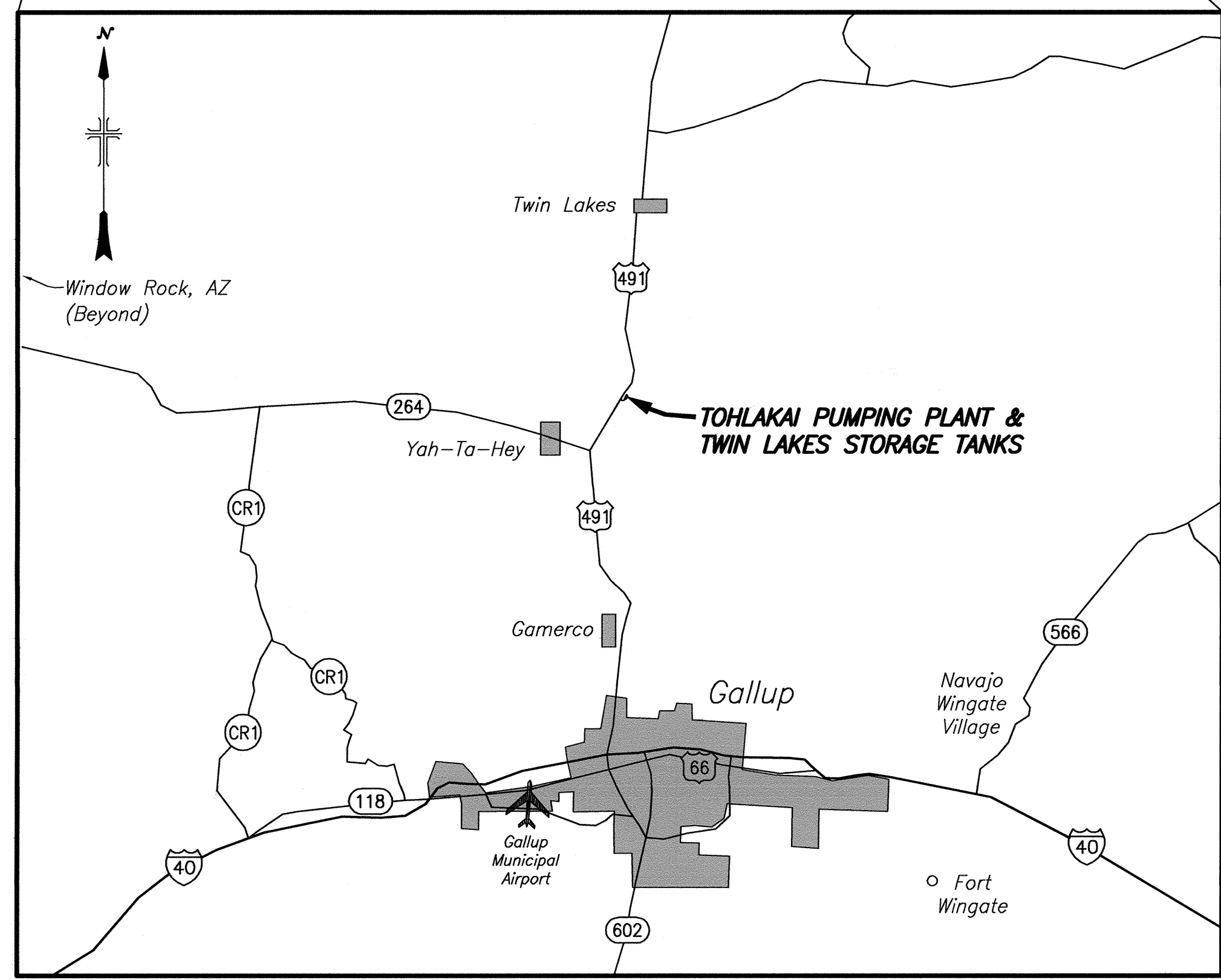
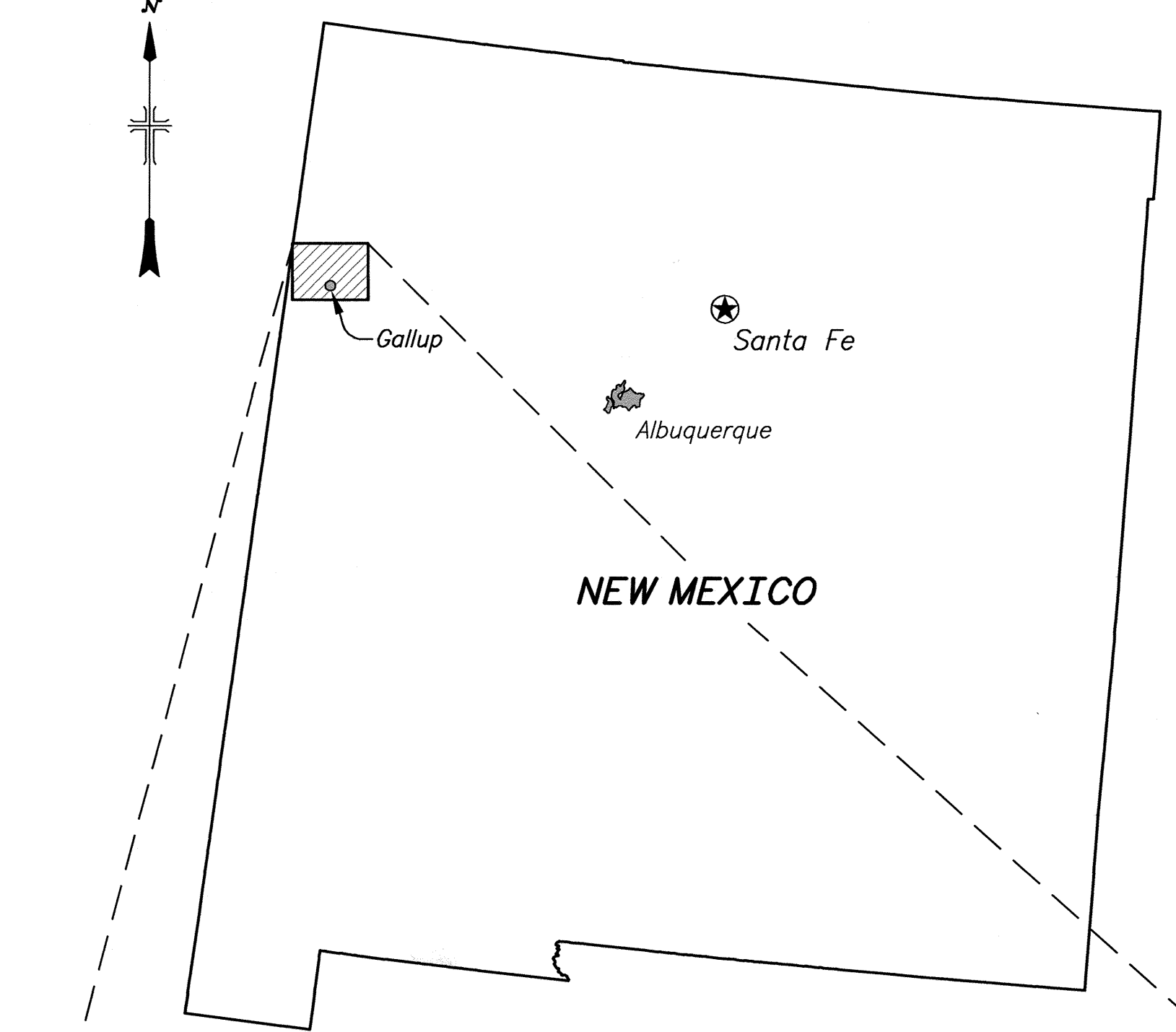


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DATE AND TIME PLOTTED
AUGUST 3, 2013 08:03
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KOSHEA

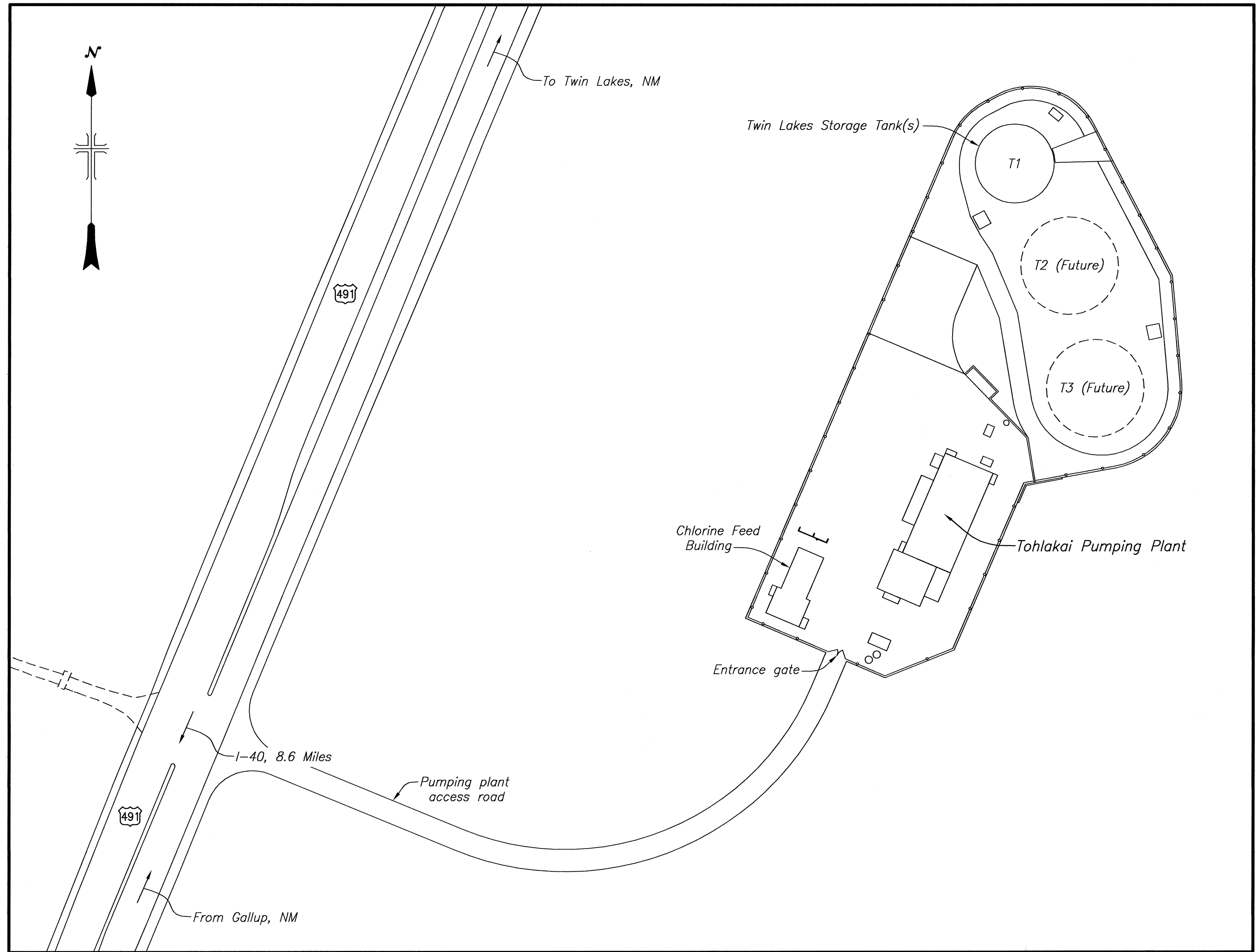


VICINITY MAP

0 3 6 9
SCALE OF MILES



KEY MAP



AREA MAP

TOHLAKAI PUMPING PLANT & TWIN LAKES STORAGE TANKS

0 80 160 240
SCALE OF FEET

NOTES

1. The Tohlakai Pumping Plant project is the result of combining three separate pumping plants into one. These plants were identified in the Navajo-Gallup Water Supply Project Planning Report and Final Environmental Impact Statement, July 2009, as Pumping Plant(s) Nos. 8, 9 and 10, respectively.

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U.S. DEPARTMENT OF THE INTERIOR
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NAVAJO GALLUP WATER SUPPLY PROJECT
NEW MEXICO

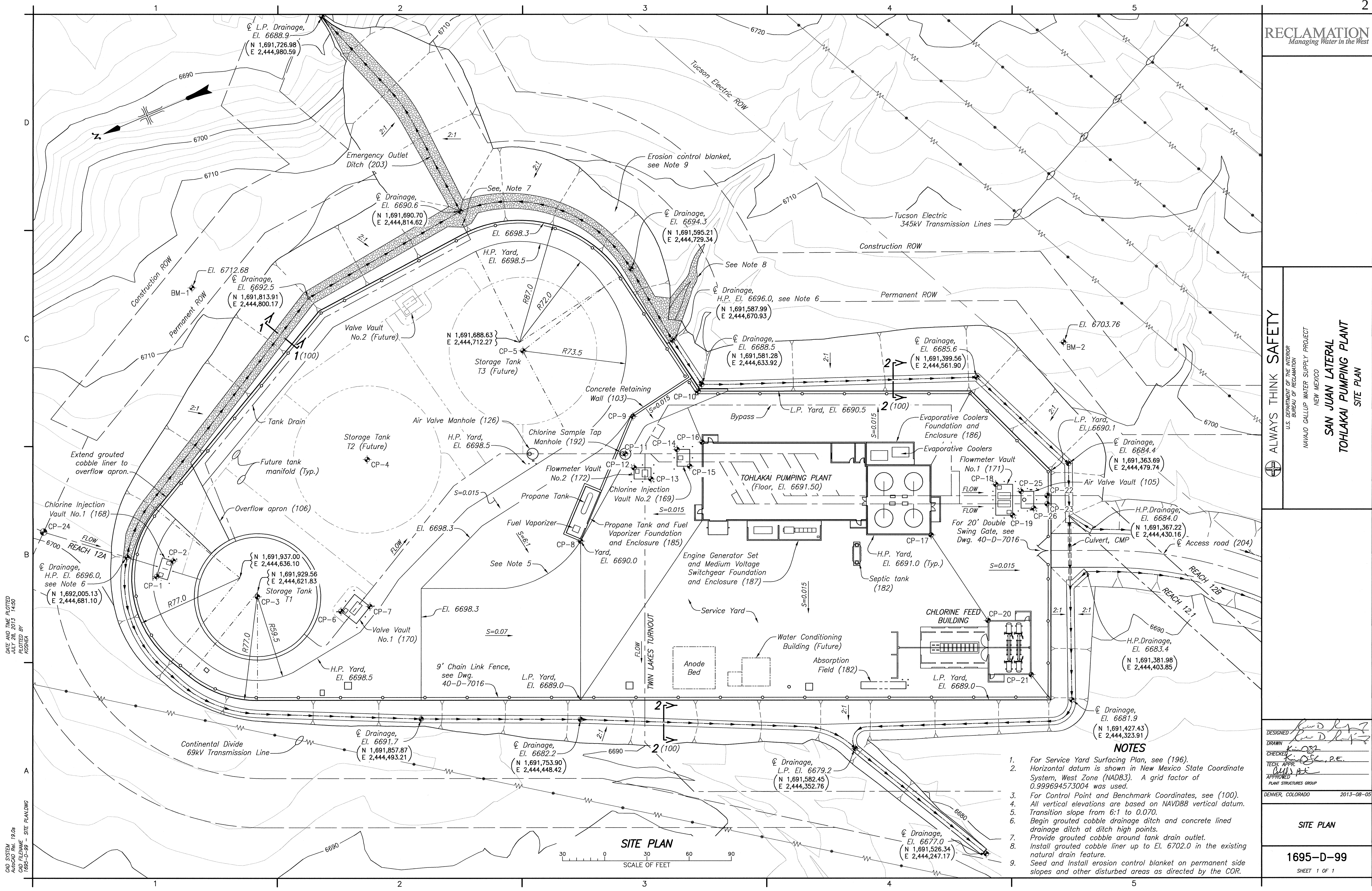
SAN JUAN LATERAL
TOHLAKAI PUMPING PLANT

KEY MAP, VICINITY MAP, AND AREA MAP

DESIGNED
DRAWN
CHECKED
TECH. APPR.
APPROVED
PLANT STRUCTURES GROUP
DENVER, COLORADO 2013-08-05

KEY MAP, VICINITY MAP,
AND AREA MAP

1695-D-98
SHEET 1 OF 1



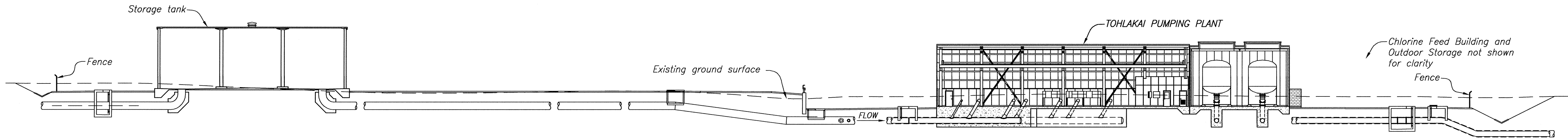
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AutoCAD Rev. 19.0s
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1695-D-99 - SITE PLAN.DWG
DATE AND TIME PLOTTED
JULY 28, 2013 14:50
PLOTTED BY
KOSHEA

- NOTES**
- For Service Yard Surfacing Plan, see (196).
 - Horizontal datum is shown in New Mexico State Coordinate System, West Zone (NAD83). A grid factor of 0.999694573004 was used.
 - For Control Point and Benchmark Coordinates, see (100).
 - All vertical elevations are based on NAVD88 vertical datum.
 - Transition slope from 6:1 to 0.070.
 - Begin grouted cobble drainage ditch and concrete lined drainage ditch at ditch high points.
 - Provide grouted cobble around tank drain outlet.
 - Install grouted cobble liner up to El. 6702.0 in the existing natural drain feature.
 - Seed and install erosion control blanket on permanent side slopes and other disturbed areas as directed by the COR.

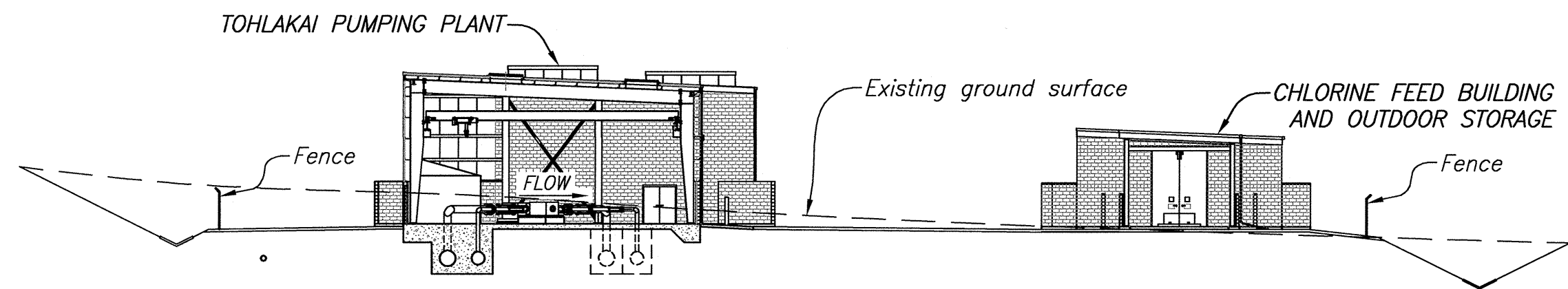
DESIGNED *[Signature]*
DRAWN *[Signature]*
CHECKED *[Signature]*
TECH. APPR. *[Signature]*
APPROVED *[Signature]*
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DENVER, COLORADO 2013-08-05

DATE AND TIME PLOTTED
JULY 27, 2013 15:39
PLOTTED BY
KOSHEA

CAD SYSTEM
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CAD FILENAME
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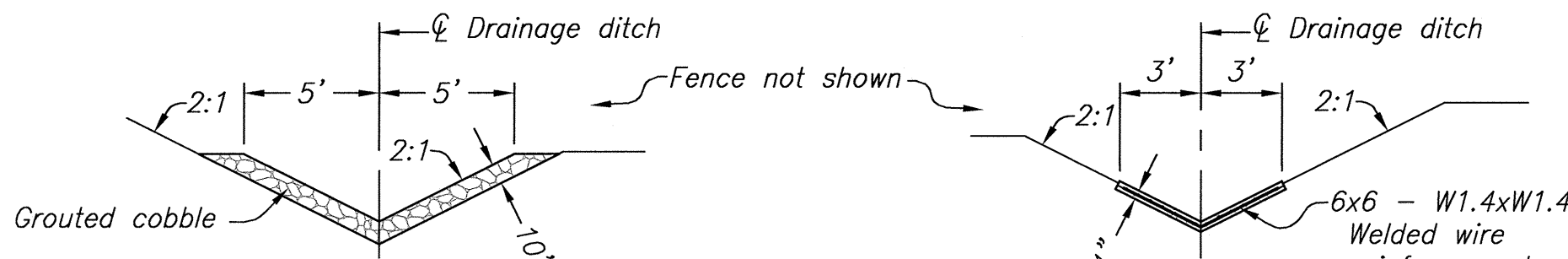


LONGITUDINAL SECTION THRU SERVICE YARD



TRANSVERSE SECTION THRU SERVICE YARD

300 0 300 600 900
SCALE OF FEET



SECTION 1-1 (99)
Grouted Cobble Drainage Ditch

SECTION 2-2 (99)
Concrete Lined Drainage Ditch

CONTROL POINT COORDINATES		
POINT	NORTHING	EASTING
CP-1	1,691,991.13	2,444,660.23
CP-2	1,691,976.01	2,444,665.83
CP-3	1,691,930.80	2,444,618.81
CP-4	1,691,820.79	2,444,678.09
CP-5	1,691,688.70	2,444,705.74
CP-6	1,691,880.27	2,444,586.01
CP-7	1,691,859.99	2,444,581.04
CP-8	1,691,704.15	2,444,565.03
CP-9	1,691,635.12	2,444,632.16
CP-10	1,691,585.42	2,444,630.50
CP-11	1,691,650.58	2,444,609.79
CP-12	1,691,648.70	2,444,598.16
CP-13	1,691,640.81	2,444,586.10
CP-14	1,691,615.52	2,444,598.23
CP-15	1,691,611.95	2,444,583.66
CP-16	1,691,597.10	2,444,595.98
CP-17	1,691,473.41	2,444,471.29
CP-18	1,691,417.04	2,444,486.37
CP-19	1,691,414.64	2,444,461.44
CP-20	1,691,459.99	2,444,399.39
CP-21	1,691,446.96	2,444,351.80
CP-22	1,691,386.66	2,444,464.58
CP-23	1,691,388.92	2,444,459.29
CP-24	1,692,052.71	2,444,720.97
CP-25	1,691,402.45	2,444,474.71
CP-26	1,692,398.89	2,444,460.15

BENCHMARK COORDINATES		
POINT	NORTHING	EASTING
BM-1	1,691,887.46	2,444,839.30
BM-2	1,691,333.12	2,444,560.49

NOTES

- For Control Point and Benchmark locations, see (99).
- Horizontal datum is shown in New Mexico State Coordinate System, West Zone (NAD83). A grid factor of 0.999694573004 was used.

DESIGNED
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PLANT STRUCTURES GROUP

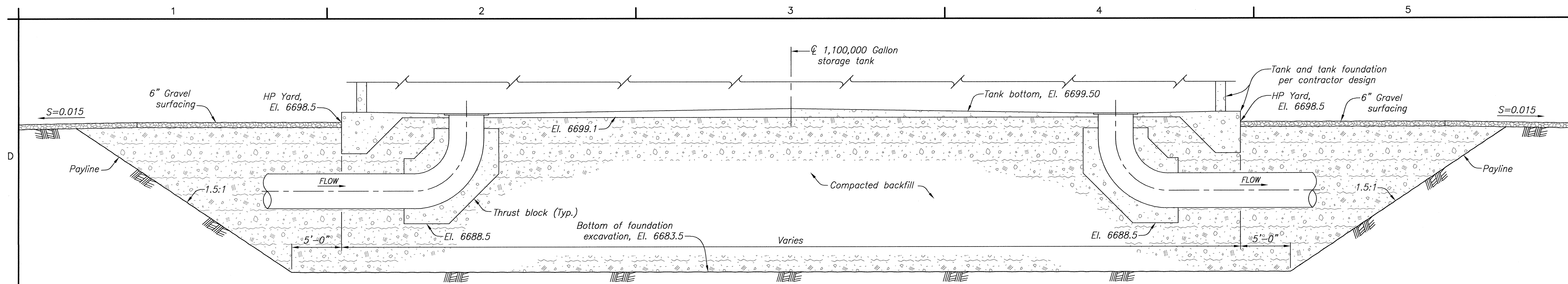
DENVER, COLORADO 2013-08-09

SITE PLAN
SECTIONS

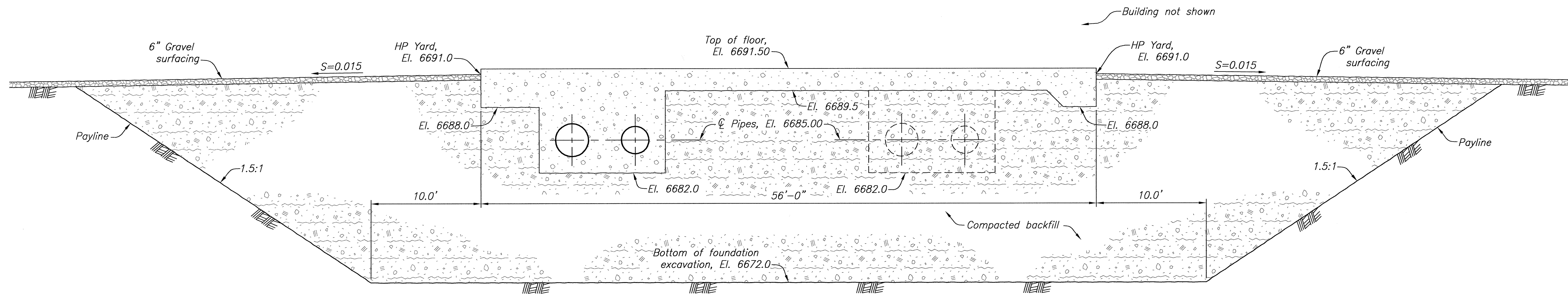
1695-D-100

SHEET 1 OF 1

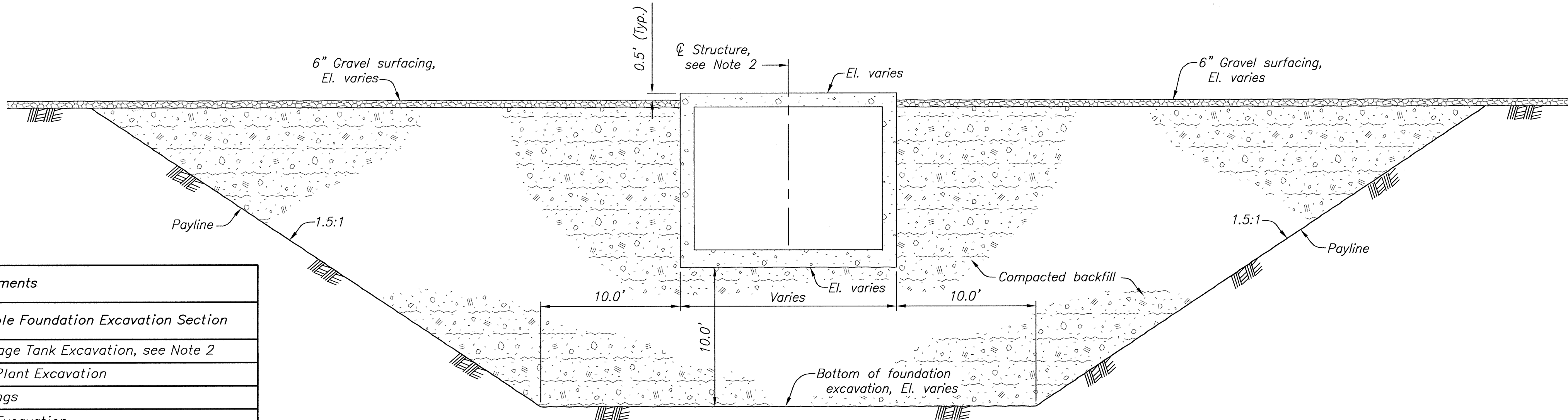
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CAD FILENAME
1695-D-108 - EXCAVATION - TYPICAL SECTIONS.DWG
DATE AND TIME PLOTTED
AUGUST 3, 2013 08:40
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KOSHIA



TYPICAL SECTION
WATER STORAGE TANK EXCAVATION (See Note 2)
(No Scale)



TYPICAL SECTION
PUMPING PLANT EXCAVATION
(No Scale)



TYPICAL SECTION
STRUCTURE EXCAVATION
(No Scale)

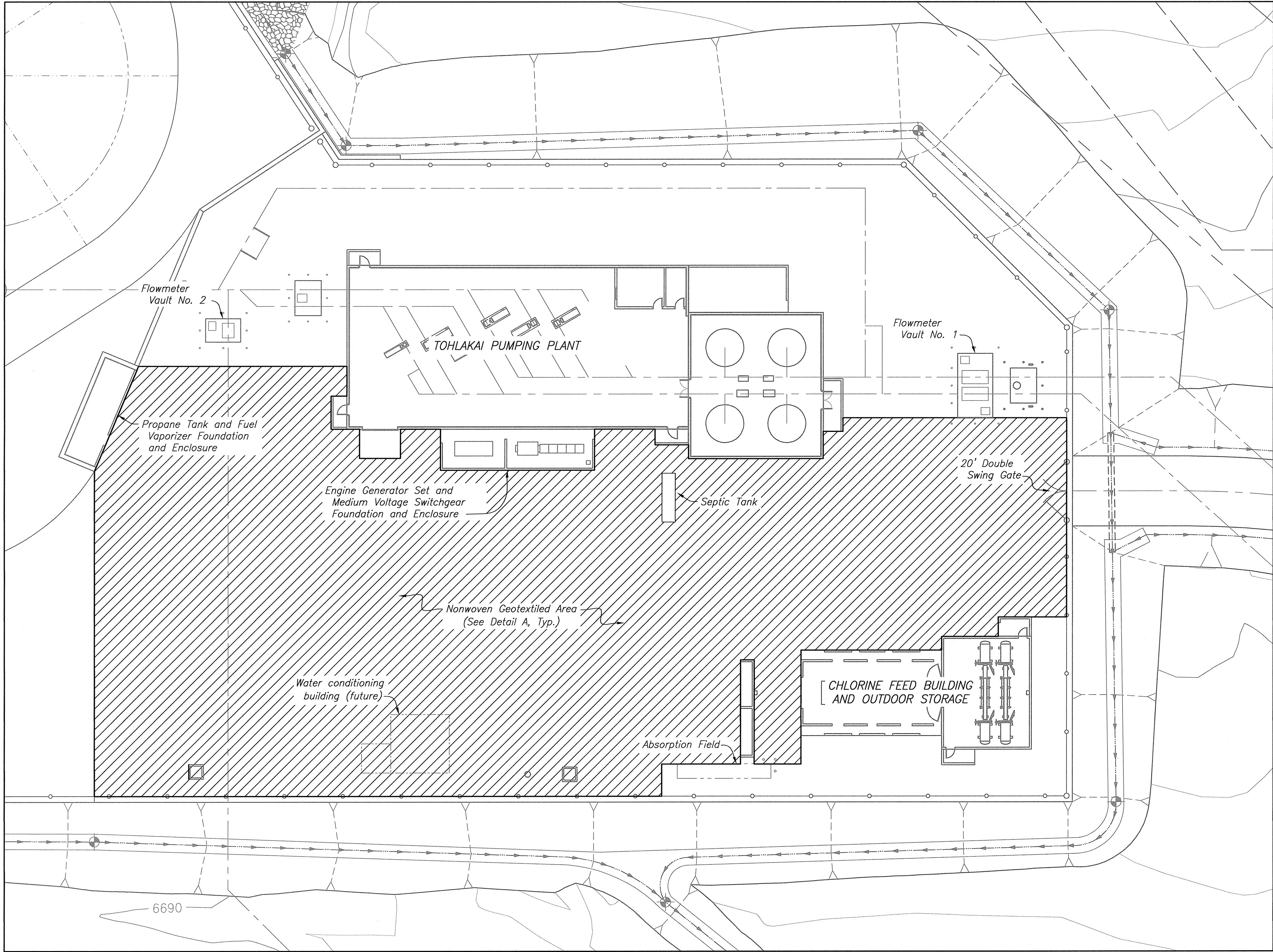
Foundation Excavation Requirements	
Feature *	Applicable Foundation Excavation Section
Storage Tanks T1, T2 and T3	Water Storage Tank Excavation, see Note 2
Pumping Plant and Air Chamber Enclosure	Pumping Plant Excavation
Chlorine Feed Building and Outdoor Storage	See drawings
Chlorine Injection Vault No.1	Structure Excavation
Chlorine Injection Vault No.2	Structure Excavation
Flowmeter Vault No.1	Structure Excavation
Flowmeter Vault No.2	Structure Excavation
Valve Vault No.1	Structure Excavation
Valve Vault No.2	Future - Not Applicable
Retaining Wall	Structure Excavation
* Features not identified in the table are assumed to be within the extents of other excavations.	

NOTES

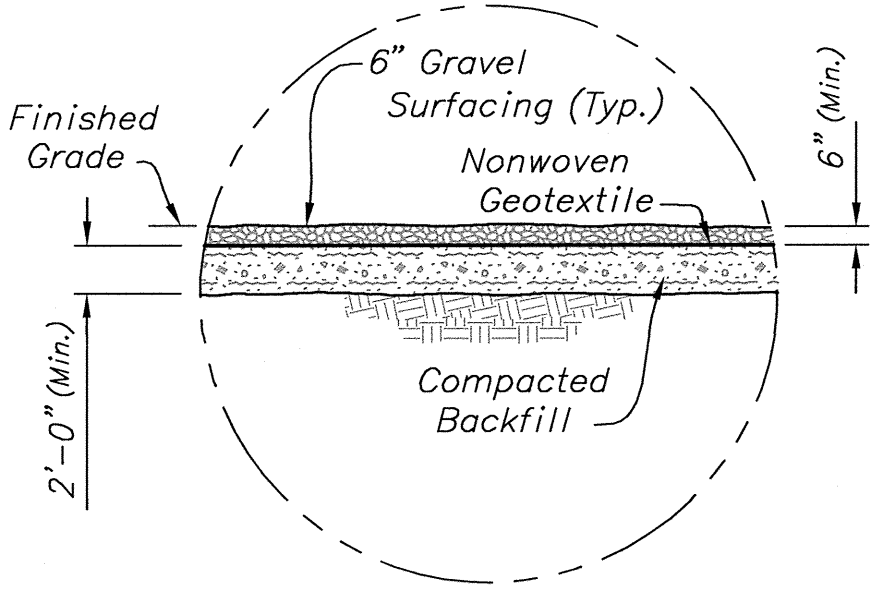
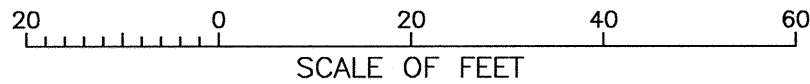
- For locations of features, see (99).
- Excavate and backfill entire tank yard for the construction of Storage Tank T1 and in preparation for the future construction of Storage Tank(s) T2 and T3. Foundation excavation requirements for Storage Tank T1 are as shown. For future Storage Tank(s) T2 and T3, excavate and replace foundation material assuming a 105-ft diameter tank.

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AUGUST 3, 2013 11:51
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KOSHEA

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OLD FILENAME
1695-D-196 - SERVICE YARD SURFACING- PLAN AND DETAILSDWG



SERVICE YARD SURFACING PLAN



DETAIL A
(Service Yard Surfacing)
(Not to Scale)

- NOTES
- For location of features, see (99).

DESIGNED *K. O'Shea*
DRAWN *K. O'Shea*
CHECKED *B. D. Van Oort*
TECH. APPR. *K. O'Shea, P.E.*
APPROVED *OMV. B...*
PLANT STRUCTURES GROUP

DENVER, COLORADO 2013-08-05

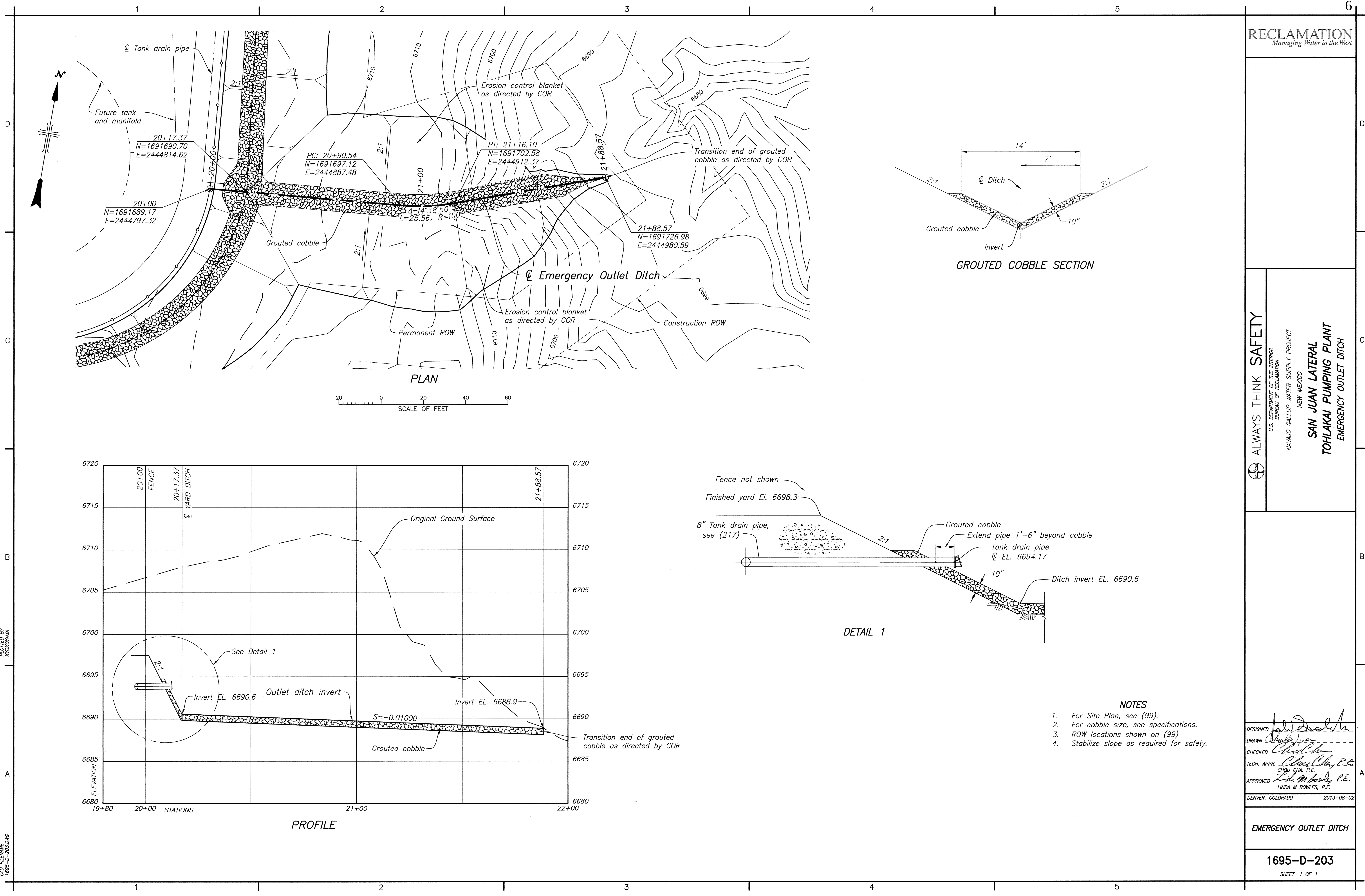
SERVICE YARD SURFACING
PLAN AND DETAILS

1695-D-196

SHEET 1 OF 1

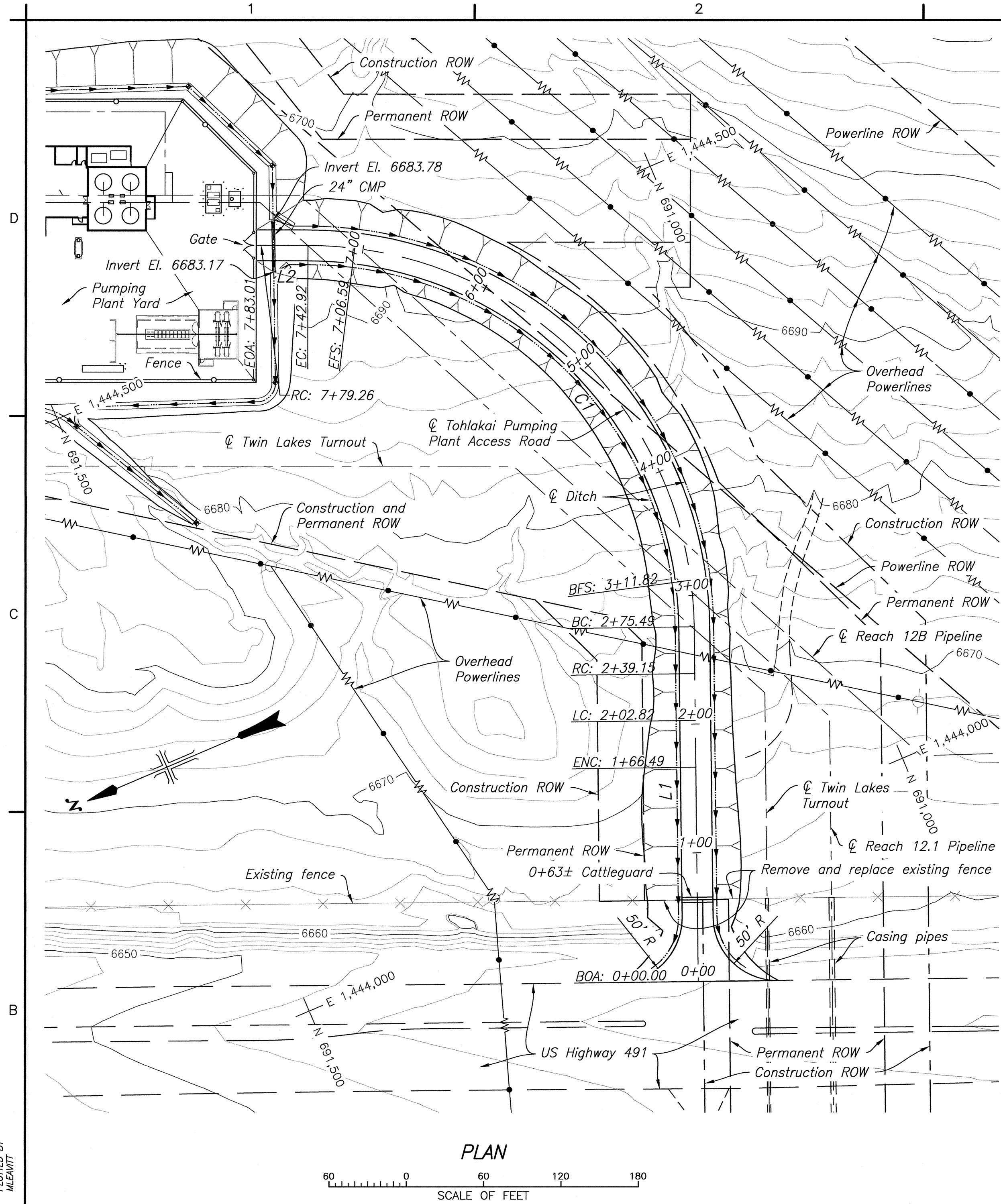
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1695-D-203.DWG

DATE AND TIME PLOTTED
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KYOKIYAMA



DATE AND TIME PLOTTED
August 14, 2013 12:42
PLOTTED BY
MLEVITT

CADD SYSTEM
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CADD FILENAME
Tohlakai Road.dwg



CAD SYSTEM
AutoCAD Rev. 19.0s
1984-5-101 - STRUCTURAL DESIGN DATA - SHEET 1 - R.L.DWG

DATE AND TIME PLOTTED
AUGUST 20, 2013 13:40
PLOTTED BY
KOSHER

DESIGN CRITERIA

BASIC LOAD COMBINATIONS

LOAD COMBINATIONS USING STRENGTH DESIGN
OR LOAD AND RESISTANCE FACTOR DESIGN

$U = 1.4(D + F)$
 $U = 1.2(D + F + T) + 1.6(L + H) + 0.5(L_r \text{ or } S \text{ or } R)$
 $U = 1.2D + 1.6(L_r \text{ or } S \text{ or } R) + (1.0L \text{ or } 0.8W)$
 $U = 1.2D + 1.6W + 1.0L + 0.5(L_r \text{ or } S \text{ or } R)$
 $U = 1.2D + 1.0E + 1.0L + 0.2S$
 $U = 0.9D + 1.6W + 1.6H$
 $U = 0.9D + 1.0E + 1.6H$

Notes:

1. Refer to ACI 318-08 Sections 9.2.1 through 9.2.5, IBC 2009, Section 1605 and ASCE 7-05, Section 2.3 for load combinations.
2. Design for maximum value of "U".
3. Omit live loads (L) if this produces a more severe design condition.
4. Omit fluid weight or pressure loads (F), lateral earth pressure loads (H), roof live loads (L_r), wind loads (W), or rain loads (R) where or when they do not occur.
5. Reduce the dead load factor (1.2) to 0.9 whenever this produces a more severe design condition.
6. The value of H to be used in combination with E for the substructure consists of the earthquake loads from backfill and water that are applied to the substructure. Refer to Bureau of Reclamation publication "Design Criteria for Concrete Retaining Walls," 1977.
7. Earthquake load (E) shown in these equations is considered an ultimate load developed using IBC load criteria. If values for E are developed based on service level seismic forces, then 1.4E should be used in place of 1.0E.

GENERAL DESIGN STANDARDS

International Building Code 2009 (IBC 2009).
American Society of Civil Engineers (ASCE) 7-05, "Minimum Design Loads for Buildings and Other Structures."

REINFORCED CONCRETE DESIGN

DESIGN STANDARDS

American Concrete Institute (ACI) 318-08, Building Code Requirements for Structural Concrete.
Bureau of Reclamation "Design Criteria for Concrete Retaining Walls," 1977.
Bureau of Reclamation Design Standards No. 9, "Buildings."

DESIGN METHOD

Strength Design

MATERIALS

CONCRETE - 28 day compressive strength (f'_c) = 4,500 lb/in²

REINFORCEMENT - Min. yield strength (f_y) = 60,000 lb/in²

MINIMUM SHRINKAGE AND TEMPERATURE REINFORCEMENT

Permanently exposed slabs.....004
All other slabs and walls.....003

Assume maximum concrete thickness of eighteen inches for each face when computing temperature and shrinkage reinforcement.

REINFORCED MASONRY DESIGN

DESIGN STANDARDS

American Concrete Institute (ACI) 530-08, Building Code Requirements for Masonry Structures.

DESIGN METHOD

Strength Design

MATERIALS

MASONRY - Compressive strength (f'_m) = 1,500 lb/in²

GROUT STRENGTH - 28-day Compressive strength (f'_g) = 2,000 lb/in²

MORTAR - Type S

REINFORCEMENT - Min. yield strength (f_y) = 60,000 lb/in²

STRUCTURAL STEEL DESIGN

DESIGN STANDARDS

American Institute of Steel Construction (AISC) Manual of Steel Construction, 13th Edition. AISC 325-05
AISC Steel Design Guide No. 7, Industrial Buildings, Second Edition, March 2005.
AISC Steel Design Guide No. 25, Frame Design Using Web-Tapered Members, 2011
Metal Building Manufacturers Association (MBMA), Metal Building Systems Manual, 2006
American Iron and Steel Institute (AISI), North American Specification for the Design of Cold-Formed Structural Steel Members, AISI S100-07

DESIGN METHOD

Load Resistance Factor Design

MATERIALS

STRUCTURAL STEEL

ASTM A36 - Minimum yield strength (f_y) = 36,000 lb/in²

ASTM A500 - Minimum yield strength (f_y) = 46,000 lb/in²

ASTM A572 - Minimum yield strength (f_y) = 50,000 lb/in²

ASTM A992 - Minimum yield strength (f_y) = 50,000 lb/in²

LOAD DESIGNATIONS AND EXPLANATION

D DEAD LOADS

Concrete..... 150 lb/ft³
Vertical earth loads
Dry..... 105 lb/ft³
Saturated..... 125 lb/ft³
Vertical water load (includes uplift)..... 62.4 lb/ft³
Structural steel..... 490 lb/ft³

L LIVE LOADS

Foundation pressures computed from stability analyses are treated as live loads.
Uniform loads and special concentrated loads are listed on drawing 1695-D-102
Construction loads are uniform loads spread over the entire area to account for construction equipment.
Completed loads are uniform loads over the area not occupied by equipment and are used in conjunction with appropriate concentrated equipment loads.
Apply roof live load (L_r) in accordance with IBC 2009.

F HYDROSTATIC LOADS

Includes all situations where horizontal water loads may exist and corresponding uplift pressures where applicable.
Water pressure..... 62.4 lb/ft²/ft

H LATERAL EARTH PRESSURES

Active Pressures
Dry..... 50 lb/ft²/ft of depth
Saturated..... 90 lb/ft²/ft of depth
At Rest Pressures
Dry..... 70 lb/ft²/ft of depth
Saturated..... 100 lb/ft²/ft of depth
Note: A surcharge equal to an additional 2 feet of dry earth is added where localized equipment loads can cause an increase in lateral earth pressures.

W WIND LOADS

Apply in accordance with IBC 2009, Section 1609 and ASCE 7-05, Chapter 6.
Basic Wind Speed (3-second gust)..... 90 mph
Building Occupancy Category III
Wind Importance Factor, I_w = 1.15
Wind Exposure C
Internal Pressure Coefficient, GC_{pi} = 0.18

E EARTHQUAKE LOADS

For earthquake loads from backfill that are applied to the below grade structures, refer to the Bureau of Reclamation publication "Design Criteria for Concrete Retaining Walls," 1977. The peak horizontal ground acceleration having a 2% chance of exceedance in 50 years is 0.11 g.

The seismic analysis and design of structures above grade are based on IBC 2009, Section 1613 and ASCE 7-05, Chapters 11 and 12, and the Design Response Spectrum as listed on drawing 1695-D-102.

Design Parameters (IBC 1613 and ASCE 7-05, Chapters 11 and 12)
Building Occupancy Category III
Seismic Importance Factor, I_E = 1.25
Latitude: 35° 38' 48.37"
Longitude: 108° 46' 16.90"
Soil Site Class: D
Mapped Spectral Response Accelerations:
S_s = 0.252, S₁ = 0.057
Spectral Response Coefficients:
S_{DS} = 0.269, S_{DI} = 0.091
Seismic Design Category, SDC = B
Basic seismic-force-resisting system(s):
Steel Systems Not Specifically Detailed For Seismic Resistance
Seismic Response Coefficient, C_s = 0.11
Response Modification Factor, R = 3.0
Bearing Wall Systems: Ordinary Reinforced Masonry Shear Walls
Seismic Response Coefficient, C_s = 0.17
Response Modification Factor, R = 2.0
Analysis Procedure: Equivalent Lateral Force Analysis

R RAIN LOADS

Apply in accordance with IBC 2009, Section 1611 and ASCE 7-05, Section 8

S SNOW LOADS

Apply in accordance with IBC 2009, Section 1608 and ASCE 7-05, Chapter 7.
Ground Snow Load, p_g = 15 psf
Flat Roof Snow Load, p_f = 16.5 psf
Snow Exposure Factor, C_e = 0.9
Snow Load Importance Factor, I_s = 1.10
Thermal Factor, C_t = 1.0

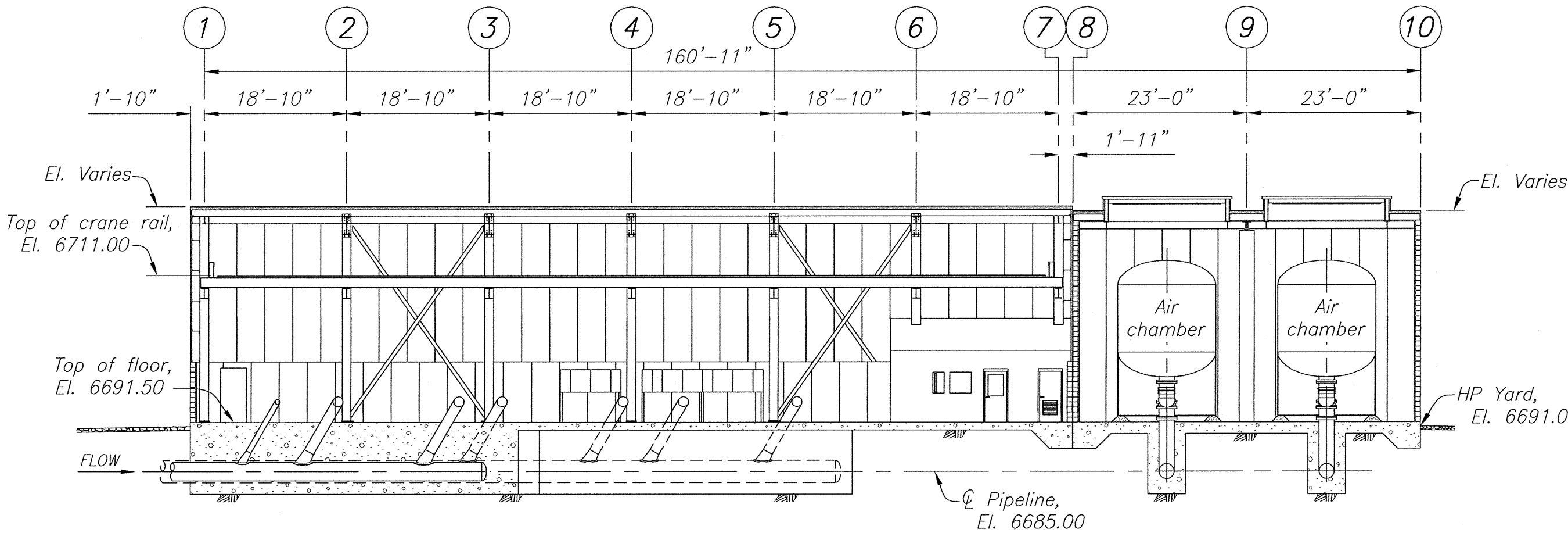
T TEMPERATURE VARIATIONS

All members above grade.....±50° F
All members below grade.....±20° F

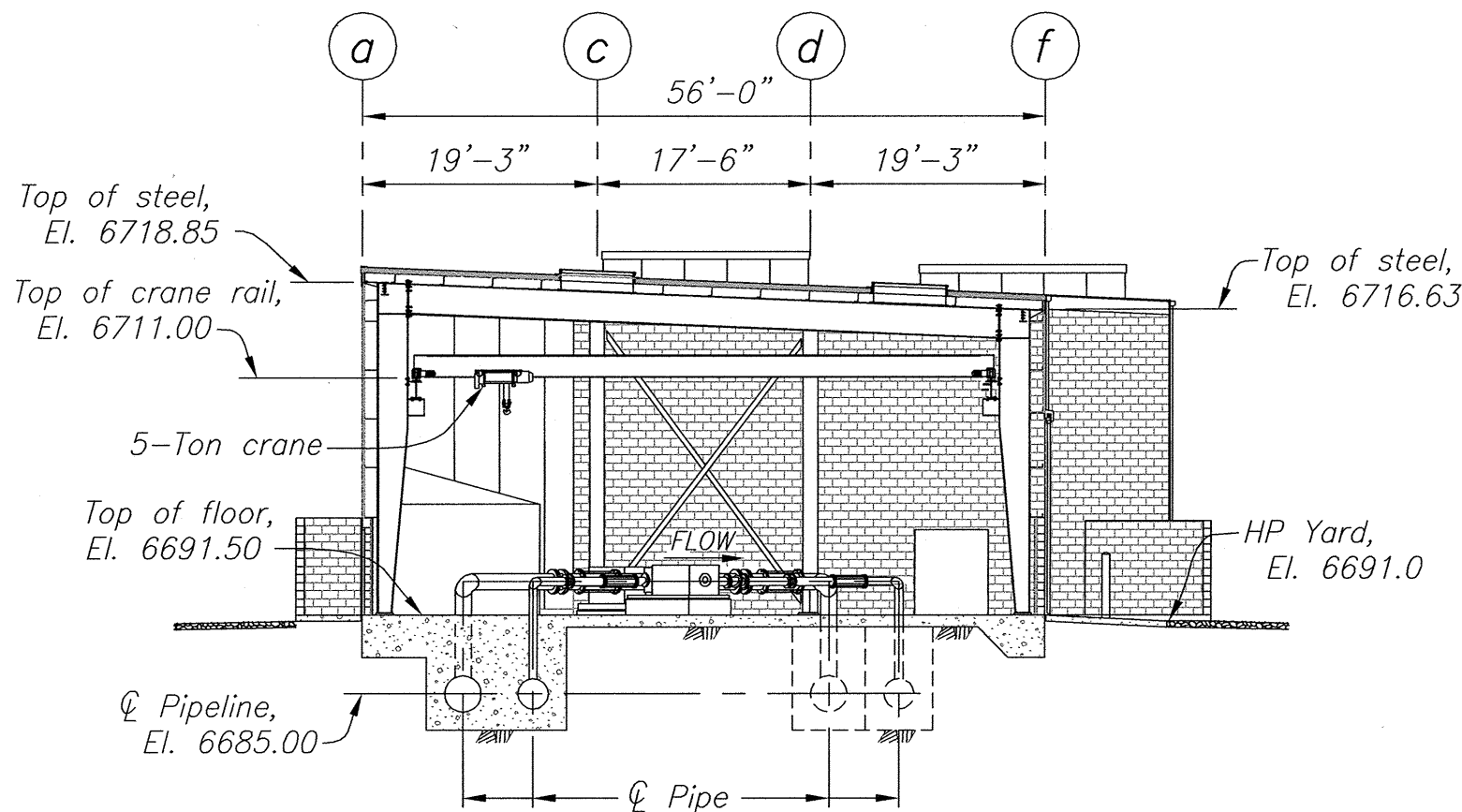
STABILITY ANALYSIS CRITERIA

Stability analyses include construction and completed conditions.
Vertical loads consist of structure dead loads, stationary equipment loads, hydrostatic and backfill loads, and uplift pressure.
Horizontal loads consist of hydrostatic loads, lateral backfill pressures, hydraulic thrusts, wind and earthquake forces.
Water does not penetrate construction joints in concrete.

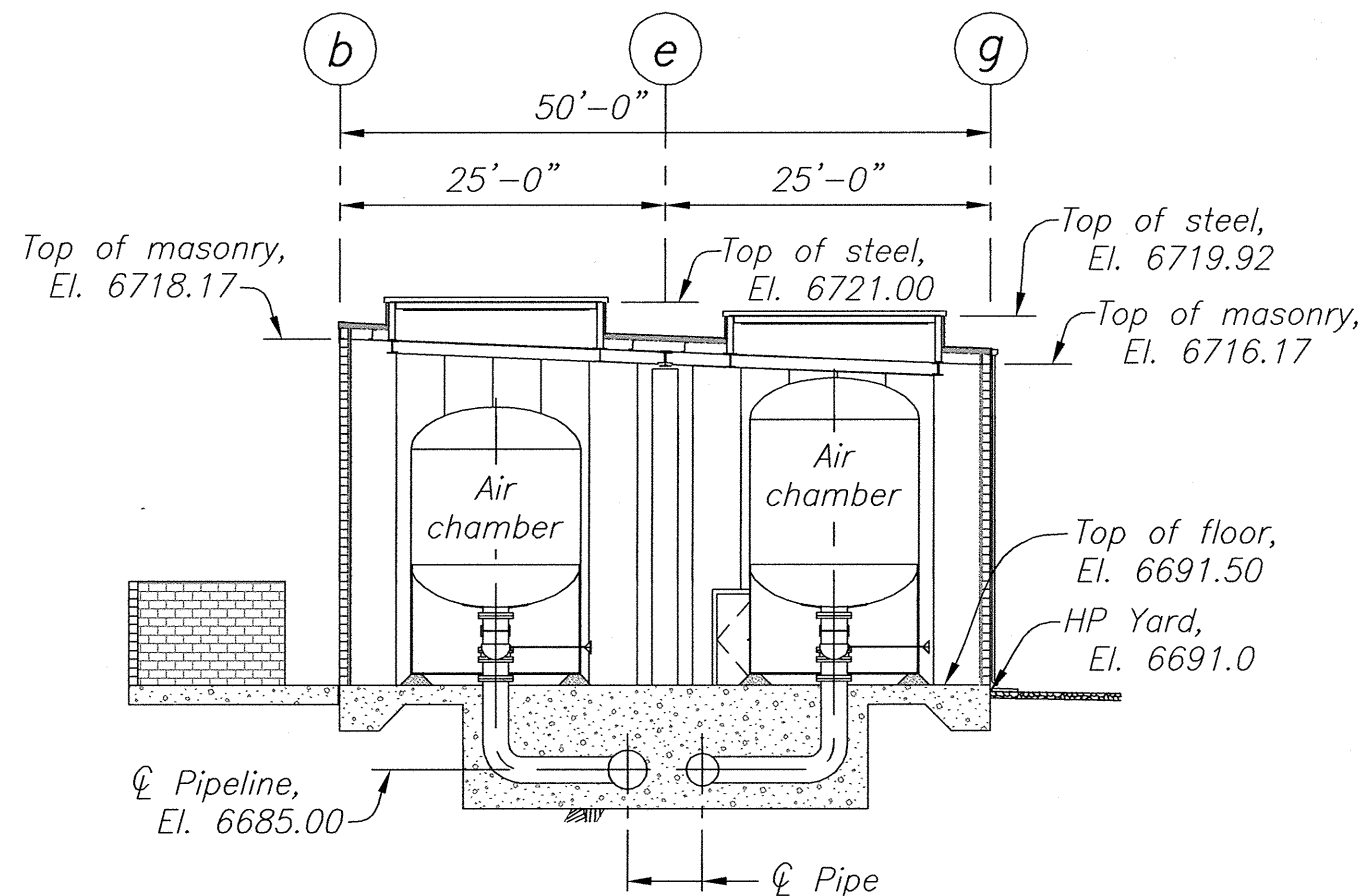
MINIMUM FACTOR OF SAFETY	DURING CONSTRUCTION		AFTER COMPLETION	
	NORMAL	EXTREME	NORMAL	EXTREME
Overturning	1.1	1.1	1.2	1.1
Shear-friction	1.5	1.1	2.0	1.5
Flotation	1.1	1.1	1.2	1.1



LONGITUDINAL SECTION THRU PUMPING PLANT/AIR CHAMBER ENCLOSURE



TRANSVERSE SECTION THRU PUMPING PLANT



TRANSVERSE SECTION THRU AIR CHAMBER ENCLOSURE

NOTE

1. For tables of live loads and equipment loads, see (102).

RECLAMATION
Managing Water in the West

ALWAYS THINK SAFETY

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
NAVAJO GALLUP WATER SUPPLY PROJECT
NEW MEXICO
SAN JUAN LATERAL
TOHLAKAI PUMPING PLANT
GENERAL STRUCTURAL DESIGN DATA

DESIGNED	Kevin O'Shea
DRAWN	Kevin O'Shea
CHECKED	B. D. VanOtterloo
TECH. APPR.	B. D. VanOtterloo, P.E.
APPROVED	Alfred Bernstein
PLANT STRUCTURES GROUP	
DENVER, COLORADO	2013-08-05

GENERAL STRUCTURAL
DESIGN DATA

1695-D-101

SHEET 1 OF 2

CAD SYSTEM
AutoCAD Rev. 19.05
CAD FILENAME
1695-D-102 - STRUCTURAL DESIGN DATA - SHEET 2.DWG
DATE AND TIME PLOTTED
AUGUST 3, 2013 08:12
PLOTTED BY
KOSHEA

1			
LIVE AND EQUIPMENT LOAD TABLE			
PUMPING PLANT			
ELEVATION	LOCATION	UNIFORM LIVE LOAD (PSF)	EQUIPMENT LOADS
El. 6691.50	Pumping Plant – Floor	300	A1, A2A, A2B & A3
El. 6691.50	Air Chamber Enclosure – Floor	300	A2C
El. 6690.00	Chlorine Feed Bldg – Floor	300	
	Roof (see Note 1 below)	20	
1. Roof load shown in table is for live load only and does not include any other loads required under design criteria.			
A1	5-TON PUMPING PLANT CRANE		
10'-6" Max. 8'-0" Min. Wheel load = 9.3K per wheel, max. + 1.0K per wheel impact. Long thrust = 1.0K per wheel. Lateral thrust = 1.0K per wheel. Span = 47'-2" ϕ to ϕ of crane rails. End clearance, ϕ rail to face column = 0'-8". Clearance above rail = 3'-3" Min., 5'-2½" Max.			
A2	HYDRAULIC EQUIPMENT		
A	Pumping Plant – Pumps (Final Build-Out)		
Unit 1 /base weight (lbs.)		1,800 ea.	
Unit 2 /base weight (lbs.)		3,626 ea.	
Unit 3 /base weight (lbs.)		3,626 ea.	
Unit 4 /base weight (lbs.)		2,397 ea.	
Unit 5 /base weight (lbs.)		2,397 ea.	
Unit 6 /base weight (lbs.)		2,397 ea.	
Unit 7 /base weight (lbs)		Installed Spare	
B	Pumping Plant – Valves		
AWWA Class 150, Manual Butterfly Valve/weight (lbs.)			
0'-4" Dia.		71 ea.	
0'-8" Dia.		125 ea.	
0'-10" Dia.		200 ea.	
1'-0" Dia.		250 ea.	
1'-4" Dia.		480 ea.	
2'-0" Dia.		1,085 ea.	
2'-6" Dia.		2,435 ea.	
3'-0" Dia.		3,425 ea.	
3'-6" Dia.		4,544 ea.	
AWWA Class 150, Motor Operated Butterfly Valve/weight (lbs.)			
0'-8" Dia.		320 ea.	
1'-0" Dia.		445 ea.	
AWWA Class 250, Manual Butterfly Valve/weight (lbs.)			
1'-4" Dia.		550 ea.	
2'-0" Dia.		1,350 ea.	
2'-6" Dia.		2,800 ea.	
AWWA Class 250, Motor Operated Butterfly Valve/weight (lbs.)			
0'-6" Dia.		325 ea.	
0'-8" Dia.		340 ea.	
ANSI Class 150 Tilting-Disc Check Valves/weight (lbs.)			
0'-8" Dia.		357 ea.	
ANSI Class 150 Pressure Sustaining Valve/weight (lbs.)			
0'-6" Dia.		295 ea.	
C	Air Chamber Enclosure – Air Chambers		
Reach 12.1/empty weight (lbs.)		52,800 ea.	
Reach 12.B/empty weight (lbs.)		37,900 ea.	

2

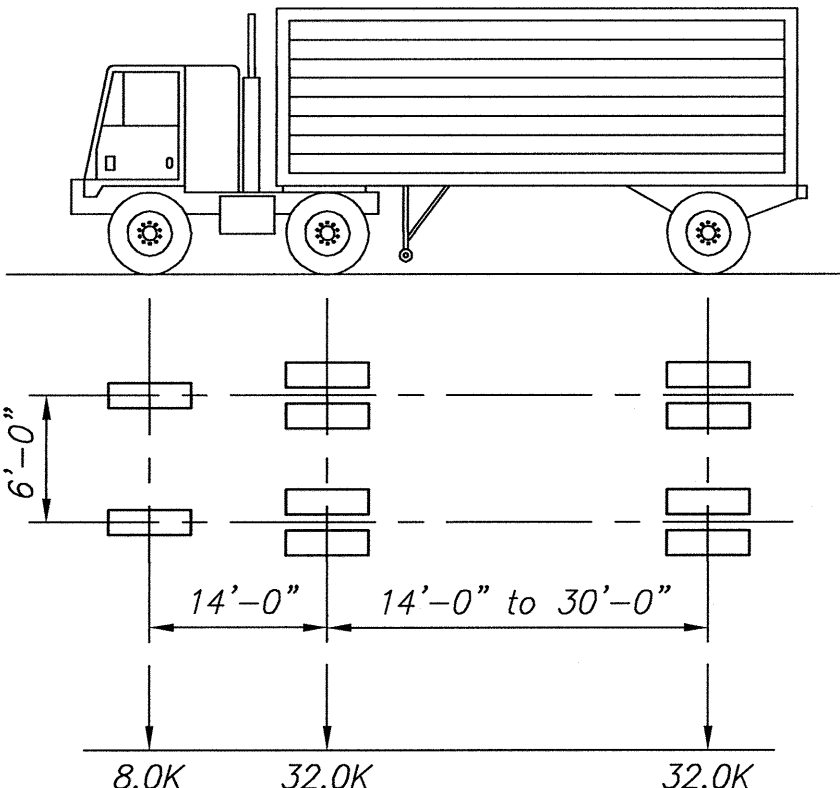
A3

ELECTRICAL EQUIPMENT – PUMPING PLANT

	Dimensions (L x W x H)	Weight (lbs.)
Motors (Final Build-Out)		
Unit 1 – Pump 12.1-1 (200 Hp)	-----	6,620
Unit 2 – Pump 12.1-2 (600 Hp)	-----	7,220
Unit 3 – Pump 12.1-3 (600 Hp)	-----	7,220
Unit 4 – Pump 12.B-1 (350 Hp)	-----	7,220
Unit 5 – Pump 12.B-2 (350 Hp)	-----	7,220
Unit 6 – Pump 12.B-3 (350 Hp)	-----	7,220
Unit 7 – Pump 12.B-4 (Spare Bay)	-----	-----
12.1 Motor Control Lineup	216" x 30" x 90"	10,200
12.B Motor Control Lineup	252" x 30" x 90"	12,200
Shared I/O Cabinet	36" x 24" x 72"	376
Network Equipment Cabinet	28" x 34" x 84"	376
Navajo Tribal Utility Authority PLC	36" x 24" x 72"	376
City of Gallup PLC	36" x 24" x 72"	376

B1

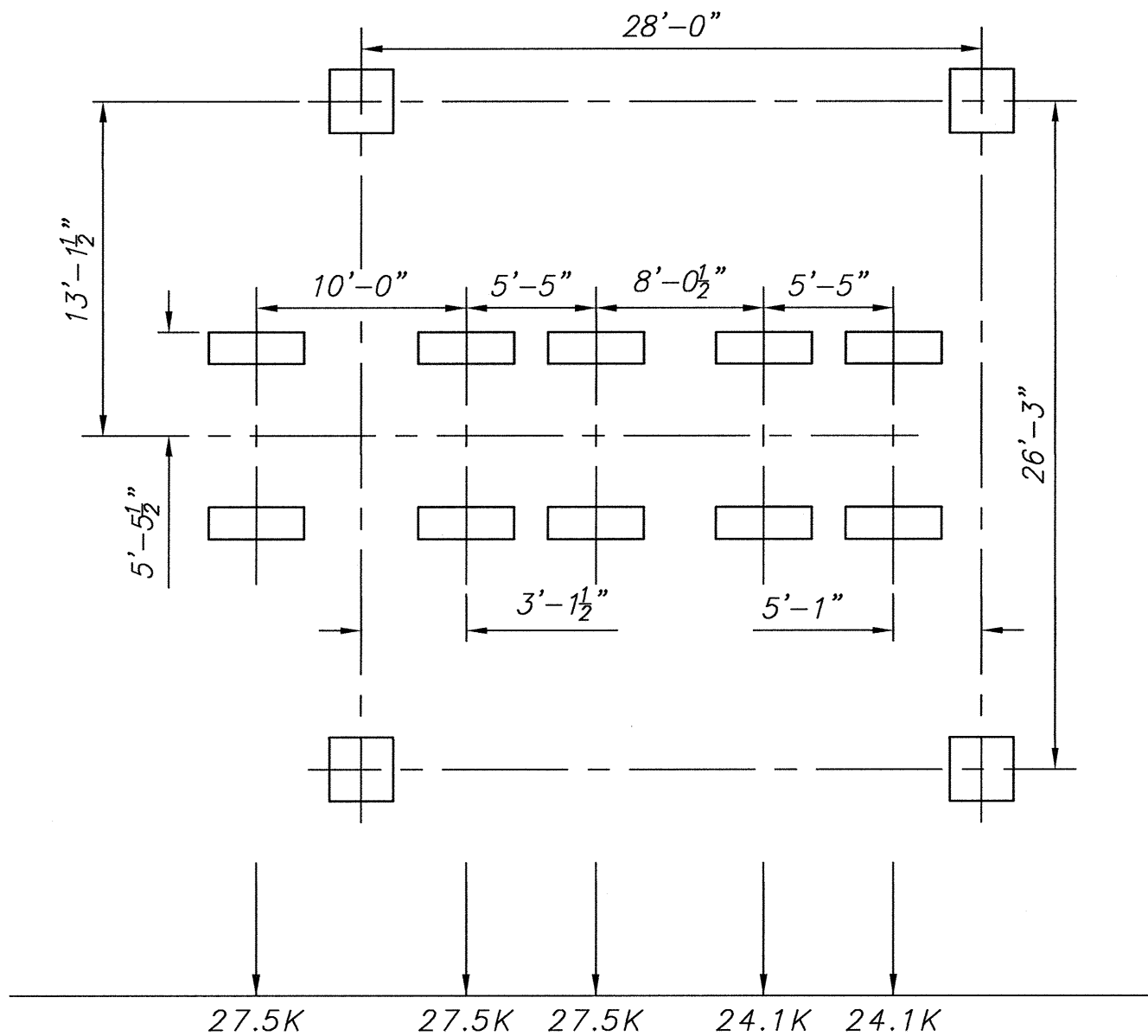
HS20-44 TRUCK



Axle load in kips. Add 25% for impact loading.

B2

275-TON MOBILE CRANE LOAD



Axle Loads in Kips-Unloaded, Max. Outrigger Load = 147-Kip
Assume outrigger load spread over 8' x 8' pontoon on 6" deep timber cribbing
Load limit for outrigger = 3,000 psf. Add 25% for impact.

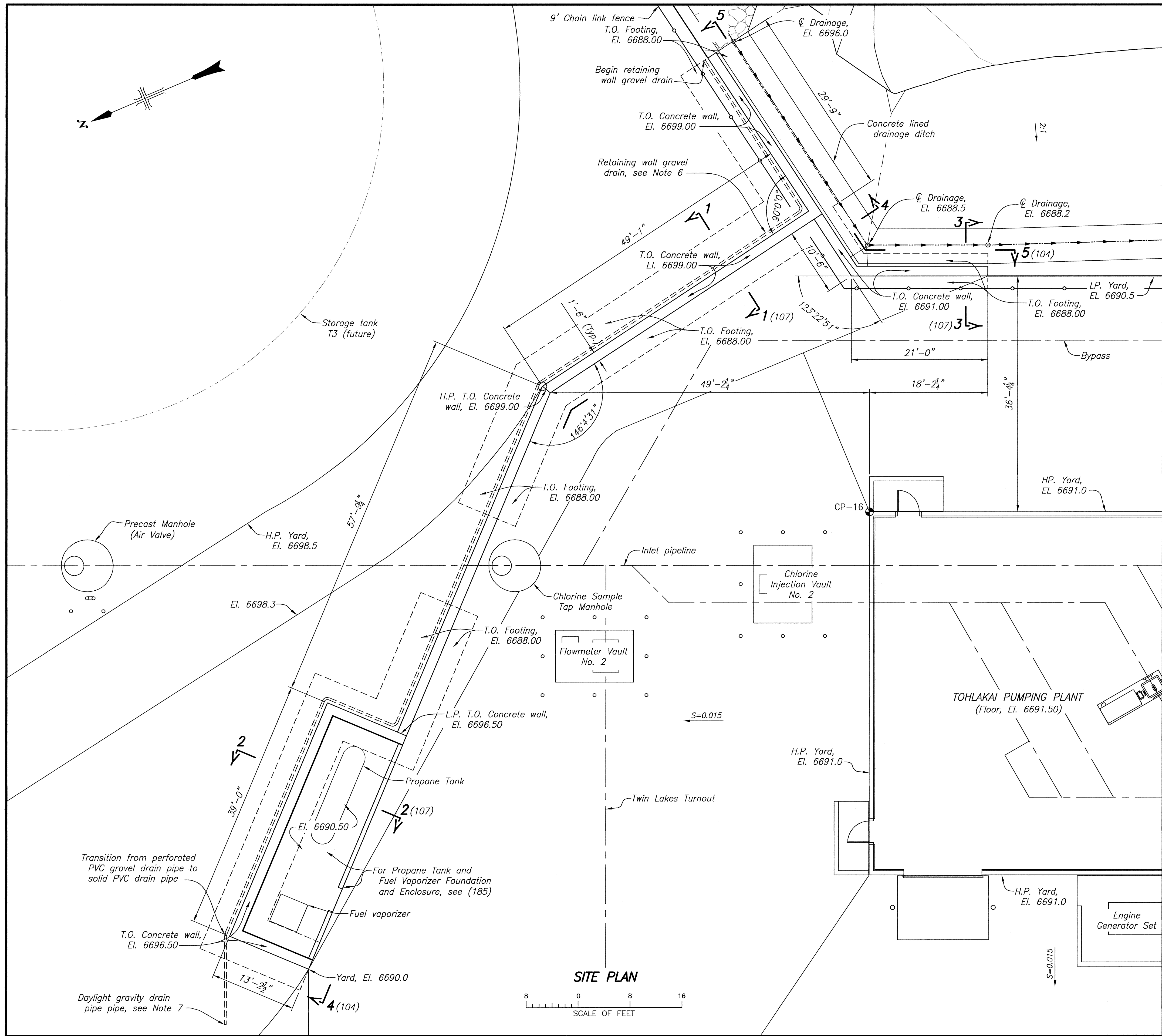
PUMP DATA				
Pump Unit	Design Head (ft)	Motor Horsepower	Speed (rpm)	Discharge at Design Head (cfs)
Unit 1	460	200	3,600	2.00
Unit 2	459	600	1,800	6.35
Unit 3	459	600	1,800	6.35
Unit 4	245	350	1,800	7.39
Unit 5	245	350	1,800	7.39
Unit 6	245	350	1,800	7.39
Unit 7	245	350	1,800	7.39
All values are for the 2040 Peak Flow Pumps				

DESIGN RESPONSE SPECTRUM		
48 Conterminous States 5% Damping (see Dwg. 1659-D-101, E _____ Earthquake Loads)		
Period (s)	Sa (g)	Sd (inches)
0.000	0.108	0.000
0.067	0.269	0.012
0.200	0.269	0.105
0.337	0.269	0.298
0.400	0.227	0.354
0.500	0.181	0.443
0.600	0.151	0.531
0.700	0.129	0.620
0.800	0.113	0.708
0.900	0.101	0.797
1.000	0.091	0.885
1.100	0.082	0.974
1.200	0.076	1.062
1.300	0.070	1.151
1.400	0.065	1.239
1.500	0.060	1.328
1.600	0.057	1.416
1.700	0.053	1.505
1.800	0.050	1.594
1.900	0.048	1.682
2.000	0.045	1.771
Design Spectrum Sa vs. T Sa (g) T (sec)		
NOTES 1. For general structural design data, see (101). 2. Weights and dimensions shown are estimated.		

9	
RECLAMATION Managing Water in the West	
D	
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B	
A	
ALWAYS THINK SAFETY	
U.S. DEPARTMENT OF THE INTERIOR BUREAU OF RECLAMATION NAVAJO GALLUP WATER SUPPLY PROJECT NEW MEXICO SAN JUAN LATERAL TOHLAKAI PUMPING PLANT GENERAL STRUCTURAL DESIGN DATA	
DESIGNED K. D. O'Shea	
DRAWN K. D. VanOtterloo	
CHECKED K. D. VanOtterloo, P.E.	
TECH. APPR. K. D. VanOtterloo	
APPROVED PLANT STRUCTURES GROUP	
DENVER, COLORADO 2013-08-05	
GENERAL STRUCTURAL DESIGN DATA	
1695-D-102	
SHEET 2 OF 2	

DATE AND TIME PLOTTED
AUGUST 3, 2013 08:13
PLOTTED BY
KOSHIA

CAD SYSTEM
AutoCAD Rev. 19.0s
CAD FILENAME
1695-D-103 - RETAINING WALL - PLANNING



SITE PLAN

SCALE OF FEET
0 8 16

NOTES

1. For Concrete General Notes, see (123).
2. For Structural Design Data, see (101 & 102).
3. For control points and coordinates, see (100).
4. All vertical elevations are based on NAVD88 vertical datum.
5. Transition slope from 6:1 to 0.070.
6. 4"ø Perforated PVC pipe. Slope pipe 1% toward discharge outlet. For typical retaining wall backfill and drainage details, see (107).
7. Continue gravity drain pipe to daylight in the site perimeter drainage ditch in accordance with Specifications Section 33 11 16.

CAD SYSTEM
AutoCAD Rev. 19.06
CAD FILENAME
1695-D-104 - RETAINING WALL - SECTIONS.dwg
DATE AND TIME PLOTTED
AUGUST 3, 2013 08:14
PLOTTED BY
KOSHEA

1 2 3 4 5

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11

RECLAMATION
Managing Water in the West

D

C

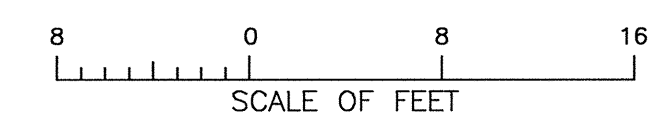
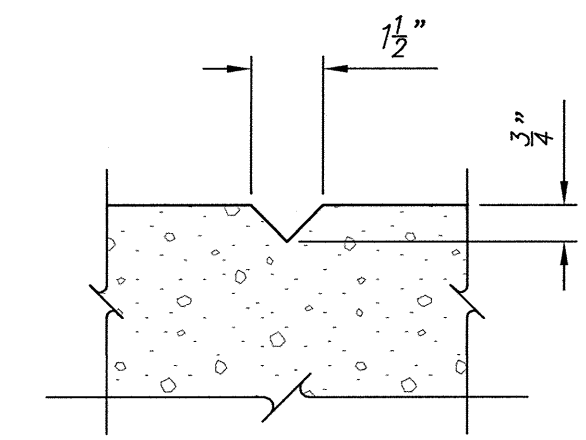
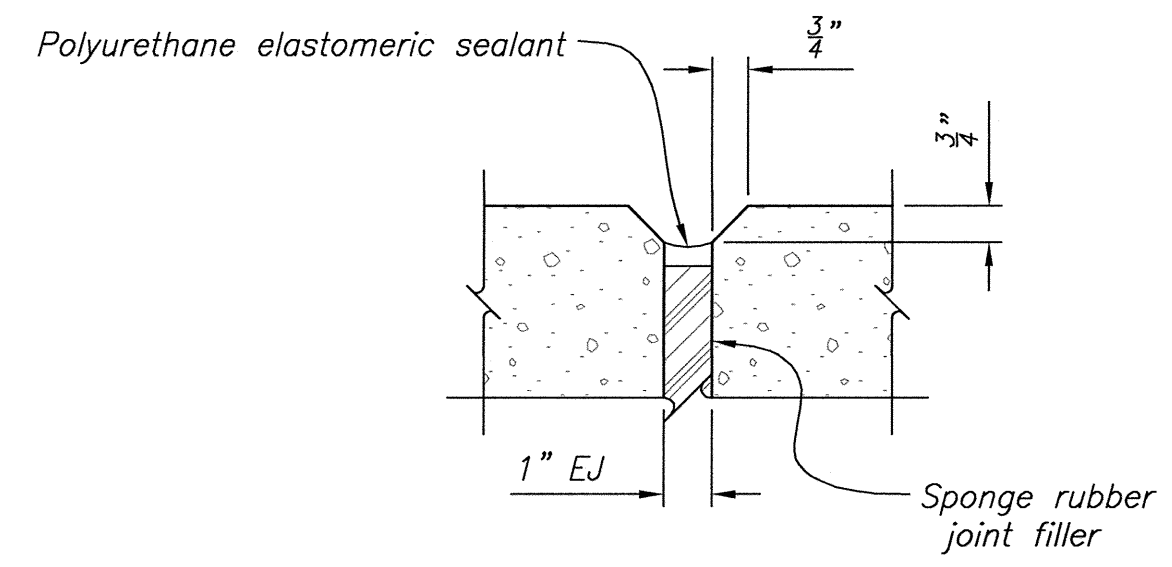
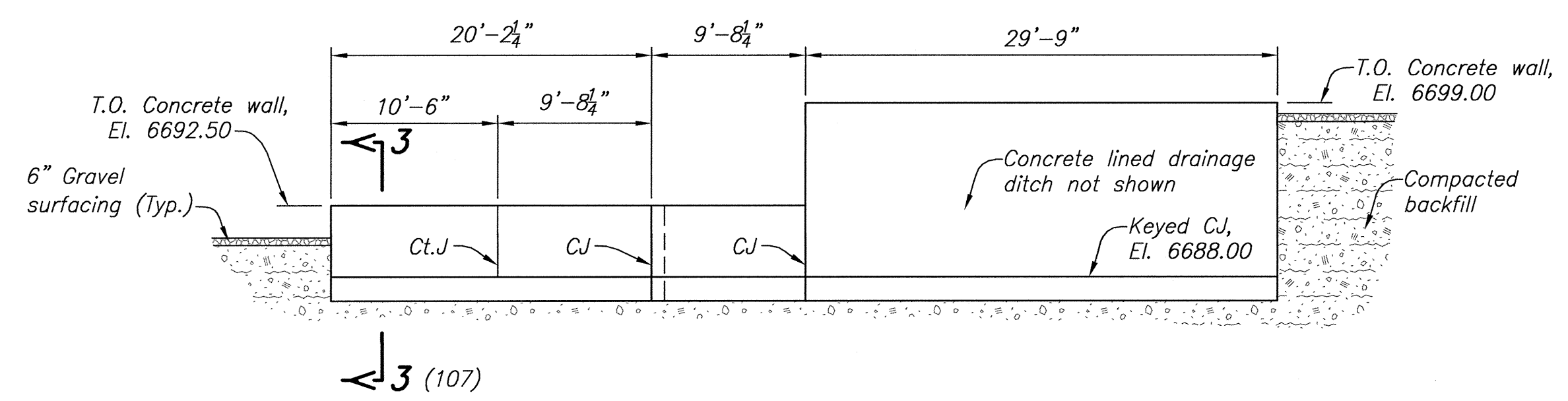
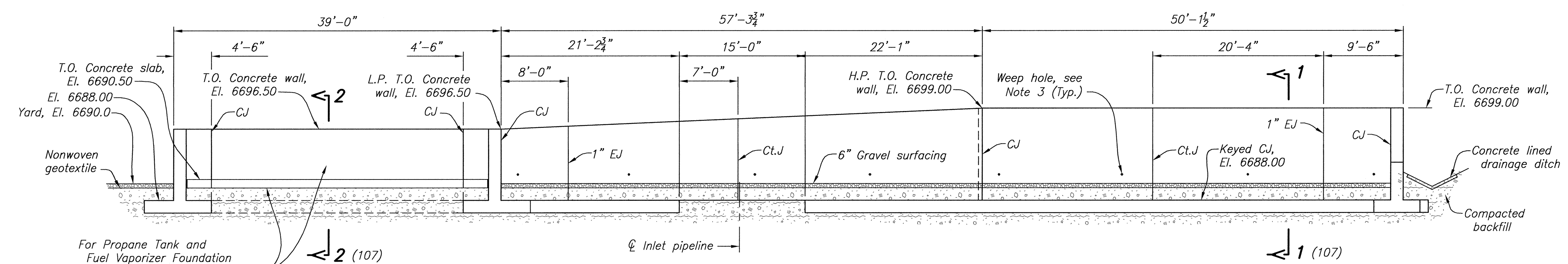
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U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

NAVAJO GALLUP WATER SUPPLY PROJECT
NEW MEXICO

SAN JUAN LATERAL
TOHLAKAI PUMPING PLANT
CONCRETE RETAINING WALL
SECTIONS

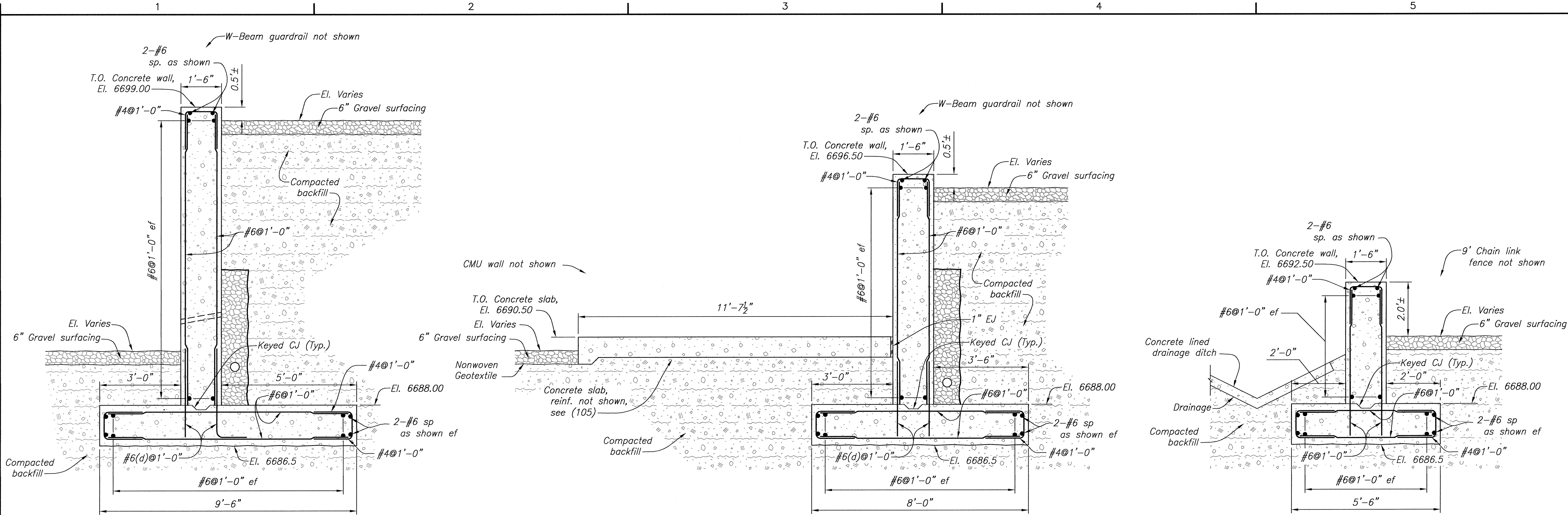


- NOTES
- For Concrete General Notes, see (123).
 - All vertical elevations are based on NAVD88 vertical datum.
 - Space weep holes at 15 feet center to center and a minimum of 2 feet from joints within the concrete retaining wall. Do not install weep holes in retaining wall sections that are exposed to the propane tank and fuel vaporizer.
 - Unless noted otherwise, provide construction joints at a maximum spacing of 30 feet center to center.

DESIGNED
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TECH. APPR.
PEER REVIEW
PLANT STRUCTURES GROUP
DENVER, COLORADO
2013-08-05

CONCRETE RETAINING WALL
SECTIONS

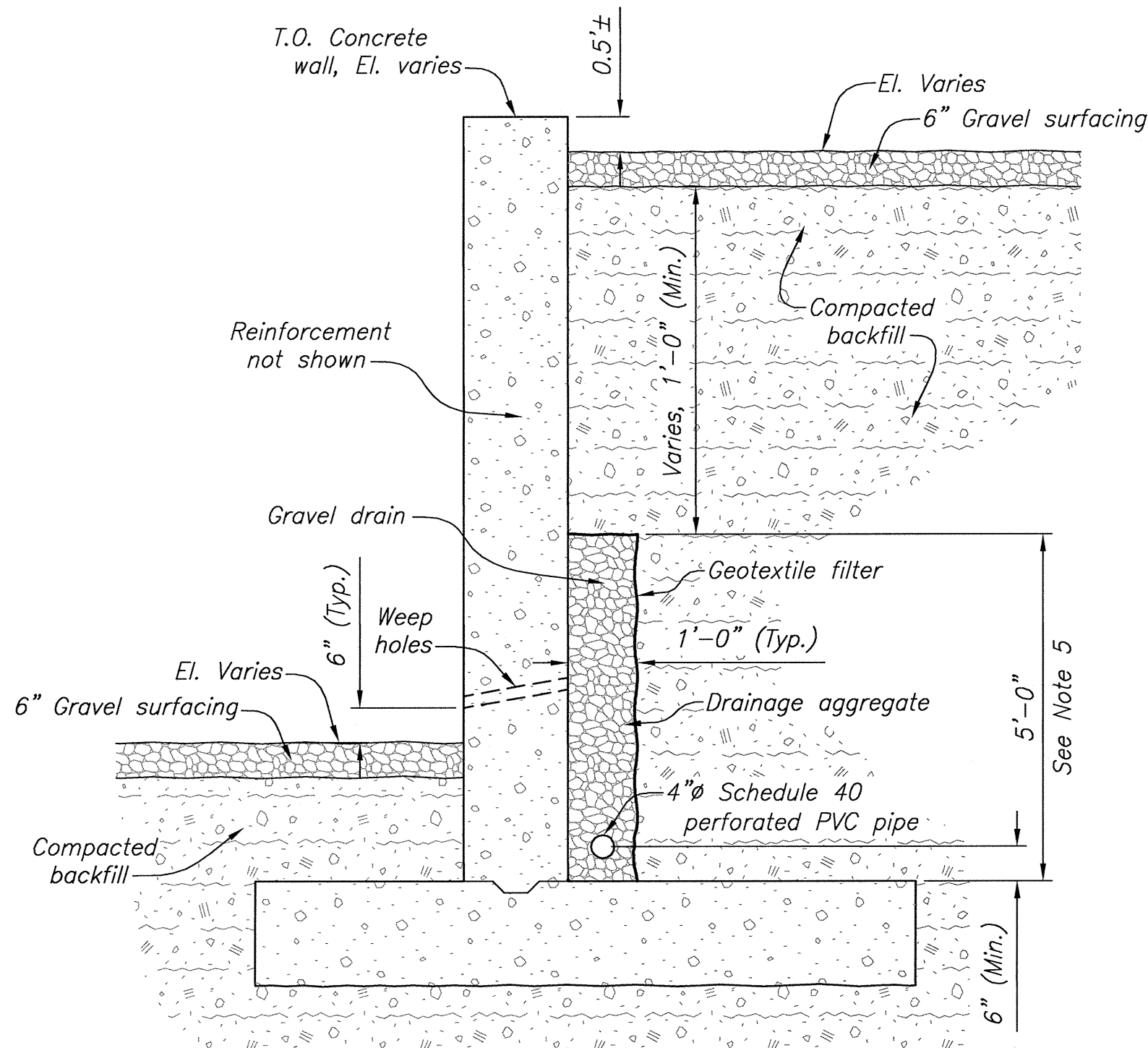
1695-D-104
SHEET 1 OF 1



SECTION 1-1 (103, 104)

SECTION 2-2 (103, 104)

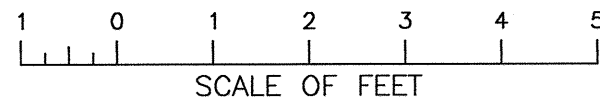
SECTION 3-3 (103, 104)

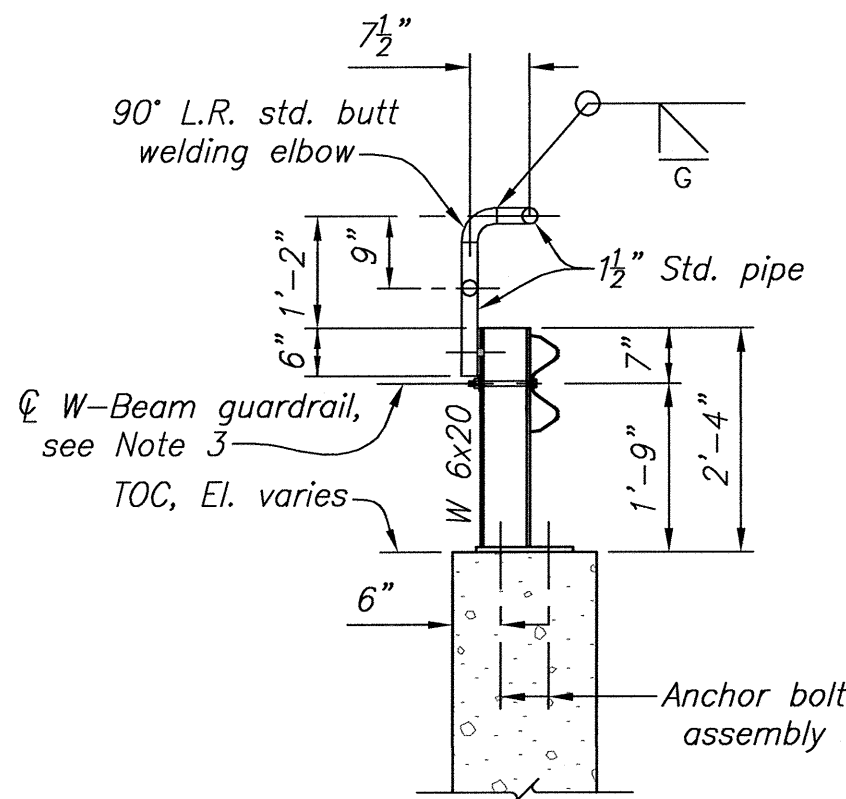


TYPICAL RETAINING WALL BACKFILL
AND DRAINAGE DETAIL

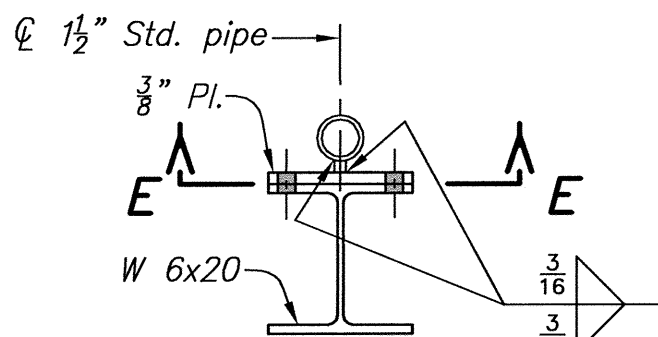
NOTES

1. For foundation excavation requirements, see (108).
2. For Concrete General Notes, see (123).
3. For Reinforcement Design General Notes, see (127).
4. All vertical elevations are based on NAVD88 vertical datum.
5. Typical depth of 5'-0" where wall height permits. Reduce depth above perforated drain pipe as required with wall taper to meet grade of site.
6. Install perforated PVC pipe with a minimum of one line of perforations facing down.

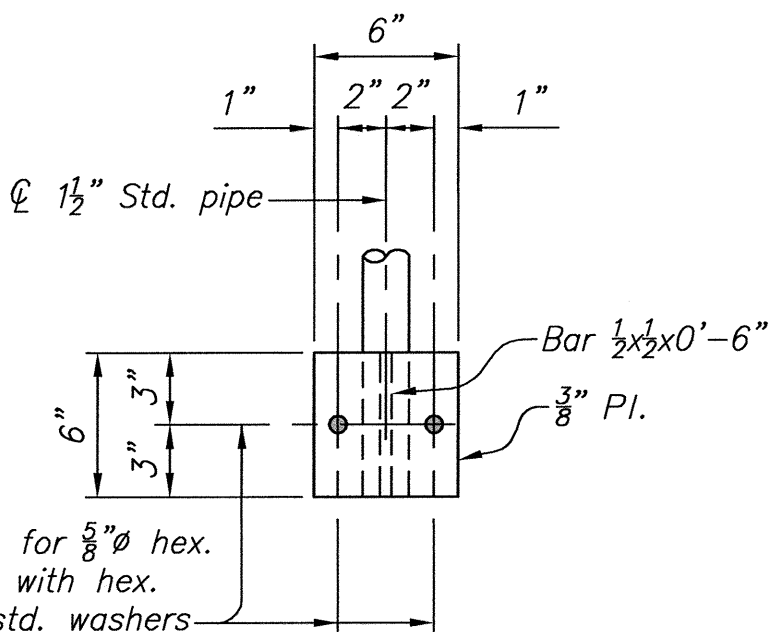




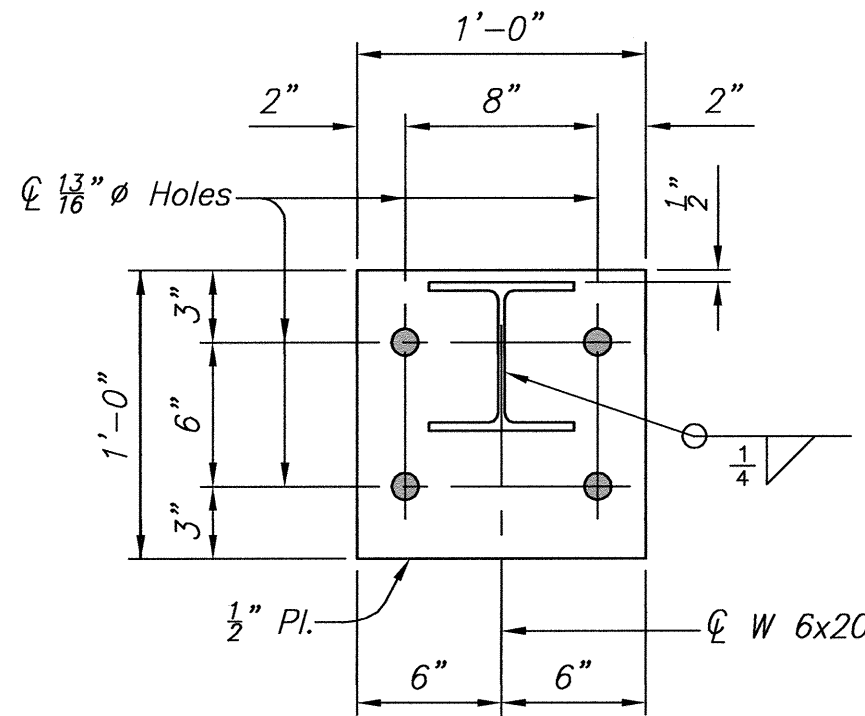
SECTION A-A



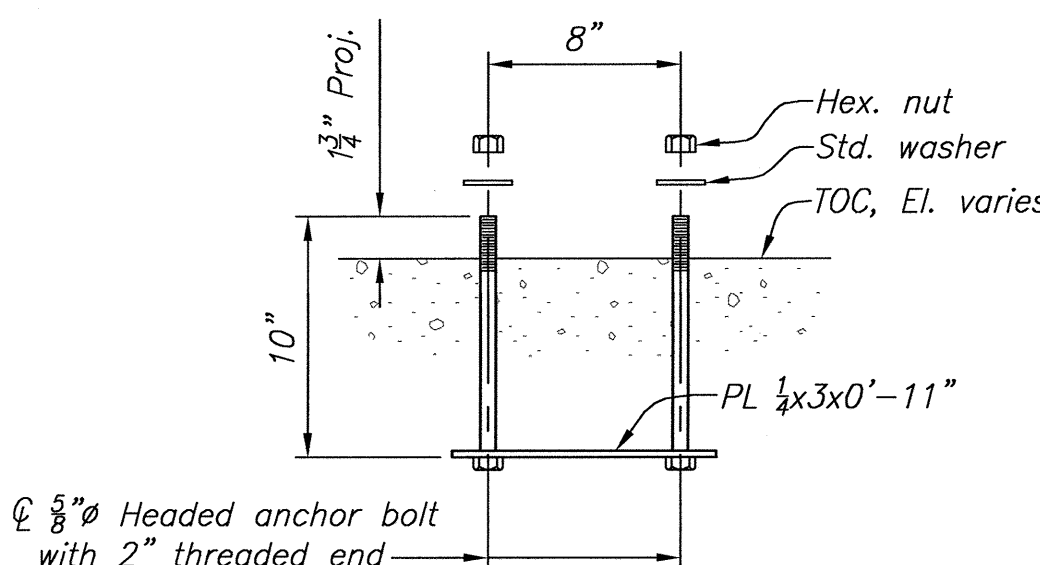
SECTION D-D



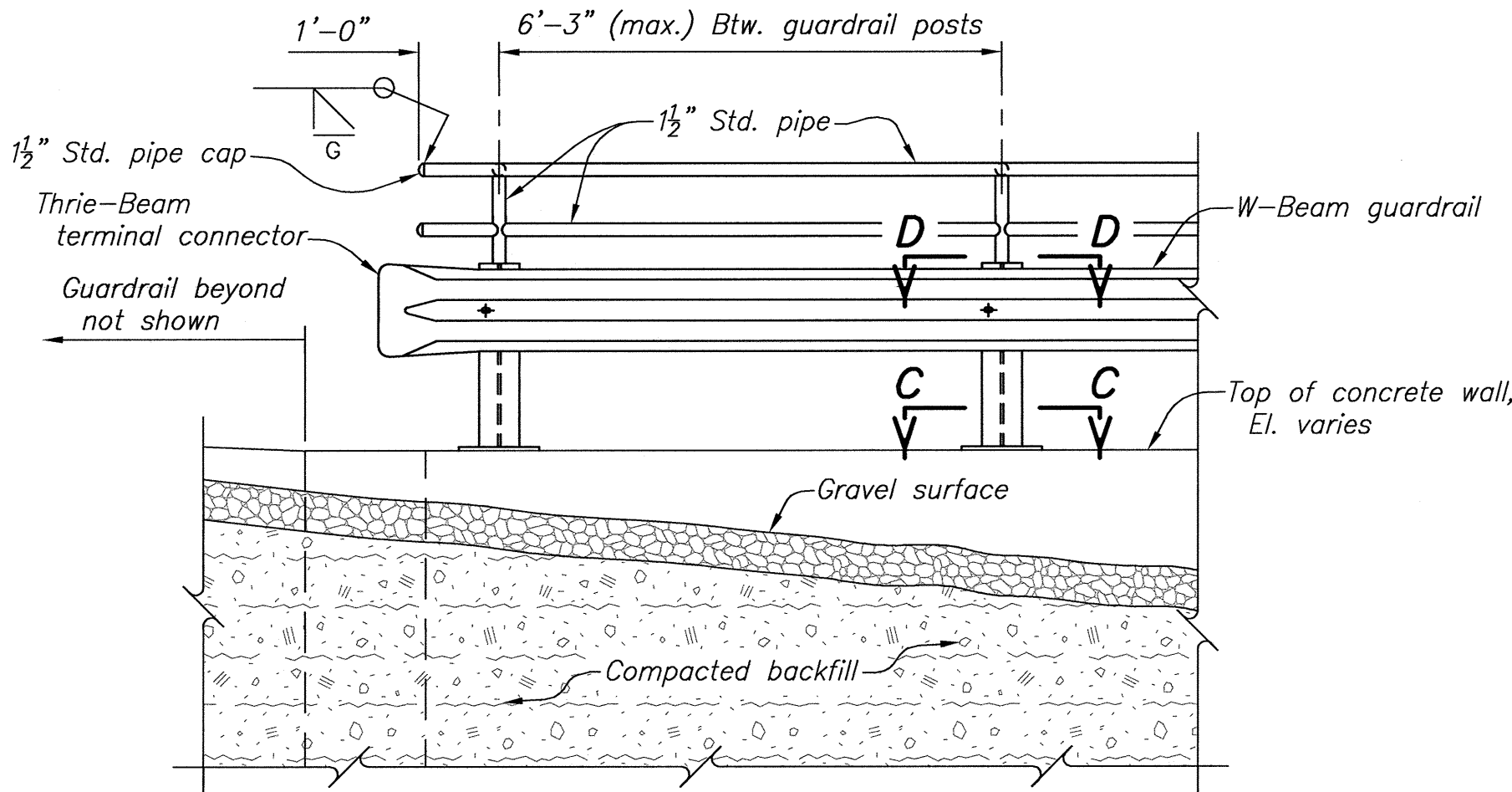
SECTION E-E



SECTION C-C



ANCHOR BOLT ASSEMBLY
56 REQUIRED

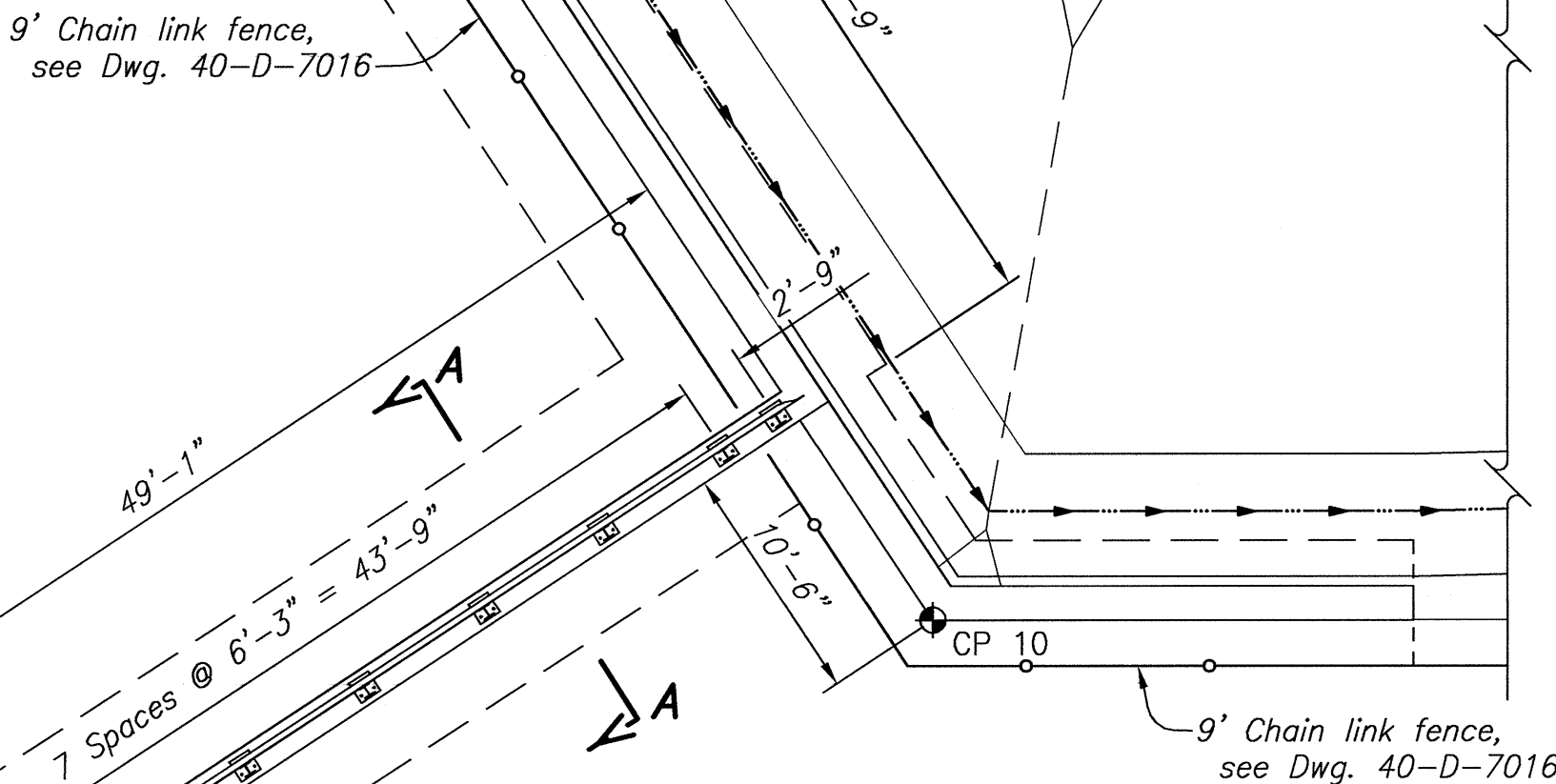


SECTION B-B

- NOTES
1. For General Notes, see (190).
 2. For details of W-Beam guardrail, see Specifications.
 3. Provide 5/8 inch carriage bolts with cut steel washers and hex. nuts.
 4. Splice pipe guardrail as required with splice locks. Provide splice lock suitable for expansion joint at 40-foot centers maximum.
 5. Place epoxy grout underneath guardrail baseplate as required to maintain plumb.
 6. For control point coordinates, see (100).

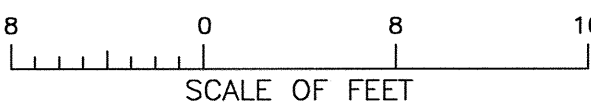
REFERENCE DRAWINGS

SITE PLAN	1695-D-99
RETAINING WALL	
PLAN	1695-D-103
SECTIONS	1695-D-104

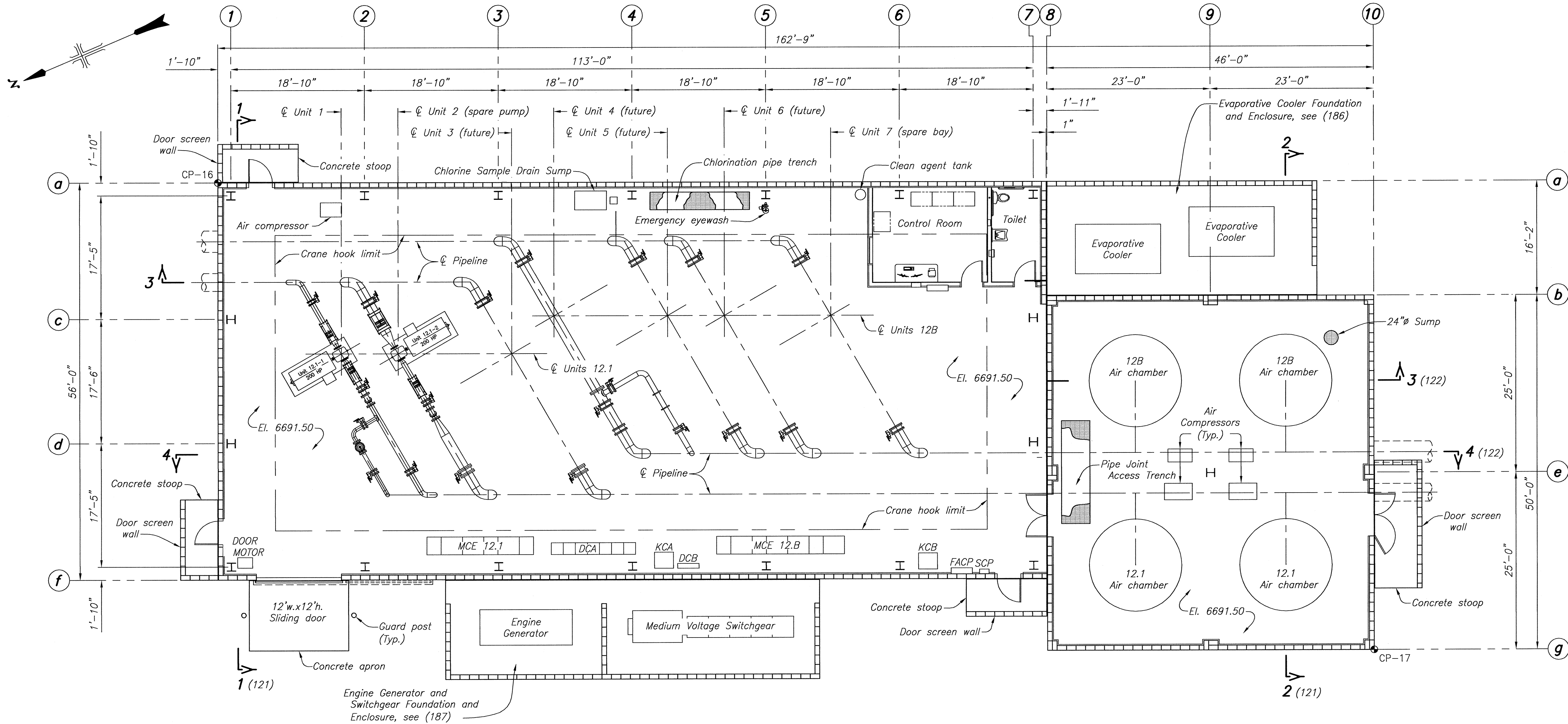


PLAN - W-BEAM GUARDRAIL

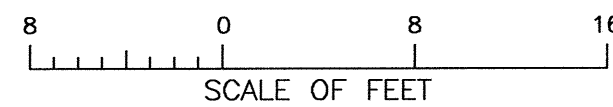
WALL ELEVATION VARIES
For Reference, See (103)



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AutoCAD Rev. 19.0s
CAD FILENAME
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DATE AND TIME PLOTTED
AUGUST 1, 2013 08:30
PLOTTED BY
KOSHEA



PLAN - EL. 6691.50
(INTERIM - See Note 4)



REFERENCE DRAWINGS

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PLAN	1695-D-99
SECTIONS	1695-D-100
PUMPING PLANT	
ARCHITECTURAL	1695-D-110 THRU 1695-D-118 AND 1695-D-195
GENERAL ARRANGEMENT	1695-D-119 THRU 1695-D-122
CONCRETE OUTLINE	1695-D-123 THRU 1695-D-125
REINFORCEMENT DESIGN	1695-D-127 THRU 1695-D-130
STRUCTURAL STEEL	1695-D-131 THRU 1695-D-136 AND 1695-D-138 THRU 1695-D-145
MASONRY	1695-D-146 THRU 1695-D-151
MISCELLANEOUS METALWORK	
GUARD POST	1695-D-190
TRENCH COVERS	1695-D-191
MECHANICAL EQUIPMENT	
STEEL MANIFOLDS	1695-D-208 THRU 1695-D-213
AIR CHAMBERS	1695-D-220 THRU 1695-D-223
BRIDGE CRANE	1695-D-257
AIR CHAMBER SUMP LIFT STATION	1695-D-260
FLOOR DRAINS	1695-D-261
AUXILIARY PIPING	1695-D-262 THRU 1695-D-264
ON-SITE SEWAGE DISPOSAL SYSTEM	1695-D-182 THRU 1695-D-184
HEATING, VENTILATING AND AIR CONDITIONING SYSTEM	1695-D-269 THRU 1695-D-272

ELECTRICAL INSTALLATION	
MAIN PUMPING UNIT CONTROLS	1695-D-231
CONDUIT PLAN	1695-D-248 THRU 1695-D-249
WIRING DEVICES	1695-D-293
INTERIOR LIGHTING	1695-D-291
SECURITY CAMERAS AND EXTERIOR	
EMERGENCY LIGHTING	1695-D-292
GROUNDING SYSTEM	1695-D-242

NOTES

- For Structural Design Data, see (101) and (102).
- For control point coordinates, see (100).
- All vertical elevations are based on NAVD88 vertical datum. Interim refers to the water demand to which the project is currently designed for and applies to items included in this specification. Additional design and specifications will be required to reach Final Build-Out, see (120).
-

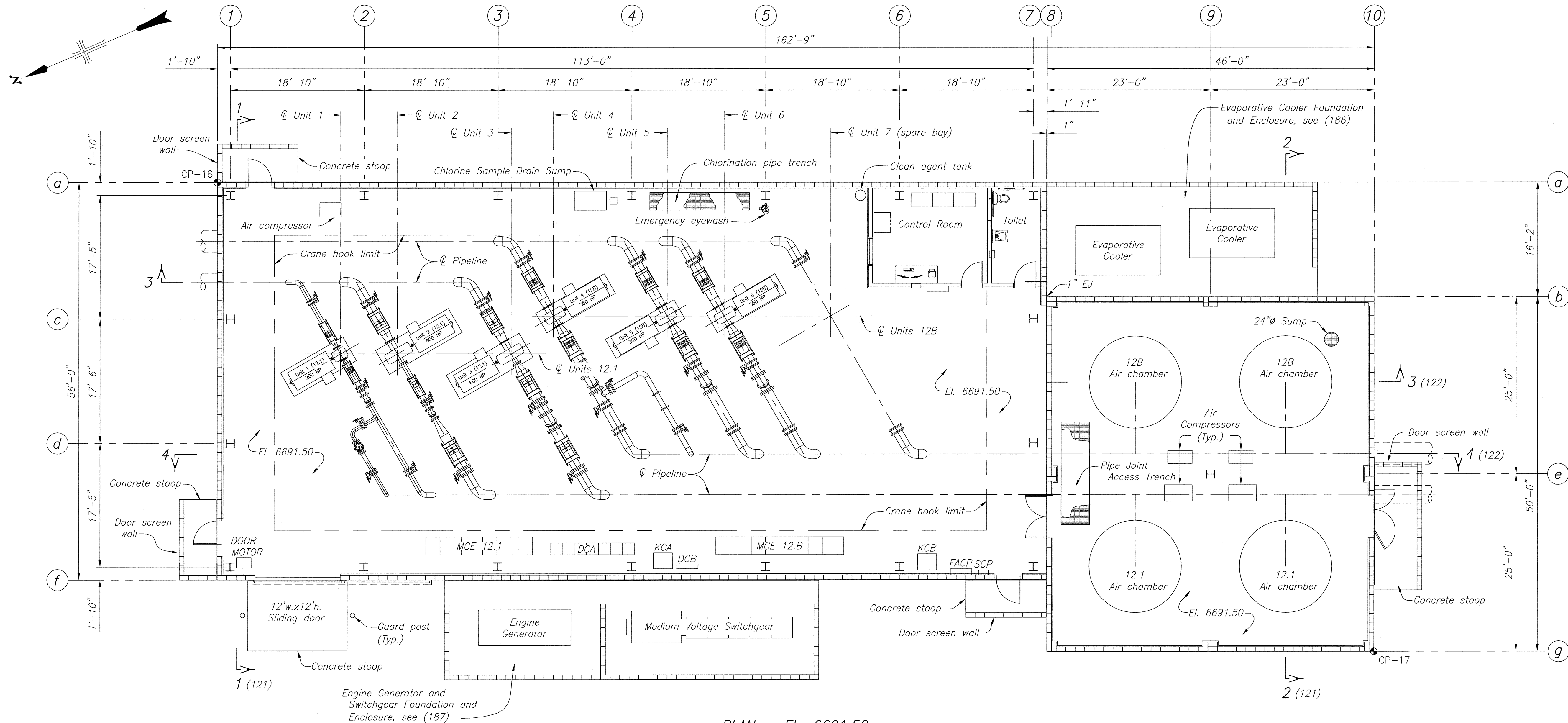
DESIGNED
DRAWN
CHECKED
TECH. APPR.
APPROVED
PLANT STRUCTURES GROUP

DENVER, COLORADO 2013-08-05

GENERAL ARRANGEMENT
PLAN - EL. 6691.50

1695-D-119

SHEET 1 OF 2

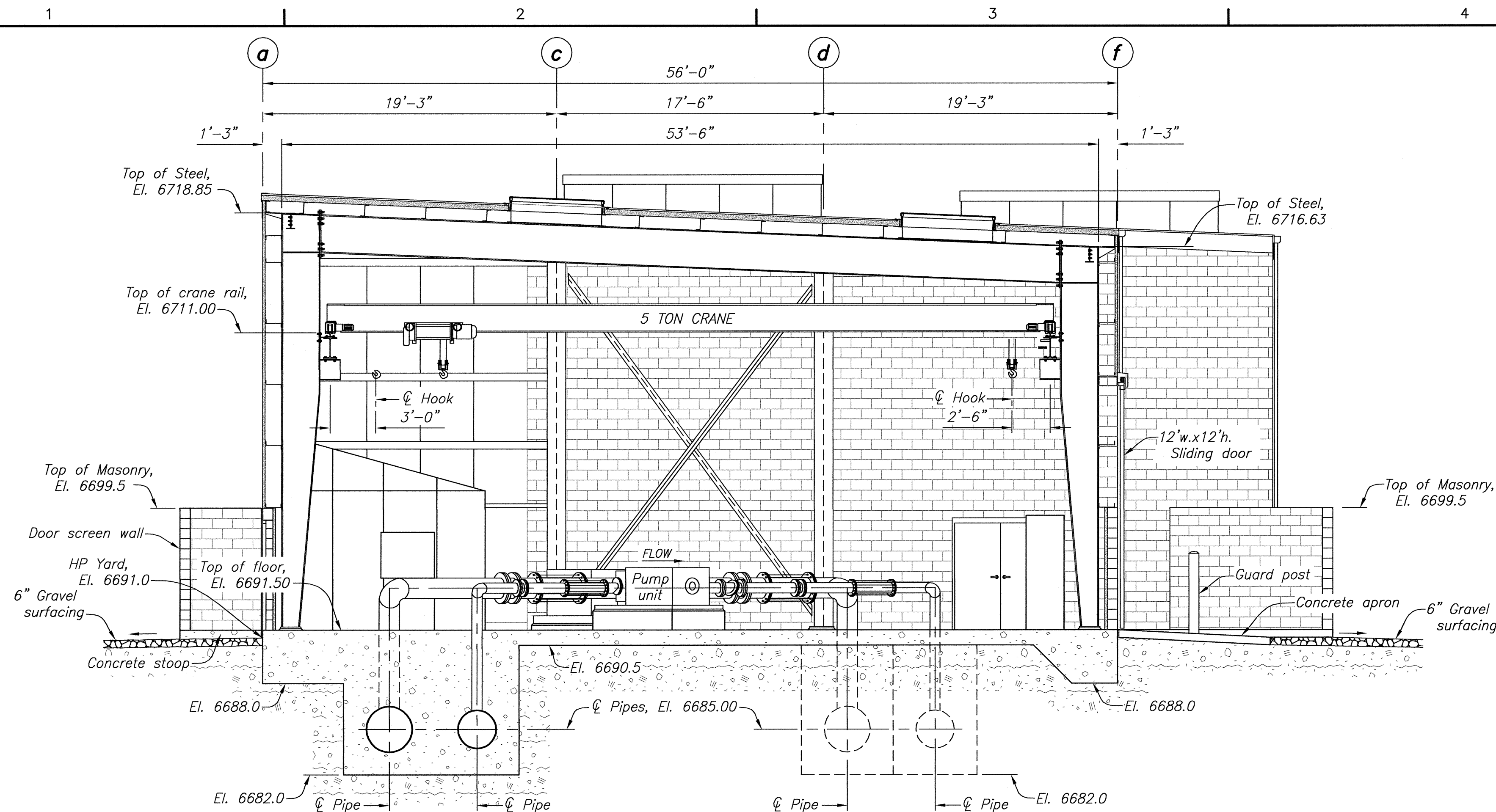


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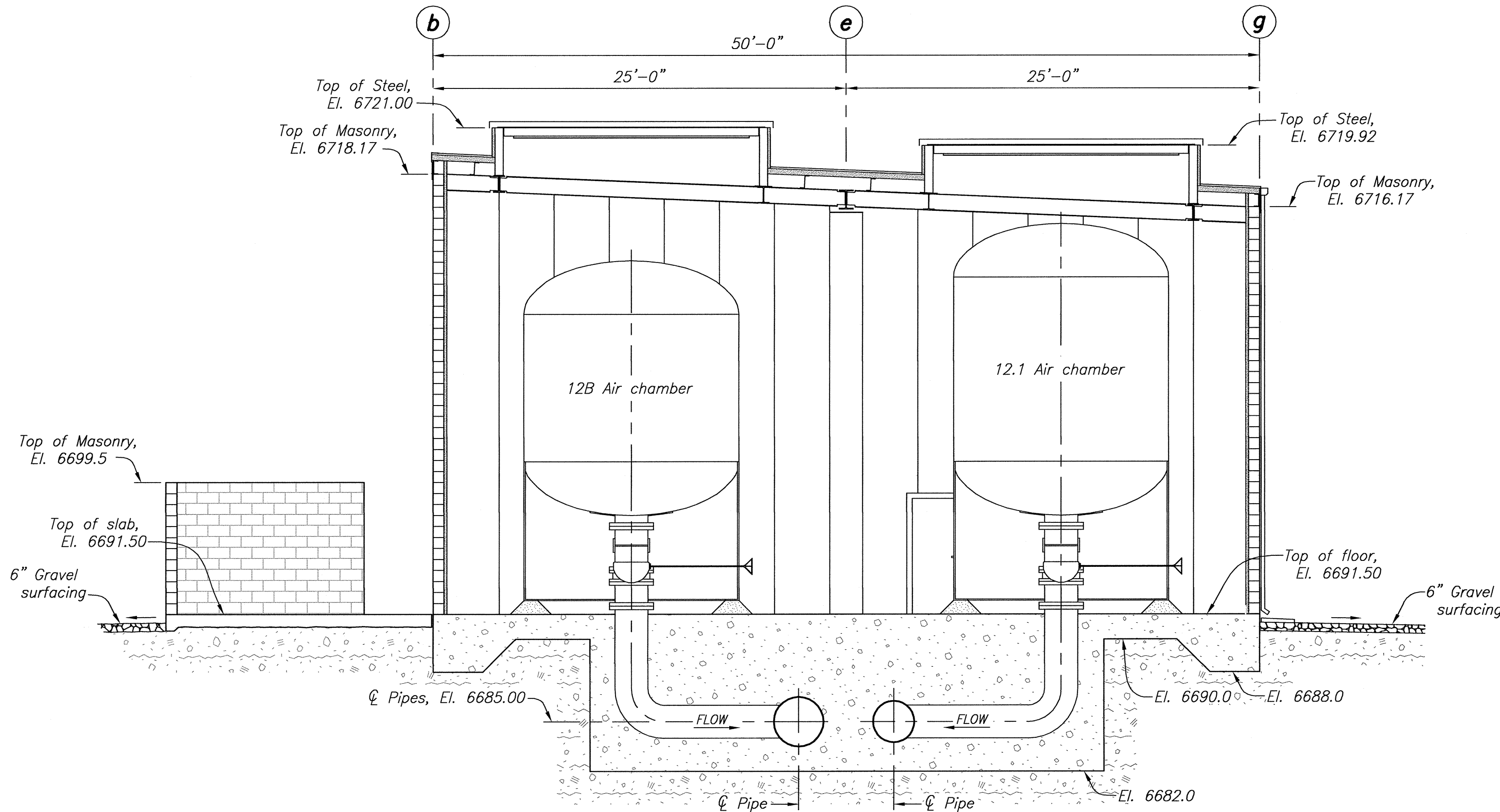
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PLAN	1695-D-99
SECTIONS	1695-D-100
PUMPING PLANT	
ARCHITECTURAL	1695-D-110 THRU 1695-D-118 AND 1695-D-195
GENERAL ARRANGEMENT	1695-D-119 THRU 1695-D-122
CONCRETE OUTLINE	1695-D-123 THRU 1695-D-125
REINFORCEMENT DESIGN	1695-D-127 THRU 1695-D-130
STRUCTURAL STEEL	1695-D-131 THRU 1695-D-136 AND 1695-D-138 THRU 1695-D-145
MASONRY	1695-D-146 THRU 1695-D-151
MISCELLANEOUS METALWORK	
GUARD POST	1695-D-190
TRENCH COVERS	1695-D-191
MECHANICAL EQUIPMENT	
STEEL MANIFOLDS	1695-D-208 THRU 1695-D-213
AIR CHAMBERS	1695-D-220 THRU 1695-D-223
BRIDGE CRANE	1695-D-257
AIR CHAMBER SUMP LIFT STATION	1695-D-260
FLOOR DRAINS	1695-D-261
AUXILIARY PIPING	1695-D-262 THRU 1695-D-264
ON-SITE SEWAGE DISPOSAL SYSTEM	1695-D-182 THRU 1695-D-184
HEATING, VENTILATING AND AIR CONDITIONING SYSTEM	1695-D-269 THRU 1695-D-272
ELECTRICAL INSTALLATION	
MAIN PUMPING UNIT CONTROLS	1695-D-231
CONDUIT PLAN	1695-D-248 THRU 1695-D-249
WIRING DEVICES	1695-D-293
INTERIOR LIGHTING	1695-D-291
SECURITY CAMERAS AND EXTERIOR / EMERGENCY LIGHTING	1695-D-292
GROUNDING SYSTEM	1695-D-242

NOTES

- For Structural Design Data, see (101) and (102).
- For control point coordinates, see (100).
- All vertical elevations are based on NAVD88 vertical datum.
- Final Build-Out refers to the overall completion of the phased project. Additional design and specifications will be required to reach Final Build-Out. For the Interim design pertaining to this specification, see (119).



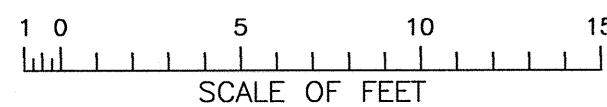
SECTION 1-1 (119, 120)
TRANSVERSE SECTION THRU PUMPING PLANT



SECTION 2-2 (119, 120)
TRANSVERSE SECTION THRU AIR CHAMBER ENCLOSURE

NOTES

1. For Structural Design Data, see (101) and (102).
2. For Reference Drawings, see (119).
3. For foundation excavation requirements, see (108).



DESIGNED: *K. O'Sh*
DRAWN: *R. D. VanOrman*
CHECKED: *R. D. VanOrman, P.E.*
TECH. APPR.: *R. D. VanOrman*
APPROVED: *R. D. VanOrman*
PLANT STRUCTURES GROUP
DENVER, COLORADO 2013-08-05

GENERAL ARRANGEMENT
SECTIONS 1-1 AND 2-2

1695-D-121

SHEET 1 OF 1

CAD SYSTEM: AutoCAD 19.0s
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PLOTTED BY: KOSHEA

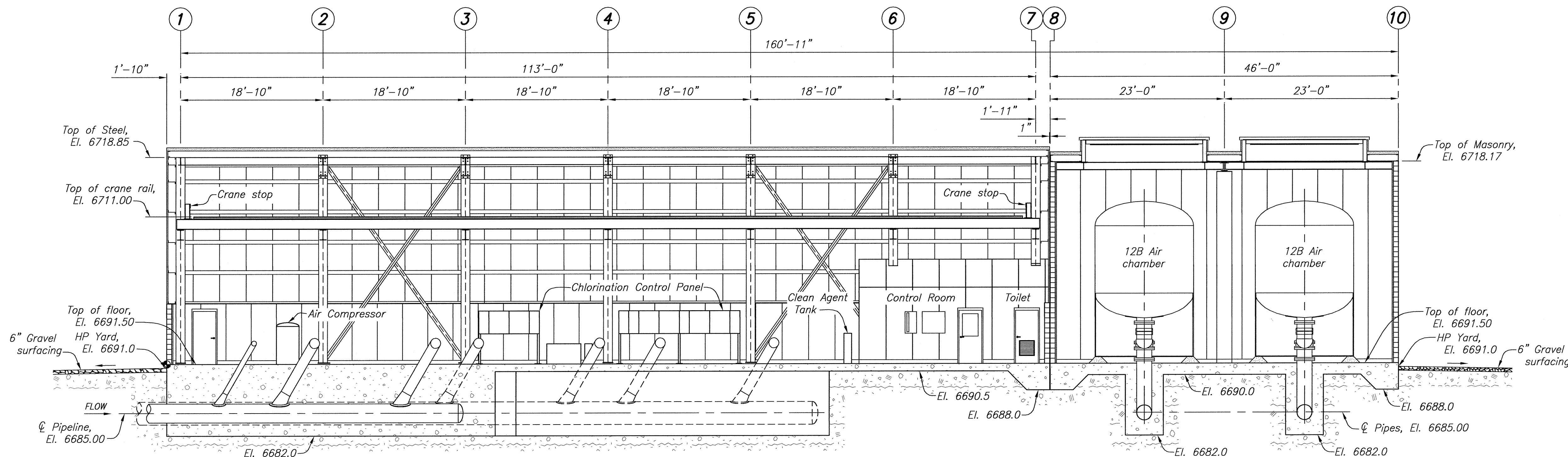
DESIGNED *K. J. G. S.*
DRAWN *R. D. K. S.*
CHECKED *R. S. M. S.*
TECH. APPR. *B. D. VanOrman, P.E.*
APPROVED *[Signature]*
PLANT STRUCTURES GROUP

DENVER, COLORADO 2013-08-05

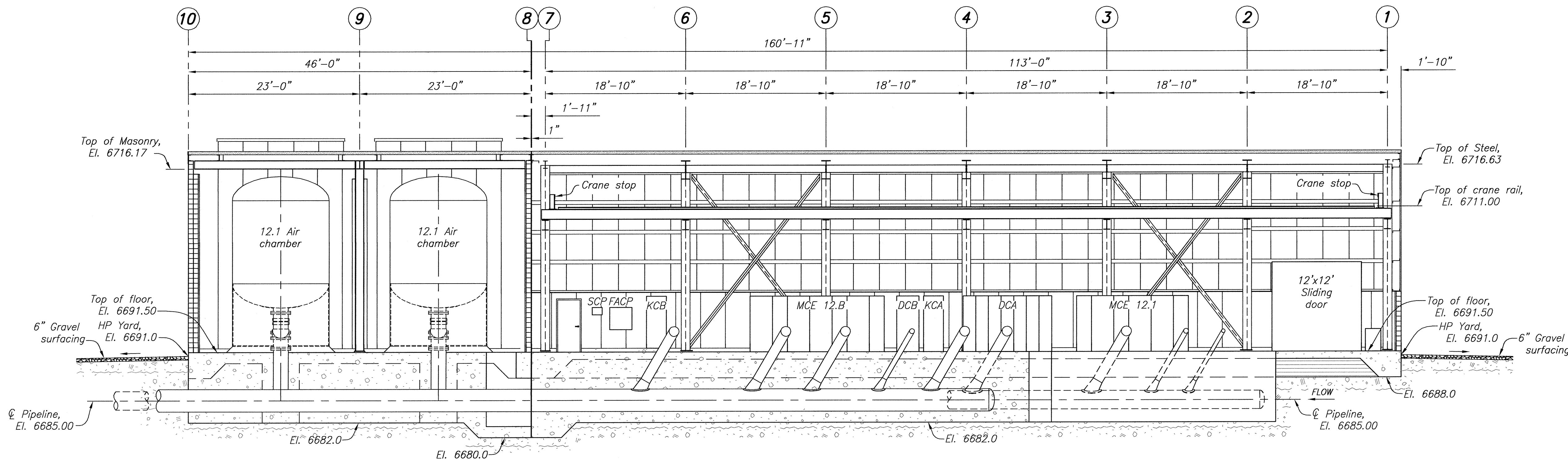
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SECTIONS 3-3 AND 4-4**

1695-D-122

SHEET 1 OF 1



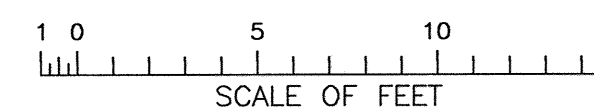
SECTION 3-3 (119, 120)
LONGITUDINAL SECTION ALONG a-LINE AND b-LINE WALLS



SECTION 4-4 (119, 120)
LONGITUDINAL SECTION ALONG f-LINE AND g-LINE WALLS

NOTES

1. For Structural Design Data, see (101) and (102).
2. For Reference drawings, see (119).
3. For foundation excavation requirements, see (108).



DATE AND TIME PLOTTED
AUGUST 3, 2013 08:50
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KOSHEA

CAD SYSTEM
AutoCAD Rev. 19.03
CAD FILENAME
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DESIGNED - J. NEUMAIER

DRAWN - J. NEUMAIER

CHECKED - C. TOBIN

TECH. APPR. K. OSHEA, P.E.

