



STATE OF DELAWARE  
DEPARTMENT OF TRANSPORTATION  
PO BOX 778  
DOVER, DELAWARE 19903

JACK MARKELL  
GOVERNOR

JENNIFER COHAN  
SECRETARY

**VIA WEBSITE POSTING**

(302) 760-2030  
FAX (302) 739-2254

August 5, 2016

Contract No. T201680102.01  
Magnolia Truck Wash  
Kent County

Ladies and Gentlemen:

Enclosed is Addendum No. 6 for the referenced contract consisting of the following:

1. The Bid Proposal Cover, revised, to be substituted for the same page in the Proposal.
2. Five (5) pages, Plan Sheets 20, 22, 30, 31 and 37 revised, to be substituted for the same pages in the Proposal.
3. Four (4) pages, Section 071416 - Cold Fluid Applied Waterproofing, has been added to Appendix-A Technical Specifications.
4. Five (5) pages, Appendix-A Technical Specification, Section 099600-High Performance Coatings, pages 1, 4, 5, 6 and 7, revised, to be substituted for the same pages in the Proposal.
5. One (1) page, Appendix-A Technical Specification, Section 221116-Domestic Water Piping, page 4, revised, to be substituted for the same page in the Proposal.
6. Seven (7) pages, Appendix-A Technical Specification, Section 221316-Sanitary Waste and Vent Piping, pages 3, 4, 5, 6, 7, 8 and 9, revised, to be substituted for the same pages in the Proposal.

Please note the revisions listed above and submit your bid based upon this information.

Sincerely,

*~signature on file~*

Robert A. Kovacs

Competitively Bid Contracts Coordinator

STATE OF DELAWARE



DEPARTMENT OF TRANSPORTATION

BID PROPOSAL

for

CONTRACT T201680102.01

MAGNOLIA TRUCK WASH

KENT COUNTY

ADVERTISEMENT DATE: June 13, 2016

**PROSPECTIVE BIDDERS ARE ADVISED THAT THERE WILL BE A PRE-BID MEETING WEDNESDAY  
JUNE 29, 2016 AT 10:00 A.M. IN THE DelDOT ADMINISTRATION BUILDING,  
800 BAY ROAD, DOVER, DELAWARE, 19903.**

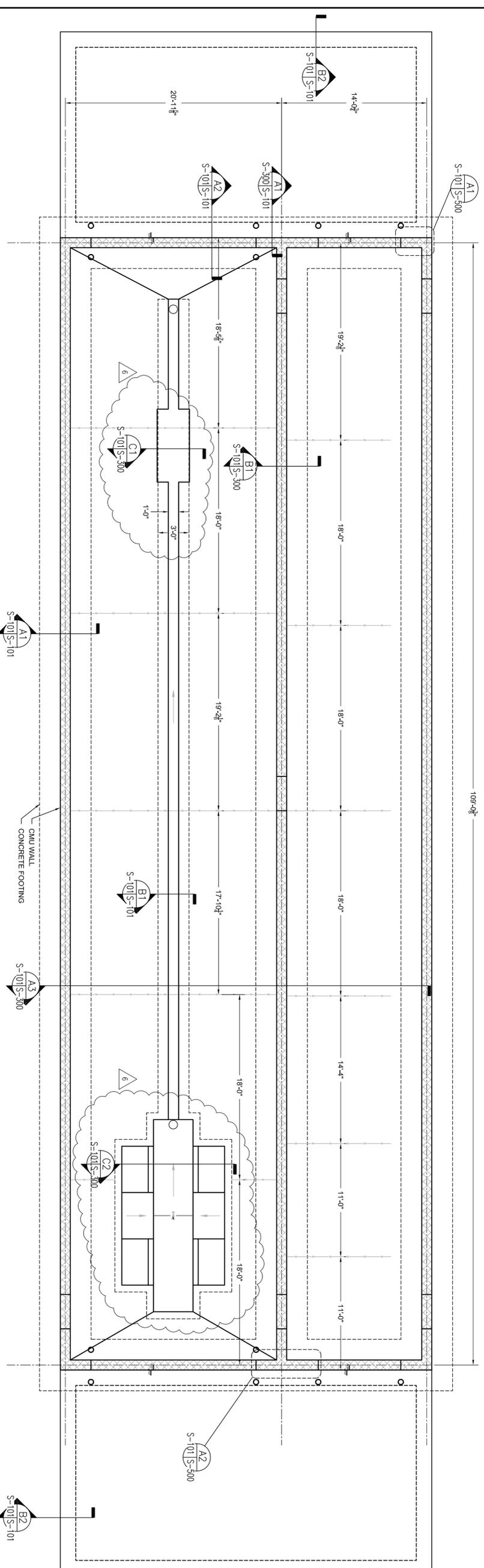
COMPLETION TIME: ~~±50~~ 210 Calendar Days

SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION  
DELAWARE DEPARTMENT OF TRANSPORTATION  
AUGUST 2001

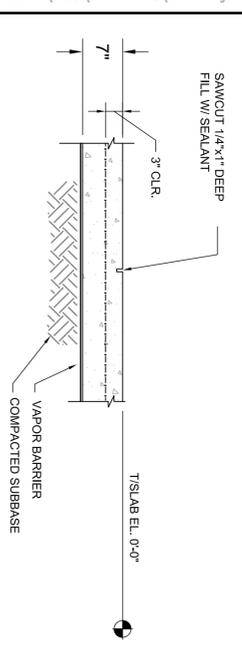
Bids will be received in the Bidder's Room at the Delaware Department of Transportation's Administration Building, 800 Bay Road, Dover, Delaware until 2:00 P.M. local time ~~July 19, 2016, July 26, 2016, August 2, 2016, August 9, 2016,~~ **August 16, 2016**

**DRAWING NOTES:**

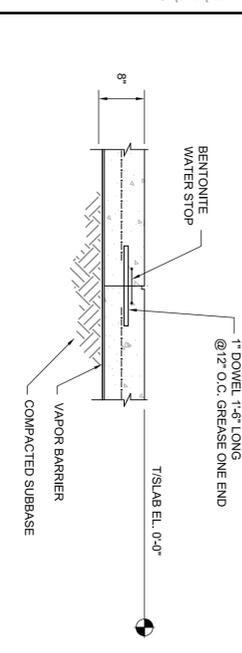
- COORDINATE WITH ARCH, MEP/AND EQUIPMENT MANUFACTURER FOR SLAB PENETRATION LOCATIONS.
- FLOOR SURFACE SHALL BE COATED WITH ECONOSURF ES-2666 BROADCAST RESURFACER COMPOSITE SYSTEM OR APPROVED EQUAL.
- EPOXY COATED REINFORCING BARS SHALL CONFORM TO ASTM A773.
- EPOXY COATED WELDED WIRE REINFORCEMENT SHALL CONFORM TO ASTM 884.
- DECKING IS TO BE GALVANIZED PER ASTM A653 G60. TOUCH UP GALVANIZED SURFACES WITH GALVANIZING REPAIR PAINT APPLIED IN ACCORDANCE WITH MANUFACTURERS INSTRUCTION.
- THE ROOF INTERIOR SHALL ALSO RECEIVE A PROTECTIVE COATING OF TNEMEG SERIES 115 UNBOND OF OR EQUAL, AFTER INSTALLATION.



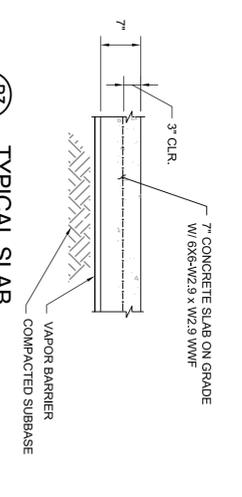
**S-101-S-101 FOUNDATION PLAN**  
SCALE: 3/16" = 1'-0"  
12" 0 2 4 8



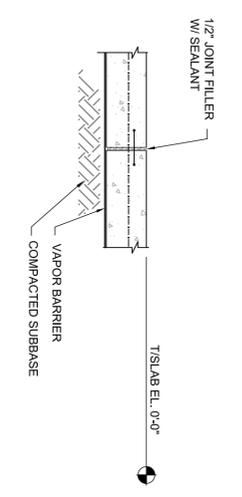
**S-101-S-101 CONTROL JOINT DETAIL**  
SCALE: 3/4" = 1'-0"  
12" 0 2 4 8



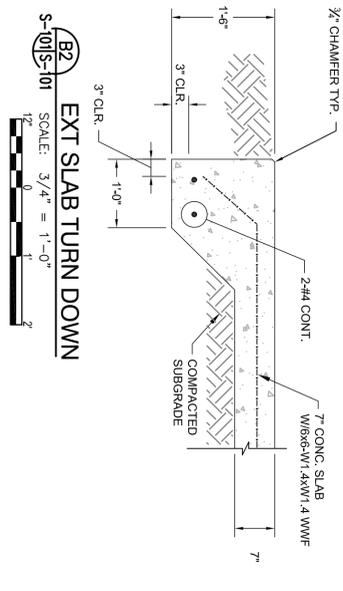
**S-101-S-101 CONSTRUCTION JOINT**  
SCALE: 3/4" = 1'-0"  
12" 0 2 4 8



