

BLOCK

1170

LOT

5

ADDRESS (SITE)

PRICE CLUB

PERMIT NO.

3553-94

RECEIVED

NOV 14 1994

BAKERY
DELI

CONSTRUCTION PERMIT APPLICATION

DIV

Applicant Completes: Sections I, II, III (optional), IV, VI and VII

I. IDENTIFICATION

1. Proposed Work-site at: 1722 Route 88 Brick N.S. 08723
2. Name of Owner in Fee: Price Costce Inc. Tel. (206) 828-8100
Address P.O. Box 97077 Kirkland WA. 98083-9777
street municipality zip code
3. Ownership in Fee: Public _____ Private _____
4. Principal Contractor: FAIR FIELD Refr. Co. Tel. (201) 227-2210
Address 159AK Rd. Fair Field N.S. 07004
- License No. OR, if new home, Builder Reg. No. _____ Exp. Date _____
- Federal Emp. No. 22-2598606 Social Security No. _____
5. Architect or Engineer MULVANNY Partnership Tel. (206) 822-0444
Address 11820 Northrup Way, STE E-300 Bellevue WA. 98005
6. Responsible Person UDO Klump Tel. (201) 227-2210
Charge of Work _____

II. PROPOSED WORK

1. ☐ Minor Work (single trade)
2. ☐ Small Job (\$5,000 and no prior approvals)
3. ☐ New Building
4. ☐ Addition
5. ☐ Alteration
6. ☒ Fire Protection
7. ☒ Plumbing
8. ☐ Electrical
9. ☐ Asbestos Abatement
10. ☐ Demolition

Est. Cost

TOTAL COSTS

158,100

OPTIONAL (for office use only)

Plans Rec'd By	Date Rec'd	Rejection Date	Approval Date	Re-viewer	Resubmission Dates	Re-viewer
Val	11/14/94		4/30/95		4/6/95	
			11/27/94		3/13/95	
			11-30-94		4-16-95	
Gy	11/27/94		11/27/94		3/17/95	

III. DO YOU WANT: (optional) 1. ☐ Partial Releases 2. ☐ Prototype Processing

IV. DOES OR WILL YOUR BUILDING CONTAIN ANY OF THE FOLLOWING?

1. ☐ Elevators/Escalators/Lifts/Dumbwaiters/Inclined Walks
2. ☐ High Pressure Boilers
3. ☐ Pressure Vessels
4. ☐ Refrigeration Systems
5. ☐ Cross-Connections/Backflow Preventers
6. ☐ Hazardous Uses/Places of Assembly
7. ☐ Sprinklers
8. ☐ Smoke Control Systems in Open Wells
9. ☐ Underground Storage Tanks

V. FEE SUMMARY (for office use only)

		Update	Update
1. Building	\$ 1990-		
2. Electrical			
3. Plumbing			
4. Fire Protection			
5. Other <u>Plans & Hards</u>	\$ 325-		
6. Subtotal	\$ 2598-		
7. Less 20% for State Plan Review	\$ 260		
8. Subtotal	\$ 80-		
9. DCA Training Fee			
10. Subtotal	\$ 20-		
11. Cert. of Occupancy			
12. Other <u>2PA+P.P.</u>	\$ 30.00		
13. TOTAL	\$ 2988.90		

VI. BUILDING/SITE CHARACTERISTICS

1. Number of Stories _____
2. Height of Structure _____ ft.
3. Area—Largest Floor _____ sq. ft.
4. Building Area—All Floors _____ sq. ft.
5. Volume of Structure _____ cu. ft.
6. Construction Classification _____
7. Total Land Area Disturbed _____ sq. ft.
8. Flood Hazard Zone _____
9. Base Flood Elevation _____ ft.
10. Wetlands yes _____ sq. ft.
no _____
11. Fire Grading _____
12. Max. Live Load _____
13. Max. Occupancy Load _____

VII. DESCRIPTION OF BUILDING USE

A. RESIDENTIAL

1. ☐ Hotels (R-1)
2. ☐ Multi-Family (R-2)
3. ☐ Two-Family (R-3) BOCA
4. ☐ Two-Family (R-4) CABO
5. ☐ One-Family (R-3) BOCA
6. ☐ One-Family (R-4) CABO
- No of dwelling units: _____
- Before Construction _____
- After Construction _____
- Net gain or loss _____

B. NON-RESIDENTIAL

1. State Specific Use: _____

2. Use Group: M 3hr

3. Change in Use Group. Indicate Former: _____

LDS BR 10505465

CERTIFICATION IN LIEU OF OATH

I OWNER SECTION (to be completed if the applicant is the owner in fee)

I hereby certify that I am the owner in fee of the property listed on Page 1.

Mark the following applicable boxes:

- A. ☐ I further certify that a new home (private residence) will be constructed on this property for my own use and occupancy. This dwelling is to be occupied by myself and is not to be used for any purpose other than single family residential use. I attest that all construction, plumbing, or electrical work will be done, in whole or in part, by me or by subcontractors under my supervision, in accordance with all applicable laws; and I further acknowledge that said new home is not covered under the New Home Warranty and Builders Registration Act (N.J.S.A. 46:3B-1 et seq.) and that such fact shall be disclosed to any person purchasing this property within ten years of the date of issuance of a certificate of occupancy.

I UNDERSTAND THAT IN MARKING BOX A, I ACKNOWLEDGE THAT I AM ASSUMING RESPONSIBILITY FOR THE WORK DONE ON SAID PROPERTY, THE CONDITION OF THE PROPERTY PRIOR TO, DURING, AND AFTER ANY WORK PERFORMED, AND FOR THE PERFORMANCE OF THE SUBCONTRACTORS I HIRE, EMPLOY, OR OTHERWISE CONTRACT OR WITH WHOM I MAKE AGREEMENTS TO PERFORM WORK. I AM VOLUNTARILY AND KNOWINGLY ASSUMING THIS RESPONSIBILITY.

- B. ☐ I further certify the following as required by the New Jersey Uniform Construction Code, N.J.A.C. 5:23-2.15(e)1.vii:

I personally prepared the plans submitted for: 1) the new home referred to in A.; or, 2) an addition, alteration, renovation, or repair to an existing single family residence owned and occupied by myself and located on the property listed on Page 1; or, 3) a new structure that will be physically separate from, but that will be deemed part of, an existing single family residence that is owned and occupied by myself and located on the property listed on Page 1.

- C. ☐ I further certify that I will perform or supervise the following work:

C.1. ☐ Building C.2. ☐ Fire Protection

I further certify that I will perform the following work:

C.3. ☐ Electrical C.4. ☐ Plumbing

- D. ☐ I agree to advise all contractors on this project that they are required to be registered with the New Jersey Division of Taxation and to comply with all New Jersey tax laws.

I further certify the following as required by the Uniform Construction Code, N.J.A.C. 5:23-2.15(a)5: All required State, county, and local prior approvals have been given, including such certification as the construction official may require.

I understand that if any of the above statements are willfully false, I am subject to punishment.

Signature _____ Date _____

II. AGENT SECTION

(to be completed if the applicant is not the owner in fee)

I hereby certify the following as required by the New Jersey Uniform Construction Code, N.J.A.C. 5:32-2.15(d): the proposed work is authorized by the owner in fee; and I have been authorized by the owner in fee to make this application as his agent.

I further certify the following as required by the Uniform Construction Code, N.J.A.C. 5:23-2.15(a)5: All required State, county, and local prior approvals have been given, including such certification as the construction official may require.

I agree to advise all contractors on this project that they are required to be registered with the New Jersey Division of Taxation and to comply with all New Jersey tax laws.

I understand that if any of the above statements are willfully false, I am subject to punishment.

☒ Check if contractor.

Agent Name _____

Address _____

Telephone (____) _____

Signature Udo O. Klemp Date 11/14/94

OFFICE DATE RECEIVED: _____

COMMENTS

VIII. PRIOR APPROVALS CHECKLIST (office use only)	LOCAL APPROVAL		COUNTY APPROVAL		REGIONAL APPROVAL		STATE APPROVAL	
	Prelimin. Initial	Final Date	Prelimin. Initial	Final Date	Prelimin. Initial	Final Date	Prelimin. Initial	Final Date
☐ Planning Board								
☐ Zoning Board								
☐ Sewer Authority								
☐ Water Authority								
☐ Fire Department								
☐ Police Department								
☐ Health Department								
☐ Soil Conservation								
☐ N.J. Dept. of Community Affairs								
☐ N.J. Department of Transportation								
☐ N.J. Dept. of Environmental Protect.								
☐ Utility Dig No.								
☐ Other								
☐								
☐								

IMPORTANT
A.H.B.T. - EXEMPT

IX. SUBCODES AND SPECIAL REGULATIONS APPLICABLE (office use only--optional)

Name of Code & Edition

Name of Code & Edition

Other

Building _____
Electrical _____
Plumbing _____
Fire Protection _____
Mechanical _____

Energy _____
Barrier Free _____
Flood Hazard _____
As Built Elevation Cert. _____
Other _____

X. CERTIFICATES ISSUED

(office use only)

DATE EXPIRED

- ☐ Temporary Certificate of Occupancy
☐ Temporary Certificate of Occupancy
☐ Continued Certificate of Occupancy
☐ Certificate of Occupancy
☒ Certificate of Approval

No. _____
No. _____
No. _____
No. _____
No. _____

3553

11/4/96



CERTIFICATE

Date Issued 1/14/96
Control #
Permit # 3553-94

IDENTIFICATION

Block 1170 Lot 5, 6, 6.01, 6.02
Work Site Location 1722 Rt. 88 East
Owner In Fee Price Cost Co., Inc.
Address P.O. Box 97077
Kirkland, Va. 9808399777
Tele. ()
Contractor Fairfield Refr. Co.
Address 15 Oak Rd.
Fairfield, NJ 07004
Tele. ()
Lic. No. of Bldrs. Reg. No.
Federal Emp. No.
or Social Security No.

Home Warranty No. N/A
Use Group M 3 hours
Maximum Live Load
Description of Work/Use:

Interior alteration (Bakery/Deli)

Type of Warranty Plan: [] State [] Private
Construction Classification
Maximum Occupancy Load

CERTIFICATE OF OCCUPANCY/APPROVAL

☐ CERTIFICATE OF OCCUPANCY

This serves notice that said building, structure, or equipment has been constructed or installed in accordance with the New Jersey Uniform Construction Code, and is approved for use and/or occupancy.

☐ CERTIFICATE OF CONTINUED OCCUPANCY

This serves notice that based on a general inspection of the visible parts of the building there are no imminent hazards and the building is approved for continued occupancy.

☐ TEMPORARY CERTIFICATE OF OCCUPANCY

If this is a Temporary Certificate of Occupancy the following conditions must be met no later than , 19 or the owner will be subject to a fine or order to vacate:

Fee \$
Paid [] Check No.
Collected by:

CONSTRUCTION OFFICIAL

Arthur J. Lewis



PERMIT UPDATE

Date Update Issued

Control #

Permit # 3553-94

Date Permit Issued

IDENTIFICATION Block 1170 Lot 5
Work Site Location PRICE CLUB
RT 88
Owner in Fee PRICE COSTCO INC.
Address PO 97077
Kirkland WA 98033
Tele. (206) 828 P100
Contractor RL Dehn & Sons Fire Protection Inc
Address 60 W Prospect St
WALDWIN NJ 07463
Tele. (201) 445 1113
Lic. No. or Bids. Reg. No. _____
Federal Emp. No. 227685232
or Social Security No. _____

is hereby granted permission to perform the following work:

☐ BUILDING ☒ PLUMBING ☐ Other _____
☐ ELECTRICAL ☒ FIRE PROTECTION

DESCRIPTION OF WORK:

*Additions of sprinklers -
Bakery Deli - Pharmacy*

Estimated Cost of Work \$ _____

CONSTRUCTION OFFICIAL

PAYMENTS (Office Use Only)

Building _____
Plumbing _____
Electrical _____
Fire Protection _____
Other _____
Other _____
DCA Training Fee _____
Cert. of Occ. _____
Other _____
Total _____
Check No. _____
Cash _____
Collected By: _____



PERMIT UPDATE

Date Update Issued 950201
Control #
Permit # 910330
Date Permit Issued 941118

Brick
IDENTIFICATION Block 1170 Lot 5-6-601602
Work Site Location 1722 Route 88 Contractor Rumson Electric
Brick N.J. 08723 Address 21 Rosalie Ave.
Owner in Fee Price Costco Rumson N.J. 07760
Address P.O. Box 97077 Tele. (908) 842-1877
Kirkland W.A. 98083-9777 Lic. No. or Bldrs. Reg. No. 8849
Tele. (206) 828-8100 Federal Emp. No. 22-785-1116
or Social Security No. _____

is hereby granted permission to perform the following work:

☐ BUILDING ☐ PLUMBING ☐ OTHER _____
☒ ELECTRICAL ☐ FIRE PROTECTION
☐ ELEVATOR DEVICES

DESCRIPTION OF WORK:

Relocation of Pharmacy and
photo. adding 17 fixtures
20 Recp. } 4-
5 switches
1 AC unit-7
4 - water heaters
(14)

Estimated Cost of Work \$ 1,900

CONSTRUCTION OFFICIAL

PAYMENTS (Office Use Only)

Building	_____
Electrical	<u>25.-</u>
Plumbing	_____
Fire Protection	_____
Elevator Devices	_____
Other	_____
DCA Training Fee	<u>2.00</u>
Cert. of Occ.	_____
Other	_____
Total	<u>27.-</u>
Check No.	<u>2325</u>
Cash	_____
Collected By:	_____

U.C.C. Form F-190B

1 WHITE—INSPECTOR COPY 2 CANARY—OFFICE COPY 3 PINK—OFFICE COPY 4 GOLD—APPLICANT COPY



PERMIT UPDATE

Date Update Issued 950201
Control #
Permit # 910330
Date Permit Issued 941118

Brick
IDENTIFICATION Block 1170 Lot 5-6-6.016.02
Work Site Location 1722 Route 88
Brick N.J. 08723
Owner in Fee Price Costco
Address P.O. Box 97077
Kirkland W.A. 98083-9777
Tele. (206) 828-8100

Contractor Rumson Electric
Address 21 Rosalie Ave.
Rumson N.J. 07760
Tele. (908) 842-1877
Lic. No. or Bldrs. Reg. No. 8849
Federal Emp. No. 22-185-1116
or Social Security No. _____

Is hereby granted permission to perform the following work:

- ☐ BUILDING ☐ PLUMBING ☐ OTHER _____
☒ ELECTRICAL ☐ FIRE PROTECTION
☐ ELEVATOR DEVICES

DESCRIPTION OF WORK:

*Relocation of Pharmacy and
photo. adding 17 Fixtures } 4-
20 Recp. }
5 switches }
1 AC unit - 7
- water heaters (14)*

Estimated Cost of Work \$ 1,900

CONSTRUCTION OFFICIAL

PAYMENTS (Office Use Only)

Building	_____
Electrical	<u>25. -</u>
Plumbing	_____
Fire Protection	_____
Elevator Devices	_____
Other	_____
DCA Training Fee	<u>2.00</u>
Cert. of Occ.	_____
Other	_____
Total	<u>25. -</u>
Check No.	<u>2325</u>
Cash	_____
Collected By:	_____

U.C.C. Form F-190B

1 WHITE—INSPECTOR COPY 2 CANARY—OFFICE COPY 3 PINK—OFFICE COPY 4 GOLD—APPLICANT COPY



**FIRE PROTECTION
SUBCODE
TECHNICAL SECTION**



Date Received 2-1-95
Date Issued
Control # 3553-94
Permit # UPDATE

A. IDENTIFICATION—APPLICANT: COMPLETE ALL APPLICABLE INFORMATION, WHEN CHANGING CONTRACTORS, NOTIFY THIS OFFICE. CALL UTILITY DIG NO: 1-800-272-1000.

Block 1170 PRICE CLUB Lot 5
Work Site Location PRICE CLUB

Owner in Fee PRICE CLUB
Address PO BOX 9707

Telephone 818 8100 9805

Contractor R.L. DENNY & SONS FIRE PROTECTION INC.

Address 60 W. ANGELO ST.
CARBUIDE NT 07465

Telephone (801) 445 1155

Lic. No. 27363333 or Social Security No. 200951 for this

B. FIRE PROTECTION CHARACTERISTICS
Use Group Present Proposed for roof storage

Const. Class. Present Proposed

Heating Systems ☐ New ☐ Existing
Type: ☐ Gas ☐ Oil ☐ Electrical ☐ Solar
☐ Other

Location: _____
Total Est. Cost of Fire Prot. Work \$ _____ ☐ Other _____

JOB SUMMARY (Office Use Only)

PLAN REVIEW:

☐ No Plans Required
Joint Plan Review Required:

☐ Bldg. ☐ Plumb.
☐ Elec. ☐ Elevator

☒ Fire Plans Approved
Date: 1/3/95

Approved by: [Signature] 1625

SUBCODE APPROVAL:
☐ CO ☒ CCO ☒ CA

Date: 2/3/95
Approved by: [Signature]

INSPECTIONS:

Type: _____
Suppression Test
Fire Alarm Test
Smoke Test
Mechanical
TCO

Failure _____
Failure _____
Approval 3/95 Initial [Signature]

Other _____
Other _____
Other _____

Other _____
Other _____
Other _____

Other _____
Other _____
Other _____

Other _____
Other _____
Other _____

C. CERTIFICATION IN LIEU OF OATH

I hereby certify that I am the (agent of) owner of record and am authorized to make this application

[Signature]

SIGNATURE

D. TECHNICAL SITE DATA

Description of Work New sprinklers - Bakery/Deu Areas

Water Supply Source existing

Method of Valve Supervision "

Local Alarm Supervision "

Central Supervision "

Proprietary Supervision "

Flammable Liquid Storage Tanks _____

Combustible Liquid Storage Tanks _____

L.P.G. Storage Tanks _____

L.N.G. Storage Tanks _____

Wet Sprinkler Heads _____

Dry Sprinkler Heads _____

TOTAL 2718

Smoke Detectors _____

Heat Detectors _____

TOTAL _____

Stand Pipes _____

Kitchen Hood Exhaust Systems _____

Pre-Engineered Systems _____

CO₂ Suppression _____

Halon Suppression _____

Foam Suppression _____

Dry Chemical _____

Wet Chemical _____

Gas or Oil Fired Appliance _____

OTHER _____

Administrative Surcharge \$ _____

Paid ☐ Check # _____

Collected by: _____

Minimum Fee \$ _____

DCA Training Fee \$ _____

TOTAL FEE \$ 0

FEE (Office Use Only)

0



STATE OF CALIFORNIA
DIVISION OF OCCUPATIONAL SAFETY AND HEALTH
SUBCODE
TECHNICAL SECTION



DATE RECEIVED
Date Issued
Control #
Permit #

12/11/97
3553-94

A. IDENTIFICATION—APPLICANT: COMPLETE ALL APPLICABLE INFORMATION. WHEN CHANGING CONTRACTORS, NOTIFY THIS OFFICE. CALL UTILITY DIG NO: 1-800-272-1000.

Block 1170 Lot 5.6-601+602

Work Site Location ROUTE 88 BRICK B'Y.

Owner in Fee PRICE CUSTOM INC

Address P.O. Box 97077

Tele. (206) 828-8100

Contractor Hobart

Address 1917 ATLANTIC AVE

Tele. (206) 227-2210

Lic. No. 22-7598606 or Social Security No. _____

Federal Emp. No. _____

Use Group _____ Present _____ Proposed _____

Const. Class. _____ Present _____ Proposed _____

Heating Systems () New () Existing

Type: (X) Gas () Oil () Electrical () Solar

Location: New Bakery BPP.

Total Est. Cost of Fire Prot. Work \$ 10,000.00 () Other _____

B. FIRE PROTECTION CHARACTERISTICS

PLAN REVIEW: () No Plans Required () Plans Required

Joint Plan Review Required: _____

() Bldg. () Plumb. _____

() Elec. () Elevator _____

() Fire Plans Approved _____

Date: 11/29/94 _____

Approved by: _____

SUBCODE APPROVAL: _____

() CO () CCO () CA _____

Date: 3/18/97 _____

Approved by: _____

INSPECTIONS: _____

Type: _____

Suppression Test _____

Fire Alarm Test _____

Smoke Test _____

Mechanical _____

TCO _____

Other _____

Other _____

Other _____

Other _____

Other _____

Other _____

Other _____

Other _____

C. CERTIFICATION IN LIEU OF OATH

I hereby certify that I am the (agent of) owner of record and am authorized to make this application.

Mike Williams
SIGNATURE

D. TECHNICAL SITE DATA

Description of Work

Water Supply Source

Method of Valve Supervision

Local Alarm Supervision

Central Supervision

Proprietary Supervision

Flammable Liquid Storage Tanks

Combustible Liquid Storage Tanks

L.P.G. Storage Tanks

L.N.G. Storage Tanks

Wet Sprinkler Heads

Dry Sprinkler Heads

TOTAL

Smoke Detectors

Heat Detectors

TOTAL

Stand Pipes

Kitchen Hood Exhaust Systems

Pre-Engineered Systems

CO₂ Suppression

Halon Suppression

Foam Suppression

Dry Chemical

Wet Chemical

OTHER _____

(Gas) or Oil Fired Appliance ovens

OTHER B₂

Administrative Surcharge

Minimum Fee

DCA Training Fee

TOTAL FEE

Paid () Check # _____

Collected by: _____

U.C.C. Form F-140B

1 White = Inspector Copy

2 Canary = Office Copy

3 Pink = Office Copy

4 Gold = Applicant Copy

5 Yellow = Office Copy

6 Blue = Office Copy

7 Green = Office Copy

8 Orange = Office Copy

FEE (Office Use Only)

() Capacity _____ Fuel _____

() Capacity _____ Fuel _____

() Capacity _____ Fuel _____

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Spencer
Cordley



**FIRE PROTECTION
SUBCODE
TECHNICAL SECTION**



Date Received 12/15/94
Date Issued
Control # 3553-94
Permit #

A. IDENTIFICATION-APPLICANT: COMPLETE ALL APPLICABLE INFORMATION. WHEN CHANGING CONTRACTORS, NOTIFY THIS OFFICE. CALL UTILITY DIG NO: 1-800-272-1000.

Block 1170 1722 Route 88 Lot 5-6-6.01 + 6.02
Work Site Location Price Costco Inc.
Owner in Fee Price Costco Inc.
Address P.O. Box 97077
Kirkland, WA 98083-9777
Tele. (206) 828-8180
Contractor R.C. DENNIS FIRE PROTECTION INC
Address 65 W PROSPECT ST
WALDWIN CT
Tele. (206) 445-1155
Lic. No. 222503232 or Social Security No. _____
Federal Emp. No. _____

B. FIRE PROTECTION CHARACTERISTICS

Use Group Present _____ Proposed _____
Const. Class. Present _____ Proposed _____
Heating Systems [] New [] Existing
Type: [] Gas [] Oil [] Electrical [] Solar
[] Other _____
Location: _____

Total Est. Cost of Fire Prot. Work \$ 15,100.00 [] Other _____

JOB SUMMARY (Office Use Only)

PLAN REVIEW:	INSPECTIONS:	Dates (Month/Day)
[] No Plans Required	Type:	Failure Failure Approval Initial
Joint Plan Review Required:	Suppression Test	<u>3/1/95</u>
[] Bldg. [] Plumb.	Fire Alarm Test	
[] Elec. [] Elevator	Smoke Test	
[] Fire Plans Approved	Mechanical	
Date: <u>11/23/94</u>	TCO	
Approved by: _____	Other	
SUBCODE APPROVAL:	Other	
[] CO [] CCO [X] CA	Other	
Date: <u>3/1/95</u>	Other	
Approved by: _____	Other	

C. CERTIFICATION IN LIEU OF OATH

I hereby certify that I am the (agent of) owner of record and am authorized to make this application.

E. E. E.
SIGNATURE

D. TECHNICAL SITE DATA

Description of Work
Water Supply Source
Method of Valve Supervision
Local Alarm Supervision
Central Supervision
Proprietary Supervision

Flammable Liquid Storage Tanks () Capacity _____ Fuel _____
Combustible Liquid Storage Tanks () Capacity _____ Fuel _____
L.P.G. Storage Tanks () Capacity _____ Fuel _____
L.N.G. Storage Tanks () Capacity _____ Fuel _____

Wet Sprinkler Heads Number 36
Dry Sprinkler Heads 4
TOTAL 60

Smoke Detectors
Heat Detectors
TOTAL

Stand Pipes
Kitchen Hood Exhaust Systems

Pre-Engineered Systems
CO₂ Suppression
Halon Suppression
Foam Suppression
Dry Chemical
Wet Chemical

Gas or Oil Fired Appliance
OTHER

Paid [] Check # _____
Collected by: _____
Administrative Surcharge \$ 85-
Minimum Fee \$ _____
DCA Training Fee \$ _____
TOTAL FEE \$ _____

FEE (Office Use Only)

85-



PLUMBING
SUBCODE
TECHNICAL SECTION



Date Received 12/15/94
Date Issued
Control # 3553-94
Permit #

A. IDENTIFICATION-APPLICANT: COMPLETE ALL APPLICABLE INFORMATION. WHEN CHANGING

CONTRACTORS, NOTIFY THIS OFFICE. CALL UTILITY DIG NO: 1-800-272-1000.

Block 1170 Lot 5-6-6.01 + 6.02

Work Site Location 1722 Reiter St
Brix N.J. 08723

Owner in Fee Price Costco Inc

Address PO, Box 97077

Kirkland WA 98083-9777

Tele: (206) 822-8100 Plumbing Co.

Contractor 10312000 Plumbing Co.

Address 719 Hekerman Ave

Glen Rock, N.J. 07452

Tele: (201) 670-6773

Lic. No. 85151

Federal Emp. No. or Social Security No. 137-36-7816

B. PLUMBING CHARACTERISTICS

Use Group Present 411 Proposed 611

Building Sewer Size 2" Public Sewer Private Septic

Water Service Size 2" Public Water Private Well

Estimated Cost of Plumbing Work \$ 43,000

JOB SUMMARY (Office Use Only)

PLAN REVIEW: INSPECTIONS

PLAN REVIEW: () No Plans Required Type: Failure Failure Approval Initial

Joint Plan Review Required: Slab 1/24/95 8/2/95

() Bldg. () Elec. Rough 1/24/95 8/2/95

() Fire () Elevator Water 1/24/95 8/2/95

() Plumb. Plans Approved Sewer 1/24/95 8/2/95

Date: 11-30-94 Fixtures 1/24/95 8/2/95

Approved by: [Signature] Gas Equipment 1/24/95 8/2/95

SUBCODE APPROVAL: Gas Piping 1/24/95 8/2/95

TCO 1/24/95 8/2/95

Approved By: [Signature] CA 1/24/95 8/2/95

Date: 4/6/95

C. CERTIFICATION IN LIEU OF OATH

I hereby certify that I am the (agent of) owner of record and am authorized to make this application and perform the work listed on this application.

Signature: [Signature]
Contractor Seal

Licensed Plumbing Contractor () Exempt Applicant

D. TECHNICAL SITE DATA (List all fixtures.)

NO. FIXTURE/EQUIPMENT

1 Water Closet

1 Urinal/Bidet

1 Bath Tub

1 Lavatory

1 Shower

1 Floor Drain

1 Sink

1 Dishwasher

1 Drinking Fountain

1 Washing Machine

1 Hose Bibb

1 Water Heater 100 gallons

1 Fuel Oil Piping

1 Gas Piping

1 Steam Boiler

1 Hot Water Boiler

1 Sewer Pump

1 Interceptor/Separator

1 Backflow Preventer

1 Greasetrap

1 Water Cooled A/C

1 or Refrigeration Unit

1 Sewer Connection

1 Water Service Connection

1 Active Solar System

1 Other Floor Sinks.

FEE (Office Use Only)

Administrative Surcharge \$

Paid () Check # Minimum Fee \$

DCA Training Fee \$

Collected by: TOTAL \$ 325-

5

1

1

3

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

2/8/95 PARTIAL - SINKS - OK - EYE WASH OK

- VENTS for floor drains will be done
by finish and will be exposed on
BACK WALL

- Vent on grease interceptor - OK -

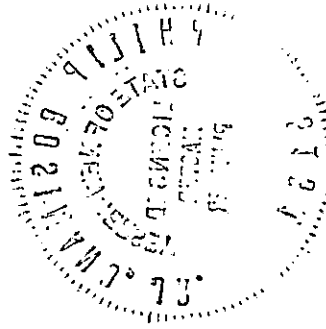
DA

3/20/95

- vacuum protection on water mixer

- exposed vents must be run

- eye wash must be capped





**BUILDING
SUBCODE
TECHNICAL SECTION**



Date Received
Date Issued
Control #
Permit #

12/15/94
3553-94

A. IDENTIFICATION—APPLICANT: COMPLETE ALL APPLICABLE INFORMATION. WHEN CHANGING CONTRACTORS, NOTIFY THIS OFFICE. CALL UTILITY DIG NO: 1-800-272-1000.

Block 1170 Lot 5-6 6.01 + 6.02
Work Site Location BRICE ROUTE 88
Owner in Fee PRICE COSTCO INC.
Address P.O. Box 97077
KIRKLAND, WA 98083-9777
Tele. (206) 822-0744 828-8100
Contractor FAIRFIELD REFRIGERATION CO.
Address 15 OAK R.D.
FAIRFIELD, N.J. 07004
Tele. (201) 227-2210
Lic. No. or Bids. Reg. No. _____
Federal Emp. No. 22-2598606 or Social Security No. _____

C. CERTIFICATION IN LIEU OF OATH

I hereby certify that I am the (agent of) owner of record and am authorized to make this application.

Signature Aldo O. Mungai

D. TECHNICAL SITE DATA
DESCRIPTION OF WORK

1) Heat Prep + Sales AREA, Bakery AREA
Product AREA, Refrigeration Upgrade
Interior Alterations

JOB SUMMARY (Office Use Only)			
PLAN REVIEW	Date	Initial	INSPECTIONS
☒ No Plans Req.	<u>11/30/94</u>	<u>RT</u>	Type: _____
☐ All			Footings _____
☐ Footing			Foundation _____
☐ Foundation			Slab _____
☐ Frame			Frame _____
☐ Other			Insulation _____
Joint Plan Review Required:			Finishes: _____
☐ Elec. ☐ Plumb. ☐ Fire			Energy _____
SUBCODE APPROVAL			Mechanical _____
☐ CO ☐ CCO ☐ CA			TCO _____
Date: _____			Other _____
Approved By: _____			Final _____

TYPE OF WORK:

☐ New Building

☐ Addition

☒ Alteration

☐ Roofing

☐ Siding

☐ Fence _____ Height (6' or over)

☐ Sign _____ Sq. Ft.

☐ Pool

☐ Asbestos Abatement

☒ Other Refrigeration Upgrade

☐ Other + Alteration

☒ Demolition

(Office Use Only)
FEE

B. BUILDING CHARACTERISTICS		
Use Group	Present	Proposed
Constr. Class	_____	_____
No. of Stories	_____	_____
Height of Structure	_____	_____
Area—Largest Floor	_____	_____
New Bldg. Area/All Floors	_____	_____
Volume of New Structure	_____	_____
Total Land Area Disturbed	_____	_____

Est. Cost of Bldg. Work:

1. New Bldg. \$ _____

2. Alteration \$ _____

3. Total (1+2) \$ _____

Administrative Surcharge	
Paid ☐ Check # _____	Minimum Fee \$ _____
Collected by: _____	DCA TRAINING FEE \$ _____
TOTAL FEE \$ _____	

U.C.C. Form F-110B

1 White - Inspector Copy

2 Canary - Office Copy

3 Pink - Office Copy

4 Gold - Applicant Copy



**ELECTRICAL
SUBCODE
TECHNICAL SECTION**



Date Received
Date Issued
Control #
Permit #

NOV 18 94 01 03 30

FEE (Office Use Only)

A. IDENTIFICATION—APPLICANT: COMPLETE ALL APPLICABLE INFORMATION. WHEN CHANGING CONTRACTORS, NOTIFY THIS OFFICE. CALL UTILITY DIG NO: 1-800-272-1000.

Block 1177 Lot 5-E-6-C1 + 6-C2
Work Site Location 1722 Route 28
Buick N.S. 02723
Owner in Fee Price Costco Inc
Address P.O. Box 97077
Kirkland, WA. 98083-9777
Tele. (206) 822-2100
Contractor Rumson Electric Co Inc.
Address 21 Rosalie Ave.
Rumson N.J. 07760
Tele. (908) 843-1877
Lic. No. 8849
Federal Emp. No. 23-1851116 or Social Security No. _____

B. ELECTRICAL CHARACTERISTICS

Use Group Present _____ Proposed Renovation
☐ Pole/Pad # _____ ☐ Temporary ☐ Other _____
Building Occupied as _____ Utility Co. _____
Est. Cost of Elec. Work \$ 40,000.00

JOB SUMMARY (Office Use Only)

PLAN REVIEW:	INSPECTIONS	Dates (Month/Day)	Initial
☐ No Plans Required	Type: _____	Failure _____	Approval _____
Joint Plan Review Required:	Rough _____	_____	_____
☐ Bldg. ☐ Plumb.	_____	_____	_____
☐ Fire ☐ Elevator	_____	_____	_____
Date: <u>5/5/95</u>	Other <u>Amperage</u>	_____	_____
Approved by: <u>MM 22</u>	Service _____	_____	_____
SUBCODE APPROVAL	Final <u>5/19/95</u>	_____	_____
☐ CO ☐ CCO ☐ CA	Temp. Cut-in-Card Date Issued _____	_____	_____
Date: <u>10/6/95</u>	Final Cut-in-Card Date Issued _____	_____	_____
Approved By: <u>5433</u>	_____	_____	_____

D. TECHNICAL SITE DATA

NO.	SIZE	ITEM	
120		Fixtures (1)	64-
35		Receptacles (2)	81-
14		Switches (3)	7-
169		Total 1 + 2 + 3	
3		Kw Range	
30		Over(s)	
1		Kw Surface Unit	
10		hp Dishwasher	
		hp Garbage Disposal	
		Kw Dryer	
		Kw AC Unit	
		Burglar Alarms	
		Intercoms Panels	
		Smoke Detectors	
		hp Whirlpool/spa	
		Pool Bonding	
		hp Pool Filler Motor	
		Pool Lights	
		Kw Water Heater(s)	
		Kw Central heat:	
		oil, gas or elec.	
		Kw Baseboard Heat Units	
		Thermostats	
		hp Heat Pump	
		hp Pump(s)	
		600 Amp Service Sub Panels	75-
		Signs	
		Light Standards	
		1/4 hp Motors—Fractional H.P. Cases	
		20 hp Motors—All Others compressors	33-
		Kw Transformers	375-
		Kw Generators	
		Amp Service Entrance	
		3000 Other Power Box	9-

C. CERTIFICATION IN LIEU OF OATH

I hereby certify that I am the (agent of) owner of record and am authorized to make this application and perform the work listed on this application.

Electrical Contractor ☐ Exempt Applicant

Signature—Contractor Seal

Edna R. Ott

Paid ☐ Check # <u>2453</u>	Administrative Surcharge	\$
	Minimum Fee	\$ 582-
	DCA Training Fee	\$ 33-
Collected by: _____	TOTAL FEE	\$ 614-

U.C.C. Form F-1208 RRP
1 White = Inspector Copy
3 Pink = Office Copy
2 Canary = Office Copy
4 Gold = Applicant Copy
pd by fairfield Re.

11/2/95

(1) NO WORK PLANNED
(2) JUST SLOWLY

WATER (2) NEW WALL OF NEW BUILDING DELT (24)

2010.95 - NEW WALL OF NEW BUILDING DELT (24)

3/16/95 REMOVE CONCRETE PARTIAL

OUTSIDE STEP DOWN TRANSDUCER FOR
DELTA: ~~CONCRETE~~ ✓

3/24/95 NEW
PHARM ROUTE OK
5433

DELTA CISTERNE STD 303

3/24/95 TRANSFORMER SQD

DISCONNECTS AT:
① TWO WAGNET OVEN 15 KVA
② ONE PROOF OVEN 15 AMP
③ TWO 5 HP WAGNET MIXERS 208 V 20 41.6 A
④ PUMP WASHING 5433

180 DEC INS SYSTEM 115 DEC CIRCULAR

328.95

① HOBART OVEN NO DISCONNECT ✓

② PUMP WASHING NO DISCONNECT ✓
6455 WIL

3/31/95 WORK IN PHARMACY

4/5/95 NEW PHARMACY 2 ROOM ✓

UNIT OK. NEEDS ALARM REPAIR

③ BANKING NO ACCESS TO 2 WORKS OVEN ✓

① NEED CUT SHEET
② HAZEL WASH - 15 ON BOXES FOR WASHING ALGAE
(PRODUCE & MEAT CASES)
DELTA CASE

③ REPRESENTATIVE USED 4 ~~CL~~ USED
IN TROUGH

5433

④ BOND BOXES ON LOBBIES DISCONNECTS
TIM COOPER

TOWNSHIP OF BRICK

ZONING PERMIT

Date of Issue: Nov. 16, 1994 11/94 **Z** 0266

Block 1170 Lot 5 Zone B-3, H.D.

Property Address: 1722 Route 88

Owner: Price Costco, Inc. (Phone): 206-828-8100

Applicant: Udo Klemp, Fairfield Refrigeration (Phone): 201-227-2210

Use: The Price Club retail store

Proposed Construction (if any): Interior alterations, including food sales
area.

Conditions:

Please note that Building Permits, as well as Zoning Permits, must be obtained prior to any construction.

This permit shall be null, void and of no effect if any of the facts contained in the application upon the basis of which this permit was granted are false or untrue in any material respect. This permit shall expire one (1) year after the date of issuance if the use or substantial construction has not been commenced.

Sean Kinney
Land Use Officer



UNITED CONSTRUCTION
433-8877 #33

TOWNSHIP OF BRICK

INSPECTOR: Chusley 004030 01-12

DATE	TIME	PERMIT NO.	BLOCK	LOT	Type of Inspection XXXXXXXXXX	CONSTRUCTION LOCATION	INSPECTION RESULTS			COMMENTS
							Passed	Failed	Not Done	
		1/487-07		6	938 Quincy	FINAL	☒	☒	☒	Back set in GAR
		1/487-07		5	934 Quincy	FINAL	☒	☒	☒	
		1/487-08		6	941 Quincy	FINAL	☒	☒	☒	
		1/487-08		20	873 Columbus	FINAL	☒	☒	☒	
		1/487-01		72	842 Columbus	FRAME	☒	☒	☒	✓ F/FAN
		1/487-01		47	942 Columbus	FRAME	☒	☒	☒	need mech. hangers/utl not
		1/265-12			14 Jewel Ave	FRAME	☒	☒	☒	Can't put on FR1 -
		1/273-71		73	73 Marshall	FRAME	☒	☒	☒	
		1/170-5-6			Price Club Rt 70	FINAL	☒	☒	☒	
		1/151-05		10	241 Service	FRAME	☒	☒	☒	
		1/124-01		3	White Oak	SLAB	☒	☒	☒	
					2 Cambridge - Fence height? - Fence is 6'					

ENGINEERS - NORTHWEST INC. P.S.

6869 WOODLAWN AVE. N.E. - SUITE 205 - SEATTLE, WA 98115 - (206) 525-7560 - FAX # (206) 522-6698

JOB NO. _____ JOB NAME _____ DATE _____
 SUBJECT CHECK SHEAR CONNS. FOR $\frac{3RW}{8} \times DSN. LOAD$ SHEET MC.16 OF _____
 BY _____

SECT. A.6 REF. CALC. SHT. MC.7

$$V_{D+L} = 16.32$$

$$V_{D+L+E} = 18.08 \text{ } \circ \circ \text{ } V_E = 1.80K$$

$$\frac{3RW}{8} = 2.25 \Rightarrow 2.25 V_E + V_{D+L} = 20.37K$$

$$(4) \frac{3}{4}" \phi A325N \text{ BOLTS} \Rightarrow (4) 9.3(1.7) = 63.24 > 20.37 \text{ OK}$$

SECT. B.6 REF. CALC. SHT. MC.12

$$V_{D+L} = 1.82K \neq V_{D+L+E} = 3.97K \text{ } \circ \circ \text{ } V_E = 2.15$$

$$\text{C } \frac{3RW}{8} \quad 2.25 V_E + V_{D+L} = 6.66K$$

$$(3) \frac{3}{4}" \phi A325N \text{ BOLTS} \Rightarrow (3) 9.3(1.7) = 47.43K > 6.66K \text{ OK}$$

SECT. F.6 REF. CALC. SHT. RM.19

$$V_{D+L} = 9.23K \Rightarrow V_{D+L+E} = 7.75K \text{ } \circ \circ \text{ } V_E = 3.52K$$

$$\text{C } \frac{3RW}{8} \Rightarrow 2.25 V_E + V_{D+L} = 12.2K$$

$$(3) \frac{3}{4}" \phi A325N \Rightarrow (3) 9.3(1.7) = 47.43K > 12.2K \text{ OK}$$

ENGINEERS - NORTHWEST INC. P.S.

6869 WOODLAWN AVE. N.E. - SUITE 205 - SEATTLE, WA 98115 - (206) 525-7560 - FAX # (206) 522-8898

JOB NO. _____ JOB NAME Meat Cooler Mezz DATE 2.21.94
 SUBJECT _____ SHEET MC-2 OF _____
 BY TL2

joist @ 3-6' o.c. → 3.6 ft
 $l = 24.0$
Case I 125 psf LL

$$W = (125 + 40) 3.6 = 594 \text{ plf}$$

C 12 x 25

$$F_b = 99\%$$

$$R_e = R_v = 7.13 \text{ k}$$

$$\text{defl. } 1.06 \text{ " } \frac{9}{272}$$

Case II

$$W = (20 + 40) 3.6 = 216 \text{ plf}$$

$$T = 415 \times 3.6 = 1,500 \text{ plf}$$

C 12 x 25

$$F_b = 66\%$$

$$R_{max} = 4.2 \text{ k}$$

$$\text{defl. } .7 \text{ "}$$

Bm

$$W = (125 + 40) \frac{24}{2} = 1.98 \text{ klf}$$

$$4.2 \text{ or } \frac{1}{3.6} = 1.17 \text{ klf}$$

$$l = 28.6$$

W21 x 68

worst case

$$F_b = 73\%$$

$$R = 28.3 \text{ k}$$

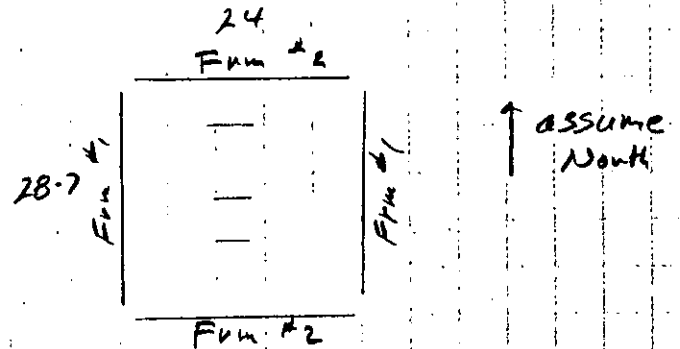
$$\text{defl. } .7 \text{ "}$$

ENGINEERS-NORTHWEST INC. P.S.

6869 WOODLAWN AVE. N.E. - SUITE 205 - SEATTLE, WA 98115 - (206) 525-7560 - FAX # (206) 522-8698

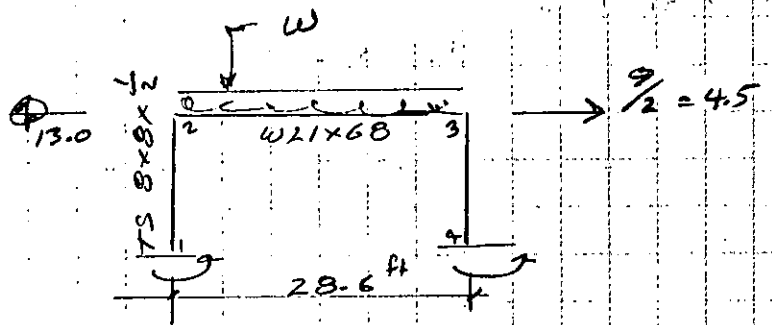
JOB NO. _____ JOB NAME Heat cooler Mezz DATE 2.21.94
 SUBJECT lateral SHEET MC-3 OF _____
 BY R12

$$DL = 24 \times 28.7 \times 40 \\
+ 18.0 \text{ (mech)} \\
+ 2.0 \text{ (tank/comp)} \\
\Sigma = 47.6 \text{ k}$$



$$U = \frac{2 F C W}{12 W} \\
= \frac{.4 \times 1.0 \times 2.75}{6} W \\
= .183 W = 8.7 \text{ k} \rightarrow 9.0$$

Frame #1



$$W_{DL} = 40 \times \frac{24}{2} \text{ pif (DL)} = 480 \text{ pif} \\
W_{LL} = 45 \text{ pif (compressor)} + 20 \times \frac{24}{2} = 655 \text{ pif}$$

allow drift $= H \cdot .04 / 12 W = 1.04''$

MC.4

RISA-2D (R) Version 3.03

Engineers Northwest
6869 Woodlanwn Ave, NE, Suite 205
Seattle, Washington 98115

Job _____
Page _____
Date _____

=====
Units Option : US Standard
AISC Code Checks : 9th Edition ASD
Shear Deformation: No
P-Delta Effects : No
Redesign : No
Edge Forces : No
A.S.I.F. : 1.333

Node No	Boundary Conditions						Temp. (F)
	X-Coord (ft)	Y-Coord (ft)	X-dof (in,K/in)	Y-dof (in,K/in)	Rotation (r,K-ft/r)		
1	0.00	0.00	R	R			0.00
2	0.00	13.00					0.00
3	28.60	13.00					0.00
4	28.60	0.00	R	R			0.00

Material Label	Elastic Modulus (Ksi)	Poisson's Ratio	Thermal Coefficient (F)	Weight Density (K/ft3)	Yield Stress (Fy) (Ksi)
1	29000.00	0.30000	0.65000	0.490	36.000

Section Label	Database Shape	Matl. Set	Area (in^2)	Moment of Inertia (in^4)	As Coef	y/y
1	W21X68	1	20.00	1480.000	1.20	
2	TUBXBXB	1	14.40	131.000	1.20	

I No	Node	J Node	Section	I Releases J			Sec	Sway	End Offsets		Length (ft)
				x	y	z			I (in)	J (in)	
1	1	2	2					Y			13.00
2	2	3	1					Y			28.60
3	3	4	2					Y			13.00

I No	Node	J Node	Unbraced Lengths			K Factors		Bending Coefs	
			Lb-in (ft)	Lb-out (ft)	Lc (ft)	In	Out	Cm	Cb
1	1	2			2.00	2.10			

MCS

RISA-2D (R) Version 3.03

Engineers Northwest
6869 Woodlanwn Ave, NE, Suite 205
Seattle, Washington 98115

Job _____
Page _____
Date _____

I No	J Node	Unbraced Lengths			K Factors		Bending Coefs	
		Lb-in (ft)	Lb-out (ft)	Lc (ft)	In	Out	Cm	Cb
2	2 - 3				1.20			
3	3 - 4				2.10			

BLC No.	Basic Load Case Description	Load Totals		
		Nodal	Point	Dist.
1	DL			1
2	LL			1
3	LAT	3		

Member Distributed Loads, BLC 1: DL

Memb No	I Node	J Node	Dir	Start Magnitude (K/ft,F)	End Magnitude (K/ft,F)	Start Location (ft)	End Location (ft)
2	2	3	Y	-0.480	-0.480	0.000	28.600

Member Distributed Loads, BLC 2: LL

Memb No	I Node	J Node	Dir	Start Magnitude (K/ft,F)	End Magnitude (K/ft,F)	Start Location (ft)	End Location (ft)
2	2	3	Y	-0.655	-0.655	0.000	28.600

Nodal Loads, BLC 3: LAT

Node Number	Global X (K)	Global Y (K)	Moment (K-ft)
2	4.500	0.000	0.000
1	0.000	0.000	3.500
4	0.000	0.000	3.500

Load No.	Combination Description	Self Wt Dir Fac	BLC Fac	BLC Fac	BLC Fac	BLC Fac	BLC Fac	DYNA	W S	E V
1	DL LL		1 1	2 1					Y	1
2	.85DL LAT		1 .85	3 1					Y	1
3	D LL LAT		1 1	2 1	3 1				Y	1

14C.6

RISA-2D (R) Version 3.03

Engineers Northwest
6869 Woodlanwn Ave, NE, Suite 205
Seattle, Washington 98115

Job _____
Page _____
Date _____

Dynamic Analysis Data

Number of modes (frequencies) : 3
Basic Load Case for masses : None
BLC mass direction of action : X only
Acceleration of Gravity : 32.20 ft/sec**2

ENVELOPE SOLUTION
Nodal Displacements

Node		Global X		Global Y		Rotation	
		(in)	LC	(in)	LC	(rad)	LC
1	max	0.00000	2	-0.00000	2	0.00143	1
	min	-0.00000	1	-0.00000	1	-0.00539	2
2	max	0.68088	3	-0.00151	2	-0.00145	2
	min	0.00040	1	-0.00606	1	-0.00329	3
3	max	0.67901	2	-0.00285	2	0.00287	1
	min	-0.00040	1	-0.00674	3	0.00062	2
4	max	0.00000	3	-0.00000	2	-0.00143	1
	min	0.00000	1	-0.00000	3	-0.00732	3

ENVELOPE SOLUTION
Reactions

Node		Global X		Global Y		Moment	
		(K)	LC	(K)	LC	(K-ft)	LC
1	max	1.34442	1	16.23050	1	0.00000	1
	min	-1.76827	2	4.03370	2	0.00000	1
4	max	-1.34442	1	18.03120	3	0.00000	1
	min	-3.59287	3	7.63510	2	0.00000	1

ENVELOPE SOLUTION
Member Section Results

Nodes				Member Quarter Points							
No		I	J	I-End	1/4	1/2	3/4	J-End			
				(K,Kft,in)	LC(K,Kft,in)	LC(K,Kft,in)	LC(K,Kft,in)	LC(K,Kft,in)			
1	A	1-2		16.23	1	16.23	1	16.23	1	16.23	1
				4.03	2	4.03	2	4.03	2	4.03	2
	V			1.77	2	1.77	2	1.77	2	1.77	2
				-1.34	1	-1.34	1	-1.34	1	-1.34	1
	M			3.50	2	4.37	1	8.74	1	13.11	1
				-0.00	1	-2.25	2	-7.99	2	-13.74	2
	D			0.000	1	0.052	1	0.084	1	0.073	1
				0.000	1	-0.214	2	-0.417	2	-0.581	2

↑ no uplift

ML07

RISA-2D (R) Version 3.03

Engineers Northwest
6869 Woodlanwn Ave, NE, Suite 205
Seattle, Washington 98115

Job _____
Page _____
Date _____

No	Nodes			Member Quarter Points							
	I	J		I-End	1/4	1/2	3/4	J-End			
				(K,Kft,in)LC	(K,Kft,in)LC	(K,Kft,in)LC	(K,Kft,in)LC	(K,Kft,in)LC	(K,Kft,in)LC	(K,Kft,in)LC	(K,Kft,in)LC
2	2-	3	A	3.59 3	3.59 3	3.59 3	3.59 3	3.59 3	3.59 3	3.59 3	3.59 3
				1.34 1	1.34 1	1.34 1	1.34 1	1.34 1	1.34 1	1.34 1	1.34 1
			V	16.23 1	8.12 1	-0.00 1	-4.72 2	-7.64 2	-7.64 2	-7.64 2	-7.64 2
				4.03 2	1.12 2	-1.80 2	-9.92 3	-18.03 3	-18.03 3	-18.03 3	-18.03 3
			M	17.48 1	-37.90 2	-35.45 2	-12.15 2	43.21 3	43.21 3	43.21 3	43.21 3
				-19.49 2	-82.45 3	-98.59 3	-69.56 1	17.48 1	17.48 1	17.48 1	17.48 1
			D	0.000 1	-0.096 2	-0.118 2	-0.071 2	-0.004 2	-0.004 2	-0.004 2	-0.004 2
				0.000 1	-0.243 3	-0.327 3	-0.232 1	-0.007 3	-0.007 3	-0.007 3	-0.007 3
			A	18.03 3	18.03 3	18.03 3	18.03 3	18.03 3	18.03 3	18.03 3	18.03 3
				7.64 2	7.64 2	7.64 2	7.64 2	7.64 2	7.64 2	7.64 2	7.64 2
3	3-	4	V	3.59 3	3.59 3	3.59 3	3.59 3	3.59 3	3.59 3	3.59 3	3.59 3
				1.34 1	1.34 1	1.34 1	1.34 1	1.34 1	1.34 1	1.34 1	1.34 1
			M	43.21 3	31.53 3	-19.85 3	8.18 3	-0.00 1	-0.00 1	-0.00 1	-0.00 1
				17.48 1	13.11 1	8.74 1	4.37 1	-3.50 3	-3.50 3	-3.50 3	-3.50 3
			D	0.000 1	0.074 1	0.084 1	0.053 1	0.001 1	0.001 1	0.001 1	0.001 1
				0.000 1	-0.045 2	-0.202 2	-0.427 2	-0.678 2	-0.678 2	-0.678 2	-0.678 2
			A	18.03 3	18.03 3	18.03 3	18.03 3	18.03 3	18.03 3	18.03 3	18.03 3
				7.64 2	7.64 2	7.64 2	7.64 2	7.64 2	7.64 2	7.64 2	7.64 2
			V	3.59 3	3.59 3	3.59 3	3.59 3	3.59 3	3.59 3	3.59 3	3.59 3
				1.34 1	1.34 1	1.34 1	1.34 1	1.34 1	1.34 1	1.34 1	1.34 1

ENVELOPE SOLUTION
AISC Code Checks

No	Nodes		Max	lc	O	lc	Member Quarter Points								L	lc	Shear	lc
	I	J					1/4	lc	1/2	lc	3/4	lc	L	lc				
1	1-	2	0.274	1	0.10	3	0.12	1	0.17	1	0.22	1	0.27	1	0.01	2		
2	2-	3	0.709	3	0.16	2	0.60	3	0.71	3	0.49	1	0.33	3	0.10	3		
3	3-	4	0.579	3	0.58	3	0.44	3	0.31	3	0.17	3	0.12	3	0.02	3		

~ ok

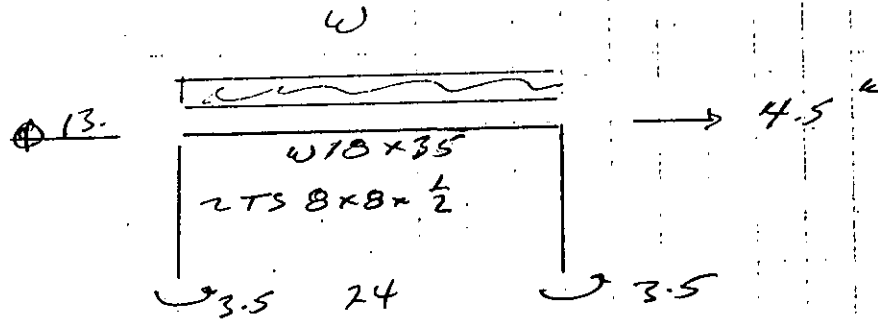
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JOB NO. _____ JOB NAME Meat Cooler M22 DATE 2-21-94
 SUBJECT _____ SHEET 16.8 OF _____
 BY _____

Frame

2



$$W_D = \frac{3.6}{2} \cdot 40 + 40 = 112 \text{ plf}$$

$$W_L = \frac{3.6}{2} \cdot 20 = 36 \text{ plf}$$

RISA-2D (R) Version 3.03

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Job _____
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Units Option : US Standard

AISC Code Checks : 9th Edition ASD

Shear Deformation: No

P-Delta Effects : No

Redesign : No

Edge Forces : No

A.S.I.F. : 1.333

Node No	X-Coord (ft)	Y-Coord (ft)	Boundary Conditions			Temp. (F)
			X-dof (in,K/in)	Y-dof (in,K/in)	Rotation (r,K-ft/r)	
1	0.00	0.00	R	R		0.00
2	0.00	13.00				0.00
3	24.00	13.00				0.00
4	24.00	0.00	R	R		0.00

Material Label	Elastic Modulus (Ksi)	Poisson's Ratio	Thermal Coefficient (F)	Weight Density (K/ft3)	Yield Stress (Fy) (Ksi)
1	29000.00	0.30000	0.65000	0.490	36.000

Section Label	Database Shape	Matl. Set	Area (in^2)	Moment of Inertia (in^4)	As Coef	y/y
1	W18X35	1	10.30	510.000	1.20	
2	TUB8X8	1	14.40	131.000	1.20	

I No	J Node	Section	Releases		Sec	Sway	End Offsets		Length (ft)
			x	y			I (in)	J (in)	
1	1	2				Y			13.00
2	2	3				Y			24.00
3	3	4				Y			13.00

I No	J Node	Unbraced Lengths			K Factors		Bending Coefs	
		Lb-in (ft)	Lb-out (ft)	Lc (ft)	In	Out	Cm	Cb
1	1			2.00	2.10			

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I No	J Node	Unbraced Lengths			K Factors		Bending Coefs	
		Lb-in (ft)	Lb-out (ft)	Lc (ft)	In	Out	Cm	Cb
2	2 - 3				1.20			
3	3 - 4				2.10			

BLC No.	Basic Load Case Description		Load Totals		
			Nodal	Point	Dist.
1	DL				1
2	LL				1
3	LAT		3		

Member Distributed Loads, BLC 1: DL

Memb No	I Node	J Node	Dir	Start Magnitude (K/ft,F)	End Magnitude (K/ft,F)	Start Location (ft)	End Location (ft)
2	2	3	Y	-0.112	-0.112	0.000	24.000

Member Distributed Loads, BLC 2: LL

Memb No	I Node	J Node	Dir	Start Magnitude (K/ft,F)	End Magnitude (K/ft,F)	Start Location (ft)	End Location (ft)
2	2	3	Y	-0.040	-0.040	0.000	24.000

Nodal Loads, BLC 3: LAT

Node Number	Global X (K)	Global Y (K)	Moment (K-ft)
2	4.500	0.000	0.000
1	0.000	0.000	3.500
4	0.000	0.000	3.500

Load Combination No.	Description	Self Wt Dir Fac	BLC Fac	BLC Fac	BLC Fac	BLC Fac	BLC Fac	DYNA	W S	E V
1	DL LL		1	1	2	1			Y	1
2	.85DL LAT		1	.85	3	1			Y	1
3	D LL LAT		1	1	2	1	3	1	Y	1

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Dynamic Analysis Data

Number of modes (frequencies) : 3
Basic Load Case for masses : None
BLC mass direction of action : X only
Acceleration of Gravity : 32.20 ft/sec**2

ENVELOPE SOLUTION
Nodal Displacements

Node	Global X			Global Y			Rotation		
		(in)	LC		(in)	LC		(rad)	LC
1	max	0.00000	2		0.00000	2		0.00025	1
	min	-0.00000	1		-0.00000	1		-0.00634	2
2	max	0.77347	3		0.00037	2		-0.00050	1
	min	0.00011	1		-0.00068	1		-0.00151	3
3	max	0.77112	2		-0.00068	1		0.00050	1
	min	-0.00011	1		-0.00148	3		-0.00069	2
4	max	0.00000	3		-0.00000	1		-0.00025	1
	min	0.00000	1		-0.00000	3		-0.00673	3

ENVELOPE SOLUTION
Reactions

Node	Global X			Global Y			Moment		
		(K)	LC		(K)	LC		(K-ft)	LC
1	max	0.23308	1		1.82400	1		0.00000	1
	min	-2.10592	2		-1.00343	2		0.00000	1
4	max	-0.23308	1		3.96983	3		0.00000	1
	min	-2.48118	3		1.82400	1		0.00000	1

ENVELOPE SOLUTION
Member Section Results

No	Nodes		Member Quarter Points									
	I	J	I-End	1/4	1/2	3/4	J-End					
			(K,Kft,in)	LC(K,Kft,in)	LC(K,Kft,in)	LC(K,Kft,in)	LC(K,Kft,in)	LC(K,Kft,in)	LC(K,Kft,in)	LC(K,Kft,in)	LC(K,Kft,in)	LC(K,Kft,in)
1	1-2	A	1.82	1	1.82	1	1.82	1	1.82	1	1.82	1
			-1.00	2	-1.00	2	-1.00	2	-1.00	2	-1.00	2
		V	2.11	2	2.11	2	2.11	2	2.11	2	2.11	2
			-0.23	1	-0.23	1	-0.23	1	-0.23	1	-0.23	1
	M		3.50	2	0.76	1	1.52	1	2.27	1	3.03	1
			0.00	1	-3.34	2	-10.19	2	-17.03	2	-23.88	2
		D	0.000	1	0.009	1	0.014	1	0.013	1	-0.000	1
			0.000	1	-0.250	2	-0.484	2	-0.669	2	-0.773	3

MC-12

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No	Nodes		Member Quarter Points										
	I	J	I-End		1/4		1/2		3/4		J-End		
			(K,Kft,in)	LC(K,Kft,in)	(K,Kft,in)	LC(K,Kft,in)	(K,Kft,in)	LC(K,Kft,in)	(K,Kft,in)	LC(K,Kft,in)	(K,Kft,in)	LC(K,Kft,in)	
2	2-	3	A	2.48	3	2.48	3	2.48	3	2.48	3	2.48	3
				0.23	1	0.23	1	0.23	1	0.23	1		
			V	1.82	1	0.91	1	-0.00	1	-0.91	1	-1.82	1
				-1.00	2	-1.57	2	-2.15	2	-3.06	3	-3.97	3
			M	3.03	1	-5.18	1	-4.98	2	9.61	2	28.76	3
				-23.88	2	-18.08	3	-7.94	3	-5.18	1	3.03	1
			D	0.000	1	-0.035	1	-0.034	2	0.002	2	-0.001	1
				0.000	1	-0.063	3	-0.053	3	-0.036	1	-0.004	3
3	3-	4	A	3.97	3	3.97	3	3.97	3	3.97	3	3.97	3
				1.82	1	1.82	1	1.82	1	1.82	1	1.82	1
			V	2.48	3	2.48	3	2.48	3	2.48	3	2.48	3
				0.23	1	0.23	1	0.23	1	0.23	1	0.23	1
			M	28.76	3	20.69	3	12.63	3	4.56	3	0.00	1
				3.03	1	2.27	1	1.52	1	0.76	1	-3.50	2
			D	0.000	1	0.013	1	0.015	1	0.009	1	0.000	1
				0.000	1	-0.087	2	-0.269	2	-0.510	2	-0.770	2

ENVELOPE SOLUTION
AISC Code Checks

No	Nodes		Member Quarter Points											
	I	J	Max	lc	0	lc	1/4	lc	1/2	lc	3/4	lc	L	lc Shear lc
1	1-	2	0.279	2	0.04	2	0.04	2	0.12	2	0.20	2	0.28	2 0.01 2
2	2-	3	0.393	3	0.34	2	0.27	3	0.21	1	0.17	2	0.39	3 0.04 3
3	3-	4	0.350	3	0.35	3	0.26	3	0.16	3	0.07	3	0.06	3 0.02 3

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JOB NO. _____ JOB NAME Meat cooler Muzz DATE 2.21.94
 SUBJECT _____ SHEET MC.13 OF _____
 BY _____

Bm Col connection

W 21 x 68

$$M_{DL} = 17.5$$

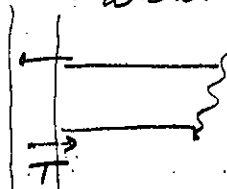
$$M_{DL+E} = 43.2$$

$$\therefore M_E = 25.7$$

$$\frac{3}{8} R_w \times 25.7 = 57.8$$

$$\therefore M_{DL} + \frac{3}{8} R_w \times E = 75.3$$

$\therefore$ T 2 x 3 weld to flange



$$T = 75.3 \times \frac{12}{21} = 43.0^k$$

$$2" \times \frac{3}{16} \rightarrow 2(9 \times 7) = 44.1 \text{ OK}$$

W 18 x 35

$$M_{DL} = 3.0$$

$$M_{DL+E} = 28.8$$

$$\therefore M_E = 25.8$$

$$\frac{3}{8} R_w = 2.25$$

$$M_{DL} + \frac{3}{8} R_w \times E = 25.8 \times 2.25 + 3.0$$

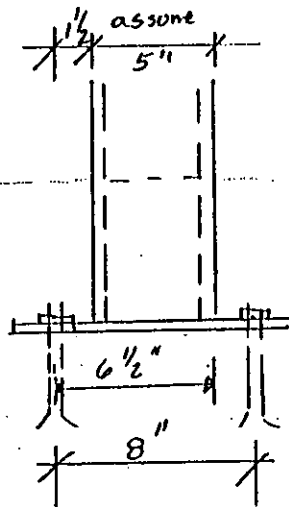
$$= 61 < 75.3 \therefore 2" \times \frac{3}{16} \text{ OK}$$

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JOB NO. _____ JOB NAME Meat Cooler MC22 DATE 2.21.94
 SUBJECT _____ SHEET MC14 OF _____
 BY H. D. J.

