriorated finishes or components that cannot be successfully repaired by finish touchup or similar minor repair procedures.

Remove temporary protective coverings and strippable films as signs are installed.

On completion of installation, clean exposed surfaces of signs according to manufacturer's written instructions, and touch up minor nicks and abrasions in finish. Maintain signs in a clean condition during construction and protect from damage until acceptance by Owner.

END OF SECTION 101423.16

DIVISION 10 – SPECIALTIES
SECTION 101423 - PANEL SIGNAGE

GENERAL

SUMMARY

Section includes plaques.

DEFINITIONS

Accessible: In accordance with the accessibility standard.

ACTION SUBMITTALS

Product Data: For each type of product.

Shop Drawings: For plaques.

Include fabrication and installation details and attachments to other work.

Show plaque mounting heights, locations of supplementary supports to be provided by others, and accessories.

Show message list, typestyles, graphic elements, and layout for each plaque at least half size.

INFORMATIONAL SUBMITTALS

Sample Warranty: For special warranty.

CLOSEOUT SUBMITTALS

Maintenance Data: For plaques to include in maintenance manuals.

QUALITY ASSURANCE

Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

WARRANTY

Special Warranty: Manufacturer agrees to repair or replace components of plaques that fail in materials or workmanship within specified warranty period.

Failures include, but are not limited to, the following:

Deterioration of finishes beyond normal weathering.

Deterioration of embedded graphic image.

Warranty Period: Five years from date of Substantial Completion.

PRODUCTS

PERFORMANCE REQUIREMENTS

Accessibility Standard: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines for Buildings and Facilities for signs.

PLAQUES

Cast Plaque: Plaque with background texture, border, and characters having uniform faces, sharp corners, and precisely formed lines and profiles; and as follows:

Manufacturers: Subject to compliance with requirements, provide products by one of the following:
Plaque Material: Cast bronze.

Plaque Thickness: 0.50 inch (12.7 mm).

Finishes:

Baked-Enamel or Powder-Coat Finish: Manufacturer's standard, in color as selected by Architect from manufacturer's full range.

Overcoat: Manufacturer's standard baked-on clear coating.

Background Texture: Leatherette.

Integrally Cast Border Style: Double-raised line border.

Mounting: Concealed studs.

Text and Typeface: Cast Bronze Plaque: Bronze plaque shall be 20” – 30” and shall contain the following:

All characters shall be helvetica:

1” – 50 characters
1/2” – 100 characters
1/4” – 250 characters
Maltese Cross

MATERIALS

Aluminum Extrusions: ASTM B 221 (ASTM B 221M), alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated.

Bronze Castings: ASTM B 584, alloy recommended by manufacturer and finisher for finish indicated.
ACCESSORIES

Fasteners and Anchors: Manufacturer's standard as required for secure anchorage of plaques, noncorrosive and compatible with each material joined, and complying with the following:

Use concealed fasteners and anchors unless indicated to be exposed.

For exterior exposure, furnish nonferrous-metal, stainless-steel, hot-dip galvanized, devices unless otherwise indicated.

Exposed Metal-Fastener Components, General:

Fabricated from same basic metal and finish of fastened metal unless otherwise indicated.
Plaque Mounting Fasteners:

Concealed Studs: Concealed (blind), threaded studs welded or brazed to back of plaque, screwed into back of plaque, or screwed into tapped lugs cast integrally into back of plaque, unless otherwise indicated.

FABRICATION

General: Provide manufacturer's standard plaques according to requirements indicated.

Preassemble plaques in the shop to greatest extent possible. Disassemble plaques only as necessary for shipping and handling limitations. Clearly mark units for reassembly and installation; apply markings in locations concealed from view after final assembly.

Mill joints to a tight, hairline fit. Form assemblies and joints exposed to weather to resist water penetration and retention.

Comply with AWS for recommended practices in welding and brazing. Provide welds and brazes behind finished surfaces without distorting or discoloring exposed side. Clean exposed welded and brazed connections of flux, and dress exposed and contact surfaces.

Conceal connections if possible; otherwise, locate connections where they are inconspicuous.

Provide rebates, lugs, and brackets necessary to assemble components and to attach to existing work. Drill and tap for required fasteners. Use concealed fasteners where possible; use exposed fasteners that match plaque finish.

Castings: Fabricate castings free of warp, cracks, blowholes, pits, scale, sand holes, and other defects that impair appearance or strength. Grind, wire brush, sandblast, and buff castings to remove seams, gate marks, casting flash, and other casting marks before finishing.

GENERAL FINISH REQUIREMENTS

Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

Organic, Anodic, and Chemically Produced Finishes: Apply to formed metal after fabrication but before applying contrasting polished finishes on raised features unless otherwise indicated.

ALUMINUM FINISHES

Baked-Enamel or Powder-Coat Finish: AAMA 2603 except with a minimum dry film thickness of 1.5 mils (0.04 mm). Comply with coating manufacturer's written instructions for cleaning, conversion coating, and applying and baking finish.

EXECUTION

EXAMINATION

Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of plaque work.

Verify that plaque-support surfaces are within tolerances to accommodate plaques without gaps or irregularities between backs of plaques and support surfaces unless otherwise indicated.

Proceed with installation only after unsatisfactory conditions have been corrected.

INSTALLATION

General: Install plaques using mounting methods indicated and according to manufacturer's written instructions.

Install plaques level, plumb, true to line, and at locations and heights indicated, with plaque surfaces free of distortion and other defects in appearance.

Install plaques so they do not protrude or obstruct according to the accessibility standard.

Before installation, verify that plaque surfaces are clean and free of materials or debris that would impair installation.

Corrosion Protection: Coat concealed surfaces of exterior aluminum in contact with grout, concrete, masonry, wood, or dissimilar metals, with a heavy coat of bituminous paint.

Mounting Methods:

Concealed Studs: Using a template, drill holes in substrate aligning with studs on back of plaque. Remove loose debris from hole and substrate surface.

Masonry Substrates: Fill holes with adhesive. Leave recess space in hole for displaced adhesive. Place plaque in position and push until flush to surface, embedding studs in holes. Temporarily support plaque in position until adhesive fully sets.

ADJUSTING AND CLEANING

Remove and replace damaged or deformed plaques and plaques that do not comply with specified requirements. Replace plaques with damaged or deteriorated finishes or components that cannot be successfully repaired by finish touchup or similar minor repair procedures.

Remove temporary protective coverings and strippable films as plaques are installed.

On completion of installation, clean exposed surfaces of plaques according to manufacturer's written instructions, and touch up minor nicks and abrasions in finish. Maintain plaques in a clean condition during construction and protect from damage until acceptance by Owner.

END OF SECTION 101416

DIVISION 10 – SPECIALTIES
SECTION 102113.19 - PLASTIC TOILET COMPARTMENTS

GENERAL

SUMMARY

Section Includes:

Solid-plastic toilet compartments configured as toilet enclosures and urinal screens.

COORDINATION

Coordinate requirements for blocking, reinforcing, and other supports concealed within wall.

ACTION SUBMITTALS

Product Data:

Solid-plastic toilet compartments:

Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for toilet compartments.

Shop Drawings: For solid-plastic toilet compartments.

Include plans, elevations, sections, details, and attachment details.

Show locations of cutouts for compartment-mounted toilet accessories.

Show locations of centerlines of toilet fixtures.

Show locations of floor drains.

Show overhead support or bracing locations.

Samples for Initial Selection: Manufacturer's standard color sheets, showing full range of available colors for each type of toilet compartment material indicated.

Include Samples of hardware and accessories involving material and color selection.

INFORMATIONAL SUBMITTALS

CLOSEOUT SUBMITTALS

Maintenance Data: For toilet compartments.

MAINTENANCE MATERIAL SUBMITTALS

Extra Stock Material: Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

Door Hinges: One hinge(s) with associated fasteners.

Latch and Keeper: One latch(es) and keeper(s) with associated fasteners.

Door Bumper: One bumper(s) with associated fasteners.

Door Pull: One door pull(s) with associated fasteners.

Fasteners: 10 fasteners of each size and type.

FIELD CONDITIONS

Field Measurements: Verify actual locations of toilet fixtures, walls, columns, ceilings, and other construction contiguous with toilet compartments by field measurements, and coordinate before fabrication.

PRODUCTS

PERFORMANCE REQUIREMENTS

SOLID-PLASTIC TOILET COMPARTMENTS

Manufacturers: Subject to compliance with requirements, provide products by one of the following:

Scranton Products

Marlite.

Ampco bt AJW

Toilet-Enclosure Style: Floor anchored .

Urinal-Screen Style: Wall hung .

Door, Panel, and Pilaster Construction: Solid, high-density polyethylene (HDPE) panel material, not less than 1 inch thick, seamless, with eased edges, no-sightline system, and with homogenous color and pattern throughout thickness of material.

Integral Hinges: Configure doors and pilasters to receive integral hinges.

Heat-Sink Strip: Manufacturer's standard continuous, stainless steel strip fastened to exposed bottom edges of solid-plastic components to hinder malicious combustion.

Color and Pattern: Two colors and patterns in each room as selected by Architect from manufacturer's full range .

Pilaster Shoes and Sleeves (Caps): Manufacturer's standard design; stainless steel.

Brackets (Fittings):

Stirrup Type: Ear or U-brackets, stainless steel .

Overhead Cross Bracing for Ceiling-Hung Units: As recommended by manufacturer and fabricated from solid polymer.

HARDWARE AND ACCESSORIES

Hardware and Accessories, Heavy Duty: Manufacturer's heavy-duty operating hardware and accessories.

Hinges: Manufacturer's minimum 0.062-inch- thick stainless steel paired, self-closing type that can be adjusted to hold doors open at any angle up to 90 degrees , allowing emergency access by lifting door. Mount with through bolts.

Latch and Keeper: Manufacturer's heavy-duty, surface-mounted, cast-stainless steel latch unit, designed to resist damage due to slamming, with combination rubber-faced door strike and keeper, and with provision for emergency access. Provide units that comply with regulatory requirements for accessibility at compartments designated as accessible. Mount with through bolts.

Coat Hook: Manufacturer's heavy-duty combination cast-stainless steel hook and rubber-tipped bumper, sized to prevent inswinging door from hitting compartment-mounted accessories. Mount with through bolts.

Door Bumper: Manufacturer's heavy-duty, rubber-tipped, cast-stainless steel bumper at outswinging doors. Mount with through bolts.

Door Pull: Manufacturer's heavy-duty, cast-stainless steel pull at outswinging doors that complies with regulatory requirements for accessibility. Provide units on both sides of doors at compartments designated as accessible. Mount with through bolts.

Overhead Bracing: Manufacturer's standard continuous, extruded-aluminum head rail with antigrip profile and in manufacturer's standard finish.

Anchorages and Fasteners: Manufacturer's standard exposed fasteners of stainless steel, finished to match the items they are securing, with theft-resistant-type heads. Provide sex-type bolts for through-bolt applications. For concealed anchors, use stainless steel, hot-dip galvanized steel, or other rust-resistant, protective-coated steel compatible with related materials.

MATERIALS

Stainless Steel Sheet: ASTM A240/A240M or ASTM A666, Type 304, stretcher-leveled standard of flatness.

Stainless Steel Castings: ASTM A743/A743M.

Zamac: ASTM B86, commercial zinc-alloy die castings.

FABRICATION

Fabrication, General: Fabricate toilet compartment components to sizes indicated. Coordinate requirements and provide cutouts for through-partition toilet accessories where required for attachment of toilet accessories.

Floor-Anchored Units: Provide manufacturer's standard corrosion-resistant anchoring assemblies with leveling adjustment nuts at pilasters for structural connection to floor. Provide shoes at pilasters to conceal anchorage.

Door Size and Swings: Unless otherwise indicated, provide 24-inch- wide, inswinging doors for standard toilet compartments and 36-inch- wide, outswinging doors with a minimum 32-inch- wide, clear opening for compartments designated as accessible.

EXECUTION

EXAMINATION

Examine areas and conditions, with Installer present, for compliance with requirements for fastening, support, alignment, operating clearances, and other conditions affecting performance of the Work.

Confirm location and adequacy of blocking and supports required for installation.

Proceed with installation only after unsatisfactory conditions have been corrected.

INSTALLATION OF PLASTIC TOILET COMPARTMENTS

General: Comply with manufacturer's written installation instructions. Install units rigid, straight, level, and plumb. Secure units in position with manufacturer's recommended anchoring devices.

Maximum Clearances:

Pilasters and Panels: 1/2 inch.

Panels and Walls: 1 inch.

Stirrup Brackets: Secure panels to walls and to pilasters with no fewer than three brackets attached at midpoint and near top and bottom of panel.

Locate wall brackets, so holes for wall anchors occur in masonry or tile joints.

Align brackets at pilasters with brackets at walls.

Floor-Anchored Units: Set pilasters with anchors penetrating not less than 2 inches into structural floor unless otherwise indicated in manufacturer's written instructions. Level, plumb, and tighten pilasters. Hang doors and adjust, so tops of doors are level with tops of pilasters when doors are in closed position.

Urinal Screens: Attach with anchoring devices to suit supporting structure. Set units level and plumb, rigid, and secured to resist lateral impact.

ADJUSTING

Hardware Adjustment: Adjust and lubricate hardware according to hardware manufacturer's written instructions for proper operation. Set hinges on inswinging doors to hold doors open approximately 30 degrees from closed position when unlatched. Set hinges on outswinging doors to return doors to fully closed position.

END OF SECTION 102113.19

DIVISION 10 – SPECIALTIES
SECTION 102600 - WALL AND DOOR PROTECTION

GENERAL

SUMMARY

Section Includes:

Corner guards.

ACTION SUBMITTALS

Product Data: For each type of product.

Include construction details, material descriptions, impact strength, dimensions of individual components and profiles, and finishes.

Include fire ratings of units recessed in fire-rated walls and listings for door-protection items attached to fire-rated doors.

Samples for Initial Selection: For each type of impact-resistant wall-protection unit indicated, in each color and texture specified.

Include Samples of accent strips and accessories to verify color selection.

Samples for Verification: For each type of exposed finish on the following products, prepared on Samples of size indicated below:

Corner Guards: 12 inches long. Include example top caps.

INFORMATIONAL SUBMITTALS

Sample Warranty: For special warranty.

CLOSEOUT SUBMITTALS

Maintenance Data: For each type of wall and door protection product to include in maintenance manuals.

Include recommended methods and frequency of maintenance for maintaining best condition of plastic covers under anticipated traffic and use conditions. Include precautions against using cleaning materials and methods that may be detrimental to finishes and performance.

MAINTENANCE MATERIAL SUBMITTALS

Furnish extra materials , from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

Corner-Guard Covers: Full-size plastic covers of maximum length equal to 2 percent of each type, color, and texture of cover installed, but no fewer than two, 48-inch- long units.

Mounting and Accessory Components: Amounts proportional to the quantities of extra materials. Package mounting and accessory components with each extra material.

QUALITY ASSURANCE

DELIVERY, STORAGE, AND HANDLING

Store wall and door protection in original undamaged packages and containers inside well-ventilated area protected from weather, moisture, soiling, extreme temperatures, and humidity.

Maintain room temperature within storage area at not less than 70 deg F during the period plastic materials are stored.

Keep plastic materials out of direct sunlight.

Store plastic wall- and door-protection components for a minimum of 72 hours, or until plastic material attains a minimum room temperature of 70 deg F.

Store corner-guard covers in a vertical position.

WARRANTY

Special Warranty: Manufacturer agrees to repair or replace components of wall- and door-protection units that fail in materials or workmanship within specified warranty period.

Failures include, but are not limited to, the following:

Structural failures including detachment of components from each other or from the substrates, delamination, and permanent deformation beyond normal use.

Deterioration of metals, metal finishes, plastics, and other materials beyond normal use.

Warranty Period: Five years from date of Substantial Completion.

PRODUCTS

MANUFACTURERS

Source Limitations: Obtain wall- and door-protection products from single source from single manufacturer.

PERFORMANCE REQUIREMENTS

Surface Burning Characteristics: Comply with ASTM E 84 or UL 723; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

Flame-Spread Index: 25 or less.

Smoke-Developed Index: 450 or less.

Regulatory Requirements: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines for Buildings and Facilities and ICC A117.1 .

CORNER GUARDS

Surface-Mounted, Metal Corner Guards : Fabricated as one piece from formed or extruded metal with formed edges; with 90- or 135-degree turn to match wall condition.

Manufacturers: Subject to compliance with requirements, provide products by one of the following:

Balco; a CSW Industrials Company.

Pawling Corporation.

WallGuard.com.

Material: Stainless-steel sheet, Type 304 .

Thickness: Minimum 0.0781 inch .

Finish: Directional satin, No. 4 .

Wing Size: Nominal 2-1/2 by 2-1/2 inches .

Corner Radius: 1/8 inch .

Mounting: Flat-head, countersunk screws through factory-drilled mounting holes .

MATERIALS

Fasteners: Aluminum, nonmagnetic stainless-steel, or other noncorrosive metal screws, bolts, and other fasteners compatible with items being fastened. Use security-type fasteners where exposed to view.

Adhesive: As recommended by protection product manufacturer.

FABRICATION

Quality: Fabricate components with uniformly tight seams and joints and with exposed edges rolled. Provide surfaces free of wrinkles, chips, dents, uneven coloration, and other imperfections. Fabricate members and fittings to produce flush, smooth, and rigid hairline joints.

FINISHES

Protect finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

EXECUTION

EXAMINATION

Examine substrates and wall areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

Proceed with installation only after unsatisfactory conditions have been corrected.

PREPARATION

Complete finishing operations, including painting, before installing wall and door protection.

Before installation, clean substrate to remove dust, debris, and loose particles.

INSTALLATION

Accessories: Provide splices, mounting hardware, anchors, trim, joint moldings, and other accessories required for a complete installation.

Provide anchoring devices and suitable locations to withstand imposed loads.

CLEANING

Immediately after completion of installation, clean plastic covers and accessories using a standard ammonia-based household cleaning agent.

Remove excess adhesive using methods and materials recommended in writing by manufacturer.

END OF SECTION 102600

DIVISION 10 – SPECIALTIES
SECTION 102800 - TOILET, BATH, AND LAUNDRY ACCESSORIES

GENERAL

SUMMARY

Section Includes:

Public-use washroom accessories.

Public-use shower room accessories.

Hand dryers.

Custodial accessories.

COORDINATION

Coordinate accessory locations with other work to prevent interference with clearances required for access by people with disabilities, and for proper installation, adjustment, operation, cleaning, and servicing of accessories.

Deliver inserts and anchoring devices set into concrete or masonry as required to prevent delaying the Work.

ACTION SUBMITTALS

Product Data: For each type of product.

Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

Include anchoring and mounting requirements, including requirements for cutouts in other work and substrate preparation.

Product Schedule: Indicating types, quantities, sizes, and installation locations by room of each accessory required.

Identify locations using room designations indicated.

INFORMATIONAL SUBMITTALS

CLOSEOUT SUBMITTALS

Maintenance Data: For accessories to include in maintenance manuals.

PRODUCTS

PERFORMANCE REQUIREMENTS

Structural Performance: Design accessories and fasteners to comply with the following requirements:

Grab Bars: Installed units are able to resist 250 lbf concentrated load applied in any direction and at any point.

Shower Seats: Installed units are able to resist 360 lbf applied in any direction and at any point.

PUBLIC-USE WASHROOM ACCESSORIES

Source Limitations: Obtain public-use washroom accessories from single source from single manufacturer.

Toilet Tissue (Roll) Dispenser :

Manufacturers: Subject to compliance with requirements, undefined:

American Specialties, Inc.

Bobrick Washroom Equipment, Inc.

Bradley Corporation.

Description: Roll-in-reserve dispenser with hinged front secured with tumbler lockset .

Mounting: Surface mounted.

Operation: Noncontrol delivery with standard spindle .

Capacity: Designed for 4-1/2- or 5-inch- diameter tissue rolls.

Material and Finish: Stainless steel, ASTM A480/A480M No. 4 finish (satin) .

Grab Bar :

Manufacturers: Subject to compliance with requirements, undefined:

American Specialties, Inc.

Bobrick Washroom Equipment, Inc.

Bradley Corporation.

Mounting: Flanges with concealed fasteners.

Material: Stainless steel, 0.05 inch thick.

Finish: Smooth, ASTM A480/A480M No. 4 finish (satin).

Outside Diameter: 1-1/4 inches .

Configuration and Length: As indicated on Drawings .

Mirror Unit :

Manufacturers: Subject to compliance with requirements, undefined:

American Specialties, Inc.

Bobrick Washroom Equipment, Inc.

Bradley Corporation.

Frame: Stainless steel channel .

Corners: Welded and ground smooth.

Size: As indicated on Drawings .

Shelf:

Type: Integral, welded .

Depth: 5 inches .

Hangers: Manufacturer's standard rigid, tamper and theft resistant .

PUBLIC-USE SHOWER ROOM ACCESSORIES

Source Limitations: Obtain public-use shower room accessories from single source from single manufacturer.

Shower Curtain Rod :

Manufacturers: Subject to compliance with requirements, undefined:

American Specialties, Inc.

Bobrick Washroom Equipment, Inc.

Bradley Corporation.

Description: 1-1/4-inch- outside diameter, straight rod.

Configuration: As indicated on Drawings

Mounting Flanges: Concealed fasteners; in material and finish matching rod .

Rod Material and Finish: Stainless steel, ASTM A480/A480M No. 4 finish (satin) .

Shower Curtain :

Manufacturers: Subject to compliance with requirements, undefined:

American Specialties, Inc.

Bobrick Washroom Equipment, Inc.

Bradley Corporation.

Size: Minimum 12 inches wider than opening by 72 inches high.

Material: Nylon-reinforced vinyl, minimum 9 oz. or 0.008-inch- thick vinyl, with integral antibacterial and flame-retardant agents .

Color: As selected from manufacturer's full range .

Grommets: Corrosion resistant at minimum 6 inches o.c. through top hem.

Shower Curtain Hooks: Chrome-plated or stainless steel, spring wire curtain hooks with snap fasteners , sized to accommodate specified curtain rod. Provide one hook per curtain grommet.

Folding Shower Seat :

Manufacturers: Subject to compliance with requirements, undefined:

American Specialties, Inc.

Bobrick Washroom Equipment, Inc.

Bradley Corporation.

Configuration: L-shaped seat, designed for wheelchair access .

Seat: Phenolic or polymeric composite of slat-type or one-piece construction in color as selected by Architect .

Mounting Mechanism: Stainless steel, ASTM A480/A480M No. 4 finish (satin) .

Dimensions: As required by code .

Robe Hook :

Manufacturers: Subject to compliance with requirements, undefined:

American Specialties, Inc.

Bobrick Washroom Equipment, Inc.

Bradley Corporation.

Description: Double -prong unit.

Material and Finish: Stainless steel, ASTM A480/A480M No. 4 finish (satin) .

HAND DRYERS

Source Limitations: Obtain hand dryers from single source from single manufacturer.

High-Speed Air Dryer :

Manufacturers: Subject to compliance with requirements, provide products by one of the following:

American Specialties, Inc.

Bobrick Washroom Equipment, Inc.

Bradley Corporation.

Description: High-speed, warm -air hand dryer for rapid hand drying.

Mounting: Semirecessed .

Protrusion Limit: Installed unit protrudes maximum 4 inches from wall surface.

Operation: Infrared-sensor activated with timed power cut-off switch.

Average Dry Time: 12 seconds.

Automatic Shut Off: At 60 seconds.

Maximum Sound Level: 69 dB.

Cover Material and Finish: Stainless steel, ASTM A480/A480M No. 4 finish (satin) .

Electrical Requirements: 115 V, 20 A, 2300 W .

CUSTODIAL ACCESSORIES

Source Limitations: Obtain custodial accessories from single source from single manufacturer.

Custodial Utility Shelf :

Manufacturers: Subject to compliance with requirements, undefined:

American Specialties, Inc.

Bobrick Washroom Equipment, Inc.

Bradley Corporation.

Description: With exposed edges turned down not less than 1/2 inch and supported by two triangular brackets welded to shelf underside.

Size: 16 inches long by 6 inches deep .

Material and Finish: Not less than nominal 0.05-inch- thick stainless steel, ASTM A480/A480M No. 4 finish (satin).

Custodial Mop and Broom Holder :

Manufacturers: Subject to compliance with requirements, undefined:

American Specialties, Inc.

Bobrick Washroom Equipment, Inc.

Bradley Corporation.

Description: Unit with shelf, hooks, holders, and rod suspended beneath shelf .

Length: 36 inches .

Hooks: Four .

Mop/Broom Holders: Three , spring-loaded, rubber hat, cam type.

Material and Finish: Stainless steel, ASTM A480/A480M No. 4 finish (satin).

Shelf: Not less than nominal 0.05-inch- thick stainless steel.

Rod: Approximately 1/4-inch- diameter stainless steel.

MATERIALS

Stainless Steel: ASTM A240/A240M or ASTM A666, Type 304, 0.031-inch- minimum nominal thickness unless otherwise indicated.

Fasteners: Screws, bolts, and other devices of same material as accessory unit, unless otherwise recommended by manufacturer or specified in this Section, and tamper and theft resistant where exposed, and of stainless or galvanized steel where concealed.

Mirrors: ASTM C1503, Mirror Glazing Quality, clear-glass mirrors, nominal 6.0 mm thick.

FABRICATION

General: Fabricate units with tight seams and joints, and exposed edges rolled. Hang doors and access panels with full-length, continuous hinges. Equip units for concealed anchorage and with corrosion-resistant backing plates.

Keys: Provide universal keys for internal access to accessories for servicing and resupplying. Provide minimum of six keys to Owner's representative.

EXECUTION

INSTALLATION

Install accessories according to manufacturers' written instructions, using fasteners appropriate to substrate indicated and recommended by unit manufacturer. Install units level, plumb, and firmly anchored in locations and at heights indicated.

Remove temporary labels and protective coatings.

Grab Bars: Install to comply with specified structural-performance requirements.

Shower Seats: Install to comply with specified structural-performance requirements.

ADJUSTING AND CLEANING

Adjust accessories for unencumbered, smooth operation. Replace damaged or defective items.

Clean and polish exposed surfaces according to manufacturer's written instructions.

END OF SECTION 102800

DIVISION 10 – SPECIALTIES
SECTION 103400 – CUPOLA

General

Summary

Provide Cupola as specified herein, and as needed for a complete and proper installation.

Coordinate Cupola work of this section with General Conditions and Supplementary Conditions.

Submittals

Submit shop drawings designed in accordance with local building code requirements.

Submit color samples of exterior covering.

Submit close-out documents, warranties, and manuals

Quality Assurance

Use materials which shall be free from defects impairing strength, durability, and appearance; shall be of best commercial quality for purpose required; and shall comply with approved drawings.

Use manufacturer with over fifteen (15) years of experience in the manufacturing of the specified product.

Warranty

Warrant the product for one year after date of delivery of product installed by others.

Products

Manufacturer

Basis of Design - #8513 Aluminum cupola as manufactured by:

Décor Architectural Products, Inc.
2375 Dorr Street Suite E, Toledo, OH 43607
Phone: 419-537-9493, Fax: 419-537-9493
Email: decorap@sbcglobal.net.

Materials

Cupolas to be wood and/or aluminum framing.

Cupola to be clad in .032 aluminum standard colors.

Fabrication

Design and Fabricate wood framing to maintain the utmost of quality per drawings.

Design and Fabricate all exterior cladding with experienced sheet metal practices.

Cupola to weigh approx. 600lbs.

Finishes

Body to be aluminum clad in either baked on polyester finishes – standard colors or Kynar 500 finishes, standard colors.

Top to be either aluminum or copper

Accessories

Fabricate finial, weathervane and/or other topping ornament per drawings.

Design and fabricate louver blades and firmly secure to cupola frame

Design and fabricate moldings and ornaments in accordance with approved drawings.

Caulk

Clean and dry all surfaces to be caulked.

Apply with caulking gun, using nozzle of proper size to fit the joint.

Use silicone caulking by Dow Corning, or approved equal.

Execution

Project Site Conditions

Verify with owner of general contractor that site conditions are suitable for delivery.

Confirm with owner or general contractor that all preparatory work is in place in accordance with shop drawings before delivery.

Installation

Coordinate with other trades as required to assure proper and adequate installation.

Install work with skilled workmen who are familiar with such work in accordance with approved shop drawings.

END OF SECTION 103400

DIVISION 10 – SPECIALTIES
SECTION 104413 - FIRE PROTECTION CABINETS

GENERAL

SUMMARY

Section Includes:

Fire-protection cabinets for the following:

Portable fire extinguisher.

PREINSTALLATION CONFERENCE

ACTION SUBMITTALS

Product Data: For each type of product.

Show door hardware, cabinet type, trim style, and panel style. Include roughing-in dimensions and details showing recessed-, semirecessed-, or surface-mounting method and relationships of box and trim to surrounding construction.

Product Schedule: For fire-protection cabinets. Indicate whether recessed, semirecessed, or surface mounted. Coordinate final fire-protection cabinet schedule with fire-extinguisher schedule to ensure proper fit and function. Use same designations indicated on Drawings.

CLOSEOUT SUBMITTALS

Maintenance Data: For fire-protection cabinets to include in maintenance manuals.

COORDINATION

Coordinate size of fire-protection cabinets to ensure that type and capacity of fire extinguishers indicated are accommodated.

Coordinate sizes and locations of fire-protection cabinets with wall depths.

PRODUCTS

MANUFACTURERS

Source Limitations: Obtain fire-protection cabinets, accessories, and fire extinguishers from single source from single manufacturer.

FIRE-PROTECTION CABINET

Cabinet Type: Suitable for fire extinguisher .

Manufacturers: Subject to compliance with requirements, provide products by one of the following:

Babcock-Davis.

JL Industries, Inc.; a division of the Activar Construction Products Group.

Larsens Manufacturing Company.

Cabinet Construction: Nonrated .

Fire-Rated Cabinets: Construct fire-rated cabinets with double walls fabricated from 0.043-inch- thick cold-rolled steel sheet lined with minimum 5/8-inch- thick fire-barrier material. Provide factory-drilled mounting holes.

Cabinet Material: Stainless steel sheet.

Shelf: Same metal and finish as cabinet.

Semirecessed Cabinet: One-piece combination trim and perimeter door frame overlapping surrounding wall surface, with exposed trim face and wall return at outer edge (backbend).

Rolled-Edge Trim: 2-1/2-inch backbend depth.

Cabinet Trim Material: Stainless steel sheet .

Door Material: Stainless steel sheet .

Door Style: Center glass panel with frame .

Door Hardware: Manufacturer's standard door-operating hardware of proper type for cabinet type, trim style, and door material and style indicated.

Provide projecting door pull and friction latch .

Provide continuous hinge, of same material and finish as trim, , permitting door to open 180 degrees.

Accessories:

Identification: Lettering complying with authorities having jurisdiction for letter style, size, spacing, and location. Locate as directed by Architect .

Identify fire extinguisher in fire-protection cabinet with the words " FIRE EXTINGUISHER ."

Location: Applied to cabinet glazing .

Application Process: Decals .

Lettering Color: Red .

Orientation: Vertical .

Materials:

Stainless Steel: ASTM A240/A240M or ASTM A666, Type 304.

Finish: ASTM A480/A480M No. 4 directional satin finish, .

Tempered Float Glass: ASTM C1048, Kind FT, Condition A, Type I, Quality q3, 3 mm thick, .

FABRICATION

Fire-Protection Cabinets: Provide manufacturer's standard box (tub) with trim, frame, door, and hardware to suit cabinet type, trim style, and door style indicated.

Weld joints and grind smooth.

Miter corners and grind smooth.

Provide factory-drilled mounting holes.

Prepare doors and frames to receive locks.

Cabinet Doors: Fabricate doors according to manufacturer's standards, from materials indicated and coordinated with cabinet types and trim styles.

Fabricate door frames with tubular stiles and rails and hollow-metal design, minimum 1/2 inch thick.

Fabricate door frames of one-piece construction with edges flanged.

Miter and weld perimeter door frames and grind smooth.

Cabinet Trim: Fabricate cabinet trim in one piece with corners mitered, welded, and ground smooth.

GENERAL FINISH REQUIREMENTS

Comply with NAAMM's AMP 500, "Metal Finishes Manual for Architectural and Metal Products," for recommendations for applying and designating finishes.

Protect mechanical finishes on exposed surfaces of fire-protection cabinets from damage by applying a strippable, temporary protective covering before shipping.

Finish fire-protection cabinets after assembly.

Appearance of Finished Work: Noticeable variations in same piece are unacceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

EXECUTION

EXAMINATION

Examine roughing-in for hose and cabinets to verify actual locations of piping connections before cabinet installation.

Examine walls and partitions for suitable framing depth and blocking where semirecessed cabinets will be installed.

Proceed with installation only after unsatisfactory conditions have been corrected.

PREPARATION

Prepare recesses for semirecessed fire-protection cabinets as required by type and size of cabinet and trim style.

INSTALLATION

General: Install fire-protection cabinets in locations and at mounting heights indicated

Fire-Protection Cabinets: 42 inches above finished floor to top of fire extinguisher.

Fire-Protection Cabinets: Fasten cabinets to structure, square and plumb.

Unless otherwise indicated, provide recessed fire-protection cabinets. If wall thickness is inadequate for recessed cabinets, provide semirecessed fire-protection cabinets.

Fasten mounting brackets to inside surface of fire-protection cabinets, square and plumb.

Identification:

Apply decals at locations indicated.

Apply decals on field-painted fire-protection cabinets after painting is complete.

ADJUSTING AND CLEANING

Remove temporary protective coverings and strippable films, if any, as fire-protection cabinets are installed unless otherwise indicated in manufacturer's written installation instructions.

Adjust fire-protection cabinet doors to operate easily without binding. Verify that integral locking devices operate properly.

On completion of fire-protection cabinet installation, clean interior and exterior surfaces as recommended by manufacturer.

Touch up marred finishes, or replace fire-protection cabinets that cannot be restored to factory-finished appearance. Use only materials and procedures recommended or furnished by fire-protection cabinet and mounting bracket manufacturers.

Replace fire-protection cabinets that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 104413

DIVISION 10 – SPECIALTIES
SECTION 105113 - METAL LOCKERS

GENERAL

SUMMARY

Section Includes:

Knocked-down corridor lockers.

Locker benches.

ACTION SUBMITTALS

Shop Drawings: For metal lockers.

Include plans, elevations, sections, details, and attachments to other work.

Show locker trim and accessories.

Include locker identification system and numbering sequence.

Samples for Initial Selection: Manufacturer's color charts showing the full range of colors available.

Product Schedule: For lockers.

INFORMATIONAL SUBMITTALS

Sample Warranty: For special warranty.

CLOSEOUT SUBMITTALS

Maintenance Data: For adjusting, repairing, and replacing locker doors and latching mechanisms to include in maintenance manuals.

MAINTENANCE MATERIAL SUBMITTALS

Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

Full-size units of the following metal locker hardware items equal to 10 percent of amount installed for each type and finish installed, but no fewer than five units:

Locks.

Identification plates.

Hooks.

DELIVERY, STORAGE, AND HANDLING

Do not deliver metal lockers until spaces to receive them are clean, dry, and ready for their installation.

Deliver master and control keys combination control charts to Owner by registered mail or overnight package service.

FIELD CONDITIONS

Field Measurements: Verify actual dimensions of recessed openings by field measurements before fabrication.

COORDINATION

Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of work specified in other Sections to ensure that metal lockers can be supported and installed as indicated.

WARRANTY

Special Warranty: Manufacturer agrees to repair or replace components of metal lockers that fail in materials or workmanship, excluding finish, within specified warranty period.

Failures include, but are not limited to, the following:

Structural failures.

Faulty operation of latches and other door hardware.

Damage from deliberate destruction and vandalism is excluded.

Warranty Period for Knocked-Down Metal Lockers: Two years from date of Substantial Completion.

Warranty Period for Welded Metal Lockers: Lifetime from date of Substantial Completion.

PRODUCTS

MANUFACTURERS

Source Limitations: Obtain metal lockers, locker benches, and accessories from single source from single locker manufacturer.

Obtain locks from single lock manufacturer.

PERFORMANCE REQUIREMENTS

Accessibility Requirements: For lockers indicated to be accessible, comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines and ICC A117.1.

KNOCKED-DOWN CORRIDOR LOCKERS

Products: Subject to compliance with requirements, provide one of the following:

Lyon Workspace Products, LLC. Heavy Duty.

Penco Products, Inc.

Art Metal Products

Doors: Six apiece; fabricated from 0.075-inch nominal-thickness steel sheet; formed into channel shape with double bend at vertical edges and with right-angle single bend at horizontal edges.

Doors less than 12 inches wide may be fabricated from 0.048-inch nominal-thickness steel sheet.

Doors for box lockers less than 15 inches wide may be fabricated from 0.048-inch nominal-thickness steel sheet.

Reinforcement: Manufacturer's standard reinforcing angles, channels, or stiffeners for doors more than 15 inches wide; welded to inner face of doors.

Stiffeners: Manufacturer's standard full-height stiffener fabricated from 0.048-inch nominal-thickness steel sheet; welded to inner face of doors.

Sound-Dampening Panels: Manufacturer's standard, designed to stiffen doors and reduce sound levels when doors are closed, of die-formed metal with full perimeter flange and sound-dampening material; welded to inner face of doors.

Door Style: Vented panel as follows:

Louvered Vents: No fewer than six louver openings at top and bottom for single-tier lockers.

Body: Assembled by riveting or bolting body components together. Fabricate from unperforated steel sheet with thicknesses as follows:

Tops, Bottoms, and Intermediate Dividers: 0.024-inch nominal thickness, with single bend at sides.

Backs and Sides: 0.024-inch nominal thickness, with full-height, double-flanged connections.

Shelves: 0.024-inch nominal thickness, with double bend at front and single bend at sides and back.

Frames: Channel formed; fabricated from 0.060-inch nominal-thickness steel sheet; lapped and factory welded at corners; with top and bottom main frames factory welded into vertical main frames. Form continuous, integral, full-height door strikes on vertical main frames.

Cross Frames between Tiers: Channel formed and fabricated from same material as main frames; welded to vertical main frames.

Frame Vents: Fabricate face frames with vents.

Hinges: Welded to door and attached to door frame with no fewer than two factory-installed rivets per hinge that are completely concealed and tamper resistant when door is closed; fabricated to swing 180 degrees.

Hinges: Manufacturer's standard, steel, continuous or knuckle type.

Recessed Door Handle and Latch: Stainless-steel cup with integral door pull, recessed so locking device does not protrude beyond door face; pry and vandal resistant.

Multipoint Latching: Finger-lift latch control designed for use with built-in combination locks, built-in key locks, or padlocks; positive automatic latching and prelocking.

Latch Hooks: Equip doors 48 inches and higher with three latch hooks and doors less than 48 inches high with two latch hooks; fabricated from 0.105-inch nominal-thickness steel sheet; welded or riveted to full-height door strikes; with resilient silencer on each latch hook.

Latching Mechanism: Manufacturer's standard, rattle-free latching mechanism and moving components isolated to prevent metal-to-metal contact, and incorporating a prelocking device that

allows locker door to be locked while door is open and then closed without unlocking or damaging lock or latching mechanism.

Door Handle and Latch for 16-Person Lockers: Stainless-steel strike plate with integral pull; with steel padlock loop that projects through metal locker door.

Locks: Combination padlocks.

Identification Plates: Manufacturer's standard, etched, embossed, or stamped aluminum plates, with numbers and letters at least 3/8 inch high.

Hooks: Manufacturer's standard ball-pointed type hooks, aluminum or steel; zinc plated. 2 per locker

Coat Rods: Manufacturer's standard.

Continuous Zee Base: Fabricated from manufacturer's standard thickness, but not less than 0.060-inch nominal-thickness steel sheet.

Height: 4 inches.

Continuous Sloping Tops: Fabricated from manufacturer's standard thickness, but not less than 0.036-inch nominal-thickness steel sheet.

Closures: Hipped-end type.

Sloping-top corner fillers, mitered.

Filler Panels: Fabricated from manufacturer's standard thickness, but not less than 0.036-inch nominal-thickness steel sheet.

Boxed End Panels: Fabricated from 0.060-inch nominal-thickness steel sheet.

Materials:

Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B; with A60 zinc-iron, alloy (galvannealed) coating designation.

Finish: Baked enamel or powder coat.

Color: As selected by Architect from manufacturer's full range.

LOCKS

Manufacturers: Subject to compliance with requirements, provide products by one of the following:

Master Lock Company, LLC.

Combination Padlocks: Key-controlled, three-number dialing combination locks; capable of five combination changes.

