

BLOCK 1170.01 LOT 4,5,6 QUALIFICATION CODE _____ADDRESS (SITE) HESS STATIONPERMIT NO. 13-1657CANOPY &
SITE IMPROVEMENTSCONSTRUCTION PERMIT
APPLICATION

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

C-12-004249

I. IDENTIFICATION

1. Proposed Work Site at: 1672 ROUTE 88
2. Name of Owner in Fee: HESS CORPORATION
Tel. (732) 750-6192 e-mail _____
Address 1 HESS PLAZA, WOODBRIDGE NJ 07095
street municipality zip code
3. Ownership in Fee: Public _____ Private ☒
4. Principal Contractor: H.A. FERNOT CO., INC. Tel. (973) 575 8376
Address 32 KULICK ROAD FAIRFIELD NJ e-mail 07004
License No. OR, if new home, Builder Reg. No. _____ Exp. Date _____
Home Improvement Contractor Registration No. or Exemption Reason (if applicable): _____
Federal Emp. ID No. 22-2282264 FAX: (973) 575 7704
5. Architect or Engineer: BOHLER ENGINEERING Contact BRUCE BOYER
Address 35 TECHNOLOGY DR WARREN NJ 07095
Tel. (908) 668-8300 FAX: (908) 754-4401
6. Responsible Person in Charge once Work has Begun: RANDY MITCHELL
Tel. (973) 575 8376 FAX: (973) 575 7704

V. FEE SUMMARY (for office use only)

		Update	Update
1. Building	\$ <u>2,198</u>	☒	
2. Electrical	<u>400</u>	☒	
3. Plumbing	<u>30</u>	☒	
4. Fire Protection	<u>720</u>	☒	
5. Elevator Devices			
6. Subtotal	\$		
7. Less 20% for State Plan Review			
8. Subtotal	\$		
9. State Permit Surcharge Fee	<u>272</u>		
10. Subtotal	\$ <u>346</u>		
11. Cert. of Occupancy			
12. Other <u>CP</u>	<u>150</u>		
13. TOTAL	\$ <u>4146</u>		

VI. BUILDING/SITE CHARACTERISTICS

1. Number of Stories 1 ~~19~~
2. Height of Structure 19'
3. Area — Largest Floor 4284
4. New Building Area 4284
5. Volume of New Structure 81,396
6. Construction Classification _____
7. Total Land Area Disturbed 5000 ±
8. Flood Hazard Zone C
9. Base Flood Elevation N/A
10. Wetlands yes _____ no ☒
11. Max. Live Load 20 PSF
12. Max. Occupancy Load N/A

OPTIONAL (for office use only)

II. PROPOSED WORK	Est. Cost	Plans Rec'd	Date Rec'd	Rejection Date	Approval Date	Re-viewer	Resubmission Dates Approval	Rejection	Re-viewer
1. ☐ Minor Work									
2. ☒ New Building	<u>75,000</u>	<u>11/10/12</u>					<u>3/6/13</u>		
3. ☐ Addition									
4. ☐ a. Repair									
☐ b. Alteration									
☐ c. Renovation									
☐ d. Reconstruction									
5. ☒ Fire Protection	<u>25,000</u>			<u>12/12</u>	<u>3/1/13</u>	<u>12/12</u>	<u>12-18-12</u>		
6. ☒ Plumbing	<u>15,000</u>			<u>12-12</u>	<u>12-11-12</u>	<u>12/11</u>			
7. ☒ Electrical	<u>20,000</u>								
8. ☐ Elevator Devices									
9. ☐ Asbestos Abat. Subch. 8									
10. ☐ Lead Hazard Abatement									
11. ☐ Demolition									
TOTAL COSTS	<u>135,000</u>								

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/Moving Walks
2. ☐ High Pressure Boilers
3. ☐ Refrigeration Systems
4. ☐ Cross-Connections/Backflow Preventers
5. ☐ Hazardous Uses/Places of Assembly
6. ☐ Smoke Control Systems in Open Wells
7. ☐ Swimming Pools, Spas and Hot Tubs
8. ☐ Underground Storage Tanks
9. ☐ Demolition

2.

3. Change in Use Group, Indicate Former:

HESS-12-004249 FOR LIVES ONLY

HESS-12-004465 STRUCTURE

1170.01-4

GAS STATION

me-urder

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.ix:

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 Uniform Construction Code, N.J.A.C. 5:23-2.15(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 _____

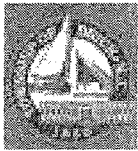
Address _____

HAF *H.A. Ferret Co. Inc.*
32 Mulick Rd.
Fairfield, NJ 07004

Telephone (973) 575 8376

Signature R. Mitchell

III. ☐ LEAD HAZARD ABATEMENT: Include Homeowner or Building Owner Affidavit as per N.J.A.C. 5:17.



Brick Township
401 Chambersbridge Rd
Brick, NJ 08723

Date Issued 9/27/2013
Control Number C-12-004249
Permit Number 13-1657
Permit Issue Date 4/18/2013
Certificate Number 13-1657

Certificate

Construction Code Division
(Certificate of Occupancy)

Identification

Work Site Location: 1672 ROUTE 88 Canopy and 3 gas islands (Hess station) Brick Township, NJ Block: 1170.01 Lot: 4 Qual: _____
Owner in Fee: HESS REALTY CORPORATION
Owner Address: PO BOX 696419 SAN ANTONIO NJ 78269
Telephone: _____
Contractor H. A. Fernot Company, Inc.
Address 32 Kulick Road Fairfield NJ 07004
Telephone: (973) 575-8376 Fax: (973) 575-7704
License Number or Builders Registration Number: 4497 Federal Emp. Number: _____

Home Warranty Number: _____

Type of Warranty Plan: ☐ State ☐ Private

Use Group: M Construction Classification: _____

Maximum Live Load: 0 Maximum Occupancy Load: 0

Description of Work/Use: NEW COMMERCIAL STRUCTURE 3 Gas Islands with kiosks and canopy

Certificate Comments:

☒ **Certificate of Occupancy**

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

☐ **Certificate of Approval**

This serves notice that the work completed has been constructed or installed in accordance with the New Jersey Uniform Construction Code and is approved. If the permit was issued for minor work, this certificate was based upon what was visible at the time of inspection.

☐ **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 Compliance**

The following conditions must be met no later than or the owner will be subject to fine or order to vacate:

This certificate has an expiration date of:

Conditions to be met:

☐ **Certificate of Clearance - Lead Abatement 5:17**

This serves notice that based on written certification, lead abatement was performed as per NJAC5:17 to the following extent.

- ☐ Total removal of lead-based paint hazards in scope of work
☐ Partial or limited time period (years); see file

☐ **Certificate of Clearance - Asbestos Abatement**

This serves notice that based on written certification, asbestos abatement was performed to the following extent.

- ☐ Total removal of asbestos hazards in scope of work
☐ Partial or limited time period (years); see file

☐ **Certificate of Compliance**

This serves notice that said potentially hazardous equipment has been installed and/or maintained in accordance with the New Jersey Uniform Construction Code and is approved for use until

☐ **Temporary Certificate of Occupancy**

The following conditions must be met no later than: or the owner will be subject to fine or order to vacate:

This certificate has an expiration date of:

Conditions to be met:


Construction Official

Fee: \$346.00
Check Number: 4893
Collected By: Lisa Rose Tavalaiaccio

Date Printed: 9/27/2013

U.C.C. F260 (rev. 08/05)

Page 1



Brick Township
401 Chambersbridge Rd
Brick, NJ 08723

Date Issued 9/25/2013
Control Number C-12-004249
Permit Number 13-1657
Permit Issue Date 4/18/2013
Certificate Number 13-1657

Certificate

Construction Code Division
(Temporary Certificate of Occupancy)

Identification

Work Site Location: 1672 ROUTE 88 Canopy and 3 gas islands Block: 1170.01 Lot: 4 Qual: _____
(Hess station) Brick Township, NJ
Owner in Fee: HESS REALTY CORPORATION
Owner Address: PO BOX 696419 SAN ANTONIO NJ 78269
Telephone: _____
Contractor _____
Address _____
Telephone: _____ Fax: _____
License Number or Builders Registration Number: _____ Federal Emp. Number: _____
Home Warranty Number: _____
Type of Warranty Plan: ☐ State ☐ Private
Use Group: M Construction Classification: _____
Maximum Live Load: 0 Maximum Occupancy Load: 0
Description of Work/Use: NEW COMMERCIAL STRUCTURE 3 Gas Islands with kiosks and canopy

Certificate Comments:

☐ **Certificate of Occupancy**

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

☐ **Certificate of Approval**

This serves notice that the work completed has been constructed or installed in accordance with the New Jersey Uniform Construction Code and is approved. If the permit was issued for minor work, this certificate was based upon what was visible at the time of inspection.

☐ **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 Compliance**

The following conditions must be met no later than or the owner will be subject to fine or order to vacate:
This certificate has an expiration date of:
Conditions to be met:

☐ **Certificate of Clearance - Lead Abatement 5:17**

This serves notice that based on written certification, lead abatement was performed as per NJAC5:17 to the following extent.

- ☐ Total removal of lead-based paint hazards in scope of work
☐ Partial or limited time period (years); see file

☐ **Certificate of Clearance - Asbestos Abatement**

This serves notice that based on written certification, asbestos abatement was performed to the following extent.

- ☐ Total removal of asbestos hazards in scope of work
☐ Partial or limited time period (years); see file

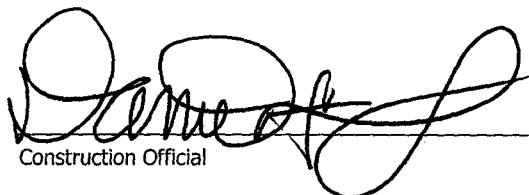
☐ **Certificate of Compliance**

This serves notice that said potentially hazardous equipment has been installed and/or maintained in accordance with the New Jersey Uniform Construction Code and is approved for use until

☒ **Temporary Certificate of Occupancy**

The following conditions must be met no later than: 10/2/2013
or the owner will be subject to fine or order to vacate:
This certificate has an expiration date of: 10/2/2013
Conditions to be met:

Final approval of Building Subcode Official


Construction Official

Fee: \$0.00
Check Number: _____
Collected By: _____



APPLICATION FOR CERTIFICATE

Date Received 11/27/2012
Date Permit Issued 4/18/2013
Control # C-12-004249
Permit # 13-1657
Date Issued 9/27/2013

IDENTIFICATION

Block 1170.01 Lot 4 Qualifier _____
Work Site Location 1672 ROUTE 88 Canopy and 3 gas islands (Hess station) Brick Township, NJ Contractor H. A. Fernot Company, Inc.
Owner in Fee HESS REALTY CORPORATION Address 32 Kulick Road Fairfield NJ 07004
PO BOX 696419 SAN ANTONIO NJ 78269 Telephone (973) 575-8376
Telephone _____ Lic. No. or Bldrs. Reg. No. 4497
Federal Employee. No. _____

ACTION

- ☒ CERTIFICATE OF OCCUPANCY
☐ CERTIFICATE OF CONTINUED OCCUPANCY
☐ LEAD HAZARD ABATEMENT CERTIFICATE OF CLEARANCE
☐ TEMPORARY CERTIFICATE OF OCCUPANCY

USE GROUP _____ Previous _____ M _____ Current _____

FINAL COST OF CONSTRUCTION: \$ 135000

(Include value of any new structure, all on-site improvements, built-in furnishings and fixtures and all the integral equipment exclusive of process or manufacturing equipment.)

A set of "As Built" or amended drawings is required if the building or structure deviates from the approved plans filed with the construction permit. Use space below to describe any deviations from approved plans:

If you are requesting a Temporary Certificate of Occupancy, please explain why in the space below.

DESCRIPTION OF WORK/USE:

New NEW COMMERCIAL STRUCTURE 3 Gas Islands with kiosks and canopy

I hereby attest, that to the best of my knowledge, all work has been completed in accordance with the approved plans, permit, and regulations. Incomplete items listed on a Temporary Certificate of Occupancy will be completed by the date on the Certificate.

SIGNED: _____

Owner/Agent

☐ OWNER

☒ AGENT

BUILDING SUBCODE

TECHNICAL SECTION



Date Received
Control #

Date Issued
Permit #

4/18/13
13-1657

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

Block 1170.01 Lot 4, 5, 6 Qualification Code _____
Work Site Location 1672 ROUTE 88

Owner in Fee: HESS CORPORATION

Tel. (732) 750-6192 e-mail _____

Address 1 HESS PLAZA WOODBRIDGE NY 07095
street municipality zip code

Contractor: H.A. FERNOT CO., INC. Tel. (973) 575 8376

Address 32 KULICK ROAD FAIRFIELD email NJ. 07004

Contractor License No. or Builder Registration No. _____ Exp. Date _____

Home Improvement Contractor Registration No. or Exemption Reason (if applicable): _____

Federal Emp. ID No. 22-2282264 FAX: (973) 575 7704

JOB SUMMARY (Office Use Only)

PLAN REVIEW			INSPCTIONS		Dates (Month/Day)			
	Date	Initial			Failure	Failure	Approval	Initial
☐ No Plans Required	_____	_____	Type:	Failure	_____	_____	_____	_____
☐ All	_____	_____	Footing	_____	_____	8/18/13	_____	W
☐ Footing	_____	_____	Footing Bonding	_____	_____	_____	_____	_____
☐ Foundation	_____	_____	Foundation	_____	_____	_____	_____	_____
☐ Slab	_____	_____	Slab	_____	_____	_____	_____	_____
☐ Frame	_____	_____	Frame	_____	_____	_____	_____	_____
☒ Other	3/5/13	HA	Truss Sys./Bracing	_____	_____	_____	_____	_____
Joint Plan Review Required:			Barrier-Free	_____	_____	_____	_____	_____
☐ Elec.	☐ Plumb.	☐ Fire	☐ Elevator	Insulation	_____	_____	_____	_____
				Finishes -Base Layer	_____	_____	_____	_____
				Finishes -Final	_____	_____	_____	_____
SUBCODE APPROVAL				Energy	_____	_____	_____	_____
☐ CO	☐ CCO	☒ CA		Mechanical	_____	_____	_____	_____
Date:	09/27/13			TCO	_____	_____	_____	_____
Approved by:	JCK			Other	_____	_____	_____	_____
				Final	8/19/13	W	9/20/13	W
				Barrier-Free	_____	_____	_____	_____

B. BUILDING CHARACTERISTICS

Use Group	Present <u>M</u>	Proposed <u>M</u>	Est. Cost of Bldg. Work:
Constr. Class	Present _____	Proposed _____	1. New Bldg. \$ <u>75,000.00</u>
No. of Stories	<u>1</u>		2. Rehabilitation \$ _____
Height of Structure	<u>19'</u>	Ft.	3. Total (1+ 2) \$ _____
Area — Largest Floor	<u>4284</u>	Sq. Ft.	<i>NIR</i>
New Bldg. Area/All Floors	<u>4284</u>	Sq. Ft.	
Volume of New Structure	<u>81,396</u>	Cu. Ft.	
Total Land Area Disturbed	<u>6,000 ±</u>	Sq. Ft.	

U.C.C. F110
1 White
2 Pink

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 R. Mitchell

D. TECHNICAL SITE DATA

DESCRIPTION OF WORK

42'x102' AREA CANOPY

4'x8' Kiosk

8 FUEL dispensers

5 AREA LIGHTS

~~1 AIA STATION~~

~~10'x24' TRASH ENCLOSURE~~

separate permit

TYPE OF WORK:

☒ New Building *ASA Canopy*
☐ Addition *w/ 3 gnd island*
☐ Rehabilitation *dispensers*
☐ Roofing
☐ Siding
☐ Fence _____ Height (exceeds 6')
☐ Sign _____ Sq. Ft.
☐ Pool _____
☐ Retaining Wall _____ Sq. Ft.
☐ Asbestos Abatement Subchapter 8
☐ Lead Haz. Abatement NJAC 5:17
☐ Radon Remediation
☐ Other _____
☐ Demolition

FEE (Office Use Only)

[illegible]

Administrative Surcharge \$ _____
Minimum Fee \$ _____
State Permit Surcharge Fee \$ _____
TOTAL FEE \$ _____



APPLICATION FOR CERTIFICATE

Date Received 11/27/2012
Date Permit Issued 4/18/2013
Control # C-12-004249
Permit # 13-1657
Date Issued

IDENTIFICATION

Block 1170.01 Lot 4 Qualifier _____
Work Site Location 1672 ROUTE 88 Canopy and 3 gas islands (Hess station) Brick Township, NJ Contractor H. A. Fernet Company, Inc.
Address 32 Kulick Road Fairfield NJ 07004
Owner in Fee HESS REALTY CORPORATION Telephone (973) 575-8376
PO BOX 696419 SAN ANTONIO NJ 78269 Lic. No. or Bldrs. Reg. No. 4497
Telephone _____ Federal Employee. No. _____

ACTION

- ☐ CERTIFICATE OF OCCUPANCY
☐ CERTIFICATE OF CONTINUED OCCUPANCY
☐ LEAD HAZARD ABATEMENT CERTIFICATE OF CLEARANCE
☒ TEMPORARY CERTIFICATE OF OCCUPANCY

USE GROUP _____ Previous _____ M _____ Current _____

FINAL COST OF CONSTRUCTION: \$ 135000

(Include value of any new structure, all on-site improvements, built-in furnishings and fixtures and all the integral equipment exclusive of process or manufacturing equipment.)

A set of "As Built" or amended drawings is required if the building or structure deviates from the approved plans filed with the construction permit. Use space below to describe any deviations from approved plans:

If you are requesting a Temporary Certificate of Occupancy, please explain why in the space below.

SO THAT STORE / GAS PUMPS CAN OPEN FOR BUSSINESS
UNTIL BUILDING SUB-CODE OFFICIAL GIVES FINAL SIGN-OFF.

DESCRIPTION OF WORK/USE:

New NEW COMMERCIAL STRUCTURE 3 Gas Islands with kiosks and canopy

I hereby attest, that to the best of my knowledge, all work has been completed in accordance with the approved plans, permit, and regulations. Incomplete items listed on a Temporary Certificate of Occupancy will be completed by the date on the Certificate.

SIGNED: _____

Owner/Agent

☐ OWNER

☒ AGENT



FIRE PROTECTION SUBCODE TECHNICAL SECTION



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

Block 1170.01 Lot 4,5,6 Qualification Code _____
Work Site Location 1672 Route 88

Owner in Fee: HESS CORPORATION
Tel. (732) 751-6192 e-mail _____
Address 1 HESS PLAZA WADDICK NJ 07045
Contractor: H.A. FERNOT CO. INC. Tel. (973) 575 8376
Address 32 KULICK ROAD FAIRFIELD NJ 07004

Fire Protection Equipment, NJ Div of Fire Safety Permit No. _____
Fire Protection Equipment, NJ Div of Fire Safety Installer No. _____
Fire Alarm Contractor No. _____ Exp. Date _____

Home Improvement Contractor Registration No. or Exemption Reason (if applicable): _____
Federal Emp. ID No. 22-2282264 FAX: (973) 575 7704

B. FIRE PROTECTION CHARACTERISTICS

Use Group: Present M Proposed M Fire Alarm System: [] New OR [] Existing
Constr. Class: Present _____ Proposed _____ Location of Panel: _____
Heating System: [] New OR [] Existing [] HVAC Fire Suppression/Standpipe System:
Type: [] Gas [] Oil [] Electric [] Solar [] New OR [] Existing
[] Other _____ Location of Main Control Valve: _____

Location: _____

Fuel Storage Tank:

Fuel Type: [] Flammable OR [] Combustible Capacity _____

Total Cost of Fire Protection Work \$ 25,000.00

JOB SUMMARY (Office Use Only)	INSPECTIONS	Dates (Month/Day)			
		Type:	Failure	Approval	Initial
PLAN REVIEW	Alarm System	_____	_____	_____	_____
[] No Plans Required	Suppression Sys.	_____	_____	_____	_____
Joint Plan Review Required:	Standpipe	_____	_____	_____	_____
[] Building [] Plumbing	Fire Pump	_____	_____	_____	_____
[] Electric [] Elevator	Pre-Eng. System	_____	_____	_____	_____
[X] Fire Plans Approved	Mechanical	_____	_____	_____	_____
Date: <u>3/1/13</u>	Smoke Control	_____	_____	_____	_____
Approved by: <u>NSD</u>	TCO	_____	_____	_____	_____
SUBCODE APPROVAL	Flam/Combust Tanks	_____	_____	_____	_____
[] CO [] CCO [] CA	Fireplace Venting	_____	_____	_____	_____
Date: <u>9/23/13</u>	Final	_____	_____	_____	_____
Approved by: <u>RP</u>	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. 25 March

Applicant's Signature/Contractor's Signature

[X] Certified Contractor

[] Exempt Applicant

D. TECHNICAL SITE DATA

DESCRIPTION OF WORK: EXISTING UNDERGROUND TANKS REMAIN.

NEW FUEL DISPENSERS.

Water Supply Source _____

Method of Alarm/Suppression System Supervision _____

	NUMBER	FEE (Office Use Only)
Flammable/Combustible Tanks	<u>4</u>	
Alarm Systems		
[X] System		
[] 110v Interconnected		
[] CO Detectors/110v		
Alarm Devices (i.e., smoke, heat, pulls, water/flow)	<u>3</u>	
Supervisory Devices (i.e., tamper, low/high air)		
Signaling Devices (i.e., horn/strobes, bells)	<u>1</u>	
Other Devices <u>GASOLINE SENSOR</u>	<u>20</u>	
TOTAL	<u>24</u>	
Suppression Systems		
Fire Pump _____ GPM Type _____		
Dry Pipe/Alarm Valves		
Pre-action Valves		
Sprinkler Heads (Dry and Wet)		
Standpipes		
Pre-engineered Systems		
Wet Chemical		
Dry Chemical		
CO ₂ Suppression		
Foam Suppression		
FM200 Suppression		
Other _____		
Other Systems		
Kitchen Hood Exhaust System <u>E-STOP</u> <u>(2)</u>		
Smoke Control System		
Fired Appliances [] Gas or [] Oil		
Fireplace Venting/Metal Chimney		
Other <u>FUEL DISPENSER</u>	<u>8</u>	

W/ CRASH VALVES

Administrative Surcharge \$ _____
Minimum Fee \$ _____
State Permit Surcharge Fee \$ _____
TOTAL FEE \$ 730

<table><tr><th>Rev</th><th>Date</th><th>Description</th></tr><tr><td>0</td><td>8/22/12</td><td>Orig</td></tr><tr><td>1</td><td>12/18/12</td><td>Gen Rev</td></tr></table>			Rev	Date	Description	0	8/22/12	Orig	1	12/18/12	Gen Rev	<table><tr><td colspan="2"> MADISON www.madisonind.com "ENGINEERED PRODUCTS FOR THE WORLD" </td></tr><tr><td>CUSTOMER</td><td>Hess Corporation</td></tr><tr><td>DESCRIPTION</td><td>42'-0" x 102'-0" (6) Column Canopy</td></tr></table>		MADISON www.madisonind.com "ENGINEERED PRODUCTS FOR THE WORLD"		CUSTOMER	Hess Corporation	DESCRIPTION	42'-0" x 102'-0" (6) Column Canopy	<table><tr><td>JOB NO.</td><td>WGA06793-2</td></tr><tr><td>SHT</td><td>1 OF 37</td></tr><tr><td>DATE</td><td>12/18/2012</td></tr><tr><td>DES. BY</td><td>JFB</td></tr><tr><td>REV</td><td>1</td></tr></table>		JOB NO.	WGA06793-2	SHT	1 OF 37	DATE	12/18/2012	DES. BY	JFB	REV	1
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REV	1																														

STRUCTURAL CALCULATIONS FOR
Hess Corporation
42'-0" x 102'-0" (6) Column Canopy

LOCATED AT
Hess Station #30279
1672 State Highway 88
Laurelton, New Jersey

REVISION 1
Dated December 18, 2012
(Revised for 115 mph Wind Speed)

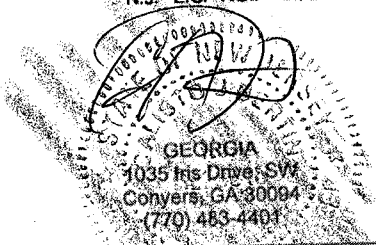


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Madison Industries
Designed by: JFB
December 18, 2012
Job No: WGA06793-2

Customer: Hess Corporation
Structure: 42'-0" x 102'-0" (6) Column Canopy
Location: Laurelton, New Jersey
Sheet 2

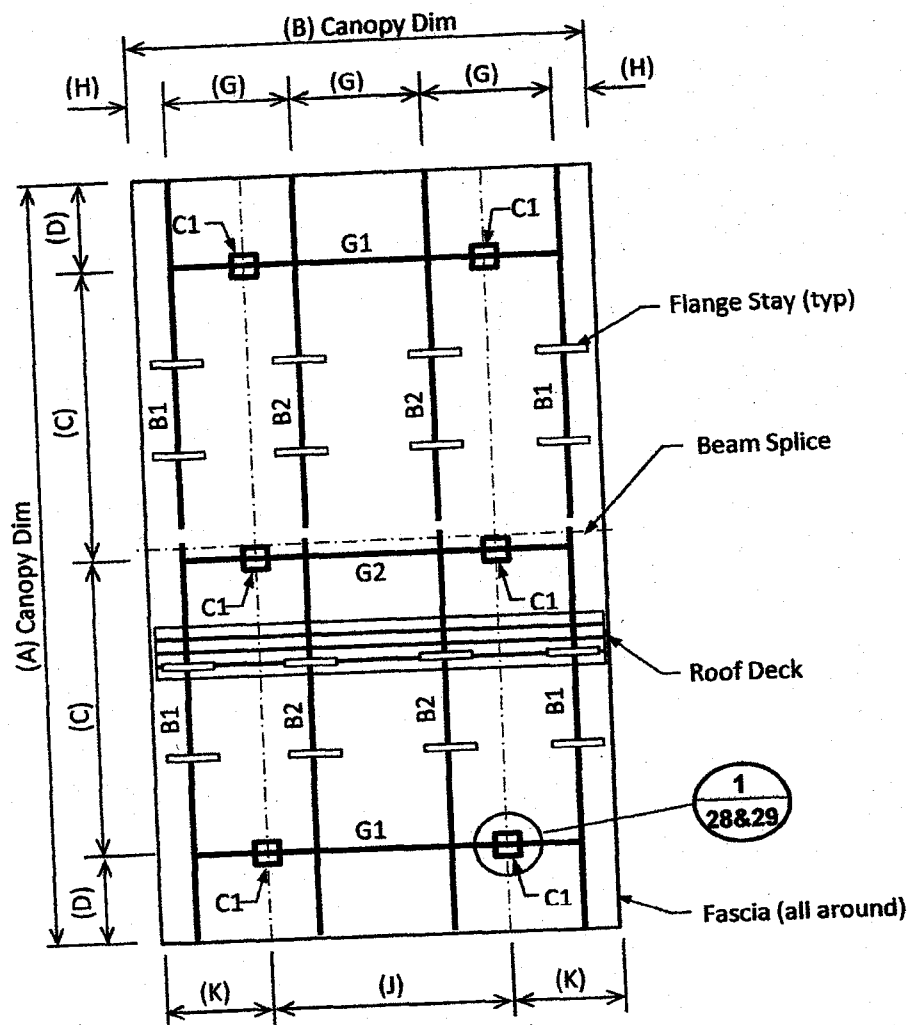
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Madison Industries
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 December 18, 2012
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Customer: Hess Corporation
 Structure: 42'-0" x 102'-0" (6) Column Canopy
 Location: Laurelton, New Jersey
 Sheet 3

Canopy Roof Framing Plan



Canopy Dimensions

(A) = 102.00 ft
 (B) = 42.00 ft
 (C) = 36.50 ft
 (D) = 14.50 ft
 (G) = 11.33 ft
 (H) = 4.00 ft
 (J) = 14.00 ft
 (K) = 14.00 ft

Canopy Clear Ht = 15.50 ft
 Fascia Ht = 3.50 ft

Member Sizes

Beam B1 = W16x26
 Beam B2 = W16x26
 Girder G1 = W16x36
 Girder G2 = W16x36
 Column C1 = HSS12x12x5/16

Qty	Length	Total Weight	Material	E _y
4	51.00 ft	5304 lbs	A992	50 ksi
4	51.00 ft	5304 lbs	A992	50 ksi
2	34.00 ft	2448 lbs	A992	50 ksi
1	34.00 ft	1224 lbs	A992	50 ksi
6	19.50 ft	5717 lbs	A500 Gr. B	46 ksi
			A653	50 ksi

Roof Deck = 20 gage with 3 inch tall ribs @ 16 inch spacing
 3210 linear feet of deck panel required

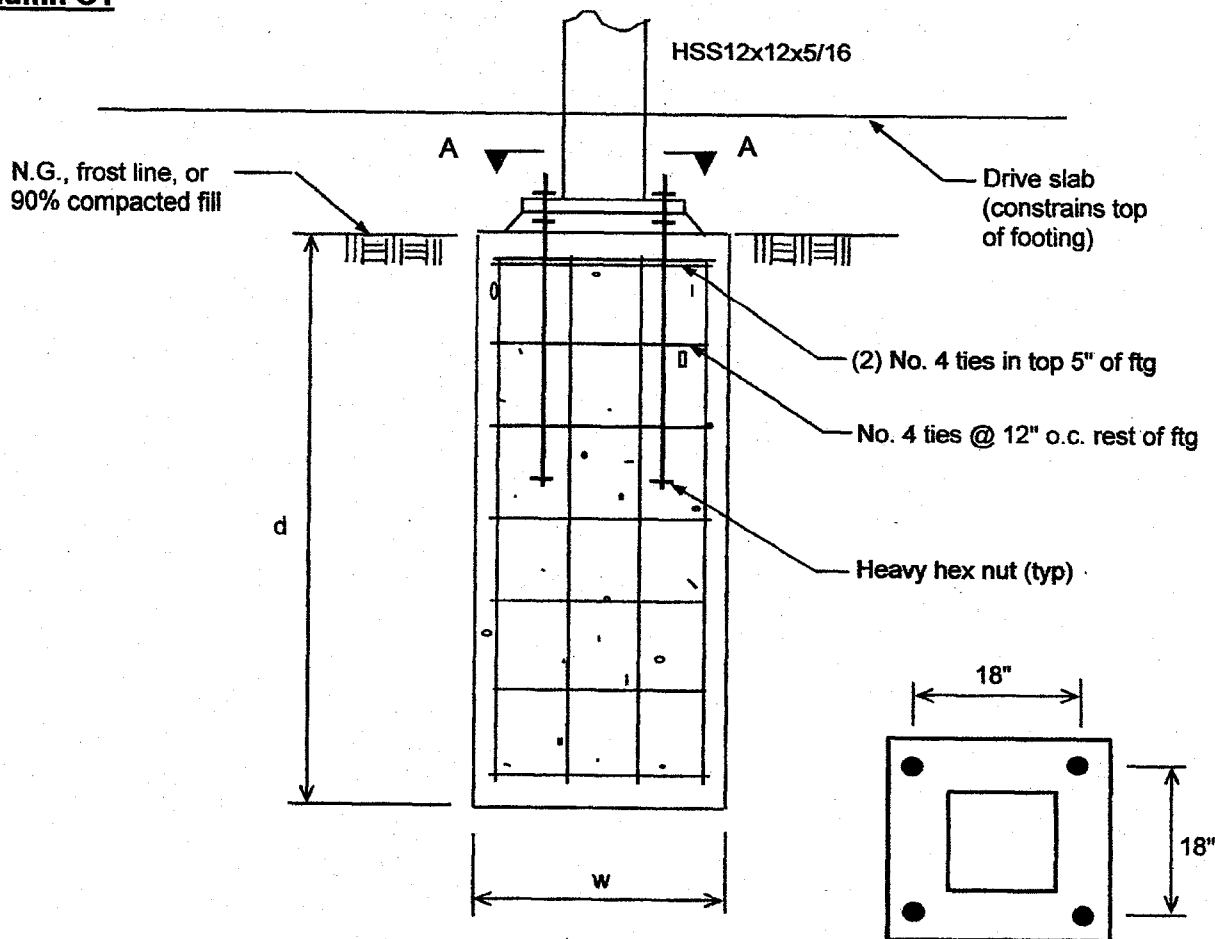
Framing: Girders rest on top of columns; beams hang from girders; deck is fastened to bottom of beams.