APPROVED - A. BERNSTEIN

PLANT STRUCTURES GROUP

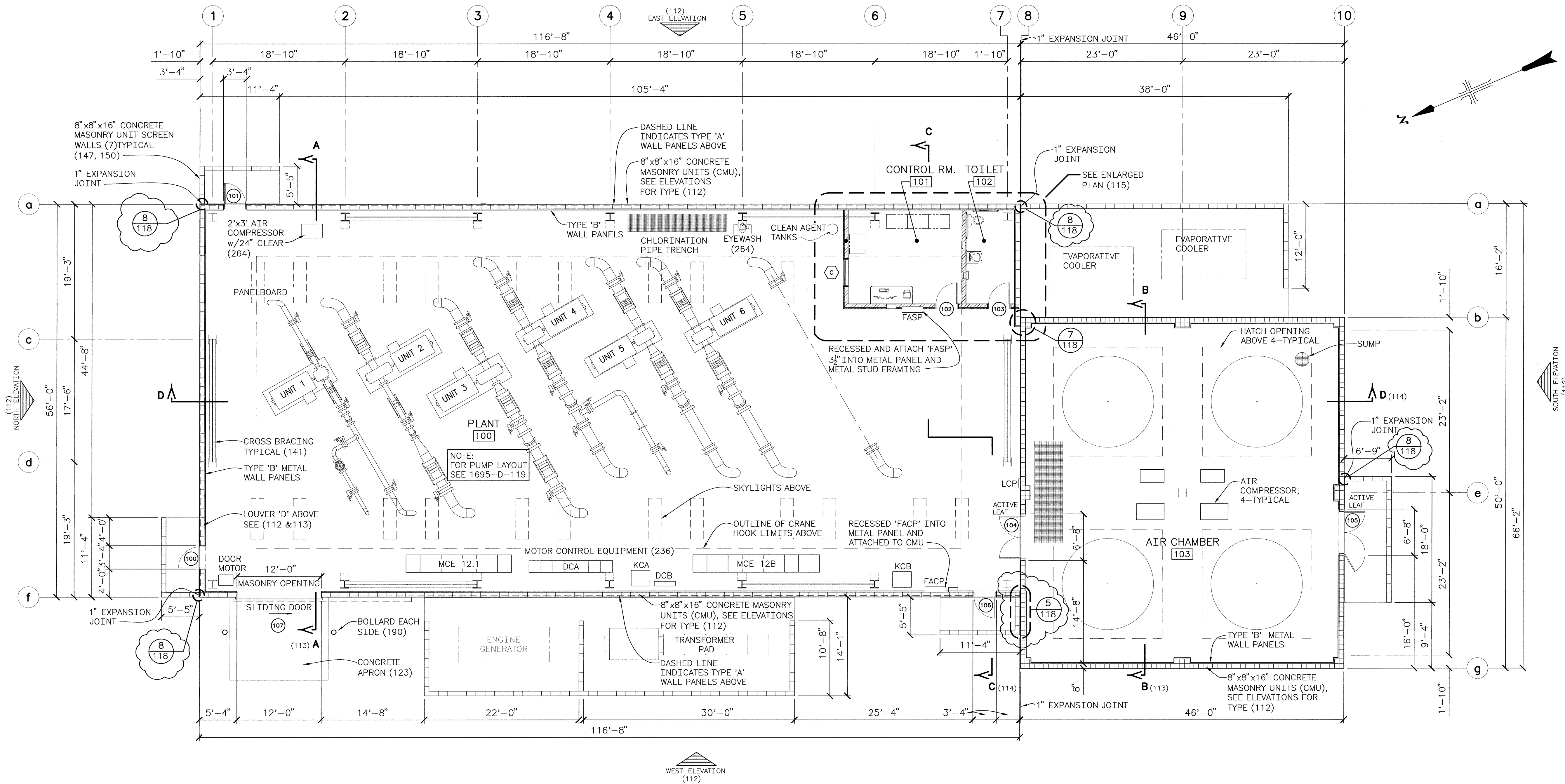
DENVER, COLORADO

2013 08 05

FLOOR PLAN AND
SCHEDULES

1695-D-110

SHEET 1 OF 1

FLOOR PLAN
(111, 147, 150)

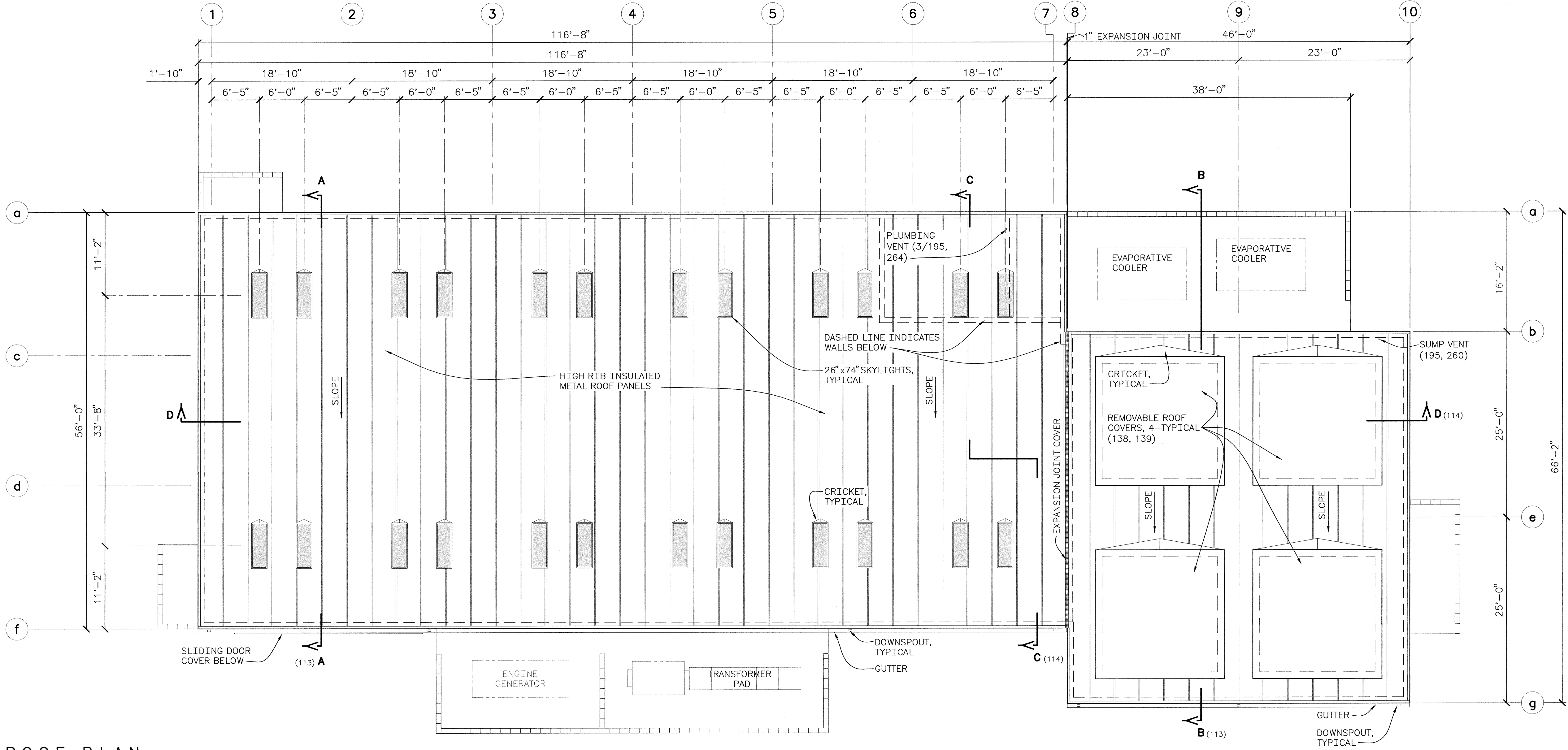
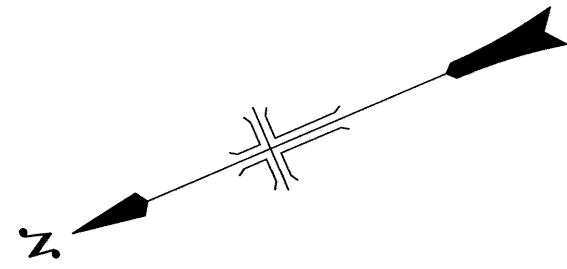
LEGEND

999	ROOM SYMBOL		METAL INSULATED STUD WALLS WITH 8" GYPSUM BOARD EACH SIDE
X	OPENING SYMBOL, WINDOWS AND LOUVERS		METAL INSULATED STUD WALLS WITH 8" GYPSUM BOARD ONE SIDE AND 2" PRE-INSULATED METAL PANEL ON THE OTHER SIDE
000	DOOR SYMBOL		8" CMU WALL WITH 2" PRE-INSULATED METAL PANEL ON THE INTERIOR SIDE
1 & a	BUILDING LINE SYMBOLS		8" CMU WALL 8' HIGH WITH 2" PRE-INSULATED METAL PANEL ON THE INTERIOR SIDE AND 2" PRE-INSULATED METAL PANEL ON THE EXTERIOR SIDE ON TOP OF THE CMU WALL
	ELEVATION SYMBOL		
	FLOOR GRATING		
	STEEL FRAME COLUMN AND CROSS BRACING		

ARCHITECTURAL GENERAL NOTES

- ALL DIMENSIONS ARE TO FACE OF BUILDING GIRT, FACE OF STUD, FACE OF CONCRETE MASONRY UNIT (CMU), CENTERLINE OF COLUMN, CENTERLINE OF DOOR, OR CENTERLINE OF WINDOW, CENTERLINE OF STEEL, UNLESS OTHERWISE NOTED ON DRAWING.
- ALL SEALANTS, GASKETS AND SEALING MATERIALS MAY NOT BE SHOWN, BUT SHALL BE APPLIED AS RECOMMENDED AND REQUIRED BY ROOF AND WALL PANEL MANUFACTURER FOR CONSISTENT WEATHERPROOFING.
- DETAILS SHOWN ON DRAWINGS MAY REQUIRE ADJUSTMENTS TO ACCOMMODATE PANEL MANUFACTURER'S STANDARD DETAILS. CONTRACTOR SHALL COORDINATE WITH PANEL MANUFACTURER ON ROOF/WALL PANEL DETAILS AND SUBMIT ACCEPTABLE DETAILS FOR APPROVAL PRIOR TO CONSTRUCTION.
- FOR EYEWASH/SHOWERS SEE DRAWING 1695-D-262 THRU 264.
- THE NUMBER OF DOWNSPOUTS AND THEIR LOCATION ON THE BUILDING TO BE CONTRACTOR DESIGNED. PRECAST CONCRETE SPLASH BLOCKS TO BE INSTALLED AT LOCATIONS WHERE DOWNSPOUTS SPILL OUT ON TO GRAVEL, SEE SPECIFICATIONS.
- THE PRE-INSULATED METAL PANELS ARE NOT STRUCTURAL THEREFORE, DO NOT SUPPORT ANY EQUIPMENT, CABLE TRAYS, CABINETS, CONDUITS, EYEWASHES ETC. FROM THE WALL PANELS. SEE DETAIL 2 ON DRAWING 1695-D-159. ANY PENETRATIONS THROUGH THE METAL WALL PANELS MUST BE APPROPRIATELY WEATHER SEALED TO INSURE AIR TIGHTNESS.

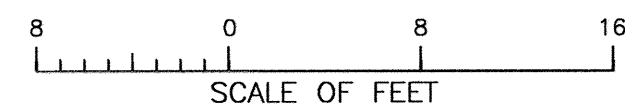
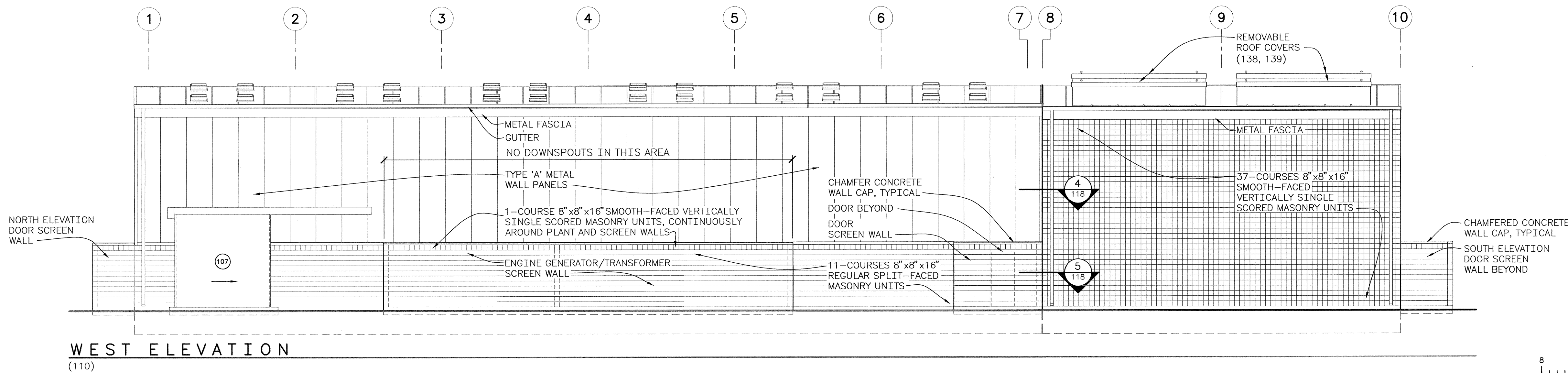
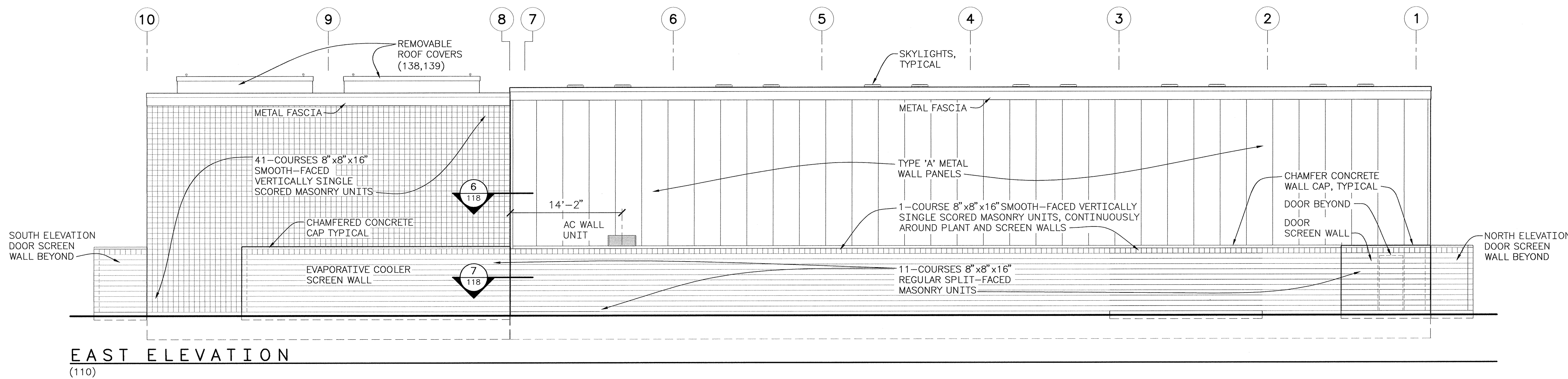
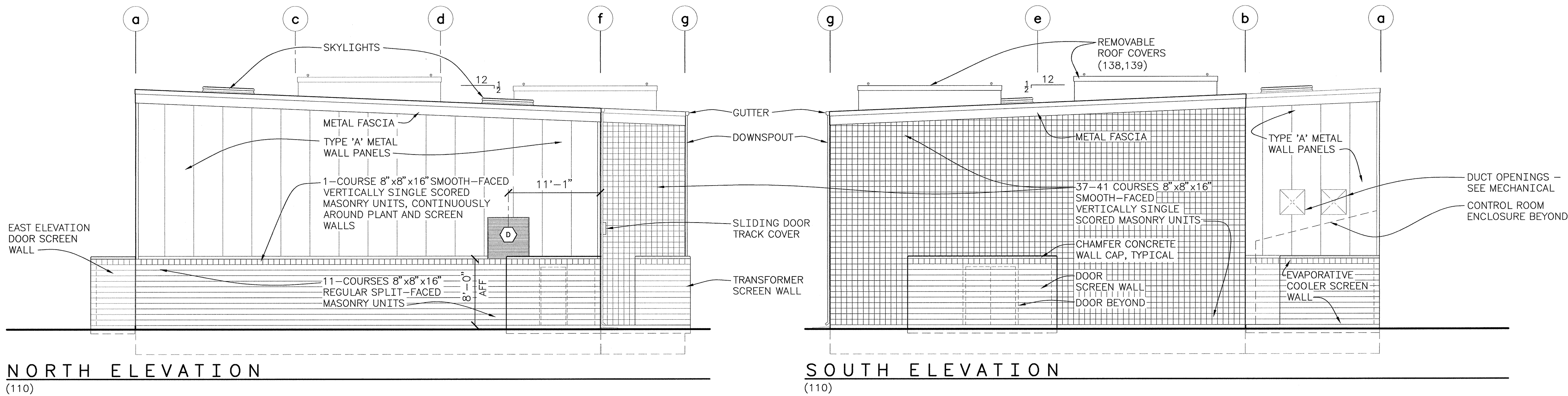
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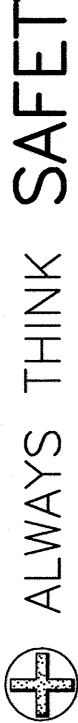
ROOF PLAN
(110)

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AUGUST 5, 2013 14:12
PLOTTED BY
JNEUMER

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U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
NAVAJO GALLUP WATER SUPPLY PROJECT
NEW MEXICO
**SAN JUAN LATERAL
TOHLAKAI PUMPING PLANT**
ARCHITECTURAL
ELEVATIONS

DESIGNED *[Signature]*
DRAWN *[Signature]*
CHECKED *[Signature]*
TECH. APPR. *[Signature]*
APPROVED *[Signature]*
PLANT STRUCTURES GROUP
DENVER, COLORADO 2013 08 05

ELEVATIONS

1695-D-112

SHEET 1 OF 1

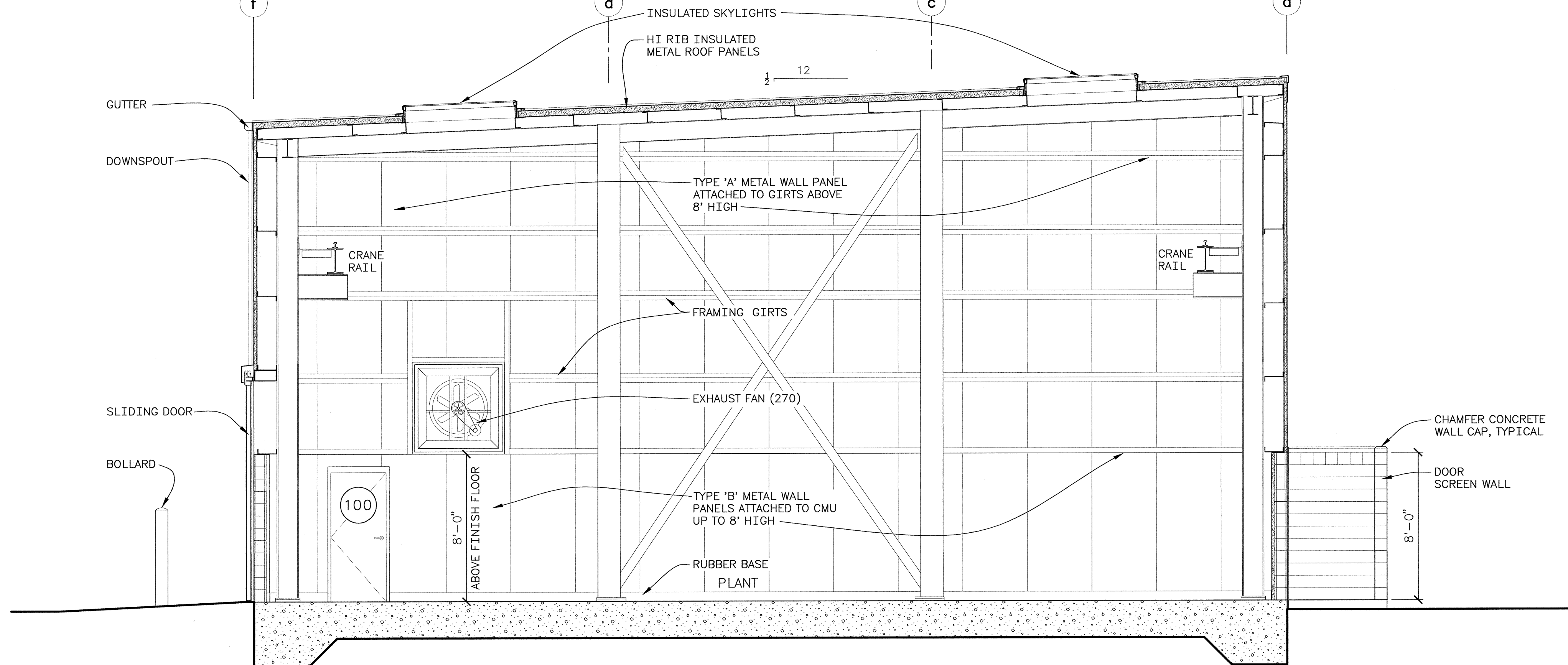
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DATE AND TIME PLOTTED
AUGUST 5, 2013 14:12
PLOTTED BY
JNEUMAYER

DESIGNED *J. Neumann*
DRAWN *J. Neumann*
CHECKED *[Signature]*
TECH. APPR. *R. O'Shea, P.E.*
APPROVED *[Signature]*
PLANT STRUCTURES GROUP
DENVER, COLORADO 2013 08 05

BUILDING SECTIONS
A-A AND B-B

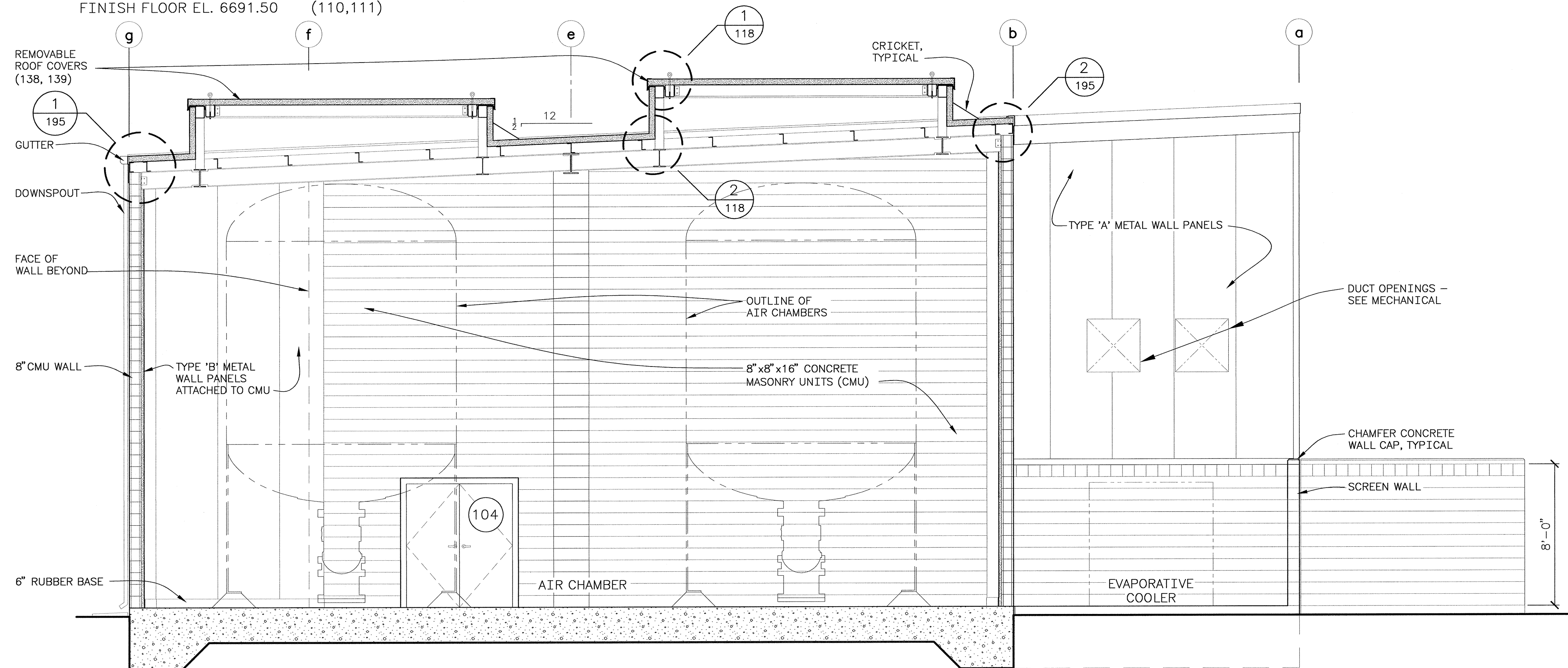
1695-D-113

SHEET 1 OF 1



BUILDING SECTION A-A

FINISH FLOOR EL. 6691.50 (110,111)



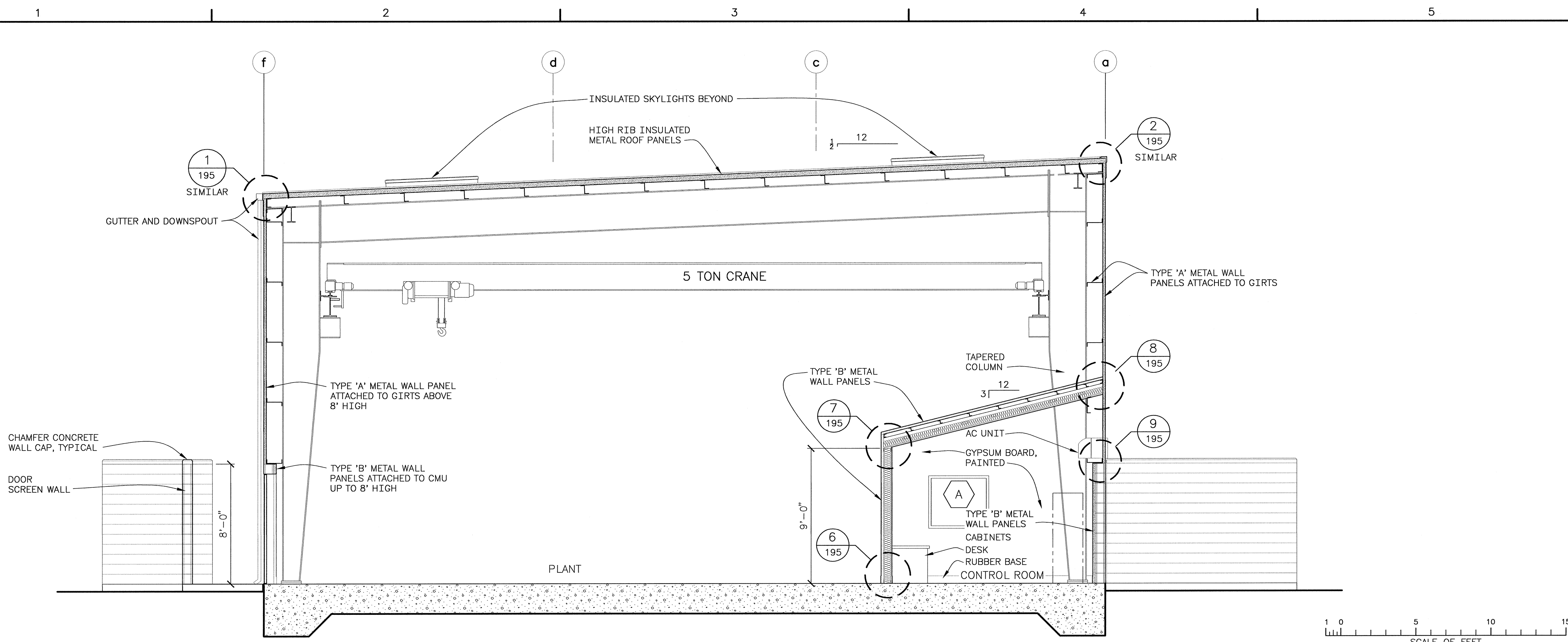
BUILDING SECTION B-B

FINISH FLOOR EL. 6691.50 (110,111)

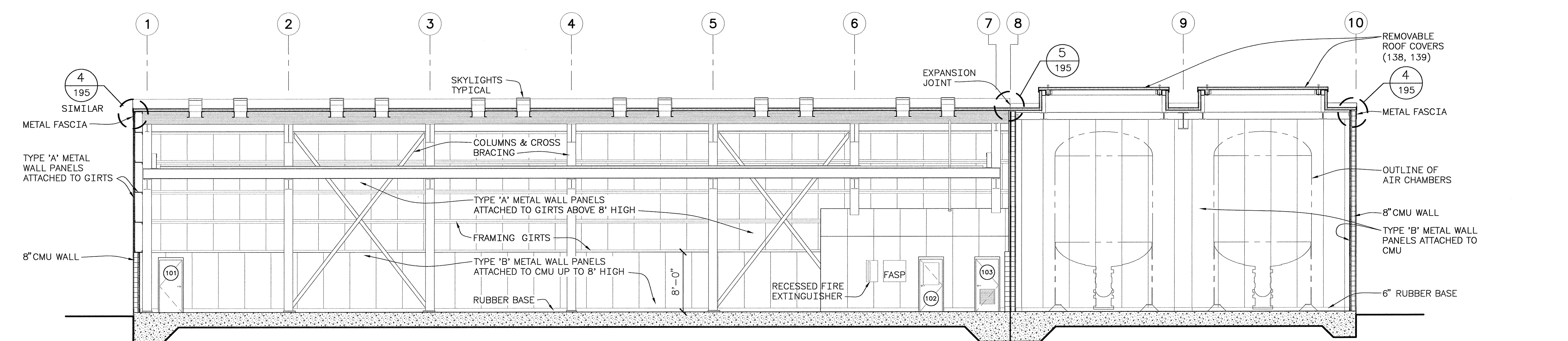
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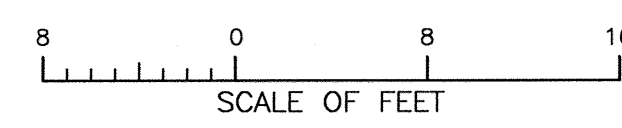
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BUILDING SECTION C-C
FINISH FLOOR EL. 6691.50



BUILDING SECTION D-D
FINISH FLOOR EL. 6691.50 (110,111)



DESIGNED *[Signature]*
DRAWN *[Signature]*
CHECKED *[Signature]*
TECH. APPR. *[Signature]*
APPROVED *[Signature]*
PLANT STRUCTURES GROUP
DENVER, COLORADO 2013 08 05

BUILDING SECTIONS
C-C AND D-D

1695-D-114
SHEET 1 OF 1

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DOOR SCHEDULE										
DOOR NUMBER	SIZE W x H x THK	DOOR		FRAME			DETAIL			REMARKS
		TYPE	MAT'L	TYPE	MAT'L	GROUT	HEAD	JAMB	THRHL	
100	3'-0" x 7'-0" x 1 3/4"	F	STEEL	1	STEEL	YES	H1	J1	T1	EXTERIOR, INSULATED
101	3'-0" x 7'-0" x 1 3/4"	F	STEEL	1	STEEL	YES	H1	J1	T1	EXTERIOR, INSULATED
102	3'-0" x 7'-0" x 1 3/4"	HG	STEEL	3	STEEL		H3	J3	T3	INTERIOR, INSULATED
103	3'-0" x 7'-0" x 1 3/4"	L	STEEL	3	STEEL		H4	J4	T4	INTERIOR, INSULATED
104	(PR) 3'-0" x 7'-0" x 1 3/4"	F	STEEL	2	STEEL	YES	H2	J2	T2	INTERIOR, INSULATED
105	(PR) 3'-0" x 7'-0" x 1 3/4"	F	STEEL	2	STEEL	YES	H2	J2	T2	EXTERIOR, INSULATED
106	3'-0" x 7'-0" x 1 3/4"	F	STEEL	1	STEEL	YES	H1	J1	T1	EXTERIOR, INSULATED
107	12'-0" x 12'-0" SLIDING DOOR		STEEL	EXTERIOR, INDUSTRIAL SLIDING DOOR, LEVEL 3 BULLET RESISTANCE, INSULATED, SEE SPECIFICATIONS & MANUFACTURER'S DRAWINGS FOR MOUNTING DETAILS						

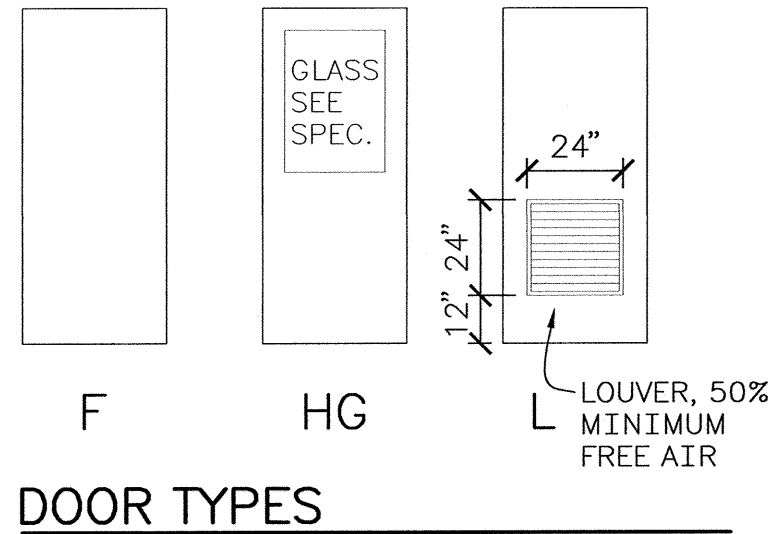
NOTE: DOOR DETAILS ON DRAWING 117

WINDOW SCHEDULE									
WINDOW NUMBER	SIZE WIDTH x HEIGHT	QTY	MATERIAL	FRAME TYPE	DETAIL			GLAZING	REMARKS
					HEAD	JAMB	SILL		
C	48" x 42"	1	STEEL	4	H5	J5	S1	FIXED	EXTERIOR, INSULATED GLASS

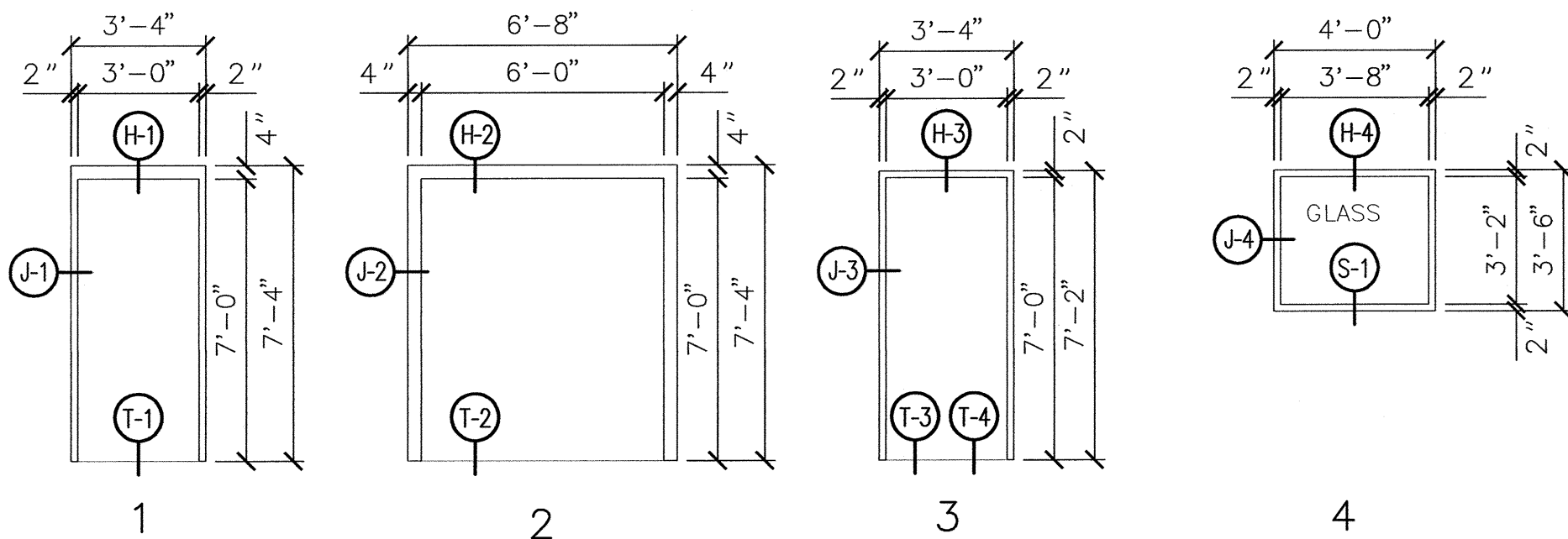
NOTE: WINDOW DETAILS ON DRAWING 117

LOUVER SCHEDULE							
LOUVER NUMBER	SIZE WIDTH x HEIGHT	QTY	DESCRIPTION	DETAIL			REMARKS
				HEAD	JAMB	SILL	
D	60" x 60"	1	EXHAUST	H6	J6	S2	SEE MECHANICAL DRAWINGS AND SPECIFICATIONS

NOTE: DOOR AND LOUVER DETAILS ON DRAWING 117

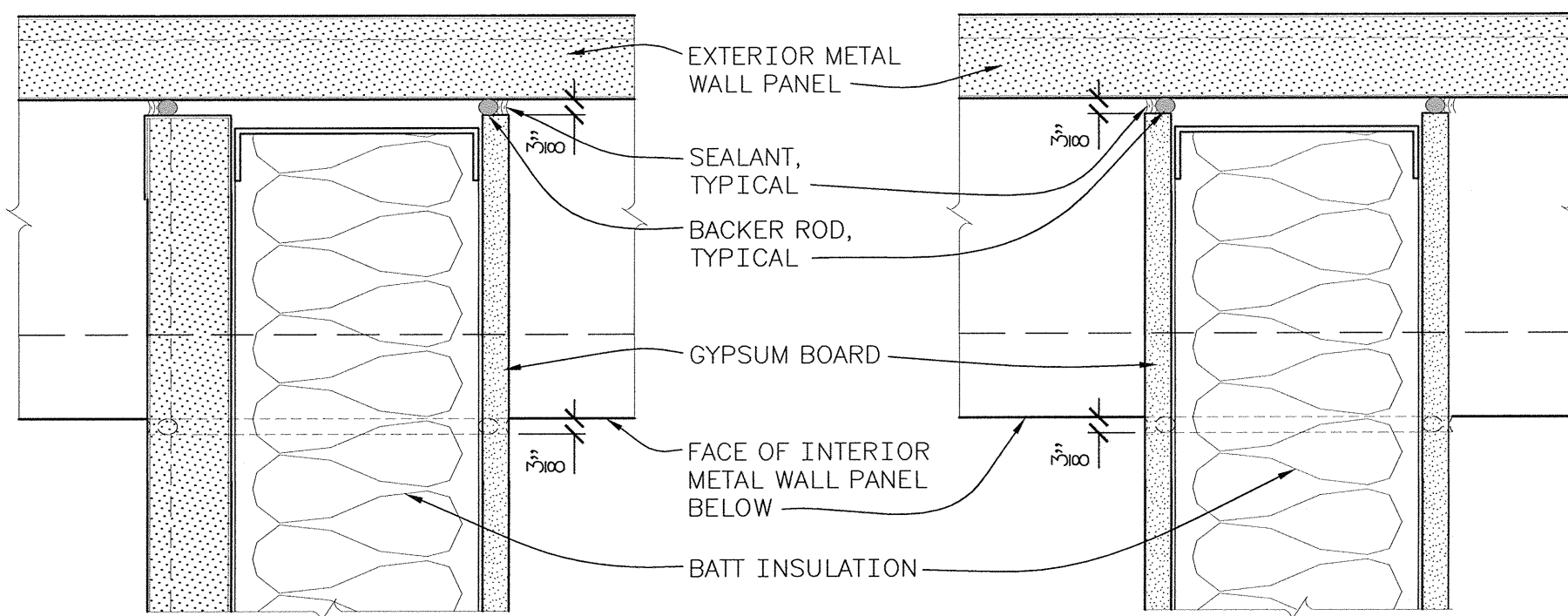


DOOR TYPES



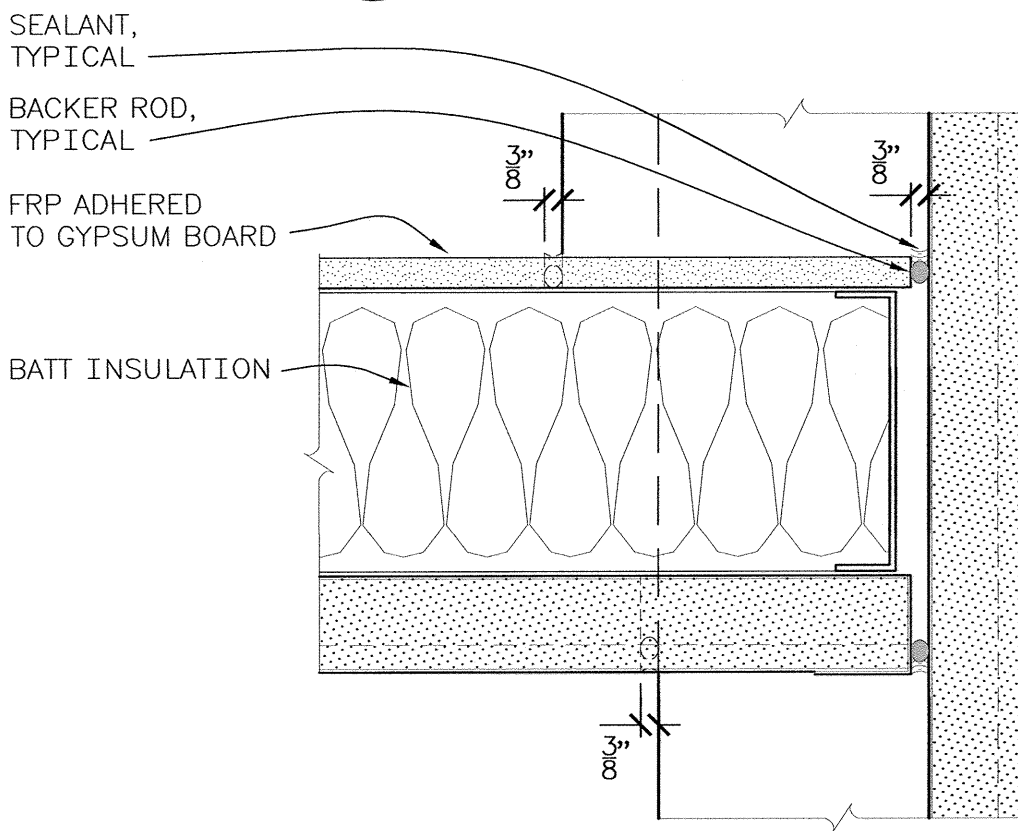
FRAME TYPES

NOTE: DOOR DETAILS ON DRAWING 117

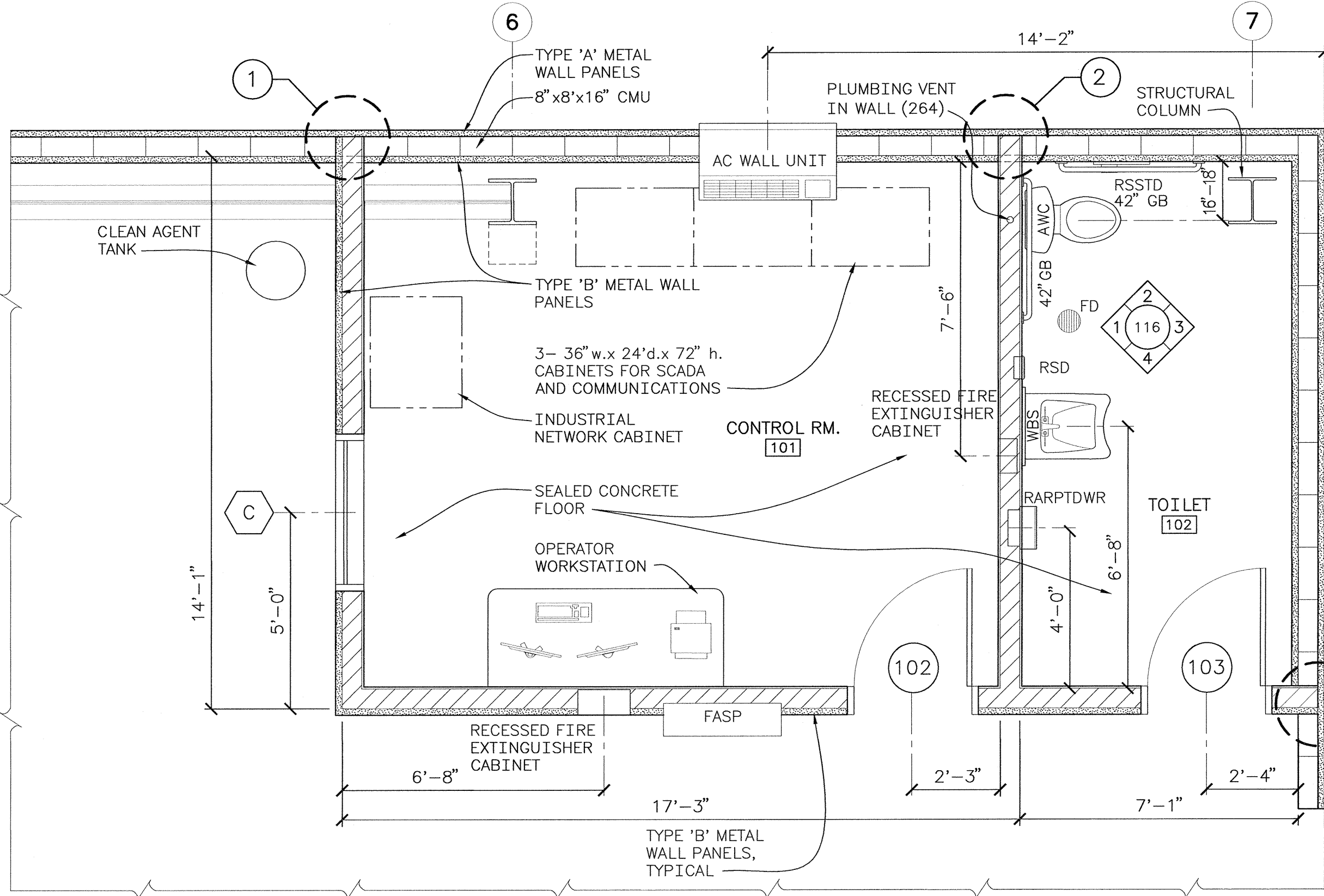
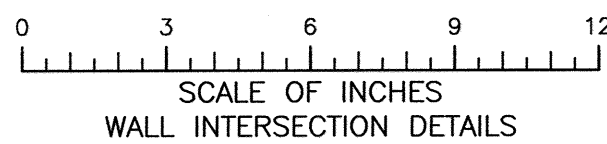


1 DETAIL

2 DETAIL



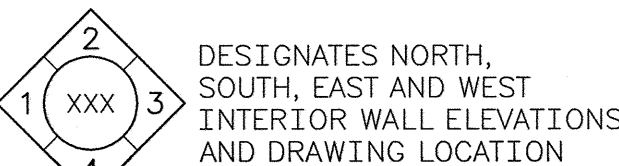
3 DETAIL



ENLARGED PLAN

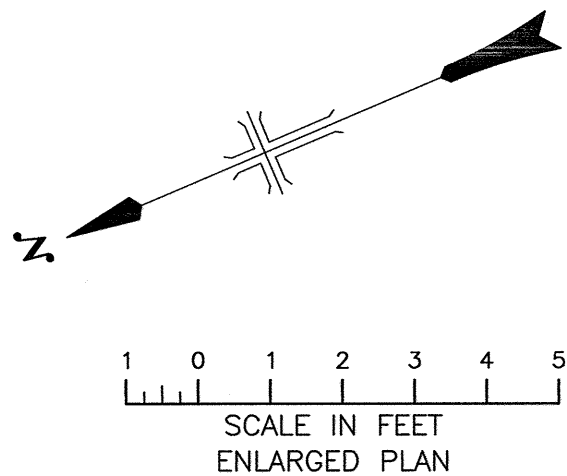
SEE ROOF PLAN (116)

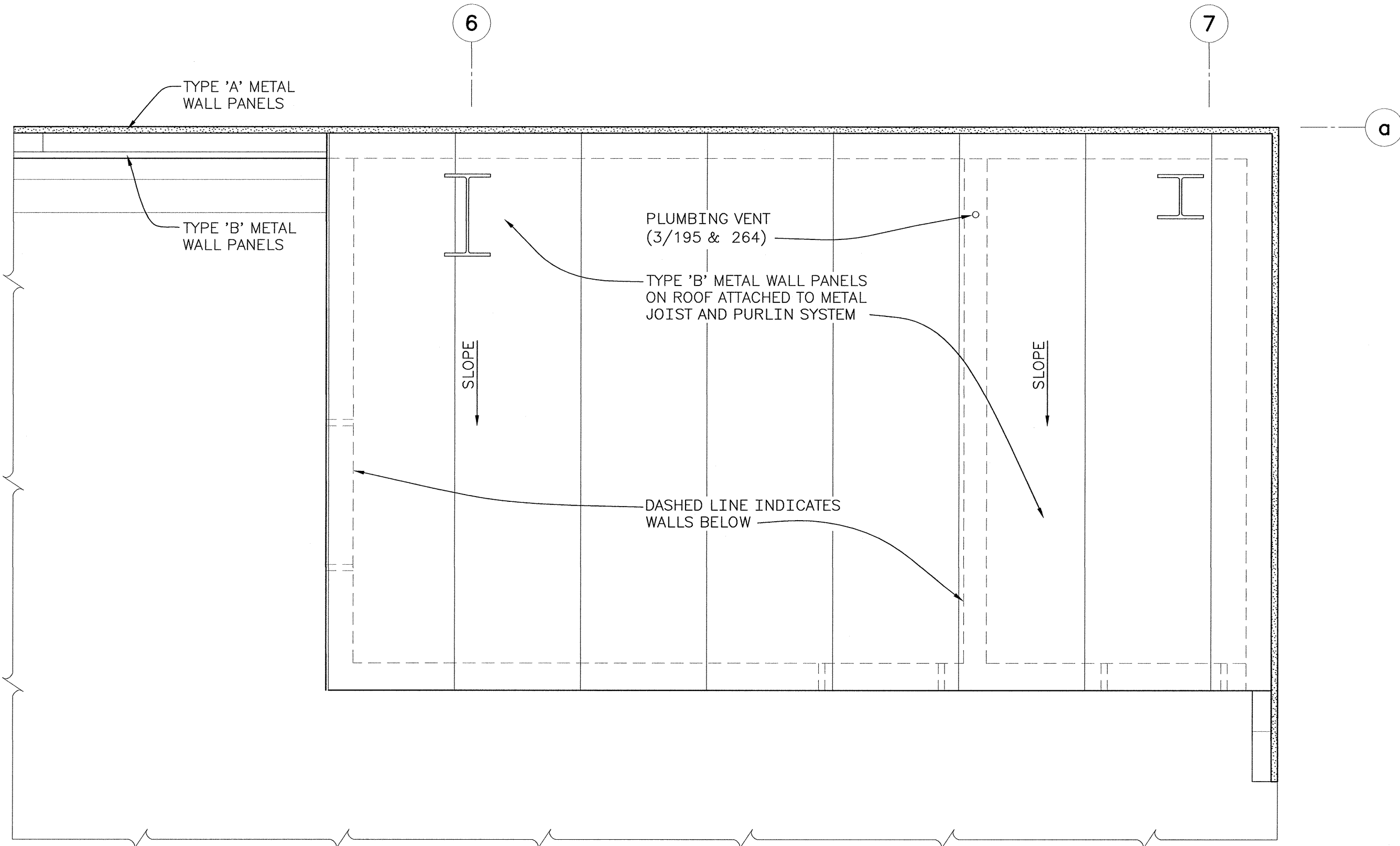
LEGEND



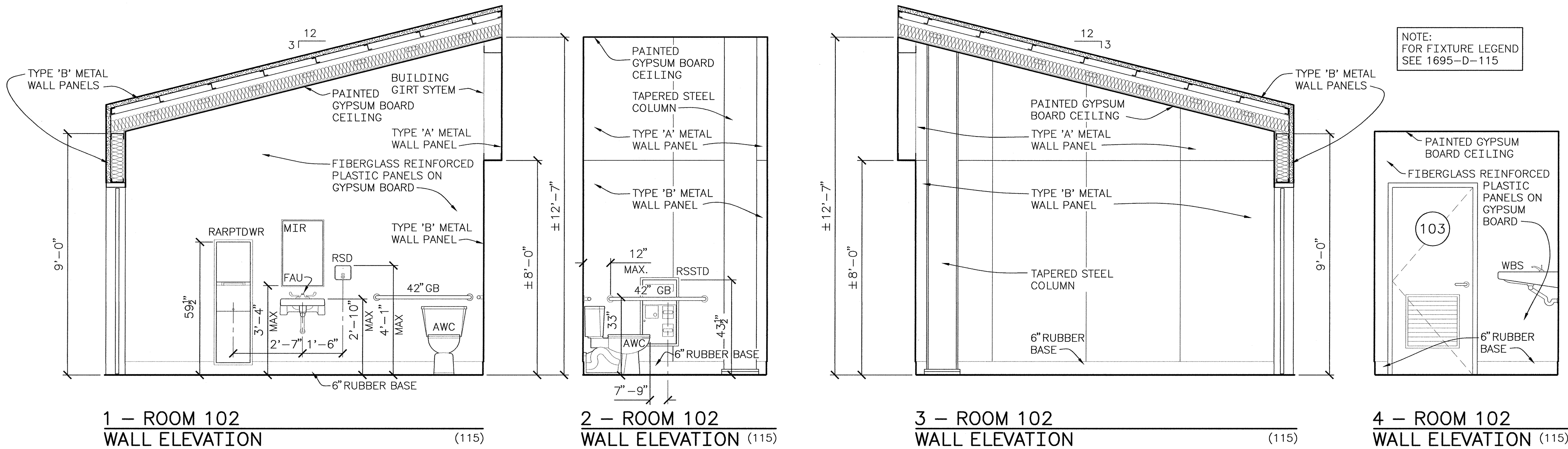
- AWC ACCESSIBLE WATER CLOSET
- FD FLOOR DRAIN
- GB GRAB BAR
- MIR MIRROR
- RARPTDWR RECESSED AUTOMATIC UNIVERSAL ROLL PAPER TOWEL DISPENSER, & WASTE RECEPTACLE
- RSSTD RECESSED SEAT-COVER DISPENSER, SANITARY NAPKIN DISPOSAL, AND TOILET PAPER DISPENSER
- RSD RECESSED SOAP DISPENSER
- FAU FAUCET
- WBS WHEELCHAIR BATHROOM SINK
- SOUND BATT INSULATED METAL STUD WALLS WITH 5/8" GYPSUM BOARD EACH SIDE
- METAL INSULATED STUD WALLS WITH 5/8" GYPSUM BOARD ONE SIDE AND 2" PRE-INSULATED METAL PANEL ON THE OTHER SIDE

NOTES:
ALL WALLS TO BE 6", 20 GA., METAL STUDS AT 16" O.C.
CONTROL ROOM 101 - GYPSUM BOARD WALLS TO BE PAINTED.
TOILET ROOM 102 - GYPSUM BOARD WALLS TO HAVE FIBERGLAS REINFORCED PLASTIC APPLIED AS PER MANUFACTURE'S RECOMMENDATIONS





INTERIOR ROOF PLAN
SEE ENLARGED PLAN (115)



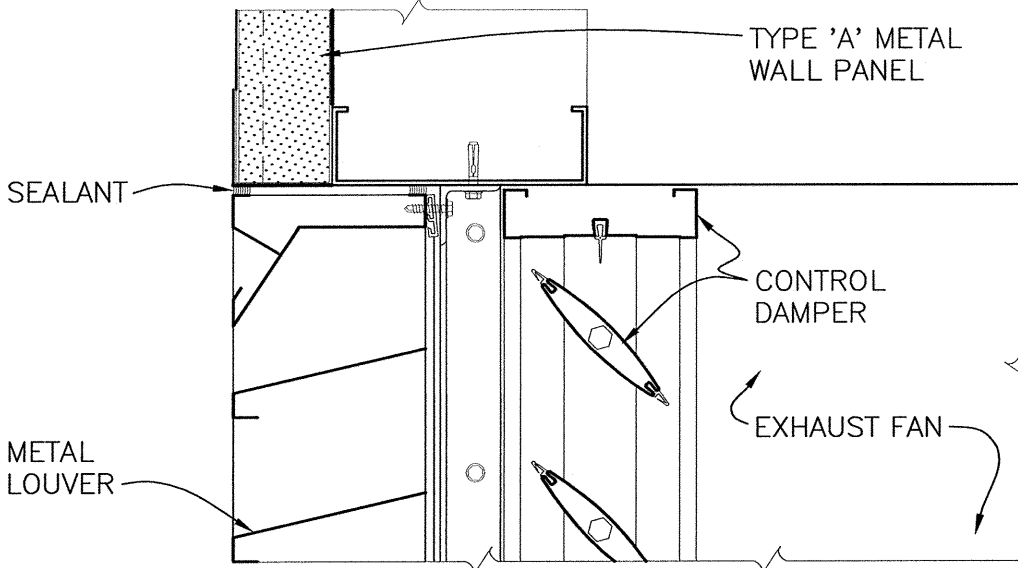
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SCALE IN FEET
ENLARGED PLAN & WALL ELEVATIONS

DESIGNED *[Signature]*
DRAWN *[Signature]*
CHECKED *[Signature]*
TECH. APPR. *[Signature]*
APPROVED *[Signature]*
PLANT STRUCTURES GROUP
DENVER, COLORADO 2013 08 05

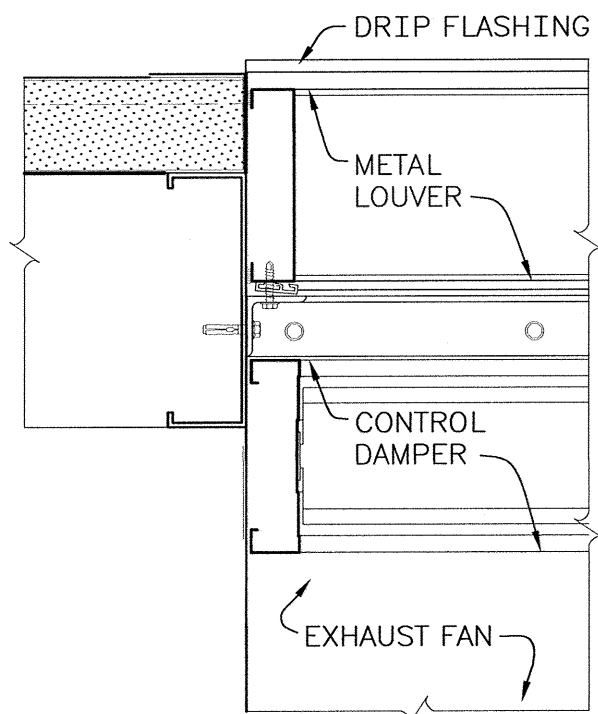
INTERIOR ROOF PLAN
AND WALL ELEVATIONS

1695-D-116

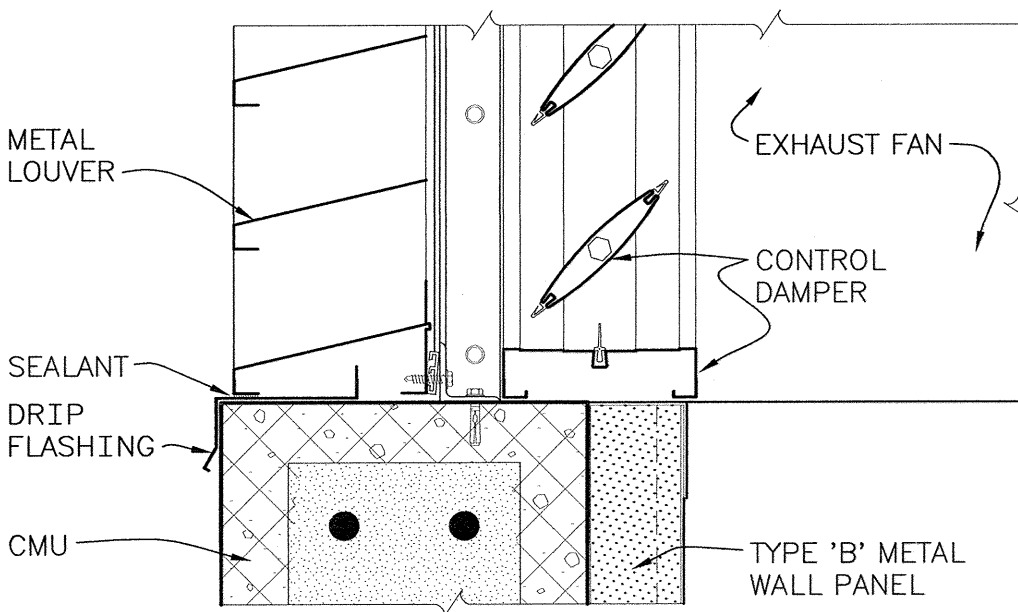
SHEET 1 OF 1



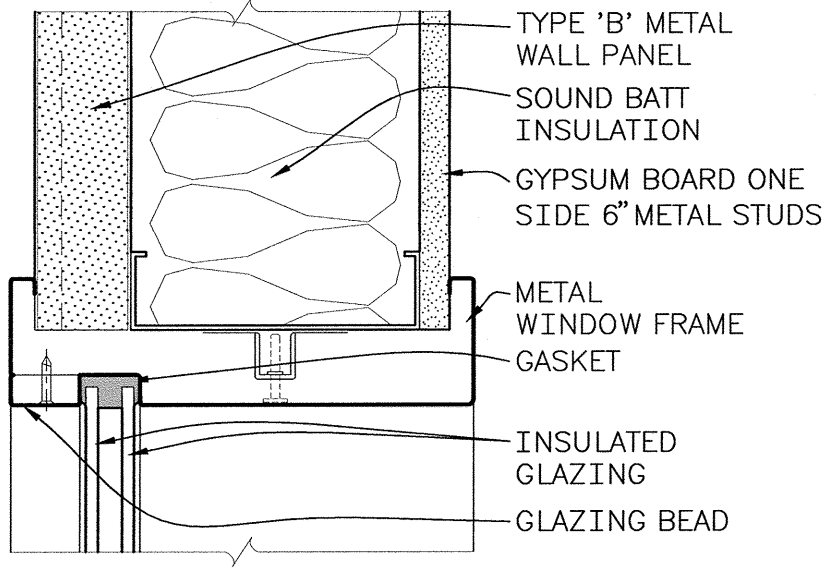
H6 LOUVER HEAD
@ CMU WALL



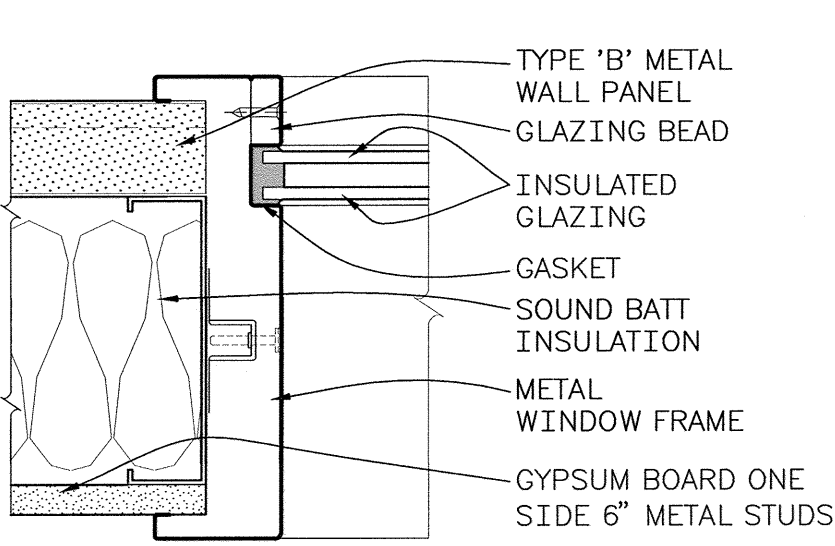
J6 LOUVER JAMB
@ CMU WALL



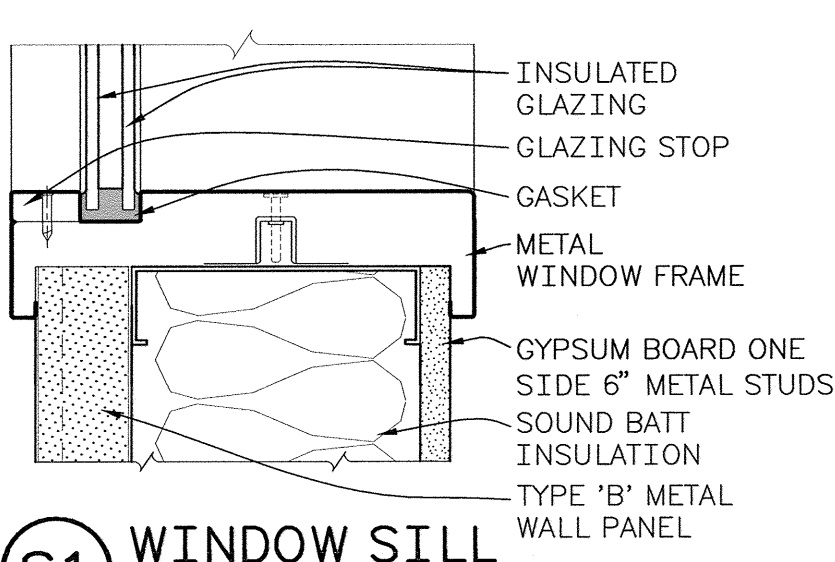
S2 LOUVER SILL
@ CMU WALL



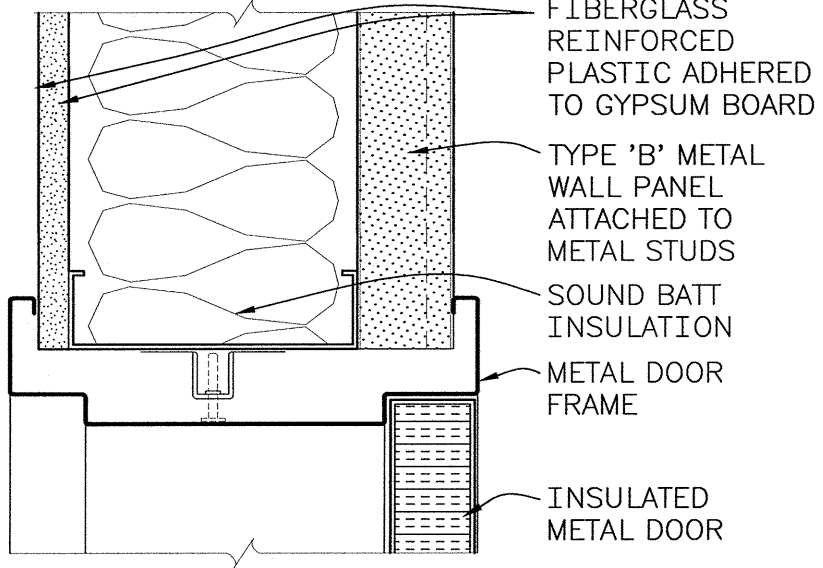
H5 WINDOW HEAD
@ STUD WALL



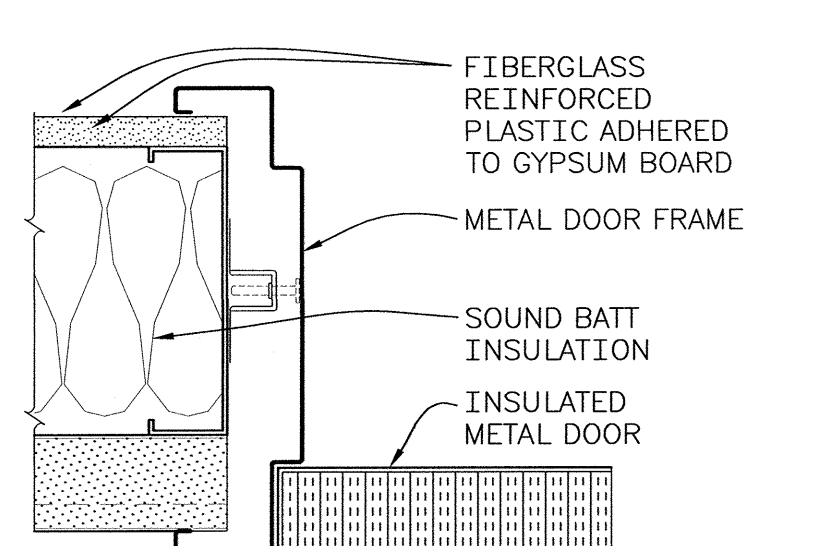
J5 WINDOW JAMB
@ STUD WALL



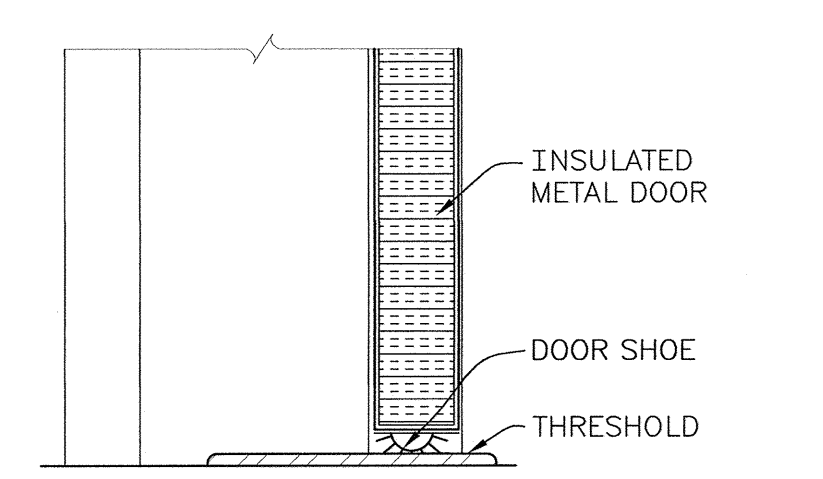
S1 WINDOW SILL
@ STUD WALL



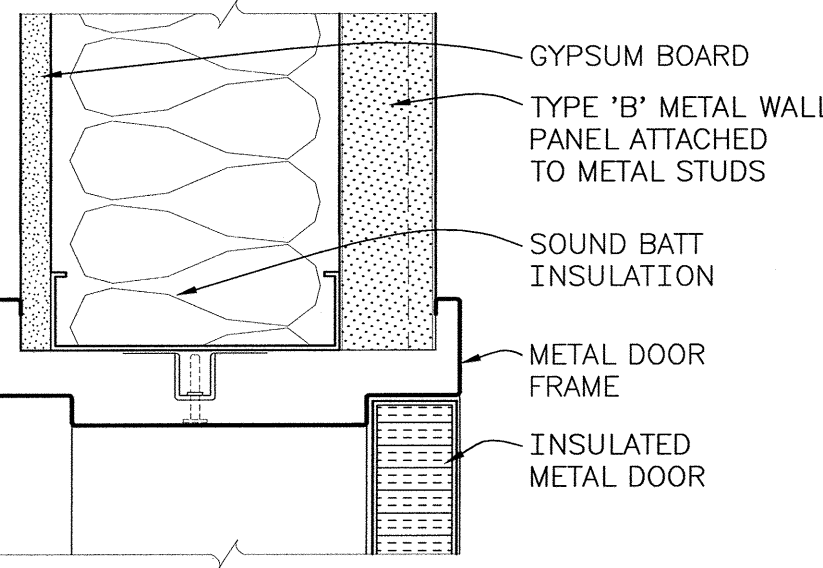
H4 DOOR HEAD
@ STUD WALL



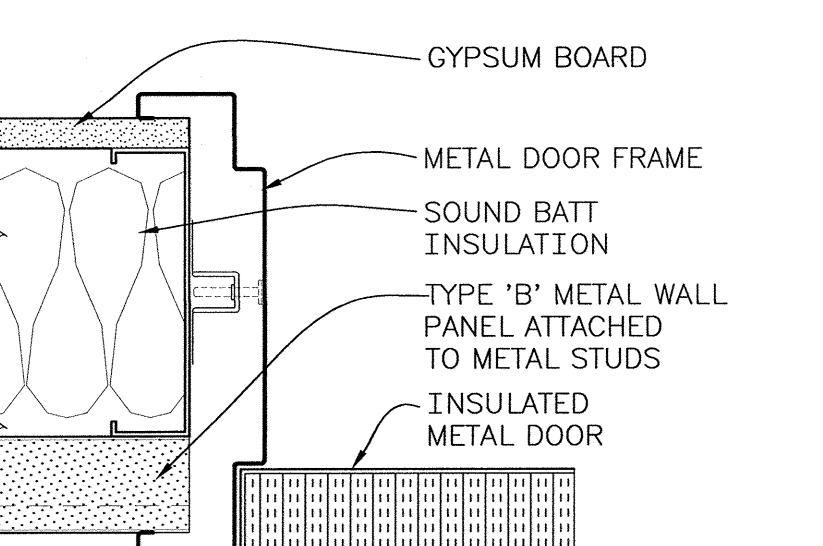
J4 DOOR JAMB
@ STUD WALL



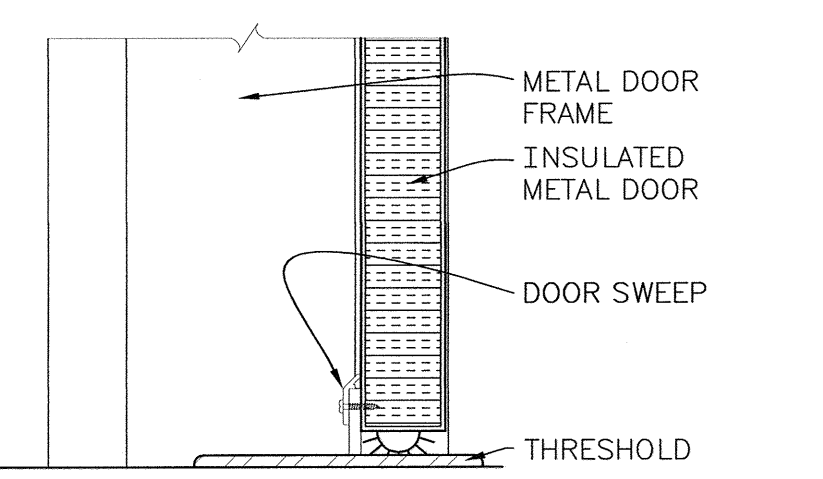
T4 DOOR THRESHOLD
@ STUD WALL



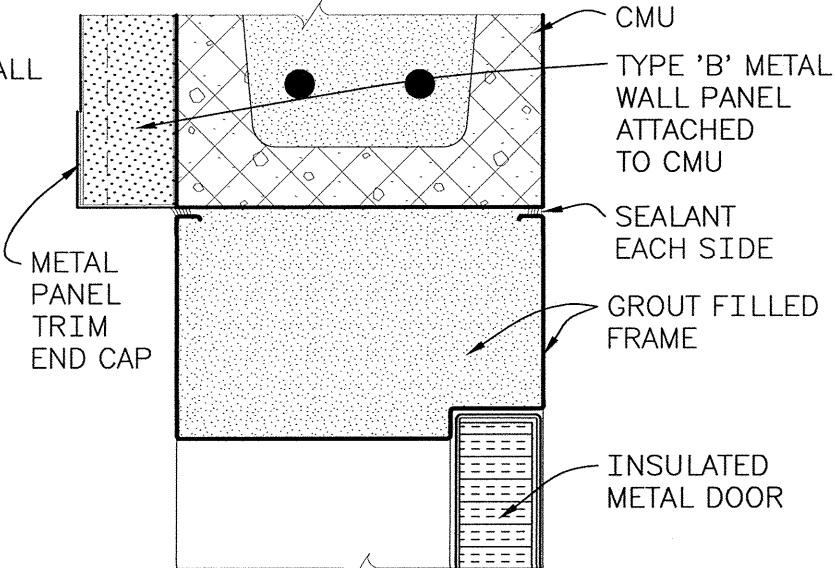
H3 DOOR HEAD
@ STUD WALL



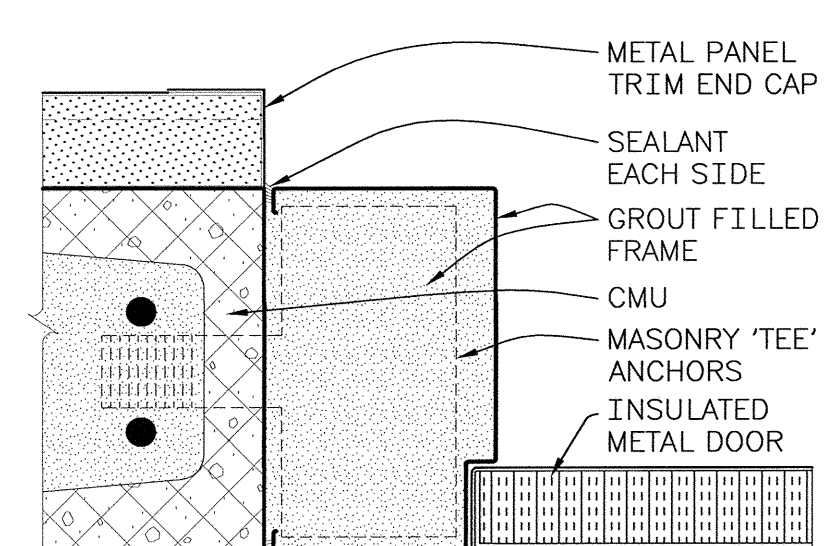
J3 DOOR JAMB
@ STUD WALL



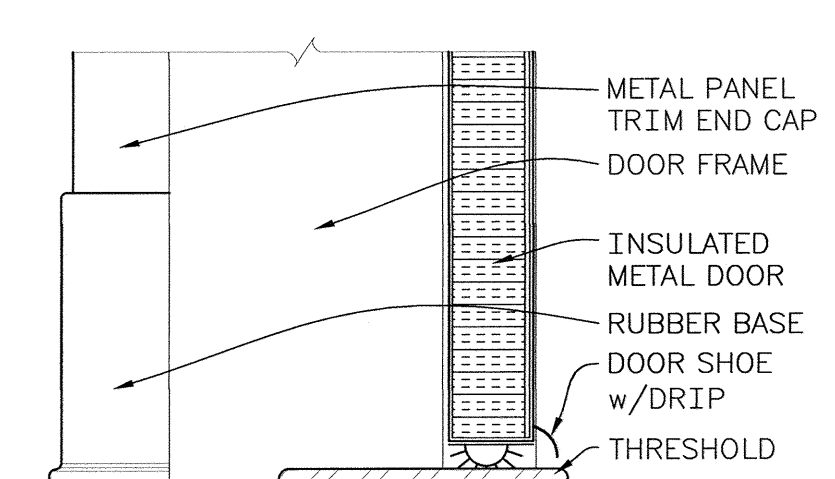
T3 DOOR THRESHOLD
@ STUD WALL



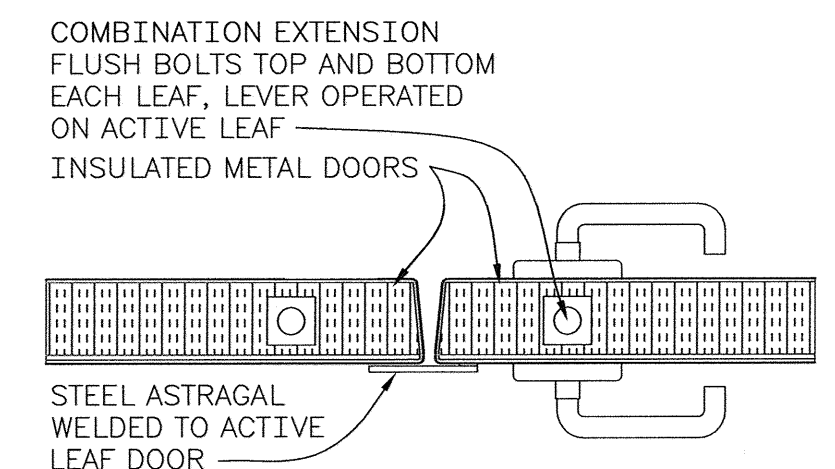
H2 DOOR HEAD
@ CMU WALL



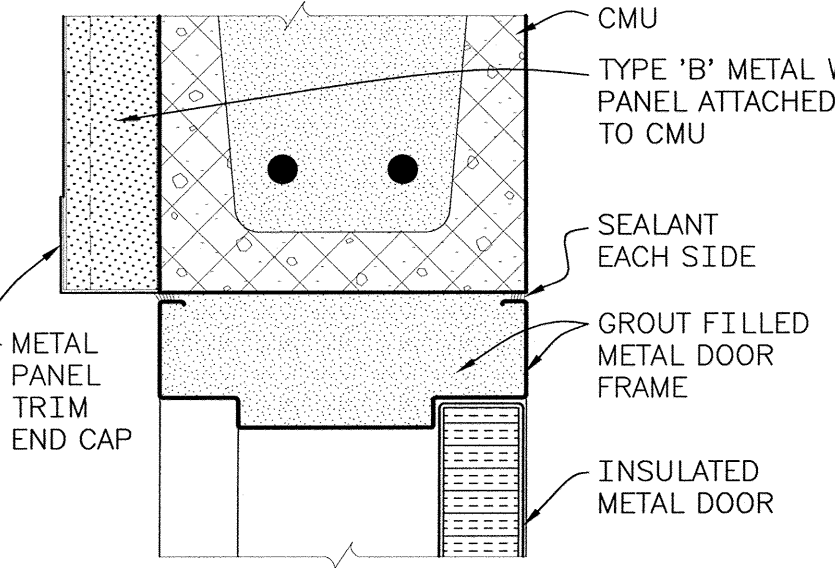
J2 DOOR JAMB
@ CMU WALL



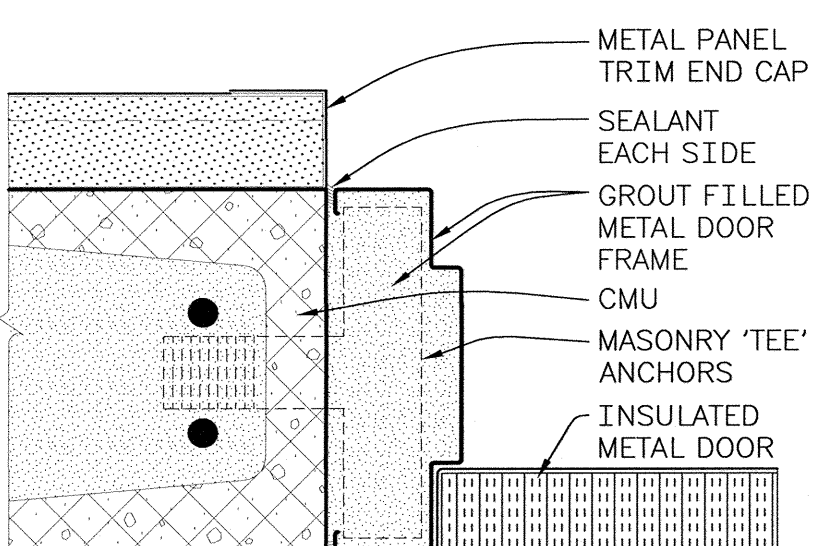
T2 DOOR THRESHOLD
@ CMU WALL



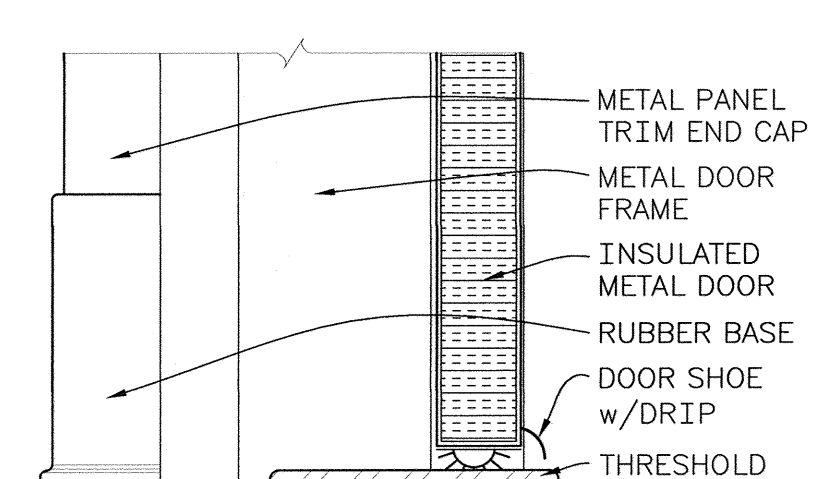
A1 ASTRAGAL WITH
LOCKING BAR LATCH



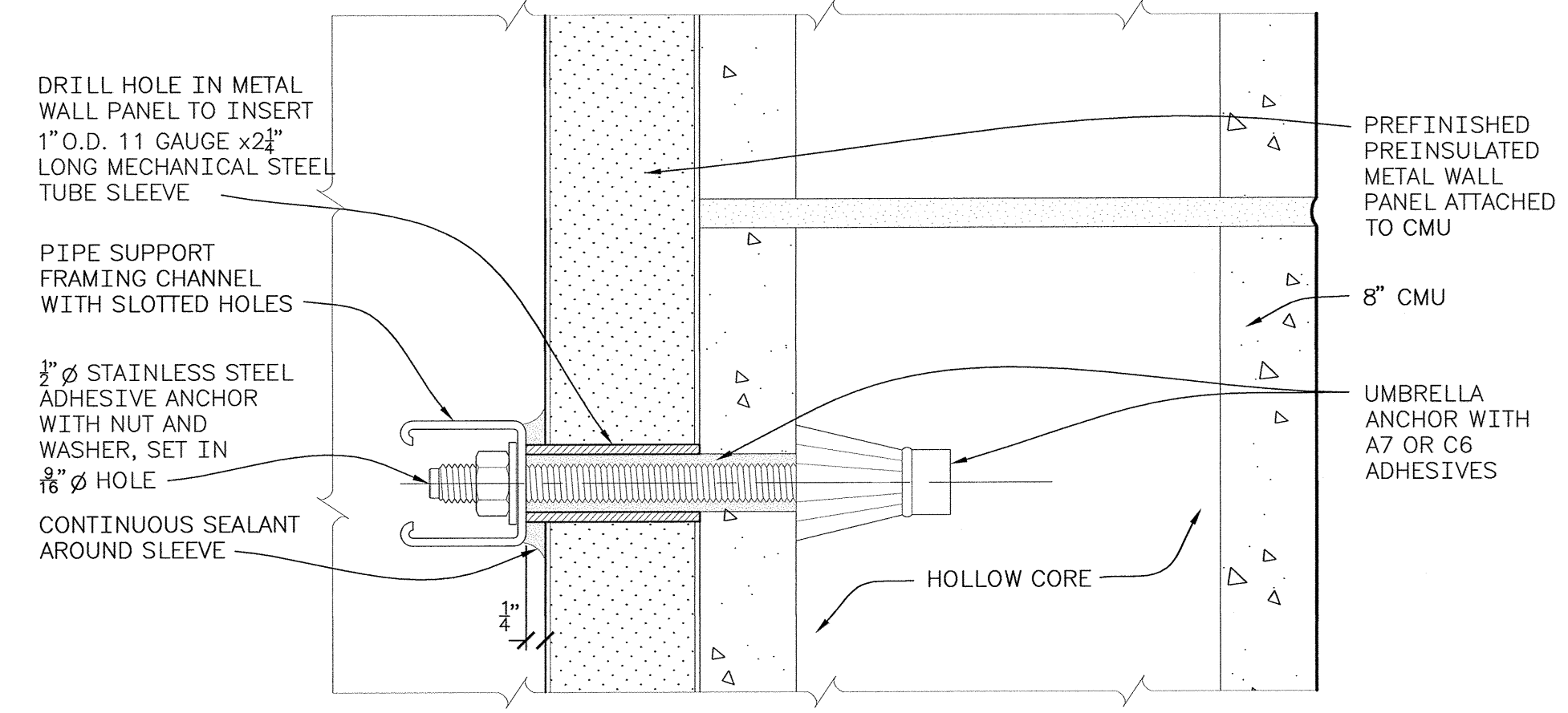
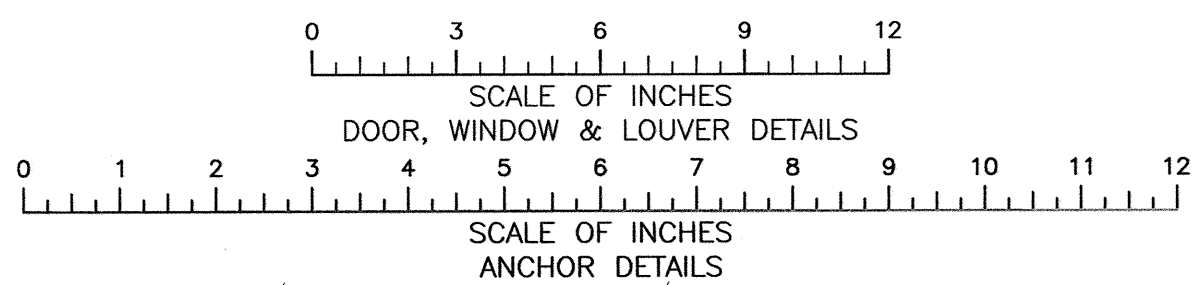
H1 DOOR HEAD
@ CMU WALL



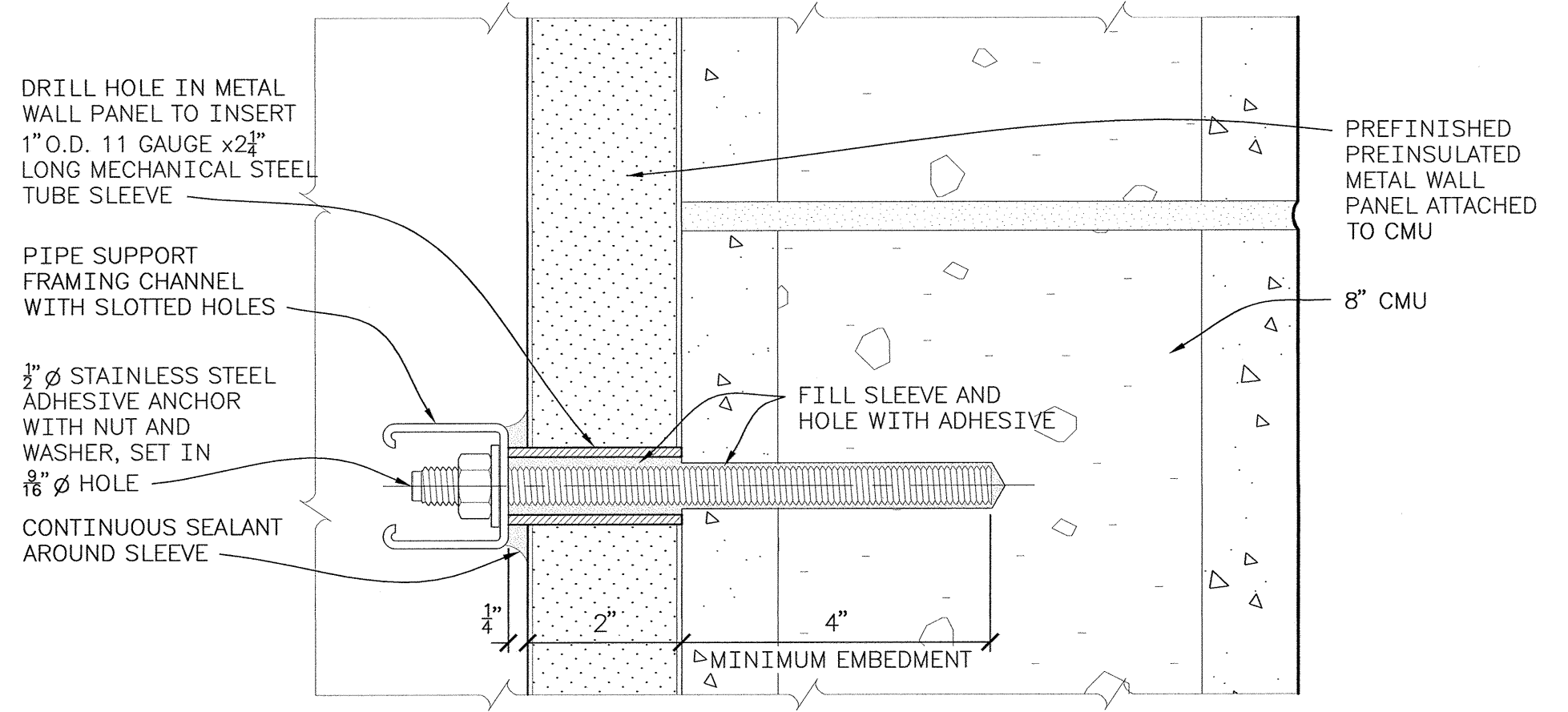
J1 DOOR JAMB
@ CMU WALL



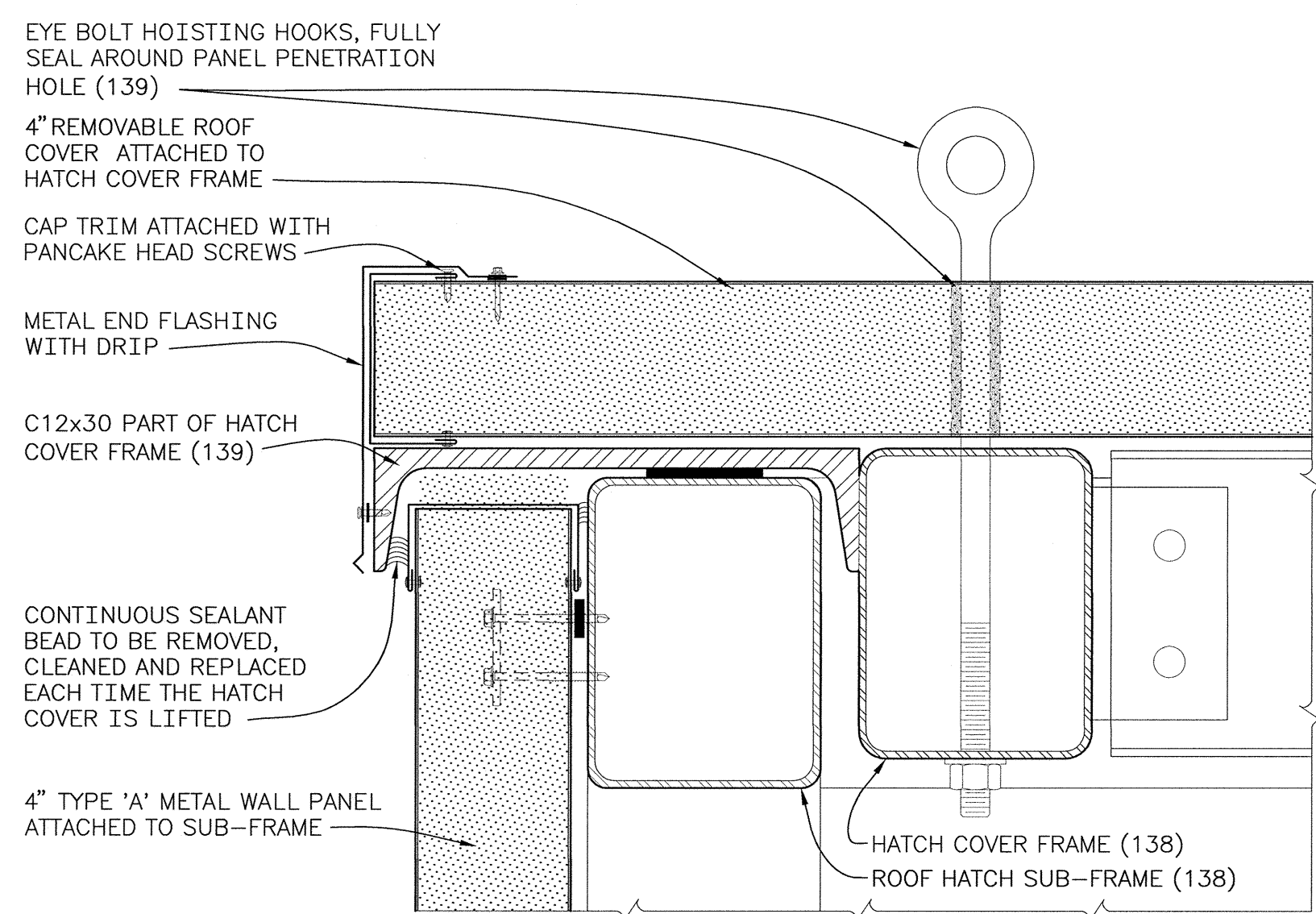
T1 DOOR THRESHOLD
@ CMU WALL



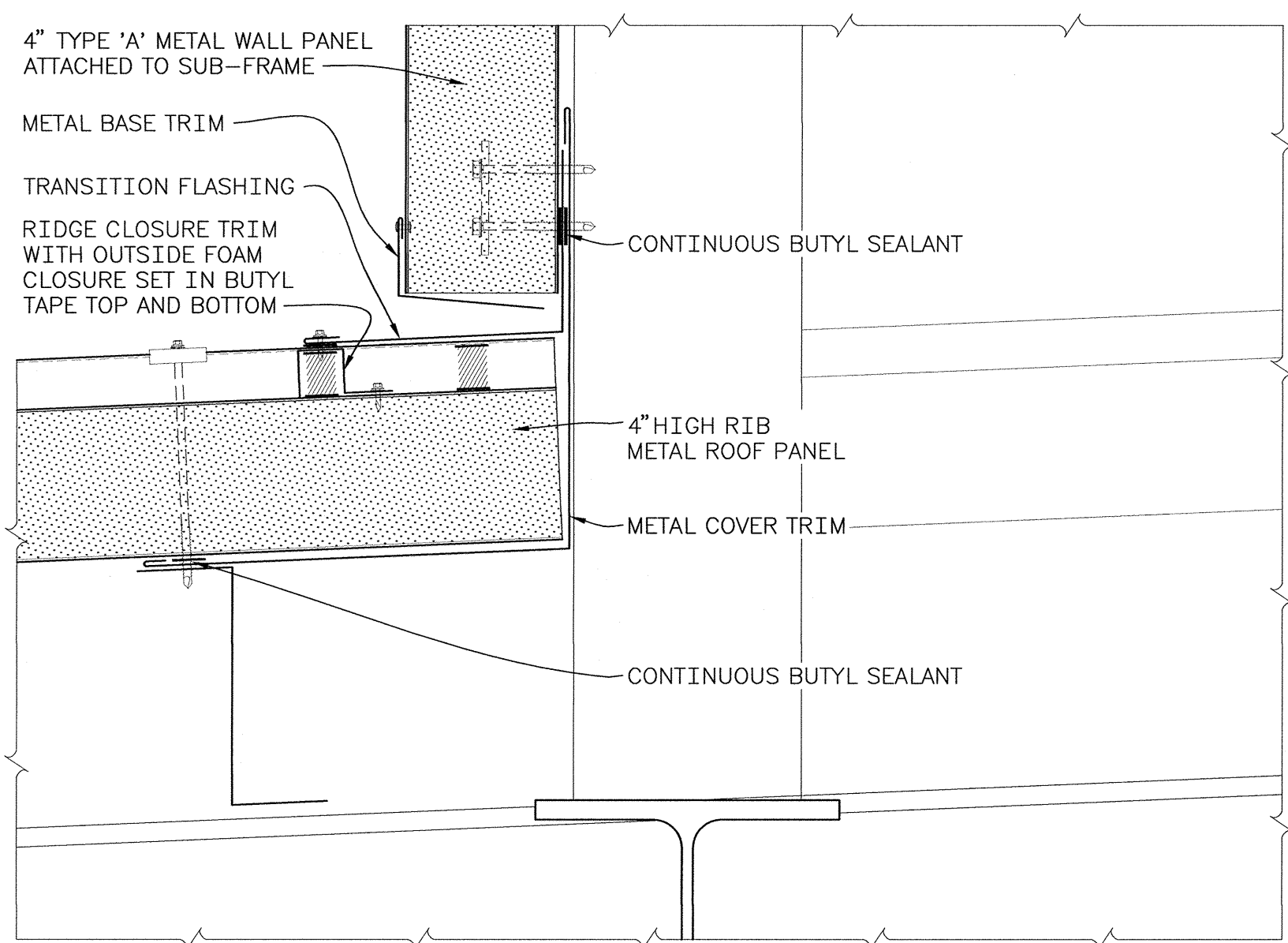
2 TYPICAL THRU WALL PANEL ANCHOR ATTACHMENT DETAIL
WITH OUT GROUT FILLED BLOCKS



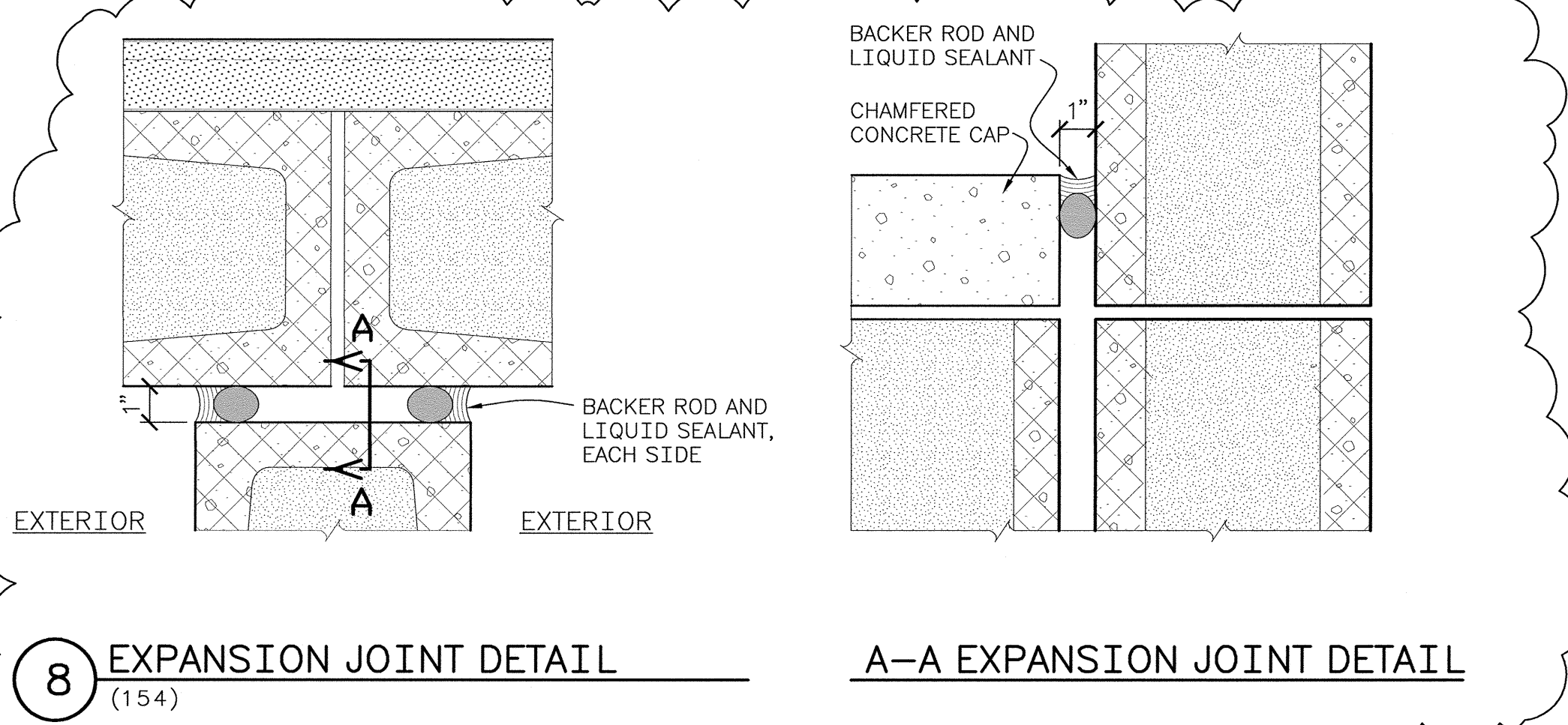
1 TYPICAL THRU WALL PANEL ANCHOR ATTACHMENT DETAIL
GROUT FILLED BLOCKS



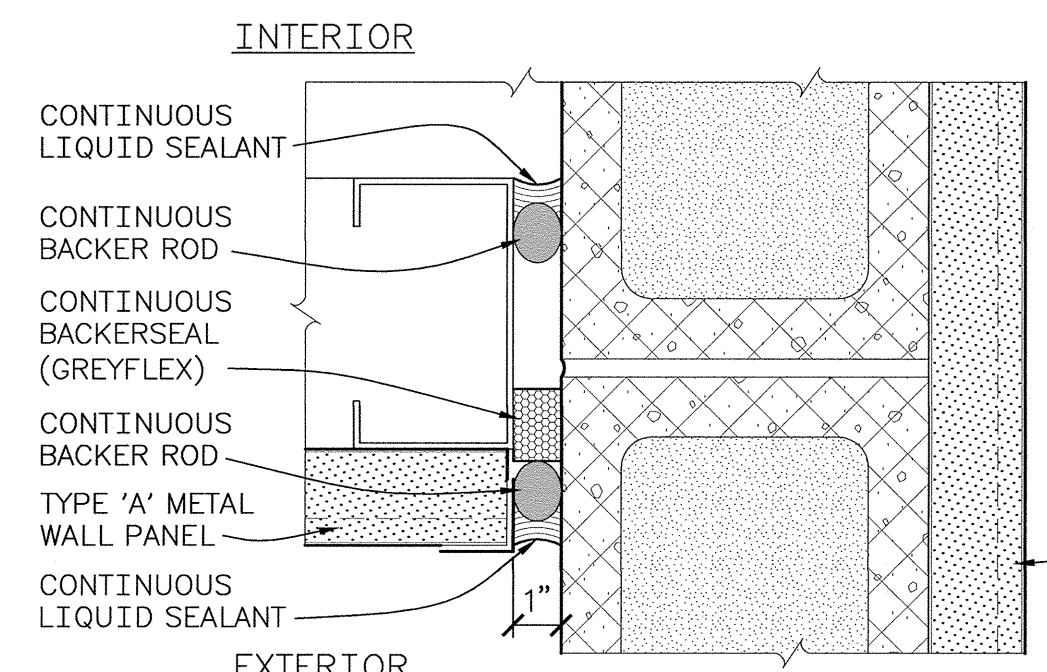
1 TYPICAL REMOVABLE COVER DETAIL AT WALL/COVER (113)



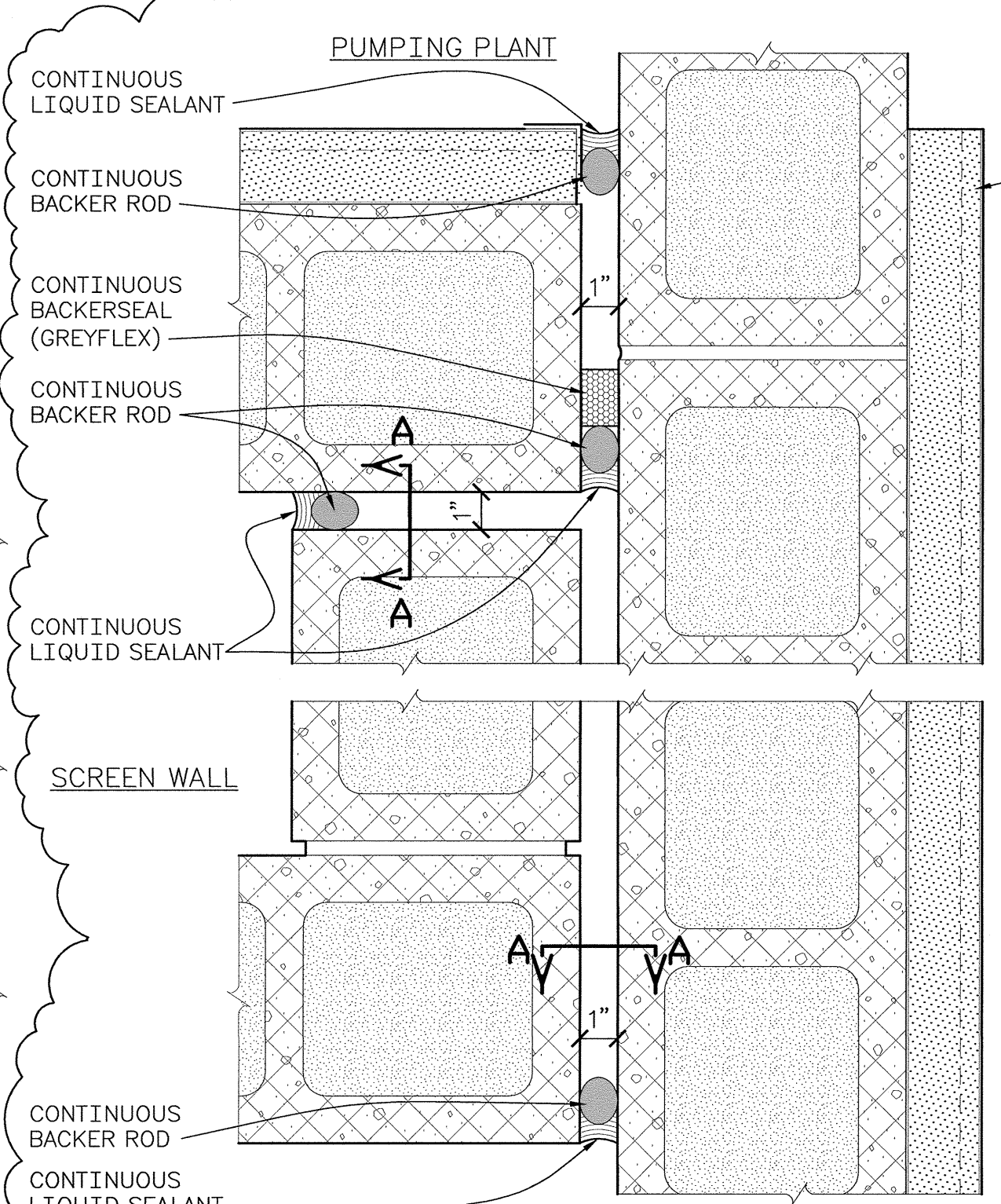
2 TYPICAL REMOVABLE COVER DETAIL AT ROOF/WALL (DOWN SLOPE) (113)



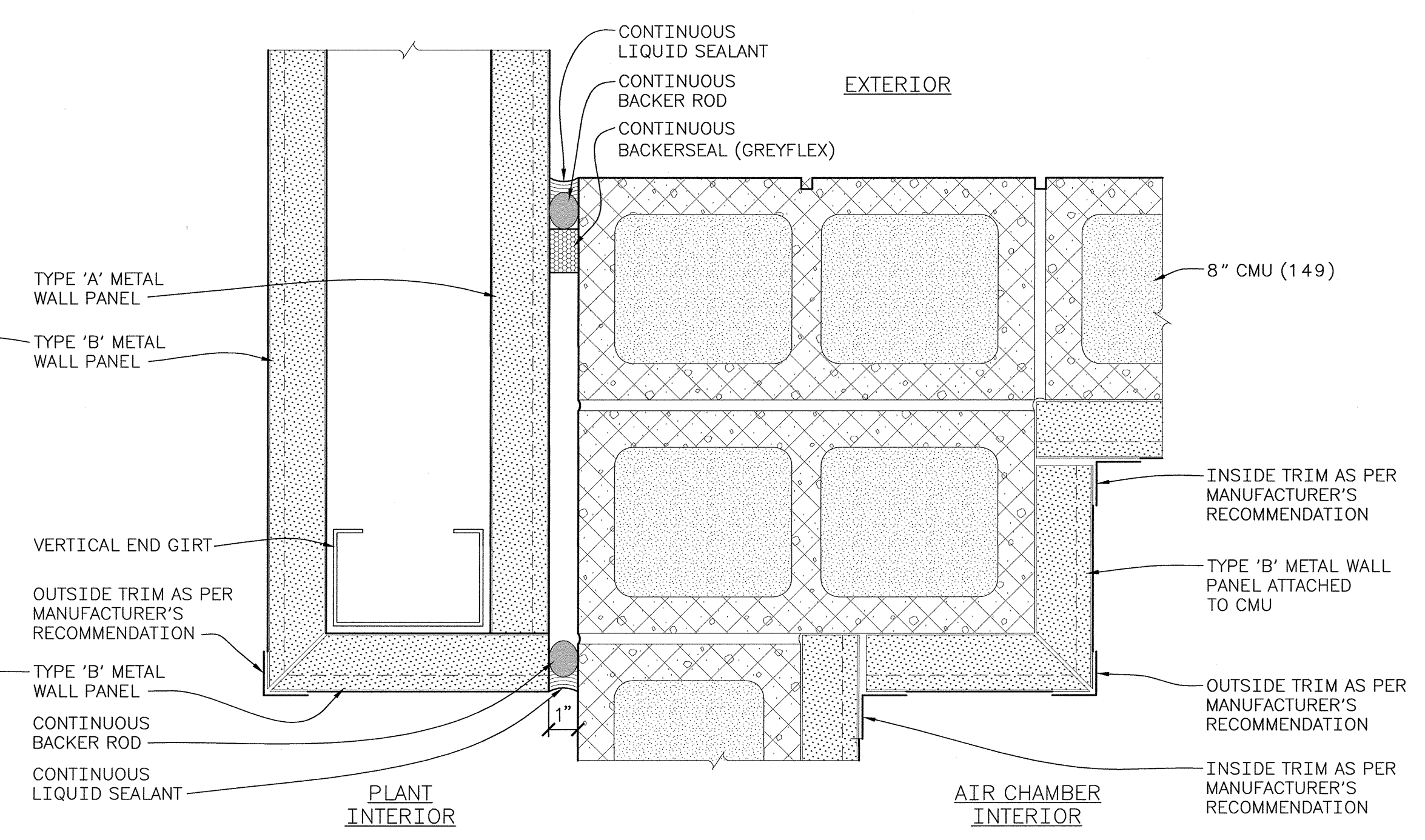
8 EXPANSION JOINT DETAIL (154) A-A EXPANSION JOINT DETAIL



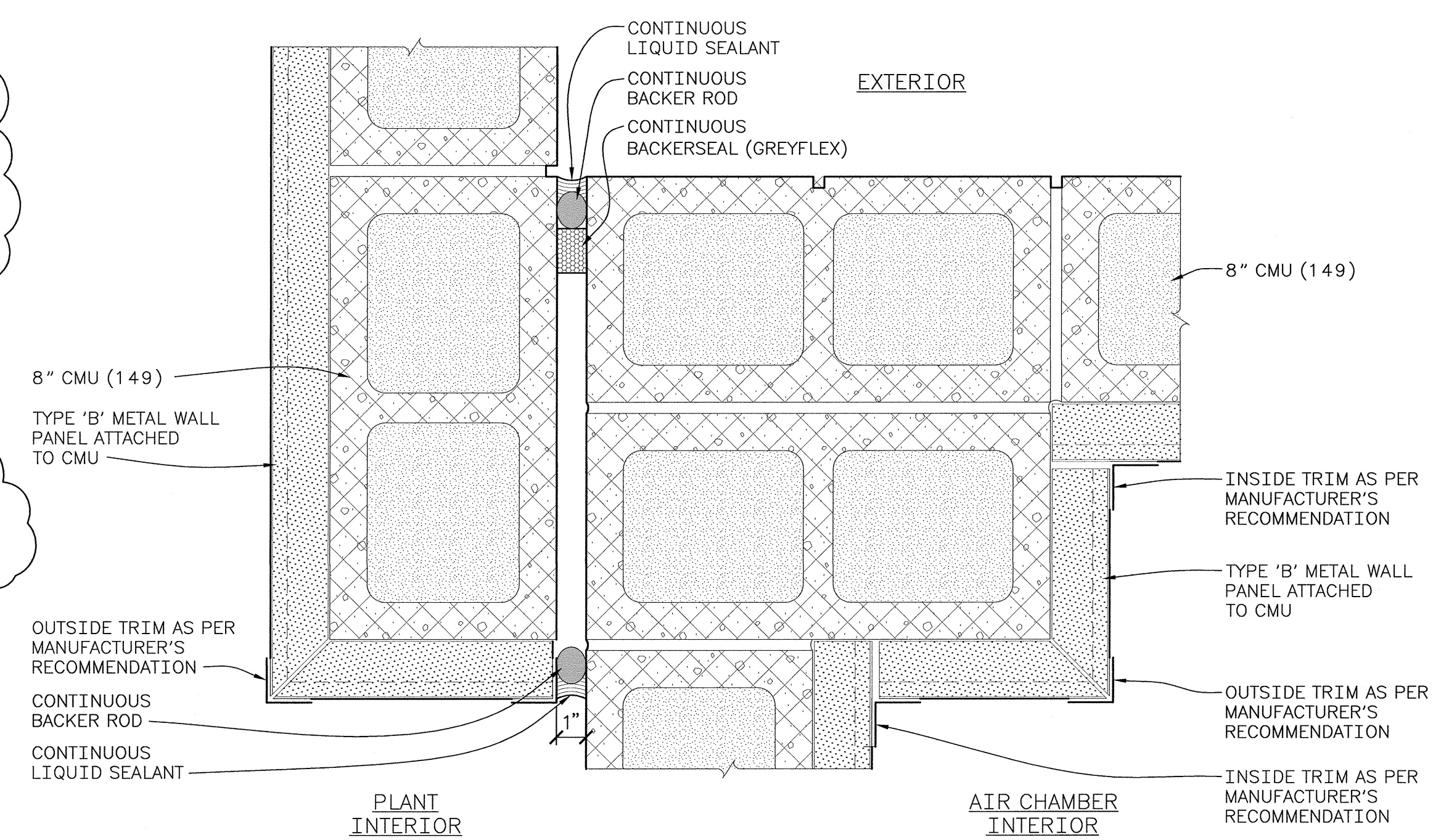
4 EXPANSION JOINT DETAIL - ABOVE 8' (110)



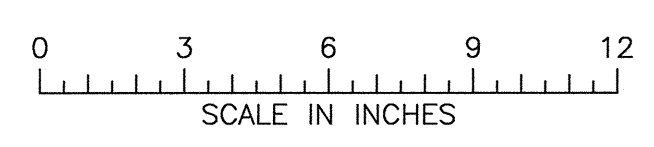
5 EXPANSION JOINT DETAIL - BELOW 8' (110)

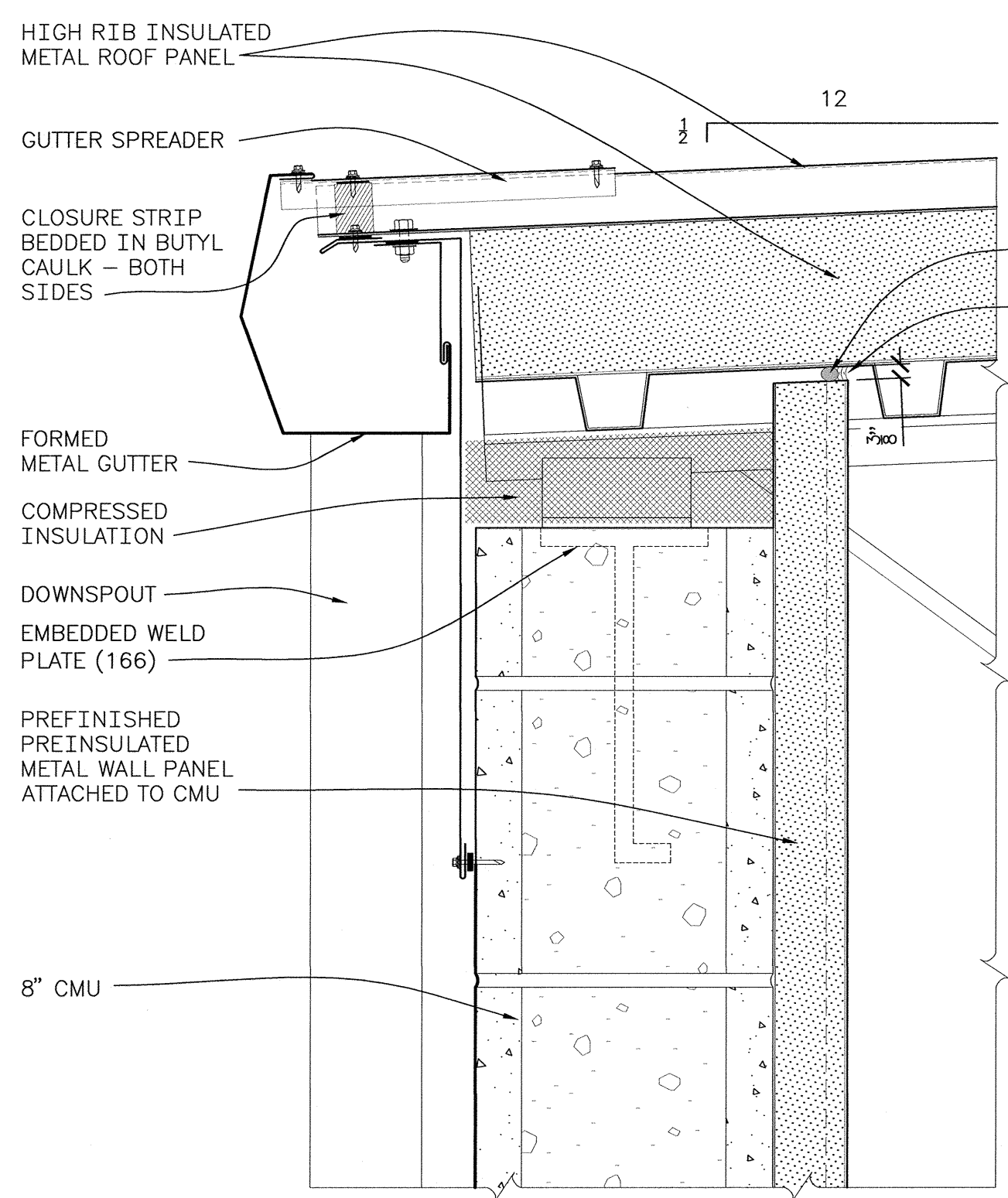
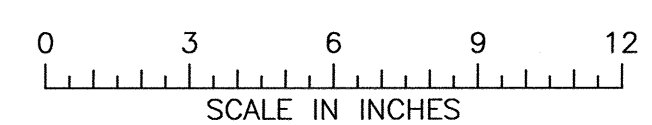


6 EXPANSION JOINT DETAIL ABOVE 8' (110)

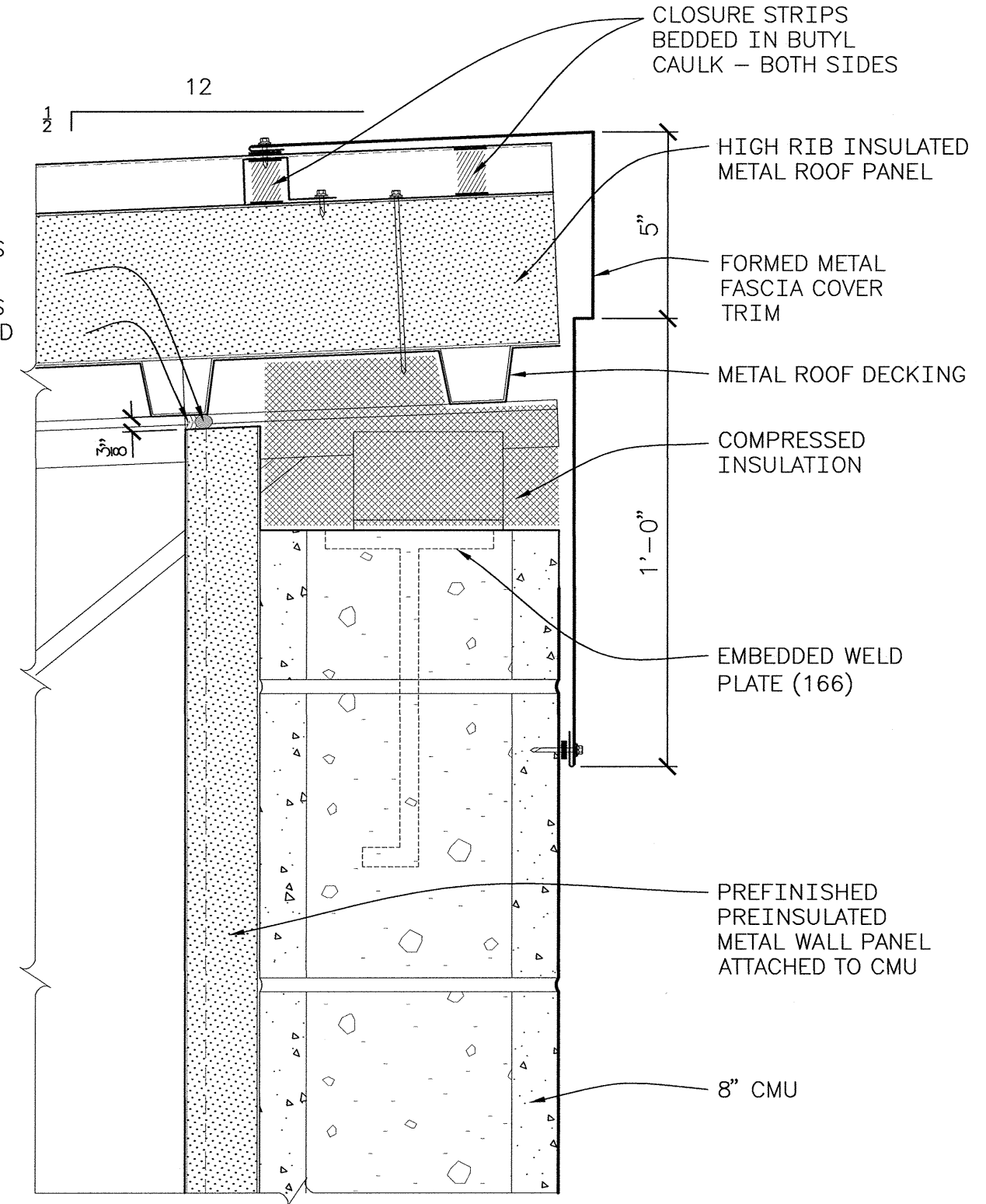


7 EXPANSION JOINT DETAIL BELOW 8' (110)

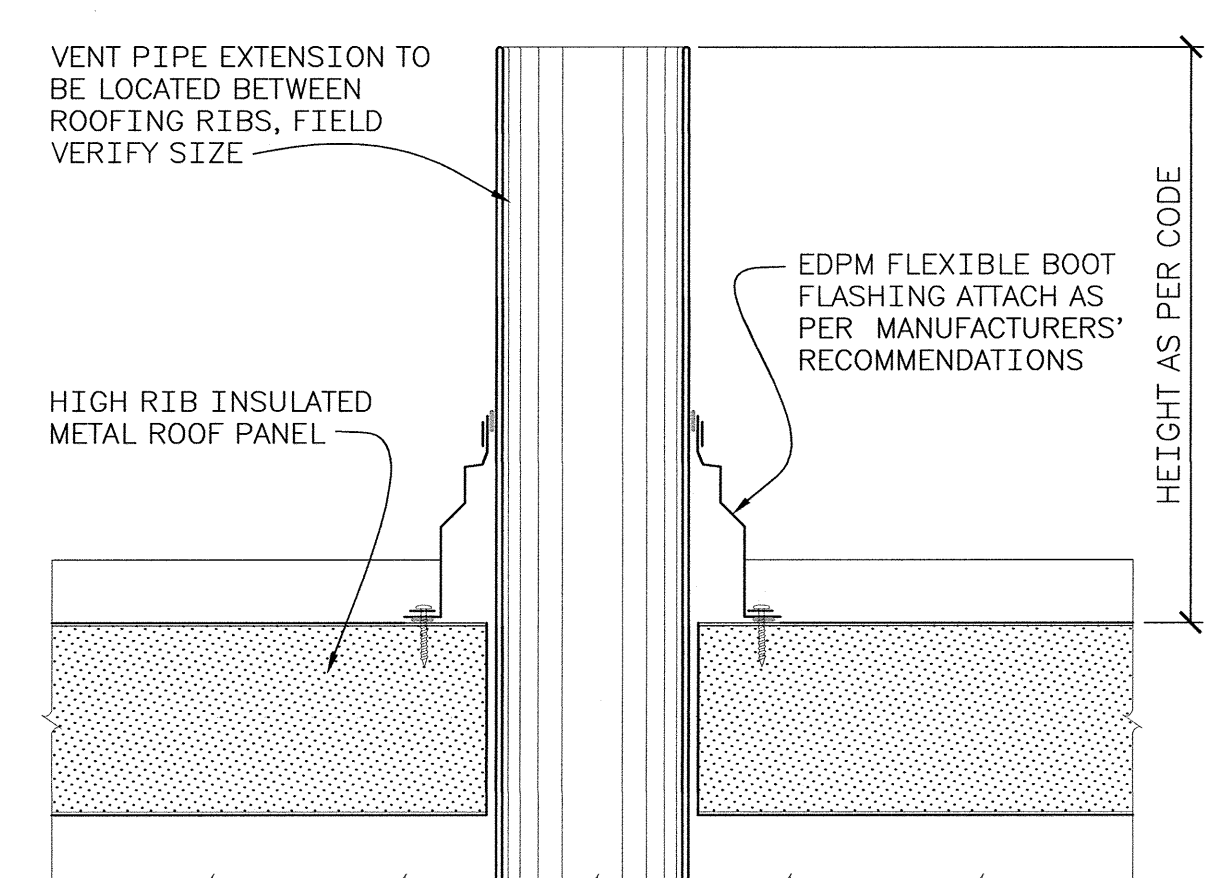




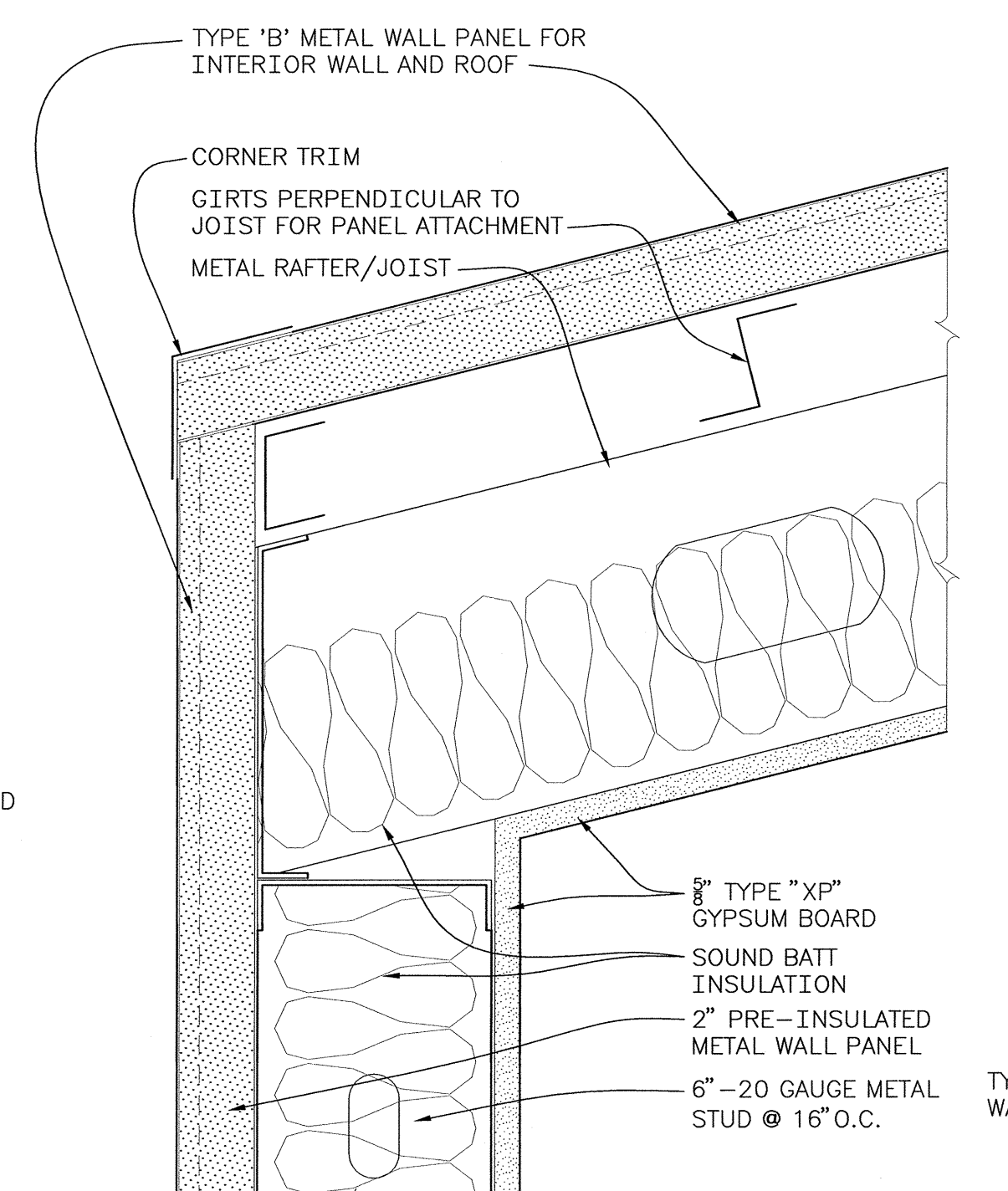
1 LOW EAVE DETAIL
(113)



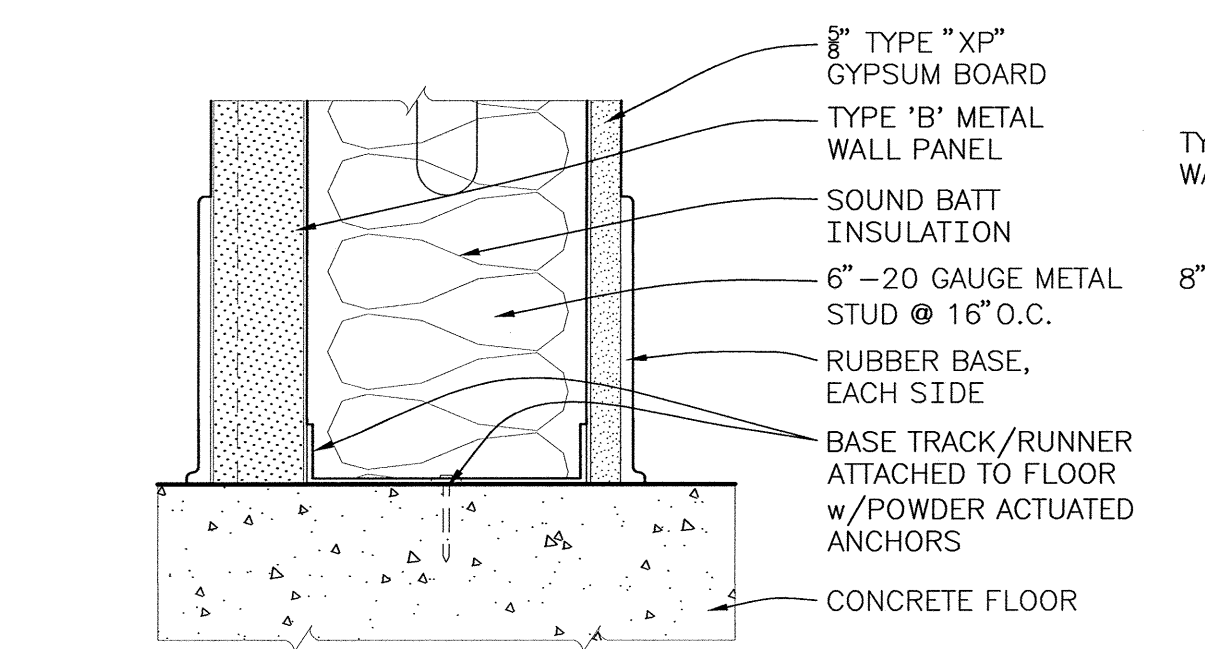
2 HIGH EAVE DETAIL
(113)



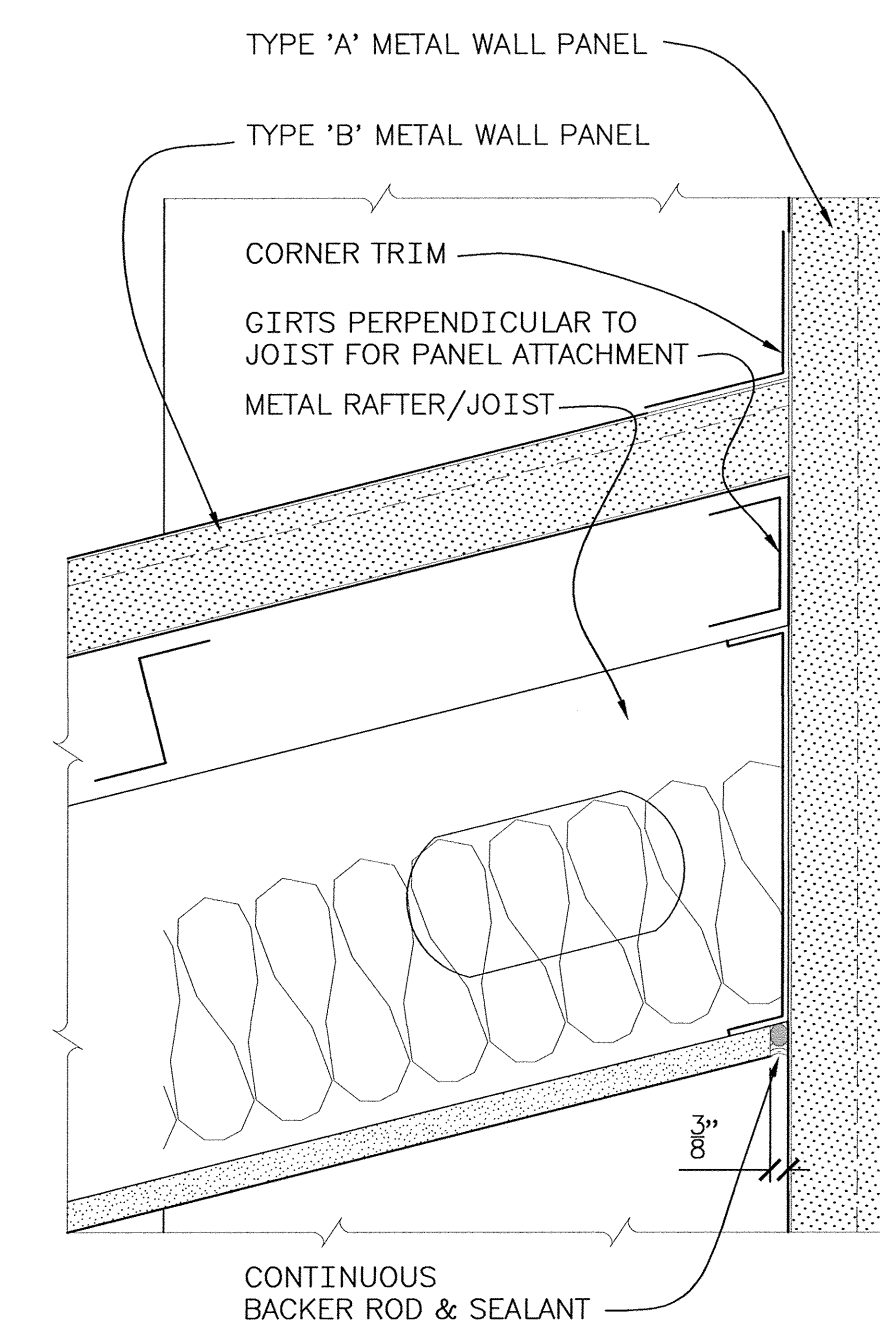
3 VENT PIPE DETAIL
(114)



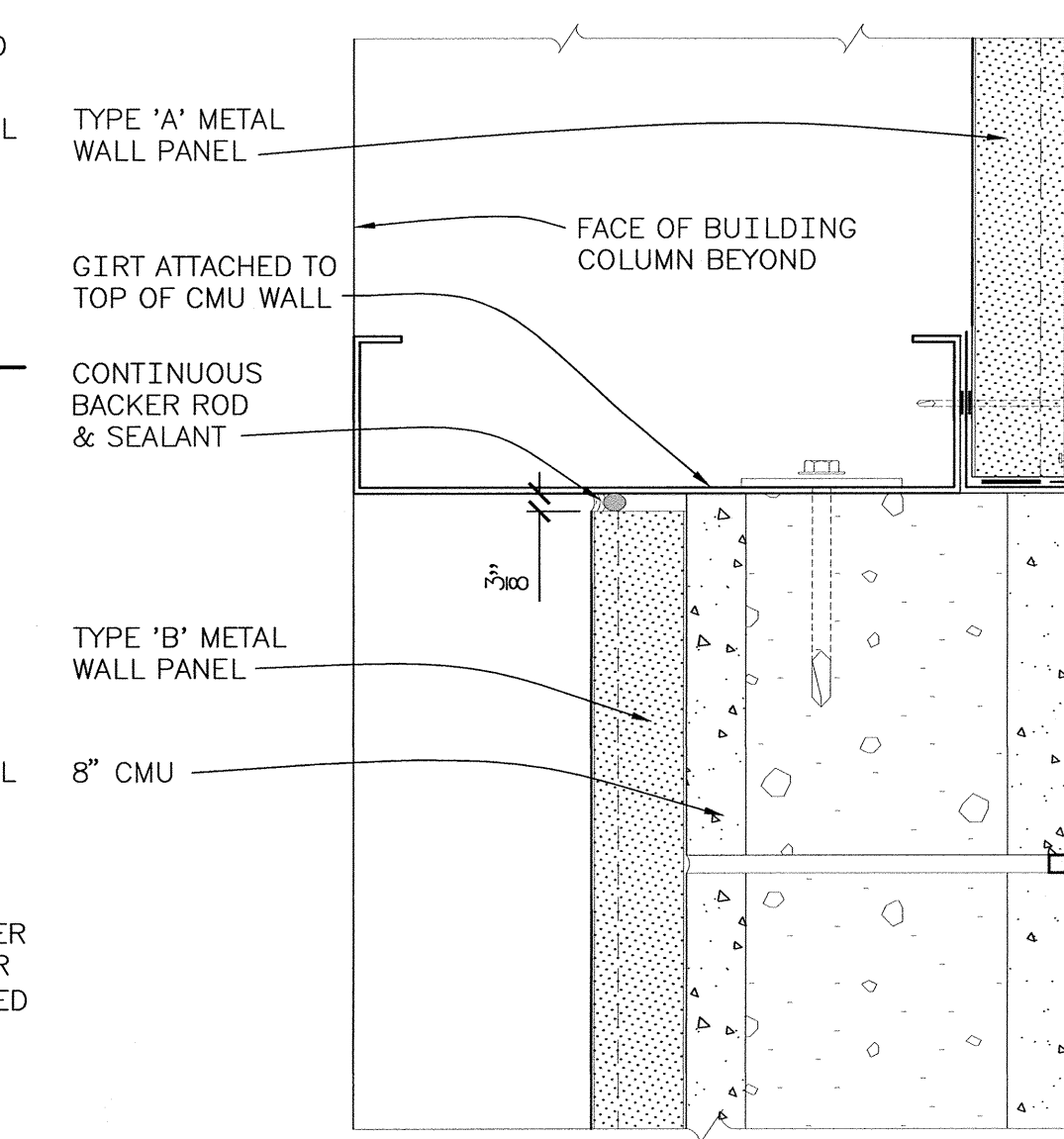
7 WALL/CEILING DETAIL
(114)



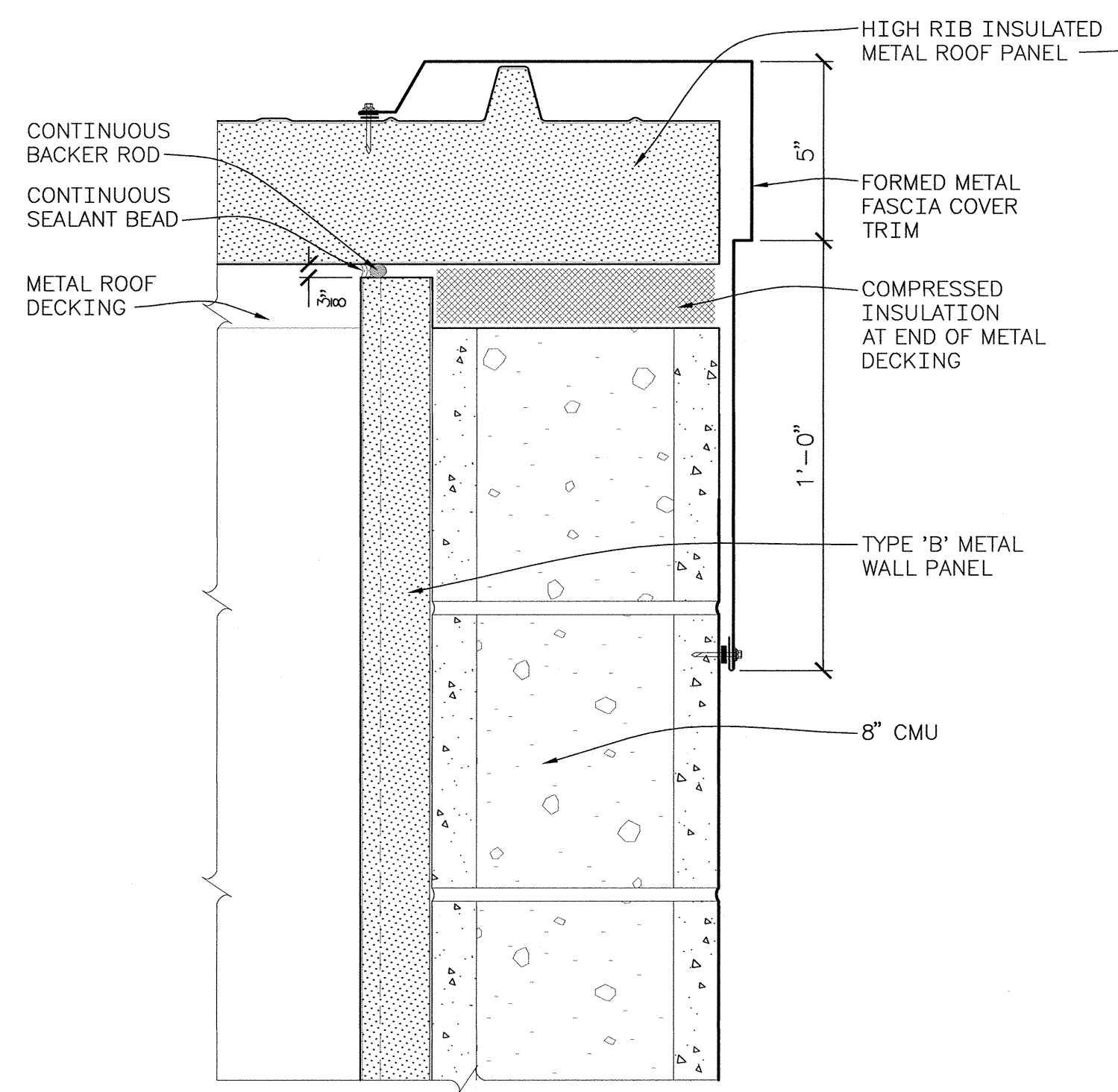
6 WALL/FLOOR DETAIL
(114)



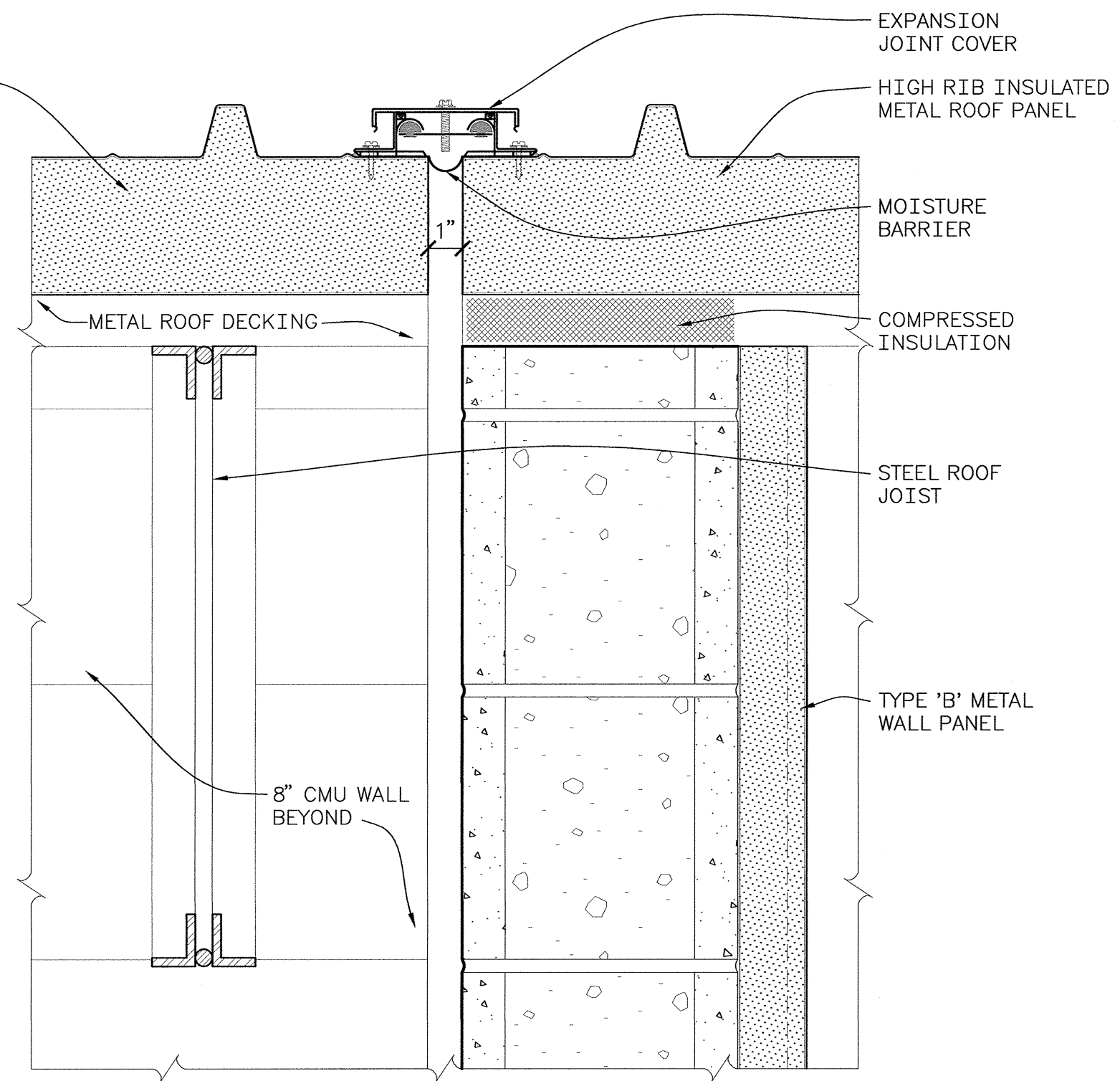
8 WALL/CEILING DETAIL
(114)



9 WALL INTERSECTION DETAIL
(114)

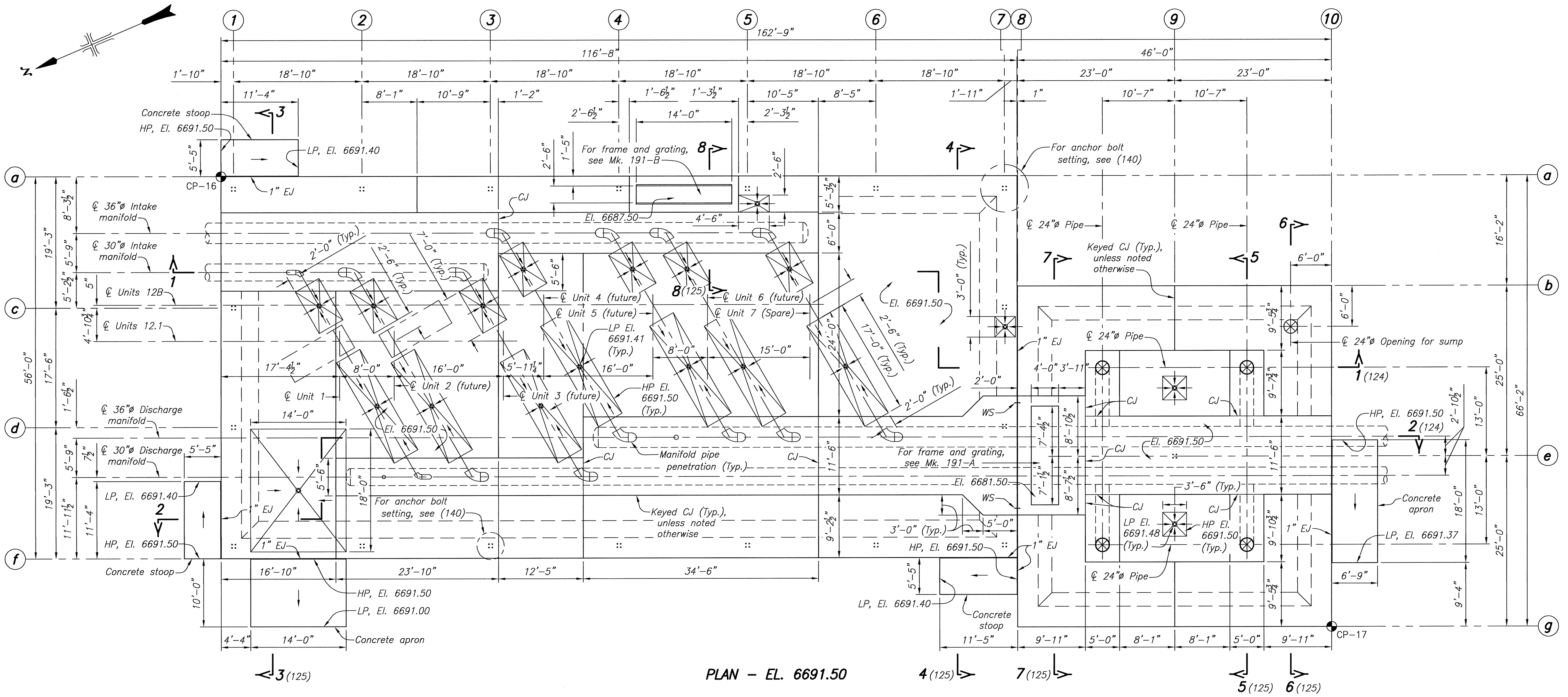


4 RAKE DETAIL
(114)



5 EXPANSION JOINT DETAIL
(114)

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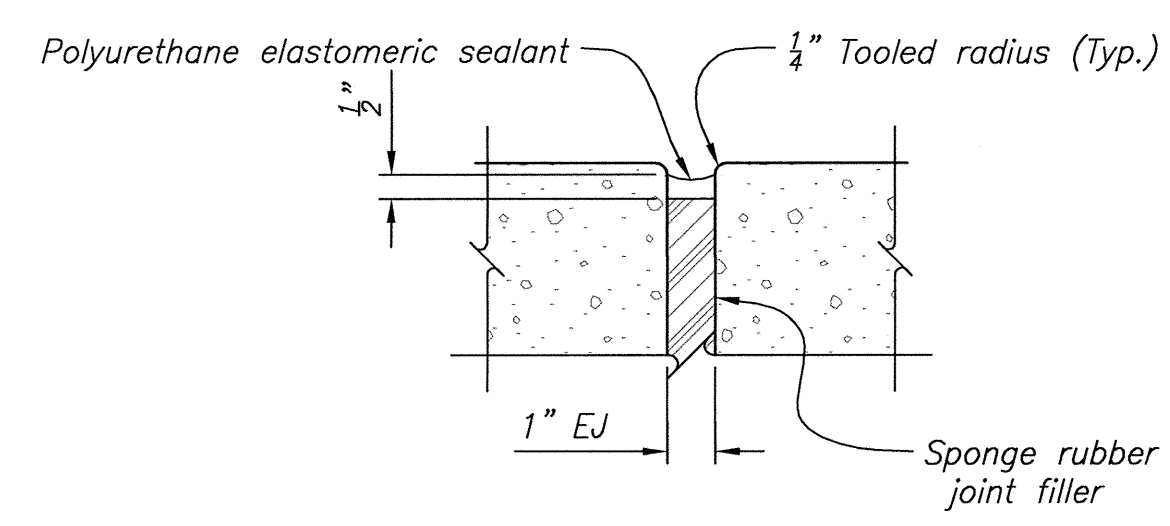
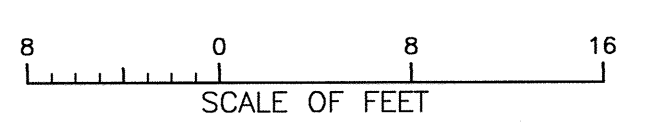
PLAN - EL. 6691.50

CONCRETE GENERAL NOTES

- For general concrete outline notes, see 40-D-7012.
- Structural design for cast-in-place concrete is based on concrete with a compressive strength of 4,500 pounds per square inch at 28 days and reinforcement with a minimum yield strength of 60,000 pounds per square inch.
- Dimensions not shown are the same dimensions for identical details shown elsewhere on the drawings.
- Where concrete with varying thickness is shown on the drawings, vary thickness of concrete uniformly between dimensions and elevations shown.
- Pipe sleeves and embedded piping 12 inches in diameter and larger are shown on the outline drawings. Smaller diameter pipe sleeves or piping may or may not be shown.
- Not all embedded items are shown on the outline drawings.
- Before placing concrete on grade, make sure that all buried material below the concrete is in place.
- For details of method of building forms for successive lifts, see 40-D-5246.
- Backfill shall not be placed against foundation and walls until concrete has attained a compressive strength of 4,500 pounds per square inch.
- Chamfer edges of permanently exposed concrete surfaces with a 45° bevel $\frac{3}{4}$ " x $\frac{3}{4}$ ", unless otherwise shown on the drawings.
- For details of construction joint keys, see 40-D-5249.
- For details of construction joints, see 40-D-5247.
- Keys as shown may be reversed to suit the contractor's placement requirements, if approved by the Contracting Officer's Representative.
- Construction joints may be added or relocated, if approved by the Contracting Officer's Representative.
- Stop keys 12 inches from exposed surfaces unless otherwise shown on the drawings.
- The pumping unit pedestal and mounting details shall conform to the details shown on 40-D-5599 and (218). These details shall be prepared by the contractor and approved by the Contracting Officer's Representative.
- For details of small equipment foundations, see 40-D-5599.
- For structural design data, see (101) and (102).
- Conduit shall not be larger in outside diameter than one-third of the overall thickness of the slab, wall, or beam in which they are embedded.
- Conduit shall not be spaced closer than 3 diameters or widths on center and conduit shall be located within the middle third of the cross sectional depth of the member, slab, or wall in which they are embedded.

