

# GREEN RIVER VALLEY WATER DISTRICT

## WATER TREATMENT PLANT EXPANSION

### HART COUNTY, KENTUCKY

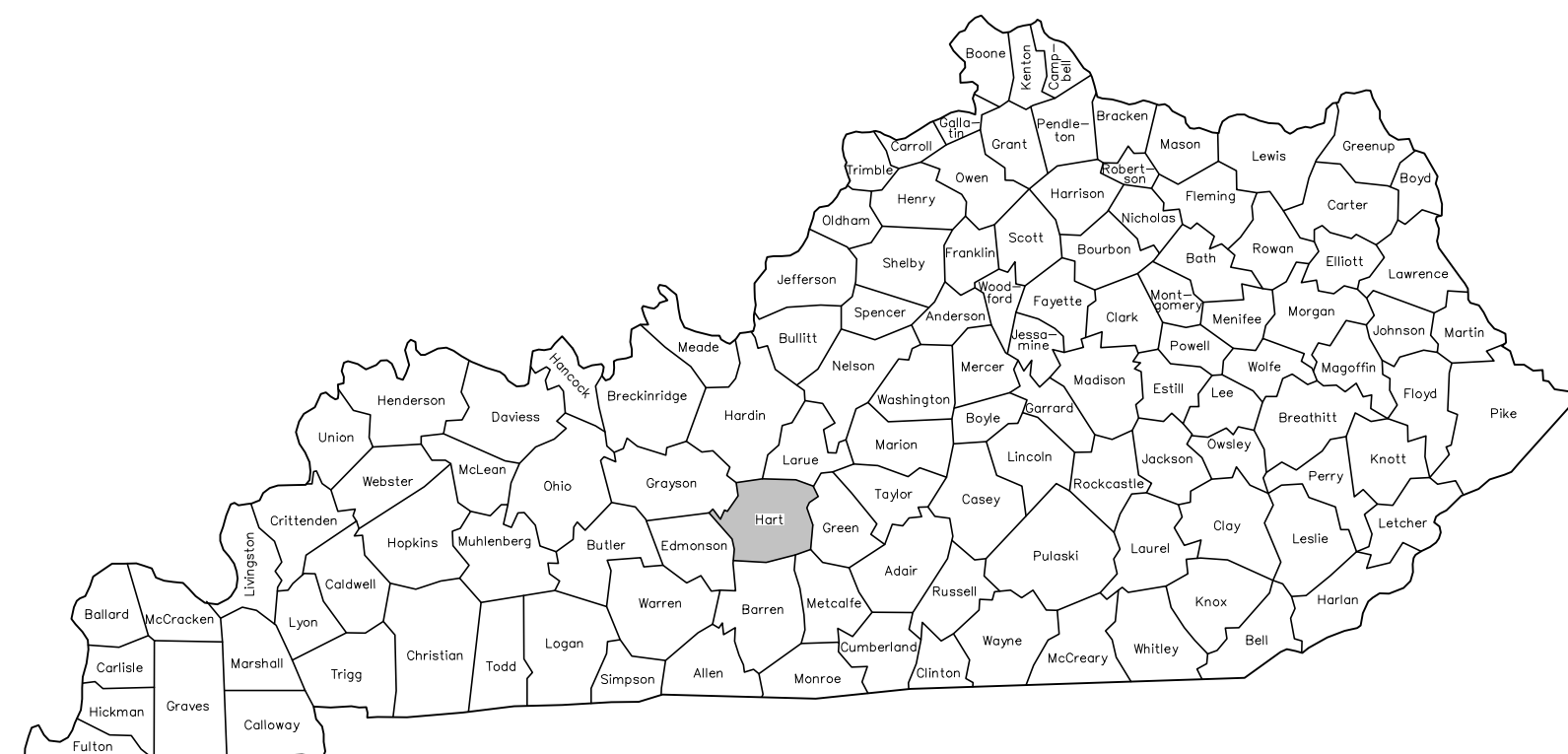
#### BOARD MEMBERS

**PHILLIP DOYLE, CHAIRMAN**  
**JOHN BUNNELL, SECRETARY/TREASURER**  
**LELAND GLASS**  
**KERRY McDANIEL**  
**PAT TUCKER**

**DAVID PAIGE, MANAGER**

#### SENIOR PLANT OPERATORS

**JOHN RUTLEDGE**  
**DAVID MATHEWS**  
**JAMES NUNN**



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**MAY 2019**





**GENERAL NOTES**

- The Contractor shall be responsible for coordinating all construction work with local utility companies and other concerned parties.
- Existing buried utilities are shown on the drawings in their general location utilizing the best available information. Before construction begins near or through existing utilities (i.e. Gas Co., Telephone Co., etc.) each utility company shall be notified, a request for the exact location of the utility shall be made, and permission to proceed with construction obtained. The utility shall be given at least one week advance notice for location verification. BUD provides a clearinghouse service for member utilities relative to underground utilities location. The Contractor shall contact BUD at telephone no. 1-800-752-6007 or 811.
- In general, the location of all gravity drain piping will take precedence. Other piping may be adjusted only through coordination and with the approval of the Engineer.
- All yard piping shall be either D.I. Cl 200, PVC C-900 Cl 200, or PVC C-905 Cl. 235 unless otherwise noted. Piping below interior floors and inside basins to be D.I.
- The Contractor shall have on hand at the job site 11 1/4", 22 1/2", 45" and 90" bends for use where necessary for proper installation.
- The Contractor shall be responsible for ordering material quantities necessary for installation to the limits as shown on the drawings unless otherwise instructed. Any left-over quantities shall be the property of the Contractor unless other arrangements are made. The Owner shall not be responsible for re-stocking or other charges associated with left-over materials or increased costs associated with increases in price for materials needed to complete the project as shown on the drawings.
- All Ductile iron pipe shall be installed in accordance with Standard AWWA C150/ANSI A21.50 Laying Condition Type 3 unless otherwise noted.
- All open cut roadways, proposed roadways and trenches cut in existing pavements shall be backfilled with compacted crushed stone (KYDOT #57) or DGA in accordance with the miscellaneous details drawings. The costs of this backfill is not a separate pay item and shall be included in the lump sum contact price.
- The Contractor shall obtain and pay for all grading, storm water, building, etc. permits, if any required to complete the work. The contractor shall maintain compliance with all conditions, limitations and stipulations of all permits. The contractor shall not commence work, except mobilization, until he has obtained all required permits for said work. The contractor shall supply the owner with copies of all permits within 24 hours of receipt. A KPDES Storm Water Discharge Permit will be required for this project. The contractor shall fill out, sign and submit the Notice of Intent (NOI) and the Notice of Termination (NOT). The Notice to Proceed will not be issued until the Permit has been provided.
- All work shall be provided in accordance with all terms of the General Construction Permit as issued for the Project by the Kentucky Department for Environmental Protection, Division of Water. The Owner will secure said Construction Permit and deliver a copy of each to the Contractor, to be maintained on-site at all times during construction.
- All work shall be provided in compliance with all applicable local, state and national building codes.
- All work shall be executed in compliance with the current workplace safety regulations of the U.S. Department of Labor, Occupational Safety and Health Administration (O.S.H.A.).
- All excavation shall be considered unclassified excavation. No additional payment shall be due and payable to the Contractor for dewatering of pipe trenches/excavations or for excavation and removal of rock.
- All water main fittings shall be ductile iron, mechanical joint compact fittings for water service complying with AWWA Standard C153. Unless otherwise specifically shown or noted, no PVC fitting, other than in-line repair couplings, will be accepted. All ductile iron fittings shall be restrained joint.
- All water main fittings shall be anchored with poured concrete thrust blocks as shown in the miscellaneous detail drawings. Wrap fittings in minimum 5-mil plastic (PVC) wrap prior to forming and pouring the block.
- The Contractor shall repair/replace any and all existing utility lines and equipment damaged by the Contractor's Work, to the satisfaction of the damaged utility and at no additional cost to the Owner.
- The Contractor shall submit shop drawings regarding every aspect of the project to the Engineer for review. The Contractor shall not purchase any equipment or materials nor shall he perform any work until the Engineer has completed his review of the shop drawings and returned them to the Contractor.
- Where it is necessary to install one pipe over another, compacted granular fill shall be required between the pipes. The cost of this backfill shall be included in the bid item to which it is subsidiary.
- All piping within surfaced areas subject to vehicular traffic and within 4 feet of the surface shall be backfilled to the surface with compacted crushed stone (KYDOT #57.) The cost of this backfill is not a separate pay item and shall be included in the lump sum contract price.
- The fittings shown are representative only. Conditions may necessitate revisions in the number and type of fittings required to accomplish the intended objective. No additional payment will be made for such revisions. Thrust blocking at bends and tees shall be installed in accordance with the Standard Drawings.
- Aggregate grading designations per ASTM C33.
- Salvage material designated by the owner shall be returned to the owner. Remainder of salvage and demolition waste to be disposed of by the Contractor.

**ENVIRONMENTAL NOTES**

- During construction, straw bales or silt fences shall be put in place to prevent sediment runoff onto adjacent areas. Disturbed surfaces shall be restored to original contours and excess materials removed to a properly confined area.
- 
- Any excavation by the Contractor that uncovers a historical or archaeological artifact shall be immediately reported to the Owner and Engineer. Construction shall be temporarily halted pending the notification process and further directions after consultation with the State Historic Preservation Officer (SHPO).

**ABBREVIATIONS**

ARV	Air Release Valve	Inv.	Invert
AS	Air Scour	L.F.	Linear Feet
AVV	Air/Vacuum Valve	MCC	Motor Control Center
BFV	Butterfly Valve	MH	Manhole
BM	Bench Mark	MJ	Mechanical Joint
BV	Ball Valve	MV	Meter Vault
BW	Backwash	NC	Normally Closed
BWS	Backwash Supply	OD	Outside Diameter
BWW	Backwash Waste	OE	Overhead Electric
CA	Chlorine Analyzer	OF	Overflow
CFE	Combined Filter Effluent	PCV	Pump Control Valve
CG	Chlorine Gas	PE	Polyethylene
CL	Centerline	PH	Post Hydrant
CO	Cleanout	PP	Power Pole
CS	Chlorine Solution	PS	Pump Station
Conc.	Concrete	PV	Plug Valve
CP	Control Point	PVC	Polyvinylchloride
CTR	Center	Rad.	Radius
CV	Control Valve	Req'd.	Required
CW	Clearwell	RCP	Reinforce Concrete Pipe
D.I.	Ductile Iron	RF	Rate of Flow
Dia.	Diameter	RPZ	Relief Pressure Zone
DR	Drain	RW	Raw Water
DS	Downspout	San.	Sanitary
EA	Each	SL	Sludge
Ecc.	Eccentric	SLR	Sludge Return
Eff.	Effluent	SQ	Square
El.	Elevation	S.S.	Stainless Steel
Elev.	Elevation	Sta.	Station
ELL	Elbow	Stl.	Steel
Exist.	Existing	Std.	Standard
FCA	Flanged Coupling Adapter	Stm.	Storm Sewer
FD	Floor Drain	SW	Service Water
FFE	Finished Floor Elevation	TA	Turbidity Analyzer
FH	Fire Hydrant	TBA	To be Abandoned
FLE	Flocculator Effluent	T	Telecommunication
FLI	Flocculator Influent	Temp.	Temporary
FLH	Flush Hydrant	TOF	Top of Filter
FLG	Flange	T/S	Top of Slab
FM	Force Main	T/W	Top of Wall
FTW	Filter to Waste	TRM	Turf Reinforcing Mat
FW	Finished Water	Turb.	Turbidimeter
G	Gas	TW	Tap Water
GV	Gate Valve	Typ.	Typical
HB	Hose Bib	UE	Underground Electric
HDPE	High Density Polyethylene	UG	Underground
HS	High Service	VC	Vitrified Clay
HW	Headwall	VFD	Variable Frequency Drive
IBC	Intermediate Bulk Container	VTR	Vent thru Roof
I.I.	Invert In	VV	Valve Vault
I.O.	Invert Out	YH	Hard Hydrant
Infl.	Influent		

**LEGEND**

Fire Hydrant	⊕
Water Valve	⊕
Light Pole	⊕
Power Pole	⊕
Guy Wire	→
Centerline	—
Property Line	—
Creek/Stream	—
Gas	—
Overhead Electric	—
Underground Electric	—
Telecommunication	—
Chain Link Fence	—
Existing Contour (Major)	—
Existing Contour (Minor)	—
Proposed Contour (Major)	—
Proposed Contour (Minor)	—

	Asphalt Pavement - (Existing)
	Crushed Stone - (Existing)
	Compacted Crushed Stone
	Asphalt Pavement

Items in this Font Style (Upper/lower, vertical) indicate items that are existing.  
Items in this Font Style (Upper/lower, slanted) indicate items that are proposed.

**CONTACT INFORMATION**

*Green River Valley Water District*  
Water Treatment Plant  
4665 North Jackson Highway  
Munfordville, Kentucky 42765  
(270) 528-2081

*Telecommunications*  
South Central RTC  
1399 Happy Valley Road  
P.O. Box 159  
Glasgow, KY 42142-0159  
(280) 678-8249

*Electric*  
LG&E and KU Energy LLC  
One Quality Street  
Lexington, KY 40507  
(859) 226-6414

*KYTC District 4*  
634 East Dixie Highway  
Elizabethtown, KY 42701  
(280) 766-5066

*Kentucky Underground*  
Phone: 811



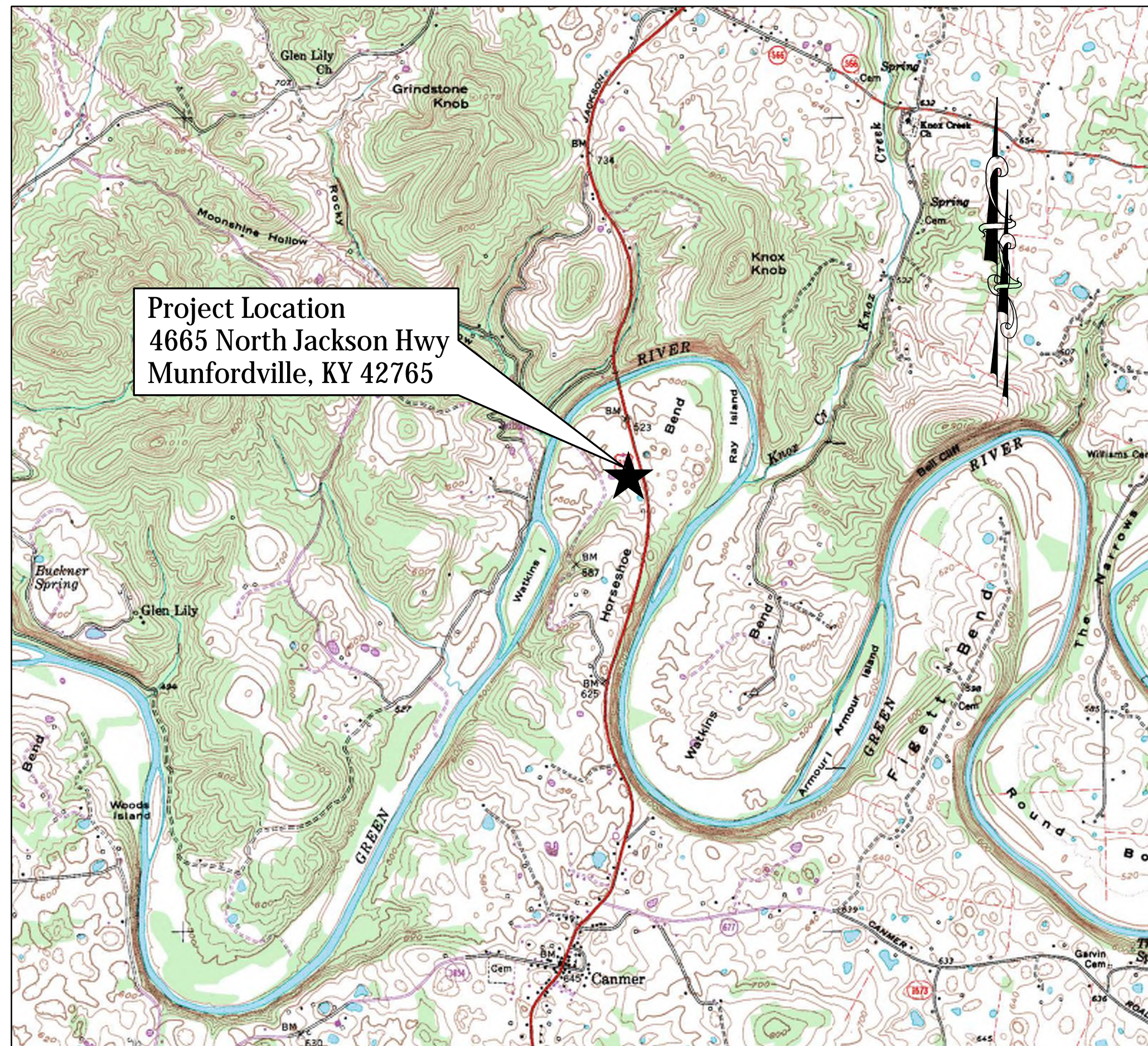
In compliance with the Kentucky Dig Law, the Contractor shall call (800) 752-6007 (Kentucky811) toll free or dial 811 a minimum of two and no more than ten business days prior to excavation for information of the location of existing underground utilities. It will be the Contractors responsibility to coordinate excavation with all Utility Owners.



DRAWN BY: JKP
CHECKED BY: RVW
DATE: MAY 2019
SCALE: N/A
REVISIONS







Project Location  
4665 North Jackson Hwy  
Munfordville, KY 42765

**TOPOGRAPHICAL LOCATION MAP**  
CANMER, KY. U.S.G.S. QUADRANGLE - SCALE: 1"=2,000'



Install new pumps and screens  
at the existing River Intake.

New Air Burst System

New Spring Pump Station

New Floc. and Sed. Basins  
No. 7 & No. 8

Chlorine Bldg.

Filter Building Addition  
Filter No. 7 & No. 8

Chemical Feed Addition

0.20 MG Clearwell

0.30 MG Clearwell

0.40 MG Clearwell

1.45 MG Clearwell

0.50 MG Clearwell

HSPS No. 3

GRVWD Water Treatment Plant

New Grit Separator

Maintenance Bldg.

Chemical Feed

Floc. Basins

Sed. Basins

Filter Bldg.

(SCALE IN FEET)  
1 inch = 60 ft.

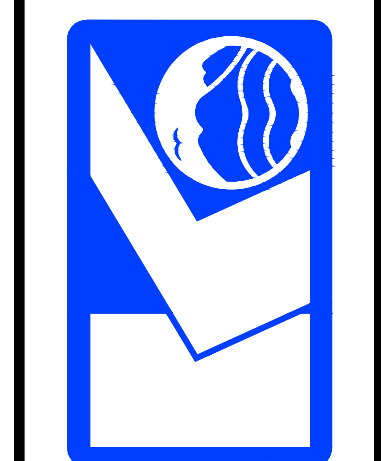
**PROJECT OVERVIEW**

**GREEN RIVER VALLEY WATER DISTRICT**  
**WATER TREATMENT PLANT EXPANSION**  
**HART COUNTY, KENTUCKY**



DRAWN BY: JRE/PTH
CHECKED BY: RWV
DATE: MAY 2019
SCALE: AS SHOWN
REVISIONS

**KENVIRONS, INC.**  
**FRANKFORT, KENTUCKY**



PROJECT NO.  
**2014042**

SHEET NO.  
**0.3**

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**GREEN RIVER VALLEY WATER DISTRICT  
WATER TREATMENT PLANT EXPANSION  
HART COUNTY, KENTUCKY**

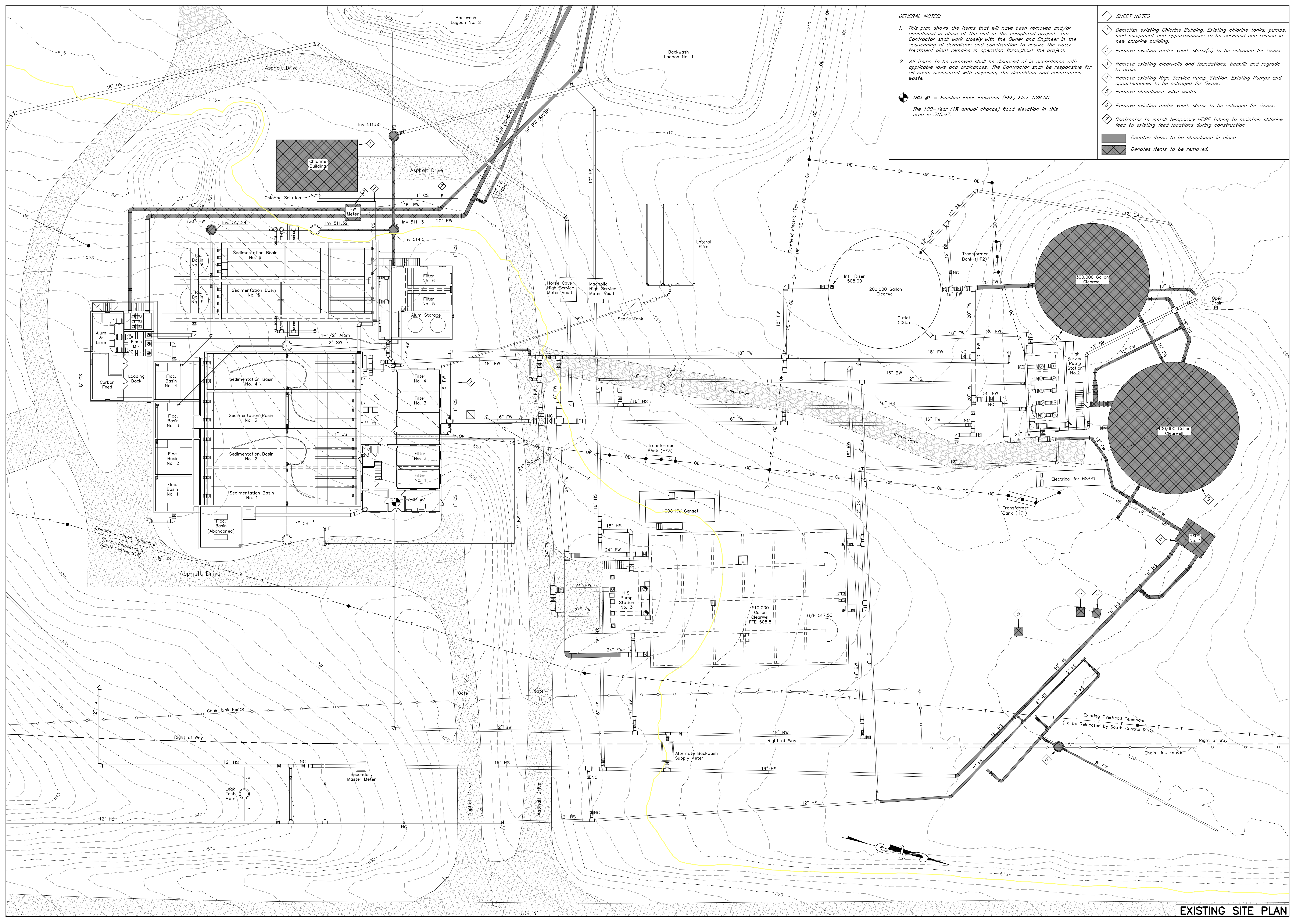


DRAWN BY: JRE/PTH
CHECKED BY: RWV
DATE: MAY 2019
SCALE: 1"=20'
REVISIONS

**KENVIRONS, INC.  
FRANKFORT, KENTUCKY**



PROJECT NO.  
**2014042**  
SHEET NO.  
**1.1**



- GENERAL NOTES:**
- This plan shows the items that will have been removed and/or abandoned in place at the end of the completed project. The Contractor shall work closely with the Owner and Engineer in the sequencing of demolition and construction to ensure the water treatment plant remains in operation throughout the project.
  - All items to be removed shall be disposed of in accordance with applicable laws and ordinances. The Contractor shall be responsible for all costs associated with disposing the demolition and construction waste.
- TBM #1 = Finished Floor Elevation (FFE) Elev. 528.50  
The 100-Year (1% annual chance) flood elevation in this area is 515.97.
- SHEET NOTES**
- Demolish existing Chlorine Building. Existing chlorine tanks, pumps, feed equipment and appurtenances to be salvaged and reused in new chlorine building.
  - Remove existing meter vault. Meter(s) to be salvaged for Owner.
  - Remove existing clearwells and foundations, backfill and regrade to drain.
  - Remove existing High Service Pump Station. Existing Pumps and appurtenances to be salvaged for Owner.
  - Remove abandoned valve vaults.
  - Remove existing meter vault. Meter to be salvaged for Owner.
  - Contractor to install temporary HDPE tubing to maintain chlorine feed to existing feed locations during construction.
- Denotes items to be abandoned in place.  
Denotes items to be removed.

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**EXISTING SITE PLAN**



**GREEN RIVER VALLEY WATER DISTRICT  
WATER TREATMENT PLANT EXPANSION  
HART COUNTY, KENTUCKY**



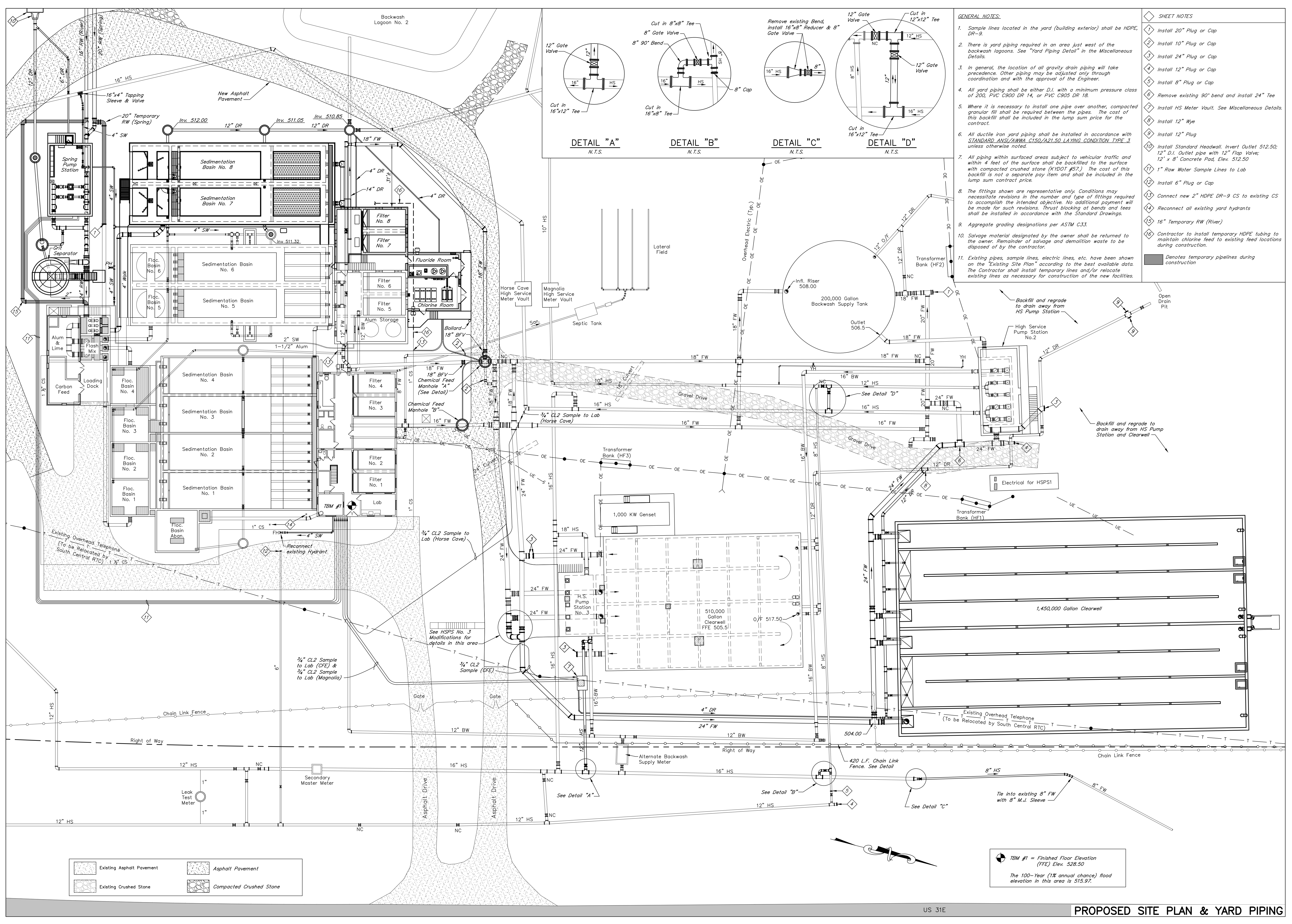
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CHECKED BY: RWV  
DATE: MAY 2019  
SCALE: 1"=20'  
REVISIONS

**KENVIRONS, INC.  
FRANKFORT, KENTUCKY**



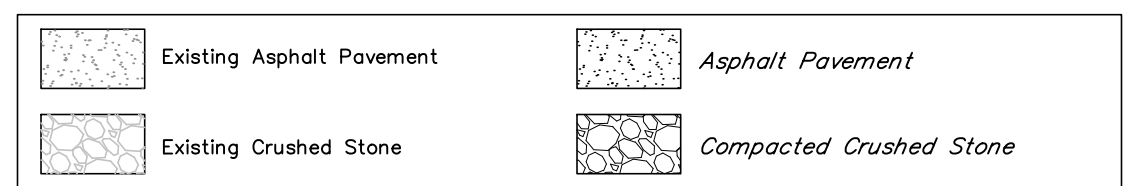
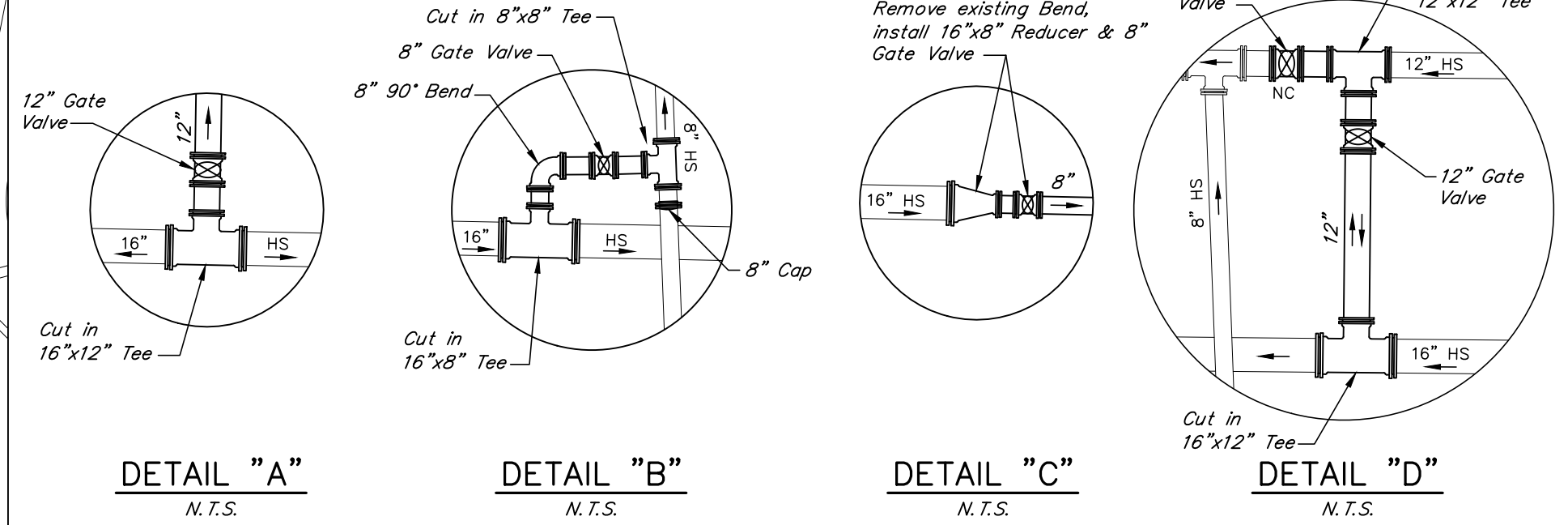
PROJECT NO.  
**2014042**

SHEET NO.  
**1.2**



- GENERAL NOTES:**
- Sample lines located in the yard (building exterior) shall be HDPE, DR-9.
  - There is yard piping required in an area just west of the backwash lagoons. See "Yard Piping Detail" in the Miscellaneous Details.
  - In general, the location of all gravelly drain piping will take precedence. Other piping may be adjusted only through coordination and with the approval of the Engineer.
  - All yard piping shall be either D.I. with a minimum pressure class of 200, PVC C900 DR 14, or PVC C905 DR 18.
  - Where it is necessary to install one pipe over another, compacted granular fill shall be required between the pipes. The cost of this backfill shall be included in the lump sum price for the contract.
  - All ductile iron yard piping shall be installed in accordance with STANDARD ANSI/AWWA C150/A21.50 LAYING CONDITION TYPE 3 unless otherwise noted.
  - All piping within surfaced areas subject to vehicular traffic and within 4 feet of the surface shall be backfilled to the surface with compacted crushed stone (KYDOT #57). The cost of this backfill is not a separate pay item and shall be included in the lump sum contract price.
  - The fittings shown are representative only. Conditions may necessitate revisions in the number and type of fittings required to accomplish the intended objective. No additional payment will be made for such revisions. Thrust blocking at bends and tees shall be installed in accordance with the Standard Drawings.
  - Aggregate grading designations per ASTM C33.
  - Salvage material designated by the owner shall be returned to the owner. Remainder of salvage and demolition waste to be disposed of by the contractor.
  - Existing pipes, sample lines, electric lines, etc. have been shown on the "Existing Site Plan" according to the best available data. The Contractor shall install temporary lines and/or relocate existing lines as necessary for construction of the new facilities.

- SHEET NOTES**
- Install 20" Plug or Cap
  - Install 10" Plug or Cap
  - Install 24" Plug or Cap
  - Install 12" Plug or Cap
  - Install 8" Plug or Cap
  - Remove existing 90° bend and install 24" Tee
  - Install HS Meter Vault. See Miscellaneous Details.
  - Install 12" Wye
  - Install 12" Plug
  - Install Standard Headwall, Invert Outlet 512.50; 12" D.I. Outlet pipe with 12" Flap Valve; 12' x 8' Concrete Pad, Elev. 512.50
  - 1" Raw Water Sample Lines to Lab
  - Install 6" Plug or Cap
  - Connect new 2" HDPE DR-9 CS to existing CS
  - Reconnect all existing yard hydrants
  - 16" Temporary RW (River)
  - Contractor to install temporary HDPE tubing to maintain chlorine feed to existing feed locations during construction.
- Denotes temporary pipelines during construction

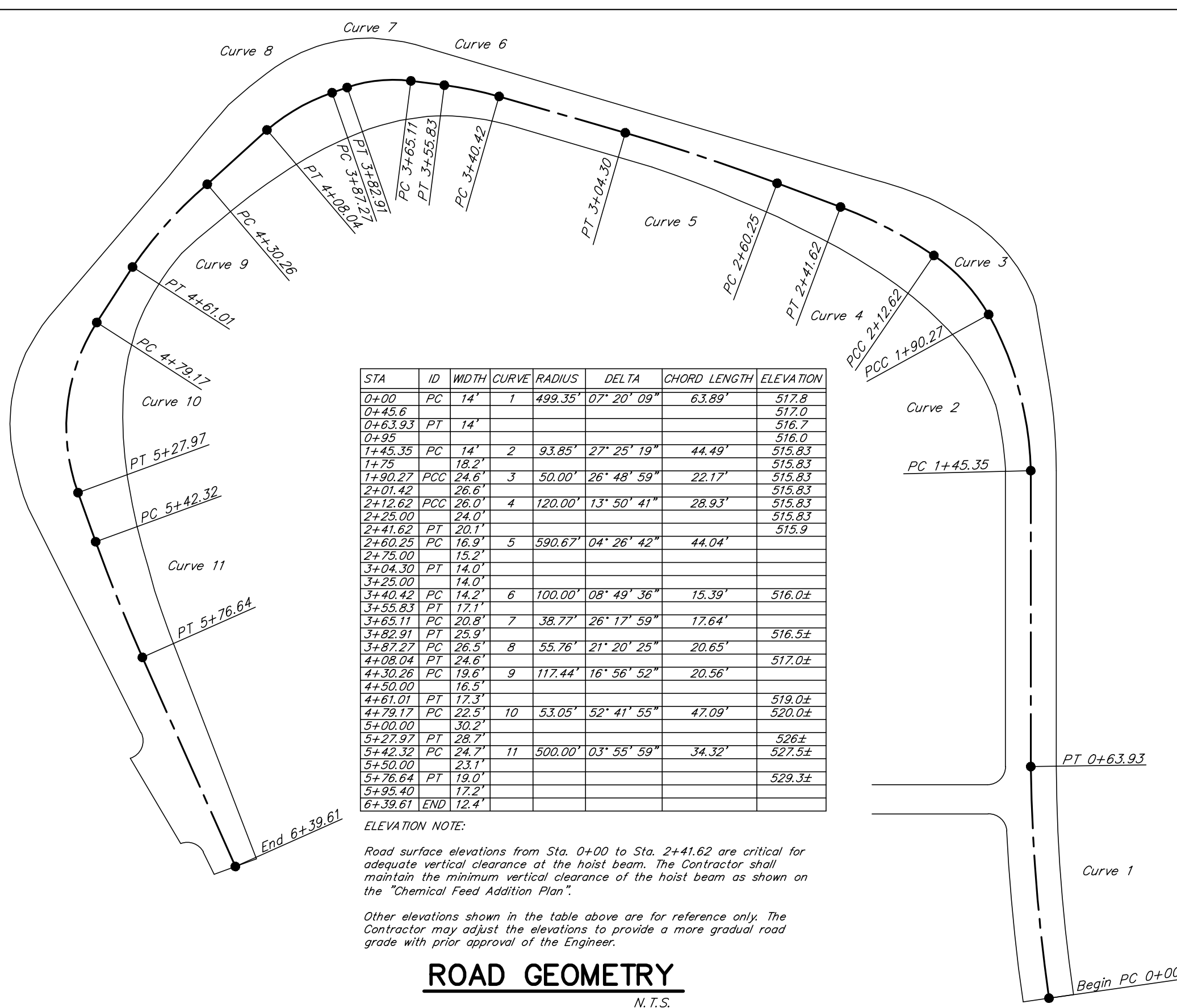
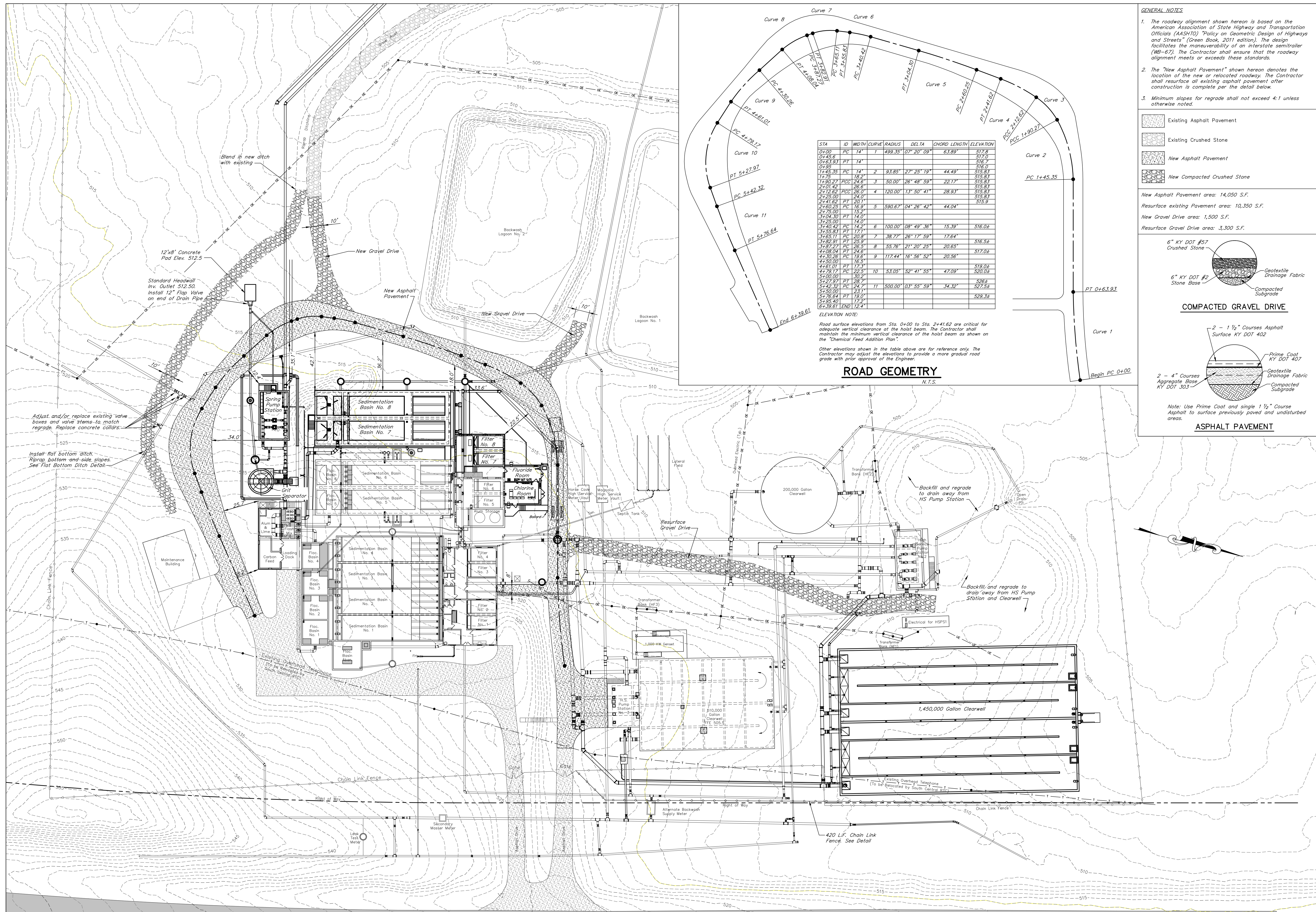


TBM #1 = Finished Floor Elevation (FFE) Elev. 528.50  
The 100-Year (1% annual chance) flood elevation in this area is 515.97.

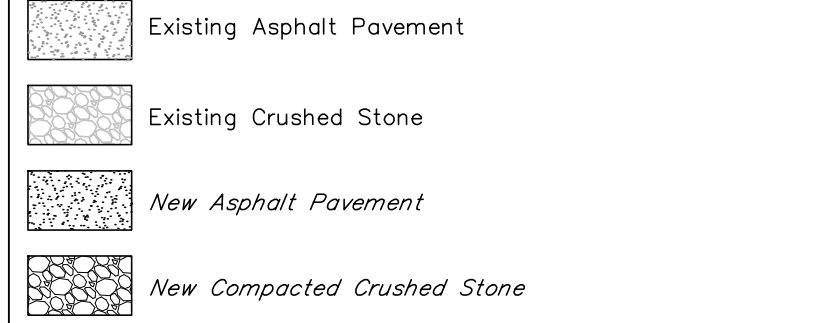
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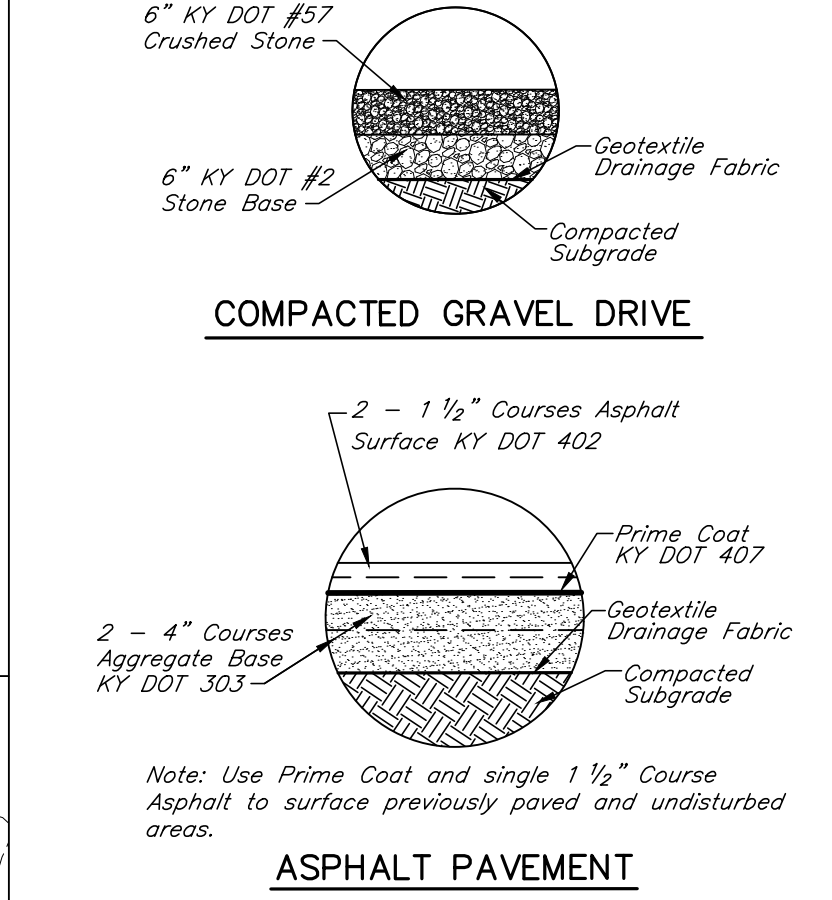
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- GENERAL NOTES**
- The roadway alignment shown herein is based on the American Association of State Highway and Transportation Officials (AASHTO) "Policy on Geometric Design of Highways and Streets" (Green Book, 2011 edition). The design facilitates the maneuverability of an interstate semitrailer (WB-67). The Contractor shall ensure that the roadway alignment meets or exceeds these standards.
  - The "New Asphalt Pavement" shown herein denotes the location of the new or relocated roadway. The Contractor shall resurface all existing asphalt pavement after construction is complete per the detail below.
  - Minimum slopes for regrade shall not exceed 4:1 unless otherwise noted.



New Asphalt Pavement area: 14,050 S.F.  
 Resurface existing Pavement area: 10,350 S.F.  
 New Gravel Drive area: 1,500 S.F.  
 Resurface Gravel Drive area: 3,300 S.F.



**ROAD GEOMETRY**  
N.T.S.

Road surface elevations from Sta. 0+00 to Sta. 2+41.62 are critical for adequate vertical clearance at the hoist beam. The Contractor shall maintain the minimum vertical clearance of the hoist beam as shown on the "Chemical Feed Addition Plan".  
 Other elevations shown in the table above are for reference only. The Contractor may adjust the elevations to provide a more gradual road grade with prior approval of the Engineer.

**GREEN RIVER VALLEY WATER DISTRICT  
 WATER TREATMENT PLANT EXPANSION  
 HART COUNTY, KENTUCKY**

DRAWN BY: JRE/PTH  
 CHECKED BY: RWV  
 DATE: MAY 2019  
 SCALE: 1"=30'  
 REVISIONS

**KENVIRONS, INC.**  
 FRANKFORT, KENTUCKY



PROJECT NO.  
2014042  
 SHEET NO.  
1.3









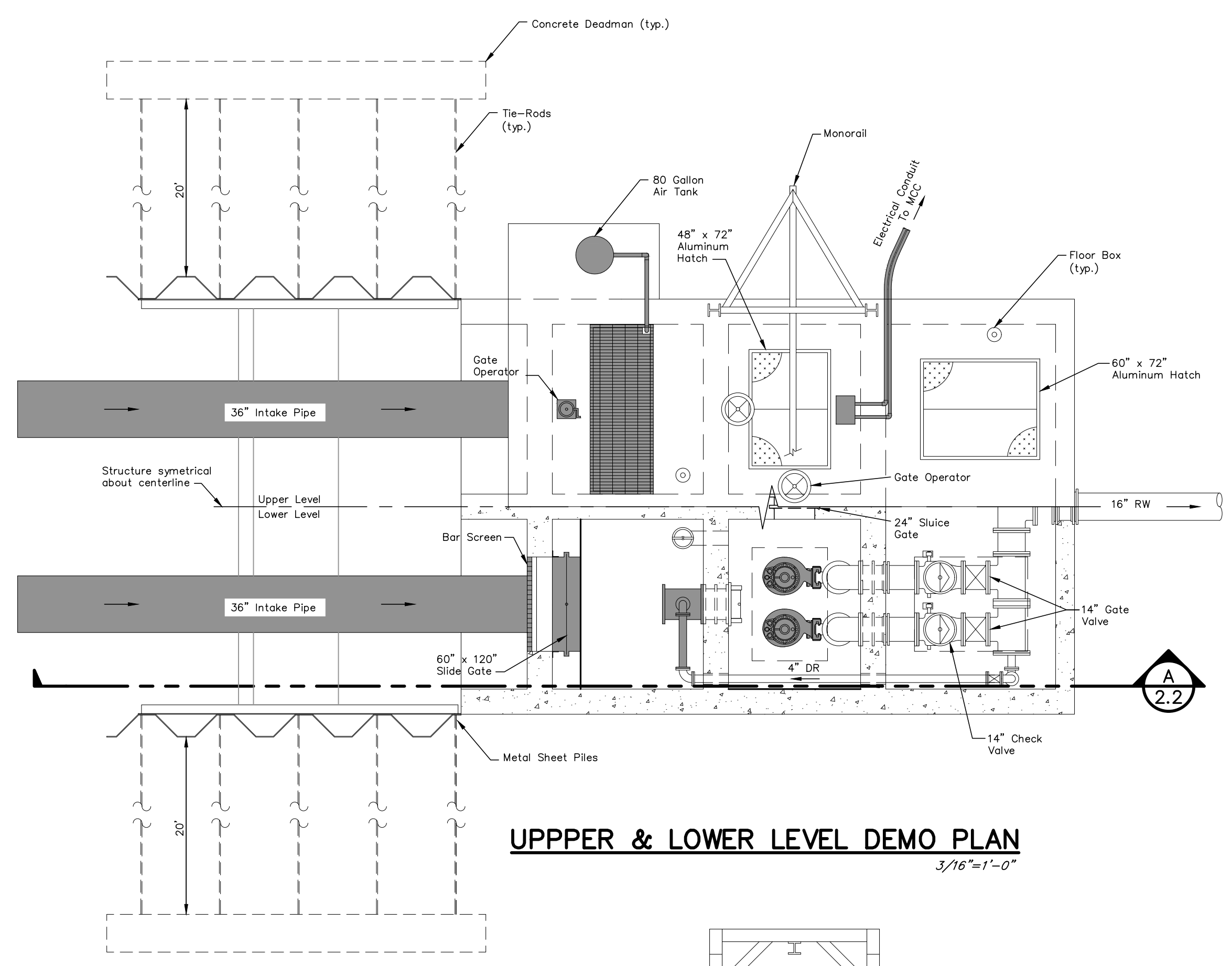
DRAWN BY: JKP
CHECKED BY: RWV
DATE: MAY 2019
SCALE: 3/16"=1'-0"
REVISIONS



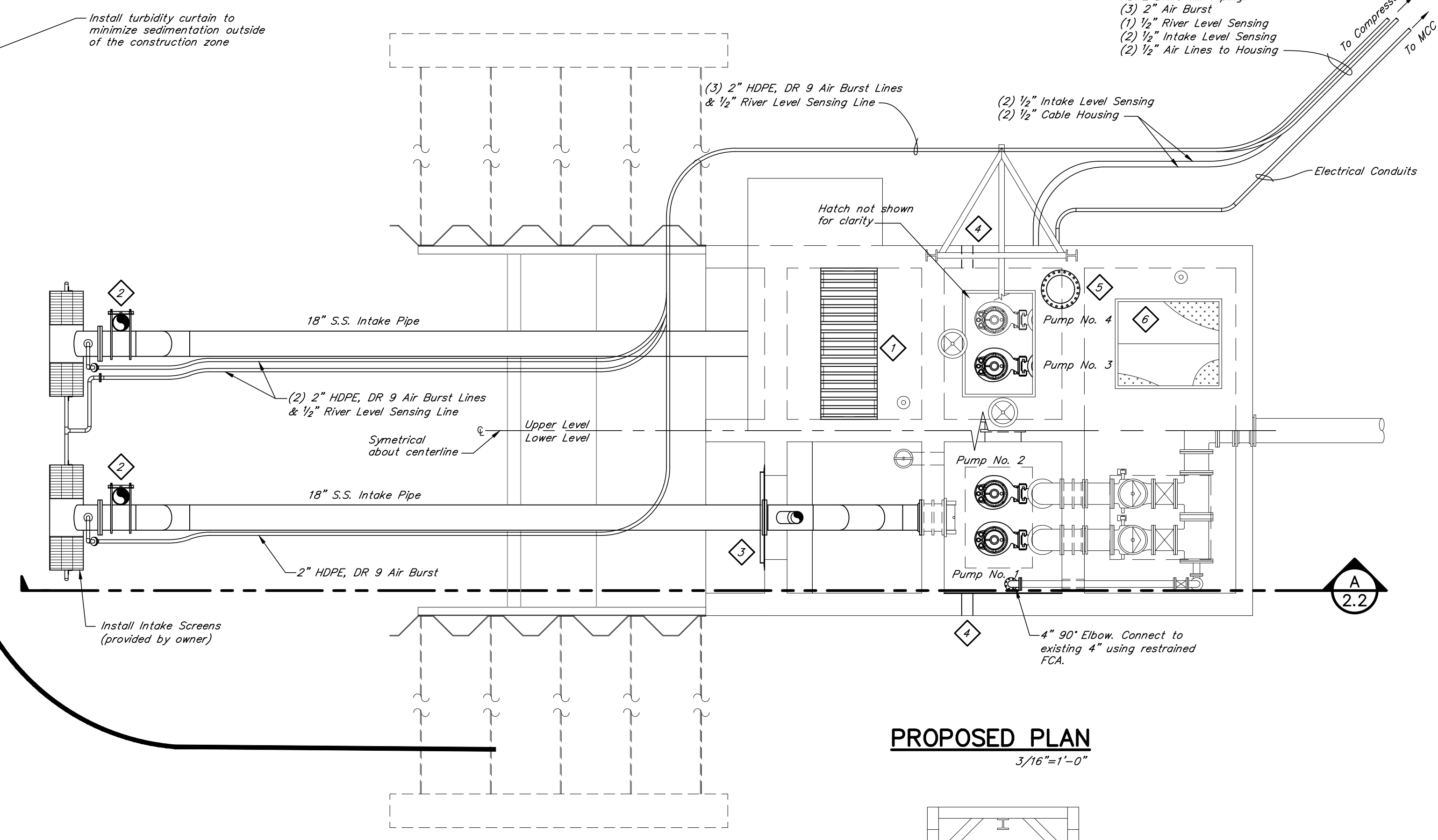
PUMP I.D.	STATUS	PUMP DATA		
		Drive	H.p.	GPM TDH
RW Pump No. 1	New	SS	50	1,500 80'
RW Pump No. 2	New	SS	50	1,500 80'
RW Pump No. 3	New	SS	30	1,500 80'
RW Pump No. 4	Existing	SS	30	1,000

- SHEET NOTES**
1. Install aluminum solid plank grating
  2. Install Pipe Supports on upstream side of Intake Pipes
  3. Install Stainless Steel Cover Plate over existing opening
  4. Core 8" hole in Intake Wall for pump chamber vent
  5. 20" Ductile Iron Cable Housing
  6. Existing Pump No. 4 to remain

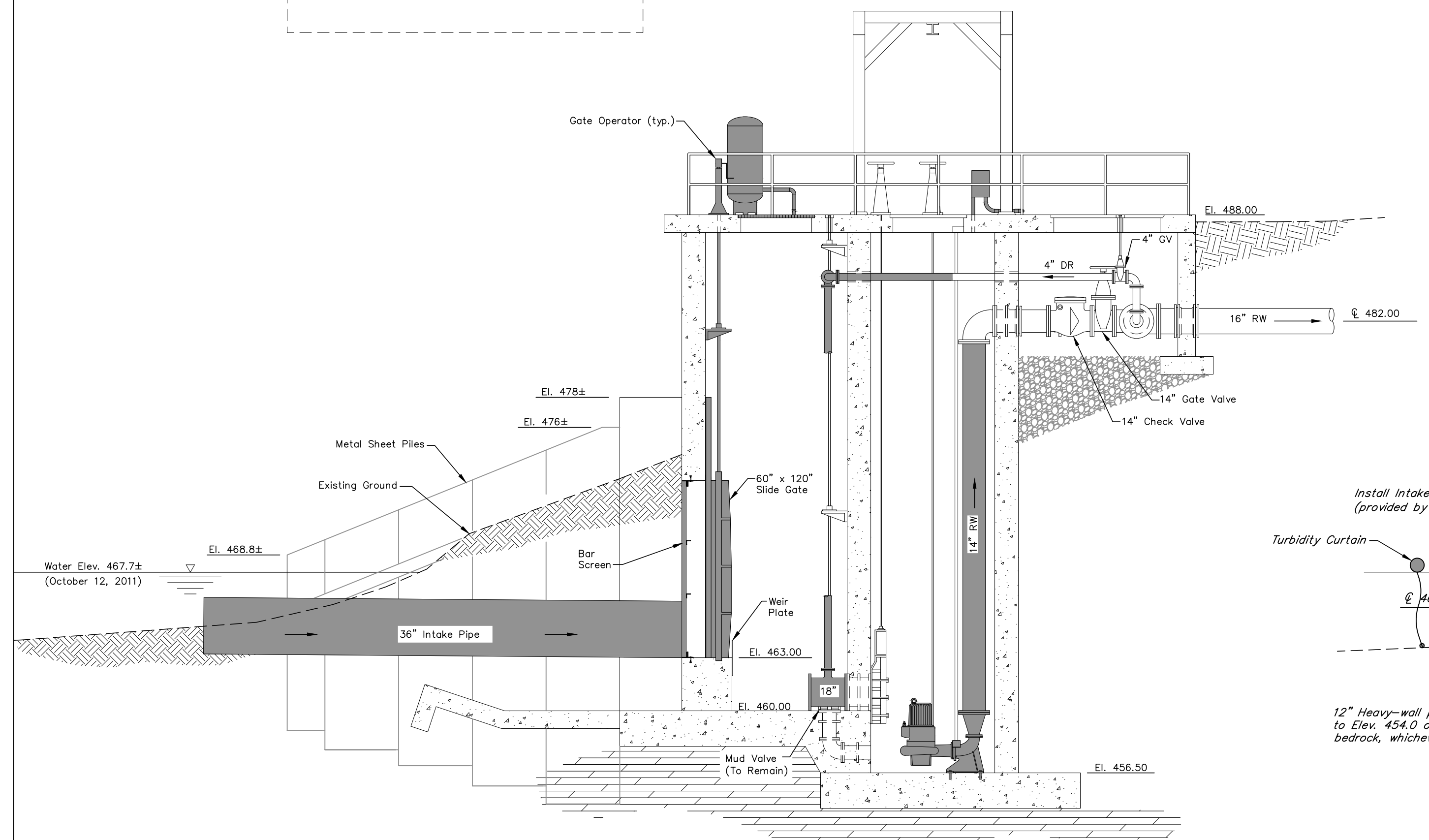
- GENERAL NOTES:**
1. Structure is symmetrical about centerline. All work shown on each side of the centerline either above and/or below the top slab of structure is required on both sides.
  2. Major items to be removed (shaded) include but are not limited to: Grating, Intake Pipes, Air Tank piping, Bar Screens, Slide Gates, Gate Operators, Pumps, and all associated appurtenances.
  3. The Contractor will be responsible for obtaining a qualified and approved Biologist to inspect and relocate any mussels found within the area of the turbidity curtain.
  4. Any openings and/or penetrations in the concrete that remain after demolition shall be grouted to the original condition.
  5. All SS piping shall be 304 Stainless Steel, Sch. 10.
- Shaded areas indicate items to be removed



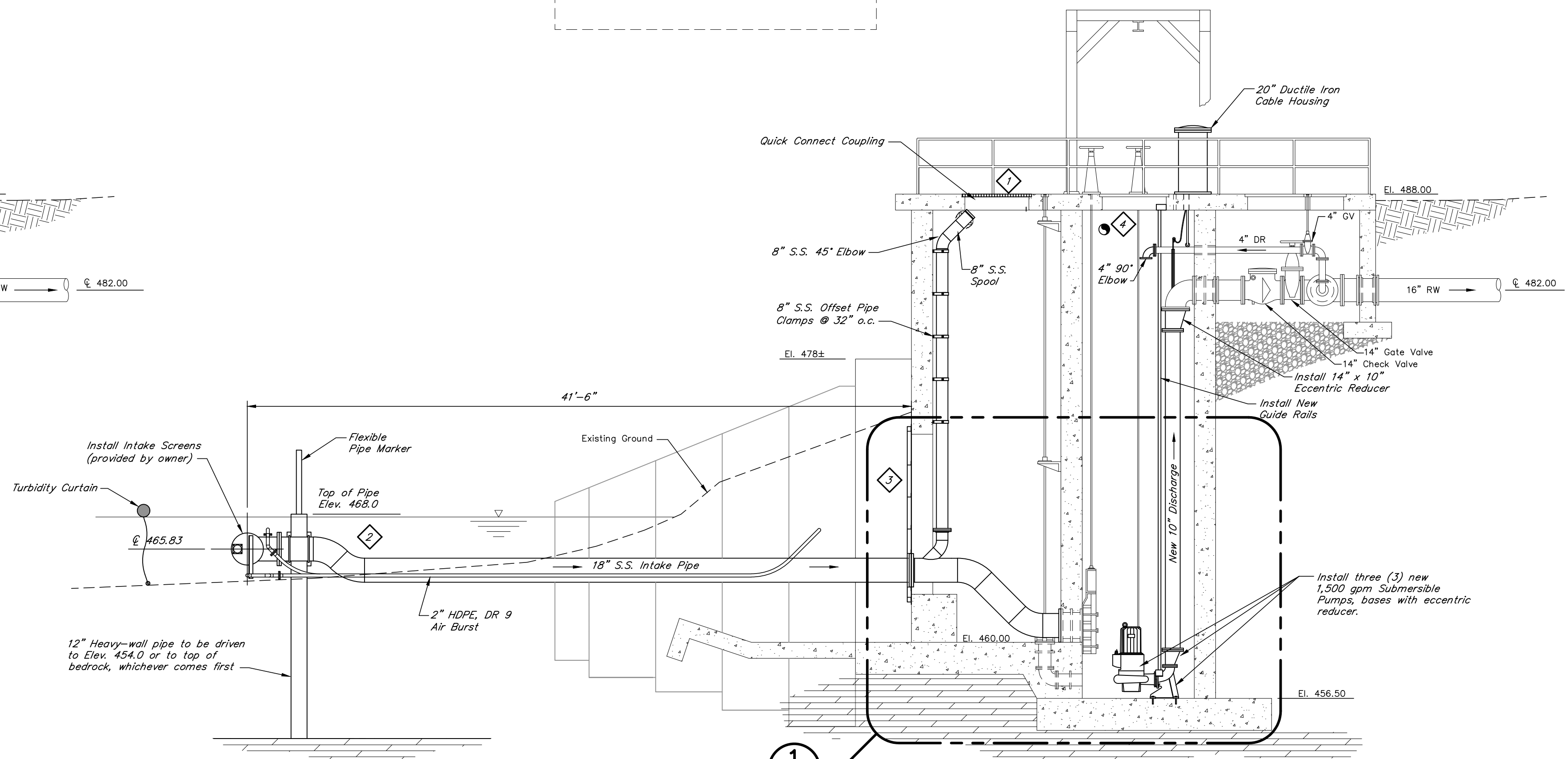
**UPPPER & LOWER LEVEL DEMO PLAN**  
3/16"=1'-0"



**PROPOSED PLAN**  
3/16"=1'-0"



**DEMO PLAN SECTION A-2.2**  
3/16"=1'-0"



**PROPOSED PLAN SECTION A-2.2**  
3/16"=1'-0"

N:\P\2014042\PIANS\2.2 River Intake Plan Sections.dwg, 5/23/2019 10:50:13 AM, pth, DWG To PDF.pc3





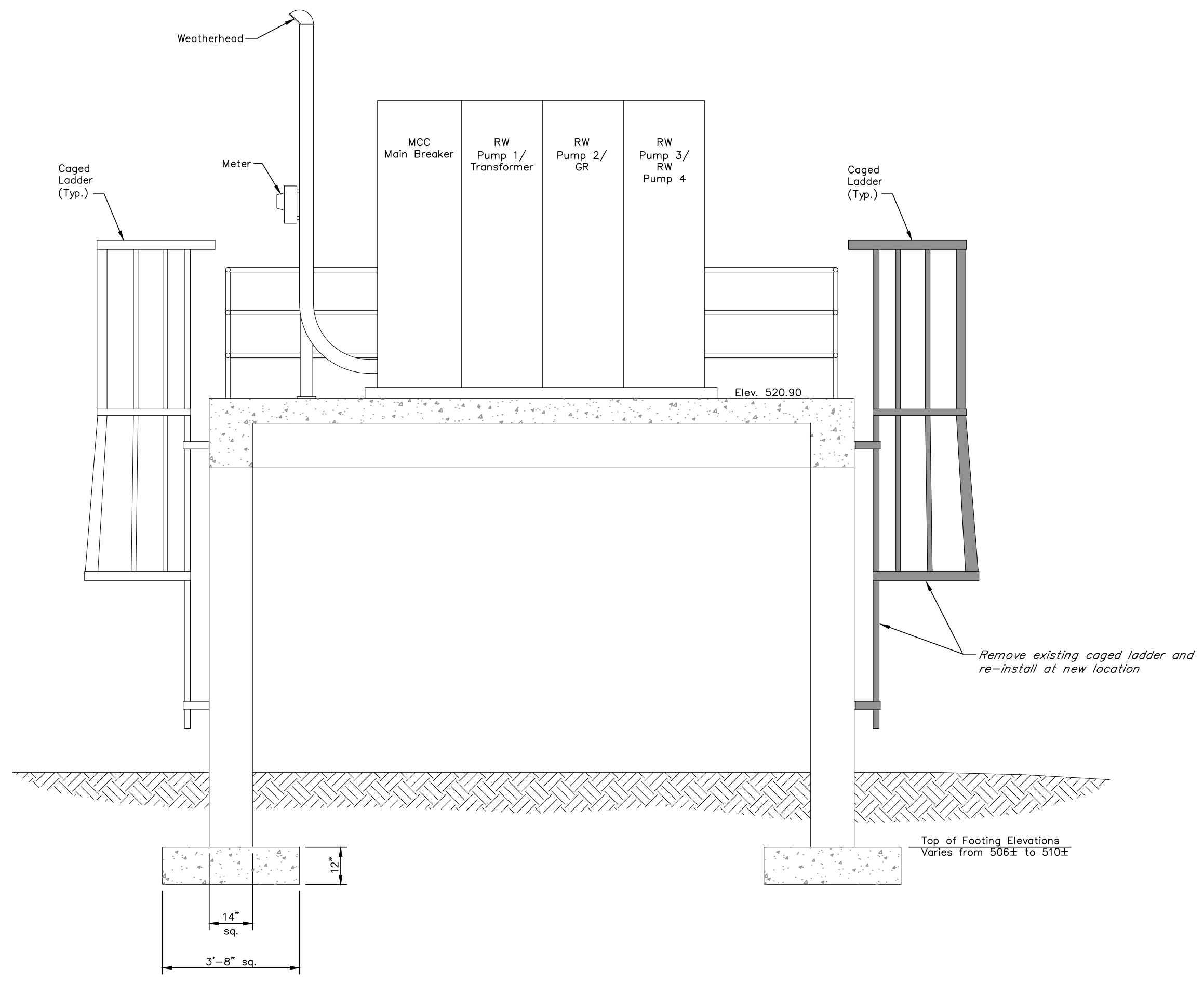




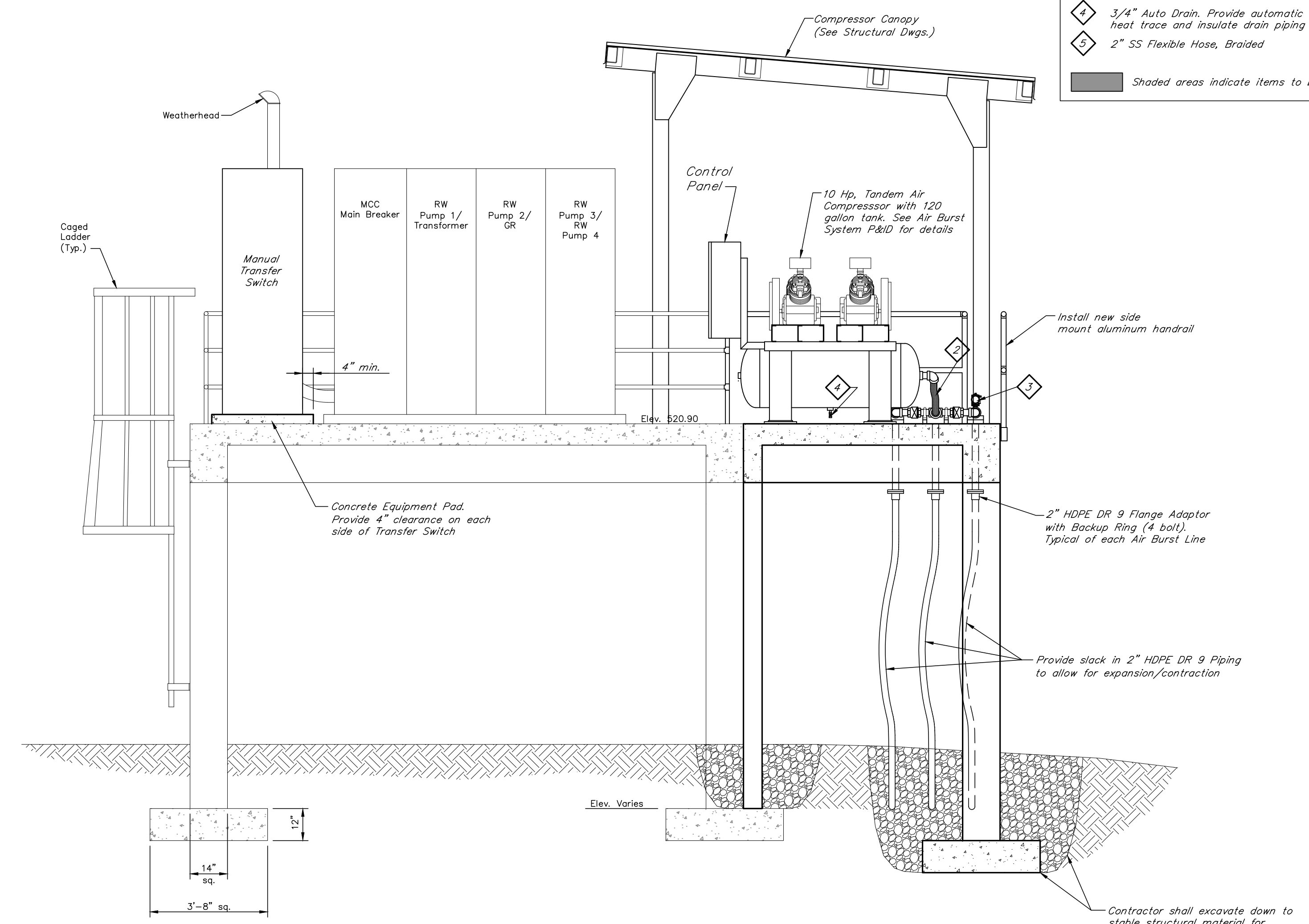
DRAWN BY: JKP
CHECKED BY: RWV
DATE: MAY 2019
SCALE: 3/8"=1'-0"
REVISIONS



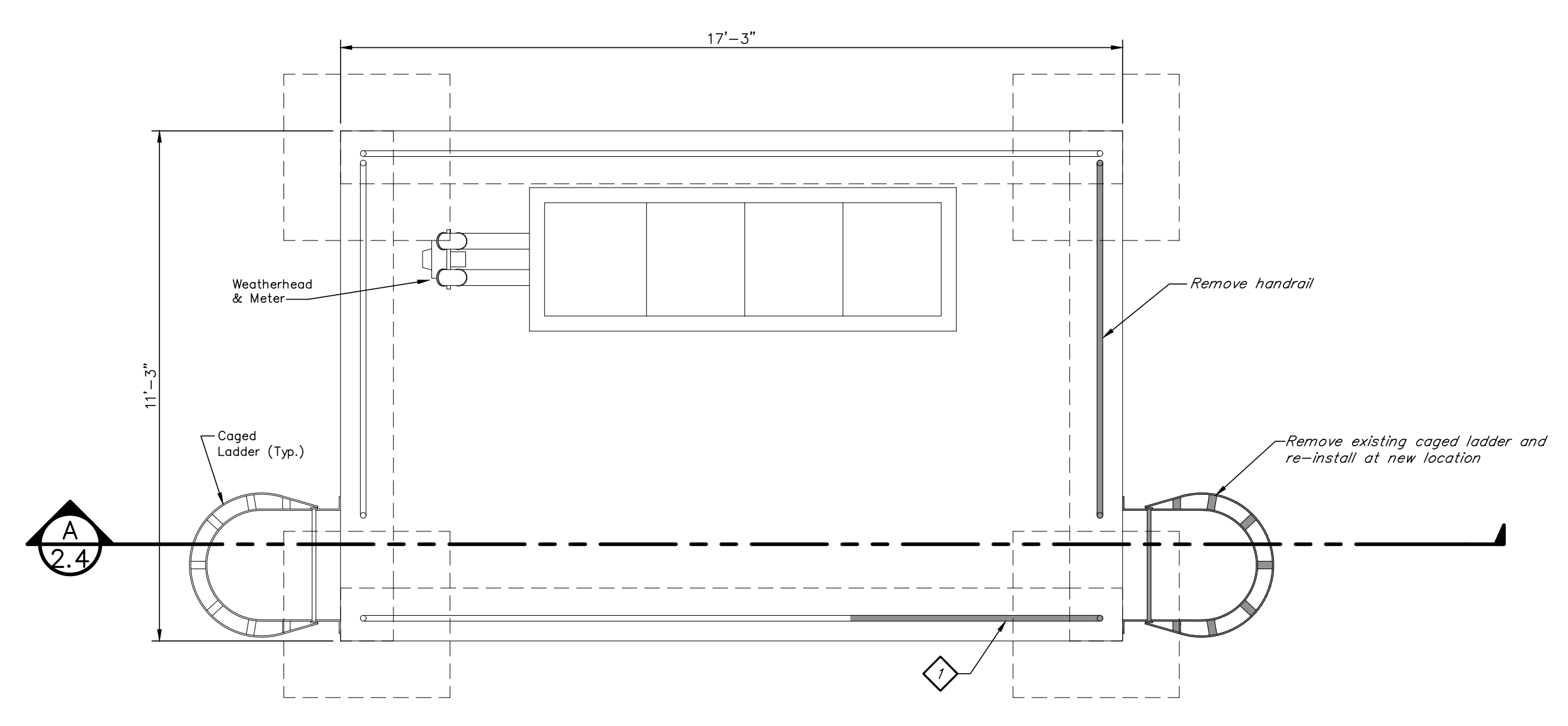
- SHEET NOTES**
- 1 Remove end section of handrail in preparation of relocating existing caged ladder to this location.
  - 2 2" SS Flexible Hose, Braided
  - 3 2" Electric Actuated, Solenoid Control Ball Valves
  - 4 3/4" Auto Drain, Provide automatic thermostat controls, heat trace and insulate drain piping
  - 5 2" SS Flexible Hose, Braided
- Shaded areas indicate items to be removed



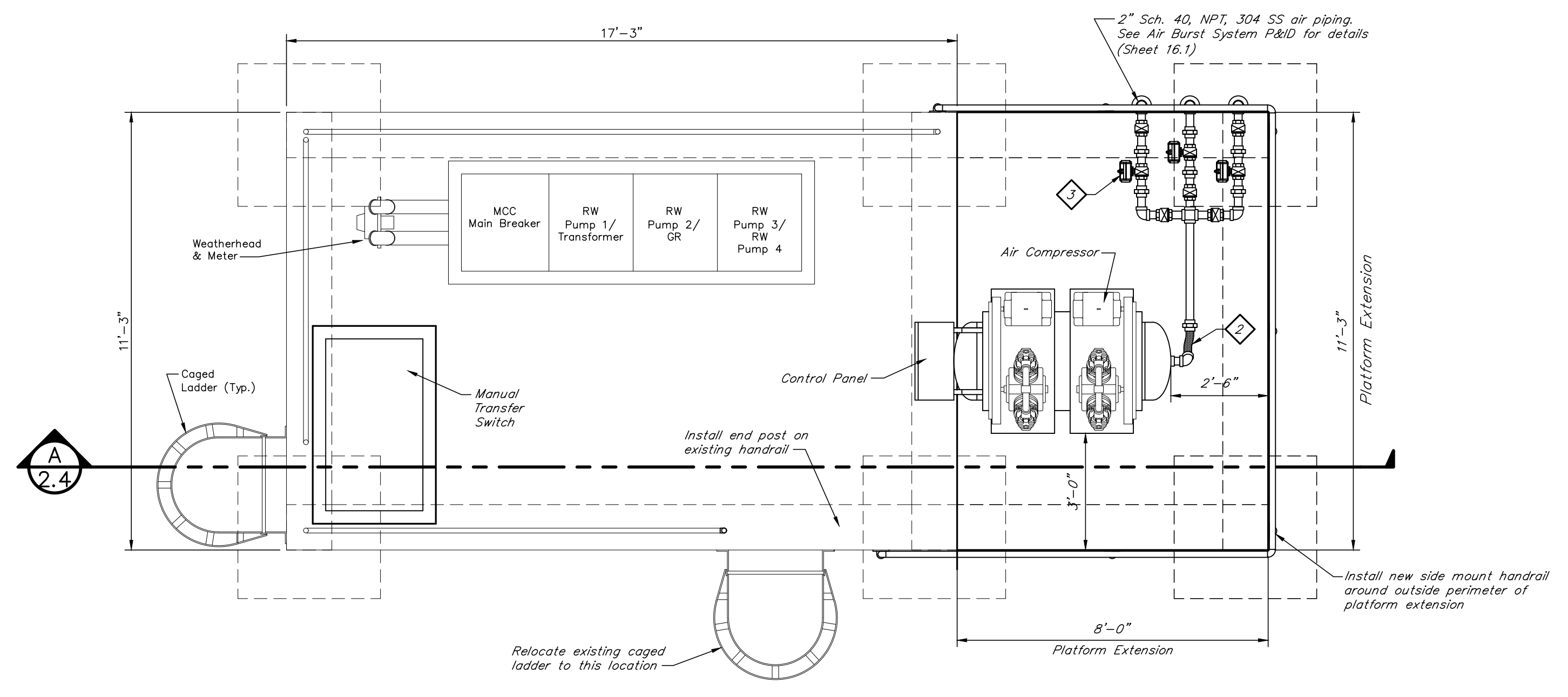
**MCC PLATFORM DEMOLITION SECTION A-2.4**  
3/8"=1'-0"



**MCC PLATFORM SECTION A-2.4**  
3/8"=1'-0"



**MCC PLATFORM DEMOLITION PLAN A-2.4**  
3/8"=1'-0"



**MCC PLATFORM MODIFICATIONS PLAN A-2.4**  
3/8"=1'-0"

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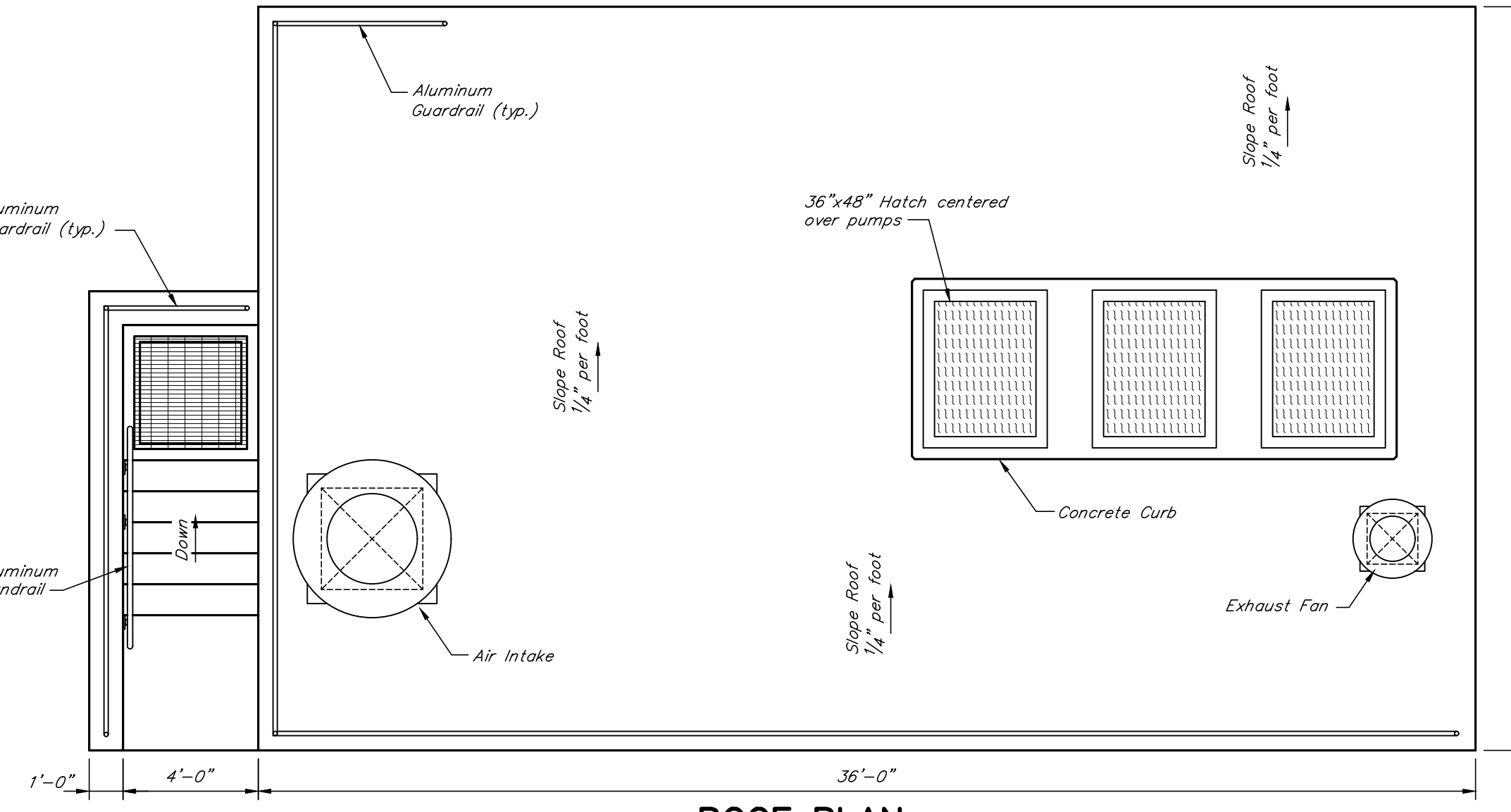
**GENERAL NOTES**

- Small piping, 2" and smaller, used for RW samples to be Sch. 40, 316 S.S. w/ NPT connections on the interior of the pump station. Piping to transition to HDPE, DR-9 outside of the building.

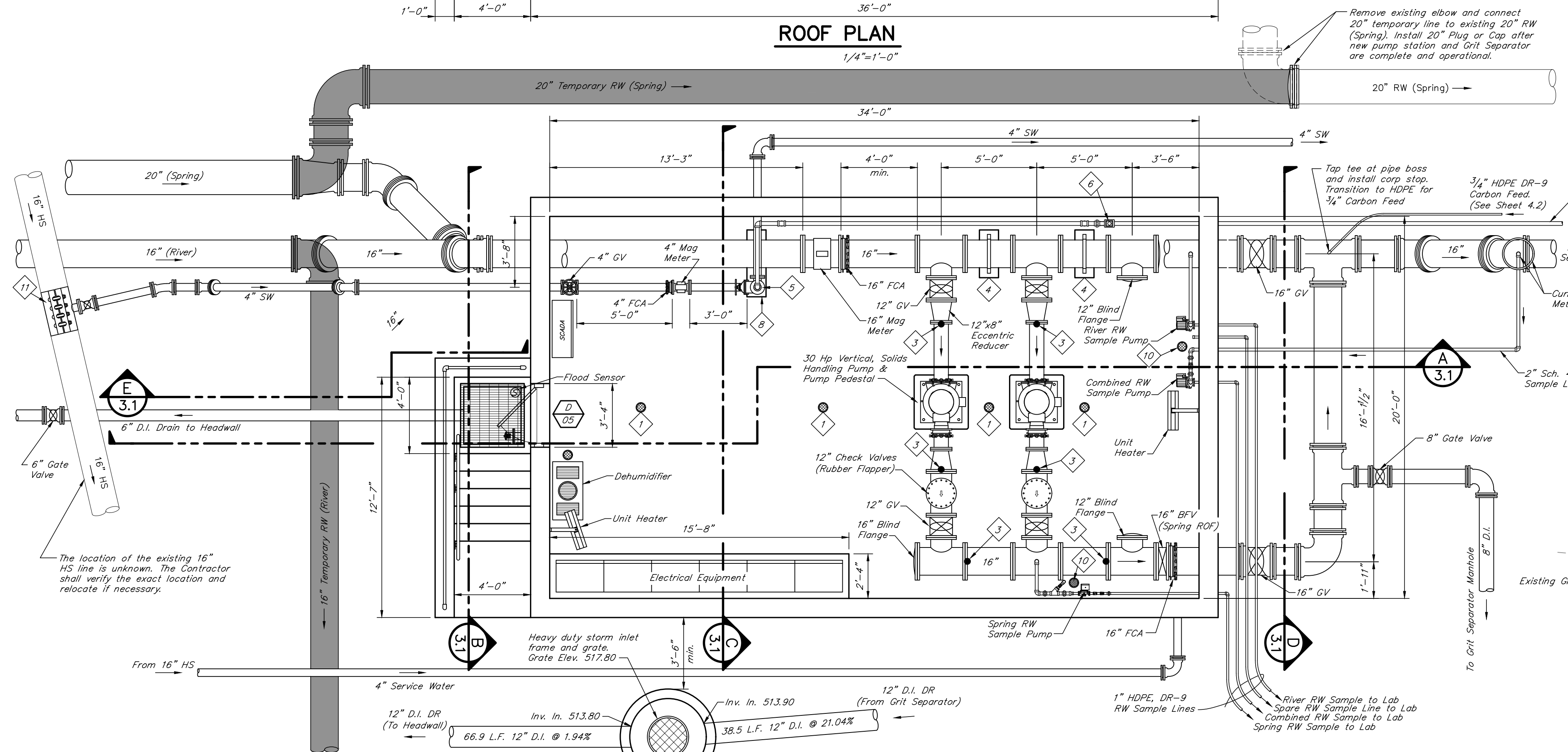
Denotes temporary pipelines during construction

**SHEET NOTES**

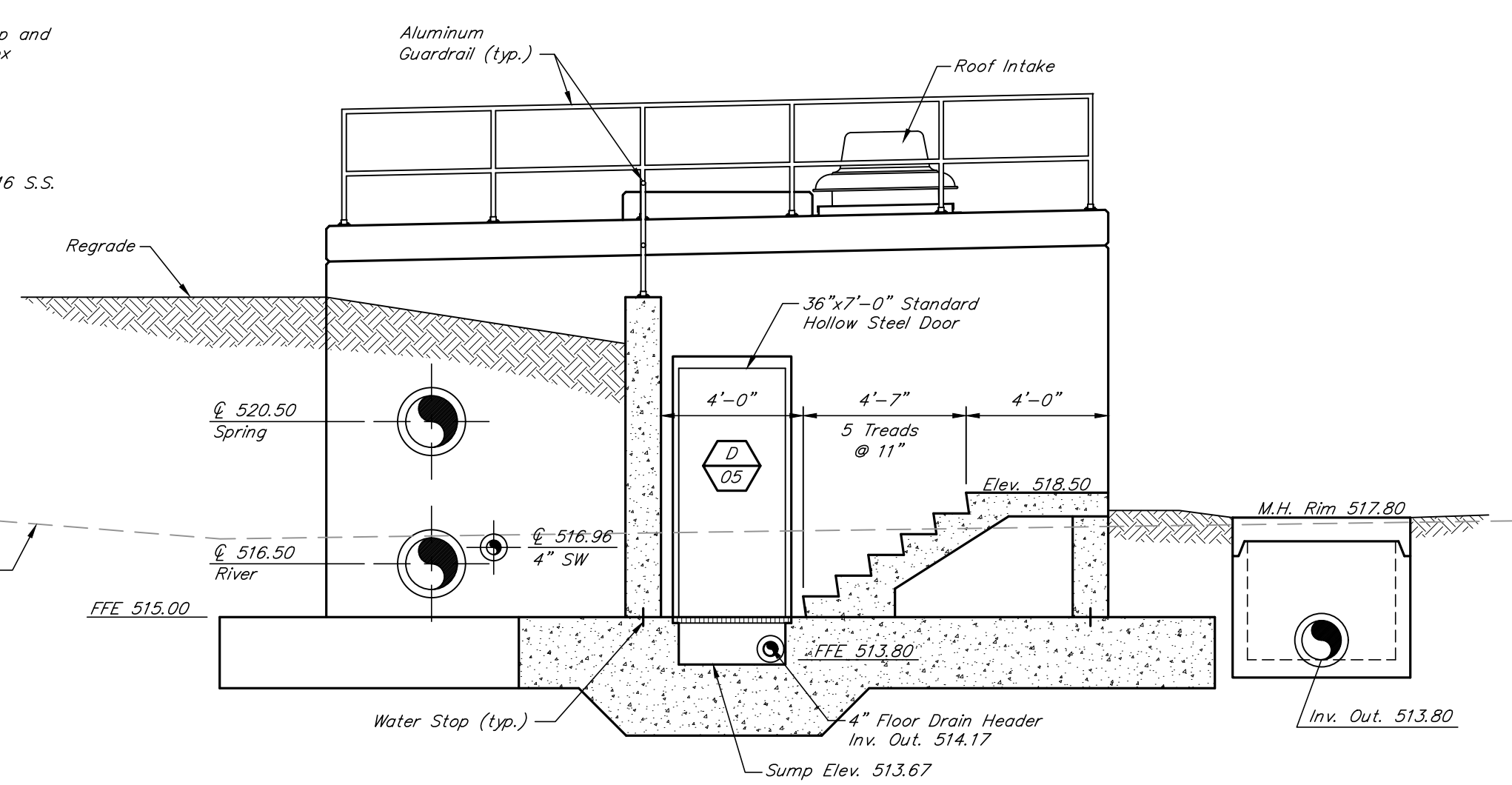
- Slope floor to drains 1/8" to 1/4" per foot
- Pipe Hangers (3 required)
- Flange Pipe Supports (6 required)
- Concrete Pipe Supports (3 required)
- 4" Blind Flange w/ 2" NPT Tap
- 2" Ball Valve with Electric Actuator
- 3/4" Hose Bib
- Lengthen Concrete pipe support to accommodate placement of 4" base elbow.
- Provide unistrut supports/bracing for all sample pumps.
- Provide Drum Trap Drain w/ 5" Strainer and 2" outlet for sample pump(s).
- 16"x4" Tapping Sleeve & Valve



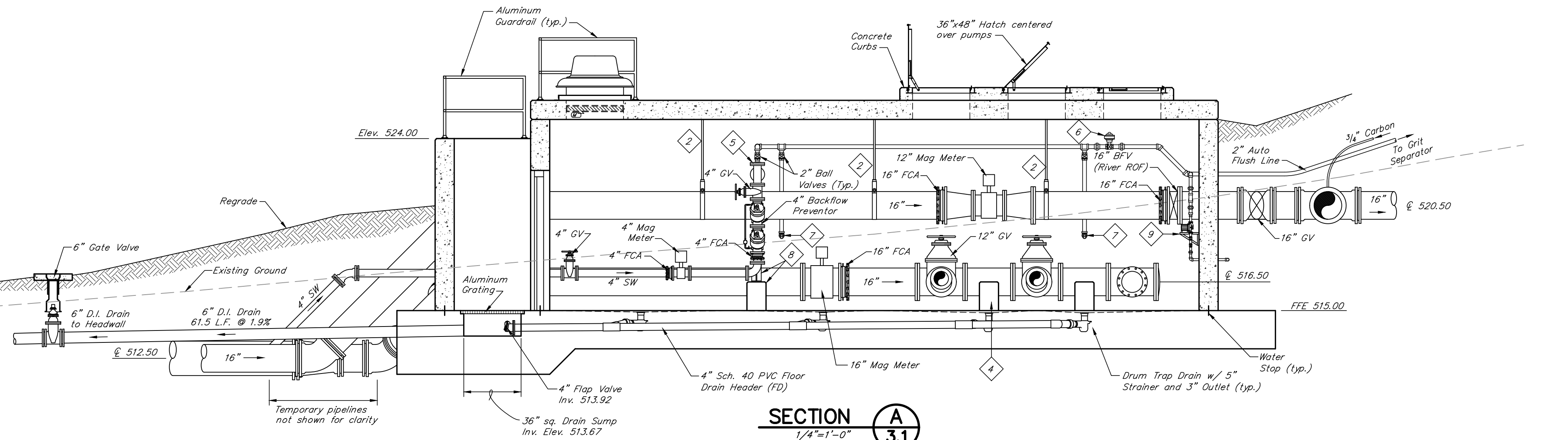
**ROOF PLAN**  
1/4"=1'-0"



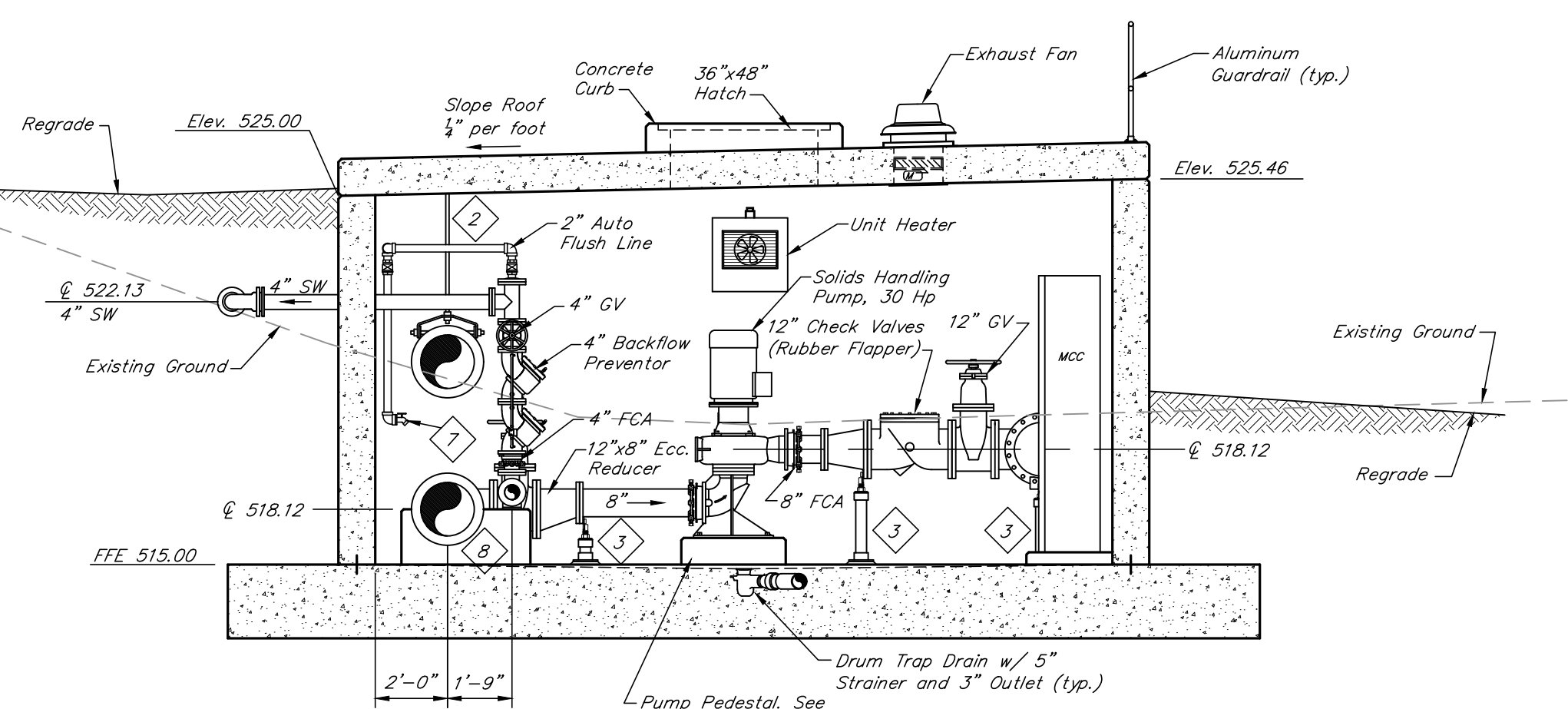
**FLOOR PLAN**  
1/4"=1'-0"



**SECTION B**  
1/4"=1'-0"



**SECTION A**  
1/4"=1'-0"

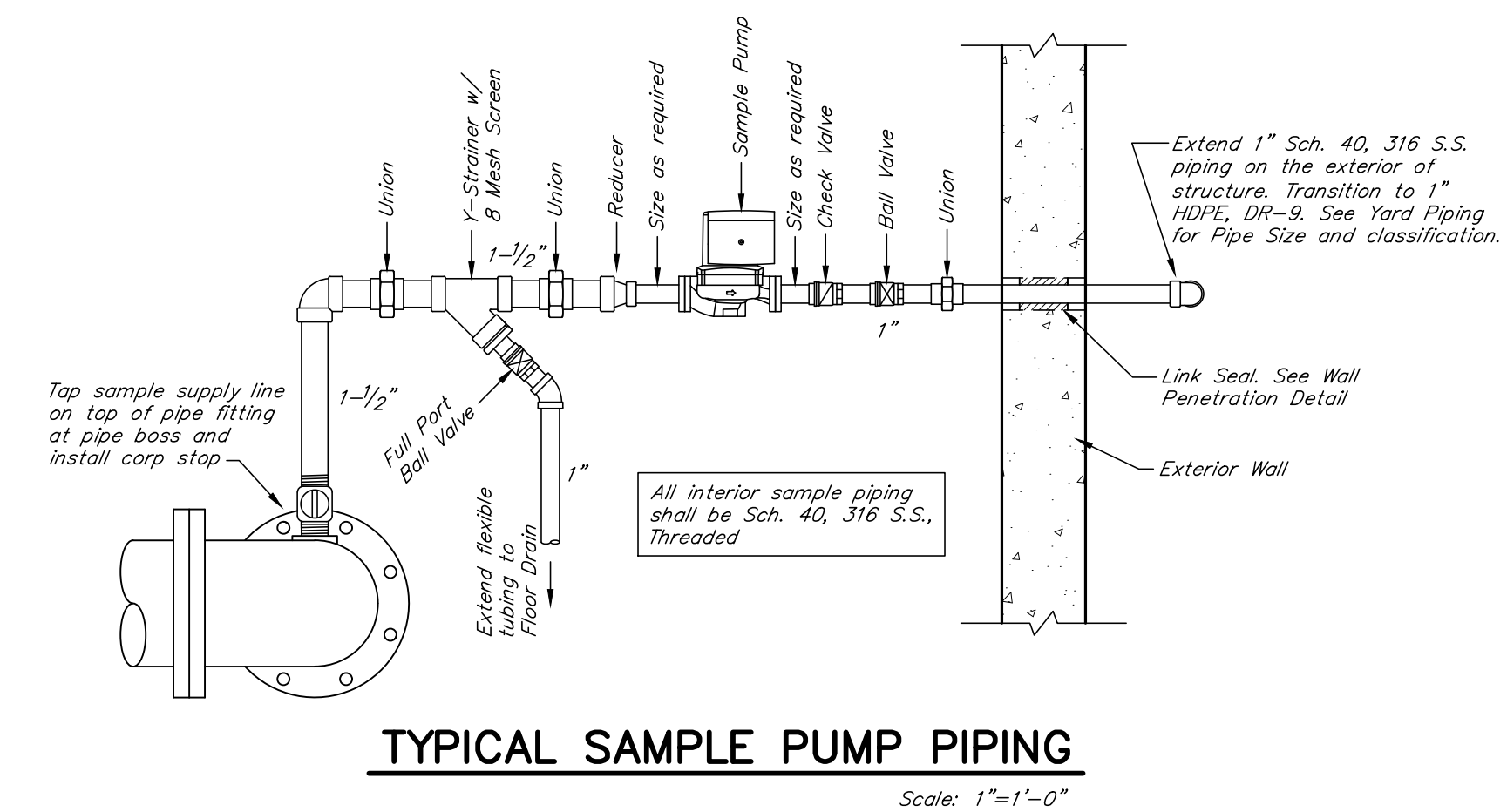
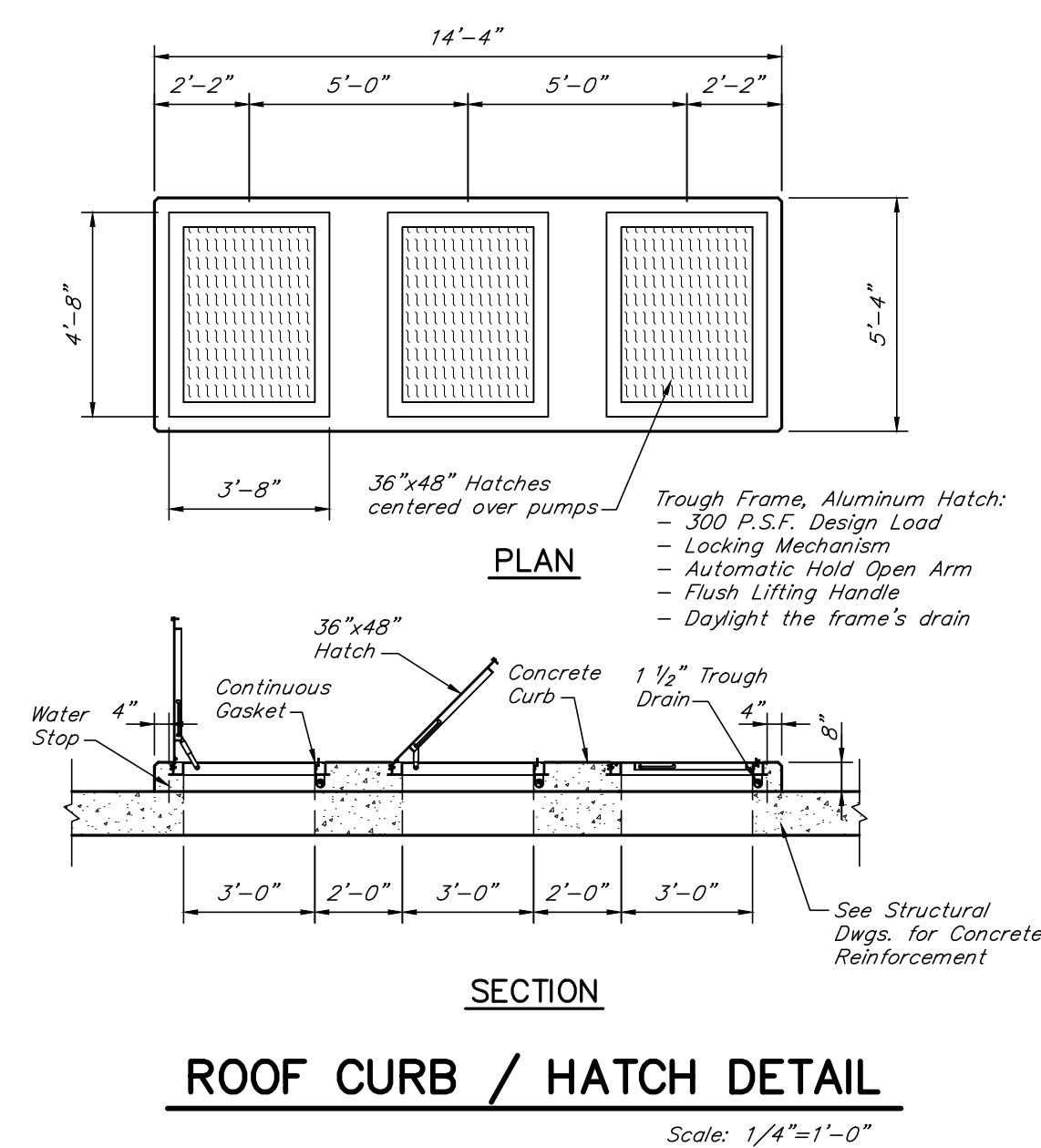
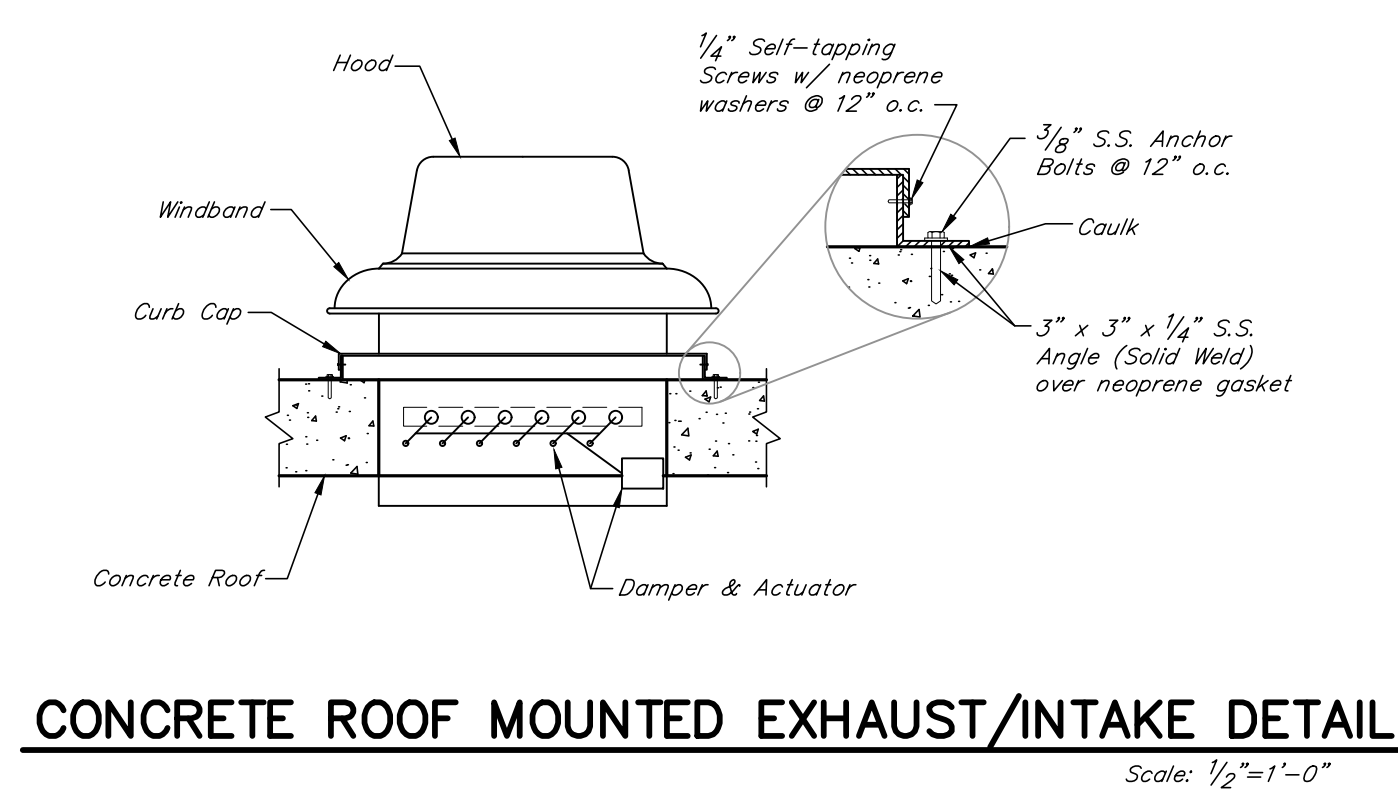
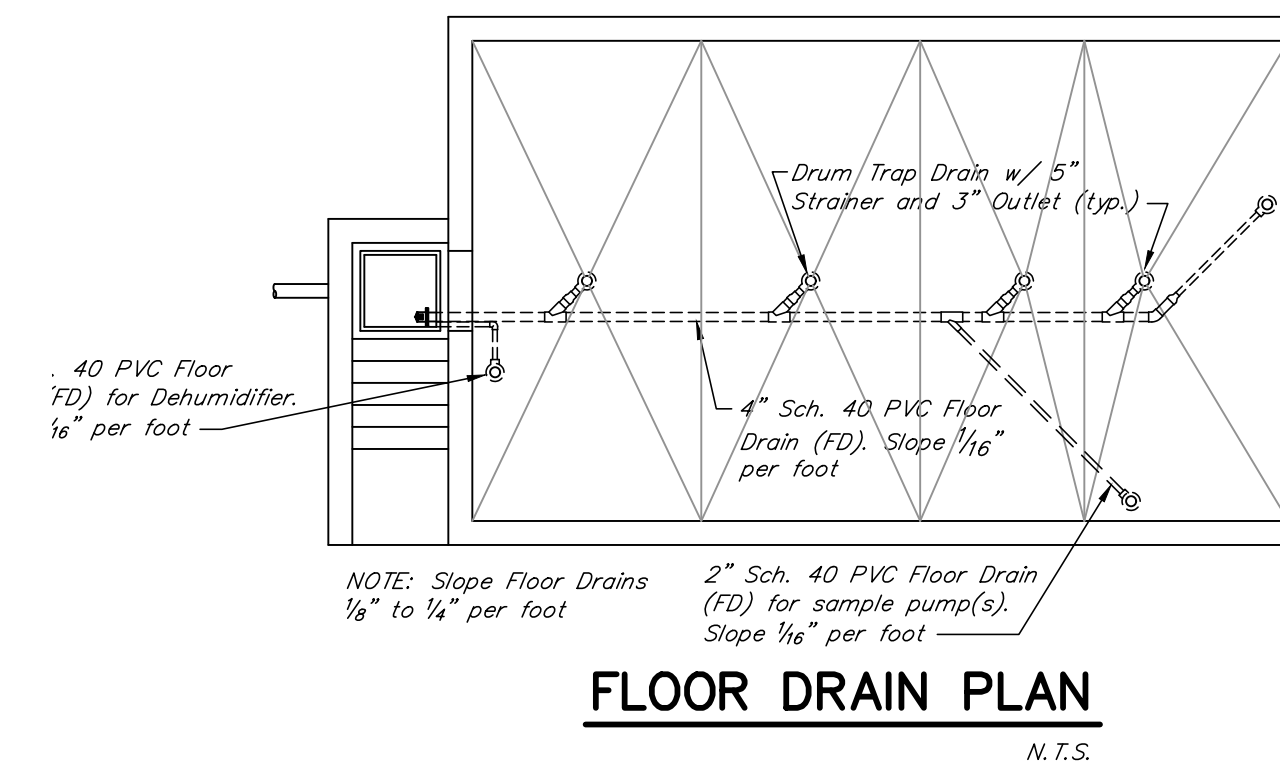
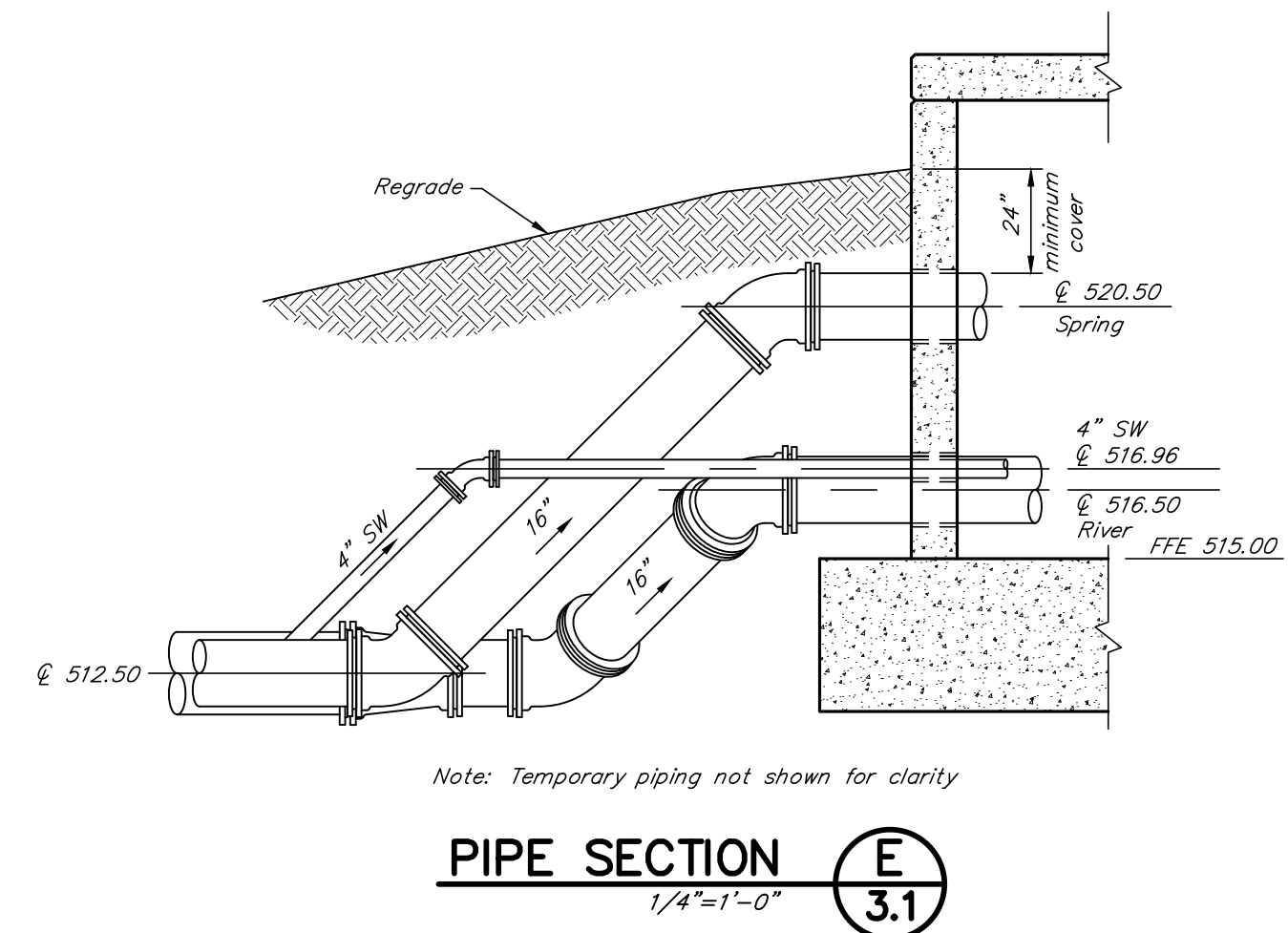
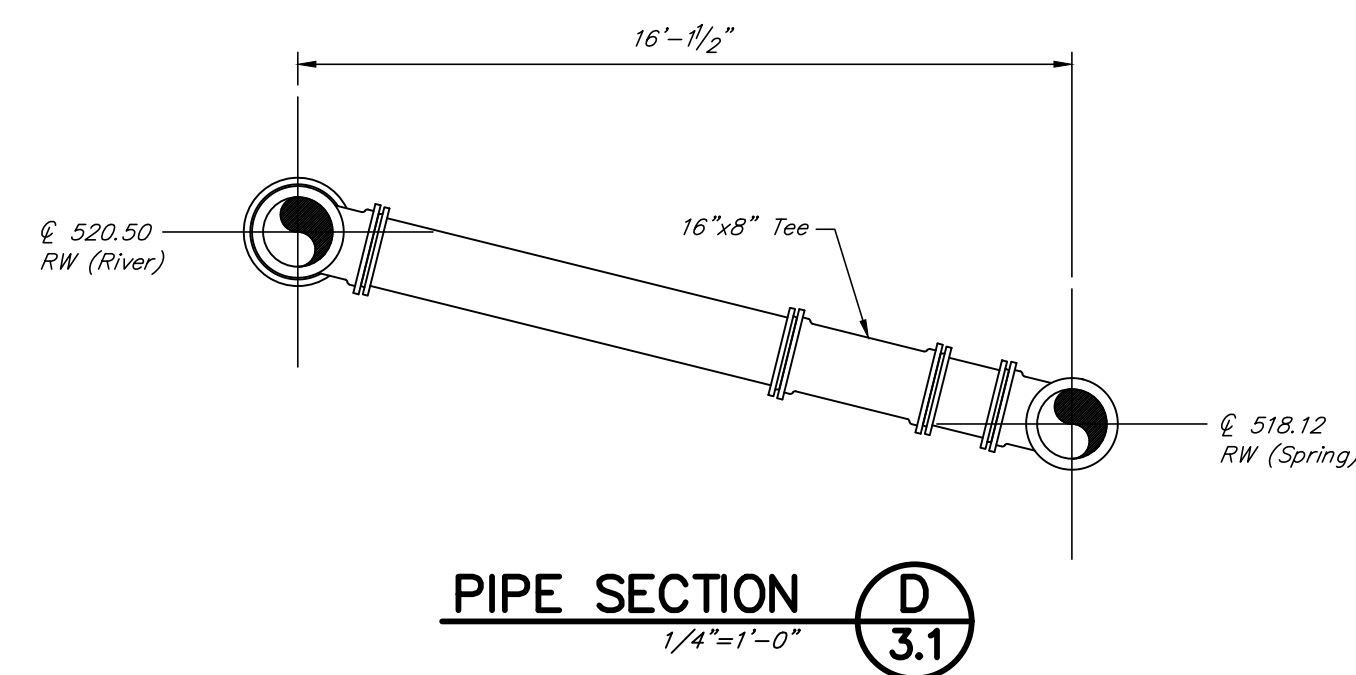


**SECTION C**  
1/4"=1'-0"

**SPRING WATER PUMP STATION**

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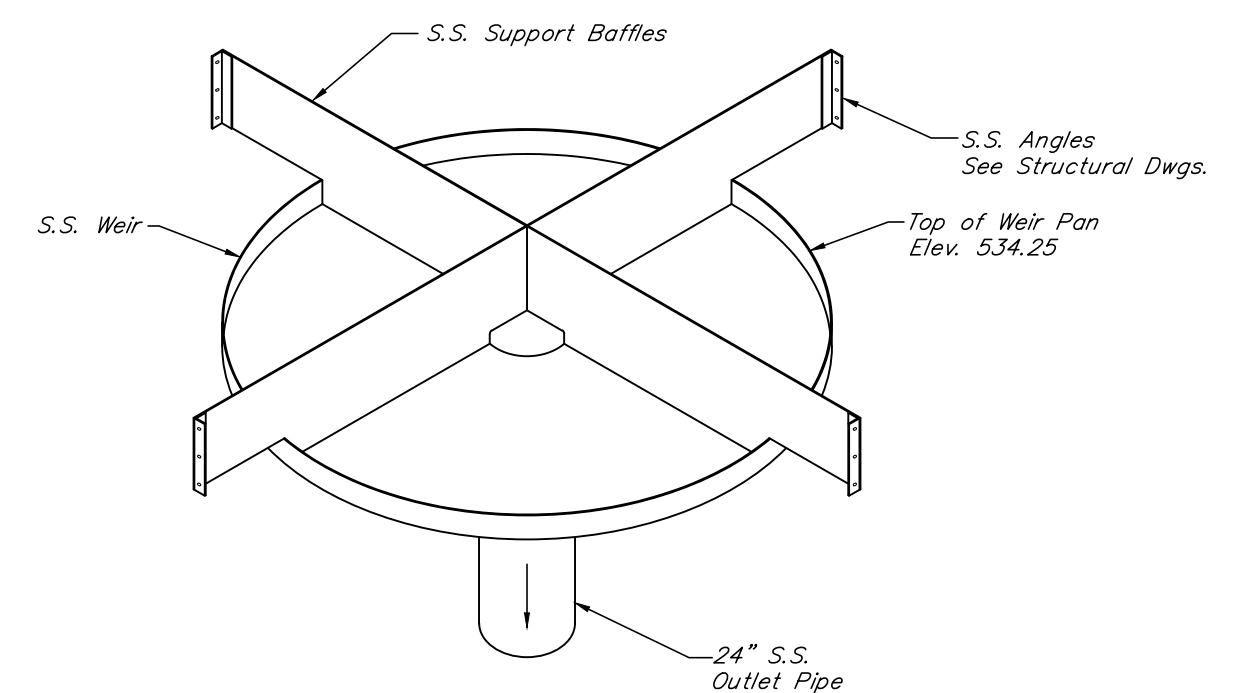




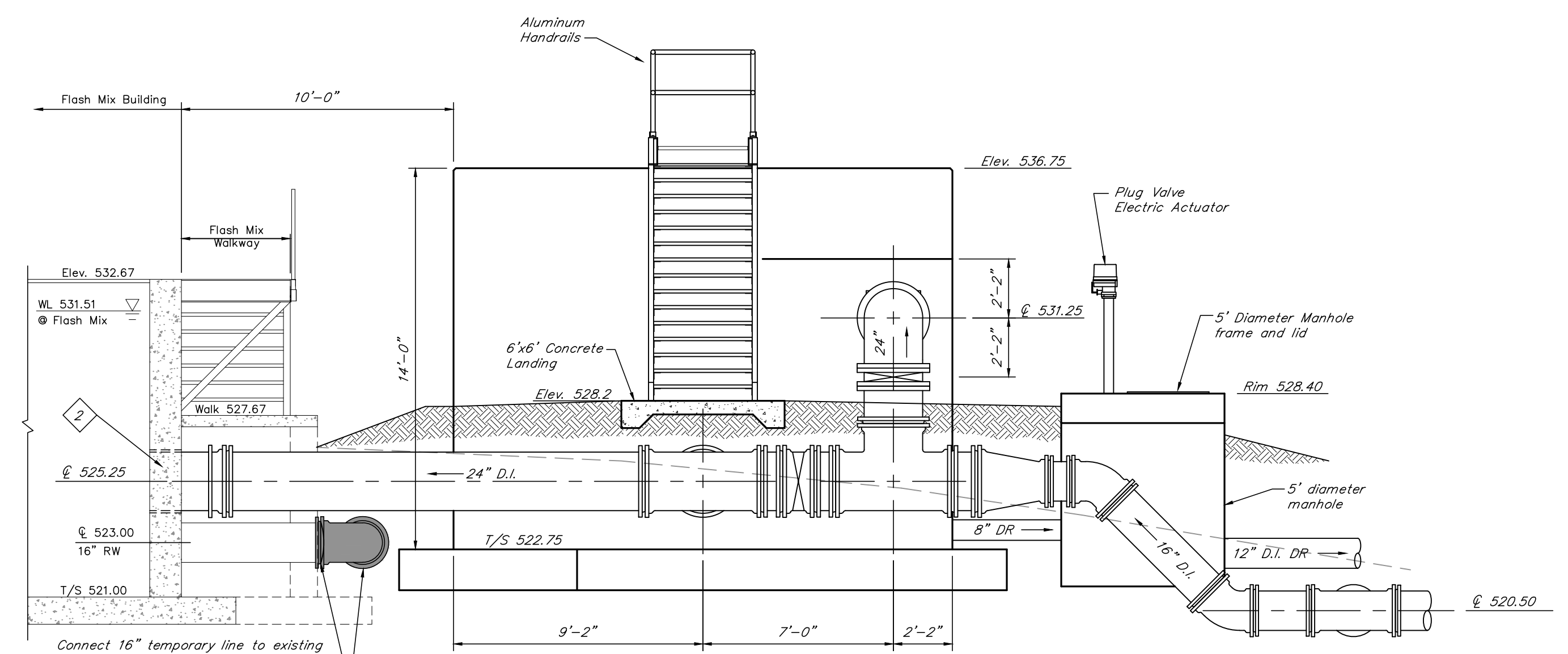
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SCALE: 1/4"=1'-0"
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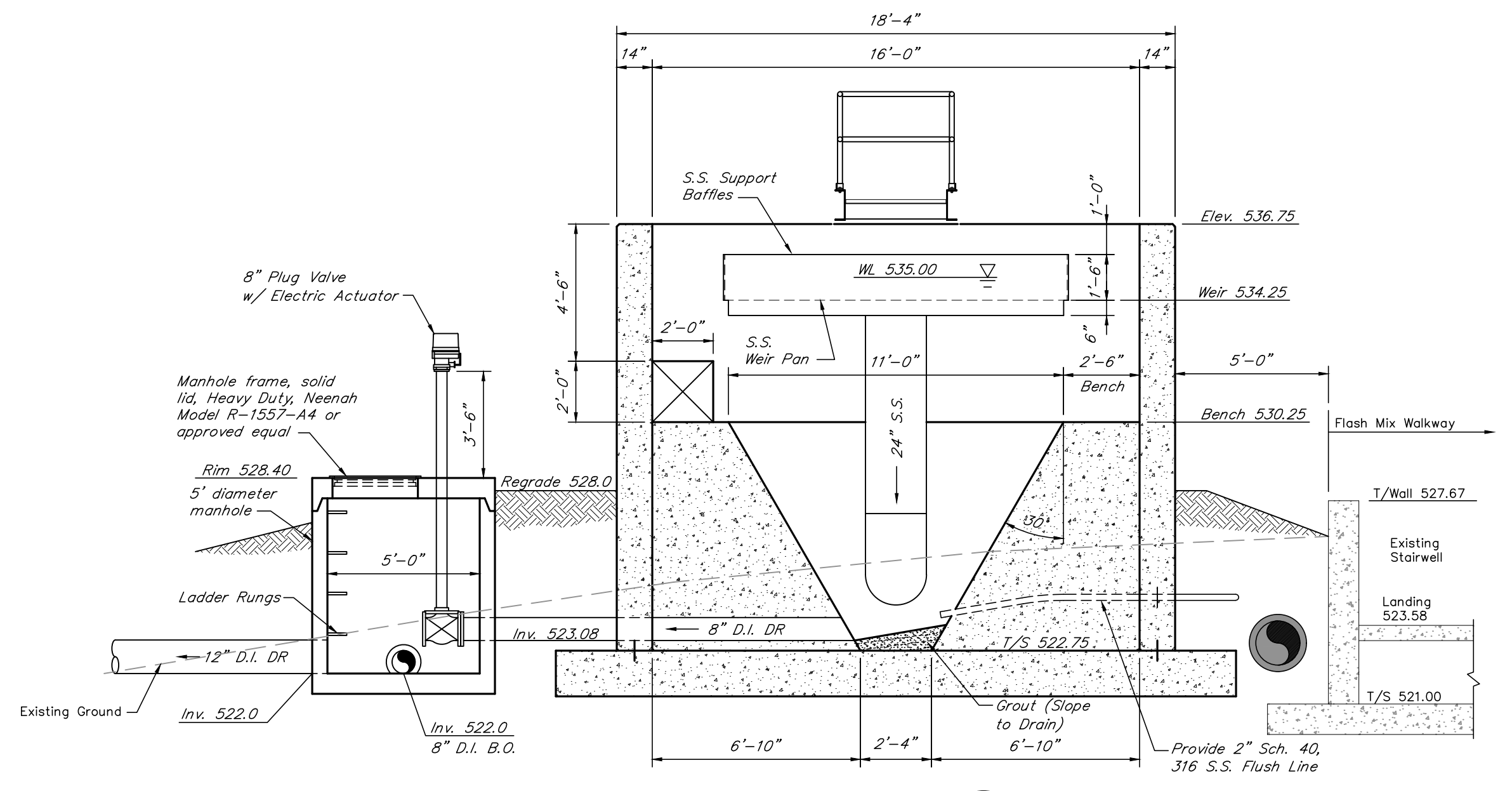
- SHEET NOTES**
- Combined RW Sample. Connect with Service Saddle and extend to RW Sample Pump in Spring Pump Station.
  - Core existing wall and use Link-Seal to install new 24". Pack cavity with non-shrink grout.
  - Tie into existing 2" Service Water with Service Saddle.
- Denotes temporary pipelines during construction
- GENERAL NOTES**
- Contractor shall perform Hydrostatic Test on finished structure prior to backfill per Concrete Specifications.



**WEIR & SUPPORT FRAME**  
N.T.S.

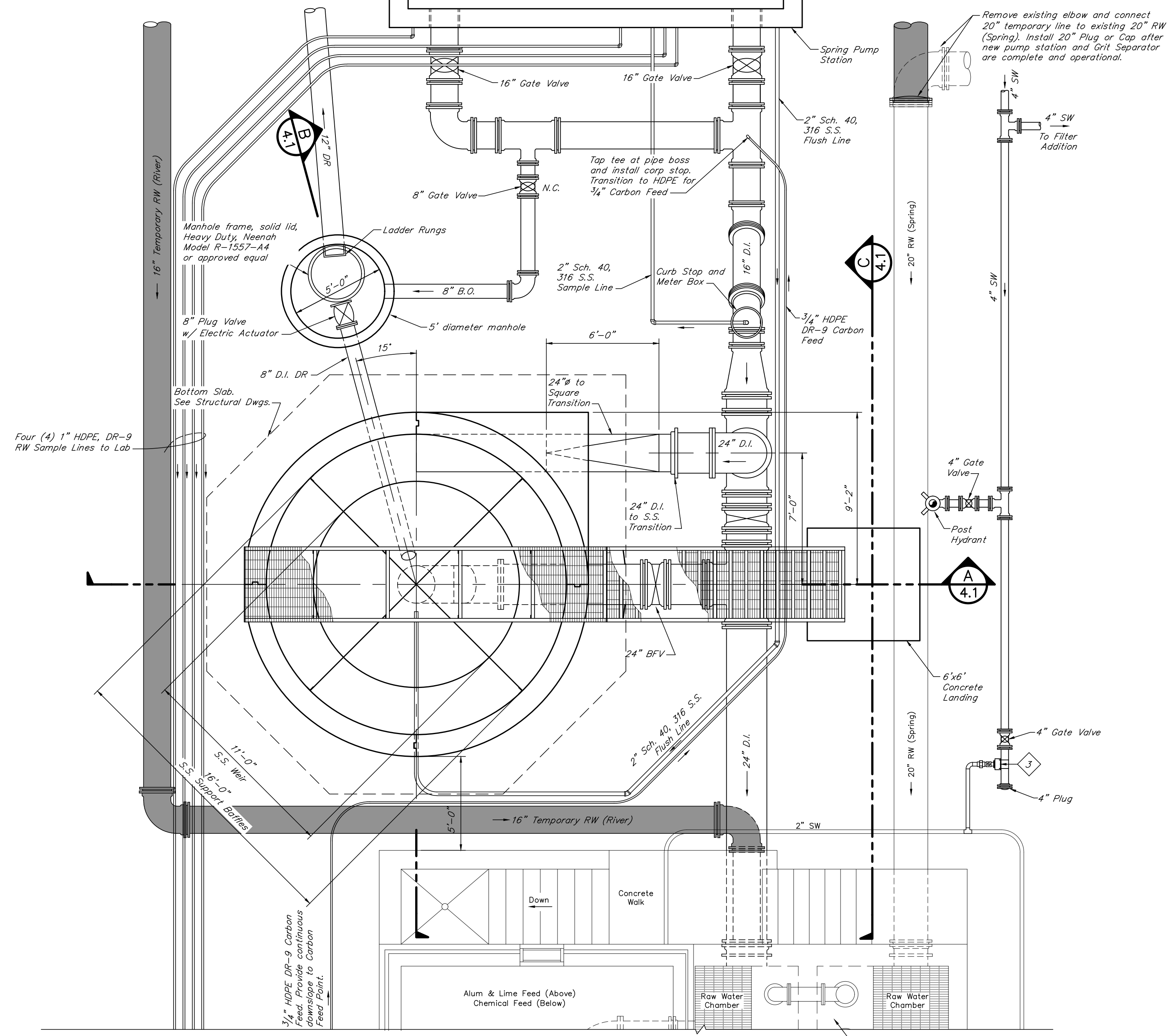


**ELEVATION C**  
1/4"=1'-0" **4.1**

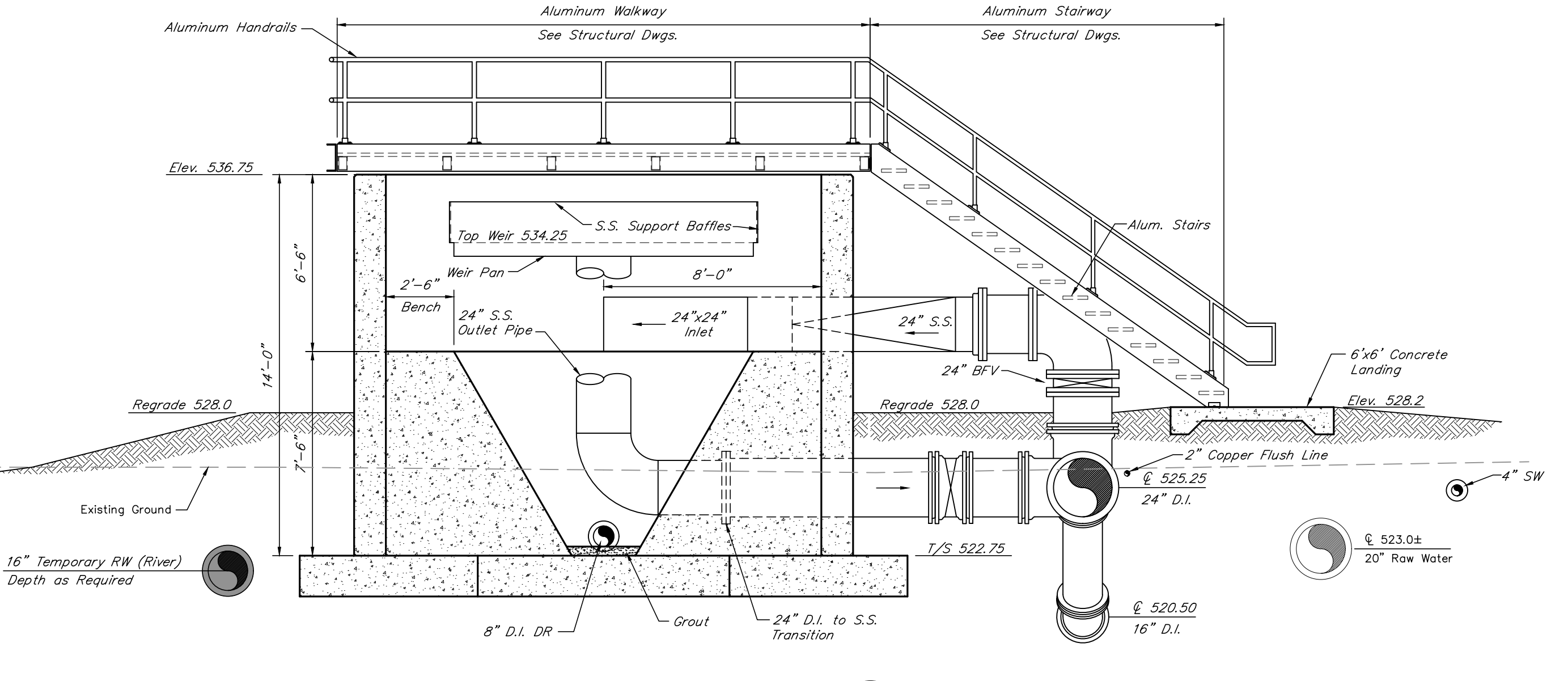


**SECTION B**  
1/4"=1'-0" **4.1**

**GRIT SEPARATOR & FLOW DISTRIBUTION**



**PLAN VIEW**  
1/4"=1'-0"



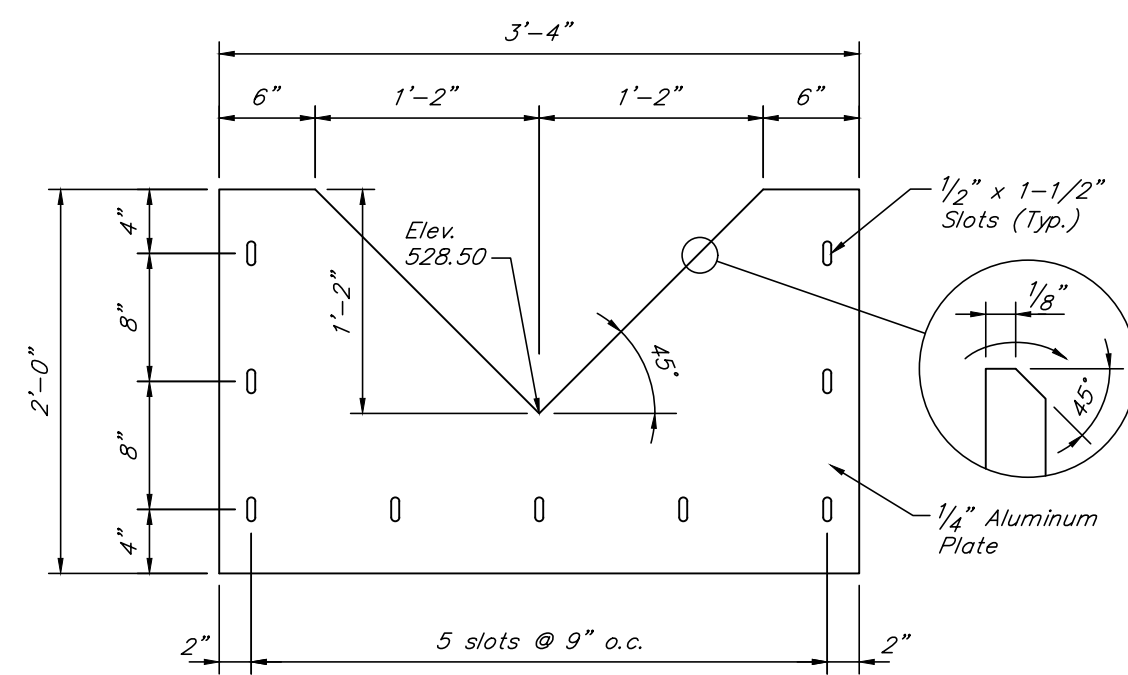
**SECTION A**  
1/4"=1'-0" **4.1**

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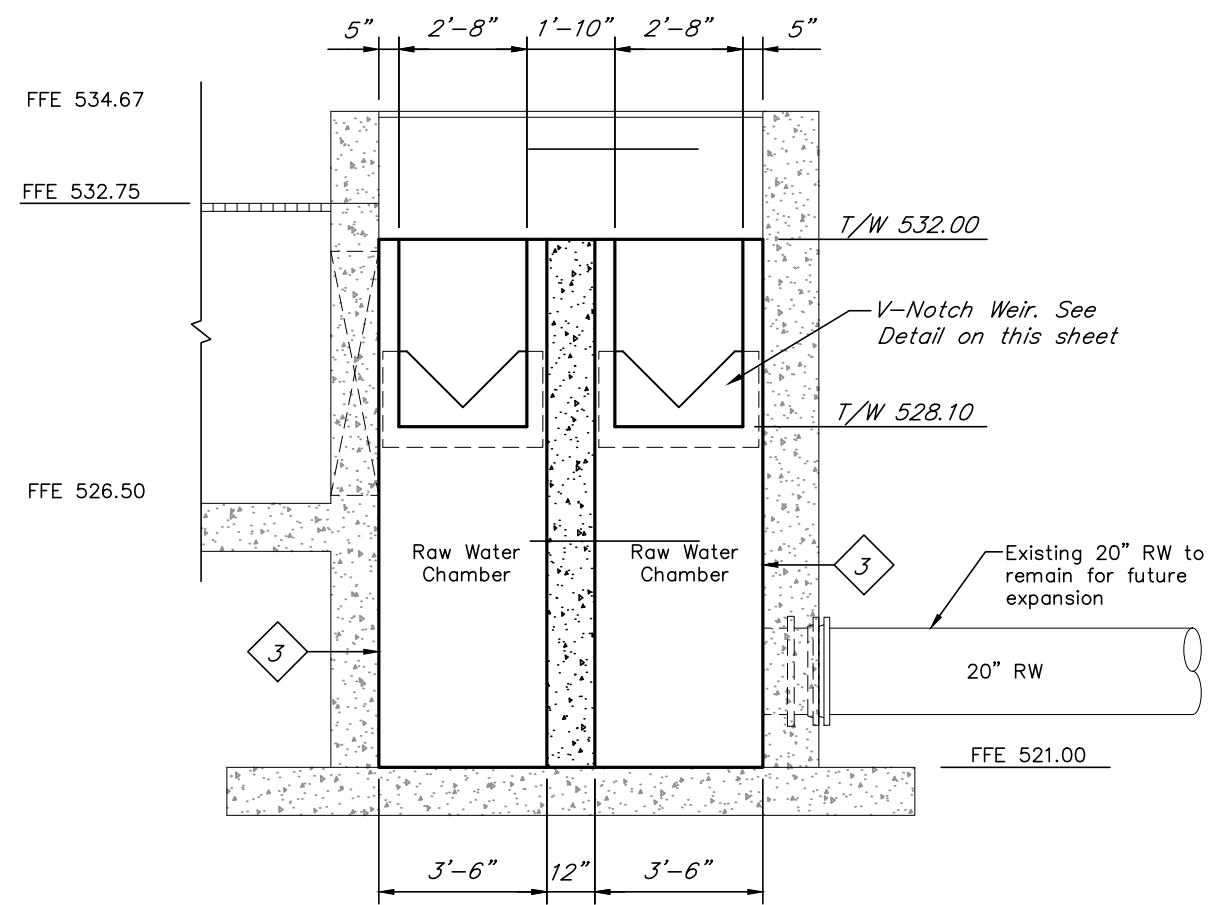


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CHECKED BY: RW
DATE: MAY 2019
SCALE: 1/4" = 1'-0"
REVISIONS

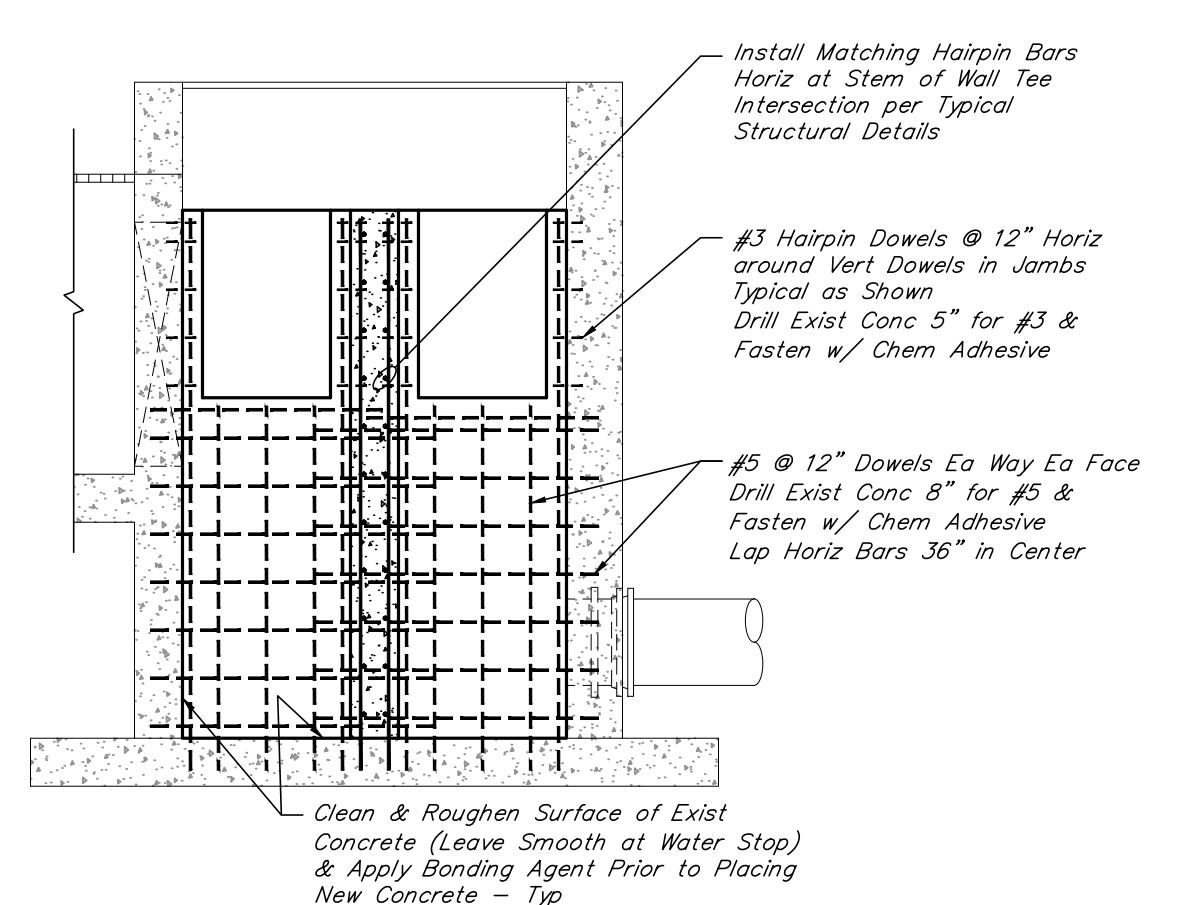


NOTE:  
Attach to wall with 3/16" x 4" S.S. Expansion Anchors at 12" o.c. Caulk around perimeter during installation.

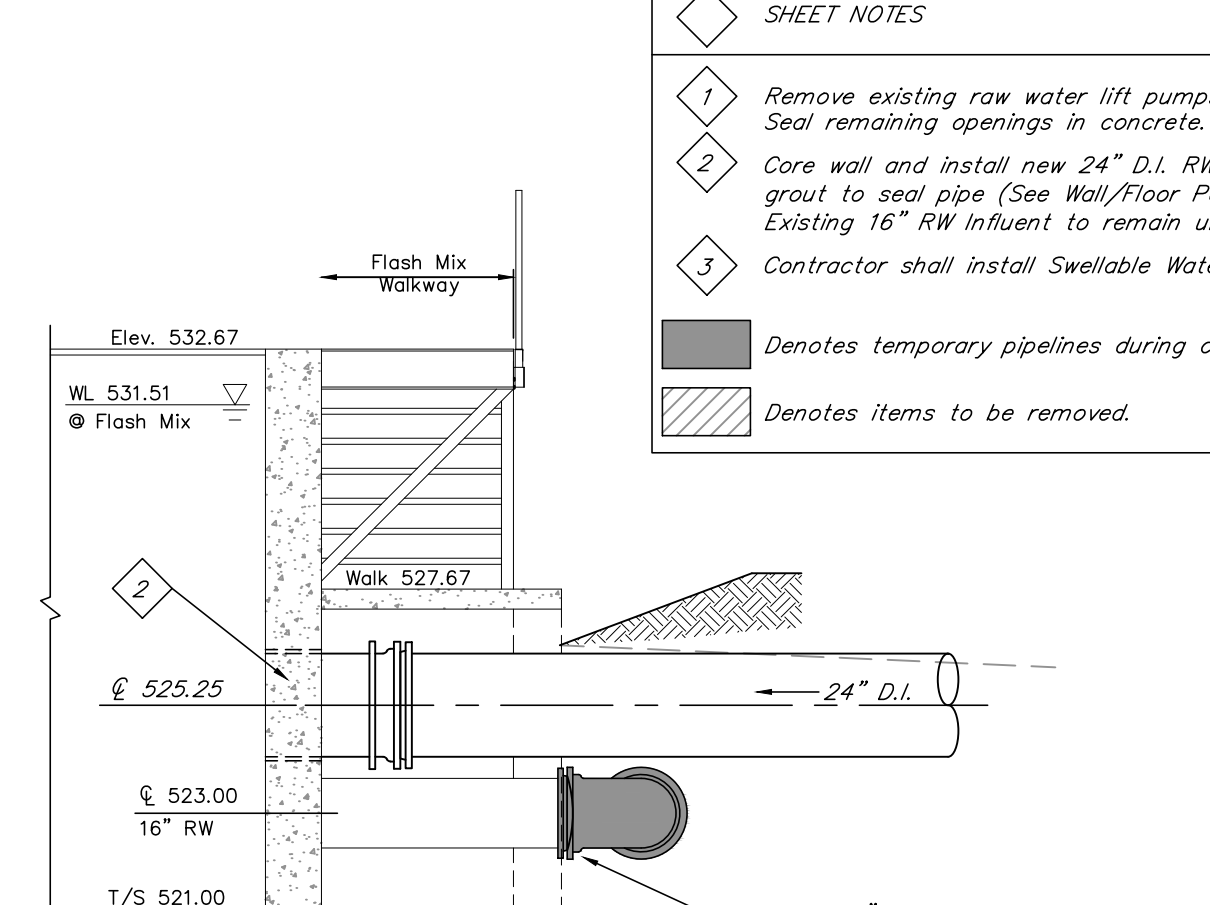
**V-NOTCH WEIR PLATE**  
1" = 1'-0"



**ELEVATION C**  
1/4" = 1'-0" 4.2

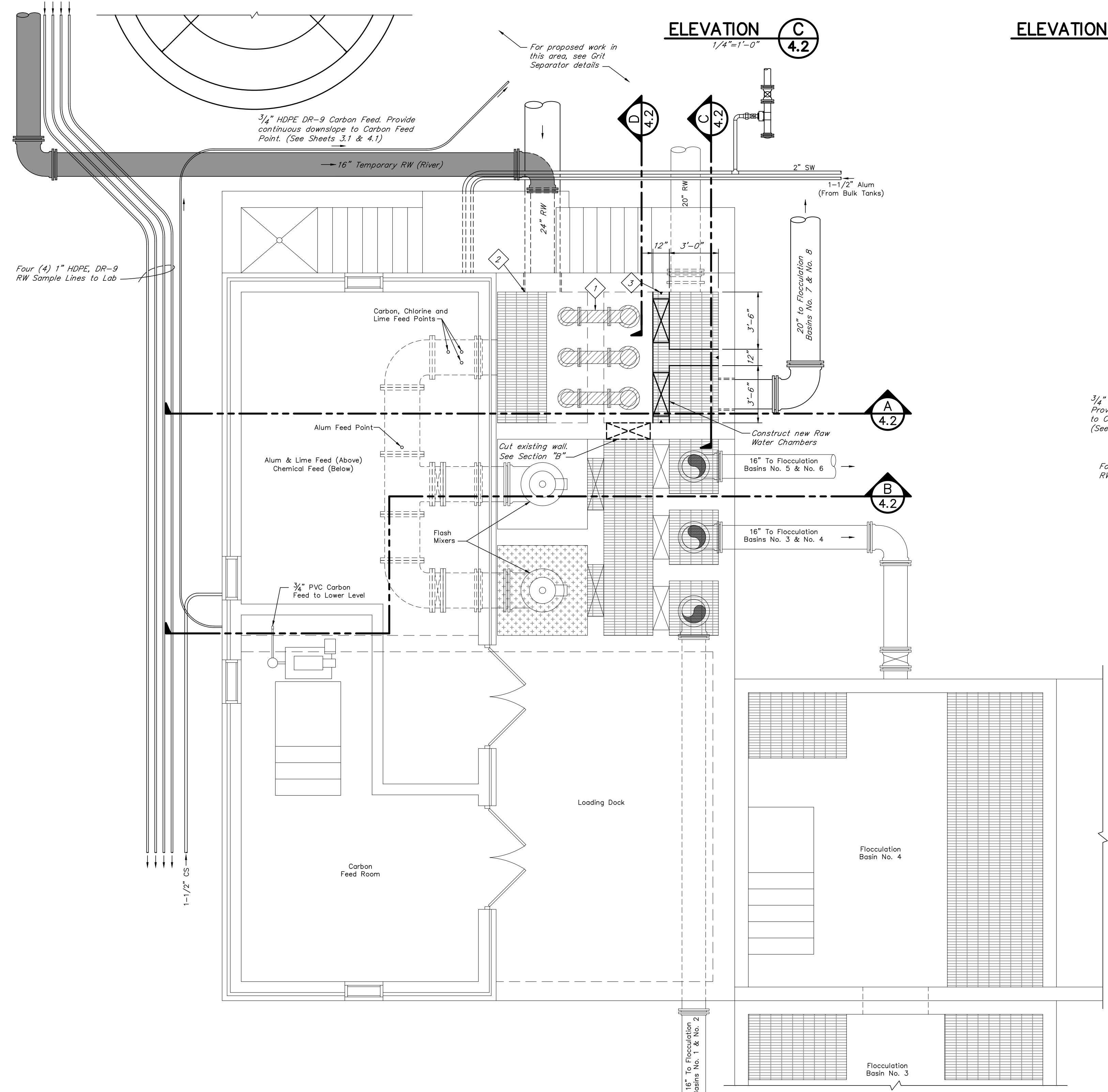


**ELEVATION - STRUCTURAL C**  
1/4" = 1'-0" 4.2

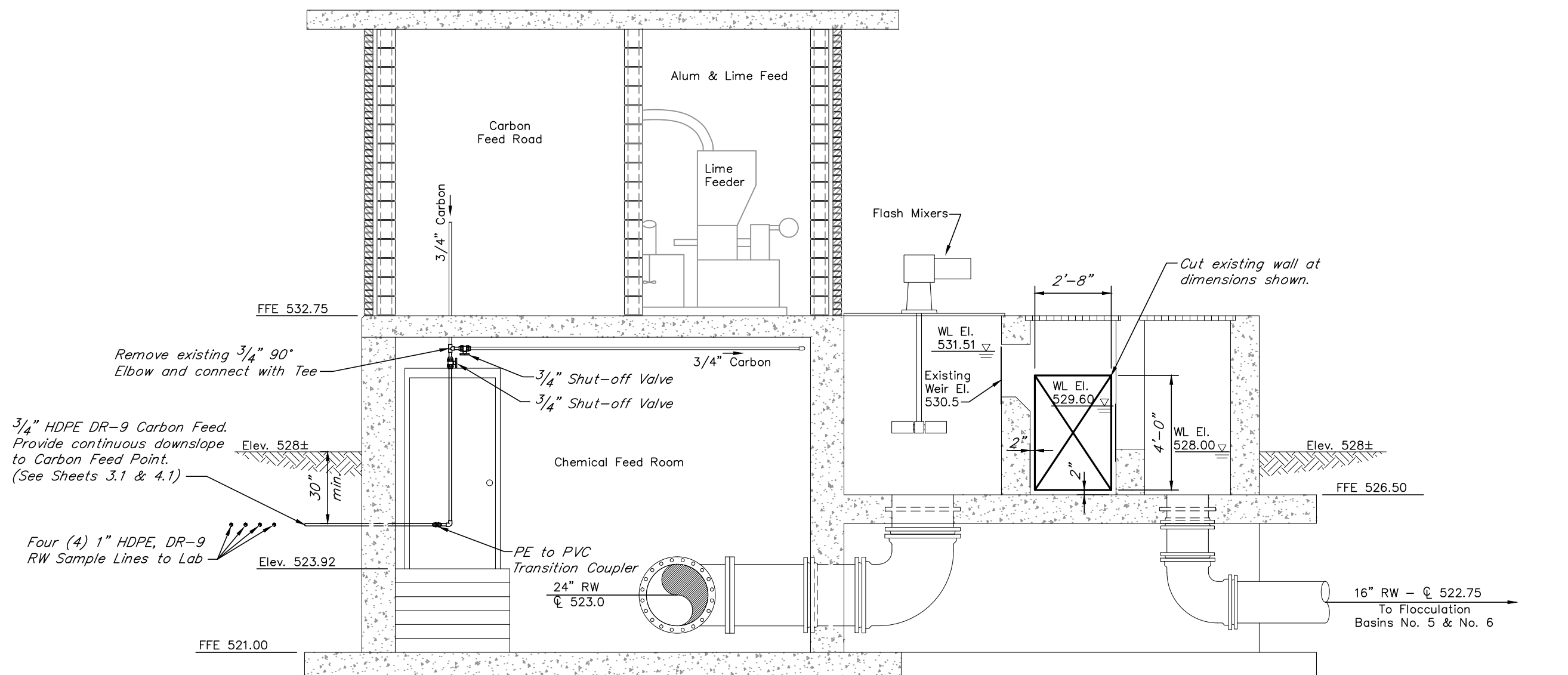


**SECTION D**  
1/4" = 1'-0" 4.2

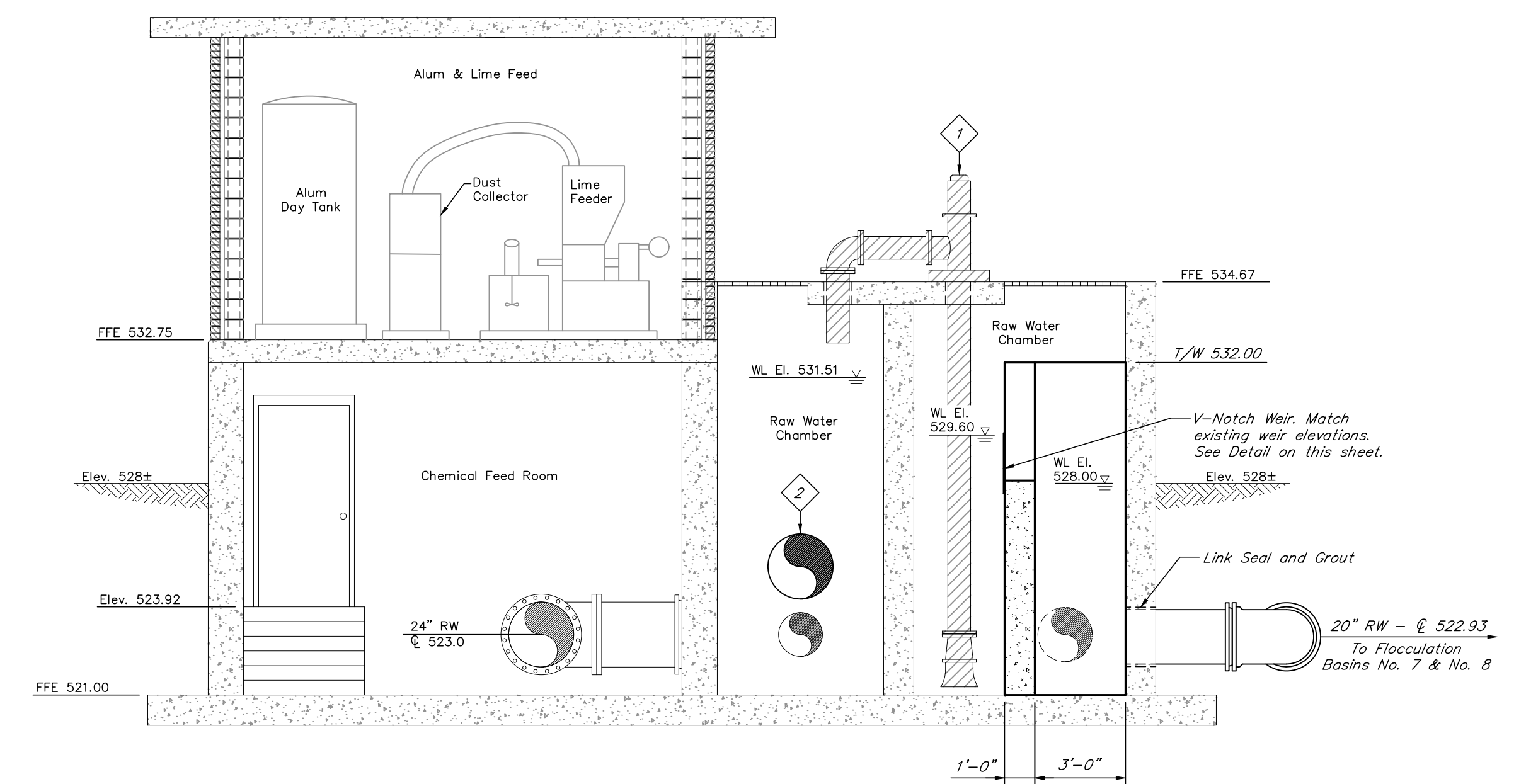
- SHEET NOTES**
- Remove existing raw water lift pumps, pedestals, piping and appurtenances. Seal remaining openings in concrete.
  - Core wall and install new 24" D.I. RW Influent. Use Link Seal and non-shrink grout to seal pipe (See Wall/Floor Penetration Detail). E Lev. 525.25. Existing 16" RW Influent to remain until new work is completed and operational.
  - Contractor shall install Swellable Waterstops at new walls.
- Denotes temporary pipelines during construction  
Denotes items to be removed.