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 Sheet 4

Foundation Summary Sheet

Column C1



Section A-A

Footing designs include either a round or square alternate:

Round Foundation: $w = 4.5$ ft diameter x $d = 8.0$ ft deep
 with 12 no. 6 vertical rebars per ftg w/ # 4 horz ties @ 12" o.c.

Square Foundation: $w = 4.0$ ft square x $d = 8.0$ ft deep
 with 4 no. 6 vertical rebars per face of sq. ftg w/ # 4 horz ties @ 12" o.c.

Anchor Bolts: Use: 4 — 1.25 inch dia. x min. 48 in long (Material = A36)
 (40 inches min. embedment to top of nut)

Base Plate: Use: 22 inch square x 1.375 in thick (Material = A36)
 (c/c spacing of outside bolt holes = 18 inches)

Weld of Column to Base Plate: 0.375 inch fillet weld all around

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Sheet 6

IBC 2009 Wind Design Loads

IBC 2009 Wind Design Pressures:

Lateral Wind:

Per ASCE 7-05 Sect. 6.5.12.2.4

Lateral Wind Pressure: $P_{LAT} = 2.5q_p =$ **64.7 psf**

Where: Velocity Pressure (q_p) = $0.00256K_zK_{zt}K_dV^2I =$ 25.9 psf

Height to Top of Canopy Fascia / Parapet = 15.5 ft

Fascia Height (h) = 3.5 ft

Basic Wind Speed (V) = 115 mph (3-second gust)

Exposure = C

Importance Factor (I) = 1.00

$K_z =$ 0.90

$K_{zt} = (1+K_1K_2K_3)^2 =$ 1.0

$K_1 =$ 1.0

$K_2 =$ 1.0

$K_3 =$ 1.0

$K_d =$ 0.85

Base Shear: $V_w = P_{LAT}hA =$ **23.1 k**

Where: A = 102.0 ft (max canopy dimension)

Wind Uplift:

Wind Uplift Pressure: $P_{UP} = q_hGC_N =$ **26.4 psf**

Where: $q_h = q_p =$ 25.9 psf (conservative)

$C_N =$ 1.2

Overturning Moment (at base plate level):

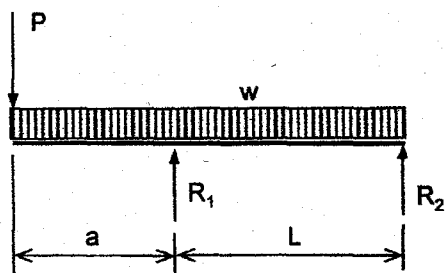
$M_w = (V_w)(H_{column}) =$ **451 ft-k**

Where: $H_{column} =$ 19.50 ft

Madison Industries
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 Structure: 42'-0" x 102'-0" (6) Column Canopy
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 Sheet 8

Roof Deck



'x' is measured from R_2

P_{DL}	=	37 lbs
P_{LL}	=	0 lbs
$P_{WIND\ DOWN}$	=	115 lbs
DL	=	3.26 psf
LL	=	20 psf
Wind uplift load (enter negative number)	=	-26.4 psf
Deck Wt	=	2.95 plf
Tributary Loading Strip	=	1.33 ft
w_{DL}	=	4.33 plf
w_{LL}	=	26.6 plf
w_{DL+LL}	=	30.9 plf
$w_{WIND\ UPLIFT}$	=	-35.1 plf
$w_{SELF\ WEIGHT\ OF\ DECK}$	=	2.951 plf
L	=	11.33 ft
a	=	4.00 ft

Check Span (L):

Positive Bending

Max. allowable moment for positive bending (DL+LL on span; DL on cant.):

Procedure I - Based on Initiation of Yielding

(Procedure II strain check produces same result)

$$\text{Nominal Moment } (M_{np}) = S_{ep} F_y = 19.53 \text{ in-k}$$

$$\text{Allowable Moment } (M_{ap}) = M_{np} / \Omega_f = 11.7 \text{ in-k}$$

$$\text{Where } \Omega_f = 1.67 \text{ (Factor of Safety)}$$

Actual positive bending moment

$$R_2 \text{ for this case} = 159 \text{ lbs}$$

$$\text{Pt. to max. moment} = x = 5.1 \text{ ft}$$

$$m_{ap} = (R_2)(x)/2 = 4.9 \text{ in-k}$$

Since $m_{ap} < M_{ap}$, 20 ga. Sheet Metal Deck Span is OK for Positive Bending

Negative Bending

Max Allowable Moment for negative bending (Wind Uplift):

Procedure I - Based on Initiation of Yielding

(Procedure II strain check produces same result)

$$\text{Nominal Moment } (M_{nn}) = S_{en} F_y = 15.05 \text{ in-k}$$

$$\text{Allowable Moment } (M_{an}) = M_{nn} / \Omega_f = 9.0 \text{ in-k}$$

$$\text{Where } \Omega_f = 1.67 \text{ (Factor of Safety)}$$

Actual negative bending moment

$$m_{an} = (w_{WIND\ UPLIFT} - w_{DL})(L^2)/8 = 5.9 \text{ in-k}$$

Since $m_{an} < M_{an}$, 20 ga. Sheet Metal Deck Span is OK for Negative Bending

Madison Industries
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 Structure: 42'-0" x 102'-0" (6) Column Canopy
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 Sheet 10

Roof Deck Section Properties

20 Gauge Deck, 3 in. Ribs -- Positive Bending

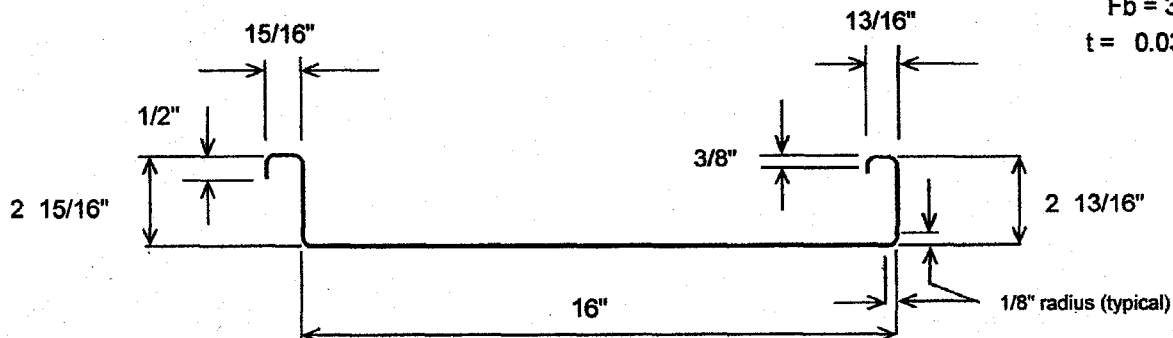
(Top Flange of Deck in Compression)

ASTM A653 Gr. 50

Fy = 50,000 psi

Fb = 30,000 psi

t = 0.036 in



Previous	Area	b	d	Theta	a	h	AREA	Y	AY	AY^2	Io
1	-	16	0.036	0	0.000	0.036	0.576	0.018	0.01	0.0	0.00
2	1	0.072	2.4015	0	0.036	2.438	0.173	1.237	0.21	0.3	0.08
3	2	0.144	0.339	0	2.438	2.777	0.049	2.607	0.13	0.3	0.00
4	3	0.8125	0.036	0	2.777	2.813	0.029	2.795	0.08	0.2	0.00
5	4	0.072	0.089	0	2.813	2.902	0.006	2.857	0.02	0.1	0.00
6	5	0.9375	0.036	0	2.902	2.938	0.034	2.920	0.10	0.3	0.00
7	6	0	0	0	2.938	2.938	0.000	2.938	0.00	0.0	0.00
8	7	0	0	0	2.938	2.938	0.000	2.938	0.00	0.0	0.00
9	8	0	0	0	2.938	2.938	0.000	2.938	0.00	0.0	0.00
10	9	0	0	0	2.938	2.938	0.000	2.938	0.00	0.0	0.00
TOTAL AREA =							0.867 in ²		0.55		1.2

TOTAL DEPTH =

2.938 in

CENTROID (Y) = SUM(AY)/SUM(AREA) =

0.634 in

C1 = Y =

0.634 in

C2 = DEPTH - Ybar =

2.303 in

I(total) = [SUM(AY^2) + SUM(Io)] - (AREA)(Y)^2 =

0.90 in⁴

Sx1 = I/C1 =

1.418 in³

Sx2 = I/C2 =

0.391 in³

Radius of gyration (r) = (I/A)^{1/2} =

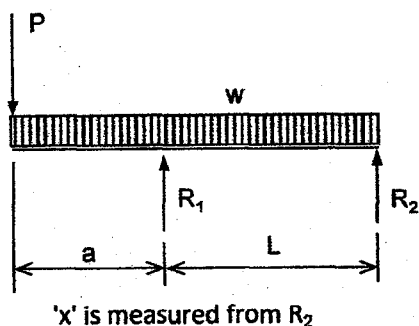
1.019 in

← comp. flg.

Madison Industries
 Designed by: JFB
 December 18, 2012
 Job No: WGA06793-2

Customer: Hess Corporation
 Structure: 42'-0" x 102'-0" (6) Column Canopy
 Location: Laurelton, New Jersey
 Sheet 12

Roof Support Beam B1



Geometry:

L = 36.50 ft
 a = 14.50 ft

Span: Max Unbraced Top Fig. Length (L') = 12.2 ft
 Span: Max Unbraced Bottom Fig. Length (L'') = 2 ft
 Cant.: Max Unbraced Top Fig. Length (a') = 14.5 ft
 Cant.: Max Unbraced Bott. Fig. Length (a'') = 2 ft

Load Combinations (Strength Design):

$w_{u1} = 1.4w_{DL} = 120 \text{ plf}$
 $w_{u2} = 1.2w_{DL} + 1.6w_{LL} = 471 \text{ plf}$
 $w_{u3} = 0.9w_{DL} - 1.3w_{WIND} = 255 \text{ plf}$
 $P_{u1} = 1.4P_{DL} = 378.9 \text{ lbs}$
 $P_{u2} = 1.2P_{DL} + 1.6P_{LL} = 1377 \text{ lbs}$
 $P_{u3} = 0.9P_{DL} = 243.6 \text{ lbs}$

Selected Beam:

Suggested Shapes: Stress only = W8x24
 Stress & deflection = W21x50

Beam Used = W16x26

A = 7.68 in²
 $S_x = 38.4 \text{ in}^3$
 $I_x = 301.0 \text{ in}^4$
 $I_y = 9.6 \text{ in}^4$
 $d/A_f = 8.27$
 $r_y = 1.12 \text{ in}$
 $J = 0.26 \text{ in}^4$
 $C_w = 565 \text{ in}^6$
 $Z_x = 44.2 \text{ in}^3$

Unfactored Loads:

$P_{DL} = 271 \text{ lbs}$
 $P_{LL/\text{snow drift}} = 657 \text{ lbs}$
 $DL = 3.3 \text{ psf}$
 $LL = 23.8 \text{ psf}$
 Wind uplift load = -26.4 psf
 Beam Wt/Extra Load = 54 plf
 Tributary Loading Strip = 9.67 ft
 $w_{DL} = 85.5 \text{ plf}$
 $w_{LL} = 230.4 \text{ plf}$
 $w_{DL+LL} = 315.9 \text{ plf}$
 $w_{WIND \text{ UPLIFT}} = -255 \text{ plf}$

Reactions:

$R_{1(DL)} = 3424 \text{ lbs}$
 $R_{1(DL+LL)} = 12552 \text{ lbs}$
 $R_{1(DL+WIND)} = -5675 \text{ lbs}$
 $R_{1(\text{CASE } 2)} = 7629 \text{ lbs}$
 $R_{2(DL)} = 1206 \text{ lbs}$
 $R_{2(DL+LL)} = 4486 \text{ lbs}$
 $R_{2(DL+WIND)} = -2719 \text{ lbs}$
 $R_{2(\text{CASE } 2)} = 5411 \text{ lbs}$

Material = A992
 $F_y = 50 \text{ ksi}$

Actual Stresses:

$f_{b[\text{span}(p)]} = M_{\text{span}(p)}/S_x = 14.48 \text{ ksi}$
 $f_{b[\text{span}(n)]} = M_{\text{span}(n)}/S_x = 14.58 \text{ ksi}$
 $f_{b[\text{cant}(p)]} = M_{\text{cant}(p)}/S_x = 5.58 \text{ ksi}$
 $f_{b[\text{cant}(n)]} = M_{\text{cant}(n)}/S_x = 14.58 \text{ ksi}$

Actual deflections:
 $\delta_{DL(\text{span})} = 0.182 \text{ in}$
 $\delta_{LL(\text{span})} = 1.049 \text{ in}$
 $\delta_{DL+LL(\text{span})} = 1.231 \text{ in}$
 $\delta_{DL(\text{cant})} = 0.102 \text{ in}$
 $\delta_{LL(\text{cant})} = 1.563 \text{ in}$
 $\delta_{DL+LL(\text{cant})} = 1.665 \text{ in}$

Roof Support Beam B1, cont.

Design Strengths - Span:

For $L_b \leq L_p$:

Top Flange:	$\phi_b M_n' = 165.8 \text{ ft-k}$	N/A this case
Bottom Flange:	$\phi_b M_n'' = 165.8 \text{ ft-k}$	Governs for bottom flange

Where: $\phi = 0.9$

$M_n = \text{lesser of: } 1) M_p = F_y Z_x = 184.2 \text{ ft-k}$

2) $1.5M_y = 1.5F_y S_x = 240 \text{ ft-k}$

For $L_p < L_b \leq L_r$:

Top Flange:	$\phi_b M_n' = 101.4 \text{ ft-k}$	N/A this case
Bottom Flange:	$\phi_b M_n'' = 181.1 \text{ ft-k}$	N/A this case

Where: $\phi = 0.9$

$M_n' = C_b \{M_p - (M_p - M_r) [(L_b' - L_p) / (L_r - L_p)]\} = 112.6 \text{ ft-k}$

$M_n'' = C_b \{M_p - (M_p - M_r) [(L_b'' - L_p) / (L_r - L_p)]\} = 201.2 \text{ ft-k}$

$C_b = 1.0$

$M_r = F_L S_x = 128.0 \text{ ft-k}$

For $L_b > L_r$:

Top Flange:	$\phi_b M_n' = 87.5 \text{ ft-k}$	Governs for top flange
Bottom Flange:	$\phi_b M_n'' = 2770.0 \text{ ft-k}$	N/A this case

Where: $\phi = 0.9$

$M_n' = M_{cr}' = [C_b S_x X_1 (2)^{1/2} / (L_b' / r_y)] [1 + X_1^2 X_2 / [2(L_b' / r_y)^2]]^{1/2} = 97 \text{ ft-k}$

$M_n'' = M_{cr}'' = [C_b S_x X_1 (2)^{1/2} / (L_b'' / r_y)] [1 + X_1^2 X_2 / [2(L_b'' / r_y)^2]]^{1/2} = 3078 \text{ ft-k}$

Design Strengths - Cantilever:

For $L_b \leq L_p$:

Top Flange:	$\phi_b M_n' = 165.8 \text{ ft-k}$	N/A this case
Bottom Flange:	$\phi_b M_n'' = 165.8 \text{ ft-k}$	Governs for bottom flange

For $L_p < L_b \leq L_r$:

Top Flange:	$\phi_b M_n' = 83.1 \text{ ft-k}$	N/A this case
Bottom Flange:	$\phi_b M_n'' = 181.1 \text{ ft-k}$	N/A this case

Where: $\phi = 0.9$

$M_n' = C_b \{M_p - (M_p - M_r) [(L_b' - L_p) / (L_r - L_p)]\} = 92.3 \text{ ft-k}$

$M_n'' = C_b \{M_p - (M_p - M_r) [(L_b'' - L_p) / (L_r - L_p)]\} = 201.2 \text{ ft-k}$

For $L_b > L_r$:

Top Flange:	$\phi_b M_n' = 65.1 \text{ ft-k}$	Governs for top flange
Bottom Flange:	$\phi_b M_n'' = 2770.0 \text{ ft-k}$	N/A this case

Where: $\phi = 0.9$

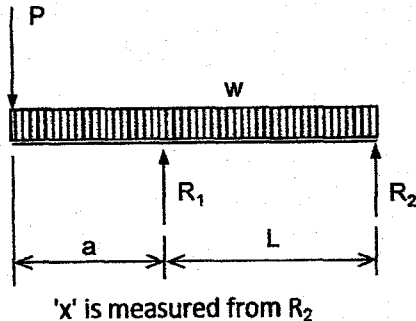
$M_n' = M_{cr}' = [C_b S_x X_1 (2)^{1/2} / (L_b' / r_y)] [1 + X_1^2 X_2 / [2(L_b' / r_y)^2]]^{1/2} = 72 \text{ ft-k}$

$M_n'' = M_{cr}'' = [C_b S_x X_1 (2)^{1/2} / (L_b'' / r_y)] [1 + X_1^2 X_2 / [2(L_b'' / r_y)^2]]^{1/2} = 3078 \text{ ft-k}$

Madison Industries
Designed by: JFB
December 18, 2012
Job No: WGA06793-2

Customer: Hess Corporation
Structure: 42'-0" x 102'-0" (6) Column Canopy
Location: Laurelton, New Jersey
Sheet 16

Roof Support Beam B2



Geometry:
L = 36.50 ft
a = 14.50 ft

Span: Max Unbraced Top Flg. Length (L') = 12.2 ft
Span: Max Unbraced Bottom Flg. Length (L'') = 2 ft
Cant.: Max Unbraced Top Flg. Length (a') = 14.5 ft
Cant.: Max Unbraced Bott. Flg. Length (a'') = 2 ft

Load Combinations (Strength Design):

$w_{u1} = 1.4w_{DL} = 88 \text{ plf}$
 $w_{u2} = 1.2w_{DL} + 1.6w_{LL} = 380 \text{ plf}$
 $w_{u3} = 0.9w_{DL} - 1.3w_{WIND} = 333 \text{ plf}$
 $P_{u1} = 1.4P_{DL} = 444 \text{ lbs}$
 $P_{u2} = 1.2P_{DL} + 1.6P_{LL} = 1614 \text{ lbs}$
 $P_{u3} = 0.9P_{DL} = 285.6 \text{ lbs}$

Selected Beam:

Suggested Shapes: Stress only = W10x22
Stress & deflection = W21x50

Beam Used = **W16x26**

A = 7.68 in²
S_x = 38.4 in³
I_x = 301 in⁴
I_y = 9.6 in⁴
d/A_t = 8.27
r_y = 1.12 in
J = 0.26 in⁴
C_w = 565 in⁶
Z_x = 44.2 in³

Unfactored Loads:

$P_{DL} = 317 \text{ lbs}$
 $P_{LL/snow \text{ drift}} = 771 \text{ lbs}$
DL = 3.3 psf
LL = 16.8 psf
Wind uplift load = -26.4 psf
Beam Wt/Extra Load = 26 plf
Tributary Loading Strip = 11.33 ft
 $w_{DL} = 62.9 \text{ plf}$
 $w_{LL} = 190.4 \text{ plf}$
 $w_{DL+LL} = 253.3 \text{ plf}$
 $w_{WIND \text{ UPLIFT}} = -299 \text{ plf}$

Reactions:

$R_{1(DL)} = 2684 \text{ lbs}$
 $R_{1(DL+LL)} = 10545 \text{ lbs}$
 $R_{1(DL+WIND)} = -7983 \text{ lbs}$
 $R_{1(CASE 2)} = 6159 \text{ lbs}$
 $R_{2(DL)} = 841 \text{ lbs}$
 $R_{2(DL+LL)} = 3461 \text{ lbs}$
 $R_{2(DL+WIND)} = -3761 \text{ lbs}$
 $R_{2(CASE 2)} = 4315 \text{ lbs}$

Material = A992
 $F_y = 50 \text{ ksi}$

Actual Stresses:

$f_{b[\text{span}(p)]} = M_{\text{span}(p)}/S_x = 11.49 \text{ ksi}$
 $f_{b[\text{span}(n)]} = M_{\text{span}(n)}/S_x = 13.25 \text{ ksi}$
 $f_{b[\text{cant}(p)]} = M_{\text{cant}(p)}/S_x = 7.77 \text{ ksi}$
 $f_{b[\text{cant}(n)]} = M_{\text{cant}(n)}/S_x = 13.25 \text{ ksi}$

Actual deflections:
 $\delta_{DL(\text{span})} = 0.106 \text{ in}$
 $\delta_{LL(\text{span})} = 0.866 \text{ in}$
 $\delta_{DL+LL(\text{span})} = 0.973 \text{ in}$
 $\delta_{DL(\text{cant})} = 0.158 \text{ in}$
 $\delta_{LL(\text{cant})} = 1.453 \text{ in}$
 $\delta_{DL+LL(\text{cant})} = 1.611 \text{ in}$

Roof Support Beam B2, cont.

Design Strengths - Span:

For $L_b \leq L_p$:

Top Flange:	$\phi_b M_n' = 165.8 \text{ ft-k}$	N/A this case
Bottom Flange:	$\phi_b M_n'' = 165.8 \text{ ft-k}$	Governs for bottom flange

Where: $\phi = 0.9$

M_n = lesser of: 1) $M_p = F_y Z_x = 184.2 \text{ ft-k}$

2) $1.5M_y = 1.5F_y S_x = 240 \text{ ft-k}$

For $L_p < L_b \leq L_r$:

Top Flange:	$\phi_b M_n' = 101.4 \text{ ft-k}$	N/A this case
Bottom Flange:	$\phi_b M_n'' = 181.1 \text{ ft-k}$	N/A this case

Where: $\phi = 0.9$

$M_n' = C_b \{M_p - (M_p - M_r) [(L_b' - L_p) / (L_r - L_p)]\} = 112.6 \text{ ft-k}$

$M_n'' = C_b \{M_p - (M_p - M_r) [(L_b'' - L_p) / (L_r - L_p)]\} = 201.2 \text{ ft-k}$

$C_b = 1.0$

$M_r = F_L S_x = 128.0 \text{ ft-k}$

For $L_b > L_r$:

Top Flange:	$\phi_b M_n' = 87.5 \text{ ft-k}$	Governs for top flange
Bottom Flange:	$\phi_b M_n'' = 2770.0 \text{ ft-k}$	N/A this case

Where: $\phi = 0.9$

$M_n' = M_{cr}' = [C_b S_x X_1 (2)^{1/2} / (L_b' / r_y)] [1 + X_1^2 X_2 / [2(L_b' / r_y)^2]]^{1/2} = 97 \text{ ft-k}$

$M_n'' = M_{cr}'' = [C_b S_x X_1 (2)^{1/2} / (L_b'' / r_y)] [1 + X_1^2 X_2 / [2(L_b'' / r_y)^2]]^{1/2} = 3078 \text{ ft-k}$

Design Strengths - Cantilever:

For $L_b \leq L_p$:

Top Flange:	$\phi_b M_n' = 165.8 \text{ ft-k}$	N/A this case
Bottom Flange:	$\phi_b M_n'' = 165.8 \text{ ft-k}$	Governs for bottom flange

For $L_p < L_b \leq L_r$:

Top Flange:	$\phi_b M_n' = 83.1 \text{ ft-k}$	N/A this case
Bottom Flange:	$\phi_b M_n'' = 181.1 \text{ ft-k}$	N/A this case

Where: $\phi = 0.9$

$M_n' = C_b \{M_p - (M_p - M_r) [(L_b' - L_p) / (L_r - L_p)]\} = 92.3 \text{ ft-k}$

$M_n'' = C_b \{M_p - (M_p - M_r) [(L_b'' - L_p) / (L_r - L_p)]\} = 201.2 \text{ ft-k}$

For $L_b > L_r$:

Top Flange:	$\phi_b M_n' = 65.1 \text{ ft-k}$	Governs for top flange
Bottom Flange:	$\phi_b M_n'' = 2770.0 \text{ ft-k}$	N/A this case

Where: $\phi = 0.9$

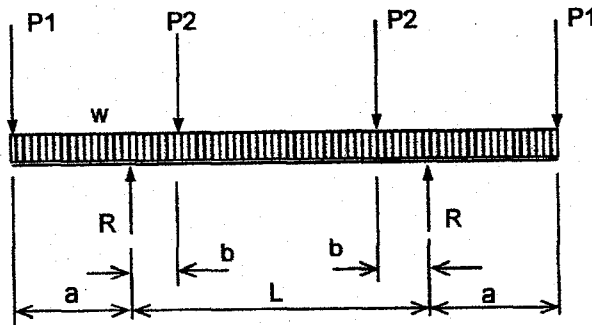
$M_n' = M_{cr}' = [C_b S_x X_1 (2)^{1/2} / (L_b' / r_y)] [1 + X_1^2 X_2 / [2(L_b' / r_y)^2]]^{1/2} = 72 \text{ ft-k}$

$M_n'' = M_{cr}'' = [C_b S_x X_1 (2)^{1/2} / (L_b'' / r_y)] [1 + X_1^2 X_2 / [2(L_b'' / r_y)^2]]^{1/2} = 3078 \text{ ft-k}$

Madison Industries
 Designed by: JFB
 December 18, 2012
 Job No: WGA06793-2

Customer: Hess Corporation
 Structure: 42'-0" x 102'-0" (6) Column Canopy
 Location: Laurelton, New Jersey
 Sheet 20

Roof Support Girder G1



Geometry:
 $L = 14.00$ ft
 $a = 10.00$ ft
 $b = 1.33$ ft

Span: Max Unbraced Top Flg. Length (L') = 14.00 ft
 Span: Max Unbraced Bottom Flg. Length (L'') = 11.33 ft
 Cant.: Max Unbraced Top Flg. Length (a') = 10.00 ft
 Cant.: Max Unbraced Bott. Flg. Length (a'') = 10.00 ft

Load Combinations (Strength Design):

$w_{u1} = 1.4w_{DL} = 50.4$ plf
 $w_{u2} = 1.2w_{DL} = 43.2$ plf
 $w_{u3} = 0.9w_{DL} = 32.4$ plf
 $P1_{u1} = 1.4P1_{DL} = 4793$ lbs
 $P1_{u2} = 1.2P1_{DL} + 1.6P1_{LL} = 18713$ lbs
 $P1_{u3} = 0.9P1_{DL} - 1.3P1_{WIND} = 8747$ lbs

$P2_{u1} = 1.4P2_{DL} = 3758$ lbs
 $P2_{u2} = 1.2P2_{DL} + 1.6P2_{LL} = 15799$ lbs
 $P2_{u3} = 0.9P2_{DL} - 1.3P2_{WIND} = 11452$ lbs

Unfactored Loads:

$P1_{DL} = 3424$ lbs
 $P1_{LL} = 9128$ lbs
 $P1_{WIND\ UPLIFT} = -9099$ lbs
 $P2_{DL} = 2684$ lbs
 $P2_{LL} = 7861$ lbs
 $P2_{WIND\ UPLIFT} = -10668$ lbs
 Beam W/Extra Load = 36 plf
 Tributary Loading Strip = 32.8 ft
 $w_{DL} = 36$ plf

Reactions:

$R_{DL} = 6.7$ k
 $R_{LL} = 17.0$ k
 $R_{DL+LL} = 23.7$ k
 $R_{WIND\ UPLIFT} = -19.8$ k
 $R_{(CASE\ 2)} = 14.6$ k

Selected Beam:

Suggested Shapes: Stress only = W16x36
 Stress & deflection = W24x55

Beam Used = **W16x36**

$A = 10.6$ in²
 $S_x = 56.5$ in³
 $I_x = 448.0$ in⁴
 $I_y = 24.5$ in⁴
 $d/A_f = 5.28$
 $r_y = 1.52$ in
 $J = 0.54$ in⁴
 $C_w = 1460$ in⁶
 $Z_x = 64.0$ in³

Material = A992
 $F_y = 50$ ksi

Actual Stresses:

$f_{b[span(p)]} = M_{span(p)}/S_x = 4.33$ ksi
 $f_{b[span(n)]} = M_{span(n)}/S_x = 27.04$ ksi
 $f_{b[cant(p)]} = M_{cant(p)}/S_x = 11.67$ ksi
 $f_{b[cant(n)]} = M_{cant(n)}/S_x = 27.04$ ksi

Actual deflections:

$\delta_{DL(span)} = -0.104$ in
 $\delta_{LL(span)} = 0.034$ in
 $\delta_{DL+LL(span)} = -0.070$ in
 $\delta_{DL(cant)} = 0.354$ in
 $\delta_{LL(cant)} = 0.971$ in
 $\delta_{DL+LL(cant)} = 1.325$ in

Roof Support Girder G1, cont.