Compute MAX. Fixity from TS Base R DETAIL.



* $\frac{3}{4}$ " ϕ KBII carbon steel
 EMBED $4\frac{3}{4}$ " INSPECTED
 ICBO 4627

$$T_a = 3,875 \# \times < 4,450$$

$$V_a = 4,225 \# > 3,560$$

$\frac{3}{4}$ " AB TOL 26.5

$$12 \cdot \frac{3}{4} = 9"$$

$$CB" T_a = 3444 \#$$

$$M = \frac{6.5}{12} \cdot 3,444 \cdot 2 \text{ bolts} = 3.73 \text{ K.ft}$$

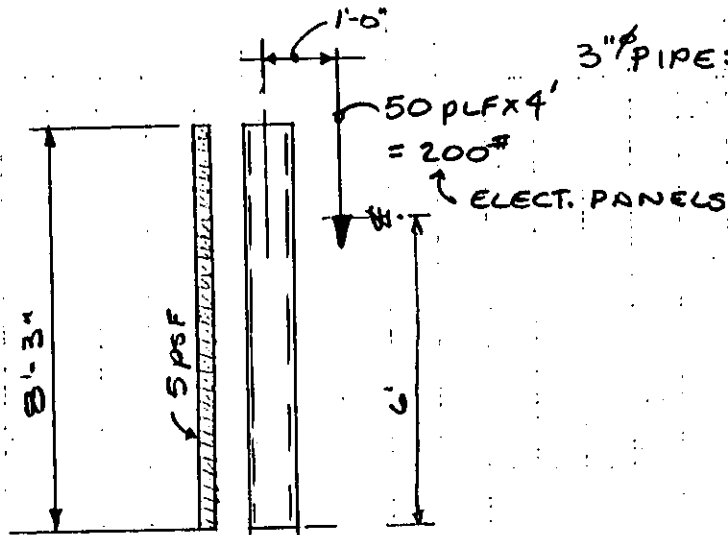
(USE 3.5 CONSERV.)

* ANCHOR BOLTS SHOWN ON DWGS. THE KBII IS IN CASE AB'S ARE MISPLACED OR JUST MISSED, AND A CONG. ANCHOR IS THE ONLY OPTION.

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JOB NO. _____ JOB NAME _____ DATE _____
 SUBJECT 8' CANTILEVER WALL @ M/C MEZZ. SHEET MC-15 OF _____
 BY _____



3" PIPES @ 4' o/c

WALL WEIGHT

3" ϕ PIPE	2.0 psf
3/4 PLY	2.3
5/8" GWB	2.8
STL STUDS	1.1
MISC	0.8
	<u>9.0 psf</u>

WALL. $F_p = ZIC_p W_p$
 $= .9(1)2 W_p = .8 W_p = 7.2 \text{ psf}$
 $> 5 \text{ psf}$

ELECT. PNL. $F_p = .8 (.200) = .16$

$$M = \frac{.009(8.25)^2}{2} (.4) + .16(6) = 1.23 + .96 = 2.19 \text{ KFT}$$

$$S = \frac{2.19 \times 12}{.6(36)1.33} = 0.913 \text{ IN}^3 < 1.72 \text{ IN}^3 \text{ (3" ϕ ST PIPE)}$$

$$T = C = \frac{2.19 \text{ KFT} \times 12}{3 \text{ IN}} = 8.8 \text{ K/BOLT} < 9.3 \text{ K } 3/4" \text{ A325N}$$

$$\text{PIPE WALL THK} = .216"$$

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JOB NO. _____ JOB NAME _____ DATE _____
SUBJECT CHECK SHEAR CONNS. FOR $\frac{3RW}{8}$ X DSN. LOAD SHEET MC-16 OF _____
BY _____

SECT. A-6 REF. CALC. SHT. MC-7

$$V_{D+L} = 16.32$$

$$V_{D+L+E} = 18.08 \text{ } \circ \circ \text{ } V_E = 1.80^k$$

$$\frac{3RW}{8} = 2.25 \Rightarrow 2.25 V_E + V_{D+L} = 20.37^k$$

$$(4) \frac{3}{4}'' \phi A325N \text{ BOLTS} \Rightarrow (4) 9.3(1.7) = 63.24 > 20.37 \text{ OK}$$

SECT. B-6 REF. CALC. SHT MC-12

$$V_{D+L} = 1.82^k \neq V_{D+L+E} = 3.97^k \text{ } \circ \circ \text{ } V_E = 2.15$$

$$C \frac{3RW}{8} \quad 2.25 V_E + V_{D+L} = 6.66^k$$

$$(3) \frac{3}{4}'' \phi A325N \text{ BOLTS} \Rightarrow (3) 9.3(1.7) = 47.43^k > 6.66^k \text{ OK}$$

SECT. F-6 REF. CALC. SHT RM-19

$$V_{D+L} = 4.23^k \Rightarrow V_{D+L+E} = 7.75^k \text{ } \circ \circ \text{ } V_E = 3.52^k$$

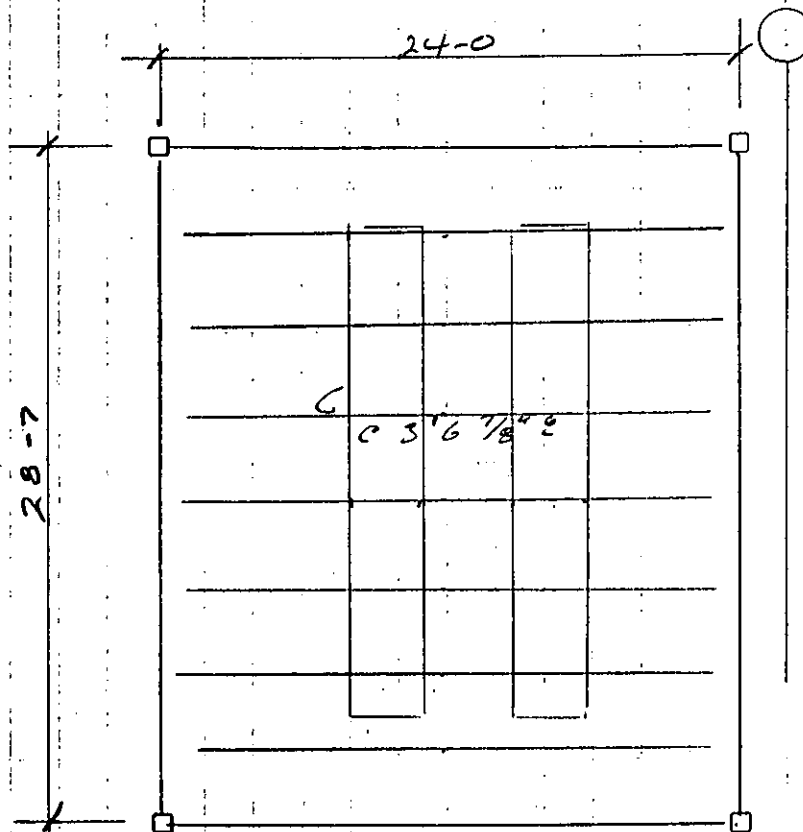
$$C \frac{3RW}{8} \Rightarrow 2.25 V_E + V_{D+L} = 12.2^k$$

$$(3) \frac{3}{4}'' \phi A325N \Rightarrow (3) 9.3(1.7) = 47.43^k > 12.2^k \text{ OK}$$

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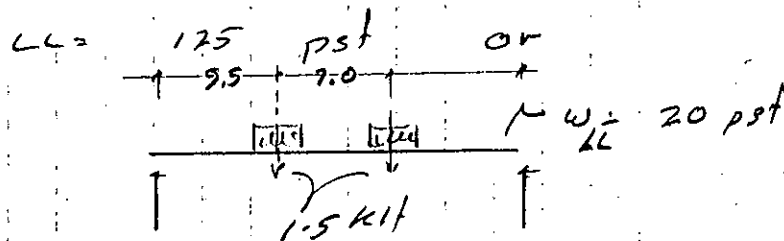
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JOB NO. _____ JOB NAME _____ DATE 2.21.94
 SUBJECT MEAT COOLER MEZZANINE SHEET MC-1 OF _____
 BY TR



$A = 24 \times 28.58 = 686\#$
 THESE LATERAL
 CALCS. WORK FOR
 ALL MEZZ, THIS
 AREA OR SMALLER.

joist



DL =	conc	26.6
	deck	1.0
	C 12	3.0
	misc	4.4
		<u>40.0</u>

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JOB NO. _____ JOB NAME Meat Cooler Mezz DATE 2.21.94
 SUBJECT _____ SHEET MC-2 OF _____
 BY RLZ

joist @ 3 - 6' @ c → 3.6 ft
 $l = 24.0$
case I 125 psf LL

$$W = (125 + 40) 3.6 = 594 \text{ plf}$$

C 12 x 25

$$F_b = 99\%$$

$$R_{ex} R_{er} = 7.13'' \quad \text{defl. } 1.06'' \quad \frac{l}{272}$$

Case II

$$W = (20 + 40) 3.6 = 216 \text{ plf}$$

$$P = 415 \times 3.6 = 1,500 \text{ plf}$$

C 12 x 25

$$F_b = 66\%$$

$$R_{max} = 4.2''$$

$$\text{defl} = .7''$$

Bsm

$$W = (125 + 40) \frac{24}{2} = 1.98 \text{ klf}$$

$$4.2 \text{ or } \frac{1}{3.6} = 1.17 \text{ klf}$$

$$l = 28.6$$

W 21 x 68

worst case

$$F_b = 73\%$$

$$R = 28.3''$$

$$\text{defl} .7''$$

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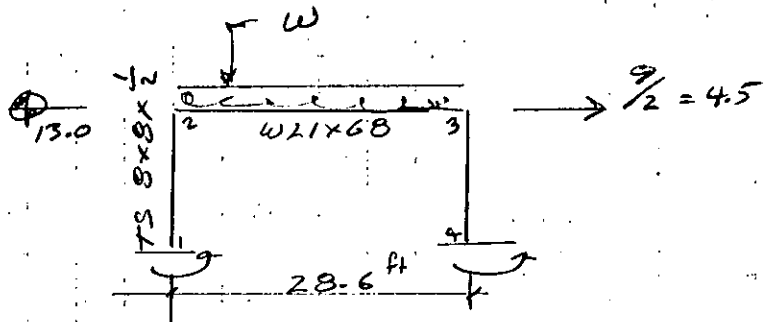
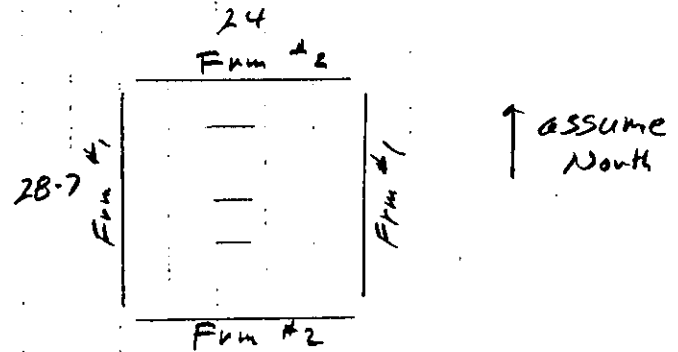
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JOB NO. _____ JOB NAME Heat cooler M22 DATE 2.21.9K
 SUBJECT lateral SHEET M2-3 OF _____
 BY R12

$$DL = 24 \times 28.7 \times 40 \\
+ 18.0 \text{ (mech)} \\
+ 2.0 \text{ (tank/comp)} \\
\Sigma = 47.6 \text{ K}$$

$$U = \frac{2 I C W}{12 W} \\
= \frac{.4 \times 1.0 \times 2.75}{6} W \\
= .183 W = 8.7 \text{ K} \rightarrow 9.0$$

Frame #1



$$W_{DL} = 40 \times \frac{24}{2} \text{ plf (DL)} = 480 \text{ plf} \\
W_{LL} = 415 \text{ plf (compressor)} \\
+ 20 \times \frac{24}{2} = 655 \text{ plf}$$

$$\text{allow drift} = H \cdot .04 / 12 W = 1.04''$$

MC.4

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Job _____
Page _____
Date _____

Units Option : US Standard

AISC Code Checks : 9th Edition ASD

Shear Deformation: No

P-Delta Effects : No

Redesign : No

Edge Forces : No

A.S.I.F. : 1.333

Node No	Boundary Conditions						Temp. (F)
	X-Coord (ft)	Y-Coord (ft)	X-dof (in,K/in)	Y-dof (in,K/in)	Rotation (r,K-ft/r)		
1	0.00	0.00	R	R			0.00
2	0.00	13.00					0.00
3	28.60	13.00					0.00
4	28.60	0.00	R	R			0.00

Material Label	Elastic Modulus (Ksi)	Poisson's Ratio	Thermal Coefficient (F)	Weight Density (K/ft3)	Yield Stress (Fy) (Ksi)
1	29000.00	0.30000	0.65000	0.490	36.000

Section Label	Database Shape	Matl. Set	Area (in^2)	Moment of Inertia (in^4)	As Coef	y/y
1	W21X68	1	20.00	1480.000	1.20	
2	TUBX8X8	1	14.40	131.000	1.20	

I No	J Node	Section	I Releases			J Node	End Offsets		Length (ft)
			x	y	z		Sec	Sway	
1	1	2	2					Y	13.00
2	2	3	1					Y	28.60
3	3	4	2					Y	13.00

I No	J Node	Unbraced Lengths			K Factors		Bending Coefs	
		Lb-in (ft)	Lb-out (ft)	Lc (ft)	In	Out	Cm	Cb
1	1	2		2.00	2.10			

MC5

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Seattle, Washington 98115

Job _____
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Date _____

I			J			Unbraced Lengths			K Factors		Bending Coefs	
No	Node		Node			Lb-in	Lb-out	Lc	In	Out	Cm	Cb
						(ft)	(ft)	(ft)				
2	2	-	3						1.20			
3	3	-	4						2.10			

BLC		Basic Load Case		Load Totals		
No.		Description		Nodal	Point	Dist.
1	DL					1
2	LL					1
3	LAT			3		

Member Distributed Loads, BLC 1: DL

Memb	I	J	Start		End		Start	End
No	Node	Node	Dir	Magnitude	Magnitude		Location	Location
				(K/ft,F)	(K/ft,F)		(ft)	(ft)
2	2	-	3	Y	-0.480	-0.480	0.000	28.600

Member Distributed Loads, BLC 2: LL

Memb	I	J	Start		End		Start	End
No	Node	Node	Dir	Magnitude	Magnitude		Location	Location
				(K/ft,F)	(K/ft,F)		(ft)	(ft)
2	2	-	3	Y	-0.655	-0.655	0.000	28.600

Nodal Loads, BLC 3: LAT

Node	Global X		Global Y		Moment
Number		(K)		(K)	(K-ft)
2		4.500		0.000	0.000
1		0.000		0.000	3.500
4		0.000		0.000	3.500

Load Combination	Self Wt	BLC	BLC	BLC	BLC	BLC	W	
No.	Description	Dir	Fac	Fac	Fac	Fac	DYNA	S V
1	DL LL		1 1	2 1				Y 1
2	.85DL LAT		1 .85	3 1				Y 1
3	D LL LAT		1 1	2 1	3 1			Y 1

RISA-2D (R) Version 3.03

Engineers Northwest
6867 Woodlanwn Ave, NE, Suite 205
Seattle, Washington 98115

Job _____
Page _____
Date _____

Dynamic Analysis Data

Number of modes (frequencies) : 3
Basic Load Case for masses : None
BLC mass direction of action : X only
Acceleration of Gravity : 32.20 ft/sec**2

ENVELOPE SOLUTION
Nodal Displacements

Node		Global X (in)	LC		Global Y (in)	LC		Rotation (rad)	LC
1	max	0.00000	2	<i>2.104</i>	-0.00000	2		0.00143	1
	min	-0.00000	1	<i>ok</i>	-0.00000	1		-0.00539	2
2	max	0.68088	3		-0.00151	2		-0.00145	2
	min	0.00040	1		-0.00606	1		-0.00329	3
3	max	0.67901	2		-0.00285	2		0.00287	1
	min	-0.00040	1		-0.00674	3		0.00062	2
4	max	0.00000	3		-0.00000	2		-0.00143	1
	min	0.00000	1		-0.00000	3		-0.00732	3

ENVELOPE SOLUTION
Reactions

Node		Global X (K)	LC		Global Y (K)	LC		Moment (K-ft)	LC
1	max	1.34442	1		16.23050	1		0.00000	1
	min	-1.76827	2		4.03370	2		0.00000	1
4	max	-1.34442	1		18.03120	3		0.00000	1
	min	-3.59287	3		7.63510	2		0.00000	1

ENVELOPE SOLUTION
Member Section Results

No	Nodes		Member Quarter Points									
	I	J	I-End		1/4		1/2		3/4		J-End	
			(K,Kft,in)	LC(K,Kft,in)	(K,Kft,in)	LC(K,Kft,in)	(K,Kft,in)	LC(K,Kft,in)	(K,Kft,in)	LC(K,Kft,in)	(K,Kft,in)	LC(K,Kft,in)
1	1-2	A	16.23	1	16.23	1	16.23	1	16.23	1	16.23	1
			4.03	2	4.03	2	4.03	2	4.03	2	4.03	2
		V	1.77	2	1.77	2	1.77	2	1.77	2	1.77	2
			-1.34	1	-1.34	1	-1.34	1	-1.34	1	-1.34	1
		M	3.50	2	4.37	1	8.74	1	13.11	1	17.48	1
			-0.00	1	-2.25	2	-7.99	2	-13.74	2	-19.49	2
		D	0.000	1	0.052	1	0.084	1	0.073	1	-0.001	1
			0.000	1	-0.214	2	-0.417	2	-0.581	2	-0.681	3

no uplift

RISA-2D (R) Version 3.03

Engineers Northwest
6869 Woodlanwn Ave, NE, Suite 205
Seattle, Washington 98115

Job _____
Page _____
Date _____

No	Nodes			Member Quarter Points									
	I	J		I-End	1/4	1/2	3/4	J-End					
				(K,Kft,in)LC	(K,Kft,in)LC	(K,Kft,in)LC	(K,Kft,in)LC	(K,Kft,in)LC					
2	2-	3	A	3.59 3	3.59 3	3.59 3	3.59 3	3.59 3					
				1.34 1	1.34 1	1.34 1	1.34 1	1.34 1					
			V	16.23 1	8.12 1	-0.00 1	-4.72 2	-7.64 2					
				4.03 2	1.12 2	-1.80 2	-9.92 3	-18.03 3					
			M	17.48 1	-37.90 2	-35.45 2	-12.15 2	43.21 3					
				-19.49 2	-82.45 3	-98.59 3	-69.56 1	17.48 1					
			D	0.000 1	-0.096 2	-0.118 2	-0.071 2	-0.004 2					
				0.000 1	-0.243 3	-0.327 3	-0.232 1	-0.007 3					
3	3-	4	A	18.03 3	18.03 3	18.03 3	18.03 3	18.03 3					
				7.64 2	7.64 2	7.64 2	7.64 2	7.64 2					
			V	3.59 3	3.59 3	3.59 3	3.59 3	3.59 3					
				1.34 1	1.34 1	1.34 1	1.34 1	1.34 1					
			M	43.21 3	31.53 3	19.85 3	8.18 3	-0.00 1					
				17.48 1	13.11 1	8.74 1	4.37 1	-3.50 3					
			D	0.000 1	0.074 1	0.084 1	0.053 1	0.001 1					
				0.000 1	-0.045 2	-0.202 2	-0.427 2	-0.678 2					

ENVELOPE SOLUTION
AISC Code Checks

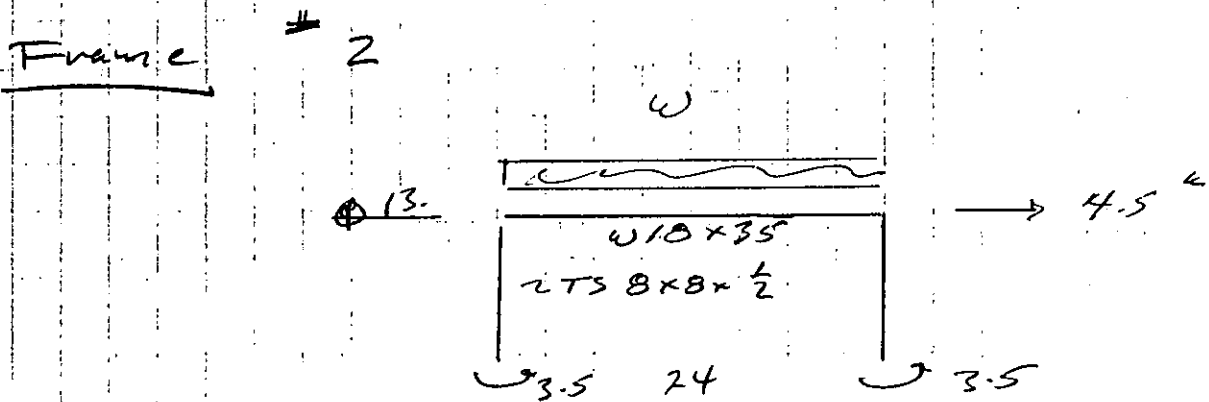
No	Nodes		Member Quarter Points													
	I	J	Max	lc	0	lc	1/4	lc	1/2	lc	3/4	lc	L	lc	Shear	lc
1	1-	2	0.274	1	0.10	3	0.12	1	0.17	1	0.22	1	0.27	1	0.01	2
2	2-	3	0.709	3	0.16	2	0.60	3	0.71	3	0.49	1	0.33	3	0.10	3
3	3-	4	0.579	3	0.58	3	0.44	3	0.31	3	0.17	3	0.12	3	0.02	3

2 ok

ENGINEERS - NORTHWEST INC. P.S.

6869 WOODLAWN AVE. N.E. - SUITE 205 - SEATTLE, WA 98115 - (206) 525-7560 - FAX # (206) 522-6698

JOB NO. _____ JOB NAME Meat Cooler M22 DATE 2.21.94
 SUBJECT _____ SHEET 16.8 OF _____
 BY _____



$$W_D = \frac{3.6}{2} \quad 40 + 40 = 112 \text{ plf}$$

$$W_L = \frac{3.6}{2} \quad 20 = 36 \text{ plf}$$

Engineers Northwest
6869 Woodlanwn Ave, NE, Suite 205
Seattle, Washington 98115

RISA-2D (R) Version 3.03

Job _____
Page _____
Date _____

Units Option : US Standard

AISC Code Checks : 9th Edition ASD

Shear Deformation: No

P-Delta Effects : No

Redesign : No

Edge Forces : No

A.S.I.F. : 1.333

Node No	Boundary Conditions						Temp. (F)
	X-Coord (ft)	Y-Coord (ft)	X-dof (in,K/in)	Y-dof (in,K/in)	Rotation (r,K-ft/r)		
1	0.00	0.00	R	R			0.00
2	0.00	13.00					0.00
3	24.00	13.00					0.00
4	24.00	0.00	R	R			0.00

Material Label	Elastic Modulus (Ksi)	Poisson's Ratio	Thermal Coefficient (F)	Weight Density (K/ft3)	Yield Stress (Fy) (Ksi)
1	29000.00	0.30000	0.65000	0.490	36.000

Section Label	Database Shape	Matl. Set	Area (in^2)	Moment of Inertia (in^4)	As Coef	y/y
1	W18X35	1	10.30	510.000	1.20	
2	TU8X8XB	1	14.40	131.000	1.20	

I No	Node	J Node	Section	Releases		Sec	End Offsets		Length (ft)
				x y z	x y z		Sway	I J (in) (in)	
1	1	2	2				Y		13.00
2	2	3	1				Y		24.00
3	3	4	2				Y		13.00

I No	Node	J Node	Unbraced Lengths			K Factors		Bending Coefs	
			Lb-in (ft)	Lb-out (ft)	Lc (ft)	In	Out	Cm	Cb
1	1	2			2.00	2.10			

RISA-2D (R) Version 3.03

Engineers Northwest
6869 Woodlanwn Ave, NE, Suite 205
Seattle, Washington 98115

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Page _____
Date _____

I No	J Node	Unbraced Lengths			K Factors		Bending Coefs	
		Lb-in (ft)	Lb-out (ft)	Lc (ft)	In	Out	Cm	Cb
2	2 - 3				1.20			
3	3 - 4				2.10			

BLC No.	Basic Load Case Description		Load Totals		
			Nodal	Point	Dist.
1	DL				1
2	LL				1
3	LAT		3		

Member Distributed Loads, BLC 1: DL

Memb No	I Node	J Node	Dir	Start Magnitude (K/ft,F)	End Magnitude (K/ft,F)	Start Location (ft)	End Location (ft)
2	2	3	Y	-0.112	-0.112	0.000	24.000

Member Distributed Loads, BLC 2: LL

Memb No	I Node	J Node	Dir	Start Magnitude (K/ft,F)	End Magnitude (K/ft,F)	Start Location (ft)	End Location (ft)
2	2	3	Y	-0.040	-0.040	0.000	24.000

Nodal Loads, BLC 3: LAT

Node Number	Global X (K)	Global Y (K)	Moment (K-ft)
2	4.500	0.000	0.000
1	0.000	0.000	3.500
4	0.000	0.000	3.500

Load Combination No.	Description	Self Wt Dir Fac	BLC Fac	BLC Fac	BLC Fac	BLC Fac	BLC Fac	BLC Fac	DYNA	W S	E V
1	DL LL		1 1	2 1						Y	1
2	.85DL LAT		1 .85	3 1						Y	1
3	D LL LAT		1 1	2 1	3 1					Y	1

RISA-2D (R) Version 3.03

Engineers Northwest
6869 Woodlanwn Ave, NE, Suite 205
Seattle, Washington 98115

Job _____
Page _____
Date _____

Dynamic Analysis Data

Number of modes (frequencies) : 3
Basic Load Case for masses : None
BLC mass direction of action : X only
Acceleration of Gravity : 32.20 ft/sec**2

ENVELOPE SOLUTION

Nodal Displacements

Node		Global X		Global Y		Rotation	
		(in)	LC	(in)	LC	(rad)	LC
1	max	0.00000	2	0.00000	2	0.00025	1
	min	-0.00000	1	-0.00000	1	-0.00634	2
2	max	0.77347	3	0.00037	2	-0.00050	1
	min	0.00011	1	-0.00068	1	-0.00151	3
3	max	0.77112	2	-0.00068	1	0.00050	1
	min	-0.00011	1	-0.00148	3	-0.00069	2
4	max	0.00000	3	-0.00000	1	-0.00025	1
	min	0.00000	1	-0.00000	3	-0.00673	3

ENVELOPE SOLUTION

Reactions

Node		Global X		Global Y		Moment	
		(K)	LC	(K)	LC	(K-ft)	LC
1	max	0.23308	1	1.82400	1	0.00000	1
	min	-2.10592	2	-1.00343	2	0.00000	1
4	max	-0.23308	1	3.96983	3	0.00000	1
	min	-2.48118	3	1.82400	1	0.00000	1

ENVELOPE SOLUTION

Member Section Results

Nodes				Member Quarter Points									
No	I	J		I-End		1/4		1/2		3/4		J-End	
				(K,Kft,in)	LC(K,Kft,in)	(K,Kft,in)	LC(K,Kft,in)	(K,Kft,in)	LC(K,Kft,in)	(K,Kft,in)	LC(K,Kft,in)	(K,Kft,in)	LC(K,Kft,in)
1	1-	2	A	1.82	1	1.82	1	1.82	1	1.82	1	1.82	1
				-1.00	2	-1.00	2	-1.00	2	-1.00	2	-1.00	2
	V		2.11	2	2.11	2	2.11	2	2.11	2	2.11	2	
			-0.23	1	-0.23	1	-0.23	1	-0.23	1	-0.23	1	
	M		3.50	2	0.76	1	1.52	1	2.27	1	3.03	1	
			0.00	1	-3.34	2	-10.19	2	-17.03	2	-23.88	2	
	D		0.000	1	0.009	1	0.014	1	0.013	1	-0.000	1	
			0.000	1	-0.250	2	-0.484	2	-0.669	2	-0.773	3	

RISA-2D (R) Version 3.03

Engineers Northwest
6869 Woodlanwn Ave, NE, Suite 205
Seattle, Washington 98115

Job _____
Page _____
Date _____

No	Nodes			Member Quarter Points								
	I	J		I-End	1/4	1/2	3/4	J-End				

				(K,Kft,in)	LC(K,Kft,in)	LC(K,Kft,in)	LC(K,Kft,in)	LC(K,Kft,in)	LC(K,Kft,in)	LC(K,Kft,in)	LC(K,Kft,in)	LC(K,Kft,in)
2	2-	3	A	2.48 3	0.23 1	2.48 3	0.23 1	2.48 3	0.23 1	2.48 3	0.23 1	2.48 3
			V	1.82 1	-1.00 2	0.91 1	-1.57 2	-0.00 1	-2.15 2	-0.91 1	-3.06 3	-1.82 1
			M	3.03 1	-23.88 2	-5.18 1	-18.08 3	-4.98 2	-7.94 3	9.61 2	-5.18 1	28.76 3
			D	0.000 1	0.000 1	-0.035 1	-0.063 3	-0.034 2	-0.053 3	0.002 2	-0.036 1	-0.001 1
												0.004 3
3	3-	4	A	3.97 3	1.82 1	3.97 3	1.82 1	3.97 3	1.82 1	3.97 3	1.82 1	3.97 3
			V	2.48 3	0.23 1	2.48 3	0.23 1	2.48 3	0.23 1	2.48 3	0.23 1	2.48 3
			M	28.76 3	3.03 1	20.69 3	2.27 1	12.63 3	1.52 1	4.56 3	0.76 1	0.00 1
			D	0.000 1	0.000 1	0.013 1	-0.087 2	0.015 1	-0.269 2	0.009 1	-0.510 2	0.000 1
												-0.770 2

ENVELOPE SOLUTION
AISC Code Checks

No	Nodes		Max	Member Quarter Points												L	lc	Shear	lc
	I	J		lc	0	lc	1/4	lc	1/2	lc	3/4	lc							
1	1-	2	0.279	2	0.04	2	0.04	2	0.12	2	0.20	2	0.28	2	0.01	2			
2	2-	3	0.393	3	0.34	2	0.27	3	0.21	1	0.17	2	0.39	3	0.04	3			
3	3-	4	0.350	3	0.35	3	0.26	3	0.16	3	0.07	3	0.06	3	0.02	3			

ENGINEERS - NORTHWEST INC. P.S.

6869 WOODLAWN AVE. N.E. - SUITE 205 - SEATTLE, WA 98115 - (206) 525-7560 - FAX # (206) 522-6698

JOB NO. _____ JOB NAME Meat cooler M-22 DATE 2.21.94
 SUBJECT _____ SHEET MC.18
 BY _____

Bm Col connection

W 21 x 68

$$M_{DL} = 17.5$$

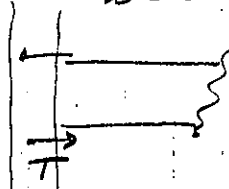
$$M_{DL+E} = 43.2$$

$$\therefore M_E = 25.7$$

$$\frac{3}{8} RW \times 25.7 = 57.8$$

$$\therefore M_{DL} + \frac{3}{8} RW + E = 75.3$$

$\therefore$ T & B weld to flange



$$T = 75.3 \times \frac{12}{21} = 43.0^k$$

$$2" \times \frac{7}{16} \rightarrow 2(.9 \times 7) = 44.1 \text{ OK}$$

W 18 x 35

$$M_{DL} = 3.0$$

$$M_{DL+E} = 28.8$$

$$\therefore M_E = 25.8$$

$$\frac{3}{8} RW = 2.25$$

$$M_{DL} + \frac{3}{8} RW + E = 25.8 \times 2.25 + 3.0$$

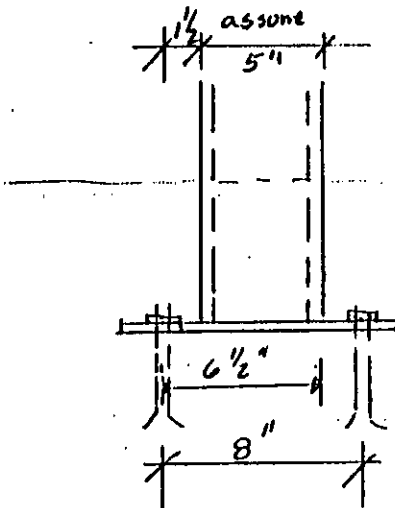
$$= 61 < 75.3 \therefore 2" \frac{7}{16} \text{ OK}$$

ENGINEERS - NORTHWEST INC. P.S.

6869 WOODLAWN AVE. N.E. - SUITE 205 - SEATTLE, WA 98115 - (206) 525-7560 - FAX # (206) 522-6698

JOB NO. _____ JOB NAME Meat Cooler MC22 DATE 2.21.94
 SUBJECT _____ SHEET MC14 OF _____
 BY H.D.J.

Compute MAX. FIXITY FROM T.S. Base R DETAIL.



* $\frac{3}{4}" \phi$ KBII carbon steel
 EMBED $4\frac{3}{4}"$ INSPECTED

ICBO 4627

$$T_a = 3,875 \# \times < 4,450$$

$$V_a = 4,225 \# > 3,560$$

$\frac{3}{4}"$ AB TABLE

$$12 \cdot \frac{3}{4} = 9"$$

$$e 8" T_a = 3444 \#$$

$$M = \frac{6.5}{12} \cdot 3.444 \cdot 2 \text{ bolts} = 3.73 \text{ K.ft}$$

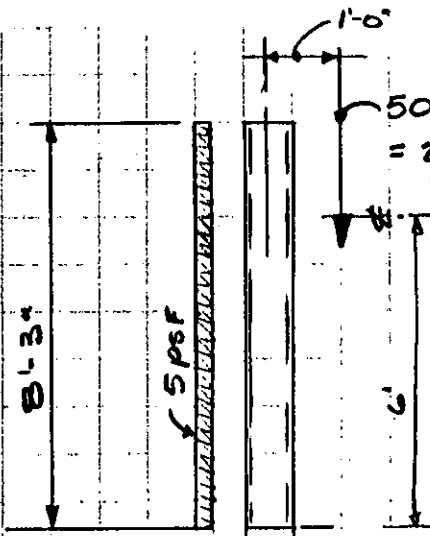
(USE 3.5 CONSERV.)

* ANCHOR BOLTS SHOWN ON DWGS. THE KBII IS IN CASE AB'S ARE MISPLACED OR JUST MISSED, AND A CONC. ANCHOR IS THE ONLY OPTION.

ENGINEERS - NORTHWEST INC. P.S.

6869 WOODLAWN AVE. N.E. - SUITE 205 - SEATTLE, WA 98115 - (206) 525-7560 - FAX # (206) 522-6698

JOB NO. _____ JOB NAME _____ DATE _____
 SUBJECT 8' CANTILEVER WALL @ M/C MEZZ. SHEET MC-15 OF _____
 BY _____



3" PIPES @ 4' o/c

WALL WEIGHT

3" ϕ PIPE	2.0 psf
3/4" PLY	2.3
5/8" B.W.B	2.8
STL STUDS	1.1
MISC	0.8
	<u>9.0 psf</u>

WALL. $F_p = ZIC_p W_p$
 $= .9(1)2 W_p = .8 W_p = 7.2 \text{ psf}$
 $> 5 \text{ psf}$

ELECT. PNL. $F_p = .8 (.200) = .16$

$$M = \frac{.009(8.25)^2}{2} (4) + .16(6) = 1.23 + .96 = 2.19 \text{ KFT}$$

$$S = \frac{2.19 \times 12}{.6(36)1.33} = 0.913 \text{ IN}^3 < 1.72 \text{ IN}^3 (3" \phi \text{ STD PIPE})$$

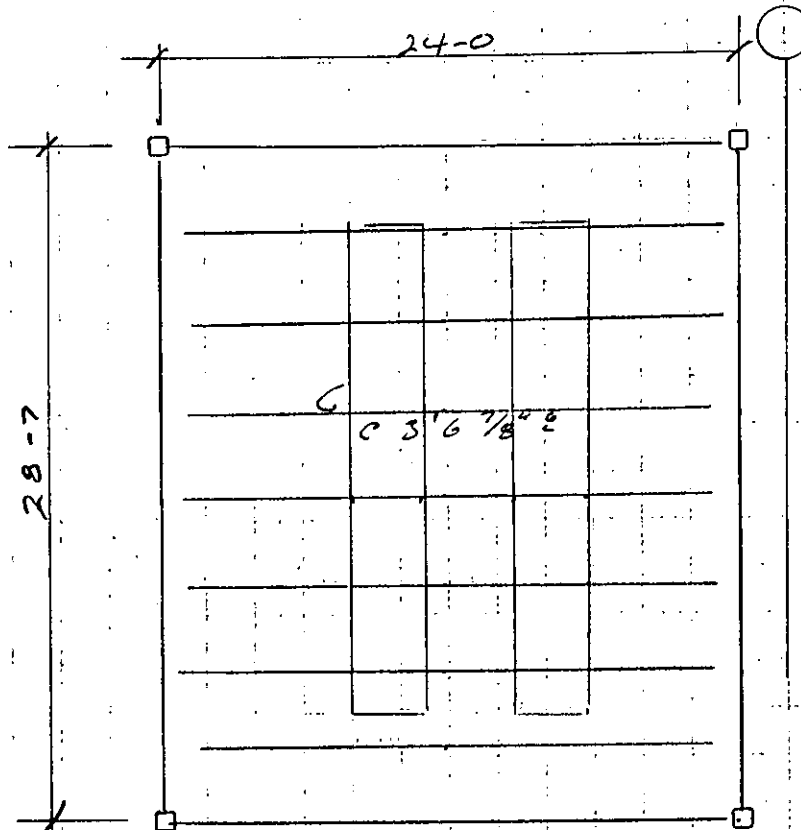
$$T = C = \frac{2.19 \text{ KFT} \times 12}{3 \text{ IN}} = 8.8 \text{ K/BOLT} < 9.3 \text{ K } 3/4" \text{ A325N}$$

$$\text{PIPE WALL THK} = .216"$$

ENGINEERS - NORTHWEST INC. P.S.

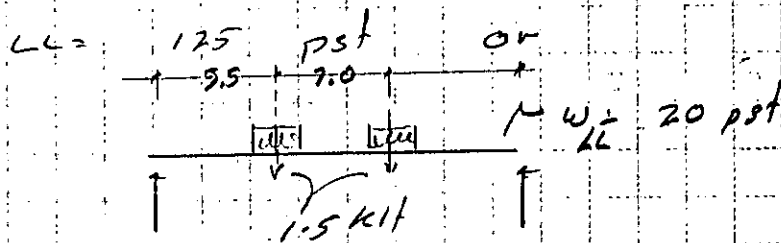
6869 WOODLAWN AVE. N.E. - SUITE 205 - SEATTLE, WA 98115 - (206) 525-7560 - FAX # (206) 522-6698

JOB NO. 94136 JOB NAME PRICE CLUB - BRICK, N.J. DATE 2.21.94
 SUBJECT MEAT COOLER MEZZANINE SHEET MC-1 OF
 BY TR



$A = 24 \times 28.58 = 686\text{sf}$
 THESE LATERAL
 CALCS. WORK FOR
 ALL MEZZ, THIS
 AREA OR SMALLER.

joist



DL =

conc	26.6
deck	1.0
C 12	8.0
misc	4.4
	<u>40.0</u>

Richard J. Jenke

Members

Gary Casperson, Chairman
Walter F. Rehak, Vice Chairman
Robert Singer, Secretary-Treasurer
Leon Dwulet, M.D.
Barbara Hiering
Robert S. Laureigh
Patricia Seeber
Peter Smith, Ed. D
Warren Wolf
James F. Lacey, Freeholder Liaison



OCEAN COUNTY BOARD OF HEALTH

P.O. Box 2191
Toms River, N.J. 08754-2191
908-341-9700

Herbert W. Roeschke
Public Health Coordinator

Township of Brick
401 Chambers Bridge Road
Brick, New Jersey 08723

November 17, 1994

Re: Proposed Floor Plans
Block 1150 Lot 5

THE PRICE CLUB
1722 ROUTE 88
BRICK, NEW JERSEY

Dear Sir:

I have reviewed the floor plans for the above referenced proposed food establishments and have found them to be in substantial compliance with Chapter XII, the New Jersey State Retail Food Code.

If you should have any questions, please feel free to contact me at this office.

Very truly yours,

Joseph A. Caprio
Joseph A. Caprio
Sanitary Inspector

JC:gl

cc: Brick Twp. Health Department
Brick Twp. Construction Official (Arthur Cierzo)

BD OF HEALTH
PRICE CLUB



OCEAN COUNTY HEALTH DEPARTMENT

No: _____

SANITARY INSPECTION REPORT

ESTABLISHMENT INFORMATION			
PHONE # 0 1150 L5 458-5360		ESTABLISHMENT CODE 39	GOODS ☐ DESTROYED ☐ EMBARGOED
ESTABLISHMENT TRADING NAME THE PRICE CLUB		EVALUATION ☒ SATISFACTORY ☐ CONDITIONALLY SATISFACTORY ☐ UNSATISFACTORY	
NUMBER AND STREET 1722 Rt 88			
CITY OR MUNICIPALITY BRICK	ZIP CODE 08724		
ESTABLISHMENT LICENSE NO.	COMMUN. CODE 1506	RISK II	WATER SUPPLY ☒ Public - Community ☐ Individual (Public - Non-Community)
OWNER INFORMATION (Complete this section only if different from establishment information)		TIME (2400 HOURS)	
NAME OF OWNER(S), CORPORATION OR REGISTERED AGENT PRICE COST CO INC		DATE 11-17-94	BEGIN 10:40 END 11:10
NUMBER AND STREET P.O. Box 97077			
CITY OR MUNICIPALITY KIRKLAND	STATE WA	COMPLAINT NO. _____ COMPLAINT REC. _____ COMPLAINT INSPECTED _____	
ZIP CODE 98083	COMMUN. CODE		
INSPECTION TYPE ☐ COMPLAINT ☐ INITIAL INSPECTION ☐ REINSPECTION ☒ PLAN REVIEW ☐ CONFERENCE	TYPE OF ESTABLISHMENT ☒ RETAIL ☐ WHOLESALE ☐ VENDING MACHINE NO. OF MACHINES _____ ☐ FROZEN DESSERTS ☐ OTHER _____	Herbert W. Roeschke Health Officer Sunset Avenue P.O. Box 2191 Toms River, N.J. 08754-2191 Telephone No. 908-341-9700 NAME OF INSPECTING OFFICIAL (Print) Joseph A. Caprio SIGNATURE OF INSPECTING OFFICIAL Joseph A. Caprio PERMANENT REG. NO. B-375	

**OCEAN COUNTY HEALTH DEPARTMENT
ENVIRONMENTAL HEALTH SERVICES**

[illegible]

H.D.67

Page

of

Pages

TOWNSHIP OF BRICK
OCEAN COUNTY, NEW JERSEY
401 CHAMBERS BRIDGE ROAD, BRICK, N.J. 08723

Carolyn L. Patetta, Mayor

Township Council:

Warren H. Wolf, President
Albert Chrobocinski
Victor Cantillo
Helen Fayad
Lee Hartman
Thomas G. Maiorine
Mary Lou Powner



Office of Affordable Housing
Carol A. Wolfe
Affordable Housing Administrator
(908) 262-1048

TO: Frederick Millman, CTA
Tax Assessor

FROM: Carol A. Wolfe
Affordable Housing Administrator

RE: Block 1170, Lot 5

DATE: 11/10/77

*Use Club
RT-58
Allocation 7 Food
\$158,100.00*



Please review the attached application for a **Preliminary** construction permit.

The estimated equalized added assessment for the construction at the above site is \$ _____.

Preliminary

F. R. Millman
Frederick R. Millman, CTA

11-21-77
Date



Please review the attached application for a **Final** Certificate of Occupancy / Approval.

The final equalized added assessment for construction at the above site is \$ _____.

Final

F. R. Millman
Frederick R. Millman, CTA

Date

☒ EXEMPT 1/17/97
☐ PRELIMINARY _____
☐ TEMPORARY _____
☐ FINAL _____

CERTIFICATE OF COMPLIANCE

NAME: THE SUSTO INC DATE: 1/17/97

ADDRESS: 2008 57077

1400 (area) W. 57077

PROPERTY LOCATION: 1711 Route 58

ACCOUNT NO: _____ BLOCK 1170 LOT 5

INCLUSIONARY DEVELOPMENT

☐ Affordable Fee Required \$500.00 Date _____
Down Payment _____ Date _____
Balance _____ Date _____
Pd. in Full _____ Date _____
☐ Market Rate No Fee Required _____ Date _____

MANDATORY DEVELOPER FEES

☐ Residential is .005%
☒ Commercial is .01%

Estimated Fee : None Date: 1/17/97
Down Payment : _____ Date: _____
Final Fee : _____ Date: _____
(Less down payment)
Balance : _____ Date: _____
Pd. in Full : _____ Date: _____

I hereby certify that the above applicant has complied with all rules and regulations of the Office of Affordable Housing and has paid all required fees and charges.

Carol A Wolfe
CAROL A. WOLFE
AFFORDABLE HOUSING ADMINISTRATOR

OCEAN COUNTY, NEW JERSEY
401 CHAMBERS BRIDGE ROAD, BRICK, N.J. 08723

DATE _____

Name Bruce Clark

Block 1170 Lot 5 - 6.02

DATE _____

FIRE PROTECTION SUBCODE

[illegible]

SUBMITTAL SERIAL NO:2408H-10
R.L. DEHN & SONS FIRE PROTECTION INC.
WALDWICK, N.J.

01-25-1995 PAGE 1

PRICE CLUB MEAT / BAKERY ADDITION
TOWNSHIP OF BRICK, N.J.
ORDINARY HAZARD GROUP 2 OCCUPANCY
DENSITY = 0.20 GPM / 1500 SQ FT

FLOW TEST RESULTS

STATIC	55.00 PSI
RESIDUAL AT 1734.0 GPM	48.00 PSI
PRESSURE AVAILABLE AT 905.4 GPM	52.90 PSI

SUMMARY OF SPRINKLER OUTFLOWS

SPR	ACTUAL FLOW	MINIMUM FLOW	K-FACTOR	PRESSURE
201	27.04	26.00	5.60	23.32
202	28.14	26.00	5.60	25.25
203	32.93	26.00	5.60	34.58
204	34.77	26.00	5.60	38.55
205	37.09	26.00	5.60	43.86
206	40.57	26.00	5.60	52.49
207	31.11	26.00	5.60	30.85
208	32.75	26.00	5.60	34.20
209	38.37	26.00	5.60	46.94
210	26.13	26.00	5.60	21.77
211	27.50	26.00	5.60	24.11
212	32.15	26.00	5.60	32.97
213	33.91	26.00	5.60	36.66
214	36.27	26.00	5.60	41.94
215	39.81	26.00	5.60	50.54
216	26.00	26.00	5.60	21.56
217	27.37	26.00	5.60	23.88
218	32.00	26.00	5.60	32.65
219	34.59	26.00	5.60	38.15
220	36.91	26.00	5.60	43.45

TOTAL WATER REQUIRED FOR SYSTEM	655.39 GPM
OUTSIDE HOSE STREAMS AT 0	250.00 GPM
TOTAL WATER REQUIREMENT	905.39 GPM
PRESSURE REQUIRED AT 0	1.75 PSI

MAXIMUM PRESSURE UNBALANCE IN LOOPS	0.081 PSI
MAXIMUM VELOCITY IN PIPES	25.21 FPS


NICHOLAS G. ROSANIA III, P.E.
CONSULTING ENGINEER
14 BEECH PLACE DENVER, N.J. 07034
(201) 863-0874

SUBMITTAL SERIAL NO:2408H-10
R.L. DEHN & SONS FIRE PROTECTION INC.
WALDWICK, N.J.

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PRICE CLUB MEAT / BAKERY ADDITION
TOWNSHIP OF BRICK, N.J.
ORDINARY HAZARD GROUP 2 OCCUPANCY
DENSITY = 0.20 GPM / 1500 SQ FT

FROM	TO	FLOW GPM	DIAM IN	EQUIV PIPE LEN/FT	P-LOSS PSI/FT	PRESSURE SUMMARY PSI

217	216		1.049	L	11.00	0.2114 PT 21.56 (216)
	Q	26.00		F=0 F	0.00	PE 0.00
			BN4	C120 T	11.00	PF 2.33
218	217DQ	27.37	1.049	L	11.00	0.7997 PT 23.89 (217)
	Q	53.37		F=0 F	0.00	PE 0.00
			BN4	C120 T	11.00	PF 8.80
219	218DQ	32.00	1.380	L	11.00	0.5016 PT 32.69 (218)
	Q	85.37		F=0 F	0.00	PE 0.00
			BN4	C120 T	11.00	PF 5.52
220	219DQ	34.59	1.610	L	12.00	0.4442 PT 38.21 (219)
	Q	119.95		F=0 F	0.00	PE 0.00
			BN4	C120 T	12.00	PF 5.33
68	220DQ	36.91	1.610	L	9.00	0.7297 PT 43.54 (220)
	Q	156.87		F=T F	8.00	PE 0.00
			BN4	C120 T	17.00	PF 12.40
67	68		3.260	L	7.50	0.0235 PT 55.94 (68)
	Q	156.87		F=0 F	0.00	PE 0.00
			NC1	C120 T	7.50	PF 0.18
						PT 56.12 (67)

211	210		1.049	L	9.00	0.2133 PT 21.77 (210)
	Q	26.13		F=E F	2.00	PE 0.00
			BN3	C120 T	11.00	PF 2.35
212	211DQ	27.50	1.049	L	11.00	0.8069 PT 24.12 (211)
	Q	53.63		F=0 F	0.00	PE 0.00
			BN3	C120 T	11.00	PF 8.88
213	212DQ	32.15	1.380	L	7.33	0.5061 PT 33.00 (212)
	Q	85.78		F=0 F	0.00	PE 0.00
			BN3	C120 T	7.33	PF 3.71
214	213DQ	33.91	1.610	L	12.00	0.4424 PT 36.71 (213)
	Q	119.69		F=0 F	0.00	PE 0.00
			BN3	C120 T	12.00	PF 5.31
215	214DQ	36.27	1.610	L	12.00	0.7219 PT 42.02 (214)
	Q	155.95		F=0 F	0.00	PE 0.00
			BN3	C120 T	12.00	PF 8.66

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R.L. DEHN & SONS FIRE PROTECTION INC.
WALDWICK, N.J.

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PRICE CLUB MEAT / BAKERY ADDITION
TOWNSHIP OF BRICK, N.J.
ORDINARY HAZARD GROUP 2 OCCUPANCY
DENSITY = 0.20 GPM / 1500 SQ FT

FROM TO	FLOW GPM	DIAM IN		EQUIV PIPE LEN/FT	P-LOSS PSI/FT	PRESSURE SUMMARY PSI
67 215DQ	39.81	2.067		L 6.70	0.3256	PT 50.68 (215)
Q 195.77			F=T F	10.00		PE 0.00
		BN3	C120 T	16.70		PF 5.44
66 67DQ	156.87	3.260		L 6.25	0.1052	PT 56.12 (67)
Q 352.63			F=0 F	0.00		PE 0.00
		NC1	C120 T	6.25		PF 0.66
						PT 56.78 (66)

208 207		1.049		L 11.40	0.2946	PT 30.85 (207)
Q 31.11			F=0 F	0.00		PE 0.00
		BN2	C120 T	11.40		PF 3.36
209 208DQ	32.75	1.049		L 11.50	1.1145	PT 34.21 (208)
Q 63.85			F=0 F	0.00		PE 0.00
		BN2	C120 T	11.50		PF 12.82
66 209DQ	38.37	1.380		L 7.90	0.7000	PT 47.03 (209)
Q 102.22			F=T F	6.00		PE 0.00
		BN2	C120 T	13.90		PF 9.73
65 66DQ	352.63	3.260		L 2.00	0.1684	PT 56.76 (66)
Q 454.85			F=0 F	0.00		PE 0.00
		NC1	C120 T	2.00		PF 0.34
64 65		3.260		L 9.25	0.1684	PT 57.10 (65)
Q 454.85			F=0 F	0.00		PE 0.00
		NC1	C120 T	9.25		PF 1.56
						PT 58.66 (64)

202 201		1.049		L 6.50	0.2274	PT 23.32 (201)
Q 27.04			F=E F	2.00		PE 0.00
		BN1	C120 T	8.50		PF 1.93
203 202DQ	28.14	1.049		L 11.00	0.8506	PT 25.25 (202)
Q 55.18			F=0 F	0.00		PE 0.00
		BN1	C120 T	11.00		PF 9.36
204 203DQ	32.93	1.380		L 7.50	0.5318	PT 34.61 (203)
Q 88.11			F=0 F	0.00		PE 0.00
		BN1	C120 T	7.50		PF 3.99
205 204DQ	34.77	1.610		L 11.50	0.4644	PT 38.60 (204)
Q 122.88			F=0 F	0.00		PE 0.00
		BN1	C120 T	11.50		PF 5.34

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R.L. DEHN & SONS FIRE PROTECTION INC.
WALDWICK, N.J.

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PRICE CLUB MEAT / BAKERY ADDITION
TOWNSHIP OF BRICK, N.J.
ORDINARY HAZARD GROUP 2 OCCUPANCY
DENSITY = 0.20 GPM / 1500 SQ FT

FROM	TO	FLOW GPM	DIAM IN	EQUIV PIPE LEN/FT	P-LOSS PSI/FT	PRESSURE SUMMARY PSI
206	205DQ	37.09	1.610	L 11.50	0.7566	PT 43.94 (205)
	Q	159.96		F=0 F 0.00		PE 0.00
			BN1	C120 T 11.50		PF 8.70
64	206DQ	40.57	2.067	L 7.70	0.3404	PT 52.64 (206)
	Q	200.54		F=T F 10.00		PE 0.00
			BN1	C120 T 17.70		PF 6.03
						PT 58.67 (64)
26	60		4.124	L 5.00	0.0296	PT 94.78 (60)
	Q	329.71		F=T F 22.00		PE 0.00
			CM2	C120 T 27.00		PF 0.80
27	26DQ	-302.08	4.124	L 10.00	0.0003	PT 95.58 (26)
	Q	27.63		F=0 F 0.00		PE 0.00
			CM2	C120 T 10.00		PF 0.00
28	27DQ	265.01	4.124	L 10.00	0.0237	PT 95.58 (27)
	Q	292.64		F=0 F 0.00		PE 0.00
			CM2	C120 T 10.00		PF 0.24
29	28DQ	-59.65	4.124	L 10.00	0.0155	PT 95.82 (28)
	Q	233.00		F=0 F 0.00		PE 0.00
			CM2	C120 T 10.00		PF 0.15
30	29DQ	-58.81	4.124	L 10.00	0.0091	PT 95.97 (29)
	Q	174.19		F=0 F 0.00		PE 0.00
			CM2	C120 T 10.00		PF 0.09
31	30DQ	-58.23	4.124	L 10.00	0.0043	PT 96.06 (30)
	Q	115.95		F=0 F 0.00		PE 0.00
			CM2	C120 T 10.00		PF 0.04
32	31DQ	-57.90	4.124	L 10.00	0.0012	PT 96.10 (31)
	Q	58.05		F=0 F 0.00		PE 0.00
			CM2	C120 T 10.00		PF 0.01
54	32		2.067	L 2.00	0.0344	PT 96.11 (32)
	Q	58.05		F=T F 10.00		PE -0.87
			RN	C120 T 12.00		PF 0.41
316	54		2.157	L 24.50	0.0279	PT 95.65 (54)
	Q	58.05		F=0/T F 12.00		PE 0.00
			BL	C120 T 36.50		PF 1.02
315	316		2.157	L 8.00	0.0279	PT 96.67 (316)
	Q	58.05		F=0 F 0.00		PE 0.00
			BL	C120 T 8.00		PF 0.22

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 J.L. DEHN & SONS FIRE PROTECTION INC.
 ALDWICK, N.J.

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PRICE CLUB MEAT / BAKERY ADDITION
 TOWNSHIP OF BRICK, N.J.
 ORDINARY HAZARD GROUP 2 OCCUPANCY
 DENSITY = 0.20 GPM / 1500 SQ FT

FROM TO	FLOW GPM	DIAM IN	EQUIV PIPE LEN/FT	P-LOSS PSI/FT	PRESSURE SUMMARY PSI
14 315	58.05	2.157	L 8.00	0.0279	PT 96.89 (315)
Q			F=0 F 0.00		PE 0.00
		BL	C120 T 8.00		PF 0.22
13 314	58.05	2.157	L 8.00	0.0279	PT 97.11 (314)
Q			F=0 F 0.00		PE 0.00
		BL	C120 T 8.00		PF 0.22
12 313	58.05	2.157	L 8.00	0.0279	PT 97.33 (313)
Q			F=0 F 0.00		PE 0.00
		BL	C120 T 8.00		PF 0.22
11 312	58.05	2.157	L 8.00	0.0279	PT 97.55 (312)
Q			F=0 F 0.00		PE 0.00
		BL	C120 T 8.00		PF 0.22
43 311	58.05	2.157	L 155.50	0.0279	PT 97.77 (311)
Q			F=T F 12.00		PE 0.00
		BL	C120 T 167.50		PF 4.67
21 43	58.05	2.067	L 2.00	0.0344	PT 102.44 (43)
Q			F=T F 10.00		PE 0.87
		RN	C120 T 12.00		PF 0.41
20 21	58.05	6.249	L 10.00	0.0002	PT 103.72 (21)
Q			F=0 F 0.00		PE 0.00
		CM1	C120 T 10.00		PF 0.00
					PT 103.72 (20)
53 31	57.90	2.067	L 2.00	0.0342	PT 96.08 (31)
Q			F=T F 10.00		PE -0.87
		RN	C120 T 12.00		PF 0.41
10 53	57.90	2.157	L 24.50	0.0278	PT 95.62 (53)
Q			F=0/T F 12.00		PE 0.00
		BL	C120 T 36.50		PF 1.01
09 310	57.90	2.157	L 8.00	0.0278	PT 96.63 (310)
Q			F=0 F 0.00		PE 0.00
		BL	C120 T 8.00		PF 0.22
08 309	57.90	2.157	L 8.00	0.0278	PT 96.85 (309)
Q			F=0 F 0.00		PE 0.00
		BL	C120 T 8.00		PF 0.22
07 308	57.90	2.157	L 8.00	0.0278	PT 97.07 (308)
Q			F=0 F 0.00		PE 0.00
		BL	C120 T 8.00		PF 0.22

SUBMITTAL SERIAL NO:2408H-10
R.L. DEHN & SONS FIRE PROTECTION INC.
WALDWICK, N.J.