**FLOW DISTRIBUTION PLAN**  
1/4" = 1'-0"



**SECTION B**  
1/4" = 1'-0" 4.2



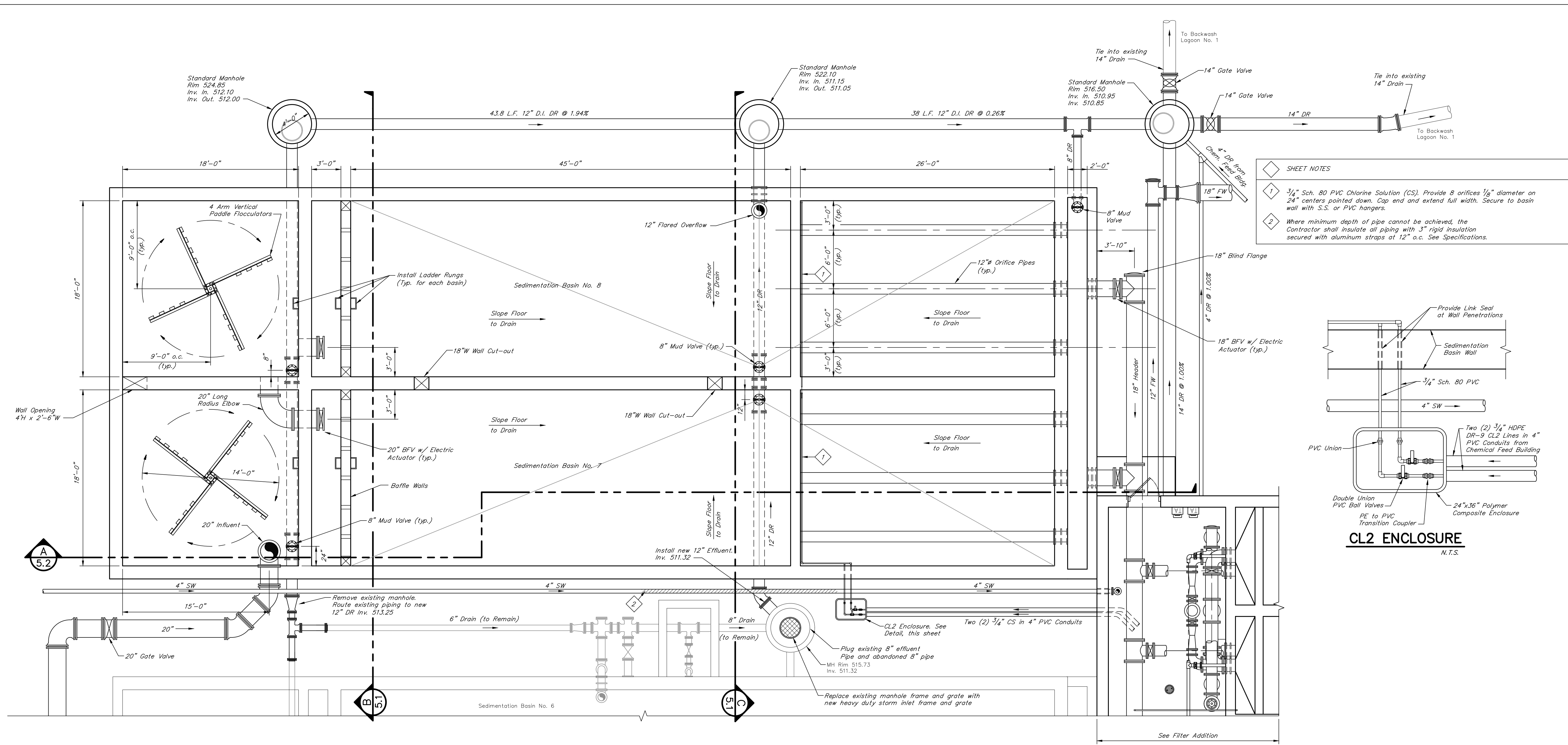
**SECTION A**  
1/4" = 1'-0" 4.2

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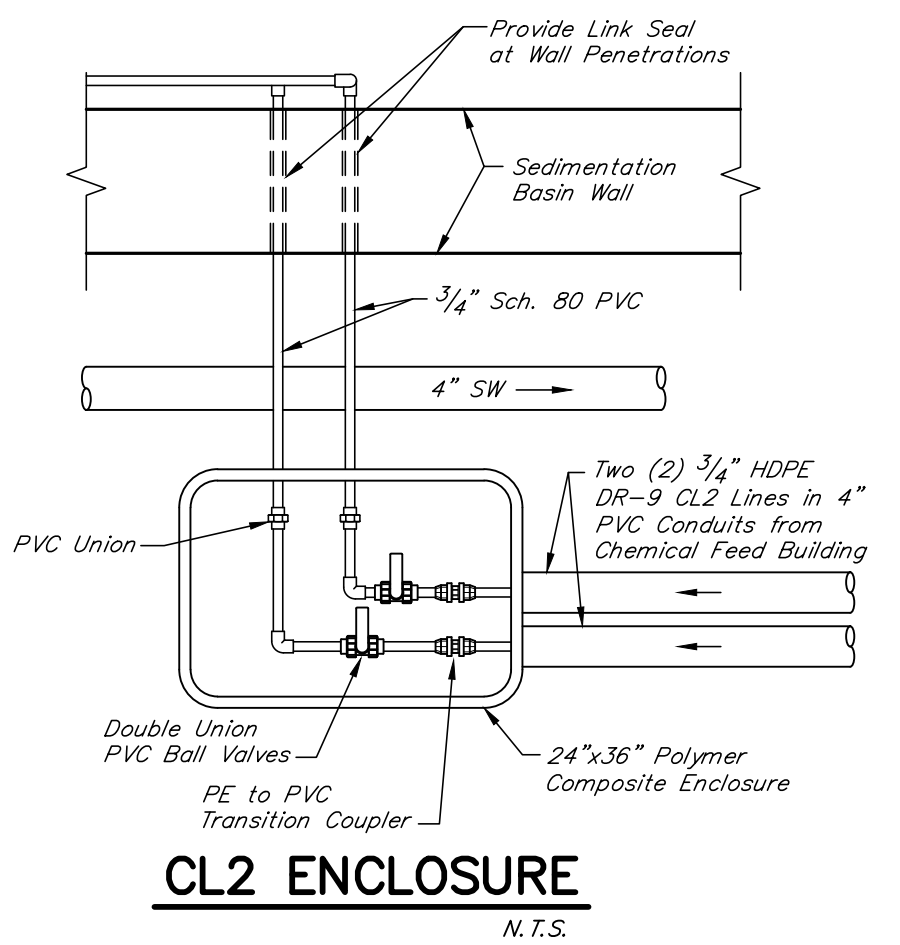




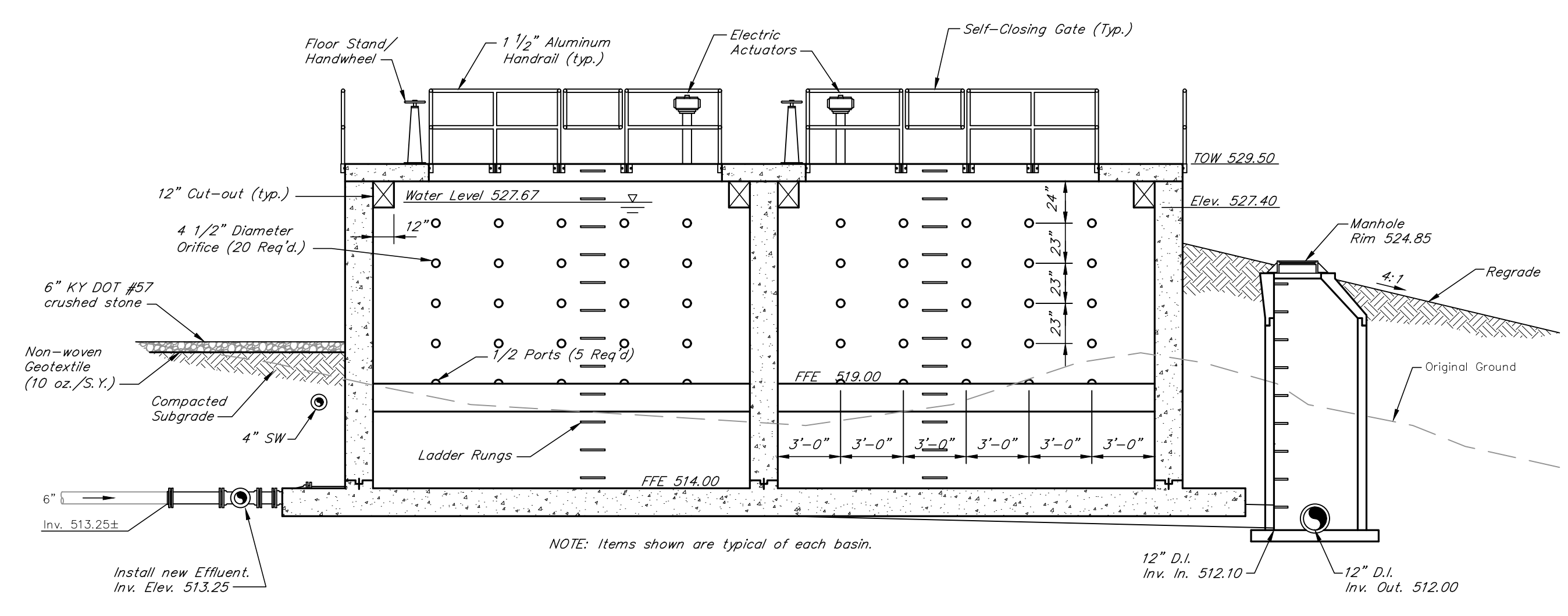
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DATE: MAY 2019
SCALE: 3/16"=1'-0"
REVISIONS



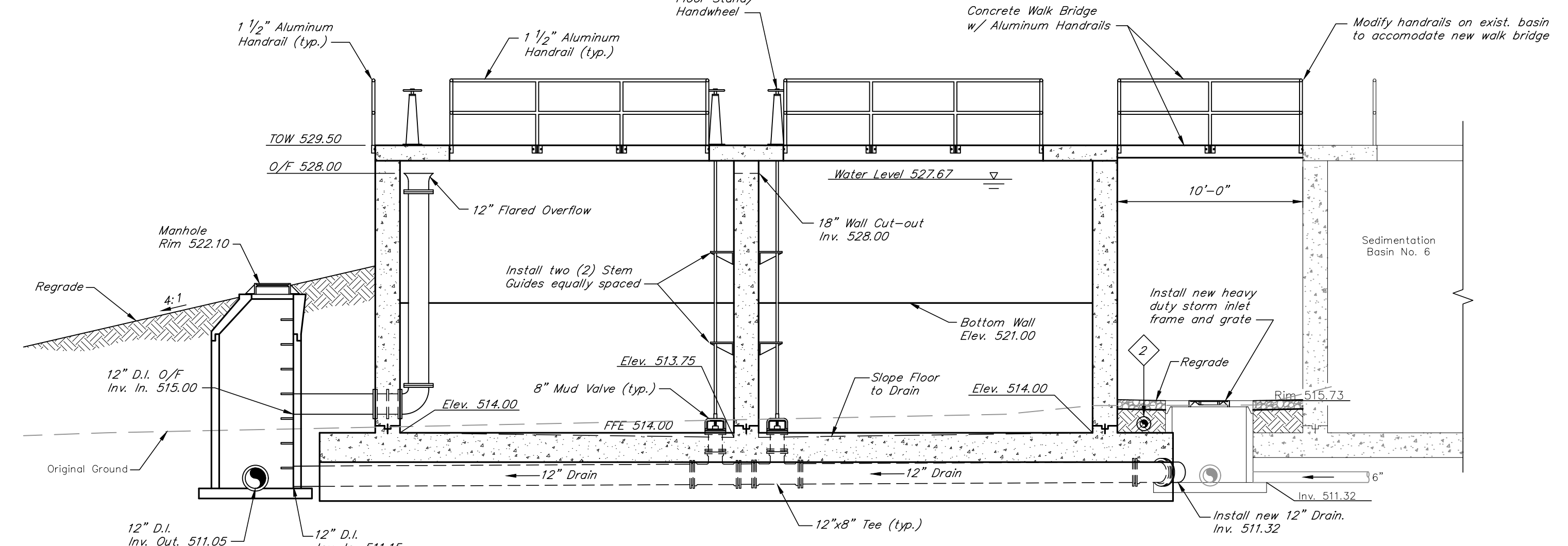
- SHEET NOTES**
- 3/4" Sch. 80 PVC Chlorine Solution (CS). Provide 8 orifices 1/8" diameter on 24" centers pointed down. Cap end and extend full width. Secure to basin wall with S.S. or PVC hangers.
  - Where minimum depth of pipe cannot be achieved, the Contractor shall insulate all piping with 3" rigid insulation secured with aluminum straps at 12" o.c. See Specifications.



**SEDIMENTATION BASINS - LOWER LEVEL**  
 3/16"=1'-0"



**SECTION B**  
 3/16"=1'-0" **5.1**



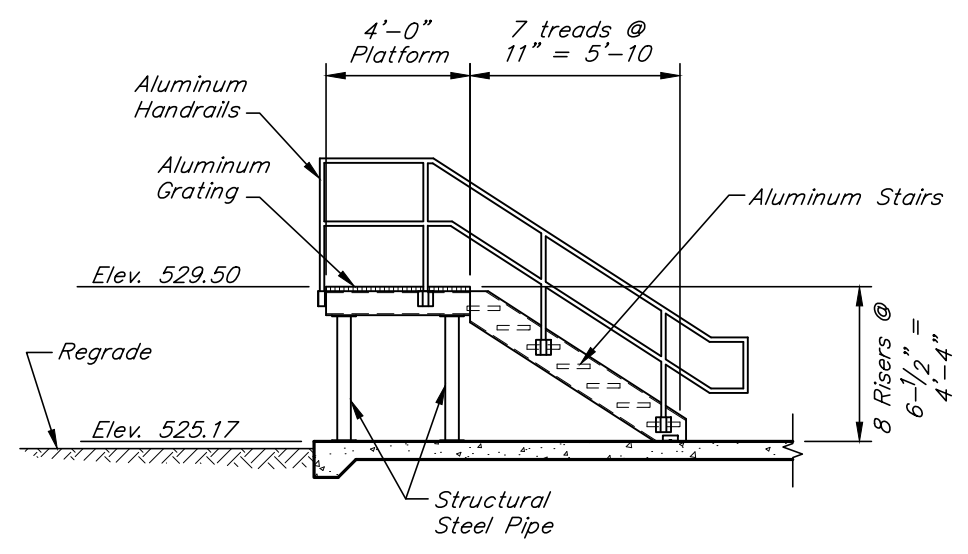
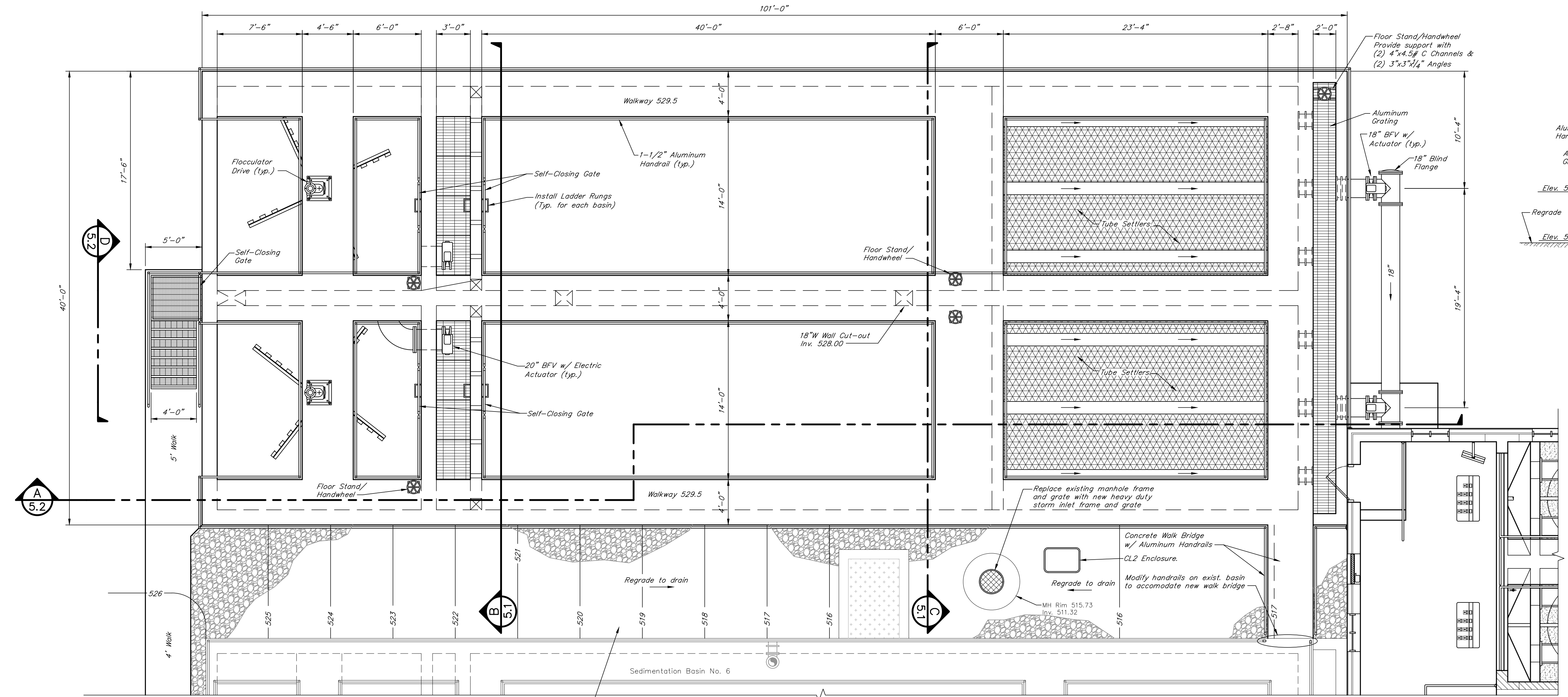
**SECTION C**  
 3/16"=1'-0" **5.1**

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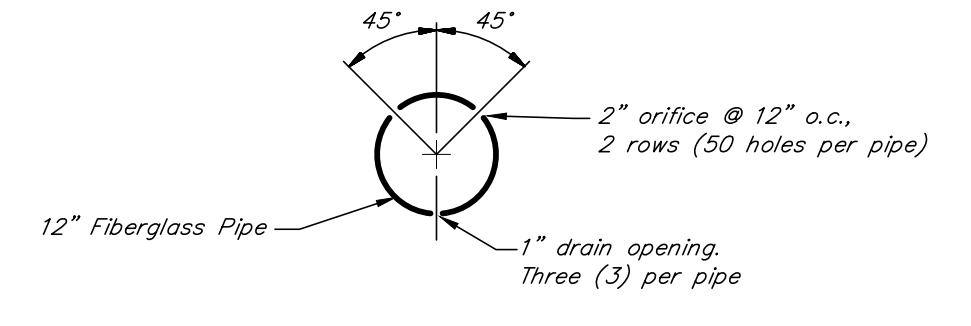
GENERAL NOTES  
 1. Contractor shall perform Hydrostatic Test on finished structure prior to backfill per Concrete Specifications.

SHEET NOTES  
 1. 3/4" Sch. 80 PVC Chlorine Solution (CS). Provide 8 orifices 1/8" diameter on 24" centers painted down. Cap end and extend full width. Secure to basin wall with S.S. or PVC hangers.

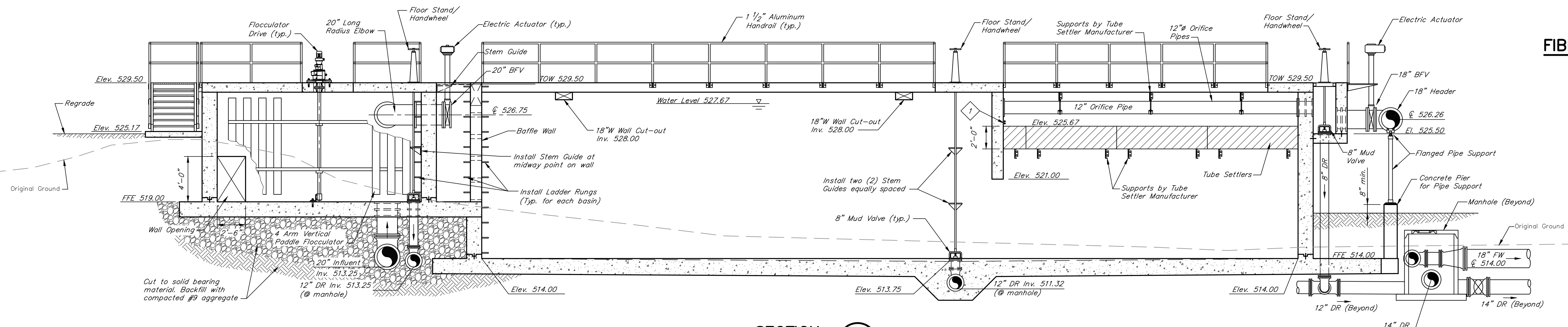


**SEDIMENTATION BASINS - UPPER LEVEL**  
 3/16"=1'-0"

The area between the existing and proposed sedimentation basins shall be graded to drain to the new storm inlet grate. The Contractor shall install 6" of KY DOT #57 crushed stone on top of non-woven Geotextile (10 oz./S.Y.) on compacted subgrade.



**FIBERGLASS ORIFICE PIPE**  
 N.T.S.



**SECTION A 5.2**  
 3/16"=1'-0"



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SCALE: 3/16"=1'-0"
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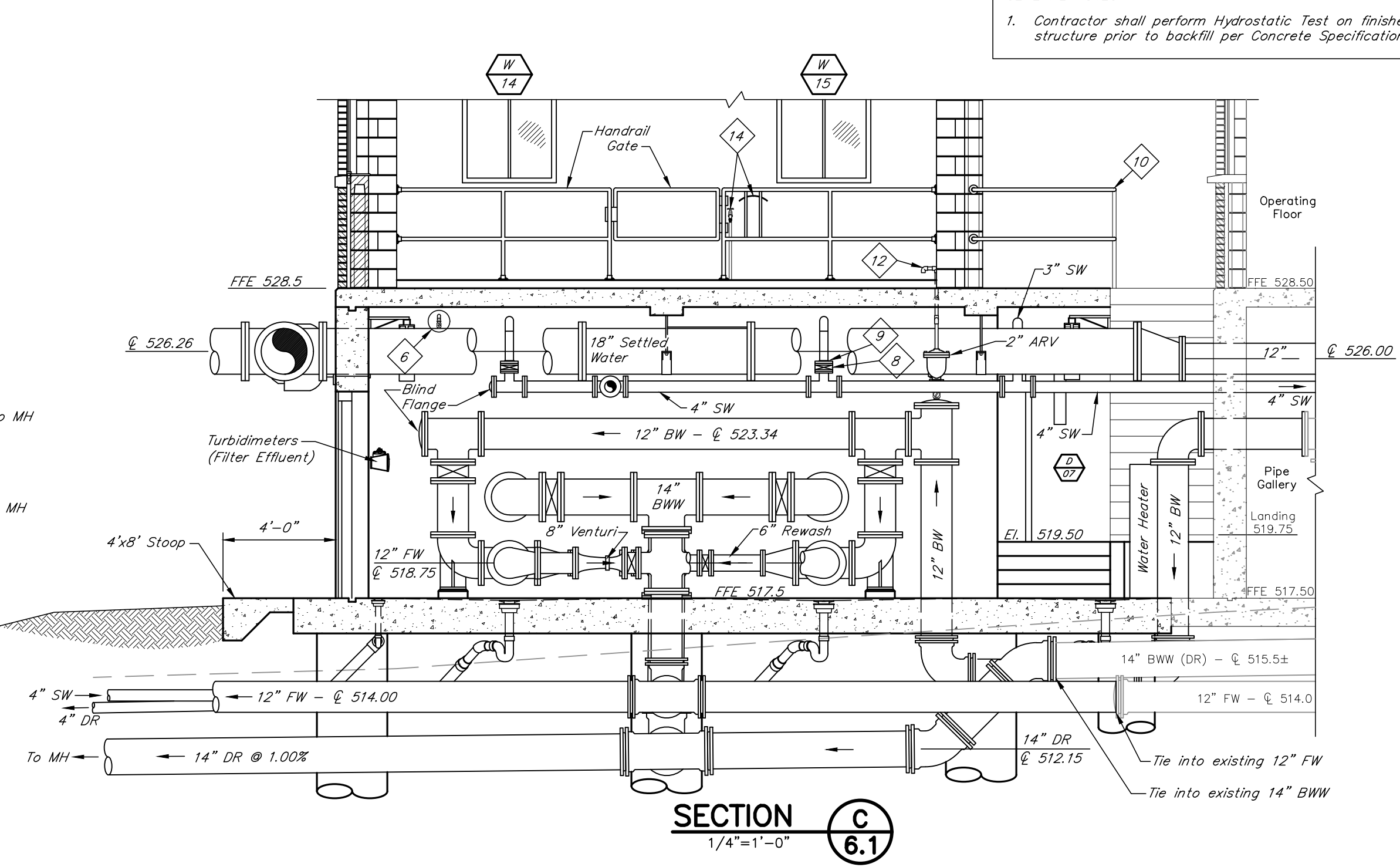
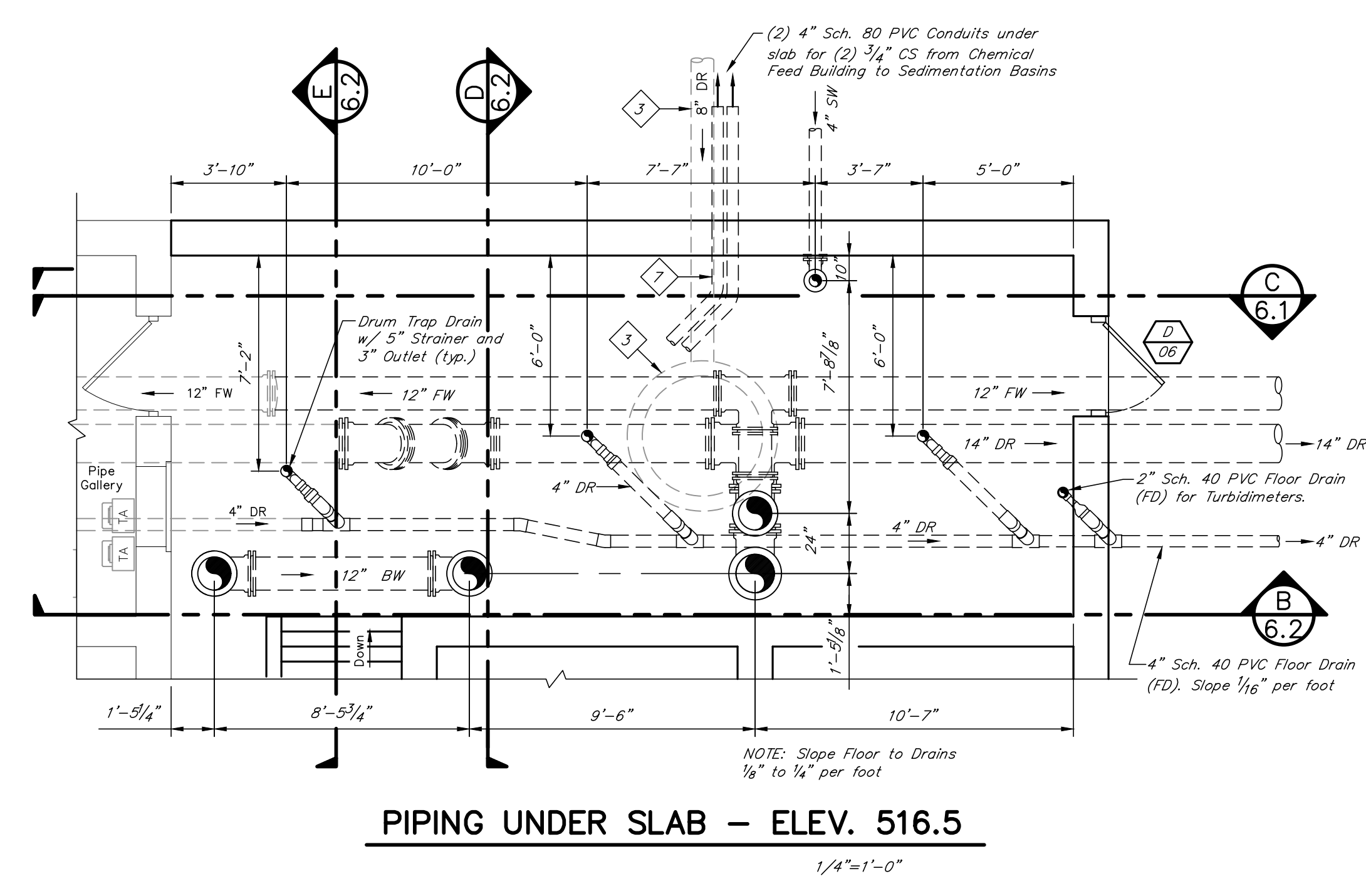


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DATE: MAY 2019  
SCALE: As Noted  
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- SHEET NOTES**
- Remove blind flange and connect to existing 12" Backwash.
  - Core existing concrete wall for proposed piping (All cores are not called out).
  - Remove existing manhole and 8" Drain
  - Extend Turbidimeter PVC drain to floor drain. See Turbidimeter details.
  - Replace existing 3" PVC Service Water with 4" D.I. and reconnect existing surface wash piping.
  - Install 3/4" Corp Stop and piping for manual air release. Extend 3/4" piping to filter gullet and terminate at elevation 530.50
  - 3/4" CS and 4" Conduits from Chemical Feed Addition to Basins.
  - 3" Lugged BFV (Surface Wash)
  - 3" D.I. to S.S. Transition (Surface Wash)
  - Connect to existing handrail
  - Provide control joints on each side of window for future door
  - 1" Vent Line for Air Release Valve. Extend to filter bay and terminate above elevation 529.00 with candy cane.
  - Demolish existing stairs to sedimentation basins.
  - Install hose bib and heavy duty hose hanger. Secure to handrail with aluminum channels.

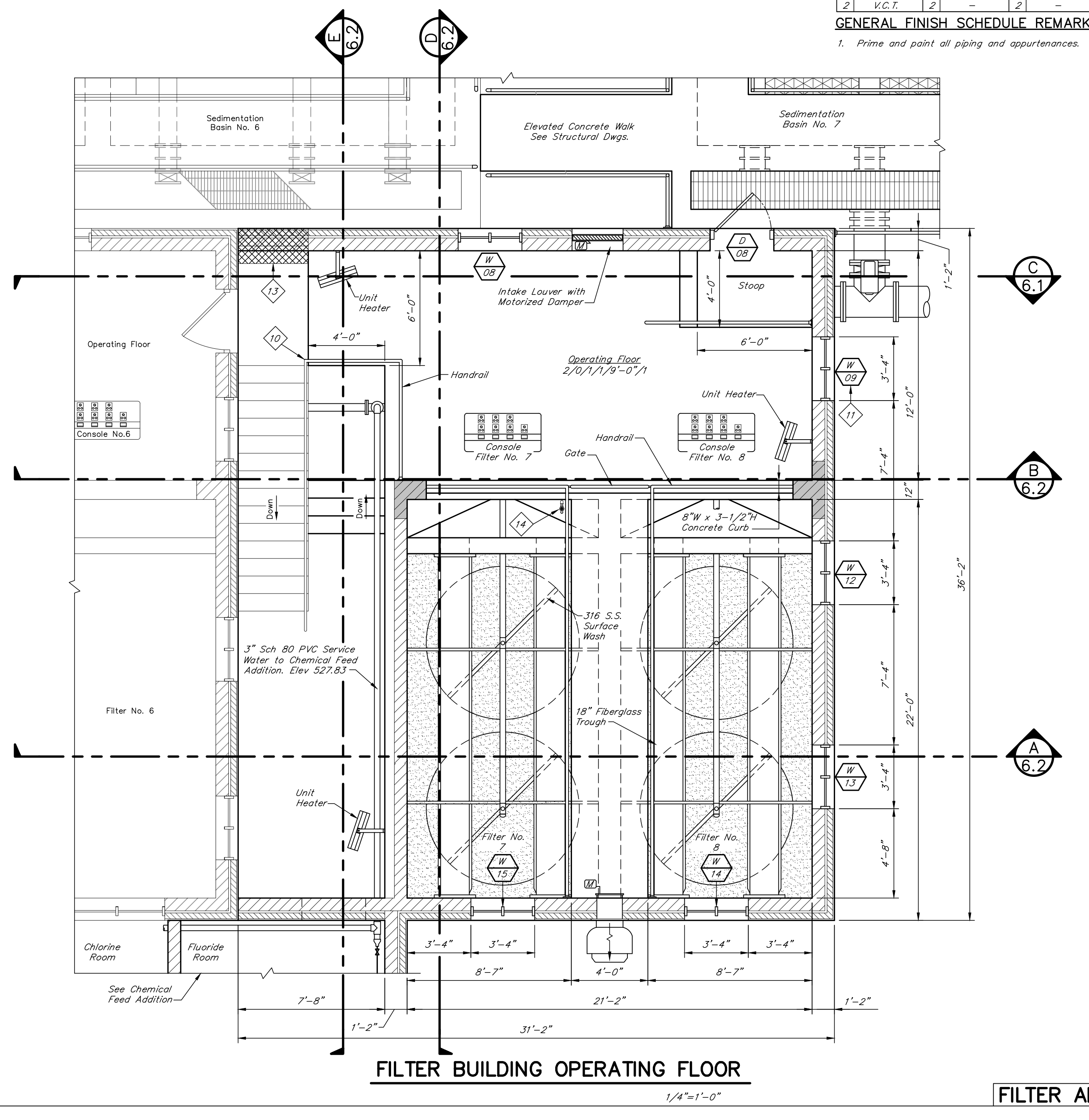
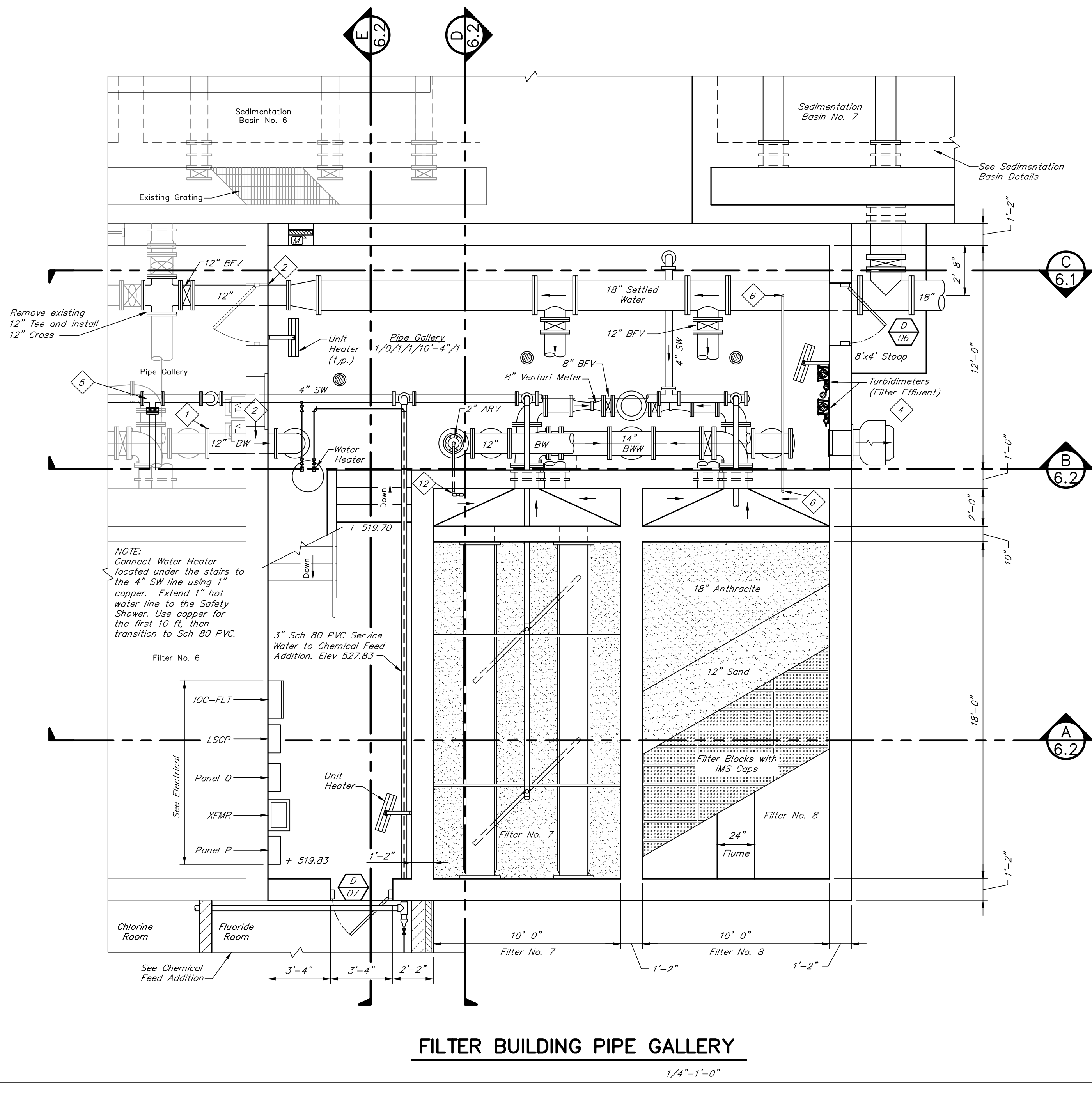
**ROOM FINISH SCHEDULE**

EXAMPLE ROOM

Floor Finish 1/2/3/4/10/5 Notes

#	First No.	Second No.	Third No.	Fourth No.
0	None/Exist.	0	None/Exist.	0
1	Sealer	1	Paint	1
2	V.C.T.	2	2	2

**GENERAL FINISH SCHEDULE REMARKS:**  
1. Prime and paint all piping and appurtenances.



**FILTER ADDITION PLAN**

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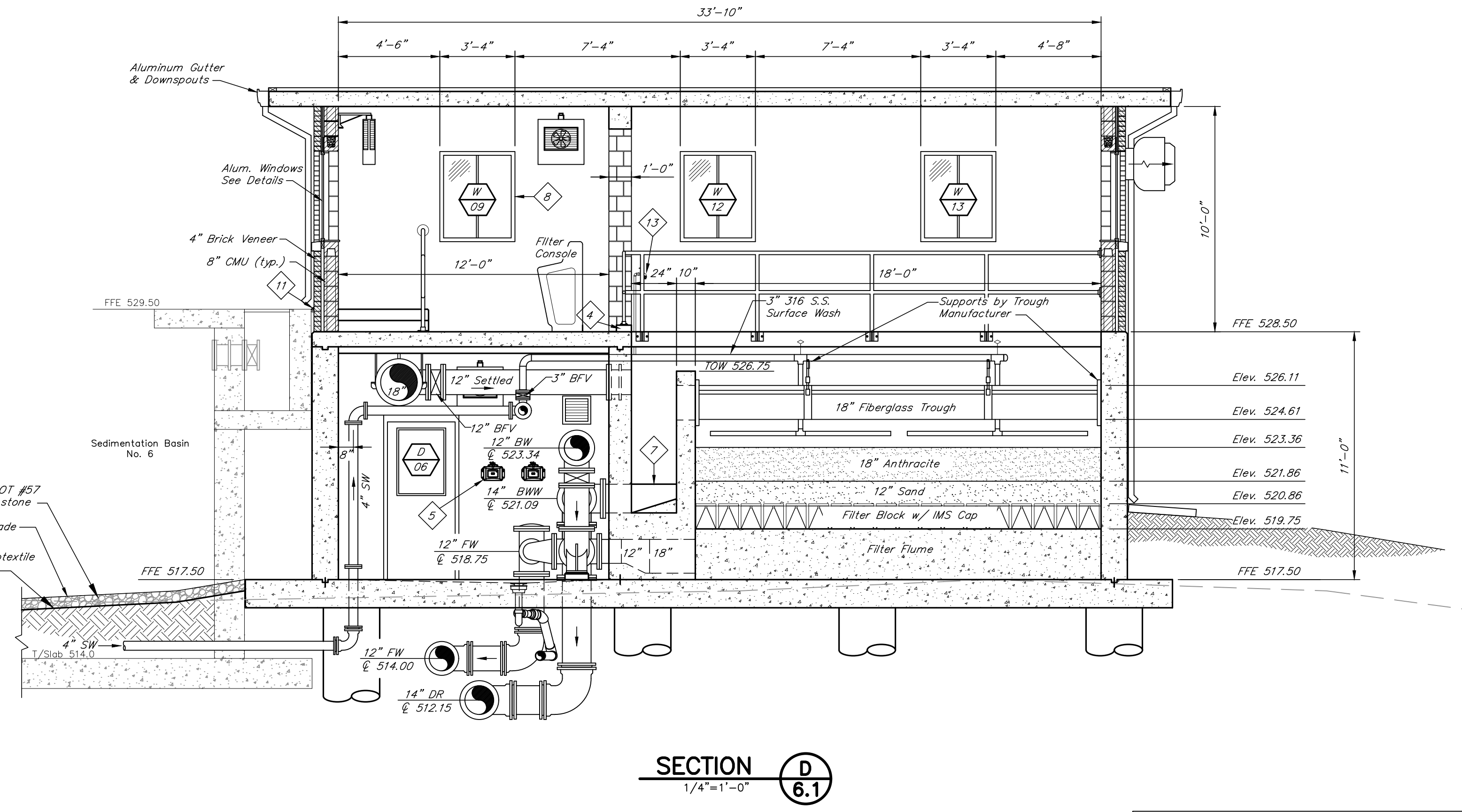
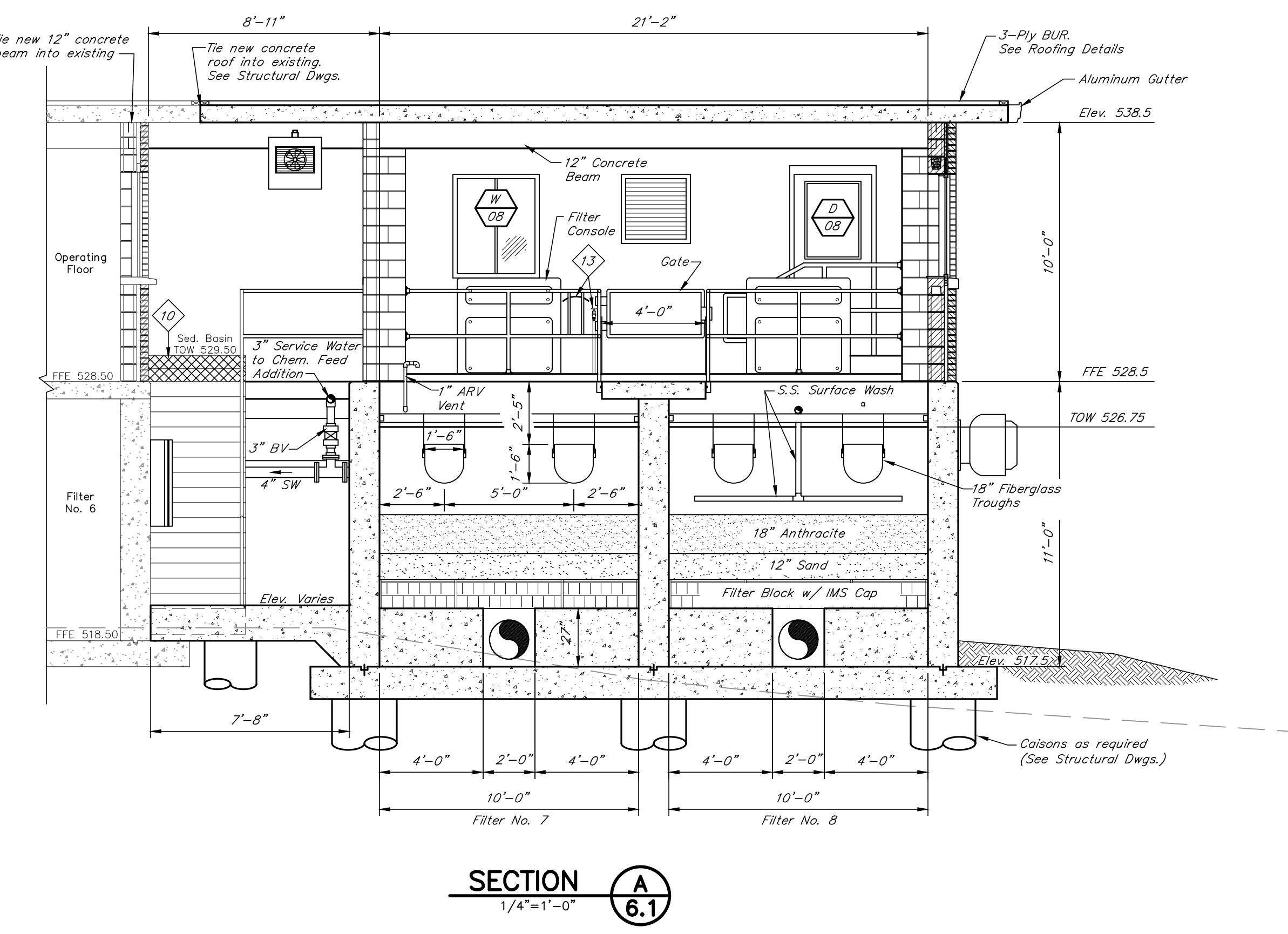
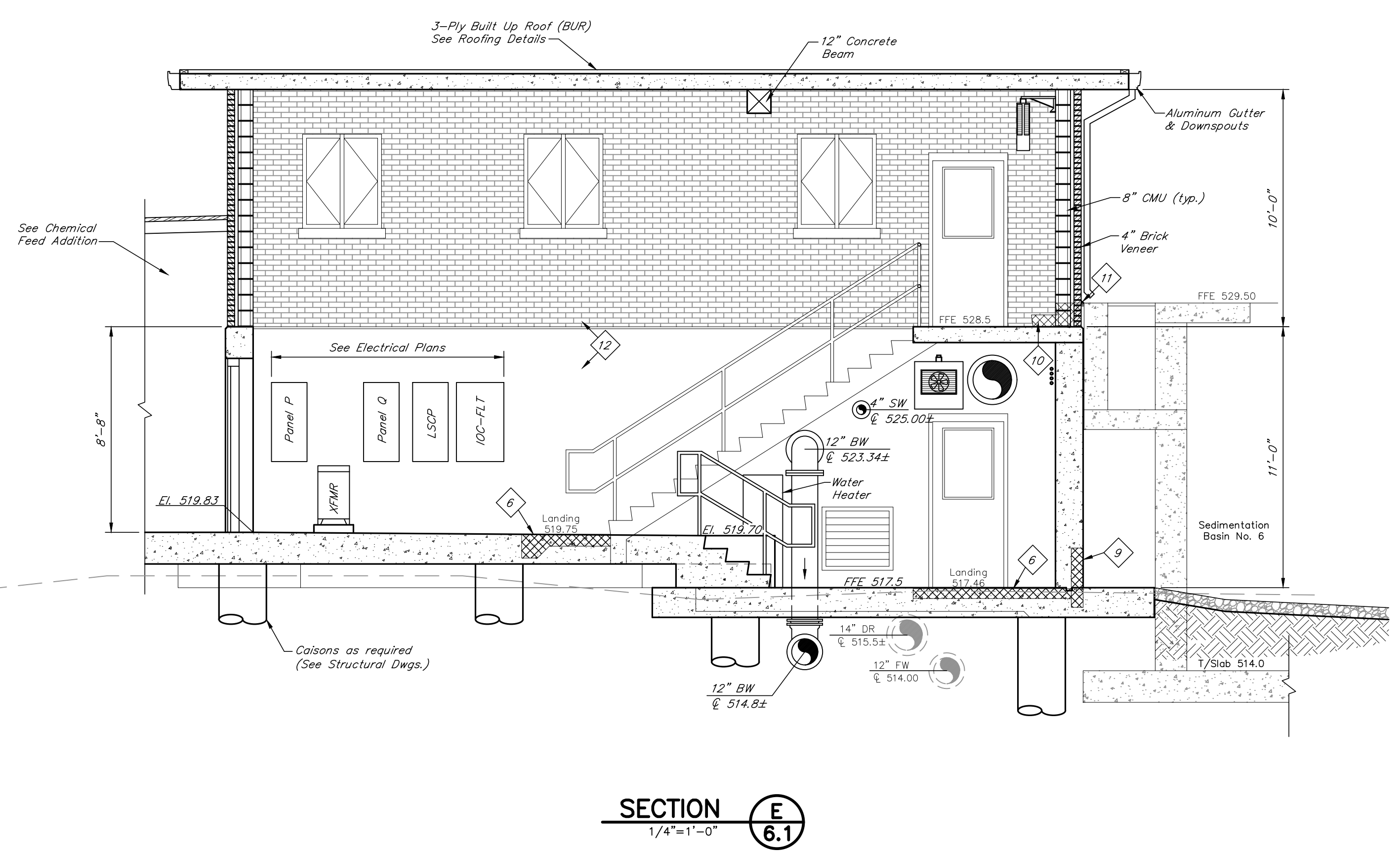
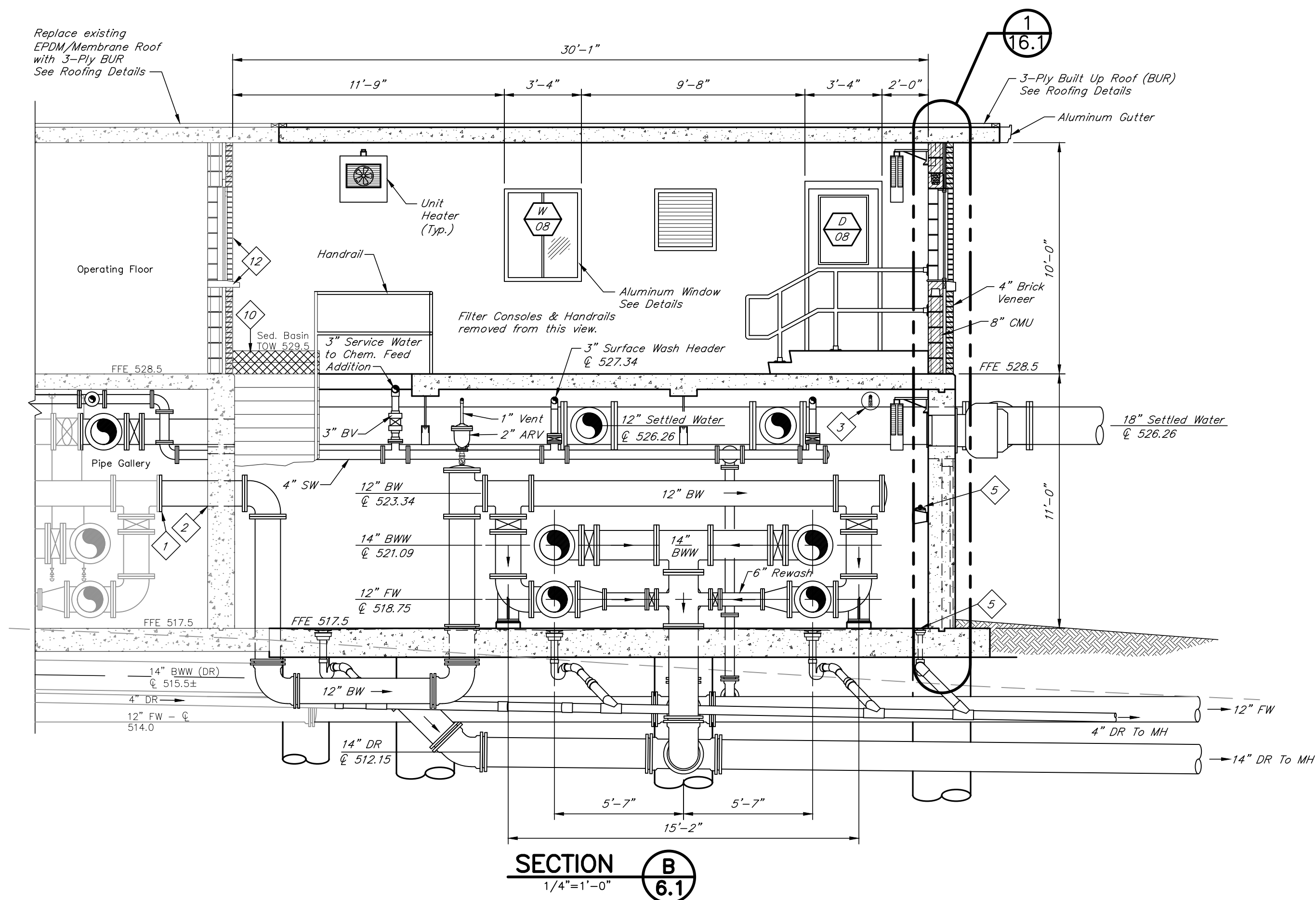




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SCALE: As Noted
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- SHEET NOTES**
- Remove blind flange and connect to existing 12" Backwash.
  - Core existing concrete wall for 12" BW.
  - Install 3/4" Corp Stop and piping for manual air release for 18" Settled Water. Extend 3/4" Piping to drain into filter & terminate above elev. 530.50.
  - Install 8"W x 3-1/2"H concrete curb.
  - Extend Turbidimeter PVC drain to floor drain. See Turbidimeter details.
  - Remove existing landing prior to pouring floor.
  - Grout gullet to drain.
  - Provide control joints on each side of window for future door.
  - Demolish existing retaining wall.
  - Demolish existing stairs.
  - Fill void with foam backer rod and caulk with Sikaflex, or equal.
  - Contractor shall wash/clean existing concrete, brick, doors, windows, and all features of the existing building to be enclosed by the new building addition. Paint similar to new construction.
  - Install hose bib and heavy duty hose hanger. Secure to handrail with aluminum channels.



**FILTER ADDITION SECTIONS**

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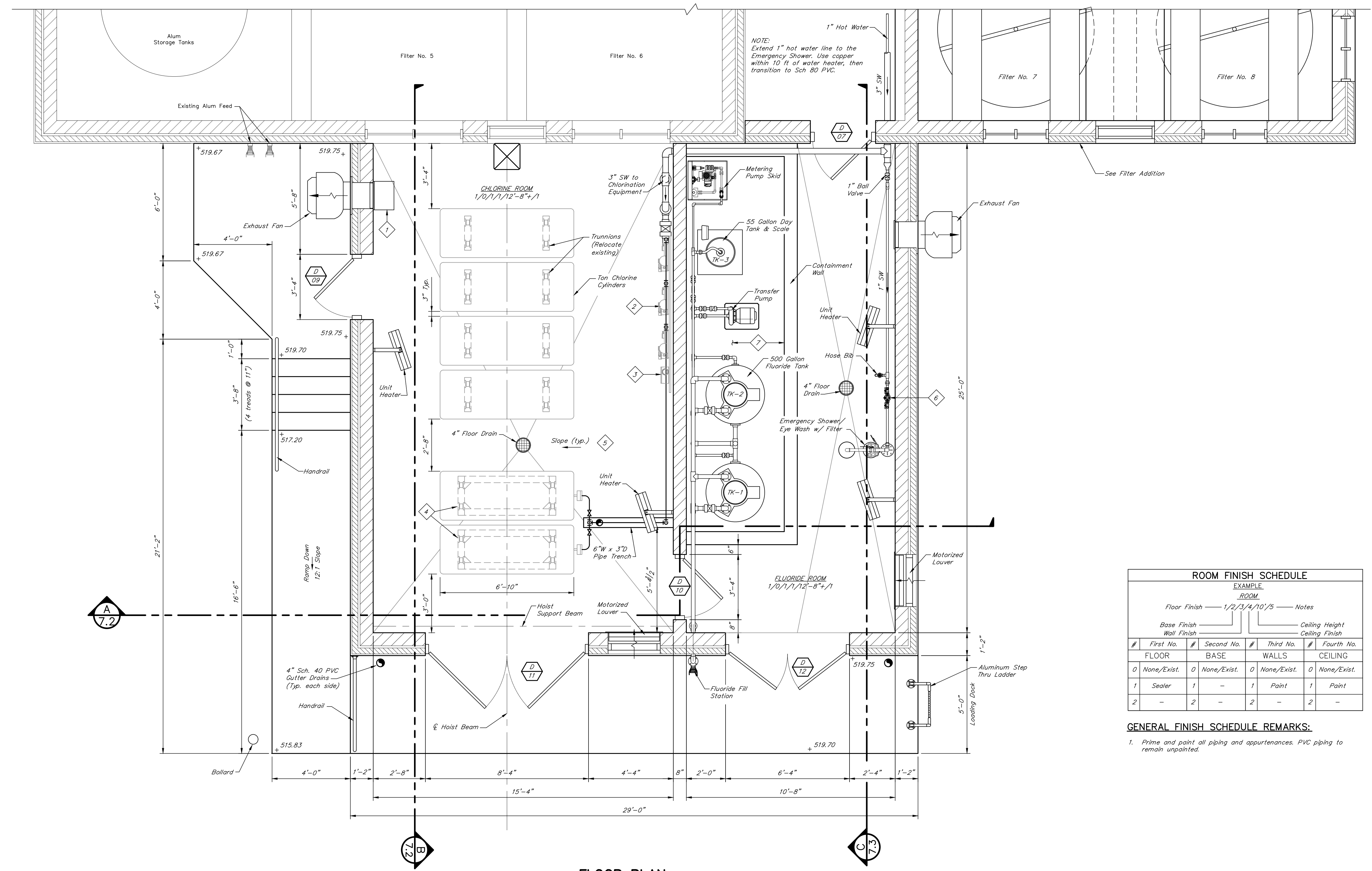




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- SHEET NOTES**
- 1 Provide aluminum sheet metal plenum. Connect to fan and turn down. Extend vertically down wall and terminate 12" above finished floor.
  - 2 Relocate existing Chlorination Equipment Panel.
  - 3 Relocate existing Chlorine Gas Sensor and Alarm System.
  - 4 Relocate existing Scales and Trunnions.
  - 5 Slope floor to floor drains. Slope shall be a minimum of 1/8" per ft. and a maximum of 1/4" per ft.
  - 6 Install balancing valve and pressure reducing valve on supply for Emergency Shower/Eye Wash (ESEW) station. Include isolating ball valve.
  - 7 All exposed concrete in the secondary containment pit shall be sealed with a chemical resistant coating/liner system.



**FLOOR PLAN**  
3/8"=1'-0"

**ROOM FINISH SCHEDULE**

EXAMPLE ROOM

Floor Finish 1/2/3/4/10/5 — Notes

Base Finish — Ceiling Height

Wall Finish — Ceiling Finish

#	First No.	Second No.	Third No.	Fourth No.
FLOOR	BASE	WALLS	CEILING	
0	None/Exist.	0	None/Exist.	0
1	Sealer	1	Paint	1
2	-	2	-	2

**GENERAL FINISH SCHEDULE REMARKS:**

1. Prime and paint all piping and appurtenances. PVC piping to remain unpainted.

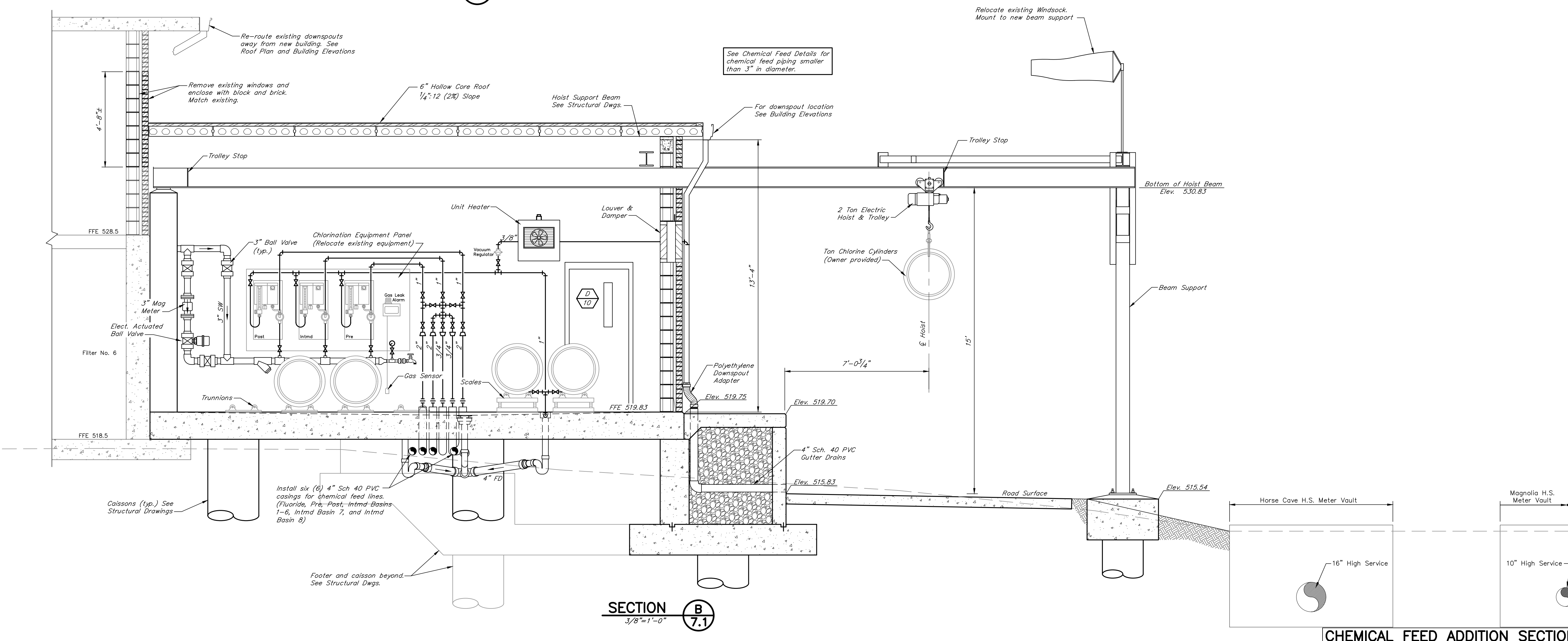
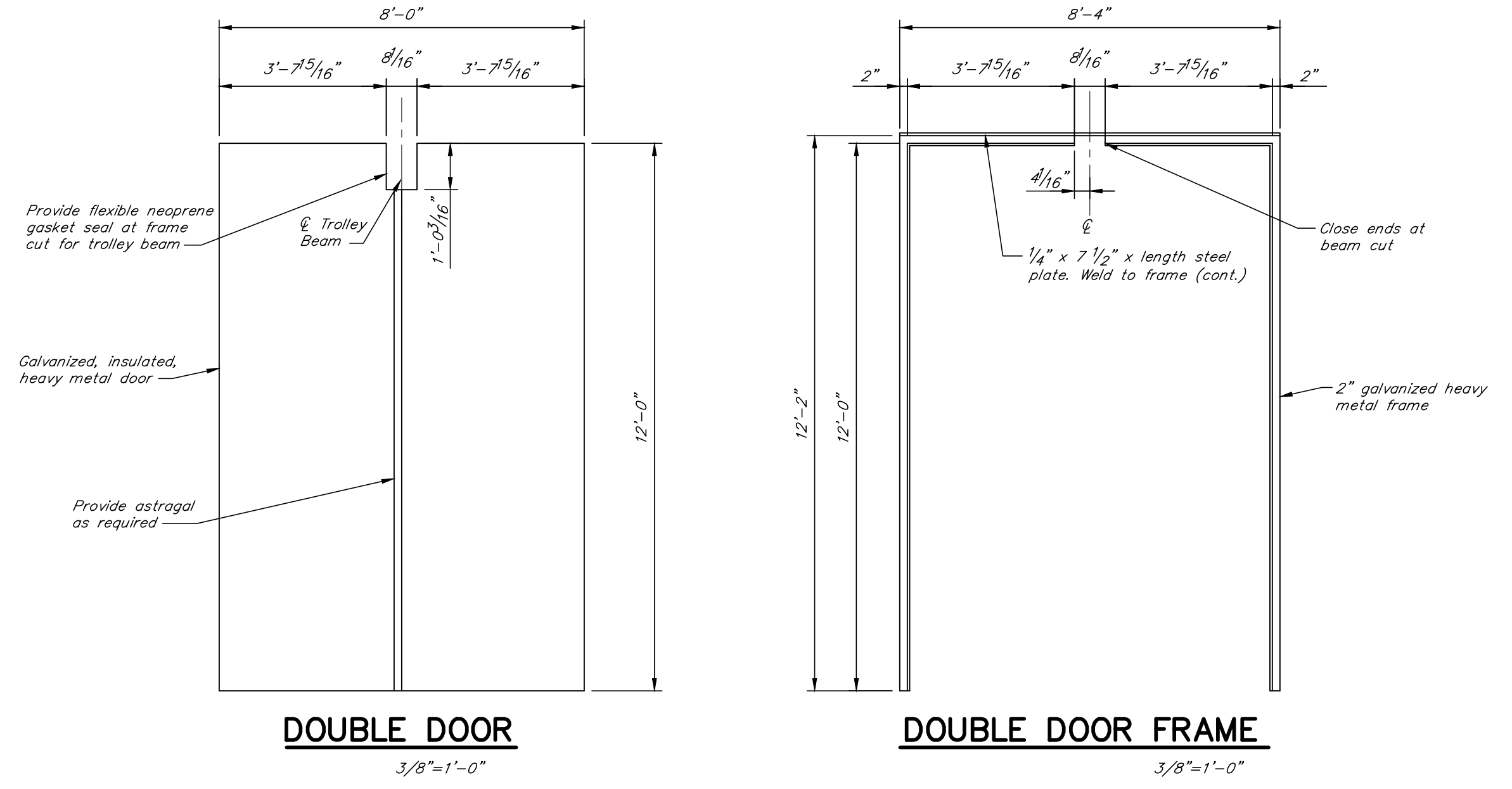
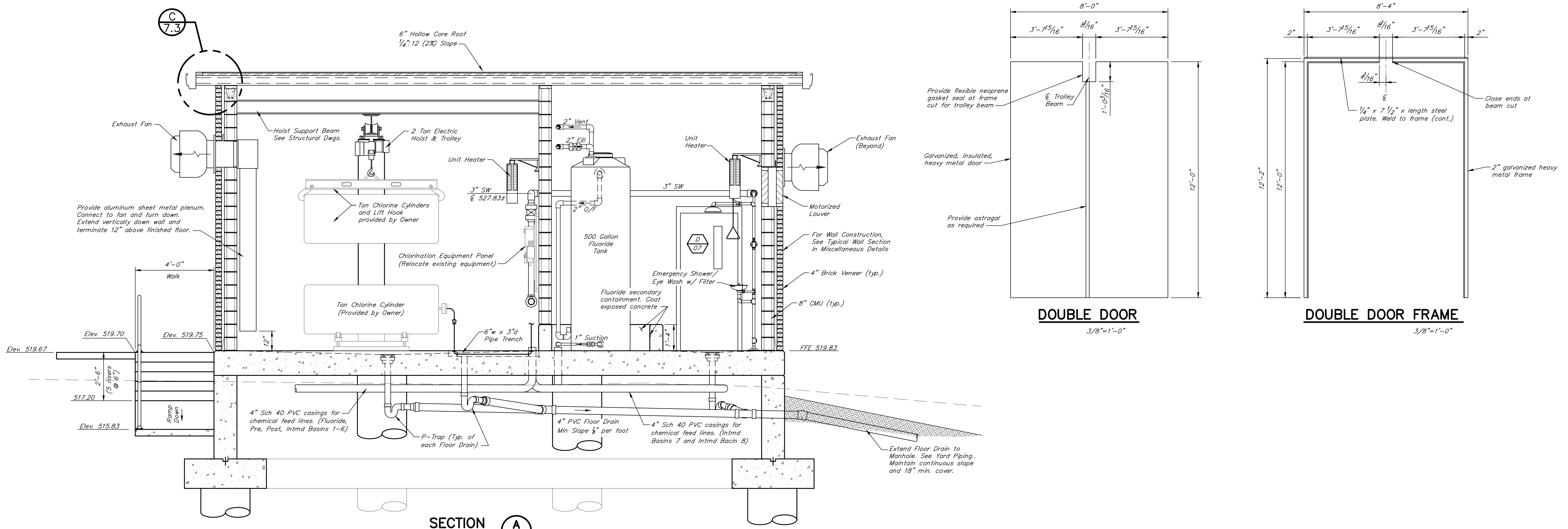
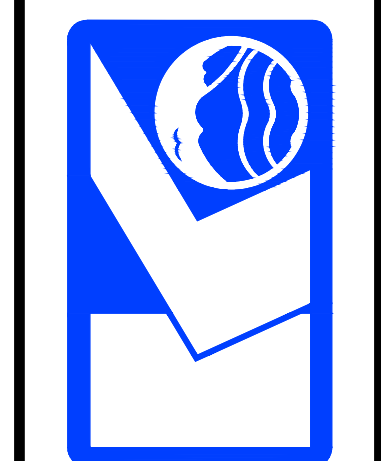
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REVISIONS

**KENVIRONS, INC.**  
FRANKFORT, KENTUCKY



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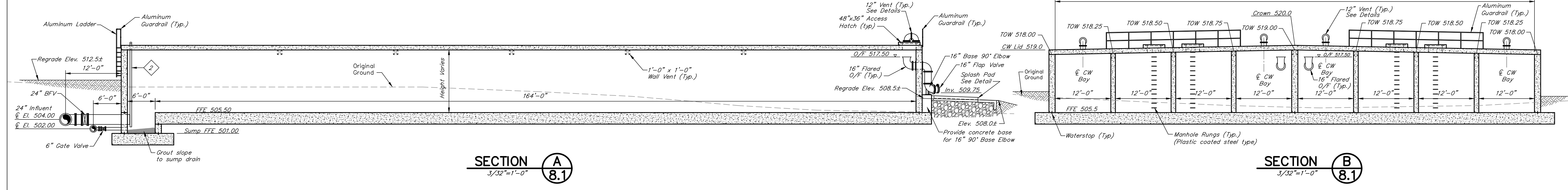
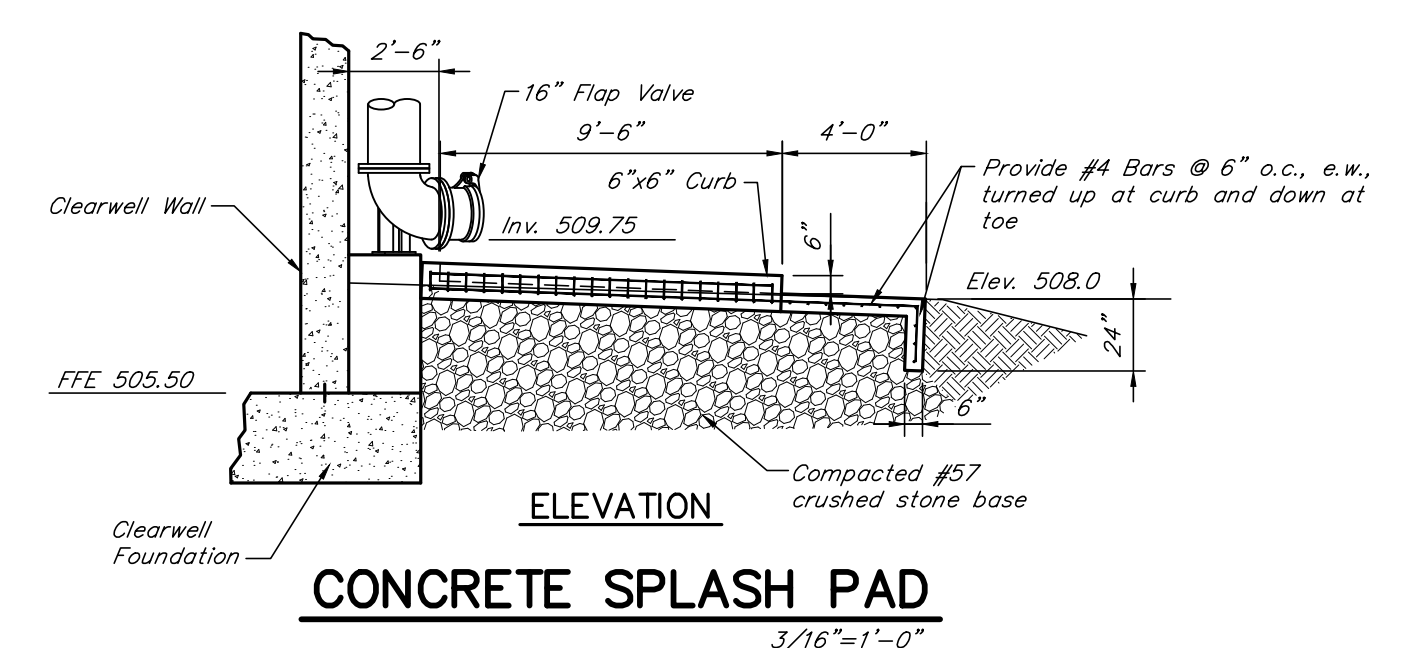
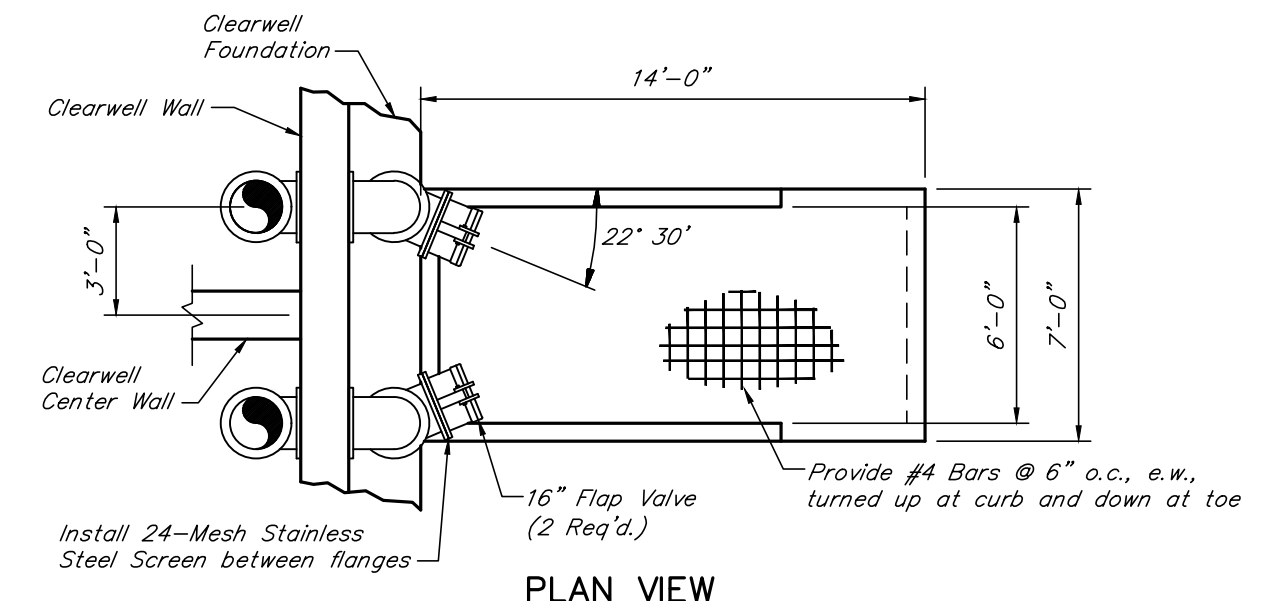
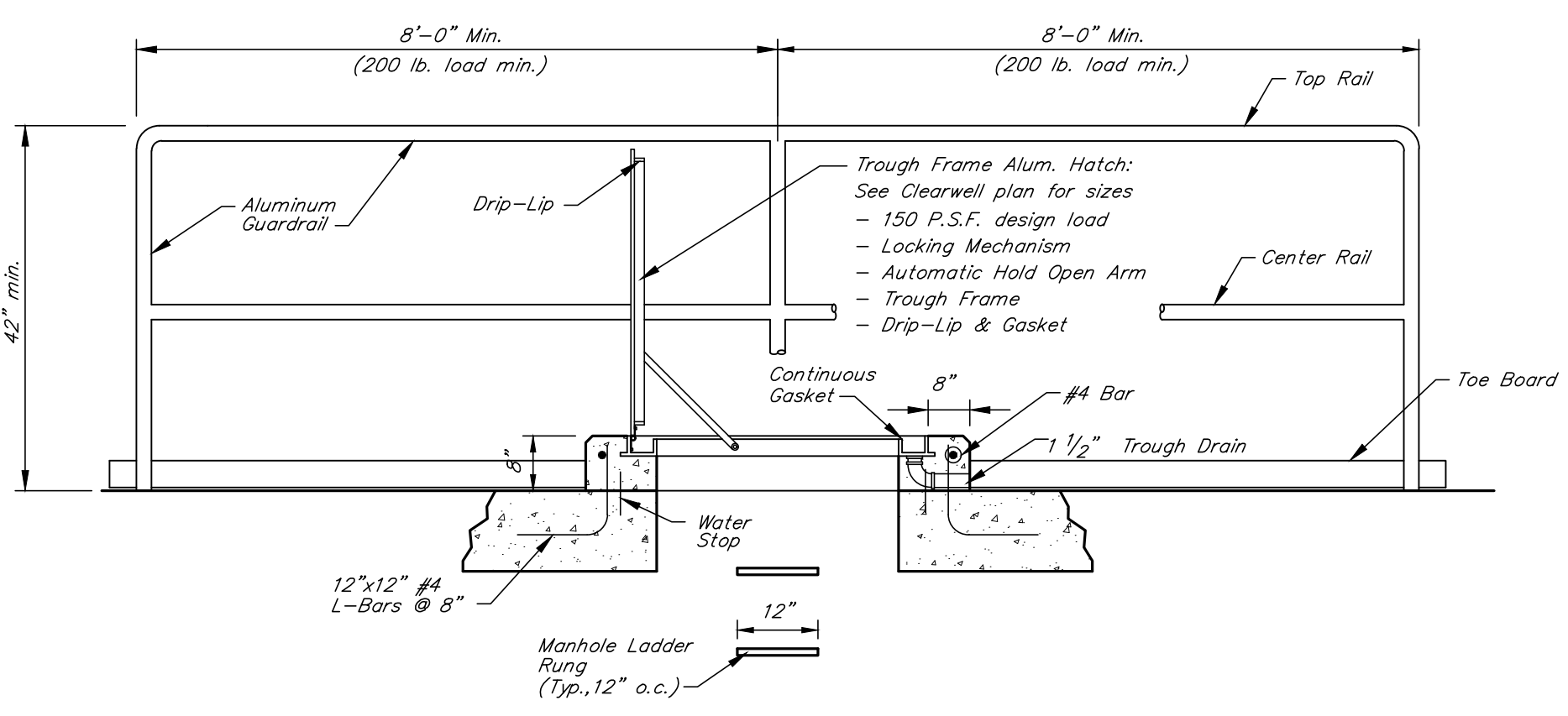
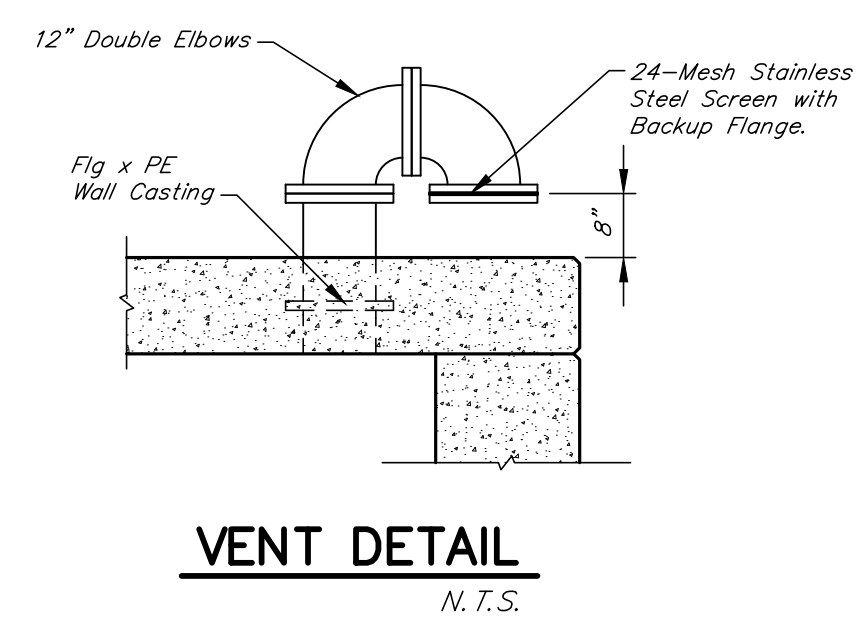
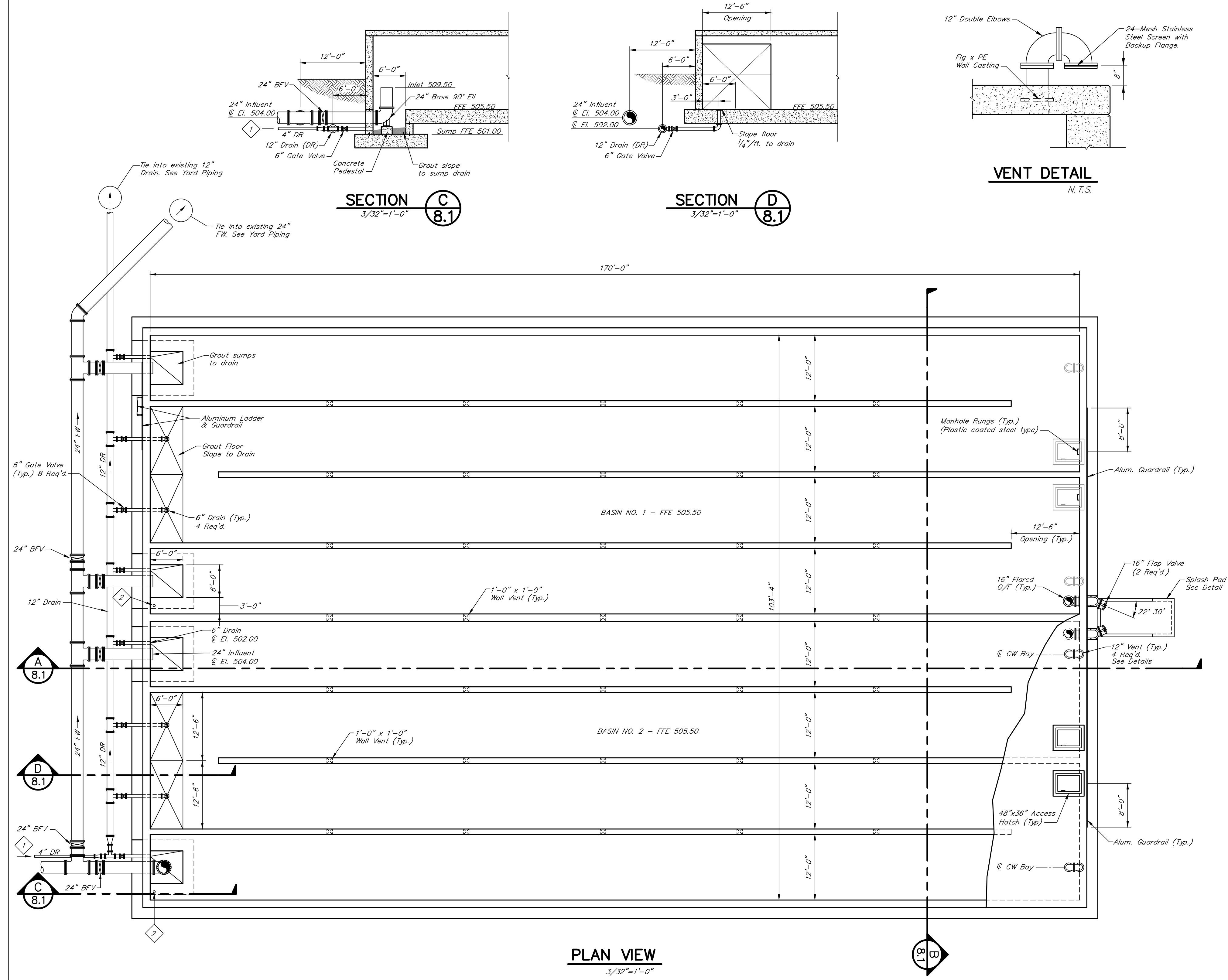


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CHECKED BY: RWV
DATE: MAY 2019
SCALE: 3/32"=1'-0"
REVISIONS



- GENERAL NOTES**
- Clearwell shall be sterilized prior to placing in service per AWWA C652.
  - Contractor shall perform Hydrostatic Test on finished structure prior to backfill per Concrete Specifications.
- SHEET NOTES**
- 4" PVC, Sch. 40 drain from high service meter vault.
  - Stilling Well/Pressure Transducer. See Electrical Plans for details.

**FLOOD NOTE:**  
The 100-year (1% annual chance) flood elevation is 515.97. If the flood level reaches elevation 514.0, the Operator shall maintain a minimum water level of 48 inches in the clearwell to prevent buoyancy.



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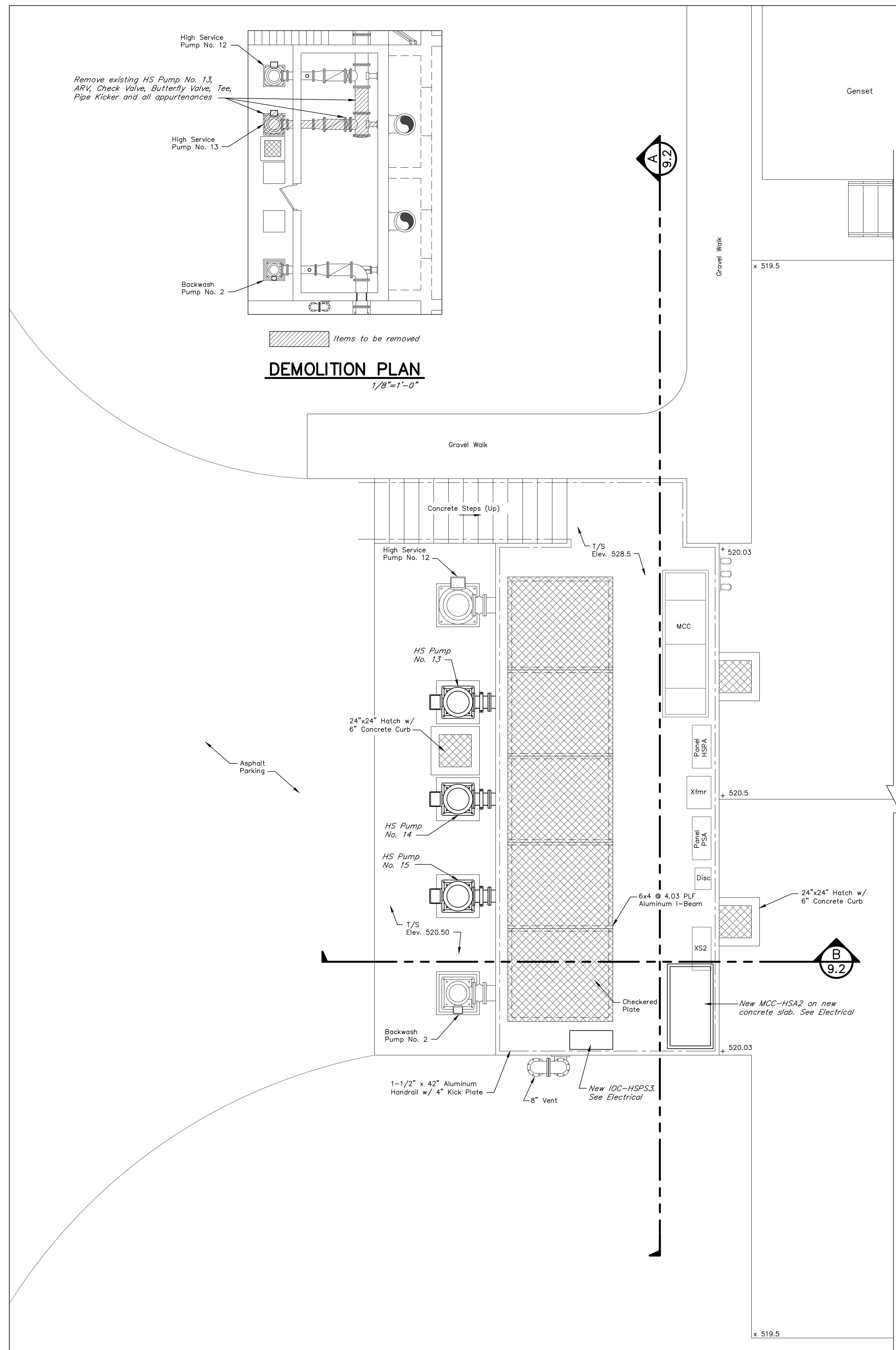


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CHECKED BY: RVW
DATE: MAY 2019
SCALE: As Noted
REVISIONS

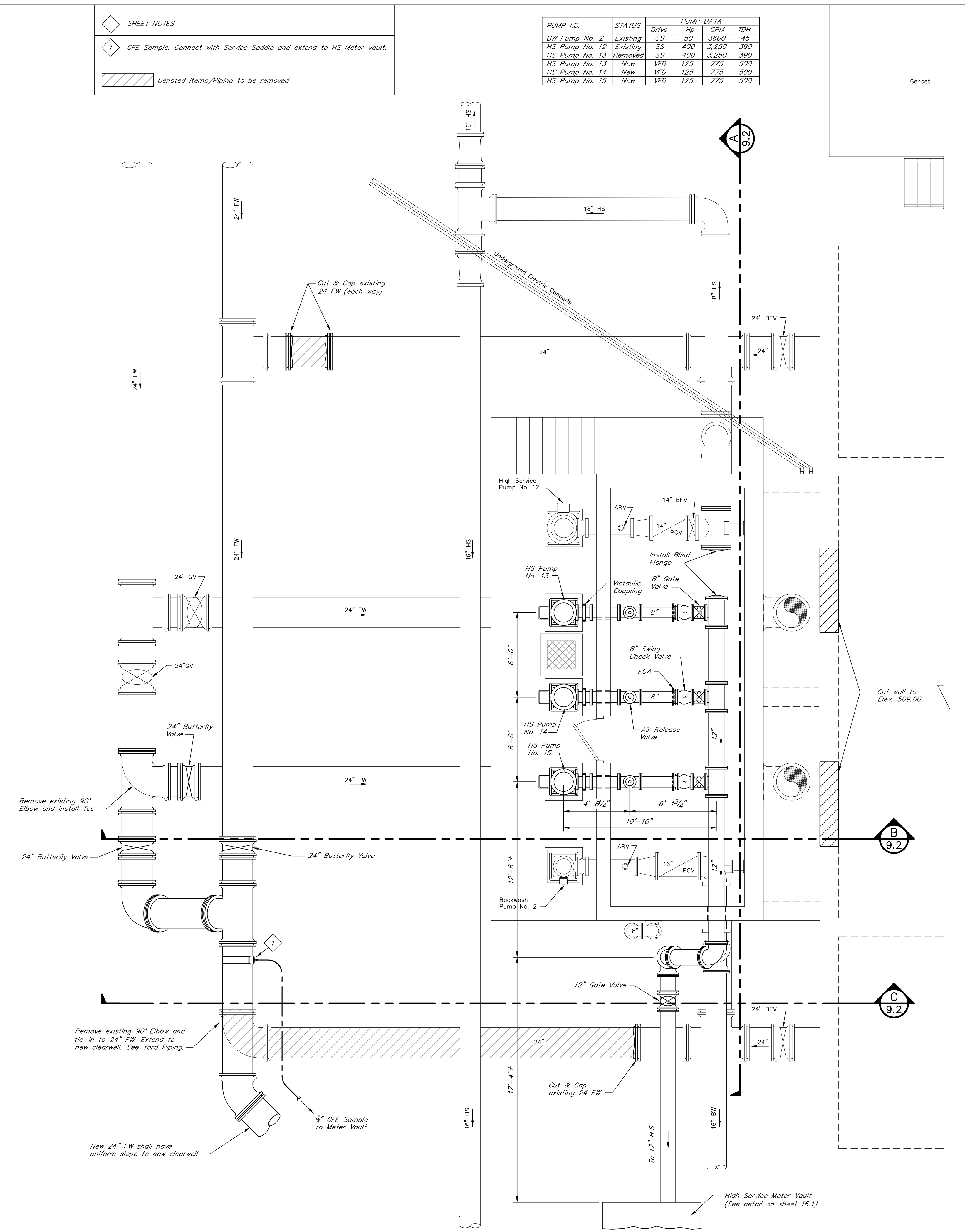


PUMP I.D.	STATUS	PUMP DATA			
		Drive	Hp	GPM	TDH
BW Pump No. 2	Existing	SS	50	3600	45
HS Pump No. 12	Existing	SS	400	3,250	390
HS Pump No. 13	Removed	SS	400	3,250	390
HS Pump No. 14	New	VFD	125	775	500
HS Pump No. 15	New	VFD	125	775	500

- SHEET NOTES**
- 1 CFE Sample. Connect with Service Saddle and extend to HS Meter Vault.
  - Denoted Items/Piping to be removed



**HSPS No. 3 MODIFICATIONS TOP PLAN**  
1/4"=1'-0"



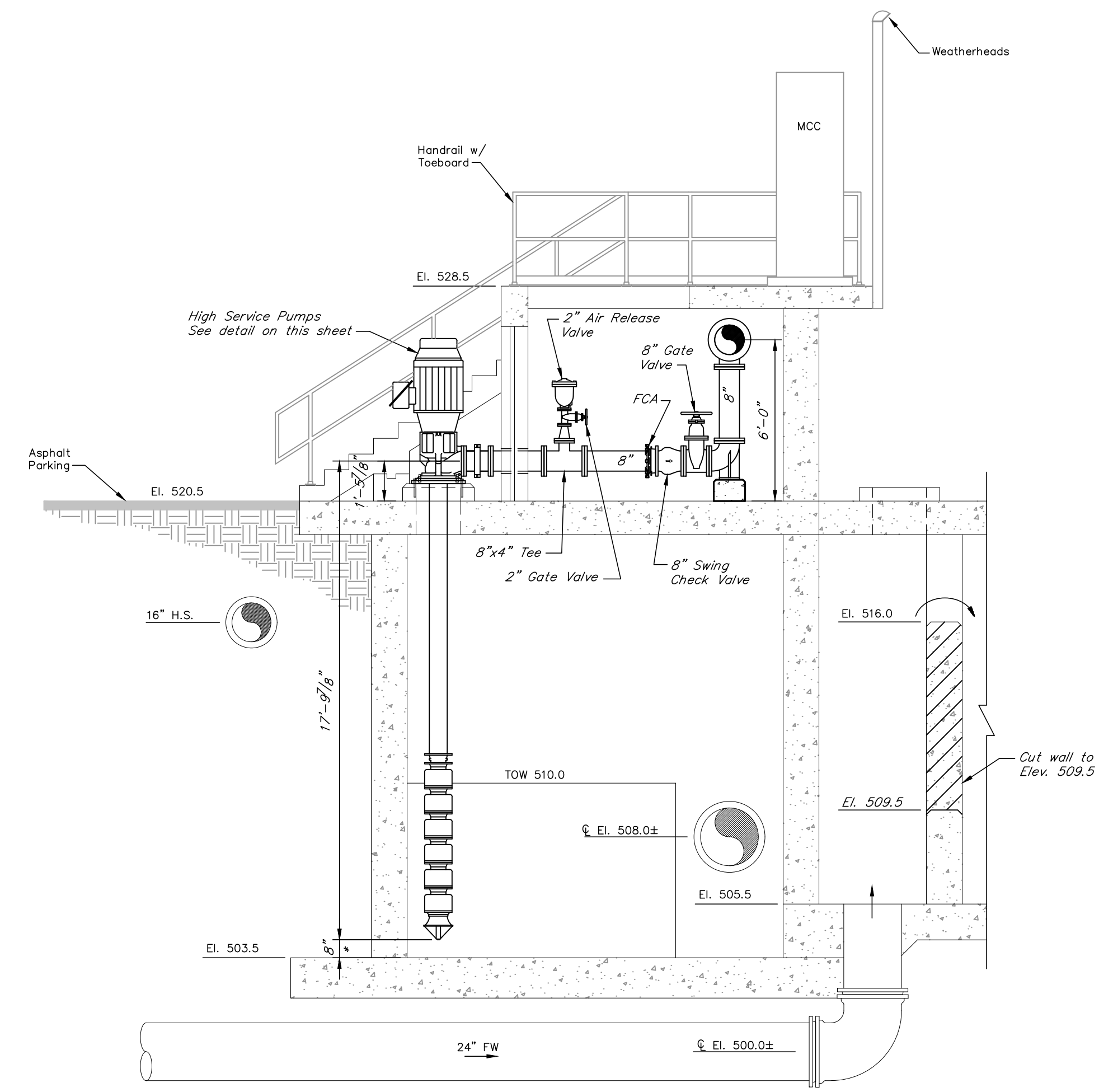
**HSPS No. 3 MODIFICATION PLAN**  
1/4"=1'-0"

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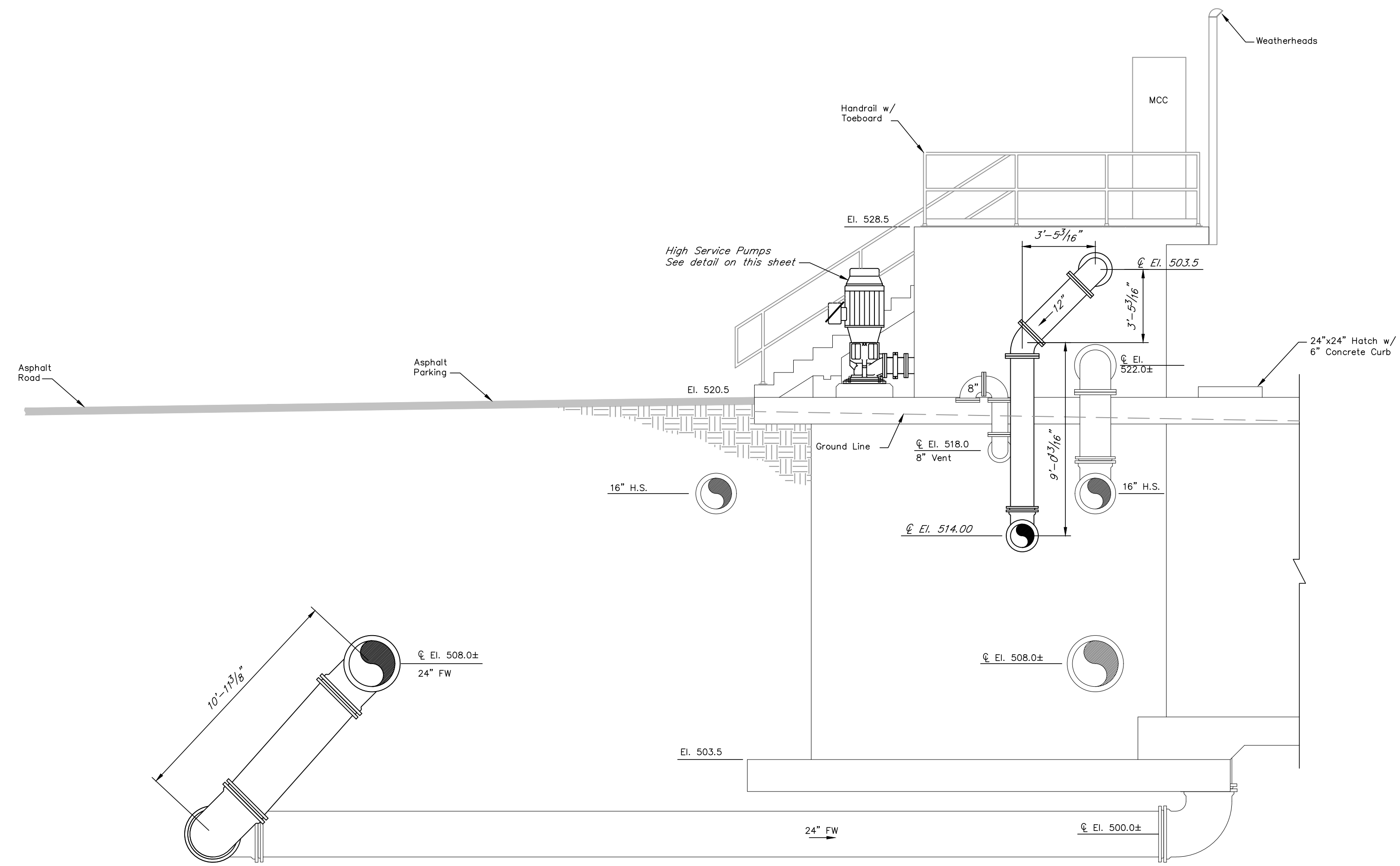


DRAWN BY: JKP
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DATE: MAY 2019
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REVISIONS

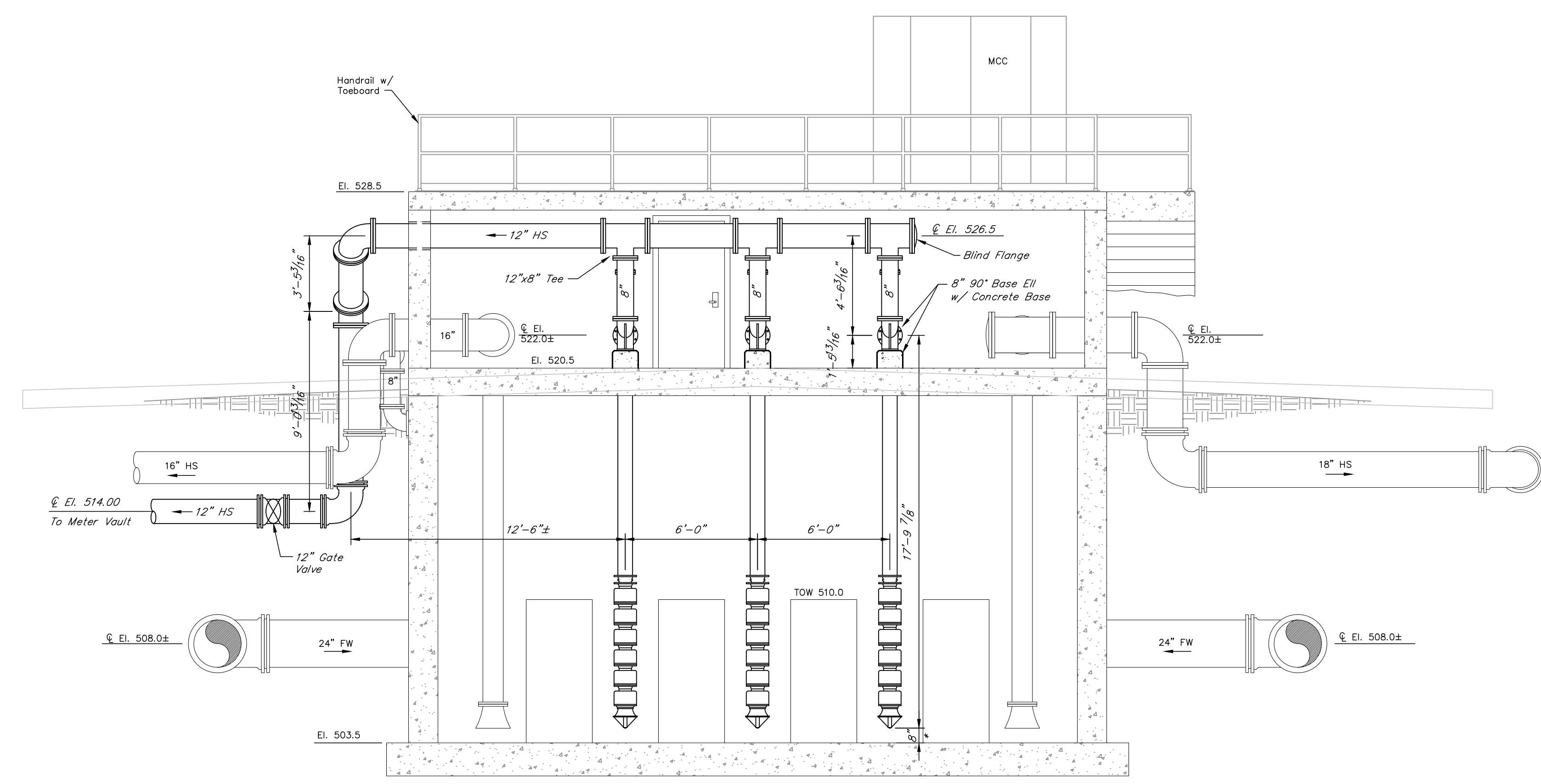
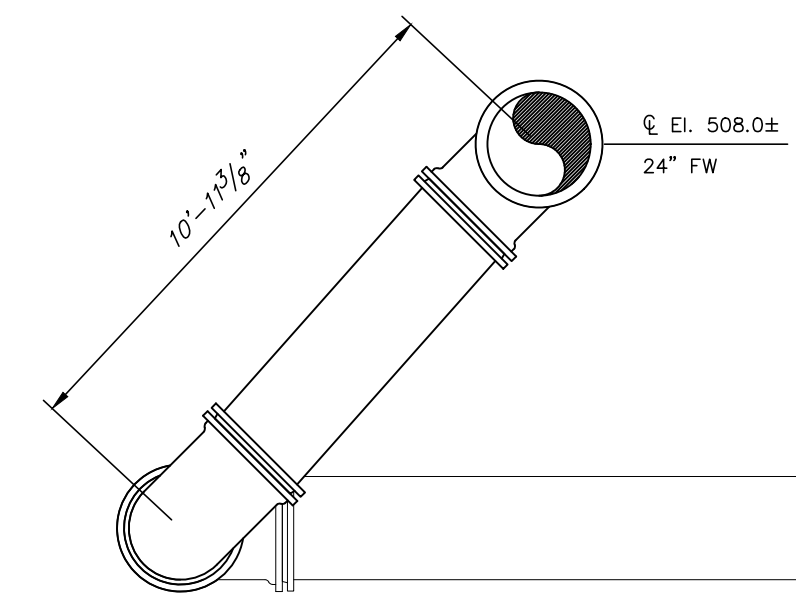


**SECTION B**  
1/4"=1'-0" **9.1**

\* Verify with pump manufacturer

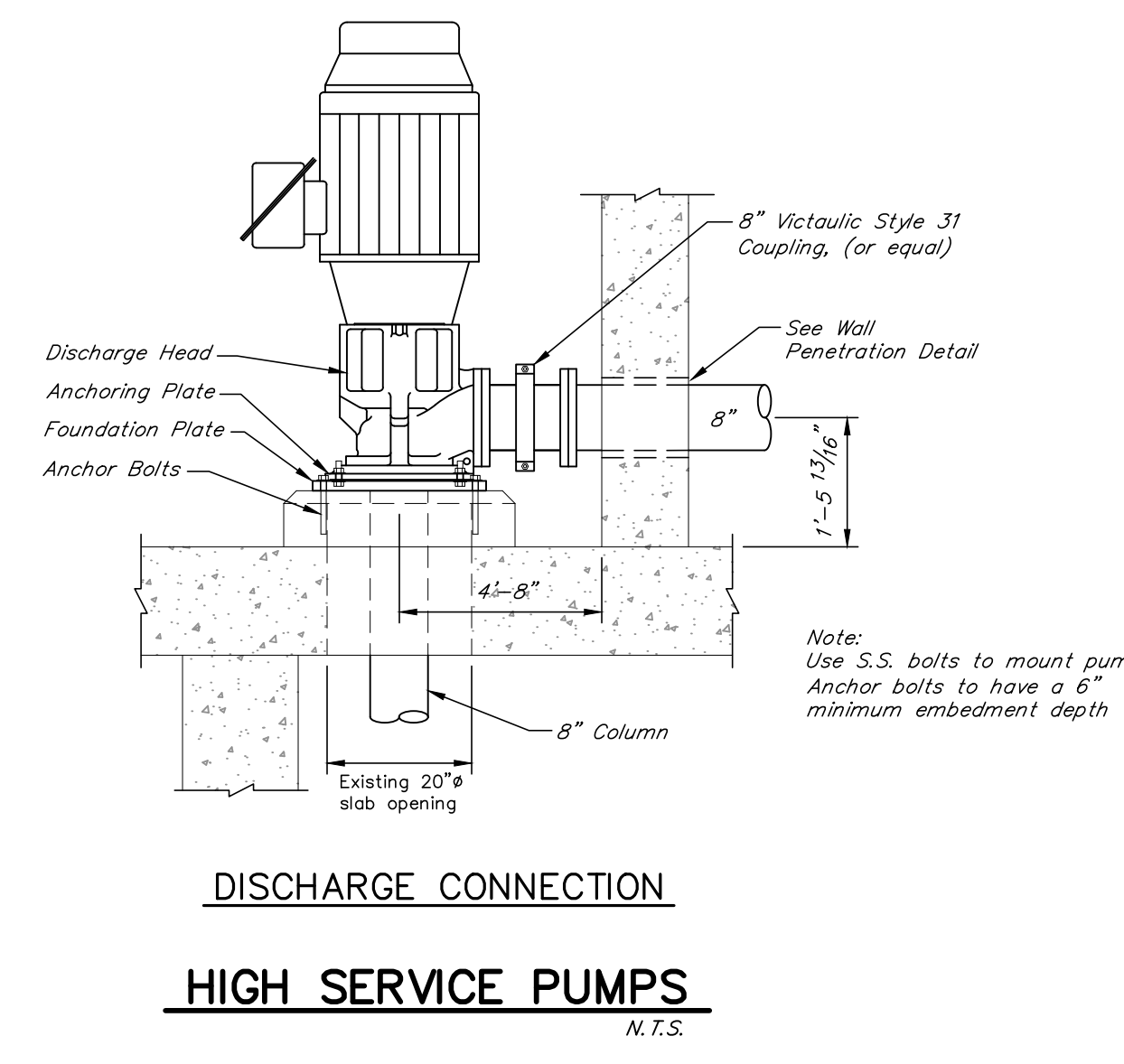
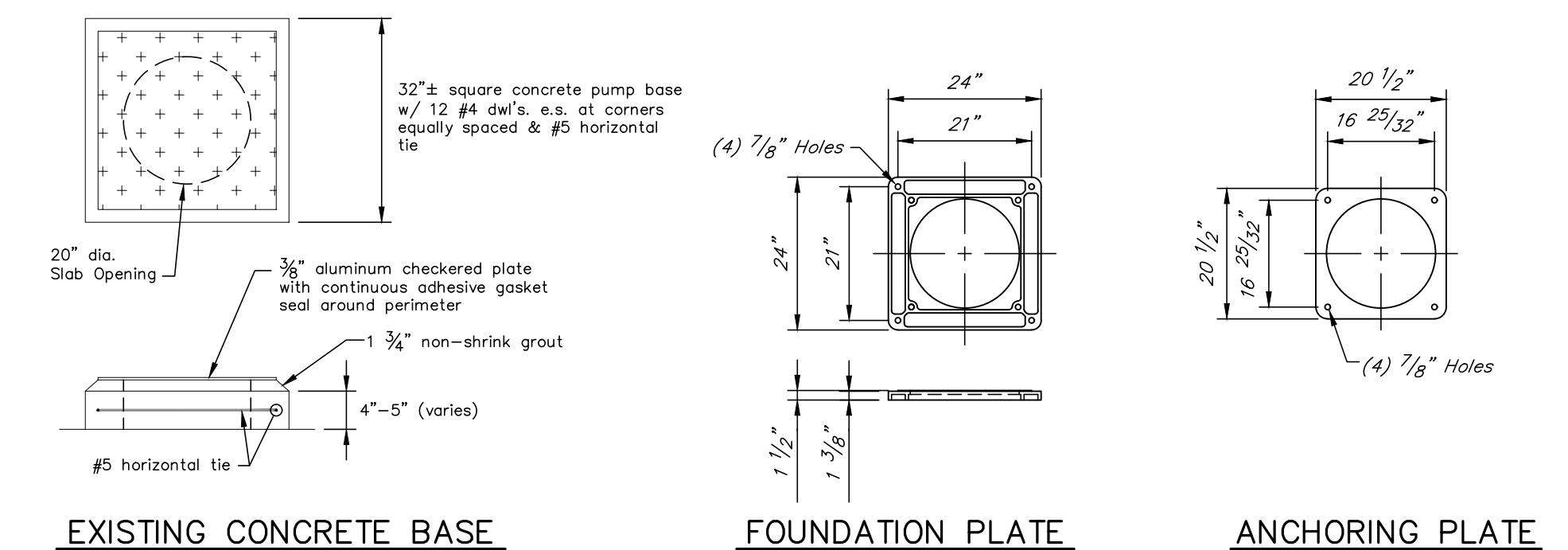


**SECTION C**  
1/4"=1'-0" **9.1**



**SECTION A**  
1/4"=1'-0" **9.1**

\* Verify with pump manufacturer







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REVISIONS



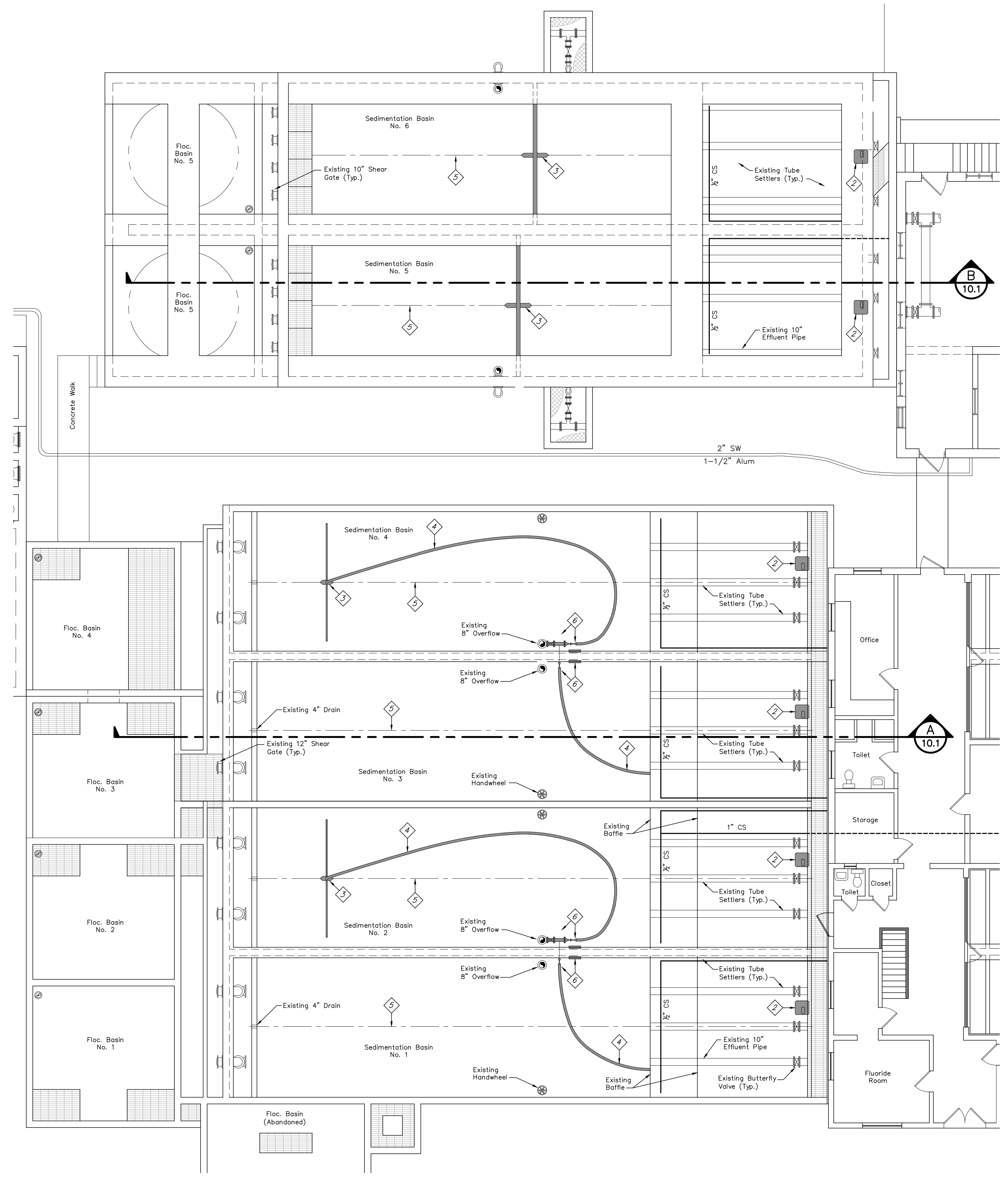
**GENERAL NOTES:**

- This plan shows the items that will be removed and/or abandoned in place at the end of the completed project. The Contractor shall work closely with the Owner and Engineer in the sequencing of demolition and construction to ensure the water treatment plant remains in operation throughout the project.
- While the main components of the sludge collection system have been identified on this sheet, it is the intent that the entire sludge collection systems and appurtenances be removed from all sedimentation basins.
- All piping, conduit, fasteners, and appurtenances on or in Sedimentation Basins 1 thru 4 shall be cleaned, prepped and painted.
- After the sludge collector drives are removed, the Contractor shall repair or replace that section of handrail to eliminate any remaining openings.

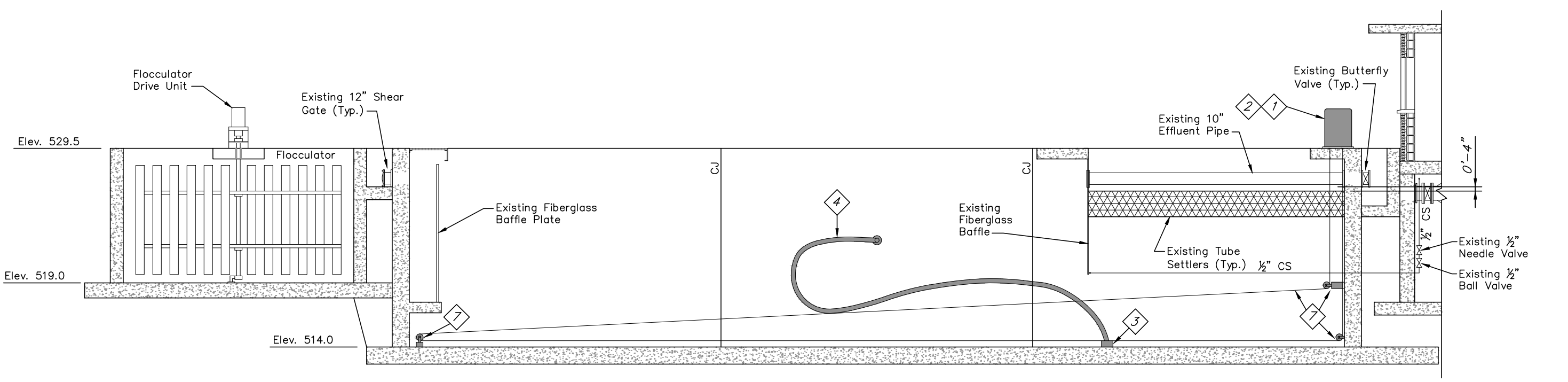
Denotes items to be removed and/or abandoned in place.  
Denotes concrete locations to be coated.

**SHEET NOTES**

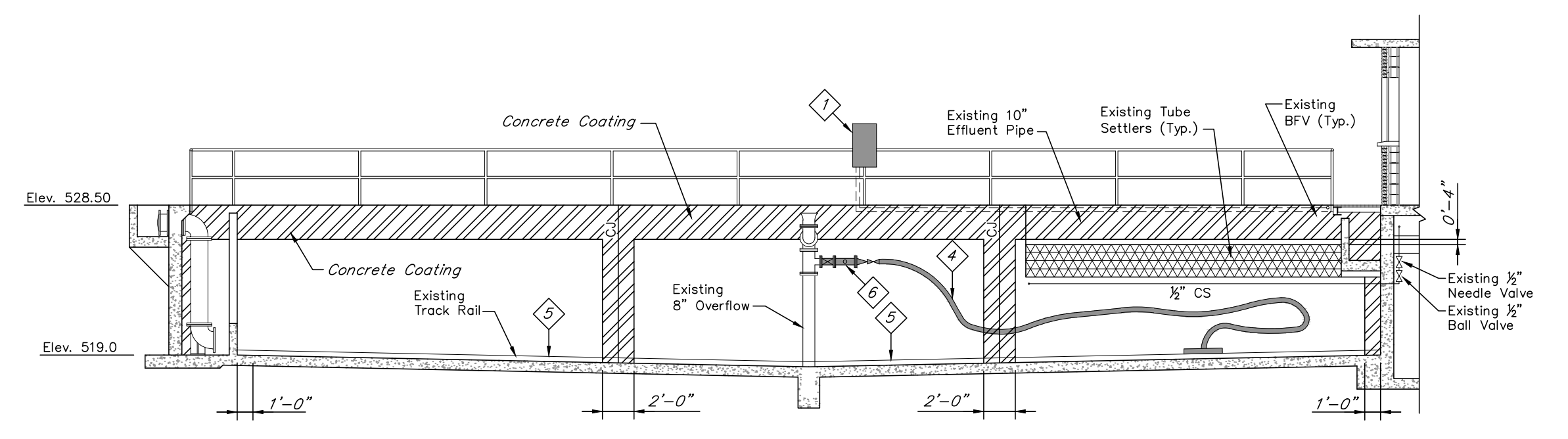
- Remove sludge collector control panel, wiring and conduits
- Remove sludge collector drives
- Remove existing header pipe and guide assembly
- Remove existing flexible sludge hose and control umbilical
- Remove existing Rails
- Remove existing pneumatic sludge valve panel, valves, piping and appurtenances
- Remove sludge collector pulleys, cables and appurtenances



**EXISTING SEDIMENTATION BASINS PLAN**  
1/8"=1'-0"



**SECTION B**  
1/8"=1'-0" 10.1



**Concrete Repair Notes:**  
Concrete in the existing sedimentation basins #1 thru #4 shall be cleaned and coated at the following locations:  
Top of the basins to within 3" of the tube settlers;  
Areas within 12" of each corner;  
12" on each side of each control joint.  
A sample of these areas has been shown on this section.

**SECTION A**  
1/8"=1'-0" 10.1

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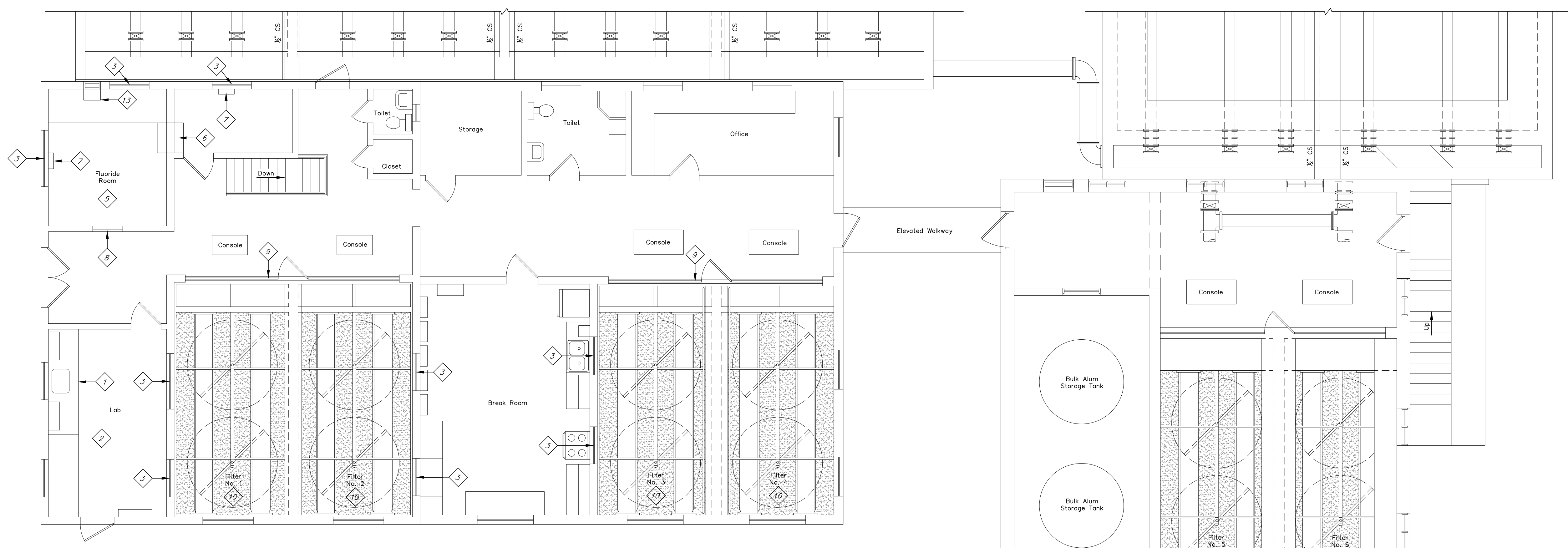




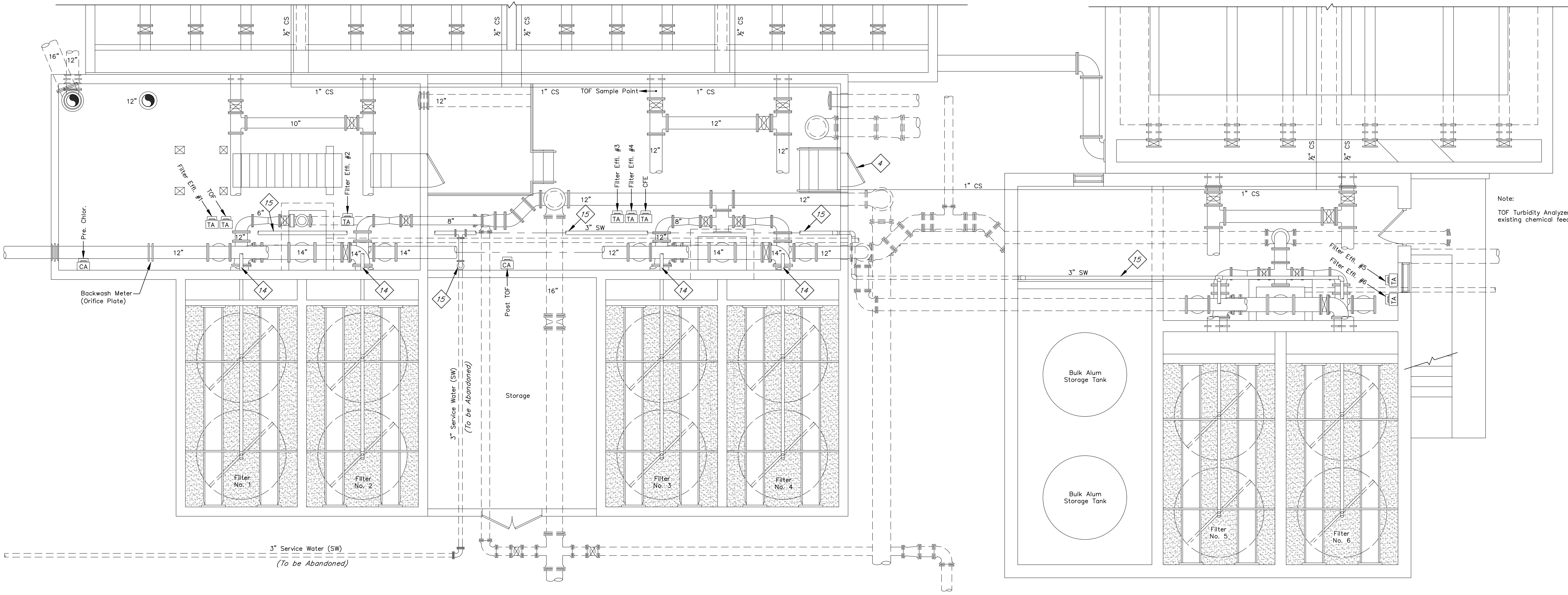
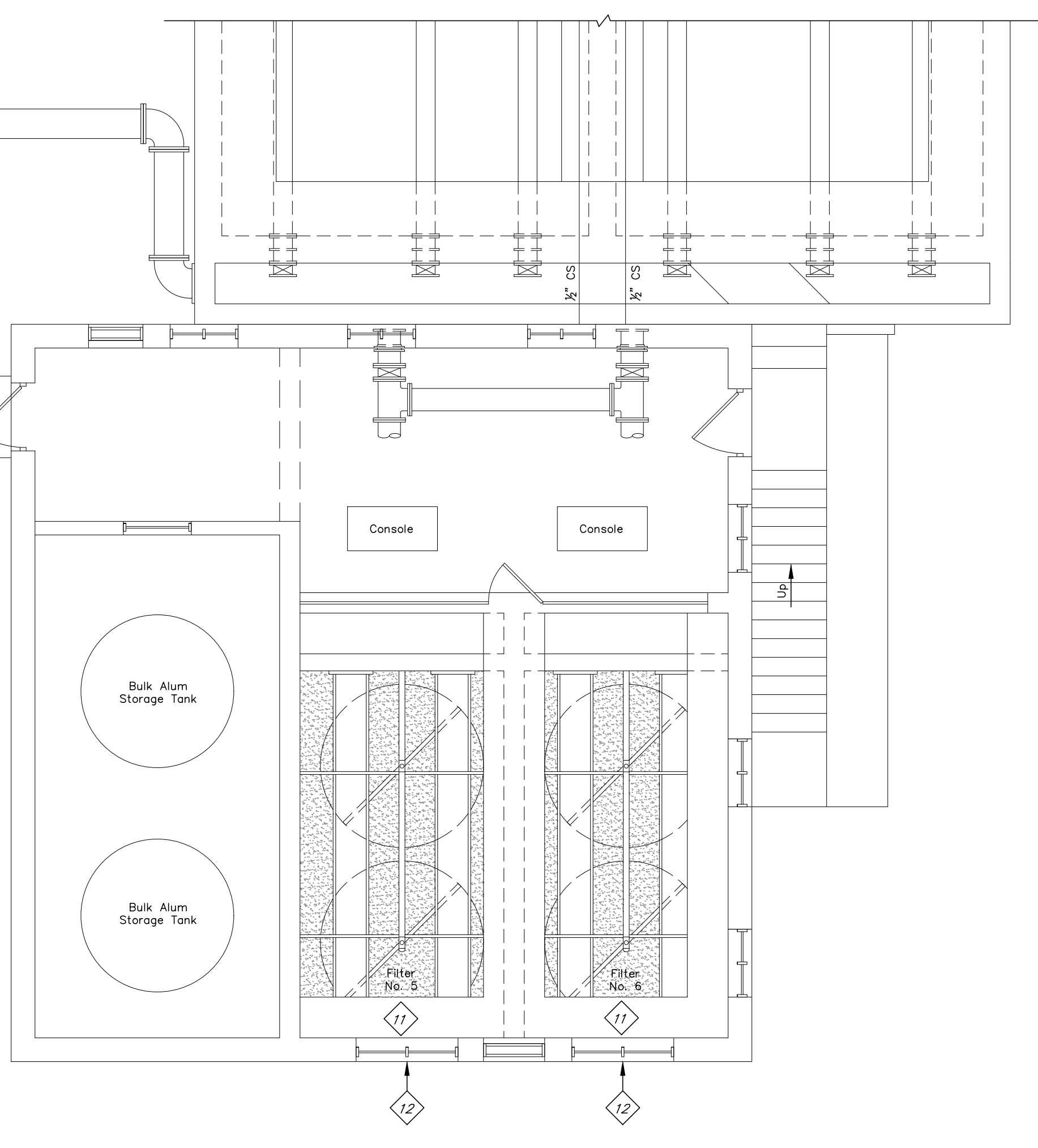
DRAWN BY: JKP
CHECKED BY: RVW
DATE: MAY 2019
SCALE: As Noted
REVISIONS



- SHEET NOTES**
- 1 Remove cabinets, sink, and countertop
  - 2 Remove drop ceiling
  - 3 Remove window and frame
  - 4 Remove existing Exterior Door
  - 5 Remove existing fluoride piping and appurtenances. Grout and/or repair concrete floor slab and walls. Remove concrete steps
  - 6 Remove wall mounted heater
  - 7 Remove door enclosure
  - 8 Remove door enclosure
  - 9 Remove Handrails and gate from top of concrete curb. Remove concrete curb.
  - 10 Remove filter media, filter underdrains, wash troughs, surface wash headers, piping, and all filter appurtenances
  - 11 Remove filter media
  - 12 Remove existing window, frame and sill
  - 13 Remove existing louver and repair wall.
  - 14 Remove existing surface wash piping
  - 15 Remove existing 3" PVC service water piping



**UPPER LEVEL**  
3/16"=1'-0"



**LOWER LEVEL**  
3/16"=1'-0"

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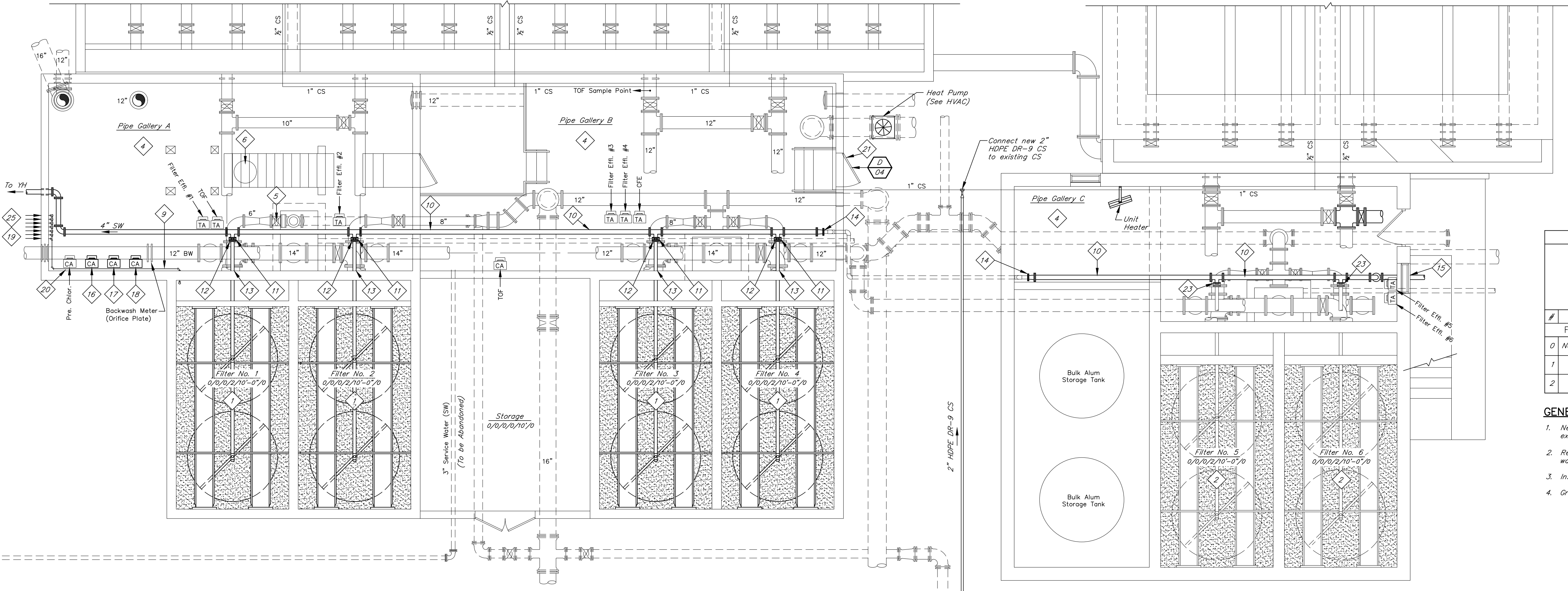
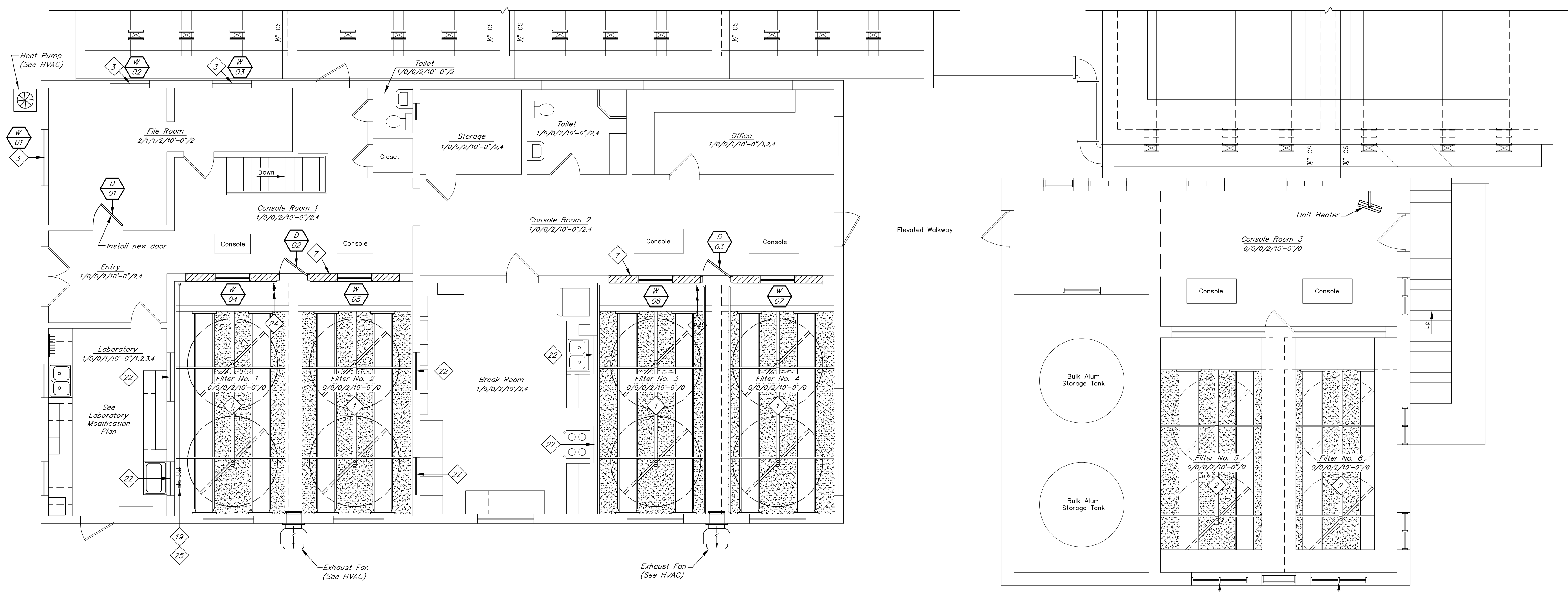




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 CHECKED BY: RVM  
 DATE: MAY 2019  
 SCALE: As Noted  
 REVISIONS



- SHEET NOTES**
1. Install new wash troughs, surface wash headers and filter components. Install new filter media and block. See "Existing Filter Rehabilitation".
  2. Install new filter media. See "Existing Filter Rehabilitation".
  3. Install new window and window frame.
  4. All exposed piping, valves, and appurtenances to be prepared, primed, and painted.
  5. Replace Effluent Valve Actuator (Filter No. 1).
  6. Replace existing Hot Water Heater.
  7. Construct Filter Enclosure for Filters No. 1 thru 4. See Filter Wall Enclosure Details.
  8. Replace existing surface wash valve with lugged butterfly valve with electric actuator.
  9. Connect house water to the Horse Cave FW sample line.
  10. Install new 4" D.I. service water.
  11. Install 3" lugged BVF with electric actuator.
  12. D.I. to S.S. Transition
  13. Install 3" stainless steel surface wash header. See "Existing Filter Rehabilitation" for surface wash piping.
  14. Connect to existing 3" PVC SW supply.
  15. Core existing concrete wall and extend 4" D.I. SW to new Filter Station.
  16. Chlorine Analyzer (FW Magnolia) from HS Meter Vault. See Chlorine Analyzer details.
  17. Chlorine Analyzer (FW Horse Cave) from 16" HS Line. See Chlorine Analyzer details.
  18. Chlorine Analyzer (CFE) from HS Meter Vault. See Chlorine Analyzer details.
  19. (3) 3/4" CL2 Sample Lines to Chlorine Analyzers & lab sink.
  20. Relocate existing Pre. Chlor. Chlorine Analyzer to new panel. See Chlorine Analyzer details.
  21. Replace existing exterior door.
  22. Fill in existing window openings with glazed block and brick. Match existing colors, style, etc. of adjoining surfaces.
  23. Reconnect to existing surface wash header.
  24. Install new hose bib and heavy duty hose hanger. Secure hanger to new block wall with aluminum channels.
  25. (4) 1" Raw Water Sample Lines. (3) to Lab Sink. Terminate spare in pipe gallery.

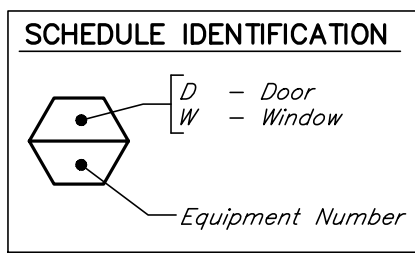


**ROOM FINISH SCHEDULE**

EXAMPLE

FLOOR	ROOM			
	First No.	Second No.	Third No.	Fourth No.
0	None/Exist.	0 None/Exist.	0 None/Exist.	0 None/Exist.
1	Refinish	1 Resilient Base	1 Paint	1 Drop
2	V.C.T.	2	2	2 Paint

- GENERAL FINISH SCHEDULE REMARKS:**
1. New acoustical tile ceiling height to match existing.
  2. Repair and grout existing holes and/or cracks in walls. Clean existing tile grout.
  3. Install new casework and equipment. See Details.
  4. Ground, seal, and refinish existing tile.

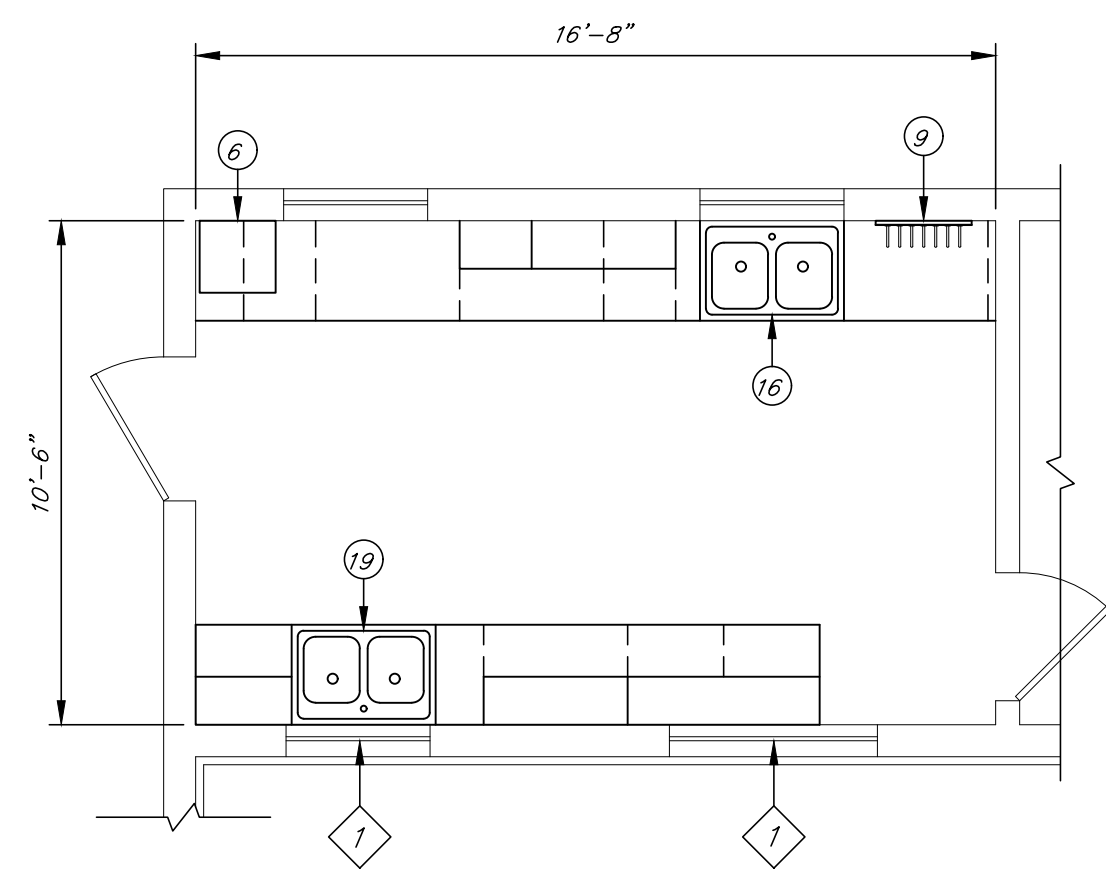


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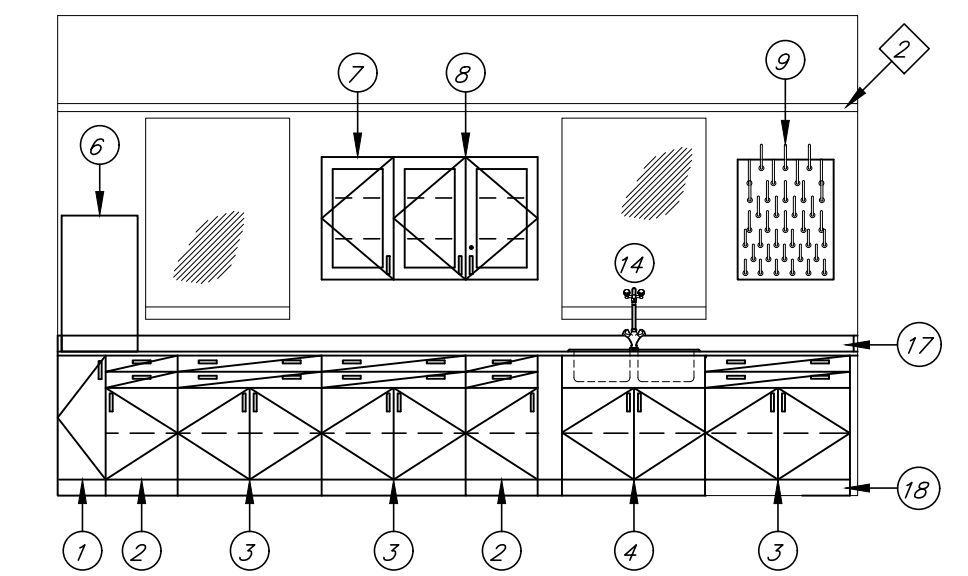




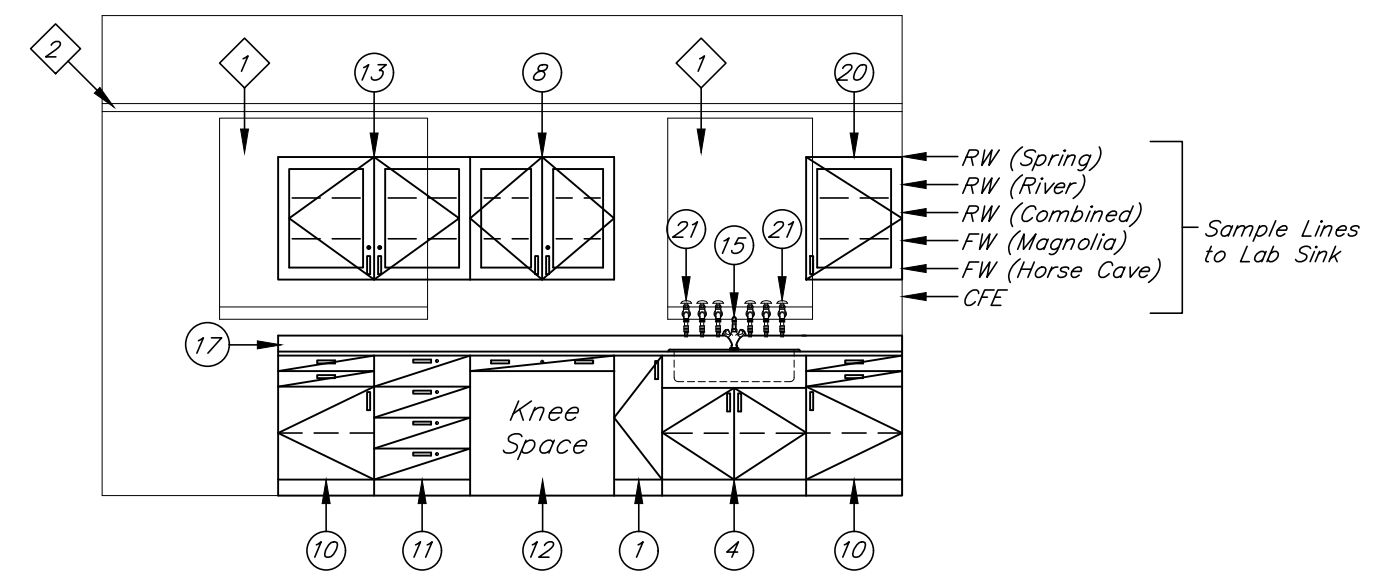
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CHECKED BY: RWV
DATE: MAY 2019
SCALE: As Noted
REVISIONS



**LABORATORY PLAN**  
1/4"=1'-0"



**WEST ELEVATION**  
1/4"=1'-0"



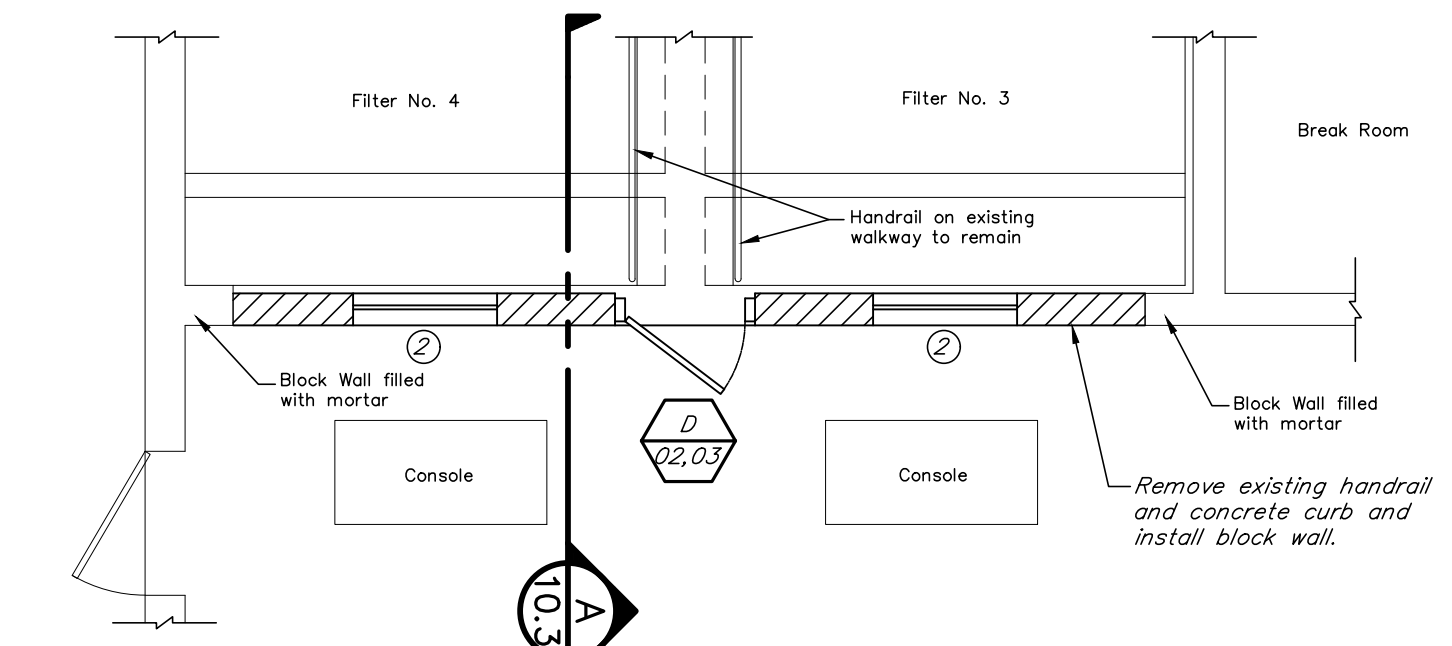
**EAST ELEVATION**  
1/4"=1'-0"

**LABORATORY MODIFICATIONS**  
1/4"=1'-0"

LABORATORY MODIFICATIONS	
ITEM DESCRIPTION	
1	12" x 36" x 24" Base Cabinet
2	18" x 36" x 24" Base Cabinet
3	36" x 36" x 24" Base Cabinet
4	36" x 36" x 24" Sink Base Cabinet
5	Not Used
6	4.5 Cu. ft. Refrigerator, S.S. finish
7	18" x 30" x 12" Wall Cabinet
8	36" x 30" x 12" Wall Cabinet
9	Glassware Pegboard
10	24" x 36" x 24" Base Cabinet
11	24" x 36" x 24" 4 Drawer Base Cabinet
12	36" Drawer Frame w/ Standard Drawer
13	48" x 30" x 12" Wall Cabinet
14	High Arc S.S. Faucet w/ EEW
15	Low Arc S.S. Faucet
16	S.S. Dual Bowl Insulated Sink
17	Epoxy Resin countertop w/ backsplash
18	4" Base around perimeter of all casework
19	S.S. Single Bowl Insulated Sink
20	24" x 30" x 12" Wall Cabinet
21	Hose Bib Faucet (6 required)

NOTES	
1	Enclose existing filter window. Match existing block.
2	Replace existing drop ceiling, including frame, hardware and fluorescent light fixtures.
3	Provide labels for sample lines.