Design Strengths - Span:

For $L_b \leq L_p$:

Top Flange: $\phi_b M_n' = 240.0 \text{ ft-k}$ N/A this case
 Bottom Flange: $\phi_b M_n'' = 240.0 \text{ ft-k}$ N/A this case

Where: $\phi = 0.9$

$M_n = \text{lesser of: } 1) M_p = F_y Z_x = 266.7 \text{ ft-k}$

$2) 1.5M_y = 1.5F_y S_x = 353 \text{ ft-k}$

For $L_p < L_b \leq L_r$:

Top Flange: $\phi_b M_n' = 170.0 \text{ ft-k}$ Governs for top flange
 Bottom Flange: $\phi_b M_n'' = 191.6 \text{ ft-k}$ Governs for bottom flange

Where: $\phi = 0.9$

$M_n' = C_b \{M_p - (M_p - M_r) [(L_b' - L_p) / (L_r - L_p)]\} = 188.8 \text{ ft-k}$

$M_n'' = C_b \{M_p - (M_p - M_r) [(L_b'' - L_p) / (L_r - L_p)]\} = 212.9 \text{ ft-k}$

$C_b = 1.0$

$M_r = F_L S_x = 188.3 \text{ ft-k}$

For $L_b > L_r$:

Top Flange: $\phi_b M_n' = 170.7 \text{ ft-k}$ N/A this case
 Bottom Flange: $\phi_b M_n'' = 247.1 \text{ ft-k}$ N/A this case

Where: $\phi = 0.9$

$M_n' = M_{cr}' = [C_b S_x X_1 (2)^{1/2} / (L_b' / r_y)] [1 + X_1^2 X_2 / (2(L_b' / r_y)^2)]^{1/2} = 190 \text{ ft-k}$

$M_n'' = M_{cr}'' = [C_b S_x X_1 (2)^{1/2} / (L_b'' / r_y)] [1 + X_1^2 X_2 / (2(L_b'' / r_y)^2)]^{1/2} = 275 \text{ ft-k}$

Design Strengths - Cantilever:

For $L_b \leq L_p$:

Top Flange: $\phi_b M_n' = 240.0 \text{ ft-k}$ N/A this case
 Bottom Flange: $\phi_b M_n'' = 240.0 \text{ ft-k}$ N/A this case

For $L_p < L_b \leq L_r$:

Top Flange: $\phi_b M_n' = 202.4 \text{ ft-k}$ Governs for top flange
 Bottom Flange: $\phi_b M_n'' = 202.4 \text{ ft-k}$ Governs for bottom flange

Where: $\phi = 0.9$

$M_n' = C_b \{M_p - (M_p - M_r) [(L_b' - L_p) / (L_r - L_p)]\} = 224.9 \text{ ft-k}$

$M_n'' = C_b \{M_p - (M_p - M_r) [(L_b'' - L_p) / (L_r - L_p)]\} = 224.9 \text{ ft-k}$

For $L_b > L_r$:

Top Flange: $\phi_b M_n' = 309.8 \text{ ft-k}$ N/A this case
 Bottom Flange: $\phi_b M_n'' = 309.8 \text{ ft-k}$ N/A this case

Where: $\phi = 0.9$

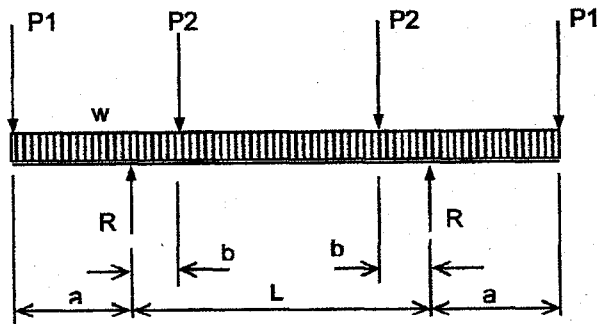
$M_n' = M_{cr}' = [C_b S_x X_1 (2)^{1/2} / (L_b' / r_y)] [1 + X_1^2 X_2 / (2(L_b' / r_y)^2)]^{1/2} = 344 \text{ ft-k}$

$M_n'' = M_{cr}'' = [C_b S_x X_1 (2)^{1/2} / (L_b'' / r_y)] [1 + X_1^2 X_2 / (2(L_b'' / r_y)^2)]^{1/2} = 344 \text{ ft-k}$

Madison Industries
 Designed by: JFB
 December 18, 2012
 Job No: WGA06793-2

Customer: Hess Corporation
 Structure: 42'-0" x 102'-0" (6) Column Canopy
 Location: Laurelton, New Jersey
 Sheet 24

Roof Support Girder G2



Geometry:
 $L = 14.00$ ft
 $a = 10.00$ ft
 $b = 1.33$ ft

Span: Max Unbraced Top Fig. Length (L') = 14.00 ft
 Span: Max Unbraced Bottom Fig. Length (L'') = 11.33 ft
 Cant.: Max Unbraced Top Fig. Length (a') = 10.00 ft
 Cant.: Max Unbraced Bott. Fig. Length (a'') = 10.00 ft

Load Combinations (Strength Design):

$w_{u1} = 1.4w_{DL} = 50.4$ plf
 $w_{u2} = 1.2w_{DL} = 43.2$ plf
 $w_{u3} = 0.9w_{DL} = 32.4$ plf
 $P1_{u1} = 1.4P1_{DL} = 3377$ lbs
 $P1_{u2} = 1.2P1_{DL} + 1.6P1_{LL} = 13391$ lbs
 $P1_{u3} = 0.9P1_{DL} - 1.3P1_{WIND} = 8034$ lbs

$P2_{u1} = 1.4P2_{DL} = 2354$ lbs
 $P2_{u2} = 1.2P2_{DL} + 1.6P2_{LL} = 10402$ lbs
 $P2_{u3} = 0.9P2_{DL} - 1.3P2_{WIND} = 10451$ lbs

Selected Beam:

Suggested Shapes: Stress only = W14x30
 Stress & deflection = W21x50

Beam Used = W16x36

$A = 10.6$ in²
 $S_x = 56.5$ in³
 $I_x = 448.0$ in⁴
 $I_y = 24.5$ in⁴
 $d/A_f = 5.28$
 $r_y = 1.52$ in
 $J = 0.54$ in⁴
 $C_w = 1460$ in⁶
 $Z_x = 64.0$ in³

Material = A992
 $F_y = 50$ ksi

Actual Stresses:

$f_{b[span(p)]} = M_{span(p)}/S_x = 3.21$ ksi
 $f_{b[span(n)]} = M_{span(n)}/S_x = 19.44$ ksi
 $f_{b[cant(p)]} = M_{cant(p)}/S_x = 11.17$ ksi
 $f_{b[cant(n)]} = M_{cant(n)}/S_x = 19.44$ ksi

Actual deflections:

$\delta_{DL(span)} = -0.075$ in
 $\delta_{LL(span)} = 0.022$ in
 $\delta_{DL+LL(span)} = -0.052$ in
 $\delta_{DL(cant)} = 0.255$ in
 $\delta_{LL(cant)} = 0.698$ in
 $\delta_{DL+LL(cant)} = 0.953$ in

Unfactored Loads:

$P1_{DL} = 2412$ lbs
 $P1_{LL} = 6560$ lbs
 $P1_{WIND\ UPLIFT} = -7850$ lbs
 $P2_{DL} = 1681$ lbs
 $P2_{LL} = 5240$ lbs
 $P2_{WIND\ UPLIFT} = -9204$ lbs
 Beam Wt/Extra Load = 36 plf
 Tributary Loading Strip = 36.5 ft
 $w_{DL} = 36$ plf

Reactions:

$R_{DL} = 4.7$ k
 $R_{LL} = 11.8$ k
 $R_{DL+LL} = 16.5$ k
 $R_{WIND\ UPLIFT} = -17.1$ k
 $R_{(CASE\ 2)} = 9.9$ k

Roof Support Girder G2, cont.

Design Strengths - Span:

For $L_b \leq L_p$:

Top Flange:	$\phi_b M_n' = 240.0 \text{ ft-k}$	N/A this case
Bottom Flange:	$\phi_b M_n'' = 240.0 \text{ ft-k}$	N/A this case

Where: $\phi = 0.9$

$M_n = \text{lesser of: } 1) M_p = F_y Z_x = 266.7 \text{ ft-k}$

2) $1.5 M_y = 1.5 F_y S_x = 353 \text{ ft-k}$

For $L_p < L_b \leq L_r$:

Top Flange:	$\phi_b M_n' = 170.0 \text{ ft-k}$	Governs for top flange
Bottom Flange:	$\phi_b M_n'' = 191.6 \text{ ft-k}$	Governs for bottom flange

Where: $\phi = 0.9$

$M_n' = C_b \{M_p - (M_p - M_r) [(L_b' - L_p) / (L_r - L_p)]\} = 188.8 \text{ ft-k}$

$M_n'' = C_b \{M_p - (M_p - M_r) [(L_b'' - L_p) / (L_r - L_p)]\} = 212.9 \text{ ft-k}$

$C_b = 1.0$

$M_r = F_L S_x = 188.3 \text{ ft-k}$

For $L_b > L_r$:

Top Flange:	$\phi_b M_n' = 170.7 \text{ ft-k}$	N/A this case
Bottom Flange:	$\phi_b M_n'' = 247.1 \text{ ft-k}$	N/A this case

Where: $\phi = 0.9$

$M_n' = M_{cr}' = [C_b S_x X_1 (2)^{1/2} / (L_b' / r_y)] [1 + X_1^2 X_2 / [2 (L_b' / r_y)^2]]^{1/2} = 190 \text{ ft-k}$

$M_n'' = M_{cr}'' = [C_b S_x X_1 (2)^{1/2} / (L_b'' / r_y)] [1 + X_1^2 X_2 / [2 (L_b'' / r_y)^2]]^{1/2} = 275 \text{ ft-k}$

Design Strengths - Cantilever:

For $L_b \leq L_p$:

Top Flange:	$\phi_b M_n' = 240.0 \text{ ft-k}$	N/A this case
Bottom Flange:	$\phi_b M_n'' = 240.0 \text{ ft-k}$	N/A this case

For $L_p < L_b \leq L_r$:

Top Flange:	$\phi_b M_n' = 202.4 \text{ ft-k}$	Governs for top flange
Bottom Flange:	$\phi_b M_n'' = 202.4 \text{ ft-k}$	Governs for bottom flange

Where: $\phi = 0.9$

$M_n' = C_b \{M_p - (M_p - M_r) [(L_b' - L_p) / (L_r - L_p)]\} = 224.9 \text{ ft-k}$

$M_n'' = C_b \{M_p - (M_p - M_r) [(L_b'' - L_p) / (L_r - L_p)]\} = 224.9 \text{ ft-k}$

For $L_b > L_r$:

Top Flange:	$\phi_b M_n' = 309.8 \text{ ft-k}$	N/A this case
Bottom Flange:	$\phi_b M_n'' = 309.8 \text{ ft-k}$	N/A this case

Where: $\phi = 0.9$

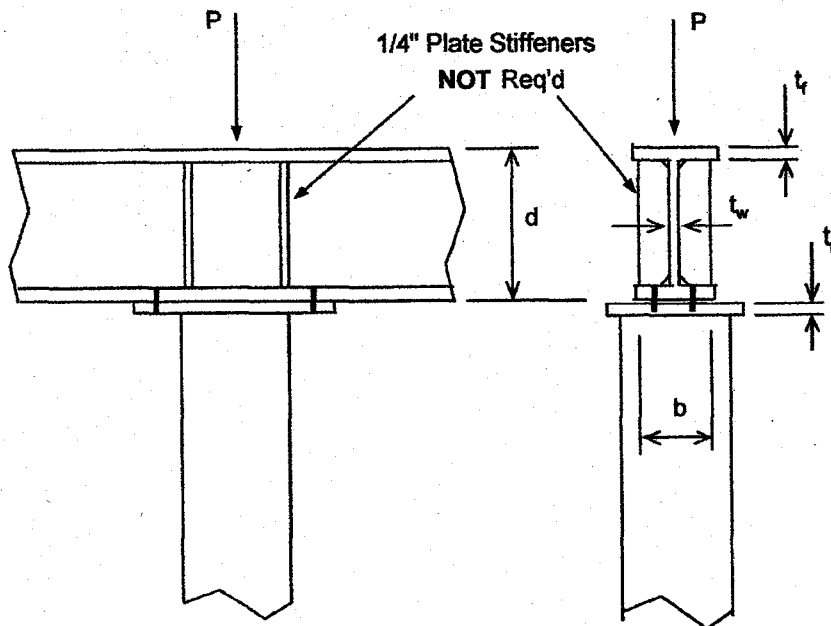
$M_n' = M_{cr}' = [C_b S_x X_1 (2)^{1/2} / (L_b' / r_y)] [1 + X_1^2 X_2 / [2 (L_b' / r_y)^2]]^{1/2} = 344 \text{ ft-k}$

$M_n'' = M_{cr}'' = [C_b S_x X_1 (2)^{1/2} / (L_b'' / r_y)] [1 + X_1^2 X_2 / [2 (L_b'' / r_y)^2]]^{1/2} = 344 \text{ ft-k}$

Madison Industries
 Designed by: JFB
 December 18, 2012
 Job No: WGA06793-2

Customer: Hess Corporation
 Structure: 42'-0" x 102'-0" (6) Column Canopy
 Location: Laurelton, New Jersey
 Sheet 28

Girders - Check if Web Stiffeners Req'd



Member:

W16x36

Geometry:

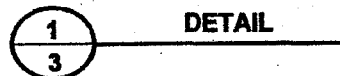
d = 15.86 in
 b = 6.99 in
 $t_w = 0.295$ in
 $t_f = 0.43$ in
 $t_p = 0.75$ in

Material:

A992 for beam
 $F_y = 50$ ksi
 $S = 0.6F_y = 30.0$ ksi

Loads:

$P_{D+L(max)} = 23.7$ k



DETAIL

Check if Web Stiffener Plates are Req'd:

Check local flange bending (AISC 13th Sect. J10.1):

$$\text{Req'd flange thk } (t_f) = [\Omega P_{D+L} / (6.25 F_y)]^{1/2} = 0.356 \text{ in}$$

$$\Omega = 1.67$$

Actual flange thk = 0.43 in

STIFFENERS NOT REQ'D FOR LOCAL FLANGE BENDING

Check web crippling (AISC 13th Sect. J10.2):

Max allowable concentrated load w/o web stiffeners:

$$R = 80 t_w^2 [1 + 3(N/d)(t_w/t_f)^{1.5}] [(F_{yw})(t_f/t_w)]^{1/2} = 90 \text{ k}$$

$$\text{Where: } N = (4)(t_p + t_f) = 4.72 \text{ in}$$

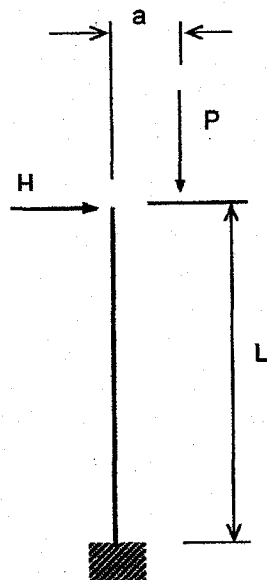
STIFFENERS NOT REQ'D FOR WEB CRIPPLING

Madison Industries
 Designed by: JFB
 December 18, 2012
 Job No: WGA06793-2

Customer: Hess Corporation
 Structure: 42'-0" x 102'-0" (6) Column Canopy
 Location: Laurelton, New Jersey
 Sheet 30

Column C1

Design Code: AISC Steel Construction Manual 13th Edition (ASD)



Fixed base; axial compression & bending
 $K = 2.1$

Material

A500 Gr. B
 $F_y = 46 \text{ ksi}$
 $E = 29000 \text{ ksi}$

Geometry

$L = 19.50 \text{ ft}$

Deflection shown below (to account for $P\Delta$ effects) = $a = 0.207 \text{ ft}$

Loads

$P_{DL+LL} = 23.71 \text{ k}$

$P_{DL} = 6.72 \text{ k}$

Mom. added to wind/seis/unbal due to ecc. $P_{DL} (M1) = 1.39 \text{ ft-k}$

Moment due to ecc. $P_{LL} (M2) = 3.52 \text{ ft-k}$

$H_{wind} = (\text{trib wind load}) = 4.14 \text{ k}$

$H_{seis} = (0.7)(\text{trib seismic load}) = 1.03 \text{ k}$

$M_{wind} = 80.6 \text{ ft-k}$

$M_{seis} = 20.1 \text{ ft-k}$

$M_{unbalanced DL+LL} = 0.0 \text{ ft-k}$

$M_{unbalanced DL} = 0.0 \text{ ft-k}$

WIND CONDITIONS GOVERN

Try: **HSS12x12x5/16**

(Slender Element Section)

Downspout Penetrates Column wall, (y/n)? y

Nominal Section Props (for T & Δ_M calcs):

Effective Section Properties @ 3.5" cutout:

$I_{nom} = 324 \text{ in}^4$

$A_e = 13.52 \text{ in}^2$

$S_{nom} = 54 \text{ in}^3$

$I_{eff} = 292.5 \text{ in}^4$

$Wt = 48.9 \text{ plf}$

$S_{eff} = 45.18 \text{ in}^3$

$r = 4.65 \text{ in}$

Flange Width and Web Depth to Thickness ratio = $b/t = h/t = 33.4$

Limiting Flange Width to Thickness ratio = $1.40[E/F_y]^{1/2} = 35.2 > 33.4$ OK

Limiting Web Depth to Thickness ratio = $5.70[E/F_y]^{1/2} = 143.1 > 33.4$ OK

Base Plate for Column C1

Base Plate Dim's & Material:

Material = A36
 $F_t = 21.6$ ksi
 $F_y = 36.0$ ksi

Length of square edge of base plate, $w = 22$ in (Use min of 21.75 inches)
 Base Plate Area, $A = 484$ in²

Column used = HSS12x12x5/16

Base Plate Thickness: (ASD Design)

- 1) Base plate thickness ($tp1$) per compression of concrete:

Pressure due to Axial Load P , $f_{p1} = P/A = 15.9$ psi

Pressure Due to Moment M , $f_{p2} = (2M/jd)/wkd = 900$ psi

Where: $P = 7.67$ k
 $M = 82.0$ ft-k

Where: $kd = 5.47$ in
 $jd = 18.18$ in
 $d = 20$ in

$tp1 = (2)(a-0.95b)\sqrt{f_{p1}/F_y} + (a-0.95b)\sqrt{f_{p2}/F_y} = 1.013$ in (min)

Where: $a = 11$ in
 $b = 6$ in

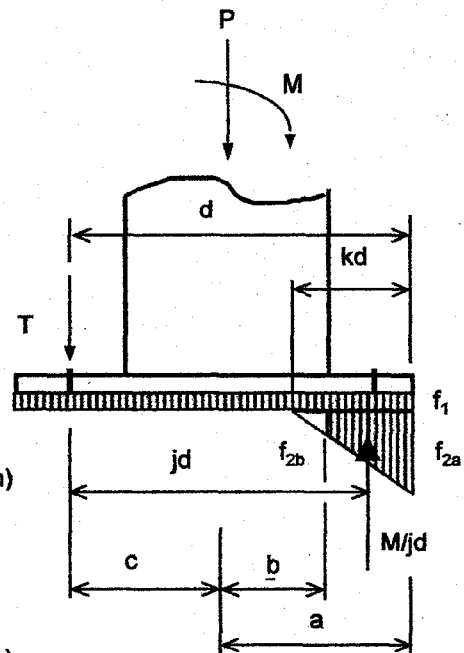
- 2) Base plate thickness ($tp2$) per tension on anchor bolt:

Tension on A.B.'s, one side of B.P. = $T = (M - Pc)/(2c) = 50.9$ k

$tp2 = \sqrt{6M'/[(0.75)(F_y)(w)]} = 1.298$ in (min)

Where: $c = 9.0$ in
 $P = 7.7$ k

$M' = (T)(c-0.95b) = 167.8$ in-k



Therefore use Base Plate 1.375 in thk x 22 in x 22 in

Weld of Column to Base Plate:

Allowable stress in weld:

Fillet weld: $F_w = (0.3)(70\text{ksi}) = 21.0$ ksi

Full Pen. weld: $F_w = F_t(\text{Base Plate}) = 21.6$ ksi (same as base metal)

Actual stress in weld:

Square fillet weld: Weld size = 0.375 in

$f_w = P/A_w + M/S_w = 19.9$ ksi OK

Simple square full penetration weld:

$f_w = P/A_w + M/S_w = 16.9$ ksi OK

Use 0.375 inch fillet weld all around for column to base plate

Anchor Bolts, cont.

Per ACI 318-08, Anchor Bolts are Acceptable If:

Anchor bolt tensile strength is greater than factored tension load: $\phi N_n > N_u$
 and anchor bolt shear strength is greater than factored shear load: $\phi V_n > V_u$

And if interaction checks are satisfied (see loads below):

Case 1) Steel strength: $N_u/\phi N_s + V_u/\phi V_s = 0.994 < 1.2 - \text{OK}$
 Case 2) Concrete breakout: $N_u/\phi N_{cb} + V_u/\phi V_{cb} = \text{Load is transferred to Vert Rebar}$

Therefore Anchors are OK per Interaction Checks

Check anchor bolt tension:

- Check following cases:
- 1) Steel strength of anchor in tension: $\phi N_s > N_u$
 - 2) Concrete breakout strength of anchor in tension: $\phi N_{cb} > N_u$
 - 3) Pullout strength of anchor in tension: $\phi N_{pn} > N_u$
 - 4) Concrete side-face blowout strength of anchor in tension: $\phi N_{sb} > N_u$

Factored seismic uplift load per bolt (N_u) = 42.13 k (see above)

Case (1): Steel strength of anchor bolt in tension: $\phi N_s > N_u$

$$\begin{aligned}\phi N_s &= \phi A_{se} f_{ut} = 43.6 \text{ k} > 42.13 \text{ k} - \text{OK} \\ \text{Where: } \phi &= 0.75 \\ A_{se} &= 0.97 \text{ in}^2 \\ f_{ut} &= 60 \text{ ksi}\end{aligned}$$

Case (2): Concrete breakout strength of anchor bolt in tension: $\phi N_{cb} > N_u$

$$\begin{aligned}\phi N_{cb} &= (A_{Nc}/A_{Nco})(y_{ed,N})(y_{c,N})(y_{cp,N})(N_b) = 26.7 \text{ k} \quad \text{Anchor bolts are embedded} \\ \text{Where: } \phi &= 0.70 \quad \text{sufficiently to transfer forces to} \\ A_{Nc} &= 1145 \text{ in}^2 \quad \text{vertical rebar} \\ A_{Nco} &= 14400 \text{ in}^2 \\ y_{ed,N} &= 1.00 \\ y_{c,N} &= 1.25 \\ y_{cp,N} &= 1.00 \\ N_b &= k(f'_c)^{1/2}(h_{ef})^{1.5} = 384 \text{ k} \\ k &= 24\end{aligned}$$

Case (3): Pullout strength of anchors in tension:

$$\begin{aligned}\phi N_{pn} &= \phi y_{c,P} N_p = 47.1 \text{ k} > 42.13 \text{ k} - \text{OK} \\ \text{Where: } \phi &= 0.70 \\ y_{c,P} &= 1.00 \\ N_p &= 8A_{brg} f'_c = 62.8 \text{ ksi} \\ A_{brg} &= 1.96 \text{ in}^2\end{aligned}$$

Case (4): Concrete side-face blowout strength of anchor in tension: $\phi N_{sb} > N_u$

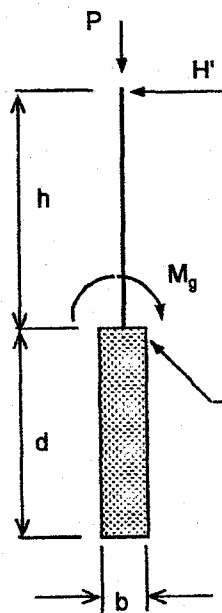
$$\begin{aligned}\phi N_{sb} &= (\phi 160c)(A_{brg})^{0.5}(f'_c)^{0.5} = 148.9 \text{ k} > 42.13 \text{ k} - \text{OK} \\ \text{Where: } \phi &= 0.70 \\ c &= 15 \text{ in}\end{aligned}$$

Therefore Anchors are OK for Tension Loads

Madison Industries
 Designed by: JFB
 December 18, 2012
 Job No: WGA06793-2

Customer: Hess Corporation
 Structure: 42'-0" x 102'-0" (6) Column Canopy
 Location: Laurelton, New Jersey
 Sheet 36

Foundation for Column C1



Use constrained design employing lateral bearing per IBC Section 1805.7.2.2:

Soils Report Received? (y/n) n

WIND CONDITIONS GOVERN

Base lateral bearing pressure = 100 psf/ft depth (Table 1804.2)

Is structure adversely affected by 1/2 inch ground motion? (y/n) n

Equivalent applied lateral force (H') = 4207.2 lbs

Design lateral passive earth pressure = 200 psf/ft depth (Sect. 1804.3.1)

Design Loads: $P = P_{DL+LL} = 23.71 \text{ k}$

$H' = [H_{wind} + (M1+M2)/L] = 4.21 \text{ k}$

Column height (h) = 19.50 ft

$M_g = H'h = 82 \text{ ft-k}$

Required Footing Depth (d) = $[4.25M_g/(S_3b)]^{1/2}$

Alternate No. 1: Drilled Pier Footing

Diameter of round footing (b_1) = 4.50 ft

Required depth for this diameter: Lateral Loads = 8.0 ft

Uplift = 7.0 ft

Therefore use depth (d_1) = 8.0 ft

Actual bearing on soil at bottom of footing = $(P)/(A_{\text{footing}}) = 1491 \text{ psf}$

Allowable bearing to check soil at bottom of footing = 1500 psf per IBC

Footing Size is OK for Soil Bearing

Therefore use 4.50 ft diameter x 8.0 ft deep footing

Cross-sectional Area of Reinforcing Steel Required:

$A_x \text{ per quad} = 1.33M/[(f_s)(j)(d)] = 1.30 \text{ in}^2 \text{ per quadrant}$

Where: $M = 82 \text{ ft-k}$

$f_s = 24 \text{ ksi}$

$j = 0.875$ (conservative)

$d = 4.00 \text{ ft}$

Area of Footing, $A_{f_0} = 1809.6 \text{ in}^2$

Area steel, $A_x \text{ total reqd.} = 4.33 \text{ in}^2$ or

$A_x \text{ total reqd} = 0.0018A_{f_0} = 3.26 \text{ in}^2$ **OK**

Use 12 No. 6 vertical rebars per footing

($A_x = 5.28 \text{ in}^2$)

OCEAN COUNTY HEALTH DEPARTMENT SANITARY INSPECTION REPORT

Hess Express
Name of Establishment

Address

SATISFACTORY

DETAIL SUPPORTING DATA SHEETS ARE AVAILABLE UPON REQUEST
ON THESE PREMISES OR AT THE OCEAN COUNTY HEALTH DEPARTMENT.

FOOD ESTABLISHMENT



**Ocean
County
Health
Department**

Environmental Health Services

175 Sunset Ave.

PO Box 2191

Toms River, NJ 08754

(732) 341-9700 Ext. 7416

Fax - (732) 286-1495

www.ochd.org



Public Health
Prevent. Promote. Protect

Inspector's Signature

Inspector's Name

Inspector's Permanent Registration Number

Date:

NOTE:

In accordance with the State Sanitary Code, this "report shall be posted in a conspicuous place near the public entrance of the establishment." Specific references in the Detail Data Sheets are to Chapter 24 of the State Sanitary Code, and/or Title 24, N.J.S.A.



ELECTRICAL SUBCODE TECHNICAL SECTION



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

Block 1170.01 Lot 4, 5, 6 Qualification Code _____
 Work Site Location 1672 Route 88

Owner In Fee: Hess Corporation

Tel. (732) 750-6192 e-mail _____

Address 1 Hess Plaza Woodbridge NJ 07095

Contractor: H.A. FERNOT CO. INC. Tel. (973) 575 8376

Address 32 Kulick Road Fairfield CT 07004

Contractor License No. 4476 Exp. Date _____

Home Improvement Contractor Registration No. or Exemption Reason (if applicable): _____

Federal Emp. ID No. 22-2282264 FAX: (973) 575 7704

B. ELECTRICAL CHARACTERISTICS

Use Group Present M Proposed M

☐ Pole/Pad # _____ ☐ Temporary ☐ Other _____

Building Occupied as Auto Laundry Utility Co. VEPPL

Est. Cost of Elec. Work \$ 20,000.00

JOB SUMMARY (Office Use Only)

PLAN REVIEW	Date	Initial	INSPECTIONS	Dates (Month/Day)	Initial
☐ No Plans Required			Type:	Failure	Approval
Joint Plan Review Required:			Rough		
☐ Building ☐ Plumbing			Barrier-Free		
☐ Fire ☐ Elevator			Trench		
☒ Elec. Plans Approved			Temp. Serv.		
			Constr. Serv.		
Date: <u>11/14/03</u>			TCO		
Approved by: <u>[Signature]</u>			Other		
			Service		
			Final		
			Barrier-Free		
SUBCODE APPROVAL			Temp. Cut-in-Card Date Issued		
☐ CO ☐ CCO ☐ CA			Final Cut-in-Card Date Issued		
Date: <u>7/6/13</u>			Annual Pool Inspection		
Approved by: <u>[Signature]</u>			Date of Grounding and Bonding Certification		

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.

Applicant's Signature [Signature] Contractor's Seal and Signature _____

☒ Licensed Elec. Contractor ☐ Certif'd Landscape Irrigation Contr ☐ Exempt Applicant

D. TECHNICAL SITE DATA

QTY. SIZE ITEMS

18 Lighting Fixtures

Switches

Detectors

Motors—Fract. HP 11/12

Emergency & Exit Lights

Communications Points

Alarm Devices/F.A.C. Panel

TOTAL NUMBERS 725-350

Pool Permit/with UW Lights

Storable Pool/Spa/Hot Tub

KW Elec. Range/Receptacle

KW Oven/Surface Unit

KW Elec. Water Heater

KW Elec. Dryer/Receptacle

KW Dishwasher

HP Garbage Disposal

KW Central A/C Unit

HP/KW Space Heater/Air Handler

KW Baseboard Heat

HP Motors 1/+ HP

KW Transformer/Generator

AMP Service 30

AMP Outlets

AMP Motor Control Center

KW Elec. Sign Emergency

KW Elec. Sign Emergency

5.76 KW Fuel business

1.3 KW Elec. Sign Emergency

4.68 KW Elec. Sign Emergency

5.76 KW Fuel business

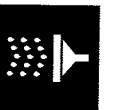
FEE (Office Use Only)

Administrative Surcharge \$ _____
 Minimum Fee \$ _____
 State Permit Surcharge Fee \$ _____
 TOTAL FEE \$ _____

Date Received 4/18/13
 Control # 13-1657
 Date Issued
 Permit #



PLUMBING SUBCODE TECHNICAL SECTION



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

Block 1170.01 Lot 4, 5, 6 Qualification Code _____
Work Site Location 1672 RT 88

Owner in Fee: HESS CORPORATION

Tel. (732) 750 6192 e-mail _____

Address 1 HESS PLAZA WOODBRIIDGE NJ 07095

Contractor: H.A. FERNOT CO. INC. Tel. (913) 575 8316

Address 32 KULICK ROAD e-mail _____

FAIRFIELD NJ 07004

Contractor License No. _____ Exp. Date _____

Home Improvement Contractor Registration No. or Exemption Reason (if applicable): _____

Federal Emp. ID No. 22-2282264 FAX: (913) 575 7104

B. PLUMBING CHARACTERISTICS

Use Group Present Proposed _____
Building Sewer Size _____ Public Sewer _____ Private Septic _____
Water Service Size _____ Public Water _____ Private Well _____
Est. Cost of Plumbing Work \$ 15,000.00

JOB SUMMARY (Office Use Only)

PLAN REVIEW		INSPECTIONS				
		Type	Failure	Failure	Approval	Initial
☐ No Plans Required		Slab				
☐ Partial - Underslab Utilities Approved		Rough				
Date: _____	Approved by: _____	Water				
☐ Plumbing Plans Approved		Sewer				
Date: _____	Approved by: _____	Fixtures				
Joint Plan Review Required:		Gas Equipment				
☐ Bldg. ☐ Elec. ☐ Fire. ☐ Elev.		Gas Piping				
SUBCODE APPROVAL FOR PERMIT		LP Gas Tank				
Date: <u>12-18-12</u>	Approved by: <u>2</u>	Fuel Oil Piping				
SUBCODE APPROVAL FOR CERTIFICATE		Solar				
Date: <u>9-24-13</u>	Approved by: <u>AS</u>	TOC				
Approved by: _____		Pha				

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.