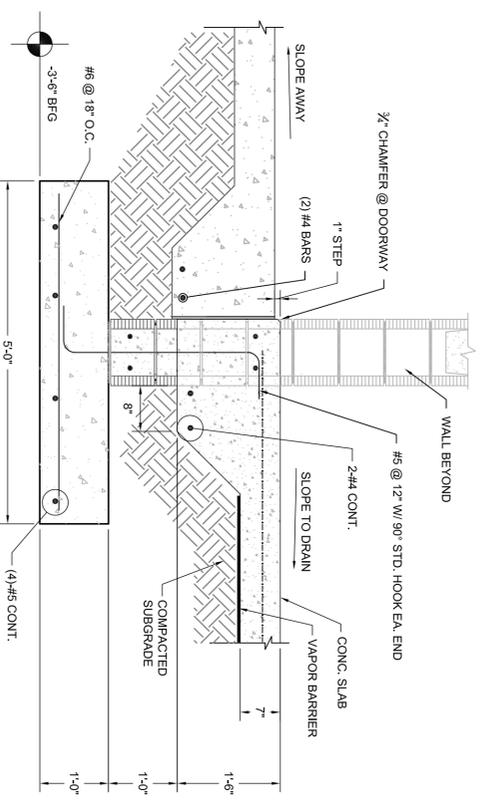
**S-101-S-101 TYPICAL SLAB**  
SCALE: 3/4" = 1'-0"  
12" 0 2 4 8



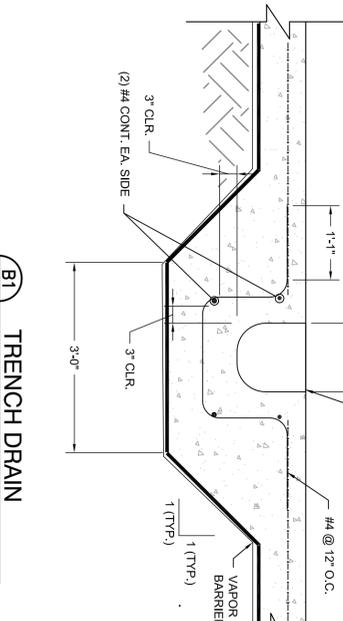
**S-101-S-101 EXPANSION JOINT**  
SCALE: 3/4" = 1'-0"  
12" 0 2 4 8



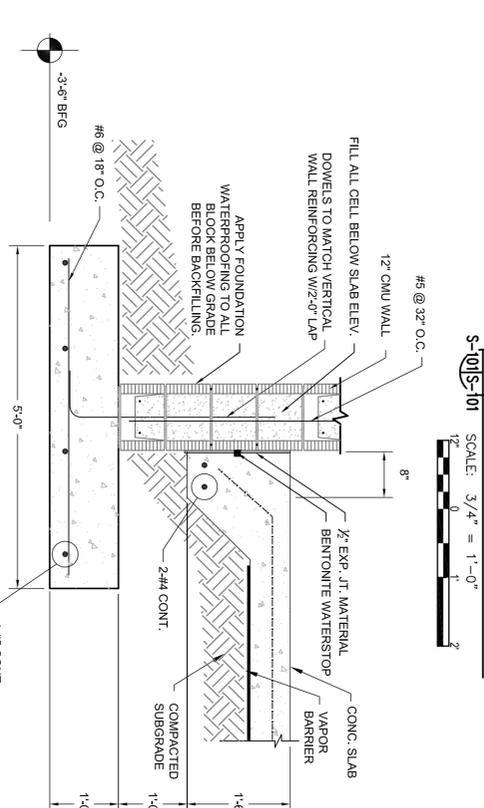
**S-101-S-101 EXT SLAB TURN DOWN**  
SCALE: 3/4" = 1'-0"  
12" 0 2 4 8



**S-101-S-101 DOORWAY DETAIL**  
SCALE: 3/4" = 1'-0"  
12" 0 2 4 8



**S-101-S-101 TRENCH DRAIN**  
SCALE: 3/4" = 1'-0"  
12" 0 2 4 8



**S-101-S-101 FOOTING SECTION**  
SCALE: 3/4" = 1'-0"  
12" 0 2 4 8

REVISION #1	8/4/16	ADDENDUM 6
ADDENDUMS / REVISIONS		

CONTRACT	T201690102
COUNTY	KENT

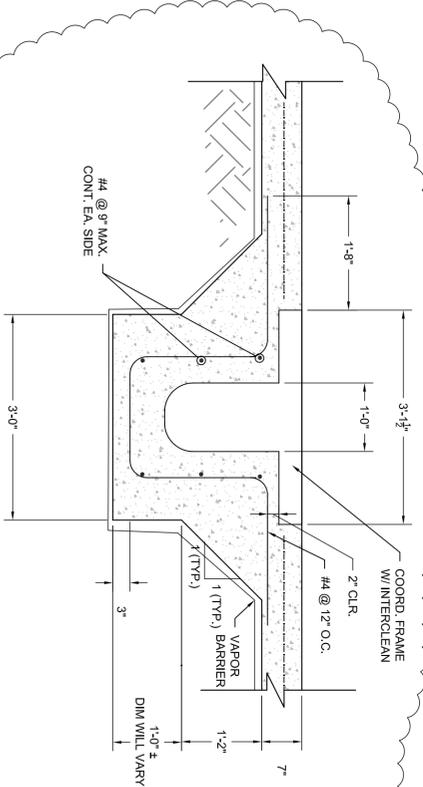
BRIDGE NO.	N/A
DESIGNED BY:	AA
CHECKED BY:	DDO

STRUCTURAL FLOOR PLAN	SHEET NO.	20
	TOTAL SHEETS	39

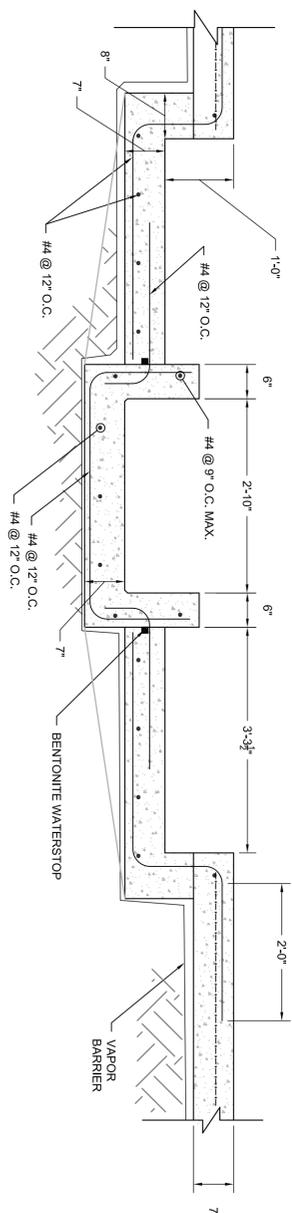


DEPARTMENT OF TRANSPORTATION

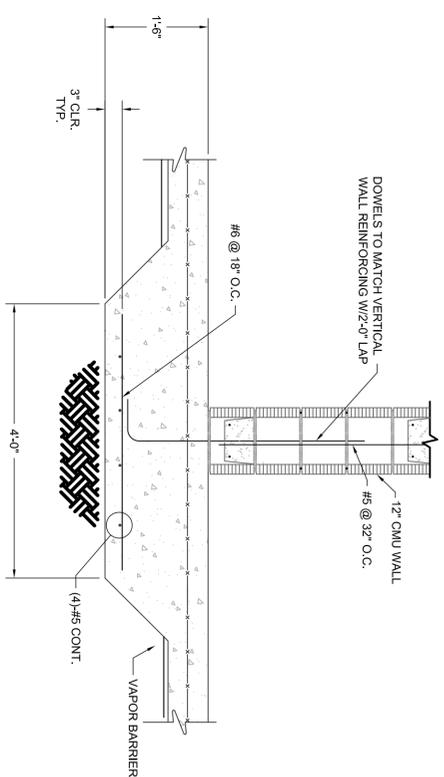
DELaware



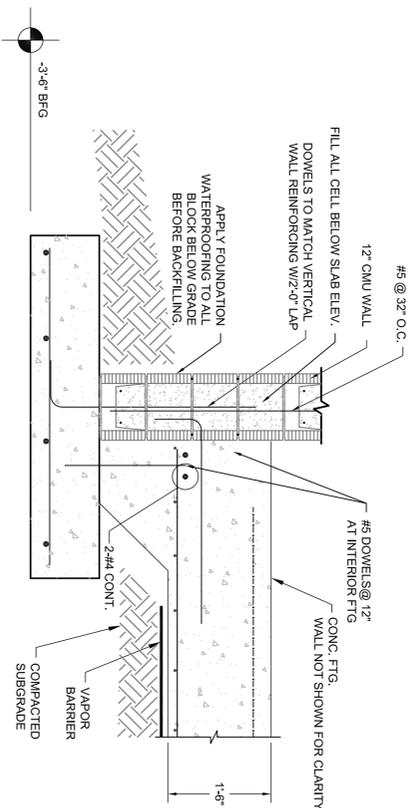
**C1** TRENCH DRAIN SECTION  
SCALE: 3/4" = 1'-0"