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PRICE CLUB MEAT / BAKERY ADDITION
TOWNSHIP OF BRICK, N.J.
ORDINARY HAZARD GROUP 2 OCCUPANCY
DENSITY = 0.20 GPM / 1500 SQ FT

FROM	TO	FLOW GPM	DIAM IN	EQUIV PIPE LEN/FT	P-LOSS PSI/FT	PRESSURE SUMMARY PSI
306	307		2.157	L 8.00	0.0278	PT 97.29 (307)
	Q	57.90		F=0 F 0.00		PE 0.00
			BL	C120 T 8.00		PF 0.22
305	306		2.157	L 8.00	0.0278	PT 97.51 (306)
	Q	57.90		F=0 F 0.00		PE 0.00
			BL	C120 T 8.00		PF 0.22
42	305		2.157	L 155.50	0.0278	PT 97.73 (305)
	Q	57.90		F=T F 12.00		PE 0.00
			BL	C120 T 167.50		PF 4.66
20	42		2.067	L 2.00	0.0342	PT 102.39 (42)
	Q	57.90		F=T F 10.00		PE 0.87
			RN	C120 T 12.00		PF 0.41
19	20DQ	58.05	6.249	L 10.00	0.0006	PT 103.67 (20)
	Q	115.95		F=0 F 0.00		PE 0.00
			CM1	C120 T 10.00		PF 0.01
						PT 103.68 (19)

52	30		2.067	L 2.00	0.0346	PT 96.04 (30)
	Q	58.23		F=T F 10.00		PE -0.87
			RN	C120 T 12.00		PF 0.42
304	52		2.157	L 24.50	0.0281	PT 95.59 (52)
	Q	58.23		F=0/T F 12.00		PE 0.00
			BL	C120 T 36.50		PF 1.03
303	304		2.157	L 8.00	0.0281	PT 96.62 (304)
	Q	58.23		F=0 F 0.00		PE 0.00
			BL	C120 T 8.00		PF 0.22
302	303		2.157	L 8.00	0.0281	PT 96.84 (303)
	Q	58.23		F=0 F 0.00		PE 0.00
			BL	C120 T 8.00		PF 0.22
301	302		2.157	L 8.00	0.0281	PT 97.06 (302)
	Q	58.23		F=0 F 0.00		PE 0.00
			BL	C120 T 8.00		PF 0.22
300	301		2.157	L 8.00	0.0281	PT 97.28 (301)
	Q	58.23		F=0 F 0.00		PE 0.00
			BL	C120 T 8.00		PF 0.22
299	300		2.157	L 8.00	0.0281	PT 97.50 (300)
	Q	58.23		F=0 F 0.00		PE 0.00
			BL	C120 T 8.00		PF 0.22

SUBMITTAL SERIAL NO:2408H-10
R.L. DEHN & SONS FIRE PROTECTION INC.
WALDWICK, N.J.

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PRICE CLUB MEAT / BAKERY ADDITION
TOWNSHIP OF BRICK, N.J.
ORDINARY HAZARD GROUP 2 OCCUPANCY
DENSITY = 0.20 GPM / 1500 SQ FT

FROM	TO	FLOW GPM	DIAM IN	EQUIV PIPE LEN/FT	P-LOSS PSI/FT	PRESSURE SUMMARY PSI
41	299		2.157	L 155.50	0.0281	PT 97.72 (299)
	Q	58.23		F=T F 12.00		PE 0.00
			BL	C120 T 167.50		PF 4.71
19	41		2.067	L 2.00	0.0346	PT102.43 (41)
	Q	58.23		F=T F 10.00		PE 0.87
			RN	C120 T 12.00		PF 0.42
18	19DQ	115.95	6.249	L 10.00	0.0012	PT103.72 (19)
	Q	174.19		F=0 F 0.00		PE 0.00
			CM1	C120 T 10.00		PF 0.01
						PT103.73 (18)

51	29		2.067	L 2.00	0.0352	PT 95.95 (29)
	Q	58.81		F=T F 10.00		PE -0.87
			RN	C120 T 12.00		PF 0.42
40	51		2.157	L 220.00	0.0286	PT 95.50 (51)
	Q	58.81		F=T/T F 24.00		PE 0.00
			BL	C120 T 244.00		PF 6.98
18	40		2.067	L 2.00	0.0352	PT102.48 (40)
	Q	58.81		F=T F 10.00		PE 0.87
			RN	C120 T 12.00		PF 0.42
17	18DQ	174.19	6.249	L 10.00	0.0021	PT103.77 (18)
	Q	233.00		F=0 F 0.00		PE 0.00
			CM1	C120 T 10.00		PF 0.02
16	17DQ	59.65	6.249	L 10.00	0.0031	PT103.79 (17)
	Q	292.64		F=0 F 0.00		PE 0.00
			CM1	C120 T 10.00		PF 0.03
15	16DQ	60.67	6.249	L 10.00	0.0044	PT103.82 (16)
	Q	353.31		F=0 F 0.00		PE 0.00
			CM1	C120 T 10.00		PF 0.04
14	15DQ	60.87	6.249	L 10.00	0.0060	PT103.86 (15)
	Q	414.18		F=0 F 0.00		PE 0.00
			CM1	C120 T 10.00		PF 0.06
13	14DQ	60.45	6.249	L 10.00	0.0077	PT103.92 (14)
	Q	474.62		F=0 F 0.00		PE 0.00
			CM1	C120 T 10.00		PF 0.08
10	13DQ	60.31	6.249	L 4.00	0.0096	PT104.00 (13)
	Q	534.93		F=0 F 0.00		PE 0.00
			CM1	C120 T 4.00		PF 0.04
						PT104.04 (10)

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WALDWICK, N.J.

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PRICE CLUB MEAT / BAKERY ADDITION
TOWNSHIP OF BRICK, N.J.
ORDINARY HAZARD GROUP 2 OCCUPANCY
DENSITY = 0.20 GPM / 1500 SQ FT

FROM	TO	FLOW GPM	DIAM IN	EQUIV PIPE LEN/FT	P-LOSS PSI/FT	PRESSURE SUMMARY PSI
27	60	Q 325.68	4.124	L 5.00 F=T F 22.00 CM2 C120 T 27.00	0.0289	PT 94.78 (60) PE 0.00 PF 0.78
49	27DQ	-265.01 Q 60.67	2.067	L 2.00 F=T F 10.00 RN C120 T 12.00	0.0373	PT 95.56 (27) PE -0.87 PF 0.45
38	49	Q 60.67	2.157	L 220.00 F=T/T F 24.00 BL C120 T 244.00	0.0303	PT 95.14 (49) PE 0.00 PF 7.39
16	38	Q 60.67	2.067	L 2.00 F=T F 10.00 RN C120 T 12.00	0.0373	PT102.53 (38) PE 0.87 PF 0.45 PT103.85 (16)
50	28	Q 59.65	2.067	L 2.00 F=T F 10.00 RN C120 T 12.00	0.0361	PT 95.79 (28) PE -0.87 PF 0.43
39	50	Q 59.65	2.157	L 220.00 F=T/T F 24.00 BL C120 T 244.00	0.0294	PT 95.35 (50) PE 0.00 PF 7.17
17	39	Q 59.65	2.067	L 2.00 F=T F 10.00 RN C120 T 12.00	0.0361	PT102.52 (39) PE 0.87 PF 0.43 PT103.82 (17)
48	26	Q 60.87	2.067	L 2.00 F=T F 10.00 RN C120 T 12.00	0.0375	PT 95.58 (26) PE -0.87 PF 0.45
37	48	Q 60.87	2.157	L 220.00 F=T/T F 24.00 BL C120 T 244.00	0.0305	PT 95.16 (48) PE 0.00 PF 7.44
15	37	Q 60.87	2.067	L 2.00 F=T F 10.00 RN C120 T 12.00	0.0375	PT102.60 (37) PE 0.87 PF 0.45 PT103.92 (15)
25	26	Q 241.21	4.124	L 10.00 F=0 F 0.00 CM2 C120 T 10.00	0.0166	PT 95.58 (26) PE 0.00 PF 0.17

SUBMITTAL SERIAL NO:2408H-10
 R.L. DEHN & SONS FIRE PROTECTION INC.
 WALDWICK, N.J.

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PRICE CLUB MEAT / BAKERY ADDITION
 TOWNSHIP OF BRICK, N.J.
 ORDINARY HAZARD GROUP 2 OCCUPANCY
 DENSITY = 0.20 GPM / 1500 SQ FT

FROM	TO	FLOW GPM	DIAM IN	EQUIV PIPE LEN/FT	P-LOSS PSI/FT	PRESSURE SUMMARY PSI
47	25DQ	-180.77	2.067	L 2.00	0.0370	PT 95.75 (25)
	Q	60.45		F=T F 10.00		PE -0.87
			RN	C120 T 12.00		PF 0.44
36	47		2.157	L 220.00	0.0301	PT 95.32 (47)
	Q	60.45		F=T/T F 24.00		PE 0.00
			BL	C120 T 244.00		PF 7.34
14	36		2.067	L 2.00	0.0370	PT102.66 (36)
	Q	60.45		F=T F 10.00		PE 0.87
			RN	C120 T 12.00		PF 0.44
						PT103.97 (14)

24	25		4.124	L 10.00	0.0097	PT 95.72 (25)
	Q	180.77		F=0 F 0.00		PE 0.00
			CM2	C120 T 10.00		PF 0.10
46	24DQ	-120.46	2.067	L 2.00	0.0369	PT 95.82 (24)
	Q	60.31		F=T F 10.00		PE -0.87
			RN	C120 T 12.00		PF 0.44
35	46		2.157	L 220.00	0.0300	PT 95.39 (46)
	Q	60.31		F=T/T F 24.00		PE 0.00
			BL	C120 T 244.00		PF 7.32
13	35		2.067	L 2.00	0.0369	PT102.71 (35)
	Q	60.31		F=T F 10.00		PE 0.87
			RN	C120 T 12.00		PF 0.44
						PT104.02 (13)

23	24		4.124	L 10.00	0.0046	PT 95.82 (24)
	Q	120.46		F=0 F 0.00		PE 0.00
			CM2	C120 T 10.00		PF 0.05
45	23DQ	-60.18	2.067	L 2.00	0.0368	PT 95.87 (23)
	Q	60.28		F=T F 10.00		PE -0.87
			RN	C120 T 12.00		PF 0.44
34	45		2.157	L 220.00	0.0299	PT 95.44 (45)
	Q	60.28		F=T/T F 24.00		PE 0.00
			BL	C120 T 244.00		PF 7.30
12	34		2.067	L 2.00	0.0368	PT102.74 (34)
	Q	60.28		F=T F 10.00		PE 0.87
			RN	C120 T 12.00		PF 0.44
						PT104.05 (12)

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PRICE CLUB MEAT / BAKERY ADDITION
TOWNSHIP OF BRICK, N.J.
ORDINARY HAZARD GROUP 2 OCCUPANCY
DENSITY = 0.20 GPM / 1500 SQ FT

FROM	TO		FLOW GPM	DIAM IN		EQUIV PIPE LEN/FT	P-LOSS PSI/FT	PRESSURE SUMMARY PSI
22	23			4.124	L	10.00	0.0013	PT 95.86 (23)
		Q	60.18		F=0 F	0.00		PE 0.00
				CM2	C120 T	10.00		PF 0.01
44	22			2.067	L	2.00	0.0367	PT 95.87 (22)
		Q	60.18		F=T F	10.00		PE -0.87
				RN	C120 T	12.00		PF 0.44
33	44			2.157	L	220.00	0.0298	PT 95.44 (44)
		Q	60.18		F=T/T F	24.00		PE 0.00
				BL	C120 T	244.00		PF 7.27
11	33			2.067	L	2.00	0.0367	PT102.71 (33)
		Q	60.18		F=T F	10.00		PE 0.87
				RN	C120 T	12.00		PF 0.44
12	11			6.249	L	10.00	0.0002	PT104.02 (11)
		Q	60.18		F=0 F	0.00		PE 0.00
				CM1	C120 T	10.00		PF 0.00
10	12DQ		60.28	6.249	L	6.00	0.0006	PT104.02 (12)
		Q	120.46		F=0 F	0.00		PE 0.00
				CM1	C120 T	6.00		PF 0.00
								PT104.02 (10)
63	64			3.260	L	5.50	0.3310	PT 58.58 (64)
		Q	655.39		F=0 F	0.00		PE 0.00
				FM5	C120 T	5.50		PF 1.82
62	63			3.260	L	73.00	0.3310	PT 60.40 (63)
		Q	655.39		F=0 F	0.00		PE 0.00
				FM4	C120 T	73.00		PF 24.16
61	62			3.260	L	5.50	0.3310	PT 84.56 (62)
		Q	655.39		F=E F	9.00		PE 0.00
				FM3	C120 T	14.50		PF 4.80
60	61			3.260	L	12.00	0.3310	PT 89.36 (61)
		Q	655.39		F=T F	20.00		PE -5.20
				FM2	C120 T	32.00		PF 10.59
								PT 94.75 (60)
4	10			6.249	L	30.00	0.0139	PT104.06 (10)
		Q	655.39		F=E F	16.00		PE 0.00
				FM1	C120 T	46.00		PF 0.64

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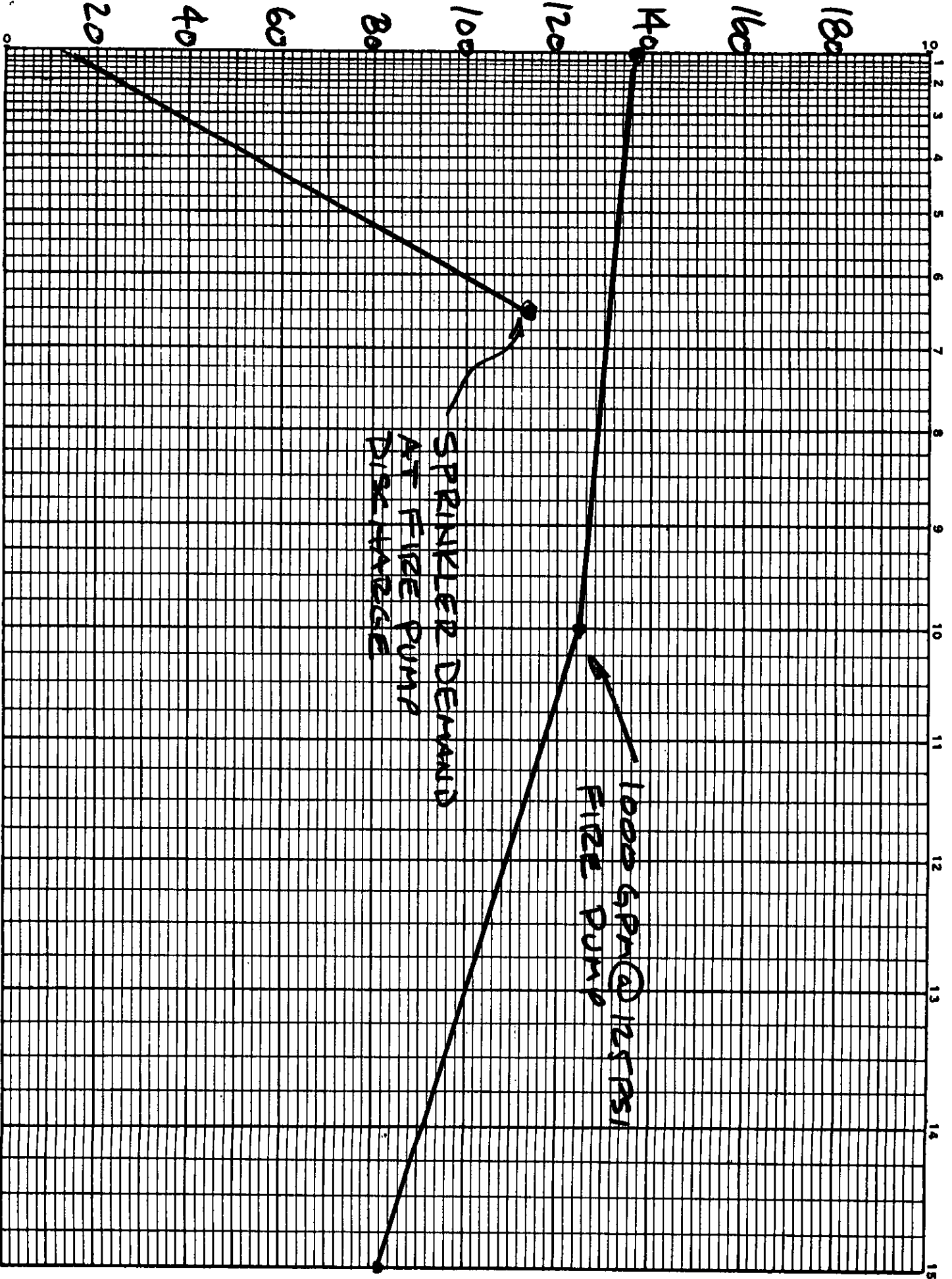
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PRICE CLUB MEAT / BAKERY ADDITION
 TOWNSHIP OF BRICK, N.J.
 ORDINARY HAZARD GROUP 2 OCCUPANCY
 DENSITY = 0.20 GPM / 1500 SQ FT

FROM	TO	FLOW GPM	DIAM IN	EQUIV PIPE LEN/FT	P-LOSS PSI/FT	PRESSURE SUMMARY PSI
3	4	Q 655.39	6.249	L 24.00 F=2CV,2GV,3E F 128.00 FR C120 T 152.00	0.0139	PT104.70 (4) PE 10.39 PF 2.11
2	3	Q 655.39				PT117.20 (3)
PUMP RATED PRESSURE				125.00 PSI		
PUMP RATED FLOW				1,000.00 GPM		
DISCHARGE PRESSURE				117.20 PSI		
PRE AVAIL. @ 655.39 GPM =				138.55 PSI	PF%-117.20	
SUCTION PRESSURE				0.00 PSI		
1	2	Q 655.39	8.071	L 5.00 F=2E,2GV F 44.00 UN C120 T 49.00	0.0040	PT 0.00 (2) PE 0.00 PF 0.20
0	1	Q 655.39	8.325	L 600.00 F=0 F 0.00 UN C140 T 600.00	0.0026	PT 0.20 (1) PE 0.00 PF 1.56
						PT 1.76 (0)

PRESSURE AVAILABLE AT NODE 0 AT 905.4 GPM 52.9 PSI
 MAXIMUM PRESSURE UNBALANCE IN LOOPS 0.081 PSI
 MAXIMUM VELOCITY IN PIPES 25.21 FPS

P.S.I. MULTIPLY SCALE BY



G.P.M.

MULTIPLY SCALE BY 100

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PRICE CLUB MEAT / BAKERY ADDITION
TOWNSHIP OF BRICK, N.J.
ORDINARY HAZARD GROUP 2 OCCUPANCY
DENSITY = 0.20 GPM / 1500 SQ FT

FLOW TEST RESULTS

STATIC	55.00 PSI
RESIDUAL AT 1734.0 GPM	48.00 PSI
PRESSURE AVAILABLE AT 905.4 GPM	52.90 PSI

SUMMARY OF SPRINKLER OUTFLOWS

SPR	ACTUAL FLOW	MINIMUM FLOW	K-FACTOR	PRESSURE
----	-----	-----	-----	-----
201	27.04	26.00	5.60	23.32
202	28.14	26.00	5.60	25.25
203	32.93	26.00	5.60	34.58
204	34.77	26.00	5.60	38.55
205	37.09	26.00	5.60	43.86
206	40.57	26.00	5.60	52.49
207	31.11	26.00	5.60	30.85
208	32.75	26.00	5.60	34.20
209	38.37	26.00	5.60	46.94
210	26.13	26.00	5.60	21.77
211	27.50	26.00	5.60	24.11
212	32.15	26.00	5.60	32.97
213	33.91	26.00	5.60	36.66
214	36.27	26.00	5.60	41.94
215	39.81	26.00	5.60	50.54
216	26.00	26.00	5.60	21.56
217	27.37	26.00	5.60	23.88
218	32.00	26.00	5.60	32.65
219	34.59	26.00	5.60	38.15
220	36.91	26.00	5.60	43.45

TOTAL WATER REQUIRED FOR SYSTEM	655.39 GPM
OUTSIDE HOSE STREAMS AT 0	250.00 GPM
TOTAL WATER REQUIREMENT	905.39 GPM
PRESSURE REQUIRED AT 0	1.75 PSI

MAXIMUM PRESSURE UNBALANCE IN LOOPS	0.081 PSI
MAXIMUM VELOCITY IN PIPES	25.21 FPS


NICHOLAS G. ROSANIA III, P.E.

CONSULTING ENGINEER
14 BESON PLACE DENVER, N.J. 07034
(201) 883-0874

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PRICE CLUB MEAT / BAKERY ADDITION
TOWNSHIP OF BRICK, N.J.
ORDINARY HAZARD GROUP 2 OCCUPANCY
DENSITY = 0.20 GPM / 1500 SQ FT

FROM	TO	FLOW GPM	DIAM IN	EQUIV PIPE LEN/FT	P-LOSS PSI/FT	PRESSURE SUMMARY PSI
217	216		1.049	L	11.00	0.2114 PT 21.56 (216)
	Q	26.00		F=0 F	0.00	PE 0.00
			BN4	C120 T	11.00	PF 2.33
218	217DQ	27.37	1.049	L	11.00	0.7997 PT 23.89 (217)
	Q	53.37		F=0 F	0.00	PE 0.00
			BN4	C120 T	11.00	PF 8.80
219	218DQ	32.00	1.380	L	11.00	0.5016 PT 32.69 (218)
	Q	85.37		F=0 F	0.00	PE 0.00
			BN4	C120 T	11.00	PF 5.52
220	219DQ	34.59	1.610	L	12.00	0.4442 PT 38.21 (219)
	Q	119.95		F=0 F	0.00	PE 0.00
			BN4	C120 T	12.00	PF 5.33
68	220DQ	36.91	1.610	L	9.00	0.7297 PT 43.54 (220)
	Q	156.87		F=T F	8.00	PE 0.00
			BN4	C120 T	17.00	PF 12.40
67	68		3.260	L	7.50	0.0235 PT 55.94 (68)
	Q	156.87		F=0 F	0.00	PE 0.00
			NC1	C120 T	7.50	PF 0.18
						PT 56.12 (67)
211	210		1.049	L	9.00	0.2133 PT 21.77 (210)
	Q	26.13		F=E F	2.00	PE 0.00
			BN3	C120 T	11.00	PF 2.35
212	211DQ	27.50	1.049	L	11.00	0.8069 PT 24.12 (211)
	Q	53.63		F=0 F	0.00	PE 0.00
			BN3	C120 T	11.00	PF 8.88
213	212DQ	32.15	1.380	L	7.33	0.5061 PT 33.00 (212)
	Q	85.78		F=0 F	0.00	PE 0.00
			BN3	C120 T	7.33	PF 3.71
214	213DQ	33.91	1.610	L	12.00	0.4424 PT 36.71 (213)
	Q	119.69		F=0 F	0.00	PE 0.00
			BN3	C120 T	12.00	PF 5.31
215	214DQ	36.27	1.610	L	12.00	0.7219 PT 42.02 (214)
	Q	155.95		F=0 F	0.00	PE 0.00
			BN3	C120 T	12.00	PF 8.66

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PRICE CLUB MEAT / BAKERY ADDITION
TOWNSHIP OF BRICK, N.J.
ORDINARY HAZARD GROUP 2 OCCUPANCY
DENSITY = 0.20 GPM / 1500 SQ FT

FROM TO	FLOW GPM	DIAM IN		EQUIV PIPE LEN/FT	P-LOSS PSI/FT	PRESSURE SUMMARY PSI
67 215DQ	39.81	2.067		L 6.70	0.3256	PT 50.68 (215)
Q 195.77				F=T F 10.00		PE 0.00
		BN3	C120 T	16.70		PF 5.44
66 67DQ	156.87	3.260		L 6.25	0.1052	PT 56.12 (67)
Q 352.63				F=0 F 0.00		PE 0.00
		NC1	C120 T	6.25		PF 0.66
						PT 56.78 (66)

208 207		1.049		L 11.40	0.2946	PT 30.85 (207)
Q 31.11				F=0 F 0.00		PE 0.00
		BN2	C120 T	11.40		PF 3.36
209 208DQ	32.75	1.049		L 11.50	1.1145	PT 34.21 (208)
Q 63.85				F=0 F 0.00		PE 0.00
		BN2	C120 T	11.50		PF 12.82
66 209DQ	38.37	1.380		L 7.90	0.7000	PT 47.03 (209)
Q 102.22				F=T F 6.00		PE 0.00
		BN2	C120 T	13.90		PF 9.73
65 66DQ	352.63	3.260		L 2.00	0.1684	PT 56.76 (66)
Q 454.85				F=0 F 0.00		PE 0.00
		NC1	C120 T	2.00		PF 0.34
64 65		3.260		L 9.25	0.1684	PT 57.10 (65)
Q 454.85				F=0 F 0.00		PE 0.00
		NC1	C120 T	9.25		PF 1.56
						PT 58.66 (64)

202 201		1.049		L 6.50	0.2274	PT 23.32 (201)
Q 27.04				F=E F 2.00		PE 0.00
		BN1	C120 T	8.50		PF 1.93
203 202DQ	28.14	1.049		L 11.00	0.8506	PT 25.25 (202)
Q 55.18				F=0 F 0.00		PE 0.00
		BN1	C120 T	11.00		PF 9.36
204 203DQ	32.93	1.380		L 7.50	0.5318	PT 34.61 (203)
Q 88.11				F=0 F 0.00		PE 0.00
		BN1	C120 T	7.50		PF 3.99
205 204DQ	34.77	1.610		L 11.50	0.4644	PT 38.60 (204)
Q 122.88				F=0 F 0.00		PE 0.00
		BN1	C120 T	11.50		PF 5.34

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PRICE CLUB MEAT / BAKERY ADDITION
TOWNSHIP OF BRICK, N.J.
ORDINARY HAZARD GROUP 2 OCCUPANCY
DENSITY = 0.20 GPM / 1500 SQ FT

FROM	TO	FLOW GPM	DIAM IN		EQUIV PIPE LEN/FT	P-LOSS PSI/FT	PT	PRESSURE SUMMARY PSI
206	205DQ	37.09	1.610	L	11.50	0.7566	PT	43.94 (205)
	Q	159.96		F=0 F	0.00		PE	0.00
			BN1	C120 T	11.50		PF	8.70
64	206DQ	40.57	2.067	L	7.70	0.3404	PT	52.64 (206)
	Q	200.54		F=T F	10.00		PE	0.00
			BN1	C120 T	17.70		PF	6.03
							PT	58.67 (64)

26	60		4.124	L	5.00	0.0296	PT	94.78 (60)
	Q	329.71		F=T F	22.00		PE	0.00
			CM2	C120 T	27.00		PF	0.80
27	26DQ	-302.08	4.124	L	10.00	0.0003	PT	95.58 (26)
	Q	27.63		F=0 F	0.00		PE	0.00
			CM2	C120 T	10.00		PF	0.00
28	27DQ	265.01	4.124	L	10.00	0.0237	PT	95.58 (27)
	Q	292.64		F=0 F	0.00		PE	0.00
			CM2	C120 T	10.00		PF	0.24
29	28DQ	-59.65	4.124	L	10.00	0.0155	PT	95.82 (28)
	Q	233.00		F=0 F	0.00		PE	0.00
			CM2	C120 T	10.00		PF	0.15
30	29DQ	-58.81	4.124	L	10.00	0.0091	PT	95.97 (29)
	Q	174.19		F=0 F	0.00		PE	0.00
			CM2	C120 T	10.00		PF	0.09
31	30DQ	-58.23	4.124	L	10.00	0.0043	PT	96.06 (30)
	Q	115.95		F=0 F	0.00		PE	0.00
			CM2	C120 T	10.00		PF	0.04
32	31DQ	-57.90	4.124	L	10.00	0.0012	PT	96.10 (31)
	Q	58.05		F=0 F	0.00		PE	0.00
			CM2	C120 T	10.00		PF	0.01
54	32		2.067	L	2.00	0.0344	PT	96.11 (32)
	Q	58.05		F=T F	10.00		PE	-0.87
			RN	C120 T	12.00		PF	0.41
316	54		2.157	L	24.50	0.0279	PT	95.65 (54)
	Q	58.05		F=0/T F	12.00		PE	0.00
			BL	C120 T	36.50		PF	1.02
315	316		2.157	L	8.00	0.0279	PT	96.67 (316)
	Q	58.05		F=0 F	0.00		PE	0.00
			BL	C120 T	8.00		PF	0.22

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PRICE CLUB MEAT / BAKERY ADDITION
 TOWNSHIP OF BRICK, N.J.
 ORDINARY HAZARD GROUP 2 OCCUPANCY
 DENSITY = 0.20 GPM / 1500 SQ FT

FROM TO	FLOW GPM	DIAM IN	EQUIV PIPE LEN/FT	P-LOSS PSI/FT	PRESSURE SUMMARY PSI
14 315	Q 58.05	2.157	L 8.00	0.0279	PT 96.89 (315)
			F=0 F 0.00		PE 0.00
		BL	C120 T 8.00		PF 0.22
13 314	Q 58.05	2.157	L 8.00	0.0279	PT 97.11 (314)
			F=0 F 0.00		PE 0.00
		BL	C120 T 8.00		PF 0.22
12 313	Q 58.05	2.157	L 8.00	0.0279	PT 97.33 (313)
			F=0 F 0.00		PE 0.00
		BL	C120 T 8.00		PF 0.22
11 312	Q 58.05	2.157	L 8.00	0.0279	PT 97.55 (312)
			F=0 F 0.00		PE 0.00
		BL	C120 T 8.00		PF 0.22
43 311	Q 58.05	2.157	L 155.50	0.0279	PT 97.77 (311)
			F=T F 12.00		PE 0.00
		BL	C120 T 167.50		PF 4.67
21 43	Q 58.05	2.067	L 2.00	0.0344	PT 102.44 (43)
			F=T F 10.00		PE 0.87
		RN	C120 T 12.00		PF 0.41
20 21	Q 58.05	6.249	L 10.00	0.0002	PT 103.72 (21)
			F=0 F 0.00		PE 0.00
		CM1	C120 T 10.00		PF 0.00
					PT 103.72 (20)
53 31	Q 57.90	2.067	L 2.00	0.0342	PT 96.08 (31)
			F=T F 10.00		PE -0.87
		RN	C120 T 12.00		PF 0.41
10 53	Q 57.90	2.157	L 24.50	0.0278	PT 95.62 (53)
			F=0/T F 12.00		PE 0.00
		BL	C120 T 36.50		PF 1.01
09 310	Q 57.90	2.157	L 8.00	0.0278	PT 96.63 (310)
			F=0 F 0.00		PE 0.00
		BL	C120 T 8.00		PF 0.22
08 309	Q 57.90	2.157	L 8.00	0.0278	PT 96.85 (309)
			F=0 F 0.00		PE 0.00
		BL	C120 T 8.00		PF 0.22
07 308	Q 57.90	2.157	L 8.00	0.0278	PT 97.07 (308)
			F=0 F 0.00		PE 0.00
		BL	C120 T 8.00		PF 0.22

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PRICE CLUB MEAT / BAKERY ADDITION
TOWNSHIP OF BRICK, N.J.
ORDINARY HAZARD GROUP 2 OCCUPANCY
DENSITY = 0.20 GPM / 1500 SQ FT

FROM	TO	FLOW GPM	DIAM IN	EQUIV PIPE LEN/FT	P-LOSS PSI/FT	PRESSURE SUMMARY PSI
306	307		2.157	L 8.00	0.0278	PT 97.29 (307)
	Q	57.90		F=0 F 0.00		PE 0.00
			BL	C120 T 8.00		PF 0.22
305	306		2.157	L 8.00	0.0278	PT 97.51 (306)
	Q	57.90		F=0 F 0.00		PE 0.00
			BL	C120 T 8.00		PF 0.22
42	305		2.157	L 155.50	0.0278	PT 97.73 (305)
	Q	57.90		F=T F 12.00		PE 0.00
			BL	C120 T 167.50		PF 4.66
20	42		2.067	L 2.00	0.0342	PT 102.39 (42)
	Q	57.90		F=T F 10.00		PE 0.87
			RN	C120 T 12.00		PF 0.41
19	20DQ	58.05	6.249	L 10.00	0.0006	PT 103.67 (20)
	Q	115.95		F=0 F 0.00		PE 0.00
			CM1	C120 T 10.00		PF 0.01
						PT 103.68 (19)
52	30		2.067	L 2.00	0.0346	PT 96.04 (30)
	Q	58.23		F=T F 10.00		PE -0.87
			RN	C120 T 12.00		PF 0.42
304	52		2.157	L 24.50	0.0281	PT 95.59 (52)
	Q	58.23		F=0/T F 12.00		PE 0.00
			BL	C120 T 36.50		PF 1.03
303	304		2.157	L 8.00	0.0281	PT 96.62 (304)
	Q	58.23		F=0 F 0.00		PE 0.00
			BL	C120 T 8.00		PF 0.22
302	303		2.157	L 8.00	0.0281	PT 96.84 (303)
	Q	58.23		F=0 F 0.00		PE 0.00
			BL	C120 T 8.00		PF 0.22
301	302		2.157	L 8.00	0.0281	PT 97.06 (302)
	Q	58.23		F=0 F 0.00		PE 0.00
			BL	C120 T 8.00		PF 0.22
300	301		2.157	L 8.00	0.0281	PT 97.28 (301)
	Q	58.23		F=0 F 0.00		PE 0.00
			BL	C120 T 8.00		PF 0.22
299	300		2.157	L 8.00	0.0281	PT 97.50 (300)
	Q	58.23		F=0 F 0.00		PE 0.00
			BL	C120 T 8.00		PF 0.22

SUBMITTAL SERIAL NO:2408H-10
R.L. DEHN & SONS FIRE PROTECTION INC.
WALDWICK, N.J.

01-25-1995 PAGE 7

PRICE CLUB MEAT / BAKERY ADDITION
TOWNSHIP OF BRICK, N.J.
ORDINARY HAZARD GROUP 2 OCCUPANCY
DENSITY = 0.20 GPM / 1500 SQ FT

FROM	TO	FLOW GPM	DIAM IN	EQUIV PIPE LEN/FT	P-LOSS PSI/FT	PRESSURE SUMMARY PSI
41	299		2.157	L 155.50	0.0281	PT 97.72 (299)
	Q	58.23		F=T F 12.00		PE 0.00
			BL	C120 T 167.50		PF 4.71
19	41		2.067	L 2.00	0.0346	PT102.43 (41)
	Q	58.23		F=T F 10.00		PE 0.87
			RN	C120 T 12.00		PF 0.42
18	19DQ	115.95	6.249	L 10.00	0.0012	PT103.72 (19)
	Q	174.19		F=0 F 0.00		PE 0.00
			CM1	C120 T 10.00		PF 0.01
						PT103.73 (18)
51	29		2.067	L 2.00	0.0352	PT 95.95 (29)
	Q	58.81		F=T F 10.00		PE -0.87
			RN	C120 T 12.00		PF 0.42
40	51		2.157	L 220.00	0.0286	PT 95.50 (51)
	Q	58.81		F=T/T F 24.00		PE 0.00
			BL	C120 T 244.00		PF 6.98
18	40		2.067	L 2.00	0.0352	PT102.48 (40)
	Q	58.81		F=T F 10.00		PE 0.87
			RN	C120 T 12.00		PF 0.42
17	18DQ	174.19	6.249	L 10.00	0.0021	PT103.77 (18)
	Q	233.00		F=0 F 0.00		PE 0.00
			CM1	C120 T 10.00		PF 0.02
16	17DQ	59.65	6.249	L 10.00	0.0031	PT103.79 (17)
	Q	292.64		F=0 F 0.00		PE 0.00
			CM1	C120 T 10.00		PF 0.03
15	16DQ	60.67	6.249	L 10.00	0.0044	PT103.82 (16)
	Q	353.31		F=0 F 0.00		PE 0.00
			CM1	C120 T 10.00		PF 0.04
14	15DQ	60.87	6.249	L 10.00	0.0060	PT103.86 (15)
	Q	414.18		F=0 F 0.00		PE 0.00
			CM1	C120 T 10.00		PF 0.06
13	14DQ	60.45	6.249	L 10.00	0.0077	PT103.92 (14)
	Q	474.62		F=0 F 0.00		PE 0.00
			CM1	C120 T 10.00		PF 0.08
10	13DQ	60.31	6.249	L 4.00	0.0096	PT104.00 (13)
	Q	534.93		F=0 F 0.00		PE 0.00
			CM1	C120 T 4.00		PF 0.04
						PT104.04 (10)

SUBMITTAL SERIAL NO:2408H-10
R.L. DEHN & SONS FIRE PROTECTION INC.
WALDWICK, N.J.

01-25-1995 PAGE 8

PRICE CLUB MEAT / BAKERY ADDITION
TOWNSHIP OF BRICK, N.J.
ORDINARY HAZARD GROUP 2 OCCUPANCY
DENSITY = 0.20 GPM / 1500 SQ FT

FROM	TO	FLOW GPM	DIAM IN	EQUIV PIPE LEN/FT	P-LOSS PSI/FT	PRESSURE SUMMARY PSI

27	60	Q 325.68	4.124	L 5.00	0.0289	PT 94.78 (60)
				F=T F 22.00		PE 0.00
			CM2 C120 T 27.00			PF 0.78
49	27DQ	-265.01	2.067	L 2.00	0.0373	PT 95.56 (27)
	Q 60.67			F=T F 10.00		PE -0.87
			RN C120 T 12.00			PF 0.45
38	49	Q 60.67	2.157	L 220.00	0.0303	PT 95.14 (49)
				F=T/T F 24.00		PE 0.00
			BL C120 T 244.00			PF 7.39
16	38	Q 60.67	2.067	L 2.00	0.0373	PT102.53 (38)
				F=T F 10.00		PE 0.87
			RN C120 T 12.00			PF 0.45

50	28	Q 59.65	2.067	L 2.00	0.0361	PT 95.79 (28)
				F=T F 10.00		PE -0.87
			RN C120 T 12.00			PF 0.43
39	50	Q 59.65	2.157	L 220.00	0.0294	PT 95.35 (50)
				F=T/T F 24.00		PE 0.00
			BL C120 T 244.00			PF 7.17
17	39	Q 59.65	2.067	L 2.00	0.0361	PT102.52 (39)
				F=T F 10.00		PE 0.87
			RN C120 T 12.00			PF 0.43

48	26	Q 60.87	2.067	L 2.00	0.0375	PT 95.58 (26)
				F=T F 10.00		PE -0.87
			RN C120 T 12.00			PF 0.45
37	48	Q 60.87	2.157	L 220.00	0.0305	PT 95.16 (48)
				F=T/T F 24.00		PE 0.00
			BL C120 T 244.00			PF 7.44
15	37	Q 60.87	2.067	L 2.00	0.0375	PT102.60 (37)
				F=T F 10.00		PE 0.87
			RN C120 T 12.00			PF 0.45

25	26	Q 241.21	4.124	L 10.00	0.0166	PT 95.58 (26)
				F=0 F 0.00		PE 0.00
			CM2 C120 T 10.00			PF 0.17

SUBMITTAL SERIAL NO:2408H-10
R.L. DEHN & SONS FIRE PROTECTION INC.
WALDWICK, N.J.

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PRICE CLUB MEAT / BAKERY ADDITION
TOWNSHIP OF BRICK, N.J.
ORDINARY HAZARD GROUP 2 OCCUPANCY
DENSITY = 0.20 GPM / 1500 SQ FT

FROM	TO	FLOW GPM	DIAM IN	EQUIV PIPE LEN/FT	P-LOSS PSI/FT	PRESSURE SUMMARY PSI
47	25DQ	-180.77	2.067	L 2.00	0.0370	PT 95.75 (25)
	Q	60.45		F=T F 10.00		PE -0.87
			RN	C120 T 12.00		PF 0.44
36	47	60.45	2.157	L 220.00	0.0301	PT 95.32 (47)
	Q			F=T/T F 24.00		PE 0.00
			BL	C120 T 244.00		PF 7.34
14	36	60.45	2.067	L 2.00	0.0370	PT102.66 (36)
	Q			F=T F 10.00		PE 0.87
			RN	C120 T 12.00		PF 0.44
						PT103.97 (14)
24	25	180.77	4.124	L 10.00	0.0097	PT 95.72 (25)
	Q			F=0 F 0.00		PE 0.00
			CM2	C120 T 10.00		PF 0.10
46	24DQ	-120.46	2.067	L 2.00	0.0369	PT 95.82 (24)
	Q	60.31		F=T F 10.00		PE -0.87
			RN	C120 T 12.00		PF 0.44
35	46	60.31	2.157	L 220.00	0.0300	PT 95.39 (46)
	Q			F=T/T F 24.00		PE 0.00
			BL	C120 T 244.00		PF 7.32
13	35	60.31	2.067	L 2.00	0.0369	PT102.71 (35)
	Q			F=T F 10.00		PE 0.87
			RN	C120 T 12.00		PF 0.44
						PT104.02 (13)
23	24	120.46	4.124	L 10.00	0.0046	PT 95.82 (24)
	Q			F=0 F 0.00		PE 0.00
			CM2	C120 T 10.00		PF 0.05
45	23DQ	-60.18	2.067	L 2.00	0.0368	PT 95.87 (23)
	Q	60.28		F=T F 10.00		PE -0.87
			RN	C120 T 12.00		PF 0.44
34	45	60.28	2.157	L 220.00	0.0299	PT 95.44 (45)
	Q			F=T/T F 24.00		PE 0.00
			BL	C120 T 244.00		PF 7.30
12	34	60.28	2.067	L 2.00	0.0368	PT102.74 (34)
	Q			F=T F 10.00		PE 0.87
			RN	C120 T 12.00		PF 0.44
						PT104.05 (12)

SUBMITTAL SERIAL NO:2408H-10
R.L. DEHN & SONS FIRE PROTECTION INC.
WALDWICK, N.J.

01-25-1995 PAGE 10

PRICE CLUB MEAT / BAKERY ADDITION
TOWNSHIP OF BRICK, N.J.
ORDINARY HAZARD GROUP 2 OCCUPANCY
DENSITY = 0.20 GPM / 1500 SQ FT

FROM	TO	FLOW GPM	DIAM IN	EQUIV PIPE LEN/FT	P-LOSS PSI/FT	PRESSURE SUMMARY PSI
22	23	Q 60.18	4.124	L 10.00 F=0 F 0.00 CM2 C120 T 10.00	0.0013	PT 95.86 (23) PE 0.00 PF 0.01
44	22	Q 60.18	2.067	L 2.00 F=T F 10.00 RN C120 T 12.00	0.0367	PT 95.87 (22) PE -0.87 PF 0.44
33	44	Q 60.18	2.157	L 220.00 F=T/T F 24.00 BL C120 T 244.00	0.0298	PT 95.44 (44) PE 0.00 PF 7.27
11	33	Q 60.18	2.067	L 2.00 F=T F 10.00 RN C120 T 12.00	0.0367	PT102.71 (33) PE 0.87 PF 0.44
12	11	Q 60.18	6.249	L 10.00 F=0 F 0.00 CM1 C120 T 10.00	0.0002	PT104.02 (11) PE 0.00 PF 0.00
10	12DQ	Q 60.28 Q 120.46	6.249	L 6.00 F=0 F 0.00 CM1 C120 T 6.00	0.0006	PT104.02 (12) PE 0.00 PF 0.00 PT104.02 (10)
63	64	Q 655.39	3.260	L 5.50 F=0 F 0.00 FM5 C120 T 5.50	0.3310	PT 58.58 (64) PE 0.00 PF 1.82
62	63	Q 655.39	3.260	L 73.00 F=0 F 0.00 FM4 C120 T 73.00	0.3310	PT 60.40 (63) PE 0.00 PF 24.16
61	62	Q 655.39	3.260	L 5.50 F=E F 9.00 FM3 C120 T 14.50	0.3310	PT 84.56 (62) PE 0.00 PF 4.80
60	61	Q 655.39	3.260	L 12.00 F=T F 20.00 FM2 C120 T 32.00	0.3310	PT 89.36 (61) PE -5.20 PF 10.59 PT 94.75 (60)
4	10	Q 655.39	6.249	L 30.00 F=E F 16.00 FM1 C120 T 46.00	0.0139	PT104.06 (10) PE 0.00 PF 0.64

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600 FT 0 - NODE POINTS
 I X - DISCHARGING SPRINKLER NODES
 I * - NON-DISCHARGING SPRINKLER NODES
 I () - TOP OF RISER NIPPLES

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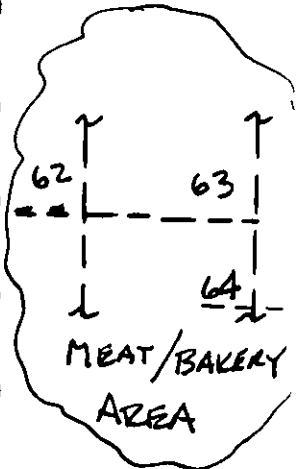
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 (34)I I(45)
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 13 0-----0 24
 (35)I I(46)
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 14 0-----0 25
 (36)I I(47)
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 15 0-----0 26
 (37)I I(48)
 I I
 16 0-----0 27
 (38)I I(49)
 I I
 17 0-----0 28
 (39)I I(50)
 I I
 18 0-----0 29
 (40)I I(51)
 I I
 19 0-----*-----X-----X-----X-----X-----0 30
 (41)I I(52)
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 20 0-----X-----X-----X-----X-----X-----X-----0 31
 (42)I I(53)
 I I
 21 0-----X-----X-----X-----X-----X-----X-----0 32
 (43) I(54)

SPRINKLER SPACING



1170 5

PRICE CLUB

1722 ROUTE 88
BRICK, NJ 08723

MP PROJECT#: 94-076

October 25, 1994

SPECIFICATIONS

FOR

PRICECOSTCO, INC.
P.O. BOX 97077
KIRKLAND, WA 98083-9777

MULVANNY PARTNERSHIP
ARCHITECTS P.S.

11820 Northup Way, Ste E-300, Bellevue, WA 98005 (206) 822-0444 FAX (206) 822-4129

PRICE CLUB/COSTCOWHOLESALE BUILDING SPECIFICATIONS

PRICE CLUB
1722 ROUTE 88
BRICK, NJ 08723

OWNER: PRICECOSTCO, INC.
P.O. BOX 97077
KIRKLAND, WA 98083-9777

MP #: 94-076

OCTOBER 25, 1994

MULVANNY PARTNERSHIP

(206) 822-0444

Architect

ENGINEERS NORTHWEST

(206) 525-7560

Structural Engineer

T.E.I.

(206) 226-7832

Mechanical Engineer

T.E.I.

(206) 226-7832

Electrical Engineer

T.V.A.

(619) 576-6466

Fire Protection

This particular project is not allowed to be a part of any sub-contractor Bid Depository of any kind, for any reason.

By _____
Architect of Record

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BID DOCUMENTS

Invitation to Bid
Instructions to Bidders
Base Bid and Alternates
Form of Bid Proposal

CONDITIONS OF THE CONTRACT

General Conditions (AIA-201)
Supplementary Conditions
Special Conditions

DIVISION 1. GENERAL REQUIREMENTS

Section 1A. Summary of Work
1B. Inspections and Tests
1C. Temporary Construction Facilities
1D. Miscellaneous Requirements

DIVISION 2. SITE WORK

Section 2A. Site Clearing NOT USED
2B. Demolition NOT USED
2C. Earthwork NOT USED
2D. Drainage NOT USED
2E. Paving and Surfacing NOT USED
2F. Water System NOT USED
2G. Sanitary Sewage System NOT USED
2H. Planting NOT USED
2I. Irrigation System NOT USED

DIVISION 3. CONCRETE

Section 3A. Concrete Formwork
3B. Concrete Reinforcement
3C. Cast-in-Place Concrete
3D. Specially Finished Concrete NOT USED
3E. Specially Placed Concrete NOT USED
3F. Precast Concrete NOT USED
3G. Cementitious Decks NOT USED
3H. Prestressed Concrete Piles
3I. Post-Tensioned Concrete

DIVISION 4. MASONRY

Section 4A. Mortar
4B. Masonry Accessories NOT USED
4C. Unit Masonry
4D. Stone NOT USED
4E. Masonry Restoration and Cleaning NOT USED
4F. Refractories NOT USED

DIVISION 5. METALS

Section	5A. Structural Steel Framing	
	5B. Steel Joists & Joist Girders	
	5C. Steel Decking	
	5D. Light Gauge Metal Framing	
	5E. Metal Fabrications	
	5F. Ornamental Metal	NOT USED
	5G. Expansion Control	NOT USED
	5H. Steel H Piles	NOT USED

DIVISION 6. WOOD AND PLASTICS

Section	6A. Rough Carpentry	
	6B. Heavy Timber Construction	NOT USED
	6C. Prefabricated Structural Wood	NOT USED
	6D. Finish Carpentry	NOT USED
	6E. Wood Treatment	NOT USED
	6F. Architectural Woodwork	NOT USED
	6G. Prefabricated Structural Plastics	NOT USED
	6H. Plastic Fabrications	NOT USED

DIVISION 7. THERMAL AND MOISTURE PROTECTION

Section	7A. Waterproofing	NOT USED
	7B. Dampproofing	NOT USED
	7C. Insulation	NOT USED
	7D. Water Repellents	NOT USED
	7E. Preformed Roofing and Siding	NOT USED
	7F. Membrane Roofing	NOT USED
	7G. Single Ply Roofing	
	7H. Flashing and Sheet Metal	
	7I. Roof Accessories	
	7J. Sealants	
	7K. Exterior Insulation Finish System	NOT USED
	7L. Fireproofing	NOT USED
	7M. Parking Deck Sealer	NOT USED

DIVISION 8. DOORS AND WINDOWS

Section	8A. Metal Doors and Frames	
	8B. Wood and Plastic Doors	NOT USED
	8C. Special Doors	NOT USED
	8D. Entrances and Storefronts	NOT USED
	8E. Metal Windows	NOT USED
	8F. Wood and Plastic Windows	NOT USED
	8G. Hardware	
	8H. Glazing	NOT USED
	8I. Window Walls/Curtain Walls	NOT USED

DIVISION 9. FINISHES

Section	9A. Lath and Plaster	NOT USED
	9B. Gypsum Wallboard	
	9C. Tile	NOT USED
	9D. Terrazzo	NOT USED
	9E. Acoustical Treatment	
	9F. Ceiling Suspension Systems	
	9G. Wood Flooring	NOT USED
	9H. Resilient Flooring	NOT USED
	9I. Carpeting	NOT USED
	9J. Special Flooring	
	9K. Floor Treatment	NOT USED
	9L. Special Coatings	NOT USED
	9M. Painting	
	9N. Wall Covering	

DIVISION 10. SPECIALTIES

Section	10A. Compartments.	NOT USED
	10B. Toilet Accessories	NOT USED
	10C. Miscellaneous Specialties	

DIVISION 11. EQUIPMENT

Section	11A. Dock Equipment	NOT USED
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DIVISION 12.

Section	12A. Elevator	NOT USED
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DIVISION 13. PRE-ENGINEERED METAL

Section	13A. Pre-Engineered Metal Building	NOT USED
	13B. Pre-Engineered Metal Roof	NOT USED

DIVISION 14. FIRE SPRINKLER SYSTEM

	14A. Fire Sprinkler	
	14B. Fire Alarm System.	NOT USED

DIVISION 15. MECHANICAL

Section	15010 General Mechanical Requirement
	15050 Basic Materials and Methods
	15060 Piping Systems
	15180 Insulation
	15300 Special Piping Systems
	15310 Fuel Gas Piping & Equipment
	15350 Domestic Water System
	15400 Soil, Waste and Drainage
	15450 Plumbing Fixtures & Trim
	15800 Air Distribution System
	15820 Air Handling Equipment
	15900 Controls & Automation

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Section 16010 General Provisions
 16100 Basic Materials & Methods
 16150 Electrical Workmanship
 16500 Lighting

INVITATION TO BID

ARCHITECT:

Mulvanny Partnership
11820 Northup Way, Ste E-300
Bellevue, Washington 98005

PROJECT:

Price Club
1722 Route 88
Brick, NJ
MP#: 94-076

INVITATION TO BID

1. Notice to General Contractors:

Sealed bids will be received by PriceCostco, Inc., at the Project Architect's office until 2:00 pm on November 21, 1994. Proposals received after the time and date stated above will not receive consideration. Bids may be sent by Fax, if the General Contractor is immediately available by phone.

2. Description of the Work:

The project involves approximately 6,850 square feet of remodeled building on 1 level. Building is CMU walls, E.P.D.M. roof system and concrete slab on grade.

3. Type of Bid Proposals:

Combined bids will be received from a pre-selected list of general contractors only, as follows:

A. General Contractor (prime bidder)

1. Building construction
2. Plumbing
3. Heating/Ventilating/Air Conditioning
4. Fire sprinkler system
5. Electrical

4. General Contractor Bid List

The following contractors have been selected to bid this project:

Miller Refrigeration, Inc.
7521 Lake Drive
Baltimore, MD 21237
(410) 866-3600

5. Pre-Selected Sub-Contractor Bid List

The following sub-contractors have been selected to bid this project. No other bidders from these trades will be accepted. Whatever each subcontractors bid is, it must be the same to all general contractors. If it is not the same, that particular sub-contractor may be disqualified, by the Owner, on future projects.

A. Polymer Flooring:

1. Stonhard Manufacturing Co.

6. Bid Opening

Bids will be opened publically and read aloud at the time and location indicated above. A tabulation of bids will be furnished to all bidders.

7. Bidding Documents

Drawings and Specifications may be examined at the following locations:
General Contractors Office

8. Drawings and Specifications

A. Bid Sets: Bluelines

Six (6) complete sets of bid drawings and specifications will be issued at Owner's cost to the selected list of bidding General Contractors, from the office of MULVANNY PARTNERSHIP. Additional sets of drawings and specifications may be obtained by the General Contractors for the cost of the printing, shipping and handling, \$75.00 each. All copies of Drawings and Specifications shall remain the property of the Architect and shall be returned to Architect within seven (7) days of the Bid Opening.

B. Construction Sets: Blacklines

Eight (8) complete sets of construction drawings and specifications will be issued at Owner's cost by MULVANNY PARTNERSHIP to the selected General Contractor. Additional sets may be obtained by the General Contractor for the cost of the printing, shipping and handling, \$75.00 each.

9. Right to Reject Bids

The owner reserves the right to waive irregularities in or to reject any and/or all bid proposals.

End of Invitation to Bid

INSTRUCTIONS TO BIDDERS

ARCHITECT:

Mulvanny Partnership
11820 Northup Way, Ste E-300
Bellevue, Washington 98005

PROJECT:

Price Club
1722 Route 88
Brick, NJ
MP#: 94-076

INSTRUCTIONS TO BIDDERS

Proposals to be entitled to consideration must be made in accordance with the following instructions:

1. General
Invitation to Bid, as included in the Specifications, shall be considered as a part of these Instructions to Bidders as if repeated herein.
2. Examination of Site and Documents
Before submitting a proposal, the bidder shall:
 - A. Carefully examine the Drawings and Specifications.
 - B. Visit the site of the work and fully inform himself of existing conditions and limitations.
 - C. Rely upon his own judgment in preparing his proposal, and include in his bid, a sum sufficient to cover all items required by the Contract.
3. Interpretations
Questions regarding Drawings and Specifications should be addressed to the Architect and will be answered by addenda addressed to all bidders. Neither the Owner nor the Architect will be responsible for oral interpretations.

If there is any discrepancy contained in the bidding documents between the drawings and specifications, the specifications govern.

The General Contractor is required to notify the Architect of all discrepancies contained in the bidding documents. In the event of an unclarified discrepancy the contractor is required to bid the item of greater costs.

Questions received less than 24 hours before the time set for bid opening cannot be answered. All addenda issued during the bidding period will be incorporated into the Contract.

4. Form of Bid

Submit bid in duplicate, on forms furnished by the Architect, without alterations in the form, or any recapitulation of the work to be done. Fill in all blank spaces in the form, in accordance with the portion or portions of work bidding upon, and sign in longhand. Failure to bid on all items listed in the bid form may cause rejection of the bid. If a bidder is a partnership, each partner must sign; if a corporation, print name of state in which incorporated, followed by the signature or signatures of the person(s) authorized to sign, and the names of the offices they hold in the corporation.

5. Oral, or Telegraphic Bids

Oral, and telegraphic bids, or modifications of bids will not be considered. Fax bids will be acceptable if approved by Architect.

6. Substitutions

Bids shall be based on the articles and materials named in the specifications as defined below:

A. Bidding Procedure Prior to Contract between Owner/Gen. Contractor.

Whenever the item or class or material is specified exclusively by detail specification, trade name, mfg. name, or by catalog reference; use only such items. (No substitutions allowed).

B. After Contract Signing between Owner/Gen. Contr.

Should the Contractor desire to substitute items, equipment, etc., after the contract is signed, a proposal should be submitted to reflect a credit to the Owner and include complete literature and specification.

If the Architect and Owner approve any substitutions, the approval is given with the understanding that the Contractor guarantees the substitution to be equal to or better in every respect to the original specification. The Contractor shall assume responsibility that substitution will fit the project regarding space, access and service utility requirements.

7. Alternate Bids

Except as stated above, alternate bids other than those listed in the bid form will not be considered.

8. Submission of Bid

Enclose bid in opaque sealed envelope addressed to Owner. Deliver as required by the "Invitation to Bid".

Bidder is responsible for delivery of his bid at or before the time set for opening. Architect will verify the correct time and control the time set. Any bids not received at or before the time set will be rejected.

No telephones will be available to bidders at the place designated for receiving and opening bids.

9. Evidence of Qualification

A bidder whose proposal is under consideration shall, upon request, promptly furnish satisfactory evidence of his financial resources, his experience and the organization he has available for the performance of the contract.

10. Withdrawal of Bids

Any bidder may withdraw his bid, either personally or by written request, at any time prior to the hour set for the bid opening. No bid may be withdrawn or modified after the time set for opening unless and until the award of contract is delayed for a period exceeding 30 days.

11. Performance Bond and Labor and Material Payment Bond

The Contractor shall secure and pay for the Performance Bond and Labor and Material Payment Bond issued by a bonding company licensed to transact business in the locality of the project, on A.I.A. form A-311. Liability under each of the bonds shall be 100% of the contract sum. Deliver bonds in accordance with Par. 11.4. of the General Conditions. The bond amount to be increased with each change order increase, so that final bond amount reflects final contract total.

12. Bid Proposal Supplement

After bids are received and prior to signing of the Contract, Architect will request the following from the successful General Contractor:

- A. Breakdown of Bid Proposal on forms furnished by the Architect.
- B. Breakdown of Bid Proposal for future payment requests as selected by the Contractor.

13. Project Schedule Time Line

To complete the project within 110 consecutive calendar days. Proposed construction schedule and phasing plan to be submitted by the General Contractor as part of his package. Project is to be fast tracked as quickly as possible with minimal disruption of warehouse operations. General Contractor to meet with Wally Lynch of Mulvanny Partnership to evaluate schedule and phasing prior to bid.

14. Rejection of Bids

The Owner reserves the right to reject any and all bids.

End of Instructions to Bidders

BASE BID AND ALTERNATES

ARCHITECT:

Mulvanny Partnership
11820 Northup Way, Ste E-300
Bellevue, Washington 98005

PROJECT:

Price Club
1722 Route 88
Brick, NJ
MP#: 94-076

BASE BID AND ALTERNATES

1. General

Each bidder shall state in his bid, in the space provided in the bid form, the following:

- A. Base Bid - includes all work indicated on drawings and specified, excepting only those items included in the following alternates, and work specifically indicated or noted as not in contract (NIC).
- B. Alternate Bids - includes additional items of work for substituting materials and/or construction for work specified in the Base Bid.

2. Alternate Bids

Alternate No. 1: _____

Alternate No. 2: _____

Alternate No. 3: _____

Alternate No. 4: _____

3. Adjustments:

Bid prices for alternates shall include adjustments in the work of all trades as may be necessary because of additions, eliminations, and/or substitutions. Also include adjustments as required for 100% performance and payment bonds.

This sheet inserted in Specifications for explanation of alternates to be included. Actual alternate explanation will be submitted with addenda.

End of Base Bid and Alternates

FORM OF BID PROPOSAL

Date: _____

ARCHITECT:

Mulvanny Partnership
11820 Northup Way, Ste E-300
Bellevue, Washington 98005

PROJECT:

Price Club
1722 Route 88
Brick, NJ
MP#: 94-076

FORM OF BID PROPOSAL

Bidder: _____

(firm name)

To: PriceCostco, Inc.