[] Licensed Plumbing Contractor [] Exempt Applicant

Applicant's Signature/Contractor's Seal and Signature

D. TECHNICAL SITE DATA

DESCRIPTION OF WORK

INSTALLATION OF BLW FIBERGLASS
PETROLEUM PIPING.

Date Received 4/18/13
Control # 13-1657
Date Issued _____
Permit # _____

QTY. FUTURE/EQUIPMENT

Water Closet

Urinal/Bidet

Bath Tub

Lavatory

Shower

Floor Drain

Sink

Dishwasher

Drinking Fountain

Washing Machine

Hose Bibb

Water Heater

Fuel Oil Piping

Gas Piping

LP Gas Tank

Steam Boiler

Hot Water Boiler

Sewer Pump

Interceptor/Separator

Backflow Preventer

Greasetrap

Sewer Connection

Water Service Connection

Stacks

Other DOUBLE WALL

Other FIBERGLASS PETROLEUM

Other PIPES

Other 1 - vent

Other 400 FT.

Other 1 - vent

Other 1 - vent

Other 1 - vent

Other 1 - vent

Other 1 - vent

Other 1 - vent

Other 1 - vent

Other 1 - vent

Other 1 - vent

Other 1 - vent

Other 1 - vent

Other 1 - vent

Other 1 - vent

Other 1 - vent

Other 1 - vent

Other 1 - vent

Other 1 - vent

Other 1 - vent

Administrative Surcharge \$ _____
Minimum Fee \$ _____
State Permit Surcharge Fee \$ _____
TOTAL FEE \$ _____

FEE (Office Use Only) \$ _____

New Commercial Structure

Certificate Requirements

[print](#)
[reset defaults](#)
[check all](#)
[complete](#)

Certificate of Occupancy for New Commercial Structure**Prior Approvals**

Proof of final payment to Affordable Housing (mandatory development fee)

[comment](#) ☒

n/a

Engineering Final Approval

[comment](#) ☐

Temp. for merchandising exp. 10/17/13

Certificate of Compliance from the BTMUA

[comment](#) ☒

emailed carol 9/19/13 mjr They need to pay fees and move box off sidewalk before co

Ocean County Soil Conservation District final approval

[comment](#) ☒**Code Requirements**

Final Building inspection - including original permit and all updates

[comment](#) ☐

90 day temp. for merchandising from 9/18/13

Final Plumbing inspection - including original permit and all updates

[comment](#) ☐

30 day temp. from 9/18/13

Final Fire inspection - including original permit and all updates

[comment](#) ☐

Final Electrical inspection - including original permit and all updates

[comment](#) ☐

If applicable Final Elevator inspection - including original permit and all updates

[comment](#) ☒

n/a

CO application

[comment](#) ☐This checklist has been given to: [\(edit\)](#)



For Information Call: _____

Permit No. 13-1659

APPROVAL FOR FIRE PROTECTION

Date

Inspector

☐ Sprinklers

☐ Standpipes

☐ Special Supp.

☐ Alarm

☐ Mechanical

☐ Other

☒ Final

U.C.C. Form F-224A

9/20/13 MD

PRO 117



1235



For Information Call: _____

Permit No. 13-1659 13-1657 13-2228

APPROVAL FOR ELECTRICAL

Date

Inspector

☐ Rough

☐ Service

☐ Other

☒ Final

U.C.C. Form F-222A

9-23-13

JLK

TOWNSHIP OF BRICK



For information call _____

Permit No. 13-1657

APPROVAL FOR BUILDING

Date

Inspector

☐ Footing

☐ Foundation

☐ Frame

☐ Mechanical

☐ Other

☒ Final

U.S.C. Form F-221B

9/20/13 MD



CONSTRUCTION PERMIT

Date Issued 4/18/13
Control # C-12-004249
Permit # 13-1657

IDENTIFICATION Block: 1170.01 Lot: 4 Qualifier _____
Work Site Location: 1672 ROUTE 88 Canopy and 3 gas islands (Hess station) Brick Township, NJ Contractor H. A. Fernot Company, Inc.
Address 32 Kulick Road Fairfield NJ 07004
Owner in Fee HESS REALTY CORPORATION Telephone: (973) 575-8376
PO BOX 696419 SAN ANTONIO, NJ 78269 Lic. No. or Bldrs. Reg. No. 4497
Telephone: _____ Federal Employee No. 22-228224

Is hereby granted permission to perform the following work:

- | | | |
|--|--|--|
| ☒ BUILDING | ☒ PLUMBING | ☐ LEAD HAZARD ABATEMENT |
| ☒ ELECTRICAL | ☒ FIRE PROTECTION | ☐ DEMOLITION |
| ☐ ELEVATOR DEVICES | ☐ ASBESTOS ABATEMENT
(Subchapter 8 only) | ☐ OTHER |

DESCRIPTION OF WORK:

NEW COMMERCIAL STRUCTURE 3 Gas Islands with kiosks and canopy

Note: If construction does not commence within one (1) year of date of issuance, or if construction ceases for a period of six (6) months, this permit is void.

Estimated Cost of Work \$135,000

Daniel Newman Jr.
Construction Official

3/11/11
Date

U.C.C. F170
equiv (rev 1/04)

1 WHITE - INSPECTOR

2 CANARY - OFFICE

3 PINK - TAX ASSESSOR

4 GOLD - APPLICANT

PAYMENTS (Office Use Only)

Building	\$2,198
Electrical	\$400
Plumbing	\$50
Fire Protection	\$730
Elevator Devices	\$0
Other	\$0.00
DCA Training Fee	\$272
CO Fee	\$346.00
Other	\$150
Total	\$4,146
Check No. <u>4893</u>	
Cash	\$0
Credit	\$0
Collected By	

150
4,146

REQUIRED INSPECTIONS

Construction work must be inspected in accordance with the State Uniform Construction Code Regulations N.J.A.C. 5:23-2.18. This agency will carry out such periodic inspections during the progress of work as are necessary to insure that the work installed conforms with the requirements of the Uniform Construction Code.

The owner or other responsible person in charge of work must notify this agency when work is ready for any required inspections specified below. Requests for inspections must be made at least 24 hours prior to the time the inspection is desired. Inspections will be performed within three business days of the time for which they are requested. The work must not proceed in a manner which will preclude the inspection until it has been made and approval granted.

- ☒ Required inspections for all subcodes for one- and two-family dwellings are as follows:

1. The bottom of footing trenches before placement of footings, except that in cases of pile foundations, inspections shall be made in accordance with the requirements of the building subcode.
2. Foundations and all walls up to grade level prior to back filling.
3. All structural framing, connections, wall and roof sheathing and insulation; electrical rough wiring, panel and service installation; rough plumbing. The framing inspection shall take place after the rough electrical and plumbing inspections and after the installation of the heating, ventilation and/or air conditioning duct system. The insulation inspection shall be performed after all other subcode rough inspections and prior to the installation of any interior finish material.
4. Installation of all finished materials, sealings of exterior joints, plumbing piping, trim and fixtures; electrical wiring, devices and fixtures; mechanical systems equipment.

Additional required inspections for all subcodes of construction, for other than one- and two-family dwellings, are fire suppression systems, heat producing devices and Barrier Free subcode accessibility, if applicable.

- ☐ Required special inspections. The applicant by accepting the permit will be deemed to have consented to these requirements:

- ☒ A final inspection is required for each applicable subcode area before a final Certificate of Occupancy or Approval may be issued. The final inspections include the installation of all interior and exterior finish materials, sealing of exterior joints, mechanical system and other required equipment; electrical wiring, devices and fixtures; plumbing pipes, trim and fixtures; tests required by any provision of the adopted subcodes, Barrier Free accessibility, if applicable; and verification of compliance with NJAC 5:23-3.5, "Posting structures".

- ☒ A complete copy of released plans must be kept on the job site.

If you do not understand any of this information, please ask.

**CERTIFICATE OF STORAGE TANK SYSTEM TESTING**

Crompco, LLC
1815 Gallagher Road
Plymouth Meeting, PA 19462

Phone: (610) 278-7203
Fax: (610) 278-7621

SEP 13 2013

Work Order #367386		Client Information		Location #30279	
Date: Thu Aug 22nd, 2013 Reason: Post Constuction Retest Compliance: Yes		Hess Corporation (Accounts Payable: Compliance) Invoice # 576285 Permit# P.O.# 13849149		Hess Corporation Hess Service Station 1672 Route #88 Laurelton, NJ 08723 County: Ocean State ID: 0087843	
Testing was conducted in accordance with all applicable portions of Federal, NFPA, and local regulations.					
Leak Detectors					
Equip #	Grade	Test	Result		
5	Premium	Leak Detector	Pass		
7	Regular	Leak Detector	Pass		
8	Diesel	Leak Detector	Pass		
UST Monitor					
Test		Result			
UST Monitor System (Hess)		Operational			
Additional Costs					
LABOR: Labor: 1 Man (4.5 hours)					
MISCELLANEOUS FIELD SERVICES: Hess First Hour Travel/Labor/Truck					

Tony Hughes
Veeder Root Certification# A25496
API Worksafe Safety Key# 72718677

Crompco, LLC
1815 Gallagher Road
Plymouth Meeting, PA 19462

Hess Service Station
Phone: (610) 278-7203
FAX: 610-278-7621

1672 Route #88
Laurelton, NJ 08723
State ID: 0087843

Facility/Agency Copy
Site #30279 / WO #367386
Thu Aug 22nd, 2013

Line Leak Detector Test		Line Leak Detector Test	
Leak Detector Number:	5	Leak Detector Number:	7
Grade:	Premium	Grade:	Regular
Dispenser Range:	1-2,5-12,15-16	Dispenser Range:	1-2,5-12,15-16
Make:	Veeder Root	Make:	Veeder Root
Model:	PLLD	Model:	PLLD
Serial #	347276	Serial #	349873
☐ Mechanical ☒ Electronic ☐ Interstitial Sensor		☐ Mechanical ☒ Electronic ☐ Interstitial Sensor	
Equipment Information (where test was conducted):	1/2	Equipment Information (where test was conducted):	1/2
Submersible Pump Operating Pressure (psi):	37	Submersible Pump Operating Pressure (psi):	37
Check Valve Holding Pressure (psi):	6	Check Valve Holding Pressure (psi):	6
Bleedback Check (gal):	.006	Bleedback Check (gal):	.005
During actual testing, when simulated leak is induced. The mechanical line leak detector stays in leak search position or the electronic line leak detector sets off an alarm as required by the manufacturer (Yes = pass), (No = fail):	☒ Yes ☐ No	During actual testing, when simulated leak is induced. The mechanical line leak detector stays in leak search position or the electronic line leak detector sets off an alarm as required by the manufacturer (Yes = pass), (No = fail):	☒ Yes ☐ No
Result: ☒ Pass ☐ Fail ☐ Inconclusive		Result: ☒ Pass ☐ Fail ☐ Inconclusive	
Test is conducted by simulating a calibrated 3.0 GPH at 10 psi leak on the product line.		Test is conducted by simulating a calibrated 3.0 GPH at 10 psi leak on the product line.	

Line Leak Detector Test	
Leak Detector Number:	8
Grade:	Diesel
Dispenser Range:	3-4,13-14
Make:	Veeder Root
Model:	PLLD
Serial #	347334
☐ Mechanical ☒ Electronic ☐ Interstitial Sensor	
Equipment Information (where test was conducted):	3/4
Submersible Pump Operating Pressure (psi):	40
Check Valve Holding Pressure (psi):	7
Bleedback Check (gal):	.007

During actual testing, when simulated leak is induced. The mechanical line leak detector stays in leak search position or ☒ Yes the electronic line leak detector sets off an alarm as required by the manufacturer (Yes = pass), (No = fail):

Result: ☒ Pass ☐ Fail ☐ Inconclusive

Test is conducted by simulating a calibrated 3.0 GPH at 10 psi leak on the product line.

Crompco, LLC
1815 Gallagher Road
Plymouth Meeting, PA 19462

Hess Service Station
Phone: (610) 278-7203
FAX: 610-278-7621

1672 Route #88
Laurelton, NJ 08723
State ID: 0087843

Facility/Agency Copy
Site #30279 / WO #367386
Thu Aug 22nd, 2013

Annual Leak Monitoring Inspection Form

Leak monitor manufacturer's name: Veeder Root

Leak Monitor Model #: TLS-350 Plus

Leak Monitor Serial#: n03224335111008

Are the interstitial sensors labeled in the correct sequence order? ☒ Yes ☐ No ☐ N/A ☐ Unknown

Console Inspection

Leak monitor console sensor/probe assignments are correctly programmed and labeled (confirm when operation of sensors/probes are checked). ☒ Yes ☐ No ☐ N/A ☐ Unknown

Printer is operable. ☒ Yes ☐ No ☐ N/A ☐ Unknown

Print out set-up value, if printer installed. ☒ Yes ☐ No ☐ N/A ☐ Unknown

Are there any active alarms? If yes, what type of alarms (list in comment section)? ☐ Yes ☒ No ☐ N/A ☐ Unknown

Monitor console has battery back-up installed. ☒ Yes ☐ No ☐ N/A ☐ Unknown

The leak monitor console audible alarm is operational. ☒ Yes ☐ No ☐ N/A ☐ Unknown

The leak monitor console visual alarms are operational. ☒ Yes ☐ No ☐ N/A ☐ Unknown

The communication equipment (e.g. modem) is operational for leak monitoring systems and will relay alarms to a remote station, if applicable. ☒ Yes ☐ No ☐ N/A ☐ Unknown

Is there a RED Hess Release Detection Procedure sticker affixed to or near the Veeder Root / INCON console? ☐ Yes ☒ No ☐ N/A ☐ Unknown

Is the date on the red sticker accurate? (Today's Date) ☐ Yes ☒ No ☐ N/A ☐ Unknown

Test Result Inspection

All single wall tanks must have CSLD (Veeder-Root) or SCALD (INCON). All CSLD or SCALD alarms must be handled as an emergency. If you cannot resolve the issue, advise operations so a test can be scheduled. Do not remove an Electronic Leak Detector or replace with a Mechanical Leak Detector without talking to operations first.

If in-tank probes are installed for leak detection in the inner wall of tank: are weekly, monthly or continuous tests performed? ☒ Yes ☐ No ☐ N/A ☐ Unknown

If electronic line leak detection is installed, are continuous 3.0 gph tests performed? ☒ Yes ☐ No ☐ N/A ☐ Unknown

If electronic line leak detection is installed, is a monthly .2 gph test performed? ☐ Yes ☐ No ☒ N/A ☐ Unknown

Is the Periodic Test Warning enabled at 20 days for CSLD or SCALD? ☐ Yes ☐ No ☒ N/A ☐ Unknown

Is the Periodic Test Warning enabled at 20 days for Electronic Leak Detection? ☐ Yes ☐ No ☒ N/A ☐ Unknown

Is the Periodic Test Alarm enabled at 25 days for CSLD or SCALD? ☐ Yes ☐ No ☒ N/A ☐ Unknown

If single wall tanks and single wall lines with PLLD then change the .2 testing from repetitive to monthly and change setup warnings values 30 days and alarm values to 33 days.

Is the Periodic Test Alarm enabled at 25 days for Electronic Leak Detection? ☐ Yes ☐ No ☒ N/A ☐ Unknown

Are the Electronic Leak Detectors programmed to shut down the submersible when a 3gph leak is detected? ☒ Yes ☐ No ☐ N/A ☐ Unknown

Probe Inspection (ATG)

- Do both floats on all probes move freely? ☒ Yes ☐ No ☐ N/A ☐ Unknown
- Are probes free of residue buildup? If no, remove residue. ☒ Yes ☐ No ☐ N/A ☐ Unknown

Sensor Inspection

Never raise a sensor to 'Fix' an alarm. This action invalidates the release detection method. Brine levels must be properly set per manufacturer's instructions. Tank flex is not acceptable for cause of alarm. CSLD or SCALD should not be installed for double wall tanks. 20 day periodic test warnings and 25 day test alarms should be disabled on double wall tanks.

- Are dry tank interstitials properly positioned? (bottom of tank for fiberglass; bottom of riser for steel tank) ☐ Yes ☐ No ☒ N/A ☐ Unknown
- Are sump sensors positioned on top of the manway or below the lowest penetration in the sump? ☒ Yes ☐ No ☐ N/A ☐ Unknown
- If Double Wall, are all secondary boots pulled back or shroud valve stems removed to allow free product flow to the sump in the event of a primary pipe leak? ☐ Yes ☐ No ☒ N/A ☐ Unknown
- Tank interstitial sensor is positioned per manufacturers recommendations. ☒ Yes ☐ No ☐ N/A ☐ Unknown
- Brine level of the tank interstitial space is within the manufacturers operating range. ☒ Yes ☐ No ☐ N/A ☐ Unknown
- Piping secondary containment (piping, intermediate, and/or dispenser sump) sensors are positioned per manufacturer recommendation. ☒ Yes ☐ No ☐ N/A ☐ Unknown
- All sensors were visually inspected and cleaned if applicable. ☒ Yes ☐ No ☐ N/A ☐ Unknown
- All sensors were manually tested and alarms activated (if tank has interstitial sensor wrapped around the tank and cannot be removed, please check "no" and note this in the comments section below). ☒ Yes ☐ No ☐ N/A ☐ Unknown
- Secondary containment sumps and the piping sumps are free of liquid. ☒ Yes ☐ No ☐ N/A ☐ Unknown
- Are Veeder Root Smart Sensors installed in all tank pumps (both STP and Piping Sumps)? ☒ Yes ☐ No ☐ N/A ☐ Unknown
- If Smart Sensors are installed, is the system programmed to shut down the submersible pumps when the smart sensor goes into fuel alarm only (it should not shut down the submersible pump if it detects water)? ☒ Yes ☐ No ☐ N/A ☐ Unknown
- Do all Smart Sensors shut down the appropriate submersible pumps when manually tested? ☒ Yes ☐ No ☐ N/A ☐ Unknown

Miscellaneous Inspection

- Do ATG risers have universal monitor caps (418TM-40) installed? ☒ Yes ☐ No ☐ N/A
- Are all cables, monitor caps and electrical connections free of visual defects? ☒ Yes ☐ No ☐ N/A ☐ Unknown
- If smart sensors are present, are they aluminum sleeve (not plastic type)? ☒ Yes ☐ No ☐ N/A
- Are all existing secondary containments on site monitored? If no, explain. ☒ Yes ☐ No ☐ N/A ☐ Unknown

****Massachusetts Sites Only****

- If the tank(s) are single wall and the customer IS NOT using CSLD on his Veeder Root ATG for his monthly method of release detection, it has been verified that the ATG is ☐ Yes ☐ No ☒ N/A ☐ Unknown programmed to perform a 6-hour static .2 gph test at least monthly on his tank(s)
- It has been verified that the "Leak Test Early Stop" (TST Early

Stop) has been disabled for all tanks (this is required for a 6- ☐ Yes ☐ No ☒ N/A ☐ Unknown
hour test)

Monitor Operational

Based on your inspection, is the monitoring system operating ☒ Yes ☐ No ☐ N/A ☐ Unknown
according to manufacturer's specifications?

Result

☐ Fail ☐ Incomplete ☐ Inconclusive ☒ Pass ☐ Unknown

Comments:

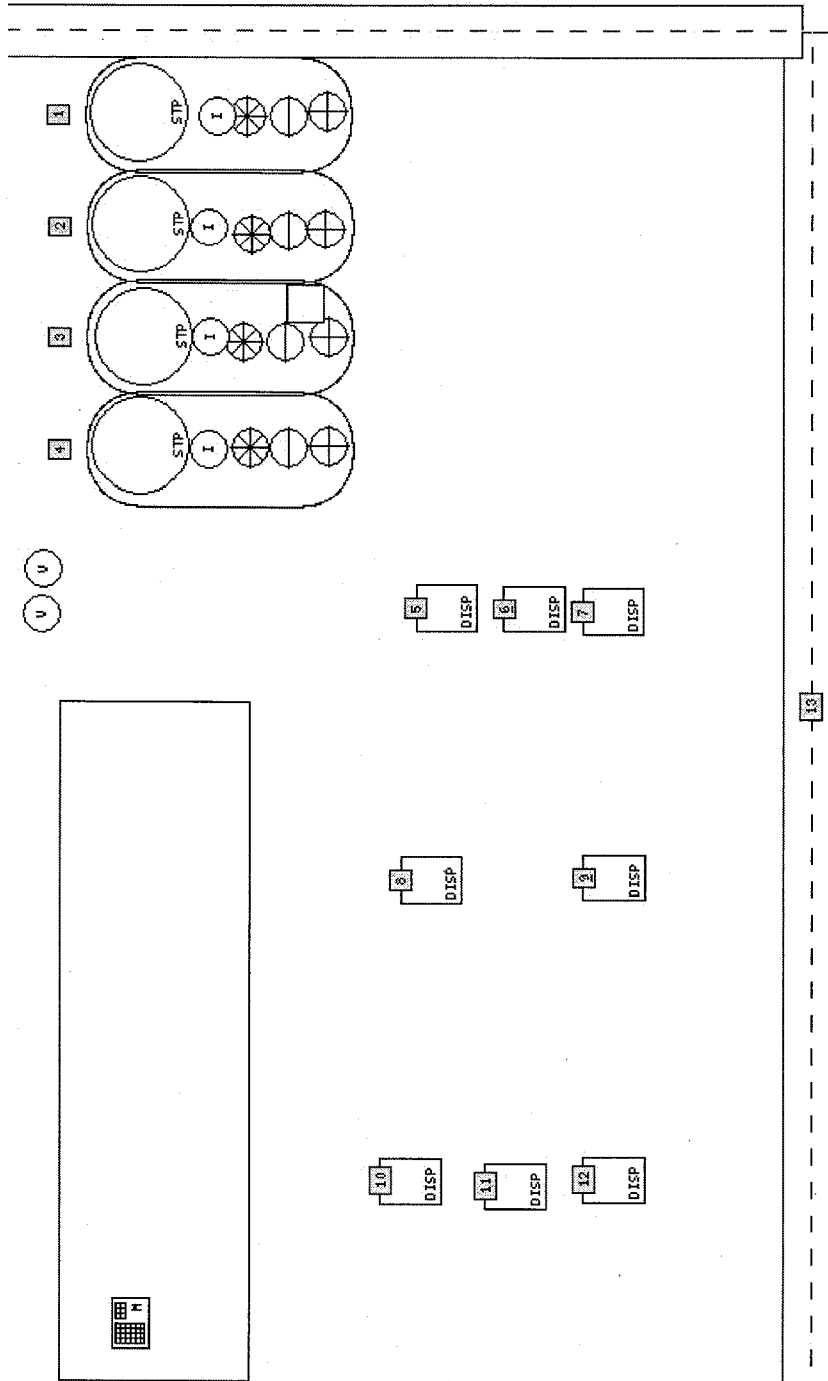
Crompco, LLC
1815 Gallagher Road
Plymouth Meeting, PA 19462

Hess Service Station
Phone: (610) 278-7203
FAX: 610-278-7621

1672 Route #88
Laurelton, NJ 08723
State ID: 0087843

Facility/Agency Copy
Site #30279 / WO #367386
Thu Aug 22nd, 2013

 CROMPCO		Date: 2013-08-22 Work Order #: 367386 Location #: 30279
Remote Fill 	ATG 	Road 
Dry Brake 	Emergency Stop 	Block 
	Riser 	Fill 
	Anode 	STP 
	Extractor 	CP Junction Box 
		Tank 
		Flapper Direction 
		CP Test Station 
		Stage 1 w/ Extractor 
		Fixed Reference Cell 
		Circuit Breaker 
		Temp Well Installed 
		Interstitial 
		Vent 
		Overfill Alarm 
		Dispenser 
		Rectifier 
		Drop Tank 
		Remote Dry Brake 



Crompco, LLC
1815 Gallagher Road
Plymouth Meeting, PA 19462

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Phone: (610) 278-7203
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1672 Route #88
Laurelton, NJ 08723
State ID: 0087843

Facility/Agency Copy
Site #30279 / WO #367386
Thu Aug 22nd, 2013

Site Diagram Labels

- 1: Tank - Diesel
- 2: Tank - Premium
- 3: Tank - Regular Drone
- 4: Tank - Regular Master
- 5: Dispenser - 1/2
- 6: Dispenser - 3/4 Diesel
- 7: Dispenser - 5/6
- 8: Dispenser - 7/8
- 9: Dispenser - 9/10
- 10: Dispenser - 11/12
- 11: Dispenser - 13/14 Diesel
- 12: Dispenser - 15/16
- 13: Road - 1672 Route #88



IMPORTANT LEGAL DOCUMENTS

September 5th, 2013

Hess Service Station #30279
1672 Route #88
Laurelton, NJ 08723

Re:

2013 Compliance Test Results
Crompco Work Order #367386
Test Performed on Thu Aug 22nd, 2013

Dear Manager (Facility #30279):

Enclosed are the 2013 Compliance Test Results for testing performed by Crompco for Hess Corporation. These test results are **important legal documents** that are required to be retained at your facility in the "Environmental Compliance Binder" in case an inspection would occur by a state or local agency. Upon receipt, please put the results in the binder as requested by Hess Corporation.

The 2013 compliance tests performed at your facility are indicated below. For specific testing detail, please refer to the enclosed test report.

	Tank(s)
X	Line(s) and/or Leak Detector(s)
	Cathodic Protection
X	Monitor Inspection
	Vapor Recovery
	Other (See Report for Details)

If you should have any questions regarding the test results enclosed, please contact Crompco at 1-800-646-3161.

Sincerely,

Francyne Klein
Compliance Administrator

Work Ticket #: 367386

PO #: 13849149

Address: 1672 Route #88 Laurelton, NJ 08723

Station #: 30279

Service Date: 08/22/2013

Parts Sold

Quantity Sold	Part Name	Manufacturer	Part #	Description
---------------	-----------	--------------	--------	-------------

Service Details

Crompco was on site performing testing, repairs, calibration and/or inspections for the following reason:

Comments

Post Constuction Retest

Gallons Pumped:

Site Arrival Time: 09:15:00

Site Depart Time: 14:45:00

Confirmation

By signing this verification you are agreeing that Crompco LLC performed various compliance testing and/or repairs and replaced parts as listed above.

Printed Name

Email

Signature

mike mathis



☒ Signature captured

☐ Refused to sign

☐ No one available to sign



Brick Township
401 Chambersbridge Rd
Brick, NJ 08723
(732) 262-1030

Subcode Official Review

Date: Thursday, December 06, 2012

To: HESS REALTY CORPORATION
PO BOX 696419
SAN ANTONIO, NJ 78269

RE: Plumbing Subcode
Block: 1170.01 Lot: 4 Qual:
1672 ROUTE 88
Permit Number: Control Number: C-12-004249
Last Submit Date: Wednesday, December 05, 2012

Dear HESS REALTY CORPORATION,

The following comments were made during the Plan Review process:

- #1- Plumbing technical required for new building
- #2-Submit plans for new building
- #3-Gasoline piping is not inspected by plumbing inspector only the vent system on tanks is
- #4-submit calulations for roof drainage on new building & canopy

Sincerely,

Robert Wennlund, Subcode Official

CC:

3/1/13 - Resubmit - RWT

*** FAX TX REPORT ***

TRANSMISSION OK

JOB NO. 2565
DESTINATION ADDRESS 919735757704
PSWD/SUBADDRESS
DESTINATION ID
ST. TIME 12/11 12:58
USAGE T 00' 38
PGS. 3
RESULT OK



Brick Township
401 Chambersbridge Rd
Brick, NJ 08723
(732) 262-1030

Subcode Official Review

Date: Tuesday, December 04, 2012

To: HESS REALTY CORPORATION
PO BOX 696419
SAN ANTONIO, NJ 78269

RE: Building Subcode
Block: 1170.01 Lot: 4 Qual:
1672 ROUTE 88
Permit Number: Control Number: C-12-004249
Last Submit Date: Monday, December 03, 2012

Dear HESS REALTY CORPORATION,

The following comments were made during the Plan Review process:
Provide geotechnical report. Signed/sealed by design professional.

Wind speed design minimum 115mph. Plans indicate 110mph. Revise plans and calcs accordingly.

Sincerely,

Kenneth Anderson, Subcode Official

CC:



BOHLER

ENGINEERING

35 Technology Drive
Warren, NJ 07059
PHONE 908.668.8300
FAX 908.754.4401

March 1, 2013

Via Hand Delivery

Township of Brick
401 Chambersbridge Road
Brick, New Jersey 08723

Attention: Construction Official

**RE: Hess Corporation
Proposed Site Reconstruction
1672 Route 88
Block 1170.01; Lots 4, 5 & 6
Township of Brick
Ocean County, NJ
BENJ No. 010390.01
Permit Control # C-12-004249**

To Whom It May Concern:

Our office is in receipt of a comment letter dated 12/04/12, prepared by the Building Subcode, a comment letter dated 12/07/12, prepared by the Fire Subcode Official, and a comment letter dated 12/06/12, prepared by the Plumbing Subcode Official.

In response to the above referenced letters, our office offers the following itemized responses to each comment:

Building Subcode Comment Letter, dated 12/04/12:

1. Comment: Provide Geotechnical Report. Signed and sealed by design engineer.
Response: Copy of the signed and sealed Geotechnical Report, dated 10/23/12, prepared by Whitestone Associates has been enclosed.
2. Comment: Wind speed design minimum 115 mph. Plans indicate 110 mph. Revised plans and calcs accordingly.
Response: Plan revised to indicate 115 mph wind speed. Please see Sheet No. CS-1 (1of 6). Revised structural calculations for area canopy attached.

Fire Subcode Comments dated 12/07/12

1. Comment: Need plan showing piping to fuel pumps.
Response: Core States Group design plans indicate proposed piping. Please refer to Sheet DWT-1.
2. Comment: Need specs. For fuel dispensers
Response: Specs for fuel dispensers are attached.

OTHER OFFICE LOCATIONS:

• Southborough, MA 508.480.9900	• Albany, NY 518.438.9900	• Ronkonkoma, NY 631.738.1200	• Center Valley, PA 610.709.9971	• Chalfont, PA 215.996.9100	• Philadelphia, PA 267.402.3400
• Towson, MD 410.821.7900	• Bowie, MD 301.809.4500	• Sterling, VA 703.709.9500	• Warrenton, VA 540.349.4500	• Fort Lauderdale, FL 954.202.7000	• Tampa, FL 813.379.4100

CIVIL AND CONSULTING ENGINEERS • PROJECT MANAGERS • SURVEYORS • ENVIRONMENTAL CONSULTANTS • LANDSCAPE ARCHITECTS

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Plumbing Subcode Official comment letter dated 12/06/12

1. Comment: Plumbing technical required for new building.
Response: Plumbing Technical Application was filed 11/16/12 for new building Permit Control No. C-12-004465.
2. Comment: Submit plans for new building.
Response: Plans and applications for new building were filed on 11/16/12. Permit Control No. C-12-004465.
3. Comment: Gasoline piping is not inspected by a plumbing inspector, only the vent system on tanks.
Response: Agree with comment.
4. Comment: Submit calculations for roof drainage on new building and canopy.
Response: Building roof drainage areas and calculations indicated on Madison Industries drawings, Sheets A-10.1 (18 of 32) and P-1.1 (28 of 32). Canopy roof drainage areas and calculations indicated on Madison Industries drawings, Sheets F-1 (2 of 6).