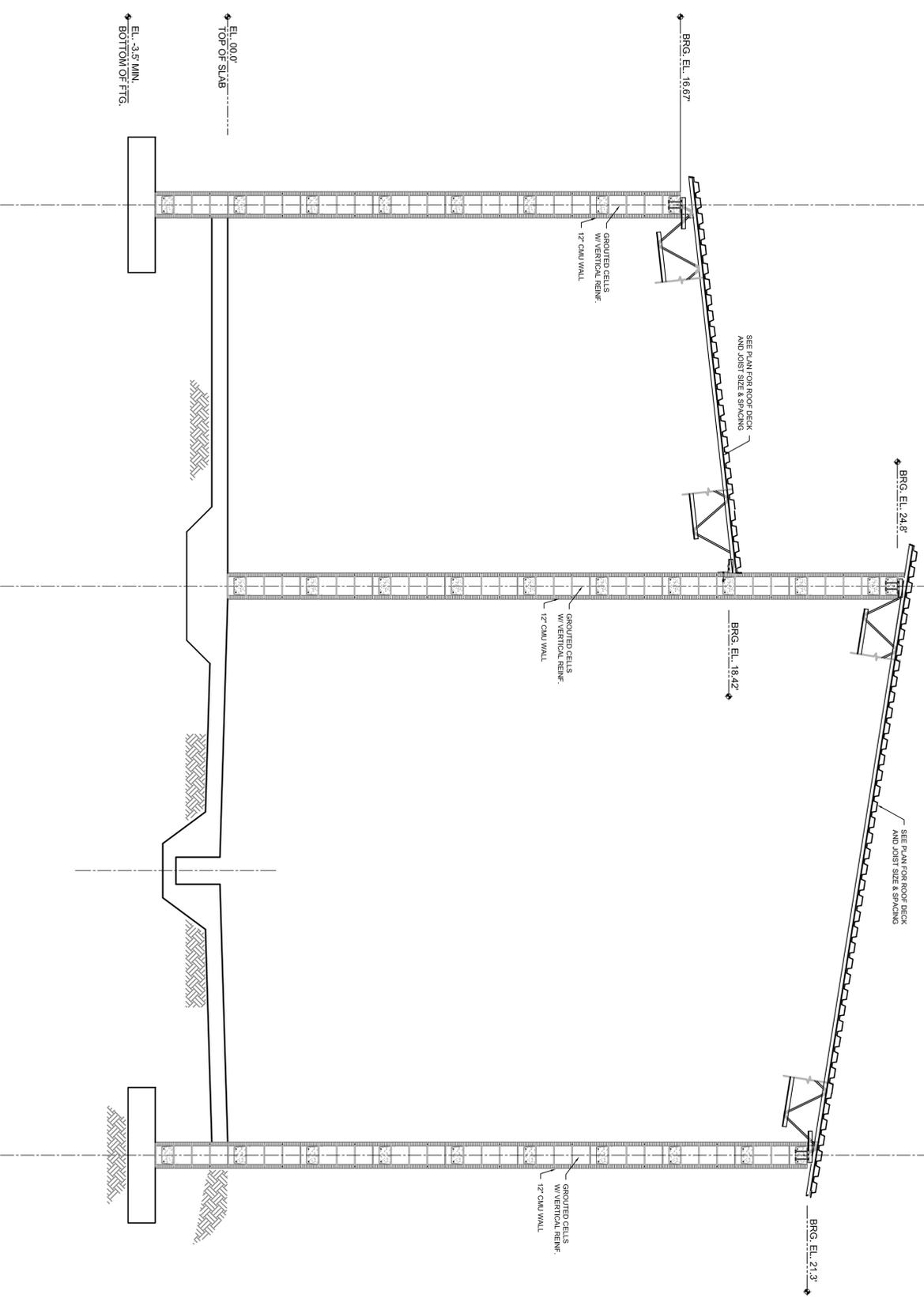
**C2** FOOTING SECTION  
SCALE: 3/4" = 1'-0"



**B1** FOOTING SECTION  
SCALE: 3/4" = 1'-0"



**A1** FOOTING SECTION  
SCALE: 3/4" = 1'-0"



**A3** BUILDING SECTION  
SCALE: 3/8" = 1'-0"

- DRAWING NOTES:**
1. ALL STEEL ELEMENTS SHALL BE GALVANIZED AND RECEIVE A SPRAY APPLIED PROTECTIVE COATING.
  2. SEE SHEET S-500 FOR LINTEL SCHEDULE.
  3. EPOXY COATED REINFORCING BARS SHALL CONFORM TO ASTM A775.
  4. EPOXY COATED WELDED WIRE REINFORCEMENT SHALL CONFORM TO ASTM 884.
  5. DECKING IS TO BE GALVANIZED PER ASTM A653, G80. TOUCH UP GALVANIZED SURFACES WITH GALVANIZING REPAIR PAINT APPLIED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTION.
  6. THE ROOF INTERIOR SHALL ALSO RECEIVE A PROTECTIVE COATING OF THEMEC SERIES 115 UNBOND DF OR EQUAL, AFTER INSTALLATION.
  7. COORDINATE WITH ARCH, MEP/ AND EQUIPMENT MANUFACTURER FOR SLAB PENETRATION LOCATIONS.

ADDENDUMS / REVISIONS	
REVISION #1	8/4/16
ADDENDUM 6	

MAGNOLIA TRUCK WASH

CONTRACT	
T201690102	
COUNTY	
KENT	

BRIDGE NO.	N/A
DESIGNED BY:	AA
CHECKED BY:	DDO

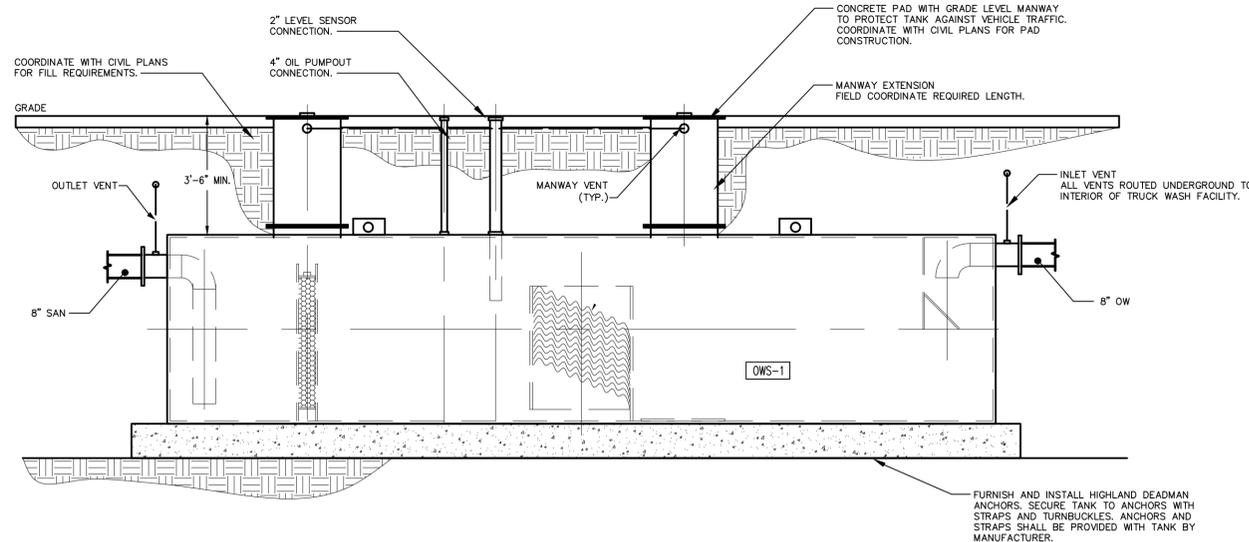
**GENERAL SHEET NOTES:**

1. INFORMATION SHOWN ON THIS DRAWING PERTAINING TO EXISTING CONDITIONS HAS BEEN OBTAINED FROM AVAILABLE BUILDING DRAWINGS OR GENERAL FIELD OBSERVATIONS AND MAY NOT INDICATE ACTUAL EXISTING CONDITIONS IN DETAIL OR DIMENSION. THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE ACTUAL EXISTING CONDITIONS PRIOR TO FABRICATION OR PERFORMANCE OF ANY WORK. SHOULD CONDITIONS BE DISCOVERED THAT PREVENT EXECUTION OF THE WORK AS INDICATED, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ARCHITECT IN WRITING AND AWAIT DIRECTION BEFORE PROCEEDING WITH THE WORK.
2. UNLESS OTHERWISE NOTED, MECHANICAL/PLUMBING ITEMS SHOWN HEAVY SOLID (——) SHALL BE NEW WORK AND MECHANICAL/PLUMBING ITEMS SHOWN LIGHT SOLID (---) SHALL BE EXISTING.
3. DO NOT LOCATE DUCTWORK OR PIPING ABOVE ELECTRICAL PANELS OR EQUIPMENT.
4. NATURAL GAS PIPING IN THE WASH BAY SHALL BE STAINLESS STEEL.
5. DOMESTIC WATER PIPING IN THE WASH BAY TO BE PVC COATED COPPER OR STAINLESS STEEL.
6. ALL HOSE BIBS SHALL BE RATED FOR OUTDOOR USE.
7. WASH SYSTEM MANUFACTURER WILL BE RESPONSIBLE FOR SYSTEM CALIBRATION, PROGRAMMING, AND OPERATIONAL TRAINING OF DELDOT EMPLOYEES. GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING WITH THE WASH SYSTEM MANUFACTURER.
8. REFER TO MP-001 FOR GENERAL NOTES, ABBREVIATIONS, SYMBOLS, AND LEGEND.
9. ALL PIPING WITHIN WASH BAY TO BE STAINLESS STEEL, UNLESS OTHERWISE NOTED. REFER TO SPECIFICATIONS FOR MORE INFORMATION.