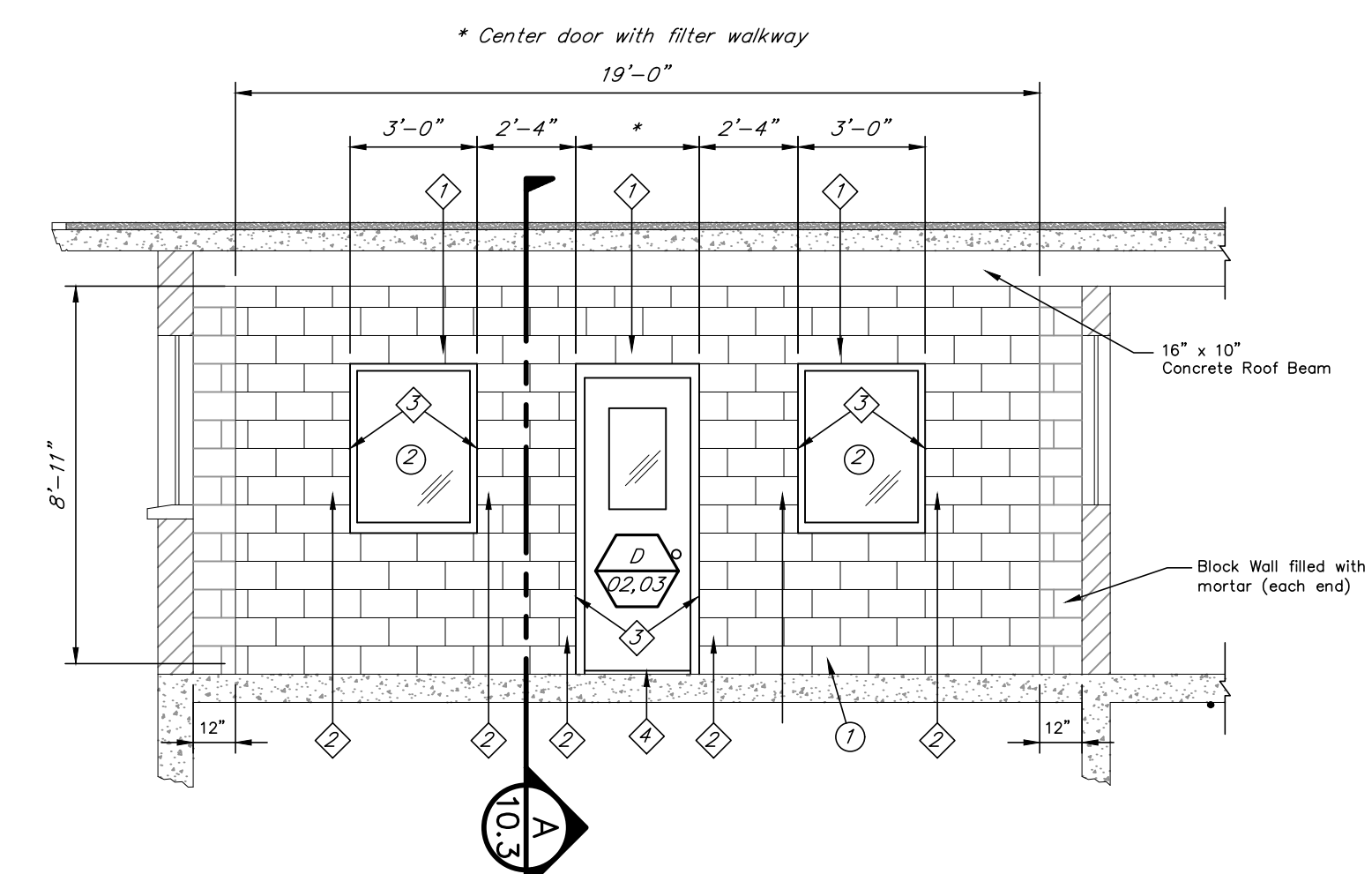


**FILTER WALL ENCLOSURE**  
1/4"=1'-0"

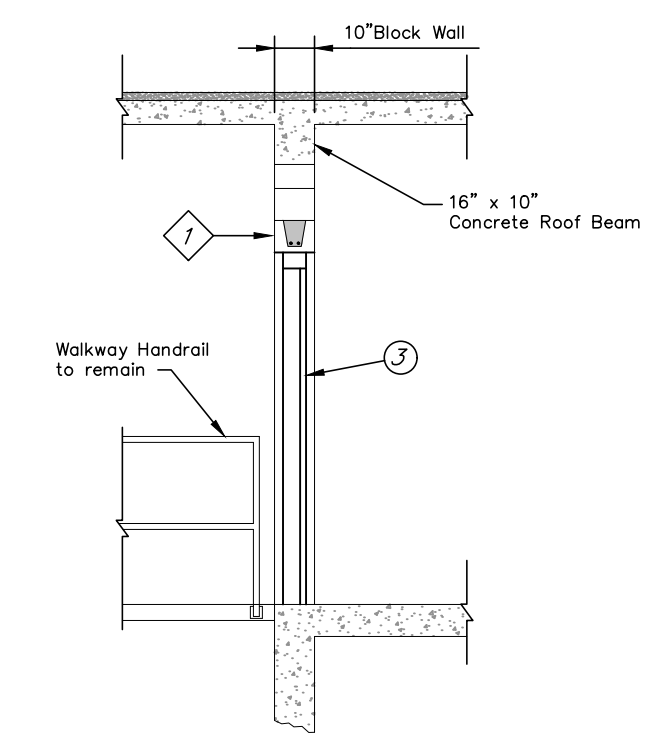
FILTER WALL ENCLOSURE	
ITEM DESCRIPTION	
1	6" Concrete Block
2	36"x48" aluminum casement, double hung w/ window

NOTES	
1	Install lintel block grouted solid with two (2) #5 bars at openings. Extend 8" past rough opening.
2	Grout block cells to floor next to openings.
3	Bullnose block shall be used at all openings.
4	Install 1" threshold at door opening.



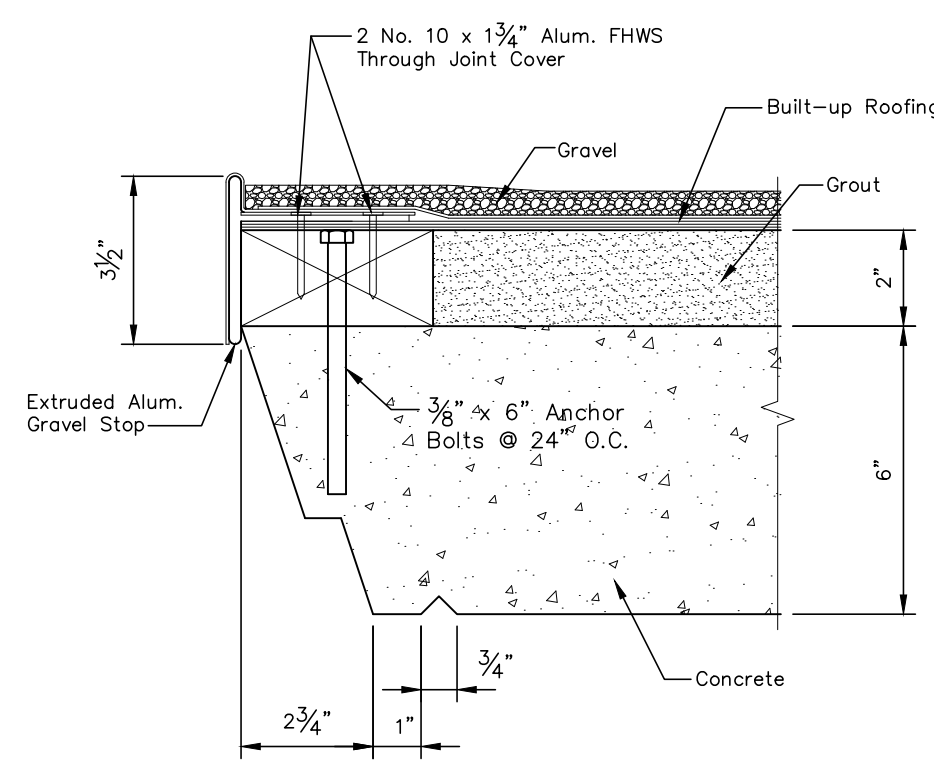
**FILTER WALL ENCLOSURE ELEVATION**  
1/4"=1'-0"



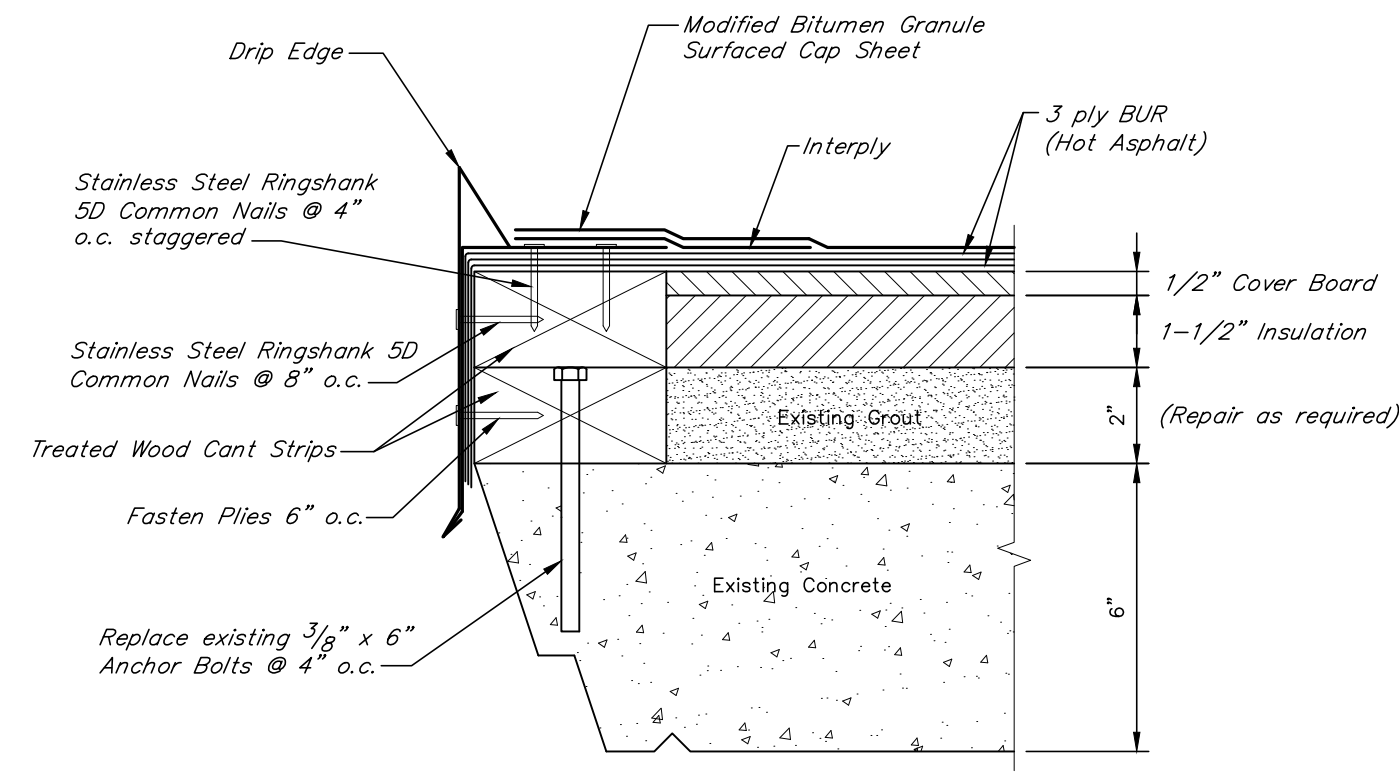
**WALL SECTION**  
1/4"=1'-0"  
**A**  
10.3

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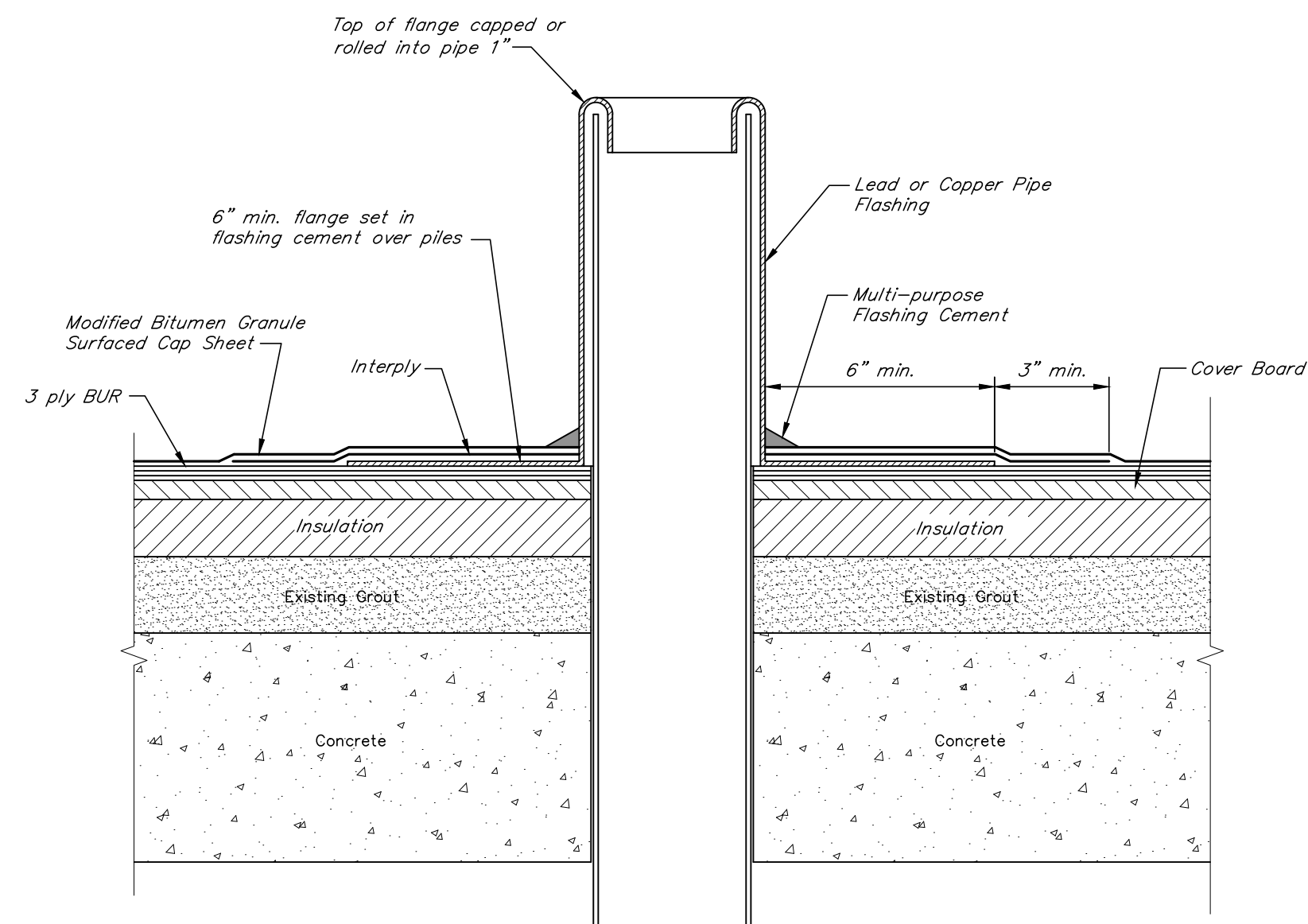


**EXISTING ROOF DETAIL**  
3/16"=1'-0"

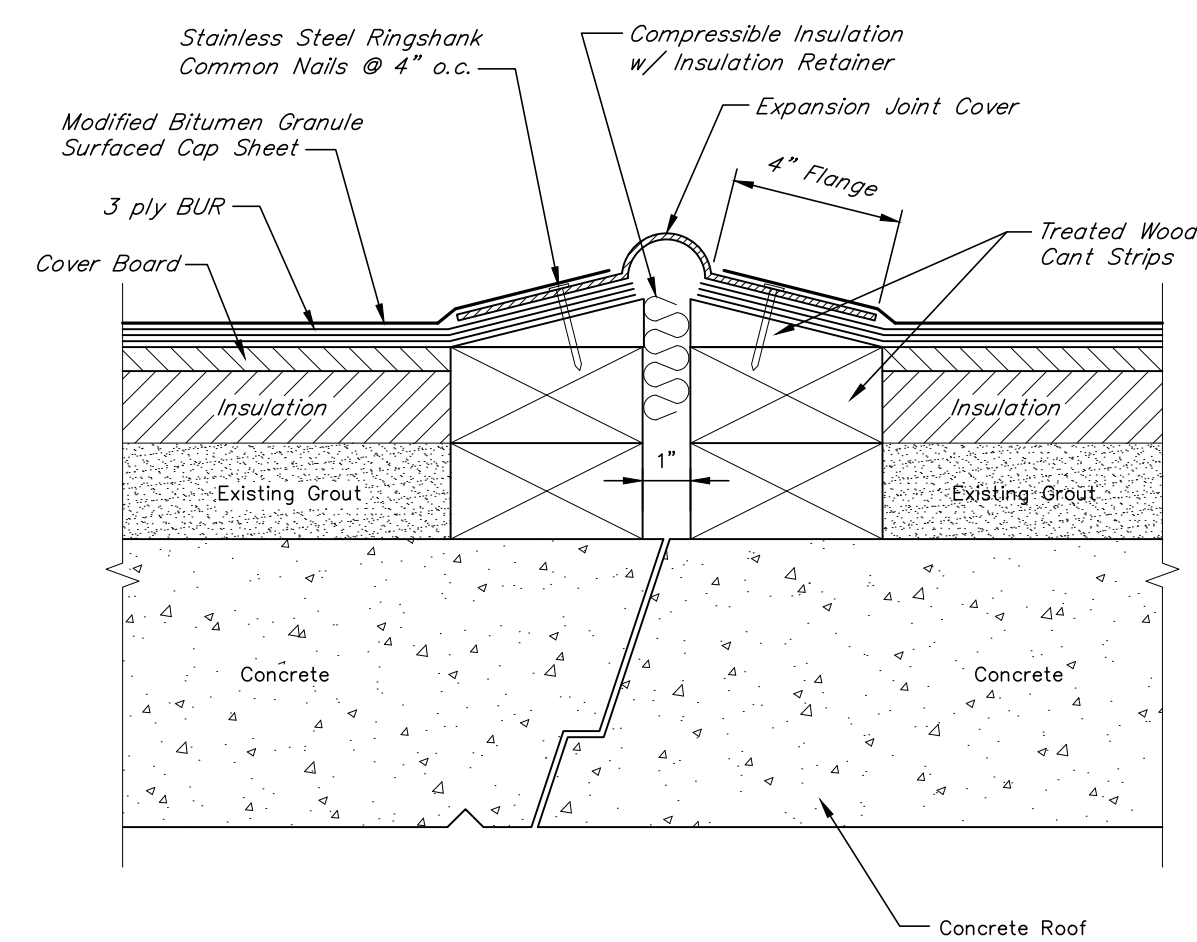


**PROPOSED ROOF DETAIL**  
3/16"=1'-0"

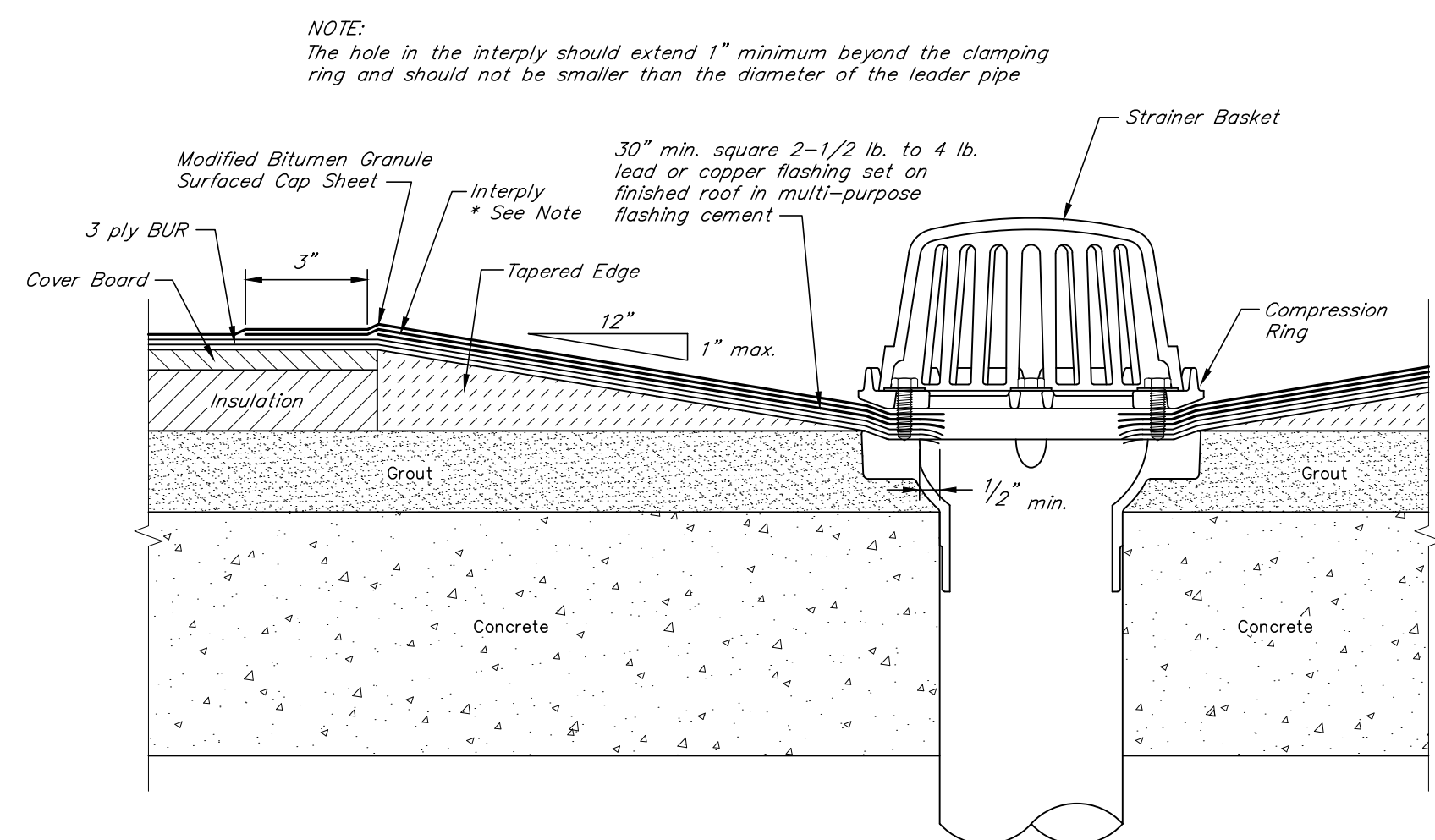
- GENERAL NOTES:**
1. Remove existing gravel, gravel stop, built up roofing, edging, cant strips, fasteners, and anchor bolts down to existing concrete and grout.
  2. Ensure that the existing roof is clean, clear of any debris, and dry before proceeding with new roof installation.
  3. The Contractor shall utilize cant strips where necessary to eliminate tight bends.
  4. Flashing shall be aluminum or galvanized steel and shall be primed with an asphalt primer.
  5. The construction of the built up roof shall be in strict accordance with manufacturer's recommendations.
  6. The minimum slope of the new roof shall be 0.25:12 (2%) or as specified by the manufacturer's recommendations.
  7. The Contractor shall temporarily remove the three (3) existing flood lights as shown on the roof plan and re-install them after the new roof has been completed. This shall include the lights, mounting hardware, electrical junction boxes, wiring, and all appurtenances required to maintain a good operating condition.



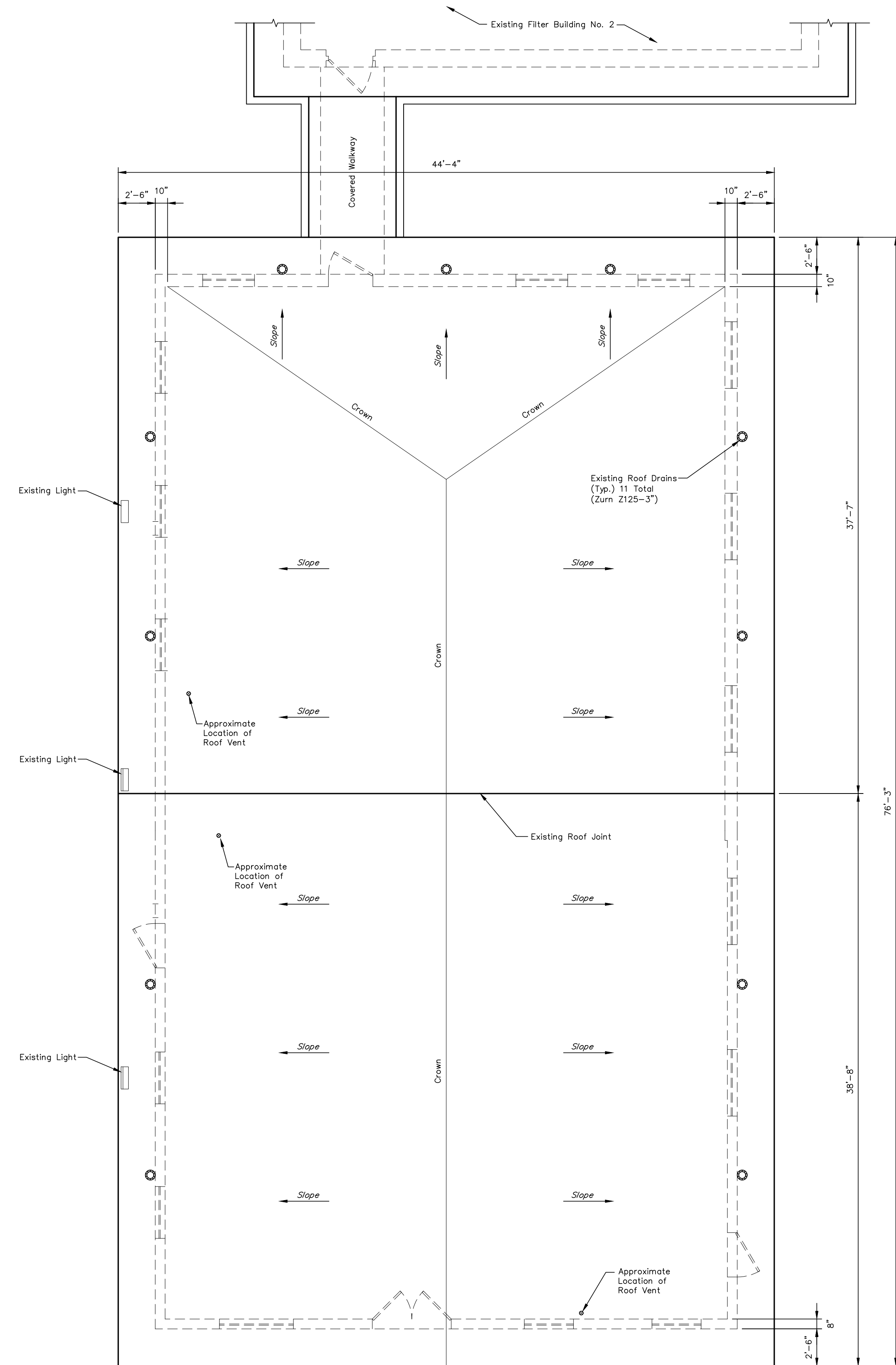
**PIPE PENETRATION**  
3/16"=1'-0"



**ROOF JOINT DETAIL**  
3/16"=1'-0"



**ROOF DRAIN DETAIL**  
N.T.S.



**ROOF PLAN - EXISTING FILTER BUILDING No.1**  
3/16"=1'-0"

**EXISTING FILTER BUILDING ROOF REPLACEMENT**

**GREEN RIVER VALLEY WATER DISTRICT  
WATER TREATMENT PLANT EXPANSION  
HART COUNTY, KENTUCKY**



DRAWN BY: JKP
CHECKED BY: RVW
DATE: MAY 2019
SCALE: As Noted
REVISIONS

**KENVIRONS, INC.**  
FRANKFORT, KENTUCKY



PROJECT NO.  
**2014042**  
SHEET NO.  
**11.4**

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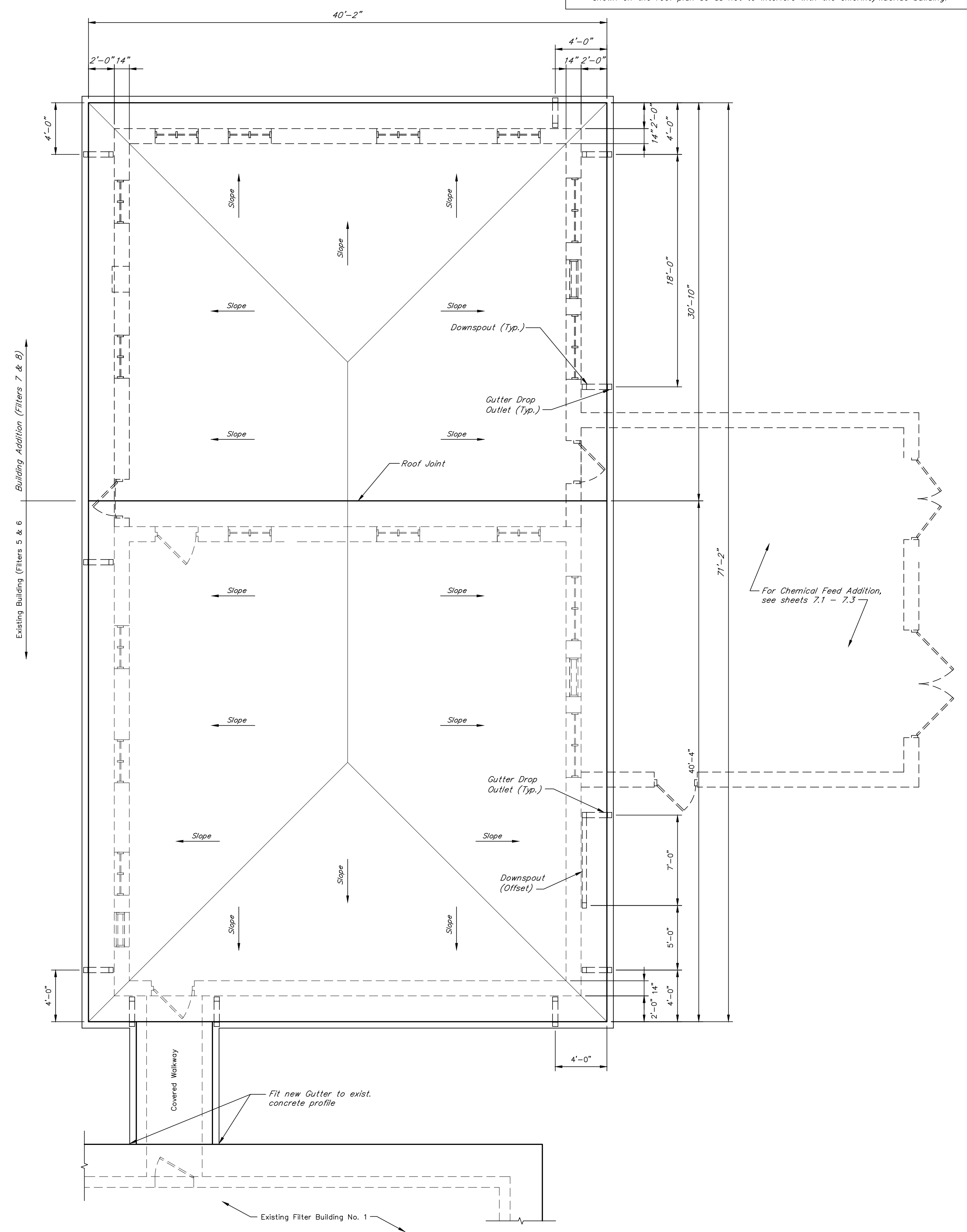
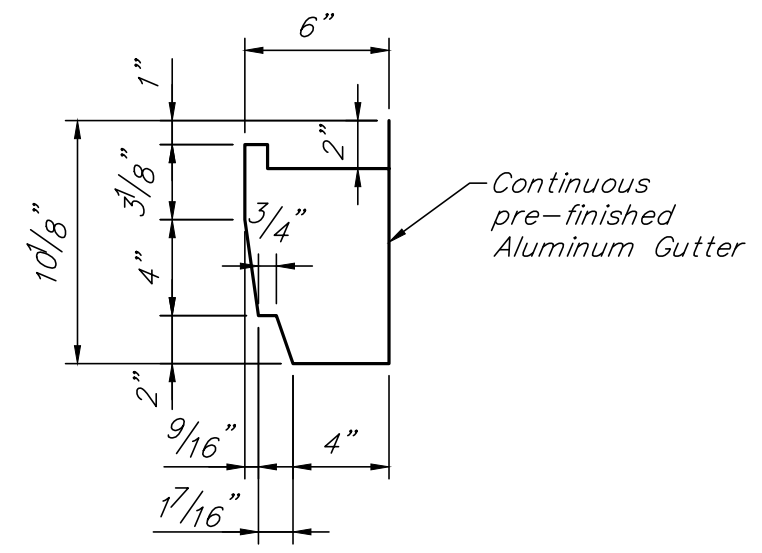
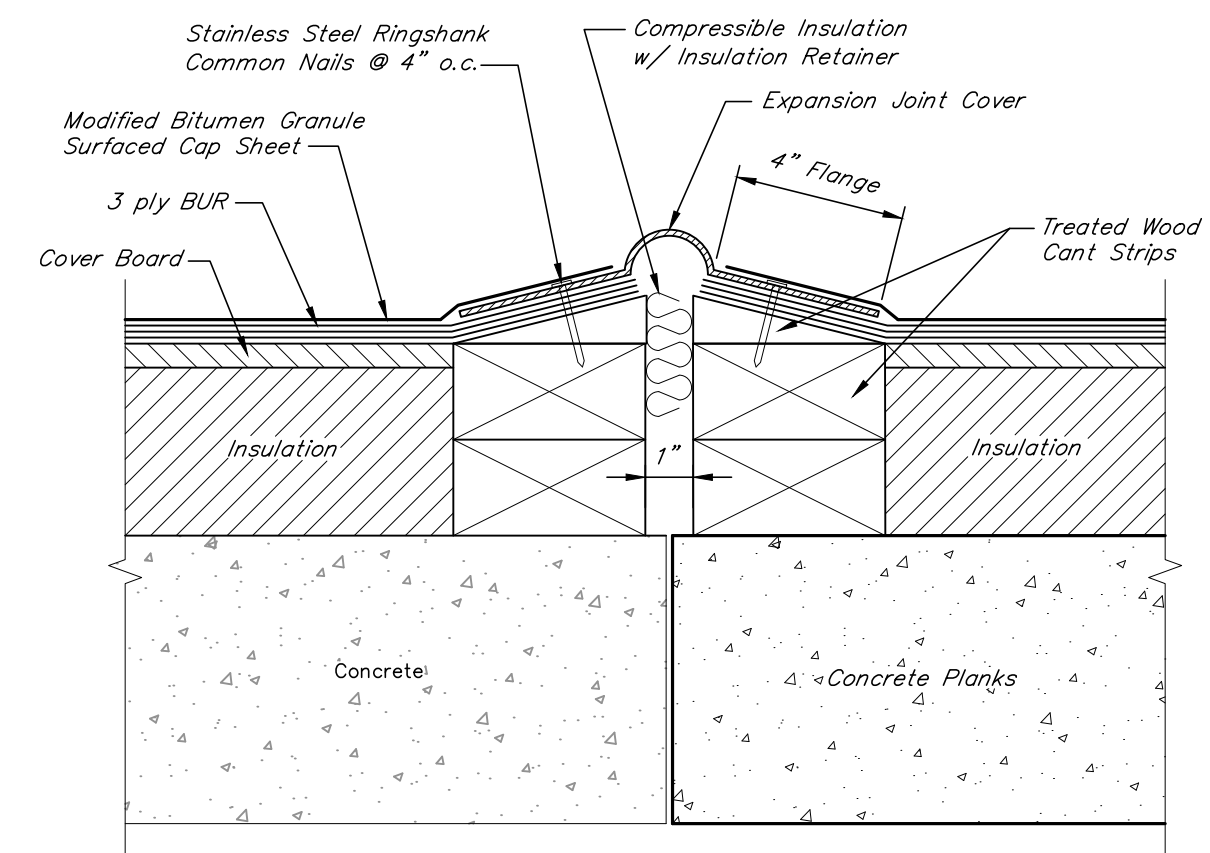
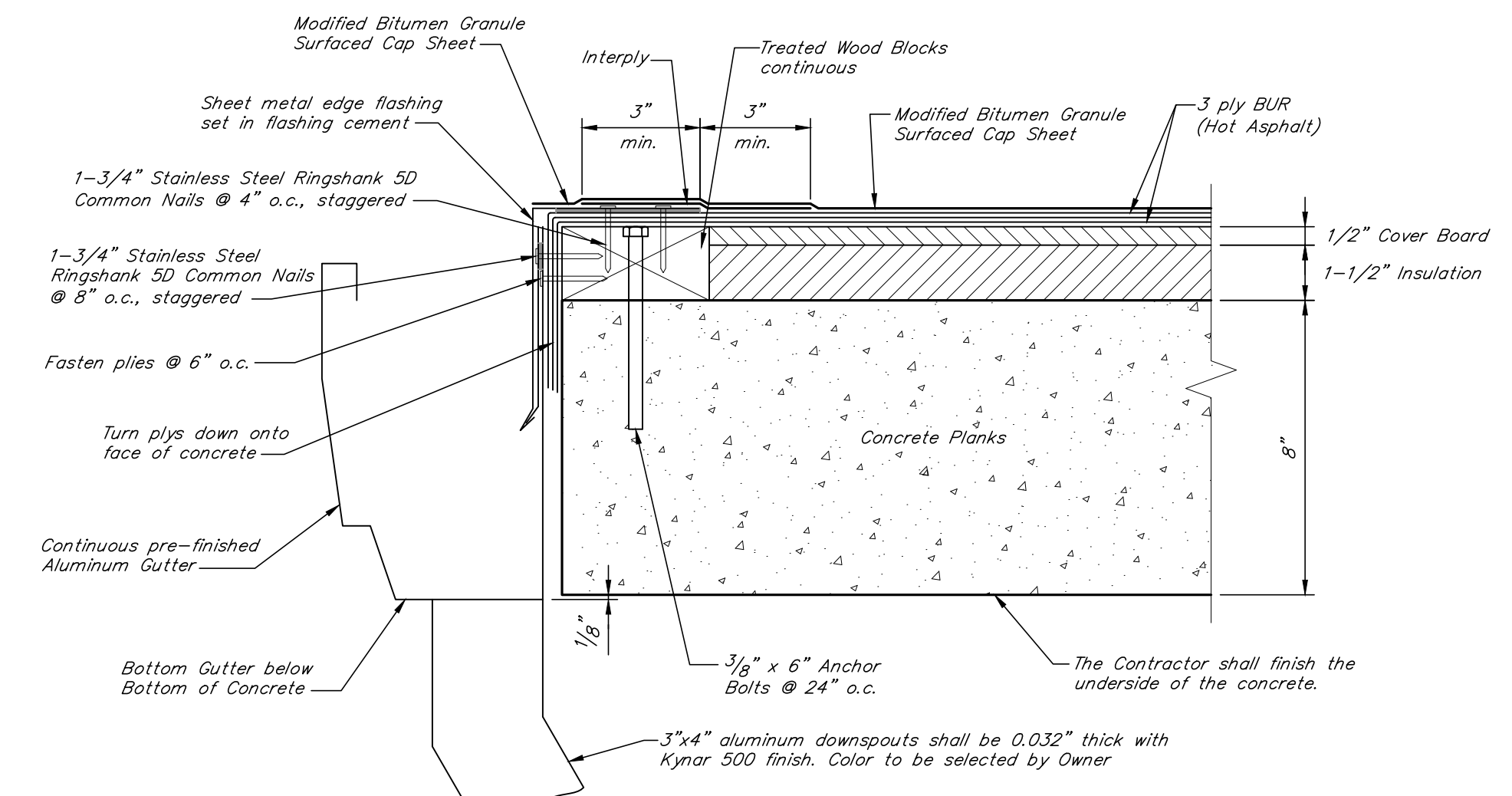




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CHECKED BY: RVW
DATE: MAY 2019
SCALE: As Noted
REVISIONS



- GENERAL NOTES:**
1. Remove existing gutters, downspouts, membrane roofing, insulation boards, edging, cant strips, fasteners, and anchor bolts down to existing concrete.
  2. Ensure that the existing roof is clean, clear of any debris, and dry before proceeding with new roof installation.
  3. The Contractor shall utilize cant strips where necessary to eliminate tight bends.
  4. Flashing shall be aluminum or galvanized steel and shall be primed with an asphalt primer.
  5. The construction of the roof shall be in strict accordance with manufacturer's recommendations.
  6. The minimum slope of the new roof shall be 0.25:12 (2%) or as specified by the manufacturer's recommendations.
  7. The new continuous pre-finished aluminum gutter shall be as shown on the "Gutter Detail" on this sheet to match the existing concrete roof on the existing building.
  8. The new gutters shall be sloped toward the new downspouts. The downspouts locations shall be as shown on the roof plan so as not to interfere with the chlorine/fluoride building.



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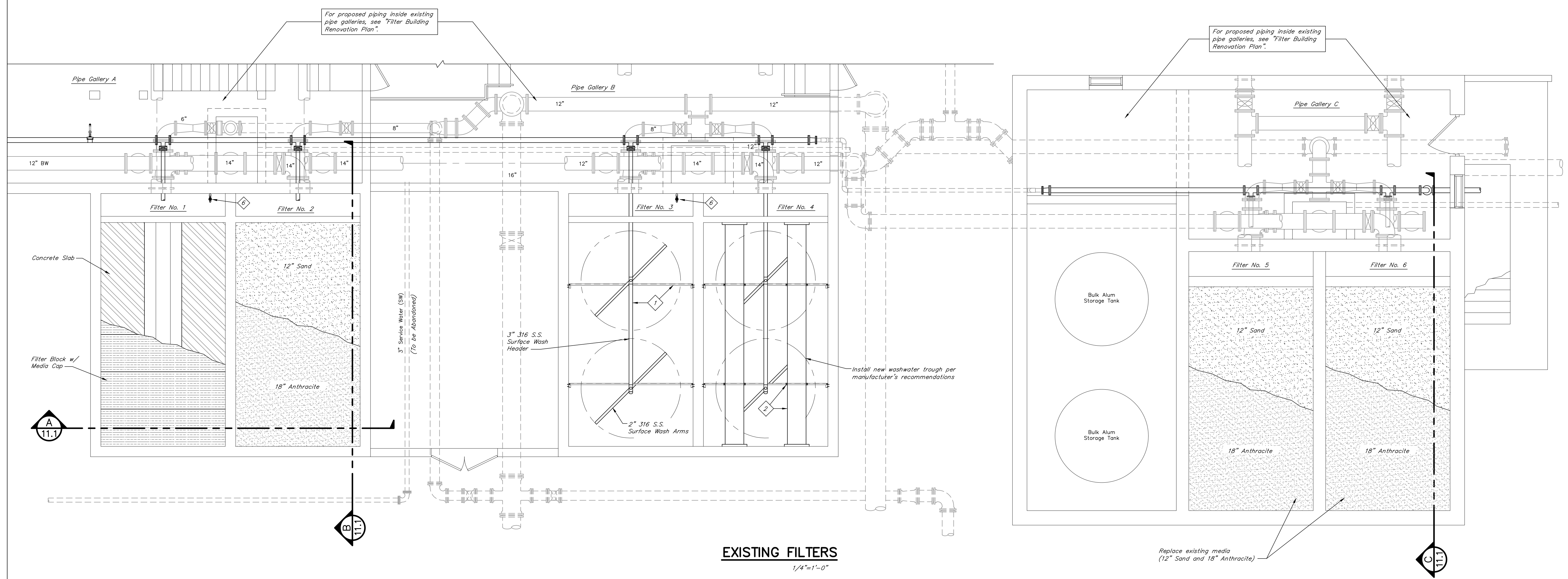




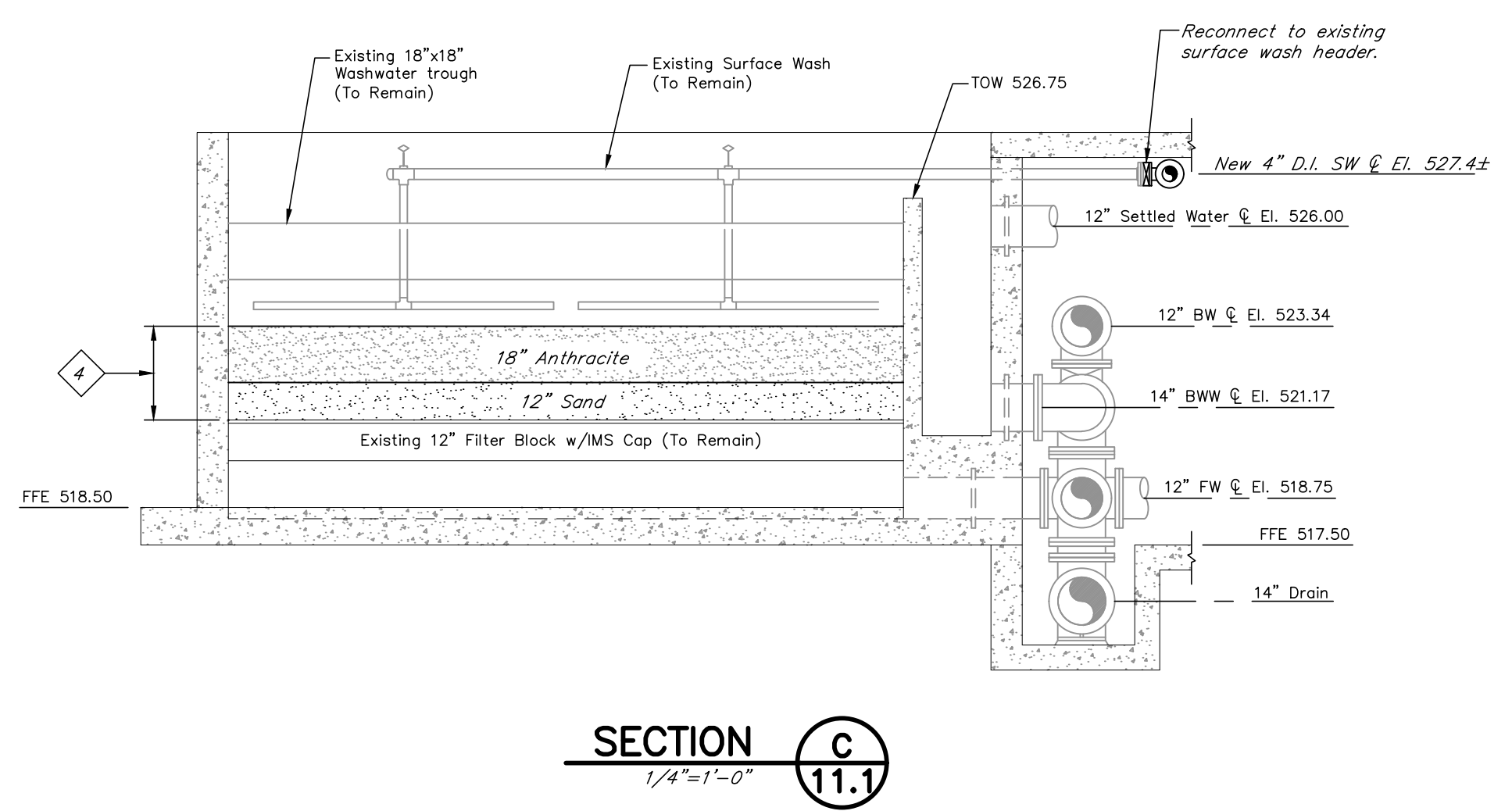
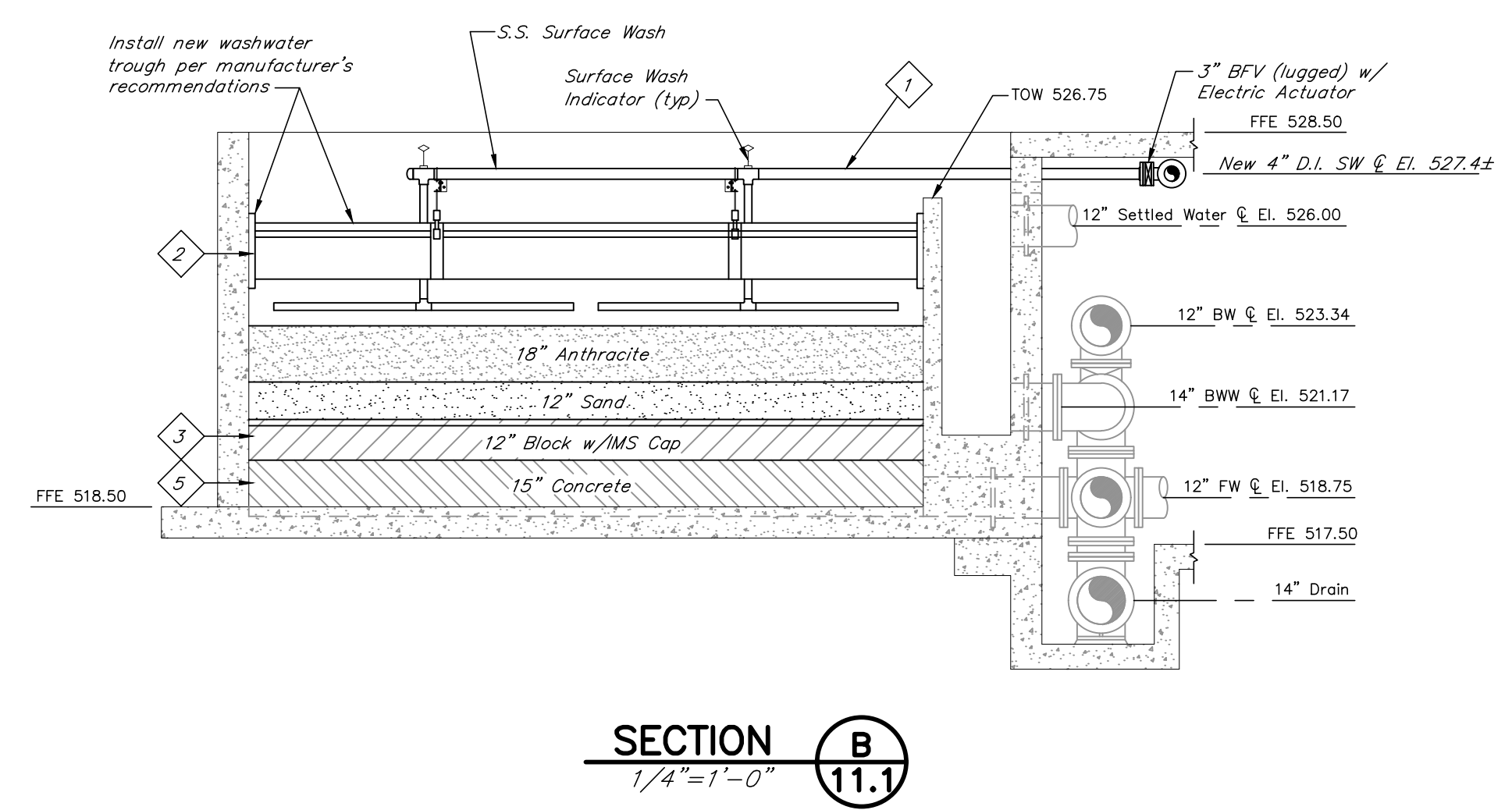
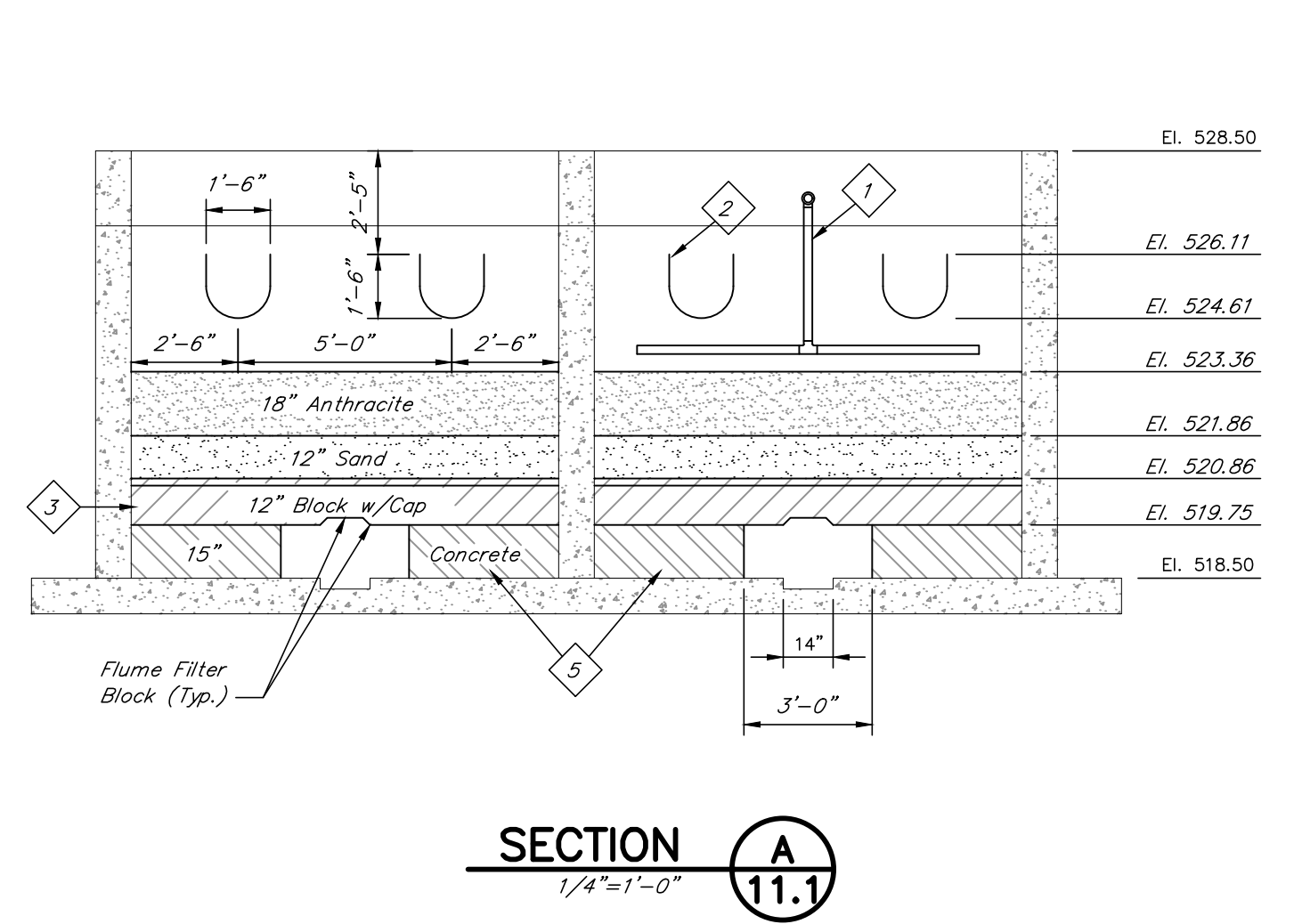
DRAWN BY: JKP
CHECKED BY: RVW
DATE: MAY 2019
SCALE: As Noted
REVISIONS



- GENERAL NOTES:**
- The Contractor to completely rebuild Filters 1 thru 4. This shall include removing the filter media, wash troughs, surface wash headers, piping, and all filter appurtenances.
  - The Contractor shall repair and grout existing holes and/or cracks in the existing filter walls.
  - New equipment shall be installed per manufacturer's recommendations.
  - Sections A & B typical of Filters 1 thru 4.
  - Section C typical of Filters 5 and 6.
- SHEET NOTES**
- Install new surface wash equipment and appurtenances. Typical of Filters 1 thru 4.
  - Install new 18"x18" Washwater Troughs and supports. Typical of Filters 1 thru 4.
  - Install new Filter Block and Cap. Typical of Filters 1 thru 4.
  - Replace existing media (12" Sand and 18" Anthracite). Existing filter block to remain. Typical of Filters 5 and 6.
  - Contractor shall form a 15" concrete flume as shown and dimensioned in section "A". Typical of Filters 1 thru 4.
  - Install new hose bib and heavy duty hose hanger. Secure hanger to new block wall with aluminum channels.



**EXISTING FILTERS**  
 1/4"=1'-0"



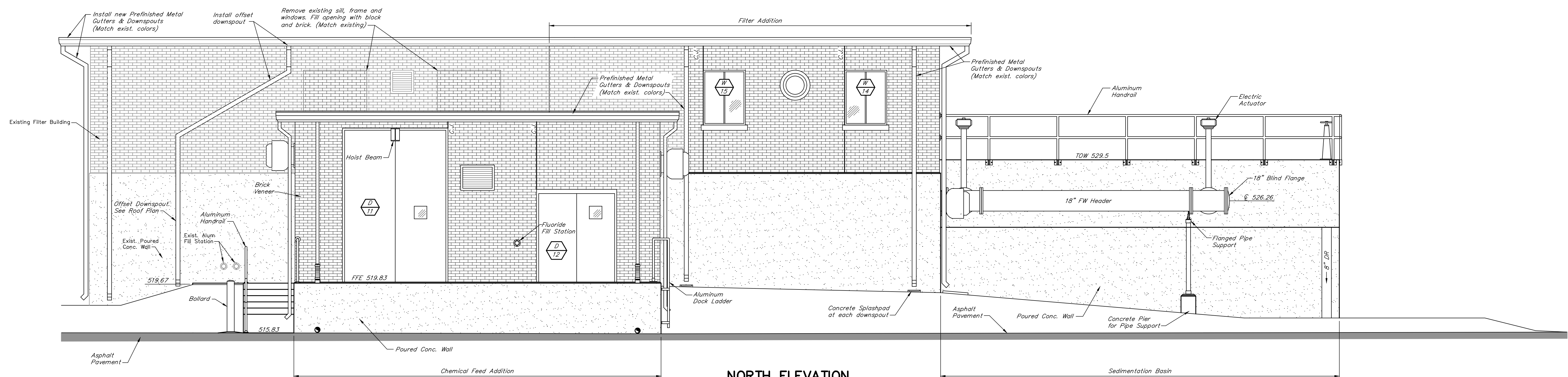
**EXISTING FILTER REHABILITATION**

N:\P\2014042\PIANS\12.1 Existing Filter Rehab.dwg, 5/23/2019 11:15:25 AM, rth, DWG To PDF.pc3

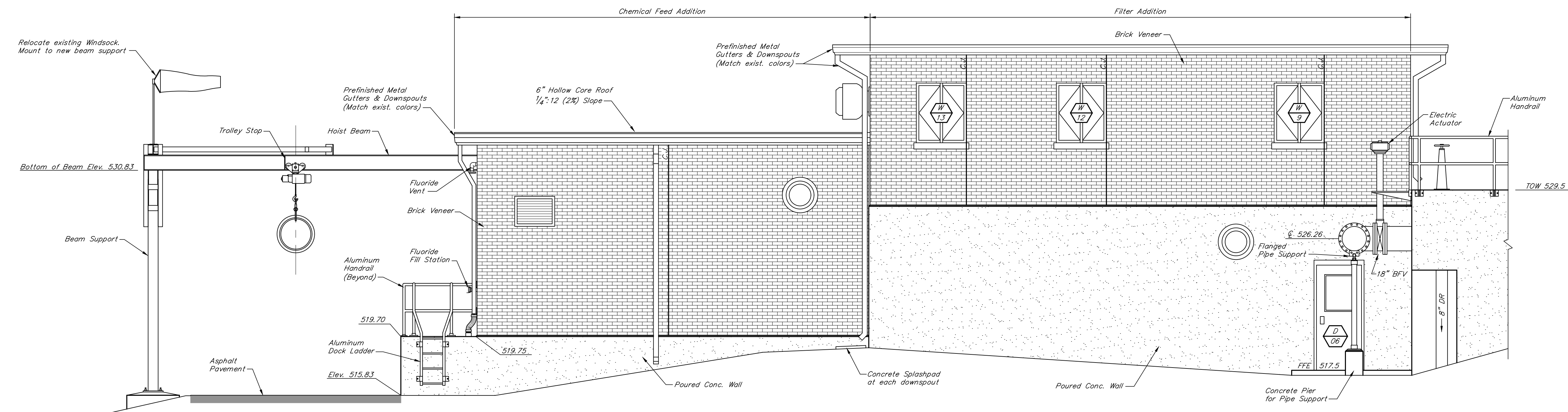




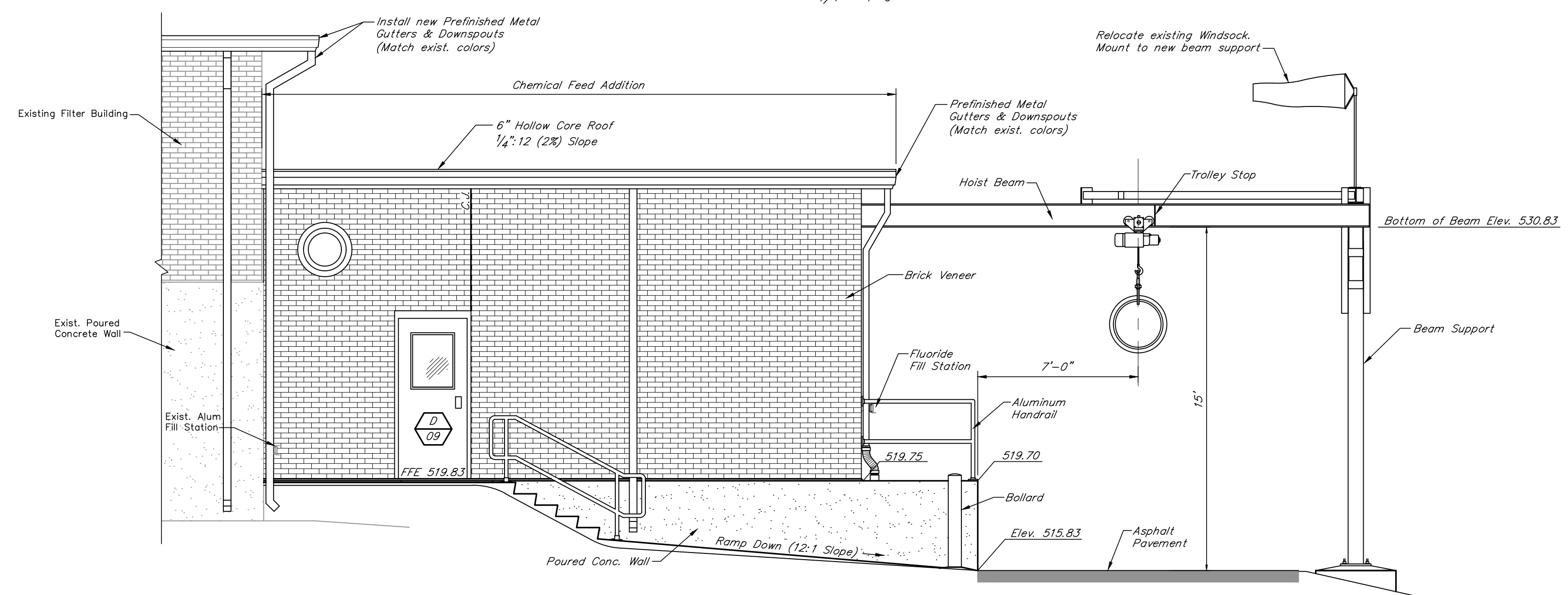
DRAWN BY: JKE/PTH
CHECKED BY: RVW
DATE: MAY 2019
SCALE: As Noted
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**NORTH ELEVATION**  
 1/4" = 1'-0"



**WEST ELEVATION**  
 1/4" = 1'-0"



**EAST ELEVATION**  
 1/4" = 1'-0"

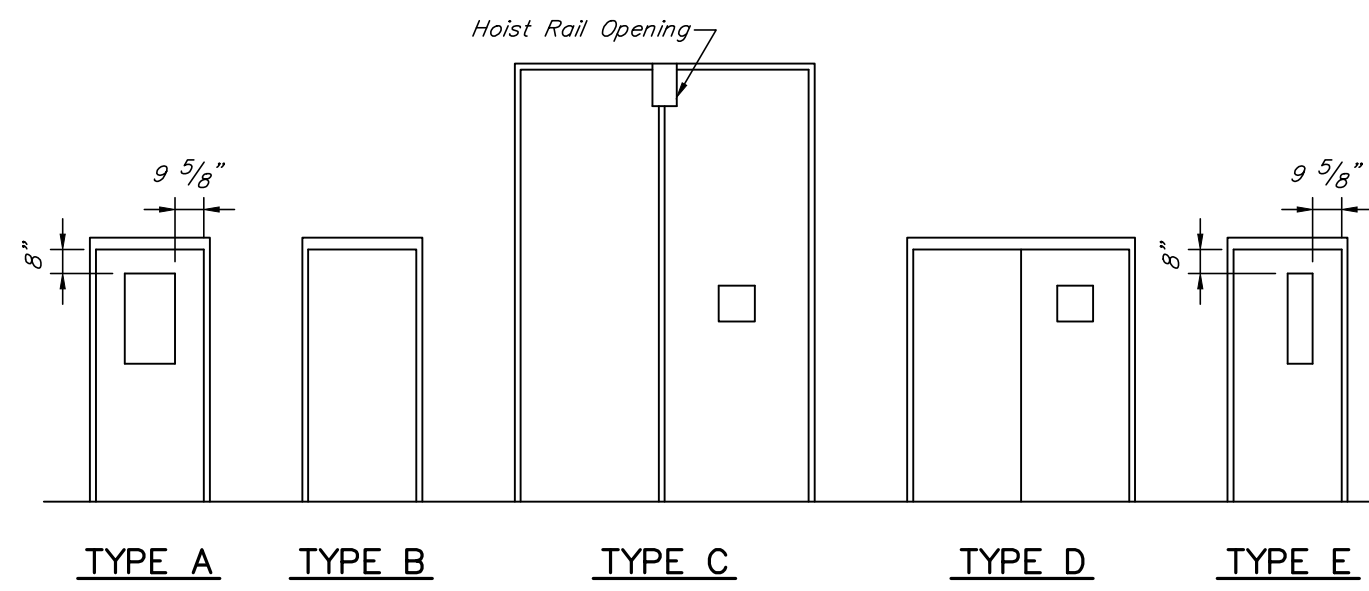
N:\P\2014042\PLANS\13.1 Building Elevations.dwg, 5/22/2019 11:16:35 AM, pld, DMC, To PDF, p.3



**DOOR SCHEDULE**

Door Number	Type	Pair	Style	Location	Door		Frame		Remarks	Detail No.			Hardware Set
					Width	Height	Width	Height		Head	Jamb	Sill	
D-01	A	-	Hollow Metal w/ window	Foyer/File Room	3'-0"	7'-0"	3'-4"	7'-4"	1,2	H-3	J-3	S-3	1
D-02	A	-	Hollow Metal w/ window	Filter Enclosure	2'-6"	7'-0"	2'-10"	7'-4"	1,2	H-3	J-3	S-3	2
D-03	A	-	Hollow Metal w/ window	Filter Enclosure	2'-6"	7'-0"	2'-10"	7'-4"	1,2	H-3	J-3	S-3	2
D-04	A	-	Hollow Metal w/ window	Filter Enclosure	2'-6"	7'-0"	2'-10"	7'-4"	1,2	H-3	J-3	S-3	2
D-05	A	-	Hollow Metal w/ window	Filter Enclosure	2'-6"	7'-0"	2'-10"	7'-4"	1,2	H-3	J-3	S-3	2
D-06	A	-	Hollow Metal w/ window	Filter Addition Entrance	3'-0"	7'-0"	3'-4"	7'-4"	1,2,3	H-1	J-1	S-1	3
D-07	E	-	Hollow Metal w/ window	Filter Addition/Fluoride Room	3'-0"	7'-0"	3'-4"	7'-4"	2,7,8	H-2	J-2	S-2	4
D-08	A	-	Hollow Metal w/ window	Filter Addition/Sed. Basins	3'-0"	7'-0"	3'-4"	7'-4"	1,2	H-1	J-1	S-1	3
D-09	A	-	Hollow Metal w/ window	Chlorine Room Entrance	3'-0"	7'-0"	3'-4"	7'-4"	1,2	H-1	J-1	S-1	4
D-10	E	-	Hollow Metal w/ window	Chlorine Room/Fluoride Room	3'-0"	7'-0"	3'-4"	7'-4"	2,7,8	H-3	J-3	S-3	5
D-11	C	Yes	FRP w/ sight window	Chlorine Room/Loading Dock	4'-0"	12'-0"	8'-4"	12'-4"	2,4,5,6,8,9	H-1	J-1	S-1	6
D-12	D	Yes	FRP w/ sight window	Fluoride Room/Loading Dock	3'-0"	7'-0"	6'-4"	7'-4"	2,4,6,8,9	H-1	J-1	S-1	4

- Remarks:
1. Half window.
  2. Door shall be painted.
  3. Replace existing door and frame.
  4. Double Door
  5. Verify Hoist Rail Size in field
  6. See Detail on Sheet 7.2
  7. Narrow Window
  8. Window to be PVC
  9. 12"x12" PVC Sight Window



**DOOR ELEVATIONS**  
Scale: 3/16"=1'-0"

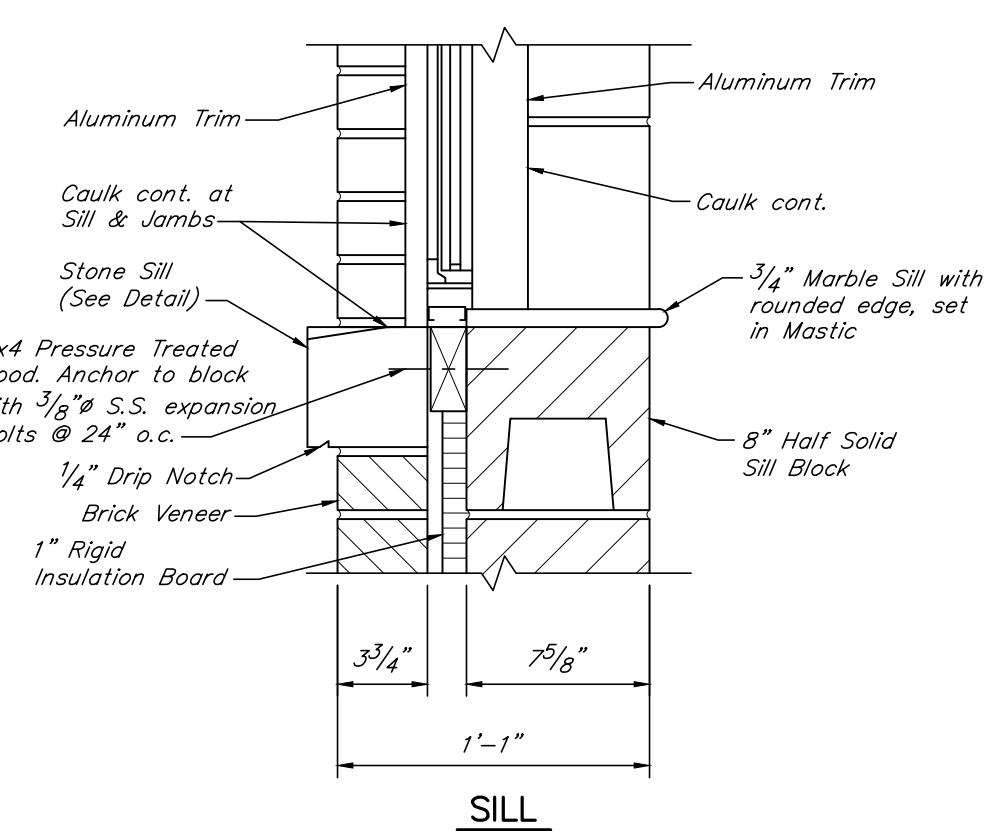
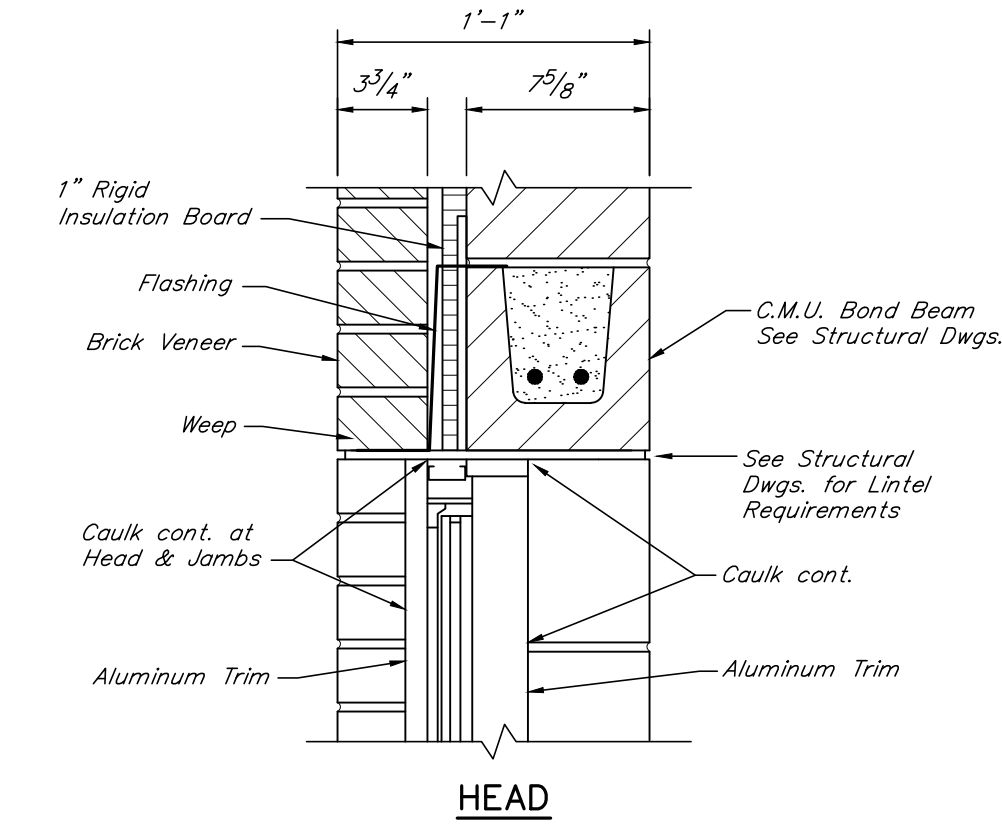
**WINDOW SCHEDULE**

Window Number	Style	Location	Width	Height	Remarks
W-01	Alum. Casement, Inside Swing	File Room	4'-8"	4'-0"	1
W-02	Alum. Casement, Inside Swing	File Room	3'-0"	4'-0"	1
W-03	Alum. Casement, Inside Swing	File Room	3'-0"	4'-0"	1
W-04	Alum. Casement, Double Hung	Filter Enclosure	3'-0"	4'-0"	-
W-05	Alum. Casement, Double Hung	Filter Enclosure	3'-0"	4'-0"	-
W-06	Alum. Casement, Double Hung	Filter Enclosure	3'-0"	4'-0"	-
W-07	Alum. Casement, Double Hung	Filter Enclosure	3'-0"	4'-0"	-
W-08	Alum. Casement, Double Hung	Filter Addition	3'-0"	4'-0"	-
W-09	Alum. Casement, Double Hung	Filter Addition	3'-0"	4'-0"	-
W-10	Not Used	N/A	N/A	N/A	-
W-11	Not Used	N/A	N/A	N/A	-
W-12	Alum. Casement, Double Hung	Filter Addition	3'-0"	4'-0"	-
W-13	Alum. Casement, Double Hung	Filter Addition	3'-0"	4'-0"	-
W-14	Alum. Casement, Double Hung	Filter Addition	3'-0"	4'-0"	-
W-15	Alum. Casement, Double Hung	Filter Addition	3'-0"	4'-0"	-

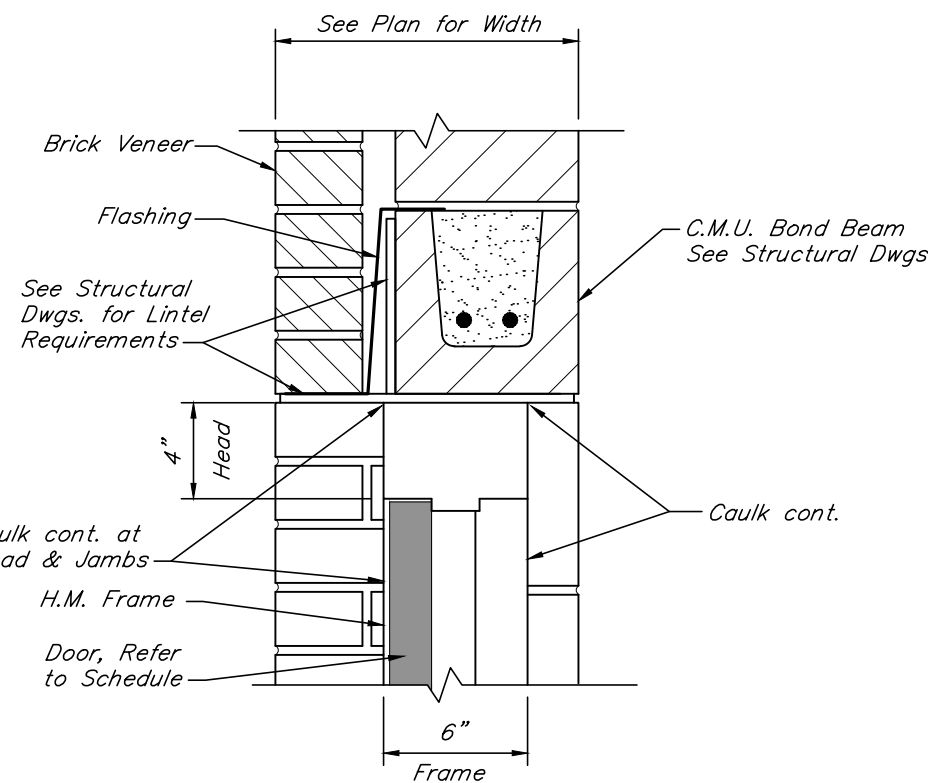
- Remarks:
1. Match existing color(s)

**GENERAL NOTES:**

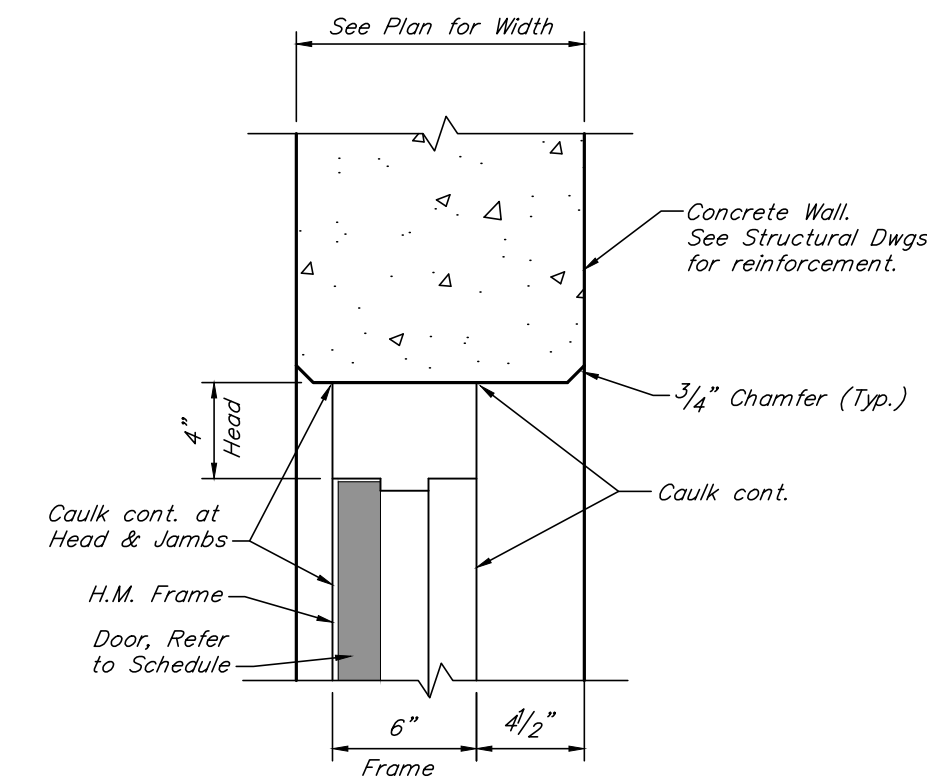
1. Contractor to verify all existing window and door openings prior to bid. Sizes in schedules are nominal for existing openings.



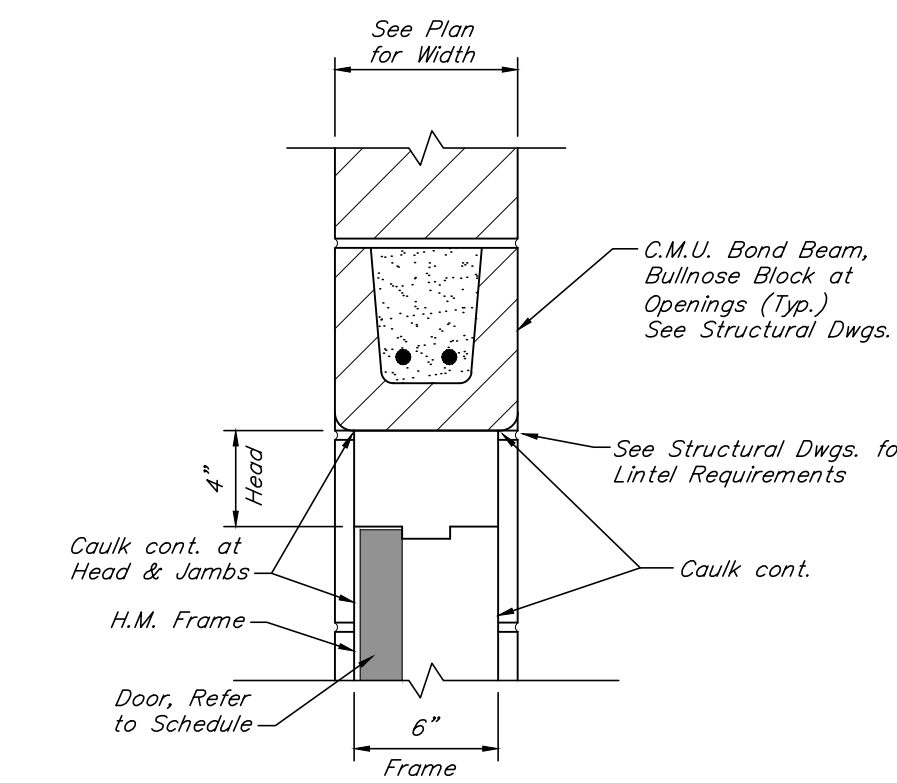
**TYPICAL WINDOW DETAIL**  
Scale: 1-1/2"=1'-0"



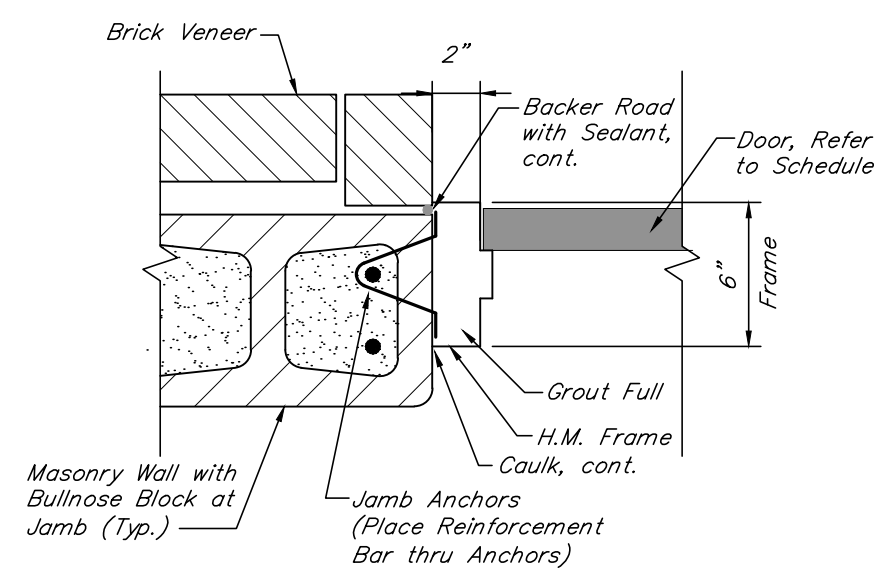
**DOOR HEAD DETAIL - H-1**  
Scale: 1-1/2"=1'-0"



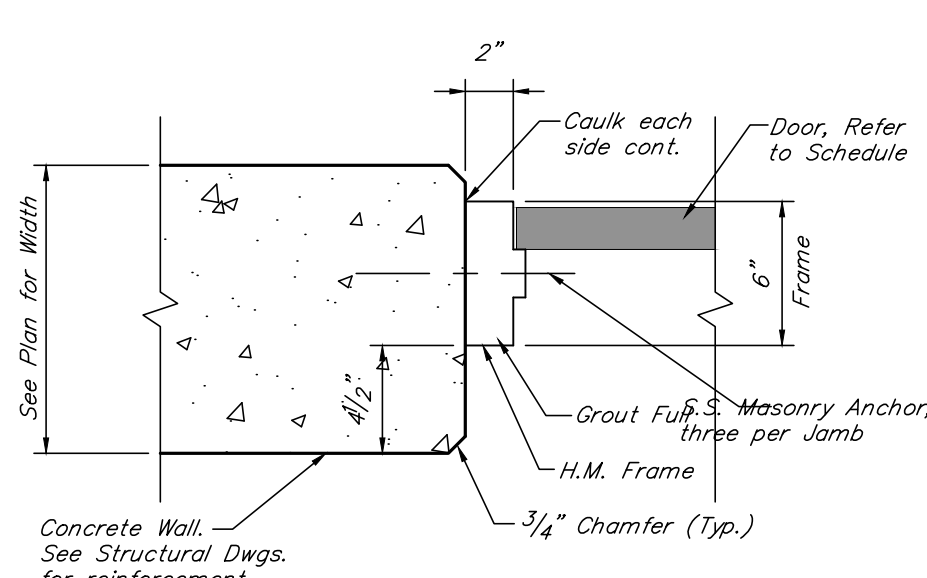
**DOOR HEAD DETAIL - H-2**  
Scale: 1-1/2"=1'-0"



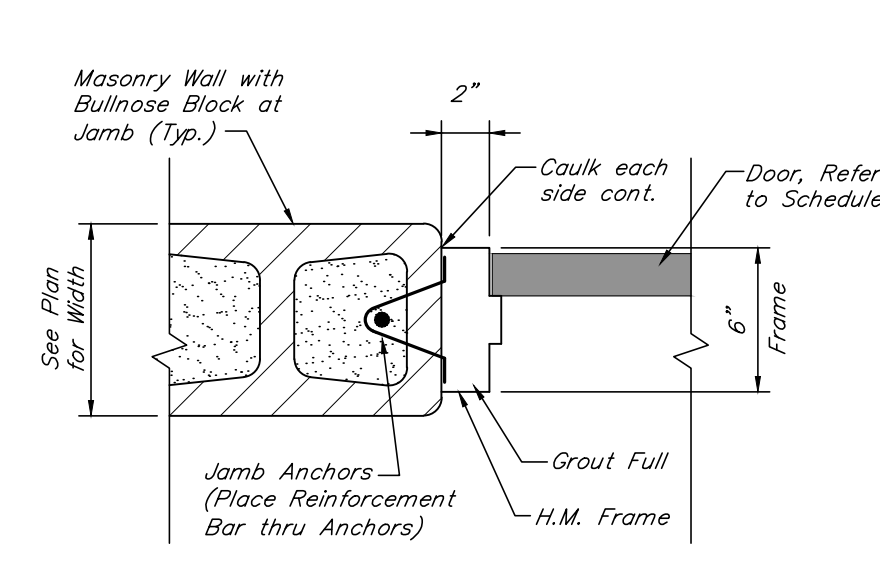
**DOOR HEAD DETAIL - H-3**  
Scale: 1-1/2"=1'-0"



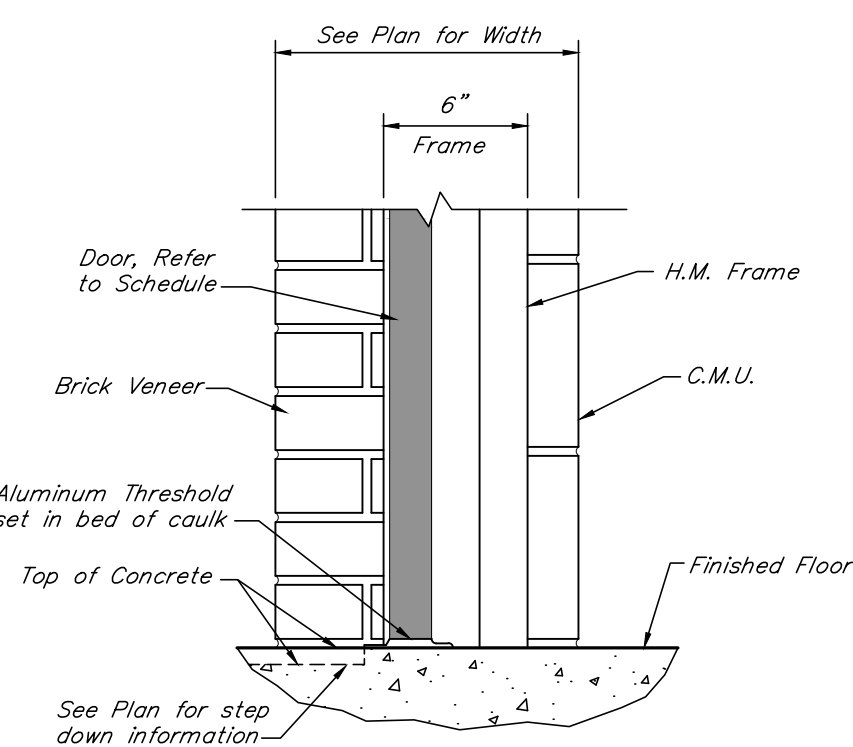
**DOOR JAMB DETAIL - J-1**  
Scale: 1-1/2"=1'-0"



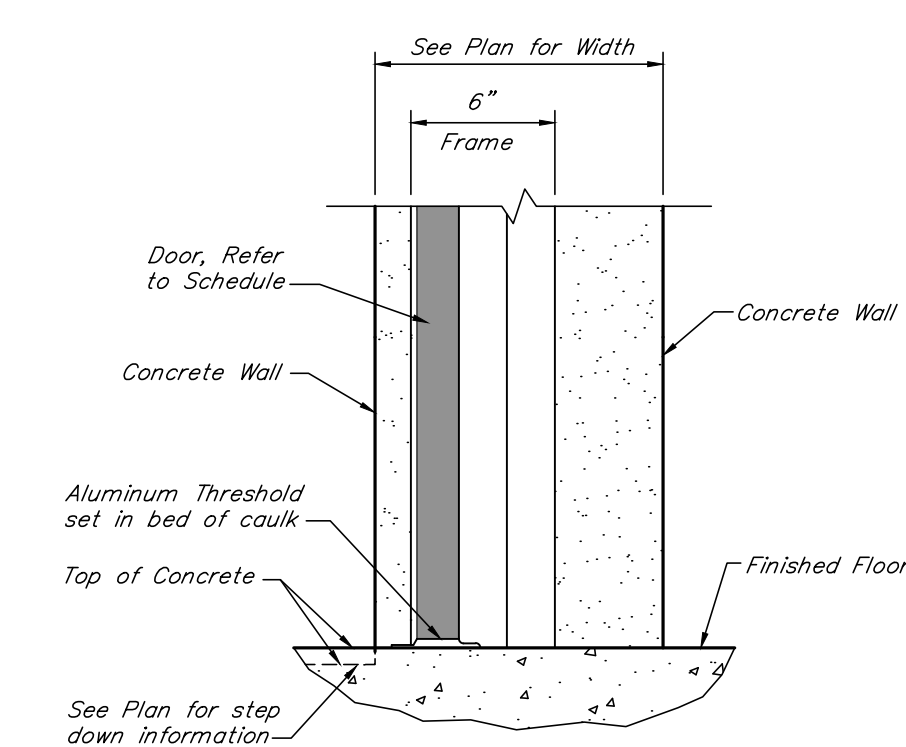
**DOOR JAMB DETAIL - J-2**  
Scale: 1-1/2"=1'-0"



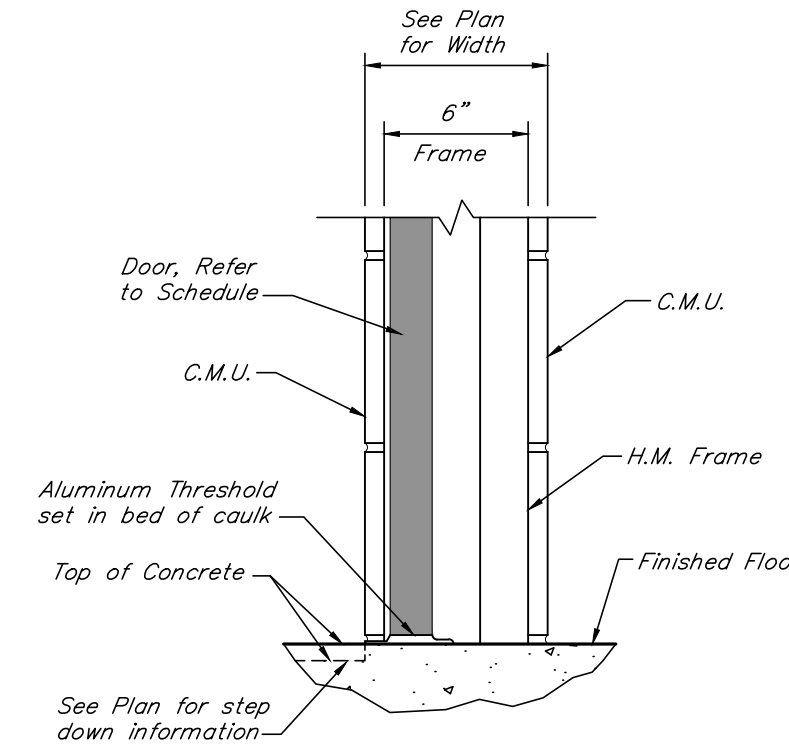
**DOOR JAMB DETAIL - J-3**  
Scale: 1-1/2"=1'-0"



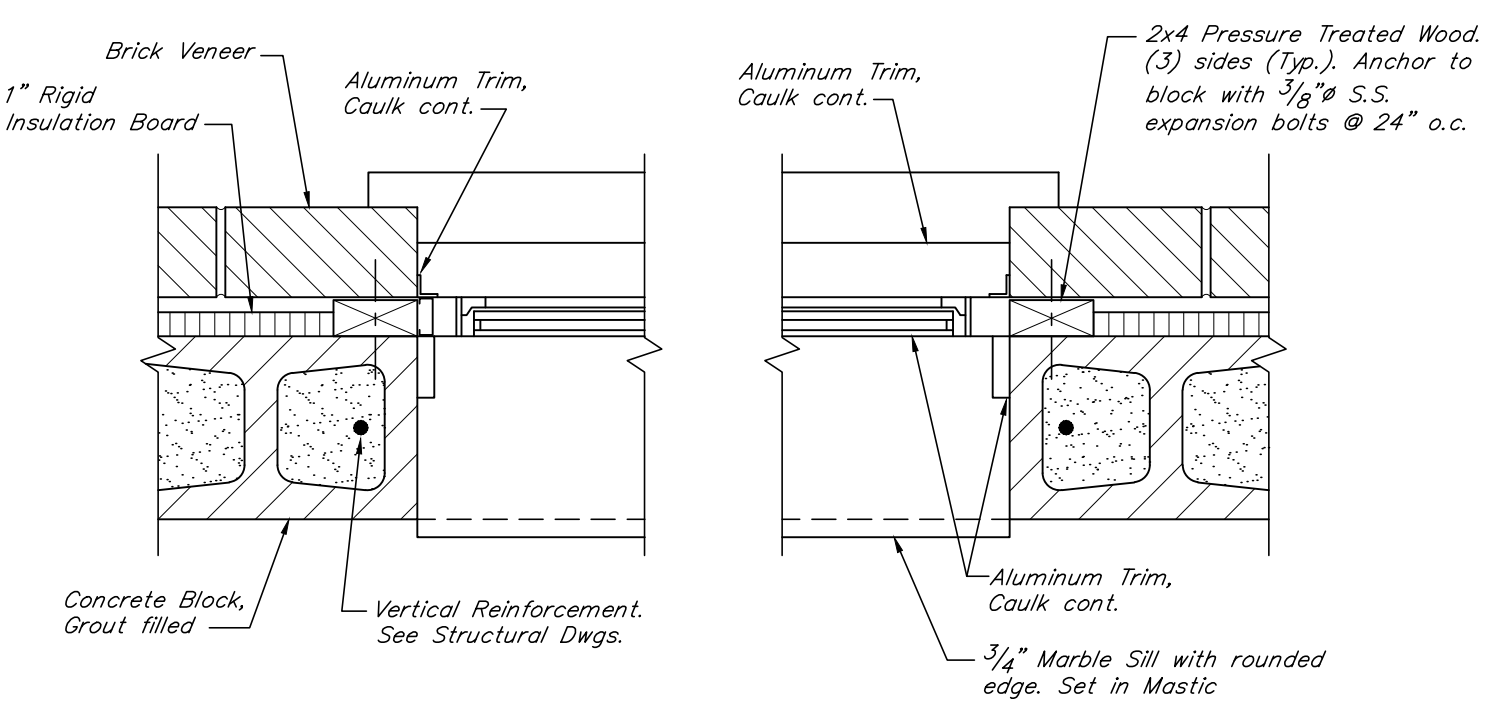
**DOOR SILL DETAIL - S-1**  
Scale: 1-1/2"=1'-0"



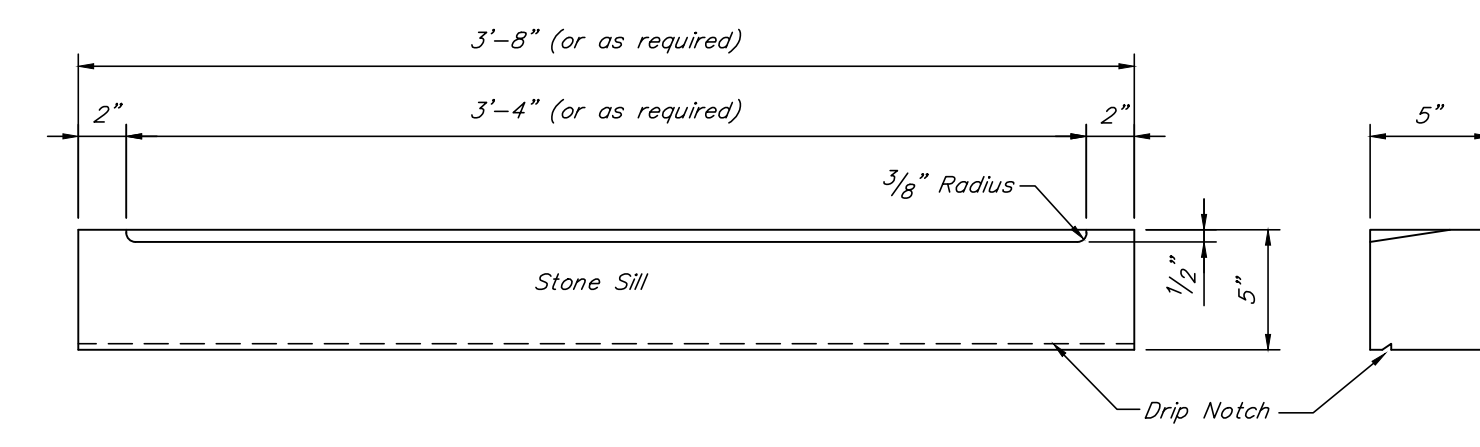
**DOOR SILL DETAIL - S-2**  
Scale: 1-1/2"=1'-0"



**DOOR SILL DETAIL - S-3**  
Scale: 1-1/2"=1'-0"



**WINDOW JAMB DETAIL**  
Scale: 1-1/2"=1'-0"



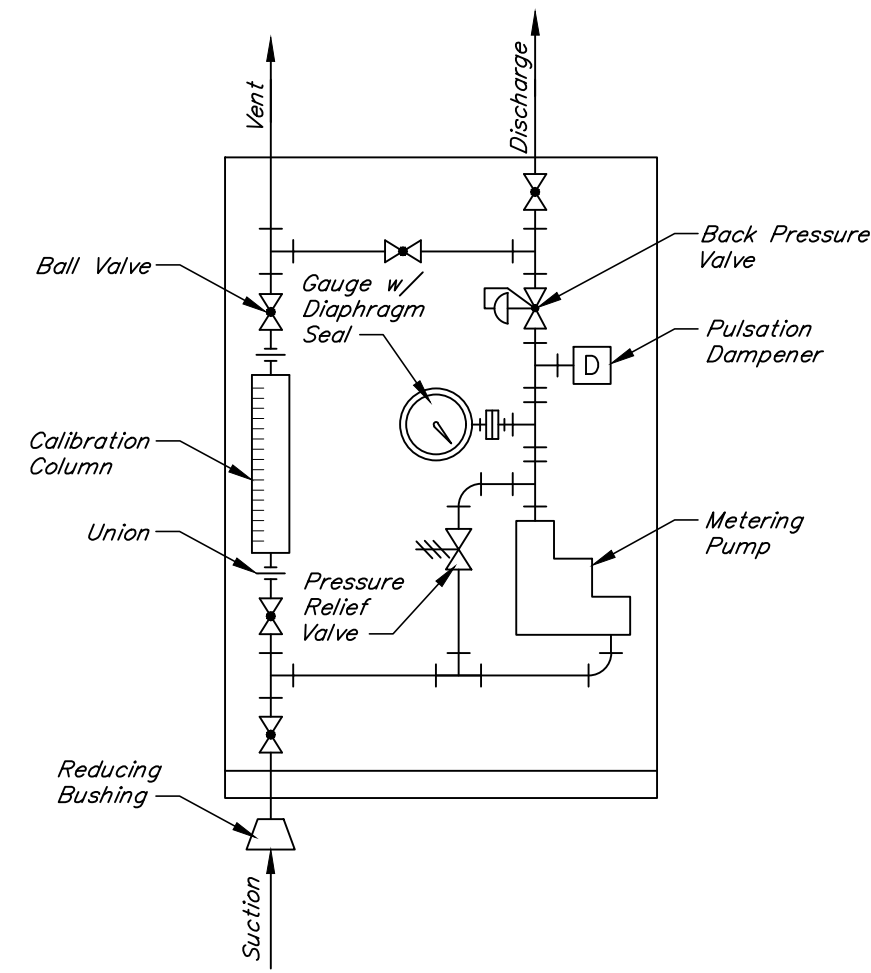
**WINDOW SILL DETAIL**  
Scale: 1-1/2"=1'-0"



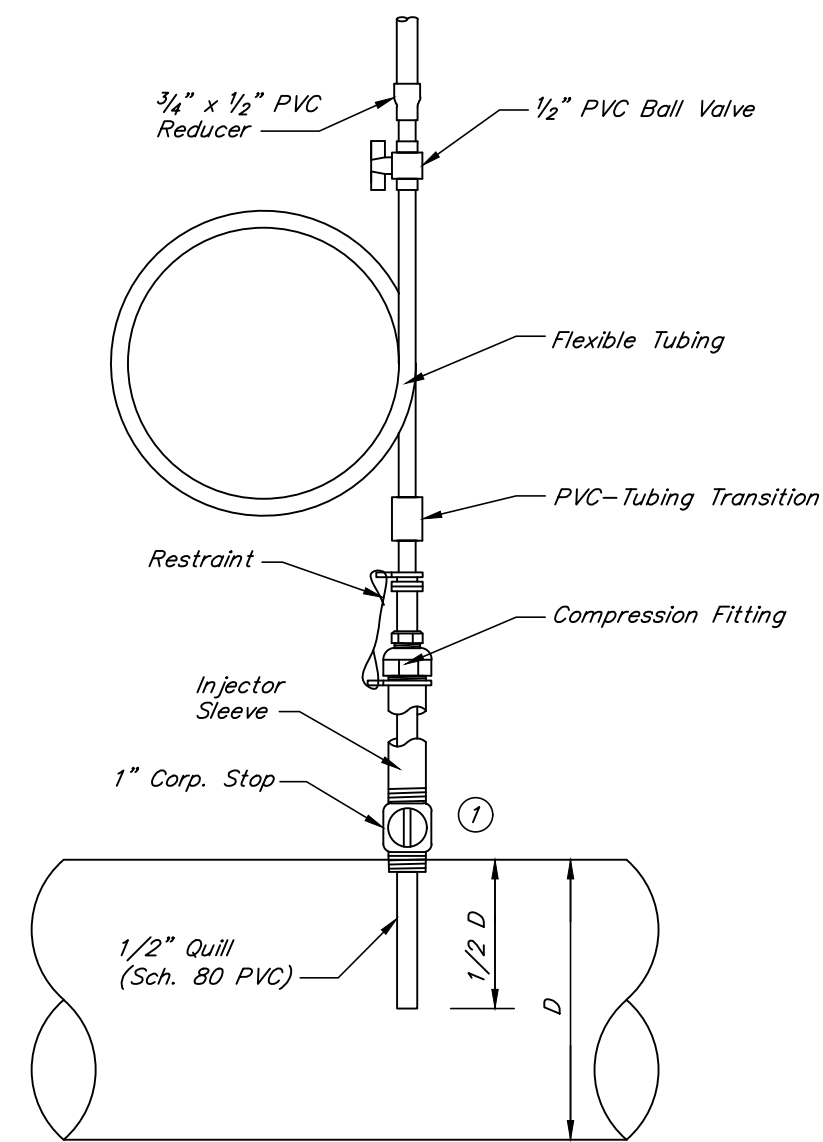
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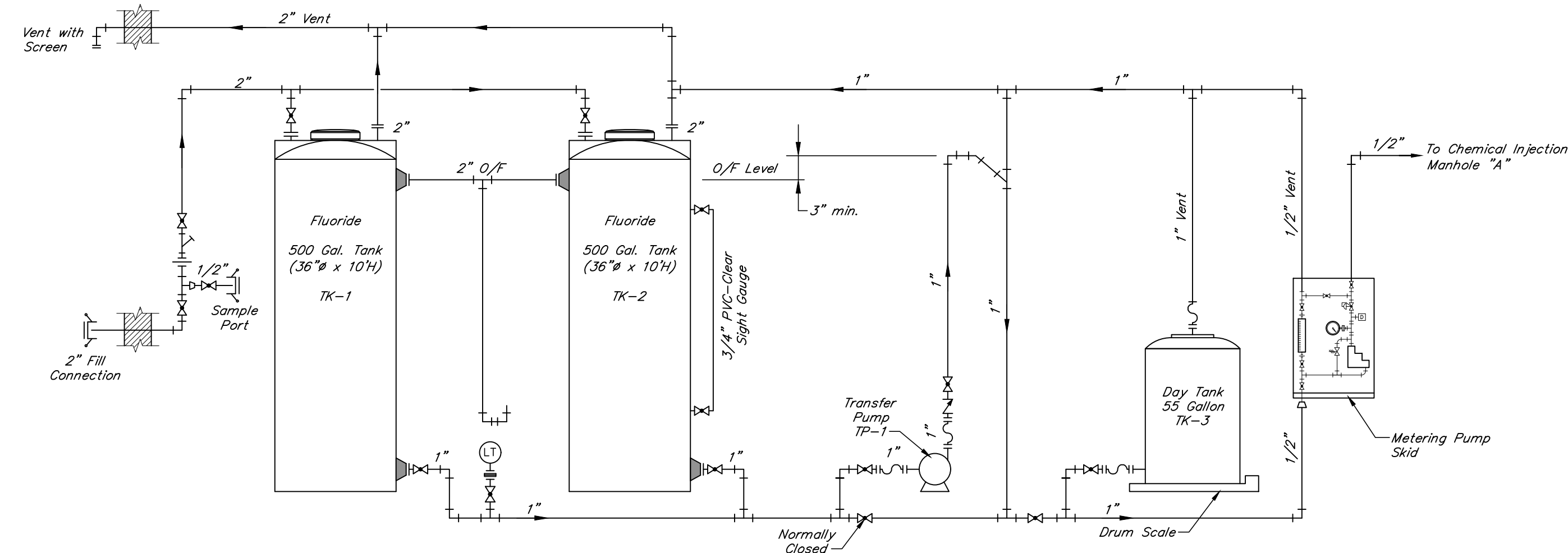


**PRE-ENGINEERED METERING PUMP SKID**  
Scale: N.T.S.

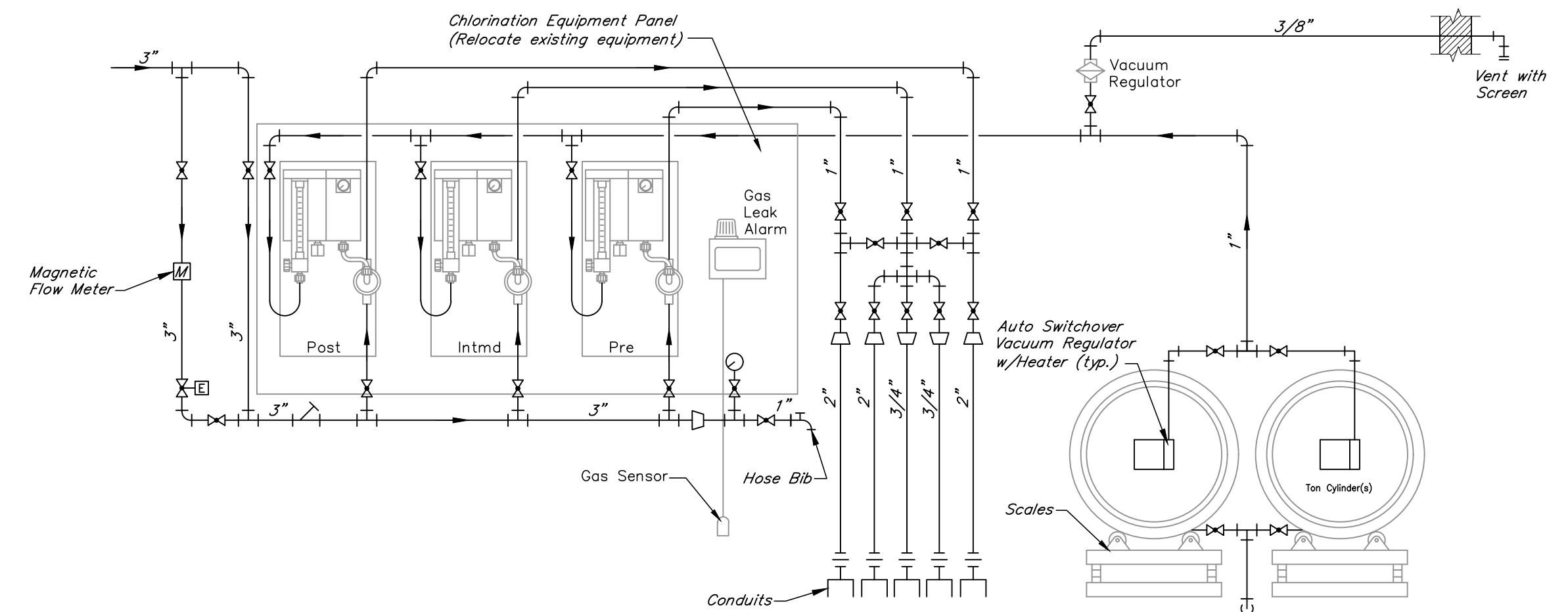


Note:  
① Service Saddle to be used where shown on plans.

**CHEMICAL INJECTION QUILL**  
N.T.S.

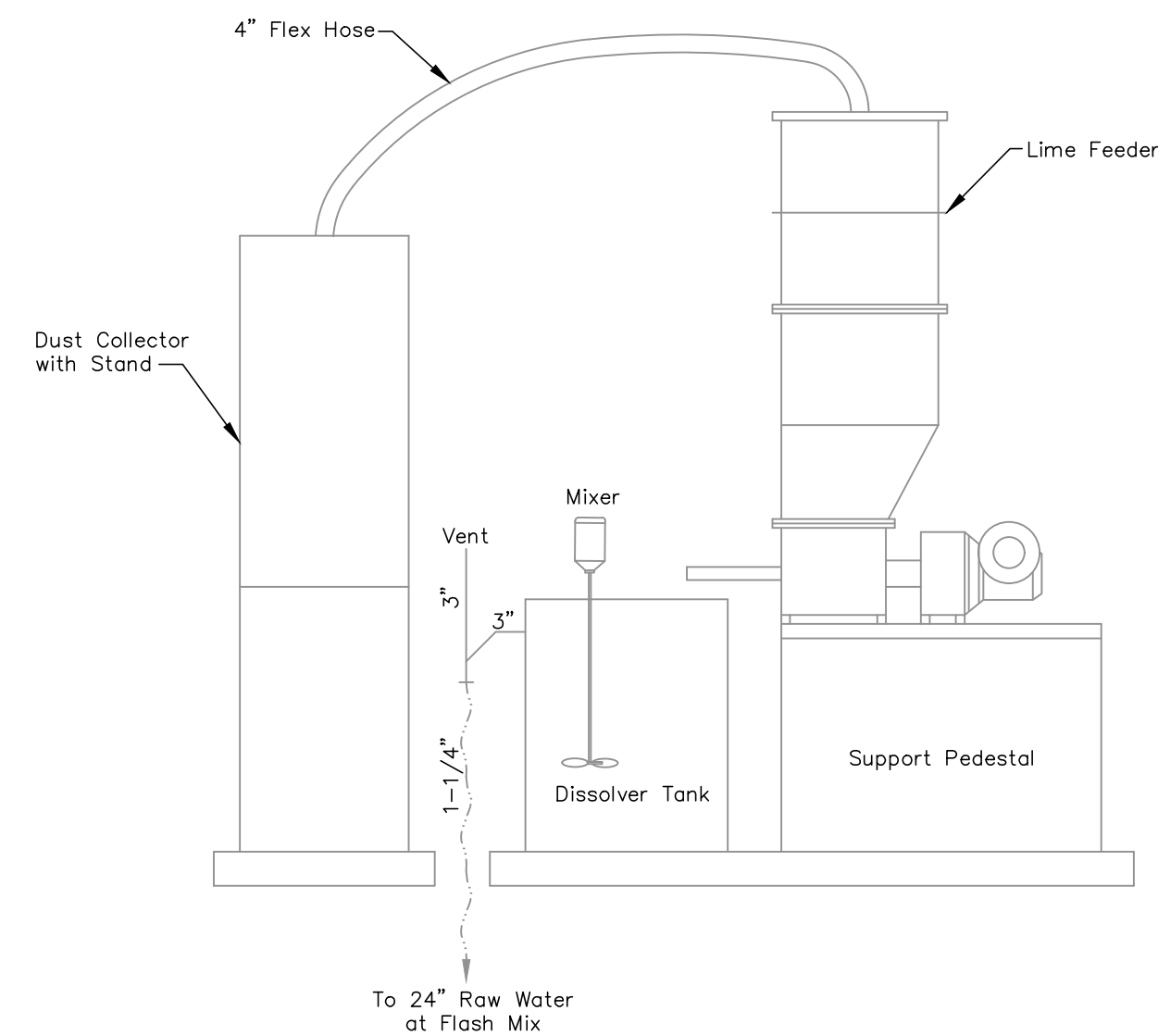


**NEW FLUORIDE (FLUOSILICIC ACID) FEED SYSTEM**  
Scale: N.T.S.

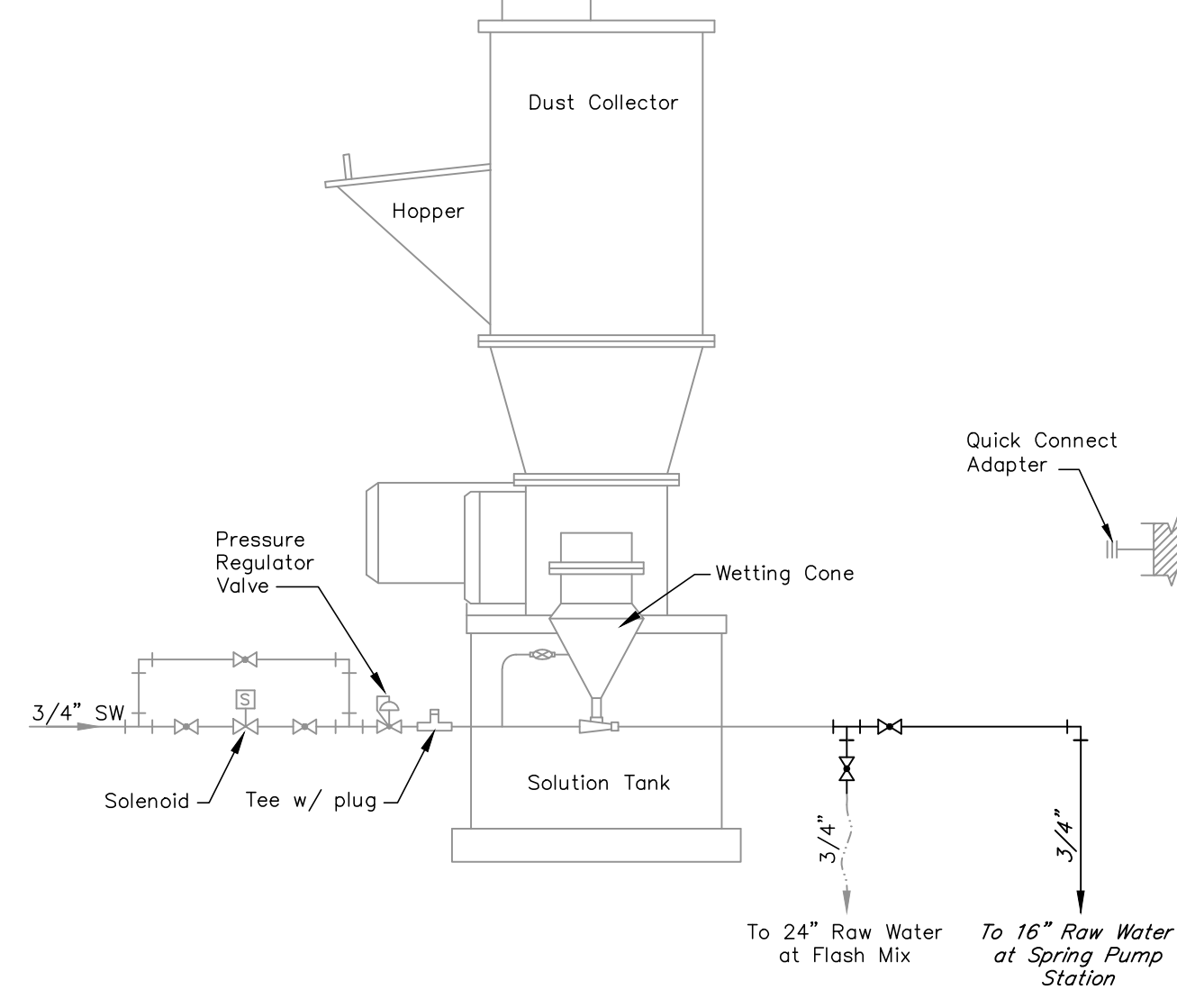


Equipment for the new gas feed system shall be relocated from the existing chlorine feed building.  
The Contractor shall provide and install any piping, valves and appurtenances necessary to provide a complete and operable system at the new location.  
The Contractor shall work closely with the Owner and Engineer during the relocation of the equipment to ensure the plant remains in operation throughout this process.

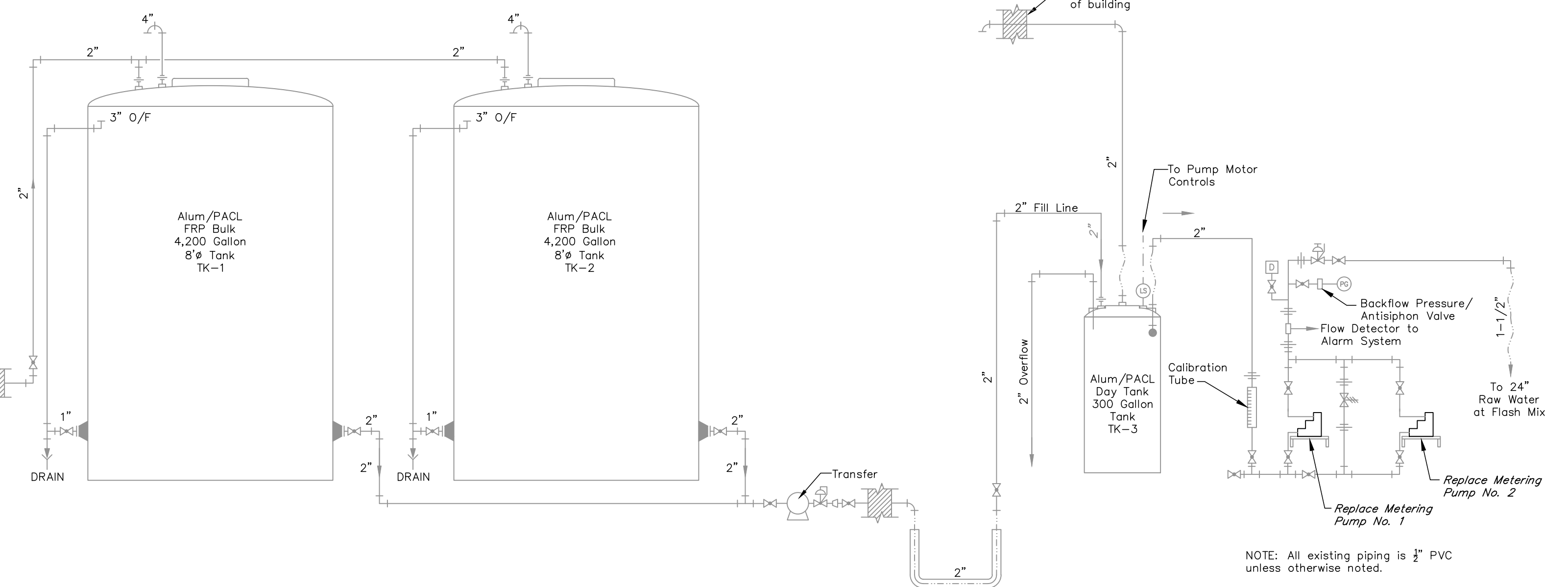
**NEW CHLORINE GAS FEED SYSTEM**  
Scale: N.T.S.



**EXISTING LIME FEED SYSTEM**  
Scale: N.T.S.



**EXISTING CARBON FEED SYSTEM**  
Scale: N.T.S.



NOTE: All existing piping is 1\"/>

**EXISTING ALUM/PACL FEED MODIFICATIONS**  
Scale: N.T.S.

LEGEND

	ADJUSTABLE FLOWMETER		BACK PRESSURE VALVE		METERING PUMP		BUTTERFLY VALVE		SOLENOID VALVE
	BALL VALVE		UNION		PULSATION DAMPENER		GLOBE VALVE		LEVEL ALARM HIGH
	SOLENOID VALVE		BALL CHECK VALVE		EDUCTOR		PRESSURE SWITCH		TEMPERATURE SWITCH
	ELECTRIC ACTUATED BALL VALVE		CARTRIDGE FILTER		BACKFLOW PREVENTER		LEVEL ELEMENT		LEVEL SWITCH
	3-WAY PRESSURE RELIEF VALVE		REDUCING BUSHING		PRESSURE REGULATOR VALVE		TEMPERATURE/LEVEL SWITCH		PRESSURE ALARM LOW
	2-WAY PRESSURE RELIEF VALVE		Y-STRAINER		FLOAT VALVE		TOTAL CHLORINE SENSOR		FLOW ALARM LOW
	SIGHT GLASS		CAMLOCK FITTING		FLEXIBLE CONNECTION		FREE CHLORINE SENSOR		FLOW INDICATOR
	FOOT VALVE W/STRAINER		FLEX TUBING		PRESSURE GAUGE		pH SENSOR		FLOW SWITCH
	ELECTRIC WIRING		ELECTRIC WIRING		HAND SWITCH		LEVEL TRANSMITTER		LEVEL TRANSMITTER

**CHEMICAL FEED NOTES:**

Chemical feed piping and valves to be Sch. 80 PVC unless otherwise noted or approved.

All hangers, brackets, and miscellaneous items used to install the piping shall be constructed from corrosion resistant materials such as aluminum and stainless steel.

The Chemical Feed Systems are "closed" type systems to prevent vapor transmission. Use gaskets and/or solvent weld connections to tanks.

Tank manways, accesses, and fill caps to be sealed on "closed" feed systems.

Exterior vents shall be installed with insect screens.



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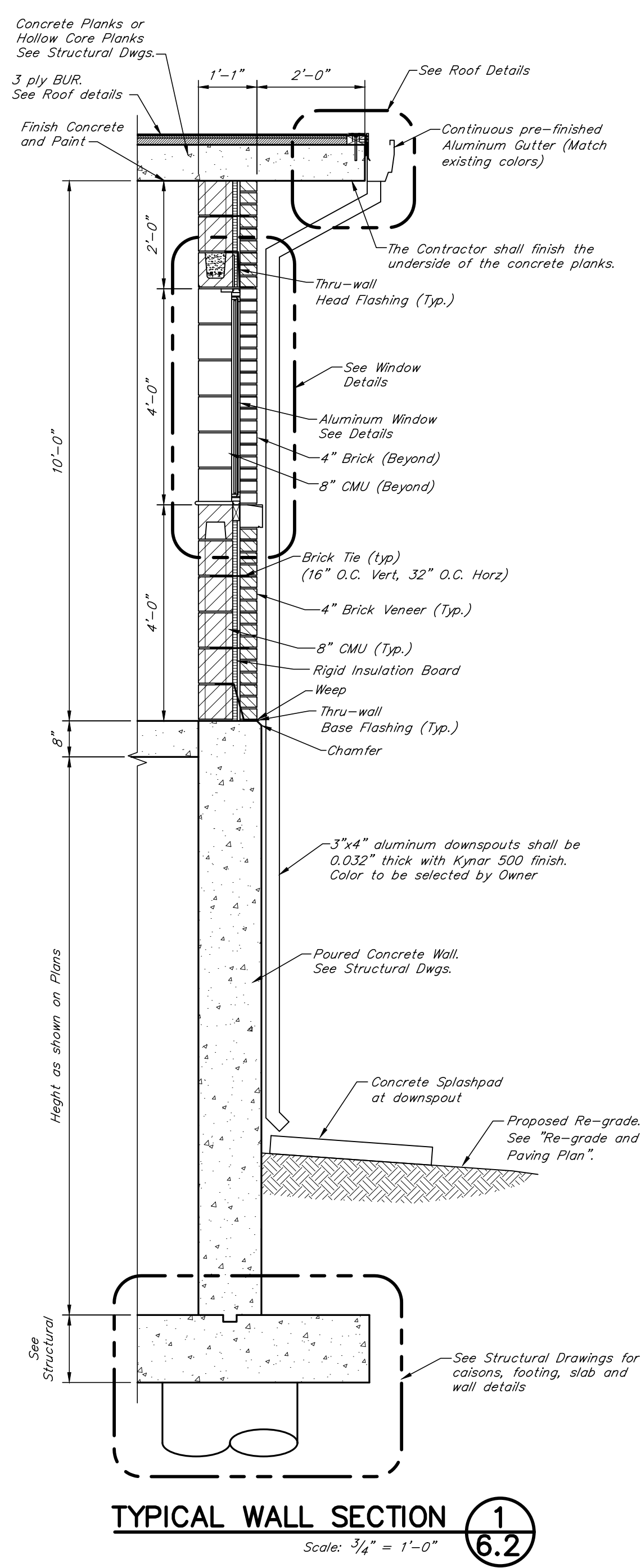
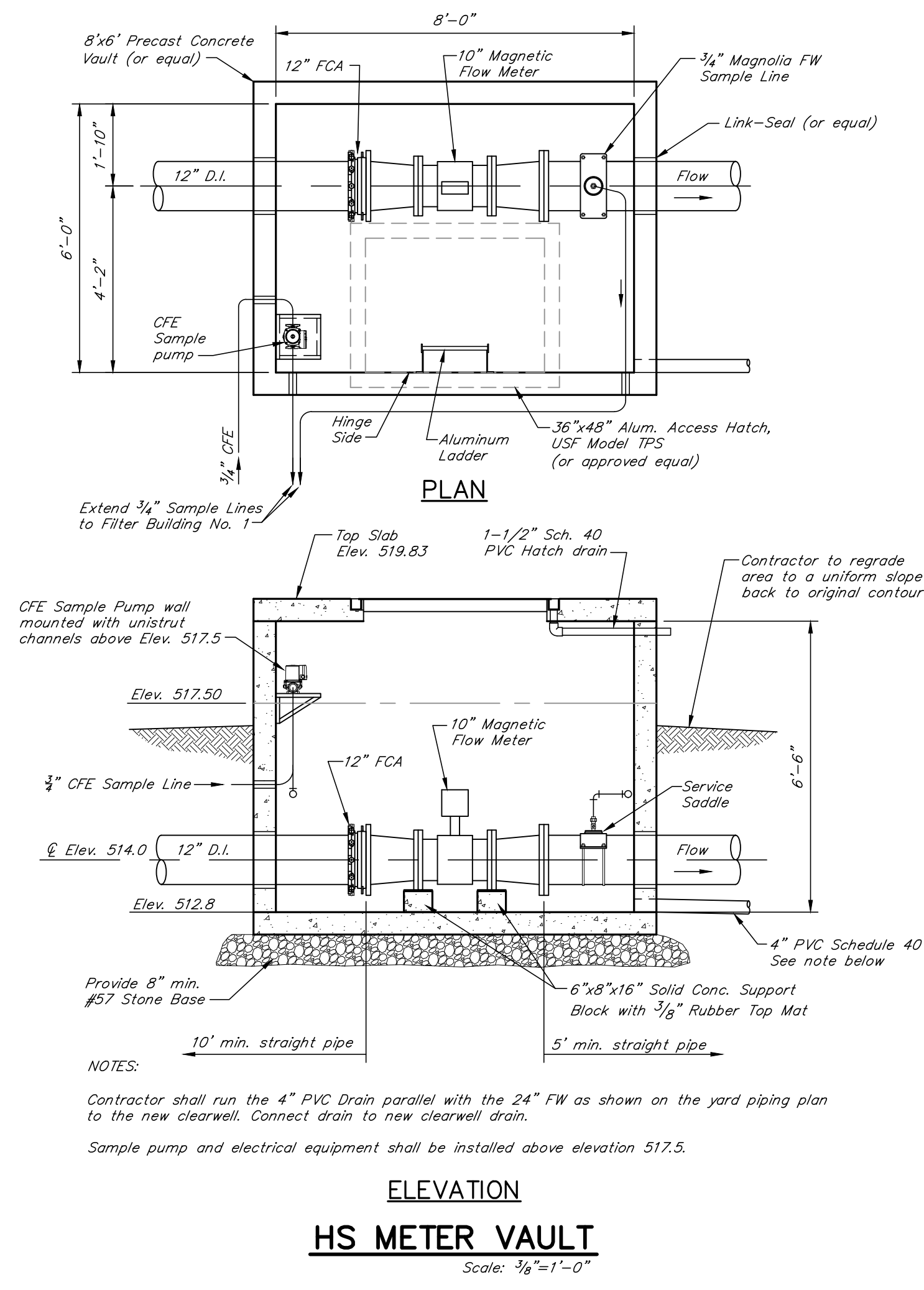
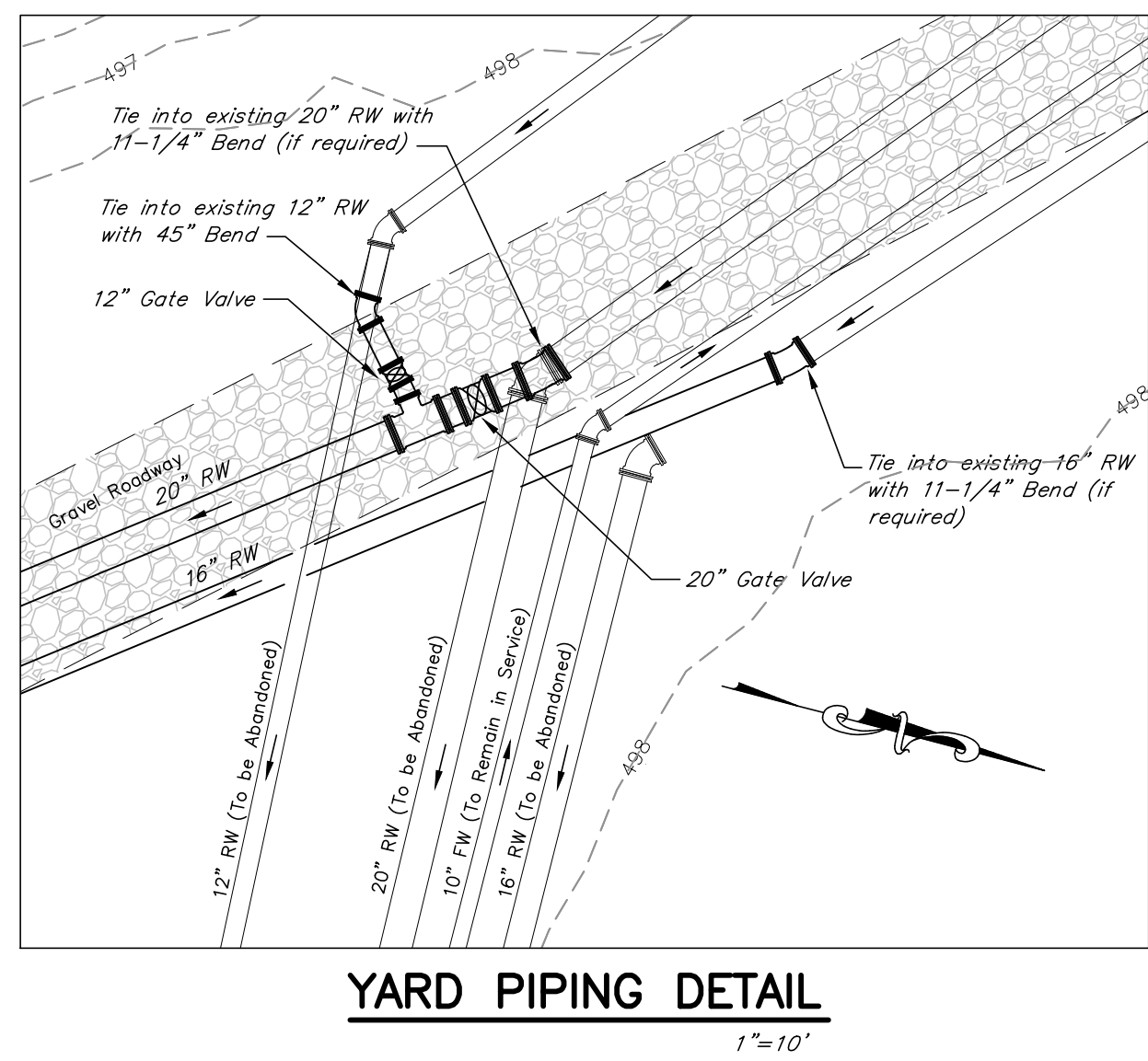
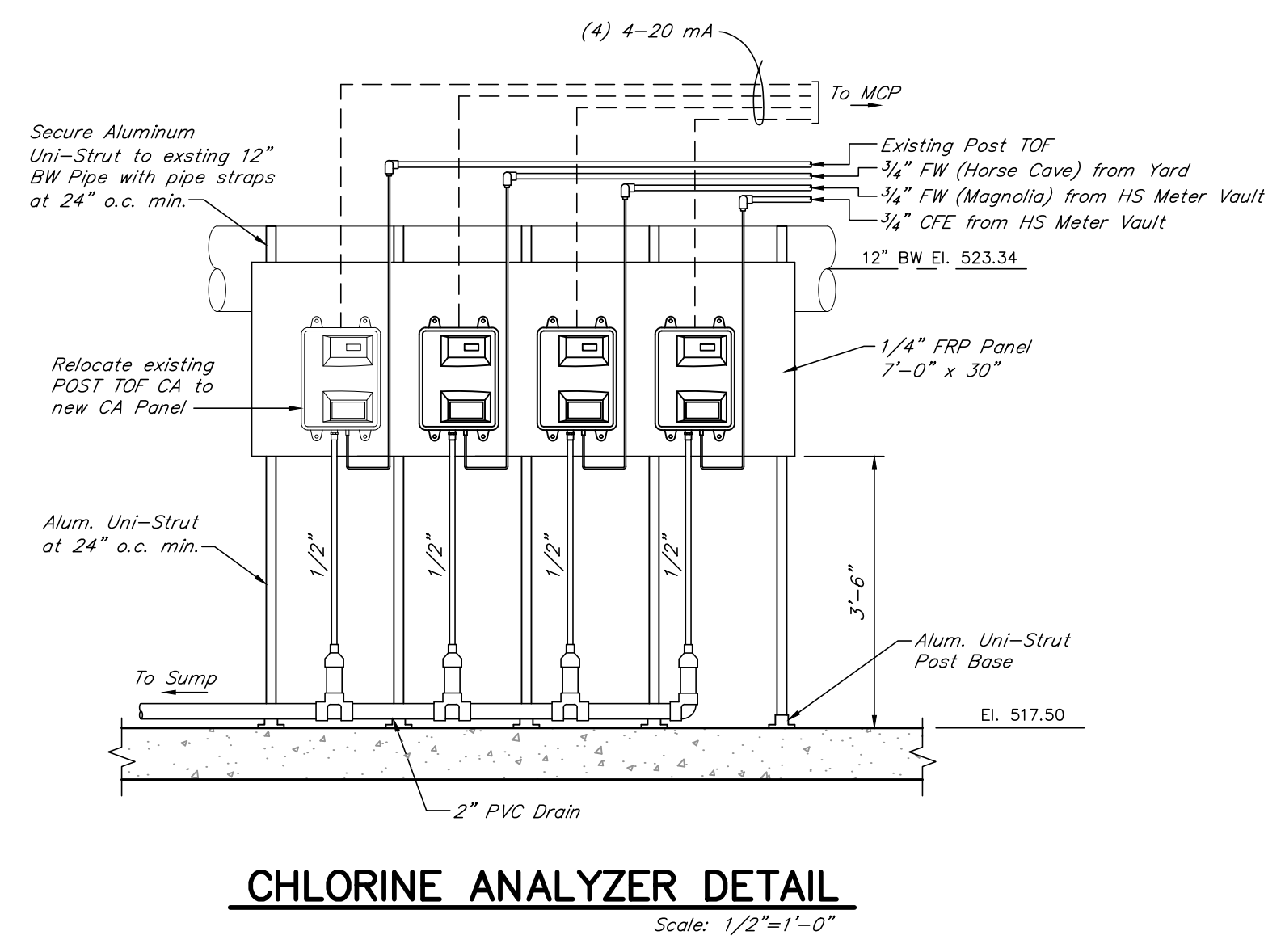
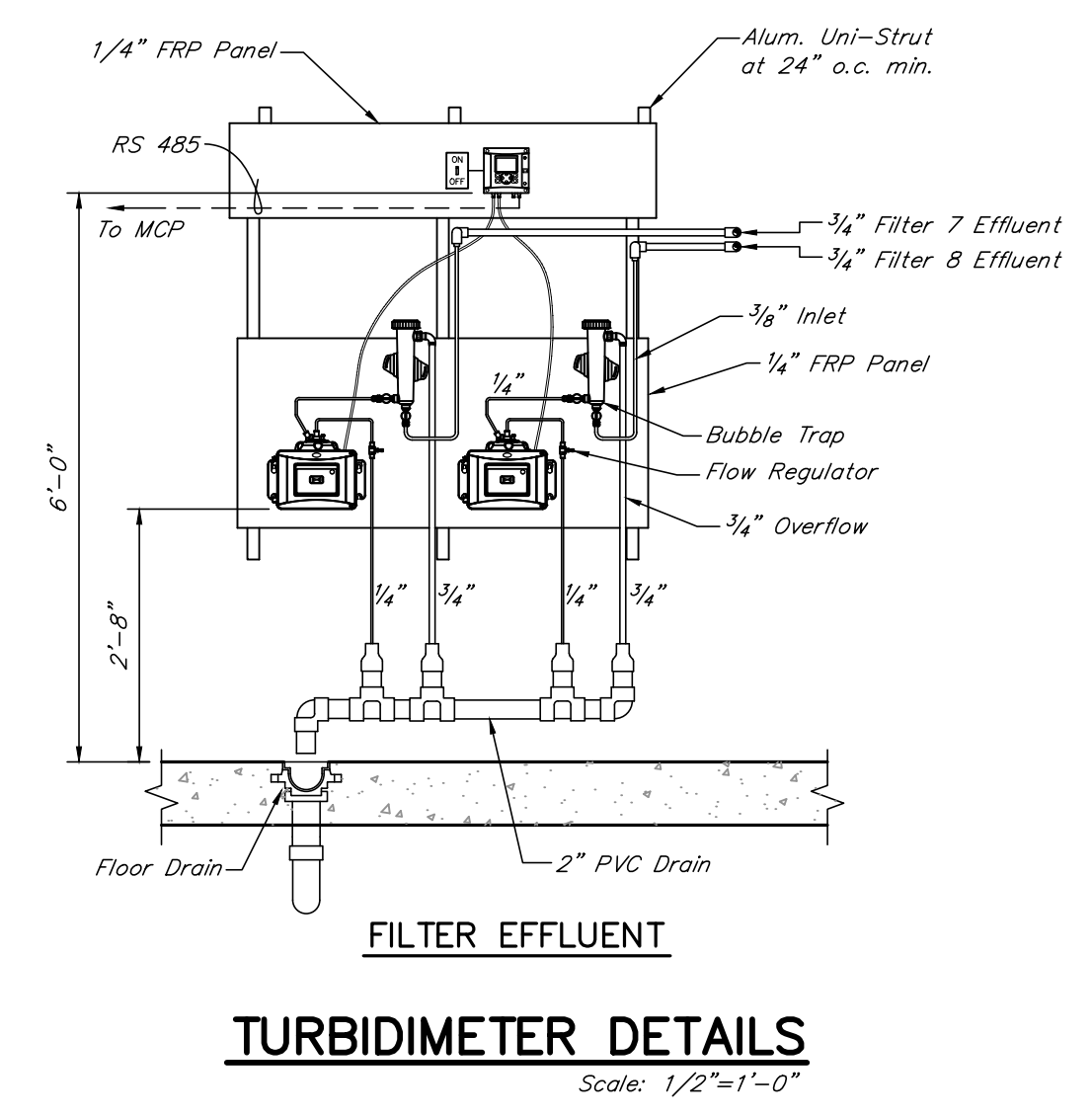
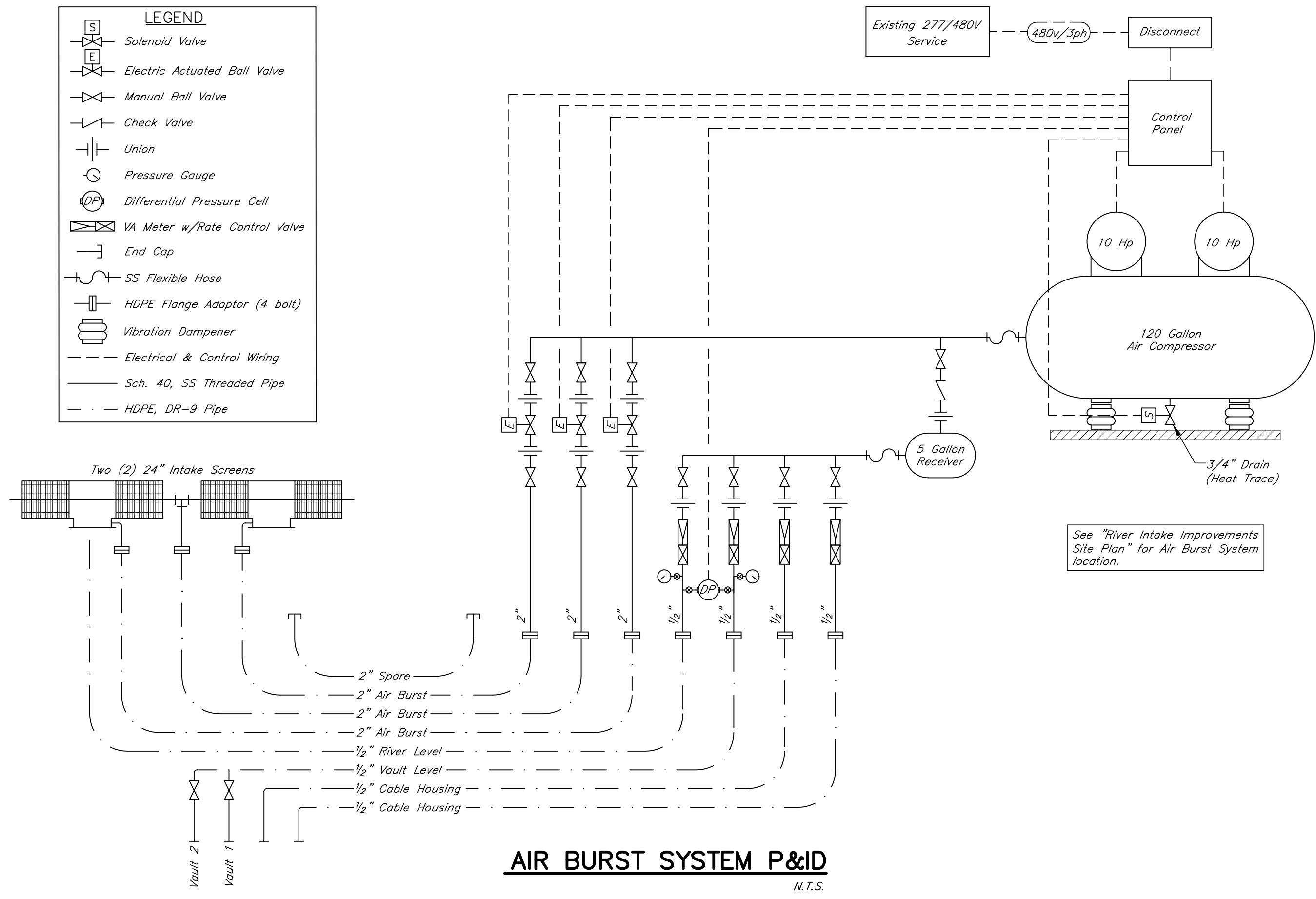


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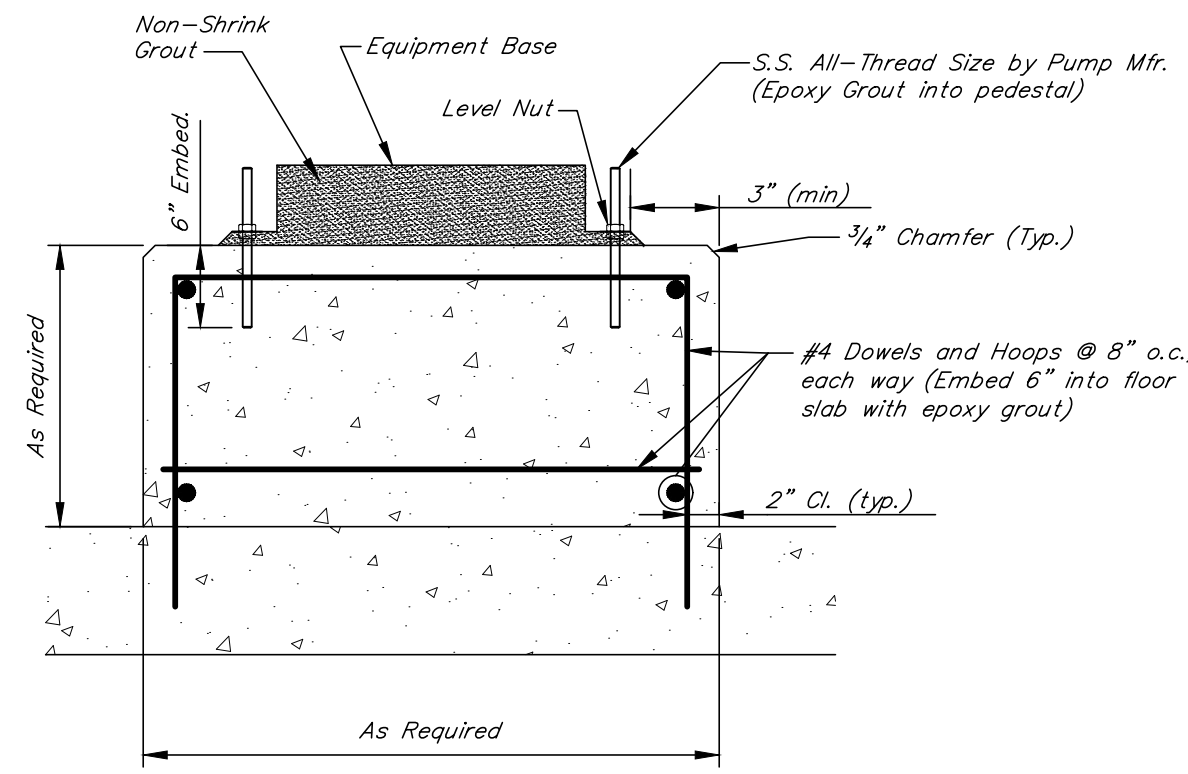
**LEGEND**

- Solenoid Valve
- Electric Actuated Ball Valve
- Manual Ball Valve
- Check Valve
- Union
- Pressure Gauge
- Differential Pressure Cell
- VA Meter w/Rate Control Valve
- End Cap
- SS Flexible Hose
- HDPE Flange Adaptor (4 bolt)
- Vibration Damper
- Electrical & Control Wiring
- Sch. 40, SS Threaded Pipe
- HDPE, DR-9 Pipe



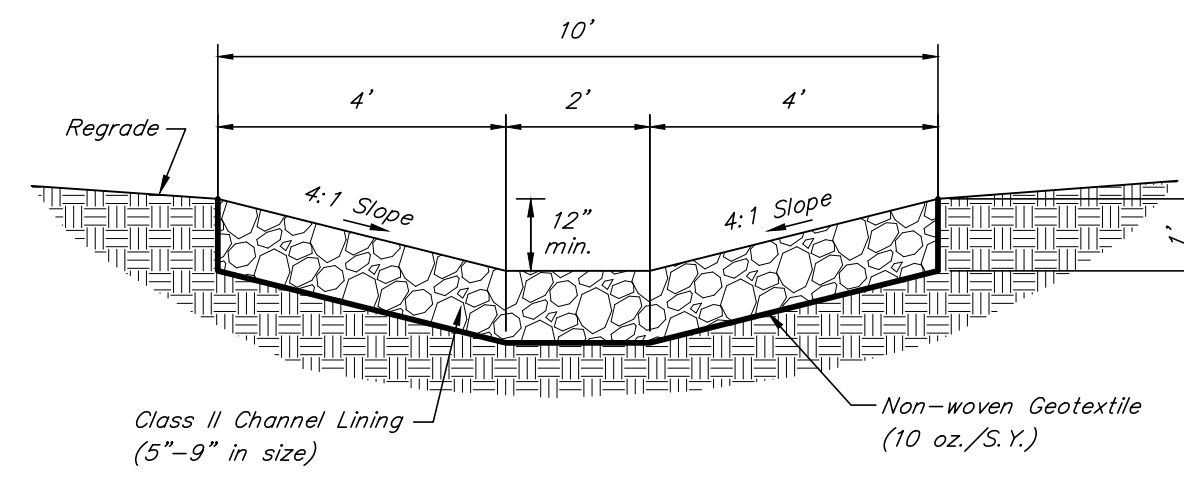
MISCELLANEOUS DETAILS





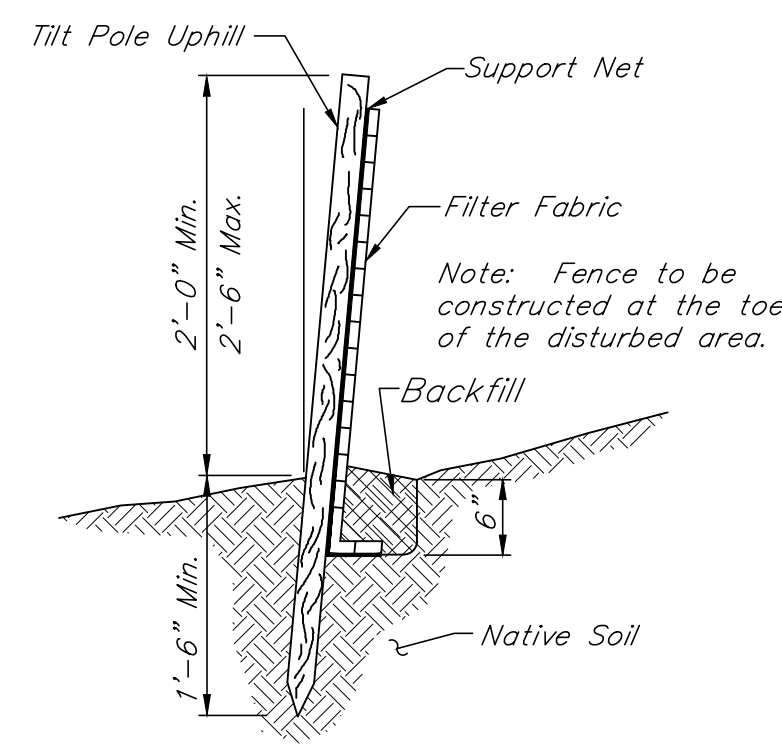
**TYPICAL PUMP & EQUIPMENT PEDESTAL  
CONCRETE SUPPORT REINFORCEMENT**

N.T.S.