Should you have any questions or require any additional information, please do not hesitate to contact our office at your convenience.

Sincerely,

BOHLER ENGINEERING

Bruce E. Boyer

John M. DeRiso, P.E., P.P.

BEB/nlg J:\Hess\2001\010390.01\Letters-OUT\Construction Official (Brick Twp)-02-28-13.doc

cc (via email): Andrew Lautenbacher, Amerada Hess Corporation
Robert Doyle, Amerada Hess Corporation
Patrick Henry, Amerada Hess Corporation
Donna M. Jennings, Esq., Wilentz, Goldman & Spitzer
David F Owen, P.E., P.P., C.M.E., FASCE, Owen, Little & Associates, Inc. (w/ 1 set of plans)



Brick Township
401 Chambersbridge Rd
Brick, NJ 08723
(732) 262-1030

Subcode Official Review

Date: Friday, December 07, 2012

To: HESS REALTY CORPORATION
PO BOX 696419
SAN ANTONIO, NJ 78269

RE: Fire Subcode
Block: 1170.01 Lot: 4 Qual:
1672 ROUTE 88
Permit Number: Control Number: C-12-004249
Last Submit Date: Thursday, December 06, 2012

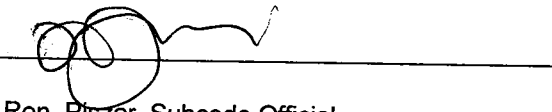
Dear HESS REALTY CORPORATION,

Your request is hereby denied based upon the following infractions.

Need plan showing piping to fuel pumps..

Need specs. for fuel dispensers

Sincerely,



Ron Piszar, Subcode Official

CC:

3/1/13- Resubmitted Let



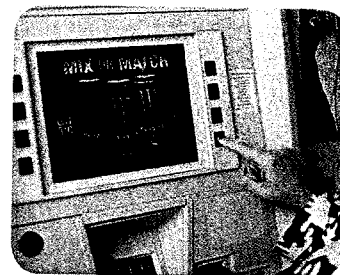
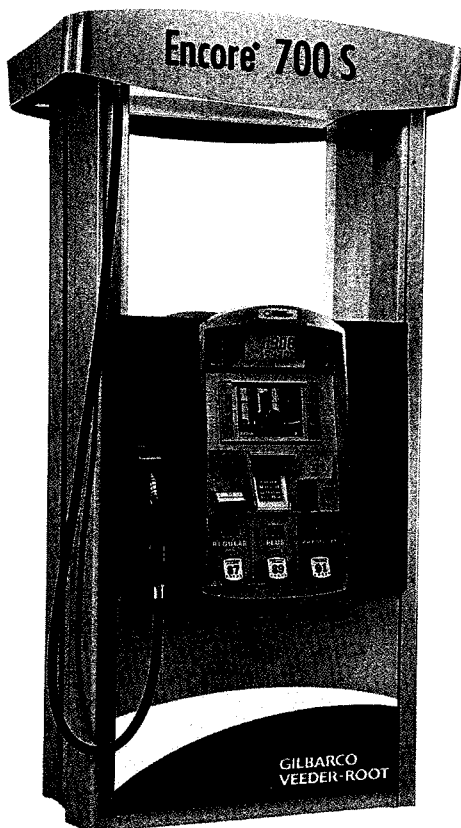
High Handsome ROI.
performance.

Encore®

Can new dispensers generate new profit? When you choose the Encore family from Gilbarco Veeder-Root, they can. Whether you're looking for a fresh look, industry leading security, the highest reliability, a better flex fuel or Diesel Exhaust Fluid (DEF) offering, or a whole new way to market your brand, Encore has what you are looking for.

As the technology leader, we've designed the Encore family to grow with you. Our modular approach provides the greatest runway to adapt to rapidly evolving forecourt technologies. So no matter which model or combination you choose, your investment will keep paying off for years to come. For more information call your local distributor or visit www.gilbarco.com.

Technology with a human touch.



Encore® 700 S

Secure your competitive advantage and increase profits with Gilbarco Veeder-Root's Encore 700 S - your best fuel dispenser investment for today and tomorrow.

Quality that lasts

We build dispensers that stay new for a long, long time. With the best materials and designs that simply look and work better, you'll have a timeless image that keeps your forecourt looking fresh for years to come, while ensuring industry-leading site uptime to maximize profits.

A platform that grows with you

Today's customers expect a lot from your forecourt.

Tomorrow, they'll expect even more. That's why we build more powerful, flexible, durable electronics that set the pace for CRIND® technology. Robust processors and flexible components allow you to get what you need today and upgrade as your needs and security requirements change.

Better, brighter forecourt merchandising

If you're not using your dispensers to engage customers, build loyalty and sell high-margin items, you're leaving money on the table. Encore 700 S offers an unbeatable variety of ways to engage every fuel customer, every time, with the industry's clearest displays, richest colors and most vibrant video.

Industry-leading security

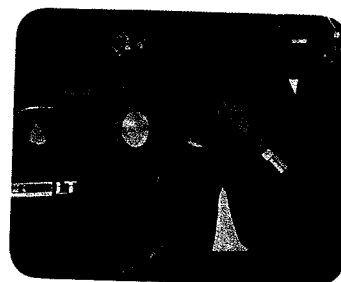
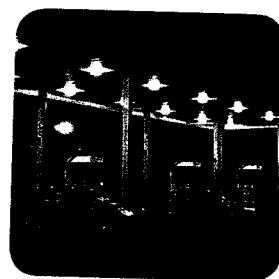
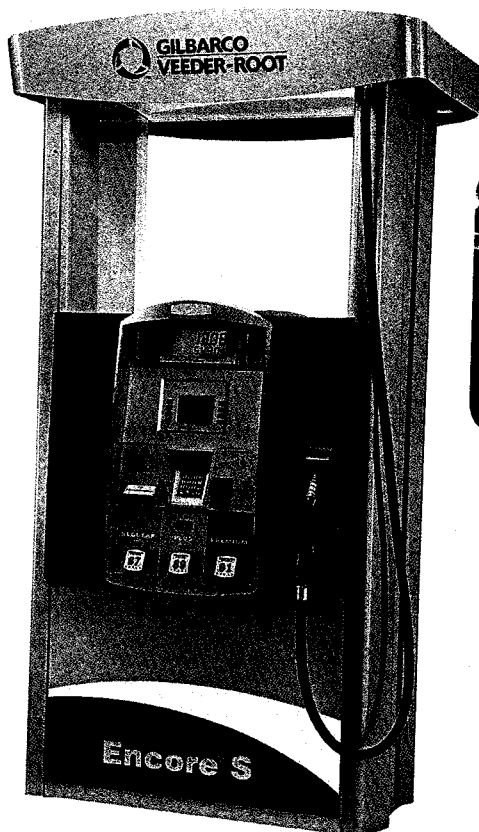
With the largest installed base of PCI-compliant and EMV fueling pay points in North America, nothing can secure your fuel and payment systems like Encore. The Encore 700 S features PCI-UPT and EMV certification and incorporates the latest electronics and physical security features, giving you peace of mind.

More flexible dispensing options

With ever changing government mandates, customer preferences and site traffic patterns to consider, choosing fuel dispensing options can be a difficult decision. We're making it easier by offering the widest variety of dispenser configurations in the industry.



Encore S DEF + 1



Encore® S

With the Encore S Fuel Dispenser, your hardest worker is on your forecourt. Every day, Encore S delivers unparalleled reliability that has proven to incur 30% fewer service calls than the competition. And it offers you the lowest cost of ownership, so you keep more profits in your pocket.

Flexible Fuel Dispensers

Encore offers the industry's broadest flex fuel option with up to five product selections from one fueling position. It's a smart investment that lets you maximize branding and sales opportunities with one of the fastest growing customer groups in retail fueling. All with unmatched durability and reliability

you expect from the industry leader in flexible fuel dispensers. See chart for model specs/details.

DEF

By the end of 2015 75% of trucks on the road will require Diesel Exhaust Fluid (DEF). With this increased demand comes new opportunity to capture additional customers. Our innovative Encore S DEF dispenser helps you capitalize on this opportunity.

- > Unique Coriolis meter ensures accuracy
- > Hydraulics are made of stainless steel to protect against corrosion
- > Thermostat-controlled, heated cabinets prevent DEF from freezing and crystalizing

Ultra-Hi Flow

Gilbarco Veeder-Root's Ultra-Hi flow masters and satellites for retail truck stops are made to last and they cut in half the amount of time it takes to pump and pay. You can sell more fuel during busy periods and your customers get back on the road faster.

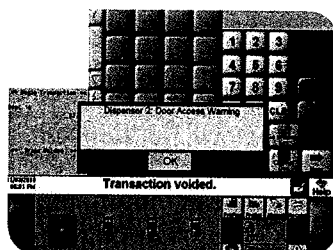
Technology with a human touch.



Forecourt Merchandising

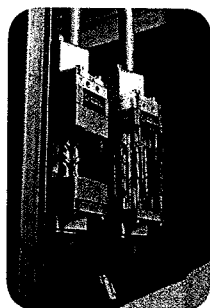
Applause TV offers you a full-color, professionally managed in-dispenser entertainment and advertising system with content managed by Outcast Media, the leading fuel television network. It's a hassle-free way to provide your customers with a memorable fueling experience that drives them into your store and builds loyalty. And it's available to any retailer in the US without restrictions or qualifications.

Applause Media System turns every dispenser into an interactive, full-color, fully customizable, self-managed forecourt merchandising system that's proven to increase revenue. It gives you ultimate control over what to promote and when, driving fueling customers inside the store for higher margin purchases.



Enhanced Security

To help you eliminate fuel theft and protect your forecourt we offer Encore Security Door Switches that monitor the dispenser access points and alert the cashier via the Point of Sale should someone enter the dispenser. Once the door is returned to the closed position the alarm resets itself. No service calls are required to reset the dispenser.



Ecometer™

Did you know that ordinary meters cost high-volume retailers more than 3,000 gallons annually in lost fuel? It adds up to thousands of dollars in lost profits. With the Ecometer, Gilbarco redirects those profits back into your business. We've designed Ecometer with 75% fewer parts and 33% fewer leak points than traditional piston meters, so you get higher precision and keep more of your profits. In fact, the Ecometer option usually pays for itself after two years.



Dispenser Rebranding

We've made it easy for you to rebrand your site, meet major oil image requirements, or just get a branding facelift with our Gilbarco reimage kits for Encore® and The Advantage® dispensers. We have one price regardless of brand or model and we offer the highest quality factory graphics for new dispenser like appearance. Although Encore's finished upper housing can stand on its own, we offer four all metal canopy styles. Promote your brand your way by selecting from Brandview, oval, rounded, or square corners. Choose the best shape for your brand image.

Encore Dispenser Family Options & Comparison Chart

		Encore 700 S	Encore S	Encore 300
Quality that lasts	Standard 2-year warranty includes labor	S	S	S
	4-year corrosion protection	S	S	S
	Angled hose outlets	S	S	S
	No pulse, no flow	S	S	S
	Ecometer™	O	O	Not Available
	Progressive lighting cues	S	S	Not Available
	LED display lighting	S	S	Not Available
	Brand View canopy	O	O	O
	Rounded and rectangular canopies	O	O	O
	Stainless steel sheathing	O	O	O
Better, brighter forecourt merchandising	5.7" Color display	S	Not Available	Not Available
	5.7" Monochrome display	Not Available	S	O
	10.4" Color display	O	Not Available	Not Available
	Applause™ TV / Applause Media System	O	Not Available	Not Available
Industry-leading security	Hidden security clasp for pad lock	S	S	Not Available
	Security door switches	O	O	O
	FlexPay™ Encrypting PIN Pad (EPP)	S	O	O
	FlexPay Secure Card Reader (SCR)	S	O	O
	Bar code scanner	O	O	O
	Contactless card reader	O	O	R
	Cash acceptor (US currency only)	O	O	O
More flexible dispensing options	DEF + Diesel dispenser models	O	O	O
	Ultra-Hi Flow	N	O	Not Available
	Flex Fuel models for alternative fuel	O	O	O
	ISD ready for balanced vapor recovery	O	O	Not Available
	Up to 8 hoses (4 per side)	O	O	Not Available

S = Standard Feature, O = Optional Feature, R = Available as Retrofit only, N = Not Available

Technology with a human touch.

Encore[®] Family Model Guide

Type	Encore 300	Encore S	Encore 700 S	Model	Description	Product Inlets	Grade Dispensed	Hoses Per Side	Activation Method	CIM Location Encore 300	CIM Location Encore 700 S Encore S	Meters
	•	•	•	NA0	Dispenser 1-Grade	1	1	1	Lever	Left	Center	2
	•	•	•	NA1	Dispenser 2-Grade	2	2	2	Lever	Center	Center	4
	•	•	•	NA2	Dispenser 3-Grade	3	3	3	Lever	Offset	Center	6
	•	•	•	NA3	Dispenser 4-Grade	4	4	4	Lever		Center	8
	•	•	•	NC0	Pump 1-Grade	1	1	1	Lever	Left	Center	2
	•	•	•	NC1	Pump 2-Grade	2	2	2	Lever	Center	Center	4
	•	•	•	NC2	Pump 3-Grade	3	3	3	Lever	Offset	Center	6
	•	•	•	NC3	Pump 4-Grade	4	4	4	Lever		Center	8
	•	•	•	NG4	Dispenser 2-Grade	2	2	1	Grade Button	Left	Center	4
	•	•	•	NG0	Dispenser 3-Grade	3	3	1	Grade Button	Left	Center	6
	•	•	•	NG1	Single Hose + 1 Dispenser 4-Grade	4	4	2	Grade Button		Center	8
	•	•	•	NG5	Pump 2-Grade	2	2	1	Grade Button	Left	Center	4
	•	•	•	NG2	Pump 3-Grade	3	3	1	Grade Button	Left	Center	6
	•	•	•	NG3	Single Hose + 1 Pump 4-Grade	4	4	2	Grade Button		Center	8
X+0 Blender	•	•	•	NN1	Dispenser 3+0	2	3	1	Grade Button	Left	Center	4
	•	•	•	NN2	Dispenser 4+0	2	4	1	Grade Button	Left	Center	4
	•	•	•	NN3	Dispenser 5+0	2	5	1	Grade Button	Left	Center	4
	•	•	•	NN5	Pump 3+0	2	3	1	Grade Button	Left	Center	4
	•	•	•	NN6	Pump 4+0	2	4	1	Grade Button	Left	Center	4
	•	•	•	NN7	Pump 5+0	2	5	1	Grade Button	Left	Center	4
	•	•	•	NL0	Dispenser 2+1	3	3	2	Grade Button	Offset	Center	6
X+1 Blender	•	•	•	NL1	Dispenser 3+1	3	4	2	Grade Button	Offset	Center	6
	•	•	•	NL2	Dispenser 4+1	3	5	2	Grade Button	Offset	Center	6
	•	•	•	NL3	Blender Dispenser 3+1+1	4	5	3	Grade Button		Center	8
	•	•	•	NL4	Pump 2+1	3	3	2	Grade Button	Offset	Center	6
	•	•	•	NL5	Pump 3+1	3	4	2	Grade Button	Offset	Center	6
	•	•	•	NL6	Pump 4+1	3	5	2	Grade Button	Offset	Center	6
	•	•	•	NJ0	Dispenser	2	3	3	Lever	Offset	Center	4
Multi-Hose Blender	•	•	•	NJ2	Multi-Hose + 1 Dispenser	3	4	4	Lever		Center	6
	•	•	•	NJ1	Pump	2	3	3	Lever	Offset	Center	4
	•	•	•	NJ3	Multi-Hose + 1 Pump	3	4	4	Lever		Center	6
Ultra-Hi Flow	•	•	•	NJ4	Multi-Hose Hybrid Blender 3+2	3	5	3	Lever		Center	8
	•	•	•	NP3	Master Dispenser 1-Grade	1 or 2	1	1	Lever		Center	1 or 2
	•	•	•	NP4	Combo Dispenser 1-Grade	2	1	1	Lever		Center	1
	•	•	•	NP5	Satellite Dispenser 1-Grade	1 or 2	1	1	Lever		Center	0
	•	•	•	NP6	Master Dispenser 2-Grade	2	2	2	Lever		Center	2
	•	•	•	NP8	Satellite Dispenser 2-Grade	2	2	2	Lever			0
	•	•	•	NA4	MPD Dispenser 1-Grade, Single-Side	1	1	1	Grade Button		Center	1
DEF	•	•	•	NPA	Ultra-Hi DEF +1, Master for Diesel	2	2	2	Grade Button		Center	2
	•	•	•	NPB	Ultra-Hi Master/Satellite, Combo & DEF	3	2	2/1	Grade Button		Center	2
	•	•	•	NPC	Master Diesel 2-Grade, DEF 1-Side only	3	3	3/0	Grade Button		Center	3
	•	•	•	NA0	MPD Dispenser 1-Grade	1	1	1	Lever	Center	Center	1
	•	•	•	NA1	MPD Dispenser 2-Grade (1 or 2 alt)	2	2	2	Lever	Center	Center	2
	•	•	•	NA2	MPD Dispenser 3-Grade (1 alt)	3	3	3	Lever	Center	Center	3
	•	•	•	NA3	MPD Dispenser 4-Grade (1 or 2 alt)	4	4	4	Lever	Center	Center	8
Flexible Fuel Models for E85 and/or Biodiesel	•	•	•	NG0*	Single-Hose + 1 MPD Dispenser 3-Grade (1 alt)	3	3	2	Grade Button	Center	Center	6
	•	•	•	NG1*	Single-Hose + 1 MPD Dispenser 4-Grade (1 or 2 alt)	4	4	2	Grade Button	Center	Center	8
	•	•	•	NL0*	2+1 Blender Dispenser (1 alt)	3	3	2	Grade Button	Center	Center	6
	•	•	•	NJ2*	Multi-Hose Blender Dispenser +1	3	4	4	Grade Button		Center	6
	•	•	•	NL1*	3+1 Blender Dispenser (1 alt)	3	4	2	Grade Button	Center	Center	6
	•	•	•	NL2*	4+1 Blender Dispenser (1 alt)	3	5	2	Grade Button	Center	Center	6
	•	•	•	NN1*	Dispenser 3+0	2	3	1	Grade Button		Center	4
	•	•	•	NN2*	Dispenser 4+0	2	4	1	Grade Button		Center	4
	•	•	•	NN3*	Dispenser 5+0	2	5	1	Grade Button		Center	4
	•	•	•	NA0	Dispenser 1-Grade	1	1	1	Lever	Left	Center	2
	•	•	•	NA1	Dispenser 2-Grade	2	2	2	Lever	Center	Center	4
	•	•	•	NA2	Dispenser 3-Grade	3	3	3	Lever	Offset	Center	6
	•	•	•	NA3	Dispenser 4-Grade	4	4	4	Lever		Center	8
	•	•	•	NC0	Pump 1-Grade	1	1	1	Lever	Left	Center	2
	•	•	•	NC1	Pump 2-Grade	2	2	2	Lever	Center	Center	4

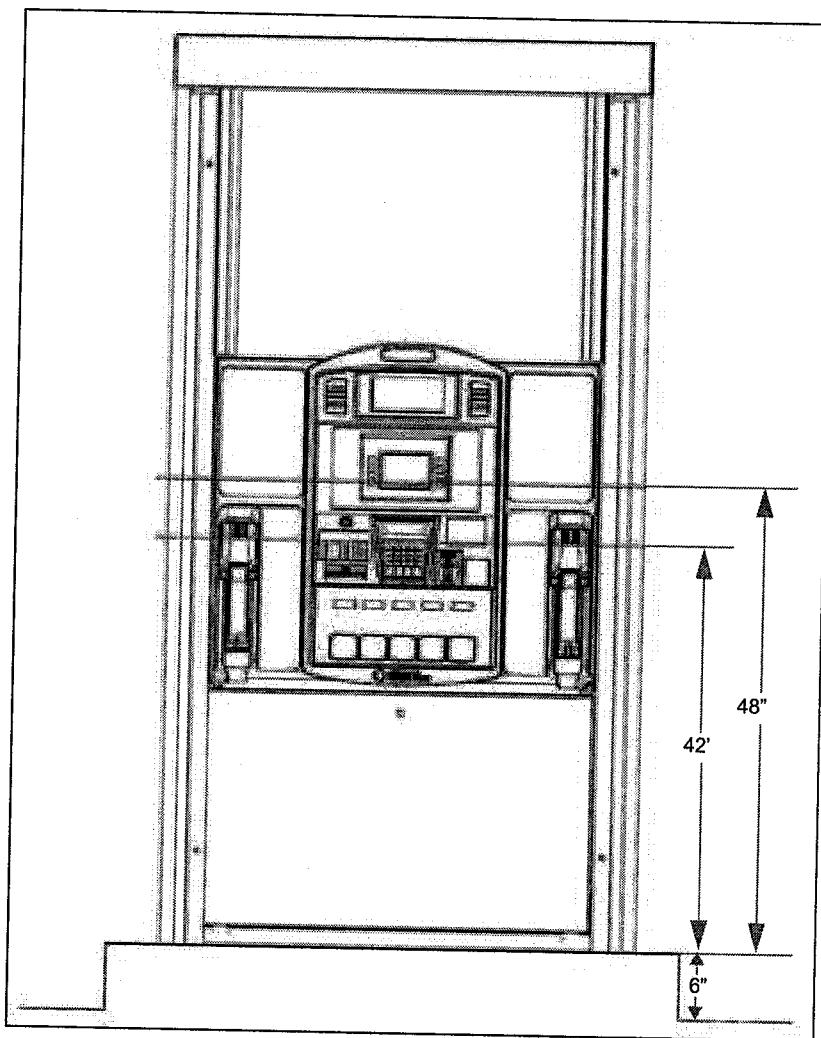
* Standard fuel can not be dispensed through the same hose as flexible fuels. ^ Pending UL Approval ** UL Approved for E85

Americans with Disabilities Act (ADA) Requirements

IMPORTANT INFORMATION

To meet the reach requirements as specified by the Americans with Disabilities Act, the island of the dispenser must not be higher than 6" tall.

Figure 1-1: ADA Requirements



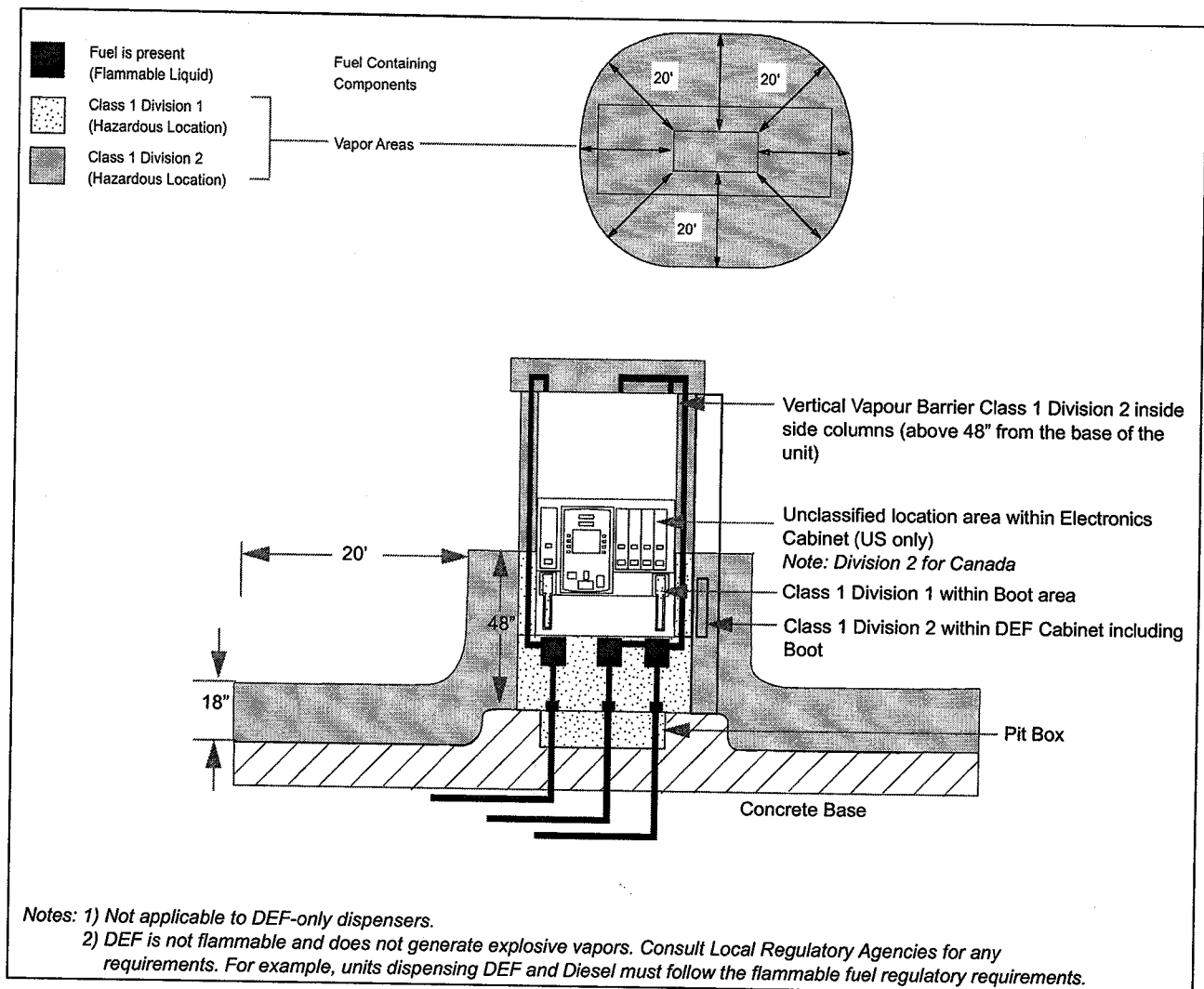
3 – Hazardous Locations

Classifying Hazardous Locations

Any activity (such as smoking or drilling) that can cause an explosion must be done well outside the vapor area.

Figure 3-1 is based on NFPA 30A and NFPA 70.

Figure 3-1: Hazardous Locations Diagram



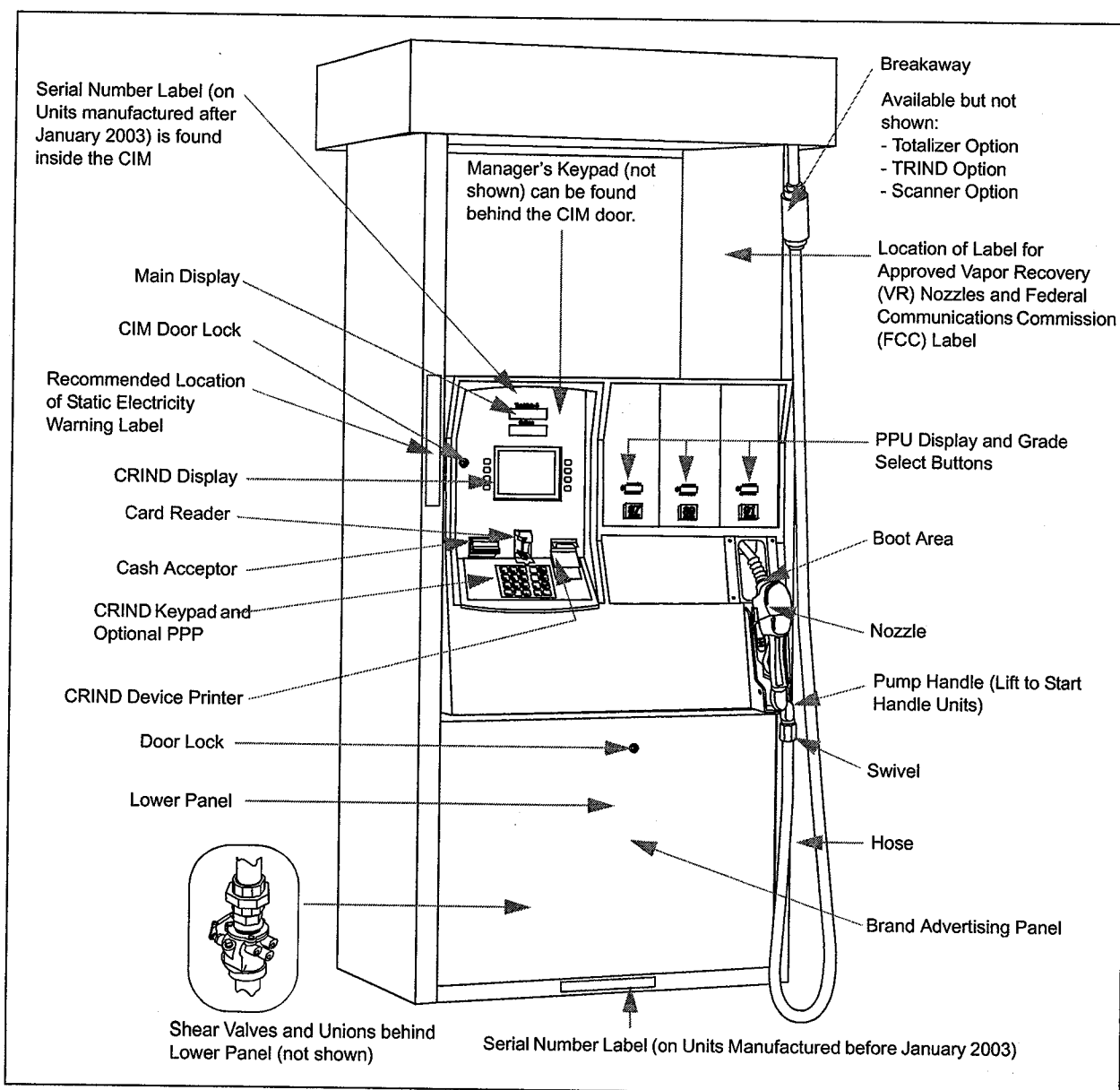
3 – Introducing the Encore/Eclipse Series

This chapter provides illustrations of the Encore and Eclipse units and their components. Refer to this chapter when you perform the procedures in this manual.

Encore 300 and Encore 500

The Encore 300 and 500 units, which are similar in appearance are shown below. However, each series has its own hardware/software package. For information on programming the unit, refer to "Programming Encore 300" in MDE-4732 Encore and Eclipse Series Owner's Programming Manual. All options may not be available on your unit.

Figure 3-1: Encore 300 and Encore 500 Units



To determine the model code on a Gilbarco dispenser, refer to the following tables.

Note: Not all model types are available in an Encore 500/500 S or Encore 300 Series.