**SHEET KEYNOTES:**

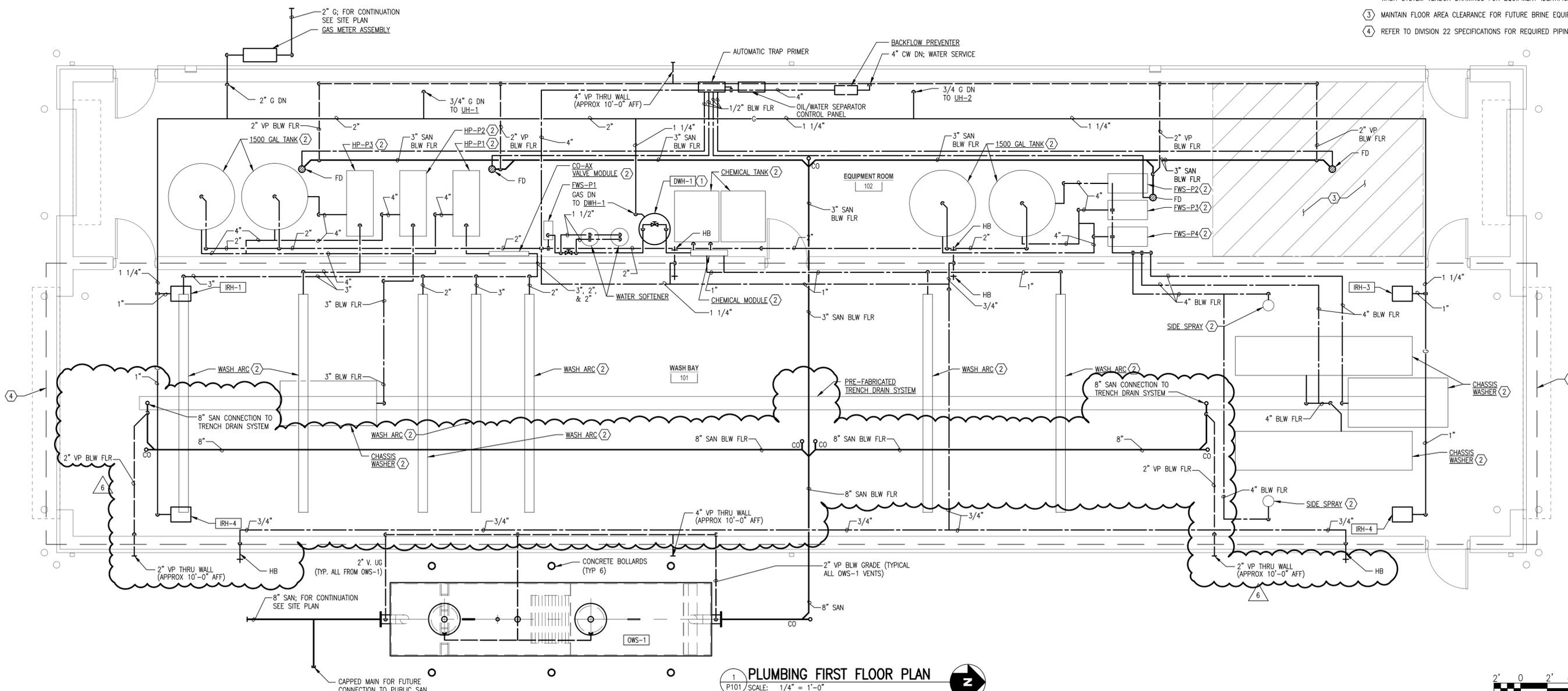
- ① DOMESTIC WATER HEATER TO BE FURNISHED BY WASH SYSTEM MANUFACTURER, AND INSTALLED BY PLUMBING CONTRACTOR. REFER TO MECHANICAL DRAWINGS FOR COMBUSTION AIR AND FLUE CONNECTIONS.
- ② PLUMBING CONTRACTOR SHALL BE RESPONSIBLE FOR ALL INTERCONNECTING PIPING BETWEEN WASH EQUIPMENT, ASSOCIATED VALVES, GAUGES, AND PIPING ACCESSORIES. COORDINATE WITH WASH SYSTEM VENDOR DRAWINGS FOR EQUIPMENT IDENTIFICATION.
- ③ MAINTAIN FLOOR AREA CLEARANCE FOR FUTURE BRINE EQUIPMENT.
- ④ REFER TO DIVISION 22 SPECIFICATIONS FOR REQUIRED PIPING MATERIALS IN WASH BAY.

PLUMBING EQUIPMENT SCHEDULE		
DESIG.	DESCRIPTION	BASIS
DOMESTIC WATER HEATER DWH-1	GAS-FIRED WATER HEATER, 150 GALLON NOMINAL STORAGE, UNLINED, DUPLEX ALLOY, 200 GPH RECOVERY AT 100°F TEMP RISE, INPUT: 199 MBH, MOTOR: 1/6 HP, 120V-1Ø.  NOTE: DWH-1 SHALL BE FURNISHED BY WASH SYSTEM VENDOR AND INSTALLED BY PLUMBING CONTRACTOR.	LOCHINVAR SHIELD
OIL-WATER SEPARATOR OWS-1	OIL-WATER SEPARATOR, FLOWRATE: 400 GPM, GREASE COLLECTOR CAPACITY: 800 GALLONS OVERALL TANK CAPACITY: 4,000 GALLONS	HIGHLAND TANK SERIES G



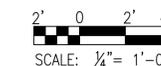
**2 OIL WATER SEPARATOR DETAIL**

P101 SCALE: NTS



**1 PLUMBING FIRST FLOOR PLAN**

P101 SCALE: 1/4" = 1'-0"



**P-101**

ADDENDUMS / REVISIONS		
REVISION #1	8/4/16	ADDENDUM 6

MAGNOLIA TRUCK WASH

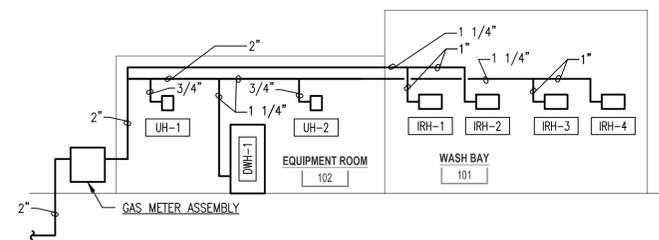
CONTRACT	BRIDGE NO.	N/A
T201680102	DESIGNED BY:	SSP
COUNTY	CHECKED BY:	WWR
KENT		

PLUMBING FIRST FLOOR PLAN

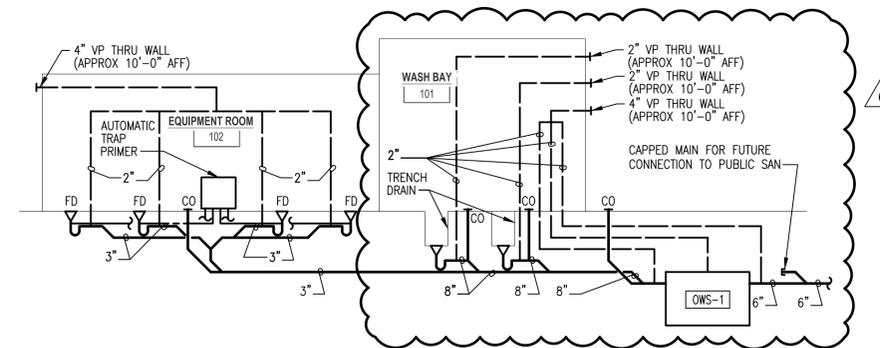
SHEET NO.	30
TOTAL SHTS.	39

**GENERAL SHEET NOTES:**

1. INFORMATION SHOWN ON THIS DRAWING PERTAINING TO EXISTING CONDITIONS HAS BEEN OBTAINED FROM AVAILABLE BUILDING DRAWINGS OR GENERAL FIELD OBSERVATIONS AND MAY NOT INDICATE ACTUAL EXISTING CONDITIONS IN DETAIL OR DIMENSION. THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE ACTUAL EXISTING CONDITIONS PRIOR TO FABRICATION OR PERFORMANCE OF ANY WORK. SHOULD CONDITIONS BE DISCOVERED THAT PREVENT EXECUTION OF THE WORK AS INDICATED, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ARCHITECT IN WRITING AND AWAIT DIRECTION BEFORE PROCEEDING WITH THE WORK.
2. UNLESS OTHERWISE NOTED, MECHANICAL/PLUMBING ITEMS SHOWN HEAVY SOLID (————) SHALL BE NEW WORK AND MECHANICAL/PLUMBING ITEMS SHOWN LIGHT SOLID (— — — —) SHALL BE EXISTING.
3. DO NOT LOCATE DUCTWORK OR PIPING ABOVE ELECTRICAL PANELS OR EQUIPMENT.
4. NATURAL GAS PIPING IN THE WASH BAY SHALL BE STAINLESS STEEL.
5. DOMESTIC WATER PIPING IN THE WASH BAY TO BE PVC COATED COPPER OR STAINLESS STEEL.
6. ALL HOSE BIBS TO BE RATED FOR OUTDOOR USE.
7. WASH SYSTEM MANUFACTURER WILL BE RESPONSIBLE FOR SYSTEM CALIBRATION, PROGRAMMING, AND OPERATIONAL TRAINING OF DELDOT EMPLOYEES.
8. REFER TO MP-001 FOR GENERAL NOTES, ABBREVIATIONS, SYMBOLS, AND LEGEND