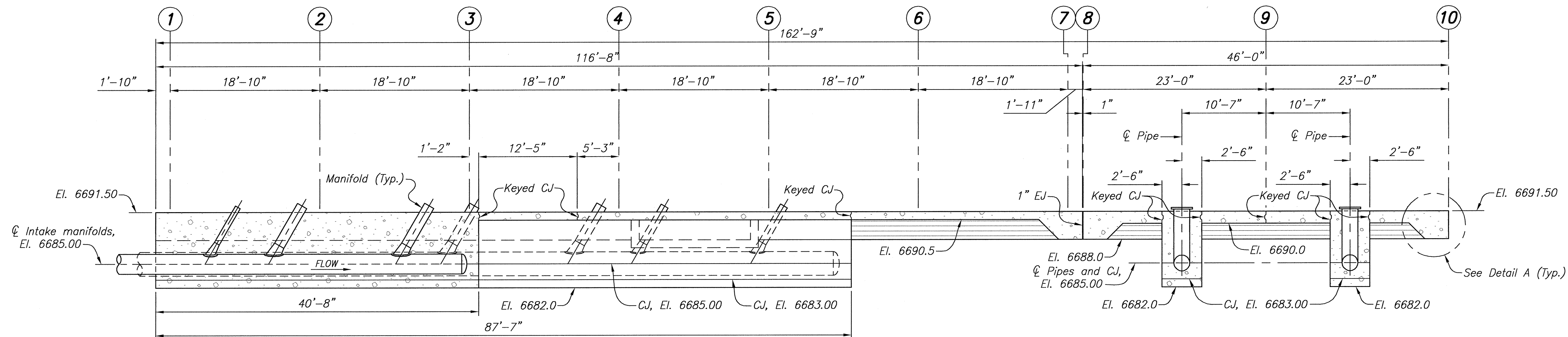
NOTES

- For reinforcement design, see (127) and (129).
- For control point coordinates, see (100).
- For floor drain locations, see (261).

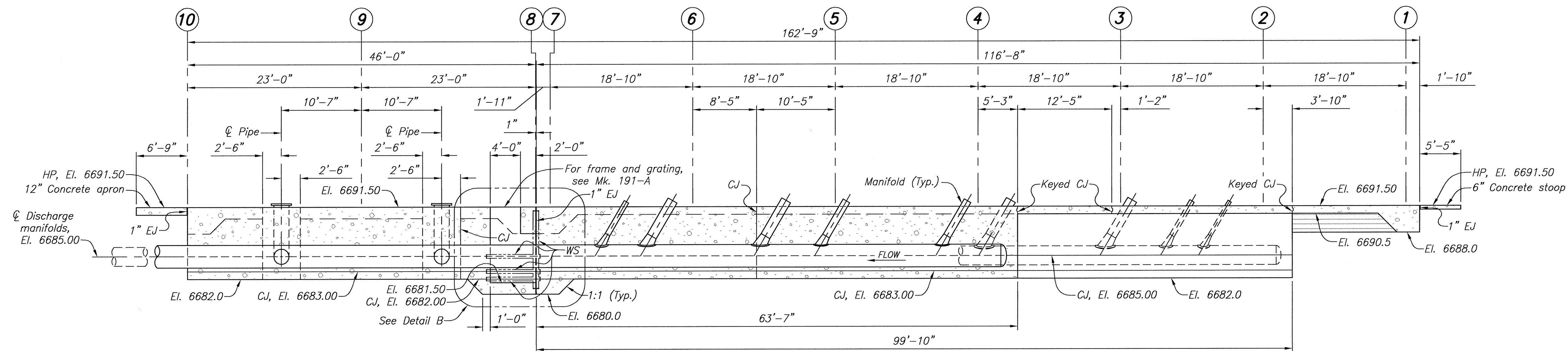


TYPICAL EXPANSION JOINT DETAIL
(NOT TO SCALE)

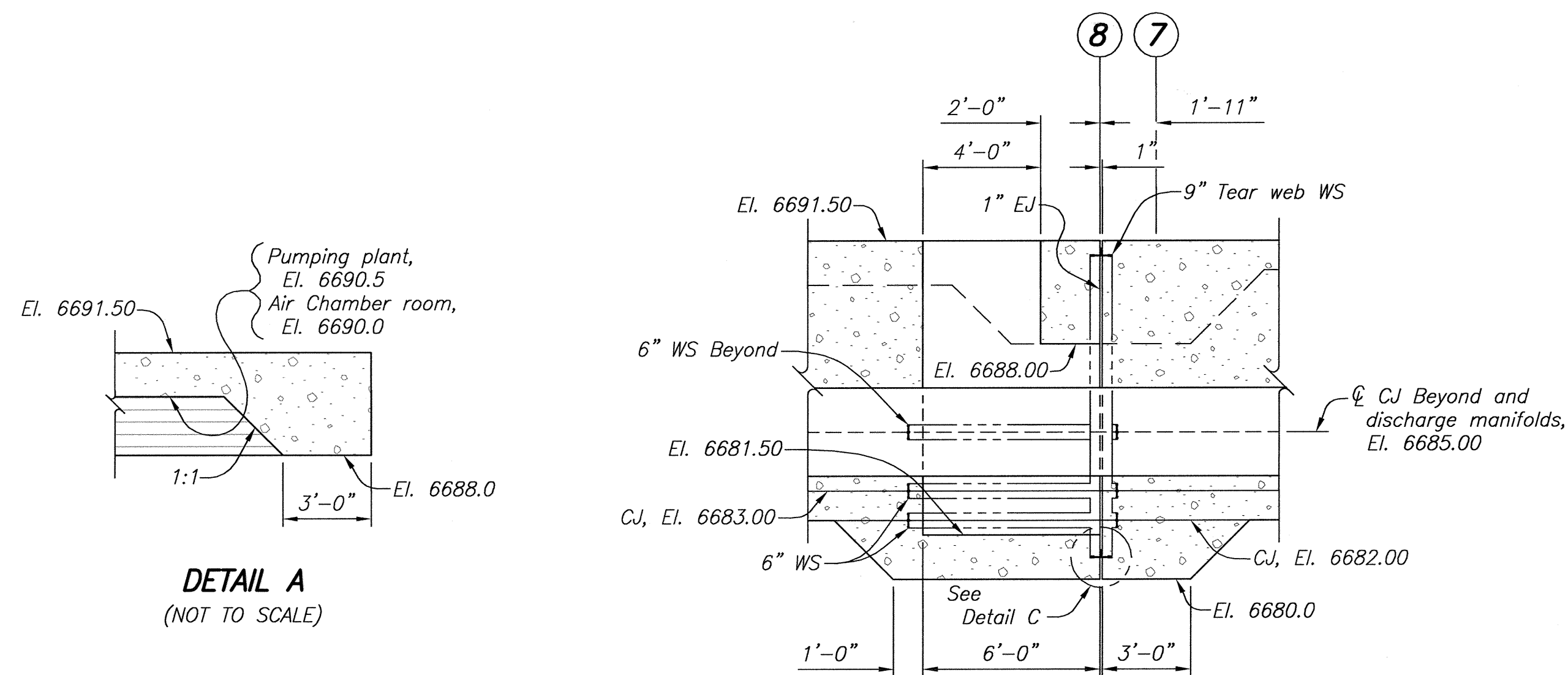
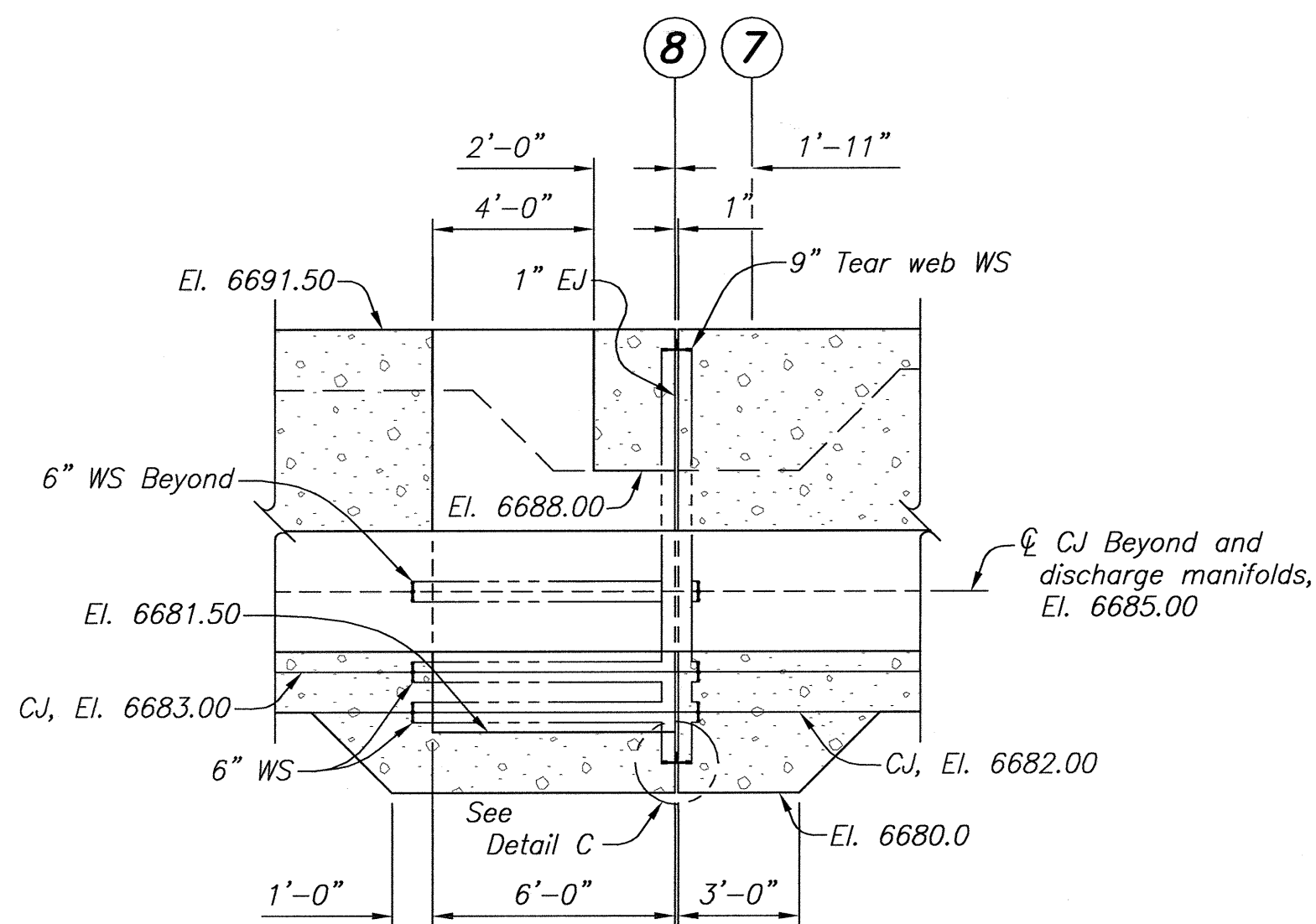
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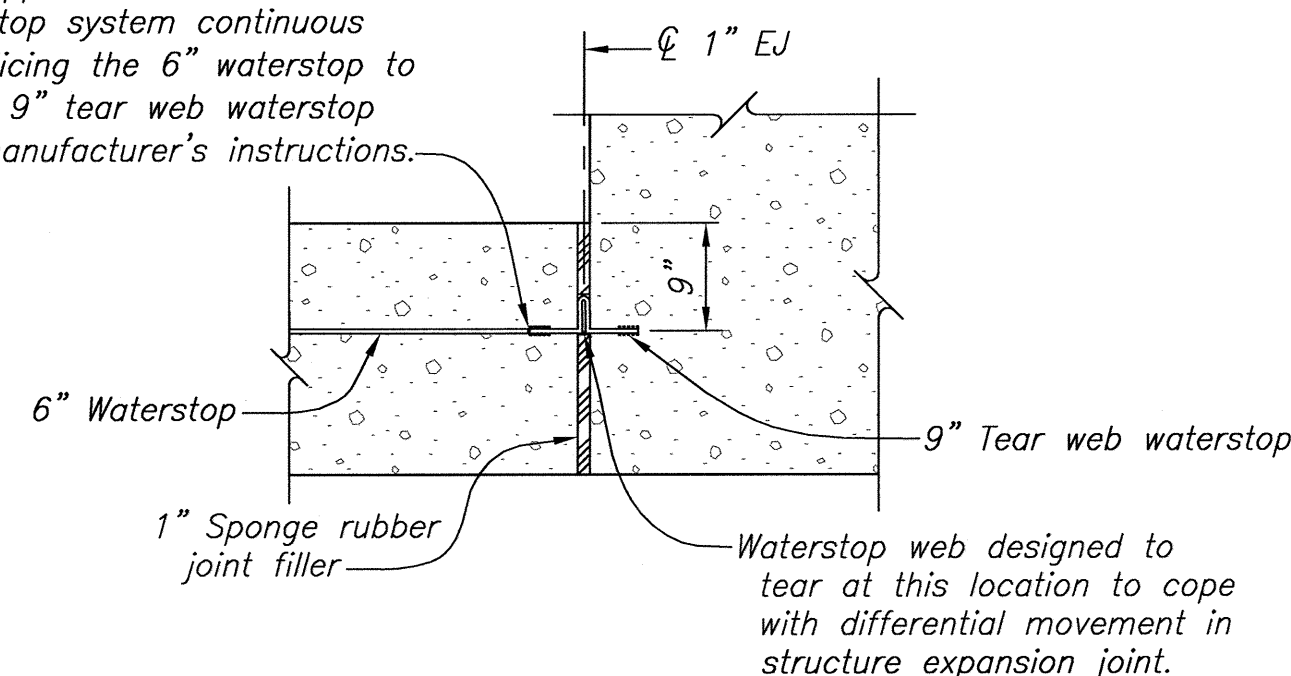
SECTION 1-1 (123)



SECTION 2-2 (123)

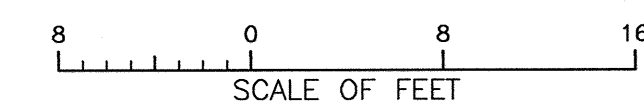
DETAIL A
(NOT TO SCALE)DETAIL B
(NOT TO SCALE)

Where applicable make the waterstop system continuous by splicing the 6" waterstop to fin of 9" tear web waterstop per manufacturer's instructions.

DETAIL C
9" TEAR WEB WATERSTOP
(NOT TO SCALE)

NOTES

1. For General Notes, see (123).
2. For reinforcement design, see (128) and (129).

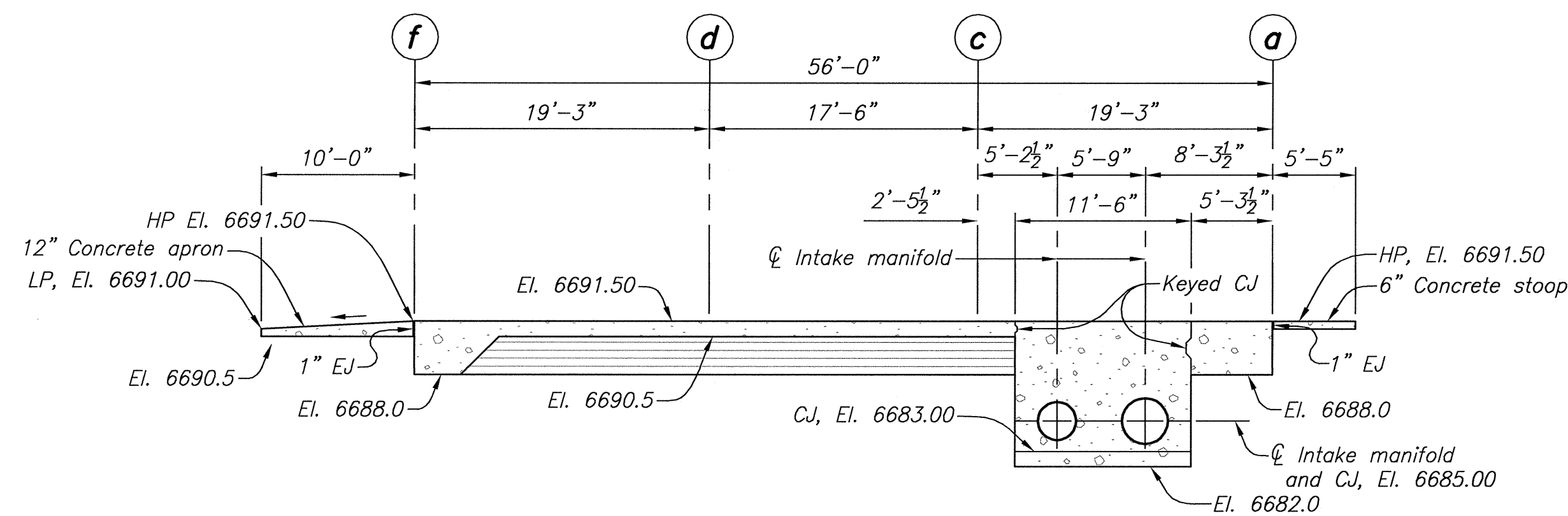


DESIGNED: *K. J. Olson*
DRAWN: *K. D. Roser*
CHECKED: *E. J. Dawson*
TECH. APPR.: *S. R. Brown P.E.*
APPROVED: *PLANT STRUCTURES GROUP*
DENVER, COLORADO 2013-08-05

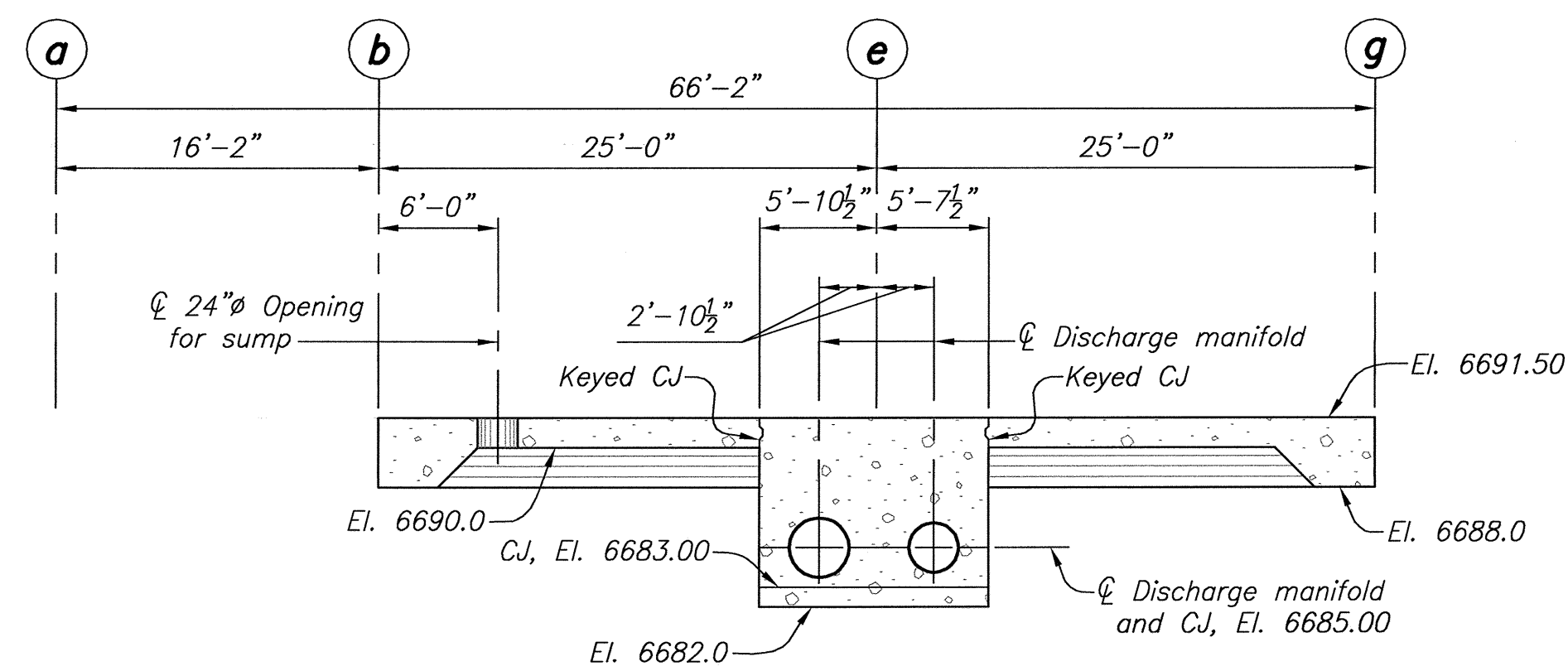
CONCRETE OUTLINE
SECTIONS 1-1, 2-2,
AND DETAILS

1695-D-124

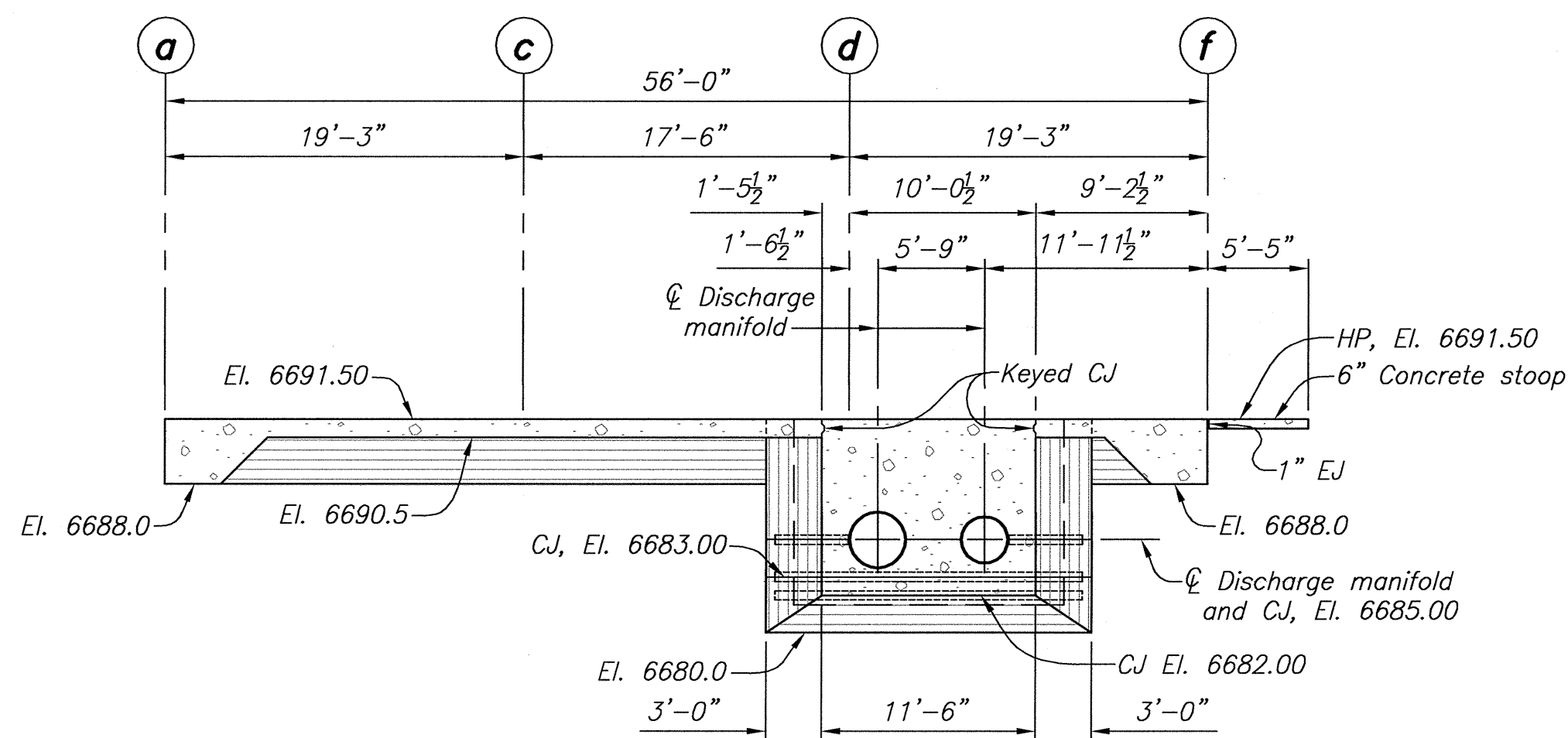
SHEET 1 OF 1



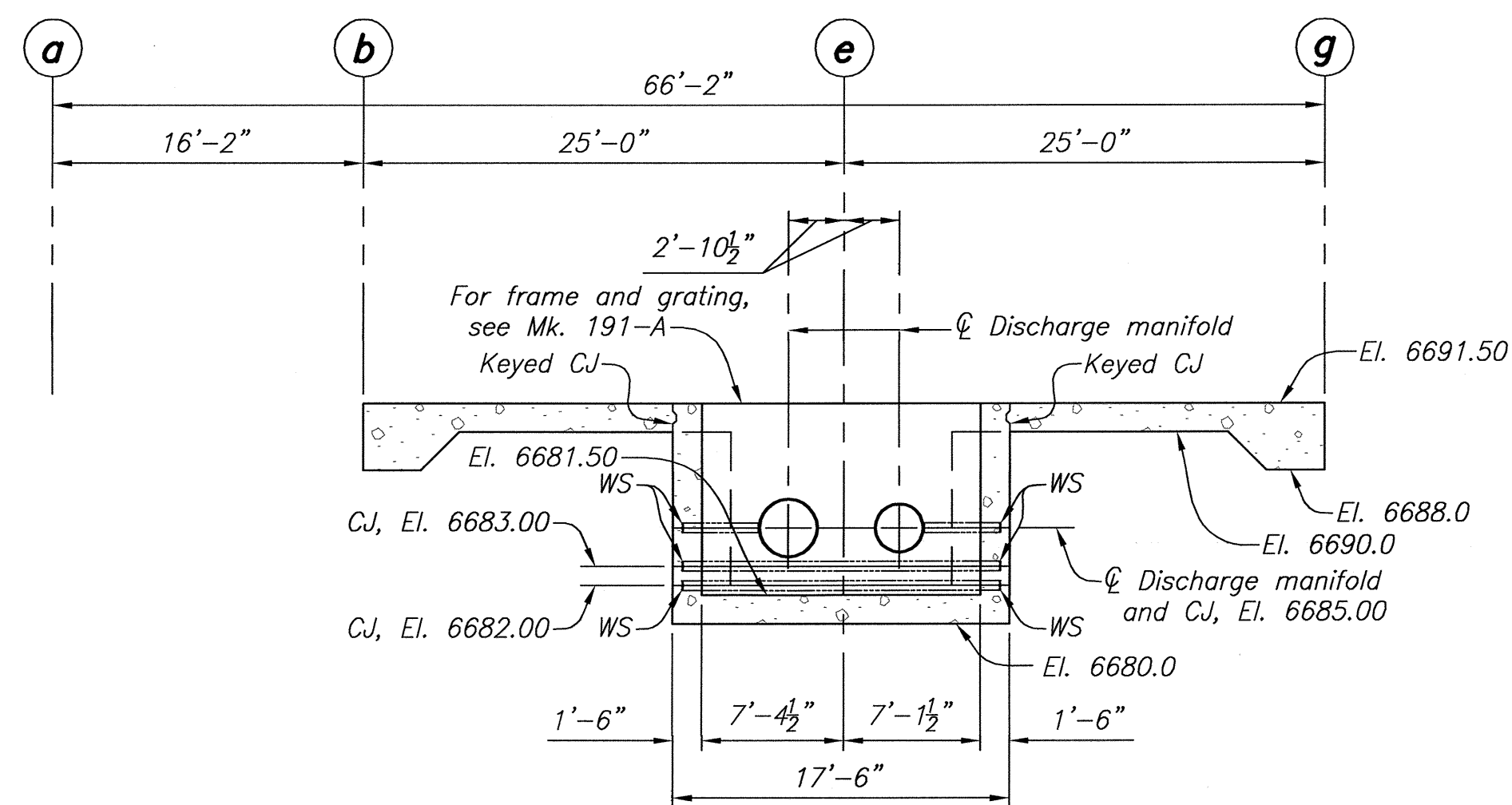
SECTION 3-3 (123)



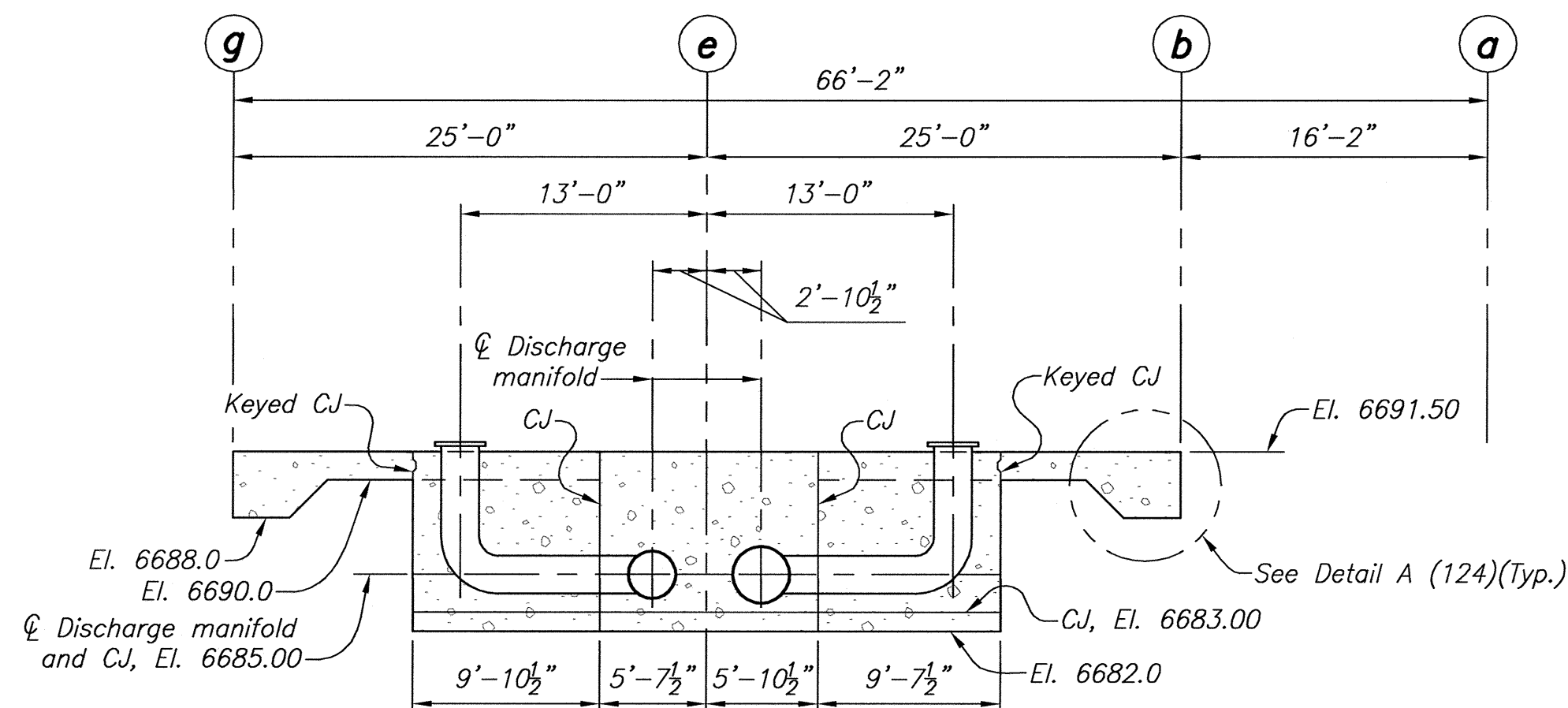
SECTION 6-6 (123)



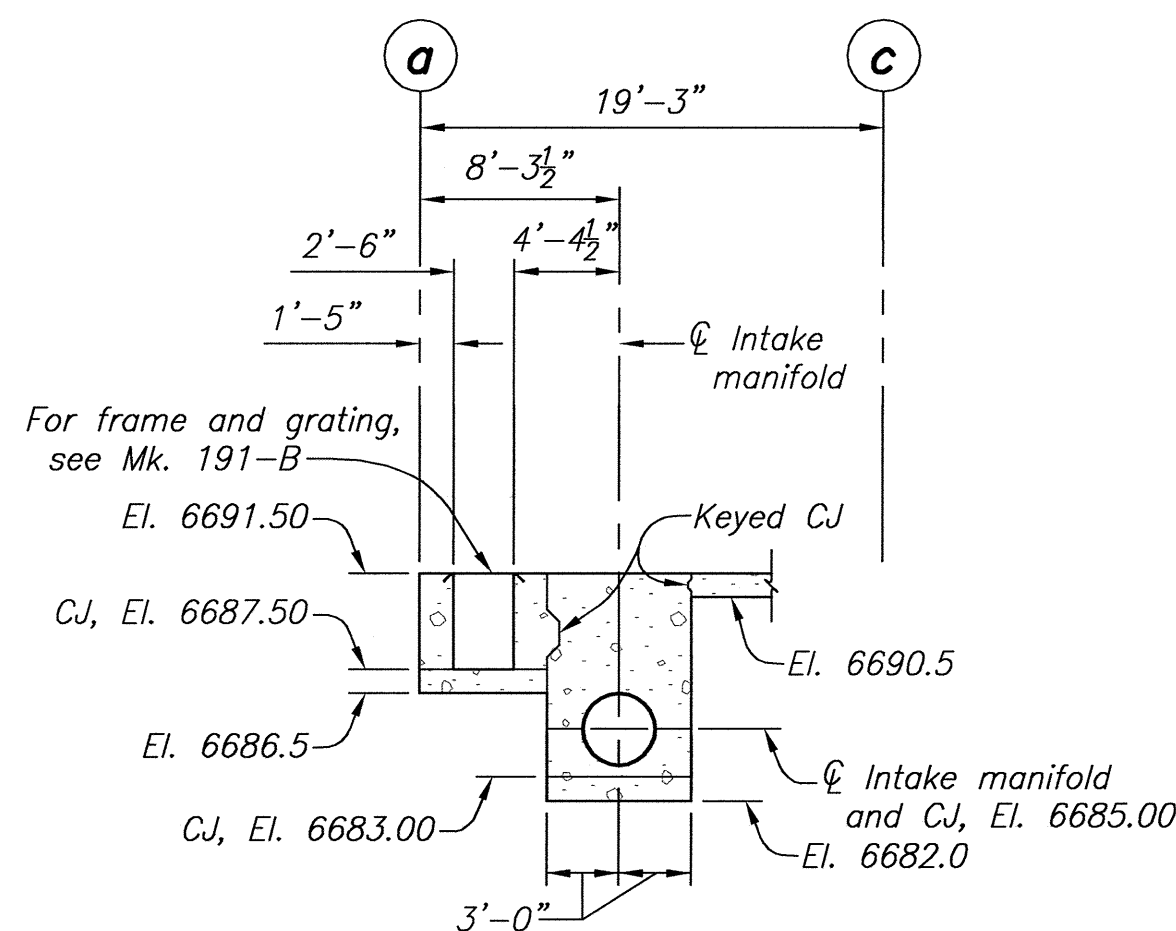
SECTION 4-4 (123)



SECTION 7-7 (123)



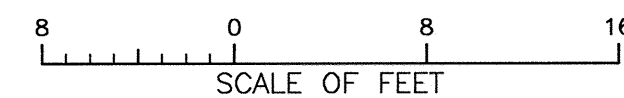
SECTION 5-5 (123)



SECTION 8-8 (123)

NOTES

- For General Notes, see (123).
- For reinforcement design, see (127) and (129).



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BUREAU OF RECLAMATION
NAVAJO GALLUP WATER SUPPLY PROJECT
NEW MEXICO

SAN JUAN LATERAL
TOHLAKAI PUMPING PLANT
CONCRETE OUTLINE
SECTIONS 3-3 THRU 8-8

DESIGNED: K. O. 08/10
DRAWN: [Signature]
CHECKED: S. H. Appen P.E.
TECH. APPR.: [Signature]
APPROVED: [Signature]
PLANT STRUCTURES GROUP

DENVER, COLORADO 2013-08-05

CONCRETE OUTLINE
SECTIONS 3-3 THRU 8-8

1695-D-125

SHEET 1 OF 1

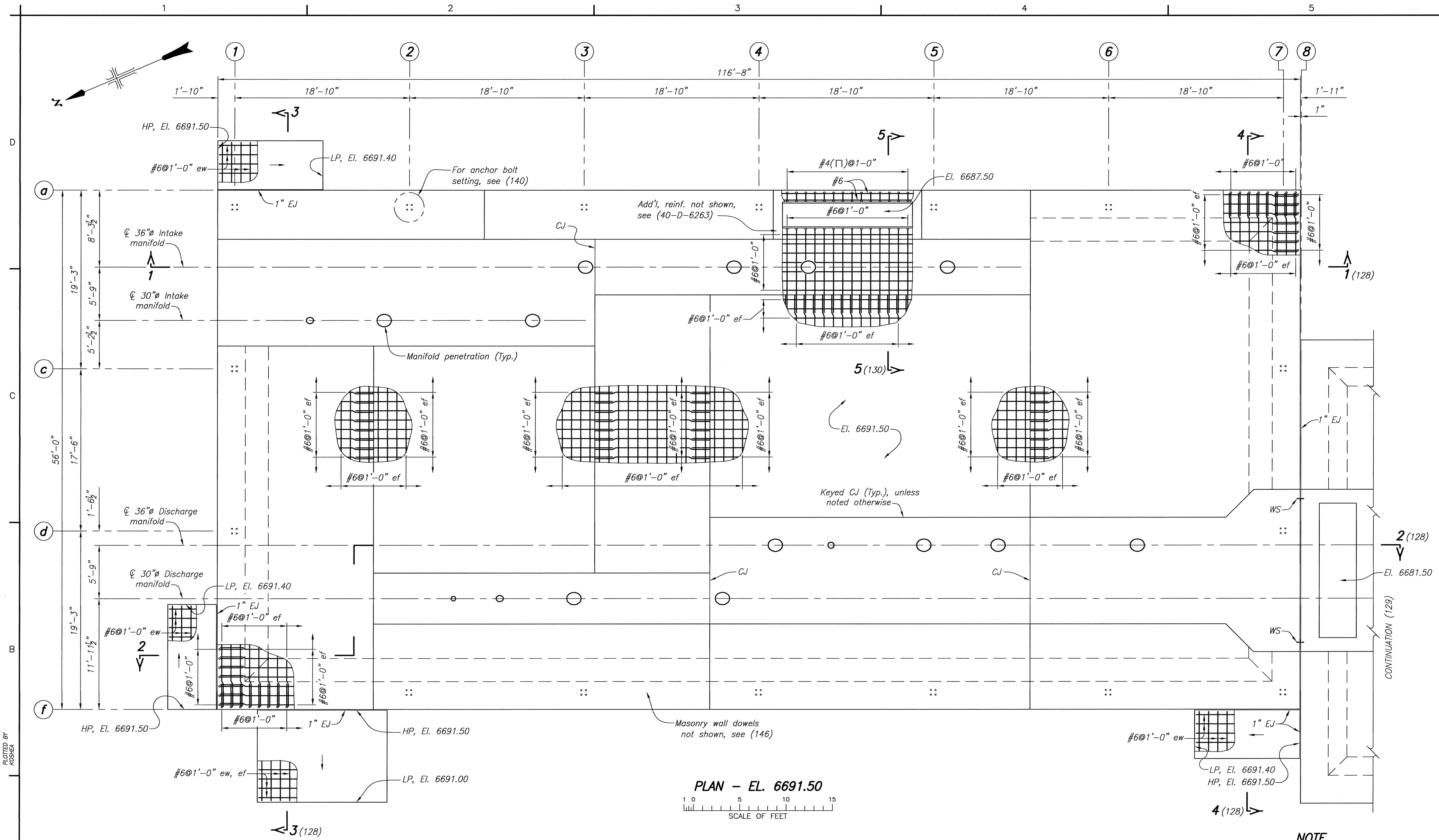
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U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
NAVALO GALLUP WATER SUPPLY PROJECT
NEW MEXICO
SAN JUAN LATERAL
TOHLAKAI PUMPING PLANT
REINFORCEMENT DESIGN
PLAN - EL. 6691.50

DESIGNED *K. J. R. S.*
DRAWN *R. J. Jackson*
CHECKED *B. K. Hoffman P.E.*
TECH. APPR. *W. J. B.*
APPROVED
PLANT STRUCTURES GROUP
DENVER, COLORADO 2013-08-05

REINFORCEMENT DESIGN
PLAN - EL. 6691.50

1695-D-127
SHEET 1 OF 1



REINFORCEMENT DESIGN GENERAL NOTES

For General Notes and minimum requirements for detailing reinforcement, see 40-D-6263.

For Structural Design Data, see (101) and (102).

Structural design for cast-in-place concrete is based on concrete with a compressive strength of 4,500 pounds per square inch at 28 days and reinforcement with a minimum yield strength of 60,000 pounds per square inch.

"L" is embedment or lapped splice length, see 40-D-6263.

Reinforcement not shown is similar to that shown elsewhere on the drawing for similar details.

Splices in reinforcement at vertical construction joints may be shifted to agree with the sequence of construction.

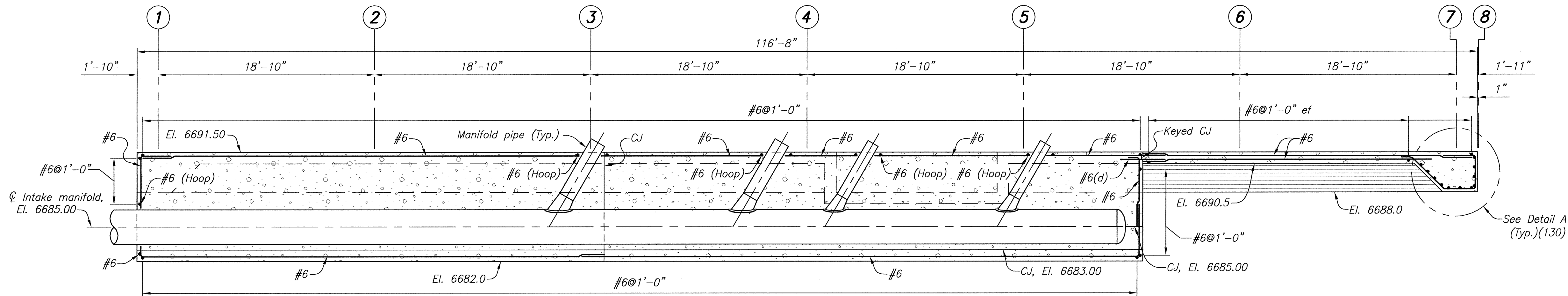
Unless shown otherwise, only the first and last bars are shown in a line of bars cut in cross section.

All horizontal wall splices and development lengths are "other bar" unless noted otherwise.

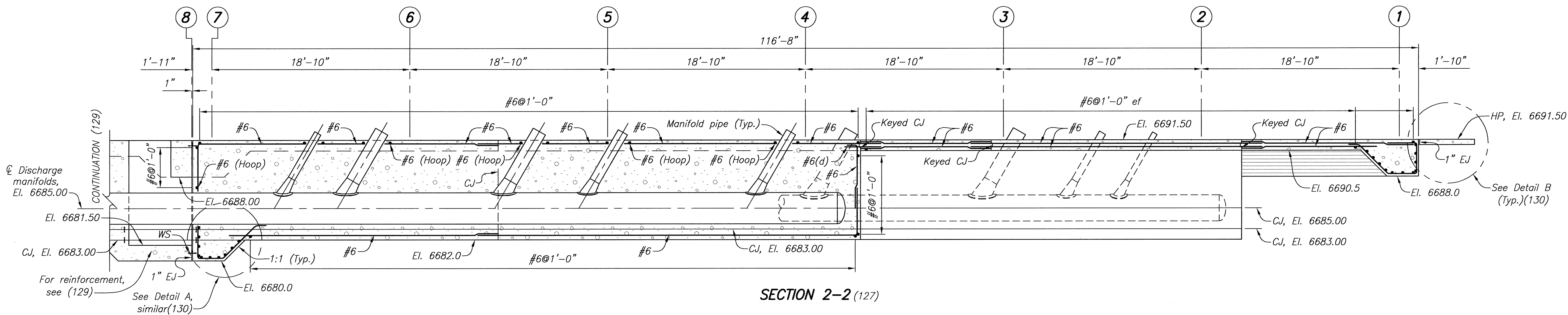
TOC - Denotes Top of Concrete

NOTE

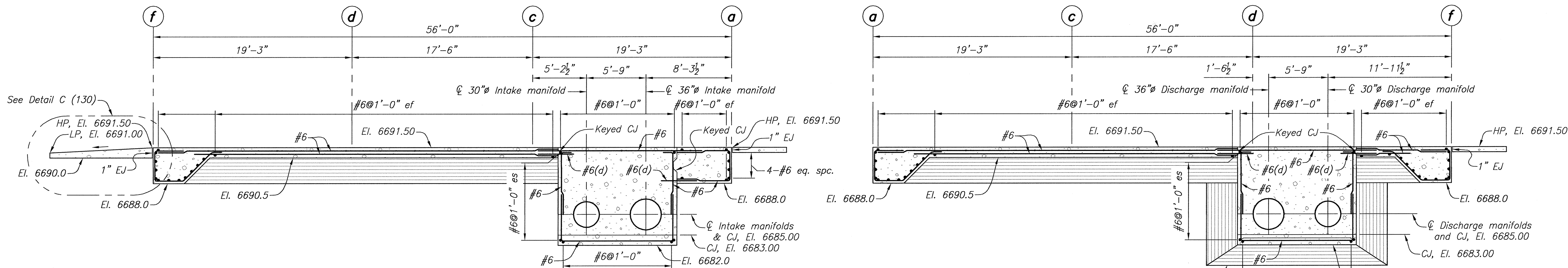
1. For concrete outline, see (123).



SECTION 1-1 (127)



SECTION 2-2 (127)

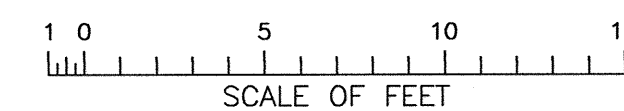


SECTION 3-3 (127)

SECTION 4-4 (127)

NOTES

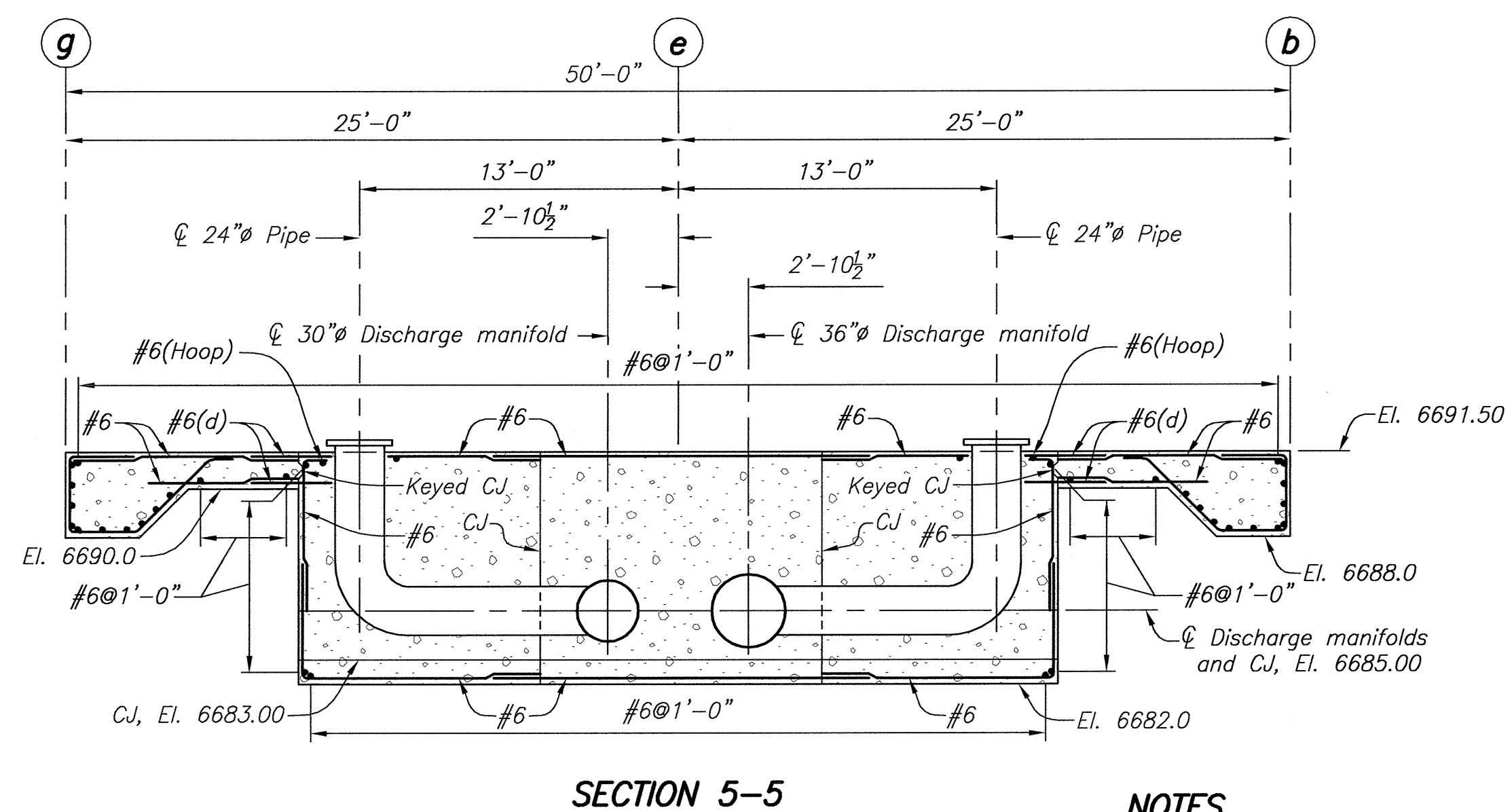
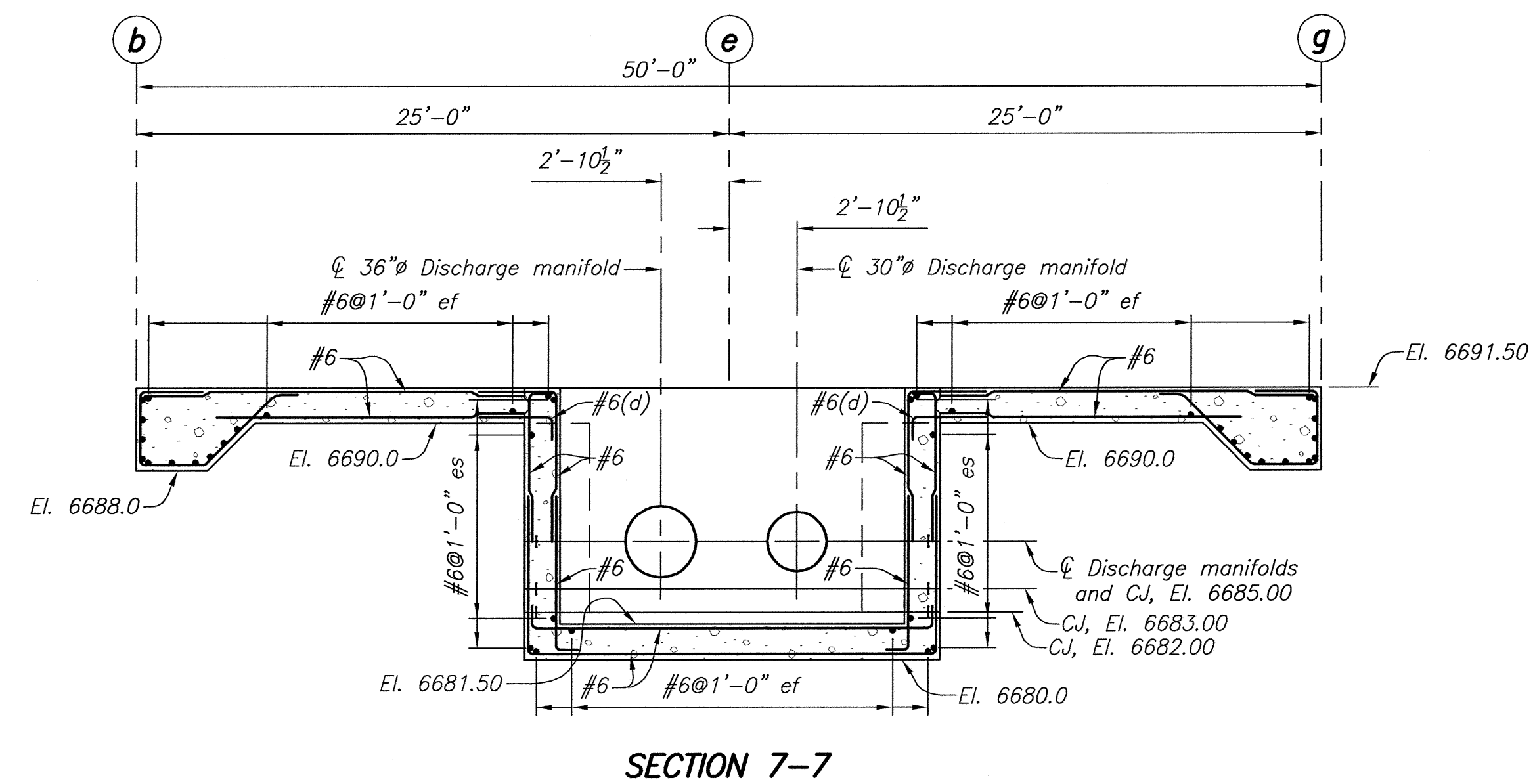
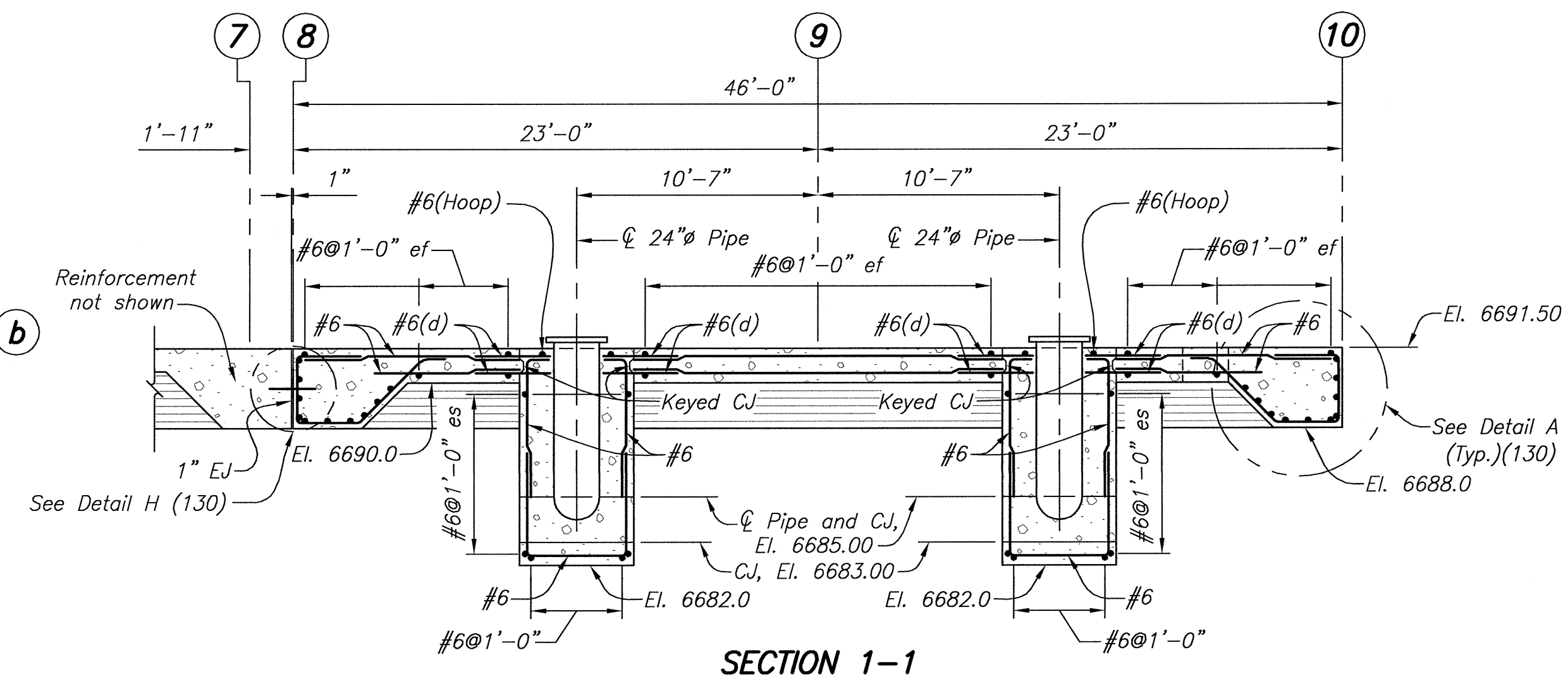
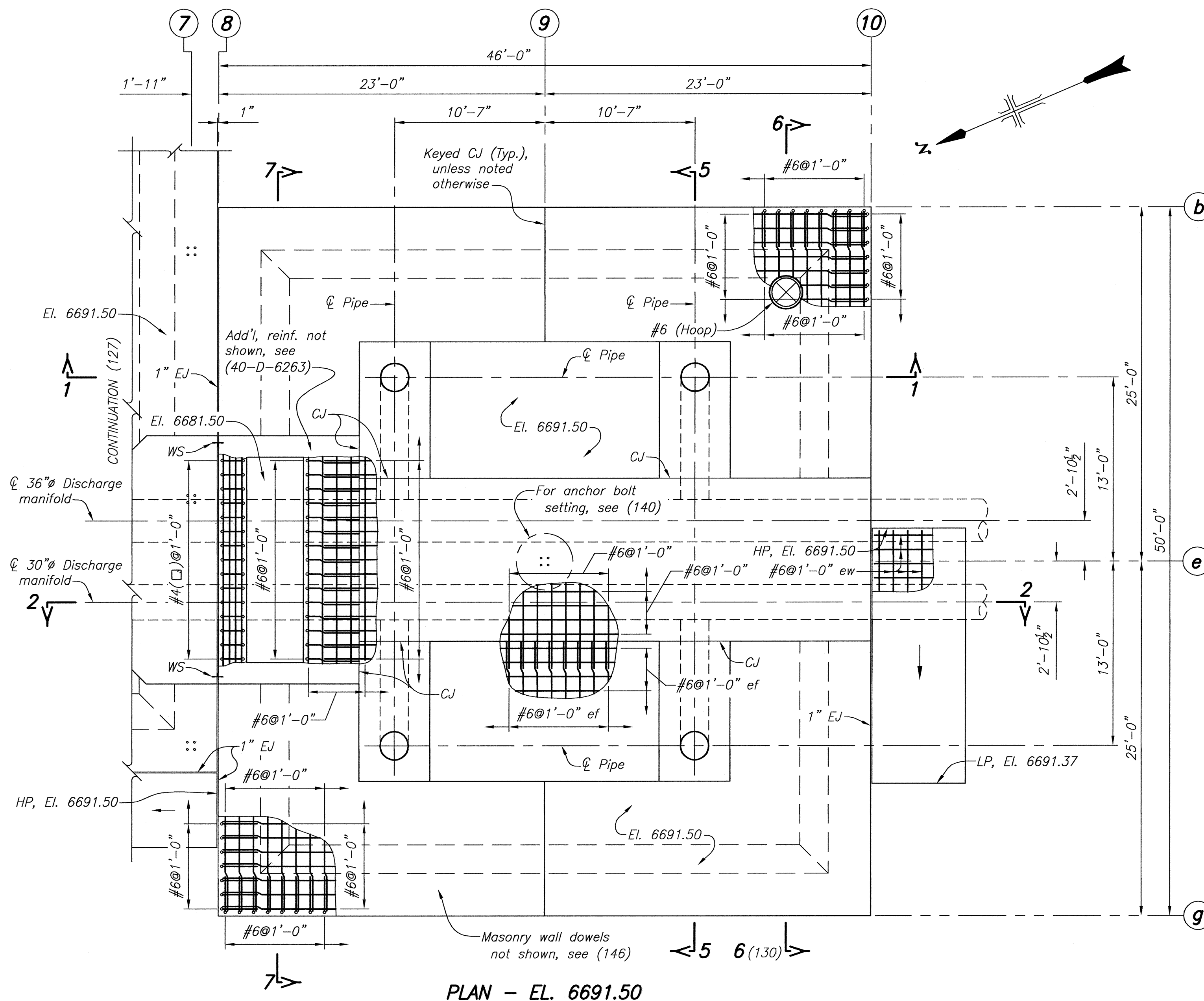
1. For reinforcement design general notes, see (127).
2. For concrete outlines, see (124) and (125).



DESIGNED: K. OSE
DRAWN: R. D. R. 12
CHECKED: B. P. R. 12
TECH. APPR.: C. W. 12
APPROVED: PLANT STRUCTURES GROUP
DENVER, COLORADO 2013-08-05

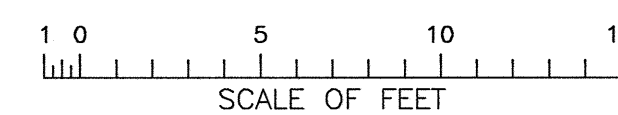
REINFORCEMENT DESIGN
PLAN - EL. 6691.50
SECTIONS

1695-D-129
SHEET 1 OF 1

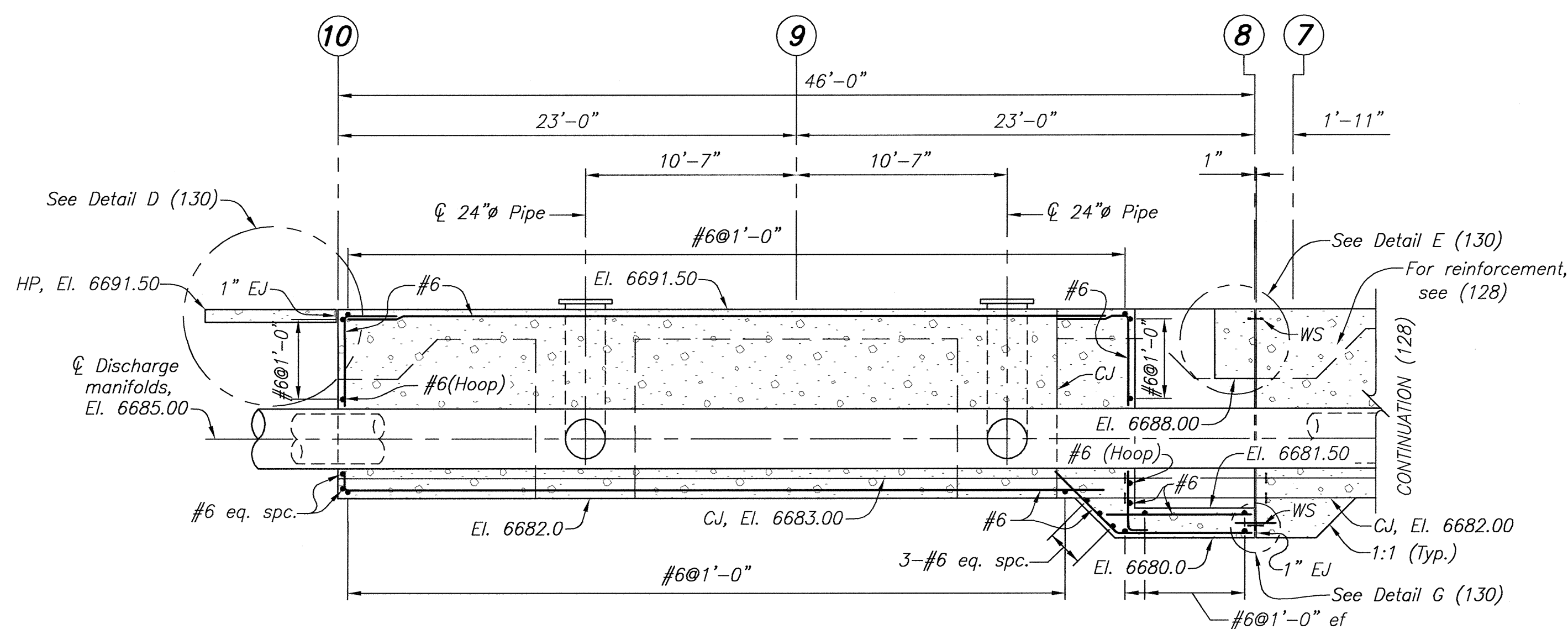


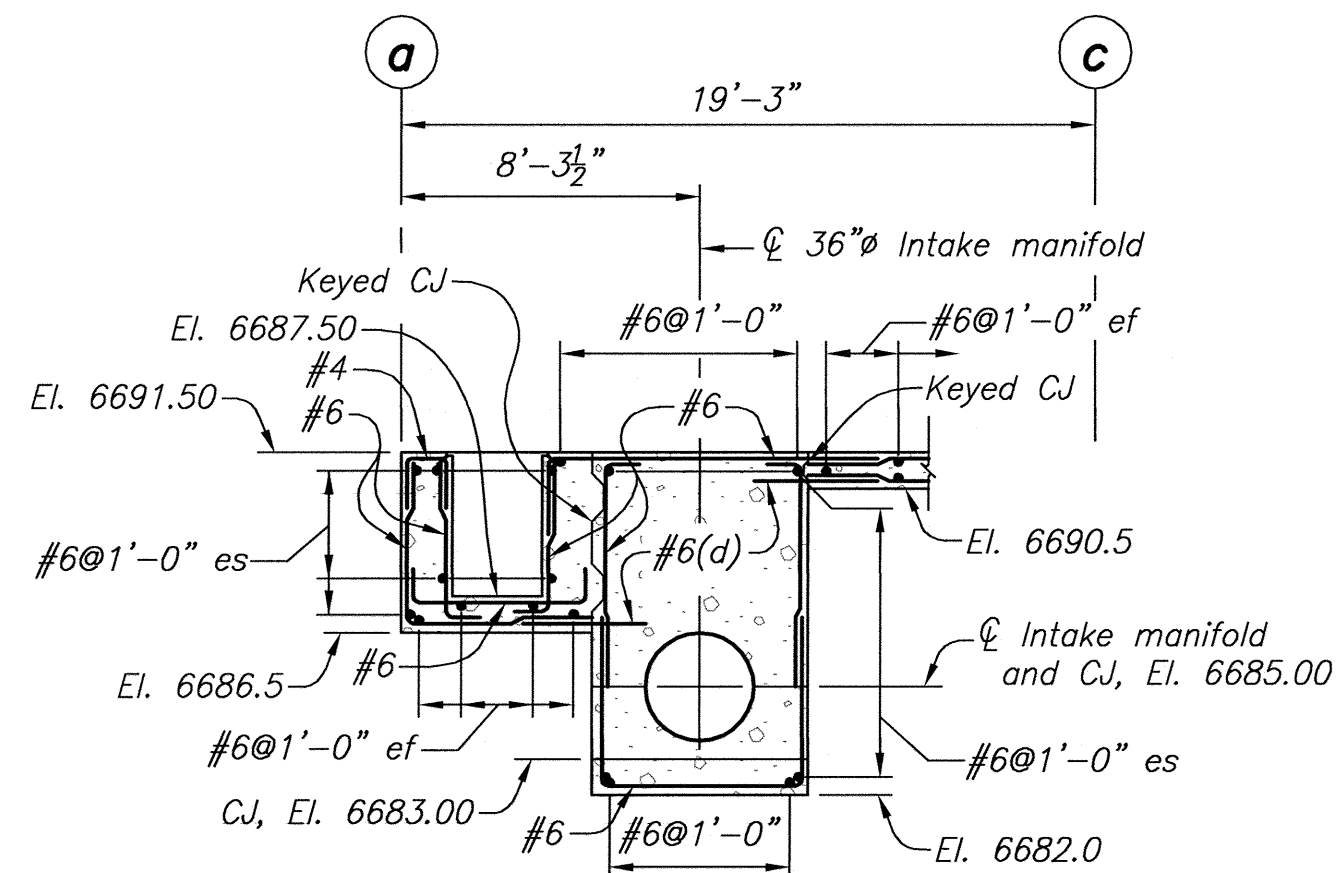
NOTES

1. For reinforcement design general notes, see (127).
2. For concrete outlines, see (123), (124), and (125).

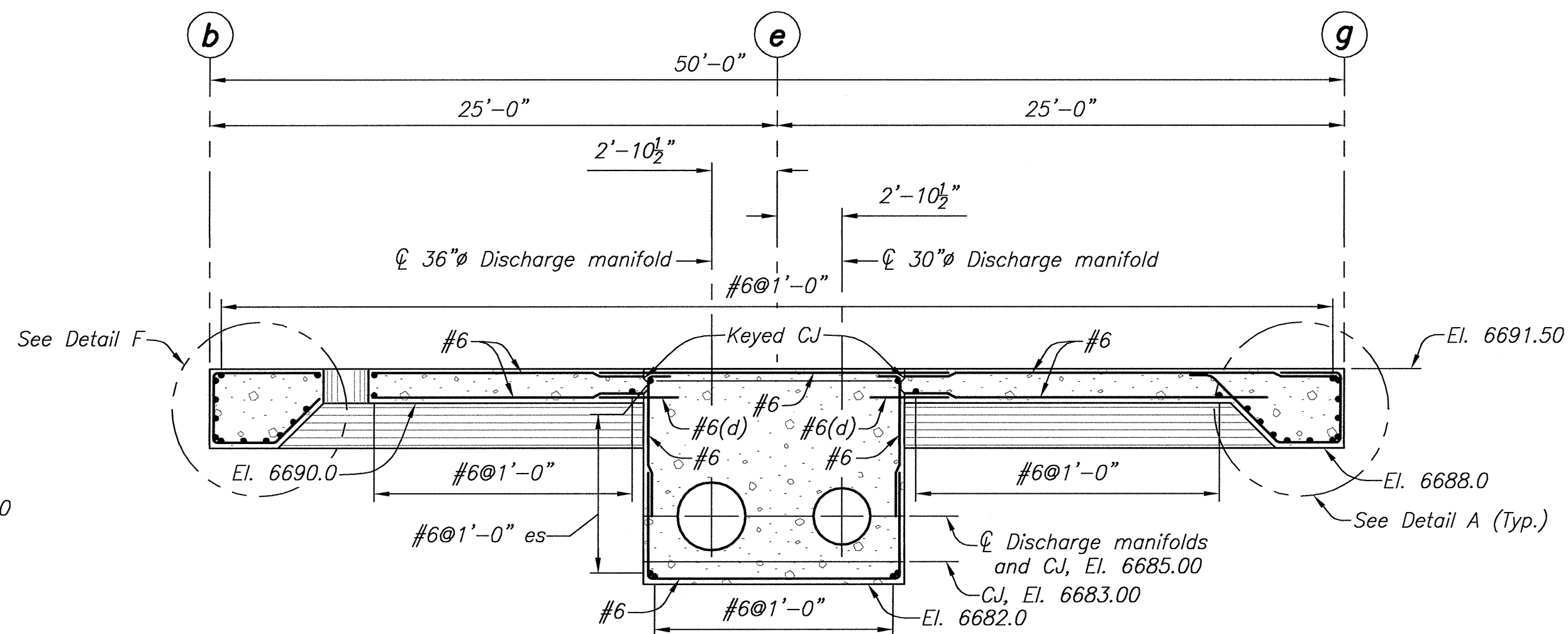


SECTION 2-2

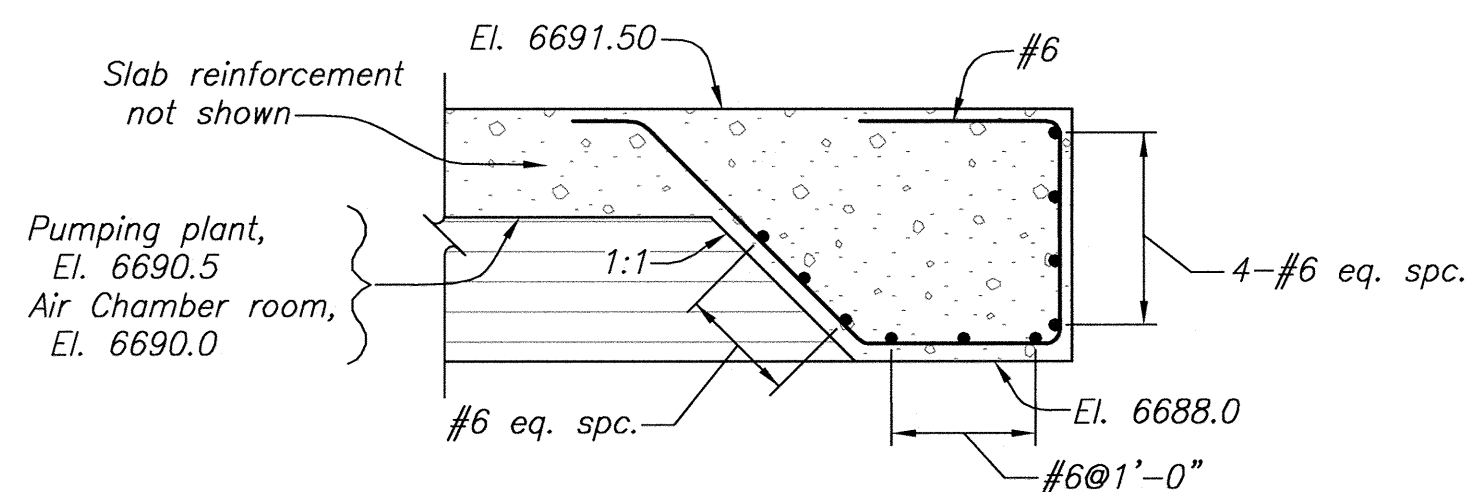
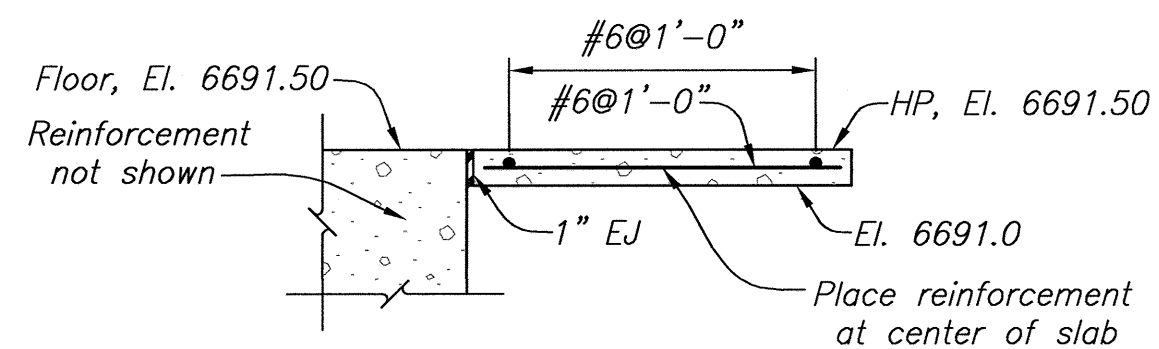
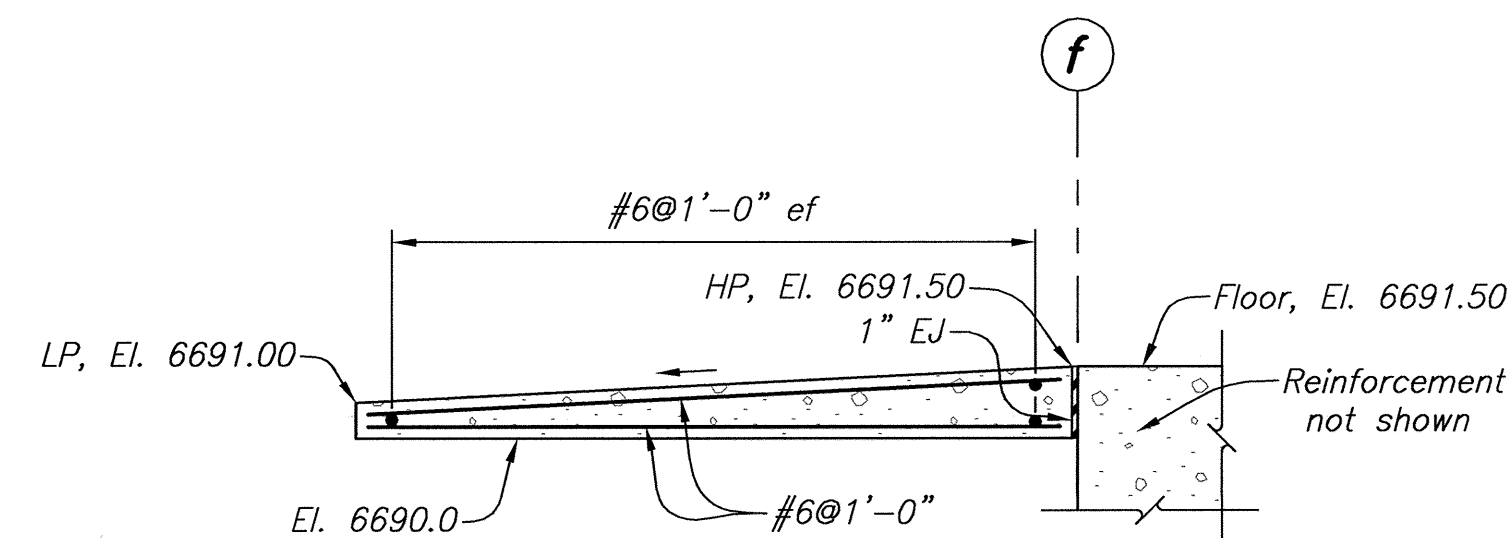
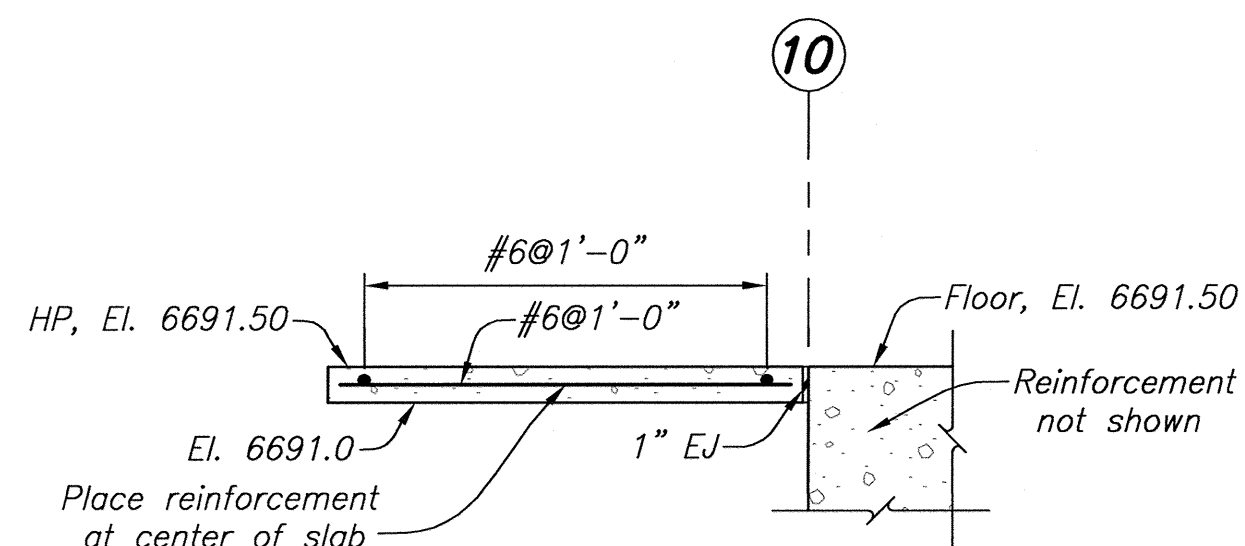
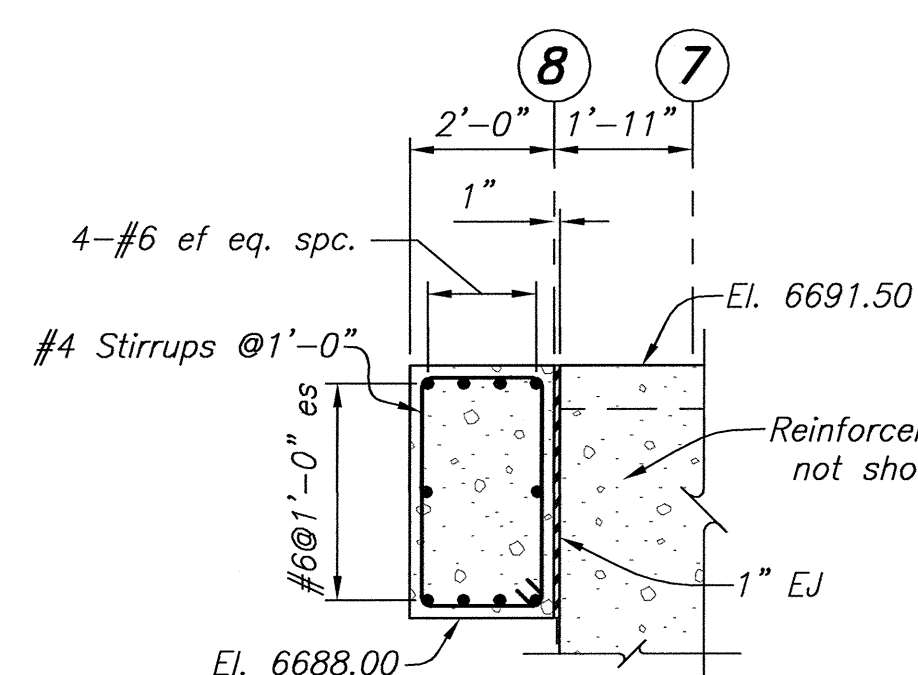
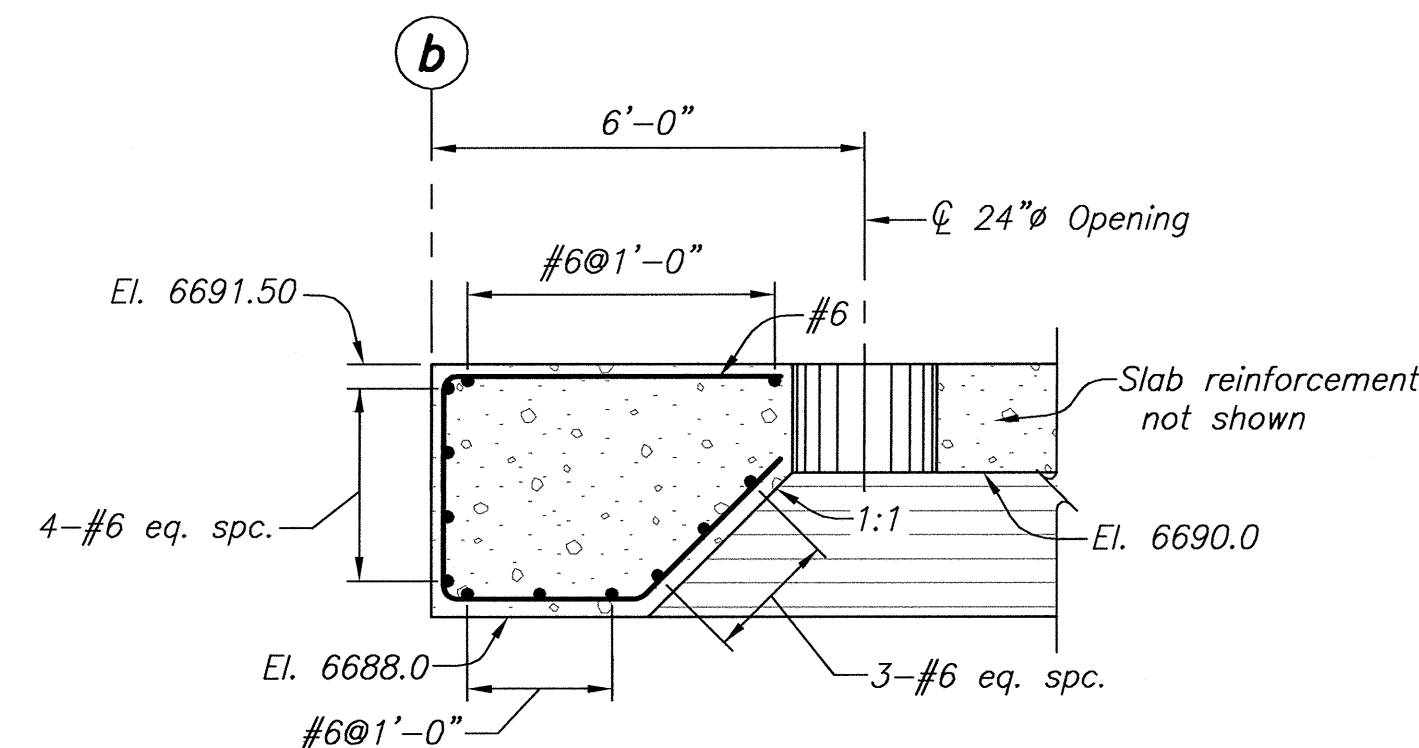
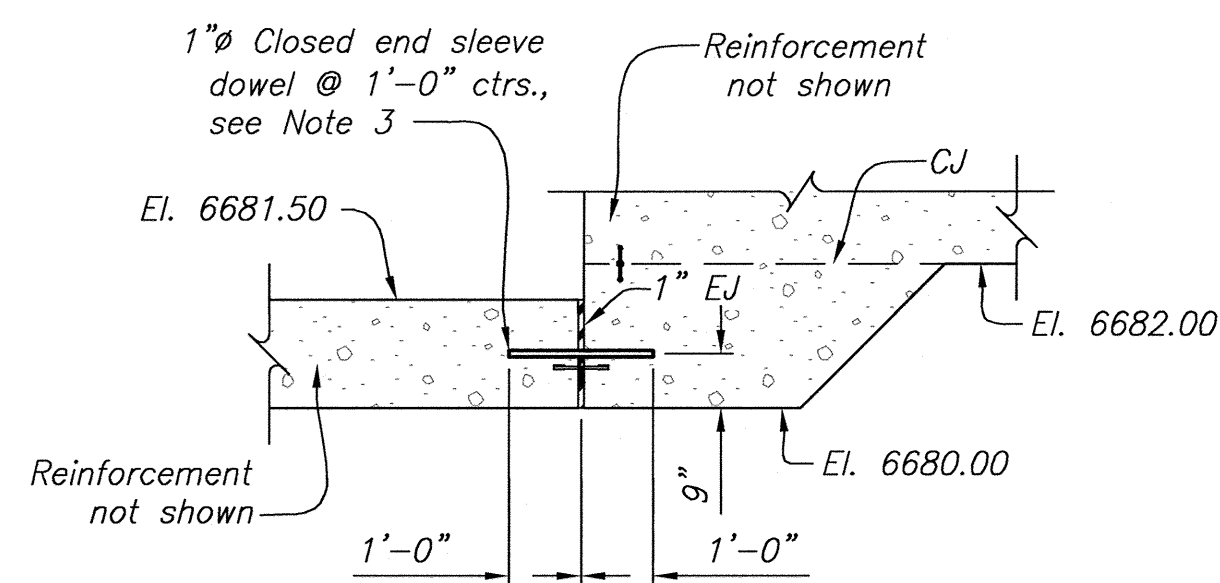
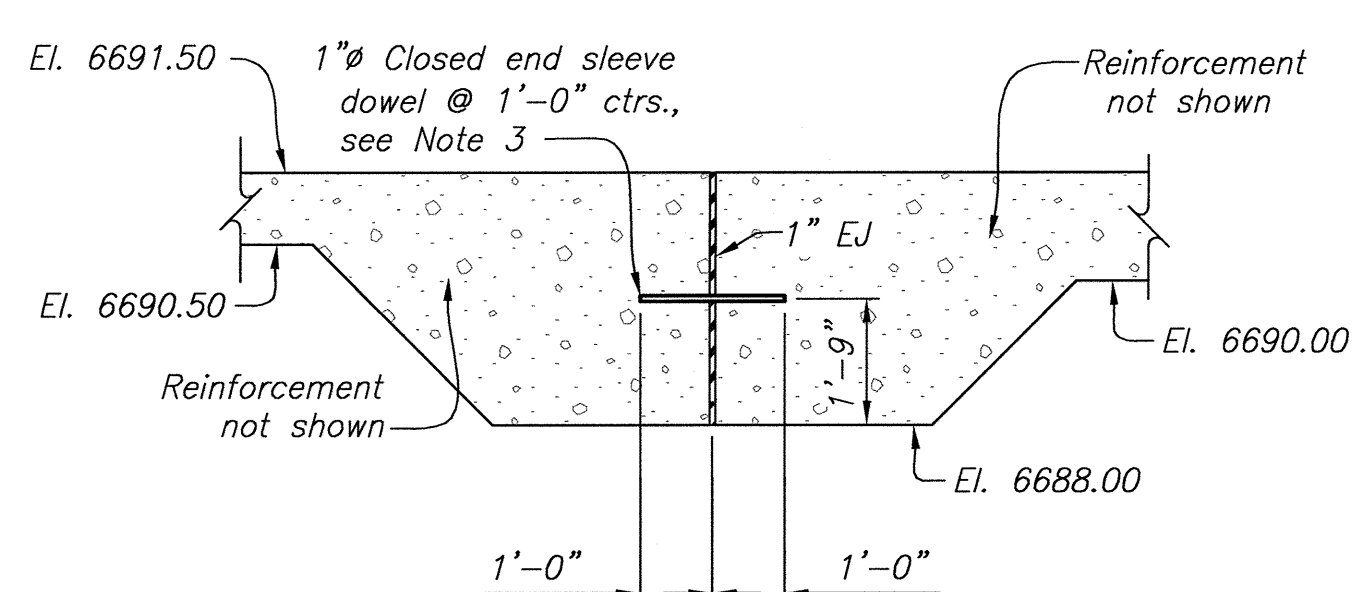




SECTION 5-5 (127)

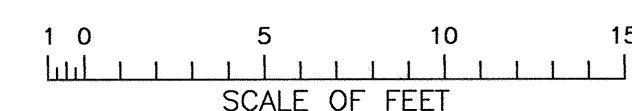


SECTION 6-6 (129)

DETAIL A (128, 129)
(No Scale)DETAIL B (128)
(No Scale)DETAIL C (128)
(No Scale)DETAIL D (129)
(No Scale)DETAIL E (129)
(No Scale)DETAIL F (129)
(No Scale)DETAIL G (129)
(No Scale)DETAIL H (129)
(No Scale)

NOTES

1. For reinforcement design general notes, see (127).
2. For concrete outlines, see (123), (124), and (125).
3. Grease exposed ends of dowel bars to prevent bond.



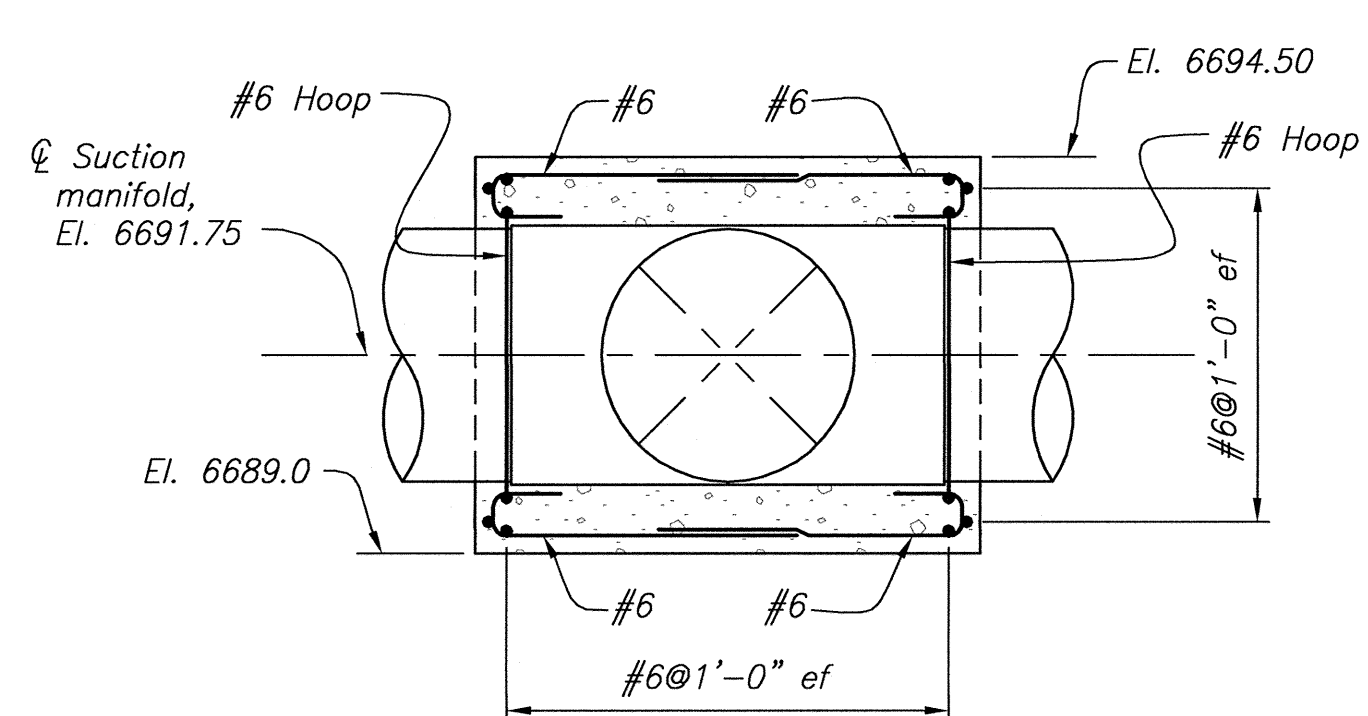
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NEW MEXICO
SAN JUAN LATERAL
TOHLAKAI PUMPING PLANT
STEEL MANIFOLD ENCASEMENTS
CONCRETE OUTLINE AND REINFORCEMENT DESIGN
PLAN AND SECTIONS

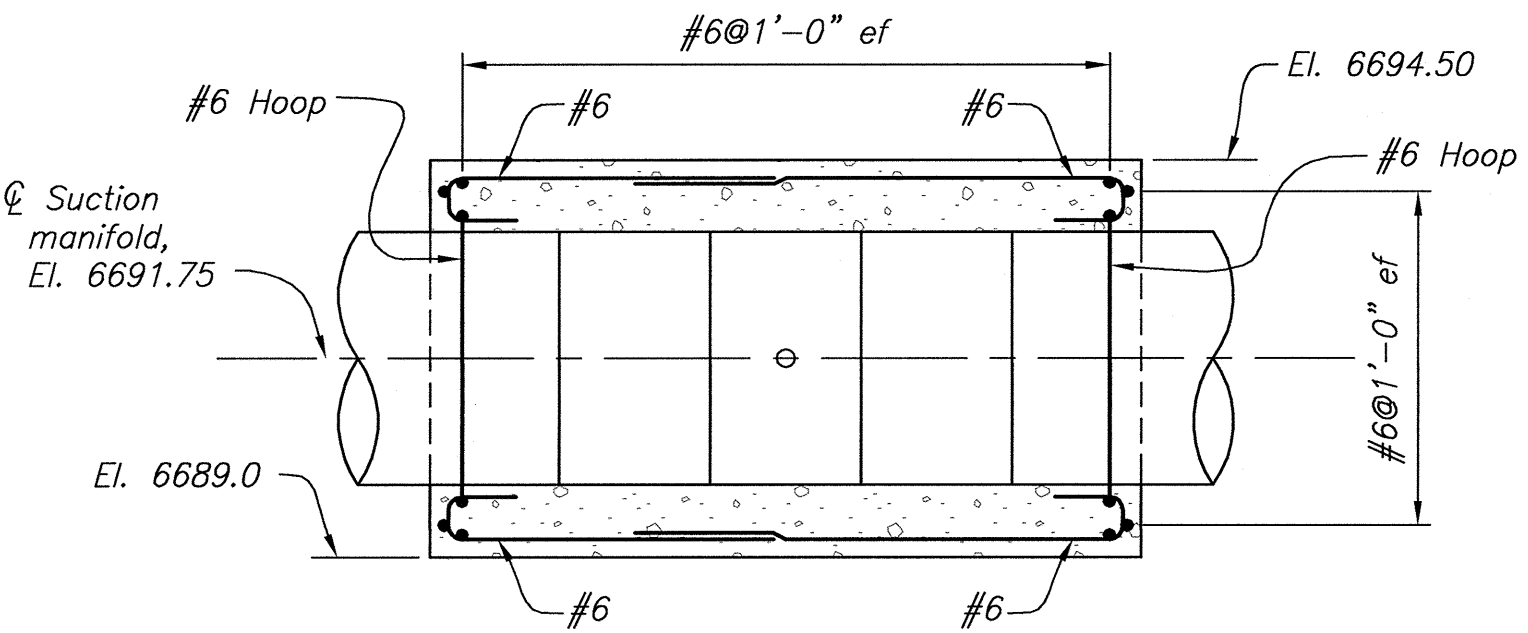
CONCRETE OUTLINE AND
REINFORCEMENT
PLAN AND SECTIONS

1695-D-327

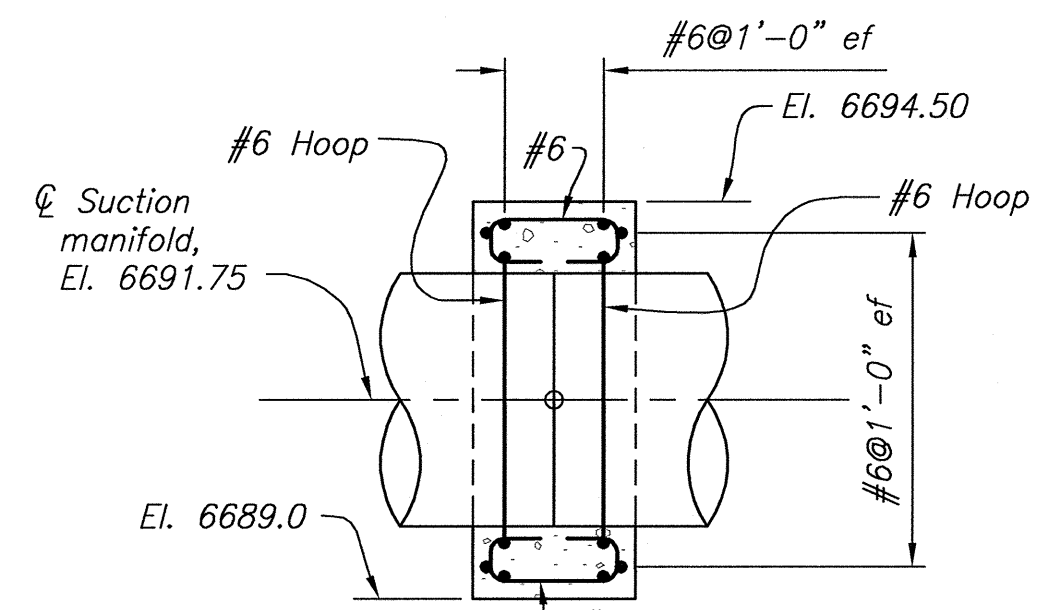
SHEET 1 OF 3



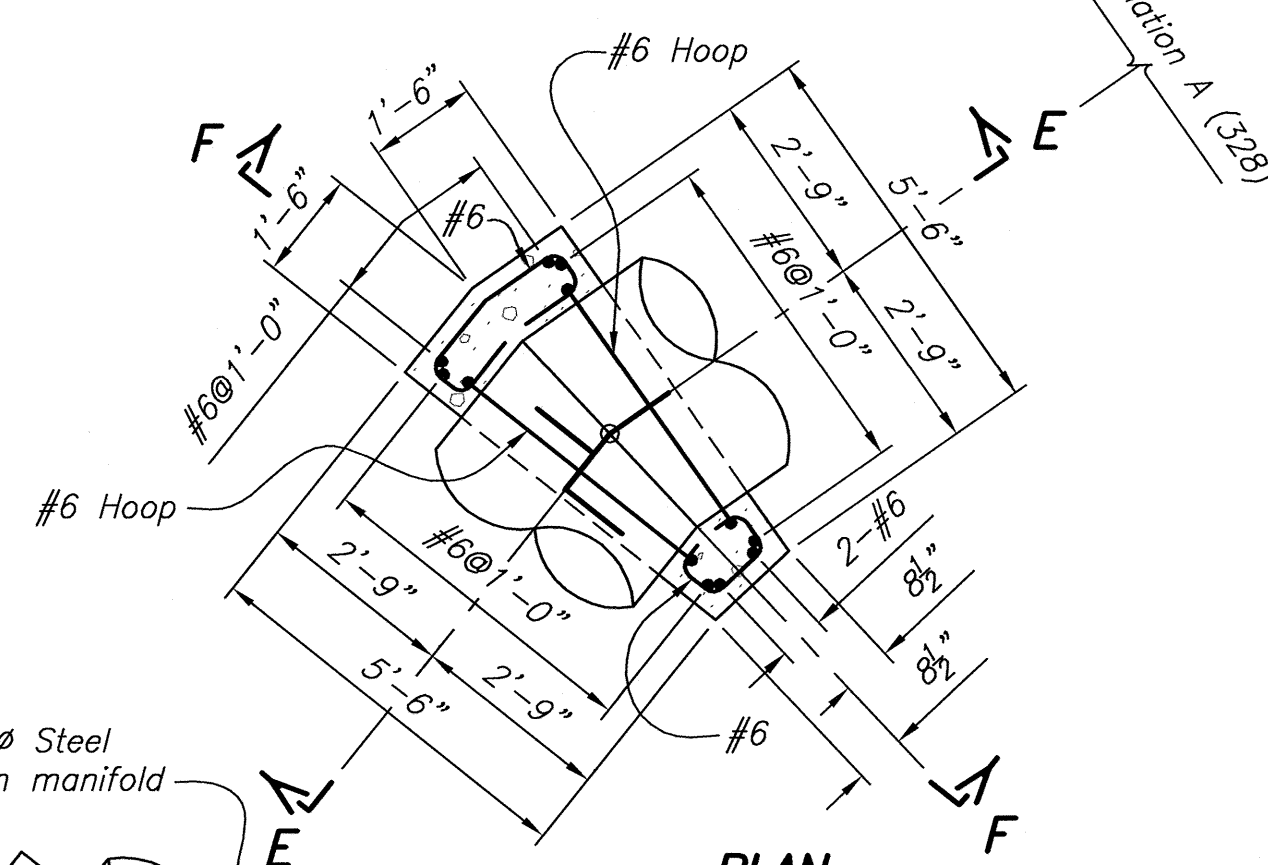
SECTION A-A



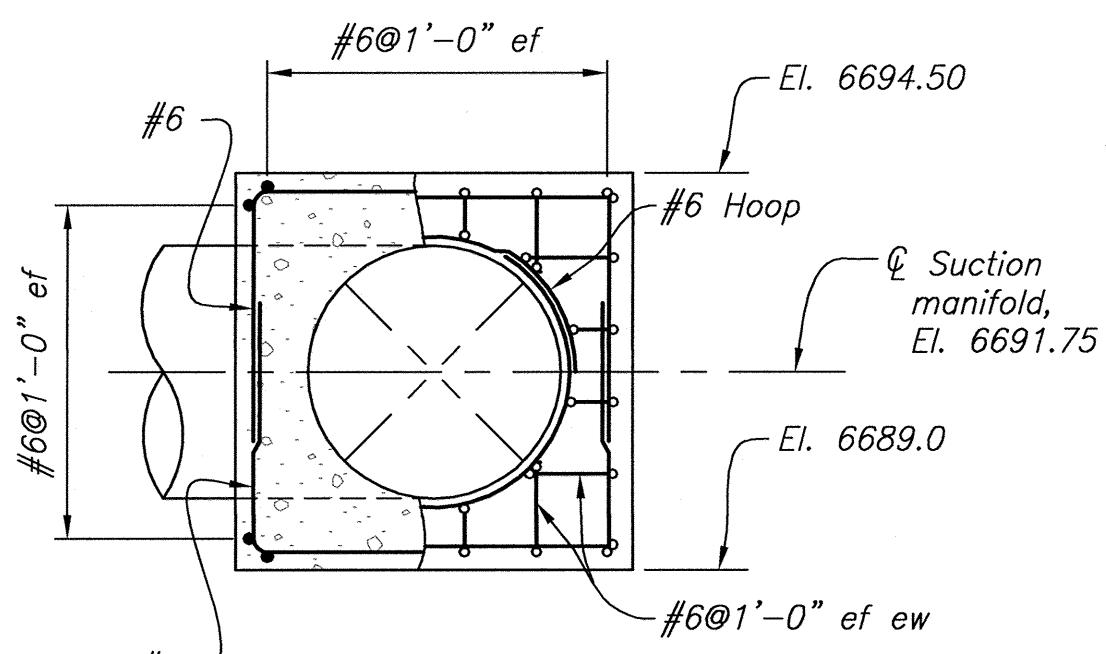
SECTION C-C



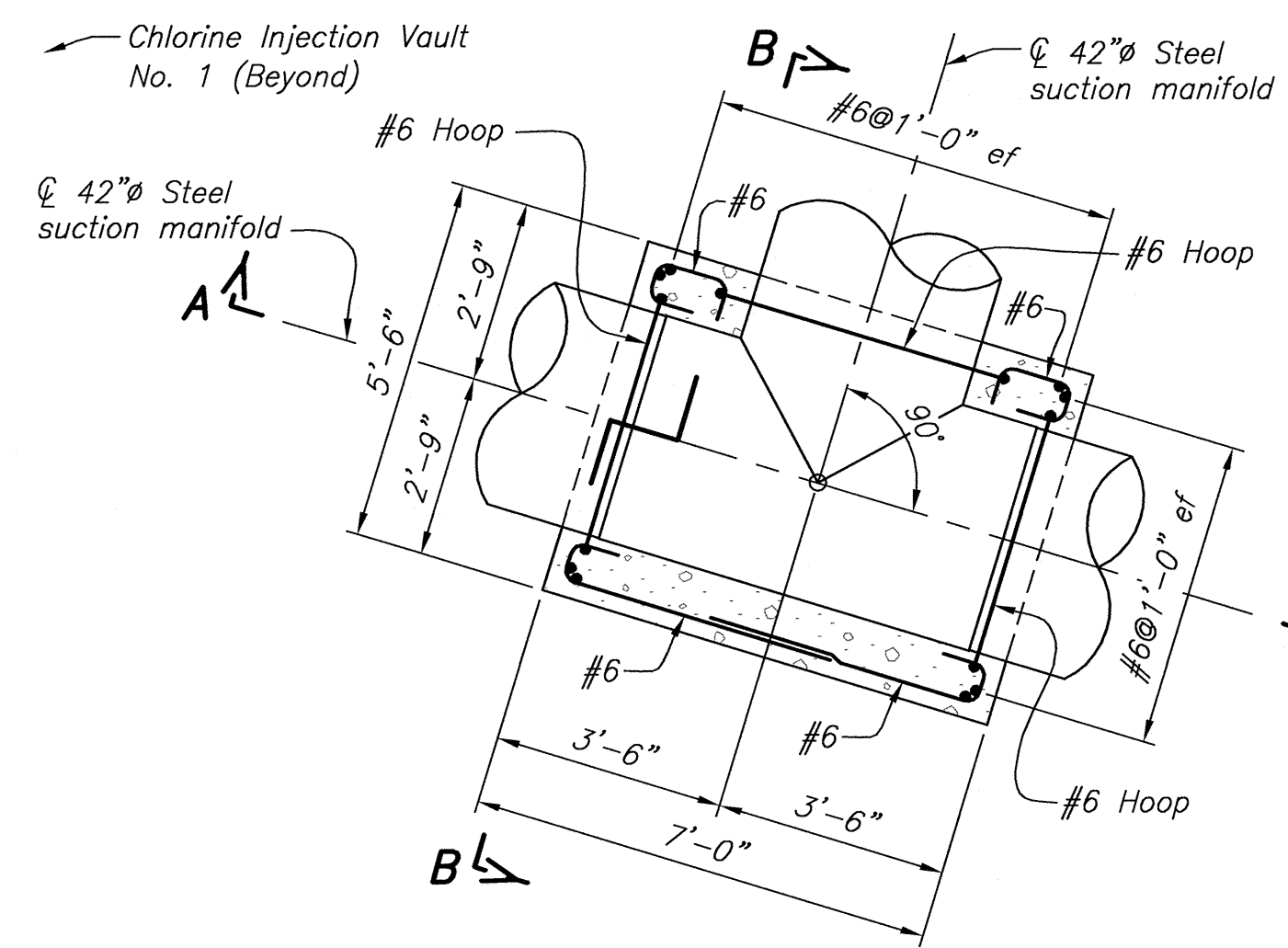
SECTION E-E (AS SHOWN)
SECTION 1-1 (328)(SIMILAR)



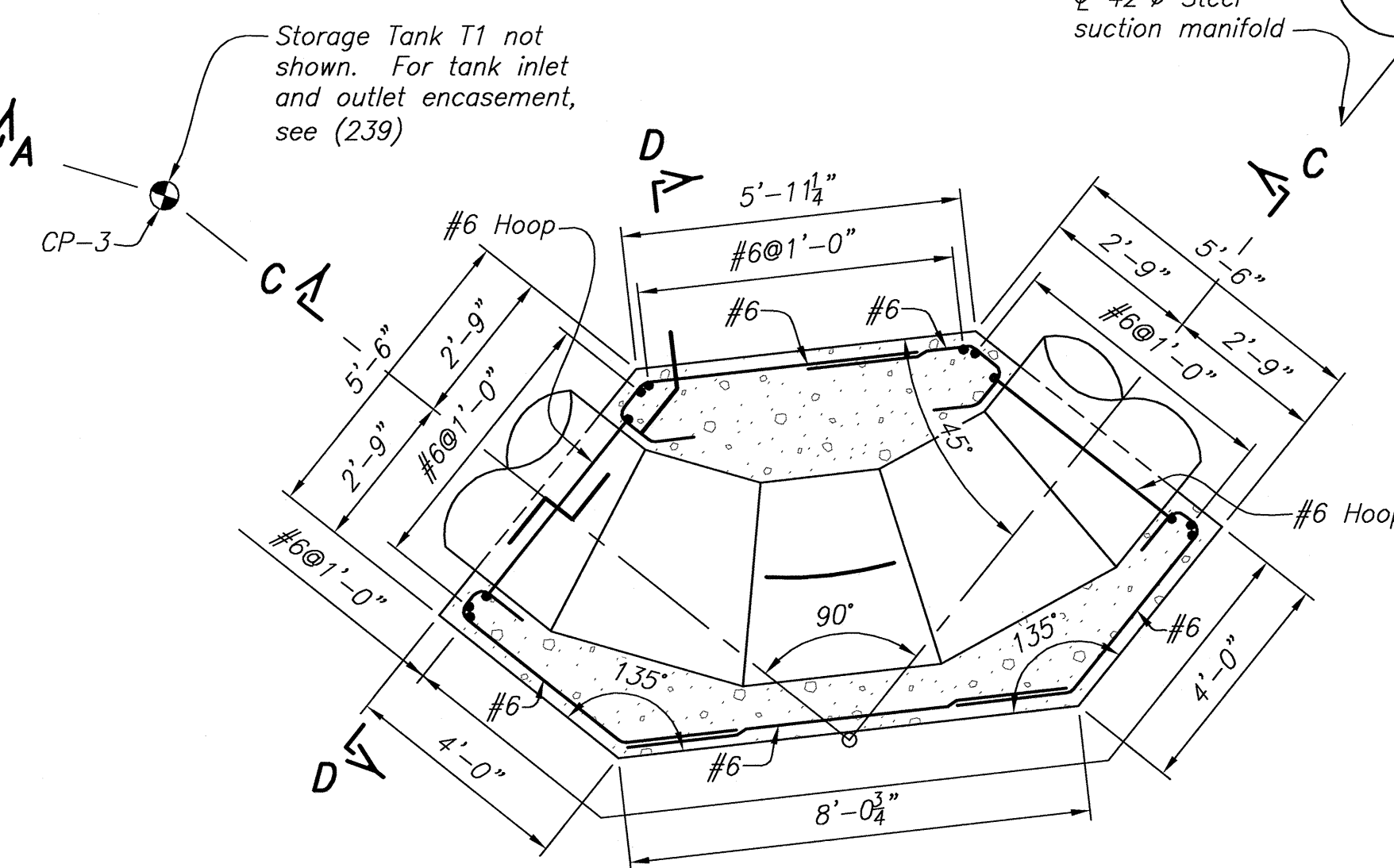
PLAN
MANIFOLD ENCASEMENT - TYPE 3
For reference, see (206)
ONE REQUIRED



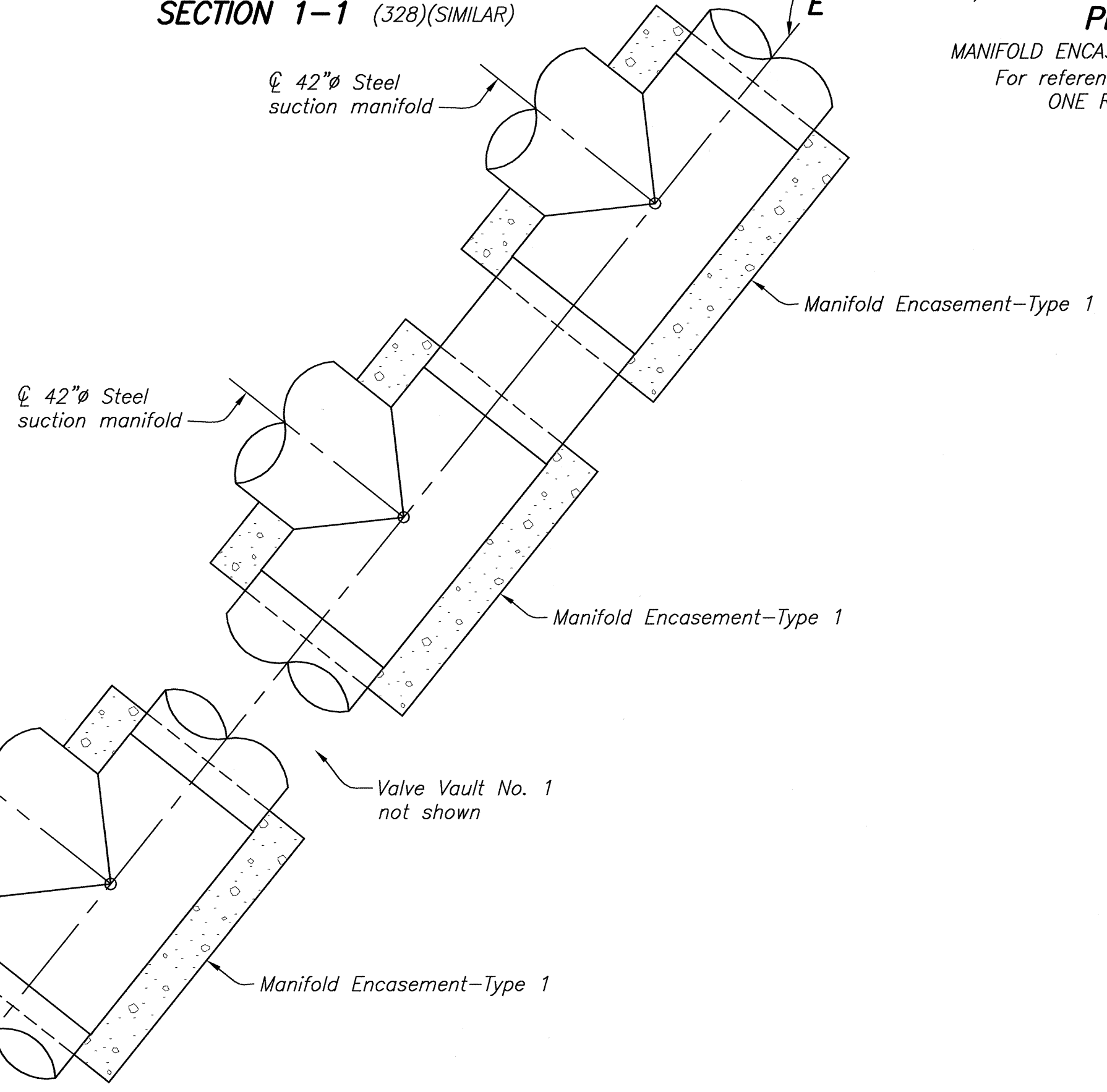
SECTION B-B (AS SHOWN)
SECTION D-D (SIMILAR)
SECTION F-F (SIMILAR)
SECTION 2-2 (328)(SIMILAR)



PLAN
MANIFOLD ENCASEMENT - TYPE 1
For reference, see (206)
7 REQUIRED



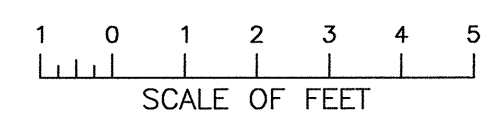
PLAN
MANIFOLD ENCASEMENT - TYPE 2
For reference, see (206)
ONE REQUIRED



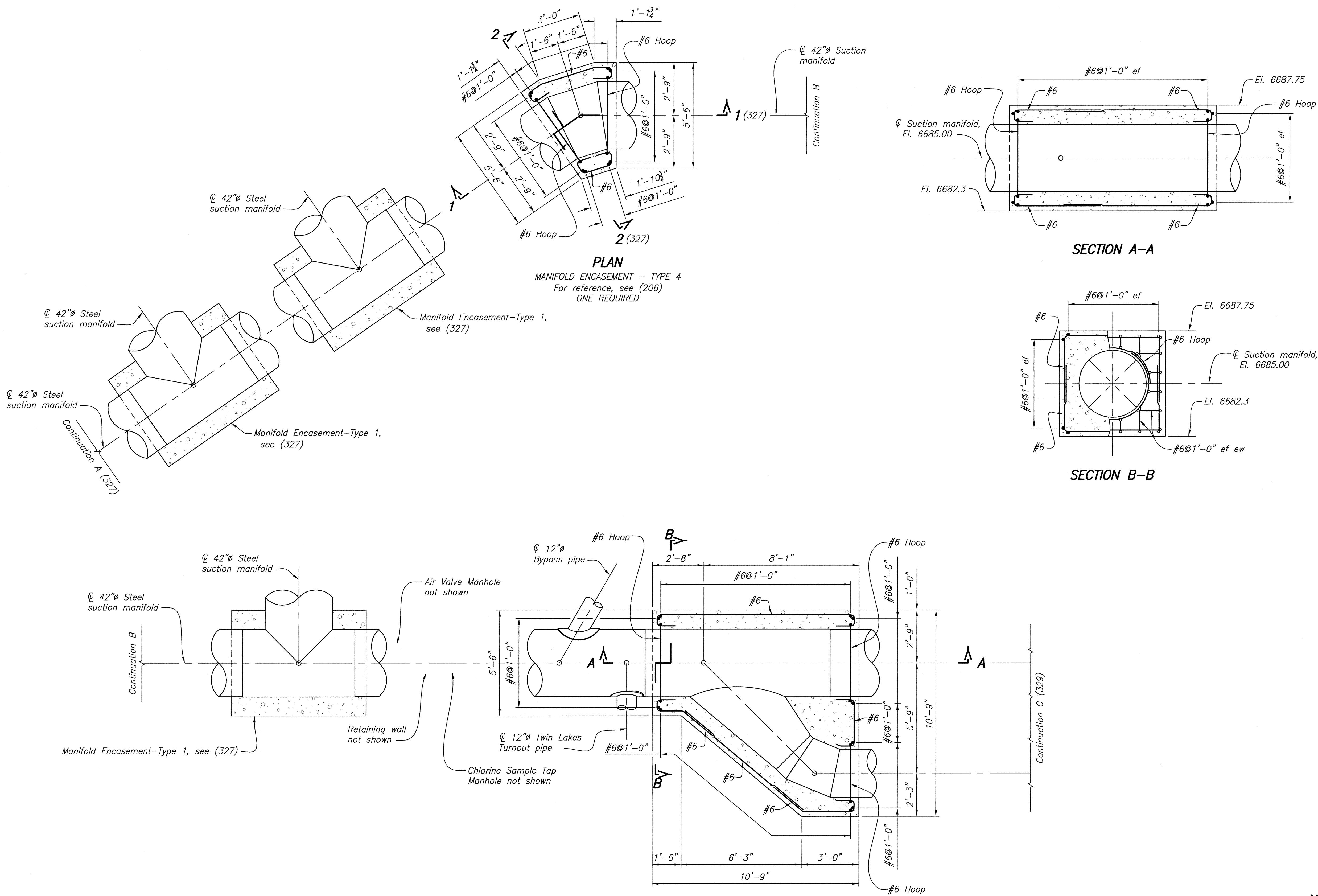
- NOTES**
- For Concrete General Notes, see (123).
 - For Reinforcement Design General Notes, see (127).
 - For Structural Design Data, see (101) and (102).
 - For control point locations, see (99).
 - For control point coordinates, see (100).
 - All vertical elevations are based on NAVD88 vertical datum.

REFERENCE DRAWINGS

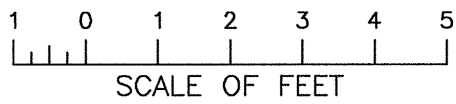
SITE PLAN	1695-D-99
MECHANICAL EQUIPMENT	1695-D-205 THRU 1695-D-208, 1695-D-210, AND 1695-D-211
WATER STORAGE TANK	1.1 MG PRESTRESSED CONCRETE STORAGE TANK 1695-D-106
	1.1 MG STEEL STORAGE TANK 1695-D-224

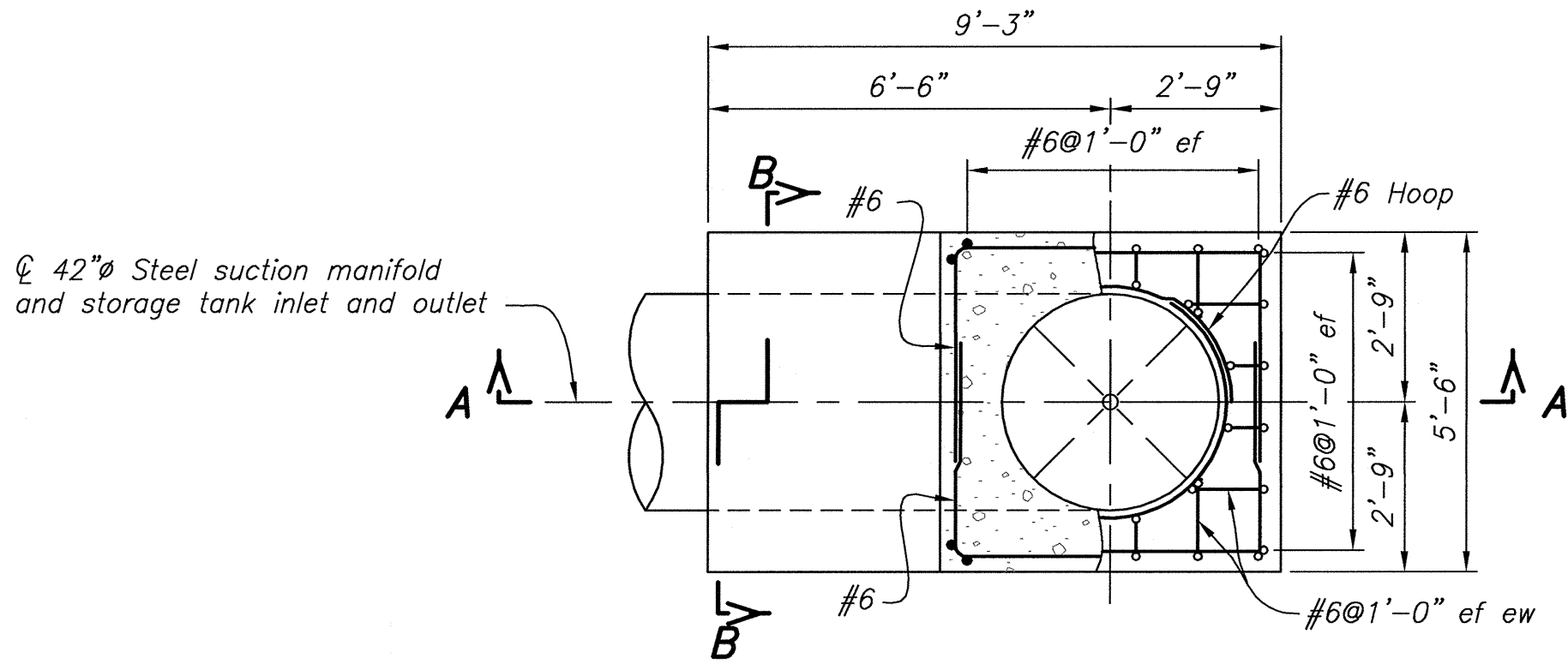


CAD SYSTEM 19.08
DATE AND TIME PLOTTED
AUGUST 22, 2015 08:50
CDD FILENAME
1695-D-327 - STEEL MANIFOLD ENCASEMENT - SHEET 1 OF 3.DWG
KOSHER

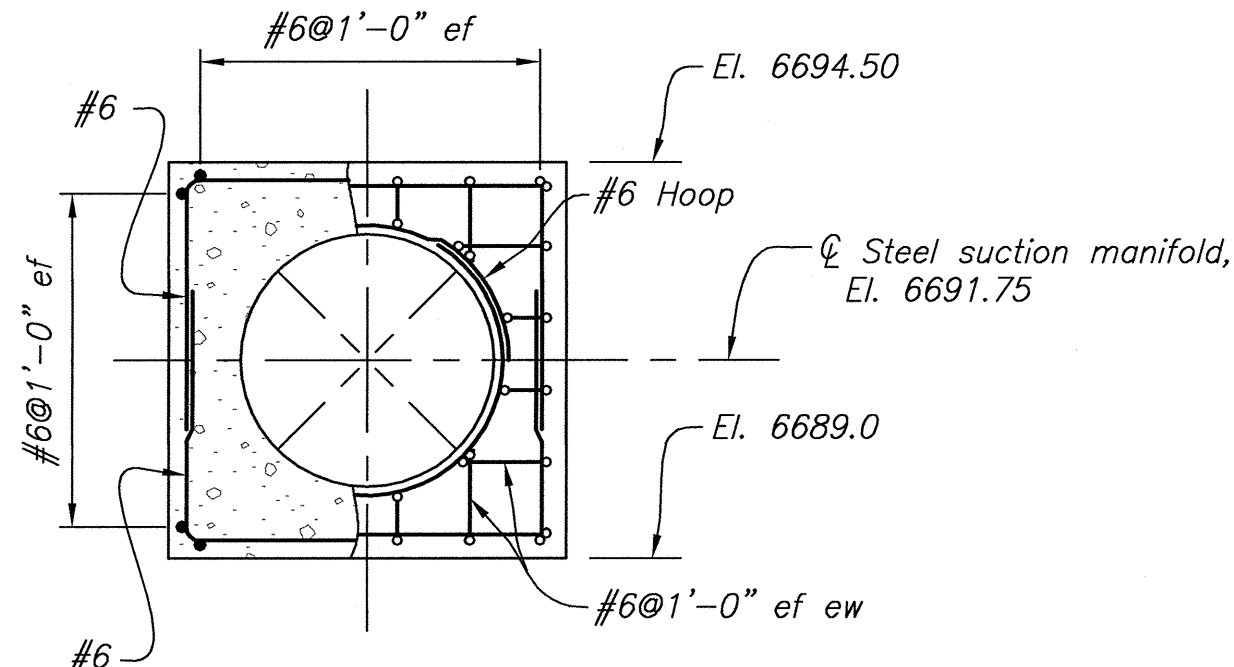


- NOTES**
1. For Concrete General Notes, see (123).
 2. For Reinforcement Design General Notes, see (127).
 3. For Structural Design Data, see (101) and (102).
 4. For control point locations, see (99).
 5. For control point coordinates, see (100).
 6. All vertical elevations are based on NAVD88 vertical datum.
 7. For Reference Drawings, see (327).