LOCKER BENCHES

Provide bench units with overall assembly height of 17-1/2 inches.

Bench Tops: Manufacturer's standard one-piece units, with rounded corners and edges.

Size: Minimum 9-1/2 inches wide by 1-1/4 inches thick except provide minimum 20-inch- wide tops where accessible benches are indicated.

Laminated clear hardwood with one coat of clear sealer on all surfaces and one coat of clear lacquer on top and sides.

Fixed Pedestals: Manufacturer's standard supports, with predrilled fastener holes for attaching bench top and anchoring to floor, complete with fasteners and anchors, and as follows:

Tubular Steel: 1-1/4-inch- diameter steel tubing, with 0.1265-inch- thick steel flanges welded at top and base; with zinc-plated finish; anchored with exposed fasteners.

Color: As selected by Architect from manufacturer's full range.

Materials:

Stainless Steel: ASTM A 666, Type 304.

Plastic Laminate: NEMA LD 3, Grade HGP.

Extruded Aluminum: ASTM B 221 , alloy and temper recommended by aluminum producer and manufacturer for type of use and finish indicated.

Steel Tube: ASTM A 500/A 500 M, cold rolled.

Particleboard: ANSI A208.1, Grade M-2.

FABRICATION

Fabricate metal lockers square, rigid, without warp, and with metal faces flat and free of dents or distortion. Make exposed metal edges safe to touch and free of sharp edges and burrs.

Form body panels, doors, shelves, and accessories from one-piece steel sheet unless otherwise indicated.

Provide fasteners, filler plates, supports, clips, and closures as required for complete installation.

Fabricate each metal locker with an individual door and frame; individual top, bottom, and back; and common intermediate uprights separating compartments. Factory weld frame members of each metal locker together to form a rigid, one-piece assembly.

Equipment: Provide each locker with an identification plate and the following equipment:

Double Tier Units: One double-prong ceiling hook.

Coat Rods: For each compartment of each locker.

Knocked-Down Construction: Fabricate metal lockers using nuts, bolts, screws, or rivets for nominal assembly at Project site.

Accessible Lockers: Fabricate as follows:

Locate bottom shelf no lower than 15 inches above the floor.

Where hooks, coat rods, or additional shelves are provided, locate no higher than 48 inches above the floor.

Continuous Base: Formed into channel or zee profile for stiffness, and fabricated in lengths as long as practical to enclose base and base ends of metal lockers; finished to match lockers.

Continuous Sloping Tops: Fabricated in lengths as long as practical, without visible fasteners at splice locations; finished to match lockers.

Sloping-top corner fillers, mitered.

Filler Panels: Fabricated in an unequal leg angle shape; finished to match lockers. Provide slip-joint filler angle formed to receive filler panel.

Boxed End Panels: Fabricated with 1-inch- wide edge dimension, and designed for concealing fasteners and holes at exposed ends of non-recessed metal lockers; finished to match lockers.

Provide one-piece panels for double-row (back-to-back) locker ends.

ACCESSORIES

Fasteners: Zinc- or nickel-plated steel, slotless-type, exposed bolt heads; with self-locking nuts or lock washers for nuts on moving parts.

Anchors: Material, type, and size required for secure anchorage to each substrate.

Provide nonferrous-metal or hot-dip galvanized anchors and inserts on inside face of exterior walls, and elsewhere as indicated, for corrosion resistance.

Provide toothed-steel or lead expansion sleeves for drilled-in-place anchors.

PART 3 - EXECUTION

EXAMINATION

Examine walls, floors, and support bases, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.

Proceed with installation only after unsatisfactory conditions have been corrected.

INSTALLATION

General: Install lockers level, plumb, and true; shim as required, using concealed shims.

Anchor locker runs at ends and at intervals recommended by manufacturer, but not more than 36 inches o.c. Using concealed fasteners, install anchors through backup reinforcing plates, channels, or blocking as required to prevent metal distortion.

Anchor single rows of metal lockers to walls near top and bottom of lockers.

Anchor back-to-back metal lockers to floor.

Knocked-Down Lockers: Assemble with standard fasteners, with no exposed fasteners on door faces or face frames.

Equipment:

Attach hooks with at least two fasteners.

Attach door locks on doors using security-type fasteners.

Identification Plates: Identify metal lockers with identification indicated on Drawings.

Attach plates to each locker door, near top, centered, with at least two aluminum rivets.

Attach plates to upper shelf of each open-front metal locker, centered, with a least two aluminum rivets.

Trim: Fit exposed connections of trim, fillers, and closures accurately together to form tight, hairline joints, with concealed fasteners and splice plates.

Attach recess trim to recessed metal lockers with concealed clips.

Attach filler panels with concealed fasteners. Locate filler panels where indicated on Drawings.

Attach sloping-top units to metal lockers, with closures at exposed ends.

Attach boxed end panels using concealed fasteners to conceal exposed ends of nonrecessed metal lockers.

Attach finished end panels using fasteners only at perimeter to conceal exposed ends of nonrecessed metal lockers.

Freestanding Locker Benches: Place benches in locations indicated on Drawings.

1 ADJUSTING

2 Clean, lubricate, and adjust hardware. Adjust doors and latches to operate easily without
3 binding. Verify that integral locking devices operate properly.

4 PROTECTION

5 Protect metal lockers from damage, abuse, dust, dirt, stain, or paint. Do not permit use during
6 construction.

7 Touch up marred finishes, or replace metal lockers that cannot be restored to factory-finished
8 appearance. Use only materials and procedures recommended or furnished by locker manufacturer.

9 END OF SECTION 105113

DIVISION 10 – SPECIALTIES
SECTION 107516 - GROUND-SET FLAGPOLES

GENERAL

SUMMARY

Section includes ground-set flagpoles made from fiberglass.

Owner-Furnished Material: Flags.

ACTION SUBMITTALS

Product Data: For each type of product.

Include construction details, material descriptions, dimensions of individual components and profiles, operating characteristics, fittings, accessories, and finishes for flagpoles.

Shop Drawings: For flagpoles.

Include plans, elevations, and attachment details. Show general arrangement, jointing, fittings, accessories, grounding, anchoring, and support.

Include section, and details of foundation system.

Samples for Verification: For each type of exposed finish, in manufacturer's standard sizes.

Delegated-Design Submittal: For flagpoles.

CLOSEOUT SUBMITTALS

Operation and Maintenance Data: For flagpoles to include in operation and maintenance manuals.

DELIVERY, STORAGE, AND HANDLING

Spiral wrap flagpoles with heavy paper and enclose in a hard fiber tube or other protective container.

PRODUCTS

MANUFACTURERS

Source Limitations: Obtain flagpoles as complete units, including fittings, accessories, bases, and anchorage devices, from single source from single manufacturer.

PERFORMANCE REQUIREMENTS

Delegated Design: Engage a qualified professional engineer to design flagpole assemblies.

Structural Performance: Flagpole assemblies, including anchorages and supports, shall withstand design loads indicated within limits and under conditions indicated.

Wind Loads: Determine according to NAAMM FP 1001. Basic wind speed for Project location is 140 MPH .

Base flagpole design on nylon or cotton flags of maximum standard size suitable for use with flagpole or flag size indicated, whichever is more stringent.

FIBERGLASS FLAGPOLES

Fiberglass Flagpoles: Entasis-tapered flagpoles fabricated from polyester resin reinforced with woven glass-fiber roving with 75 percent of glass fibers parallel to length of flagpole.

Manufacturers: Subject to compliance with requirements, undefined:

Atlantic Fiberglass Products, Inc.

Eder Flag Manufacturing Company, Inc.

Ewing Flagpoles.

Exposed Height: 2 - 25 feet, 1- 30 feet.

Construct flagpoles in one piece if possible. If more than one piece is necessary, comply with the following:

Fabricate shop and field joints without using fasteners, screw collars, or lead calking.

Provide flush hairline joints using self-aligning, snug-fitting, internal sleeves.

Sleeve for Fiberglass Flagpole: Fiberglass foundation sleeve, made to fit flagpole, for casting into concrete foundation.

Flashing Collar: Same material and finish as flagpole.

FITTINGS

Finial Ball: Flush-seam ball, sized as indicated or, if not indicated, to match flagpole-butt diameter.

0.063-inch spun aluminum .

Internal Halyard, Winch System: Manually operated winch with control stop device and removable handle, stainless-steel cable halyard, and concealed revolving truck assembly with plastic-coated counterweight and sling. Furnish flush access door secured with cylinder lock. Finish truck assembly to match flagpole.

Halyard Flag Snaps: Stainless-steel swivel snap hooks. Furnish two per halyard.

MISCELLANEOUS MATERIALS

Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C1107/C1107M.

Sand: ASTM C33/C33M, fine aggregate.

Elastomeric Joint Sealant: Single-component neutral-curing silicone joint sealant complying with requirements in Section 079200 "Joint Sealants."

Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D1187/D1187M.

FIBERGLASS FINISHES

Fiberglass: UV-light stable, hard, high-gloss gel coat or high-gloss, high-build polyurethane or polyester coating.

Color: As selected by Architect from manufacturer's full range .

EXECUTION

PREPARATION

Foundation Excavation: Excavate to neat clean lines in undisturbed soil. Remove loose soil and foreign matter from excavation and moisten earth before placing concrete. Place and compact drainage material at excavation bottom.

Provide forms where required due to unstable soil conditions and for perimeter of flagpole base at grade. Secure and brace forms to prevent displacement during concreting.

Foundation Tube: Place foundation tube, center, and brace to prevent displacement during concreting. Place concrete. Plumb and level foundation tube and allow concrete to cure.

Sleeves: Locate and secure sleeves in forms by bracing to reinforcement and forms.

Place concrete, as specified in Section 033000 "Cast-in-Place Concrete." Compact concrete in place by using vibrators. Moist-cure exposed concrete for no fewer than seven days or use nonstaining curing compound.

Trowel exposed concrete surfaces to a smooth, dense finish, free of trowel marks, and uniform in texture and appearance. Provide positive slope for water runoff to perimeter of concrete base.

FLAGPOLE INSTALLATION

General: Install flagpoles where indicated and according to Shop Drawings and manufacturer's written instructions.

Foundation Tube: Place flagpole in tube, seated on bottom plate between steel centering wedges, and install hardwood wedges to secure flagpole in place. Place and compact sand in foundation tube and remove hardwood wedges. Seal top of foundation tube with a 2-inch layer of elastomeric joint sealant and cover with flashing collar.

Baseplate: Cast anchor bolts in concrete foundation. Install baseplate on washers placed over leveling nuts on anchor bolts and adjust until flagpole is plumb. After flagpole is plumb, tighten retaining nuts and fill space under baseplate solidly with nonshrink, nonmetallic grout. Finish exposed grout surfaces smooth and slope 45 degrees away from edges of baseplate.

END OF SECTION 107516

DIVISION 10 – SPECIALTIES
SECTION 109990 – BACK LIGHTED FLUSH MOUNTED CLOCKS

GENERAL

Section Includes

Tower Clock Components and Remote Control System.

PRODUCTS

CLOCKS

Furnish complete clock system consisting of tower clock and remote control system.

Manufacturer:

Electric Time Company, Inc., 97 West Street, Medfield, MA, USA (800)-531-2562
The Verdin Company, 444 Reading Road, Cincinnati, Ohio 45202, 800-543-0488
Campbellsville Industries, Inc. PO Box 278-W, Campbellsville, KY. 800/467-8135

Tower Clock Components

Dial:
Single sheet (not pieced) translucent milky-white acrylic.

Finishes:
Dial markings to have a matte black finish, rings and hands to have a black polyurethane finish.

Hands:
As selected by architect.

Dial Markings:
As selected by architect.

Illumination:
High-output, fluorescent illumination. Ring radially mounted “U” shaped fluorescent tubes to be supplied so that illumination is uniform. Low temperature high-output ballast. Illumination to be an integral part of the clock. Lamps to be manufactured and available in the United States.

Crystal:
Provide clear, flat tempered glass crystal.

Listing:
Provide UL 48 listing on clock assembly

Movement:
Style MI Design. 24VAC drive motor and electronics. 8 second maximum run time. Alternating hall effect switched closed loop minute impulse operation. Composite lubrication free bearing. Single source: Clock and movement to be manufactured by the same company.

Rings:
Aluminum flat retaining and angle rings.
Size: 36” or as shown on drawing.
Control: Remote system provided by manufacturer for complete control of clock.

Provide Type 99B-MI automatic reset control;

IP65 Enclosure – Indoor & Outdoor Use
Automatically resets clock after power failures.
Automatically resets clocks for daylight savings time (if required)
Precision Quartz Time base 4 minutes per year maximum drift.
Optional GPS – no drift.
Built in 100 year daylight savings time calendar.
2 Line 16 character backlighted LCD display.
ETL listed to UL 863.
Power Failure Event logging.
Standard MI output – 4 clocks maximum standard
Standard 24VDC RP output -20 clocks maximum
Sweep Second hand output
Hour Strike Capability.
RS-232 and RS-485 output ports
24 VAC hour strike output – configurable pulse output

EXECUTION

Installation

Inspect substrates, supporting items and related conditions, to ensure that they are ready to receive each item, prior to commencement of installation.

Install each item at locations indicated on drawings, as detailed, and in accordance with manufacturers’ instructions.

END OF SECTION 109990

DIVISION 11 – EQUIPMENT
SECTION 113100 – RESIDENTIAL APPLIANCES

GENERAL

SUMMARY

Section Includes:

Cooking appliances.

Kitchen exhaust ventilation.

Refrigeration appliances.

ACTION SUBMITTALS

Product Data: For each type of product indicated. Include rated capacities, operating characteristics, dimensions, furnished accessories, and finishes for each appliance.

Product Schedule: For appliances. Use same designations indicated on Drawings.

INFORMATIONAL SUBMITTALS

Warranties: Sample of special warranties.

CLOSEOUT SUBMITTALS

Operation and Maintenance Data: For each residential appliance to include in operation and maintenance manuals.

QUALITY ASSURANCE

Manufacturer Qualifications: Maintains, within 100 miles of Project site, a service center capable of providing training, parts, and emergency maintenance repairs.

Installer Qualifications: An employer of workers trained and approved by manufacturer for installation and maintenance of units required for this Project.

Source Limitations: Obtain residential appliances from single source and each type of residential appliance from single manufacturer.

Regulatory Requirements: Comply with the following:

NFPA: Provide electrical appliances listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

Accessibility: Where residential appliances are indicated to comply with accessibility requirements, comply with the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines, ICC/ANSI A117.1.

WARRANTY

Special Warranties: Manufacturer's standard form in which manufacturer agrees to repair or replace residential appliances or components that fail in materials or workmanship within specified warranty period.

Warranty Period: Five years from date of Substantial Completion.

Electric Range: Full warranty including parts and labor for on-site service on surface-burner elements. Warranty Period: Five years from date of Substantial Completion.

Microwave Oven: Full warranty including parts and labor for on-site service on the magnetron tube. Warranty Period: Five years from date of Substantial Completion.

Refrigerator/Freezer, Sealed System: Full warranty including parts and labor for on-site service on the product.

Warranty Period for Sealed Refrigeration System: Five years from date of Substantial Completion.

Warranty Period for Other Components: Two years from date of Substantial Completion.

PRODUCTS

RANGES

Manufacturers: Subject to compliance with requirements, provide products by one of the following:

Electric Range: Freestanding range with one oven(s) and complying with AHAM ER-1.

Width: 30 inches (762 mm).

Electric Burner Elements: Four.

Induction Type: Manufacturer's standard.

Controls: Digital panel controls, located on front.

Oven Features:

Capacity: 3.3 cu. ft. (0.09 cu. m).

Operation: Baking,, self-cleaning,.

Broiler: Located in top of oven.

Oven Door(s): Counterbalanced, removable, with observation window, and handle.

Electric Power Rating:

Oven(s): Manufacturer's standard

Broiler: Manufacturer's standard.

Controls: Digital panel controls and timer display, located on front.

Anti-Tip Device: Manufacturer's standard.

Electric Power Supply: As indicated on Drawings.

Material: Stainless steel with manufacturer's standard cooktop.

Color/Finish: Black.

MICROWAVE OVENS

Manufacturers: Subject to compliance with requirements, provide products by one of the following:

Microwave Oven:

Mounting: Undercabinet.

Type: Conventional.

Dimensions:

Width: 30 inches (762 mm).

Depth: 19-1/2 inches (495 mm).

Height: 18 inches (457 mm).

Capacity: 2.0 cu. ft. (0.06 cu. m).

Oven Door: Door with observation window and push-button latch release.

Exhaust Fan: Four-speed fan, vented to outside and with manufacturer's standard capacity.

Microwave Power Rating: Manufacturer's standard.

Electric Power Supply: As indicated on Drawings.

Controls: Digital panel controls and timer display.

Other Features: Turntable

Material: Stainless steel.

Color/Finish: Black.

REFRIGERATOR/FREEZERS

Manufacturers: Subject to compliance with requirements, provide products by one of the following:

Refrigerator/Freezer: Two-door, side-by-side refrigerator/freezer and complying with AHAM HRF-1.
Type: Freestanding.

Dimensions:

Width: 36 inches (914 mm).

Depth: 27 inches (686 mm).

Height: 84 inches (2134 mm).

Storage Capacity:

Refrigeration Compartment Volume: 15.6 cu. ft. (0.44 cu. m).

Freezer Volume: 5.13 cu. ft. (0.15 cu. m).

Shelf Area: Three adjustable glass shelves, 26 sq. ft. (2.42 sq. m) Insert area.

General Features:

Door Configuration: Overlay.

Dispenser in door for with dispenser lock.

Separate temperature controls for each compartment.

Refrigerator Features:

Interior light in refrigeration compartment.

Compartment Storage: Insert requirement.

Freezer Features: One freezer compartment(s) with door(s).

Automatic defrost.

Front Panel(s): Manufacturer's standard.

Panel Color: Black.

Appliance Color/Finish: Stainless steel

GENERAL FINISH REQUIREMENTS

Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

EXECUTION

EXAMINATION

Examine substrates and conditions, with Installer present, for compliance with requirements for installation tolerances, power connections, and other conditions affecting installation and performance of residential appliances.

Examine roughing-in for piping systems to verify actual locations of piping connections before appliance installation.

Examine walls, ceilings, and roofs for suitable conditions where, microwave ovens with vented exhaust fans will be installed.

Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work. Proceed with installation only after unsatisfactory conditions have been corrected.

INSTALLATION, GENERAL

General: Comply with manufacturer's written instructions.

Built-in Equipment: Securely anchor units to supporting cabinets or countertops with concealed fasteners. Verify that clearances are adequate for proper functioning and that rough openings are completely concealed.

Freestanding Equipment: Place units in final locations after finishes have been completed in each area. Verify that clearances are adequate to properly operate equipment.

Range Anti-Tip Device: Install at each range according to manufacturer's written instructions.

Utilities: Comply with plumbing and electrical requirements.

FIELD QUALITY CONTROL

Perform tests and inspections.

Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.

Tests and Inspections:

Perform visual, mechanical, and electrical inspection and testing for each appliance according to manufacturers' written recommendations. Certify compliance with each manufacturer's appliance-performance parameters.

Leak Test: After installation, test for leaks. Repair leaks and retest until no leaks exist.

Operational Test: After installation, start units to confirm proper operation.

Test and adjust controls and safeties. Replace damaged and malfunctioning controls and components.

An appliance will be considered defective if it does not pass tests and inspections.

Prepare test and inspection reports.

DEMONSTRATION

Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain residential appliances.

END OF SECTION 113100

DIVISION 12 FURNISHINGS
SECTION 123623 - PLASTIC-LAMINATE-CLAD COUNTERTOPS

GENERAL

SUMMARY

Section Includes

Plastic-laminate-clad countertops.

ACTION SUBMITTALS

Product Data: For each type of product.

Include data for fire-retardant treatment from chemical-treatment manufacturer and certification by treating plant that treated materials comply with requirements.

Shop Drawings: For plastic-laminate-clad countertops.

Include plans, sections, details, and attachments to other work. Detail fabrication and installation, including field joints.

Show locations and sizes of cutouts and holes for items installed in plastic-laminate-clad countertops.

Apply AWI Quality Certification WI Certified Compliance Program label to Shop Drawings.

Samples for Initial Selection: For plastic laminates.

INFORMATIONAL SUBMITTALS

Qualification Data: For Installer fabricator.

Quality Standard Compliance Certificates: AWI Quality Certification Program .

QUALITY ASSURANCE

Fabricator Qualifications: Shop that employs skilled workers who custom fabricate products similar to those required for this Project and whose products have a record of successful in-service performance.

Shop Certification: AWI's Quality Certification Program accredited participant .

Installer Qualifications: Fabricator of products AWI's Quality Certification Program accredited participant .

DELIVERY, STORAGE, AND HANDLING

Deliver countertops only after casework and supports on which they will be installed have been completed in installation areas.

Store countertops in areas where environmental conditions comply with requirements specified in "Field Conditions" Article.

Keep surfaces of countertops covered with protective covering during handling and installation.

FIELD CONDITIONS

Environmental Limitations: Do not deliver or install countertops until building is enclosed, wet-work is complete, and HVAC system is operating and maintaining temperature and relative humidity at levels planned for building occupants during the remainder of the construction period.

Environmental Limitations: Do not deliver or install countertops until building is enclosed, wet-work is complete, and HVAC system is operating and maintaining temperature between 60 and 90 deg F and relative humidity between 25 and 55 percent during the remainder of the construction period.

Field Measurements: Where countertops are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

Established Dimensions: Where countertops are indicated to fit to other construction, establish dimensions for areas where countertops are to fit. Provide allowance for trimming at site, and coordinate construction to ensure that actual dimensions correspond to established dimensions.

PRODUCTS

PLASTIC-LAMINATE-CLAD COUNTERTOPS

Quality Standard: Unless otherwise indicated, comply with the "Architectural Woodwork Standards" for grades of plastic-laminate-clad countertops indicated for construction, finishes, installation, and other requirements.

Provide inspections of fabrication and installation together with labels and certificates from AWI certification program indicating that countertops comply with requirements of grades specified.

The Contract Documents contain requirements that are more stringent than the referenced quality standard. Comply with requirements of Contract Documents in addition to those of the referenced quality standard.

Grade: Premium .

High-Pressure Decorative Laminate: NEMA LD 3, Grade HGF .

Manufacturers: Subject to compliance with requirements, provide products by one of the following:

Formica Corporation.

Lamin-Art, Inc.

Wilsonart LLC.

Colors, Patterns, and Finishes: Provide materials and products that result in colors and textures of exposed laminate surfaces complying with the following requirements:

As selected by Architect from manufacturer's full range in the following categories:

Solid colors, matte finish.

Solid colors with core same color as surface, matte finish.

Wood grains, matte finish with grain running parallel to length of countertop.

Patterns, matte finish.

Edge Treatment: Same as laminate cladding on horizontal surfaces .

Core Material: Exterior-grade plywood .

Core Material at Sinks: exterior-grade plywood .

Core Thickness: 1-1/8 inch .

Build up countertop thickness to 1-1/2 inches at front, back, and ends with additional layers of core material laminated to top.

Backer Sheet: Provide plastic-laminate backer sheet, NEMA LD 3, Grade BKL, on underside of countertop substrate.

Paper Backing: Provide paper backing on underside of countertop substrate.

WOOD MATERIALS

Wood Products: Provide materials that comply with requirements of referenced quality standard unless otherwise indicated.

Wood Moisture Content: 5 to 10 percent.

Composite Wood and Agrifiber Products: Provide materials that comply with requirements of referenced quality standard for each type of countertop and quality grade specified unless otherwise indicated.

Softwood Plywood: DOC PS 1.

ACCESSORIES

Wire-Management Grommets: Circular, molded-plastic grommets and matching plastic caps with slot for wire passage.

Outside Diameter: 1-1/4 inch .

Color: Black ,

MISCELLANEOUS MATERIALS

Adhesive for Bonding Plastic Laminate: As selected by fabricator to comply with requirements.

Adhesive for Bonding Edges: Hot-melt adhesive or adhesive specified above for faces.

FABRICATION

Sand fire-retardant-treated wood lightly to remove raised grain on exposed surfaces before fabrication.

Fabricate countertops to dimensions, profiles, and details indicated. Provide front and end overhang of 1 inch over base cabinets. Ease edges to radius indicated for the following:

Solid-Wood (Lumber) Members: 1/16 inch unless otherwise indicated.

Complete fabrication, including assembly, to maximum extent possible before shipment to Project site. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.

Notify Architect seven days in advance of the dates and times countertop fabrication will be complete.

Trial fit assemblies at fabrication shop that cannot be shipped completely assembled. Install dowels, screws, bolted connectors, and other fastening devices that can be removed after trial fitting. Verify that various parts fit as intended, and check measurements of assemblies against field measurements before disassembling for shipment.

Shop cut openings to maximum extent possible to receive appliances, plumbing fixtures, electrical work, and similar items. Locate openings accurately, and use templates or roughing-in diagrams to produce accurately sized and shaped openings. Sand edges of cutouts to remove splinters and burrs.

Seal edges of cutouts by saturating with varnish.

EXECUTION

PREPARATION

Before installation, condition countertops to average prevailing humidity conditions in installation areas.

Before installing countertops, examine shop-fabricated work for completion and complete work as required, including removal of packing.

INSTALLATION

Grade: Install countertops to comply with same grade as item to be installed.

Assemble countertops and complete fabrication at Project site to the extent that it was not completed in the shop.

Provide cutouts for appliances, plumbing fixtures, electrical work, and similar items. Locate openings accurately, and use templates or roughing-in diagrams to produce accurately sized and shaped openings. Sand edges of cutouts to remove splinters and burrs.

Seal edges of cutouts by saturating with varnish.

Field Jointing: Where possible, make in the same manner as shop jointing, using dowels, splines, adhesives, and fasteners recommended by manufacturer. Prepare edges to be joined in shop so Project-site processing of top and edge surfaces is not required. Locate field joints where shown on Shop Drawings.

Secure field joints in countertops with concealed clamping devices located within 6 inches of front and back edges and at intervals not exceeding 24 inches. Tighten according to manufacturer's written instructions to exert a constant, heavy-clamping pressure at joints.

Scribe and cut countertops to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.

Countertop Installation: Anchor securely by screwing through corner blocks of base cabinets or other supports into underside of countertop.

Install countertops level and true in line. Use concealed shims as required to maintain not more than a 1/8-inch-in-96-inches variation from a straight, level plane.

Secure backsplashes to tops with concealed metal brackets at 16 inches o.c. and to walls with adhesive.

Seal joints between countertop and backsplash, if any, and joints where countertop and backsplash abut walls with mildew-resistant silicone sealant or another permanently elastic sealing compound recommended by countertop material manufacturer.

ADJUSTING AND CLEANING

Repair damaged and defective countertops, where possible, to eliminate functional and visual defects. Where not possible to repair, replace countertops. Adjust joinery for uniform appearance.

Clean countertops on exposed and semiexposed surfaces.

Protection: Provide Kraft paper or other suitable covering over countertop surfaces, taped to underside of countertop at a minimum of 48 inches o.c. Remove protection at Substantial Completion.

END OF SECTION 123623

DIVISION 12 FURNISHINGS
SECTION 123661.16 - SOLID SURFACING COUNTERTOPS

GENERAL

SUMMARY

Section Includes:

Solid surface material countertops.

Solid surface material backsplashes.

ACTION SUBMITTALS

Product Data: For countertop materials.

Shop Drawings: For countertops. Show materials, finishes, edge and backsplash profiles, methods of joining, and cutouts for plumbing fixtures.

Show locations and details of joints.

Show direction of directional pattern, if any.

Samples for Initial Selection: For each type of material exposed to view.

INFORMATIONAL SUBMITTALS

Qualification Data: For fabricator.

CLOSEOUT SUBMITTALS

Maintenance Data: For solid surface material countertops to include in maintenance manuals. Include Product Data for care products used or recommended by Installer and names, addresses, and telephone numbers of local sources for products.

QUALITY ASSURANCE

Fabricator Qualifications: Shop that employs skilled workers who custom-fabricate countertops similar to that required for this Project, and whose products have a record of successful in-service performance.

Installer Qualifications: Fabricator of countertops.

FIELD CONDITIONS

Field Measurements: Verify dimensions of countertops by field measurements after base cabinets are installed but before countertop fabrication is complete.

COORDINATION

Coordinate locations of utilities that will penetrate countertops or backsplashes.

PRODUCTS

SOLID SURFACE COUNTERTOP MATERIALS

Solid Surface Material: Homogeneous-filled plastic resin complying with ICPA SS-1.

Manufacturers: Subject to compliance with requirements, provide products by one of the following:

Consentino, Style Silestone Quartz

Avonite Surfaces.

Samsung Chemical USA, Inc.

Wilsonart LLC.

Colors and Patterns: As selected by Architect from manufacturer's full range.

COUNTERTOP FABRICATION

Fabricate countertops according to solid surface material manufacturer's written instructions and to the AWI/AWMAC/WI's "Architectural Woodwork Standards."

Grade: Premium .

Countertops: 3/4-inch- thick, solid surface material with front edge built up with same material.

Backsplashes: 1/2-inch- thick, solid surface material.

Fabricate tops with shop-applied edges and backsplashes unless otherwise indicated. Comply with solid surface material manufacturer's written instructions for adhesives, sealers, fabrication, and finishing.

Joints: Fabricate countertops without joints.

Cutouts and Holes:

Undercounter Plumbing Fixtures: Make cutouts for fixtures in shop using template or pattern furnished by fixture manufacturer. Form cutouts to smooth, even curves.

Provide vertical edges, slightly eased at juncture of cutout edges with top and bottom surfaces of countertop and projecting 3/16 inch into fixture opening.

Fittings: Drill countertops in shop for plumbing fittings, undercounter soap dispensers, and similar items.

INSTALLATION MATERIALS

Adhesive: Product recommended by solid surface material manufacturer.

EXECUTION

EXAMINATION

Examine substrates to receive solid surface material countertops and conditions under which countertops will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of countertops.

Proceed with installation only after unsatisfactory conditions have been corrected.

INSTALLATION

Install countertops level to a tolerance of 1/8 inch in 8 feet, 1/4 inch maximum. Do not exceed 1/64-inch difference between planes of adjacent units.

Fasten countertops by screwing through corner blocks of base units into underside of countertop. Predrill holes for screws as recommended by manufacturer. Align adjacent surfaces and, using adhesive in color to match countertop, form seams to comply with manufacturer's written instructions. Carefully dress joints smooth, remove surface scratches, and clean entire surface.

Install backsplashes and end splashes by adhering to wall and countertops with adhesive. Mask areas of countertops and splashes adjacent to joints to prevent adhesive smears.

Complete cutouts not finished in shop. Mask areas of countertops adjacent to cutouts to prevent damage while cutting. Make cutouts to accurately fit items to be installed, and at right angles to finished surfaces unless beveling is required for clearance. Ease edges slightly to prevent snipping.

Seal edges of cutouts in particleboard subtops by saturating with varnish.

Apply sealant to gaps at walls.

END OF SECTION 123661.16

DIVISION 13 -SPECIAL CONSTRUCTION
SECTION 134800 – SOUND, VIBRATION, AND SEISMIC CONTROL
SECTION 134823 – FABRICATED SOUND AND VIBRATION CONTROL ASSEMBLIES

GENERAL

DESCRIPTION

SCOPE OF WORK

This Section describes the requirements for ground vibration monitoring, settlement (displacement) monitoring and the completion of Inspections, Monitoring and Reports associated with this work.

Ground Vibration and Settlement Monitoring shall be performed continuously during all construction operations/activities including, but not limited to: the installation of Permanent Sheeting, Demolition of the existing building, excavation or any other construction or demolition operation activity that has the potential to have significant impact on existing or newly constructed building components, existing retaining walls, or the existing adjacent buildings and properties, as required or as directed by the Engineer.

Ground Vibration monitoring shall monitor, measure, record and analyze the ground vibration levels caused by the construction operations/activities described above.

Settlement monitoring shall monitor, measure, record and analyze the movement, settlement and/or rotation of: the existing adjacent buildings, the existing retaining walls, or newly constructed structure; as well as any existing cracks, deterioration, deformities, damage, etc., noted at any of these locations prior to construction, caused by the construction operations/activities described above.

The Contractor shall repair any damage done to the existing retaining walls, buildings and properties, roadways, etc., due to the excessive ground vibrations and/or settlement during construction operation/activities as required and/or as directed by the Engineer. All repairs will be made at no cost to the Township and to the satisfaction of the Engineer.

QUALIFICATIONS

The Contractor shall be required to hire, subject to the approval of the Engineer, an independent, qualified firm that specializes in the monitoring and analyzing of ground vibrations and settlement/movement produced by construction operations/activities.

The firm must have a minimum of ten (10) years experience in work of this nature and shall have an on-staff a New Jersey Professional Engineer to certify the work performed and have professional level capability in related geotechnical and structural evaluations and engineering.

The Ground Vibration and Settlement Monitoring firm (Firm) chosen shall be subject to the approval of the Engineer. The Contractor shall submit the qualifications of his Firm within ten (10) calendar days from Notice to Proceed.

The Firm shall be required to submit two (2) copies (one (1) original or certified copy and one (1) copy) of each test result, report, documentation, photograph, video, etc., performed for this project

directly to the Engineer. The Contractor shall provide written authorization to the firm to release this data/information directly to the Engineer.

Firms qualified to perform this work include, but are not limited to:

Big Apple Group, Collingswood, NJ; Phone No.: 856-229-1012
Dayton Inspection Services Inc., Delanco, NJ; Phone No.: 856-824-1010
Pile Mechanics, Inc., Princeton, NJ; Phone No.: 609-452-0333
Protec Documentation Services, Rancocas, NJ; Phone No.: 856-234-0200 / 609-267-2666
Vibra-Tech Engineers, Inc., Mount Holly, NJ; Phone No.: 856-787-1313

The person responsible for developing and implementing the structures monitoring program shall be a Professional Engineer licensed in the State of New Jersey with a minimum of 5-years of experience in seismic monitoring of the same type and scope to this monitoring work. The qualifications of the Professional Engineer licensed in the State of New Jersey, including a copy of their license, proposed to develop and conduct the structures monitoring shall be submitted. All submittals required as listed below shall be prepared by, signed by, and bear the seal of the aforementioned Engineer.

SUBMITTALS

PRE-CONSTRUCTION SUBMITTALS

Letter to Owner: The proposed letter to the owners of the monitored structures shall be submitted for approval by the Engineer.

Plan for Pre and Post Construction Surveys: The Contractor shall submit, for approval, the proposed plan for conducting pre and post construction surveys. Included in the plan shall be the locations and owners of the structures to be surveyed and the methods used for surveying in order to ensure compliance with the pre and post construction survey requirements below.

Structures Monitoring Plan: The contractor shall submit, for approval, a structures monitoring plan describing all personnel, materials, equipment and methods to be employed to monitor the effects of contract operations on existing structures. The plan shall include the qualifications of the personnel developing the monitoring plan and conducting the monitoring, the frequency of monitoring during each phase of construction, the maximum allowable vibration level, and a contingency plan if that vibration level is approached, including a list of recommended actions to be implemented by the Contractor to reduce vibrations to within acceptable limits.

Pre-Construction Survey: Once item the Pre-construction Survey Plan has been approved by the Engineer, the Contractor shall conduct a thorough pre- construction survey of the interior and exterior of all the structures within the monitoring limits, including the foundations of same.

The surveys shall include, but not be limited to, taking digital photographs and video of all exterior faces of the structures, recording the type of structures and their construction, recording overall interior and exterior conditions, recording specific interior and exterior distress areas (with close-up photos), including, but not limited to, measuring and recording the location, width and length of

existing interior and exterior cracks, details of any other pre-existing damage, and any and all additional information as required.

Completed pre-construction surveys for the contractor's actual worksites shall be submitted to Engineer at least 10 days prior to the commencement of work.

DURING CONSTRUCTION SUBMITTALS

The Contractor shall submit, for approval, monitoring reports. Reports of the monitoring shall be submitted electronically within five (5) business days following the actual monitoring, and include details of where and when the monitoring was performed, the frequency and peak particle velocities of vibrations, the limiting criteria, and any other pertinent information.

POST-CONSTRUCTION SUBMITTALS

Post-Construction Survey: Within 30 days of demobilization by the Contractor, the Contractor shall conduct a thorough post-construction survey of the interior and exterior of all the structures within the monitoring limits, including the foundations of same. The surveys shall include, but not be limited to, taking digital photographs and video of all exterior faces of the structures, recording the type of structures and their construction, recording overall interior and exterior conditions, recording specific interior and exterior distress areas (with close-up photos), including, but not limited to, measuring and recording the location, width and length of existing interior and exterior cracks, documenting details of any changes to pre-existing damage or new damage, if any, and any and all additional information as required.

EXECUTION

OBJECTIVE

The objective of this Section is to predict and prevent any damage to existing structures resulting from the operations of this contract. Any damage to structures resulting from the Contractors operations shall be the responsibility of the Contractor.

COORDINATION

After approval of the monitoring plan by the Engineer, and before work begins at the site, the Contractor shall draft a letter to the owners of the all structures within the monitoring limits to inform them of the methods of construction to be used for this contract, the hours of operation, and the content of the monitoring plan. In addition, the Contractor shall explain to the owners that people may "experience" vibrations at levels much lower than vibration levels that would damage structures.

Upon approval of this letter by the Engineer, the Contractor shall disseminate the letter.

DESCRIPTION OF STRUCTURES

All structures within 200 LF of any portion of the sheet pile to be driven or 200 LF from the construction limits shall be monitored.

MAXIMUM ACCEPTABLE VIBRATION LEVELS

The maximum acceptable vibration level shall be determined by the Structures Monitoring Engineer and shall be based upon the Report of Investigation RI - 8507 entitled "Structure Response and Damage Produced by Ground Vibrations from Surface Mine Blasting," published by the United States Bureau of Mines, latest edition. The maximum acceptable vibration level shall be clearly defined in the plan developed by the contractor’s Professional Engineer licensed in the State of New Jersey with a minimum of 5-years of experience.

MONITORING

Monitoring shall include the daily use of a seismograph at representative structures located within the limits throughout the Contractor's entire construction operation.

The seismographs shall be placed at locations on or at the base of the structures to obtain the highest peak particle velocities. Representative structures shall be defined as one of each foundation type (pile foundation, masonry, concrete, slab on grade). Not less than seven (7) structures within the monitoring limits outlined in this Section shall be monitored

The Structures Monitoring Engineer shall be on-site for the duration of sheet pile installation work to oversee continuous monitoring

During all other work, monitoring may be remote.

If the maximum acceptable vibration level threshold is approached, the engineer shall immediately notify the Engineer and direct the Contractor to immediately begin implementation of contingency measures to reduce vibrations to within acceptable means.

EXCEEDING ACCEPTABLE VIBRATION LEVELS

The Contractor shall immediately cease any activity that results in peak particle velocities greater than the maximum acceptable vibration level.

The Structures Monitoring Engineer shall immediately report to the project site to oversee continuous monitoring. The Structures Monitoring Engineer shall be on-site for the duration of sheet pile wall installation activities to oversee continuous monitoring. The Structures Monitoring Engineer shall review the contingency plan included in the Structures Monitoring Plan and make any necessary revisions, adjustments and/or recommendations based upon current construction activities and site conditions. Based upon the revised latest contingency plan, the Structures Monitoring Engineer shall prepared a prioritized list (based on ease of implementation and impact on construction activities) of successive actions to be implemented by the Contractor to reduce vibrations to within acceptable limits. The Structures Monitoring Engineer shall remain onsite, on a

continual basis, during the Contractor's normal work hours until he/she determines that vibration levels have been reduced to within acceptable limits.

The Contractor shall immediately begin implementation of the measures recommended by the Structures Monitoring Engineer as outlined above. Successive contingency measures shall be undertaken by the Contractor until the Structures Monitoring Engineer determines that vibration levels have been reduced to within acceptable limits. Any and all such measures required to reduce vibration levels must be undertaken by the Contractor at no cost to the Township of Lower.

Should any construction activity impact a structure, as reported by a property owner or as determined by the Structures Monitoring Engineer, the aforementioned engineer will re-inspect the structure(s) and report the findings, including digital images, to the Engineer via compact disk no later than one day following the re-inspection.

PROTECTION AND REMEDIATION

Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards that could develop during excavation support system operations.

The Contractor shall repair all damage to adjacent properties/structures and restore the surfaces and finishes to the original state or better.