**1 GAS RISER DIAGRAM**  
P201 SCALE: NONE



**2 SANITARY RISER DIAGRAM**  
P201 SCALE: NONE

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**DELAWARE**  
DEPARTMENT OF TRANSPORTATION

ADDENDUMS / REVISIONS		
REVISION #1	8/4/16	ADDENDUM 6

MAGNOLIA TRUCK WASH

CONTRACT	BRIDGE NO.	N/A
T201680102	DESIGNED BY:	SSP
COUNTY	CHECKED BY:	WWR
KENT		

PLUMBING FIRST FLOOR PLAN

SHEET NO.	31
TOTAL SHTS.	39

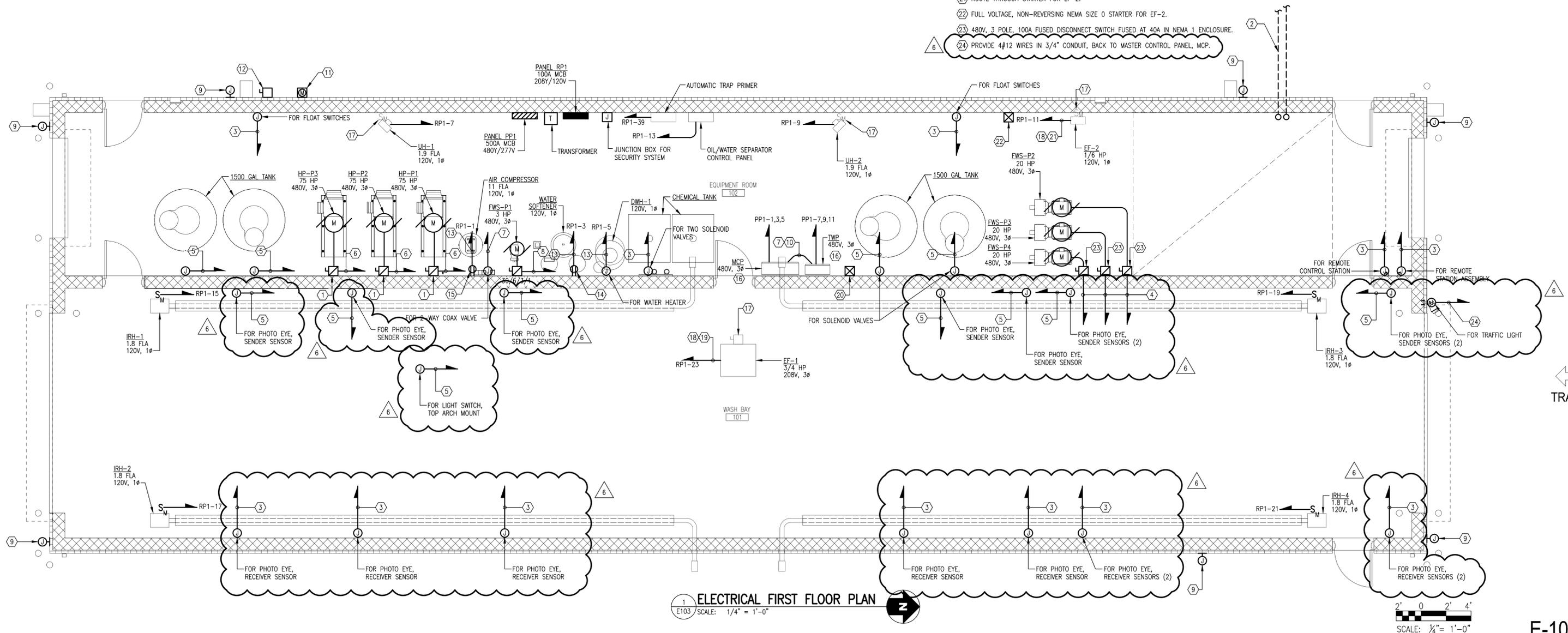
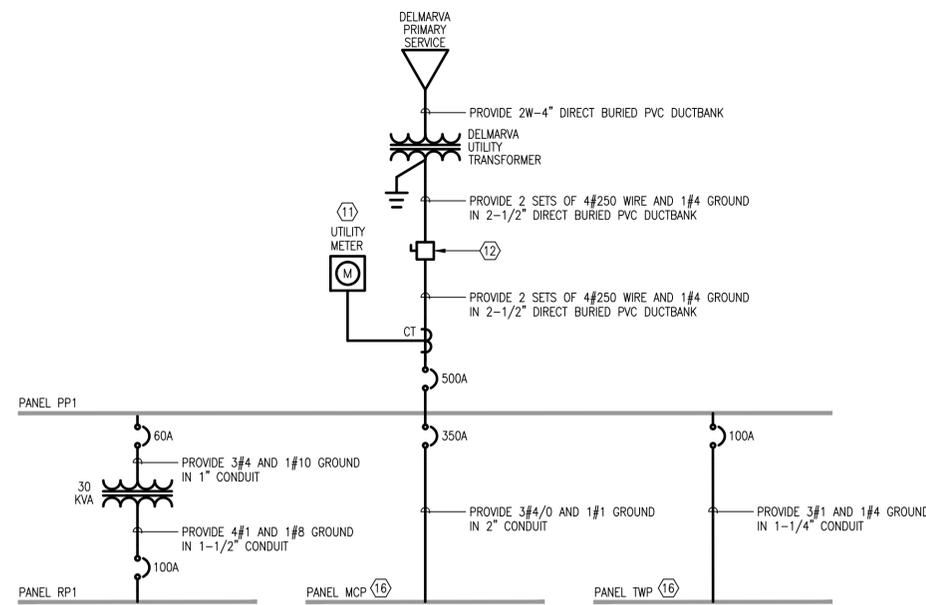
P-201

**SHEET KEYNOTES:**

- ① 480V, 3 POLE, 200A FUSED DISCONNECT SWITCH FUSED AT 150A IN NEMA 1 ENCLOSURE.
- ② PROVIDE 2-4" CONDUIT STUBBED UP THROUGH FLOOR AND CAPPED 5' FROM BUILDING FOR FUTURE BRINE SYSTEM. MAINTAIN PROPER CLEARANCE FROM PIPING TRENCH DETAIL ON P-101.
- ③ PROVIDE 3#16, 24VDC, IN 3/4" CONDUIT, BACK TO MASTER CONTROL PANEL, MCP.
- ④ PROVIDE 3#8 AND 1#10 GROUND IN 1" CONDUIT BACK TO TIRE WASH PANEL, TWP.
- ⑤ PROVIDE 2#16, 24VDC, IN 3/4" CONDUIT, BACK TO MASTER CONTROL PANEL, MCP.
- ⑥ PROVIDE 3#1/0 AND 1#6 GROUND IN 1-1/2" CONDUIT BACK TO MASTER CONTROL PANEL.
- ⑦ PROVIDE 4#16, 24VDC, IN 3/4" CONDUIT, BACK TO MASTER CONTROL PANEL, MCP.
- ⑧ PROVIDE 3#12 AND 1#12 GROUND IN 3/4" CONDUIT BACK TO MASTER CONTROL PANEL, MCP.
- ⑨ JUNCTION BOX FOR FUTURE CCTV CAMERAS. COORDINATE FINAL LOCATIONS WITH DELDOT. ROUTE 1" CONDUIT BACK TO SECURITY SYSTEM JUNCTION BOX.
- ⑩ PROVIDE 1-ETHERNET CAT5E CABLE WITH RJ-45 CONNECTORS IN 3/4" CONDUIT.
- ⑪ UTILITY METER PROVIDED BY DELMARVA.
- ⑫ 480V, 600A, NON-FUSED DISCONNECT SWITCH.
- ⑬ PROVIDE 2#12 AND 1#12 GROUND IN 3/4" CONDUIT.
- ⑭ PROVIDE 15A, 125V, STRAIGHT BLADE RECEPTACLE FOR AIR COMPRESSOR.
- ⑮ PROVIDE 15A, 125V, STRAIGHT BLADE RECEPTACLE FOR WATER SOFTENER.
- ⑯ PANEL PROVIDED BY TRUCK WASH VENDOR.
- ⑰ DISCONNECT SWITCH PROVIDED WITH UNIT.
- ⑱ PROVIDE 3#12 AND 1#12 GROUND IN 3/4" CONDUIT.
- ⑲ ROUTE THROUGH STARTER FOR EF-1.
- ⑳ FULL VOLTAGE, NON-REVERSING NEMA SIZE 0 STARTER FOR EF-1.
- ㉑ ROUTE THROUGH STARTER FOR EF-2.
- ㉒ FULL VOLTAGE, NON-REVERSING NEMA SIZE 0 STARTER FOR EF-2.
- ㉓ 480V, 3 POLE, 100A FUSED DISCONNECT SWITCH FUSED AT 40A IN NEMA 1 ENCLOSURE.
- ㉔ PROVIDE 4#12 WIRES IN 3/4" CONDUIT, BACK TO MASTER CONTROL PANEL, MCP.