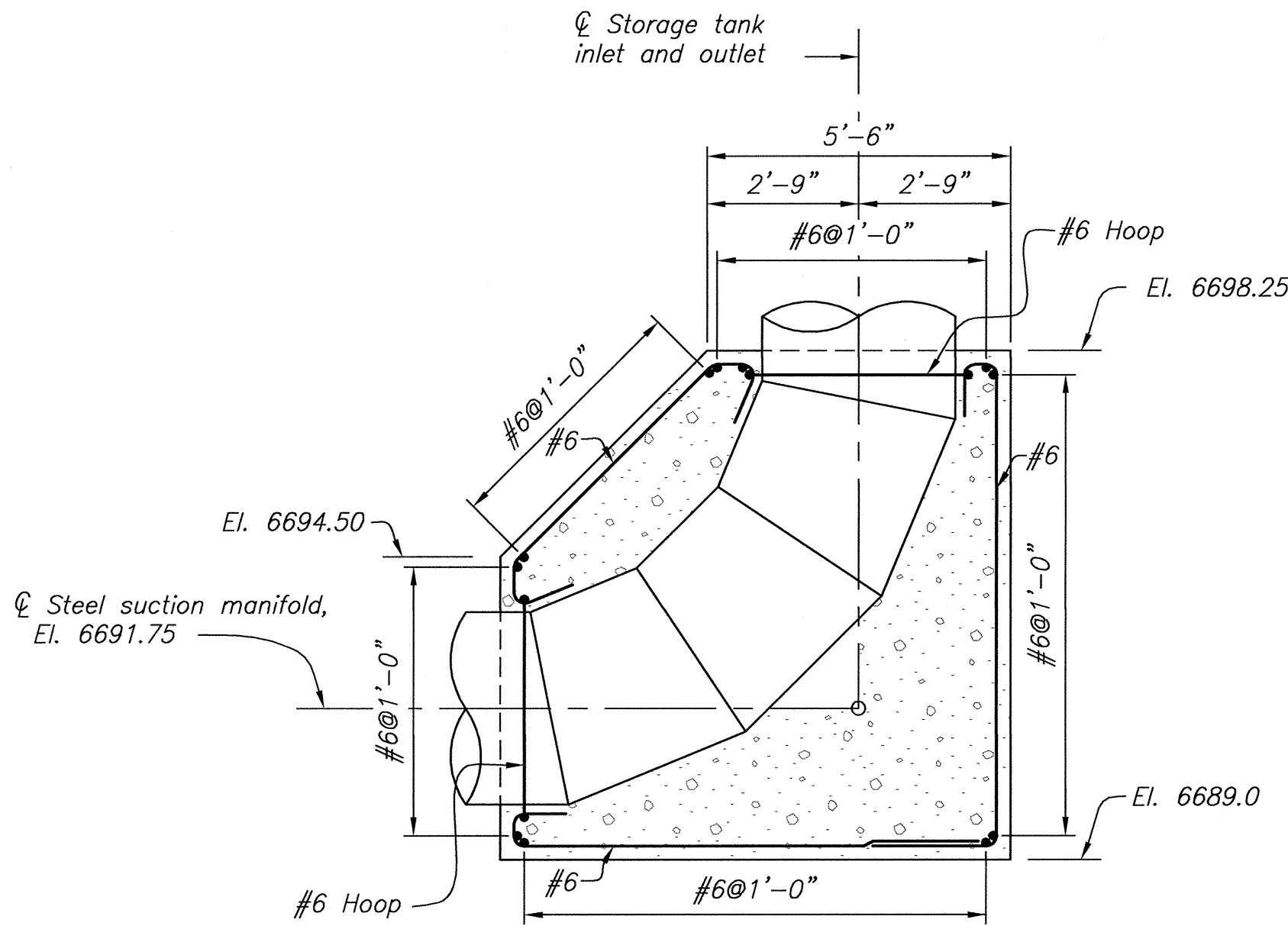




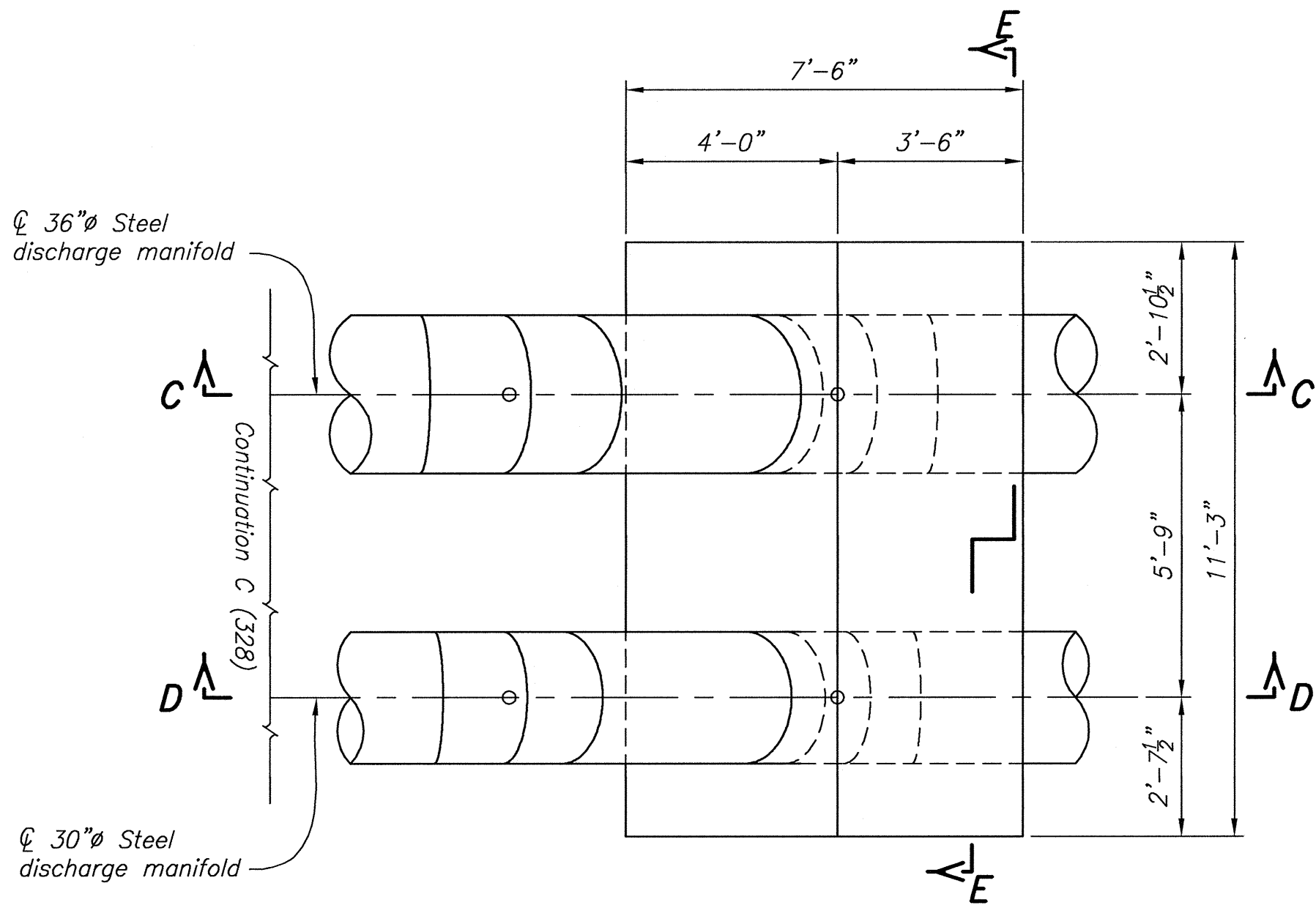
PLAN
MANIFOLD ENCASEMENT - TYPE 6
For reference, see (106) and (224)
TWO REQUIRED



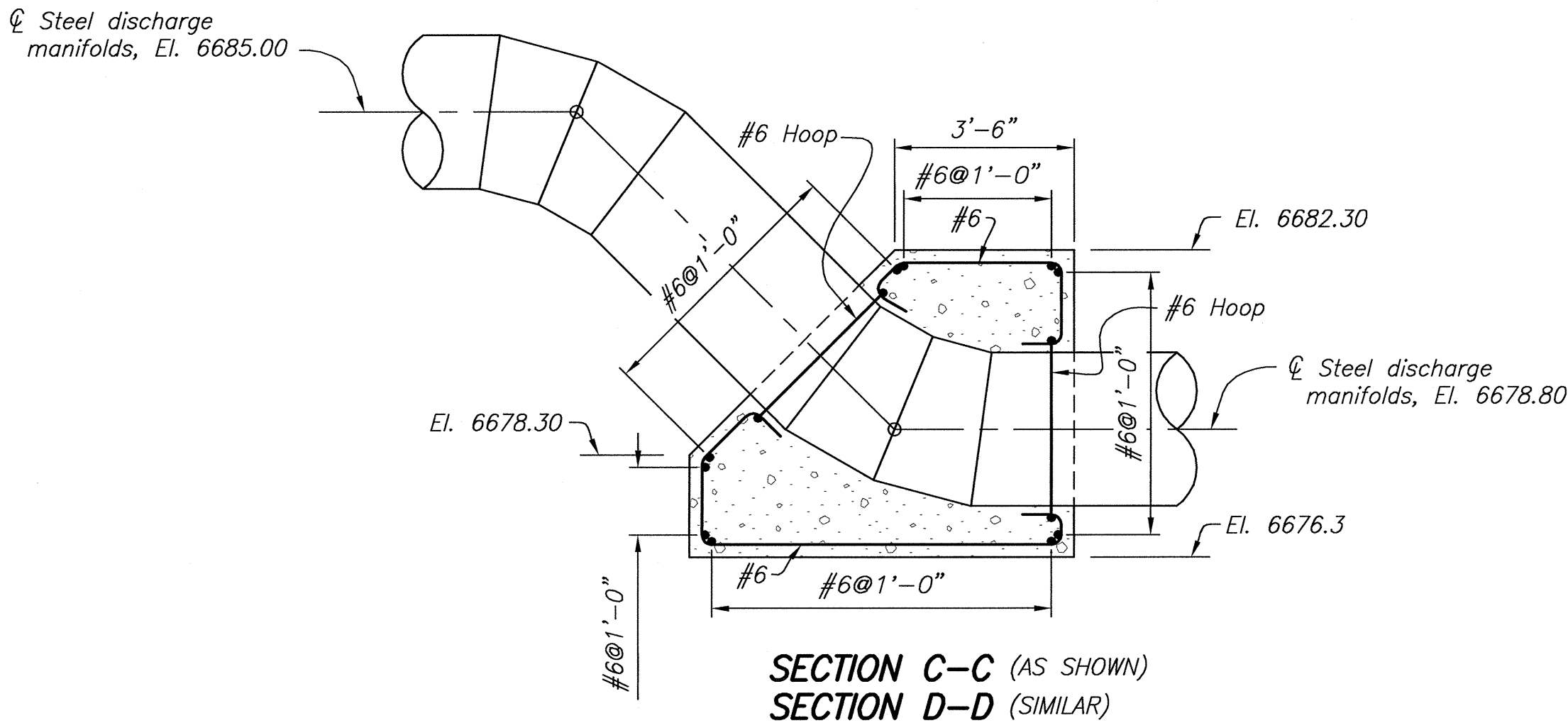
SECTION B-B



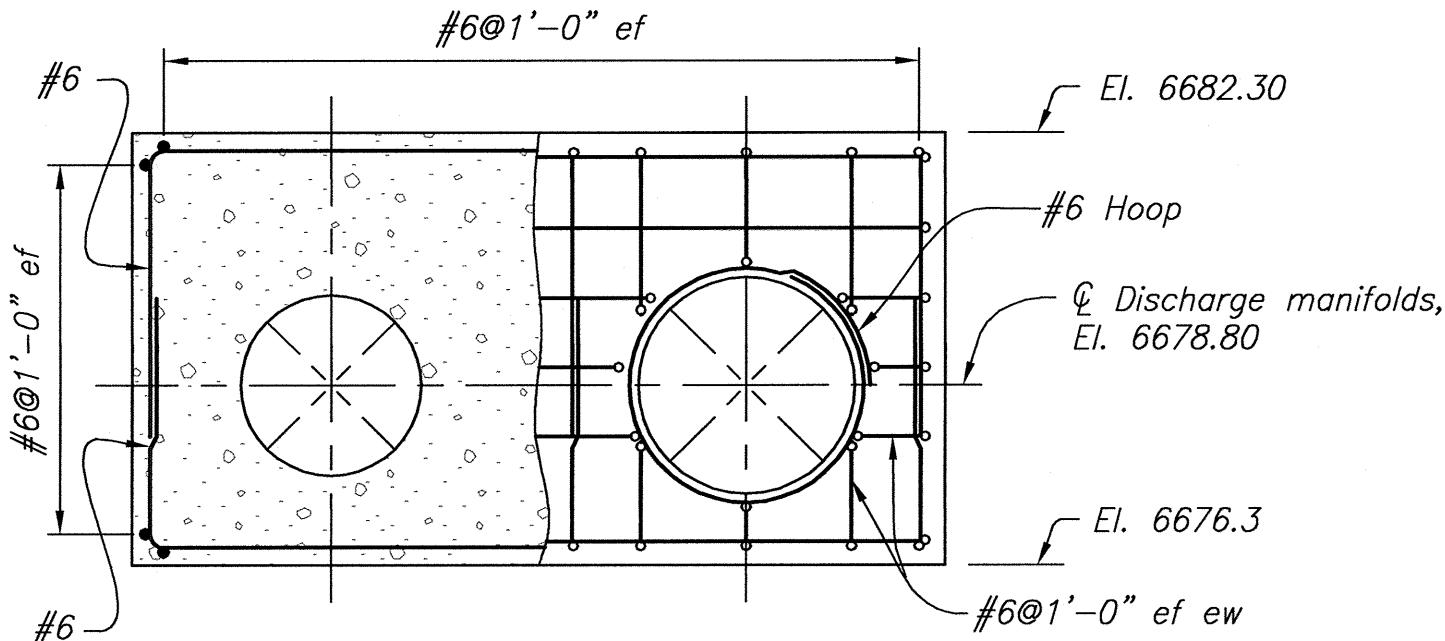
SECTION A-A



PLAN
MANIFOLD ENCASEMENT - TYPE 7
For reference, see (208), (210) and (211)
ONE REQUIRED



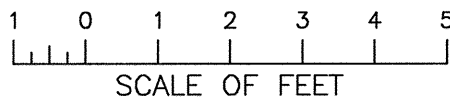
SECTION C-C (AS SHOWN)
SECTION D-D (SIMILAR)

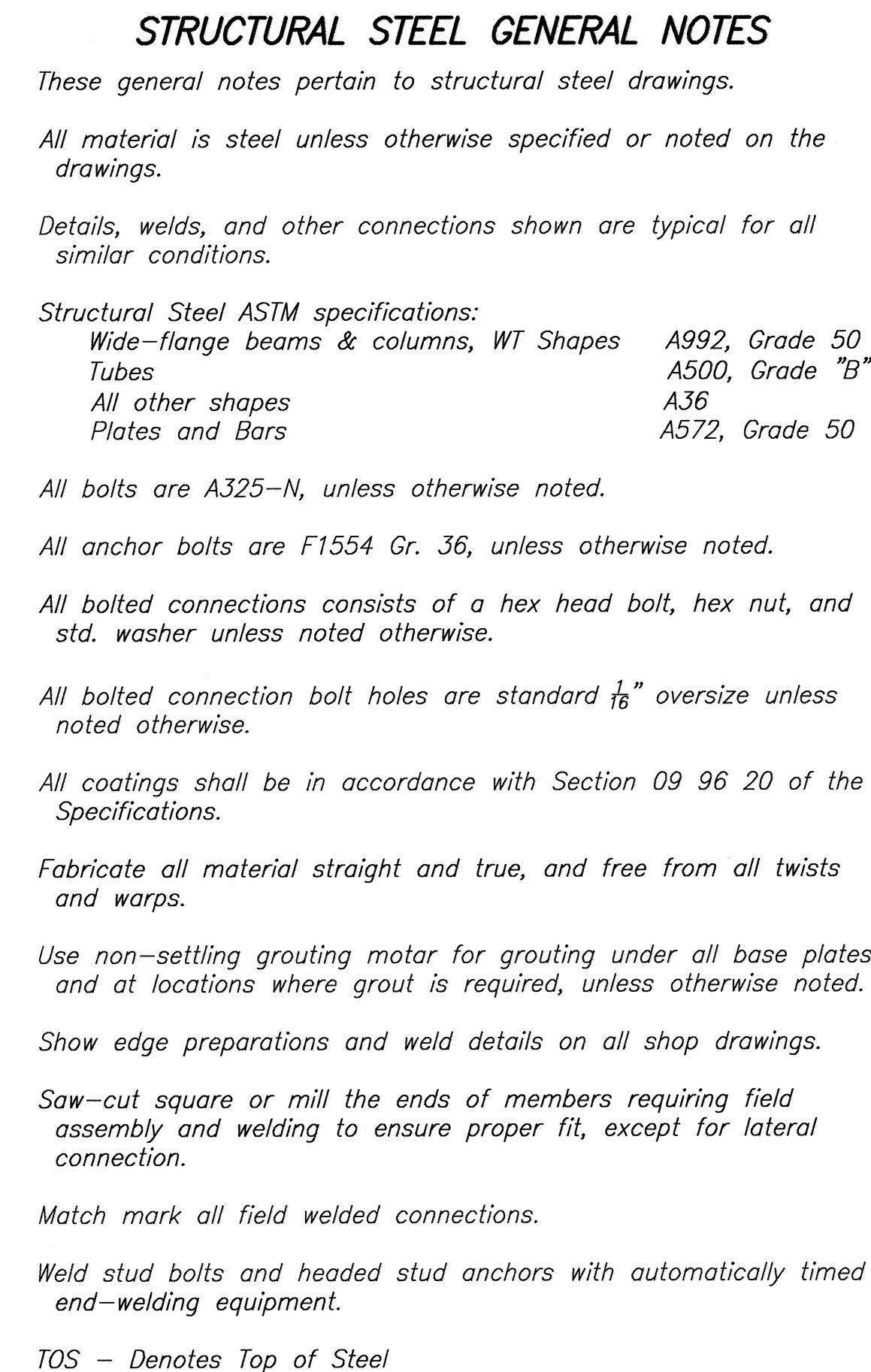


SECTION E-E

NOTES

1. For Concrete General Notes, see (123).
2. For Reinforcement Design General Notes, see (127).
3. For Structural Design Data, see (101) and (102).
4. For control point locations, see (99).
5. For control point coordinates, see (100).
6. All vertical elevations are based on NAVD88 vertical datum.
7. For Reference Drawings, see (327).





1. For Structural Design Data, see (101) and (102).
2. Bolts for crane rail clips are A325.
3. Girder/rail assembly shall be straight, parallel, level, and at the same elevation within the tolerances shown on the table (132).
4. Rail separation at joints, including expansion joints, should not exceed $\frac{1}{2}$ inch.
5. Stagger rail joints on opposite runway girders. Do not coincide rail joints with runway girder splices. Do not coincide rail pad joints at EJ or girder splice joints.
6. For typical connection assembly alignment, see (133).

GENERAL ARRANGEMENT
PLAN EL. 6691.50 _____ 1695-D-119 and -120

STRUCTURAL STEEL
FRAMING PLAN - EL. 6691.50 _____ 1695-D-140

CONCRETE OUTLINE
PLAN - EL. 6691.50 _____ 1695-D-123

DESIGNED *K. J. G. S. G. A.*
DRAWN *R. D. R. O. T. T. I. S. A. K. S. O. N.*
CHECKED *R. D. V. A. N. O. T. T. I. S. A. K. S. O. N.*
TECH. APPR. *R. D. V. A. N. O. T. T. I. S. A. K. S. O. N.*
APPROVED
PLANT STRUCTURES GROUP
DENVER, COLORADO 2013-08-0

**STRUCTURAL STEEL
—TON CRANE RUNWAY
GIRDERS
PLANS, SECTIONS, AND
DETAILS**

1695-D-131

SHEET 1 OF 3

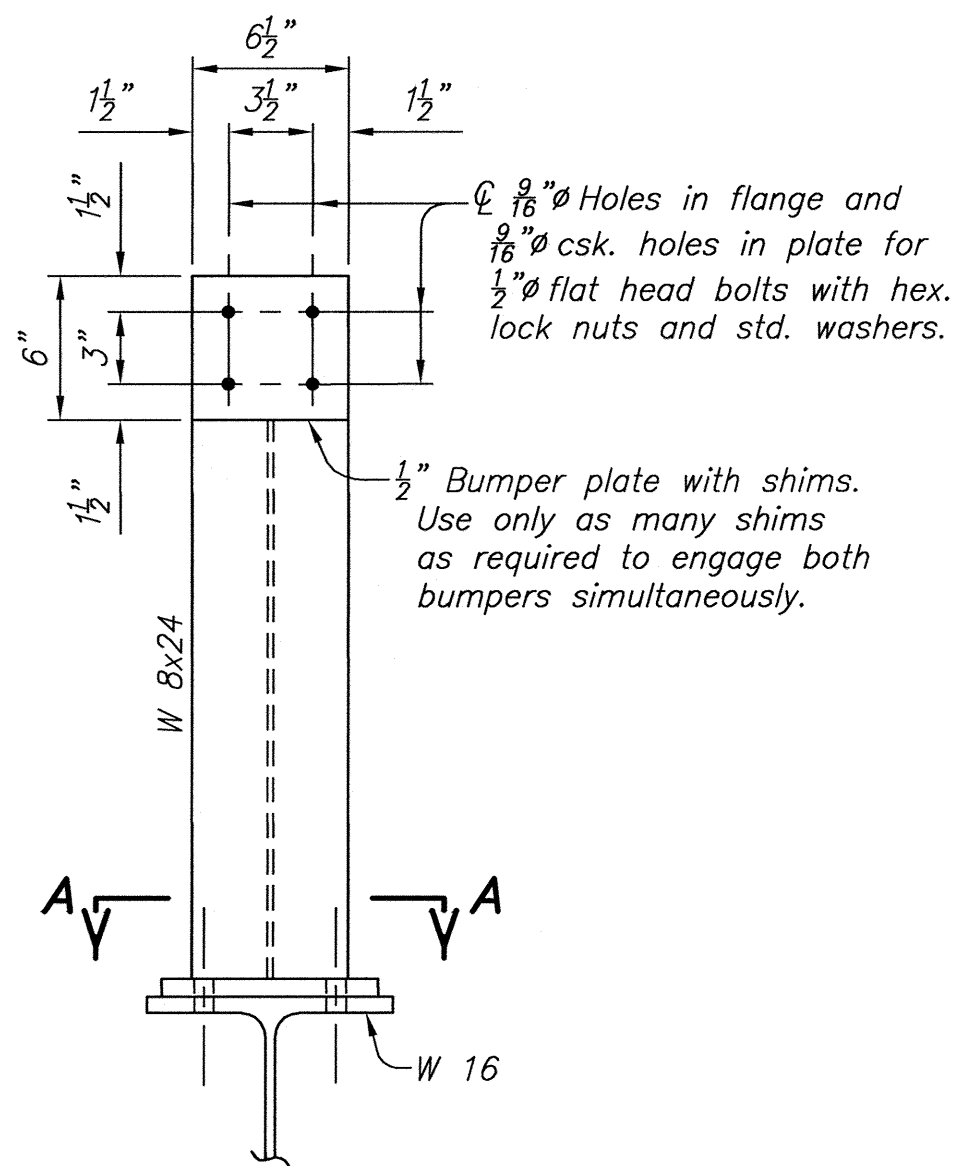
CAD SYSTEM AutoCAD Rel. 19.0s
 CAD FILENAME 1695-D-131 - SS - 5-TON CRANE GIRTERS - PLANS, SECTIONS AND DETAILS.DWG
 DATE AND TIME PLOTTED AUGUST 3, 2013 09:26
 PLOTTED BY KOSHEA

CAD SYSTEM 19,08
AutoCAD Rev.
1695-D-132 - SS - 5-TON CRANE GIRDERS - PLANS, SECTIONS AND DETAILS.DWG
AUGUST 3, 2013 08:26
PLOTTED BY KOSHIA

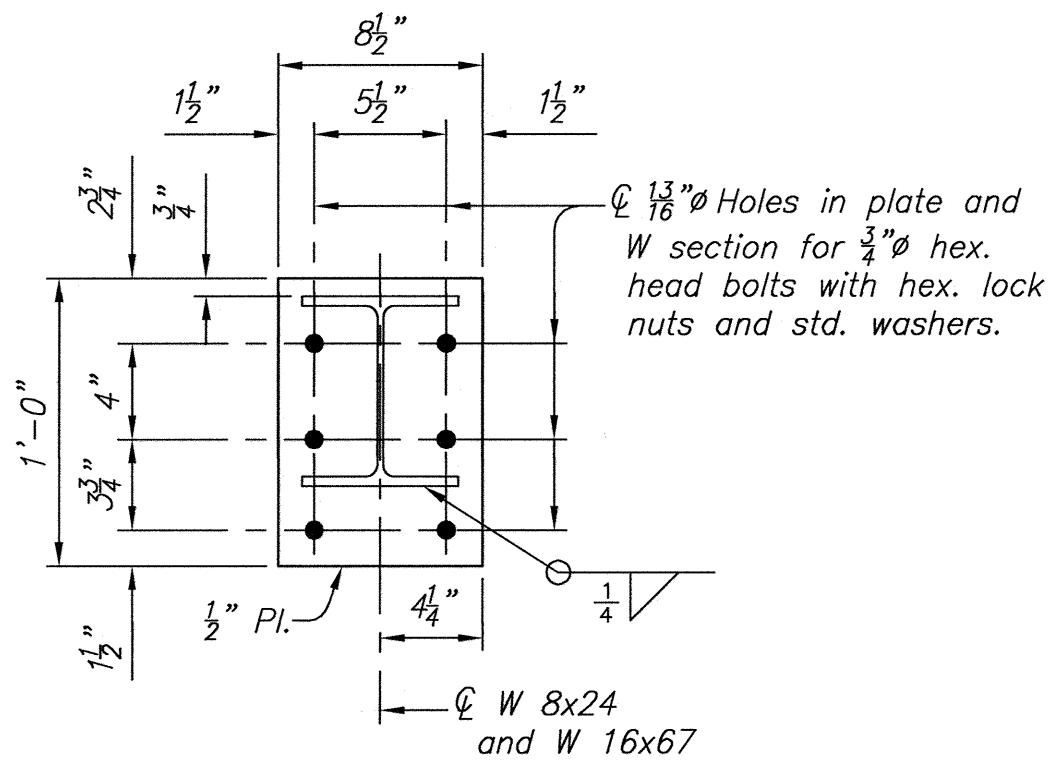
D

C

B



SECTION 1-1 (131)
CRANE STOP
4 REQ'D



SECTION A-A

ITEM	FIGURE	OVERALL TOLERANCE	MAXIMUM RATE OF CHANGE
SPAN		$A = \frac{3}{16}''$	$\frac{1}{4}''$ in 20'-0"
STRAIGHTNESS		$B = \frac{3}{8}''$	$\frac{1}{4}''$ in 20'-0"
ELEVATION		$C = \frac{3}{8}''$	$\frac{1}{4}''$ in 20'-0"
RAIL-TO-RAIL ELEVATION		$D = \pm \frac{3}{16}''$	$\frac{1}{4}''$ in 20'-0"

TOLERANCES FOR CRANE RUNWAY GIRDERS, RAILS, PADS, AND FINAL LOCATIONS
(All items listed must be met individually along entire length)

NOTES

- For Reference Drawings, see (131).
- For Structural Steel General Notes, see (131).

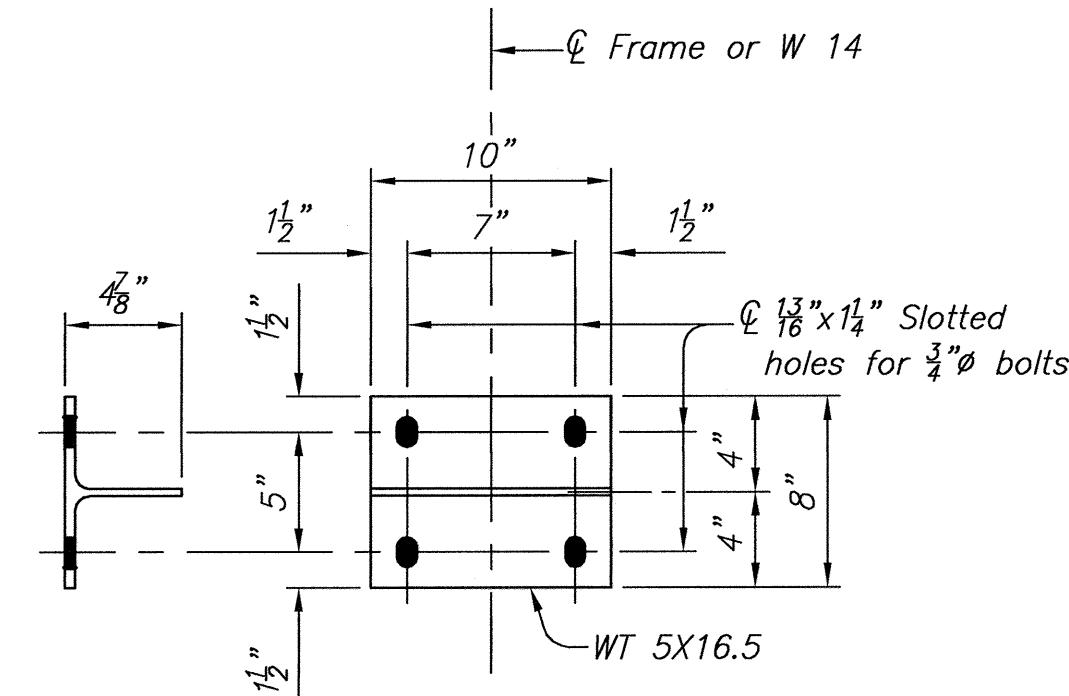
ALWAYS THINK SAFETY

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
NAVALO GALLUP WATER SUPPLY PROJECT
NEW MEXICO
SAN JUAN LATERAL
TOHLAKAI PUMPING PLANT
STRUCTURAL STEEL
5-TON CRANE RUNWAY GIRDERS
PLANS, SECTIONS, AND DETAILS

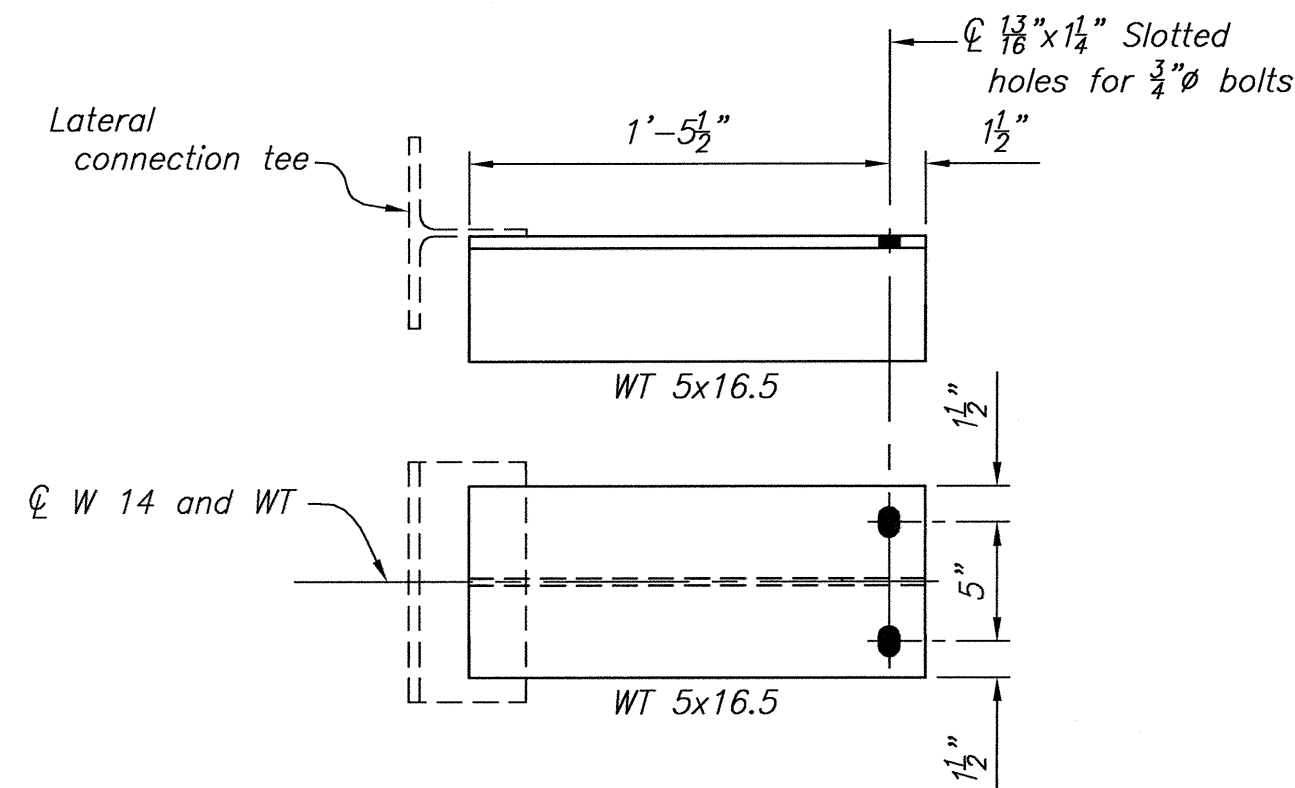
DESIGNED *Kamiyoshi*
DRAWN *R. D. R. Jr.*
CHECKED *E. J. Anderson*
TECH. APPR. *D. D. VanOrman, P.E.*
APPROVED *AWB*
PLANT STRUCTURES GROUP

DENVER, COLORADO 2013-08-05

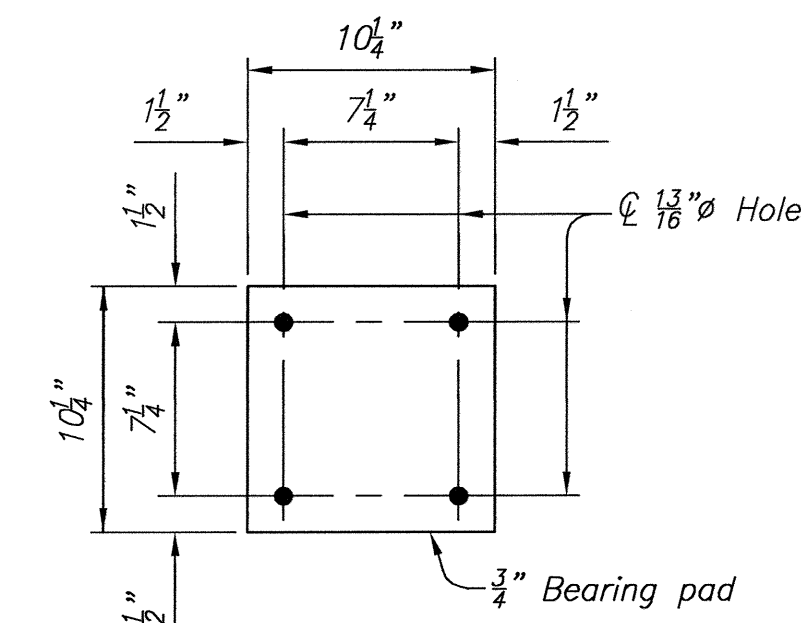
STRUCTURAL STEEL
5-TON CRANE RUNWAY
GIRDERS
PLANS, SECTIONS, AND
DETAILS



LATERAL CONNECTION TEE
INTERIOR FRAMES
14 REQUIRED



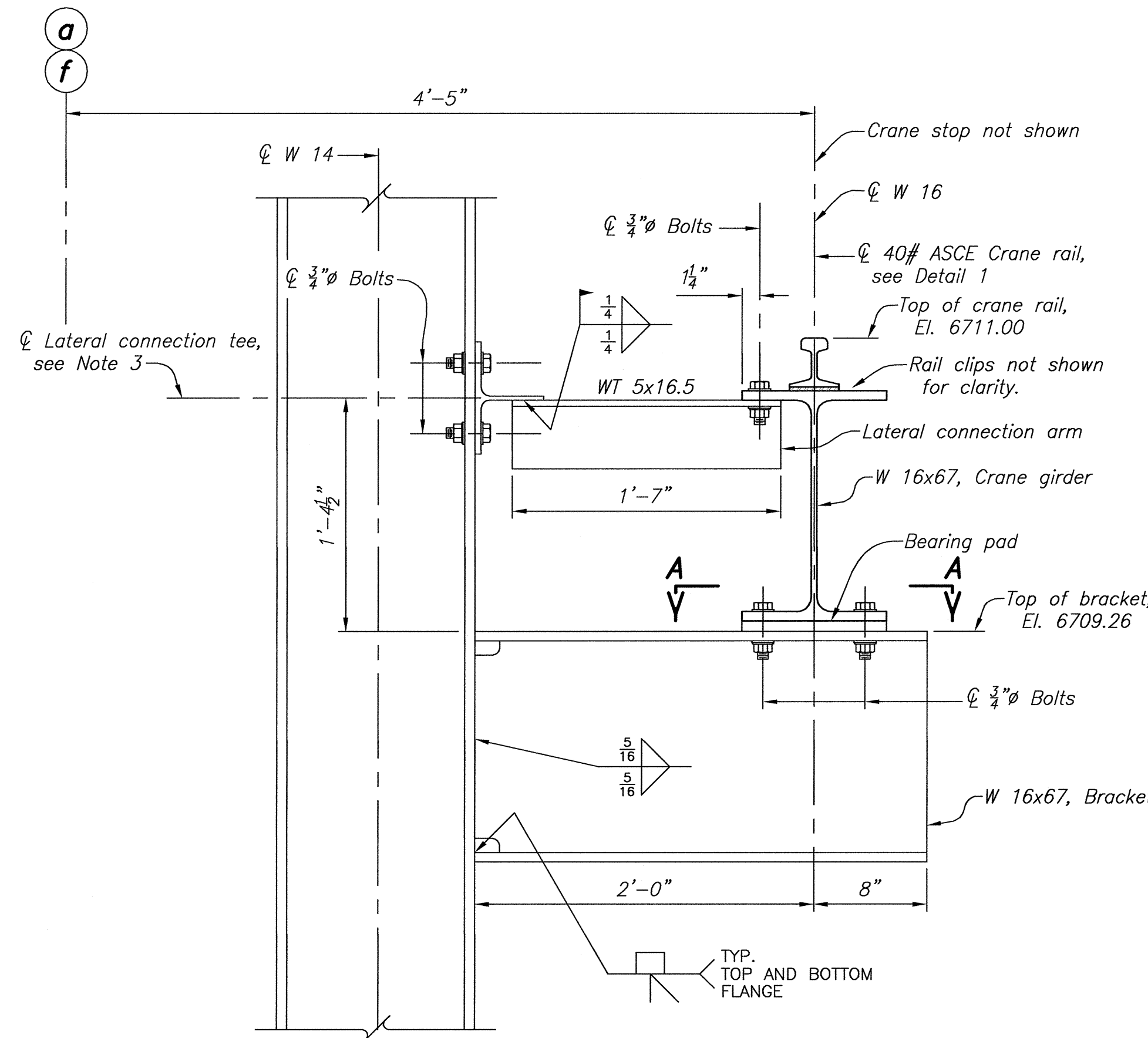
LATERAL CONNECTION ARM
END BAY COLUMNS
4 REQUIRED



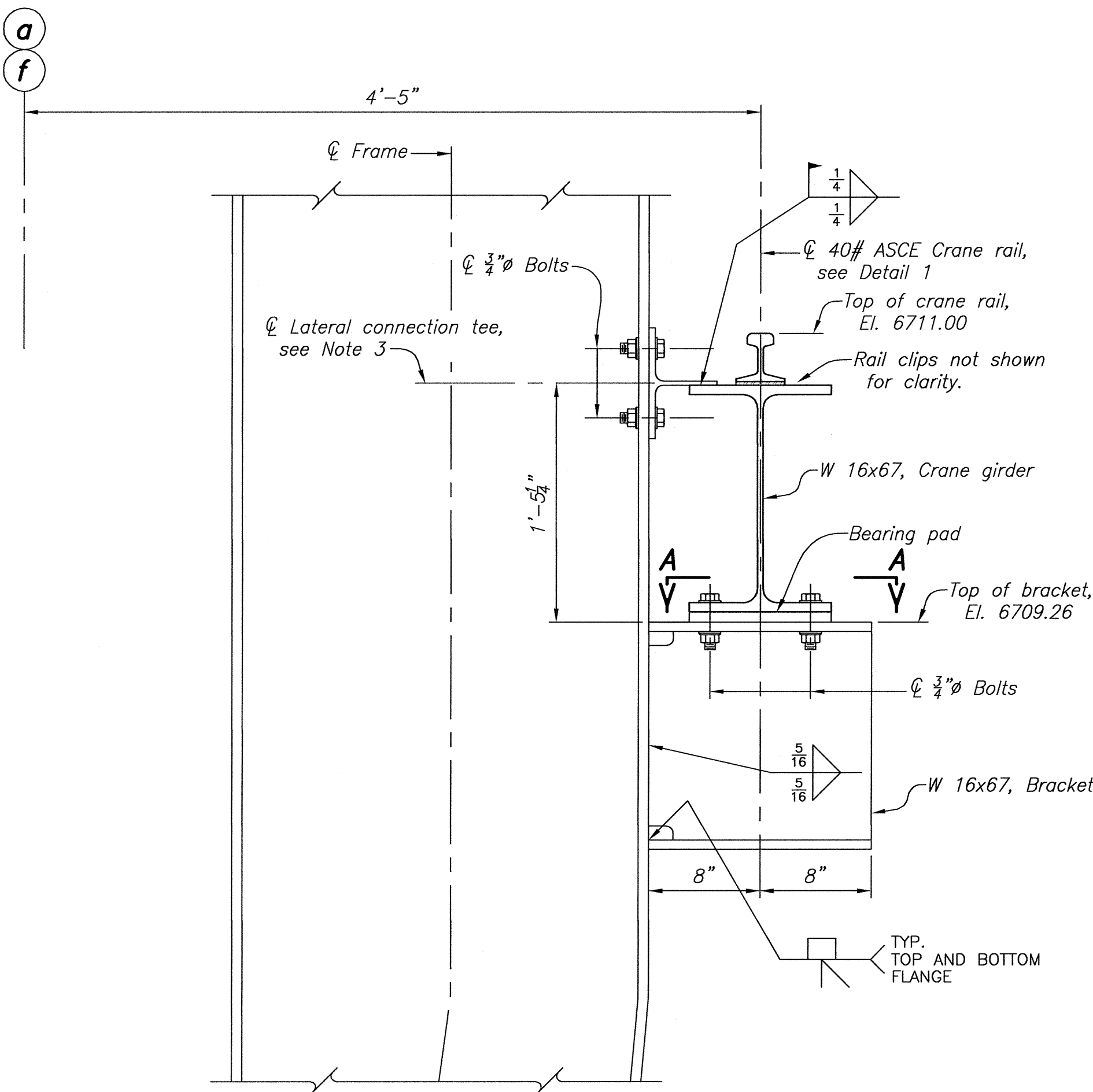
BEARING PAD
14 REQUIRED

NOTES

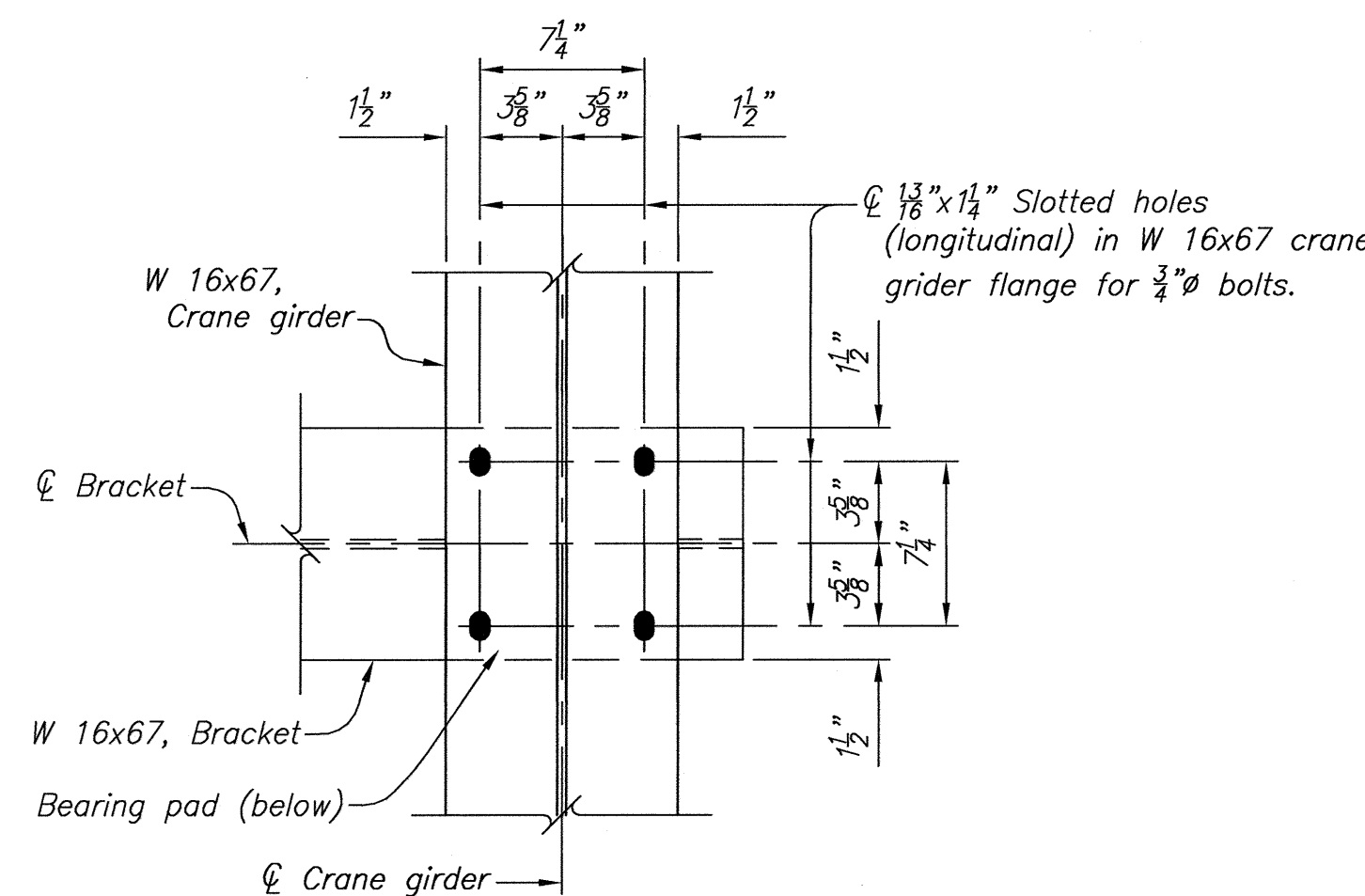
1. For Reference Drawings, see (131).
2. For Structural Steel General Notes, see (131).
3. Center lateral connection tee on the column support and align crane girder before welding tee to crane girder or lateral connection arm.
4. Determine location of rail clips based on rail clip manufacturer's recommendations.



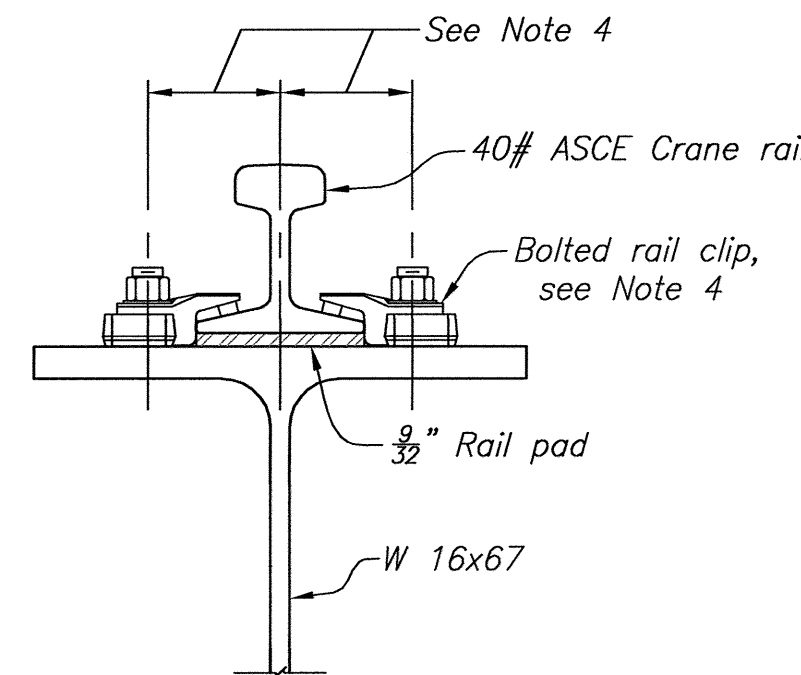
CONNECTION ASSEMBLY 2 (131, 132, 142)



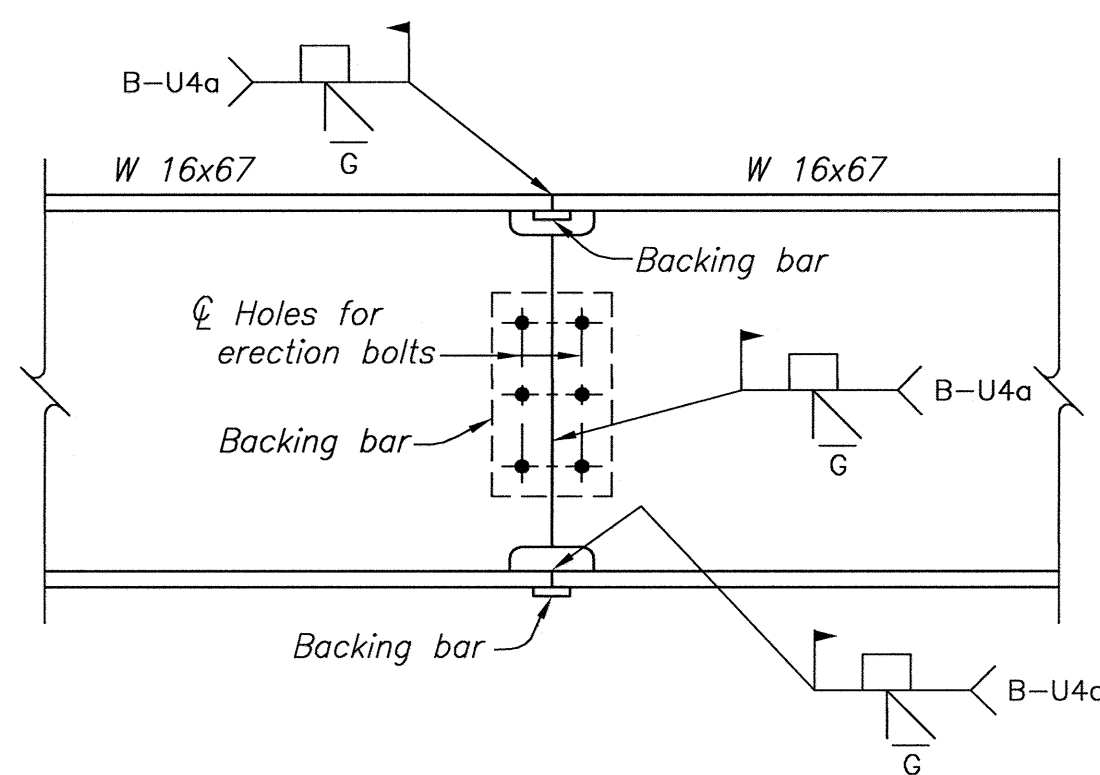
CONNECTION ASSEMBLY 1 (131, 132, 143)



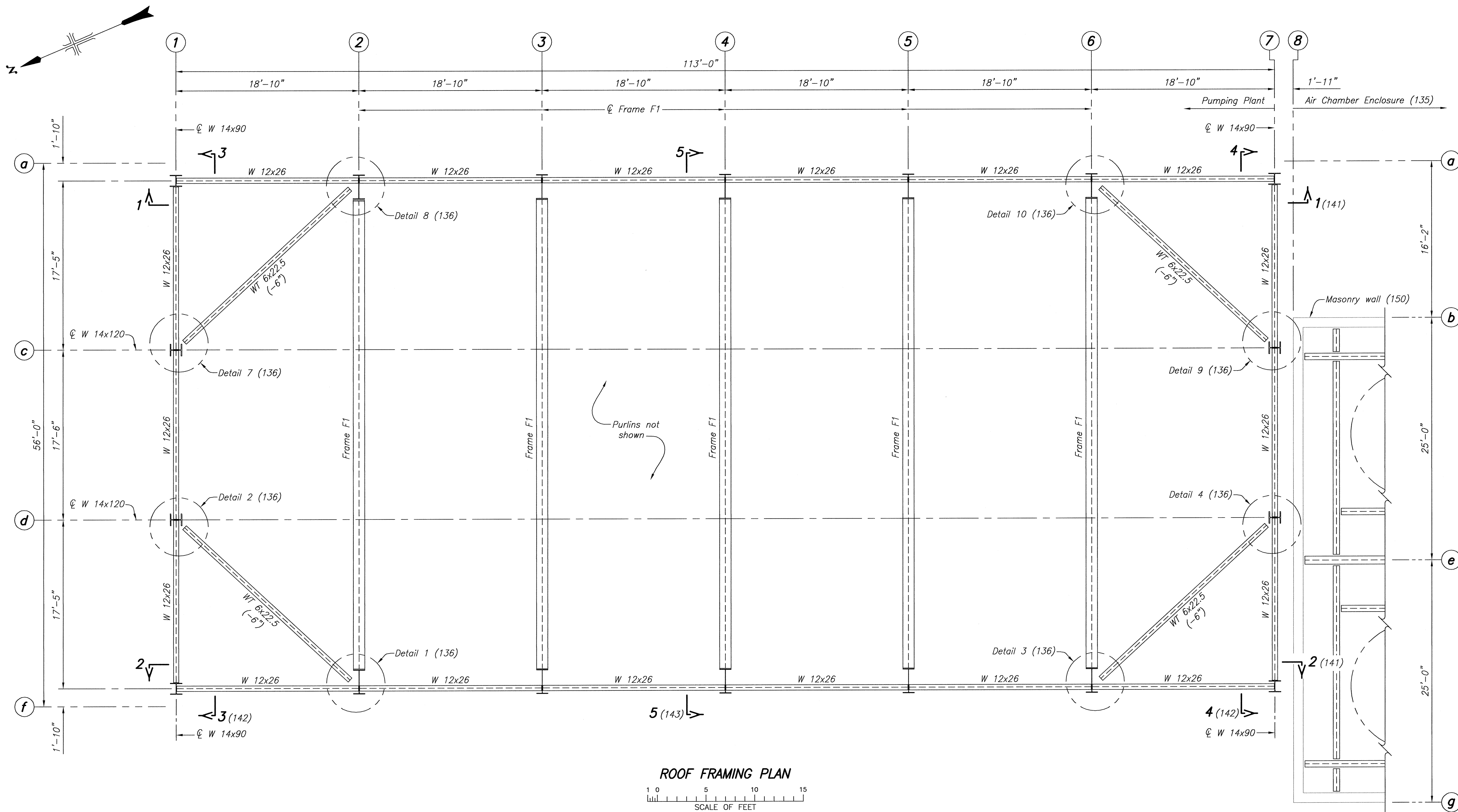
SECTION A-A



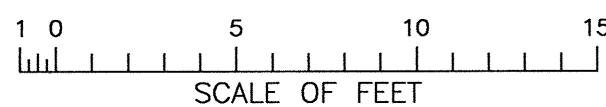
DETAIL 1
CRANE RAIL ASSEMBLY



TYPICAL FIELD SPLICE

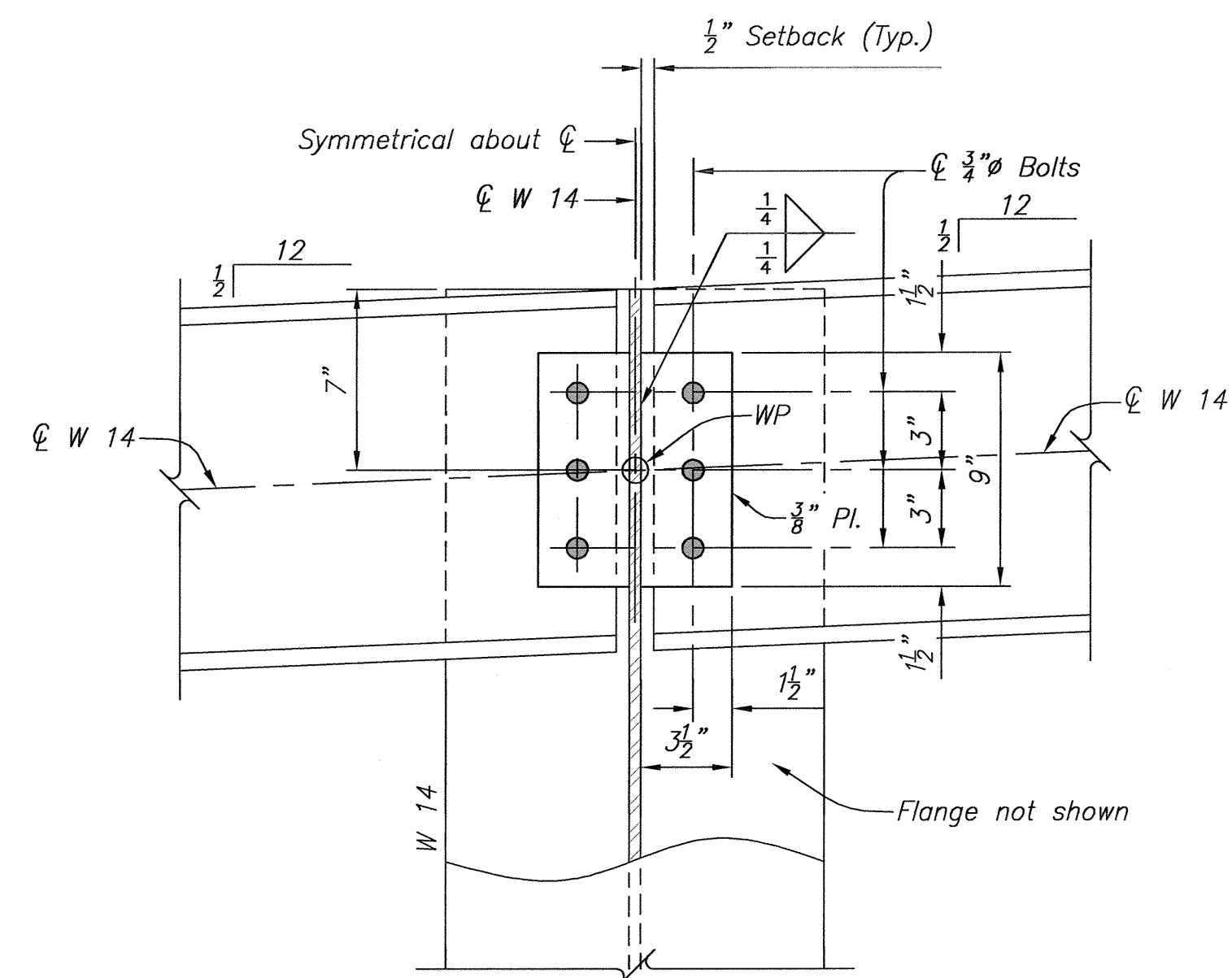
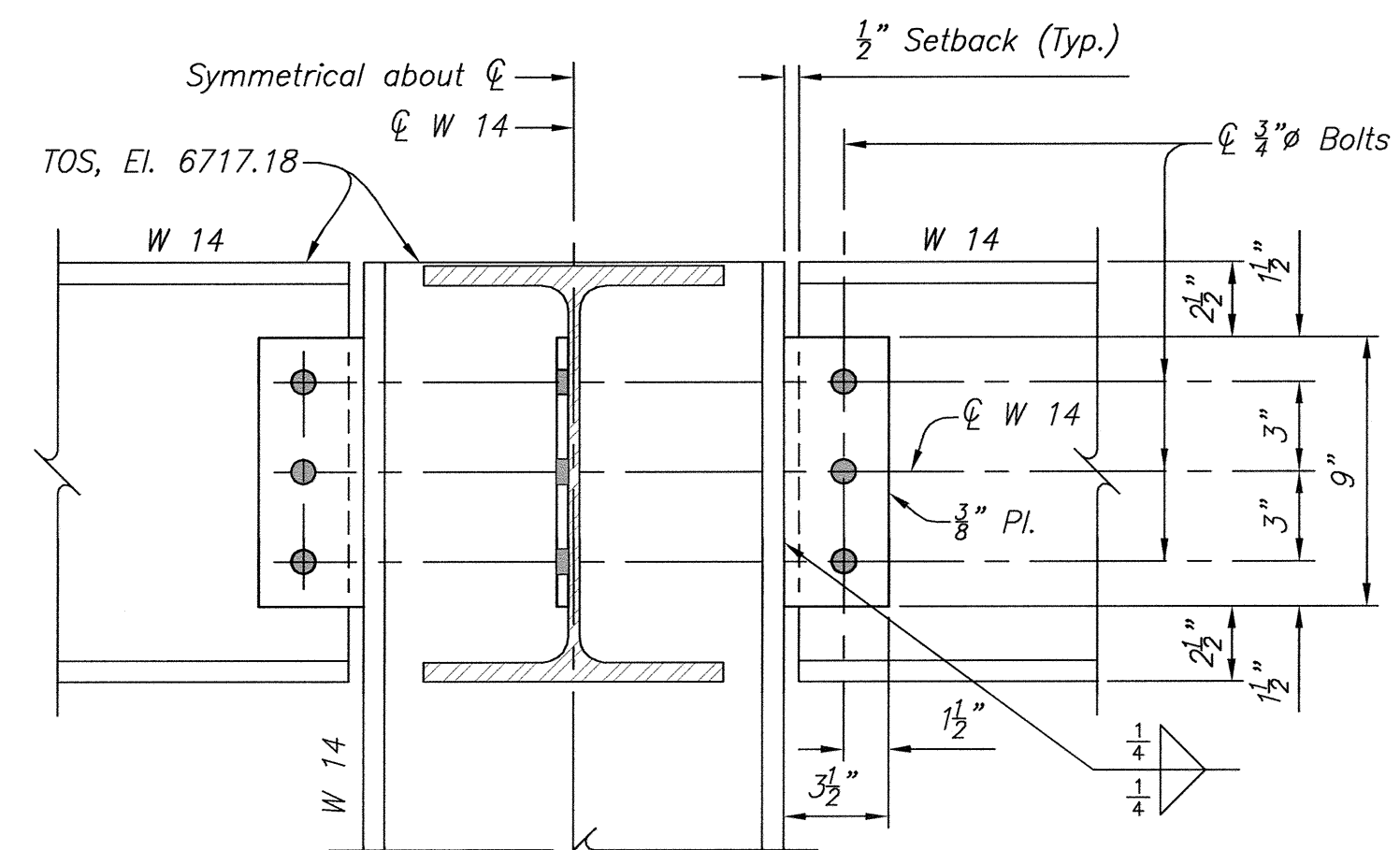
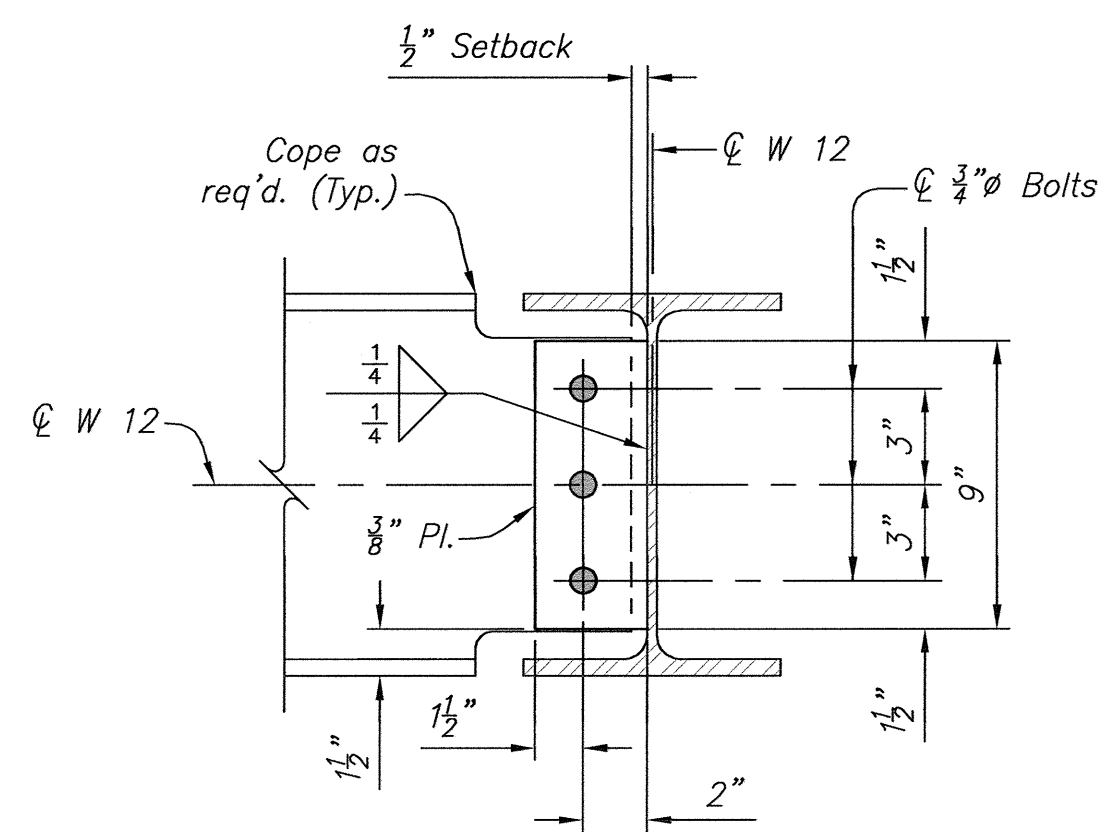
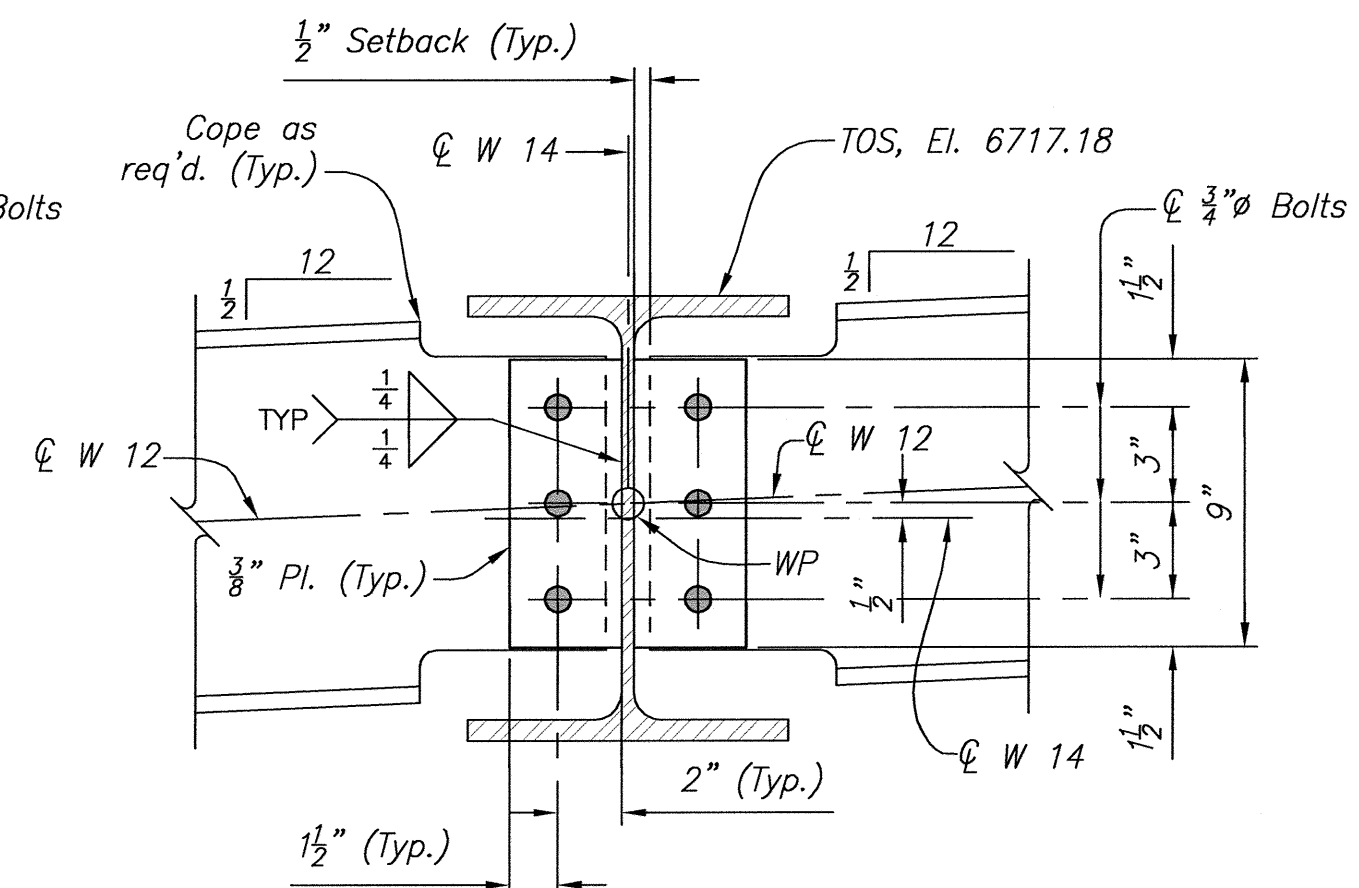
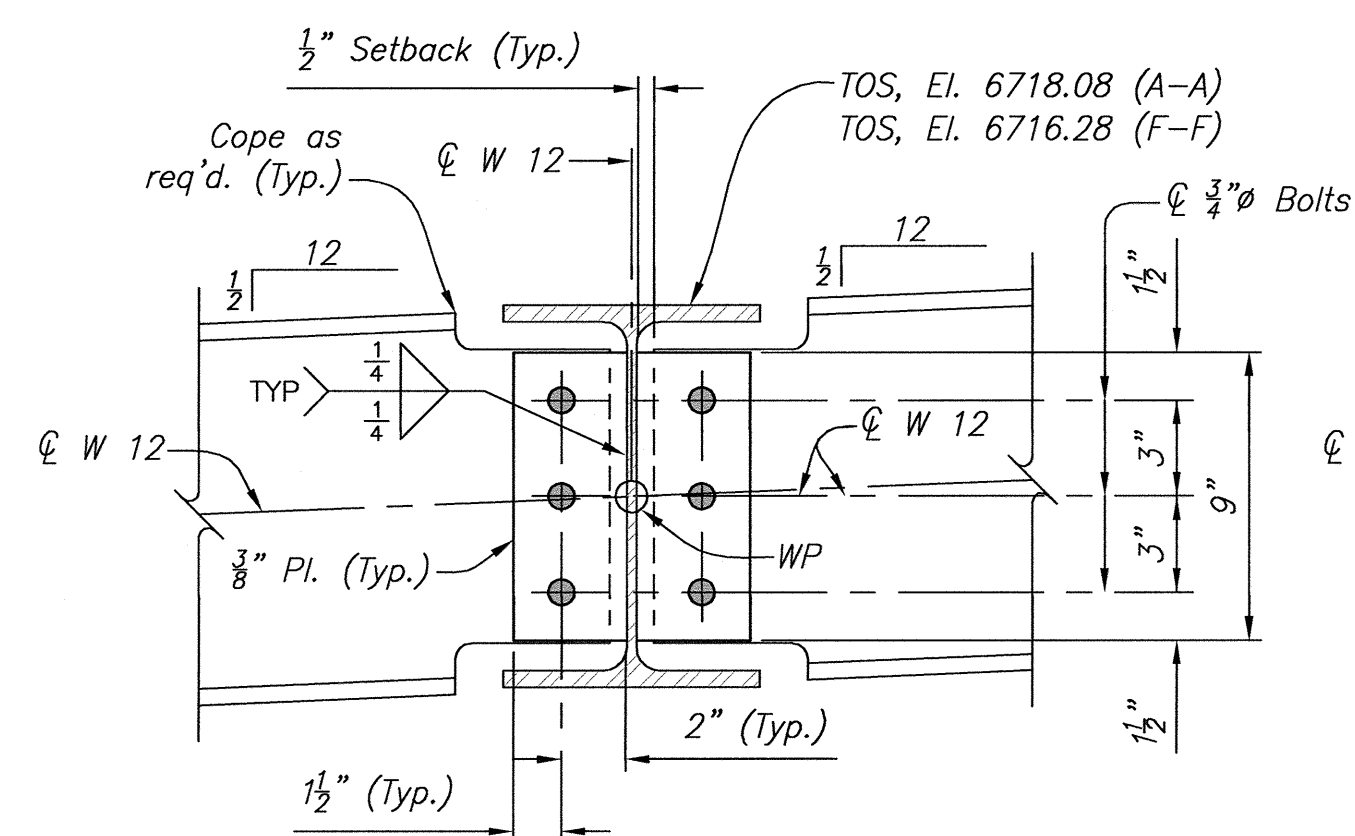
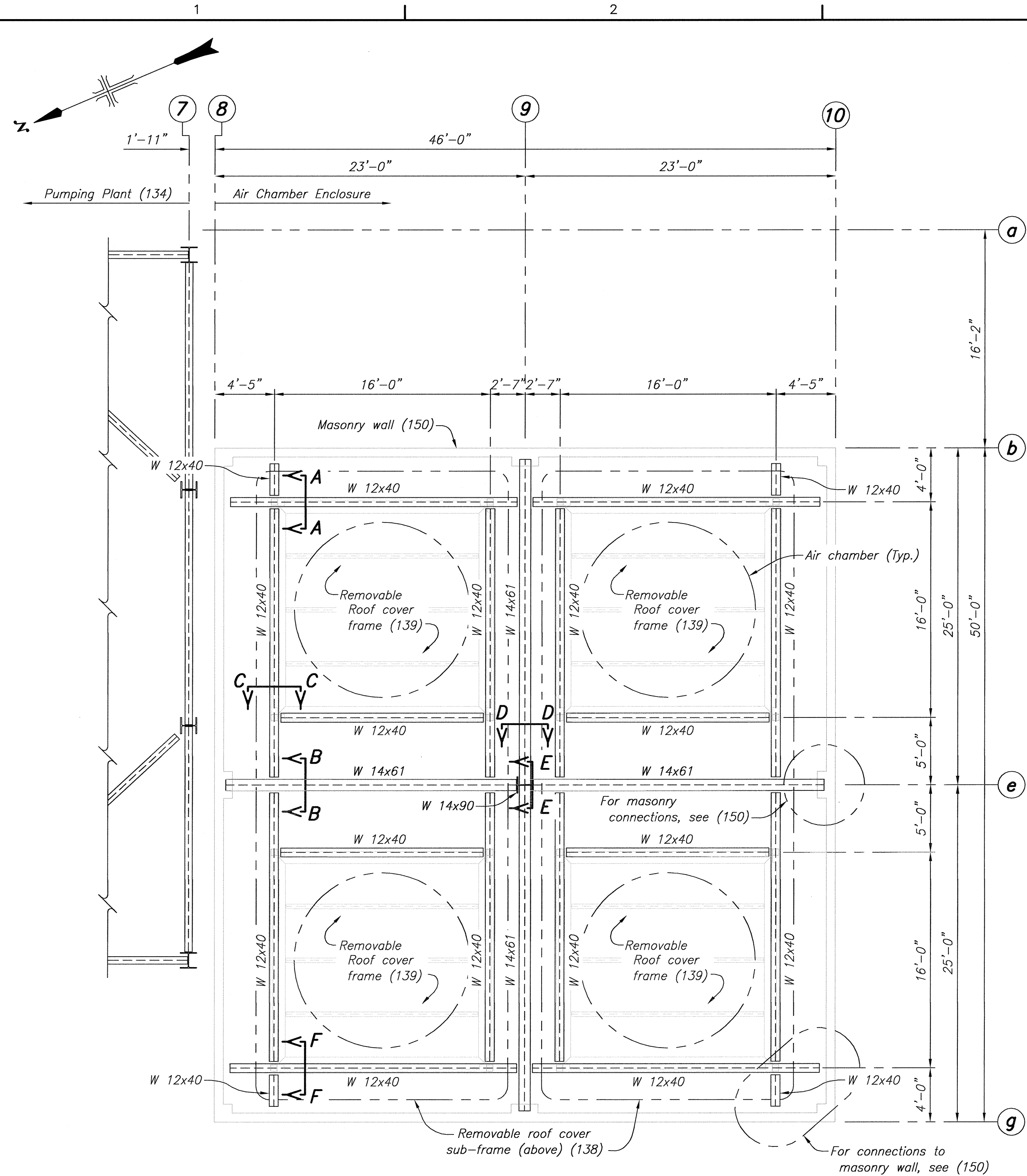


ROOF FRAMING PLAN

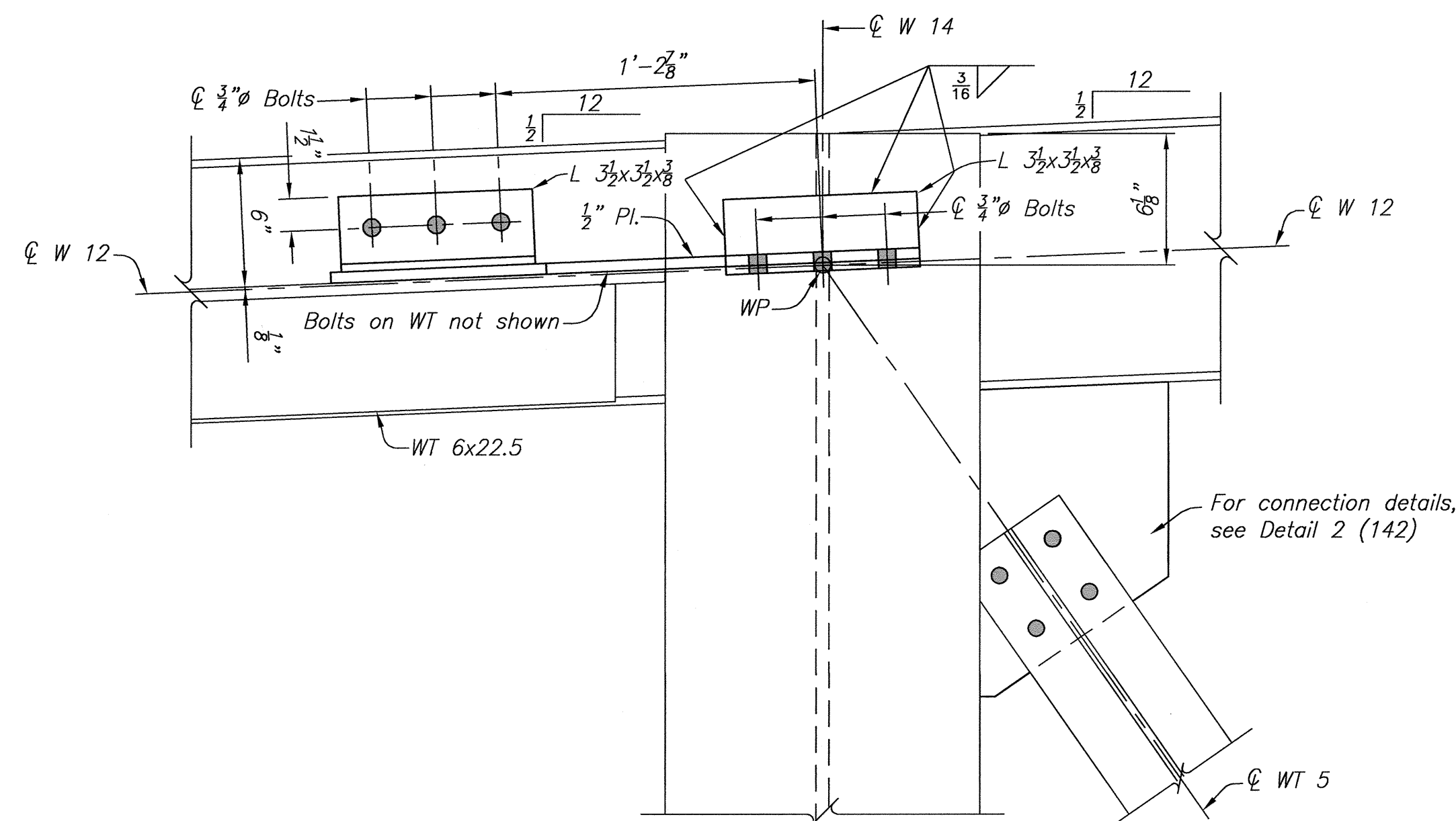


NOTES

1. For Reference Drawings, see (131).
2. For Structural Steel General Notes, see (131).
3. For Structural Design Data, see (101) & (102).

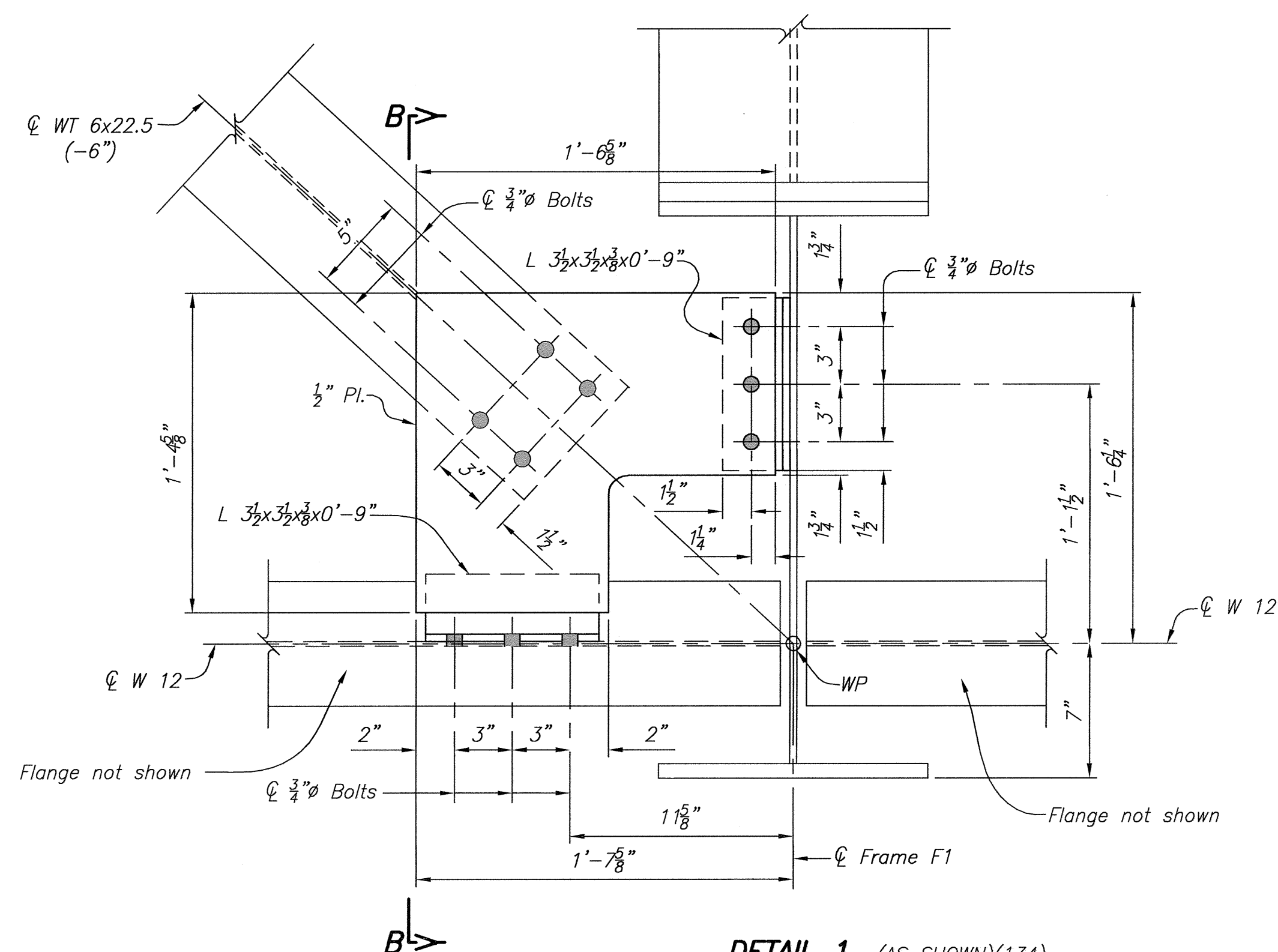
**NOTES**

- For Reference Drawings, see (131).
- For Structural Steel General Notes, see (131).
- For Structural Design Data, see (101) and (102).



SECTION A-A

SECTION B-B



DETAIL 1 (AS SHOWN)(134)
DETAIL 3 (OPP. HAND)(134)
DETAIL 8 (SIMILAR)(134)
DETAIL 10 (SIMILAR)(134)

1. For Reference Drawings, see (131).
2. For Structural Steel General Notes, see (131).

DESIGNED *K. J. Olson*
DRAWN *K. D. R. [unclear]*
CHECKED *R. J. Jackson*
TECH. APPR. *S. D. Van Otterloo, P.E.*
APPROVED *[Signature]*
PLANT STRUCTURES GROUP
DENVER, COLORADO 2013-08-01

**STRUCTURAL STEEL
ROOF FRAMING PLAN,
SECTIONS, AND DETAILS**

1695-D-136

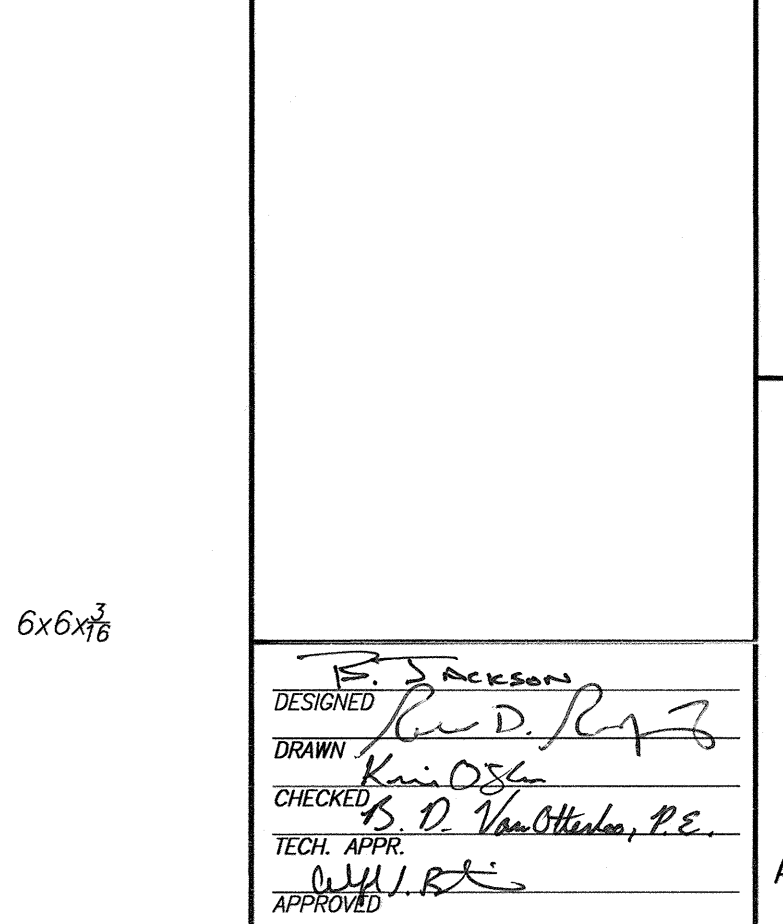
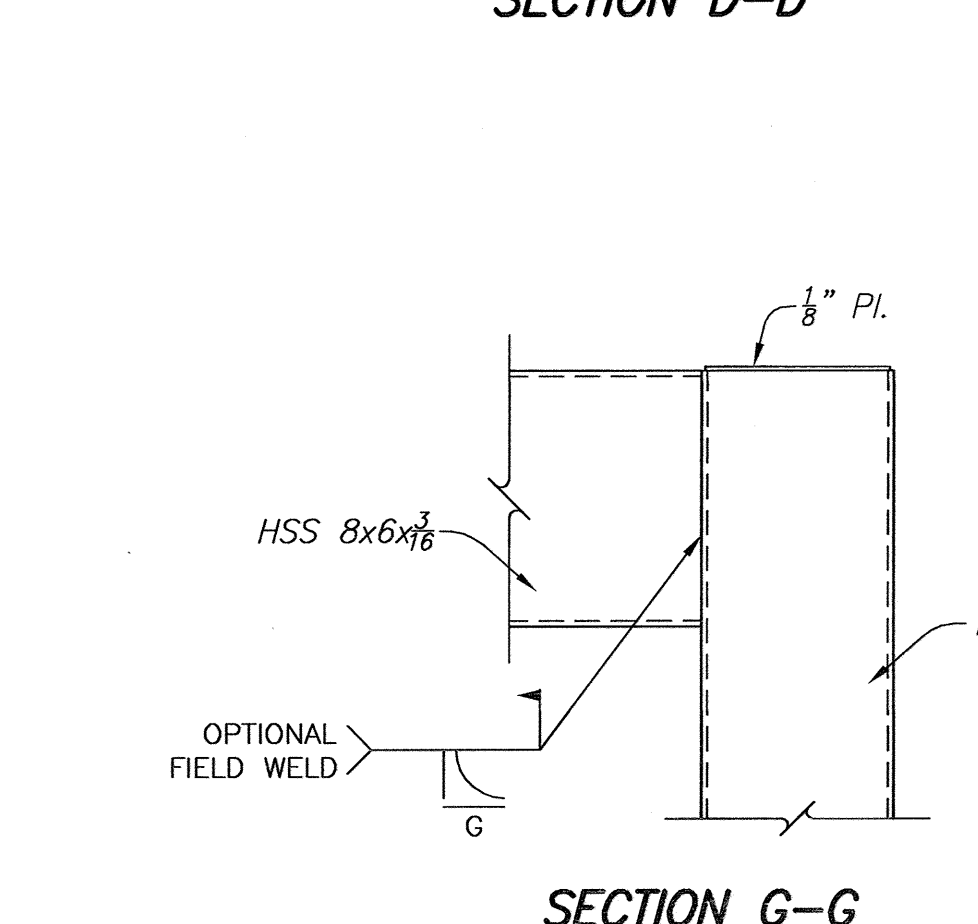
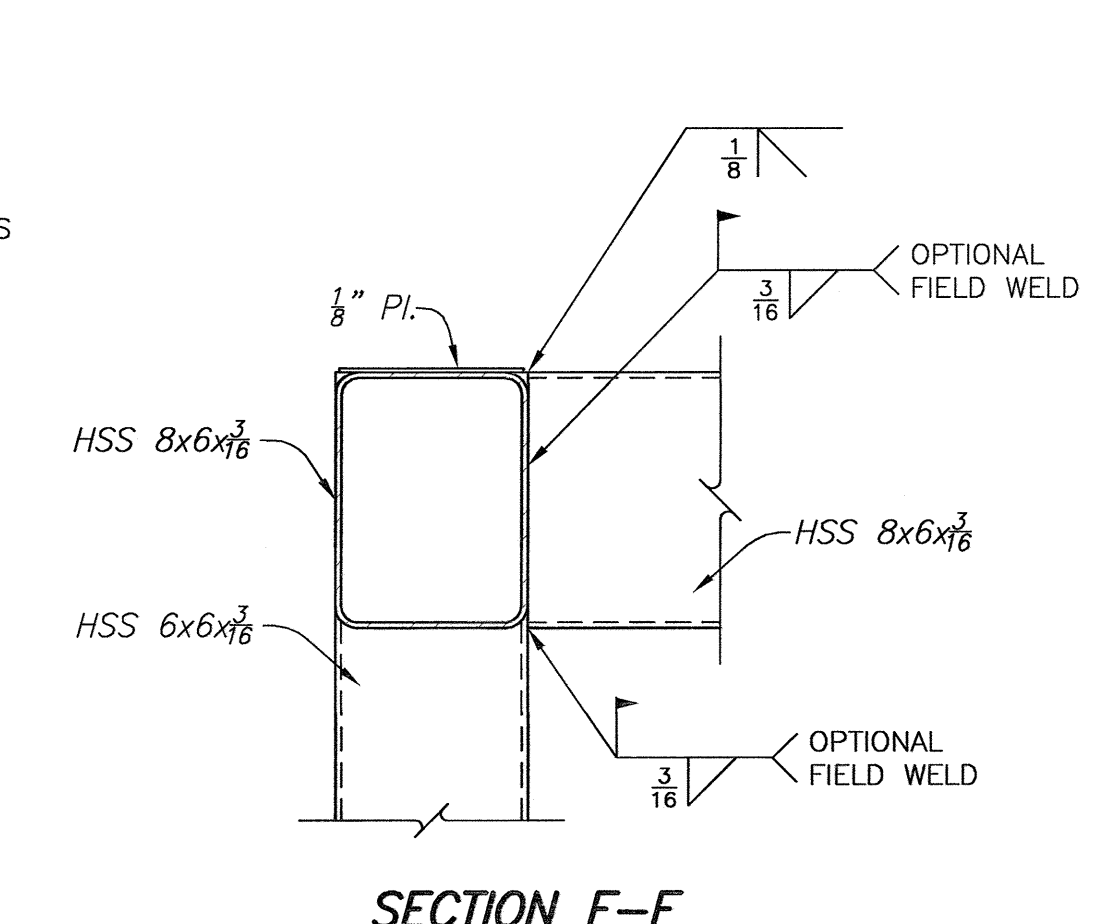
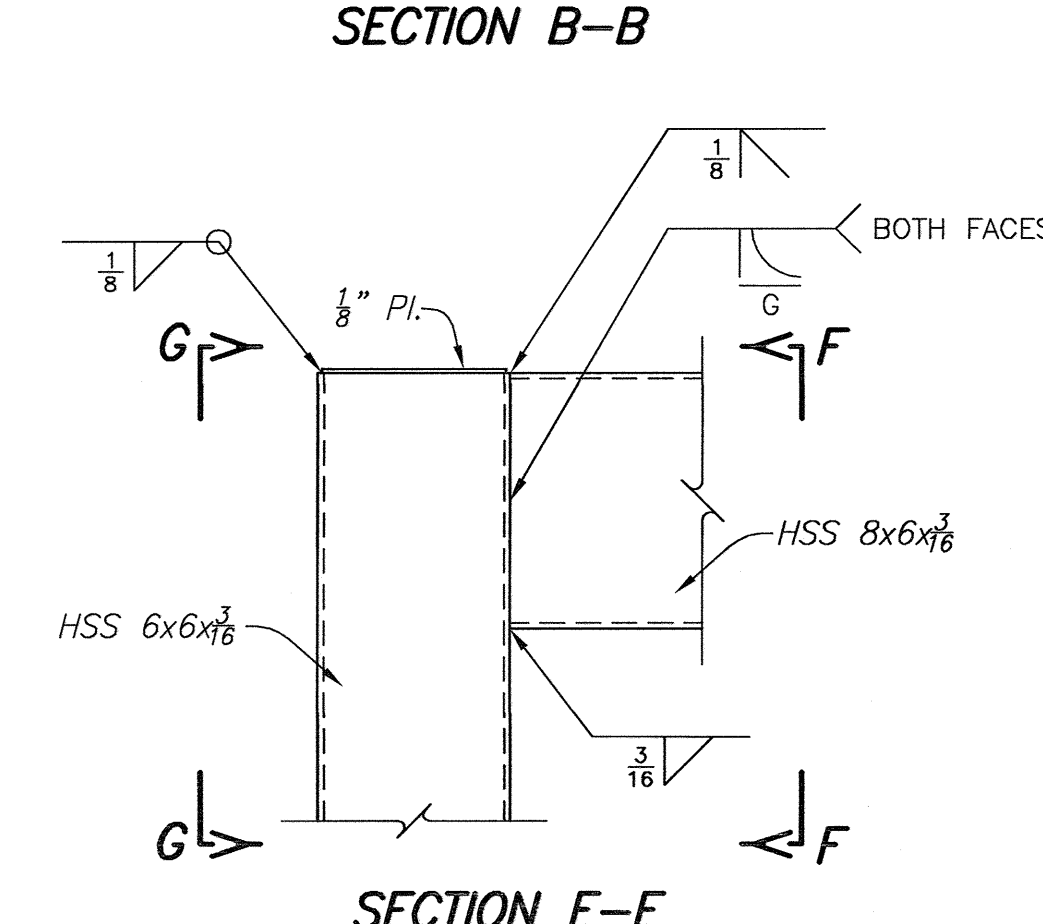
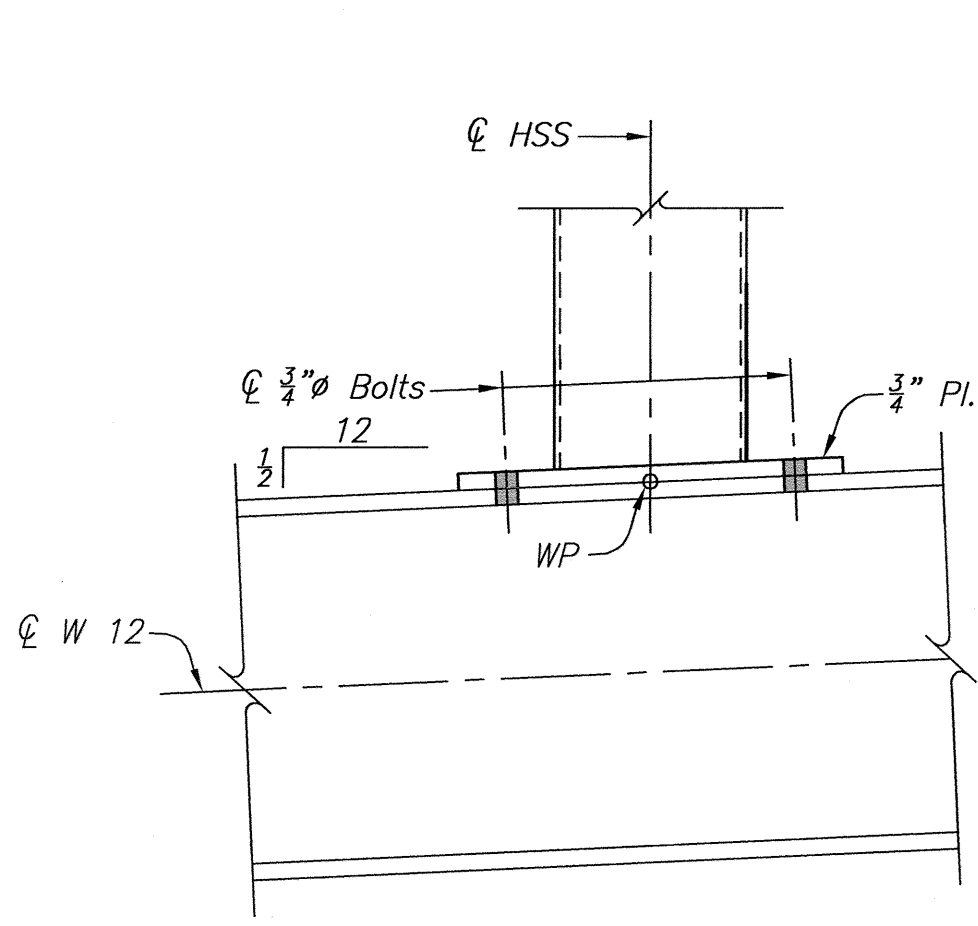
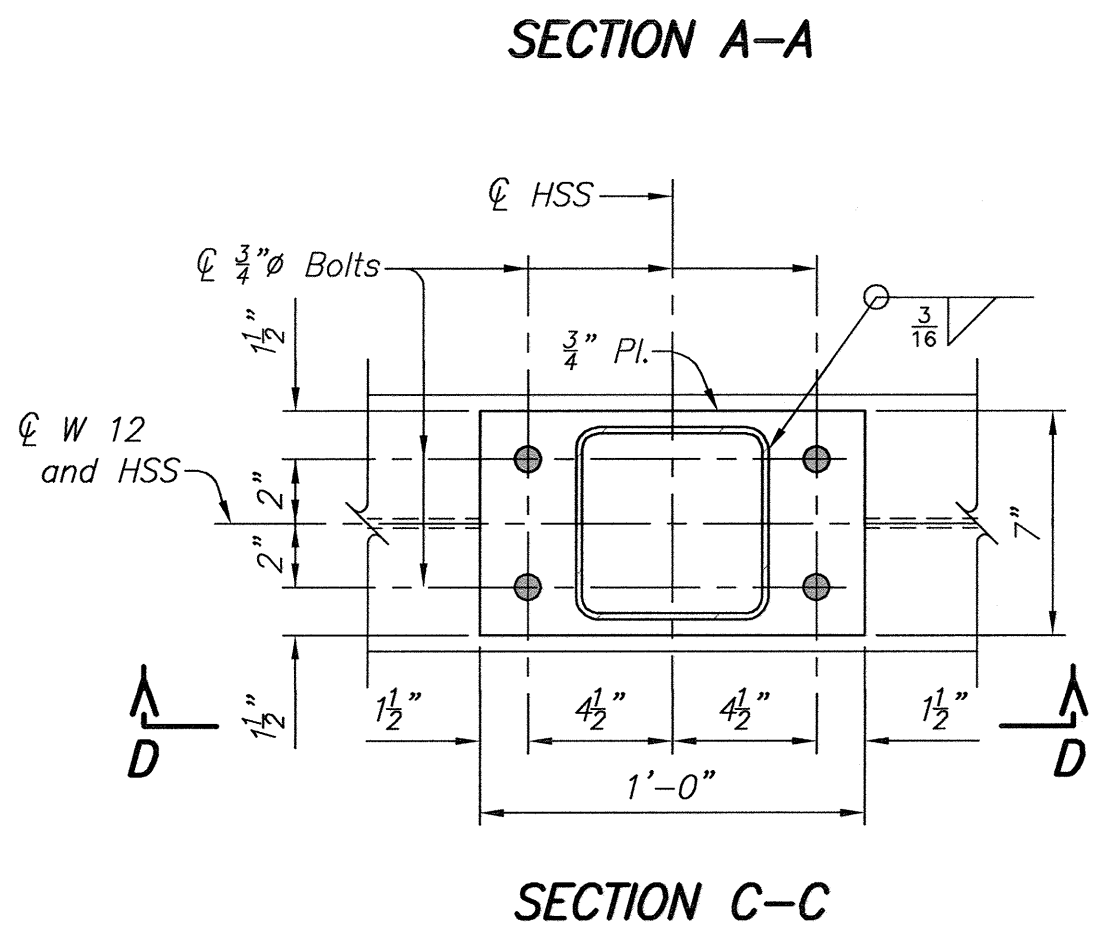
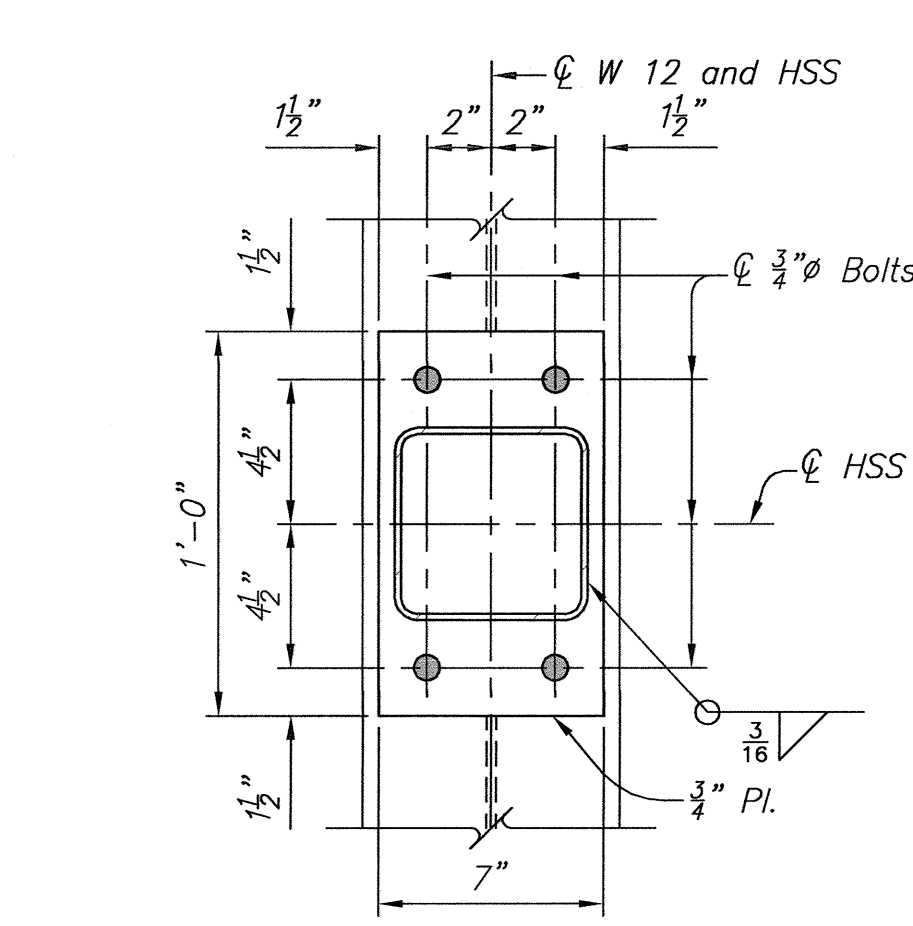
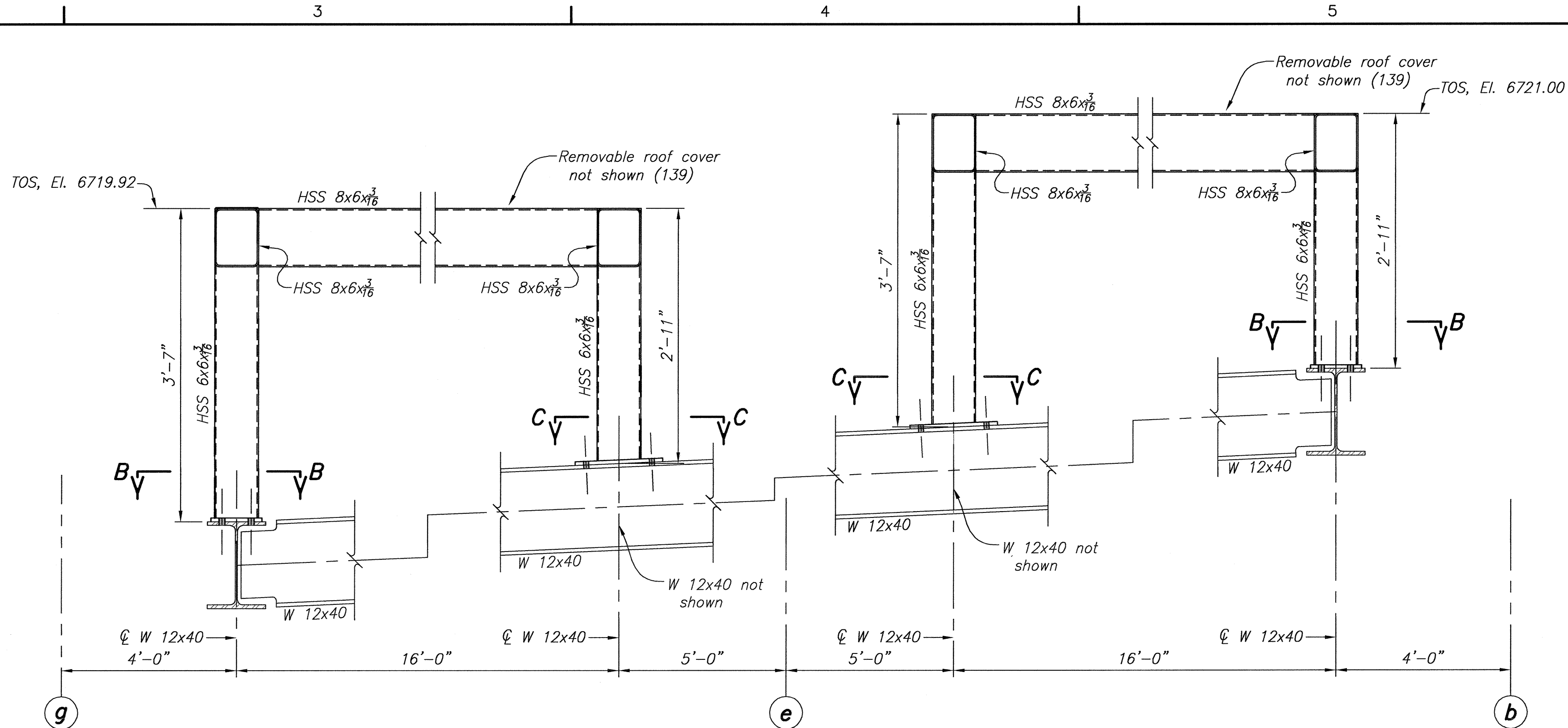
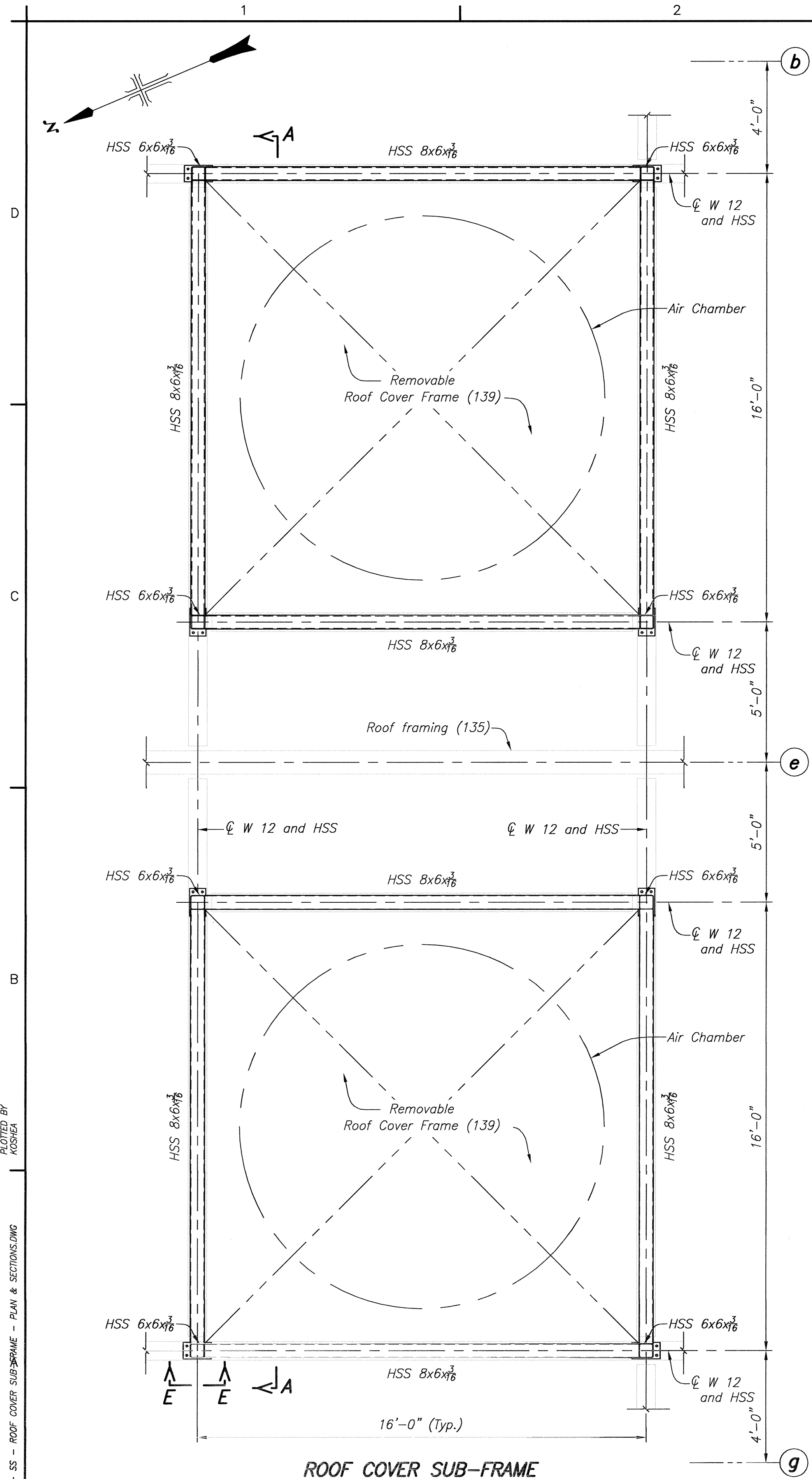
SHEET 3 OF 3

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AUGUST 3, 2013 09:28
PLOTTED BY
KOSHEA

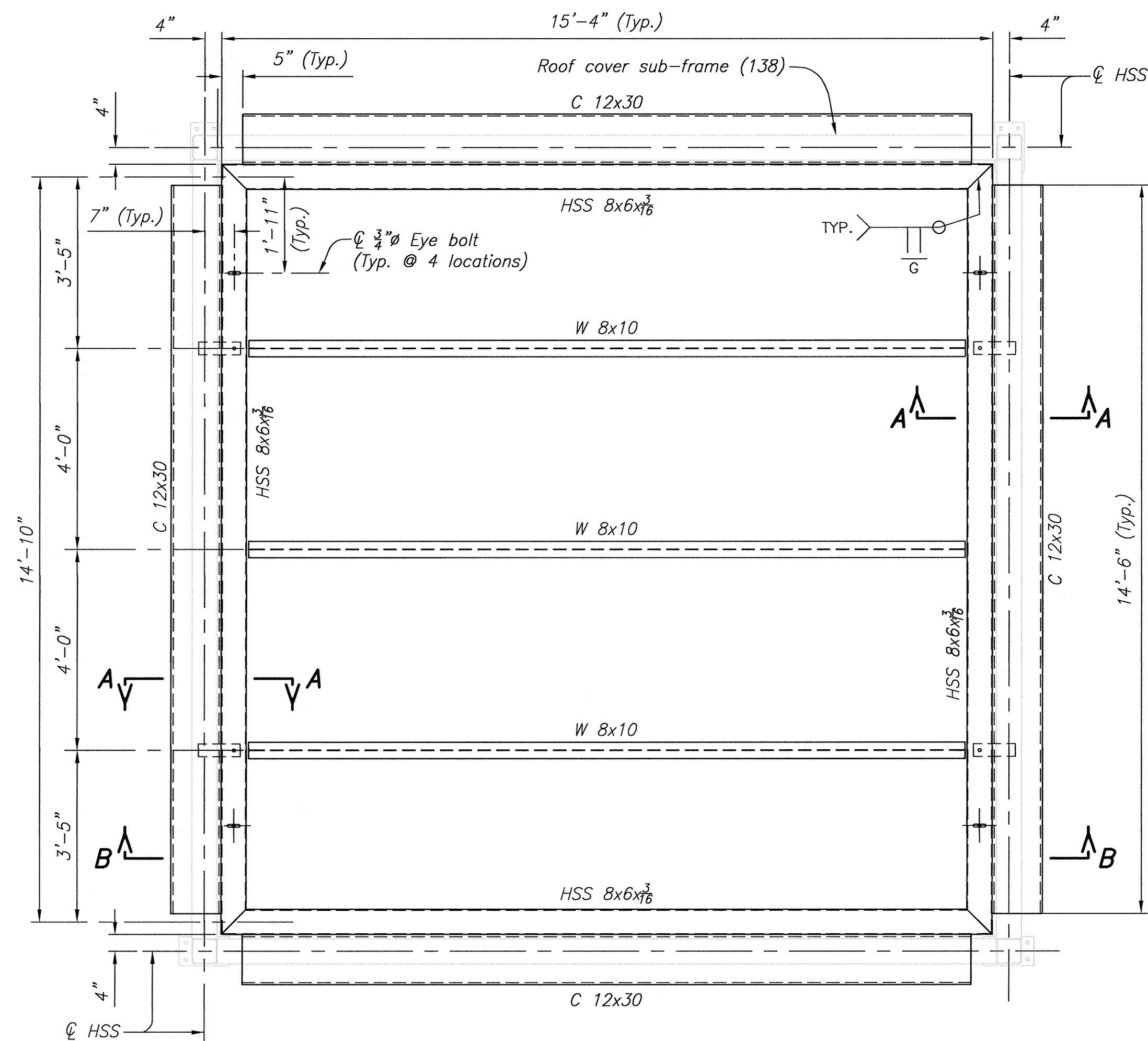
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1695-D-136 - SS

CAD SYSTEM
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CWD FILENAME
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DATE AND TIME PLOTTED
AUGUST 3, 2013 09:29
PLOTTED BY
KOSHEA

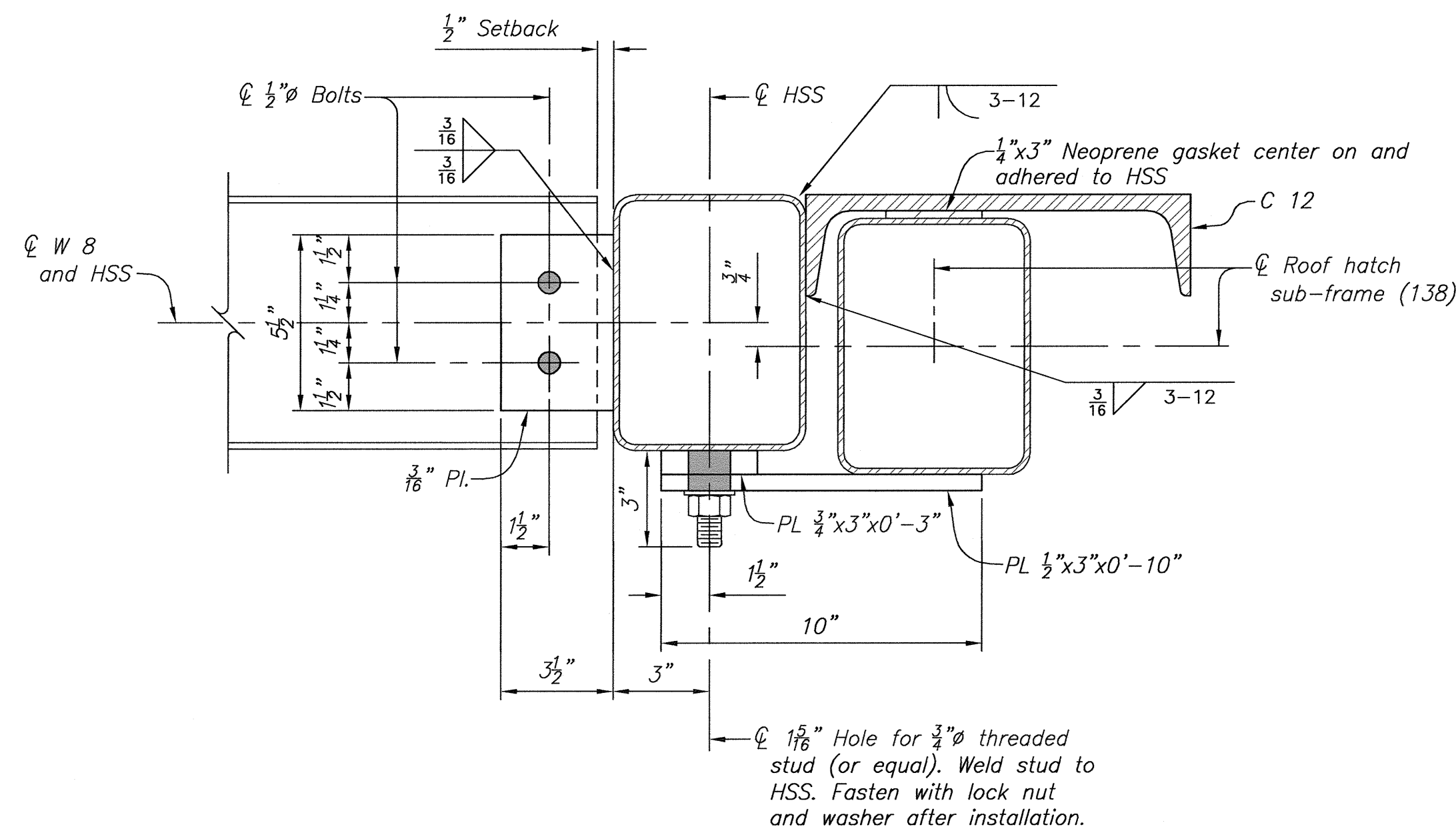
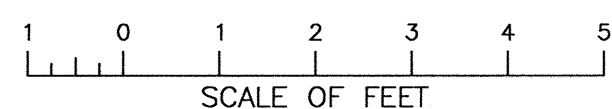


- NOTES
- For Reference Drawings, see (131).
 - For Structural Steel General Notes, see (131).
 - For Structural Design Data, see (101) and (102).

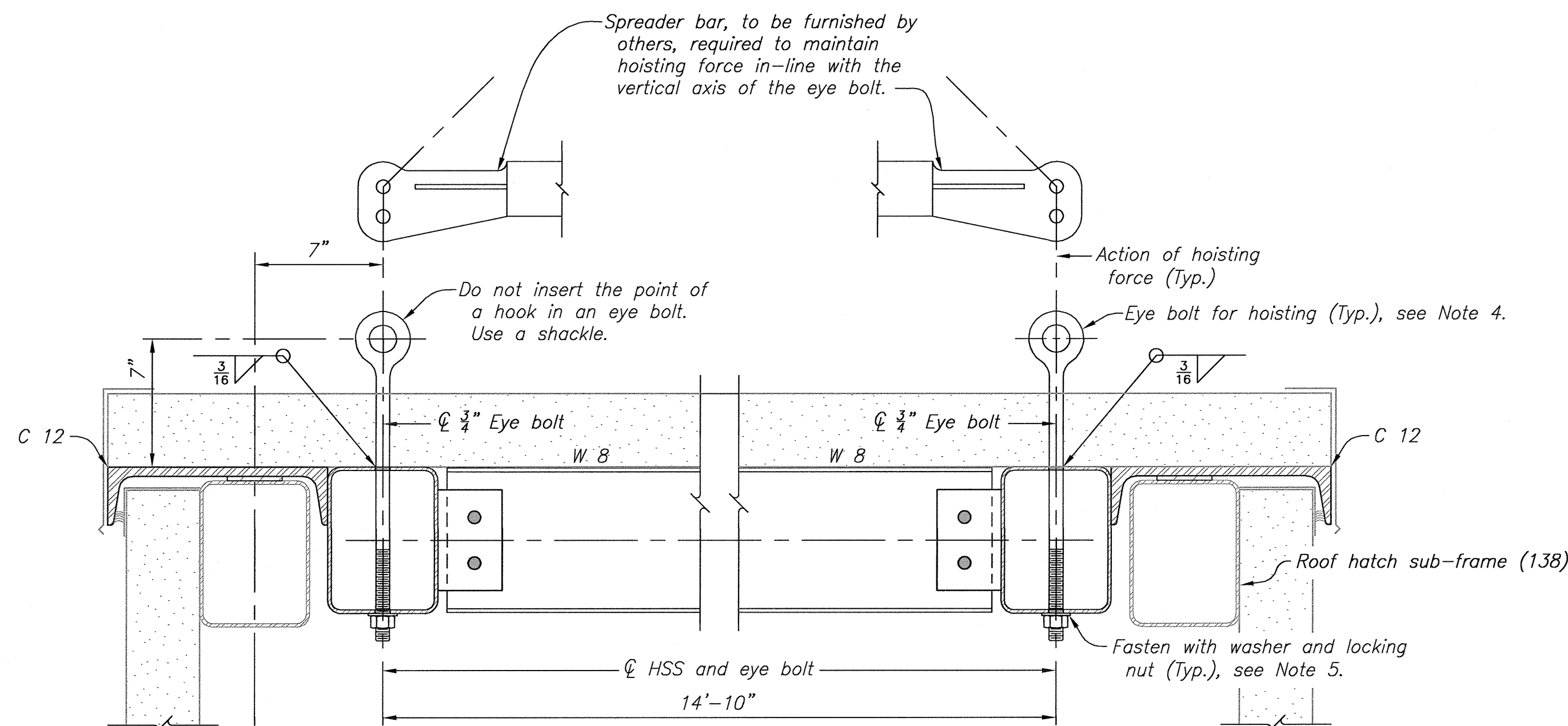


REMOVABLE ROOF COVER FRAME (135, 138)

4 REQ'D



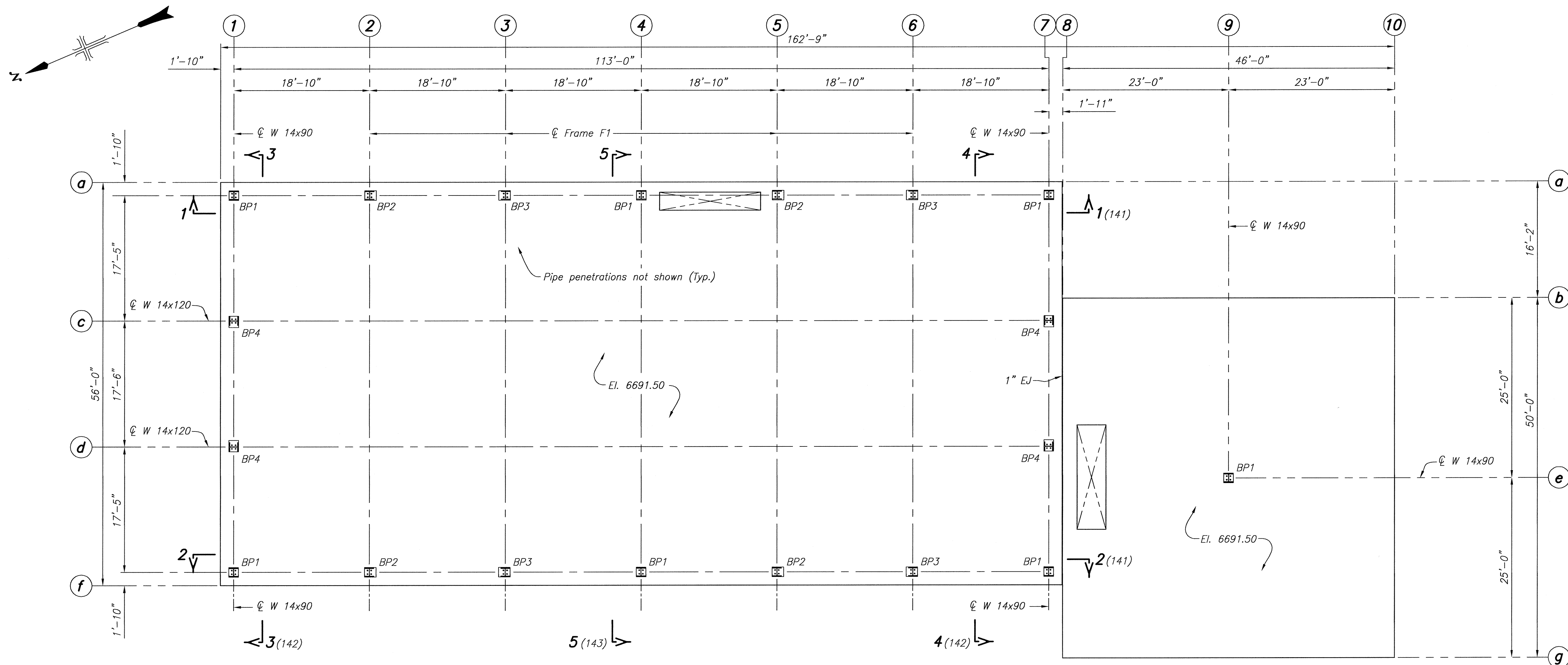
SECTION A-A



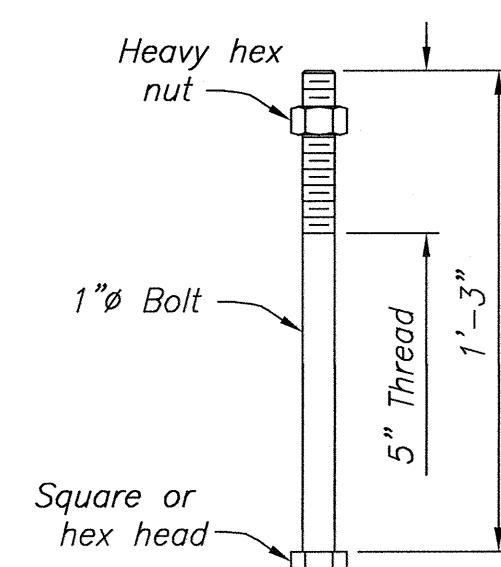
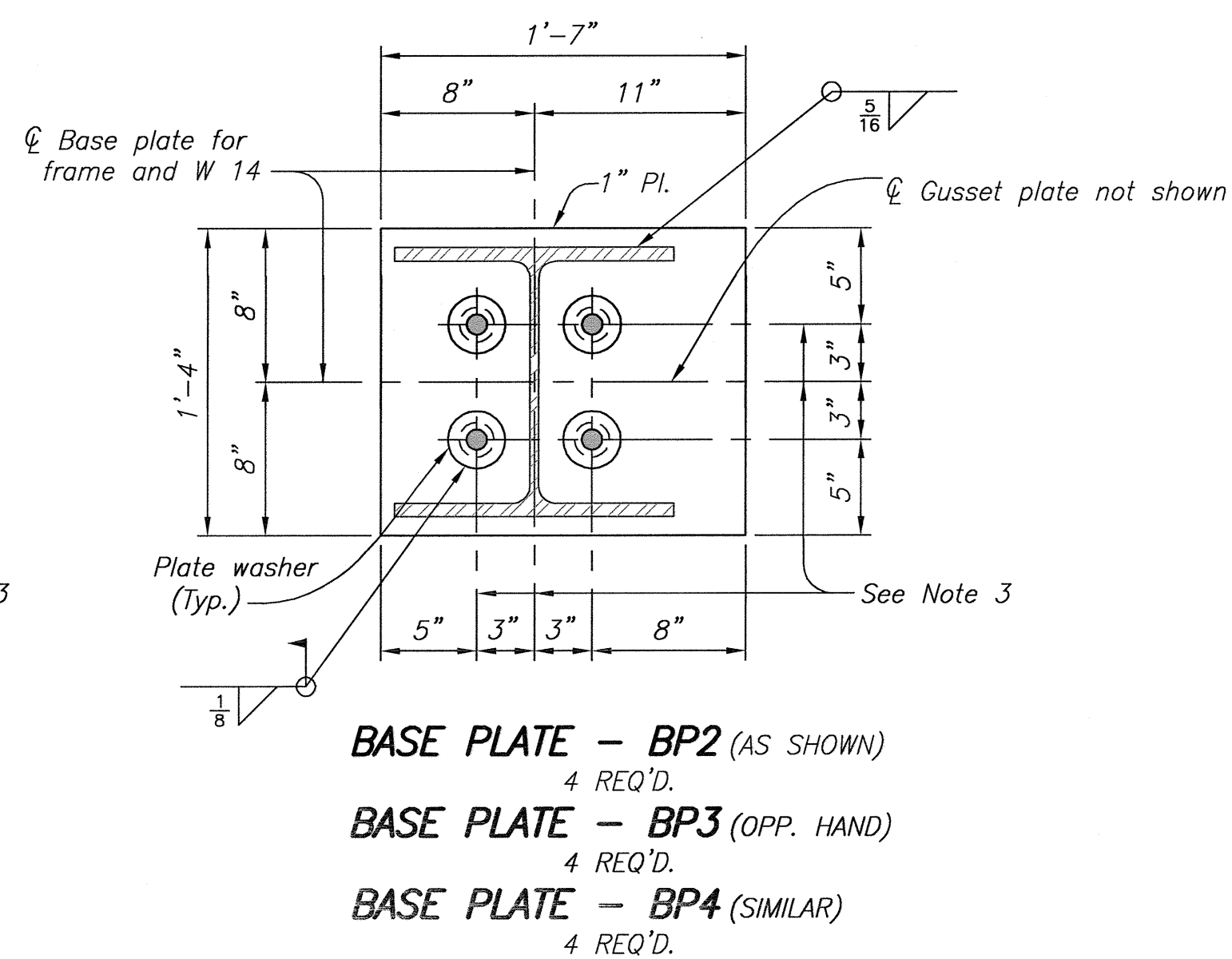
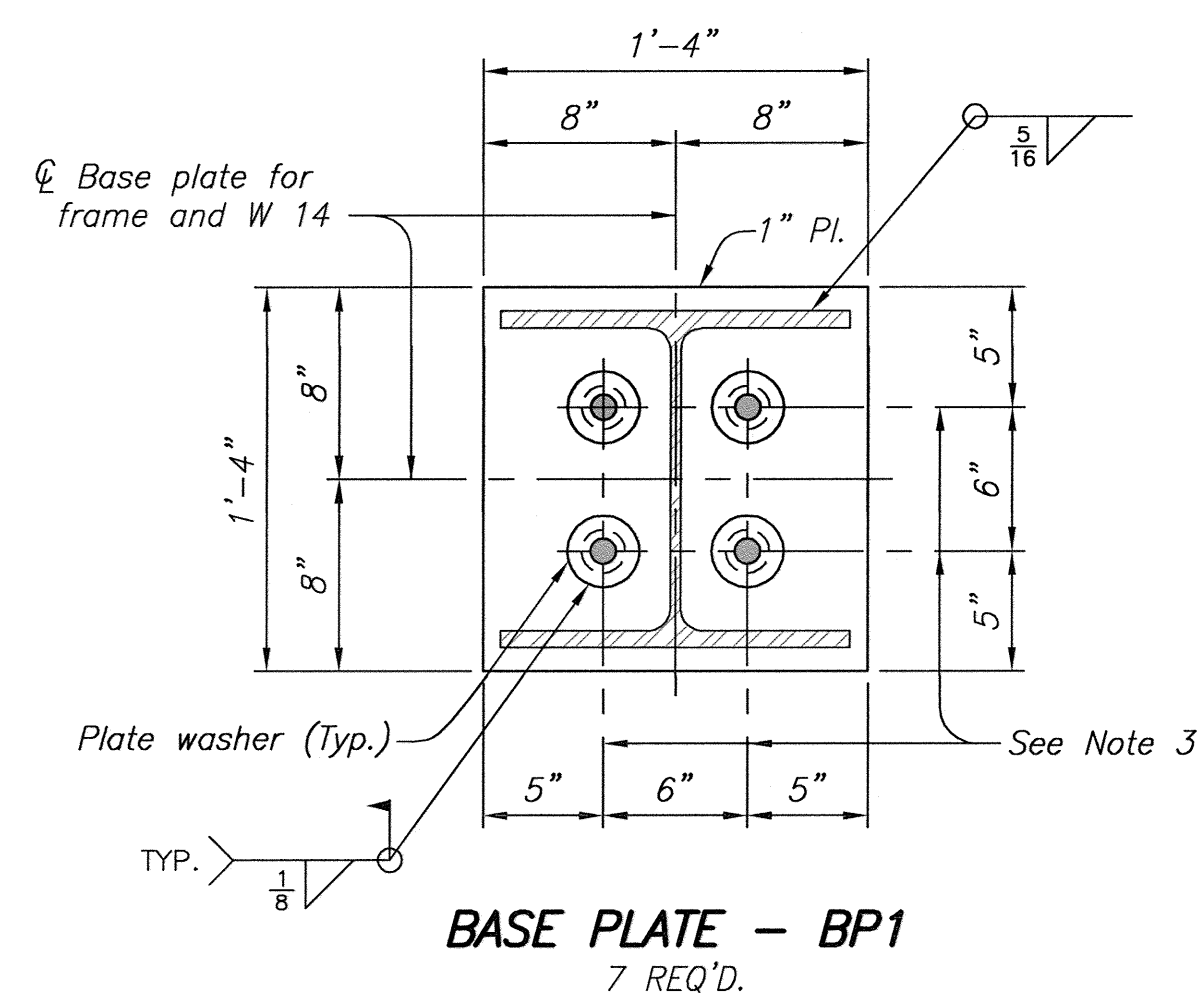
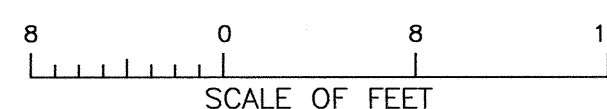
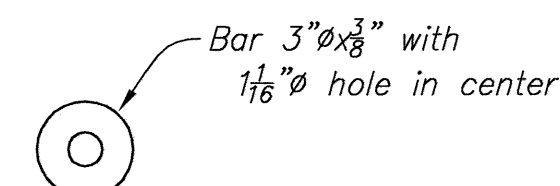
SECTION B-B

NOTES

- For Reference Drawings, see (131).
- For Structural Steel General Notes, see (131).
- For Structural Design Data, see (101) and (102).
- Maximum safe working load per bolt, 2,000 lbs.
- Snug tighten bolt, do not pretension.



FRAMING PLAN - EL. 6691.50

ANCHOR BOLT DETAIL
(76 REQ'D.)PLATE WASHER DETAIL
(76 REQ'D.)

NOTES

- For Reference Drawings, see (131).
- For Structural Steel General Notes, see (131).
- $\varnothing 1\frac{3}{8}$ " Holes in 1" base pl. for 1" $\varnothing$ anchor bolts. Anchor bolts 15-Inch long 1" $\varnothing$ anchor bolt with 5-Inch projection as shown. Field weld plate washers to 1" base plates after setting base plates.