If in the opinion of the Engineer the integrity of the adjacent structures or paved areas is jeopardized due to movement, the Contractor shall immediately discontinue further Work in the affected area and implement a plan of action to mitigate further movement. Mitigating measures shall remain in effect until such time that the Engineer evaluates the impact on the structure and may direct the Contractor to perform any remedial work. The Contractor shall submit proposed remedial measures to the Engineer for review and approval. Submittals shall include methods and names of subcontractors. The Contractor shall proceed with remedial work upon acceptance by the Engineer. Mitigating measures shall be at no additional cost to the Owner.

At no time shall the Contractor obstruct the operation of the canal. The Contractor shall install appropriate sediment control devices such as silt curtains or booms downstream of the work area to prevent silting of water leaving the project site if heavy silt release is observed as being caused by the driving operations.

END OF SECTION 134823

DIVISION 14 – CONVEYING EQUIPMENT
SECTION 142400 – HYDRAULIC ELEVATORS

1 GENERAL

2 SUMMARY

3 This Section specifies hydraulic elevators.

4 Work Required:

5 The work required under this section consists of all labor, materials and services required for the
6 complete installation (including operational verification) of all the equipment required for the
7 elevator(s) as herein specified.

8 All work shall be performed in a first class, safe and workmanlike manner.

9 In all cases where a device or part of the equipment is herein referred to in the singular, it is
10 intended that such reference shall apply to as many of such devices or parts as are required to
11 make complete installation.

12 Applicable Codes: Comply with applicable building and elevator codes at the project site,
13 including but not limited to the following:

14 ANSI A117.1, Buildings and Facilities, Providing Accessibility and Usability for Physically
15 Handicapped People.

16 ADAAG, Americans with Disabilities Act Accessibility Guidelines.

17 ANSI/NFPA 70, National Electrical Code.

18 ANSI/NFPA 80, Fire Doors and Windows.

19 ASME/ANSI A17.7, Safety Code for Elevators and Escalators.

20 ANSI/UL 10B, Fire Tests of Door Assemblies.

21 CAN/CSA C22.1, Canadian Electrical Code.

22 CAN/CSA-B44, Safety Code for Elevators and Escalators.

23 EN 12016 (May 1998): “EMC Product Family Standards for lifts, escalators, and passenger
24 conveyors Part 2 – immunity”

25 Local Building Codes.

26 All other local applicable codes.

27 SYSTEM DESCRIPTION

28 Equipment Description: Equipment Description: Holeless Hydraulic elevator

29 Equipment Control: Elevonic® Control System.

Quantity of Elevators: 1

Elevator Stop Designations: Front At First Floor and Second Floor, Rear At Lower Level (Ambulance Squad).

Stops: 3

Openings: 2 Front, 1 Rear

Travel: 17 ft 4 in plus any required overruns

Rated Capacity: 3500 lbs Passenger

Rated Speed: 100 fpm

Platform Size: 6' 6- 3/4" wide x 6' 1- 3/16" deep

Clear Inside Dimensions:

6 ft 5 in 9/16 wide x 5 ft 5 in 9/16 deep

Cab Height: 93”

Clear Cab Height: 7’ 8- 1/16”

Single-Slide door @ each stop

Entrance Height: 7’ 0” (2134 mm)

Main Power Supply: 208 Volts + or - 5% of normal, three-Phase, with a separate equipment grounding conductor.

Car Lighting Power Supply: 120 Volts, Single-phase, 15 Amp, 60 Hz.

Machine and Controller Location at landing at First Floor (Lobby)

Signal Fixtures: Manufacturer’s standard with metal button targets (exc. CA).

Stopping Accuracy: *±1/4" (6.4 mm)* under any loading condition or direction of travel.

Operation: Simplex Collective Operation- Using a microprocessor-based controller, operation shall be automatic by means of the car and hall buttons. If all calls in the system have been answered, the car shall park at the last landing served.

Operating Features – Standard

Full Collective Operation

Fan and Light Protection, Sleep Mode

Independent Service.

Full Collective Service.

Firefighters' Service Phase I and Phase II.

Top of Car Inspection.

Operation Features – Optional

Zoned Access at Upper Landing.

Door Control Features:

Door control to open doors automatically when car arrives at a landing in response to a normal hall or car call.

Elevator doors shall be provided with a reopening device that will stop and reopen the car door(s) and hoistway door(s) automatically should the door(s) become obstructed by an object or person.
Door protection shall consist of a two dimensional, multi-beam array projecting across the car door opening.

Door nudging operation to occur if doors are prevented from closing for an adjustable period of time.

Provide equipment according to: Seismic Zone 1

SUBMITTALS

Product Data: Submit manufacturer’s product data for each system proposed for use. Include the following:

Signal and operating fixtures, operating panels and indicators.

Cab design, dimensions and layout.

Hoistway-door and frame details.

Electrical characteristics and connection requirements.

Expected heat dissipation of elevator equipment in hoistway (BTU).

Color selection chart for Cab and Entrances.

Shop Drawings: Submit approval layout drawings. Include the following:

Car, guide rails, buffers and other components in hoistway.

Maximum rail bracket spacing.

Maximum loads imposed on guide rails requiring load transfer to building structure.

Clearances and travel of car.

Clear inside hoistway and pit dimensions.

Location and sizes of access doors, hoistway entrances and frames.

Operations and Maintenance Manuals: Provide manufacturer's standard operations and maintenance manual.

QUALITY ASSURANCE

Manufacturer: Elevator manufacturer shall be ISO 9001 certified.

Installer: Elevators shall be installed by the manufacturer.

Permits, Inspections and Certificates: The Elevator Contractor shall obtain and pay for necessary Municipal or State Inspection and permit as required by the elevator inspection authority, and make such tests as are called for by the regulations or such authorities. These tests shall be made in the presence of such authorities or their authorized representatives.

DELIVERY, STORAGE AND HANDLING

Should the building or the site not be prepared to receive the elevator equipment at the agreed upon date, the General Contractor will be responsible to provide a proper and suitable storage area on or off the premises.

Should the storage area be off-site and the equipment not yet delivered, then the elevator contractor, upon notification from the General Contractor, will divert the elevator equipment to the storage area. If the equipment has already been delivered to the site, then the General Contractor shall transport the elevator equipment to the storage area. The cost of elevator equipment taken to storage by either party, storage, and redeliver to the job site shall not be at the expense of the Owner.

WARRANTY

The elevator contractor’s acceptance is conditional on the understanding that their warranty covers defective material and workmanship. The warranty period shall not extend longer than one (1) year from the date of completion or acceptance thereof by beneficial use, whichever is earlier, of each elevator. The warranty excludes: ordinary wear and tear, improper use, vandalism, abuse, misuse, or neglect or any other causes beyond the control of the elevator contractor and this express warranty is in lieu of all other warranties, express or implied, including any warranty of merchantability or fitness for a particular purpose.

MAINTENANCE and SERVICE

Maintenance service consisting of regular examinations and adjustments of the elevator equipment shall be provided by the elevator contractor for a period of 12 months after the

elevator has been turned over for the customer's use. This service shall not be subcontracted but shall be performed by the elevator contractor. All work shall be performed by competent employees during regular working hours of regular working days. This service shall not cover adjustments, repairs or replacement of parts due to negligence, misuse, abuse or accidents caused by persons other than the elevator contractor. Only genuine parts and supplies as used in the manufacture and installation of the original equipment shall be provided.

The elevator control system must:

Provide in the controller the necessary devices to run the elevator on inspection operation.

Provide on top of the car the necessary devices to run the elevator in inspection operation.

Provide in the controller an emergency stop switch. This emergency stop switch when opened disconnects power from the brake and prevents the motor from running.

Provide system capabilities to enable a remote expert to create a live, interactive connection with the elevator system to enable the following functions:

Remotely diagnose elevator issues with a remote team of experts

Remotely return an elevator to service

Provide real-time status updates via email

Remotely make changes to selected elevator functions including:

Control building traffic: Restrict floor access, remove car from group operation, shut down elevator, select up peak / down peak mode, activate independent service

Conserve energy: Activate cab light energy save mode, activate fan energy save mode, shut down car(s)

Improve passenger experience: Extend door open times, change parking floor, activate auto car full, activate anti-nuisance, advance door opening, door nudging, extend specific floor extended opening time, release trapped passengers

PRODUCTS

DESIGN AND SPECIFICATIONS

Provide holeless hydraulic elevators from Otis Elevator Company. The control system and car design based on materials and systems manufactured by Otis Elevator Company. Specifically, the system shall consist of the following components:

Sleep mode operation for LED ceiling lights and car fan.

LED lighting standard in ceiling lights and elevator fixtures.

Sleep mode operation for LED ceiling lights and car fan.

Approved Installer: Otis Elevator

EQUIPMENT: MACHINE COMPONENTS

The hydraulic system shall be of compact design suitable for operation under the required pressure. The power component shall be mounted in the hydraulic-fluid storage tank. The control valve shall control flow for up and down directions hydraulically and shall include an integral check valve. A control section including control solenoids shall direct the main valve and control: up and down starting, acceleration, transition from full speed to leveling speed, up and down stops, pressure relief and manual lowering. All of these functions shall be fully adjustable for maximum smoothness and to meet contract conditions. System to be provided with a low-pressure switch and a shut-off valve.

A microprocessor-based controller shall be provided, including necessary starting switches together with all relays, switches, solid-state components and hardware required for operation, including door operation, as described herein. A three (3) phase overload device shall be provided to protect the motor against overloading.

A manual lowering feature shall permit lowering the elevator at slow speed in the event of power failure or for adjusting purposes.

Pressure Switch

Low-oil control.

EQUIPMENT: HOISTWAY COMPONENTS

Plunger(s) and Cylinder(s): Each cylinder shall be constructed of steel pipe of sufficient thickness and suitable for the operating pressure. The top of each cylinder shall be equipped with a cylinder head with a drip ring to collect any oil seepage as well as an internal guide ring and self-adjusting packing. Each plunger shall be constructed of selected steel tubing or pipe of proper diameter machined true and smooth with a fine polished finish. Each plunger shall be provided with a stop ring electrically welded to it to prevent the plunger from leaving the cylinder. Each plunger and cylinder shall be installed plumb and shall operate freely with minimum friction.

Car Guide Rails: Tee-section steel rails with brackets and fasteners.

Polyurethane type buffers shall be used.

Wiring: Wiring for hoistway electrical devices included in scope of the elevator system, hall panels, pit emergency stop switch, and the traveling cable for the elevator car.

Hoistway Entrances:

Frames: Entrance frames shall be of bolted construction for complete one-piece unit assembly. All frames shall be securely fastened to fixing angles mounted in the hoistway and shall be of UL fire rated steel.

Sill Finish(es):

Extruded Aluminum at Front 1, 2

Doors: Entrance doors shall be of metal construction with vertical channel reinforcements.

Fire Rating: Entrance and doors shall be UL fire rated for 1-1/2 hour (for M1, M2, M3, D1, and D2 Entrance Arrangements or 1 hour for D3 Entrance Arrangement.

Entrance Finish(es):

Stainless Steel at Front 1, 2

Frame Finish(es):

Stainless Steel at Front 1, 2

Entrance marking plates: Entrance jambs shall be marked with 4” x 4” (102 mm x 102 mm) plates having raised floor markings with Braille located adjacent to the floor marking. Marking plates shall be provided on both sides of the entrance.

Sight Guards: Black sight guards will be furnished with all doors.

EQUIPMENT: CAR COMPONENTS

Cab Options:

Steel shell cab with raised stainless steel, vertical, removable panels.

Black vertical trim pieces

Paints and laminate to be selected from manufacturer’s catalog of choices.

Brushed Stainless Steel finished base plate located at top and bottom.

Car Front Finish: Satin Stainless Steel.

Car Door Finish: Satin Stainless Steel.

Ceiling Type: Brushed Steel Finish (BSF) Flush Metal Ceiling with 4 LED lights

Emergency Car Lighting: An emergency power unit employing a 6-volt sealed rechargeable battery and totally static circuits shall be provided to illuminate the elevator car in the event of building power failure.

Fan: A one-speed 120 VAC fan will be mounted to the structural ceiling to facilitate in-car air circulation, meeting A17.1 code requirements. The fan shall be rubber mounted to prevent the transmission of structural vibration and will include a baffle to diffuse audible noise. A switch shall be provided in the car-operating panel to control the fan.

Handrails: Handrails shall be provided on the Side & Rear walls of the car enclosure. Handrails shall be 3/8”x 2” (9.5mm x 51mm) Flat Tubular handrail with a Brushed Steel Finish

Threshold: Extruded Aluminum

Emergency Exit Contact: An electrical contact shall be provided on the car-top exit.

Guides: Car roller type guides at the top and the bottom.

Platform: Car platform shall be constructed of metal.

Certificate frame- Provide a Certificate frame with a satin stainless steel finish.

The LED ceiling lights and the fan should automatically shut off when the system is not in use and be powered back up after a passenger calls the elevator and pushes a hall button.

Security Camera Provisions: Provide spare wires in elevator traveling cable for power and signal transmission as well as pipe and wire on car top to location to be field coordinated.

EQUIPMENT: SIGNAL DEVICES AND FIXTURES

Car Operating Panel: A car operating panel shall be provided which contains all push buttons, key switches, and message indicators for elevator operation. The car operating panel shall have a satin stainless steel finish.

A car operating panel shall be furnished. It shall contain a bank of round stainless steel, mechanical LED illuminated buttons. Flush mounted to the panel and marked to correspond to the landings served. All buttons to have raised numerals and Braille markings with:

Flat Flush Mounted satin stainless steel button with blue or white LED illuminating halo)

Optional- 1/8” (3mm) satin stainless steel projecting button with blue illuminating halo

Vandal-Resistant, Flush satin stainless steel button with blue LED illuminating center jewel

Plastic 1/8” (3mm) fully illuminated button with white LED (required by some local California codes)

The car operating panel shall be equipped with the following features:

Raised markings and Braille to the left hand side of each push-button.

Car Position Indicator at the top of and integral to the car operating panel.

1 Door open and door close buttons.

2 Inspection key-switch.

3 Elevator Data Plate marked with elevator capacity and car number.

Help Button: The help button shall initiate two-way communication between the car and a location inside the building, switching over to another location if the call is unanswered, where personnel are available who can take the appropriate action. Visual indicators are provided for call initiation and call acknowledgement.

Landing Passing Signal: A chime bell shall sound in the car to signal that the car is either stopping at or passing a floor served by the elevator.

In car stop switch (toggle or key unless local code prohibits use)

Firefighter's hat

Firefighter's Phase II Key-switch

Call Cancel Button

Optional

Firefighter's Phase II Emergency In-Car Operating Instructions: worded according to A17.1 2000, Article 2.27.7.2.

Car Position Indicator: A digital, LED car position indicator shall be integral to the car operating panel.

Hall Fixtures: Hall fixtures shall be provided with necessary push buttons and key switches for elevator operation.

Hall fixtures shall feature:

Stainless Steel Hall Position Indicators at1

Integral Hall fixtures shall feature:

Round stainless steel, mechanical buttons marked to correspond to the landings.

Hall fixtures to be located in the entrance frame face. Therefore, separate wiring and installation of electrical boxes inside the wall for the hall buttons are not required.

Buttons shall be in vertically mounted fixture.

Fixture shall be satin stainless steel finish.

Button Options:

Flat Flush Mounted satin stainless steel button with blue or white LED illuminating halo

Optional- 1/8" (3mm) satin stainless steel projecting button with blue illuminating halo

Vandal-Resistant, Flush satin stainless steel button with blue LED illuminating center jewel

Plastic 1/8" (3mm) fully illuminated button with white LED (required by some local California codes)

Car Lantern and Chime: A directional lantern visible from the corridor shall be provided in the car entrance. When the car stops and the doors are opening, the lantern shall indicate the direction in which the car is to travel and a chime will sound.

Access key-switch at top floor in entrance jamb.

EXECUTION

PREPARATION

Take field dimensions and examine conditions of substrates, supports, and other conditions under which this work is to be performed. Do not proceed with work until unsatisfactory conditions are corrected.

INSTALLATION

Installation of all elevator components except as specifically provided for elsewhere by others.

DEMONSTRATION

The elevator contractor shall make a final check of each elevator operation with the Owner or Owner's representative present prior to turning each elevator over for use. The elevator contractor shall determine that control systems and operating devices are functioning properly.

END OF SECTION 142400

DIVISION 31 - EARTHWORK
SECTION 312000 - EARTH MOVING

GENERAL

SUMMARY

Section Includes:

Preparing subgrades for slabs-on-grade walks pavements and plants.

Excavating and backfilling for buildings and structures.

Drainage course for concrete slabs-on-grade.

Subbase course for concrete walks pavements.

Subbase course and base course for asphalt paving.

Subsurface drainage backfill for walls and trenches.

Excavating and backfilling trenches for utilities and pits for buried utility structures.

DEFINITIONS

Backfill: Soil material or controlled low-strength material used to fill an excavation.

Initial Backfill: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.

Final Backfill: Backfill placed over initial backfill to fill a trench.

Base Course: Aggregate layer placed between the subbase course and hot-mix asphalt paving.

Bedding Course: Aggregate layer placed over the excavated subgrade in a trench before laying pipe.

Borrow Soil: Satisfactory soil imported from off-site for use as fill or backfill.

Drainage Course: Aggregate layer supporting the slab-on-grade that also minimizes upward capillary flow of pore water.

Excavation: Removal of material encountered above subgrade elevations and to lines and dimensions indicated.

Authorized Additional Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions as directed by Architect. Authorized additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work.

Bulk Excavation: Excavation more than 10 feet in width and more than 30 feet in length.

Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions without direction by Architect. Unauthorized excavation, as well as remedial work directed by Architect, shall be without additional compensation.

Fill: Soil materials used to raise existing grades.

Rock: Rock material in beds, ledges, unstratified masses, conglomerate deposits, and boulders of rock material that exceed 1 cu. yd. for bulk excavation or 3/4 cu. yd. for footing, trench, and pit excavation that cannot be removed by rock-excavating equipment equivalent to the following in size and performance ratings, without systematic drilling, ram hammering, ripping, or blasting, when permitted:

Equipment for Footing, Trench, and Pit Excavation: Late-model, track-mounted hydraulic excavator; equipped with a 42-inch- maximum-width, short-tip-radius rock bucket; rated at not less than 138-hp flywheel power with bucket-curling force of not less than 28,700 lbf and stick-crowd force of not less than 18,400 lbf with extra-long reach boom.

Equipment for Bulk Excavation: Late-model, track-mounted loader; rated at not less than 230-hp flywheel power and developing a minimum of 47,992-lbf breakout force with a general-purpose bare bucket.

Rock: Rock material in beds, ledges, unstratified masses, conglomerate deposits, and boulders of rock material 3/4 cu. yd. or more in volume that exceed a standard penetration resistance of 100 blows/2 inches when tested by a geotechnical testing agency, according to ASTM D1586.

Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.

Subbase Course: Aggregate layer placed between the subgrade and base course for hot-mix asphalt pavement, or aggregate layer placed between the subgrade and a cement concrete pavement or a cement concrete or hot-mix asphalt walk.

Subgrade: Uppermost surface of an excavation or the top surface of a fill or backfill immediately below subbase, drainage fill, drainage course, or topsoil materials.

Utilities: On-site underground pipes, conduits, ducts, and cables as well as underground services within buildings.

ACTION SUBMITTALS

INFORMATIONAL SUBMITTALS

Qualification Data: For qualified testing agency.

Preexcavation Photographs or Videotape: Show existing conditions of adjoining construction and site improvements, including finish surfaces that might be misconstrued as damage caused by earth-moving operations. Submit before earth moving begins.

QUALITY ASSURANCE

Geotechnical Testing Agency Qualifications: Qualified according to ASTM E329 and ASTM D3740 for testing indicated.

FIELD CONDITIONS

Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during earth-moving operations.

Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.

Provide alternate routes around closed or obstructed traffic ways if required by Owner or authorities having jurisdiction.

Improvements on Adjoining Property: Authority for performing earth moving indicated on property adjoining Owner's property will be obtained by Owner before award of Contract.

Do not proceed with work on adjoining property until directed by Architect.

Utility Locator Service: Notify utility locator service for area where Project is located before beginning earth-moving operations.

Do not commence earth-moving operations until temporary site fencing and erosion- and sedimentation-control measures specified in are in place.

Do not commence earth-moving operations until plant-protection measures specified in Section 015639 "Temporary Tree and Plant Protection" are in place.

The following practices are prohibited within protection zones:

Storage of construction materials, debris, or excavated material.

Parking vehicles or equipment.

Foot traffic.

Erection of sheds or structures.

Impoundment of water.

Excavation or other digging unless otherwise indicated.

Attachment of signs to or wrapping materials around trees or plants unless otherwise indicated.

Do not direct vehicle or equipment exhaust towards protection zones.

Prohibit heat sources, flames, ignition sources, and smoking within or near protection zones.

PRODUCTS

SOIL MATERIALS

General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.

Satisfactory Soils: Soil Classification Groups GW, GP, GM, SW, SP, and SM according to ASTM D2487 Groups A-1, A-2-4, A-2-5, and A-3 according to AASHTO M 145, or a combination of these groups; free of rock or gravel larger than 3 inches in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.

Liquid Limit: .

Plasticity Index: .

Unsatisfactory Soils: Soil Classification Groups GC, SC, CL, ML, OL, CH, MH, OH, and PT according to ASTM D2487 Groups A-2-6, A-2-7, A-4, A-5, A-6, and A-7 according to AASHTO M 145, or a combination of these groups.

Unsatisfactory soils also include satisfactory soils not maintained within 2 percent of optimum moisture content at time of compaction.

Subbase Material: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D2940/D2940M; with at least 90 percent passing a 1-1/2-inch sieve and not more than 12 percent passing a No. 200 sieve.

Base Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D2940/D2940M; with at least 95 percent passing a 1-1/2-inch sieve and not more than 8 percent passing a No. 200 sieve.

Engineered Fill: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D2940/D2940M; with at least 90 percent passing a 1-1/2-inch sieve and not more than 12 percent passing a No. 200 sieve.

Bedding Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D2940/D2940M; except with 100 percent passing a 1-inch sieve and not more than 8 percent passing a No. 200 sieve.

Drainage Course: Narrowly graded mixture of washed crushed stone, or crushed or uncrushed gravel; ASTM D448; coarse-aggregate grading Size 57; with 100 percent passing a 1-1/2-inch sieve and zero to 5 percent passing a No. 8 sieve.

Filter Material: Narrowly graded mixture of natural or crushed gravel, or crushed stone and natural sand; ASTM D448; coarse-aggregate grading Size 67; with 100 percent passing a 1-inch sieve and zero to 5 percent passing a No. 4 sieve.

Sand: ASTM C33/C33M; fine aggregate.

Impervious Fill: Clayey gravel and sand mixture capable of compacting to a dense state.

ACCESSORIES

Detectable Warning Tape: Acid- and alkali-resistant, polyethylene film warning tape manufactured for marking and identifying underground utilities, a minimum of 6 inches wide and 4 mils thick, continuously inscribed with a description of the utility, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30 inches deep; colored as follows:

Red: Electric.

Yellow: Gas, oil, steam, and dangerous materials.

Orange: Telephone and other communications.

Blue: Water systems.

Green: Sewer systems.

EXECUTION

PREPARATION

Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earth-moving operations.

Protect and maintain erosion and sedimentation controls during earth-moving operations.

Protect subgrades and foundation soils from freezing temperatures and frost. Remove temporary protection before placing subsequent materials.

DEWATERING

Provide dewatering system of sufficient scope, size, and capacity to control hydrostatic pressures and to lower, control, remove, and dispose of ground water and permit excavation and construction to proceed on dry, stable subgrades.

Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.

Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.

Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches.

Dispose of water removed by dewatering in a manner that avoids endangering public health, property, and portions of work under construction or completed. Dispose of water and sediment in a manner that avoids inconvenience to others.

EXPLOSIVES

Explosives: Do not use explosives.

EXCAVATION, GENERAL

Unclassified Excavation: Excavate to subgrade elevations regardless of the character of surface and subsurface conditions encountered. Unclassified excavated materials may include rock, soil

materials, and obstructions. No changes in the Contract Sum or the Contract Time will be authorized for rock excavation or removal of obstructions.

If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil materials.

Remove rock to lines and grades indicated to permit installation of permanent construction without exceeding the following dimensions:

24 inches outside of concrete forms other than at footings.

12 inches outside of concrete forms at footings.

6 inches outside of minimum required dimensions of concrete cast against grade.

Outside dimensions of concrete walls indicated to be cast against rock without forms or exterior waterproofing treatments.

6 inches beneath bottom of concrete slabs-on-grade.

6 inches beneath pipe in trenches and the greater of 24 inches wider than pipe or 42 inches wide.

Classified Excavation: Excavate to subgrade elevations. Material to be excavated will be classified as earth and rock. Do not excavate rock until it has been classified and cross sectioned by Architect. The Contract Sum will be adjusted for rock excavation according to unit prices included in the Contract Documents. Changes in the Contract Time may be authorized for rock excavation.

Earth excavation includes excavating pavements and obstructions visible on surface; underground structures, utilities, and other items indicated to be removed; and soil, boulders, and other materials not classified as rock or unauthorized excavation.

Intermittent drilling; blasting, if permitted; ram hammering; or ripping of material not classified as rock excavation is earth excavation.

Rock excavation includes removal and disposal of rock. Remove rock to lines and subgrade elevations indicated to permit installation of permanent construction without exceeding the following dimensions:

24 inches outside of concrete forms other than at footings.

12 inches outside of concrete forms at footings.

6 inches outside of minimum required dimensions of concrete cast against grade.

Outside dimensions of concrete walls indicated to be cast against rock without forms or exterior waterproofing treatments.

6 inches beneath bottom of concrete slabs-on-grade.

6 inches beneath pipe in trenches and the greater of 24 inches wider than pipe or 42 inches wide.

EXCAVATION FOR STRUCTURES

Excavate to indicated elevations and dimensions within a tolerance of plus or minus 1 inch. If applicable, extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, and for inspections.

Excavations for Footings and Foundations: Do not disturb bottom of excavation. Excavate by hand to final grade just before placing concrete reinforcement. Trim bottoms to required lines and grades to leave solid base to receive other work.

Excavation for Underground Tanks, Basins, and Mechanical or Electrical Utility Structures: Excavate to elevations and dimensions indicated within a tolerance of plus or minus 1 inch. Do not disturb bottom of excavations intended as bearing surfaces.

EXCAVATION FOR WALKS AND PAVEMENTS

Excavate surfaces under walks and pavements to indicated lines, cross sections, elevations, and subgrades.

EXCAVATION FOR UTILITY TRENCHES

Excavate trenches to indicated gradients, lines, depths, and elevations.

Beyond building perimeter, excavate trenches to allow installation of top of pipe below frost line.

Excavate trenches to uniform widths to provide the following clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12 inches higher than top of pipe or conduit unless otherwise indicated.

Clearance: 12 inches each side of pipe or conduit .

Trench Bottoms: Excavate trenches 4 inches deeper than bottom of pipe and conduit elevations to allow for bedding course. Hand-excavate deeper for bells of pipe.

Excavate trenches 6 inches deeper than elevation required in rock or other unyielding bearing material to allow for bedding course.

SUBGRADE INSPECTION

Notify Architect when excavations have reached required subgrade.

If Architect determines that unsatisfactory soil is present, continue excavation and replace with compacted backfill or fill material as directed.

Proof-roll subgrade below the building slabs and pavements with a pneumatic-tired to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.

Completely proof-roll subgrade in one direction , repeating proof-rolling in direction perpendicular to first direction. Limit vehicle speed to 3 mph.

Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting, as determined by Architect, and replace with compacted backfill or fill as directed.

Authorized additional excavation and replacement material will be paid for according to Contract provisions for .

Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Architect, without additional compensation.

UNAUTHORIZED EXCAVATION

Fill unauthorized excavation under foundations or wall footings by extending bottom elevation of concrete foundation or footing to excavation bottom, without altering top elevation. Lean concrete fill, with 28-day compressive strength of 2500 psi, may be used when approved by Architect.

Fill unauthorized excavations under other construction, pipe, or conduit as directed by Architect.

STORAGE OF SOIL MATERIALS

Stockpile borrow soil materials and excavated satisfactory soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.

Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.

BACKFILL

Place and compact backfill in excavations promptly, but not before completing the following:

Construction below finish grade including, where applicable, subdrainage, dampproofing, waterproofing, and perimeter insulation.

Surveying locations of underground utilities for Record Documents.

Testing and inspecting underground utilities.

Removing concrete formwork.

Removing trash and debris.

Removing temporary shoring, bracing, and sheeting.

Place backfill on subgrades free of mud, frost, snow, or ice.

UTILITY TRENCH BACKFILL

Place backfill on subgrades free of mud, frost, snow, or ice.

Place and compact bedding course on trench bottoms and where indicated. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.

Backfill voids with satisfactory soil while removing shoring and bracing.

Initial Backfill:

Soil Backfill: Place and compact initial backfill of subbase material , free of particles larger than 1 inch in any dimension, to a height of 12 inches over the pipe or conduit.

Carefully compact initial backfill under pipe haunches and compact evenly up on both sides and along the full length of piping or conduit to avoid damage or displacement of piping or conduit. Coordinate backfilling with utilities testing.

Final Backfill:

Soil Backfill: Place and compact final backfill of satisfactory soil to final subgrade elevation.

Warning Tape: Install warning tape directly above utilities, 12 inches below finished grade, except 6 inches below subgrade under pavements and slabs.

SOIL FILL

Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.

Place and compact fill material in layers to required elevations as follows:

Under grass and planted areas, use satisfactory soil material.

Under walks and pavements, use satisfactory soil material.

Under steps and ramps, use engineered fill.

Under building slabs, use engineered fill.

Under footings and foundations, use engineered fill.

Place soil fill on subgrades free of mud, frost, snow, or ice.

SOIL MOISTURE CONTROL

Uniformly moisten or aerate subgrade and each subsequent fill or backfill soil layer before compaction to within 2 percent of optimum moisture content.

Do not place backfill or fill soil material on surfaces that are muddy, frozen, or contain frost or ice.

Remove and replace, or scarify and air dry, otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.

COMPACTION OF SOIL BACKFILLS AND FILLS

Place backfill and fill soil materials in layers not more than 8 inches in loose depth for material compacted by heavy compaction equipment and not more than 4 inches in loose depth for material compacted by hand-operated tampers.

Place backfill and fill soil materials evenly on all sides of structures to required elevations and uniformly along the full length of each structure.

Compact soil materials to not less than the following percentages of maximum dry unit weight according to ASTM D698 :

Under structures, building slabs, steps, and pavements, scarify and recompact top 12 inches of existing subgrade and each layer of backfill or fill soil material at 95 percent.

Under walkways, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill soil material at 95 percent.

Under turf or unpaved areas, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill soil material at 90 percent.

For utility trenches, compact each layer of initial and final backfill soil material at 90 percent.

GRADING

General: Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.

Provide a smooth transition between adjacent existing grades and new grades.

Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.

Site Rough Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to elevations required to achieve indicated finish elevations, within the following subgrade tolerances:

Turf or Unpaved Areas: Plus or minus 1 inch.

Walks: Plus, or minus 1 inch.

Pavements: Plus or minus 1/2 inch.

Grading inside Building Lines: Finish subgrade to a tolerance of 1/2 inch when tested with a 10-foot straightedge.

SUBSURFACE DRAINAGE

Subsurface Drain: Place subsurface drainage geotextile around perimeter of subdrainage trench. Place a 6-inch course of filter material on subsurface drainage geotextile to support subdrainage pipe. Encase subdrainage pipe in a minimum of 12 inches of filter material, placed in compacted layers 6 inches thick, and wrap in subsurface drainage geotextile, overlapping sides and ends at least 6 inches.

Compact each filter material layer to 85 percent of maximum dry unit weight according to ASTM D698 with a minimum of two passes of a plate-type vibratory compactor.

Drainage Backfill: Place and compact filter material over subsurface drain, in width indicated, to within 12 inches of final subgrade, in compacted layers 6 inches thick. Overlay drainage backfill with one layer of subsurface drainage geotextile, overlapping sides and ends at least 6 inches.

Compact each filter material layer to 85 percent of maximum dry unit weight according to ASTM D698 with a minimum of two passes of a plate-type vibratory compactor.

Place and compact impervious fill over drainage backfill in 6-inch- thick compacted layers to final subgrade.

SUBBASE AND BASE COURSES UNDER PAVEMENTS AND WALKS

Place subbase course and base course on subgrades free of mud, frost, snow, or ice.

On prepared subgrade, place subbase course and base course under pavements and walks as follows:

Install separation geotextile on prepared subgrade according to manufacturer's written instructions, overlapping sides and ends.

Place base course material over subbase course under hot-mix asphalt pavement.

Shape subbase course and base course to required crown elevations and cross-slope grades.

Place subbase course and base course 6 inches or less in compacted thickness in a single layer.

Place subbase course and base course that exceeds 6 inches in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches thick or less than 3 inches thick.

Compact subbase course and base course at optimum moisture content to required grades, lines, cross sections, and thickness to not less than 95 percent of maximum dry unit weight according to ASTM D698.

Pavement Shoulders: Place shoulders along edges of subbase course and base course to prevent lateral movement. Construct shoulders, at least 12 inches wide, of satisfactory soil materials and compact simultaneously with each subbase and base layer to not less than 95 percent of maximum dry unit weight according to ASTM D698 .

DRAINAGE COURSE UNDER CONCRETE SLABS-ON-GRADE

Place drainage course on subgrades free of mud, frost, snow, or ice.

On prepared subgrade, place and compact drainage course under cast-in-place concrete slabs-on-grade as follows:

Install subdrainage geotextile on prepared subgrade according to manufacturer's written instructions, overlapping sides and ends.

Place drainage course 6 inches or less in compacted thickness in a single layer.

Place drainage course that exceeds 6 inches in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches thick or less than 3 inches thick.

Compact each layer of drainage course to required cross sections and thicknesses to not less than 95 percent of maximum dry unit weight according to ASTM D698.

PROTECTION

Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.

Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.

Scarify or remove and replace soil material to depth as directed by Architect; reshape and recompact.

Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.

Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

DISPOSAL OF SURPLUS AND WASTE MATERIALS

Remove surplus satisfactory soil and waste materials, including unsatisfactory soil, trash, and debris, and legally dispose of them off Owner's property.

END OF SECTION 312000

GENERAL

SCOPE

This section covers all members to be used in the construction of steel sheet pile.

This specification also covers the installation of steel sheet piling and trimming of the sheet pile to the lines and grades shown on the drawings or as required.

This work also includes pre-drilling to facilitate driving sheet pile to the designated elevations.

REFERENCES

American Concrete Institute (ACI): 318/318R, Building Code Requirements for Structural Concrete and Commentary.

American Petroleum Institute (API): Spec 5L, Specification for Line Pipe.

ASTM International (ASTM):
A36, Standard Specification for Carbon Structural Steel.
A53, Standard Specification for Pipe, Steel, Black and Hot-Dipped, ZincCoated, Welded and Seamless.
A139, Standard Specification for Electric-Fusion (ARC)-Welded Steel Pipe (NPS 4 and Over).
A252, Standard Specification for Welded and Seamless Steel Pipe Piles.
A328, Standard Specification for Steel Sheet Piling.
A572, Standard Specification for High-Strength Low-Alloy ColumbiumVanadium Structural Steel.
A690, Standard Specification for High-Strength Low-Alloy Nickel, Copper, Phosphorus Steel H Piles and Sheet Piling with Atmospheric Corrosion Resistance for Use in Marine Environments.
A1011/A1011M, Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High Strength Low-Alloy and High-Strength LowAlloy with Improved Formability.

American Water Works Association (AWWA):
C200, Steel Water Pipe—6 in. (50 mm) and Larger
American Welding Society (AWS):
D1.1, Structural Welding Code—Steel

SUBMITTALS

Provide qualifications of proposed sheet pile installer.

Contractor shall provide information from the manufacturer that indicates the sheet piling meets or exceeds the specifications listed in this section.

Contractor shall submit verification from the manufacturer that the hammer can deliver the required energy.

Splice locations, if necessary, shall be reviewed and accepted by Engineer prior to installation.

QUALTIY ASSURANCE

Installer Qualifications: Sheet piling installer shall have, as a minimum, three (3) successful past installations of sheet piling of comparable overall heights and sections and comparable penetration into soils similar to those found on the project.

PRODUCTS

All steel sheet piling shall be new and unspliced material throughout, unless otherwise reviewed and accepted by Engineer.

Steel sheet piles and special fabricated shapes shall be of a design that ensures continuous interlock throughout the entire length when in place.

MATERIALS

Steel sheet piling shall meet the requirements of ASTM A328, (Grade 50).

Steel corners, tees, wyes, and crosses shall meet the requirements of ASTM A328 or ASTM A690.

Steel sheet piles required for the project shall be the type and weight shown on the drawings.

Contractor may use another size or type of sheeting if approved by engineer. Drawings and calculations must be signed and sealed by a Professional Engineer of New Jersey for approval.

Sheet piling shall be constructed with a weathering finish. Additional length beyond those indicated on the drawings may be required to provide for trimming of tops of sheet piling.

The interlocks between steel sheet pile sections shall be configured such that the average width of the annular space between all contact points of the interlocks shall be a maximum of one-eighth (1/8) inch, as determined by Engineer.

All fabricated connections shall be made with the use of angles or bent plates, as necessary, and shall be adequately welded or connected with high strength bolts as accepted by Engineer.

Handling Holes:

If handling holes are provided, they shall be two (2) standard two and nine sixteenth (2-9/16) inch diameter handling holes located six (6) inches from one end.
The holes shall be plugged by welding a piece of steel over the hole prior to installing any riprap, backfill or drop structure cap.

The plated hole shall be watertight.

STORAGE AND HANDLING

Do not subject piles to damage by impact bending stresses in transporting to and storing piles onsite.

Store and handle piles such that corrosion protection coating will not be damaged.

EXECUTION

EXAMINATION

Do not begin sheet pile installation until the earthwork in the area where the piles are to be driven has been completed to the extent that the grade elevation is at no more than twelve (12) inches above or below the top of the piling elevation as indicated on the DRAWINGS.

PREPARATION

Any fill along the alignment of the sheet pile must be in place to sub-grade elevations and compacted prior to driving the sheet pile.

Fill material (except riprap, boulders, bedding and grout) is not to be placed around the sheet pile after the sheet pile is in place.

At least 15 days before constructing sheeting, submit to the engineer for approval a dewatering plan including method of dewatering and controlling sediment and contaminants from entering adjacent waterbodies, wetlands, and environmentally sensitive areas. Dewater according to the approved dewatering plan. Continue dewatering operations until no longer required.

INSTALLATION

All welding or gas cutting shall be in accordance with the current standards of the American Welding Society.

Virtual Refusal:

Steel sheet piling shall be driven to the depths shown on the DRAWINGS or to virtual refusal.

Virtual refusal is defined as ten (10) blows per inch with an approved pile hammer.

A pile hammer shall be used to determine virtual refusal.

The hammer shall be operating at the manufacturer’s recommended stroke and speed when virtual refusal is measured.

Steel Sheet Pile Driving:

Steel sheet piling shall be assembled before driving and then driven as a continuous wall, progressively in stages to keep the piles aligned correctly and minimize the danger of breaking the interlock between the sheets.

Steel sheet piling shall be driven to form a tight bulkhead.

A driving head shall be used and any piling which is damaged in driving or which has broken interlocks between sections shall be pulled and replaced at Contractor's expense.

The piling shall be driven within the following tolerances:

Alignment:

Sheet pile shall be driven to form a relatively straight line between the termini points shown on the drawings.

Horizontal deviation of any point from a straight line connecting the two ends of the wall section shall be a maximum of six (6) inches.

Construct permanent sheeting as shown on the Plans. Ensure that the sheeting has no gaps and is continuous for its entire length.

Plumbness: Each individual sheet pile section shall be driven vertical, within a horizontal tolerance of two percent (2%) of any vertical length measured along the pile.

Elevation:

Tops of sheet pile sections shall be within a tolerance of one (1) inch from plan elevations.

Contractor shall not be paid for excess sheet pile trimmed off the end of the pile to meet final grade.

Contractor shall brace and/or provide soil grading as necessary during construction operations in order to provide lateral stability for the sheet pile wall. The sheet pile wall has been designed for the soil grades of the final configuration denoted on the drawings only. Other temporary configurations during the construction period shall not be allowed.

Care shall be taken during driving to keep from causing deformations of the top of the piles, splitting of section, or breaking of the interlock between sections. Care shall also be taken during driving to prevent and correct any tendency of steel sheet piles to twist or get out of plumb.

Steel Z piling shall be driven with the ball-end leading. Proper care and planning shall be used to allow for this construction procedure in both immediate and possible future walls.

Alternate Z piles shall be reversed end for end for proper interlocking in the "normal" position. Piles shall also be aligned properly to maintain a "normal" driving width.