The undersigned bidder, having familiarized himself with the terms of the contract, the local conditions affecting the contract, and with the Drawings and Specifications and other Contract Documents, hereby proposes and agrees to provide all labor, material, equipment, and services necessary to complete in a workmanlike manner all work required in connection with the construction of:

All in strict accordance to Drawings, Specifications, and other Contract Documents; hereby submit a combined base bid as follows:

1. Combined Base Bid

_____ dollars (\$ _____). The above base bid includes _____
_____ dollars (\$ _____) for the cost of the 100% performance bond and payment
bonds.

2. Alternates

The combined base bid does not include alternate bids as listed below. The listed alternates make provisions for certain additions, deletions, or substitutions. Alternate acceptance, if any, will be added to or deleted from the combined base bid. Owner reserves the right to accept or reject any or all alternates. General contractor must furnish owner with alternate cost.

Alternate No. 1-----(\$ _____)
Alternate No. 2-----(\$ _____)
Alternate No. 3-----(\$ _____)
Alternate No. 4-----(\$ _____)
Alternate No. 5-----(\$ _____)
Alternate No. 6-----(\$ _____)
Alternate No. 7-----(\$ _____)
Alternate No. 8-----(\$ _____)

3. General Contractor Bid Breakdown

The following breakdown will be used by the General Contractor and will not be changed after submission of bid, unless specifically approved by Architect and Owner in writing. Dollar amounts shown (*) should reflect the actual sub bid as received by the General Contractor. If the dollar amounts and the subcontractor names are not listed at the time of bidding (as shown below), the Owner reserves the right to reject the General Contractors bid.

Type of ConstructionAmount

1. Building

\$ _____

Total Combined Base Bid

\$ _____

Building BreakdownAmountSub-Contractor

- Concrete/Rebar	\$ _____	_____
- Roof Structure	\$ _____	_____
- Built-up Roofing	\$ _____	_____
- Plumbing	\$ _____	_____
- HVAC	\$ _____	_____
- Sprinkler System	\$ _____	_____
- Fire Alarm System	\$ _____	_____
- Electrical	\$ _____	_____
- High Bay Lighting	\$ _____	_____
- Switch Gear/Panel Boards	\$ _____	_____
- Polymer Flooring	\$ _____	_____
- Building (other than listed ABOVE)	\$ _____	_____
- General Conditions	\$ _____	_____
- Contractors Profit & Overhead	\$ _____	_____
- Performance Bond	\$ _____	_____
- Fair Wages Policy	\$ <u>Included</u>	_____
- Builders Risk Insurance	\$ _____	_____

Total Building Cost Only

\$ _____

4. Overhead and Profit

Combined base bid and alternate bids listed include Contractor overhead and profit.

5. Change Orders

All extra work not included in the Contract, if requested, will be performed by the Contractor by material and labor costs plus overhead and profit. Ten percent (10%) (overhead and profit) will be added or deleted accordingly by the sub-contractor completing the work. Five percent (5%) (overhead and profit) will be added or deleted accordingly by the General Contractor.

6. Sales Tax

Sales Tax is included in Combined Base Bid and alternates.

A. In State of Washington, sales tax will be added as required to each payment request as it is submitted, and not included in the combined Base Bid.

7. Time of Completion

The undersigned hereby agrees to complete the work described in the contract as follows:

A. Proposed Signing of Contract Date November 29, 1994.

B. Proposed Commencement of Construction Date January 1, 1995.

C. Commencement of Owner Supplied Refrigeration Equipment - per contractors bid date to be outlined in bid.

D. Partial Substantial Completion. Owner will start racking and stocking on the date of partial substantial completion. (Liquidated damages commence if building is not ready to receive racks) and start stocking. Contractor to obtain necessary Occupancy or Temporary Occupancy Permit to allow stocking.

E. Substantial Completion/Grand Opening - date to outlined in General Contractors bid.

F. Final Completion - date to be outlined in General Contractors bid. All final punch list items shall be corrected and/or completed to the satisfaction of the owner.

8. Liquidated Damages

The undersigned hereby agrees to pay the Owner liquidated damages in the amount of \$5,000.00 for each consecutive calendar day the work remains uncompleted after the date of Partial Substantial Completion.

9. Contract Bonds

If the undersigned is notified of the acceptance of this bid within 30 calendar days after the time set for opening of bids, he agrees to execute a contract for the above work, for a compensation computed from the above sums, in A.I.A. Form of Agreement A-101, and to furnish performance and payment bonds as required by the specifications.

10. Addenda

Receipt of addenda is hereby acknowledged as follows:

Addenda Nos.

Date

_____	_____
_____	_____
_____	_____

11. Cash Allowances

Cash allowances, as specified in Section 1-A, Summary of Work, are included in this Combined Base Bid, as follows:

- 1.
- 2.
- 3.
- 4.

12. General Contractor Signature

Bidder

Street Address

City Zip Code

Telephone No.

By

License No.

Title

End of Form of Bid Proposal

GENERAL CONDITIONS

GENERAL CONDITIONS

The American Institute of Architects Standard Form of General Conditions of the Contract for Construction, A.I.A. Document A201 (1987 Edition), shall form a part of these Specifications with the same force and effect as if bound herein. A copy of these General Conditions is available at the office of the Architect. Copies may be purchased at any reprographics firm, or the local chapter of the A.I.A.

The Contractor is hereby directed to obtain copies of Document A201 to acquaint himself with the articles contained therein and to notify and appraise all subcontractors, suppliers, and other parties to the Contract as to its contents.

No contractual adjustments shall be due as a result of failure on the part of the Contractor to fully acquaint himself and all other parties to the Contract with the conditions of Document A201.

SUPPLEMENTARY CONDITIONS

MODIFICATIONS TO A.I.A. DOCUMENT A201 - 1987 EDITION

SC-1. CONFLICTS

In case of conflict between the Technical Specifications and the General and Supplementary Conditions, the Specifications shall govern.

SC-2. MODIFICATIONS OF THE GENERAL CONDITIONS

Par. 1.1.1 The Contract Documents

Change to read: Contract Documents "DO" include Bid Documents (Invitation to Bid, Instructions to Bidders, sample forms, Addenda, Contractors Bid Proposal, and Bid Proposal Breakdown), and other documents as specifically enumerated in the Owner/Contractor Agreement.

Par. 2.2.2 Information and Services

Add to paragraph: "Owner shall furnish all soils/geological reports describing the physical characteristics for the site of the project."

Par. 3.4.1 Labor and Materials

Add to paragraph: "Contractor shall pay for all water, gas, electricity, and other utility costs as required to construct the project, until date of Substantial Completion of the work. The Owner shall pay all utility costs from that date on."

Par. 3.7.1 Permits, Fees & Notices

Owner to pay plan check and basic building permit fee costs. Contractor shall secure and pay for all other subcontractor permits, as required by local jurisdictions.

Par. 3.9.1 Superintendent

Add to paragraph: "Prior to commencing the work, the Contractor, his Superintendent, and the Architect shall set the standards and levels of responsibility for the Superintendent for the duration of the work, some of which include:

1. Quality Workmanship
2. Control and Leadership
3. General Project Order and Clean-up

Par. 3.12.5 Shop Drawings, Product Data and Samples

Add to paragraph: "The Contractor shall submit five (5) sets of the shop drawings listed in Section 1A-02.B.1. of the Specifications to the Architect, with his stamp indicating review and approval. All shop drawings shall be submitted to the Architect prior to the approval of the first payment request."

Par. 4.2.7 Architect Administration of The Contract

Allow ten (10) days for checking of shop drawings by the Architect.

Par. 4.2.8 Change Orders

Change to read: The contractor will prepare change orders. The Architect will prepare Field Order Directives, and may authorize minor changes in work as provided in Paragraph 7.4.

Par. 4.5.1 Inclusive Arbitration

(4.2.6, 4.2.11, 4.2.12, 4.2.13, 4.3.1 through 4.3.4, Section 4.4 and Section 4.5) "Arbitration" as included in these General Conditions & other Contract Documents shall be excluded in its entirety. Any dispute that cannot be settled by the Architects interpretation, must be pursued, by either party to the Contract, in any court having jurisdiction thereof.

Par. 9.3.2 Applications for Payment

Add to paragraph: "suitably stored at the site" means protected for security (theft and vandalism), and protected from the weather (sun, rain, snow, freezing temperatures, etc.).

Par. 9.3.3 Applications for Payment

Add to paragraph: "Free and clear of all liens, claims, security interests or encumbrances" means that the Contractor has paid all parties for work previously completed and reimbursements have been made to the Contractor by the Owner. Should a lien, claim, etc., be placed on the work, the Contractor is responsible for its removal, and the Owner will be held harmless in the process. See SC-1.L for "Lien Waiver and Affidavit" requirements.

Par. 9.8.1 Substantial Completion

Delete paragraph and add the following: The date of Substantial Completion of the work, is the date certified by the Architect that construction is 100% complete, (with only final corrections remaining to be completed) in accordance with Contract Documents, so Owner can occupy or utilize the work for the use for which it is intended.

Par. 9.8.2 Substantial Completion

Delete first portion of paragraph, and add the following: "When the Architect considers the work to be 100% complete in accordance with the Contract Documents, the Architect shall prepare a list of items to be corrected. The Contractor shall proceed promptly to complete and correct items on the list." Resume with "The failure to include an item", etc.....

ARTICLE 11 INSURANCE

Delete the entire article and add the following:

Par. 11.1 Contractor's Liability Insurance

Par. 11.1.1 The Contractor shall purchase and maintain such insurance as will protect him from claims set forth below which may arise out of or result from the Contractor's operations under the Contract, whether such operations be by himself or by any Subcontractor or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable. The Owner shall be named as an additional insured under all the Contractor's insurance policies included herewith.

1. claims under workers' or workmens' compensation, disability benefit and other similar employee benefit acts;
2. claims for damages because of bodily injury, occupational sickness or disease, or death of his employees;
3. claims for damages because of bodily injury, sickness or disease, or death of any person other than his employees;
4. claims for damages insured by usual personal injury liability coverage which are sustained (1) by any person as a result of an offense directly or indirectly related to the employment of such person by the Contractor, or (2) by any other person;
5. claims for damages, other than to the work itself, because of injury to or destruction of tangible property, including loss of use resulting therefrom; and,
6. claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance, or use of any motor vehicle.

The policies of insurance purchased and maintained by the Contractor shall include, but are not limited to, the following:

A. General Liability

Comprehensive form including premises operations, explosion and collapse hazard (X.C.U. exclusion deleted), underground hazard, products/complete operations hazard, contractual insurance, broad form property damage, independent contractors and personal injury (with exclusion "C" deleted), the stop-gap endorsement.

B. Automobile Liability

Comprehensive form, including owned, hired, and non-owned vehicles.

C. Excess Liability
Umbrella form.

D. Workers' Compensation and Employers' Liability

Par. 11.1.2 The insurance required by Subparagraph 11.1.1 shall include contractual liability insurance applicable to the Contractor's obligations under Paragraph 3.18., and shall be written for limits required by laws governing in localities having jurisdiction, but no less than the limits set forth below:

	<u>EACH OCCURRENCE</u>	<u>AGGREGATE</u>
Bodily Injury <u>(each person)</u>	<u>\$ 500,000</u>	<u>\$ 1,000,000</u>
Bodily Injury <u>(each accident)</u>	<u>\$ 500,000</u>	<u>\$ 1,000,000</u>
<u>Property Damage</u>	<u>\$ 500,000</u>	<u>\$ 1,000,000</u>
Bodily Injury and Property Damage Combined (under <u>umbrella form</u>)	<u> </u>	<u>\$ 5,000,000</u>

Par. 11.1.3 Certificates of insurance acceptable to the Owner shall be filed with the Owner and Architect prior to commencement of the work. These certificates must convey legal rights to the certificate holder, or the original policies may be substituted for the certificates. These certificates and/or policies must contain a provision that coverages afforded under the policies will not be canceled until the work has been completed and a minimum of thirty (30) days prior written notice has been given to the Owner.

11.2 Owner's Liability Insurance

Par. 11.2.1 The Owner is named as an additional insured on all insurance required by Subparagraph 11.1.1, and will be protected against all claims which may arise from operations under the Contract.

11.3 Property Insurance

Par. 11.3.1 The Contractor shall purchase and maintain property insurance upon the entire work at the site to the full value of the work required by the Contract Documents and not less than the final completed value of the project. This insurance shall include the interests of the Owner, the Contractor, Subcontractors, Sub-subcontractors, and any loss payees in the work. This insurance shall insure against the perils of fire and extended coverage, and shall include Builder's "All-Risk" insurance, on an ALS 72 Form or Facsimile for physical loss or damage including, without duplication of coverage; theft, vandalism, and malicious mischief. This insurance shall also include "Difference in Conditions" (D.I.C.) in the insured property. This insurance shall include and maintain coverage as mentioned above for the work stored off-site and/or in transit to the work on-site.

- Par. 11.3.2 The Contractor shall purchase and maintain such boiler and machinery insurance as necessary to provide full replacement cost coverage and liability coverage for bodily injury or property damage with limits of \$1,000,000.00, and/or as may be required by any governing law. This insurance shall include the interests of the Owner, the Contractor' Subcontractors, Sub-subcontractors, and any loss payees in the work.
- Par. 11.3.3 Loss of Use Insurance
The Owner, at his option, may purchase and maintain such insurance as will insure him against loss of use of his property due to fire or other hazards, however caused. The Owner waives all rights of action against the Contractor for loss of use of his property, including consequential losses due to fire or other hazards however caused, to the extent covered by insurance under this Paragraph 11.3.
- Par. 11.3.4 If the Owner requests in writing that insurance for risks other than those described in Subparagraphs 11.3.1 and 11.3.2 or other special hazards be included in the property insurance policy, the Contractor shall include such insurance.
- Par. 11.3.5 If during the Project construction period the Owner insures properties, real or personal or both, adjoining 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, the Owner shall waive all rights in accordance with the terms of Subparagraph 11.3.7 for damages caused by fire or other perils covered by this separate property insurance. all separate policies shall provide this waiver of subrogation by endorsement or otherwise.
- Par. 11.3.6 The Contractor shall file a copy of all policies or "Legal Document" certificate of insurance with the Owner before any exposure to loss may occur. The work, as included in the Contract Documents, will not commence until the insurance certificates or policies have been approved by the Owner in writing to the Contractor.
- Par. 11.3.7 The Contractor shall indemnify, hold harmless, and defend Owner its officers, agents and employees from liability of any nature or kind, including costs and expenses, for or on account of any and all legal actions or claims of any character whatsoever resulting from injuries or damages sustained by any person or property. The Owner and Contractor waive all rights against (1) each other and the Subcontractors, Sub-subcontractors, agents and employees each of the other, and (2) the Architect and separate contractors, if any, and their subcontractors, sub-subcontractors, agents and employees, for damages caused by fire or other perils to the extent covered by insurance obtained pursuant to this Paragraph 11.3 or any other property insurance applicable to the work, except such rights as they may have to the proceeds of such insurance held by the Owner as trustee. The foregoing waiver afforded the Architect, his agents and employees shall not extend to the liability imposed by Subparagraph 3.18.3 The Architect, separate contractors, Subcontractors, and Sub-subcontractors by appropriate agreements written where legally required for validity, similar waivers each in favor of all other parties enumerated in this Subparagraph 11.3.7.

- Par. 11.3.8 Any loss insured under Subparagraph 11.3.1 is to be adjusted with the Owner as trustee for the insureds, as their interests may appear, subject to the requirements of any applicable mortgagee clause and of Subparagraph 11.3.10. The Contractor shall pay each Subcontractor a just share of any insurance moneys received by the Contractor, and by appropriate agreement, written where legally required for validity, shall require each Subcontractor to make payments to his Sub-subcontractors in a similar manner.
- Par. 11.3.9 If required in writing by any party in interest, the party acting as trustee, shall, upon the occurrence of an insured loss, give bond for the proper performance of his duties. He shall deposit, in a separate account, any money so received, and he shall distribute it in accordance with such agreement as the parties in interest may reach, or in accordance with an award by arbitration, in which case the procedure shall be as provided in Paragraph 4.5. If, after such loss, no other special agreement is made, replacement of damaged work shall be covered by an appropriate Change Order.
- Par. 11.3.10 The party acting as trustee, shall have power to adjust and settle any loss with the insurers, unless one of the parties in interest shall object in writing within five (5) days after the occurrence of loss to the trustee's exercise of this power, and if such Paragraph 4.5. The party acting as trustee shall, in that case, make settlement with the insurers in accordance with the directions of such arbitrators. If distribution of the insurance proceeds by arbitration is required, the arbitrators will direct such distribution.
- Par. 11.3.11 If the Owner finds it necessary to occupy or use a portion or portions of the work prior to Substantial Completion thereof, such occupancy or use shall not commence prior to a time mutually agreed to by the Owner and Contractor and to which the insurance company or companies providing the property insurance have consented by endorsement to the policy or policies. This insurance shall not be canceled or lapsed on account of such partial occupancy or use. Consent of the Contractor and of the insurance company or companies to such occupancy or use shall not be unreasonably withheld.

PROJECT ARCHITECT:

Mulvanny Partnership
11820 Northup Way, Ste E-300
Bellevue, Washington 98005

PROJECT:

Price Club
1722 Route 88
Brick, NJ
MP#: 94-076

SPECIAL CONDITIONS

SC-1 Special Conditions

A. Wording of these Specifications

These Specifications are written in the abbreviated or "streamlined" form, and frequently include incomplete sentences. Words such as "shall", "shall be", "the Contractor shall", and similar mandatory phrases shall be supplied by inference as they are in a note of the Drawings. The Contractor shall provide all items listed and perform all operations as called for, all in accordance with Paragraph 3.4 of the General Conditions as modified herein.

B. Definitions

The word "approved", as used herein, means "approved by the Architect". "For approval" means "for the Architect's approval". "Selected" means "selected by the Architect". "As directed" means "as directed by the Architect". "Provide" means "furnish and install". Where the words "or approved" are used, the Architect is the sole judge of the quality and suitability of the proposed substitution.

The word "certify" as used by the Architect means to state or declare a professional opinion of conditions whose true properties cannot be known at the time such certification was made, despite appropriate professional evaluation. A design professional's certification of conditions in no way relieves any other party from meeting requirements imposed by the contract or other means, including commonly accepted industry practices.

C. Number of Specified Items Required

Wherever in these Specifications an article, device or a piece of equipment is referred to in the singular number, such reference shall include as many such items as are indicated on the Drawings or required to complete the installation.

D. Lines and Levels

Before starting work, locate all general reference points. Take such steps as are necessary to prevent their dislocation or destruction. If disturbed or destroyed, replace as directed. Employ a licensed surveyor to lay out and stake the building and be responsible for its accuracy.

- E. Prior Use or Occupancy
The Owner has the right to use or occupancy the building or any part thereof, or to use equipment installed under the Contract prior to final acceptance.
- F. Contractor/Subcontractor
These Specifications are divided into sections for convenience only. The Architect is not obliged to define the limits of any subcontract, and will not enter into disputes between subcontractors or between the Contractor and his employees, INCLUDING SUBCONTRACTORS.
- G. Itemized Schedule of Costs
Prepare a complete breakdown of the contract sum in the schedule of values as required by the Architect. Furnish to the Architect before first monthly payment is applied for.
- H. Building Codes
All construction shall be in accordance with the codes and ordinances adapted by the locality in which the work is being completed.
- I. Federal and State Regulations
All work on this project will be done in accordance with the applicable regulations of the federal register Occupational Safety and Health Administration (commonly known as OSHA). Compliance with these regulations shall be the responsibility of the General Contractor and his subcontractors.
- J. Owner Supplied Refrigeration Equipment
Date to be determined in contract.
- K. Warehouse Stocking
Date to be determined in contract. General Contractor shall secure necessary occupancy permit for Owner to stock the building.
- L. Lien Waivers & Affidavit
Each progress payment as submitted by the contractor, must be accompanied by an original waiver/release of lien executed by Contractor and by the ten largest subcontractors and/or material suppliers, approved by the architect, in an original form for whom payment is requested. All dates and dollar amounts covered by the lien waivers must match the dates and dollar amounts stated in the payment request.

Prior to the final payment, an affidavit (in recordable form) from the Contractor must be delivered to the Owner, stating that all subcontractors and material suppliers who furnished labor and materials for the construction project have been paid in full and final lien releases from Contractor and all subcontractors and suppliers have been delivered to Owner.

M. Fair Wages Policy

Contractor and each subcontractor shall pay "Fair Wages" to its employees and use its best commercially reasonable efforts to insure that each of its subcontractors pay "Fair Wages" to their employee.

For purposes of this agreement, "Fair Wages" shall mean not less than ninety percent (90%) of the general prevailing hourly wage rate and ninety percent (90%) of the general prevailing hourly compensation for holiday pay and overtime pay practices to be calculated in the same manner as noted for "prevailing hourly wage rates". Any questions regarding the calculations of prevailing rates (wages, holiday pay, and overtime pay practices) shall be determined at the sole discretion of PriceCostco, Inc.

In calculating the "prevailing hourly wage rate", Contractor and each subcontractor shall be guided by the U.S. Department of Labor's "prevailing wage" determinations under the Davis-Bacon Act, as amended for the locality involved for each craft, classification or type of workman needed to perform the work. However, in making such calculations Contractor and each subcontractor shall reduce the hourly rates by a prorated amount determined by Contractor and each subcontractor to be comparable to the value of fringe benefits in the U.S. Department of Labor statistics.

Contractor and each subcontractor employed on the site shall provide adequate fringe benefits to its employees such as pension plan, profit sharing plan, and medical and health care. The adequacy of this program shall be determined in the sole discretion of PriceCostco, Inc., and will be compared with the pattern of plans prevalent locally and nationwide in the commercial building construction industry.

Contractor and each subcontractor shall have an industrial experience rating for similar construction projects that equals or exceeds the average experience rating for the state in which the project is located. Any questions regarding determination of the industrial experience rating shall be determined at the sole discretion of PriceCostco, Inc..

Contractor and each subcontractor shall, upon written request of PriceCostco, Inc., provide PriceCostco, Inc. with a certified payroll for the work performed, showing the wages and fringe benefits paid for the work done by Contractor and subcontractor.

Contractor and each subcontractor shall, upon written request of PriceCostco, Inc., provide PriceCostco, Inc. with certified descriptions of all fringe benefits available to its employees.

Contractor acknowledges and agrees that the purpose of wage and fringe benefits information is to allow PriceCostco, Inc. to verify Contractor's compliance with the fair wage policy described above. In the event that Contractor or any of its subcontractors is not in compliance with the fair wage policy stated above, as determined by PriceCostco, Inc., PriceCostco, Inc. shall have the right to terminate the contract and/or any subcontract, if, after notice, such Contractor or subcontractor has not complied with this fair wage policy promptly to the full satisfaction of PriceCostco, Inc..

Contractor shall cause each subcontract for the project to contain the fair wage policy described above.

If you have questions on this policy or need further explanation, please call Mulvanny Partnership.

SECTION 1A
SUMMARY OF WORK

1A-01. WORK INCLUDED

A. General Scope of Work

The work included in this Contract consists of the construction and completion of a 1 story building-renovation to include all walls and special finishes. Construction type to be 2C unlimited (sprinklered) for Group M occupancy, including appurtenances indicated on the Drawings, excepting only those items specifically indicated or noted as Not In Contract (N.I.C.).

B. Reference

Refer to Conditions of the Contract for possible effect on work of this section.

C. Contracts

The work will be performed concurrently under a combined contract.

D. Work Not in Contract (NIC)

Items indicated as NIC will be furnished and installed by the Owner. All rough-in requirements to and/or for these items shall be completed by the Contractor. All final connections by the Contractor.

E. Special Items in this Contract (Furnished and Installed by Owner)

The following items will be furnished and installed by the Owner. All rough-in requirements to these items will be completed by the Contractor. All final connections and hook-up to be completed by the Contractor as a part of this Contract. Some items listed below may be provided by the General Contractor under a separate contract with the owner.

1. Freezer/Cooler Boxes
(slab, insulation, venting & fire protection by General Contractor)
2. Product Casework
3. Refrigeration
4. Security System
5. Bakery Equipment
6. Meat Prep. Equipment
7. Fire Extinguishers
8. Interior Chain Link Fencing, Turnstiles
9. Steel Storage Racks

F. Special Items in this Contract (Furnished by Owner and Installed by Contractor)

The following items will be furnished by the Owner and installed by the Contractor. All rough-in requirements to and/or for these items shall be completed by the Contractor. All final connections by the Contractor.

SECTION 1A
SUMMARY OF WORK

1. Hose Reels
2. Air Compressor
3. Heating/Air Conditioning Units (see Div. 15)
4. Battery Chargers

Contractor must request delivery of equipment from the Owner, to meet the Contractor's schedule.

G. Owner Directives/Changes

All directives and/or changes that affect this project shall come from the Owner to the Architect, and then to the General Contractor. A Change Order shall be issued by the General Contractor to the Architect and Owner for signature. Field directives and/or changes shall NOT be included in the work until the Architect and Owner have signed the Change Order. No work is to be done at the request of the Warehouse Manager.

H. Project Coordinator

The General Contractor is the project coordinator, and shall provide coordination and control for all work of the entire contract included in these Contract documents and specified herein.

I. Completion for Owner's Racking

The following work must be 100% complete at date of partial substantial completion:

1. Complete plumbing.
2. Building security operational.
3. Floor covering, lighting, ceilings and sprinkler systems.
4. Fire protection system (it must have final city approval).
5. All exterior doors installed, operational, with all hardware.
6. Occupancy permit for stocking warehouse.

1A-02. SUBMITTALS

A. CPM Schedule

The Contractor shall provide the architect with a CPM schedule and bar graph for the project before the start of construction. The schedule will be updated weekly, and sent directly to the owner and architect for their review.

B. Shop Drawings, Product Data & Samples

The Contractor shall review, approve and submit to the Architect shop drawings, product data and samples as required by the specifications and contract documents with reasonable promptness as to cause no delay in work. Submittals made by the Contractor which are not required by the Architect will be returned without action. No work shall be installed until respective shop drawings have been reviewed by the Architect.

Shop drawings, product data and samples to include, but not limited to the following:

1. Shop Drawings
 - a. Concrete Reinforcing 3B-01.D
 - b. Concrete Mix Design 3C-01.E
 - c. Mortar & Grout Mix Design 4A-01.C
 - d. Structural Steel 5A-01.F
 - e. Miscellaneous Metal 5E-01.C

SECTION 1A
SUMMARY OF WORK

- | | | |
|------------------------|-------------------------------|---------|
| f. | Metal Doors & Frames | 8A-01.D |
| g. | Finish Hardware | 8G-01.E |
| 2. <u>Product Data</u> | | |
| a. | Concrete cure, seal, hardener | 3C-01.E |
| b. | Insulation | 7C-01.D |
| c. | Metal Doors & Frames | 8A-01.D |
| d. | Finish Hardware | 8G-01.E |
| e. | Paint | 9M-01.D |
| 3. <u>Samples</u> | | |
| a. | Paint | 9M-01.D |

1A-03. CASH ALLOWANCES

See General Conditions for explanation of Contract Profit and Overhead Markup.

The following cash allowances are included in the Base Bid and shall be expended as directed by the Architect. See Technical Section of these Specifications for the work included in these allowances.

1A-04. TRANE MANUFACTURING COMPANY INFORMATION AND FORMS

The General Contractor must notify his H.V.A.C. and Electrical subcontractors of the information as listed below.

Copies of this information has also been sent to the local Trane office to give General Contractor local support and advice local service department of the future startup. In order to properly support the owner and insure proper coordination between trades, the General Contractor should be advised of the following items of responsibility:

1. The Trane Company wiring responsibilities are strictly limited to internal wiring on the rooftops. All other external wiring indicated on the contract M/E drawings is by the General Contractor. The local Trane service agency will confirm proper wiring terminations at the Tracer panel external control devices but the wiring terminations are the responsibility of the installing contractor.
2. Installation of optional field installed equipment, (I.E. economizers, relief hoods, oversize motors, flue vent caps and TIM-E modules) is by the General Contractor.
3. Mounting of the Tracer panel, electrical interface panels, thermostats, and other external devices is the responsibility of the General Contractor. Functional checkout of these items will be done at startup by the Trane service agency.
4. All electrical power, gas piping, external wiring, Tracer and interface panels shall be installed and operable prior to arrival of the Trane service agency.
5. To properly support contractor requests for startup, please advise Trane at least 2 weeks in advance of required startup date. Trane will furnish installation checklists to help coordinate field installation requirements. Please return these checklists to Trane so that we can advise the local Trane office that installation is complete and startup can be scheduled.

SECTION 1A
SUMMARY OF WORK

6. Complete startup, checkout, and Owner training is the responsibility of the local Trane service agency and Seattle Trane service agency. The local Trane service agency will do mechanical startup and the Seattle Trane service agency will do Energy Management System startup, and owner/contractor training. Energy Management System (E.M.S.) startup is typically done after HVAC equipment has been started by the local Trane service agency.
7. After startup and checkout is complete, the warranty and maintenance responsibilities are as specified in the contract documents. All labor warranty is the responsibility of the installing contractor. If installing contractor has a service agency it would be beneficial to schedule E.M.S. training for service engineers. This can be done thru the local Trane Company. If warranty work is required during the Owner warranty period, please call the local Trane service agency or Seattle Trane Company, Trane to do the work.

SECTION 1B
INSPECTIONS AND TESTS

1B-01. GENERAL

A. Inspections by Public Officials

Contractor shall call for all inspections required by building officials having jurisdiction. Final payment to the Contractor will not be made until final inspection has been made, all items corrected, and an occupancy permit has been issued for the building.

B. Inspections by Independent Agencies

The inspection work as listed below shall be made by a testing laboratory selected by the Architect and approved by the building official. All tests shall be performed in accordance with the building code. Submit written reports of inspections and tests to the Architect, Structural Engineer, General Contractor, and building official.

C. Notices

Notify independent agency, building official, and Architect at least twenty-four (24) hours before work requiring inspection is started.

D. Costs

1. All fees required for inspections and testing by public officials will be paid for by the Contractor.
2. All fees required for inspections and testing by an independent agency will be paid by the Owner.
3. Additional inspections and testing required because of defective work or ill-timed notices shall be paid for by the Contractor.

1B-02. DETAILED REQUIREMENTS

The following inspections and tests shall be made by an independent agency as outlined below (paid by Owner):

A. Cast-in-Place Concrete

Check placement and condition of all reinforcement, and complete form inspection. Inspect during placing of concrete. Observe finishing, form, removal, curing and protection of concrete work. Make one (1) slump test per twenty-five (25) yards; maintain record. Cast one (1) set of standard cylinders per (100) yards and have tested in accordance with ASTM-C31-44 and C30-44. Keep Architect informed of problems and unusual conditions.

B. Reinforced Masonry

Inspection of that portion as noted in the Structural Notes.

E. Reinforcing Steel

Continuous inspection of that portion as noted in the structural notes.

F. Steel Welding

Continuous inspection of that portion as noted in the structural notes.

SECTION 1C
TEMPORARY CONSTRUCTION FACILITIES

1C-01. GENERAL

- A. Reference
Refer to the Conditions of the Contract for possible effect on work of this section.

1C-02. DETAILED REQUIREMENTS

- A. Field Office Building
Provide substantial, weathertight office building on site where directed.
- B. Field Office Equipment
Provide when work is started, a fax machine and a copy machine.
- C. Field Office Staff
Provide separate job superintendents for the on-site and off-site portions of the project. A full-time secretary is also required.
- D. Job Telephone
Provide non-coinbox telephone connected to serving utility exchange. Install when work is started. Maintain until full completion. Pay all charges. All those connected with the work to use, provided they pay for toll calls. Contractor also to provide telephone service to the owner's on-site job shack.
- E. Temporary Utilities
Water and electricity for construction will be furnished by the general contractor. Ascertain where these services will be available, make temporary connections as required, and remove upon completion of the work. Costs for temporary electrical service and power charges to be paid 100% by the general contractor until date of substantial completion. Price Costco, Inc. shall pay 100% of utilities from date of substantial completion. Contractor also to provide electricity service to the owner's on-site job shack.
- F. Temporary Heat
Furnish temporary heat, including fuel and power, as required to protect materials and work from dampness and cold and to dry out the building. Use methods approved by the Architect. Permanent heating plant may be used for this purpose when completed at no cost to the Owner. Refer to technical sections for temperatures to be maintained for the work of various trades.
- G. Drinking Water
Furnish from a proven safe source for all those connected with the work.
- H. Temporary Toilets
Provide chemical type toilets, adequate in number for all those connected with the work. Locate where directed when work is started; keep in sanitary condition. Remove from site upon completion of work or sooner, if and when permanent toilets are made available.
- I. Temporary Enclosures
Provide wood batten doors and transparent plastic covered windows for exterior wall openings of building until it is dry. Windows may be glazed in lieu of covering, if glass is protected.

SECTION 1C

TEMPORARY CONSTRUCTION FACILITIES

J. Temporary Barricades and Fences

Contractor shall provide fences and all safeguards necessary for the convenience and protection of the public, as required by code and law enforcement regulations. Keep abutting streets and other thoroughfares open to traffic, using only portions of streets allowed by permit.

Provide temporary barriers for all demolition and remodel work to ensure the safe and clean operations of store facilities. Contractor to be responsible for providing temporary exits as required by the state and local authorities. Temporary barriers are to be 2' x 4' @ 2' oc. with plywood 8' and 6 mil viscreen to deck (typical).

SECTION 1D
MISCELLANEOUS REQUIREMENTS

1D-01. ASSOCIATIONS AND STANDARDS

A. Associations

- AIA American Institute of Architects
1765 New York Ave. NW
Washington DC, 20006
- ASA American Standards Association
10 East 40th Street
New York, NY 10016
- ASTM American Society for Testing and Materials
1916 Race Street
Philadelphia, PA 19103
- CS Commercial Standards of U.S. Department of Commerce
Washington DC, 20025
- CSI Construction Specifications Institute
Dupont Circle Building
Washington DC, 20036
- DFPA Douglas Fir Plywood Association
now known as:
American Plywood Association P.O. Box 1337
Tacoma, WA 98401
- BOCA Building Officials & Code
Administrators International Inc.
4051 W. Flossmoor Road
Country Club Hills, IL 60478-5795
- UL Underwriter's Laboratories
207 East Olive Street Chicago, IL 60611

Names and addresses of other organizations appear in the technical section where their products are specified, or are listed in Sweet's Architectural File.

B. Dates of Standards

Except where a specific date of issue is mentioned hereinafter, references to specifications issued by the above named associations and other organizations shall mean the edition current on the date of the Invitation to Bid.

SECTION 1D
MISCELLANEOUS REQUIREMENTS

1D-02. MISCELLANEOUS REQUIREMENTS

- A. Special Cleaning
In addition to clean-up specified in Par. 3.15 and Par. 6.3 of the General Conditions, and after this and all other work has been completed, the Contractor shall:
1. Vacuum-clean interior of building, including heating and ventilating ducts.
 2. Leave entire building clean and ready for occupancy.
- B. Building Warranties and Maintenance Manuals
Before final payment, furnish to the Owner, through the Architect, all written warranties and maintenance manuals of work and equipment installed under the Contract. In addition, and when so requested, instruct Owner's maintenance personnel as to such care and maintenance required.
- C. OSHA Requirements
Contractor must comply with all standards and requirements of the Occupational Safety and Health Administration. Notify Architect immediately of items not complying.
- D. Building Codes
All construction shall be in accordance with the building code adopted by the locality in which the work is being completed.
- E. Itemized Schedule of Costs
Prepare a complete breakdown of the Contract Sum as required by the Architect. Furnish to the Architect before first monthly payment is applied for.
- F. Prior Use or Occupancy
The Owner and/or the Tenant has the right to use or occupy the building or any part thereof, or to use equipment installed under the Contract prior to final acceptance. Such use or occupancy shall not constitute acceptance of the work or any part thereof.
- G. Lines and Levels
Before starting work, locate all general reference points. Take such steps as are necessary to prevent their dislocation or destruction. If disturbed or destroyed, replace as directed. Employ competent surveyor to lay out work; be responsible for its accuracy.
- H. On-Site Fire Protection
FROM THE TIME THAT THE BUILDING IS MADE WEATHERTIGHT UNTIL ITS COMPLETION AND ACCEPTANCE BY THE OWNER, THE GENERAL CONTRACTOR SHALL MAINTAIN ADEQUATE FIRE EXTINGUISHERS ON THE PREMISES, READILY AVAILABLE TO HIS WORKMEN, FOR THE PROTECTION OF THE BUILDING AND ITS CONTENTS.

SECTION 1D

MISCELLANEOUS REQUIREMENTS

I. As-Built Drawings

1. Upon completion of construction, the Contractor shall furnish to the Owner, as part of this Contract, a set of as-built drawings, showing to scale (where possible) or by figured dimensions the locations of all ducts, conduits, pipes, or other facilities not exposed in the finished work. He shall show materials, size and depth from surface of said installations, as well as line followed, and also as required in the following paragraphs.
2. Exact location of all utilities under ground within the construction limit lines.
3. Contract shall not be deemed completed, nor shall final payment become due, until the above requirements have been accomplished.

J. Owner's Warranty and Maintenance Manual

Upon completion of construction and before final payment, the Contractor shall furnish to the Owner through the Architect, as part of his contract, a bound Owner's Warranty and Maintenance Manual consisting of, but not limited to the following:

OWNER'S MANUAL REQUIREMENTS

1. List of Subcontractors
2. Certificate of Occupancy
3. Building Permits - Originals
 - a. Water
 - b. Sewer
 - c. Building
 - d. Fire Protection
4. Work Guarantees - Originals
 - a. Building - General Contractor
 - b. HVAC
 - c. Masonry
 - d. Concrete Work
 - e. Miscellaneous Steel
 - f. Fire Protection System
 - g. Plumbing
 - h. Roofing - E.D.P.M.

SECTION 1D
MISCELLANEOUS REQUIREMENTS

4. Work Guarantees - Original - Continued
 - i. Electrical
 - j. Asphaltic Paving
 - k. Doors, Windows and Hardware
 - l. Stonhard
 - m. Acoustical Ceiling
 - n. Sealants
 - o. Insulation
 - p. Painting
5. Operation & Maintenance Manuals
 - a. HVAC
 1. Cook Fans
 2. Dampers
 3. Spot Heaters
 4. Air Curtains
 5. Tracer 100-Building Management System - by Trane
 6. Tim - E Tracer Integration Mobile - Enhanced
 - b. Fire Protection
 - c. Plumbing
 1. Mop Sink
 2. Service Sink
 3. Eye Wash
 4. Hose Bib
 5. Water Heater
 6. Circulator Pump
 7. Backflow Preventers
 - d. Electrical
 1. Main Switchboard
 2. Subdistribution Panel
 3. 480 Volt Panels
 4. 208 Volt Panels
 5. Transformers
 6. Safety Switches
 7. Fuses
 8. Lighting Fixtures
 9. Lamps
 10. Flexible Wiring System
 11. MATV System
 12. Bakery and Meat Miscellaneous

SECTION 1D
MISCELLANEOUS REQUIREMENTS

6. As-Built Drawings

- a. HVAC
- b. Miscellaneous Steel
- c. Masonry
- d. Fire Protection System
- e. Plumbing
- f. Electrical

K. Mechanics Lien Guarantee

Contractor shall provide Owner with satisfactory "Mechanics Lien Guarantee" with submission of each payment request.

L. Vendor and Subcontractors

Contractor shall provide Owner with a complete list of subcontractors and principal vendors including addresses and telephone numbers.

M. Drawings and Specifications

Contractor shall return to Architect all drawings and specifications loaned to Contractor during construction period.

N. Workmanship

All work involved in this project shall reflect the best possible workmanship. Work which is not of the best workmanship shall be corrected or redone as is required for approval by the Architect, at no additional cost to the Owner.

No trade should apply finishes or materials to surfaces until he feels that the surfaces are ready to receive his finish or material and produce the best possible workmanship. A trade who does apply his finish or material to a surface which is not ready shall remove and correct his work, as well as prepare the existing surface involved at no additional cost to the Owner.

O. Termination by Owner

General Contractor is responsible for determination and coordination of union and/or non-union project affiliation.

General Contractor must adhere to contract construction schedule. In the event of termination by parties hereto, all work performed and materials furnished shall be fairly allocated and apportioned in accordance with good construction practices.

P. Project Schedule

General Contractor shall submit a "critical path" project schedule to the Architect, prior to commencing the work. Schedule should reflect Contract dates.

SECTION 3A
CONCRETE FORMWORK

3A-01. GENERAL

- A. Scope
Requirements of the Conditions of the Contract and of Division 1 of these Specifications apply to all work of this section.
- B. Extent of Work (in this section)
Do all Concrete Formwork required for completion of the work indicated on the Drawings and specified herein.
- C. Related Work (in other sections)
Concrete reinforcement, bar supports and accessories, hangers, inserts, and sleeving for mechanical and electrical work.
- D. Structural Notes
Refer to the Structural Notes indicated on the Drawings.
- E. Coordination
Compare Architectural, Structural, Mechanical, and Electrical Drawings to insure correct and complete installation of embedded items. Allow other trades necessary time and facilities. Bring all discrepancies to the attention of the Architect prior to commencing formwork.

3A-02. PRODUCTS

- A. Plywood Forms (all exposed work)
New "Plyform" grade Douglas Fir, edge sealed and factory treated with form sealer; thickness as required to support concrete at rate poured. If forms are not new, obtain approval before using.
- B. Form Sealer
 - 1. "Form Saver" - Sonneborn Building Products, Inc.
 - 2. "Formfilm" - Grace Construction Materials
 - 3. "Antisol" - Sika Chemical Corporation
- C. Form Ties
Dayton "Sure-Grip", Richmond "Snap-Tys", or approved equal; spaced maximum 2'-0" o.c. each way, type recommended by manufacturer for conditions of installations. Wire ties and wood spacers not permitted. Fill tie holes with dry cement mortar and ram solid.

3A-03. EXECUTION

- A. Form Workmanship
 - 1. Conform to shape, lines, and dimensions indicated on the Drawings. Brace and tie together to insure that position and shape are maintained.

SECTION 3A
CONCRETE FORMWORK

2. Where exposed, make joints in plywood flush in regular pattern, and as inconspicuous as possible.
3. Provide access openings as required for cleaning and inspection of forms and embedded items prior to placing concrete.
4. If forms are re-used, clean and recoat with approved form sealer.

B. Treatment of Forms

Plywood forms: For surfaces to be painted, use silicone-type bond breaker, or approved equal, applied in accordance with manufacturer's recommendations. Coat other surfaces with approved stainless form oil, using minimum quantity required for satisfactory removal.

C. Coring

Provide coring of slabs and walls as required and approved.

D. Embedded Anchors

Install anchors furnished by fabricator in accordance with approved setting drawings of the material involved. Approved dovetail-type of 22 gauge, 1" x 1" galvanized steel with removable insert.

E. Removal of Forms

1. Remove forms without damage to concrete surfaces. Provide and maintain supporting forms and shoring in place until concrete has attained sufficient strength, as directed by the Structural Engineer or Building Official.
2. Repair all blemishes by patching and sacking.

SECTION 3B
CONCRETE REINFORCEMENT

3B-01. GENERAL

- A. Scope
Requirements of the Conditions of the Contract and of Division 1 of these Specifications apply to all work of this section.
- B. Extent of Work (in this section)
Do all "Concrete Reinforcement" required for completion of the cast-in-place concrete work indicated on the Drawings and specified herein.
- C. Structural Notes
Refer to the Structural Notes as indicated on the Drawings, for all grades and strengths of reinforcement.
- D. Shop Drawings
Submit in accordance with the Conditions of the Contract. Prepare complete bending and placing diagrams, prepared by a professional reinforcing steel detailer in accordance with ACI publication No. 15, latest edition. Submit mill test reports for all high strength reinforcement.

3B-02. PRODUCTS

- A. Reinforcing Bars
Steel grade marked for shipment to include certificate of inspection.
- B. Reinforcing General
See Structural Notes.
- C. Supports and Accessories
Supports to be well cured concrete blocks or approved metal chairs. Include all devices necessary for proper placing, spacing, and fastening steel in place.

Galvanized accessories in all areas where finish is exposed. (Plastic substituted with Architect's approval).
- D. Welded Wire Fabric
Conform to ASTM A-82 and A-185. Steel grade marked for shipment to include certificate of inspection. Wire spacing and size number be as indicated on Drawings.

3B-03. EXECUTION

- A. Fabrication
Reinforcement to be unpainted, uncoated, free from rust or loose scale. Bending and splicing in accordance with ACI publication number 15, latest edition.
- B. Preparation
 - 1. Notify inspection agency, building officials and Architect after reinforcement is placed and before wall forms are closed.

SECTION 3B
CONCRETE REINFORCEMENT

2. Cast concrete until reinforcement has been inspected and approved, by building department inspector and independent testing inspector.

C. Installation

1. Place steel accurately in accordance with approved placing diagrams. Fasten securely in place with #16 double annealed iron wire to prevent displacement before and during casting of concrete.
2. Exercise care that reinforcement is protected by the required minimum thickness of concrete, as indicated in approved placement diagrams.
3. See Structural Drawings for all slab and wall reinforcement clearances.

SECTION 3C
CAST-IN-PLACE CONCRETE

3C-01. GENERAL

- A. Scope
Requirements of the Conditions of the Contract and of Division 1 of these Specifications apply to all work in this section.
- B. Extent of Work (in this section)
Do all cast-in-place concrete work required for completion of the work indicated on the Drawings and specified herein.
- C. Related Work (in other sections)
Inspections and Tests - Section 1B.
Water Repellant - Section 7D
- D. Standard Specifications
Conform to "Specifications for Structural Concrete for Building" ACI-301, as modified herein and on the drawings as part of these Specifications. One (1) copy of ACI Field Reference Manual (Sp-15) containing ACI-301 shall be available in the field office. Reference is available from American Concrete Institute, P.O. Box 19150, Redford Station, Detroit, MI 48219 (313) 532-2600. All product application to conform to the manufacturer's recommendations.
- E. Submittals
 - 1. Concrete Mix Design
 - a. (15) Fifteen days prior to placing concrete submit written mix designs of each proposed mix for each class of concrete to Architect for review. Provide sieve analysis for the aggregate for each mix.
 - b. All admixtures proposed for use shall be listed on the mix designs. Mix design submittals shall include manufacture's literature for every proposed admixture.
 - c. Do not begin concrete production until mix designs and admixtures have been reviewed and accepted by the Structural Engineer.
 - d. Review of mix design does not relieve Contractor of responsibility of concrete performance.
 - 2. Cure Seal & Hardeners
 - a. Materials list of items proposed to be provided under this section.
 - b. Manufacturer's specifications of the specified products to be used.
 - c. Manufacturer's recommended installation procedures which, when reviewed by the Architect, became the basis for installation procedure used.
 - d. Letter from Manufacturer approving installing Contractor for this project.

SECTION 3C
CAST-IN-PLACE CONCRETE

3. Joint Armor and Fillers
 - a. Submit manufacturer's cut sheet of joint armor material to be used for Architect's review.
 - b. Submit manufacturer's cut sheet of control joint filler to be used for Architect's review. Submit letter from manufacturer stating application is approved by manufacturer.
 - c. Submit manufacturer's cut sheet of exterior construction joint filler to be used for Architect's review.

F. Defective Work

Remove and replace as directed all concrete work which is damaged or improperly placed, cured, or finished.

G. Structural Notes and Details

Refer to Structural Notes and Details as indicated on the Drawings.

H. Embedded Items - General Contractor's Responsibility

Embedded items should not impair structural strength of concrete or displace reinforcing steel. General Contractor is responsible for supervision of the placement by all trades.

I. Warranty

The manufacturer shall reseal all defective areas of the concrete for forty years, supplying material and labor. Upon completion of the work, as a condition of its acceptance, furnish the owner/architect with a written labor and material warranty signed by the manufacturer.

3C-02. PRODUCTS

A. Concrete

1. General

- a. Use only ready-mix concrete furnished by an established supplier.
- b. Conform to specification for ready-mixed concrete, ASTM C94.

2. Quality

Concrete shall attain the ultimate strength called for in Structural Notes, and shall be determined by standard 3 and 7 day (type III cement) and 7 and 28 day (type I cement) cylinder tests, ASTM C-31 and C-150.

Slabs on grade - 3" to 4" maximum slump
Walls and footings - 3" to 4" maximum slump
See Structural General Notes.

SECTION 3C
CAST-IN-PLACE CONCRETE

3. Components

a. Cement

Portland Cement, one brand of uniform color conforming to ASTM-150. See Structural Notes.

b. Aggregate

- 1) Fine - Natural sand conforming to ASTM C33.
- 2) Coarse - Natural gravel conforming to ASTM C33, size No. 467 or 1½" to No. 4 size.
Free from deleterious substances.
- 3) For slab on grade, the gradation of coarse aggregate shall be between 8 and 18 percent of all aggregates retained on all sieve sizes, except the 1-1/2 inch and 100/200 sieves, no exceptions. Aggregate up to 1-3/4" max. may be used.
- 4) For the loading dock wall, use aggregate gradation the same as slab on grade, except limit maximum aggregate size to 1".

c. Water

- 1) Clean and free from deleterious substances and shall be potable.
- 2) Maximum water to cement ratio = .49.
- 3) Limit water to cement ratio to 0.45 and use Type 'V' cement where soils water soluble sulfate exceeds 0.20 percent by weight.
- 4) Add no water to concrete at the site.
- 5) If increased workability is required, submit mix design with super-plasticizer admixture to be added at the concrete plant.

d. Admixtures

- 1) Air entraining agent - ASTM C-260 (Master Builders "MB-VR") or equal.
- 2) Non-shrink admixture - "Sika Set" by Sika Chemical Corp. or approved equal.
- 3) Bonding agent -
 - a. "Flex-Con" by Euclid Chemical Company.
 - b. "Everbond", by L & M Construction Chemicals, Inc.

SECTION 3C
CAST-IN-PLACE CONCRETE

4. Proportioning and Design of Concrete Mixes

A. Cure and Seal Hardener

- a. Refer to Structural Notes for specific proportions.
- b. Prepare design mix for each type and strength of concrete by either laboratory trial batch or field experience methods as specified in ACI 301. If trial batch method used, use an independent testing facility acceptable to Architect/Structural Engineer for preparing and reporting proposed mix designs. The testing facility shall not be the same as used for field quality control testing.
- c. Use no fly ash in concrete.
- d. Use no air entrainment for interior slab on grade.
- e. Adjustment to Concrete Mixes: Mix design adjustments requested by Contractor, when characteristics of materials, job conditions, weather, test results, or other circumstances warrant, shall be at no additional cost to Owner. Laboratory test data for revised mix design and strength results shall be submitted to and accepted by Architect before using in work.
- f. Add no water to concrete at site.

B. Cure, Seal & Hardeners -

(Test for adhesion in resilient tile areas before application.)

1. "Ashford Formula" as manufactured by "Curecrete Distribution" 1201 West Spring Creek Dr., Springville, Utah 84663 (800) 998-5664.
 - a. Curecrete will distribute to all bidders information on their products and pricing, spec data sheet and MSDS.
 - b. A Curecrete representative will be designated for this project in the bid information.
2. "Shure-Seal", as manufactured by Paul M. Wolff Co., Inc., 536 West Southern Avenue, Orange, CA, 92665; (714)974-0630, is also approved.
3. No substitutions.
4. Applicator shall be approved by manufacturer and Architect.

C. Floor Slab Joints

1. Armored (Construction Joints) -

- a. "Euco-Plate" H.D. by Euclid Chemical Co.
- b. "Masterplate 200" or "Masterplate FF", by Master Builders, Inc.
- c. "Ferro Tuff", by Dayton Superior Corp.
- d. No alternatives, no substitutions.

SECTION 3C
CAST-IN-PLACE CONCRETE

2. Control Joints (Shrinkage Joints) - Joint filler for use with sawn joints, and the "Soff-Cut System" (1-909) 272-2330. (no alternate):
 - a. Chemtron CP 2010 as manufactured by Chemtron.
 - b. No alternate, no substitutions.

E. Miscellaneous

1. Expansion joint - Celotex "Flexcell" premolded asphalt.
2. Non-shrink grout -
 - a. "Embeco" Masterflow #713 by Master Builders, Inc.
 - b. "Duragrout", by L & M Construction Chemicals, Inc.
 - c. "Euco N-Sgrout", by Euclid Chemical, Co.
 - d. As per Structural Notes.
3. Vapor barrier - (6) mil thick white polyethylene sheet as recommended by the Soils Report.
4. Truckwell and Produce Cooler Door Drainage Systems
 - a. Manufactured by Scofield
 - 1) Series S-100 precast drainage
 - 2) Cast-iron bolt down grating.
 - 3) Catch basin S-171 regular.
 - b. Polydrain by ABT, Inc., also approved.
 - 1) No. 512 H.D. Grate
 - 2) No. 610 Catch Basin.
5. Non-Slip Additive
 - a. "Euco Non-Slip", by the Euclid Chemical Co.
 - b. "Grip it AO", by L & M Construction Chemical, Inc.
 - c. "Emery Non-Slip" by Dayton Superior Corp.

3C-03. EXECUTION

A. Preparation

1. Give notification to Architect at least 24 hours before an intended pour.
2. Place no concrete until all reinforcing, steel pipes, conduits, sleeves, hangers and all other work required to be built into concrete is inspected by required testing agencies and local building officials as required.

SECTION 3C
CAST-IN-PLACE CONCRETE

B. Placing Concrete

1. Use agitator type trucks and place within 1-1/2 hours after introduction of water. Keep equipment clean and free of dried concrete.
2. Concrete placing, once started, shall be carried on as a continuous operation until placing of section is complete. Convey in a method to insure no separation, segregation or intrusion of foreign matter. Coat existing concrete to be joined with new concrete with concrete bond, applied in accordance with manufacturer's instructions.
3. All concrete shall be thoroughly consolidated by means of mechanical vibrators.
4. Maximum allowable placing temperatures as indicated in ACI-301 and outlined below:
 - a. Hot weather (maximum) 80°F. (If higher, use ACI-305)
 - b. Cold weather (minimum) 40°F. (If lower, use ACI-306)
5. Stop slabs at joints as indicated on the Drawings. Structural slab stops to be approved by the Structural Engineer.
6. Where recommended by the Soils Report, install vapor barrier in 16' minimum widths; lap joints 8". Repair punctures in membrane before pouring concrete. Tape barrier to all penetrations to form tight seal. Extend down foundation walls a minimum of 8".

C. Joints - Control Joints (Shrinkage)

1. Saw cut control joints using "Soff-Cut System" model G-2000 with 10" $\pm$ 1/8" blade. Cut as soon as the slab will support the weight of the saw and operator without disturbing the final finish. Normally from 0 to 2 hours after final finish at each control joint location or 150 psi (1.1 MPa - 10.5 Kg/cm²) to 800 psi (5.6 MPa - 56.3 kg/cm²). Replace manufacturers patented skid plate with each new blade to avoid spalling and raveling.
2. Installation must be completed by a manufacturer approved applicator. Contact: Soff-Cut International, Attn: Ralph Chiumiatta, 1112 Olympic Drive, Corona, CA 91719 (714) 272-2330.
3. Soff-Cut Joint Spacers shall be used at Intersection cuts to maintain openness until joint filler is applied.

SECTION 3C
CAST-IN-PLACE CONCRETE

4. If ambient temperature allows, cutting may be performed before curing application to control shrinkage stress. Remove dry powder by vacuum, or light soft sweep and follow specified cure procedure. Avoid wheeled equipment across cuts for 24 hours.
5. Cold weather concrete placements may extend the initial start of control joint installation. To insure desired performance, test cut 2' - 6' L.F. at proper depth. If desired results are achieved, continue to complete balance of cuts at control joint locations.

D. Joints - Construction Joints (armored)

1. Armoured joints shall be installed at all construction joints at the formed edge of each slab and at the adjacent infill slab pours at the construction joints (not at perimeter walls), as indicated on the drawings.
2. After screeding concrete slab level with forms, cut out and take away the concrete at the edge to the desired 1/2" depression at the form face and tapering back 4" to featheredge.
3. Float this section smooth, filling all voids and shaping the joint with a wooden handfloat. Let the concrete stiffen sufficiently to support the mortar made with the specified metallic hardener material.
DO NOT PLACE METALLIC MORTAR TOO SOON AS IT MAY OTHERWISE SINK INTO THE CONCRETE.
4. The metallic hardener shall be mixed in a very stiff consistency (stiffer than brickmortar).
5. Just prior to placing the metallic mortar in the joint sections, float the area again with a wood float to open the surface of the plastic concrete to insure good bonding between the metallic mortar and the concrete.
6. Place the mortar by hand or with a shovel neatly along the edge of the slab and pack it into place and float level with the slab.
7. Once the metallic mortar is placed and floated level, the slab shall be finished and troweled normally. Cure the slab with the specified curing and sealing compound as soon as possible, while not marring the surface. The curing compound shall also be applied at the edges immediately after forms have been removed.
8. Yield for Euco-Plate H.D. at Stiff Mortar.
Consistency:
Bag size - 50 lbs/bag
Yield - @ 1/2" to 0"-4"
2.25 lbs./lin. ft./side of joint. 4.5 lbs/lin. ft./both sides and Approx. 22 L.F./bag/side of joint or 11 lin. ft./bag per joint.
9. Grind all construction joints smooth.

SECTION 3C
CAST-IN-PLACE CONCRETE

E. Finishing Concrete

1. Screed slabs to proper elevations without irregularities. Maintain joint edges as shown on Drawings. Allowable tolerance for all finished slabs shall be 1/8" in 10 feet, controlled by 10 foot straight edge. Pivot the 10 foot straight edge to align with all four compass directions, check slab tolerance along each alignment of the 10 foot straight edge.
2. All concrete slabs to have trowel finish unless otherwise indicated. Trowel by hand or machine to produce hard, dense surface free from trowel marks. Do not finish bleed water into the surface of the concrete slabs.
3. Where indicated on Drawings, slope evenly to drains.
4. Finishing
 - a. Interior floor slabs, monolithic steel trowel finish throughout whether or not scheduled to receive resilient flooring, or epoxy flooring (slope to floor drains). Do not finish bleed water into the surface of the concrete slabs.
 - b. Ramps on site: See site plan for locations of broom finish ramps. Broom finish ramps to receive non-slip additive, at the rate of 40 lbs/100 sq.ft. Follow the manufacturer's two-step application instructions.
 - c. All exposed concrete surfaces not specifically mentioned: sack finish, remove ties, fine projections, and patch all pockets with grout. Grind smooth. Sack all surfaces with grout to an even texture no more than 14 days after placing concrete.
 - d. Do not use unvented waters in the presence of new concrete.

F. Curing

1. Protect fresh concrete from direct rays of sun or excessive drying wind.
2. Protect all concrete against rain spatter; no pitted concrete will be accepted.
3. Concrete must be kept moist for a least the first two (2) days after pour when concrete and air temperatures are above 50°F; longer periods of curing, as directed, when temperatures are below 50°F.

G. Application of Cure, Seal & Hardener Coats

1. Quality Assurance
 - a. Comply with the manufacturer's recommended installation procedures which, when approved by the Architect, will become the basis for accepting or rejecting the actual installation procedures used on the work.

SECTION 3C
CAST-IN-PLACE CONCRETE

- b. Protect the materials of this section before and after installation.
- c. Use adequate numbers of skilled workmen, who are thoroughly trained and experienced in the necessary crafts, and who are completely familiar with the specified requirements and the methods needed for the proper installation of the product. Only manufacturer and Architect approved applicators shall be accepted.
- d. To prevent permanent stains on the concrete surface, the following steps shall be taken:
 - 1) All hydraulic powered equipment shall be diapered to avoid staining of the concrete.
 - 2) No trade shall park vehicles on the inside slab. If necessary to complete their scope of work, drop cloths shall be placed under vehicles at all times.
 - 3) No pipe cutting machine shall be used on the inside floor slab.
 - 4) To avoid rust staining, place no steel on interior floor slab.
 - 5) All exposed concrete surfaces shall be finished in a smooth, hard, glazed, steel troweled finish.
- e. In the event of damage, immediately make replacements and repairs to the approval of the Architect and at no additional cost to the owner.

2. Application Requirements

- a. Two applications are required. The first application at 200 sq. ft./gallon as the curing agent at time of concrete placement. the second application at 400 sq. ft./gallon as the final coat, after final cleaning of the concrete and before racking.
- b. Curing application to be by an applicator approved by Architect and manufacturer and supervised by a manufacturer representative.
- c. Finish application to be completed by an applicator approved by Architect and manufacturer.

SECTION 3C
CAST-IN-PLACE CONCRETE

3. Application

a. Curing Application (first application):

- 1) Application shall be made immediately following the final concrete finishing operation as soon as the concrete is firm enough to work on. This will help prevent temperature and hairline cracking.
- 2) Application shall be made with a low pressure spray. All concrete surfaces shall be kept wet for 30 - 45 minutes.
- 3) After this period, when the treated surfaces become slippery under foot, lightly sprinkle the surfaces with water to aid penetration.
- 4) After the surface begins to dry once again, flush the entire surface with water to remove excess material, alkali, or impurities. Squeegee the surfaces completely dry. Rinse entire surface with water if needed.

b. Finish Application (second application):

- 1) Concrete to be cleaned by the General Contractor to a dirt free condition.
- 2) Application of sealer should be made to all exposed concrete areas after the cleaning of the concrete is complete, but prior to racking.
- 3) Apply sealer with low pressure sprayer at 400 sq. ft./gallon coverage rate.
- 4) Use a lambs wool or fine bristle broom to spread the sealer evenly across the concrete surface. Do not allow to puddle.
- 5) Allow sealer to dry into surface for 30 minutes. After 30-40 minutes remove all excess material.
- 6) Keep standing water off concrete surface for 30 days. Do not wet scrub for 21 days.