**GENERAL SHEET NOTES:**

- 1. INFORMATION SHOWN ON THIS DRAWING PERTAINING TO EXISTING CONDITIONS HAS BEEN OBTAINED FROM AVAILABLE BUILDING DRAWINGS OR GENERAL FIELD OBSERVATIONS AND MAY NOT INDICATE ACTUAL EXISTING CONDITIONS IN DETAIL OR DIMENSION. THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE ACTUAL EXISTING CONDITIONS PRIOR TO FABRICATION OR PERFORMANCE OF ANY WORK. SHOULD CONDITIONS BE DISCOVERED THAT PREVENT EXECUTION OF THE WORK AS INDICATED, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ARCHITECT IN WRITING AND AWAIT DIRECTION BEFORE PROCEEDING WITH THE WORK.
- 2. UNIT VENTILATORS, FAN COIL UNITS, AND CABINET UNIT HEATERS PROVIDED WITH FACTORY INSTALLED DISCONNECTS UNDER DIVISION 23.



**1 ELECTRICAL FIRST FLOOR PLAN**  
E103 SCALE: 1/4" = 1'-0"

SCALE: 1/4" = 1'-0"

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ADDENDUMS / REVISIONS		
REVISION #1	8/4/16	ADDENDUM 6

CONTRACT	BRIDGE NO.	N/A
T201680102	DESIGNED BY:	AMS
COUNTY	CHECKED BY:	JWL
KENT		

## SECTION 071416

### COLD FLUID-APPLIED WATERPROOFING

#### PART 1 - GENERAL

##### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

##### 1.2 SUMMARY

- A. Section Includes:
  - 1. Polyurethane waterproofing.

##### 1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
  - 1. Include construction details, material descriptions, and tested physical and performance properties of waterproofing.
  - 2. Include manufacturer's written instructions for evaluating, preparing, and treating substrate.
- B. Shop Drawings:
  - 1. Show locations and extent of waterproofing.
  - 2. Include details for substrate joints and cracks, sheet flashings, penetrations, inside and outside corners, tie-ins with adjoining waterproofing, and other termination conditions.
- C. Samples: For each exposed product and for each color and texture specified.

##### 1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Field quality-control reports.
- C. Sample Warranties: For special warranties.

## 1.5 QUALITY ASSURANCE

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

## 1.6 FIELD CONDITIONS

- A. Environmental Limitations: Apply waterproofing within the range of ambient and substrate temperatures recommended in writing by waterproofing manufacturer.
  - 1. Do not apply waterproofing to a damp or wet substrate, when relative humidity exceeds 85 percent, or when temperatures are less than 5 deg F above dew point.
  - 2. Do not apply waterproofing in snow, rain, fog or mist, or when such weather conditions are imminent during application and curing period.
- B. Maintain adequate ventilation during application and curing of waterproofing materials.

## 1.7 WARRANTY

- A. Manufacturer's Special Warranty: Manufacturer agrees to repair or replace waterproofing that fails in materials or workmanship within specified warranty period.
  - 1. Warranty Period: 10 years from date of Substantial Completion.
- B. Installer's Special Warranty: Specified form, signed by Installer, covering Work of this Section, for warranty period of two years.

## **PART 2 - PRODUCTS**

### 2.1 MATERIALS, GENERAL

- A. Source Limitations for Waterproofing System: Obtain waterproofing materials from single source from single manufacturer.

### 2.2 SINGLE-COMPONENT POLYURETHANE WATERPROOFING

- A. Single-Component, Modified Polyurethane Waterproofing: ASTM C 836/C 836M.
  - 1. BASF Corporation; MasterSeal HLM 5000.
  - 2. Carlisle Coatings and Waterproofing; CCW-225
  - 3. W.R. Meadows; MEL-ROL LM Waterproofing System.

### 2.3 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials recommended in writing by waterproofing manufacturer for intended use and compatible with one another and with waterproofing.

1. Furnish liquid-type auxiliary materials that comply with VOC limits of authorities having jurisdiction.
- B. Primer: Manufacturer's standard primer, sealer, or surface conditioner; factory-formulated acrylic latex, polyurethane, or epoxy.
- C. Joint Sealant: Multicomponent polyurethane sealant, compatible with waterproofing; ASTM C 920, Type M, Class 25 or greater; Grade NS for sloping and vertical applications; and as recommended by manufacturer for substrate and joint conditions.
  1. Backer Rod: Closed-cell polyethylene foam.

## 2.4 PROTECTION COURSE

- A. Protection Course: Manufacturer's standard protection course; 10 mils minimum thickness.

## **PART 3 - EXECUTION**

### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.
  1. Verify that substrate is visibly dry and within the moisture limits recommended in writing by manufacturer. Test for capillary moisture by plastic sheet method according to ASTM D 4263.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Clean, prepare, and treat substrates according to manufacturer's written instructions. Provide clean, dust-free, and dry substrates for waterproofing application.
- B. Mask off adjoining surfaces not receiving waterproofing to prevent spillage and overspray affecting other construction.
- C. Remove fins, ridges, and other projections, and fill honeycomb, aggregate pockets, holes, and other voids.

### 3.3 PREPARATION AT TERMINATIONS, PENETRATIONS, AND CORNERS

- A. Prepare surfaces at terminations and penetrations through waterproofing and at expansion joints, drains, sleeves, and corners according to waterproofing manufacturer's written instructions and to recommendations in ASTM C 1471.

### 3.4 WATERPROOFING APPLICATION

- A. Apply waterproofing according to manufacturer's written instructions and to recommendations in ASTM C 1471.
- B. Start installing waterproofing in presence of manufacturer's technical representative.
- C. Apply primer over prepared substrate unless otherwise instructed in writing by waterproofing manufacturer.
- D. Apply membrane by spray, roller, or brush at a minimum coverage rate of 20-25 ft.<sup>2</sup>/U.S. gal providing a thickness of 60 wet mils.
  - 1. Apply waterproofing to prepared wall terminations and vertical surfaces.
  - 2. Verify manufacturer's recommended wet film thickness of waterproofing every 100 sq. ft..
- E. Cure waterproofing, taking care to prevent contamination and damage during application and curing.

### 3.5 PROTECTION

- A. Protect membrane with application of waterproofing protection course, drainage board, or other approved material.
- B. Backfill immediately using care to avoid damaging waterproofing membrane system.

### 3.6 FIELD QUALITY CONTROL

- A. Manufacturer's Field Service: Engage a site representative qualified by waterproofing membrane manufacturer to inspect substrate conditions, surface preparation, membrane application, flashings, protection, and drainage components and to furnish daily reports to Architect.
- B. If test results or inspections show waterproofing does not comply with requirements, remove and replace or repair the waterproofing as recommended in writing by manufacturer, and make further repairs after retesting and inspecting until waterproofing installation passes.
- C. Prepare test and inspection reports.

END OF SECTION 071416

## SECTION 099600

### HIGH-PERFORMANCE COATINGS

#### PART 1 - GENERAL

##### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

##### 1.2 SUMMARY

- A. Section includes surface preparation and the application of high-performance coating systems on the following substrates:

- 1. Interior Substrates:

- a. Concrete, horizontal surfaces.
    - ~~b. Concrete masonry units (CMUs).~~
    - ~~c. Steel.~~

- B. Related Requirements:

- 1. Section 099123 "Interior Painting" for general field painting.

##### 1.3 DEFINITIONS

- A. MPI Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D 523.
- B. MPI Gloss Level 6: 70 to 85 units at 60 degrees, according to ASTM D 523.
- C. MPI Gloss Level 7: More than 85 units at 60 degrees, according to ASTM D 523.

##### 1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include preparation requirements and application instructions.
  - 1. Include printout of current "MPI Approved Products List" for each product category specified, with the proposed product highlighted.
  - 2. Indicate VOC content.
- B. Samples for Initial Selection: For each type of topcoat product indicated.
- C. Samples for Verification: For each type of coating system and each color and gloss of topcoat indicated.

recoat surfaces coated with rejected materials. Contractor will be required to remove rejected materials from previously coated surfaces if, on recoating with complying materials, the two coatings are incompatible.

### **PART 3 - EXECUTION**

#### **3.1 EXAMINATION**

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
  - 1. Concrete: 12 percent.
  - 2. ~~Masonry (Clay and CMUs): 12 percent.~~
- C. Verify suitability of substrates, including surface conditions and compatibility, with existing finishes and primers.
- D. Proceed with coating application only after unsatisfactory conditions have been corrected.
  - 1. Application of coating indicates acceptance of surfaces and conditions.

#### **3.2 PREPARATION**

- A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates and coating systems indicated.
- B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
  - 1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.
- C. Clean substrates of substances that could impair bond of coatings, including dust, dirt, oil, grease, and incompatible paints and encapsulants.
  - 1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce coating systems indicated.

- D. Concrete Substrates: Remove release agents, curing compounds, efflorescence, and chalk. Do not coat surfaces if moisture content or alkalinity of surfaces to be coated exceeds that permitted in manufacturer's written instructions.
1. Clean surfaces with pressurized water. Use pressure range of 1500 to 4000 psi at 6 to 12 inches.
  2. Abrasive blast clean surfaces to comply with SSPC-SP 7/NACE No. 4.