D

C

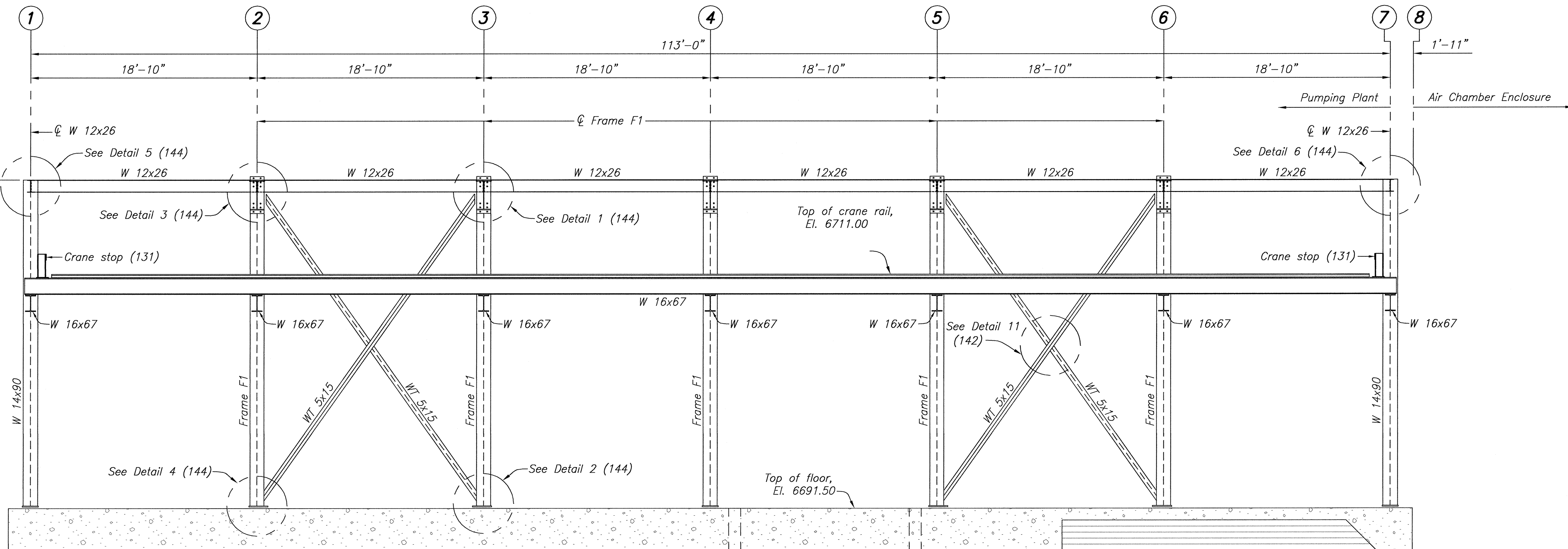
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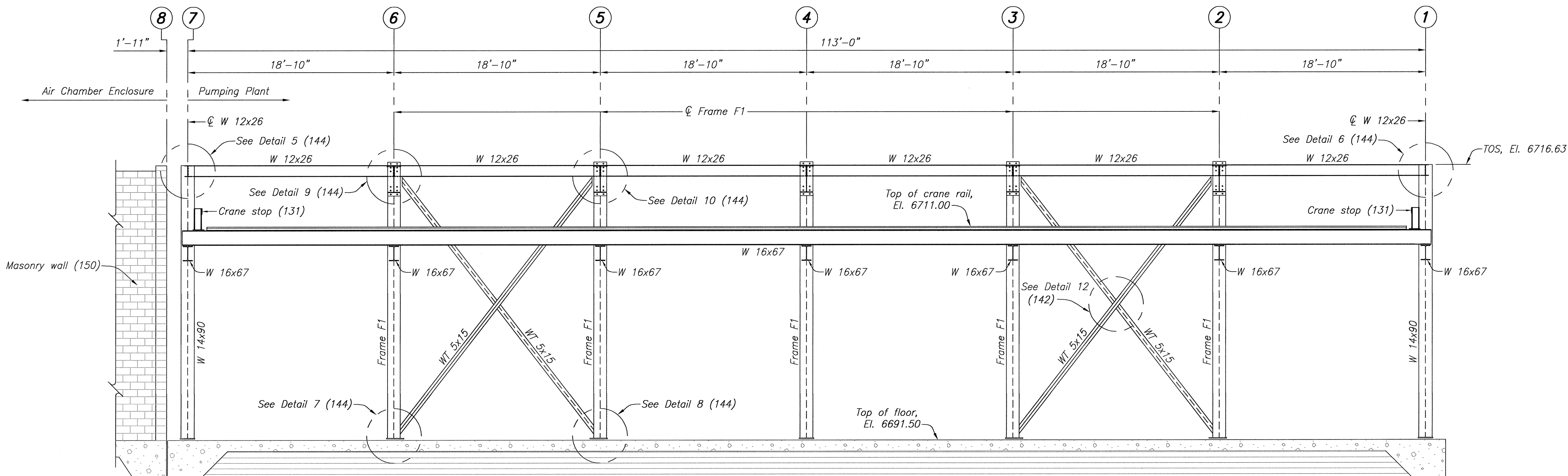
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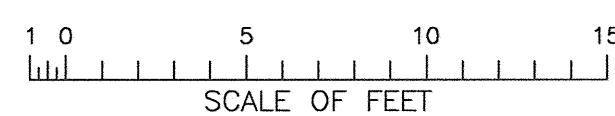
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SECTION 1-1 (134, 140)



SECTION 2-2 (134, 140)



NOTES

1. For Reference Drawings, see (131).
2. For Structural Steel General Notes, see (131).

ALWAYS THINK SAFETY

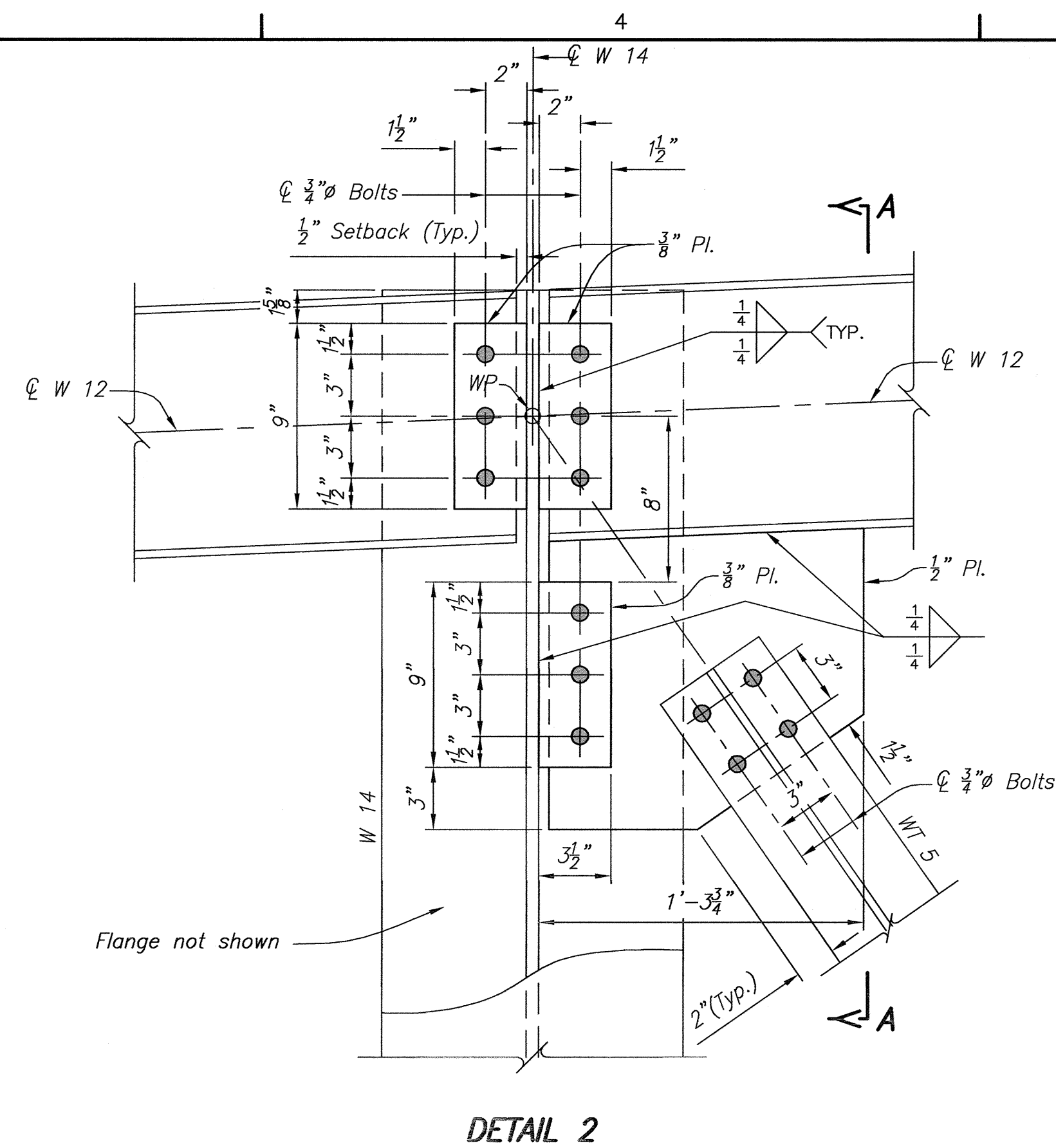
U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
NAVAJO GALLUP WATER SUPPLY PROJECT
NEW MEXICOSAN JUAN LATERAL
TOHLAKAI PUMPING PLANT
STRUCTURAL STEEL
SECTIONS AND DETAILS

DESIGNED: *R. D. Olson*
 DRAWN: *R. D. Olson*
 CHECKED: *R. D. Olson*
 TECH. APPR.: *R. D. Olson*
 APPROVED: *R. D. Olson*
 PLANT STRUCTURES GROUP
 DENVER, COLORADO 2013-08-05

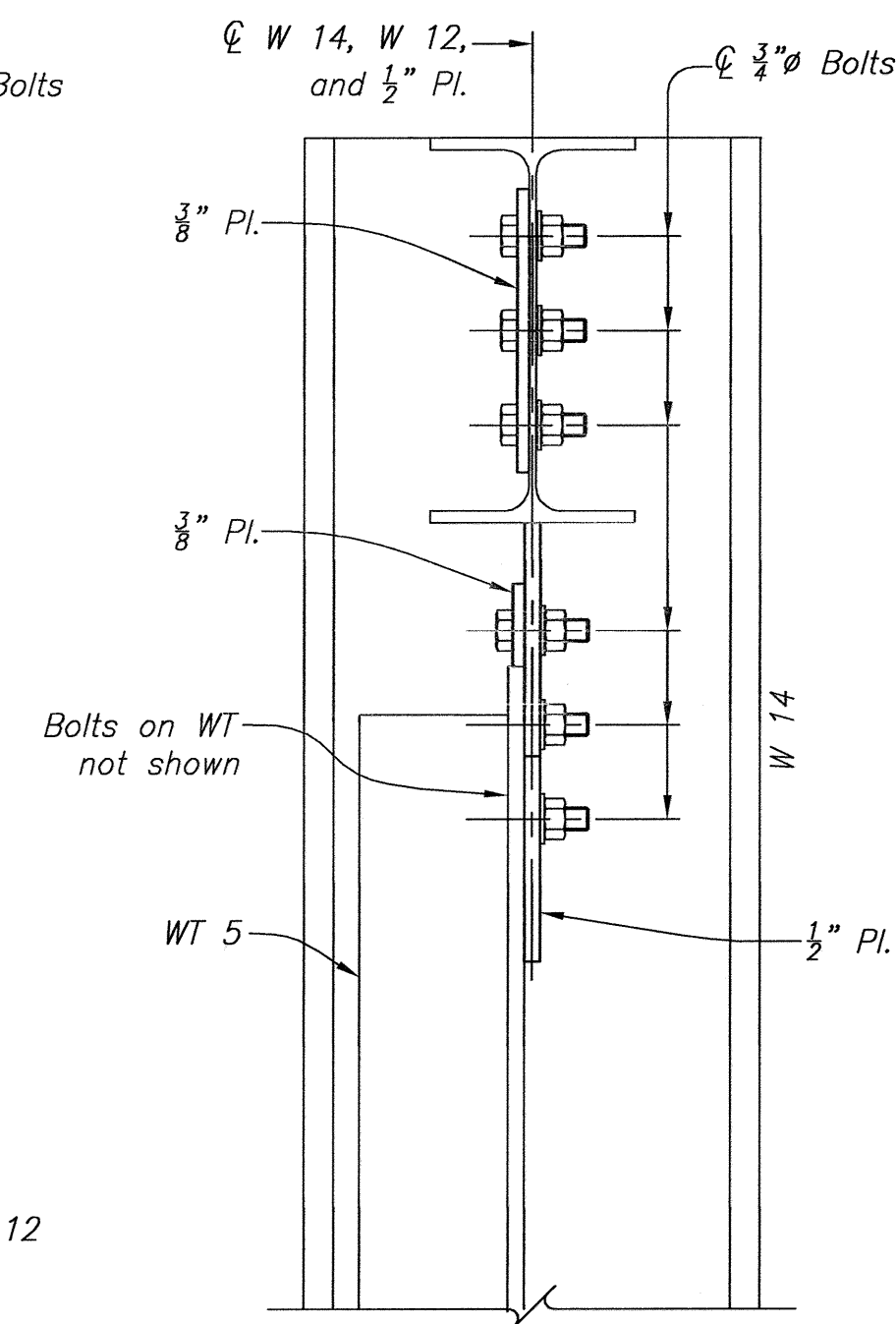
STRUCTURAL STEEL
SECTIONS AND DETAILS

1695-D-141

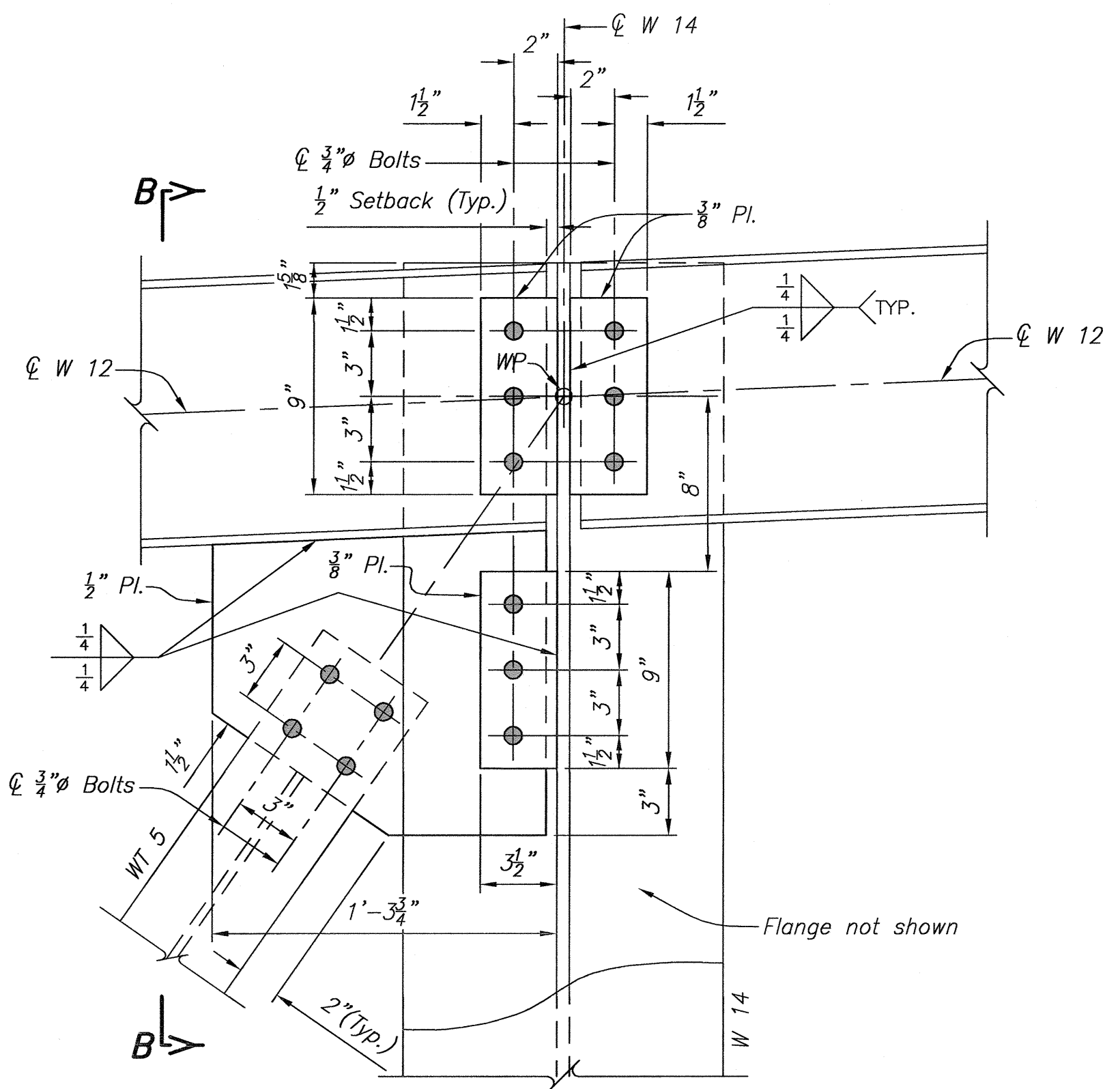
SHEET 1 OF 5



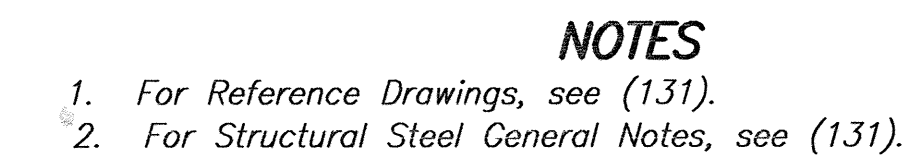
DETAIL 2



SECTION A-A (AS SHOWN)
SECTION B-B (SIMILAR)



DETAIL 3



NOTES

1. For Reference Drawings, see (131).
2. For Structural Steel General Notes, see (131).

ALWAYS THINK SAFETY

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

NAVALO GALLUP WATER SUPPLY PROJECT
NEW MEXICO

SAN JUAN LATERAL
ATCHOLAIKAI PUMPING PLANT
STRUCTURAL STEEL
SECTIONS AND DETAILS

DESIGNED *K. Singh*
DRAWN *K. Singh*
CHECKED *B. D. Van Otterloo, P.E.*
TECH. APPR. *B. D. Van Otterloo, P.E.*
APPROVED *AM. B. T.*
PLANT STRUCTURES GROUP
DENVER, COLORADO 2013-08-01

STRUCTURAL STEEL SECTIONS AND DETAILS

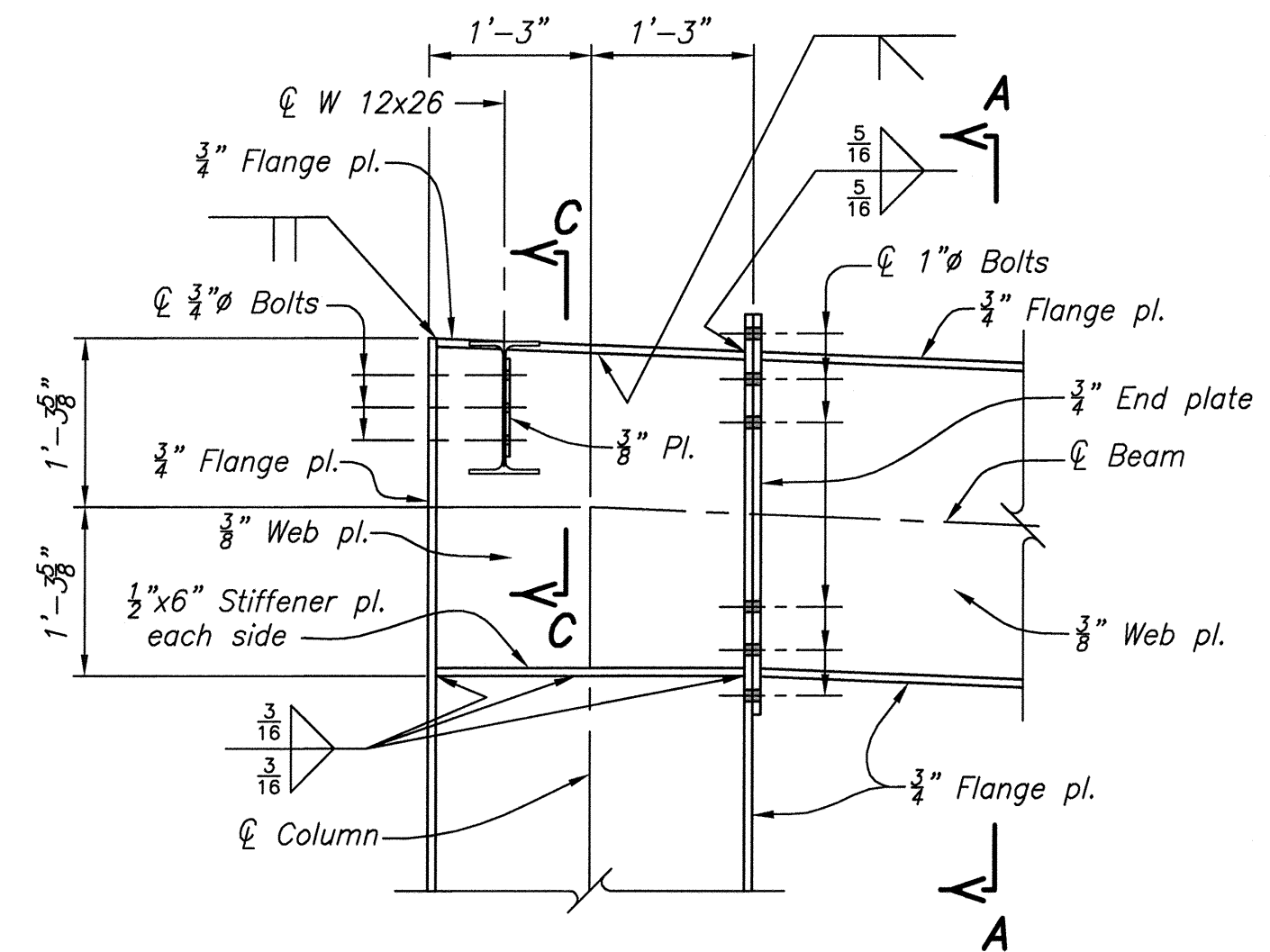
1695-D-142

SHEET 2 OF 5

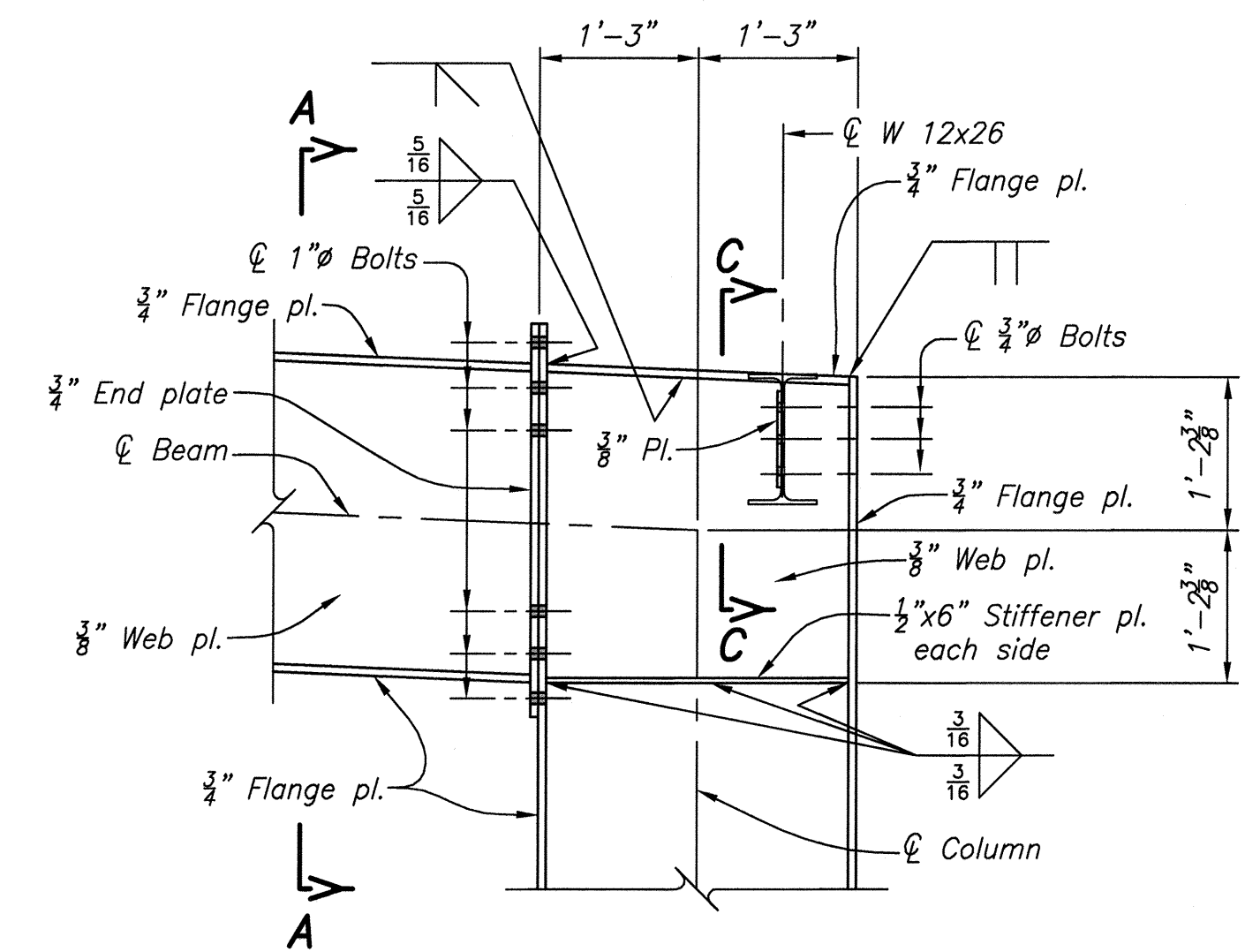
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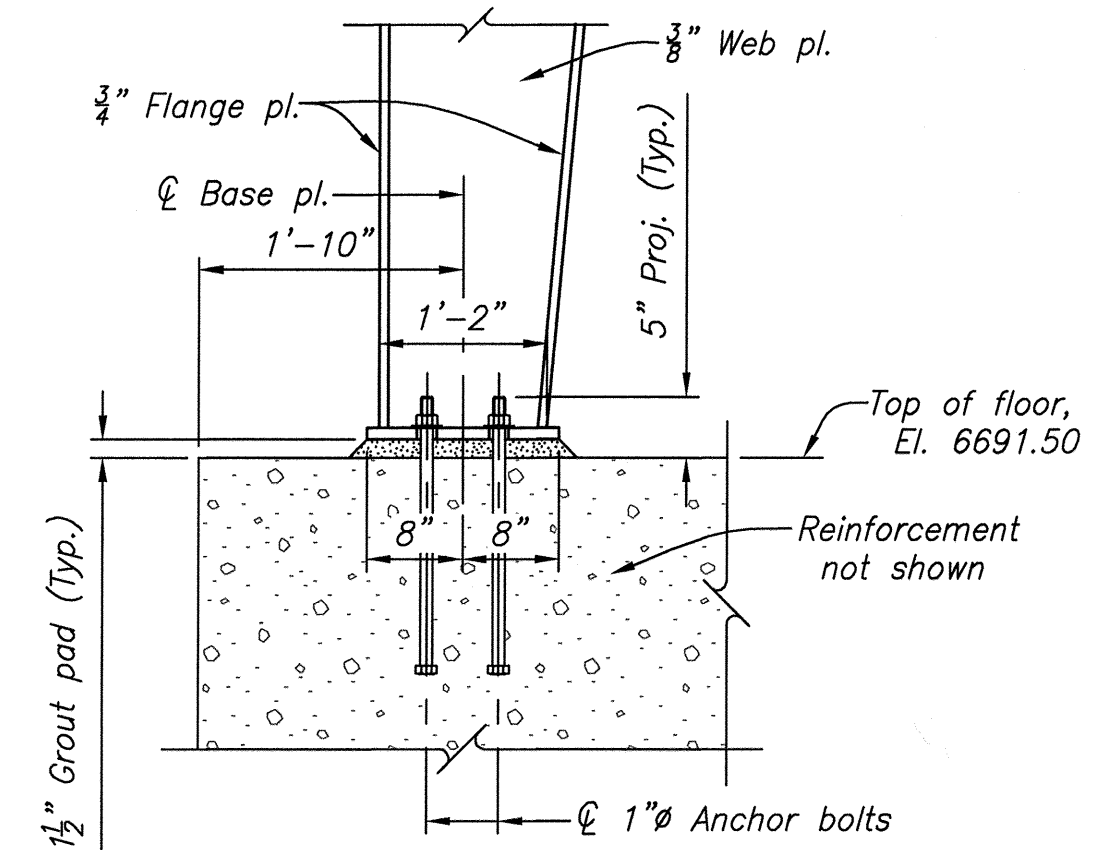
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DETAIL 3



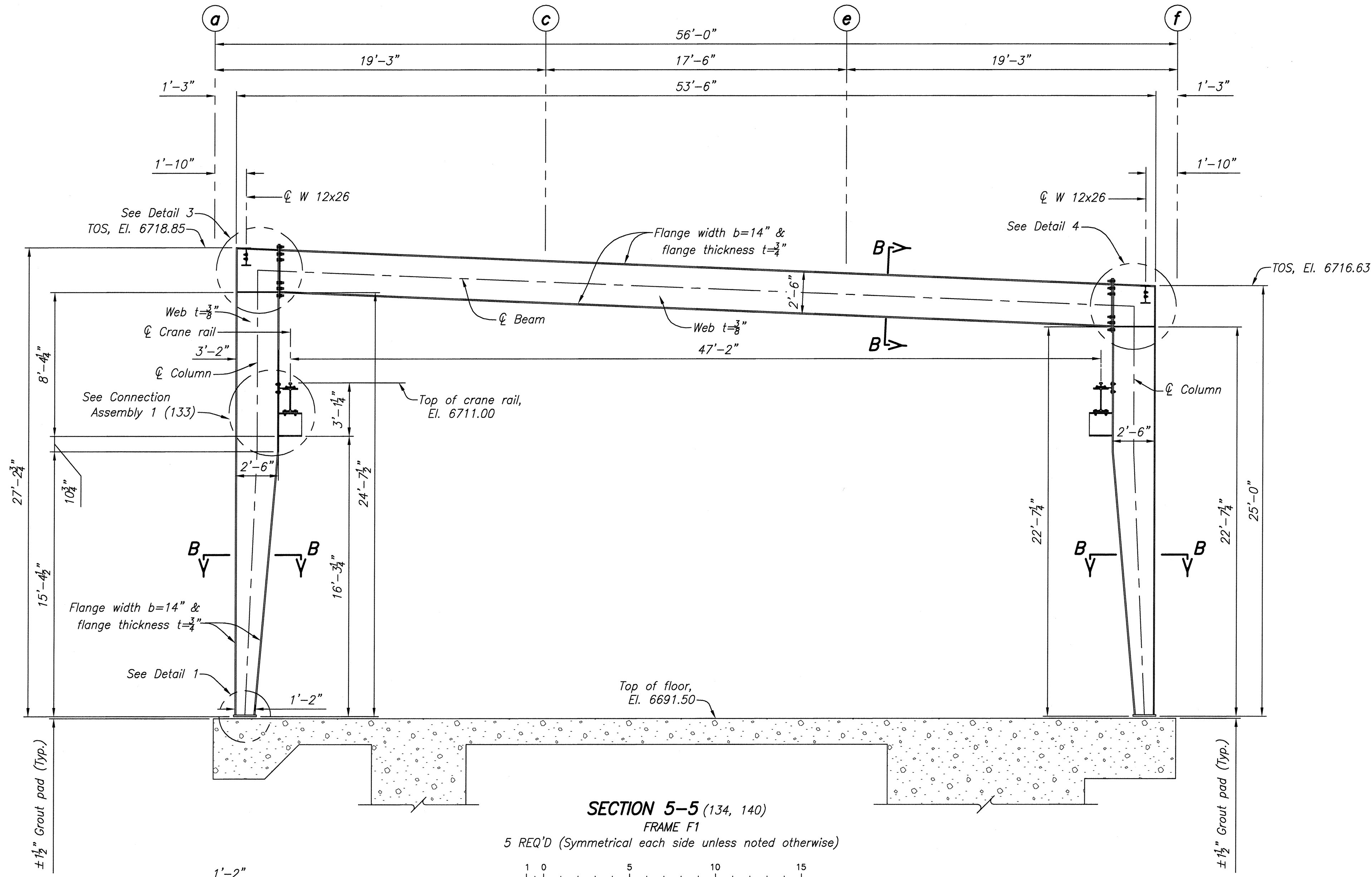
DETAIL 4



DETAIL 1
(Typical)

NOTES

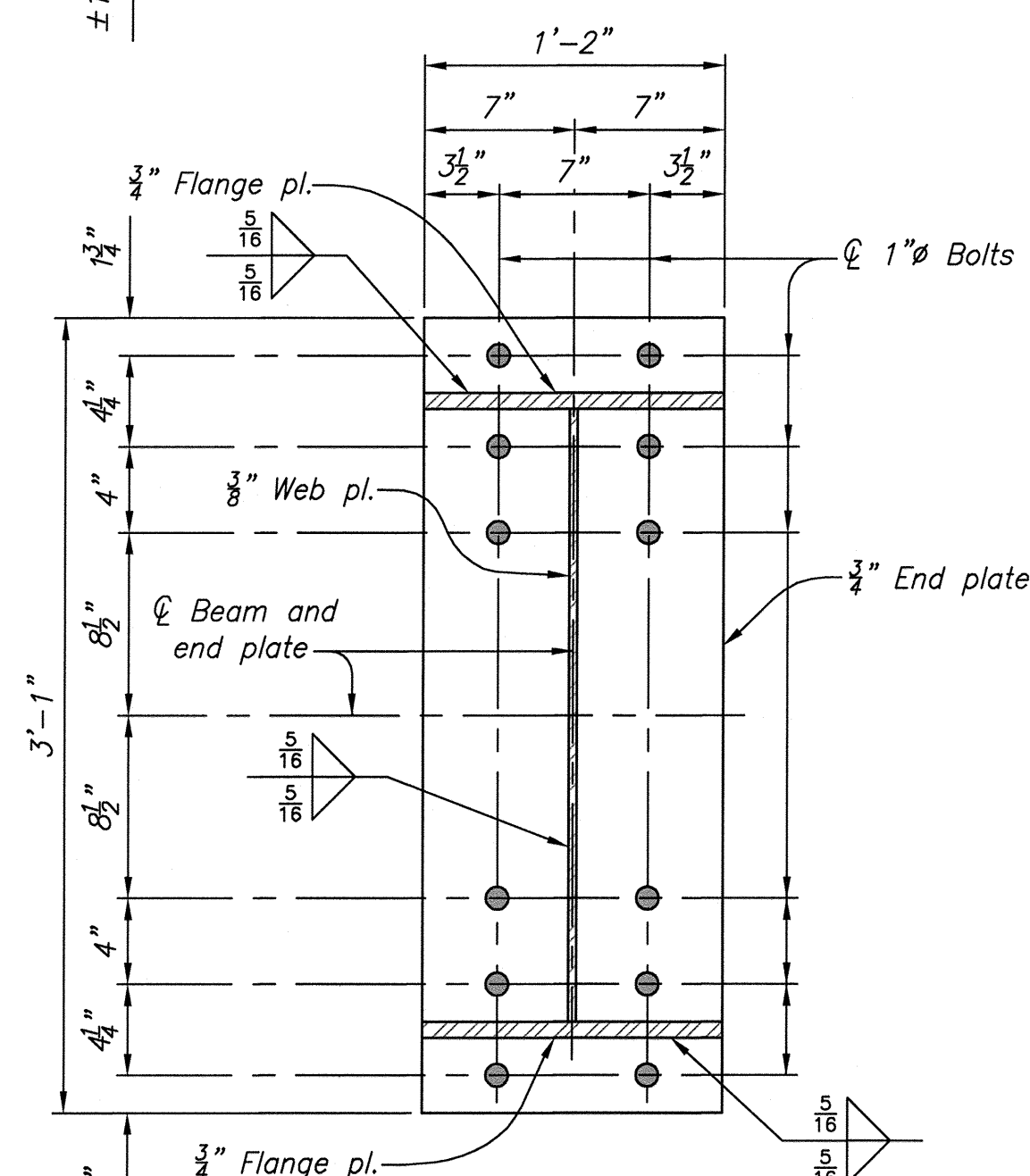
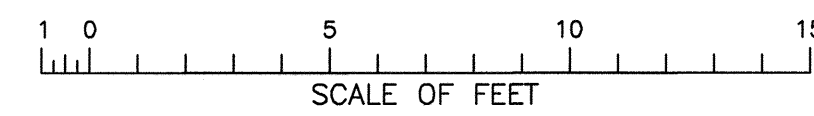
1. For Reference Drawings, see (131).
2. For Structural Steel General Notes, see (131).



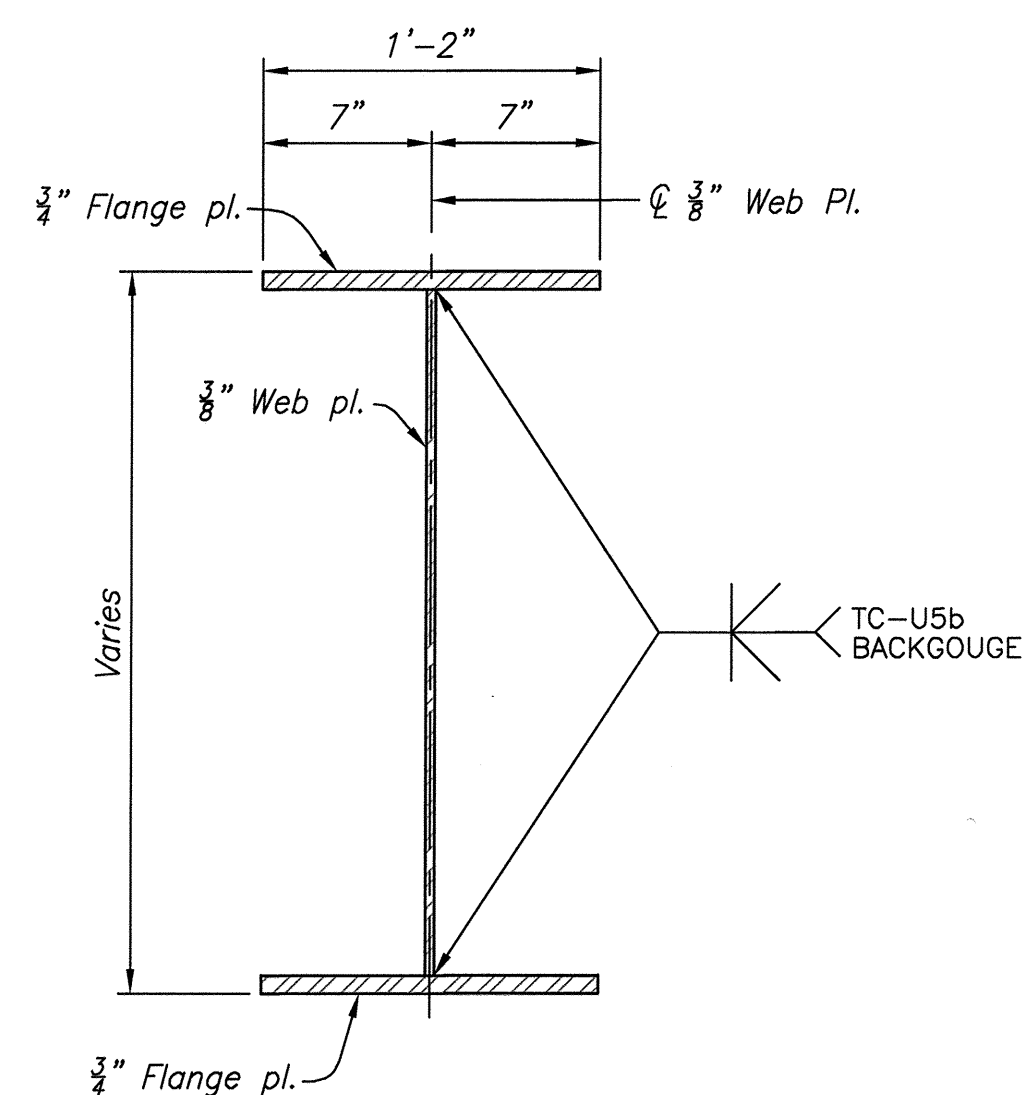
SECTION 5-5 (134, 140)

FRAME F1

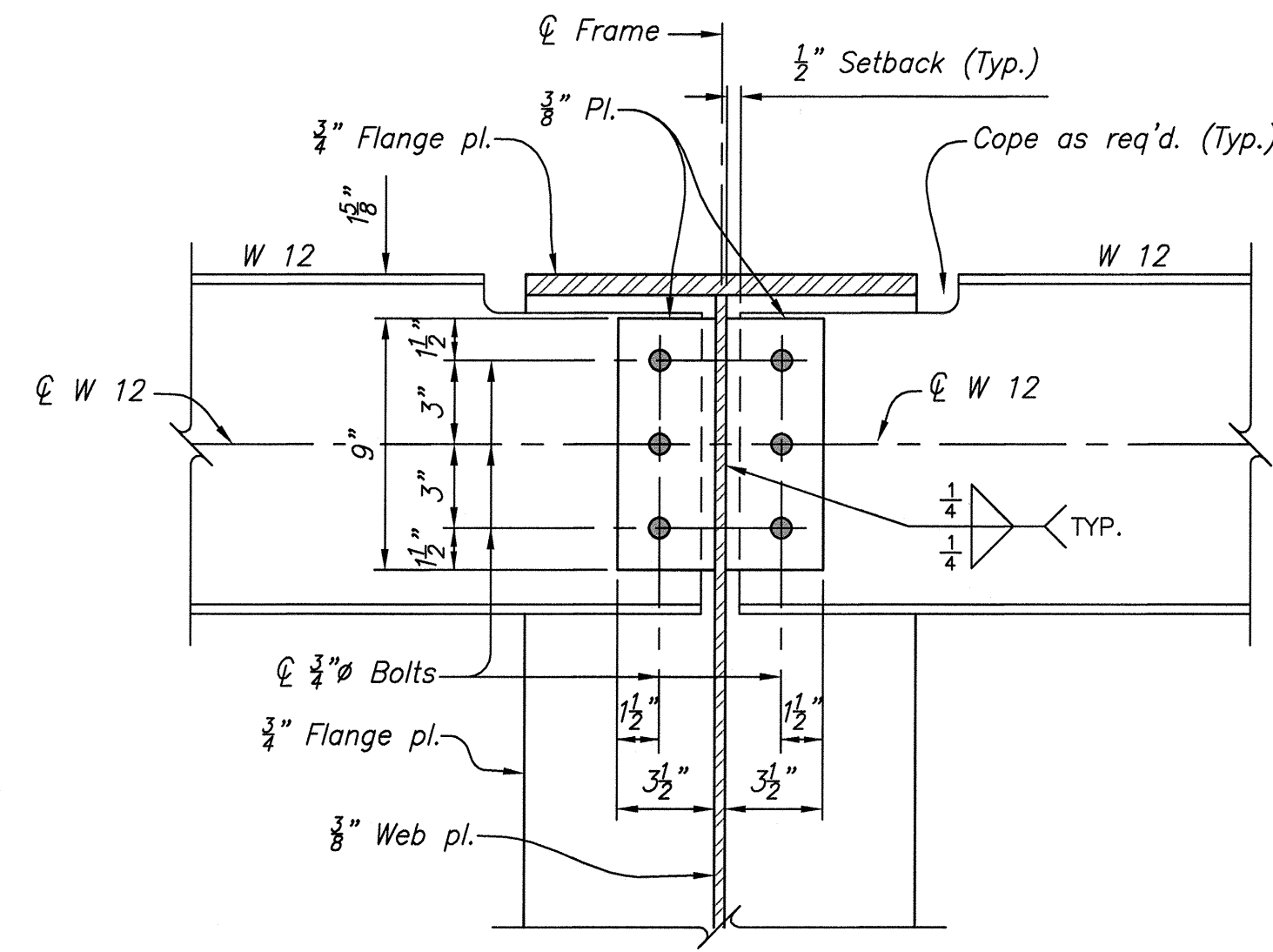
5 REQ'D (Symmetrical each side unless noted otherwise)



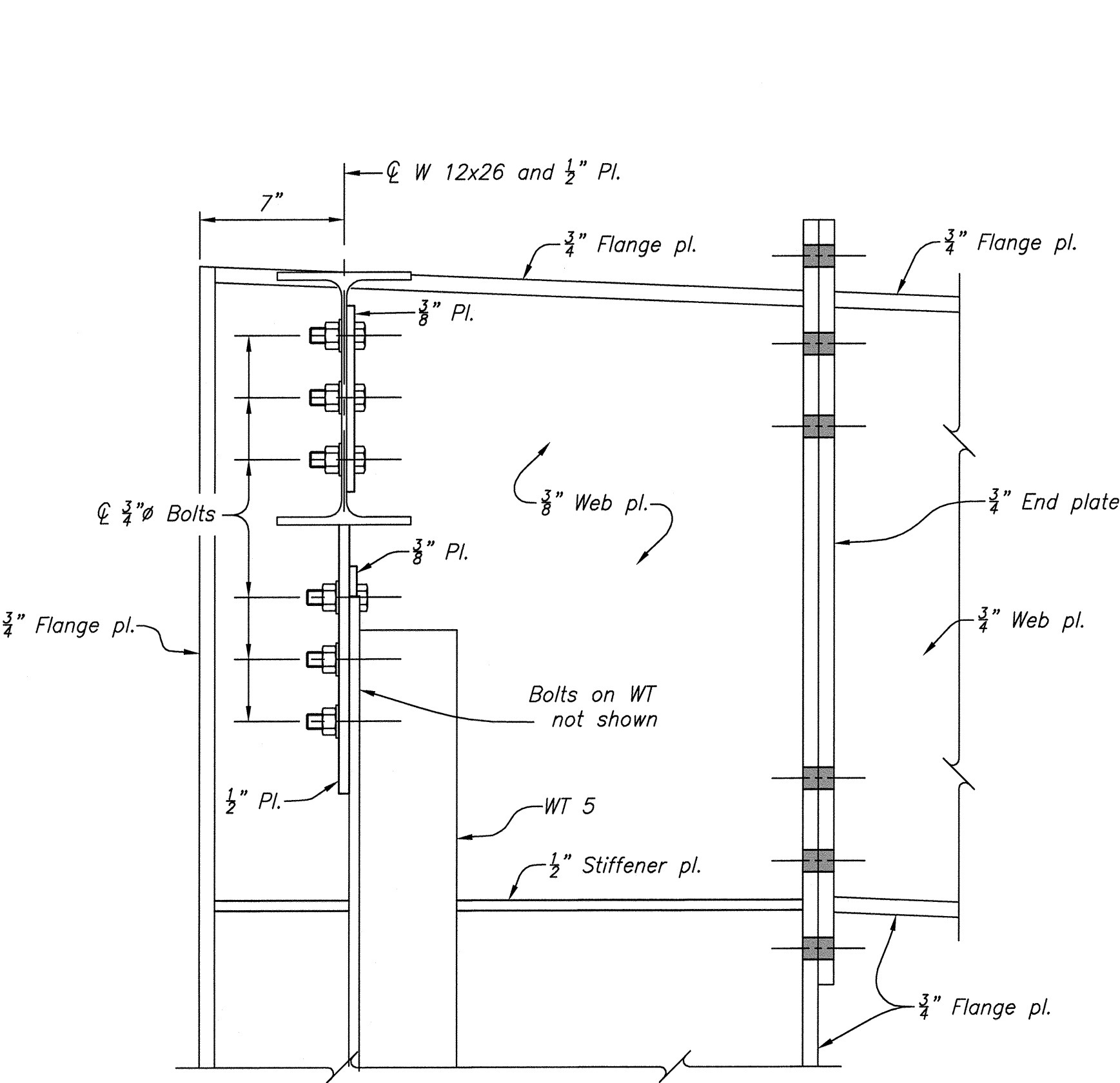
SECTION A-A
BEAM TO COLUMN
MOMENT END - PLATE CONNECTION



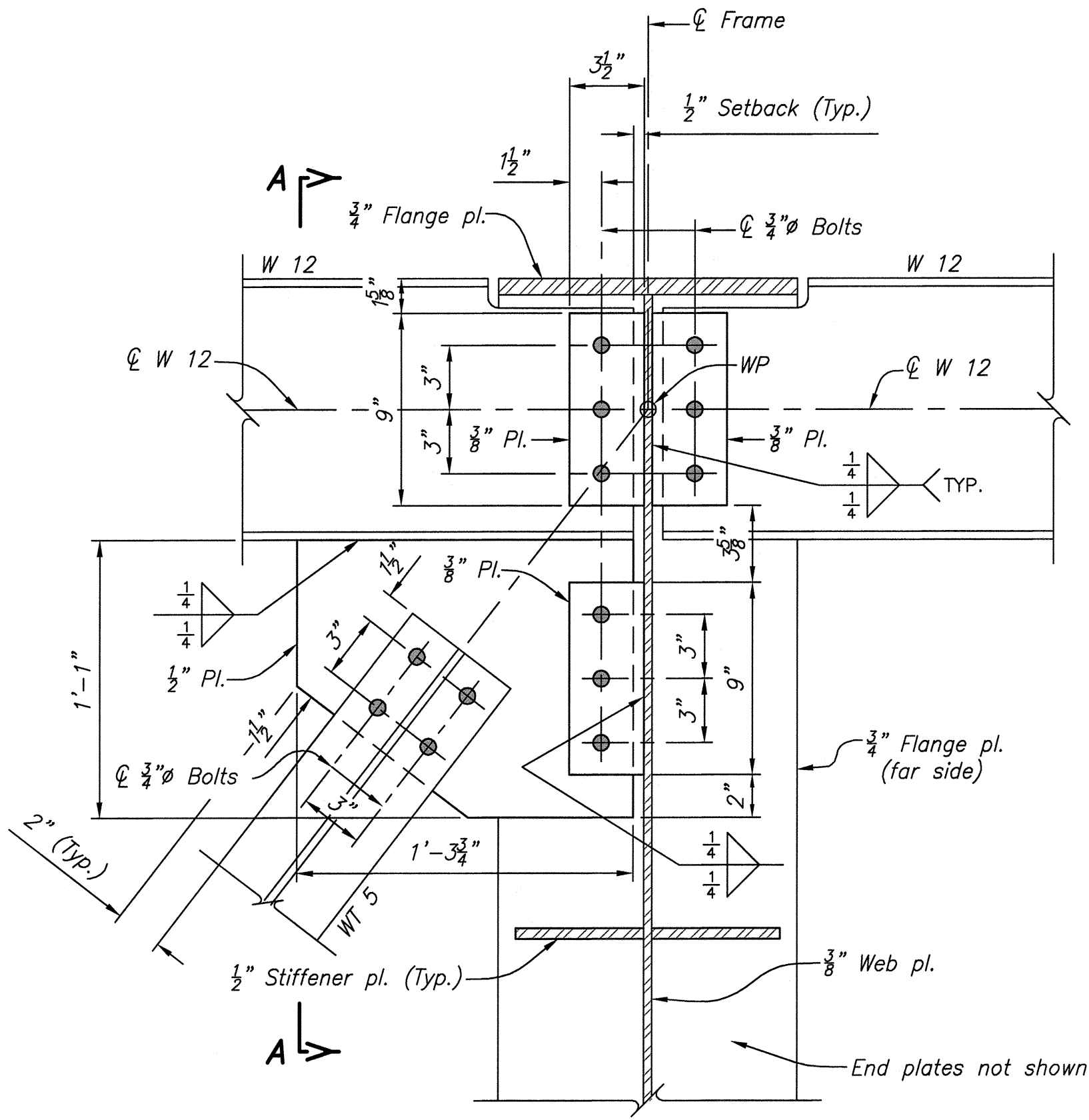
SECTION B-B
TYPICAL FRAME



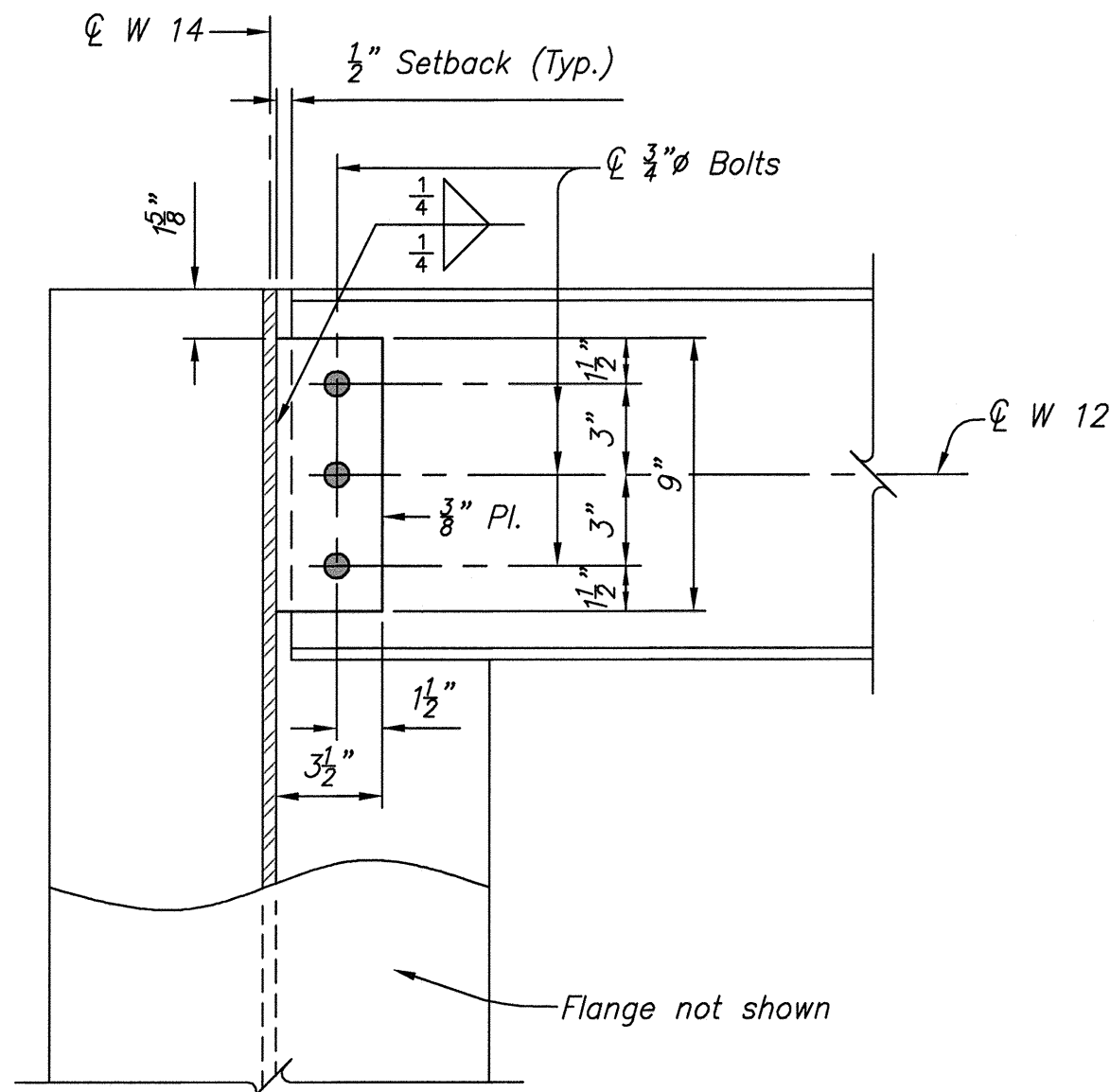
SECTION C-C



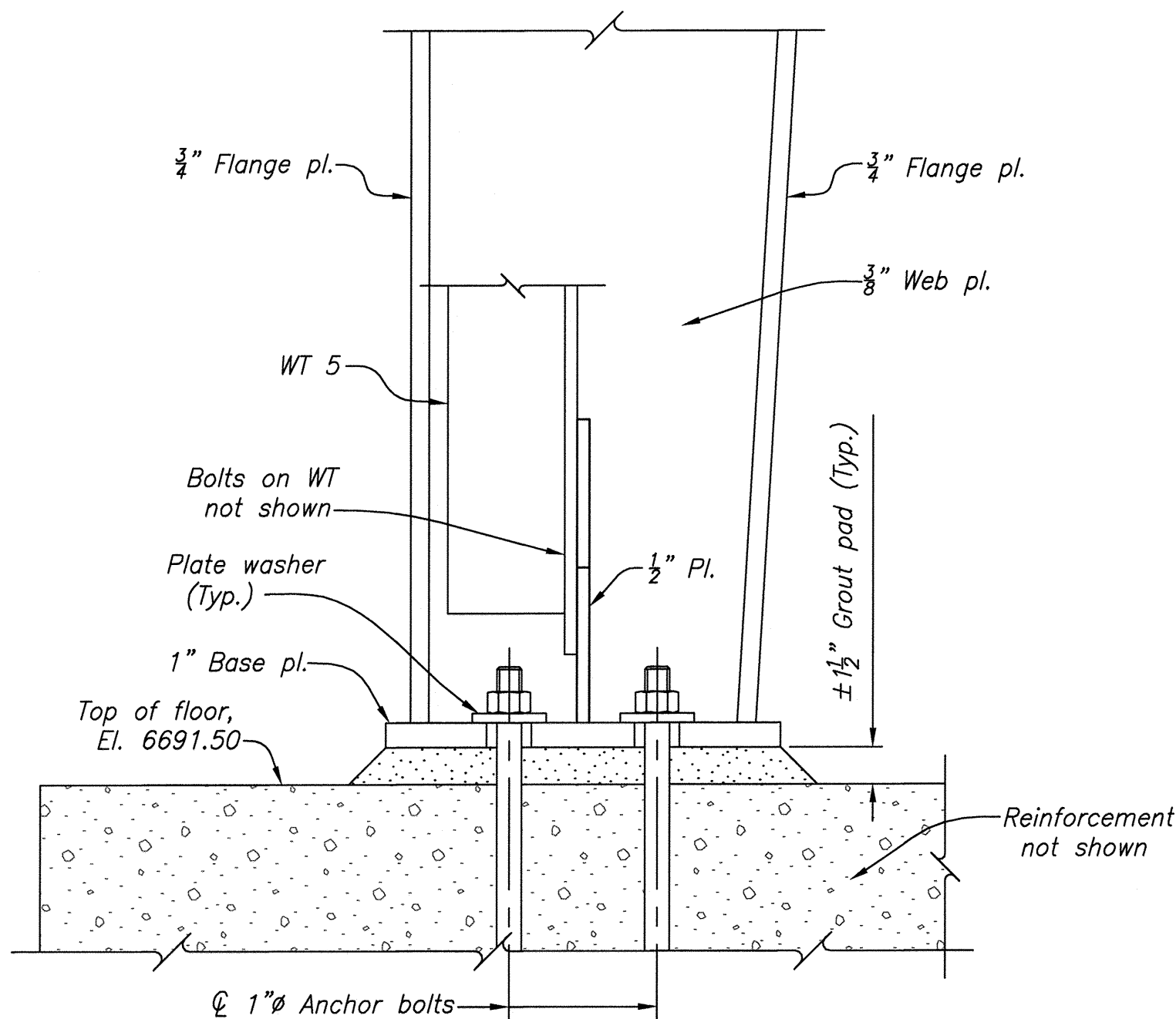
SECTION A-A



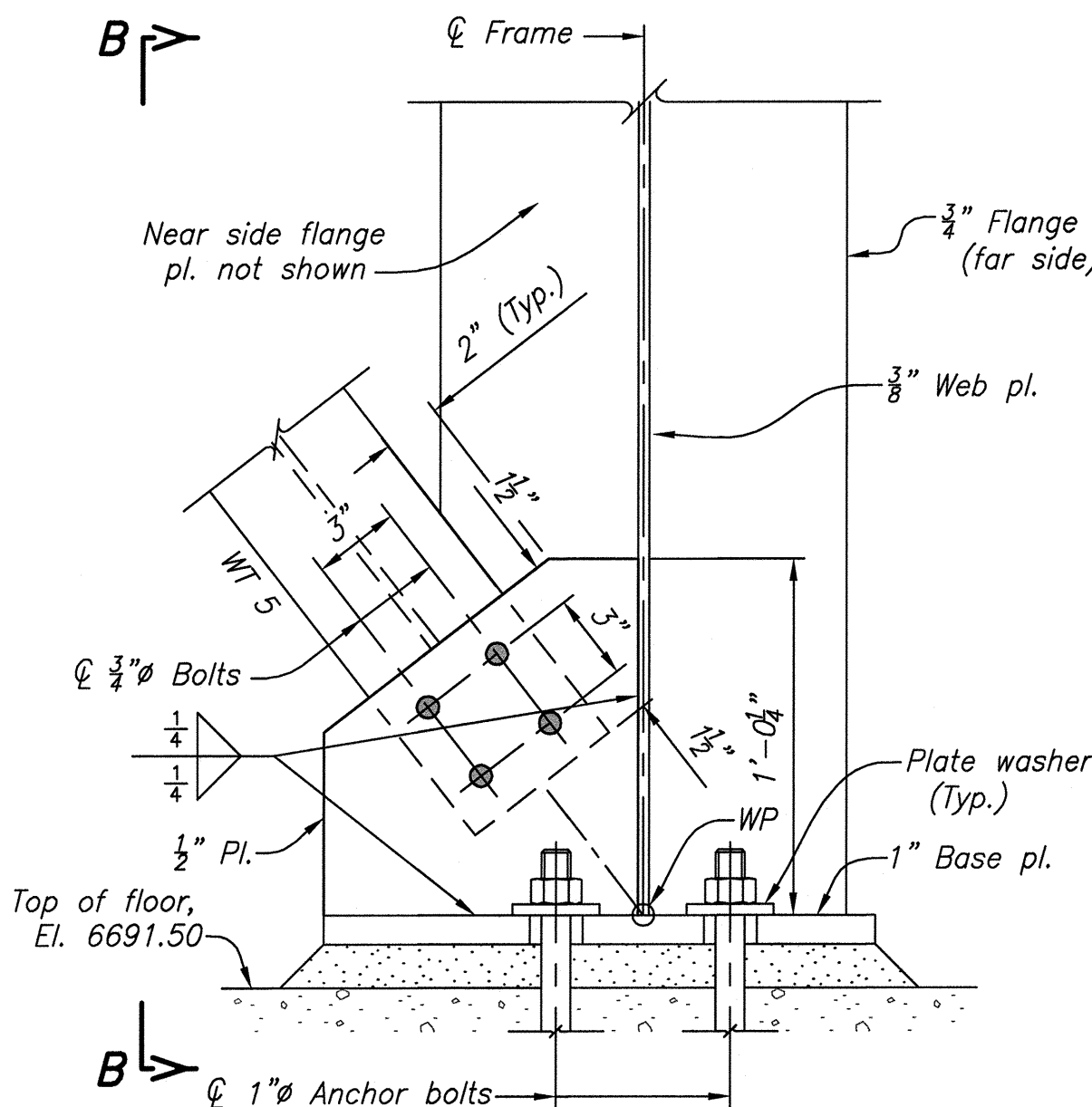
DETAIL 1 (AS SHOWN)(141)
DETAIL 3 (SIMILAR)(OPP. HAND)(141)
DETAIL 9 (SIMILAR)(OPP. HAND)(144)
DETAIL 10 (SIMILAR)(141)



DETAIL 5 (AS SHOWN)(141)
DETAIL 6 (OPP. HAND)(141)



SECTION B-B



DETAIL 2 (AS SHOWN)(141)
DETAIL 4 (SIMILAR)(OPP. HAND)(141)
DETAIL 7 (SIMILAR)(OPP. HAND)(141)
DETAIL 8 (SIMILAR)(141)

- NOTES
- For Reference Drawings, see (131).
 - For Structural Steel General Notes, see (131).

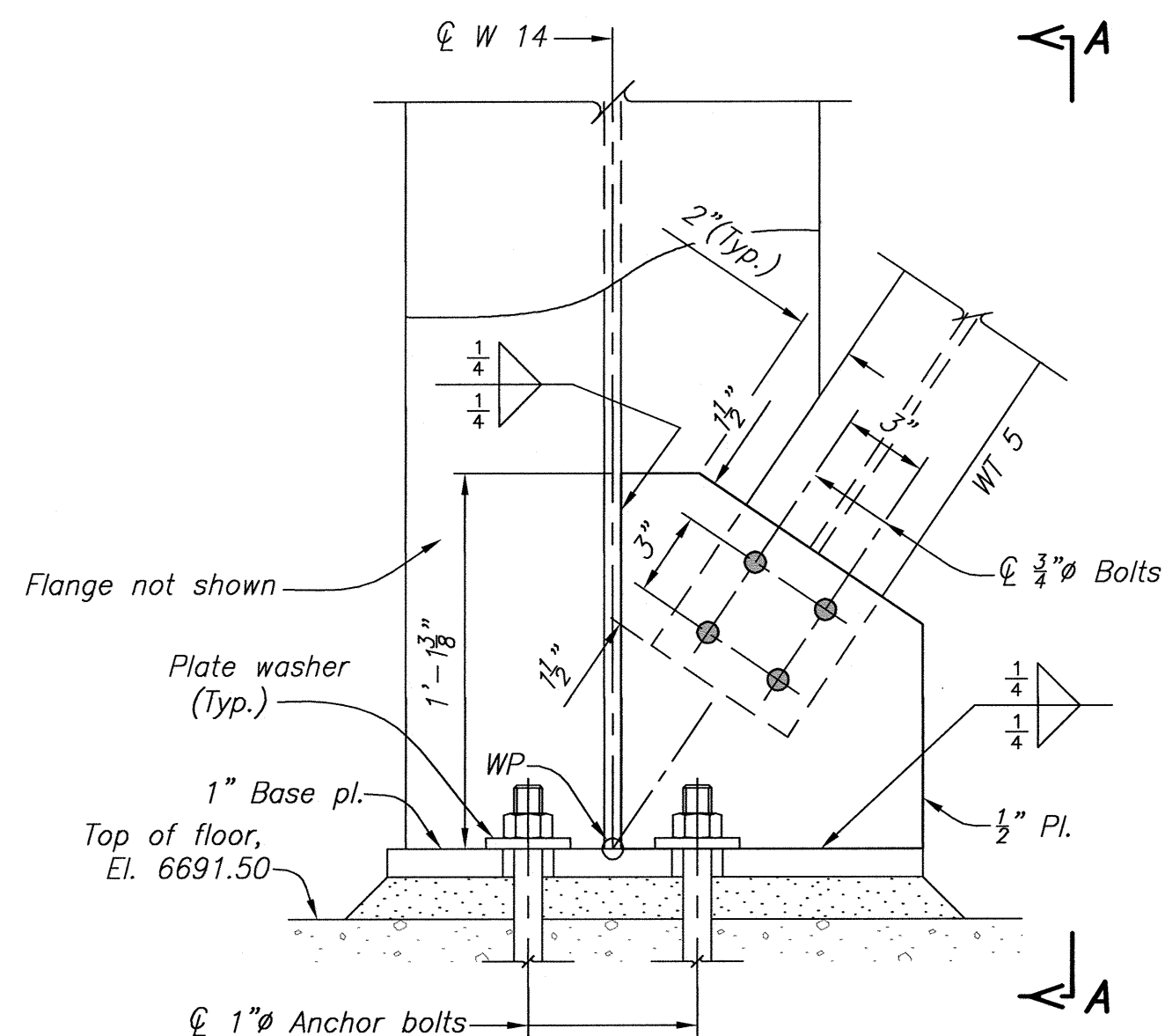
DESIGNED *K. D. Sh*
DRAWN *R. D. R. J.*
CHECKED *E. Jackson*
TECH. APPR. *P. D. VanSteen, P.E.*
APPROVED *W. B. S.*
PLANT STRUCTURES GROUP

DENVER, COLORADO 2013-08-05

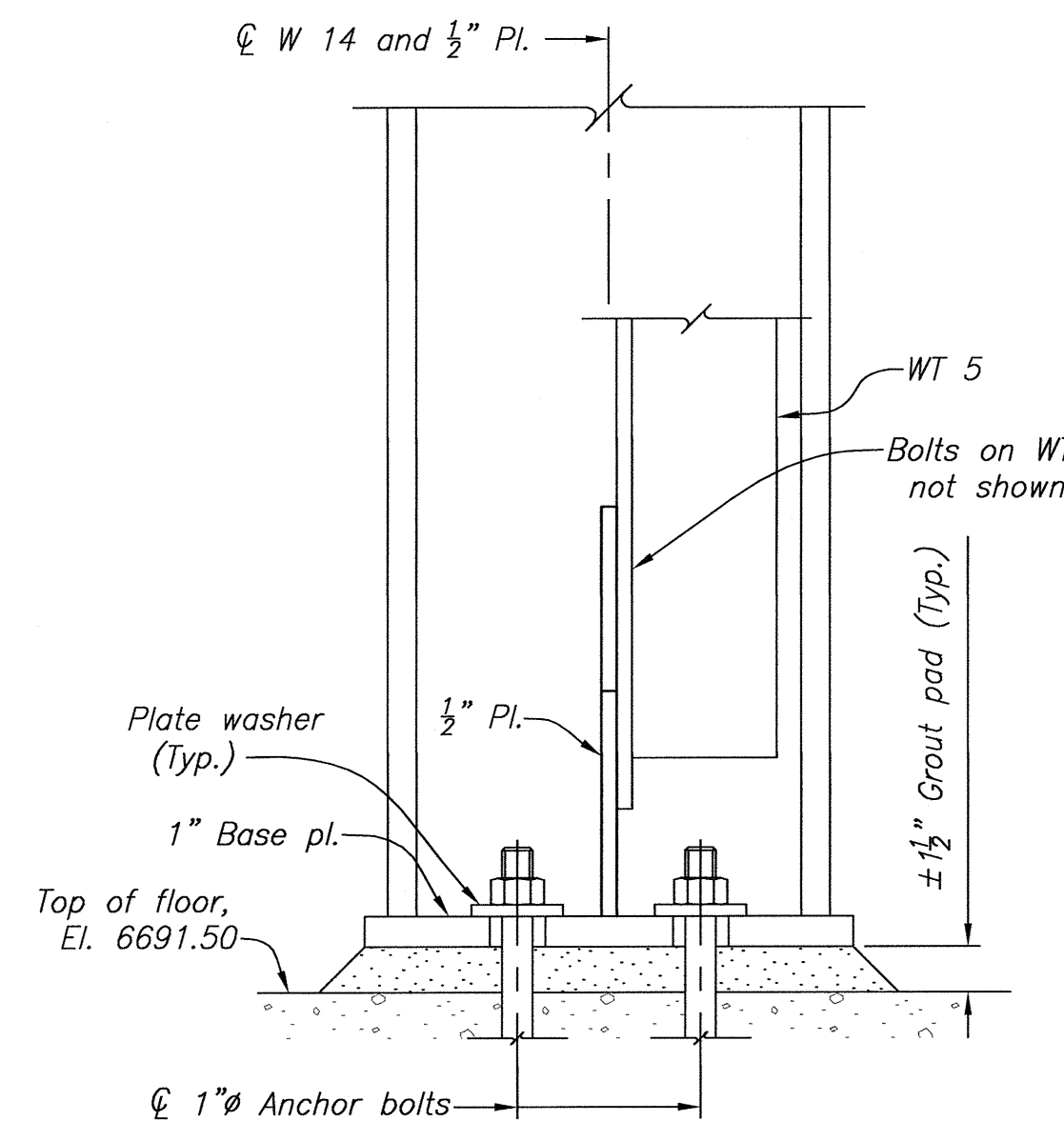
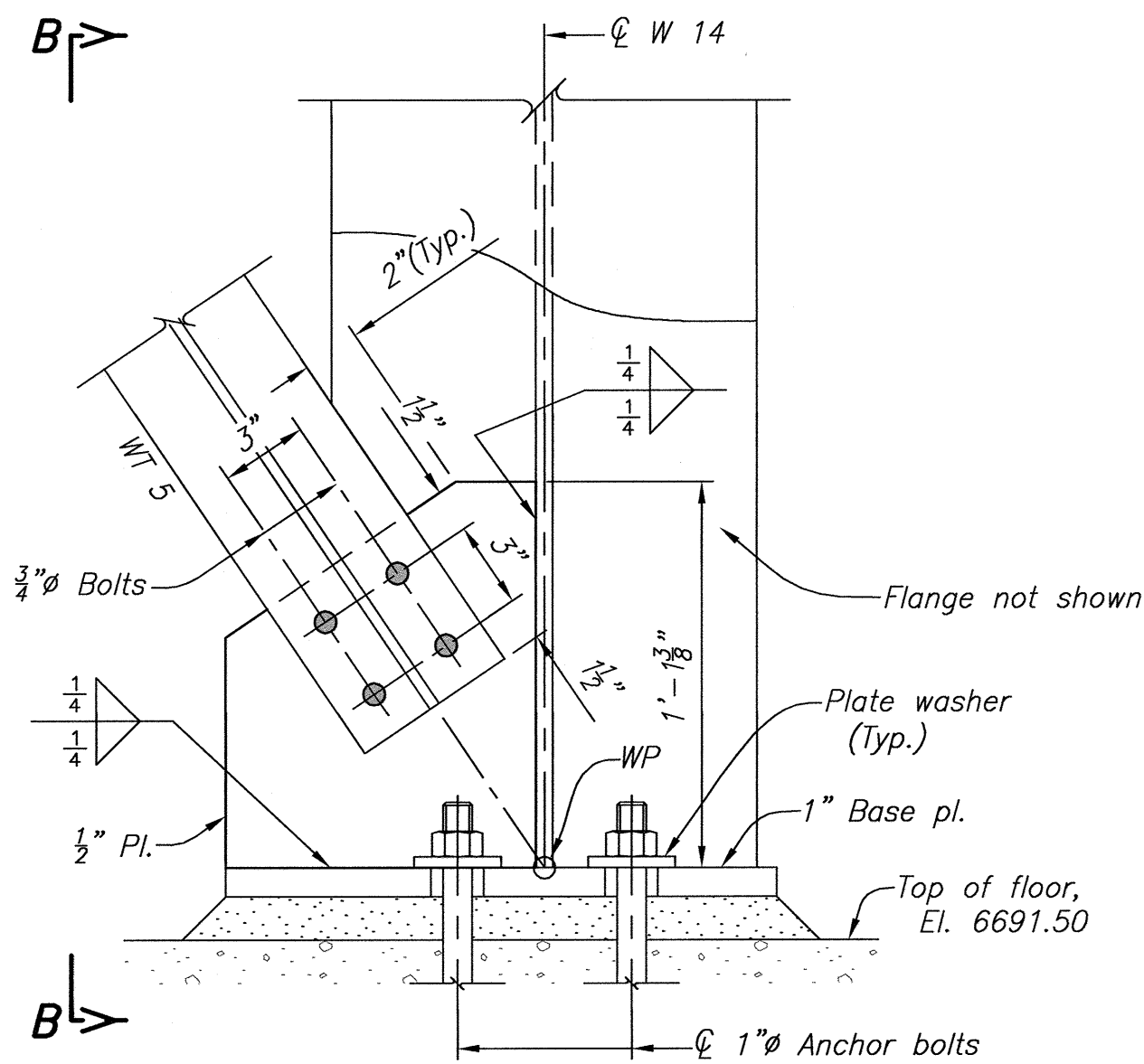
STRUCTURAL STEEL
SECTIONS AND DETAILS

1695-D-145

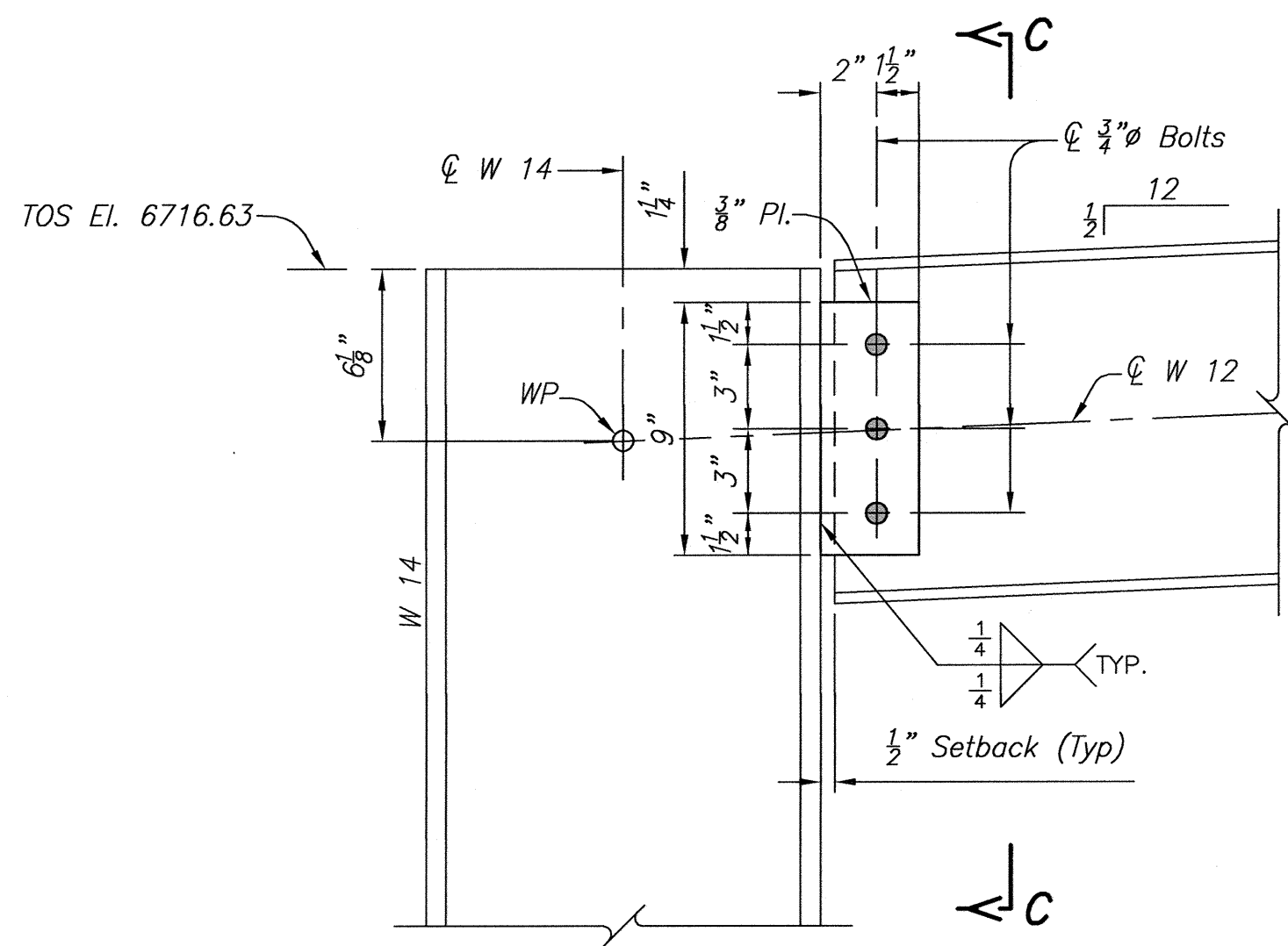
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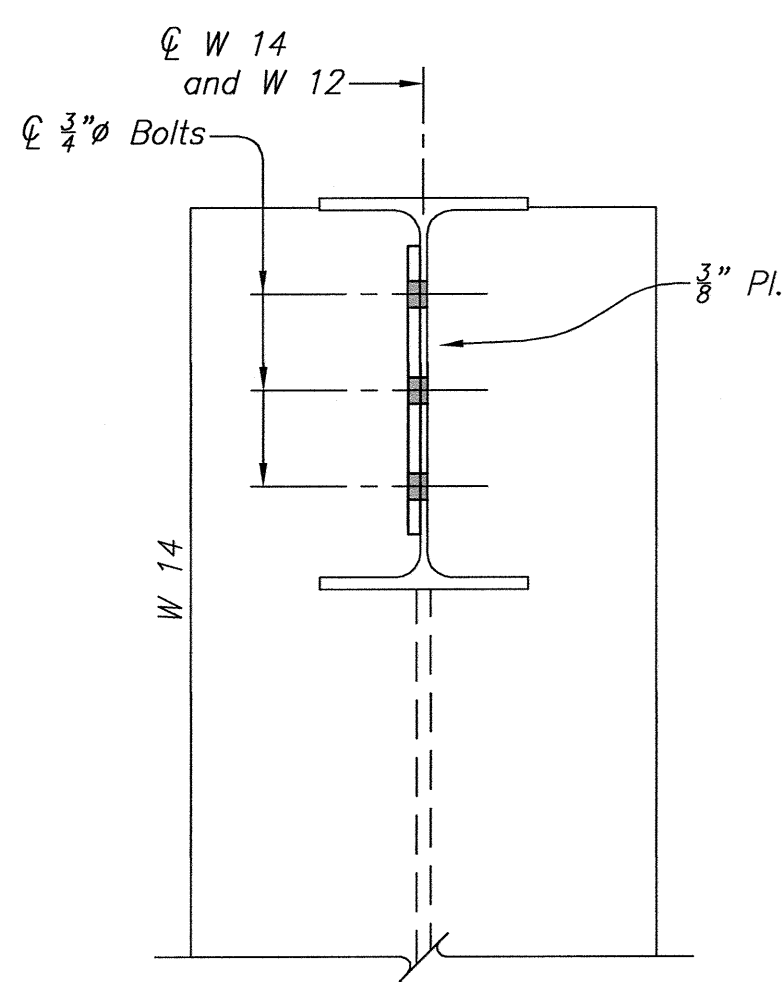
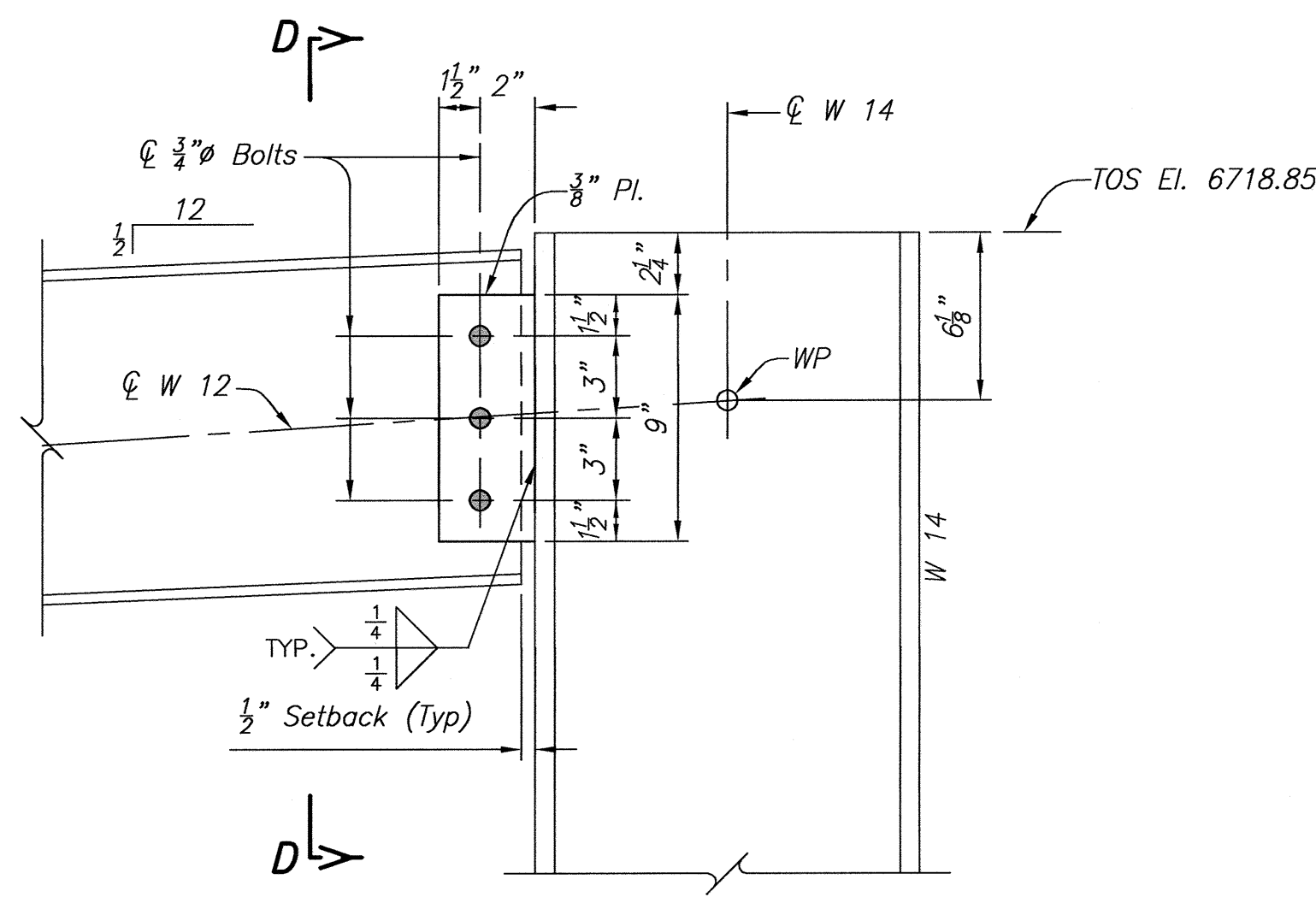
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SECTION A-A
SECTION B-B

DETAIL 6 (142)



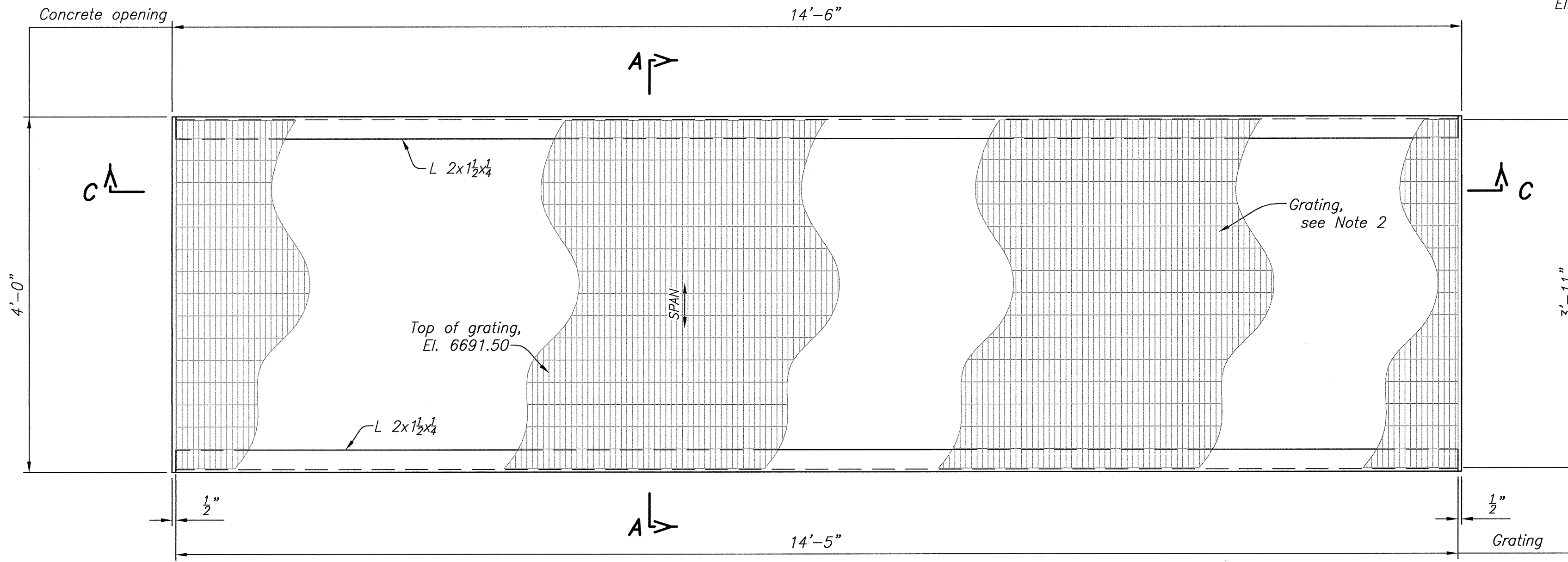
DETAIL 7 (142)

SECTION C-C (AS SHOWN)
SECTION D-D (SIMILAR)

DETAIL 8 (142)

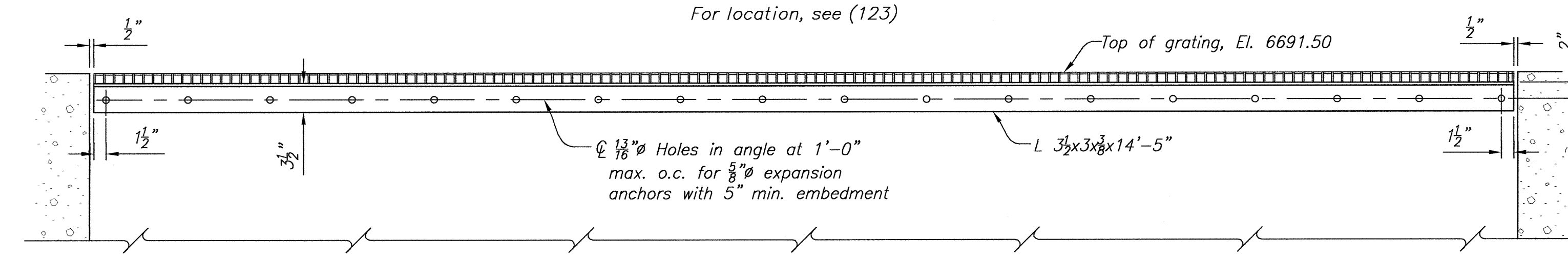
NOTES

1. For Reference Drawings, see (131).
2. For Structural Steel General Notes, see (131).

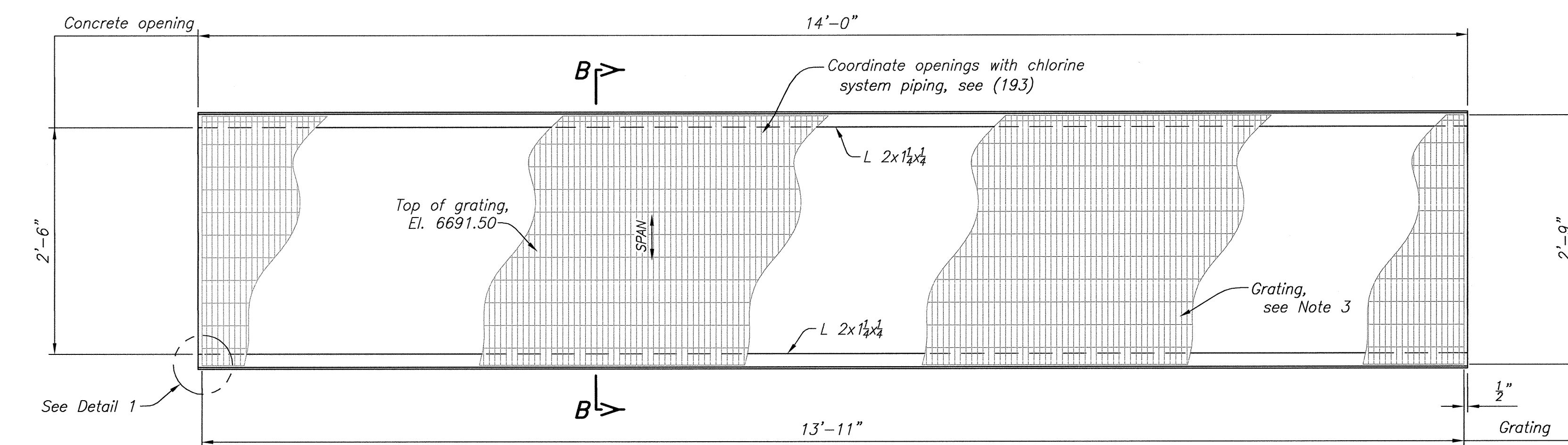


GRATING AND ANGLES FOR PIPE JOINT ACCESS TRENCH

ONE REQ'D, MK. 191-A
Design Live Load = 100 Lbs/sq. ft.
For location, see (123)

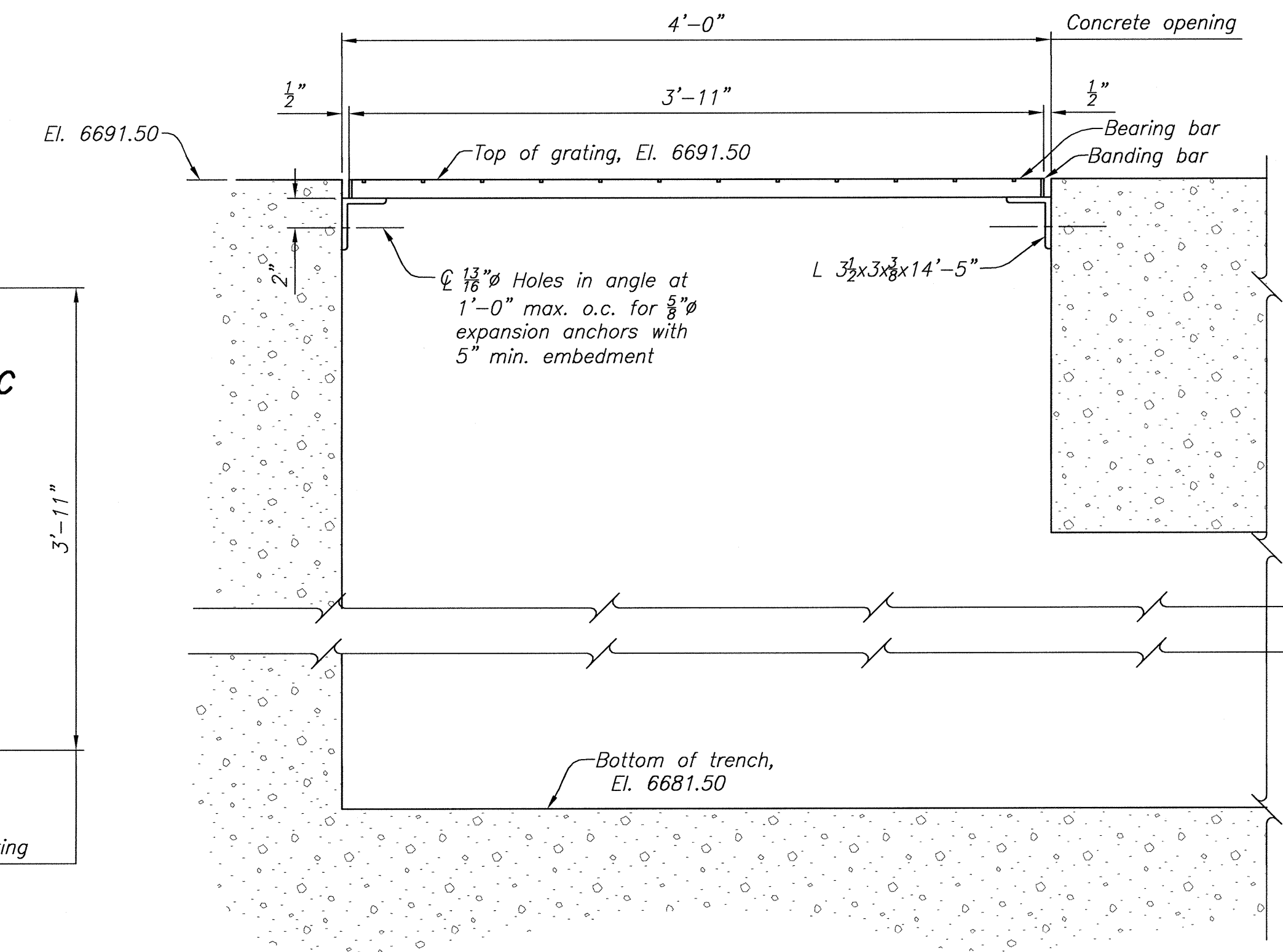


SECTION C-C

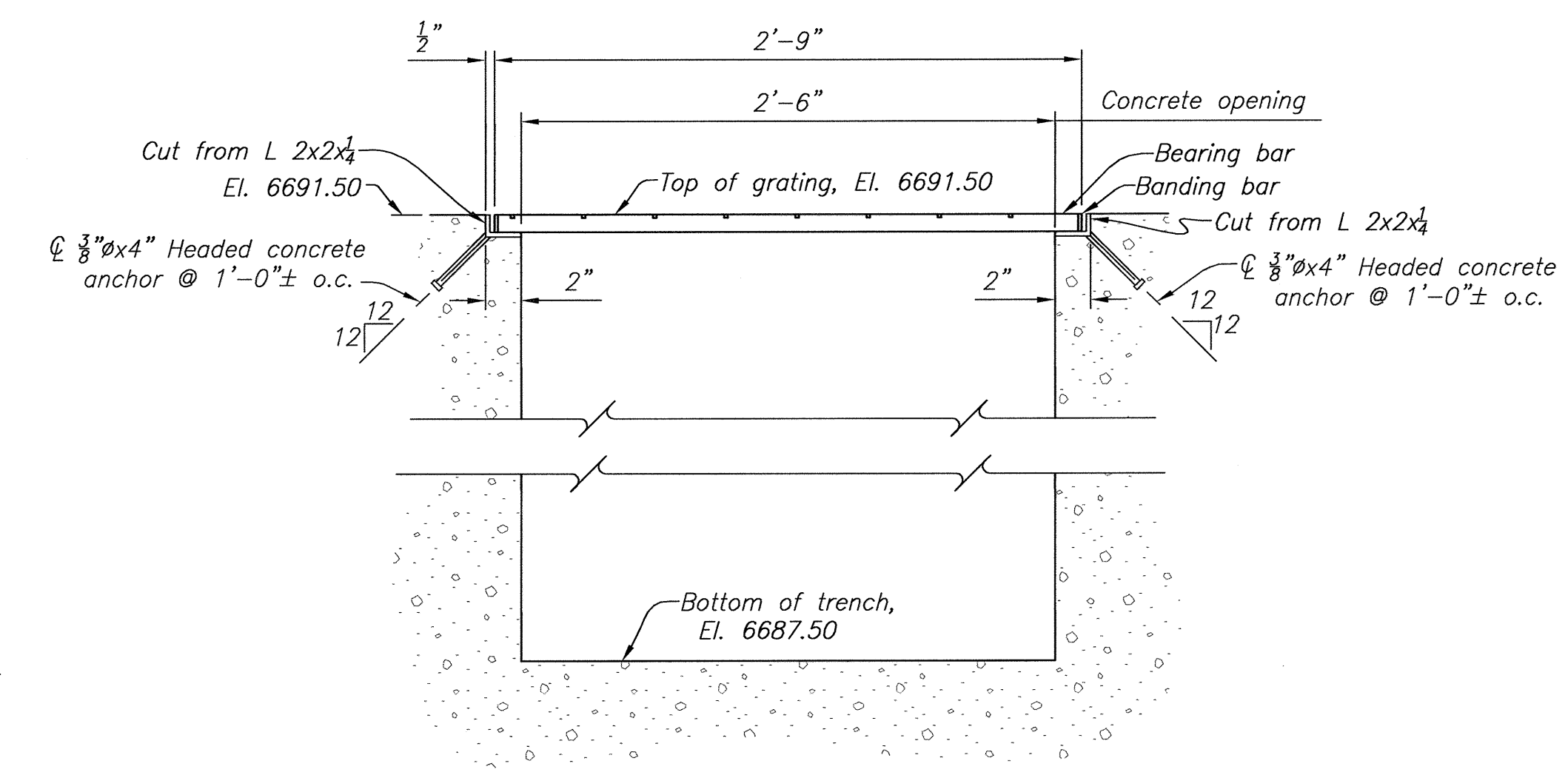


GRATING AND ANGLES FOR CHLORINATION PIPE TRENCH

ONE REQ'D, MK. 191-B
Design Live Load = 100 Lbs/sq. ft.
For location, see (123)



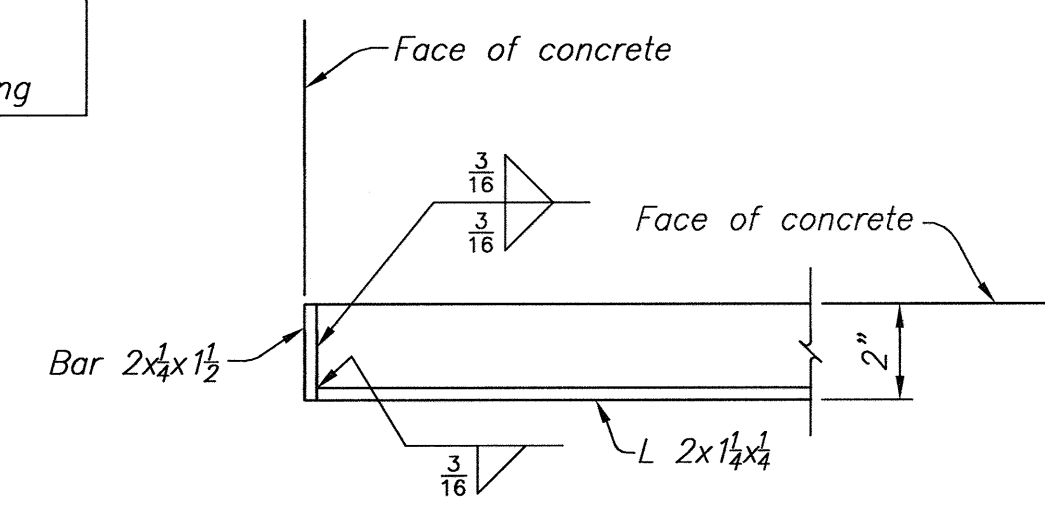
SECTION A-A



SECTION B-B

NOTES

- For General Notes, see (190).
- Grating: Bearing bars $1\frac{1}{4} \times \frac{3}{16}$ @ $1\frac{3}{16}$ on centers. Cross bars @ 4" on centers. Banding bars same size as bearing bars. Provide grating in panel widths not to exceed 3'-0". Allow $\frac{1}{8}$ " max. between grating panels. Fasten each grating panel with 4 standard saddle clips and $\frac{1}{4}$ " $\emptyset$ threaded stud bolt with hex. nut and standard washers.
- Grating: Bearing bars $1 \times \frac{1}{8}$ @ $1\frac{3}{16}$ on centers. Cross bars @ 4" on centers. Banding bars same size as bearing bars. Provide grating in panel widths not to exceed 3'-0". Allow $\frac{1}{8}$ " max. between grating panels. Fasten each grating panel with 4 standard saddle clips and $\frac{1}{4}$ " $\emptyset$ threaded stud bolt with hex. nut and standard washers.



DETAIL 1

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AutoCAD Rev. 19.0s
CAD FILENAME
1695-D-191 - MM - TRENCH GRATING & PLANS, SECTIONS & DETAILS.DWG
DATE AND TIME PLOTTED
AUGUST 3, 2013 11:48
PLOTTED BY
KOSHEA

MASONRY DESIGN GENERAL NOTES

Notes apply to masonry shown on structural drawings and shall be the minimum requirements for masonry shown on architectural drawings.

Concrete Masonry:
Compressive strength of masonry: $f'_m = 1,500\text{-psi}$
Grout strength at 28 days: $f'_g = 2,000\text{-psi}$
Mortar: Type S
Special inspections and testing of masonry construction shall be conducted in accordance with the 2009 International Building Code Sections 1704 and 1705.

Provide lightweight load-bearing "hollow" concrete masonry units for general use. Provide normal weight and/or "solid" units where specifically indicated. Non-load bearing units unacceptable. Obtain each type of exposed material from one manufacturer for entire project.

Provide necessary concrete masonry units shapes and sizes, bond beam units, lintel units, and corner units as required to satisfy conditions indicated on the drawings. Include half-size units where required.

Not all penetrations through concrete masonry walls have been shown. Details shown are typical unless noted otherwise.

Dimensions of concrete masonry units are nominal block dimensions.

Thoroughly roughen and clean concrete surfaces on which masonry units are to be placed.

Coordinate block outs, reveals, holes, openings and built in items with all contract documents and trades.

Grout cells solid at: Reinforcing, bond beams, inserts, anchors, elevator guide rails, and 24" below bearing point of steel sections and 12" each side. Additional cell grouting may be required, see drawings.

Control Joints: Unless noted otherwise, provide control joints at 30 feet center to center.

Control joints must be a minimum of 2'-0" outboard of opening.

Reinforcing bars splice length, development length, clear cover, standard hooks and minimum bend diameters shall be in accordance with ACI 530-08.

Provide standard hooks on bars terminating into a masonry face in walls at openings, heads, jambs, expansion joints, and ends.

Continue vertical reinforcing through construction joints.

Continue reinforcing through control joints and around corners unless noted otherwise.

Number and location of splices to be determined by contractor.

Dowels from concrete to be furnished and placed by concrete contractor.

Provide vertical wall reinforcing at all wall corners; end walls; each side of openings and at each side of control and expansion joints. Match vertical bars in wall.

For details of expansion joints, see (118) and (159).

NOTES

- 1. For Structural Design Data, see (101) and (102).
- 2. For reinforcement, see (147) thru (150)

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U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
NAVAJO GALLUP WATER SUPPLY PROJECT
NEW MEXICO
SAN JUAN LATERAL
TOHLAKAI PUMPING PLANT
MASONRY
GENERAL NOTES AND TYPICAL DETAILS

DESIGNED BY: B. J. Jackson
DRAWN BY: B. J. Jackson
CHECKED BY: K. J. O'Shea
TECH. APPR. BY: K. J. O'Shea, P.E.
APPROVED BY: B. J. Jackson
PLANT STRUCTURES GROUP
DENVER, COLORADO 2013-08-05

MASONRY
GENERAL NOTES AND
TYPICAL DETAILS

1695-D-146

SHEET 1 OF 1

1

2

3

4

5

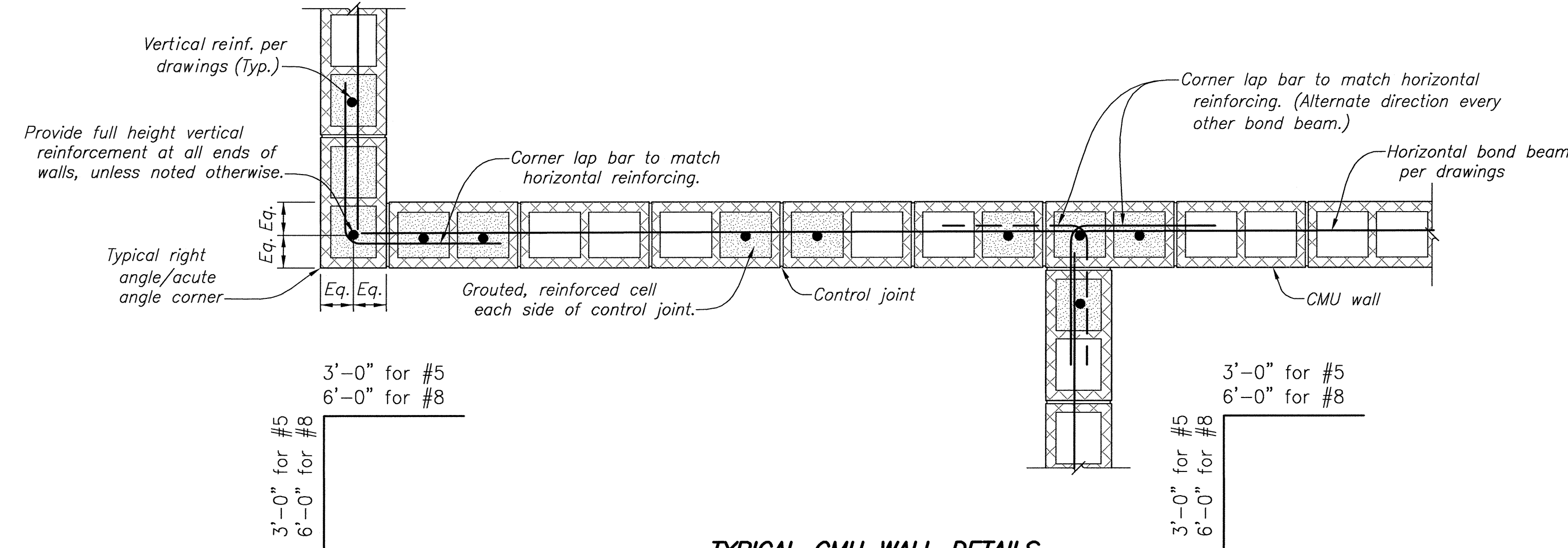
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2

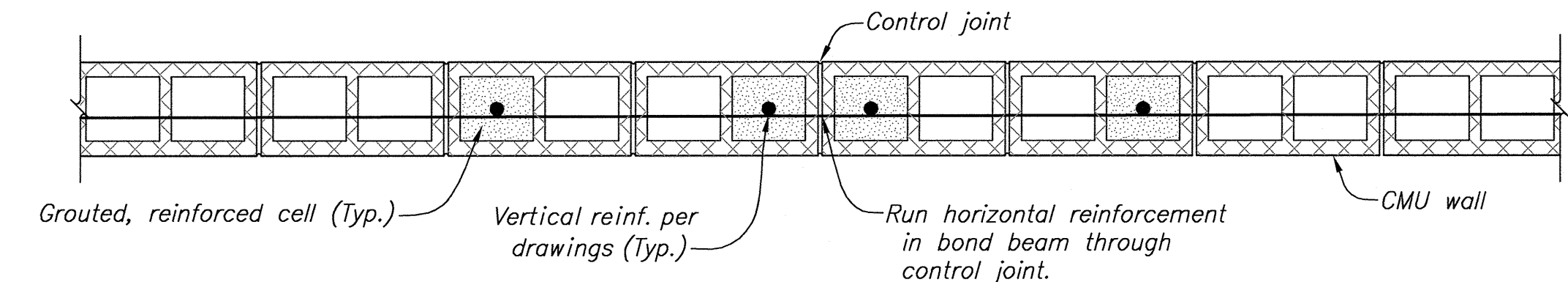
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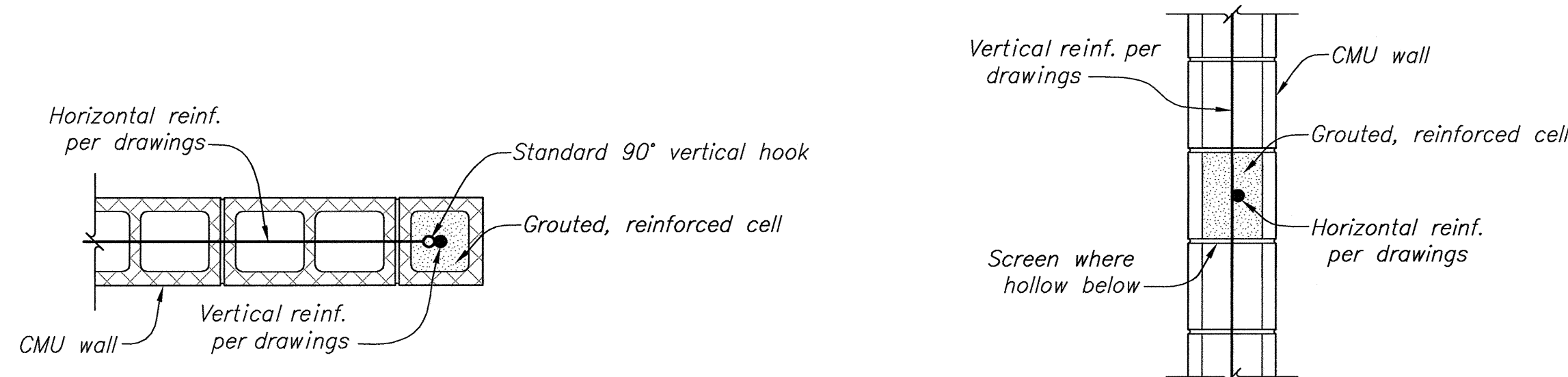
5



TYPICAL CMU WALL DETAILS

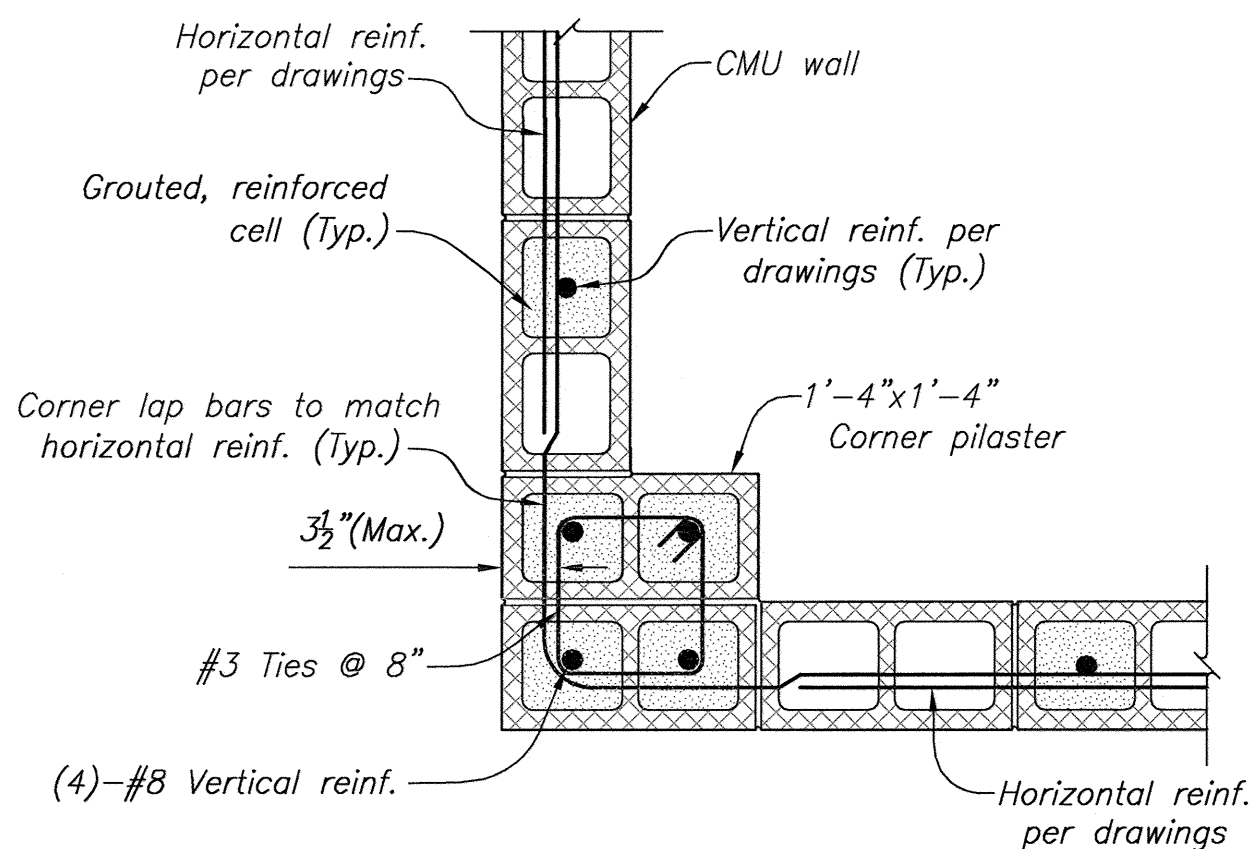


TYPICAL CMU BOND BEAM AND BOND BEAM CONTROL JOINT

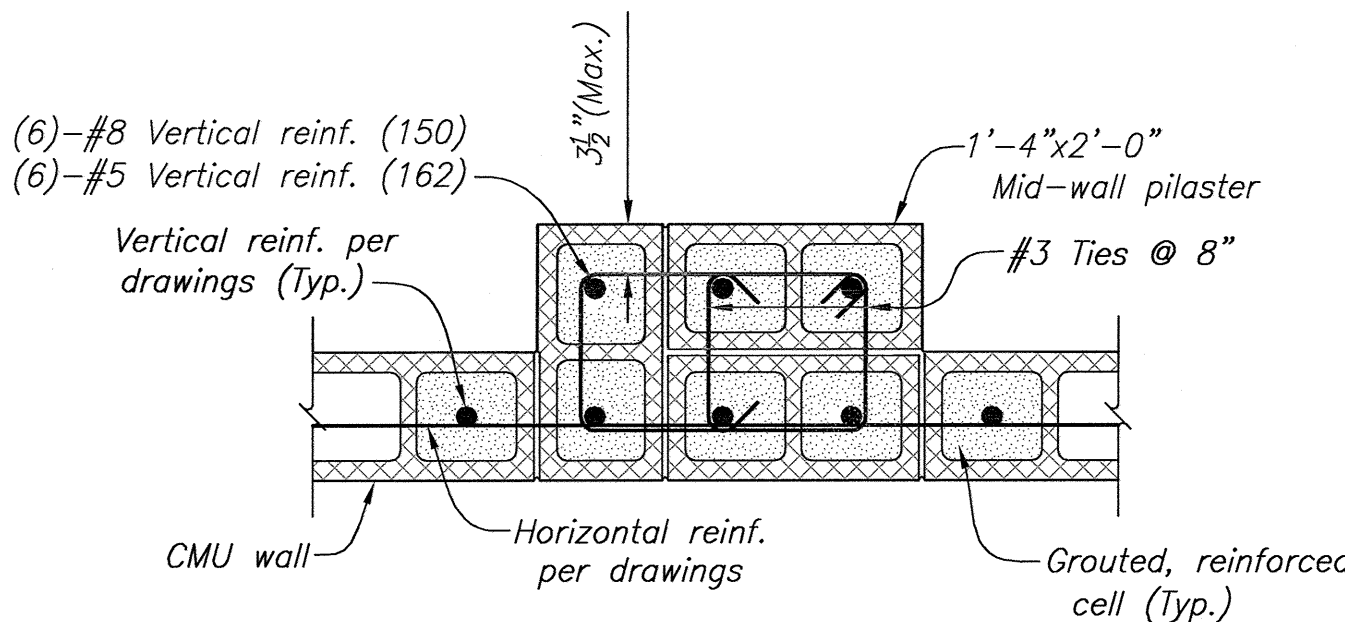


TYPICAL END WALL DETAIL

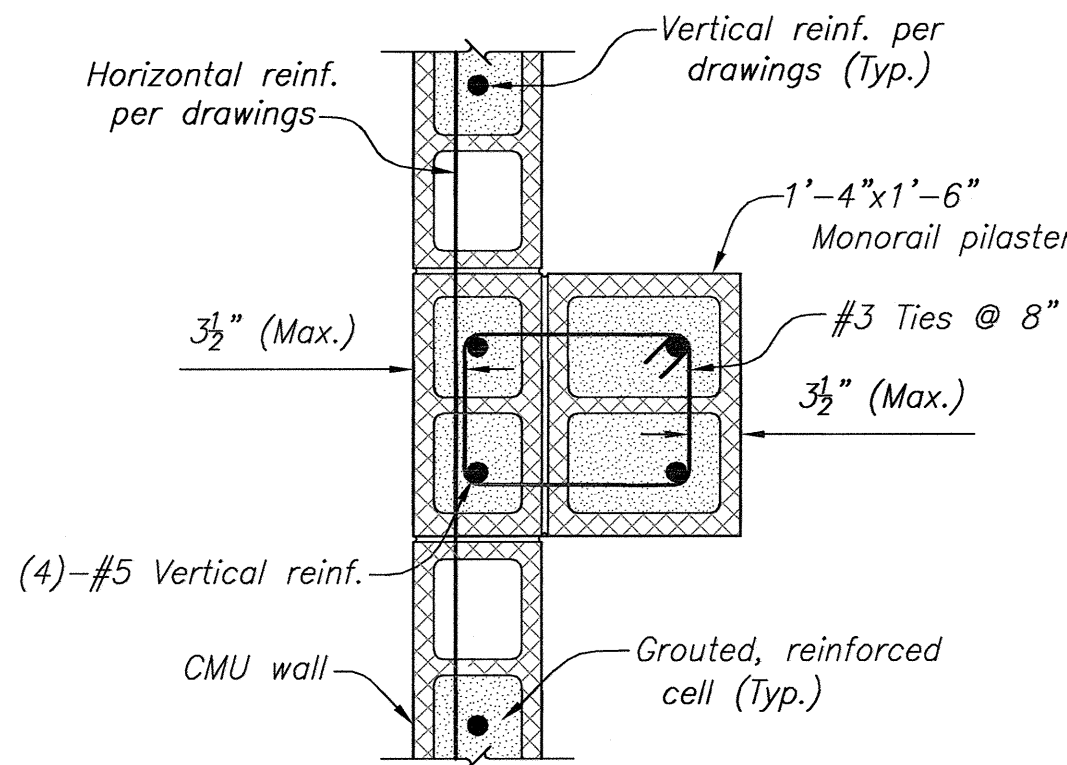
TYPICAL CMU BOND BEAM



DETAIL 1 (150)
TYPICAL WALL CORNER PILASTER

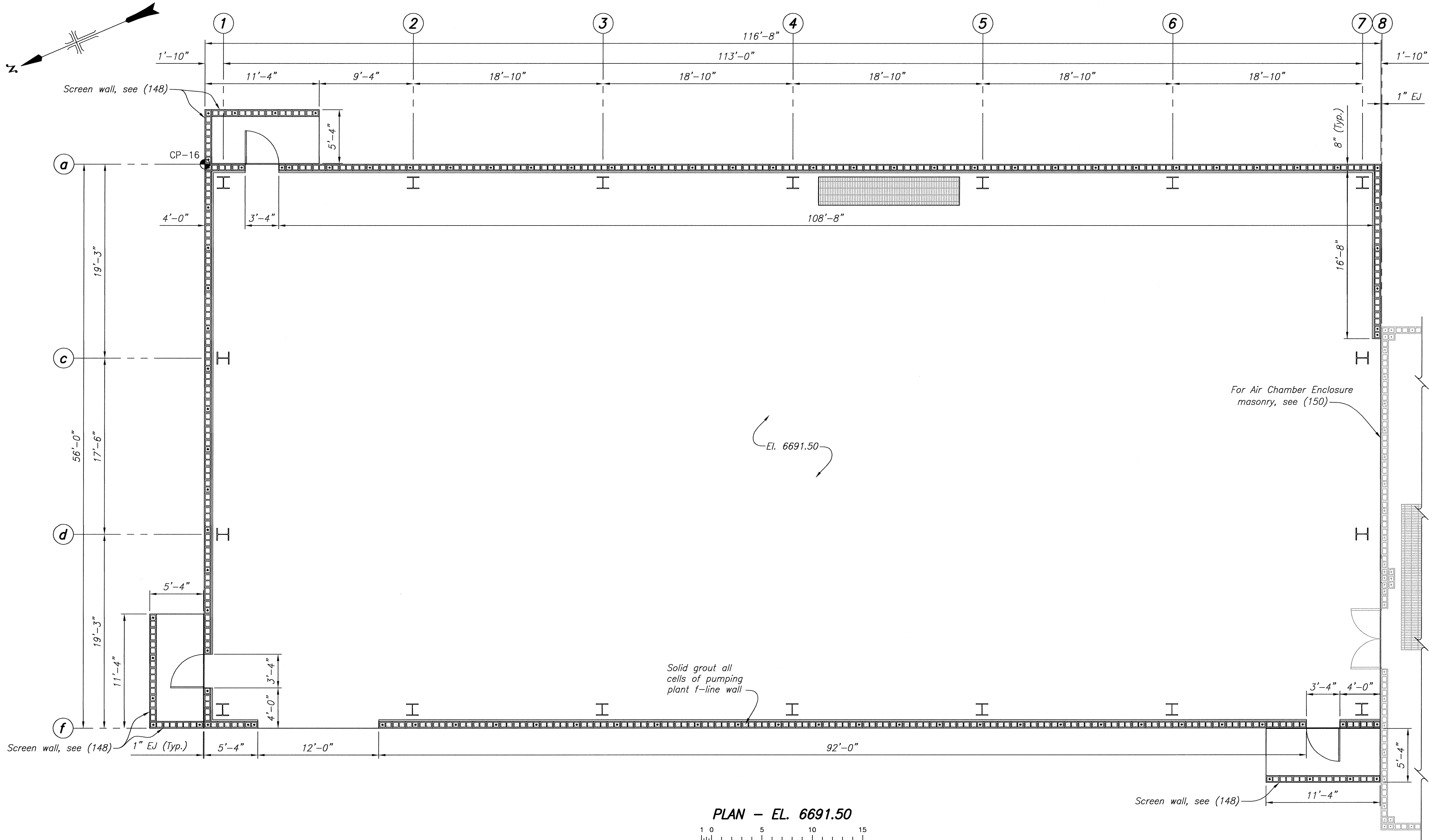


DETAIL 2 (150, 162)
TYPICAL MID-WALL PILASTER



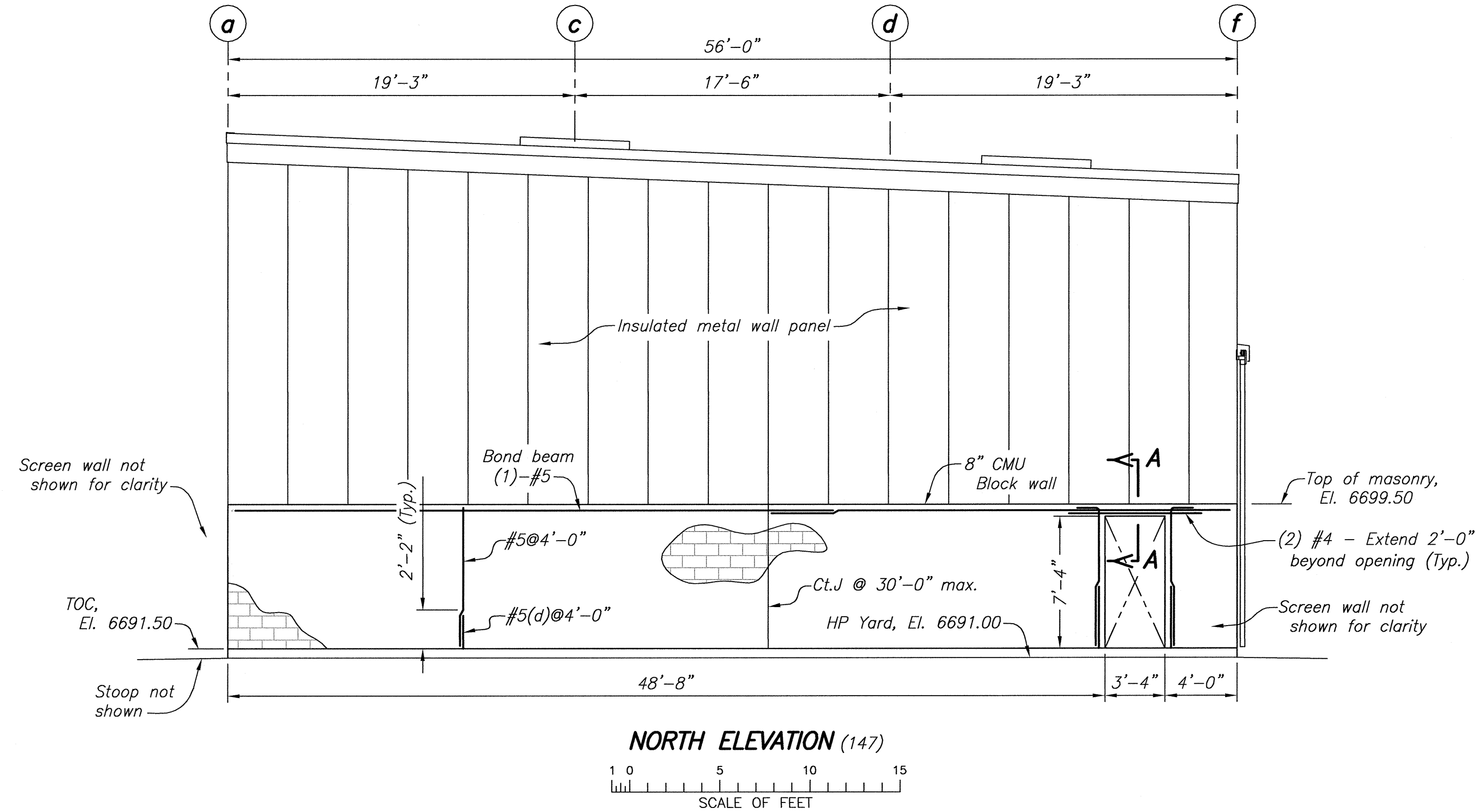
DETAIL 3 (162)
TYPICAL MONORAIL PILASTER

CAD SYSTEM
AutoCAD Rev. 19.0a
CAD FILENAME
1695-D-146 - MASONRY - GENERAL NOTES & TYPICAL DETAILS.DWG
DATE AND TIME PLOTTED
AUGUST 3, 2013 10:16
PLOTTED BY
KOSHER

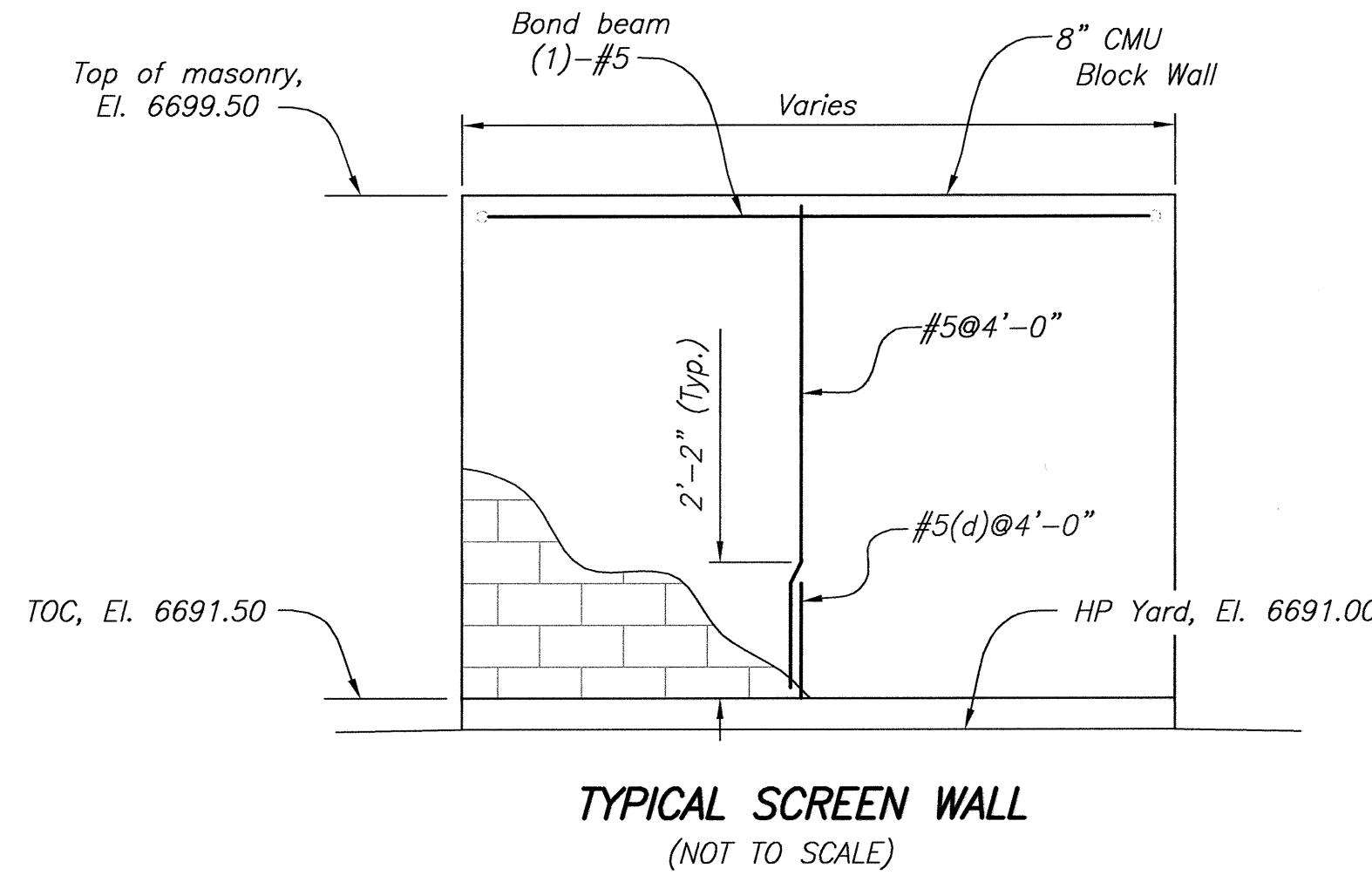
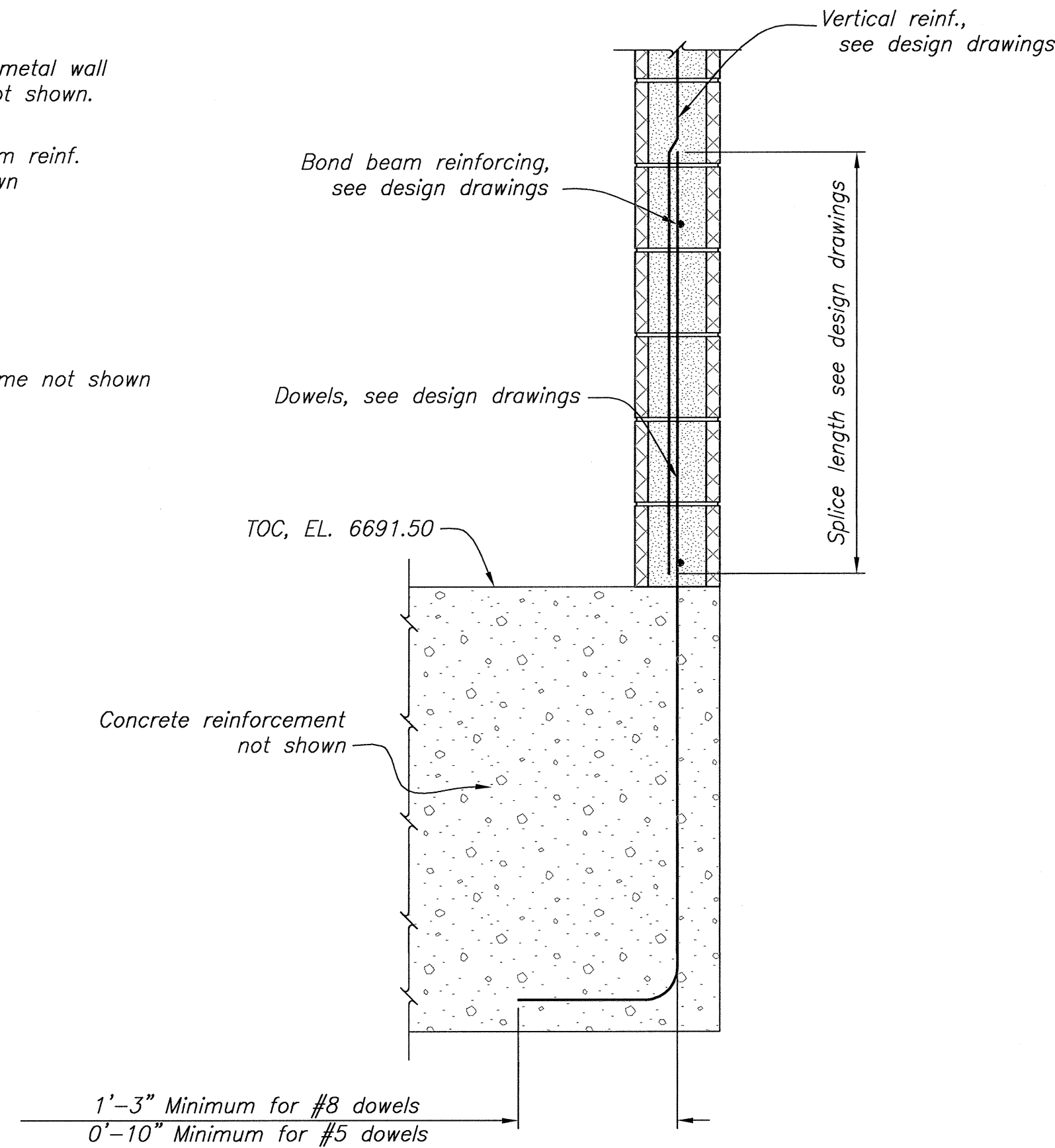
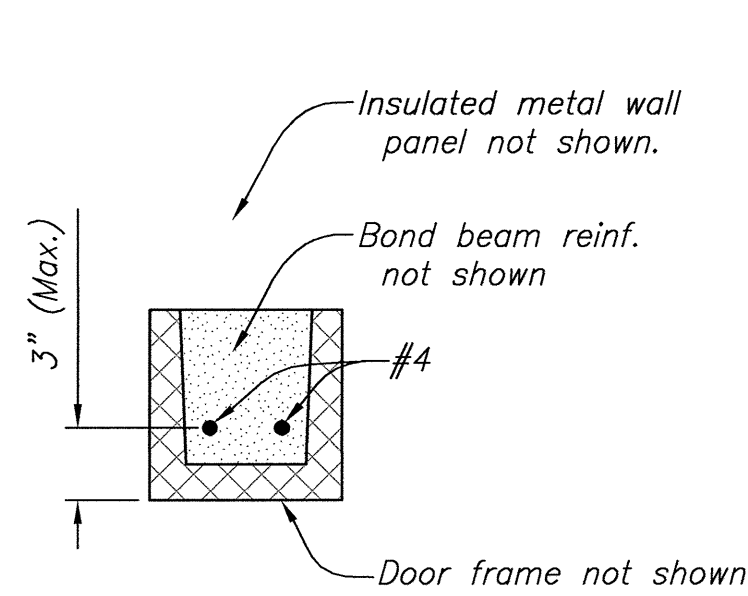


NOTES

1. For Masonry Design General Notes, see (146).
2. For Structural Design Data, see (101) and (102).
3. For Typical Details, see (146).
4. For control point coordinates, see (100).

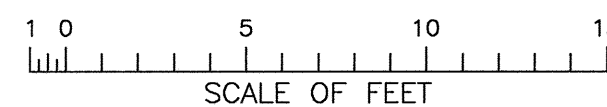
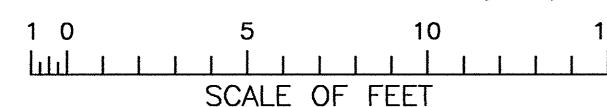


SECTION A-A
LINTEL
(NOT TO SCALE)



NOTES

- For Masonry Design General Notes, see (146).
- For Typical Details, see (146).



1. For Masonry Design General Notes, see (146).
2. For Typical Details, see (146).

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BUREAU OF RECLAMATION

NAVAJO GALLUP WATER SUPPLY PROJECT
BUREAU OF RECLAMATION

NEW MEXICO

SAN JUAN LATERAL
TOHLAKAI DUMBING DIANT

HLAAAI PUMFING FLAI

ELEVATIONS AND SECTIONS

B. J. Tresson
DESIGNED
B. J. Tresson
DRAWN
K. O'Shea
CHECKED
K. O'Shea, P.E.
TECH. APPR.
Alex. B.
APPROVED
PLANT STRUCTURES GROUP

DENVER, COLORADO 2013-08-03

**MASONRY
ELEVATIONS AND SECTIONS**

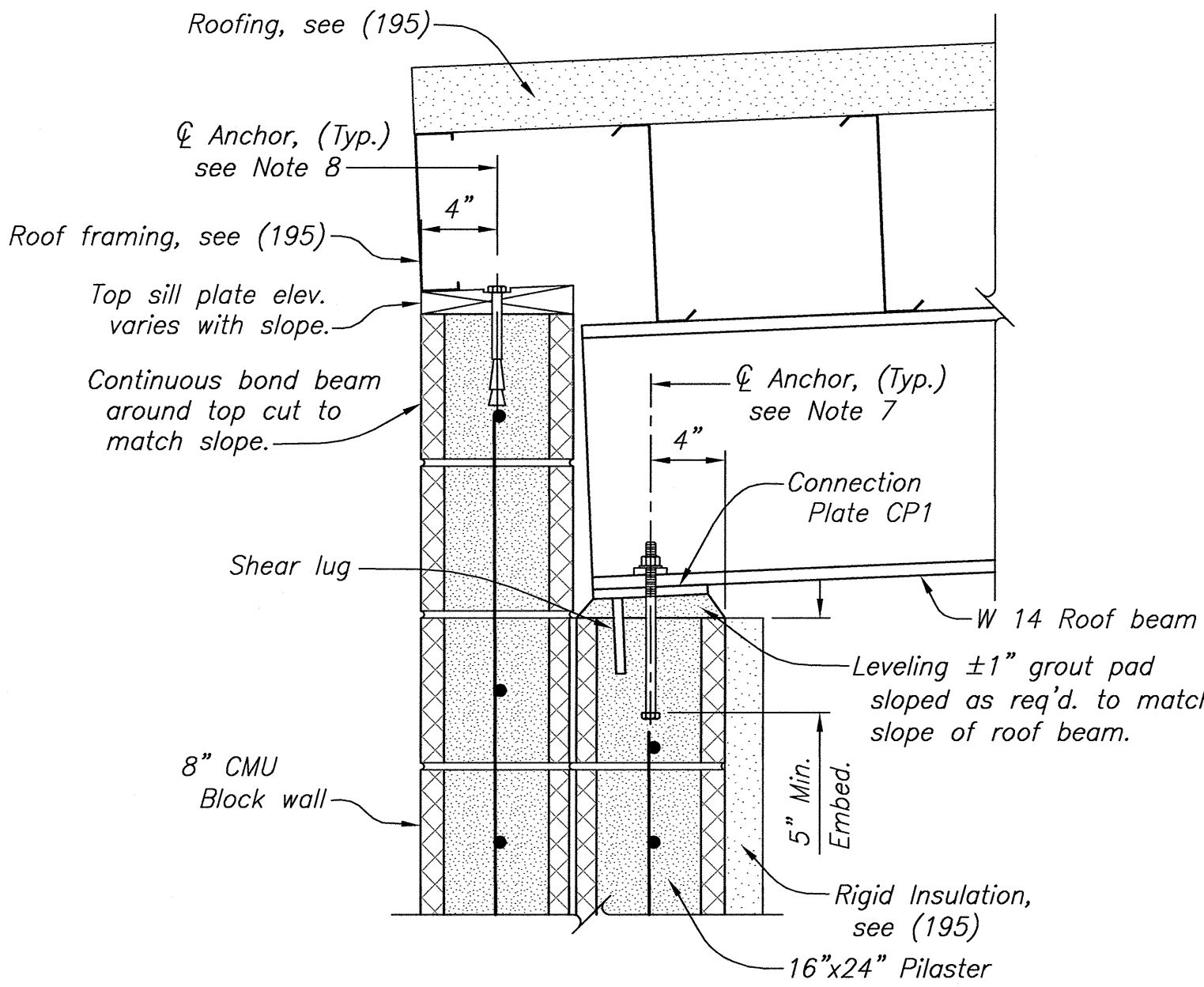
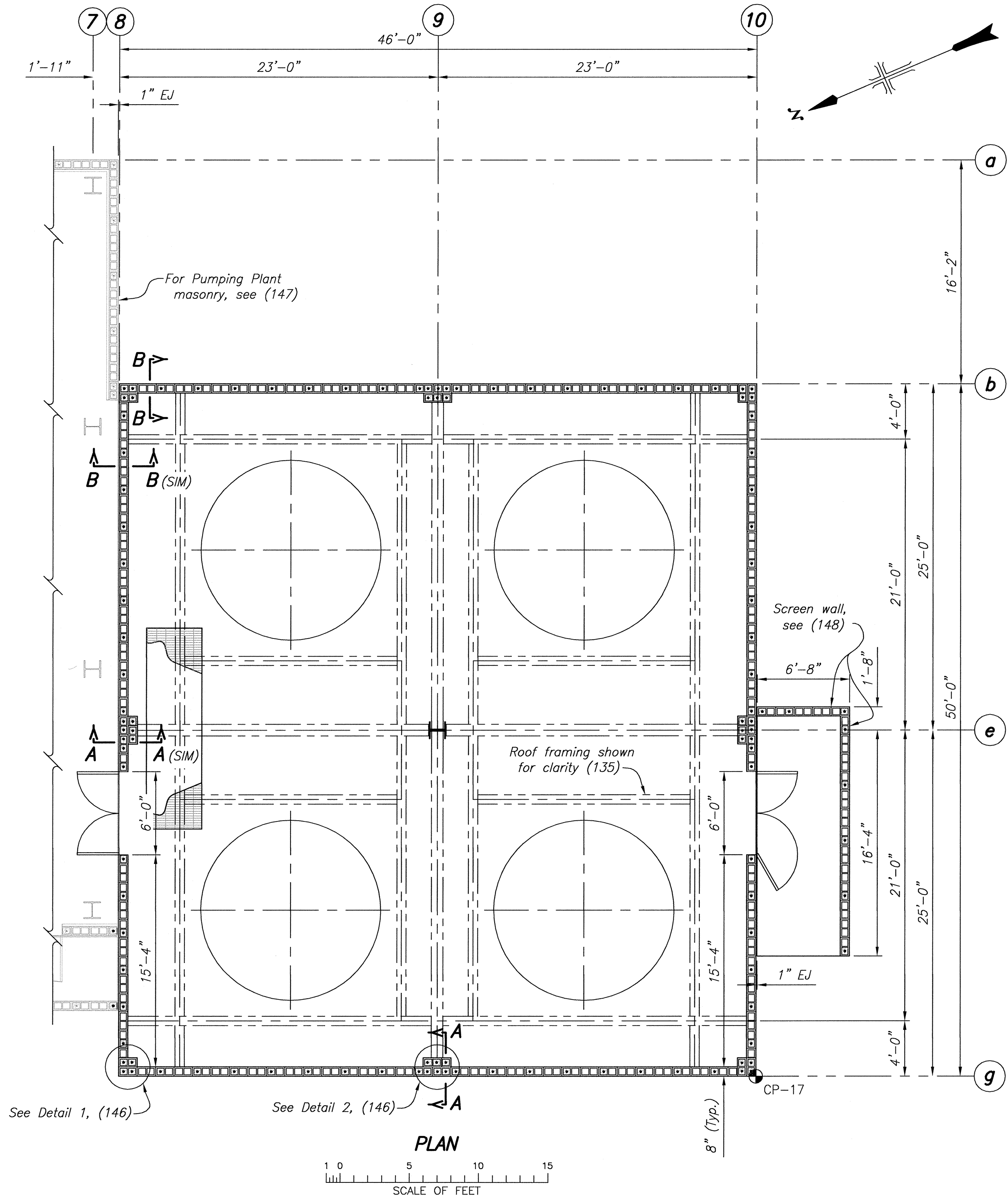
1695-D-149

SHEET 2 OF 2

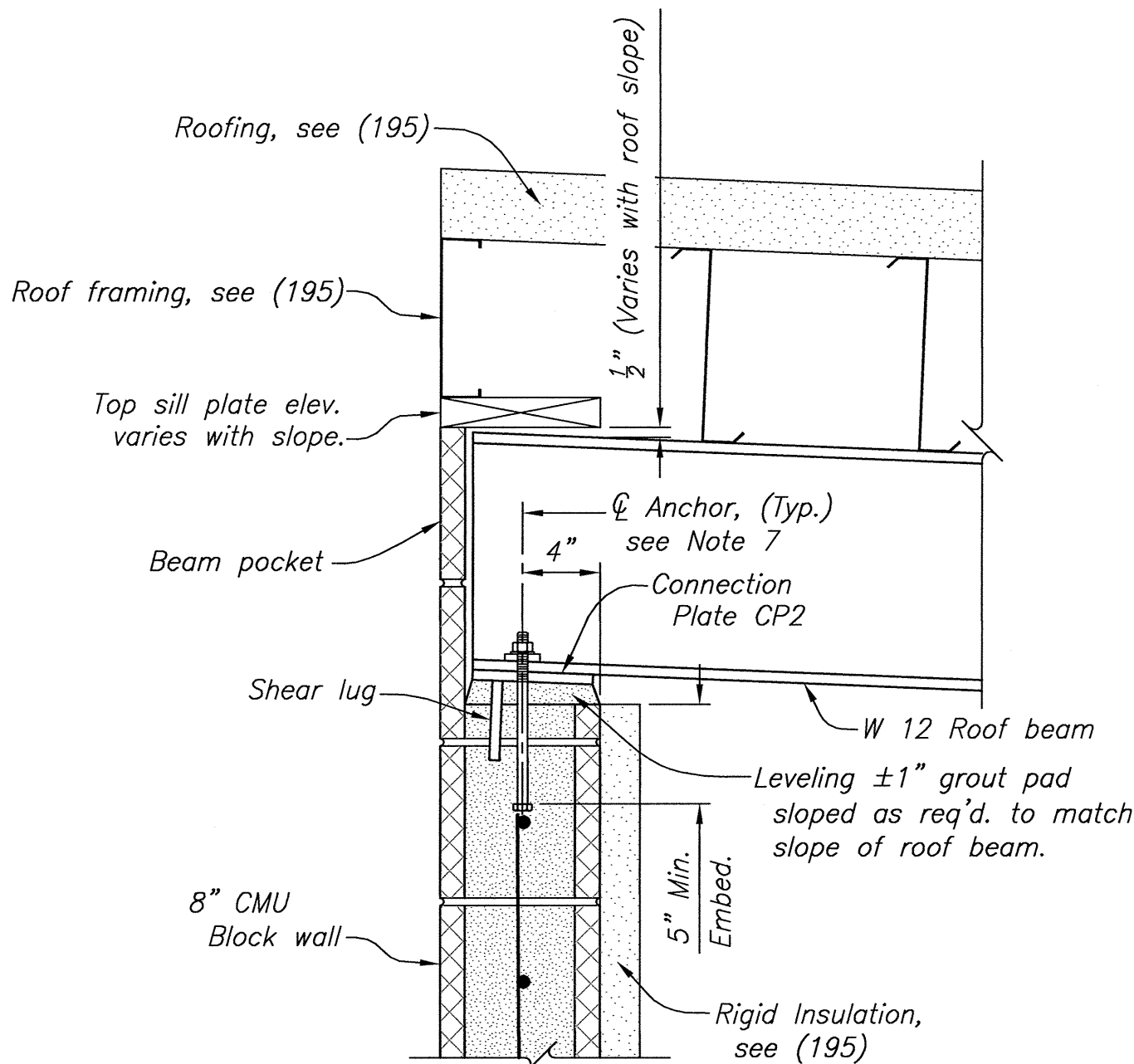
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PLOTTED BY
KOSHEA

ELEVATIONS, ~~SECTIONS~~ SECTIONS & DETAILS - SHEET 2 OF 2.DWG

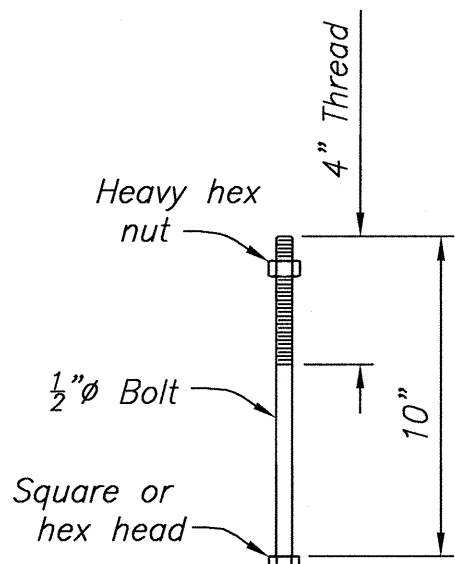
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CAD FILENAME
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SECTION A-A
(Not to Scale)



SECTION B-B
(Not to Scale)



ANCHOR BOLT DETAIL
(24 REQ'D.)