H. Installation of Joint Fillers

1. Preparation (control joints, construction joints)

- a. Clean joint surfaces of all contaminants and dry prior to application. Clean only as much joint length as can be filled in one day. Saw joint if necessary, surfaces shall be dry and dust free.
- b. Personnel shall be instructed to review all MSDS data and wear appropriate safety equipment.
- c. Activator (Part B) must be mixed with base (Part A) before product is ready to use. Place materials within 2-3 minutes of mixing.

CAST-IN-PLACE CONCRETE

2. Control Joints Filler Installation

- a. At time of racking, inspect all control joints. Portions of control joints exposed to traffic shall be filled with joint filler.
- b. Use no backer rods, sand or other backing material in control joints. Joints shall be filled fill depth with Chemtron CP 2010. Top off joint with additional joint filler to bring flush with finish floor. Slice off over-pours.
- c. Protect freshly placed material from traffic for 1 hour after installation.

3. Construction Joints (Interior)

- a. At time of racking, inspect all construction joints. All joints that have opened to thickness of credit card or more shall be filled with Chemtron CP 2010 per instructions for control joints.

I. Miscellaneous

1. Concrete fill around pipes, ducts, and conduit passing through floors and walls.
2. Concrete fill or grout all metal door frames, exterior doors only (not interior).
3. Provide Latex type flooring underlayment or approved; apply over interior concrete slabs which, in the Architect's opinion, are too rough or uneven to provide a satisfactory base for floor finish materials.
4. Concrete fill around all steel guard posts.
5. Concrete floor to receive ceramic tile epoxy mortar shall be free of sealers, curing compounds, oil, dirt and dust, and shall be dry. Where curing compounds have been used in areas to receive tile, mechanically scarify concrete slab prior to tile installation.

SECTION 4A
MORTAR

4A-01. GENERAL

- A. Scope
Requirements of the Conditions of the Contract and of Division 1 of these Specifications apply to all work of this section.
- B. Extent of Work (in this section)
Do all mortar work required for completion of the work shown on the Drawings or specified herein.
- C. Submittals
Submit mix design to Architect for review on all job-mix mortar. If ready-mix mortar is used, furnish certificates from mixing plant stating that mortar delivered to project conforms to these Specifications.

4A-02. PRODUCTS

- A. Mortar
 - 1. Cement - Portland Cement conforming to ASTM C150 (type 1). One brand of uniform color.
 - 2. Lime - Conform to ASTM C207, minimum of 92% hydrated.
 - 3. Aggregates -
 - a. Mortar - conform to ASTM C144.
 - b. Grout - conform to ASTM C404. Provide "fine" grout when so specified on Structural Drawings.
 - 4. Water - Clean and free of deleterious substances (potable).
 - 5. Proportions -
 - a. Setting mortars:
Type S - Uniform Building Code.
- B. Admixtures
Waterproofing admixture - Master Builders "OM" or "OMX", Horms "Hydratite Plus". Add in proportions as recommended by manufacturer where exposed to weather or in contact with earth. Waterproof cement of type specified may be used in lieu of waterproofer at Contractor's option.

4A-03. EXECUTION

- A. Storage of Material
Store material in such a manner as to prevent deterioration or intrusion of foreign matter. Do not use material, which, in Architect's opinion, has become unsuitable.
- B. Measuring and Mixing
 - 1. Measure ingredients accurately; mix in mechanical drum type mixer for minimum of 3 minutes until mortar is completely and uniformly mixed.

SECTION 4A
MORTAR

2. Hand mixing permitted for small quantities only, then only with approval.
3. Retempering of mortar NOT PERMITTED.
4. DO NOT USE mortar which has stood more than one hour nor mortar in which cement material has started to set.
5. Antifreeze compounds NOT PERMITTED in mortar.

SECTION 4C
UNIT MASONRY

4C-01. GENERAL

- A. Scope
Requirements of the Conditions of the Contract and of Division 1 of these Specifications apply to all work of this section.
- B. Extent of Work (in this section)
Do all Unit Masonry required for completion of the work shown on the Drawings and specified herein.
- C. Related Work (in other sections)
Insulation - Section 7C
Structural Steel Framing - Section 5A
Water Repellants - Section 7D
- D. Coordination
Obtain exact sizes of openings for ducts and pipes, etc.; properly build around same. Build-in work furnished by other trades as required.
- E. Structural Notes
Refer to Structural Notes on Drawings for all grades and strengths of reinforcement.
- F. Shop Drawings
Submit in accordance with Conditions of the Contract. Prepare complete bending and placing diagrams prepared by an engineer in accordance with the Uniform Building Code. Submit five (5) copies for review by the Architect and Engineer. See structural drawings for minimum cell dimensions.

4C-02. PRODUCTS

- A. Standard Concrete Masonry Block (load bearing - half and half) Conform to ASTM C-90, Grade N, sized as shown on Drawings, moisture controlled units. See Structural Notes for allowable stresses. All block shall be integrally colored as listed below and where indicated on the building elevations. Comply with minimum cell dimensions as indicated on Structural Drawings. Size, depth, color and finish to match existing.
- B. Wall Reinforcement
Bars - see Section 3B and Structural Notes.
- C. Preformed Expansion Joint
Dur-O-Wal "Rapid Joint Wide Flange" or Progress Unlimited "MVC-3".
- D. Expansion Joint Seal - see Section 7.
- E. Anchors and Ties (galvanized)
 - 1. Dovetail anchors - 16 gauge corrugated at 1" flat.
 - 2. Rigid steel anchors - 24" long X 1" X 1/4", ends turned minimum 3".

SECTION 4C
UNIT MASONRY

4C-03. EXECUTION

A. Preparation

1. Store masonry materials off ground and keep covered; protect against damage.
2. Verify all grades and lines for dimensions shown. Report variances to the Architect.
3. Contractor is responsible for all damage to the work caused by freezing or other causes.

B. Installation

1. Lay work true to line, plumb and level.
2. Keep bond plumb and uniform.
3. Lay no masonry when temperature is below 35° on rising temperature or below 40° on falling temperature unless work is enclosed to maintain temperature.
4. Protect against freezing at least 72 hours (anti-freeze ingredients not permitted).
5. Cover unfinished work at end of day with waterproof covering.
6. Cut, refill and retool all defective joints.
7. Install dry masonry units only.
8. Clean up excess mortar at CMU walls.
9. Install masonry block pattern as indicated on drawing elevations and drawing sections.

C. Workmanship

1. Lay with nominal 3/8" bed and head joints in running bond.
2. Cut mortar joints flush, then tool to rodged joint before mortar sets too hard. Tool head joints first (3/8" concave joints typical).
3. When coursing requires less than full length units, cut with saw and shape ends to match factory ends. All cutting to be done neatly and accurately with a saw.
4. Do not use chipped or cracked blocks. If such blocks are in a finished wall, promptly remove them and replace with new blocks.
5. Take special care to keep exposed surfaces clean as work progresses. Clean up all excess mortar at walls prior to sealing and painting.
6. Masonry units below grade, strike mortar joints flush and grout all units solid (as indicated on structural drawings).

SECTION 4C
UNIT MASONRY

D. Expansion Joints

Expansion joints to run full vertical height of walls with sealant on both sides. See Structural drawings for locations.

E. Weep Holes

Provide holes 32" on center for the first course at bottom of vertical joint.

F. Masonry Foundation Walls

All masonry foundation walls to be grouted solid from footing to finish floor elevation.

G. Miscellaneous

1. Fill around wall penetrations and built-in items solid with mortar. Fill all other voids with mortar until flush.
2. Fill jambs and heads of hollow metal frames solid with mortar (exterior doors only).
3. Clean and wash all exposed surfaces with 10% solution of muriatic acid and water. Interior surfaces to be rinsed with neutral solution of ammonia and water. All work to be left in clean and serviceable condition.

SECTION 5A
STRUCTURAL STEEL FRAMING

5A-01. GENERAL

- A. Scope
Requirements of the Conditions of the Contract and of Division 1 of these Specifications apply to all work of this section.
- B. Extent of Work (in this section)
The work required under this section consists of all structural steel and erection, which is not a part of the pre-engineered roof or building system, shop painting, and related items necessary to complete the work indicated on the Drawings and specified herein. This includes, but is not limited to, the following:
1. Structural steel beams, columns, embeds and plates.
 2. Steel lintels designated on Drawings.
- C. Related Work (in other sections)
Coordinate related work specified in other parts of the Specifications including, but not limited to, the following:
1. Metal Fabrications - Section 5E
 2. Dampproofing - Section 7B.
- D. Quality Assurance
1. Qualifications
 - a. Materials: see Structural Notes on Drawings
 - b. Fabrication: by certified welders - Section 5F
 2. Source Quality Control
Testing agency to perform visual shop inspection.
 3. Regulatory Requirements
American Institute of Steel Construction (AISC) Code of Standard Practice for Steel Buildings and Bridges, edition current as of date of Specifications.
 4. Source Quality Control
Testing agency to perform visual shop inspection and report.
- E. References
1. American Institute of Steel Construction (AISC)
 - a. Fabrication and erection: "Specification for Design Fabrication and Erection of Structural Steel for Buildings".
 - b. Workmanship: "Manual of Steel Construction"

SECTION 5A
STRUCTURAL STEEL FRAMING

2. Steel Structures Painting Council (SSPC)
 - a. Painting: Volume 1 - "Good Painting Practice"
Volume 2 - "Systems and specifications"
 - b. Solvent cleaning - SP-1-63
 - c. Hand cleaning - SP-2-63
3. American Society for Testing and Materials (ASTM - Latest Edition)
 - A36- Specification for Structural Steel
 - A53- Specifications for Pipe, Steel, Black and Hot-Dipped, Zinc Coated, Welded, and Seamless
 - A108- Specification for Steel Bars, Carbon Cold-Finished, Standard Quality
 - A123- Specification for Zinc Coatings (Hot-Galvanized) on Products Fabricated from Rolled, Pressed and Forged Steel Shapes, Plates, Bars, and Strips.
 - A153- Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
 - A307- Specification for Carbon Steel Externally and Internally Threaded Standard Fasteners
 - A325- High Strength Bolts for Structural Steel Joints including Suitable Nuts and Hardened Steel Washers
 - A490- Specification for Quenched and Tempered Alloy Steel Bolts for Structural Steel Joints

F. Submittals

1. Submit shop drawings in accordance with the following requirements:
 - a. Submit prior to fabrication.
 - b. Show dimensions, connections with adjoining materials, and construction.
 - c. Show finishing, welds, details, anchoring, and all fabrication. Show erection accessories required.
 - d. Prior to fabrication verify all dimensions and correlate with adjoining construction and materials. Errors in dimensions on shop drawings shall be the responsibility of the Contractor.
 - e. Indicate size, type and grade of all members.
2. Templates and Placement Plans
As required for satisfactory placing, connection, and anchorages.
3. Certificate
Submit certification letter attesting that specified priming procedures, methods and products have been followed.

SECTION 5A
STRUCTURAL STEEL FRAMING

- G. Delivery, Storage and Handling
1. Conform to the following:
 - a. Store all metal above ground on platforms or skids; above snow or mud.
 - b. Protect from moisture and corrosion until erected.
 - c. Include templates and instructions for proper setting of anchor bolts.
- H. Job Conditions
1. Protection
Protect from corrosion at all times. All steel anchoring ties and other embedment members to be clean.
- I. Sequencing/Scheduling
1. Schedule fabrication and erection as required to meet reviewed progress schedule.
 - a. Allow ample coordination time for galvanized finish, specified shop prime, etc.

5A-02. PRODUCTS

- A. Materials and Fabrication
1. Conform to specified Regulatory Requirements, References, and Specifications, except as modified or supplemented.
- B. Steel
Provide carbon steel shapes, plates and bars (ASTM A36) of structural quality, sizes and types as noted on Drawings and in Structural Notes. See specifications for ASTM "Zinc Coating" requirements in 5A-01.E-3 of this section.
1. Grout
Master Builders "Embeco" for use under bearing plates.
 2. Steel Pipe Columns
In accordance with Notes on Structural Drawings. ASTM A53, grade B, Type E or S.
 3. Steel Tube Sections
In accordance with Notes on Structural Drawings. ASTM A500, grade B.
 4. Steel Primer
Rust inhibitive red lead type. Federal Specification #TT-P-86#, Type II. Black primer finish.

SECTION 5A
STRUCTURAL STEEL FRAMING

- G. Delivery, Storage and Handling
1. Conform to the following:
 - a. Store all metal above ground on platforms or skids; above snow or mud.
 - b. Protect from moisture and corrosion until erected.
 - c. Include templates and instructions for proper setting of anchor bolts.
- H. Job Conditions
1. Protection
Protect from corrosion at all times. All steel anchoring ties and other embedment members to be clean.
- I. Sequencing/Scheduling
1. Schedule fabrication and erection as required to meet reviewed progress schedule.
 - a. Allow ample coordination time for galvanized finish, specified shop prime, etc.

5A-02. PRODUCTS

- A. Materials and Fabrication
1. Conform to specified Regulatory Requirements, References, and Specifications, except as modified or supplemented.
- B. Steel
Provide carbon steel shapes, plates and bars (ASTM A36) of structural quality, sizes and types as noted on Drawings and in Structural Notes. See specifications for ASTM "Zinc Coating" requirements in 5A-01.E-3 of this section.
1. Grout
Master Builders "Embeco" for use under bearing plates.
 2. Steel Pipe Columns
In accordance with Notes on Structural Drawings. ASTM A53, grade B, Type E or S.
 3. Steel Tube Sections
In accordance with Notes on Structural Drawings. ASTM A500, grade B.
 4. Steel Primer
Rust inhibitive red lead type. Federal Specification #TT-P-86#, Type II. Black primer finish.

SECTION 5A
STRUCTURAL STEEL FRAMING

5. Other Materials

Provide all incidental and accessory materials, tools, methods and equipment required. Comply with referenced quality assurance requirements as above.

C. Fabrication

1. Fabricate structural steel in accordance with requirements of AISC Specifications and drawn details as shown on accepted shop drawings.

a. Tolerances: Unless otherwise noted, fabricate structural members to AISC tolerances.

b. Connections: As detailed. Weld shop connections as shown on approved shop drawings.

D. Fastening Devices in Concrete

1. Embedded bolts or Hilti's Kwik bolt II as indicated on drawings.

a. Types and sizes as detailed or required by conditions of installation.

5A-03. EXECUTION

A. Inspection

1. Examine surfaces receiving structural steel work for:

a. Defects adversely affecting execution and quality of work.

2. Do not start work until all unsatisfactory conditions are corrected.

3. Remove all loose mill scale, flake rust, oil and foreign material including weld splatter from surfaces to be painted.

B. Erection

1. Erect structural steel framing in accordance with Specifications, specified requirements of regulatory agencies and "references". Conform with configurations and connections indicated on reviewed shop and erection drawings. Include:

a. All necessary or required devices for complete installations.

b. Bracing: Shore and brace framing until permanent connections are made and members are securely anchored into structure.

c. All exterior fastenings and connections to be waterproof.

2. Column bases set level and to correct elevation on bearing plates. Grout with full beds of non-shrink grout. Anchor bolts drawn tight and threads burred.

SECTION 5A
STRUCTURAL STEEL FRAMING

3. Welded, riveted or bolted connections in accordance with AISC code. Design to develop effective strength of connected member.
4. Welding in accordance with current "Code for Arc and Gas Welding in Building Construction" of American Welding Society and UBC 27-7. Grind exposed welds smooth.
5. Holes punched or drilled; cutting torch not permitted.
6. Set accurately to the lines and grades indicated with the permanent connections made only after the members have been plumbed and checked for line and level.
7. Structural steel must be within normal tolerances for shapes to permit the erection of abutting materials.
8. Provide holes and connections for the work of other trades.

C. Field Quality Control

Testing agency will perform inspections as indicated on structural drawings and indicate if work is in conformance with Specifications.

D. Cleaning

Leave work and premises clean and free from residue of work of this section.

SECTION 5B
STEEL JOISTS & JOIST GIRDERS

5B-01. GENERAL

- A. Scope
Requirements of the Conditions of the Contract and of Division 1 of these Specifications apply to all work of this section.
- B. Extent of Work (in this section)
The work required under this section consists of all steel joists & joist girders erection and related items necessary to complete the work indicated on the Drawings and specified herein.
- C. Related Work (in other sections)
Coordinate related work specified in other parts of the Specifications including, but not limited to, the following:
1. Structural Steel Framing - section 5A
 2. Steel Decking - Section 5C
 3. Sprayed Fireproofing - Section 7L.
- D. Shop Drawings
1. Prior to fabrication submit six (6) to the Architect for review. Shop drawings for all work included in this section shall be prepared by the steel fabricators. Obtain review of drawings before starting fabrication of material or proceeding with the work.
 2. Shop drawings shall include all information necessary for the fabrication of the component parts of the structure. They shall indicate size and weight of members, type and location of shop and field connections, and complete details and schedules for fabrication and erection, including layout, special connections, jointing and accessories, also the type, size and extent of all welds, and the welding sequence when required. The welding symbols used on the shop drawings shall be as adopted by the American Welding Society.
 3. The review of shop drawings will be for depth and arrangement of principal and auxiliary members. Errors in dimensions shown on shop drawings shall be the responsibility of the Contractor.
 4. Prime all joists unless otherwise indicated.
- E. Quality Assurance
1. Any material or operation specified by reference to the published specifications of a manufacturer. the American Society of Testing and Materials (ASTM), the American Institute of Steel Construction (AISC), the American Standards Association (ASA), the American Welding Society (AWS), or other published standards, shall comply with the requirements of the standard listed. In case of a conflict between the referenced specification and the project specifications, the project specifications shall govern.

SECTION 5B
STEEL JOISTS & JOIST GIRDERS

2. Submit manufacturer's certification that steel joists and joist girders comply with the specified requirements.
 - a. Steel:
ASTM A 36, or other per SJI "Specifications".
 - b. Fasteners:
High-strength bolts and nuts, ASTM A 325N.
 - c. Shop Paint:
Comply with SJI "Specifications" for materials and application.
 - d. Fabrication:
Comply with SJI "Specifications" and final shop drawings.
 - e. Provisions for Other Work:
Provide holes to accommodate other work to be secured to joists as indicated on final shop drawings.
 - f. Extended and Special Ends:
Provide where indicated, complying with SJI "Specifications".
 - g. Ceiling Extensions:
Provide at locations having ceilings attached directly to joist bottom chord. Extend ends to within 1/2" of finished wall surface.
 - h. Header Units:
Provide header units to support tail joists at openings in floor or roof system not framed with steel shapes.
 - i. Bridging:
Comply with SJI "Specifications" for type of joists and installation requirements. Provide bridging anchors for ends of bridging lines terminating at walls or beams.
 - j. End Anchorage:
Comply with SJI "Specifications" unless otherwise indicated.
3. Source Quality Control
Testing agency to perform visual shop inspection and report.

F. Delivery, Storage and Handling

1. Conform to the following:
 - a. Store all metal above ground on platforms or skids; above snow or mud.
 - b. Protect from moisture and corrosion until erected.
 - c. Include templates and instructions for proper setting of anchor bolts.

SECTION 5B
STEEL JOISTS & JOIST GIRDERS

G. Job Conditions

1. Protection

Protect from corrosion at all times. All steel anchoring ties and other embedment members to be clean.

5B-02. PRODUCTS

A. Materials and Fabrication

1. Conform to specified regulatory requirements, references and specifications, except as modified or supplemented.

2. Steel Joists & Joist Girders

In accordance with Structural Notes and Drawings. Manufactured by Vulcraft.

3. Steel Primer

Rust inhibitive red lead type. Federal Specifications #TT-P-86#, Type II. Black primer finish.

5B-03. EXECUTION

A. Inspection

Examine all steel joists for defects and replace all unsatisfactory joists.

B. Execution

Steel joists shall be designed, fabricated and erected in accordance with the latest specifications of Steel Joist Institute. Maintain work in safe and stable condition during erection. Do not apply construction loads until bridging and anchorages are completed.

SECTION 5B
STEEL JOISTS & JOIST GIRDERS

G. Job Conditions

1. Protection

Protect from corrosion at all times. All steel anchoring ties and other embedment members to be clean.

5B-02. PRODUCTS

A. Materials and Fabrication

1. Conform to specified regulatory requirements, references and specifications, except as modified or supplemented.

2. Steel Joists & Joist Girders

In accordance with Structural Notes and Drawings. Manufactured by Vulcraft.

3. Steel Primer

Rust inhibitive red lead type. Federal Specifications #TT-P-86#, Type II. Black primer finish.

5B-03. EXECUTION

A. Inspection

Examine all steel joists for defects and replace all unsatisfactory joists.

B. Execution

Steel joists shall be designed, fabricated and erected in accordance with the latest specifications of Steel Joist Institute. Maintain work in safe and stable condition during erection. Do not apply construction loads until bridging and anchorages are completed.

SECTION 5C
STEEL DECKING

5C-01 GENERAL

- A. Scope
Requirements of the Conditions of the Contract and of Division 1 of these Specifications apply to all work of this section.
- B. Extent of Work (in this section)
The work required under this section consists of all steel decking and erection, shop painting, and related items necessary to complete the work indicated on the Drawings and specified herein.
- C. Related Work (in other section)
Coordinate related work specified in other parts of the Specifications including, but not limited to, the following:
1. Structural Steel Framing - Section 5A
 2. Steel Joists & Joist Girders - Section 5B
 3. Metal Fabrications - Section 5E
 4. Sprayed Fireproofing - Section 7L
- D. Quality Assurance
1. Any material or operation specified by reference to the published specifications of a manufacturer. The American Society of Testing and Materials (ASTM), the American Institute of Steel Construction (AISC), the American Standards Association (ASA), the American Welding Society (AWS), or other published standards, shall comply with the requirements of the standard listed. In case of a conflict between the referenced specification and the project specifications, the project specifications shall govern.
 2. Provide manufacturer's certification that the steel decking complies with the specified requirements.
 - a. Steel for Galvanized Units:
ASTM A 446, Grade A.
 - b. Steel Shapes:
ASTM A 36.
 - c. Sheet Metal Accessories:
ASTM A 526, galvanized.
 - d. Galvanizing:
ASTM A 525, C60.
 - e. Galvanizing Repair:
ASTM A 780.
 3. Source Quality Control
Testing agency to perform visual shop inspection and report.

SECTION 5C
STEEL DECKING

- E. Delivery, Storage and Handling
1. Conform to the following:
 - a. Store all metal above ground on platforms or skids; above snow or mud.
 - b. Protect from moisture and corrosion until erected.
 - c. Include templates and instructions for proper setting of anchor bolts.
- F. Job Conditions
1. Protection
Protect from corrosion at all times. All steel anchoring ties and other embedment members to be clean.
 2. Do not use deck units for storage or working platforms until permanently secured in position.
 3. Assure that construction loads do not exceed carrying capacity of deck.

5C-02 PRODUCTS

- A. Materials
In accordance with Structural Notes on Drawings.
- B. Manufacturer
1. Roof deck as manufactured by Verco, galvanized type HSB-36 with interlocking side seams, gauge per structural drawings.
 2. Mezzanine galvanized floor deck as manufactured by Verco, "Deep Verco" form deck, gauge properties and yield strength per structural drawings, or Wheeling Corrugating Co. "Tensilform" Type 125-26 or H3-24 or Vulcraft 1.3, CSV "Conform."
- C. Fabrication
1. Attach steel deck to joists and supporting members by welding. Use recommended erection specifications of the Steel Roof Deck Institute to determine amount of welding required. Weld roof deck to develop diaphragm capacity as stated on structural drawings.
 2. Spans of roof decking units shall be as shown on the drawings. Minimum section properties shall be as shown on structural drawings.

Roof deck shall conform to ASTM A-466, grade E with minimum 80,000 psi yield.
 3. Accessories shall be installed to support the deck and roofing as applicable and as indicated on the drawings. All fabricated items necessary to complete to installation of roof deck shall be only approved accessories in standard designs of the manufacturers. Provide steel angle frames around all openings through deck.

SECTION 5C
STEEL DECKING

5C-03 EXECUTION

A. Erection

1. All supporting members shall be completely placed and finally attached before steel decking is installed. Ribs of each unit shall interlock with the adjacent unit. Laying and aligning of units shall be done in such a manner as to maintain the required number of units indicated on the drawings, and to prevent stretching or contracting the interlocks of the side laps.
2. Fillet and plug welds or welding washers for fastening the roof deck to the supports shall be done with welding rods, per structural engineer. The voltage shall be carefully watched and regulated to prevent burning through the metal deck units and shall be shown on the approved shop drawings. Chalk lines must be used to mark joist alignment and all welds must be directly over joist top chord that will allow for a full contact weld.
3. After erection, all scarred areas on top side of the decking including welds, weld scars, bruises, and rust spots shall be wire brushed and touched up with the same type and kind of paint used in the original shop coat.
4. Place accessory units in accordance with manufacturer's recommendations, unless noted otherwise.
5. Leave steel decking free of oil, dirt, rust or scale, or other materials that will impair bond of concrete and fire proofing.

SECTION 5D
LIGHT GAUGE METAL FRAMING

5D-01. GENERAL

- A. Scope
Requirements of the Conditions of the Contract and of Division 1 of these Specifications apply to all work of this section.
- B. Extent of Work (in this section)
Provide all steel studs as necessary and required accessories for a complete installation.
- C. Related Work (in other sections)
Gypsum wallboard - Section 9B.
- D. Shop Drawings
Submit shop drawings required on Structural Drawings. See drawings for notes and details.

5D-02. PRODUCTS

- A. Manufacturers
Metal Stud Manufacturer Association, Cemco, and Dietrich Industries are approved manufacturers.
- B. Materials
 - 1. All studs and accessories shall be of the type, size and gauge as required by local codes.
 - 2. All studs and runners shall be formed from corrosion resistant steel, corresponding to the requirements of ASTM A446, with a minimum yield strength of 50 ksi for 16GA and thicker members, 33 ksi for 18GA and thinner members.
- C. Fabrication
 - 1. Prefabrication panels shall be square, with components attached to prevent racking and minimize distortion while lifting.
 - 2. All framing components shall be cut squarely for attachment to perpendicular members, or as required for angular fit against structure.
 - 3. Insulation equal to that specified elsewhere shall be provided in all doubled jamb studs and doubled headers not accessible to insulation contractors.
 - 4. Fastening of components shall be with self-drilling screws or welding as noted on the drawings. Screws or welds shall be of sufficient size to insure the strength of the connection. Wire tying of components is **NOT** permitted. All welds shall be touched up with zinc-rich paint.

5D-03. EXECUTION

- A. Erection
 - 1. Runners shall be securely anchored to the supporting structure. Abutting lengths of runner shall each be securely anchored to a common structural element, butt-welded or spliced.

SECTION 5D
LIGHT GAUGE METAL FRAMING

2. Studs shall be plumbed, aligned and securely attached to flanges of both upper and lower runners.
3. Jack studs or cripples shall be installed above window and door heads and elsewhere to furnish supports, securely attached to connecting members.
4. Lateral bracing shall be provided by use of gypsum board and gypsum sheathing or by horizontal straps or cold-rolled channels.
5. Provisions for structural vertical movement shall be provided as indicated on the Drawings.
6. Handling and lifting of prefabricated panels shall be done in a manner to prevent distortion in members. Temporary bracing, as required, shall be provided until erection is completed.
7. Provide blocking for handrails, toilet fixtures, toilet accessories, etc.
8. Comply with ALL details and sections indicated on the Structural Drawings.

SECTION 5E
METAL FABRICATIONS

5E-01. GENERAL

- A. Scope
Requirements of the Conditions of the Contract and of Division 1 of these Specifications apply to all work of this Section.
- B. Extent of Work (in this section)
Furnish and install all miscellaneous steel and iron items not specified elsewhere. Examine other divisions for items of steel and iron provided or installed thereunder.
- C. Related Work (in other sections)
Metal vent screen - Section 9B
- D. Shop Drawings
Submit five (5) copies for Architect and Engineer review
- E. Structural Notes
See Structural Notes indicated on the Drawings.

5E-02. PRODUCTS

- A. Components
 - 1. Steel and Iron
 - a. ASTM A-36 - new and free from rust.
 - b. Conform to requirements of the Uniform Building Code.
 - 2. Bolts, Nuts and Washers
 - a. ASTM A-307 - new and free from rust.
 - b. Malleable iron washers, size as indicated on Drawings.
 - 3. Studs or Stud Anchors
Nelson Company automatic end-welded connectors. Minimum yield strength 50,000 psi. ASTM A108 material, sizes as shown.
 - 4. Bolts and Nuts
In accordance with ASTM A-3097, Class A, B, C, and D as applicable.
 - 5. Zinc Coated (Galvanized) Material
Hot-dip galvanize after fabrication/ASTM A-123 and A-153. Galvanize bolts and similar threaded fasteners in accordance with referenced standards/ASTM A-307, class A, B, C, and D as applicable.
 - 6. Steel Primer
Rust inhibitive red lead type. Federal Specification #TT-P-86#, Type II. Black primer finish.
 - 7. Galvanized Steel Primer
Portland cement - alkyd resin type, black color.

SECTION 5E
METAL FABRICATIONS

B. Fabricated Items

Provide the following fabrications listed herein and as indicated on the Drawings for a complete installation:

1. Pipe Handrails
Provide 1-1/2" interior diameter pipe handrails, schedule 40 steel, with pipe balastrate supports.
2. Pipe Bumper Posts
Provide 6" and 4" diameter pipe posts (see Drawings for location) 4'0" above grade (concrete filled) for traffic protectors (see Drawings for location) exterior, and interior to protect equipment.
3. Guard Rails and Steel Railings
Provide guard rails as indicated on the Drawings. Fabricate accurately of mild steel shapes, joints welded and ground smooth. See Drawings for sizes, shapes and connection details.
4. Steel Ladders with Safety Cage
Provide 1'-9" wide steel ladders where indicated on drawings, including wrap-around steel cage above surrounding walls. Ladders shall be OSHA approved.

5E-03. EXECUTION

A. Fabrication

1. Form steel to accurate sizes and shapes, with sharp lines and angles. Punch and shear to leave clean surfaces. Weld or rivet permanent connections; grind exposed welds smooth, provide holes and connections for work of other trades.
2. Detail joints and fastenings for ample strength and stiffness; conceal wherever possible.
3. Where possible, work, fit and shop assemble work ready for erection.
4. Take measurements at the building, and check all parts of the drawings to be sure that items are properly sized for their location, and are in the correct position.

B. Installation

1. Execute work in accordance with details indicated in approved shop drawings.
2. Shop connections are to be welded. Use certified welders only.
3. Jointing and intersections of metals to be accurately made and tightly fitted with adequate fastenings.
4. Bolted work to be screwed up tight and threads nicked to prevent loosening of bolts.

SECTION 5E
METAL FABRICATIONS

5. Provide drilled or punched holes and connections for the work of other trades.
 6. Wherever dissimilar metals are in contact they shall be insulated from one another by means of a bituminous paint to prevent corrosion.
 7. Work shall be made square, plumb, straight and true, and accurately fitted with tight joints and intersections.
 8. Exposed work shall be finished smooth with even, close joints and neat connections.
 9. Do all cutting and fitting required to make all parts to fit accurately to their places in the building.
 10. When necessary to cut into concrete or other parts of the building to set steel parts accurately, *do so in such manner* so as not to damage the adjoining parts and repair such adjoining parts, thoroughly and neatly, where such cutting is done.
- C. Screws, Bolts, Rods, Plates, etc.
Use standard shapes of size and weight, unless indicated otherwise. Install anchor bolts accurately and plates level. Provide all shown and all necessary items for complete installation.
- D. Finishes
1. Shop prime all miscellaneous metal.
 2. After erection touch up all marred or damaged portions of the shop coat with the same type of paint.
 3. Clean all metal fabrications prior to racking.

SECTION 6A
ROUGH CARPENTRY

6A-01. GENERAL

- A. Scope
Requirements of the Conditions of the Contract and of Division 1 of these Specifications apply to all work of this section.
- B. Extent of Work (in this section)
 - 1. All carpentry and related items required to complete work as indicated on Drawings and specified herein.
 - 2. Examine other divisions for carpentry not specified therein, but necessary to complete the work.
- C. Related Work (in other sections)
 - 1. Finished Carpentry - Section 6D
 - 2. Metal Doors & Frames - Section 8A
 - 3. Wood & Plastic Doors - Section 8B
 - 4. Hardware - Section 8G
- D. Product Handling
 - 1. Pile lumber to insure proper ventilation, drainage and prevention of sun warpage.
 - 2. Protect millwork against dampness during and after delivery. Store in well-ventilated building, where not exposed to extreme changes of temperature and humidity.
- E. Structural Notes
Refer to Structural Notes for all work in this section.
- F. Certificates
Furnish moisture content certificate from recognized authority upon request.

6A-02. PRODUCTS

- A. Grading Rules and Inspection
 - 1. Soft woods: WCLIB Book #16.
 - 2. Plywood: Softwood plywood identified with DFPA grade trade marks of American Plywood Association and meeting the requirements of PS-1.
 - 3. Identification marks: Grade and mill stamp on each piece. Lumber not grade stamped shall be removed from jobsite.

SECTION 6A
ROUGH CARPENTRY

B. Framing Lumber

1. Lumber surfaced four (4) sides, kiln dried to 19% maximum moisture content. Material free from warpage that cannot be corrected by nailing and bridging.
2. Refer to Structural Notes on the Drawings for lumber grades and species.

C. Plywood

1. Roof Sheathing - see Structural Notes, 19% maximum moisture content.
2. Interior shear walls - see Structural Notes.
3. Exterior shear walls - see Structural Notes.
4. Mezzanine decking - DFPA exterior glue; see Structural Notes.
5. Canopy sheathing - see Structural Notes.

D. Other Related Products

1. Wood preservative: "Woodlife", "Cupro-Lignum", or equal.
2. Power-driven fastenings: "Ramset", "Drive It", or equal.
3. Building felt: Asphalt saturated roofing felt. Weight as indicated.
4. Joist hangers and framing connections: As indicated on Drawings.
5. Insect screen (where indicated on Drawings): Copper or bronze.
6. Common nails throughout except where indicated otherwise (exterior nailing with galvanized nails only).
7. Pressure treating: LP-22 Standards (CCA to .40 retention).

6A-03. EXECUTION

A. Preparation

1. All measurements and dimensions verified at job. Contractor is responsible for work not fitting properly.
2. Work to detail where indicated on Drawings, or as required by Conditions of the Contract.
3. Apply 2 coats wood preservative to all surfaces of wood furring members adjacent to concrete or masonry. Colored type (other than framing material, plates and studs which are pressure treated).

SECTION 6A
ROUGH CARPENTRY

B. Installation - General

1. Layout, cut, fit, and erect framing, sheathing, sub-flooring, bridging, blocking and all items of trim and other carpentry.
2. Do cutting work of carpentry for other trades.
3. Brace, plumb and level members and secure with nails, screens, or bolts as indicated on drawings.
4. Cut out defects which render any piece unusable for purpose intended or discard piece.
5. Rough carpentry, self-fitting, nailed and drawing up tight.
6. Finish work finished smooth, free from machining or tool marks, abrasions, raised grain, etc., on exposed surfaces, and machine sanded and hand dressed to smooth finish.
7. Joints tight and formed to conceal shrinkage.

C. Framing Walls and Partitions

1. Studs unless otherwise shown, nominal 2" x 4", spaced 16" o.c., doubled at sides and heads of openings, tripled at corners and spaced to provide end nailing for sheathing.
2. Plates for partitions (pressure treated where in contact with concrete) single at floor, double at top of framing.
3. Horizontal block between studs with 2 x 4's so as to provide one row each story height. Where plates do not form firestop, provide firestop in walls and partitions at level required by Building Code.
4. Frame as required for installation and support of plumbing, heating and other work.
5. Furr interior block walls, as indicated on Drawings, and secure to walls with approved metal ties or nails, not over 3' apart.
6. Provide wood grounds, strips, and blocking, as indicated on Drawings. Install all roof curbs and openings. See Drawings for location.
7. Provide firm, solid backing in studs and joists for cabinets, fixtures, racks, door stops, etc., supported on framing.
8. Provide and install all rough hardware for proper installation of carpentry and millwork. Nails, spikes, screws, bolts and similar items of type and sizes sufficient to dray and rigidly secure members in place.

SECTION 6A
ROUGH CARPENTRY

9. Provide necessary contraction joints in long runs of frame walls to receive gypsum board.

D. Framing Roofs and Floors

1. Set joists and rafters, lap and spike together over supports.
2. Double joists under partitions parallel to joists.
3. Provide bridging as indicated on the Structural Drawings.
4. Protect roof and floor decks from weather until roofing is applied.
5. Provide wood crickets at equipment platforms.

E. Installation of Plywood Sheathing

1. Install plywood sheathing with face grain perpendicular to supports and continuous over at least one (1) support.
2. Refer to Structural Drawings for layout pattern.
3. Center joints accurately over supports and nail into solid wood per nailing schedule on Structural Drawings.
4. Protect all plywood from moisture.

F. Installation of Miscellaneous Plywood

Install plywood facing with long dimension perpendicular to supports and continuous over at least 1 support. Center joints accurately over supports and nail. Allow 1/8" min. gap at joints for caulking (under another section of these Specifications). Continuous solid blocking at all plywood edges.

G. Installation of Items Furnished Under Other Sections

1. Hollow Metal Doors & Frames

Install frames in accurate location, plumb and level.

2. Wood Doors

Install frames in accurate location indicated on Drawings; anchor securely in place. Fit doors to frames with uniform clearance, not more than 3/16 inch at heads and jambs and proper clearance at threshold to clear flooring. As required during progress of the work, remove and reset doors and hardware for the installation of work of other trades.

SECTION 6A
ROUGH CARPENTRY

3. Finish Hardware
Install hardware listed in hardware schedule or required to complete the project. Adjust moving parts to operate freely, without binding, at time of final acceptance. Make further adjustments, when requested, during one year guarantee period.
4. Rough Hardware
Provide and install all rough hardware for proper installation of carpentry and millwork. Nails, spikes, screws, bolts, and similar items of type and sizes sufficient to draw and rigidly secure members in place.

H. Surface Treatments

The following treatments must be applied to material as specified, without exception. Deviation from specified procedure will be cause for rejection and removal of material from jobsite.

1. Wood Preservative
Pentachlorophenol per UBC Standards 25-12F applied to all exposed wood on the building exterior only (do not treat framing lumber covered by another material). This penta treatment to be applied only by a treating application plant per Federal Specification TT-W-571 and 572. Applicator and material supplier to submit certification on applicator's letterhead that preservative was applied as specified.
 - a. Material to be completely surface dry prior to application.
 - b. Dip tank to have ten (10) gallons preservative per thousand board feet of material.
 - c. Sling stack with separators and submerge in preservative for three (3) minutes, minimum.
 - d. Stack in dry place, protected from the weather and allow to dry prior to shipment.
 - e. Stamp and/or tag material prior to shipment.
 - f. Contractor to apply preservative to all exposed edges and ends recut during construction.
2. Pressure Treatment
This treatment to be applied only by a treating application plant per spec. LP-2 standard (CCA to .40 retention). Applicator, material supplier to submit certification on applicators' letterhead that treatment was applied as specified. Apply treatment to all framing material (plates and studs) that come in contact with concrete or masonry material.

SECTION 7C
INSULATION

7C-01. GENERAL

- A. Scope
Requirements of the Conditions of the Contract and of Division 1 of these Specifications apply to all work of this section.
- B. Extent of Work (in this section)
All rigid and batt insulation as specified herein and indicated on the Drawings for a complete installation.
- C. Related Work (in other sections)
Roof and Wall Insulation - Section 13A.
- D. Submittals
Prior to installation submit 5 copies of a complete list of all materials provided in this Section. Include manufacturer's name, catalog numbers, "R" values and reference locations to be installed.
- E. Product Handling
All materials must be delivered in original unopened packages with manufacturer's name and contents legibly indicated. Store in a dry, safe enclosed area protected from damage until ready for use.

7C-02. PRODUCTS

- A. Batt Insulation (non-exposed for installation in walls and enclosed areas)
 - 1. Glass fiber batts enclosed in a continuous vapor retarder envelope:
 - a. Comply with performance requirements of Federal Specification HH-1-521F Type II Class C.
 - b. All products shall carry NAHB Research Foundation Inc. label which represents that samples of the product have been tested and the "R" values stated on the package are accurate and the insulation will perform as stated.
 - c. Provide 15" width batts (as required by stud spacing) with stapling flange.
 - 2. "Light Density Thermal Insulation" as manufactured by Owens-Corning with Kraft vapor retarder.
 - 3. Glass fiber insulation by Johns-Manville is also approved.
 - 4. Mineral wool is NOT accepted as a substitute for glass fiber.
- B. Sound Insulation Batts (walls and ceiling as indicated on Drawings)
 - 1. Unfaced glass fiber acoustical batts, "Fiberglass Noise Barrier Batts" as manufactured by Owens-Corning Fiberglass Corporation.
 - 2. 3-1/2" thick batts (R-11), 15" width.

SECTION 7C
INSULATION

- C. Masonry Insulation (internal cavity)
1. Granular vermiculite, water repellent, "Zonolite Masonry Insulation" as manufactured by W.R. Grace Company #2.412. Block wall insulation shall conform to ASTM Specification C-516-80, Type II Material (Specification for Loose Fill Insulation) or Federal Specification HH-1-585C or
 2. Core-Fill 500, foamed-in-place insulation as manufactured by Tailored Chemical Products, Inc. (704) 322-6512.
- D. Freezer Slab Insulation
1. "Styrofoam Hi-60" extruded polystyrene foam as manufactured by Dow Chemical Company.
 2. 8" thickness (2 (two)-4" layers), minimum 1.8# density, 2' x 8' sheets, minimum R-40 each.
 3. Minimum comp. strength = 60 psi/sq.in., meet ASTM-C578-Type VII.
 4. 6 mil vapor barrier under & up sides all insulation board.
- E. Fasteners
Staples, zinc-coated wire, and other devices for anchoring insulation shall be approved type furnished by insulation manufacturer or shall be type recommended by insulation manufacturer and approved by the Architect.

7C-03. EXECUTION

- A. Preparation
1. All work by other trades to be concealed by insulation must be inspected and approved by those having jurisdiction prior to installation of insulation.
 2. All material shall be stamped or printed with manufacturer's name and identifying grade, type and number.
- B. Installation of Batt Insulation (walls)
1. Installation of the insulation shall be in strict accordance with the manufacturer's printed instructions for the specific product.
 2. The vapor retarder on insulation shall face building interior.
 3. Fit insulation between studs with flanges stapled to either the face of stud or side of stud every 8" to 12" o.c. to prevent gaps in the vapor barrier.
 4. Do not install insulation over or within 3" of fixtures containing lights, fans or other heat-generating electrical devices. Baffles shall be used to maintain 3" minimum clearance.
 5. Fit insulation in all framing spaces, including areas behind electrical outlets, piping and other areas, to form a complete insulating blanket around conditioned areas of structure.

SECTION 7C
INSULATION

C. Installation of Masonry Insulation (internal cavities granular)

1. Provide granular insulation in all masonry cavities not noted grouted solid.
2. Installation shall be poured from the bag into the concrete block cores directly or via a hopper placed on top of the wall.
3. Pours may be made at any convenient interval without bridging, but the height of a pour shall not exceed 20 feet. Rodding or tamping is not necessary.
4. Block joints at pilasters or other vertical members shall be mortared in by the mason and weep holes shall be filled with glass fiber, rope or copper screen to prevent insulation leakage.

D. Installation of Masonry Insulation - (Foam)

Install per manufacturers recommendations.

E. Installation of Freezer Slab Insulation

1. Install 6 mil vapor barrier on granular surface and up sides to top of finished floor slab.
2. Install 2 layers - (each layer is 4") 2' x 8' board, stagger joints in both directions.
3. Secure both layers together with treated wood skewers at 4' O.C.

F. Locations and Thicknesses

1. Sound insulation - 3-1/2" "Fiberglass Noise Barrier Batts" in all restroom walls.

H. Clean Up

Upon completion of all insulation work, remove all implements of service, tools and excess materials, rubbish, and debris and leave the entire building in a clean, acceptable manner.

SECTION 7G
SINGLE PLY ROOFING

7G-01. GENERAL

A. Scope

Requirements of the Conditions of the Contract and of Division 1 of these specifications apply to all work of this section.

B. Extent of Work (in this section)

• Work includes, but is not limited to, these major items:

1. Firestone RubberGard EPDM (Ethylene Propylene Diene Monomer) roofing system with insulation and ballast, or match existing for repair work.
2. Base flashing.
3. Inspection of sheet metal flashing installation in connection with roofing.

C. Related Work (in other sections)

Flashing and Sheet Metal - Section 7H

Metal Counter Flashing (mechanical, electrical, etc.)

Roof Accessories - Section 7I

D. References

1. ASTM

D297 Test Method for Rubber Products -Chemical Analysis

D412 Rubber Properties in Tension

D471 Test Method for Rubber Properties - Affect of Liquids

D573 Method of Testing Rubber Deterioration in Air Oven

D624 Rubber Property - Tear Resistance

D746 Brittleness Temperature of Plastics and Elastomers by Impact

D816 Method of Testing Rubber Cement

D1149 Test Method for Linear Dimensional Surface Ozone cracking in a chamber (Flat Specimen)

D2240 Test Method for Rubber Property - Durometer Hardness

E84 Test Method for Surface Burning Characteristics of Building Materials

E96 Water Vapor Transmission of Materials

2. Federal Specifications (FS):

HH-I-1972/2 Class 1, polyisocyanurate

HH-I-1972/Gen. and HH-I-1972/3 Style 2

E. Systems Description

Elastomeric sheet roofing laid loose over tapered roof insulation and held in place with stone ballast.

F. Submittals

Prior to installation of the roofing system, submit to the Architect for review:

1. Prior to bid, submit alternative materials to be used due to lack of availability with a letter from the specified manufacturer acknowledging this situation.
2. A list of materials the roofing contractor intends to use on the job.
3. A signed statement that all the materials listed therein meet the reference standards of these Specifications.

SECTION 7G
SINGLE PLY ROOFING

4. A copy of the primary roofing manufacturers publications applicable to the proposed system. Highlight individual system in publication.
5. Person designated as Quality Controller for the roofing portion of the project.
6. Submit shop drawings indication roof size, location and types of penetrations, perimeter and penetration details, roof insulation layout and makeup, that have been accepted by an authorized manufacturer's representative.
7. Submit two copies of manufacturer's warranty.
8. Submit manufacturer's installation specifications or instructions.

G. Quality Assurance

1. Installer Qualifications

- a. At time of bid, submit a letter from manufacturer certifying that the roofing contractor is a manufacturer licensed applicator and is authorized to install the specified EPDM roofing system eligible for 15 year guarantee.
- b. A single installer shall perform the work of this Section and shall have completed projects of similar scope and complexity.

2. Quality Controller

General Contractor shall designate one person to act as Quality Controller for the roofing application. During roofing, this person shall observe the application and report all discrepancies immediately to the Architect. Quality Controller shall prepare daily log reports of the roofing installation. Reports shall contain:

- 1) starting time and temperature, daily.
- 2) stopping time and temperature, daily.
- 3) general comments on the application.
- 4) At completion of roofing, Quality Controller shall submit the daily log report of the roofing installation to the Architect.

3. Field Conditions

Prior to roofing, Manufacturer's representative, Quality Controller and roofing applicator shall inspect the roof dec, related work and adjacent surfaces. Report all conditions which prevent proper execution of this work to the General Contractor and the Architect.

4. Requirements of Regulatory Agencies

- a. See referenced Codes and Ordinances.
- b. Conform to local Fire Marshal and Fire Department standards and requirements.
- c. Underwriter's Laboratory (UL) Class A.

SECTION 7G
SINGLE PLY ROOFING

H. Delivery, Storage and Handling

1. Deliver roofing materials, insulation and accessories in manufacturer's protective containers with labels intact and legible, and comply with manufacturer's instructions for storage and handling.
2. Handle rolled goods to prevent damage.
3. Store all materials on clean, raised platforms with weather-protective covering.

I. Project Site Conditions

Proceed with installation of insulation and elastomeric sheet roofing work only when weather conditions comply with manufacturer's recommendations, and will permit materials to be applied and cured in accordance with those recommendations. Do not exceed temperature limitations recommended by roofing manufacturer. Apply no roofing when correct temperature of adhesives cannot be maintained or when moisture in any form is present on the roof.

J. Warranty

For EDPM elastomeric roofing system (including insulation), manufacturer shall provide a 15 year no dollar limit, non-penal sum limit, total system manufacturer's warranty on labor and materials from the date of completion of the roofing membrane installation.

1. Warranty shall cover roof insulation, membrane, base flashings and all other related products.
2. Warranty cost is part of roofing bid.
3. Prior to applicator leaving the jobsite, Manufacturer, Quality Controller and applicator shall provide complete warranty roof inspection. All corrective work shall be made by applicator prior to leaving jobsite.
4. Another inspection, if deemed necessary by the Manufacturer, will be made prior to issuance of roof warranty at substantial completion.
5. Architect will make another roofing observation at substantial completion of the project, which may result in another list of corrective items.

7G-02. PRODUCTS

- A. Firestone Building Products Company is the approved manufacturer. Contact Bill Kemp, Sales Representative at (206) 255-0656.

1. Types, weights, quantities of materials and methods of installation shall NOT be changed.

B. Products and Systems for EPDM Roofing

1. Roof Insulation

- a. First layer: Firestone ISO 95+ Polyisocyanurate tapered insulation board meeting ASTM E84. Board shall be 2-1/2" to 3-1/2" thick.
- b. Second layer: Firestone Isocyanurate insulation cover board, thickness and type as recommended by Manufacturer.

SECTION 7G
SINGLE PLY ROOFING

- c. Minimum roof system R value shall be R-19, average over entire roof.
- 2. **Single Ply Roofing**
Firestone RubberGard Ethylene Propylene Diene Terpolymer (EPDM) Roofing System, as manufactured by Firestone Building Products Company, 525 Congressional Blvd., Carmel, IN 46032-5607.
- 3. **Roof Flashing**
Firestone FormFlash Membrane.
- 4. **Ballast**
Ballast shall be of adequate size and weight to protect the roof system against wind uplift.
 - a. Stone ballast shall be smooth water-worn gravel with rounded edges and corners, free from contaminants, fractures, loam, sand and all other foreign substances. Submit testing report that ballast does not contain contaminants. Stone shall be nominal 3/4" to 1-1/2" diameter meeting ASTM D-448 size #4 using ASTM C-136 testing method.
 - b. Or, Crushed stone ballast shall be durable, free of excessive fractures, free from contaminants, loam, sand and all other foreign substances as per stone ballast described above.
- 5. **Miscellaneous**
Provide all incidental and accessory materials, tools, equipment and methods as required. Contact Firestone for a complete listing of accessories.

7G-03. EXECUTION

- A. On-Site Pre-Installation Meeting
Notify Manufacturer's Representative, applicator, Quality Controller and Architect of date and time of meeting.
- B. Examination
Deck and adjacent spaces shall be ready to receive roofing system. Make all penetrations and set curbs prior to starting work. Verify proper placement of all roof openings, pipes, curbs, sleeves, ducts, vents and drains.
- C. Substrate Preparation
 - 1. Comply with manufacturer's instructions for preparation of substrate to receive elastomeric sheet roofing. Clean substrate of dust, debris, and other substances detrimental to elastic sheet roofing work.
 - 2. Beginning of installation means acceptance of roof deck conditions as satisfactory.
- D. Batten Strips, Nailers, Blocking
 - 1. Install batten strips at the base of projections, penetrations and non-roof edge perimeters as required by Manufacturer.

SECTION 7G
SINGLE PLY ROOFING

2. Install treated wood nailers at roof perimeters, at base of roof projections and around specified roof penetrations.

- a. Total nailer height shall match total thickness of insulation being used. Install with 1/8" gap between each length and at changes in direction/
- b. Firmly fasten nailer to the deck or existing structurally sound and secured nailers. Fasten so as to resist a force of 200 lbs. per linear foot in any direction.
- c. Taper nailer where applicable to be flush at point of contact with membrane in either the vertical or horizontal applications.

E. Roof Insulation

Loosely lay roof insulation with end joints staggered and stagger joints between layers of insulation. Joints shall be 1/4" or less in width. Neatly cut and fit insulation round roof penetrations and projections. Install only dry insulation and only as much insulation as can be covered the same day with membrane and completed.

F. Installation Instructions

1. Install elastomeric sheet roofing in accordance with Firestone's printed instructions.

- a. The entire roof membrane section shall be completed and flashings installed around completed section at the end of each days construction.
- b. Before stopping each days work, protect unfinished roofing with Night Sealant Caulking, as a full water cut-off. Allow NO water to enter roof system during construction. Remove all night seals before continuing roof installation next day.
- c. Conform with governing authorities regarding the use and type of all equipment. Obtain approval of all equipment and methods prior to starting work.

2. Loosely lay sheet membrane over roof insulation. Allow membrane to relax 30 minutes before splicing.

- a. Laps may be spliced with either Firestone Splice Adhesive or Firestone QuickSeam Splice Tape System.
- b. Laps which are spliced with splice adhesive shall be finished with a continuous bead of Firestone Lap Sealant. Lap Sealant is not required with the QuickSeam Splice Tape System.
- c. Secure membrane at penetrations.
- d. Complete splicing and flashing before bonding flashing to vertical surface.

3. Cover membrane with ballast at a minimum rate of 10 lbs./sq.ft.

SECTION 7G
SINGLE PLY ROOFING

G. Cleaning

Remove Trash and debris resulting from roofing work at end of each day's work.

SECTION 7H
FLASHING AND SHEET METAL

7H-01. GENERAL

- A. Scope
Requirements of the Conditions of the Contract and of Division 1 of these Specifications apply to all work of this section.
- B. Extent of Work (in this section)
Furnish and install all sheet metal work and related items require to complete work indicated on Drawings and specified, except work in connection with Division 15.
- C. Shop Drawings
Submit five (5) sets of complete shop drawings of all sheet metal work for Architect's review. Detail drawings to include sheet metal joints.
- D. Quality Assurance
Roofing contractor shall install or have installed sheet metal used in roofing application.
- E. Warranty
Sheet metal used in flashing and roofing application is included in built-up roofing warranty (See Section 7F). Guarantee sheet metal against leakage.

7H-02. PRODUCTS

- A. General
All material best commercial quality, thickness not less than noted below. Use heavier gauges where called for in items specified and as noted on Drawings.
- B. Galvanized Sheet Steel
 - 1. Hot dipped zinc coated sheet steel; 1 1/2 oz. per sq. ft. coating treated to hold paint.
 - 2. A.S.T.M. A-93.
 - 3. Armco "Zinc Grip", Republic "U-Lay" or approved.
- C. Solder
 - 1. Best commercial quality of type most suitable for metal to be soldered.
 - 2. A.S.T.M. B-32-49 50% lead, 50% tin.
- D. Fasteners
Large head nails, galvanized steel for galvanized steel and zinc alloy, with neoprene washers.
- E. Plastic Cement
Plastic bituminous cement Federal Specifications SS-C-153. Type 1.

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FLASHING AND SHEET METAL

- F. Sheet Metal Counter Flashing
"Fry Springlock" 24 gauge galvanized steel, Type SA (masonry), type ST (E.I.F.S.)
- G. Shop Paint
"Tnemec" #99 - red primer, or equal.

7H-03. EXECUTION

- A. Preparation
 - 1. Shop Painting of Galvanized Steel - Coat with solution of 8 oz. copper sulphate to the gallon of water. Permit coating to remain on surface 12 hours, then dust off with stiff brushes. Prime all surfaces one coat approved metal paint. Touch-up damaged areas with same material after installation.
 - 2. Electrolytic Protection - Where materials dissimilar in galvanic range are in contact, paint contact surfaces with bituminous paint or epoxy chromate primer.
- B. Workmanship - General
 - 1. Lines, molding, and edges sharp and true, reinforced as required for stiffness.
 - 2. Allow for expansion and contraction, for shrinkage of construction. Joints and seams neatly formed and finished, surfaces free from waves and buckles.
 - 3. Make exterior work permanently weathertight.
 - 4. Conceal all fastenings where possible.
- C. Flashing - General
 - 1. Corners shop formed and soldered, extending at least 1 foot each side of corner. Use concealed fastenings where possible.
 - 2. Where necessary to expose nailing, use large head nails, capped with lead.
- D. Coping
 - 1. Form to detail of 24 gauge steel (galvanized) in 10'-0" - 12'-0" lengths, or as detailed.
 - 2. End sections to be formed, closed and soldered to appear as one piece.
 - 3. Provide concealed offset interlock slip joint at all joints. No standing seam joints allowed.

SECTION 7H
FLASHING AND SHEET METAL

4. Miter and solder corners and interlock each side with concealed slip joint. Exterior coverplates are not allowed.
 5. Caulk all joints with one part Thiokol caulking.
 6. End lap all flashings at least 6" unless noted otherwise. Lap seams in direction of flow.
 7. Whenever possible, secure metal by means of clips or cleats without nailing through the metal. In general, space all nails, rivets, and screws not more than 24" apart, and when exposed to weather, use neoprene washers. For nailing into wood, use barbed roofing nails 1-1/4" long by 11 gauge. For nailing into concrete or masonry, use drilled plug holes and plugs.
- E. Scupper Overflows
Furnish and install 24 gauge sheet metal overflows, locations as indicated on Drawings.
- F. Downspouts (exterior)
Furnish and install 24 gauge galvanized downspouts where indicated on Drawings.
- G. Roof Drains
See Section 15 Mechanical (Plumbing) for roof drains.

SECTION 7I
ROOF ACCESSORIES

7I-01. GENERAL

- A. Scope
Requirements of the Conditions of the Contract and of Division 1 of these Specifications apply to all work in this section.
- B. Extent of Work (in this section)
Provide all roof accessories specified herein for a complete installation, including:
1. All labor and equipment rental necessary to install products as indicated on the drawings, and perform all warrantee work required during the warrantee period.
 2. Contractor to provide all curbs for all roof mounted equipment.
- C. Related Work (in other sections)
Section 6A - Rough Carpentry
Section 7G - Single Ply Roofing
Section 7H - Flashing and Sheet Metal Section
Section 7J - Caulking and Sealants
Section 13A- Pre-Engineered Metal Building
Section 13B- Pre-Engineered Metal Roof
- D. Submittals
Contractor to submit smoke venting skylight to Building Dept./Fire Dept. for approval and then to Architect for review prior to installation. Submit five (5) copies of manufacturer's literature and complete shop drawings of fabrication and installation of items of this section to Architect prior to installation.
- E. Warranty
Provide 10 year leakage and workmanship and material warranty for skylights, smoke venting skylights and roof hatch.

7I-02. PRODUCTS

- A. Roof Curbs (Building Type B & C only)
As manufactured by:
Custom Curbs, Inc.
4705 W. Jefferson Street, Suite 16
Phoenix, Arizona 85043
(800) 262-6669 - Contact: Bob Banicki
1. HVAC, Exhaust Fan, Curb
 - a. Model No. CRC-3, with gaskets as indicated on drawings.
 - b. 2 x 2 pressure treated nailer under lip of curb.
 - c. 18 ga. outer curb, 20 g. inner curb.
 - d. Fully insulated with minimum 16" curb height.
 - e. Curb shall be constructed to match slope of roof and provide a level top surface.
 - f. Coordinate curbs sizes and details with roof mounted equipment supplier.

SECTION 7I
ROOF ACCESSORIES

2. Refrigeration Condenser Curb
 - a. Model No. CES-3
 - b. 2 x 6 pressure treated nailer.
 - c. Curb gauge as required by manufacturer's engineer for unit weight indicated on drawing.
 - d. Coordinate size and details with Refrigeration Contractors.
3. Refrigeration Piping Penetration
 - a. Model No. CPB-3
 - b. Size as required by refrigerator contractor.
 - c. Fully insulated with minimum 16" curb height (to nailer plate).

7I-03. EXECUTION

- A. Installation of Curbs:
 1. Install curbs per shop drawings and manufacturers recommendations.
 2. Verify all locations with HVAC drawings and shop drawings of roof joists.
 3. Install gaskets on day roof mounted units are set on curbs.

SECTION 7J
SEALANTS

7J-01. GENERAL

- A. Scope
Requirements of the "Conditions of the Contract. and of Division I of these Specifications apply to all work in this section.
- B. Extent of Work (in this section)
Work includes but is not limited to all caulking and sealants indicated on the Drawings, sealing of joints, for a complete, weathertight installation.
- C. Related Work (in other sections)
Entrances and Storefronts - Section 8D.
Unit Masonry - Section 4C
Exterior Insulation Finish System - Section 7K
- D. Product Handling
Deliver all materials in original unopened containers bearing manufacturer's labels.