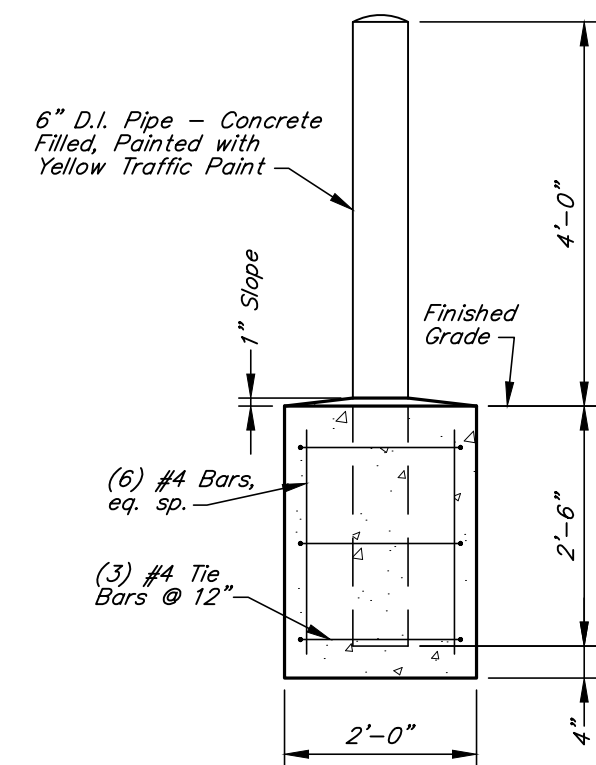
**FLAT BOTTOM DITCH**

3/8"=1'-0"



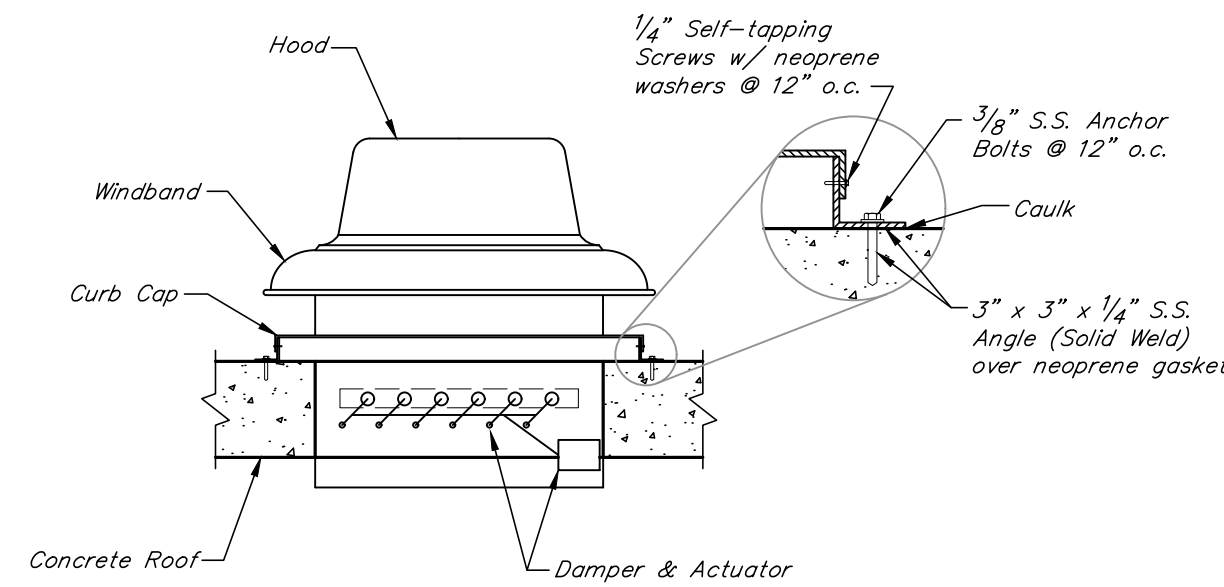
**SILT FENCE DETAIL**

NTS



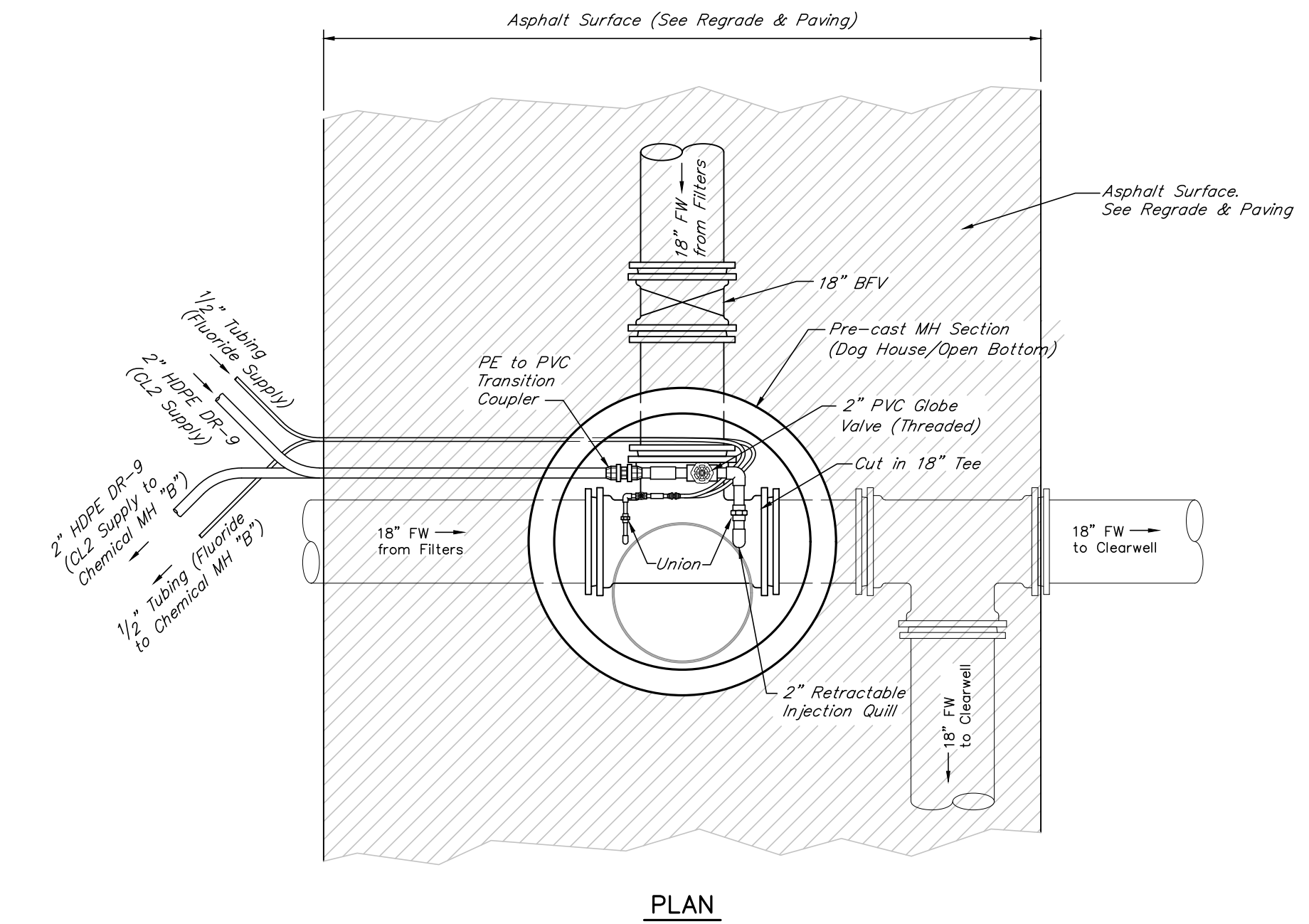
**BOLLARD DETAIL**

1/2"=1'-0"

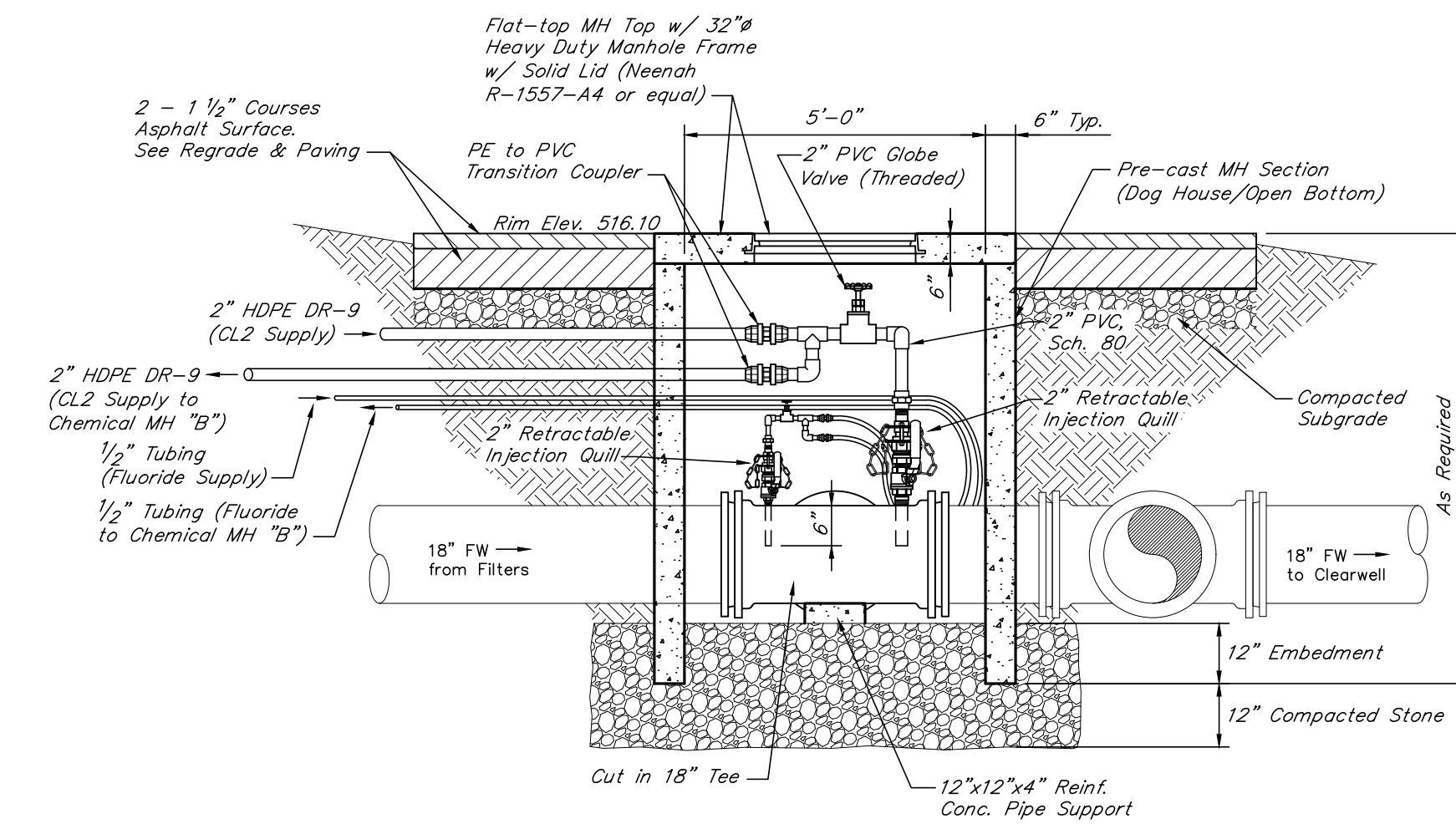


**CONCRETE ROOF MOUNTED EXHAUST/INTAKE DETAIL**

Scale: 1/2"=1'-0"



**PLAN**



**ELEVATION**

NOTES:

- The elevations of the Finished Water (FW) Lines are unknown. The Contractor shall verify the existing elevations before ordering manholes.
- The detail shown hereon is Chemical Feed Manhole "A". Chemical Feed Manhole "B" shall have the same manhole characteristics with the new injection quills being installed on the existing 16" FW line.

**CHEMICAL FEED MANHOLE "A"**

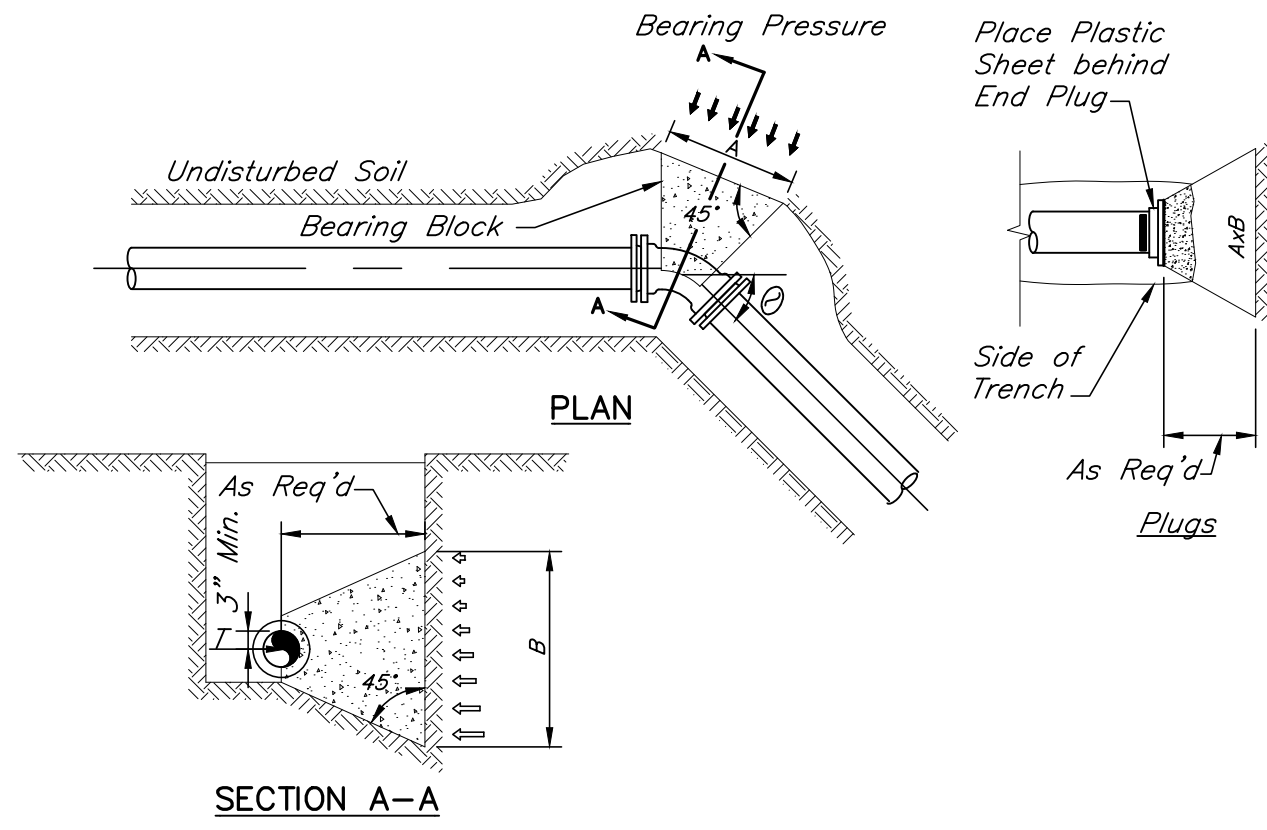
3/8" = 1'-0"



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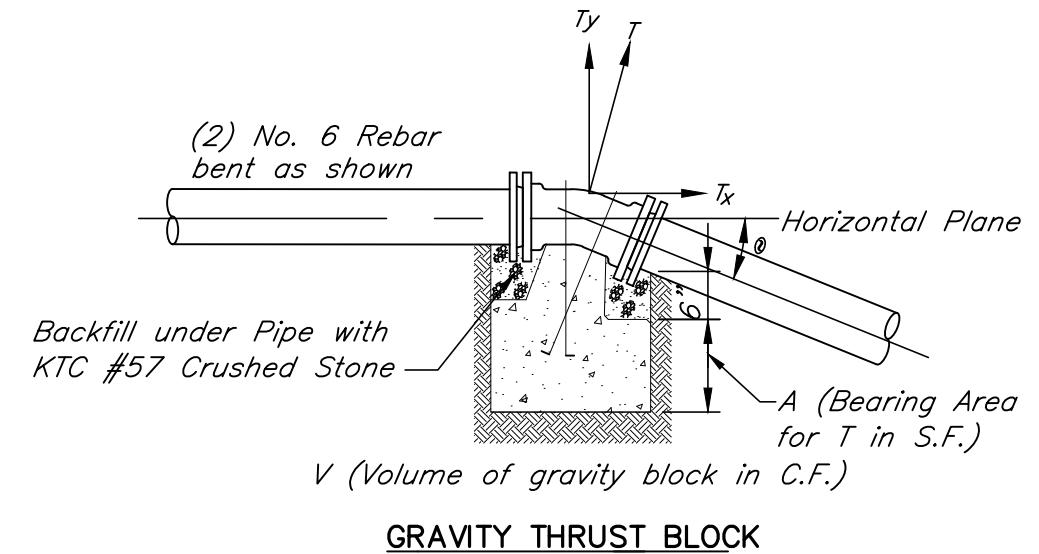


- NOTES:**
1. Thrust restraint table is based on pipeline pressure of 200 psi and earth bearing capacity of 1500 psf. During construction, the specific soil type may be evaluated and concrete thrust block size revised at the discretion of the Engineer.
  2. On large diameter pipes where space limitations or construction difficulties render concrete thrust blocks not feasible or impractical, a joint restraint system may be used. This restrained joint system must be approved by the Engineer.
  3. Concrete shall be 3000 psi minimum conforming to KTC Specifications 601.
  4. Accessibility to fittings and bolts must be maintained.
  5. Wrap fittings in plastic prior to placing concrete.

**HORIZONTAL THRUST BLOCK SCHEDULE**

PIPE SIZE (INCHES)	90° BEND		45° BEND		22 1/2° BEND		11 1/4° BEND		TEE, DEAD END	
	A	B	A	B	A	B	A	B	A	B
3 & 4	3'-3"	1'-8"	2'-4"	1'-2"	1'-8"	1'-0"	1'-0"	1'-0"	2'-8"	1'-4"
6	4'-8"	2'-4"	3'-5"	1'-8"	2'-6"	1'-3"	1'-6"	1'-10"	3'-10"	2'-0"
8	6'-0"	3'-0"	4'-5"	2'-3"	3'-2"	1'-7"	2'-3"	1'-2"	5'-0"	2'-6"
10	7'-6"	3'-9"	5'-5"	2'-9"	3'-10"	2'-0"	2'-9"	1'-5"	6'-3"	3'-2"
12	8'-10"	4'-5"	6'-6"	3'-3"	4'-8"	2'-4"	3'-4"	1'-8"	7'-5"	3'-9"
14	10'-3"	5'-2"	7'-6"	3'-9"	5'-4"	2'-8"	3'-10"	2'-0"	8'-8"	4'-4"
16	11'-8"	5'-10"	8'-7"	4'-4"	6'-1"	3'-0"	4'-4"	2'-2"	9'-9"	4'-11"
18	13'-0"	6'-6"	9'-7"	4'-9"	6'-10"	3'-5"	4'-10"	2'-5"	11'-0"	5'-6"
20	14'-5"	7'-3"	10'-7"	5'-4"	7'-7"	3'-9"	5'-4"	2'-8"	12'-2"	6'-1"
24	17'-3"	8'-8"	12'-8"	6'-4"	9'-0"	4'-6"	6'-5"	3'-3"	14'-6"	7'-3"

**HORIZONTAL THRUST BLOCK**  
July, 2015 Scale: 3/8"=1'-0"

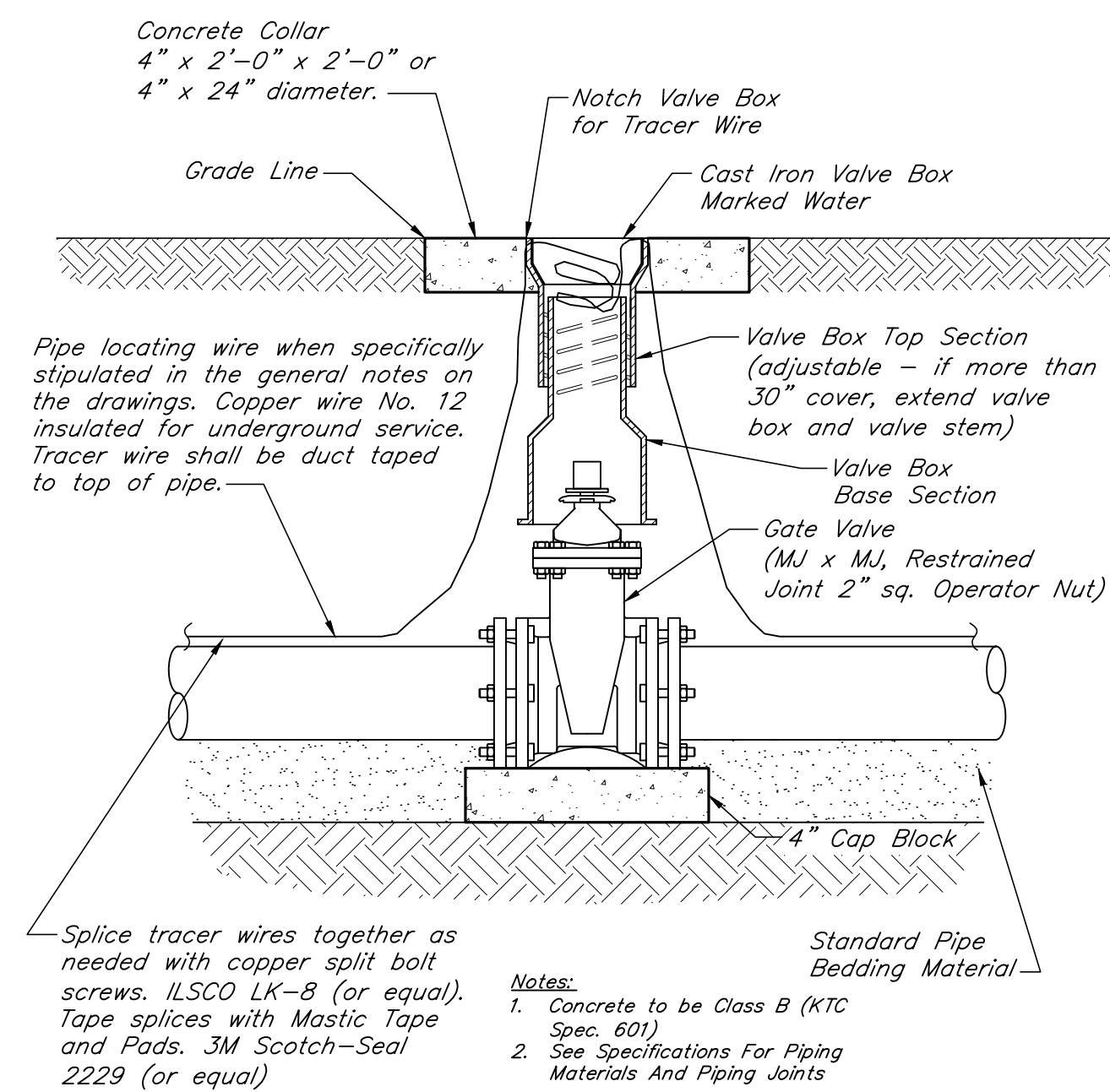


- GRAVITY THRUST BLOCK**
- NOTES:**
1. Thrust restraint table is based on pipeline pressure of 200 psi and earth bearing capacity of 1500psf. During construction, the specific soil type may be evaluated and concrete thrust block size revised at the discretion of the Engineer.
  2. On large diameter pipes where space limitations or construction difficulties render concrete thrust blocks not feasible or impractical, a joint restraint system may be used. This restrained joint system must be approved by the Engineer.
  3. Concrete shall be 3000 psi minimum conforming to KTC Specifications 601.
  4. Accessibility to fittings and bolts must be maintained.
  5. Wrap fittings in plastic prior to placing concrete.

**VERTICAL THRUST BLOCK SCHEDULE**

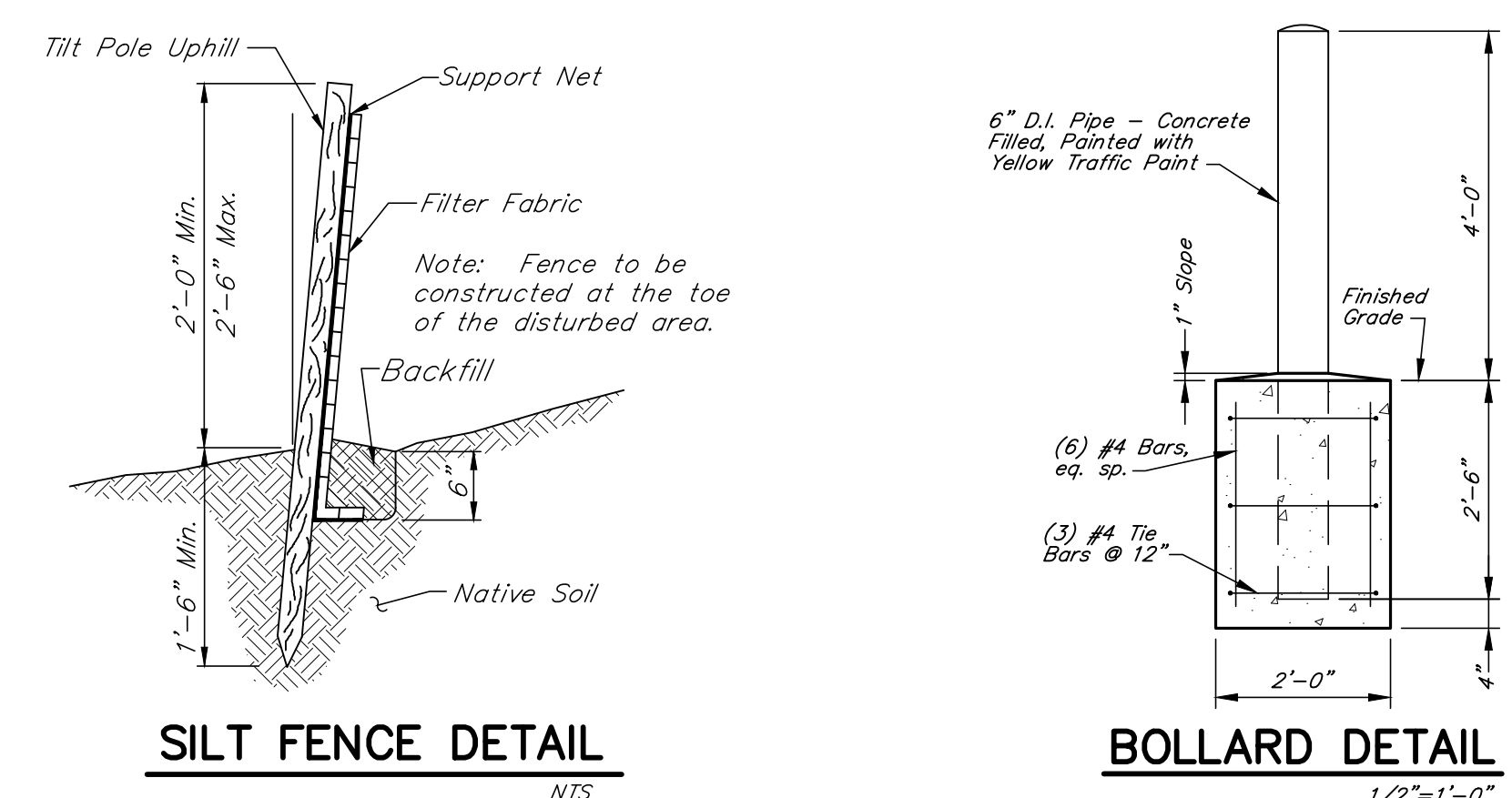
PIPE SIZE (INCHES)	90° BEND		45° BEND		22 1/2° BEND		11 1/4° BEND	
	V	A	V	A	V	A	V	A
3 & 4	29	2	20	1	11	1	6	1
6	64	5	46	2	25	1	13	1
8	114	8	81	4	43	1	23	1
10	174	12	123	5	66	2	35	1
12	248	17	176	8	95	2	50	1
14	337	23	238	10	128	3	67	1
16	439	29	311	13	167	4	88	1
18	555	37	393	16	211	5	111	1
20	685	46	484	20	260	6	137	2
24	985	66	696	29	374	8	197	2

**VERTICAL THRUST BLOCK**  
July, 2015 Scale: 1/2"=1'-0"

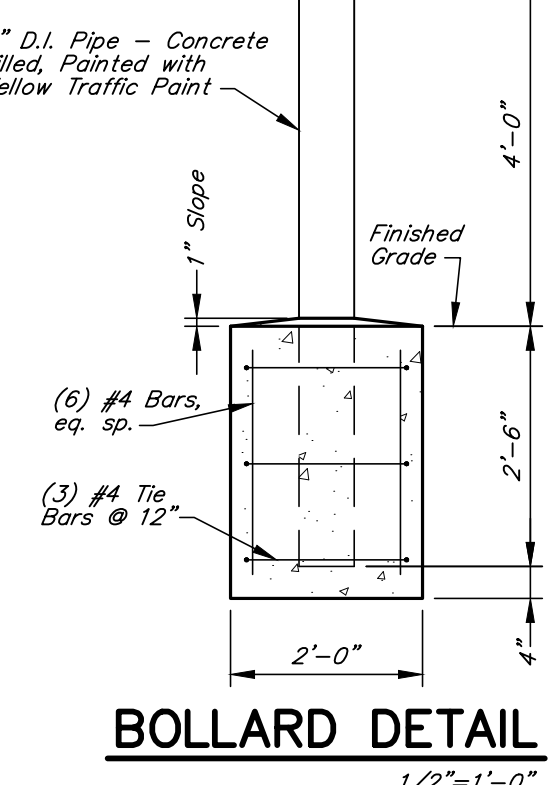


- VALVE BOX INSTALLATION**
- NOTES:**
1. Concrete to be Class B (KTC Spec. 601)
  2. See Specifications For Piping Materials And Piping Joints
- Splice tracer wires together as needed with copper split bolt screws. ILSCO LK-8 (or equal). Tape splices with Mastic Tape and Pads. 3M Scotch-Seal 2229 (or equal)

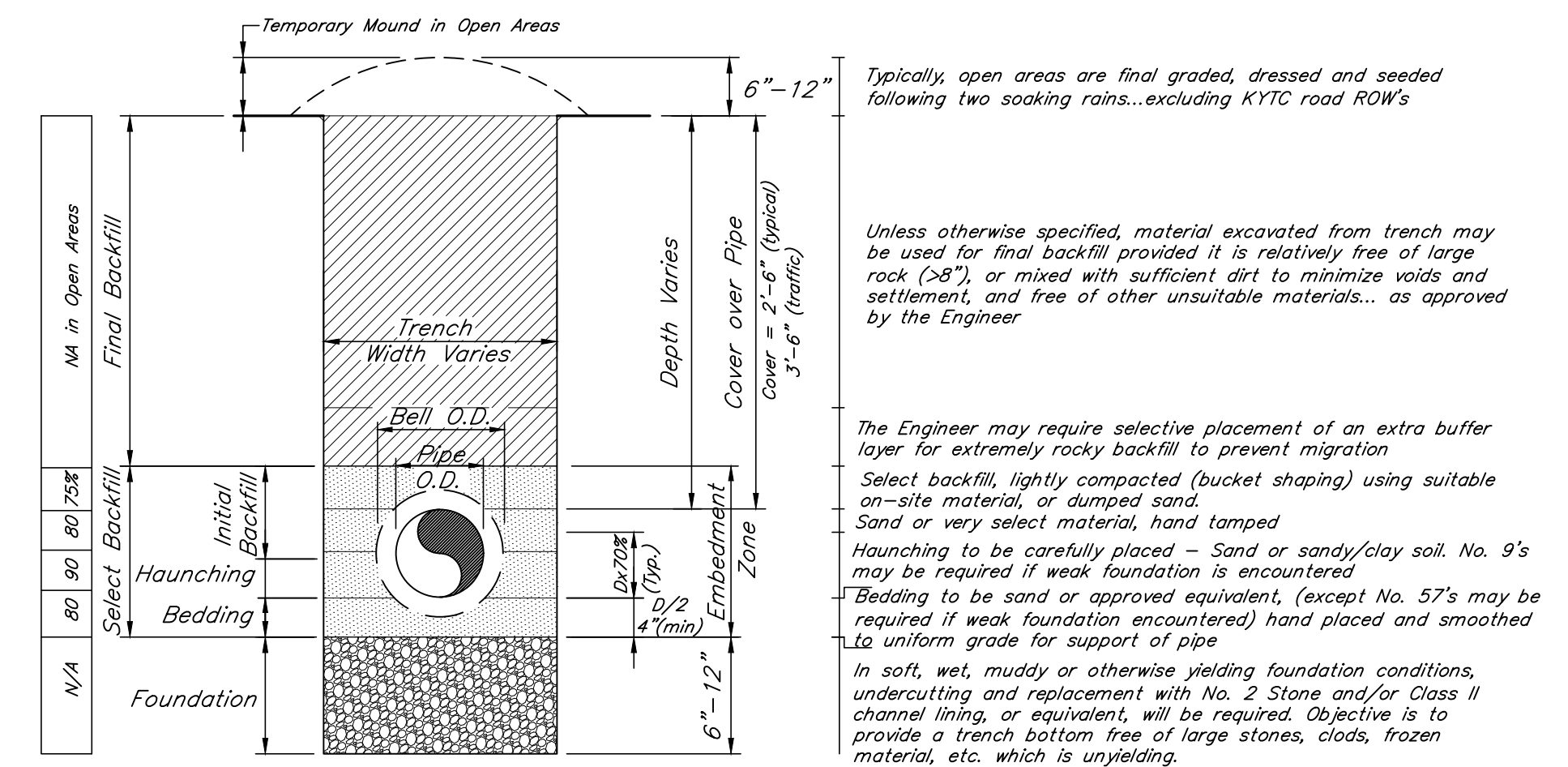
**VALVE BOX INSTALLATION**  
July 2015 Scale: 1"=1'-0"



**SILT FENCE DETAIL**  
NTS

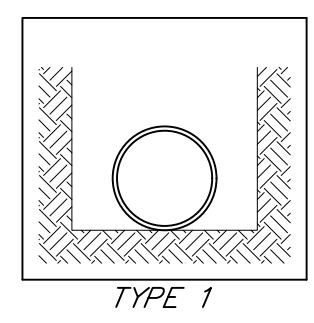


**BOLLARD DETAIL**  
1/2"=1'-0"

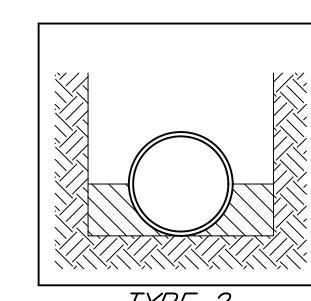


- TRENCH BACKFILL OPEN AREAS - PLASTIC PIPE**
- NOTES:** No rocks larger than 1-1/2" allowed in embedment zone.
- Typical desired densities in open areas are depicted above in the boxes to the left of the figure. In other laying situations, more stringent selection, placement and compaction will be required.
- Trench width should be no wider than necessary for adequate work room and to assure safe working conditions. Nominal outside diameter (O.D.) pipe plus 6" on each side is typically considered minimal.

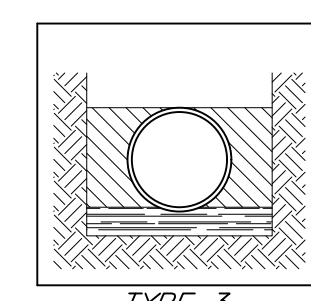
**TRENCH BACKFILL OPEN AREAS - PLASTIC PIPE**  
Oct. 2016 Scale: 3/4"=1'-0"



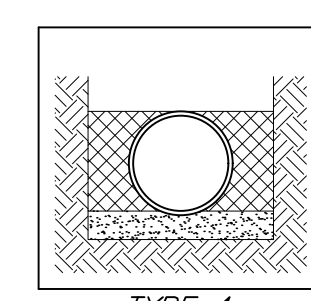
**TYPE 1**  
Flat-bottom trench Loose Backfill



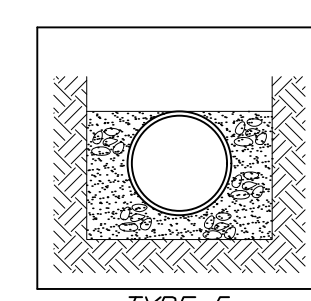
**TYPE 2**  
Flat-bottom trench in undisturbed earth. Backfill lightly consolidated to centerline of pipe



**TYPE 3**  
Pipe bedded in 4" minimum loose soil as approved. Backfill lightly consolidated to top of pipe

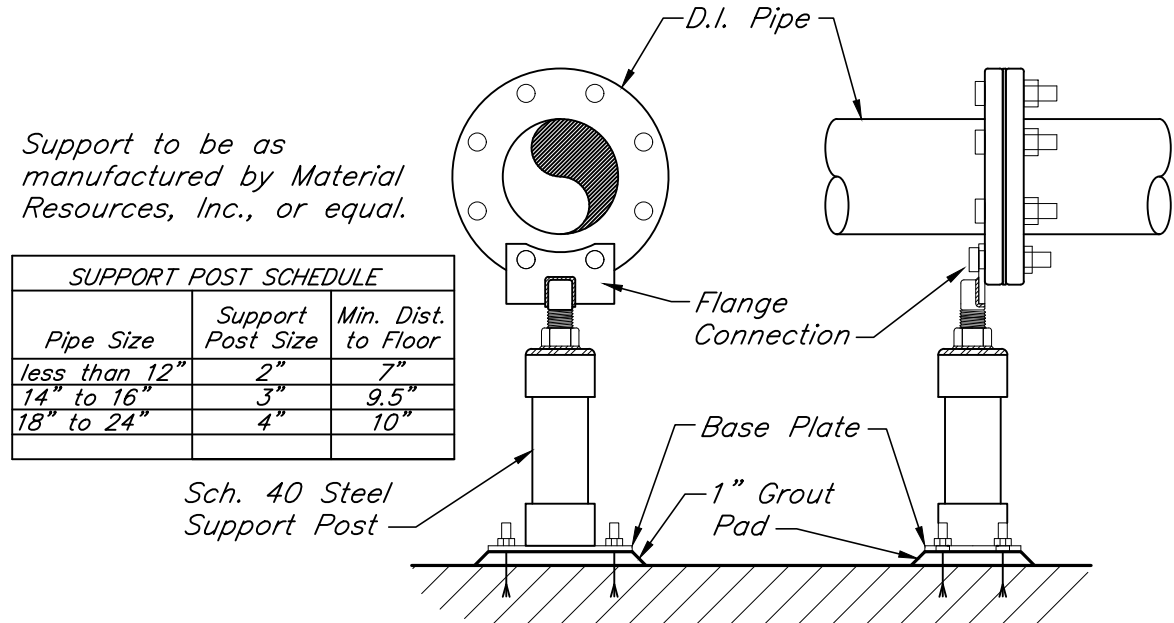


**TYPE 4**  
Pipe bedded in sand, gravel, or crushed stone to depth of 4" minimum. Backfill hand compacted to top of pipe (approximately 80 percent Standard Proctor).



**TYPE 5**  
Pipe bedded in compacted granular material to centerline of pipe, 4" minimum under pipe. Compacted granular or select material to top of pipe (approximately 90 percent Standard Proctor).

**LAYING CONDITIONS FOR DUCTILE IRON PIPE**  
Dec., 2010 N.T.S. Ref. AWWA C150

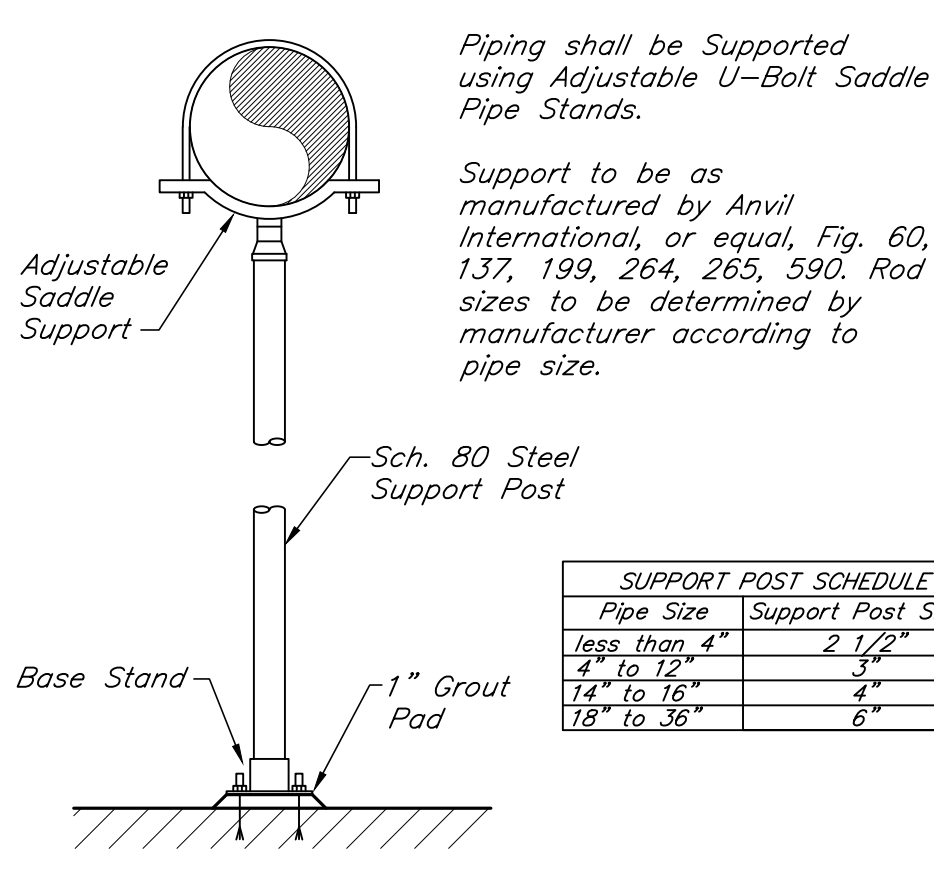


Support to be as manufactured by Material Resources, Inc., or equal.

**SUPPORT POST SCHEDULE**

Pipe Size	Support Post Size	Min. Dist. to Floor
less than 12"	2"	7"
14" to 16"	3"	9.5"
18" to 24"	4"	10"

**FLANGED PIPE SUPPORT**  
N.T.S.



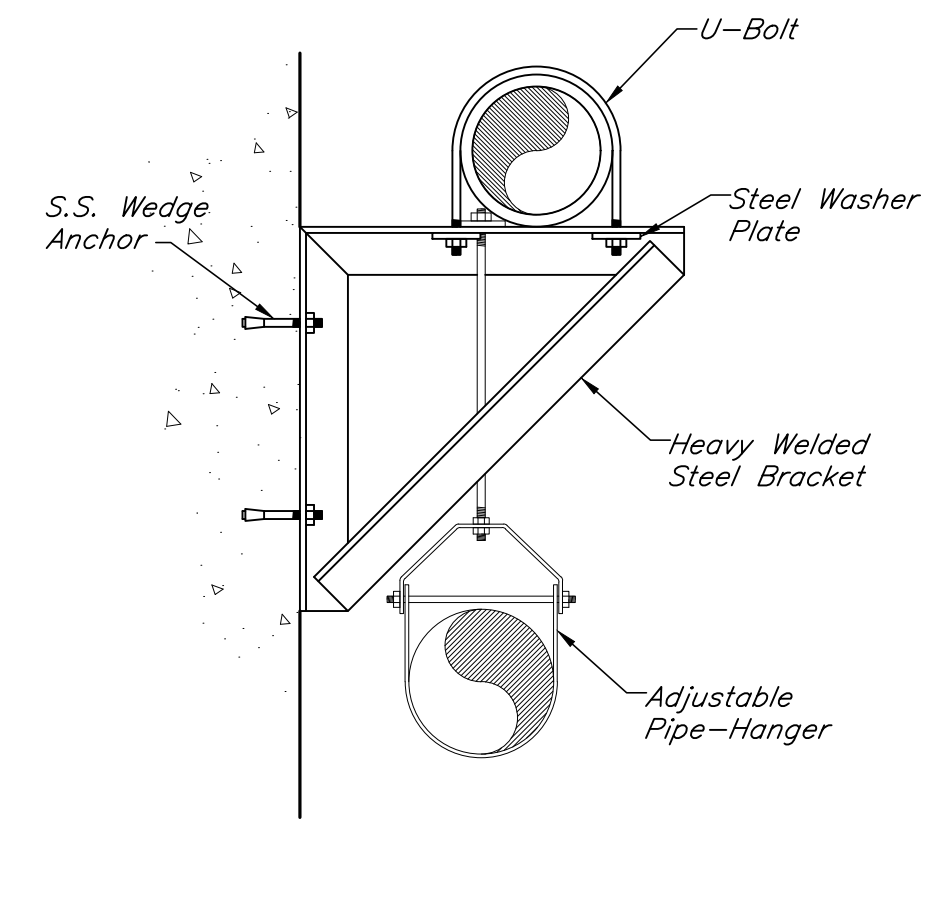
Piping shall be supported using Adjustable U-Bolt Saddle Pipe Stands.

Support to be as manufactured by Anvil International, or equal, Fig. 60, 137, 199, 204, 255, 590. Rod sizes to be determined by manufacturer according to pipe size.

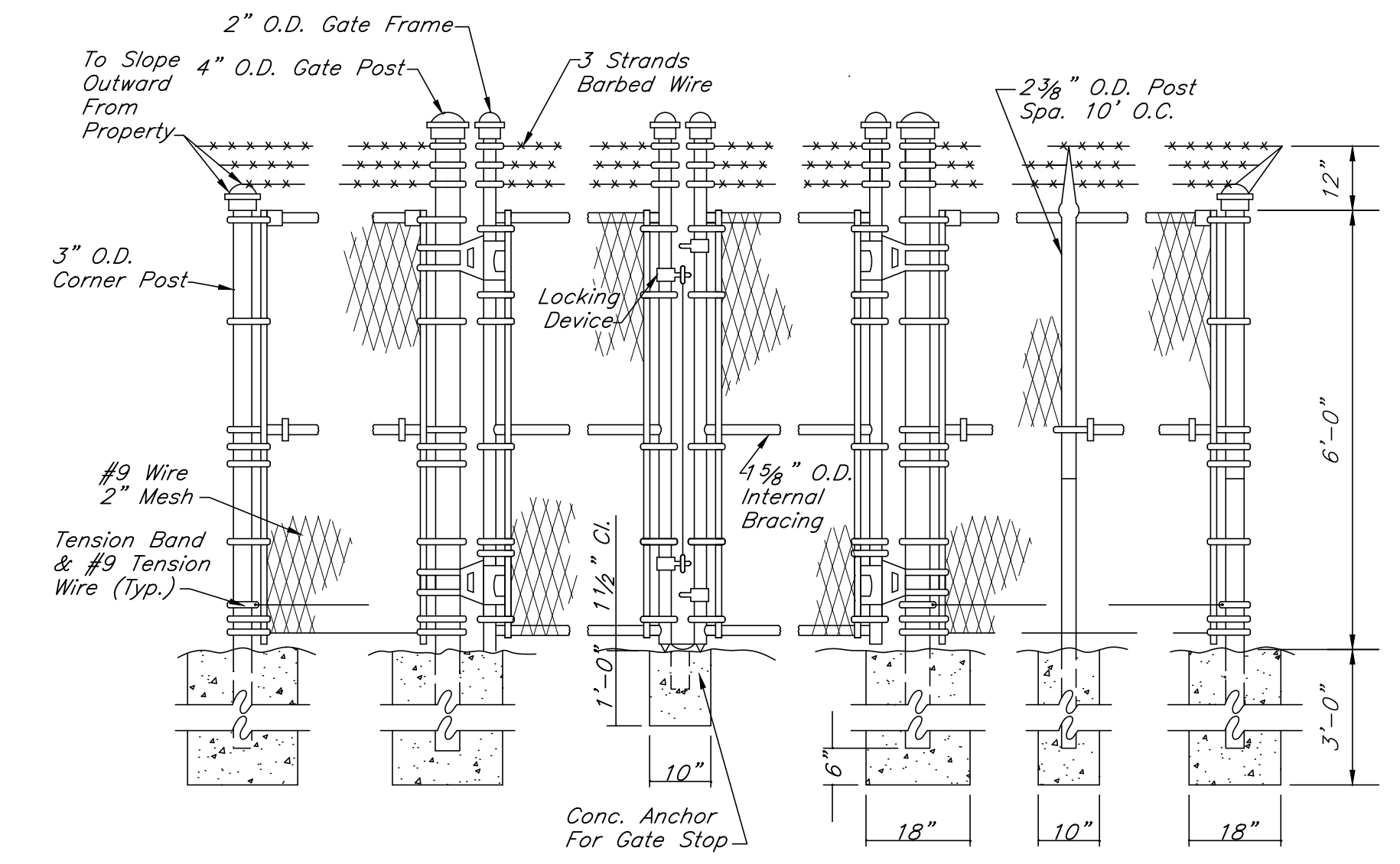
**SUPPORT POST SCHEDULE**

Pipe Size	Support Post Size
less than 4"	2 1/2"
4" to 12"	3"
14" to 16"	4"
18" to 36"	6"

**PIPE SADDLE DETAIL**  
N.T.S.



**PIPE BRACKET AND HANGER DETAIL**  
N.T.S.



**CHAIN LINK FENCE DETAIL**  
N.T.S.



**REVISIONS**

NO.	DATE	DESCRIPTION
1	MAY 2019	AS NOTED



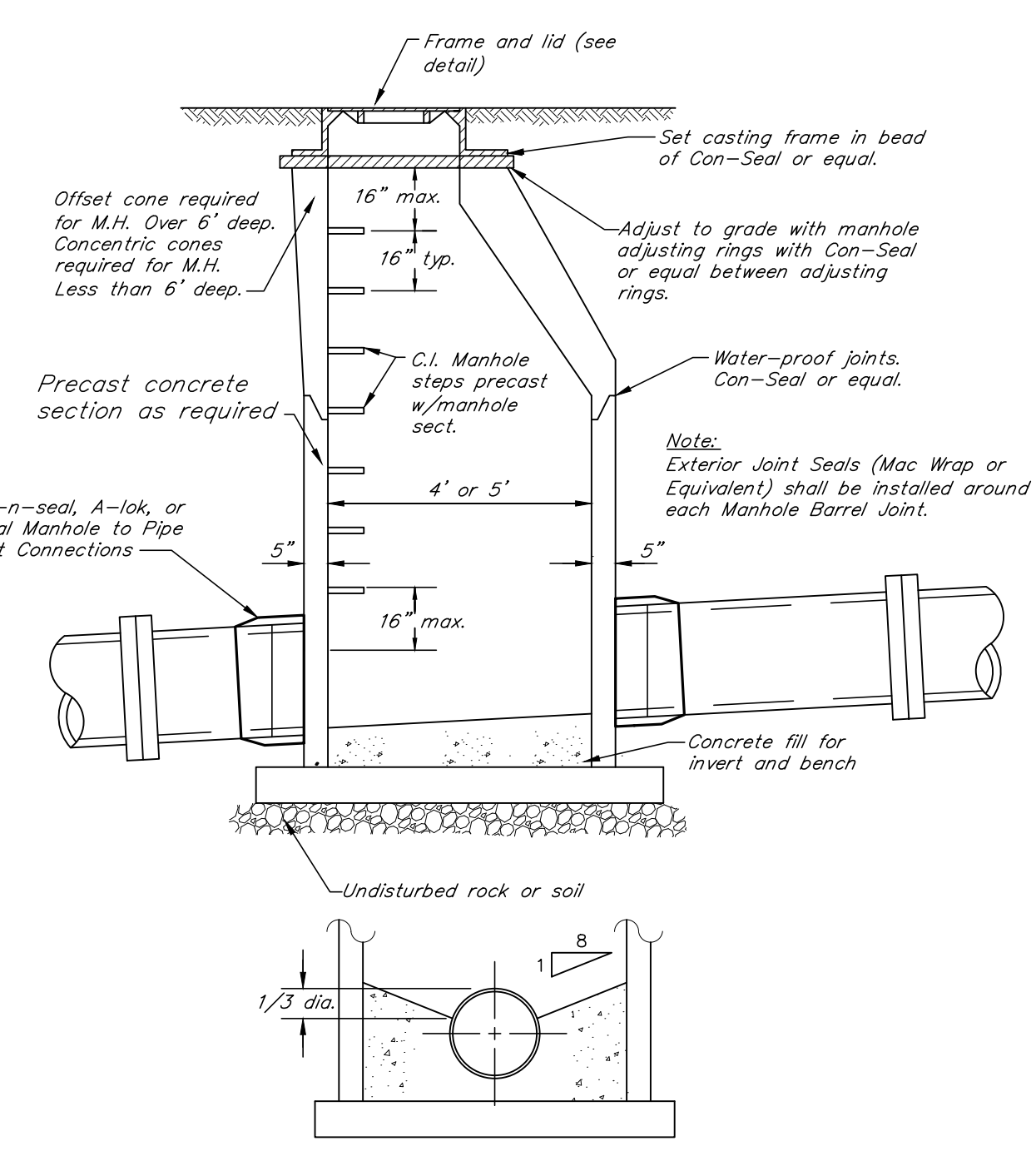




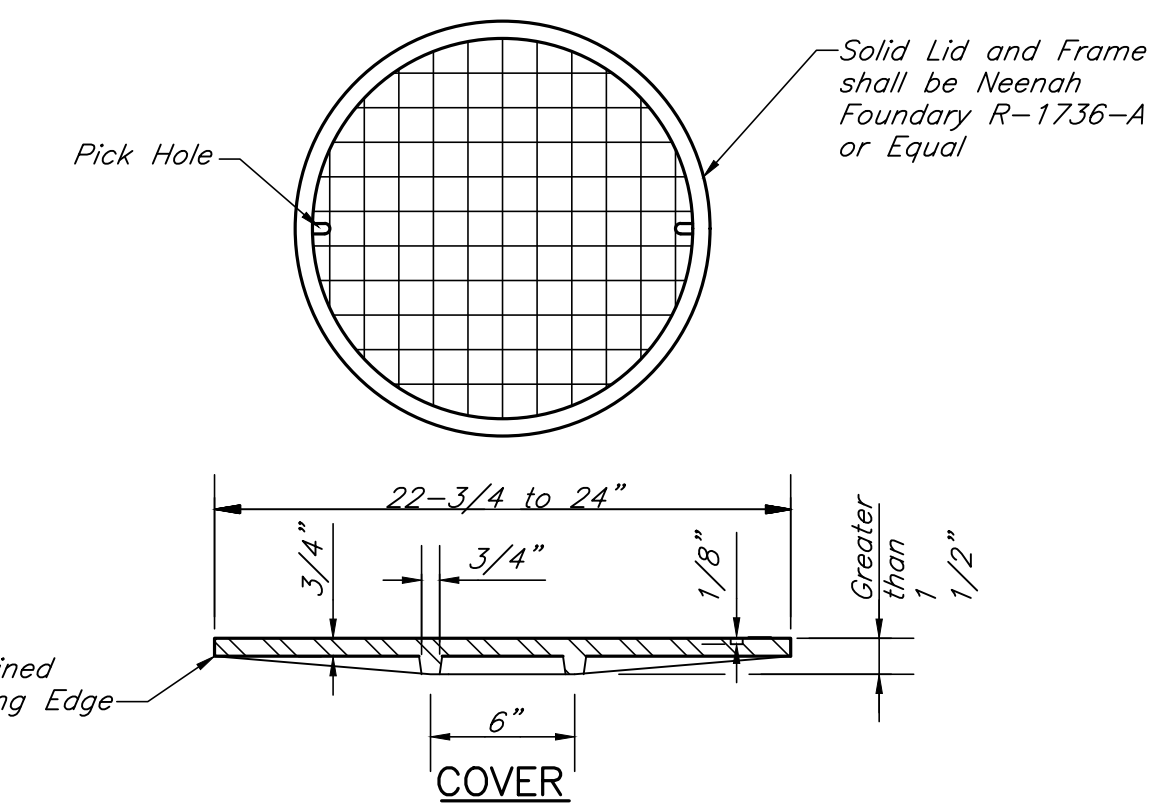
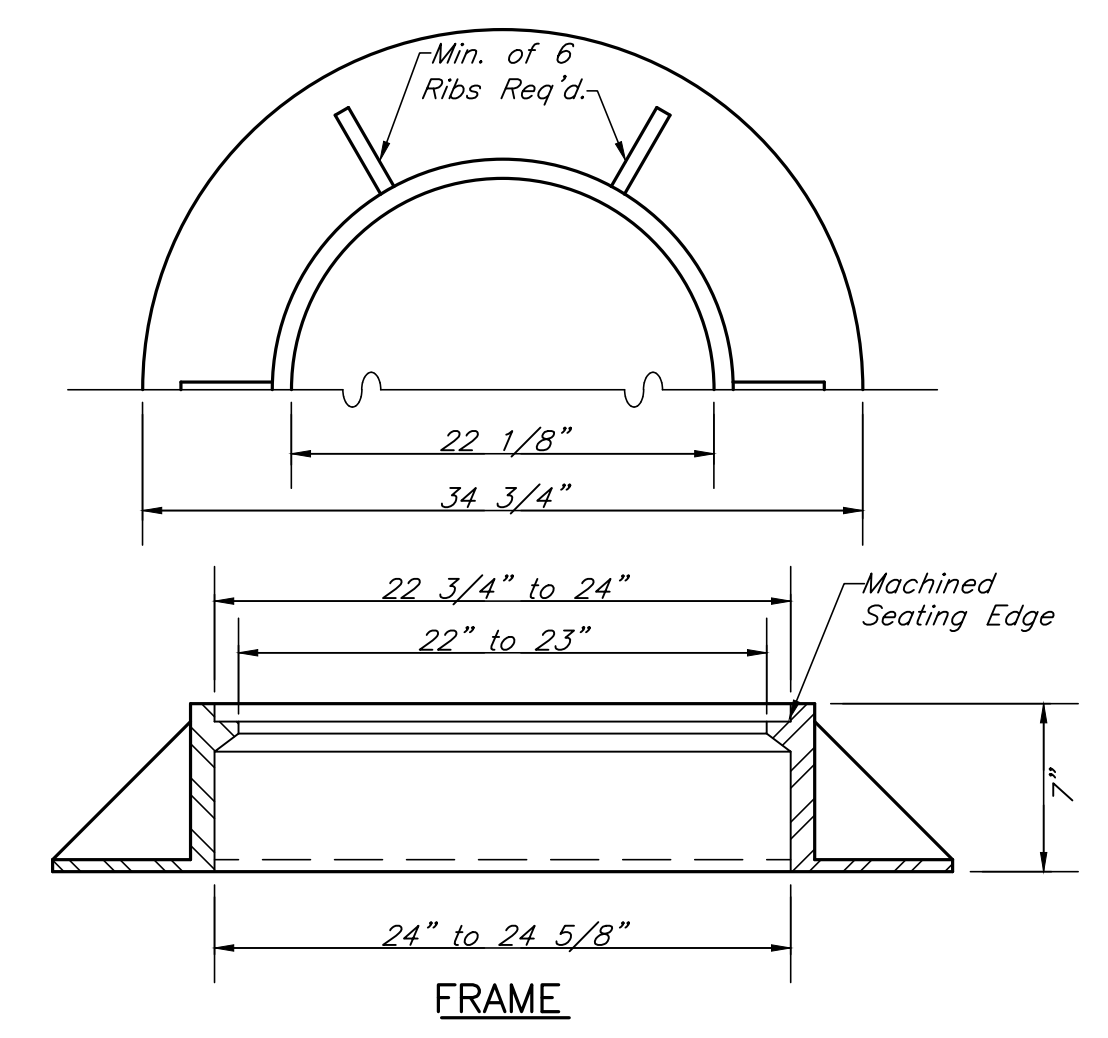
DRAWN BY: JKP
CHECKED BY: RWV
DATE: MAY 2019
SCALE: As Noted
REVISIONS



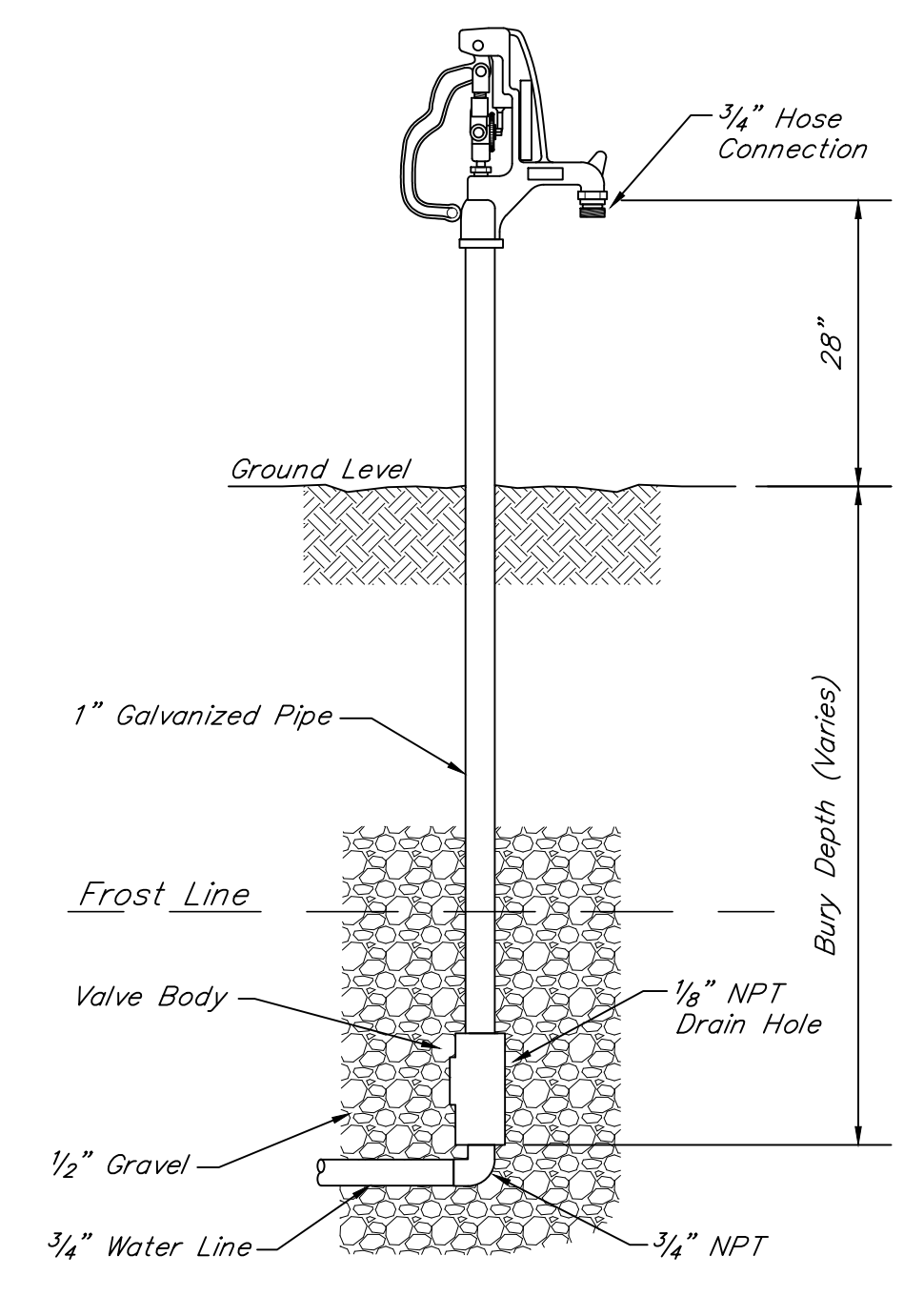
MISCELLANEOUS DETAILS



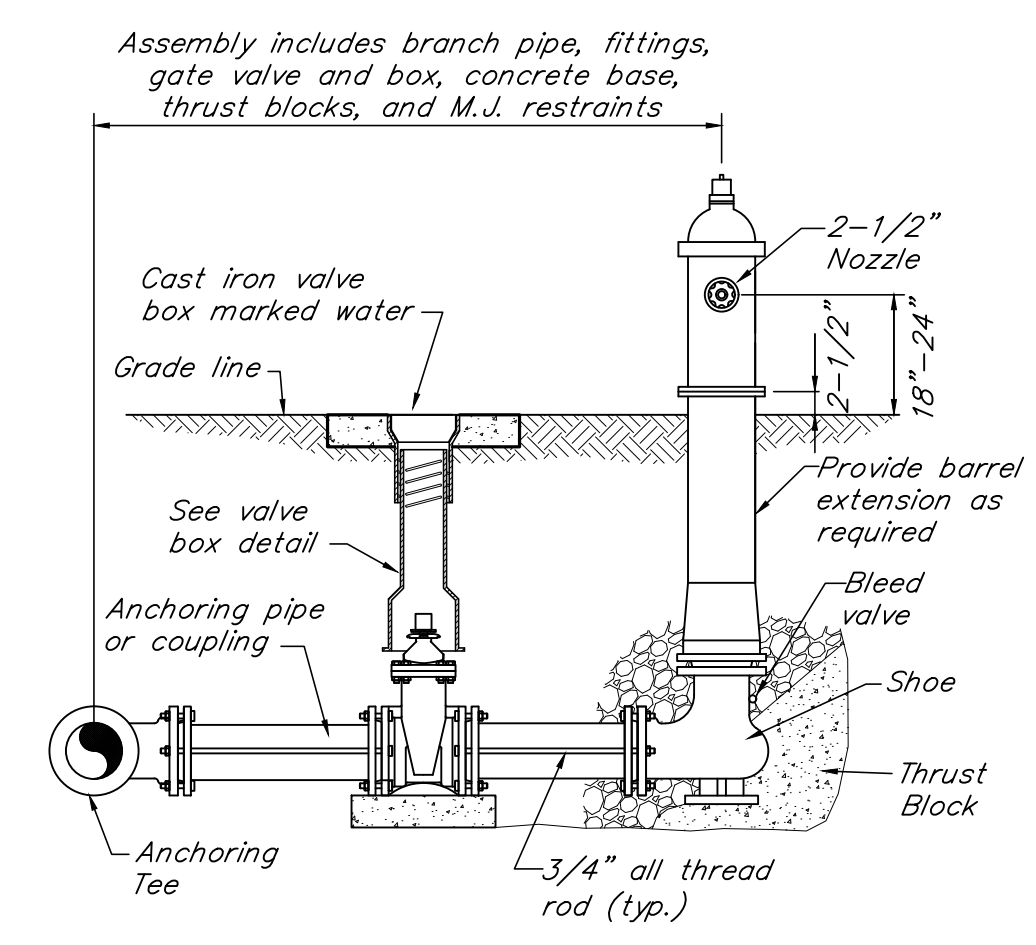
Note: Steps shall be vertically aligned.  
**STANDARD MANHOLE**  
 Jan., 2011 N.T.S.



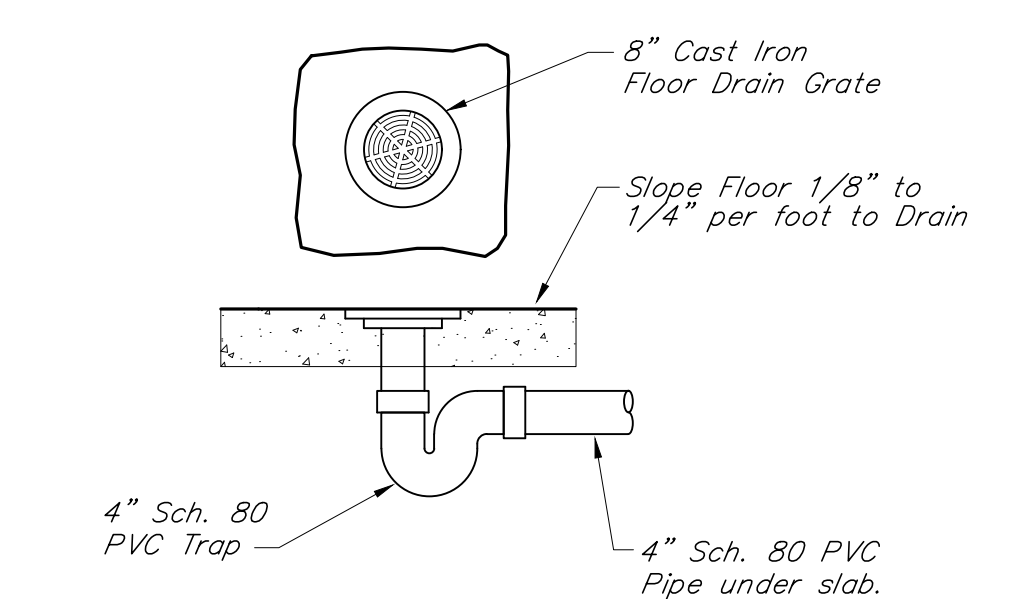
**MANHOLE FRAME AND COVER**  
 Jan., 2011 N.T.S.



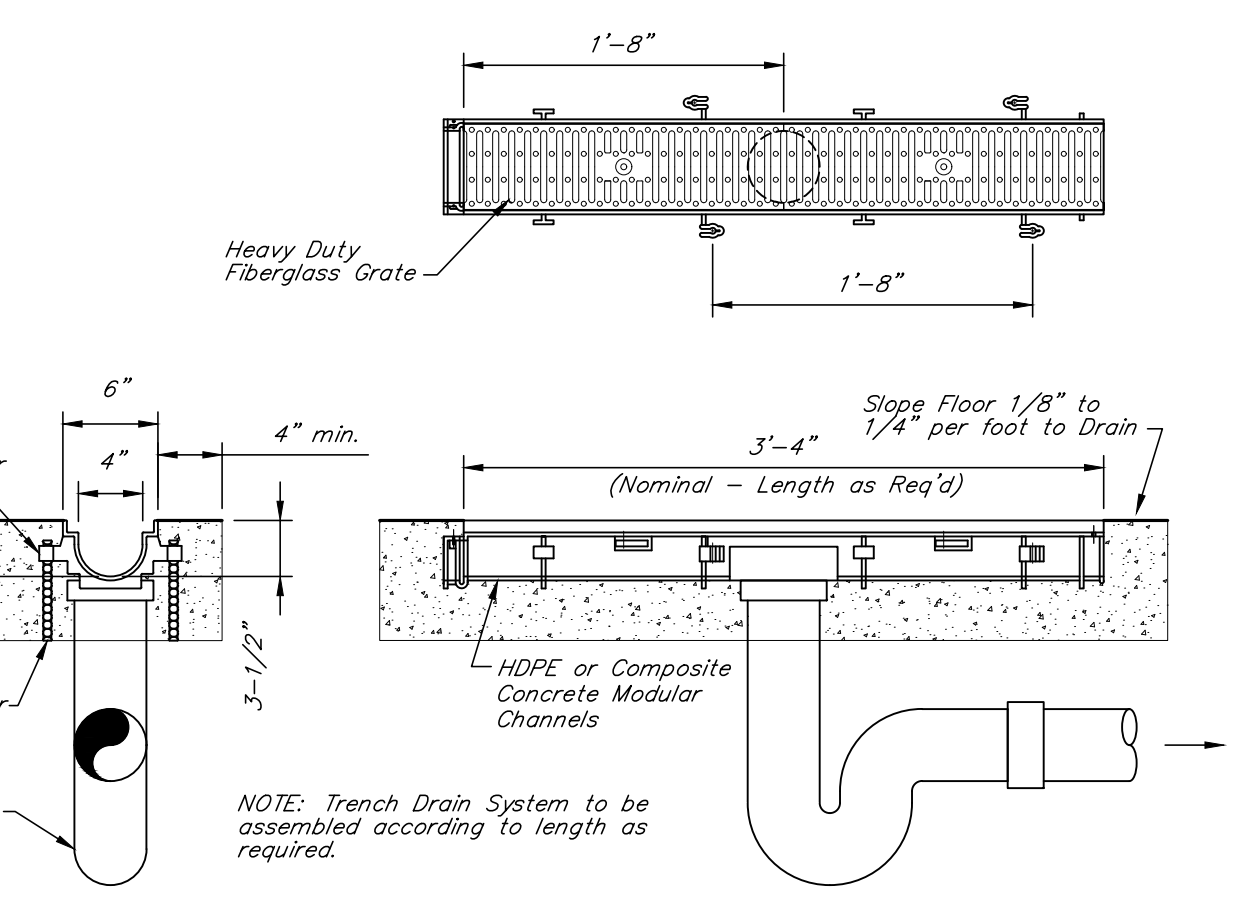
**FROST-PROOF YARD HYDRANT**  
 Dec., 2010 N.T.S.



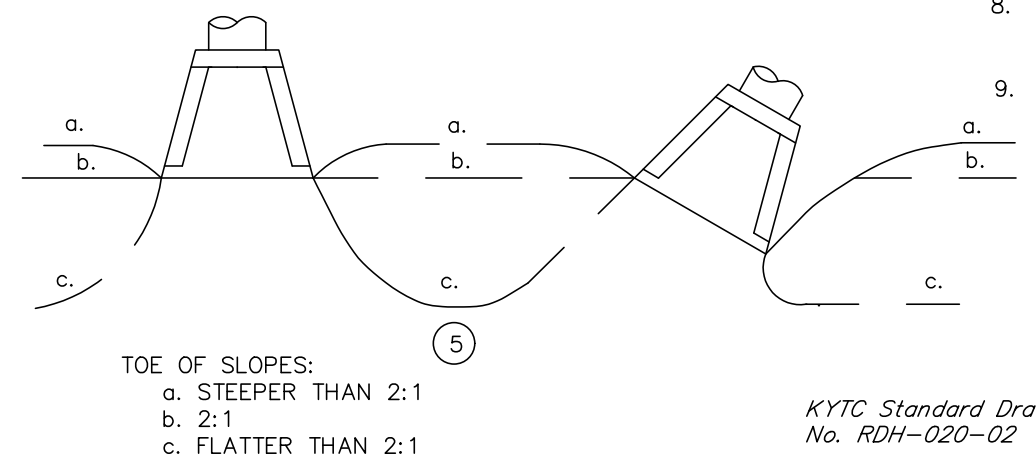
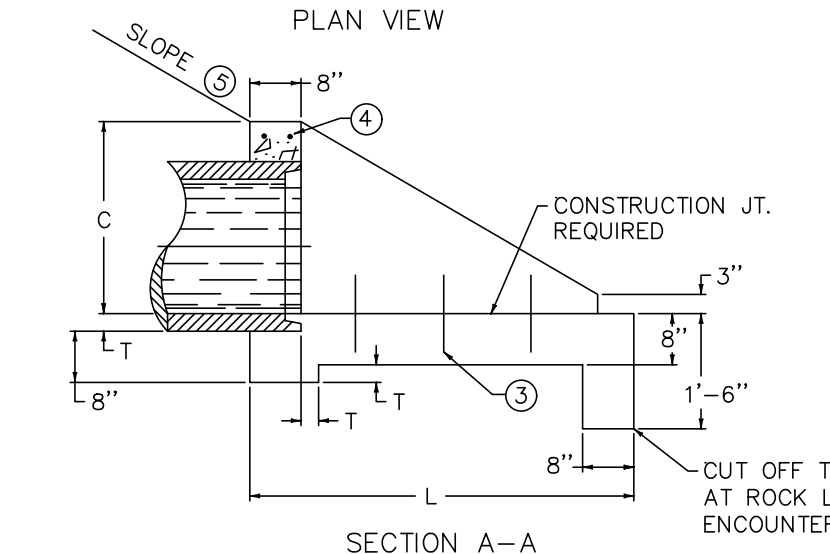
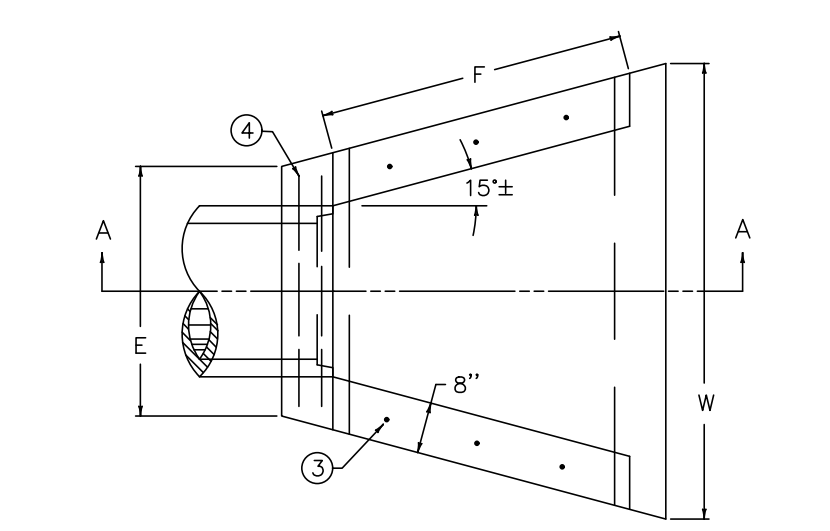
**POST HYDRANT**  
 N.T.S.



**FLOOR DRAIN**  
 N.T.S.



**TRENCH DRAIN**  
 1" = 1'-0"

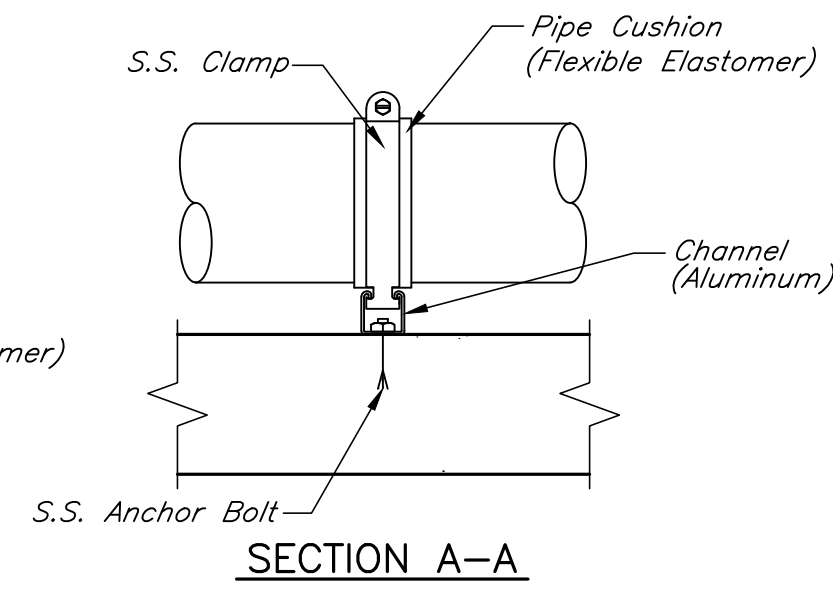
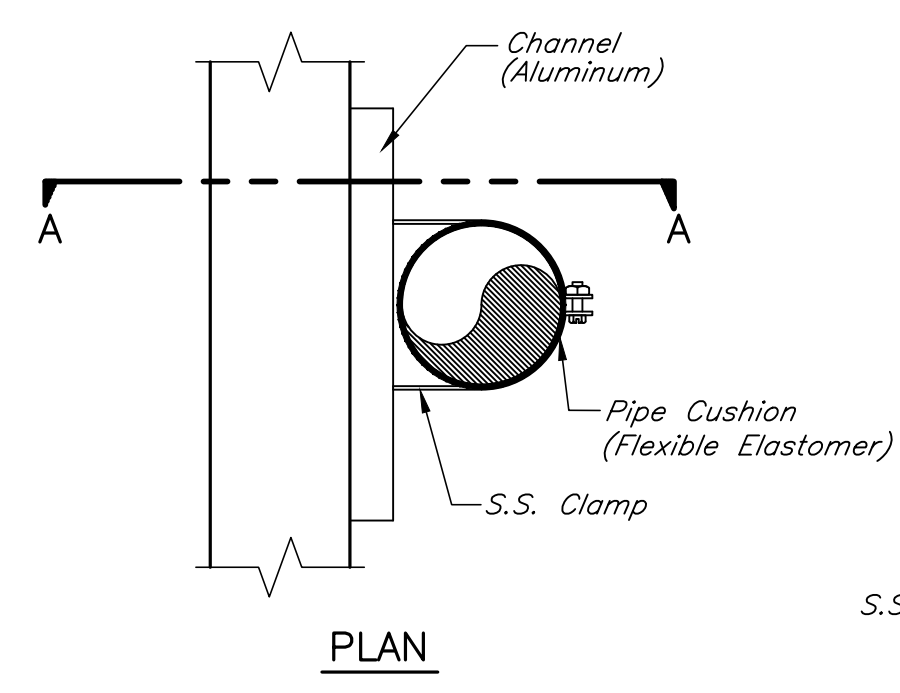


**STANDARD HEADWALL DETAIL**  
 N.T.S.

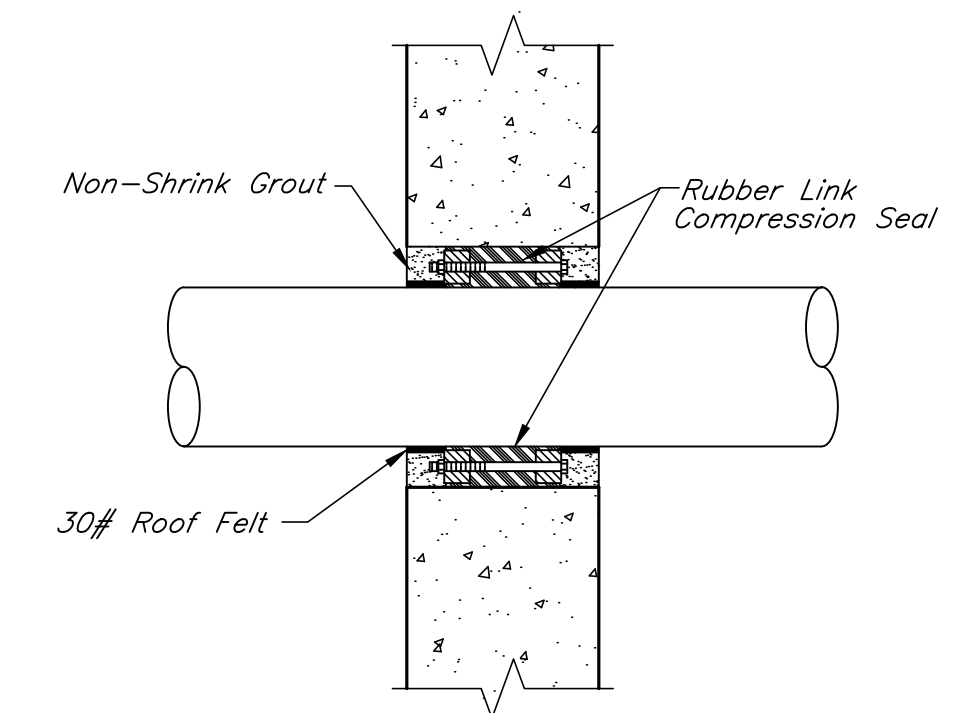
PIPE DIA. OR EQUIV. DIA.	SHAPE	DIMENSIONS						
		C	E	F	L	W	T	
8"	○	1'-9"	2'-6"	2'-3"	3'-6"	4'-0"	2"	
12"	○	1'-9"	2'-6"	2'-3"	3'-6"	4'-0"	2"	
15"	○	2'-0"	2'-9"	2'-9"	4'-0"	4'-9"	2"	
18"	○	1'-9"	3'-0"	2'-6"	3'-6"	4'-9"	2"	
	○	2'-3"	3'-0"	3'-6"	4'-6"	5'-3"	2"	
21"	○	2'-0"	3'-6"	3'-0"	4'-0"	5'-6"	2 1/2"	
	○	2'-6"	3'-3"	4'-0"	5'-0"	6'-0"	2"	
24"	○	2'-3"	3'-0"	3'-6"	4'-6"	6'-0"	3"	
	○	2'-9"	3'-6"	4'-6"	5'-6"	6'-6"	3"	
27"	○	2'-6"	4'-0"	4'-0"	5'-0"	6'-9"	3"	
	○	3'-0"	3'-9"	5'-0"	6'-0"	7'-0"	3"	
27"	○	2'-9"	4'-6"	4'-3"	5'-3"	7'-3"	3"	
	○	2'-9"	4'-6"	4'-3"	5'-3"	7'-3"	3"	

- NOTES
- DIMENSIONS AND QUANTITIES ARE BASED ON CONCRETE PIPE AND WILL VARY INSIGNIFICANTLY FOR CORRUGATED METAL OR PVC PIPE.
  - REINFORCING STEEL: MINIMUM GRADE 40, BARS EVENLY SPACED.
  - 6 - NO. 4 x 1'-0" DOWEL BARS.
  - 2 - NO. 4 x (E DIMENSION MINUS 4").
  - SLOPES SHALL BE WARPED TO FIT HEADWALL WHEN PIPE IS SKEWED AND/OR NORMAL SLOPE VARIES FROM 2:1.
  - VOLUME DISPLACED BY PIPE COMPUTED USING INSIDE DIAMETER OF PIPE.
  - WING ANGLES AND/OR DIMENSIONS MAY BE ALTERED DURING CONSTRUCTION TO ACCOMMODATE FLOW OF WATER.
  - APRON BETWEEN WINGS SHALL BE SLOPED IN DIRECTION OF FLOW EQUAL TO SLOPE OF PIPE. FRONT FACE OF HEADWALL SHALL REMAIN VERTICAL.
  - HEADWALLS ARE FOR CIRCULAR, ARCH, AND HORIZONTAL ELLIPTICAL 8" - 27" EQUIVALENT PIPE SIZES.

KYTC Standard Drawing  
 No. RDH-020-02



**1/2" TO 8" PVC PIPE SUPPORT**  
 N.T.S.

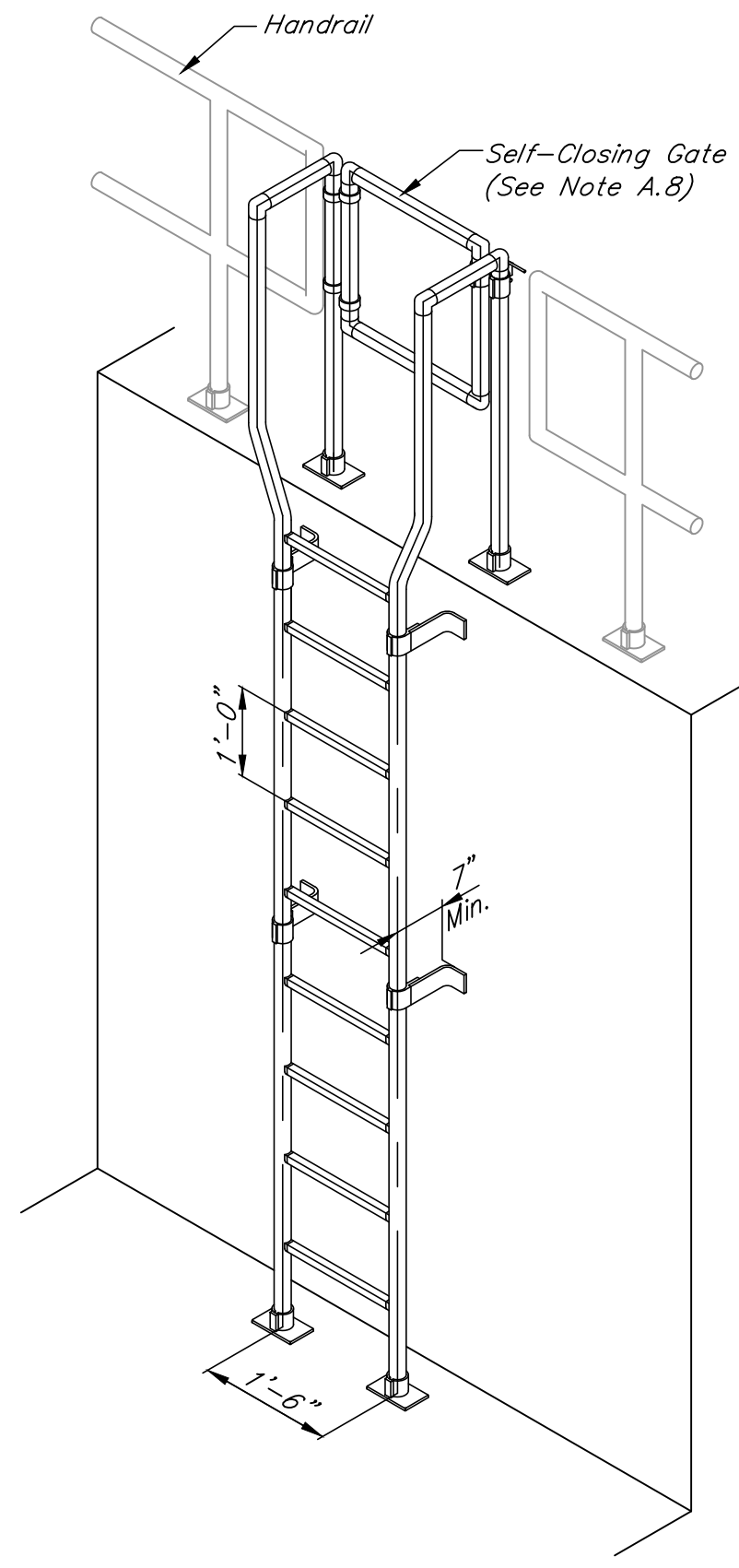


**WALL/FLOOR PENETRATION SEAL**  
 N.T.S.

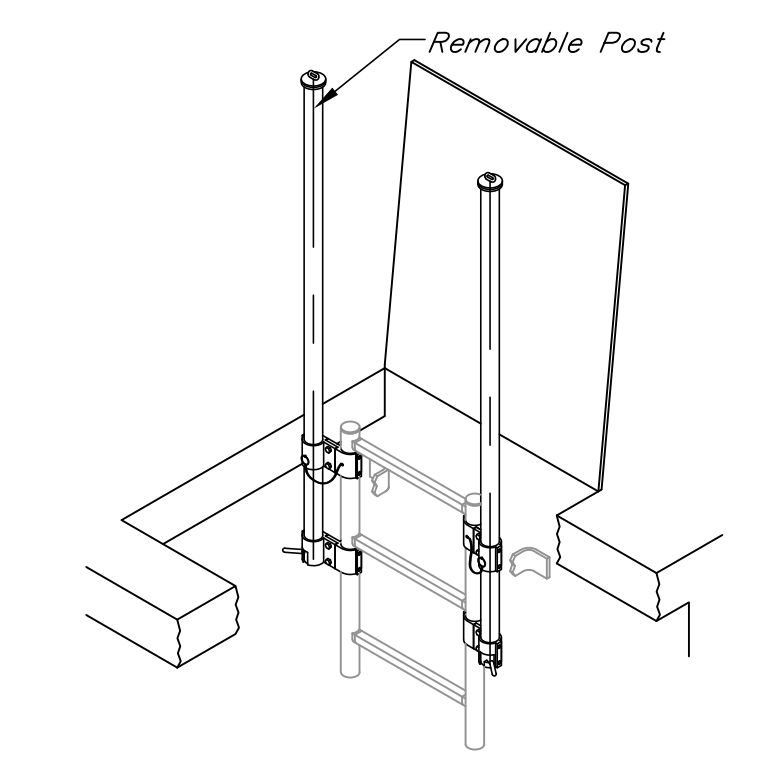


**A: SPECIFICATIONS FOR ALUMINUM LADDER**

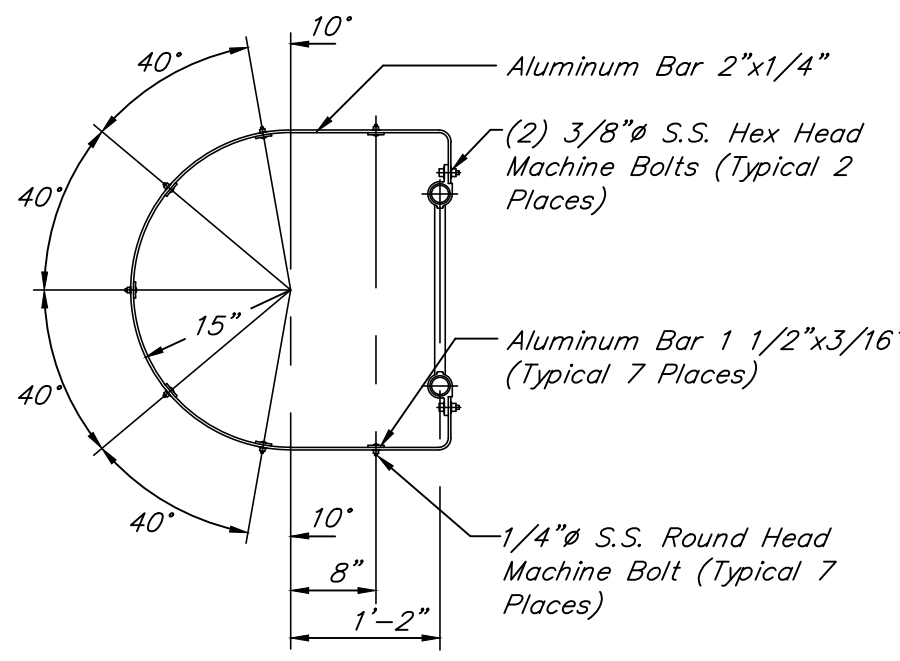
- Ladder shall be TUF Ladder as manufactured by Thompson Fabricating Company (Birmingham, Alabama) or approved equal.
- Rung Description**  
The Rung shall be designed to provide a non-slip power grip surface with a flat 1" wide serrated top surface and a semicircular bottom. The straight sides and semicircular bottom shall have striations of approximately 5/16" centers for gripping surface. The Rung shall be an aluminum extrusion, Alloy 6063-T5, of sufficient section modulus and moment of inertia to withstand the design loads.
- Side Rail Description**  
The Side Rail shall be 1 1/2" Schedule 40 Pipe, Alloy 6063-T6, 6105-T5 or 6061-T6. Pipe shall conform to ASTM-B-429 or ASTM-B-221.
- Codes**  
The Ladder shall meet the requirements of ANSI-A14.3.
- Design Loads**
  - Ladder Rungs shall be designed to withstand a concentrated load of 250 pounds plus 30% impact. Maximum Rung deflection shall not exceed L/360. The design load shall be applied at the center of the Rung on a 4" wide area.
  - Ladder side rails shall be designed to withstand a minimum live load of two 250 pound loads plus 30% impact concentrated between any two consecutive attachments.
- Testing**  
Submit test reports for the Engineer's approval to verify design loads and deflections on the Rungs and Rung to Side Rail attachments. Testing to be verified by an independent testing laboratory. The design load, 325 lbs. (250x1.3), shall be applied at the center of the Rung on an area 4" wide. The test Rung will be attached to the Side Rails in the same manner as the production Ladder. Design loads shall be applied and released a minimum of 200,000 times to demonstrate fatigue resistance and a safe extended service life. Deflection shall be checked periodically and shall not exceed L/360 at any time under full design load. At completion of testing the Rung and attachments to the Side Rail shall be inspected for cracks, looseness, distortion, bending (permanent set) or other obvious damage.
- Finish**  
Pipe for side rails shall have the same finish as handrail if the ladder is located at an opening in Handrail. Rungs, Cage and Brackets are to be mill finish.
- Guarding Floor, Wall Openings and Holes [OSHA 1910.23(a)(2)]**  
Every Ladder way floor opening or Platform shall be guarded by a standard Railing with standard Toe board on all exposed sides (except at entrance to opening), with the passage through the Railing either provided with a Swinging Gate or so offset that a person cannot walk directly into the opening. Self-closing Gates are required only where shown on plans.
- All Ladders shall be equipped with a fall prevention device.
- Specifications for Aluminum Ladder Cage:**
  - Cage general design and size shall be in accordance with ANSI-A-14.3. The Cage shall be shipped knocked down for field assembly.
  - The prefabricated horizontal bands shall be aluminum bars, alloy 6061-T6, 3"x1/4" for the top and bottom bands and 2"x1/4" for the intermediate bands.
  - The pre-cut, pre-drilled Vertical Bars shall be Aluminum Bars 1 1/2" x3/16", Alloy 6061-T6.
  - All necessary stainless steel hardware shall be furnished for field assembly of the Cage.
  - Cages are required on Ladders only where shown on the plans.



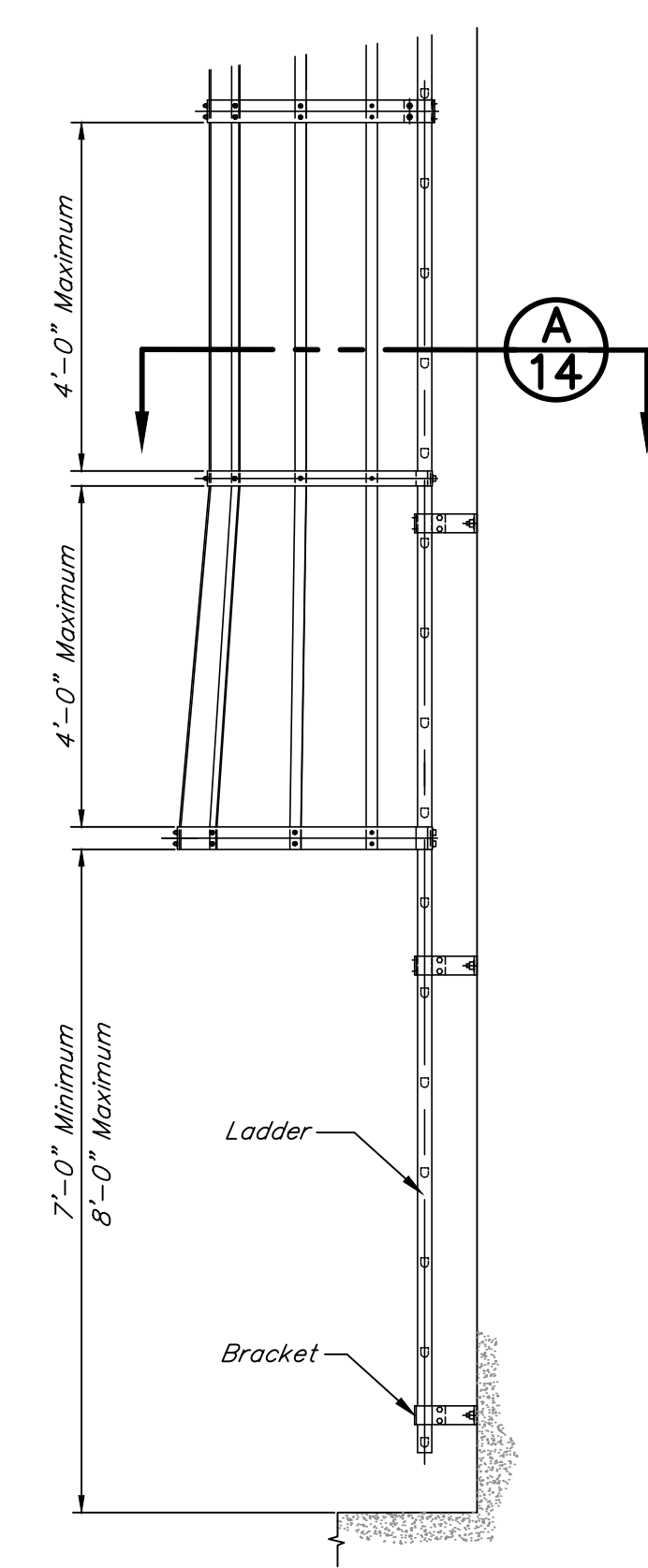
**TYPICAL LADDER DETAIL**  
N.T.S.



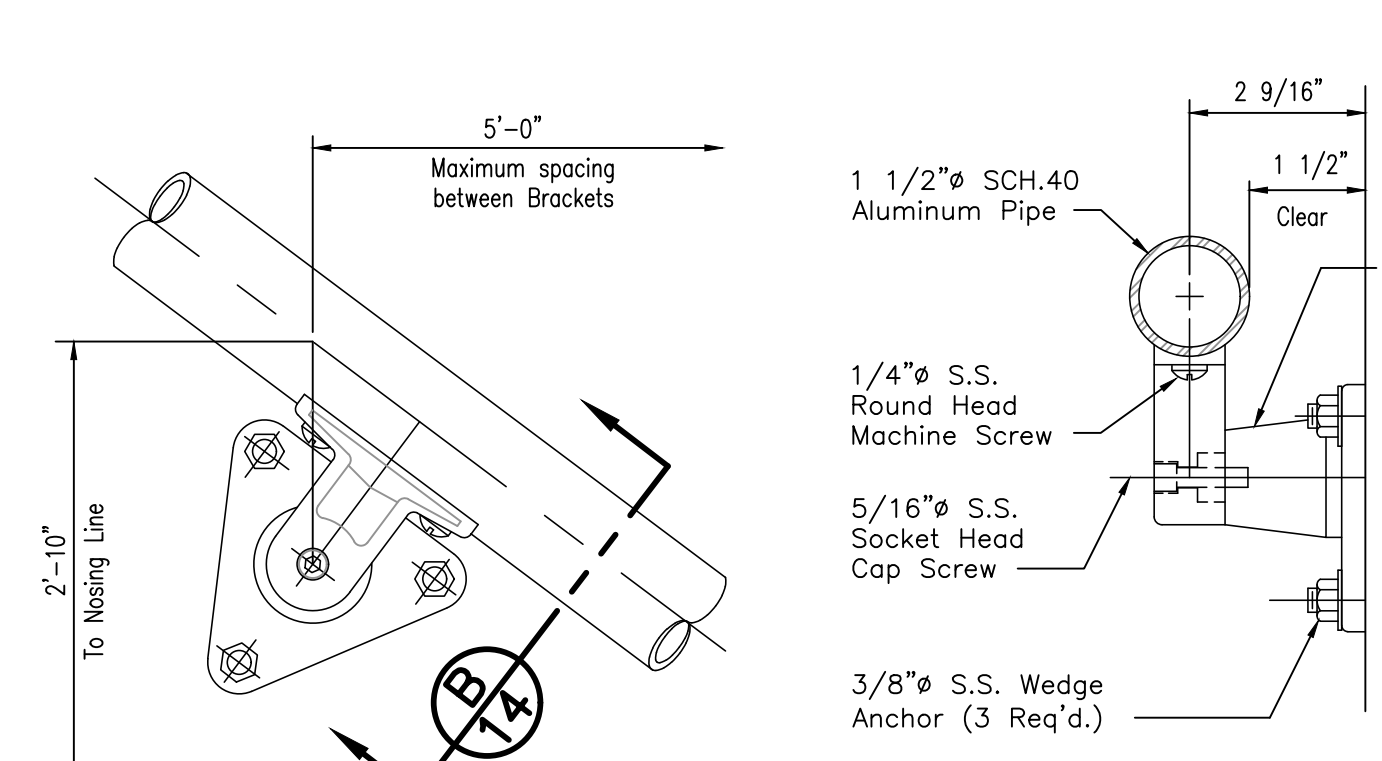
**LADDER CLIMB-OUT DEVICE**  
N.T.S.



**SECTION A**  
N.T.S.

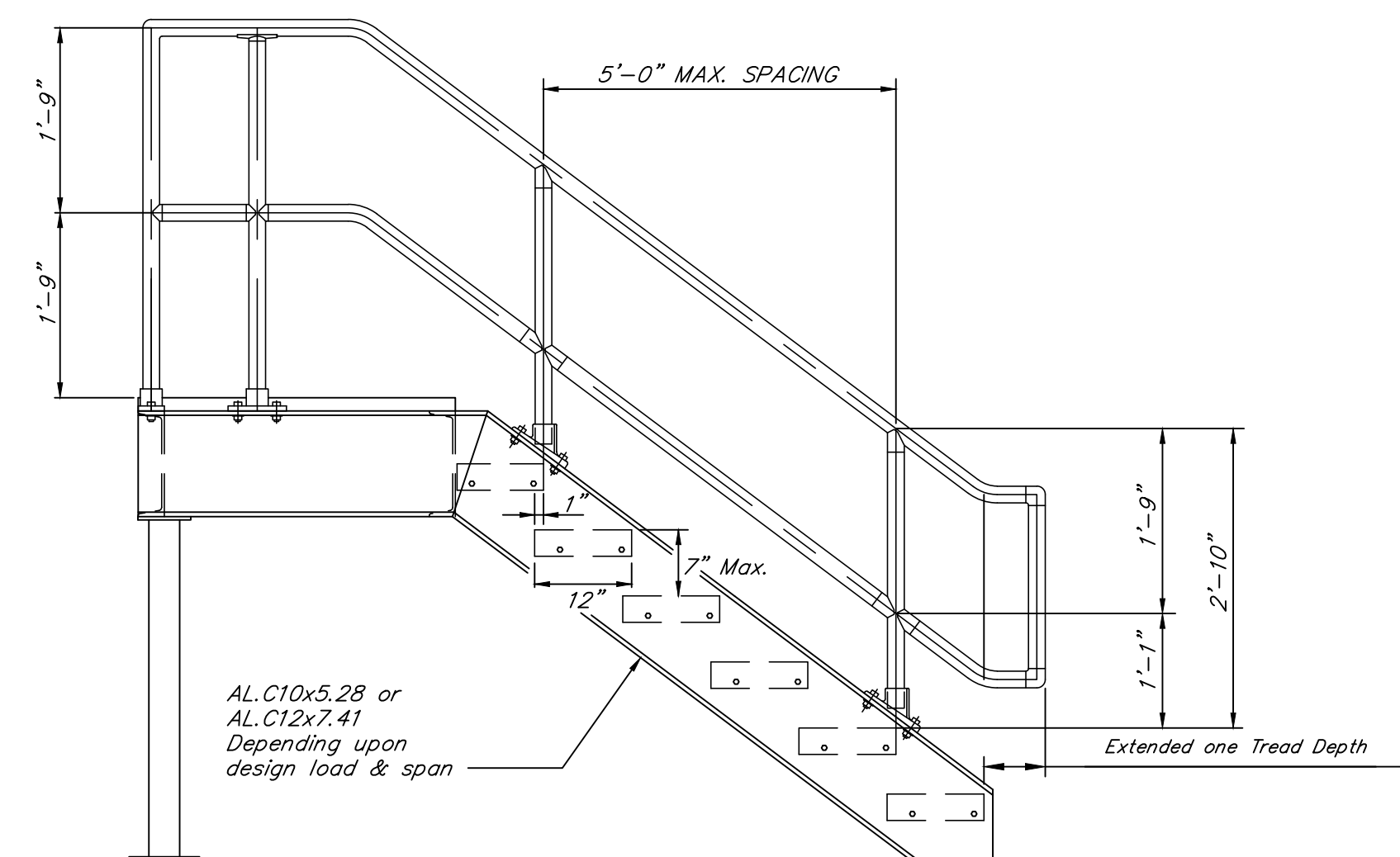


**CAGED LADDER DETAIL**  
N.T.S.

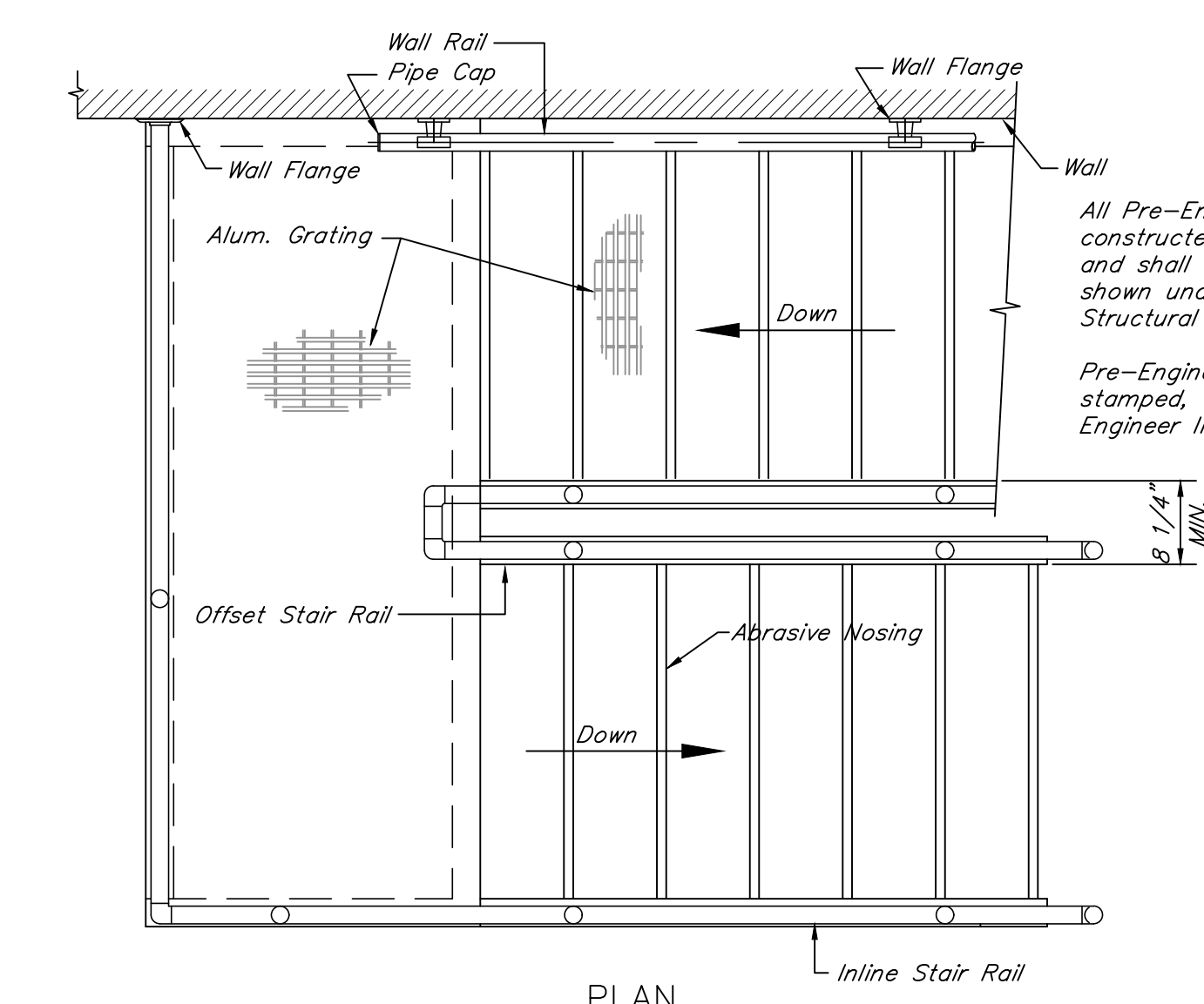


**WALL RAIL DETAIL**  
N.T.S.

**SECTION B**  
N.T.S.



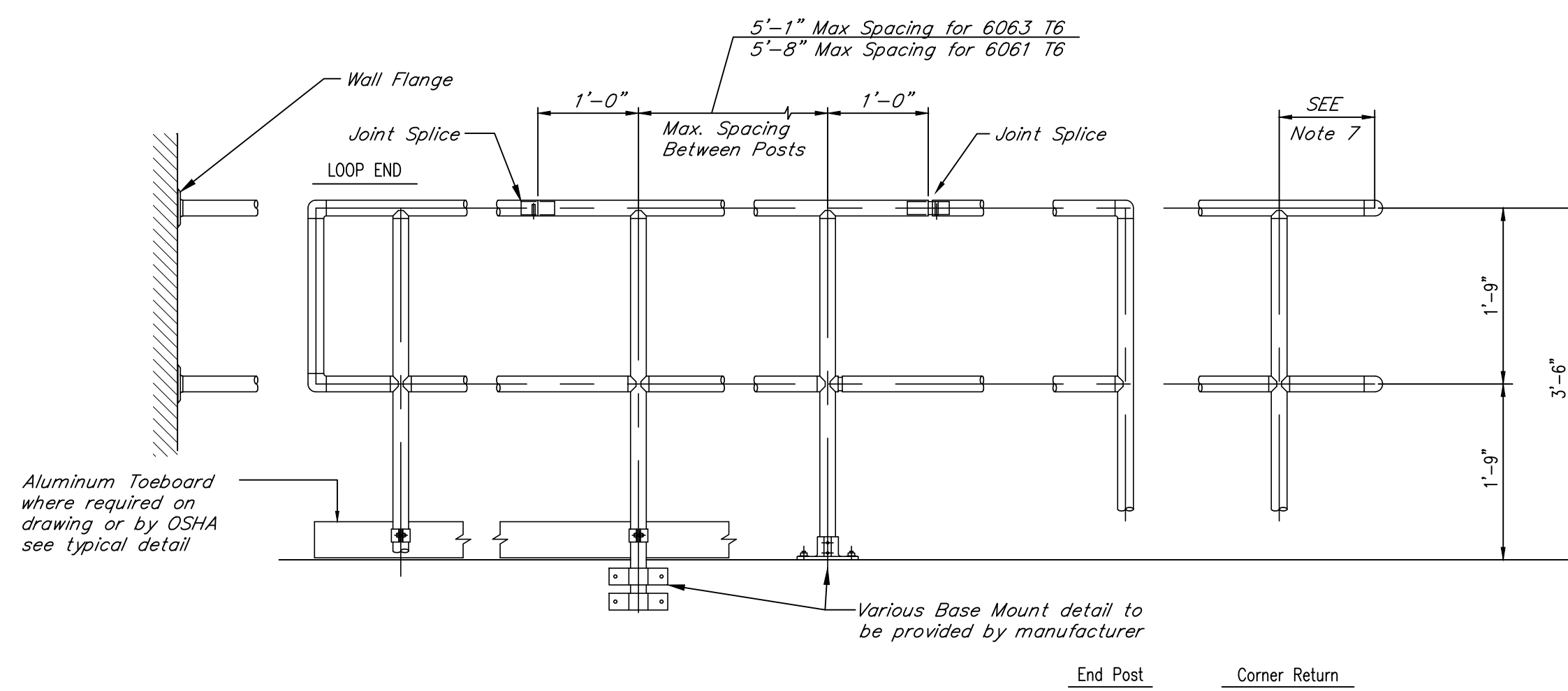
**PRE-ENGINEERED STAIR ELEVATION**  
N.T.S.



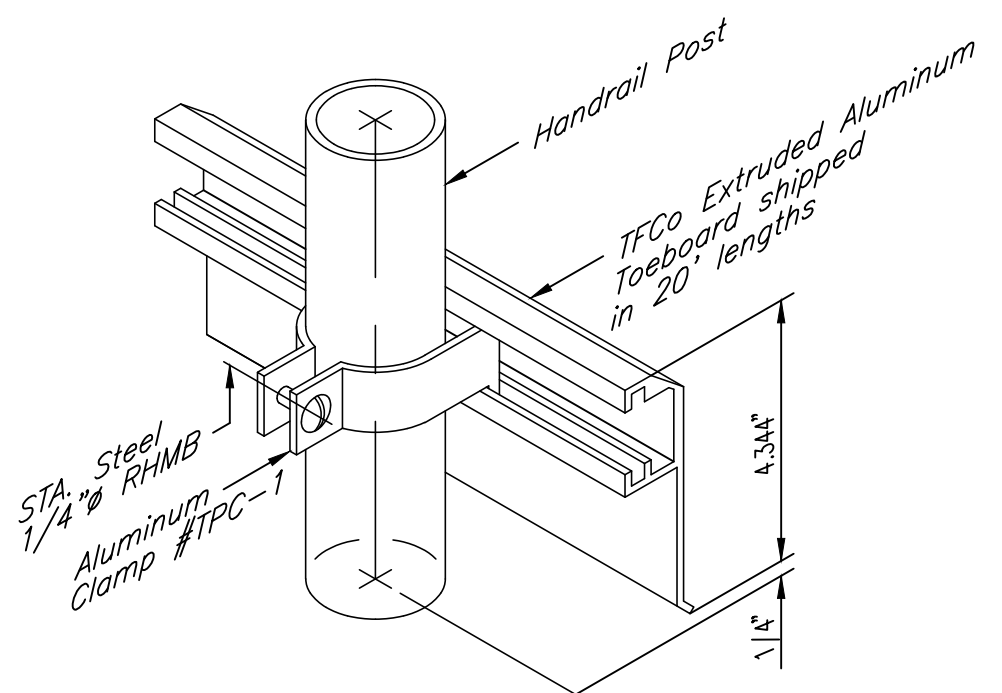
**TYPICAL PRE-ENGINEERED STAIR PLAN**  
N.T.S.

**B: OSHA HANDRAIL DESIGN SPECIFICATIONS**

- Handrail shall be the product of a company normally engaged in the manufacturing of Pipe Railing. Railing shall be shop assembled in lengths not to exceed 24 feet for field erection. All Handrails shall be in accordance with Kentucky Building Code 2002.
- Handrails shall be designed to withstand 200# concentrated load applied in any direction to the top rail.
- The manufacturer shall submit calculations to the Engineer for approval. Testing of base castings or base extrusions by an independent lab or manufacturer's lab (if manufacturer's lab meets the requirements of the Aluminum Association) will be an acceptable substitute for calculations. Calculations will be required for approval of all other design aspects.
- Post spacing shall be a maximum of 6'-0". Posts and Railings shall be a minimum of 1-1/2" Schedule 40 Aluminum Pipe Alloy 6105-T5, ASTM-B-429 or ASTM-B-221. The handrail manufacturer shall show that their Posts are of adequate strength to meet the loading requirements. If the manufacturer's Posts are not of adequate strength, the manufacturer may reduce the Post spacing or add reinforcing Dowels or may do both in order to meet the loading requirements.
- The Handrail shall be made of Pipes joined together with Component Fittings. Samples of all Components, Bases, Toe Plate and Pipe must be submitted for approval. Components that are pop-riveted or glued at the joints will not be acceptable. All Components must be mechanically fastened with stainless steel hardware. Handrail and components shall be TUF Rail, as manufactured by Thompson Fabricating Company (Birmingham, Alabama) or an approved equal.
- Posts shall not interrupt the continuation of the top Rail at any point along the Railing, including Corners and end terminations (OSHA 1910.23). The top surface of the Top Railing shall be smooth and shall not be interrupted by Projected Fittings.
- The Mid Rail at a corner return shall be able to withstand a 200# load without loosening. The manufacturer is to determine this dimension for their system. Provide physical tests from a laboratory to confirm compliance.
- Expansion Bolts shall be spaced 10d apart and 5d edge distance for no reduction in pullout strength. A safety factor of 4 shall be used on Expansion Bolt pullout values published by the manufacturer. Expansion bolts shall be stainless steel type 18-8 Wedge Bolts and shall be furnished by the Handrail manufacturer.
- Toe Plate shall conform to OSHA standards. Toe Plate shall be a minimum of 4" high and shall be an extrusion that attaches to the posts with clamps which will allow for expansion and contraction between Posts. Toe plates shall be set 1/4" above the walking surface. Toe Plates shall be provided on Handrails as required by OSHA and/or as shown on drawings. Toe Plates shall be shipped loose in stock lengths with pre-manufactured corners for field installation.
- Openings in the Railing shall be guarded by a self-closing gate (OSHA 1910.23). Safety Chains shall not be used unless specifically shown on the drawings.
- Finish shall be Aluminum Association M10-C22-A41 (215-R1). The Pipe shall be plastic wrapped. The plastic wrap is to be removed after erection.
- Aluminum surfaces in contact with Concrete, Grout or dissimilar metals will be protected with a coat of Bituminous Paint, Mylar Isolators or other approved material.



**TYPICAL HANDRAIL DETAIL**  
N.T.S.



**TOEBOARD DETAIL**  
N.T.S.

**GREEN RIVER VALLEY WATER DISTRICT**  
**WATER TREATMENT PLANT EXPANSION**  
**HART COUNTY, KENTUCKY**



DRAWN BY: JKP
CHECKED BY: RWV
DATE: MAY 2019
SCALE: As Noted
REVISIONS

**KENVIRONS, INC.**  
**FRANKFORT, KENTUCKY**



PROJECT NO.  
**2014042**  
 SHEET NO.  
**16.5**

MISCELLANEOUS DETAILS

N:\P2014042\PIANS\16.5 Misc Details Handrails.dwg, 5/23/2019 11:22:03 AM, pht, DWG To PDF.pc3





**LEGEND**

- Water Storage Tank
- ▲ Pump Station
- Master Meter

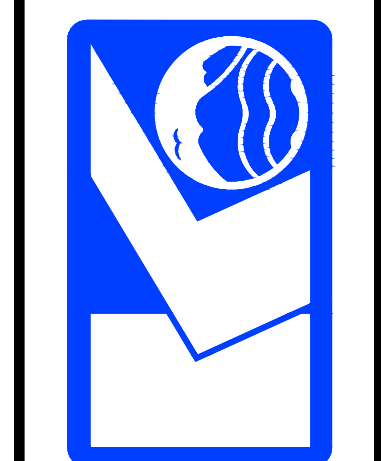
TELEMETRY SITES LOCATION MAP

**GREEN RIVER VALLEY WATER DISTRICT  
WATER TREATMENT PLANT EXPANSION  
HART COUNTY, KENTUCKY**



DRAWN BY: JKB/PTH
CHECKED BY: BLW
DATE: MAY 2019
SCALE: 1"=6,000'
REVISIONS

**KENVIRONS, INC.**  
FRANKFORT, KENTUCKY





**DESIGN CRITERIA**

Building Code ASCE 7 / 2018 Kentucky Building Code, 1st Edition  
 Each as only as applicable

County / State Hart  
 Occupancy Category III

**Floor Loads**  
 Floor live load 100 psf  
 Floor dead load actual weight of floor system plus weight of equipment

**ROOF LOADS**  
 Roof live load 20 psf  
 Roof dead load (superimposed) 15 psf  
 Roof snow load  
 Ground snow load Pg = 15 psf  
 Snow exposure factor Ce = 1.0  
 Thermal factor Ct = 1.2  
 Importance factor Is = 1.10  
 Rain on snow surcharge Pr = 0 psf  
 Flat-roof snow load Pf = 13.9 psf  
 Sloped-roof snow load Ps = 13.9 psf  
 Minimum roof snow load Pm = 16.5 psf  
 Snow drift no snow drift loadings

**WIND LOAD DATA**  
 Basic wind speed (3 second gust) 120 mph (ultimate) 90 mph (service)  
 Wind exposure category C  
 Wind importance factor lw = 1.15 (service)  
 Components and cladding wind design pressures 28 psf (service)

**EARTHQUAKE LOAD DATA**  
 Seismic site class D, E For Clearwell  
 Mapped short period spectral response acceleration Ss = 0.183  
 Mapped 1 second spectral response acceleration S1 = 0.094  
 Design short period spectral response acceleration Sds = 0.146  
 Design 1 second period spectral response acceleration Sd1 = 0.107  
 Seismic design category D  
 Seismic importance factor Ie = 1.25  
 Basic structural system Bearing Wall System  
 Seismic force resisting system Intermediate Reinforced Masonry Shear Walls for Buildings  
 Special Reinforced Concrete Shear Walls for Sanitary Structures  
 Seismic response factor R=2  
 Method of analysis Equivalent Lateral Force Procedure  
 Seismic coefficient Cs = 0.091

**MATERIAL STRENGTHS USED IN DESIGN**  
 (for reference in calculations - see specifications or notes for actual material specifications)  
 Concrete:  
 Class A (structural)(see specifications) 28 day fc = 4,500 psi  
 class b (non-struct)(see specifications) 28 day fc = 3,500 psi  
 Reinforcing bars (ASTM A615 OR A706 GRADE 60) fy = 60,000 psi  
 Welded wire fabric (ASTM A185) fu = 65,000 psi  
 Prestressing strand (ASTM A416 GRADE 270 LO LAX) fu = 270,000 psi  
 Deformed bar anchors (ASTM A496) fy = 80,000 psi  
 Structural steel sections W AND WT (ASTM A992) fy = 50,000 psi  
 Structural steel sections C, L, M, S, HP, MT and ST (ASTM A36) fy = 36,000 psi  
 Structural steel plates bars, and rods u.n.o. (ASTM A36) fy = 36,000 psi  
 Structural steel sections HSS (ASTM A500 GRADE B) fy = 46,000 psi  
 Structural steel pipe (ASTM A53 GRADE B) fy = 35,000 psi  
 Structural bolts (ASTM A325) fu = 120,000 psi  
 Concrete masonry (VARIOUS) fm = 1,500 psi  
 Soil allowable bearing pressure for foundations qa = 2,000 psf  
 Rock allowable bearing pressure qa = 10,000 psf

**GENERAL**  
 1. The requirements of these general notes apply unless otherwise noted on plans or in specifications.  
 2. All dimensions of existing conditions shall be verified prior to commencing work. Discrepancies between existing conditions or between the drawings and specifications shall be communicated to the structural engineer and architect.  
 3. This structure is designed to be stable and self-supporting only when fully completed. Stability of the structure during construction is the responsibility of the contractor. All necessary temporary bracing required to stabilize and support the structure during all construction phases shall be furnished and installed by the contractor. If required, temporary bracing shall be designed by a licensed engineer employed by the contractor.  
 4. Construction loads imposed on the structural framing shall not exceed the design capacity of the framing at the time such loads are imposed.  
 5. Non-structural elements of the building (architectural finishes, masonry veneer and associated ties, insulation, sheathing, ductwork, piping, etc.) are generally not shown on these structural drawings. Certain non-structural elements that are shown on the structural drawings are shown for reference only. Non-structural elements shall be constructed as shown on the architectural and trade drawings.  
 6. Any material ordered or work performed prior to the engineer's review and approval of the shop drawings is at the contractor's sole risk.

**FOUNDATIONS**

- The foundations have been designed based on the recommendations in the geotechnical report, Number 218-357 by American Engineers, Inc. of Glasgow, KY dated October 30, 2018.
- Foundation design is based on an allowable bearing capacity of 2,000 psf for native soil (undercut as may be required) and controlled fill and 10,000 psf for bedrock.
- A qualified testing company shall be engaged by the contractor to verify bearing capacities prior to installing foundations.
- All footings shall be supported on undisturbed soil, engineered fill or competent bedrock where indicated.
- Fill shall be compacted to 98% of optimum laboratory density in accordance with ASTM D 698 Standard Proctor Method in maximum 8" lifts unless noted otherwise in the geotechnical report.
- All piers and spread footings are centered on column centerlines and all wall footings are centered under walls unless indicated otherwise.
- Location of existing foundations, if any are shown on drawings, are approximate. exact condition shall be verified at time of construction.
- The structural engineer shall be notified if soft, loose or lower bearing capacity soils or rock are encountered.
- Existing underground utilities in areas of foundation construction shall be located prior to construction of foundations. appropriate measures shall be taken to avoid damage to existing utilities and to ensure adequate foundation bearing around utilities.
- Foundations shall not be placed on mud or muck, soft or loose soil, in standing water or on frozen ground.
- All non-cantilever walls shall be adequately braced prior to backfill.
- Cantilever retaining walls shall not be backfilled until the concrete has developed 100% of the required 28-day compressive strength for the class of concrete specified.

**CAST-IN-PLACE CONCRETE**

- All concrete construction shall be performed in accordance with aci 301-10, aci 318-11, ACI 117-10, ACI 308.1-11, and ACI SP-66, the ACI Detailing Manual-2004. Hot and cold weather concrete construction shall be performed in accordance with ACI 305 and ACI 306 as required. Shoring and reshoring of concrete structures shall be performed in accordance with ACI 347. Structural design and removal of concrete formwork, shores and reshores shall be the responsibility of the contractor.
- Shop drawings showing the size, length, quantity, location and mark of all reinforcing bars, supports and accessories shall be submitted for approval prior to fabrication.
- Mix designs and admixture product data shall be submitted for approval prior to ordering concrete.
- Concrete properties shall be in accordance with the specifications.
- Reinforcement and accessory properties shall be in accordance with the specifications.
- Reinforcement compression splices shall be lapped 30 bar diameters of the larger bar.
- Reinforcement tension splices shall be lapped in accordance with the following table:

bar size	3,000 psi conc. lap length	>=4,000 psi conc. lap length
#3	17"	15"
#4	23"	20"
#5	28"	24"
#6	34"	29"
#7	49"	43"
#8	56"	49"
#9	69"	60"

- add 30% for horizontal top bars with more than 12" of concrete below.  
 add 50% for bar spacing less than two bar diameters.  
 lap length adds are cumulative.
- Concrete protection for reinforcement shall be in accordance with the following table:  

condition	clear cover over bars
concrete cast against and permanently exposed to earth	3"
concrete exposed to earth or weather	
#6 through #18 bars	2"
#5 bar, W31 or D31 wire and smaller	1 1/2"
concrete not exposed to weather or in contact with ground slabs, walls, and joists	
#14 and #18 bars	1 1/2"
#11 bar and smaller	3/4"

- The typical details on these drawings contain additional general concrete construction notes and information.
- All concrete shall be reinforced unless noted otherwise.
- supports to adequately position reinforcing bars during construction shall be installed.
- Foundation dowels of the same size and spacing as vertical steel shall be installed for all walls, piers, and columns.
- All reinforcing at wall and footing corners and intersections shall be continuous by the use of bent bars or corner bars unless indicated otherwise.
- Construction joints shall be positioned so as not to adversely affect the structural performance. Construction joint locations not indicated on the structural drawings shall be approved by the structural engineer.
- Pipe sleeves and inserts shall be installed in concrete work at all penetrations. penetrations of beams, joists, columns or structural slabs not indicated on the structural drawings shall be approved by the structural engineer.
- Only weldable reinforcing bars may be welded.
- Admixtures containing chloride or other corrosive chemicals shall not be used in concrete.
- Aggregates shall be free of deleterious or non-durable materials such as cherts.
- reinforcing shall be adequately tied and supported to hold it in the correct position during construction.
- Concrete shall be consolidated adequately during placement by mechanical vibration in accordance with published practices.
- Unshored slab construction shall be finished level and have the minimum required thickness of concrete at the thinnest section. Beam camber shall be verified prior to placing unshored concrete slabs.
- Plastic chairs shall be used in all concrete that will be exposed to view in the completed structure.
- Exposed concrete corners shall be chamfered minimum 3/4".
- Fill pockets around connections with concrete flush and smooth unless indicated otherwise.
- Concrete finishes shall be in accordance with the specifications.
- Concrete slab-on-grade flatness and levelness shall be in accordance with the specifications.

**PRECAST CONCRETE**

- All precast concrete design and construction shall be performed in accordance with PCI MNL-120, "PCI Design Handbook", ACI 318-05 and PCI MNL-116.
- Design of all precast concrete components is hereby delegated. The design of all precast components shall be performed under the direct supervision of a professional engineer licensed in the state in which the project is located and qualified and experienced in the design of precast concrete components and structures.
- The design of all precast components shall be according to the criteria stated in these plans and specifications at a minimum. Exceptions to these criteria shall be submitted by the precast engineer to the structural engineer of record for approval.
- Erection drawings and structural calculations shall be submitted for approval prior to fabrication. Erection drawings shall conform to the requirements of the specifications.
- The precast concrete components of this structure interact with the rest of the structural elements to form a complete structure. All loads delivered to the precast components from other structural components shall be considered in their design.
- Supports to adequately position reinforcing bars strand and wire mesh during manufacture shall be properly installed.
- Plastic chairs shall be used in all precast concrete that will be exposed to view in the completed structure.
- Pipe sleeves and inserts shall be installed in precast concrete work where required.
- Precast components shall be supported at locations designated on the erection drawings during all phases of erection including shipping, storage and tilting and lifting.
- Precast components shall be clearly marked so they can be accurately erected using the erection drawings.
- The location of field-installed anchors shall be verified prior to erection so that adjustments can be made before the precast components are being set.
- The precast manufacturer and erector shall each be certified by pci for the types of components and structures being produced and erected.

**CONCRETE MASONRY**

- Concrete masonry walls shown on the structural drawings are structural walls. concrete masonry walls not shown on the structural drawings are partitions. Refer to architectural drawings for details of partitions unless indicated otherwise on the structural drawings.
- Concrete masonry walls shown on structural drawings shall be constructed in accordance with ACI 530.1 "Specifications for Masonry Structures".
- Installation drawings, product data and material certifications shall be submitted for approval. The submittals shall conform to the specifications.
- Concrete masonry materials shall conform to the requirements of the specifications.
- Minimum compressive strength of concrete masonry (fm) shall be 1,500 psi determined in accordance with the specifications.
- Mortar cement shall be portland-lime cement. Masonry cement shall not be used.
- The typical details on the drawings contain additional general masonry notes and details.
- Bearing walls shall be anchored at intersections with galvanized steel straps 1 1/2" x 1/4" x 24" with 2" bend at 90 degrees each end. Install straps into grouted cores of c.m.u. at 24" maximum vertical spacing. do not install anchors at control joints or where non-bearing partitions abut bearing walls.
- Corners of load bearing concrete masonry walls shall be laid in running bond.
- Provide solid grouted concrete masonry around bearing ends of all beams and joists.
- No openings for trades shall occur in concrete masonry walls within 16 inches of beam bearing centerlines.
- Pipe sleeves and inserts shall be installed in concrete work at all penetrations.
- Embedded item locations shall be coordinated with the approved shop drawings of the trades.
- Only weldable reinforcing bars may be welded.
- Concrete masonry is supposed to absorb water from mortar and grout. do not place or grout wet concrete masonry units.
- Webs of masonry units for piers, columns, pilasters, and the starter course shall be mortared. webs of masonry units shall also be mortared where required to confine grout.
- Cells of masonry in piers, columns, pilasters and where otherwise indicated shall align. this may require the use of block styles other than stretchers (e.g. square-end block).
- Spaces to be filled with grout shall be kept clean and free from protrusions of masonry or mortar.
- All cells of below-grade concrete masonry units shall be grouted .
- The maximum grout pour height for each specific type and size of concrete masonry unit shall not exceed the limits specified in ACI 530.1.
- Masonry grouting shall conform to the specifications.
- Vertical control joints are indicated on the civil or architectural drawings.
- Vertical control joints shall be installed between all non-loadbearing partitions and bearing walls.
- Spacing of control joints shall not exceed 24 feet unless noted otherwise.
- Splice lap lengths for reinforcing shall be in accordance with the following table:  

bar size	lap length
#3	18"
#4	25"
#5	31"
#6	57"
- Do not embed any non-structural items in structural masonry without written permission from the structural engineer.

**ALUMINUM BAR GRATING**

- Manufacture, detailing, fabrication, and erection of aluminum bar grating shall conform to NAAM MBG 531 "Bar Grating Manual".
- Shop drawings shall be submitted for approval prior to fabrication of aluminum bar grating.
  - Shop drawings shall contain erection drawings and detail drawings.
  - Erection drawing shall show the layout and piecemark of all aluminum bar grating pieces and all connections of between them and the support structure. shop-made and field-made connections shall be indicated on the erection drawings.
  - Detail drawings shall show the dimensions of each piece including the dimensions of all holes, slots, copes, cuts etc.
  - Where pieces are shipped as assemblies, the assemblies shall be detailed showing connections between the individual pieces.
  - Detail drawings shall show the type and extent of prime painting for each piece and/or assembly.
- Aluminum bar grating materials shall conform to the following specifications:  

member type	specification
bearing bars	ASTM B 221 alloy 6061-T6
cross bars	ASTM B 221 alloy 6061-T1
saddle clips	Grating Fasteners, LLC type F-10, 304 stainless or equal
self drilling screws	SAE J78
- The typical details on the drawings contain additional general aluminum grating construction notes and details.
- All edges of aluminum bar grating shall be banded with an equivalent depth bearing bar.
- Aluminum bar grating pieces shall be fabricated in shop to the fullest extent possible.
- Aluminum bar grating pieces shall be fabricated to fit together precisely with hairline joints.
- Burs shall be removed and sharp edges shall be eased to a radius.
- Connections that maintain the structural capacity of the joined pieces shall be used.
- Aluminum bar grating pieces shall be clearly marked so they can be accurately erected using the erection drawings.
- Welding materials and methods shall be used that minimize distortion and develop the strength and corrosion resistance of the base metal.
- Welds shall have a quality appearance without excessive overlap or undercut and the welding flux removed.
- Dimensions of existing structure where aluminum bar grating interfaces shall be verified in the field prior to fabrication.
- All shop and field welding shall be done by a certified welder using qualified welding procedures according to the appropriate aws code.
- Aluminum bar grating shall have a mill finish.

**STRUCTURAL STEEL**

- Detailing, fabrication, and erection of structural steel shall conform to the AISC "Specification for Structural Steel", (ANSI/AISC 360-10), AISC "Code of Standard Practice for Structural Steel Buildings and Bridges", AISC / RCSC "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" and AWS D1.1 "Structural Welding Code."
- Shop drawings shall be submitted for approval prior to fabrication of structural steel. Shop drawings shall conform to requirements in the specifications.
- Structural steel members shall conform to the following specifications:

member type	specification
wide flange	ASTM A 992
standard beam	ASTM A 36
channel	ASTM A 36
angle	ASTM A 36
plate	ASTM A 36
bar and rod	ASTM A 36
rectangular, square & round tube (hss)	ASTM A 500 Gr B
pipe	ASTM A 53 Gr B
threaded rod	ASTM A 36
anchor rod	ASTM F 1554 Gr 36
common bolts	ASTM A 307 Gr A
high strength bolts (twist off)	ASTM F 1582
high strength bolts (snug tight)	ASTM A 325
direct tension indicating washers	ASTM F 959
hardened washers	ASTM F 436
nuts	ASTM A 563
shear connectors (studs)	ASTM A 108
welding electrode	AWS D1.1 E70XX (except as otherwise req'd)

- Grout shall conform to requirements in the specifications.
- The typical details on the drawings contain additional general steel construction notes and details.
- High-strength bolted connections shall be fully pretensioned unless noted as snug tight on the drawings.
- Hardened washers shall be installed under all nuts for fully pretensioned bolts.
- Hardened washers shall be installed over all oversized holes, standard slots and short slotted holes. plate washers 3/16" thick shall be welded over large holes and long slots.
- Bolted joints where relative movement is allowed shall have jam nuts to prevent unthreading.
- Structural steel surface preparation and finishes shall conform to the requirements in the specifications.

**GREEN RIVER VALLEY WATER DISTRICT**  
**WATER TREATMENT PLANT EXPANSION**  
**HART COUNTY, KENTUCKY**



DRAWN BY: AN/AMC	
CHECKED BY: AWC	
DATE: MAY 2019	
SCALE: AS NOTED	
REVISIONS	

**KENVIRONS, INC.**  
**FRANKFORT, KENTUCKY**

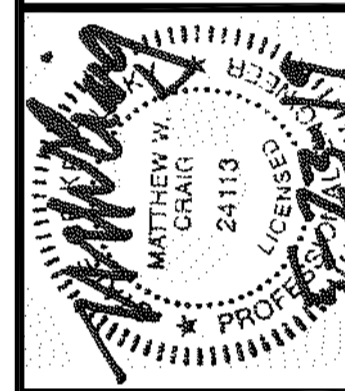


PROJECT NO.  
2014042

SHEET NO.  
SO.1

**SDG**  
 SDG LLC  
 306 W Main St Ste 410  
 Frankfort, KY 40601  
 (502) 351-9169





DRAWN BY: AN/AMC
CHECKED BY: AWC
DATE: MAY 2019
SCALE: AS NOTED
REVISIONS



**SPECIAL INSPECTION**

1. Special inspection is required according to section 1704 of the building code.
2. Special inspection on this project applies only to the following construction:
  - 2.1. The superstructure (c.m.u. and up) of the filter building addition,
  - 2.2. The chemical feed building addition.

All other structures shall be inspected according to these notes, but those inspections are not considered "Special Inspections" as required by the building code because these structures are not primarily for human occupancy and are not in the scope of the building code. The inspector shall keep special inspections and non-"Special" inspections reports and tests separate and identifiable for record keeping purposes.
3. Special inspections shall be performed for the following work as required in the building code:
  - 3.1. Contractor's statement of responsibility in accordance with section 1704.4
    - 3.1.1. Contractor shall submit a statement that:
      - 3.1.1.1. acknowledges the requirements stated in this statement of special inspections.
      - 3.1.1.2. acknowledges that control will be exercised over the quality of construction to conform to the approved construction documents.
      - 3.1.1.3. acknowledges that there are organizational procedures in place for exercising control of quality of the construction including:
        - 3.1.1.3.1. appointment of a person within the contractor's organization to exercise control quality of construction
        - 3.1.1.3.2. the persons within the contractor's organization to whom the quality control reports are distributed
        - 3.1.1.3.3. the method and frequency of reporting the quality control results within the contractor's organization.
    - 3.2. Fabricators in accordance with section 1704.2
      - 3.2.1. Submit report of inspector's approval of fabricator's qc plan or fabricator's nationally recognized qc certification.
      - 3.2.2. Submit fabricator's certificate of compliance stating that the work was performed in accordance with the approved construction documents submitted at the completion of such work.
    - 3.3. Steel construction in accordance with section 1705.2
      - 3.3.1. Submit mill test reports and material certifications for all steel members, fasteners, bolts, nuts, washers, deck, and reinforcement steel for concrete and masonry.
      - 3.3.2. Submit report of inspection of marking and connection details for all members and connections. verify all steel members and steel deck are installed in the correct locations and are connected in accordance with the construction documents and approved erection drawings.
      - 3.3.3. Submit report of inspection of bolt tensioning for each applicable connection.
      - 3.3.4. Submit report of visual inspection of all field welds.
    - 3.4. Concrete construction in accordance with section 1705.3
      - 3.4.1. Submit material certifications of cement, aggregate, admixtures and reinforcement.
      - 3.4.2. Submit report of compressive strength, slump and air content test results. sample and test concrete at least once per day and once for every additional 100 cubic yards of concrete per day thereafter.
      - 3.4.3. Submit report of inspection of forms, reinforcement, and concrete delivery tickets prior to each placement of concrete.
      - 3.5.4. Submit report of inspection of installation of all wedge and chemical adhesive anchors in concrete.
    - 3.4. Masonry construction in accordance with section 1705.4
      - 3.4.1. Submit material certifications of cement, aggregate, admixtures and reinforcement.
      - 3.4.2. Submit report of test of mortar aggregate ratio and air content and observation of mortar proportioning. test once at beginning of project and once every 5,000 s.f. of wall thereafter.
      - 3.4.3. Submit report of placement of masonry, reinforcement and grout prior to and during each placement of grout.
      - 3.4.4. Submit report of installation of chemical adhesive anchorage in concrete at base of masonry walls. inspect installation of 10% of anchorage installations.
    - 3.5. Soils construction in accordance with section 1705.6
      - 3.5.1. Submit report that soil bearing capacity is adequate according to the geotechnical report prior to each placement of foundation concrete.
      - 3.5.2. Submit report of density and moisture content of controlled fill for each lift under building structure.
    - 3.6. Cast-in-place deep foundations in accordance with section 1705.8
      - 3.6.1. Submit report of continuous observation of all drilling operations including complete and accurate records for each drilled shaft.
      - 3.6.2. Submit report indicating the location, plumbness, diameter, length, concrete volume, embedment into bedrock, and adequate end-bearing strata capacity of each pier.
      - 3.6.3. For concrete, perform tests & inspections as required by the concrete special inspection requirements.
  4. The type and extent of each test and inspection required for each type of work shall be as indicated in the specifications and/or the building code and the references incorporated therein.
  5. Inspection reports shall include the:
    - 5.1. name, address, and telephone number of special inspector performing the inspection and making the report.
    - 5.2. dates and locations of samples and tests or inspections, date of report.
    - 5.3. record of temperature and weather conditions at time of sample taking and testing and inspecting.
    - 5.4. description of the work, identification of products, specification section, tests, and inspection methods.
    - 5.5. photographs of the work inspected for that report
    - 5.6. complete test or inspection data.
  6. Special inspection shall be performed by a qualified inspection agency approved by the building official and the structural engineer.
  7. Work requiring special inspection shall be inspected by the special inspector for conformance with the approved drawings and specifications. Inspection reports indicating the results of special inspections shall be promptly submitted to the contractor, the civil engineer, the structural engineer.
  8. The special inspector shall observe activities, actions, and procedures performed before and during execution of the work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.
  9. All special inspections indicating non-conforming work shall be reported immediately to the contractor, the civil engineer and the structural engineer. Impending construction work that would impede economical correction of non-conforming work shall not proceed without written approval. The contractor shall maintain a discrepancy log on the site. log shall list each discrepancy documented by the special inspector, state the date of discovery and special inspector's report number, and room for the special inspector to sign and date when said discrepancy is corrected. Cost of additional retesting that are required due to non-conforming work may be charged to the contractor.
  10. A final report certifying completion of all required special inspections and correction of any non-conforming work noted in the inspections shall be submitted by the special inspector at the completion of the project, or if not, detailing non-inspected and/or unresolved non-conformances.
  11. The contractor shall notify the inspector when construction is ready to be inspected. contractor shall give timely and adequate notice to the special inspector.
  12. The contractor shall provide the special inspector access to plans, shop drawings, and change orders at the jobsite.
  13. The contractor shall retain at the jobsite all special inspection records submitted by the special inspector and provide these records for review by the engineer and building inspector upon request.

**EXPANSION ANCHORS**

1. Expansion anchors shall be one of the following products:
  - Kwik Bolt TZ by HILTI
  - Trubolt+ by ITW Red Head
  - Strong-bolt by Simpson Strong-tie
2. All expansion anchors for the project shall be produced by the same manufacturer unless approved by the structural engineer.
3. Expansion anchor product data and a keyed plan showing the location, diameter, length, material and finish of each expansion anchor shall be submitted for approval.
4. The expansion anchor manufacturer's installation instructions shall be strictly followed, particularly with regard to drilling and cleaning out the hole.
5. If any of the following minimum distances are not indicated or available then verify the detail and field conditions with the structural engineer prior to installing:
 

anchor dia	c to c distance	edge distance	embed distance	mat'l thickness
1/2"	3 1/2"	4"	3 1/2"	5 1/2"
5/8"	4"	5"	4"	6"
3/4"	6"	6"	5"	8"
6. If any of the following conditions are indicated or present then verify acceptability of expansion anchor type, material or finish with the structural engineer prior to installing:
  - cracked concrete or masonry near installation (see edge distance above)
  - corrosive, chemical or abnormal temperature environment
  - vibratory or fatigue loading of anchor
  - impact or shock loading of anchor
  - continuous tension (e.g. hanging loads from ceilings)

**CHEMICAL ADHESIVE AND PROPRIETARY ADHESIVE ANCHORS**

1. Chemical adhesives and proprietary adhesive anchors shall be produced by one of the following manufacturers:
  - HILTI, Inc.
  - ITW Red Head
  - Simpson Strong-tie
2. All chemical adhesives and proprietary adhesive anchors for the project shall be produced by the same manufacturer unless approved by the structural engineer.
3. Proprietary adhesive anchors shall be fastened with compatible chemical adhesive from the same manufacturer.
4. Chemical adhesive and proprietary adhesive anchor product data and a keyed plan showing the location, type of chemical adhesive and installation conditions of each adhesive anchor shall be submitted for approval. installation conditions are:
  - dry, damp or wet hole
  - cored hole or hammer drilled hole
  - standard (per manufacturer) or oversize hole
  - horizontal, vertical or overhead surface
  - temperature range of installation.
5. The chemical adhesive and proprietary adhesive anchor manufacturer's installation instructions shall be strictly followed, particularly with regard to drilling and cleaning out the hole and the installation conditions.
6. If any of the following minimum distances are not indicated or available then verify the detail and field conditions with the structural engineer prior to installing:
 

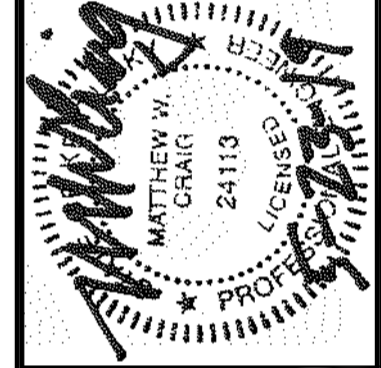
anchor dia	c to c distance	edge distance	embed distance	mat'l thickness
1/2"	3 1/2"	4"	3 1/2"	5 1/2"
5/8"	4"	5"	4"	6"
3/4"	6"	6"	5"	8"
7. If any of the following conditions are indicated or present then verify acceptability of chemical adhesive or proprietary adhesive anchor type, material or finish with the structural engineer prior to installing:
  - corrosive, chemical or abnormal temperature environment
  - vibratory or fatigue loading of anchor
  - impact or shock loading of anchor
  - continuous tension (e.g. hanging loads from ceilings).