For sheet piles driven into the native soils, pre-drilled soils, or excavated soils a vibratory driver may be used as long as the required depth is obtained.

For sheet piles being driven into bedrock, an approved hammer utilizing a minimum hammer energy of 19,000 foot-pounds per square inch of steel section shall be used to obtain the required depth or virtual refusal. The hammer shall be clearly marked so that it can be identified at the job site.

Steel sheet pile that is full length as shown on the DRAWINGS and is required to be driven below the specified cutoff elevation shall be spliced with additional steel sheet piling with a full penetration butt weld.

END SECTION 316216.13

DIVISION 32-EXTERIOR IMPROVEMENTS
SECTION 321313 - CONCRETE PAVING

GENERAL

SUMMARY

Section Includes Concrete Paving Including the Following:

Driveways.

Curbs and gutters.

Walks.

DEFINITIONS

Cementitious Materials: Portland cement alone or in combination with one or more of blended hydraulic cement, fly ash, slag cement, and other pozzolans.

W/C Ratio: The ratio by weight of water to cementitious materials.

PREINSTALLATION MEETINGS

ACTION SUBMITTALS

Product Data: For each type of product.

Design Mixtures: For each concrete paving mixture. Include alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.

INFORMATIONAL SUBMITTALS

Qualification Data: For qualified Geo-technical Engineer .

Material Test Reports: For each of the following:

Aggregates: Include service-record data indicating absence of deleterious expansion of concrete due to alkali-aggregate reactivity.

Field quality-control reports.

QUALITY ASSURANCE

PRECONSTRUCTION TESTING

Preconstruction Testing Service: Engage a qualified independent testing agency to perform preconstruction testing on concrete paving mixtures.

FIELD CONDITIONS

Traffic Control: Maintain access for vehicular and pedestrian traffic as required for other construction activities.

Cold-Weather Concrete Placement: Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing, or low temperatures. Comply with ACI 306.1 and the following:

When air temperature has fallen to or is expected to fall below 40 deg F, uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 deg F and not more than 80 deg F at point of placement.

Do not use frozen materials or materials containing ice or snow.

Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in design mixtures.

Hot-Weather Concrete Placement: Comply with ACI 301 and as follows when hot-weather conditions exist:

Cool ingredients before mixing to maintain concrete temperature below 90 deg F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated in total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.

Cover steel reinforcement with water-soaked burlap, so steel temperature will not exceed ambient air temperature immediately before embedding in concrete.

Fog-spray forms , steel reinforcement, and subgrade just before placing concrete. Keep subgrade moisture uniform without standing water, soft spots, or dry areas.

PRODUCTS

CONCRETE, GENERAL

ACI Publications: Comply with ACI 301 unless otherwise indicated.

FORMS

Form Materials: Plywood, metal, metal-framed plywood, or other approved panel-type materials to provide full-depth, continuous, straight, and smooth exposed surfaces.

Use flexible or uniformly curved forms for curves with a radius of 100 feet or less. Do not use notched and bent forms.

Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and that will not impair subsequent treatments of concrete surfaces.

STEEL REINFORCEMENT

Epoxy-Coated Reinforcing Bars: ASTM A 775/A 775M or ASTM A 934/A 934M; with ASTM A 615/A 615M, Grade 60 deformed bars.

Plain-Steel Wire: ASTM A 1064/A 1064M, .

Epoxy-Coated-Steel Wire: ASTM A 884/A 884M, Class A; coated, deformed.

Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars, welded-wire reinforcement, and dowels in place. Manufacture bar supports according to CRSI's "Manual of Standard Practice" from steel wire, plastic, or precast concrete of greater compressive strength than concrete specified, and as follows:

Equip wire bar supports with sand plates or horizontal runners where base material will not support chair legs.

For epoxy-coated reinforcement, use epoxy-coated or other dielectric-polymer-coated wire bar supports.

Epoxy Repair Coating: Liquid, two-part, epoxy repair coating, compatible with epoxy coating on reinforcement.

Zinc Repair Material: ASTM A 780/A 780M.

CONCRETE MATERIALS

Cementitious Materials: Use the following cementitious materials, of same type, brand, and source throughout Project:

Portland Cement: ASTM C 150/C 150M, white portland cement Type I/II .

Fly Ash: ASTM C 618, Class C or Class F.

Normal-Weight Aggregates: ASTM C 33/C 33M, Class 1N , uniformly graded. Provide aggregates from a single source.

Maximum Coarse-Aggregate Size: 3/4 inch nominal.

Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.

Exposed Aggregate: Selected, hard, and durable; washed; free of materials with deleterious reactivity to cement or that cause staining; from a single source, with gap-graded coarse aggregate as follows:

Aggregate Sizes: 3/4 to 1 inch nominal.

Aggregate Source, Shape, and Color: .

Air-Entraining Admixture: ASTM C 260/C 260M.

Chemical Admixtures: Admixtures certified by manufacturer to be compatible with other admixtures and to contain not more than 0.1 percent water-soluble chloride ions by mass of cementitious material.

High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.

Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.

Water: Potable and complying with ASTM C 94/C 94M.

FIBER REINFORCEMENT

Synthetic Fiber: Monofilament polypropylene fibers engineered and designed for use in decorative concrete paving, complying with ASTM C 1116/C 1116M, Type III, 1/2 to 1-1/2 inches long.

Manufacturers: Subject to compliance with requirements, provide products by one of the following:

Euclid Chemical Company (The); an RPM company.

FiberForce; ABC Polymer Industries, LLC.

Sika Corporation.

CURING MATERIALS

Absorptive Cover: AASHTO M 182, Class 3, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. dry or cotton mats.

Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.

Water: Potable.

Evaporation Retarder: Waterborne, monomolecular, film forming, manufactured for application to fresh concrete.

Manufacturers: Subject to compliance with requirements, provide products by one of the following:

Euclid Chemical Company (The); an RPM company.

Sika Corporation.

W.R. Meadows, Inc.

RELATED MATERIALS

Joint Fillers: ASTM D 1751, asphalt-saturated cellulosic fiber in preformed strips.

CONCRETE MIXTURES

Prepare design mixtures, proportioned according to ACI 301, for each type and strength of normal-weight concrete, and as determined by either laboratory trial mixtures or field experience.

Use a qualified independent testing agency for preparing and reporting proposed concrete design mixtures for the trial batch method.

When automatic machine placement is used, determine design mixtures and obtain laboratory test results that comply with or exceed requirements.

Cementitious Materials:

Fly Ash or Pozzolan: 25 percent.

Slag Cement: 50 percent.

Combined Fly Ash or Pozzolan, and Slag Cement: 50 percent, with fly ash or pozzolan not exceeding 25 percent.

Add air-entraining admixture at manufacturer's prescribed rate to result in normal-weight concrete at point of placement having an air content as follows:

Air Content: 4-1/2 percent plus or minus 1-1/2 percent for 1-1/2-inch nominal maximum aggregate size.

Air Content: 4-1/2 percent plus or minus 1-1/2 percent for 1-inch nominal maximum aggregate size.

Air Content: 5 percent plus or minus 1-1/2 percent for 3/4-inch nominal maximum aggregate size.

Limit water-soluble, chloride-ion content in hardened concrete to 0.15 percent by weight of cement.

Chemical Admixtures: Use admixtures according to manufacturer's written instructions.

Use plasticizing and retarding admixture in concrete as required for placement and workability.

Synthetic Fiber: Uniformly disperse in concrete mixture at manufacturer's recommended rate, but not less than 1.5 lb/cu. yd. .

Concrete Mixtures: Normal-weight concrete.

Compressive Strength (28 Days): 4500 psi .

Maximum W/C Ratio at Point of Placement: 0.45 .

Slump Limit: 5 inches , plus or minus 1 inch.

CONCRETE MIXING

Ready-Mixed Concrete: Measure, batch, and mix concrete materials and concrete according to ASTM C 94/C 94M and ASTM C 1116/C 1116M. Furnish batch certificates for each batch discharged and used in the Work.

When air temperature is between 85 and 90 deg F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.

EXECUTION

EXAMINATION

Examine exposed subgrades and subbase surfaces for compliance with requirements for dimensional, grading, and elevation tolerances.

Proof-roll prepared subbase surface below concrete paving to identify soft pockets and areas of excess yielding.

Completely proof-roll subbase in one direction and repeat in perpendicular direction. Limit vehicle speed to 3 mph.

Proof-roll with a pneumatic-tired and loaded, 10-wheel, tandem-axle dump truck weighing not less than 15 tons.

Correct subbase with soft spots and areas of pumping or rutting exceeding depth of 1/2 inch according to requirements in Section 312000 "Earth Moving."

Proceed with installation only after unsatisfactory conditions have been corrected.

PREPARATION

Remove loose material from compacted subbase surface immediately before placing concrete.

EDGE FORMS AND SCREED CONSTRUCTION

Set, brace, and secure edge forms, bulkheads, and intermediate screed guides to required lines, grades, and elevations. Install forms to allow continuous progress of work and so forms can remain in place at least 24 hours after concrete placement.

Clean forms after each use and coat with form-release agent to ensure separation from concrete without damage.

STEEL REINFORCEMENT INSTALLATION

General: Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.

Clean reinforcement of loose rust and mill scale, earth, ice, or other bond-reducing materials.

Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement. Maintain minimum cover to reinforcement.

Install welded-wire reinforcement in lengths as long as practicable. Lap adjoining pieces at least one full mesh, and lace splices with wire. Offset laps of adjoining widths to prevent continuous laps in either direction.

Zinc-Coated Reinforcement: Use galvanized-steel wire ties to fasten zinc-coated reinforcement. Repair cut and damaged zinc coatings with zinc repair material.

Epoxy-Coated Reinforcement: Use epoxy-coated steel wire ties to fasten epoxy-coated reinforcement. Repair cut and damaged epoxy coatings with epoxy repair coating according to ASTM D 3963/D 3963M.

Install fabricated bar mats in lengths as long as practicable. Handle units to keep them flat and free of distortions. Straighten bends, kinks, and other irregularities, or replace units as required before placement. Set mats for a minimum 2-inch overlap of adjacent mats.

JOINTS

General: Form construction, isolation, and contraction joints and tool edges true to line, with faces perpendicular to surface plane of concrete. Construct transverse joints at right angles to centerline unless otherwise indicated.

When joining existing paving, place transverse joints to align with previously placed joints unless otherwise indicated.

Construction Joints: Set construction joints at side and end terminations of paving and at locations where paving operations are stopped for more than one-half hour unless paving terminates at isolation joints.

Continue steel reinforcement across construction joints unless otherwise indicated. Do not continue reinforcement through sides of paving strips unless otherwise indicated.

Provide tie bars at sides of paving strips where indicated.

Butt Joints: Use bonding agent at joint locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.

Edging: After initial floating, tool edges of paving, gutters, curbs, and joints in concrete with an edging tool to a 3/8-inch radius. Repeat tooling of edges after applying surface finishes. Eliminate edging-tool marks on concrete surfaces.

CONCRETE PLACEMENT

Before placing concrete, inspect and complete formwork installation , steel reinforcement, and items to be embedded or cast-in.

Remove snow, ice, or frost from subbase surface and steel reinforcement before placing concrete. Do not place concrete on frozen surfaces.

Moisten subbase to provide a uniform dampened condition at time concrete is placed. Do not place concrete around manholes or other structures until they are at required finish elevation and alignment.

Comply with ACI 301 requirements for measuring, mixing, transporting, and placing concrete.

Do not add water to concrete during delivery or at Project site. Do not add water to fresh concrete after testing.

Deposit and spread concrete in a continuous operation between transverse joints. Do not push or drag concrete into place or use vibrators to move concrete into place.

Consolidate concrete according to ACI 301 by mechanical vibrating equipment supplemented by hand spading, rodding, or tamping.

Consolidate concrete along face of forms and adjacent to transverse joints with an internal vibrator. Keep vibrator away from joint assemblies , reinforcement, or side forms. Use only square-faced shovels for hand spreading and consolidation. Consolidate with care to prevent dislocating reinforcement dowels and joint devices.

Screed paving surface with a straightedge and strike off.

Commence initial floating using bull floats or darbies to impart an open-textured and uniform surface plane before excess moisture or bleedwater appears on the surface. Do not further disturb concrete surfaces before beginning finishing operations or spreading surface treatments.

Curbs and Gutters: Use design mixture for automatic machine placement. Produce curbs and gutters to required cross section, lines, grades, finish, and jointing.

Slip-Form Paving: Use design mixture for automatic machine placement. Produce paving to required thickness, lines, grades, finish, and jointing.

Compact subbase and prepare subgrade of sufficient width to prevent displacement of slip-form paving machine during operations.

FLOAT FINISHING

General: Do not add water to concrete surfaces during finishing operations.

Float Finish: Begin the second floating operation when bleedwater sheen has disappeared and concrete surface has stiffened sufficiently to permit operations. Float surface with power-driven floats or by hand floating if area is small or inaccessible to power units. Finish surfaces to true planes. Cut down high spots and fill low spots. Refloat surface immediately to uniform granular texture.

Medium-to-Coarse-Textured Broom Finish: Provide a coarse finish by striating float-finished concrete surface 1/16 to 1/8 inch deep with a stiff-bristled broom, perpendicular to line of traffic.

CONCRETE PROTECTION AND CURING

General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.

Comply with ACI 306.1 for cold-weather protection.

Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete but before float finishing.

Begin curing after finishing concrete but not before free water has disappeared from concrete surface.

Curing Methods: Cure concrete by moisture curing moisture-retaining-cover curing or a combination of these as follows:

Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:

Water.

Continuous water-fog spray.

Absorptive cover, water saturated and kept continuously wet. Cover concrete surfaces and edges with 12-inch lap over adjacent absorptive covers.

Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive. Immediately repair any holes or tears occurring during installation or curing period, using cover material and waterproof tape.

PAVING TOLERANCES

Comply with tolerances in ACI 117 and as follows:

Elevation: 3/4 inch.

Thickness: Plus 3/8 inch, minus 1/4 inch.

Surface: Gap below 10-feet- long; unleveled straightedge not to exceed 1/2 inch.

Alignment of Tie-Bar End Relative to Line Perpendicular to Paving Edge: 1/2 inch per 12 inches of tie bar.

Lateral Alignment and Spacing of Dowels: 1 inch.

Vertical Alignment of Dowels: 1/4 inch.

Alignment of Dowel-Bar End Relative to Line Perpendicular to Paving Edge: 1/4 inch per 12 inches of dowel.

Joint Spacing: 3 inches.

Contraction Joint Depth: Plus 1/4 inch, no minus.

Joint Width: Plus 1/8 inch, no minus.

FIELD QUALITY CONTROL

Testing Agency: Engage a qualified testing agency to perform tests and inspections.

Testing Services: Testing and inspecting of composite samples of fresh concrete obtained according to ASTM C 172/C 172M shall be performed according to the following requirements:

Testing Frequency: Obtain at least one composite sample for each 5000 sq. ft. or fraction thereof of each concrete mixture placed each day.

When frequency of testing will provide fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.

Slump: ASTM C 143/C 143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.

Air Content: ASTM C 231/C 231M, pressure method; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.

Concrete Temperature: ASTM C 1064/C 1064M; one test hourly when air temperature is 40 deg F and below and when it is 80 deg F and above, and one test for each composite sample.

Compression Test Specimens: ASTM C 31/C 31M; cast and laboratory cure one set of three standard cylinder specimens for each composite sample.

Compressive-Strength Tests: ASTM C 39/C 39M; test one specimen at seven days and two specimens at 28 days.

A compressive-strength test shall be the average compressive strength from two specimens obtained from same composite sample and tested at 28 days.

Strength of each concrete mixture will be satisfactory if average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi.

Test results shall be reported in writing to Architect, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.

Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.

Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect.

Concrete paving will be considered defective if it does not pass tests and inspections.

Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

Prepare test and inspection reports.

REPAIR AND PROTECTION

Remove and replace concrete paving that is broken, damaged, or defective or that does not comply with requirements in this Section. Remove work in complete sections from joint to joint unless otherwise approved by Architect.

Drill test cores, where directed by Architect, when necessary to determine magnitude of cracks or defective areas. Fill drilled core holes in satisfactory paving areas with portland cement concrete bonded to paving with epoxy adhesive.

Protect concrete paving from damage. Exclude traffic from paving for at least 14 days after placement. When construction traffic is permitted, maintain paving as clean as possible by removing surface stains and spillage of materials as they occur.

Maintain concrete paving free of stains, discoloration, dirt, and other foreign material. Sweep paving not more than two days before date scheduled for Substantial Completion inspections.

END OF SECTION 321313

Appendix “A”

TECHNICAL SPECIFICATIONS

FOR

EMERGENCY SERVICES COMPLEX

LOTS 44 & 48, BLOCK 3104
656 WASHINGTON AVENUE
TOWNSHIP OF WASHINGTON
BERGEN COUNTY, NEW JERSEY

OUR FILE NO. WT-110

PREPARED BY:

BOSWELL ENGINEERING
330 PHILLIPS AVENUE
SOUTH HACKENSACK, NJ 07606

June 30, 2020

_____

Jeffrey L. Morris, P.E.
NJ License No. 30979

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SECTION 01 33 23 – SUBMITTALS (Shop Drawings, Product Data, and Samples)

PART ONE - GENERAL

1.1 DESCRIPTION OF REQUIREMENTS

This section specifies the general methods and requirements of submissions applicable to the following work-related submittals: Shop Drawings, Product Data and Samples.

1.2 SHOP DRAWINGS, PROJECT DATA, SAMPLES

1.2.1 Shop Drawings

(1) Shop drawings as specified in individual work sections include, but are not necessarily limited to, data such as fabrication and drawings, scheduled information, setting diagrams, actual shopwork manufacturing instructions, custom templates, coordination drawings, individual system or equipment inspection and test reports including performance curves and certifications, as applicable to the Work.

(2) All shop drawings submitted by subcontractors for approval shall be sent directly to the Contractor for preliminary checking. The Contractor shall be responsible for their submission at the proper time so as to prevent delays in delivery of materials.

(3) The Contractor shall check all subcontractors' shop drawings regarding measurements, size of members, materials and details to satisfy himself that they conform to the intent of the Contract Drawings and Specifications. Drawings found to be inaccurate or otherwise in error shall be returned to the subcontractors for correction before submission thereof.

(4) All details on shop drawings submitted for approval shall show clearly the elevations of the various parts to the main members and lines of the structure and where correct fabrications of the work depends upon field measurements, such measurements shall be made and noted on the drawings before being submitted for approval.

1.2.2 Product Data: As specified in individual sections, these include but are not necessarily limited to standard prepared data for manufactured products (sometimes referred to as catalog data), such as the manufacturer's product specification and installation instructions, and manufacturer's printed statements of compliances and applicability, catalog cuts, product photographs, production or quality control inspection and test reports and certifications, mill reports, product operating and maintenance instructions and recommended spare parts listing, and printed product warranties, as applicable to the Work.

1.2.3 Samples: Samples specified in individual sections include but are not necessarily limited to physical examples of the work, such as sections of manufactured or fabricated work, of pattern swatches and as applicable to the Work.

1.3 CONTRACTOR'S RESPONSIBILITIES

The Contractor shall review shop drawings, product data and samples prior to submission to determine and verify the following:

(1) Field measurements,
(2) Field construction criteria,
(3) Catalog numbers and similar data, and
(4) Conformance with the specifications.

Each shop drawing, working drawing, sample and catalog data submitted by the Contractor shall have affixed to it the following Certification Statement, signed by the Contractor: "Certification Statement: By this submittal, I hereby represent that I have determined and verified all field measurements, field construction criteria, materials, dimensions, catalog numbers and similar data and I have checked and coordinated each item with other applicable approved shop drawings and all Contract requirements."

Notify the Architect in writing, at the time of submittal, of any deviations in the submittals from the requirements of the contract documents.

No portion of the work requiring a shop drawing, working drawing, sample or catalog data shall be started nor shall any materials be fabricated or installed prior to the approval or qualified approval of such item. Fabrication performed, materials purchased or on-site construction accomplished which does not conform to approved shop drawings and data shall be at the Contractor's risk. The Owner will not be liable for any expense or delay due to corrections or remedies required to accomplish conformity.

Project work, materials, fabrication and installation shall confirm with approved shop drawings, working drawings, applicable samples and catalog data.

1.4 SUBMISSION REQUIREMENTS

Make submittals promptly in accordance with approved schedule and in such sequence as to cause no delay in the Work or in the work of any other Contractor.

Number of submittals required:

(1)	Shop Drawings:	Submit six (6) copies.
(2)	Product Data:	Submit six (6) copies.
(3)	Samples:	Submit the number stated in the respective Specification Sections.

Submittals shall contain:

(1) The date of submission and the dates of any previous submissions.

(2) The project title and number.

(3) Contractor identification.

(4) The names of:

a. Contractor
b. Supplier
c. Manufacturer

(5) Identification of the product, with the specification section number.

(6) Field dimensions, clearly identified as such.

(7) Relation to adjacent or critical features of the Work or materials.

(8) Applicable standards, such as ASTM or Federal Specification numbers.

(9) Identification of deviations from Contract Documents.

(10) Identification of revisions of re-submittals.

(11) A 3 inch x 3-inch blank space for Contractor and Engineer stamp.

1.5 RESUBMISSION REQUIREMENTS

Make any corrections or changes in the submittals required by the Architect and resubmit until approved.

Shop drawings and Product Data:

(1) Revise initial drawings or data and resubmit as specified for the initial submittal.

(2) Indicate any changes that have been made other than those requested by the Engineer.

Samples: Submit new samples as required for initial submittal.

1.6 DISTRIBUTION

Distribute reproductions of approved shop drawings and copies of approved product data and samples, where required, to the job site file and elsewhere as directed by the Architect. Number of copies shall be as directed but shall not exceed six (6).

1.7 GENERAL PROCEDURES FOR SUBMITTALS

1.7.1 Coordination of Submittals: Prepare and transmit each submittal sufficiently in advance of performing the related work or other applicable activities, or within the time specified in the individual work sections of the Specifications, so that the installation will not be delayed by processing times including disapproval and re-submittal (if required), coordination with other submittals, testing, purchasing, fabricating, delivery and similar sequenced activities. No extension of time will be authorized because of the Contractor's failure to transmit submittals sufficiently in advance of the work.

1.8 WORKMANSHIP BONDS

1.8.1 General: Where specific units of work require the issuance of a bond or similar provision, as a means of assuring the Owner that certain possible failures of the work to perform as represented will be rectified at someone else's expense, submit fully executed bond backed by a surety company acceptable to the Owner and in the principal amount indicated. Include information sheet for the Owner's maintenance/operating personnel outlining proper procedures in case of failure or other instances which might affect the validity of the bond; list names, addresses and telephone numbers for the Owner's emergency and follow-up in connection with the implementation of each bond.

PART TWO - PRODUCTS - Not applicable.

PART THREE - EXECUTION - Not applicable.

END OF SECTION 01 33 23

SECTION 31 10 00 - SITE CLEARING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Protecting existing trees, shrubs, groundcovers, plants and grass to remain.
2. Removing existing trees, shrubs, groundcovers, plants and grass.
3. Clearing and grubbing.
4. Stripping and stockpiling topsoil.
5. Removing above- and below-grade site improvements.
6. Disconnecting, capping or sealing, and removing site utilities.
7. Temporary erosion and sedimentation control measures.

B. Related Sections include the following:
1. Division 01 Section "Temporary Tree and Plant Protection" for protecting trees remaining on-site that are affected by site operations.
2. Division 31 Sections "Earth Moving" and “Excavation and Fill” for soil materials, excavating, backfilling, and site grading.

1.3 DEFINITIONS

A. Topsoil: Natural or cultivated surface-soil layer containing organic matter and sand, silt, and clay particles; friable, pervious, and black or a darker shade of brown, gray, or red than underlying subsoil; reasonably free of subsoil, clay lumps, gravel, and other objects more than 2 inches (50 mm) in diameter; and free of subsoil and weeds, roots, toxic materials, or other non-soil materials.

B. Tree Protection Zone: Area surrounding individual trees or groups of trees to be protected during construction, and defined by the drip line of individual trees or the perimeter drip line of groups of trees, unless otherwise indicated.

1.4 MATERIAL OWNERSHIP

A. Except for stripped topsoil or other materials indicated to remain Owner's property, cleared materials shall become Contractor's property and shall be removed from Project site.

1.5 SUBMITTALS

A. Photographs or videotape, sufficiently detailed, of existing conditions of trees and plantings, adjoining construction, and site improvements that might be misconstrued as damage caused by site clearing.

B. Record drawings, according to Division 1 Section "Project Record Documents," identifying and accurately locating capped utilities and other subsurface structural, electrical, and mechanical conditions.

1.6 QUALITY ASSURANCE

A. Pre-installation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination."

1.7 PROJECT CONDITIONS

A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during site-clearing operations.

1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
2. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.

B. Improvements on Adjoining Property: Authority for performing site clearing indicated on property adjoining Owner's property will be obtained by Owner before award of Contract.

1. Do not proceed with work on adjoining property until directed by the Architect.

C. Salvable Improvements: Carefully remove items indicated to be salvaged and store on Owner's premises where indicated.

D. Utility Locator Service: Notify utility locator service for area where Project is located before site clearing.

E. Do not commence site clearing operations until temporary erosion and sedimentation control measures are in place.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

A. Satisfactory Soil Materials: Requirements for satisfactory soil materials are specified in Division 2 Section "Earthwork."

1. Obtain approved borrow soil materials off-site when satisfactory soil materials are not available on-site.

PART 3 - EXECUTION

3.1 PREPARATION

A. Protect and maintain benchmarks and survey control points from disturbance during construction.

B. Locate and clearly flag trees and vegetation to remain or to be relocated.

C. Protect existing site improvements to remain from damage during construction.

1. Restore damaged improvements to their original condition, as acceptable to Owner.

3.2 TEMPORARY EROSION AND SEDIMENTATION CONTROL

A. Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to the Soil Erosion and Sediment Control Plan..

B. Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.

C. Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

3.3 TREE PROTECTION

A. Erect and maintain temporary fencing around tree protection zones before starting site clearing. Remove fence when construction is complete.

1. Do not store construction materials, debris, or excavated material within fenced area.
2. Do not permit vehicles, equipment, or foot traffic within fenced area.

3. Maintain fenced area free of weeds and trash.

B. Do not excavate within tree protection zones, unless otherwise indicated.

C. Where excavation for new construction is required within tree protection zones, hand clear and excavate to minimize damage to root systems. Use narrow-tine spading forks, comb soil to expose roots, and cleanly cut roots as close to excavation as possible.

1. Cover exposed roots with burlap and water regularly.
2. Temporarily support and protect roots from damage until they are permanently redirected and covered with soil.
3. Coat cut faces of roots more than 1-1/2 inches (38 mm) in diameter with emulsified asphalt or other approved coating formulated for use on damaged plant tissues.
4. Backfill with soil as soon as possible.

D. Repair or replace trees and vegetation indicated to remain that are damaged by construction operations, in a manner approved by the Architect.

1. Employ an arborist, licensed in jurisdiction where Project is located, to submit details of proposed repairs and to repair damage to trees and shrubs.
2. Replace trees that cannot be repaired and restored to full-growth status, as determined by Architect.

3.4 UTILITIES

A. Owner will arrange for disconnecting and sealing indicated utilities that serve existing structures before site clearing, when requested by Contractor.

1. Verify that utilities have been disconnected and capped before proceeding with site clearing.

B. Locate, identify, disconnect, and seal or cap off utilities indicated to be removed.

1. Arrange with utility companies to shut off indicated utilities.
2. Owner will arrange to shut off indicated utilities when requested by Contractor.

C. Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:

1. Notify Architect not less than two days in advance of proposed utility interruptions.
2. Do not proceed with utility interruptions without Architect's written permission.

D. Excavate for and remove underground utilities indicated to be removed.

E. Removal of underground utilities is included in Division 2 Sections covering site utilities.

3.5 CLEARING AND GRUBBING

A. Remove obstructions, trees, shrubs, grass, and other vegetation to permit installation of new construction.

1. Do not remove trees, shrubs, and other vegetation indicated to remain or to be relocated.
2. Cut minor roots and branches of trees indicated to remain in a clean and careful manner where such roots and branches obstruct installation of new construction.
3. Grind stumps and remove roots, obstructions, and debris extending to a depth of 18 inches (450 mm) below exposed subgrade.
4. Use only hand methods for grubbing within tree protection zone.
5. Chip removed tree branches and dispose of off-site.

B. Fill depressions caused by clearing and grubbing operations with satisfactory soil material unless further excavation or earthwork is indicated.

1. Place fill material in horizontal layers not exceeding a loose depth of 8 inches (200 mm), and compact each layer to a density equal to adjacent original ground.

3.6 TOPSOIL STRIPPING

A. Remove sod and grass before stripping topsoil.

B. Strip topsoil to whatever depths are encountered in a manner to prevent intermingling with underlying subsoil or other waste materials.

1. Remove subsoil and non-soil materials from topsoil, including trash, debris, weeds, roots, and other waste materials.

C. Stockpile topsoil materials away from edge of excavations without intermixing with subsoil. Grade and shape stockpiles to drain surface water. Cover to prevent windblown dust.

1. Limit height of topsoil stockpiles to 72 inches (1800 mm).
2. Do not stockpile topsoil within tree protection zones.
3. Dispose of excess topsoil as specified for waste material disposal.
4. Stockpile surplus topsoil to allow for re-spreading deeper topsoil.

3.7 SITE IMPROVEMENTS

A. Remove existing above- and below-grade improvements as indicated and as necessary to facilitate new construction.

B. Remove slabs, paving, curbs, gutters, and aggregate base as indicated.

1. Unless existing full-depth joints coincide with line of demolition, neatly saw-cut length of existing pavement to remain before removing existing pavement. Saw-cut faces vertically.
2. Paint cut ends of steel reinforcement in concrete to remain to prevent corrosion.

3.8 DISPOSAL

A. Disposal: Remove surplus soil material, unsuitable topsoil, obstructions, demolished materials, and waste materials including trash and debris, and legally dispose of them off Owner's property and/or at sites provided by the contractor.

1. Separate recyclable materials produced during site clearing from other non-recyclable materials. Store or stockpile without intermixing with other materials and transport them to recycling facilities.

END OF SECTION 31 10 00

SECTION 31 23 19 - DEWATERING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes construction dewatering.

1.2 PERFORMANCE REQUIREMENTS

A. Dewatering Performance: Design, furnish, install, test, operate, monitor, and maintain dewatering system of sufficient scope, size, and capacity to control hydrostatic pressures and to lower, control, remove, and dispose of ground water and permit excavation and construction to proceed on dry, stable subgrades.

1.3 SUBMITTALS

A. Shop Drawings: For dewatering system. Show arrangement, locations, and details of wells and well points; locations of risers, headers, filters, pumps, power units, discharge lines, piezometers, and flow-measuring devices; and means of discharge, control of sediment, and disposal of water.

B. Delegated-Design Submittal: For dewatering system indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.4 QUALITY ASSURANCE

A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning dewatering. Comply with hauling and disposal regulations of authorities having jurisdiction.

B. Preinstallation Conference: Conduct conference at Project site.

1.5 PROJECT CONDITIONS

A. Survey Work: Engage a qualified land surveyor or professional engineer to survey adjacent existing buildings, structures, and site improvements, establishing exact elevations at fixed points to act as benchmarks. Clearly identify benchmarks and record existing elevations.

1. During dewatering, regularly resurvey benchmarks, maintaining an accurate log of surveyed elevations for comparison with original elevations. Promptly notify Architect if changes in elevations occur or if cracks, sags, or other damage is evident in adjacent construction.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 INSTALLATION

A. Provide temporary grading to facilitate dewatering and control of surface water.

B. Monitor dewatering systems continuously.

C. Protect and maintain temporary erosion and sedimentation controls, which are specified in Division 2 Section "Site Clearing" during dewatering operations.

D. Install dewatering system utilizing wells, well points, or similar methods complete with pump equipment, standby power and pumps, filter material gradation, valves, appurtenances, water disposal, and surface-water controls.

1. Space well points or wells at intervals required to provide sufficient dewatering.
2. Use filters or other means to prevent pumping of fine sands or silts from the subsurface.

E. Before excavating below ground-water level, place system into operation to lower water to specified levels. Operate system continuously until drains, sewers, and structures have been constructed and fill materials have been placed or until dewatering is no longer required.

F. Provide an adequate system to lower and control ground water to permit excavation, construction of structures, and placement of fill materials on dry subgrades. Install sufficient dewatering equipment to drain water-bearing strata above and below bottom of foundations, drains, sewers, and other excavations.

1. Do not permit open-sump pumping that leads to loss of fines, soil piping, subgrade softening, and slope instability.

G. Reduce hydrostatic head in water-bearing strata below subgrade elevations of foundations, drains, sewers, and other excavations.

H. Provide standby equipment on site, installed and available for immediate operation, to maintain dewatering on continuous basis if any part of system becomes inadequate or fails. If dewatering requirements are not satisfied due to inadequacy or failure of dewatering system, restore damaged structures and foundation soils at no additional expense to Owner.

1. Remove dewatering system from Project site on completion of dewatering. Plug or fill well holes with sand or cut off and cap wells a minimum of 36 inches (900 mm) below overlying construction.

END OF SECTION 31 23 19

SECTION 31 50 00 - EXCAVATION SUPPORT AND PROTECTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes temporary excavation support and protection systems.

B. Related Sections:

1. Division 1 Section Construction Progress Documentation, Photographic Documentation for recording preexisting conditions and excavation support and protection system progress.
2. Division 1 Section "Temporary Facilities and Controls" for temporary utilities and support facilities.
3. Division 2 Section "Dewatering" for dewatering system for excavations.

1.3 PERFORMANCE REQUIREMENTS

A. Design**,** furnish, install, monitor, and maintain excavation support and protection system capable of supporting excavation sidewalls and of resisting soil and hydrostatic pressure and superimposed and construction loads.

1. Delegated Design: Design excavation support and protection system, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
2. Prevent surface water from entering excavations by grading, dikes, or other means.
3. Install excavation support and protection systems without damaging existing buildings, structures, and site improvements adjacent to excavation.
4. Monitor vibrations, settlements, and movements.

1.4 SUBMITTALS

A. Shop Drawings: For excavation support and protection system.

B. Delegated-Design Submittal: For excavation support and protection system indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

C. Qualification Data: For qualified professional engineer.

D. Other Informational Submittals:

1. Photographs: Show existing conditions of adjacent construction and site improvements that might be misconstrued as damage caused by the absence of, the installation of, or the performance of excavation support and protection systems. Submit before Work begins.
2. Record Drawings: Identifying and locating capped utilities and other subsurface structural, electrical, or mechanical conditions.

    a. Note locations and capping depth of wells and well points.

1.5 QUALITY ASSURANCE

A. Preinstallation Conference: Conduct conference at Project site.

1. Review methods and procedures related to excavation support and protection system including, but not limited to, the following:

    a. Geotechnical report.
    b. Existing utilities and subsurface conditions.
    c. Proposed excavations.
    d. Proposed equipment.
    e. Monitoring of excavation support and protection system.
    f. Working area location and stability.
    g. Coordination with waterproofing.
    h. Abandonment or removal of excavation support and protection system.

1.6 PROJECT CONDITIONS

A. Interruption of Existing Utilities: Do not interrupt any utility serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility according to requirements indicated:

1. Notify Owner no fewer than two (2) days in advance of proposed interruption of utility.
2. Do not proceed with interruption of utility without Owner's written permission.

B. Project-Site Information: A geotechnical report has been prepared for this Project and is available for information only. The opinions expressed in this report are those of geotechnical engineer and represent interpretations of subsoil conditions, tests, and results of analyses conducted by geotechnical engineer. Owner will not be responsible for interpretations or conclusions drawn from the data.

1. Make additional test borings and conduct other exploratory operations necessary for excavation support and protection.

C. Survey Work: Engage a qualified land surveyor or professional engineer to survey adjacent existing buildings, structures, and site improvements; establish exact elevations at fixed points to act as benchmarks. Clearly identify benchmarks and record existing elevations.

1. During installation of excavation support and protection systems, regularly resurvey benchmarks, maintaining an accurate log of surveyed elevations and positions for comparison with original elevations and positions. Promptly notify Architect if changes in elevations or positions occur or if cracks, sags, or other damage is evident in adjacent construction.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Provide materials that are either new or in serviceable condition.

B. Structural Steel: ASTM A 36/A 36M, ASTM A 690/A 690M, or ASTM A 992/A 992M.

C. Steel Sheet Piling: ASTM A 328/A 328M, ASTM A 572/A 572M, or ASTM A 690/A 690M; with continuous interlocks.

D. Wood Lagging: Lumber, mixed hardwood, nominal rough thickness of size and strength required for application.

E. Shotcrete: Comply with Division 3 Section "Shotcrete" for shotcrete materials and mixes, reinforcement, and shotcrete application.

F. Cast-in-Place Concrete: ACI 301, of compressive strength required for application.

G. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), deformed.

H. Tiebacks: Steel bars, ASTM A 722/A 722M.

I. Tiebacks: Steel strand, ASTM A 416/A 416M.

PART 3 - EXECUTION

3.1 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards that could develop during excavation support and protection system operations.

1. Shore, support, and protect utilities encountered.

B. Install excavation support and protection systems to ensure minimum interference with roads, streets, walks, and other adjacent occupied and used facilities.

1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.

C. Locate excavation support and protection systems clear of permanent construction so that forming and finishing of concrete surfaces are not impeded.

D. Monitor excavation support and protection systems daily during excavation progress and for as long as excavation remains open. Promptly correct bulges, breakage, or other evidence of movement to ensure that excavation support and protection systems remain stable.

E. Promptly repair damages to adjacent facilities caused by installing excavation support and protection systems.

3.2 SOLDIER PILES AND LAGGING

A. Install steel soldier piles before starting excavation. Extend soldier piles below excavation grade level to depths adequate to prevent lateral movement. Space soldier piles at regular intervals not to exceed allowable flexural strength of wood lagging. Accurately align exposed faces of flanges to vary not more than 2 inches (50 mm) from a horizontal line and not more than 1:120 out of vertical alignment.

B. Install wood lagging within flanges of soldier piles as excavation proceeds. Trim excavation as required to install lagging. Fill voids behind lagging with soil, and compact.

C. Install wales horizontally at locations indicated on Drawings and secure to soldier piles.

3.3 SHEET PILING

A. Before starting excavation, install one-piece sheet piling lengths and tightly interlock to form a continuous barrier. Accurately place the piling, using templates and guide frames unless otherwise recommended in writing by the sheet piling manufacturer. Limit vertical offset of adjacent sheet piling to 60 inches (1500 mm). Accurately align exposed faces of sheet piling to vary not more than 2 inches (50 mm) from a horizontal line and not more than 1:120 out of vertical alignment. Cut tops of sheet piling to uniform elevation at top of excavation.

3.4 TIEBACKS

A. Tiebacks: Drill, install, grout, and tension tiebacks. Test load-carrying capacity of each tieback and replace and retest deficient tiebacks.

1. Test loading shall be observed by a qualified professional engineer responsible for design of excavation support and protection system.
2. Maintain tiebacks in place until permanent construction is able to withstand lateral soil and hydrostatic pressures.

3.5 BRACING

A. Bracing: Locate bracing to clear columns, floor framing construction, and other permanent work. If necessary to move brace, install new bracing before removing original brace.

1. Do not place bracing where it will be cast into or included in permanent concrete work unless otherwise approved by Architect.
2. Install internal bracing, if required, to prevent spreading or distortion of braced frames.
3. Maintain bracing until structural elements are supported by other bracing or until permanent construction is able to withstand lateral earth and hydrostatic pressures.

3.6 REMOVAL AND REPAIRS

A. Remove excavation support and protection systems when construction has progressed sufficiently to support excavation and bear soil and hydrostatic pressures. Remove in stages to avoid disturbing underlying soils or damaging structures, pavements, facilities, and utilities.

1. Remove excavation support and protection systems to a minimum depth of 48 inches (1200 mm) below overlaying construction and abandon remainder.
2. Fill voids immediately with approved backfill compacted to density specified in Division 2 Section "Earthwork."
3. Repair or replace, as approved by Architect, adjacent work damaged or displaced by removing excavation support and protection systems.

B. Leave excavation support and protection systems permanently in place.

END OF SECTION 31 50 00

SECTION 01 57 13 – SOIL EROSION AND SEDIMENT CONTROL

PART ONE - GENERAL

1.1 DESCRIPTION

1.1.1 Work Included: Under this section, the Contractor shall provide all labor, equipment and material necessary to control soil erosion resulting from construction operations and prevent excessive flow of sediment from the construction site, as shown on the Contract Drawings or as specified herein and approved by the Architect. The Contractor shall perform all work required, such work may include the installation of water diversion structures, diversion ditches and sediment basins and seeding, mulching critical areas to provide temporary protection.