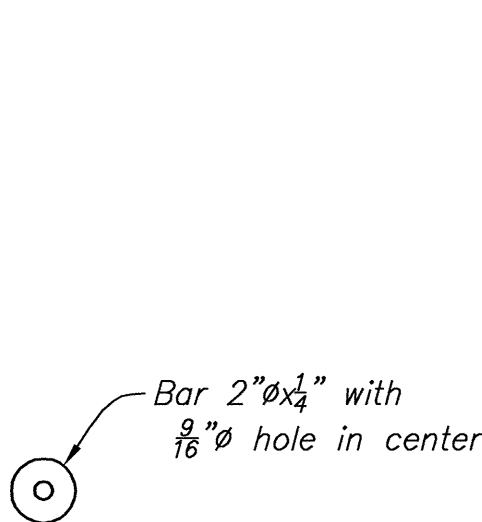
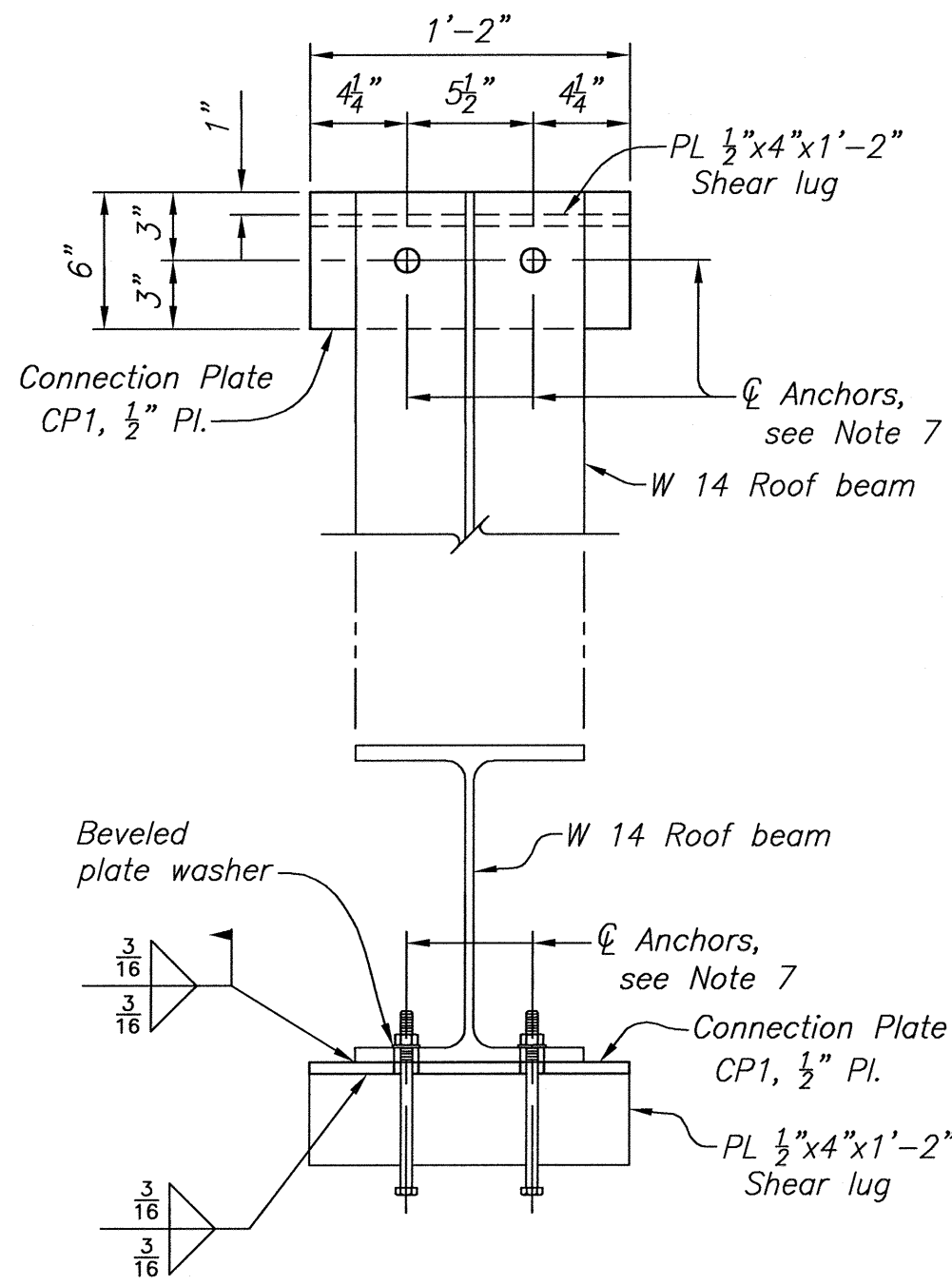
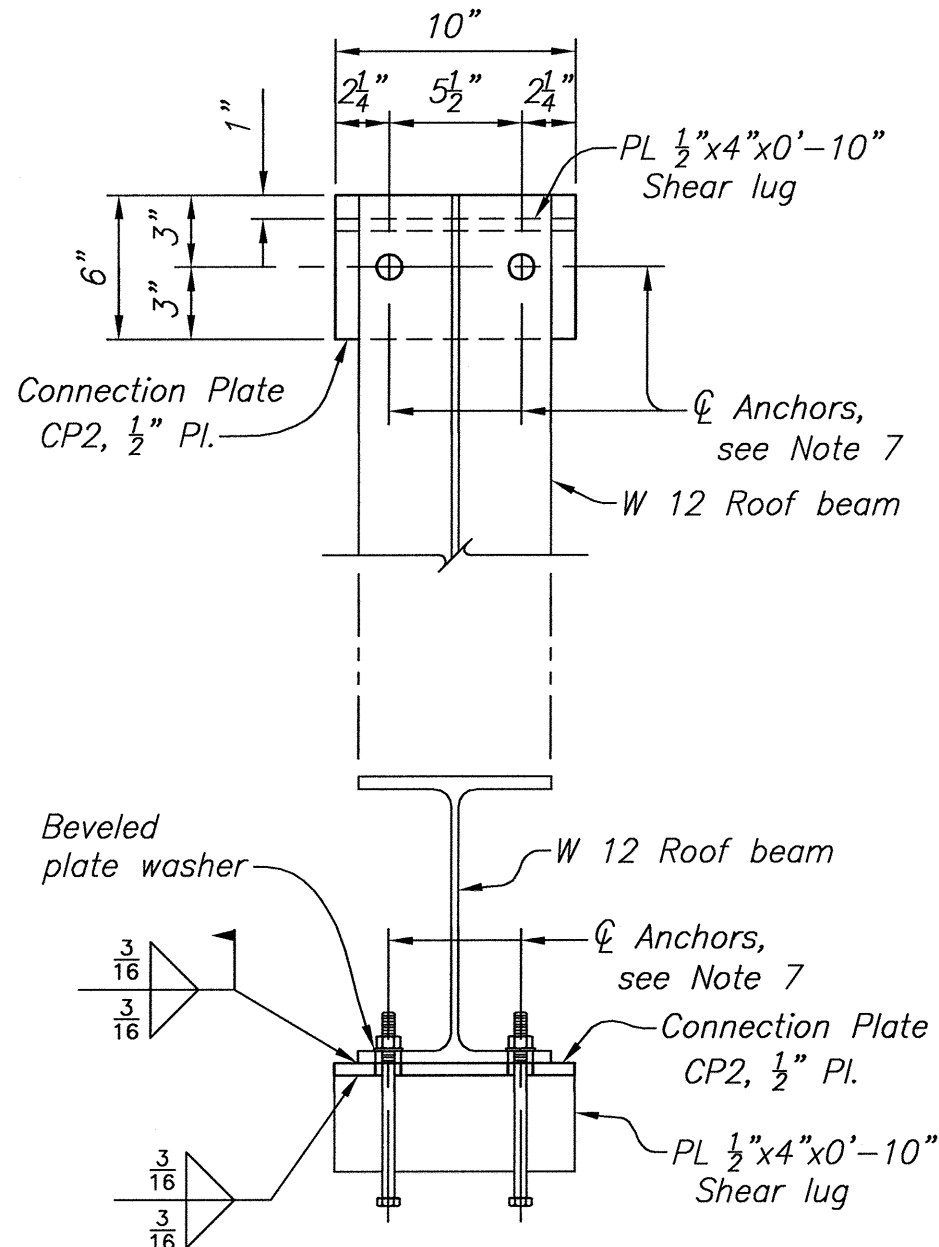


PLATE WASHER DETAIL
(24 REQ'D.)



CONNECTION PLATE CP1
4 REQUIRED
(Not to Scale)

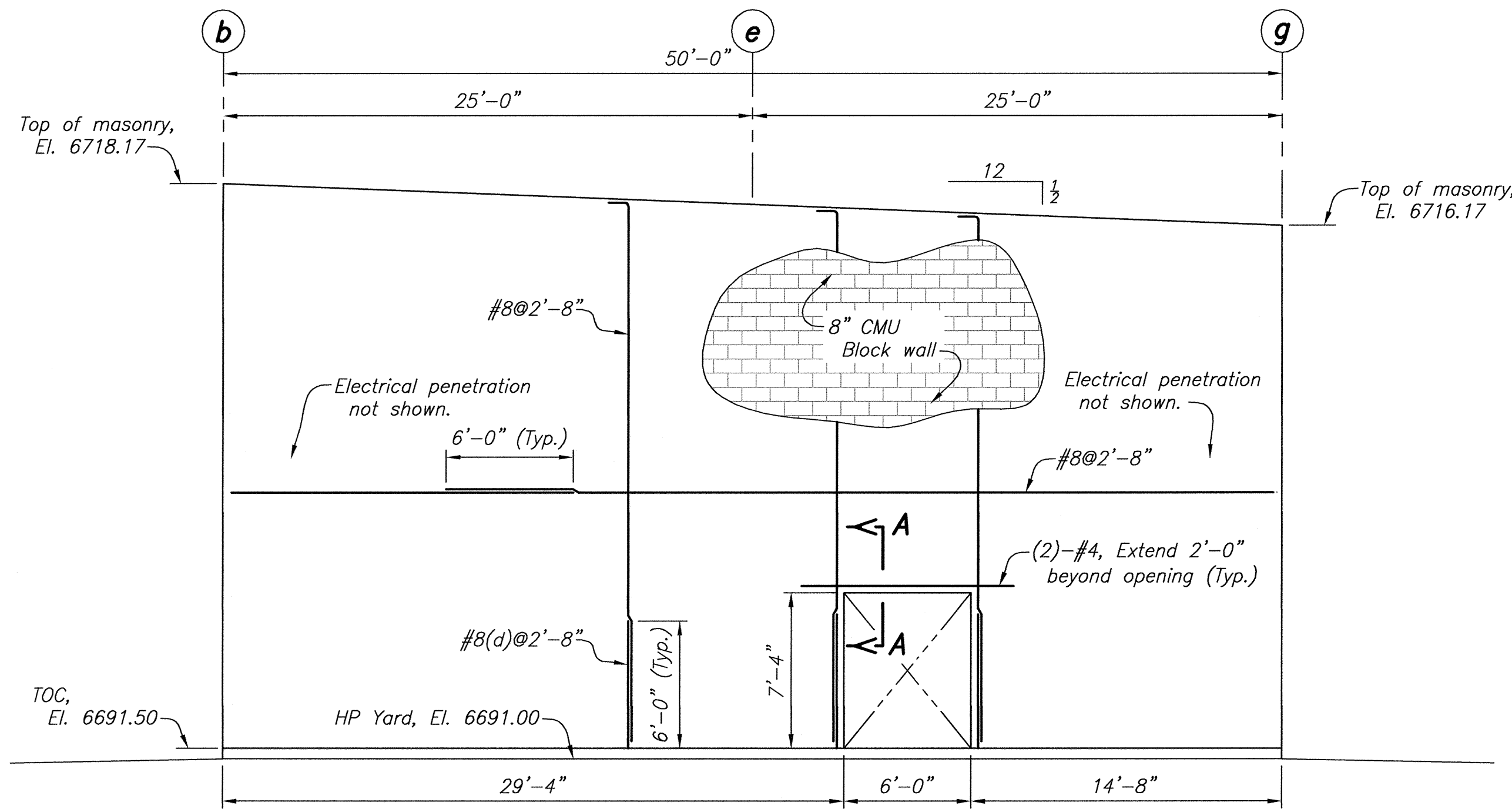


CONNECTION PLATE CP2
8 REQUIRED
(Not to Scale)

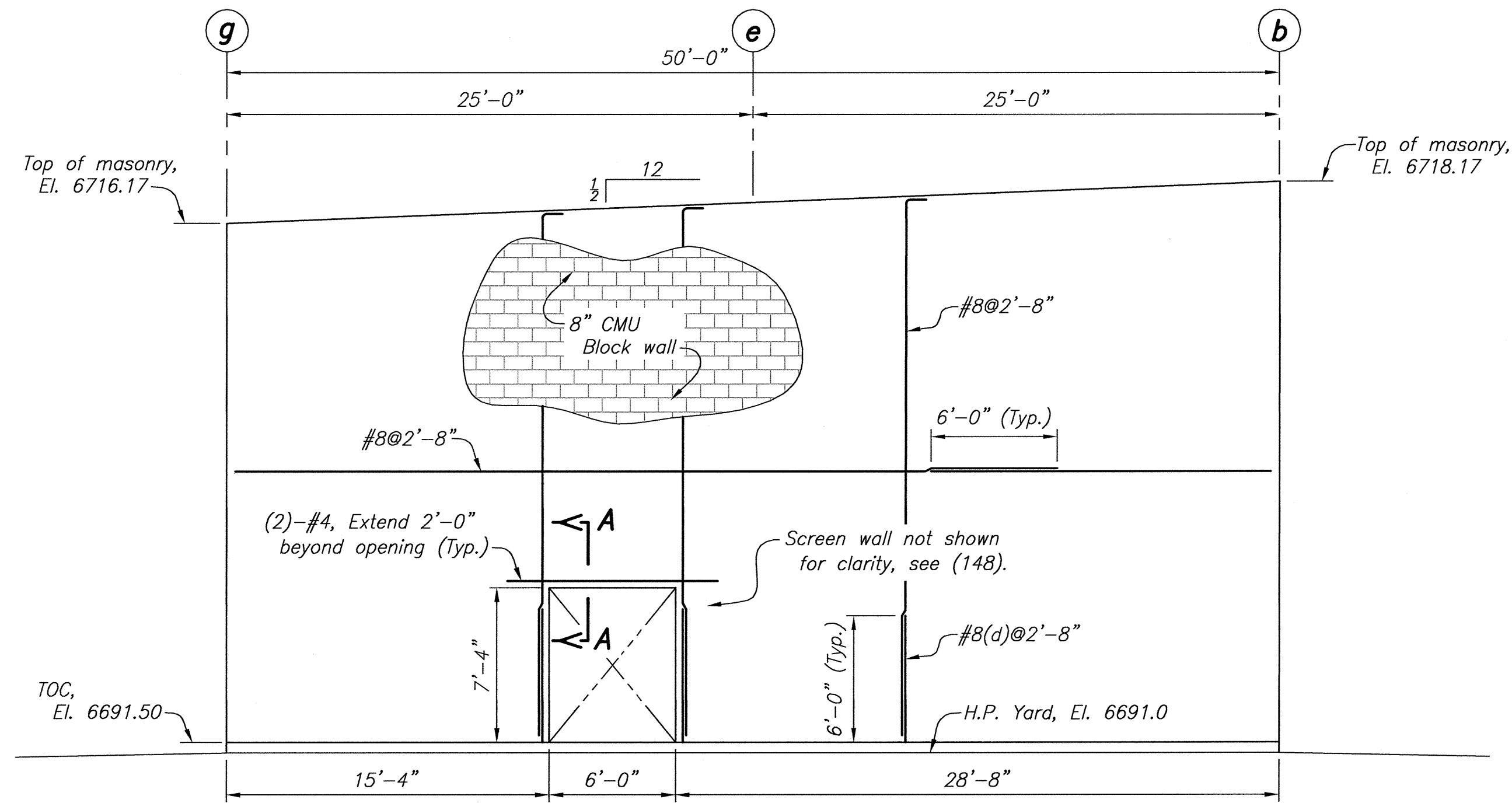
NOTES

1. For Structural Design Data, see (101) and (102).
2. For Structural Steel General Notes, see (131).
3. For Masonry Design General Notes, see (146).
4. For Typical Details, see (146).
5. For Reference Drawings, see (119).
6. For coordinates of control point CP-17, see (100).
7. 1 1/8" diameter Holes in W-shape bottom flange and plate for 3/8" anchor bolt(s) with beveled plate washers and 5" min. embedment into CMU.
8. 7/8" diameter Holes in sill plate for 3/8" expansion anchors with 5" min. embedment at 2'-0" o.c.

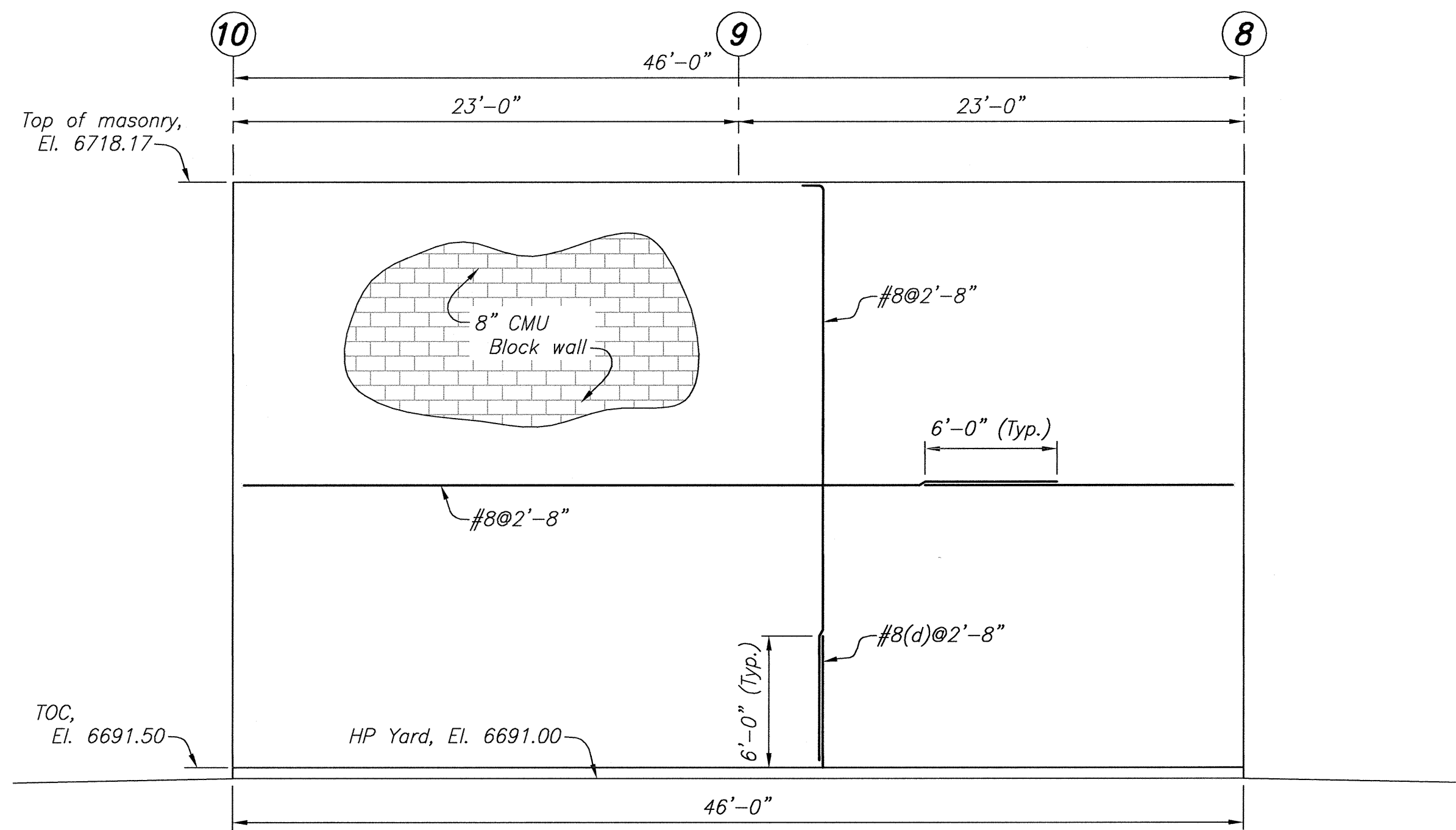
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AutoCAD Rev. 19.08
CAD FILENAME
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AUGUST 3, 2013 10:18
PLOTTED BY
KOSHEA



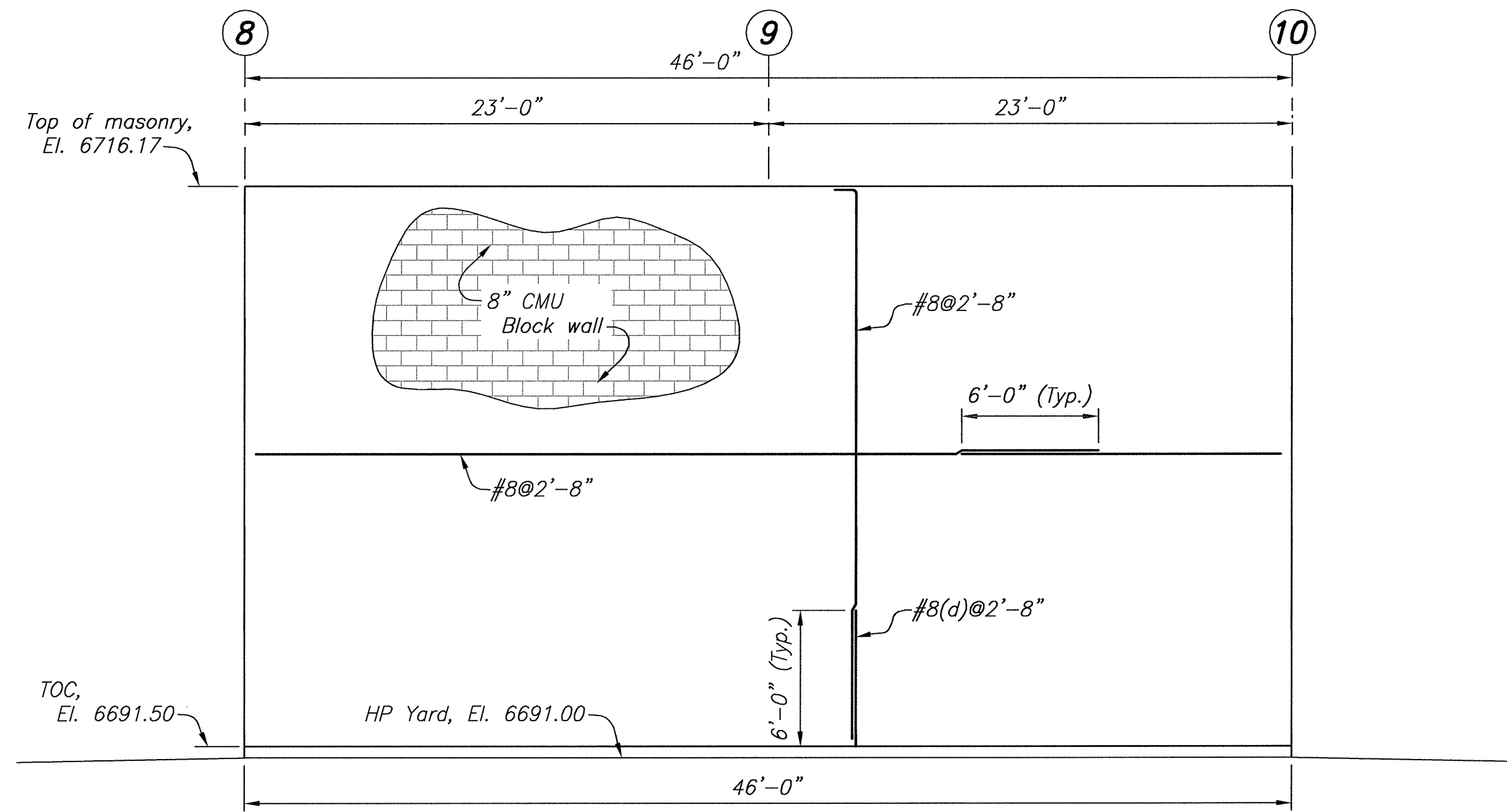
NORTH ELEVATION (150)



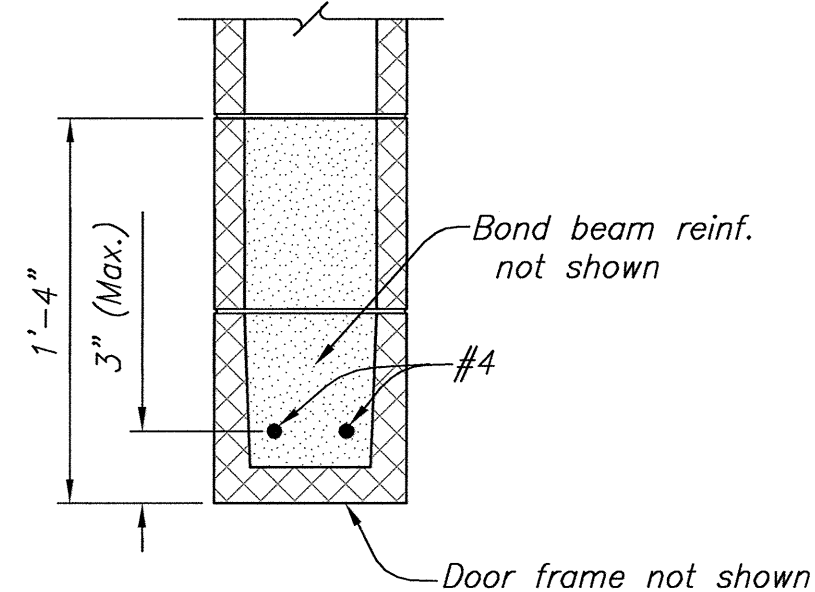
SOUTH ELEVATION (150)



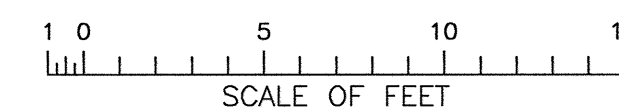
EAST ELEVATION (150)



WEST ELEVATION (150)



SECTION A-A
LINTEL
(NOT TO SCALE)



NOTES

1. For Masonry Design General Notes, see (146).
2. For Typical Details, see (146).
3. For Structural Design Data, see (101) and (102).

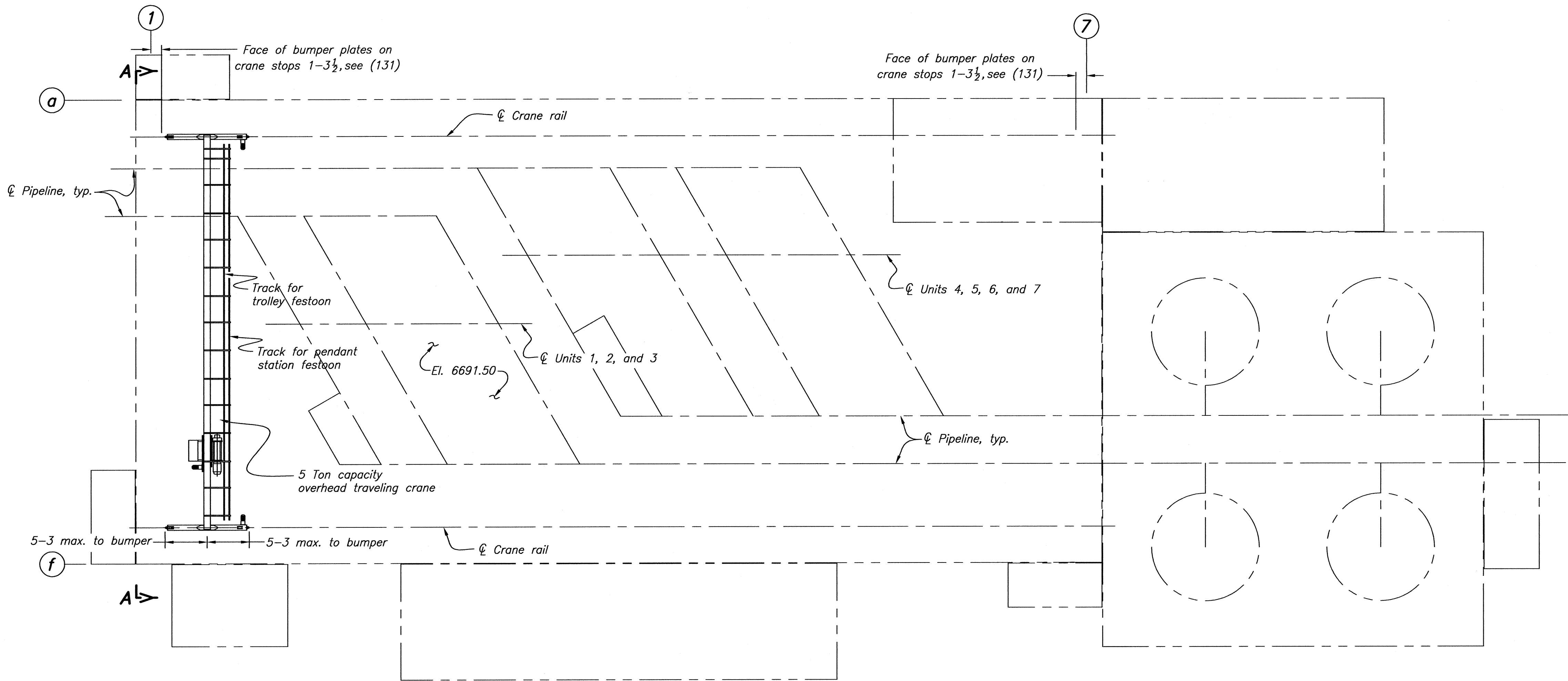
DESIGNED BY B. JACKSON
DRAWN BY K. OSH
CHECKED BY K. OSH, P.E.
TECH. APPR. W. D. R.
APPROVED
PLANT STRUCTURES GROUP

DENVER, COLORADO 2013-08-05

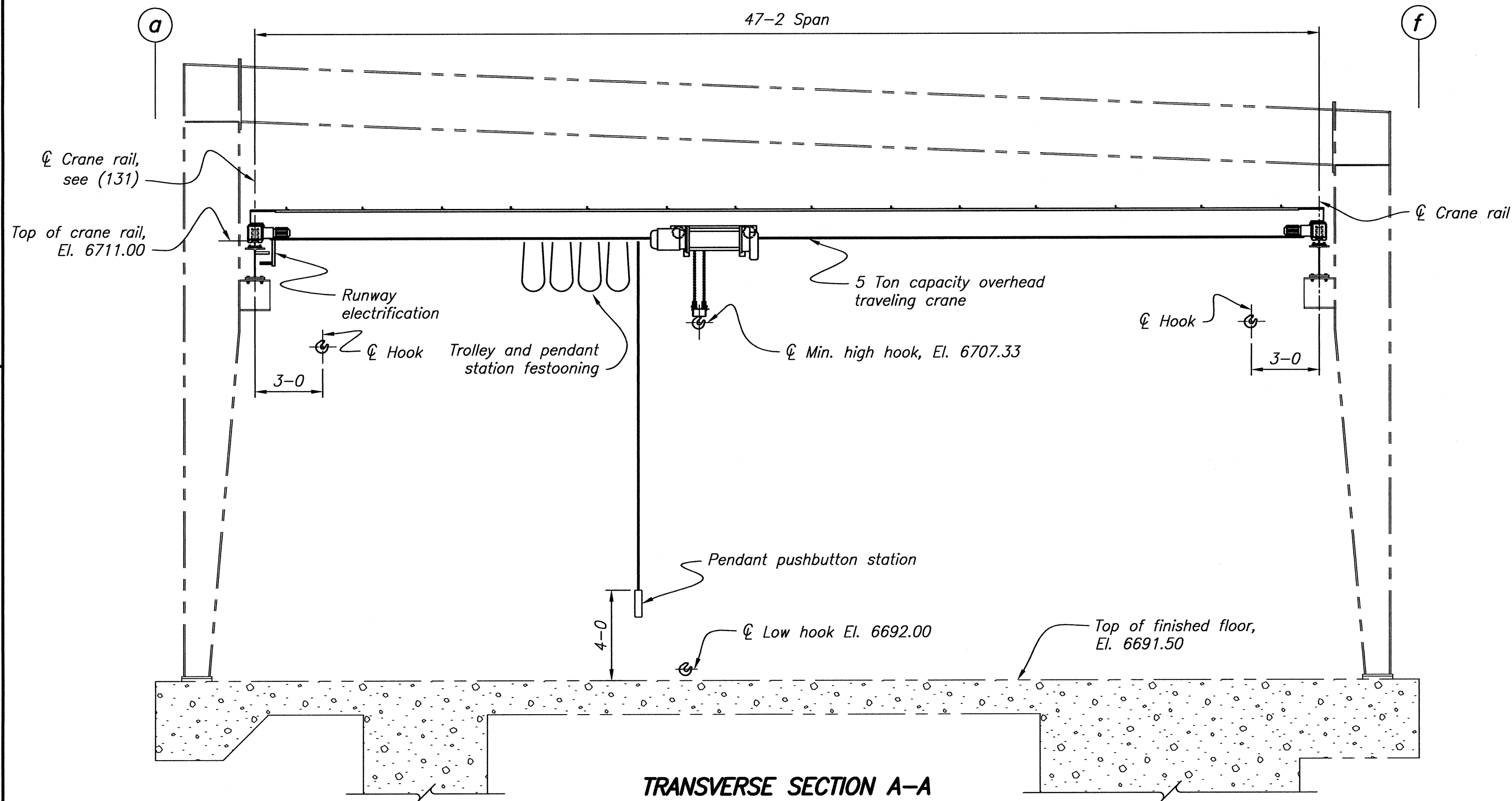
MASONRY
ELEVATIONS, SECTIONS, AND
DETAILS

1695-D-151

SHEET 3 OF 3



PLAN
PUMPING PLANT OUTLINE



TRANSVERSE SECTION A-A
BUILDING MASONRY AND FEATURES NOT SHOWN

NOTES

1. Dimensions are in feet and inches unless otherwise indicated.
Elevations are in feet above sea level.

REFERENCE DRAWINGS

SAN JUAN LATERAL
TOHLAKAI PUMPING PLANT
GENERAL ARRANGEMENT
PLAN - EL. 6691.50.....1695-D-119
5 TON CRANE RUNWAY GIRDERS
PLANS, SECTIONS, AND DETAILS.....1695-D-131

DESIGNED *Adi*
DRAWN *Adi*
CHECKED *Rogers*
TECH. APPR. *Adi*
ALEXANDER M. RITT, P.E. - MECHANICAL ENGINEER

APPROVED *M.D. McStrain*
M.D. McSTRAIN, P.E. - MANAGER, MECHANICAL EQUIPMENT GROUP
DENVER, COLORADO 2013-07-29

5-TON CAPACITY OVERHEAD TRAVELING CRANE

1695-D-257

SHEET 1 OF 1

DATE AND TIME PLOTTED
JANUARY 10, 2013 13:01
PLOTTED BY
ARIT

CAD SYSTEM
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CAD FILENAME
1695-D-257X CRANE.DWG



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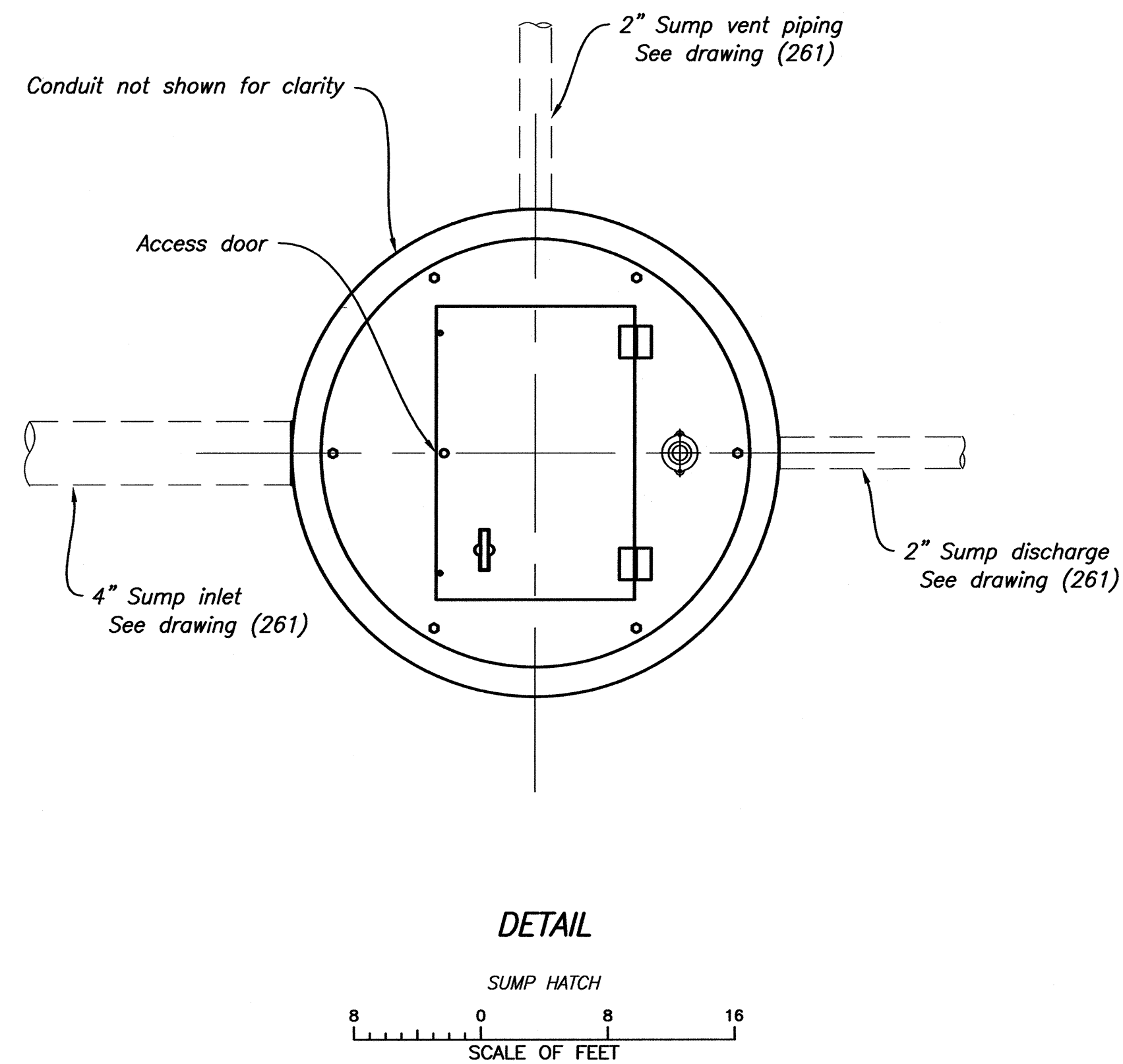
1
2013-08-28
PATRICK DAWSON, P.E.
D
ADDED ELECTRICAL CONDUIT REQUIREMENT TO
NOTES AND CORRECTED ELECTRICAL DRAWING
REFERENCES.

Stephanie Enz
DESIGNED
Stephanie Enz
DRAWN
Jeff Hoss
CHECKED
Patrick Dawson
TECH. APPR.
William D. McStraw
APPROVAL
MANAGER, MECHANICAL EQUIPMENT GROUP
DENVER, COLORADO July 31, 2013

**AIR CHAMBER SUMP LIFT
STATION**

1695-D-260

SHEET 1 OF 1

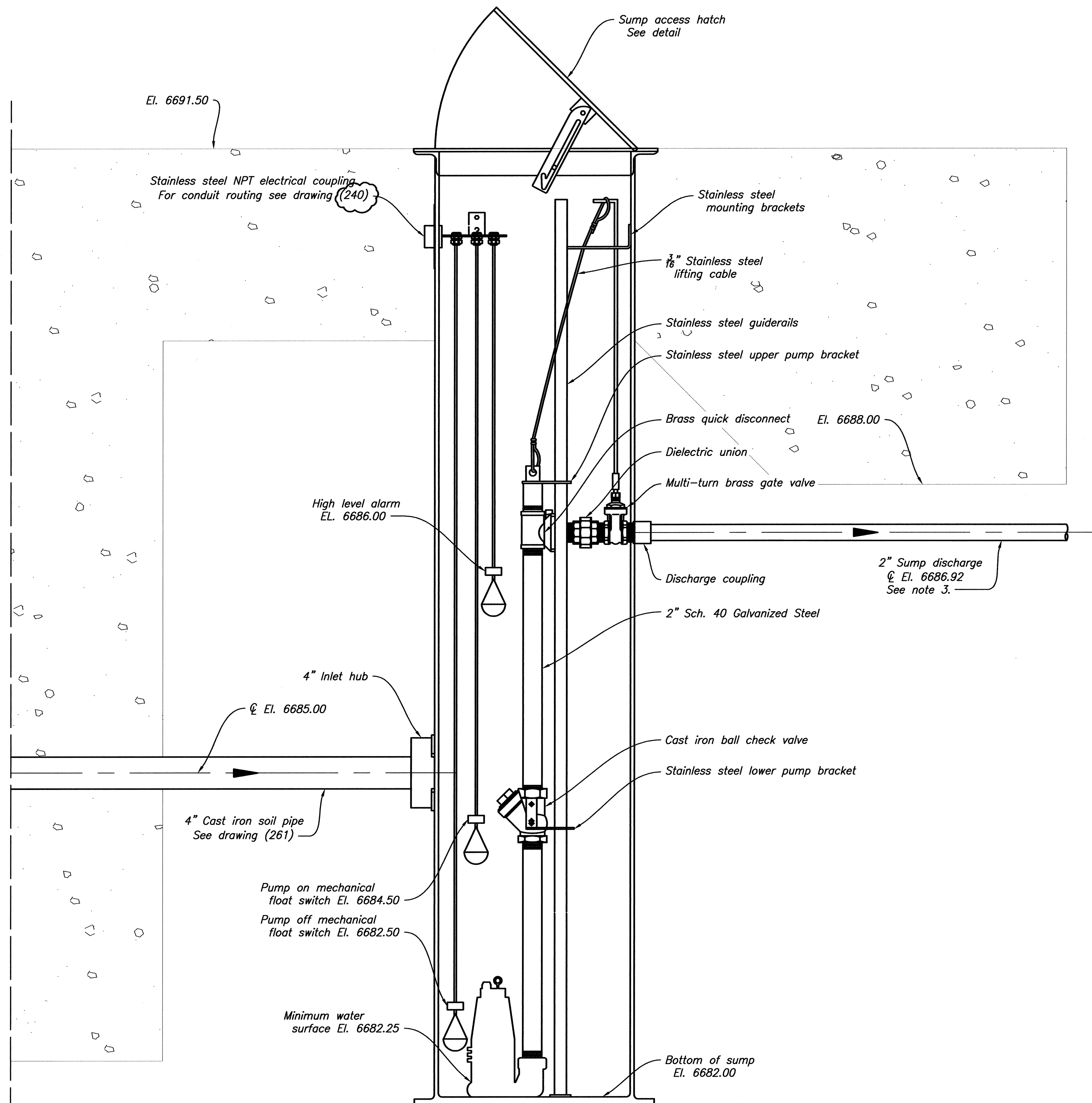


NOTES

1. Final dimensions and elevations may vary depending on approved equipment.
2. Slope sump discharge piping a minimum of 1/4 -Inch per foot toward drainage trench.
3. Encase piping that extends below concrete slab in non-reinforced concrete with a minimum of 6-inches of cover in all directions.
4. Daylight sump discharge piping in accordance with Specification Section 33 11 16 - Site Water Utility Distribution Piping.
5. Coordinate electrical coupling location and vent pipe routing with electrical conduit layout.

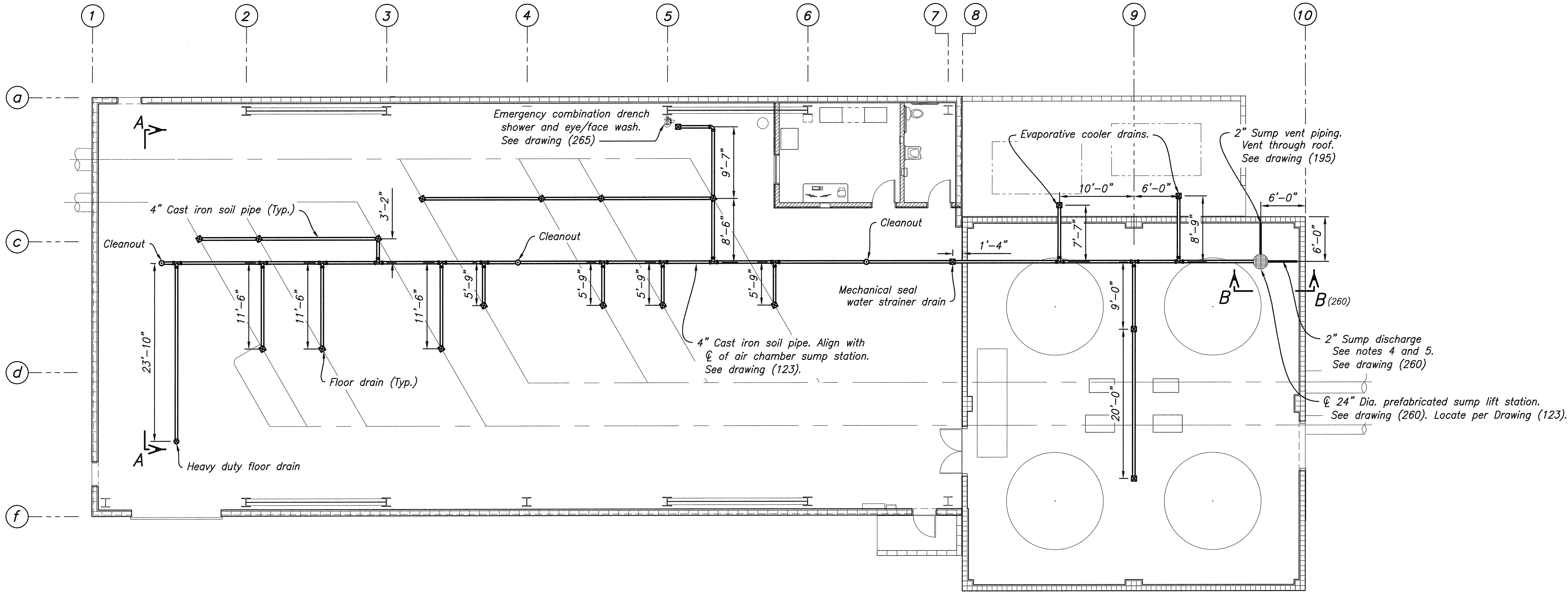
REFERENCE DRAWINGS

TOHLAKAI PUMPING PLANT -
SITE PLAN _____ 1695-D-99
GENERAL ARRANGEMENT _____ 1695-D-119
ELECTRICAL INSTALLATION -
AIR CHAMBER - CONDUIT PLAN _____ 1695-D-240
GRAVITY DRAINAGE _____ 1695-D-261

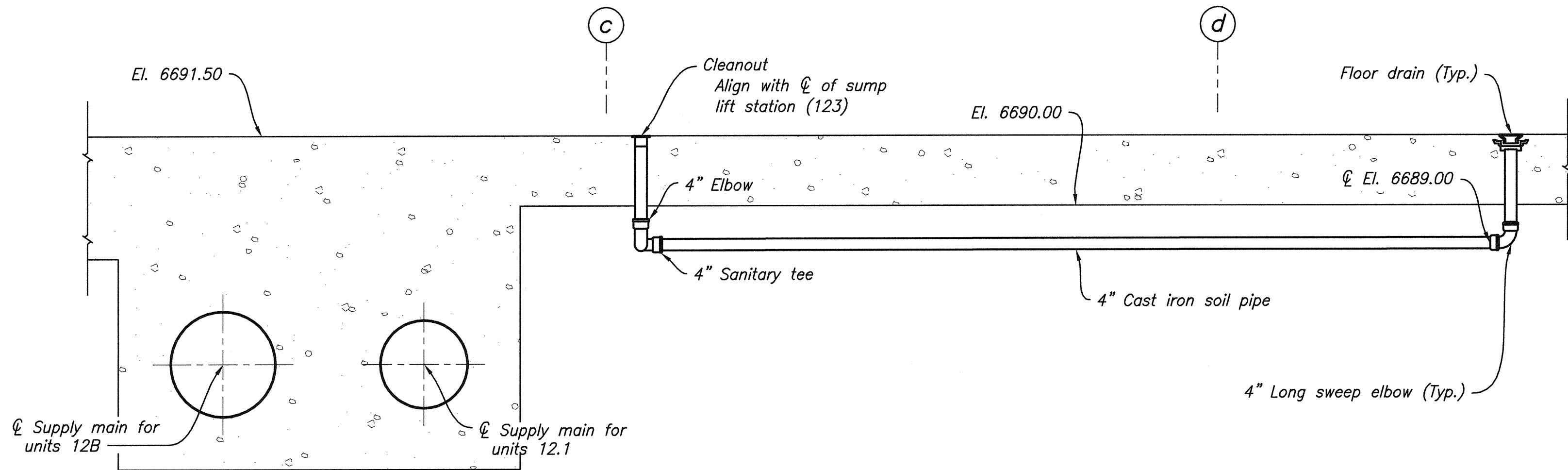
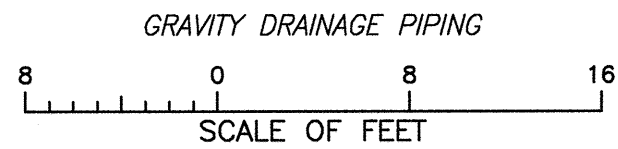


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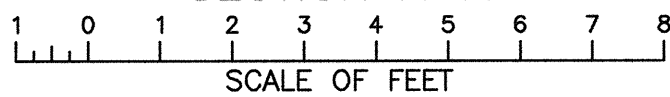
CAD SYSTEM
AutoCAD Rev. 15.0s
CAD FILENAME
1695-D-260.dwg



PLAN EL. 6691.50



SECTION A-A



NOTES

1. Slope gravity drainage piping toward air chamber sump pit.
2. Encase piping that extends below concrete slab in non-reinforced concrete with a minimum of 6-inches of cover in all directions.
3. Use long sweep fittings unless otherwise noted.
4. Refer to sump lift station manufacturer's data for gravity drainage piping connection to sump lift station.
5. Daylight sump discharge piping in accordance with Specification Section 33 11 16 - Site Water Utility Distribution Piping.

REFERENCE DRAWINGS

TOHLAKAI PUMPING PLANT -	
GENERAL ARRANGEMENT -	
SHEET 1 OF 2	1695-D-119
SHEET 2 OF 2	1695-D-120
CONCRETE OUTLINE -	
PLAN	1695-D-123
SECTIONS 1 AND 2	1695-D-124
SECTIONS 3 THRU 8	1695-D-125
ARCHITECTURAL	
DETAILS - SHEET 3 OF 3	1695-D-195
AIR CHAMBER SUMP LIFT STATION	1695-D-260
AUXILIARY PIPING -	
SECTIONS AND DETAILS	1695-D-265

DESIGNED	
DRAWN	
CHECKED	
TECH/ APPR	PATRICK DAVISON, P.E.
APPROVAL	
WILLIAM D. MASTRAN, P.E.	
MANAG. MECHANICAL EQUIPMENT GROUP	
DENVER, COLORADO	August 8, 2013

CONTINUED ON DRAWING 1695-D-263

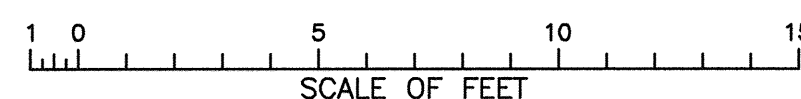
REFERENCE DRAWINGS

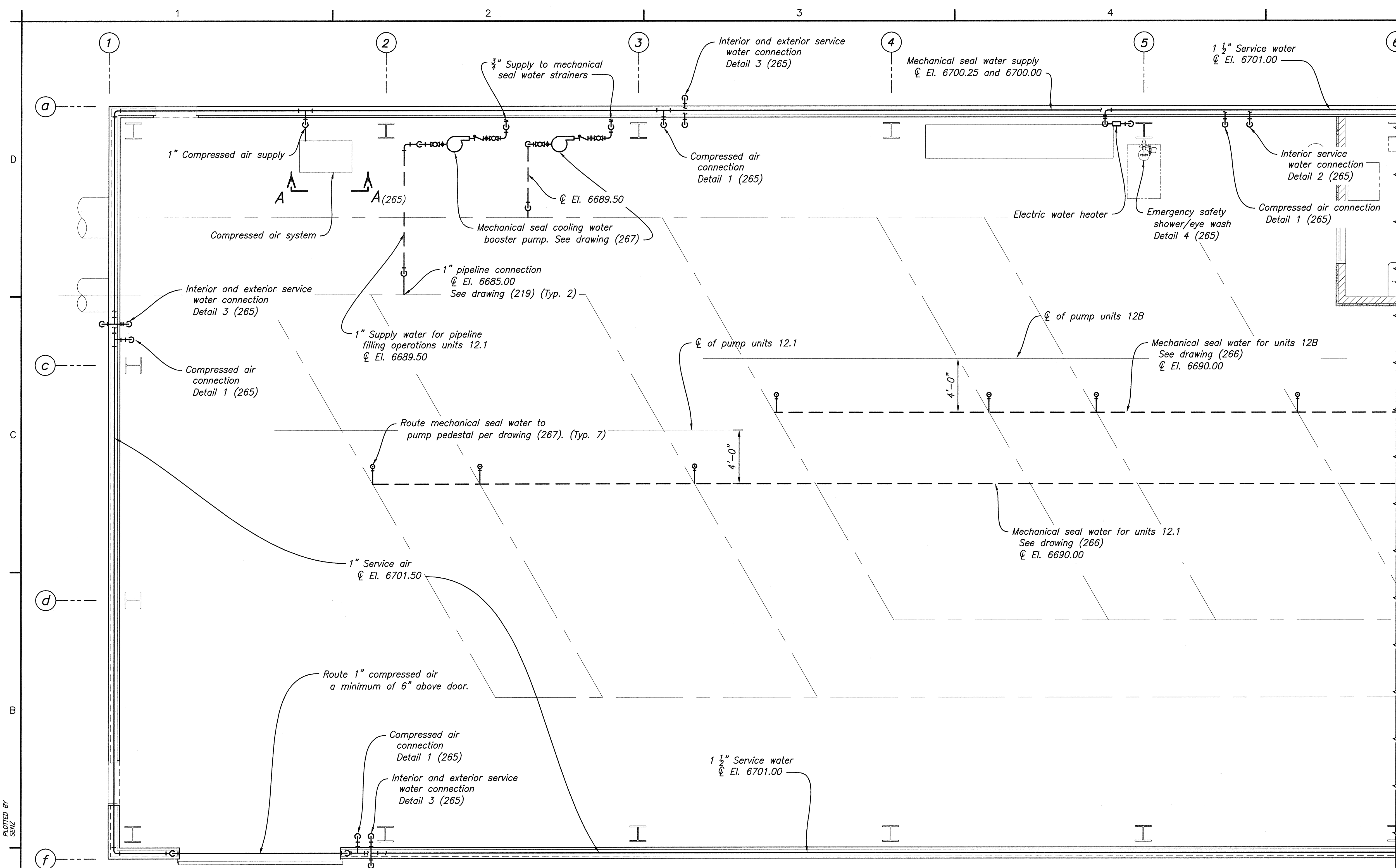
TOHLAKAI PUMPING PLANT -	
ARCHITECTURAL	
DETAILS - SHEET 1 OF 2	1695-D-117
DETAILS - SHEET 1 OF 2	1695-D-118
GENERAL ARRANGEMENT -	
SHEET 1 OF 2	1695-D-119
SHEET 2 OF 2	1695-D-120
ON-SITE SEWAGE AND DISPOSAL -	
PROFILE	1695-D-183
STEEL AND MANIFOLD -	
PLAN AND SECTIONS	1695-D-219
AUXILIARY PIPING -	
SECTIONS	1695-D-263
SECTIONS AND DETAILS	1695-D-264
MECHANICAL SEAL COOLING WATER -	
PIPE DIAGRAM	1695-D-266
DETAILS	1695-D-267
STANDARD DESIGN -	
SMALL EQUIPMENT FOUNDATIONS	40-D-5599

NOTES

1. Installed elevations of pipe are dependant on approved equipment and mounting hardware.
2. Mount mechanical equipment per Standard Design Drawing 40-D-5599.
3. Insulate exposed piping with commercially available, mold resistant, fire-rated, adhesive backed pipe insulation designed to specific pipe diameters.

PARTIAL PLAN EL. 6691.50


 DATE AND TIME PLOTTED
7/29/2013 4:51:32 PM
PLOTTED BY
SENZ

 CAD SYSTEM
AutoCAD Rel. 13.0s
CAD FILENAME
1695-D-262.dwg


NOTES

1. Installed elevations of pipe are dependant on approved equipment and mounting hardware.
2. Mount mechanical equipment per Standard Design Drawing 40-D-5599.
3. Insulate exposed piping with commercially available, mold resistant, fire-rated, adhesive backed pipe insulation designed to specific pipe diameters.

REFERENCE DRAWINGS

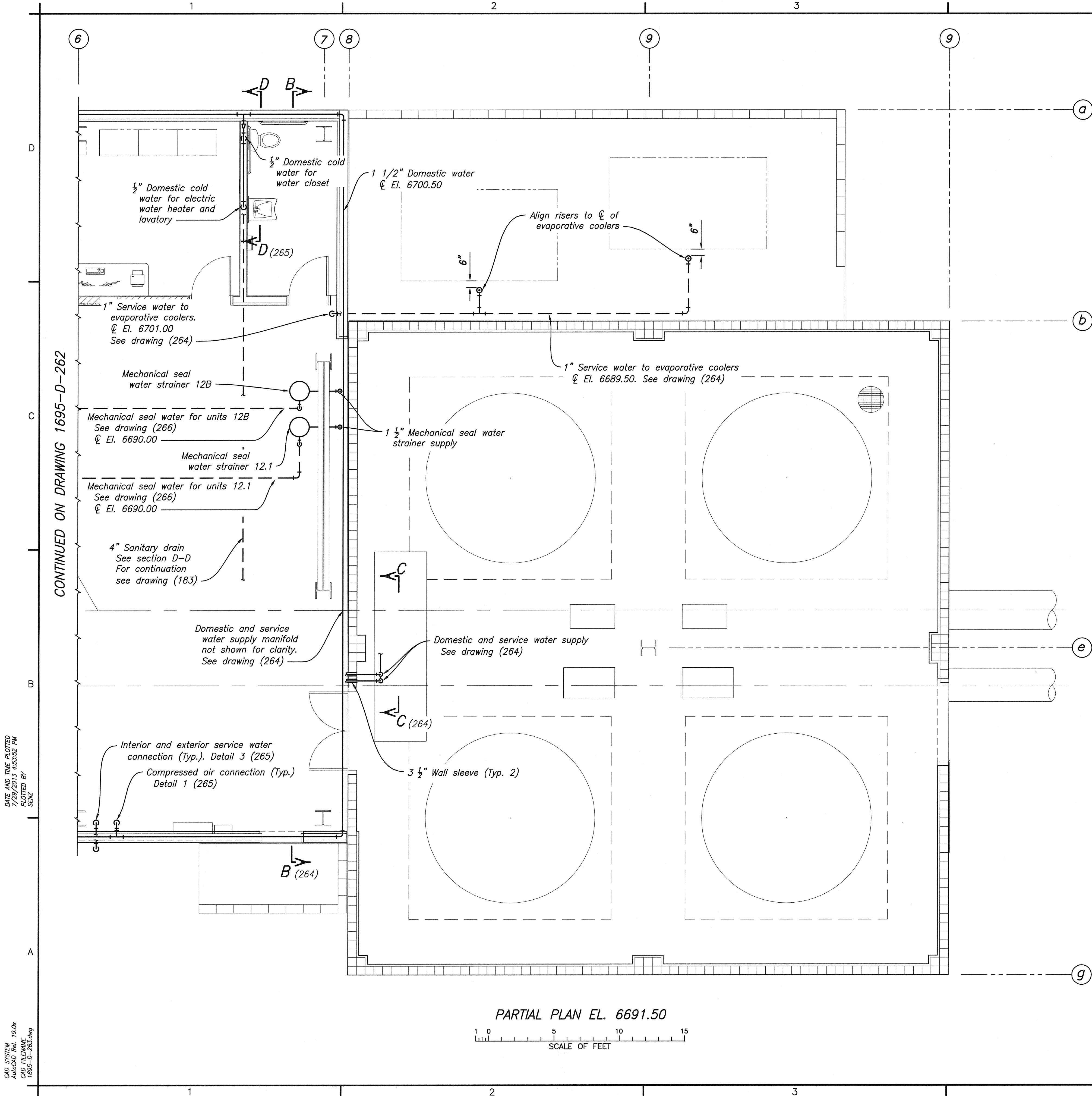
TOHLAKAI PUMPING PLANT -	
ARCHITECTURAL -	
DETAILS -	
SHEET 1 OF 2	1695-D-117
SHEET 1 OF 2	1695-D-118
GENERAL ARRANGEMENT -	
SHEET 1 OF 2	1695-D-119
SHEET 2 OF 2	1695-D-120
ON-SITE SEWAGE AND DISPOSAL -	
PROFILE	
1695-D-183	
AUXILIARY PIPING -	
PARTIAL PLAN EL. 6691.50	1695-D-262
SECTIONS	1695-D-264
SECTIONS AND DETAILS	1695-D-265
MECHANICAL SEAL COOLING WATER -	
PIPE DIAGRAM	1695-D-266
DETAILS	1695-D-267
STANDARD DESIGN -	
SMALL EQUIPMENT FOUNDATIONS	40-D-5599

DESIGNED: *[Signature]*
DRAWN: *[Signature]*
CHECKED: *[Signature]*
TECH. APPR. *[Signature]*
APPROVAL: *[Signature]*
WILLIAM D. MCSTRAIN, P.E.
MANAGER, MECHANICAL EQUIPMENT GROUP
DENVER, COLORADO 2013-06-06

AUXILIARY PIPING
PARTIAL PLAN
EL. 6691.50

1695-D-263

SHEET 1 OF 1

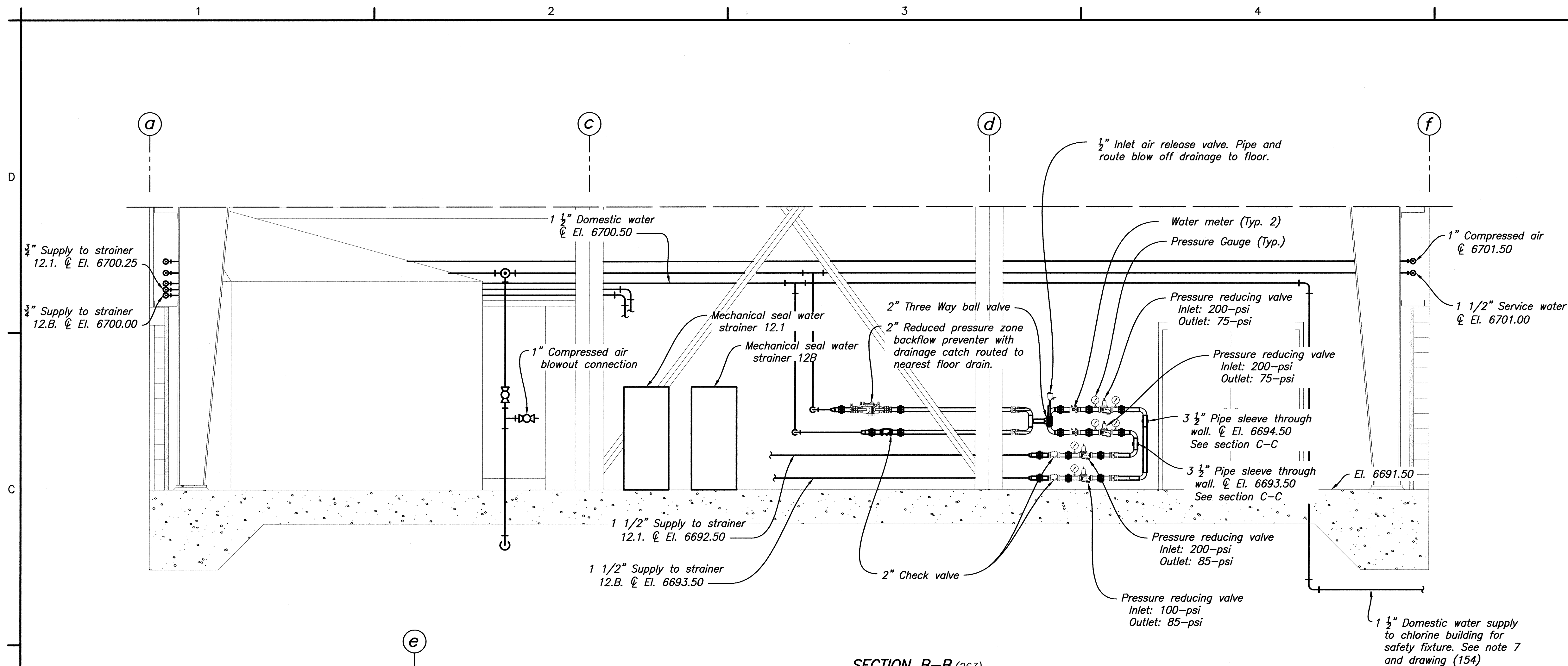


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PLOTTED BY
SENZ

CAD SYSTEM
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CAD FILENAME
1695-D-263.dwg

PARTIAL PLAN EL. 6691.50

0 5 10 15
SCALE OF FEET



SECTION B-B (263)

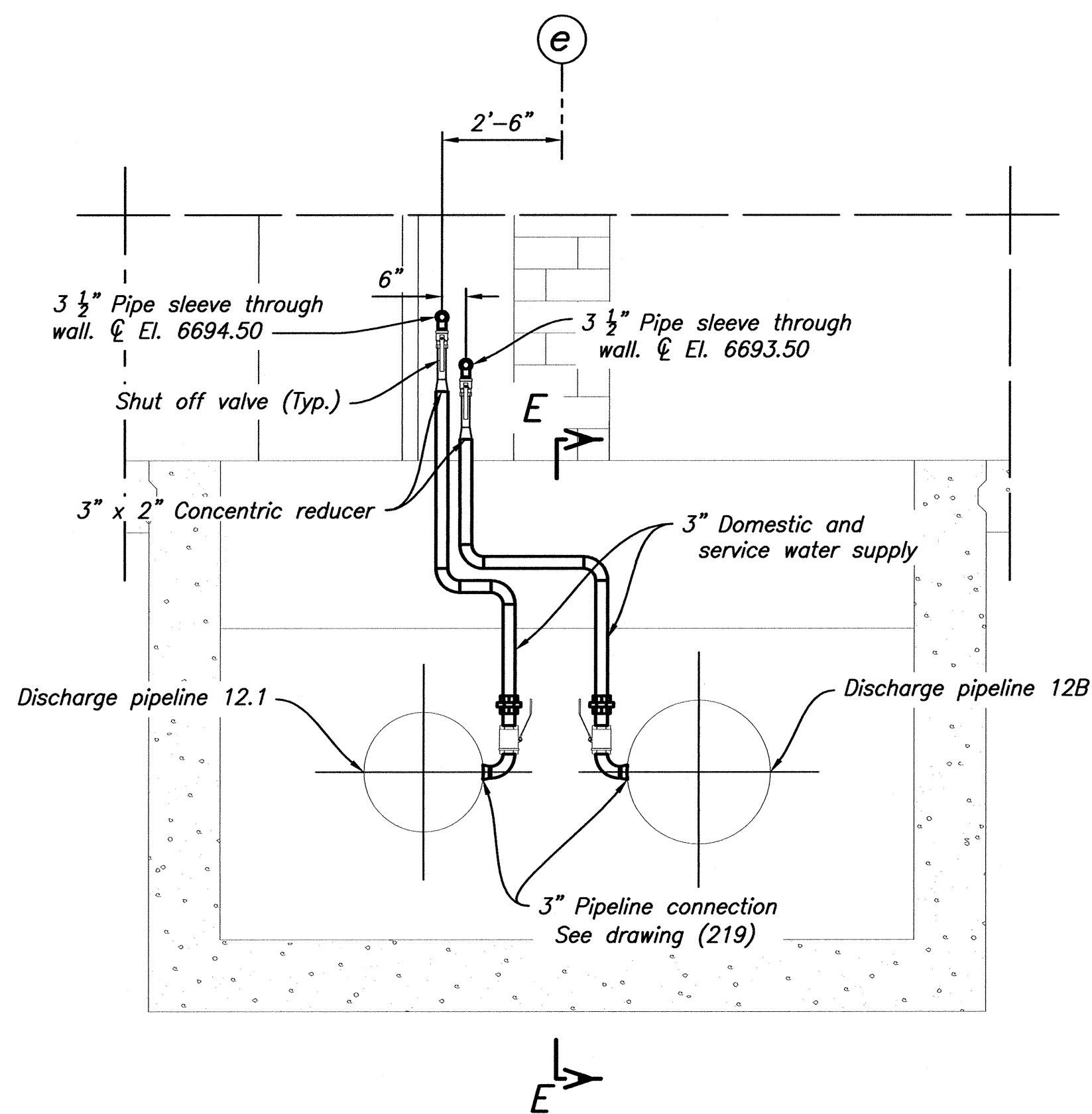
1 0 1 2 3 4 5 6 7 8
SCALE OF FEET

NOTES

1. Installed elevations of pipe are dependant on approved equipment and mounting hardware.
2. Mount mechanical equipment per Standard Design Drawing 40-D-5599.
3. See Drawing 1695-D-115 for restroom fixture layout.
4. Route domestic water piping in accordance with Specification Section 33 11 16 - Site Water Utility Distribution Piping.
5. Insulate exposed piping with commercially available, mold resistant, fire-rated, adhesive backed pipe insulation designed to specific pipe diameters.
6. Coordinate piping placement with electrical installations. See drawing 1695-D-248.

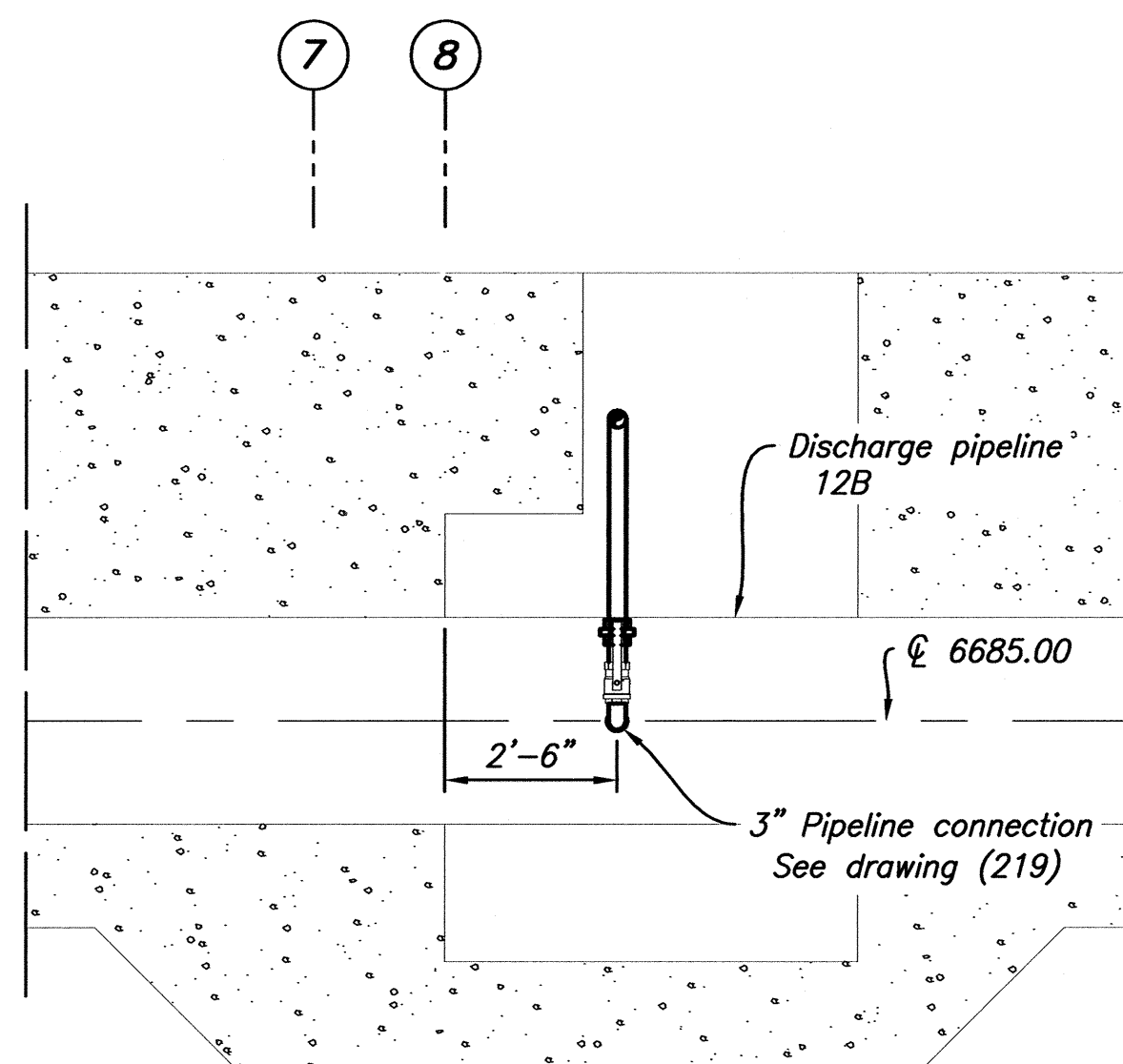
REFERENCE DRAWINGS

ARCHITECTURAL -	
DETAILS -	
ENLARGED PLAN	1695-D-115
SHEET 1 OF 2	1695-D-117
SHEET 1 OF 2	1695-D-118
GENERAL ARRANGEMENT -	
SHEET 1 OF 2	1695-D-119
SHEET 2 OF 2	1695-D-120
ON-SITE SEWAGE AND DISPOSAL -	
PROFILE	1695-D-183
STEEL MANIFOLD	
SECTIONS AND DETAILS	1695-D-219
ELECTRICAL INSTALLATIONS	1695-D-248
AUXILIARY PIPING	
PARTIAL PLAN EL. 6691.50	1695-D-262
PARTIAL PLAN EL. 6691.50	1695-D-263
SECTIONS AND DETAILS	1695-D-265
MECHANICAL SEAL COOLING WATER	
PIPE DIAGRAM	1695-D-267
STANDARD DESIGN -	
SMALL EQUIPMENT FOUNDATIONS	40-D-5599



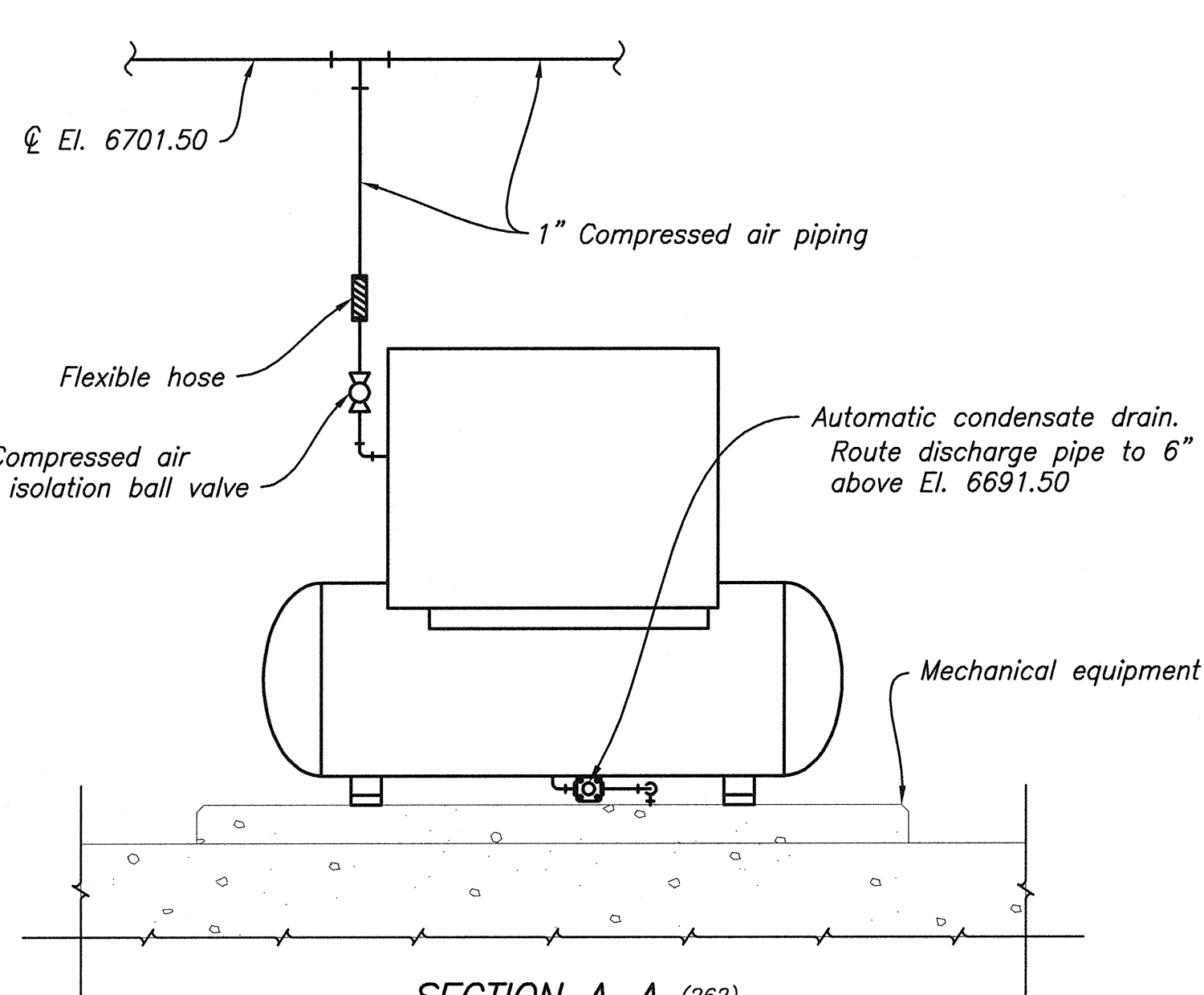
SECTION C-C (263)

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SCALE OF FEET

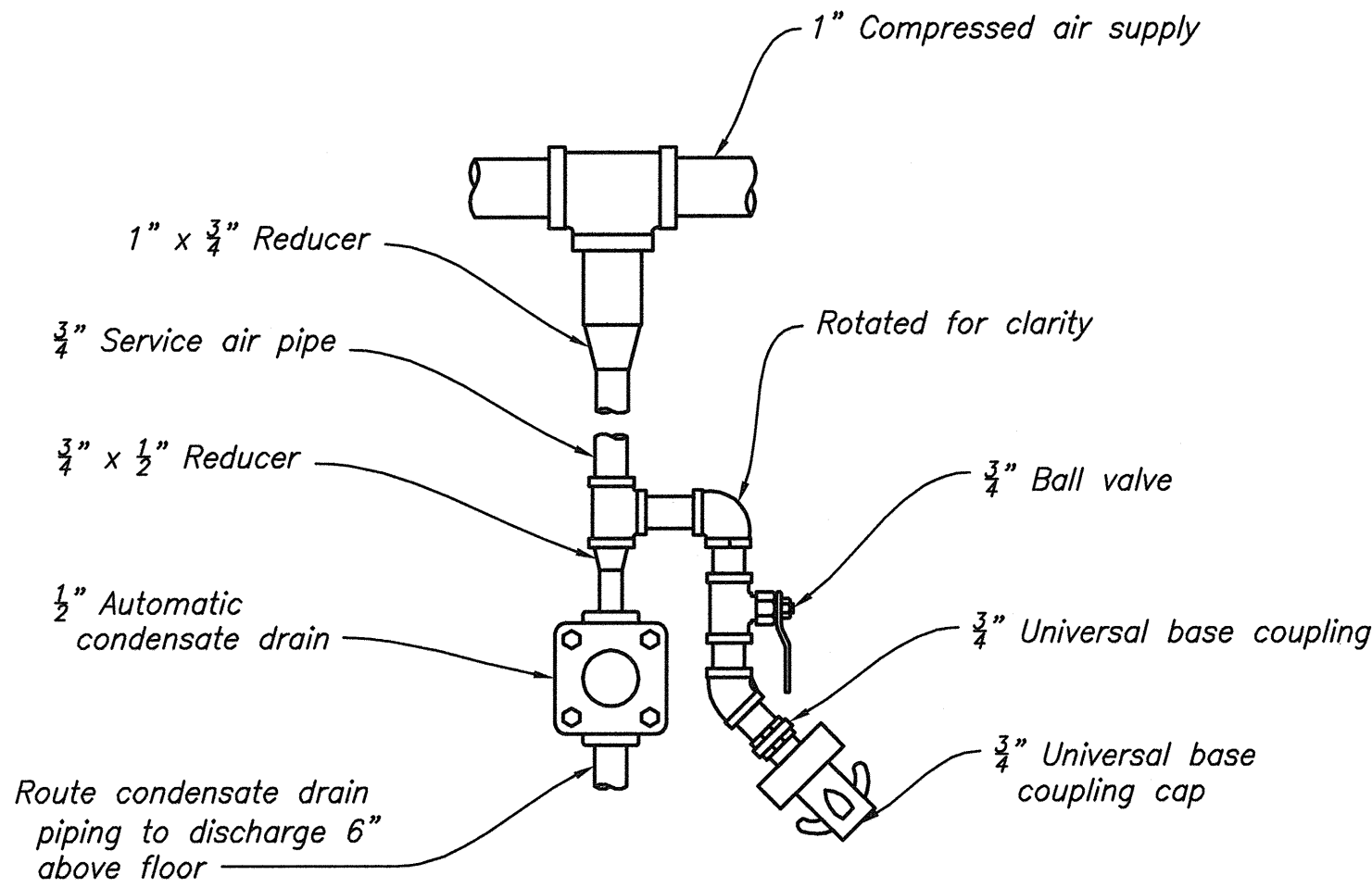


SECTION E-E

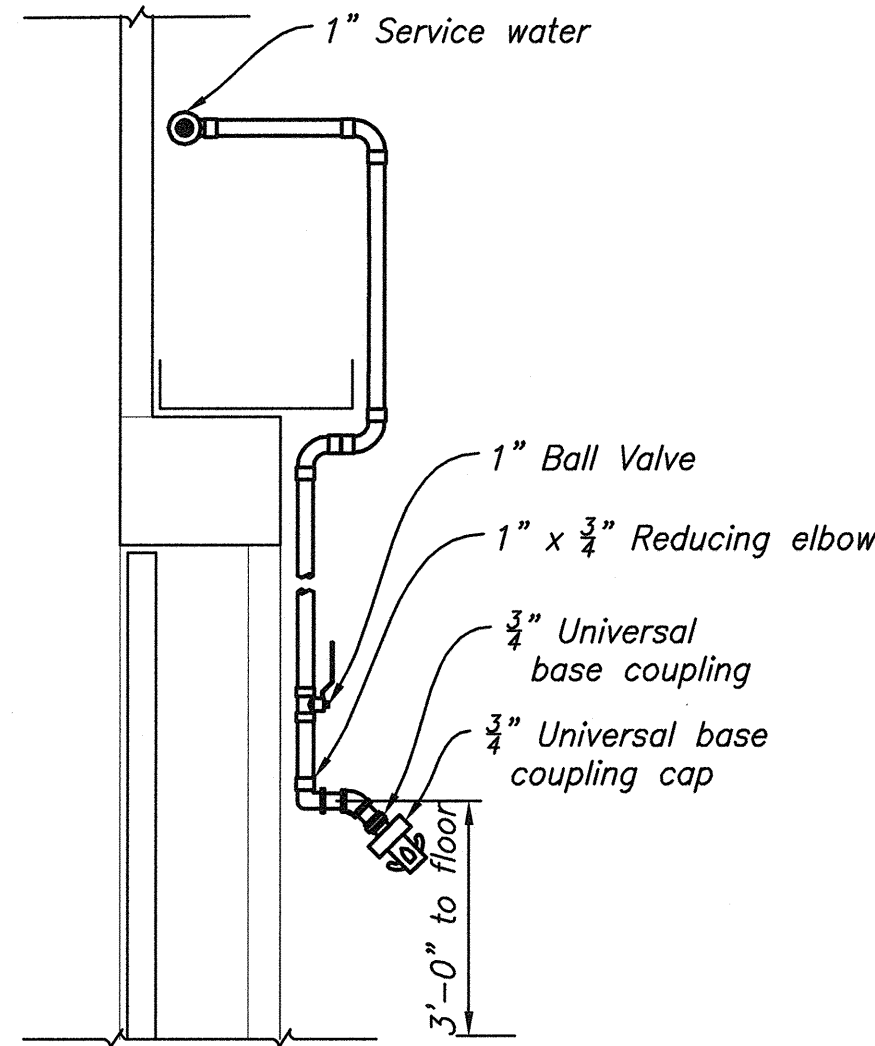
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SCALE OF FEET



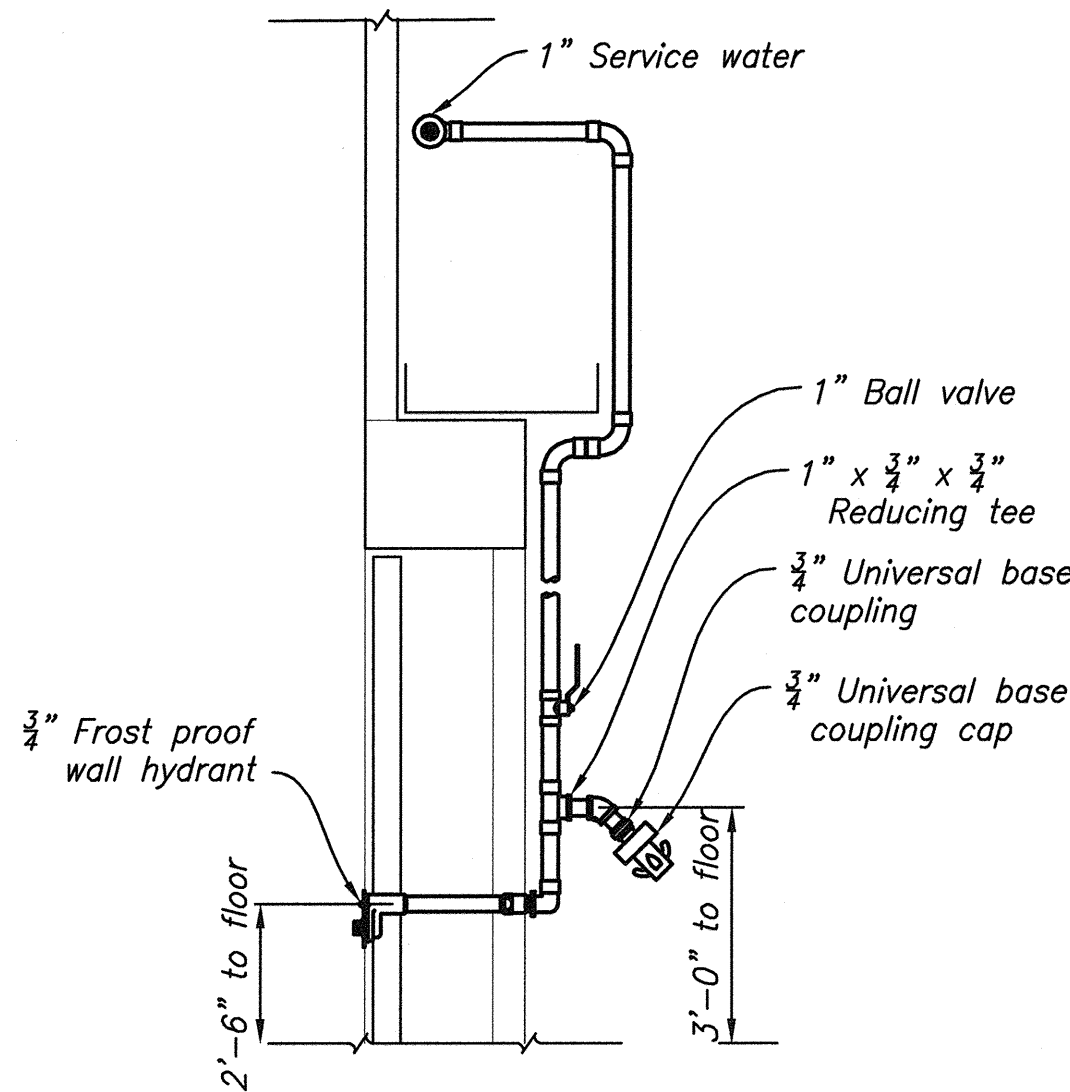
SECTION A-A (262)
COMPRESSED AIR SYSTEM
(NOT TO SCALE)



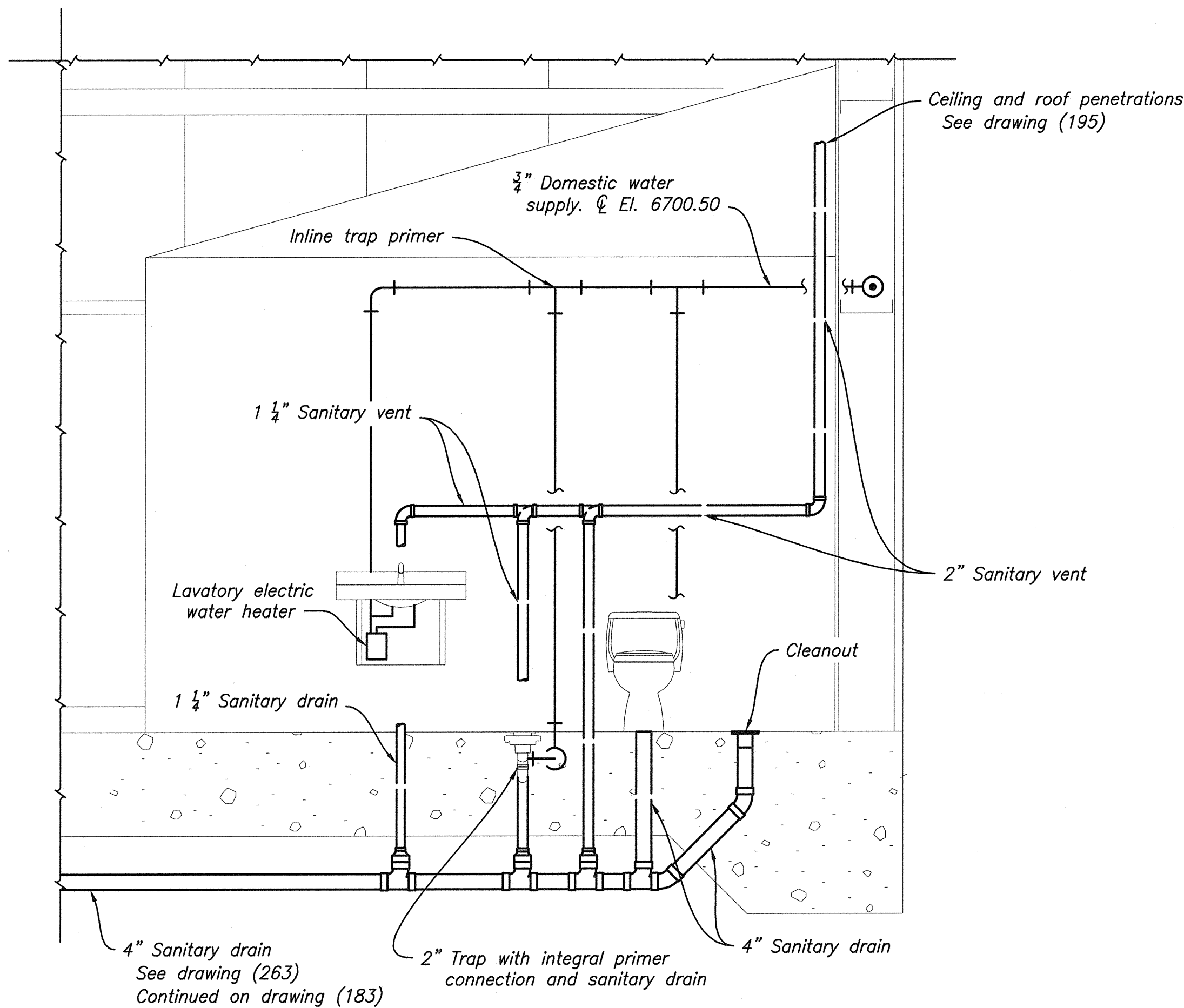
DETAIL 1
SERVICE AIR CONNECTION
(NOT TO SCALE)



DETAIL 2
INTERIOR SERVICE WATER
CONNECTION
(NOT TO SCALE)

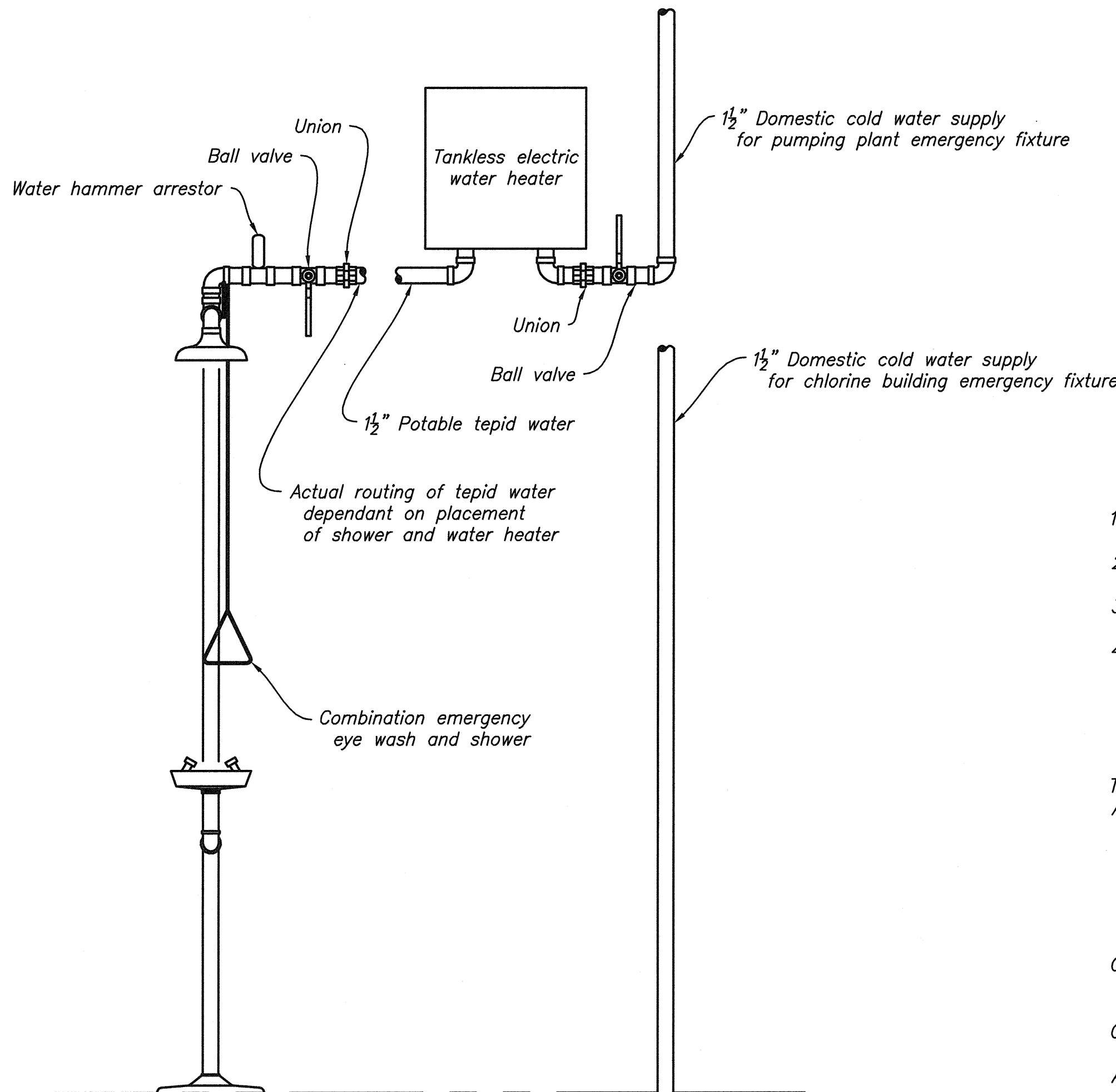


DETAIL 3
INTERIOR AND EXTERIOR
SERVICE WATER CONNECTION
(NOT TO SCALE)



SECTION D-D (263)
SANITARY SEWER

0 1 2 3 4 5
SCALE OF FEET



DETAIL 4

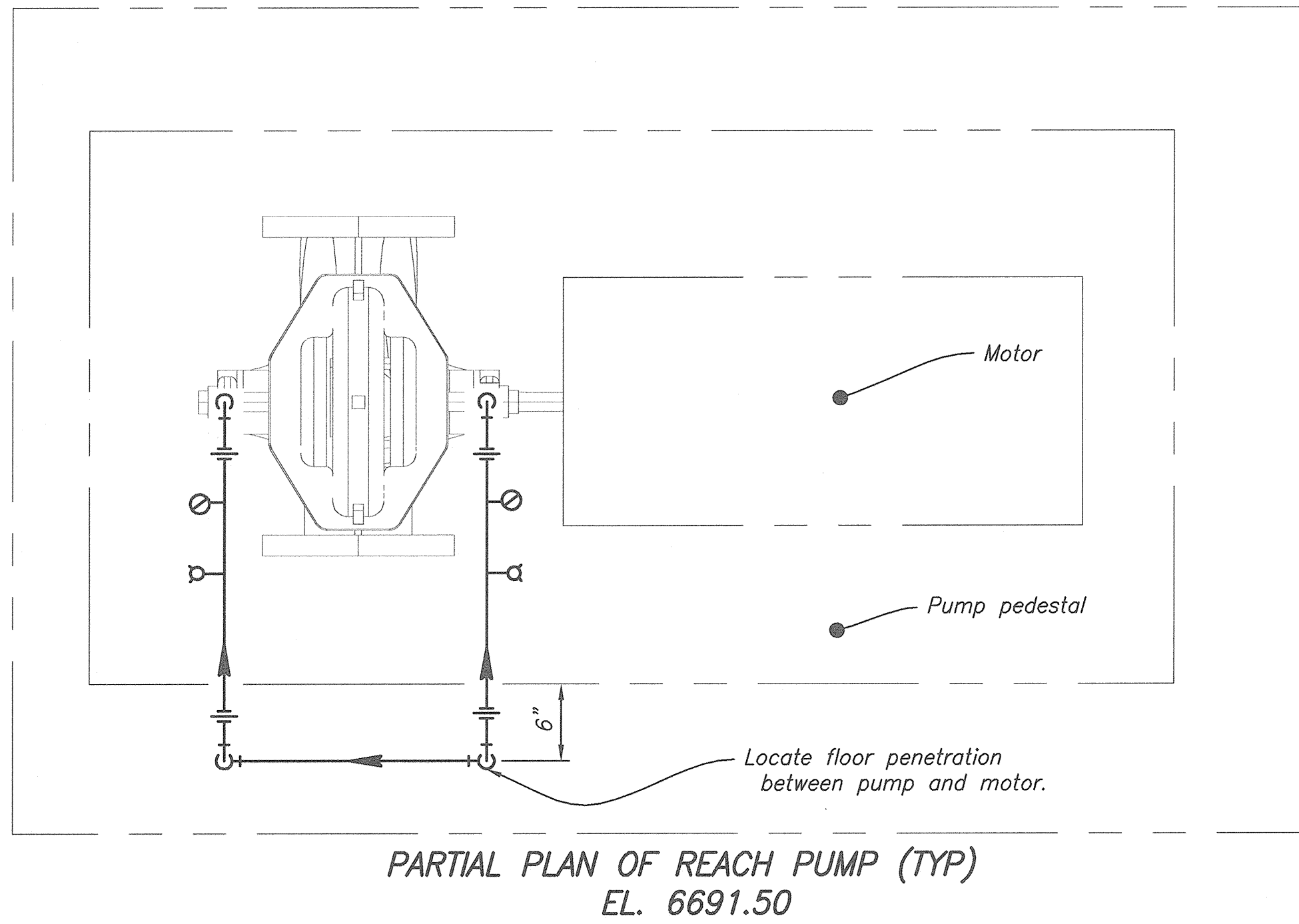
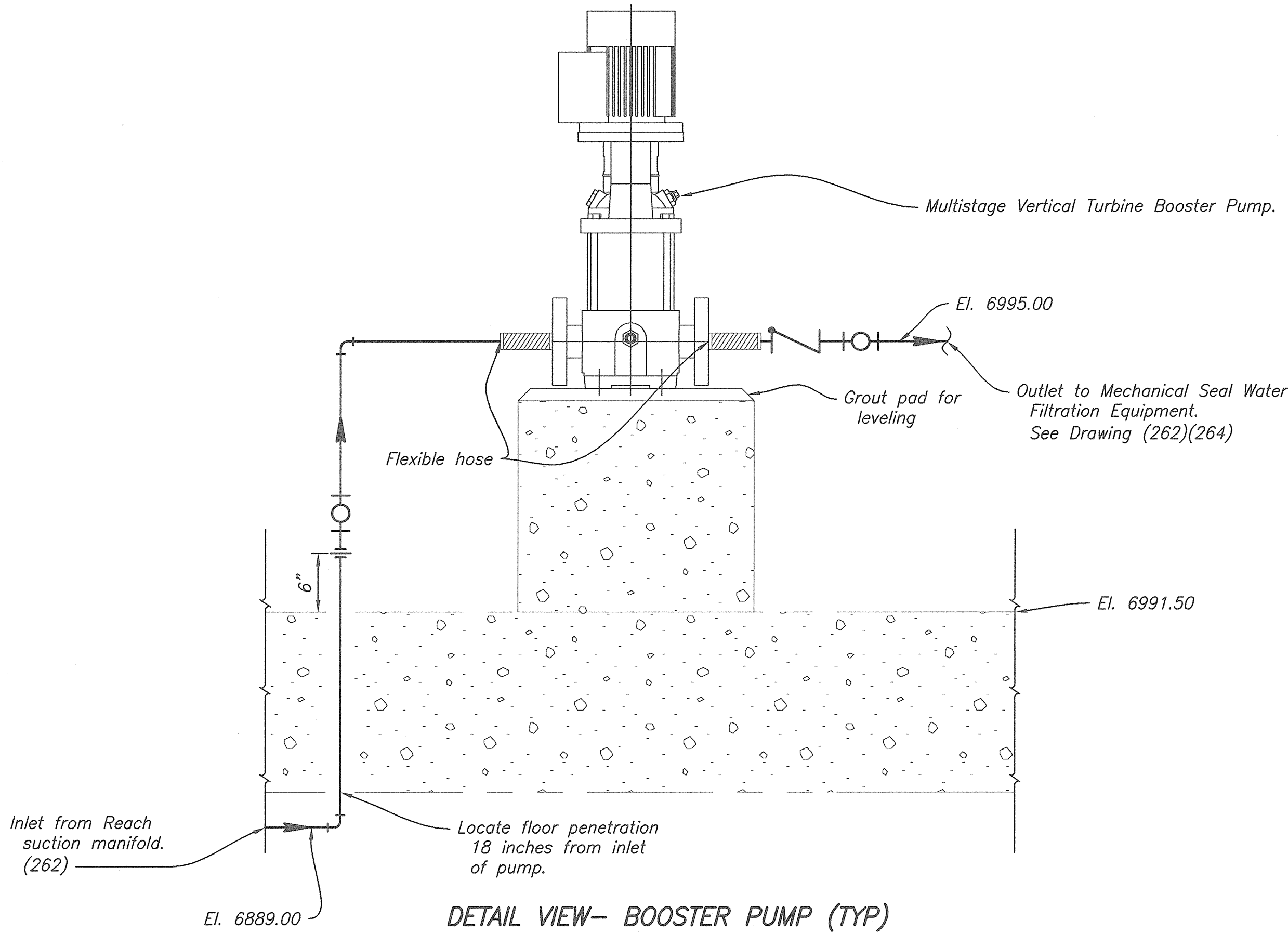
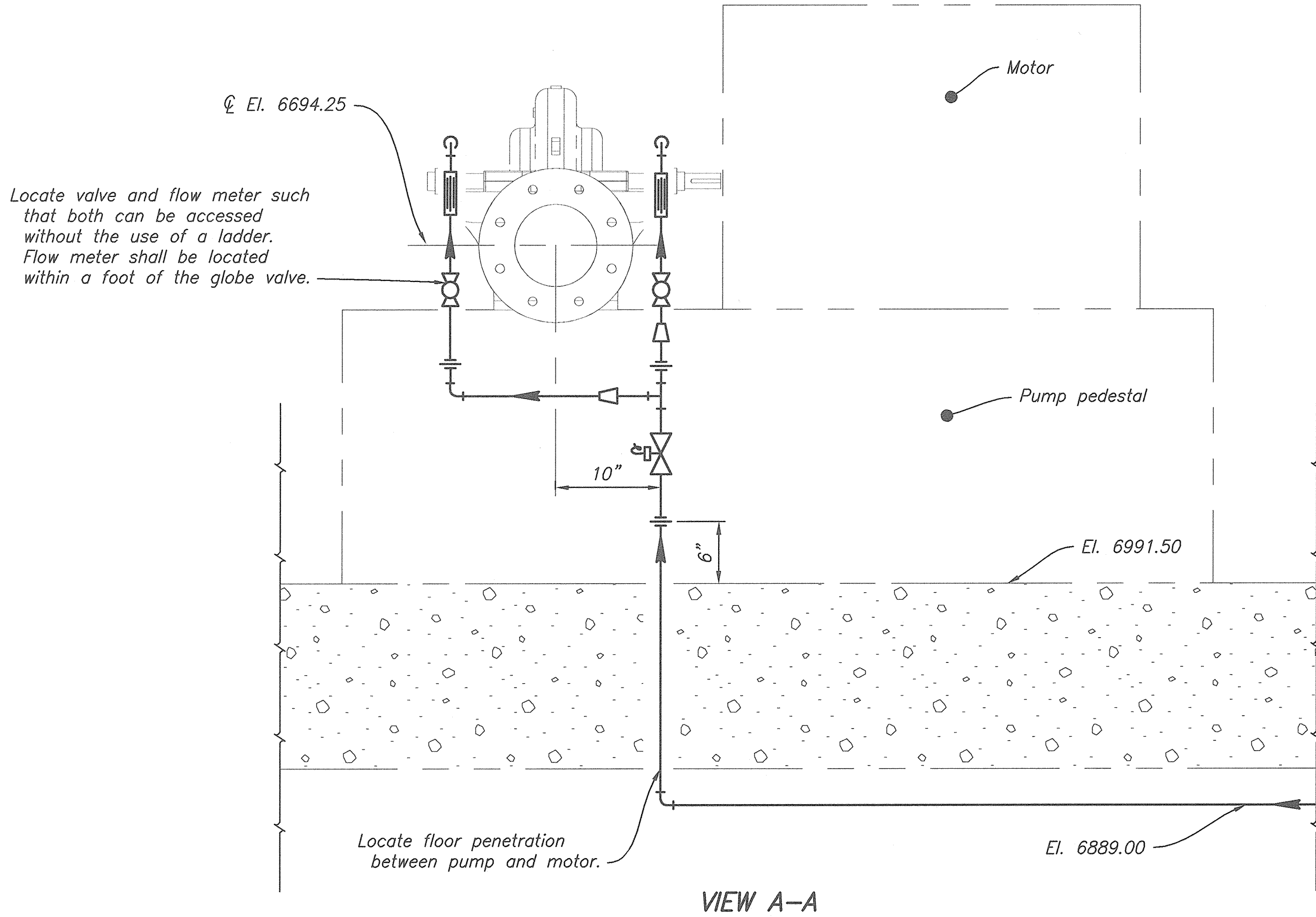
EMERGENCY SHOWER AND EYE/FACE WASH STATION
(NOT TO SCALE)

NOTES

1. Service water and compressed air connections shall be located 30-inches above El. 6691.50.
2. Mount mechanical equipment per Standard Design Drawing 40-D-5599.
3. Equipment pads shall have a minimum thickness of 4-inches.
4. Installed elevations of pipe are dependant on approved equipment and mounting hardware.

REFERENCE DRAWINGS

TOHLAKAI PUMPING PLANT -	
ARCHITECTURAL -	
INTERIOR ROOF -	
PLAN AND ELEVATIONS	1695-D-116
DETAILS -	
SHEET 1 OF 3	1695-D-117
SHEET 2 OF 3	1695-D-118
SHEET 3 OF 3	1695-D-195
GENERAL ARRANGEMENT -	
SHEET 1 OF 2	1695-D-119
SHEET 2 OF 2	1695-D-120
ON-SITE SEWAGE AND DISPOSAL -	
PROFILE	1695-D-183
AUXILIARY PIPING -	
PARTIAL PLAN EL. 6691.50	1695-D-262
PARTIAL PLAN EL. 6691.50	1695-D-263
SECTIONS	1695-D-264
STANDARD DESIGN -	
SMALL EQUIPMENT FOUNDATIONS	40-D-5599



NOTES

1. All pipe shall be Type K Copper Tube.
2. See 1695-D-266 for pipe sizes and symbols.
3. This drawing is not to scale.

REFERENCE DRAWINGS

TOHLAKAI PUMPING PLANT- MECHANICAL SEAL COOLING WATER- PIPE DIAGRAM	1695-D-266
AUXILIARY PIPING- PLAN	1695-D-262
SECTION A-A	1695-D-263
AUXILIARY PIPE SECTIONS	1695-D-264

DESIGNED BY: D. M. Rodwell
DRAWN BY: D. M. Rodwell
CHECKED BY: P. Dawson, P.E., MECH. ENGINEER
ADMIN. APPROVAL: William D. McStraw, P.E., MANAGER, MECHANICAL EQUIPMENT GROUP
DENVER, COLORADO 2013-26-07

MECHANICAL SEAL
COOLING WATER
DETAILS

1695-D-267

SHEET 1 OF 1

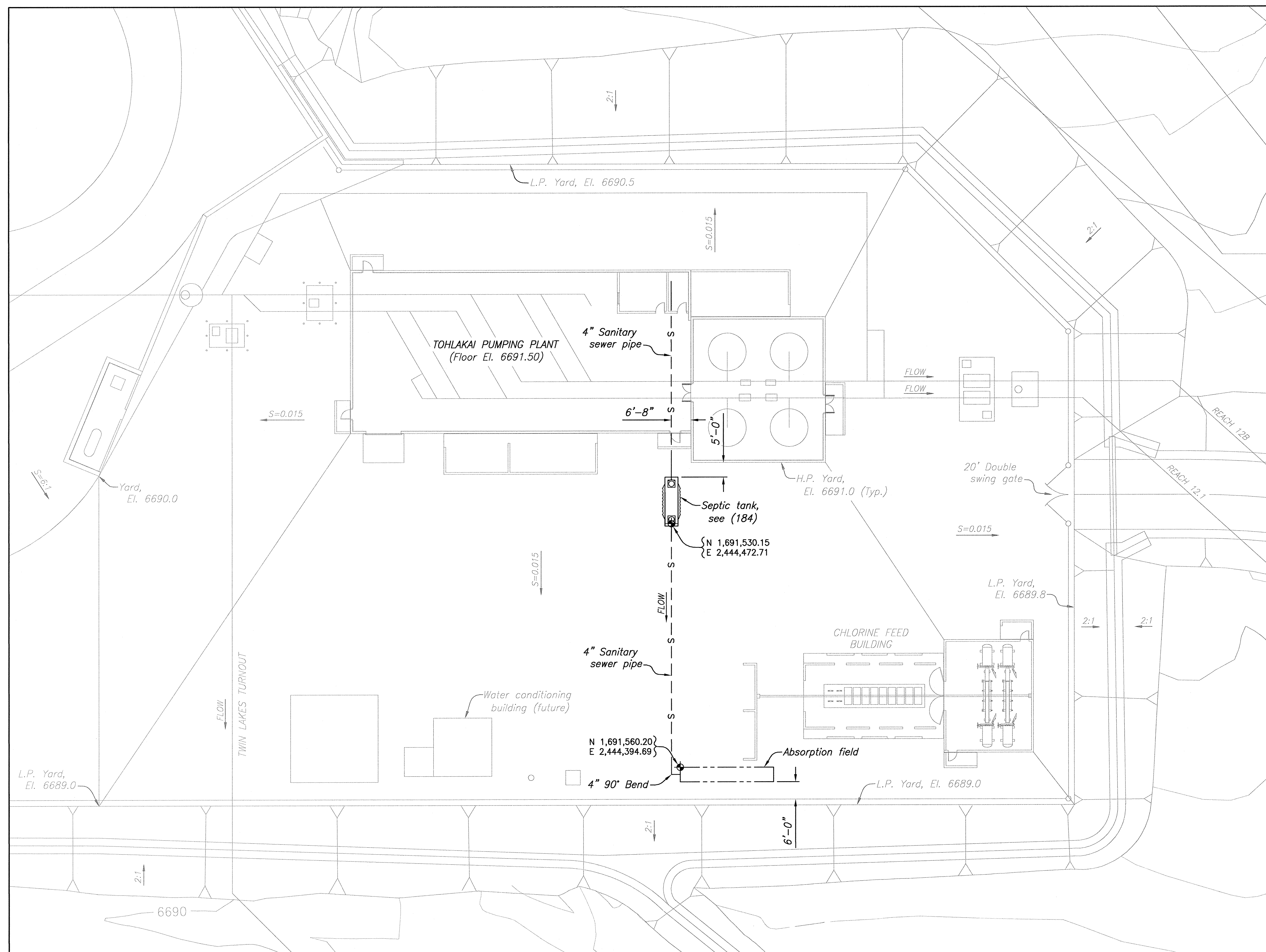
Don LeBlanc
 DESIGNED
 R. D. P. A. M. 77
 DRAWN
 Robert G. Wrenche
 CHECKED
 M. L. P. E.
 TECH. APPR.
 C. J. B. C.
 PEER REVIEW
 PLANT STRUCTURES GROUP

DENVER, COLORADO	2013-08-05
------------------	------------

ON-SITE SEWAGE DISPOSAL SYSTEM PLAN

1695-D-182

SHEET 1 OF 3



PLAN
ON-SITE SEWAGE DISPOSAL SYSTEM



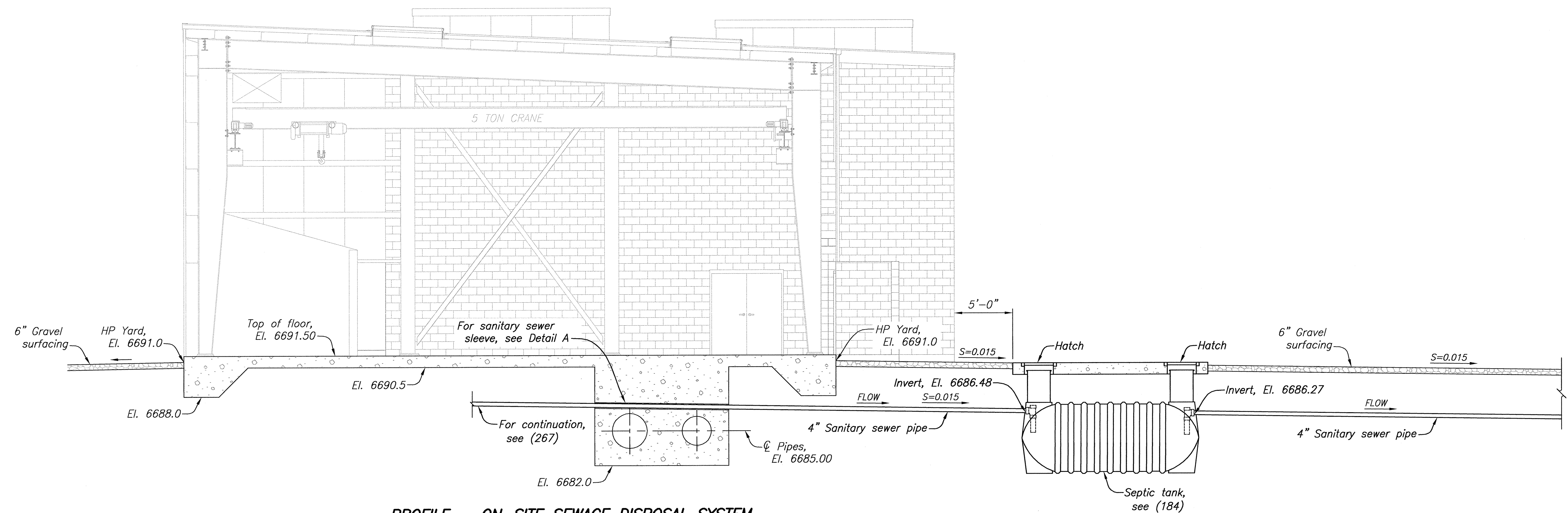
A horizontal scale bar with tick marks every 10 feet. The numbers 0, 20, and 40 are printed above the bar. The text "SCALE OF FEET" is printed below the bar.

NOTES

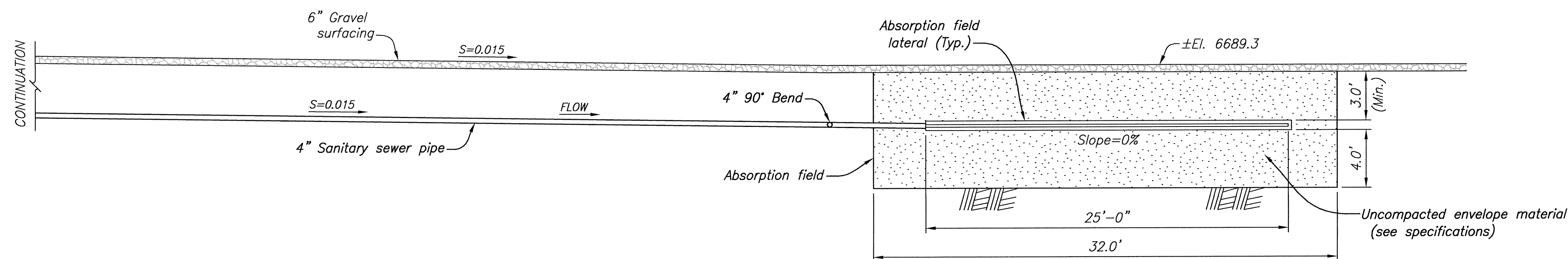
1. For General Notes and Reference drawings, see (100).
2. Horizontal datum is shown in New Mexico State Coordinate System, West Zone (NAD83). A grid factor of 0.999694573004 was used.
3. All vertical elevations are based on NAVD88 vertical datum.

DATE AND TIME PLOTTED
AUGUST 2, 2013 13:55
PLOTTED BY
KOSHEA

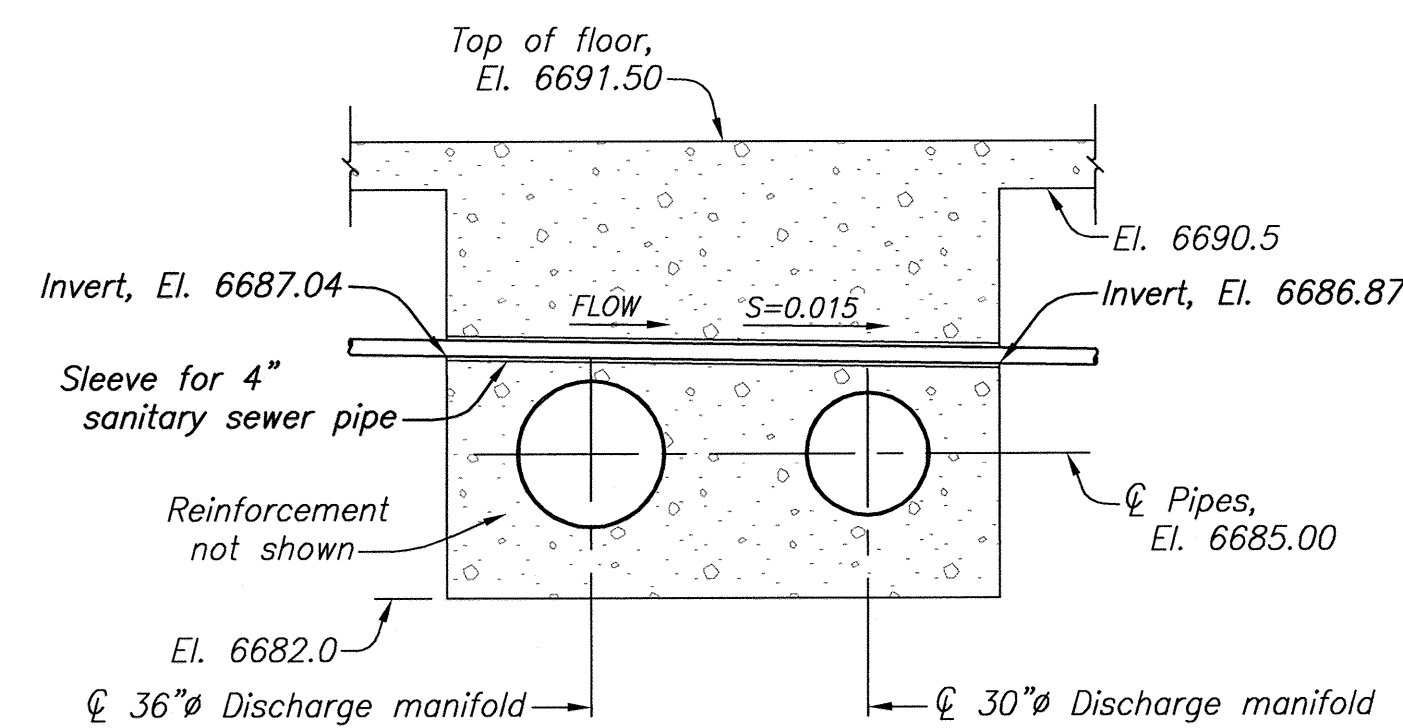
CAD SYSTEM
AutoCAD Rel. 19.0s
CAD FILENAME
1695-D-182 SEWAGE_SITE_PLAN.DWG



PROFILE – ON-SITE SEWAGE DISPOSAL SYSTEM
(No Scale)



PROFILE – ON-SITE SEWAGE DISPOSAL SYSTEM
(No Scale)



DETAIL A
SANITARY SEWER SLEEVE
(No Scale)

NOTES

- For location, see (182).
- Construction equipment and vehicles are not permitted to drive over leach field.
- For pipe trench and septic tank details, see (184).
- Provide sleeve with 4" sanitary sewer pipe supported at $\frac{1}{3}$ and $\frac{2}{3}$ length of sleeve.

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U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

NAVAJO GALLUP WATER SUPPLY PROJECT
NEW MEXICO

SAN JUAN LATERAL
TOHLAKAI PUMPING PLANT
ON-SITE SEWAGE DISPOSAL SYSTEM
PROFILE

DESIGNED *[Signature]*
DRAWN *[Signature]*
CHECKED *[Signature]* P.E.
TECH. APPR. *[Signature]*
APPROVED
PLANT STRUCTURES GROUP
DENVER, COLORADO 2013-08-05

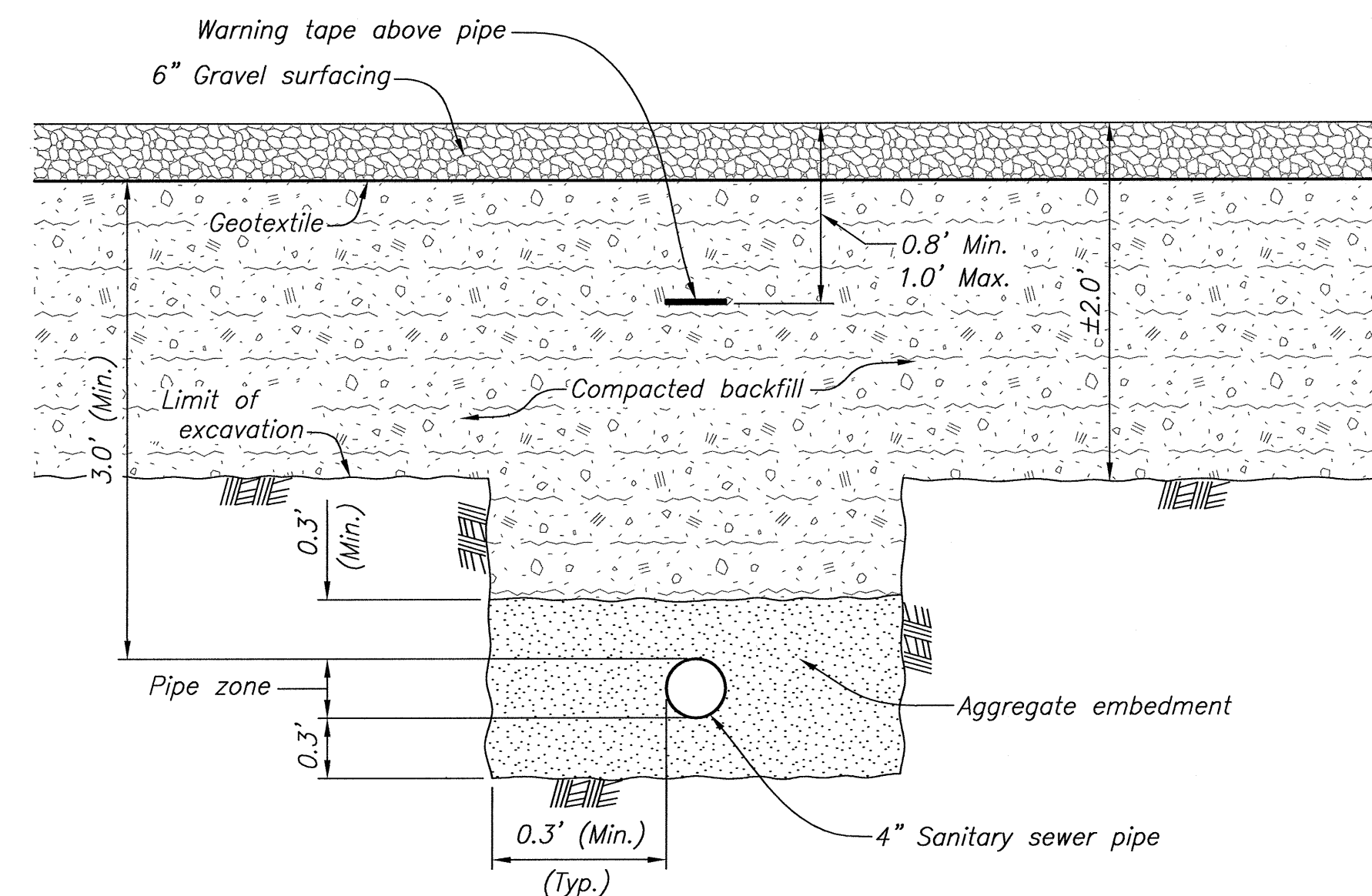
**ON-SITE SEWAGE DISPOSAL
SYSTEM
PROFILE**

1695-D-183

SHEET 2 OF 3

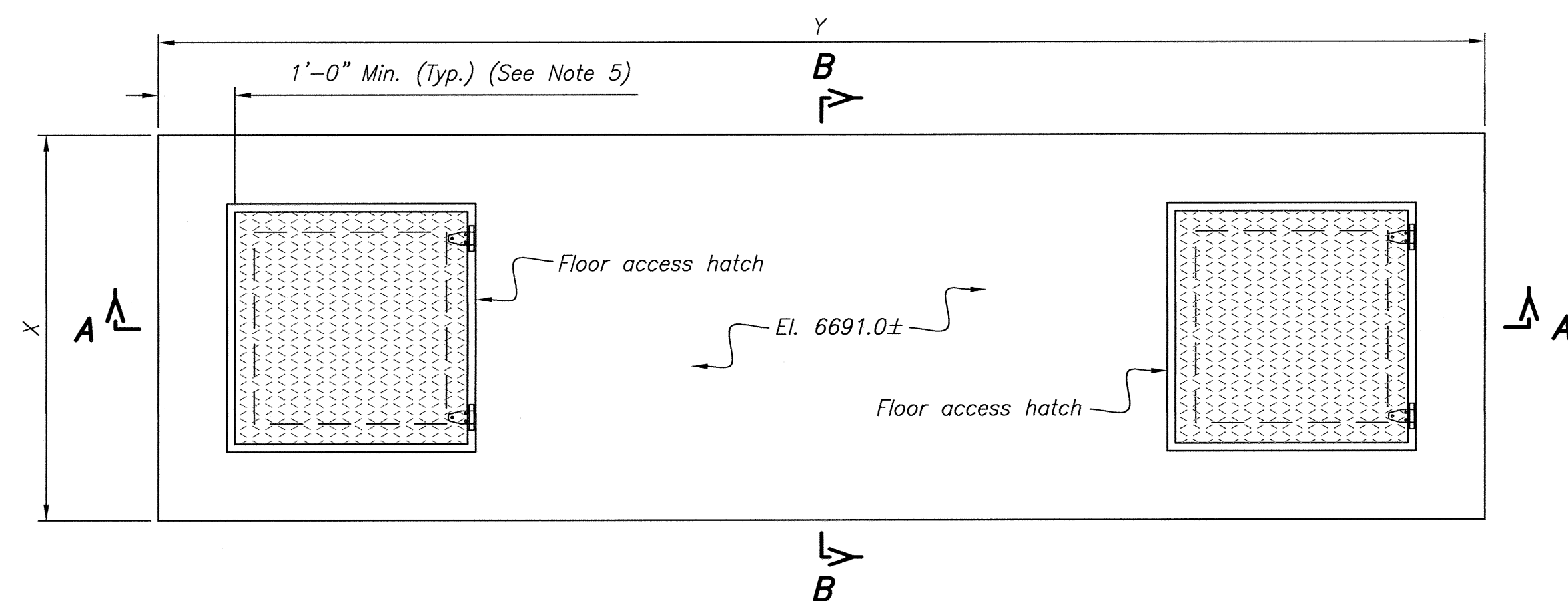
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PLOTTED BY
KOSHIEA

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AUGUST 19, 2013
CADD FILENAME
1695-D-183 SEWAGE_PROFILING

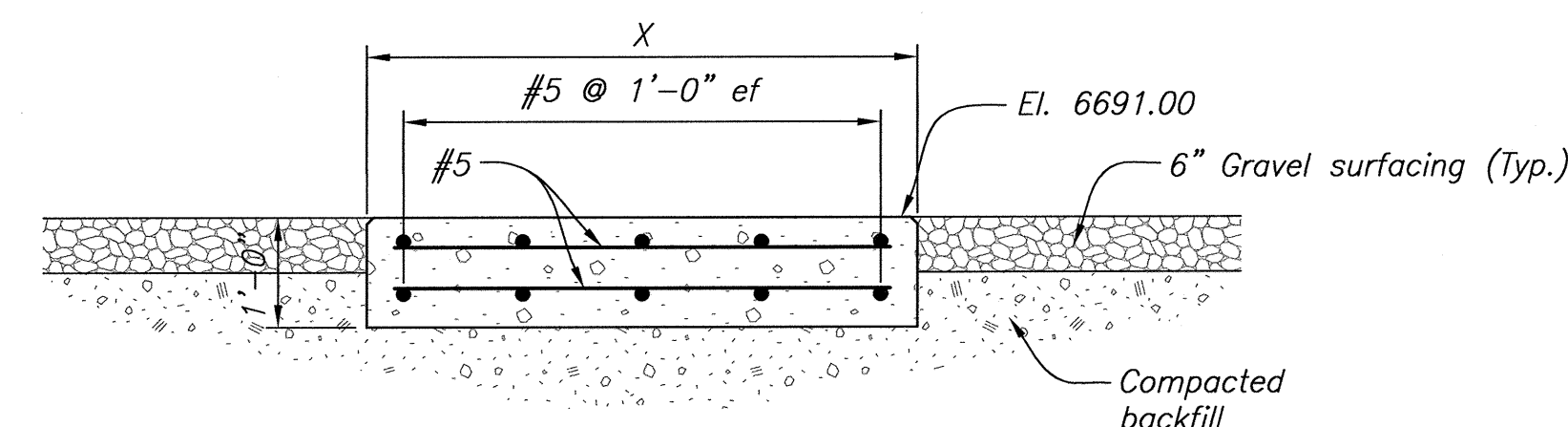


TYPICAL SEWER PIPE TRENCH
(Not to Scale)

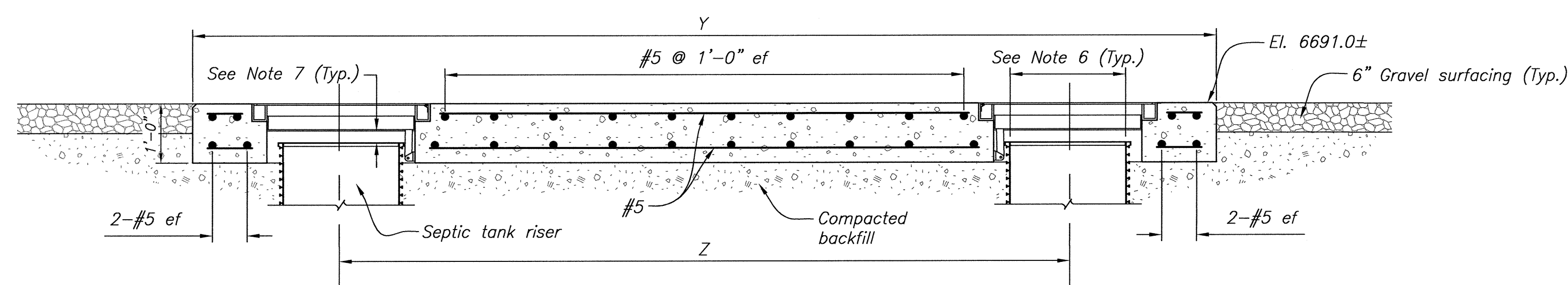
PROFILE – SEPTIC TANK
(Not to Scale)



PLAN - FOUNDATION SLAB



SECTION B-B



SECTION A-A

NOTES

1. *For Concrete General Notes, see (123).*
2. *Sloping, shoring, and benching shall be in accordance with Reclamation Safety and Health Standards.*
3. *Sewer pipe trench detail applies under building to septic tank and from septic tank to absorption field.*
4. *Dimensions X, Y, and Z are to be determined by the contractor based on equipment furnished.*
5. *The minimum 1'-0" dimension is to be measured from the outer edge of the hatch frame to the edge of the concrete slab.*
6. *Minimum clear opening of embedded floor access hatches is 36-inches by 36-inches. Center opening over septic tank riser.*
7. *Maintain 3-inch minimum clearance between bottom of floor access hatch and top of riser cover.*

DESIGNED *San Zetlara*
DRAWN *David Rogers*
CHECKED *Robert A. Smith*
TECH. APPR. *M. C. P.E.*
APPROVED *W. J. B. Jr.*
PLANT STRUCTURES GROUP
DENVER, COLORADO 2013-08-06

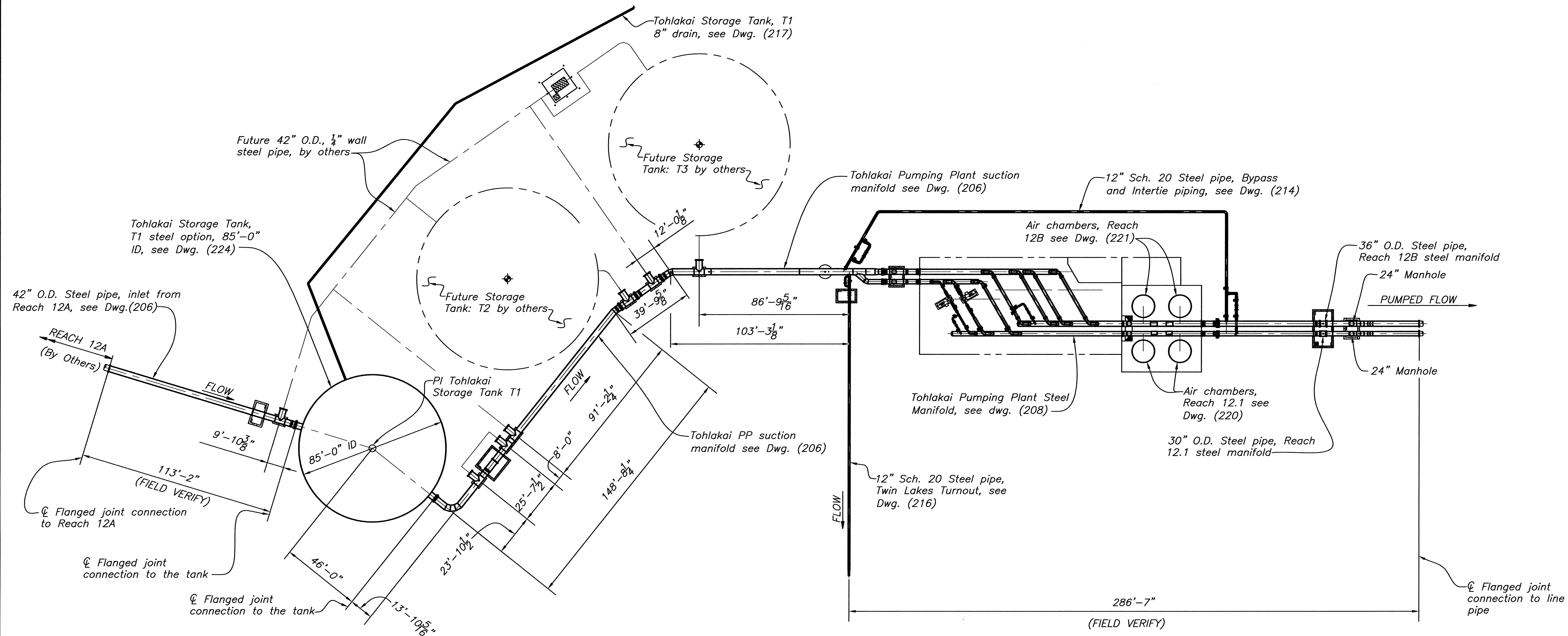
SEPTIC TANK PROFILE: FOUNDATION, PLAN, SECTIONS, AND DETAILS

1695-D-184

SHEET 3 OF 3

DATE AND TIME PLOTTED
AUGUST 2, 2013 14:24
PLOTTED BY
RRODRIGUEZ

CAD SYSTEM
AutoCAD Rel. 19.0s
CAD FILENAME
1695-D-184 SEWAGE_PLAN, PROFILE, SECTIONS AND DETAILS.DWG



PLAN

(TOHLAKAI STORAGE TANK AND PUMPING PLANT)

STANDARD REFERENCE DRAWINGS

FLANGE SUPPORT _____ 40-D-7018
 MANHOLES _____ 40-D-6137

REFERENCE DRAWING

SITE PLAN _____ 1695-D-99

GENERAL NOTES

Provide nuts, bolts, and gaskets suitable for cold water service.
 All flanges shall be AWWA Class D, E, or F as shown.