7J-02. PRODUCTS

- A. Sealant
 - 1. "PRC Rubber Caulk 5000" as manufactured by Products Research and Chemical Corporation.
 - 2. "G.E. Silicone Sealant 1300" or "Dap-Butyl-Flex" or Chem-Seal CS-2400.
 - 3. Use resilient, non-hardening elastomeric sealants with insulating glass. Oil based glazing and putty compounds are NOT to be used with insulating glass units. Verify that sealants are compatible with insulating units and contain no solvents.
- B. Caulking Compound
"Kaukit" by Sonneborn, "Horn Seal" elastomeric caulking compound as manufactured by W. R. Grace and Company.
- C. Primer
Type and location as recommended by manufacturer of compound or sealant.
- D. Caulking Rope
Resilient extruded gasket, #3M-RC-1020, or approved, 1/2" bead maximum size or polyethylene foam rod.
- E. Plastic Cement
Plastic bituminous cement Federal Specification SS-3-153, Type 1.

SECTION 7J
SEALANTS

7J-03. EXECUTION

A. Preparation

Be sure that joints are clean and dry, ready for caulking or sealing. Prime unpainted surfaces to be caulked or sealed. Mask surfaces adjacent to joints as required for complete protection.

B. Installation of Caulking and Sealants

1. Mix and apply sealants and caulking in accordance with manufacturer's directions.
2. Caulk/seal joints before final coat of paint is applied.
3. Apply with pressure gun having nozzle of proper size to fit joints.
4. Fill joints solidly and smoothly without thin edges (DO NOT apply superficial pointing with skin bead)
5. Provide caulking/sealant as indicated on the Drawings and the following locations:
 - a. Joints between concrete block and concrete walls and all exterior window and door frames, etc.
 - b. Joints between concrete block and concrete walls and metal counterflashing throughout.
 - c. Wall expansion joints (vertical) on perimeter walls, both interior and exterior (verify sealer compatible with foundation waterproofing.)
6. Remove excess material; leave surfaces neat, smooth and clean.
7. After completion, building shall be carefully caulked as indicated and specified and points showing penetration of moisture shall be rendered tight at the Contractor's expense.
8. Color of caulking or sealant: match adjacent surfaces as required and colors as indicated on Drawings. Submit samples to Architect for approval before application.

SECTION 8A
METAL DOORS AND FRAMES

8A-01. GENERAL

- A. Scope
Requirements of the Conditions of the Contract and of Division 1 of these Specifications apply to all work of this section.
- B. Extent of Work (in this section)
Furnish and install all hollow metal doors and hollow metal frames as indicated on Drawings and specified herein.
- C. Related Work (in other sections)
 - 1. Section 4A - Grout for Hollow Metal frames.
 - 2. Section 6A - Installation of Hollow Metal frames.
 - 3. Section 8G - Hardware
- D. Submittals
Submit five (5) sets of shop drawings to Architect for approval. Indicate details of door and frame construction and all cutouts and hardware reinforcing.
- E. Schedule
All exterior doors shall be installed and operational prior to Partial Substantial Completion to allow Owner's personnel to install security system.

8A-02. PRODUCTS

- A. Doors
 - 1. Conform to U.S. Commercial Standards CS-242.
 - 2. "Type LF-18" as manufactured by Steelcraft 18 gauge flush panel with edge seams welded and filled.
 - a. All voids filled with mineral insulation and sound deadening material.
 - b. 1-3/4" thick with reinforcing for all hardware.
 - c. Weld flush plates to top of all exterior doors.
 - 3. U.L. label as required.
 - 4. Fenestra and Ceco are also approved door manufacturers.
- B. Frames
 - 1. Conform to U.S. Commercial Standards CS-242.
 - 2. Door frames welded unit 16 gauge, width as required to wrap around all finish wall material, as manufactured by Fenestra, Steelcraft or Ceco.
 - a. Provide jamb anchors not more than 8" from tops and bottoms of frames, not more than 2 feet apart between, minimum four (4) anchors per jamb.

SECTION 8A
METAL DOORS AND FRAMES

- b. All 7'0" high door frames in concrete masonry openings shall have 4" high frame head.
 - c. All pairs of 4'0" doors in concrete masonry openings shall have 2" wide frame jambs and 4" wide center mullion.
 - d. Make standard provision for hardware in accordance with practice of Steel Door Institute. See Finish Hardware Schedule.
 - e. Install 10 gauge reinforcing at double acting door hinge locations.
 - f. Note frames with double acting doors - no stops.
- 3. U.L. label as required.
 - 4. Provide hollow metal frames for interior relites, where indicated, with steel keystock stops all around.

8A-03. EXECUTION

A. Shop Finishes

Exterior doors and frames chemically treated under shop prime painting.

B. Installation

- 1. Installation included in Sections 6A and 4A.
- 2. Erect frames and doors true and plumb in all openings. Brace during installation of block and concrete. Install wall ties in block courses and concrete during masonry and concrete construction.

SECTION 8G
HARDWARE

8G-01. GENERAL

A. Scope

Requirements of the Conditions of the Contract and of Division 1 of these Specifications apply to all work of this section.

B. Work Included (in this section)

1. Furnish all architectural hardware, as herein specified, with all necessary templates, shop drawings, etc., as may be required to complete the work.
2. Furnish to contractors, under other sections of the Specifications, all necessary templates and blueprints as required. Hardware for application on metal surfaces shall be made on standard templates. Blueprint templates shall be supplied to the manufacturer of metal items requiring template hardware.

C. Quality Assurance

1. Product Qualifications/manufacturers

- a. Manufacturers and model numbers listed are intended for purposes of exact requirements. No substitutions allowed unless written request and samples are submitted ten (10) days prior to bid opening, and approved by the Architect. If substitutions are approved, the Architect will acknowledge by addendum to the specification.

After bid, requests for substitutions will be reviewed, and if accepted, acknowledged by a Field Order Directive.

2. Supplier Qualifications

Finish hardware shall be supplied by recognized Finish Hardware Supplier who has been furnishing hardware in the same area as the project for a period of not less than five years. The supplier's organization shall include consultants who are available at all reasonable times during the course of the work to meet personally with the Owner, Architect, or Contractor for hardware consultation. The supplier shall maintain a parts inventory of items supplied for future service to the Owner. The supplier must be an authorized "Factory Direct" distributor of the specified products.

D. Submittals

1. Schedules

Within 7 days of receipt of purchase order, submit six (6) copies of completely detailed hardware schedules. List hardware for each door separately in the vertical format.

Note: The issuance of the purchase order, and submittal and review of the hardware schedule in a timely manner are critical to the project schedule.

2. Catalog Information

Provide three (3) copies of complete catalog information for each item along with the schedules.

3. Templates
Provide one copy of complete template information for each item along with one copy of the approved hardware schedule to hollow metal, wood and aluminum door and frame suppliers.
4. Keying Schedule
After meeting with the Owner and/or Architect to discuss specific keying requirements, submit three (3) copies of keying schedules.
5. Wiring Diagrams
Provide complete wiring diagram and information for each electromechanical or electro-magnetic device.

E. Delivery, Storage and Handling

1. Marking and Packaging
All items of hardware shall be delivered to the jobsite in the manufacturers' original packages and must be marked with door number and item number corresponding to the approved hardware schedule.
2. Storage
The General Contractor shall provide a secure and dry area for storage of hardware items and must protect the material and finishes.

G. Project Schedule

All hardware for exterior doors shall be installed and operational at Partial Substantial Completion, ready for Owner's installation of security system.

H. Warranty

1. All hardware items shall be guaranteed free from defects in material and workmanship for a period of one (1) year from the date of occupancy of the building, except for door closers which shall be guaranteed for a period of ten (10) years.

8G-02. PRODUCTS

A. Manufacturers.

<u>Items</u>	<u>Manufacturer Listed</u>
Butts	McKinney
Locks	Sargent
Alarmed Exit Devices	Sargent
Exit Alarms	Sargent
Delayed Egress System	Sargent
Padlocks	Sargent
Surface Closers	Sargent
Door Pulls	Tice
Kick Plates	Tice
Floor & Wall Stops	Ives
Threshold, Weatherstripping	Pemko
Smoke Gasket	Pemko
Silencers	Ives
Signs	Florenclif

SECTION 8G
HARDWARE

B. Hardware Finishes

Butts (Interior)	652 Brushed Chrome Plated
Butts (Exterior)	630 Satin Stainless Steel
Locks	626 Brushed Chrome Plated
Exit Devices	628 EN (Painted Aluminum)
Alarmed Exit Devices	628 EN (Painted Aluminum)
Cylinders	626 Brushed Chrome Plated
Surface Closers	628 EN (Painted Aluminum or 689 Plastic)
Stops	630 Satin Stainless Steel
Pulls, Push Plates	630 Satin Stainless Steel
Kick Plates, Armor Plates	630 Satin Stainless Steel
Thresholds	Clear Anodized Aluminum

C. Hinges

1. Type: Provide as listed in hardware groups.
2. Size: 4-1/2" for doors 1-3/4" thick, up to 36" wide. 5" for doors 1-3/4" thick, over 36" wide.
The width of the hinge shall be sufficient to clear all trim.
3. Quantity:
Furnish two (2) hinges for all doors up to 60" high. Furnish one (1) additional hinge for every additional 30" or fraction thereof.
4. All locking outswinging doors shall have (NRP) non-removable pin hinges.

D. Locks, Latches

1. Series: 10 line.
2. Trim Design: "LJ"
3. Strikes: Provide curved lip strikes with strike box.
4. Function: Provide as listed in hardware groups.

E. Exit Devices

1. Series: Sargent 80; Von Duprin 900.
2. Trim: Provide as listed in hardware groups.
Shall be thru bolted to chassis.
3. Function: Provide as listed in hardware groups.
4. Push Rail Assembly: Stainless steel with Lexan touchpad.
5. Provide glass bead kits where required to accommodate light frames.

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HARDWARE

- F. Exit Alarms
1. Match existing
- G. Surface Closers
1. Series: Sargent 350.
2. Mounting: Provide arm for mounting as listed in hardware groups.
3. Covers: High impact, noncorrosive, self-extinguishing.
- H. Door Trim Units
1. Push Plates
Provide as listed in hardware groups.
2. Pulls
Provide as listed in hardware groups.
3. Kick Plates
Provide Tice B4E.
Height: 12"
Width: Single doors 2" L.T.D.W. Pairs of doors 1" L.T.D.W.
Color: As selected from manufacturers "Stock" list.
4. Door Louvers
K.N. Crowder, Inc.
Size: 24" w x 12" h.
Color: Match door
- I. Stops
1. Wall Stops: Ives 407-½.
2. Floor Stops: Ives 436.
- J. Silencers
1. Type: Ives 20/21.
2. Quantity: Provide three (3) for each single door, and four (4) for each pair of doors.
- K. Thresholds
1. Provide aluminum thresholds as listed in hardware groups.
2. Provide FHSL 25 fasteners with all thresholds.

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HARDWARE

- L. Door Bottoms
 - 1. Type: Pemko 315 CN
 - 2. Mount with stainless steel screws.
- M. Door Drip
 - 1. Type: Pemko 346c
 - 2. Mount with stainless steel screws.
- N. Keys and Keying
 - 1. Establish "New" masterkey system.
 - 2. Individual keying as directed by manager.
 - 3. One exterior door shall be construction keyed for contractors use during the construction phase. Provide 10 construction keys. Rekey to Owners permanent system when construction is complete.

8G-03. EXECUTION

- A. Installation
 - 1. Hardware shall be installed by skilled mechanics to Architect's satisfaction. Conform strictly to Manufacturer's templates and instructions.
 - 2. Hardware Placement:
 - a. Reference the Door and Hardware Institute Handbook "Recommended Locations for Builders' Hardware for Standard Steel Doors and Frames".
 - b. Comply with barrier free design code where more stringent requirements are indicated.
- B. Inspection
 - 1. After installation has been completed, the hardware supplier shall have a qualified hardware consultant check the job for proper installation and operation.
- C. Protection
 - 1. The general contractor is responsible for the proper protection of all items of hardware until the Owner accepts the project as complete.

SECTION 8G
HARDWARE

D. Hardware Sets

1. Provide hardware as specified in the previous articles in sets according to the following schedule:

HW-1, Roll-Up/Upward Acting Doors/Panoramic Doors
(Not Used)

Each shall have:

- | | | |
|-----------|--------------------------|---------|
| 1 Padlock | 756 HSC x 2-1/2" Shackle | Sargent |
|-----------|--------------------------|---------|

Balance of hardware shall be provided by Door Supplier.

HW-2, Single Exit Door/Tire Entry
(Not Used)

Each shall have:

- | | | |
|--------------------|----------------|----------|
| 1 1/2 Pr. Butts | TA2314 x NRP | McKinney |
| 1 Exit Device | 8813 x ETL | Sargent |
| 1 Closer | EN350-P9 | Sargent |
| 1 Threshold | 171A x FHSL 25 | Pemko |
| 1 Door Bottom | 315CN | Pemko |
| 1 Set Weatherstrip | S88D | Pemko |
| 1 Rain Drip Cap | 346c | Pemko |

HW-3, Pairs of Exit Doors (Fixed Mullion) (Not Used)

Each shall have:

- | | | |
|------------------------|----------------|----------|
| 3 Pr. Butts | T4A3386 | McKinney |
| 2 Alarmed Exit Devices | 5810 x EN | Sargent |
| 2 Closers | EN351-P9 | Sargent |
| 2 Thresholds | 171A x FHSL 25 | Pemko |
| 2 Door Bottoms | 315CN | Pemko |
| 2 Sets Weatherstrip | S88D | Pemko |
| 2 Rain Drip Caps | 346c | Pemko |

Mullions to be provided by Frame Supplier

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HARDWARE

HW-4, Single Exit Doors

Each shall have:

1-1/2 Pr. Butts	TA2314 x NRP	McKinney
1 Alarmed Exit Device	5804 x 28-K-GTB	Sargent
1 Closer	EN351-P9	Sargent
1 Threshold	171A x FHSL 25	Pemko
1 Door Bottom	315CN	Pemko
1 Set Weatherstrip	S88D	Pemko
1 Rain Drip Cap	346c	Pemko

Keying of door to be coordinated with store manager

HW-5, Restrooms/Changing Rooms
(Not Used)

Each shall have:

1-1/2 Pr. Butts	TA2714	McKinney
1 Privacy Lock	28-10U65	Sargent
1 Louver (Emp. R.R. Only)	SDL-V90 12-12	K.N. Crowder
1 Closer	EN350-0 x TB	Sargent
1 Kick Plate	B 4E	Tice
1 Wall Stop	407 1/2	Ives
3 Silencers	20	Ives

HW-6,
(Not Used)

HW-7, Storage Room/Elec.Room/Janitor Room Doors
(Not Used)

Each shall have:

1-1/2 Pr. Butts	TA2714	McKinney
1 Lock	28-10G05	Sargent
1 Closer	EN351-0 x TB	Sargent
1 Kick Plate	B4E	Tice
1 Wall Stop	407 1/2	Ives
3 Silencers	20	Ives

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HW-8, Single Exit Door/Receiving Entry (Electric Release) (Not Used)

Each shall have:

1 Pr. Butts	TA2314 x NRP	McKinney
1 Elec. Power Transfer Hinge	TA2314-CC (8 wire)	McKinney
1 Elec. Mech Exit Device	8976 x ETL	Sargent
1 Exit Alarm	550	Sargent
1 Closer	EN351-P9	Sargent
1 Threshold	171A x FHSL 25	Pemko
1 Door Bottom	315CN	Pemko
1 Set Weatherstrip	S88D	Pemko
3 Silencers	20	Ives
1 Rain Drip Cap	346 C	Pemko

HW-9, Baler Door (Not Used)

Each shall have:

1 Pr. Spring Hinges	1502	McKinney
1 Exit Latch	28-10G13	Sargent
1 Holder	93 F14	Ives
1 Set Weatherstrip	S88D (All sides)	Pemko

HW-10, Compactor Opening (Not Used)

Each shall have:

Hardware Not Required. (Provided by Owner)

HW-11, Pair Doors Compressor Enclosure (Not Used)

Each Shall have:

3 Pr. Butts	T2714	McKinney
1 Latchset	10U15	Sargent
2 Flushbolts	458	Ives
1 Dustproof Strike	487-489	Ives
4 Silences	20	Ives
2 Chain Stops	115-20	Ives

HW-12, Dutch Door (Not Used)

Each shall have:

2 Pr. Butts	TA2714	McKinney
1 Lock	28-10G05	Sargent
1 Dutch Door Bolt	0345	Baldwin
1 Holder	93 F14	Ives
1 Wall Stop	407 ½	Ives
3 Silencers	20	Ives

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HW-13, Office Doors
(Not Used)

Each shall have:

1-1/2 Pr. Butts	TA2714	McKinney
1 Lock	28-10G05	Sargent
1 Closer	EN351-P9	Sargent
1 Wall Stop	407 1/2	Ives
3 Silencers	20	Ives

HW-14, Rated Door
(Not Used)

Each shall have:

1-1/2 Pr. Butts	TA2714	McKinney
1 Lock	28-10G04	Sargent
1 Closer	EN351-0 x TB1	Sargent
1 Kick Plate	B4E	Tice
1 Wall Stop	407 1/2	Ives
1 Set Smoke Gasket	S88D	Pemko

HW-15, Aluminum Storefront Doors
(Not Used)

Each shall have:

- 1 Cylinder (Provide appropriate "Sargent" cylinder for use with lock or exit device provided by Door Supplier)

Balance of hardware by Door Supplier

HW-16, Bi-Parting Exit Doors (Not Used)
Hardware supplied by door manufacturer
including security power locking device with deadbolt

HW-17, Pairs of Exit Doors (Fixed Mullion) w/Delay Device
(Not Used)

Each shall have:

3 Pr. Butts	T4A3386 x NRP	McKinney
1 Pr. Power Transfer Hinges	T4A3386-CC (8 wire)	McKinney
1 Delayed Egress System	231	Sargent
1 Fixed Mullion	(To be provided by Frame Supplier)	
2 Floor Stops	444	Ives
2 Thresholds	2005AV x FHSL25	Pemko
2 Door Bottoms	315CN	Pemko
2 Sets Weatherstrip	S88D	Pemko
1 Rain Drip Cap	346C	Pemko

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HW-18, Single Exit Doors with Delay Device
(Not Used)

Each shall have:

1 Pr. Butts	TA2314 x NRP	McKinney
1 Ea. Power Transfer Hinge	TA2314-cc (8 wire)	McKinney
1 Delayed Egress System	232	Sargent
1 Floor Stop	444	Ives
1 Threshold	171A x FHSL25	Pemko
1 Door Bottom	315CN	Pemko
1 Set Weatherstrip	S88D	Pemko
1 Rain Drip Cap	346C	Pemko

1 Sign: "Keep Pushing. This Door Will Open in 15 Seconds. Alarm Will Sound".

HW-19, Door Restroom
(Not Used)

Each shall have:

1½ Pr. Butts	T2714	McKinney
1 Privacy Lock	28-1U65	Sargent
1 Closer	EN351-0 X TB1	Sargent
1 Threshold	171A x FHSL 25	Pemko
1 Door Bottom	315 CN	Pemko
1 Wall Stop	407 ½	Ives
1 Set Smoke Gasket	S88D	Pemko

HW-20
(Not Used)

Each shall have:

2 Pr. Butts	T2714	McKinney
1 Lock Set	28-10G05	Sargent
1 Closer	EN351-0 X TB1	Sargent
1 Threshold	171A x FHSL 25	Pemko
1 Door Bottom	315 CN	Pemko
1 Wall Stop	407 ½	Ives
1 Set Smoke Gasket	S88D	Pemko

SECTION 9B
GYPSUM WALLBOARD

9B-01. GENERAL

- A. Scope
Requirements of the Conditions of the Contract and of Division 1 of these Specifications apply to all work of this section.
- B. Extent of Work (in this section)
Provide all gypsum wallboard, joint treatment, and related accessories as indicated on the Drawings and specified herein for a complete installation.
- C. Product Handling
Protect stored wallboard from excessive and continuous exposure to moisture and extremes in temperature.

9B-02. PRODUCTS

- A. Gypsum Wallboard
 - 1. Conform to American National Standards Institute Specifications for Gypsum Wallboard finishes, A97.1 as supplemented and modified.
 - 2. Wallboard as manufactured by U.S. Gypsum Company (U.S.G.). National Gypsum Co., Kaiser Gypsum Company and Georgia-Pacific are also approved manufacturers.
 - 3. Gypsum Wallboard shall be:
 - a. 5/8" thick type "X" U.L. labeled tapered edges, typical.
 - b. 5/8" thick type "X" U.L. labeled moisture resistant (M.R.) tapered edges where indicated on Drawings (all toilet room walls).
 - c. 5/8" exterior grade type "X" U.L. labeled for E.I.F.S. substrate, and exterior soffits.
 - d. 1/2" exterior grade, cementitious based, U.L. labeled roofing substrate, vertical surface.
- B. Wallboard Accessories
 - 1. Exterior Corner bead: U.S. Gypsum Dur-a-Bead Corner bead.
 - 2. Edge trim: U.S. Gypsum, #200 series to form corners and edges as required.
 - 3. Fasteners to wood: Type W bugle head screws.
 - 4. Fasteners to light gauge metal: Type "S" bugle head screws.

SECTION 9B
GYPSUM WALLBOARD

5. Fasteners to 22 to 14 gauge metal: Type "S-12" bugle head screws.
6. Joint System: Joint system, including reinforcement tape and compound, shall be a system recommended by the manufacturer of the gypsum panels as compatible with the panels used. A single compound may be used for embedment of tape, skim coating, and finishing if the compound so used is recommended for that purpose by the manufacturer of the gypsum panels.
7. Ventilating Screen: Model No. 224 ($\frac{1}{2}$ " x $4\frac{1}{2}$ ") 26 Ga., galvanized steel as manufactured by:
Delta Star, Inc.
1777 Industrial Way
P.O. Box 38
Belmont, CA 94002-4085
(800) 892-8673

9B-03. EXECUTION

A. Gypsum Wallboard Installation - Walls

1. Wallboard shall be attached to light gauge metal supports with 1" Type S Bugle Head screws by electric screwguns. Comply with ASTM C-646 and local codes.
2. In shear wall areas, attach wallboard with nails as called out in the Structural Notes.
3. All ends and edges of all gypsum wallboard shall occur over framing members, except when joints are at right angles to framing members as in horizontal application or when the end joints are to be back-blocked.
4. End joints shall be staggered. Joints on opposite sides of a partition shall be so arranged as to occur on different studs.
5. Reinforce inside corners in accordance with manufacturer's directions. Treat field joints and screw heads in accordance with standard specifications. Protect external corners and exposed edges with metal trim.
6. Jointing system applied as one coat joint compound with two (2) coats finishing compound.
7. Metal trim shall be used where wallboard abutts all dissimilar materials.
8. Finish and fire tape all areas as indicated in schedule. Fire tape only in attic spaces.

SECTION 9B
GYPSUM WALLBOARD

9. Gypsum wallboard used as substrate for Exterior Insulation and Finish System (E.I.F.S.) shall be screw attached per these requirements noted above and per recommendations of E.I.F.S. manufacturer, based on wind load requirements. Maximum spacing of attachment is 8" O.C. (per table 47G of U.B.C.).
10. See structural drawings for shear nailing requirements.
11. Attach 5/8" gypsum sheathing per UBC exterior rated wall requirements. Provide control joints as indicated on Drawings.
12. M.R. Gypsum board used on walls only, where indicated on the drawings. Do not use M.R. Gypsum board on ceilings.
13. Paint all Gypsum wallboard per Section 9M, unless otherwise noted.

B. Suspended Ceiling Wallboard Installation

1. Apply gypsum board in maximum practical lengths, at right angles to support channels. Position ends under channel supports and stagger splices (minimum every third row).
2. Attach gypsum board to metal furring channel with one inch (1") long number 6 screws at 6" o.c., all joints.
3. Apply jointing system as specified above. One coat joint compound; two coats finishing compound.
4. Install additional support wires for electrical lighting. Coordinate location with electrical contractor.

C. Other Requirements

1. Install ventilating screen at exterior canopy soffits as indicated on drawings.
2. After installation and before painting, correct surface damage and defects. Leave wall and ceiling surfaces clean and smooth, ready for paint.

SECTION 9E
ACOUSTIC TREATMENT

9E-01. GENERAL

- A. Scope
Requirements of the Conditions of the Contract and of Division 1 of these Specifications apply to all work of this section.
- B. Extent of Work (in this section) Addition
Provide lay-in acoustical board as specified herein and indicated on the Drawings.
- C. Related Work (in other sections)
Ceiling Suspension System - Section 9F
Fiberglass Reinforced Plastic Panels - Section 9N
- D. Shop Drawings
Submit five (5) sets of shop drawings and samples of all board to the Architect for approval.
- E. Coordination
Coordinate as necessary with other trades to insure proper and adequate provisions for the work of their trades.
- F. Product Handling
Deliver manufactured materials in original unbroken cartons, containers or packages bearing name of manufacturer and brand seals. Keep materials dry, clean and properly protected against deterioration of any form.

9E-02. PRODUCTS

- A. General
 - 1. Refer to Bulletin No. XXIX of Acoustic Materials Association, 335 East 45th Street, New York, NY 10017.
 - 2. Acoustical subcontractor approved by manufacturer of the acoustic materials.
- B. Lay-in Acoustical Ceiling Board
Board to be 5/8" X 24" X 48" fissured mineral fiber Class A ceiling panel as manufactured by Armstrong, U.S. Gypsum, Celotex or Conwed. Board shall be square edge with non-directional pattern, color white, with ICBO identification attached.
- C. Moisture Resistant (M.R.) Ceiling Board - Lay in Washable Ceiling Board
 - 1. Board shall be 5/8" x 24" x 48" firecode "C" with 2 mil vinyl facing, U.L. labeled and approved for use in food preparation area by local health department having jurisdiction. #3270 manufactured by U.S. Gypsum. Armstrong, Celotex, and Conwed are also approved manufacturers.

SECTION 9E
ACOUSTIC TREATMENT

2. Alternate to moisture resistant board shall be 1/4" x 24" x 48" Fiberglass Reinforced Plastic (FRP) with "Surfaseal," as manufactured by Kemlite Company. Fiberlite is also an approved manufacturer.

9E-03. EXECUTION

A. General

1. Conform to standard specifications, manufacturer's printed directions, and approved shop drawings. Finished surfaces level and true, with a tolerance of 1/4" in 12 feet.
2. Install hold-down clips with ceiling board.

B. Preparation

Acoustic board subcontractor shall verify all existing building conditions and coordinate his work with all other trades.

C. Installation of Lay-in Acoustical Board

1. Install ceiling board according to manufacturer's recommendations and as detailed on Drawings.
2. Replace all damaged boards prior to final acceptance.
3. Delivery two (2) extra boxes of each board type specified (unopened) to Owner for future replacement.

D. Finishing

Finished surfaces shall be clean, undamaged and of uniform appearance. If cleaning proves ineffective, replace soiled board at no additional cost.

SECTION 9F
CEILING SUSPENSION SYSTEMS

9F-01. GENERAL

- A. Scope
Requirements of the Conditions of the Contract and of Division 1 of these Specifications apply to all work of this section.
- B. Extent of Work (in this section)
Provide metal ceiling suspension systems as indicated on the Drawings for a complete installation.
- C. Related Work (in other sections)
Gypsum Wallboard - Section 9B
Acoustic Treatment - Section 9D
- D. Shop Drawings
Submit five (5) sets of the grid layout shop drawings and samples of all board to the Architect for approval.
- E. Coordination
Coordinate as necessary with other trades to insure proper and adequate provisions for the work of their trades.
- F. Product Handling
Deliver manufactured materials in original unbroken cartons, containers or packages bearing name of manufacturer and brand seals. Keep materials dry, clean and properly protected against deterioration of any form.

9F-02. PRODUCTS

- A. Ceiling Suspension System (gypsum wallboard)
 - 1. Provide "DONN Rigid X Drywall Suspension System" as manufactured by Donn Corporation, Westlake, Ohio.
 - 2. The suspension system shall support the ceiling assembly as indicated on the Drawings and specified herein, with a maximum deflection of 1/360 of the span.
 - 3. Components:
 - a. Main tee - 12 feet long, 1-1/2" X 15/16" tee sections of 24 gauge steel. Beams are slotted 8" on center for intersecting cross channel and 4" on center for hanger wire.
 - b. Cross tee - 2-7/8" X 7/8" hat shaped sections of 25 gauge hot dipped galvanized steel, four feet long. Screw surfaced or knurled.

SECTION 9F
CEILING SUSPENSION SYSTEMS

- c. Wall moulding - 1-1/8" X 12 feet of 25 gauge hot dipped galvanized steel.
- 4. Roblin and Chicago Metallic Corporation are also approved manufacturers.
- B. Ceiling Suspension System (lay-in board with exposed grid)
 - 1. Provide "DONN DX" exposed grid system as manufactured by Donn Corporation, Westlake, Ohio.
 - 2. Chicago Metallic Corporation and National Rolling Mills are also approved manufacturers.
 - 3. Components shall be formed from commercial quality, cold-rolled, prepainted steel.
 - 4. The suspension system shall support the ceiling assembly indicated on the Drawings and specified herein, with a maximum deflection of 1/360 of the span.
 - 5. Provide 1-hr. rated grid for ceiling in vault room.
 - 6. Components:
 - a. Main tee 1-1/2" with double web design and rectangular bulb; 15/16" face on lower exposed flange and with rolled cap; cross tee holes at 6" o.c.; hanger wire holes at 2" o.c.; integral reversible splice; and expansion notch for controlled buckling.
 - b. Cross tee 1-1/2" with double web design and a rectangular bulb; high tensile steel end clenched to the cross tee web shall interlock opposing cross tee through main tee web holes; lower flange extended and offset to provide flush level intersection with controlled expansion.
 - c. Wall molding at edge tile shall be as manufactured by DONN Corporation, formed from commercial quality, cold-rolled steel with pre-painted flanges of low sheen satin white.
 - d. Hold-down clips provided by suspended ceiling system manufacturer.

SECTION 9F
CEILING SUSPENSION SYSTEMS

9F-03. EXECUTION

A. General

1. Conform to standard specifications, manufacturer's printed directions and approved shop drawings. Finished surfaces level and true, with a tolerance of 1/4" in 12 feet.
2. Verify all existing building conditions and coordinate with Owner's fixture suppliers, contractors and personnel.
3. Provide 11 gauge galvanized steel wire hangers at 4'-0" o.c., add additional hangers for support of mechanical and electrical work.
4. All hangers shall be wrapped around bottom cord of trusses.
5. All electrical lighting not supported on main runners shall be wired up with #12 wires at the point of every lighting clip to ceiling.
6. Accurately level all main runners.
7. Securely anchor all wall angle members in place.
8. Provide seismic bracing, with uplift rods, as required by code.
9. Install hold down clips.
10. Provide 1-hour ceiling system in vault room.

B. Finishing

Finished surfaces shall be clean, undamaged, and of uniform appearance. If cleaning proves ineffective, replace soiled units at no additional cost.

SECTION 9J
SPECIAL FLOORING

9J-01. GENERAL

A. Scope

Requirements of the Conditions of the Contract and of Division 1 of these Specifications apply to all work of this section.

B. Extent of Work (in this section)

Provide Polymer flooring as specified and indicated on the Drawings.

C. Job Conditions

1. Concrete substrate shall have cured for a minimum of 30 days. Concrete subfloors on or below grade shall be adequately water proofed. Concrete need not be sealed, nor steel trowelled finish.
2. Job area to be free from all trades during, and 24 hours after floor installation. Installation shall be coordinated with local representative.
3. Protection of finished floor from damage by subsequent trades is the responsibility of the G.C.

D. Utilities

1. Power requirements are the responsibility of the General Contractor requires 3 Phase 440 volt 30 amp power. This is to be at the job site and not further than 10 feet from the installation area.
2. Construction lighting shall be provided by the General Contractor.
Example:
Bakery floor can be sufficiently lit with two high bay H.I.D. lamps.
Meat/Food Prep area should have overhead fluorescent.
Two 1000 watt Quartz lamps are not sufficient.
3. Keep installation area between 68-90°F, throughout the duration of application and curing of polymer flooring.

E. Guarantee

1. Manufacturer shall furnish Owner with a single, written warranty, covering both the materials and installation. Additional specific warranty information is covered in the National Account Agreement, including repairs.

SECTION 9J
SPECIAL FLOORING

9J-02. PRODUCTS

A. Manufacturer's Representative

1. To contact Stonhard, use the following (800) numbers and ask for Chris Campton in Division 5. Four weeks notice is required prior to installation of Stonhard floors.

In Seattle & U.S.: 1-800-854-0350

Canada & Worldwide: (510) 231-8930

TWX710-892-0769-STONHARD MASE

B. Polymer Flooring:

1. Material Description:

The nominal 3/16" (4.8mm) thick Stonshield HRI (over Bakery, Meat and Food Service) is comprised of:

- a. Penetrating, moisture tolerant, two-component epoxy primer.
- b. High-performance, three component mortar consisting of epoxy resin, curing agent, and selected graded aggregate blended with inorganic pigments.
- c. Two component, Thixotropic epoxy undercoat.
- d. Brightly colored, quartz silica aggregate broadcast.
- e. High-performance, two component, clear epoxy sealer.

2. Delivery, Storage, and Handling:

- a. Material shall be delivered to the job site and checked by Stonhard for completeness and shipping damage prior to job start.
- b. Material shall be stored in a dry, enclosed area protected from exposure to moisture. Temperature shall be maintained between 60-90°F.

3. Finishes:

- a. The bakery department consists of the HRI floor, with a Medium texture finish.
- b. The meat department floor consists of the HRI floor with a Standard texture finish.
- c. The food service floor consists of the HRI floor with a medium texture finish.

9J-03. EXECUTION

A. Substrate Preparation

1. Concrete preparation shall be by a BLASTTRAC machine, utilizing shot as a means of removing all latents.

SECTION 9J
SPECIAL FLOORING

B. Mechanical Requirements

1. All floor drains, sinks, or utility boxes shall be placed flush with the concrete. Stonhard will be responsible for chasing and providing a smooth transition from polymer finish to the drain. General Contractor is responsible for proper drainage, overall.

C. Material Installation

1. Floor installation shall strictly adhere to Stonhard's written instructions and directions.
2. All garbage and debris shall be properly disposed of in refuse containers. Containers are the responsibility of the General Contractor.

D. Color - #208 "Malt"

SECTION 9M
PAINTING

9M-01. GENERAL

- A. Scope
Requirements of the Conditions of the Contract and of Division 1 of these Specifications apply to all work of this section.
- B. Extent of Work (in this section)
Provide painting and related items required to complete work indicated on Drawings and specified herein.
- C. Related Work (in other sections)
Shop Painting of Structural Metal - Sections 5A and 5E.
Foundation Dampproofing - Section 7B.
Water Repellants - Section 7D.
- D. Submittals
Submit (2) 8" x 12" color samples made up from numbers indicated on the Drawings to the Architect for approval, along with list of materials and manufacturers. Colors shall be reviewed to application.
- E. Product Handling
Deliver paint materials in original unopened containers, with labels and tags intact. Protect from freezing and intrusion of foreign matter.

9M-02. PRODUCTS

- A. Paint
 - 1. All materials new and of highest quality for use specified.
 - 2. Comply with Federal Specifications.
 - 3. Paint to be one of the following approved manufacturers:
 - a. W.P. Fuller West Coast:
 - b. Parker and/or Frazee
 - c. Sherwin-Williams
 - d. Kelly-Moore Company East Coast:
 - e. Fuller O'Brien
 - f. Benjamin Moore
 - g. Dutch Boy Canada:
 - h. Sinclair
 - 4. Paint Types - specified herein
- B. Stain
New and of highest quality and suited for purpose; manufactured by Olympic Stain Co.
- D. Elastomeric Coating - used as an alternate to paint.
 - 1. All materials new and of highest quality and to be used for purpose for which manufactured.
 - 2. Comply with Federal Specification.

SECTION 9M
PAINTING

3. Elastomeric coating to be one of the following:
 - a. Tnemec
 - b. Thorolastic
 - c, Sonneborn - Colorflex

9M-03. EXECUTION

A. Acceptance of Surfaces and Working Conditions

Before commencing painting, painter shall ascertain that the work to be covered is in perfect condition to receive the paint; that the surfaces are clean, dry, smooth and at proper temperature; should the painter find surfaces and proper conditions impossible of acceptance, he shall, at once, report such conditions to the Architect and cease operation of the portion of the work affected. The application of paint shall be held to be an acceptance of the surface and working conditions and the true painter will be held responsible for the results.

B. Preparation for Painting

1. Before painting, remove hardware and provide ample protection for accessories, lighting fixtures and similar items. Replace same upon completion. Remove doors, if necessary, to paint bottom and top edge. Clean all concrete masonry units.

2. Preparation of Surfaces

- a. Surfaces to be clean, dry and free from dirt and frost.
- b. Cover knots and pitch streaks with orange shellac, aluminum paint or resin sealer.
- c. Fill nail holes and minor imperfections with putty between first and second coat. Color putty to match stained work.
- d. Grease, rust, scale and dirt to be removed from steel and iron. Touch up chipped or abraded places on material previously shop coated.
- e. Galvanized metal, zinc, lead and copper requiring paint are to be cleaned with commercial pre-treating solution or solution consisting of four (4) ounces of copper sulphate in one (1) gallon of water. Permit solution to dry on surface not less than 12 hours, and dust off with stiff brush. Follow manufacturer's directions for pre-treating solution.
- f. Field painting not required on aluminum, copper, brass and bronze.

3. Wood Preparation

Sandpaper smooth, then dust off. Seal sap and knots. After prime or seal coat has been applied, fill holes and cracks with putty or plastic wood. For natural finish, color putty to match wood.

4. Galvanized Steel and Iron Preparation

Wipe surfaces clean with turpentine, mineral spirits or naphtha. Remove all traces of oil, grease or dirt, rinse thoroughly. Treat with Neilson "Galva-Prep #5" preservative, "Surebond #28-56", or equal approved by the Architect. Paint one (1) coat approved zinc chromate paint.

SECTION 9M
PAINTING

C. Application of Paint - General

1. Exterior painting to be performed when air temperature is 50°F or higher, and in dry weather.
2. Maintain interior temperature at 50° F or higher during interior painting.
3. Maintain interior temperature at 70° F or higher when applying varnish.
4. Apply interior finish coats with brush or roller.
5. Protect all work from damage by use of drop cloths. Remove paint stains completely from finished work.
6. Coverage to be complete. When color, stain, dirt or undercoats show through final coat of paint, work is to be covered by additional coats until paint is of uniform color and appearance and coverage is complete. Coat under final coat to be noticeably lighter than final coat.
7. Any required thinning of paint is to be done in compliance with printed instructions of manufacturer. Shop coat accepted in lieu of any priming coat required by these Specifications.
8. Work is to be done by skilled mechanics, and is to be uniform in appearance, of approved color, smooth and free from runs, sags, skips and defective brushing. Make edges of paint adjoining other materials or colors sharp and clean without overlapping. Should workmanship of finish be found defective, proper preparatory work is to be done and additional coats are to be applied as necessary to provide a finish in accordance with Specifications and color samples.
9. Sand interior enamel surfaces lightly between coats.
10. Allow paint to dry hard between coats (two to seven days).
11. At completion, touch-up and restore finish where damaged or defaced, and leave in first class condition. Painted or finished surfaces cut in fitting or erection are to be restored.
12. Provide Owner with one (1) gallon of each color and type of interior paint used, properly labeled.

D. Application of Paint and Finish

1. Protection of Work

The Contractor shall be fully responsible for protection of his own work and that of other contractors from injury or staining. He shall provide the necessary drop cloths and cover all finished surfaces adjacent to his work. Special care shall be taken to avoid coating or spattering hardware, light fixtures and finish floors. All damage done by smearing with paint and varnish shall be promptly and completely repaired.

2. Time of Drying

Time of drying shall, in all cases, be ample to secure the best possible results.

SECTION 9M
PAINTING

3. Responsibility of Painter

In case of all work done by painter, he will be held responsible for results to be reasonably expected from materials and methods specified. Painter shall also be responsible for the surfaces to which paint is applied, and after application of same, no excuse of improper surfaces will be accepted. In all work covered by the painter, and especially in the case of plaster painting, painter shall go over his work after completion and repair all damaged spots, whether due to defective materials or workmanship or defects of the surfaces covered. The necessary additional coats of paint shall be applied to cover all spots, uneven coverage, or discoloration of every sort without additional charge.

E. Coverage

1. Color intensity of sales area walls sometimes requires additional coats of paint to cover. See Color Schedule for color and number. Wall areas will be painted to cover at no extra cost to the Owner, roof mounted condenser support frame.
2. All painted gypsum wallboard to have two (2) or more coats of paint as required to cover.

F. Finish Schedule - Exterior

Work scheduled here is in addition to shop coats.

1. Ferrous Metal
One coat metal primer to unprimed surfaces. Two coats exterior industrial enamel. Hollow metal and overhead doors, roof-mounted mechanical equipment, railings, louvers and roof mounted condenser support frame.
2. Galvanized Metal
One coat galvanized iron primer Two coats alkyd gloss enamel
3. Gypsum Board
One coat primer, tinted to final color
One coat acrylic latex
4. All exposed surfaces not listed above subject to weathering shall be painted/stained with a minimum of two (2) coats of paint/stain. Applicable exposed surfaces shall be determined by the Architect.

G. Finish Schedule - Interior

1. Interior Ferrous Metal
One coat primer (if not factory primed)
One coat enamel undercoater (tint to final color)
One coat industrial enamel, semi-gloss finish.
Frames, hollow metal doors, guardrails, bollards, etc., are included.
Match Frazee #5413M "Chapel Gray".

SECTION 9N
FIBERGLASS REINFORCED PLASTIC PANELS

9N-01. GENERAL

- A. Scope
Requirement of the Conditions of the contract and of Division 1 of these Specifications apply to all work in this Section.
- B. Extent of Work (in this Section)
Provide fiberglass reinforced plastic panels (FRPP) for wall finish in food preparation areas noted on the drawings.
- C. Related Work (in other Sections)
Acoustic Treatment - Section 9E
- D. Submittals
Submit two samples of each panel and color specified to Architect for review.
- E. Quality Assurance
Provide panels, moldings and adhesive only from the manufacturer specified to ensure warranty and color coordination of accessories.
- F. Delivery, Storage and Handling
 - 1. Deliver packaged sheets on skids or pallets for shipment to project site. Deliver adhesive in sealed containers with labels legible and intact.
 - 2. Store sheets in dry place at project site.
 - 3. When moving more than a single sheet, place sheets face-to-face and back-to-back. Remove foreign matter from face of panels using a soft bristle brush, avoiding abrasive action.

9N-02. PRODUCTS

- A. Wall Panels
Kemlite Fire-X Glasbord with "Surfaseal", as manufactured Kemlite Company. Panel thickness nominal 3/32" for high moisture conditions, U.L. labeled. Contact Kemlite at 1-800-435-0080. This specification is based on Kemlite. Masonite and Lasco are also approved manufacturers.
 - 1. Colors:
White in Bakery, Meat Prep, Deli Prep .
- B. Moldings
Provide coordinating color PVC moldings. Provide rivets in coordinating colors in Meat Prep, Bakery, Deli Prep.
- C. Adhesive
Non-flammable, waterproof construction adhesive compatible with high-moisture conditions, Kemlite adhesive No. 260.

SECTION 9N
FIBERGLASS REINFORCED PLASTIC PANELS

D. Joint Sealant

Kemlite 255 silicone sealant for food preparation, storage and processing areas, and janitor rooms. All joints shall be sealed where high moisture and steam cleaning occurs. Food preparation, storage and processing are areas that will be high moisture and steam cleaned.

9N-03. EXECUTION

A. Project Conditions

1. Installation shall not begin until building is enclosed, permanent heating and cooling equipment is in operation, and residual moisture from plaster and concrete work has dissipated.
2. 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.
3. Do not allow containers of adhesive to be opened until all potential sources of flame or spark have been shut down or extinguished and until warnings against their ignition during adhesive application have been posted.
4. Provide ventilation to disperse fumes during application of solvent-based adhesive.
5. Prior to installation, acclimate panels for at least 24 hours in temperature and humidity conditions approximating the operating environment of the finished rooms.

B. Preparation

1. Examine backup surface to determine that corners are plumb and straight, surfaces are smooth, uniform, clean and free from foreign matter, nails are countersunk, joints and cracks filled flush and smooth with the adjoining surface.
2. Do not begin installation until backup surfaces are put into satisfactory condition. Remove high spots, fill low spots.

C. Installation - Per manufacturer's printed instructions-

1. Panel Fitting

The first panel installed shall be set true with a plumb line. Both vertical and horizontal lines should be used to assure alignment. Position panels for 1/4" minimum gap at ceiling and floor junctions. Allow larger gap for panels longer than 8'-0". Between panels and division bar moldings, allow 1/8" minimum gap for normal expansion and contraction. Provide 1/8" minimum gap around pipes, electrical fittings and other projections. Prefit each panel before fastening in place. Use carbide-tipped power saw or swivel head shear to cut panels.

SECTION 9N

FIBERGLASS REINFORCED PLASTIC PANELS

2. Fastening

Apply adhesive when temperature is between 50 90 F. Area shall be well ventilated. Follow manufacturer's caution instructions. To panels that have be pre-fitted, spread adhesive over entire back of panel using notched trowel, covering entire panel. See installation guide. Do not skimp on adhesive. Before adhesive skins over, set panel into position and press against wall. Side brace until adhesive is completely cured.

Fastening Alternate for Factory Mutual compliance - use mechanical fasteners per manufacturer's installation guide.

3. Division Bars - Sealed

Provide one-piece vinyl molding division bars between panels and seal both panels into bar at all edges. Apply sealant for a moisture resistant installation as required in manufacturer's instructions.

D. Cleaning

Remove all adhesive and excessive sealant from face of panels using solvent or cleaner recommended by panel manufacturer.

SECTION 10C
MISCELLANEOUS SPECIALTIES

10C-01. GENERAL

- A. Scope
Requirements of the Conditions of the Contract and of Division 1 of these Specifications apply to all work of this section.
- B. Extent of Work (in this section)
Provide all miscellaneous specialties as specified herein and as indicated on the drawings.
- C. Shop Drawings
Submit five (5) sets of shop drawings to Architect for approval.

10C-02. PRODUCTS

- A. Fire Extinguishers and Cabinets
Provide rough-in for fire extinguishers. Locate rough-ins as directed by fire marshal. Verify with fire marshal prior to building occupancy. Locate one (1) 20 BC extinguisher near roof hatch on roof. Fire extinguishers furnished by Costco.

10C-03. EXECUTION

- A. General
Install all miscellaneous specialties per manufacturer's recommendations and as indicated on the Drawings.

SECTION 14A

FIRE SPRINKLER

PART 1 - GENERAL

1.1 WORK INCLUDED

- 1.1.1 Work in this Section includes, but is not necessarily limited to, providing all engineering, calculations, labor, materials, flow and tamper switches, testing, permits and approvals required to design, install and obtain final acceptance of the automatic fire protection sprinkler system complete in all respects.

1.2 RELATED SECTIONS

Section 15I - Plumbing.

1.3 SYSTEM DESCRIPTION

- 1.3.1 The fire protection system shall provide full and complete coverage of all areas of the remodel.
- 1.3.2 The fire protection system shall be compatible with the architectural contract document layouts and avoid interference with work of all other trades in the building. Fire sprinkler contractor to coordinate piping locations with all other trades, and around other trades if necessary.
- 1.3.3 Provide fire protection system in accordance with NFPA Pamphlet 13 (1991 edition), 231 (1990 edition), and 231C (1991 edition).
- 1.3.4 Provide fire protection system complete with all component equipment and material items. Install and test in full conformity with the requirements of all applicable codes, National Fire Protection Association (NFPA) standards, authority having jurisdiction agencies, reviewing consultant, and the owners reviewing consultant.
- 1.3.5 Locate fire sprinkler heads as required in NFPA Pamphlet 13 and 231C (1991 editions). Minimum distance between sprinklers is to be 6 feet or as required by sprinkler manufacturer.
- 1.3.6 Sprinkler heads in finished ceilings shall be symmetrically spaced to provide proper coverage, and to avoid interference with lights, diffusers, grilles, or other ceiling mounted equipment. Heads located in ceiling tile shall not be closer than 12-inches to "T" bars. The head layout shall conform to the typical pattern.

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FIRE SPRINKLER

- 1.3.7 Provide additional standard spray upright sprinklers as required at the roof level in the warehouse area to protect heads from damage by forklifts moving merchandise.
- 1.3.8 Referenced NFPA standards require that the spray deflector on the sprinkler heads be installed 18 inches minimum above the top of the merchandise stored on the racks. In addition, all roof sprinkler deflectors shall be a minimum of 21 feet-6 inches clear above finished floor to allow for 20 feet-0 inch storage throughout the warehouse area.
- 1.3.9 Outside bell shall be connected by the fire protection contractor.
- 1.3.10 Sprinkler system is to be calculated at a maximum of 90% of Authority Having Jurisdiction water flow or a minimum of 5 psi buffer must be used, whichever is worse.
- 1.3.11 Contractor to remove all demolition materials and waste to an approved dumping site.
- 1.3.12 Contractor to be responsible for repairing or replacing items damaged during demolition and construction.
- 1.3.13 Contractor is to patch all holes left unused after sprinkler piping is removed from these holes.
- 1.3.14 Sprinkler systems not a part of demolition shall be left in service.
- 1.4 SUBMITTALS
 - 1.4.1 Submit hydraulic calculations, shop drawings and product data under provisions of the General Conditions and Supplementary Conditions. Shop drawings shall include, but not be limited to, all information contained in a working plan as defined in NFPA 13, 1991 edition. Also, include all one-line format peak calcs, and in areas subject to earthquake brace requirements provide earthquake brace calculations.
 - 1.4.2 Submit hydraulic calculations, shop drawings, and material and equipment lists to the Architect and the local Authority having jurisdiction for their review.
 - 1.4.3 Submit sprinkler system shop drawings and product data for review by, and acknowledgement from, the structural engineer and truss manufacturer prior to ordering or installing the sprinkler system piping.
 - 1.4.4 Deliver all certificates of inspections to the Architect.

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FIRE SPRINKLER

1.5 WARRANTY

- 1.5.1 Provide warranty in accordance with the General Conditions.
- 1.5.2 The Contractor shall further warrant that in the event of the failure of any system or its component equipment items, or the improper functioning thereof, during the period of the warranty, the Contractor shall have available, and on call, competent service personnel for the restoration of all systems and equipment for complete operation. Should the nature of the failure be such as to present an emergency, in the opinion of the Owner, such personnel shall be promptly available, regardless of the hour of the day or the day of the week. Should the failure be such as to fall under the warranty, the cost of the service shall be borne by the Contractor. Otherwise, the Owner will pay therefore at the prevailing rate for such services.
- 1.5.3 If service personnel are not promptly available "on call" as required by the warranty, the Owner may employ such personnel as are available to him at the expense of the Contractor.

PART 2 - PRODUCTS

2.1 MATERIALS

- 2.1.1 All sprinklers and materials shall be as required by applicable codes and standards and must be UL listed or Factory Mutual approved.
- 2.1.2 Sprinkler Heads:
 - 2.1.2.1 155° F, 1/2" orifice, sprinkler heads installed with finished ceilings shall be chrome plated standard pendant type with chrome plated recessed escutcheon.
 - 2.1.2.2 286° F, 17/32" orifice upright sprinkler heads shall be standard bronze finish.
 - 2.1.2.3 212° F, 1/2" orifice exterior sprinkler heads shall be standard bronze finish.
 - 2.1.2.4 286° F, 1/2" orifice dry pendant sprinklers shall be chrome plated, with recessed chrome plated escutcheon.
 - 2.1.2.5 165° F, 1/2" orifice sidewall sprinklers shall be standard bronze finish, and equipped with protective head cage.

SECTION 14A

FIRE SPRINKLER

2.2 SYSTEM DESIGN REQUIREMENTS

- 2.2.1 All bakery, meat cooler, meat prep, and deli areas shall be designed to a density of .15 gpm over hydraulically most demanding 1500 square feet. Sprinklers shall protect a maximum of 130 square feet. 250 gpm shall be added to the demand at the connection to supply of a fire hydrant. This criteria is based on NFPA 13 Ordinary Hazard Group 1.
- 2.2.2 Offices shall be designed to a density of .15 gpm per square foot over the hydraulically most demanding 1500 square feet. Sprinklers shall protect a maximum of 130 square feet. 250 gpm shall be added to the demand at the connection to supply of a fire hydrant. This criteria is based on NFPA 13 Ordinary Hazard Group 1.
- 2.2.3 All dry pipe system areas of calculation to be increased by 30 percent. A C-factor of 100 shall be used in calculations for all dry piping.
- 2.2.4 All calculations must be balanced to within one half of one psi.
- 2.2.5 Inspectors tests to be provided with half inch orifice, discharging at three inches above a hard paved surface. Provide pressure relief valves at inspectors test location on all "grid" type systems.

PART 3 - EXECUTION

- 3.0 All brackets for attaching pipe hangers to building structure shall be the size and type for the intended use and acceptable to the structural engineer and in accordance with NFPA 13, 1991 edition and UL listed or Factory Mutual approved.
- 3.1 INSTALLATION
 - 3.1.1 Furnish and install under this Section all trapeze piping or assemblies, other than building structure, required for proper support of piping and equipment.
 - 3.1.2 Hanger Attachment:
 - 3.1.2.1 Support of pipes with diameter larger than 2 inches may require modification of structural members to support increased loads. Suspend piping and equipment supported by building structure at those locations acceptable to the structural engineer.
 - 3.1.2.2 Do not suspend piping and equipment of any size from 2x joists or the roof deck.

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FIRE SPRINKLER

- 3.1.2.3 Do not attach wood members or steel fabrications for support of hangers to 2x joists or the roof deck.
 - 3.1.2.4 Where a pipe hanger point is not directly below a structural beam, girder, steel joist or wood truss, provide supplementary supporting wood member or steel fabrication to bridge between structural members to receive the hanger. Attach supplementary members to building structure at those locations acceptable to the structural engineer.
 - 3.1.2.5 Earthquake bracing must be provided for piping larger than 2" in diameter as specified in NFPA 13 if required by local jurisdiction. Brace fastener attachment sizes and diameters must be calculated per NFPA 13.
- 3.2 INSPECTION, TESTING AND CLEANING
- 3.2.1 Arrange and pay for all inspections, examinations and tests in full conformity with the requirements of all applicable codes, National Fire Protection Association (NFPA) standards, Authority Having Jurisdiction, and the owner's fire protection consultant as necessary to obtain complete and final acceptance of the fire sprinkler system.
 - 3.2.2 All piping and system components shall be cleaned, and free of oils, greases, and residues at conclusion of installation. The job site and sprinkler system shall be left clean in all respects.

END OF SECTION

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PART 1 - GENERAL

A. DESCRIPTION

1. Outline of Work
Includes plumbing, piping, ventilation, controls and insulation of mechanical work, as specified in this Division and shown on the drawings.
2. Work of Other Trades
 - a. Drawings do not show complete details of construction.
 - b. Refer to other drawings for additional details which may affect execution of the mechanical work.
3. Equipment Furnished by Others
 - a. Rough-in and connect all equipment furnished by Owner, General Contractor, or Electrical Contractor.
 - b. Check drawings and specifications for service characteristics and requirements for each piece of equipment.
4. General Requirement
Conform to Division I.
5. Permits, Inspections and Fees
 - a. Obtain permits and pay fees required by National, State and Local authorities.
 - b. During its progress, the work will be observed by Architect and by the appropriate inspectors.
 - c. Present Inspector's certificates of compliance to the Owner.
6. Underwriter's Listing Equipment
 - a. Equipment with electrical components shall bear the Underwriters' Laboratories Inc. label whenever published standards exist.
 - b. Equipment otherwise shall be certified by the manufacturer as complying with UL standards.
7. Intent of Drawings
 - a. Drawings are diagrammatic and show approximate locations of piping, ducts, fixtures and equipment.
 - b. Take measurements from building or site, and verify with related drawings.
 - c. Report any conflict to Architect prior to proceeding with the work.
 - d. Failure to follow this instruction shall be considered sufficient cause for Contractor to alter work at his own expense, as directed by the Architect.
8. Detail Drawings by Contractor
 - a. Wherever the Contractor's work requires additional detailing, prepare detail drawings to scale 1/4"=1 ft., on tracing paper same size as contract drawings; layout and coordinate work with the work of other trades.
 - b. Such detailing work shall be identified on the drawings as by room number and building column lines.
 - c. Submit these drawings to the Architect for approval.
 - d. At completion, include a set of approved drawings with each set of as-built drawings.

B. SUBMITTALS

1. Submitted Data
 - a. Submit complete bound brochures giving names of, technical data and required information on each item to be furnished. Reference equipment items corresponding to identification method used on the drawings. Submittal shall be in one Bound Volume indexed by Specification Section

SECTION 15010
GENERAL MECHANICAL REQUIREMENT

(use of multiple volumes will be permitted when volume exceeds 1-1/2" thickness). **Incomplete or partial submittals will be returned to the contractor unopened for resubmittal as required above.** Control Diagrams will be accepted separately.

- b. Submit shop drawings and detailed description of items which are not manufactured and which have to be specifically fabricated.
- c. Submit five copies each within 21 days after award of contract. Submit on all equipment.
- d. As-builts, operating instructions, maintenance manuals and tool list.
- e. Pressure vessel certificates.
- f. Air balance report.
- g. Certificates of completion, one year guarantee and inspection certificates by governing authorities.

2. List of Manufacturers of Pipe Valves, Fittings, and Specialties

- a. Submit list of items identifying each by mfr. and model number.
- b. Where more than one manufacturer is listed, advise architect within 21 days after award of contract.

C. **QUALITY**

1. Standards

Perform all work in accord with following codes:

- a. BOCA plumbing, mechanical and Building Codes.
- b. Applicable Energy Code.
- c. American Gas Association.
- d. National Electrical Code.
- e. National Fire Protection Association.
- f. All authorities having jurisdiction.

2. Quality

Materials, products and equipment furnished and installed by the Contractor shall be furnished and installed in strict accordance with all governing codes and ordinances, must be new and of first quality, in line with the best current practices, and as further specified.

3. Quantity

Items of any one classification used in quantity, such as air handling units, fans, pumps, accessories, valves, specialties, cleanouts, drains, fittings, etc., shall be products of one manufacturer only, and used only for services recommended by manufacturer.

4. Approvals

Approval of manufacturer's name or project by architect does not relieve Contractor of responsibility for providing materials and equipment which comply with the detail requirements in contract documents. Contractor assumes responsibility for equipment submitted fitting in available space as indicated by drawings.

5. Workmanship

If the Architect judges any portion of the work to be unsatisfactory, or left in rough unfinished condition, Contractor, at his expense, shall remove and reinstall all such work, patch and paint surroundings satisfactory to Architect.

D. **ELECTRICAL WORK**

1. Control Wiring

The General Contractor must notify his HVAC and Electrical Subcontractors of the information listed below. In order to properly support Price/Costco and insure proper coordination between Trades, the General Contractor shall take note of the following items of responsibility.

SECTION 15010
GENERAL MECHANICAL REQUIREMENT

- a. The Mechanical Contractor is responsible for the following: To provide all equipment scheduled on plans for controls with wall switches, thermostats, interlocks or time clocks. The mechanical contractor shall provide all necessary controls and control wiring to make each system complete and operable. This includes exhaust fans.
- b. The Electrical Contractor is responsible for the following: Service: service and disconnect switches for mechanical equipment will be furnished and installed by Electrical Contractor. Motors will be wired by Electrical Contractor. Flexible conduit limited to short runs to equipment subject to vibration, i.e. motors, fans.
- c. After startup and checkout is complete, the warranty and maintenance responsibilities are as specified in the Contract Documents. All labor warranty is the responsibility of the installing Contractor..

2. Motors and Control

- a. Motors: for all motors 3/4 hp and over provide a magnetic starter having thermal overload - undervoltage protection and push button station. For fractional hp motors not required to have magnetic starters, provide a motor starting switch (manual starter) having built-in thermal overload protection devices to suit Code requirements. Use type with pilot light where switch is remote from motor. Verify motor characteristics with Drawings.
- b. Control: Provide all relays or other control devices necessary to accomplish control functions described.

3. See Section 15050 for Motor, Motor Control specification.

4. Equipment

All electrical equipment furnished under this section of the Specifications shall be in strict accordance with the National Electric Code and shall conform to standard accepted trade practices.

E. **ABBREVIATIONS**

AGA	American Gas Association
AMCA	Air Moving and Conditioning Association
ANSI	American National Standards Institute.
ARI	Air-Conditioning and Refrigeration Institute
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
AWWA	American Water Works Association
CISPI	Cast Iron soil Pipe Institute
MSS	Manufacturers Standardization Society
NFPA	National Fire Protection Association
NEMA	National Electrical Manufacturers Association
PDI	plumbing & drainage institute
UL	Underwriters Laboratory

F. **AS-BUILTS, OPERATING INSTRUCTIONS, MAINTENANCE MANUALS AND TOOLS**

1. As-builts

Furnish one set of as-builts to Architect.

2. Operating Instructions

Provide three sets of approved operating instructions.