Encore 300, 500/550, and Encore S Series

N	X	X
→ Encore	A = Multi-hose Dispenser	0 = 1-grade 1 = 2-grade 2 = 3-grade 3 = 4-grade 4 = DEF only
	<i>NAD</i>	
	C = Multi-hose Pump	0 = 1-grade 1 = 2-grade 2 = 3-grade 3 = 4-grade
	G = Single-hose	0 = 3-grade Dispenser 1 = 3-grade + 1 Dispenser 2 = 3-grade Pump 3 = 3-grade Pump + 1 4 = 2-grade Single-hose Multi Product Dispenser (MPD®) 5 = 2-grade Single-hose Pump
	J = Multi-hose Blender	0 = 3-grade Blender Dispenser 1 = 3-grade Blender Pump 2 = 4-grade Blender + 1 Dispenser 3 = 4-grade Blender + 1 Pump 4 = 3 + 2 Grade Blender Dispenser
	L = X+1 Blender	0 = 2 + 1 Grade Blender Dispenser → 1 = 3 + 1 Grade Blender Dispenser 2 = 4 + 1 Grade Blender Dispenser 3 = 3 + 1 + 1 Grade Blender Dispenser 4 = 2 + 1 Grade Blender Pump 5 = 3 + 1 Grade Blender Pump 6 = 4 + 1 Grade Blender Pump
	<i>NLI</i>	
	N = X+0 Blender	1 = 3 + 0 Grade Blender Dispenser 2 = 4 + 0 Grade Blender Dispenser 3 = 5 + 0 Grade Blender Dispenser 5 = 3 + 0 Grade Blender Pump 6 = 4 + 0 Grade Blender Pump 7 = 5 + 0 Grade Blender Pump
	P = Ultra-Hi Flow	3 = Ultra-Hi Master 4 = Ultra-Hi Combo 5 = Ultra-Hi Satellite 6 = Ultra-Hi Master Dispenser - Single-sided Dual Product Unit 8 = Ultra-Hi Satellite Dispenser - Single-sided Dual Product Unit
	R = Special	0 = No Hydraulics 1 = Robot 2 = Simulator 3 = Pumpless Pump 4 = No Electronics

5 – Unit Configuration

Multi Product (MPD) Configuration

Dispenser (MPD) Configuration

For Dispenser Blenders, proceed to “Dispenser Blender Configuration” on page 36. For more information, refer to M01432 Foundation Layout-Encore.

Note: For units with the Ecometer option, pipe directly to the manifold. Practice care when installing piping directly to the aluminum manifold. It is strongly recommended that you attach the lower U-bolts to the installer-provided inlet pipe, at the cross bar, before wrenching the pipe tight. This will help prevent damage to the manifold threads or casting from incorrect threading or side loading of the pipe from wrench action during tightening. The U-bolts must be initially tightened to allow the pipe to be easily tightened but still remain aligned. After the pipe is installed, tighten all the U-bolts.

Figure 5-1: Encore Dispenser MPD Product Inlets

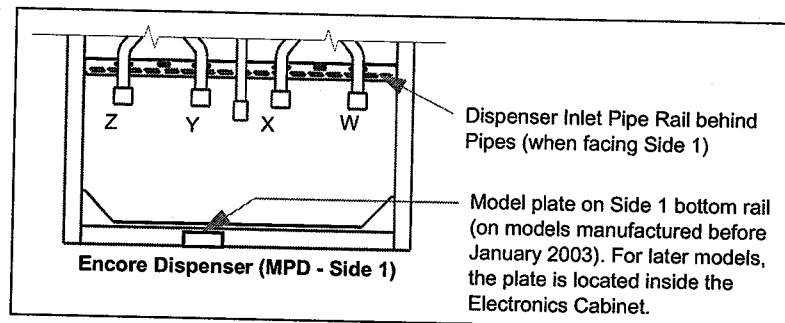
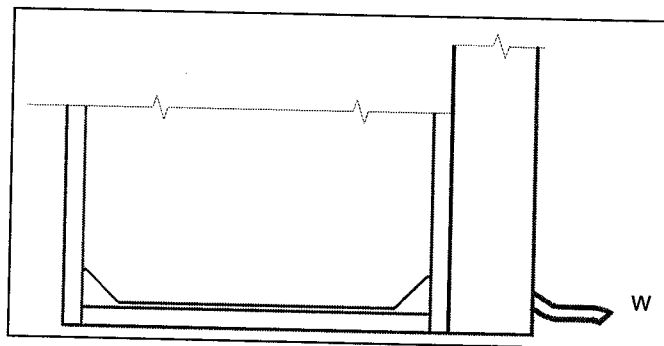


Figure 5-2: DEF Only Dispenser - Product Inlet



Model #	Multi Product Dispenser Model Description	Encore Inlets	Product Inlets (Typical)
NA0	1-grade 2-hose MPD Dispenser	W	W = Product 1
NA1	2-grade 4-hose MPD Dispenser	W, X	W = Product 1 X = Product 2
NG4	2-grade Single-hose MPD Dispenser		
NA2	3-grade 6-hose MPD Dispenser	W, X, Y	W = Product 1 X = Product 2 Y = Product 3
NG0	Single-hose MPD Dispenser 3-grade 2-hose		
NA3	MPD Dispenser 4-grade 8-hose	W, X, Y, Z	W = Product 1 X = Product 2 Y = Product 3 Z = Product 4
NA4	1-grade Single-hose DEF only Dispenser	W	W = DEF
NG1	Single-hose +1 MPD Dispenser, 3+1-grade, 4-hose	W, X, Y, +Z	W = Product 1 X = Product 2 Y = Product 3 +Z = Straight/Unblended Product

Note:

The information provided in the table is for two-sided units.

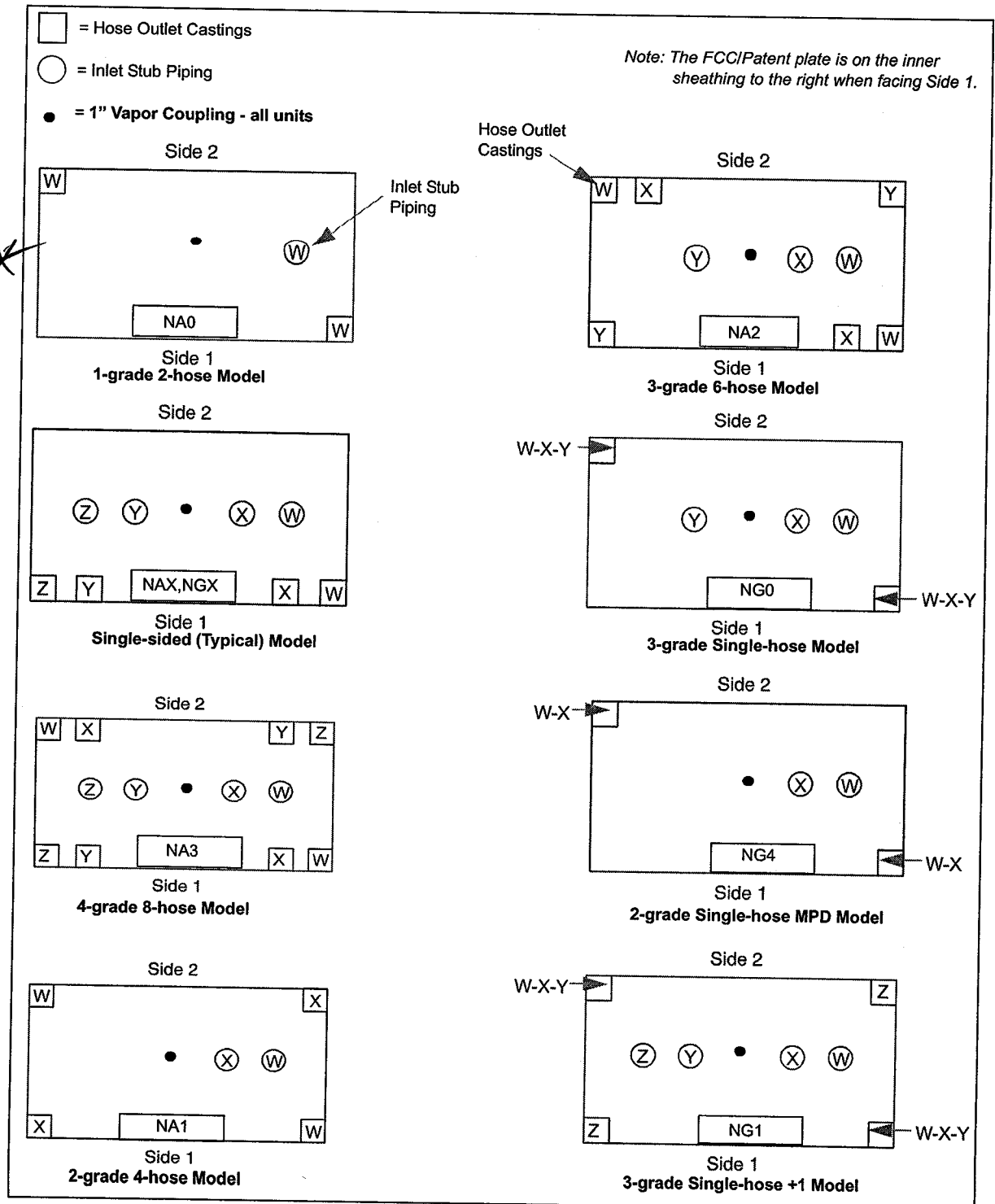
- Z is always a Straight/Unblended Product Inlet, +Z is always a Straight/Unblended +1 Product.

- Product number does not signify grade on MPD units, for example, Product 1 is not always Lo Grade, but is optionally Lo, Mid, or Hi.

Dispenser MPD Piping to Hose Fitting Configurations

Note: For multi-hose units, piping must align with graphics when facing Side 1.

Figure 5-3: Encore Dispenser MPD Piping to Hose Fitting Layout



Blender Configuration

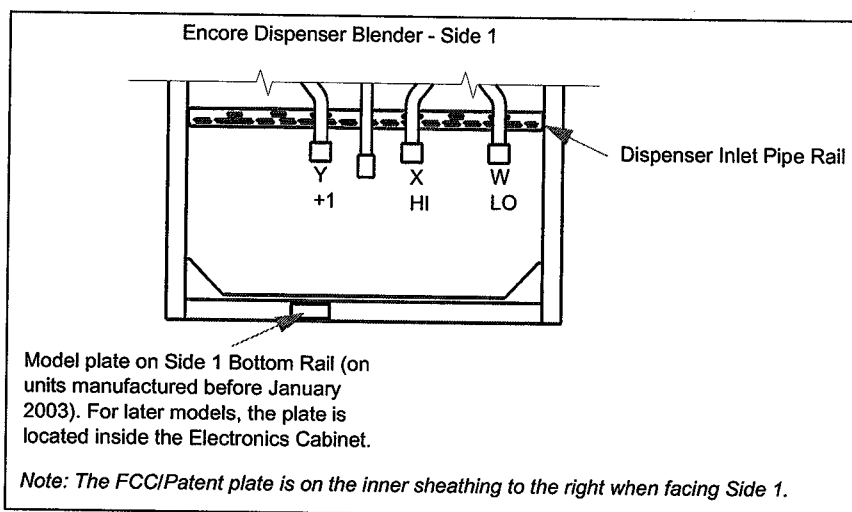
Dispenser Blender Configuration

For dispenser (MPD) blender configuration, refer to “Dispenser (MPD) Configuration” on page 27.

Read and understand all information in “Before Mounting the Unit on the Fuel Island” on page 22.

Note: For units with the Ecometer option, pipe directly to the manifold. Practice care when installing piping directly to the aluminum manifold. It is strongly recommended that you attach the lower U-bolts to the installer-provided inlet pipe, at the cross bar, before wrenching the pipe tight. This will help prevent damage to the manifold threads or casting from incorrect threading or side loading of the pipe from wrench action during tightening. The U-bolts must be initially tightened to allow the pipe to be easily tightened but still remain aligned. After the pipe is installed, tighten all the U-bolts.

Figure 5-10: Dispenser (MPD) Product Inlets

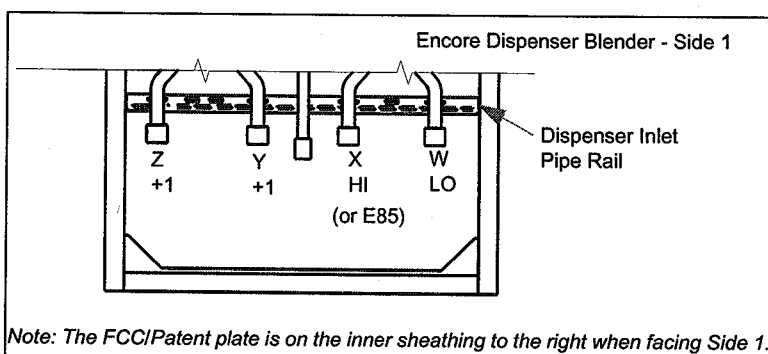


Model #	Blender Dispenser Model Description	Encore Inlets	Product Inlets (Typical)
NN1	Blender Dispenser 3+0		
NN2	Blender Dispenser 4+0		
NN3	Blender Dispenser 5+0	W, X	W = Lo Product X = Hi Product
NJ0	Multi-hose Blender Dispenser 3-grade 6-hose		
NL0	Blender Dispenser 2+1		
NL1	Blender Dispenser 3+1		
NL2	Blender Dispenser 4+1	W, X, Y	W = Lo Product X = Hi Product Y = +1 Straight/ Unblended Product
NL3	Blender Dispenser 5+1		
NJ2	Multi-hose Blender Dispenser 3+1-grade, 8-hose		

Notes:

- W = Product 1 (On Blenders only Product 1 is always Lo Product)
- X = Product 2
- Y = Straight/Unblended Product Inlet

Figure 5-11: Dispenser Blender Product Inlets (Model #NL3)

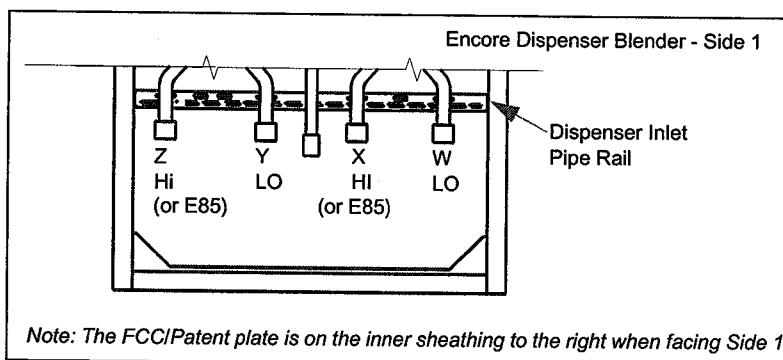


Model #	Blender Dispenser Model Description	Encore Inlets	Product Inlets (Typical)
NL3	Blender Dispenser 3 + 1 + 1	W, X, Y, Z	W = Lo Product X = Hi Prod or E85 Note: Selectable Blender Side of Dispenser Y = + 1 Straight Z = + 1 Straight Note: Straight Product Side of Dispenser

Notes:

- W = Product 1 (**On Blenders only Product 1 is always Lo Product**)
- X = Product 2 - If the selectable blender side of the dispenser is to include E85, inlet "X" will be for the E85
- Y = Straight/Unblended Product Inlet
- Z = Straight/Unblended Product Inlet - If one straight product is to be E85, inlet "Z" will be for E85

Figure 5-12: Dispenser Blender Product Inlets (Model #NJ4)



Model #	Blender Dispenser Model Description	Encore Inlets	Product Inlets (Typical)
NJ4	Blender Dispenser 3 + 2	W, X, Y, Z	W = Lo Product X = Hi Prod or E85 Note: Selectable Blender Side of Dispenser Y = Lo Product Z = Hi Prod or E85 Note: Multi-Hose Blender Side of Dispenser

Notes:

- W = Product 1 (**On Blenders only Product 1 is always Lo Product**)
- X = Product 2 - If the selectable blender side of the dispenser is to include E85, inlet "X" will be for the E85
- Y = Product 3
- Z = Product 4 - If the multi-hose blender side of the dispenser is to include E85, inlet "Z" will be for E85

Dispenser Blender Piping to Hose Fitting Configuration

Figure 5-13: Encore Dispenser Blender Piping to Hose Fitting Layout (Model # NN1, NN2, NN3, NJ0, NL0, NL1, NL2, NL3, and NJ2)

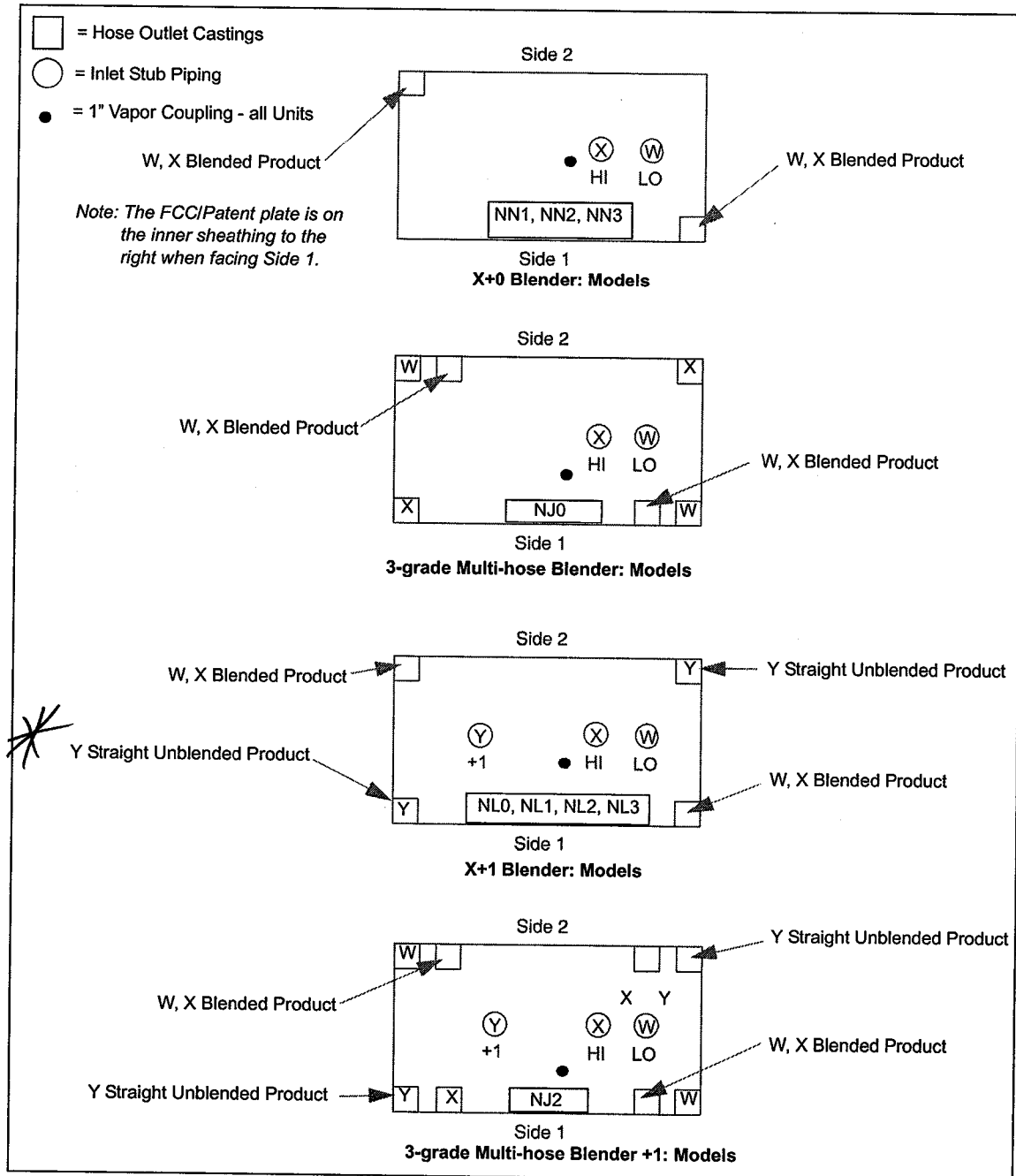
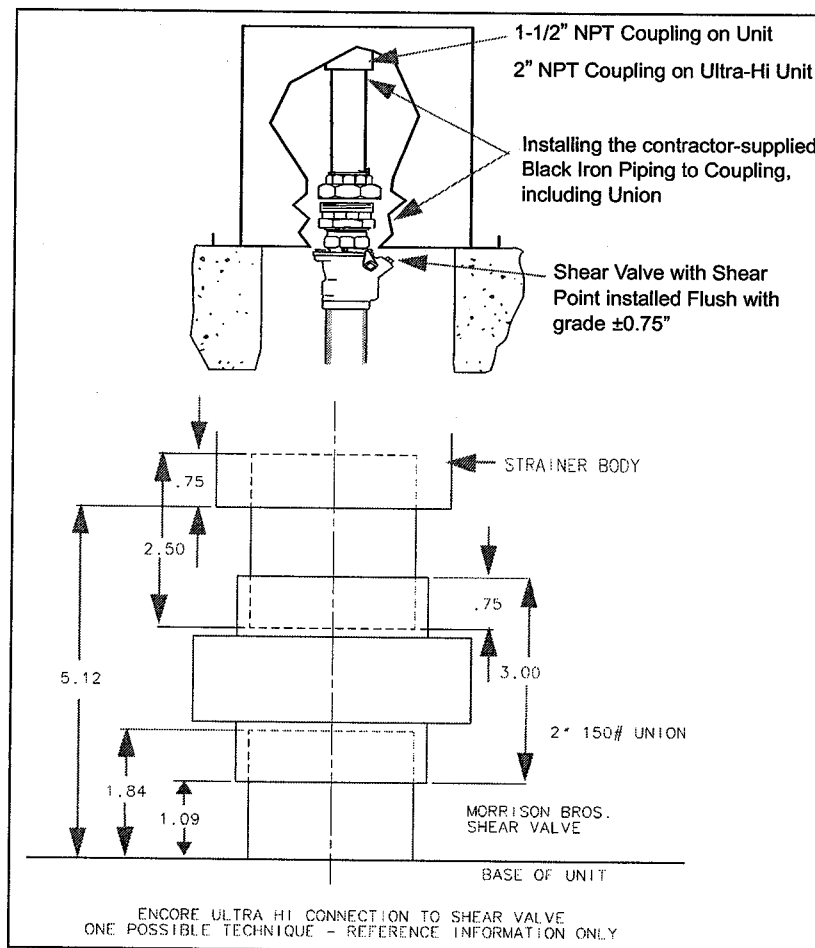


Figure 6-5: Shear Valve at Grade



Notes: 1) Regular (non-double wall) Shear Valve is shown.

2) OPW supplies an Encore Ultra-Hi compatible double poppet Shear Valve with a union top (OPW part # 10RUP-2006).

3) It is a mandatory code requirement that the shear section of the Shear Valve be within $\pm 3/4"$ (or to Shear Valve manufacturer's requirement, whichever is tighter) from the plane of the bottom of the base of a dispenser. Not all Shear Valve styles allow the maintenance of this tolerance for Encore Ultra-Hi units. A N23047 single poppet male top Morrison 2x2 636M-0200AV or a code-approved equivalent Shear Valve meets the code requirements. Do not modify the dispenser plumbing (for example, remove the strainer housing) to accommodate other model valves, or install units such that the shear groove of the Shear Valve is not within $\pm 3/4"$ of the base plane of the dispenser. Use a N23274 Check Valve between the union and strainer housing to ensure that the shear section is properly located.

6 Tighten the union halves together.

7 Tighten the anchor bolts at this time. Verify if the Shear Valves are properly tightened to the Pit Box or Shear Valve anchor bracket, as required. If removed earlier, reinstall the vertical cabinet brace in the lower hydraulic cabinet.

For Ultra-Hi installations:

- Selection of proper components mounted to the bottom of the strainer housing is critical in maintaining the proper location of the Shear Valve groove of the Shear Valve to the base plane of the dispenser. You must follow the Shear Valve manufacturer's required positioning for this groove.
- A check valve is strongly recommended. When installed, Gilbarco recommends using N23274, which is approximately 2-1/2" long and can take the place of the close nipple located above the union. Failure to install a check valve here could result in fuel sale indication when the fueling position is activated with the nozzle closed and the check valve back at the STP is leaking.
- A union is required above the Shear Valve.
- A Morrison male end Shear Valve N23047 (Morrison # 636M-0200AV) can be used to properly maintain the position of the shear groove. The installer must verify if other manufacturer's Shear Valves would ensure proper positioning of the shear groove as per their specifications.
- Not all double poppet Shear Valve models or styles will fit the Ultra-Hi unit.
- Other combinations of unions, check valves, and Shear Valves may be possible and still maintain proper location of the shear groove.
- Removal of a strainer from the system will void warranty.

Follow the Shear Valve manufacturer's instructions for installation procedures, testing, and so on.

- Install the Shear Valve on each product inlet pipe.

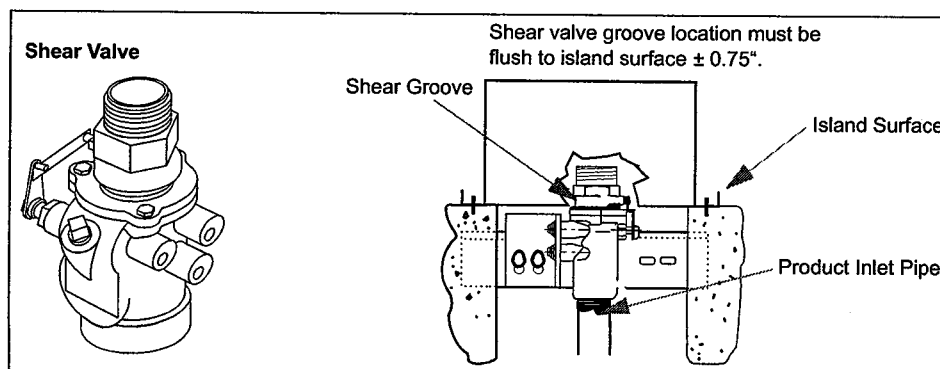
Note: Encore dispensers require 1-1/2" male top Shear Valves. Gilbarco strongly recommends using double poppet Shear Valves that shut off flow from both storage tanks and internal to the unit (for example, OPW #10BHMP or Exxon - OPW # 10RMSP). The Encore Ultra-Hi dispensers use 2" male top Shear Valve (for example, Morrison Bros. 2" 636 m).

- For Ultra-Hi units, install the Shear Valve on each 2" inlet and outlet.
- Install a Shear Valve on the master dispenser satellite outlet and at satellite inlet.
- Do not mount the Shear Valve upside down.
- Ensure that the valve linkage is accessible and has no interference to open or close from other piping, structure, or components.

Note: The dispenser product inlet pipes must be aligned with the Shear Valve. Do not restrict Shear Valve linkage with pipes, braces, and so on.

- Test Shear Valve operation.
- Close the Shear Valve until equipment start-up. Cap the inlet pipe. This prevents dirt and other particles from entering the product line. It also prevents fuel spillage.

Figure 6-6: Shear Valve

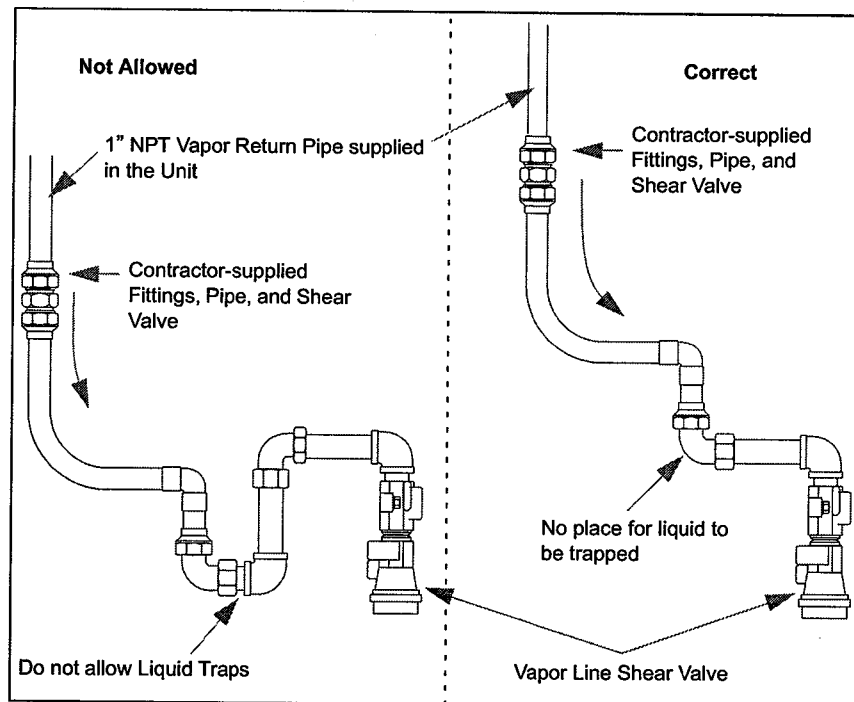


Connecting the Vapor Return Line to the Vapor Shear Valve

Do not create any liquid traps when connecting the vapor return line to the vapor line Shear Valve (see Figure 6-7). A liquid trap is a low spot in the vapor return line that can accumulate fuel and cause blockage, which could cause a system to fail vapor recovery certification tests or create operation issues with vapor balance nozzles.

- Notes:* 1) The contractor must provide and install the pipe union for connecting to the 1" NPT coupling in the unit.
- 2) Follow the vapor Shear Valve's manufacturer information regarding mounting of the Shear Valve to the unit.

Figure 6-7: Correct Vapor Line Connection Method



Anchoring the Pump/Dispenser to the Island

Note: Pumps do not normally require Shear Valves. The following procedure for a pump is identical to that of a dispenser, except that the Shear Valve may not be used.

WARNING

Improper anchoring of units could cause damage, severe injury, or death resulting from the unit tipping over from the impact or drive-off.

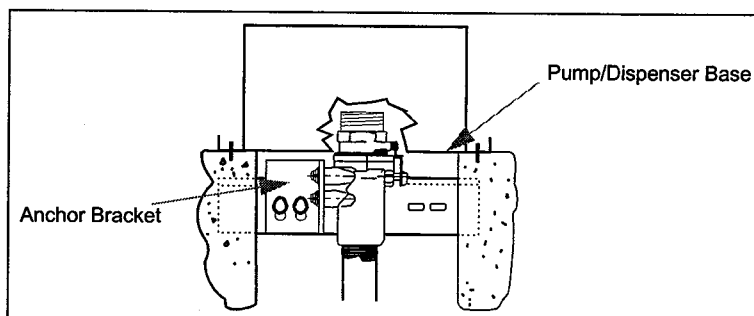
NFPA 30A requires the anchoring of pumps/dispensers.
Securely install anchor bolts at all anchoring locations as shown on foundation diagrams for safe operation of Shear Valves and hose breakaways.

To anchor pumps/dispensers to the island, proceed as follows:

- 1 Verify if the Shear Valves are firmly anchored to the island form (concrete or Pit Box) (see Figure 6-8).