Valves and Flanges:

AWWA Class 150 Butterfly Valves to be bolted to AWWA Class D steel pipe flanges.

AWWA Class 250 Butterfly Valves to be bolted to AWWA Class F flanges.

ANSI Class 150 Valves to be bolted to AWWA Class E flanges.

Threaded fittings shall be 150 lb. or 300 lb. MI. as shown.
 Additional fittings, flanges, or welded joints added by the contractor to facilitate installation of the manifold piping are subject to Government approval.

Thread-O-Lets may be substituted for 3000 lb. steel welding couplings and half couplings.

Welding symbols apply to the joints of all members of similar identification.

All fillet welds shall be returned.

Pipe couplings: 2 or more (multiple)-piece split sleeve-type.

Hydrostatic test pressures:

Pumping Plant Bypass and 12.1 Discharge Manifold: 225 psig.

Pumping Plant Bypass and 12B Discharge Manifold: 145 psig.

Reach 12A Connection, Suction Manifolds, and Twin Lakes

Turnout: 35 psig.

Coupling Design Pressures:

Suction manifold, Twin Lakes Turnout, and Reach 12B discharge manifold pipe couplings shall be rated for at least 150 psig at 100°F.

Pumping Plant Bypass, Intertie and Reach 12.1 pipe couplings shall be rated for at least 250 psig at 100°F.

Manholes shown on Dwg. 40-D-6137:

Suction Pipe: Class 150.

Reach 12.1 Discharge Manifold: Class 300.

Reach 12B Discharge Manifold: Class 150.

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 BUREAU OF RECLAMATION

NAVALO GALLUP WATER SUPPLY PROJECT
 NEW MEXICO

SAN JUAN LATERAL
TOHLAKAI PUMPING PLANT
 STEEL MANIFOLD AND STORAGE TANK
 PLAN

REV. NO. 1
 2013-09-09
 D ADDED 24-INCH MANHOLES. REVISED NOTES.
 JCY/P.E.

DESIGNED JERRY WAUGH
 DRAWN LUCAS ADAMS
 CHECKED NATHAN NAKAMOTO
 TECH. APPR. JERRY WAUGH P.E.
 APPROVED TERRY HUMMEL
 HYDRAULIC EQUIPMENT GROUP
 DENVER, COLORADO 2013-08-02

PLAN

1695-D-205

SHEET 1 OF 1





REV NO	2013-09-09	D	ADDED ANOTHER 42-INCH BUTTERFLY VALVE IN SECTION B-B.
	1		

DESIGNED	JERRY WAUGH	
DRAWN	LUCAS ADAMS	
CHECKED	NATHAN NAKAMOTO	
TECH. APPR.	JERRY WAUGH	P.E.
APPROVED	TERRY HUMMEL	
HYDRAULIC EQUIPMENT GROUP		
DENVER, COLORADO	2013-08-02	

SECTIONS AND DETAIL

1695-D-207

SHEET 2 OF 2

NOTES
For General Notes, see Dwg. (205)

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATIONNAVAJO GALLUP WATER SUPPLY PROJECT
BUREAU OF RECLAMATION

**SAN JUAN LATERAL
TOHLAKAI PUMPING PLANT**
NEW MEXICO

STEEL MANIFOLD
PLAN AND SECTIONS

(FIELD VERIFY)



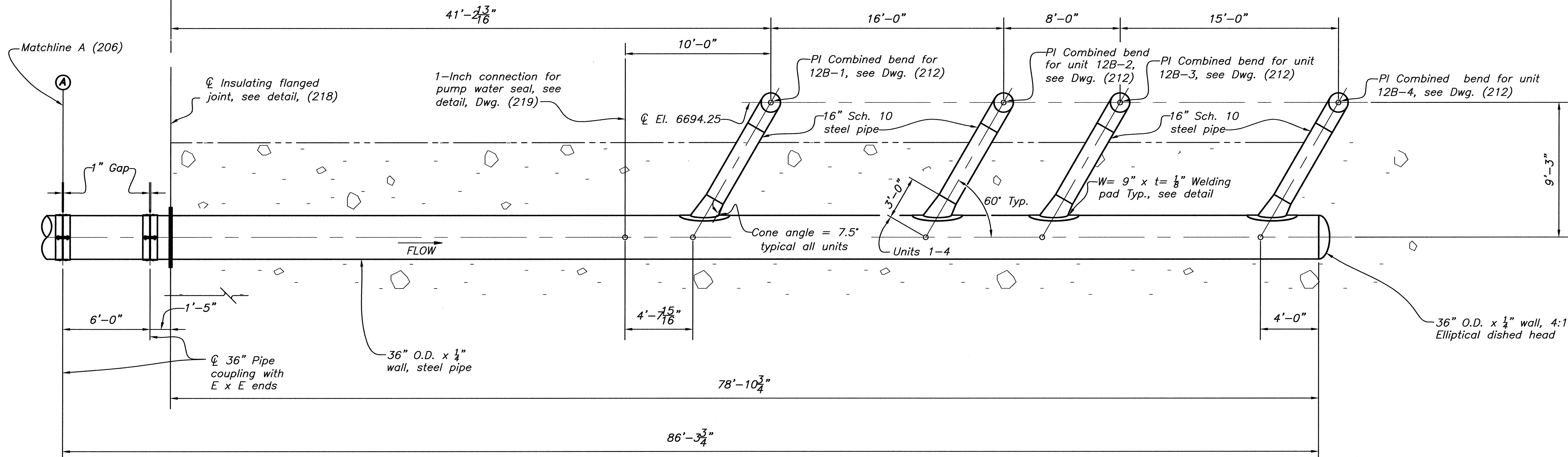
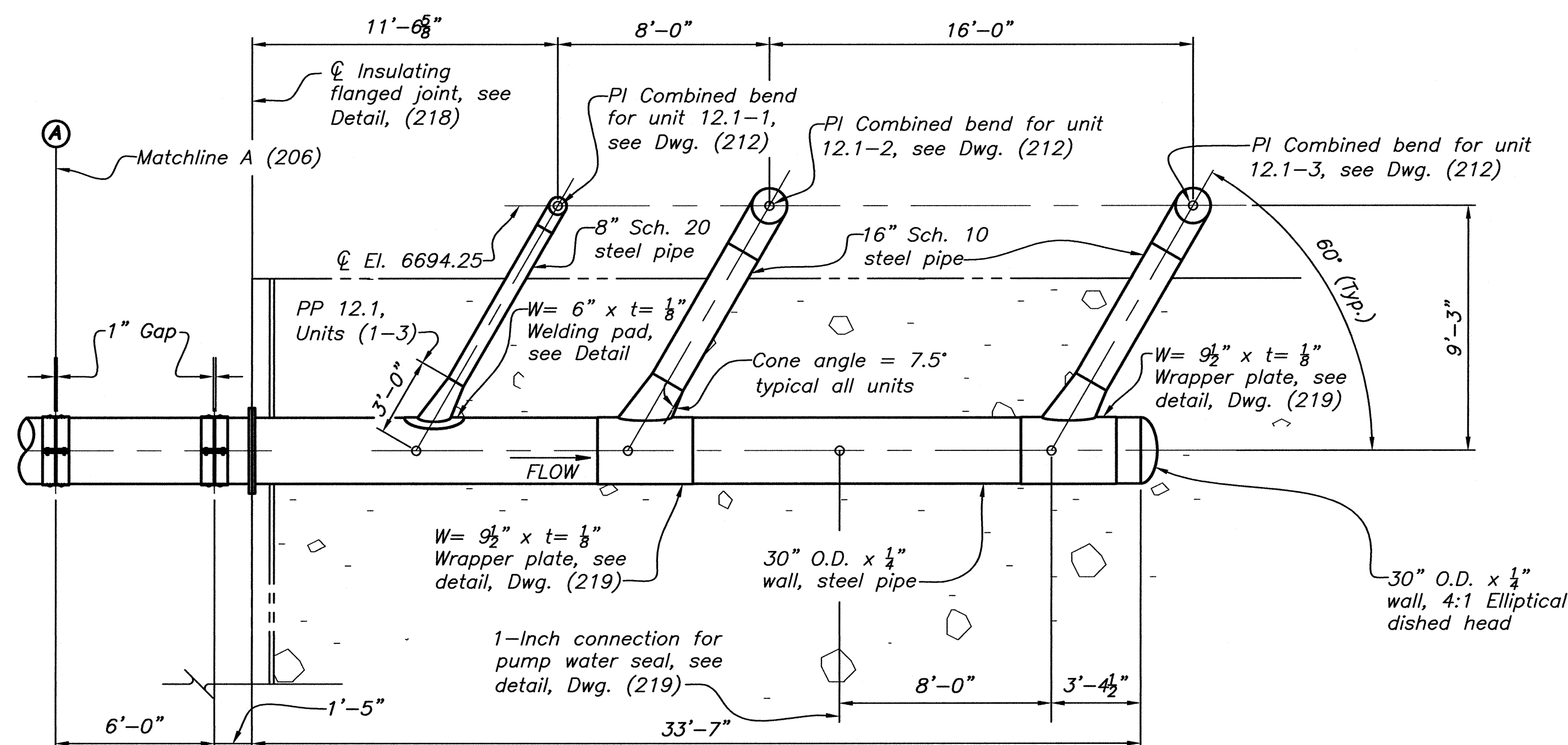
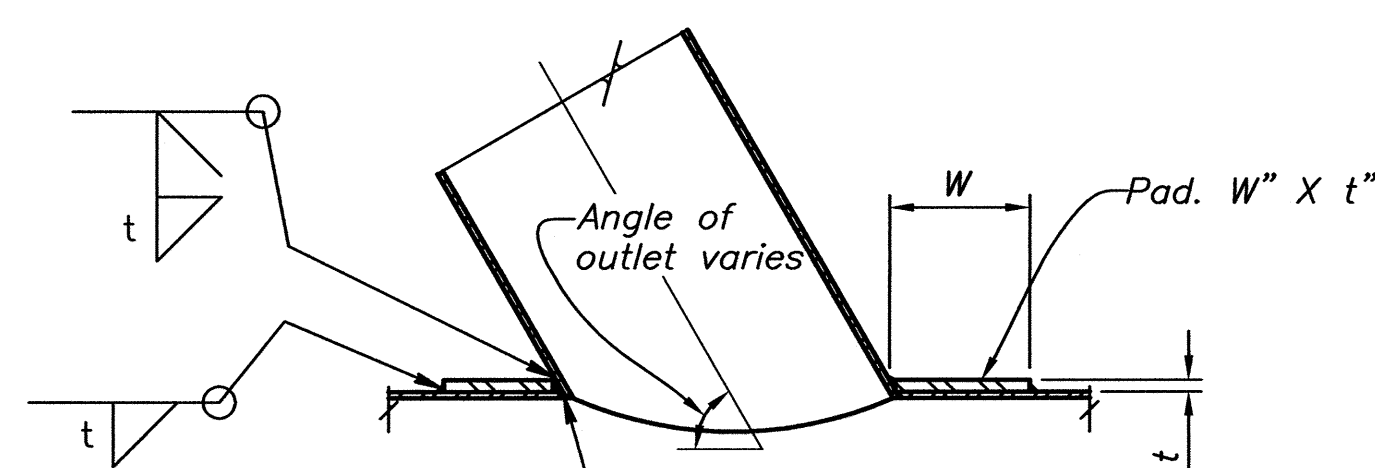
For General Notes, see Dwg. (205).

JERRY WAUGH	
DESIGNED	LUCAS ADAMS
DRAWN	NATHAN NAKAMOTO
CHECKED	JERRY WAUGH P.E.
TECH. APPR.	TERRY HUMMEL
APPROVED HYDRAULIC EQUIPMENT GROUP	
DENVER, COLORADO	2013-08

PLAN AND SECTIONS

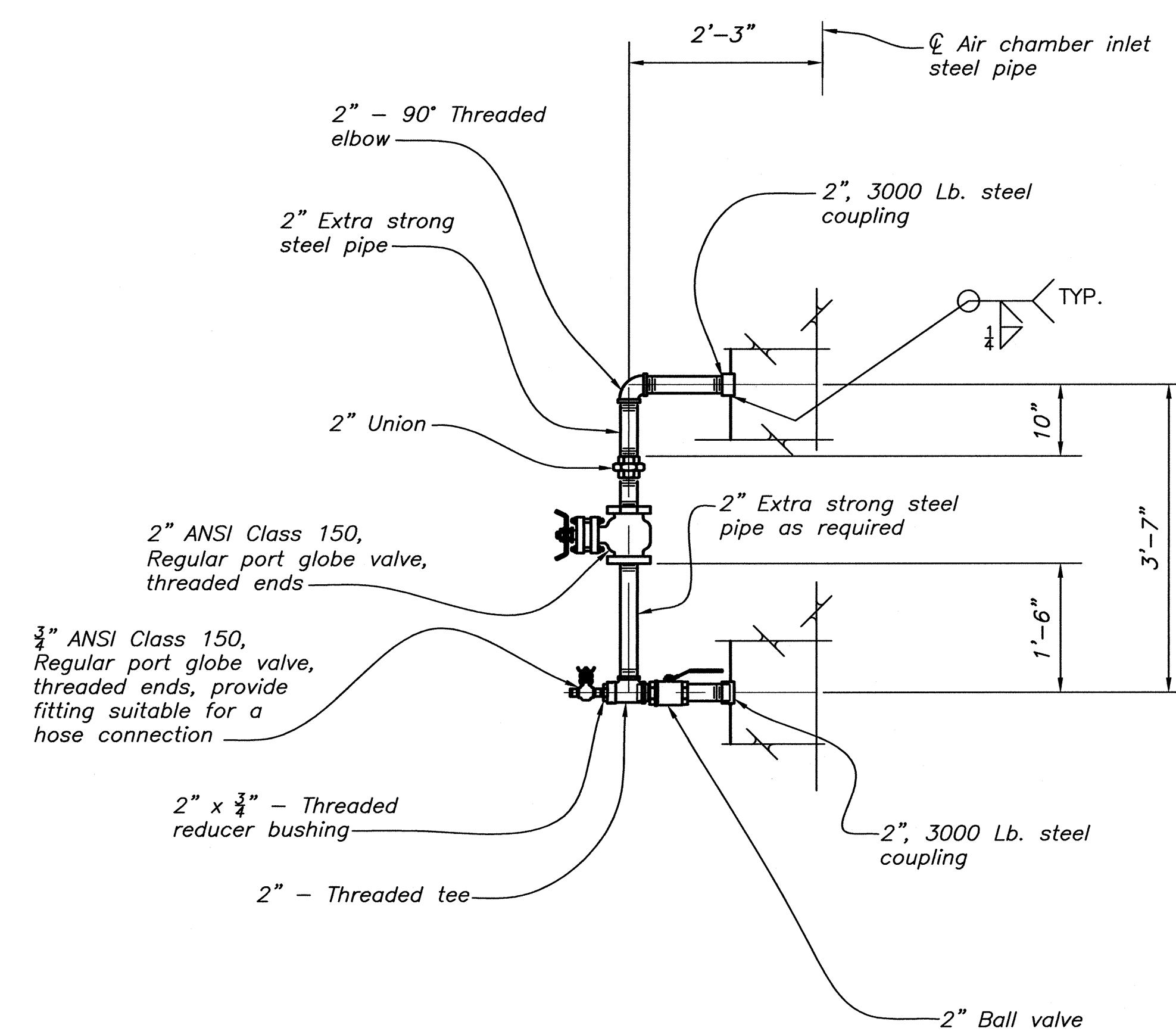
1695-D-208

SHEET 1 OF 6

SECTION C-C
(208)SECTION D-D
(208)WELDING PAD
(208, 209, 210, 211, 213)

NOTES

For General Notes, see Dwg. (205).
Welding pad and wrapper plate detail opposite for suction.

2-INCH FILL AND DRAIN LINE
(208, 220, 221)

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BUREAU OF RECLAMATION
NAVAJO GALLUP WATER SUPPLY PROJECT
NEW MEXICO

SAN JUAN LATERAL
TOHLAKAI PUMPING PLANT
STEEL MANIFOLD

SECTIONS AND DETAIL

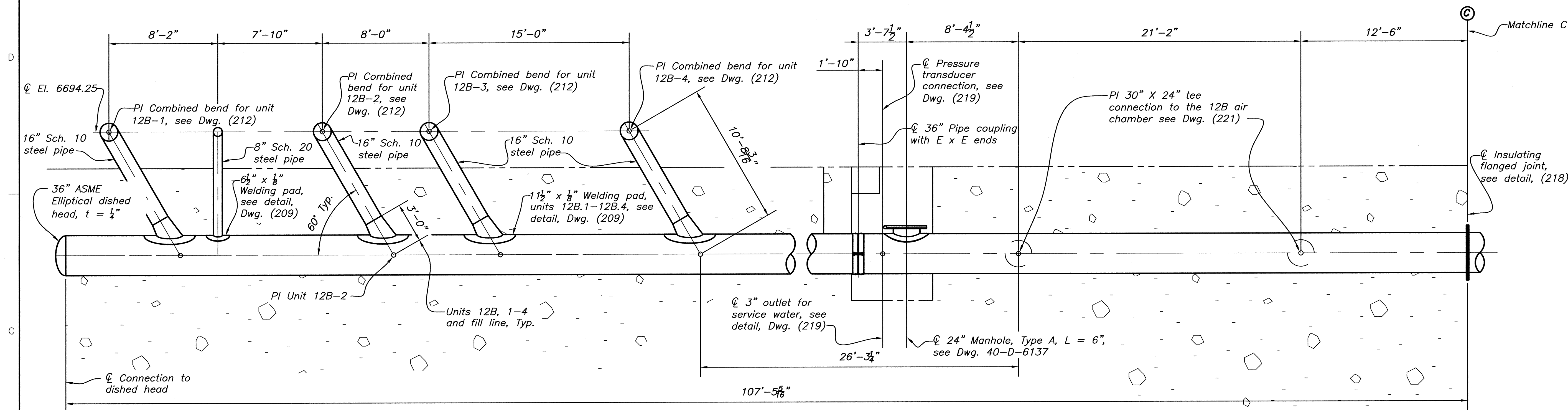
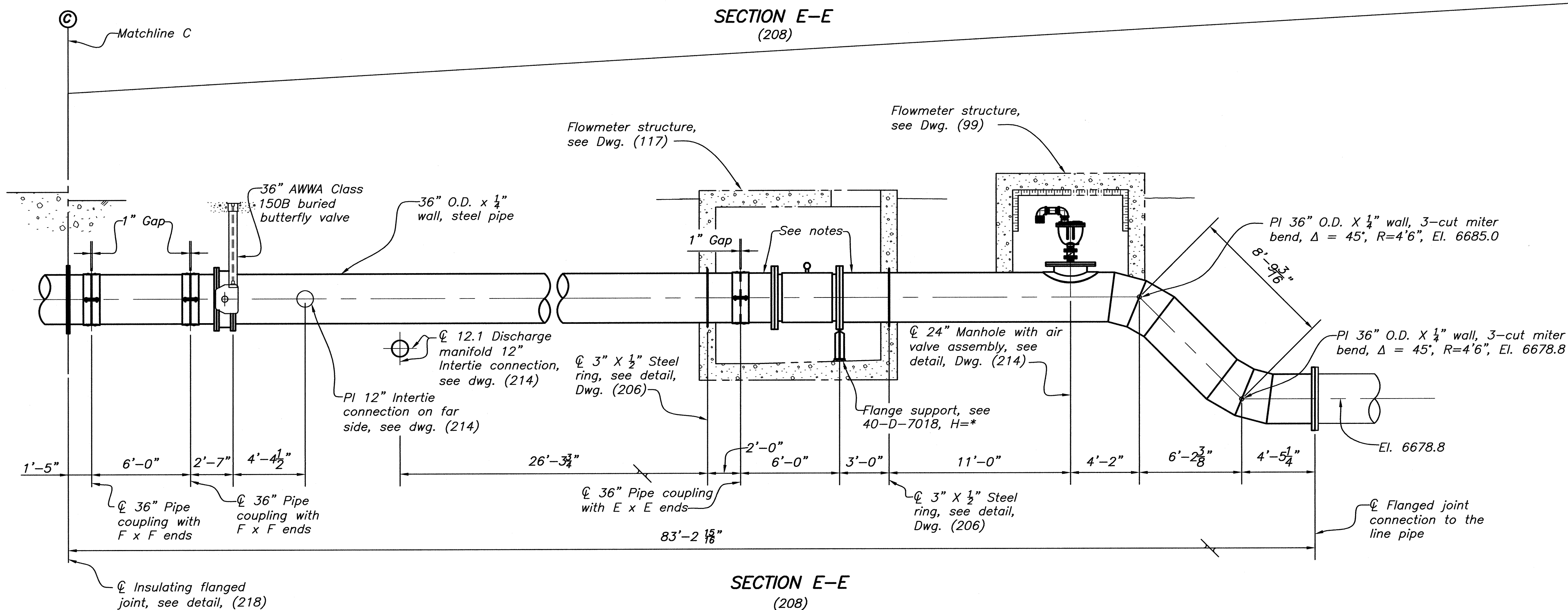
DATE: 2013-08-08
DRAWN BY: JERRY WAUGH
CHECKED BY: JERRY WAUGH
DESIGNED BY: JERRY WAUGH
APPROVED BY: TERRY HUMMEL
HYDRAULIC EQUIPMENT GROUP
DENVER, COLORADO 2013-08-02

JERRY WAUGH
DESIGNED
LUCAS ADAMS
DRAWN
NATHAN NAKAMOTO
CHECKED
JERRY WAUGH P.E.
TECH. APPR.
TERRY HUMMEL
APPROVED
HYDRAULIC EQUIPMENT GROUP
DENVER, COLORADO 2013-08-02

SECTIONS
AND DETAIL

1695-D-209

SHEET 2 OF 6

SECTION E-E
(208)SECTION E-E
(208)

NOTES

For General Notes, see Dwg. (205).
Dimensions marked with an * are to
be determined by the contractor.
Provide $\frac{1}{4}$ " wall reducer, as needed
to match I.D. of flowmeter, see
specifications.

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BUREAU OF RECLAMATION

NAVAJO GALLUP WATER SUPPLY PROJECT
NEW MEXICO

SAN JUAN LATERAL
TOHLAKAI PUMPING PLANT
STEEL MANIFOLD
SECTION

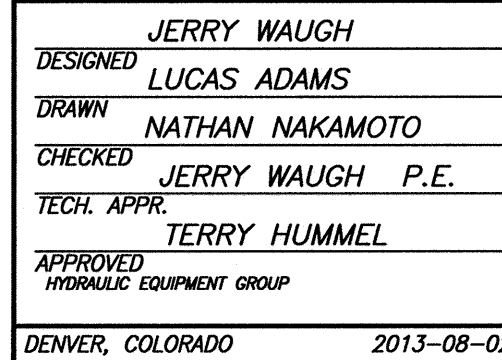
REV. NO. 2013-09-09
D. ADDED AIR VALVE AND MANHOLE.
P.E.

DESIGNED JERRY WAUGH
DRAWN LUCAS ADAMS
CHECKED NATHAN NAKAMOTO
TECH. APPR. JERRY WAUGH P.E.
APPROVED TERRY HUMMEL
HYDRAULIC EQUIPMENT GROUP
DENVER, COLORADO 2013-08-02

SECTION

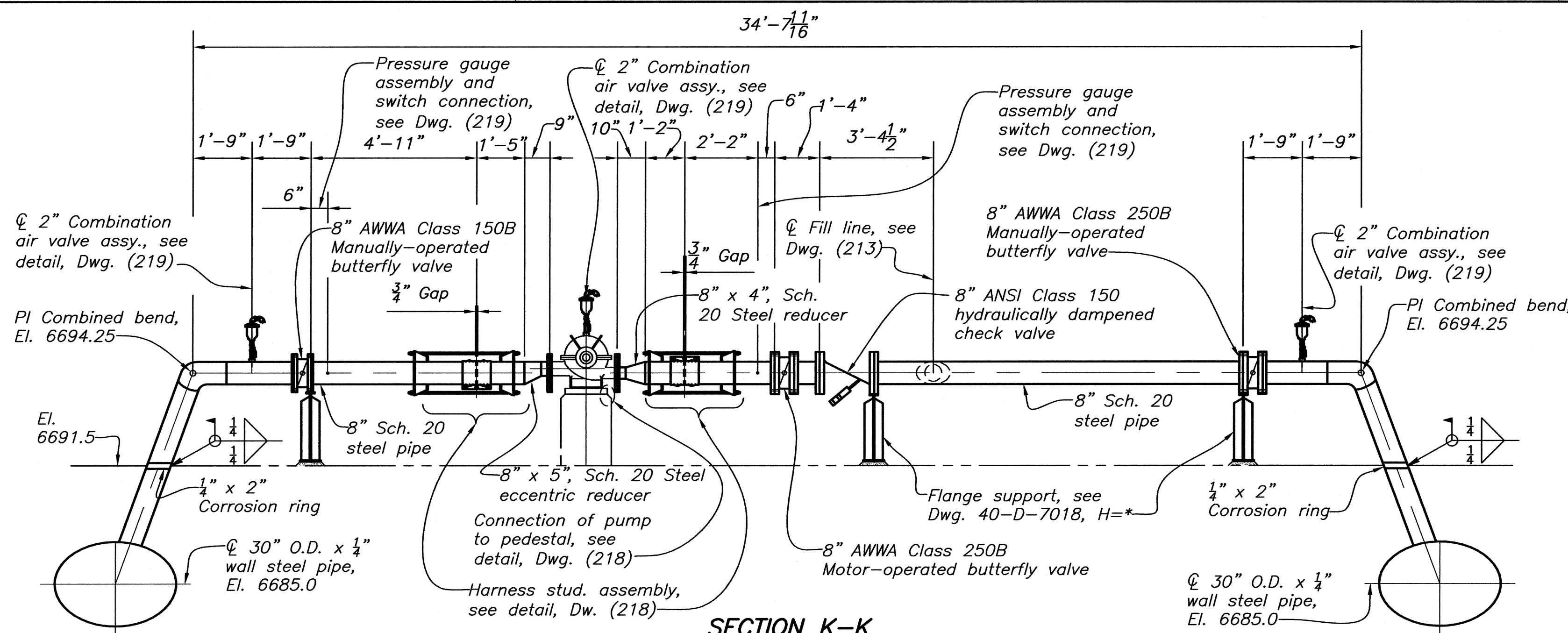
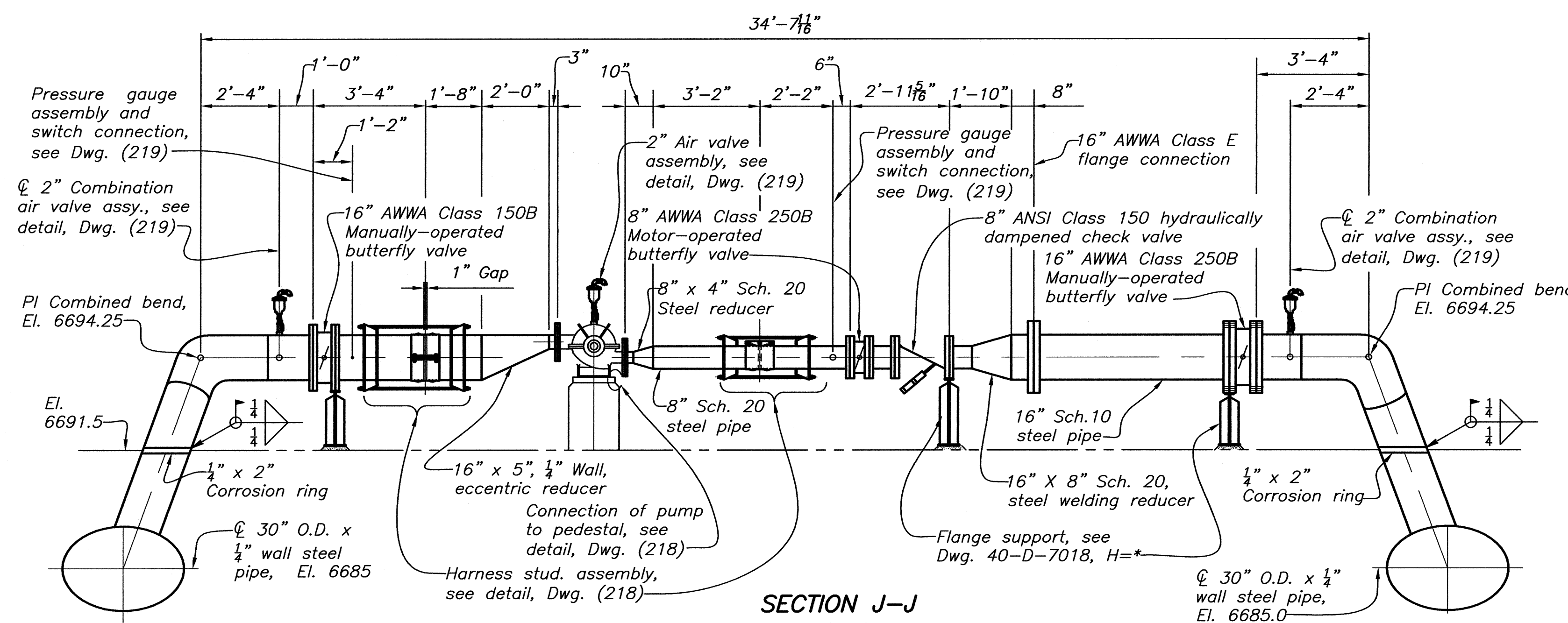
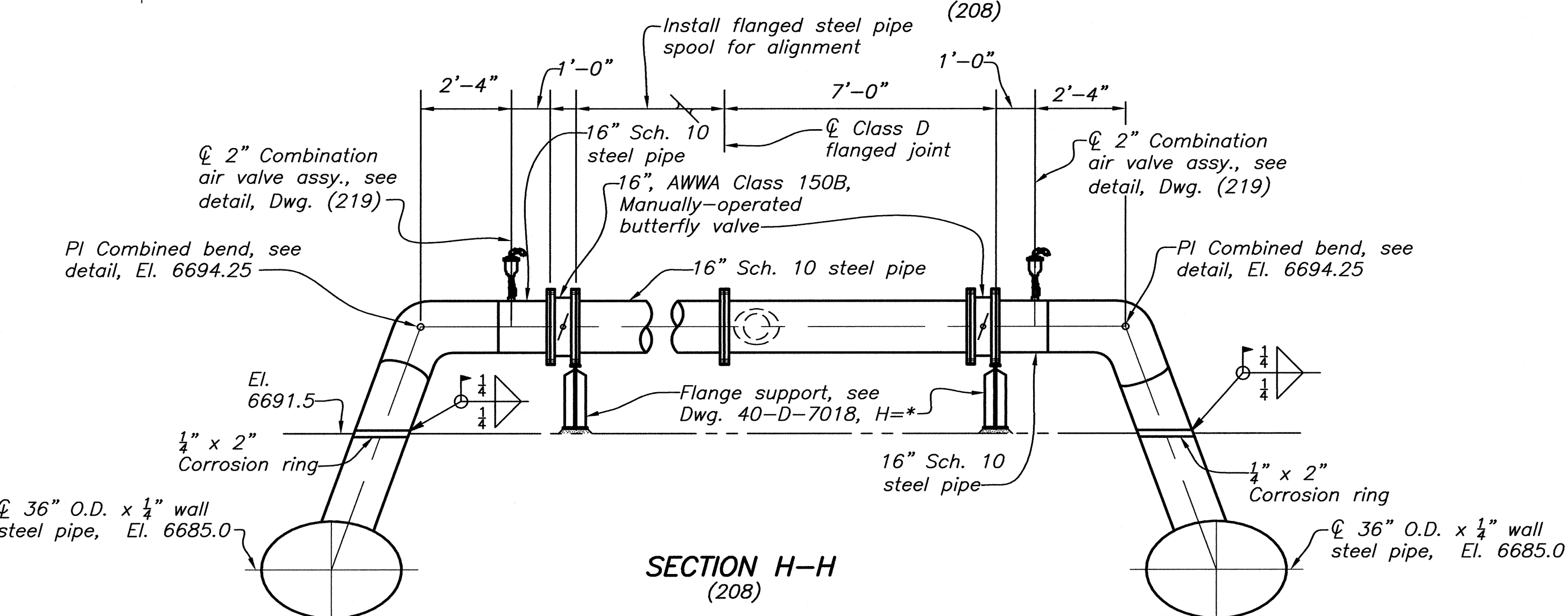
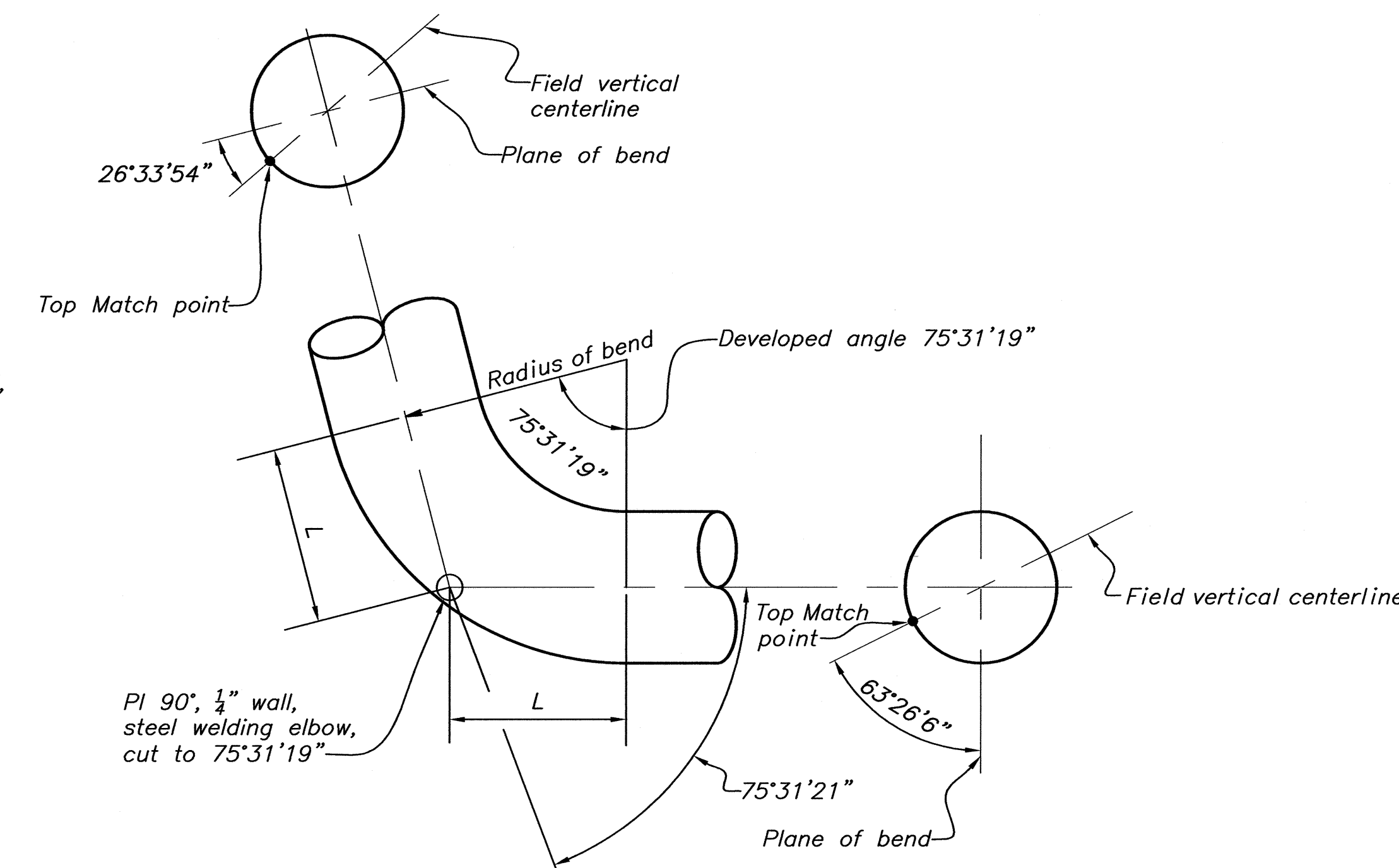
1695-D-210

SHEET 3 OF 6



For General Notes, see Dwg. (205).
Dimensions marked with an * are to
be determined by the contractor.
Provide $\frac{1}{4}$ " wall reducer, as needed
to match I.D. of flowmeter, see
specifications.

CAD SYSTEM
AutoCAD Rel. 19.0s
CAD FILENAME
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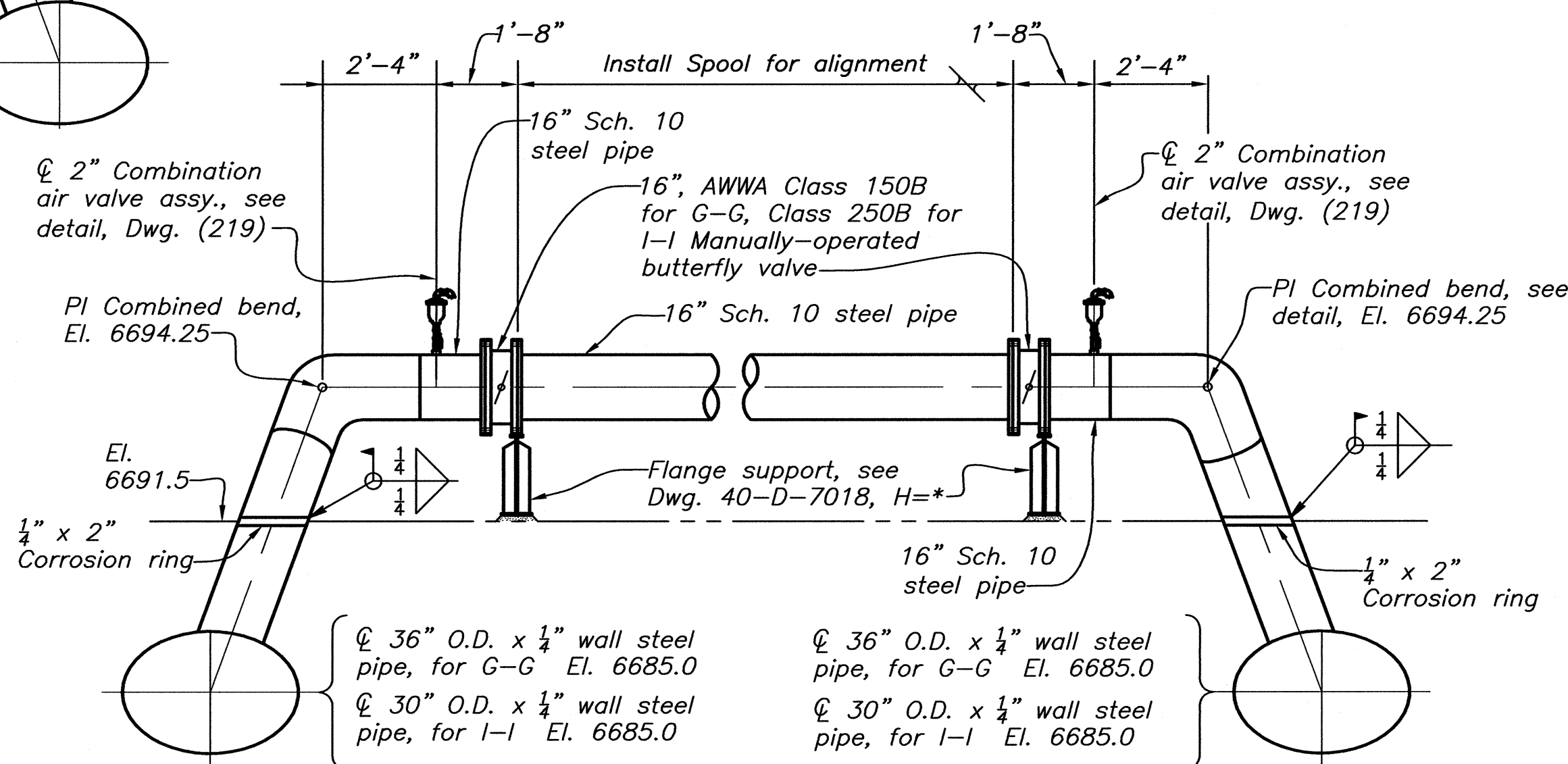
SECTION K-K
(208)SECTION J-J
(208)SECTION H-H
(208)COMBINED BEND
(208, 209, 210)

Pipe diameter	Radius of bend	L
6" Std.	9	7
8" Sch. 20	1-0	9 7/8
12" Sch. 20	1-6	1-2
16" Sch. 10	2-0	1-6 7/8

NOTE: This detail is for the combined bends on the discharge side of the manifolds, the detail for the suction side of the manifolds is similar but opposite hand.

NOTES

For General Notes, see Dwg. (205).
Dimensions marked with an * are to be determined by the contractor.
Concrete encasement not shown.

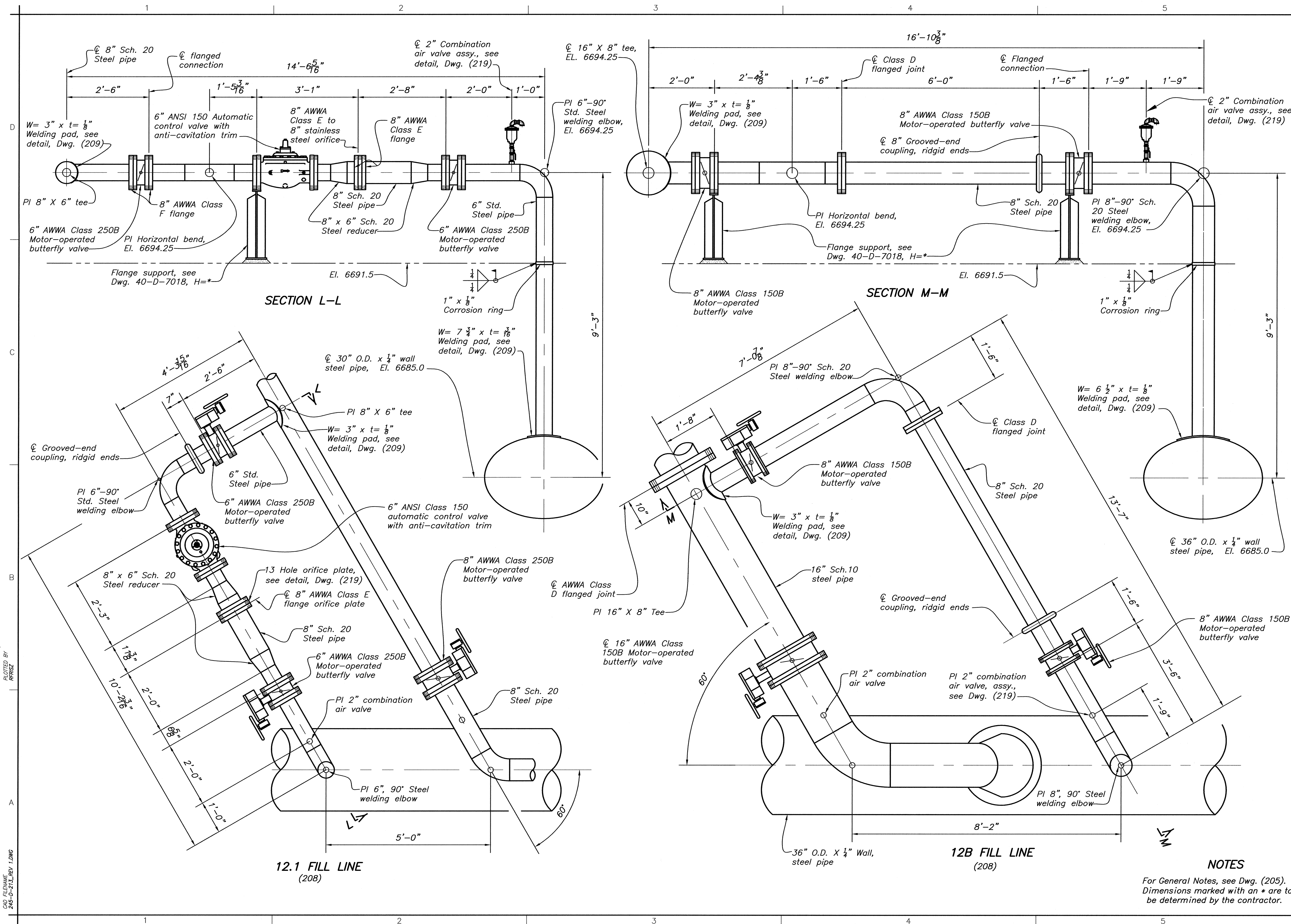
SECTION G-G
(SECTION I-I SIMILAR EXCEPT AS NOTED)
(208)

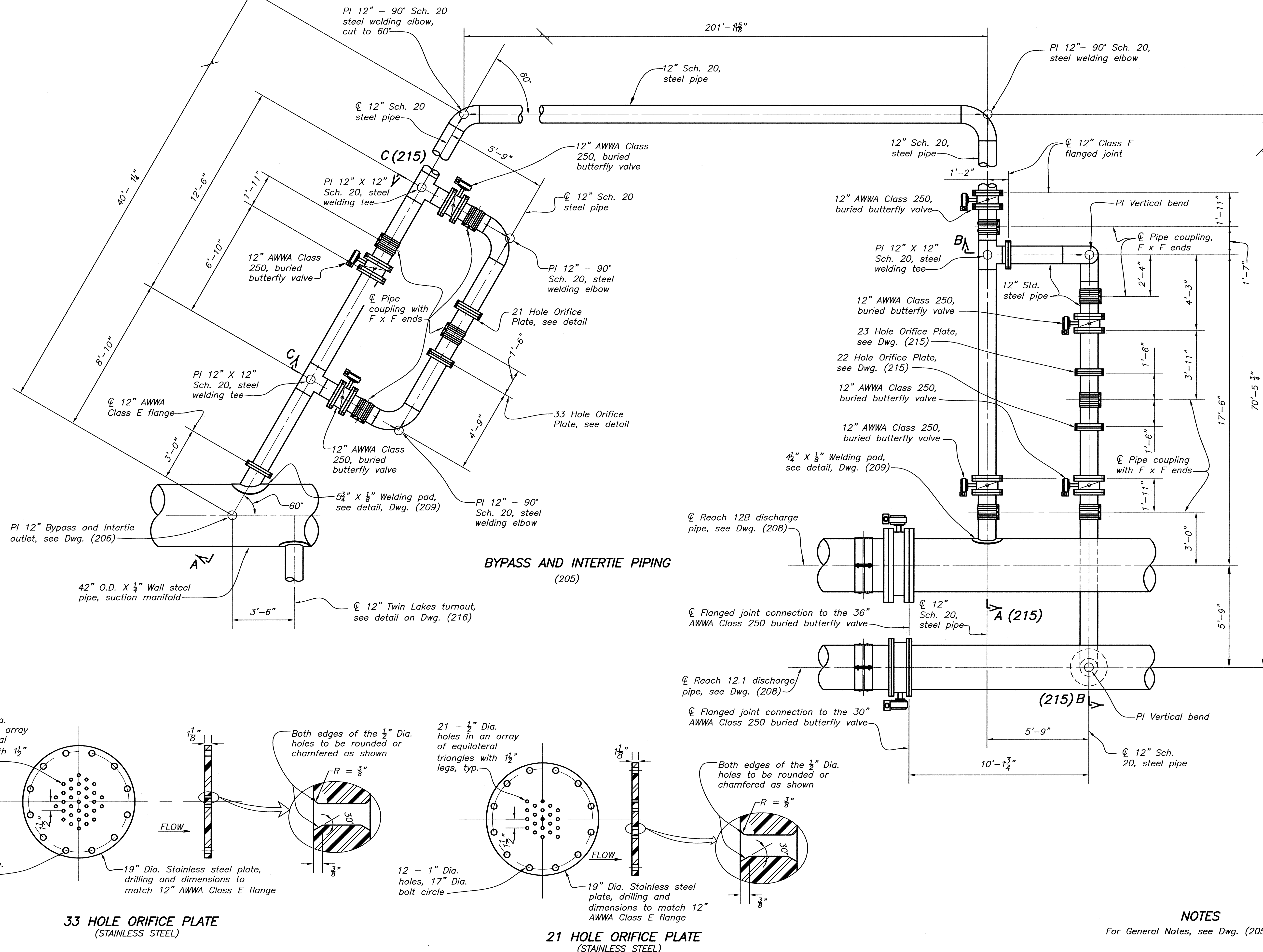
DESIGNED JERRY WAUGH
 DRAWN LUCAS ADAMS
 CHECKED NATHAN NAKAMOTO
 TECH. APPR. JERRY WAUGH P.E.
 APPROVED TERRY HUMMEL
 HYDRAULIC EQUIPMENT GROUP
 DENVER, COLORADO 2013-08-02

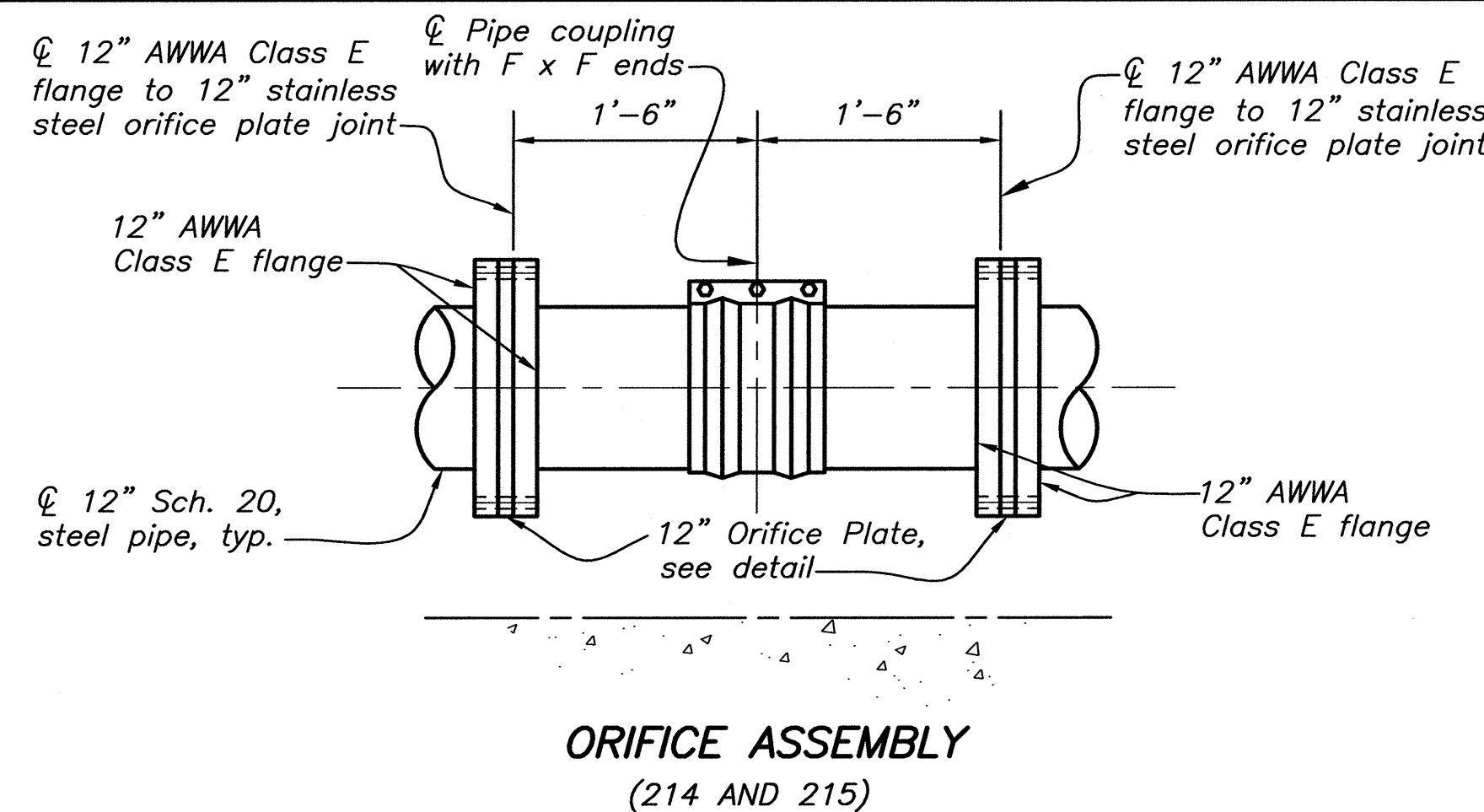
PLANS AND SECTIONS

1695-D-213

SHEET 6 OF 6

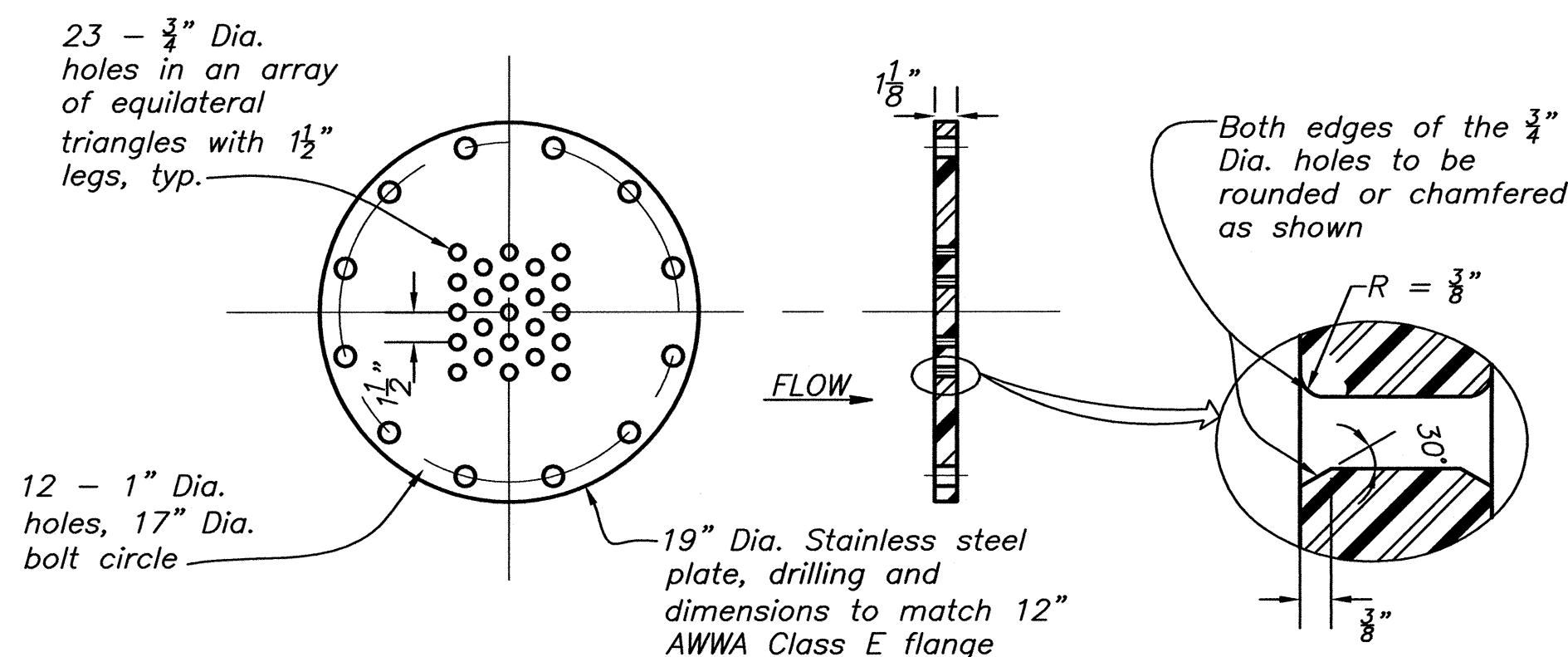


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RFR/SZCAD SYSTEM
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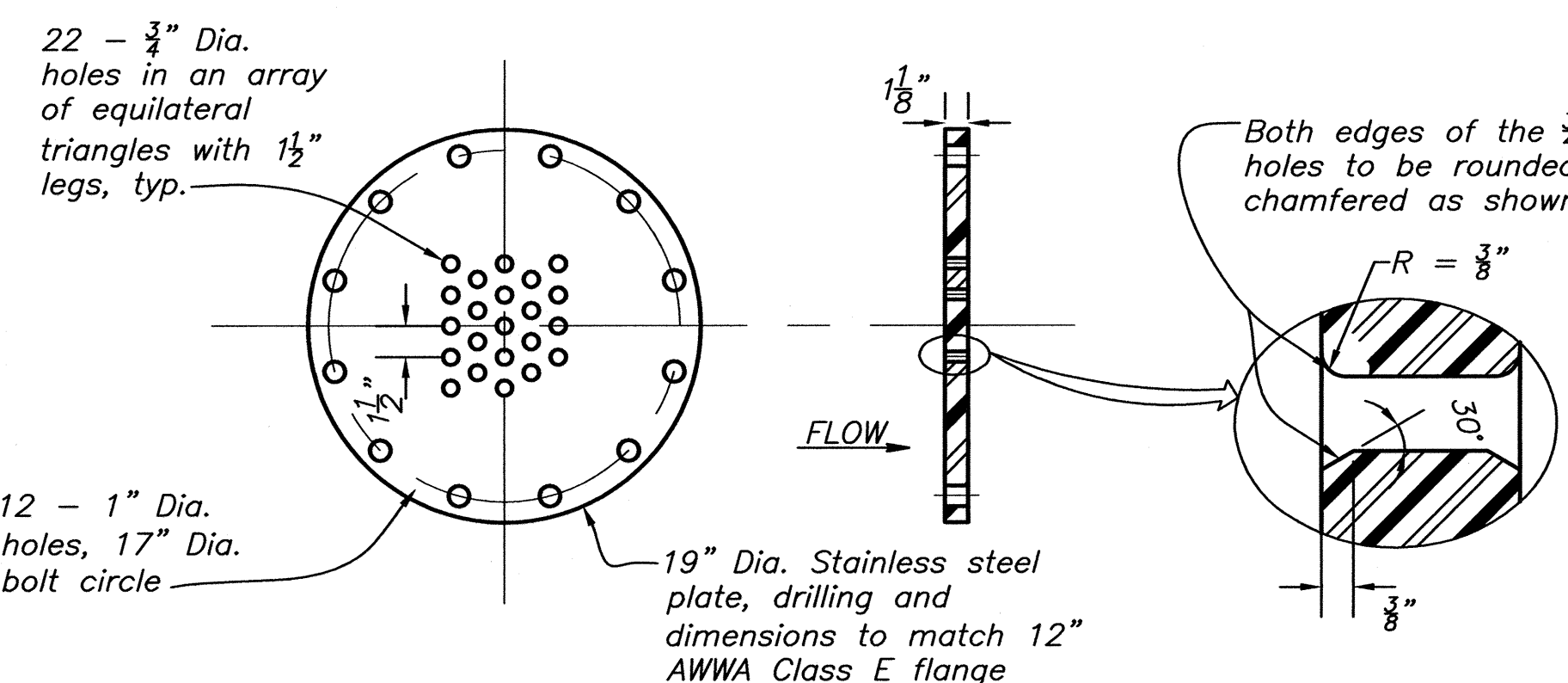


ORIFICE ASSEMBLY

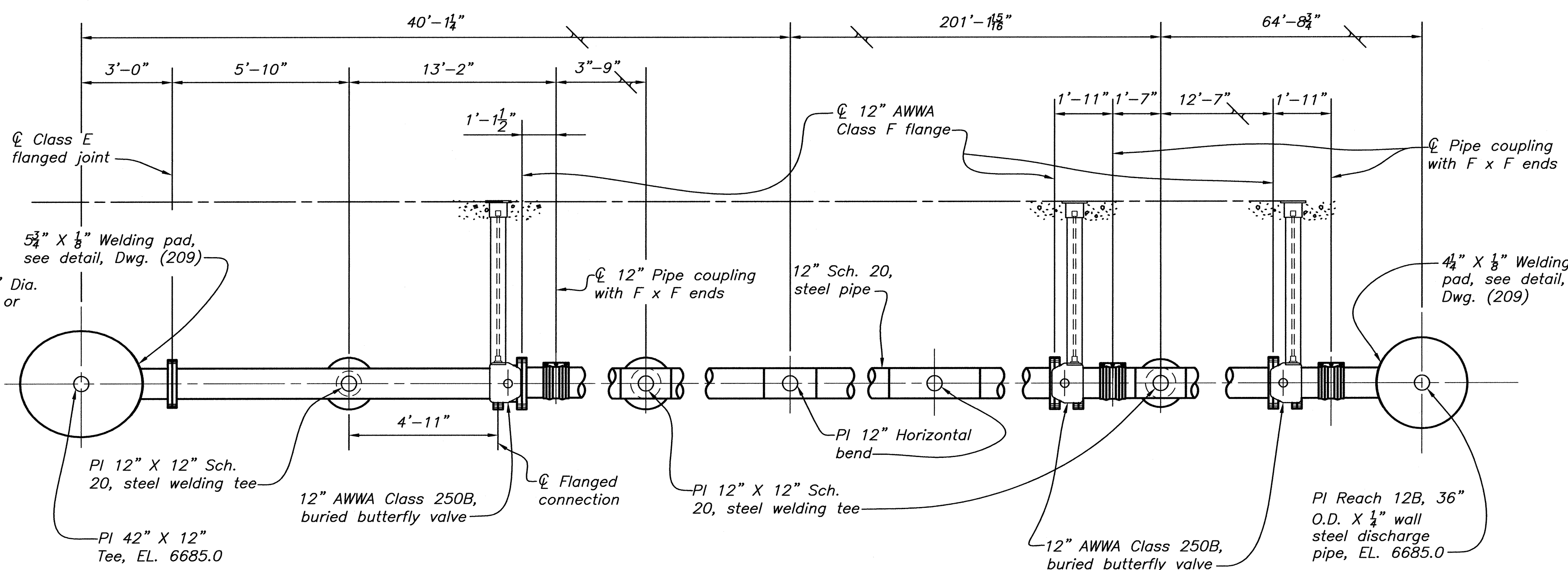
(214 AND 215)



23 HOLE ORIFICE PLATE
(STAINLESS STEEL)
(214)



22 HOLE ORIFICE PLATE
(STAINLESS STEEL)
(214)



SECTION A-A
(214)

NOTES
For General Notes, see Dwg. (205)

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NAVAJO GALLUP WATER SUPPLY PROJECT
BUREAU OF RECLAMATION

SAN JUAN LATERAL
NEW MEXICO
TOHLAKAI PUMPING PLANT
STEEL MANIFOLD — BYPASS AND INTERTIE
SECTIONS AND DETAILS

REV NO	2013-09-09	0	MINOR REVISIONS
--------	------------	---	-----------------

JERRY WAUGH	
DESIGNED	LUCAS ADAMS
DRAWN	NATHAN NAKAMOTO
CHECKED	JERRY WAUGH P.E.
TECH. APPR.	TERRY HUMMEL
APPROVED HYDRAULIC EQUIPMENT GROUP	
DENVER, COLORADO	2013-08

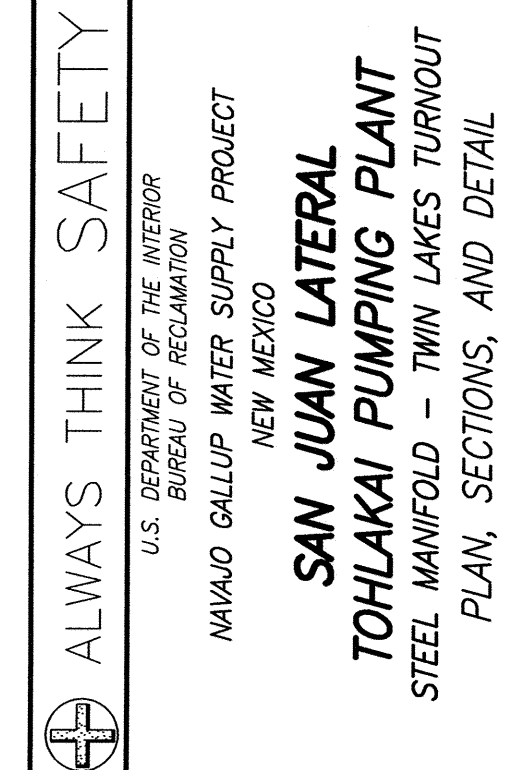
SECTIONS AND DETAILS

1695-D-215

SHEET 2 OF 2

DATE AND TIME PLOTTED
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PLOTTED BY
RFRISZ

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CAD FILENAME
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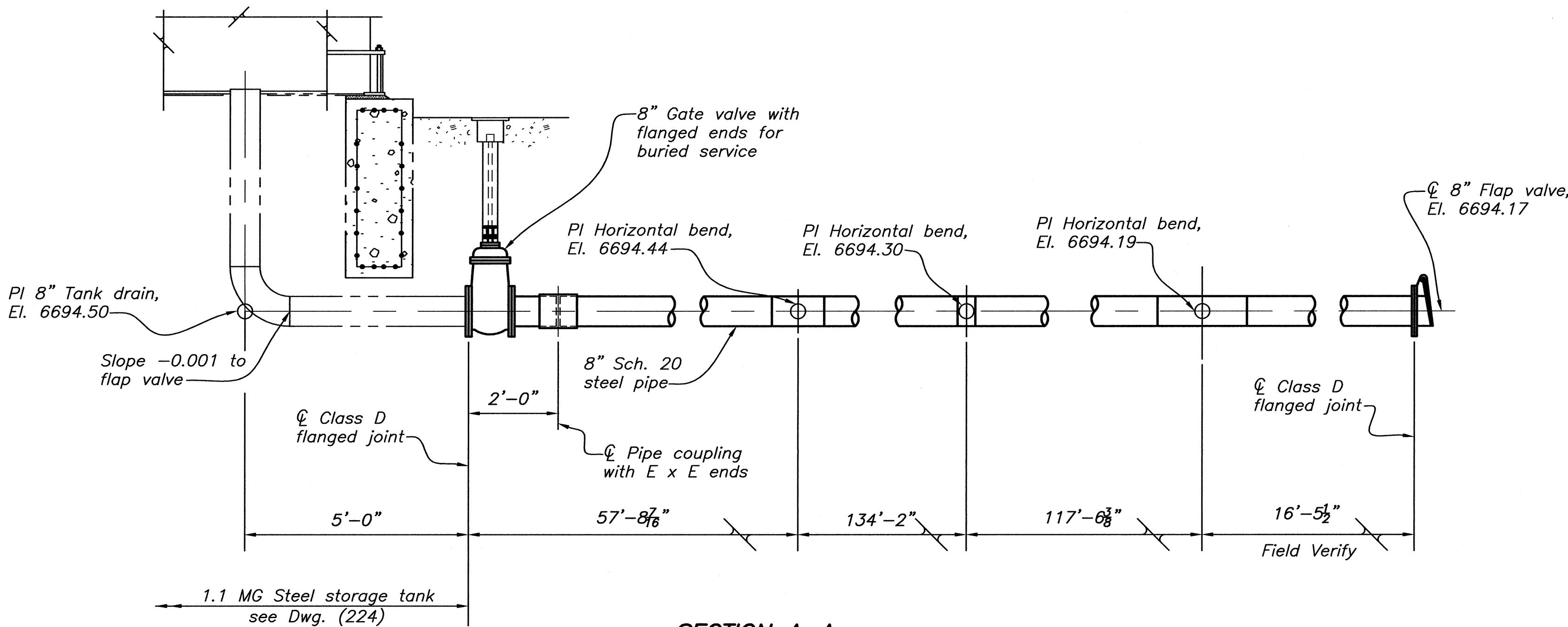


JERRY WAUGH	
DESIGNED	LUCAS ADAMS
DRAWN	NATHAN NAKAMOTO
CHECKED	JERRY WAUGH P.E.
TECH. APPR.	TERRY HUMMEL
APPROVED HYDRAULIC EQUIPMENT GROUP	
DENVER, COLORADO	2013-08-02

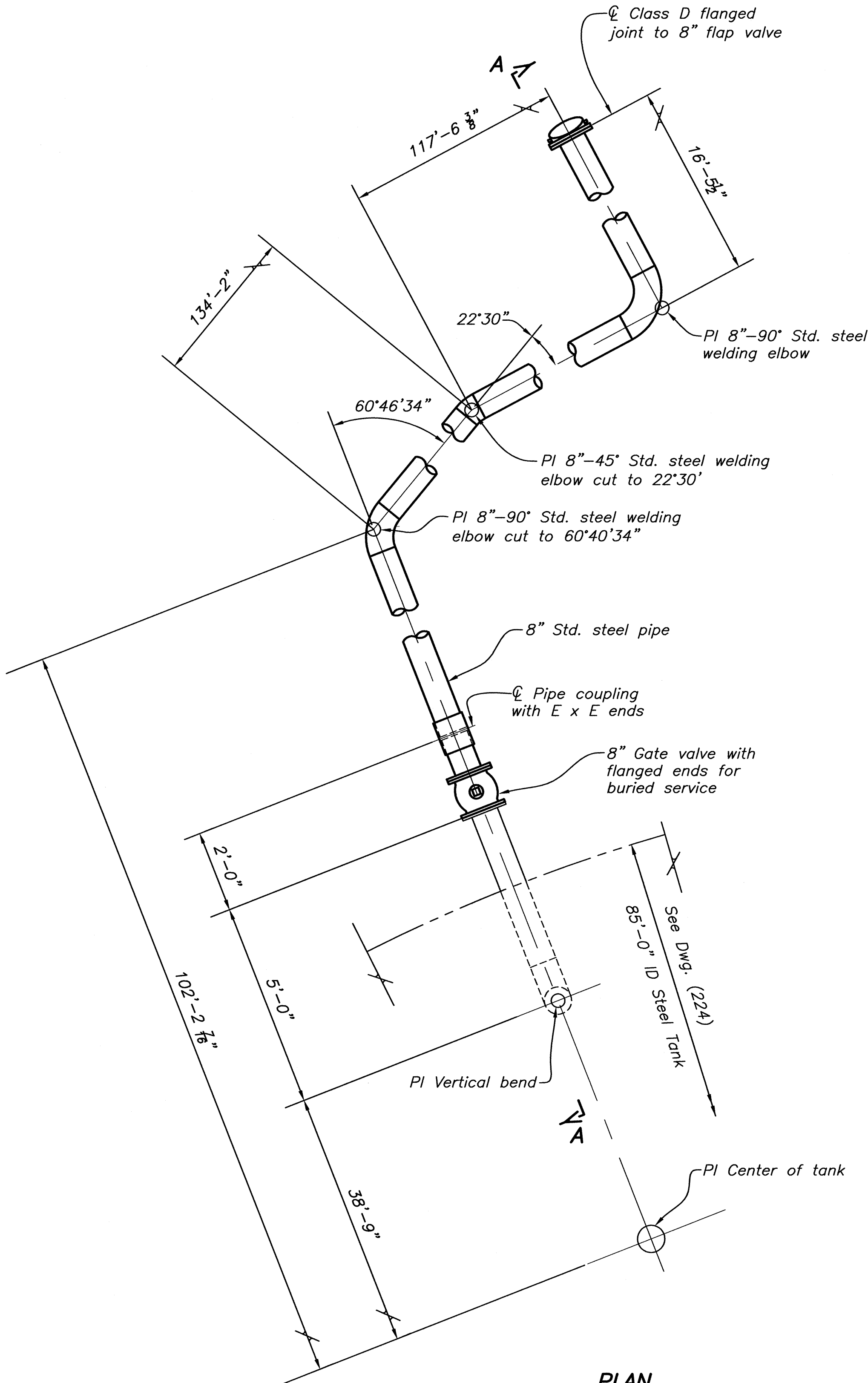
PLAN, SECTIONS, AND DETAIL

1695-D-216

SHEET 1 OF 1



SECTION A-A



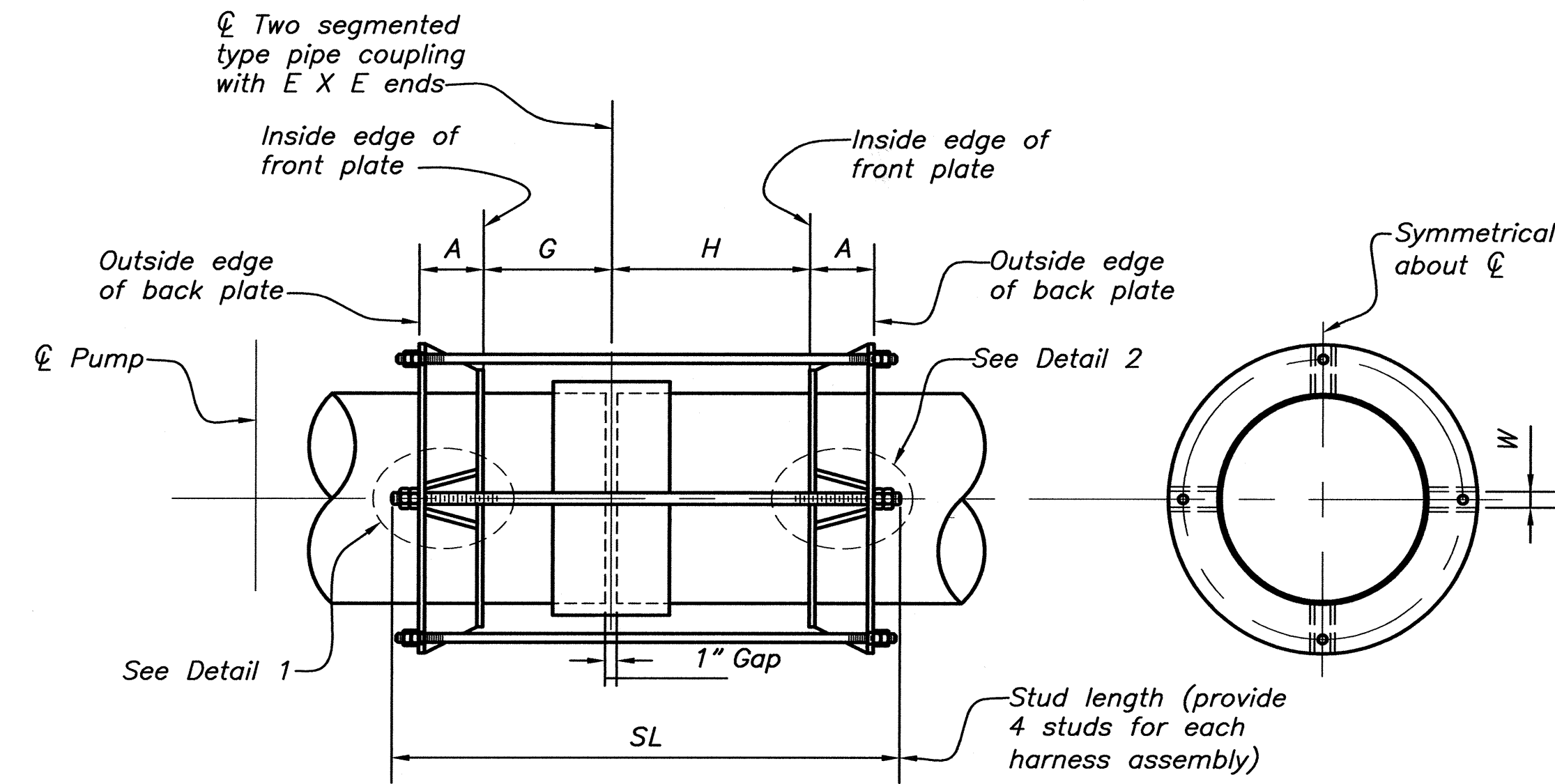
PLAN
(1.1 MG STEEL STORAGE TANK DRAIN PIPE)
(205)

NOTES

For General Notes, see Dwg. (205).

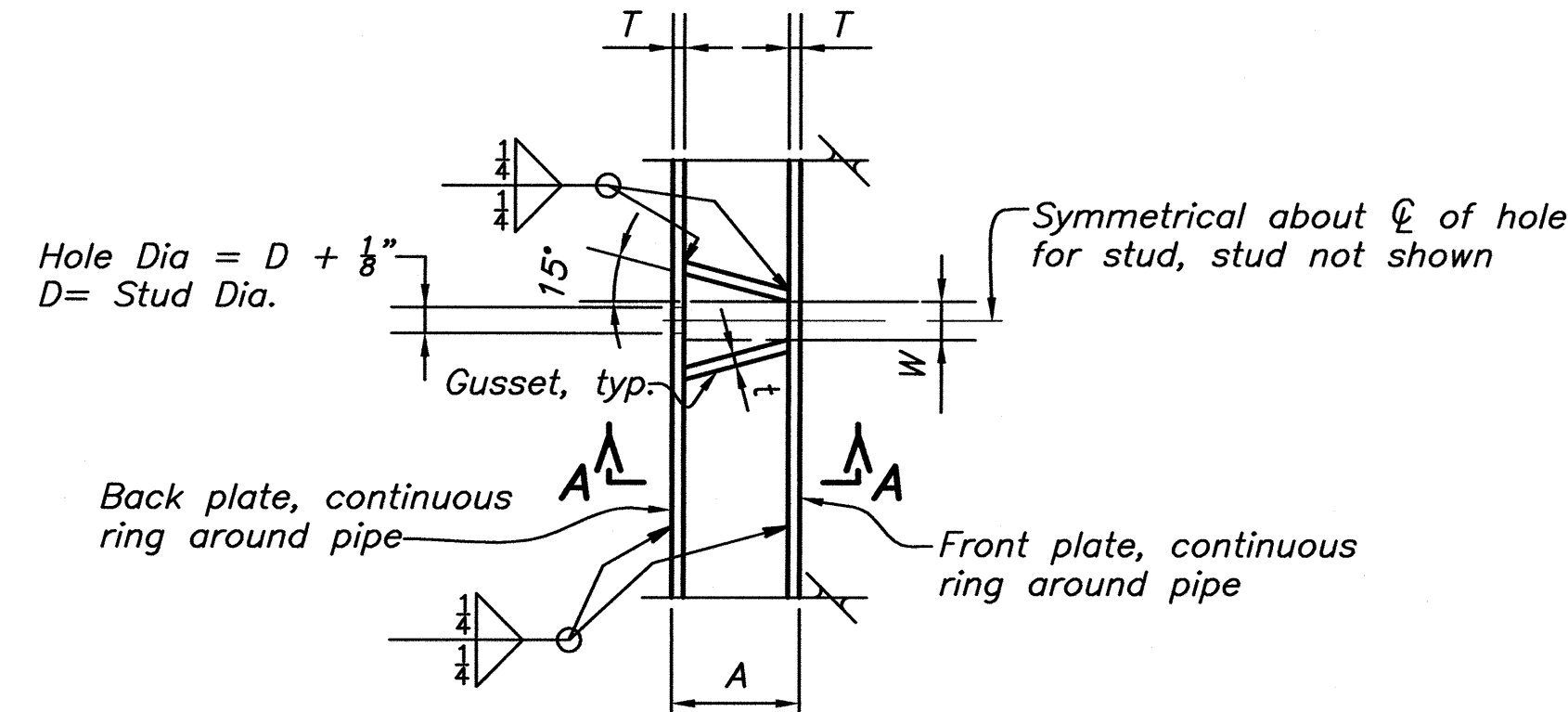
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RPR/SZ

CAD SYSTEM
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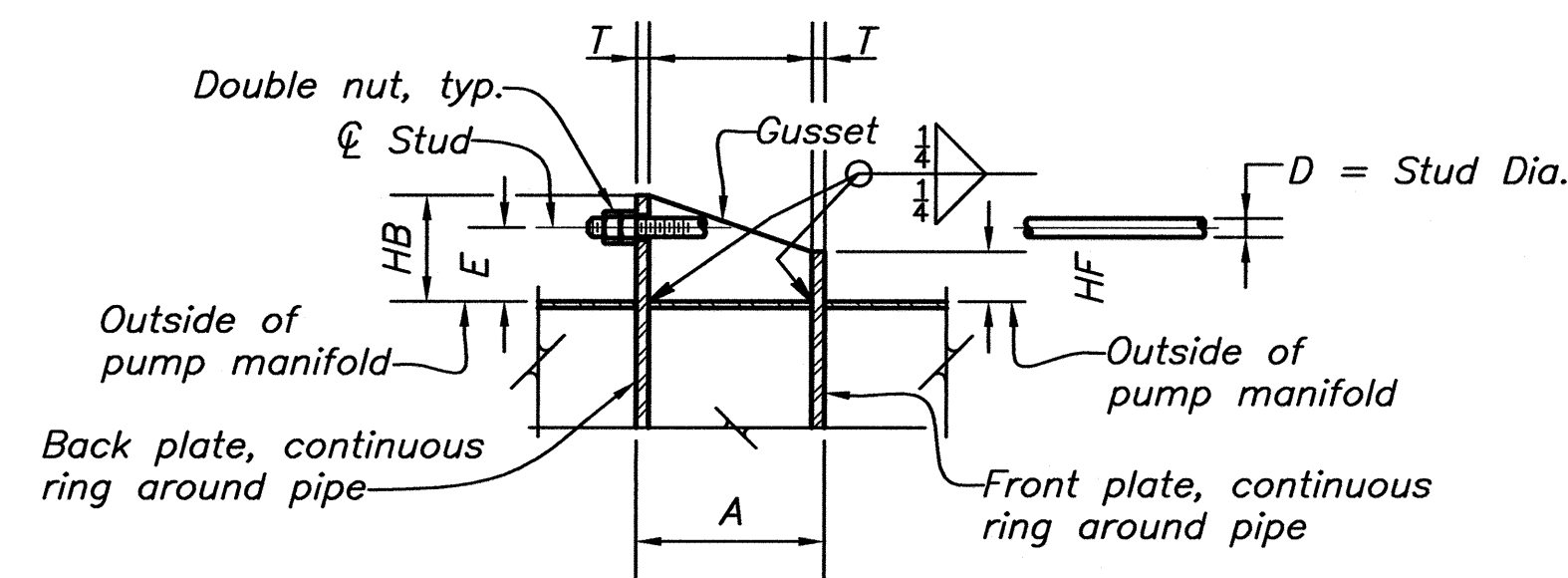
HARNESS STUD ASSEMBLY
(212)

PUMPING PLANT (Pressure Class)	UNIT NO. (Pipe Dia.)	A	G	H	HB	HF	E	SL	D	T	W
Suction (50 psi)	12.1-1 (8 inch)	5"	8"	12"	3/8"	2"	3"	35"	5/8"	3/8"	1 3/8"
	12.1-2 (16 inch)	5"	8"	12"	3/8"	2"	3"	35"	5/8"	3/8"	1 3/8"
Discharge (250 psi)	12.1-1 (8 inch)	5"	8"	12"	3/8"	2"	3"	35"	5/8"	3/8"	1 3/8"
	12.1-2 (8 inch)	5"	8"	12"	3/8"	2"	3"	35"	5/8"	3/8"	1 3/8"

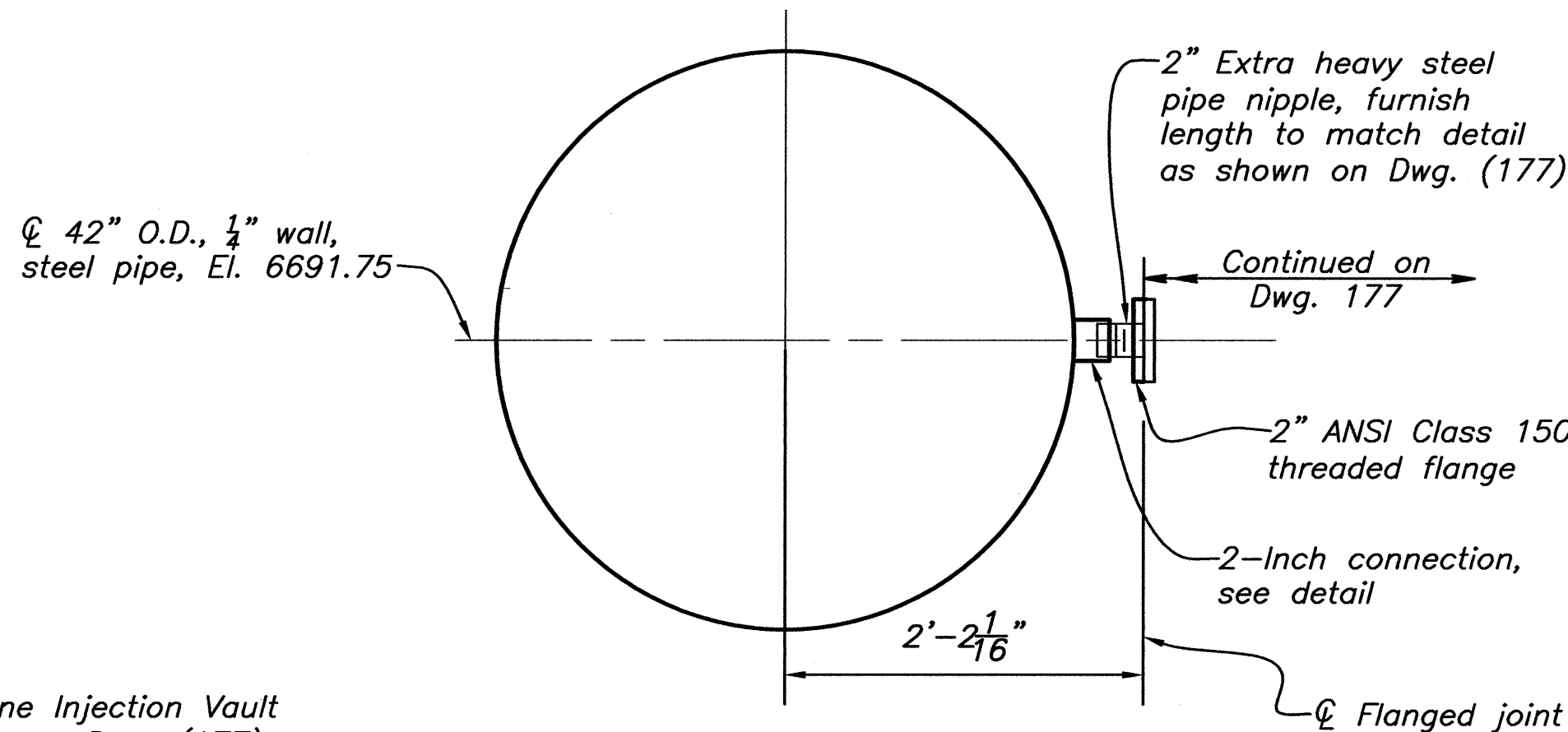


DETAIL 1

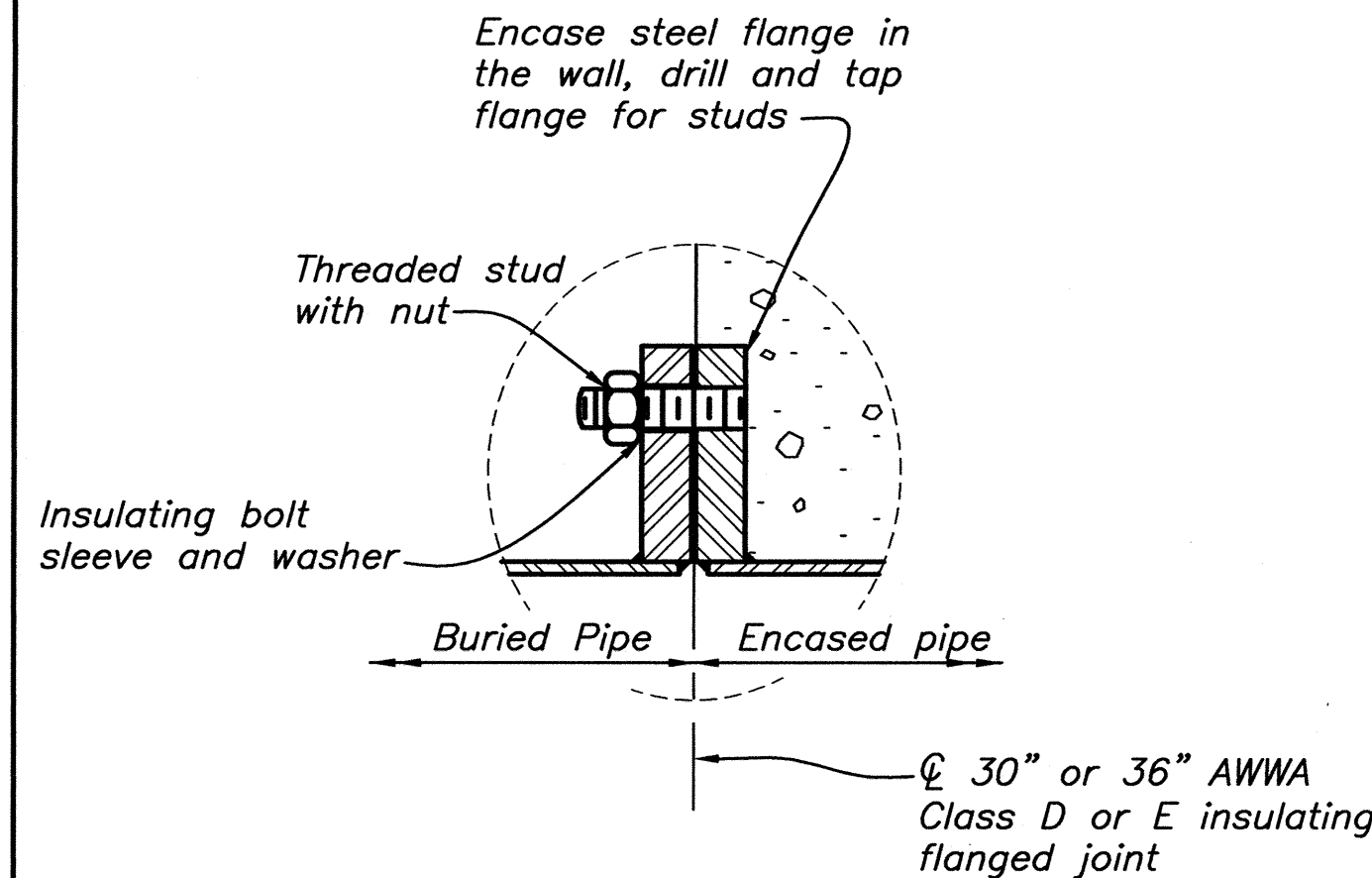
(DETAIL 2 SIMILAR, OPPOSITE HAND)



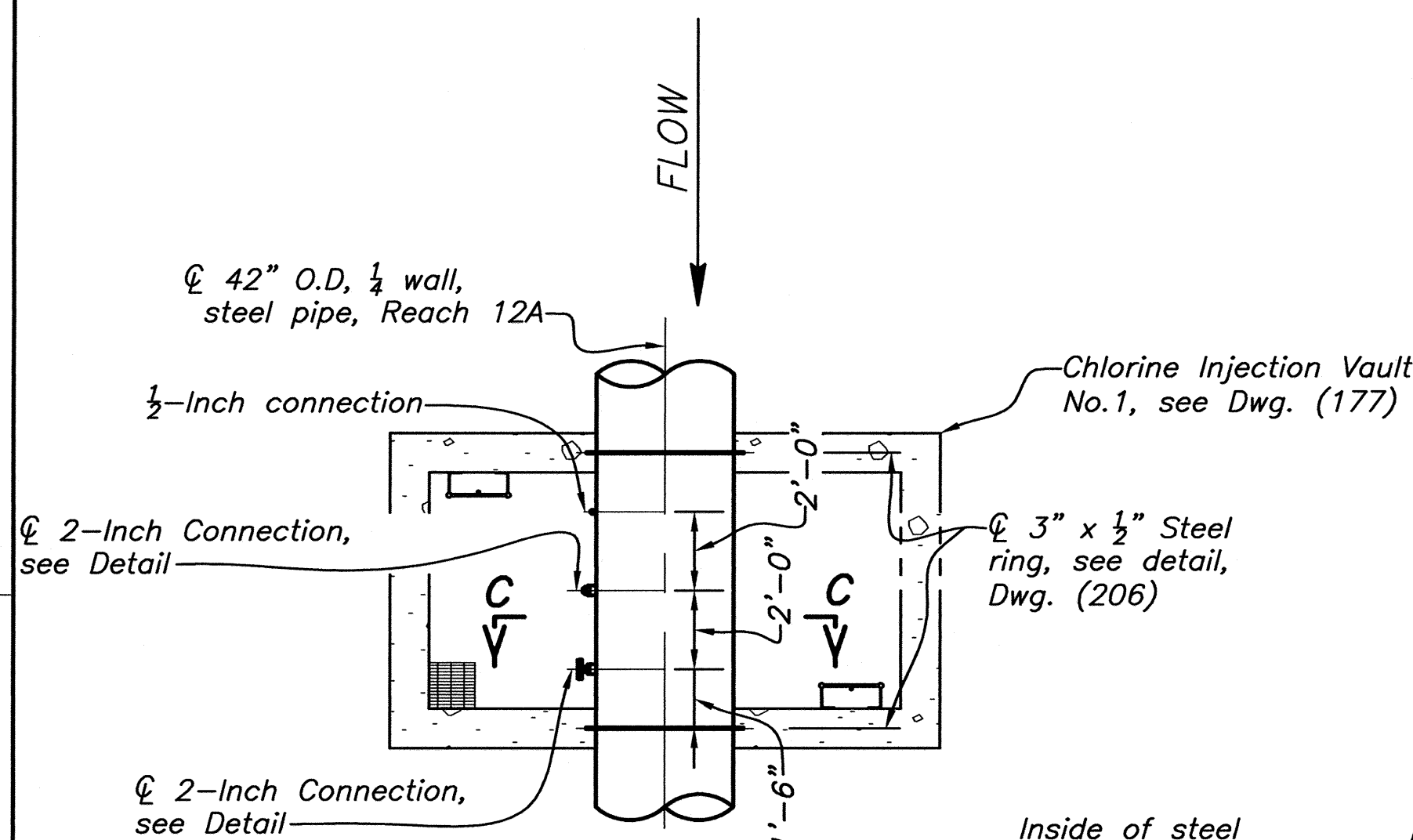
SECTION A-A



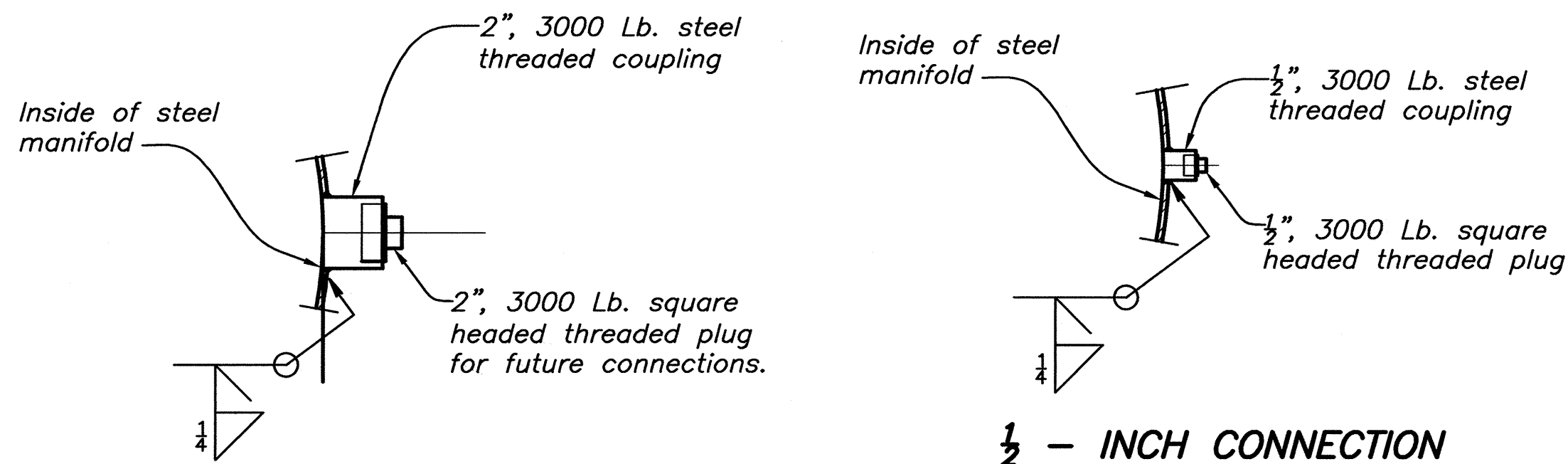
SECTION C-C
(CHLORINE INJECTION VAULT NO.1)



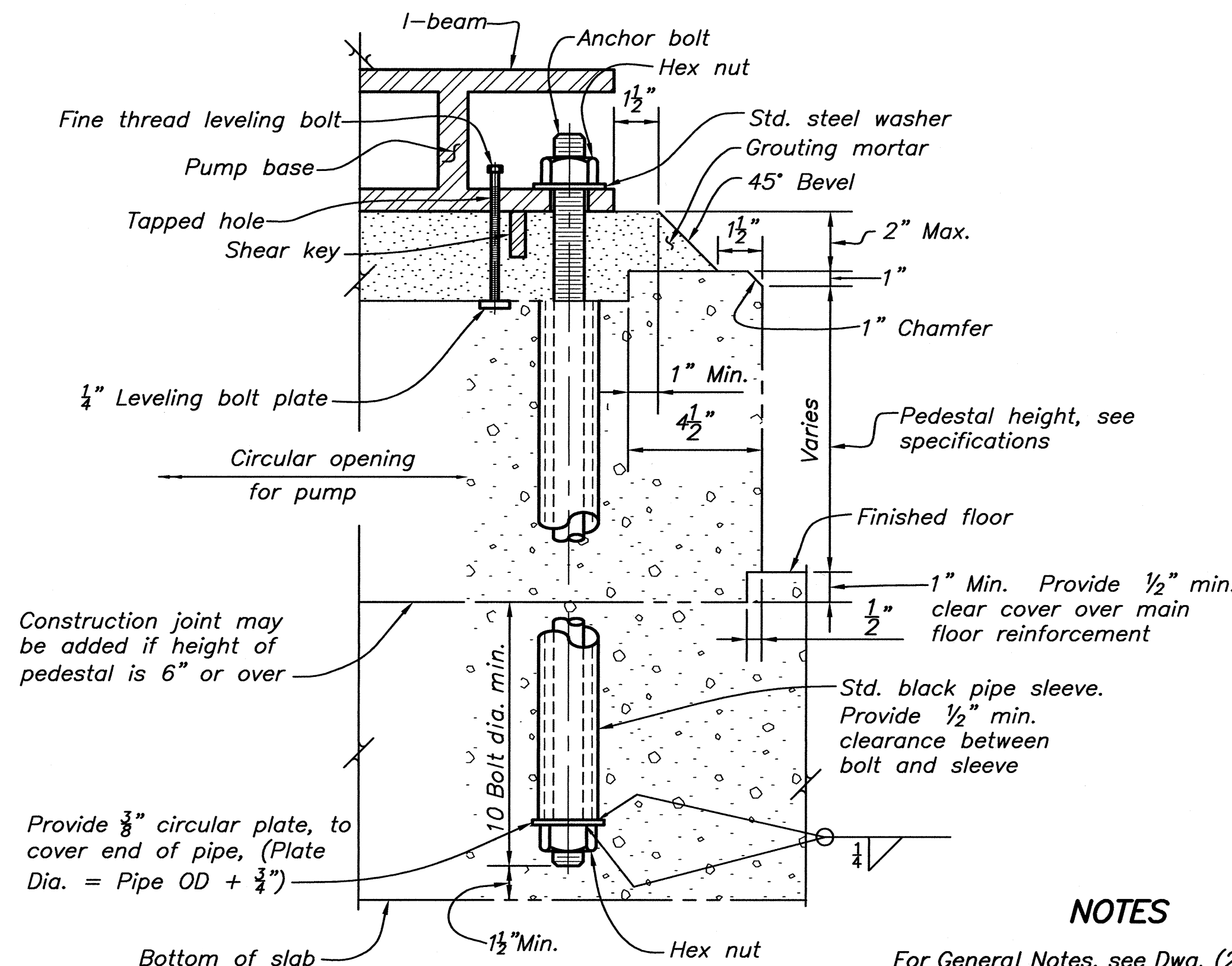
INSULATING FLANGE JOINT
(209, 210, 211)



PLAN - CHLORINE INJECTION VAULT NO. 1
(206)



2 - INCH CONNECTION

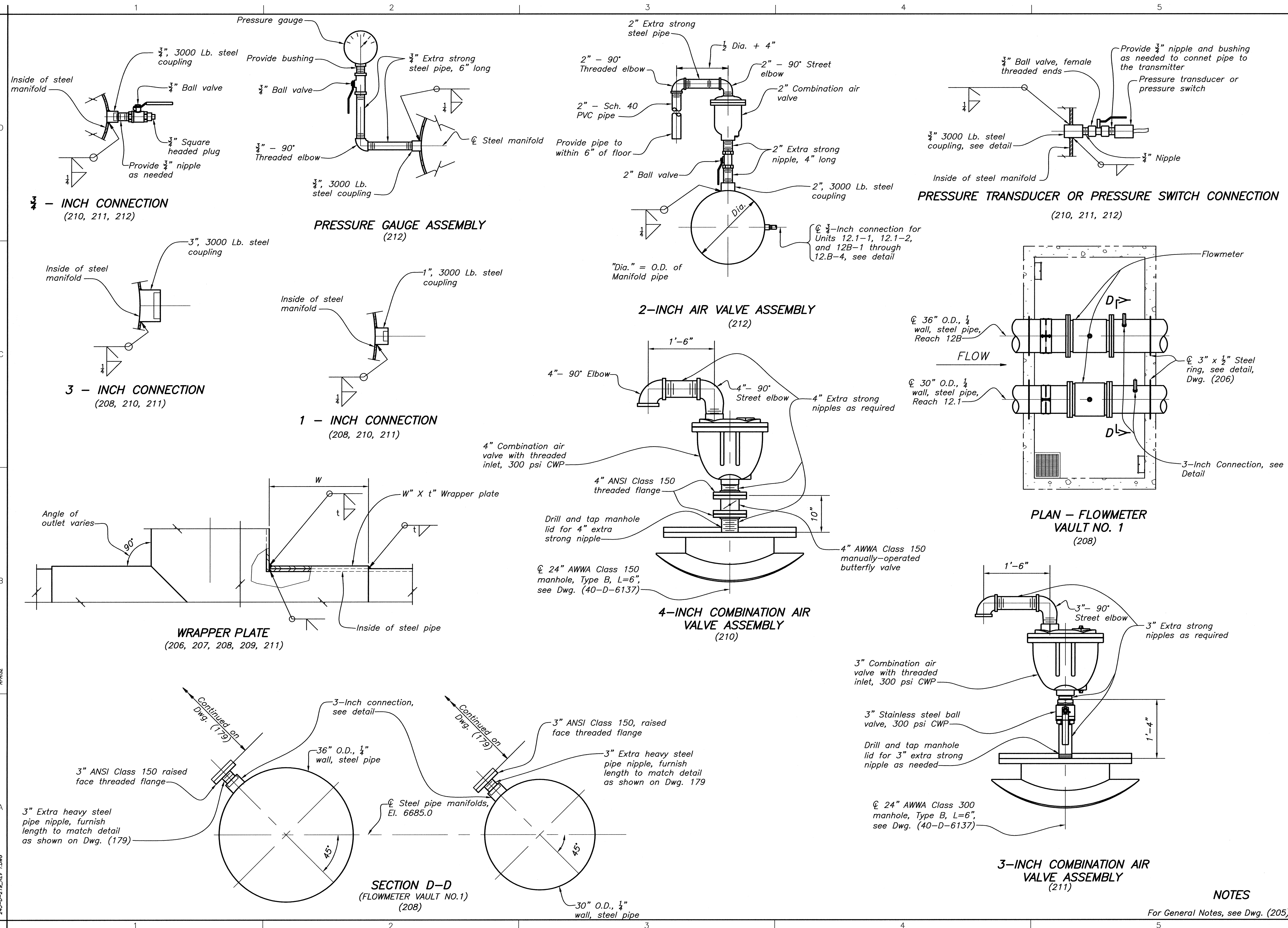


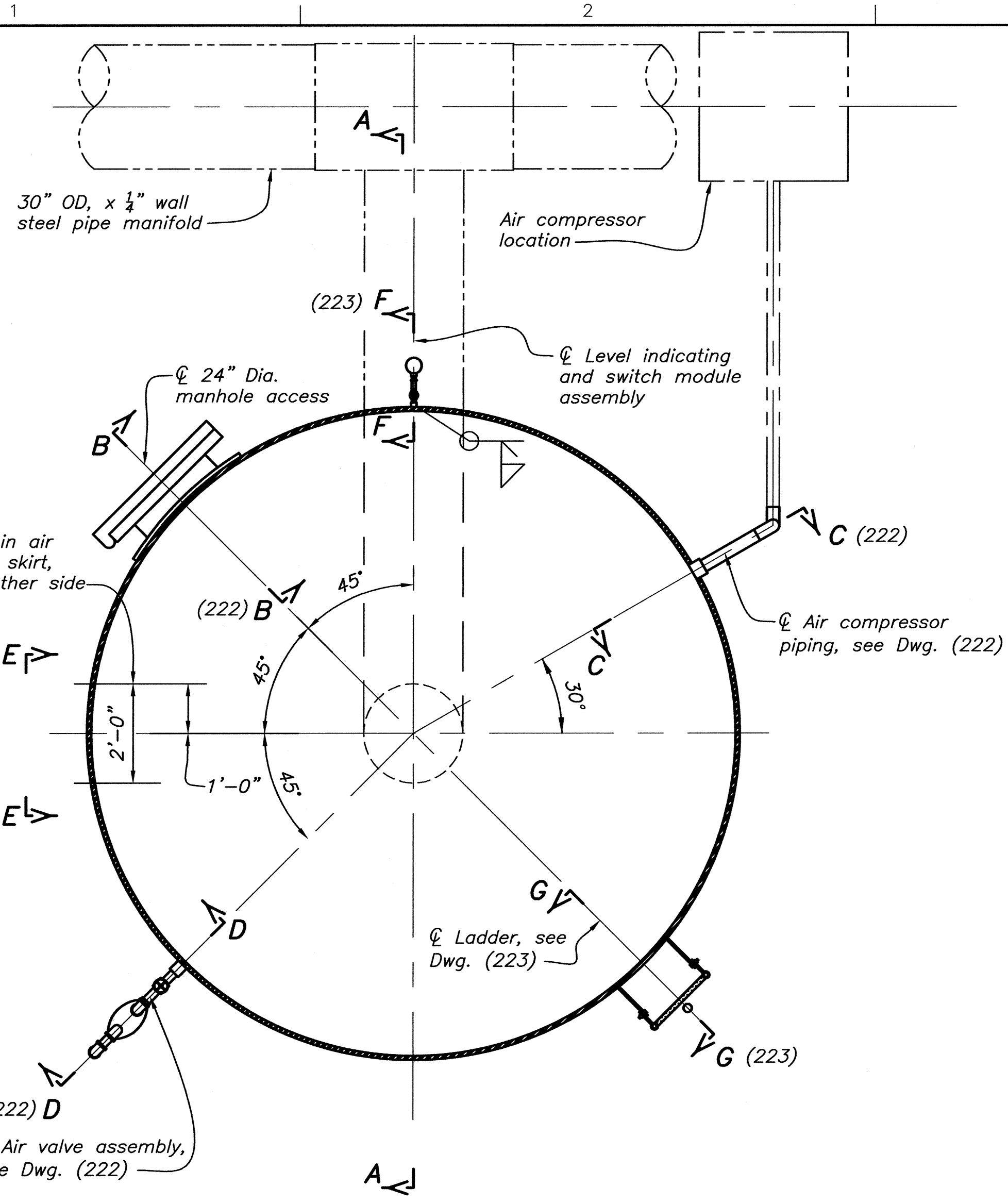
PUMP PEDESTAL
(212)

NOTES

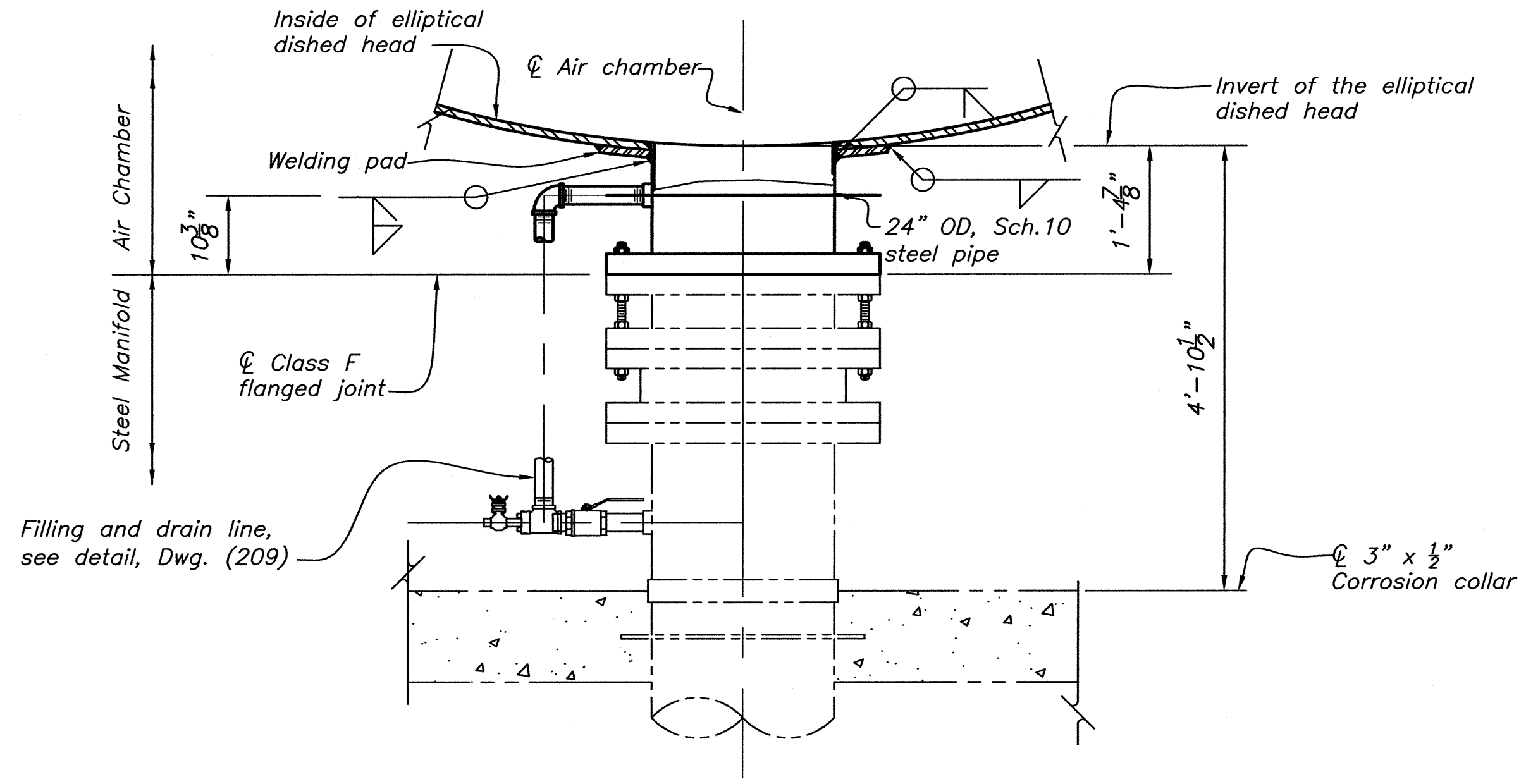
For General Notes, see Dwg. (205).
Pump base and anchor bolt to be designed by contractor.

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PLOTTED BY: LADAMS
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CAD FILENAME: ADAMS_TOHLAKAI_REV1.DWG

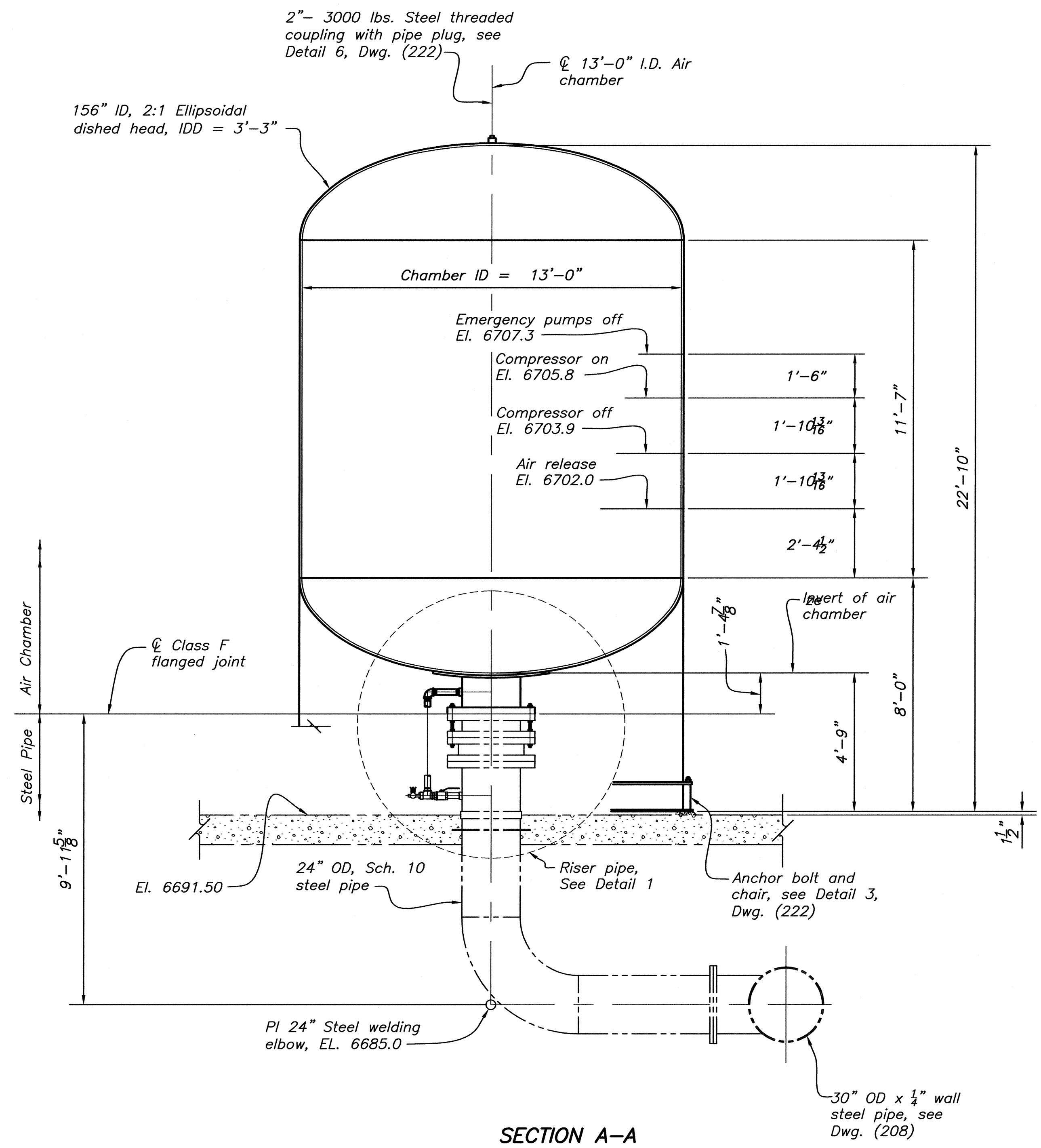




PLAN - REACH 12.1
(2 REQUIRED)
(2ND AIR CHAMBER OPPOSITE HAND)



DETAIL 1



SECTION A-A

NOTES

Provide nuts, bolts, and gaskets suitable for cold water service.

Threaded fittings shall be 300 lb. malleable iron for 12.1 and 150 lb. malleable iron for 12B.

Additional fittings, flanges, or welded joints added by the Contractor to facilitate installation of the steel piping are subject to Government approval.

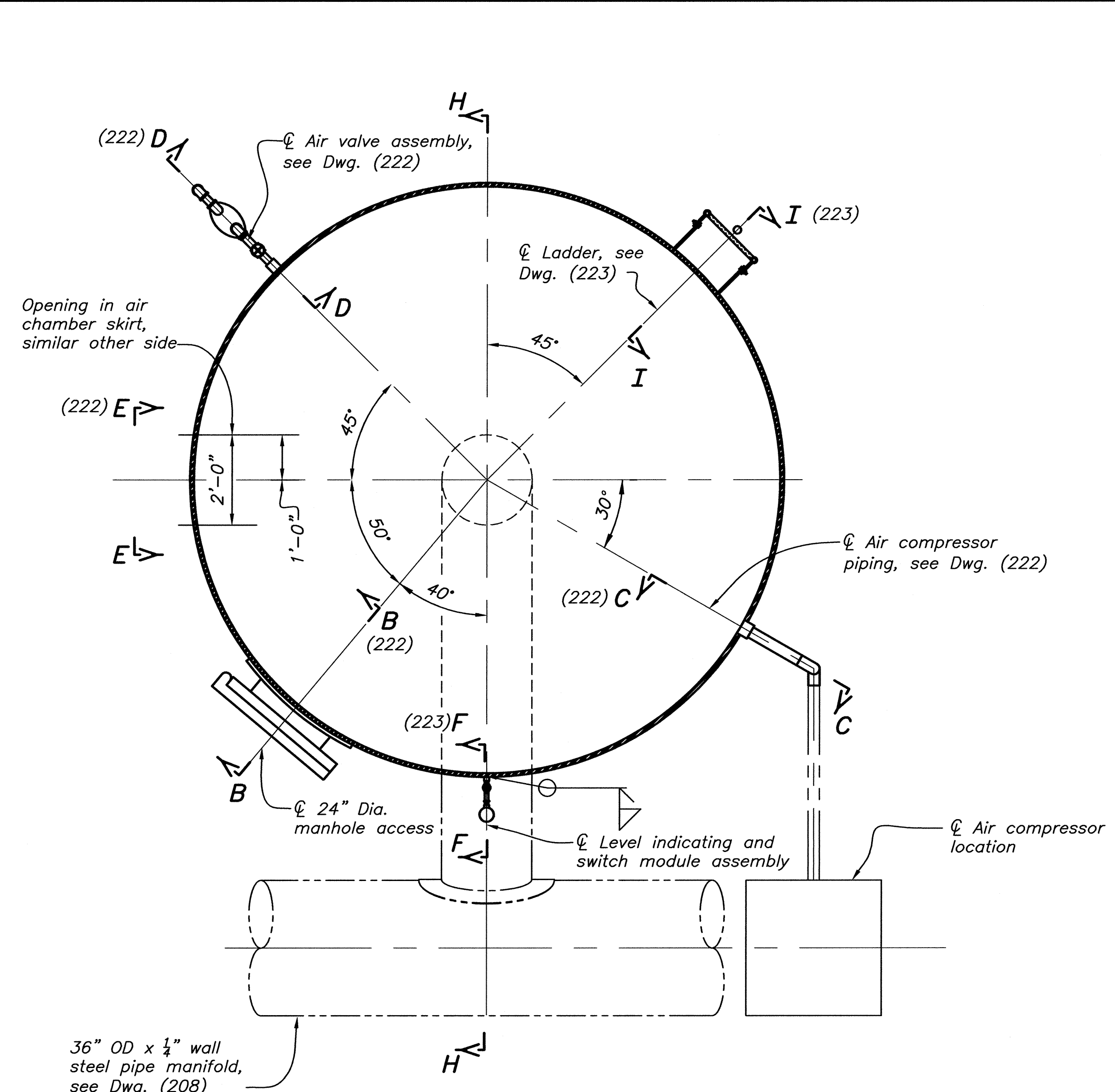
Hydrostatic test pressure shall be 336 psig for 12.1 and 218 psig for 12B.

Welding symbols apply to the joints of all members of similar identification.

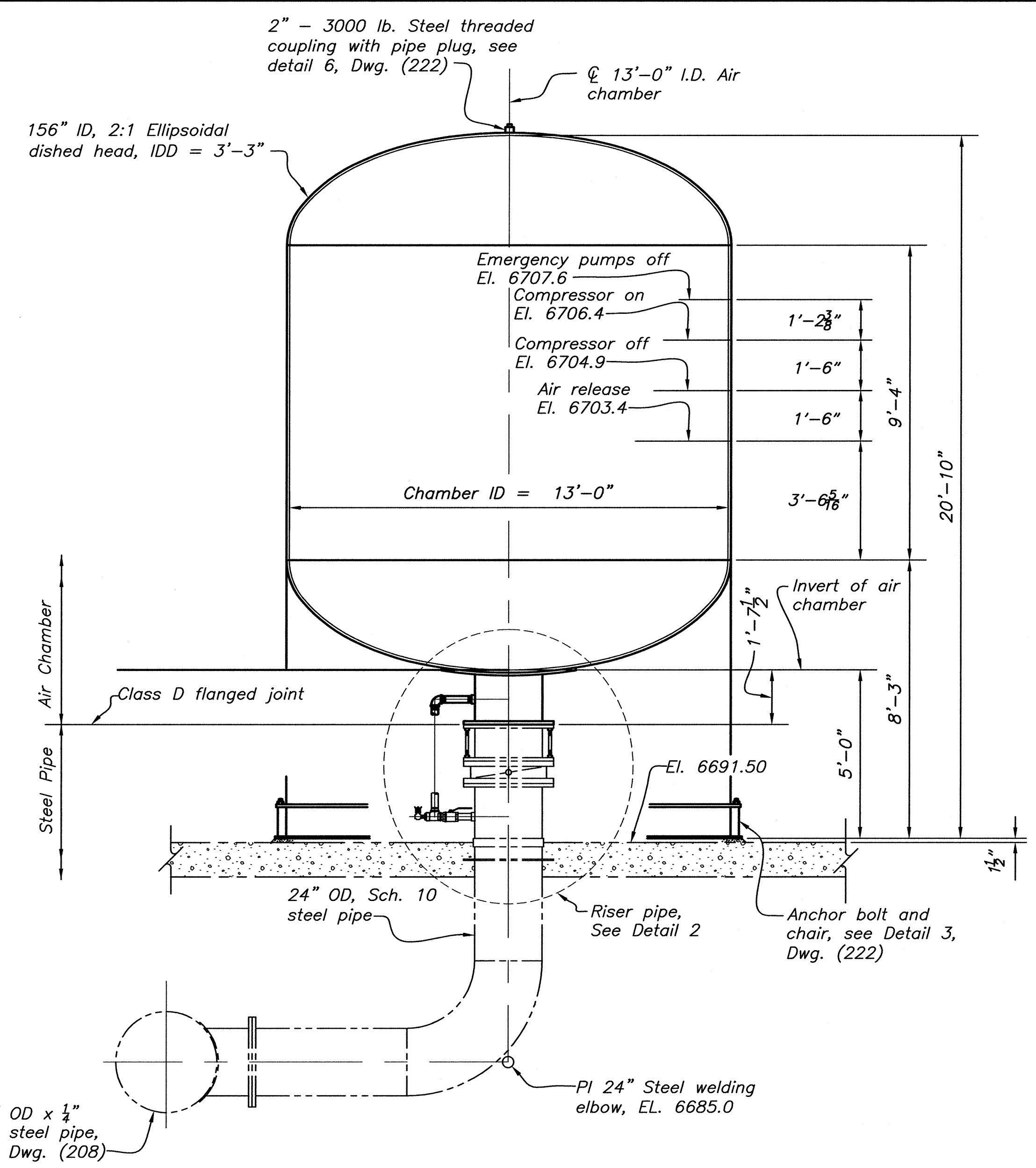
All fillet welds shall be returned.

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DATE AND TIME PLOTTED SEPTEMBER 7, 2013 13:58
PLOTTER BY RFRISZ
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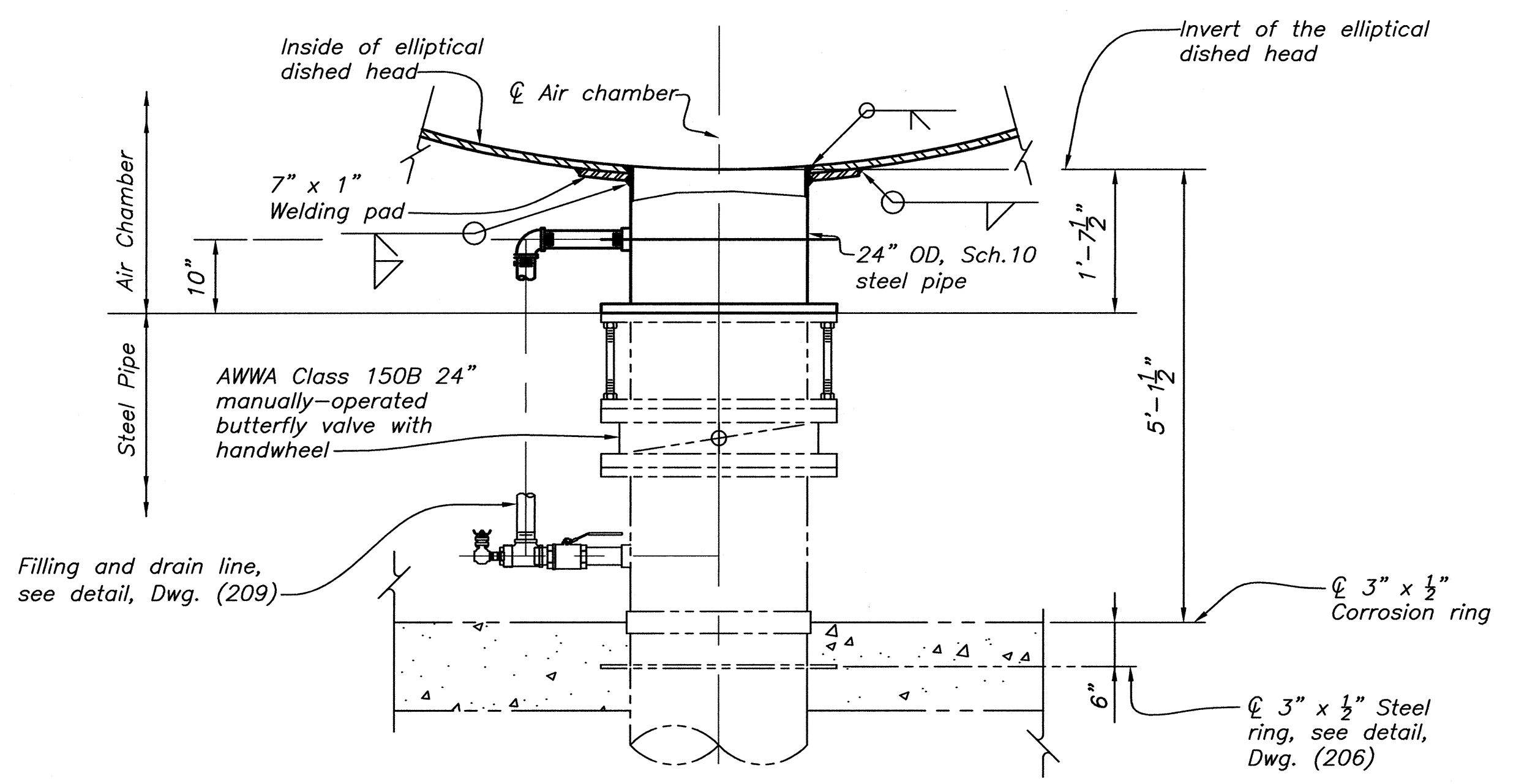
DESIGNED	JERRY WAUGH
DRAWN	K. R. SMITH
CHECKED	NATHAN NAKAMOTO
TECH. APPR.	JERRY WAUGH P.E.
APPROVED	TERRY HUMMEL
HYDRAULIC EQUIPMENT GROUP	
DENVER, COLORADO	2013-08-02



PLAN - REACH 12B
2 REQUIRED
2nd Air Chamber opposite hand



SECTION H-H

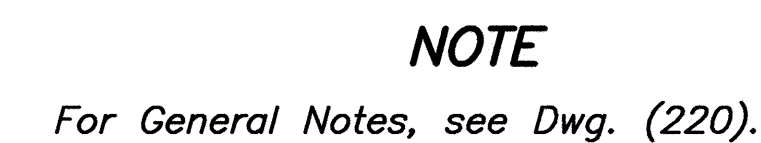


DETAIL 2

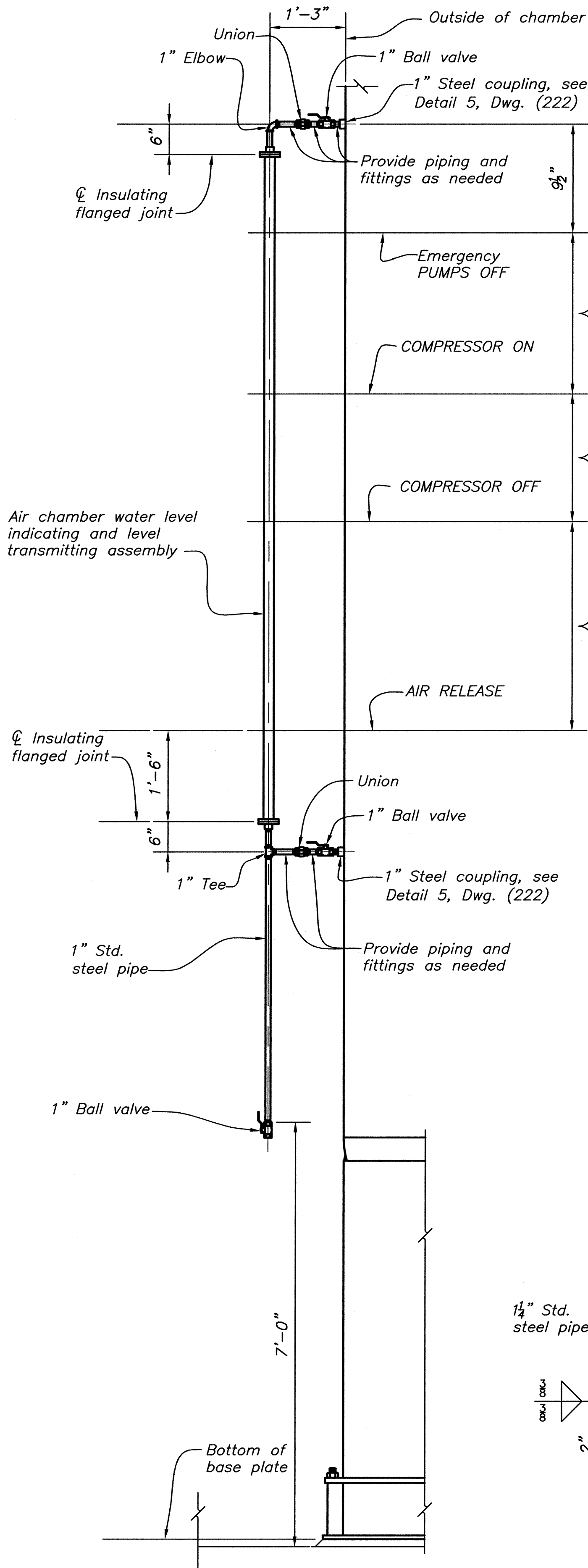
NOTES

Provide nuts, bolts, and gaskets suitable for cold water service.
Threaded fittings shall be 300 lb. malleable iron for 12.1 and 150 lb. malleable iron for 12B.
Additional fittings, flanges, or welded joints added by the Contractor to facilitate installation of the steel piping are subject to Government approval.
Hydrostatic test pressure shall be 336 psig for 12.1 and 218 psig for 12B.
Welding symbols apply to the joints of all members of similar identification.
All fillet welds shall be returned.

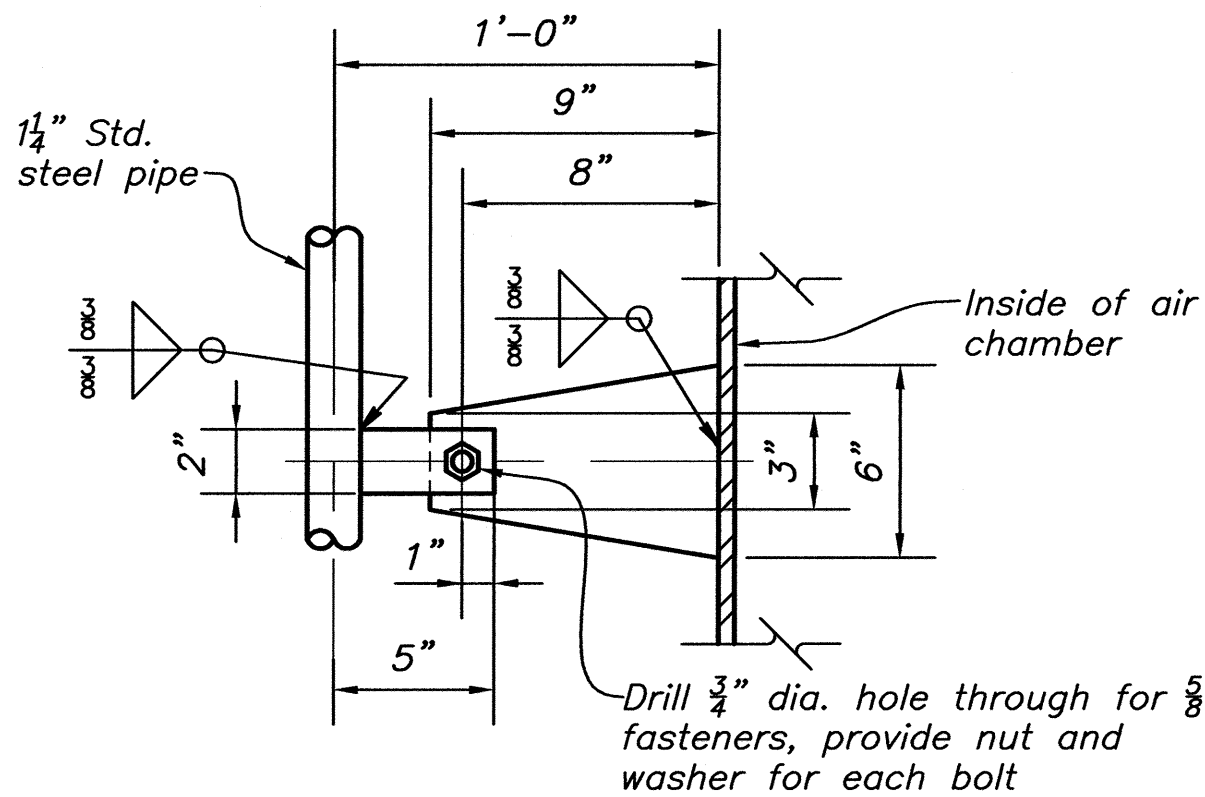
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RPRISZ



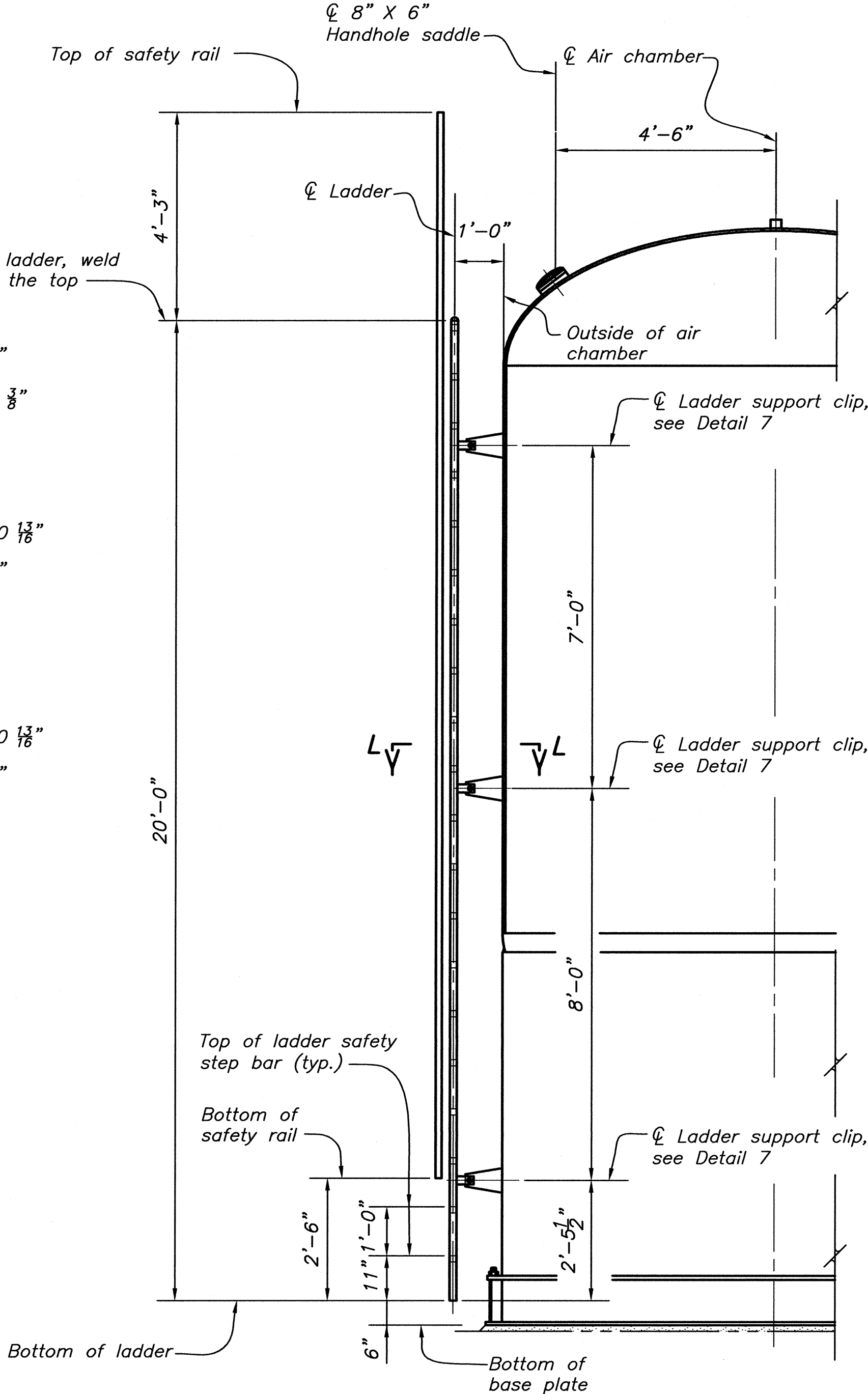
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PLOTTED BY
LADAMS



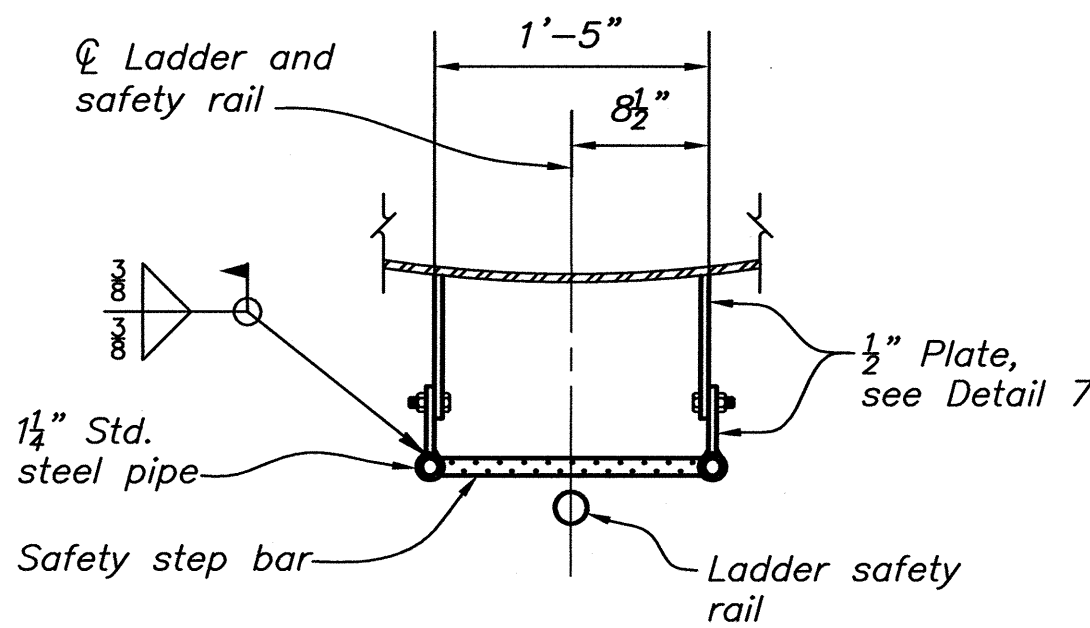
SECTION F-F
(220, 221)



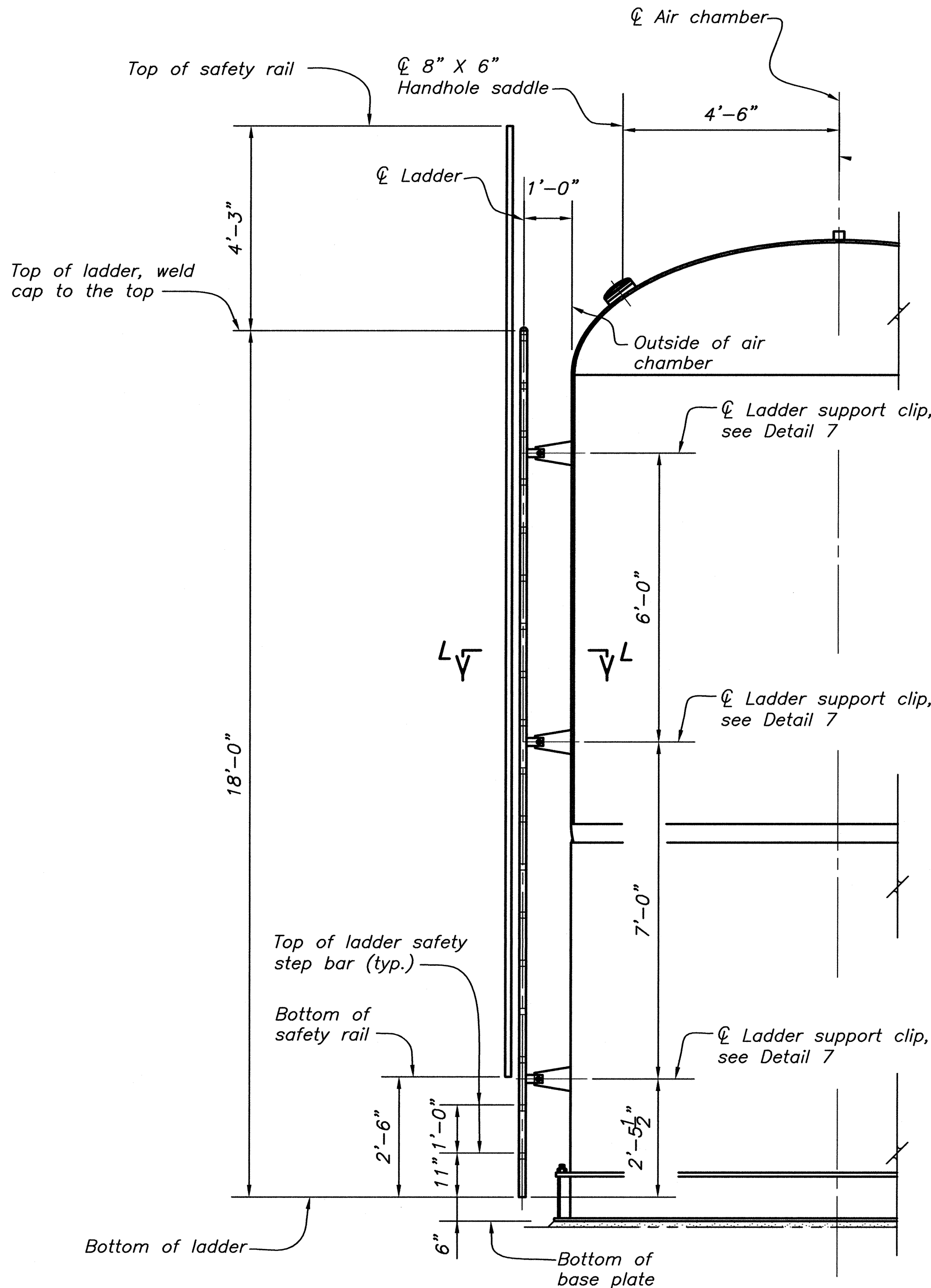
DETAIL 7



SECTION G-G
(220)
(REACH 12.1)



SECTION L-L



SECTION I-I
(221)
(REACH 12B)

NOTE
For General Notes, see Dwg. (220).