~~E. Masonry Substrates: Remove efflorescence and chalk. Do not coat surfaces if moisture content, alkalinity of surfaces, or alkalinity of mortar joints exceeds that permitted in manufacturer's written instructions.~~

~~F. Shop Primed Steel Substrates: Clean field welds, bolted connections, and areas where shop paint is abraded. Paint exposed areas with the same material as used for shop priming to comply with SSPC PA 1 for touching up shop primed surfaces.~~

### 3.3 APPLICATION

- A. Apply high-performance coatings according to manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual."
1. Use applicators and techniques suited for coating and substrate indicated.
  2. Coat surfaces behind movable equipment and furniture same as similar exposed surfaces. Before final installation, coat surfaces behind permanently fixed equipment or furniture with prime coat only.
  - ~~3. Coat backsides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.~~
  - 4.3. Do not apply coatings over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
- ~~B. Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of the same material are to be applied. Tint undercoats to match color of finish coat, but provide sufficient difference in shade of undercoats to distinguish each separate coat.~~
- ~~C. If undercoats or other conditions show through final coat, apply additional coats until cured film has a uniform coating finish, color, and appearance.~~
- ~~D.B.~~ Apply coatings to produce surface films without cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections. Produce sharp glass lines and color breaks.

### 3.4 FIELD QUALITY CONTROL

- A. Dry Film Thickness Testing: Owner may engage the services of a qualified testing and inspecting agency to inspect and test coatings for dry film thickness.
1. Contractor shall touch up and restore coated surfaces damaged by testing.

2. If test results show that dry film thickness of applied coating does not comply with coating manufacturer's written recommendations, Contractor shall pay for testing and apply additional coats as needed to provide dry film thickness that complies with coating manufacturer's written recommendations.

### 3.5 CLEANING AND PROTECTION

- A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
- B. After completing coating application, clean spattered surfaces. Remove spattered coatings by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.
- C. Protect work of other trades against damage from coating operation. Correct damage to work of other trades by cleaning, repairing, replacing, and recoating, as approved by Architect, and leave in an undamaged condition.
- D. At completion of construction activities of other trades, touch up and restore damaged or defaced coated surfaces.

### 3.6 INTERIOR HIGH-PERFORMANCE COATING SCHEDULE

- A. Concrete Substrates, Horizontal Surfaces.

- ~~1. Epoxy, High Build System:~~

- ~~a. Prime Coat: High build epoxy, matching topcoat (reduced).~~

- ~~b. Intermediate Coat: High build epoxy, matching topcoat.~~

- ~~c. Topcoat: High build epoxy, low gloss, MPI #108.~~

- ~~1) Sherwin Williams; Macropoxy 646 Fast Cure Epoxy.~~

- ~~2) PPG Architectural; High Build Epoxy Marine Coating.~~

- ~~3) Approved Equal.~~

1. Pigmented Polyurethane System:

- a. Prime Coat: Epoxy, as recommended in writing by topcoat manufacturer.

- b. Intermediate Coat: Polyurethane, two-component, pigmented, gloss (Gloss Level 6), MPI #72.

- c. Topcoat: Polyurethane, two-component, pigmented, gloss (Gloss Level 6), MPI #72.

- 1) Sherwin Williams; Armorseal HS polyurethane floor coating

- 2) PPG Architectural; Pitthane Ultra Gloss

- 3) Approved Equal

~~B. CMU Substrates:~~

~~1. Epoxy, High Build System:~~

- ~~a. Prime Coat: Epoxy block filler, MPI #116.~~
- ~~b. Intermediate Coat: High build epoxy, matching topcoat.~~
- ~~c. Topcoat: High build epoxy, low gloss, MPI #108.~~
  - ~~1) Sherwin Williams; Macropoxy 646 Fast Cure Epoxy.~~
  - ~~2) PPG Architectural; High Build Epoxy Marine Coating.~~
  - ~~3) Approved Equal.~~

~~C. Steel Substrates:~~

~~1. Epoxy, High Build System:~~

- ~~a. Prime Coat: Primer, epoxy, anti-corrosive, for metal, MPI #101.~~
- ~~b. Intermediate Coat: High build epoxy, matching topcoat.~~
- ~~c. Topcoat: High build epoxy, low gloss, MPI #108.~~
  - ~~1) Sherwin Williams; Macropoxy 646 Fast Cure Epoxy.~~
  - ~~2) PPG Architectural; High Build Epoxy Marine Coating.~~
  - ~~3) Approved Equal.~~

**PART 4 - METHOD OF MEASUREMENT**

4.1 METHOD OF MEASUREMENT:

- A. No separate measurement shall be made for work under this section.

**PART 5 - BASIS OF PAYMENT**

5.1 METHOD OF PAYMENT:

- A. No separate payment will be made for work under this Specification Section. The cost of the work, complete in place, described in this Specification Section shall be included in the respective Lump Sum Bid.
- B. Costs include all labor, material, services and equipment necessary to complete the work in every respect

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- c. Joints: Solder, lead free, ASTM B32, 95-5 tin-antimony, or tin and silver, with melting range 430 to 535 degrees F (220 to 280 degrees C).
  - d. Unions:
    - 1) Copper Piping: Class 150, bronze unions with soldered
    - 2) Dielectric Connections: Union with galvanized or plated steel threaded end, copper solder end, water impervious isolation barrier.
2. Inside the Wash Bay
- a. Pipe: Type 304 Stainless Steel, Schedule 40
  - b. Fittings: Type 304 Stainless Steel, Schedule 40.
  - c. Joint: Threaded
- C. ~~Plastic pipe~~ Below Grade Piping to Wash System Equipment:
- 1. PVC Pipe and Fittings (cold Water pipe and fittings)
    - a. PVC Pipe: ASTM D 1785, Schedule 80.
    - b. PVC Socket Fittings: ASTM D 2466 for Schedule 80.
- D. Underfloor Trap Primer Pipe
- 1. PEX
- E. Ductile Iron Pipe: Building Water Service below ground 4 inches and larger:
- 1. Mechanical Joints:
    - a. AWWA C151/A21.51, with mechanical-joint bell and plain spigot end unless grooved or flanged ends are indicated.
    - b. Glands, Gaskets, and Bolts: AWWA C111/A21.11, ductile- or gray-iron glands, rubber gaskets, and steel bolts.

### **PART 3 - EXECUTION**

#### **3.1 EXAMINATION**

- A. Division 01 - Administrative Requirements: Coordination and project conditions.

#### **3.2 PREPARATION**

- A. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.
- B. Remove scale and dirt, on inside and outside, before assembly.

1.7 ENVIRONMENTAL REQUIREMENTS

- A. Division 01 - Product Requirements.

1.8 FIELD MEASUREMENTS

- A. Verify field measurements prior to fabrication.

1.9 WARRANTY

- A. Division 01 - Execution Requirements: Product warranties and product bonds.

1.10 EXTRA MATERIALS

- A. Division 01 - Execution Requirements: Spare parts and maintenance products.

**PART 2 - PRODUCTS**

2.1 PIPING MATERIALS

- A. Above Grade Sanitary and Vent Pipe outside of the Wash Bay: Service Weight Cast-Iron Pipe and Fittings with Hub connections: ASTM A 888 or CISPI 301. Neoprene compression Tyler Ty-Seal connections.
- B. Above Grade Sanitary and Vent Piping inside the Wash Bay: Type 304 Schedule 40 Stainless Steel with Sanitary fittings. Threaded connections.
- C. Below Grade Sanitary and Vent Pipe 4" diameter and below: Cellular core PVC pipe: ASTM F 891, schedule 80 underground. PVC socket fittings, ASTM D 2665, made to ASTM D3311. ~~Extra heavy Weight Cast Iron pipe and fittings ASTM A88 or CISPI301 with neoprene compression gasket Ty Seal type joints.~~
1. Adhesive Primer: ASTM F 656
    - a. Adhesive primer shall have a VOC content of 550 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
    - b. Adhesive primer shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
  2. Solvent Cement: ASTM D 2564
    - a. PVC solvent cement shall have a VOC content of 510 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
    - b. Solvent cement shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers"

- D. Below Grade Sanitary and Vent Pipe 6” diameter and above: Cellular core PVC pipe; ASTM F 891, schedule 80 underground. PVC socket fittings, ASTM D 2665, made to ASTM D3311.
1. Adhesive Primer: ASTM F 656
    - a. Adhesive primer shall have a VOC content of 550 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
    - b. Adhesive primer shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
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    - b. Solvent cement shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers"
- E. Above Grade Sanitary and Vent Pipe outside the Wash Bay: Copper DWV hard temper seamless copper type ASTM B306 with lead free soldered joints. Fittings to be cast bronze lead free soldered drainage joints, ANSI B16.23 or wrought copper ANSI B16.29
- F. Above grade vent piping outside the Wash Bay: Schedule 40 galvanized steel pipe ASTM A53 or A106, Grade A or B. Threaded joints. Fittings Standard weight galvanized cast iron screwed drainage fittings Type ANSI B16.12, ASTM A126.