3. Maintenance Manuals
Provide three sets of approved maintenance manuals with name, address and 24-hour phone number of firm responsible under warranty.
4. Tools
Furnish in conformance with the General Conditions.
- G. **STORAGE OF MATERIALS**
Make necessary provisions for storing materials at site, to prevent damage or corrosion of materials which are to be incorporated in work.
- H. **CUTTING AND PATCHING**
Cutting and patching shall be kept to a minimum; if required, all patching shall produce results which conform to specifications for new general construction work. Finish to match adjacent work. See Division 1.
- I. **EXCAVATING AND BACKFILL**
Excavating trenches for installation of piping to proper grade and backfill after installation of pipes. See Division 2. Contractor is cautioned not to disturb soil below elevation of adjacent footings without Architects permission. Do not lay piping directly on rock encountered in excavation. Remove rock 8" below grade of pipe and place clean earth in bottom of ditch to level of pipe grade. Remove all form material and debris before backfilling. Backfill with clean material. Use mechanical compaction, compacting backfill in manner and to density as approved by Architect.
- J. **MEASUREMENTS**
Verify space availability by field measurement prior to submitting shop drawings for approval.
- K. **ROUGHING-IN DIMENSIONS**
Obtain roughing-in dimensions for equipment from approved shop drawings or actual equipment measurements.
- L. **MANUFACTURER'S INSTALLATION DETAILS**
Follow where furnished; provide valves or special fittings required, if manufacturer's details are in conflict with design drawings, notify Architect for resolution.
- M. **ACCESSIBILITY**
All equipment requiring periodic servicing or repairs shall be installed in a manner and location to be readily accessible for such maintenance or repairs. Otherwise, obtain Architect's approval of location.
- N. **PROVISION FOR LIGHTING FIXTURES**
In laying out duct and piping work, allow space for light fixtures. If interferences occur, move the piping or ducts.
- O. **OPENINGS IN PIPES AND DUCTS**
Keep closed during construction.
- P. **REJECTED MATERIALS**
Remove all materials which are damaged, or have been rejected from the site.
- Q. **OPERATION OF EQUIPMENT AND SYSTEMS**
Contractor is responsible during all periods of balancing and testing. Provide temporary utilities as required.

R. TESTS

1. Testing and Demonstration

Perform all hydrostatic tests required in codes and ordinances, as well as demonstrating operation of equipment, each test witnessed by Architect. Give sufficient notice before performing such tests. Additional tests are required under Balancing and Testing.

S. INSTRUCTION PERIOD FOR OWNER'S PERSONNEL

1. Scope

Following installation of mechanical equipment and prior to acceptance of mechanical work, representatives of installation tradesmen shall conduct demonstrations and instruction periods to point out locations of servicing points and required points of maintenance to Owner's representatives.

2. Contractor's Representatives

Instructors shall be qualified foremen or superintendents from the trade involved. Their qualifications shall be submitted before conducting the instruction, if requested by Architect.

3. General Description of Instruction Periods

Each period shall include preliminary discussion, and presentation of information from maintenance manuals with appropriate references to drawings; followed by tours of building areas explaining maintenance requirements, access methods, servicing and maintenance procedures and equipment cleaning procedures.

4. Scheduling of Instruction Periods

Notice of Contractor's readiness to conduct such instruction and demonstration shall be given to Architect at least 2 weeks prior to instruction periods, and agreement reached as to date at which instruction periods are to be performed. Receive approvals of proposed data prior to making final arrangements.

T. CERTIFICATIONS

1. Completion of Work

Provide written certification that Contractor has fully completed work in strict accordance with plans and specifications and requesting final inspection (10-day notice).

2. Materials and Workmanship Warranty

Provide written certification that Contractor will replace all materials and workmanship that prove defective for one year after date of acceptance.

3. Inspection

Provide written certification of inspection from the governing building authority, stating that all work has been inspected, accepted and approved as complying with existing governing ordinances and codes.

END OF SECTION

PART 1 - GENERAL

A. WORK INCLUDED

Existing mechanical work is to be altered as shown on the drawings and/or as directed by the Architect. Plan is general in nature and does not show all existing conditions or demolition work. This contractor shall coordinate with all other trades and disconnect/reconnect, extend/relocate, remove or alter, all existing mechanical equipment and piping required to facilitate work in remodel areas. Coordinate with general contractor and Architect for details prior to bid.

B. INSPECTION

Prior to submitting his bid, the M.C. shall inspect the existing facility and thoroughly familiarize himself with all conditions which may affect his contract. Determine plumbing, HVAC, piping, duct work and other misc. items effected by this work. The on-site inspection called for here shall be carried out sufficiently to afford the Contractor with information necessary to include in his bid the cost for all items involved in this project or required for completion of his work. Failure to follow these instructions shall be considered sufficient cause for this Contractor to provide necessary equipment at his own expense, as directed by the Engineer.

C. CUTTING AND PATCHING

Cutting and patching shall be kept to a minimum; if required, all patching shall produce results which conform to specifications for new general construction work. Finish to match adjacent work.

PART 2 - PRODUCTS

A. EXISTING MATERIALS

All materials which are a part of the building shall remain the property of the Owner.

B. EXISTING MATERIAL RE-INSTALLED

Existing materials and equipment that are removed as a part of the work or stored in surplus may be reinstalled as a part of the new system subject to approval of conditions suitability by the Architect/Engineer. The requirements of the specifications (i.e. installation, warranty, testing, etc.) shall apply as if the materials were new, supplied by the Contractor.

C. EXISTING MATERIALS NOT TO BE RE-INSTALLED

1. In coordination with the Architect/Engineer, these materials shall be made available for his inspection and decision as to whether the Owner will retain possession. Items selected for retention shall be delivered to a location on the premises selected by the Owner and turned over to him, take reasonable care to avoid damage to this material. If the Contractor fails to conform to this requirement, he shall purchase and turn over to the Owner replacement materials of like kind and quality.
2. All material not selected for retention by the Owner and debris, shall be disposed of by the Contractor.

PART 3 - EXECUTION

A. EXISTING CONDITIONS

Examine the structure, building, and conditions under which Division 15 work is to be installed for conditions detrimental to proper and timely completion of the work. Do not proceed with work until deficiencies encountered in installation have been corrected.

Report any delay or difficulties encountered in installation of Division 15 work which might be unsuitable to connect with work by other Divisions of this Specifications. Failure to report conditions shall constitute acceptance of other work as being fit and proper for the installation of Division 15 work.

B. DEMOLITION

1. Plumbing, mechanical equipment, ductwork and piping (exposed) no longer of service as a result of this contract shall be removed.
2. Prior to disconnecting or altering any piping or ductwork contractor shall determine areas or devices served by it, and repipe as required to retain system continuity as necessary.

C. CLEAN UP

Remove all debris from the site and dispose of at Contractor's expense. Leave the site in a neat and orderly condition to the approval of the Architect.

END OF SECTION

PART 1 - GENERAL

A. DESCRIPTION

1. General
Provide motors, mounting accessories, painting, color banding, expansion shells and bolts, steel channels, vibration isolation and miscellaneous other basic materials.
2. General Requirement
Conform to Division 1.

B. SUBMITTALS

Items for which submittal requirements specified elsewhere apply are as follows:

1. Shop drawings
Ceiling hanger installation
Vibration isolation bases or frames
Equipment Base Installation Drawings
Information
Equipment Supports
Sleeves Installation
2. Product Data
Motors
Beam Attachments
Ceiling hangers
Vibration Isolation Mountings and Seismic Restraints
Nameplates and Valve Tags
Thermometers and gages
Paint
3. Reports
Balancing Reports
4. Certificates
Pressure Vessels
Inspections

PART 2 - PRODUCTS & MATERIALS

A. MATERIALS AND FABRICATED ASSEMBLIES

1. Structural steel for supports: ASTM A36
 - a. Galvanize members installed in fan plenums or areas of high humidity or condensation, and outside.
 - b. Furnish other members with shop coat of red lead primer.
 - c. Shop fabricate for field assembly using bolts.
 - d. Minimize field welding.
 - e. Retouch primer after field welding.
2. Rain Hood and Flashings
 - a. Stainless steel: Minimum 20 Ga.
 - b. Sheet lead: 8 LB/SF minimum.
 - c. Sheet copper: 24 OZ/SF.

3. Access doors, panels and frames

Style and type as required for material in which installed.

- a. Size: 12x12 inch minimum, as indicated, or as required to allow inspection and removal of items served.
- b. 14 Ga. minimum sheet metal, cadmium-plated or galvanized after fabrication.
- c. Key lock, keyed alike, for panels in public areas. Primer painted.
- d. U/L labeled when in fire-rated construction.
- e. Acceptable manufacturers: Inryco/Milcor; Ventfab; American Warming; and Potter-Roemer.
- f. Provide in walls, floors, and ceilings to permit access to all equipment and piping requiring service or adjustment.

4. Drain Pans

16 Ga. minimum, galvanized steel or black steel bonderized and painted.

- a. Provide satisfactory drainage with outlet connection not less than 1-1/2 inch pipe or tubing. Locate outlet to insure complete drainage of pan.
- b. Insulate with not less than 1/2 inch rigid, water impervious insulation of sprayed or foam-in-place type.
- c. Provide drain line from drain pan to nearest floor drain or as indicated.
- d. Provide in each coil unit.

5. Equipment Guards

- a. Use suitable structural frames with minimum 12 Ga., 3/4 inch galvanized mesh, or expanded metal mesh.
- b. Attach to equipment by removable clips and bolts with wiring nuts, or other approved connectors.
- c. At belts, provide opening for measuring RPMs.
- d. Provide at all belts, couplings, moving machinery and equipment in accord with OSHA.

B. MOTORS

1. General

Motors shall conform to the following unless noted otherwise.

2. Design and Construction

Unless otherwise specified, electric motors and enclosures covered by this specification shall conform to the applicable definitions and requirements of NEMA MG1 "Motors and Generators." (Application for copies should be addressed to the National Electrical Manufacturers Association, 155 East 44th Street, New York, NY 10017.)

3. Nameplates

Provide with a readily visible nameplate containing the information required in NEMA MG1.

4. Manufacturer

Mfr.: General Electric, Westinghouse, Allis-Chalmers, Goulds or U.S. Motors, high efficiency equal to Goulds "E" plus or G.E. "Energy Saver".

5. One-third HP and smaller:

Single phase capacitor type unless noted otherwise; 120 volt or 115/230 volt nameplate rating.

6. One-half HP and larger:

Three-phase, single speed induction type. Nameplate inscription 200/230/460 volt unless otherwise noted, shall be suitable for operation at 480 volts.

7. Service Factor:

Not less than 1.1 NEMA Standard.

8. Construction of Motor frames:

In general, open drip-proof; for motors exposed to the weather, total enclosed or epoxy encapsulated as applicable for the service.

C. **MOTOR CONTROL EQUIPMENT**

Motor control equipment is specified in the electrical work specification; unless specified herein or noted otherwise. For coordination, refer to electrical drawings and specifications. Motor control specified in Division 15 shall be provided with the mechanical equipment and meet the requirement of Division 16, Electrical.

D. **SLEEVES**

1. General

Shall be Schedule 40 black or galv steel pipe with unthreaded ends where piping passes through any floor slab. Other sleeves sheet steel as factory made sleeves or Miracle or Adjus-to-Crete mfr., or Sinco wall/slab sleeves.

2. Sealant

Provide per Section 07900, Sealants; use silicone Rubber Base Sealant - One Component.

E. **EXPANSION SHELLS AND BOLTS**

1. Expansion Shells for Rod Hangers

Phillips self-drilling anchors, Gregory "Bulldog" Omark "Drill Anchors", or Fastite shells, in holes drilled in structural concrete.

2. Expansion Bolts for Equipment

USM "Molly Parabolit", or McCullough "Kwik-Bolt" in holes drilled in concrete.

F. **FORMED STEEL CHANNELS AT SLAB**

1. Channels

12 gage min. 1-3/8" x 1-5/8" min. cross-section size; Uni-strut, Powerstrut, Storack, Fee & Mason, or Elcen Mfr.

2. Locations of Channels

Neat and workmanlike, parallel to walls; max. spacing 5 ft. on centers in general, measured along the length of the pipe.

3. Attachment of Channels to Slab

Attach to inserts in slab on 36" max. spacing, with one attachment to embedded insert within 3" of end of each channel.

4. Attachment of Hanger to Channels

Provide mfr.'s standard locking type inserted nuts, or same mfr. as channel, and attach hangers thereto.

G. **WELDING TO BUILDING STRUCTURAL MEMBERS**

Not allowed except as shown or noted on the drawings.

H. **VIBRATION ISOLATION MOUNTINGS AND SEISMIC RESTRAINTS**

1. General

Provide as specified under equipment sections of these specifications.

2. Manufacturers

Vibration isolation mountings shall be as manufactured by Amber/Booth, Consolidated Kinetics, Vibration Eliminator Co., Vibrations Mountings Inc., Korfund, Mason, or approved equal.

3. Type

Spring isolation shall be of the stable spring type, housed or unhoused with or without rubber inserts as indicated. Provide a 1/2" thick pad of waffle type rubber damper material between the mount and the bearing surface. Spring shall be sized per manufacturer's recommendations. Provide anchor bolts for each mounting. Seismic restraint may be integral with the spring mount or provided as a separate snubber assembly, as required.

4. Exceptions

Unitary equipment with internal isolators for all rotating equipment meeting the requirements of this specification requires no additional isolation; except, where floor or curb mounted, provide a 1/2" thick pad of waffle type rubber damper material between the unit and the bearing surface.

I. **NAMEPLATES AND VALVE TAGS**

1. Nameplates

Make of laminated black plastic with lettering cut through to white background. (Plastic strips with raised letters made by a marking device are not acceptable.)

2. Valve Tags

Shall be of 0.030 " thick brass or stainless steel 1" x 2-1/2" size; shall state the service and destination of the line controlled. Tag inscriptions shall be made with a lettering device; 5/16" high cut lettering. Laminated plastic tags, construction similar to nameplates, will also be acceptable.

J. **PIPING IDENTIFICATION**

1. Piping throughout the building shall be identified with W.H. Brady Co. B-946, or approved equal, meeting or exceeding ANSI A13.1-1981. Pipe markers shall consist of an arrow in direction of flow, color, and wording as indicated in the following schedule. Stencils shall be visibly located and spaced on maximum 20'-0" centers for long straight pipe runs.

2. Color Code: In accordance with the following standards:

<u>SERVICE</u>	<u>COLOR</u>	<u>STENCIL</u>
Domestic Cold Water	Blue	C.W.
Domestic Hot Water	Red	H.W.
Domestic Hot Water Circulating	Red	H.W.C.
Condensate Lines	Green	C.
Gas Piping	Yellow	GAS

K. SPECIAL MAINTENANCE MATERIALS

For equipment requiring frequent replacement of maintenance materials, such as filters, lubricants, etc., provide a 3-month supply to the Owner, together with grease guns or other application devices and instructions. Submit list of equipment and required maintenance materials and frequency of service to architect for approval.

L. PIPE THERMOMETERS

1. General

Locally mounted temperature indicators shall be bi-metallic thermometers with five-inch dial, corrosion-and weather-proof case, 316 stainless steel stem, and suitable for back-mounting in standard thermowells. Range shall be 30-130 deg F for cold water and 0-250 deg F for hot water; otherwise to suit service. Accuracy shall be + 1% of range.

2. Location

If necessary for operating visibility, or in vibrating service, a dial thermometer with filled thermal system of sufficient capillary tubing length shall be used.

3. Installation Limitations

Thermowells shall have two-inch lagging extension where installed on insulated piping.

4. Manufacturers

Temperature indicators shall be industrial grade: American, Ashcroft, Palmer, Terice, Weksler or approved equal.

M. PRESSURE GAGES

1. Pressure gages: ANSI B40.1 - 1974 Grade A.

- a. Provide as indicated.
- b. Acceptable manufacturers: Ashcroft; U.S. Gage; Terice; American; March; Duragage; and Weksler.
- c. Run one-quarter inch hard temper copper tubing from gage with a 1/4 inch angle shutoff valve to its respective pipe connection.

2. Calibration

Properly calibrate and zero all gages at job site for pressure head and temperature in accord with manufacturer's instructions.

3. Size

Unless code requires otherwise, provide pressure gages with 4-1/2 inch dial, surface or flush type as required, with white faces, black numerals, black pointers, bronze bourdon tubes.

4. Pressure gage characteristics

	Range PSIG	Fig. Interval PSIG	Inter. Graduations PSIG
a. Domestic	0-150	20	2
b. Compressed air	0-150	20	2

5. Service

Use pressure gages suitable for service intended. Install siphons in accord with gage manufacturer's recommendations and best practices of trade.

PART 3 - EXECUTION

A. MOTORS

Install motor per manufacturer's recommendation and properly align with driven device.

B. CONTROL WIRING

Install per current National Electrical Code and Division 16, Electrical.

C. INSTALLATION OF PIPE SLEEVES

1. General

Provide pipe sleeve where pipe passes through wall or floor and at other locations indicated. Sleeves through floor should project 1-inch above finished floor.

2. Diameter

Provide minimum of 1/2 inch radial clearance beyond pipe and pipe plus insulation, where required. Extend sleeve full thickness of wall or floor.

3. Installation

Set sleeves in place prior to pouring of concrete in new construction; core drill and grout sleeves in place for unit masonry construction and existing construction. Fasten sleeves to wood forms with centered lag screws or nails. Attach sleeves to metal forms with Kalon type "U" drive screws and sheet metal clips.

4. Sealing

Where pipes pass through fire-rated walls, or floors, place fire caulking material, in accordance with UL 1479, between pipe and pipe sleeve for full length of sleeve to maintain fire rating. Where pipes pass through non-rated walls or floors, caulk space between pipes and pipe sleeves with oakum and caulk both ends with non-hardening silicone construction sealant. Where pipes pass through walls below grade, provide compression seal as indicated.

D. EXPANSION SHELLS AND BOLTS

Expansion shells and expansion bolts shall be used only where shown to hang piping or equipment from concrete slabs or walls.

E. FORMED STEEL CHANNELS AT SLABS

1. Scope

At locations shown, and also wherever groups of these pipes or more in a 24" width are suspended from slabs, provide formed steel channels bolted to concrete inserts embedded in slab; length to extend across all pipes and 6" beyond outermost pipes; and suspend hangers for piping from these channels.

2. Locations of Channels

Neat and workmanlike, parallel to walls; spacing 5 ft. on centers in general, measured along the length of the pipe.

3. Attachment of Channels to Slab

Attach to inserts in slab on 36" max. spacing with one attachment to embedded insert within 3" of end of each channel.

4. Attachment of Hangers to Channels

Provide manufacturer's standard locking type inserted nuts, of same manufacturer as channel, and attach hangers thereto.

F. VIBRATION ISOLATION MOUNTINGS AND SEISMIC RESTRAINTS

Vibration isolation mountings and seismic restraints shall be provided for all rotating machinery, as shown. Install mountings and anchor bolts.

G. NAMEPLATES AND VALVE TAGS

1. Nameplates

Provide for all equipment, except equipment upon which name has been painted (See H. below)

2. Valve Tags

Provide wherever the destination or identity of the line is not visible from the valve; fastened with chain to the valve stem.

H. PAINTING OF NAMES OF EQUIPMENT

Lettering shall be done by stenciling; shall be proportional to the size of the equipment and in contrasting color. Generally, 2" high letters will be the max. requirement.

I. EARTHWORK

1. Scope

Do all earthwork required for the installation of mechanical work in the ground.

2. Excavation

Do as necessary for the installation of the work.

3. Trench Excavation

Trenches shall be of the necessary width for proper laying of pipe, with banks as nearly vertical as possible. Trench bottoms shall be accurately graded to provide uniform undisturbed bedding for each section of pipe, along its entire length. The holes and depressions for joints shall be formed after trench bottom has been graded. Provide temporary pumping equipment to keep the excavation free from water. Pipe bedding in rock excavation shall consist of not less than six inches of sand or equivalent material.

4. Bracing and Shoring

Bracing and shoring shall be provided.

5. Backfilling

Backfill trenches only after completion of pressure tests and inspection by the Architect. Fill spaces between pipe and sides of trench by hand, shovel tamped in place. Cover in 6-inch layers to thickness of 12 inches over top of pipe. Fill and tamp remainder of backfill material in 1 foot layers. Backfill materials generally shall be clean earth or sand relatively free of clods or stones. For sewer and water piping, use pea gravel under, around and to 6 inches above top piping. Gas and water piping shall be the same except that sand shall be used instead of pea gravel. In addition, wherever paving or future paving is indicated over backfill, the remainder of the backfill shall be granular subgrade backfill material (Butler fill).

6. Compacting:

Compacting shall be performed individually, for each layer of 6" max. loose thickness of backfill. Where roadway or parking area surfaces are to be placed over backfill, it shall be placed at a moisture condition which will produce max. density; elsewhere, 90%. Measurement in accordance with Method D of AASHTO Standard T-180.

7. Surplus Earth:

Contractor shall dispose of surplus earth.

8. Barricades

Barricades, construction signs, torches, red lanterns and guards, as required, shall be placed and maintained during periods of open excavation as necessary to protect persons from injury and to avoid property damage.

9. Clean-up
Leave premises thoroughly clean at completion.

J. BURIED PIPING

Wherever any piping is to be installed in areas which have been excavated below pipe inverts, for any purpose, install the piping in compacted backfill. Do not install the piping until the backfill is at specified compaction has been completed up to a level of 18" or more above the level of the installed pipe; then, the piping shall be installed in trenches which have been re-excavated through the backfill.

K. BALANCING WORK

1. General

The Contractor, as part of his contract, shall obtain services of a qualified testing agency not affiliated with the General Contractor or his Sub-Contractors. Prior to commencing work under this section of specifications, testing agency shall have been approved by Architect and shall be a certified member of Associated Air Balance Council or shall have submitted adequate documentation to satisfy Architect of his competence. Minimum qualifications for acceptance shall be General Membership standards of Associated Air Balance Council, as published in AABC "National Standards for Field Measurements and Instrumentation - Total System Balance," Volume One, No. 81266. Balancing agency and personnel shall be unrelated to sale or installation of system and control equipment.

2. Procedures

Balancing will be accomplished in accordance with schedules approved by the Owner. Procedures, in general, will be in accordance with the Associated Air Balance Council's "National Standards for Field Measurements and Instrumentation - Total System Balance," Volume One, No. 81266. Contractor shall also comply with the applicable procedures outlined under duct leakage tests of this specification.

3. Qualifications

Contractor shall submit name of agency he proposes to employ to the Architect for approval within two weeks after award of the contract. Submittal shall further include certified individual qualifications of all persons responsible for supervising and performing actual balancing, the name of certifying engineer and qualifications of Registered Professional Engineer certifying the report.

4. Instruments

All instruments used for measurements shall be accurate and calibration histories for each instrument will be available for examination. Method of application of instrumentation shall be per AABC Procedure.

5. Air Balance Testing Procedure

- a. Perform tests and balance system in accord with following:
- b. Test and adjust equipment RPM to design requirements.
- c. Test motor load amperes.
- d. Test system static pressures.
- e. Test and adjust system for design CFM.
- f. Test and adjust each grille to within 10 percent of design requirements.
 - 1) Identify location and area of each grille.
 - 2) Identify and list size, type and manufacture of grilles.
 - 3) Use manufacturer's ratings on all equipment to make required calculations.
- g. Make any changes in pulleys, belts, and dampers, or add dampers required for correct balance at no additional cost to Owner.

6. Certified Reports

Three copies of reports, covering air balance. The reports shall be certified by a Registered Professional Engineer who is versed in the field of air and water balancing, Certification shall include adherence to agenda, calculation procedure and final summaries.

L. **EQUIPMENT INSTALLATION**

1. General

Necessary supports shall be provided for all equipment, appurtenances and pipe as required; these include frames or supports for chillers, pumps, cooling towers, air handling units, and fans.

2. Equipment Supports

Equipment shall not be hung from concrete floors; provide hangers from structure as required; span between structural members with additional structural steel as required to mount equipment in locations shown.

END OF SECTION

PART 1 - GENERAL

A. DESCRIPTION

1. General
Provide piping, fittings, supports, hangers and miscellaneous system accessories.

B. SUBMITTALS

Items for which submittal requirements specified elsewhere apply are as follows:

1. Product data Submit for:
Pipe and fittings
Valves
Gaskets
Strainers
Unions
Dielectric unions
Escutcheon plates
Balancing/Measuring Valves
Pipe hangers
Hose end drain valves
Solder
Pipe and wall seal

2. Certificates
Submit for welders.

C. DIAGRAMS

1. Schematic
Diagrams showing pipe connections are schematic only. Do not use for calculating lineal runs or number and types of fittings.
2. Scale and detail
The drawings do not show exact details of piping. No extra payments for offsetting due to obstructions will be made.

D. GENERAL REQUIREMENTS

Conform to Division 1, of these specifications.

PART 2 - PRODUCTS

A. MANUFACTURER

1. Acceptable mfrs. for pipes, fittings, valves, flanges, and gaskets:
Listed below or specified.
 - a. Steel pipe: U.S. Steel, "National", Bethlehem, Youngstown, Republic Tube or Jones & Laughlin.
 - b. Copper tubing: Chase, Anaconda, Revere, Mueller, Phelps-Dodge, Reading Tube or Bridgeport.
 - c. Fittings: Aeroquip, Grinnell, Grabler, Stockham, Walworth, Kuhns, Flagg, Fraters, Nibco, Tube Turns, Crane, Anaconda, Chase, Revere, Phelps-Dodge, Bridgeport, Tube Forgings of America, Vogt Acheson or Bonney Forge.

- d. Valves: Crane, Lunkenheimer, Keystone, Jenkins, Walworth, Kennedy, Stockham, Nibco, W-K-M, Milwaukee, Powell, Dezurik, Homestead or Ohio.
- e. Gaskets: Crane, Garlock, U.S. Rubber, Anchor, Flexitallic.
- f. Strainers: Armstrong, McAlear, Sarco, Hoffman, Crane or Nicholson.
- g. Shaped Nipples: Allied or Bonney Forge.

B. VALVES

1. General: Except as otherwise indicated, provide factory - fabricated valves of type, body material, and pressure class indicated. Provide pressure class selected from MSS or ANSI standards based on maximum pressure and temperature in piping system. Except as otherwise indicated, provide valves size same as connecting pipe size, and ends suitable for piping material.
2. Gate Valves
 - a. Packing: Design for repacking under pressure when fully opened. Equip with packing suitable for intended service. Design so back seating protects packing and stem threads from fluid when valve is fully opened. Equip with gland follower.
 - b. Comply with following standards: Cast iron valves: MSS SP-70; bronze valves: MSS SP-80; Steel valves: ANSI B16.34.
 - c. For Domestic Water Service:
 - 1) Threaded Ends 2" and Smaller: Class 125, bronze body, union bonnet, rising stem, solid wedge.
 - 2) Flanged Ends 2-1/2" and Larger: Class 125, iron body bronze mounted, bolted bonnet, rising stem, OS & Y, solid wedge.
 - 3) Solder Ends 2" and Smaller: Class 125, bronze body, screwed bonnet, nonrising stem, solid wedged.
3. Globe Valves:
 - a. Packing: Design for repacking under pressure when fully opened. Equip with packing suitable for intended service. Design so back seating protects packing and stem threads from fluid when valve is fully opened. Equip with gland follower.
 - b. Composition Discs: Where used, provide suitable material for intended service. For steam throttling service, fit composition disc valve with throttling nut. For metal seated globe valves, provided hardened stainless steel disc and seat ring.
 - c. Comply with the following standards:
 - 1) Bronze valves: MSS SP-80
 - 2) Steel valves: ANSI B16.34
 - d. For Domestic Water Service:
 - 1) Threaded ends 2" and smaller: class 150, bronze body, union bonnet, rising stem, composition disc.
 - 2) Solder ends 2" and smaller: Class 125, bronze body, screwed bonnet, rising stem, composition disc.
 - 3) Flanges ends 2-1/2" and larger: Class 125, iron body, bolted bonnet, rising stem, OS & Y, renewable seat and disc.
 - e. Drain Valves For Low Pressure Drainage Service:
 - 1) Threaded end 2" and smaller: Class 125, bronze body, screwed bonnet, rising stem, composition disc, 3/4" hose outlet connection.
 - 2) Solder ends 2" and smaller: Class 125, bronze body, screwed bonnet, rising stem, composition disc, 3/4" hose outlet connection.
4. Swing Check Valves:
 - a. General: Support hanger pins on both ends by removable side plugs. Design disc and hanger as separate parts, and mount so disc can rotate.
 - b. Comply with following standards:

- 1) Cast iron valves: MSS SP-71
 - 2) Bronze valves: MSS SP-80
 - 3) Steel valves: ANSI B16.34
 - c. For Domestic Water Service
 - 1) Threaded ends 2" and smaller: Class 125, bronze body, screwed cap, horizontal swing, bronze disc.
 - 2) Solder ends 2" and smaller: Class 125, bronze body, screwed cap horizontal swing, bronze disc.
 - 3) Flanged ends 2-1/2" and larger: Class 125, iron body bronze mounted, bolted cap, horizontal swing, cast iron disc.
5. Ball Valves:
- a. General: Design port area equal to or greater than connecting pipe area, include seat ring designed to hold sealing material. Comply with MSS SP-72 for cast iron valves, ANSI B16.34 for steel valves.
 - b. For Domestic Water Service:
 - 1) Threaded ends 2" and smaller: Class 125, bronze 2 piece body, bronze ball, bronze stem.
 - 2) Solder ends 2" and smaller: Class 125, bronze 2 piece body, bronze ball, bronze stem.
- C. **PIPING MATERIALS**
1. General: Provide pipe and tube of the type, grade, size and weight (wall thickness or Class) indicated for each service. Comply with governing regulations and industry standards.
 2. Steel Pipe:
 - a. Black Steel Pipe: ASTM A-53 seamless or A-120 except comply with ASTM A-53 seamless where close coiling or bending is required.
 - b. Galvanized Steel Pipe: ASTM A-53 or A-120; except comply with ASTM A-53 where close coiling or bending is required.
 3. Copper Tube:
 - a. Copper Tube: ASTM B-88; Type (wall thickness) as indicated for each service; hard-drawn temper, except as otherwise indicated.
 - b. DWV Copper Tube: ASTM B-306.
 4. Cast-Iron Pressure Pipe: ANSI A21.12.
 5. Ductile-Iron Pipe: ANSI A21.51.
 6. Cast-Iron soil Pipe:
 - a. Hubless Cast-Iron Soil Pipe: CISPI 301-75 include coupling assembly.
 7. DWV Pipe and Fittings: (if permitted by local codes).
Building drain, waste & vent pipe & fittings shall meet ASTM standards D2661-81 a, D3311-82, F628-81 for ABS systems.
- D. **PIPE/TUBE FITTINGS**
1. General: Provide factory-fabricated fittings of the type, materials, grade, class and pressure rating indicated for each service and pipe size. Provide sizes and types matching pipe, tube valve, or equipment connection in each case. Where not otherwise indicated, comply with governing regulations and industry standards for selections, and with pipe manufacturer's recommendations where applicable.

2. Fittings for Steel Pipe:
 - a. Cast-Iron Flanged Fittings: ANSI B16.1, Class 125, including bolting.
 - b. Malleable Iron Threaded Fittings: ANSI B16.3, Class 150; plain or galvanized as indicated.
 - c. Malleable Iron Threaded Unions: MSS SP-76; selected by installer for proper piping fabrication and service requirements, including style, and connections, and metal-to-metal seats (iron, bronze or brass); plain or galvanized as indicated.
 - d. Threaded Pipe Plugs: ANSI B16.14.
 - e. Steel Flanges/Fittings: ANSI B16.5, including bolting and gasketing of the following material group, and connection and facing, except as otherwise indicated.
 - f. Corrosion-Resistant Cast Flanges/Fittings: MSS SP-51, including bolting and gasketing.
 - g. Forged-Steel Socket-Welding and Threaded Fittings: ANSI B16.11, except MSS SP-79 for threaded reducer inserts; rated to match schedule of connected pipe.
 - h. Wrought-Steel Butt-welding Fittings: ANSI B16.9, except ANSI B16.28 for short-radius elbows and returns; rated to match connected pipe.
3. Cast-Iron Threaded Drainage Fittings: ANSI B16.22
4. Forged Branch-Connection Fittings: Except as otherwise indicated, provide the type as determined by the installer to comply with installation requirements.
5. Pipe Nipples: Fabricated from same pipe as used for connected pipe; except do not use less than Schedule 80 pipe where length remaining unthreaded is less than 1-1/2", and where pipe size is less than 1-1/4", and do not thread nipples full length (no close-nipples).
6. Fittings for Copper Tube:
 - a. Wrought-Copper Solder-Joint Drainage Fittings: ANSI B16.29.
 - b. Copper-Tube Unions: Provide standard products recommended by the manufacturer for use in the service indicated.
7. Fittings for Cast-Iron Soil Pipe:
 - a. Hubless Cast-Iron Soil Pipe Fittings: CISPI 301-75; and complying with governing regulations.

E. GROOVED PIPING PRODUCTS

1. General: Except as otherwise indicated, provide products recommended by the manufacturer for use in the service indicated, as published in the manufacturer's product literature, and complying with one of the following:
2. Grooved-End Fittings: Fabricate from malleable iron.
3. Pipe Fittings: Comply with ANSI B16.1 for end-to-end and center-to-end dimensions.
4. Flanged Fittings: Comply with ANSI B16.1 for bolt-hole dimensioning, materials and flange-thickness.

F. MISCELLANEOUS PIPING MATERIALS/PRODUCTS

1. Insulating (Dielectric) Unions: Provide standard products recommended by the manufacturer for use in the service indicated, and which isolate ferrous from non-ferrous piping.
2. Welding Materials:
Comply with Section 2-C, ASME Boiler Code for welding materials.
3. Soldering Materials:
 - a. Tin-Antimony Solder: ASTM B 32, Grade 95/5 solder water piping.

b. Silver Solder: ASTM B 32, Grade 96.5TS.

4. Brazing Materials:

Comply with Section 9, ASME Boiler Code for brazing materials.

5. Gaskets for Flanged Joints: ANSI B16.21; full-faced for cast-iron flanges; raised-face for steel flanges, unless otherwise indicated.

6. ABS Solvent Cements: ASTM D-2235.

7. Escutcheon Plates: Metal split-ring units, with nickel or chrome plated finish except primed-for-painting finish where painted finish is indicated for adjoining surface. Provide units sized to fit outside of pipe insulation or bare pipe where no covering is indicated. Where sleeves extend above floor finish, provide units with sufficient depth to conceal sleeves.

G. **FABRICATED ACCESSORIES**

Drip-Pans: Provide drip-pans fabricated from corrosion - resistant sheet metal with watertight joints, and with edges turned up 2.5" and reinforce either by structural angles or by rolling over 0.25" steel rod; provide flanges for drain connections.

H. **HORIZONTAL-PIPING HANGERS AND SUPPORTS**

1. General: Except as otherwise indicated, provide factory - fabricated horizontal piping hangers and supports of MSS type and size indicated, bolts (if any) and washers; comply with MSS SP-58 and manufacturer's published product information. Where MSS type or size is not indicated, comply with MSS SP-69 and manufacturer's published product information; size hangers and supports properly for piping, including insulation (if any).

2. Adjustable Clevis Hanger: MSS Type 1, fabricated from steel.

3. Adjustable Band Hanger: MSS Type 7, fabricated from steel.

4. Adjustable Swivel-Band Hanger: MSS Type 10.

5. Clamp: MSS Type 4.

6. Double-Bolt Clamp: MSS Type 3, including pipe spacers.

I. **VERTICAL-PIPING CLAMPS**

1. General: Except as otherwise indicated, provide factory - fabricated vertical-piping clamps of type and size indicated; comply with manufacturer's published product information. Where type or size is not indicated, comply with manufacturer's published product information. Size clamps properly for piping, including insulation (if any).

2. Two-Bolt Riser Clamp: MSS Type 8.

J. **HANGER-ROD ATTACHMENTS**

1. General: Except as otherwise indicated, provide factory-fabricated hanger-rod attachments of type and size indicated; comply with manufacturer's published product information. Where type or size is not indicated, comply with manufacturer's published product information. Size attachments properly for piping, including insulation (if any).

2. Turnbuckles: MSS Type I3.
3. Weldless Eye-Nut: MSS Type I7.
4. Malleable Eye-Socket: MSS Type I4.
5. Clevises: MSS Type 14.

K. BUILDING ATTACHMENTS

1. General: Except as otherwise indicated, provide factory- fabricated building attachments of type and load-rating indicated; comply with manufacturer's published product information. Where type or load-rating is not indicated, comply with manufacturer's published product information. Size units for the piping loading.
2. Concrete Inserts: MSS Type 18, steel.
3. Top Beam C-Clamp: MSS Type 19.
4. Steel C-Clamps: MSS Type 23, steel.
5. Malleable Iron C-Clamps: MSS Type 23, malleable iron.
6. Single-Side Clamp: MSS Type 25.
7. Top I-Beam Clamp: MSS Type 25.
8. Side Beam Clamp: MSS Type 20.
9. Beam Clamp/Eye-Nut: MSS Type 28
10. Wide-Flange Beam Clamp/Eye-Nut: MSS Type 29.
11. Beam Clamp/Extension Piece: MSS Type 30.

L. SADDLES AND SHIELDS

1. General: Except as otherwise indicated, provide factory- fabricated saddles and shields of MSS type and size indicated; comply with MSS SP-58 and manufacturer's published product information. Where MSS type or size is not indicated, comply with MSS SP-69 and manufacturer's published product information. Size saddles and shields for insulation and vapor barrier (if any).
2. Protection Saddles: MSS Type 39.
3. Protection Shields: MSS Type 40.

PART 3 - EXECUTION

A. INSTALLATION OF VALVES

1. General: Except as otherwise indicated, comply with following requirements.
 - a. Install valves where required for proper operation of piping and equipment, including valves in branch lines where necessary to isolate sections of piping. Locate valves so as to be accessible and so that separate support can be provided when necessary.

- b. Install valves with stems pointed up, in vertical position where possible, but in no case with stems pointed downward from horizontal plane unless unavoidable.
- 2. Selection of Valve Ends (Pipe Connections): Except as otherwise indicated, select and install valves with following ends or types of pipe/tube connections:
 - a. Tube Size 2" and Smaller: Solder-joint valves.
 - b. Pipe Size 2" and Smaller: One of the following, at Installer's option: threaded valves, butt-welding valves, socket-welding valves, flanged valves, flangeless valves, or single flange valves.
 - c. Pipe Size 2-1/2" and Larger: One of the following, at Installer's option: butt-welding valves, socket-welding valves, flangeless valves, or single flange valves.

B. INSTALLATION OF PIPE

- 1. General: Install pipe tube and fittings to achieve leak proof piping systems, capable of performing indicated service. Install each run with a minimum of joints and couplings, but with accessible unions for disassembly and maintenance/ replacement of valves and equipment. Reduce sizes (where indicated) by use of reducing fittings. Align piping accurately at connections, within 1/16" misalignment tolerance.
- 2. Comply with ANSI B31 Code for Pressure Piping. Locate piping runs, except as otherwise indicated, vertically and horizontally (pitched to drain) and avoid diagonal runs. Orient horizontal runs parallel with walls and column lines. Locate runs as shown or described by diagrams, details and notations or, if not otherwise indicated, run piping in the shortest route which does not obstruct usable space or block access for servicing the building and its equipment. Hold piping close to wall, overhead construction, columns and other structural and permanent-enclosure elements of the building; limit clearance to 0.5% where furring is shown for enclosure or concealment of piping, but allow for insulation thickness, if any. Where possible, locate insulated piping for 1.0" clearance outside insulation. Wherever possible in finished and occupied spaces, conceal piping from view, by locating in column enclosures, in hollow wall construction or above suspended ceilings; do not encase horizontal runs in solid partitions.
- 3. Electrical Equipment Spaces: Do not run piping through transformer vaults and other electrical or electronic equipment spaces and enclosures:
- 4. Piping System Joints: Provide joints of the type indicated in each piping system.
 - a. Thread pipe in accordance with ANSI B2.1; cut threads full and clean using sharp dies. Ream threaded ends to remove burrs and restore full inside diameter. Apply pipe joint compound, or pipe joint tape, (Teflon) where recommended by pipe/fitting manufacturer, on male threads at each joint and tighten joint to leave not more than 3 threads exposed.
 - b. Braze copper tube-and-fitting joints where indicated, in accordance with ANSI B31. All underground water lines to have brazed joints.
 - c. Solder copper tube-and-fitting joints where indicated, in accordance with recognized industry practice. Cut tube ends squarely, ream to full inside diameter, and clean outside of tube ends and inside of fittings. Apply solder flux to joint areas of both tubes and fittings. Insert tube full depth into fitting, and solder in a manner which will draw solder full depth and circumference of joint. Wipe excess solder from joint before it hardens. Notching of copper tubing for connections will not be permitted.
- 5. Weld pipe joints in accordance with ANSI B31 and as follows:
 - a. Weld pipe joints only when ambient temperature is above 0 degrees F where possible.
 - b. Bevel pipe ends at a 37.5 degree angle where possible, smooth rough cuts, and clean to remove slag, metal particles and dirt.
 - c. Install welding rings for butt-welded joints, sizes, 6" and larger.
 - d. Use pipe clamps or tack-weld joints with 1.0" long welds; 4 welds for pipe sized to 10", 8 welds for pipe sizes up to 20".

- e. Build up welds with a stringer-bead pass, followed by a hot pass, followed by a cover or filler pass. Eliminate valleys at center and edges of each weld. Weld by procedures which will ensure elimination of unsound or unfused metal, cracks, oxidation, blow-holes and non-metallic inclusions.
 - f. Do not weld-out piping system imperfections by tack-welding procedures; refabricate to comply with requirements.
 - g. Install forged branch-connection fittings wherever branch pipe is indicated, or install regular "T" fitting (at Contractor's option).
 - h. Install forged branch-connection fittings wherever branch pipe is of size smaller than main pipe is indicated, or install regular "T" fitting (at Contractor's option).
5. Flanged Joints: Match flanges within piping system, and at connections with valves and equipment. Clean flange faces and install gaskets. Tighten bolts to provide uniform compression of gaskets.
6. Hubless Cast-Iron Joints: Comply with CISPI Standard HSN-75.
7. Grooved Pipe Joints: Comply with fitting manufacturer's instructions for making grooves in pipe ends. Remove burrs and ream pipe ends. Assemble joints in accordance with manufacturer's instructions.
8. Insulating (Dielectric) Unions: Comply with manufacturer's instructions for installing unions. Install unions in a manner which will prevent galvanic action and stop corrosion where the joining of ferrous and non-ferrous piping is indicated.
9. Install drainage piping (perforated, porous or tile) from lowest end of slope to highest, solidly bedded in filtering or drainage fill. Shape bed for bells of piping (if any). Place bells/hubs and grooved ends of units upstream. Lay perforated pipe with perforations down.
10. Solvent Weld (PVC): As recommended by manufacturer.

C. INSTALLATION OF MANUFACTURED PRODUCTS

1. Escutcheons: Install escutcheon plates at pipe sleeves where piping is exposed to view in occupied spaces of the building, on the exterior, and elsewhere as indicated.

D. INSTALLATION OF HANGERS AND SUPPORTS

1. General: Install hangers, supports, clamps and attachments to support piping properly from building structure. Arrange for grouping of parallel runs of horizontal piping to be supported with maximum spacings. Where piping of various sizes is to be supported together by trapeze hangers, space hangers for smallest pipe size or install intermediate supports for smaller diameter pipe. Support spacing shall be in accordance with maximum spacing listed on table at the end of this section. Do not use wire or perforated metal to support piping, and do not support piping from other piping.
- a. Install hangers and supports complete with necessary inserts, bolts, rods, nuts, washers and other accessories. Except as otherwise indicated for exposed continuous pipe runs, install hangers and supports of same type and style as installed for adjacent similar piping.
 - b. Support fire-water piping independently of other piping.
 - c. Prevent electrolysis in support of copper tubing by use of hangers and supports which are copper plated, or by other recognized industry methods.
2. Provisions for Movement:
Install hangers and supports to allow controlled movement of piping systems and to permit freedom of movement between pipe anchors, and to facilitate action of expansion joints, expansion loops, expansion bends and similar units.

3. Load Distribution: Install hangers and supports so that piping live and dead loading and stresses from movement will not be transmitted to connected equipment.
4. Insulated Piping: Comply with the following installation requirements.
 - a. Clamps: Attach clamps, including spacers (if any), to piping with clamps projecting through insulation; do not exceed pipe stresses allowed by ANSI B31.
 - b. Shields: Where low-compressive-strength insulation or vapor barriers are indicated on cold water piping, install coated protective shields. For pipe 8" and over, install wood insulation saddles.
 - c. Saddles: Where insulation without vapor barrier is indicated, install protection saddles.

E. INSTALLATION OF PIPE HANGERS

1. General: Space hangers and supports to prevent sagging and reduce strain on valves and specialties with spacing no greater and rod no smaller than shown in the following table. Hangers shall allow for expansion and contraction.

- a. Ferrous piping and copper tubing:

Diameter of Piping	Maximum Spacing	Rod Size
1/2" through 1-1/2"	6 ft.	3/8"
2" through 3"	10 ft.	1/2"
4" through 5"	12 ft.	5/8"
6" and larger	16 ft.	3/4"

- b. Cast iron piping:

Diameter of Piping	Maximum Spacing	Rod Size
2" and 3"	Each Joint	3/8"
4" and 5"	Each joint	1/2"
6" and 8"	Each joint	3/4"
10" and 15"	(two hangers)	3/4"

2. Painting of Base Supports: Refer to painting work sections of these specifications.

F. ADJUSTMENT OF HANGERS AND SUPPORTS

Adjust hangers and supports and place grout as required under supports to bring piping to proper levels and elevations.

G. CLEANING, FLUSHING, INSPECTING

1. General: Clean exterior surfaces of installed piping systems of superfluous materials, and prepare for application of specified coatings (if any). Flush out piping systems with clean water before proceeding with required tests. Inspect each run of each system for completion of joints, supports and accessory items.
 - a. Inspect pressure piping in accordance with procedures of ANSI B31.

H. PIPING TESTS

1. General: Test pressure piping in accordance with ANSI B31. Provide temporary equipment for testing, including pump gauges. Test piping system before insulation is installed wherever feasible, and remove control devices before testing. Test each natural section of each piping system independently, but do not use piping system valves to isolate sections where test pressure exceeds valve pressure rating. Fill each section with water and pressurize for the indicated pressure and time.
 - a. Required test period is 2 hours.
 - b. Test long runs of Schedule 40 pipe at 150 psi, except where fittings are lower Class or pressure rating.

- c. Test each piping system at 150% of operating pressure indicated, but not less than 25 psi test pressure.
 - d. Observe each test section for leakage at end of test period. Test fails if leakage is observed or if pressure drop exceeds 5% of test pressure.
2. Failure Repairs: Repair piping systems sections which fail the require piping test, by disassembly and reinstallation, using new materials to the extent required to overcome leakage. Do not use chemicals, stop-leak compounds, mastics, or other temporary repair methods.
 3. Drain: Drain test water from piping systems after testing and repair work that has been completed.

END OF SECTION

PART 1 - GENERAL

A. DESCRIPTION

1. General
Provide insulation required for piping systems.
2. General Requirement
Conform to Division 1.

B. SUBMITTALS

Items for which the submittal requirements, specified elsewhere, apply are as follows:

1. Product Data
All materials.
2. Certificates of Compliance
Insulation.

C. APPLICABLE PUBLICATIONS

The most recent edition of the publications listed below form a part of this specification to the extent indicated by the references thereto.

ASTM E84	"Surface Burn Characteristic of Building Materials"
NFPA 255	"Building Materials, Tests of Surface Burning Characteristics"
UL 723	"Test Hazard Classification of Building Materials"
ASTM E96	"Test for Water Vapor Transmission of Materials"
ASTM D-781	"Test for Paperboard Puncture" (Beach Puncture)
ASTM D-774	"Burst Strength of Paper Test" (Mullen Burst)
NFPA 90A	"Air Conditioning and Ventilating Systems"
ASTM C177	"Test for Thermal Conductivity of Materials by Guarded Hot Plate"

D. FIRE RESISTANCE

1. Ratings
Insulation tape, adhesives, vapor barrier materials and jackets shall have a flame spread rating of not more than 25. Smoke developed ratings shall not exceed the following:
 - a. Fiberglass with all service jacket, not more than 50.
 - b. Phenolic Foam with all service jacket, not more than 50.
 - c. Closed Cell Elastomeric Insulation, 1" thickness or less, no jacket, not more than 270.
 - d. Continuously molded Rigid Urethane Foam, with all service jacket, not more than 200.
 - e. Other insulation items not exempted from fire resistant ratings: smoke developed rating not more than 50. Ratings shall be developed by testing in accordance with NFPA 255, ASTM E84 and UL 723.
2. Factory/Field Applied Items
Materials that are factory applied shall be tested as assembled. Materials that are field applied may be tested individually. UL label or listing or satisfactory certified test report from an approved testing laboratory will be required to indicate compliance with the preceding paragraph. Flameproofing treatments subject to deterioration are not acceptable.
3. Exempt Items
The following materials are exempt from Fire Resistant Rating:
 - a. Nylon duct insulation anchors
 - b. Treated wood insulation inserts

c. PVC fitting and valve covers

E. THICKNESS

The normal thickness of insulation given is the thickness of the basic block insulating medium and does not include the finishing coats.

F. PROOF OF COMPLIANCE

Proof of approval of materials shall be delivered to the Architect. This approval shall incorporate approval of Underwriters Laboratories and other authorities having jurisdiction as well as certified performance guarantees.

G. GENERAL REQUIREMENTS

Conform to Division 1 of these specifications.

PART 2 - PRODUCTS

A. FIBERGLASS PIPE INSULATION

Fiberglass pipe insulation suitable for pipe temperature from -60 deg F to 500 deg F; one piece type with only one longitudinal joint. Thermal conductivity not greater than 0.27 BTU per square foot per deg F per inch of thickness at 100 deg F, 0.30 BTU per square foot per deg F per hour at per inch of thickness 200 deg F and 0.40 BTU per square foot per hour at per inch of thickness 300 deg F. As manufactured by CTM (CertainTeed Manson) or equal. Provide factory applied all service jacket.

B. PHENOLIC FOAM PIPE INSULATION

Continuously molded, chemically neutral phenolic resin pipe insulation suitable for pipe temperatures from -40 deg F to 250 deg F; one piece type with only one longitudinal joint. Thermal conductivity not greater than 0.22 BTU per square foot per deg F per hour per inch of thickness at 40 deg F mean temperature and 0.23 BTU per square foot per deg F per hour per inch thickness at 75 deg F mean temperature. Provide factory applied all service jacket.

C. CLOSED CELL ELASTOMERIC PIPE INSULATION

Closed cell elastomeric pipe insulation suitable for pipe temperatures from -20 deg F to 180 deg F. Thermal conductivity not greater than 0.26 BTU per square foot per deg F per hour per inch of thickness at mean temperatures of 75 deg F to 90 deg F. Finish with elastomeric insulation finish in exposed areas.

D. JACKETS FOR PIPE INSULATION

1. Factory Applied All-Service Jacket

White Kraft paper outer surface bonded to aluminum foil vapor barrier, suitable for painting. Kraft paper permanently treated for fire and smoke safety and to prevent corrosion of the foil. Factory applied pressure sensitive closure system for permanent seal of laps and butt strips. Physical characteristics as follows:

- a. Water Vapor Permeability (ASTM E96) 0.02 perm
- b. Breach Puncture (ASTM D-781) 50 oz. in/in tear
- c. Mullen Burst (ASTM D-776) 70 psi

2. Jacket For Pipe Insulation Exposed to Weather

Provide PVC fitting covers & PVC .020" thick PVC jacketing for insulation exposed to weather. Fitting covers and jacketing shall be Knauf 25/50 rated proto PVC, or approved, installed in strict accordance with manufacturer's recommendations for outdoor piping insulation.

E. INSULATION OF FITTINGS AND VALVES

1. Fittings - All Service Jacket

Factory premolded one-piece PVC fitting cover; factory precut insulation same type and thickness as the adjacent pipe insulation. Seal with vapor barrier adhesive on cold lines.

F. FINISHING CEMENT

Hydraulic setting, low shrinkage insulating and finishing cement for one coat finish, Johns-Manville No. 375 Cement or approved equal, suitable for painting with water base paint.

G. INSULATING CEMENT

Mineral fiber cement suitable for application on metal in single layers up to 4" thick, Johns-Manville No. 460 cement, or equal.

H. VAPOR BARRIER ADHESIVE

Vapor barrier lap sealing adhesive, Foster 85-20 or approved equal.

I. LAGGING ADHESIVE

Lagging adhesive, Foster 30-36 or approved equal.

J. ELASTOMERIC INSULATION ADHESIVE

Armstrong 520 adhesive or approved equal.

K. ELASTOMERIC INSULATION FINISH

Armstrong Armaflex finish or approved equal, color white.

L. INSERTS BETWEEN PIPES AND PIPE HANGERS/SUPPORTS

1. Rigid block insulation

Calcium silicate of thickness equal to the adjoining insulation; provide vapor barrier.

2. Inserts

Provide inserts not less than the following length:

- a. 1/2" to 2-1/2" pipe: 6" long.
- b. 3" or greater pipe: 9" long.

3. Treated wood inserts

May be used on cold piping system.

PART 3 - EXECUTION

A. GENERAL

1. Install

All joints tightly butted.

2. Tuck and tuft

Edges of insulation.

3. Access

Install insulation to allow easy access to equipment for inspection and repairs.

4. Clean up

Remove all loose dirt, rust, all other loose foreign material, moisture and frost from surfaces prior to installing insulation.

B. TIME OF APPLICATION

1. General

Insulation shall be applied only after piping has been tested. Insulation contractor may at his option insulate the various piping systems, except flanges, with the understanding that necessary removals, repairs and modifications to insulation due to leaks that may occur in piping systems due to testing will be made without additional cost to the general contractor. All loose dirt, rust, etc., shall be removed by the subcontractor from the pipe surface. Piping must also be free of frost at time of insulating.

C. ITEMS TO BE INSULATED

The following items shall be insulated either wholly or to the extent indicated:

1. Piping

The following piping shall be insulated except (1) valve stems, handwheels and operators; (2) unions

- a. Cold lines: Condensate drain lines, domestic cold water, and piping to roof drains.
- b. Hot lines: domestic hot water supply and circulating piping.

D. INSULATION THICKNESS AND TYPE

1. Pipe insulation type and thickness shall be as follows:

Thickness for pipe size shown

Service	Insulation Type	To 1"	1-1/4"-2"	2-1/2"-4"	5"-6"
Domestic Hot Water & Domestic Hot Water	Fiberglass	1"	1"	1-1/2"	1-1/2"
	Phenolic	1"	1"	1-1/2"	1-1/2"
Circulating (100°F to 140°F)	Urethane	3/4"	3/4"	1"	1-1/2"
	Elastomeric	1"	1"	1-1/2"	1-1/2"
Service	Insulation Type	To 1"	1-1/4"-2"	2-1/2"-4"	5"-6"
RD Piping Condenser Water,	Fiberglass	1"	1"	1"	1"
Domestic Cold Water,	Phenolic	1"	1"	1"	1"
(40°F to 80°F)	Urethane	3/4"	3/4"	3/4"	3/4"
	Elastomeric	1/2"	1/2"	1/2"	3/4"
Service	Insulation Type	To 1"	1-1/4"-2"	2-1/2"-4"	5"-6"
Indirect (Cold)	Fiberglass	1"	1"	1"	1"
Drains (32°F to 70°F)	Phenolic	1"	1"	1"	1"
	Urethane	3/4"	3/4"	3/4"	3/4"
	Elastomeric	1"	1"	1"	1"

E. PIPE INSULATION INSTALLATION

1. General

- a. All insulation shall be continuous through wall and/or ceiling openings and sleeves.
- b. Insulation on all cold surfaces where vapor barrier jackets are used shall be applied with a continuous, unbroken vapor seal. Hangers, supports, anchors, etc., that are secured directly to cold surfaces shall be adequately insulated and vapor sealed to prevent condensation.

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INSULATION

- c. Metal shields shall be applied between hangers or supports of piping and the pipe insulation; refer to section 15060.
 - d. Specified adhesives, mastics and coatings shall be applied at the manufacturer's recommended minimum coverage per gallon.
2. All Service Jacketed Insulation
Insulation shall be applied over clean, dry pipe with all joints butted together. Longitudinal jacket laps and butt strips shall be smoothly secured according to manufacturer's recommendations.

F. FITTING INSULATION INSTALLATION

1. All Service Jacket Insulation Fittings
Apply factory precut insulation tucking ends of the insulation snugly into the throat of the fitting, and edges adjacent to the pipe covering tufted and tucked in, fully insulating the pipe fitting. Seal all seam edges of the one piece PVC fitting cover with vapor-barrier adhesive applied over insulation. Tape circumferential edges of cover with vapor barrier pressure sensitive tape to match fitting cover color. The tape shall extend over the adjacent pipe insulation and have an overlap on itself at least one inch.

END OF SECTION

PART 1 - GENERAL

- A. Section 15010 applies to this work.
- B. Descriptions
 - 1. Provide compressed air piping system for the bakery department.

PART 2 - PRODUCTS AND MATERIALS

- A. Air Compressor furnished by owner, set and piped by Mechanical contractor.
- B. Compressed Air Specialties: Wilkerson, Norgren and Amflo.
 - 1. Filter: Wilkerson F20 or F30 Series to match pipe size.
 - 2. Automatic Drain: Wilkerson Model F12-02-000.
 - 3. Air "Line" Regulator: Wilkerson WIR20 series, Watts series R-11 except for 30 psi blow guns R22-000.
 - 4. Quick disconnect: Match owners hose and equipment.
- D. Pipe in bakery: Type L Copper.
- E. Pipe Fittings: copper sweat.

PART 3 - INSTALLATION

- A. Equipment: Conform to manufacturers installation instructions.
- B. PIPING:
 - 1. Install piping pitched down with flow with the end drained using an automatic drain.
 - 2. Branches and take-off: Connect to top of compressed air main.
 - 3. Anchor all vertical drops.
 - 4. Anchor hose connections.
 - 5. Provide automatic drains at the base of vertical drops to disconnect fittings.
 - 6. Support piping with pipe hangers from the building structure. Install channel (Unistrut) as required for spanning between building structural members.
- C. TESTING OF PIPING
 - 1. General
 - a. Test all piping systems and connected equipment. Test after the lines have been cleaned.
 - b. Isolate from existing systems by the closest valve or valves to the existing system.
 - c. Furnish all test equipment. Install a calibrated test pressure gauge in the system being tested.
 - d. Prior to testing, remove or valve-off gauges, traps and other apparatus which may be damaged by testing.

- e. Make test in presence of the engineer.
- f. Rectify all defects which develop during testing and retest until approved by engineer at no additional charge to the owner.

2. Test Requirements

- a. Pressure: 1-1/2 times design working pressure or 150 psig, whichever is greater.
- b. Time: Hold pressure to inspect all joints and connections.
- c. Air test all joints with clean, dry air in systems by brushing with a soapy water solution.

END OF SECTION

PART 1 - GENERAL

A. DESCRIPTION

1. General
Provide all natural gas piping, regulators, safety controls, gas flues and accessories for water heaters and ovens.
2. General Requirement
Conform to Division 1.

B. SUBMITTALS

Items for which submittal requirements, specified elsewhere, are as follows:

1. Product Data
Pipe and Fittings
Regulators
Safety Controls
Sealants
Protective Tape
2. Certificate of Compliance
U.L.
AGA
ASHRAE Standard 90

PART 2 - PRODUCTS

A. PIPING MATERIALS

1. General
Comply with Sections 15050 and 15060.
2. Materials
Provide products complying with ANSI Z 223.1 "National Fuel Gas Code" (NFPA Standard No. 54), where type is not indicated.
3. Fuel Gas Piping
 - a. Pipe Size 1-1/2" and Smaller: Black steel pipe of sizes indicated.
 - 1) Pipe Weight: Standard weight
 - 2) Fittings: Class 150 malleable iron threaded.
 - 3) Fittings: Wrought steel butt welding (Contractors Option).
 - b. Pipe size 2" and larger: Black steel pipe of sizes indicated.
 - 1) Pipe Weight: Standard weight
 - 2) Fittings: Wrought steel butt welding.

B. FUEL GAS PIPING EQUIPMENT AND ACCESSORIES

1. General: Provide factory-fabricated gas piping equipment and accessories of sizes and types indicated. Comply with applicable standards and installation requirements. Provide sizes, types and materials which mate and match piping and equipment connections.

C. PIPING ISOLATION PRODUCTS

1. Piping Isolators: Provide products complying with the applicable requirements of Sections 15050 and 15060.

PART 3 - EXECUTION

A. INSTALLATION OF PIPING SYSTEM

1. General: Comply with Sections 15050 and 15060. Install piping products in accordance with manufacturer's written instructions, with applicable installation requirements of ANSI Z 223.1, and the Uniform Plumbing Code.
2. Sealants
Use sealants on metal gas piping threads which are chemically resistant to LP and natural gas. Use sealants sparingly and apply to only male threads of metal joints.
3. Grounding
Ground gas piping electrically and continuously within project, and bond tightly to grounding electrode. Buried bare metal piping is acceptable as a grounding electrode.
4. Drip-legs
Install drip-legs in gas piping at each piece of equipment and each vertical rise in piping. Install "Tee" fitting with bottom outlet plugged, or capped, at bottom of pipe risers.
5. Insulating Coupling
Use insulated couplings where dissimilar metals are joined underground.
6. Coordination
Verify gas delivery pressure and coordinate with gas utility company as necessary to interface gas piping with existing gas service supply work.

B. EQUIPMENT CONNECTIONS

1. General:
Connect fuel gas piping to equipment in manner shown; comply with equipment manufacturer's instructions where not otherwise indicated.
2. Gas Pressure Reducing Valves:
When gas delivery pressure exceeds 9" W.C. all gas fired equipment shall be equipped with pressure reducing valves.