In general, work to be included under this section shall include, but not be limited to, the following:

(1) Erosion Control
(2) Sediment Control
(3) Soil Stabilization

1.1.2 Related Work Described Elsewhere:

Earth Moving	Section 312000

1.2 QUALITY ASSURANCE

1.2.1 Standards:

(1) Comply with ANSI, OSHA, ASTM and all applicable Federal, State and local codes including revisions to date of contract.

(2) Referenced Specifications:

New Jersey Department of Transportation Standard Specifications for Road and Bridge construction, dated 2001, plus addenda when referred to, shall become part of this specification for materials and construction requirements. A referenced Pay Item Number shall serve to describe the required work for this project providing material and construction conforming to all applicable requirements under the NJDOT Specifications except for measurement and payment. The measurement and payment section of the NJDOT Specifications shall **not** apply as all work under this section shall be included in the contractor's lump sum and unit prices bid for this Contract. Where the referenced specifications cite requirements differing from those included in these specifications, the more stringent, highest quality shall govern.

1.3 EROSION CONTROL

1.3.1 General: Erosion control procedures shall be utilized along the right-of-way, access roads and stockpile areas as shown on the Contract Drawings or as directed by the Architect. Erosion control shall commence immediately and shall be maintained for the entire duration of the project.

The Contractor shall control erosion during all phases of construction, as shown on the Contract Drawings or as directed by the Architect. When no work shall be performed for more than 10 days, work areas shall be protected by temporary seeding, mulching, or the slope lengths shall be reduced by the installation of diversions or other means. When topography permits, debris basins shall be constructed at points of water concentration from critical areas that will remain unprotected longer than 10 days. Earth berms or diversions shall be constructed to intercept and divert runoff water away from critical areas. Diversion outlets shall be stable or shall be stabilized by paving or other means acceptable to the Architect.

1.4 SEDIMENT CONTROL

1.4.1 General: To allow sediment to settle out of water that interferes with construction before such water enters any surface waters, dewatering operations shall direct pumpage as far from the stream bank or receiving water as possible. Care should be taken not to damage or kill vegetation by excessive watering or by damaging silt accumulation in the discharge area. Settling basins shall be constructed and used as specified by the Architect where necessary to protect vegetation and to achieve environmental objectives.

The selection, design and construction of areas where excess excavated material, material hauled in for roads, access roads and stripped top-soil are to be placed, shall be consistent with environmental objectives and constraints. All such areas shall be approved by the Architect. The stockpiling and dispersal of excess material, disposal of stockpile areas and access routes shall not be permitted within or adjacent to areas where siltation to stream corridors and wetlands could occur.

PART TWO - PRODUCTS

2.1 SEDIMENT CONTROL

2.1.1 Silt Fence: Shall consist of Geotextile fabric whose width shall be at least 3 feet to provide for a 2 foot high fence after 1 foot of fabric is buried in the existing soil. Heavy duty silt fence shall consist of Geotextile fabric whose width shall be at least 4 feet to provide for a 3 foot high fence after 1 foot of fabric is buried in the existing soil. Sections of fabric shall be joined in such a manner that, when in operation, the sections work effectively as a continuous fence. Fence posts shall be installed at a slight angle toward the anticipated runoff source.

2.1.2 Inlet Filters: Inlet filters, consisting of welded wire mesh and Geotextile fabric, shall be installed to control sedimentation at existing and proposed inlet drainage structures.

For existing inlet structures, Geotextile fabric shall be placed under the grates, over the curb pieces and extend a minimum of 6 inches beyond. Coarse aggregate size No. 8 shall be placed behind each curb piece and on the Geotextile fabric to secure the fabric in place.

Inlet filters shall be removed the same day as scheduled paving operations.

2.1.3 Inlet Sediment Traps: Inlet sediment traps, consisting of silt fence and temporary stone inlets, shall be constructed to control sedimentation at existing and new inlet drainage structures.

The silt fence shall consist of Geotextile fabric whose width shall be at least 3 feet to provide for a 2 foot high fence after 1 foot of fabric is buried in the existing soil. Sections of fabric shall be

joined in such a manner that, when in operation, the sections work effectively as a continuous fence. The silt fence shall be installed around the drainage structure and meet into the stone inlets. Fence posts shall be installed at a slight angle toward the anticipated flow.

The temporary stone inlets, consisting of coarse aggregate size No. 2, shall be placed in each flow line upgrade of the inlet structure. The coarse aggregate shall be placed on Geotextile fabric which shall be buried in the soil. When sections of Geotextile fabric need to be joined, the sections shall be overlapped a minimum of 18 inches in the direction of flow.

PART THREE - EXECUTION

3.1 DUST AND DIRT CONTROL

3.1.1 Dust Control: The Contractor shall employ construction methods and means that keep flying dust to the minimum and shall provide for the laying of water or other dust control materials on the project and on roads, streets and other areas immediately adjacent to the project limits, wherever traffic or buildings that are occupied or in use, are affected by such dust caused by his hauling or other construction operations. The materials and methods used for dust control are subject to approval and shall be as directed.

When calcium chloride is used for dust control, the calcium chloride shall be grade 2 in the form of loose dry granules or flakes and be fine enough to feed through commonly used spreaders at a rate of application of approximately 1.5 pounds per square yard. Care shall be exercised when using calcium chloride on steep slopes in order to prevent the calcium chloride from washing into streams or accumulating around plants. Calcium chloride shall not be applied in solution.

3.1.2 Dirt Control: The Contractor shall provide for prompt removal from existing roadways of all dirt and other materials that have been spilled, washed, tracked or otherwise deposited thereon by his hauling and other operations whenever the accumulation is sufficient to cause the formation of mud, interfere with drainage, damage pavements or create a traffic hazard.

In order to minimize tracking of dirt and other materials onto existing roadways, a construction driveway shall be constructed at locations where vehicles exit a work site.

The construction driveway shall consist of a layer of broken stone which shall be a minimum 4 inches thick and 100 feet long where practical and of sufficient width to serve the intended purpose. The broken stone shall be 2 to 2 1/2 inch nominal size. The driveway shall be maintained by top dressing with additional stone, as directed, and shall be removed when no longer required.

3.2 SOIL EROSION AND SEDIMENT CONTROL MAINTENANCE

Soil erosion and sediment control measures shall be maintained during the construction season as well as during winter months and other times when the project is closed down, throughout the life of the project, to ensure that the measures function properly. Soil erosion and sediment controls shall be immediately inspected after each rain and any corrective work shall immediately be performed to return the soil erosion and sediment control measures to proper function, as directed. Soil erosion control measures damaged due to washouts or siltation shall be replaced as directed.

Sediment traps and basins shall be cleaned out when they are 50 percent filled. Silt fences shall have sediment removed when the sediment reaches 50 percent of the height of the soil erosion and sediment control measure. Sediment removed shall be disposed of in accordance with subsection 202.12.

END OF SECTION 01 57 13

SECTION 32 05 00 – SELECT FILL (Soils and Aggregates for Exterior Improvements)

PART ONE - GENERAL

1.1 DESCRIPTION

1.1.1 Work Included: Under this section, the Contractor shall provide all labor, equipment and materials necessary to furnish, and install all select fill and foundation material complete and in place as specified herein or as directed by the Architect/Engineer.

1.2 QUALITY ASSURANCE

1.2.1 Standards:

1. Comply with ANSI, OSHA, ASTM and all applicable Federal, State and local codes including revisions to date of contract.

2. Comply with ASTM and all applicable Federal, State and Municipal codes including revisions to the date of the contract, such as:

   a. ASTM D-2487, Standard Test Methods for Classification of Soils for Engineering Purposes.

3. In all cases where a device or part of the equipment is referred to in this section by a singular number (such as "test"), it is intended that such reference shall apply to as many devices as are required to complete the installation.

4. Referenced Specifications:

   a. New Jersey Department of Transportation Standard Specifications for Road and Bridge construction, dated 2007, plus addenda when referred to, shall become part of this specification for materials and construction requirements. The measurement and payment section of the NJDOT Specifications shall **not** apply as all work under this section shall be included in the Contractor's lump sum prices and unit prices bid for this Contract. Where the referenced specifications cite requirements differing from those included in these specifications, the more stringent, highest quality shall govern.

1.2.2 Qualifications of Manufacturers: Products used in the work of this section shall be produced by manufacturers regularly engaged in the manufacture of similar items and with a history of successful production acceptable to the Architect/Engineer.

1.3 PRODUCTION HANDLING

1.3.1 Protection: Use all means necessary to protect the material of this section up to acceptance by the Owner upon delivery.

PART TWO - PRODUCTS

2.1 SELECT FILL

2.1.1 Type: Select Fill to be used if sufficient suitable material for backfill, fill and other purposes is not available from the excavated material, then the Contractor shall procure elsewhere, a sufficient quantity of suitable select fill material, as specified in Section 2.1.2, and shall furnish and place such materials.

2.1.2 Backfill and Select Fill: All backfill and select fill materials, unless otherwise specified, shall consist of a suitable selected and approved earth generally from storage of approved excavated soil.

2.1.3 Acceptance of Materials: A one hundred forty (140) pound bag sample of each type of material to be used as select fill shall be submitted to the Architect/Engineer ten (10) days prior to delivery. This material shall not be delivered until approved by the architect/Engineer. By submitting samples of this material, the Contractor agrees and guarantees that the material used for procurement shall conform to the sample(s) supplied. Final acceptance of material for select fill rests with the Architect/Engineer, whose decisions shall be final and binding upon the Contractor. The acceptance of any material by sample by the Engineer shall not relieve the Contractor of his responsibility to have the material used conform to the sample(s) approve by the Architect/Engineer.

Each sample bag shall be submitted bearing identification tag, naming the site and location of the borrow pit and shall be accompanying with a report, (signed and sealed by a professional engineer licensed in the State of New Jersey). The professional engineer shall be from a qualified geo-technical engineering firm and its laboratory attesting to the adequate properties of the material submitted. The Contractor shall further provide the Engineer with a volumetric computation indicating the amount of material available at the particular borrows pit from which the approved soils are to be excavated. Any change in site or actual material used shall be similarly submitted to the Architect/Engineer for approval.

The Architect/Engineer reserves the right to visit any or all borrows pit sites for purposes of inspection and verification of available supply. All testing and reports shall be developed at the cost of the Contractor.

2.2 FOUNDATION/BEDDING MATERIAL

2.2.1 General: Foundation/bedding material shall be of ¾” crushed stone for the sanitary sewer and force main. Select fill or clean fill for force main shall be placed on top of crushed stone as shown on the Contract drawings, conforming to NJDOT and ASTM specification, consisting of hard and clean material. The material shall be free from any considerable amount of flat, laminated or elongated particles and shells, clay, limestone, shale or other deleterious matter.

B. 3/4" Clean Crushed Stone: Conforming to NJDOT Section 901.08, consisting of hard, sharp, clean material. The material shall be free from any considerable amount of flat, laminated or elongated particles and shells, clay, limestone, shale or other deleterious matter. Foundation material shall conform to the following:

Sieve Size	Percent Finer by Weight
1 1/2 in	100
3/4 in	55-90
No. 4	25-60
No. 50	5-25
No. 200	3-12

Foundation material shall be placed and compacted as shown on the Contract Drawings or as directed by the Engineer.

C. Selected Native Backfill: This material must be compacted to 95% Relative Compaction (as measured by ASTM D1557 procedure). The quality of this backfill material shall be such that it exhibits an ultimate bearing strength in excess of 170kPa (3500 lbs per square foot) in the compacted state. Select native backfill may be used only at the perimeter of the excavation and as directed by the Architect/Engineer.

Foundation and bedding material shall be placed and compacted as shown on the Contract Drawings or as directed by the Architect/Engineer.

PART THREE - EXECUTION

3.1 GENERAL

All select fill, foundation material shall be filled and compacted in accordance with Section 02221, EXCAVATION, BACKFILLING AND COMPACTING.

3.2 FIELD TESTING

The Owner reserves the right to taking specimens and samples for testing by designated personnel.

END OF SECTION 32 05 00

SECTION 31 20 00 – EARTHWORK (EARTH MOVING)

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Preparing subgrades for walks, pavements, lawns, and plantings.
2. Excavating and backfilling for structures.
3. Subbase course for concrete walks and pavements.
4. Base course for asphalt paving.
5. Excavating and backfilling trenches for buried mechanical and electrical utilities and pits for buried utility structures.

B. Related Sections include the following:

1. Division 1 Section "Unit Prices" for a schedule of unit prices.
2. Division 1 Section "Construction Facilities and Temporary Controls."
3. Division 2 Section "Site Clearing" for site stripping, grubbing, removing topsoil, and protecting trees to remain.
4. Division 2 Section "Tree Protection and Trimming" for protecting and trimming trees to remain.
5. Division 2 Section "Excavation Support and Protection.".
6. Division 2 Section "Landscaping" for finish grading, including placing and preparing topsoil for lawns and plantings.

1.3 UNIT PRICES

A. Rock Measurement: Volume of rock actually removed, measured in original position, but not to exceed the following:
1. 6 inches (150 mm) outside of minimum required dimensions of concrete cast against grade.
2. Outside dimensions of concrete walls indicated to be cast against rock without forms or exterior waterproofing treatments.
3. 6 inches (150 mm) beneath bottom of concrete slabs on grade.

4. 6 inches (150 mm) beneath pipe in trenches, and the greater of 24 inches (600 mm) wider than pipe or 42 inches (1065 mm) wide.

B. Unit prices for rock excavation include replacement with approved materials.

1.4 DEFINITIONS

A. Backfill: Soil materials used to fill an excavation.

1. Initial Backfill: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.
2. Final Backfill: Backfill placed over initial backfill to fill a trench.

B. Base Course: Layer placed between the subbase course and asphalt paving.

C. Bedding Course: Layer placed over the excavated subgrade in a trench before laying pipe.

D. Borrow: Satisfactory soil imported from off-site for use as fill or backfill.

E. Drainage Course: Layer supporting slab-on-grade used to minimize capillary flow of pore water.

F. Excavation: Removal of material encountered above subgrade elevations.

1. Additional Excavation: Excavation below subgrade elevations as directed by Architect. Additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work.
2. Bulk Excavation: Excavations more than 10 feet (3 m) in width and pits more than 30 feet (9 m) in either length or width.
3. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated dimensions without direction by the Architect. Unauthorized excavation, as well as remedial work directed by the Architect, shall be without additional compensation.

G. Fill: Soil materials used to raise existing grades.

H. Rock: Rock material in beds, ledges, unstratified masses, and conglomerate deposits and boulders of rock material exceeding 1 cu. yd. (0.76 cu. m) for bulk excavation or 3/4 cu. yd. (0.57 cu. m) for footing, trench, and pit excavation that cannot be removed by rock excavating equipment equivalent to the following in size and performance ratings, without systematic drilling, ram hammering, ripping, or blasting, when permitted:

1. Excavation of Footings, Trenches, and Pits: Late-model, track-mounted hydraulic excavator; equipped with a 42-inch- (1065-mm-) wide, short-tip-radius rock bucket; rated at not less than 120-hp (89-kW) flywheel power with bucket-curling

force of not less than 25,000 lbf (111 kN) and stick-crowd force of not less than 18,700 lbf (83 kN); measured according to SAE J-1179.

2. Bulk Excavation: Late-model, track-mounted loader; rated at not less than 210-hp (157-kW) flywheel power and developing a minimum of 45,000-lbf (200-kN) breakout force; measured according to SAE J-732.

I. Rock: Rock material in beds, ledges, unstratified masses, and conglomerate deposits and boulders of rock material 3/4 cu. yd. (0.57 cu. m) or more in volume that when tested by an independent geotechnical testing agency, according to ASTM D 1586, exceeds a standard penetration resistance of 100 blows/2 inches (97 blows/50 mm).

J. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.

K. Subbase Course: Layer placed between the subgrade and base course for asphalt paving, or layer placed between the subgrade and a concrete pavement or walk.

L. Subgrade: Surface or elevation remaining after completing excavation, or top surface of a fill or backfill immediately below subbase, drainage fill, or topsoil materials.

M. Utilities include on-site underground pipes, conduits, ducts, and cables, as well as underground services within buildings.

1.5 SUBMITTALS

A. Product Data: For the following:

1. Each type of plastic warning tape.
2. Drainage fabric

B. Samples: For the following:

1. 30-lb (14-kg) samples, sealed in airtight containers, of each proposed soil material from on-site or borrow sources.
2. 12-by-12-inch (300-by-300-mm) sample of drainage fabric.

C. Material Test Reports: From a qualified testing agency indicating and interpreting test results for compliance of the following with requirements indicated:

1. Classification according to ASTM D 2487 of each on-site or borrow soil material proposed for fill and backfill.
2. Laboratory compaction curve according to ASTM D 698 for each on-site or borrow soil material proposed for fill and backfill.
3. Laboratory compaction curve according to ASTM D 1557 for each on-site or borrow soil material proposed for fill and backfill.

D. Blasting plan approved by authorities having jurisdiction, for record purposes.

E. Seismic survey agency report, for record purposes.

1.6 QUALITY ASSURANCE

A. Comply with applicable requirements of NFPA 495, "Explosive Materials Code."

B. Seismic Survey Agency: An independent testing agency, acceptable to authorities having jurisdiction, experienced in seismic surveys and blasting procedures to perform the following services:

1. Report types of explosive and sizes of charge to be used in each area of rock removal, types of blasting mats, sequence of blasting operations, and procedures that will prevent damage to site improvements and structures on Project site and adjacent properties.
2. Seismographic monitoring services during blasting operations.

C. Geotechnical Testing Agency Qualifications: An independent testing agency qualified according to ASTM E 329 to conduct soil materials and rock-definition testing, as documented according to ASTM D 3740 and ASTM E 548.

D. Pre-excavation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Meetings."

1.7 PROJECT CONDITIONS

A. Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted in writing by Architect and then only after arranging to provide temporary utility services according to requirements indicated:

1. Notify the Architect not less than two days in advance of proposed utility interruptions.
2. Do not proceed with utility interruptions without Architect's written permission.
3. Contact utility-locator service for area where Project is located before excavating.

B. Demolish and completely remove from site existing underground utilities indicated to be removed. Coordinate with utility companies to shut off services if lines are active.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.

B. Satisfactory Soils: ASTM D 2487 soil classification groups GW, GP, GM, SW, SP, and SM, or a combination of these group symbols; free of rock or gravel larger than 3 inches (75 mm) in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.

C. Unsatisfactory Soils: ASTM D 2487 soil classification groups GC, SC, ML, MH, CL, CH, OL, OH, and PT, or a combination of these group symbols.

1. Unsatisfactory soils also include satisfactory soils not maintained within 2 percent of optimum moisture content at time of compaction.

D. Backfill and Fill: Satisfactory soil materials.

E. Subbase: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 90 percent passing a 1-1/2- inch (38-mm) sieve and not more than 12 percent passing a No. 200 (0.075-mm) sieve.

F. Base: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 95 percent passing a 1-1/2-inch (38-mm) sieve and not more than 8 percent passing a No. 200 (0.075-mm) sieve.

G. Engineered Fill: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 90 percent passing a 1-1/2-inch (38-mm) sieve and not more than 12 percent passing a No. 200 (0.075-mm) sieve.

H. Bedding: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; except with 100 percent passing a 1-inch (25-mm) sieve and not more than 8 percent passing a No. 200 (0.075-mm) sieve.

I. Drainage Fill: Washed, narrowly graded mixture of crushed stone, or crushed or uncrushed gravel; ASTM D 448; coarse-aggregate grading Size 57; with 100 percent passing a 1-1/2- inch (38-mm) sieve and 0 to 5 percent passing a No. 8 (2.36-mm) sieve.

J. Filter Material: Narrowly graded mixture of natural or crushed gravel, or crushed stone and natural sand; ASTM D 448; coarse-aggregate grading Size 67; with 100 percent passing a 1-inch (25-mm) sieve and 0 to 5 percent passing a No. 4 (4.75-mm) sieve.

2.2 ACCESSORIES

A. Warning Tape: Acid- and alkali-resistant polyethylene film warning tape manufactured for marking and identifying underground utilities, 6 inches (150 mm) wide and 4 mils (0.1 mm) thick, continuously inscribed with a description of the utility; colored as follows:

B. Detectable Warning Tape: Acid- and alkali-resistant polyethylene film warning tape manufactured for marking and identifying underground utilities, minimum 6 inches (150 mm) wide and 4 mils (0.1 mm) thick, continuously inscribed with a description of utility, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30 inches (750 mm) deep; colored as follows:

1. Red: Electric.
2. Yellow: Gas, oil, steam, and dangerous materials.
3. Orange: Telephone and other communications.
4. Blue: Water systems.
5. Green: Sewer systems.

C. Drainage Fabric: Non-woven geotextile, specifically manufactured as a drainage geotextile; made from polyolefins, polyesters, or polyamides; and with the following minimum properties determined according to ASTM D 4759 and referenced standard test methods:

1. Grab Tensile Strength: 110 lbf (490 N); ASTM D 4632.
2. Tear Strength: 40 lbf (178 N); ASTM D 4533.
3. Puncture Resistance: 50 lbf (222 N); ASTM D 4833.
4. Water Flow Rate: 150 gpm per sq. ft. (100 L/s per sq. m); ASTM D 4491.
5. Apparent Opening Size: No. 50 (0.3 mm); ASTM D 4751.

PART 3 - EXECUTION

3.1 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.

B. Protect subgrades and foundation soils against freezing temperatures or frost. Provide protective insulating materials as necessary.

C. Provide erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

3.2 DEWATERING

A. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.

B. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.

1. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches.
2. Install a dewatering system to keep subgrades dry and convey ground water away from excavations. Maintain until dewatering is no longer required.

3.3 EXPLOSIVES

A. Explosives: The use of explosives are permitted.

3.4 EXCAVATION, GENERAL

A. Unclassified Excavation: Excavation to subgrade elevations regardless of the character of surface and subsurface conditions encountered, including rock, soil materials, and obstructions.

1. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil materials.

B. Classified Excavation: Excavation to subgrade elevations classified as earth and rock. Rock excavation will be paid for by adjusting the Contract Sum according to unit prices included in the Contract Documents.

1. Earth excavation includes excavating pavements and obstructions visible on surface; underground structures, utilities, and other items indicated to be removed; together with soil, boulders, and other materials not classified as rock or unauthorized excavation.

a. Intermittent drilling; blasting, if permitted; ram hammering; or ripping of material not classified as rock excavation is earth excavation.

2. Rock excavation includes removal and disposal of rock.

a. Do not excavate rock until it has been classified and cross-sectioned by Architect.

3.5 EXCAVATION FOR WALKS AND PAVEMENTS

A. Excavate surfaces under walks and pavements to indicated cross sections, elevations, and grades.

3.6 EXCAVATION FOR UTILITY TRENCHES

A. Excavate trenches to indicated gradients, lines, depths, and elevations.

1. Beyond building perimeter, excavate trenches to allow installation of top of pipe below frost line.

B. Excavate trenches to uniform widths to provide a working clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12 inches (300 mm) higher than top of pipe or conduit, unless otherwise indicated.

1. Clearance: 12 inches (300 mm) on each side of pipe or conduit.
2. Clearance: As indicated.

C. Trench Bottoms: Excavate and shape trench bottoms to provide uniform bearing and support of pipes and conduit. Shape subgrade to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits. Remove projecting stones and sharp objects along trench subgrade.

1. For pipes and conduit less than 6 inches (150 mm) in nominal diameter and flat-bottomed, multiple-duct conduit units, hand-excavate trench bottoms and support pipe and conduit on an undisturbed subgrade.
2. For pipes and conduit 6 inches (150 mm) or larger in nominal diameter, shape bottom of trench to support bottom 90 degrees of pipe circumference. Fill depressions with tamped sand backfill.
3. Excavate trenches 6 inches (150 mm) deeper than elevation required in rock or other unyielding bearing material to allow for bedding course.

D. Trench Bottoms: Excavate trenches 6 inches (150 mm) deeper than bottom of pipe elevation to allow for bedding course. Hand excavate for bell of pipe.

1. Excavate trenches 6 inches (150 mm) deeper than elevation required in rock or other unyielding bearing material to allow for bedding course.

3.7 APPROVAL OF SUBGRADE

A. Notify Architect when excavations have reached required subgrade.

B. If Architect determines that unsatisfactory soil is present, continue excavation and replace with compacted backfill or fill material as directed.

1. Additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work.

C. Proof roll subgrade with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding. Do not proof roll wet or saturated subgrades.

D. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by the Architect.

3.8 UNAUTHORIZED EXCAVATION

A. Fill unauthorized excavation under foundations or wall footings by extending bottom elevation of concrete foundation or footing to excavation bottom, without altering top elevation. Lean concrete fill may be used when approved by the Architect.

1. Fill unauthorized excavations under other construction or utility pipe as directed by Architect.

3.9 STORAGE OF SOIL MATERIALS

A. Stockpile borrow materials and satisfactory excavated soil materials. Stockpile soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.

1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.

3.10 BACKFILL

A. Place and compact backfill in excavations promptly, but not before completing the following:
1. Surveying locations of underground utilities for record documents.
2. Inspecting and testing underground utilities.
3. Removing concrete formwork.
4. Removing trash and debris.
5. Removing temporary shoring and bracing, and sheeting.
6. Installing permanent or temporary horizontal bracing on horizontally supported walls.

3.11 UTILITY TRENCH BACKFILL

A. Place and compact bedding course on trench bottoms and where indicated. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.

B. Backfill trenches excavated under footings and within 18 inches (450 mm) of bottom of footings; fill with concrete to elevation of bottom of footings.

C. Place and compact initial backfill of subbase material, free of particles larger than 1 inch (25 mm), to a height of 12 inches (300 mm) over the utility pipe or conduit.

1. Carefully compact material under pipe haunches and bring backfill evenly up on both sides and along the full length of utility piping or conduit to avoid damage or displacement of utility system.

D. Coordinate backfilling with utilities testing.

E. Fill voids with approved backfill materials while shoring and bracing, and as sheeting is removed.

F. Place and compact final backfill of satisfactory soil material to final subgrade.

G. Install warning tape directly above utilities, 12 inches (300 mm) below finished grade, except 6 inches (150 mm) below subgrade under pavements and slabs.

3.12 FILL

A. Preparation: Remove vegetation, topsoil, debris, unsatisfactory soil materials, obstructions, and deleterious materials from ground surface before placing fills.

B. Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.

C. Place and compact fill material in layers to required elevations as follows:

1. Under grass and planted areas, use satisfactory soil material.
2. Under walks and pavements, use satisfactory soil material.
3. Under steps and ramps, use engineered fill.
4. Under building slabs, use engineered fill.
5. Under footings and foundations, use engineered fill.

3.13 MOISTURE CONTROL

A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill layer before compaction to within 2 percent of optimum moisture content.

1. Do not place backfill or fill material on surfaces that are muddy, frozen, or contain frost or ice.
2. Remove and replace, or scarify and air-dry, otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.

3.14 COMPACTION OF BACKFILLS AND FILLS

A. Place backfill and fill materials in layers not more than 8 inches (200 mm) in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches (100 mm) in loose depth for material compacted by hand-operated tampers.

B. Place backfill and fill materials evenly on all sides of structures to required elevations, and uniformly along the full length of each structure.

C. Compact soil to not less than the following percentages of maximum dry unit weight according to ASTM D 1557:

D. Compact soil to not less than the following percentages of maximum dry unit weight according to ASTM D 698:

1. Under structures, building slabs, steps, and pavements, scarify and recompact top 12 inches (300 mm) of existing subgrade and each layer of backfill or fill material at 95 percent.
2. Under walkways, scarify and recompact top 6 inches (150 mm) below subgrade and compact each layer of backfill or fill material at 92 percent.
3. Under lawn or unpaved areas, scarify and recompact top 6 inches (150 mm) below subgrade and compact each layer of backfill or fill material at 85 percent.

3.15 GRADING

A. General: Uniformly grade areas to a smooth surface, free from irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.

1. Provide a smooth transition between adjacent existing grades and new grades.
2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.

B. Site Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to required elevations within the following tolerances:

1. Lawn or Unpaved Areas: Plus or minus 1 inch (25 mm).
2. Walks: Plus or minus 1 inch (25 mm).
3. Pavements: Plus or minus 1/2 inch (13 mm).

3.16 SUBSURFACE DRAINAGE

A. Drainage Piping: Drainage pipe is specified in Division 2 Section "Foundation Drainage Systems."

B. Drainage Backfill: Place and compact filter material over subsurface drain, in width indicated, to within 12 inches (300 mm) of final subgrade. Overlay drainage backfill with one layer of drainage fabric, overlapping sides and ends at least 6 inches (150 mm).

1. Compact each course of filter material to 95 percent of maximum dry density according to ASTM D 698.
2. Place and compact impervious fill material over drainage backfill to final subgrade.

3.17 SUBBASE AND BASE COURSES

A. Install separation fabric on prepared subgrade according to manufacturer's written instructions, overlapping sides and ends.

B. Under pavements and walks, place subbase course on separation fabric according to fabric manufacturer's written instructions and as follows:

C. Under pavements and walks, place subbase course on prepared subgrade and as follows:

1. Place base course material over subbase.
2. Compact subbase and base courses at optimum moisture content to required grades, lines, cross sections, and thickness to not less than 95 percent of maximum dry unit weight according to ASTM D 1557.
3. Shape subbase and base to required crown elevations and cross-slope grades.
4. When thickness of compacted subbase or base course is 6 inches (150 mm) or less, place materials in a single layer.
5. When thickness of compacted subbase or base course exceeds 6 inches (150 mm), place materials in equal layers, with no layer more than 6 inches (150 mm) thick or less than 3 inches (75 mm) thick when compacted.

3.18 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified independent geotechnical engineering testing agency to perform field quality-control testing.

B. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earthwork only after test results for previously completed work comply with requirements.

C. Testing agency will test compaction of soils in place according to ASTM D 1556, ASTM D 2167, ASTM D 2922, and ASTM D 2937, as applicable. Tests will be performed at the following locations and frequencies:

1. Paved Areas: At subgrade and at each compacted fill and backfill layer, at least one test for every 2000 sq. ft. (186 sq. m) or less of paved area, but in no case fewer than three tests.
2. Trench Backfill: At each compacted initial and final backfill layer, at least one test for each 150 feet (46 m) or less of trench length, but no fewer than two tests.

D. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil to depth required; re-compact and retest until specified compaction is obtained.

3.19 PROTECTION

A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.

B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.

1. Scarify or remove and replace soil material to depth as directed by the Architect; reshape and re-compact.

C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.

1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to the greatest extent possible.

3.20 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Disposal: Remove surplus satisfactory soil and waste material, including unsatisfactory soil, trash, and debris, and legally dispose of it off Owner's property.

B. Disposal: Transport surplus satisfactory soil to designated storage areas on Owner's property. Stockpile or spread soil as directed by Architect.

1. Remove waste material, including unsatisfactory soil, trash, and debris, and legally dispose of it off Owner's property.

END OF SECTION 31 20 00

SECTION 333000 - SANITARY SEWERAGE

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes gravity-flow, non-pressure sanitary sewerage outside the building, with the following components:

1. Cleanouts.

1.2 PERFORMANCE REQUIREMENTS

A. Gravity-Flow, Non-pressure, Drainage-Piping Pressure Rating: 10-foot head of water (30 kPa)

1.3 DEFINITIONS

A. PVC: Polyvinyl Chloride Plastic

1.4 SUBMITTALS

A. Coordination Drawings: Show pipe sizes, locations, and elevations.

B. Field quality-control test reports.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers specified.
2. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.

2.2 PVC PIPE AND FITTINGS

A. PVC Pipe and Fittings, NPS 15 (DN 375) and Smaller: ASTM D 3034, [SDR 35] with bell-and-spigot ends for gasketed joints with ASTM F 477, elastomeric seals.

2.3 NONPRESSURE-TYPE PIPE COUPLINGS

A. Comply with ASTM C 1173, elastomeric, sleeve-type, reducing or transition coupling, for joining underground nonpressure piping. Include ends of same sizes as piping to be joined and corrosion-resistant-metal tension band and tightening mechanism on each end.

B. Sleeve Materials:

1. For Plastic Pipes: ASTM F 477, elastomeric seal or ASTM D 5926, PVC.
2. For Dissimilar Pipes: ASTM D 5926, PVC or other material compatible with pipe materials being joined.

C. Ring-Type, Flexible Couplings: Elastomeric compression seal with dimensions to fit inside bell of larger pipe and for spigot of smaller pipe to fit inside ring.

1. Available Manufacturers:

a. Fernco Inc.
b. Logan Clay Products Company (The).
c. Mission Rubber Company; a division of MCP Industries, Inc.

2.4 CLEANOUTS

A. PVC Cleanouts: PVC body with PVC threaded plug. Include PVC sewer pipe fitting and riser to cleanout of same material as sewer piping.

1. Manufacturers:

a. Canplas Inc.
b. IPS Corporation.
c. NDS Inc.
d. Plastic Oddities, Inc.
e. Sioux Chief Manufacturing Company, Inc.
f. Zurn Light Commercial Specialty Plumbing Products; Zurn Plumbing Products Group.
g. Or other approved Manufacturer.

PART 3 - EXECUTION

3.1 EARTHWORK

A. Excavating, trenching, and backfilling are specified Section 02300 "Earthwork."

3.2 PIPING APPLICATIONS

A. Pipe couplings and fittings with pressure ratings at least equal to piping rating may be used in applications below, unless otherwise indicated.

1. Use non-pressure-type flexible couplings where required to join gravity-flow, non-pressure sewer piping, unless otherwise indicated.

    a. Unshielded flexible couplings for same or minor difference OD pipes.
    b. Unshielded, increaser/reducer-pattern, flexible couplings for pipes with different OD.
    c. Ring-type flexible couplings for piping of different sizes where annular space between smaller piping's OD and larger piping's ID permits installation.

B. Gravity-Flow, Non-pressure Sewer Piping: Use the following pipe materials for each size range:

1. NPS 5 and NPS 6 (DN 125 and DN 150): NPS 6 (DN 150) PVC sewer pipe and fittings, gaskets, and gasketed joints.

2. NPS 12 and NPS 15 (DN 300 and DN 375): PVC sewer pipe and fittings, gaskets, and gasketed joints.

3.3 PIPING INSTALLATION

A. General Locations and Arrangements: Drawing plans and details indicate general location and arrangement of underground sanitary sewerage piping. Location and arrangement of piping layout take design considerations into account. Install piping as indicated, to extent practical. Where specific installation is not indicated, follow piping manufacturer's written instructions.

B. Install piping beginning at low point, true to grades and alignment indicated with unbroken continuity of invert. Place bell ends of piping facing upstream. Install gaskets, seals, sleeves, and couplings according to manufacturer's written instructions for using lubricants, cements, and other installation requirements.

C. Install proper size increasers, reducers, and couplings where different sizes or materials of pipes and fittings are connected. Reducing size of piping in direction of flow is prohibited.

D. Install gravity-flow, nonpressure, drainage piping according to the following:

1. Install piping pitched down in direction of flow, at slopes indicated on the plan.
2. Install piping at invert elevation indicated on the plan.
3. Install piping below frost line.
4. Install PVC sewer piping according to ASTM D 2321 and ASTM F 1668.
5. Install PVC profile gravity sewer piping according to ASTM D 2321 and ASTM F 1668.

3.4 PIPE JOINT CONSTRUCTION

A. Join gravity-flow, non-pressure, drainage piping according to the following:

1. Join PVC sewer piping according to ASTM D 2321 and ASTM D 3034 for elastomeric-seal joints or ASTM D 3034 for elastomeric-gasket joints.
2. Join PVC profile gravity sewer piping according to ASTM D 2321 for elastomeric-seal joints or ASTM F 794 for gasketed joints.

3.5 CLEANOUT INSTALLATION

A. Install cleanouts and riser extensions from sewer pipes to cleanouts at grade. Use PVC pipe and fittings in sewer pipes at branches for cleanouts. Install piping so cleanouts open in direction of flow in sewer pipe.

1. Use light-duty, top-loading classification cleanouts in earth or unpaved foot-traffic areas.
2. Use medium-duty, top-loading classification cleanouts in paved foot-traffic areas.
3. Use heavy-duty, top-loading classification cleanouts in vehicle-traffic service areas.

B. Set cleanout frames and covers in earth in cast-in-place-concrete block, 18 by 18 by 12 inches deep. Set with tops flush with surrounding grade.

3.6 CONNECTIONS

A. Make connections to existing piping and underground manholes.

1. Use commercially manufactured wye fittings for piping branch connections. Remove section of existing pipe; install wye fitting into existing piping; and encase entire wye fitting, plus 6-inch overlap, with not less than 6 inches of concrete with 28-day compressive strength of 3000 psi.

2. Make branch connections from side into existing piping, NPS 4 to NPS 20. Remove section of existing pipe; install wye fitting into existing piping; and encase entire wye with not less than 6 inches of concrete with 28-day compressive strength of 3000 psi .

3. Protect existing piping to prevent concrete or debris from entering while making tap connections. Remove debris or other extraneous material that may accumulate.

3.7 FIELD QUALITY CONTROL

A. Inspect interior of piping to determine whether line displacement or other damage has occurred. Inspect after approximately 24 inches of backfill is in place, and again at completion of Project.

1. Submit separate report for each system inspection.
2. Defects requiring correction include the following:

    a. Alignment: Less than full diameter of inside of pipe is visible between structures.
    b. Deflection: Flexible piping with deflection that prevents passage of ball or cylinder of size not less than 92.5 percent of piping diameter.
    c. Crushed, broken, cracked, or otherwise damaged piping.
    d. Infiltration: Water leakage into piping.
    e. Exfiltration: Water leakage from or around piping.

3. Replace defective piping using new materials, and repeat inspections until defects are within allowances specified.
4. Reinspect and repeat procedure until results are satisfactory.

B. Test new piping systems, and parts of existing systems that have been altered, extended, or repaired, for leaks and defects as directed by the Architect/Engineer.

1. Do not enclose, cover, or put into service before inspection and approval.
2. Test completed piping systems according to requirements of authorities having jurisdiction.
3. Schedule tests and inspections with the Architect/Engineer at least 24 hours' advance notice.
4. Submit separate report for each test.
5. Hydrostatic Tests: Test sanitary sewerage according to requirements of authorities having jurisdiction and the following:

    a. Allowable leakage is maximum of 50 gal./ inch of nominal pipe size per mile of pipe, during 24-hour period.
    b. Close openings in system and fill with water.
    c. Purge air and refill with water.
    d. Disconnect water supply.
    e. Test and inspect joints for leaks.
    f. Option: Test ductile-iron piping according to AWWA C600, "Hydrostatic Testing" Section. Use test pressure of at least 10 psig.

6. Air Tests: Test sanitary sewerage according to requirements of authorities having jurisdiction, UNI-B-6, and the following:

    a. Option: Test plastic gravity sewer piping according to ASTM F 1417.
    b. Option: Test concrete gravity sewer piping according to ASTM C 924.

C. Leaks and loss in test pressure constitute defects that must be repaired.

D. Replace leaking piping using new materials, and repeat testing until leakage is within allowances specified.

PART 4 - GREASE INTERCEPTOR

4.1 REFERENCES

ASTM C1613-06 Standard Specifications for Precast Grease Interceptor Tanks
ASTM C 890-06 Standard for Waste Water Structures
ASTM C 318-02 Standard for Reinforced Concrete

4.2 PRODUCTS

Manufactures: Model 3000G manufactured by Crest Precast Inc. tel. no. 1 800 658 9045 or engineer approved equal with the supplier being a certified NPCA plant.

Precast concrete grease interceptor to meet ASTM and or state design requirements. Tank to be engineered, watertight, and capable of withstanding loading conditions for this project per drawings. Tank to comply with ASTM C-1613-06.

Provide minimum 24” diameter concrete manholes spaced within a minimum of 8’ opening increments to facilitate pumping. Furnish cast iron frame and covers with gas tight, bolted access lids. Manholes shall be provided with warning labels affixed or cast into covers.

Inlet and outlet piping joints to be furnished with rubber boots meeting ASTM C923

Size of interceptor in gallons: 3000 galllons
Number of tanks: 1

4.3 EXECUTION

Excavate for exterior grease interceptor, setting precast bases on granular compacted base of 6” stone or sand under 3/4”. Base material shall support weight of tank and back fill with out settlement. Seal joints between base, top sections, risers and castings with EZ stick mastic per ASTM C990. Back fill and compact soil around grease interceptor in 12” lifts. Back fill material to be dry and under 3” size.