**MATERIAL PATTERN LEGEND**

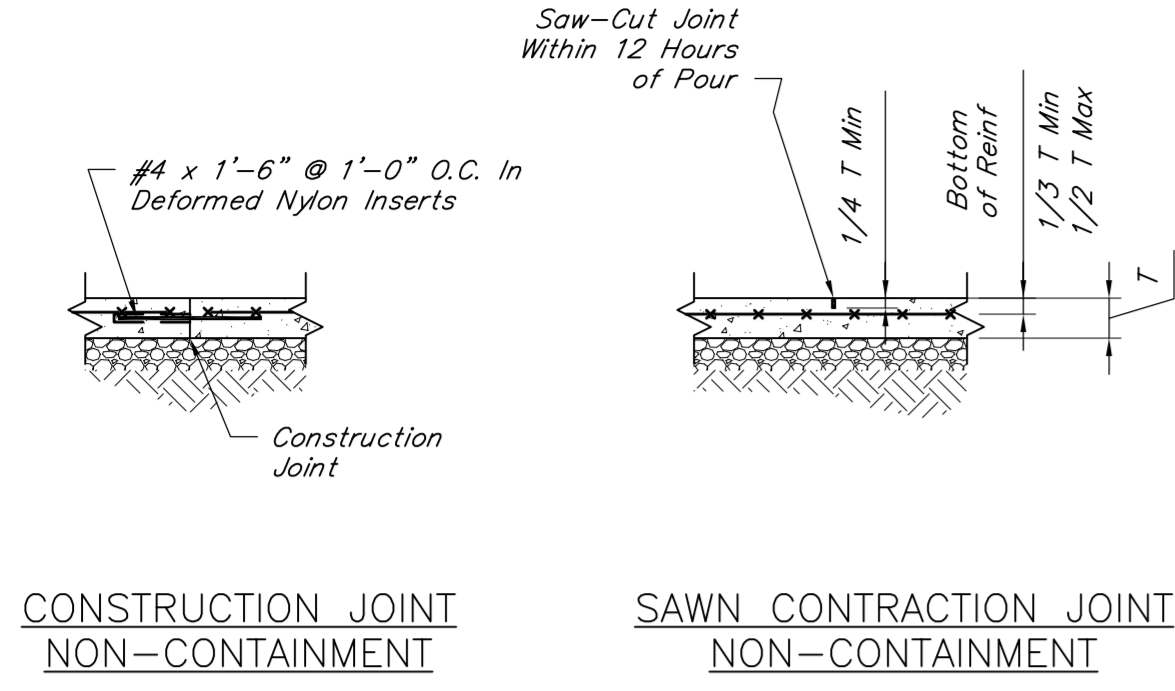
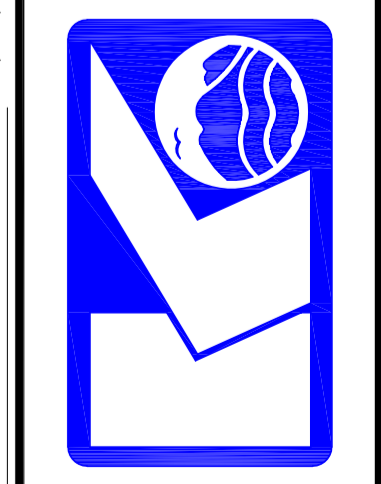
	COMPETENT ROCK		CONCRETE
	UNDISTURBED SOIL ENGINEERED FILL		LEAN CONCRETE FLOWABLE FILL GROUT
	CRUSHED STONE DENSE GRADED AGGREGATE		

SDG  
SDG LLC  
306 W Main St Ste 410  
Frankfort, KY 40601  
(859) 351-9169

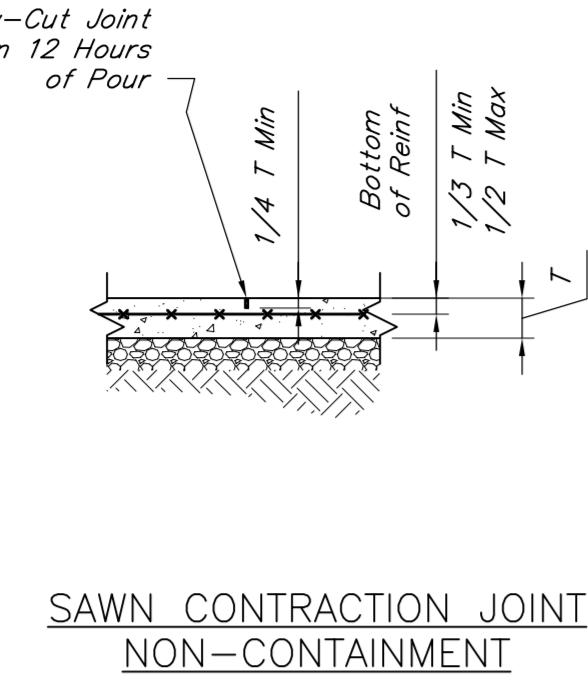




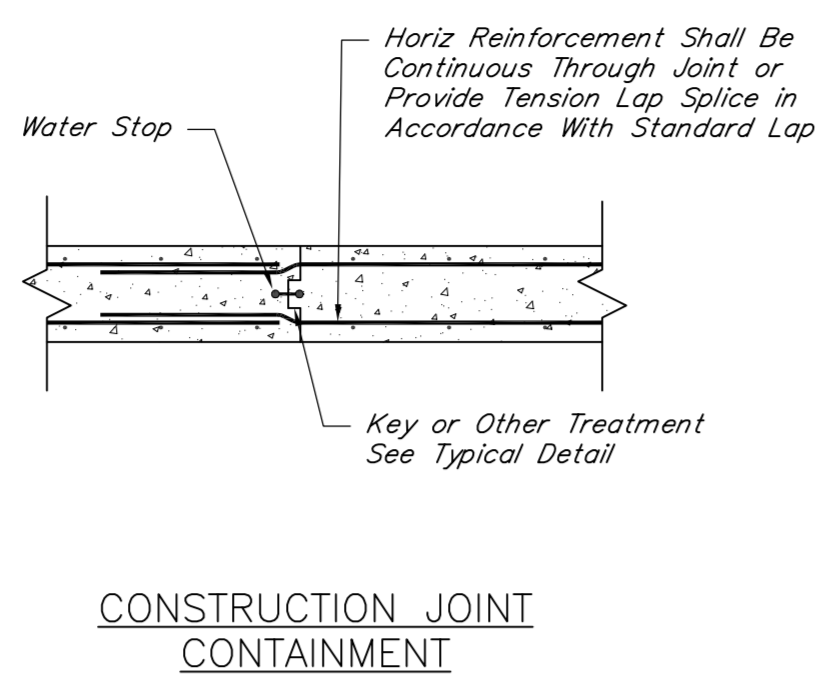
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CHECKED BY: AWC
DATE: MAY 2019
SCALE: AS NOTED
REVISIONS



CONSTRUCTION JOINT  
NON-CONTAINMENT

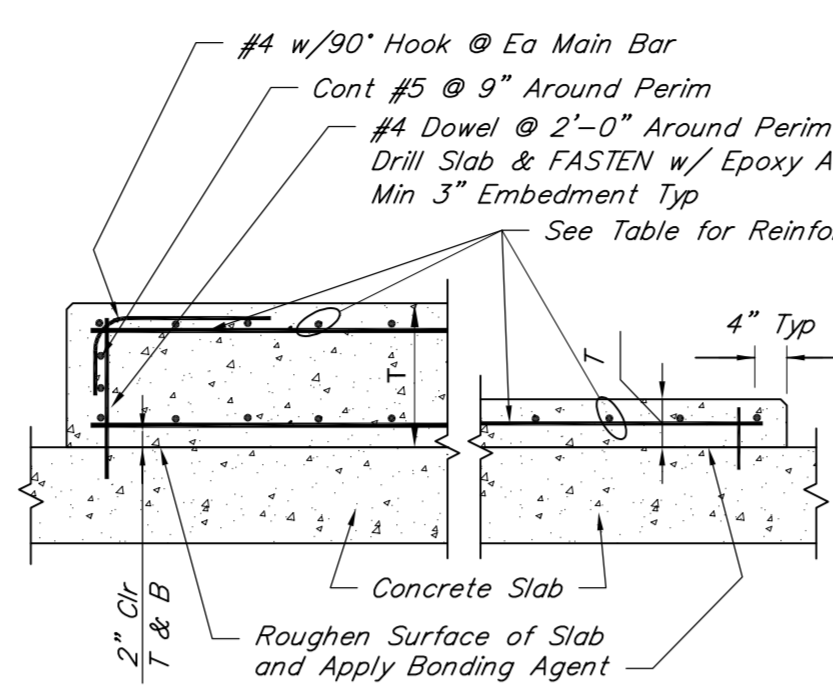


SAWN CONTRACTION JOINT  
NON-CONTAINMENT



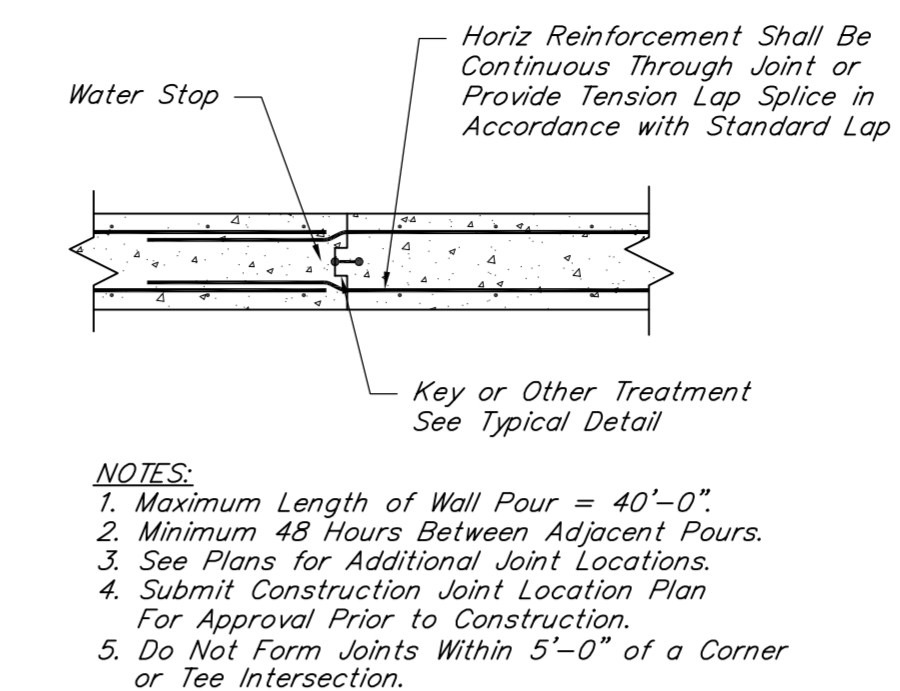
CONSTRUCTION JOINT  
CONTAINMENT

TYPICAL SLAB ON GRADE JOINTS  
Not to Scale

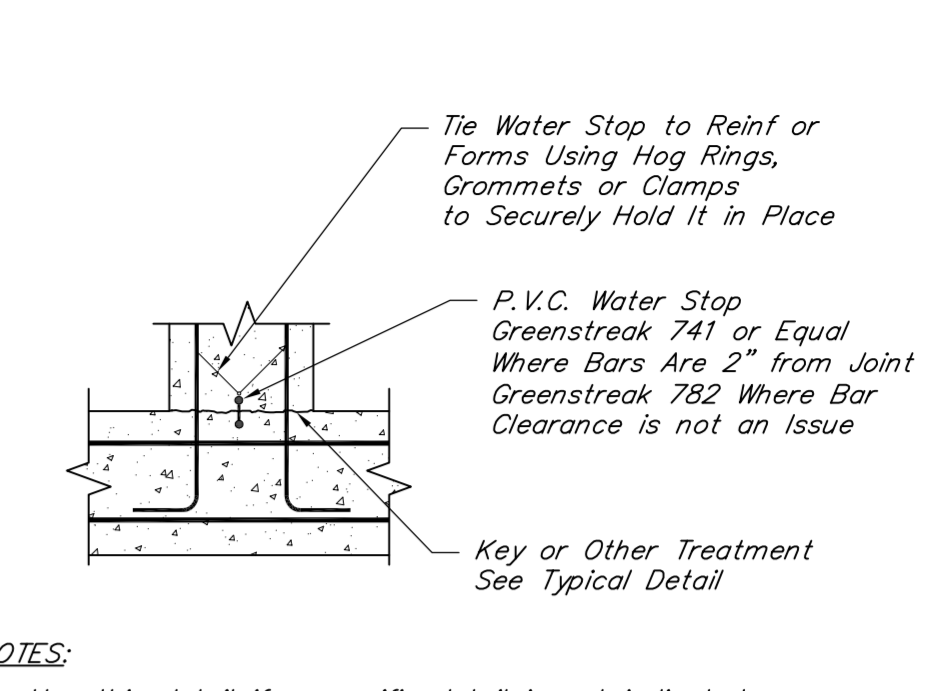


THICKNESS	REINFORCEMENT
T ≤ 4"	#3@12" Cntrd
4" < T ≤ 6"	#4@16" Cntrd
6" < T ≤ 9"	#5@18" Cntrd
9" < T ≤ 12"	#4@16" T & B
12" < T ≤ 18"	#5@18" T & B
T > 18"	#5@12" T & B

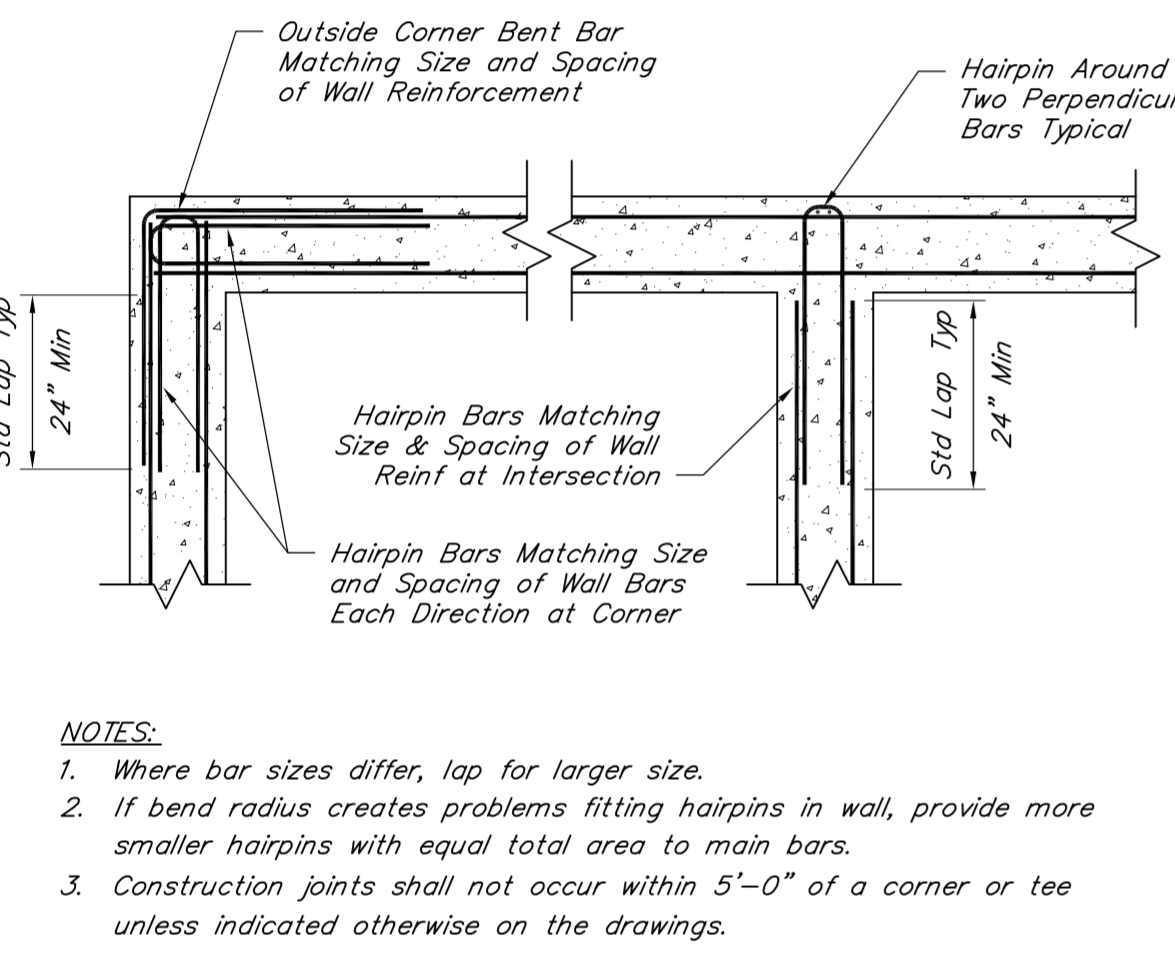
TYPICAL CONCRETE EQUIPMENT PAD  
Not to Scale



TYPICAL WALL CONSTRUCTION JOINT  
Not to Scale

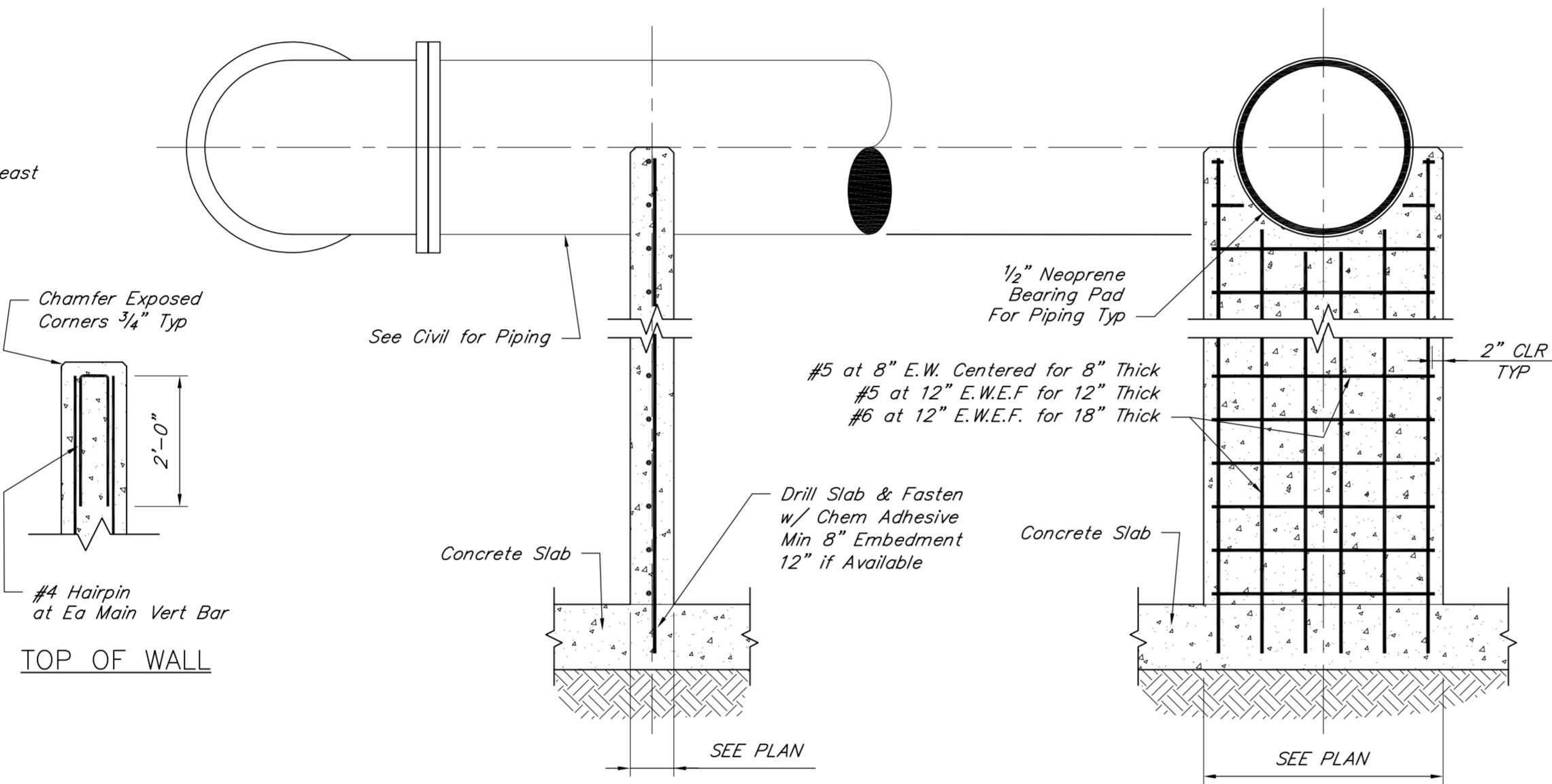


TYPICAL WATERSTOP  
Not to Scale

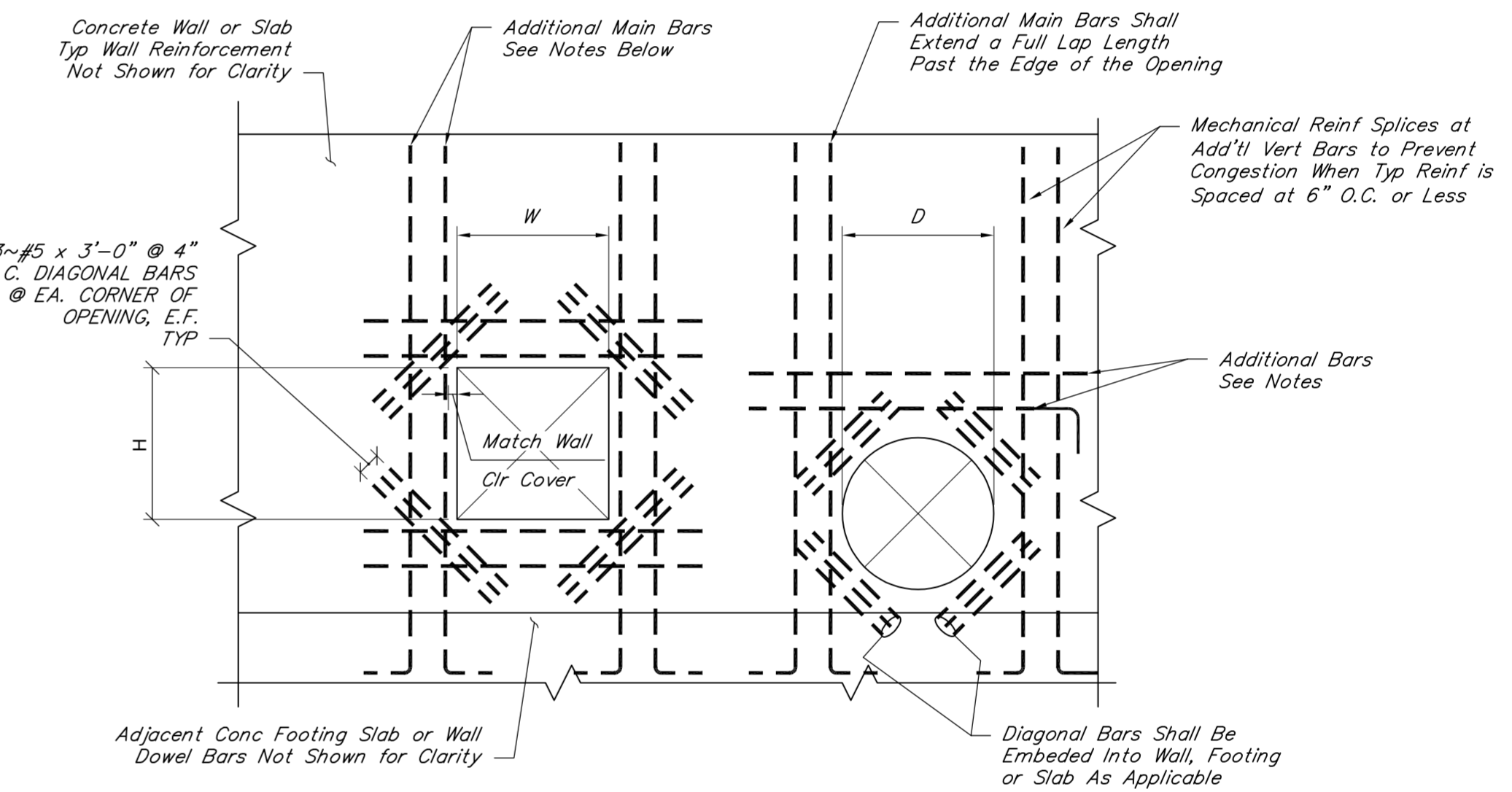


- NOTES:
- Where bar sizes differ, lap for larger size.
  - If bend radius creates problems fitting hairpins in wall, provide more smaller hairpins with equal total area to main bars.
  - Construction joints shall not occur within 5'-0" of a corner or tee unless indicated otherwise on the drawings.

TYPICAL WALL / SLAB DETAIL  
Not to Scale

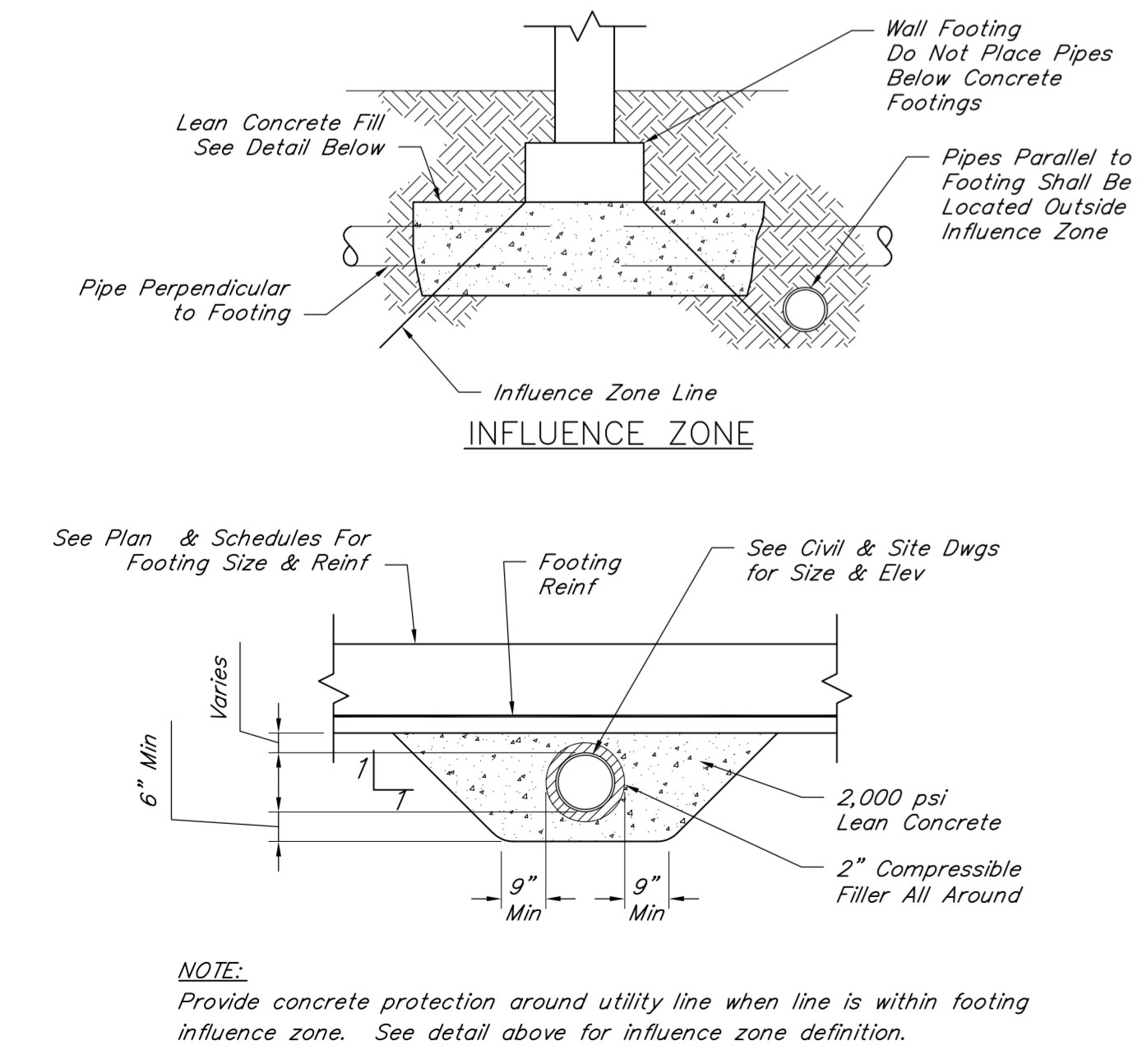


TYPICAL CONCRETE PIER DETAIL  
Not to Scale



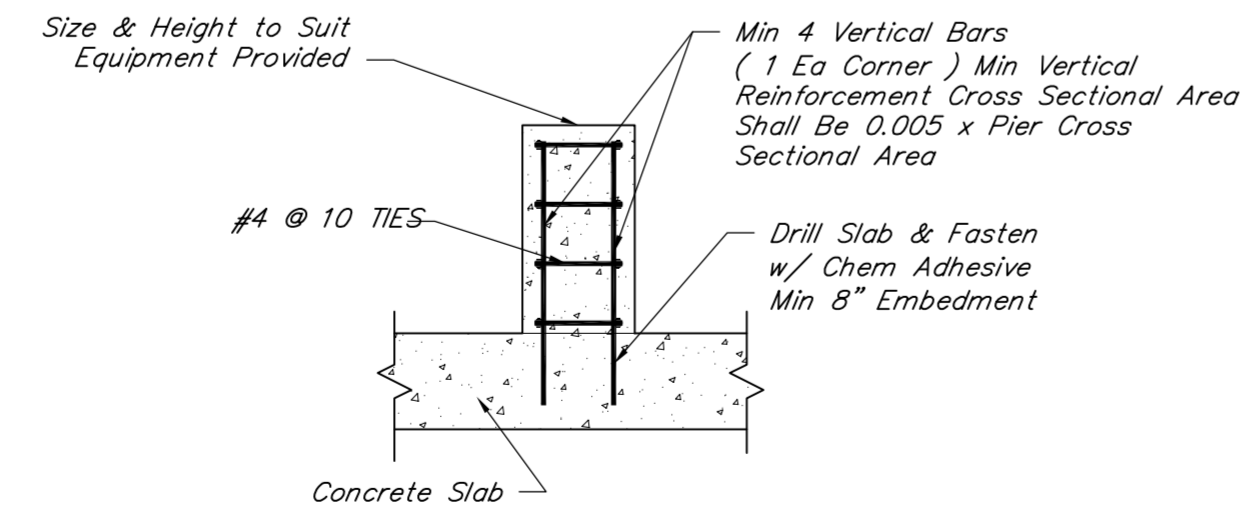
- NOTES:
- Use this detail if additional reinforcement is not indicated otherwise on drawings.
  - Specified reinforcement concrete cover required at all openings. See other sections for cover requirements.
  - Reinforcement spacing shall not exceed 12" for liquid retaining structures.
  - Additional bars shall be equal to the number and size of bars interrupted by the opening. If the interrupted bars are an odd number, then round up to the nearest even number and provide half that number as additional bars to each side of the opening and each face. The length of the bars shall equal the width of the opening + standard lap length, hook if lap length is not available at either end.
  - If additional diagonal bars required at the corners of the openings conflict with one another the conflicting ends then hook ends of diagonal bars as required.
  - Additional bars may extend across two or more openings continuously.

TYPICAL REINFORCEMENT AT WALL & SLAB OPENINGS  
Not to Scale

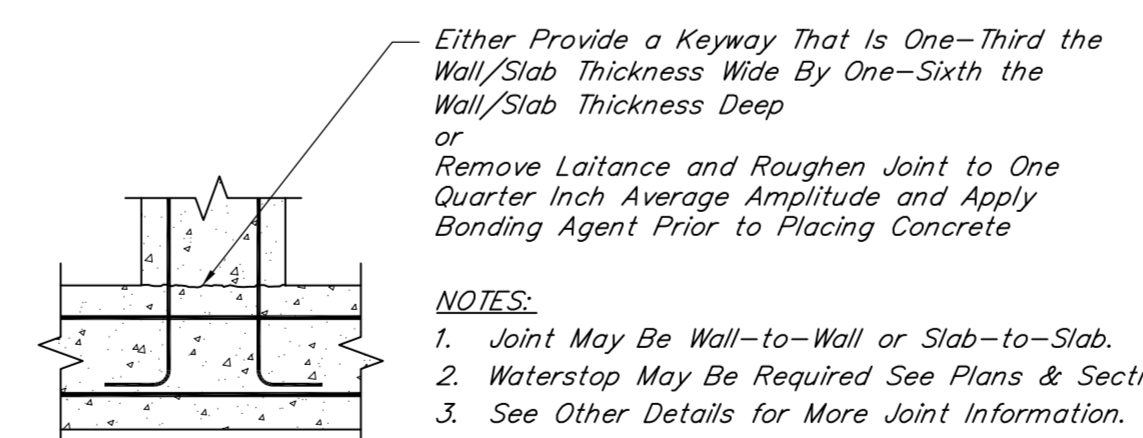


- NOTE:
- Provide concrete protection around utility line when line is within footing influence zone. See detail above for influence zone definition.

TYPICAL UTILITY LINE BELOW FOOTING  
Not to Scale



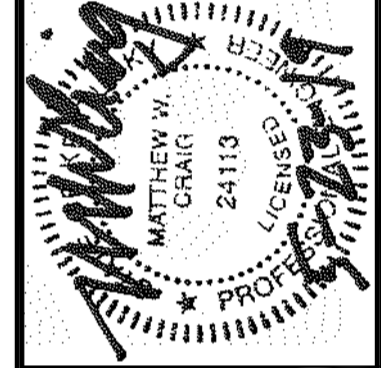
TYPICAL CONCRETE EQUIPMENT PEDESTAL  
Not to Scale



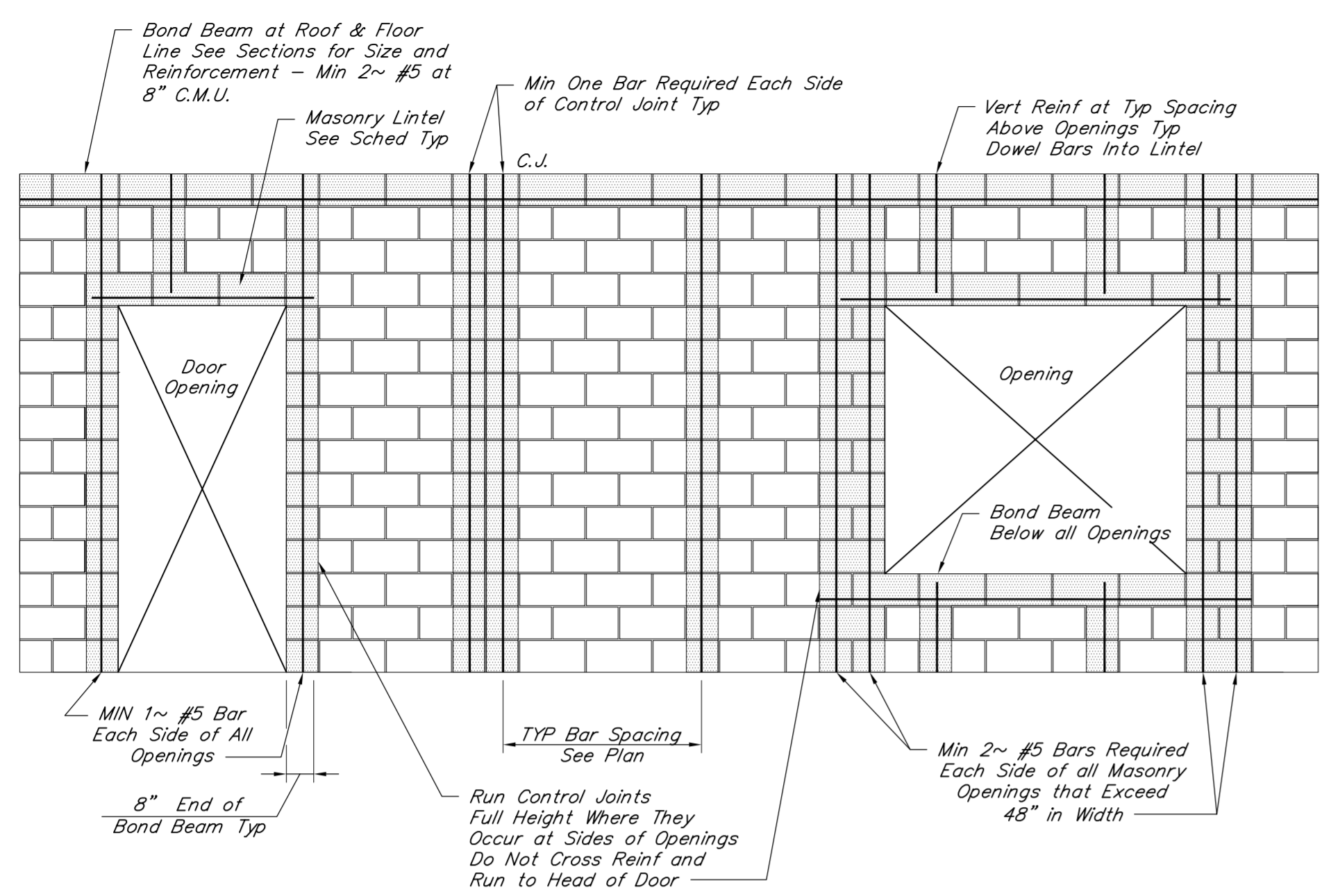
- NOTES:
- Joint May Be Wall-to-Wall or Slab-to-Slab.
  - Waterstop May Be Required See Plans & Sections.
  - See Other Details for More Joint Information.

TYPICAL CONSTRUCTION JOINT CONCRETE PREPARATION  
Not to Scale





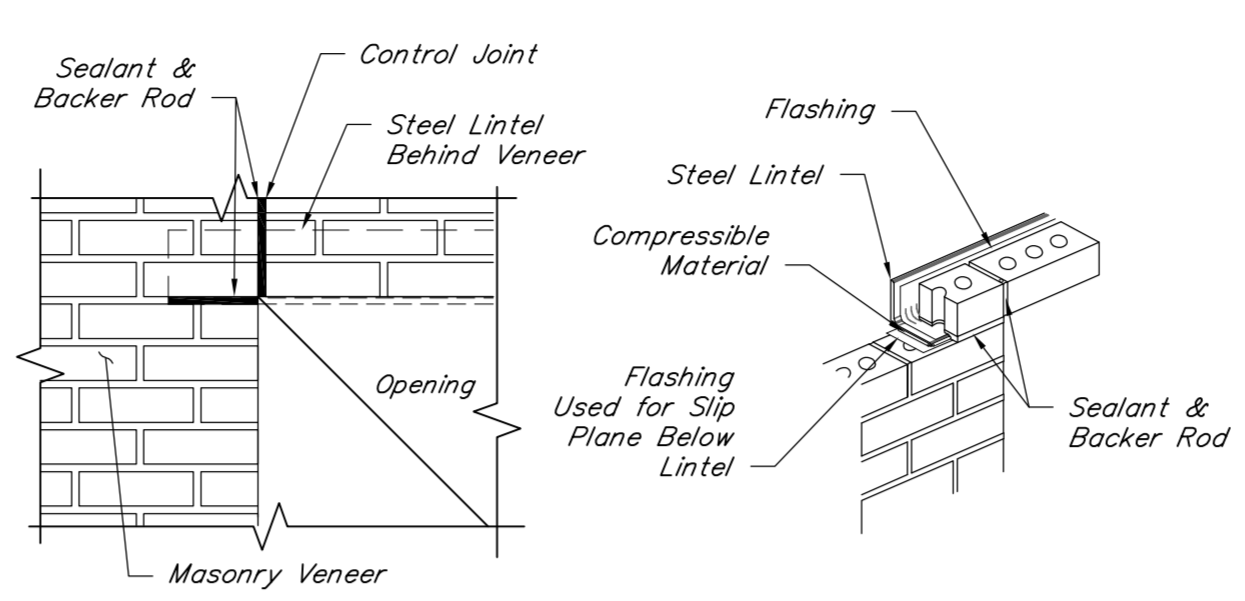
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**NOTES:**

- Minimum vertical wall reinforcing shall be #5 @ 2'-0" unless noted otherwise.
- Vertical wall reinforcing shall be continuous.
- See typical detail for dowels required at base of walls.
- Center reinforcing bars in grouted cells unless noted otherwise.
- Use bar positioners at minimum 4'-0" spacing to support reinforcing bars.
- Follow specified grouting procedures.
- Clean mortar from edges of cells so grout can flow smoothly and fill entire cell.
- Use lintel block over openings and continue with open-bottom bond beam from edge of opening into wall so that vertical reinforcing at jamb can pass.
- Control joints shall extend full height of wall and align from floor to floor.
- Where a control joint occurs through a bond beam or lintel bearing, provide 2~ 1/2" dowels across joint with grease on one side. Do not continue horizontal reinforcing across control joint.

**TYPICAL C.M.U. WALL REINFORCEMENT DETAILS**  
 Not to Scale



**LOOSE LINTEL SCHEDULE (FOR MASONRY VENEER)**

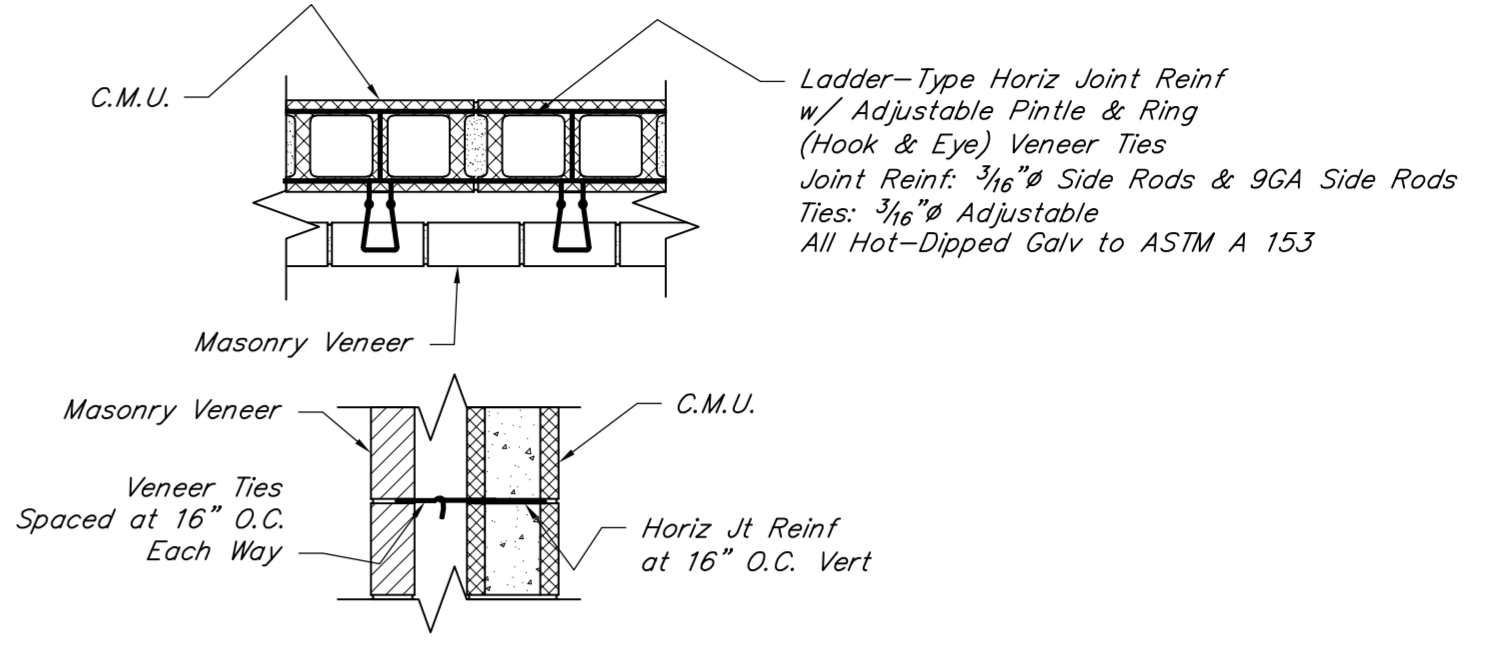
This schedule is for lintels over masonry openings not otherwise shown or noted on drawings.

SPAN	ANGLE SIZE	PLAN MARK
Up to 4'-0"	1.3x 3/16 x 3/16 LLV	AL-1
Up to 5'-6"	1.4x 3/16 x 3/16 LLV	AL-2
Up to 7'-6"	1.5x 3/16 x 3/16 LLV	AL-3
Up to 9'-6"	1.6x 3/16 x 3/16 LLV	AL-4

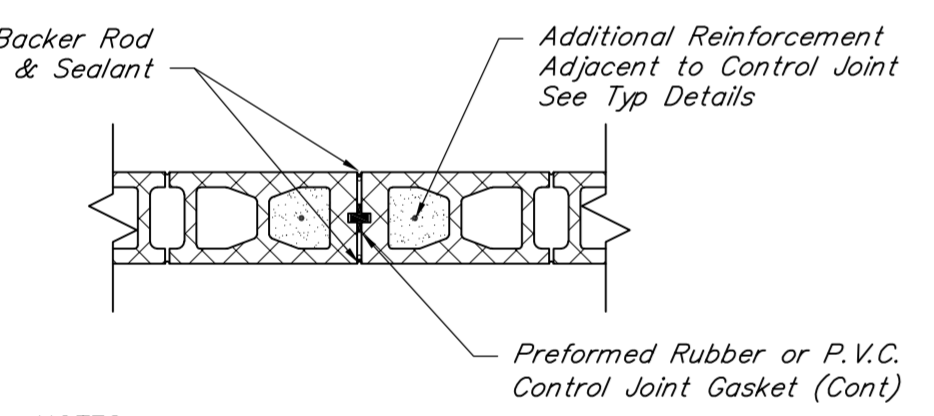
**NOTES:**

- Provide one angle for each 4" of masonry wall.
- Angles exposed to weather shall be galvanized.
- Minimum bearing length shall be 4" each end.

**TYPICAL MASONRY VENEER LINTEL DETAIL**  
 Not to Scale



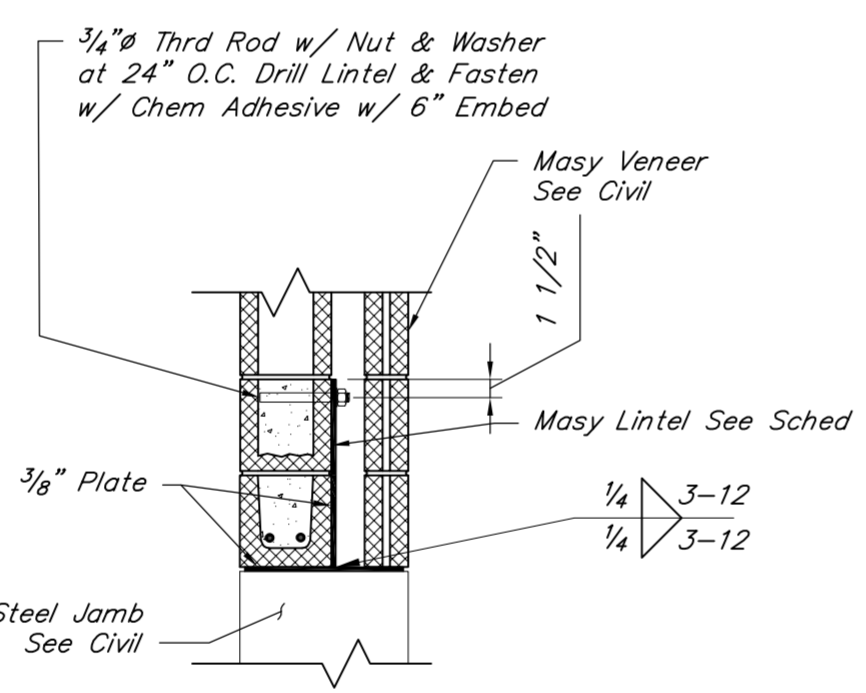
**TYPICAL HORIZ JT REINF & VENEER TIE DETAIL**  
 Not to Scale



**NOTES:**

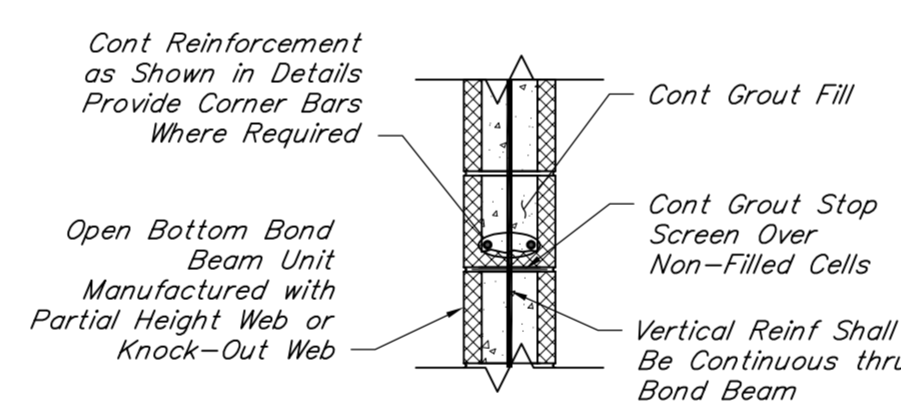
- See architectural drawings for control joint locations.
- Discontinue horizontal joint reinforcing at control joints.
- Unless otherwise shown or noted, spacing of control joints shall not exceed 24 feet.

**TYPICAL C.M.U. CONTROL JOINT DETAIL**  
 Not to Scale



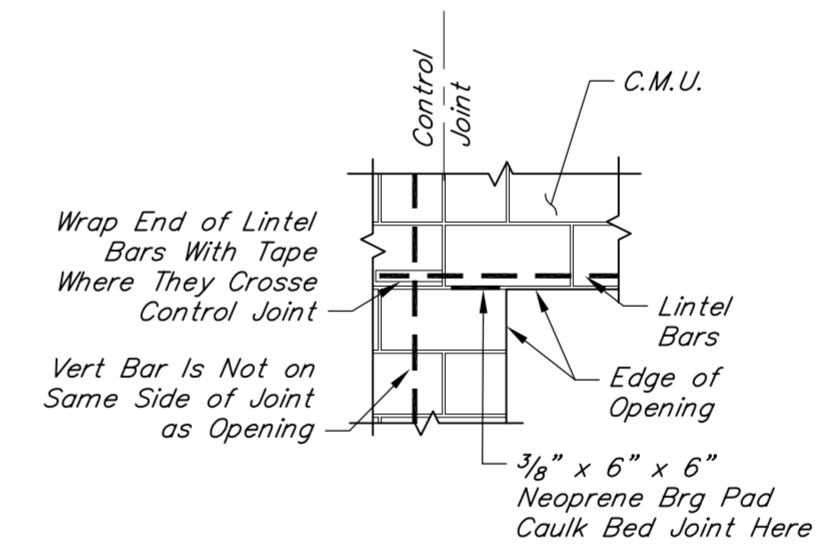
PLAN MARK A-5

**TYPICAL MASY VENEER LINTEL FOR OPENINGS >= 10 FT WIDE**  
 Not to Scale

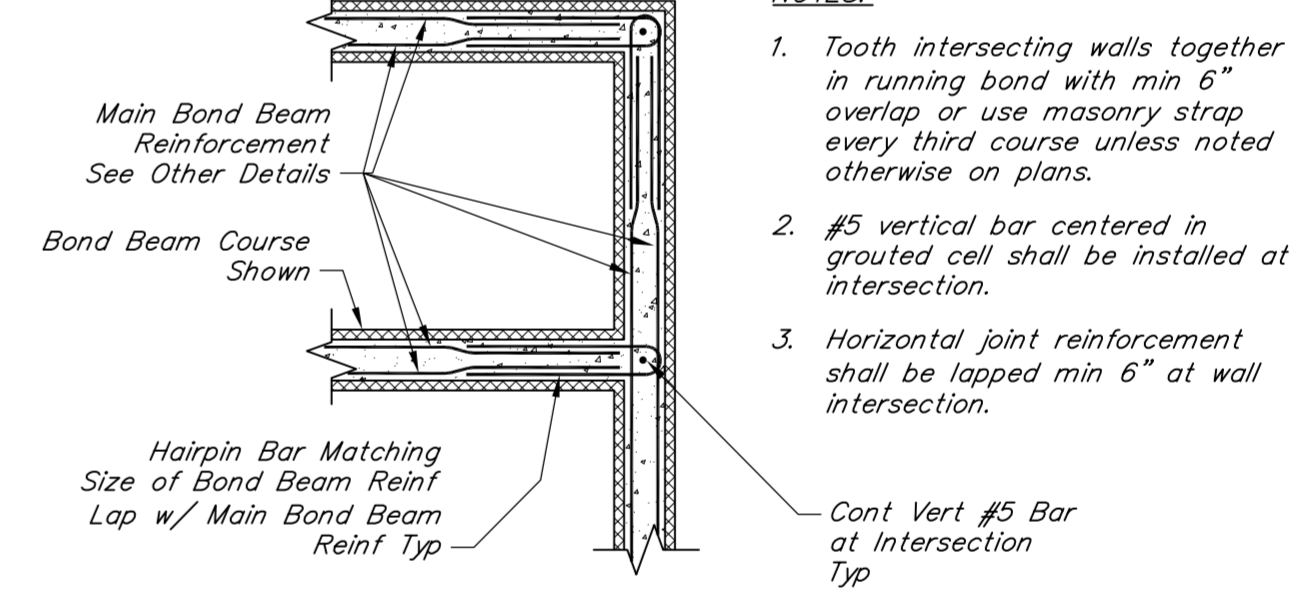


**NOTE:**  
 Reinforcing shall have 3/4" minimum grout cover to all c.m.u. surfaces.

**TYPICAL C.M.U. BOND BEAM DETAIL**  
 Not to Scale



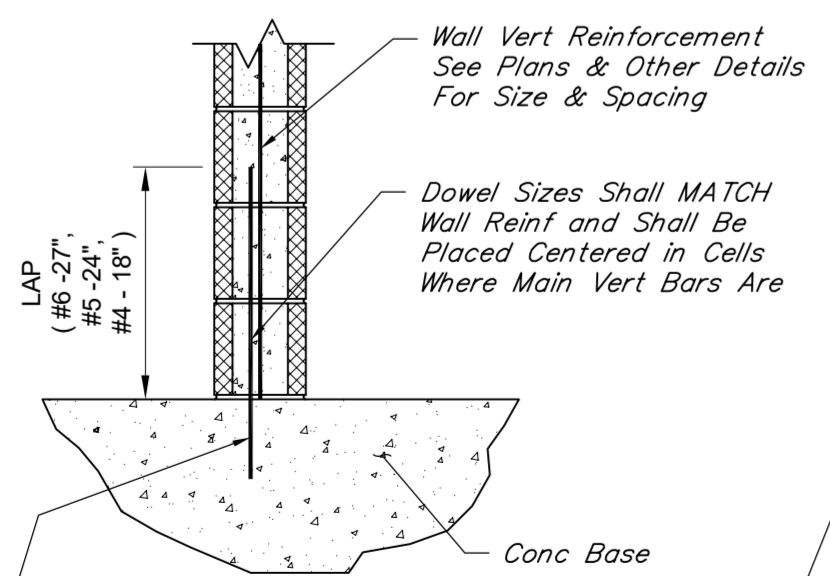
**TYPICAL C.M.U. CNTRL JT @ OPENING**  
 Not to Scale



**NOTES:**

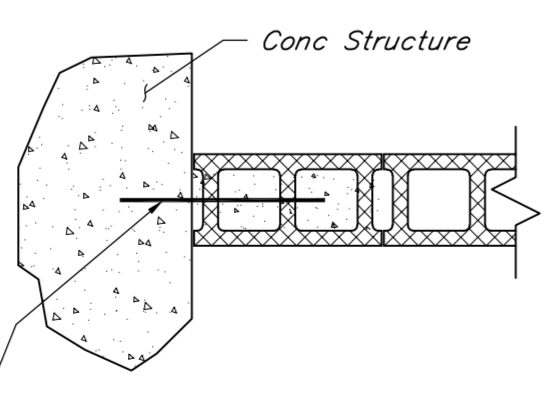
- Tooth intersecting walls together in running bond with min 6" overlap or use masonry strap every third course unless noted otherwise on plans.
- #5 vertical bar centered in grouted cell shall be installed at intersection.
- Horizontal joint reinforcement shall be lapped min 6" at wall intersection.

**TYPICAL MASY WALL INTERSECTION DETAIL**  
 Not to Scale

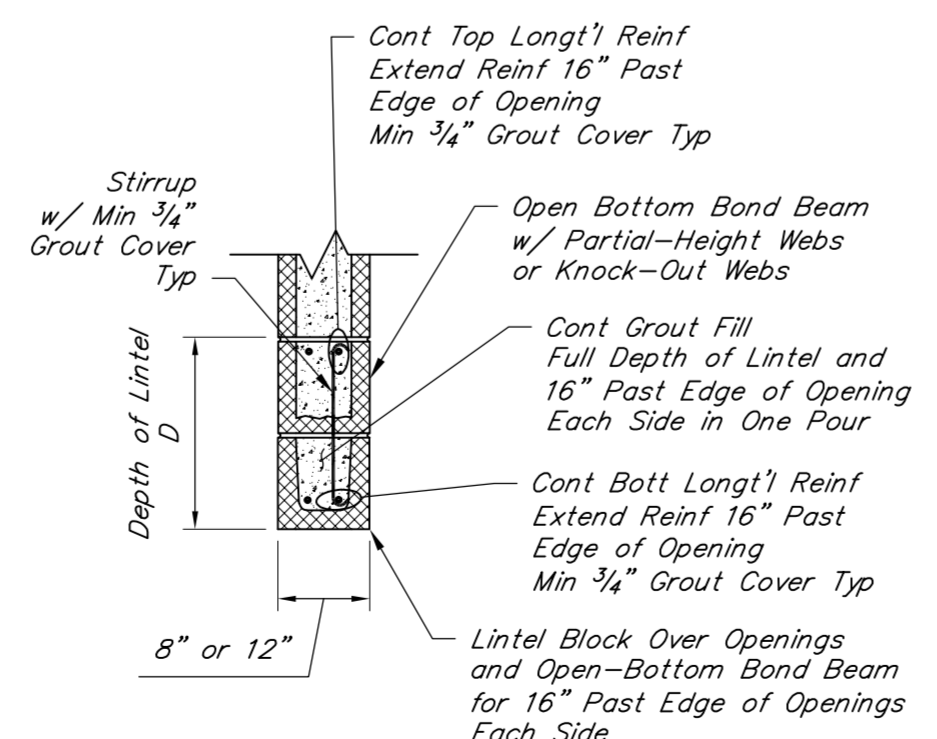


SECTION VIEW

**TYPICAL C.M.U. WALL DOWEL DETAIL**  
 Not to Scale



PLAN VIEW



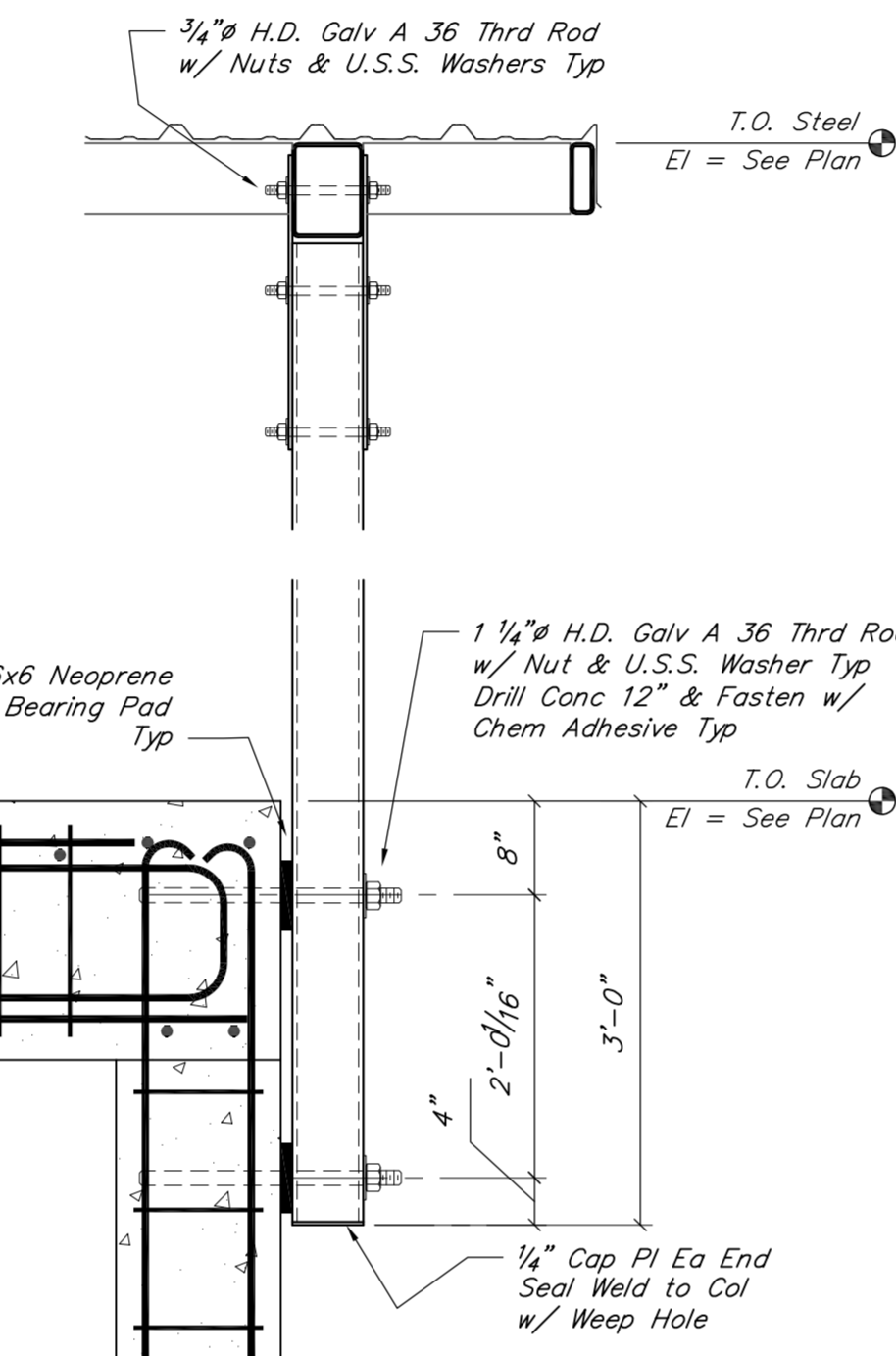
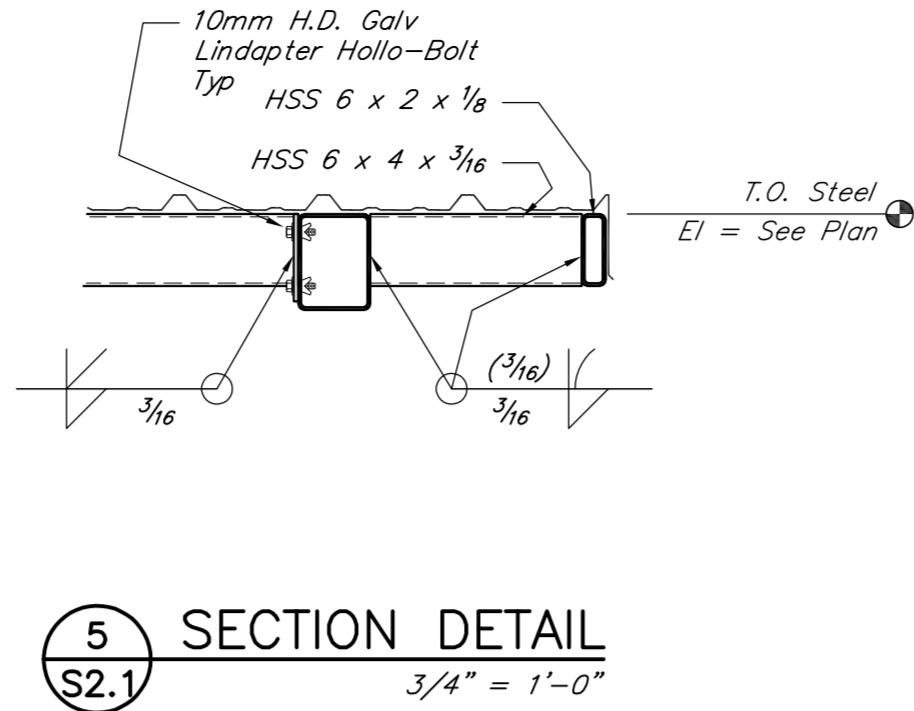
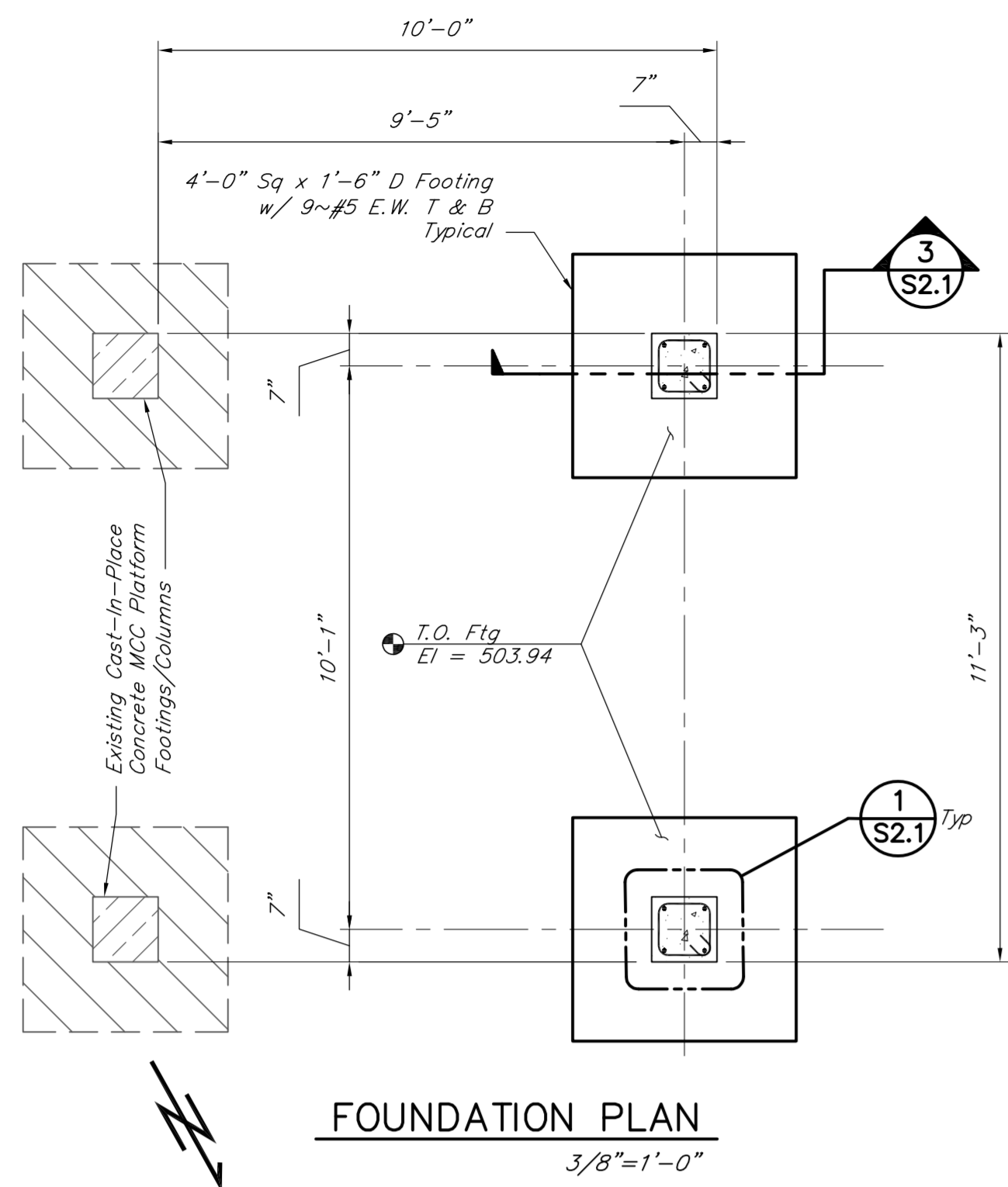
**TYPICAL C.M.U. LINTEL DETAIL**  
 Not to Scale

MASONRY LINTEL SCHEDULE					
MARK	MAX OPENING SIZE	D	BOTTOM REINF	TOP REINF	STIRRUPS
ML-1	5'-0"	8"	2~#5	None	None
ML-2	8'-0"	16"	2~#5	None	None
ML-3	11'-8"	24"	2~#5 (8" C.M.U.) 2~#6 (12" C.M.U.)	None	None
ML-4	18'-0"	24"	2~#5 (8" C.M.U.) 2~#6 (12" C.M.U.)	2~#5	#3@8"

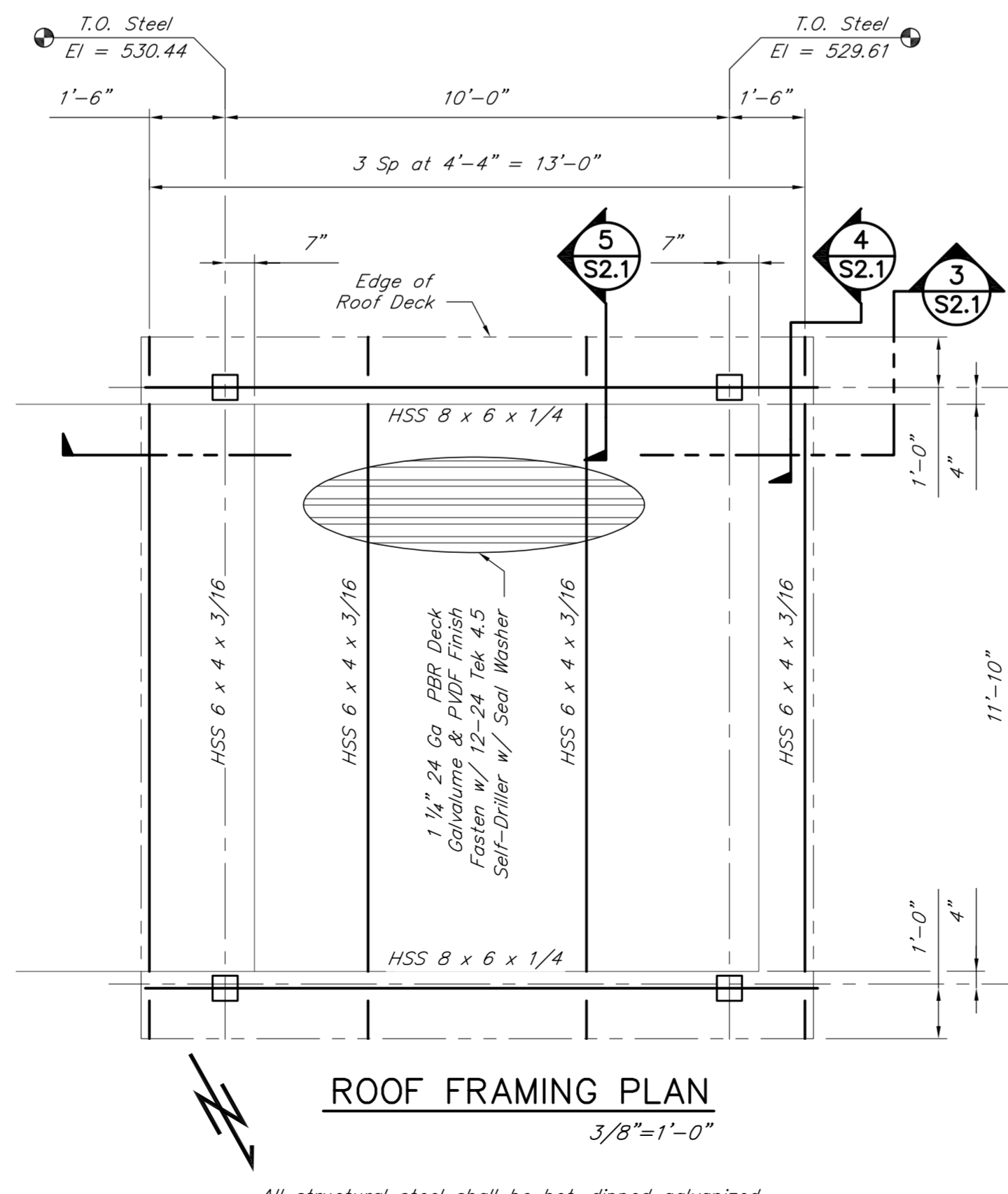
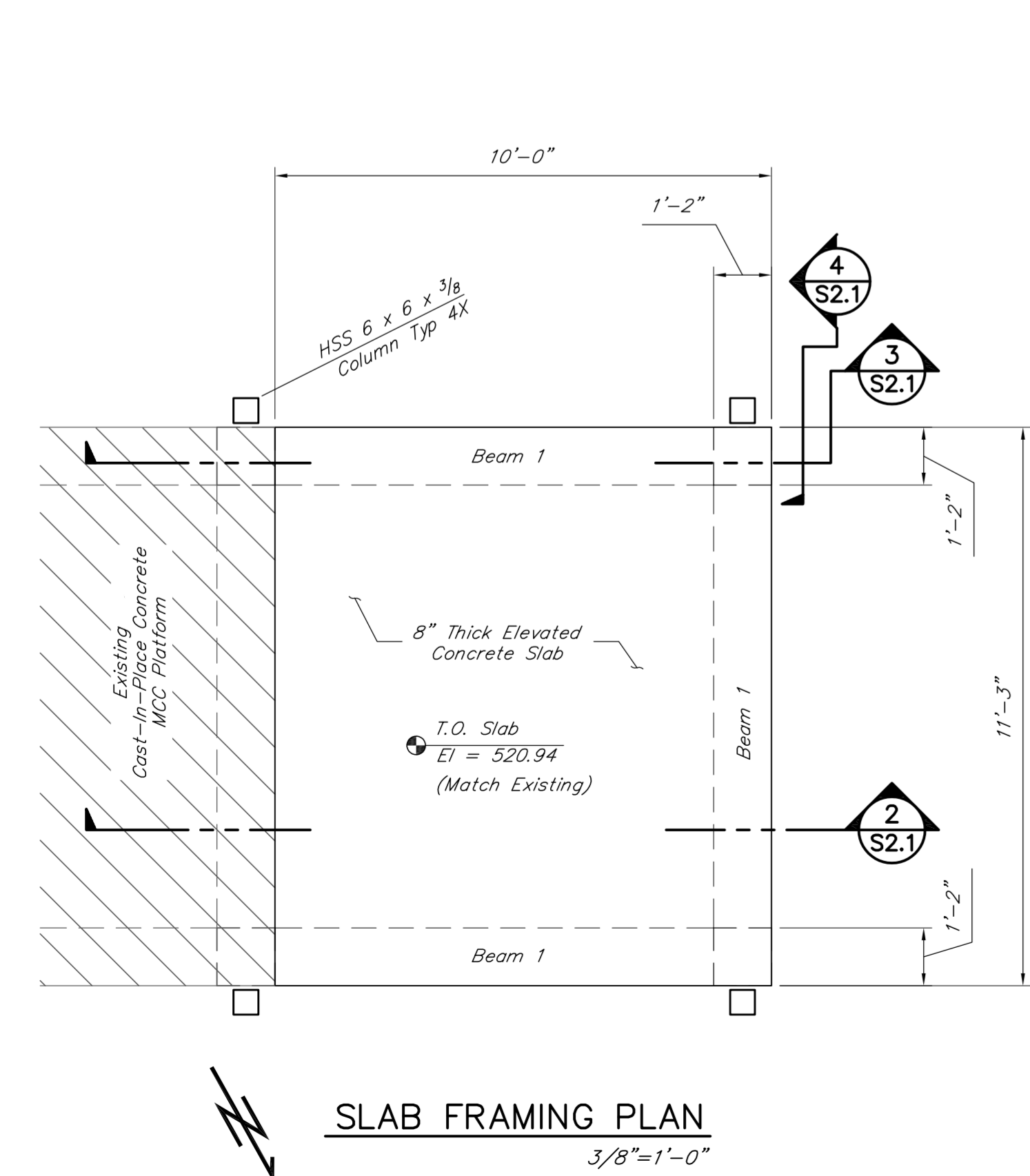
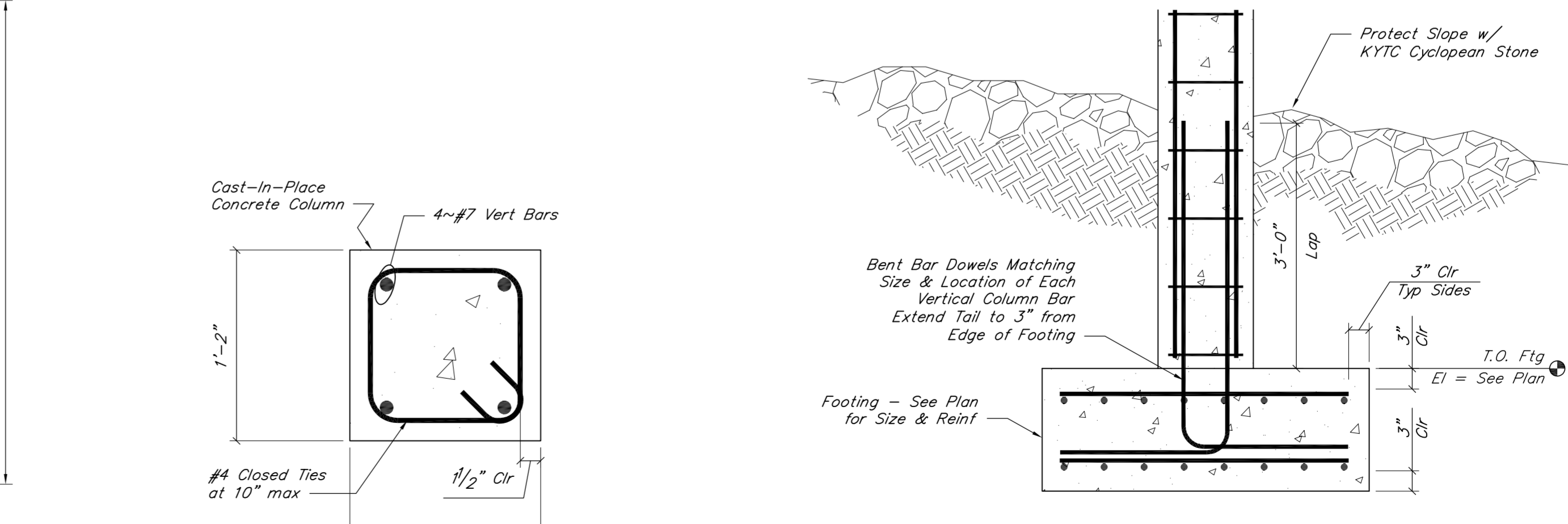
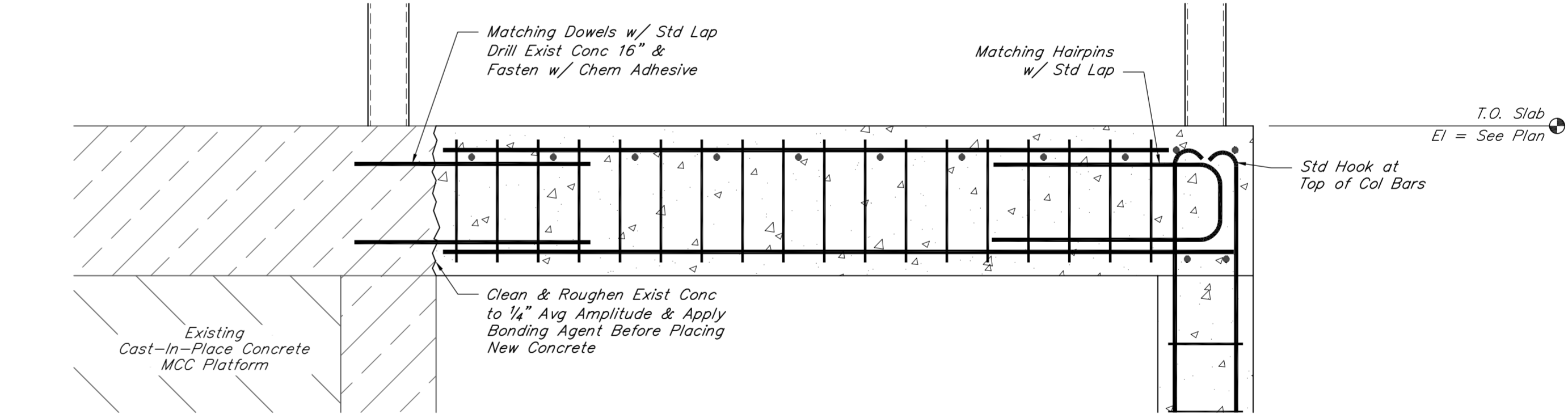
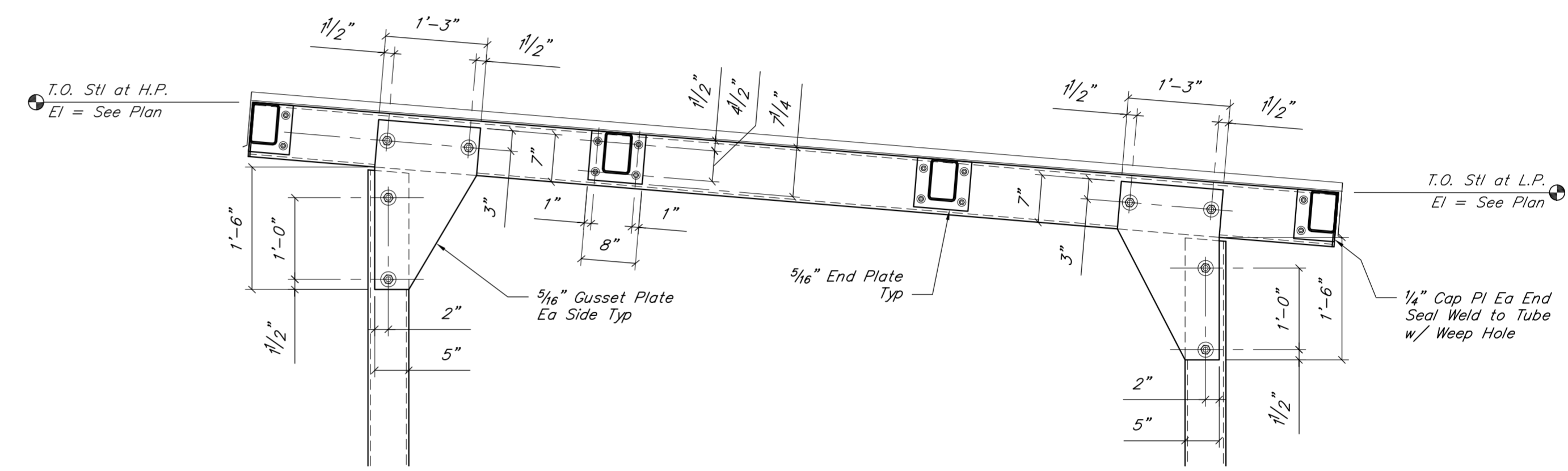
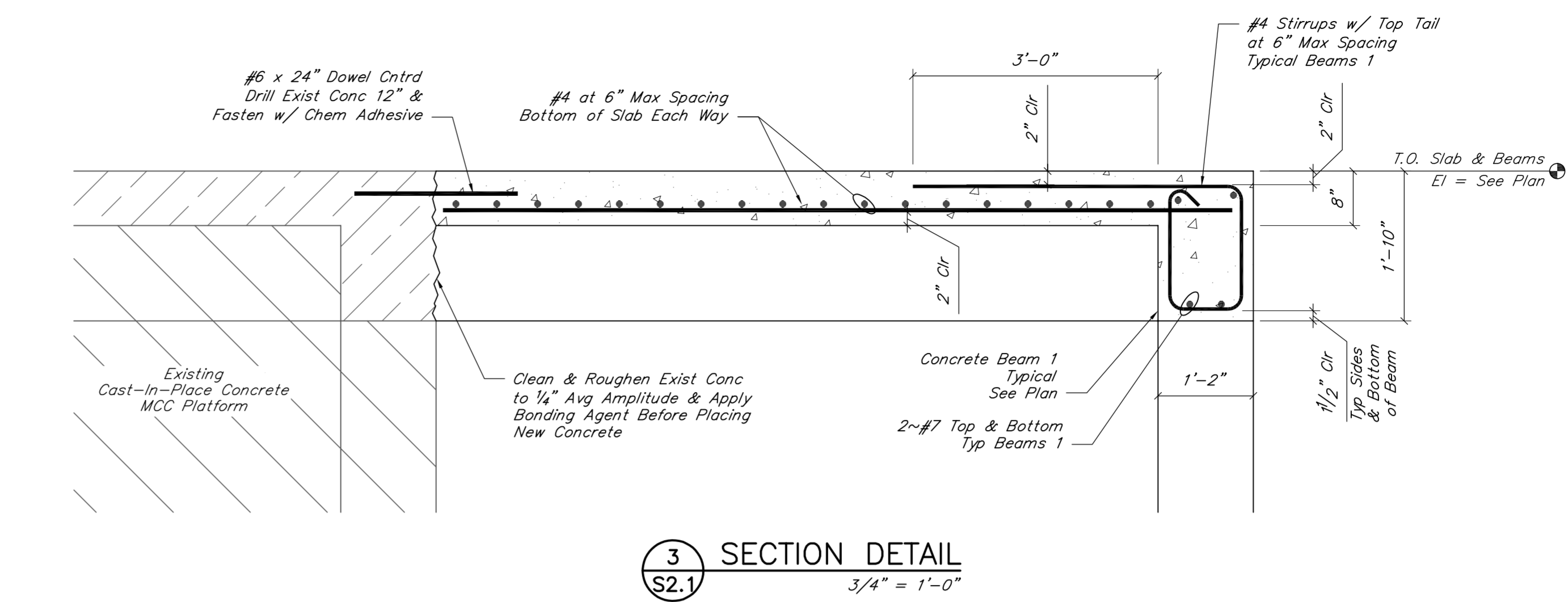
**NOTES:**

- Do not use this schedule if concentrated load is applied to the lintel at a height less than half the span above the lintel or if stack bond is specified.
- In lieu of using lintel block on the bottom of lintels which requires shoring during construction, contractor may use prestressed, precast concrete lintels by "cast-crete" (www.castcrete.com) or approved equal. submit product data and a plan and schedule of lintel locations and sizes for approval for this option.





SECTION DETAIL  
3/4" = 1'-0"



All structural steel shall be hot-dipped galvanized.

GREEN RIVER VALLEY WATER DISTRICT  
WATER TREATMENT PLANT EXPANSION  
HART COUNTY, KENTUCKY



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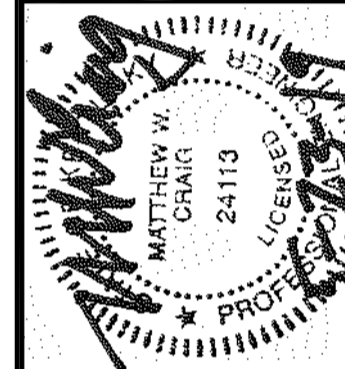


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RIVER INTAKE IMPROVEMENTS STRUCTURAL

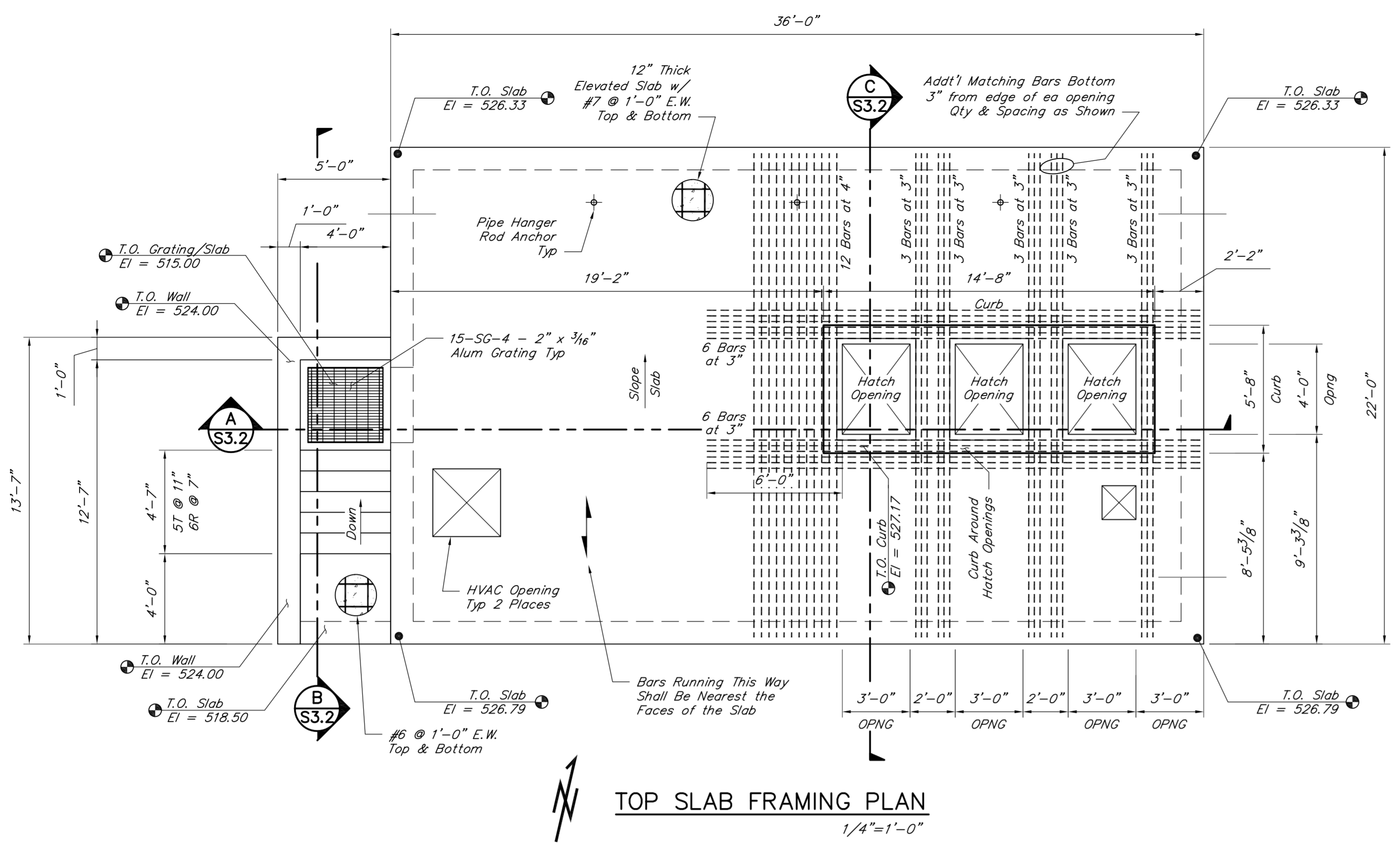




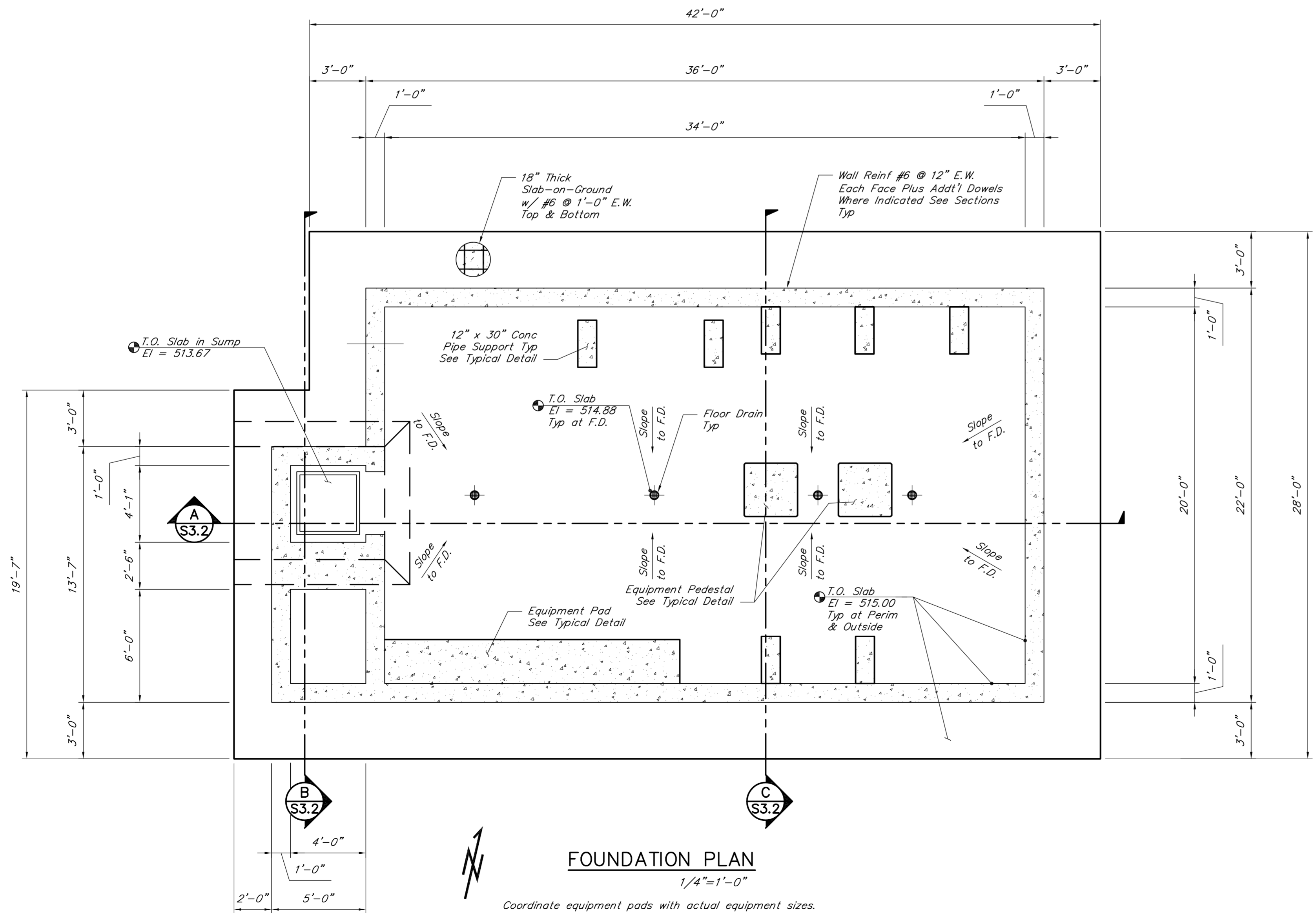
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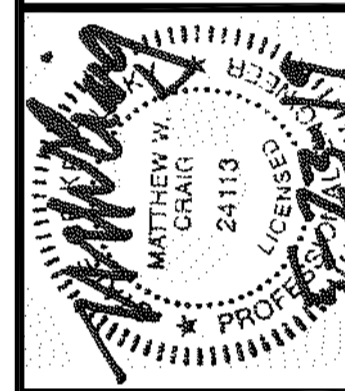


**TOP SLAB FRAMING PLAN**  
 1/4"=1'-0"



**FOUNDATION PLAN**  
 1/4"=1'-0"  
 Coordinate equipment pads with actual equipment sizes.

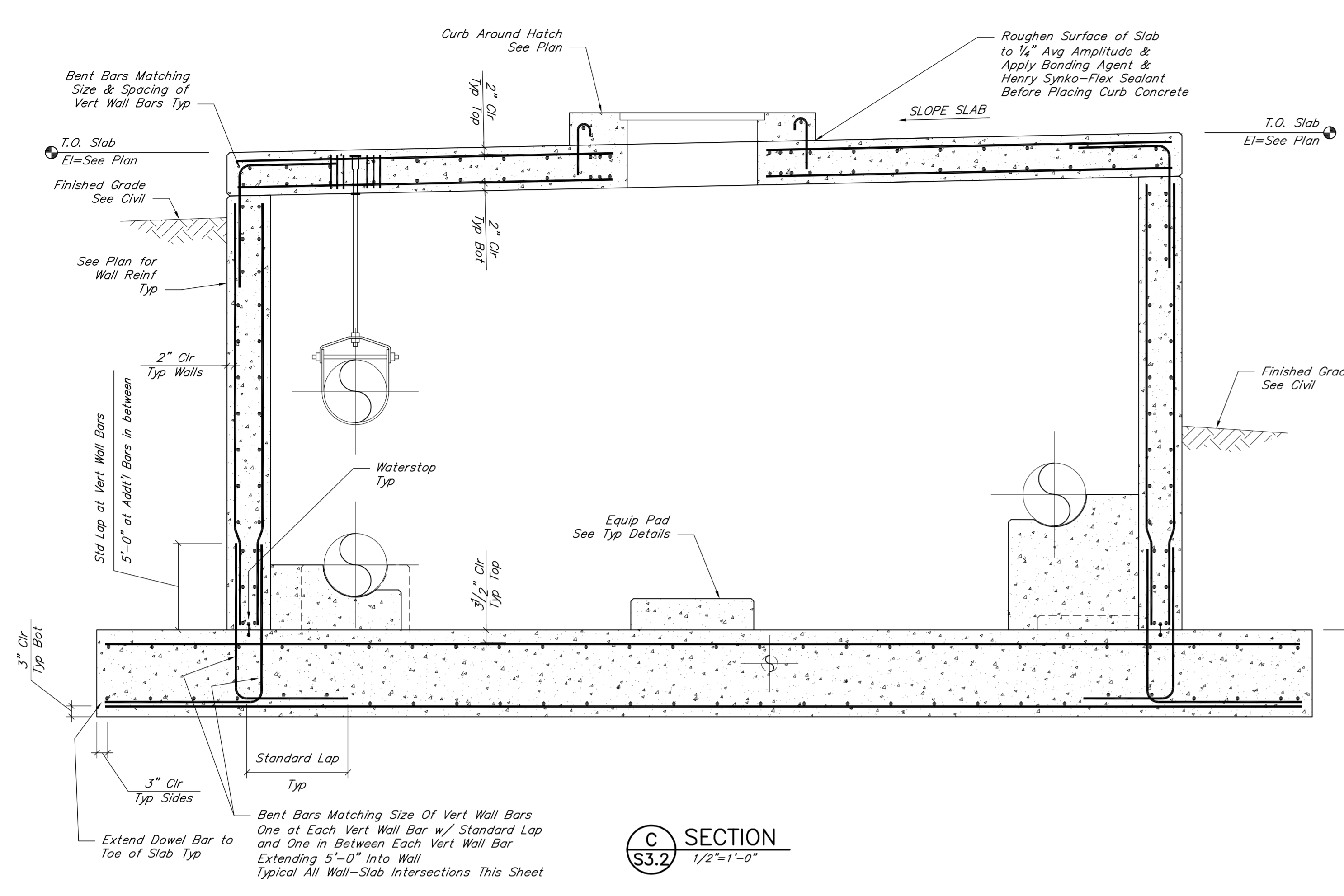




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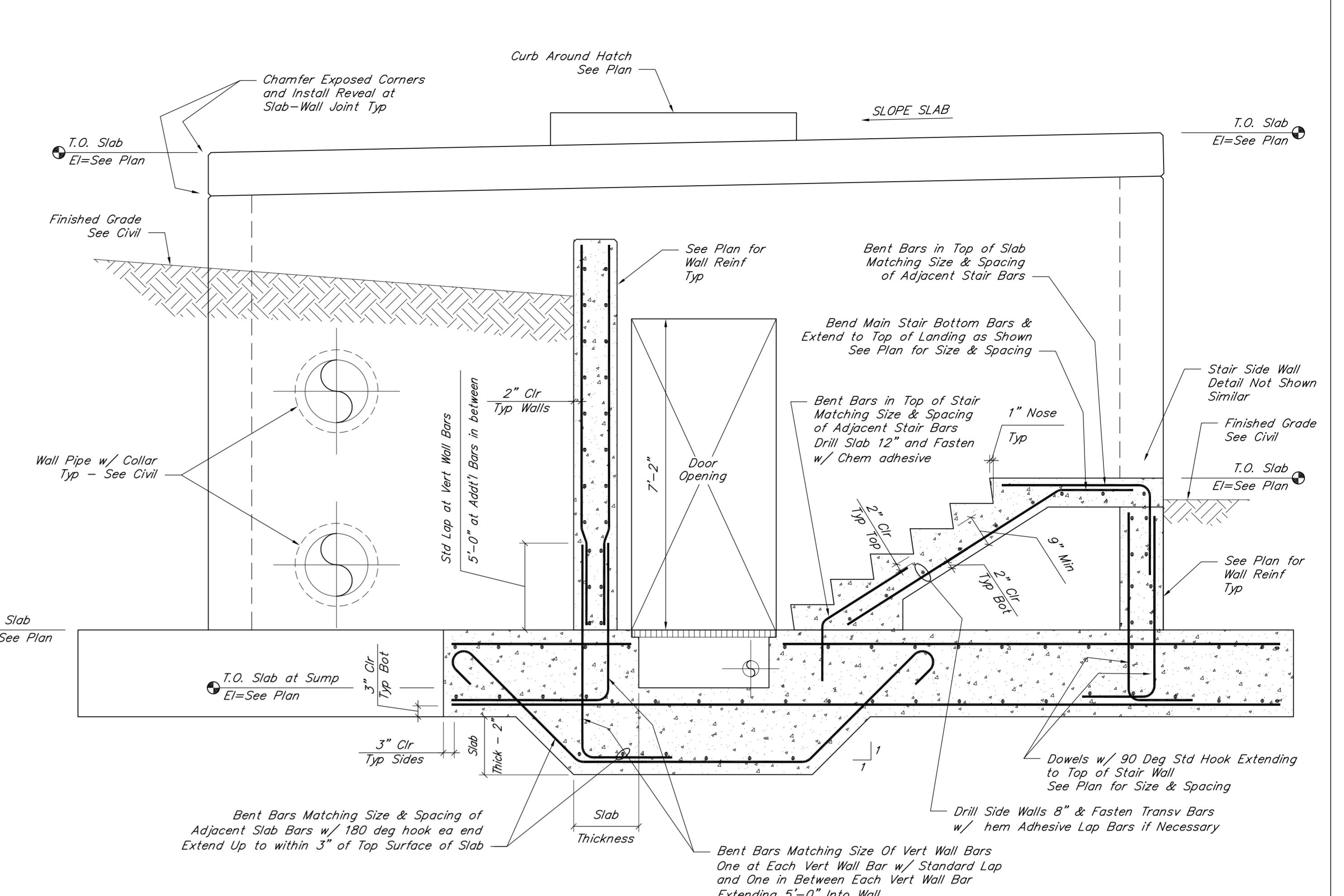


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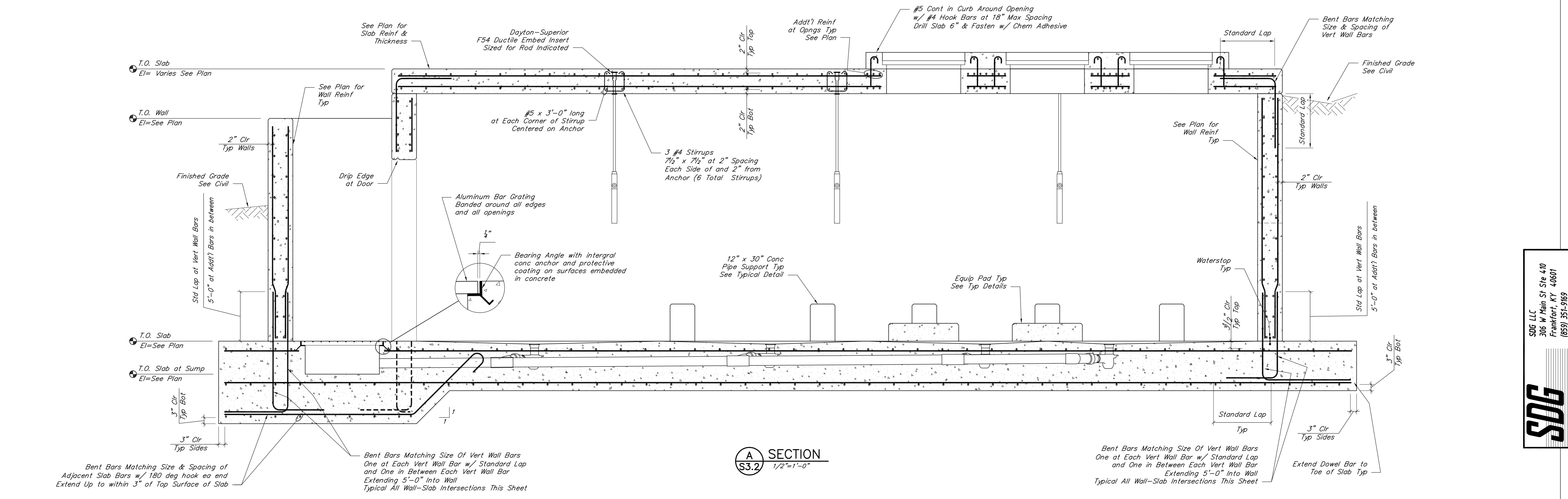
**C SECTION**  
 S3.2 1/2"=1'-0"

Bent Bars Matching Size Of Vert Wall Bars One at Each Vert Wall Bar w/ Standard Lap and One in Between Each Vert Wall Bar Extending 5'-0" Into Wall Typical All Wall-Slab Intersections This Sheet



**B SECTION**  
 S3.2 1/2"=1'-0"

Bent Bars Matching Size & Spacing of Adjacent Slab Bars w/ 180 deg hook ea end Extend Up to within 3" of Top Surface of Slab



**A SECTION**  
 S3.2 1/2"=1'-0"

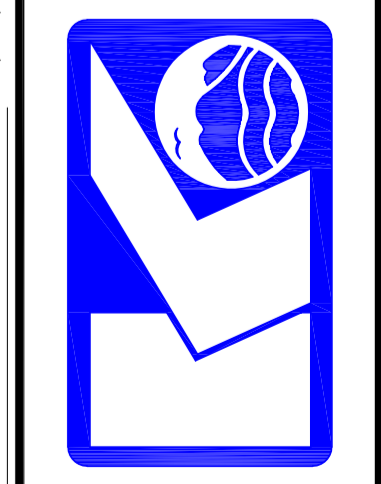
Bent Bars Matching Size Of Vert Wall Bars One at Each Vert Wall Bar w/ Standard Lap and One in Between Each Vert Wall Bar Extending 5'-0" Into Wall Typical All Wall-Slab Intersections This Sheet

Bent Bars Matching Size Of Vert Wall Bars One at Each Vert Wall Bar w/ Standard Lap and One in Between Each Vert Wall Bar Extending 5'-0" Into Wall Typical All Wall-Slab Intersections This Sheet

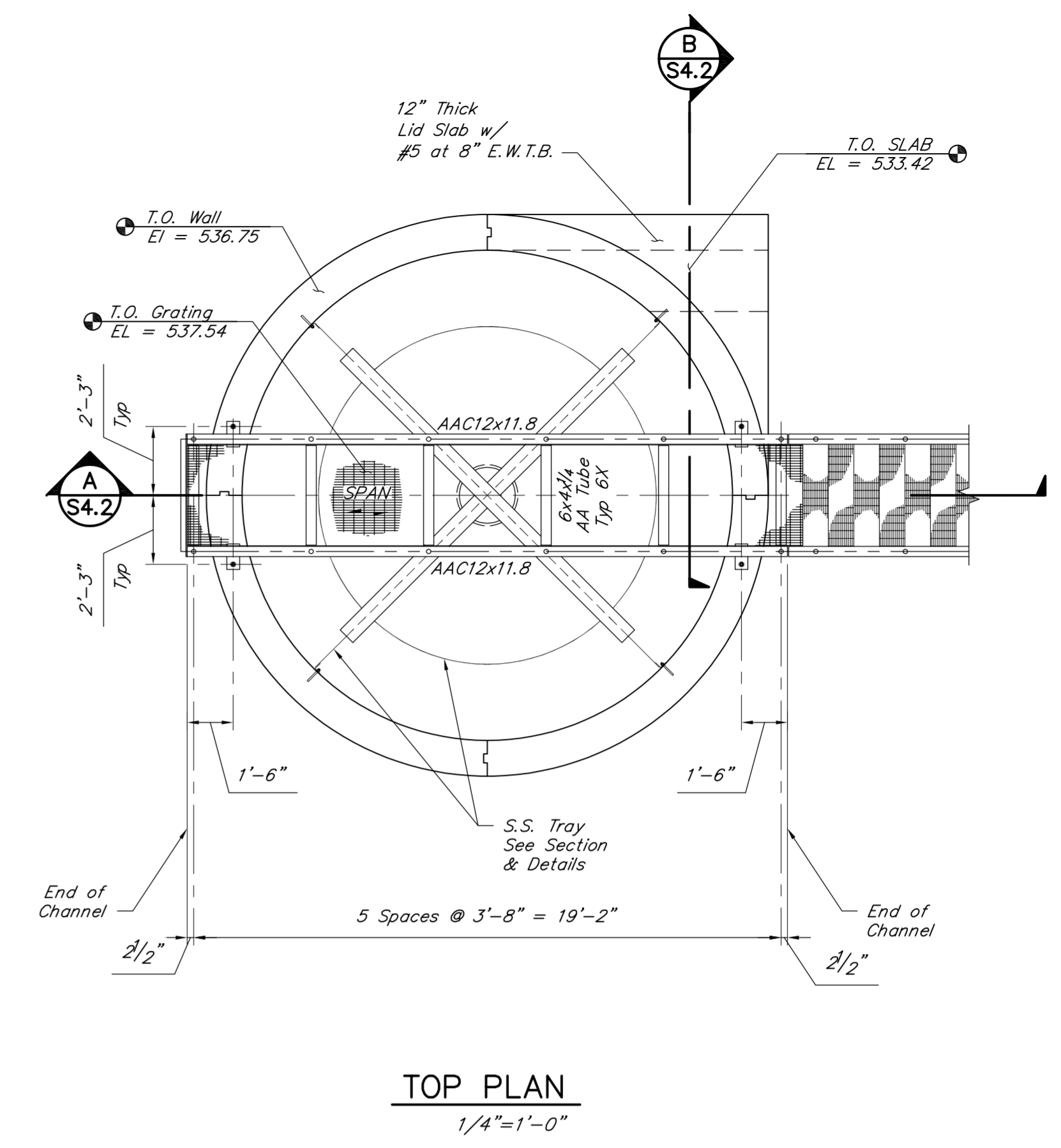




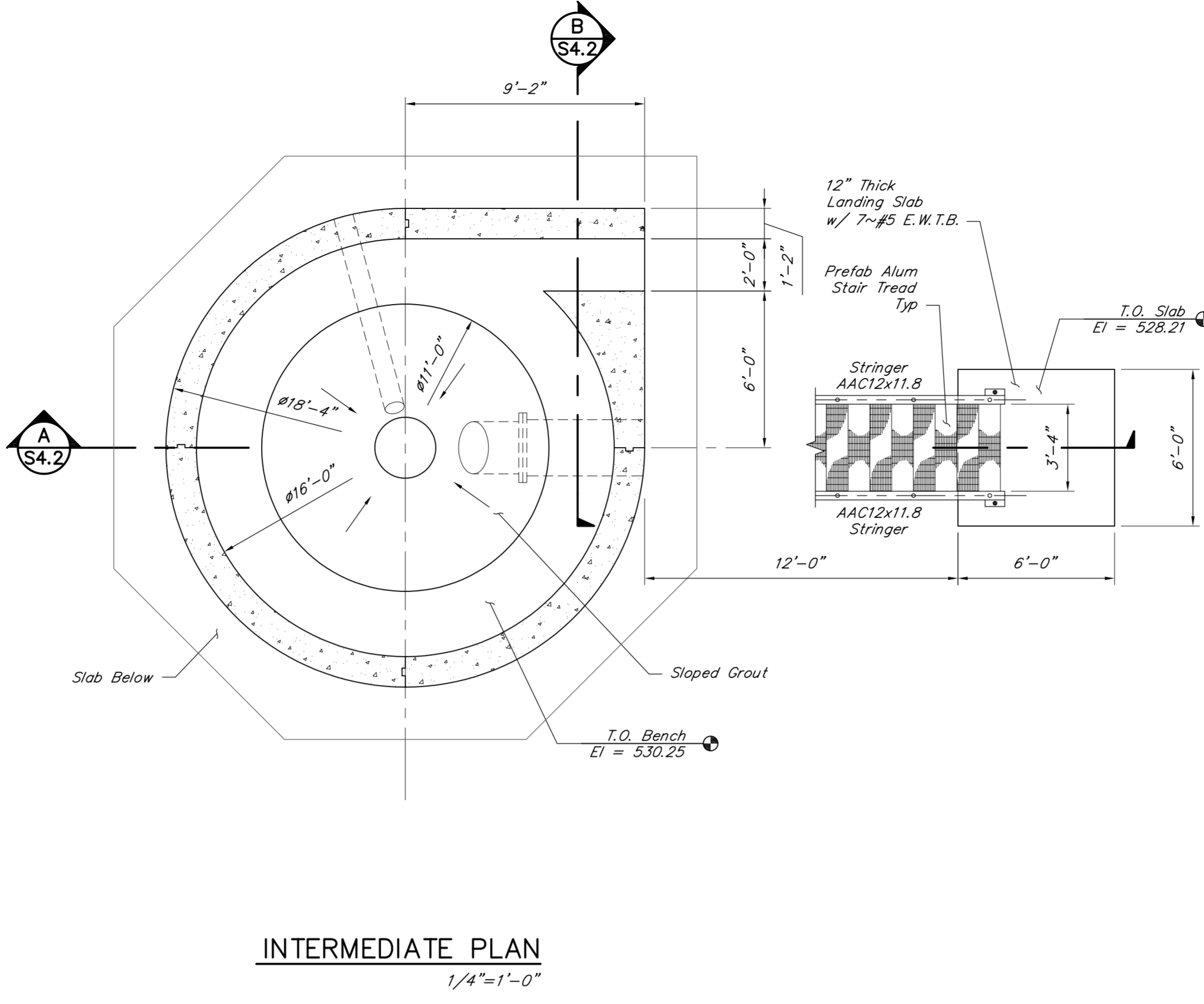
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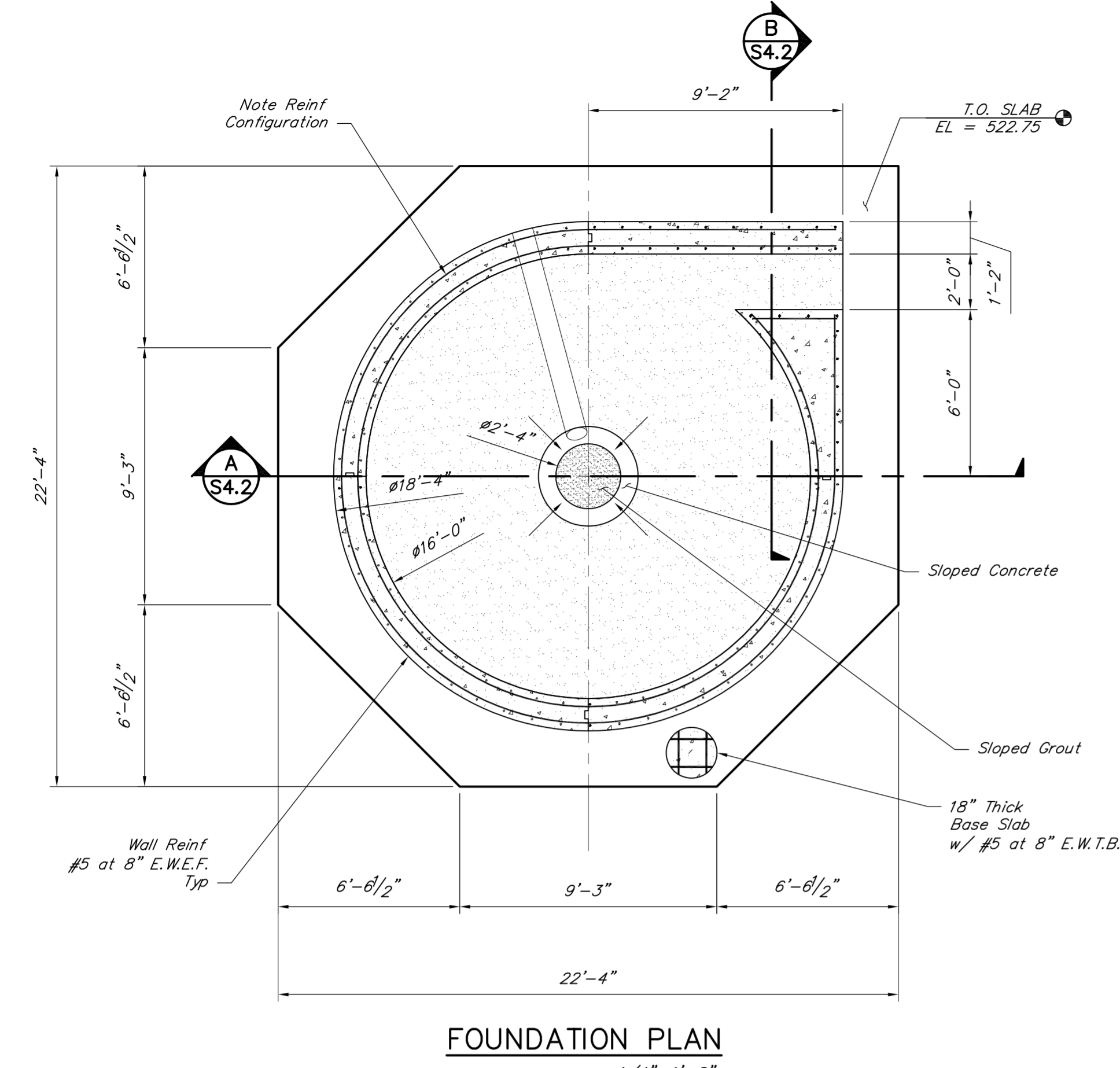
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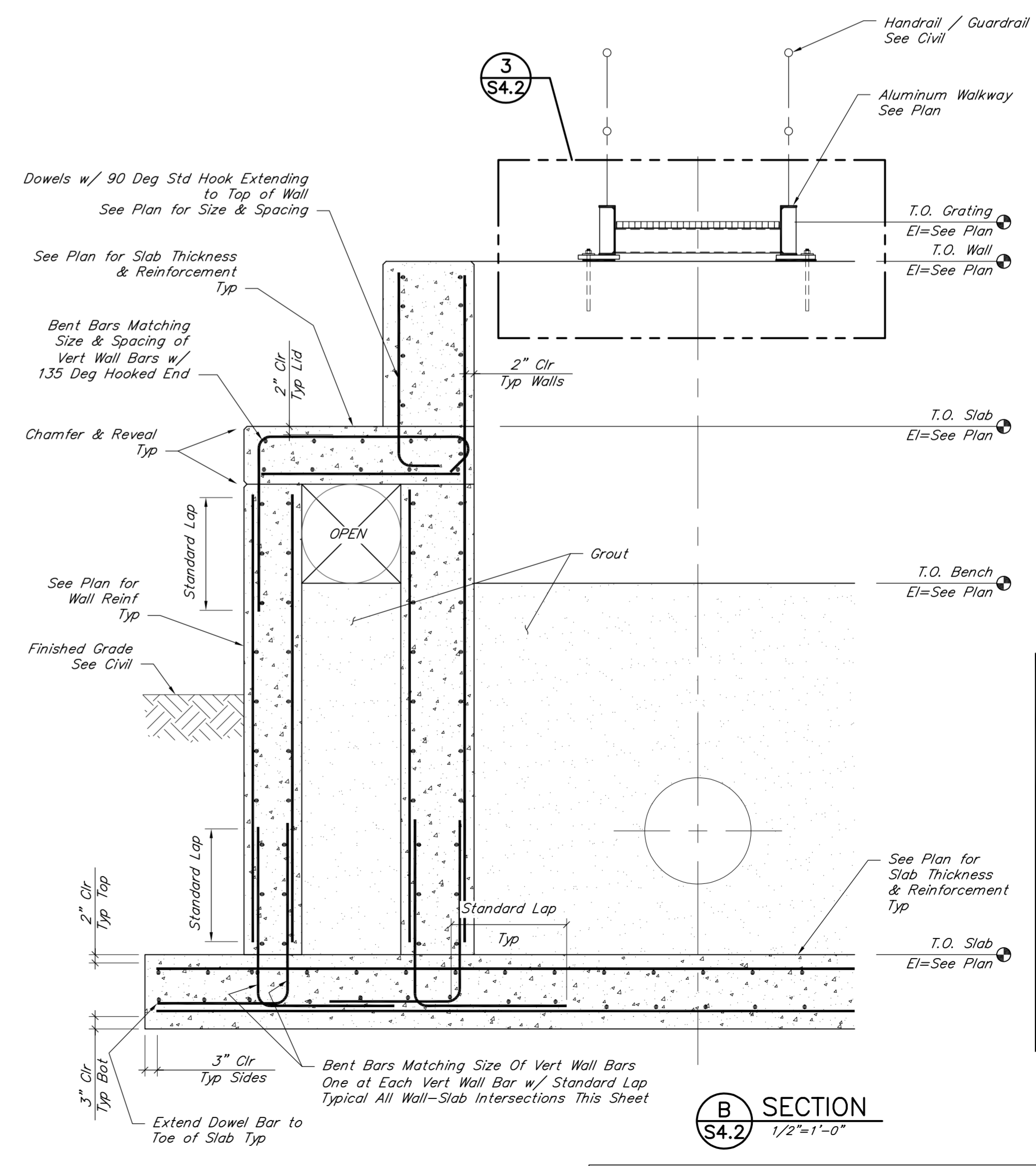
**TOP PLAN**  
 1/4"=1'-0"



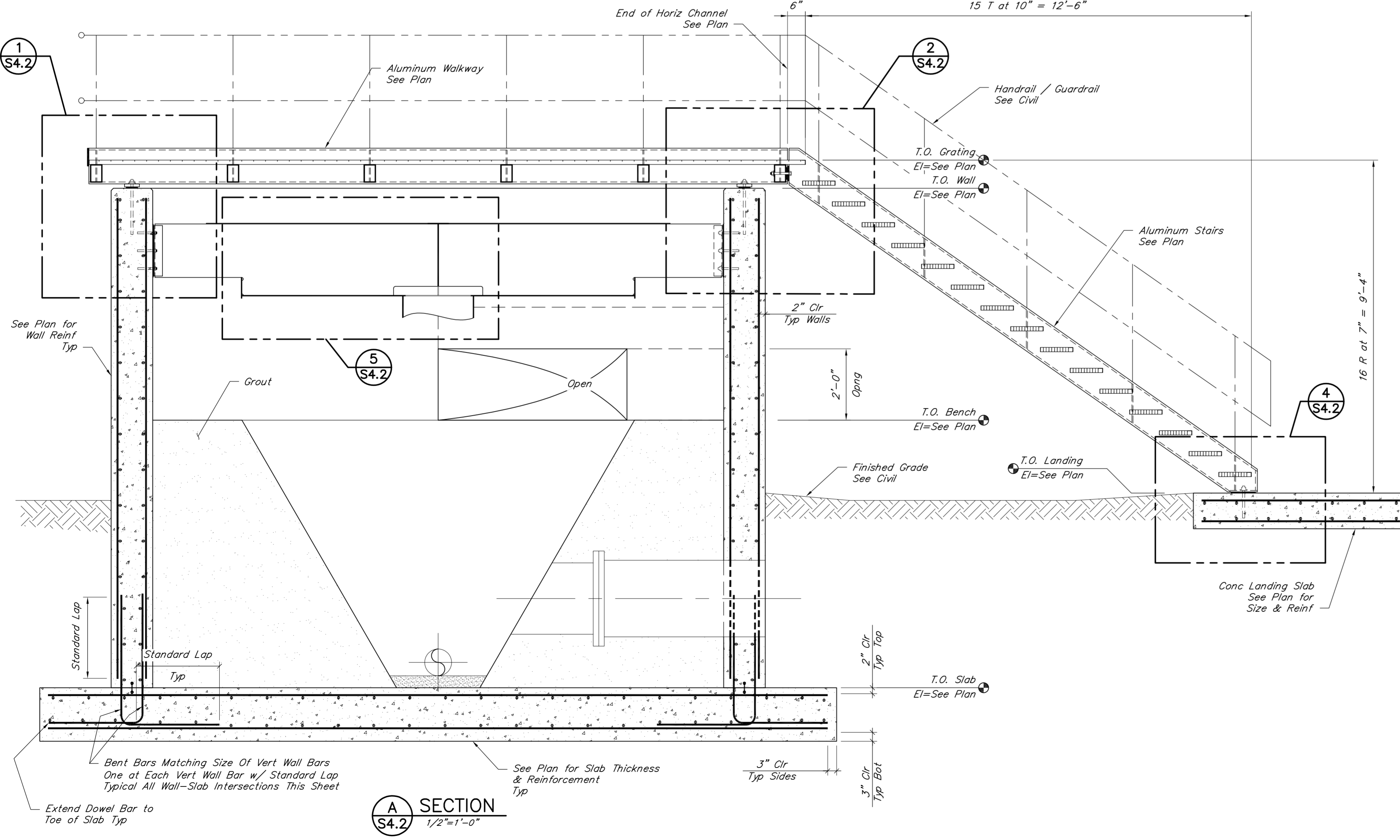
**INTERMEDIATE PLAN**  
 1/4"=1'-0"



**FOUNDATION PLAN**  
 1/4"=1'-0"

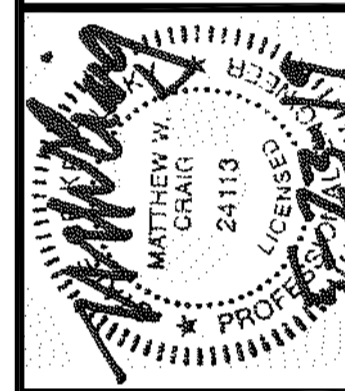


**B SECTION**  
 1/2"=1'-0"



**A SECTION**  
 1/2"=1'-0"





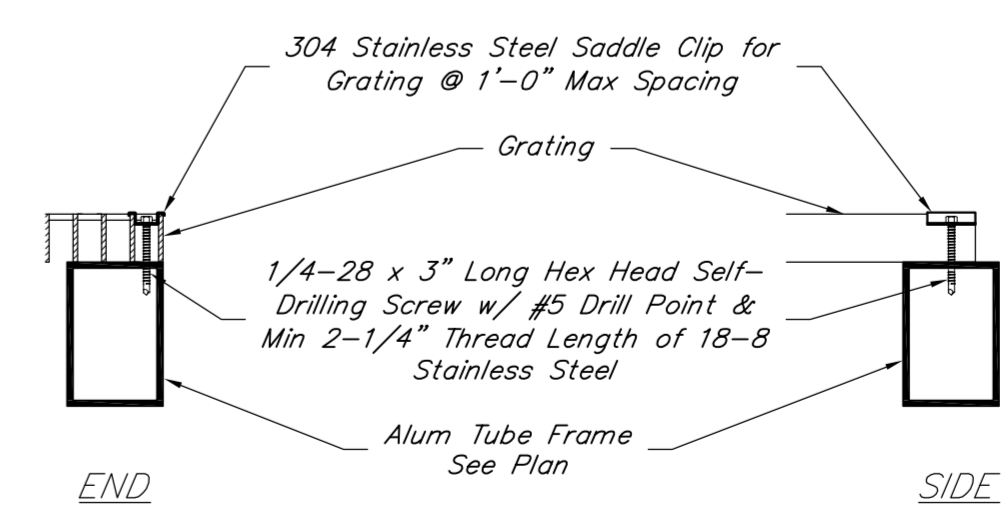
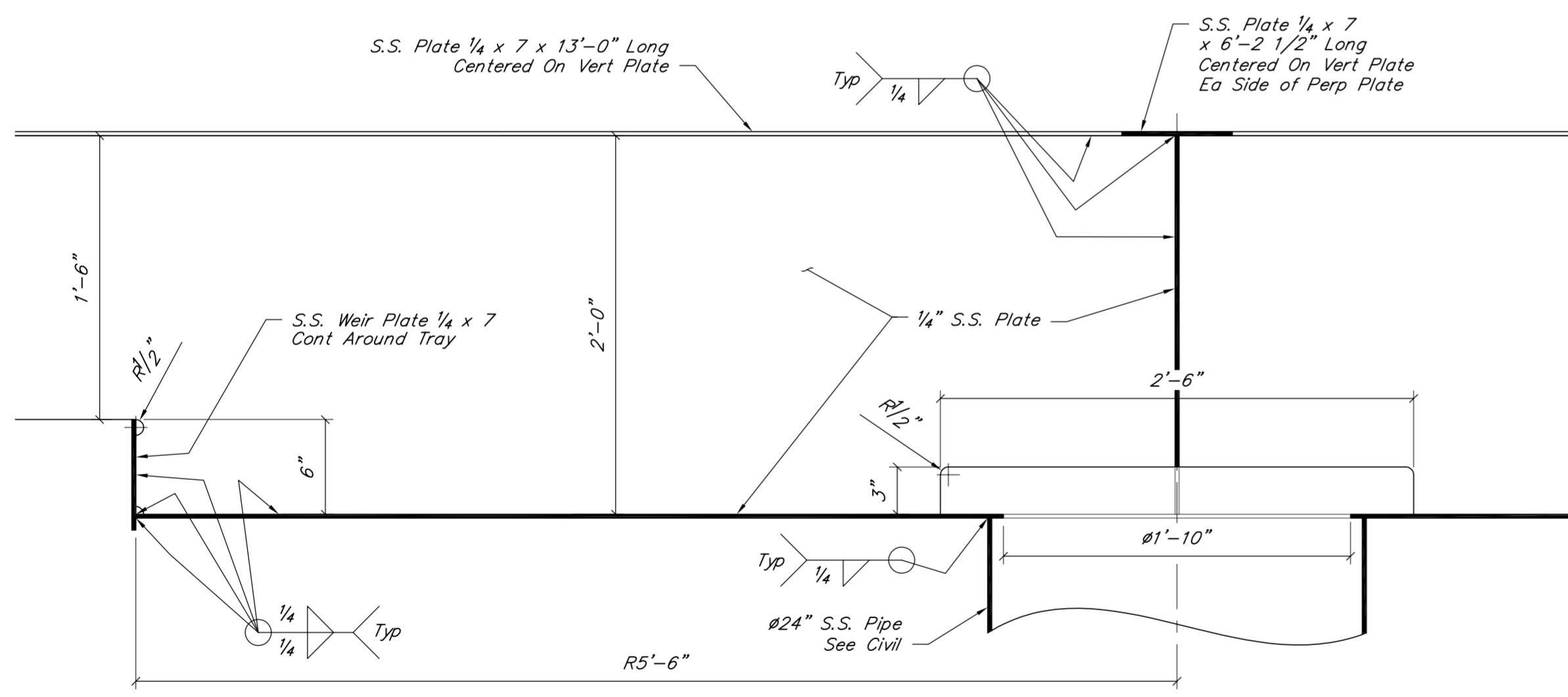
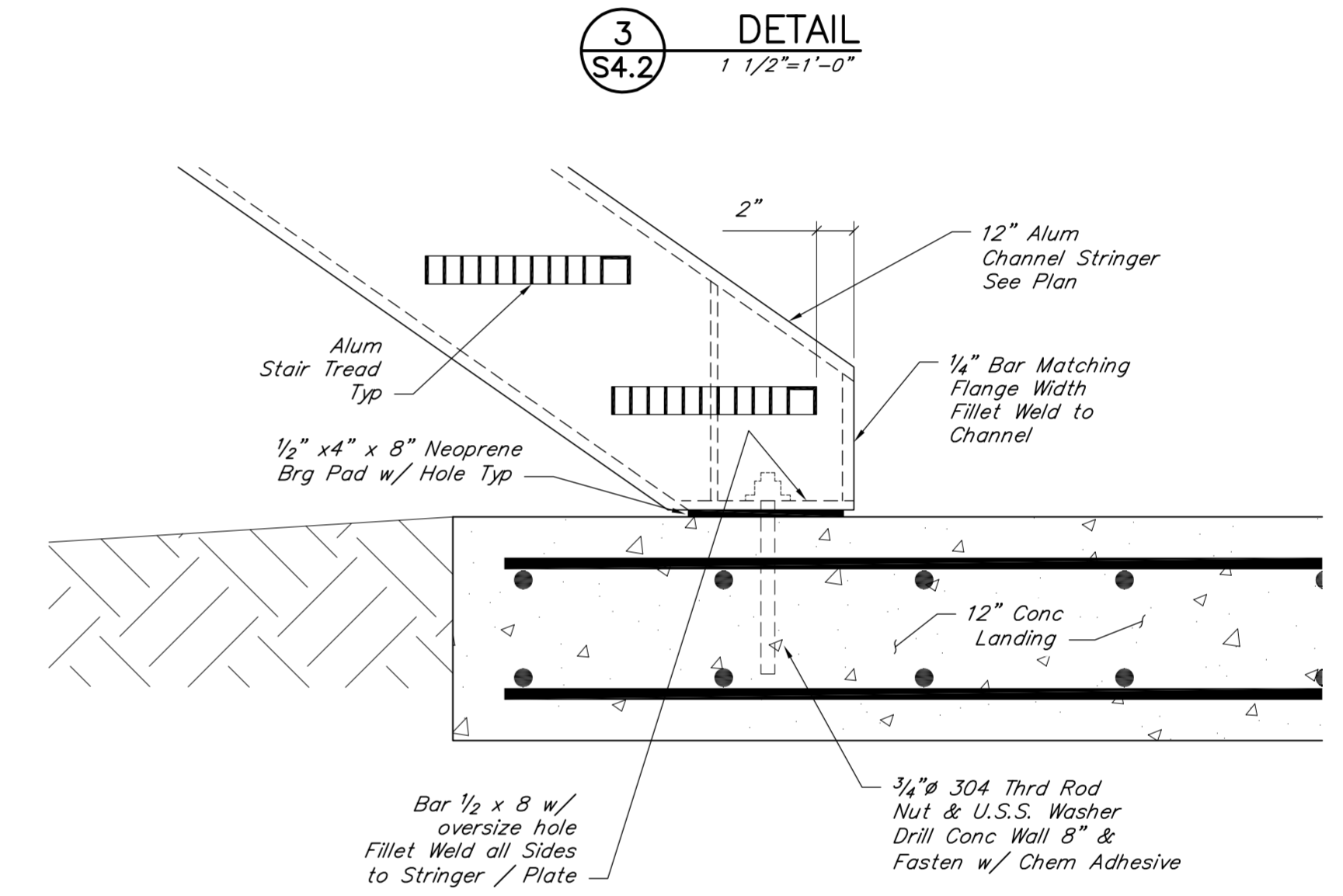
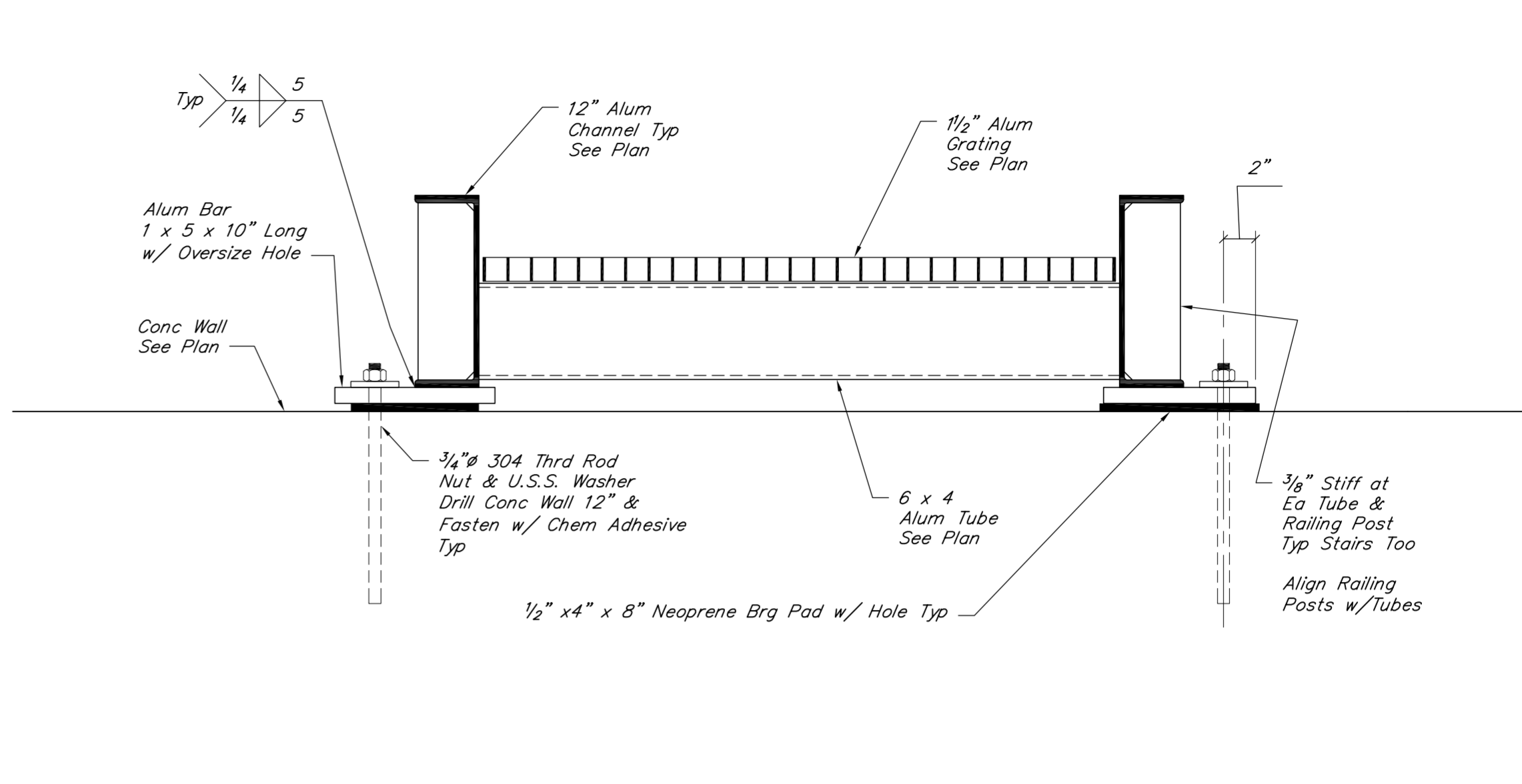
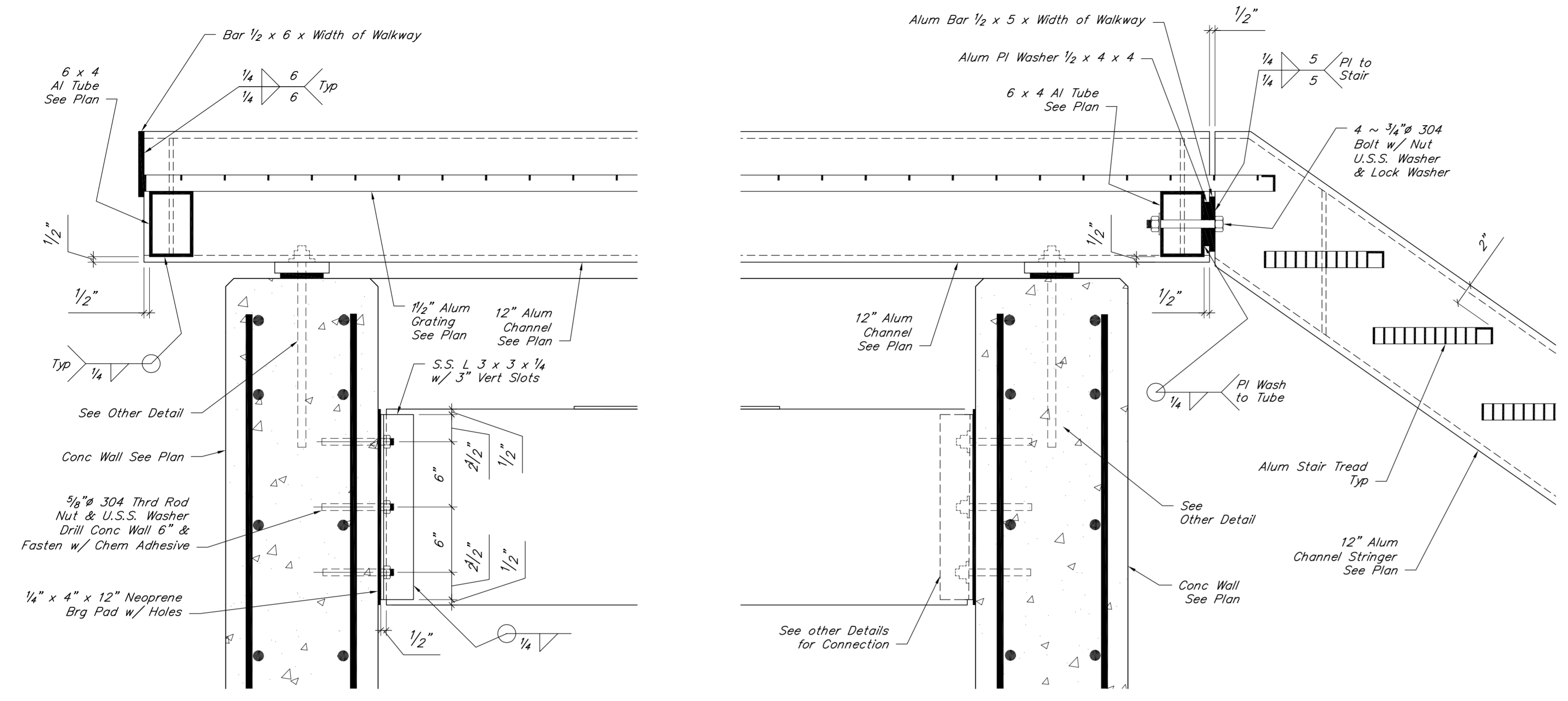
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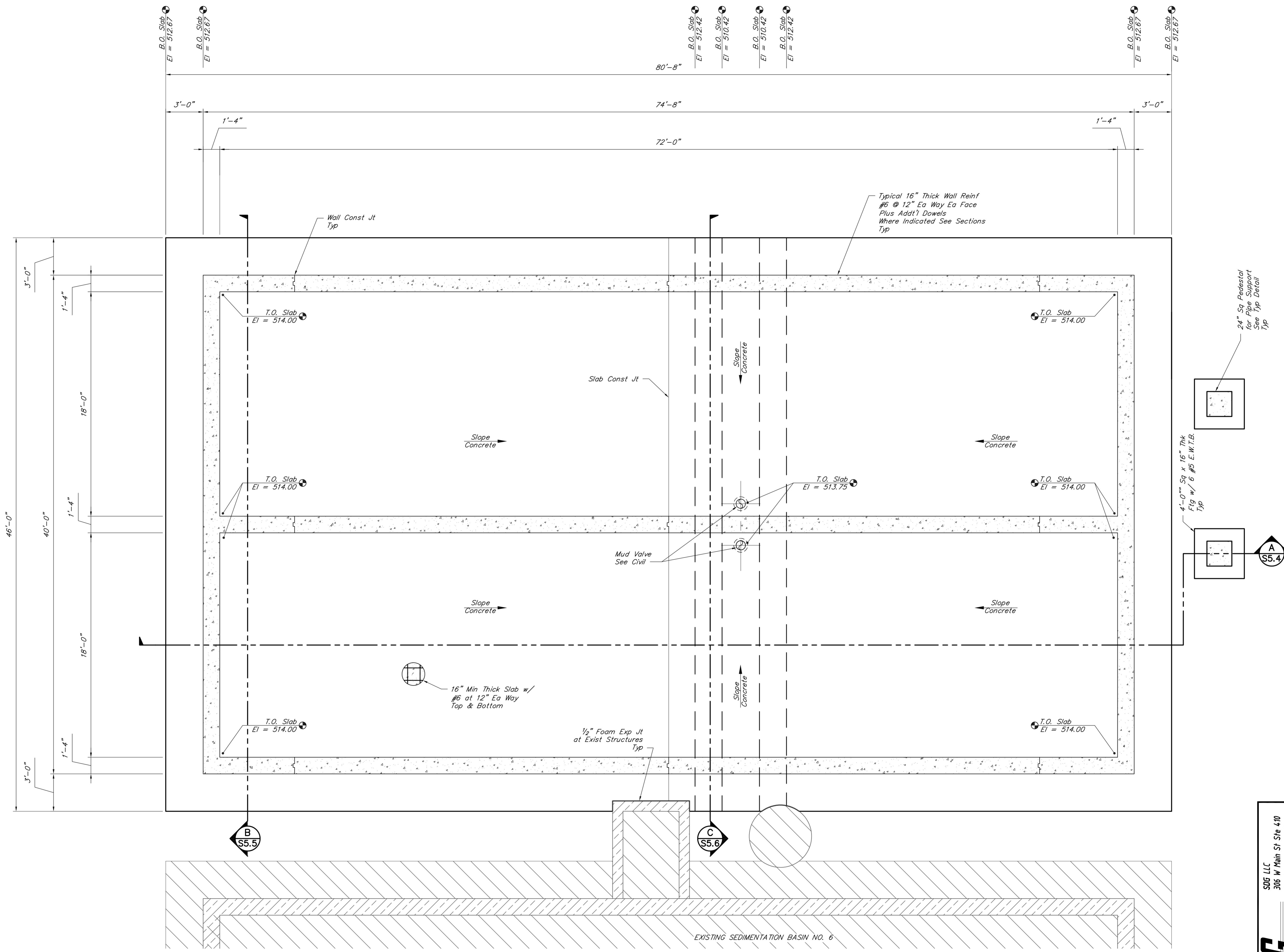


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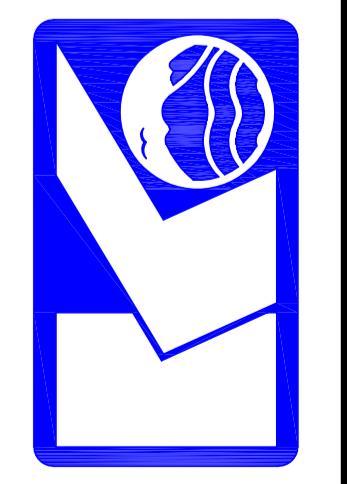
LOWER FOUNDATION/SLAB PLAN  
1/4"=1'-0"

GREEN RIVER VALLEY WATER DISTRICT  
WATER TREATMENT PLANT EXPANSION  
HART COUNTY, KENTUCKY



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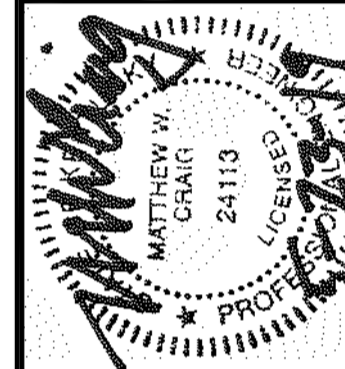
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S5.1

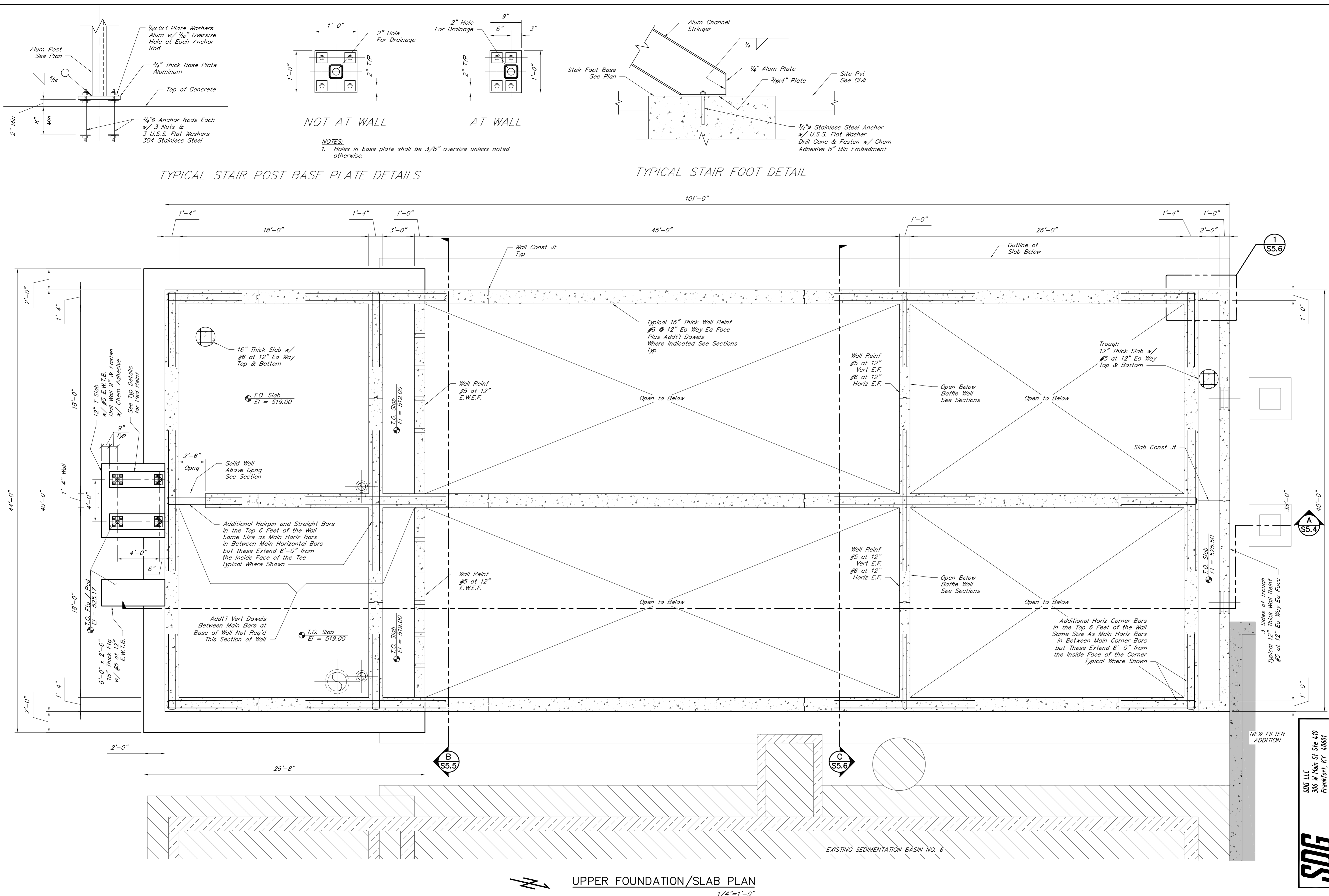
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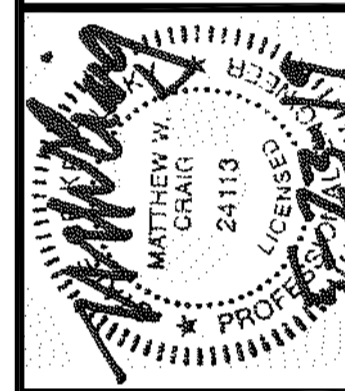


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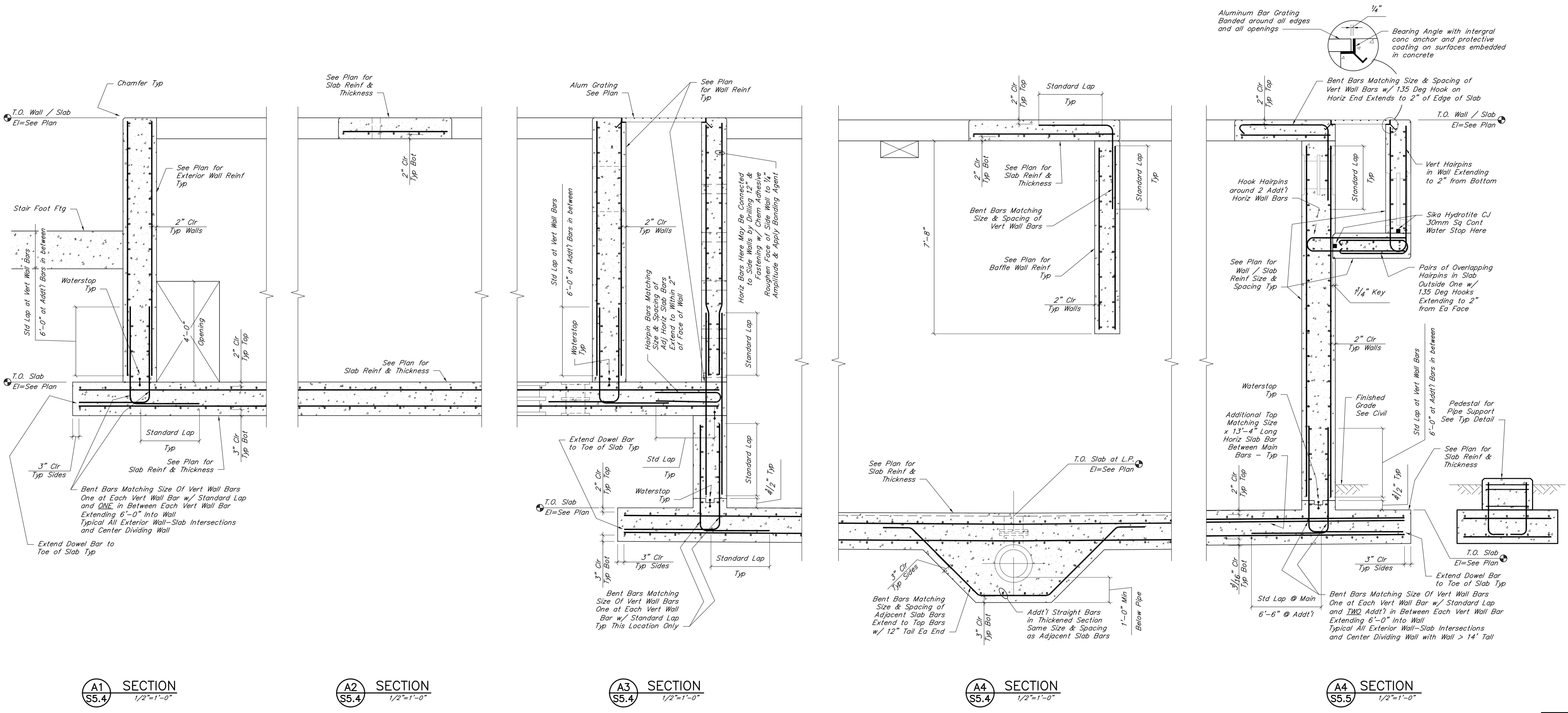




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**A1 SECTION**  
 S5.4 1/2"=1'-0"

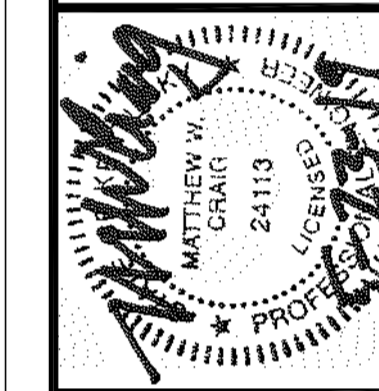
**A2 SECTION**  
 S5.4 1/2"=1'-0"

**A3 SECTION**  
 S5.4 1/2"=1'-0"

**A4 SECTION**  
 S5.4 1/2"=1'-0"

**A4 SECTION**  
 S5.5 1/2"=1'-0"



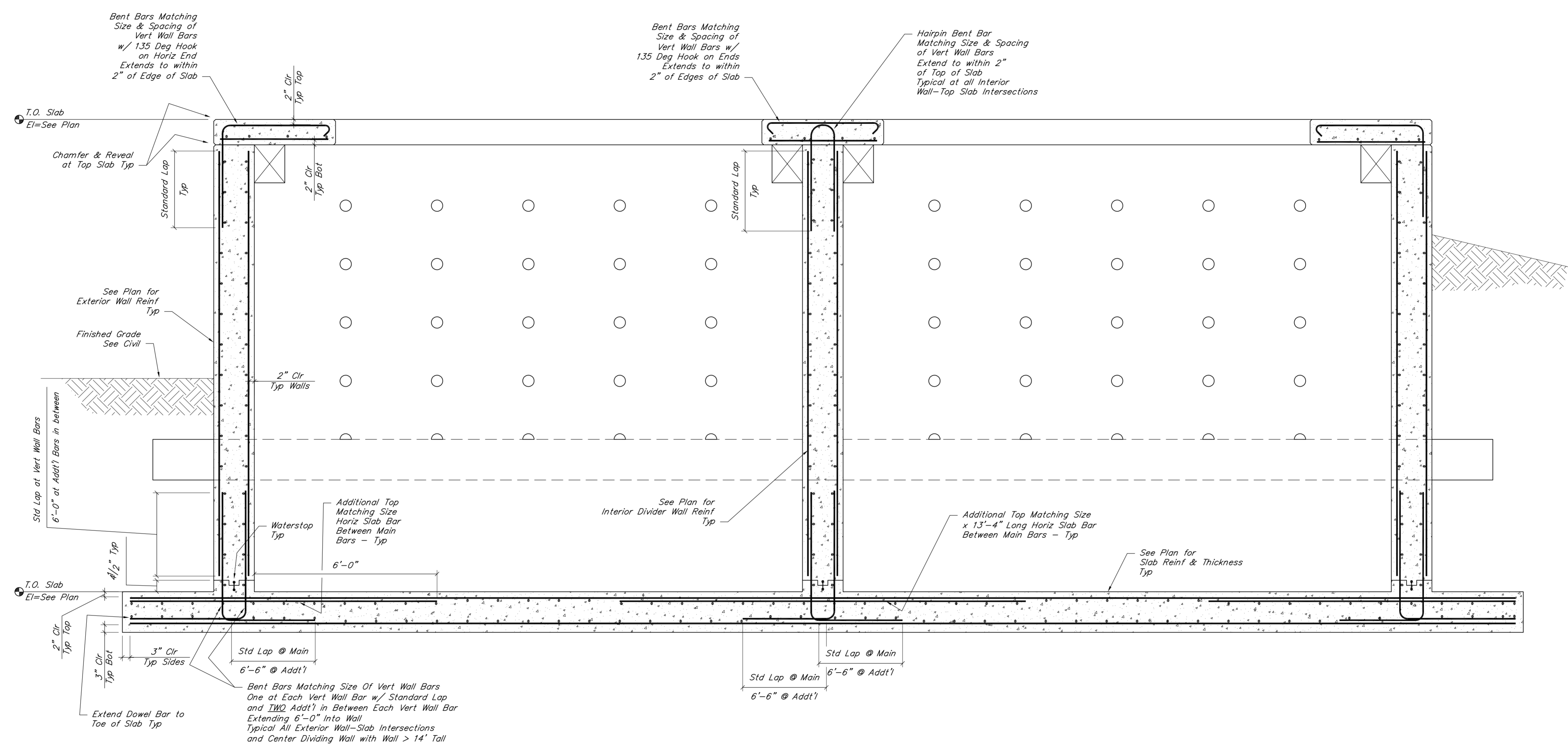


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DATE: MAY 2019
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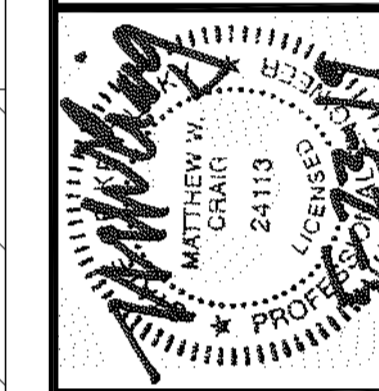
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 SHEET NO.  
 S5.5



**B** SECTION  
 S5.5 1/2"=1'-0"

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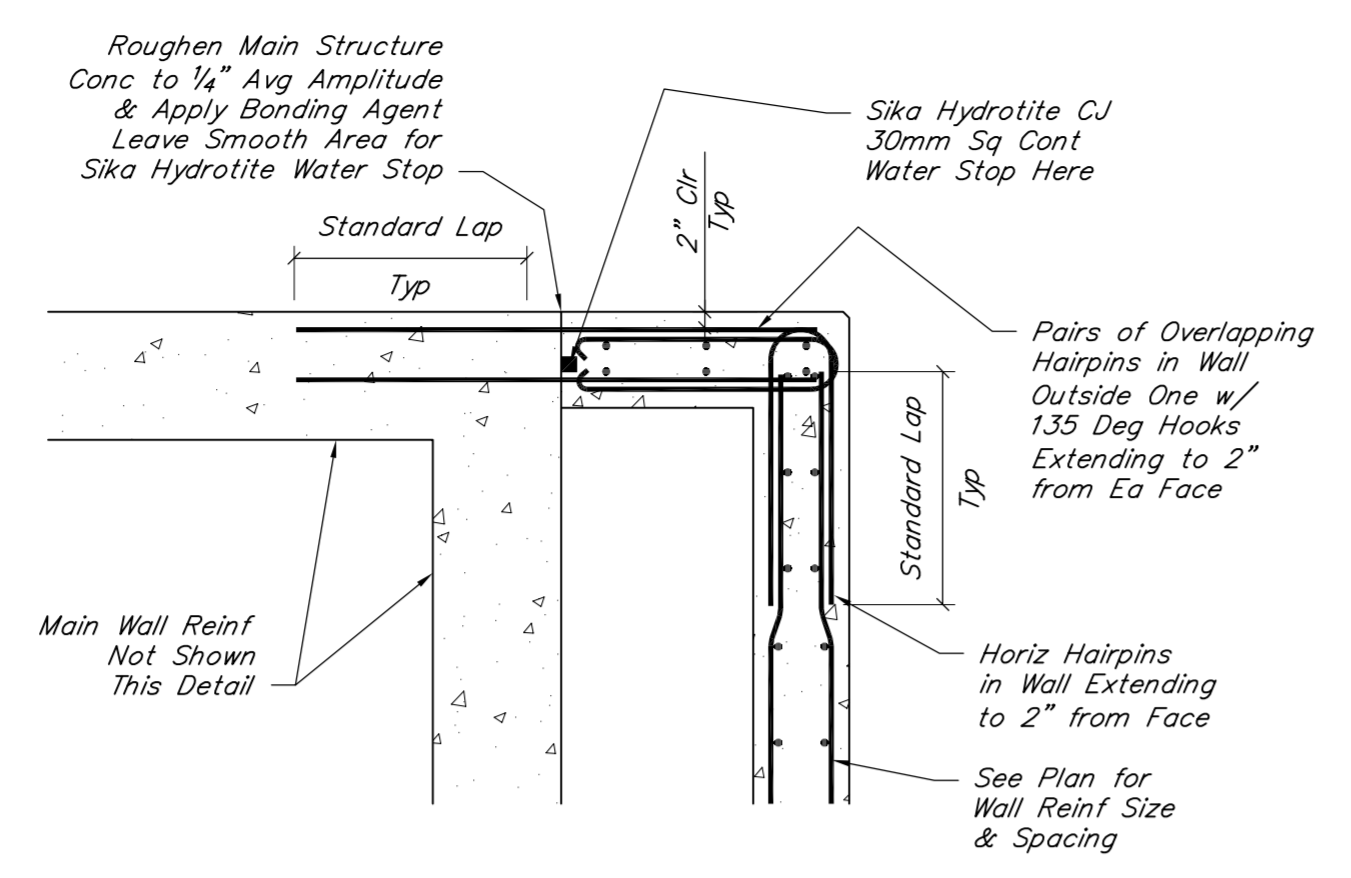