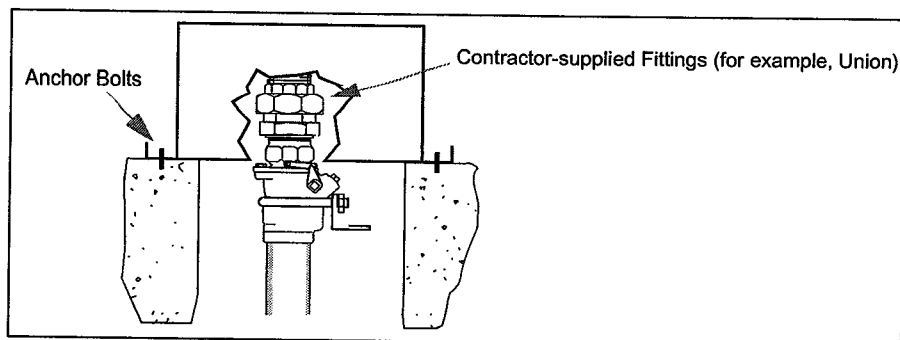
Note: If the Shear Valve is not anchored properly, it may not operate correctly during a severe impact. Follow the Shear Valve manufacturer's instructions.

Figure 6-8: Anchoring Shear Valves using Anchor Brackets



- 2 Loosely anchor the pump/dispenser to the island according to the foundation layout locations, using all the required anchoring points as follows:
- Use 1/2" anchor studs with heavy duty large washers (slot designed for that size).
 - Use bolts or studs that are of grade 5 steel.
 - Use hardware that is corrosion-protected or resistant.
- Note: Do not use plastic, low strength, or pallet bolts.*
- Studs/bolts must be securely anchored to the island or Pit Box (see Figure 6-9).
 - For additional important information, refer to the anchor or Pit Box manufacturer's instructions.

Figure 6-9: Anchors for the Pump/Dispenser



Appendix A: Elevation and Foundation Diagrams

Figure A-1: Encore 300/500 Elevation Diagram

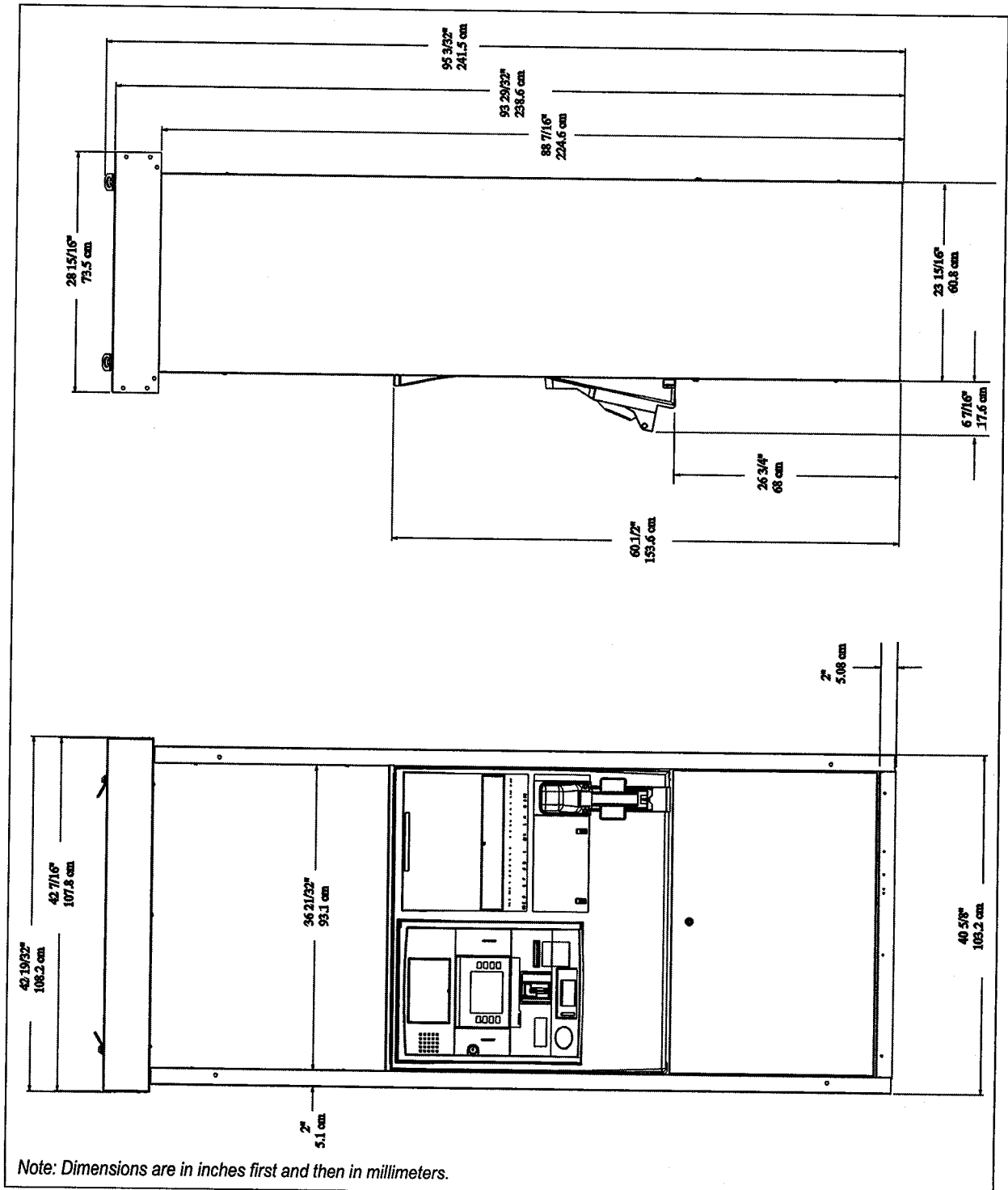


Figure A-2: Encore DEF Elevation Diagram

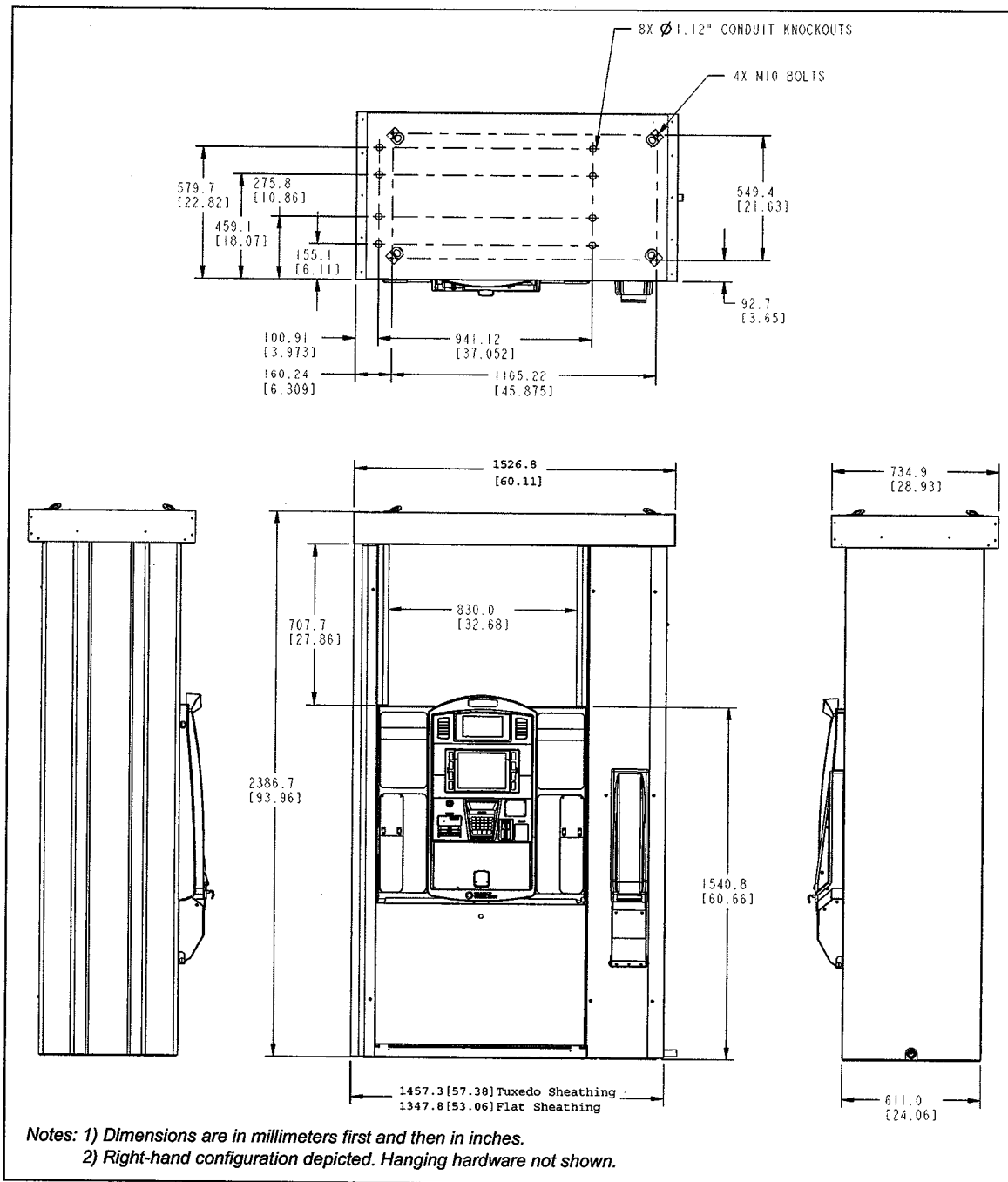
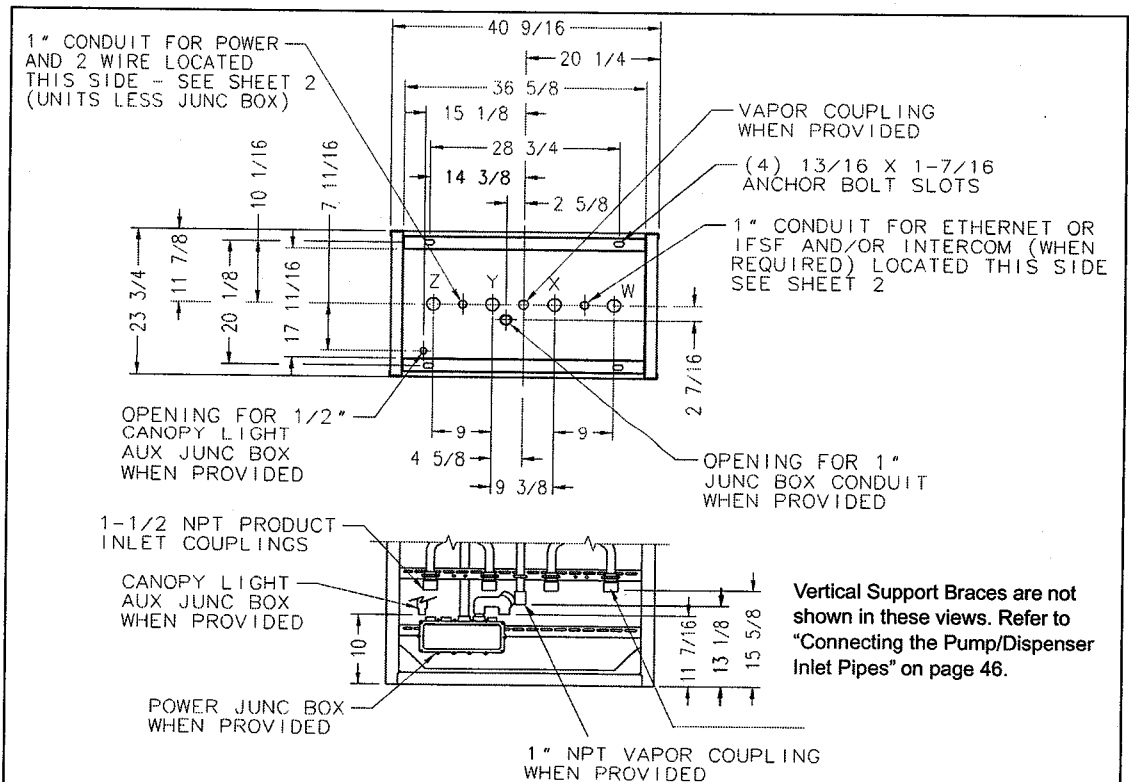


Figure A-5: Encore Foundation Diagrams: 3 of 10 (Encore 300/500 Dispensers)

SIDE 1 OF UNIT
PRIMARY ELECTRICAL SERVICE SIDE

INLETS	MODEL #	DISPENSER MODELS
W	NA0	1 GRADE 2 HOSE
W & X	NA1 NNO-3 NJ0 NG4	2 GRADE 4 HOSE X+0 SELECTABLE BLENDER 3 GR MULTI HOSE BLENDER 2 GRADE SINGLE HOSE
W, X & Y	NA2 NG0 NLO-3 NJ2	3 GRADE 6 HOSE 3 GRADE SINGLE HOSE X+1 SELECTABLE BLENDER 3+1 MULTI HOSE BLENDER
W, X, Y & Z	NA3 NG1 NL3 NJ4	4 GRADE 8 HOSE 3+1 SINGLE HOSE 3+1+1 SELECTABLE BLENDER 3+2 SELECTABLE BLENDER

NOTES:

1. MAXIMUM FIELD RETROFIT RAIN LIP SIZE WITHOUT REQUIRING ADAPTER PLATE:
17-1/2 X 39-1/2 X 2"



FOR X + 1 SELECTABLE BLENDER AND 3 + 1 MULTI HOSE BLENDER, INLET "Y" IS THE PLUS GRADE.



FOR 3 + 1 SINGLE HOSE, INLET "Z" IS THE PLUS GRADE.
FOR 3+1+1 SELECTABLE BLENDER, INLETS "Y" AND "Z" ARE PLUS GRADES.
FOR 3+2 SELECTABLE BLENDER, INLETS "W" AND "X" ARE FOR THE SELECTABLE BLENDER SIDE. INLETS "Y" AND "Z" ARE FOR THE MULTI-HOSE BLENDER SIDE.

Note: Dimensions are in inches.

Figure A-6: Encore Foundation Diagrams: 4 of 10 (Encore 300/500 Series Dispensers)

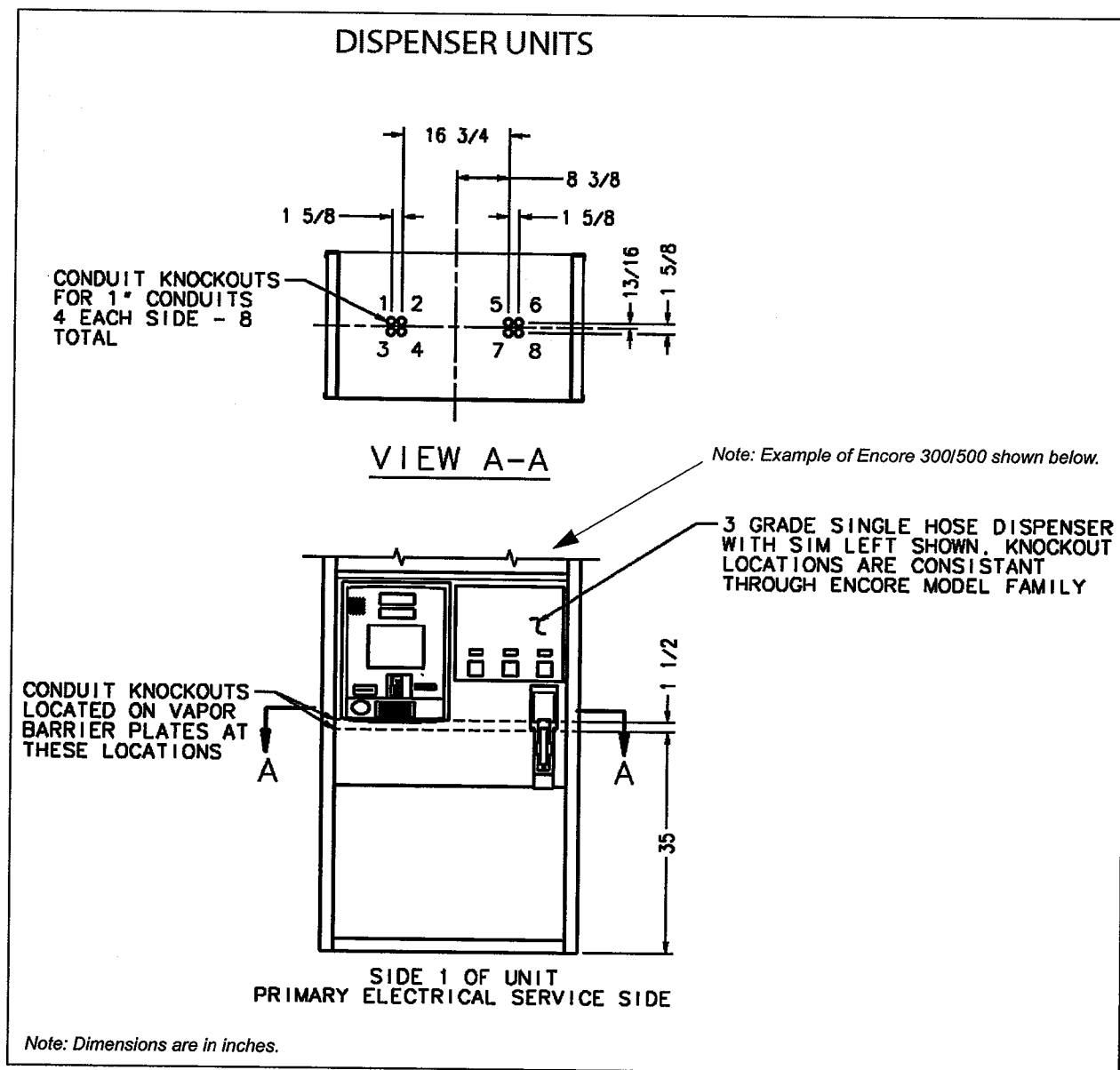
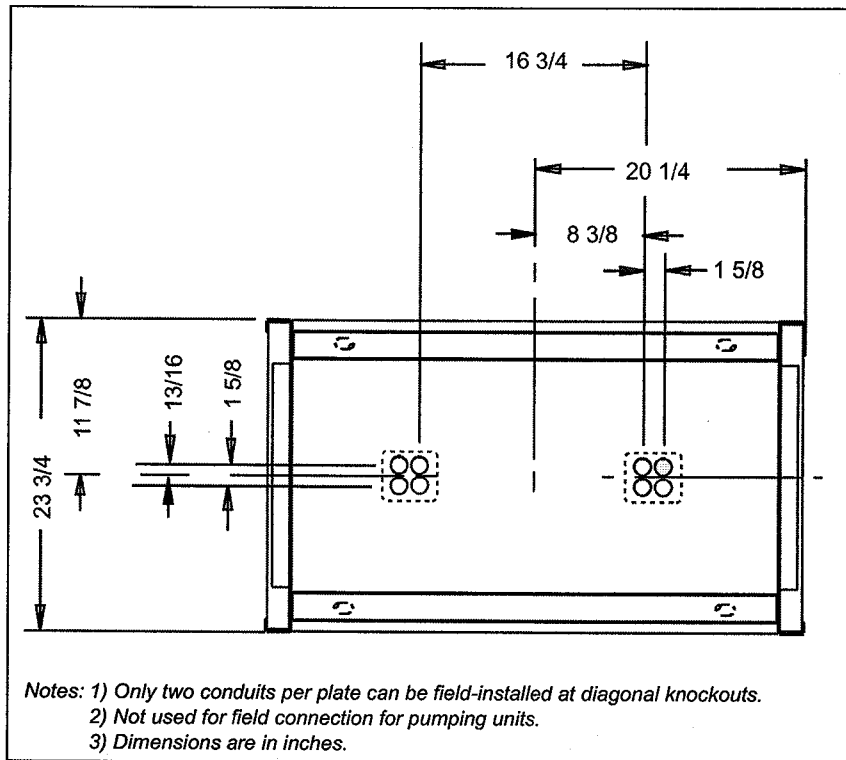


Figure A-13: Main Cabinet Conduit Knockouts





**WHITESTONE
ASSOCIATES, INC.**

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REPORT OF GEOTECHNICAL INVESTIGATION

**PROPOSED HESS SERVICE STATION #30279
1672 NEW JERSEY STATE HIGHWAY ROUTE 88
AND JOHN STREET
BLOCK 1170.01, LOTS 4, 5 AND 6
BRICK TOWNSHIP, OCEAN COUNTY, NEW JERSEY**

Prepared for:

**BOHLER ENGINEERING NJ, LLC
35 Technology Drive
Warren, New Jersey 07059**

Prepared by:

**WHITESTONE ASSOCIATES, INC.
35 Technology Drive
Warren, New Jersey 07059**


**Kevin A. Feath, P.E.
Project Manager**

Professional Engineer License No.: 24GE04675400


**Laurence W. Keller, P.E.
Director, Geotechnical Services**

**Whitestone Project #GJ1212265.000
October 23, 2012**

Other Office Locations:

■ CHALFONT, PA
215.712.2700

■ STERLING, VA
703.464.5858

■ EVERGREEN, CO
303.670.6905

October 23, 2012

via email

BOHLER ENGINEERING NJ, LLC
35 Technology Drive
Warren, New Jersey 07059

Attention: Brian McMorrow, P.E.
Senior Project Manager

**Regarding: REPORT OF GEOTECHNICAL INVESTIGATION
PROPOSED HESS SERVICE STATION #30279
1672 NEW JERSEY STATE HIGHWAY ROUTE 88 AND JOHN STREET
BLOCK 1170.01, LOTS 4, 5 AND 6
BRICK TOWNSHIP, OCEAN COUNTY, NEW JERSEY
WHITESTONE PROJECT NO.: GJ1212265.000**

Dear Mr. McMorrow:

Whitestone Associates, Inc. (Whitestone) is pleased to submit the attached *Report of Geotechnical Investigation* for the above-referenced project. The attached report presents the results of Whitestone's soils exploration efforts and recommendations for design of the proposed structural foundations, floor slabs, pavements, and related earthwork associated with the proposed Hess Service Station site development.

FOUNDATIONS: The results of the exploration indicate that the structures may be supported on conventional shallow foundations bearing on improved and approved existing fill materials (if encountered at foundation bearing elevations), the underlying natural soils, and/or properly placed structural fill following supplemental evaluation as described herein.

SUPPLEMENTAL EVALUATION OF EXISTING FILL AND INACCESSIBLE AREAS: Whitestone preliminarily anticipates that the existing fill material encountered to the maximum depth of approximately five feet within the proposed canopy area will be suitable for foundation, floor slab and pavement support contingent upon supplemental evaluation by means of construction phase test pit excavations and subgrade improvement as recommended herein. Due to the inherent variability that exists within existing fill, evidenced by the debris encountered, Whitestone anticipates that limited portions of the existing fill materials may require overexcavation and recompaction/replacement or subgrade stabilization within proposed foundation, floor slab and pavement areas. Whitestone also anticipates that a majority of the existing fill materials will be suitable for re-use as structural fill following segregation of any objectionable debris encountered and proper moisture control. The central portion of the proposed canopy footprint and north central portion of proposed pavement area were not accessible at the time of Whitestone's field investigation due to the presence of existing structures. As such, soil conditions in presently inaccessible areas below the existing structures also should be evaluated during the early stages of construction following demolition to verify that the underlying soil conditions are consistent with those encountered during this subsurface exploration.

Other Office Locations:

■ CHALFONT, PA
215.712.2700

■ STERLING, VA
703.464.5858

■ EVERGREEN, CO
303.670.6905



Whitestone's geotechnical division appreciates the opportunity to be of continued service to Bohler Engineering NJ, LLC. Please note that Whitestone has the capability to perform the additional geotechnical engineering services recommended herein. Please contact us at (908) 668-7777 with any questions regarding the enclosed report.

Sincerely,

WHITESTONE ASSOCIATES, INC.


Kevin A. Feath, P.E.
Project Manager


Laurence W. Keller, P.E.
Director, Geotechnical Services

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REPORT OF GEOTECHNICAL INVESTIGATION
Proposed Hess Service Station #30279
1672 New Jersey State Highway Route 88 and John Street
Block 1170.01, Lots 4, 5 and 6
Brick Township, Ocean County, New Jersey

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FIGURE 1 Boring Location Plan

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SECTION 1.0

Summary of Findings

Whitestone Associates, Inc. (Whitestone) has completed an exploration and evaluation of the subsurface conditions for the proposed Hess Service Station #30279 development located at 1672 New Jersey State Highway (N.J.S.H.) Route 88 at the northern intersection with John Street in Brick Township, Ocean County, New Jersey. The site is identified further as Block 1170.01, Lots 4, 5 and 6 the *Official Tax Map* of the Township of Brick, Ocean County, New Jersey. The site of the proposed construction is shown on the *Boring Location Plan* included as Figure 1.

At the time of Whitestone's exploration, the site consisted of an existing Hess Service Station including a single-story block building, frame shed, two fueling islands, four gasoline and diesel fuel underground storage tanks (USTs), one 550-gallon heating oil UST, identification sign, and associated pavement, landscaped areas and utilities. Based on the August 24, 2012 *Grading, Drainage & Utilities Plan* prepared by Bohler Engineering NJ, LLC (Bohler), the site is relatively flatlying with a slight slope downward in the easterly direction with a topographic high elevation of approximately 34.0 feet above mean sea level (msl) in the north central portion of the property and a topographic low elevation of approximately 31.5 feet above msl along the eastern border of the property.

Based on the August 24, 2012 *Site Plan* prepared by Bohler, the proposed site redevelopment will include demolition of the existing structures, with the exception of the USTs that will remain, and the construction of an approximately 1,660 square feet footprint, pre-fabricated, modular Hess Express building with a finished floor elevation (FFE) of 34.45 feet above msl, canopy over six fueling islands and a four feet by eight feet kiosk, identification sign, trash enclosure, two stormwater management (SWM) drywells, and associated new pavement, utilities and landscaped areas. The proposed building is anticipated to be a single-story with a structural reinforced concrete floor slab and no basement or crawl space.

Based on existing and proposed grades provided on the *Grading, Drainage & Utilities Plan* and *Site Plan* prepared by Bohler, the proposed building will require one foot to three feet of fill placement to achieve FFE. With the exception of the eastern portion of the site, proposed pavement areas will be redeveloped at or near existing site grades with maximum cut and fill on the order of less than one foot. The eastern portion of proposed pavement currently is grass-covered and will require up to two feet of fill placement to achieve design grades. The bottom elevation of the proposed southern SWM drywell will be approximately 24.03 feet above msl. The bottom elevation of the proposed northern SWM drywell is not known at this time. No new retaining walls currently are planned for the site redevelopment.

The subsurface exploration included performing a reconnaissance of the project site, drilling soil borings, and collecting soil samples for laboratory analyses. The data from this exploration were analyzed by Whitestone in light of the project information provided by Bohler.

A summary of Whitestone's findings and recommendations is presented in the following:

- ▶ **Subsurface Conditions:** The soil borings were performed within either existing paved or grass covered areas. Borings performed within existing paved areas encountered approximately three inches to seven inches of asphaltic concrete pavement at the surface underlain by approximately three inches to six inches of silty sand and gravel subbase materials. Subbase materials were observed below the pavement in four of the five borings performed within existing paved areas. Borings performed within existing grass covered areas encountered two inches to three inches of topsoil at the surface. Beneath the surface cover within the borings performed in the northwestern portion of the site (B-3, B-6 and B-7), existing fill materials (Stratum 1) were encountered that generally consisted of silty sand with gravel, a variable amount of debris and an occasional trace amount of fine roots. The debris observed within the existing fill materials consisted of asphalt fragments and pieces of concrete with a maximum diameter of four inches. When encountered, existing fill materials extended to depths that ranged from approximately two feet below existing ground surface (fbgs) to five fbgs. Below the surface cover or existing fill materials, the borings encountered natural coastal plain deposited soils (Stratum 2). The coastal plain deposits generally consisted of either poorly graded sand (USCS: SP-SM and SP) with variable amounts of gravel and silt or silty sand (USCS: SM) with a variable amount of gravel. The borings were terminated within this stratum at depths that ranged between approximately six fbgs and 20.0 fbgs. Static groundwater was not encountered within any of the borings performed as part of this investigation with the deepest depth and shallowest elevation explored of approximately 20.0 fbgs and 12.0 feet above msl, respectively. Static groundwater conditions likely will fluctuate seasonally and following periods of precipitation.

Recommendations developed upon consideration of these results are summarized below and presented in greater detail in the following report.

- ▶ **Supplemental Evaluation of Existing Fill Materials and Inaccessible Areas:** Based on the conditions disclosed by the soil borings, Whitestone anticipates that the existing fill material will be suitable for foundation (when encountered within the northern portion of the proposed canopy area), floor slab and pavement support following subgrade inspection and improvement as provided herein with some anticipated overexcavation, due to possible variability within existing fill materials, and with increased risk of future maintenance within proposed pavement areas where unimproved existing fill remains. Whitestone also anticipates that the majority of the existing fill materials will be suitable for reuse as structural fill with segregation of any objectionable debris encountered and proper moisture control. Whitestone recommends confirming further the condition of the existing fill for foundation, floor slab and pavement support and/or re-use as structural fill by means of supplemental evaluation either prior to or during the early stages of construction to identify areas requiring removal and possible uncontrolled conditions or deleterious materials not disclosed by the soil borings conducted during this exploration. The central portion of the proposed canopy footprint

and north central portion of proposed pavement area were not accessible at the time of Whitestone's field investigation due to the presence of existing structures. As such, soil conditions in presently inaccessible areas below the existing structures also should be evaluated during the early stages of construction following demolition to verify that the underlying soil conditions are consistent with those encountered during this subsurface exploration.

- ▶ **Foundations:** Following supplemental evaluation and improvement of existing fill materials, Whitestone recommends that the proposed structures be supported on conventional shallow spread and continuous wall footings designed to bear either within approved, existing fill materials, the underlying coastal plain deposits, and/or on controlled structural fill materials provided they are properly placed and compacted as described herein. Foundations bearing within firm, approved existing fill materials, natural soils, and/or properly placed controlled structural fill materials may be designed using a maximum allowable net bearing pressure of 3,000 pounds per square foot (psf). Due to anticipated disturbance of upper portions of the subgrade soils during footing excavations, all footing bottoms should be improved by in-trench compaction in the presence of the geotechnical engineer. Localized areas may require overexcavation and replacement of approved on-site soils in controlled lifts.
- ▶ **Pavements:** Contingent upon supplemental evaluation and compaction improvement, Whitestone anticipates that approved, existing fill materials, the underlying natural soils, and/or newly placed structural fill will be suitable for support of the proposed pavements, provided these materials are properly prepared during favorable weather and proofrolled as recommended herein. Due to the presence of existing fill materials, all subgrades should be improved by vibratory roller compaction efforts and approved by proofroll tests in the presence of the geotechnical engineer. Due to potential variability that exists within existing fill materials, areas of overexcavation, subgrade stabilization and recompaction may be anticipated within proposed floor slab and pavement areas. Localized areas may require overexcavation and recompaction of on-site soils in controlled lifts. Any areas that become softened or disturbed as a result of wetting and/or repeated exposure to construction traffic should be removed and replaced with compacted structural fill.
- ▶ **Soil Reusability:** Whitestone anticipates that the existing fill materials and underlying natural materials may be reusable as structural fill and/or backfill below proposed foundations, and pavements provided that they are free of deleterious materials and moisture contents are controlled within two percent of the optimum moisture content. Reuse of the existing fill materials will be contingent on careful inspection in the field by the owner's geotechnical engineer by visual observation and/or test pit excavations during construction as recommended herein. The on-site finer-grained silty sand soils are moderately moisture sensitive and re-use will require drying where wetted beyond the optimum. Imported materials may be required to expedite earthwork operations, especially if the construction schedule or the site area restricts moisture control operations, such as air drying the soil. Immediate re-use of on-site soil should not be expected.