Tank shall be vacuum tested after installation to insure structure is watertight per ASTM 1663-06 using 4 inch of mercury for 5 minutes or to meet state codes.

Interior coating options for high strength or industrial waste are offered using
Wasser MC Tar or Xypex C-1000 admixtures.
Consult us for coatings, larger access risers and sizing criteria.
Crest Precast Inc. 1 800 658 9045 dated 3-23-09

END OF SECTION 333000

SECTION 33 40 00 - STORM DRAINAGE UTILITIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes gravity-flow, non-pressure storm drainage outside of buildings with the following components:

1. Cleanouts
2. Manholes
3. Catch Basins

1.3 DEFINITIONS

1. RCP: Reinforced Concrete Pipe
2. PVC: Polyvinyl Chloride Plastic
3. HDPE: High Density Polyethylene

1.4 PERFORMANCE REQUIREMENTS

A. Gravity-Flow, Non-pressure, Drainage-Piping Pressure Rating: 10-foot head of water (30 kPa) Pipe joints shall be at least silt tight, unless otherwise indicated.

1.5 SUBMITTALS

A. Product Data: For the following, if provided:

1. Special pipe fittings.

B. Coordination Drawings: Show pipe sizes, locations, and elevations. Show other piping in same trench and clearances from storm drainage system piping. Indicate interface and spatial relationship between manholes, piping, and proximate structures.

Shop Drawings: For the following:

1. Manholes: Include plans, elevations, sections, details, and frames and covers.
2. Catch Basins and Stormwater Inlets. Include plans, elevations, sections, details, and frames, covers, and grates.
3. Stormwater Outlet Structures: Include plans, elevations, sections, details, frames and covers.

4. Sandfilter structures: Include plans, elevations, sections, details, frames and covers and grates.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Do not store plastic manholes, pipe, and fittings in direct sunlight.

B. Protect pipe, pipe fittings, and seals from dirt and damage.

C. Handle manholes according to manufacturer's written rigging instructions.

D. Handle catch basins, stormwater inlets, outlet structures and sandfilter structures according to manufacturer's written rigging instructions.

1.7 PROJECT CONDITIONS

A. Interruption of Existing Storm Drainage Service: Do not interrupt service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary service according to requirements indicated:

1. Notify the Architect no fewer than two days in advance of proposed interruption of service.
2. Do not proceed with interruption of service without the Architect’s written permission.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:

1. Available Manufacturers: To be provided by the Contractor, subject to compliance with requirements.
2. Manufacturers: To be provided by the Contractor, subject to compliance with requirements.

2.2 PVC PIPE AND FITTINGS

A. PVC Sewer Pipe and Fittings, NPS 15 (DN 375) and Smaller: ASTM D 3034, SDR 35, with bell-and-spigot ends for gasketed joints with ASTM F 477, elastomeric seals.Piping in paragraph below is available in 2 thicknesses and in NPS 18 to NPS 36 (DN 450 to DN 900). Joints are gasket type.

2.3 CLEANOUTS

A. PVC Cleanouts: PVC body with PVC threaded plug. Include PVC sewer pipe fittings and riser to cleanout of same material as sewer piping.

2.4 PE PIPE AND FITTINGS

A. Corrugated PE Drainage Pipe and Fittings: AASHTO M 252M, Type S, with smooth waterway for coupling joints.

1. Silttight Couplings: PE sleeve with ASTM D 1056, Type 2, Class A, Grade 2 gasket material that mates with tube and fittings.
2. Soiltight Couplings: AASHTO M 252M, corrugated, matching tube and fittings.
3. Corrugated PE Pipe and Fittings NPS 12 to NPS 48 (DN 250 to DN 1200): AASHTO M 294M, Type S, with smooth waterway for coupling joints.
4. Silttight Couplings: PE sleeve with ASTM D 1056, Type 2, Class A, Grade 2 gasket material that mates with pipe and fittings.
5. Soiltight Couplings: AASHTO M 294M, corrugated, matching pipe and fittings.

2.5 CONCRETE PIPE AND FITTINGS

A. Reinforced-Concrete Sewer Pipe and Fittings: ASTM C 76 (ASTM C 76M), groove and tongue ends and gasketed joints with ASTM C 443 (ASTM C 443M), rubber gaskets.

1. Class IV, Wall B.

2.6 MANHOLES

A. Standard Precast Concrete Manholes: ASTM C 478 (ASTM C 478M), precast, reinforced concrete, of depth indicated, with provision for sealant joints.

1. Diameter: 48 inches (1200 mm) minimum, unless otherwise indicated.
2. Ballast: Increase thickness of precast concrete sections or add concrete to base section, as required to prevent flotation.
3. Base Section: 6-inch (150-mm) minimum thickness for floor slab and 4-inch (102-mm) minimum thickness for walls and base riser section, and having separate base slab or base section with integral floor.
4. Riser Sections: 4-inch (102-mm) minimum thickness, and lengths to provide depth indicated.
5. Top Section: Eccentric-cone type unless concentric-cone or flat-slab-top type is indicated. Top of cone of size that matches grade rings.
6. Joint Sealant: ASTM C 990 (ASTM C 990M), bitumen or butyl rubber.
7. Resilient Pipe Connectors: ASTM C 923 (ASTM C 923M), cast or fitted into manhole walls, for each pipe connection.
8. Steps: FRP ladder wide enough to allow worker to place both feet on 1 step and designed to prevent lateral slippage off of step. Cast or anchor steps into sidewalls at 12- to (300 mm) intervals. Omit steps if total depth from floor of manhole to finished grade is less than 60 inches (1500 mm)
9. Adjusting Rings: Interlocking rings with level or sloped edge in thickness and diameter matching manhole frame and cover. Include sealant recommended by ring manufacturer.
10. Grade Rings: Reinforced-concrete rings, 6- to 9-inch (150- to 225-mm) total thickness, to match diameter of manhole frame and cover.
11. Protective Coating: Plant-applied, SSPC-Paint 16, coal-tar, epoxy-polyamide paint 10-mil (0.26-mm) minimum thickness applied to **exterior** surfaces.

12. Manhole Frames and Covers: Ferrous; Pattern no. 1012B, manufactured by Campbell Foundry, Inc.

    a. Material: ASTM A 536, Grade 60-40-18 ductile or ASTM A 48, Class 35 gray iron, unless otherwise indicated.
    b. Protective Coating: Foundry-applied, SSPC-Paint 16, coal-tar, epoxy-polyamide paint; **10-mil (0.26-mm)** minimum thickness applied to all surfaces, unless otherwise indicated.

2.7 CONCRETE

A. General: Cast-in-place concrete according to ACI 318/318R, ACI 350R, and the following:

1. Cement: ASTM C 150, Type II.
2. Fine Aggregate: ASTM C 33, sand.
3. Coarse Aggregate: ASTM C 33, crushed gravel.
4. Water: Potable.

B. Portland Cement Design Mix: 4000 psi (27.6 MPa) minimum, with 0.45 maximum water-cementitious materials ratio.

1. Reinforcement Fabric: ASTM A 185, steel, welded wire fabric, plain.
2. Reinforcement Bars: ASTM A 615/A 615M, Grade 60 (420 MPa), deformed steel.

C. Ballast and Pipe Supports: Portland cement design mix, 3000 psi (20.7 MPa) minimum, with 0.58 maximum water-cementitious materials ratio.

1. Reinforcement Fabric: ASTM A 185, steel, welded wire fabric, plain.
2. Reinforcement Bars: ASTM A 615/A 615M, Grade 60 (420 MPa), deformed steel.

2.8 CATCH BASINS

A. Standard Precast Concrete Catch Basins: ASTM C 478 (ASTM C 478M), precast, reinforced concrete, of depth indicated, with provision for sealant joints.

1. Base Section: 6-inch (150-mm) minimum thickness for floor slab and 4-inch (102-mm) minimum thickness for walls and base riser section, and having separate base slab or base section with integral floor.
2. Riser Sections: 4-inch (102-mm) minimum thickness, 48-inch (1220-mm) diameter, and lengths to provide depth indicated.
3. Top Section: Eccentric-cone type unless concentric-cone or flat-slab-top type is indicated. Top of cone of size that matches grade rings.
4. Joint Sealant: ASTM C 990 (ASTM C 990M), bitumen or butyl rubber.
5. Adjusting Rings: Interlocking rings with level or sloped edge in thickness and shape matching catch basin frame and grate. Include sealant recommended by ring manufacturer.
6. Grade Rings: Include 2 or 3 reinforced-concrete rings, of 6- to 9-inch (150- to 229-mm) total thickness, that match 24-inch- (610-mm-) diameter frame and grate.
7. Steps: FRP ladder ASTM A 615/A 615M. wide enough to allow worker to place both feet on 1 step and designed to prevent lateral slippage off of step. Cast or anchor steps into

sidewalls at 12- to 16-inch (300- to 400-mm) intervals. Omit steps if total depth from floor of catch basin to finished grade is less than [**60 inches (1500 mm)**

8. Pipe Connectors: ASTM C 923 (ASTM C 923M), resilient, of size required, for each pipe connecting to base section.

2.9 MISCELLANEOUS MATERIALS

A. Paint: SSPC-Paint 16.

PART 3 - EXECUTION

3.1 EARTHWORK

A. Excavation, trenching, and backfilling are specified in Division 2 Section 02300 "Earthwork."

3.2 PIPING INSTALLATION

A. General Locations and Arrangements: Drawing plans and details indicate general location and arrangement of underground storm drainage piping. Location and arrangement of piping layout take design considerations into account. Install piping as indicated, to extent practical. Where specific installation is not indicated, follow piping manufacturer's written instructions.

B. Install piping beginning at low point, true to grades and alignment indicated with unbroken continuity of invert. Place bell ends of piping facing upstream. Install gaskets, seals, sleeves, and couplings according to manufacturer's written instructions for use of lubricants, cements, and other installation requirements.

C. Install manholes for changes in direction unless fittings are indicated. Use fittings for branch connections unless direct tap into existing sewer is indicated.

D. Install gravity-flow, non-pressure drainage piping according to the following:

1. Install piping pitched down in direction of flow, at minimum slope of 0.5 percent, unless otherwise indicated.
2. Install piping with 12-inch minimum cover.
3. Install PE corrugated sewer piping according to CPPA's "Recommended Installation Practices for Corrugated Polyethylene Pipe and Fittings."
4. Install PVC sewer piping according to ASTM D 2321 and ASTM F 1668.
5. Install PVC profile gravity sewer piping according to ASTM D 2321 and ASTM F 1668.
6. Install reinforced-concrete sewer piping according to ASTM C 1479 and ACPA's "Concrete Pipe Installation Manual."

3.3 PIPE JOINT CONSTRUCTION

A. Join gravity-flow, non-pressure drainage piping according to the following:

1. Join corrugated PE piping according to CPPA 100 and the following:

    a. Use silttight couplings for Type 1, silttight joints.
    b. Use soiltight couplings for Type 2, soiltight joints.

2. Join PVC sewer piping according to ASTM D 2321 and ASTM D 3034 for elastomeric-seal joints or ASTM D 3034 for elastomeric gasket joints.
3. Join PVC profile gravity sewer piping according to ASTM D 2321 for elastomeric-seal joints or ASTM F 794 for gasketed joints.
4. Join reinforced-concrete sewer piping according to ACPA's "Concrete Pipe Installation Manual" for rubber-gasket joints.

3.4 CLEANOUT INSTALLATION

A. Install cleanouts and riser extension from sewer pipe to cleanout at grade. Use PVC pipe fittings in sewer pipes at branches for cleanouts and for riser extensions to cleanouts. Install piping so cleanouts open in direction of flow in sewer pipe.

1. Use light-duty, top-loading classification cleanouts in earth or unpaved foot-traff**ic** areas.
2. Use medium-duty, top-loading classification cleanouts in paved foot-traffic areas.
3. Use heavy-duty, top-loading classification cleanouts in vehicle-traffic service areas.
4. Use extra-heavy-duty, top-loading classification cleanouts in roads areas.

B. Set cleanout frames and covers in earth in cast-in-place concrete block, 18 by 18 by 12 inches (450 by 450 by 300 mm) deep. Set with tops 1 inch (25 mm) above surrounding earth grade.

C. Set cleanout frames and covers in concrete pavement with tops flush with pavement surface.

3.5 MANHOLE INSTALLATION

A. General: Install manholes, complete with appurtenances and accessories indicated.

B. Install precast concrete manhole sections according to ASTM C 891.

C. Install PE sheeting on earth where cast-in-place-concrete manholes are to be built.

D. Set tops of frames and covers flush with finished surface of manholes that occur in pavements. Set tops 3 inches (76 mm) above finished surface elsewhere, unless otherwise indicated.

3.6 CATCH BASIN INSTALLATION

A. Construct catch basins to sizes and shapes indicated.

B. Set frames and grates to elevations indicated.

3.7 CLOSING ABANDONED STORM DRAINAGE SYSTEMS

A. Abandoned Piping: Close open ends of abandoned underground piping indicated to remain in place. Include closures strong enough to withstand hydrostatic and earth pressures that may result after ends of abandoned piping have been closed. Use either procedure below:

1. Close open ends of piping with at least 8-inch- (203-mm-) thick, brick masonry bulkheads.
2. Close open ends of piping with threaded metal caps, plastic plugs, or other acceptable methods suitable for size and type of material being closed. Do not use wood plugs.

B. Abandoned Manholes and Structures: Excavate around manholes and structures as required and use one procedure below:

1. Remove manhole or structure and close open ends of remaining piping.
2. Remove top of manhole or structure down to at least **36 inches (915 mm)** below final grade. Fill to within [**12 inches (300 mm)** of top with stone, rubble, gravel, or compacted dirt. Fill to top with concrete.

C. Backfill to grade according to Division 2 Section "Earthwork."

3.8 COVERING ABANDONED STORM DRAINAGE SYSTEMS

A. Covering Inlets:

1. Remove inlet frame and grate and place filter fabric on top on the inlet structure.
2. Install ½" thick metal plate on top of the filter fabric.

B. Covering Manhole:

1. Remove inlet frame and grate and place filter fabric on top on the inlet structure.
2. Install back the frame and cover on top of the filter fabric.

3.9 IDENTIFICATION

A. Materials and their installation are specified in division 2 Section 02300 "Earthwork." Arrange for installation of green warning tape directly over piping and at outside edge of underground structures.

1. Use detectable warning tape over ferrous piping.
2. Use detectable warning tape over nonferrous piping and over edges of underground structures.

3.10 FIELD QUALITY CONTROL

A. Inspect interior of piping to determine whether line displacement or other damage has occurred. Inspect after approximately 24 inches of backfill is in place, and again at completion of Project.

1. Submit separate reports for each system inspection.

2. Defects requiring correction include the following:

    a. Alignment: Less than full diameter of inside of pipe is visible between structures.
    b. Deflection: Flexible piping with deflection that prevents passage of ball or cylinder of size not less than 92.5 percent of piping diameter.
    c. Crushed, broken, cracked, or otherwise damaged piping.
    d. Infiltration: Water leakage into piping.
    e. Exfiltration: Water leakage from or around piping.

3. Replace defective piping using new materials, and repeat inspections until defects are within allowances specified.
4. Re-inspect and repeat procedure until results are satisfactory.

B. Test new piping systems, and parts of existing systems that have been altered, extended, or repaired, for leaks and defects.

1. Do not enclose, cover, or put into service before inspection and approval.
2. Test completed piping systems according to authorities having jurisdiction.
3. Schedule tests and inspections by authorities having jurisdiction with at least 24 hours' advance notice.
4. Submit separate report for each test.
5. Gravity-Flow Storm Drainage Piping: Test according to requirements of authorities having jurisdiction, UNI-B-6, and the following:

    a. Exception: Piping with soil tight joints unless required by authorities having jurisdiction.
    b. Option: Test plastic piping according to ASTM F 1417.
    c. Option: Test concrete piping according to ASTM C 924

3.11 CLEANING

A. Clean interior of piping of dirt and superfluous materials. Flush with potable water.

END OF SECTION 33 40 00

SECTION 33 10 00 – WATER UTILITIES

1. Description.

This work shall consist of the furnishing and installing domestic water and fire protection service pipe lines, including gate valves and fittings.

The new domestic water service and fire protection service pipe lines will be tapped into the existing water main by the water company. The contractor is responsible for the connection of the water service pipes from the curb line to the building. Water meters (will be installed by the water company); double check detector assemblies and all valves, appurtenances and accessories required by the water company will be installed in the utility room. The contractor shall contact the water company and make the appropriate application for new service connection.

2. Materials

2.1 SERVICE CONNECTION

The Contractor shall furnish, install test and disinfect service connection pipe as shown, specified, or ordered. The pipe shall be 2” ductile iron pipe for domestic service and 3” ductile iron pipe for fire protection and shall conform to ASTM B88-47 and AWWA C800 for under ground installation. The service connections shall include corporation stops with flexible service pipe, couplings, fittings, curb stops, curb boxes, hot box enclosure, valve assemblies and all appurtenances and accessories required for a satisfactory installation.

New connection and service pipes shall be furnished and installed as indicated on the Contract Drawings and approved by the water company.

All pipes, valves and appurtenance shall be disinfected in accordance with the requirements of AWWA C651.

END OF SECTION 33 10 00

SECTION 33 12 00 - PIPE AND PIPE FITTINGS (Water distribution Piping & Equipment)

PART ONE - GENERAL

1.1 DESCRIPTION

1.1.1 Work Included: Under this section the Contractor shall furnish all labor, equipment and materials necessary to install, test and place into satisfactory service, all piping, fittings and accessories required for complete piping works and ready for use as shown on the Contract Drawings and as specified herein.

1.1.2 Related Work Described Elsewhere:

Earth Moving	Section 312000
Water Utilities	Section 331000

1.2 QUALITY ASSURANCE

1.2.1 Standards

(1) Comply with ANSI, OSHA, ASTM, AWWA and all applicable Federal, State and Municipal codes, including revisions to date of contract.

(2) In all cases where an item of equipment, or part thereof, is referred to in this section by a singular number (such as "gasket"), it is intended that such references shall apply to as many parts as are required to complete the installation.

1.3 SUBMITTALS

1.3.1 General: Submit shop drawings in accordance with Section 01340, SUBMITTALS.

1.3.2 Product Data: For pipe, pipe fittings and appurtenances, this Contractor shall furnish to the General Contractor, at the time of shop drawing submission, certified records of physical, chemical and other pertinent tests and/or certified statements from the manufacturer that the materials have been manufactured and tested in conformity with the specifications. Where such a small quantity of material is required as to make physical testing and chemical analysis impractical, a certified analysis of similar materials which were concurrently produced, may at the discretion of the Contractor, be considered as the basis for acceptance of such materials.

1.4 PRODUCT HANDLING

1.4.1 Pipe Identification: All pipe units shall be identified as to the following:

(1) Pipe class
(2) Date of manufacture
(3) Manufacturer's name or logo
(4) Inside pipe diameter
(5) Pipe material

1.4.2 Delivery and Storage: The Contractor is responsible for storing any equipment the Owner furnishes from the time the Owner delivers it to him.

1.4.3 Protection: The Contractor shall use all means necessary to protect the materials of this section, before, during and after installation and to protect installed work and materials of all other trades.

1.4.4 Replacement: In the event of damage, the Contractor shall make all repairs and replacements necessary to the approval of the Engineer and at no additional cost to the Owner.

PART TWO - PRODUCTS

2.1 DESIGN

2.1.1 General: The names of manufacturers and specific catalog numbers are given only as an indication of the quality of materials and workmanship to be used. Equal products by other manufacturers approved by the Engineer shall be acceptable in accordance with the General Conditions of the Contract.

2.2 DUCTILE IRON PIPE AND FITTINGS

2.2.1 Ductile Iron Pipe: Ductile iron pipe used for the water mains shall be push-on type connection.

Ductile iron pipe shall be Pressure Class 350. Ductile iron pipe shall be in conformance with ANSI A.21.51 and AWWA C151 for "Ductile Iron Pipe Centrifugally Cast In Metal or Sand Lined Molds, for Water or Other Liquids". The pipe shall be cast utilizing iron conforming to Grade 60-42-10 as required in the above noted ANSI specification. Pipe shall be furnished in nominal 16 foot to 20-foot lengths.

Ductile iron pipe shall be as manufactured by United States Pipe and Foundry Company or equal.

2.2.2 Ductile Iron Fittings: Ductile iron fittings used for the water mains shall be push-on type connection.

Ductile iron fittings shall be Pressure Class 350. Ductile iron fittings shall be compact type and shall be in conformance with ANSI A.21.53-94 and AWWA C153 for "Ductile Iron Compact Fittings For Water Service". The fittings shall be cast utilizing iron conforming to Grade 60-42-10 as required in the above noted ANSI specification.

Ductile iron fittings shall be as manufactured by United States Pipe and Foundry Company or equal.

2.2.3 Rubber Gasket Joints: Gaskets shall be provided at all pipe and fitting joints. Gaskets shall be field locking type to provide maximum pipe restraint. Gaskets shall be furnished in accordance with ANSI A21.11 and AWWA C111 for rubber gasket joints for ductile iron pipe and fittings.

2.2.4 Lining: Pipe and fitting lining shall consist of cement-mortar of double thickness (1/8") for the entire length of pipe and shall conform with ANSI A.21.4 and AWWA C104 for cement-mortar lining for ductile iron pipe and fittings for water. **The pipe interior shall not receive a bituminous coating**. The interior seal coat shall be continuous and shall adhere to the mortar lining at all points. The pipe exterior shall receive a bituminous coating of either coal tar or asphalt base approximately one (1) mill thick.

2.2.5 Concrete Thrust Blocks: Shall be provided at all vertical and horizontal bends.

2.3 SERVICE CONNECTIONS

2.3.1 General: The Contractor shall furnish, install, test and disinfect service connections for the water mains as shown, specified, or ordered. The service connections shall conform to ASTM B88-47 and AWWA C800 for under ground service line valves and fittings. The service connections shall include corporation stops with service saddles and clamps, flexible service pipe, couplings, fittings, curb stops, curb boxes and all appurtenances and accessories required for a satisfactory installation.

New connections and service pipes shall be furnished and installed for each lot adjacent to the water main without indication on the Contract Drawings. Flexible service pipe shall be furnished and installed including the tapping of the new water main. Diameter of new flexible service pipe shall be determined by the Contractor or as shown on the Contract Drawings.

2.3.2 Service Piping: Flexible service pipe shall be seamless copper tubing, Type K tempered for underground service. Fitting and joints shall be made utilizing compression connections.

2.3.3 Service Piping Appurtenances: Corporation stops shall be compression connection Mueller 300 Ball Corporation Valve, Catalog No. B-25008 with AWWA inlet threads or equal. Corporations shall be installed during the service connection procedure. The Contractor shall not install corporations during the main line installation unless otherwise directed by the Engineer.

Service saddles or clamps shall be forged steel, single and double strap, corporation stop thread, galvanized malleable iron body and neoprene gaskets. Straps and entire nut shall be cadmium plated. Saddles shall be required for all taps made in the water mains.

Curb stops shall be compression connection, Mueller 300 Ball Curb Valve, Catalog No. B-25209, as manufactured by Mueller Company, or equal.

Curb boxes shall be solid cover type box complete with lid marked "WATER" as manufactured by Bingham and Taylor Co., or equal. Length of the box shall be selected for depth of bury to match the existing grade or as directed by the Architect.

Each curb box shall be furnished with a stationary rod and guide ring with the length to suit the curb box supplied.

Where required by the Owner, service pipe shall be installed beneath the pavement, without disturbing said structure, by air or water jetting at depth of not less than 4 feet 6 inches below the existing surface.

The Contractor shall furnish post hydrants at the locations indicated on the Contract Drawings. Post hydrant assembly shall be Series 71400-4 as manufactured by Josam Manufacturing Co. or equal. The post hydrant shall be galvanized steel, sanitary post with Buna-N plunger, ¾" female N.P.T. inlet connection, non-freezing. The wall casing shall be galvanized. The post hydrant shall have an adjustable wheel lock handle and sanitary siphon drain system.

Hose bibs shall be installed as indicated on the Contract Drawings, consistent with operating convenience. All Hose bibs shall be manufactured by Nibco Inc. or equal. Interior hose bibs shall be three-quarter inch (3/4") Angle Sillcock Fig. No. 763-CL. Hose bibs shall be wall mounted and located three feet (3') above floor level."

2.4 CONCRETE THRUST BLOCKS AND ENCASEMENTS

2.4.1 General: This Contractor shall furnish all labor, equipment, and materials, necessary to excavate for, furnish, form, place, grade, and rod complete, all concrete required for thrust blocks, supports, encasements and other purposes as ordered by the General Contractor or as shown on the Contract Drawings.

Concrete thrust blocks shall be provided at all pipe fittings.

Concrete encasements shall be provided at all locations where the water main conflicts with an existing sanitary or storm sewer and must cross under that utility, or as directed by the General Contractor.

Concrete shall conform to the requirements of Section 03300, CAST-IN-PLACE CONCRETE or section 03301, CAST-IN-PLACE CONCRETE (Limited Application).

PART THREE - EXECUTION

3.1 INSPECTION

Examine the areas and conditions under which work of this section will be installed. Correct conditions detrimental to proper and timely completion of the work. Do not proceed until unsatisfactory conditions have been corrected.

3.2 INSTALLATION

3.2.1 Buried Pipe: All buried pipe shall also be installed in accordance with AWWA C600 (latest edition).

After installation and testing have been completed, all lines shall be flushed clean.

3.2.2 Handling of Pipe: Proper and suitable equipment for the safe and convenient handling and laying of all pipes and fittings shall be used. Care shall be taken to prevent the pipe coating from being damaged, particularly on the inside of pipes and fittings and any damage shall be remedied as directed by the Architect. No pipe and/or fittings shall be laid which are known to be defective. If any defective pipe is discovered after having been laid, it shall be removed and replaced with sound pipe or fitting in a satisfactory manner by the Contractor at his own expense.

All pipe shall be laid to proper line and grade. Open ends of pipe shall be kept plugged with a bulkhead during construction.

3.2.3 Laying of Pipe: Pipe shall be carefully laid to the lines and grades shown on the Contract Drawings or as ordered by the Architect.

Pipe must be constructed in dry trenches only. The Contractor shall be required to keep all excavations for trenches or other structures in this contract free from water at all times during the construction of the work therein.

The pipe shall be evenly bedded as shown on the Contract Drawings except for the bell under which a recess shall be excavated to a sufficient depth to relieve it of any load and to allow ample space for making the joint. In case the bed trimmed in the bottom of the trench is too low, earth must be placed in the bottom and thoroughly rammed and new bed trimmed for the pipe. It is forbidden to raise the grade of the pipe by ramming earth beneath it. When the pipe has been bedded satisfactorily and the joint made, the recess around the bell shall be refilled and tamped

on each side of the pipe to hole it securely in place, care being taken not to disturb the position of the pipe during this process.

Where pipe is supported by concrete, before the concrete is set, the pipe shall be evenly bedded therein, so as to have a uniform support for its entire length, and the remainder of the concrete shall be immediately deposited and carefully tamped in such a manner as to avoid changing the position of the pipe.

Each pipe shall be laid so as to form a close joint with the next adjoining pipe and bring the inverts continuously to the required line and grade.

3.2.4 Rock Subgrade: Ledge rock, hard pan, cobbles, boulders or stones larger than 1-1/2 inches shall be removed from the trench bottom to permit a minimum bedding thickness under the pipe as shown, ordered, or required.

3.2.5 Cleaning Pipe: The inside of all pipe and fittings shall be cleaned by crushing and by thoroughly blowing out with air to remove slag, dirt and other sediment, as well as other foreign materials, before being installed. During installation, sufficient care shall be exercised to prevent foreign matter from entering the lines. Use temporary closures during construction to protect open ends of pipe.

After installation and testing have been completed, all lines shall be flushed clean.

3.2.6 Line and Grade: The Contractor shall establish the benchmark and position of control point as shown on the Contract Drawings. The Contractor shall furnish all horizontal and vertical measurement from this control point including inverts and grade.

3.2.7 Service House Connections: The Contractor shall make service connections as directed by the General Contractor. Although house connections are not shown on the Contract Drawings, they are required. It is the intent of this Contract to provide a service connection for each housing unit, to the water main, as directed by the General Contractor. All service connections for existing housing units shall be located in the field as construction progresses. Service connections shall be paid for under the unit price bid for this item. Service connections disturbed or damaged by the Contractor which are beyond the limits of Work, or within the limits of the Work and not ordered removed by the General Contractor, shall be repaired or replaced by the Contractor at his own expense.

3.2.8 Cutting of Pipe: Whenever pipe requires cutting, it shall be done with an approved pipe cutter in such a manner as to leave a smooth end at right angles to the axis of the pipe. Cutting by hammer and cold chisel shall not be permitted. When a piece of pipe is cut, no direct compensation will be made for the portion cut off and not used in the line.

3.2.9 Sequence of Work: Excavation, cleaning, laying, jointing and backfilling of buried pipe shall be performed as promptly as possible upon completion of the previous operation. In no case shall pipe be left in the trench overnight without completing jointing. Trenches shall be partially backfilled or protected immediately after pipes are laid and joints inspected by the Construction Manager, unless other protection of the pipeline is directed. This partial backfilling does not imply approval of the buried pipe nor does it relieve the Contractor of the responsibility of locating to repair or replace defective work subsequent to testing. Normally, partial backfilling shall not follow jointing and final alignment of pipe by more than three lengths of pipe. The completed pipeline shall never be left exposed in the trench unnecessarily. At the close of each workday, when pipe laying is not in progress, the exposed end of the pipeline in the trench shall be closed by the use of an approved head or barrier of wood or metals. If at any time it becomes

necessary to cover the end of an uncompleted pipeline with backfill, the end of the pipe shall be closed using a mechanical joint plug for pipe.

3.2.10 Pipe Caps and Plugs: All caps and plugs shall be thrusted, braced, staked, anchored, wired on or otherwise secured to the pipe to prevent leakage under the maximum anticipated thrust from internal abnormal operating conditions or test pressures from water or air.

3.3 CONCRETE

3.3.1 General: Concrete shall not be placed before forms, embedded materials, and reinforcement are securely fastened in position, and these and all other preliminary work have been inspected and approved. If chutes are used, they shall be of metal or metal lined. Concrete shall not, under any circumstances, be permitted to be placed using aluminum pipe, aluminum chutes or aluminum-lined chutes.

Concrete shall conform to the requirements of Section 03300, CAST-IN-PLACE CONCRETE.

3.4 FIELD TESTING

3.4.1 General: The piping systems of this Specification shall be tested as indicated on the attached piping schedule and in the manner described below. Each test shall be performed in the presence of the Engineer. The Contractor shall provide water, air and all labor, equipment and accessories required to perform the tests and retest at no additional cost the Owner.

Upon completion of the installation and as a condition of its acceptance, the Contractor shall provide all necessary equipment and personnel to perform all tests and retests, making all adjustments necessary for the equipment to operate as specified.

All noticeable leaks in the completed lines shall be satisfactorily repaired. After installation of the pipe, including the placing of the backfill, but prior to the placing of pavement materials and plantings, the pipelines shall be tested in accordance with the piping schedule. All piping shall be tested.

For sections of pipe which do not pass the test; the pipe shall be repaired and retested at no additional cost to the Owner until the requirements have been satisfied.

The Contractor shall be responsible for furnishing all labor, equipment and accessories necessary for testing and retesting and making all adjustments required. Test appurtenances shall include, but not be limited to, pressure relief devices and certified gauges.

All tests shall be performed in the presence of the Engineer.

The Contractor, at his own expense, with sound material shall replace defective pipes and fittings. All joints examined during the tests and found to be leaking shall be repaired in a satisfactory manner, in the opinion of the Engineer. Tests shall continue until a passing test is achieved.

All test gauges shall be certified for accuracy.

All instruments other than test instruments shall be disconnected during testing to prevent damage.

3.4.2 Hydrostatic Testing: The system shall be so pressurized to the hold test pressure specified for a given system on the attached piping schedule. In no case shall the internal hydrostatic pressure developed for the test be less than 200 psi or 1.5 times the working pressure, which ever is greater. Test pressure shall not exceed thrust restraint design. Valves shall not be operated during the test. Pressure shall be applied to the piping by means of a hand pump or other approved method, with all air expelled out of the line. The pump, pipe connections, certified gauges; the Contractor shall furnish test bulkheads and all necessary apparatus. Duration of the test shall be at least two (2) hours of sustained pressure unless otherwise permitted in the specific testing procedures of individual pipe sections of these specifications. Test pressure shall not vary by more than ±5 psi for the duration of the test.

The hydrostatic leakage test shall be performed in strict accordance with AWWA C 600.

If losses in pressure exceed the allowable specified, the system shall be examined and soap tested until the leak is found and corrected. All visible leaks are to be repaired regardless of the amount of leakage. No leakage is allowed for interior piping.

3.5 DISINFECTION

3.5.1 General: All fresh and domestic water mains, including building, service connections and hydrants shall be disinfected with chlorine after completion and testing of the system and before occupancy of any building. Disinfection testing shall not commence until the line has satisfactorily passed the hydrostatic testing.

3.5.2 Disinfection Procedure: The system shall be disinfected in using the Tablet Method as outlined in AWWA C 651, latest edition. The Contractor shall not test more than 1000 linear feet of water main at any given time unless otherwise directed by the Engineer.

During construction of the water main the Contractor shall place 5-gram calcium hypochlorite tablets in each section of pipe and at each fire hydrant, hydrant branch and any other water main branch as required or directed by the Engineer.

The Contractor shall completely fill and pressurize the water main and ensure that all air pockets are eliminated. The line shall be fully charged and an initial sample shall be taken. The level of chlorine shall not be less than 25 mg/l.

Allow seventy-two (72) hours for complete disinfection. The Contractor shall operate all valves in the water main several times during the disinfection period.

After the seventy-two (72) hour period has ended, a second sample shall be taken and the Free Chlorine Residual shall not be less than 10 mg/l. The line shall then be flushed and a final chlorine sample shall be taken and no Free Chlorine Residual shall be present.

3.5.3 Bacteriological Test: The Contractor shall take two (2) consecutive sets of bacteriological samples, twenty-four (24) hours apart, at a maximum distance of 1000 linear feet per test. The Contractor shall not commence bacteriological testing until all disinfection is complete and the water main is flushed clean, as directed by the Engineer.

Samples gathered shall be analyzed by a certified laboratory for the following:

TEST	**MCL**
TOTAL COLIFORM	Zero per 100 mg/l

FECAL COLIFORM	Zero per 100 mg/l

Test results are voided if chlorine residual is present in the sample. All samples taken shall meet the above said criteria in order for the line to be accepted.

All samples shall show the absence of coliform organisms. Sections of pipe which show the presence of coliform organisms shall be retested in the same manner at no additional cost to the Owner.

If a retest is required and the retest results show the absence of coliform organisms, then a third set of samples shall be gathered and tested to achieve quality assurance.

Disinfection shall include the cost and services for analysis of the total residual chlorine and coliform samples by a certified laboratory approved by the Engineer.

3.6 FINAL ACCEPTANCE

In no case shall final acceptance be given until the Contractor has complied with all requirements set forth and the Engineer has made his final inspection of the entire work and is satisfied that the entire work is properly and satisfactorily constructed and shall operate in accordance with the requirements of the Contract Documents.

No section of water main shall be placed into service until the Engineer has thoroughly reviewed all pressure, disinfection and bacteriological test results and the Contractor receives written acceptance, from the Engineer, of the tested portion of the water main.

All test results shall be submitted to the Engineer and to the owner.

END OF SECTION 33 12 00

SECTION 32 10 00 - HOT-MIX ASPHALT PAVING (Bases, Ballasts and Paving)

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Hot-mix asphalt paving.
2. Hot-mix asphalt patching.
3. Hot-mix asphalt paving overlay.
4. Asphalt surface treatments.

B. Related Sections include the following:

1. Division 31 Section "Earth Moving" for aggregate subbase and base courses and for aggregate pavement shoulders.
2. Division 32 Section "Pavement Joint Sealants" for joint sealants and fillers at paving terminations.

1.3 DEFINITIONS

A. Hot-Mix Asphalt Paving Terminology: Refer to ASTM D 8 for definitions of terms.

B. DOT: Department of Transportation.

1.4 SYSTEM DESCRIPTION

A. Provide hot-mix asphalt paving according to materials, workmanship, and other applicable requirements of standard specifications of state or local DOT.

1. Standard Specification: New Jersey Department of Transportation, 2007 as amended.
2. Measurement and payment provisions and safety program submittals included in standard specifications do not apply to this Section.

1.5 SUBMITTALS

A. Product Data: For each type of product indicated. Include technical data and tested physical and performance properties.

B. Job-Mix Designs: Certification, by authorities having jurisdiction, of approval of each job mix proposed for the Work.

C. Job-Mix Designs: For each job mix proposed for the Work.

D. Shop Drawings: Indicate pavement markings, lane separations, and defined parking spaces. Indicate, with international graphics symbol, spaces dedicated to people with disabilities.

E. Samples: For each paving fabric, 12 by 12 inches (300 by 300 mm) minimum.

F. Qualification Data: For manufacturer.

G. Material Test Reports: For each paving material.

H. Material Certificates: For each paving material, signed by manufacturers.

1.6 QUALITY ASSURANCE

A. Manufacturer Qualifications: A qualified manufacturer.

1. Manufacturer shall be a paving-mix manufacturer registered with and approved by authorities having jurisdiction or the DOT of the state in which Project is located.

B. Testing Agency Qualifications: Qualified according to ASTM D 3666 for testing indicated, as documented according to ASTM E 548.

C. Regulatory Requirements: Comply with Sections 300 and 400 of The New Jersey Department of Transportation Standard Specifications for asphalt paving work.

D. Asphalt-Paving Publication: Comply with AI MS-22, "Construction of Hot Mix Asphalt Pavements," unless more stringent requirements are indicated.

E. Pre-installation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination."

F. Pre-installation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination." Review methods and procedures related to hot-mix asphalt paving including, but not limited to, the following:

1. Review proposed sources of paving materials, including capabilities and location of plant that will manufacture hot-mix asphalt.
2. Review condition of subgrade and preparatory work.
3. Review requirements for protecting paving work, including restriction of traffic during installation period and for remainder of construction period.
4. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver pavement-marking materials to Project site in original packages with seals unbroken and bearing manufacturer's labels containing brand name and type of material, date of manufacture, and directions for storage.

B. Store pavement-marking materials in a clean, dry, protected location within temperature range required by manufacturer. Protect stored materials from direct sunlight.

1.8 PROJECT CONDITIONS

A. Environmental Limitations: Do not apply asphalt materials if subgrade is wet or excessively damp or if the following conditions are not met:

1. Prime and Tack Coats: Minimum surface temperature of 60 deg F (15.5 deg C).
2. Slurry Coat: Comply with weather limitations of ASTM D 3910.
3. Asphalt Base Course: Minimum surface temperature of 40 deg F (4 deg C) and rising at time of placement.
4. Asphalt Surface Course: Minimum surface temperature of 60 deg F (15.5 deg C) at time of placement.

PART 2 - PRODUCTS

2.1 AGGREGATES

A. General: Use materials and gradations that have performed satisfactorily in previous installations.

B. Coarse Aggregate: ASTM D 692, sound; angular crushed stone, crushed gravel, or properly cured, crushed blast-furnace slag.

C. Fine Aggregate: ASTM D 1073 or AASHTO M 29, sharp-edged natural sand or sand prepared from stone, gravel, properly cured blast-furnace slag, or combinations thereof.

1. For hot-mix asphalt, limit natural sand to a maximum of 20 percent by weight of the total aggregate mass.

D. Mineral Filler: ASTM D 242 or AASHTO M 17, rock or slag dust, hydraulic cement, or other inert material.

2.2 ASPHALT MATERIALS

A. Asphalt Binder: AASHTO MP 1, PG 70-22.

B. Asphalt Cement: ASTM D 3381 for viscosity-graded material.

C. Prime Coat: ASTM D 2027, medium-curing cutback asphalt, MC-250.

D. Prime Coat: Asphalt emulsion prime complying with The New Jersey Department of Transportation DOT requirements.

E. Tack Coat: Emulsified asphalt or ASTM D 2397 or AASHTO M 208, cationic emulsified asphalt, slow setting, diluted in water, of suitable grade and consistency for application.

F. Fog Seal: Emulsified asphalt or ASTM D 2397 or AASHTO M 208, cationic emulsified asphalt, slow setting, factory diluted in water, of suitable grade and consistency for application.