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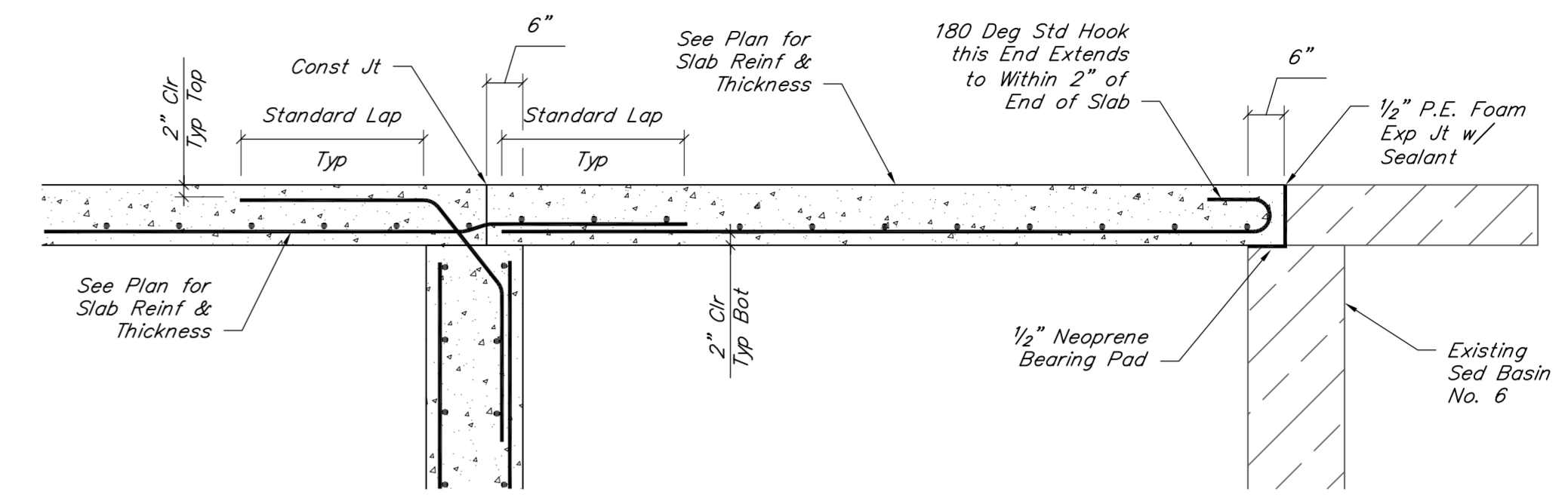
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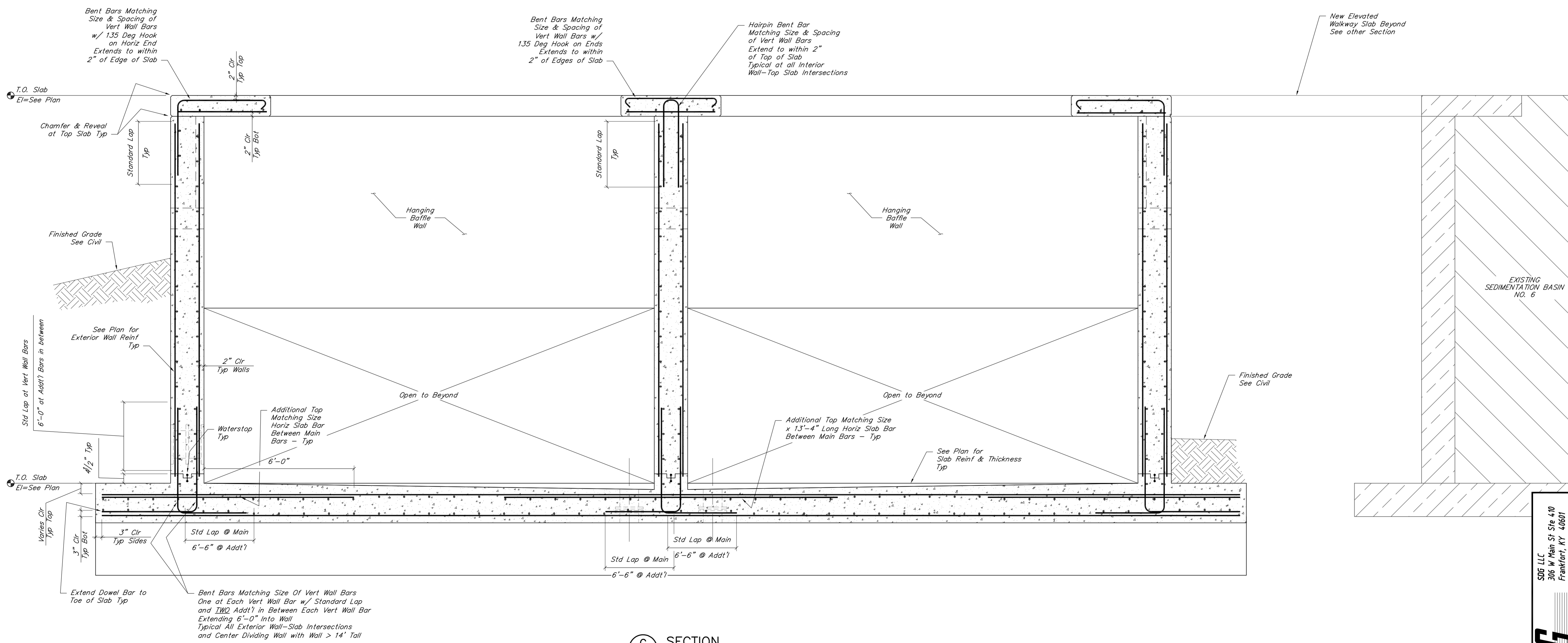
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2014042  
SHEET NO.  
S5.6



**1 SECTION**  
S5.6  
1/2"=1'-0"



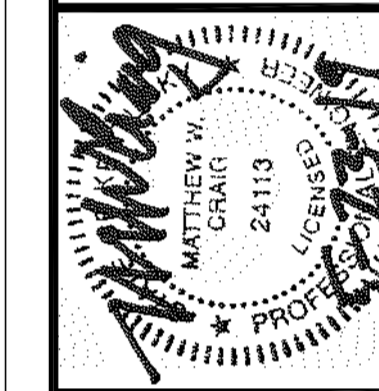
**2 SECTION**  
S5.6  
1/2"=1'-0"



**C SECTION**  
S5.6  
1/2"=1'-0"

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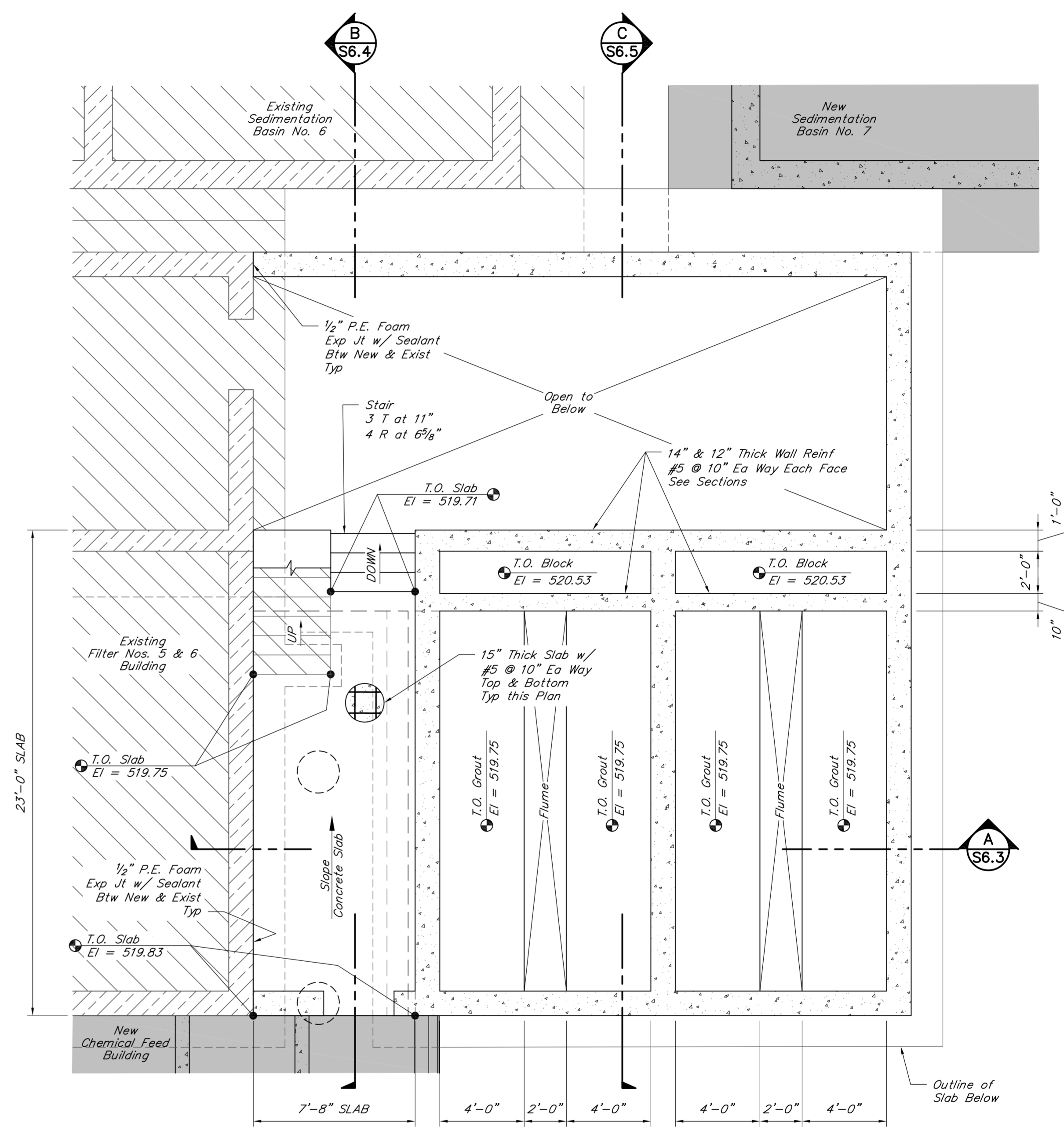




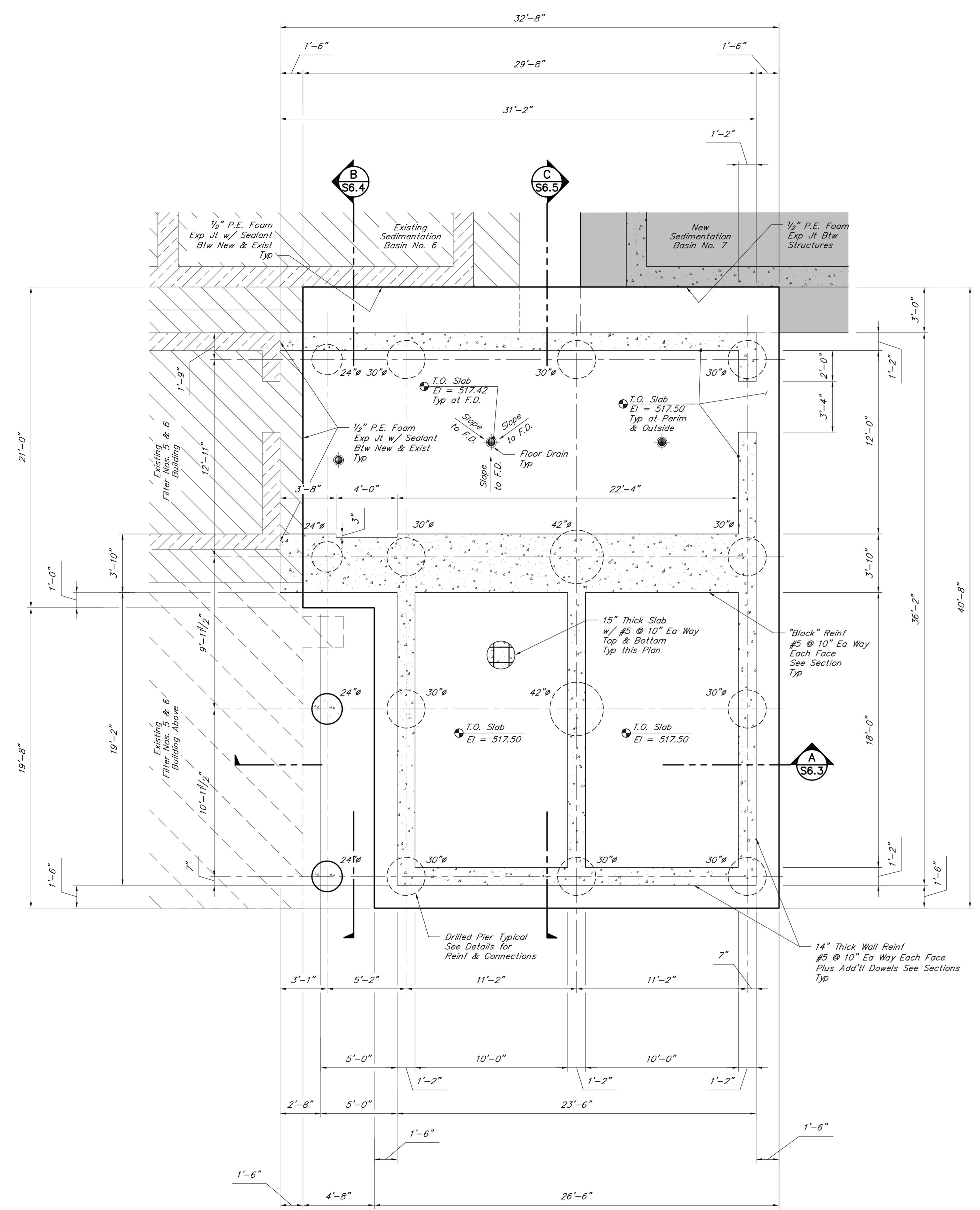
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UPPER FOUNDATION PLAN  
 1/4"=1'-0"



LOWER FOUNDATION PLAN  
 1/4"=1'-0"

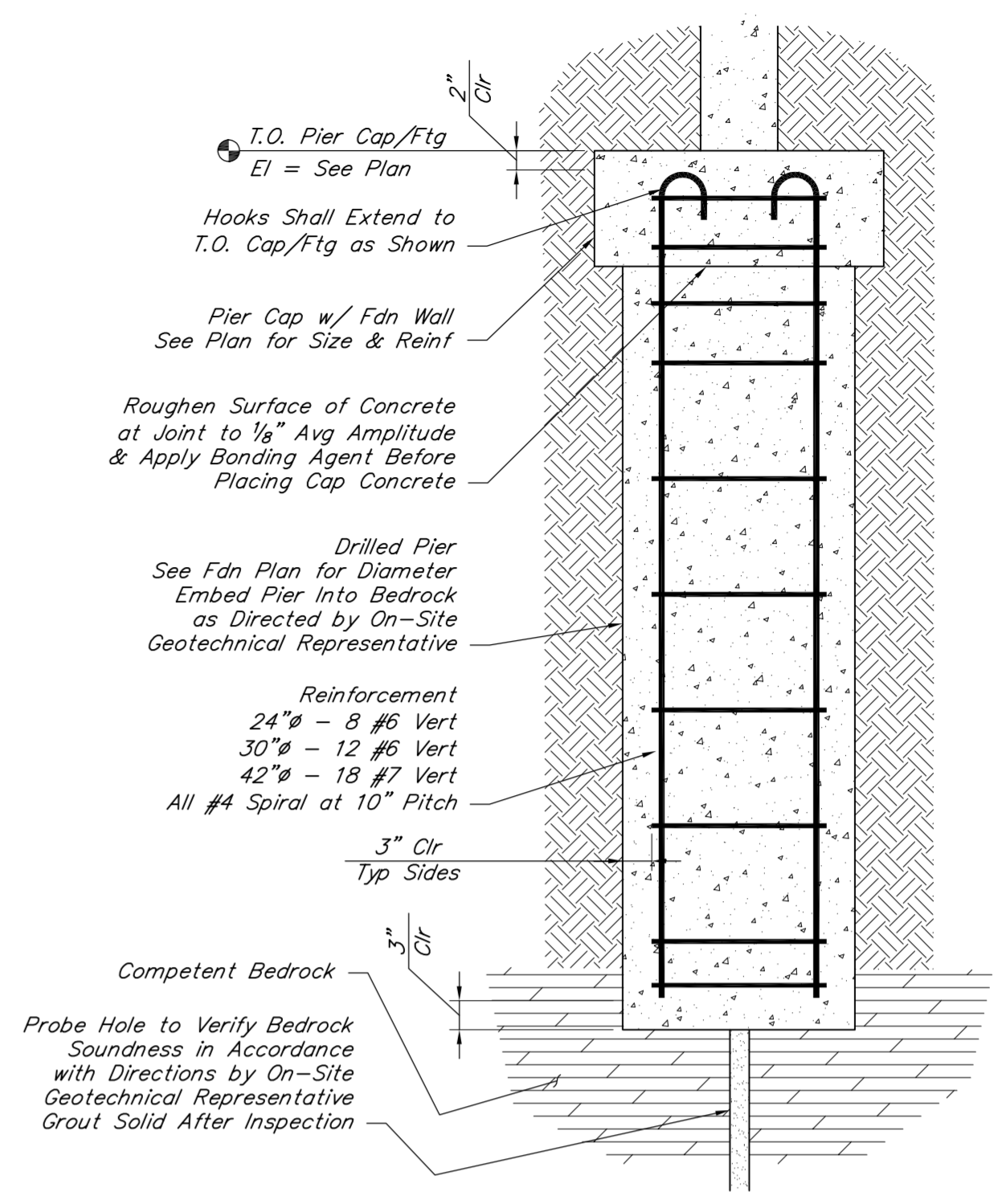
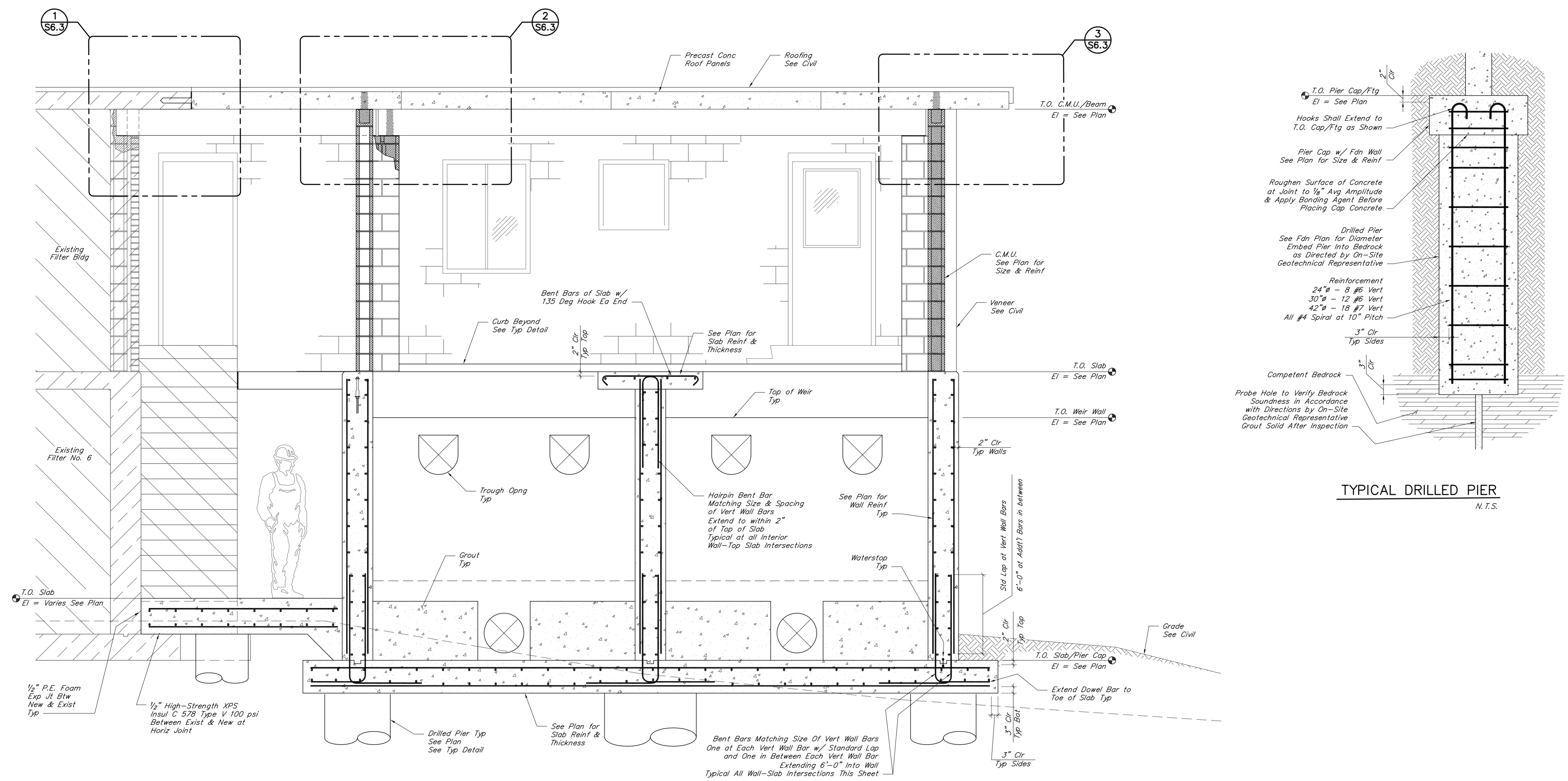




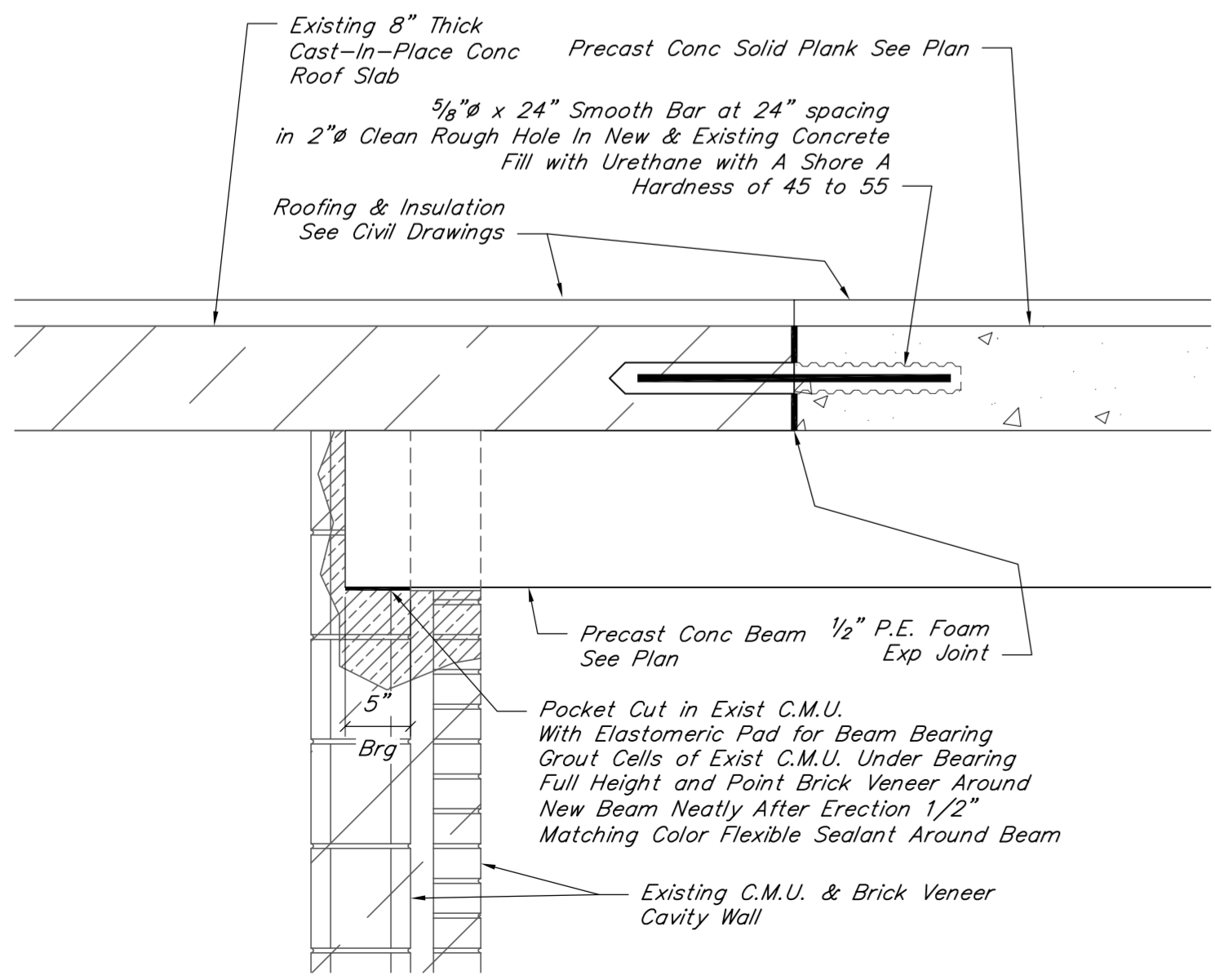




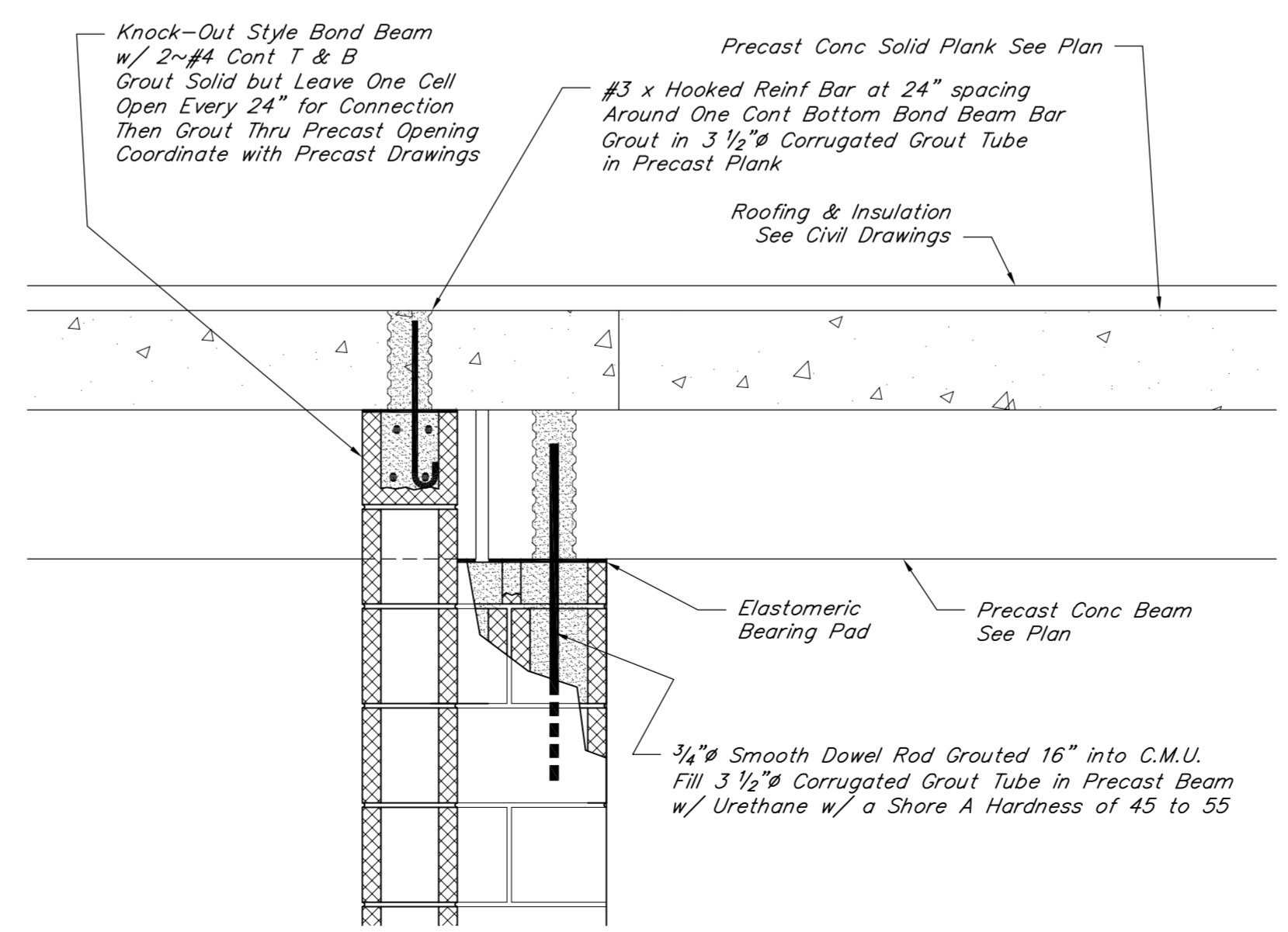
DRAWN BY: AN/AMC
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DATE: MAY 2019
SCALE: AS NOTED
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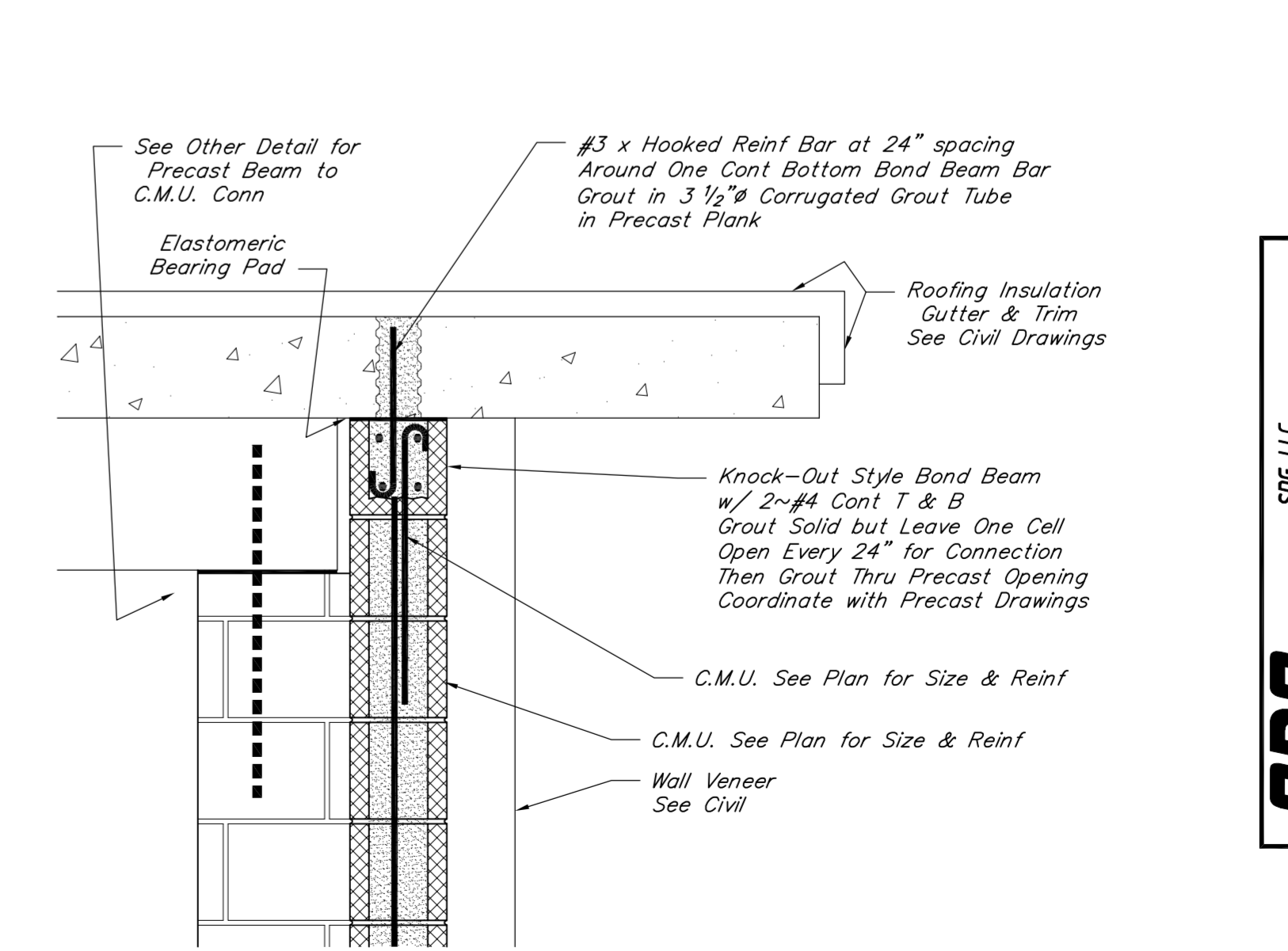
**A SECTION**  
1/2"=1'-0"



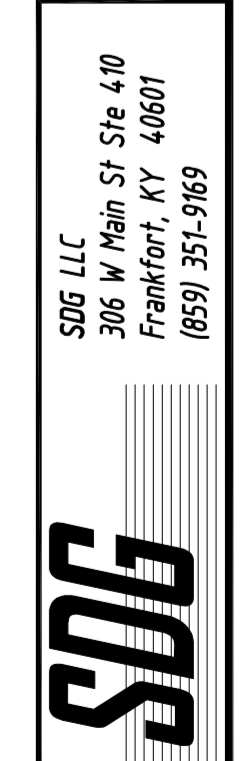
**1 DETAIL**  
1/2"=1'-0"



**2 DETAIL**  
1/2"=1'-0"

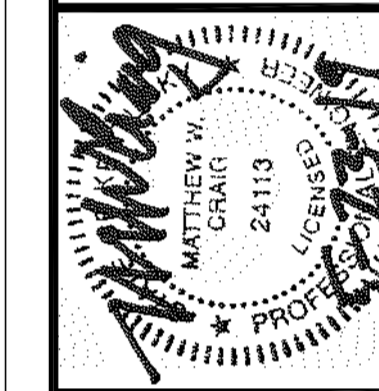


**3 DETAIL**  
1/2"=1'-0"

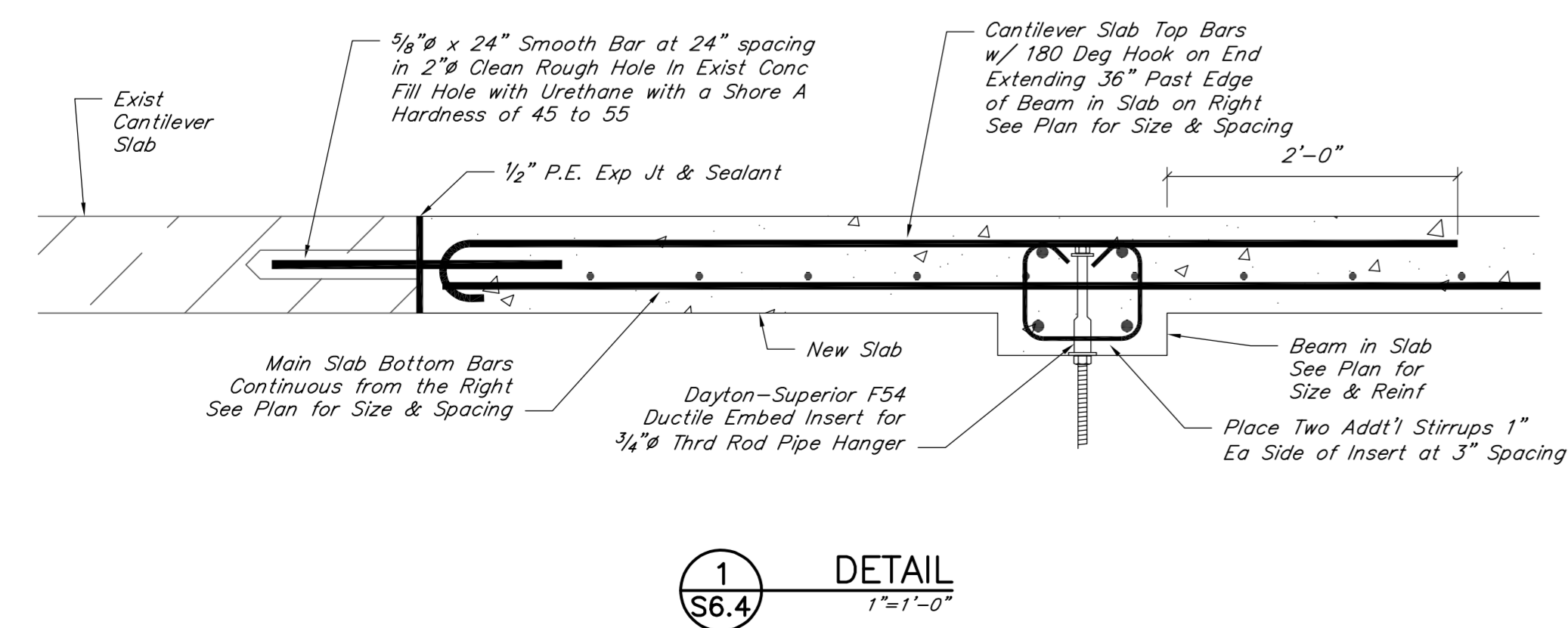
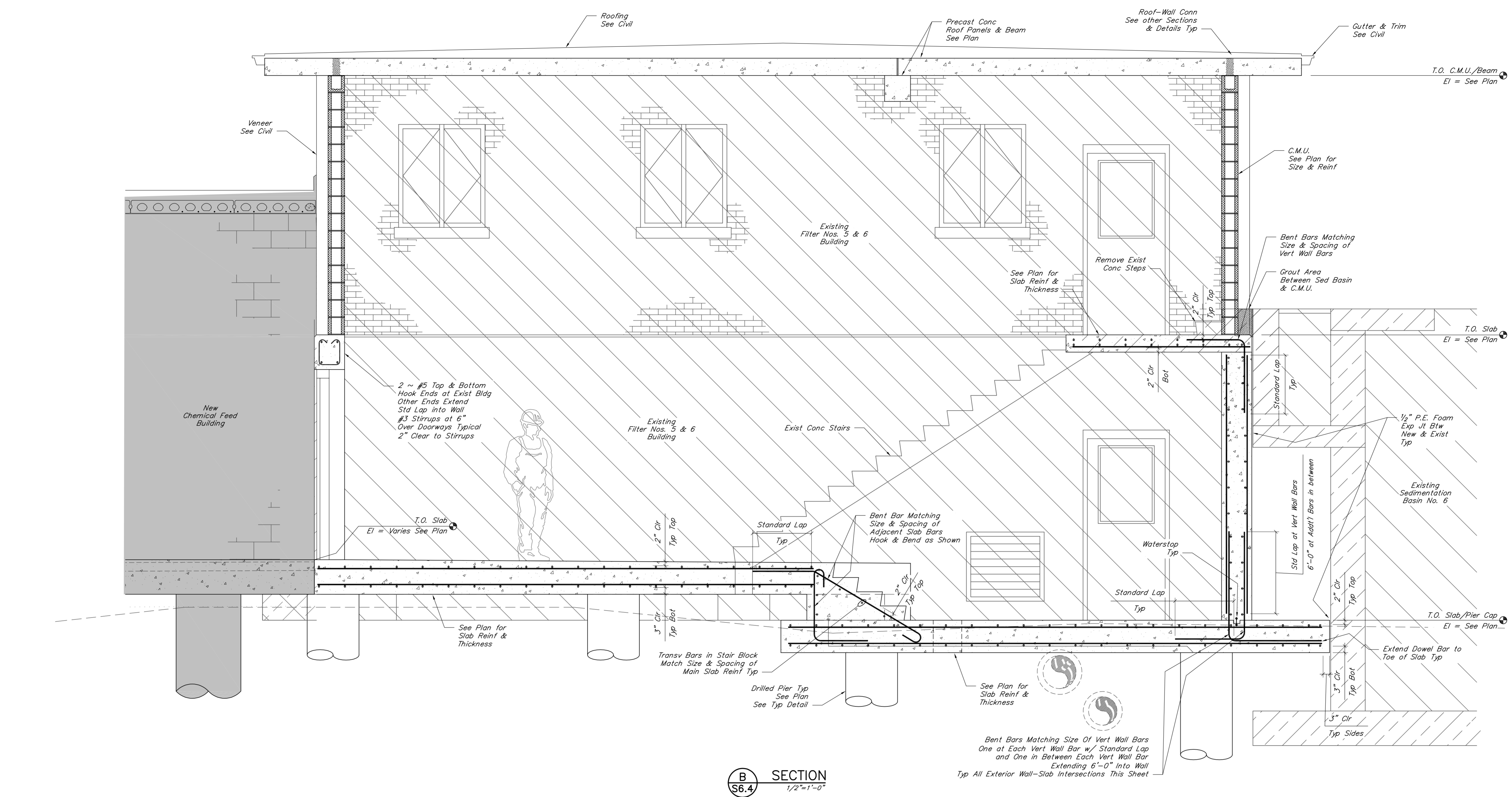


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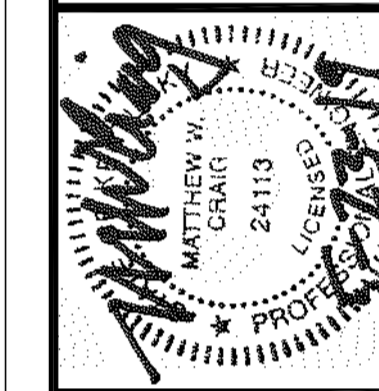


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DATE: MAY 2019
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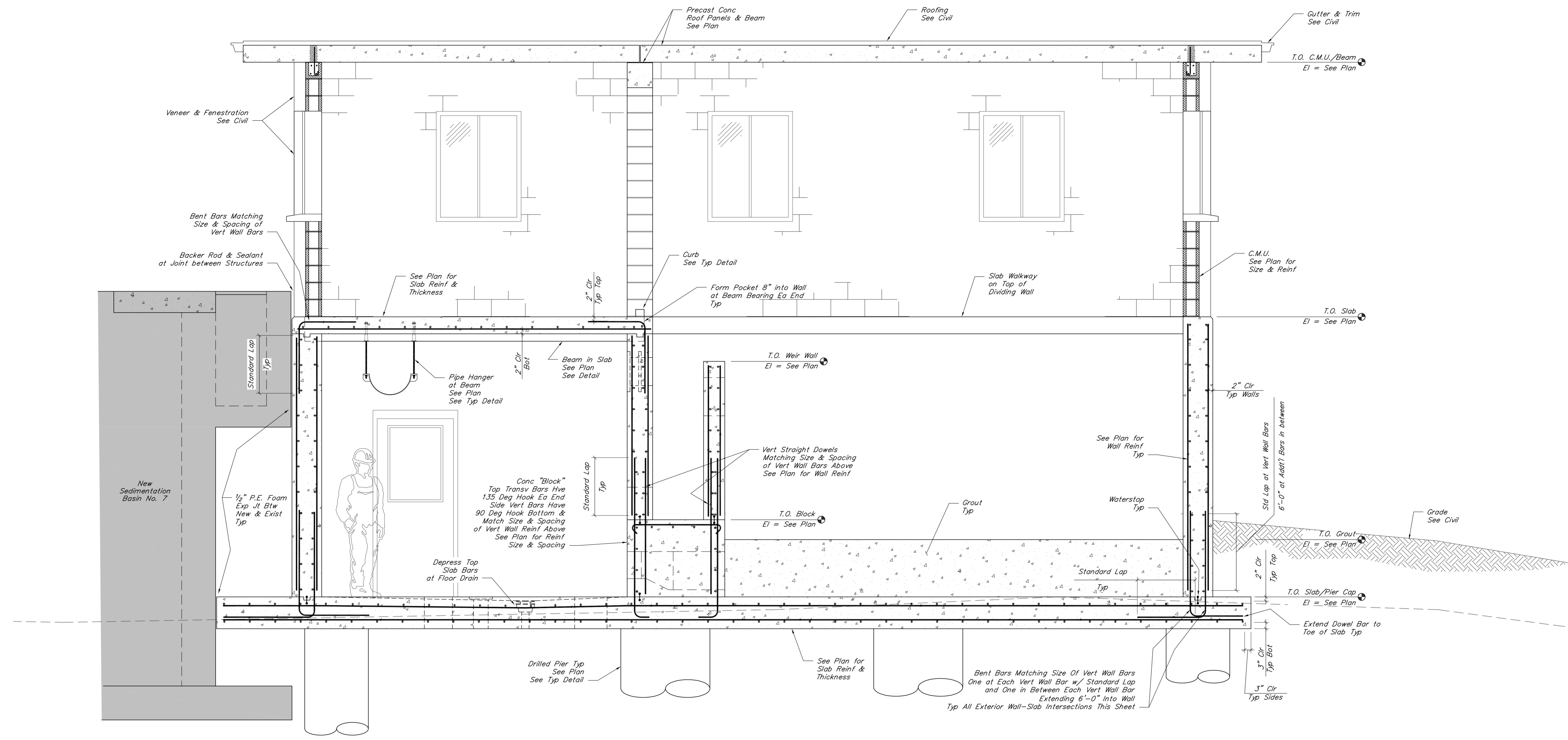




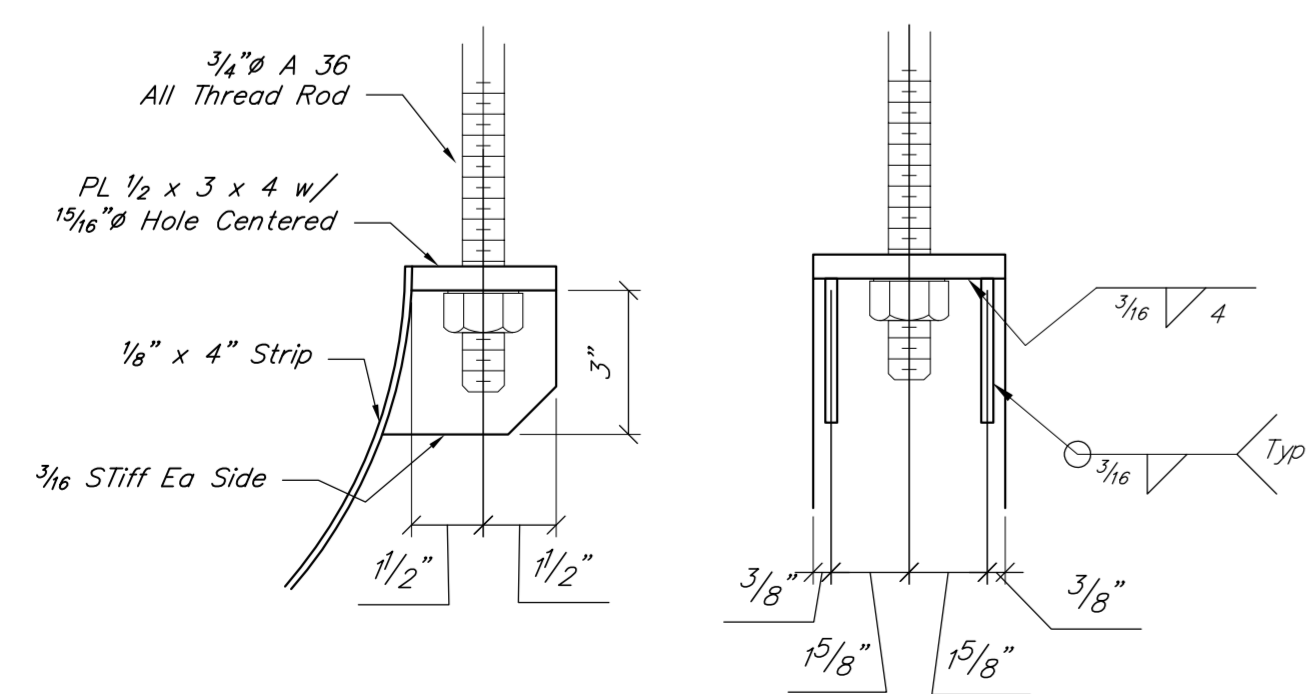
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**B** SECTION  
 S6.4  
 1/2"=1'-0"



TYPICAL PIPE STRAP SADDLE  
 Not to Scale



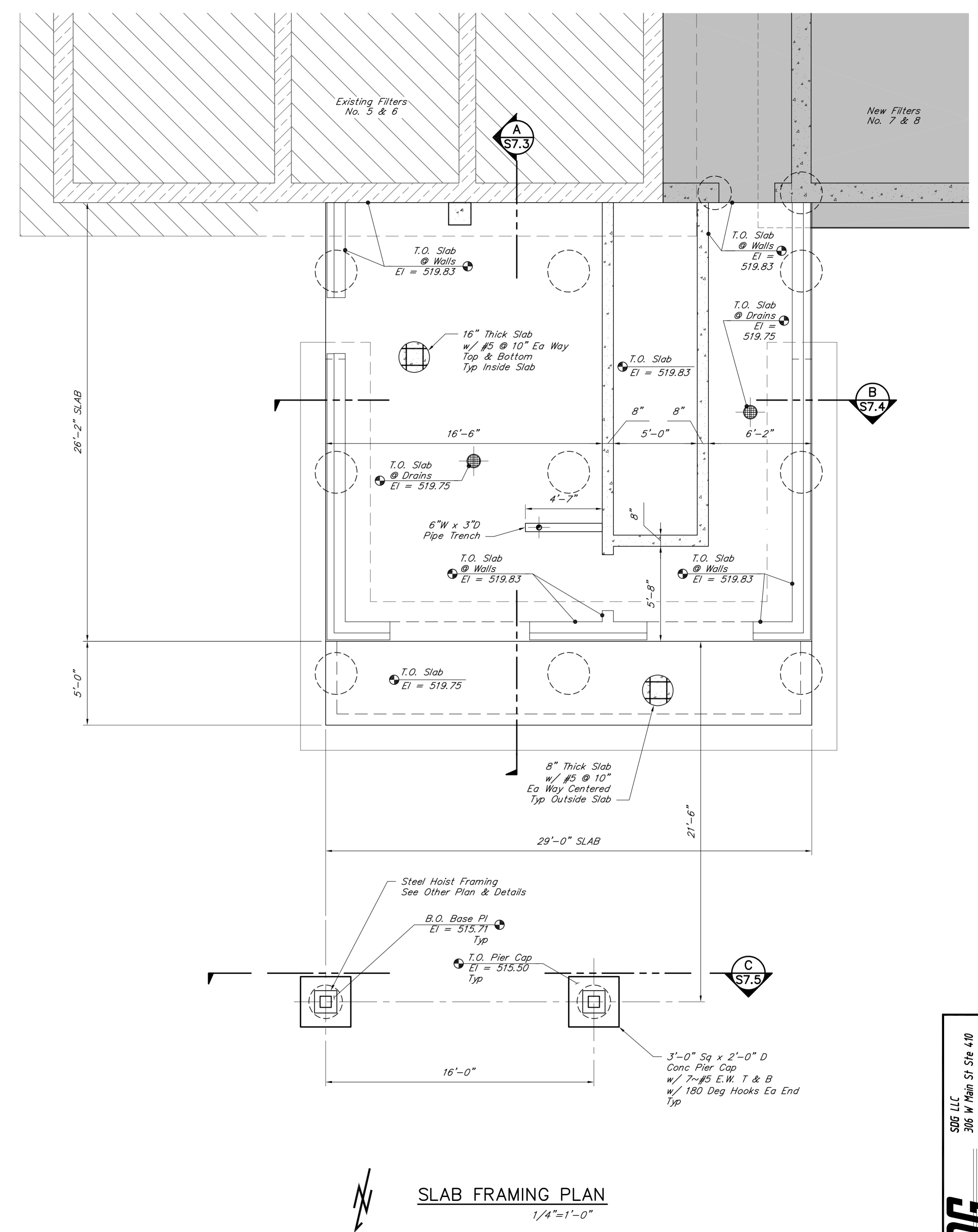
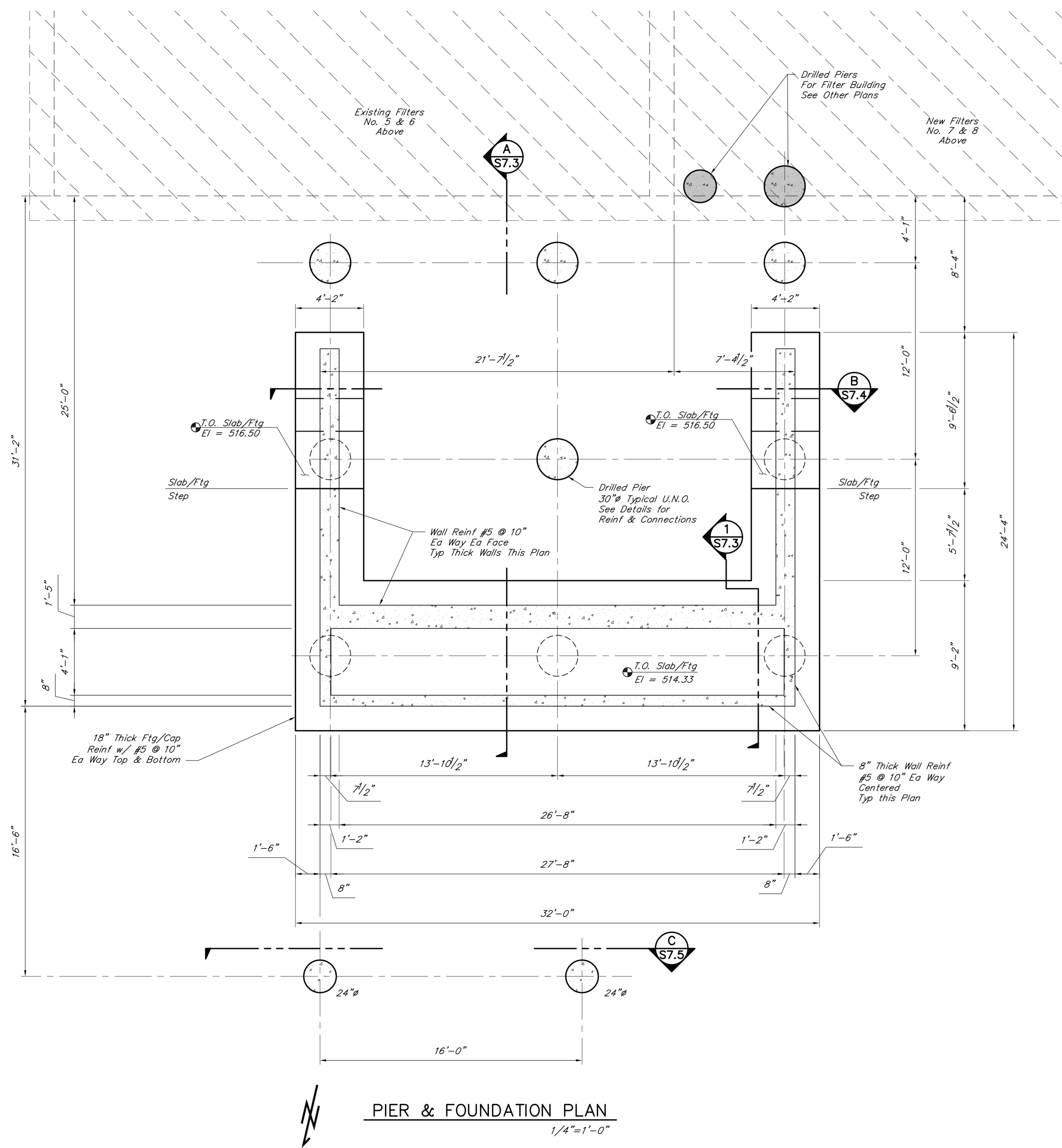


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 FRANKFORT, KENTUCKY



PROJECT NO.  
 2014042  
 SHEET NO.  
 S7.1

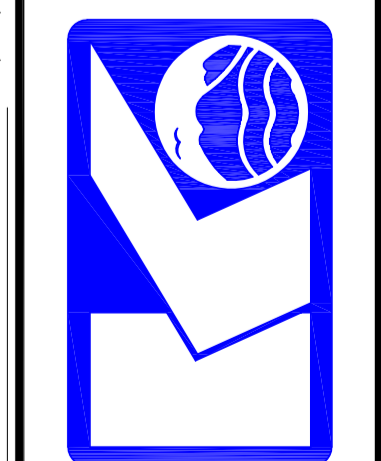


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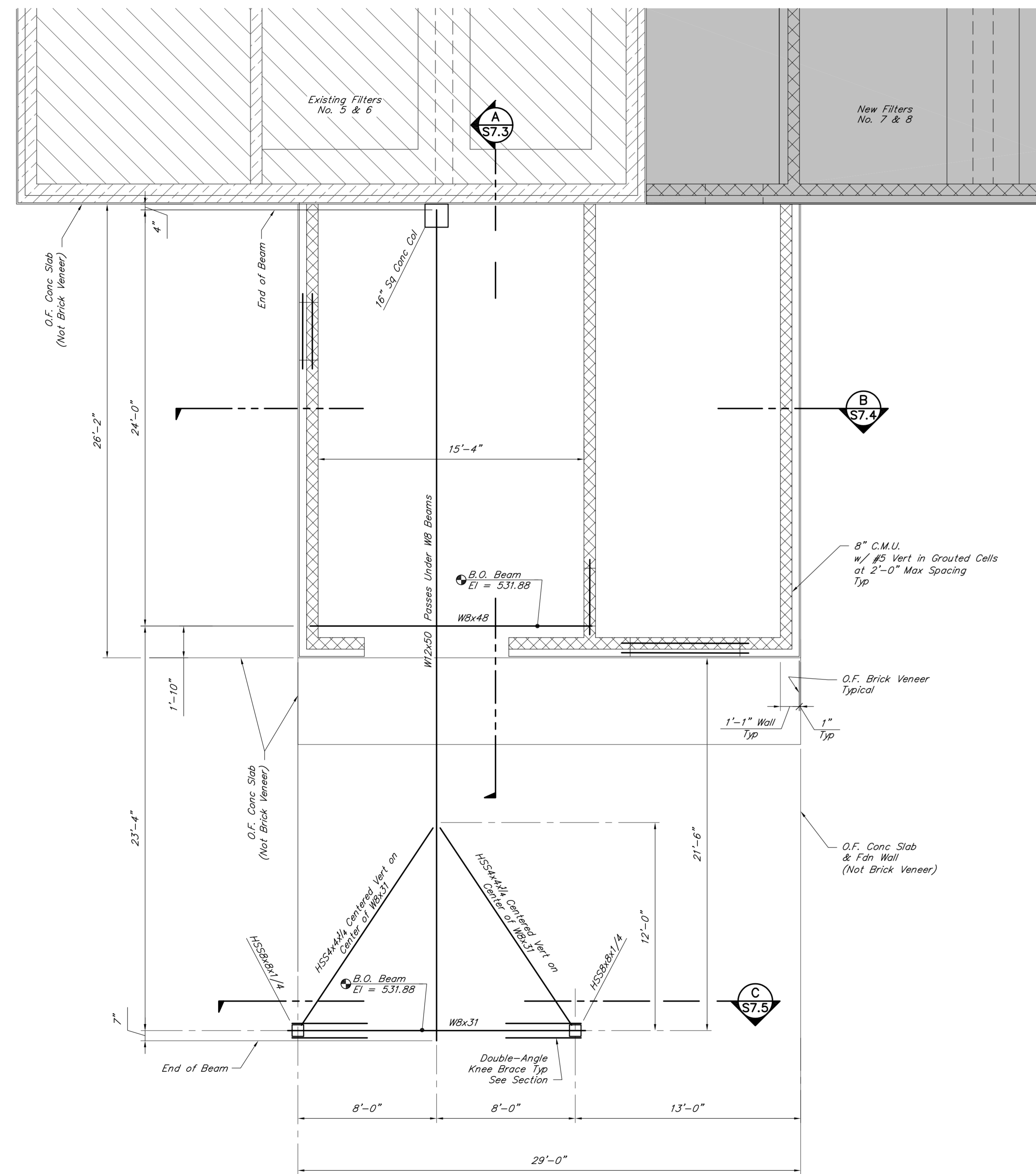




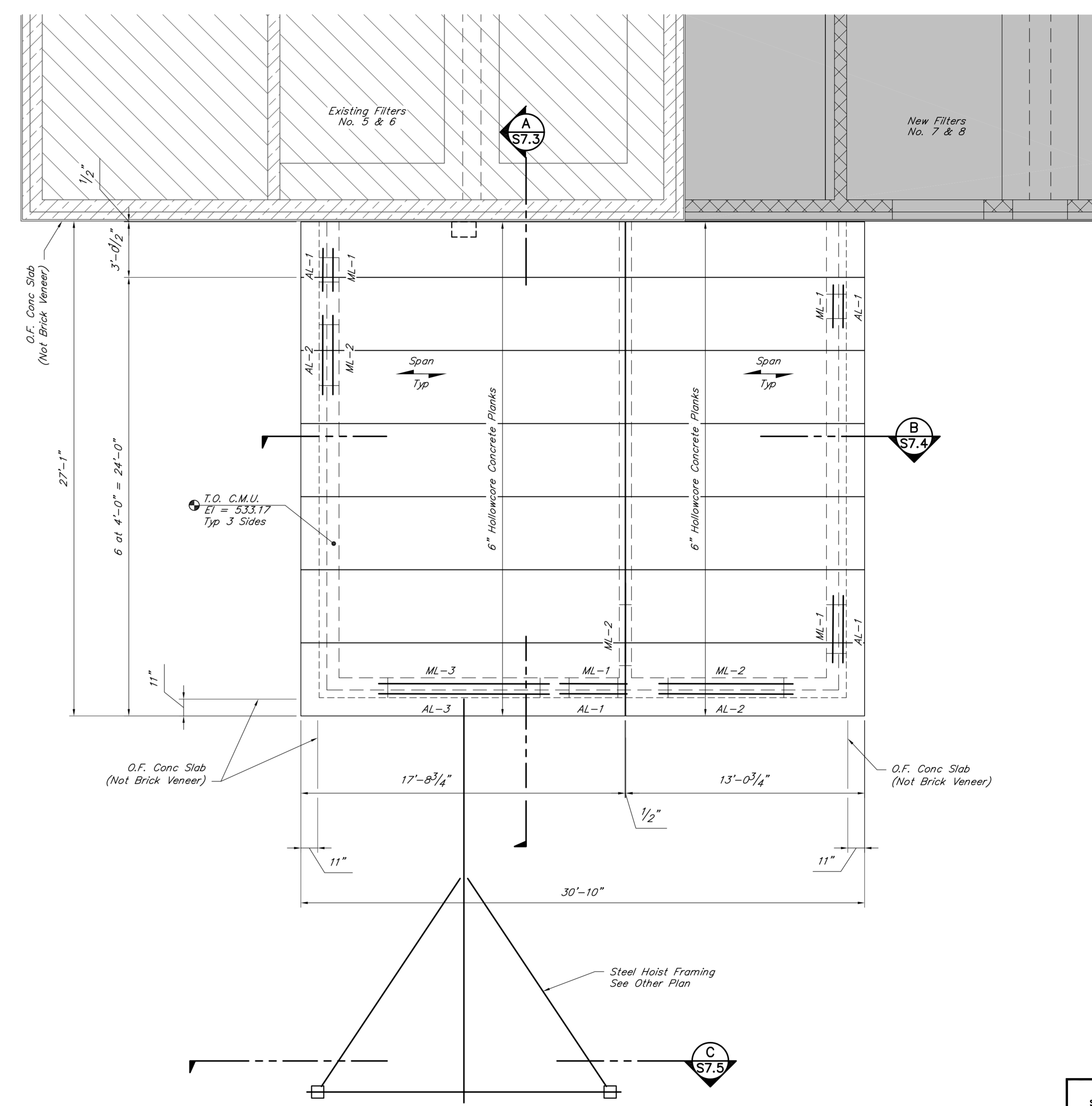
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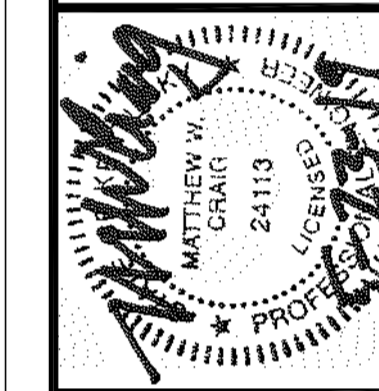


**HOIST FRAMING PLAN**  
 1/4"=1'-0"

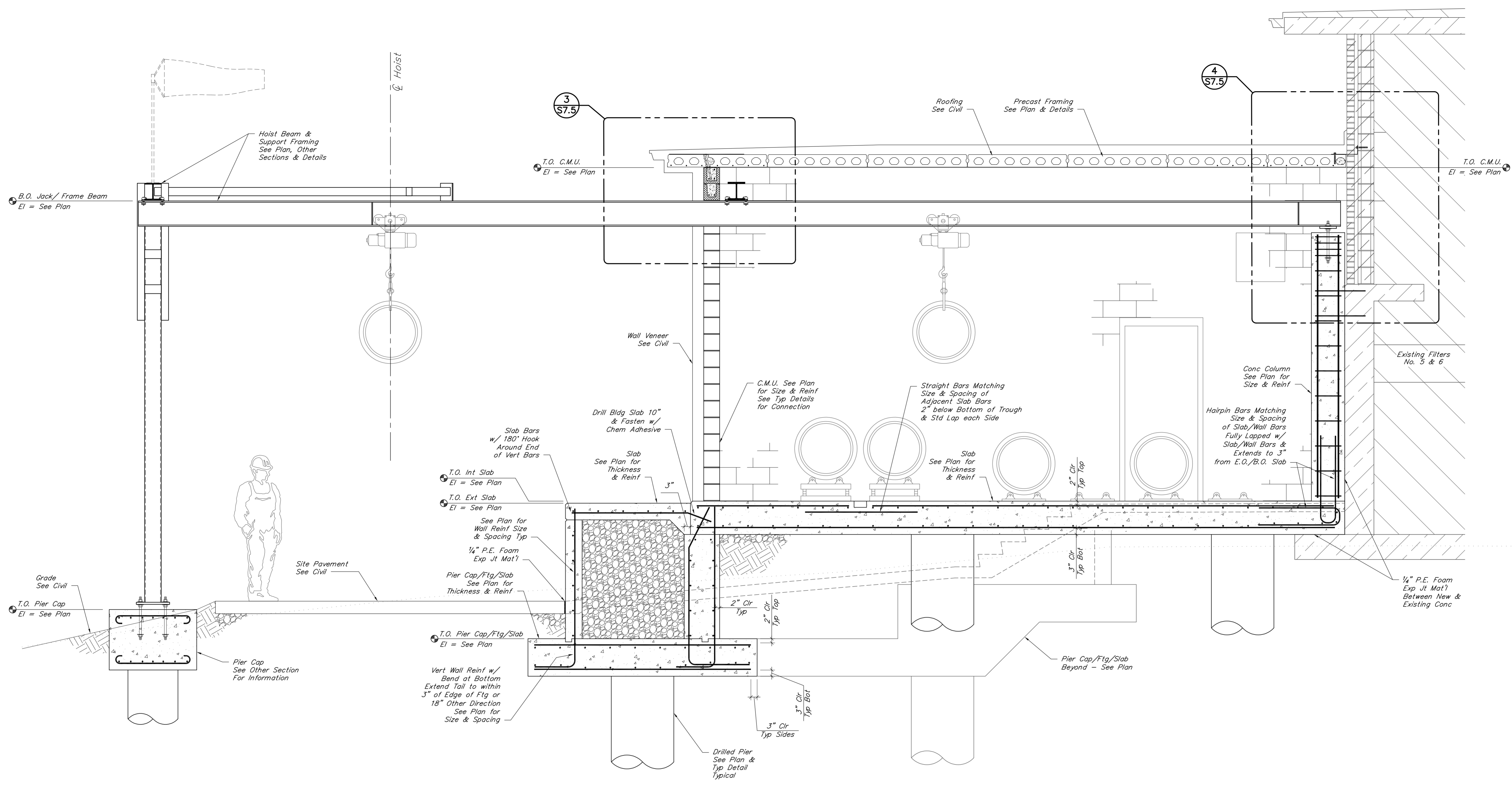


**ROOF FRAMING PLAN**  
 1/4"=1'-0"

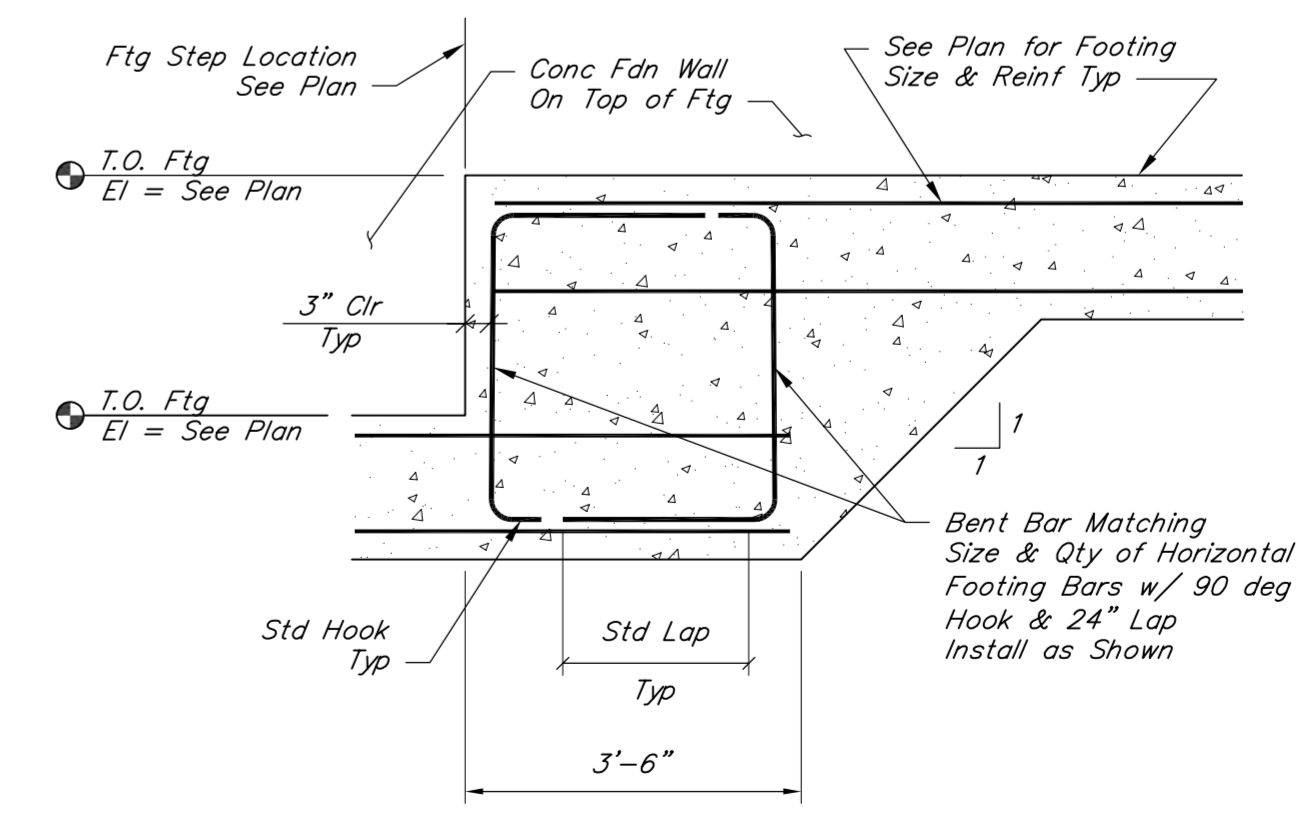




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**BUILDING SECTION**  
1/2"=1'-0"

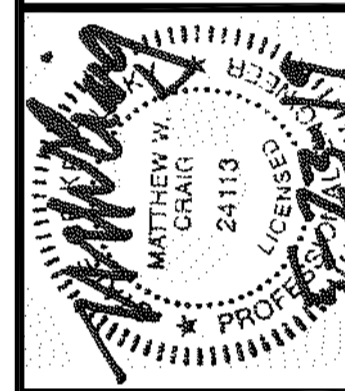


**TYPICAL FOOTING STEP**  
N.T.S.

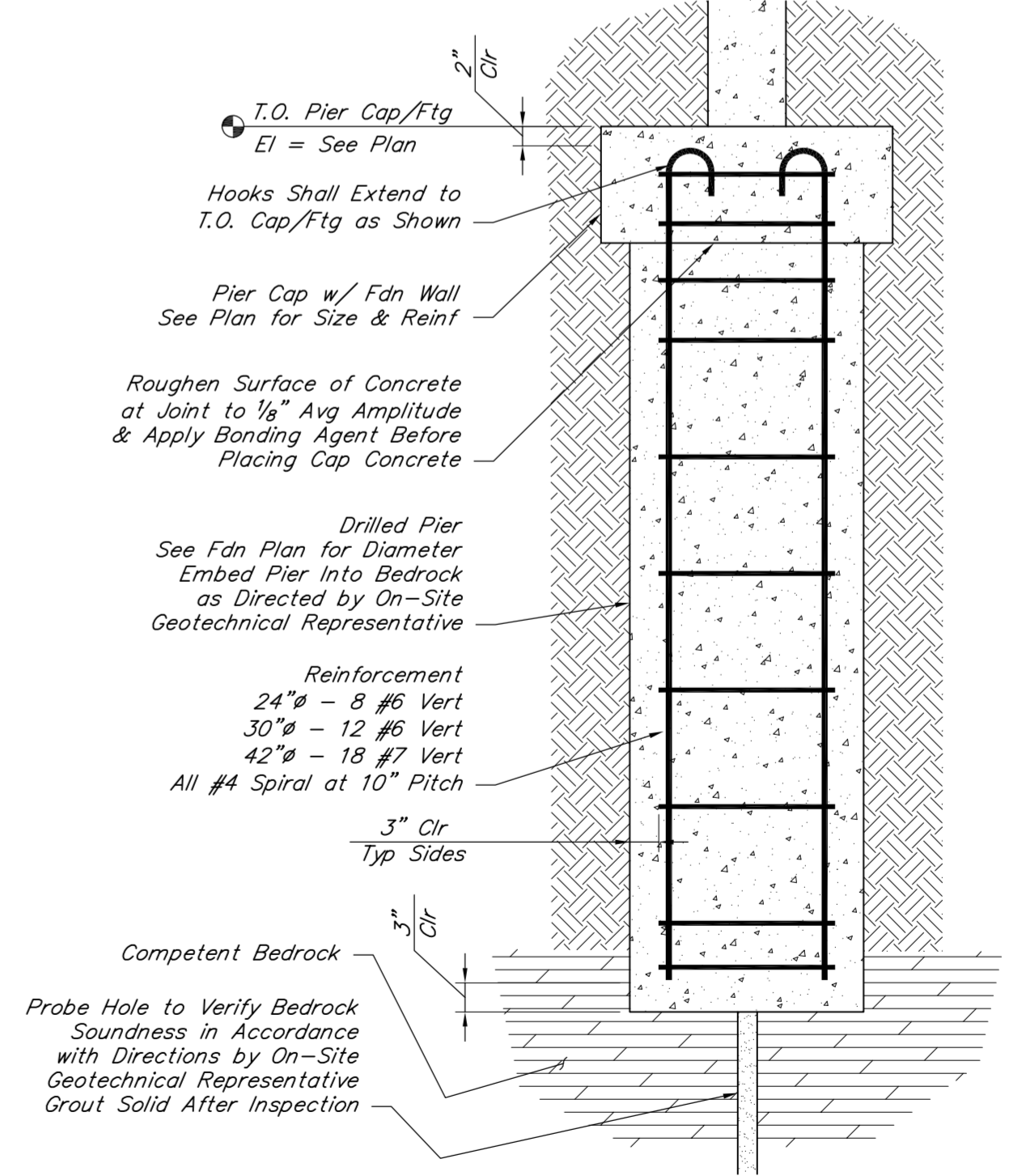
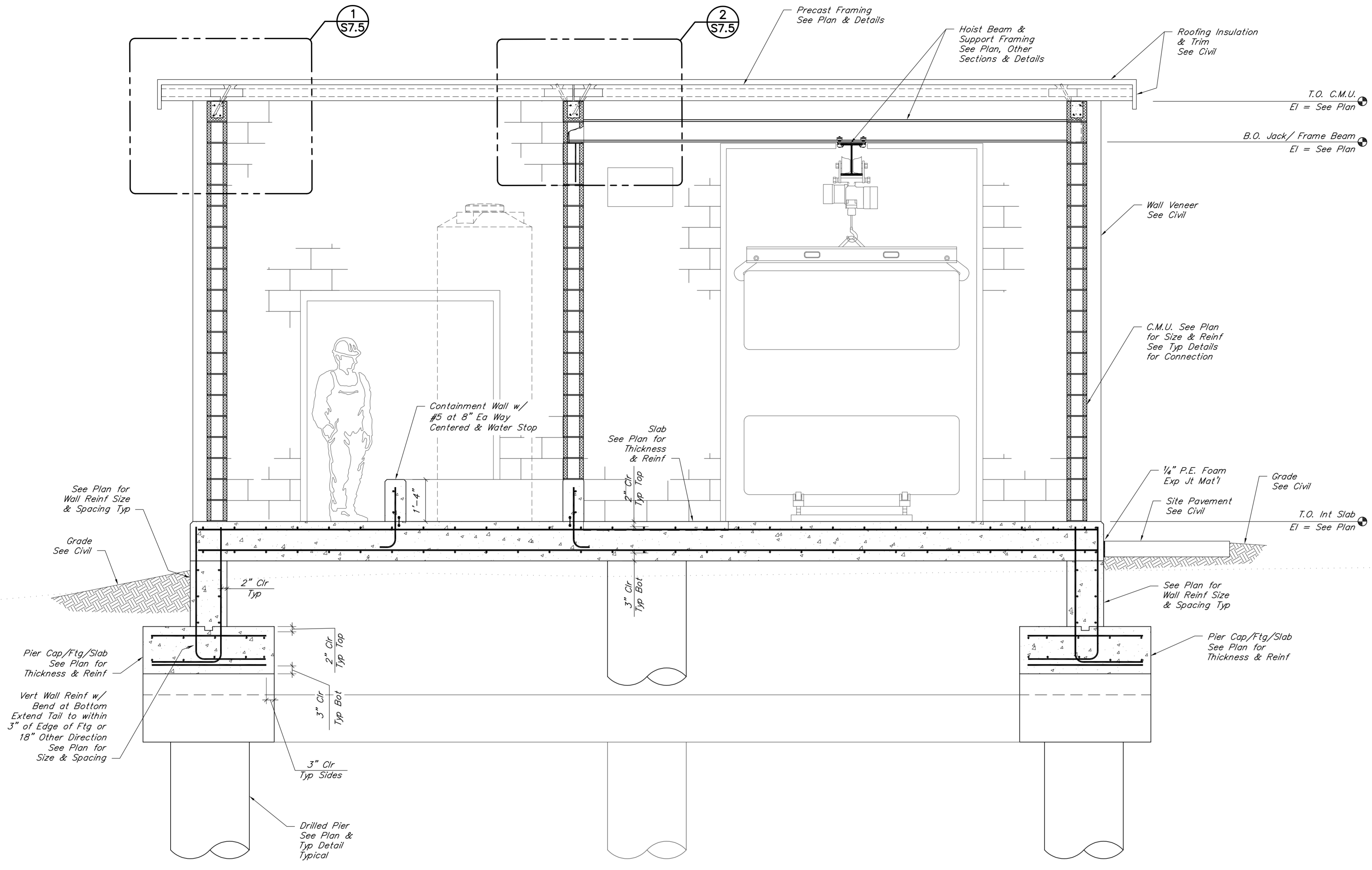
**1 SECTION**  
S7.3 1/2"=1'-0"

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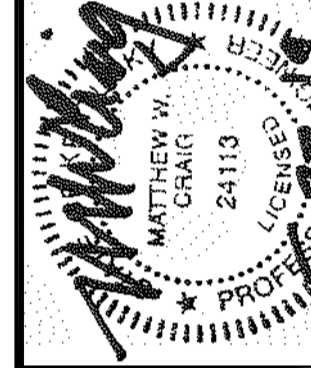
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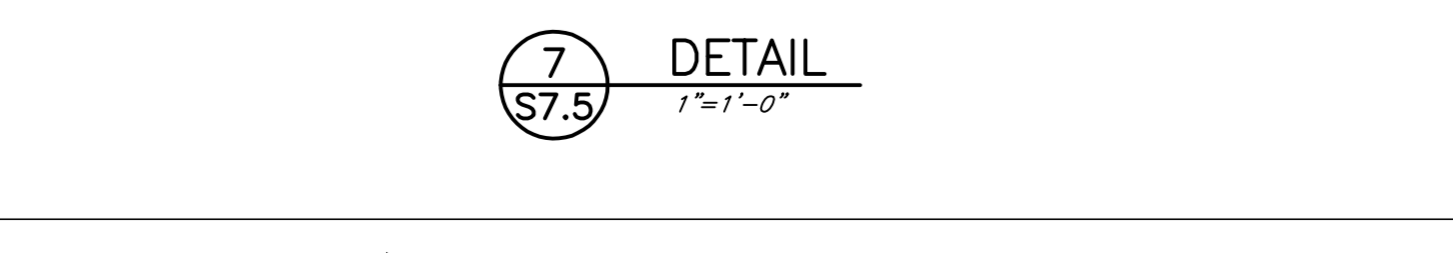
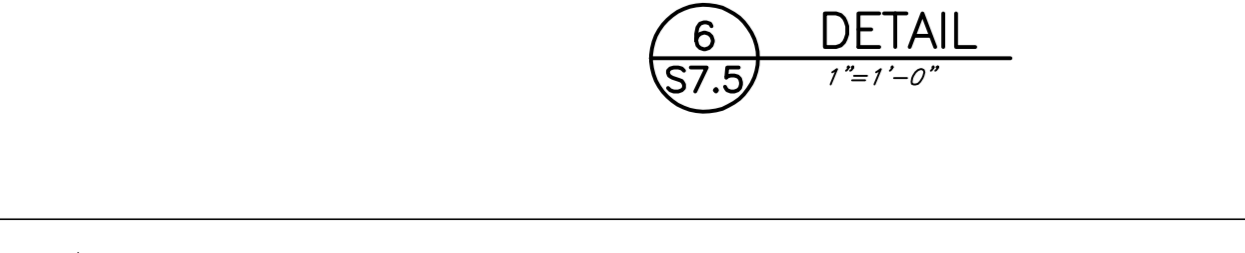
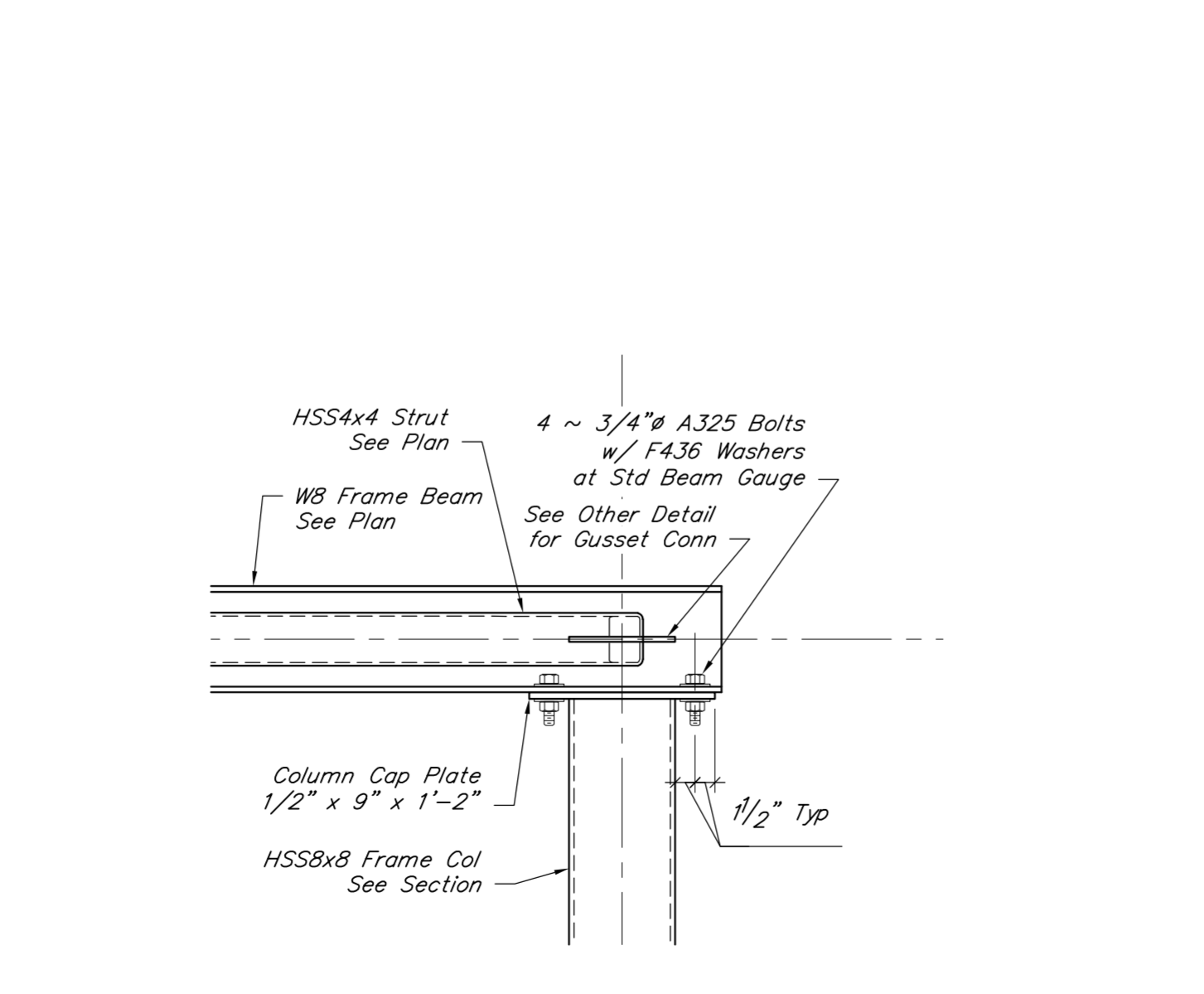
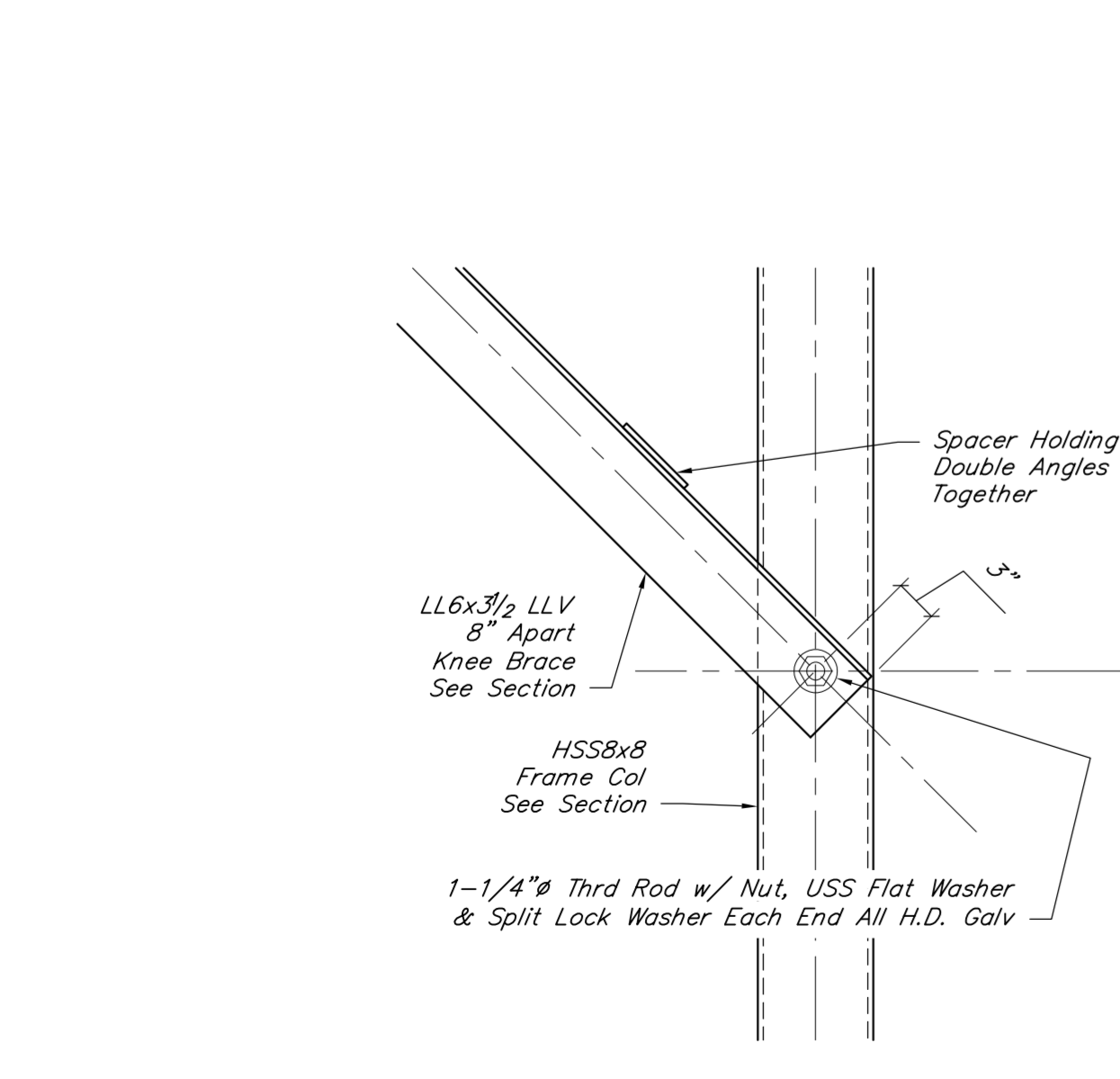
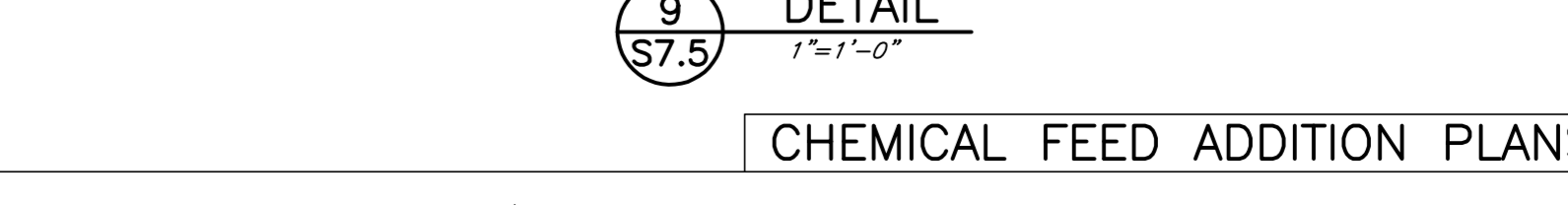
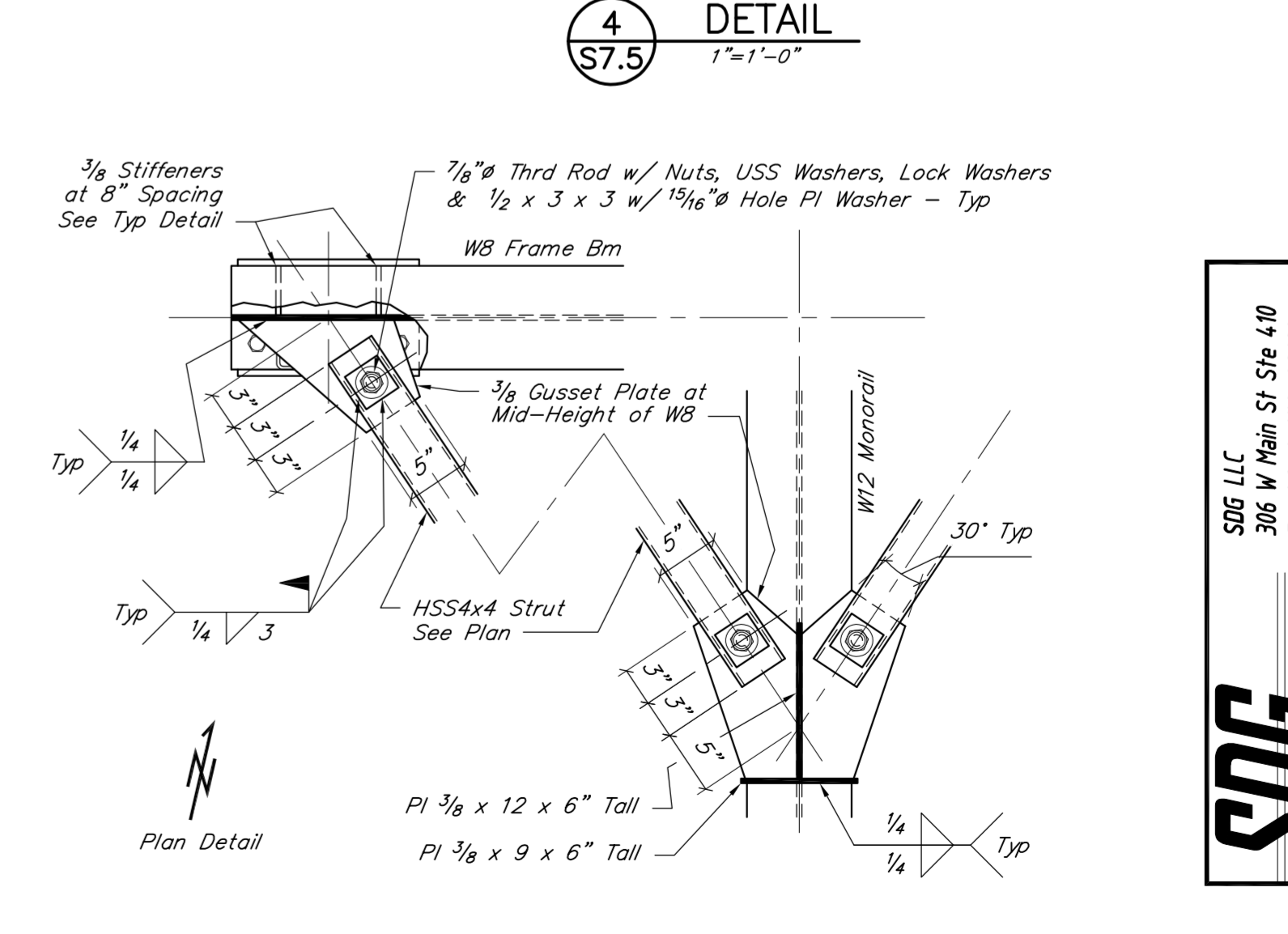
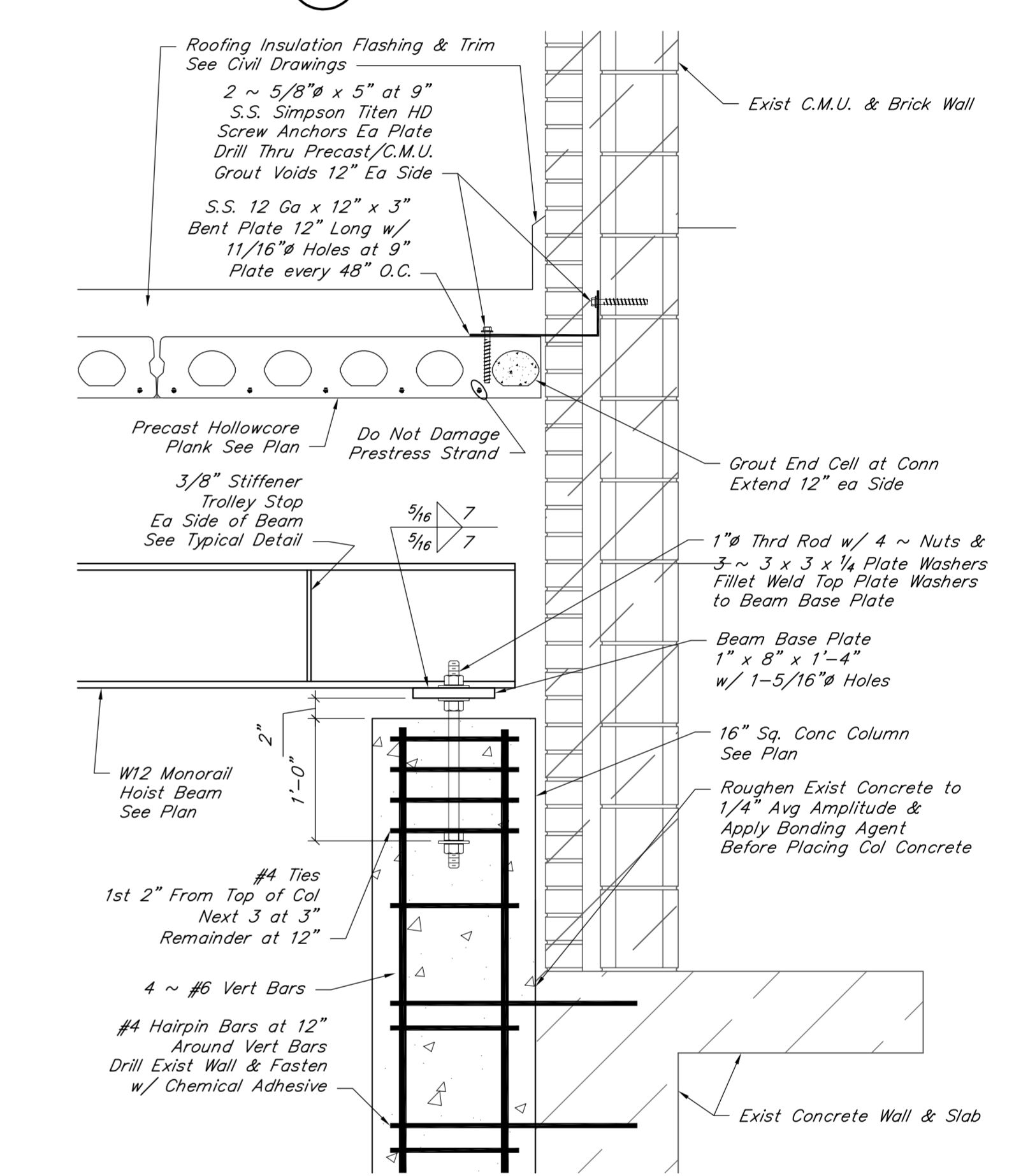
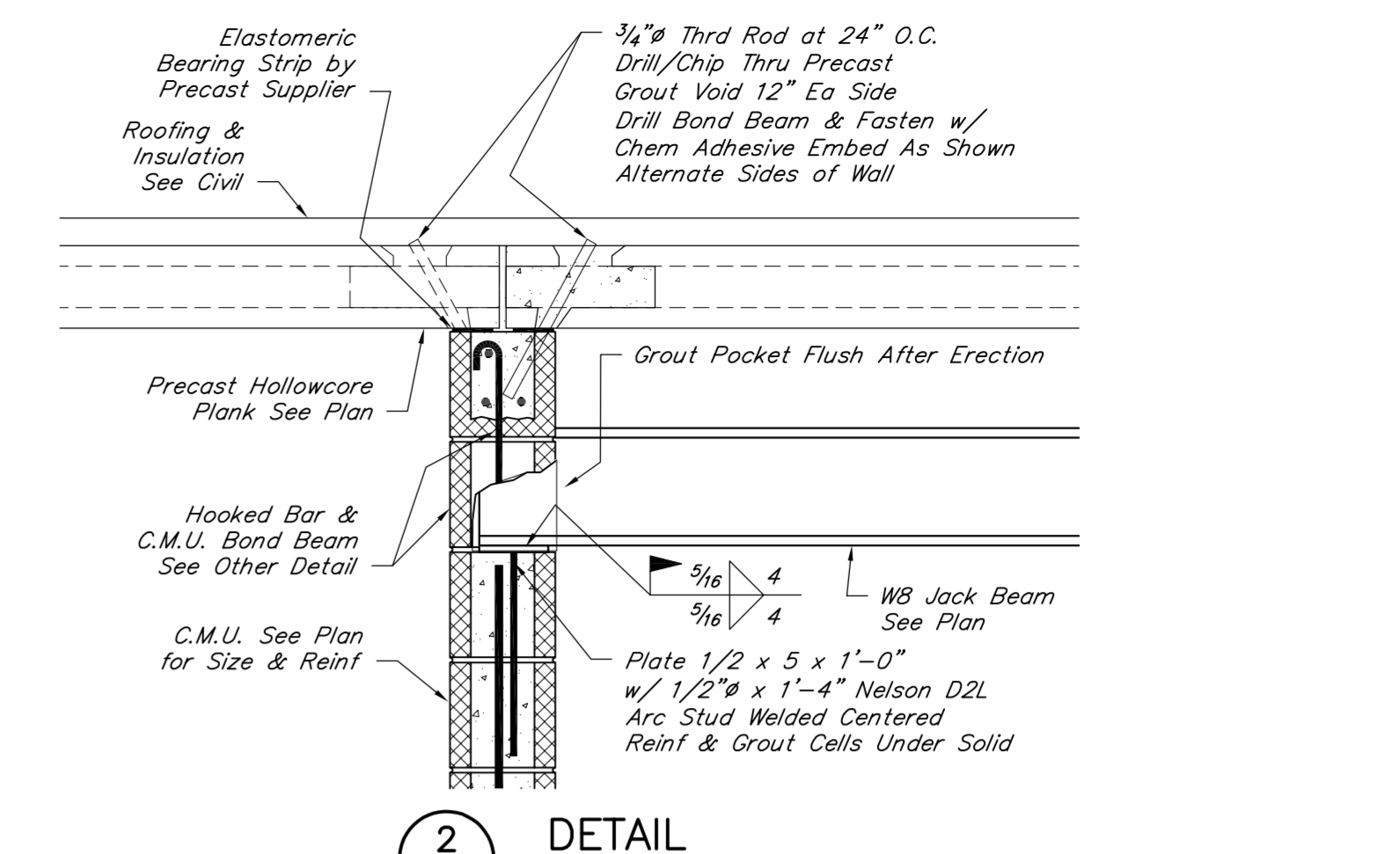
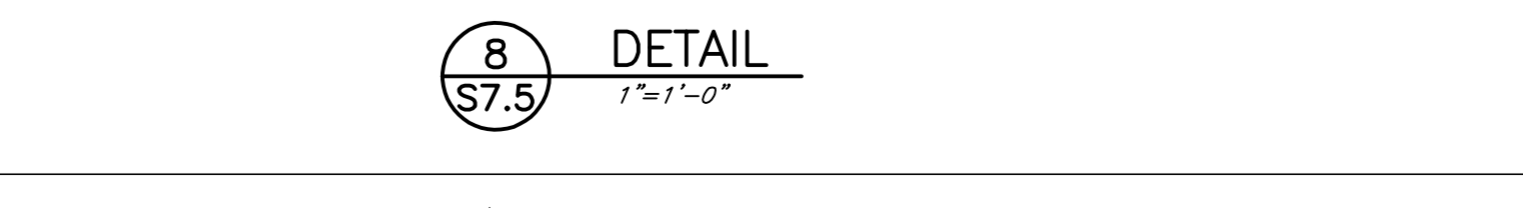
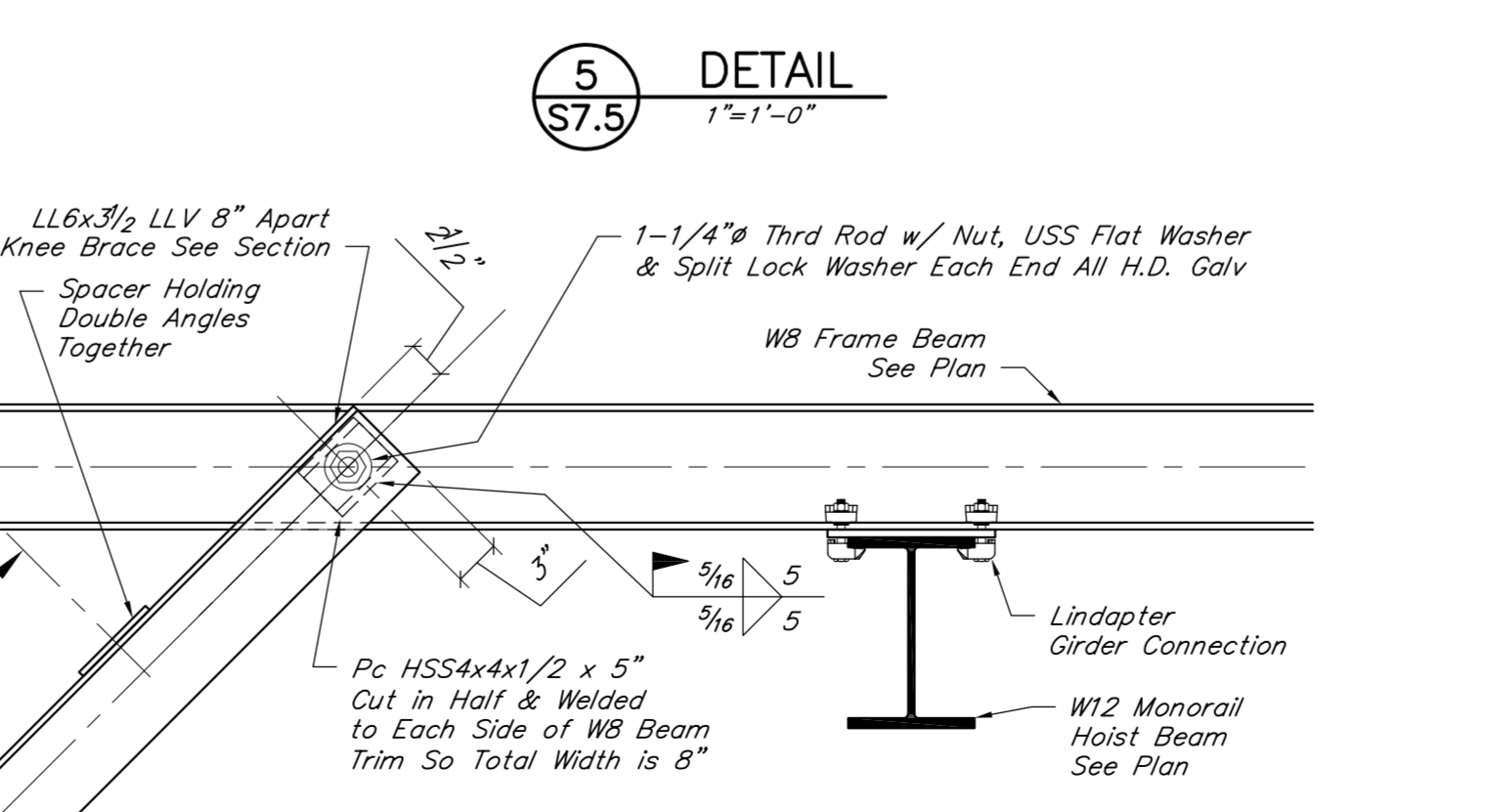
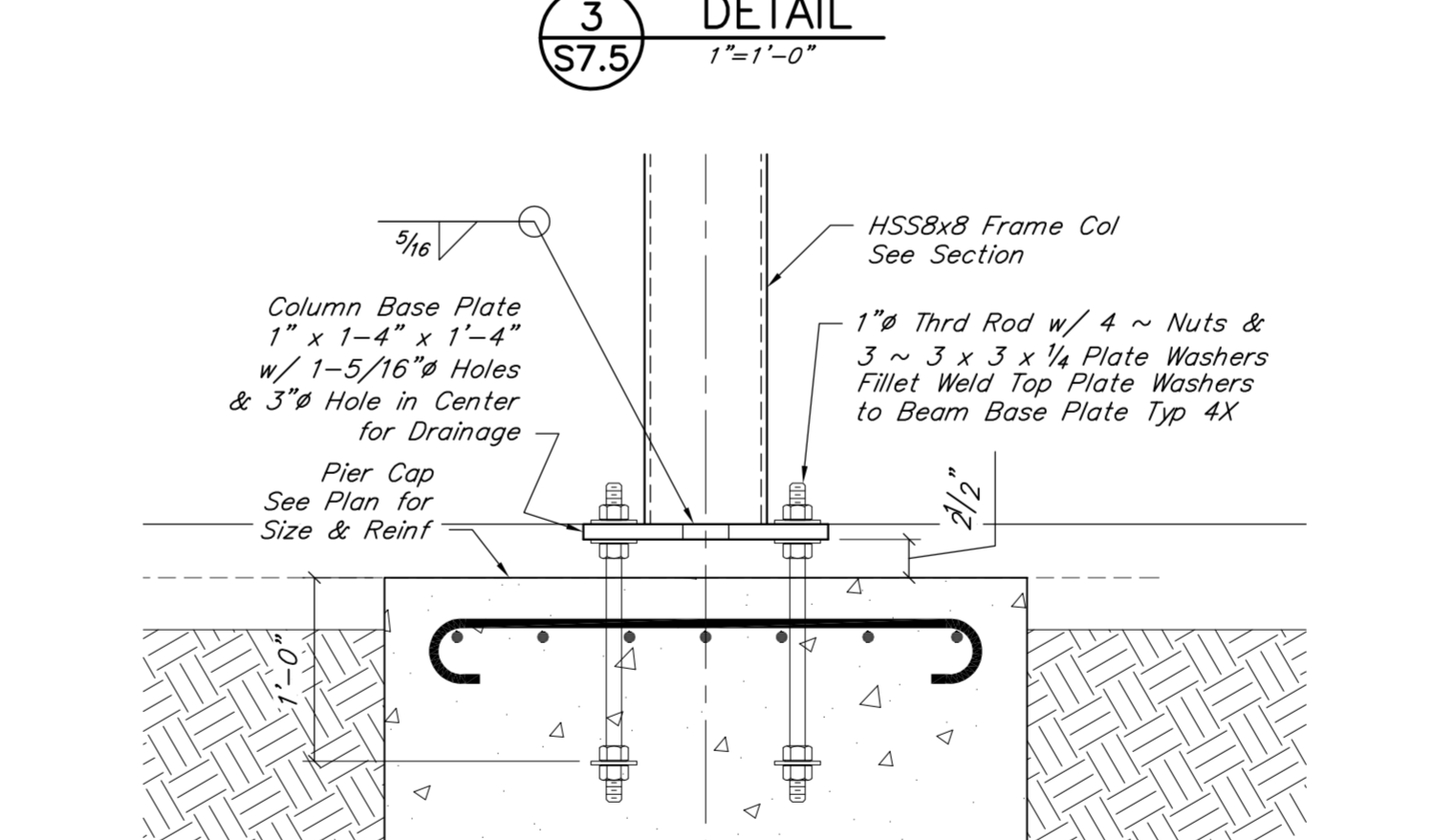
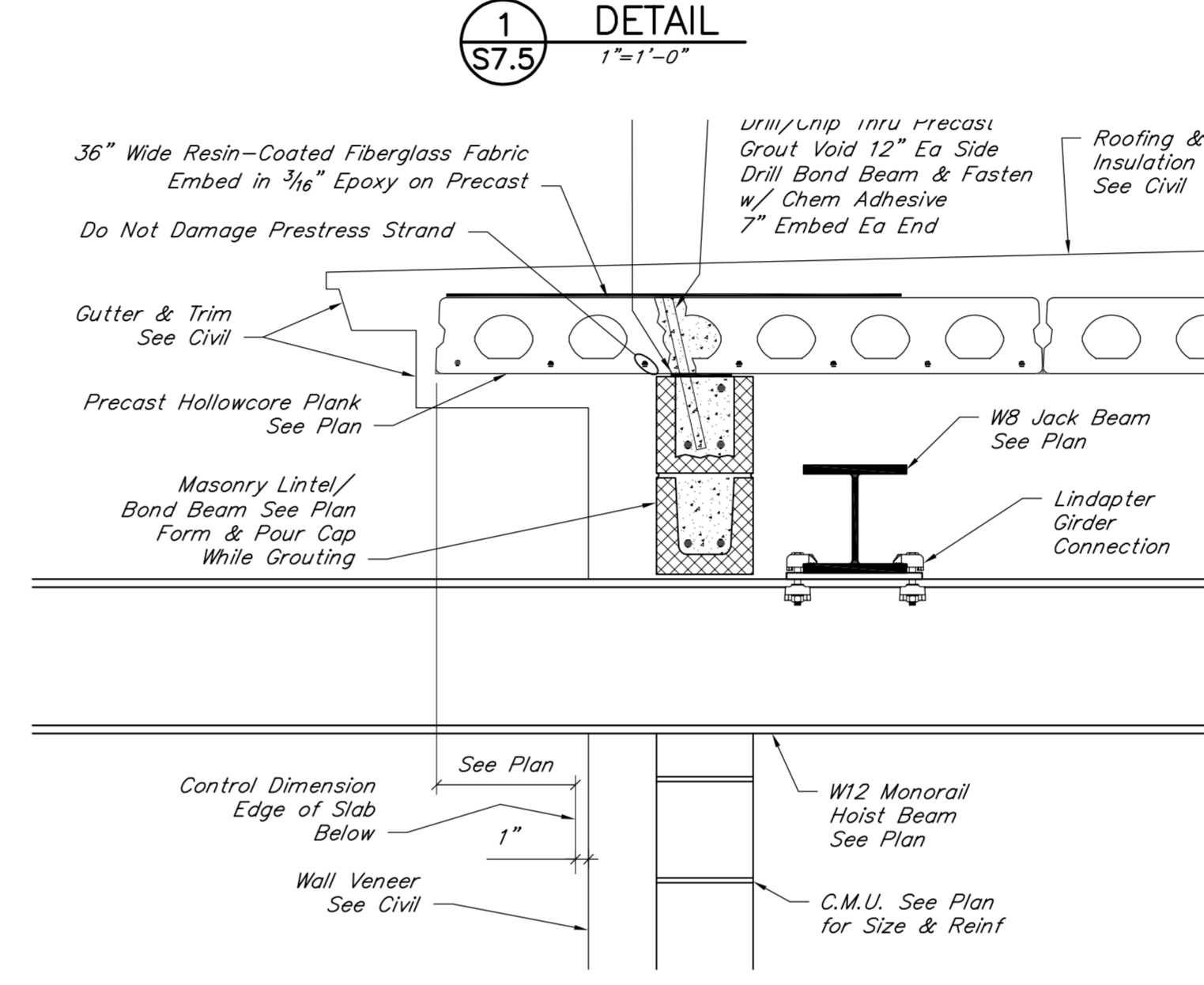
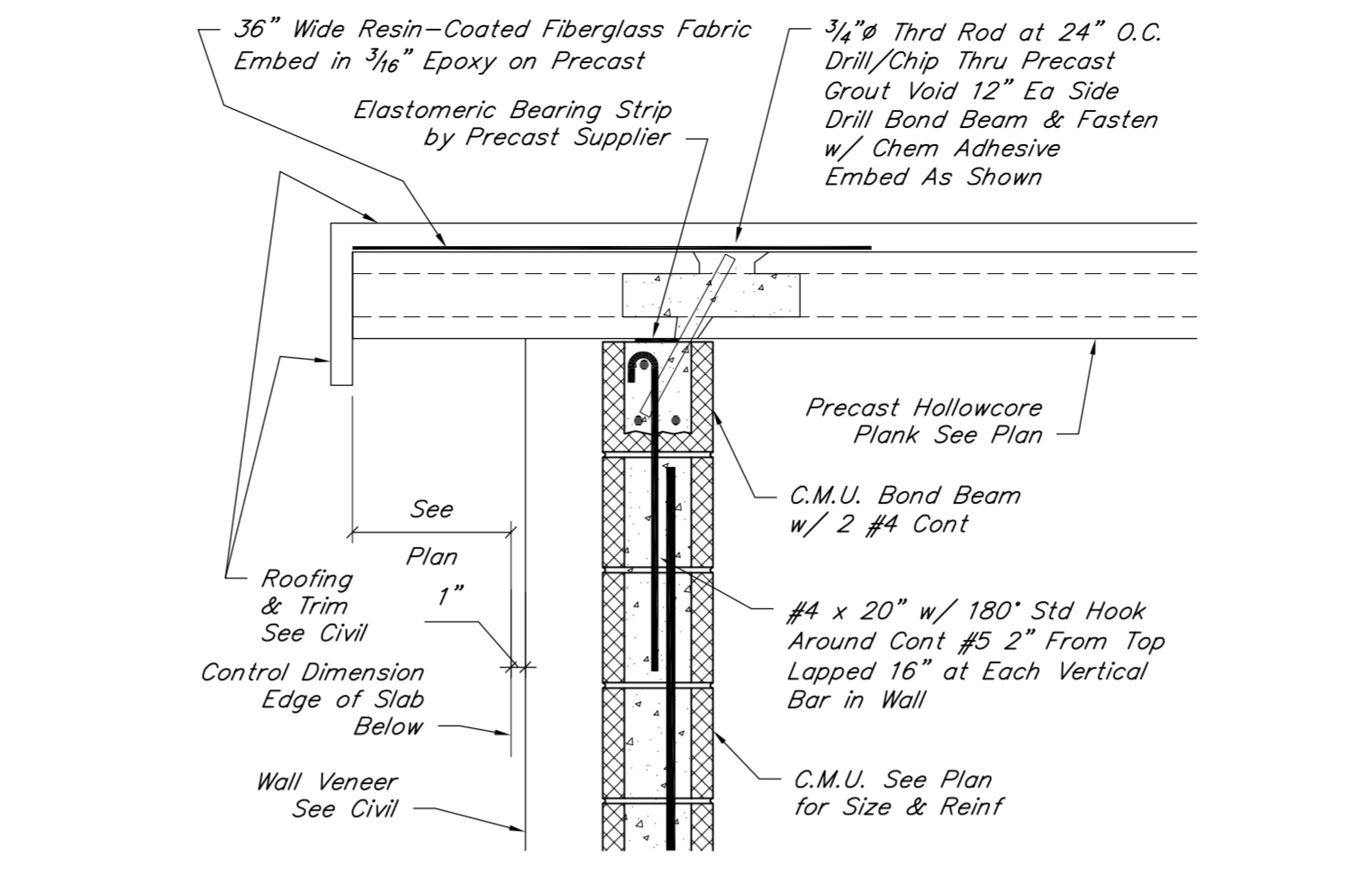
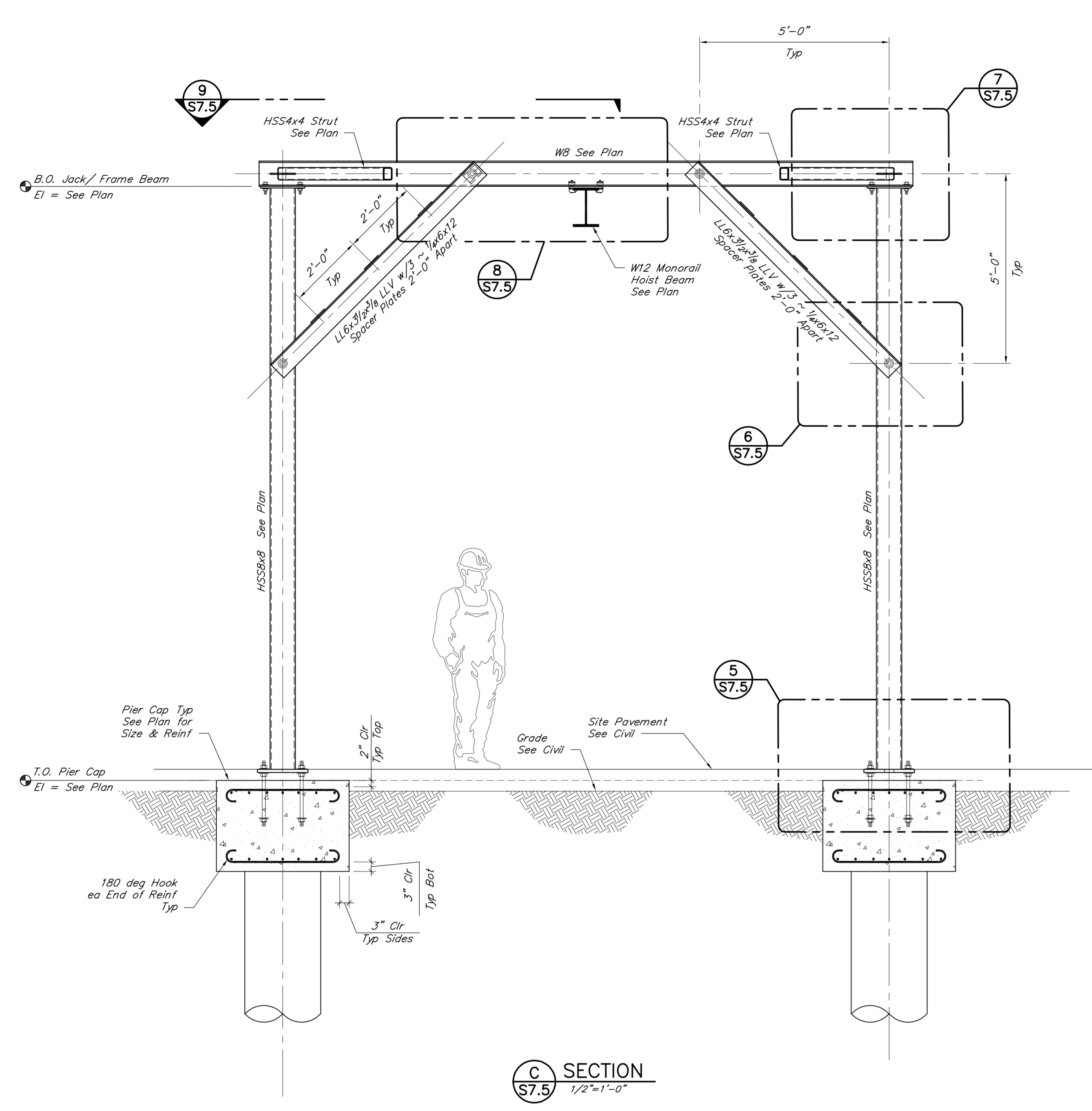
TYPICAL DRILLED PIER

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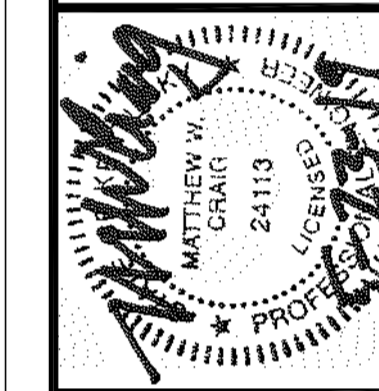


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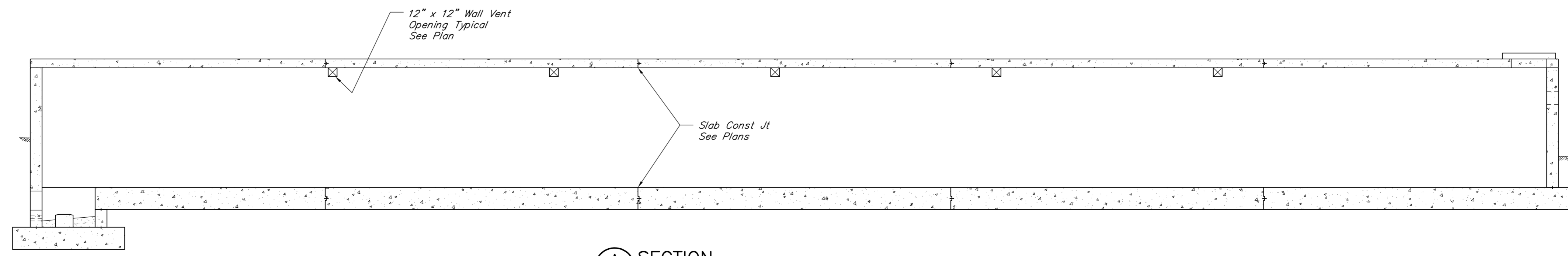
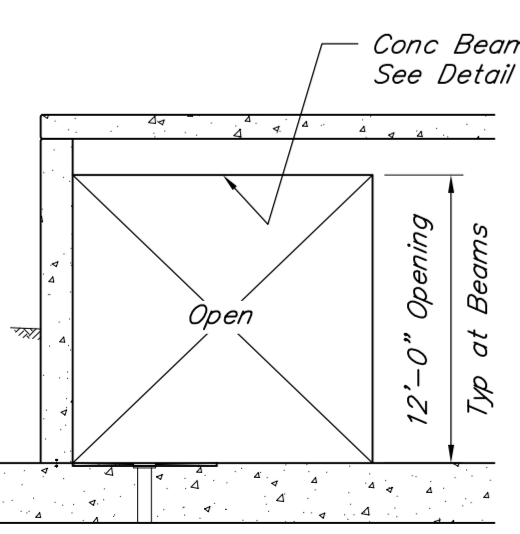
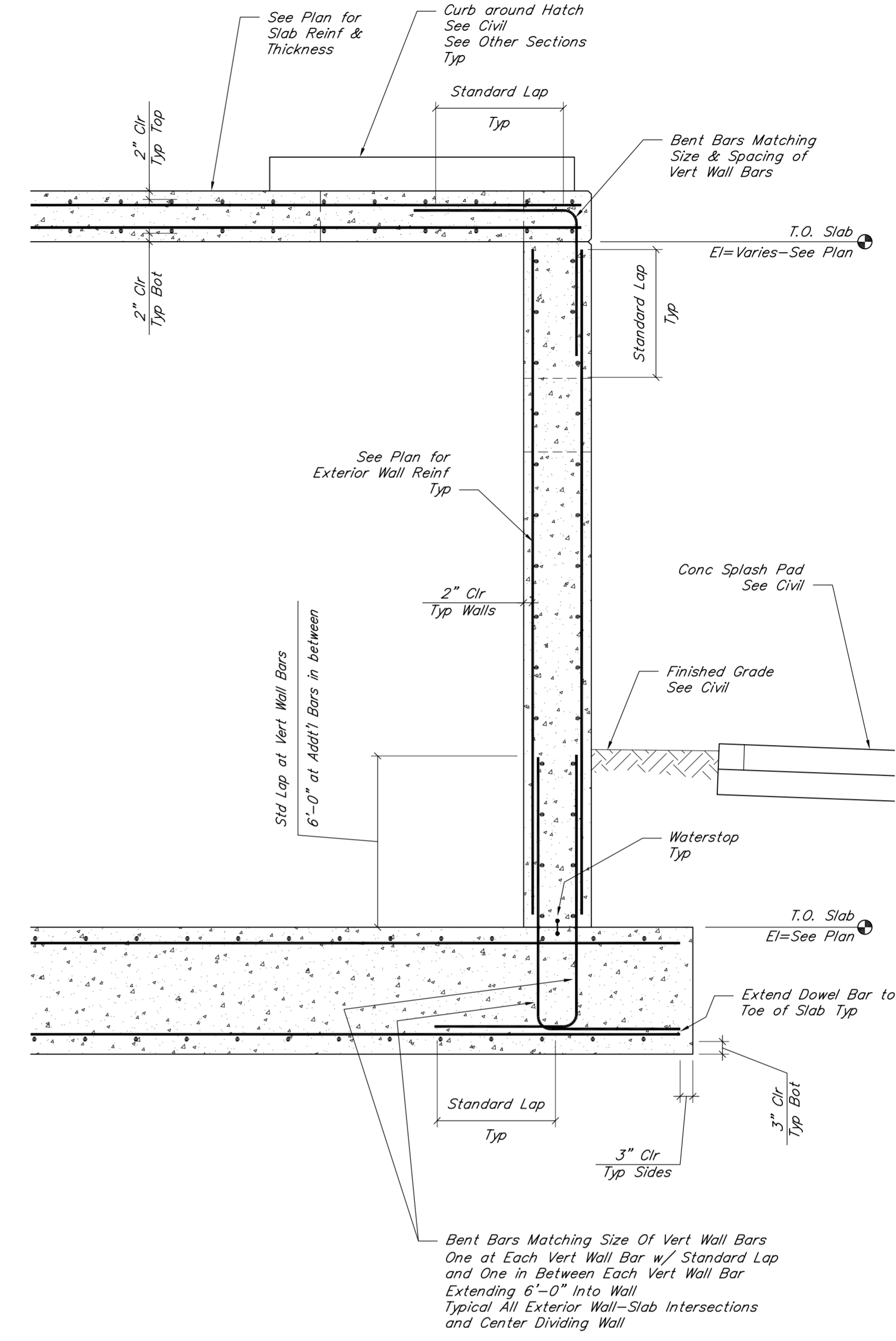
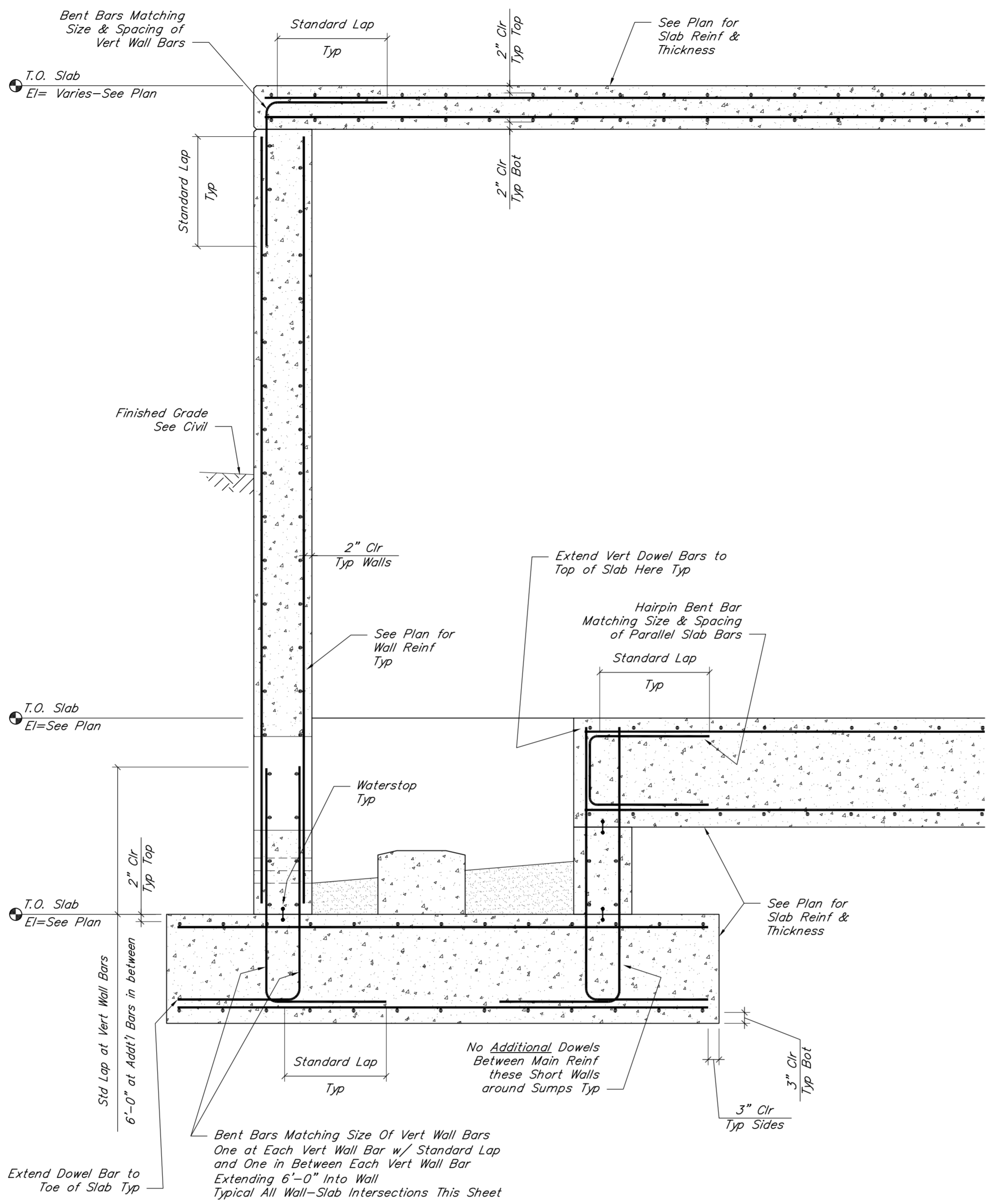
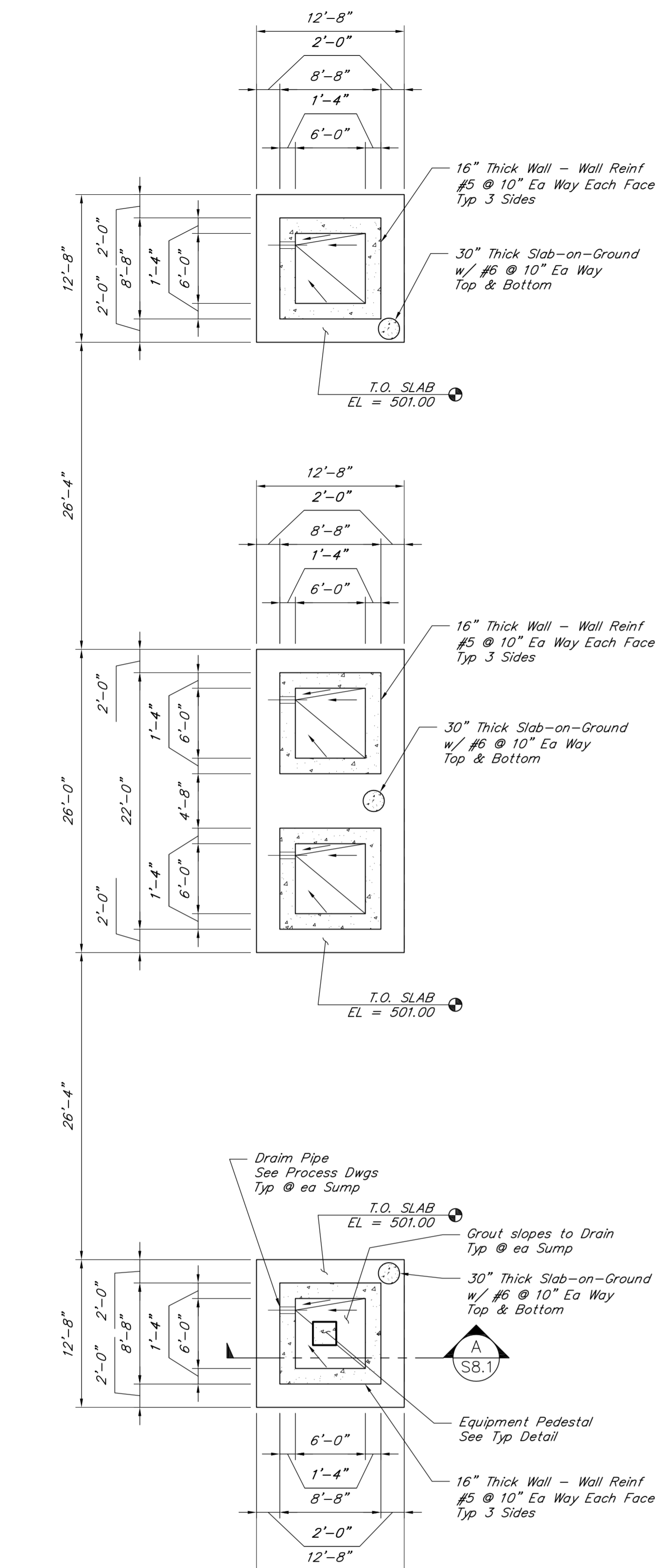


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DATE: MAY 2019
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 FRANKFORT, KENTUCKY



PROJECT NO.  
 2014042  
 SHEET NO.  
 SB.1

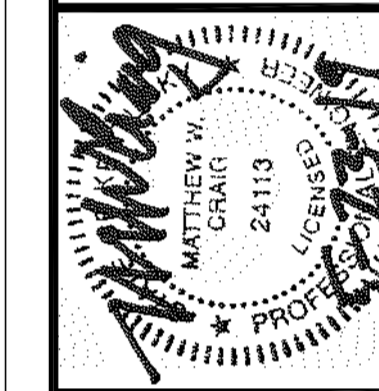


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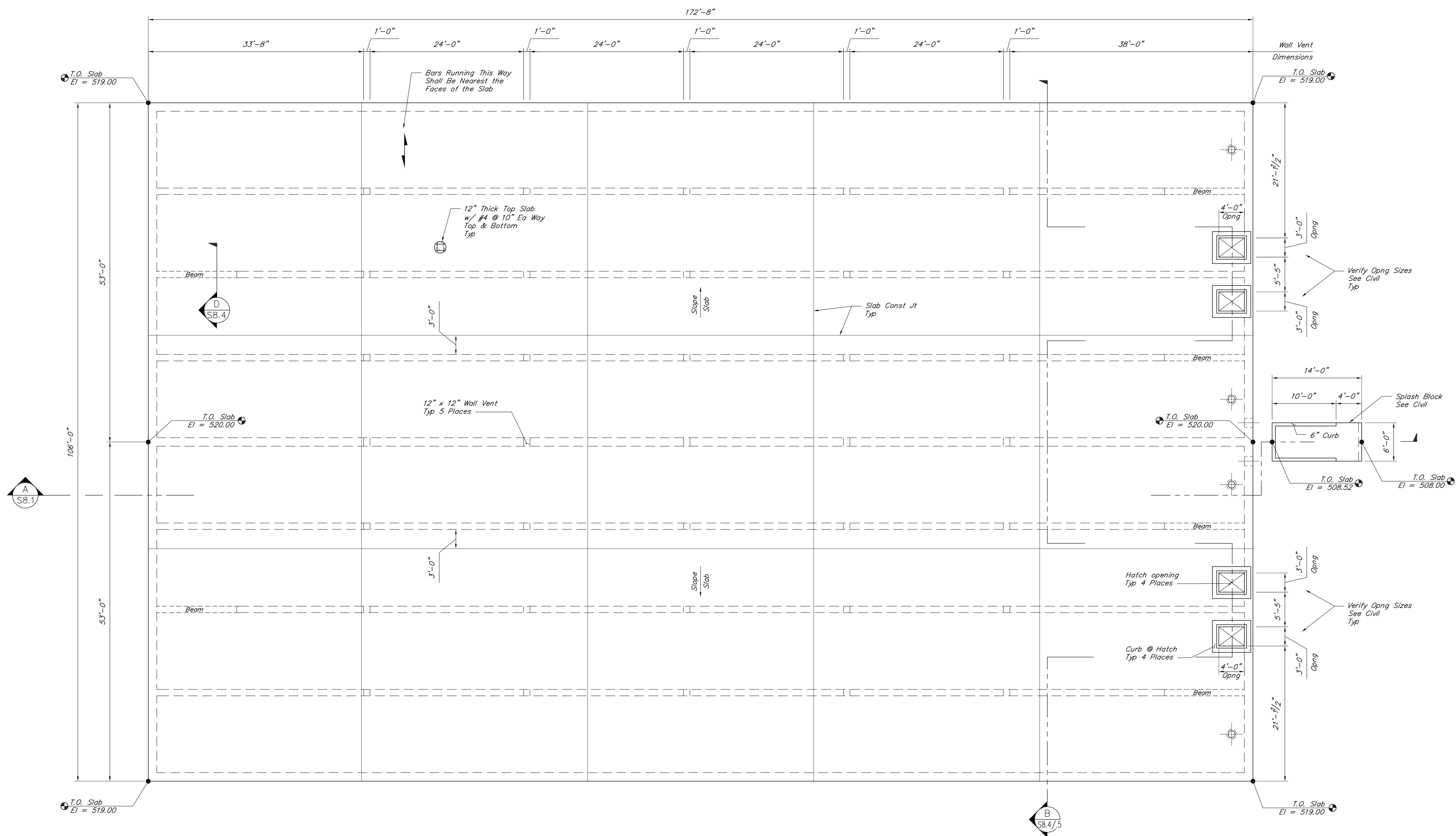
DRAWN BY: JN/AMC
CHECKED BY: MWC
DATE: MAY 2019
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REVISIONS

**KENVIRONS, INC.**  
 FRANKFORT, KENTUCKY



PROJECT NO.  
 2014042  
 SHEET NO.  
 S8.3

**SDG**  
 SDG LLC  
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 Frankfort, KY 40601  
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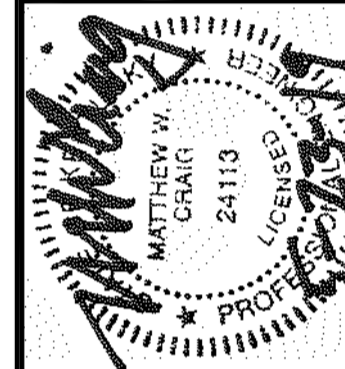


TOP SLAB FRAMING PLAN  
 1/8"=1'-0"

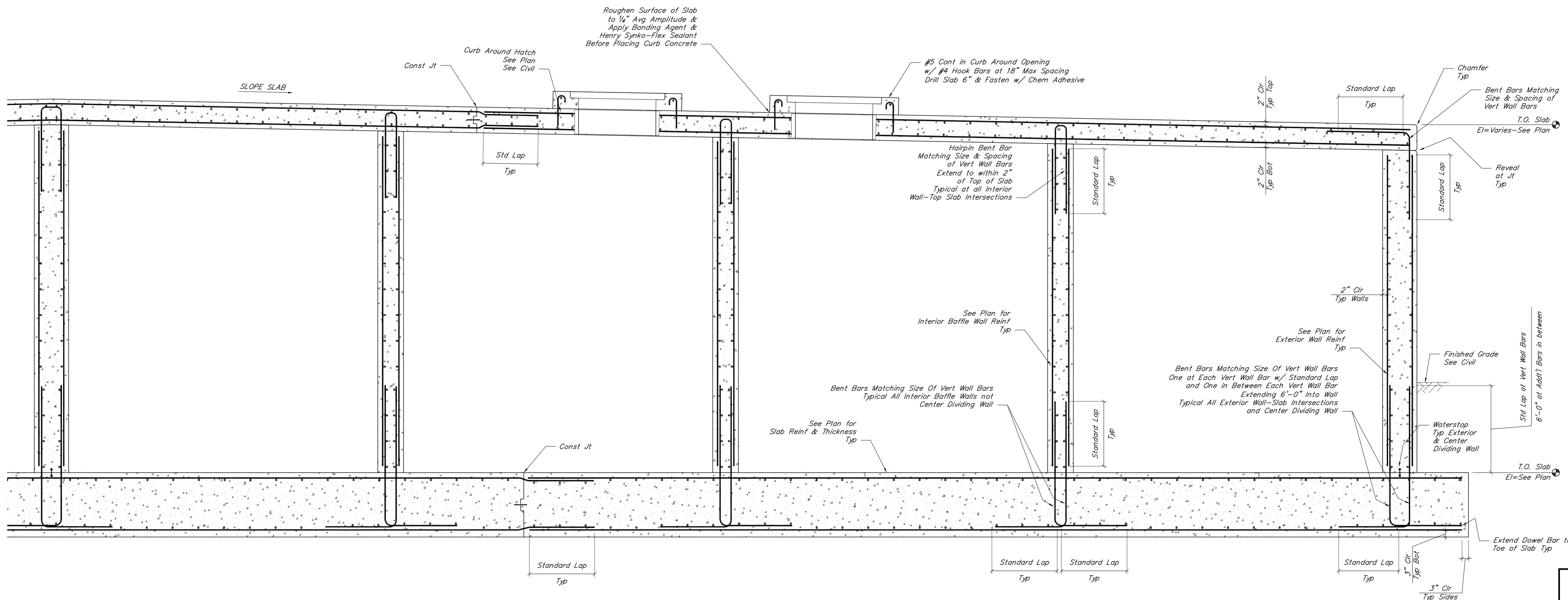








DRAWN BY: JN/AMC
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DATE: MAY 2019
SCALE: AS NOTED
REVISIONS



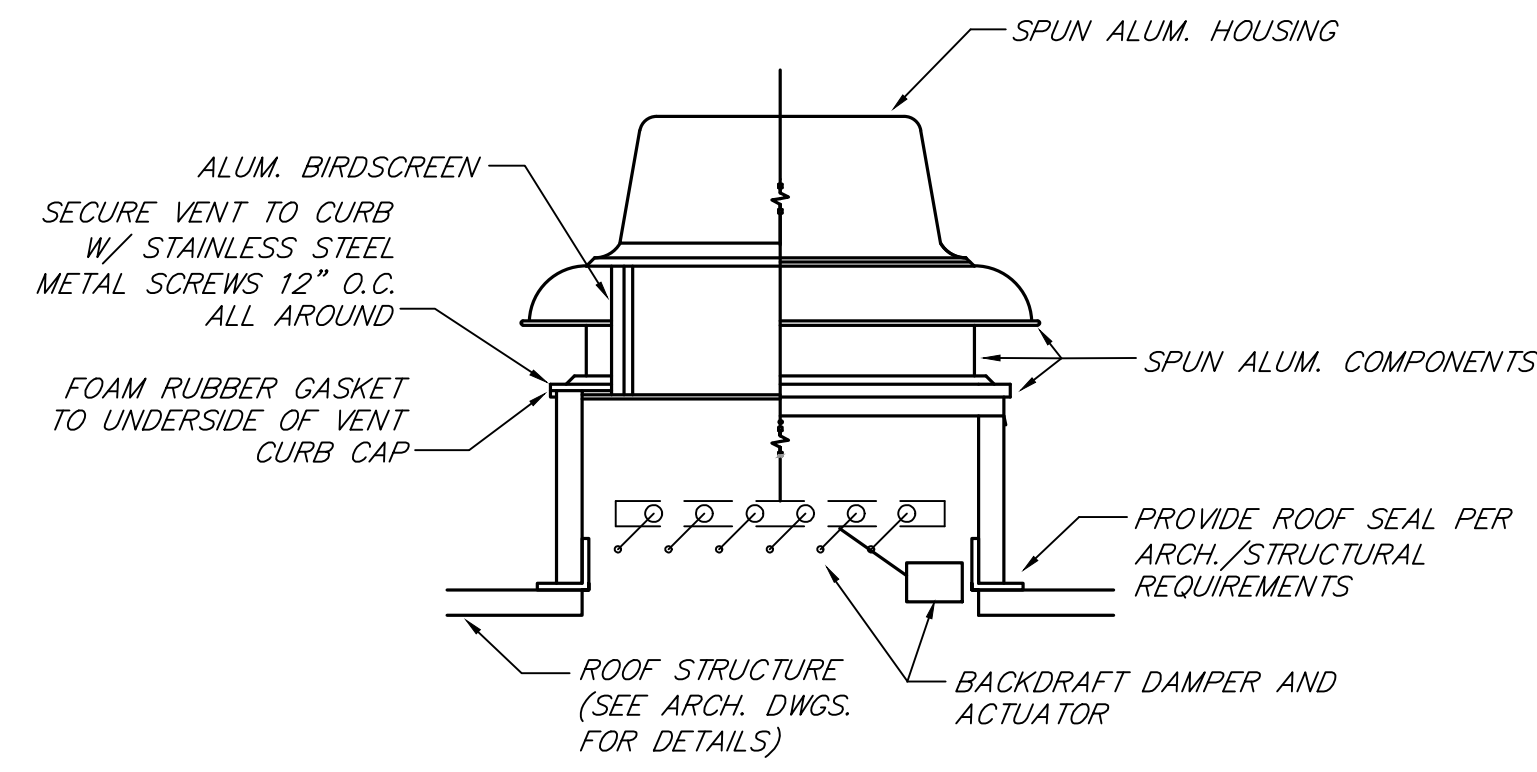
**B2 SECTION**  
 S8.5  
 1/2"=1'-0"

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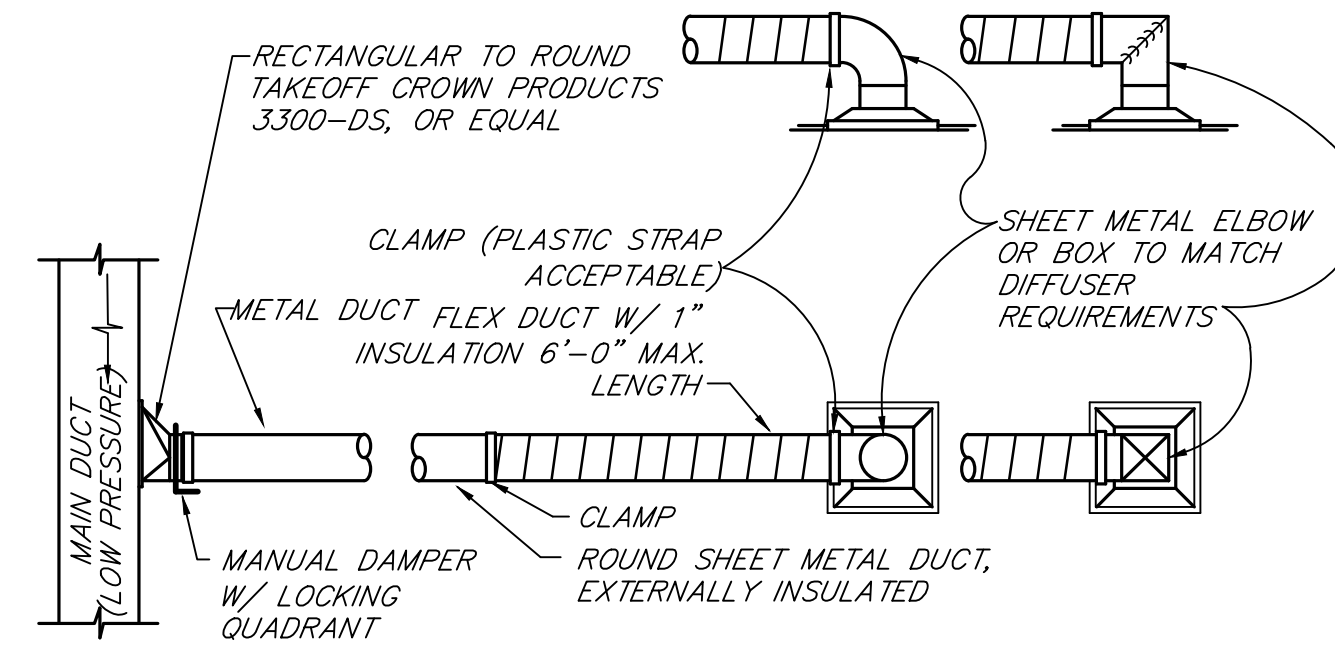






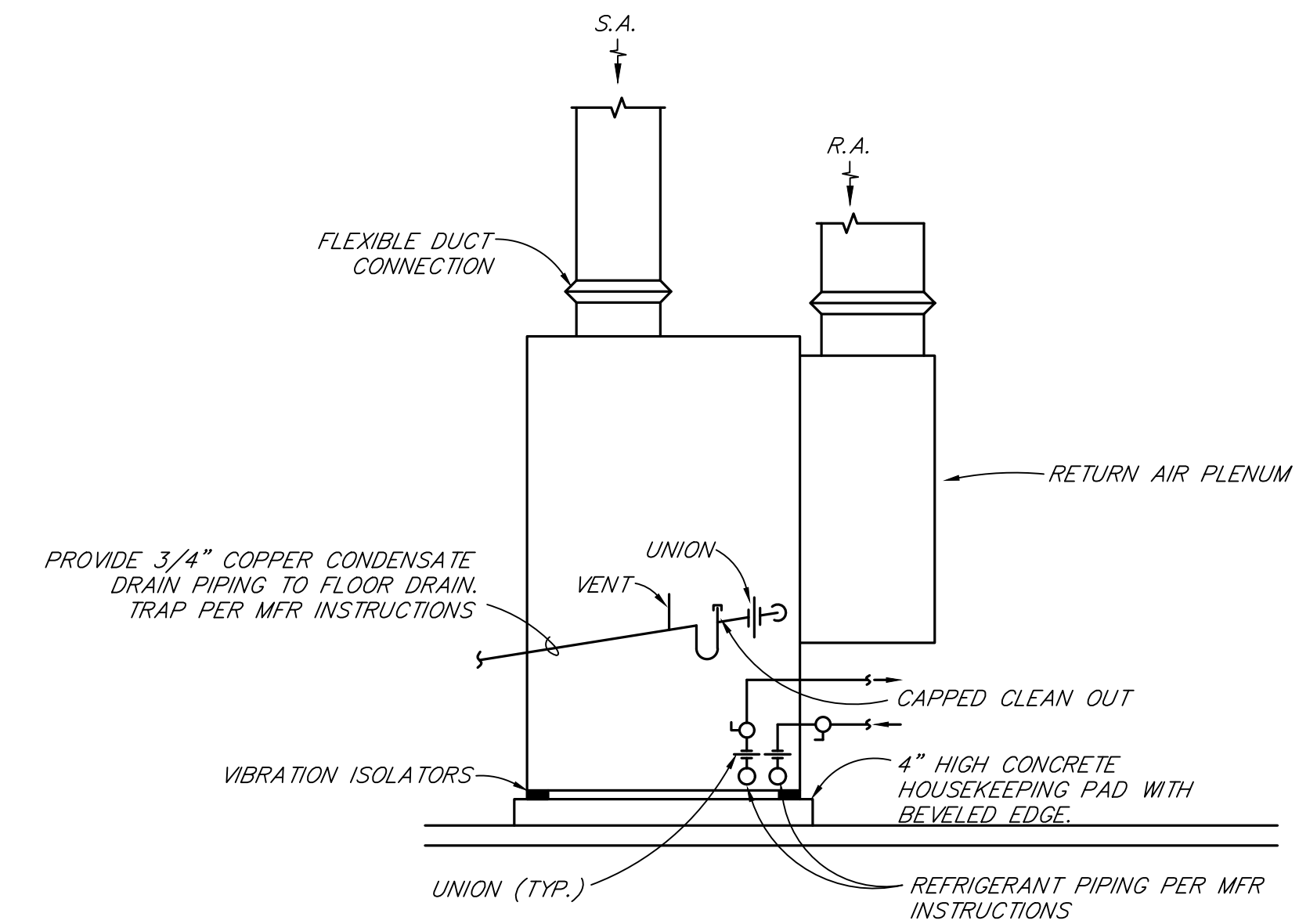
**ROOF MOUNTED GRAVITY INTAKE VENTILATOR**

NOT TO SCALE



**TYPICAL DIFFUSER AND BRANCH TAKEOFF DETAIL**

NOT TO SCALE

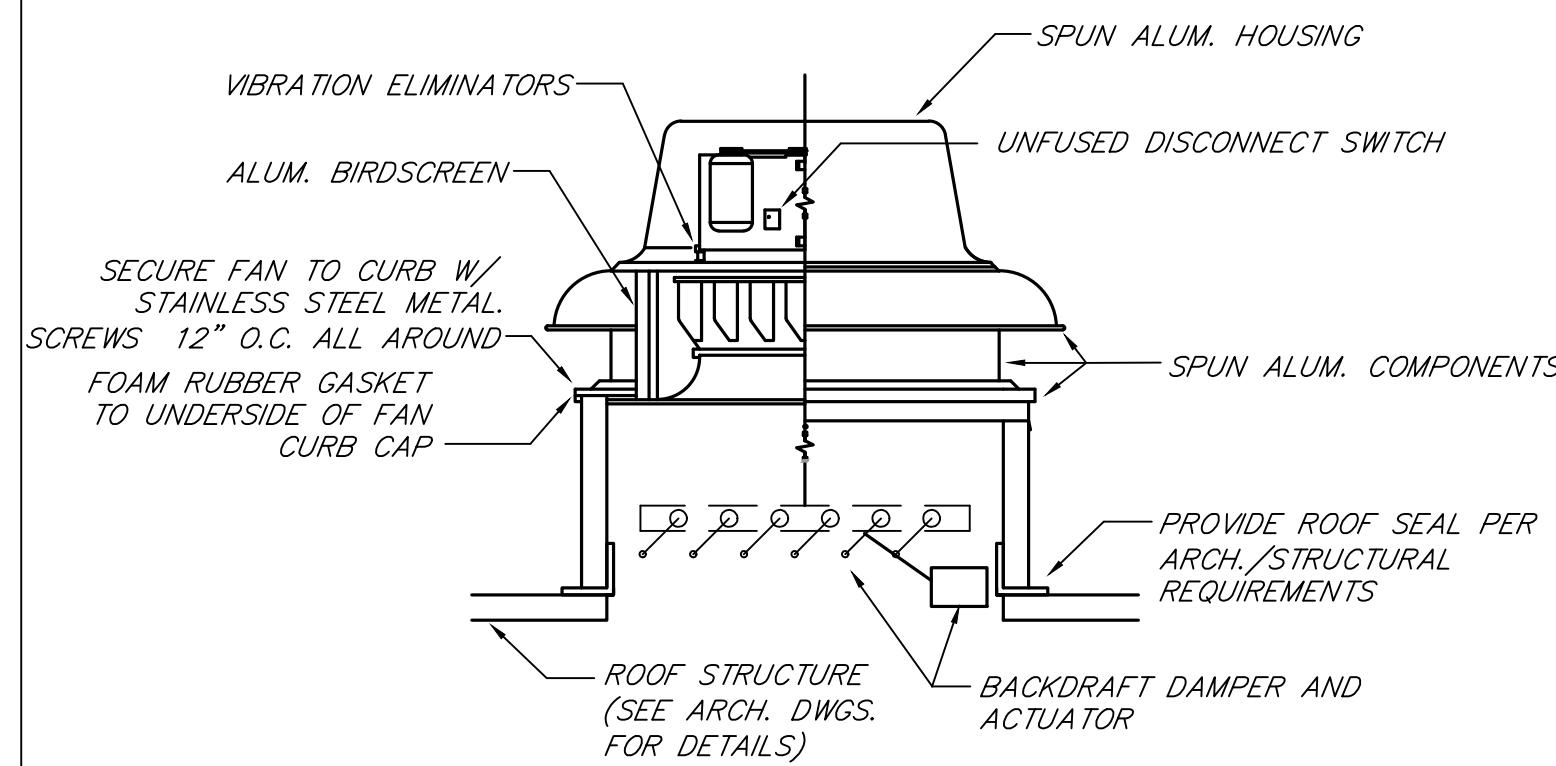


**AIR HANDLER INSTALLATION DETAIL**

NOT TO SCALE

**NOTES:**  
 \*INSTALL UNIT PER MANUFACTURE'S INSTALLATION INSTRUCTIONS. THIS DETAIL MAY NOT SHOW DUCT AND CONNECTIONS IN TRUE CONFIGURATION. CONTRACTOR SHALL ADJUST ACCORDINGLY & PROVIDE ALL NECESSARY TRANSITIONS FOR FINAL CONNECTIONS.