## 2.2 FLOOR DRAINS

- A. Type “A” (Industrial bottom outlet for unfinished spaces)
1. Description: Coated cast iron with double drainage flange, non-puncturing flashing clamp collar, weep holes, bottom outlet, inside caulk connection, round top, and removable deep sediment bucket with integral drainage rim so designed that grate cannot be set in place unless bucket is in position.
  2. Grate: Heavy duty ductile iron grate suitable for fork truck traffic.
  3. Trap: Deep seal "P" trap.
  4. Floor drain shall be Watts FD-340-Y-SET

## 2.3 CLEANOUTS

- A. General
1. Cleanouts inside the building shall be gas tight. Where cleanouts are on buried or concealed lines, they shall extend flush to the finished floor or grade. Provide "T" handle for removal of cleanout plugs.
  2. Floor Cleanouts:

- a. Cleanouts shall consist of "Y" fittings full size of pipe to 4" in diameter and not less than 4" for larger sizes. Recessed plug shall be bronze with rectangular countersunk slot. Cover shall be secured extra heavy duty ductile iron suitable for fork truck traffic. Provide "T" handle for recessed plug. Cleanout shall be Josam Series 55000-5-VP, or similar by Wade, Smith, Zurn, or Watts.
3. Wall Cleanouts
    - a. Cleanouts shall consist of "Y" fittings full size of pipe to 4" in diameter and not less than 4" for larger sizes. Plug shall be bronze with rectangular countersunk slot. Provide "T" handle for recessed plug. Provide cover with nail anchors. Frame and cover shall be polished bronze. Cover shall be Josam Series 58600, or similar by Wade, Smith, Zurn, or Watts.
  4. Exterior Cleanouts (for gravity lines)
    - a. Cleanouts shall consist of "Y" fittings full size of pipe to 4" in diameter and not less than 4" for larger sizes. Recessed plug shall be tapered thread bronze with rectangular countersunk slot. Cleanout ferrule to be cast iron. The cleanout cover frame shall be centered in a 20" square, 11" thick concrete pad. Cover shall be secured extra heavy duty ductile iron suitable for highway traffic. Cleanout shall be Josam Series 58850 with coated cast iron ferrule and bronze plug, or similar by Wade, Smith, Zurn, or Watts.

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

- A. Division 01 - Administrative Requirements: Coordination and project conditions.
- B. Verify excavations are to required grade, dry, and not over-excavated.

### **3.2 PREPARATION**

- A. Remove scale and dirt, on inside and outside, before assembly.
- B. Prepare piping connections to equipment with flanges or unions.
- C. Keep open ends of pipe free from scale and dirt. Protect open ends with temporary plugs or caps.

### **3.3 PIPING APPLICATIONS**

- A. Special pipe fittings with pressure ratings at least equal to piping pressure ratings may be used in applications below, unless otherwise indicated.

- B. Flanges and unions may be used on aboveground pressure piping, unless otherwise indicated.
- C. Aboveground, soil, waste, and vent piping NPS 4 and smaller shall be hub cast-iron soil pipe and fittings; neoprene Tyler Ty-Seal gaskets.

### 3.4 PIPING INSTALLATION

- A. Basic piping installation requirements are specified in Division 22 Section "Common Work Results for Plumbing."
- B. Install sleeve with water stop and mechanical sleeve seal at each service pipe penetration through foundation wall. Select number of interlocking rubber links required to make installation watertight. Sleeves and mechanical sleeve seals are specified in Division 22 Section "Sleeve and Sleeve Seals for Plumbing Piping."
- C. Install cast-iron soil piping according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook," Chapter IV, "Installation of Cast Iron Soil Pipe and Fittings."
- D. Make changes in direction for soil and waste drainage and vent piping using appropriate branches, bends, and long-sweep bends. Sanitary tees and short-sweep 1/4 bends may be used on vertical stacks if change in direction of flow is from horizontal to vertical. Use long-turn, double Y-branch and 1/8-bend fittings if 2 fixtures are installed back to back or side by side with common drain pipe. Straight tees, elbows, and crosses may be used on vent lines. Do not change direction of flow more than 90 degrees. Use proper size of standard increasers and reducers if pipes of different sizes are connected. Reducing size of drainage piping in direction of flow is prohibited.
- E. Install soil and waste drainage and vent piping at the following minimum slopes, unless otherwise indicated:
  - 1. Horizontal Sanitary Drainage Piping: 2 percent downward in direction of flow.
  - 2. Vent Piping: 1 percent down toward vertical fixture vent or toward vent stack.
- F. Do not enclose, cover, or put piping into operation until it is inspected and approved by authorities having jurisdiction.
- G. [Install aboveground PVC piping according to ASTM D 2665.](#)
- H. [Install underground PVC piping according to ASTM D 2321.](#)

### 3.5 JOINT CONSTRUCTION

- A. Basic piping joint construction requirements are specified in Division 22 Section "Common Work Results for Plumbing."

- B. Cast-Iron, Soil-Piping Joints: Make joints according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook," Chapter IV, "Installation of Cast Iron Soil Pipe and Fittings."
  - 1. Hub Joints: Make with neoprene gasket.

### 3.6 HANGER AND SUPPORT INSTALLATION

- A. Pipe hangers and supports are specified in Division 22 Section "Hangers and Supports for Plumbing Piping and Equipment." Install the following:
  - 1. Vertical Piping: MSS Type 8 or Type 42, clamps.
  - 2. Individual, Straight, Horizontal Piping Runs: According to the following:
    - a. 100 Feet and Less: MSS Type 1, adjustable, steel clevis hangers.
    - b. Longer than 100 Feet: MSS Type 43, adjustable roller hangers.
  - 3. Multiple, Straight, Horizontal Piping Runs 100 Feet or Longer: MSS Type 44, pipe rolls. Support pipe rolls on trapeze.
  - 4. Use all Type 304 Stainless steel materials for hangers and supports in the Wash Bay area.
- B. Install supports according to Division 22 Section "Hangers and Supports for Plumbing Piping and Equipment."
- C. Rod diameter may be reduced 1 size for double-rod hangers, with 3/8-inch minimum rods.
- D. Install hangers for cast-iron soil piping with the following maximum horizontal spacing and minimum rod diameters:
  - 1. NPS 1-1/2 and NPS 2: 60 inches with 3/8-inch rod.
  - 2. NPS 3: 60 inches with 1/2-inch rod.
  - 3. NPS 4 and NPS 5: 60 inches with 5/8-inch rod.
- E. Install supports for vertical cast-iron soil piping every 15 feet.
- F. Support piping and tubing not listed above according to MSS SP-69 and manufacturer's written instructions.
- G. Install vinyl-coated hangers for PVC piping with the following maximum horizontal spacing and minimum rod diameters:
  - 1. NPS 2 (DN 50) and Smaller: 48 inches (1200 mm) with 3/8-inch (10-mm) rod.
  - 2. NPS 2-1/2 to NPS 3-1/2 (DN 65 to DN 90): 48 inches (1200 mm) with 1/2-inch (13-mm) rod.
  - 3. NPS 4 and NPS 5 (DN 100 and DN 125): 48 inches (1200 mm) with 5/8-inch (16-mm) rod.
  - 4. NPS 6 (DN 150): 48 inches (1200 mm) with 3/4-inch (19-mm) rod.
  - 5. NPS 8 (DN 200) and Larger: 48 inches (1200 mm) with 7/8-inch (22-mm) rod.

H. Install supports for vertical PVC piping every 48 inches (1200 mm).

3.7 CONNECTIONS

- A. Connect soil and waste piping to exterior sanitary sewerage piping. Use transition fitting to join dissimilar piping materials.
- B. Connect drainage and vent piping to the following:
  - 1. Equipment: Connect atmospheric vent piping in sizes indicated, but not smaller than required by authorities having jurisdiction.
  - 2. Plumbing Specialties: Connect drainage and vent piping in sizes indicated, but not smaller than required by plumbing code.

3.8 FIELD QUALITY CONTROL

- A. During installation, notify authorities having jurisdiction at least 24 hours before inspection must be made. Perform tests specified below in presence of authorities having jurisdiction.
  - 1. Roughing-in Inspection: Arrange for inspection of piping before concealing or closing-in after roughing-in and before setting fixtures.
  - 2. Final Inspection: Arrange for final inspection by authorities having jurisdiction to observe tests specified below and to ensure compliance with requirements.
- B. Reinspection: If authorities having jurisdiction find that piping will not pass test or inspection, make required corrections and arrange for reinspection.
- C. Reports: Prepare inspection reports and have them signed by authorities having jurisdiction.
- D. Test sanitary drainage and vent piping according to procedures of authorities having jurisdiction.
  - 1. Repair leaks and defects with new materials and retest piping, or portion thereof, until satisfactory results are obtained.
  - 2. Prepare reports for tests and required corrective action.

3.9 CLEANING

- A. Clean interior of piping. Remove dirt and debris as work progresses.
- B. Protect drains during remainder of construction period to avoid clogging with dirt and debris and to prevent damage from traffic and construction work.
- C. Place plugs in ends of uncompleted piping at end of day and when work stops.

- D. Following the installation of the sanitary piping system and overall construction, the sanitary piping system (both existing and new) which is connected to sanitary piping installed under this contract shall be jet cleaned to remove debris from the piping system.

3.10 FIELD QUALITY CONTROL

- A. Division 01 - Execution Requirements: Field inspecting, testing, adjusting, and balancing.
- B. Test sanitary waste and vent piping system in accordance with applicable code and local authority having jurisdiction.

END OF SECTION 221316