G. Water: Potable.

H. Undersealing Asphalt: ASTM D 3141 or AASHTO M 238, pumping consistency.

2.3 AUXILIARY MATERIALS

A. Herbicide: Commercial chemical for weed control, registered by the EPA. Provide in granular, liquid, or wettable powder form.

B. Sand: ASTM D 1073 or AASHTO M 29, Grade Nos. 2 or 3.

C. Paving Geotextile: AASHTO M 288, non-woven polypropylene; resistant to chemical attack, rot, and mildew; and specifically designed for paving applications.

D. Joint Sealant: ASTM D 3405 or AASHTO M 301, hot-applied, single-component, polymer-modified bituminous sealant.

E. Pavement-Marking Paint: Thermoplastic, long life.

1. Color: White for parking/traffic stripes and markings. Blue for handicap parking stripes and markings.

2. Width: 4” for parking and traffic stripes.

2.4 MIXES

A. Hot-Mix Asphalt: Dense, hot-laid, hot-mix asphalt plant mixes approved by authorities having jurisdiction designed according to procedures in AI MS-2, "Mix Design Methods for Asphalt Concrete and Other Hot-Mix Types and complying with the following requirements:

1. Provide mixes with a history of satisfactory performance in geographical area where Project is located.
2. Base Course: Mix I-2
3. Surface Course: Mix I-5

B. Hot-Mix Asphalt: Dense, hot-laid, hot-mix asphalt plant mixes approved by authorities having jurisdiction and designed according to procedures in AI MS-2, "Mix Design Methods for Asphalt Concrete and Other Hot-Mix Types."

1. Provide mixes with a history of satisfactory performance in geographical area where Project is located.
2. Provide mixes complying with composition, grading, and tolerance requirements in ASTM D 3515 for the following nominal, maximum aggregate sizes:

a. Base Course: 3 inch thick (6” thick for County road pavement restoration)

b. Surface Course: 2 inch thick.

C. Emulsified-Asphalt Slurry: ASTM D 3910, Type 3, consisting of emulsified asphalt, fine aggregate, and mineral fillers.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that subgrade is dry and in suitable condition to support paving and imposed loads.

B. Proof-roll subbase using heavy, pneumatic-tired rollers to locate areas that are unstable or that require further compaction.

C. Proceed with paving only after unsatisfactory conditions have been corrected.
1. free of loose material and dust.

3.2 SURFACE PREPARATION

A. General: Immediately before placing asphalt materials, remove loose and deleterious material from substrate surfaces. Ensure that prepared subgrade is ready to receive paving.

1. Sweep loose granular particles from surface of unbound-aggregate base course. Do not dislodge or disturb aggregate embedded in compacted surface of base course.

B. Herbicide Treatment: Apply herbicide according to manufacturer's recommended rates and written application instructions. Apply to dry, prepared subgrade or surface of compacted-aggregate base before applying paving materials.

1. Mix herbicide with prime coat if formulated by manufacturer for that purpose.

C. Prime Coat: Apply uniformly over surface of compacted unbound-aggregate base course at a rate of 0.15 to 0.50 gal./sq. yd. (0.7 to 2.3 L/sq. m). Apply enough material to penetrate and seal but not flood surface. Allow prime coat to cure for 72 hours minimum.

1. If prime coat is not entirely absorbed within 24 hours after application, spread sand over surface to blot excess asphalt. Use enough sand to prevent pickup under traffic. Remove loose sand by sweeping before pavement is placed and after volatiles have evaporated.
2. Protect primed substrate from damage until ready to receive paving.

D. Tack Coat: Apply uniformly to surfaces of existing pavement at a rate of 0.05 to 0.15 gal./sq. yd. (0.2 to 0.7 L/sq. m).

1. Allow tack coat to cure undisturbed before applying hot-mix asphalt paving.
2. Avoid smearing or staining adjoining surfaces, appurtenances, and surroundings. Remove spillages and clean affected surfaces.

3.3 PAVEMENT MARKING

A. Do not apply pavement-marking paint until layout, colors, and placement have been verified with Architect.

B. Allow paving to age for 30 days or as directed before starting pavement marking.

C. Sweep and clean surface to eliminate loose material and dust.

D. Apply paint with mechanical equipment to produce pavement markings, of dimensions indicated, with uniform, straight edges. Apply at manufacturer's recommended rates to provide a minimum wet film thickness of 15 mils (0.4 mm).

3.4 HOT-MIX ASPHALT PLACING

A. Machine place hot-mix asphalt on prepared surface, spread uniformly, and strike off. Place asphalt mix by hand to areas inaccessible to equipment in a manner that prevents segregation of mix. Place each course to required grade, cross section, and thickness when compacted.

1. Place hot-mix asphalt base course in number of lifts and thicknesses indicated.
2. Place hot-mix asphalt surface course in single lift.
3. Spread mix at minimum temperature of 250 deg F (121 deg C).
4. Begin applying mix along centerline of crown for crowned sections and on high side of one-way slopes, unless otherwise indicated.
5. Regulate paver machine speed to obtain smooth, continuous surface free of pulls and tears in asphalt-paving mat.

B. Place paving in consecutive strips not less than 10 feet (3 m) wide unless infill edge strips of a lesser width are required.

1. After first strip has been placed and rolled, place succeeding strips and extend rolling to overlap previous strips. Complete a section of asphalt base course before placing asphalt surface course.

C. Promptly correct surface irregularities in paving course behind paver. Use suitable hand tools to remove excess material forming high spots. Fill depressions with hot-mix asphalt to prevent segregation of mix; use suitable hand tools to smooth surface.

3.5 JOINTS

A. Construct joints to ensure a continuous bond between adjoining paving sections. Construct joints free of depressions with same texture and smoothness as other sections of hot-mix asphalt course.

1. Clean contact surfaces and apply tack coat to joints.
2. Offset longitudinal joints, in successive courses, a minimum of 6 inches (150 mm).
3. Offset transverse joints, in successive courses, a minimum of 24 inches (600 mm).
4. Construct transverse joints as described in AI MS-22, "Construction of Hot Mix Asphalt Pavements."
5. Compact joints as soon as hot-mix asphalt will bear roller weight without excessive displacement.

6. Compact asphalt at joints to a density within 2 percent of specified course density.

3.6 COMPACTION

A. General: Begin compaction as soon as placed hot-mix paving will bear roller weight without excessive displacement. Compact hot-mix paving with hot, hand tampers or vibratory-plate compactors in areas inaccessible to rollers.

1. Complete compaction before mix temperature cools to 185 deg F (85 deg C).

B. Breakdown Rolling: Complete breakdown or initial rolling immediately after rolling joints and outside edge. Examine surface immediately after breakdown rolling for indicated crown, grade, and smoothness. Correct laydown and rolling operations to comply with requirements.

C. Intermediate Rolling: Begin intermediate rolling immediately after breakdown rolling while hot-mix asphalt is still hot enough to achieve specified density. Continue rolling until hot-mix asphalt course has been uniformly compacted to the following density:

1. Average Density: 96 percent of reference laboratory density according to AASHTO T 245, but not less than 94 percent nor greater than 100 percent.
2. Average Density: 92 percent of reference maximum theoretical density according to ASTM D 2041, but not less than 90 percent nor greater than 96 percent.

D. Finish Rolling: Finish roll paved surfaces to remove roller marks while hot-mix asphalt is still warm.

E. Edge Shaping: While surface is being compacted and finished, trim edges of pavement to proper alignment. Bevel edges while asphalt is still hot; compact thoroughly.

F. Repairs: Remove paved areas that are defective or contaminated with foreign materials and replace with fresh, hot-mix asphalt. Compact by rolling to specified density and surface smoothness.

G. Protection: After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened.

H. Erect barricades to protect paving from traffic until mixture has cooled enough not to become marked.

3.7 INSTALLATION TOLERANCES

A. Thickness: Compact each course to produce the thickness indicated within the following tolerances:

1. Base Course: Plus or minus 1/2 inch (13 mm).
2. Surface Course: Plus 1/4 inch (6 mm), no minus.

B. Surface Smoothness: Compact each course to produce a surface smoothness within the following tolerances as determined by using a 10-foot (3-m) straightedge applied transversely or longitudinally to paved areas:

1. Base Course: 1/4 inch (6 mm).
2. Surface Course: 1/8 inch (3 mm).
3. Crowned Surfaces: Test with crowned template centered and at right angle to crown. Maximum allowable variance from template is 1/4 inch (6 mm).

3.8 SURFACE TREATMENTS

A. Fog Seals: Apply fog seal at a rate of 0.10 to 0.15 gal./sq. yd. (0.45 to 0.7 L/sq. m) to existing asphalt pavement and allow to cure. With a fine sand, lightly dust areas receiving excess fog seal.

B. Slurry Seals: Apply slurry coat in a uniform thickness according to ASTM D 3910 and allow to cure.

1. Roll slurry seal to remove ridges and provide a uniform, smooth surface.

3.9 FIELD QUALITY CONTROL

A. Testing Agency: The Architect will engage a qualified independent testing and inspecting agency to perform field tests and inspections and to prepare test reports.

1. Testing agency will conduct and interpret tests and state in each report whether tested work complies with or deviates from specified requirements.

B. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

C. Thickness: In-place compacted thickness of hot-mix asphalt courses will be determined according to ASTM D 3549.

D. Surface Smoothness: Finished surface of each hot-mix asphalt course will be tested for compliance with smoothness tolerances.

E. In-Place Density: Testing agency will take samples of uncompacted paving mixtures and compacted pavement according to ASTM D 979 or AASHTO T 168.

1. Reference maximum theoretical density will be determined by averaging results from four samples of hot-mix asphalt-paving mixture delivered daily to site, prepared according to ASTM D 2041, and compacted according to job-mix specifications.
2. In-place density of compacted pavement will be determined by testing core samples according to ASTM D 1188 or ASTM D 2726.

    a. One core sample will be taken for every 1000 sq. yd. (836 sq. m) or less of installed pavement, with no fewer than 3 cores taken.
    b. Field density of in-place compacted pavement may also be determined by nuclear method according to ASTM D 2950 and correlated with ASTM D 1188 or ASTM D 2726.

F. Remove and replace or install additional hot-mix asphalt where test results or measurements indicate that it does not comply with specified requirements.

3.10 DISPOSAL

A. Except for material indicated to be recycled, remove excavated materials from Project site and legally dispose of them in an EPA-approved landfill.

1. Do not allow excavated materials to accumulate on-site.

3.11 DENSE GRADED AGGREGATE BASE

A. Dense Graded Aggregate Base Course construction shall conform to Section 302 of the New Jersey Department of Transportation Standard Specifications for Road and Bridge Construction 2007 and as amended.

END OF SECTION 32 10 00

SECTION 32 12 73 – ASPHALT PAVING JOINT SEALANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Expansion and contraction joints within portland cement concrete pavement.
2. Joints between portland cement concrete and asphalt pavement.

B. Related Sections include the following:

1. Division 32 Section "Hot-Mix Asphalt Paving" for constructing joints between concrete and asphalt pavement.
2. Division 07 Section "Joint Sealants" for sealing non-traffic and traffic joints in locations not specified in this Section.

1.3 SUBMITTALS

A. Product Data: For each joint-sealant product indicated.

B. Samples for Verification: For each type and color of joint sealant required. Install joint-sealant samples in 1/2-inch- (13-mm-) wide joints formed between two 6-inch- (150-mm-) long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.

C. Product Certificates: Signed by manufacturers of joint sealants certifying that products furnished comply with requirements and are suitable for the use indicated.

D. Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

E. Compatibility and Adhesion Test Reports: From joint sealant manufacturer indicating the following:

1. Materials forming joint substrates and joint-sealant backer materials have been tested for compatibility and adhesion with joint sealants.
2. Interpretation of test results and written recommendations for primers and substrate preparation needed for adhesion.

F. Product Test Reports: From a qualified testing agency indicating joint sealants comply with requirements, based on comprehensive testing of current product formulations.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer who has specialized in installing joint sealants similar in material, design, and extent to those indicated for this Project and whose work has resulted in joint-sealant installations with a record of successful in-service performance.

B. Source Limitations: Obtain each type of joint sealant through one source from a single manufacturer.

C. Product Testing: Obtain test results for "Product Test Reports" Paragraph in "Submittals" Article from a qualified testing agency, based on testing current sealant formulations within a 36-month period.

1. Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 to conduct the testing indicated, as documented according to ASTM E 548.
2. Test joint sealants for compliance with requirements indicated by referencing standard specifications and test methods.

D. Preconstruction Compatibility and Adhesion Testing: Submit to joint sealant manufacturer, for testing indicated below, samples of materials that will contact or affect joint sealants.

1. Use manufacturer's standard test methods to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.

a. Perform tests under environmental conditions replicating those that will exist during installation.

2. Submit not fewer than nine pieces of each type of material, including joint substrates, joint-sealant backer materials, secondary seals, and miscellaneous material.
3. Schedule sufficient time for testing and analyzing results to prevent delaying the Work.
4. For materials failing tests, obtain joint sealant manufacturer's written instructions for corrective measures, including the use of specially formulated primers.
5. Testing will not be required if joint sealant manufacturer submits joint preparation data that are based on previous testing of current sealant products for adhesion to, and compatibility with, joint substrates and other materials matching those submitted.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to Project site in original unopened containers or bundles with labels indicating manufacturer, product name and designation, color, expiration date, pot life, curing time, and mixing instructions for multicomponent materials.

B. Store and handle materials to comply with manufacturer's written instructions to prevent their deterioration or damage due to moisture, high or low temperatures, contaminants, or other causes.

1.6 PROJECT CONDITIONS

A. Environmental Limitations: Do not proceed with installation of joint sealants under the following conditions:

1. When ambient and substrate temperature conditions are outside limits permitted by joint sealant manufacturer.
2. When ambient and substrate temperature conditions are outside limits permitted by joint sealant manufacturer or are below 40 deg F (4.4 deg C).
3. When joint substrates are wet.

B. Joint-Width Conditions: Do not proceed with installation of joint sealants where joint widths are less than that allowed by joint sealant manufacturer for application indicated.

C. Joint-Substrate Conditions: Do not proceed with installation of joint sealants until contaminants capable of interfering with their adhesion are removed from joint substrates.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

A. Compatibility: Provide joint sealants, backing materials, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint sealant manufacturer based on testing and field experience.

B. Colors of Exposed Joint Sealants: Match Architect's samples.

C. Colors of Exposed Joint Sealants: As indicated by referencing manufacturer's designations.

D. Colors of Exposed Joint Sealants: As selected by the Architect from manufacturer's full ranges for this characteristic.

2.2 COLD-APPLIED JOINT SEALANTS

A. Mult-icomponent Jet-Fuel-Resistant Sealant for Concrete: Pourable, chemically curing elastomeric formulation complying with the following requirements for formulation and with ASTM C 920 for type, grade, class, and uses indicated:

1. Urethane Formulation: Type M; Grade P; Class 12-1/2; Uses T, M, and, as applicable to joint substrates indicated, O.
2. Coal-Tar-Modified Polymer Formulation: Type M; Grade P; Class 25; Uses T and, as applicable to joint substrates indicated, O.
3. Bitumen-Modified Urethane Formulation: Type M; Grade P; Class 25; Uses T, M, and, as applicable to joint substrates indicated, O.

B. Single-Component Jet-Fuel-Resistant Urethane Sealant for Concrete: Single-component, pourable, coal-tar-modified, urethane formulation complying with ASTM C 920 for Type S; Grade P; Class 25; Uses T, M, and, as applicable to joint substrates indicated, O.

C. Type NS Silicone Sealant for Concrete: Single-component, low-modulus, neutral-curing, non-sag silicone sealant complying with ASTM D 5893 for Type NS.

D. Type SL Silicone Sealant for Concrete and Asphalt: Single-component, low-modulus, neutral-curing, self-leveling silicone sealant complying with ASTM D 5893 for Type SL.

E. Multi-component Low-Modulus Sealant for Concrete and Asphalt: Proprietary formulation consisting of reactive petropolymer and activator components producing a pourable, self-leveling sealant.

F. Available Products: Subject to compliance with requirements, cold-applied joint sealants that may be incorporated into the Work include, but are not limited to, the following:

G. Products: Subject to compliance with requirements, provide one of the following:

1. Multi-component Jet-Fuel-Resistant Sealant for Concrete:

   a. Vulkem 202; Mameco International.
   b. SEALTIGHT GARDOX; W.R. Meadows, Inc.
   c. Urexpan NR-300; Pecora Corporation.
   d. Sonomeric 2; Sonneborn Building Products Div., ChemRex, Inc.

2. Single-Component Jet-Fuel-Resistant Urethane Sealant for Concrete:

   a. Vulkem 200; Mameco International.
   b. Sonomeric 1; Sonneborn Building Products Div., ChemRex, Inc.

3. Type NS Silicone Sealant for Concrete:

   a. Roadsaver Silicone-SL; Crafco Inc.
   b. 888; Dow Corning.

4. Type SL Silicone Sealant for Concrete and Asphalt:

   a. 890-SL; Dow Corning.

5. Multicomponent Low-Modulus Sealant for Concrete and Asphalt:

   a. SOF-SEAL; W.R. Meadows, Inc.

2.3 HOT-APPLIED JOINT SEALANTS

A. Jet-Fuel-Resistant Elastomeric Sealant for Concrete: Single-component formulation complying with ASTM D 3569.

B. Jet-Fuel-Resistant Sealant for Concrete and Tar Concrete: Single-component formulation complying with ASTM D 3581.

C. Elastomeric Sealant for Concrete: Single-component formulation complying with ASTM D 3406.

D. Sealant for Concrete and Asphalt: Single-component formulation complying with ASTM D 3405.

E. Available Products: Subject to compliance with requirements, hot-applied joint sealants that may be incorporated into the Work include, but are not limited to, the following:

F. Products: Subject to compliance with requirements, provide one of the following:

1. Jet-Fuel-Resistant Elastomeric Sealant for Concrete:

a. Superseal 444/777; Crafco, Inc.
b. POLY-JET 3569; W.R. Meadows, Inc.

2. Jet-Fuel-Resistant Sealant for Concrete and Tar Concrete:

a. SUPERSEAL 1614A; Crafco Inc.
b. POLY-JET 1614; W.R. Meadows, Inc.
c. POLY-JET 3406; W.R. Meadows, Inc.
d. POLY-JET 3569, W.R. Meadows, Inc.

3. Elastomeric Sealant for Concrete:

a. Superseal 444/777; Crafco, Inc.
b. POLY-JET 3406; W.R. Meadows, Inc.

4. Sealant for Concrete and Asphalt:

a. ROADSAVER 221; Crafco Inc.
b. Product #9005; Koch Materials Company.
c. Product #9030; Koch Materials Company.
d. SEALTIGHT HI-SPEC; W.R. Meadows, Inc.

2.4 JOINT-SEALANT BACKER MATERIALS

A. General: Provide joint-sealant backer materials that are non-staining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by joint sealant manufacturer based on field experience and laboratory testing.

B. Round Backer Rod for Cold- and Hot-Applied Sealants: ASTM D 5249, Type 1, of diameter and density required to control sealant depths and prevent bottom-side adhesion of sealant.

C. Backer Strips for Cold- and Hot-Applied Sealants: ASTM D 5249; Type 2; of thickness and width required to control sealant depths, prevent bottom-side adhesion of sealant, and fill remainder of joint opening under sealant.

D. Round Backer Rods for Cold-Applied Sealants: ASTM D 5249, Type 3, of diameter and density required to control sealant depths and prevent bottom-side adhesion of sealant.

2.5 PRIMERS

A. Primers: Product recommended by joint sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint- sealant-substrate tests and field tests.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint sealant manufacturer's written instructions.

B. Joint Priming: Prime joint substrates where indicated or where recommended in writing by joint sealant manufacturer, based on preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

3.3 INSTALLATION OF JOINT SEALANTS

A. General: Comply with joint sealant manufacturer's written installation instructions applicable to products and applications indicated, unless more stringent requirements apply.

B. Sealant Installation Standard: Comply with recommendations of ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

C. Install backer materials of type indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.

1. Do not leave gaps between ends of backer materials.
2. Do not stretch, twist, puncture, or tear backer materials.
3. Remove absorbent backer materials that have become wet before sealant application and replace them with dry materials.

D. Install sealants by proven techniques to comply with the following and at the same time backings are installed:

1. Place sealants so they directly contact and fully wet joint substrates.
2. Completely fill recesses provided for each joint configuration.
3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

E. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.

1. Remove excess sealants from surfaces adjacent to joint.
2. Use tooling agents that are approved in writing by joint sealant manufacturer and that do not discolor sealants or adjacent surfaces.

F. Provide joint configuration to comply with joint sealant manufacturer's written instructions, unless otherwise indicated.

G. Provide recessed joint configuration for silicone sealants of recess depth and at locations indicated.

3.4 CLEANING

A. Clean off excess sealants or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved by manufacturers of joint sealants and of products in which joints occur.

3.5 PROTECTION

A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from the original work.

END OF SECTION 32 12 73

SECTION 321600 - CONCRETE SIDEWALKS AND CURBS

PART 1 - GENERAL

1.1 DESCRIPTION

1.1.1 General

Concrete curb shall be constructed as part of the restoration work that may be necessary to replace existing sidewalks and curbs removed in the construction of this project and in situations an existing curb is damaged due to the Contractor's operations. Concrete sidewalks and curbs shall also be constructed at locations as indicated on the contract drawings. Concrete sidewalk and curb shall be constructed in accordance with these specifications.

1.1.2 Work Included

Under this section, the Contractor shall provide all labor, equipment and material necessary to furnish and concrete curb complete in place, and as shown on the Contract Drawings, specified herein and approved by the Engineer.

In general, work to be included under this section shall include, but not be limited to, the following:

(1) Concrete Sidewalks
(2) Concrete Vertical Curbs

1.1.3 Related Work Described Elsewhere:

Select Fill and Foundation Material	Section 320516
Excavation, Backfilling and Compacting	Section 312300

1.2 WEATHER LIMITATIONS

1.2.1 Placing During Cold Weather

Concrete placement shall not take place when the air temperature 40 degrees F and is falling, or is already below that point.

Placement may begin when the air temperature reaches 35 degrees F and is rising, or is already above 40 degrees F. Provisions shall be made to protect the concrete from freezing during the specified curing period. If necessary to place concrete when the temperature of the air, aggregates, or water is below 35 degrees F, placement and protection shall be approved in writing.

Approval will be contingent upon full conformance with the following provisions.

1. The underlying material shall be prepared and protected so that it is entirely free of frost when the concrete is deposited.
2. Mixing water shall be heated as necessary to result in the temperature of the in-place concrete being between 50 and 85 degrees F. Methods and equipment for heating shall be approved.
3. The aggregates shall be free of ice, snow, and frozen lumps before entering the mixer.

4. Covering and other means shall be provided for maintaining the concrete at a temperature of at least 50 degrees F for not less than 72 hours after placing, and at a temperature above freezing for the remainder of the curing period.

1.2.2 Placing During Warm Weather

The temperature of the concrete as placed shall not exceed C 85 degrees F except where an approved retarder is used. The mixing water and/or aggregates shall be cooled, if necessary, to maintain a satisfactory placing temperature. The placing temperature shall not exceed 95 degrees F at any time.

1.3 PLANT, EQUIPMENT, MACHINES, AND TOOLS

Plant, equipment, machines, and tools used in the work shall be subject to approval and shall be maintained in a satisfactory working condition at all times. The equipment shall have the capability of producing the required product, meeting grade controls, thickness control and smoothness requirements as specified. Use of the equipment shall be discontinued if it produces unsatisfactory results. The Engineer shall have access at all times to the plant and equipment to ensure proper operation and compliance with specifications.

PART 2 - PRODUCTS

2.1 CONCRETE

2.1.1 General

Concrete shall have a minimum compressive strength of 4000 psi at 28 days. Maximum size of aggregate shall be 1-1/2 inches.

2.1.2 Air Content

Mixtures shall have air content by volume of concrete of 5 to 7 percent, based on measurements made immediately after discharge from the mixer.

2.1.3 Slump

The concrete slump shall be 2 inches plus or minus 1 inch where determined in accordance with ASTM C 143.

2.1.4 Reinforcement

Wire mesh reinforcement shall conform to ASTM A 185.

2.2 CONCRETE CURING MATERIALS

2.2.1 Impervious Sheet Materials

Impervious sheet materials shall conform to ASTM C 171, type optional, except that polyethylene film, if used, shall be white opaque.

2.2.2 Burlap

Burlap shall conform to AASHTO M 182.

2.3 CONCRETE PROTECTION MATERIALS

Concrete protection materials shall be a linseed oil mixture of equal parts, by volume, of linseed oil and mineral spirits. At the option of the contractor, commercially prepared linseed oil mixtures, formulated specifically for application to concrete to provide protection against the action of deicing chemicals may be used, except that emulsified mixtures are not acceptable.

2.4 JOINT FILLER STRIPS

2.4.1 Contraction Joint Filler for Curb

Contraction joint filler for curb and gutter shall consist of hard-pressed fiberboard.

2.4.2 Expansion Joint Filler, Premolded

Expansion joint filler, premolded, shall conform to ASTM D 1751 or ASTM D 1752, 3/8 inch thick, unless otherwise indicated.

2.6 FORM WORK

2.6.1 General

Form work shall be designed and constructed to ensure that the finished concrete will conform accurately to the indicated dimensions, lines, and elevations, and within the tolerances specified. Forms shall be of wood or steel, straight, of sufficient strength to resist springing during depositing and consolidating concrete. Wood forms shall be surfaced plank, 2 inches nominal thickness, straight and free from warp, twist, loose knots, splits or other defects. Wood forms shall have a nominal length of 10 feet. Radius bends may be formed with 3/4 inch boards, laminated to the required thickness. Steel forms shall be channel-formed sections with a flat top surface and with welded braces at each end and at not less than two intermediate points. Ends of steel forms shall be interlocking and self-aligning. Steel forms shall include flexible forms for radius forming, corner forms, form spreaders, and fillers. Steel forms shall have a nominal length of 10 feet with a minimum of 3 welded stake pockets per form. Stake pins shall be solid steel rods with chamfered heads and pointed tips designed for use with steel forms.

2.6.2 Sidewalk Forms

Sidewalk forms shall be of a height equal to the full depth of the finished sidewalk.

2.6.3 Curb Forms

Curb forms shall have a height equal to the full depth of the curb. The inside form of curb shall have batter as indicated and shall be securely fastened to and supported by the outside form. Rigid forms shall be provided for curb returns, except that benders or thin plank forms may be used for curb or curb returns with a radius 10 feet or more, where grade changes occur in the return, or where the central angle is such that a rigid form with a central angle of 90 degrees cannot be used. Back forms

for curb returns may be made of 1-1/2 inch benders, for the full height of the curb, cleated together. In lieu of inside forms for curbs, a curb "mule" may be used for forming and finishing this surface, provided the results are approved.

PART 3 - EXECUTION

3.1 SUBGRADE PREPARATION

3.1.1 General

The subgrade shall be constructed to the specified grade and cross section prior to concrete placement. Subgrade shall be placed and compacted in conformance with Section 02221, EXCAVATION, BACKFILLING AND COMPACTING.

3.1.2 Sidewalk Subgrade

The subgrade shall be tested for grade and cross section with a template extending the full width of the sidewalk and supported between side forms

3.1.3 Curb and Gutter Subgrade

The subgrade shall be tested for grade and cross section by means of a template extending the full width of the curb and gutter. The subgrade shall be of materials equal in bearing quality to the subgrade under the adjacent pavement.

3.1.4 Maintenance of Subgrade

The subgrade shall be maintained in a smooth, compacted condition in conformity with the required section and established grade until the concrete is placed. The subgrade shall be in a moist condition when concrete is placed. The subgrade shall be prepared and protected to produce a subgrade free from frost when the concrete is deposited.

3.2 FORM SETTING

3.2.1 General

Forms shall be set to the indicated alignment, grade and dimensions. Forms shall be held rigidly in place by a minimum of 3 stakes per form placed at intervals not to exceed 4 feet. Corners, deep sections, and radius bends shall have additional stakes and braces, as required. Clamps, spreaders, and braces shall be used where required to ensure rigidity in the forms. Forms shall be removed without injuring the concrete. Bars or heavy tools shall not be used against the concrete in removing the forms.

Any concrete found defective after form removal shall be promptly and satisfactorily repaired. Forms shall be cleaned and coated with form oil each time before concrete is placed. Wood forms may, instead, be thoroughly wetted with water before concrete is placed, except that with probable freezing temperatures, oiling is mandatory.

3.2.2 Sidewalks

Forms for sidewalks shall be set with the upper edge true to line and grade with an allowable tolerance of 1/8 inch in any 10 foot long section. After forms are set, grade and alignment shall be checked with a 10 foot straightedge. Forms shall have a transverse slope 1/4 inch per foot with the low side adjacent to the roadway or as indicated. Side forms shall not be removed for 12 hours after finishing has been completed.

3.2.3 Curbs

The forms of the front of the curb shall be removed not less than 2 hours nor more than 6 hours after the concrete has been placed. Forms back of curb shall remain in place until the face and top of the curb have been finished, as specified for concrete finishing.

3.3 SIDEWALK CONCRETE PLACEMENT AND FINISHING

3.3.1 Formed Sidewalks Concrete shall be placed in the forms in one layer. When consolidated and finished, the sidewalks shall be of the thickness indicated. After concrete has been placed in the forms, a strike-off guided by side forms shall be used to bring the surface to proper section to be compacted. The concrete shall be consolidated with an approved vibrator, and the surface shall be finished to grade with a strike off.

3.3.2 Concrete Finishing

After straight edging, when most of the water sheen has disappeared, and just before the concrete hardens, the surface shall be finished with a wood float or darby to a smooth and uniformly fine granular or sandy texture free of waves, irregularities, or tool marks. A scored surface shall be produced by brooming with a fiber-bristle brush in a direction transverse to that of the traffic, followed by edging.

3.3.3 Edge and Joint Finishing

All slab edges, including those at formed joints, shall be finished with an edger having a radius1/8 inch. Transverse joint shall be edged before brooming, and the brooming shall eliminate the flat surface left by the surface face of the edger. Corners and edges which have crumbled and areas which lack sufficient mortar for proper finishing shall be cleaned and filled solidly with a properly proportioned mortar mixture and then finished.

3.3.4 Surface and Thickness Tolerances

Finished surfaces shall not vary more than 5/16 inch from the testing edge of a 10-foot straightedge. Permissible deficiency in section thickness will be up to 1/4 inch.

3.4 CURB CONCRETE PLACEMENT AND FINISHING

3.4.1 Formed Curb

Concrete shall be placed to the section required in a single lift.

Consolidation shall be achieved by using approved mechanical vibrators.

3.4.2 Curb Finishing

Approved slip formed curb machines may be used in lieu of hand placement.

3.4.3 Concrete Finishing

Exposed surfaces shall be floated and finished with a smooth wood float until true to grade and section and uniform in texture. Floated surfaces shall then be brushed with a fine-hair brush with longitudinal strokes. The edges of the top of the curb shall be rounded with an edging tool to a radius of 1/2 inch. Immediately after removing the front curb form, the face of the curb shall be rubbed with a wood or concrete rubbing block and water until blemishes, form marks, and tool marks have been removed. The front curb surface, while still wet, shall be brushed in the same manner as the curb top. The top surface of gutter and entrance shall be finished to grade with a wood float.

3.4.4 Joint Finishing

Curb edges at formed joints shall be finished as indicated.

3.4.5 Surface and Thickness Tolerances

Finished surfaces shall not vary more than 1/4 inch from the testing edge of a 10-foot straightedge. Permissible deficiency in section thickness will be up to 1/4 inch.

3.5 SIDEWALK JOINTS

3.5.1 General

Sidewalk joints shall be constructed to divide the surface into rectangular areas. Transverse contraction joints shall be spaced at a distance equal to the sidewalk width or 5 feet on centers, whichever is less, and shall be continuous across the slab. Longitudinal contraction joints shall be constructed along the centerline of all sidewalks 20 feet or more in width. Transverse expansion joints shall be installed at sidewalk returns and opposite expansion joints in adjoining curbs. Where the sidewalk is not in contact with the curb, transverse expansion joints shall be installed as indicated. Expansion joints shall be formed about structures and features which project through or into the sidewalk pavement, using joint filler of the type, thickness, and width indicated.

3.5.2 Sidewalk Contraction Joints (Blind)

The contraction joints shall be formed in the fresh concrete by cutting a groove in the top portion of the slab to a depth of at least one-fourth of the sidewalk slab thickness, using a jointer to cut the groove, or by sawing a groove in the hardened concrete with a power-driven saw, unless otherwise approved. Sawed joints shall be constructed by sawing a groove in the concrete with a 1/8 inch blade to the depth indicated. An ample supply of saw blades shall be available on the job before concrete placement is started, and at least one standby sawing unit in good working order shall be available at the jobsite at all times during the sawing operations.

3.5.3 Sidewalk Expansion Joints

Expansion joints shall be formed with 1/2 inch joint filler strips. Joint filler shall be placed with top edge 1/4 inch below the surface and shall be held in place with steel

pins or other devices to prevent warping of the filler during floating and finishing. Immediately after finishing operations are completed, joint edges shall be rounded with an edging tool having a radius of 1/8 inch, and concrete over the joint filler shall be removed.

3.5.4 Reinforcement Steel Placement

Reinforcement steel shall be accurately and securely fastened in place with suitable supports and ties before the concrete is placed.

3.6 CURB AND JOINTS

3.6.1 General

Curb and gutter joints shall be constructed at right angles to the line of curb.

3.6.2 Contraction Joints (Blind)

Contraction joints shall be constructed by means of 1/8 inch thick separators and of a section conforming to the cross section of the curb. Separators shall be removed as soon as practicable after concrete has set sufficiently to preserve the width and shape of the joint and prior to finishing.

3.6.3 Expansion Joints

Expansion joints shall be formed by means of preformed expansion joint filler material cut and shaped to the cross section of curb and gutter.

Expansion joints shall be provided in curb at least 3/8 inch in width and shall be provided at intervals not exceeding 20 feet.

3.7 CURING AND PROTECTION

3.7.1 General

Concrete shall be protected against loss of moisture and rapid temperature changes for at least 7 days from the beginning of the curing operation.

Unhardened concrete shall be protected from rain and flowing water. All equipment needed for adequate curing and protection of the concrete shall be on hand and ready for use before actual concrete placement begins.

Protection shall be provided as necessary to prevent cracking of the pavement due to temperature changes during the curing period.

A. Mat Method

The entire exposed surface shall be covered with 2 or more layers of burlap. Mats shall overlap each other at least 150 mm. 6 inches. The mat shall be thoroughly wetted with water prior to placing on concrete surface and shall be kept continuously in a saturated condition and in intimate contact with concrete for not less than 7 days.

B. Impervious Sheeting Method

The entire exposed surface shall be wetted with a fine spray of water and then covered with impervious sheeting material. Sheets shall be laid directly on the concrete surface with the light-colored side up and overlapped 12 inches when a continuous sheet is not used. The curing medium shall not be less than 18-inches wider than the concrete surface to be cured, and shall be securely weighted down by heavy wood planks, or a bank of moist earth placed along edges and laps in the sheets. Sheets shall be satisfactorily repaired or replaced if torn or otherwise damaged during curing. The curing medium shall remain on the concrete surface to be cured for not less than 7 days.

3.7.2 Backfilling

After curing, debris shall be removed and the area adjoining the concrete shall be backfilled, graded, and compacted to conform to the surrounding area in accordance with lines and grades indicated.

3.7.3 Protection

Completed concrete shall be protected from damage until accepted. The Contractor shall repair damaged concrete and clean concrete discolored during construction. Concrete that is damaged shall be removed and reconstructed for the entire length between regularly scheduled joints.

Refinishing the damaged portion will not be acceptable. Removed damaged portions shall be disposed of as directed.

3.8 FIELD QUALITY CONTROL

3.8.1 General

The Contractor shall perform the inspection and tests described and meet the specified requirements for inspection details and frequency of testing.

Based upon the results of these inspections and tests, the Contractor shall take the action and submit reports as required below, and any additional tests to insure that the requirements of these specifications are met.

3.8.2 Concrete Testing

A. Strength Testing

The Contractor shall provide molded concrete specimens for strength tests. Samples of concrete placed each day shall be taken not less than once a day nor less than once for every 250 cubic yards of concrete.

The samples for strength tests shall be taken in accordance with ASTM C 172. Cylinders for acceptance shall be molded in conformance with ASTM C 31/C 31M by an approved testing laboratory. Each strength test result shall be the average of 2 test cylinders from the same concrete sample tested at 28 days, unless otherwise specified or approved. Concrete specified on the basis of compressive strength will be considered satisfactory if the averages of all sets of three consecutive strength test results equal or exceed the

specified strength, and no individual strength test result falls below the specified strength by more than. 500 psi.

B. Air Content

Air content shall be determined in accordance with ASTM C 173 or ASTM C 231. ASTM C 231 shall be used with concretes and mortars made with relatively dense natural aggregates. Two tests for air content shall be made on randomly selected batches of each class of concrete placed during each shift. Additional tests shall be made when excessive variation in concrete workability is reported by the placing foreman or the Government inspector.

If results are out of tolerance, the placing foreman shall be notified and he shall take appropriate action to have the air content corrected at the plant. Additional tests for air content will be performed on each truckload of material until such time as the air content is within the tolerance specified.

C. Slump Test

Two slump tests shall be made on randomly selected batches of each class of concrete for every 190 cubic meters, 250 cubic yards, or fraction thereof, of concrete placed during each shift. Additional tests shall be performed when excessive variation in the workability of the concrete is noted or when excessive crumbling or slumping is noted along the edges of slip-formed concrete.

3.8.3 Thickness Evaluation

The anticipated thickness of the concrete shall be determined prior to placement by passing a template through the formed section or by measuring the depth of opening of the extrusion template of the curb forming machine. If a slip form paver is used for sidewalk placement, the subgrade shall be true to grade prior to concrete placement and the thickness will be determined by measuring each edge of the completed slab.

3.8.4 Surface Evaluation

The finished surface of each category of the completed work shall be uniform in color and free of blemishes and form or tool marks.

Exposed surfaces of the finished work will be inspected by the Engineer and any deficiencies in appearance will be identified. Areas which exhibit excessive cracking, discoloration, form marks, or tool marks or which are otherwise inconsistent with the overall appearances of the work shall be removed and replaced.

3.8.5 Appearance

Exposed surfaces of the finished work will be inspected by the Engineer and any deficiencies in appearance will be identified. Areas which exhibit excessive cracking, discoloration, form marks, or tool marks or which are otherwise inconsistent with the overall appearances of the work shall be removed and replaced.

END OF SECTION 321600

SECTION 32 17 23 - PAVEMENT MARKINGS

PART 1 - GENERAL

1.1 DESCRIPTION

This work shall consist of furnishing and applying paint on pavement surfaces, in the form of traffic lanes, parking bays, areas restricted to handicapped persons, crosswalks, and other detail pavement markings, in accordance with the details as shown or as prescribed by the Resident Engineer. Conform to the Manual on Uniform Traffic Control Devices for Streets and Highways, published by the U.S. Department of Transportation, Federal Highway Administration, for details not shown.

1.2 SUBMITTALS

A. In accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES, furnish Manufacturer's Certificates and Data certifying that the following materials conform to the requirements specified.

1.3 APPLICABLE PUBLICATIONS

A. The publications listed below form a part of this specification to the extent referenced. The publications are referenced in the text by the basic designation only.

B. Federal Specifications (Fed. Spec.):

TT-B-1325C.....Beads (Glass Spheres); Retro-Reflective
TT-P-1952D.....Paint, Traffic Black, and Airfield Marking, Waterborne

PART 2 - PRODUCTS

2.1 PAINT

Paint for marking pavement (parking lot and zone marking) shall conform to MPI No. 97, color as shown. Paint for obliterating existing markings shall conform to Fed. Spec. TT-P-1952D. Paint shall be in containers of at least 18 L (5 gallons). A certificate shall accompany each batch of paint stating compliance with the applicable publication.

2.2 REFLECTIVE GLASS BEADS

Beads shall conform to Fed. Spec. TT-B-1325C, Type I, Gradation A. When used in regions of high humidity, coat beads with silicone or other suitable waterproofing material to assure free flow. Furnish the glass beads in containers suitable for handling and strong enough to prevent loss during shipment. A certificate shall accompany each batch of beads stating compliance with this section.