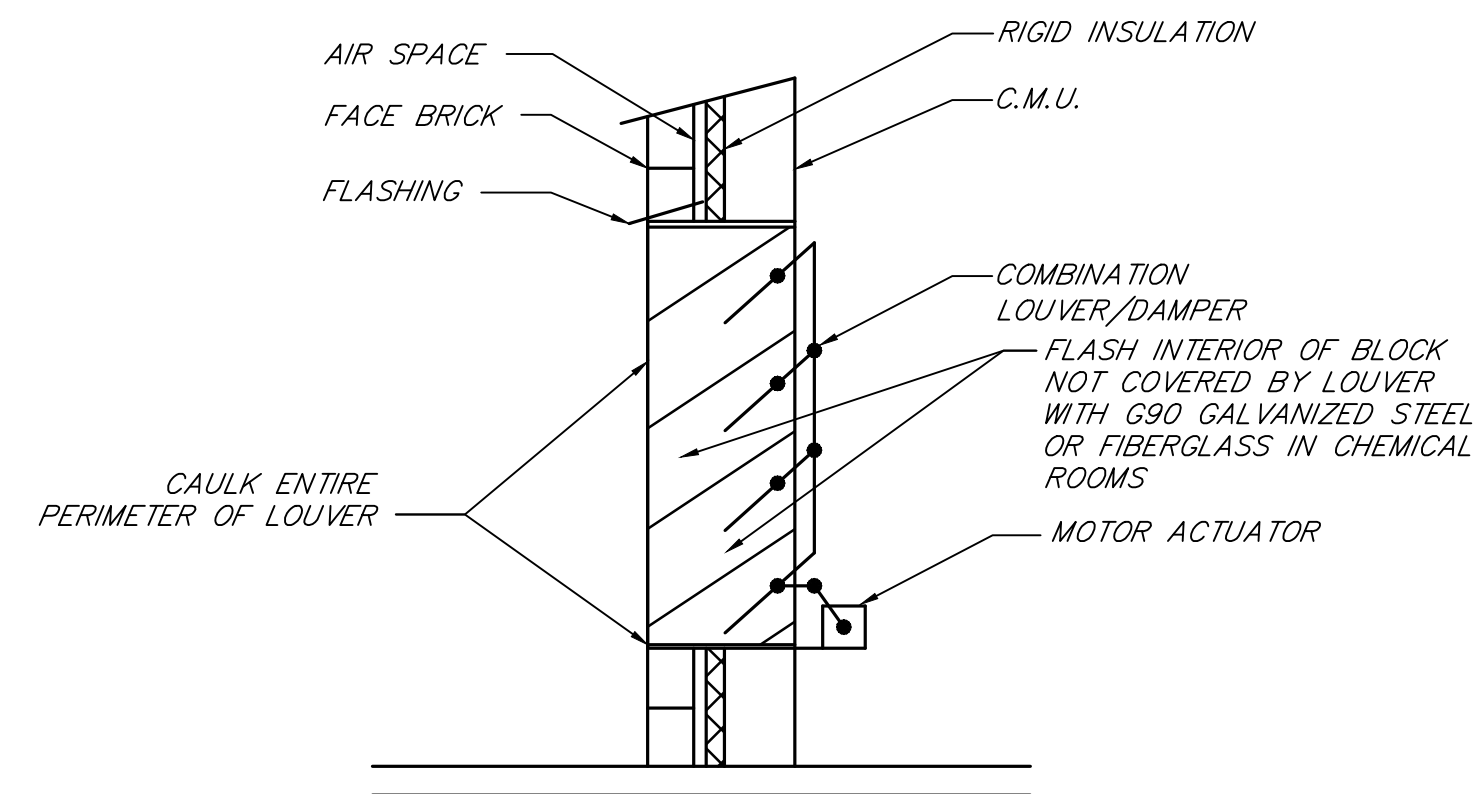
\*CONTRACTOR SHALL INSTALL ALL PIPING, ELECTRICAL, AND UNIT DUCT CONNECTIONS SO THAT IT DOES NOT INTERFERE WITH ACCESS PANELS. FILTERS SHALL BE EASILY ACCESSIBLE.



**ROOF MOUNTED EXHAUST FAN**

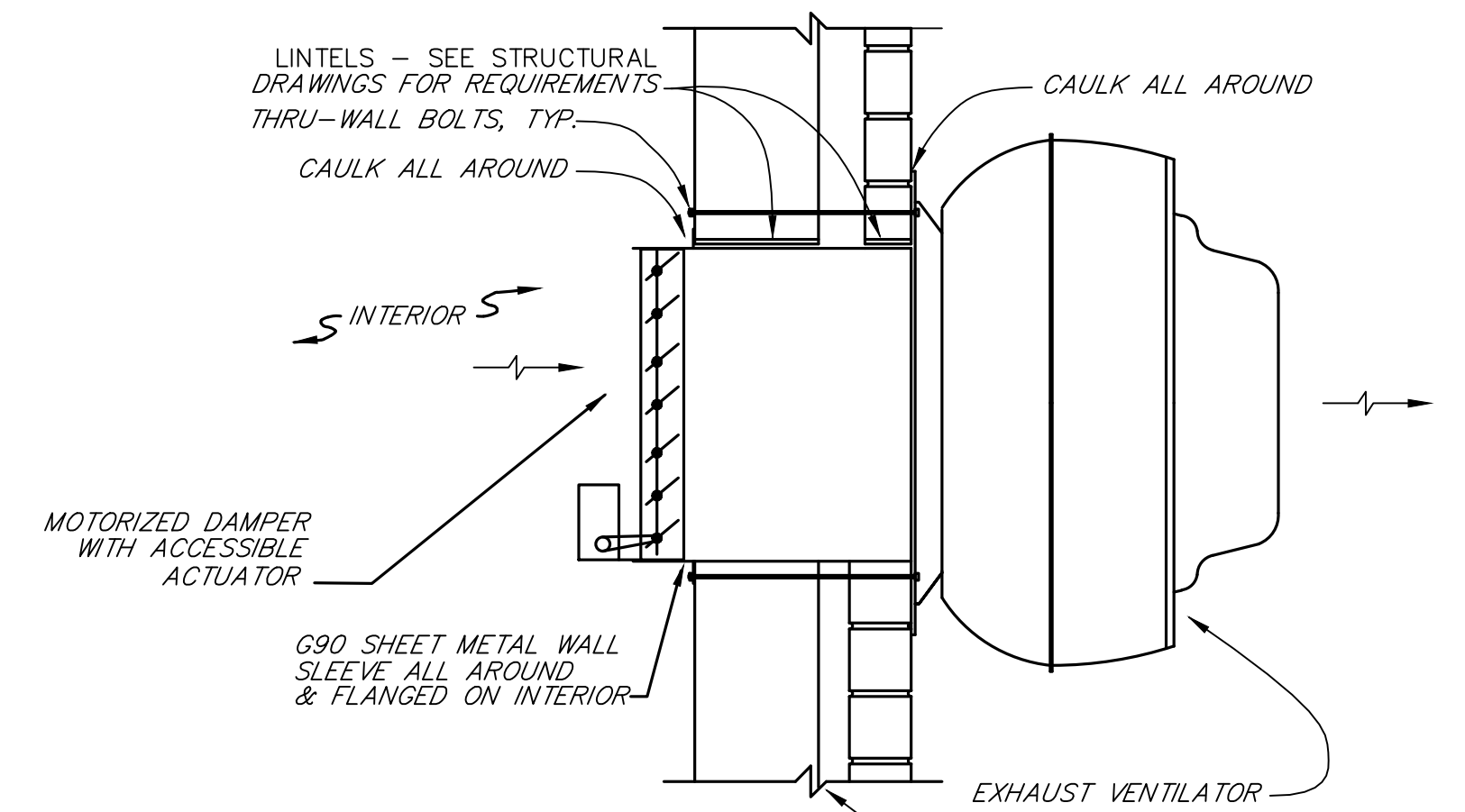
NOT TO SCALE

\*CURBS AND FANS SHALL BE FROM SAME MANUFACTURER.



**LOUVER INSTALLATION DETAIL**

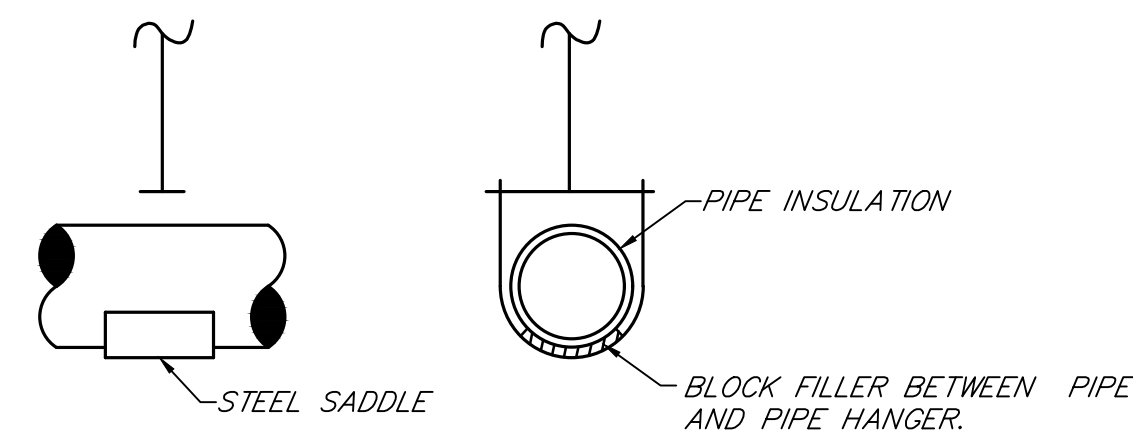
NOT TO SCALE



**WALL EXHAUST VENTILATOR**

NOT TO SCALE

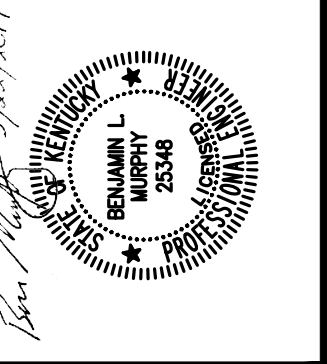
**NOTES:**  
 VENTILATOR & ACCESSORIES SHALL BE MOUNTED WITH STAINLESS STEEL FASTENERS.  
 FOR ACTUAL WALL CONSTRUCTION SEE BUILDING PLANS/SECTIONS



**PIPE INSULATION DETAIL**

NOT TO SCALE

**GREEN RIVER VALLEY WATER DISTRICT  
 WATER TREATMENT PLANT EXPANSION  
 HART COUNTY, KENTUCKY**



DRAWN BY: CA
CHECKED BY: BLM
DATE: APRIL 2018
SCALE: As Noted
REVISIONS

**KENVIRONS, INC.  
 FRANKFORT, KENTUCKY**

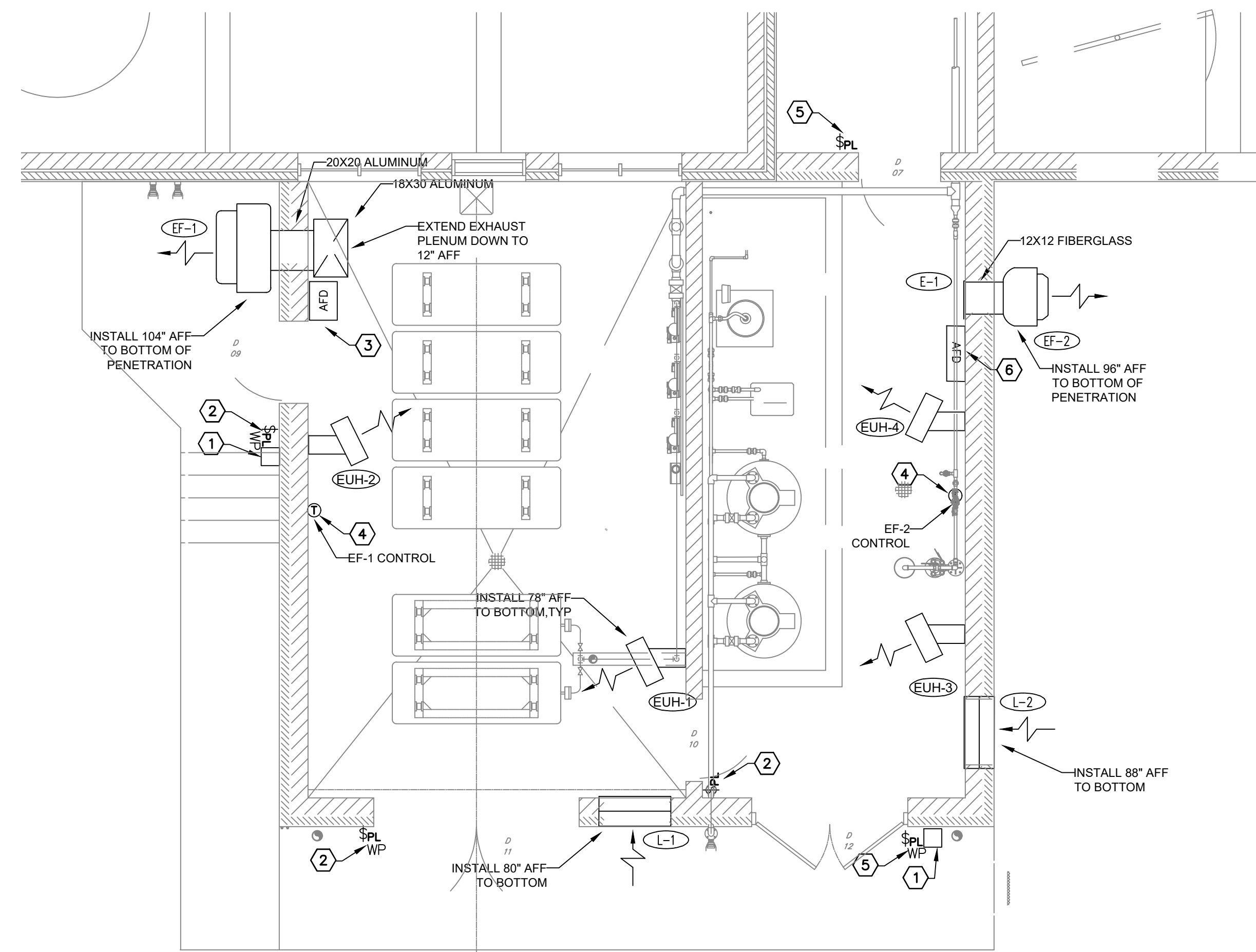


**LoVo  
 SYSTEMS**

PROJECT NO.  
 2014042  
 SHEET NO.  
 H-2

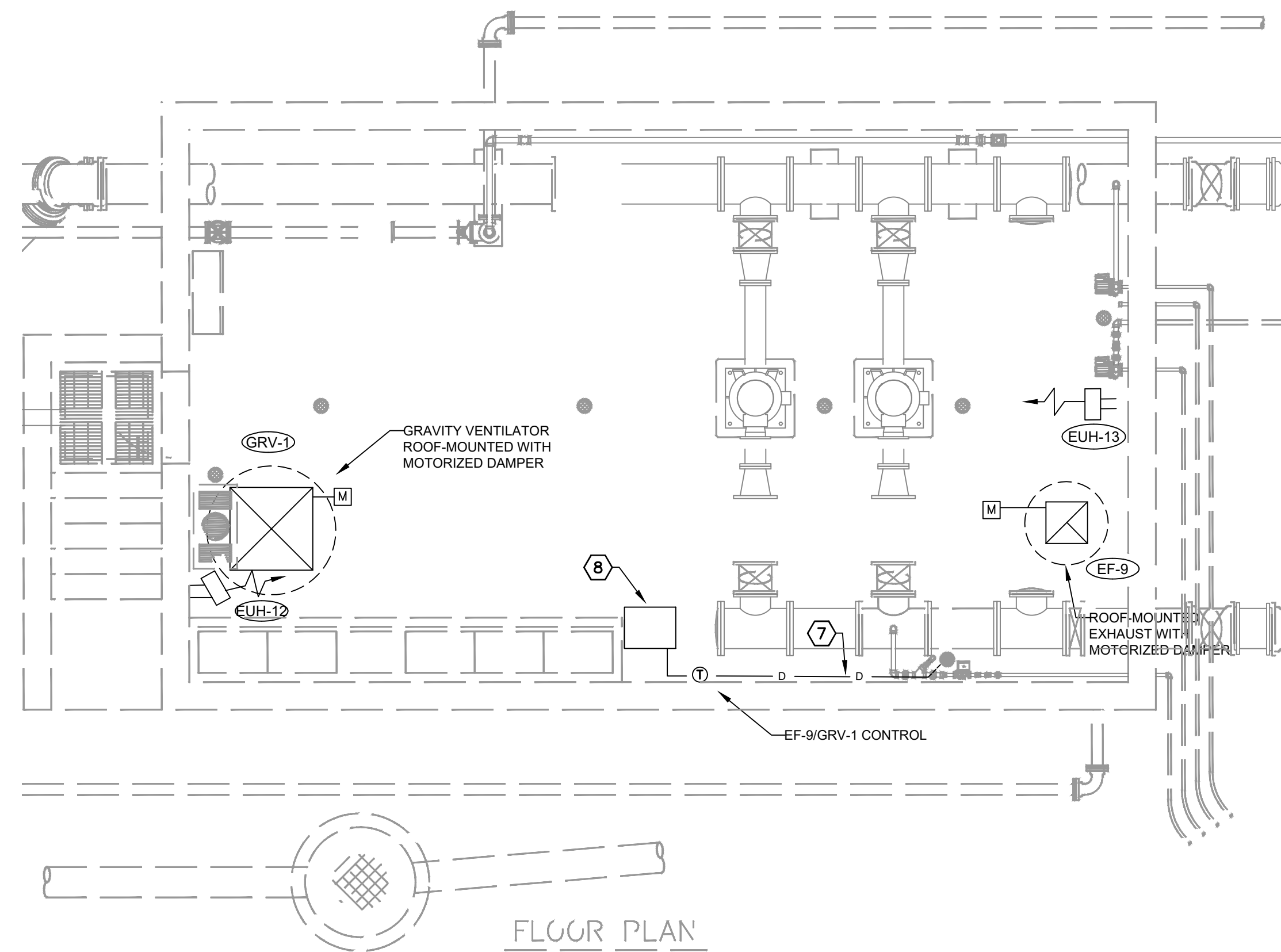
HVAC DETAILS





**CHLORINE/FLUORIDE BUILDING HVAC PLAN**

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

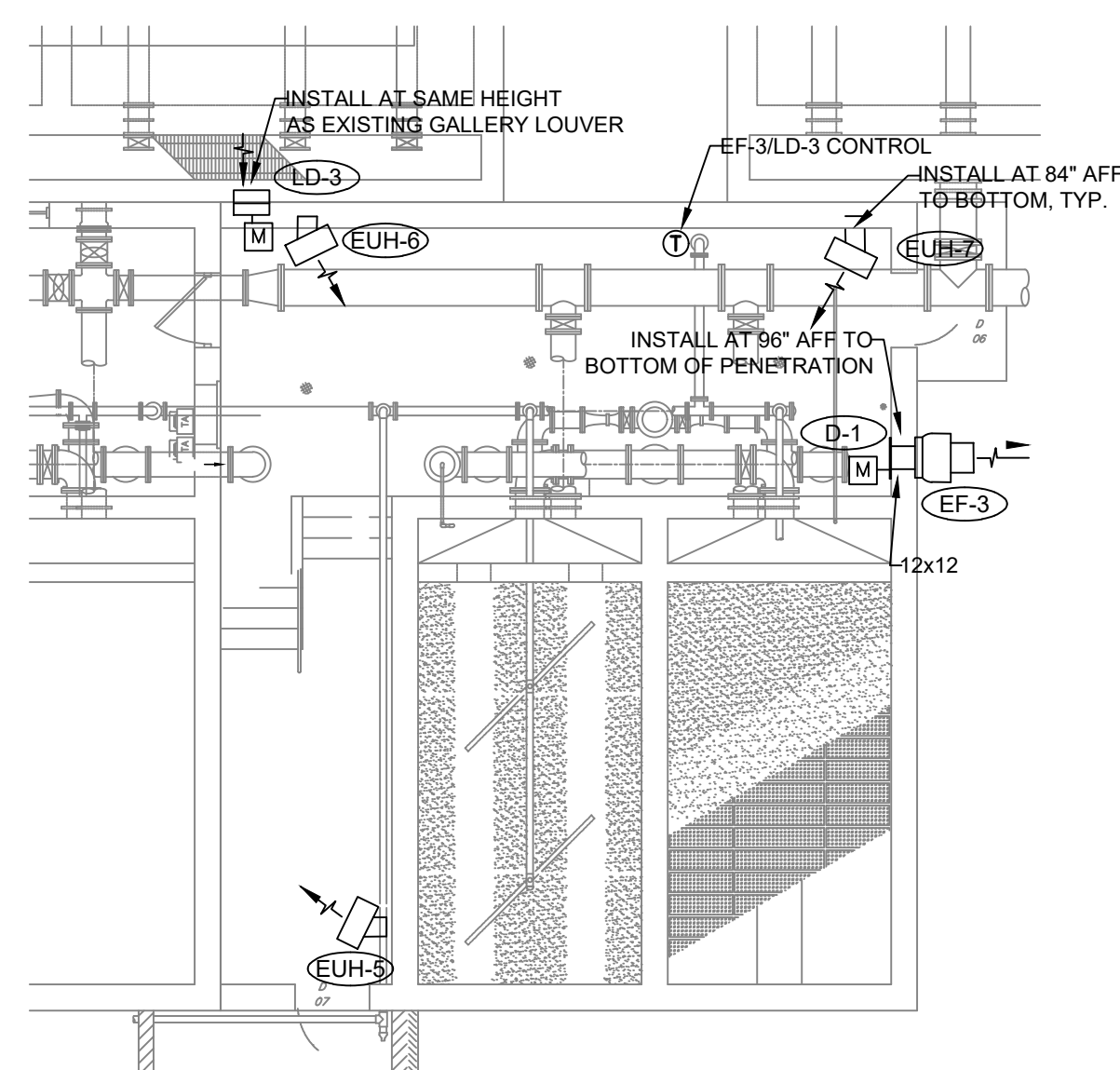


**SPRING WATER PUMP STATION HVAC PLAN**

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

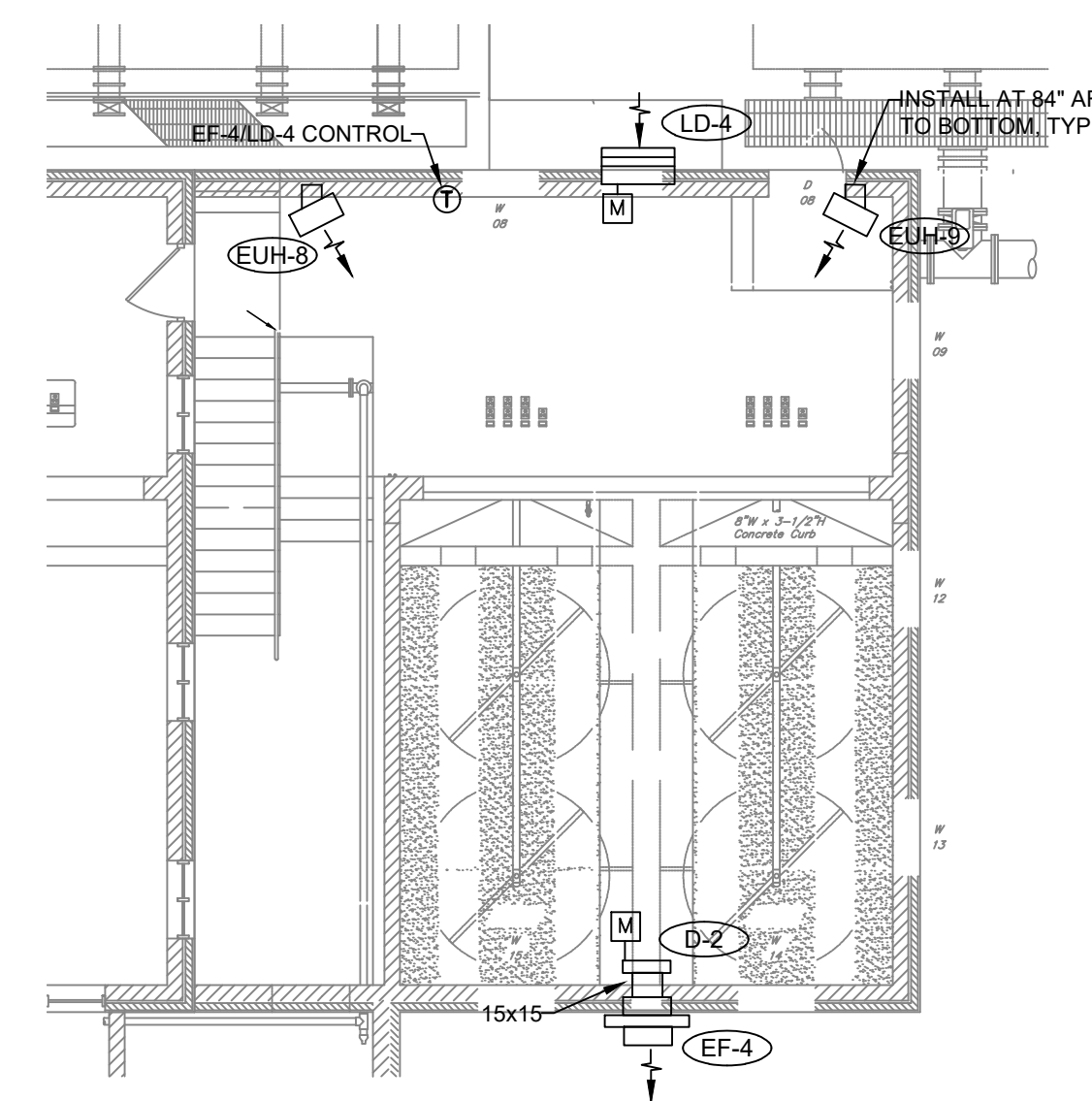
**SHEET NOTES:**

- 1 BREAK-GLASS EMERGENCY SWITCH LABELED "VENTILATION SYSTEM EMERGENCY SHUTOFF"
- 2 EF-1 CONTROL SWITCH SHALL CAUSE VENTILATION TO INCREASE FROM 400 CFM TO 4700CFM. GREEN LIGHT SHALL INDICATE FAN IS IN HIGH SPEED MODE. CONTINUOUS VENTILATION IS REQUIRED
- 3 FREQUENCY DRIVE SHALL BE PROGRAMMED FOR OPERATION AT LOW (400 CFM) AND HIGH (4700 CFM) SPEEDS. CONTINUOUS VENTILATION IS REQUIRED
- 4 PROVIDE MECHANICAL THERMOSTAT THAT SHALL CAUSE FAN SPEED TO INCREASE TO HIGH SPEED
- 5 EF-2 CONTROL SWITCH SHALL SWITCH FROM LOW TO HIGH SPEED MODE WITH GREEN PILOT LIGHT INDICATING HIGH SPEED
- 6 FREQUENCY DRIVE SHALL BE PROGRAMMED FOR OPERATION AT LOW (270 CFM) AND HIGH (550 CFM) SPEEDS. CONTINUOUS VENTILATION IS REQUIRED
- 7 PROVIDE 3/4" PVC CONDENSATE DRAIN TO NEAREST FLOOR DRAIN
- 8 PROVIDE PORTABLE DEHUMIDIFIER SEE SPECIFICATIONS FOR REQUIREMENTS



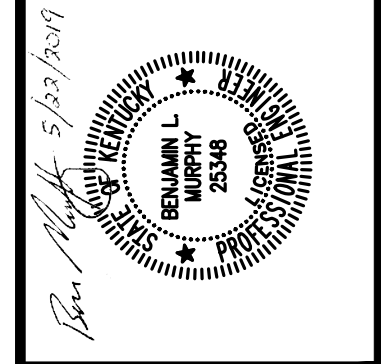
**FILTER BUILDING PIPE GALLERY HVAC PLAN**

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

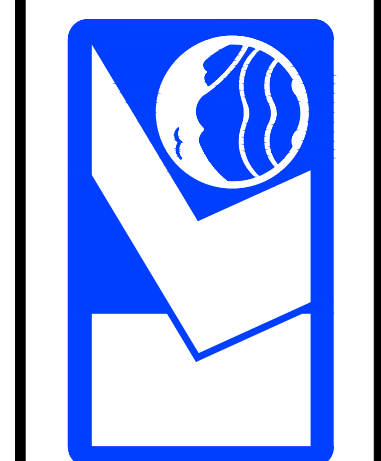


**FILTER BUILDING OPERATING FLOOR HVAC PLAN**

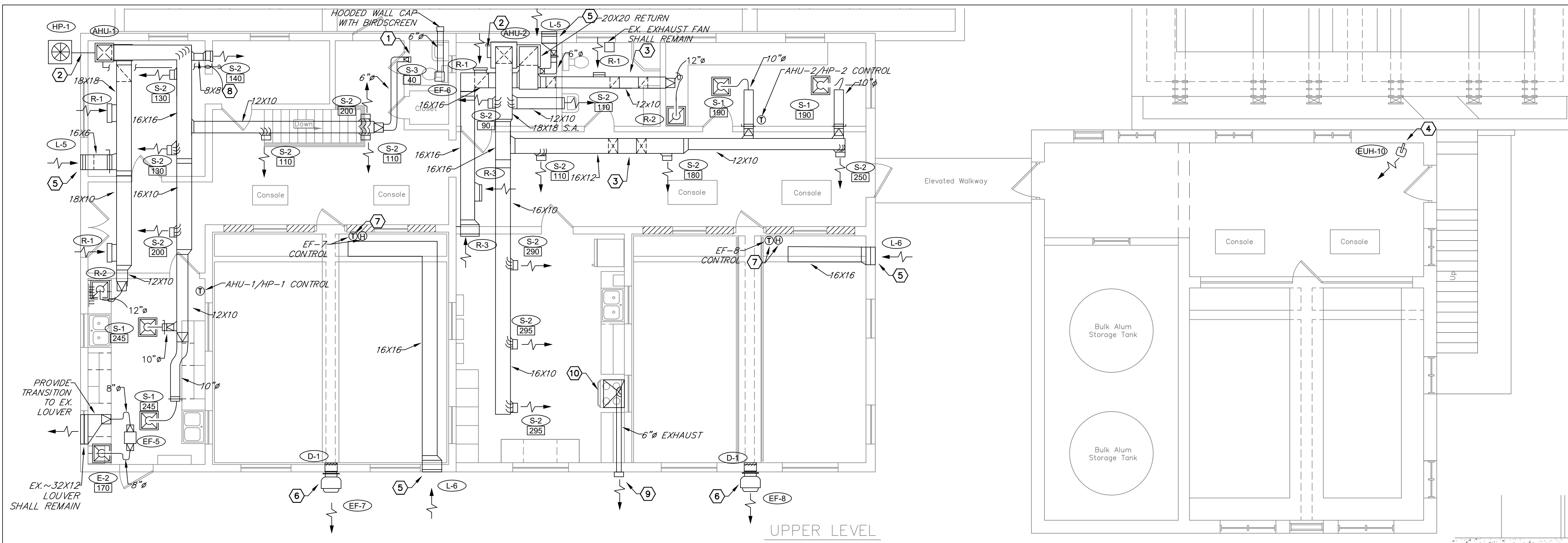
SCALE: 1/8"=1'-0"



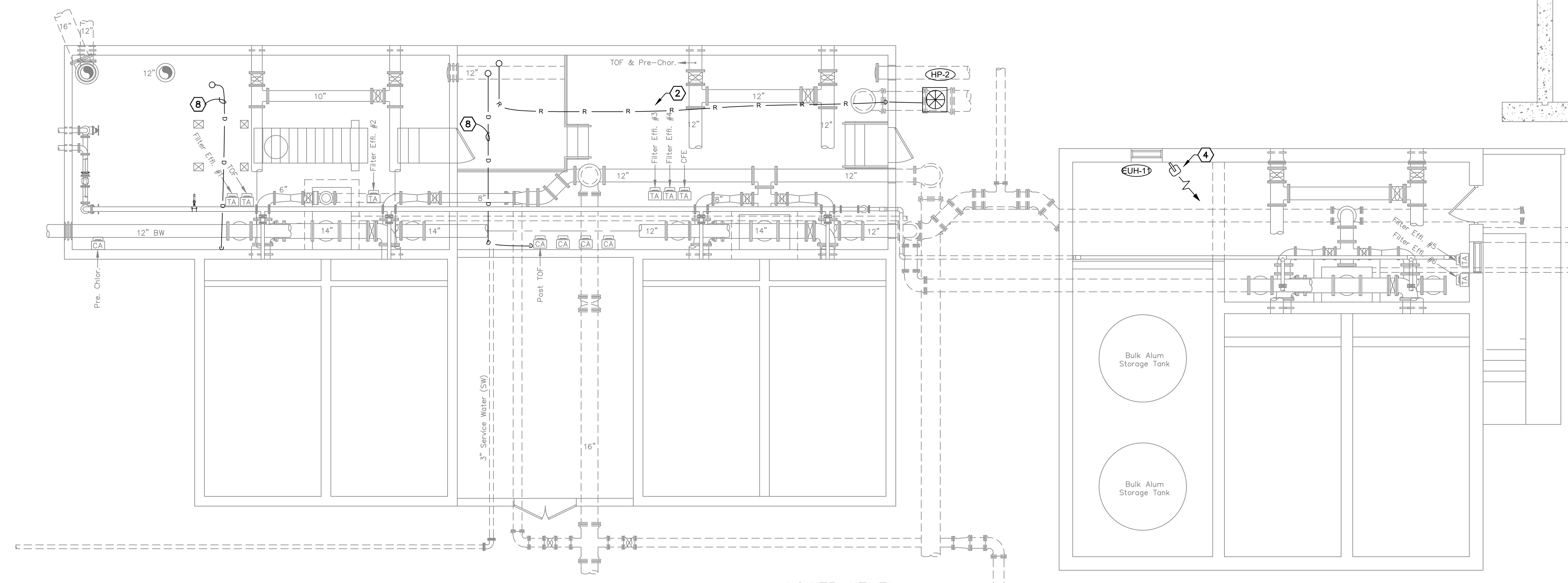
DRAWN BY: CA
CHECKED BY: BLM
DATE: APRIL 2018
SCALE: As Noted
REVISIONS







UPPER LEVEL HVAC PLAN-NEW WORK  
SCALE: 3/16"=1'0"



LOWER LEVEL HVAC PLAN-NEW WORK  
SCALE: 3/16"=1'0"

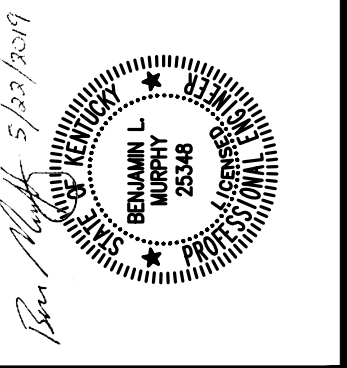
**GENERAL SHEET NOTES:**

- DUCT IN ROOMS WITH NO CEILING SHALL BE INSTALLED HIGH WITH 3" GAP TO ROOF DECK

**SHEET NOTES:**

1. PROVIDE SUPPLY GRILL INSTALLED FLUSH WITH WALL ABOVE DOOR
2. PROVIDE REFRIGERANT LINES PER MFR INSTRUCTIONS
3. OFFSET DUCT AROUND 1" DEEP CEILING BEAM
4. REPLACE EX. ELECTRIC UNIT HEATER
5. INSTALL LOUVER HIGH AS POSSIBLE ON WALL
6. INSTALL FAN APPROXIMATELY 54" AFF TO BOTTOM OF PENETRATION
7. PROVIDE NEMA 4X LINE VOLTAGE THERMOSTAT RATED FOR MINIMUM 1/4 HP, AND A JOHNSON W45A OR EQUAL HUMIDISTAT. FAN SHALL BE CONTROLLED FROM FROM BOTH TEMPERATURE AND HUMIDITY WHEN SWITCH IS IN AUTO POSITION.
8. PROVIDE 3/4" CONDENSATE DRAIN PIPED TO FLOOR DRAIN
9. PROVIDE 6" WALLCAP DESIGNED FOR RANGE EXHAUST
10. PROVIDE A 30" DOMESTIC RANGE HOOD, WALL-MOUNTED, 400CFM, STAINLESS STEEL WITH BACKDRAFT DAMPER, INSTALL PER MFR INSTRUCTIONS

**GREEN RIVER VALLEY WATER DISTRICT**  
**WATER TREATMENT PLANT EXPANSION**  
**HART COUNTY, KENTUCKY**



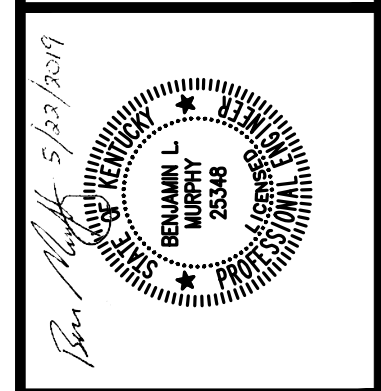
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**KENVIRONS, INC.**  
**FRANKFORT, KENTUCKY**



PROJECT NO.  
 2014042  
 SHEET NO.  
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**ELECTRICAL ABBREVIATIONS**

A	AMPERE
AF	AMPERE FRAME
AFF	ABOVE FINISHED FLOOR
AFD	ADJUSTABLE FREQUENCY DRIVE
AT	AMPERE TRIP
ATS	AUTOMATIC TRANSFER SWITCH
AWG	AMERICAN WIRE GAUGE
BC	BARE COPPER
C	CONDUIT (RACEWAY)
AT	AT
CB	CIRCUIT BREAKER
CCTV	CLOSED CIRCUIT TELEVISION
CKT	CIRCUIT
C/L	CENTERLINE
CLG	CEILING
CP	CONTROL PANEL
CT	CURRENT TRANSFORMER OR CONSTANT TORQUE
CTL	CONTROL
CU	COPPER OR CONDENSING UNIT
Δ/Y	DELTA/WYE
DB	DIRECT BURIAL
DN	DOWN
DPST	DOUBLE POLE-SINGLE THROW
EC	EMPTY CONDUIT
EF	EXHAUST FAN
EG	EQUIPMENT GROUND
EGC	EQUIPMENT GROUND CONDUCTOR
EJ	EXPANSION JOINT
EL	ELEVATION
ELEC	ELECTRIC
EOV	ELECTRICALLY OPERATED VALVE
EMERG	EMERGENCY
EUH	ELECTRIC UNIT HEATER
EWC	ELECTRIC WATER COOLER
EW	ELECTRIC WALL HEATER/WATER HEATER
EX	EXISTING
FA	FIRE ALARM
FACP	FIRE ALARM CONTROL PANEL
FO	FIBER OPTIC
FVNR	FULL VOLTAGE, NON-REVERSING
GEC	GROUNDING ELECTRODE CONDUCTOR
GFCI OR GFI	GROUND FAULT CURRENT INTERRUPTING
GND	GROUND
HOA	HAND-OFF-AUTO SELECTOR SWITCH
HP	HORSEPOWER
J OR JB	JUNCTION BOX
KVA	KILOVOLT-AMPERES
KWH	KILOWATT-HOUR
LIT	LEVEL INDICATING TRANSMITTER
LF	LIGHTING FIXTURE (LUMINAIRE)
LM	LUMEN
LTG	LIGHTING
LTS	LIGHTS
LS	LIMIT SWITCH
LV	LOW VOLTAGE
MCB	MAIN CIRCUIT BREAKER
MCP	MOTOR CIRCUIT PROTECTOR
MCC	MOTOR CONTROL CENTER
MDP	MAIN DISTRIBUTION PANEL
MFR	MANUFACTURER
MH	MANHOLE
MIN	MINIMUM
MLO	MAIN LUGS ONLY
MTD	MOUNTED
NA	NOT APPLICABLE
NC	NORMALLY CLOSED
NEC	NATIONAL ELECTRICAL CODE
NL	NON LINEAR
NO	NORMALLY OPEN
NTS	NOT TO SCALE
OH	OVERHEAD
OL	OVERLOAD
P	POLE
OT	OVER TEMPERATURE
PH OR Ø	PHASE
PNL	PANEL
PVC	POLY-VINYL CHLORIDE
PWR	POWER
RECEPT	RECEPTACLE
SHT	SHEET
S/N	SOLID NEUTRAL
SP	SINGLE POLE
SPD	SURGE PROTECTION DEVICE
SS	STAINLESS STEEL
STA	STATION
STD	STANDARD
STIC	SHIELDED TWISTED INSTRUMENT CABLE
SW	SWITCH
TB	TERMINAL BOX
TEL	TELEPHONE
TS	TAMPER SWITCH
TV	TELEVISION
TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSOR
UG	UNDERGROUND
UH	UNIT HEATER
V	VOLTAGE OR VOLTS
W	WIRE
WP	WEATHERPROOF
W/	WITH
XFMR	TRANSFORMER

**ELECTRICAL PLAN SYMBOLS**

	ELECTRICAL CIRCUIT: SHORT=PHASE CONDUCTOR; LONG = NEUTRAL, DASHED = EQUIPMENT GROUND, EMERGENCY CIRCUIT
	SWITCH: 3=3 WAY; 4=4 WAY; K=KEY; WP= WEATHERPROOF; M=MOTOR STARTER; PL=PILOT LT
	DUPLEX RECEPTACLE: WP = WEATHERPROOF; GFI = GROUND FAULT; NUMBER = MOUNTING HEIGHT
	SINGLE RECEPTACLE
	208 or 240 VOLT RECEPTACLE
	DUPLEX RECEPTACLE, FLUSH FLOORBOX MOUNTED
	SPECIAL PURPOSE RECEPTACLE OUTLET
	THERMOSTAT
	MOTOR
	JUNCTION BOX - SMALL
	JUNCTION BOX - FLUSH-MOUNTED
	SAFETY SWITCH - NONFUSED UNLESS NOTED OTHERWISE
	MAGNETIC COMBINATION STARTER - THREE PHASE
	MAGNETIC COMBINATION STARTER - SINGLE PHASE
	TELECOM OUTLET: D = DATA; T = TELEPHONE; C = CABLE; NUMBER = QTY OF CABLES & JACKS
	CONDUIT TURNED UP
	CONDUIT TURNED DOWN
	WALL MOUNTED SPEAKER OR ALARM HORN
	PANELBOARD (SURFACE MOUNTED)
	PANELBOARD (FLUSH MOUNTED IN WALL)
	ELECTRICAL UNIT HEATER
	EXHAUST FAN/VENTILATOR
	SPEAKER GENERAL
	CLOCK
	EXISTING POWER POLE
	NEW POWER POLE
	LIGHTING POLE
	PHOTO CELL
	MANHOLE
	PULLBOX
	MUSHROOM HEAD EMERGENCY SWITCH
	DUCT SMOKE DETECTOR
	HEAT DETECTOR
	SMOKE DETECTOR
	ALARM MANUAL PULL STATION
	ALARM HORN/STROBE
	ALARM STROBE
	ALARM ZONE ADDRESSABLE MODULE
	SPRINKLER SYSTEM FLOW SWITCH
	TAMPER SWITCH
	MAGNETIC DOOR HOLDER
	KEYNOTE
	CALL SWITCH
	PASSIVE INFRARED MOTION DETECTOR
	ALL WORK IN THE ROOM/AREA SHALL CONFORM TO THE NEMA RATING INDICATED
	ELECTRICAL LINE UNDERGROUND
	ELECTRICAL LINE OVERHEAD
	INSTRUMENTATION LINE UNDERGROUND
	INSTRUMENTATION LINE OVERHEAD
	TELEPHONE LINE UNDERGROUND
	TELEPHONE LINE OVERHEAD

**ELECTRICAL DIAGRAM SYMBOLS**

	TRANSFORMER
	CAPACITOR
	GROUND
	CURRENT TRANSFORMER
	POTENTIAL TRANSFORMER
	CIRCUIT BREAKER (GENERAL)
	CIRCUIT BREAKER, THERMAL-MAGNETIC
	CIRCUIT BREAKER, MAGNETIC-ONLY
	CIRCUIT BREAKER (DRAWOUT)
	GROUND FAULT PROTECTED CIRCUIT BREAKER
	RELAY CONTACTS (NORMALLY OPENED)
	RELAY CONTACTS (NORMALLY CLOSED)
	THERMAL OVERLOAD PROTECTION
	FUSE
	DOT INDICATES A CONNECTION OF TWO WIRES
	TERMINALS FOR CONNECTION OF REMOTE WIRING
	RELAY/CONTACTOR COIL: C = CONTRACTOR; CR = CONTROL RELAY; TR = TIMING RELAY; M = MOTOR
	HAND-OFF-AUTOMATIC SWITCH
	FULL VOLTAGE NON-REVERSING MOTOR STARTER; X = NEMA SIZE
	PILOT LIGHT: R = RED; G = GREEN; A = AMBER; W = WHITE
	PILOT LIGHT - PUSH-TO-TEST
	MOTOR
	FUSED DISCONNECT SWITCH
	FLOAT SWITCH
	TEMPERATURE SWITCH (THERMOSTAT)
	PRESSURE SWITCH
	LIMIT SWITCH
	FLOW SWITCH
	SOLENOID VALVE COIL
	ELAPSED TIME METER
	KEY INTERLOCK
	BATTERY
	PUSHBUTTONS, N.C. & N.O. RESPECTIVELY
	SELECTOR SWITCH - TWO POSITION
	FUSED CUTOUT
	SECTIONALIZING SWITCH (3 PHASE)
	TIMER RELAY CONTACT: NORMALLY OPEN - TIMED OPEN UPON DEENERGIZATION
	TIMER RELAY CONTACT: NORMALLY CLOSED -TIMED CLOSE UPON DEENERGIZATION
	TIMER RELAY CONTACT: NORMALLY OPEN - TIMED CLOSE UPON ENERGIZATION
	TIMER RELAY CONTACT: NORMALLY CLOSED -TIMED OPEN UPON ENERGIZATION
	TRANSFER SWITCH
	GENERATOR
	EXTERNAL WIRING

**ELECTRICAL DEVICE MOUNTING HEIGHT SCHEDULE**

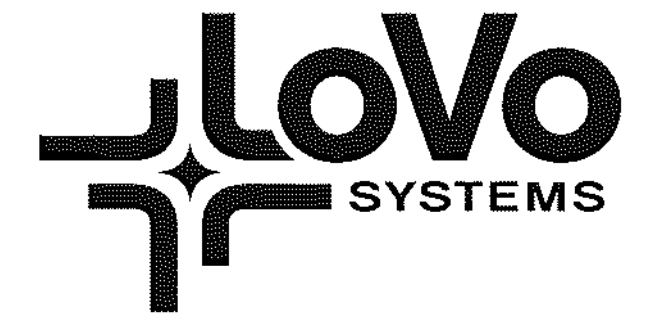
DEVICE	HEIGHT AFF	REMARKS
RECEPTACLE - LOW	1'-4"	TO BOTTOM OF DEVICE BOX
RECEPTACLE - ABOVE COUNTER/MEDIUM	4'-0"	TO TOP OF DEVICE BOX
RECEPTACLE OR FIXTURE - HIGH	7'-4"	TO TOP OF DEVICE BOX
LIGHT SWITCH	4'-0"	TO BOTTOM OF DEVICE BOX
TELEPHONE OUTLET - WALL MOUNTED	4'-8"	TO BOTTOM OF DEVICE BOX
CONTROL STATIONS & PUSH-BUTTONS	4'-0"	TO BOTTOM OF DEVICE BOX
PANELBOARDS & CONTROL PANELS	6'-6"	TO TOP OF BOX
SAFETY SWITCH	4'-0"	TO TOP OF BOX
THERMOSTAT	4'-8"	TO BOTTOM OF DEVICE BOX
CLOCKS	7'-4"	TO BOTTOM OF DEVICE BOX
ALARM MANUAL PULL STATION	4'-0"	TO BOTTOM OF DEVICE BOX
ALARM NOTIFICATION APPLIANCES	6'-8"	TO BOTTOM OF DEVICE BOX
EMERGENCY LIGHT FIXTURES	7'-4"	TO BOTTOM OF DEVICE BOX
EXIT SIGNS - WALL MOUNTED	8'-0"	TO TOP; MAINTAIN 2" CLEARANCE BELOW CEILING

**LIGHT FIXTURE SCHEDULE**

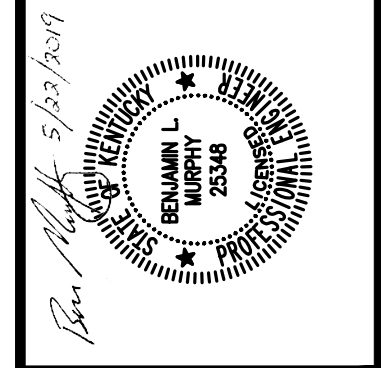
TYPE	MANUFACTURER	CATALOG SERIES	LAMPS	VOLTAGE	MOUNTING	DESCRIPTION	SYMBOL
LF-1	HOLOPHANE	EVT4 LED	6000 LM LED	120V	CHAIN OR CEILING	ROUGH SERVICE LINEAR FIXTURE, ENCLOSED AND GASKETED, POLYCARBONATE HOUSING, CLEAR POLY LENS, WIDE DISTRIBUTION, 4000K COLOR, 90 CRI, 64 WATT	
LF-1E	HOLOPHANE	EVT4 LED	6000 LM LED	120V	CHAIN OR CEILING	SAME AS LF-1 WITH 90 MIN EMERGENCY BATTERY PACK	
LF-2	HOLOPHANE	QM	2-1.5W LED	9.6V	WALL	DUAL-HEAD REMOTE FIXTURE, WEATHER-PROOF, WET LOCATION, CORROSION-RESISTANT, UV-STABILIZED THERMOPLASTIC, COLOR TO BE SELECTED BY OWNER DURING SUBMITTAL REVIEW	
LF-3	HOLOPHANE	QM	LED	120V	WALL	EXIT FIXTURE, WHITE, RED LETTER, HIGH OUTPUT NICKEL CADMIUM BATTERY SIZED FOR REMOTE HEADS, DIAGNOSTICS WITH TEST BUTTON	
LF-4	HOLOPHANE	W4GLEED	3400 LM LED	120V	WALL	WALLPACK, 4000K COLOR, GLASS REFRACTOR, CORROSION RESISTANT PAINTED ALUMINUM HOUSING, 39 WATT	
LF-5	HOLOPHANE	PLED2	8000 LM LED	120V	STANCHION	WET LOCATION, 4000K COLOR, HIGHANGLE OPTICS, PRISMATIC GLASS LENS, COLOR TO BE SELECTED BY OWNER, 74W	
LF-6	HOLOPHANE	HVT LED	3900 LM LED	120V	TROFFER	LOW PROFILE 2'X4' LUMINAIRE, BASKET DIFFUSER, 5 YEAR WARRANTY, 4000K COLOR, 80 CRI, 36W	
LF-6E	HOLOPHANE	HVT LED	3900 LM LED	120V	TROFFER	SAME AS LF-6 WITH 90 MIN EMERGENCY BATTERY PACK	
LF-7	HOLOPHANE	HVT LED	3900 LM LED	120V	SURFACE	SAME AS LF-6 WITH SURFACE MOUNT KIT	
LF-7E	HOLOPHANE	HVT LED	3900 LM LED	120V	SURFACE	SAME AS LF-6 WITH 90 MIN EMERGENCY BATTERY PACK AND SURFACE MOUNT KIT	
LF-8	LITHONIA	FMML	1985 LM LED	120V	CEILING	ROUND FLUSH-MOUNT LUMINAIRE WITH WHITE ACRYLIC DIFFUSER, DAMP LOCATION, 5-YEAR WARRANTY	
LF-9	HOLOPHANE	MG LED	20000 LM LED	120V	HORIZONTAL ARM	AREA FLOODLIGHT, IP-66, 4000K COLOR, WIDE DISTRIBUTION, 165W, HIGH TILT TO 45°, PROVIDE 2" HORIZONTAL ARM MOUNT WITH 30° BEND AND FLANGE FOR WALL-MOUNT	

**GENERAL ELECTRICAL DEMOLITION NOTES:**

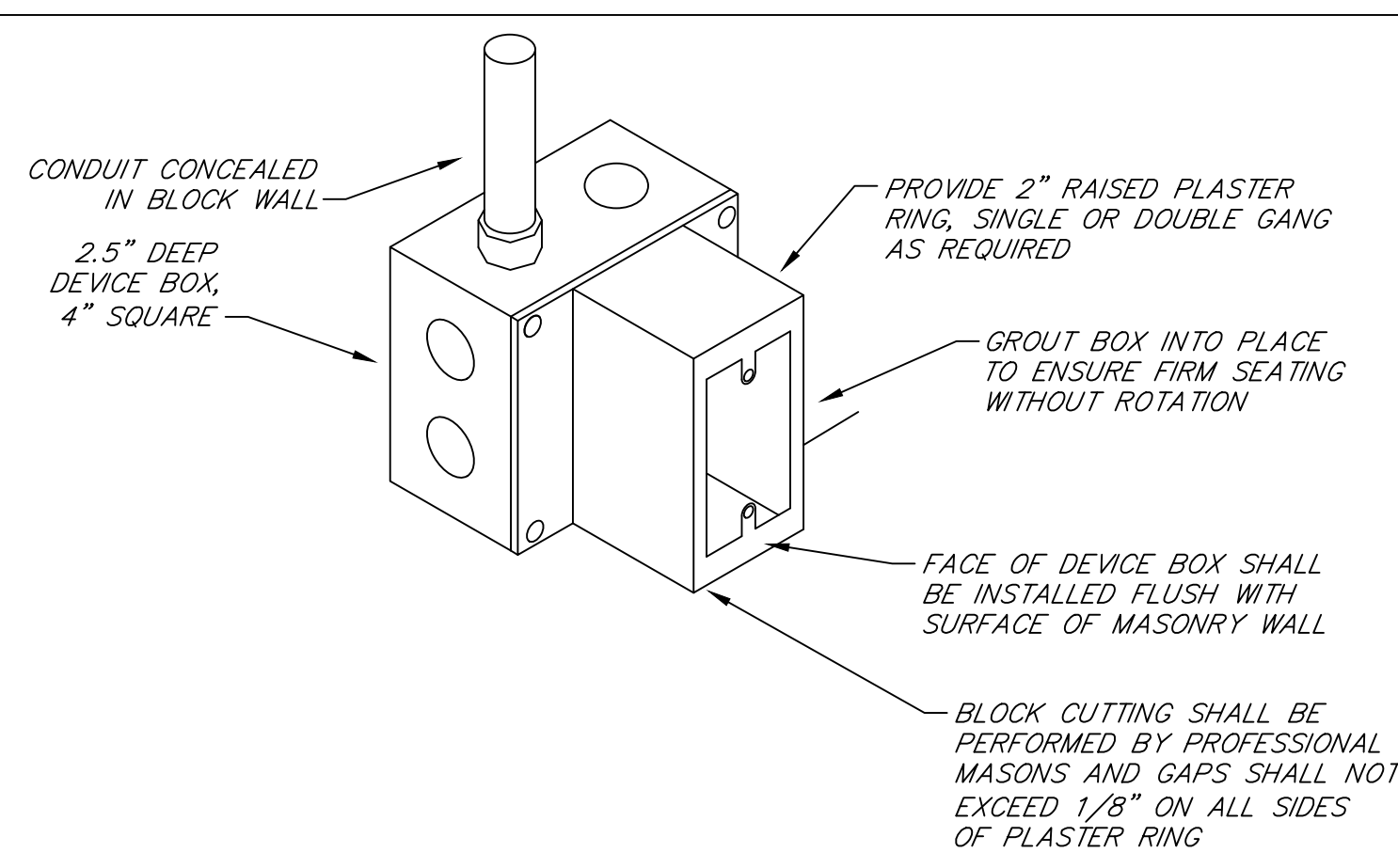
- INFORMATION FOR EXISTING EQUIPMENT AND SYSTEMS WAS TAKEN FROM PREVIOUS CONSTRUCTION DOCUMENTS AND FIELD VISITS MADE BY ENGINEER. NOT ALL DATA SHOWN MAY BE ACCURATE DUE TO CONCEALMENT, ETC. THE CONTRACTOR SHALL VISIT THE SITE PRIOR TO BIDDING TO VERIFY ALL EXISTING CONDITIONS AND QUANTITIES OF ITEMS TO BE REMOVED AND ADJUST HIS OR HER BID ACCORDINGLY.
- CONDUIT IF CONCEALED, MAY REMAIN IN PLACE, HOWEVER CONDUIT SHALL BE CUT OFF FLUSH WITH WALLS, CEILINGS, FLOORS ETC. AND BE GROUTED OVER AS TO LEAVE NO TRACE OF ITS EXISTENCE. EVERY ATTEMPT SHALL BE MADE FOR COMPLETE REMOVAL OF CONDUIT AND ITS HANGERS. ALL CONDUCTORS SHALL BE REMOVED FROM CIRCUITS BEING REMOVED FROM THE POINT OF ORIGIN (PANEL BOARD) TO DEVICE BEING REMOVED.
- ALL EQUIPMENT, CONDUIT, RACEWAYS, FIXTURES, RECEPTACLES, AND TECHNOLOGY JACKS WITH CROSS HATCHING (////) SHALL BE REMOVED.
- AFTER REMOVAL OF EQUIPMENT, CONDUIT, RACEWAYS, ETC. NO HOLES, CRACKS OR DAMAGE OF ANY KIND SHALL BE LEFT IN WALLS, FLOOR, OR CEILINGS. ALL REMAINING HOLES, CRACKS AND DAMAGE OF ANY KIND SHALL BE REPAIRED TO MATCH CONSTRUCTION OF ADJACENT SURROUNDING AREAS. SEE ARCHITECTURAL NOTES FOR ADDITIONAL PATCHING AND PAINTING REQUIREMENTS.
- CONTRACTOR SHALL LOCATE CONDUITS AND CIRCUITS IN THE FLOOR USING INSTRUMENTATION PRIOR TO CUTTING AND TRENCHING. ANY DAMAGE TO EXISTING CIRCUITS THAT ARE TO REMAIN SHALL BE REPAIRED AT NO ADDITIONAL COST TO THE OWNER.
- CONTRACTOR MAY (AND IS ENCOURAGED) TO REUSE EXISTING CONDUITS LEFT EMPTY BY DEMOLITION IN THE AREA OF WORK, IF CONDUIT IS IN ACCEPTABLE CONDITION AS DETERMINED BY THE ENGINEER.
- CONTRACTOR SHALL COORDINATE WITH THE OWNER ON EQUIPMENT THE OWNER CHOOSES TO SALVAGE. EQUIPMENT THE OWNER CHOOSES TO SALVAGE SHALL BE MOVED TO A LOCATION SPECIFIED BY THE OWNER. ALL OTHER EQUIPMENT SHALL BE REMOVED FROM THE PREMISES AND PROPERLY DISPOSED OF BY THE CONTRACTOR.



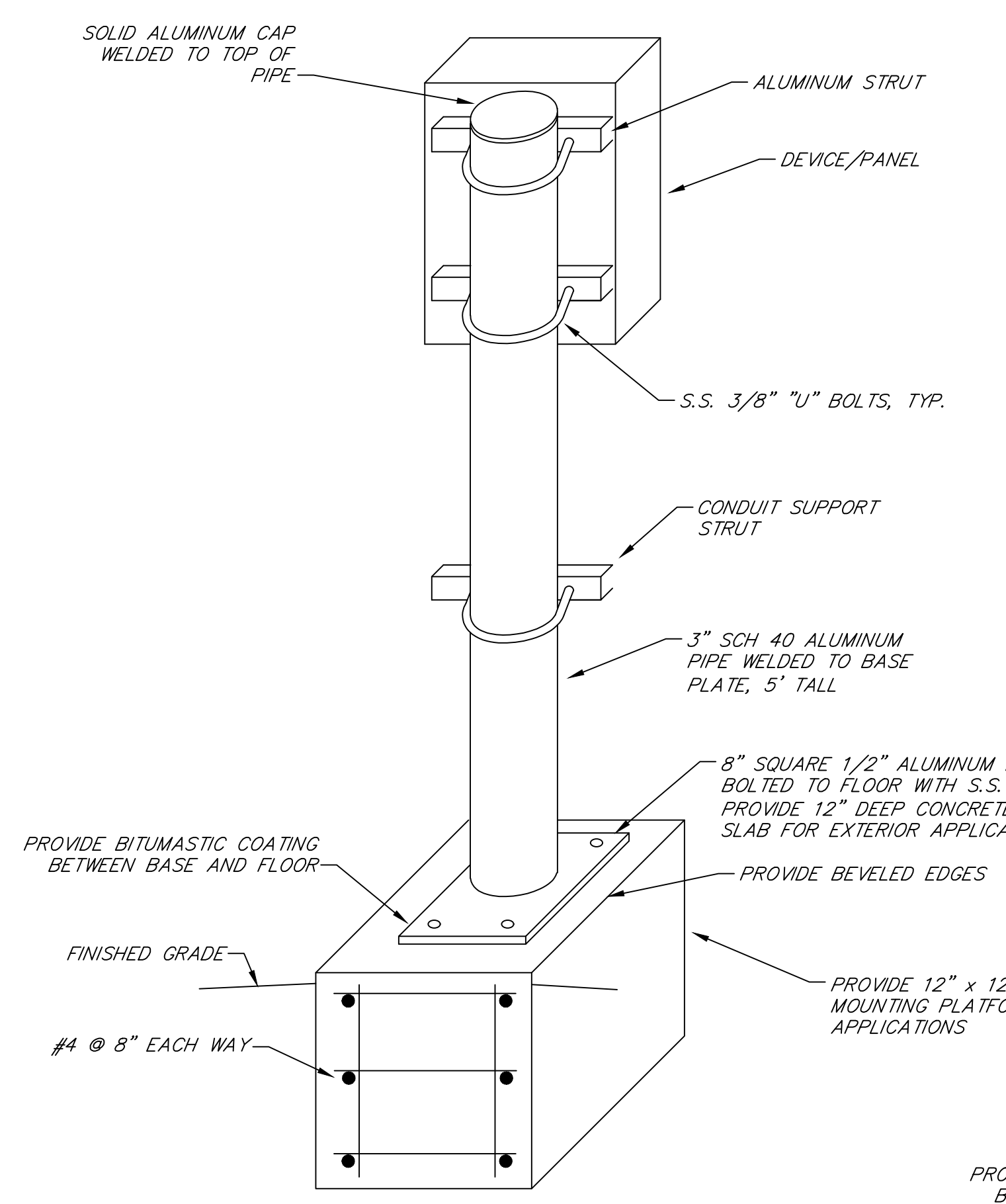




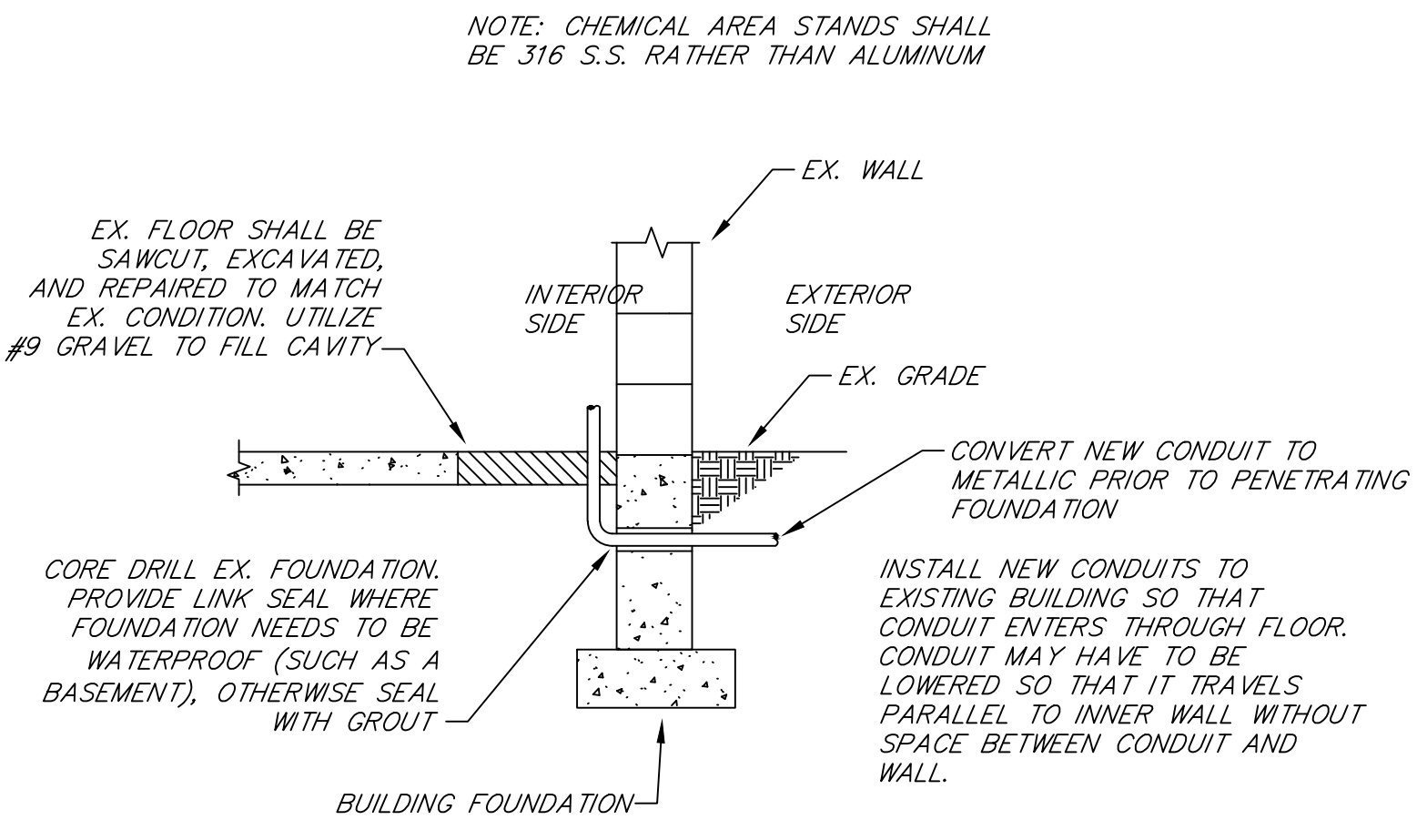
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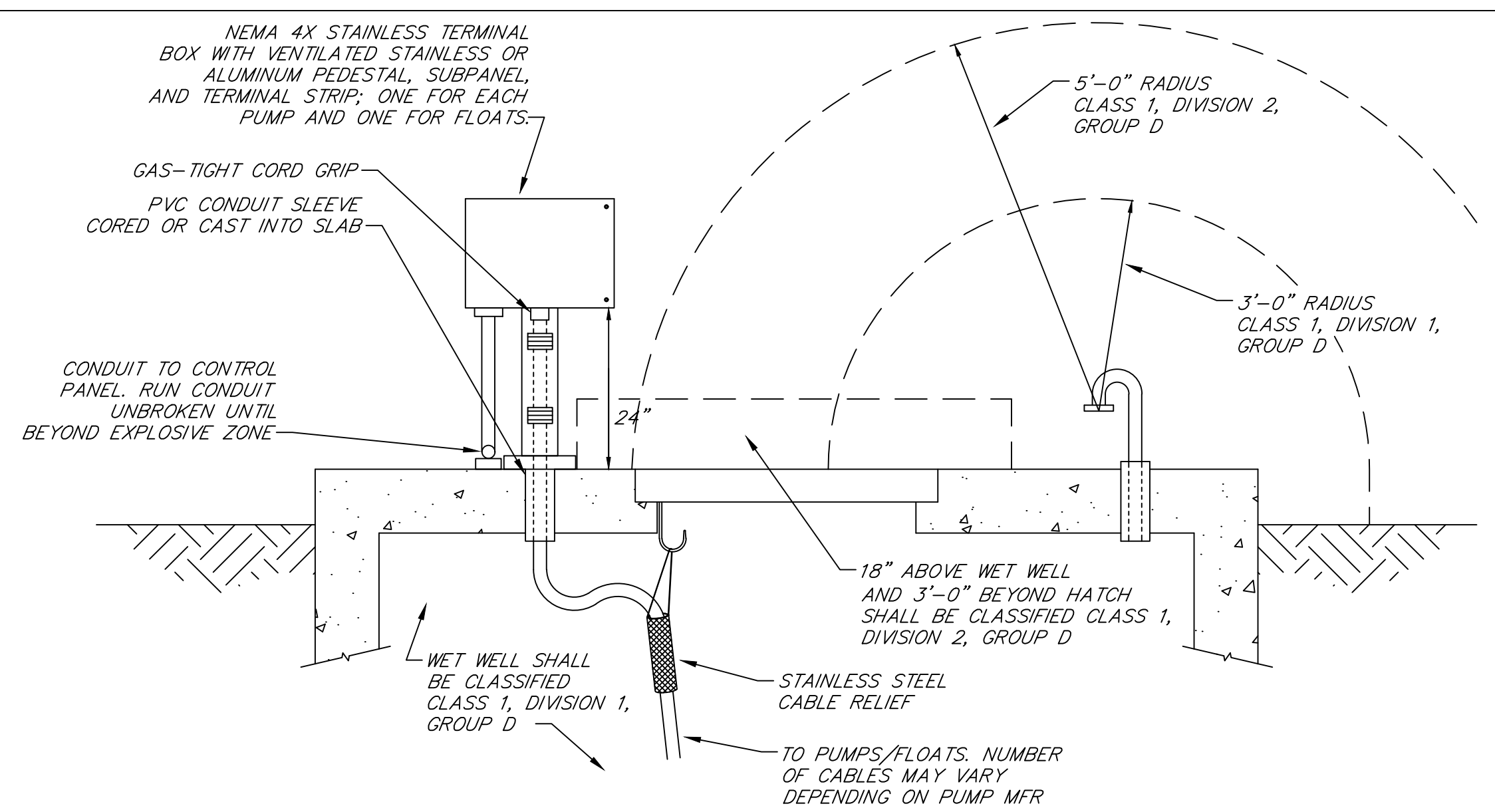
**MASONRY DEVICE BOX DETAIL**  
 NOT TO SCALE



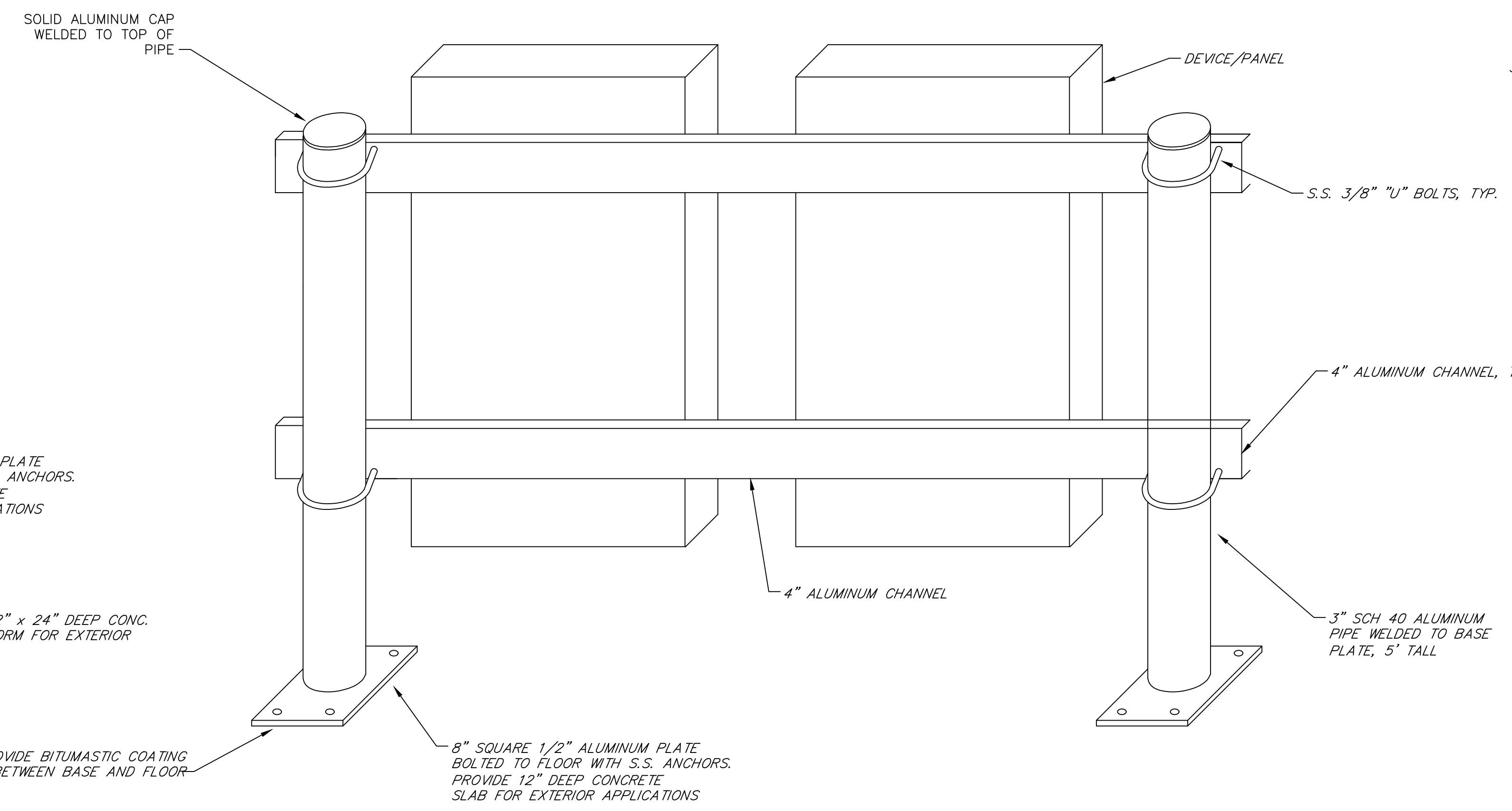
**FLOOR MOUNTING STAND**  
 NOT TO SCALE



**CONDUIT PENETRATION INTO EX. BUILDING**  
 NOT TO SCALE

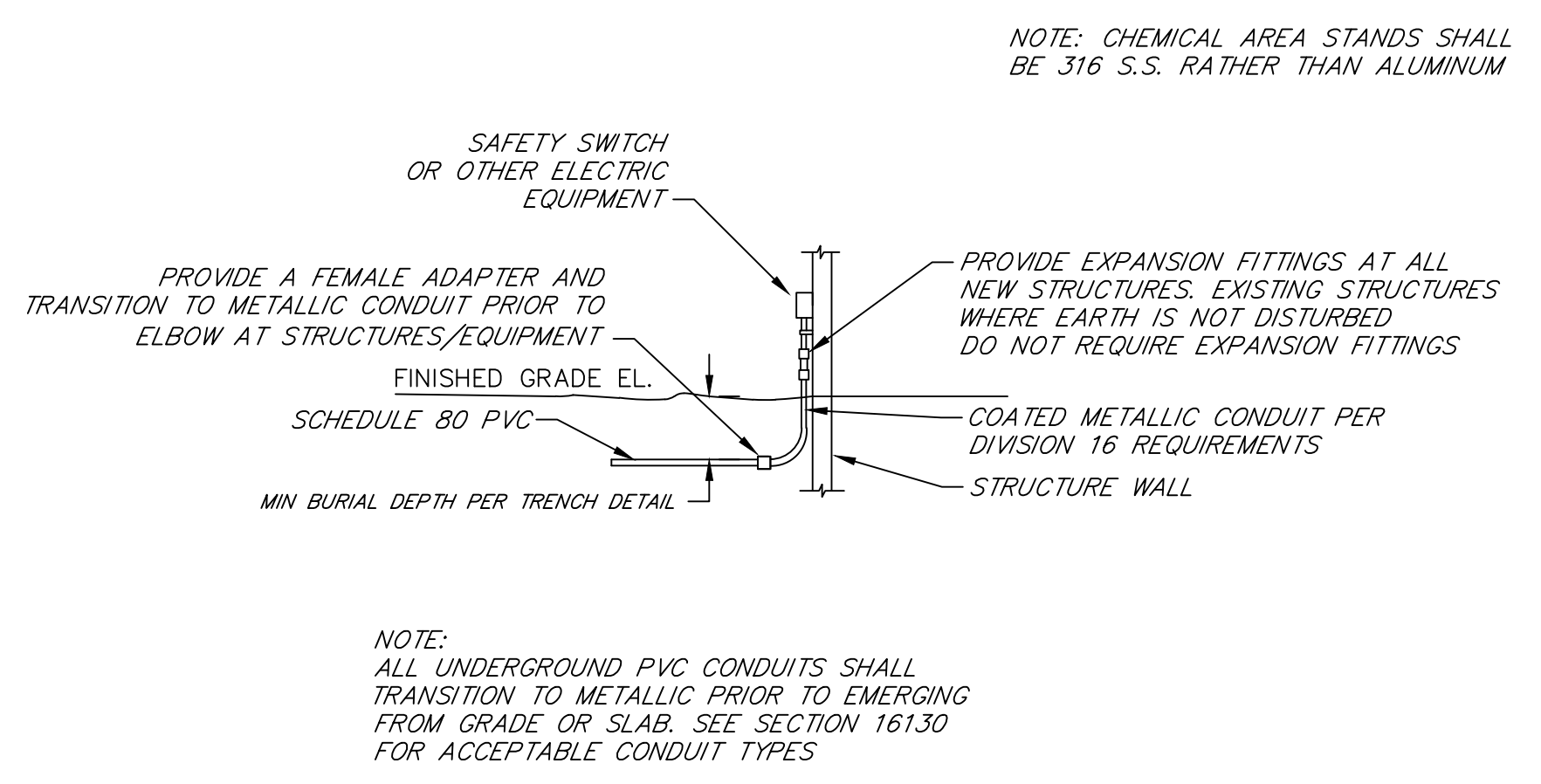


**WET WELL ELECTRICAL DETAIL**  
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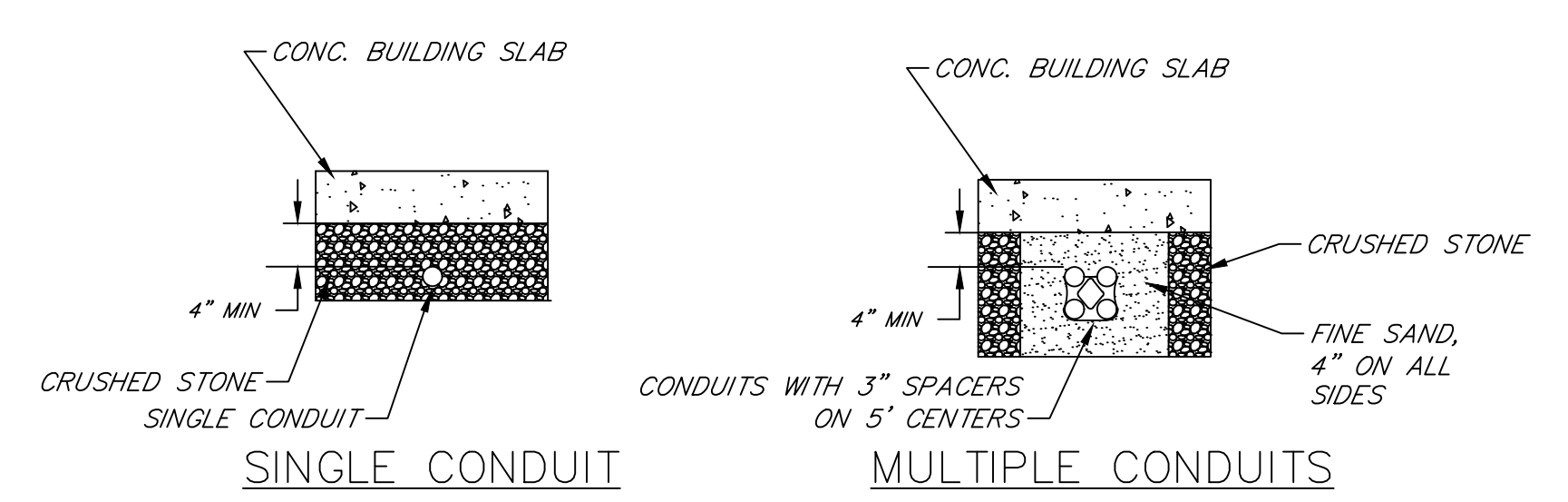


**HANDRAIL STANCHION FIXTURE DETAIL**  
 NOT TO SCALE

**FLOOR MOUNTING STAND**  
 NOT TO SCALE

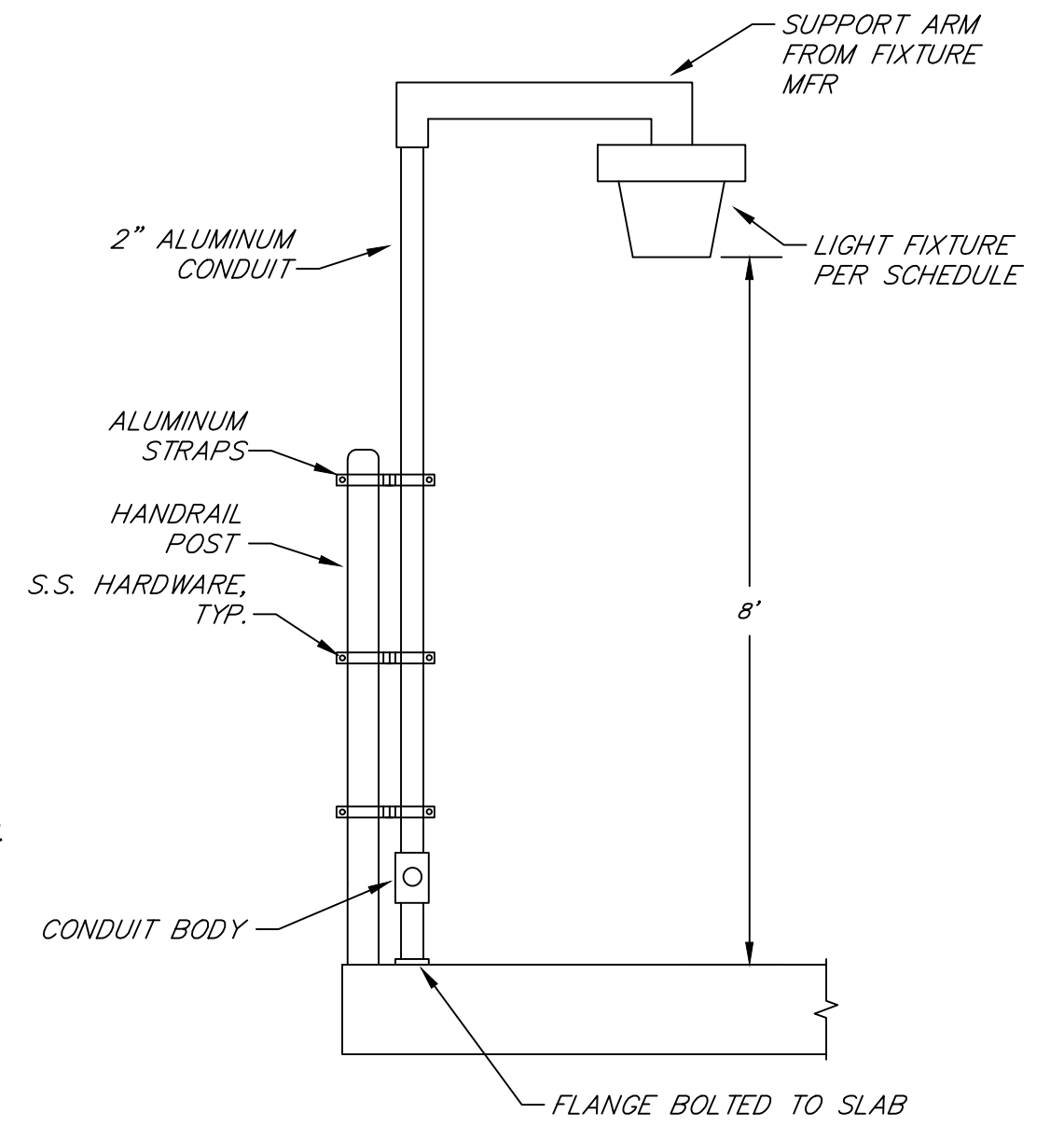


**TYPICAL UNDERGROUND PVC CONDUIT TRANSITION TO METALLIC CONDUIT**  
 NOT TO SCALE

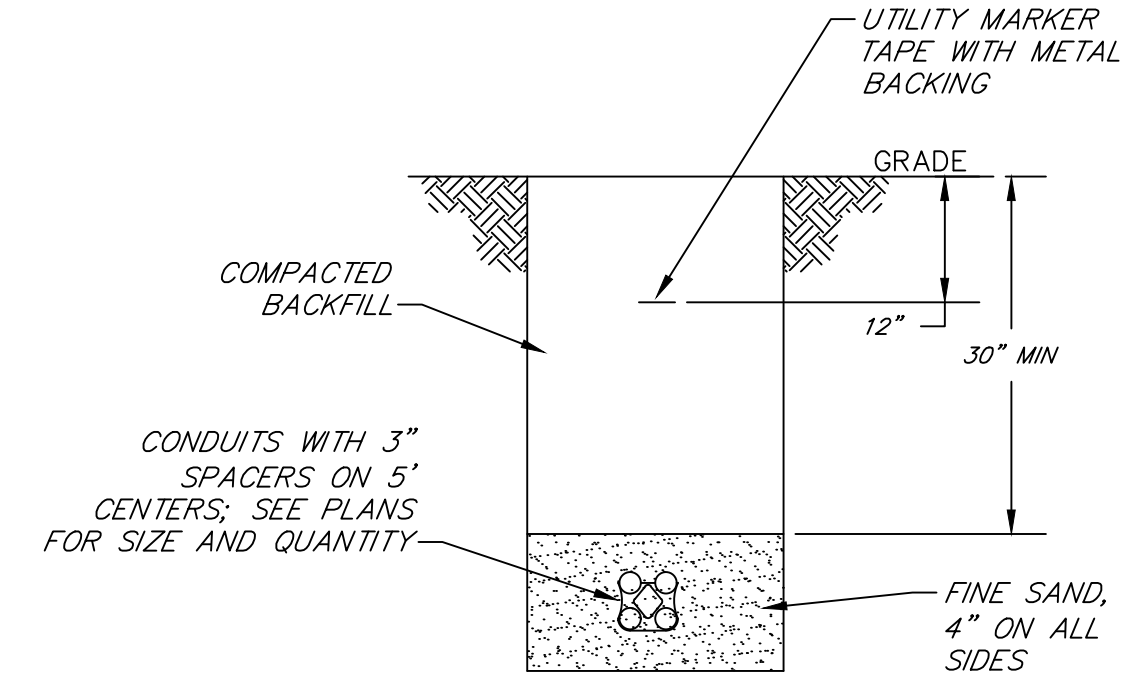


**CONDUIT INSTALLATION UNDER BUILDING SLAB**  
 NOT TO SCALE

NOTE: CONDUITS SHALL BE INSTALLED DEEPER WHERE NECESSARY TO PREVENT CURVED PORTION OF ELBOW FROM BEING EXPOSED ABOVE GRADE



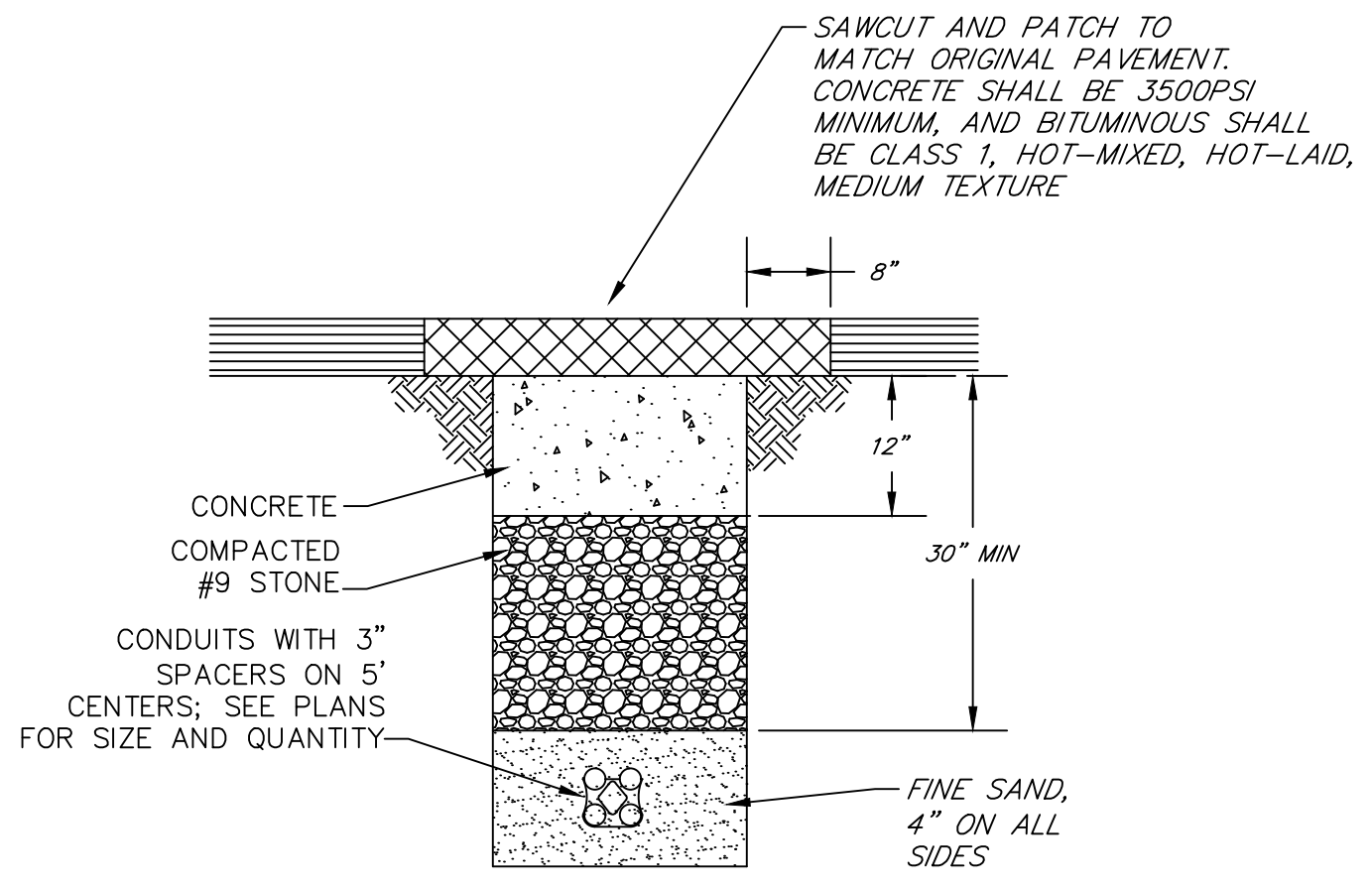
**HANDRAIL STANCHION FIXTURE DETAIL**  
 NOT TO SCALE



**TYPICAL TRENCH DETAIL**  
 NOT TO SCALE

**TRENCHING NOTES:**

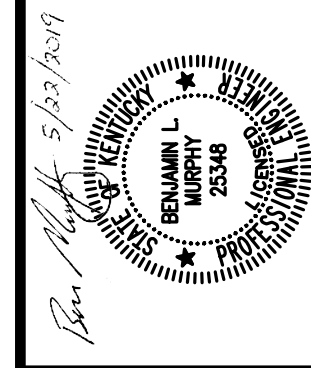
- PROVIDE FLARED ENDS ON CONDUIT AT TERMINATION POINTS IN MANHOLE AND BUILDINGS.
- PROVIDE PULL CORD IN ALL CONDUITS.
- UTILITY MARKER TAPE SHALL RUN THE ENTIRE LENGTH OF DUCT BANK.
- MAINTAIN MINIMUM 12" SPACING BETWEEN INSTRUMENTATION AND POWER, UNLESS FIBER OPTIC CABLES ARE USED.
- MAINTAIN MINIMUM 36" SPACING BETWEEN OTHER SITE PIPING, INCLUDING WATER, AND GAS.



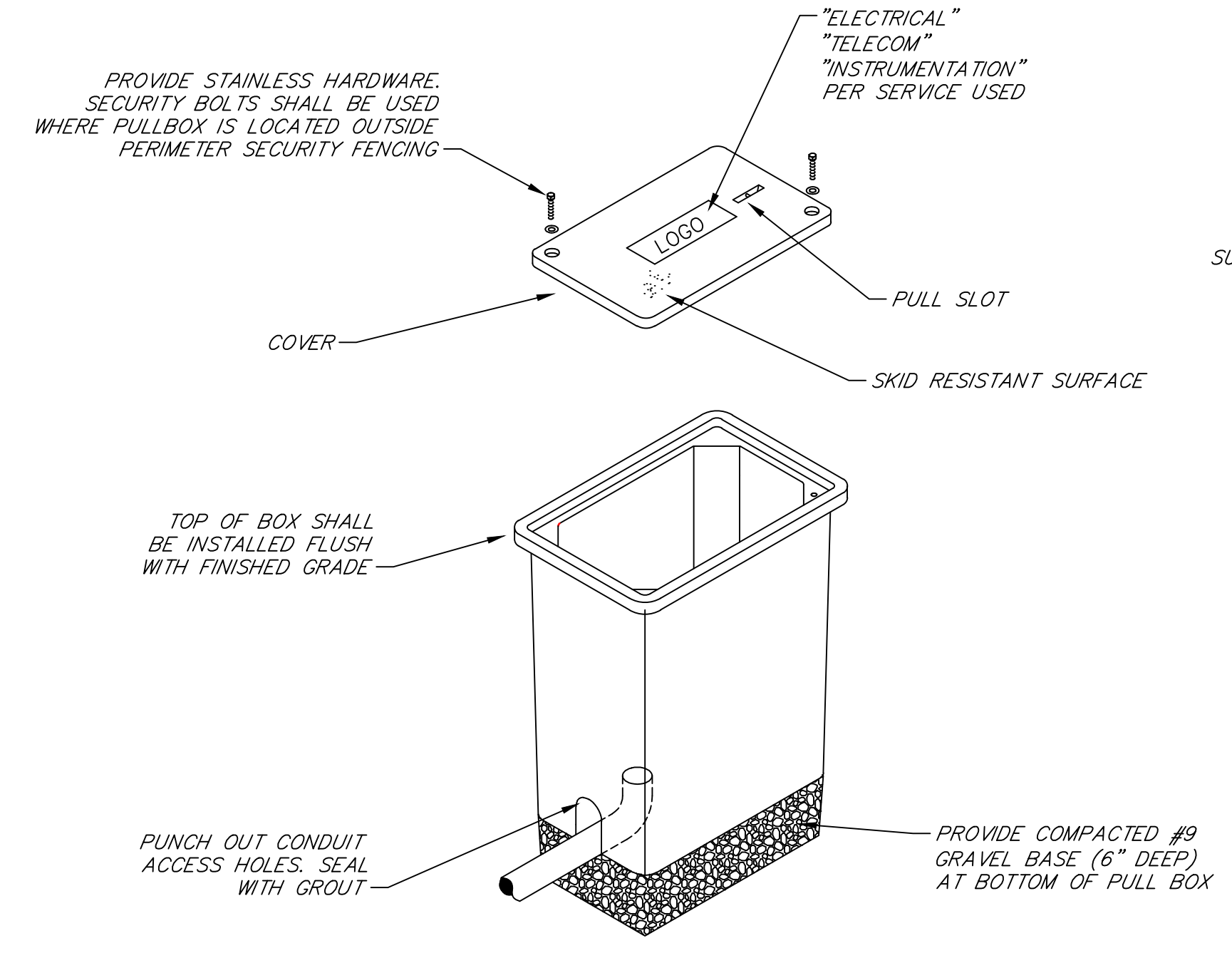
**TYPICAL PAVEMENT TRENCH DETAIL**  
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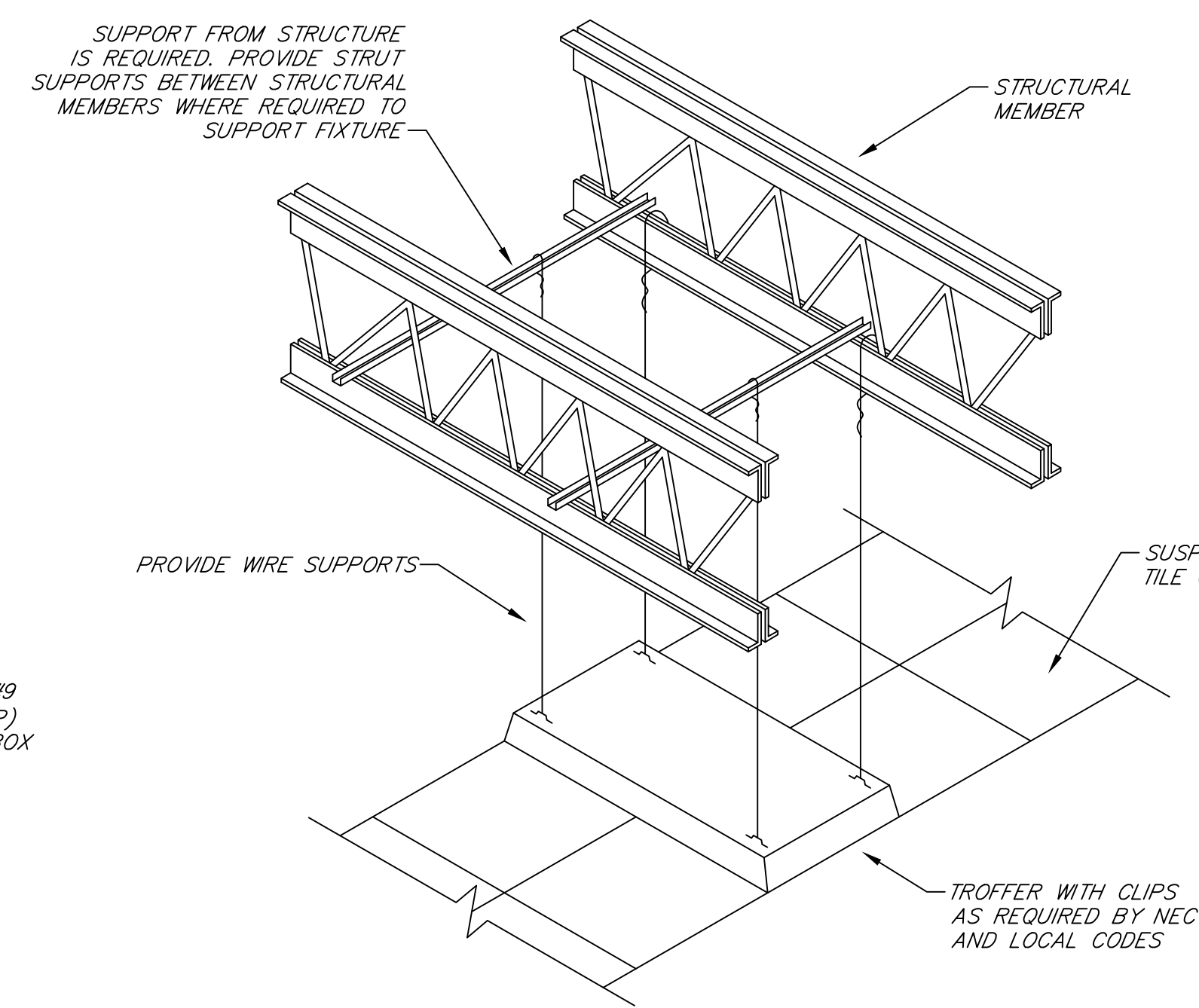


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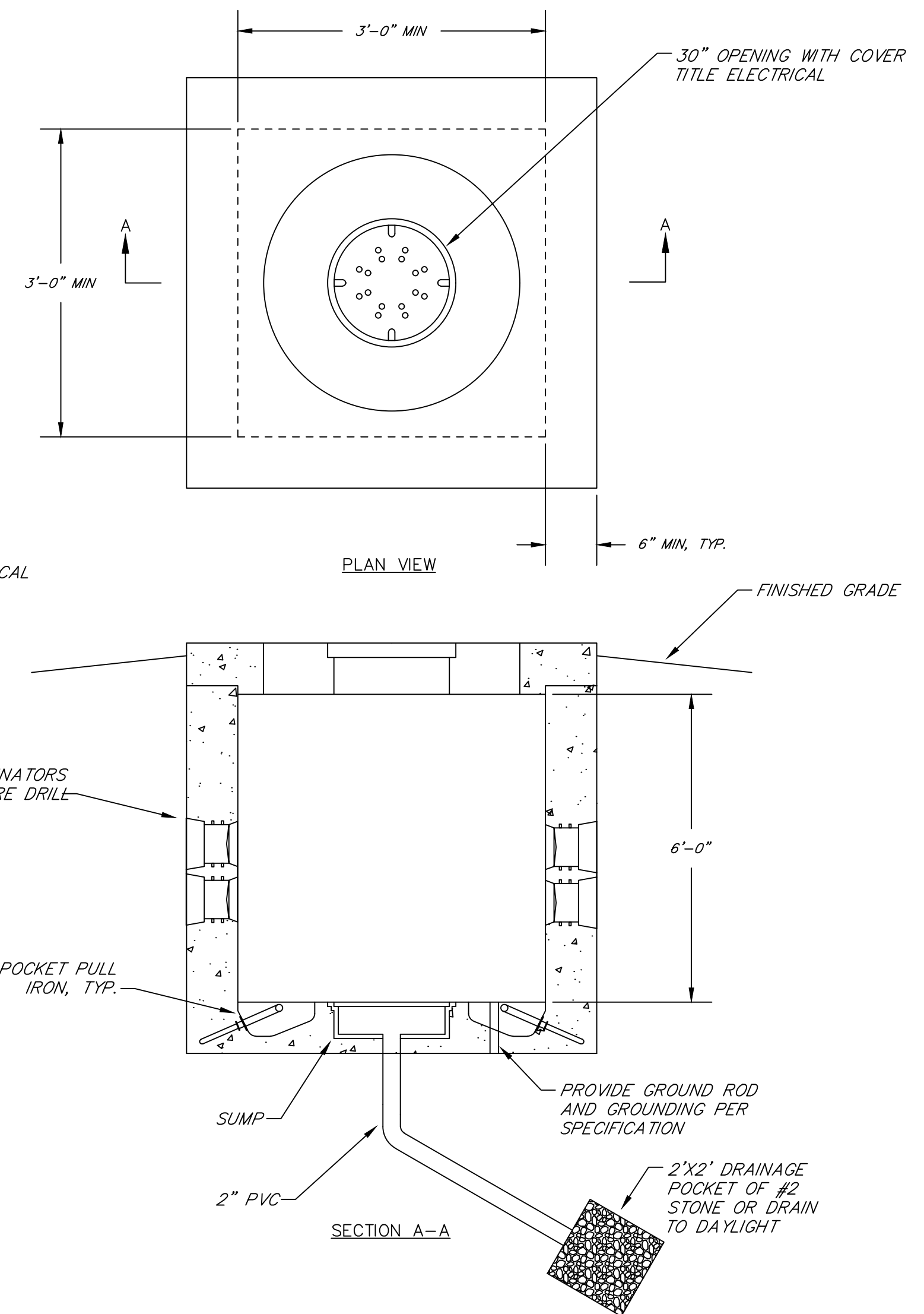
**ELECTRICAL PULL BOX DETAIL**  
 NOT TO SCALE

- NOTES:
- PROVIDE PULL BOXES AS REQUIRED BY NEC REQUIREMENTS. MINIMUM SIZE OF 20" L X 10" W X 18" D IS REQUIRED, BUT SHALL BE INCREASED WHERE LARGER CONDUCTORS REQUIRE ADDITIONAL BENDING SPACE.
  - UTILIZE STACKABLE BOXES IF NECESSARY TO EXTEND PULLBOX TO DEPTH OF 30" MIN.



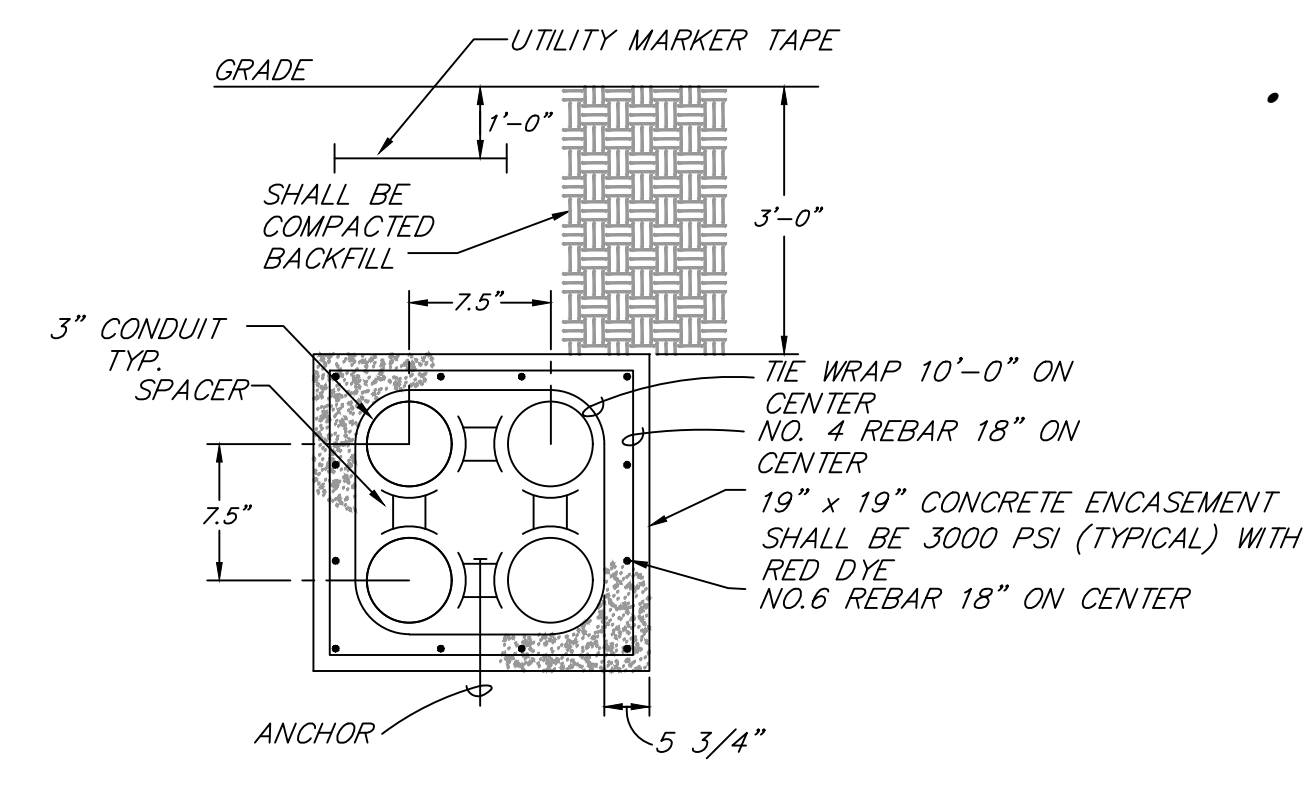
**TROFFER INSTALLATION DETAIL**  
 NOT TO SCALE

NOTE: TYPE MC CABLE IS ACCEPTABLE ABOVE SUSPENDED CEILINGS FROM TROFFER TO TROFFER OR FROM TROFFER TO THE NEAREST JUNCTION BOX IN THE SAME ROOM. OTHERWISE CONDUIT SHALL BE USED.

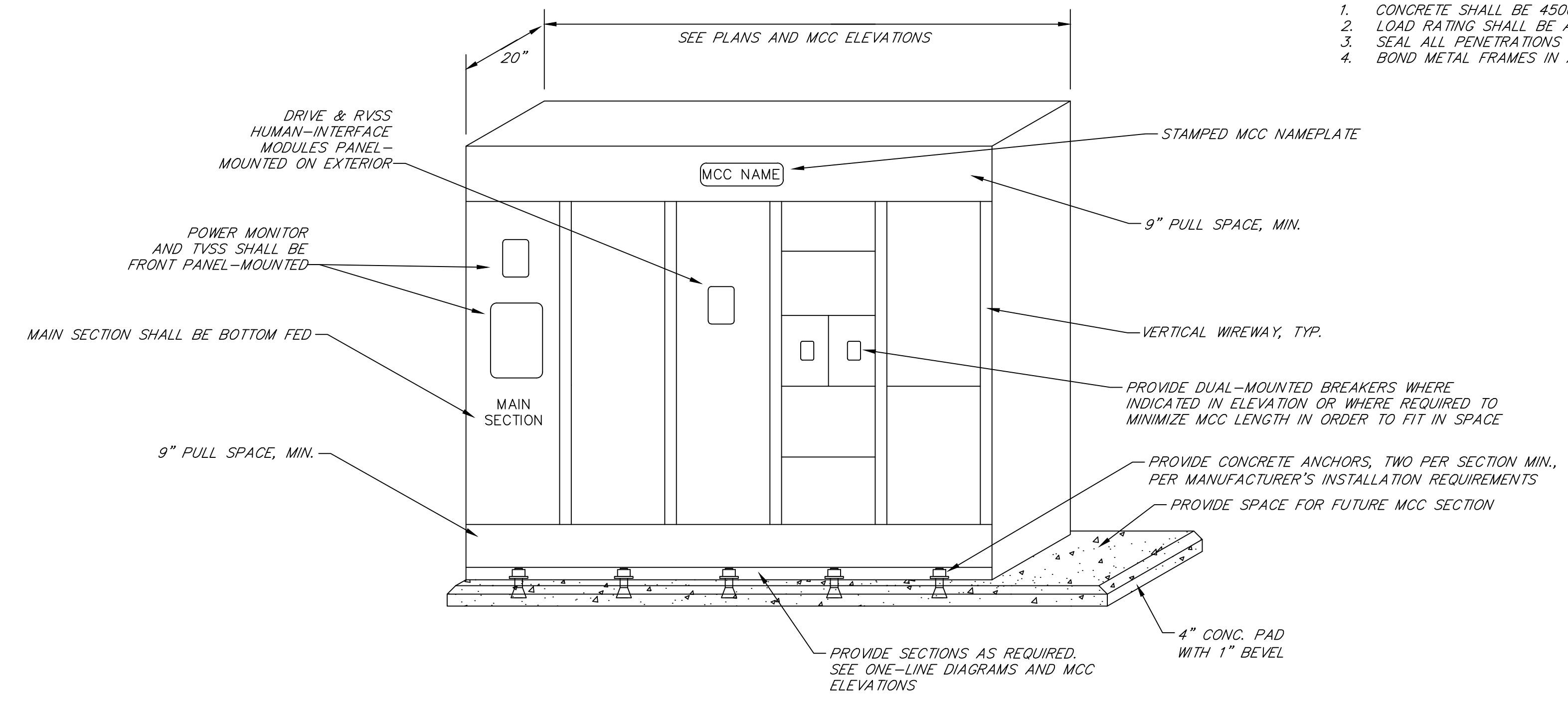


**ELECTRICAL MANHOLE**  
 NOT TO SCALE

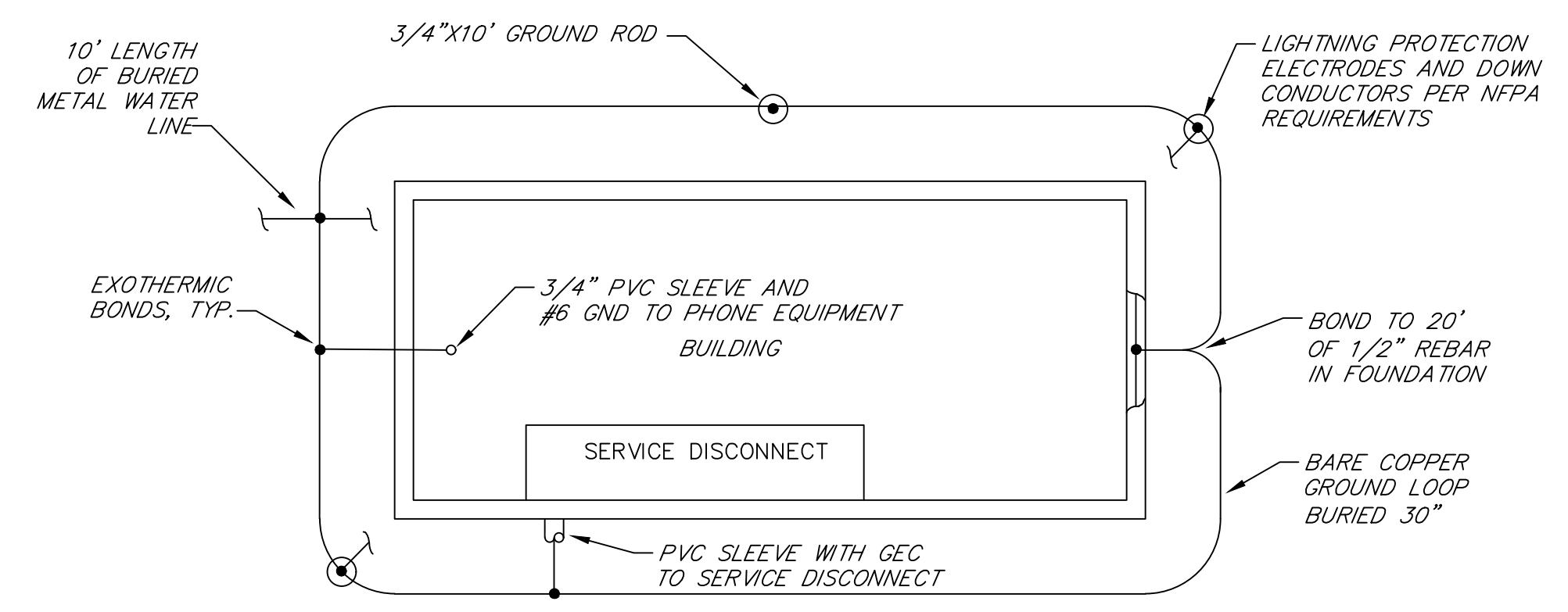
- NOTES:
- CONCRETE SHALL BE 4500 PSI AT 28 DAYS
  - LOAD RATING SHALL BE AASHTO H25 MIN.
  - SEAL ALL PENETRATIONS WITH GROUT.
  - BOND METAL FRAMES IN ACCORDANCE WITH NEC



**DUCTBANK CONSTRUCTION DETAIL**  
 NOT TO SCALE



**MOTOR CONTROL CENTER INSTALLATION DETAIL**  
 NOT TO SCALE



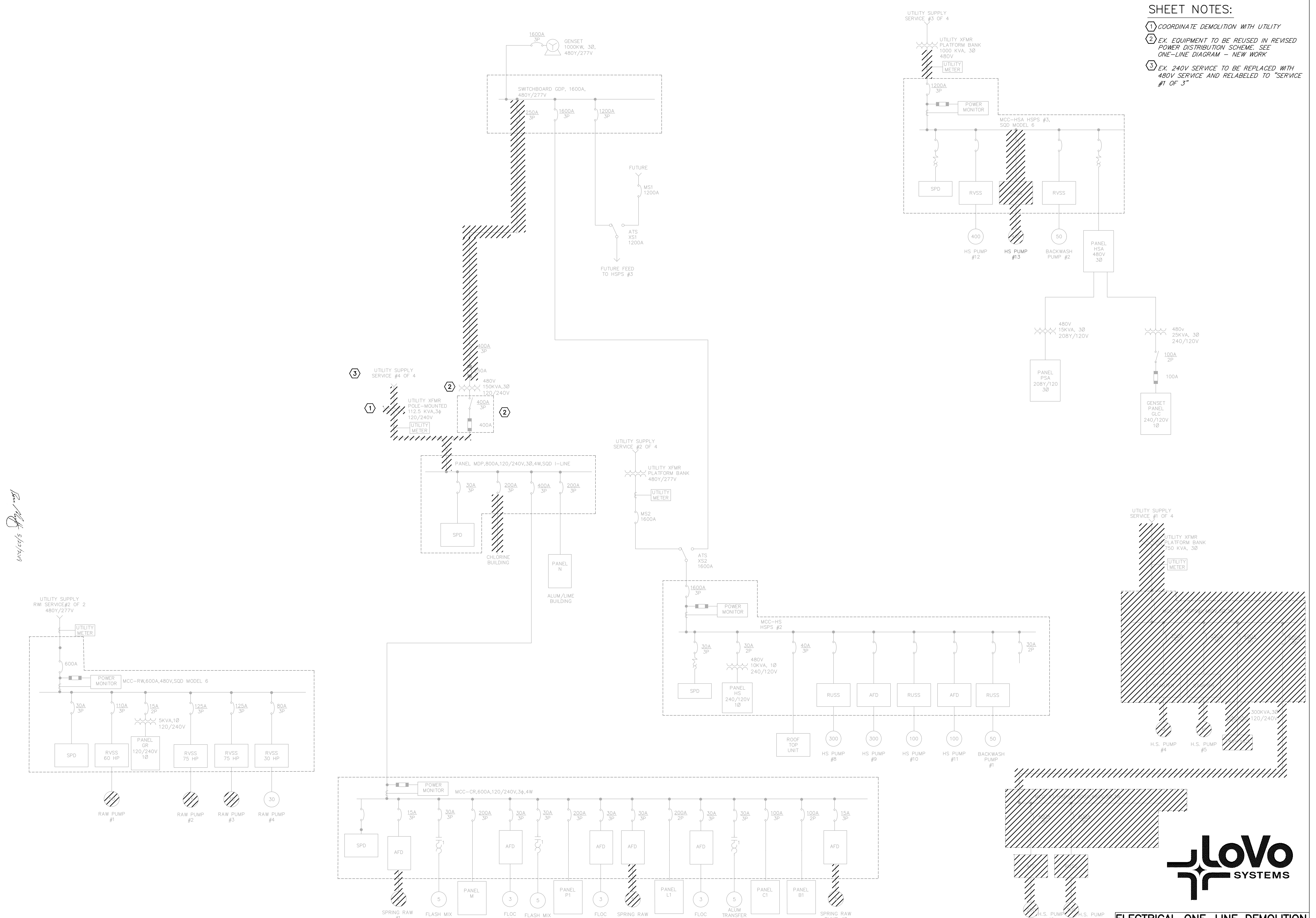
**TYPICAL BUILDING GROUNDING DETAIL**  
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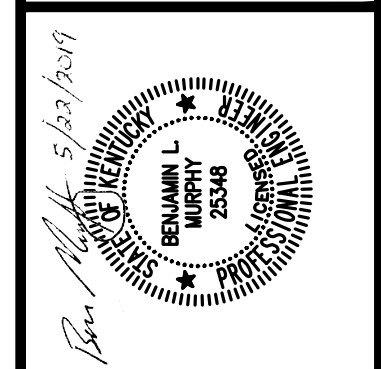


**SHEET NOTES:**

- ① COORDINATE DEMOLITION WITH UTILITY
- ② EX. EQUIPMENT TO BE REUSED IN REVISED POWER DISTRIBUTION SCHEME. SEE ONE-LINE DIAGRAM - NEW WORK
- ③ EX. 240V SERVICE TO BE REPLACED WITH 480V SERVICE AND RELABELED TO "SERVICE #1 OF 3"

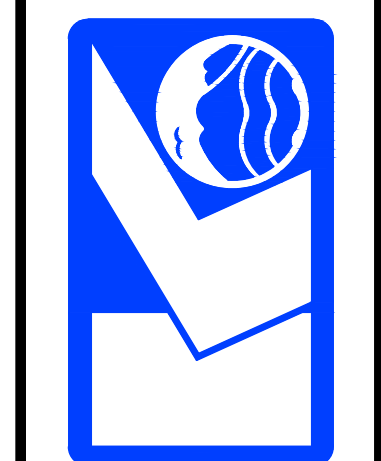


Tom Mott 5/13/2018



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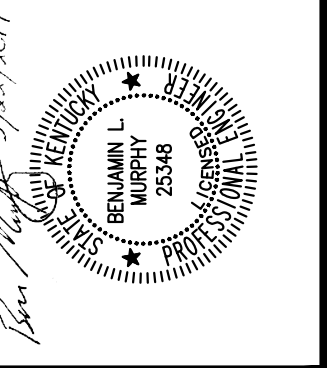
**KENVIRONS, INC.**  
FRANKFORT, KENTUCKY



PROJECT NO.  
**2014042**

SHEET NO.  
**E-4**



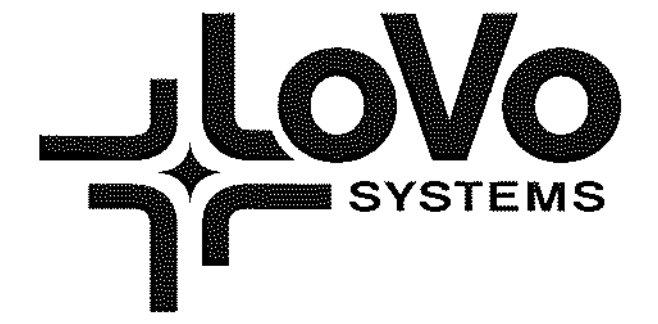
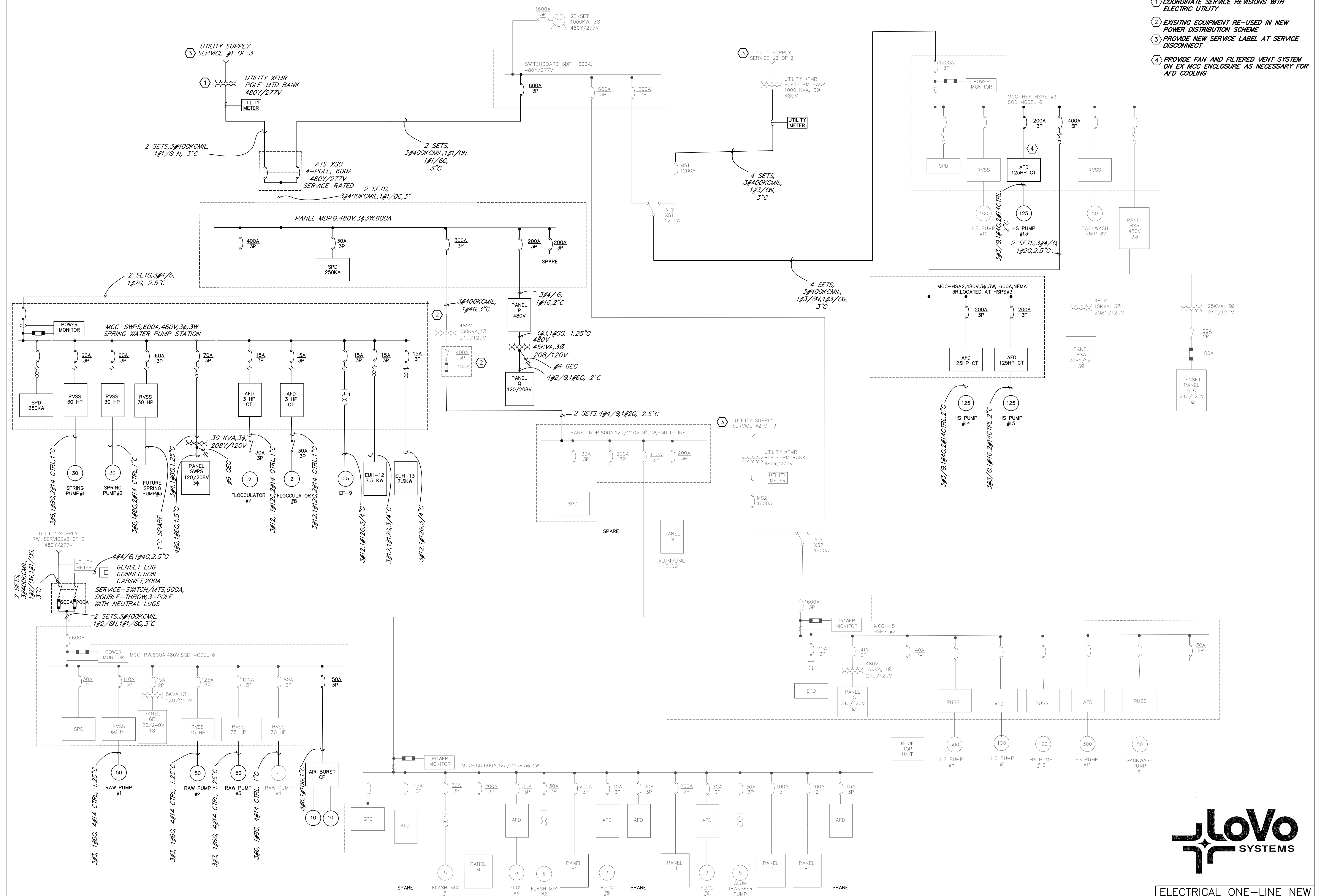


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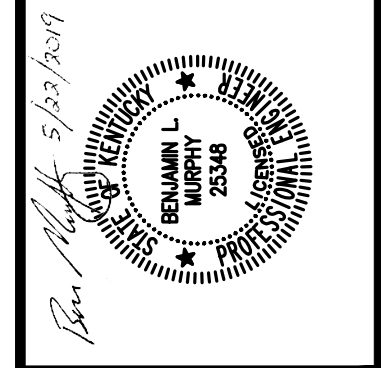


**SHEET NOTES:**

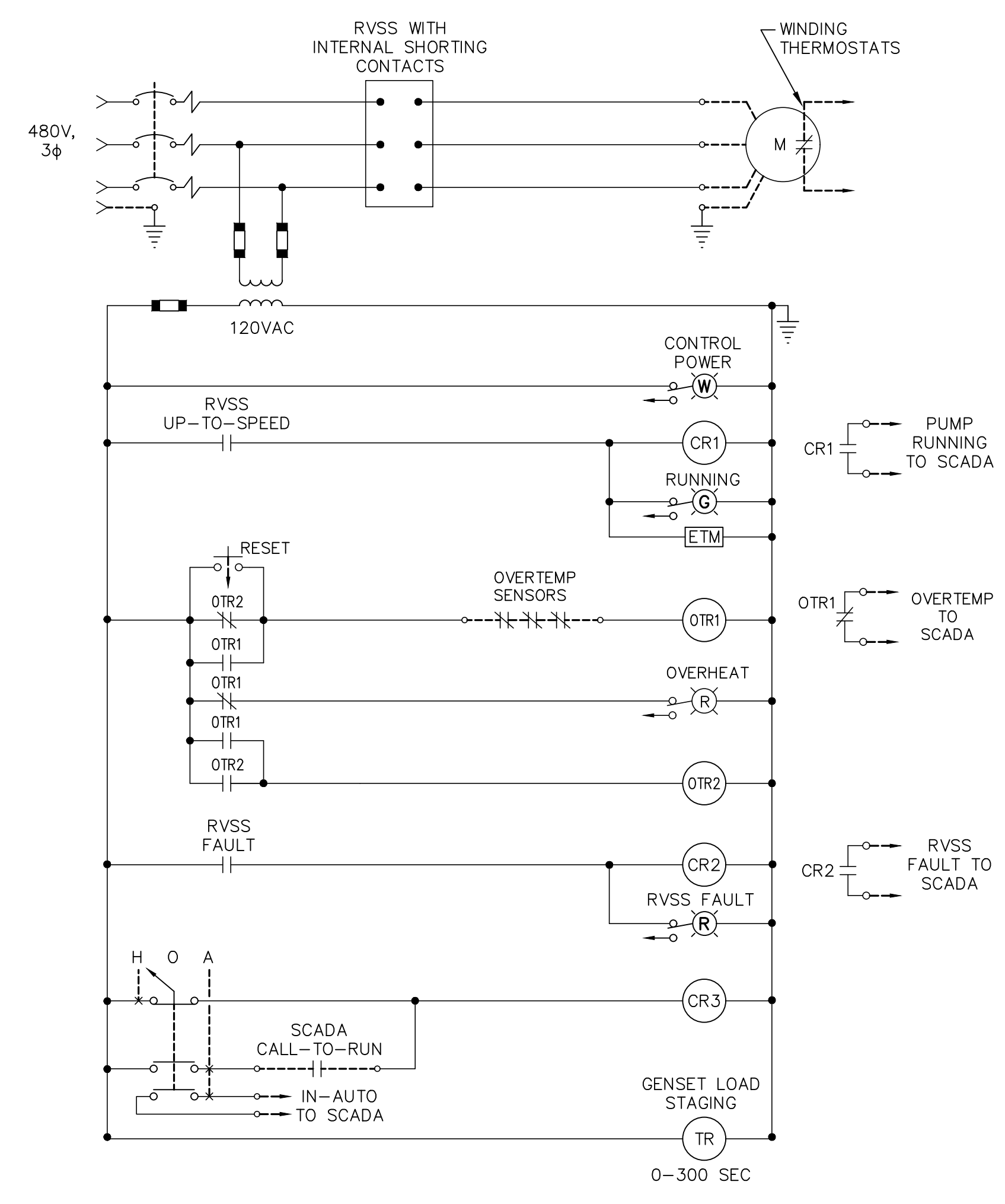
- 1) COORDINATE SERVICE REVISIONS WITH ELECTRIC UTILITY
- 2) EXISTING EQUIPMENT RE-USED IN NEW POWER DISTRIBUTION SCHEME
- 3) PROVIDE NEW SERVICE LABEL AT SERVICE DISCONNECT
- 4) PROVIDE FAN AND FILTERED VENT SYSTEM ON EX MCC ENCLOSURE AS NECESSARY FOR AFD COOLING





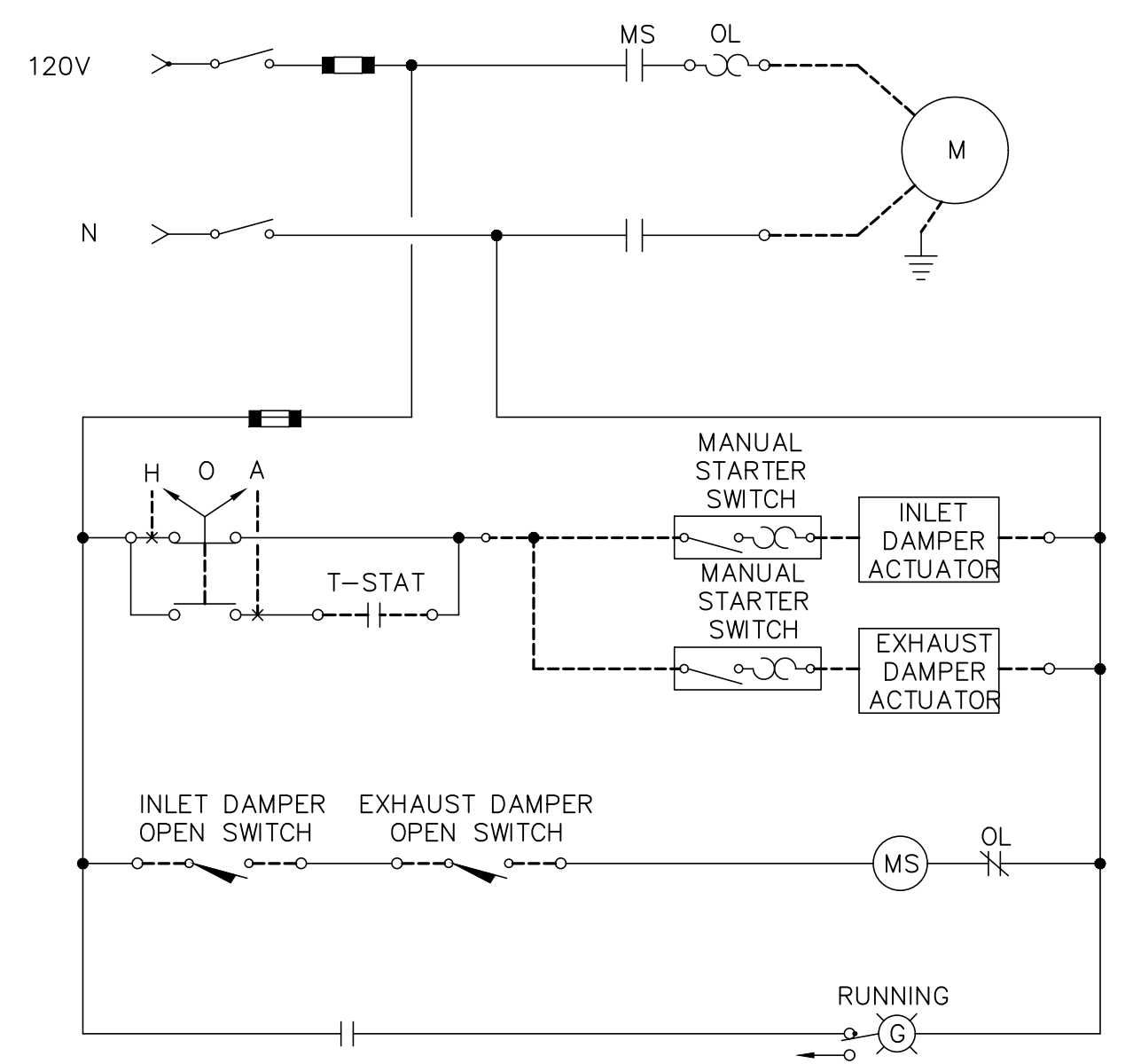
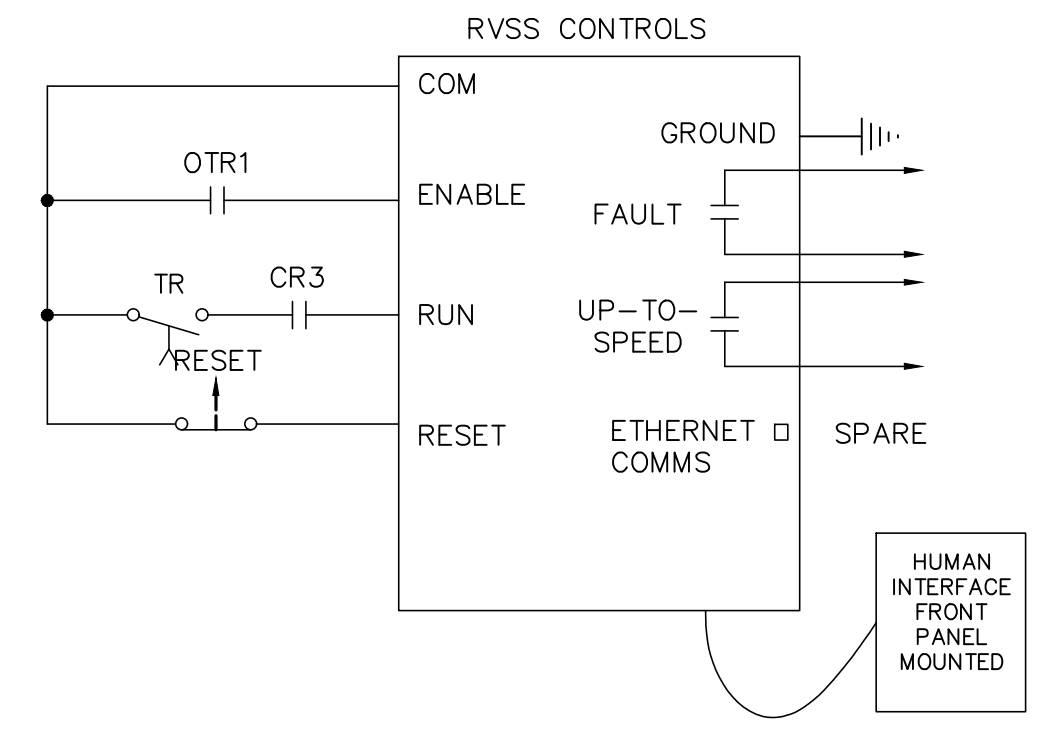


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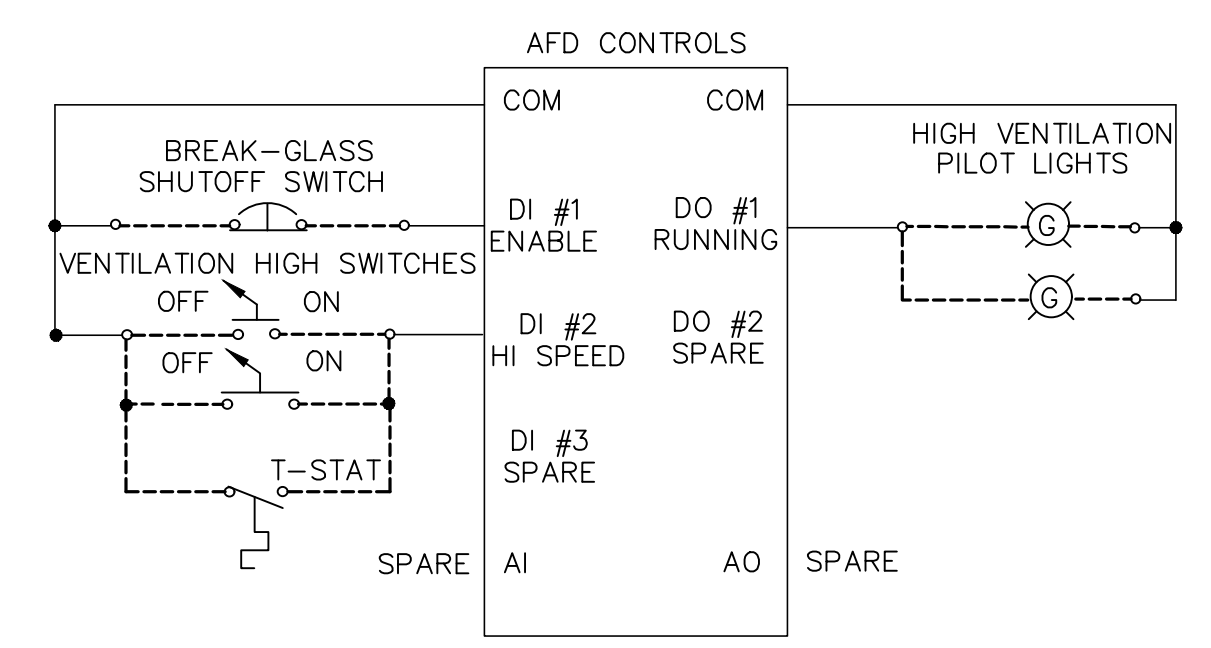
**SPRING WATER PUMP CONTROL CIRCUIT, TYP.**  
NOT TO SCALE

- POWER OUTAGE FAULT SHALL RESET AUTOMATICALLY
- SEE ONE-LINE DIAGRAM FOR SIZING AND QUANTITY



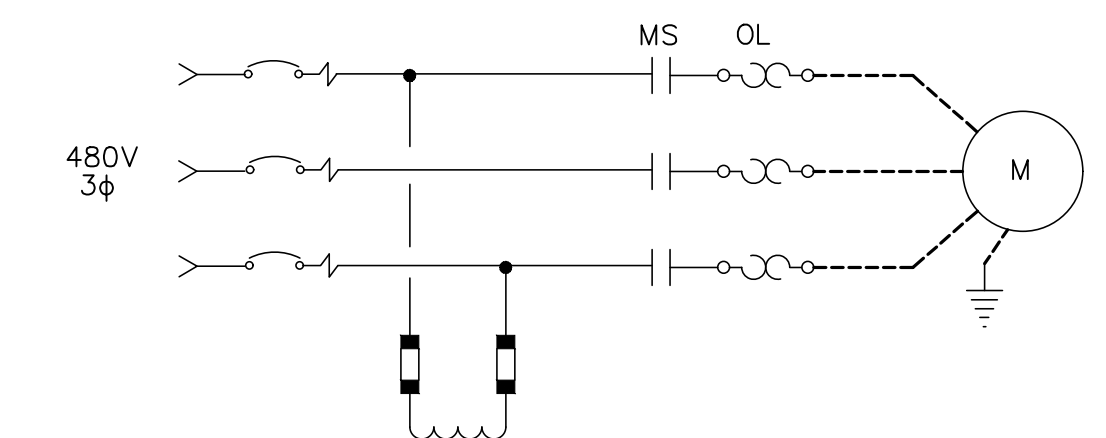
**EF-3/EF-4 CONTROL CIRCUIT**  
NOT TO SCALE

- PROVIDE COMBINATION STARTER/DISCONNECT WITH SIZE 1 STARTER



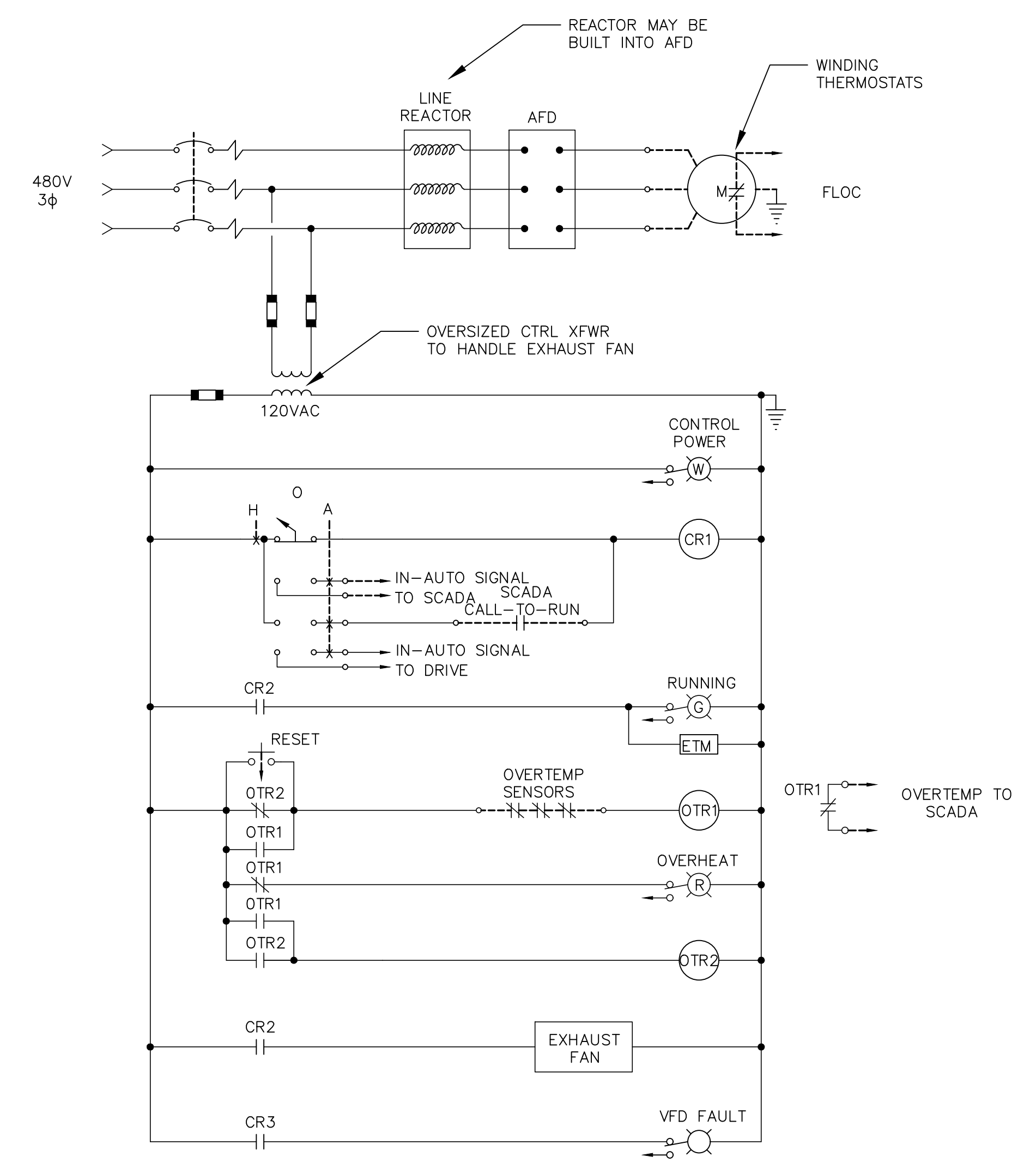
**EF-1/EF-2 CONTROL CIRCUIT**  
NOT TO SCALE

- PROVIDE HVAC-STYLE DRIVE WITH INTEGRAL DISCONNECT AND NEMA 12 ENCLOSURE WITH 2HP RATING. VOLTAGE SHALL BE 480V 3-PHASE
- CONFIGURE FOR TWO-SPEED OPERATION. SEE HVAC DESIGN FOR REQUIREMENTS. COORDINATE WITH BALANCE CONTRACTOR TO SET SPEED SETPOINTS.



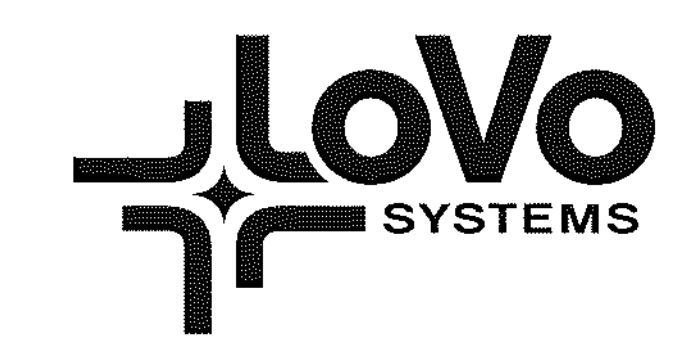
**EF-9 CONTROL CIRCUIT**  
NOT TO SCALE

- MCC BUCKET AS INDICATED ON PLANS AND ONE-LINE DIAGRAM.
- CONTROL TRANSFORMER SHALL BE SIZED FOR ACTUATOR POWER



**FLOCCULATOR CONTROL CIRCUIT, TYP.**  
NOT TO SCALE

- IN LOCAL MODE, MOTOR SHALL BE CONTROLLED FROM LOCAL FREQUENCY DRIVE DISPLAY. IN AUTO MODE, MOTOR SHALL BE CONTROLLED FROM SCADA
- POWER OUTAGE FAULT SHALL RESET AUTOMATICALLY.
- SEE ONE-LINE DIAGRAM FOR SIZING AND QUANTITY.