Detailed design criteria and construction recommendations for proposed foundations, slabs, pavements, and earthwork are discussed in the following report.

SECTION 2.0

Introduction

2.1 AUTHORIZATION

Mr. Brian McMorrow, P.E. of Bohler issued authorization to Whitestone Associates, Inc. (Whitestone) to perform a geotechnical investigation on this site relevant to the construction of a proposed Hess Service Station #30279 redevelopment. The geotechnical investigation was performed in general accordance with Whitestone's September 25, 2012 proposal to Bohler.

2.2 PURPOSE

The purpose of this subsurface exploration and analysis was to:

- ▶ ascertain the various soil profile components at test locations;
- ▶ estimate the engineering characteristics of the proposed foundation bearing and subgrade materials;
- ▶ provide geotechnical criteria for use by the design engineers in preparing the foundation, slab, and pavement design;
- ▶ provide recommendations for required earthwork and subgrade preparation;
- ▶ record groundwater levels (if encountered) at the time of the investigation and discuss the potential impact on the proposed construction; and
- ▶ recommend additional investigation and/or analysis (if warranted).

2.3 SCOPE

The scope of the exploration and analysis included the subsurface exploration, field testing and sampling, laboratory analyses, and a geotechnical engineering analysis and evaluation of the subsurface materials. This *Report of Geotechnical Investigation* is limited to addressing the site conditions as they relate to the physical support of the proposed construction. Any references to suspicious odors, materials, or conditions are provided strictly for the client's information.

2.3.1 Field Exploration

Field exploration of the project site was conducted by means of seven soil borings (identified as B-1 through B-7) performed with a truck-mounted drill rig equipped with hollow stem augers. Borings B-1 and B-2 were

drilled within the proposed building footprint and were terminated at the depth of approximately 20.0 fbgs. Borings B-3 and B-4 were performed within the proposed canopy area and extended to the depths of approximately 18.8 fbgs and 20.0 fbgs, respectively. Borings B-5 through B-7 were drilled within proposed pavement areas and extended to a depth of approximately six fbgs. Prior to mechanical auger ground penetration, the soil borings performed within the vicinity of the existing gasoline service station were hand excavated with the help of a high powered vacuum truck to the depth of approximately four fbgs. Soil borings were backfilled to the surface with soils derived from the investigation and surficially patch with asphaltic concrete cold patch, as appropriate and necessary. The locations of the soil borings are shown on the accompanying *Boring Location Plan* included as Figure 1. *Records of Subsurface Exploration* are provided in Appendix A.

The soil borings were conducted in the presence of a Whitestone engineer who performed field tests, recorded visual classifications, and collected samples of the various strata encountered. The borings were located in the field using normal taping procedures and estimated right angles. These locations are presumed to be accurate within a few feet.

Soil borings and Standard Penetration Tests (SPTs) were conducted in general accordance with American Society for Testing and Materials (ASTM) designation D 1586. The SPT resistance value (N) can be used as an indicator of the consistency of fine-grained soils and the relative density of coarse-grained soils. The N-value for various soil types can be correlated with the engineering behavior of earthworks and foundations.

Groundwater level observations, although not encountered, were measured during and immediately after the completion of field operations prior to backfilling the borings. Seasonal variations, temperature effects, man-made effects, and recent rainfall conditions may influence the levels of the groundwater, and the observed levels will depend on the permeability of the soils. Groundwater elevations derived from sources other than seasonally observed groundwater monitor wells may not be representative of true groundwater levels.

2.3.2 Laboratory Testing Program

In addition to the field investigation, a supplemental laboratory testing program was conducted to determine additional, pertinent engineering characteristics of representative samples of on-site soils. The laboratory testing program was performed in general accordance with applicable ASTM standard test methods and included physical testing of proposed building foundation, floor slab and pavement bearing stratum.

Physical/Textural Analyses: Representative samples of selected strata encountered were subjected to a laboratory testing program that included moisture content determinations (ASTM D-2216) and washed gradation analyses (ASTM D-422) in order to perform supplementary engineering soil classifications in general accordance with ASTM D-2487. The soil strata tested were classified by the Unified Soil Classification System (USCS) and results of the laboratory testing are summarized in the following table. Quantitative test results are provided in Appendix B.

PHYSICAL/TEXTURAL ANALYSES SUMMARY							
Boring	Sample	Depth (fbgs)	% Passing No. 200 Sieve	Moisture Content (%)	Liquid Limit (%)	Plastic Index (%)	USCS Classification
B-1	S-3	4.0 - 6.0	20.0	9.0	Non Plastic		SM
B-4	S-1	4.0 - 6.0	8.1	6.2	Non Plastic		SP-SM

The engineering classifications are useful when considered in conjunction with the additional site data to estimate properties of the soil types encountered and to predict the soil's behavior under construction and service loads.

SECTION 3.0

Site Description

3.1 LOCATION AND DESCRIPTION

The subject site is located at 1672 N.J.S.H. Route 88 at the northern intersection with John Street in Brick Township, Ocean County, New Jersey. The site is identified further as Block 1170.01, Lots 4, 5 and 6 on the *Official Tax Map* of the Township of Brick, Ocean County, New Jersey. The site is bound to the north a single-story building; to the south by John Street followed by a 1.5-story business building; to the east by residential structures; and to the west by N.J.S.H. Route 88 followed by a single-story business building and a 1.5-story business building. The site of the proposed construction is shown on the *Boring Location Plan* included as Figure 1.

3.2 EXISTING CONDITIONS

Surface Cover/Development: At the time of Whitestone's field investigation, the subject site consisted of an existing Hess Service Station including a single-story block building, frame shed, two fueling islands, four gasoline and diesel fuel USTs, one 550-gallon heating oil UST, identification sign, and associated pavement, landscaped areas and utilities.

Topography: Topographically, the site is relatively flatlying with a slight slope downward in the easterly direction including a high elevation of approximately 34.0 feet above msl in the north central portion of the property and a low elevation of approximately 31.5 feet above msl along the eastern border of the property. Topographic information was provided on the aforementioned *Grading, Drainage & Utilities Plan* prepared by Bohler.

Utilities: At the time of Whitestone's subsurface field investigation, the subject site was serviced by public utilities including above ground electric and telephone, and underground electric, water, gasoline product, heating oil, sanitary sewer and stormwater sewer lines. Other utilities were not observed at the subject site by Whitestone but may be present. The utility information contained in this report is presented for general discussion only and is not intended for construction purposes.

Site Drainage: Surface run-off for the site generally follows existing topography draining in the vertical direction through exposed soil areas of the site and in the horizontal direction easterly towards inlets located within the surrounding roadways right-of-ways. The termini of these inlets is unknown.

3.3 SITE GEOLOGY

The subject site is situated within the Coastal Plain Physiographic Province of New Jersey. Specifically, the subject site is located within the Lower Member of the Kirkwood Formation. The Lower Member of the Kirkwood Formation generally consists of sand and clay that is massive to thick bedded and locally cross bedded. Overburden materials also include man-made fill associated with previous development of the subject site.

3.4 PROPOSED CONSTRUCTION

Based on the aforementioned *Site Plan* prepared by Bohler, the proposed site redevelopment will include demolition of the existing structures, with the exception of the USTs which will remain, and the construction of an approximately 1,660 square feet footprint Hess Express building with a FFE of 34.45 feet above msl, canopy over six fueling islands and a four feet by eight feet kiosk, identification sign, trash enclosure, two SWM drywells, and associated new pavement, utilities and landscaped areas. The proposed building is anticipated to be a single-story, modular building with a structural floor slab and no basement or crawl space.

Based on existing and proposed grades provided on the *Grading, Drainage & Utilities Plan* and *Site Plan* prepared by Bohler, the proposed building will require one foot to three feet of fill placement to achieve FFE. With the exception of the eastern portion of the site, proposed pavement areas will be redeveloped at or near existing site grades with maximum cut and fill on the order of less than one foot. The eastern portion of proposed pavement currently is grass-covered and will require up to two feet of fill placement to achieve design grades. The bottom elevation of the proposed southern SWM drywell will be approximately 24.03 feet above msl. The bottom elevation of the proposed northern SWM drywell is not known at this time. No new retaining walls currently are planned for the site redevelopment. Maximum design loads are assumed to be less than the following:

Proposed Convenience Store

- ▶ column loads - 40 kips;
- ▶ lateral earth pressure - 250 pounds per square foot per foot of depth.

Proposed Fuel Island Canopy

- ▶ column overturning moment - 50 foot-kips
- ▶ column vertical downward load - 25 kips
- ▶ column vertical uplift load - 25 kips
- ▶ column horizontal load - 2.5 kips

The scope of Whitestone's investigation and the professional advice contained in this report were generated based on the project details and loading noted herein. Any revisions or additions to the design details enumerated in this report should be brought to the attention of Whitestone for additional evaluation as warranted.

SECTION 4.0

Subsurface Conditions

Details of the subsurface materials encountered are presented on the *Records of Subsurface Exploration* presented in Appendix A of this report. The subsurface soil conditions encountered in the soil test borings consisted of the following generalized strata in order of increasing depth.

4.1 SUBSURFACE SOIL CONDITIONS

Surface Cover Materials: The soil borings were performed within either existing paved or grass covered areas. Borings performed within existing paved areas encountered approximately three inches to seven inches of asphaltic concrete pavement at the surface underlain by approximately three inches to six inches of silty sand and gravel subbase materials. Subbase materials were observed below the pavement in four of the five borings performed within existing paved areas. Borings performed within existing grass covered areas encountered two inches to three inches of topsoil at the surface.

Existing Fill Materials (Stratum 1): Beneath the surface cover within the borings performed in the northwestern portion of the site (B-3, B-6 and B-7), existing fill materials were encountered that generally consisted of silty sand with gravel, a variable amount of debris and an occasional trace amount of fine roots. The debris observed within the existing fill materials consisted of asphalt fragments and pieces of concrete with a maximum diameter of four inches. When encountered, existing fill materials extended to depths that ranged from approximately two fbgs to five fbgs. SPT N-values encountered within the existing fill materials were five blows per foot (bpf) and 14 bpf.

Coastal Plain Deposits (Stratum 2): Below the surface cover or existing fill materials, the borings encountered natural coastal plain deposited soils. The coastal plain deposits generally consisted of either poorly graded sand (USCS: SP-SM and SP) with variable amounts of gravel and silt or silty sand (USCS: SM) with a variable amount of gravel. The borings were terminated within this stratum at depths that ranged between approximately six fbgs and 20.0 fbgs. SPT N-values within the coastal plain deposits ranged between eight bpf and refusal (refusal defined as greater than 50 blows per six inches of penetration), generally indicating loose to very dense relative densities and averaging approximately 27 bpf.

4.2 GROUNDWATER

Static groundwater was not encountered within any of the borings performed as part of this investigation with the deepest depth and shallowest elevation explored of approximately 20.0 fbgs and 12.0 feet above msl, respectively. Static groundwater conditions likely will fluctuate seasonally and following periods of precipitation.

SECTION 5.0

Conclusions and Recommendations

5.1 GENERAL

Based on the conditions disclosed by the soil borings performed as part of this investigation and contingent on improvement and supplemental evaluation of the existing fill materials, Whitestone anticipates that the proposed foundations and pavements may be supported on properly evaluated and approved existing fill materials (when encountered within the northern portion of the proposed canopy area), the underlying natural materials, and/or properly placed structural fill and backfill provided these materials are properly compacted and proofrolled as recommended herein. Subgrade evaluation by construction phase test pits and proofrolling, careful inspection by the owner's geotechnical engineer, and overexcavation and replacement of excessively unsuitable materials will be required in structural areas.

5.2 SITE PREPARATION AND EARTHWORK

Surface Cover Stripping and Demolition: Prior to stripping operations, all utilities should be identified and secured. The existing building and pavements to be demolished and stripped should be removed from within and at least five feet beyond the limits of the proposed building, canopy and pavement areas. Existing structural elements, such as foundation walls, or any concrete foundations, walls or slabs encountered during excavations, should be removed entirely from below proposed foundations and their zones of influence (as determined by lines extending at least one foot laterally beyond footing edges for each vertical foot of depth) and excavated to at least two feet below proposed construction subgrade levels elsewhere. Foundations and slabs may remain in place below these depths below proposed ground-supported slabs, pavements and landscaped areas, provided they do not interfere with future construction; however, any existing slab to remain should be thoroughly broken to allow vertical drainage of infiltrating water. The resulting excavations should be backfilled to elevations consistent with proposed construction subgrades in accordance with the recommendations of Section 5.3. The demolition contractor should be required to perform all earthwork in accordance with the recommendations in this report, including placement of structural fill following foundation removal of the existing building in accordance with Sections 5.2, 5.3, and 5.11 of this report. Stripped asphaltic concrete and topsoil should not be used as general structural fill materials.

Surface Preparation/Proofrolling: Prior to placing any fill or subbase materials to raise grades to the desired building pad or pavement subgrade elevations, the existing exposed soils should be compacted to a firm and unyielding surface with several passes in two perpendicular directions of a minimum 10 ton, vibratory drum roller. The surface should be proofrolled with a loaded tandem axle truck in the presence of the geotechnical engineer to help identify loose pockets which may require removal and replacement or further investigation. Fill and backfill should be placed and compacted in accordance with Section 5.3.

Weather Performance Criteria: Because the site soils may soften when exposed to water, every effort must be made to maintain drainage of surface water runoff away from construction areas by grading and limiting the exposure of excavations and prepared subgrades to rainfall. Accordingly, excavation and fill placement procedures should be performed during favorable weather conditions. Overexcavation of saturated soils and replacement with controlled structural fill per Section 5.3 of this report may be required prior to resuming work on disturbed subgrade soils.

Subgrade/Stockpile Protection and Inspection: Every effort should be made to minimize disturbance of the on-site soils by construction traffic and surface runoff. The on-site soils will deteriorate when subjected to repeated construction traffic and may require removal and replacement. These materials also will require wetting and recompaction during dry periods or discing, drying and aeration during wet periods. The contractor should be responsible for protection of subgrades and minimizing of exposure of the site soils to precipitation by covering stockpiles and subgrades with plastic and preventing ponding of water by sealing subgrades before precipitation events and grading the site to allow proper drainage. The services of the geotechnical engineer should be retained to inspect soils conditions during construction and verify the suitability of prepared foundation, floor slab and pavement subgrades for support of design loads.

5.3 STRUCTURAL FILL AND BACKFILL

Imported Fill Material: Any imported material placed as structural fill or backfill to raise elevations or restore design grades should consist of clean, relatively well graded sand or gravel with a maximum particle size of three inches and five percent to 15 percent of material finer than a #200 sieve. Silts, clays, and silty or clayey sands and gravels with higher percentage of fines and with a liquid limit less than 40 and a plasticity index less than 20 may be considered subject to the owner's approval, provided that the required moisture content and compaction controls are met during favorable weather conditions. The material should be free of clay lumps, organics, and deleterious material. Imported structural fill material should be approved by a qualified geotechnical engineer prior to delivery to the site.

On-site Material: Based on the conditions exposed by the soil borings, Whitestone preliminarily anticipates that a majority of the existing fill materials (Stratum 1) and the underlying natural soils (Stratum 2) will be reusable as structural fill and/or backfill below proposed foundations and pavements provided that they are free of deleterious materials and moisture contents are controlled within two percent of the optimum moisture content. Reuse of the existing fill will be contingent on careful inspection in the field by the owner's geotechnical engineer by visual observation and/or test pit excavations during construction in accordance with Section 5.11 of this report. The upper silty sand existing fill materials and natural soils are moderately to highly moisture sensitive. The reuse of these materials typically is possible only during ideal weather conditions and may require mixing with a more granular material, moisture conditioning, and/or drying to facilitate their reuse, workability, and compaction in fill areas. These materials will become increasingly difficult to reuse and compact where they are wetted beyond the optimum moisture content and immediate re-use may not always be practical. Materials that become exceedingly wet will likely require discing and

aerating. As such, construction schedules, budget, and sequences should include site area, time, and similar provisions to allow moisture control operations. Alternatively, imported fill materials may be used to attain the desired grades and expedite earthwork operations during wet weather periods.

Demolition Material: Demolition material may be used as fill material provided the material is properly segregated and processed as recommended herein. Concrete masonry materials should be crushed to a well graded blend with a maximum size of three inches in diameter. The asphaltic materials and deleterious building materials such as wood, insulation, metal, shingles, etc. should not be used as general structural fill material. Milled or recycled asphalt pavement (RAP) may be re-used as granular base for pavements provided that the RAP particle size meets New Jersey Department of Transportation (NJDOT) standard specifications for granular base and no more than 50% of the pavement granular base contains RAP.

Compaction and Placement Requirements: All fill and backfill should be placed in maximum nine-inch loose lifts and compacted to 95 percent of the maximum dry density within two percent of the optimum moisture content as determined by ASTM D 1557 (Modified Proctor). Whitestone recommends using a vibratory drum roller to compact the on-site soils or a small hand-held vibratory compactor within excavations.

Structural Fill Testing: A sample of the imported fill material or any on-site material proposed for reuse as structural fill or backfill should be submitted to the geotechnical engineer for analysis and approval at least one week prior to its use. The placement of all fill and backfill should be monitored by a qualified engineering technician to ensure that the specified material and lift thicknesses are properly installed. A sufficient number of in-place density tests should be performed to ensure that the specified compaction is achieved throughout the height of the fill or backfill. Particular attention should be brought to backfilling efforts following removal of any underground structures encountered during demolition of the current site building.

5.4 GROUNDWATER CONTROL

Static groundwater and/or indications of seasonal high groundwater elevations were not encountered during this exploration with the deepest depth and shallowest elevation explored of approximately 20.0 fbs and 12.0 feet above msl, respectively. Therefore, Whitestone anticipates that static groundwater will be deeper than proposed foundation and utility excavations and does not anticipate the need for extensive dewatering or permanent groundwater control. However, trapped water may be encountered within the existing fill materials or at the existing fill materials/natural soil interface during proposed excavations following wet weather periods. As such, construction phase dewatering of surface runoff, trapped, or perched water should be anticipated for this site that may be controlled through the use of gravity fed sump pumps. Every effort must be made to maintain drainage of surface water runoff away from construction areas by grading and limiting the exposure of excavations to precipitation.

5.5 FOUNDATIONS

Shallow Foundation Design Criteria: Contingent upon supplemental evaluation of the existing fill materials as described herein, Whitestone recommends supporting the proposed structures on conventional spread and continuous wall footings designed to bear within improved and approved portions of existing fill materials, the underlying natural soils, and/or controlled structural fill provided these materials are properly evaluated, placed and compacted in accordance with Sections 5.2, 5.3, and 5.11 of this report. Foundations bearing within these materials may be designed to impart a maximum allowable net bearing pressure of 3,000 psf. Based on the conditions encountered within the soil borings performed as part of this investigation, Whitestone anticipates encountering existing fill materials below proposed foundation influence zones requiring improvement and supplemental evaluation within the northern portion of the proposed canopy area.

Due to variability within existing fill materials, evidenced by the debris encountered, localized areas of existing fill materials or soft soils may require overexcavation and replacement in controlled lifts. Reuse of the existing fill materials for foundation support will be contingent upon supplemental evaluation, as described in Section 5.11. All footing bottoms should be improved by in-trench compaction in the presence of the geotechnical engineer. Regardless of loading conditions, proposed foundations should be sized no less than minimum dimensions of 24 inches for continuous wall footings and 36 inches for isolated column footings.

Canopy and sign footings should be designed so that the maximum toe pressure due to the combined effect of vertical loads and overturning moment does not exceed the recommended maximum allowable net bearing pressure. In addition, positive contact pressure should be maintained throughout the base of the footings such that no uplift or tension exists between the base of the footings and the supporting soil. Uplift loads should be resisted by the weight of the concrete. Side friction should be neglected when proportioning the footings so that lateral resistance should be provided by friction resistance at the base of the footings. A coefficient of friction against sliding of 0.40 is recommended for use in the design of the foundations bearing within the existing site soils or imported structural fill soils.

Inspection/Overexcavation Criteria: Whitestone recommends that the suitability of the bearing soils along the footing bottoms be verified by a geotechnical engineer prior to placing concrete for the footings. In the event that isolated areas of unsuitable materials are encountered in footing excavations, overexcavation and replacement of the materials or deeper foundation embedment may be necessary to provide a suitable footing subgrade. Any overexcavation to be restored with structural fill will need to extend at least one foot laterally beyond footing edges for each vertical foot of overexcavation. Lateral overexcavation may be eliminated if grade is restored with lean concrete. The bottoms of overexcavated areas should be compacted with static smooth drum rollers, walk-behind compactors, vibrating plates or plate tampers ("jumping jacks") to compact locally disturbed materials and densify any underlying loose zones.

Settlement: Whitestone estimates post construction settlements of proposed building foundations on the order of less than one inch if the recommendations outlined in this report are properly implemented. Differential settlements of building foundations should be less than one-half inch.

Frost Coverage: Footings subject to frost action should be placed at least 36 inches below adjacent exterior grades or the depth required by local building codes to provide protection from frost penetration. Interior footings not subject to frost action may be placed at a minimum depth of 18 inches below the slab subgrade.

5.6 FLOOR SLAB

Whitestone understands that the proposed building is a pre-fabricated, modular type building with a structurally reinforced floor slab which will be supported by the building foundations; as such, the subgrade soils are not expected to provide direct support for the slab. Therefore, subgrade improvement beneath the floor slab is not recommended.

5.7 PAVEMENT DESIGN CRITERIA

General: Following surficial compaction and proofrolling to densify upper loose zones and supplemental evaluation of existing fill materials as described in this report, Whitestone anticipates that approved and improved existing fill materials, the underlying natural coastal plain deposited soils, and/or compacted structural fill and/or backfill placed to raise or restore design elevations are expected to be suitable for support of the proposed pavements provided these materials are properly evaluated, compacted, and proofrolled in accordance with Sections 5.2, 5.3, and 5.11 of this report during favorable weather conditions. Localized overexcavation of unsuitable fill materials may be anticipated due to moderately to highly moisture sensitive, relatively loose existing fill materials containing debris that were encountered within proposed pavement areas. If the unimproved existing fill materials remain below proposed subgrades, increased maintenance, possibly including crack sealing, patching or more frequent re-paving, may be necessary. If the risk of increased maintenance is not acceptable, more extensive subgrade preparation recommendations can be developed. The following pavement section recommendations are based on the assumption that such an increased risk is acceptable. Whitestone would be pleased to prepare alternative recommendations for more substantial subgrade improvements.

Design Criteria: A California Bearing Ratio (CBR) value of five has been assigned to the properly prepared subgrade soils for pavement design purposes. This value was correlated with pertinent soil support values and assumed traffic loads to prepare flexible and rigid pavement designs per the AASHTO *Guide for the Design of Pavement Structures*.

Design traffic loads were assumed based on typical volumes for similar facilities and correlated with 18-kip equivalent single axle loads (ESAL) for a 20 year life. An estimated maximum load of 25,000 ESAL was used for all pavement areas assuming the pavement primarily will accommodate both automobile and limited heavier truck traffic. Actual pavement loads should be less than this value.

Pavement Sections: The recommended flexible pavement section is presented below in tabular format:

FLEXIBLE PAVEMENT SECTION DESIGN		
Layer	Material	Standard Pavement Thickness (Inches)
Asphalt Surface	NJDOT I-5 Surface	1.5
Asphalt Base	NJDOT I-2 Base	2.5
Granular Subbase	NJDOT DGA Subbase	6.0

A rigid concrete pavement should be used to provide suitable support at areas of high traffic or severe turns (such as at fueling island areas). The recommended rigid pavement section is presented below in tabular format:

RIGID PAVEMENT SECTION		
Layer	Material	Thickness (Inches)
Surface	4000 psi air-entrained concrete	6.0
Subbase	NJDOT DGA Subbase	6.0

Additional Design Considerations: The pavement section thickness designs presented in this report are based on the design parameters detailed herein and are contingent on proper construction, inspection, and maintenance. The designs are contingent on achieving the minimum soil support value in the field. To accomplish this requirement, all subgrade soil and supporting fill or backfill must be placed, compacted, and evaluated in accordance with Sections 5.2, 5.3, and 5.11 of this report. Proper drainage must be provided for the pavement structure including appropriate grading and surface water control.

The performance of the pavement also will depend on the quality of materials and workmanship. Whitestone recommends that NJDOT standards for materials, workmanship, and maintenance be applied to this site. Project specifications should include verifying that the installed asphaltic concrete material composition is within tolerance for the specified materials and that the percentage of air voids of the installed pavement is within specified ranges for the respective materials. All rigid concrete pavements should be suitably air-entrained, jointed, and reinforced.

5.8 RETAINING WALLS/LATERAL EARTH PRESSURES

Whitestone understands that the proposed building foundations are designed assuming that lateral forces will be partially resisted by passive earth pressure against the side of the foundation (as defined by the area projected onto a vertical plane). An assumed passive earth pressure of 250 psf per foot of depth will be used in design. Lateral forces also may be resisted by frictional forces developed at the bottom of the footing using the coefficient of friction described in Section 5.5.

5.9 SEISMIC AND LIQUEFACTION CONSIDERATIONS

Based subsurface profile encountered at the subject site, a site class D is assigned as defined by the *International Building Code 2009 - New Jersey Edition*. Based on the seismic zone and soil profile, liquefaction considerations are considered unlikely and not expected to have a substantial impact on design.

5.10 EXCAVATIONS

The existing site soils, fill materials and natural soils, encountered during this investigation typically are consistent with Type C Soil Conditions as defined by 29 CFR Part 1926 (OSHA) which require a maximum unbraced excavation angle of 1.5:1 (horizontal:vertical). Actual conditions encountered during construction should be evaluated by a competent person (as defined by OSHA) to ensure that safe excavation methods and/or shoring and bracing requirements are implemented.

5.11 SUPPLEMENTAL POST INVESTIGATION SERVICES

Supplemental Evaluation of Existing Fill Materials and Inaccessible Areas: The conditions disclosed by the soil borings preliminarily indicate that the existing fill materials will be suitable for foundation, floor slab and pavement support with some anticipated overexcavation, due to possible variability within existing fill materials evidenced by the debris encountered, and with increased risk of future maintenance within proposed pavement areas where unimproved existing fill remains. Whitestone also anticipates that the majority of the existing fill materials will be suitable for reuse as structural fill with segregation of any objectionable debris encountered and proper moisture control. However, there is a potential risk of variability in existing fill, which may not be disclosed by soils borings performed throughout the site due to the limited sample size exposed by conventional drilling and sampling methods. Whitestone recommends confirming further the condition of the existing fill for foundation, floor slab and pavement support and/or re-use as structural fill by means of supplemental evaluation either prior to or during the early stages of construction to identify areas requiring removal and possible uncontrolled conditions or deleterious materials not disclosed by the soil borings conducted during this exploration. Whitestone recommends confirming further the condition of the existing fill by means of supplemental test pit excavations either prior to or in the early stages of construction to enable an assessment for the depths, areal extent, presence of voids,

uncontrolled conditions, or additional deleterious materials. If unsuitable conditions are encountered, alternative recommendations, such as overexcavation and replacement, or deeper foundation embedment may be required. The central portion of the proposed canopy footprint and north central portion of proposed pavement area were not accessible at the time of Whitestone's field investigation due to the presence of existing structures. As such, soil conditions in presently inaccessible areas below the existing structures also should be evaluated during the early stages of construction following demolition to verify that the underlying soil conditions are consistent with those encountered during this subsurface exploration.

Construction Inspection and Monitoring: The owner's geotechnical engineer should perform inspection, testing, and consultation during construction as described in previous sections of this report. Monitoring and testing should also be performed to verify that the building is properly demolished and backfilled properly, any existing surface cover materials encountered at the site are properly removed, suitable materials are used for controlled fill, and that they are properly placed and compacted over suitable subgrade soils. The services of the geotechnical engineer should be retained to inspect soil conditions during construction and verify the suitability of prepared foundation, floor slab, and pavement subgrades for support of design loads. The owner's geotechnical engineer should be present to witness the proofrolling of all subgrades prior to foundation, floor slab and pavement support and verify any necessary overexcavation and adequacy of structural backfill placement.

5.12 UST TIE-DOWNS AND EMBEDMENT

No new UST construction is proposed. Whitestone should be notified if new USTs are proposed.

SECTION 6.0

General Comments

Supplemental recommendations may be required upon finalization of construction plans or if significant changes are made in the characteristics or location of the proposed structure. Soil bearing conditions should be checked at the appropriate time for consistency with those conditions encountered during Whitestone's geotechnical investigation.

The recommendations presented herein should be utilized by a qualified engineer in preparing the project plans and specifications. The engineer should consider these recommendations as minimum physical standards which may be superseded by local and regional building codes and structural considerations. These recommendations are prepared for the sole use of Bohler Engineering NJ, LLC for the specific project detailed and should not be used by any third party. These recommendations are relevant to the design phase and should not be substituted for construction specifications.

The possibility exists that conditions between borings may differ from those at specific boring locations, and conditions may not be as anticipated by the designers or contractors. In addition, the construction process may alter soil and rock conditions. Therefore, experienced geotechnical personnel should observe and document the construction procedures used and the conditions encountered.

Whitestone assumes that a qualified contractor will be employed to perform the construction work, and that the contractor will be required to exercise care to ensure all excavations are performed in accordance with applicable regulations and good practice. Particular attention should be paid to avoiding damaging or undermining adjacent properties and maintaining slope stability.

Whitestone recommends that the services of the geotechnical engineer be engaged to test and evaluate the soils in the footing excavations prior to concreting in order to determine that the soils will support the bearing capacities. Monitoring and testing also should be performed to verify that suitable materials are used for controlled fills and that they are properly placed and compacted over suitable subgrade soils.

The exploration and analysis of the foundation conditions reported herein are considered sufficient in detail and scope to form a reasonable basis for the foundation design. The recommendations submitted for the proposed construction are based on the available soil information and the design details furnished by Bohler Engineering NJ, LLC. Deviations from the noted subsurface conditions encountered during construction should be brought to the attention of the geotechnical engineer.

The geotechnical engineer warrants that the findings, recommendations, specifications, or professional advice contained herein have been promulgated after being prepared in accordance with generally accepted professional engineering practice in the fields of foundation engineering, soil mechanics, and engineering geology. No other warranties are implied or expressed.

FIGURE 1
Boring Location Plan