2.3 PAINT APPLICATOR

Apply all marking by approved mechanical equipment. The equipment shall provide constant agitation of paint and travel at controlled speeds. Synchronize one or more paint "guns" to automatically begin and cut off paint flow in the case of skip lines. The equipment shall have manual control to apply continuous lines of varying length and marking widths as shown. Provide pneumatic spray guns for hand application of paint in areas where a mobile paint applicator cannot be used. // If the equipment does not have a glass bead dispenser, use a separate piece of equipment. Adjust and synchronize the equipment with the paint applicator so that the reflective beads are distributed uniformly on the paint lines within ten seconds without any waste. // An experienced technician that is thoroughly familiar with equipment, materials, and marking layouts shall control all painting equipment and operations.

2.4 SANDBLASTING EQUIPMENT

Sandblasting equipment shall include an air compressor, hoses, and nozzles of proper size and capacity as required for cleaning surfaces to be painted. The compressor shall furnish not less than 0.08 m^3/s (150 cfm) of air at a pressure of not less than 625 kPa (90 psi) at each nozzle used.

PART 3 - EXECUTION

3.1 SURFACE PREPARATION

A. Allow new pavement surfaces to cure for a period of not less than 14 days before application of marking materials.

B. Thoroughly clean all surfaces to be marked before application of paint. Remove dust, dirt, and other granular surface deposits by sweeping, blowing with compressed air, rinsing with water, or a combination of these methods. Completely remove rubber deposits, existing paint markings, and other coatings adhering to the pavement with scrapers, wire brushings, sandblasting, mechanical abrasion, or approved chemicals as directed by the Resident Engineer. The application of paint conforming to Fed. Spec. TT-P-1952D is an option to removal of existing paint markings on asphalt pavement. Apply the black paint in as many coats as necessary to completely obliterate the existing markings. Where oil or grease are present on old pavements to be marked, scrub affected areas with several applications of trisodium phosphate solution or other approved detergent or degreaser, and rinse thoroughly after each application. After cleaning, seal oil-soaked

areas with cut shellac to prevent bleeding through the new paint. Pavement marking shall follow as closely as practicable after the surface has been cleaned and dried, but do not begin any marking until the Resident Engineer has inspected the surface and gives permission to proceed. The Contractor shall establish control points for marking and provide templates to control paint application by type and color at necessary intervals. The Contractor is responsible to preserve and apply marking in conformance with the established control points.

3.2 APPLICATION

Apply uniformly painted // and reflective // pavement marking of required color(s), length, and width with true, sharp edges and ends on properly cured, prepared, and dried surfaces in conformance with the details as shown and established control points. The length and width of lines shall conform within a tolerance of plus or minus 75 mm (3 inches) and plus or minus 3 mm (1/8 inch), respectively, in the case of skip markings. The length of intervals shall not exceed the line length tolerance. Temperature of the surface to be painted and the atmosphere shall be above 10°C (50°F) and less than 35°C (95°F). Apply the paint at a wet film thickness of 0.4 mm (0.015 inch). // Disperse reflective glass beads evenly on the wet paint at a rate of 720 g/L (6 pounds per gallon) of paint. // Apply paint in one coat. At the direction of the Resident Engineer, markings showing light spots may receive additional coats. The maximum drying time requirements of the paint specifications will be strictly enforced, to prevent undue softening of asphalt, and pick-up, displacement, or discoloration by tires of traffic. If there is a deficiency in drying of the marking, discontinue paint operations until cause of the slow drying is determined and corrected. Remove and replace marking that is applied at less than minimum material rates; deviates from true alignment; exceeds stipulated length and width tolerances; or shows light spots, // faulty distribution of beads //, smears, or other deficiencies or irregularities. Use carefully controlled sand blasting, approved grinding equipment, or other approved method to remove marking so that the surface to which the marking was applied will not be damaged.

3.3 PROTECTION

Conduct operations in such a manner that necessary traffic can move without hindrance. Protect the newly painted markings so that, insofar as possible, the tires of passing vehicles will not pick up paint.

Place warning signs at the beginning of the wet line, and at points well in advance of the marking equipment for alerting approaching traffic from both directions. Place small flags or other similarly effective small objects near freshly applied markings at frequent intervals to reduce crossing by traffic. Efface and replace damaged portions of markings at no additional cost to the Government.

3.4 DETAIL PAVEMENT MARKING

Use Detail Pavement Markings, exclusive of actual traffic lane marking, at exit and entrance islands and turnouts, on curbs, at crosswalks, at parking bays, and at such other locations as shown. // Show the International Handicapped Symbol at indicated parking spaces. Color shall be as shown. Apply paint for the symbol using a suitable template that will provide a pavement marking with true, sharp edges and ends. // Place detail pavement markings of the color(s), width(s) and length(s), and design pattern at the locations shown.

3.5 TEMPORARY PAVEMENT MARKING

When shown or directed by the Resident Engineer, apply Temporary Pavement Markings of the color(s), width(s) and length(s) shown or directed. After the temporary marking has served its purpose and when so ordered by the Resident Engineer, remove temporary marking by carefully controlled sandblasting, approved grinding equipment, or other approved method so that the surface to which the marking was applied will not be damaged. As an option, an approved preformed pressure sensitive, // reflective, // adhesive tape type of temporary pavement marking of the required color(s), width(s) and length(s) may be furnished and used in lieu of temporary painted // and reflective // marking. The Contractor shall be fully responsible for the continued durability and effectiveness of such marking during the period for which its use is required. Remove any unsatisfactory tape type marking and replace with painted // and reflective // markings at no additional cost to the Government.

3.6 FINAL CLEAN-UP

Remove all debris, rubbish and excess material from the Station.

END OF SECTION 32 17 23

SECTION 03 30 53 - CAST-IN-PLACE CONCRETE (LIMITED APPLICATIONS)

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section specifies cast-in-place concrete, including reinforcement, concrete materials, mix design, placement procedures, and finishes for non critical applications of concrete for project using small quantities of concrete, such as the construction of outdoor stair, driveway apron, ramps, flagpole and light pole bases, fence and bench footings, concrete pads and other work related job as specified.

B. Related Sections include the following:

1. Section 312000 "Earth Moving".

1.3 SUBMITTALS

A. General: In addition to the following, comply with submittal requirements in ACI 301.

B. Product Data: For each type of manufactured material and product indicated.

C. Design Mixes: For each concrete mix.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer who has completed concrete work similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

B. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products complying with ASTM C 94 requirements for production facilities and equipment.

C. Source Limitations: Obtain each type of cement of the same brand from the same manufacturer's plant, each aggregate from one source, and each admixture from the same manufacturer.

D. Comply with ACI 117, “Specifications for Tolerances for Concrete Construction and Materials”.

E. Comply with ACI 301, "Specification for Structural Concrete," including the following, unless modified by the requirements of the Contract Documents.

1. General requirements, including submittals, quality assurance, acceptance of structure, and protection of in-place concrete.

2. Formwork and form accessories.
3. Steel reinforcement and supports.
4. Concrete mixtures.
5. Handling, placing, and constructing concrete.
6. Lightweight concrete.

PART 2 - PRODUCTS

2.1 FORMWORK

A. Furnish formwork and form accessories according to ACI 301.

2.2 STEEL REINFORCEMENT

A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), deformed.

B. Plain-Steel Wire: ASTM A 82, as drawn.

C. Plain-Steel Welded Wire Fabric: ASTM A 185, fabricated from as-drawn steel wire into flat sheets.

D. Deformed-Steel Welded Wire Fabric: ASTM A 497, flat sheet.

2.3 CONCRETE MATERIALS

A. Portland Cement: ASTM C 150, Type II.

B. Normal-Weight Aggregate: ASTM C 33, uniformly graded, not exceeding 1-1/2-inch (38-mm) nominal size.

C. Lightweight Aggregate: ASTM C 330.

D. Water: Potable and complying with ASTM C 94.

E. Synthetic Fiber: Fibrillated or monofilament polypropylene fibers engineered and designed for use in concrete, complying with ASTM C 1116, Type III, 1/2 to 1-1/2 inches (13 to 38 mm) long.

2.4 ADMIXTURES

A. General: Admixtures certified by manufacturer to contain not more than 0.1 percent water-soluble chloride ions by mass of cement and to be compatible with other admixtures. Do not use admixtures containing calcium chloride.

B. Air-Entraining Admixture: ASTM C 260.

C. Water-Reducing Admixture: ASTM C 494, Type A.

D. High-Range, Water-Reducing Admixture: ASTM C 494, Type F.

E. Water-Reducing and Accelerating Admixture: ASTM C 494, Type E.

F. Water-Reducing and Retarding Admixture: ASTM C 494, Type D.

2.5 RELATED MATERIALS

A. Vapor Retarder: Multi-ply reinforced polyethylene sheet, ASTM E 1745, Class C, not less than 7.8 mils (0.18 mm) thick; or polyethylene sheet, ASTM D 4397, not less than 10 mils (0.25 mm) thick.

B. Fine-Graded Granular Material: Clean mixture of crushed stone, crushed gravel, and manufactured or natural sand; ASTM D 448, Size 10, with 100 percent passing a No. 4 (4.75-mm) sieve and 10 to 30 percent passing a No. 100 (0.15-mm) sieve; complying with deleterious substance limits of ASTM C 33 for fine aggregates.

C. Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber, or ASTM D 1752, cork or self-expanding cork.

2.6 CURING MATERIALS

A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.

B. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. (305 g/sq. m) dry.

C. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.

D. Water: Potable.

E. Clear, Solvent-Borne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B.

F. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B.

G. Clear, Solvent-Borne, Membrane-Forming Curing and Sealing Compound: ASTM C 1315, Type 1, Class A.

H. Clear, Waterborne, Membrane-Forming Curing and Sealing Compound: ASTM C 1315, Type 1, Class A.

2.7 CONCRETE MIXES

A. Comply with ACI 301 requirements for concrete mixtures.

B. Prepare design mixes, proportioned according to ACI 301, for normal-weight concrete determined by either laboratory trial mix or field test data bases, as follows:

1. Compressive Strength (28 Days): 4000 psi for outdoor stair, flagpole and lightpole base footings, driveway apron, ramps, and concrete pads.

2. Compressive Strength (28 Days): 3000 psi for fence and bench footings.
3. Slump: 4 inches (100 mm).

a. Slump Limit for Concrete Containing High-Range Water-Reducing Admixture: Not more than 8 inches (200 mm) after adding admixture to plant- or site-verified, 2- to 3-inch (50- to 75-mm) slump.

C. Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having an air content of 2.5 to 4.5 percent.

D. Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having an air content of 6.0 percent within a tolerance of plus 1.0 or minus 1.5 percent.

1. Air content of trowel-finished interior concrete floors shall not exceed 3.0 percent.

E. Lightweight Structural Concrete Mix: ASTM C 330, proportioned to produce concrete with a minimum compressive strength of 3000 psi (20.7 MPa) at 28 days and a calculated equilibrium unit weight of 110 lb/cu. ft. (1762 kg/cu. m) plus or minus 3 lb/cu. ft. (48 kg/cu. m), as determined by ASTM C 567. Concrete slump at point of placement shall be the minimum necessary for efficient mixing, placing, and finishing.

1. Limit slump to 5 inches (125 mm) for troweled slabs and 4 inches (100 mm) for other slabs.

F. Synthetic Fiber: Uniformly disperse in concrete mix at manufacturer's recommended rate, but not less than 1.0 lb/cu. yd. (0.60 kg/cu. m).

2.8 CONCRETE MIXING

A. Ready-Mixed Concrete: Comply with ASTM C 94.

B. Ready-Mixed Concrete: Comply with ASTM C 94 and ASTM C 1116.

1. When air temperature is between 85 and 90 deg F (30 and 32 deg C), reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F (32 deg C), reduce mixing and delivery time to 60 minutes.

C. Project-Site Mixing: Measure, batch, and mix concrete materials and concrete according to ASTM C 94. Mix concrete materials in appropriate drum-type batch machine mixer.

1. For mixer capacity of 1 cu. yd. (0.76 cu. m) or smaller, continue mixing at least one and one-half minutes, but not more than five minutes after ingredients are in mixer, before any part of batch is released.
2. For mixer capacity larger than 1 cu. yd. (0.76 cu. m), increase mixing time by 15 seconds for each additional 1 cu. yd. (0.76 cu. m).
3. Provide batch ticket for each batch discharged and used in the Work, indicating Project identification name and number, date, mix type, mix time, quantity, and amount of water added. Record approximate location of final deposit in structure.

PART 3 - EXECUTION

3.1 FORMWORK

A. Design, construct, erect, shore, brace, and maintain formwork according to ACI 301.

3.2 VAPOR RETARDER

A. Install, protect, and repair vapor-retarder sheets according to ASTM E 1643; place sheets in position with longest dimension parallel with direction of pour.

B. Lap joints 6 inches (150 mm) and seal with manufacturer's recommended tape.

1. Cover vapor retarder with fine-graded granular material, moisten, and compact with mechanical equipment to elevation tolerances of plus 0 inch (0 mm) or minus 3/4 inch (19 mm).

3.3 STEEL REINFORCEMENT

A. Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.

1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.

3.4 JOINTS

A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.

B. Construction Joints: Locate and install so as not to impair strength or appearance of concrete, at locations indicated or as approved by Architect.

C. Isolation Joints: Install joint-filler strips at junctions with slabs-on-grade and vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.

1. Extend joint fillers full width and depth of joint, terminating flush with finished concrete surface, unless otherwise indicated.

D. Contraction (Control) Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of the concrete thickness, as follows:

1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint with groover tool to a radius of 1/8 inch (3 mm). Repeat grooving of contraction joints after applying surface finishes. Eliminate groover marks on concrete surfaces.
2. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch- (3-mm-) wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.

3.5 CONCRETE PLACEMENT

A. Comply with recommendations in ACI 304R for measuring, mixing, transporting, and placing concrete.

B. Do not add water to concrete during delivery, at Project site, or during placement.

C. Consolidate concrete with mechanical vibrating equipment.

3.6 FINISHING FORMED SURFACES

A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defective areas repaired and patched, and fins and other projections exceeding 1/4 inch (6 mm) in height rubbed down or chipped off.

1. Apply to concrete surfaces not exposed to public view.

B. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defective areas. Completely remove fins and other projections.

1. Apply to concrete surfaces exposed to public view or to be covered with a coating or covering material applied directly to concrete, such as waterproofing, damp proofing, veneer plaster, or painting.
2. Do not apply rubbed finish to smooth-formed finish.
3. Apply the following rubbed finish, defined in ACI 301, to smooth-formed finished concrete.

    a. Smooth-rubbed finish.
    b. Grout-cleaned finish.
    c. Cork-floated finish.

C. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces, unless otherwise indicated.

3.7 FINISHING UNFORMED SURFACES

A. General: Comply with ACI 302.1R for screeding, re-straightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.

B. Screed surfaces with a straightedge and strike off. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane before excess moisture or bleedwater appears on the surface.

1. Do not further disturb surfaces before starting finishing operations.

C. Scratch Finish: Apply scratch finish to surfaces to receive concrete floor topping or mortar setting beds for ceramic or quarry tile, portland cement terrazzo, and other bonded cementitious floor finish, unless otherwise indicated.

D. Float Finish: Apply float finish to surfaces indicated, to surfaces to receive trowel finish, and to floor and slab surfaces to be covered with fluid-applied or sheet waterproofing, built-up or membrane roofing, or sand-bed terrazzo.

E. Trowel Finish: Apply a hard trowel finish to surfaces indicated and to floor and slab surfaces exposed to view or to be covered with resilient flooring, carpet, ceramic or quarry tile set over a cleavage membrane, paint, or another thin film-finish coating system.

F. Trowel and Fine-Broom Finish: Apply a partial trowel finish, stopping after second troweling, to surfaces indicated and to surfaces where ceramic or quarry tile is to be installed by either thickset or thin-set methods. Immediately after second troweling, and when concrete is still plastic, slightly scarify surface with a fine broom.

G. Non-slip Broom Finish: Apply a non-slip broom finish to surfaces indicated and to exterior concrete platforms, steps, and ramps. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route.

3.8 TOLERANCES

A. Comply with ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."

3.9 CONCRETE PROTECTION AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection, and follow recommendations in ACI 305R for hot-weather protection during curing.

B. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h (1 kg/sq. m x h) before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.

C. Begin curing after finishing concrete, but not before free water has disappeared from concrete surface.

D. Curing Methods: Cure formed and unformed concrete for at least seven days by moisture curing, moisture-retaining-cover curing, curing compound, or a combination of these as follows:

1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:

    a. Water.
    b. Continuous water-fog spray.
    c. Absorptive cover, water saturated and kept continuously wet. Cover concrete surfaces and edges with 12-inch (300-mm) lap over adjacent absorptive covers.

2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches (300 mm), and sealed by waterproof tape or adhesive. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.

3.10 FIELD QUALITY CONTROL

A. Testing Agency: The Architect will engage a qualified independent testing and inspecting agency to sample materials, perform tests, and submit test reports during concrete placement. Tests will be performed according to ACI 301.

1. Testing Frequency: Obtain one composite sample for each day's pour of each concrete mix exceeding 5 cu. yd. (4 cu. m), but less than 25 cu. yd. (19 cu. m), plus one set for each additional 50 cu. yd. (38 cu. m) or fraction thereof.
2. Testing Frequency: Obtain at least one composite sample for each 100 cu. yd. (76 cu. m) or fraction thereof of each concrete mix placed each day

END OF SECTION 03 30 53

SECTION 26 56 29 – ELECTRICAL – SITE LIGHTING (SITE WORK ONLY)

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. This specification and accompanying drawings are intended to illustrate the nature of work to be performed in a diagrammatic manner. All labor, material, and equipment necessary for a complete electrical installation shall be included by the Contractor in the submission of his bid.

B. Appliances, materials or equipment obviously a part of the system necessary for its satisfactory operation, although not specifically mentioned herein or indicated on the drawings shall be provided by this Contractor without extra cost to the Owner

C. Material and equipment mentioned and described in this specification shall be supplied complete in all details. Contractors bidding on this project shall insure themselves that the quotations that they use for equipment have been quoted in accordance with the specifications and the drawings. Errors by manufacturers representatives shall not relieve the Contractor, to provide the proper equipment of the obligation.

D. Without intending to limit or restrict the volume of work provided by this section of the contract documents, the work is to generally comprise of the following.

1. Installation of new light fixtures as shown on contract drawings.

2. Furnish and install all Wire, Conduit, Lighting fixtures, concrete base, and all necessary material and equipment for a complete and operating system.

1.02 LAWS, PERMITS, AND REGULATIONS.

A. Obtain and pay for all licenses, certificates and permits required by law, State County, and all Authorities having jurisdiction. Comply with the rules and requirements of the National Board of Fire Underwriters and the National Electric Code (2014) and with all governing laws, orders, regulations, and building codes. Any deviation shall be reported to the Owner or its representative in writing, for approval.

B. Certificates of approval from the above authorities shall be delivered to the Owner before final payment may be made. This Contractor shall pay the necessary fees for all inspections and certificates.

1.03 PROTECTION OF WORK AND MATERIALS

A. This Contractor shall be responsible for the proper care and protection of all portions of materials delivered and work prepared by him until completion and acceptance of the work and the issue of certificates in final payment.

1.04 MATERIALS AND WORKMANSHIP

A. All materials shall be new, recently manufactured and of the best quality.

B. All work shall be performed in a first-class, neat and workman-like manner by mechanics skilled in their trades.

C. Where the words "provide" and "supply" are used in the specifications or on the drawings, they shall be understood to mean the complete work in connection therewith, that is, furnishing, installing, testing, connecting, and warrantees of the items specified.

1.05 SHOP DRAWINGS

A. After contract award, this Contractor shall submit all shop drawings for approval within two (2) weeks.

1.06 PERFORMANCE OF EQUIPMENT

A. All materials, equipment, and appurtenances of any kind shown on the drawings, hereinafter specified, or required for the completion of the work in accordance with the intent of these specifications, shall be completely satisfactory and acceptable as regards operation, performance and capacity.

B. No acceptance, written or verbal, of any drawings, descriptive data or samples of such material, equipment and/or appurtenances shall relieve the Contractor of his responsibility to turn over the complete heating, ventilating, and air conditioning installation to the Owner in perfect working order and in complete conformance with the drawings and specifications at the completion of the work.

C. Operation, capacity or performance of which does not comply with the requirements of the drawings or specifications, or which is damaged prior to acceptance by the Owner will be held to be defective material and shall be removed and replaced with proper and acceptable materials, equipment and/or appurtenances, or put in proper working order, satisfactory to the Engineer without additional cost to the Owner.

D. All moving parts of equipment and appurtenances, shall be properly lubricated by the Contractor and shall be started up and tested by him.

E. All equipment shall operate without objectionable noise or vibration as determined by the Engineer. If such objectionable noise or vibration should be produced and transmitted to occupied portions of the building by apparatus, piping, ducts or other parts of the work, any necessary changes, as approved, shall be made without cost to the Owner.

PART 2 - PRODUCTS

2.01 MATERIALS AND EQUIPMENT

A. All materials, equipment, and devices shall, as a minimum, meet the requirements of UL where UL Standards are established for those items, and the requirements of NFPA 70. All items shall be new unless specified or indicated otherwise.

2.02 CONDUITS AND FITTINGS

A. Conduit shall be rigid steel (zinc-coated) in accordance with ANSI C80.1. The minimum conduit size shall be 3/4". Flexible metal conduit shall be in accordance with UL.1

B. Fittings for metal conduits, electrical metallic tubing, and flexible metal conduit shall be in accordance with UL 514. All ferrous fittings shall be cadmium- or zinc-coated in accordance with UL 514.

C. Fittings for rigid metal conduit and IMC SHSLL be threaded type. Split couplings are not acceptable.

2.03 OUTLET BOXES AND COVERS

A. Outlet boxes and covers shall be cadmium- or zinc-coated if of ferrous metal and shall conform to UL 514

B. Cabinets, junction boxes, and pull boxes (with volume greater than 100 cubic inches) shall conform to UL 50. Cabinets, junction boxes, and pull boxes shall be hot-dip zinc-coated if of sheet steel.

2.04 WIRES AND CABLES

A. Wires and cables shall meet the applicable requirements of NFPA 70 and UL for the type of insulation, jacket, and conductor specified or indicated. Wires and cables manufactured more than 12 months prior to date of delivery to the site shall not be used.

2.05 CONDUCTORS

A. Conductors No. 10 AWG and smaller shall be solid, and those No. 8 AWG and larger shall be stranded. Unless indicated otherwise, conductor sizes shown are based on copper. All conductors indicated to be No. 6 AWG and smaller shall be copper. All conductors indicated to be No. 4 AWG and larger shall be either copper or aluminum, at the Contractor's option, unless the type of conductor material is specifically indicated, specified, or required by equipment manufacturer.

2.06 EQUIPMENT MANUFACTURER REQUIREMENTS

A. Where Contractor provides equipment whose manufacturer requires copper conductors at the terminations, or requires that only copper conductors be provided between components of equipment, it shall be the Contractor's responsibility to provide copper conductors, or all necessary splices, splice boxes, and other work required to satisfy manufacturer's requirements.

2.07 MINIMUM CONDUCTOR SIZES

A. Minimum size for branch circuits shall be No. 12 AWG; for Class 1 remote-control and signal circuits, No. 14 AWG; and for Class 2 low-energy remote-control and signal circuits, No. 16 AWG.

B. Provide for all service, feeder, branch, control, and signalizing circuit conductors. Color shall be green for grounding conductors, and white for neutrals, except where neutrals of more than one system are installed in same raceway or box, the other neutral shall be white with a colored (not green) stripe. The color of the under-grounded conductors in different voltage systems shall be as follows:

3-phase systems	120/208 volts	277/480 volts
Phase A:	black	yellow
Phase B:	red	brown
Phase C:	blue	orange

1-phase systems	120/240 volts
phase:	black
phase:	red

2.08 INSULATION

A. Unless specified or indicated otherwise, or required to be otherwise by NFPA 70, all power wires shall be 600 volt, type THW, THWN, XHHW, or RHW, except that grounding wire may be type TW; remote control and signal circuits shall be type TW, THW or TF.

2.09 SPLICES AND TERMINATION COMPONENTS

A. Splices and termination components shall conform to UL 486A and UL 486B, as applicable for wire connectors, and UL 510 for insulating tapes. Connectors for wires No. 10 AWG and smaller shall be insulated pressure-type in accordance with UL 486A or UL 486C (twist-on splicing connector). Provide solderless terminal lugs on stranded conductors.

2.10 SWITCHES

A. Switches serving as motor-disconnect means shall be horsepower rated. Provide heavy duty type switches where indicated, where switches are rated higher than 208 volts, and for double throw switches. Fused switches shall utilize Class R fuse holders and fuses, unless indicated otherwise.

2.11 FUSES

A. Provide a complete set of fuses for each fusible switch. Time-current characteristics curves of fuses serving motors or connected in series with circuit breakers or other circuit protective devices shall be coordinated for proper operation; submit coordination data for approval. Fuses shall have a voltage rating not less than the circuit voltage.

1. Fuses shall conform to UL 198C, Class J for 0 to 600 Amps and Class L for 601 to 6000 Amps.

2.12 MOTORS

A. Motors shall be NEMA MG1, except sealed (hermetic type) motor compressors shall meet UL 984. Determine specific motor characteristics to insure provision of correctly sized starters and overload heaters. Motors shall be designed to operate at full capacity with a voltage variation of plus or minus 10 percent of the motor voltage rating.

2.13 PANELBOARDS

A. Panelboards for use as service disconnecting means shall additionally conform to UL 869. Panelboards shall be circuit breaker equipped. Design shall be such that any individual breaker can be removed without disturbing adjacent units or without loosening or removing supplemental insulation supplied as a means of obtaining clearances as required by UL. Where "spare" is indicated, make provisions for the future installation of a breaker sized as indicated. All panelboards locks included in the project shall be keyed alike. Directories shall be typed to indicate load served by each circuit and mounted in a holder behind transparent protective covering.

2.14 PANELBOARD BUSES

A. Support bus bars on bases independent of the circuit breakers. Main buses and back pans shall be designed so that breakers may be changed without machining, drilling, or tapping. Provide an isolated neutral bus in each panel for connection of circuit neutral conductors. Provide a separate ground bus marked with a green stripe along its front and bonded to the steel cabinet for connecting grounding conductors. Buses shall be copper.

2.15 CIRCUIT BREAKERS

A. Circuit breakers shall be ambient compensated thermal magnetic type with interrupting capacity of 22,000 amperes symmetrical minimum. Breaker terminals shall be UL listed as suitable for the type of conductor provided. Plug-in circuit breakers are acceptable.

2.16 MULTIPOLE BREAKERS

A. Provide common-trip type with a single operating handle. Breaker design shall be such that an overload in one pole automatically causes all poles to open. Maintain phase sequence throughout each panel so that any three adjacent breaker poles are connected to Phases A, B, and C, respectively.

PART 3 - EXECUTION

3.01 GENERAL REQUIREMENTS

A. Electrical installation shall conform to the requirements of NFPA 70, State and Local Codes, and to the requirements specified herein.

3.02 WIRING METHODS

A. Wiring method shall be insulated conductors installed in conduit, except where specifically indicated or specified otherwise, or required by NFPA 70 to be installed otherwise. An insulated equipment grounding conductor shall be provided in all feeder and branch circuits, including lighting circuits.

3.03 CONDUIT INSTALLATION

A. Keep conduit at least 6 inches away from parallel runs of flues and steam or hot water pipes. Install conduit parallel with or at right angles to ceilings, walls, and structural members where located above accessible ceilings and where conduit will be visible after completion of project.

3.04 CONDUIT SUPPORT

A. Support conduit by pipe straps, wall brackets, hangers or ceiling trapeze. Fasten by wood screws to wood; by toggle bolts on hollow masonry units; by concrete inserts of expansion bolts on concrete or brick; by machine screws, welded threaded studs, or spring-tension clamps on steel work. Threaded C-clamps may be used on rigid steel conduit only. Do not weld conduits or pipe straps to steel structures. The load applied to fasteners shall not exceed one-fourth of the proof test load. Fasteners attached to concrete ceiling shall be vibration and shock resistant. Holes cut to a depth of more than 1-1/2-inches in reinforced concrete beams or to a depth of more than 3/4-inch in concrete joints shall not cut the main reinforcing bars. Fill holes that are not used.

B. Make changes in direction of runs with symmetrical bends or cast-metal fittings. Make field-made bends and offsets with a hickey or conduit-bending machine. Do not install crushed or deformed conduits. Avoid trapped conduits. Prevent plaster, dirt, or trash from lodging in conduits, boxes, fittings, and equipment during construction. Free clogged conduits of all observations.

C. Install pull wires in empty conduits in which wire is to be installed by others. The pull wire shall be No. 14 AWG zinc-coated steel or plastic having not less than 200 pounds tensile strength. Leave not less than 12 inches of slack at each end of the pull wire.

D. Fasten conduits to sheet metal boxes and cabinets with two locknuts where required by NFPA 70. Where insulated bushings are used, and where bushings cannot be brought into firm contact with the box; otherwise, use at least a single locknut and bushing. Locknuts shall be tye type with sharp edges for digging into the wall of metal enclosures. Install bushings on the ends of conduits and provide insulating type where required by NFPA 70.

E. Flexible connections of short length shall be provided for equipment subject to vibration, noise transmission, or movement; and for all motors. Liquid-tight flexible conduit shall be used in wet locations. A separate ground conductor shall be provided across flexible connections.

3.05 BOXES, OUTLETS, AND SUPPORTS

A. Provide boxes in the wiring or raceway systems wherever required for pulling of wires, making connections, and mounting of devices or fixtures. Boxes for metallic raceways shall be of cast-metal hub type when located in normally wet locations, when surface mounted on outside of exterior surfaces or when exposed up to 7 feet above interior floors and walkways, and when installed in hazardous areas. Boxes in other locations shall be sheet steel. Each box shall have the volume required by NFPA 70 for the number of conductors enclosed in the box. Boxes for use in masonry block or tile walls shall be square-cornered tile-type, or standard boxes having square-cornered tile-type covers. Provide gaskets for cast-metal boxes installed in wet locations and boxes installed flush with the outside of exterior surfaces. Fasten boxes and supports with wood screws on wood, with bolts and expansion shields on concrete or brick, with toggle bolts on hollow masonry units, and with machine screws or welded studs on steel work. Threaded studs driven in by power charge and provided with lock washers and nuts or nail-type nylon anchors may be used in lieu of wood screws, expansion shield, or machine screws.

B. In open overhead spaces, cast boxes threaded to raceways need not be separately supported except where used for fixture support: support sheet metal boxes directly from the building structure or by bar hangers. Where bar hangers are used, attach the bar to raceway on opposite sides of the box and support the raceway with an approved type fasteners not more than 24 inches from the box. When penetrating reinforced-concrete members, avoid cutting any reinforcing steel.

C. Construct of not less than the minimum size required by NFPA 70 of code-gauge aluminum or galvanized sheet steel, except where cast-metal boxes are required in locations specified above, Furnish boxes with screw-fastened covers. Where several feeders pass through a pull box, tag the feeders to indicate clearly the electrical characteristics, circuit number, and panel designation.

3.06 CONDUCTOR IDENTIFICATION

A. Provide conductor identification within each enclosure where a tap, splice, or termination is made. For conductors No. 6 or smaller, color coding shall be by factory-applied color-impregnated insulation. For conductors No. 4 and larger, color coding shall be by plastic-coated self sticking markers. Colored nylon cable ties and plates, or heat-shrink type sleeves. Identify control circuit terminations.

3.07 SPLICES

A. Make splices in accessible locations. Make splices in conductors No. 10 AWG and smaller with an insulated pressure type connector. Make splices in conductors No. 8 AWG and larger with a solderless connector and cover with an insulation material equivalent to the conductor insulation.

3.08 COVERS AND DEVICE PLATES

A. Install with all four edges in continuous contract with finished wall surfaces without the use of mats or similar devices. Plaster fillings will not be permitted. Plates shall be installed with an alignment tolerance of 1/16-inch. The use of sectional type device plates will not be permitted. Plates installed in wet locations shall be gasketed.

3.09 GROUNDING AND BONDING

A. Ground all exposed non-current-carrying metallic parts of electrical equipment, metallic raceway systems, grounding conductor in non-metallic raceways, and neutral conductor or wiring systems. Make ground connection at the main service equipment and extend grounding conductor to the point of entrance of the metallic water service. Make connection to the water pipe by a suitable ground clamp or lug connection to a plugged Tee. If flanged pipes are encountered, make connection with the lug bolted to the street side of the flanged connection. Supplement the metallic water service grounding system with an additional make electrode in compliance with NFPA 70. Where ground fault protection is employed, take care that the connection of ground and neutral does not interfere with the correct operation of the fault protection.

3.10 GROUNDING CONDUCTOR

A. Provide an insulated, green colored equipment grounding conductor in all feeder and branch circuits. This conductor shall be separate from the electrical system neutral conductor.

3.11 REPAIR OF EXISTING WORK

A. Lay out the work carefully in advance. Where cutting, channeling, chasing, or drilling of floors, walls partitions, not ceilings, or other surfaces is necessary for the proper installation, support, or anchorage of the conduit, raceways, or other electrical work, do this work carefully. Repair any damage to buildings, piping, or equipment using mechanics of the trades involved.

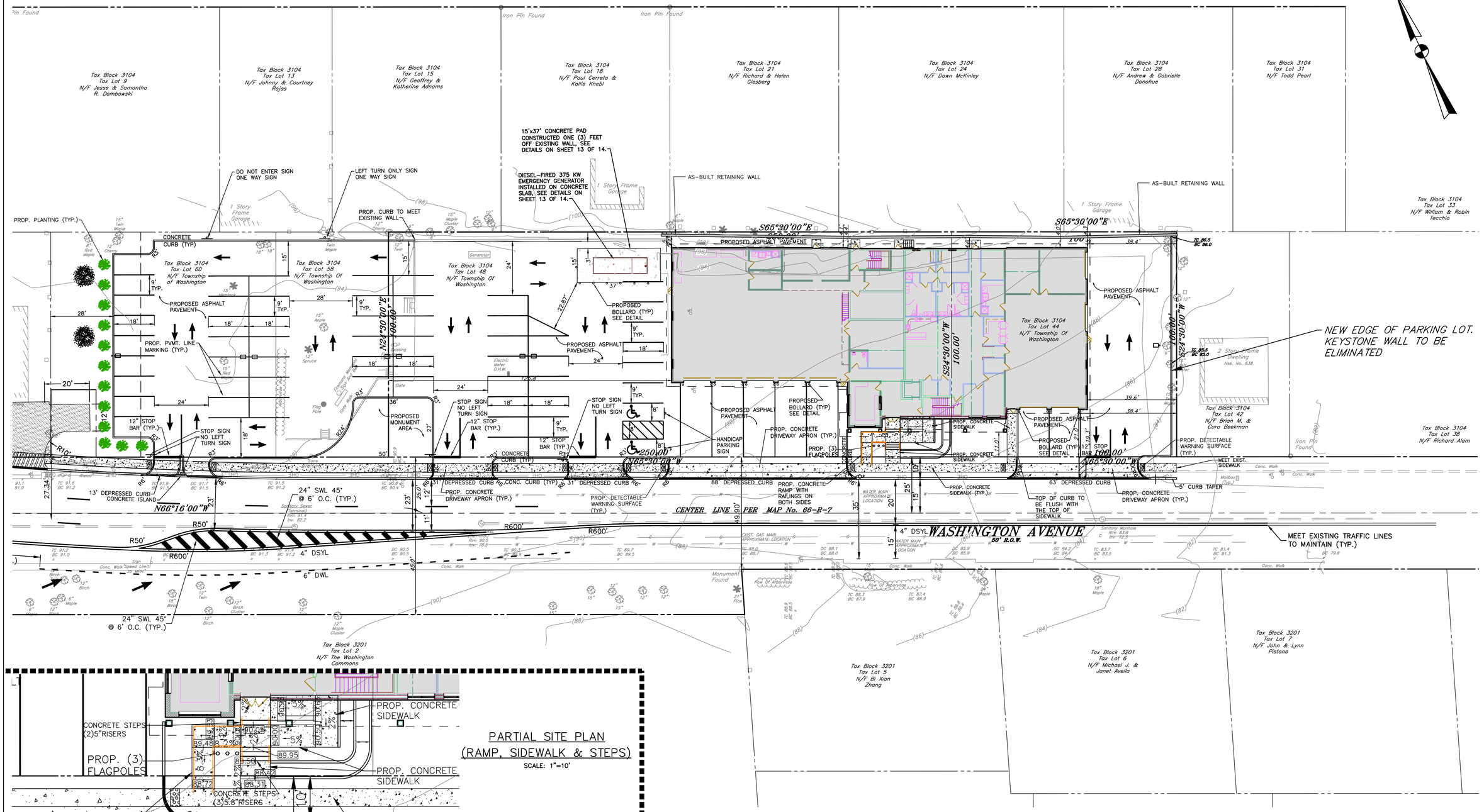
3.12 TESTING

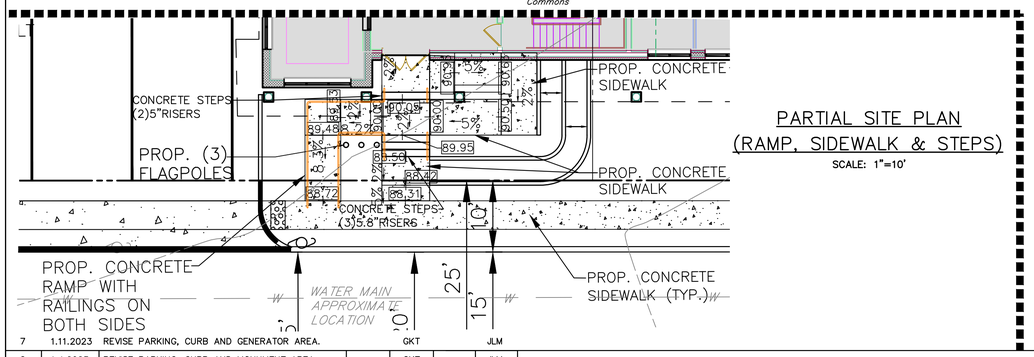
A. The Contractor shall provide all test equipment and personnel and submit written copies of all test results.

B. Test all 600-Volt wiring to verify that no short circuits or accidental grounds exist. Perform 25 insulation resistance tests on all wiring No. 6 AWG and larger using an instrument which applies a voltage of approximately 500 Volts to provide a direct reading of resistance; minimum resistance shall be 250,000 Ohms.

C. Test the grounding system to assure continuity and that the resistance to ground is not excessive.

END OF SECTION 26 56 29





PARTIAL SITE PLAN
(RAMP, SIDEWALK & STEPS)
SCALE: 1"=10'

APPROVED BY THE COUNTY PLANNING BOARD
COUNTY OF BERGEN, NEW JERSEY

ATTESTED TO BY: DATE

GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)
1 inch = 20 ft.

NO.	DATE	DESCRIPTION	SURVEYED BY	DRAWN BY	DESIGNED BY	CHECKED BY
7	1.11.2023	REVISE PARKING, CURB AND GENERATOR AREA.		GKT		JLM
6	1.4.2023	REVISE PARKING, CURB AND MONUMENT AREA.		GKT		JLM
5	12.19.2022	REVISE PARKING, CURB AND MONUMENT AREA.		GKT		JLM
4	03.30.2021	REVISE PARKING, GENERATOR AND CURB.		GKT		JLM
3	01.21.2021	ADD AS-BUILT RETAINING WALL.		GKT		JLM
2	12.28.2020	REVISED BUILDING OFFSETS.		GKT	LS	JLM
1	7.21.2020	REVISED AS PER BERGEN COUNTY PB.'S COMMENTS		LS	LS	JLM

BOSWELL ENGINEERING
ENGINEERS – SURVEYORS – PLANNERS – SCIENTISTS
330 PHILLIPS AVENUE, SOUTH HACKENSACK, N.J. 07606
TEL: (201) 641-0770 • FAX: (201) 641-1831
N.J. CERTIFICATE OF AUTHORIZATION No. 24GA27958000

STEPHEN T. BOSWELL
PROFESSIONAL ENGINEER N.J. LIC. 34680

JEFFREY L. MORRIS
PROFESSIONAL ENGINEER N.J. LIC. 30979

EMERGENCY SERVICES COMPLEX
656 WASHINGTON AVENUE
PROPOSED PARKING PLAN
LOTS 44 AND 48 BLOCK 3104
WASHINGTON TOWNSHIP
BERGEN COUNTY NEW JERSEY

SURVEYED BY	DESIGNED BY J.L.M.	SCALE:	JOB NO.	DATE
DRAWN BY G.K.T.	CHECKED BY J.L.M.	1"=20'	WT-110	07.06.2020

DRAWING NO. WT-110-PARKING SHEET 4 OF 14