C. PIPING ISOLATION

Install piping isolators in accordance with Section 15050 and 15060.

D. FIELD QUALITY CONTROL

Fuel Gas Piping Tightness Test: Prior to initial operation, test and purge fuel gas piping in accordance with ANSI Z 223.1, "National Fuel Gas Code and the Uniform Plumbing Code."

E. PROJECT CLOSE OUT

Provide Test Data, Operating and Maintenance Manuals, Certificates, Guarantees and Perform Tests and Demonstrations required in Section 15010.

END OF SECTION

PART 1 - GENERAL

A. DESCRIPTION

1. General
Provide domestic cold water piping , hot water piping, domestic hot water heating equipment and system accessories.

B. SUBMITTALS

1. General
Items for which the submittal requirements specified elsewhere apply are as follows.
2. Product Data
Submit for:
 - Pipe and Fittings
 - Pipe Wrapping
 - Valves
 - Hose Bibbs and Wall Hydrants
 - Water Heaters
 - Trap Primers
 - Back Flow Preventer
 - Vacuum Breakers

PART 2 - PRODUCTS

A. DOMESTIC WATER PIPING PRODUCTS

1. General: Provide piping materials and factory-fabricated piping products of sizes, types, pressure ratings, temperature ratings, and capacities as indicated. Provide materials and products complying with ANSI B31.1 Code for Power Piping where applicable base pressure rating on domestic water piping system maximum design pressures. Provide sizes and types matching piping and equipment connections; provide fittings of materials which match pipe materials used in domestic water piping system. Where more than one type is indicated, selection is Installer's option. Where drawings show larger pipe size than equipment connection, use larger size.

B. BASIC PIPE, TUBE, AND FITTINGS

1. General: Provide pipe, tube, and fittings, complying with Section 15060 in accordance with the following listing of pipe, tube and fittings.
2. Domestic Water Piping:
 - a. Copper tube of sizes indicated.
 - 1) Wall thickness: Type L, hard-drawn temper.
 - 2) Fittings: Wrought-copper, solder joints.

C. BASIC PIPING ACCESSORIES

1. General: Provide piping accessories complying with Section 15060 in accordance with the following listing of piping accessories:
 - Escutcheon plates
 - Steel-pipe sleeves

Iron-pipe sleeves
Sheet-metal pipe sleeves

D. BASIC HANGERS, SUPPORTS AND ANCHORS

1. General: Provide hangers, supports and anchors complying with Section 15060 in accordance with following listing of hangers, supports and anchors:

Adjustable clevis hanger for horizontal piping hangers and supports.
Single-roll support for horizontal piping hangers and supports.
Two-bolt riser clamp for vertical piping clamps.
Clevises for hanger rod attachments.
Concrete inserts for building attachments.
Top beam C-clamp for building attachments.
Protection saddles for pipe support in hanger.
Protection shields for insulation protection in hanger.
Trapeze hangers where more than one occur.

E. BASIC VALVES

1. General: Provide valves complying with Section 15060.

2. Sectional Valves

- a. 2" and smaller: Gate Valves.
- b. 2" and smaller: Ball valves.
- c. 2-1/2" and larger: Gate valves.

3. Shutoff Valves

- a. 2" and smaller: Gate valves.
- b. 2" and smaller: Ball valves.
- c. 2-1/2" and larger: Gate valves.

4. Drain valves

- a. 2" and smaller: Gate valves.

5. Check Valves

All sizes: Swing check valves.

F. WATER HEATERS

1. WH-1 (Meat & Bakery Department)

A.O. Smith BTC-154 commercial gas tank-type water heater. Glasslined, 80%+ thermal efficiency, 3 year warranty, 89 gallon, 154,000 BTUH input, recovery rate of 149 gallons per hour @ a 100°F. temperature rise, meeting ASHRAE 90.1b-1990 and C.E.C. and New York Codes for thermal efficiency and standby loss.

G. TRAP PRIMERS

1. GENERAL

Provide trap primers complying with section 15050 & 15060.

2. Valves as mfg'd. by Josam, Zurn, JR Smith, E & S.

Provide access doors when recessed in walls.

H. WATER SERVICE

1. General: Under this contract the contractor shall make connection to existing line where shown on the plans.

PART 3 - EXECUTION

A. INSTALLATION OF DOMESTIC WATER DISTRIBUTION PIPING

1. General: Install water distribution piping as specified in Section 15060 and the Plumbing Code. Install each run with minimum joints and couplings, but with adequate and accessible unions for disassembly and maintenance/replacement of valves and equipment. Reduce sizes where indicated, using reducing fittings. Align piping accurately at connections, within 1/16" misalignment tolerance. (No underground water piping inside building area. Use overhead piping only.)
2. Locate Piping Runs, except as otherwise indicated, vertically and horizontally (pitched to drain) and avoid diagonal runs. Locate runs as shown or described by diagrams, details and notations or, if not otherwise indicated, run piping in shortest route which does not obstruct usable space or block access for servicing building and its equipment.

B. INSTALLATION OF PIPING ACCESSORIES

Install piping accessories in accordance with requirements of Section 15050.

C. INSTALLATION OF HANGERS, SUPPORTS AND ANCHORS

1. Install Hangers, supports and anchors in accordance with requirements of Division 15 Basic Piping Materials and Equipment section "Hangers, Supports and Anchors."

D. INSTALLATION OF VALVES

1. Install valves where indicated, and as specified. Locate valves to be accessible for both operation and service. Install valves with stems up in vertical position, or to side in horizontal position.
2. Sectional Valves: Install on each branch and riser, close to main, where branch or riser serves 2 or more plumbing fixtures or equipment connections, and as indicated.
3. Shutoff Valves: Install on inlet of each plumbing equipment item, and on inlet of each plumbing fixture, and as indicated.
4. Drain Valves: Install on each plumbing equipment item located to completely drain equipment for service or repair. Install at base of each riser, at base of each rise or drop in piping system, and where indicated or required to completely drain domestic water piping system.
5. Check Valves: Install on discharge side of each pump, and as indicated.

E. INSTALLATION OF WATER HEATERS

Install per manufacturer's recommendation. Pipe pressure relief valve as shown on drawings.

F. EQUIPMENT CONNECTIONS

SECTION 15350
DOMESTIC WATER SYSTEM

1. Piping runouts to Fixtures: Provide hot and cold water piping runouts to fixtures of sizes indicated, but in no case smaller than required by Plumbing Code.
2. Mechanical Equipment Connections: Connect hot and cold water piping system to mechanical equipment as indicated, and comply with equipment manufacturer's installation instructions. Provide shutoff valve and union for each connection, provide drain valve on drain connection.

G. CLEANING, FLUSHING AND INSPECTION

Clean, flush, and inspect domestic water piping system in accordance with requirements of Section 15060 and Plumbing Code. Flush with potable supply water, continue to flush until potability state is maintained throughout distribution system.

H. PIPING TESTS

Test domestic water piping system in accordance with requirements of Section 15060 and Plumbing Code.

I. PROJECT CLOSE OUT

Provide Test Data, Operating and maintenance Manuals, Certificates, and Guarantees as required in Section 15010.

END OF SECTION

PART 1 - GENERAL

A. DESCRIPTION

1. General
Provide soil, waste and vent systems and associated equipment and accessories.
2. General Requirement
Conform to Division 1.

B. SUBMITTALS

Items for which requirements specified elsewhere apply are as follows:

1. Product data
Pipe and fittings
Cleanouts
Fixture supports
Drains
2. Certificates
Plumbing inspection

PART 2 - PRODUCTS

A. PIPE

1. Soil Pipe
 - a. 2" and smaller above ground: Standard weight galvanized steel; ASTM A120 or A53.
 - b. 2-1/2" and larger above ground: Standard hubless cast iron pipe; CISPI 301-72 with neoprene sleeve gasket and stainless steel shield and bands.
 - c. Underground: Standard weight hubless cast iron pipe, CISPI 301-72, neoprene sleeve gasket and stainless steel shield and bands.
2. Vent Piping
 - a. 1-1/2" and Smaller above ground: Standard weight galvanized steel; ASTM A120 or A53.
 - b. 2" and larger above ground
 - 1) Standard weight galvanized steel; ASTM A120 or A53.
 - 2) Standard weight hubless cast iron pipe; CISPI 301-72 neoprene sleeve gasket, stainless steel shield and bands.
 - c. Underground: Standard weight hubless cast iron pipe, CISPI 301-72, neoprene sleeve gasket, cast iron mechanical coupling.
3. Indirect Waste Piping
Galvanized steel pipe, copper or plastic.

B. FITTINGS

1. Galvanized Steel Pipe
 - a. Soil or roof drainage: Screwed drainage fittings ANSI B16.12.
 - b. Vent or indirect waste: 150# galvanized malleable iron screwed fittings ANSI B16.3.
2. Hubless Cast Iron
Hubless cast iron fittings ANSI A112.5.1 and ASTM 74-72.

C. CLEANOUTS

1. Floor Cleanouts

- a. Cast iron body and frame, round adjustable scoriated secured nickel bronze top, bronze plug, cast iron parts plated with zinc or cadmium.
- b. Acceptable mfrs.: Zurn ZN-1400-HD or approved equal.

2. Wall Cleanouts

- a. Cast iron cleanout tee, nickel bronze frame and cover, bronze plug.
- b. Acceptable mfrs.: Zurn Z-1446-BP or approved equal.

D. FIXTURE SUPPORTS

1. Acceptable mfrs.

Zurn, Jay R. Smith, Josam or Ancon.

2. Wall Hung Fixtures

Provide wall hung fixtures with concealed fixture hanger constructed for fixture, cast iron feet sit on sub-floor or cast in sub-floor, or supported by floor-to-ceiling pipes. Concealed arm fixture supports required where suitable for fixture. Exposed arm supports, white enamel finish where fixture is mounted on plastic walls, vitreous enamel where mounted against ceramic or glazed finish walls. Support base shall not extend beyond wall of chase into finished space.

E. DRAINS

Acceptable mfrs.

Zurn, Jay R. Smith, or Josam.

1. D-1 Zurn ZN-505-Y 3" (Meat & Bakery Area)

Heavy duty, tractor grate with Duco-coated cast iron body, flashing collar, trap primer connection, NO-HUB.

2. D-2 Zurn ZN-415 Type 1 Strainer 2" (Condensate Drain)

Adjustable round top anti-splash rim strainer with Duco-coated cast iron body

3. D-3 Zurn Z-1910-33 2"

Porcelain enameled 8" square cast iron floor sink, flashing collar, dome strainer and 1/2 solid grate.

4. D-4 Zurn Z-1902-33 4" (Indirect Sink Waste)

Porcelain enameled 12" square extra deep cast iron receptor. Flashing collar, dome bottom strainer and 1/2 grate.

5. TD-1 Zurn Z-665 AR

12" wide heavy duty trench drain 5'-0" long, 3" outlet.

PART 3 - EXECUTION

A. TRENCHING AND BACKFILLING

Perform trenching and backfilling associated with plumbing installation in strict accordance with pertinent provisions of excavating, filling and grading specifications, Section 15010.

B. INSTALLATION OF PIPING AND EQUIPMENT

1. General

- a. Install piping promptly; cap or plug open ends; conserve space for other work.

- b. Provide uniform pitch of at least 1/4 inch per foot, except where noted, for horizontal waste & soil piping within building; pitch vents for proper drainage.
- c. Cushion traps to minimize transfer of sound; firmly anchor pipes in position.
- d. Inspect each piece of pipe, fittings, and equipment for defects and obstructions; promptly remove defective material from job site.
- e. Install pipes to clear beams and obstructions; do not cut into or reduce size of load carrying members without the approval of Engineer.
- f. Vertical stacks, supported at floors with clamp anchors are required to relieve joint stresses.

2. Cast Iron Soil Pipe

- a. Install in bedding of trench, grade to provide uniform support.
- b. Hubless with stainless steel couplings.
 - 1) Install neoprene gasket and stainless steel shield coupling jointing assemblies with bolts.
 - 2) Alternately and incrementally tighten to 60 inch-pounds torque, minimum. Retorque bolts after 24 hours.
 - 3) Use single set-point torque wrench manufactured specifically for this purpose; do not use screwdrivers or other types of wrenches.

C. **PIPE HANGER SPACING - CAST IRON**

1. Vertical Piping

- a. Minimum: One hanger per floor.
- b. Maximum: 15 ft. between hangers.

2. Horizontal

- a. One hanger not more than three feet from end of run out.
- b. One hanger not more than one foot from a change in direction.
- c. One hanger at each hubless joint.
- d. Multiple hangers as required to support multiple joints.

D. **PIPE HANGER SPACING - COPPER (SEE SECTION 15060)**

E. **TESTING**

1. Drainage Piping Tests

- a. Pressure test at 5 psi minimum for 30 minutes, witnessed by Architect.
- b. Correct any leaks and repeat test.

F. **CLEANING UP**

Prior to acceptance of buildings, thoroughly clean exposed portions of plumbing installation. Remove labels and traces of foreign substance; use only a cleaning solution approved by mfr. of plumbing item to avoid damage to finished surfaces.

G. **PROJECT CLOSE-OUT**

Provide Test reports, instruction of Owners personnel; Certificates of Approval and/or Completion; guarantees and warranties; operating and maintenance manuals; and As-Built Drawings per Section 15010.

END OF SECTION

PART 1 - GENERAL

A. DESCRIPTION

1. General
Provide plumbing fixtures, with trim, sealants and accessories.
2. General Requirement
Conform to Division 1.

B. SUBMITTALS

Items for which the submittal requirements specified elsewhere apply are as follows:

1. Shop Drawings
Rough-in of Fixtures
2. Product data
Fixtures
Trim
Silicone Sealer
Accessories
3. Samples
Silicone Sealer
4. Certificates

PART 2 - PRODUCTS

A. ACCEPTABLE MANUFACTURERS

1. Plumbing brass (general)
American Standard; Kohler; Symmons; Sloan; Speakman; Watrous; and Chicago Faucet.
2. Plumbing brass (special)
Chicago Faucet; T & S Brass Co.; Speakman and Moen.
3. Stainless Steel Plumbing Fixtures
Elkay and Just.
4. Carriers and Wall hydrants
Wade; Josam; Zurn and Smith.
5. Other Items
As indicated.
6. Other Equal Products
Materials and manufacturers shall be by written approval per Section 15010.

B. TRIM

1. General
Trim shall mean any metal parts used with fixture; shall be brass except Federal Specifications grade zinc-aluminum may be furnished for faucet handles.

2. Finish
Finish of exposed metal parts, chromium over nickel.
3. Stop
Provide in each water connection to each fixture, except where fitting has integral stops, loose key pattern with shield, polished finish where exposed, rough where concealed, Bridgeport Brass, Brass Craft (Speedway), Eastman, Teledyne Ansonia or equal.
4. Exposed Supplies
1/2" O.D. tubing.
5. Faucets
Provide all trim for lavatories, sinks, etc., with renewable cartridges.
6. Escutcheon
Provide at each point where pipe or other fittings enter wall at fixture.
7. Traps
No. 17 gage seamless tubing without cleanout; shall bear the manufacturer's name and gage.
8. Vacuum Breaker
Provide on water supply to each fixture which has a water connection located below the rim, or a hose attachment; flow- through pattern; Sloan, Watrous, Coyne & Delaney, Watts or equal.
9. Sealant
Silicone type.

C. FIXTURES

WHA

1. Water Hammer Arrestor
Zurn "Shoktrol" series Z-1700, Model #600, 1".

HB-1

1. Hose Bibb
Watts SC8-4 sillcock with hand wheel & tamper proof vacuum breaker.

D. E-- FIXTURES

All "E" fixtures shown on plans shall be furnished by others. The Mechanical Contractor shall install and connect all services as outlined below. All P-traps, tailpieces, escutcheons and stop valves shall be furnished and installed by Mechanical Contractor.

E-1

1. Hand sink:
Stainless steel, wall hung, with faucet, wall bracket, and knee valve - all furnished by owner.
2. Installation:
Provide waste and water per rough in detail. Contractor shall receive, uncrate, set and connect complete and operating.

E-2

1. Triple Compartment Sink:
Stainless steel 3 compartment, adjustable legs with 2 faucets, lever wastes - all furnished by owner.

2. Installation:
Provide waste and water per rough-in detail. Contractor shall receive, uncrate, set and connect complete and operating.

E-3

1. Air Compressor:
Air cooled pump mounted on ASME 60 gallon receiver with automatic drainer, 208V, 3-phase, 3HP. Furnished by owner.
2. Trim - Provided by owner:
In line air filters, refrigerated air dryer, coalescer separator and automatic drain, 120V, 1-phase.
3. Installation:
Connect per detail with Type M 280ACR copper pipe.

E-4

1. Decorator Sink:
Stainless steel, 2 compartment, adjustable legs with 1 faucet, lever wastes - all furnished by owner.
2. Installation:
Install air outlets with quick connector on each side of sink above back splash. The quick connectors are to be Parker 1/4" Series 20. Provide waste and water per rough-in detail. Contractor shall receive, uncrate, set and connect complete and operating.

E-5

1. Bakery Water Meter:
Water meter and blender unit, with inlet stops, checks and vacuum breakers - all furnished by owner.
2. Installation:
Provide water per rough-in detail. Contractor shall set and connect.

E-6

1. Pan Washer:
Unit with rinse booster and steam vent fan - all furnished by owner.
2. Trim:
Run drain to floor sink - terminate with 1" air gap.
3. Installation:
Provide waste, water and venting per rough-in detail. Back flow preventer is for future hose and spray assembly. Unit has built-in back flow prevention. Contractor shall set and connect.

E-7

1. Bakery Oven:
Oven with hood, barometric damper, draft inducer and draft proving switch - all provided by owner. Oven will be assembled by owner. Barometric damper, draft inducer and draft proving switch installed by contractor.
2. Trim:
Provide Class B gas venting, steam hood vent duct, exhaust fan Penn FMX10Q with Honeywell S637A sail switch. Hood exhaust fan starter controlled by Relay #3M located in oven control panel. When gas supply pressure exceeds 9 inches water column provide Rockwell 3143 gas pressure regulator.
3. Installation:
Provide waste, water, gas and venting per rough-in detail. Contractor shall make all connections.

E-8

1. Proof Box:
Unit with Humidifiers provided by owner. Unit will be assembled by owner.

2. Installation:
Provide waste and water per rough-in detail. Contractor shall make all connections.

E-9

1. Sealer:
Unit is a semi-automatic wrapping machine provide by owner.
2. Trim:
Provide Parker Series 20 1/4" quick coupler assembly H.O.E. 1/4" NPT and Parker 1/4" 801-4 air hose.
3. Installation:
Drop air hose from 3/4" air main above ceiling, terminate with quick coupler assembly, screw to machine air inlet.

E-10

1. Pressure Washer:
Wall hung unit provided by owner.
2. Installation:
Provide water per rough-in detail. Contractor shall receive, uncrate, set and connect.

E-11

1. Muffin Depositor:
Pneumatic operated muffin depositor provided by owner.
2. Trim:
Provide Parker Series 20 3/8" quick coupler assembly. H.O.E. 1/4" NPT and Parker 1/2" 801-8 air hose.
3. Installation:
Drop air hose from 1" air main above ceiling, terminate with quick coupler assembly screwed to machine air inlet.

PART 3 - EXECUTION

A. INSTALLATION

1. Fixtures
Install fixtures in first-class manner with proper connections to water, drainage and vent systems.
2. Base
See that proper grounds are set to form a secure base for each fixture and an absolutely rigid setting.
3. Guards
Provide guards and/or boxing as may be required to protect fixtures against damage from operations of other trades.
4. Back Flow Preventers
All fixtures shall have water supply above rim or be provided with code approved backflow preventers.
5. Wall Connections
Connect exposed traps and supply pipes for all fixtures and equipment to rough piping systems at wall, unless otherwise specified.
6. Seal at Structure
Where plumbing fixtures abut to walls and floors, seal all joints with non hardening sealant.

B. ADJUST AND CLEAN

1. Clean Up

- a. Remove all labels from fixtures, and clean prior to final acceptance.
- b. Remove all dirt from fixtures, fittings and traps.

2. Escutcheons

Secure all escutcheons against wall.

END OF SECTION

PART 1 - GENERAL

A. DESCRIPTION

1. General
Provide all sheet metal work, air terminals and accessories.
2. General Requirement
Conform to Division 1.

B. SUBMITTALS

Items for which submittal requirements, specified elsewhere, apply are as follows:

1. Shop Drawings
Ductwork Installation
2. Product Data
Air Terminals
Dampers
Access Doors and Hardware

C. SHEETMETAL

Unless specified otherwise, all sheetmetal shall be galv steel; Bethlehem, U.S. Steel, Youngstown or Republic Steel mfr. Galvanized steel shall be G-60 min., LFQ Chemtreat.

D. DUCT CONSTRUCTION

All ductwork shall be galvanized steel unless otherwise noted.

Comply with SMACNA Duct Construction Standards, Metal and Flexible - 1985 Edition as required, with additional requirements and modifications specified herein.

E. RIVETING

Unless sheetmetal screws are called for, use rivets for attachment purposes for sheetmetal; blind rivets, where required, United Shoe "Pop", Duro Dyne "Pinriveter", or Cherry "Commercial".

F. ROUTING OF DUCTWORK

Avoid all major structural supports, and coordinate all work with work of other trades.

G. OFFSETS IN DUCTWORK

Drawings do not show all offsets which may be required. Make offsets with fittings with as small an angle of offset as possible; do not use square corner inserts, unless specifically shown.

H. FLEXIBLE CONNECTIONS AT FANS

At each sheetmetal connection to a fan; Ventfabrics, Inc. "Ventglas", or Duro Dyne "EXCELON"; fireresistive; clamped and sealed to duct and to fan.

I. COLLARS

Where an exposed duct passes through a wall, slab, or ceiling a 1" wide 18-gage angle with mitered corners shall be fastened to the building on each exposed face.

PART 2 - PRODUCTS

A. SHEETMETAL WORK, LOW PRESSURE, GENERAL

1. Scope
Provide all low pressure sheetmetal work.
2. Duct Construction
Comply with SMACNA Duct Construction Standards, 2" W.G. Static Pressure Class, Seal Class C.
3. Seams
Do not use standing S-cleats or welded seams, or standing seams, except standing seams are permitted on plenums where seams are equipped with full length rolled steel backing angles. Button punch snap-lock seams made on Lockformer tools will be acceptable, where Pittsburgh seams are called for.
4. Diagonal Creasing
On all panels wider than 18".
5. Elbows
Inside radius equal to maximum width of elbow wherever possible.
6. Turning Vanes
Double Vane Type: Comply with SMACNA Duct Construction Standards. Single Vane Type: Comply with SMACNA Duct Construction Standards.
7. Sheetmetal Connections to Building Construction
Use steel angles, riveted to the sheetmetal and bolted using expansion shells or expansion bolts to the building surface with compressible glass fiber under the angle; angles, same as for bracing; 1" x 1" x 1/8" minimum.
8. Access Doors and Frames
 - a. General: Include access door wherever access to ducts or plenums is necessary for reaching equipment; double construction, tight fitting, hinged, with latch, insulation or sound lining equivalent to that of the duct; steel angle frame.
 - b. Access Door Sizes: In general, 18" x 24" or 18" x 36" ; into plenums; for access to coils or dampers, 12" x 16" minimum size.
 - c. Latches: Die-cast, Ventfabrics No. 100 for doors 1'-0" high or smaller; Cat No. 260 for up to 3'-0" height; Cat. No. 310 for larger, and use two.
9. Transverse Joints:
Ductmate or WDCI proprietary duct connection systems will be accepted. Ductwork constructed using these systems will refer to the manufacturers guidelines for sheet gauge, intermediate reinforcement size and spacing, and joint reinforcements.

TDC/TDF/T-24 shall be constructed as a SMACNA T-24 flange. Use of these joint systems shall be limited as follows:

<u>Duct Size</u>	<u>Operating Pressure</u>
0 - 42"	0 - 2" W.G.

B. VOLUME DAMPERS AND QUADRANTS, LOW PRESSURE DUCTS

1. Scope
Provide dampers in ductwork as required to balance the system to produce the air quantities shown.
2. Acoustic Performance

Construction of dampers shall be free from any sharp edges which will produce excessive turbulence preventing obtaining the acoustic performance in the rooms served as specified for "Grilles and Diffuser".

3. Dampers

Are not shown generally. Include damper in the duct to each supply return or exhaust opening; also in each branch duct where the pressure loss is lower than other branch ducts leading from the same trunk duct; elsewhere as shown.

4. Location of dampers

At a point where the duct is accessible; where possible, with the axis of the blade the long dimension; as far from the outlet as possible.

5. Edges

Both leading and leaving, hemmed; side edges flanged 1/2", placed so that air strikes the smooth face.

6. Damper Blades

For ducts smaller than 10" maximum cross-section, 24-gage; 11" to 30", 22-gage; larger than 30", 20-gage; in ducts wider than 12", multiple blade, maximum blade width 12"; arranged so that adjacent blades rotate in alternate directions; where length exceeds 30", use a 3/8" steel rod stem fitted in a V-crease in the blade.

7. Quadrants. Where Ducts are Accessible

(Including Above-Ceiling Ducts Where Ceilings are Removable) Duro Dyne manufacture, catalog numbers as follows:

- a. For blades with maximum dimensions under 10"; cat. No. KS-145 dial regulator with locking nut, round end spring-in bearing and square end damper bearing.
- b. For blades with a maximum dimension 10" to 20" Cat No. KSR-195, dial regulator with locking nut, round end spring-in bearing and square end bearing.
- c. For blades with maximum dimension over 20"; Cat No. KS-12, damper quadrant with 1/2" size damper bearings.

8. Quadrants. Where Ducts are not Accessible

Flush mounting concealed type, Ventfabrics Cat. Type 66, or Young Regulator No. 301 Series.

C. **AIR TERMINALS**

Provide air terminals as scheduled on plans.

D. **HANGERS FOR SHEETMETAL WORK**

1. Scope

Provide hangers, supports and anchor bolts for all sheetmetal work and equipment.

2. Duct Sizes

Referred to in Following Articles: Refer to maximum cross-section dimension, at location of hangers.

3. Horizontal Low Pressure Ducts

- a. Concealed Ducts under 36" Width: Galvanized straps running down the side and turning under the bottom, attached with rivets.
- b. Exposed Ducts under 36" Width: 1/4" rods, one on each side at each point of suspension, end of the rod flattened and riveted at the top.
- c. Ducts 36" and Larger: 3/8" min. rods through the ends of the angle stiffeners under the ducts. If stiffeners are not located properly for the hangers, provide additional angles of same size.
- d. Spacing: 8' max., in general; 4' max. for ducts 38" size and larger.

PART 3 - EXECUTION

A. INSTALLATION

All ductwork shall be installed in workmanlike manner. Fabrications, fittings, joints, take-offs, attachment to sheet metal work, turning vanes, dampers, stapling, sealing and taping shall be executed in strict conformance with the mfr.'s latest recommendations. See Division 2 for seismic design requirements.

B. DAMPER POSITIONS

Set and lock all dampers in the "Full Open" position prior to balancing work.

C. LOCATION OF DIFFUSERS AND GRILLES

Verify exact location in field.

D. TESTING AND EXAMINATION

After the control is connected, before balancing and testing, representative of mfr. shall test all systems. Advise Engineer in writing when testing is complete and all systems are operating properly.

E. LEAKAGE FROM DUCTWORK

Following completion of Air Balance work. If leakage in supply or exhaust ducts as indicated by Air Balance exceeds five (5) percent the Contractor shall seal the ducts to bring leakage within the five percent limit.

F. BALANCING - SEE SECTION 15050.

G. PROJECT CLOSE-OUT

Provide Test reports, instruction of Owner's personnel; Certificates of Approval and/or Completion; guarantees and warranties; operating and maintenance manuals; and As-Built Drawings per Section 15010.

END OF SECTION

PART 1 - GENERAL CONDITIONS

A. DESCRIPTION

1. General

The Contractor shall provide roof exhaust fans.

Vibration isolation, as hereinafter specified, and detailed shall be provided by the Contractor.

B. SUBMITTALS

Items for which the submittal requirements, specified elsewhere, apply as follows:

1. Shop Drawings

Wiring diagrams for all field wiring connections and interlock with Division 16.

2. Product Data

Exhaust Fans

Vibration Isolation Equipment

PART 2 - PRODUCTS

A. ROOF CURB

1. Provide roof curb as detailed on plans.

2. Curb shall be manufactured in accordance with the National Roofing Contractors Association guidelines.

B. ROOF EXHAUST FANS

1. Manufacturers

Penn, Pace, Carnes, Greenheck, Cook.

2. General

Fans include housing, wheel, fan shaft, bearings and drive as a factory assembled unit, back draft dampers, and removable birdscreen. See drawings for ratings.

3. Housing

Heavy gauge aluminum. Unit shall have curb cap.

4. Fan Wheel

Forward curved centrifugal, spun or die formed blades, wedged hub, aluminum construction, or backward inclined shall be as indicated on Contract Drawings.

5. Type: Per equipment schedule

C. VIBRATION ISOLATION MOUNTINGS

1. Scope:

Provide the vibration isolation mountings as specified elsewhere and as shown.

2. Manufacturer:
Mfr. shall be Mason Industries, Vibration Mountings, Inc., Vibration Elimination Co., Amber/Booth, Consolidated Kinetics, Inc., Korfund, or equal.
3. Isolation Efficiency and Deflections:
The design of the foundation and its supports shall be adequate to produce not less than the following vibration isolation efficiency and spring deflections. Vibration isolation efficiency shall be based on the lowest disturbing frequency of both driving and driven units.
- | Fan RPM | Minimum Isolation
Efficiency - % | Minimum Deflection
Inches |
|-------------|-------------------------------------|------------------------------|
| 350 or less | 80 | 1.50 |
| 350 to 800 | 90 | 0.50 |
| Over 800 | 95 | 0.25 |
4. Anchor Bolts
Galv anchor bolts shall be provided for each isolator; two min. for each unit.
5. Computations
Following selection of equipment mounted on isolation mountings, the Contractor shall prepare computations showing how vibration-isolation efficiency will be produced and submit for approval.
6. Internal Isolation
Where vibration isolation of fan and drive system on package units meets these efficiencies and deflection, no additional isolation will be required.

PART 3 - EXECUTION

- A. **INSTALLATION**
Install all equipment indicated and specified.
- B. **MANUFACTURERS' INSTRUCTIONS**
Install all equipment in conformance to mfr.'s instructions.
- C. **STRUCTURAL SUPPORT**
Support in general shall be from the building structure, attached to casings or to steel structure spanning underside of unit; provide additional structural steel supports as required.
- D. **CLEANING AND ADJUSTING**
Plenums and casings shall be thoroughly cleaned of all debris and blown free of all small particles of rubbish and dust before installing and making final duct connections. Equipment shall be wiped clean, with all traces of oil, dust, dirt, or paint spots removed. Temporary filters shall be provided for all fans that are operated during construction, and after construction dirt has been removed from the building, new filters shall be installed. Bearings shall be properly lubricated with oil or grease as recommended by the manufacturer. Belts shall be tightened to proper tension. All control valves and other miscellaneous equipment requiring adjustment shall be adjusted to setting indicated or directed. Fans shall be adjusted to the speed indicated by the manufacturer to meet specified conditions, ready for air balancing.

H. **PROJECT CLOSE-OUT**

Provide Test reports, instruction of Owner's personnel; Certificates of Approval and/or Completion; guarantees and warranties; operating and maintenance manuals; and As-Built Drawings per Section 15010.

END OF SECTION

PART 1 - DESCRIPTION

- A. The general Conditions, Special Conditions, are part of this section. The electrical system required for the work includes, for the building and the site, labor and materials, equipment, and services necessary to complete the installation of electrical work and related items indicated, specified, or needed for complete and operable facility but not specifically described in other Sections of these Specifications. Material shall be new, delivered to the job in the manufacturer's labeled package.
- B. General extent of electrical work includes, among others, the following items:
1. Provide new fuse switch to existing main switchboard. See One Line Diagram.
 2. Complete system of feeders, in conduit to power and lighting panels, dry-type transformers, equipment loads.
 3. All branch circuit panels for power and lighting.
 4. Complete branch circuit wiring system for motors, receptacles, junction boxes, lighting, etc.
 5. Furnishing and installation of lighting fixtures, wall switches, receptacles, etc. as shown on drawings.
 6. Hangers, anchors, sleeves, chases, supports for fixtures, all electrical materials and equipment shown and specified.
 7. Furnishing, installation of power wiring up to and including safety switches, starters, and final connections for mechanical equipment.
 8. Dry-type transformers, installation, connections, mounting, and related feeders, disconnects and grounding.
 9. Emergency/Exit lighting system, wiring, fixtures, batteries, complete and operational.
 10. Do excavation required for work in this Section.
 11. The Electrical Contractor shall be responsible for all electrical work not done by other divisions of work.
 12. The Electrical Contractor shall make all final connections to all Owner supplied equipments.
- C. DEFINITIONS: Certain terms used herein or implied, on the Drawings, and in the Contract Documents, shall be defined as follows:
1. "Provide" Furnish and install complete and ready for service including accessories, connections and appurtenances.
 2. "Exposed" Open to view in any room, hallway, passageway, or outside.
 3. "Coordinate" Confer and work to combine the work of all concerned for a complete and operating installation, free of conflicts.
 4. "All" the word all shall be implied as applicable.

PART 2 - WORK NOT INCLUDED

- A. Telephone system equipment, wire, and cable, will be furnished by others.

- B. Mechanical equipment control devices, supplied by others.

PART 3 - RELATED WORK:

Cooperate as necessary with other trades to ensure proper and adequate interface of the work of their trades. This Contractor shall:

- A. Perform trenching and backfilling required for electrical installation.
- B. Where caulking is required in connection with the electrical installation, use only those materials and methods acceptable to Architect.

PART 4 - QUALIFICATIONS OF INSTALLERS:

For the actual fabrication, installation, and testing of work under this Section, use only thoroughly trained experienced workmen completely familiar with the items required and with the manufacturer's recommendations as to their use. In the acceptance or rejection of the finished installation, no allowance will be made for lack of skill on the part of workmen.

PART 5 - SUBSTITUTIONS:

Materials shall conform to these Specifications. No substitutions of the materials specified will be considered prior to or after bidding. Acceptable alternate manufacturers have been specified for every item of equipment to be used on the project. No others will be allowed.

PART 6 - SUBMITTALS:

- A. **EQUIPMENT LIST:** Within 30 days after award of the Contract, and before any materials of this Section are delivered to the job site, submit to the Engineer for approval, a complete list, in four (4) complete bound copies of the equipment and materials proposed to be installed. State the type of equipment and its major components by make, model number and manufacturer, and giving full performance data. This shall in no way be construed as allowing the substitution of any item for the items specified herein. Submit complete at one time. Partial submittals will not be considered.
- B. **SHOP DRAWINGS AND RELATED MATERIALS:**
1. Submit four (4) copies of Equipment Cuts or Shop Drawings for electrical equipment for this Contract items. Drawings shall be revised as directed and four (4) prints resubmitted, if necessary, for final approval before fabrication/ordering.
 2. Shop drawings or cuts shall show:
 - a. Physical size and arrangement of equipment.
 - b. Wiring diagrams for equipment showing circuit devices, conductor size, type, etc.
 - c. Specifications for all components.
 3. Furnish Shop Drawings and/or equipment cuts for the following:
 - a. Main Fused switch
 - b. Panelboards
 - c. Dry Type Transformers
 - d. Lighting Fixtures

- C. Contractor shall furnish an "As-built" drawings. Indicate depth of buried conduits and exact location of underground raceways.
- D. MANUAL: Upon completion of the installation and as a condition of its acceptance, compile a manual in three (3) copies and deliver to the Architect. The manual shall be bound in hard cover post-type binder. Documents required are:
 - 1. Identification, on outside cover, stating "Electrical Installation, Price Club, City, State, By: (name of Electrical Contractor)", Electrical Engineers: T.E. Inc., Renton, Wash.
 - 2. Neatly typewritten index near front of the manual, furnishing immediate information as to location in the manual of data for the installation.
 - 3. List of fuses, lamps and other expendable equipment and devices with size, type, ordering description and manual of data applicable to this installation.
 - 4. Copies of approved final Shop Drawings.
 - 5. Cuts of lighting fixtures.
 - 6. Where multiple types or catalog numbers are shown on sheets, underline, or suitably identify installed components.

PART 7 - PRODUCT HANDLING:

Protect electrical material and equipment before, during and after installation, and protect the installed work of other trades. In the event of damage, immediately make repairs and replacements necessary to the acceptance of the Architect and at no extra cost to the Owner.

PART 8 - PERMITS AND FEES:

Secure and pay for permits and fees necessary for initiation and completion of work. This shall include charges of the telephone and power companies.

PART 9 - CODES, RULES, AND ORDINANCES:

Work shall be in full accord with latest edition of National Electrical Code and all States, Federal, Local, and other laws and regulations applicable. Comply with requirements of National Board of Fire Underwriters, serving telephone and utility companies. However, where Specifications call for material or construction of better quality or larger sizes than required by above mentioned rules and regulations, provisions of specifications take precedence. Nothing in Plans or Specifications is to be construed to permit work not conforming to codes.

PART 10 - IDENTIFICATION OF SWITCHES AND APPARATUS:

Transformers, Panelboards, Cabinets, Safety Switches and other apparatus used for operation, control of circuits, appliances and equipment installed under contract shall be properly identified with engraved lamacoid nameplates and typewritten index cards. Lighting circuits shall be identified by row or location.

PART 11 - COOPERATION WITH OTHER CONTRACTORS

- A. Cooperate with other Contractors doing work on building as may be necessary for proper execution of work of various trades employed in construction of building.

- B. Electrical Contractor shall refer to Architectural, Structural, Mechanical Drawings for construction details and coordinate his work with that of other Contractors to the end that conflict and delays are avoided.
- C. Where lighting fixtures are in conflict with Structural members, Mechanical or other equipment, Electrical Contractor provides adequate support and wiring to clear same.

PART 12 - ACCURACY OF DATA

- A. Data given herein and on Drawings is as exact as could be secured, but absolute accuracy is not guaranteed. Specifications and Drawings are for assistance and guidance to Contractor. Exact locations, distances, levels, etc., are governed by building and Contractor shall use data contained herein with this understanding.
- B. Exact location of outlets not dimensioned on Drawings shall be located as directed by Architect. Any outlet installed without such authorization shall be moved, if required by Owner, without cost to Owner.

PART 13 - DRAWINGS

- A. Electrical Drawings are diagrammatic, follow as closely as actual construction and work of other Contractors will permit. Deviation from Drawings required to make work of Electrical Contractor conform to building as constructed, and to clear work of other Contractors, shall be made by Electrical Contractor without additional cost.
- B. Verify measurements of building prior to proceeding with rough-in.
- C. Branch circuit wiring and arrangement of home runs have been worked out for maximum economy consistent with adequate sizing for voltage drop, etc., install wiring with circuits arranged as shown on drawings.
- D. Provide J-Boxes as required for all branch circuits and Home Runs.
- E. Owner reserves the right to make minor changes in the location of outlets if decided upon before rough-in has been finished.

PART 14 - INSPECTION

- A. Work and materials covered by this Specification is subject to inspection at any time by representative of Architect or Owner and Building Inspector.
- B. If inspector finds any material not conforming to these specifications, within 3 days after being notified by Architect, remove materials from premises. If said material is installed, entire expense of removing and replacing same, including any cutting and patching that may be necessary, will be borne by the Electrical Contractor.
- C. Do not allow or cause any of this work to be covered up or enclosed until it has been inspected, tested and approved by the Architect and the authorities having jurisdiction over the work. Should any of this Contractor's work be enclosed or covered up before such inspection, test, he shall, at his own expense, uncover the work and after it has been inspected, tested, and approved, make repairs with such materials as may be necessary to restore his work and that of the other Contractors to its proper condition.

PART 15 - SUPERVISION AND WORKMANSHIP:

Contractor personally or through authorized and competent representative, constantly supervise work covered by these Specifications. So far as possible, keep same foreman on job from start to finish. Workmanship of entire job to be first class in every way. Only experienced, competent workmen employed for work.

PART 16 - GENERAL WORKMANSHIP

- A. Workmanship shall be performed by skilled mechanics according to best trade practices.
- B. Measurements shall be verified at the job site.
- C. Do not damage other Contractor's work. Repair to any damaged work shall be done by craftsmen skilled in the trade, to the Architect's acceptance, at no expense to the Owner.
- D. Cutting, Patching and Opening: Do only as necessary. Do not weaken the building structure with cutting. Patching shall be done by skilled workers and shall match the general construction as to type and quality. Special consideration is required in tilt-up construction areas.
- E. Furnish the General Contractor with the location of openings for conduit and other blockouts or holes required in the building structure for installation of electrical work. Openings shall provide as tight a fit as possible. The Electrical Contractor shall be responsible for costs of any hole mislocated or omitted from his division of the work.
- F. Location of Outlets: It shall be the responsibility of this Contractor to study the General and Mechanical Drawings and Specifications and confer with the various trades involved to the end that there is no conflict between the electrical outlets and any work of other trades. The following must be particularly checked before installing work:
 - 1. The exact outlet location.
 - 2. The location and type of furred ceilings.
 - 3. Door swings.
 - 4. Millwork and millwork details.
 - 5. Windows and other openings.
- G. Appliances: Furnish scaffolding, ladders and other appliances required for the execution of the work.
- H. Openings in Pipe: Ends of pipe shall be kept closed during the progress of the work. Pipe shall be clean and dry before any wire is installed.
- I. Empty raceways shall be furnished with nylon cord 5/16" diameter.
- J. Motors shall be connected with minimum 2'-0" length of flex conduit at motor connection box, (except roof mounted exhaust fans).
- K. Adjacent wall mounted wiring devices, room thermostats or other equipment shall be coordinated and located either at the same elevation or in line, one above the other.

PART 17 - MATERIALS - GENERAL

- A. Electrical materials are to be of type and quality specified, new, listed by Underwriter's Laboratories, Inc., meet their requirements and bear their label wherever standards have been established by them.
- B. All equipment or material for any one system shall be furnished by the same manufacturer. Such items as lamps, conduit fittings, wire, wiring devices, etc., shall be same throughout the project.

PART 18 - GUARANTEE:

Work and materials, (except lamps), furnished under this Contract shall be unconditionally guaranteed against faulty workmanship or defective material for period of one year from date of final acceptance. Fluorescent lamps shall be guaranteed for 90 days after date of acceptance. Electrical equipment failure shall be repaired at no expense to the Owner.

PART 19 - AS-BUILD LAYOUTS:

Maintain a complete set of "blue prints" forming a part of this Contract. After work is installed, carefully draw on prints, in colored pencil, correct location of work installed, with dimensions from permanent walls, walks, etc., and including depth of underground runs. Wiring diagrams and details corrected. Upon completion of project, deliver corrected "as-built" prints to Architect in good, legible condition.

PART 20 - CLEANING AND PROTECTION

- A. Keep the building and site clean and free of refuse from the work under this Division.
- B. Parts of the equipment must be thoroughly cleaned and free from cement, paint, grease, plaster, and dirt. Surfaces to be painted must be thoroughly cleaned with oil and grease dissolving solvents and exposed metal work left smooth and clean with surface free of rust.
- C. Equipment and work under other Sections of the Specifications must be kept free from damage and dirt from the work under this Section.
- D. Remove paper labels from fixtures. Fixtures and lamps must be wiped clean at completion of project.
- E. Outlet boxes shall be completely free of plaster or concrete. Contractor may use paper or plastic enclosure to fulfill this requirement.

PART 21 - TESTING

- A. General Scope: It is the intent of these tests to assure that electrical equipment, both Contractor and Owner supplied, is operational within industry and manufacturer's tolerances and is installed in accordance with design specifications.
- B. Test and Inspection:
 - 1. Work is not to be covered until inspected by the Engineer and The Local Inspectors. Give 48 hours notice of intention to cover up work to permit such inspection.
 - 2. All Tests shall be conducted by a Certified Testing Lab.
 - 3. Arrange for a final test and inspection to be observed by the Engineer of the complete electrical system. Test shall be conducted at the expense of and by the Contractor at a mutually agreed upon time. Test shall include the following:
 - a. Demonstrate that all lights and lighting control system equipment operates satisfactorily and as called for.

SECTION 16010
GENERAL PROVISIONS

- b. Inspection and test of equipment and the interior of all switchboards, panels, cabinets, and other items designated at time of final test and inspection.
- c. Spot check verification of color coding, tagging, numbering and splice makeup.
- d. With facility in normal operation Electrical Contractor is to adjust load connection as necessary to achieve phase balance of panels and provide Owner with chart of final adjusted readings.
- e. Provide sign off reports of all testing and demonstrations.

END OF SECTION

PART 1 - GENERAL

A. WORK INCLUDED

1. Plan is general in nature and does not show all existing conditions or demolition work. This contractor shall coordinate with all other trades and disconnect/reconnect, extend/relocate, remove or alter, all existing electrical equipment and circuiting required to facilitate work in remodel areas. Coordinate with general contractor and Architect for details prior to bid.

PART 2 - PRODUCTS

A. EXISTING MATERIALS

1. All materials which are a part of the building shall remain the property of the Owner.

B. EXISTING MATERIAL RE-INSTALLED

1. Existing materials and equipment that are removed as a part of the work may be reinstalled as a part of the new system, subject to approval of condition suitability by the Architect/Engineer. The requirements of the specifications (i.e. installation, warranty, testing, etc.) shall apply as if the materials were new, supplied by the Contractor.

C. EXISTING MATERIALS NOT TO BE RE-INSTALLED

1. In coordination with the Architect/Engineer, these materials shall be made available for his inspection and decision as to whether the Owner will retain possession. Items selected for retention shall be delivered to a location on the premises selected by the Owner and turned over to him. Take reasonable care to avoid damage to this material. If the Contractor fails to conform to this requirement, he shall purchase and turn over to the Owner replacement materials of like kind and quality.
2. All material not selected for retention by the Owner and debris, shall be disposed of by the Contractor.

PART 3 - EXECUTION

A. EXISTING CONDITIONS

Examine the conditions under which Division 16 work is to be installed for conditions detrimental to proper and timely completion of the work. Do not proceed with work until deficiencies encountered in installation have been corrected.

B. DEMOLITION

1. Light fixtures, other electrical equipment free standing, raceway (exposed) and conductors no longer of service as a result of this contract shall be removed. Unused raceways or sleeves shall be cut flush at floor, or wall and filled with grout.
2. Prior to disconnecting or altering any existing circuit, contractor shall determine loads fed by it, and rewire as required to retain circuit continuity as necessary.

PART 4 - INSPECTION

SECTION 16050
EXISTING CONDITIONS

- A. Prior to submitting his bid, the E.C. shall inspect the existing facility and thoroughly familiarize himself with all conditions which may affect his contract. Determine number and location of light fixtures, and other miscellaneous items affected by this work. The on-site inspection called for here shall be carried out sufficiently to afford the Contractor with information necessary to include in his bid the costs for all items involved in this project or required for completion of his work. Failure to follow these instructions shall be considered sufficient cause for this Contractor to provide necessary equipment at his own expense, as directed by the Engineer.

END OF SECTION

PART 1 - SERVICE ENTRANCE EQUIPMENT AND MAIN SWITCHBOARD.

- A. Existing Main Switchboard. See One Line Diagram.

PART 2 - GROUND SYSTEM

- A. Equipment, including transformers, conduits systems, motors, and other apparatus, shall be grounded by conductor to cold water main and grounding electrode, with ground clamps manufactured by Burndy or T & B and approved by the Engineer.
- B. Metallic conduit supports, cabinets and equipment shall be grounded in accordance with the latest codes. Ground wire shall be of the same kind and quality as other conductors in the building, shall be placed in conduit runs as specified for branch circuits and shall be placed in conduit runs as specified for branch circuits and shall be sized to meet the requirements of the National Electrical Code. Where a grounding conductor runs through metallic conduit, it shall be securely bonded to the conduit at the entrance and exit and the conduit shall be fitted with a bolted clamp to secure the same to water pipe.
- C. Flexible Conduit: Flexible conduit will not be approved for continuity in grounding system. Where flexible connections are used, a separate ground wire shall be installed and bonded to conduit system on both sides of flexible conduit. Motor bases and frames shall be grounded by pulling a separate conductor in with feeder.
- D. Bare Grounding Wire: A bare grounding wire, sized in accordance with the National Electrical Code, shall be installed in the same raceway with supplying conductors or in separate conduit and connection shall be made between the secondary neutral of transformers and the neutral buss of the main service entrance equipment.
- E. Conductors: Grounding conductors shall be bare, stranded copper wire of the size and method of installation as prescribed by governing codes, and required by Plans. Wire insulation, when used, shall be green. All driven ground rods shall be 3/4" diameter and shall be embedded not less than 10'-0" into the earth. Conduit sections shall not be used.
- F. Equipment and fixtures Connections: Connect electrical complete to and through all fixtures, including wiring to mechanical equipment.

PART 3 - ELECTRICAL

- A. Identification of components: Panelboards, cabinets, other apparatus used for operation and control of circuits, appliances and equipment installed under this Section shall be properly and completely identified by means of neatly stencilled labels of etched micarta nameplates. Panels to have engraved nameplates on outside of door and typewritten directory behind plastic plate on inside of door.
- B. Branch circuit panels: Branch circuit panels for lighting and equipment loads shall be as called for on the Plans and equipped with locks and keyed alike. Provide typewritten index of circuits, under plastic, in holder on inside of door. Each circuit listed in schedule by room name or number, as applicable, using final room numbers or names used in building as verified by Owner. Panels exposed to public view shall have nametags mounted inside enclosure and not on either side of door, and shall be readily visible with door open. Mount nametags on other panels on outside of door. Panels shall match existing manufacturer or by SQ-D.

PART 4 - WIRING DEVICES

- A. Duplex receptacles: Duplex receptacles shall be ivory 3-pole grounding type with the third pole "U" shaped and grounded, and shall be one of the following with stainless steel coverplates:
1. Bryant, Hubbell, leviton: Number 5342

2. Pass & Seymour: Number 5342I
- B. Special Outlet: verify with equipment on site.
- C. Tumbler Switches: Tumbler switches shall be commercial industrial type 20 amp, 120/277 volt AC and of the following:

Single-Pole

1. Bryant: 4901
2. Hubbell: 1221
3. Pass & Seymour: 20AC1
4. Leviton: 1221

PART 5 - RACEWAYS, FITTINGS, AND BOXES

- A. GENERAL: Conduit installed concealed in walls, above the ceiling, or exposed in work areas, shall be rigid galvanized, Sherardized steel conduit, or electrical metallic tubing. Conduit installed under the floor slab or underground shall be rigid galvanized, or Schedule 40 P.V.C. Where P.V.C. is used, Electrical Contractor shall provide ground conductor and make any necessary increase in conduit size.
- B. PLASTIC DUCT: Type ABS Type II or DB plastic duct meeting Western Underground Committee Specifications. Sand encased Service duct must be approved by the serving Utility Company.
- C. CONDUIT STEEL OR ALUMINUM: Manufacturers Walter, National, Appleton, Rome, Kaiser, or Reynolds Aluminum. Rigid steel: Galvanized or sherardized. All fittings threaded. Bends 1-1/4" or larger to be factory manufactured. Running and exposed threads not permitted.
- D. ELECTRICAL METALLIC TUBING: Manufacturers: Same as conduit. Galvanized or sherardized. Fittings Duro or Thomas & Betts. All connectors with plastic insulated throats. Couplings and connectors size 2" and less, set screw, threaded compression couplings and connectors sizes 3" and above, threaded compression type.
- E. FLEXIBLE CONDUIT: Manufacturers: same as conduit. Galvanized steel. Fittings: "Jake as manufactured by W.F. Curles Mfg. Co.
- F. PLASTIC CONDUIT: Kraloy Schedule 40 polyvinyl chloride conduit and fittings. Elbows 1-1/4" and above, are to be factory manufactured. All joints solvent welded. Provide ground wire for each race-way per N.E.C., except No. 12 minimum.
- G. Penetrations through concrete walls, floors and footings, both interior and exterior, shall be sleeved and caulked with grout or plastic compound. Provide escutcheons at penetrations through finished areas.
- H. Underground conduit shall be 3/4" min. and watertight.
- I. Motors connected with minimum 2' length of flex conduit. Provide watertight for all exterior uses.
- J. OUTLETS, JUNCTION BOXES AND SWITCH BOXES:
 1. Galvanized, code-gauge metal.
 2. Use deep boxes with conduit 1" and larger.
 3. Telephone outlets shall be standard 4" square boxes with single device covers and one-hole Bakelite telephone plates by this Contractor.
 4. Junction boxes to be size, shape and type to accommodate wires without crowding and to suit location.

- L. PULL BOXES: Galvanized, code-gauge, sheet steel with screwed-on covers, of size and shape to accommodate wires without crowding and to suit location. Provide weather-proof type for all site work, and on the roof. Finish the same as panels.
- M. CONDUIT SEALS: Provide where conduits pass from non-cooled to cool areas.

PART 6 - WIRE AND CABLE

- A. GENERAL: Anaconda, General Electric, Okonite, General Cable, Rome or Hatfield, 600 volt insulated copper wire NEC standard of following types: Wire and cable #1/0 and smaller Type THW, RH or THWN, over #1/0 Type THW and THWN 70 degrees C. Wire used in wiring channels or fluorescent lighting fixtures shall be 90 degrees C (min.) type AVA, VA, RHH, or AVB.
- B. HANDLING AND INSTALLATION: Bends shall be kept in accordance with minimum recommended by manufacturer. Cables shall be paralleled on reels and be pulled directly into raceway from the coil and reel on which they are received. Cable shall not be laid on the ground.
- C. Splicing of cables is not permitted unless approved by the Engineer. Splices shall be in strict accordance with manufacturer's specifications. Wires No. 10 and smaller spliced with insulated 3-M "Scotchloks" or Ideal "Wingnuts". Wires No. 8 and larger with "Hy-Dent" connectors.
- D. PULLING LUBRICANTS: "Ideal" - yellow.
- E. Wire and cable installed only after raceways are free of obstructions and clean. Wire color coded. Wiring shall be tagged with Brady "Quick" labels at pull boxes, junction boxes, bus gutters, and panel-boards. Wiring in panelboards and terminal cabinets neatly trained, served, and marked with circuit number.
- F. COLOR CODE WIRES AS FOLLOWS:

Phase	208/120V System	480/227V System
A	Black	Brown
B	Red	Orange
C	Blue	Yellow
Neutral	White	White
Ground Wires	Green	Green

PART 7 - SAFETY SWITCHES

- A. GENERAL: Safety switches shall be heavy-duty, horsepower rated, externally operated with provisions for padlocking, quick-make, quick-break, and shall be fusible.
- B. ENCLOSURE SHALL BE:
- Indoor: NEMA 1
 - Outdoor: NEMA 3R Raintight
- Switch enclosures shall be clearly marked for maximum voltage, current and horsepower rated.
- C. DUAL RATING SWITCHES: Switches having dual ratings (higher rating when used with dual element fuses) shall have ratings indicated on metal plate riveted or otherwise permanently fastened to the enclosure.

PART 8 - SUPPORT SYSTEMS

- A. ACCEPTABLE MANUFACTURERS: Unistrut, or Superstrut
- B. GENERAL: Materials secured in the structure by: inserts cast in concrete, machine screws or bolts on metal surfaces. Bolts and screws used on interior shall be black steel or galvanized on exterior, brass or bronze. Cartridge driven studs used only where specifically noted or approved.
- C. RACEWAYS: Supported at intervals not over 10'. Provide one support not over 12" from each change in direction. Clamps: one hole malleable iron.

PART 9 - OTHER MATERIALS:

Other materials, not specifically described but required for a complete and operable electrical installation, shall be new, first quality of their respective kinds and subject to the acceptance of the Architect.

PART 10 - DRY-TYPE TRANSFORMER:

Provide as indicated to match existing manufacturer or SQ-D Sorgel units with six 2-1/2% taps, 2 above and 4 below normal. Units shall carry UL label. Type "H" insulation system, and maximum sound rating of 50 DB.

- A. Transformers: shall be designed for a maximum temperature rise of 150 degree above 40 degree C. ambient when operating at full load.
- B. Units shall be mounted on "Korfund" vibration isolators. Conduits entering transformer isolated from case with oversize hole, ground wire and rubber grommet.
- C. Transformers shall have the core and coil installed on rubber, vibration-absorbing mounts and securely bolted to the base to keep the sound levels below NEMA standards.
- D. Each transformer shall be tested in accordance with current NEMA and ANSI standards. All transformers shall be UL listed and carry the UL label. All test results shall be certified.

END OF SECTION

PART 1 - SURFACE CONDITION:

Prior to work of this Section, carefully installed work of other trades and verify that such work is completed to the point where this installation may commence. Verify that the complete electrical installation will be in strict accordance with pertinent codes and regulations will conform with the manufacturer's recommendations for installation of the electrical items involved, and will conform with the original design. In the event of discrepancy, immediately notify the Architect and proceed as directed.

PART 2 - PREPARATIONS

A. COORDINATION:

1. Schedules: Coordinate the installation of electrical items with the schedules of work of trades to prevent unnecessary delay in the total work.

PART 3 - TRENCHING AND BACKFILLING:

Provide as required for the installation of electrical items. Dig trenches straight and true to line and grade. Bottom shall be completely smooth. Raceways shall be supported from undisturbed original earth. Trench shall be kept free of water and open trenching protected with suitable barricades and warning lights. Excess earth shall be completely removed from the area and disposed of as directed. Trenches shall be backfilled immediately after approval. Exterior trenches compacted to 90% and interior to 95% compaction.

PART 4 - INSTALLATION OF RACEWAYS AND FITTINGS

- A. GENERAL: Install work neatly. Raceways, fittings, and equipment, level, plumb, and straight. Connectors, locknuts, screws, clamps, joints made up tightly. Work installed in a manner acceptable to the Architect. Work not acceptable to him shall be corrected or replaced.

PART 5 - PROJECT COMPLETION

- A. Upon completion of work of this Section, thoroughly clean exposed portions of the electrical installation, removing soil, labels, grease, oil, and other foreign matter, using only the type cleaner recommended by the manufacturer.

END OF SECTION

PART 1 - SCOPE

A. GENERAL:

1. Light fixture shall be complete with required suspension accessories canopies, casings, lamps, sockets, holders, reflectors, ballasts, diffusing material, plaster frames, recessing boxes and other items and shall be completely wired and assembled.

B. BALLASTS:

For fluorescent fixtures shall be 277 or 120 volt, Energy Saving Electronic Ballast with 85% minimum ballast factor and total harmonic distortion less than 20% or as required by the Local Jurisdiction. Advance, Universal, or Jefferson, of the high power-factor Class P type, and their design and construction shall conform with CBM standards and be identified as such with the CBM-ETL label. Provide with "A" sound rating.

C. LAMPS:

G.E., Westinghouse, or Sylvania. Fluorescent lamps shall be 32 watt T8, 2950 lumens, cool white or as noted on Fixture Schedule. H.I.D. Lamps shall be 277 volt. All interior H.I.D lamps shall be lamps Sylvania MP400/BU or G.E. MPR400/VBU.

D. LENSES:

For recessed, troffer type fixtures shall be .125 of clear virgin acrylic plastic, with nominal overall dimensions of 1' and 2' x 4', as applicable. The upper surface of the lens shall be smooth. The bottom surface shall be covered with a uniform array of conical shapes prisms with square bases.

E. FIXTURE INSTALLATION:

Outlets shall be complete equipped with fixtures, ballast, lamp and lenses. After construction has been completed and during final cleanup of building, fixtures shall be washed lamps cleaned. Contractor is responsible to see that roughing-in details, mounting provisions are made in general construction for flush lights. Locate outlets symmetrical with acoustical tile or as directed by Architect. Recessed fixtures in fire-rated ceilings shall be installed with appropriate enclosures.

1. Ceilings: Prior to ordering any fixtures, Electrical Contractor is to verify ceiling types with latest Architectural Drawings. Any inconsistency or possible conflict is to be resolved before fixtures are ordered, or this Contractor shall be held responsible for any error resulting from his failure to exercise such precaution.
2. Fixture Supports: Lighting fixtures installed in a suspended ceiling shall be supported from the ceiling with the fixture manufacturer's regularly supplied supporting system and shall also be independently supported from the building structure. Supports may be galvanized wire, not smaller than No. 12 gauge, securely twisted, wrapped and fastened.
3. Fixtures mounted directly on the building structure shall be supported with the same number of fastenings as specified for fixtures in suspended ceilings. Supports for fastenings shall be lag screws not less than 1-1/2" long into wooden surfaces. On other surfaces threaded studs, expansion bolts or machine screws, as determined by the surface from which the fixture is supported, shall be used. Boxes supporting incandescent fixtures shall be fastened with not less than two of the fasteners specified for fixtures mounted directly on the building surface. Fixtures weighing more than 50 pounds will be required to have special supports acceptable to the Architect.

SECTION 16500
LIGHTING

4. Install surface mounted fluorescent fixtures on 1-1/2" spacers unless otherwise indicated. Only those fixtures specifically approved for the condition may be mounted tight against ceilings.
5. Recessed fixtures shall be rated and labeled as in compliance with N.E.C. 410-65 and U.L. Standard 1571. Fixtures installed in areas where directed contact with ceiling insulation is likely are to be provided with appropriate labels.

END OF SECTION