PANEL:	L1 (EXISTING PANEL)	VOLTAGE:	120/240V, 1Ø, 3W
ENCLOSURE:	NEMA 1	MAINS AMPACITY:	200A
MOUNTING:	SURFACE	MAIN C.B. SIZE:	N/A
LOCATION:	BREAK ROOM	TOTAL SPACES:	42

CIRCUIT DESCRIPTION	VA	POLES	BREAKER	NO.	PHASE A VA	PHASE B VA	PHASE C VA	NO.	BREAKER	POLES	VA	CIRCUIT DESCRIPTION
WALL PACKS	500	1	EX	1	1000			2	EX	1	500	RANGE HOOD RECEPT
MDF	500	1	NEW 20A	3		1100		4	EX	1	600	FILE ROOM RECEPTS
PHONE BACKBOARD	300	1	NEW 20A	5	900			6	EX	1	600	PIPE GALLERY RECEPTS
EX UNKNOWN	300	1	EX	7		800		8	EX	1	500	FILTER 1&2 GALLERY LIGHTS
HALL RECEPTS	400	1	EX	9	1000			10	EX	1	600	FRONT FILE RM RECEPTS
HALL RECEPTS	400	1	EX	11		1000		12	EX	1	600	LAB RECEPTS
FRONT STORAGE RECEPTS	400	1	EX	13	1400			14	EX	1	1000	GATE OPENER
CCC SCADA CABINET	500	1	EX	15		1500		16	EX	1	1000	GATE OPENER
SLUDGE CABINETS 1 & 2	1500	1	EX	17	2100			18	EX	1	600	LAB RECEPTS
SLUDGE CABINETS 3 & 4	1500	1	EX	19		2100		20	EX	1	600	LAB RECEPTS
LAB RECEPTS	600	1	EX	21	1600			22	EX	1	1000	BACKWASH VALVE
DISHWASHER	1500	1	EX	23		2500		24	EX	1	1000	MICROWAVE
LAB REFRIGERATOR	1500	1	EX	25	2500			26	EX	1	1000	LAB/FILTER1&2 LIGHTS
FILTER FANS EF-7/EF-8	1400	1	EX	27		2400		28	EX	1	1000	BREAK/FILTER3&4 LIGHTS
LAB EXHAUST EF-5	60	1	EX	29	760			30	EX	1	700	SED BASIN LIGHTS
Break Rm Recepts	400	1	NEW 20A	31		800		32	NEW 20A	1	400	CHLORINE ANALYZERS
SPARE			NEW 20A	33	0			34	NEW 20A	1		SPARE
SPARE			NEW 20A	35	0			36	NEW 20A	1		SPARE
SPARE			NEW 20A	37	0			38	NEW 20A	1		SPARE
SPARE			NEW 15A	39	0			40	NEW 15A	1		SPARE
SPARE			NEW 15A	41	0			42	NEW 15A	1		SPARE
TOTAL VA PER PHASE:					11260	12200						
TOTAL AMPS PER PHASE:					93.8	101.7			TOTAL PANEL VA: 23460			

NOTES:  
1. PROVIDE INTEGRAL SPD

PANEL:	P	VOLTAGE:	480V, 3Ø, 3W
ENCLOSURE:	NEMA 1	MAINS AMPACITY:	200
MOUNTING:	SURFACE/WALL	MAIN C.B. SIZE:	200
LOCATION:	NEW FILTER BLDG	TOTAL SPACES:	54

CIRCUIT DESCRIPTION	VA	POLES	BREAKER	NO.	PHASE A VA	PHASE B VA	PHASE C VA	NO.	BREAKER	POLES	VA	CIRCUIT DESCRIPTION
SPD		3	30A	1	600			2	15A	3	600	FLUORIDE TRANSFER PUMP
				3		600		4			600	
				5			600	6			600	
TROLLEY HOIST	600	3	15A	7	3300			8	15A	3	2700	EUH-3 FLUORIDE RM HEATER
	600			9		3300		10			2700	
	600			11			3300	12			2700	
EUH-1 CHLORINE RM HEATER	3500	3	20A	13	5400			14	15A	3	1900	EUH-4 FLUORIDE RM HEATER
	3500			15		5400		16			1900	
	3500			17			5400	18			1900	
EUH-2 CHLORINE RM HEATER	3500	3	20A	19	3750			20	15A	3	250	EF-2 FLUORIDE RM EXHAUST FAN
	3500			21		3750		22			250	
	3500			23			3750	24			250	
EF-1 CHLORINE RM FAN	500	3	15A	25	2200			26	15A	3	1700	EUH-7 FILTER GALLERY HEATER
	500			27		2200		28			1700	
	500			29			2200	30			1700	
EUH-5 FILTER STAIR WAY HEATER	1700	3	15A	31	5200			32	20A	3	3500	EUH-8 FILTER OP. FLR HEATER
	1700			33		5200		34			3500	
	1700			35			5200	36			3500	
EUH-6 FILTER GALLERY HEATER	1700			37	5200			38	20A	3	3500	EUH-9 FILTER OP. FLR HEATER
	1700			39		5200		40			3500	
	1700			41			5200	42			3500	
XFMR/PANEL Q	8500	3	80A	43	10500			44	15A	3	2000	WATER HEATER
	8500			45		10500		46			2000	
	8500			47			10500	48			2000	
SPARE		3	15A	49	0			50	20A	3		SPARE
				51				52				
				53				54				
TOTAL VA PER PHASE:					36150	36150	36150					
TOTAL AMPS PER PHASE:					130.5	130.5	130.5	TOTAL PANEL VA: 108450				

NOTES:  
1. PROVIDE INTEGRAL SPD

PANEL:	Q	VOLTAGE:	208/120V, 3Ø, 4W
ENCLOSURE:	NEMA 1	MAINS AMPACITY:	200A
MOUNTING:	SURFACE	MAIN C.B. SIZE:	150A
LOCATION:	NEW FILTER BLDG	BREAKER SPACES:	54

CIRCUIT DESCRIPTION	VA	POLES	BREAKER	NO.	PHASE A VA	PHASE B VA	PHASE C VA	NO.	BREAKER	POLES	VA	CIRCUIT DESCRIPTION
SPD		3	30A	1	100			2	15A	1	100	WIT-200 FLUORIDE DAY SCALE
				3		600		4	20A	1	600	FLUORIDE RM RECEPTS
				5			400	6	20A	1	400	FLUORIDE RM RECEPTS
FLUORIDE MTR PMP & SOL VLV	200	1	20A	7	600			8	20A	1	400	CHLORINE RM RECEPTS
CHLORINE FEED	100	1	15A	9		700		10	20A	1	600	CHLORINE RM RECEPTS
CHLORINE WATER FLOW	100	1	15A	11		200		12	15A	1	100	CHLORINE GAS SENSOR
CHLORINE TANK FEEDERS	1000	1	20A	13	1300			14	20A	1	300	FLUORIDE RM LIGHTING
LIFE SAFETY CONTROL PANEL	500	1	15A	15		950		16	20A	1	450	CHLORINE RM LIGHTING
FILTER 7 INFLUENT VLV FV-470	1500	1	20A	17		1650		18	20A	1	150	EXTERIOR LIGHTING
FILTER 8 INFLUENT VLV FV-480	1500	1	20A	19	3000			20	20A	1	1500	FLT 7 BW SUPPLY VLV FCV-473
FLT 7 EFFLUENT VLV FCV-471	1500	1	20A	21		3000		22	20A	1	1500	FLT 8 BW SUPPLY VLV FCV-483
FLT 8 EFFLUENT VLV FCV-481	1500	1	20A	23		1500		24	20A	1		FLT 7 SURF. WASH VLV FV-474
FLT 7 BW DRAIN VLV FV-472		1	20A	25	0			26	20A	1		FLT 8 SURF. WASH VLV FV-484
FLT 8 BW DRAIN VLV FV-482		1	20A	27	0			28	20A	1		FLT 7 REWASH VLV FV-475
CP-FLT7 FILTER 7 CONSOLE	500	1	20A	29		500		30	20A	1		FLT 8 REWASH VLV FV-485
CP-FLT8 FILTER 8 CONSOLE	500	1	20A	31	1000			32	20A	1	500	IOC-FLT SCADA CABINET
FILTER OP. FLOOR RECEPTS	800	1	20A	33		1400		34	20A	1	600	TURBIDIMETER RECEPTS
FILTER GALLERY RECEPTS	600	1	20A	35		1400		36	20A	1	800	FILTER GALLERY RECEPTS
LOWER FLOOR LIGHTING	700	1	20A	37	1500			38	20A	1	800	FILTER GALLERY HALL RECEPTS
UPPER FLOOR LIGHTING	700	1	20A	39		1400		40	20A	1	700	EF-3 FILTER GALLERY EXH. FAN
EF-4 FILTER OP FLR EXH. FAN	870	1	20A	41		870		42	20A	1		SPARE
SPARE			20A	43	0			44	20A	1		SPARE
SPARE			20A	45	0			46	20A	1		SPARE
SPARE			20A	47	0			48	20A	1		SPARE
SPARE			20A	49	0			50	15A	1		SPARE
SPARE			20A	51	0			52	15A	1		SPARE
SPARE			20A	53	0			54	15A	1		SPARE
TOTAL VA PER PHASE:					7500	8050	6520					
TOTAL AMPS PER PHASE:					62.5	67.1	54.3	TOTAL PANEL VA: 22070				

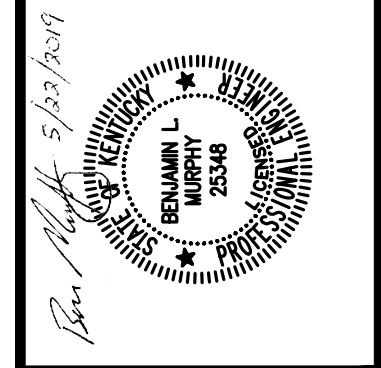
NOTES:  
1. PROVIDE INTEGRAL SPD

PANEL:	SWPS	VOLTAGE:	208/120V, 3Ø, 4W
ENCLOSURE:	NEMA 1	MAINS AMPACITY:	100A
MOUNTING:	SURFACE	MAIN C.B. SIZE:	100A
LOCATION:	SPRING WATER PUMP STATION	BREAKER SPACES:	54

CIRCUIT DESCRIPTION	VA	POLES	BREAKER	NO.	PHASE A VA	PHASE B VA	PHASE C VA	NO.	BREAKER	POLES	VA	CIRCUIT DESCRIPTION
SPD		3	30A	1	830			2	20A	1	830	RIVER WTR SAMPLE PUMP
				3		830		4	20A	1	830	SPRING WTR SAMPLE PUMP
				5			830	6	20A	1	830	COMBINED WTR SAMPLE PUMP
IOC-SWPS SCADA CABINET	500	1	20A	7	600			8	15A	1	100	FIT-900 SERVICE WTR FLOW
FIT-102 SPRING FLOW METER	100	1	15A	9		400		10	20A	1	300	EAST RECEPT
FIT-101 RIVER FLOW METER	100	1	15A	11			1672	12	20A	1	1572	SOUTH RECEPT
LIGHTING		1	20A	13	300			14	20A	1	300	WEST RECEPT
GRIT DRAIN VALVE	1200	1	20A	15		1500		16	20A	1	300	OUTSIDE RECEPT
GRIT FLUSH VALVE	840	1	20A	17			1540	18	20A	1	700	LIGHTING
SPRING FLOW CTRL VALVE	400	3	15A	19	800			20	15A	3	400	RIVER FLOW CTRL VALVE
	400			21		800		22			400	
	400			23			800	24			400	
SED BASIN #7 INFLUENT VALVE	400	3	15A	25	800			26	15A	3	400	SED BASIN #7 EFFLUENT VALVE
	400			27		800		28			400	
	400			29			800	30			400	
SED BASIN #8 INFLUENT VALVE	400	3	15A	31	800			32	15A	3	400	SED BASIN #8 EFFLUENT VALVE
	400			33		800		34			400	
	400			35			800	36			400	
SED BASIN RECEPTACLES	400	1	20A	37	400			38	15A	3		SPARE
EXTERIOR LIGHTS	200	1	20A	39		200		40				
SED BASIN LIGHTS	700	1	20A	41			700	42				
SPARE			20A	43	0			44	20A	1		SPARE
SPARE			20A	45	0			46	20A	1		SPARE
SPARE			15A	47	0			48	15A	1		SPARE
SPARE			15A	49	0			50	15A	1		SPARE
				51				52				
				53				54				
TOTAL VA PER PHASE:					4530	5330	7142					
TOTAL AMPS PER PHASE:					37.8	44.4	59.5	TOTAL PANEL VA: 17002				

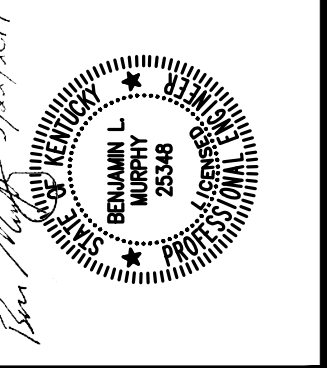
NOTES:  
1. PROVIDE INTEGRAL SURGE PROTECTION DEVICE



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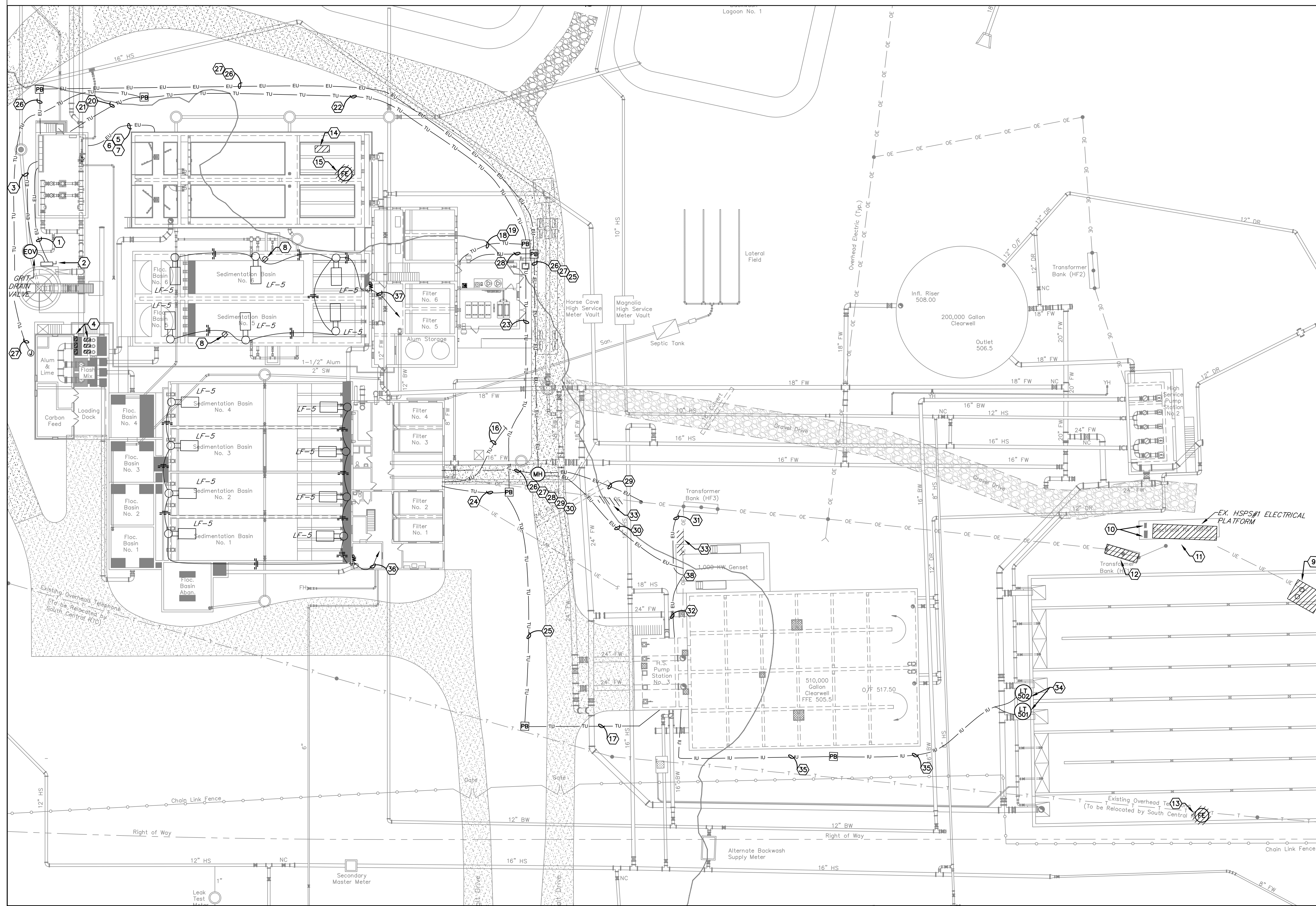


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**GENERAL SHEET NOTES:**  
**SHEET NOTES:**

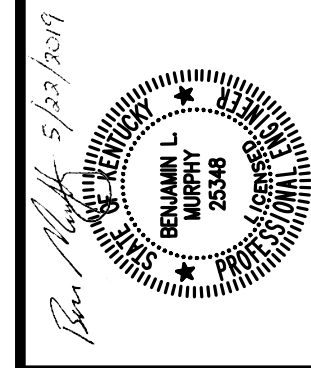
- 1 PROVIDE 2#12,1#12G,3/4" C TO PANEL SWPS
- 2 PROVIDE 20A/1P LOCKABLE SAFETY SWITCH
- 3 PROVIDE 8#14,1#14G,3/4" C TO PANEL 10C-SWPS
- 4 DEMOLISH ABOVE-GRADE PORTION OF SPRING WATER RAW PUMP ELECTRICAL CIRCUITRY FOR (3) PUMPS INCLUDING (3) SAFETY SWITCHES
- 5 PROVIDE FLOCCULATOR CIRCUITS FROM MCC-SWPS. SEE ONE-LINE DIAGRAM FOR REQUIREMENTS
- 6 PROVIDE 12#12,1#12G,1" C FOR SED BASIN VALVE ACTUATORS TO PANEL SWPS
- 7 PROVIDE 2#10,1#10G,1" C FOR SED BASIN RECEPTACLES TO PANEL SWPS
- 8 DEMOLISH EX. 25' POLE LIGHT AND ASSOCIATED CIRCUITRY
- 9 DEMOLISH EX. HSPS#1 ELECTRICAL CIRCUITRY TO (4) PUMPS INCLUDING (2) SAFETY SWITCHES
- 10 MAIN BREAKER MS2 AND TRANSFER SWITCH XS2 FEEDING HSPS#2 SHALL REMAIN
- 11 DEMOLISH EX. SWITCH GEAR, MCCS, TRANSFORMERS, PANEL BOARDS, AND ALL ASSOCIATED CIRCUITRY FOR HSPS#1. EX. PLATFORM SHALL REMAIN
- 12 DEMOLISH EX. TRANSFORMER PLATFORM. COORDINATE WITH UTILITY
- 13 EX. MAGNOLIA#1 MASTER FLOW METER AND ASSOCIATED CIRCUITRY SHALL BE DEMOLISHED
- 14 DEMOLISH FEEDER TO EX. CHLORINE BUILDING
- 15 DEMOLISH EX. RAW AND SPRING PUMP FLOW METER CIRCUITRY
- 16 PROVIDE 1800 FT FO CABLE IN EX. SPARE CONDUIT TO RAW WATER INTAKE
- 17 PROVIDE FO CABLE,1" C FROM PHONE BACKBOARD TO 10C-HSPS#3
- 18 PROVIDE FO CABLE,1" C FROM PHONE BACKBOARD TO 10C-FLT
- 19 PROVIDE 4-PAIR PHONE CABLE FROM PHONE BACKBOARD TO LSCP
- 20 PROVIDE FO CABLE,1" C FROM PHONE BACKBOARD TO 10C-SWPS
- 21 PROVIDE 4-PAIR PHONE CABLE,1" C FROM PHONE BACKBOARD TO PHONE JACK IN SPRING WATER PUMP STATION BUILDING
- 22 PROVIDE 1-FO CABLE AND 1-4-PAIR PHONE CABLE,2" C AND 1-2" C SPARE
- 23 PROVIDE 2-FO CABLES AND 2-4-PAIR PHONE CABLES,2" C AND 1-2" C SPARE
- 24 PROVIDE 3-FO CABLE AND 2-4-PAIR PHONE CABLES,2.5" C AND 1-2.5" C SPARE
- 25 PROVIDE 1-FO CABLE,2" C AND 1-2" C SPARE
- 26 PROVIDE MCC-SWPS FEEDER. SEE ONE-LINE DIAGRAM FOR REQUIREMENTS
- 27 PROVIDE 1-2" C SPARE
- 28 PROVIDE PANEL P FEEDER PER ONE-LINE DIAGRAM REQUIREMENTS
- 29 PROVIDE NEW SERVICE ENTRANCE FEEDER TO UTILITY POLE PER ONE-LINE DIAGRAM REQUIREMENTS AND DUCTBANK CONSTRUCTION DETAIL. COORDINATE WITH UTILITY
- 30 PROVIDE NEW GENSET FEED TO XSO PER ONE-LINE DIAGRAM REQUIREMENTS, AND DUCTBANK CONSTRUCTION DETAIL, AND PROVIDE 10#14,1#14G,1" C FOR ATS CONTROLS. TERMINATE CONTROL CONDUCTORS TO START GENSET UPON LOSS OF POWER
- 31 PROVIDE NEW SERVICE FEEDER TO ATS XS1 PER ONE-LINE DIAGRAM. COORDINATE WITH UTILITY
- 32 PROVIDE NEW FEEDER FROM XS1 TO MCC-HSA PER ONE-LINE DIAGRAM
- 33 DEMOLISH EX. OVERHEAD SERVICE CONDUCTORS WHEN NEW SERVICE IS ONLINE. COORDINATE WITH UTILITY
- 34 PROVIDE LEVEL SENSOR INSTALLED IN STILLING WELL PER DETAIL, WITH TERMINAL BOX AND INSTRUMENT SPD MOUNTED ON A FLOOR STAND
- 35 PROVIDE 2-2#18 STIC,1#14G,1" C
- 36 PROVIDE 2#10,1#10G,3/4" C TO PANEL LP1
- 37 PROVIDE 2#10,1#10G,3/4" C TO PANEL Q
- 38 EX. ATS XSO IS A RUSSELECTRIC MODEL RTS03-ATB1200 SERIAL#38233-2A. PROVIDE TERMINATIONS PER ONE-LINE DIAGRAM AND PROVIDE COMMISSIONING AS NEEDED TO ALLOW MCC-HSA TO BE ENERGIZED FROM THE EX. CATERPILLAR GENERATOR DURING A POWER OUTAGE.



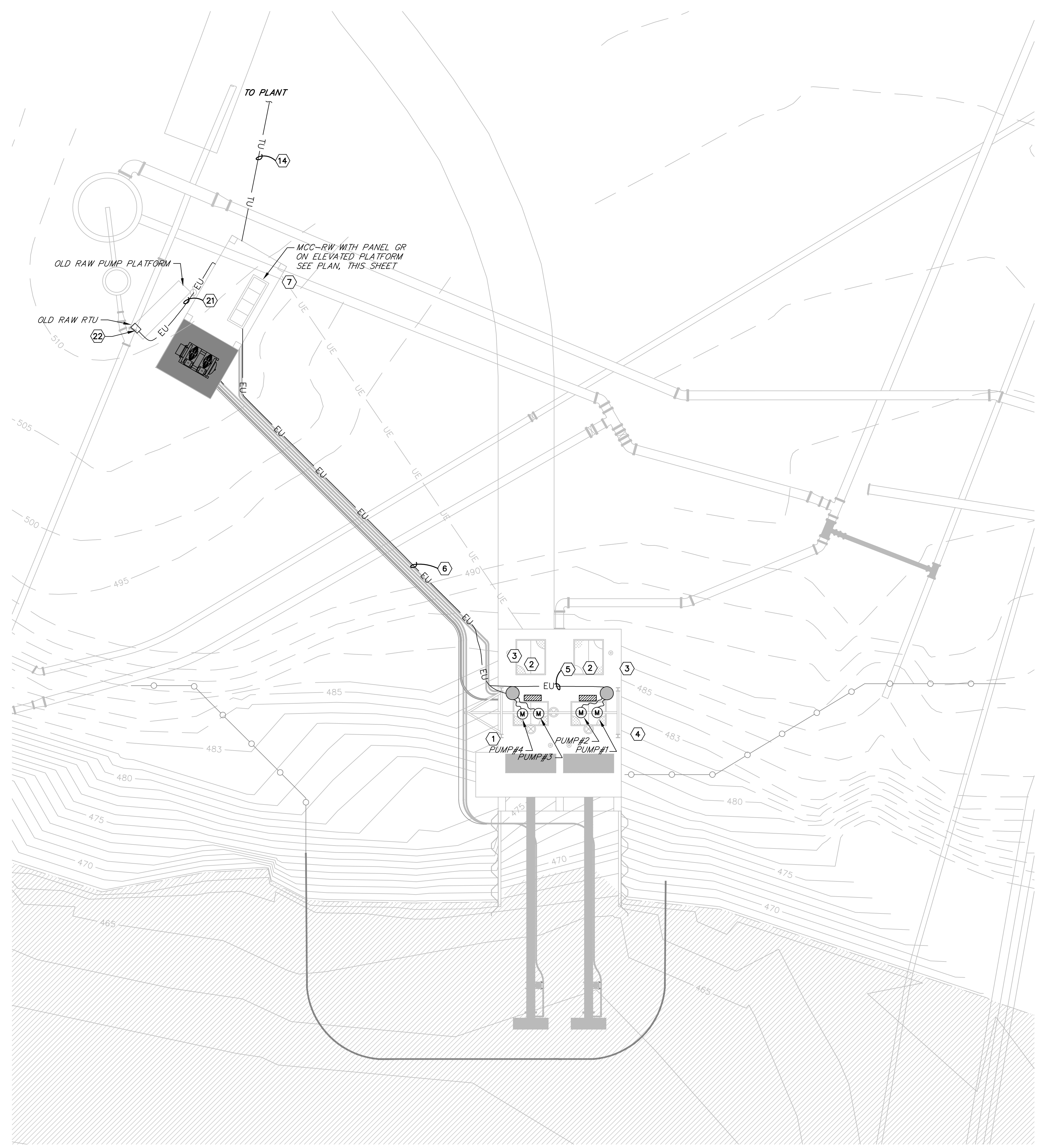
**PROPOSED ELECTRICAL SITE PLAN**  
SCALE: 1"=20'

**PROPOSED ELECTRICAL SITE PLAN**

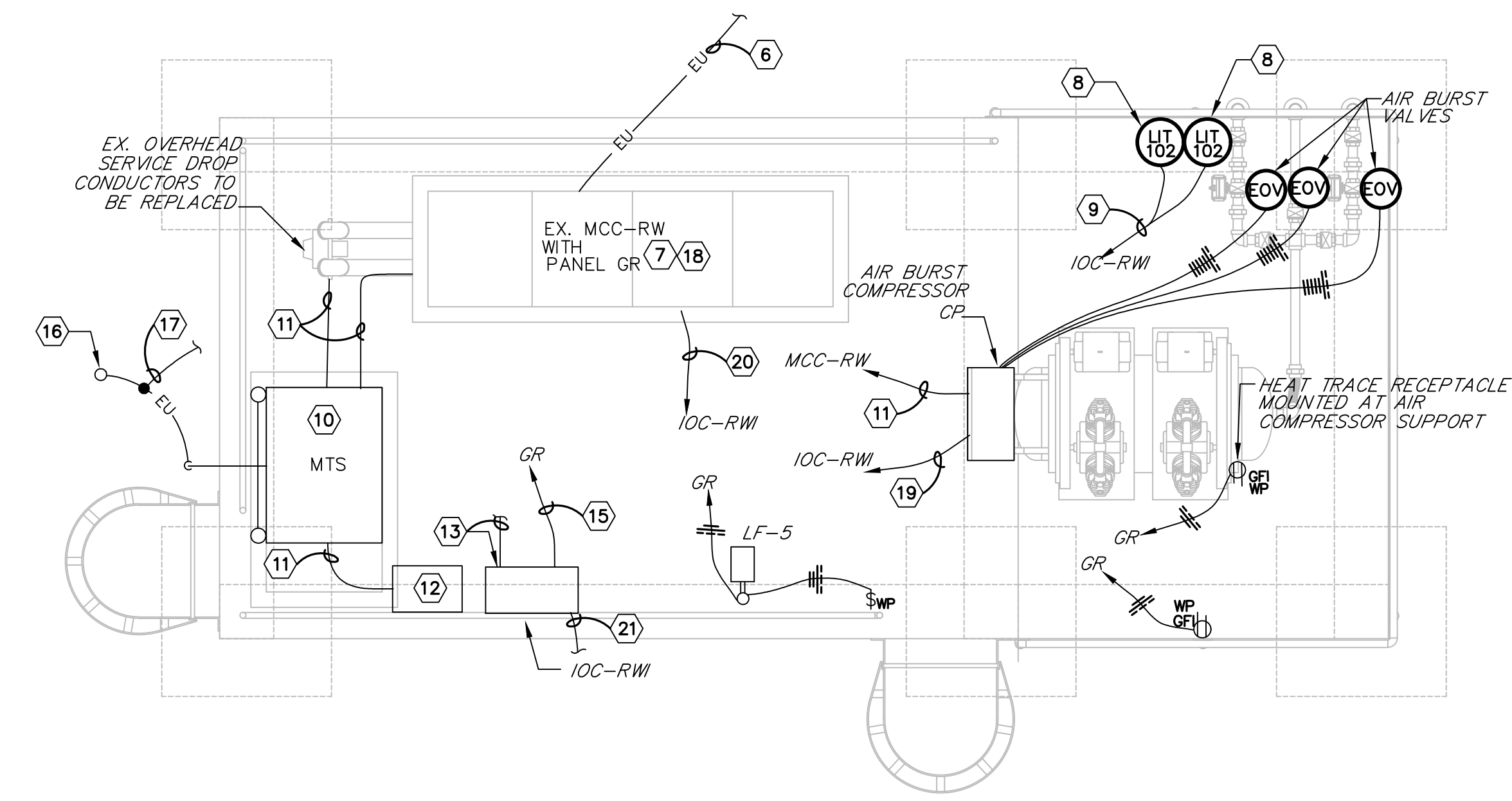




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SCALE: 1"=10'
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**RAW WATER INTAKE SITE PLAN ELECTRICAL PLAN**  
 SCALE: 1"=10'



**MOTOR CONTROL CENTER (MCC) PLATFORM - ELECTRICAL PLAN**  
 SCALE: 3/8" = 1'-0"

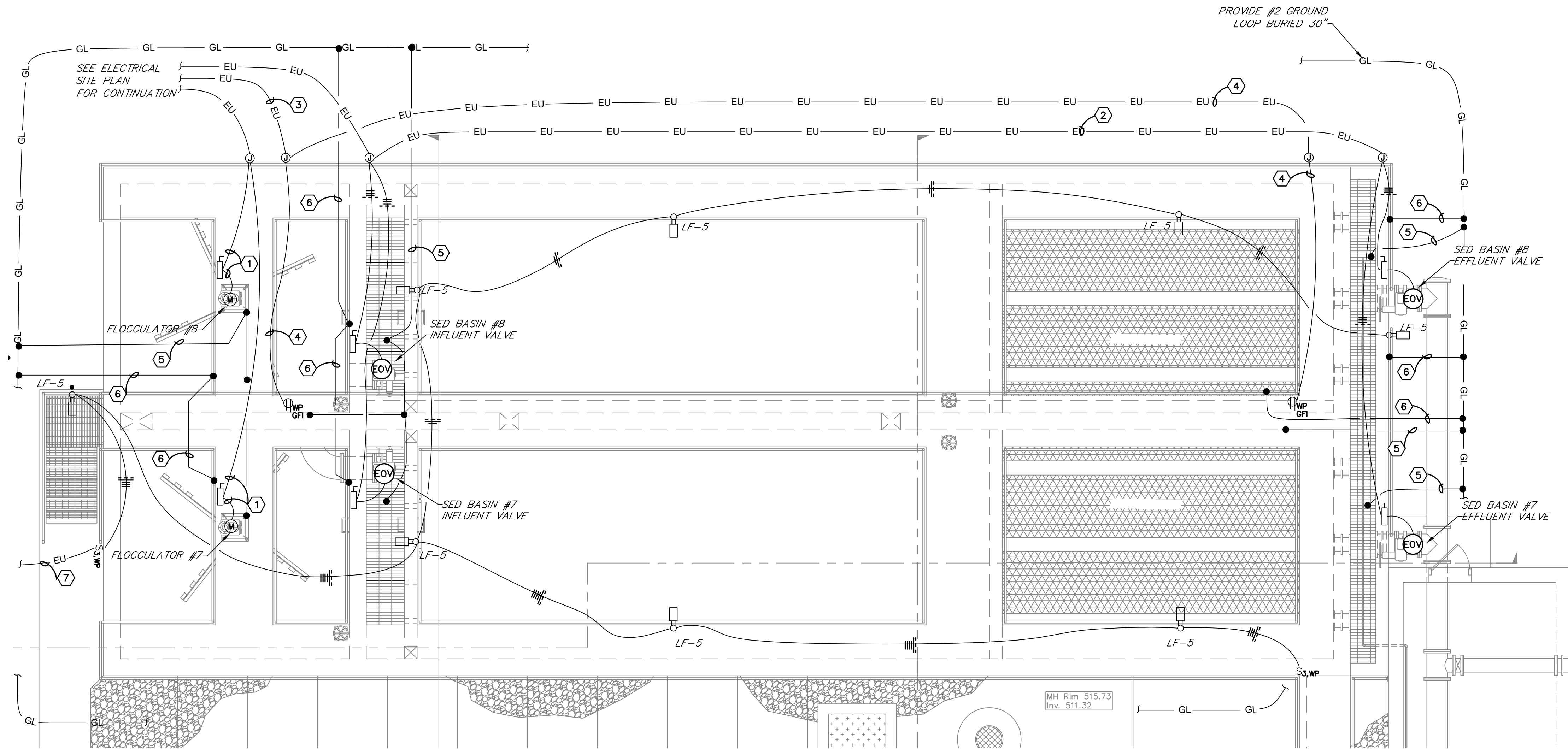
**SHEET NOTES:**

- 1 EX. PUMP #4 SHALL REMAIN. REROUTE CABLES TO NEW TERMINATION HOUSING
- 2 DEMO EX. TERMINAL BOX AND ABOVE-GRADE CONDUITS
- 3 NEW TERMINATION HOUSING. SEE INTAKE CABLE HOUSING DETAIL SHEET 2.3. PROVIDE SUBMERSIBLE TERMINATION KITS FOR POWER AND CONTROL CONDUCTORS.
- 4 NEW RAW WATER PUMP TYP. OF 3
- 5 CONDUIT SHALL BE ROUTED UNDERNEATH TOP SLAB
- 6 PROVIDE (4) NEW RAW WATER PUMP CIRCUITS. SEE ONE-LINE DIAGRAM FOR REQUIREMENTS
- 7 CONNECT NEW RAW WATER PUMP CIRCUITS TO EXISTING STARTERS. DEMOLISH THE ABOVE-GRADE PORTION OF OLD RAW WATER PUMP CIRCUITRY
- 8 PROVIDE INSTRUMENT SURGE PROTECTOR AND SUNSHIELD
- 9 PROVIDE 2-2#18 STG, 1#14G, 3/4" C
- 10 PROVIDE NEW SERVICE SWITCH PER ONE-LINE. SWITCH SHALL BE FLOOR-MOUNTED OR PROVIDE MOUNTING RACK
- 11 PROVIDE NEW FEEDER PER ONE-LINE DIAGRAM
- 12 PROVIDE GENERATOR LUG CONNECTION CABINET PER ONE-LINE DIAGRAM
- 13 PROVIDE NEW IOC-RW SCADA CABINET. PROVIDE 2" C TO INTERCEPT EX. SPARE 2" C EXTENDING OUT OF BOTTOM OF MCC-RW FOR FIBER CABLE
- 14 PROVIDE 1800' OF SINGLE-MODE FIBER IN EX. 2" SPARE CONDUIT EXTENDING TO CONTROL ROOM
- 15 PROVIDE 2#12, 1#12G, 3/4" C TO PANEL GR FOR CABINET POWER SUPPLY
- 16 PROVIDE NEW 3/4" X 10' GROUND ROD WITH 1/8 GEC TO SERVICE SWITCH
- 17 PROVIDE 1/8 GEC AND BOND TO EX. GROUNDING ELECTRODE SYSTEM
- 18 PROVIDE NEW FEEDER BREAKER BUCKET FOR AIR COMPRESSOR SYSTEM. SEE ONE-LINE DIAGRAM FOR REQUIREMENTS
- 19 PROVIDE 12#14, 1#14G, 1" C
- 20 PROVIDE 24#14, 10#14 SPARE, 1#14G, 1 1/4" C AND CONNECT TO EXISTING RAW WATER PUMP SIGNALS TO NEW IOC. SEE SCADA I-O TABLE
- 21 PROVIDE 12#14, 8#14 SPARE, 1#14G, 1" C TO CAPTURE EX. OLD RAW WATER PUMP SIGNALS
- 22 PROVIDE TERMINATIONS TO REROUTE OLD RAW PUMP SIGNALS TO NEW SCADA SYSTEM. PROVIDE DEMOLITION OF EX. RADIO AND CONTROLLER WHEN NEW SCADA IS ONLINE









**GENERAL SHEET NOTES:**

- EXTERIOR ELECTRICAL EQUIPMENT SHALL BE NEMA 4X SS, TYPE 316. CONDUIT ABOVE-GRADE SHALL BE ALUMINUM PER 16130
- CONDUITS SHALL BE ROUTED UNDERNEATH WALKWAYS. NO CONDUIT WILL BE ALLOWED TO BE INSTALLED ACROSS A WALKWAY. ALUMINUM CONDUIT SHALL BE COATED WHERE INSTALLED IN CONTACT WITH CONCRETE PER SECTION 16130

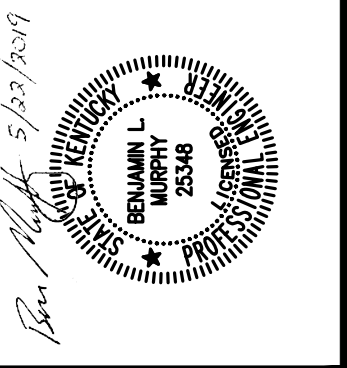
**SHEET NOTES:**

- ① PROVIDE FLOCCULATOR BRANCH CIRCUITS PER ONE-LINE DIAGRAM. CIRCUITS MAY BE COMBINED INTO A SINGLE CONDUIT
- ② PROVIDE 6#12,1#12G,1" C
- ③ PROVIDE 2#10,1#10G,1" C
- ④ PROVIDE 2#10,1#10G,3/4" C
- ⑤ PROVIDE #8 BONDING CONDUCTOR AND BOND GRATING AND REBAR AT ELECTRICAL EQUIPMENT PER NEC ARTICLE 682
- ⑥ PROVIDE #8 BONDING CONDUCTOR AND BOND HANDRAIL
- ⑦ PROVIDE 2#12,1#12G,3/4" C TO PANEL SWPS IN SPRING WATER PUMP STATION

**SEDIMENTATION BASINS ELECTRICAL PLAN**

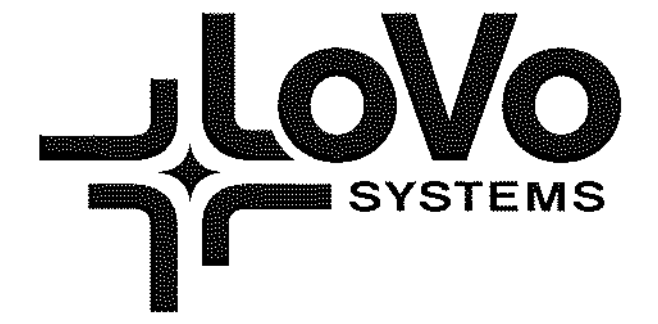
SCALE: 3/16" = 1'0"

**GREEN RIVER VALLEY WATER DISTRICT**  
**WATER TREATMENT PLANT EXPANSION**  
**HART COUNTY, KENTUCKY**



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DATE: APRIL 2018
SCALE: As Noted
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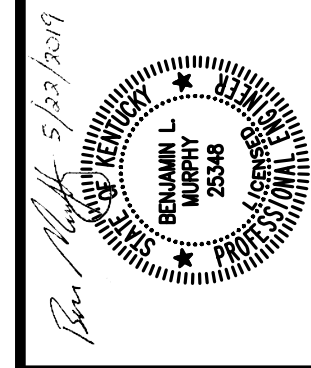
**KENVIRONS, INC.**  
**FRANKFORT, KENTUCKY**



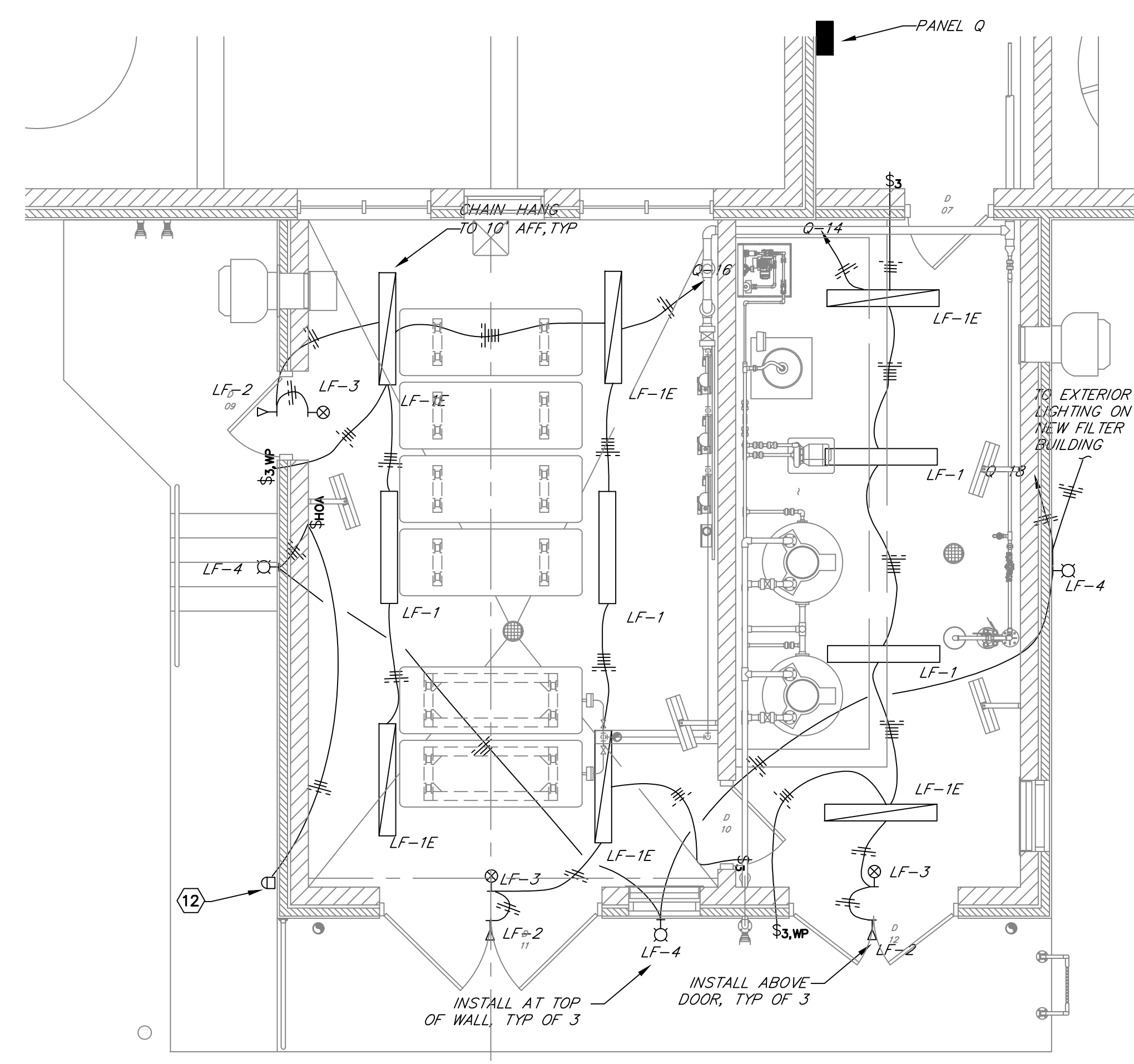




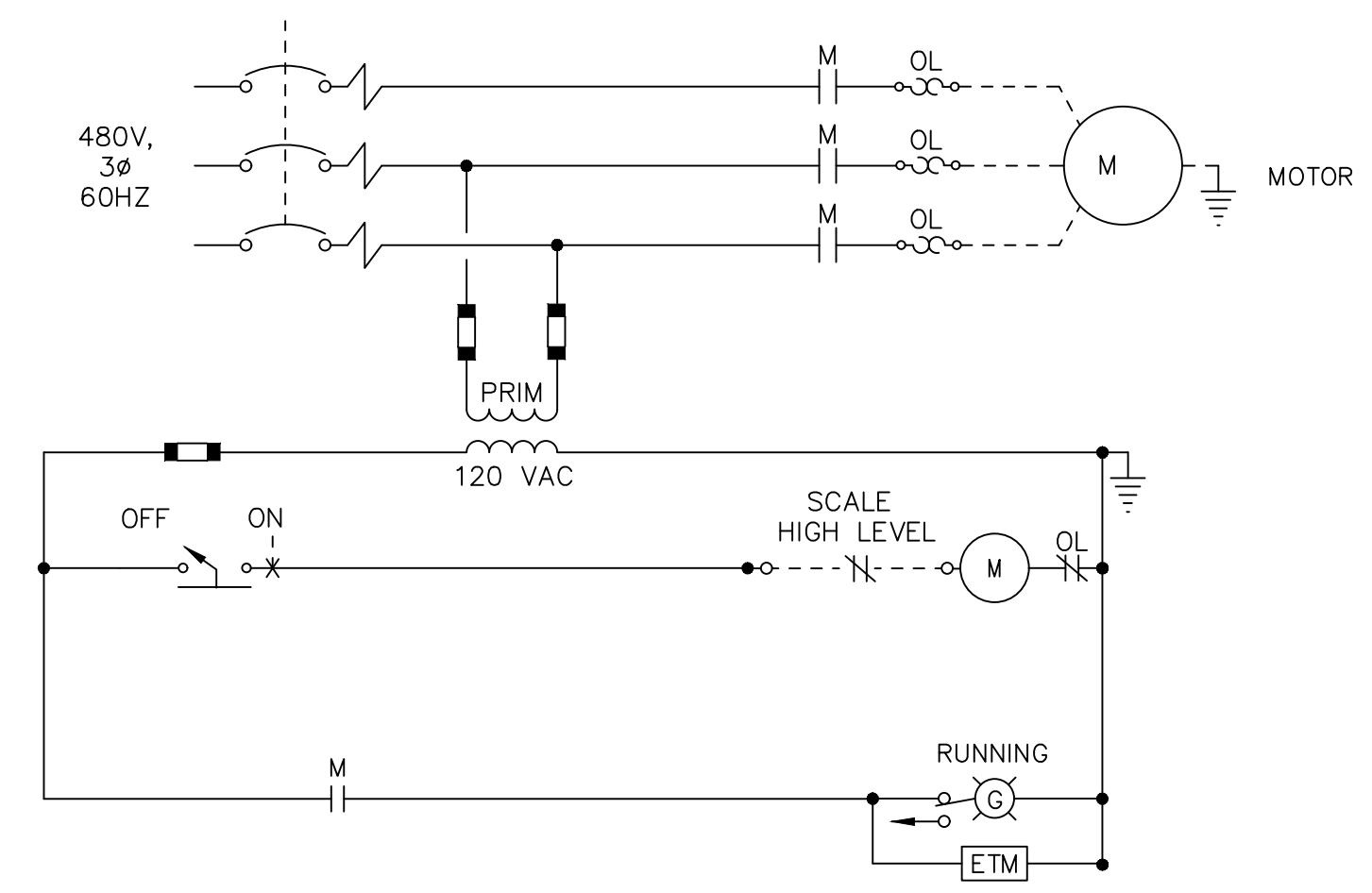




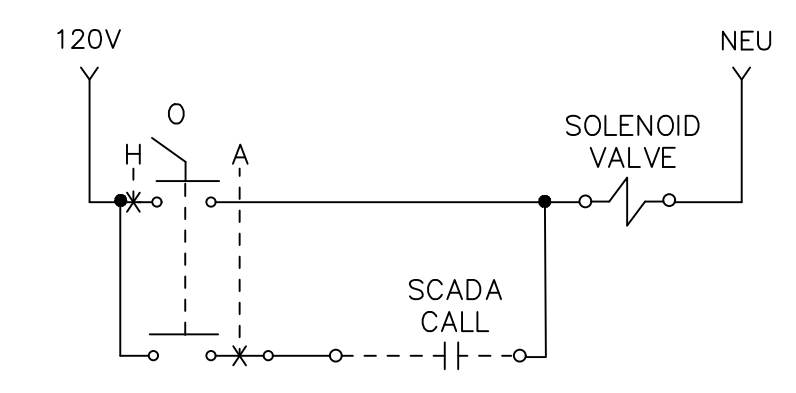
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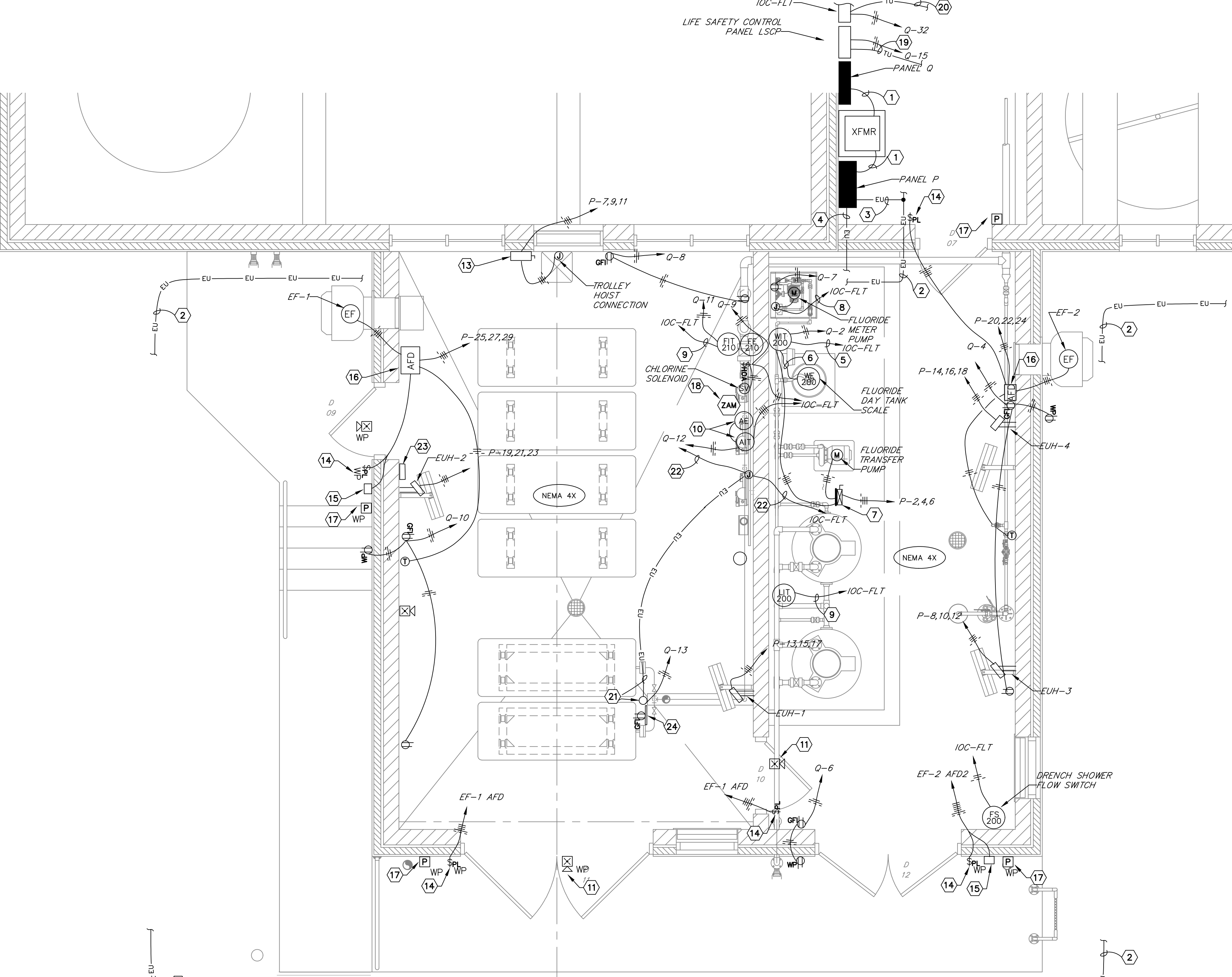
**CHLORINE/FLUORIDE BUILDING LIGHTING PLAN**  
 SCALE: 1/4"=1'-0"



**FLUORIDE TRANSFER PUMP CONTROL CIRCUIT**  
 NOT TO SCALE



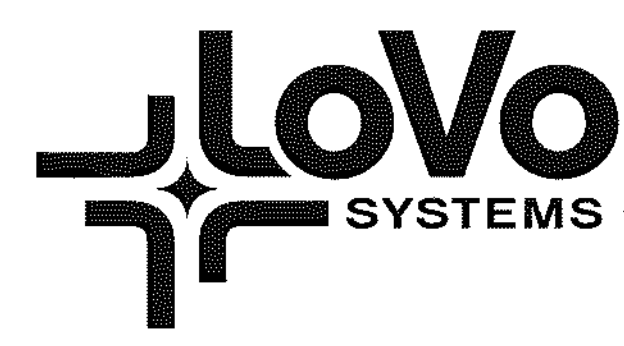
**CHLORINE SOLENOID CONTROL CIRCUIT**  
 NOT TO SCALE



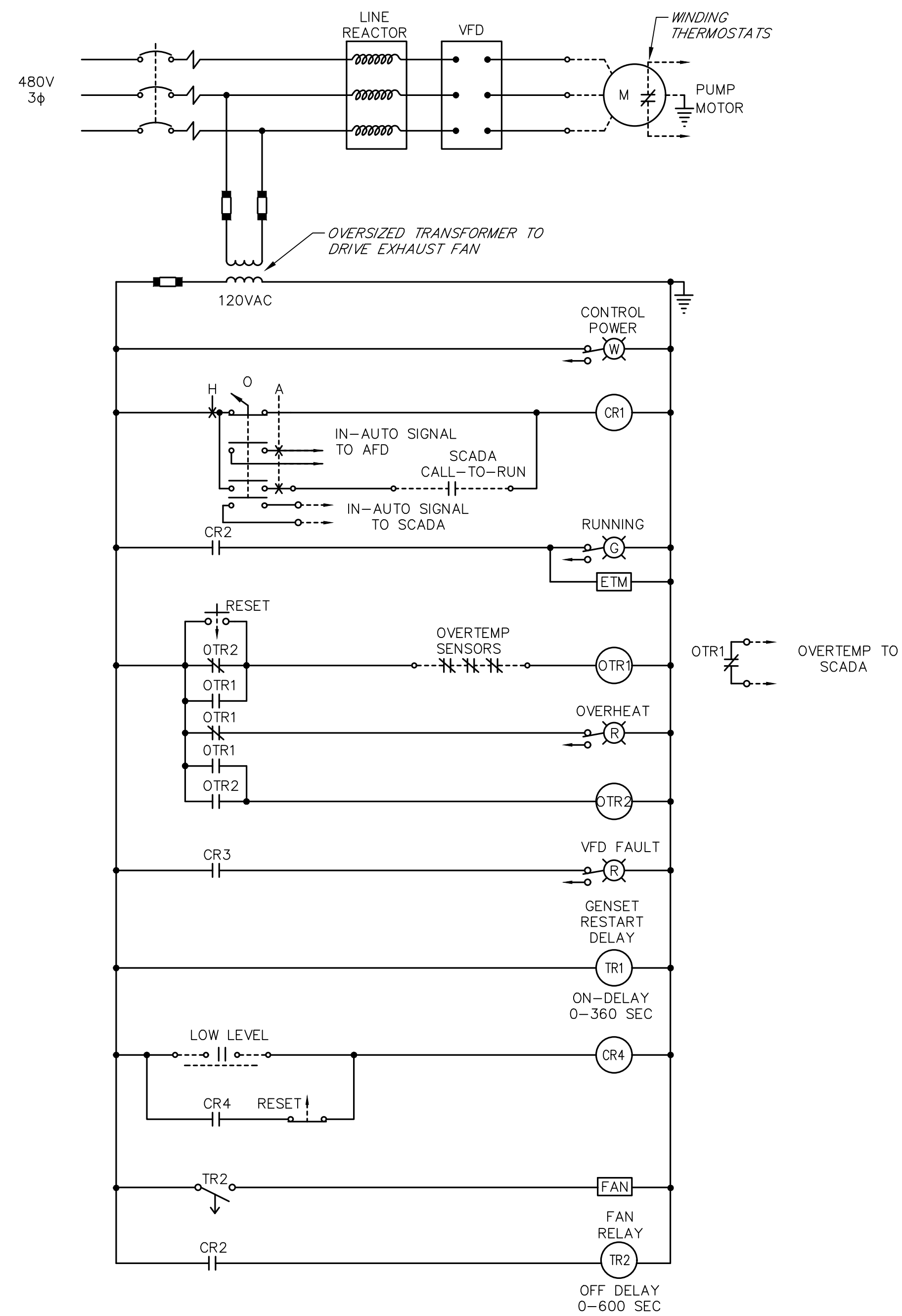
**CHLORINE/FLUORIDE BUILDING POWER PLAN**  
 SCALE: 3/8"=1'-0"

**SHEET NOTES:**

- 1) SEE ONE-LINE DIAGRAM FOR REQUIREMENTS
- 2) PROVIDE 1/Ø GROUND LOOP. SEE BUILDING GROUND DIAGRAM
- 3) PROVIDE 1/Ø GEC, 3/4" C UNDERGROUND AND CONNECT TO GROUND LOOP
- 4) PROVIDE PANEL P FEEDER FROM MDPO. SEE ONE-LINE DIAGRAM FOR REQUIREMENTS AND ELECTRICAL SITE PLAN FOR CONTINUATION
- 5) PROVIDE 2#18 STC, AND RS-485 CABLE, 1#14G, 3/4" C
- 6) PROVIDE INSTRUMENT PRIMARY CABLE 3/4" C
- 7) PROVIDE FLOOR STAND PER DETAIL
- 8) PROVIDE 8#14, 1#14G, 3/4" C AND 2-2#18 STC, 3/4" C
- 9) PROVIDE 2#18 STC, 1#14G, 3/4" C
- 10) PROVIDE RELOCATION OF EX CHLORINE DETECTION SYSTEM TO NEW BUILDING. EX SYSTEM IS WALLACE AND TIERNAN ACUTEC 35
- 11) PROVIDE NOTIFICATION APPLIANCE INSTALLED ABOVE DOOR. PROVIDE "CHLORINE GAS LEAK ALARM" SIGN
- 12) PROVIDE PHOTOCELL INSTALLED AT TOP OF WALL. EXTERIOR LIGHTING SHALL BE CONTROLLED FROM PHOTOCELL WHEN HOA SWITCH IS IN AUTOMATIC POSITION
- 13) PROVIDE 30A/3P SWITCH
- 14) PROVIDE SWITCH WITH GREEN PILOT LIGHT LABELED "VENTILATION FAN HIGH"
- 15) PROVIDE BREAK-GLASS EMERGENCY SWITCH LABELED "VENTILATION SYSTEM EMERGENCY SHUTOFF"
- 16) PROVIDE A WALL-MOUNTED AFD. SEE EF-1/EF-2 CONTROL CIRCUIT FOR REQUIREMENTS
- 17) PROVIDE EMERGENCY ALARM PULL STATION
- 18) PROVIDE LIFE SAFETY SYSTEM MONITOR MODULE FOR CHLORINE LEAK ALARM
- 19) PROVIDE PHONE CABLE CONDUIT TO PHONE BACKBOARD. SEE ELECTRICAL SITE PLAN FOR CONTINUATION
- 20) PROVIDE FO CABLE CONDUIT TO PHONE BACKBOARD. SEE ELECTRICAL SITE PLAN FOR CONTINUATION
- 21) PROVIDE 1" C FOR FUTURE CHLORINE SCALE PRIMARY CABLES. STUB CONDUIT ABOVE SLAB AND CAP.
- 22) PROVIDE 3/4" SPARE CONDUIT
- 23) PROVIDE A REMOTE ANNUNCIATOR AND GRAPHIC DISPLAY FOR LIFE SAFETY ALARM SYSTEM
- 24) PROVIDE FLOOR STAND



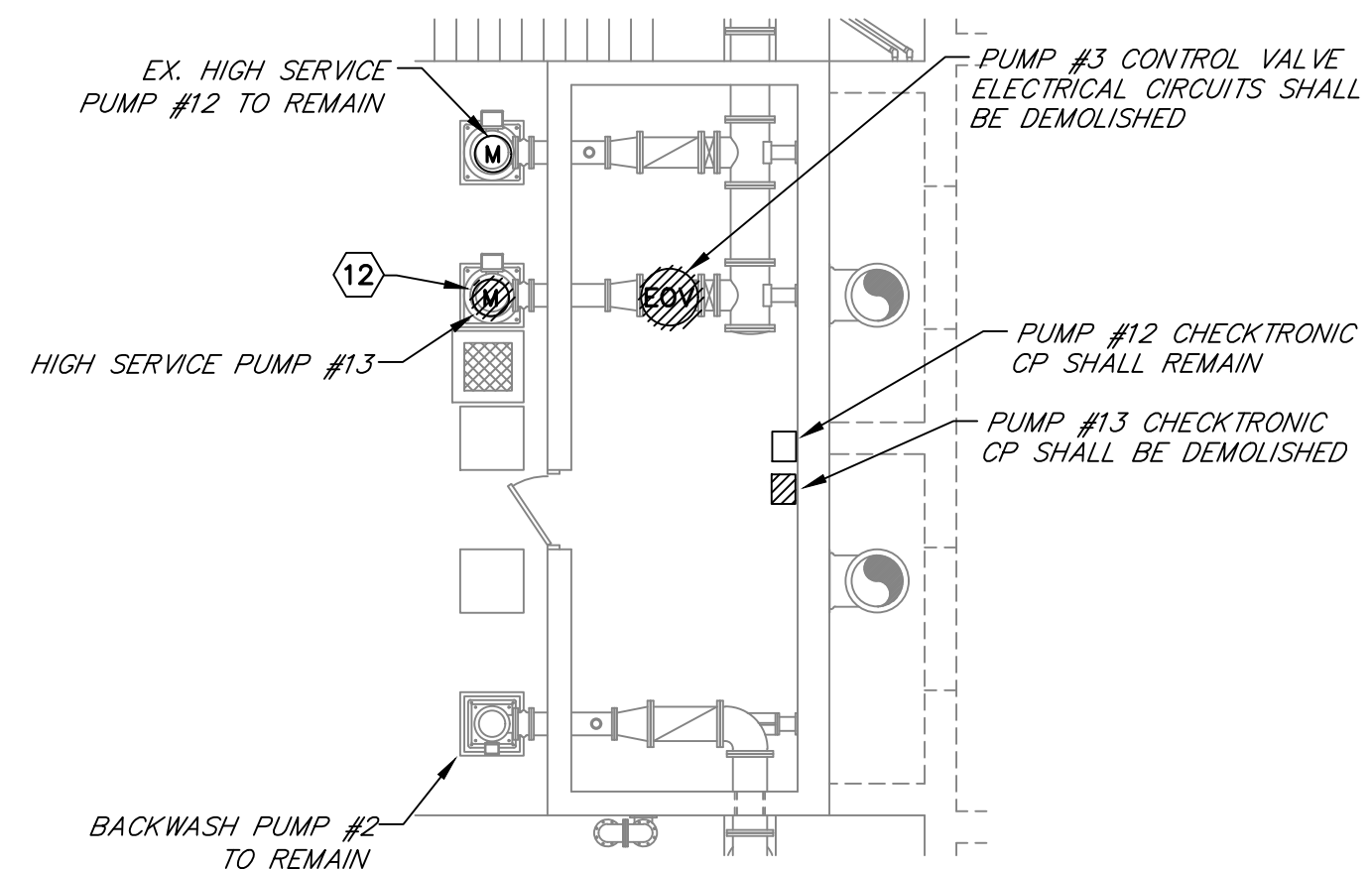
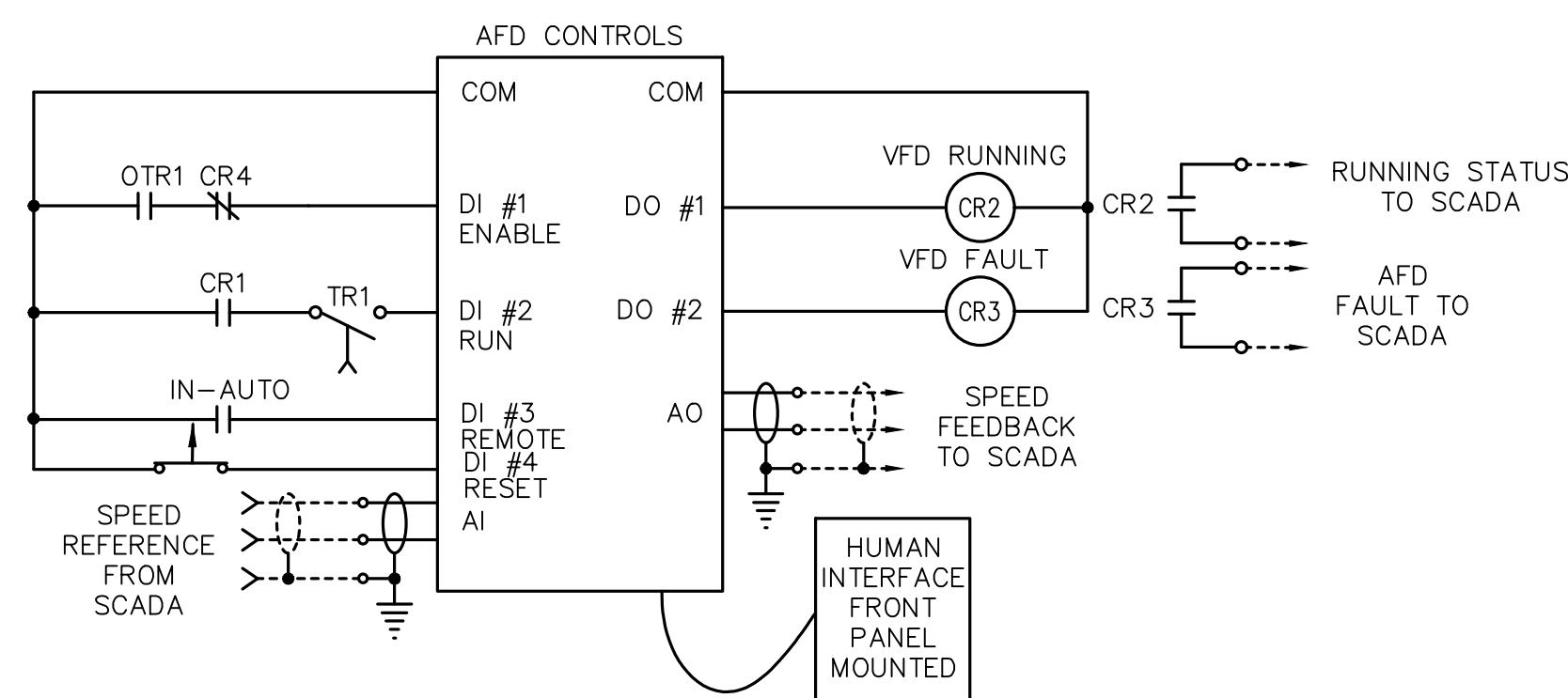




**HIGH SERVICE PUMP CONTROL CIRCUIT, TYP.**

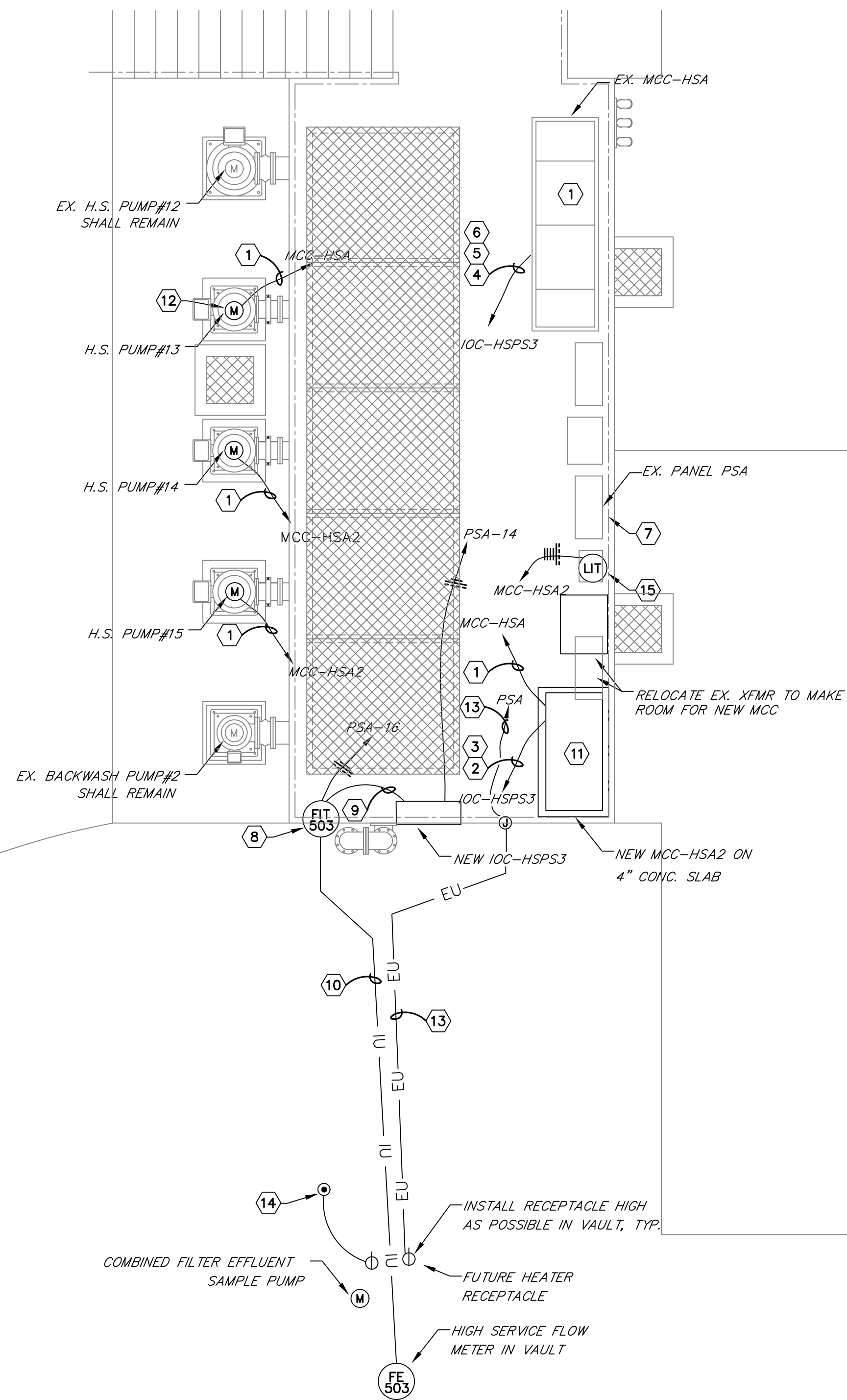
NOT TO SCALE

- NOTES:
1. IN HAND MODE, PUMP SHALL BE CONTROLLED FROM LOCAL FREQUENCY DRIVE DISPLAY. IN AUTO MODE, PUMP SHALL BE CONTROLLED FROM SCADA.
  2. POWER OUTAGE FAULTS SHALL RESET AUTOMATICALLY.
  3. SEE ONE-LINE DIAGRAM FOR PUMP HORSEPOWER.



**ELECTRICAL DEMOLITION PLAN**

SCALE: 1/8"=1'0"



**ELECTRICAL NEW WORK PLAN**

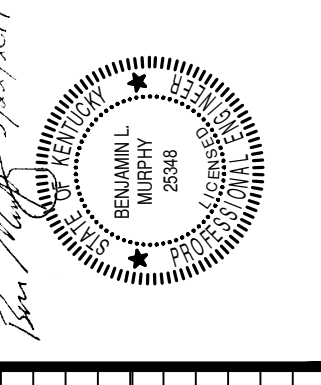
SCALE: 1/4"=1'0"

**GENERAL SHEET NOTES:**

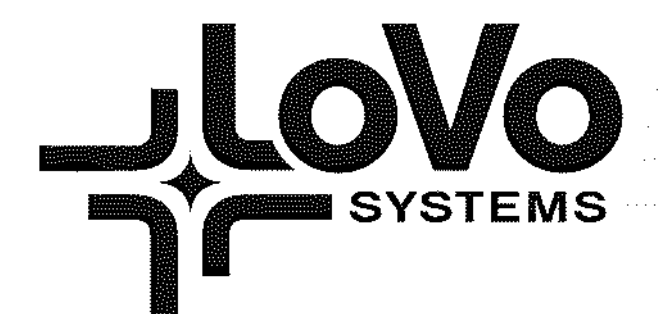
• EXTERIOR ELECTRICAL EQUIPMENT SHALL BE NEMA 4X S.S. 316 UNLESS NOTED OTHERWISE

**SHEET NOTES:**

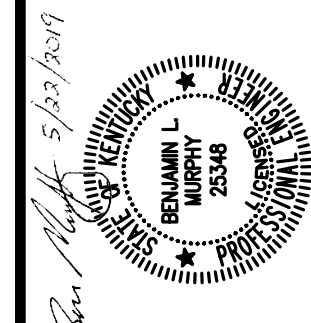
1. SEE ONE-LINE DIAGRAM FOR REQUIREMENTS
2. PROVIDE 20#14, 1#14G, 1"C
3. PROVIDE 4-2#18 STIC, 1#14G, 1.5"C
4. PROVIDE 10#4, 10#14 SPARE, 1#14G, 1"C
5. PROVIDE 2-2#18 STIC, 1#14G, 1"C
6. INTERCEPT EX. 2" SPARE CONDUIT FROM CONTROL ROOM TO MCC-HSA AND PROVIDE NEW 2"C TO IOC-HSPS3 WITH F.O. CABLE
7. PROVIDE (4) NEW 20A/1P SQUARE D TYPE OO BREAKERS
8. PROVIDE FLOWMETER DISPLAY MTD TO HANDRAIL WITH SUNSHIELD AND INSTRUMENT SPD
9. PROVIDE 2#18 STIC, 1#14G, 3/4"C
10. PROVIDE MAGMETER PRIMARY CABLE, 1"C
11. MCC-HSA2 SHALL BE RATED NEMA 3R IN A WEATHERPROOF ENCLOSURE. SEE ONE-LINE DIAGRAM FOR REQUIREMENTS
12. EX. PUMP #13 MOTOR AND CIRCUITRY SHALL BE REPLACED
13. PROVIDE 4#10, 1#10G, 1"C TO PANEL PSA
14. PROVIDE 3/4"x10' GROUND ROD WITH #6 GEC. BOND TO RECEPTACLE BOXES, CONCRETE REBAR, AND WATER PIPE
15. EX. LEVEL TRANSMITTER BELOW INSIDE VALVE VAULT. PROVIDE RELAY BOX AS NEEDED TO TRANSPORT LOW LEVEL SIGNAL TO NEW PUMP STARTER CIRCUITS



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SCALE: 1/4"=1'0"
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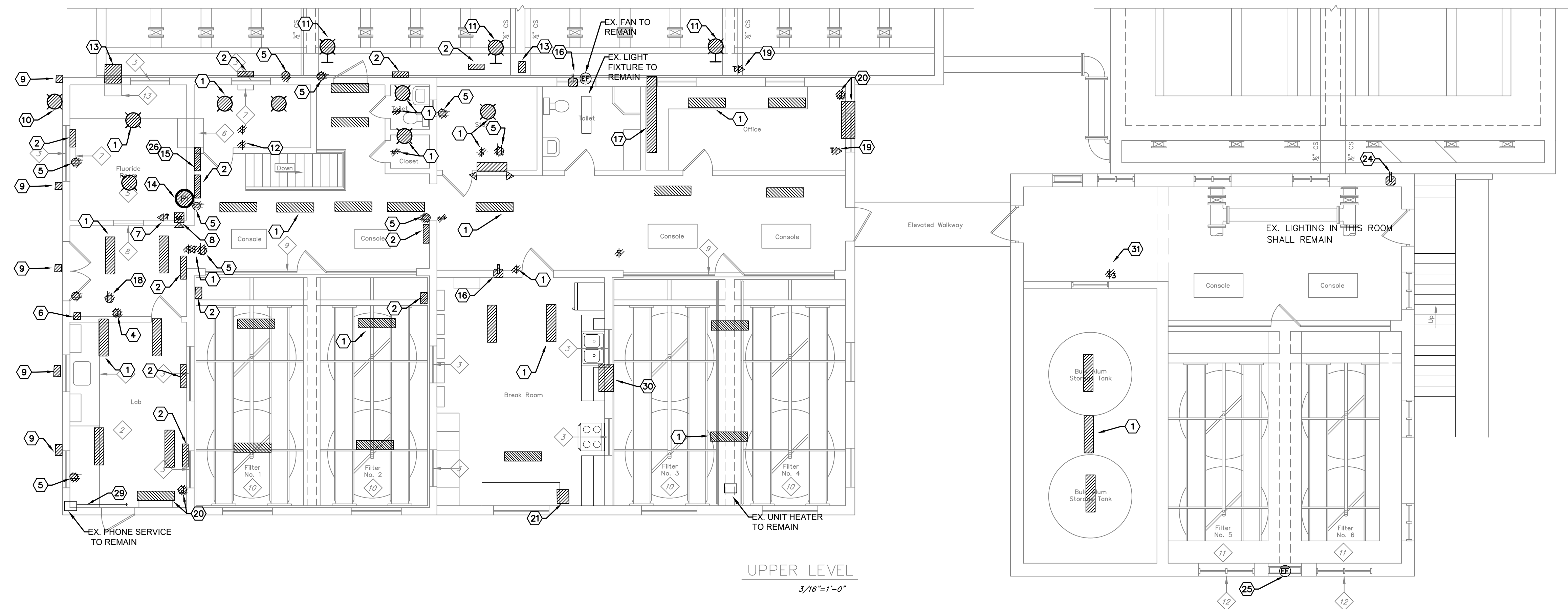


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DATE: APRIL 2018	SCALE: As Noted
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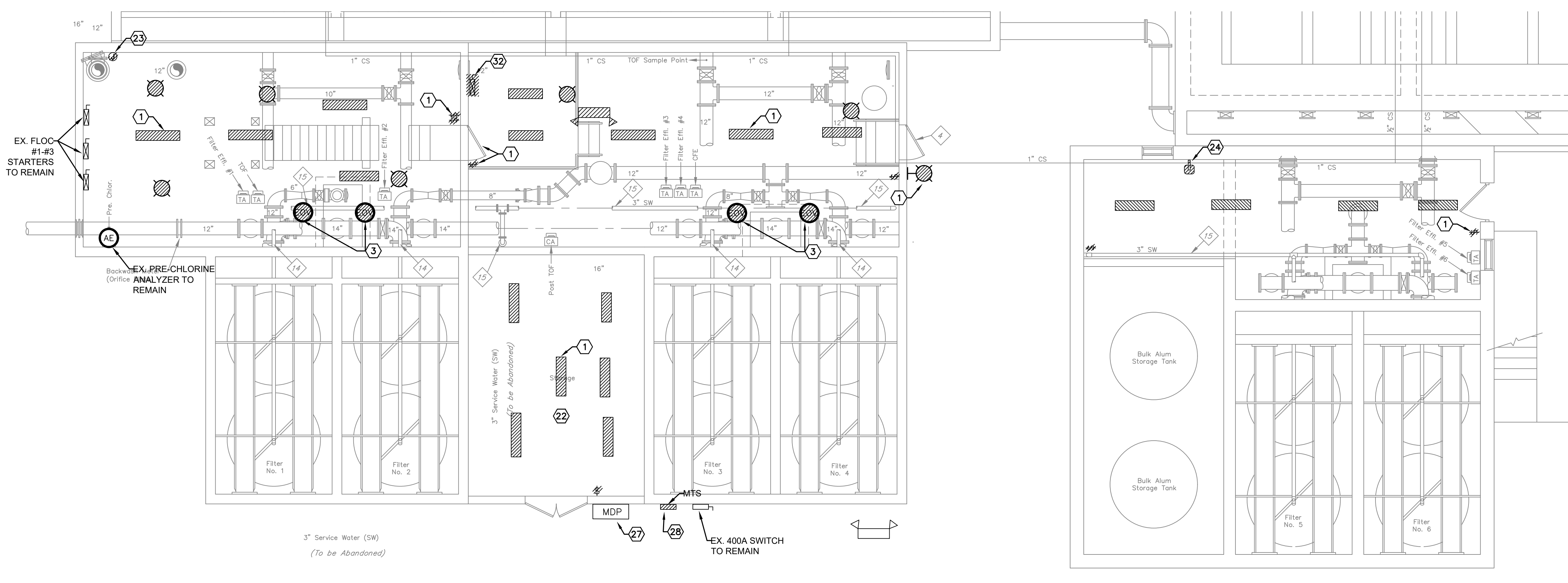


SHEET NOTES:

- 1 DEMOLISH EXISTING ROOM LIGHTING, SWITCHES, CONDUIT, AND CIRCUITRY
- 2 DEMOLISH EX. RECESSED WALL HEATER AND ASSOCIATED CIRCUITRY
- 3 DEMOLISH EX. SURFACE WASH VALVE AND ASSOCIATED CIRCUITRY
- 4 DEMOLISH RANGE RECEPTACLE AND ASSOCIATED CIRCUITRY
- 5 DEMOLISH EX. RECEPTACLE AND ASSOCIATED CIRCUITRY
- 6 RELOCATE EX. WIRELESS ACCESS POINT AND DEMOLISH EX. CABLING
- 7 DEMOLISH EX. PHONE JACK AND ASSOCIATED CABLING
- 8 DEMOLISH EX. SPEAKER AND ASSOCIATED CABLING
- 9 DEMOLISH EX. LIGHT FIXTURE RECESSED INTO CONCRETE. PROVIDE COVER PAINTED TO MATCH CONCRETE. DEMOLISH ASSOCIATED CIRCUITRY
- 10 DEMOLISH EX. ROOF LIGHTING WEATHERHEAD AND ASSOCIATED CIRCUITRY
- 11 DEMOLISH EX. ROOF MOUNTED FLOOD LIGHT FIXTURE AND ASSOCIATED CIRCUITRY
- 12 REPLACE EX. BASEMENT LIGHT SWITCH AND COVER
- 13 DEMOLISH EX. WALL FAN AND ASSOCIATED CIRCUITRY AND EXTERIOR LOUVER
- 14 DEMOLISH (3) EX. PRESSURE GAUGES AND ASSOCIATED TUBING
- 15 DEMOLISH (3) EX. SURFACE-MOUNTED CONTROL STATIONS AND (1) EX. RECESSED CONTROL STATION AND ALL ASSOCIATED CIRCUITRY
- 16 DEMOLISH EX. ELECTRIC UNIT HEATER AND ASSOCIATED CIRCUITRY
- 17 DEMOLISH (5) EX. CHART RECORDERS AND (1) EX. DIGITAL CHART RECORDER CABINET. REROUTE ALL SIGNAL CABLING TO NEW SCADA CABINET
- 18 REPLACE EX. RECEPTACLE AND COVER
- 19 DEMOLISH EX. DATA AND TELEPHONE CABLING IN CONTROL ROOM
- 20 DEMOLISH EX. 42"x16" PTAC UNIT AND RECEPTACLE AND PATCH INTERIOR AND EXTERIOR WALLS
- 21 DEMOLISH EX. 26"x17" PTAC UNIT AND PATCH INTERIOR AND EXTERIOR WALLS
- 22 DEMOLISH EX. UNUSED CABLING AND CONDUITS IN THIS ROOM
- 23 DEMOLISH EX. J-BOX AND CIRCUITRY
- 24 EX. ELECTRIC UNIT HEATER SHALL BE REMOVED AND REPLACED
- 25 EX. FAN MOTOR SHALL BE REMOVED AND REPLACED
- 26 FLOC #1, #2, AND #3 CONTROLS SHALL BE RELOCATED TO BREAK ROOM
- 27 EX. MDP SHALL REMAIN. DEMOLISH EX. SERVICE RISER, PATCH ROOF AND SOFFIT, AND DEMOLISH EX. METER. COORDINATE WITH UTILITY
- 28 DEMOLISH EX. MTS
- 29 DEMOLISH EX. PHONE CABLING AFTER NEW CABLING SYSTEM IS MADE OPERATIONAL
- 30 EX. RADIO SYSTEM SHALL BE DEMOLISHED AFTER NEW DISTRIBUTION SCADA SYSTEM IS ONLINE
- 31 REPLACE EX. SWITCH AND COVER
- 32 DEMOLISH EX. AIR COMPRESSOR STARTER AND ASSOCIATED CIRCUITRY

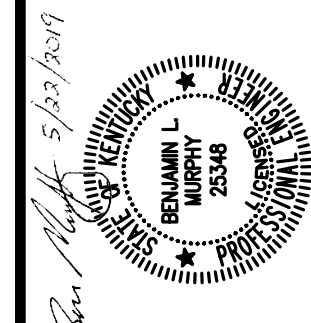


UPPER LEVEL ELECTRICAL DEMOLITION PLAN  
 SCALE: 3/16"=1'0"



LOWER LEVEL ELECTRICAL DEMOLITION PLAN  
 SCALE: 3/16"=1'0"





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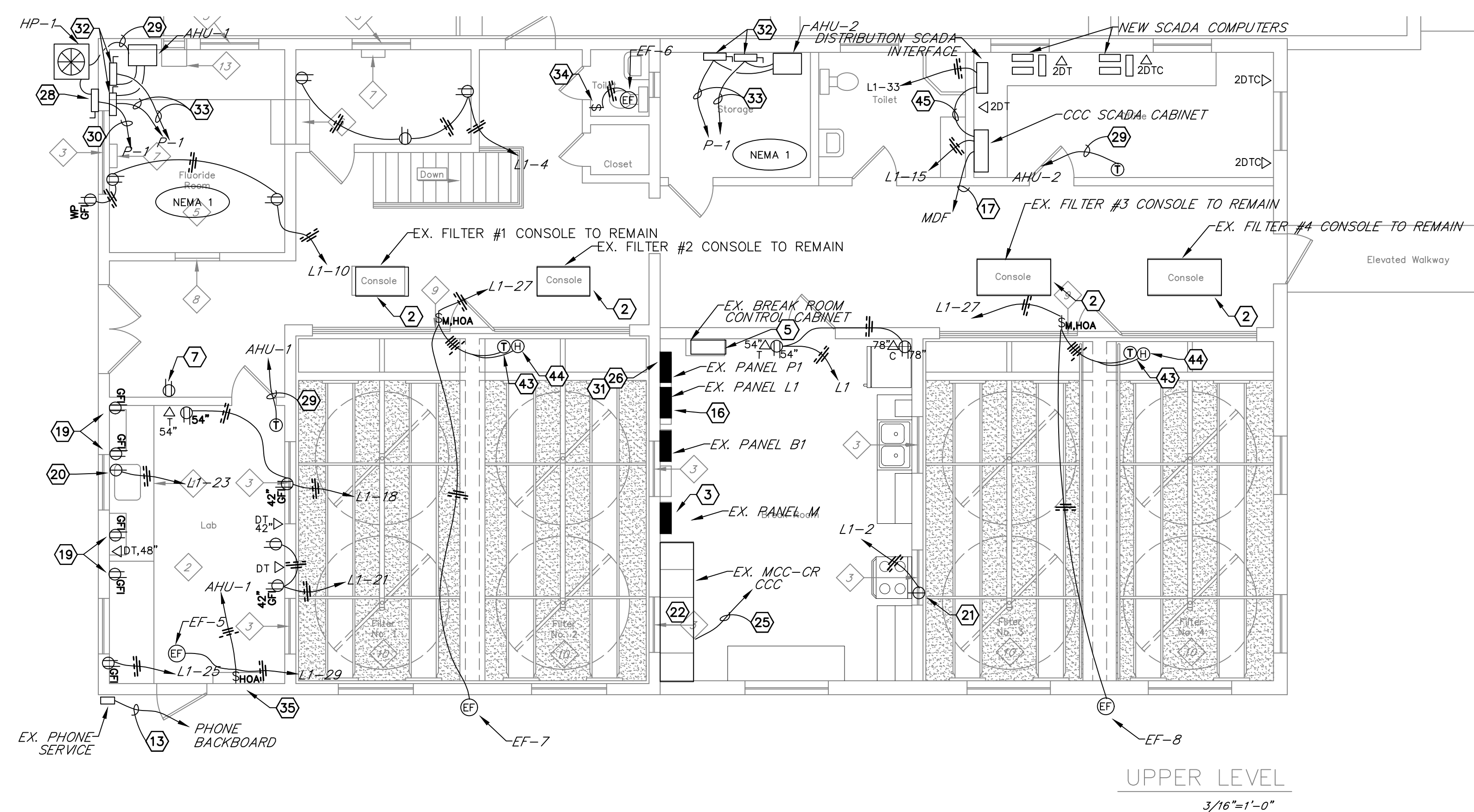


**GENERAL SHEET NOTES:**

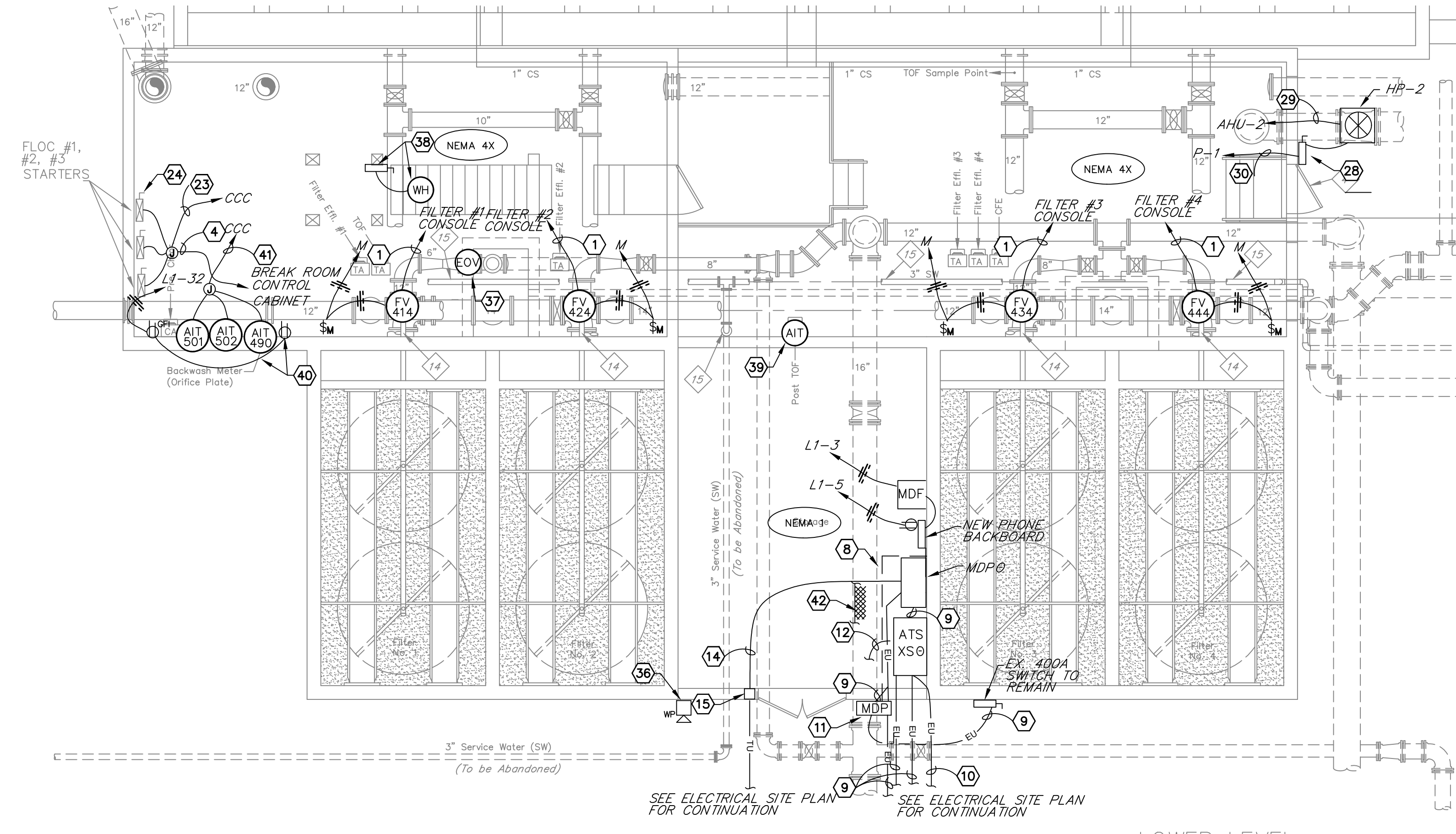
• FOR EACH PHONE JACK PROVIDE CAT-5E WHITE TO PHONE BACKBOARD FOR EACH DATA JACK, PROVIDE CAT-5E BLUE TO MDF. FOR EACH CABLE JACK, PROVIDE AN RG-6 COAX CABLE TO PHONE BACKBOARD. ALL TELECOM CABLES SHALL BE INSTALLED IN CONDUIT EXCEPT ABOVE SUSPENDED TILE CEILINGS EXCEPT ABOVE SUSPENDED TILE CEILINGS

**SHEET NOTES:**

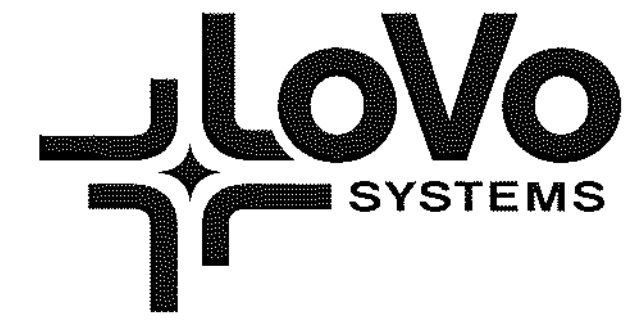
- 1) PROVIDE 8#14,1#14G,3/4" C
- 2) PROVIDE TERMINATION FOR NEW SURFACE WASH VALVE ACTUATOR
- 3) PROVIDE (4) 20A/1P SQUARE-D QO BREAKERS AND TERMINATE NEW CIRCUITRY. PROVIDE UPDATED TYPED CIRCUIT DIRECTORY
- 4) PROVIDE 15#14,1#14G,3/4" C
- 5) PROVIDE START BUTTON, STOP BUTTON, AND RUNNING STATUS LIGHT FOR FLOCCULATORS #1, #2, AND #3
- 6) PROVIDE 2.5" C FROM CCC TO BASEMENT AND REROUTE EX. CABLING FROM CHART RECORDERS TO NEW CCC
- 7) REPLACE EX. RECEPTACLE AND COVER
- 8) SAWCUT AND REPAIR SLAB TO INSTALL NEW CONDUITS UNDERGROUND WITH BOTTOM ENTRY INTO CABINETS
- 9) SEE ONE-LINE DIAGRAM FOR REQUIREMENTS
- 10) PROVIDE 10#14,1#14G,1" C TO GENSET CONTROL PANEL
- 11) EX. MDF SHALL REMAIN. DEMOLISH EX. SERVICE RISER AND METER. COORDINATE WITH UTILITY
- 12) PROVIDE 2/0 GROUNDING ELECTRODE CONDUCTOR AND BOND TO EX. GROUNDING ELECTRODE SYSTEM AT MDF. PROVIDE NEW BOND TO WATER PIPE, AND PROVIDE NEW 10'X3/4" GROUND ROD
- 13) PROVIDE 25 PAIR PHONE CABLE AND 1-RG6 SPARE COAX CABLE, 1/4" C
- 14) PROVIDE 4-FO CABLES AND 2-4-PAIR PHONE CABLES, 2.5" C
- 15) EX. CONDUIT JUNCTION BOX. PROVIDE NEW JUNCTION BOX AS NEEDED TO TERMINATE NEW CONDUITS
- 16) SEE PANELBOARD SCHEDULE FOR MODIFICATIONS. PROVIDE UPDATED TYPED CIRCUIT DIRECTORY
- 17) PROVIDE 2-CAT-5E, 3/4" C
- 18) PROVIDE 4-FO DUPLEX PATCH CABLES, 1-CAT 5E, 1.5" C
- 19) EX. RECEPTACLES SHALL BE REPLACED WITH GFCI RECEPTACLES
- 20) PROVIDE FUTURE DISHWASHER RECEPTACLE INSTALLED INSIDE CABINET IN ACCESSIBLE LOCATION
- 21) PROVIDE RECEPTACLE INSTALLED HIGH FOR RANGE HOOD. COORDINATE MOUNTING HEIGHT WITH RANGE HOOD INSTALLATION INSTRUCTIONS
- 22) EX. MCC-CR SHALL REMAIN. PROVIDE MODIFICATIONS INDICATED IN ONE-LINE DIAGRAM AND SCADA I-O TABLES
- 23) PROVIDE 12#14,1#14G,1" C
- 24) PROVIDE RELAYS IN EACH FLOC STARTER TO TRANSMIT SCADA SIGNAL
- 25) PROVIDE 20#14,1#14G,1" C
- 26) PROVIDE UPDATED CIRCUIT DIRECTORY AFTER DEMOLITION AND MODIFICATIONS
- 27) PROVIDE RECONNECTION OF NEW UNIT HEATER USING EXISTING CIRCUIT
- 28) PROVIDE 60A/2P NEMA 4X SAFETY SWITCH
- 29) PROVIDE THERMOSTAT CABLE, 3/4" C
- 30) PROVIDE 2#8,1#10G,3/4" C
- 31) PROVIDE 3-60A/2P SQUARED TYPE QO BREAKERS
- 32) PROVIDE 60A/2P SAFETY SWITCH
- 33) PROVIDE 2#6,1#10G,3/4" C
- 34) CONNECT EXHAUST FAN TO LIGHTING CIRCUIT SWITCH
- 35) FAN SHALL BE INTERLOCKED WITH AHU-1 TO RUN IN AUTO MODE
- 36) PROVIDE AMPLIFIED PHONE SYSTEM SPEAKER WITH 14/2 SPEAKER CABLE, 1#14G,3/4" C TO PHONE BACKBOARD
- 37) PROVIDE TERMINATION OF NEW VALVE ACTUATOR USING EX. CIRCUITRY
- 38) PROVIDE NEW FUSED SAFETY SWITCH AND 2#8,1#10G,3/4" C TO POWER NEW WATER HEATER. UTILIZE EX. POWER CIRCUIT
- 39) EX. CHLORINE ANALYZER SHALL REMAIN
- 40) INSTALL ANALYZERS AND RECEPTACLES ON RACK PER CHLORINE ANALYZER DETAILS
- 41) PROVIDE 3-2#18 STIC,1#14G,1" C
- 42) PROVIDE SWITCHBOARD MATTING IN FRONT OF ELECTRICAL GEAR
- 43) LINE VOLTAGE NEMA 4X THERMOSTAT RATED FOR 1/4 HP, MIN.
- 44) LINE VOLTAGE HUMIDISTAT RATED FOR 1/4 HP, MIN. JOHNSON W43A OR EQUAL
- 45) PROVIDE 4-2#18 STIC,1#14G, 1" C



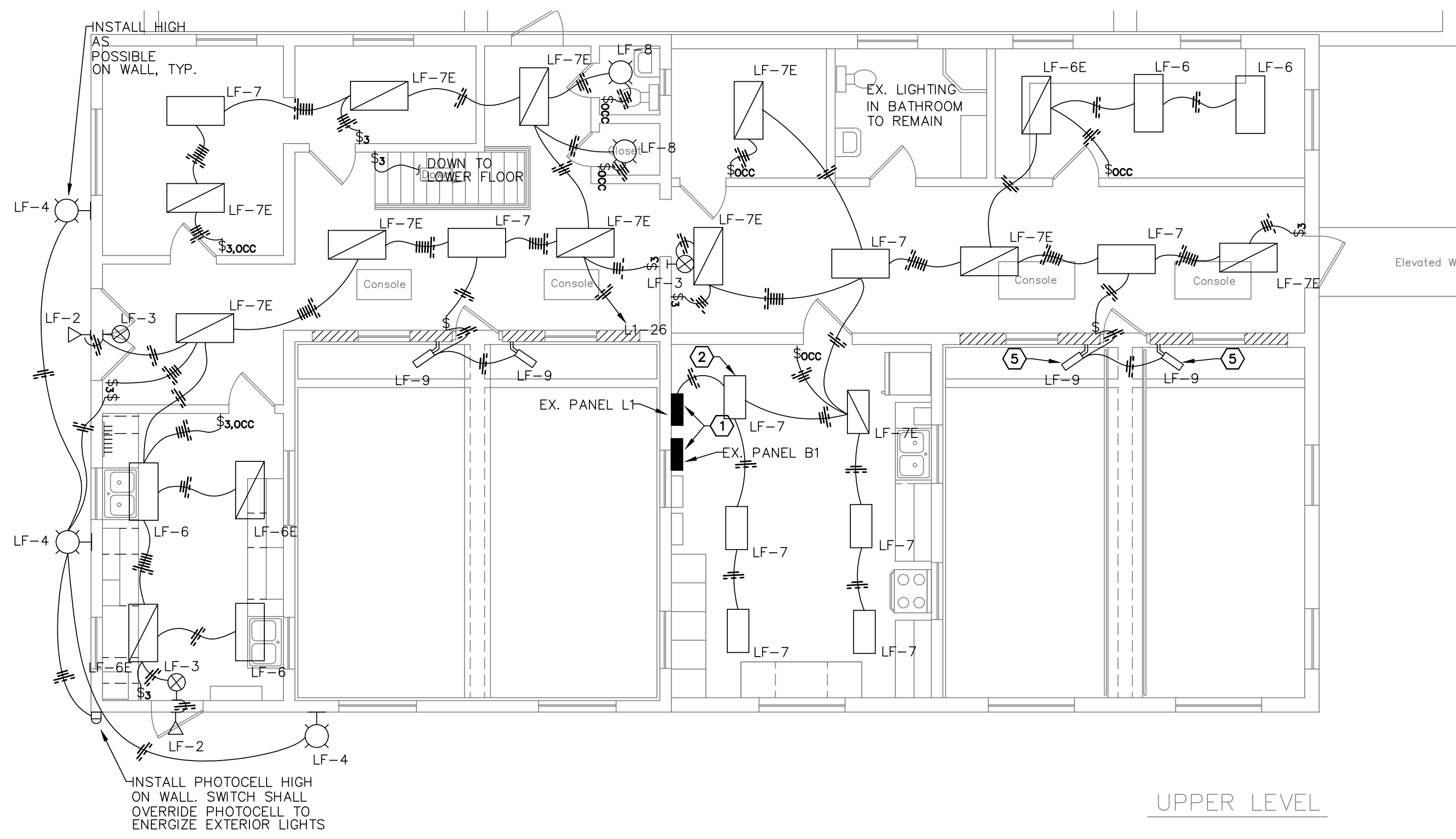
**UPPER LEVEL POWER PLAN-NEW WORK**  
SCALE: 3/16"=1'0"



**LOWER LEVEL POWER PLAN-NEW WORK**  
SCALE: 3/16"=1'0"

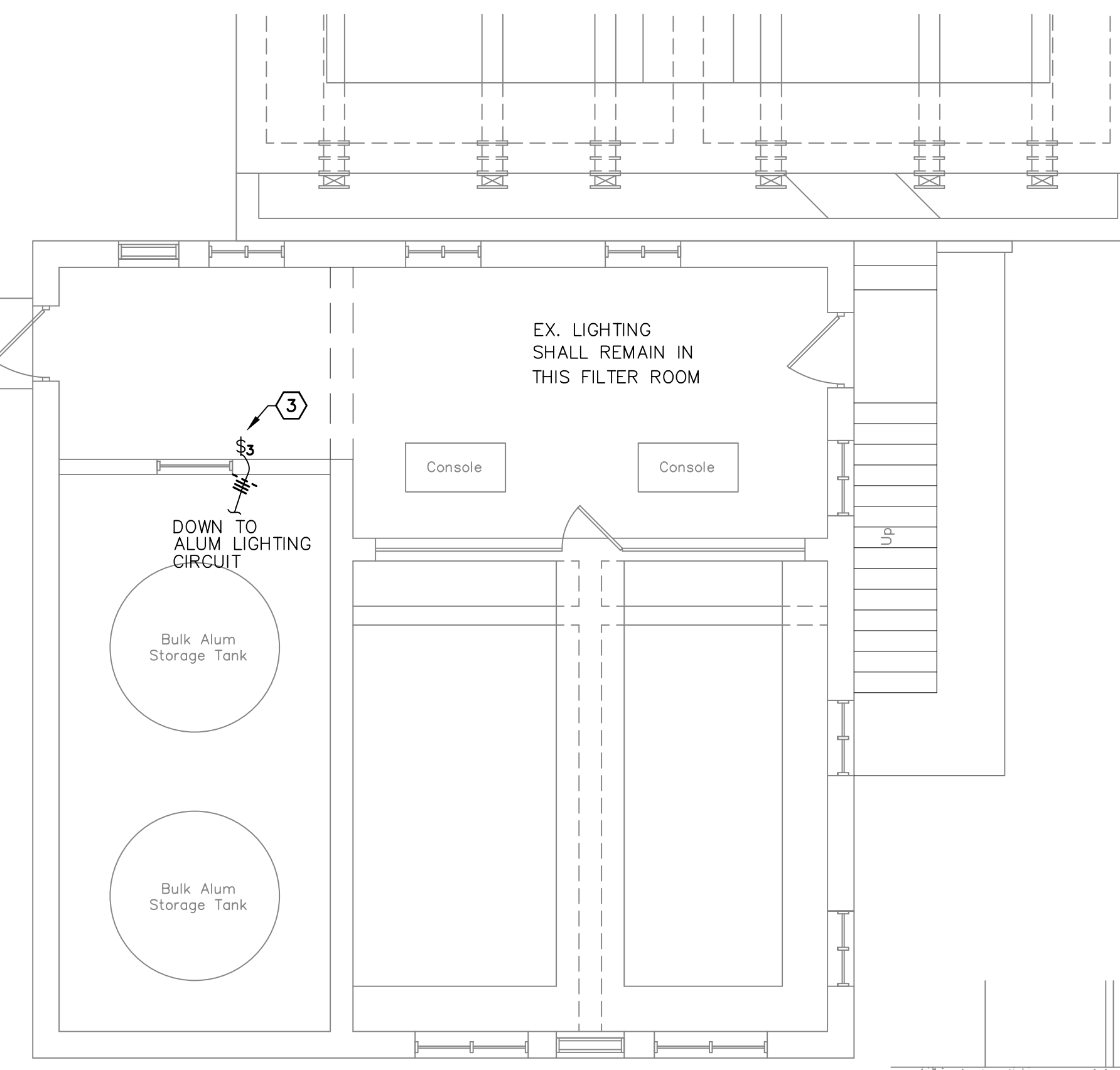






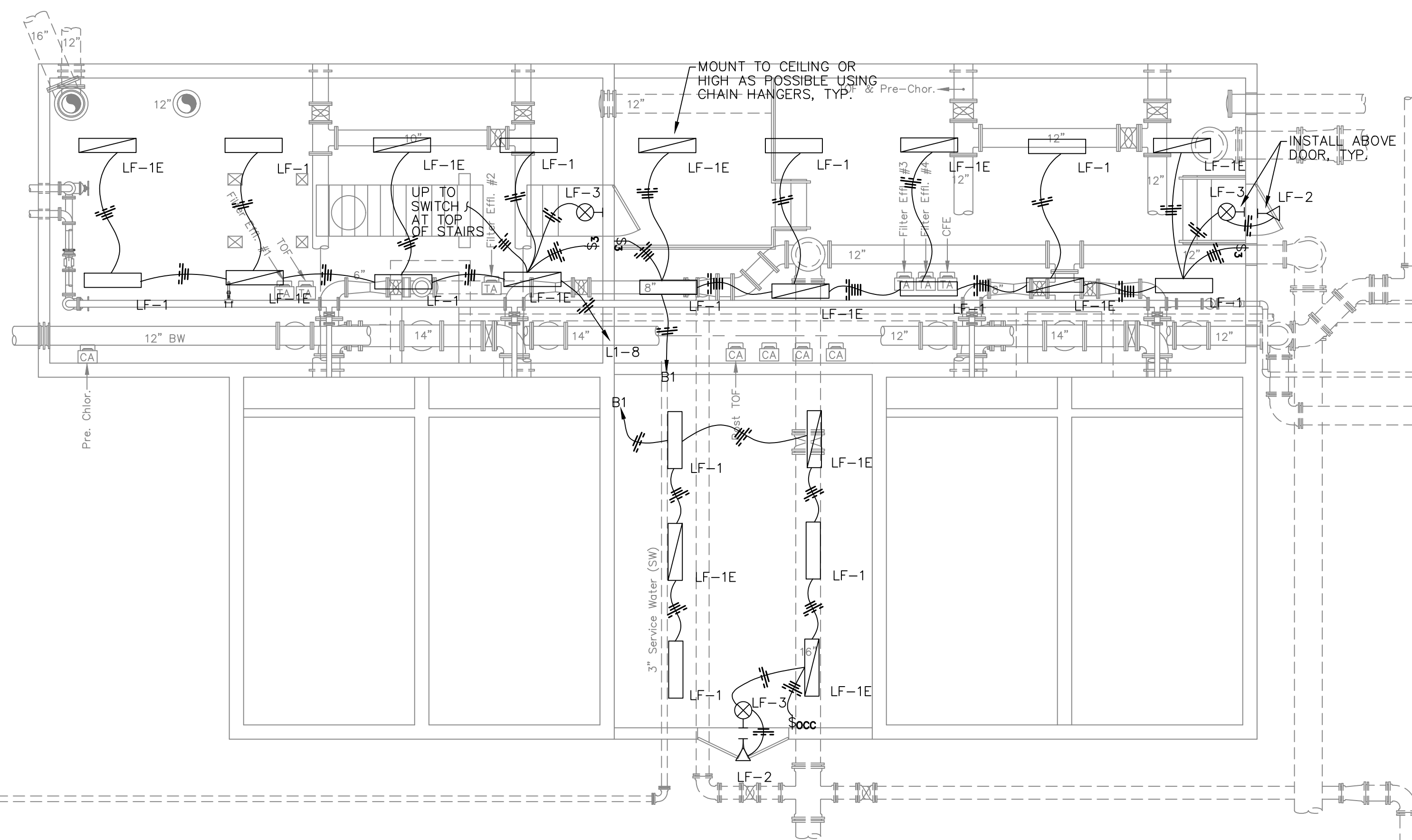
UPPER LEVEL

UPPER LEVEL LIGHTING PLAN-NEW WORK  
SCALE: 3/16"=1'0"



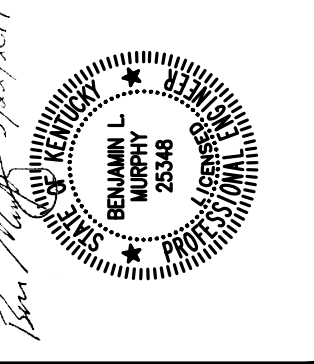
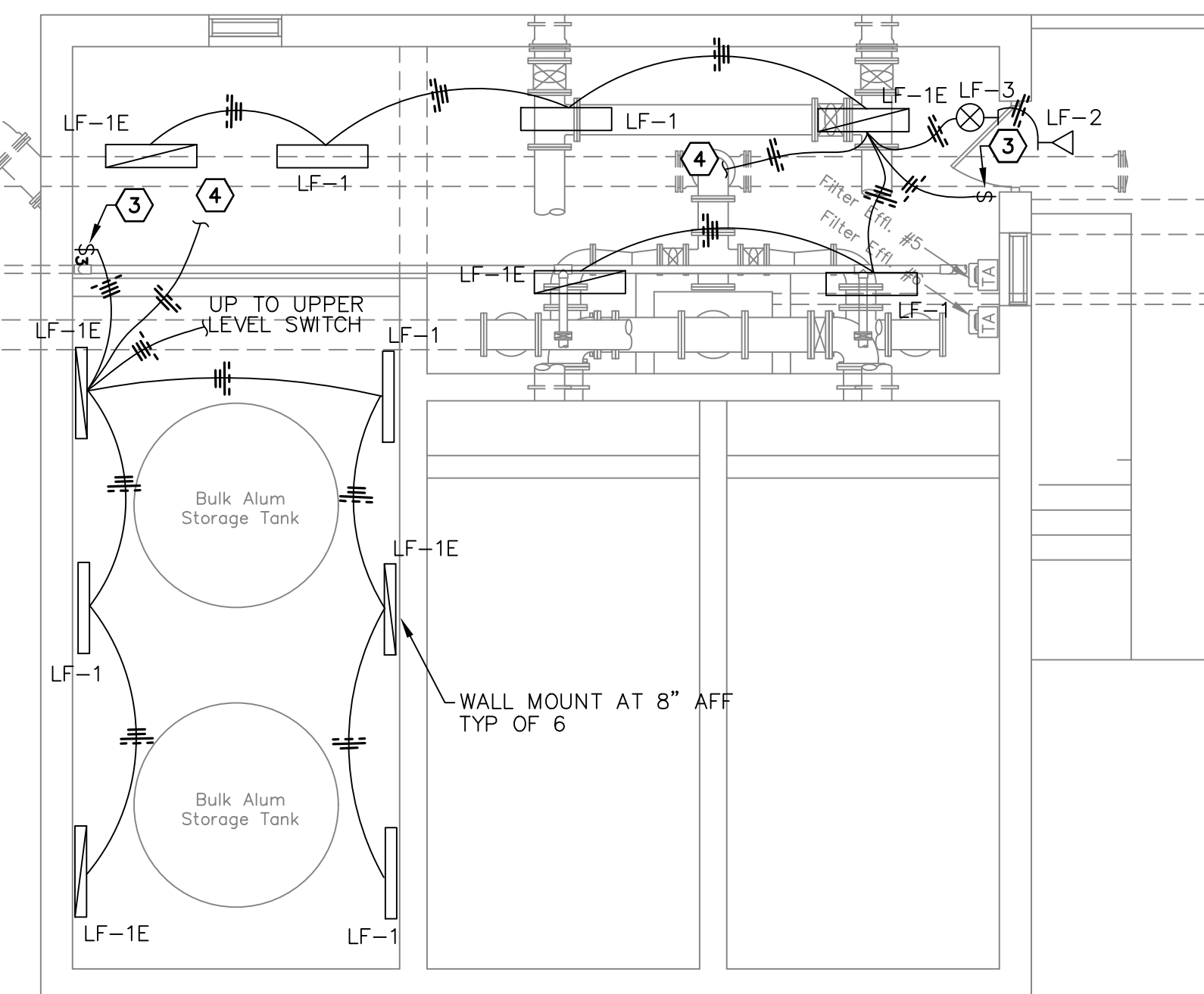
SHEET NOTES:

- 1 CONNECT NEW CIRCUITS TO EX. BREAKERS. PROVIDE NEW TYPED CIRCUIT DIRECTORY
- 2 MOUNT FIXTURE TO BOTTOM OF CEILING BEAM, TYP OF 3
- 3 REPLACE EX. SWITCH AND COVER
- 4 CONNECT TO EXISTING 120V LIGHTING CIRCUIT
- 5 INSTALL AT 84" AFF ON EITHER SIDE OF DOOR ACCESSIBLE FOR MAINTENANCE WITHOUT LADDER



LOWER LEVEL

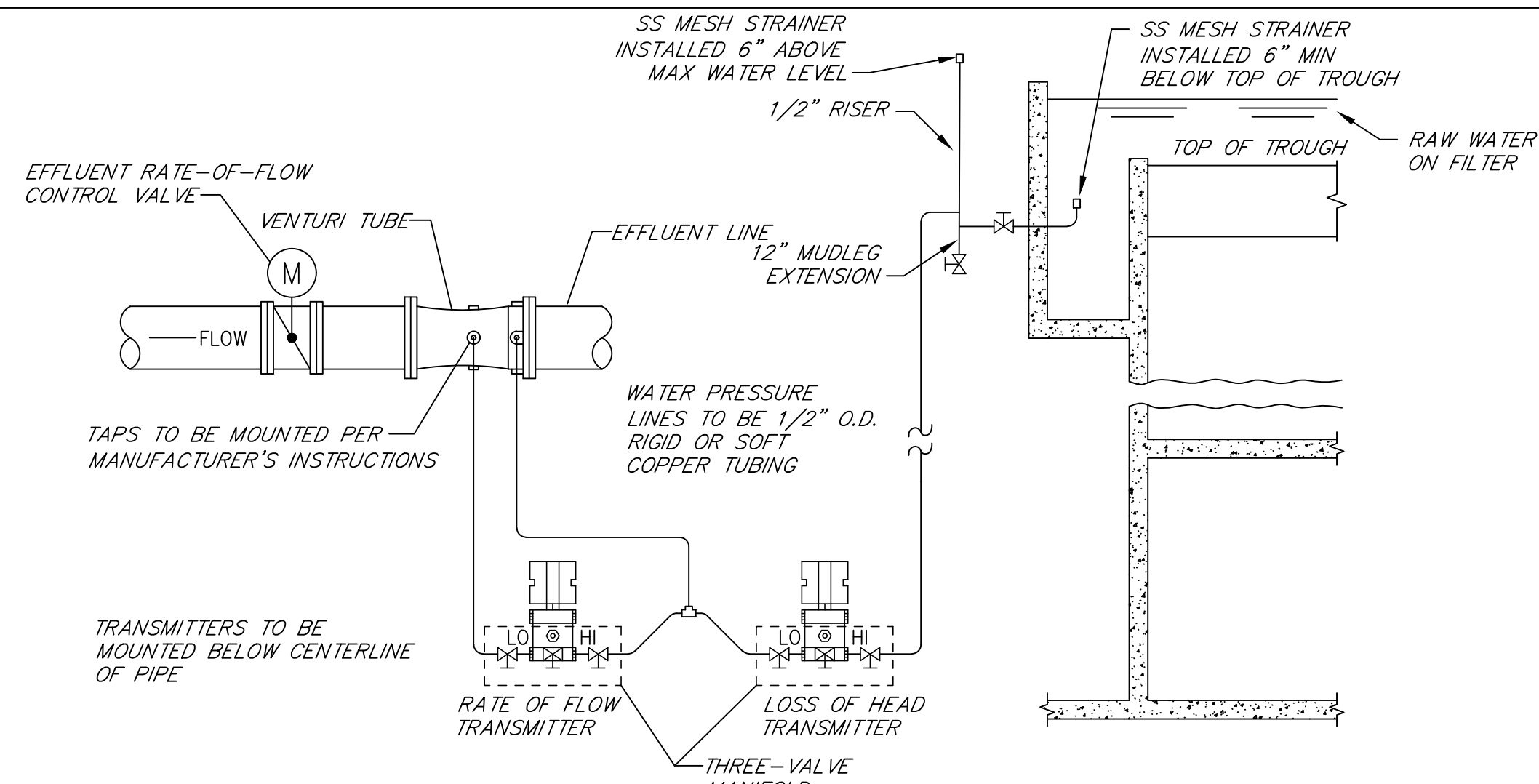
LOWER LEVEL LIGHTING PLAN-NEW WORK  
SCALE: 3/16"=1'0"



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**FILTER INSTRUMENTATION DETAIL**

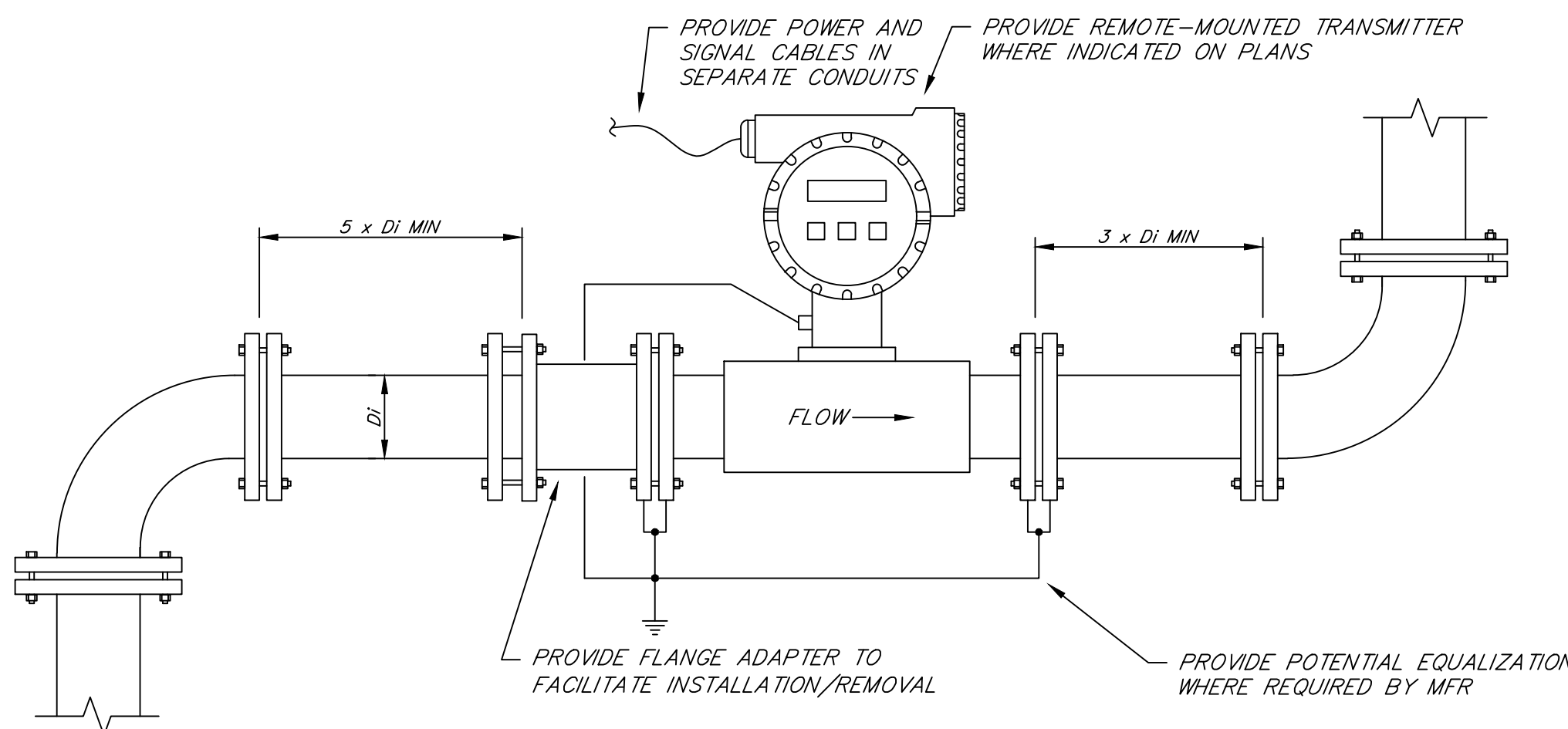
NOT TO SCALE

NOTE:  
1. TRANSMITTER MANIFOLDS SHALL INCLUDE AIR BLEED VALVES AND TUBING SHALL BE SLOPED TO PREVENT AIR TRAPS

THESE INSTRUMENTS ARE REQUIRED TO BE FURNISHED BY FILTER MFR

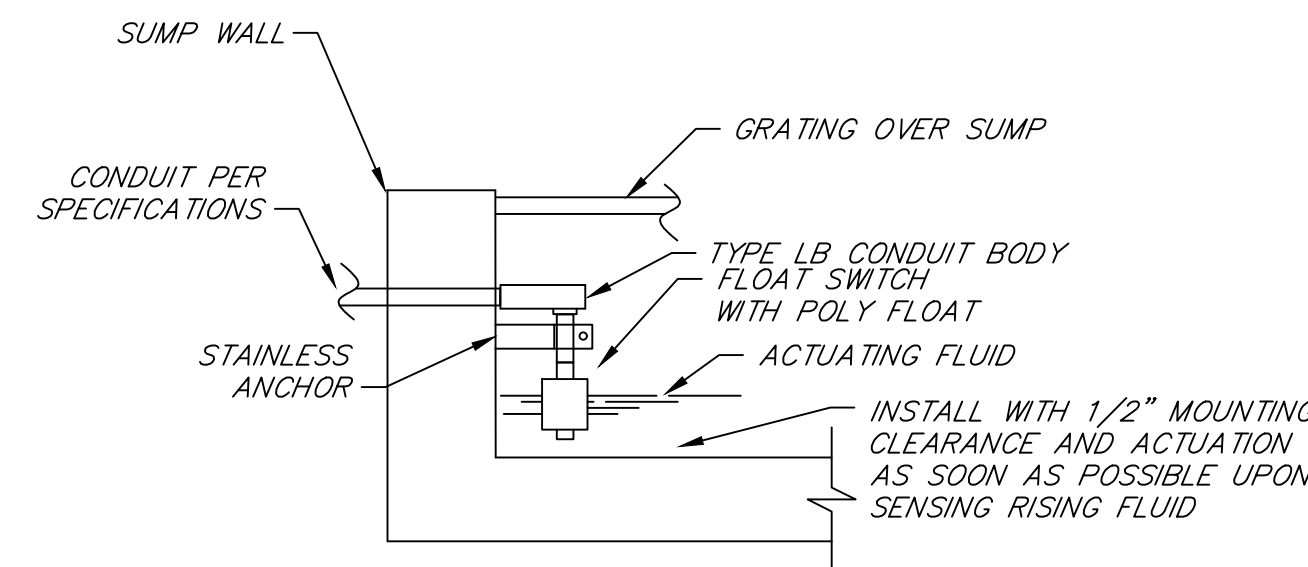
INSTRUMENTATION SCHEDULE									
TAG	DESCRIPTION	TYPE	LOCATION	RANGE	UNIT	OUTPUT	POWER	SENSOR MOUNTING	TRANS. MOUNTING
LIT-101	RIVER LEVEL	PRESSURE CELL	RAW WATER INTAKE	0-100	FT	4-20mA	LOOP	PIPE MOUNT	INTEGRAL
LIT-102	RAW WETWELL LEVEL	PRESSURE CELL	RAW WATER INTAKE	0-100	FT	4-20mA	LOOP	PIPE MOUNT	INTEGRAL
FE/FIT-101	RIVER FLOW METER	MAGNETIC	SPRING PUMP STATION	0-5000	GPM	4-20mA	120VAC	IN-LINE ANSI FLANGE	WALLMOUNT
FE/FIT-102	SPRING FLOW METER	MAGNETIC	SPRING PUMP STATION	0-5000	GPM	4-20mA	120VAC	IN-LINE ANSI FLANGE	INTEGRAL
LS-100	SPRING P.S.FLOOD SENSOR	FLOAT	SPRING PUMP STATION	N/A	N/A	DRY CONTACT	N/A	NPT PIPE	N/A
WE/WIT-200	FLUORIDE DAY TANK SCALE	WEIGHT SCALE	CHLORINE BUILDING		LB	4-20mA & MODBUS	120VAC	FLOORMOUNT	WALLMOUNT
LE/LIT-200	FLUORIDE BULK TANK LEVEL	PRESSURE CELL	CHLORINE BUILDING	0-10	FT	4-20mA	LOOP	FLANGE WITH CAPILLARY	WALLMOUNT
FS-200	DRENCH SHOWER FLOW SWITCH	FLOW SWITCH	CHLORINE BUILDING	N/A	N/A	DRY CONTACT	N/A	NPT PIPE	N/A
FE/FIT-503	H.S.PS.#3 FLOW METER	MAGNETIC	H.S. METER VAULT	0-3000	GPM	4-20mA	120VAC	IN-LINE ANSI FLANGE	WALL-MOUNT
LT-501	1.45MG CLEARWELL LEVEL A	SUBMERSIBLE	1.45MG CLEARWELL	0-12	FT	4-20mA	LOOP	STILLING WELL	N/A
LT-502	1.45MG CLEARWELL LEVEL B	SUBMERSIBLE	1.45MG CLEARWELL	0-12	FT	4-20mA	LOOP	STILLING WELL	N/A
FE/FIT-900	SERVICE WATER FLOW	MAGNETIC	SPRING PUMP STATION	0-300	GPM	4-20mA	120VAC	IN-LINE ANSI FLANGE	INTEGRAL
FE/FIT-210	CHLORINE WATER FLOW RATE	MAGNETIC	CHLORINE BUILDING	0-100	GPM	4-20mA	120VAC	WALL	INTEGRAL
DPT-470	FILTER #7 LOSS-OF-HEAD	DIFF. PRESSURE CELL	FILTER GALLERY	0-15	FT	4-20mA	LOOP	WALL-MOUNT	INTEGRAL
DPT-480	FILTER #8 LOSS-OF-HEAD	DIFF. PRESSURE CELL	FILTER GALLERY	0-15	FT	4-20mA	LOOP	WALL-MOUNT	INTEGRAL
FE/FIT-470	FILTER #7 FLOW	VENTURI	FILTER GALLERY	0-1000	GPM	4-20mA	LOOP	IN-LINE ANSI FLANGE	WALLMOUNT
FE/FIT-480	FILTER #8 FLOW	VENTURI	FILTER GALLERY	0-1000	GPM	4-20mA	LOOP	IN-LINE ANSI FLANGE	WALL-MOUNT
AE/AIT-470	FILTER #7 TURBIDITY	NEPHOLEMETRIC	FILTER GALLERY	0-10	NTU	4-20mA	120VAC	WALL	WALL
AE/AIT-480	FILTER #8 TURBIDITY	NEPHOLEMETRIC	FILTER GALLERY	0-10	NTU	4-20mA	120VAC	WALL	WALL
AE/AIT-501	FINISHED WATER-MAGNOLIA CHLORINE	CHLORINE ANALYZER	FILTER GALLERY	0.5	MG/L	4-20mA	120VAC	WALL	INTEGRAL
AE/AIT-502	FINISHED WATER-HORSE CAVE CHLORINE	CHLORINE ANALYZER	FILTER GALLERY	0.5	MG/L	4-20mA	120VAC	WALL	INTEGRAL
AE/AIT-490	COMBINED FILTER EFFLUENT CHLORINE	CHLORINE ANALYZER	FILTER GALLERY	0.5	MG/L	4-20mA	120VAC	WALL	INTEGRAL

NOTE: SEE SHEET 14.1 FOR TURBIDIMETER INSTALLATION DETAIL



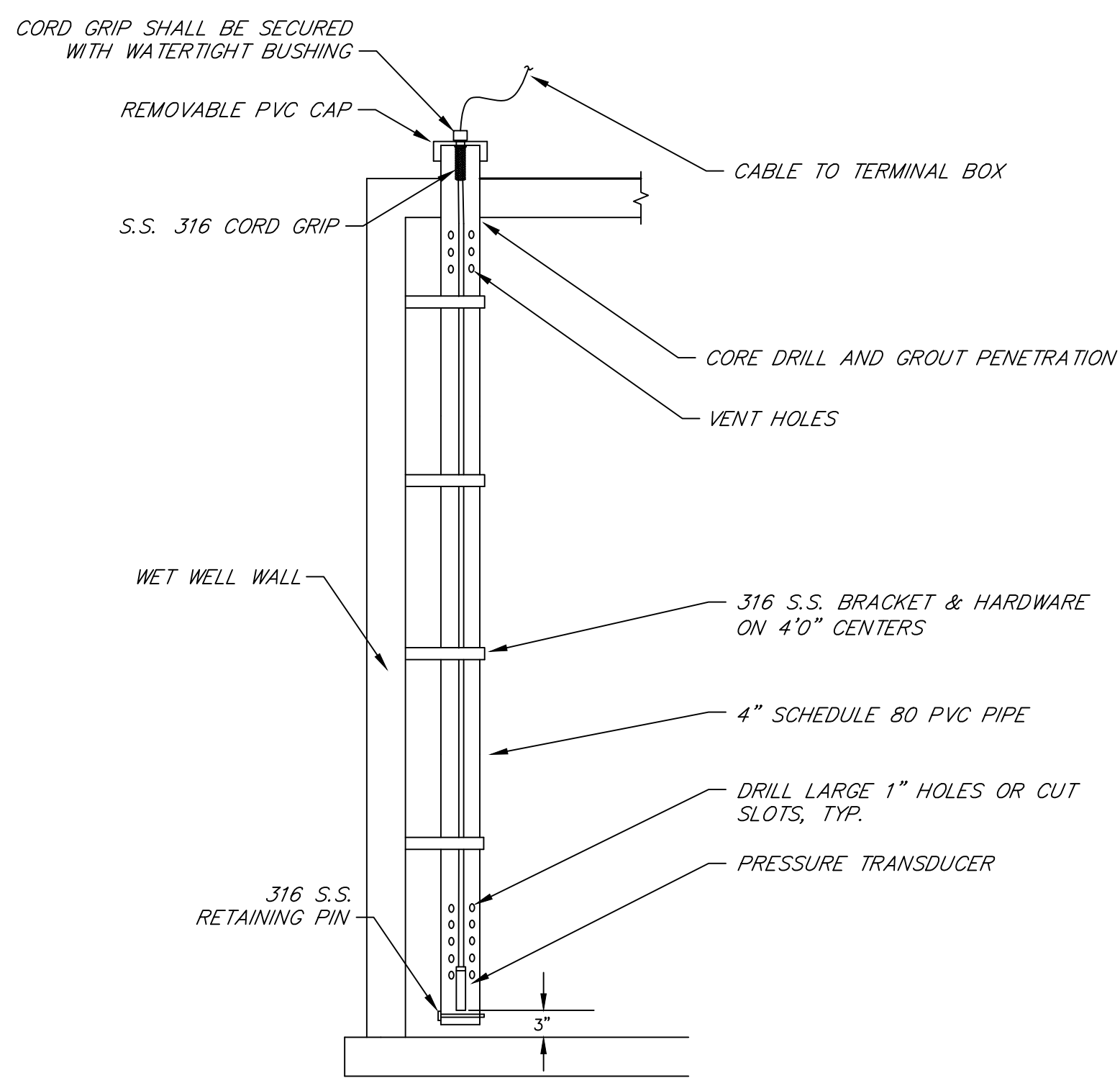
**MAGMETER INSTALLATION DETAIL**

NOT TO SCALE



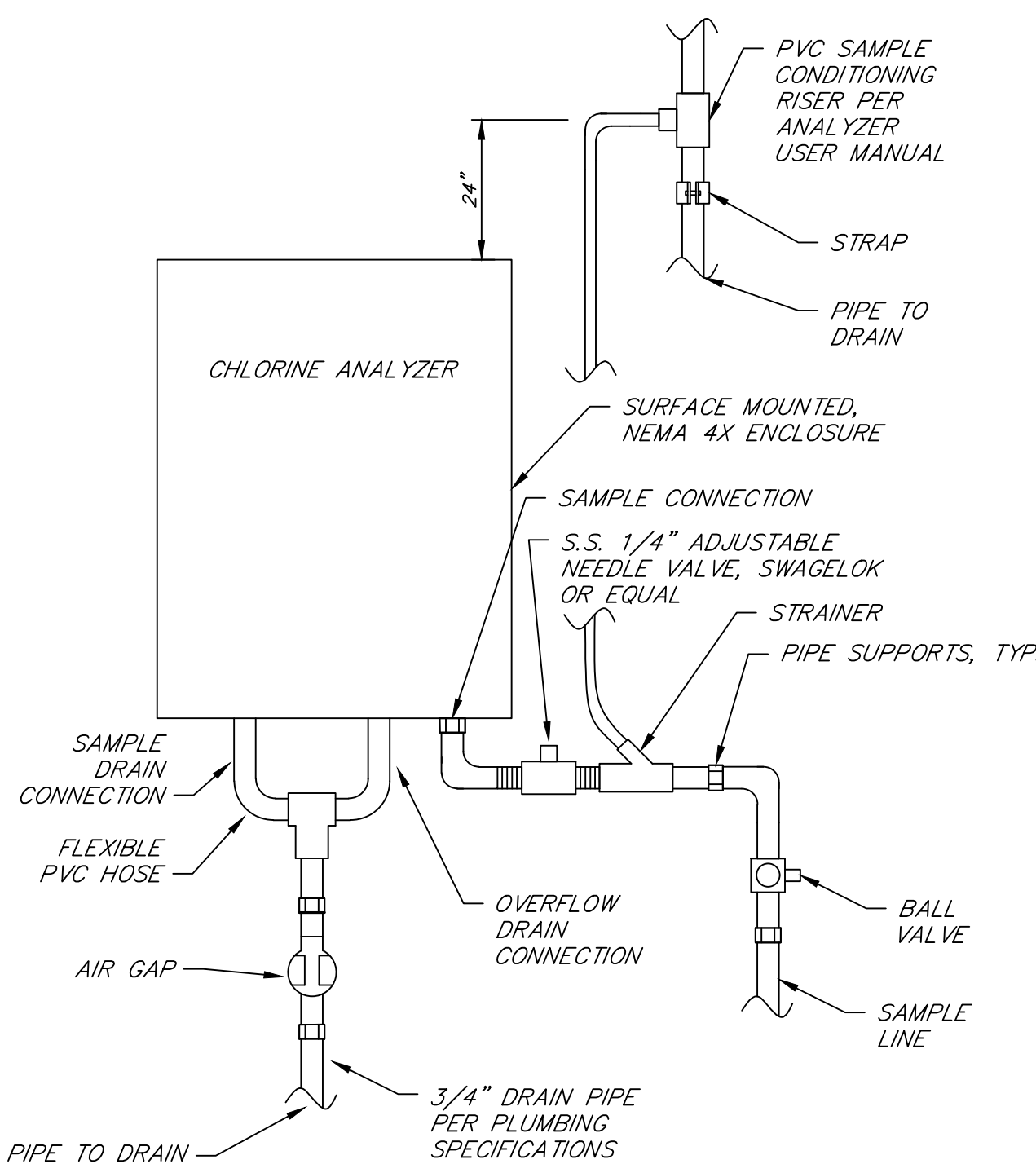
**LEVEL SWITCH DETAIL**

NOT TO SCALE



**STILLING WELL DETAIL**

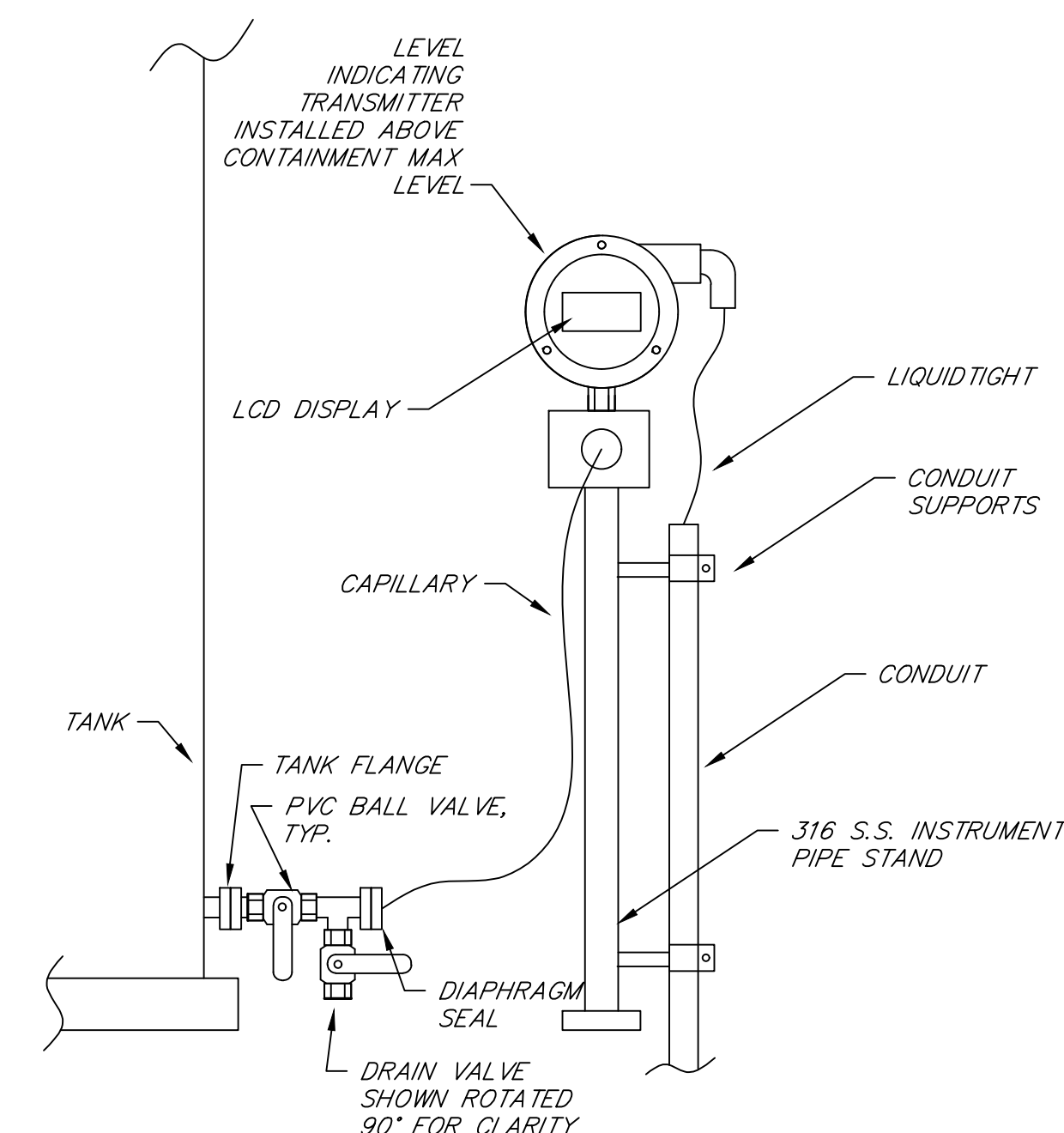
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**SINGLE CHLORINE ANALYZER DETAIL**

NOT TO SCALE

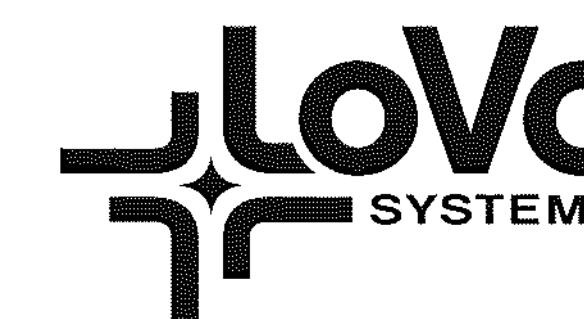
NOTE: SEE SHEET 14.1 FOR ADDITIONAL REQUIREMENTS FOR CHLORINE ANALYZER INSTALLATION



**TANK LEVEL TRANSMITTER PIPING DETAIL**

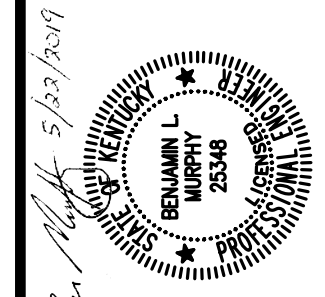
NOT TO SCALE

INSTRUMENTATION ABBREVIATIONS	
AE	ANALYZER ELEMENT (SENSOR)
AI	ANALOG INPUT
AIT	ANALYZER INDICATOR & TRANSMITTER
AO	ANALOG OUTPUT
AOV	AIR OPERATED VALVE
CCC	CENTRAL CONTROL CABINET
DCC	DISTRIBUTED CONTROL CABINET
DI	DIGITAL INPUT
DO	DIGITAL OUTPUT
DP	DIFFERENTIAL PRESSURE
EOV	ELECTRICALLY OPERATED VALVE
FCV	FLOW CONTROLLED VALVE (MODULATING)
FE	FLOW ELEMENT (SENSOR)
FIT	FLOW INDICATOR & TRANSMITTER
FQIT	FLOW TOTALIZER, INDICATOR, TRANSMITTER
FV	FLOW VALVE (TWO-POSITION)
HV	HAND VALVE
IOC	INPUT-OUTPUT CABINET
LE	LEVEL ELEMENT (SENSOR)
LIT	LEVEL INDICATOR & TRANSMITTER
LS	LEVEL OR LIMIT SWITCH
LT	LEVEL TRANSMITTER
MTU	MASTER TELEMETRY UNIT
PE	PRESSURE ELEMENT (SENSOR)
PI	PULSE INPUT OR PRESSURE INDICATOR
PIT	PRESSURE INDICATOR & TRANSMITTER
PLC	PROGRAMMABLE LOGIC CONTROLLER
RTU	REMOTE TELEMETRY UNIT
TE	TEMPERATURE ELEMENT
TI	TEMPERATURE INDICATOR
TIT	TEMPERATURE INDICATOR & TRANSMITTER
WE	WEIGHT ELEMENT (SENSOR)
WIQT	WEIGHT INDICATOR, TOTALIZER, TRANSMITTER



**INSTRUMENTATION DETAILS**

**GREEN RIVER VALLEY WATER DISTRICT**  
**WATER TREATMENT PLANT EXPANSION**  
**HART COUNTY, KENTUCKY**



DRAWN BY: CA  
 CHECKED BY: BLM  
 DATE: APRIL 2018  
 SCALE: As Noted  
 REVISIONS

**KENVIRONS, INC.**  
**FRANKFORT, KENTUCKY**

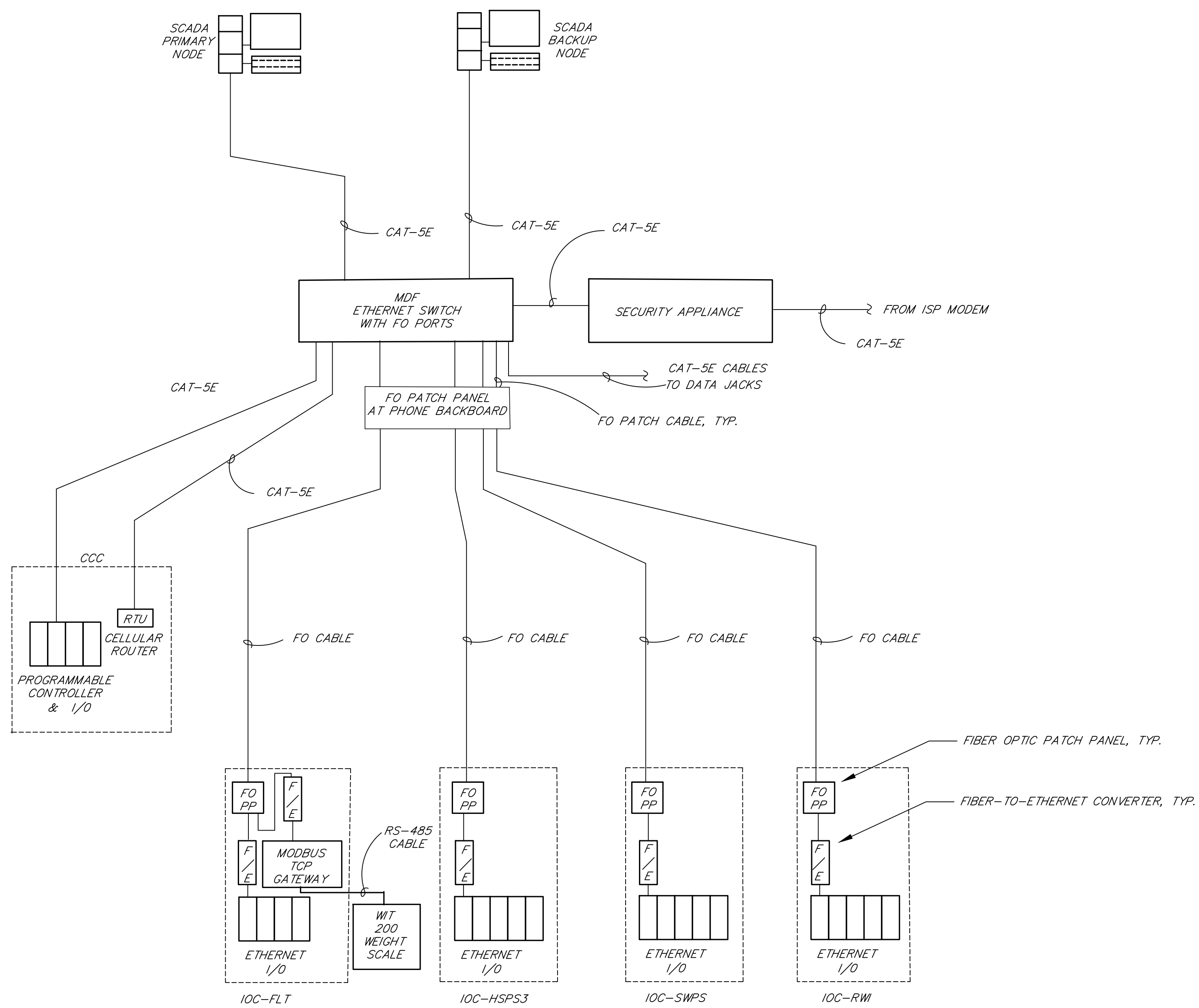


PROJECT NO.  
 2014042

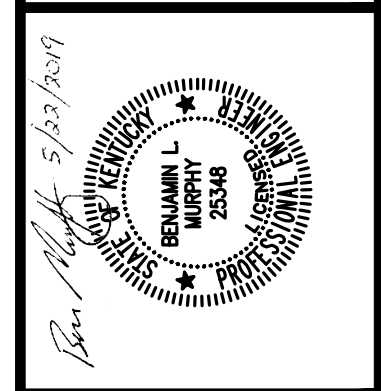
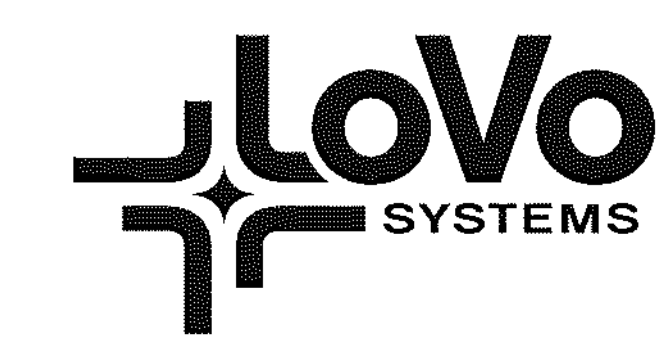
SHEET NO.

1-1





**SCADA NETWORK ARCHITECTURE**  
NOT TO SCALE

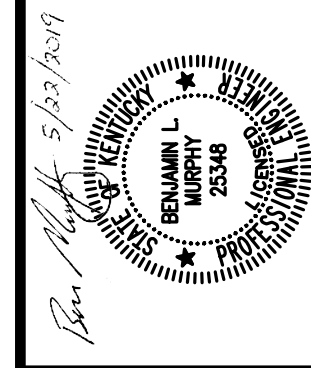


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DATE: April 2018
SCALE: As Noted
REVISIONS





**GREEN RIVER VALLEY WATER DISTRICT**  
**WATER TREATMENT PLANT EXPANSION**  
**HART COUNTY, KENTUCKY**



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 DATE: APRIL 2018  
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PROJECT NO.  
**2014042**  
 SHEET NO.  
**1-3**

LOCATION	CONDUCTORS	TAG	I/O TAG	TYPE	UNIT	CONTROL	TREND	HISTORIZE	TOTALIZE	AVERAGE	ALARM	REPORT	NOTES	
CCC	2#14		FLOCCULATOR #1 CALL-TO-RUN	DO		X								
	2#14		FLOCCULATOR #1 RUNNING STATUS	DI		X	X	X			X	X	REPORT #STARTS & RUNTIMES, ALARM FAIL-TO-RUN	
	2#14		FLOCCULATOR #2 CALL-TO-RUN	DO		X								
	2#14		FLOCCULATOR #2 RUNNING STATUS	DI		X	X	X			X	X	REPORT #STARTS & RUNTIMES, ALARM FAIL-TO-RUN	
	2#14		FLOCCULATOR #3 CALL-TO-RUN	DO		X								
	2#14		FLOCCULATOR #3 RUNNING STATUS	DI		X	X	X			X	X	REPORT #STARTS & RUNTIMES, ALARM FAIL-TO-RUN	
	2#14		FLOCCULATOR #4 CALL-TO-RUN	DO		X								
	2#14		FLOCCULATOR #4 RUNNING STATUS	DI		X	X	X			X	X	REPORT #STARTS & RUNTIMES, ALARM FAIL-TO-RUN	
	2#14		FLOCCULATOR #5 CALL-TO-RUN	DO		X								
	2#14		FLOCCULATOR #5 RUNNING STATUS	DI		X	X	X			X	X	REPORT #STARTS & RUNTIMES, ALARM FAIL-TO-RUN	
	2#14		FLOCCULATOR #6 CALL-TO-RUN	DO		X								
	2#14		FLOCCULATOR #6 RUNNING STATUS	DI		X	X	X			X	X	REPORT #STARTS & RUNTIMES, ALARM FAIL-TO-RUN	
	2#14		FLASH MIX #1 CALL-TO-RUN	DO		X								
	2#14		FLASH MIX #1 RUNNING STATUS	DI		X	X	X			X	X	REPORT #STARTS & RUNTIMES, ALARM FAIL-TO-RUN	
	2#14		FLASH MIX #2 CALL-TO-RUN	DO		X								
	2#14		FLASH MIX #2 RUNNING STATUS	DI		X	X	X			X	X	REPORT #STARTS & RUNTIMES, ALARM FAIL-TO-RUN	
	2#18 STIC	EXISTING	LIT-101	RIVER LEVEL	AI	FT	X	X	X			X		
	2#18 STIC	EXISTING	LIT-102	WETWELL LEVEL	AI	FT	X	X	X			X		
	2#14			AIRBURST CYCLE START COMMAND	DO		X							PROVIDE ADJUSTABLE LEVEL DIFFERENTIAL SETPOINT
	2#14			SCREEN #1 VALVE SOLENOID OPEN	DI		X	X						
	2#14			SCREEN #2 VALVE SOLENOID OPEN	DI		X	X						
	2#14			AIRBURST DELAY IN PROGRESS	DI		X							
	2#14			AIRBURST SYSTEM IN-AUTO	DI		X							
	2#14			AIRBURST SUMMARY ALARM	DI							X		
	2#14			RAW PUMP #1 RUNNING STATUS	DI		X	X	X			X	X	REPORT #STARTS & RUNTIMES, ALARM FAIL-TO-RUN
	2#14			RAW PUMP #1 CALL-TO-RUN	DO		X							
	2#14			RAW PUMP #1 ALARM	DI							X		
	2#14			RAW PUMP #2 RUNNING STATUS	DI		X	X	X			X	X	REPORT #STARTS & RUNTIMES, ALARM FAIL-TO-RUN
	2#14			RAW PUMP #2 CALL-TO-RUN	DO		X							
	2#14			RAW PUMP #2 ALARM	DI							X		
	2#14			RAW PUMP #3 RUNNING STATUS	DI		X	X	X			X	X	REPORT #STARTS & RUNTIMES, ALARM FAIL-TO-RUN
	2#14			RAW PUMP #3 CALL-TO-RUN	DO		X							
	2#14			RAW PUMP #3 ALARM	DI							X		
	2#14			RAW PUMP #4 RUNNING STATUS	DI		X	X	X			X	X	REPORT #STARTS & RUNTIMES, ALARM FAIL-TO-RUN
	2#14			RAW PUMP #4 CALL-TO-RUN	DO		X							
	2#14			RAW PUMP #4 ALARM	DI							X		
	2#14			OLD RAW PUMP #5 RUNNING STATUS	DI		X	X	X			X	X	REPORT #STARTS & RUNTIMES, ALARM FAIL-TO-RUN
	2#14			OLD RAW PUMP #5 CALL-TO-RUN	DO		X							
	2#14			OLD RAW PUMP #5 ALARM	DI							X		
	2#14			OLD RAW PUMP #6 RUNNING STATUS	DI		X	X	X			X	X	REPORT #STARTS & RUNTIMES, ALARM FAIL-TO-RUN
	2#14			OLD RAW PUMP #6 CALL-TO-RUN	DO		X							
	2#14			OLD RAW PUMP #6 ALARM	DI							X		
	IOC-SWPS	2#18 STIC	FIT-101	RIVER WATER FLOW	AI	GPM	X	X	X	X		X		REPORT DAILY & MONTHLY TOTALS
		2#18 STIC	FIT-102	SPRING WATER FLOW	AI	GPM	X	X	X	X		X		REPORT DAILY & MONTHLY TOTALS
		2#18 STIC	FIT-900	SERVICE WATER FLOW	AI	GPM	X	X	X	X		X		REPORT DAILY & MONTHLY TOTALS
2#14		LS-100	SPRING PUMP STATION FLOOD SENSOR	DI								X		
2#14			SPRING CTRL VALVE ALARM	DI								X		
2#18 STIC			SPRING CTRL VALVE POSITION COMMAND	AO	%	X							PROVIDE MANUAL OPERATOR SETPOINT	
2#18 STIC			SPRING CTRL VALVE POSITION FEEDBACK	AI	%	X	X	X	X			X	ALARM POSITION FAILURE	
2#14			RIVER CTRL VALVE ALARM	DI								X		
2#18 STIC			RIVER CTRL VALVE POSITION COMMAND	AO	%	X							PROVIDE MANUAL OPERATOR SETPOINT	
2#18 STIC			RIVER CTRL VALVE POSITION FEEDBACK	AI	%	X	X	X	X			X	ALARM POSITION FAILURE	
2#14			GRIT DRAIN VALVE CALL-TO-OPEN	DO		X							SEE SPECS FOR CONTROL, ALARM POSITION FAILURE	
2#14			GRIT DRAIN VALVE OPEN STATUS	DI		X								
2#14			GRIT DRAIN VALVE CLOSED STATUS	DI		X								
2#14			GRIT DRAIN VALVE ALARM	DI								X		
2#14			GRIT FLUSH VALVE CALL-TO-OPEN	DO		X							SEE SPECS FOR CONTROL, ALARM POSITION FAILURE	
2#14			GRIT FLUSH VALVE OPEN STATUS	DI		X								
2#14			GRIT FLUSH VALVE CLOSED STATUS	DI		X								
2#14			GRIT FLUSH VALVE ALARM	DI								X		
2#14			SPRING WATER PUMP #1 CALL-TO-RUN	DO		X								
2#14			SPRING WATER PUMP #1 RUNNING STATUS	DI		X	X	X	X			X	X	REPORT # STARTS/RUNTIME, ALARM FAIL-TO-RUN
2#14			SPRING WATER PUMP #1 IN-AUTO	DI		X								
2#14			SPRING WATER PUMP #1 OVERTEMP	DI								X		
2#14			SPRING WATER PUMP #1 RVSS FAULT	DI								X		
2#14			SPRING WATER PUMP #2 CALL-TO-RUN	DO		X								
2#14			SPRING WATER PUMP #2 RUNNING STATUS	DI		X	X	X	X			X	X	REPORT # STARTS/RUNTIME, ALARM FAIL-TO-RUN
2#14			SPRING WATER PUMP #2 IN-AUTO	DI		X								
2#14			SPRING WATER PUMP #2 OVERTEMP	DI								X		
2#14			SPRING WATER PUMP #2 RVSS FAULT	DI								X		
2#14				MCC-SWPS SPD ALARM	DI							X		

LOCATION	CONDUCTORS	TAG	I/O TAG	TYPE	UNIT	CONTROL	TREND	HISTORIZE	TOTALIZE	AVERAGE	ALARM	REPORT	NOTES
IOC-SWPS	CONTINUED		MCC-SWPS POWER MONITOR ALARM	DI									
			MCC-SWPS POWER MONITOR AVG. VOLTAGE	AI	VOLT	X	X	X				X	
			MCC-SWPS POWER MONITOR AVG. CURRENT	AI	AMP	X	X	X				X	
			MCC-SWPS POWER MONITOR POWER	AI	KW	X	X	X				X	
			MCC-SWPS POWER MONITOR APPARENT POWER	AI	KVA	X	X	X				X	
	2#14		FLOCCULATOR #7 CALL-TO-RUN	DO		X							
	2#14		FLOCCULATOR #7 RUNNING STATUS	DI		X	X	X			X	X	REPORT # STARTS/RUNTIME, ALARM FAIL-TO-RUN
	2#14		FLOCCULATOR #7 IN-AUTO	DI		X							
	2#14		FLOCCULATOR #7 OVERTEMP	DI								X	
	2#14		FLOCCULATOR #7 AFD FAULT	DI								X	
	2#18 STIC		FLOCCULATOR #7 SPEED COMMAND	AO		X							
	2#18 STIC		FLOCCULATOR #7 SPEED FEEDBACK	AI		X	X	X					
	2#14		FLOCCULATOR #8 CALL-TO-RUN	DO		X							
	2#14		FLOCCULATOR #8 RUNNING STATUS	DI		X	X	X			X	X	REPORT # STARTS/RUNTIME, ALARM FAIL-TO-RUN
	2#14		FLOCCULATOR #8 IN-AUTO	DI		X							
2#14		FLOCCULATOR #8 OVERTEMP	DI								X		
2#14		FLOCCULATOR #8 AFD FAULT	DI								X		
2#18 STIC		FLOCCULATOR #8 SPEED COMMAND	AO		X								
2#18 STIC		FLOCCULATOR #8 SPEED FEEDBACK	AI		X	X	X						
IOC-HSPS3	2#14		HIGH SERVICE PUMP #14 CALL-TO-RUN	DO		X							
	2#14		HIGH SERVICE PUMP #14 RUNNING STATUS	DI		X	X	X			X	X	REPORT # STARTS/RUNTIME, ALARM FAIL-TO-RUN
	2#14		HIGH SERVICE PUMP #14 IN-AUTO	DI		X							
	2#14		HIGH SERVICE PUMP #14 OVERTEMP	DI								X	
	2#14		HIGH SERVICE PUMP #14 DRIVE FAULT	DI								X	
	2#18 STIC		HIGH SERVICE PUMP #14 SPEED COMMAND	AO	HZ	X							
	2#18 STIC		HIGH SERVICE PUMP #14 SPEED FEEDBACK	AI	HZ	X	X	X					
	2#14		HIGH SERVICE PUMP #15 CALL-TO-RUN	DO		X							
	2#14		HIGH SERVICE PUMP #15 RUNNING STATUS	DI		X	X	X			X	X	REPORT # STARTS/RUNTIME, ALARM FAIL-TO-RUN
	2#14		HIGH SERVICE PUMP #15 IN-AUTO	DI		X							
	2#14		HIGH SERVICE PUMP #15 OVERTEMP	DI								X	
	2#14		HIGH SERVICE PUMP #15 DRIVE FAULT	DI								X	
	2#18 STIC		HIGH SERVICE PUMP #15 SPEED COMMAND	AO	HZ	X							
	2#18 STIC		HIGH SERVICE PUMP #15 SPEED FEEDBACK	AI	HZ	X	X	X					
	2#14		HIGH SERVICE PUMP #16 CALL-TO-RUN	DO		X							
	2#14		HIGH SERVICE PUMP #16 RUNNING STATUS	DI		X	X	X			X	X	REPORT # STARTS/RUNTIME, ALARM FAIL-TO-RUN
	2#14		HIGH SERVICE PUMP #16 IN-AUTO	DI		X							
	2#14		HIGH SERVICE PUMP #16 OVERTEMP	DI								X	
	2#14		HIGH SERVICE PUMP #16 DRIVE FAULT	DI								X	
	2#18 STIC		HIGH SERVICE PUMP #16 SPEED COMMAND	AO	HZ	X							
	2#18 STIC		HIGH SERVICE PUMP #16 SPEED FEEDBACK	AI	HZ	X	X	X					
	2#18 STIC	FIT-503	HIGH SERVICE PUMP STATION #3 FLOW RATE	AI	GPM	X	X	X				X	REPORT DAILY & MONTHLY TOTALS
	2#18 STIC	LT-501	1.45MG CLEARWELL LEVEL A	AI	FT	X	X	X				X	ALARM LOW & HIGH LEVELS
	2#18 STIC	LT-502	1.45MG CLEARWELL LEVEL B	AI	FT	X	X	X				X	ALARM LOW & HIGH LEVELS
	IOC-FLT	2#18 STIC	WIT-200	FLUORIDE DAY TANK LEVEL	AI	FT	X	X	X			X	
RS-485/MODBUS		WIT-200	FLUORIDE DAY TANK WEIGHT	AI	LBS	X	X	X					
RS-485/MODBUS		WIT-200	FLUORIDE DAY TANK DAILY USAGE	AI	LBS	X	X	X				X	REPORT DAILY & MONTHLY TOTALS
RS-485/MODBUS		WIT-200	FLUORIDE FEED RATE										