CAD FILENAME
C:\Users\jweeks\Documents\Tohokai Pumping Plant - HVAC - Central File_J. Michael Weeks.rvt

DATE AND TIME PLOTTED
7/31/2013 11:52:48 AM

DESIGN PHASE

EVAPORATIVE COOLING UNIT SCHEDULE												
TYPE	MARK	CFM	E.S.P. IN. W.C.	MOTOR DATA			FAN TYPE	WEIGHT	MANUFACTURER & MODEL	NOTES	EVAP MEDIA	
				HP	PHASE	VOLTAGE					TYPE	EFF
ECU	1	15000	1.5	10	3	460	BC	4986.00 lbf	UNITED METALS CEL-ODO-33		GLASDEK	90
ECU	2	15000	1.5	10	3	460	BC	4986.00 lbf	UNITED METALS CEL-ODO-33		GLASDEK	90

UNIT HEATER SCHEDULE												
TYPE	MARK	SIZE	VOLTAGE	PHASE	TEMP RISE	AIR THROW	CFM	WEIGHT	NOTES		MANUFACTURER	MODEL
UH	1	12.5kW	480	3	49 °F	45'	800	45.00 lbf	UNIT-MOUNTED THERMOSTAT		TPI	P3PUH12CA1
UH	3	12.5kW	480	3	49 °F	45'	800	45.00 lbf	UNIT-MOUNTED THERMOSTAT		TPI	P3PUH12CA1
UH	2	12.5kW	480	3	49 °F	45'	800	45.00 lbf	UNIT-MOUNTED THERMOSTAT		TPI	P3PUH12CA1
UH	4	12.5kW	480	3	49 °F	45'	800	45.00 lbf	UNIT-MOUNTED THERMOSTAT		TPI	P3PUH12CA1
UH	5	12.5kW	480	3	49 °F	45'	800	45.00 lbf	UNIT-MOUNTED THERMOSTAT		TPI	P3PUH12CA1
UH	6	12.5kW	480	3	49 °F	45'	800	45.00 lbf	UNIT-MOUNTED THERMOSTAT		TPI	P3PUH12CA1
UH	7	5 kW	480	3	40 °F	26'	400	44.00 lbf	UNIT-MOUNTED THERMOSTAT		TPI	P3PUH05CA1
UH	8	5 kW	480	3	40 °F	26'	400	44.00 lbf	UNIT-MOUNTED THERMOSTAT		TPI	P3PUH05CA1
UH	9	5 kW	480	3	40 °F	26'	400	44.00 lbf	UNIT-MOUNTED THERMOSTAT		TPI	P3PUH05CA1
UH	10	5 kW	480	3	40 °F	26'	400	44.00 lbf	UNIT-MOUNTED THERMOSTAT		TPI	P3PUH05CA1
UH	11	1 kW	120	1	50 °F	3'	175	26.00 lbf	UNIT-MOUNTED THERMOSTAT		TPI	E3321TD-RP
UH	12	5kW	208	3	40 °F	26'	400	44.00 lbf	UNIT-MOUNTED THERMOSTAT		TPI	P3PUH05CA1
UH	13	5kW	208	3	40 °F	26'	400	44.00 lbf	UNIT-MOUNTED THERMOSTAT		TPI	P3PUH05CA1
UH	14	5kW	208	3	40 °F	26'	400	44.00 lbf	UNIT-MOUNTED THERMOSTAT		TPI	P3PUH05CA1
UH	15	5kW	208	3	40 °F	26'	400	44.00 lbf	UNIT-MOUNTED THERMOSTAT		TPI	P3PUH05CA1

FAN SCHEDULE											
TYP E	MARK	CFM	ESP IN-W.C.	MOTOR DATA			UNIT WEIGHT	NOTES		MANUFACTURER	
				HP	WATTS	VOLTAGE	PHASE				
EF	1	180	0.4		95	120	1	25 lbs	PROVIDE W/ MANUFACTURER'S PLASTIC GRILLE. RUNS CONTINUOUSLY	COOK GC-164	
EF	2	180	0.4		95	120	1	25 lbs	PROVIDE W/ MANUFACTURER'S PLASTIC GRILLE. RUNS CONTINUOUSLY	COOK GC-164	
EF	3	30000	0.8	10		480	3	355 lbs	PROVIDE WALL-MOUNTED STEEL SUPPORT STRUCTURE.	COOK 48EW624B	
EF	4	5445	0.5	3		208	3	126 lbs	PROVIDE FLOOR-MOUNTED STEEL SUPPORT STRUCTURE TO MOUNT UNIT 18" AFF	COOK AFD-C 16	
SF	1	670	0		46	115	1	15 lbs	PROVIDE W/ MANUFACTURER'S MOUNTING HARDWARE	ZOO FANS H30	
SF	2	670	0		46	115	1	15 lbs	PROVIDE W/ MANUFACTURER'S MOUNTING HARDWARE	ZOO FANS H30	
SF	3	670	0		46	115	1	15 lbs	PROVIDE W/ MANUFACTURER'S MOUNTING HARDWARE	ZOO FANS H30	
SF	4	670	0		46	115	1	15 lbs	PROVIDE W/ MANUFACTURER'S MOUNTING HARDWARE	ZOO FANS H30	
VF	1	65	0.3	0.05	0	120	1	70 lbs	SUSPENT FROM CEILING STRUCTURE. RUNS CONTINUOUSLY.	COOK 70SQN-D	

STATIONARY LOUVER SCHEDULE									
TYPE	MARK	SIZE	AIRFLOW	FACE VELOCITY	STATIC PRESSURE LOSS	MINIMUM FREE AREA	MANUFACTURER	NOTES	
SL	1	32"x32"	5445 CFM	765	0.10 in-wg	56%	RUSKIN L6375DH	PROVIDE CONTORL DAMPER CONTROLLED BY EF-4. PROVIDE BIRD SCREEN	
SL	2	40"x40"	10222 CFM	920	0.10 in-wg	56%	RUSKIN L6375DH	PROVIDE CONTROL DAMPER. PROVIDE BIRD SCREEN.	
SL	3	60"x60"	30000 CFM	1200	1.50 in-wg	56%	RUSKIN L6375DH	PROVIDE CONTROL DAMPER CONTROLLED BY EF-3. PROVIDE BIRD SCREEN.	

PACKAGED TERMINAL HEAT PUMP SCHEDULE										
TYPE	MARK	CFM	HEATING CAPACITY	COOLING CAPACITY	MOTOR DATA			WEIGHT	MANUFACTURER AND MODEL	NOTES
					WATTS	VOLTAGE	PHASE			
PTHP	1	300	6500.0 Btu/h	7000.0 Btu/h	650	230	1	100.00 lbf	AMANA PTH073E25ADVY14	PROVIDE WITH 2.5kW AUXILIARY HEAT STANDARD DEPTH WALL SLEEVE, OUTDOOR GRILLE, CONDENSATE DRAIN KIT, POWER VENT KIT, POWER DOOR KIT AND REMOTE MOUNTED THERMOSTAT CONTROLLER

GENERAL NOTES

- CONTRACTOR IS TO PROVIDE COMPLETE CONNECTIONS TO ALL EQUIPMENT.
- CONTRACTOR SHALL COORDINATE GENERAL WORK SCHEDULE WITH THE CONTRACTING OFFICER REPRESENTATIVE.
- CONTRACTOR TO COORDINATE THE LOCATION OF ALL DUCTWORK, CEILING DEVICES, GRILLES, REGISTERS AND DIFFUSERS WITH REFLECTED CEILING PLAN AND STRUCTURE PRIOR TO BEGINNING WORK.
- DUCT DIMENSIONS GIVEN ARE INSIDE SHEET METAL DIMENSIONS.
- MECHANICAL DRAWINGS ARE DIAGRAMMATIC AND DO NOT NECESSARILY INDICATE EVERY REQUIRED OFFSET, FITTING, ETC. DRAWINGS ARE NOT TO BE SCALED FOR DIMENSIONS. TAKE ALL DIMENSIONS FROM ARCHITECTURAL DRAWINGS, CERTIFIED EQUIPMENT DRAWINGS AND FROM THE STRUCTURE ITSELF BEFORE FABRICATING ANY WORK, VERIFY ALL SPACE REQUIREMENTS COORDINATING WITH OTHER TRADES, AND INSTALL THE SYSTEMS IN THE SPACE PROVIDED WITHOUT EXTRA CHARGES TO THE GOVERNMENT.
- ALL EXTERIOR WALL AND ROOF PENETRATIONS SHALL BE SEALED WATERPROOF. SEE ARCHITECTURAL DETAILS.
- XX##** REFERS TO EQUIPMENT DESIGNATION. SEE SPECIFICATIONS AND EQUIPMENT SCHEDULES FOR FURTHER INFORMATION IN REFERENCE TO THAT DESIGNATED PIECE OF EQUIPMENT.
- WEIGHTS LISTED IN SCHEDULES ARE APPROXIMATE AND REFLECT BASIS OF DESIGN ONLY. EQUIPMENT WHOSE WEIGHT IS IN EXCESS OF THAT LISTED MUST BE APPROVED PRIOR TO INSTALLATION .

PROJECT INFORMATION

APPROX. PROJECT LOCATION:
PROJECT ALTITUDE:
SUMMER DESIGN TEMPERATURE:
WINTER DESIGN TEMPERATURE:
SUMMER DESIGN TEMP (OFFICE & CONTROL ROOM):
WINTER ROOM TEMP (OFFICE & CONTROL ROOM):
SUMMER DESIGN TEMP (PLANT):
WINTER ROOM TEMP (PLANT):

GALLUP, NEW MEXICO
6709 FEET ABOVE SEA LEVEL
102°F DRY BULB, 81°F WET BULB
-27°F DRY BULB
75°F DRY BULB - NO HUMIDITY REQUIREMENT
68°F DRY BULB - NO HUMIDITY REQUIREMENT
95°F DRY BULB - NO HUMIDITY REQUIREMENT
45°F DRY BULB - NO HUMIDITY REQUIREMENT

ABBREVIATIONS

AFF	ABOVE FINISHED FLOOR	IN W.C.	INCHES WATER COLUMN
AFG	ABOVE FINISHED GRADE	KW	KILOWATT
AI	ANALOG INPUT	LAT	LEAVING AIR TEMPERATURE
AO	ANALOG OUTPUT	LBS OR #	POUNDS
BAS	BUILDING AUTOMATION SYSTEM	MAX	MAXIMUM
BHP	BRAKE HORSEPOWER	MBH	THOUSAND BTUH
BI	BINARY INPUT	MCA	MINIMUM CIRCUIT AMPS
BO	BINARY OUTPUT	MIN	MINIMUM
BTU	BRITISH THERMAL UNIT	N/A	NOT APPLICABLE
BTUH	BTU PER HOUR	N.C.	NORMALLY CLOSED
CFM	CUBIC FEET PER MINUTE	N.O.	NORMALLY OPEN
DB	DRY BULB	NO OR #	NUMBER
DEG OR °	DEGREE	NTS	NOT TO SCALE
DIA	DIAMETER	OA	OUTSIDE AIR
DN	DOWN	OP	OPERATING
EA	EXHAUST	%	PERCENT
EAT	ENTERING AIR TEMP.	PH	PHASE (ELECTRICAL)
EFF	EFFICIENCY	PRV	PRESSURE REDUCING VALVE
ESP	EXTERNAL STATIC PRESSURE	RA	RETURN AIR
ERV	ENERGY RECOVERY VENTILATOR	RPM	ROTATIONS PER MINUTE
F	FAHRENHEIT	SA	SUPPLY AIR
FLA	FULL LOAD AMPS	SL	STATIONARY LOUVER
FPM	FEET PER MINUTE	TEMP	TEMPERATURE
FT	FOOT, FEET, FEET WATER COLUMN	THRU	THROUGH
GPM	GALLONS PER MINUTE	TSTAT	THERMOSTAT
HD	HEAD	TYP	TYPICAL
HP	HORSEPOWER	V	VOLT
IN	INCHES	WT	WEIGHT

LEGEND

	FLOW		TEMPERATURE CONTROL DAMPER (T.C.)
	CONTROL WIRING		GUAGE
	BINARY OUTPUT POINT		DAMPER ACTUATOR
	BINARY INPUT POINT		REMOTE BULB SENSOR/CONTROLLER
	ANALOG OUTPUT POINT		ROOM THERMOSTAT/SENSOR
	ANALOG INPUT POINT		DIFFERENTIAL PRESSURE SENSOR
	SPEED CONTROLLER		DUCT AVERAGING TEMPERATURE SENSOR
	CURRENT TRANSFORMER		SMOKE DETECTOR
	FAN		VARIABLE FREQUENCY DRIVE CONTROLLER
	FILTER		2 POSITION 3-WAY & 2-WAY CONTROL VALVES
	COIL		STATIONARY LOUVER
	MOTOR STARTER		

RECLAMATION

Managing Water in the West

ALWAYS THINK SAFETY

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
NAVAJO GALLUP WATER SUPPLY PROJECT
NEW MEXICO

SAN JUAN LATERAL
TOHLAKAI PUMPING PLANT

SCHEDULES AND DESIGN DATA
HVAC

DESIGNED BY *Michael Weeks*
DRAWN BY *Michael Weeks*
CHECKED BY *Michael Weeks*
TECH. APPR. *J. Michael Weeks, P.E.*
ADMIN. APPROVAL
William D. McSpew, P.E.
MANAGER

DENVER, COLORADO 2013-07-30

HVAC

1695-D-269
SHEET 1 OF 1

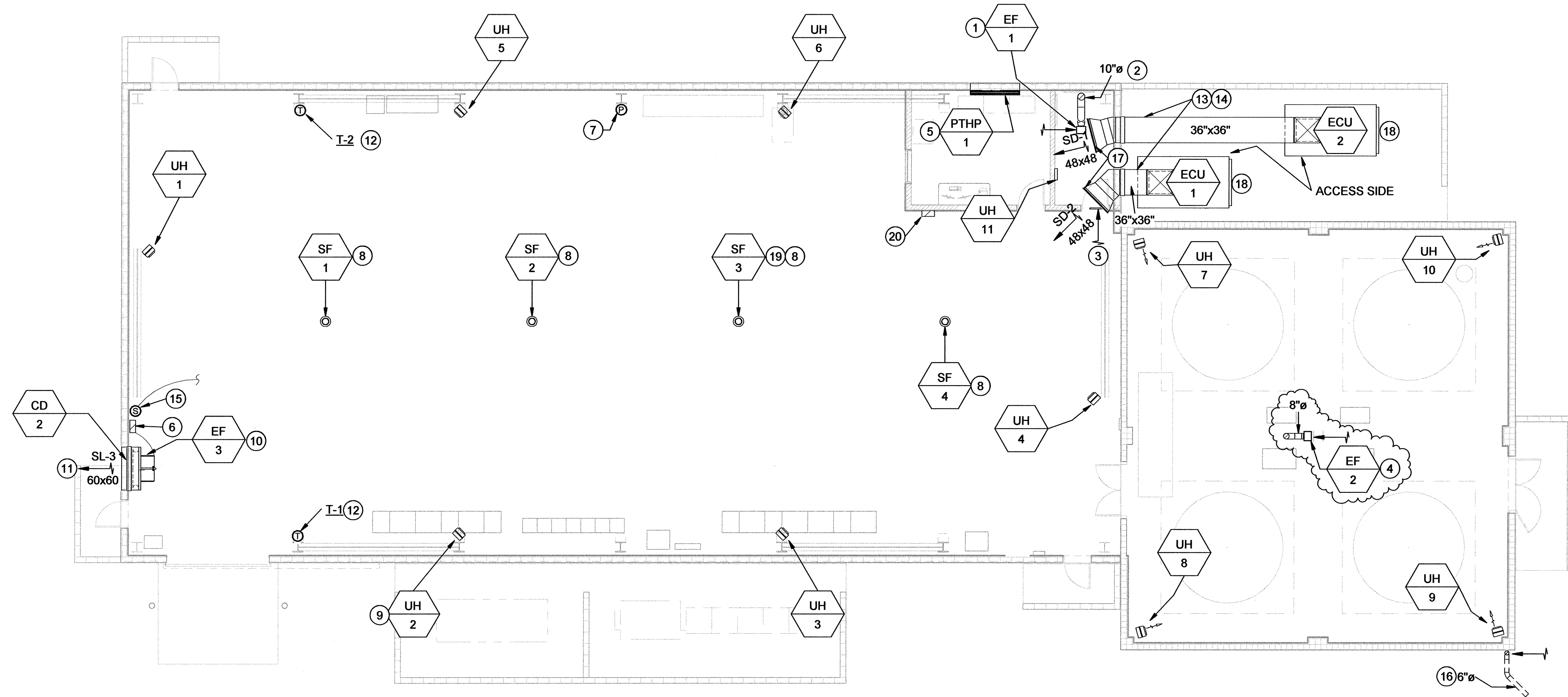
⊕ ALWAYS THINK SAFETY

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
NAVAJO GALLUP WATER SUPPLY PROJECT
NEW MEXICO
SAN JUAN LATERAL
TOHLAKAI PUMPING PLANT
HVAC
PUMPING PLANT

J. MICHAEL WEEMS
DESIGNED
J. MICHAEL WEEMS
DRAWN
PATRICK DAWSON
CHECKED
PATRICK DAWSON, P.E.
TECH. APPR.
WILLIAM D. MCSTRAW, P.E.
ADMIN. APPROVAL
MANAGER
DENVER, COLORADO 2013-07-30

HVAC

1695-D-270
SHEET 1 OF 1



FLAG NOTES: #

- EF-1 CEILING EXHAUST FAN. MOUNT AT HEIGHT SO MANUFACTURER-PROVIDED GRILLE IS FLUSH WITH CEILING.
- EXHAUST DUCT TO BE ROUTED UP AND TIGHT TO WALL UNTIL ABOVE CRANE RAIL. DUCT THEN TO BE ROUTED WEST TO BE 15' FROM ROOF EDGE. TERMINATE PER GOOSENECK DETAIL.
- LOUVERED DOOR. SEE ARCHITECTURAL DOOR HARDWARE SCHEDULE.
- EF-2 EXHAUST FAN. SUSPEND FROM ROOF STRUCTURE SO MANUFACTURER-PROVIDED GRILLE IS 8' AFF. ROUTE OUTLET DUCT UP THROUGH ROOF AND TERMINATE PER GOOSENECK DETAIL.
- FLUSH MOUNT PTAC WITH EXTERIOR WALL. BOTTOM OF UNIT TO BE 8' AFF. ROUTE CONDENSATE DRAINAGE TO EXTERIOR OF BUILDING.
- VARIABLE FREQUENCY DRIVE CONTROLLERS FOR FAN EF-3 and SF-1-4. MOUNT SO BOTTOM OF UNIT IS 36" AFF.
- PRESSURE SENSOR TO CONTROL FAN EF-3. MOUNT UNIT 48" AFF.
- LOCATION IS APPROXIMATE. COORDINATE LOCATION TO AVOID SKYLIGHTS AND LIGHTS.
- UH-# WALL MOUNTED UNIT HEATERS. PROVIDE WITH UNIT MOUNTED THERMOSTATS. SUPPORT HEATERS FROM STRUCTURAL MEMBERS USING MANUFACTURERS MOUNTING EQUIPMENT. MOUNT APPROXIMATELY 9' AFF. TYPICAL FOR ALL UNIT HEATERS.
- EF-3 WALL EXHAUST FAN. MOUNT APPROXIMATELY 96" AFF.
- SL-3 STATIONARY LOUVER. SEE ARCHITECTURAL PLANS FOR DETAILS. PROVIDE CONTROL DAMPER ON INTERIOR SIDE OF LOUVER.
- THERMOSTATS T1 & T2, FOR ECU-1 & ECU-2 RESPECTIVELY, TO BE MOUNTED 48" AFF.
- BOTTOM OF DUCT TO BE MOUNTED APPROXIMATELY 13' AFF. SUPPORT DUCT PER SPECIFICATIONS.
- EVAPORATIVE COOLER DUCTWORK TO BE INSULATED, DOUBLE-WALLED CONSTRUCTION.
- MANUFACTURER-PROVIDED VARIABLE SPEED CONTROLLER TO CONTROL ALL SF-# FANS. MOUNT 48" AFF.
- INLET DUCT TO VF-1. DUCT TO BE PVC WHILE UNDERGROUND, AND TRANSITION TO 16 GA GALVANIZED STEEL ABOVE GRADE. DUCT TO BE EXTENDED UP EXTERIOR PUMPING PLANT WALL AND TERMINATED 4' ABOVE FINISHED GRADE. PROVIDE 180 DEGREE BEND ON DUCT INLET AND FIT WITH ALUMINUM MESH INSECT SCREEN. ATTACH DUCT TO PUMPING PLANT WALL. DUCT TO BE ROUTED 6' BELOW GRADE TO THE DISINFECTION BUILDING. SEE DISINFECTION BUILDING DRAWING (-271) FOR CONTINUATION.
- SD-1 DOUBLE DEFLECTION SUPPLY DIFFUSER. DUCT AND DIFFUSER SUPPORTED FROM WALL PER SMACNA.
- ECU-# PAD MOUNTED EVAPORATIVE COOLING UNIT. SEE EVAPORATIVE COOLER DETAIL.
- SF-# STRATIFICATION FAN. SUSPEND FROM ROOF STRUCTURE AT LOWEST HEIGHT THAT STILL AVOIDS INTERFERENCE WITH CRANE OPERATION. USE MANUFACTURER'S MOUNTING HARDWARE.
- WALL MOUNT ECU# REMOTE CONTROL PANEL 48" AFF.

Managing Water in the West

SAFETY

ALWAYS THINK

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

AVAJO GALLUP WATER SUPPLY PROJECT
BUREAU OF RECLAMATION
NEW MEXICO

SAN JUAN LATERAL

TOHLAKAI PUMPING PLANT

HVAC

DISINFECTION BUILDING

REV NO	DATE	NAME, PROF. ABBR.	STA	DESCRIPTION
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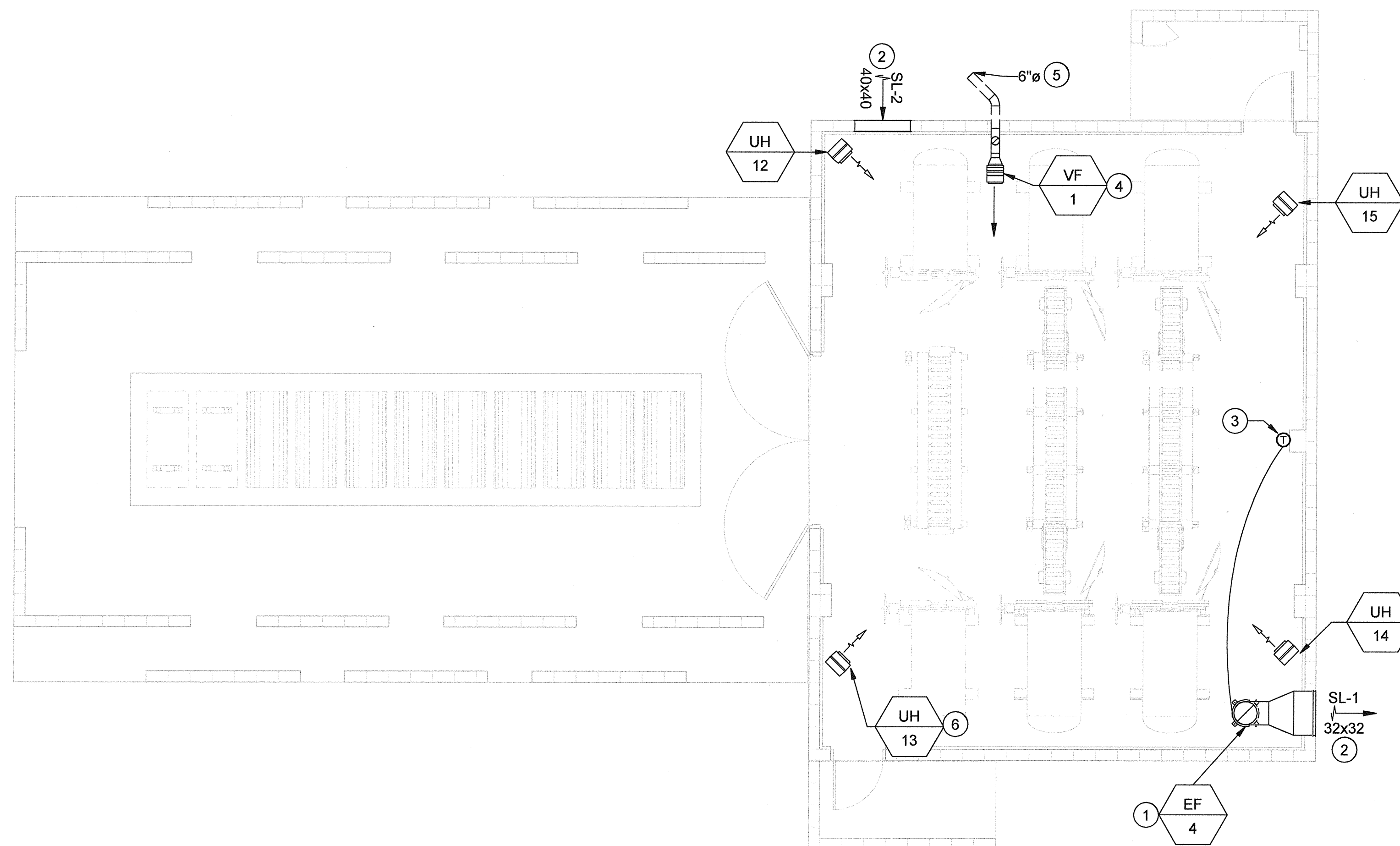
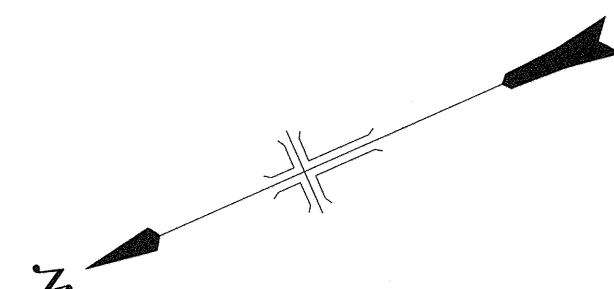
DESIGNED *J. Michael Weems*
DRAWN *J. Michael Weems*
CHECKED *William D. McStraw, P.E.*
TECH. APPR. J. MICHAEL WEEMS, P.E.
ADMIN. APPROVAL *memo*
William D. McStraw, P.E.
MANAGER

DENVER, COLORADO 2013-07-30

HVAC

1695-D-271

SHEET 1 OF



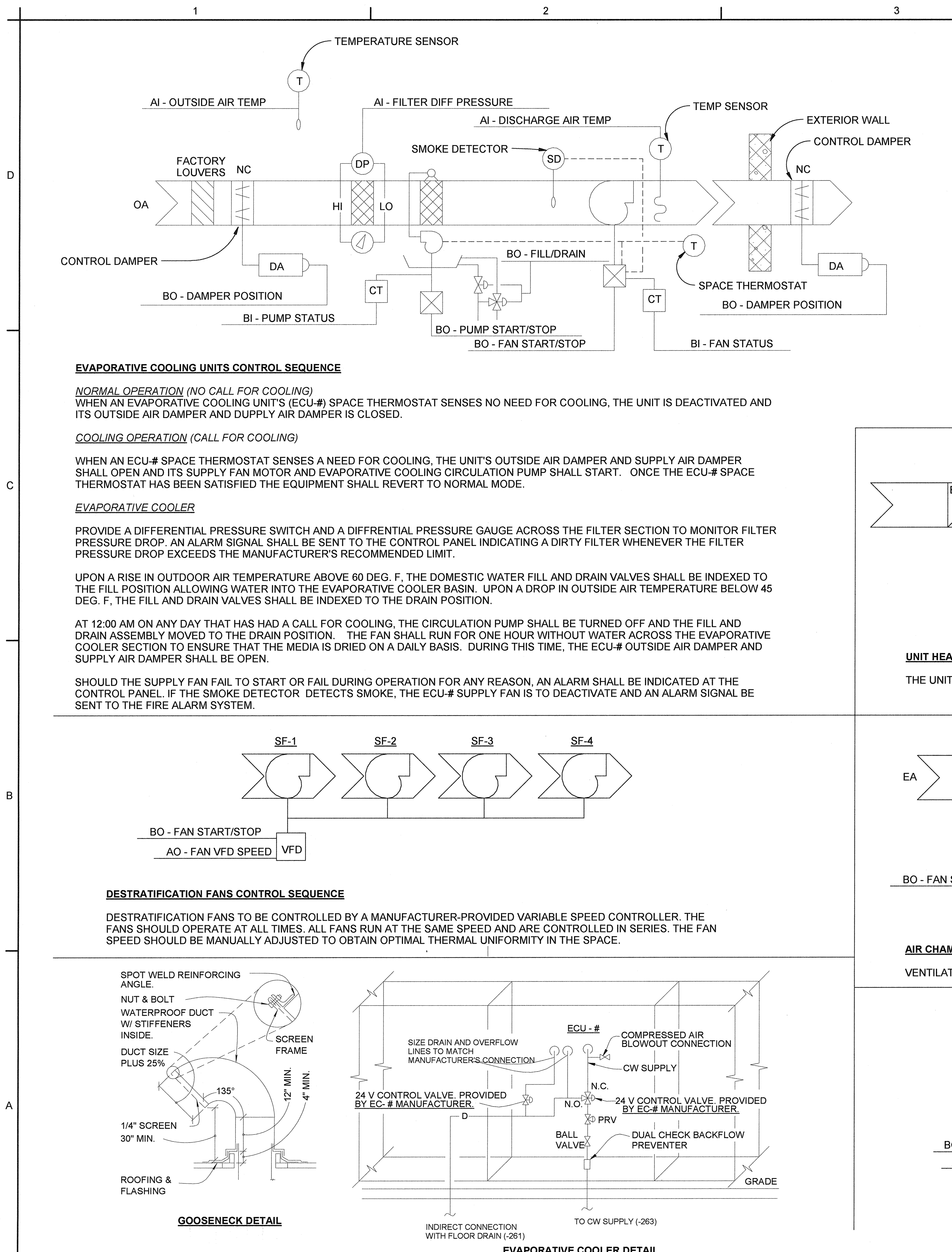
FLAG NOTES: (#)

1. EF-4 UPBLAST TUBE AXIAL EXHAUST FAN, INLET (BOTTOM) OF FAN TO BE 18" AFF. PROVIDE STEEL LEG EXTENSIONS TO SUPPORT UNIT FROM FLOOR.
2. SL-# STATIONARY LOUVER, INSTALL SO BOTTOM OF LOUVER IS 136" AFF. SEE ARCHITECTURAL PLANS FOR DETAILS. PROVIDE CONTROL DAMPER ON INTERIOR SIDE OF LOUVER.
3. THERMOSTAT TO CONTROL EF-4, MOUNT 48" AFF. FAN ALSO CONTROLLED BY GAS DETECTION SYSTEM, SEE DETAILS SHEET.
4. VE-1 SQUARE INLINE VENTILATION FAN, ATTACH TO CEILING STRUCTURE, FAN TO DISCHARGE VENTILATION AIR INTO SPACE.
5. PVC INLET DUCT TO VE-1, DUCT TO BE ROUTED DOWN WALL, THROUGH FLOOR SLAB AND BELOW GRADE TO THE PUMPING PLANT. SEE PUMPING PLANT HVAC DRAWING (-270) FOR CONTINUATION. DUCT TO BE 6" BELOW FINISHED GRADE.
6. UH-# ELECTRIC UNIT HEATRS WITH UNIT-MOUNTED THERMOSTATS. PROVIDE WALL SUPPORT. MOUNT UNIT 9" AFF. TYPICAL.

CAD FILE NAME
C:\Users\jweems\Documents\Tohokuai Pumping Plant - HVAC - Control File_J. Michael Weems.rvt

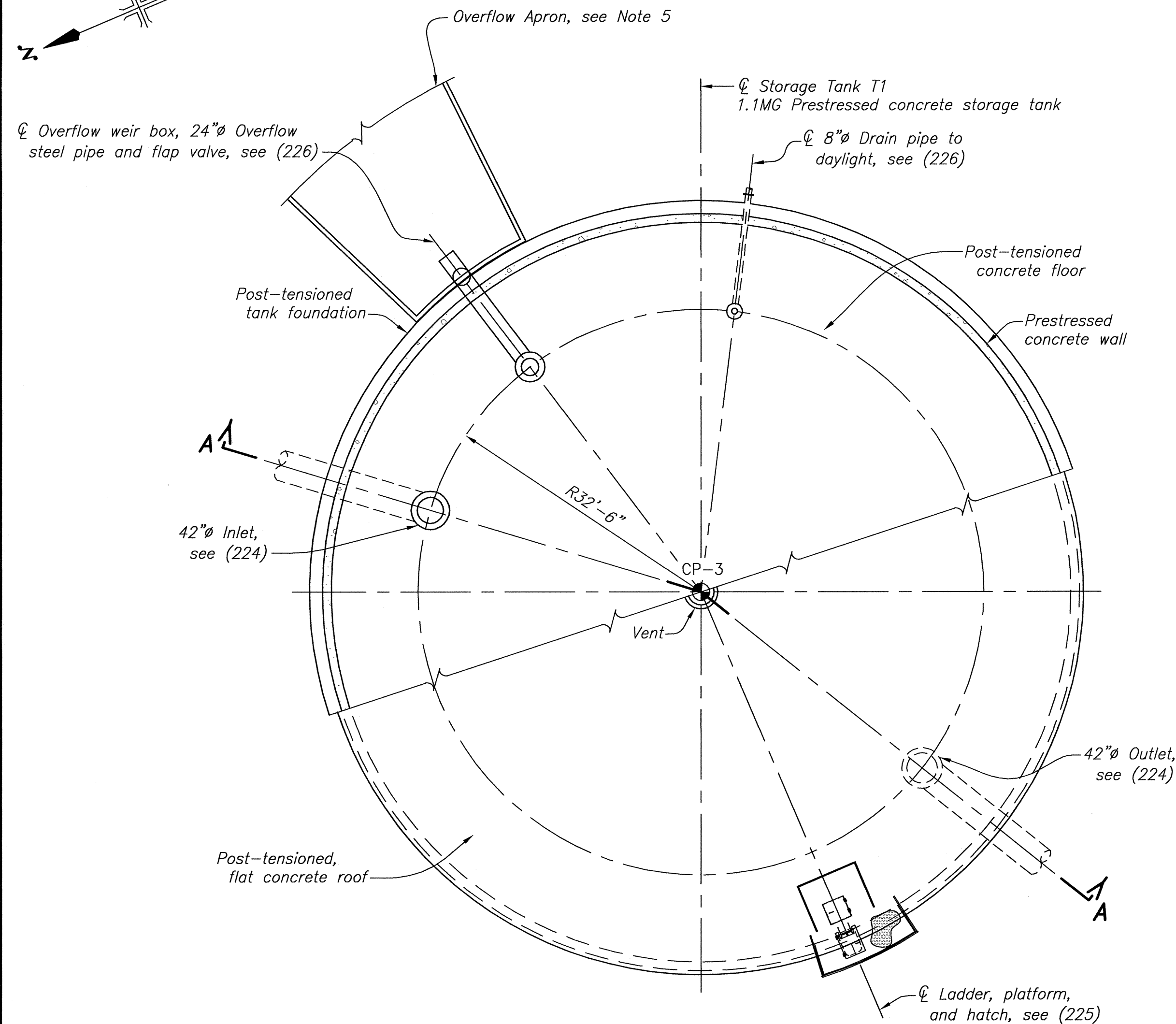
DATE AND TIME PLOTTED
7/31/2013 11:52:52 AM

DESIGN PHASE

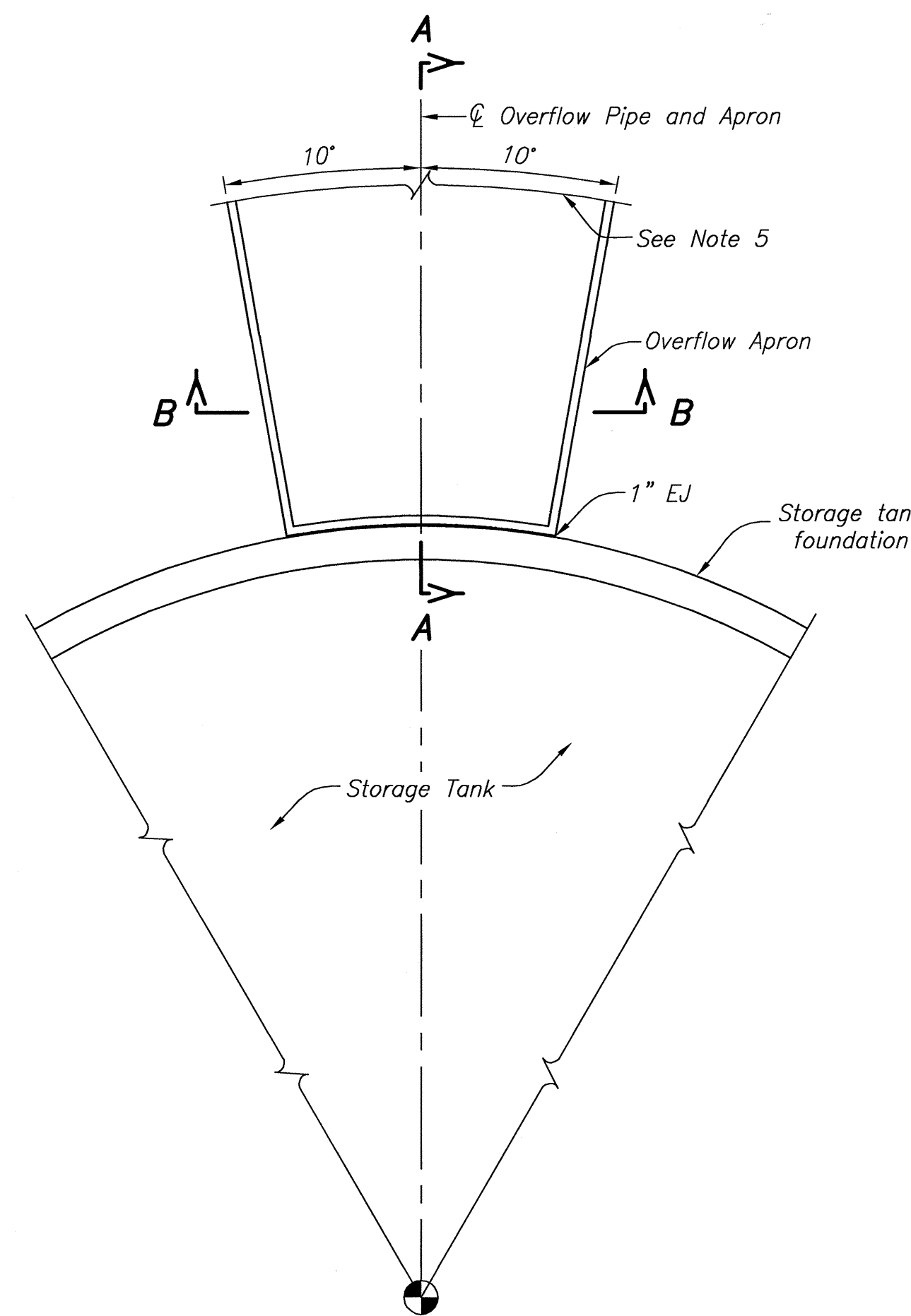


DESCRIPTION

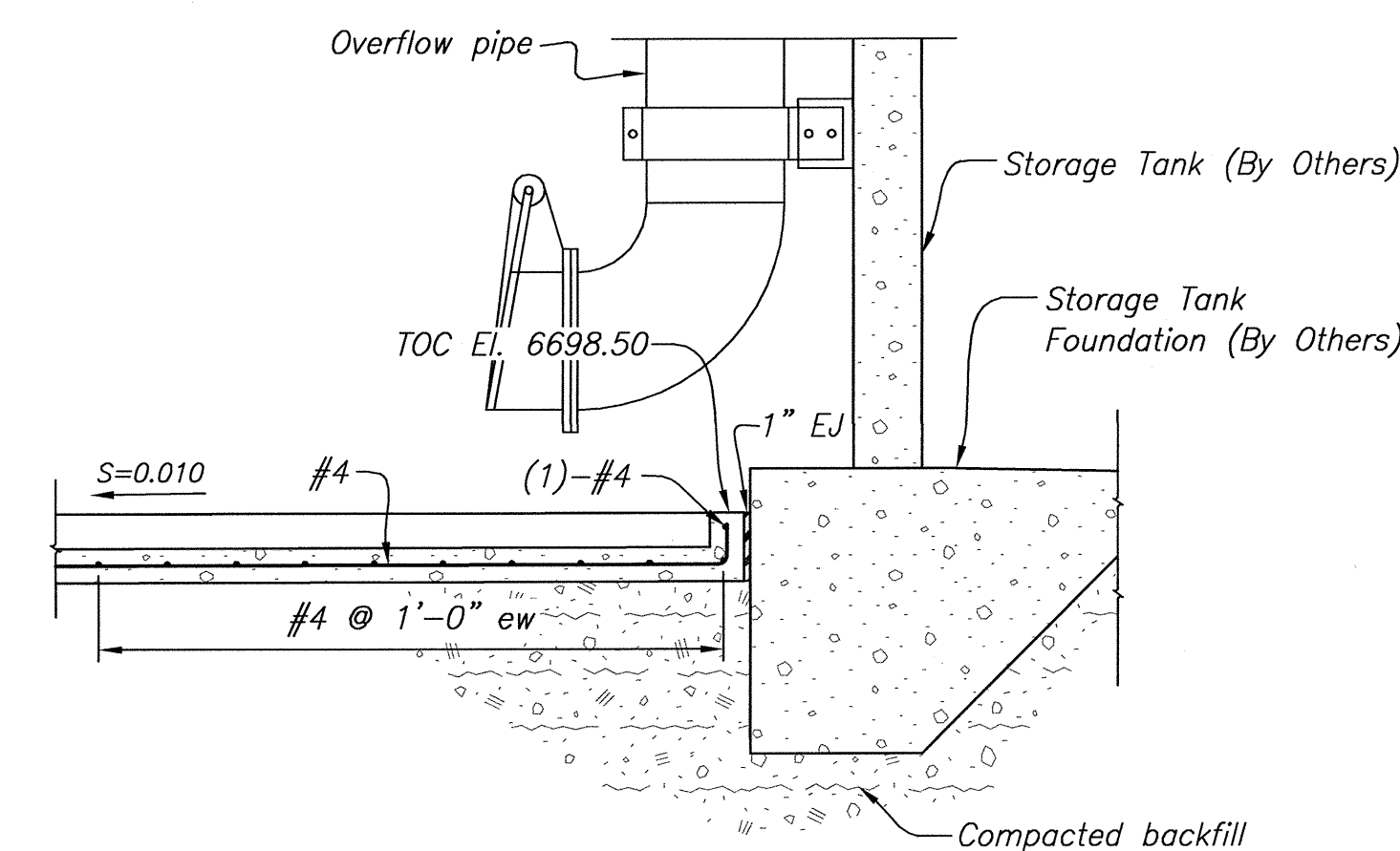
REV/NO. DATE NAME, PROF. ABBR. I STA



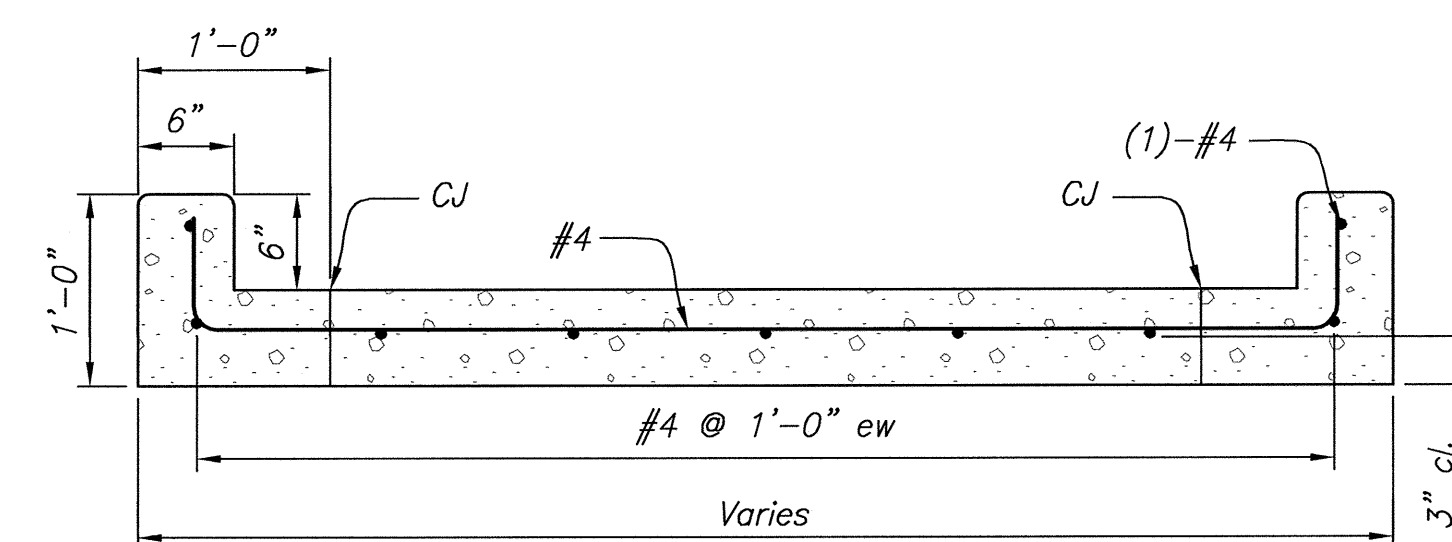
PLAN
STORAGE TANK NO.1



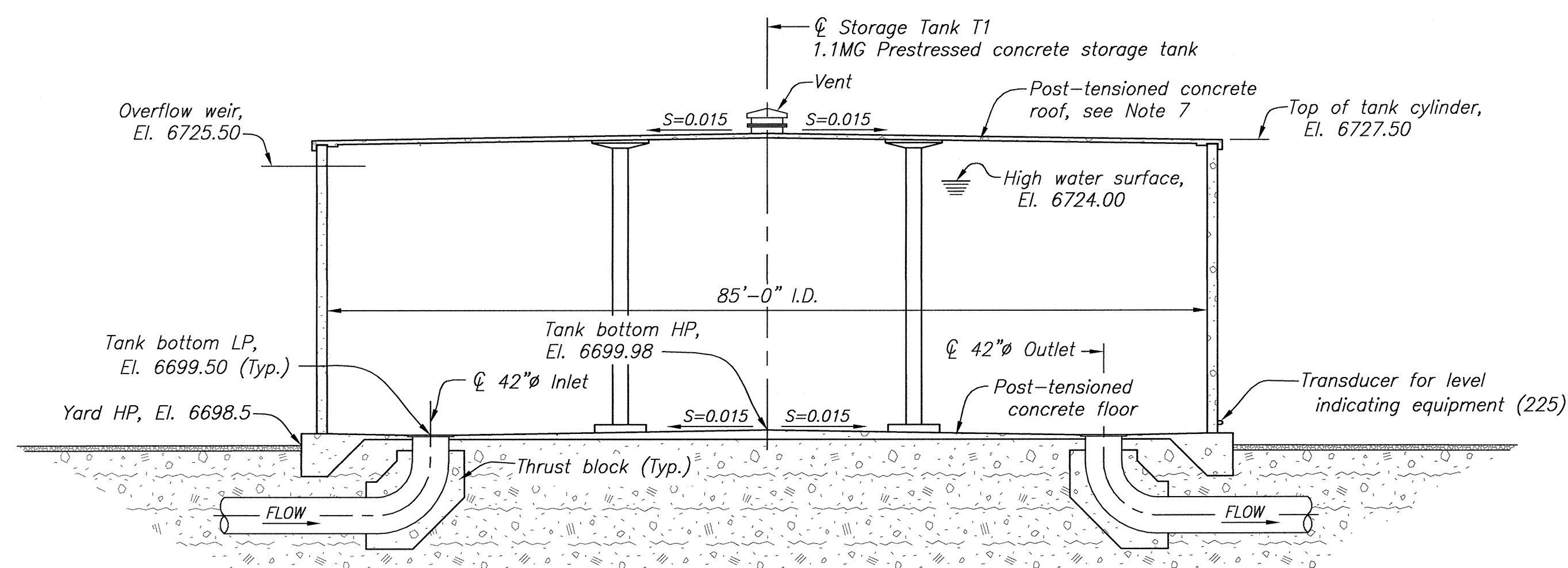
TYPICAL CONCRETE OVERFLOW APRON
(NOT TO SCALE)



SECTION A-A
(NOT TO SCALE)



SECTION B-B
(NOT TO SCALE)



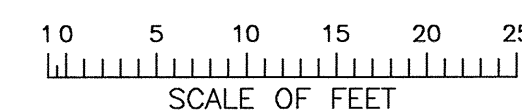
SECTION A-A

NOTES

1. For Structural Design Data, see (101) and (102).
2. All vertical elevations are based on NAVD88 vertical datum.
3. For control points coordinates, see (100).
4. For foundation excavation requirements, see (108).
5. Overflow apron shall extend from storage tank foundation to the tank yard extent as shown on (99).
6. Provide control joints in the Concrete Overflow Apron at a maximum 15 foot center-to-center spacing.
7. A free spanning domed concrete roof is permitted but is not shown, see Specifications Section 33 16 15 - Concrete Wire Wrapped Tank.

REFERENCE DRAWINGS

SITE	1695-D-99
PLAN	1695-D-100
SECTIONS	1695-D-100
MECHANICAL EQUIPMENT	
STEEL MANIFOLD	1695-D-206
STEEL STORAGE TANK	
PLAN, SECTIONS AND DETAILS	1695-D-224 THRU 1695-D-226



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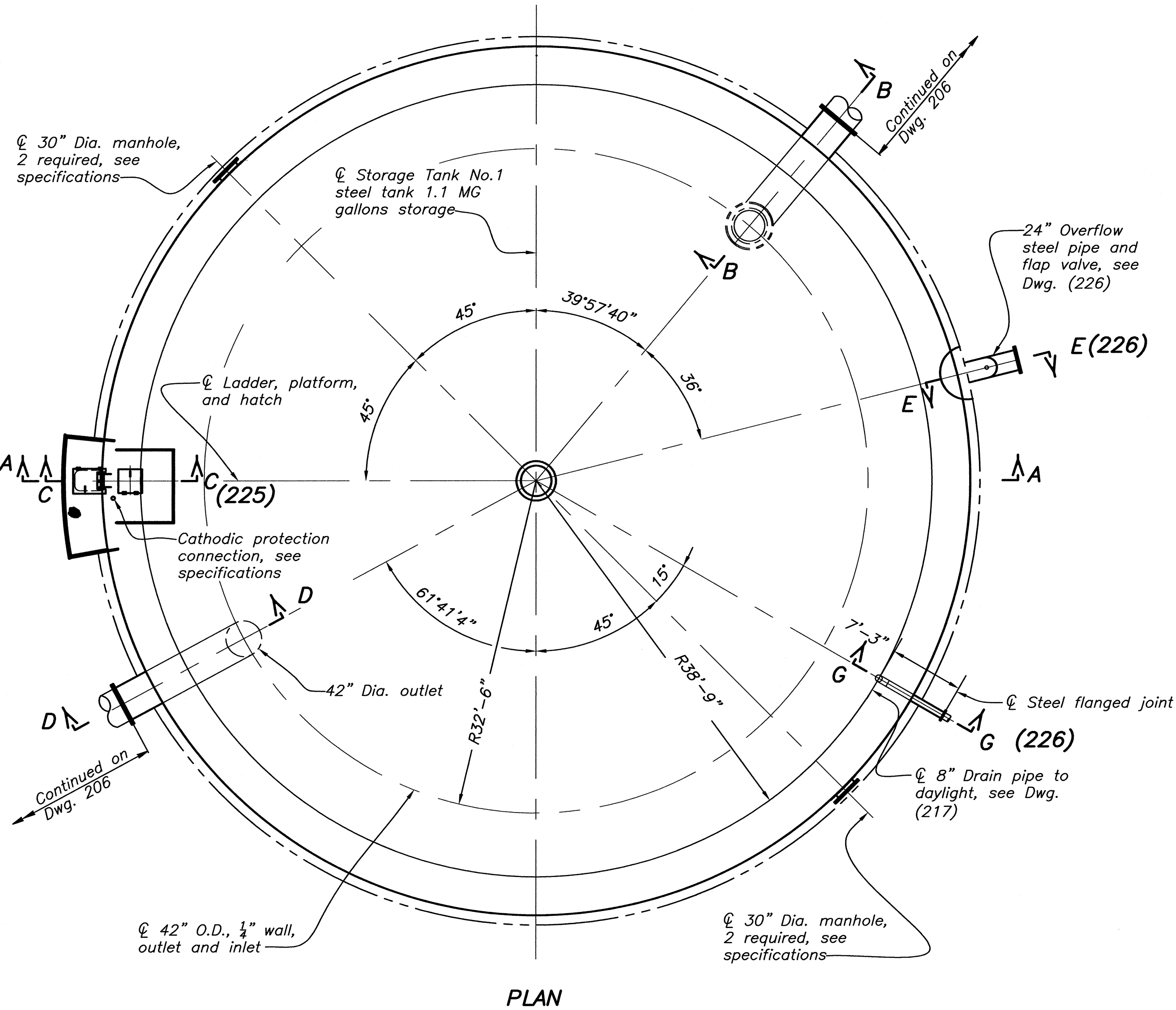
U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
NAVAJO GALLUP WATER SUPPLY PROJECT
NEW MEXICO
SAN JUAN LATERAL
TOHLAKAI PUMPING PLANT
1.1 MG PRESTRESSED CONCRETE STORAGE TANK
PLAN AND SECTION

DESIGNED: *K. Osh*
DRAWN: *R. Osh*
CHECKED: *B. D. VanOrman*
TECH. APPR.: *B. D. VanOrman, P.E.*
PEER REVIEW: *PLANT STRUCTURES GROUP*
DENVER, COLORADO 2013-08-05

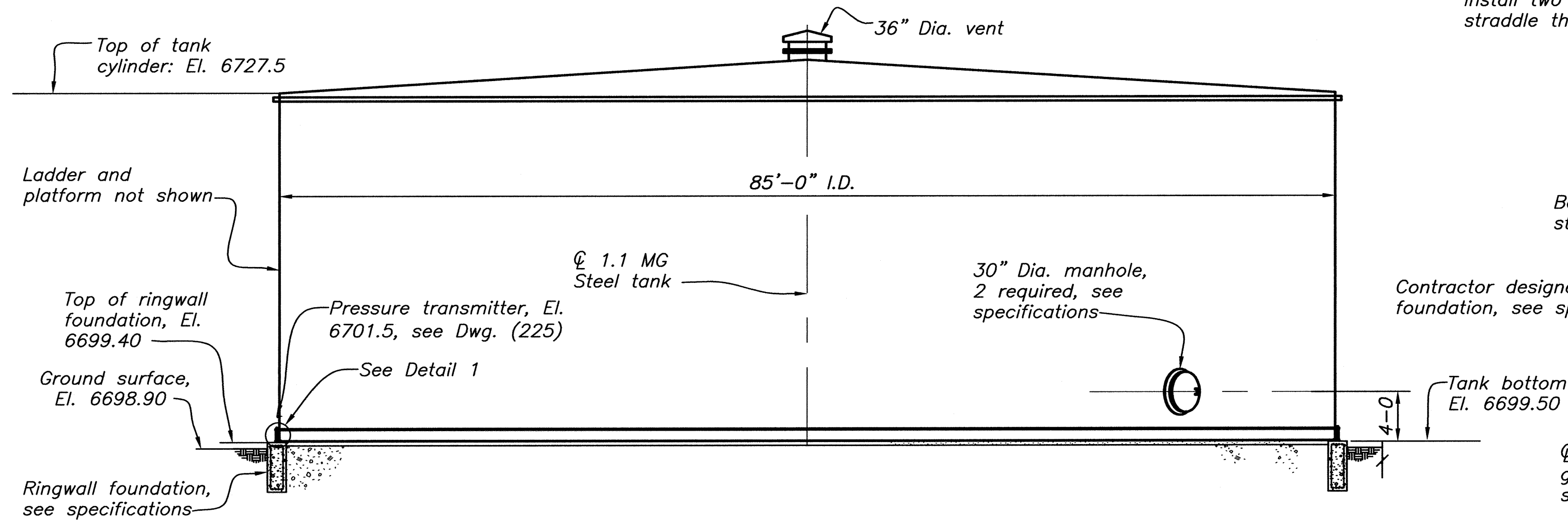
**1.1 MG PRESTRESSED
CONCRETE STORAGE TANK
PLAN AND SECTION**

1695-D-106

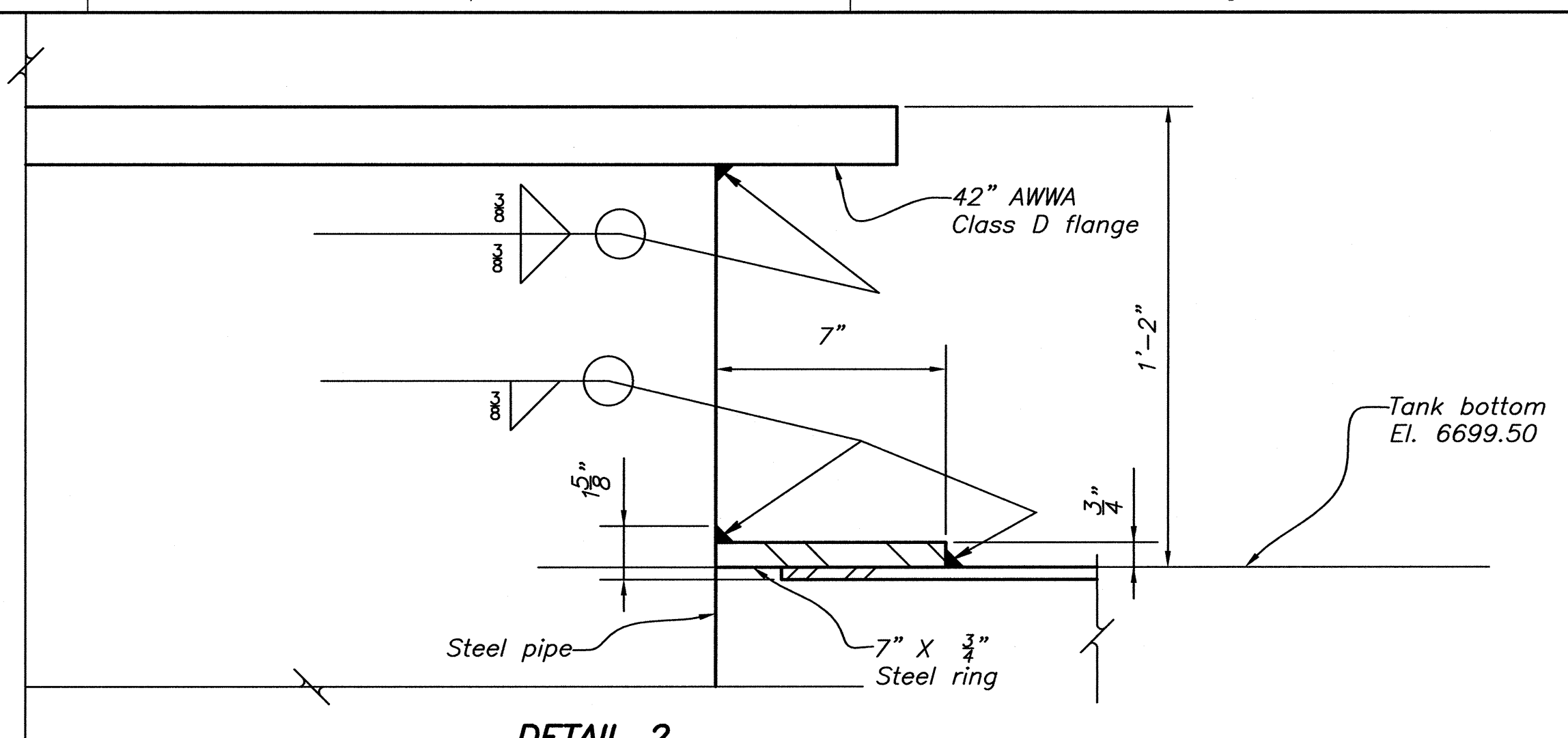
SHEET 1 OF 1



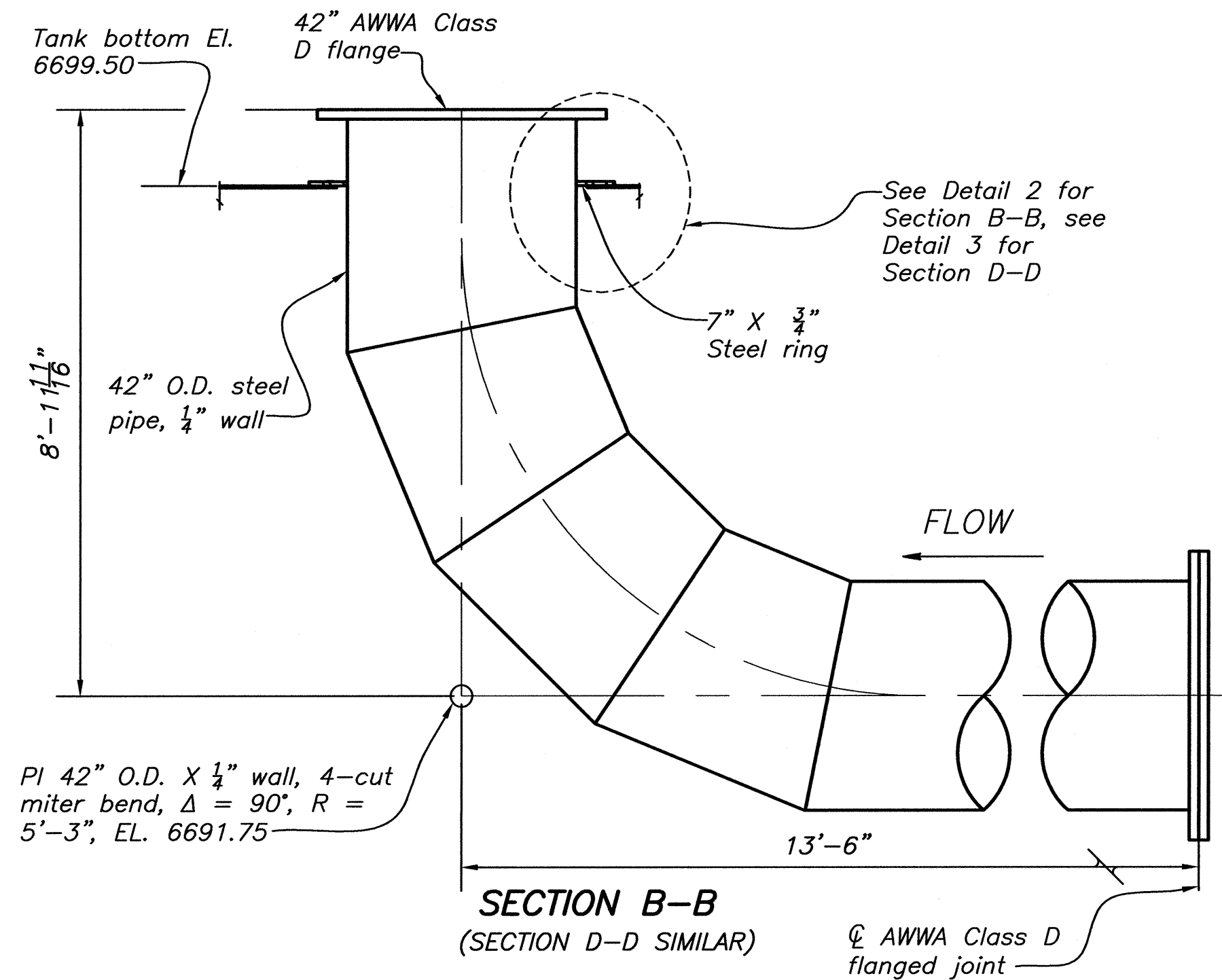
PLAN



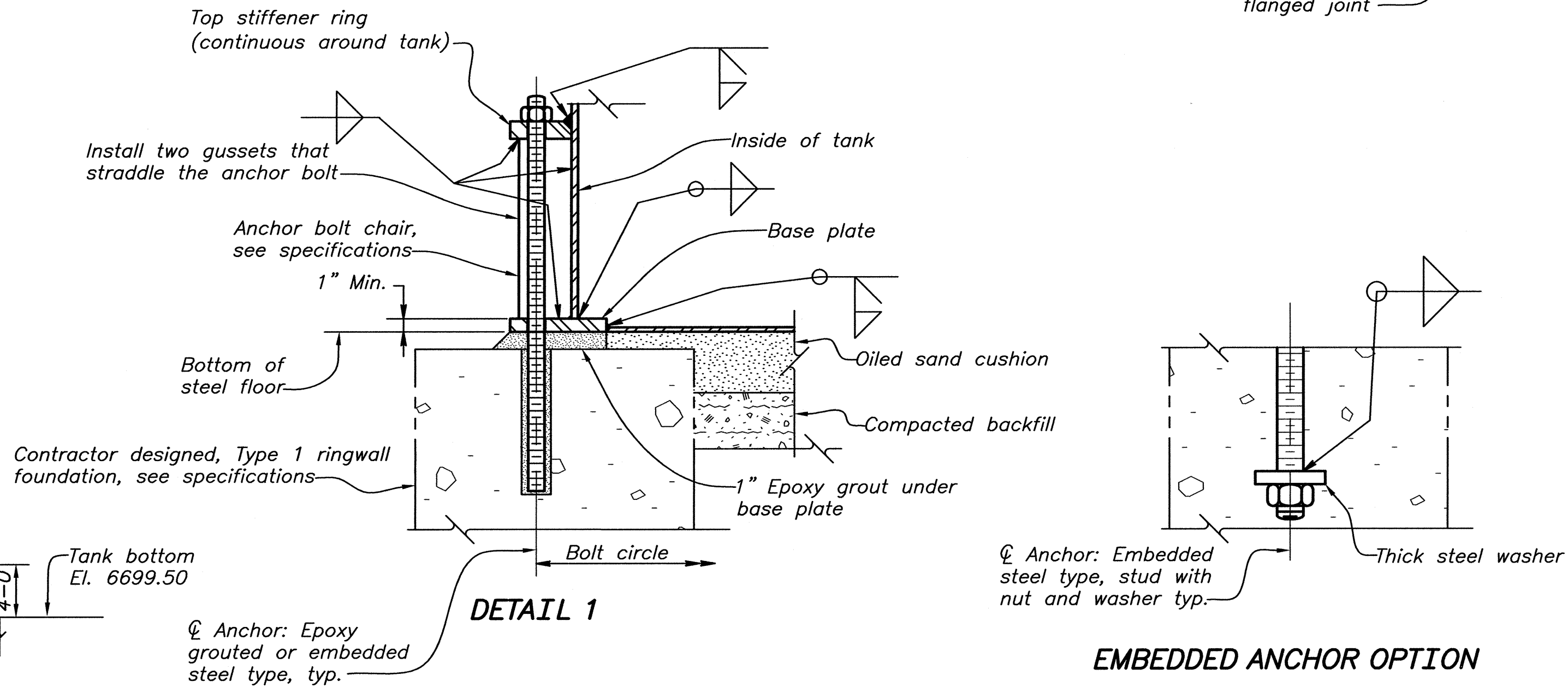
SECTION A-A



DETAIL 2



SECTION B-B
(SECTION D-D SIMILAR)



DETAIL 1

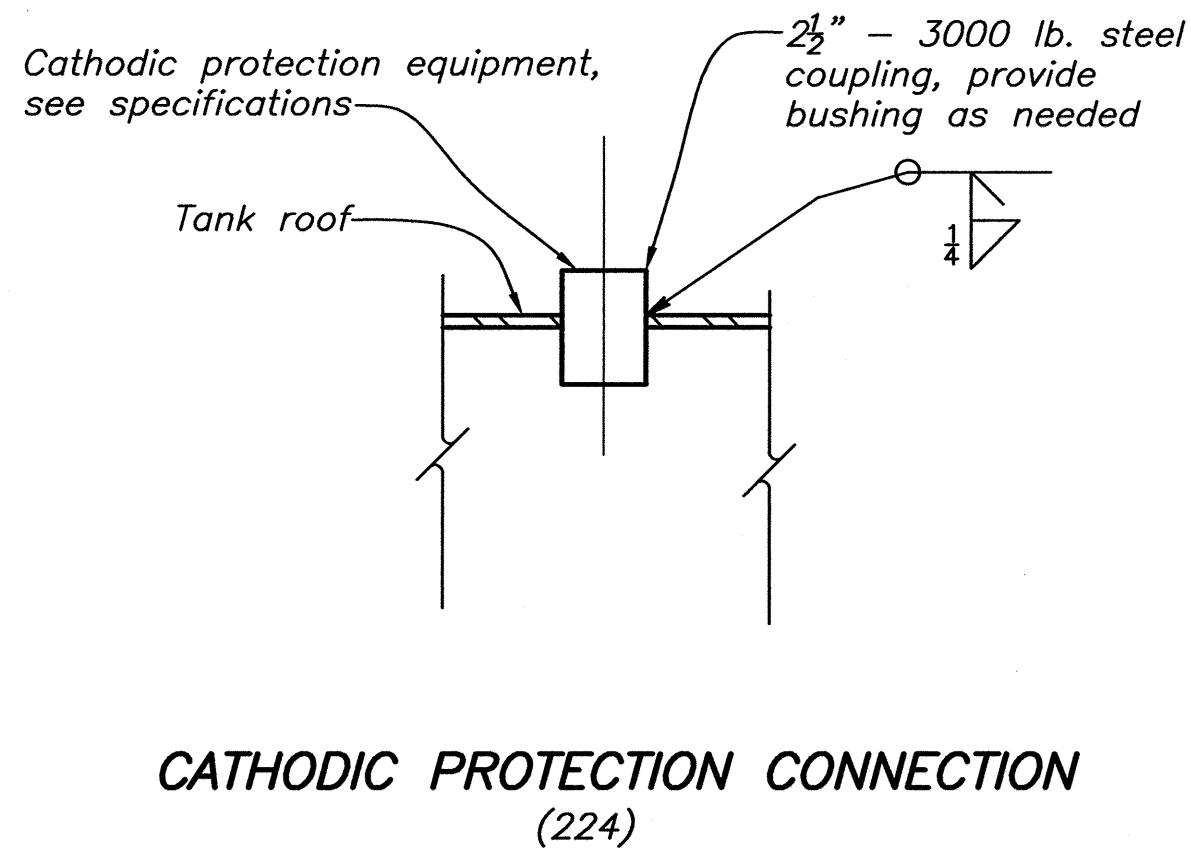
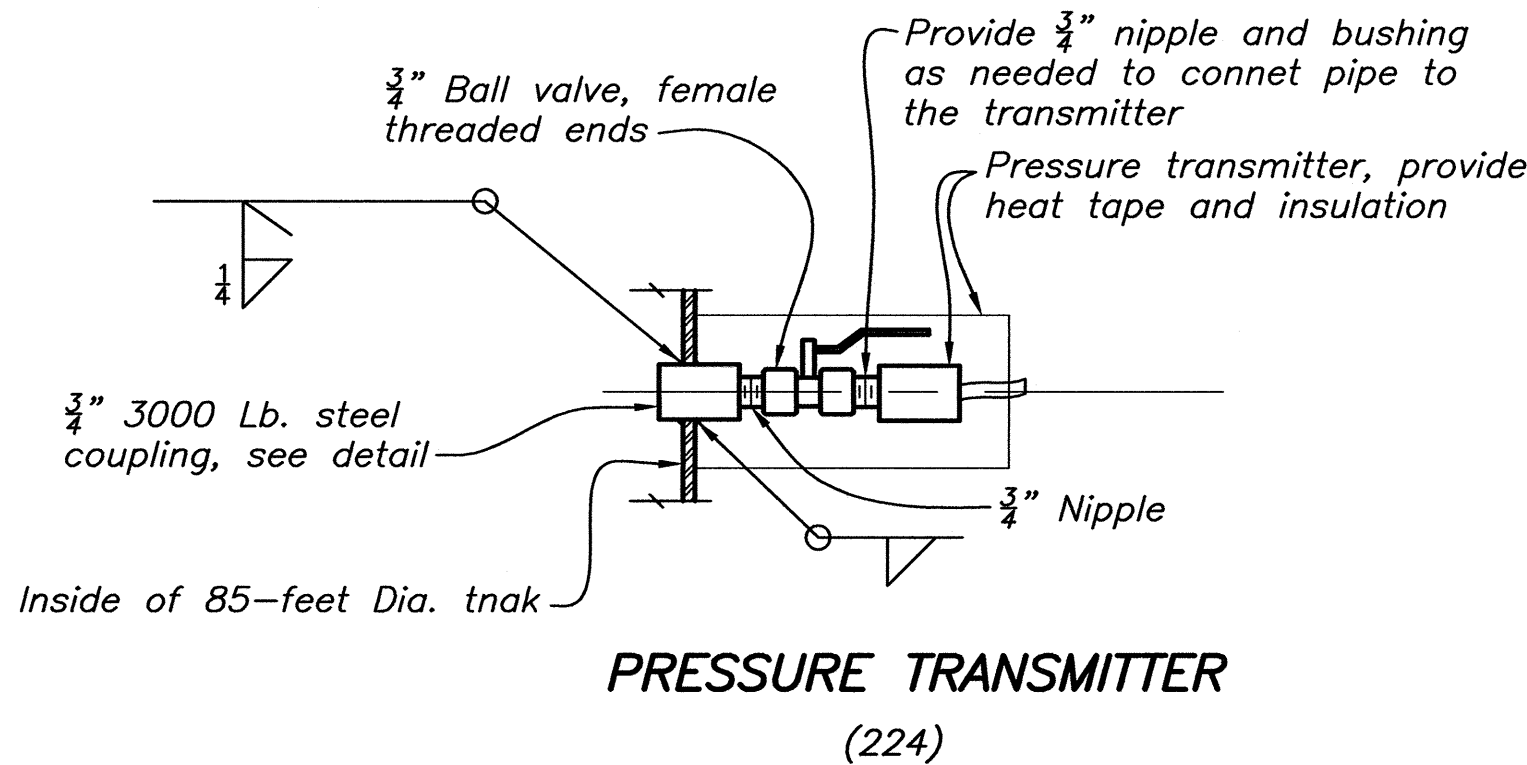
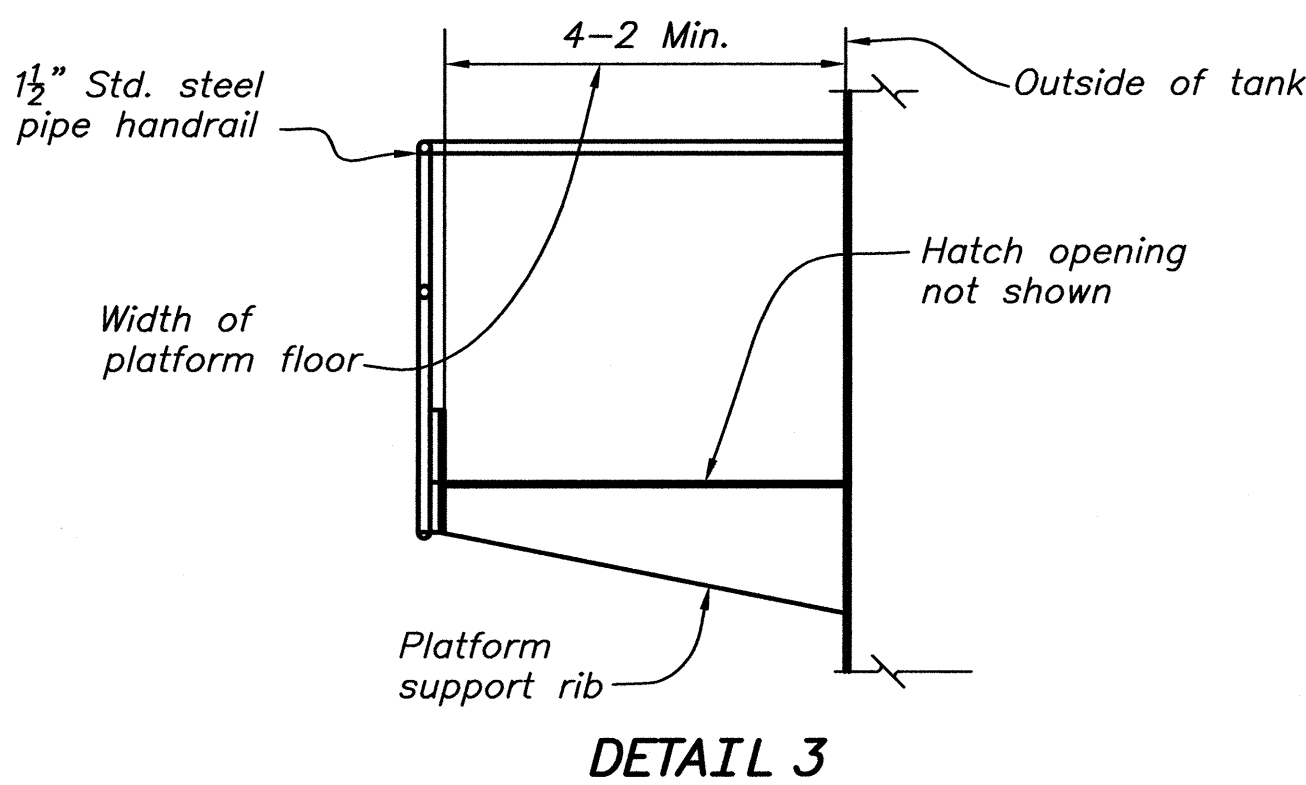
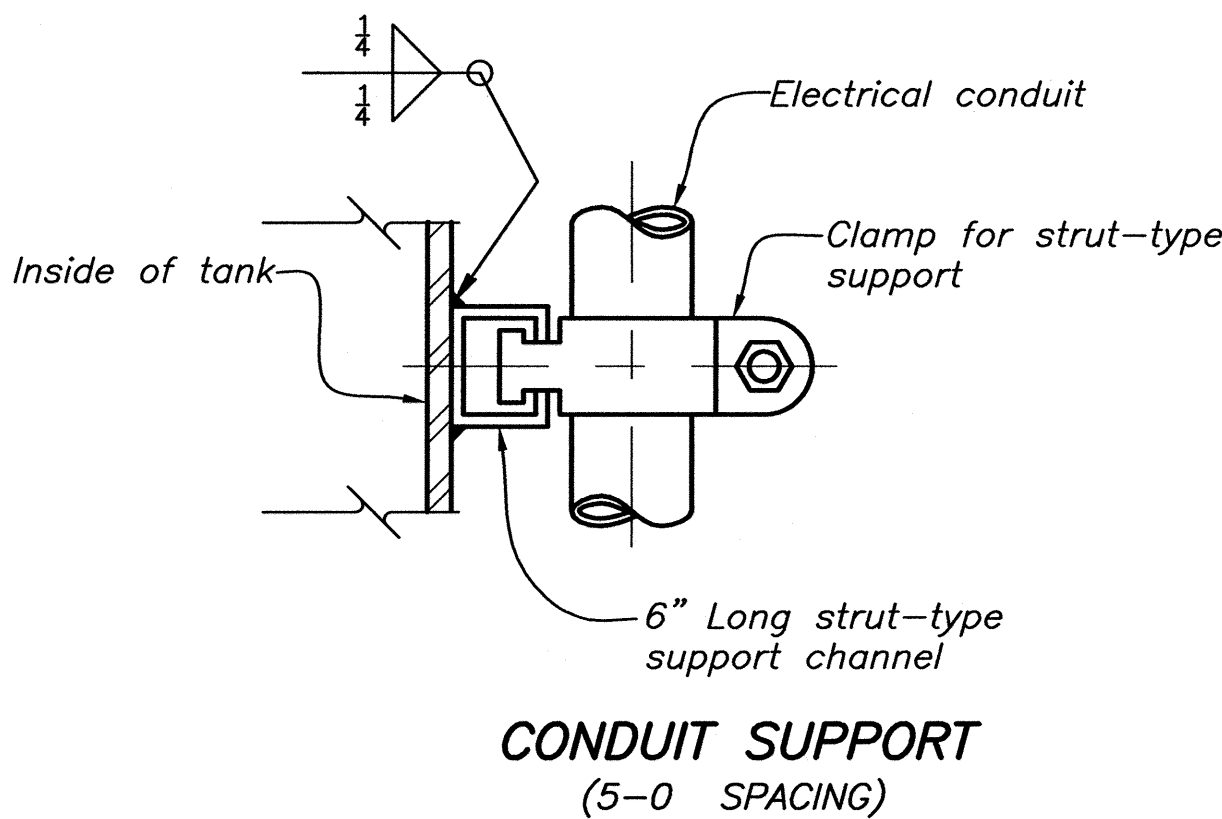
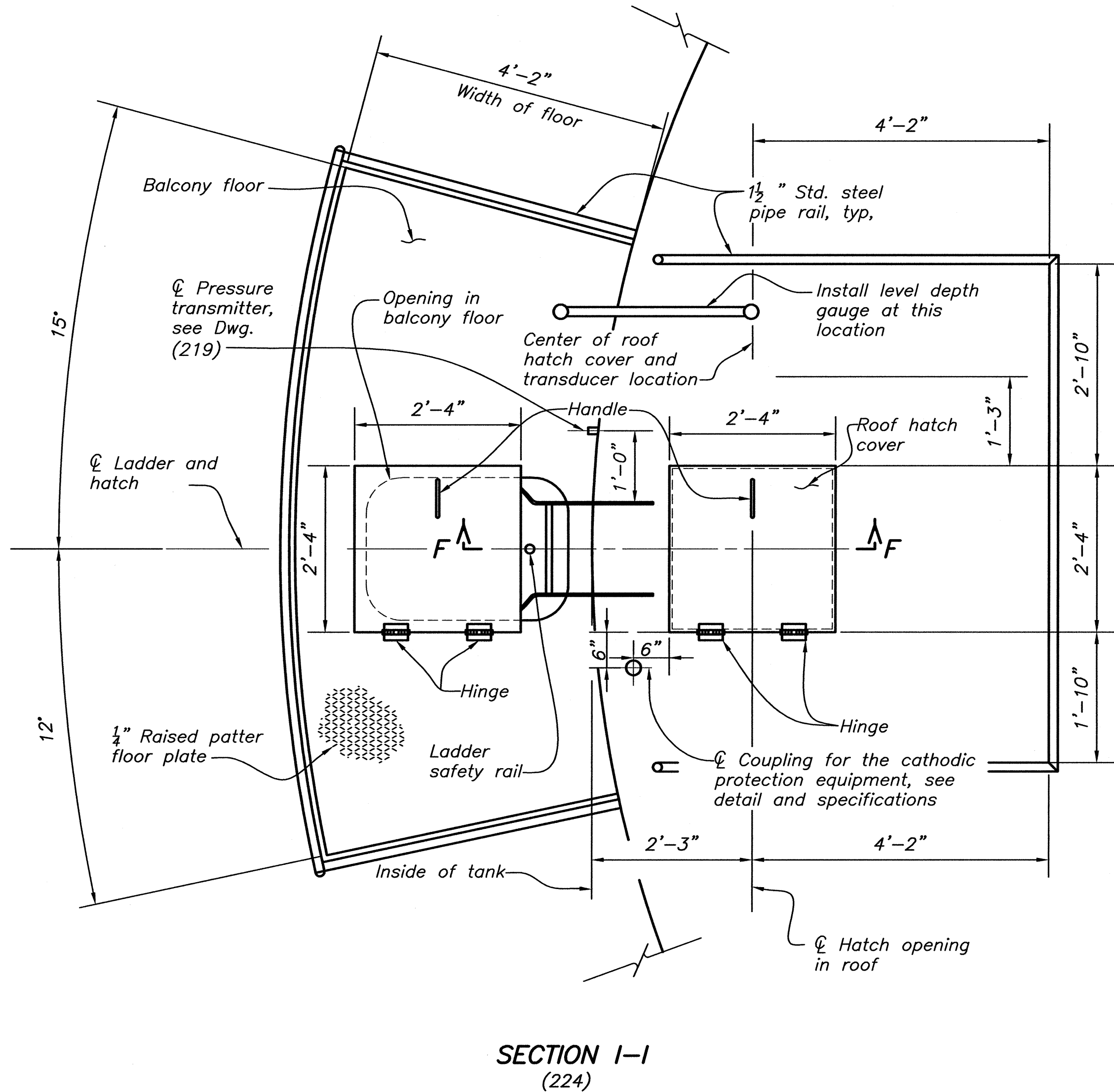
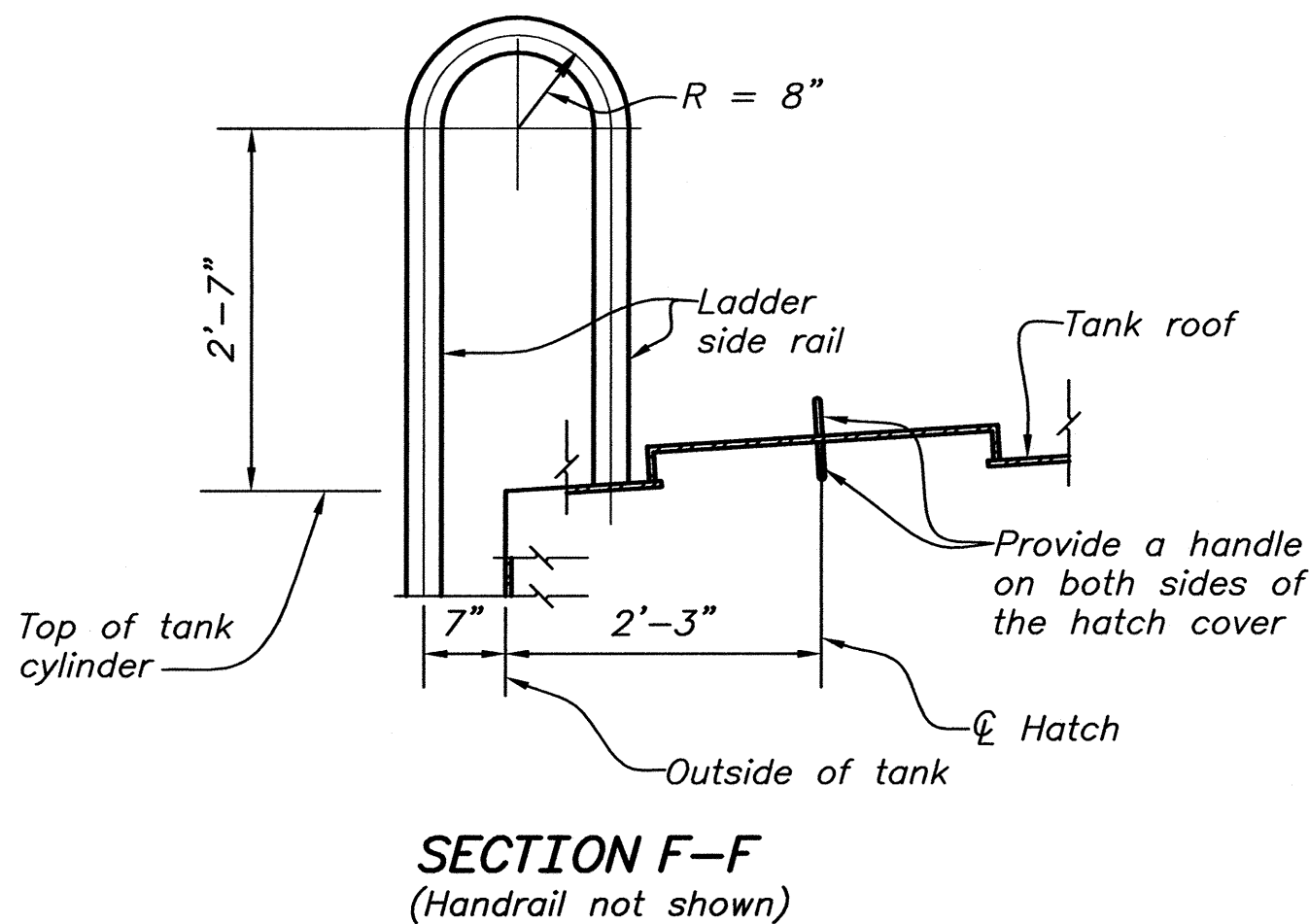
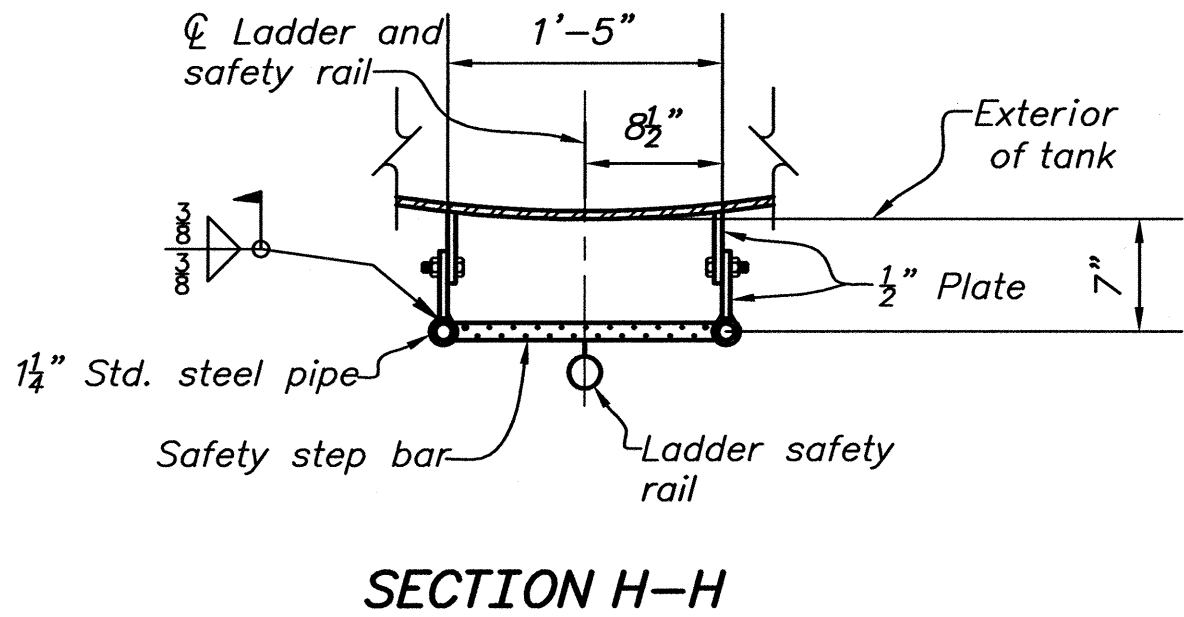
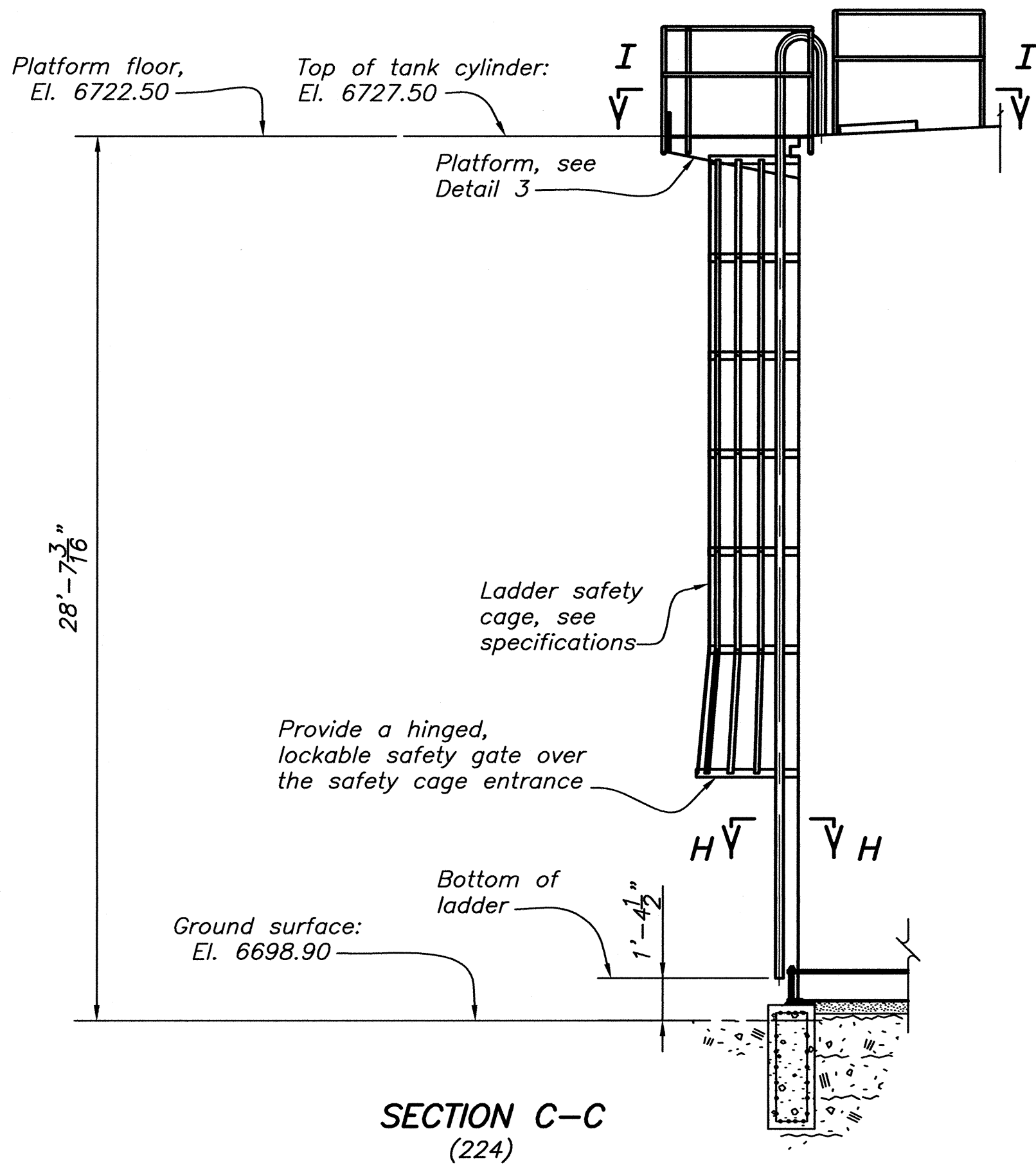
EMBEDDED ANCHOR OPTION

NOTES
For General Notes, see Dwg. (205).

DESIGNED	JERRY WAUGH
DRAWN	LUCAS ADAMS
CHECKED	NATHAN NAKAMOTO
TECH. APPR.	JERRY WAUGH P.E.
APPROVED	TERRY HUMMEL
HYDRAULIC EQUIPMENT GROUP	
DENVER, COLORADO	2013-08-02

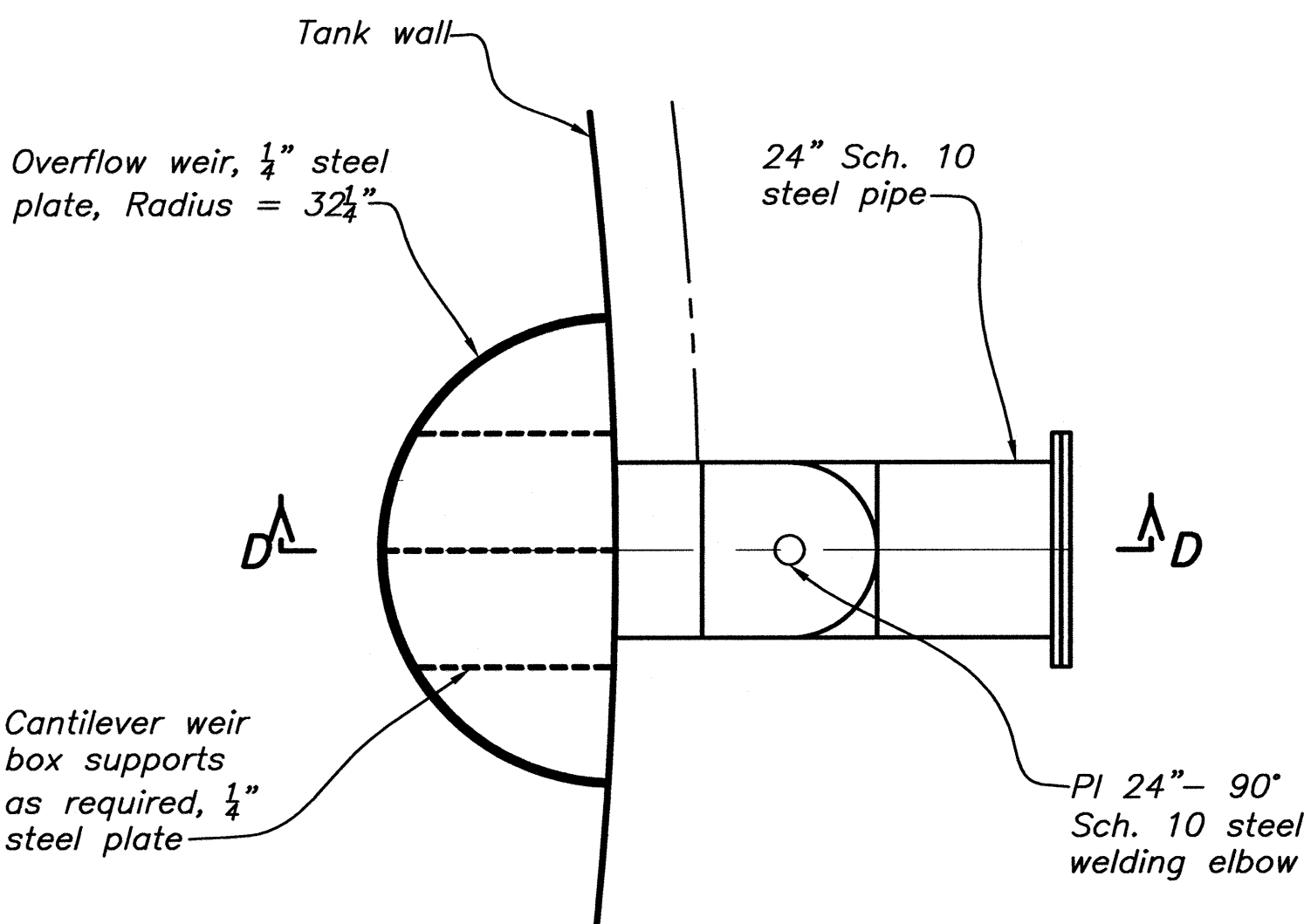
SECTIONS AND DETAILS

1695-D-225

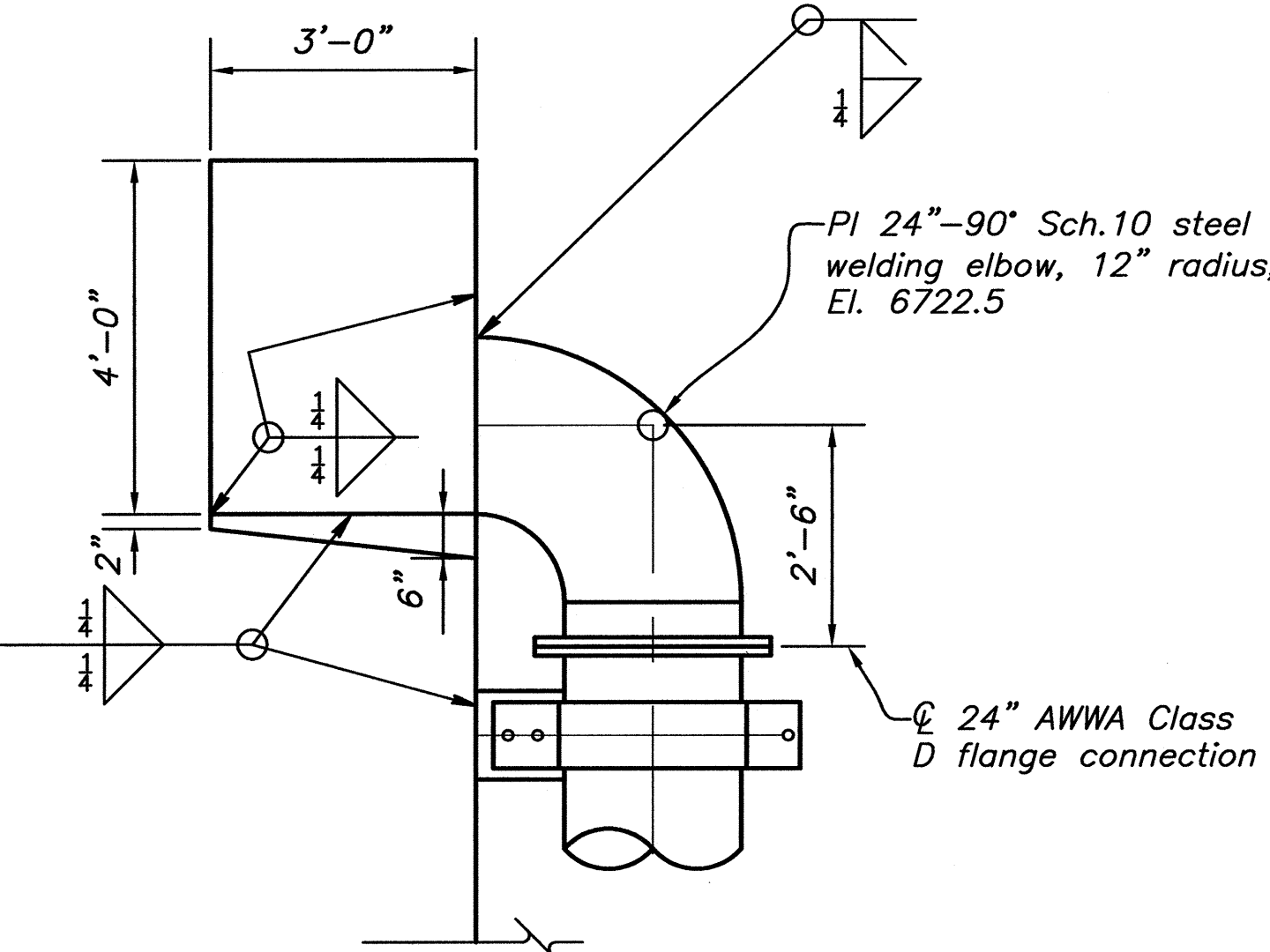


NOTES

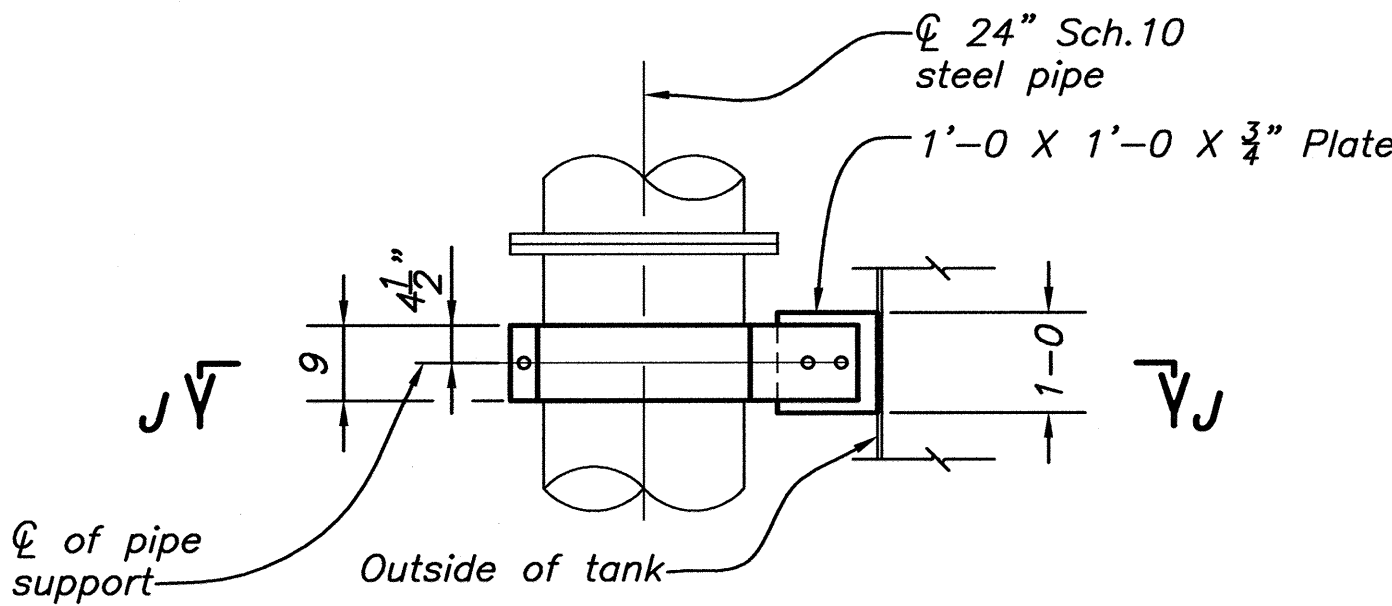
For General Notes, see Dwg. (205).
Weld 3 brackets for mounting level depth gauge to tank side wall, see specifications.



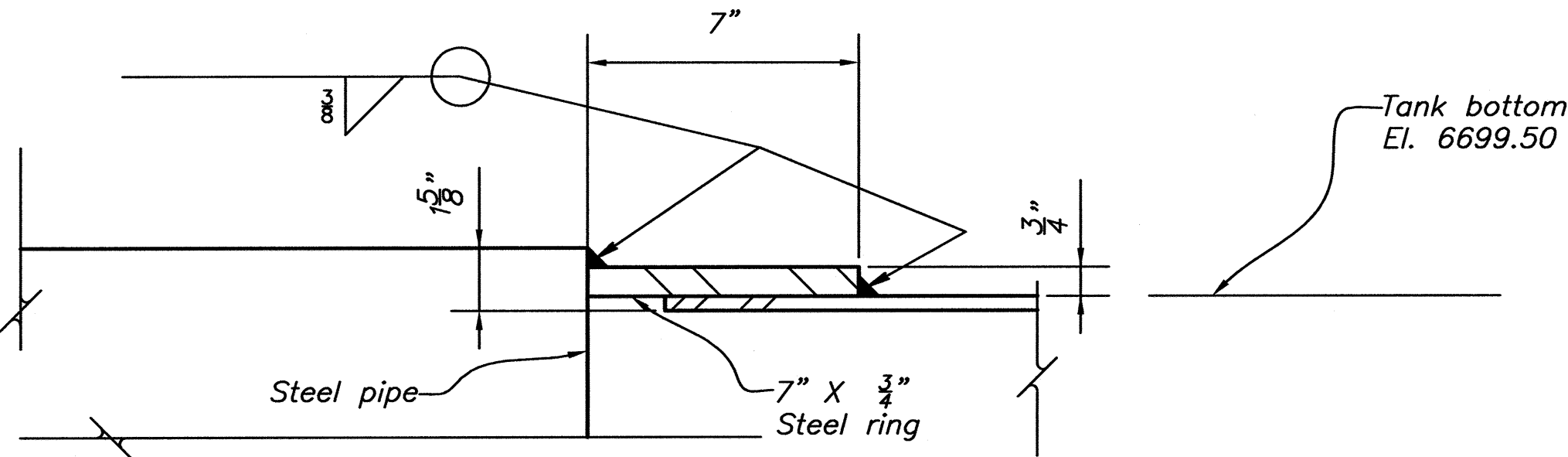
OVERFLOW WEIR BOX PLAN



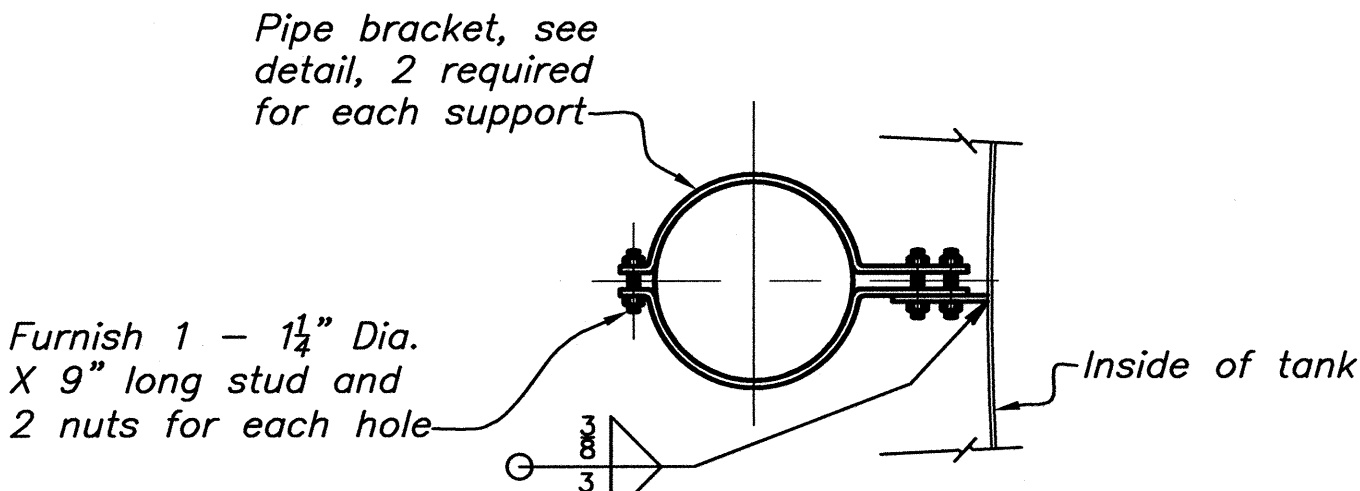
SECTION D-D
(224)



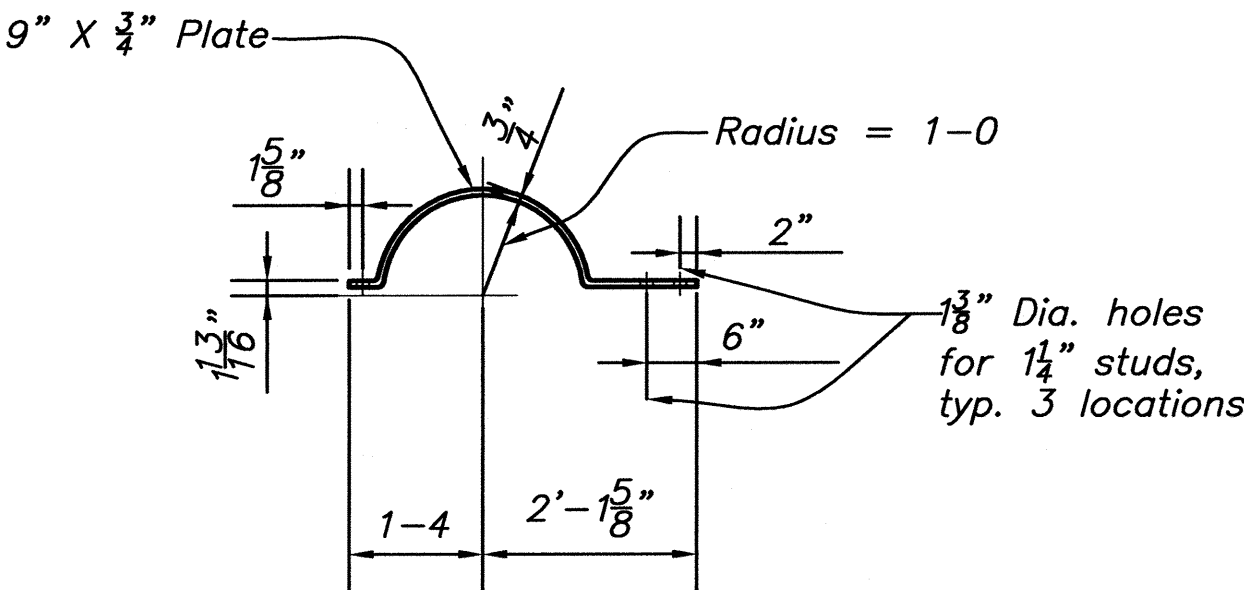
PIPE SUPPORT
(3 Required)



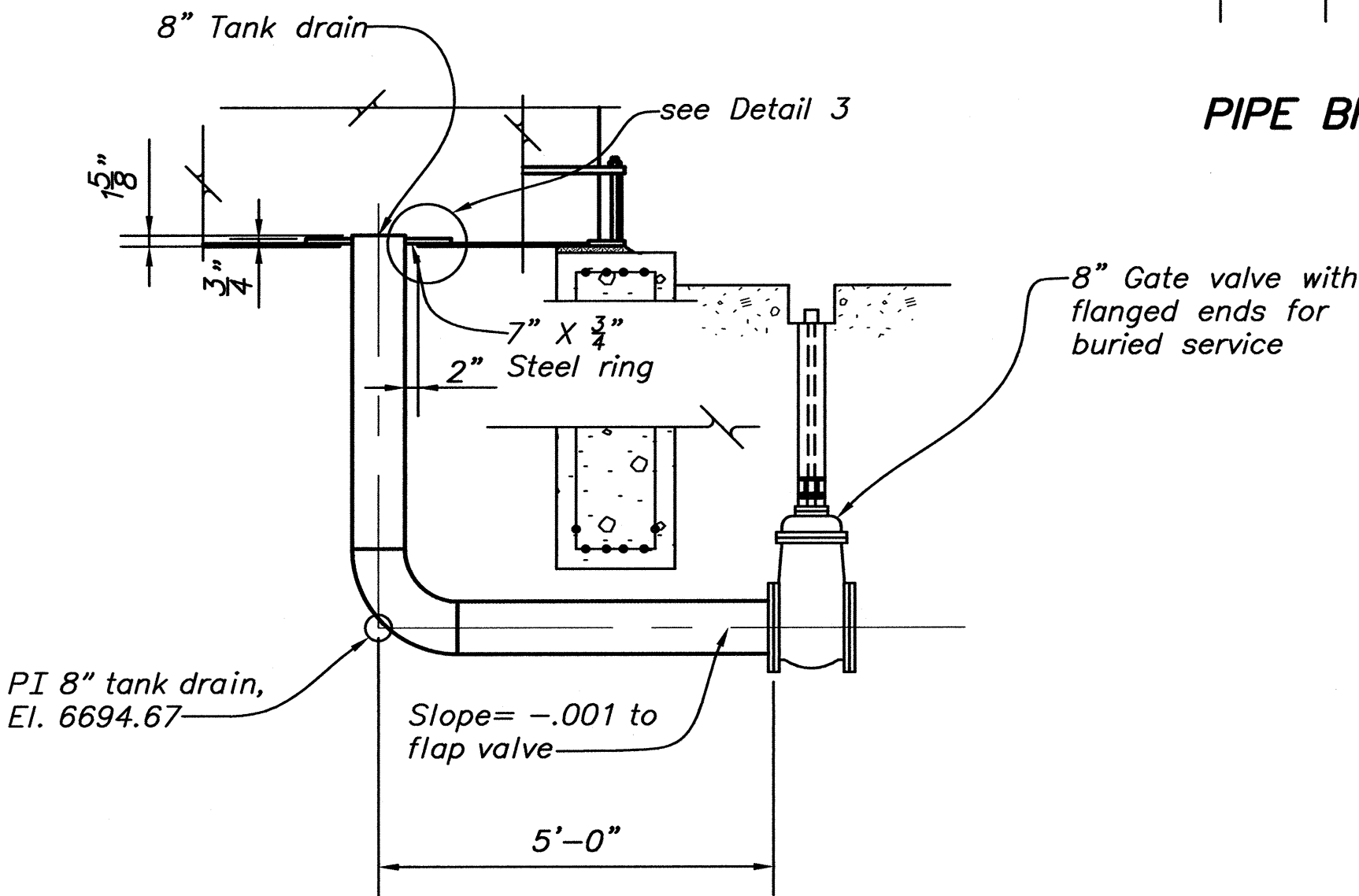
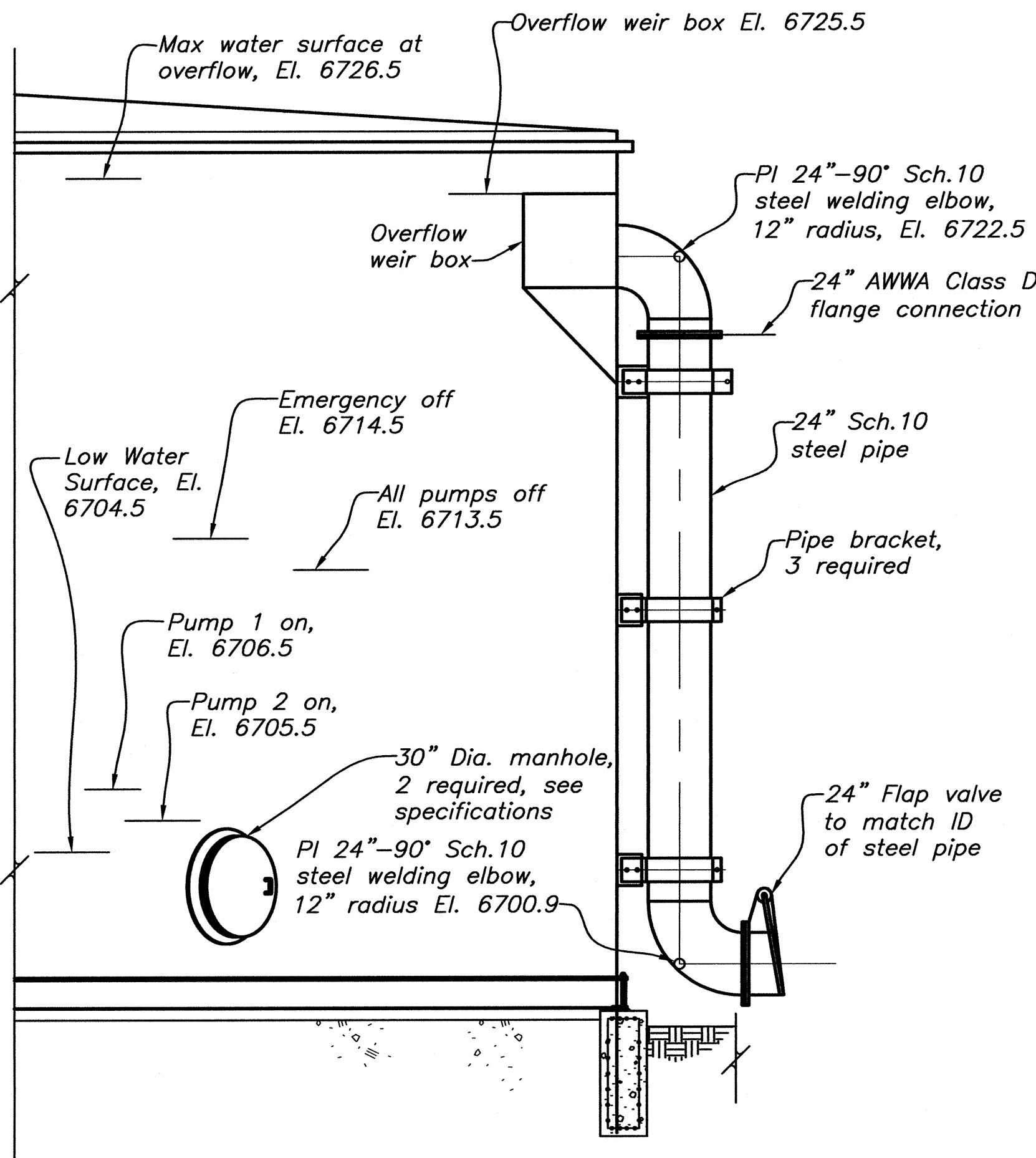
DETAIL 3
(224)



SECTION J-J



PIPE BRACKET



SECTION G-G
(224)

NOTES

For General Notes, see Dwg. (205).

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BUREAU OF RECLAMATION
NAVAJO GALLUP WATER SUPPLY PROJECT
NEW MEXICO
SAN JUAN LATERAL
TOHLAKI PUMPING PLANT
1.1 MG STEEL STORAGE TANK
SECTIONS AND DETAILS

DESIGNED *Jerry R. Wanga*
DRAWN *J. Nakamoto*
CHECKED *Jerry R. Wanga P.E.*
TECH. APPRO. *J. Nakamoto*
APPROVED
HYDRAULIC EQUIPMENT GROUP
DENVER, COLORADO 2013-08-02

SECTIONS AND DETAILS

1695-D-226

SHEET 3 OF 3

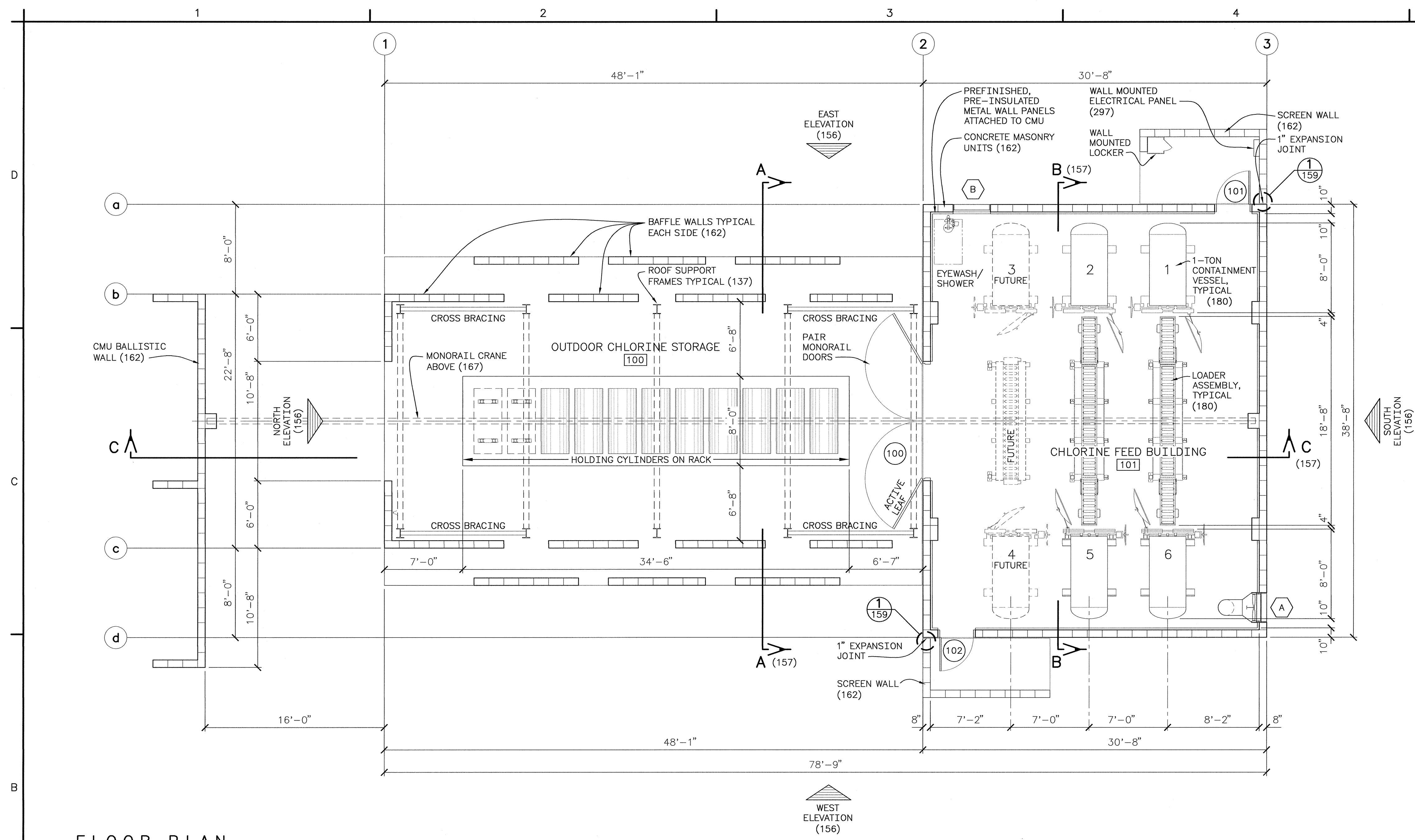
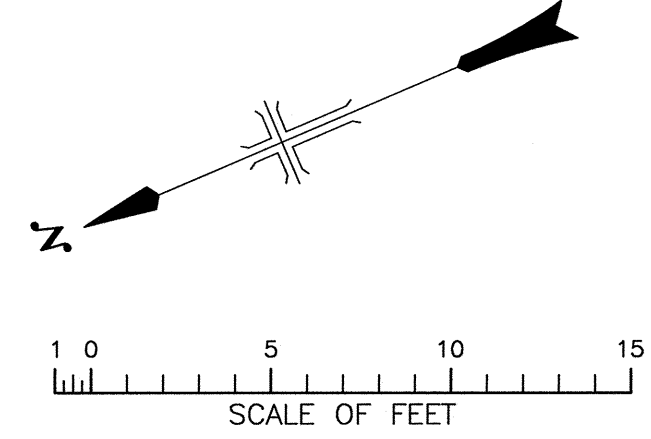
ARCHITECTURAL GENERAL NOTES

1. ALL DIMENSIONS ARE TO FACE OF CONCRETE MASONRY UNIT (CMU), CENTERLINE OF COLUMN, CENTERLINE OF STEEL, UNLESS OTHERWISE NOTED ON DRAWING.
2. ALL SEALANTS, GASKETS AND SEALING MATERIALS MAY NOT BE SHOWN, BUT SHALL BE APPLIED AS RECOMMENDED AND REQUIRED BY ROOF AND WALL PANEL MANUFACTURER FOR CONSISTENT WEATHERPROOFING.
3. ROOF DETAILS SHOWN ON DRAWINGS MAY REQUIRE ADJUSTMENTS TO ACCOMMODATE ROOFING PANEL MANUFACTURER'S MATERIALS. CONTRACTOR SHALL COORDINATE WITH ROOFING PANEL MANUFACTURER AND SUBMIT ACCEPTABLE DETAILS FOR APPROVAL PRIOR TO CONSTRUCTION.
4. THE NUMBER OF DOWNSPOUTS AND THEIR LOCATION ON THE BUILDING TO BE CONTRACTOR DESIGNED. PRECAST CONCRETE SPLASH BLOCKS TO BE INSTALLED AT LOCATIONS, WHERE DOWNSPOUTS SPILL OUT ON TO GRAVEL, SEE SPECIFICATIONS.
5. THE PRE-INSULATED METAL PANELS ARE NOT STRUCTURAL. SEE DETAIL 2 & 3 ON DRAWING 1695-D-159. ANY PENETRATIONS THROUGH THE METAL WALL PANELS MUST BE APPROPRIATELY WEATHER SEALED TO INSURE AIR TIGHTNESS.

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NAVAJO GALLUP WATER SUPPLY PROJECT
NEW MEXICO

**SAN JUAN LATERAL
TOHLAKAI PUMPING PLANT**
CHLORINE FEED BUILDING AND OUTDOOR CHLORINE STORAGE
ARCHITECTURAL
FLOOR PLAN AND SCHEDULES



FLOOR PLAN

1,012 s.f. OUTDOOR CHLORINE STORAGE
1,186 s.f. CHLORINE FEED BUILDING

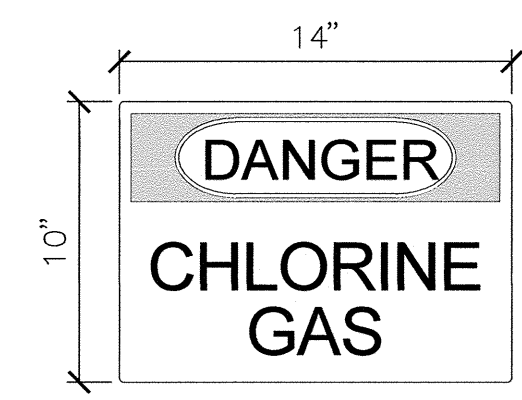
DOOR SCHEDULE

DOOR NUMBER	SIZE W x H x THK	DOOR		FRAME		GROUT	DETAIL			REMARKS
		TYPE	MAT'L	TYPE	MAT'L		HEAD	JAMB	THRHLD	
100	(PAIR) 5'-2" x 14'-6"	VD	STEEL	2	STEEL	YES	H2	J2	T2	CUSTOM OPENING FOR MONORAIL, ASTRAGAL, INSULATED
101	3'-0" x 7'-0" x 1 1/2"	V	STEEL	1	STEEL	YES	H1	J1	T1	EXTERIOR, INSULATED
102	3'-0" x 7'-0" x 1 1/2"	V	STEEL	1	STEEL	YES	H1	J1	T1	EXTERIOR, INSULATED

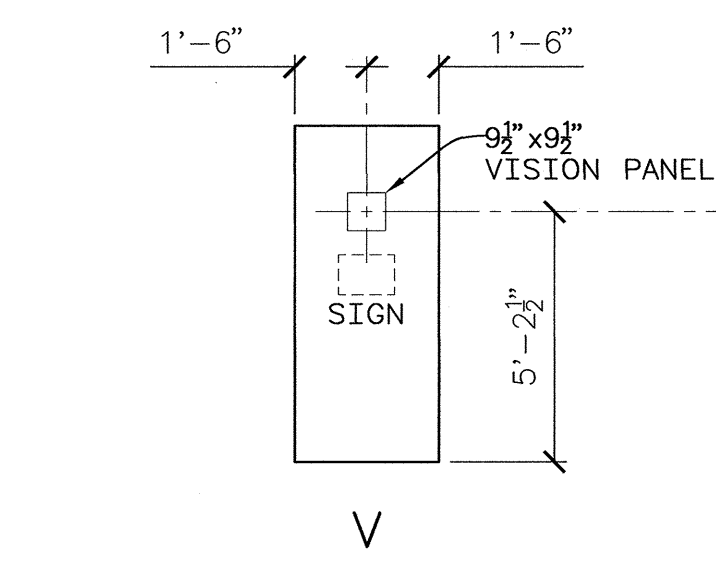
LOUVER SCHEDULE

LOUVER NUMBER	SIZE WIDTH x HEIGHT	QTY	DESCRIPTION	DETAIL			REMARKS
				HEAD	JAMB	SILL	
A	32" x 32"	1	EXHAUST	H3	J3	S1	SEE MECHANICAL DRAWINGS AND SPECIFICATIONS
B	40" x 40"	1	INTAKE	H3	J3	S1	SEE MECHANICAL DRAWINGS AND SPECIFICATIONS

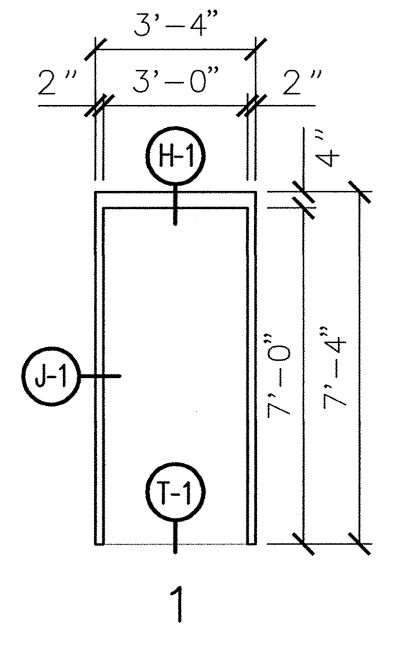
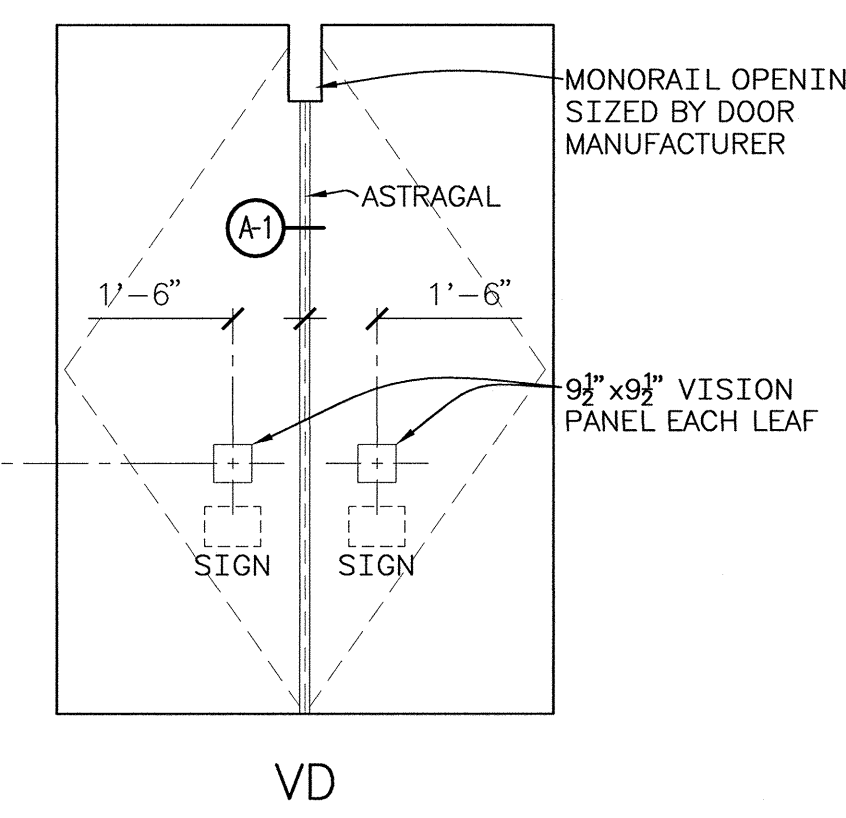
NOTE: DOOR AND LOUVER DETAILS ON DRAWING 159



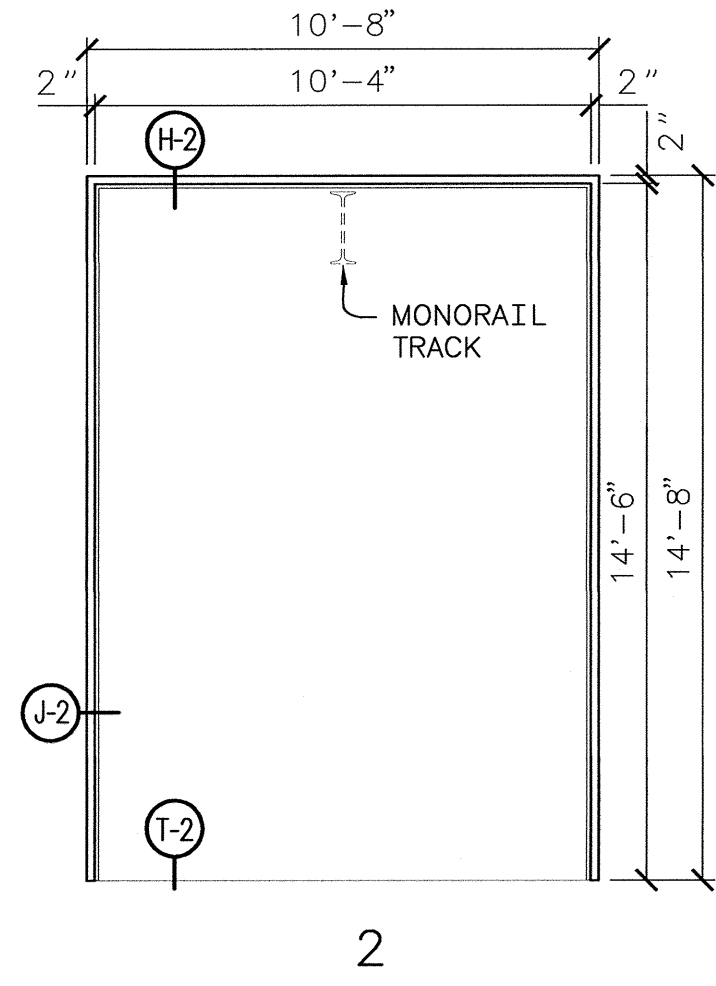
NOTE:
ATTACH THIS OSHA APPROVED
SIGN TO ALL DOORS WHERE
SHOWN, EACH FACE



DOOR TYPES



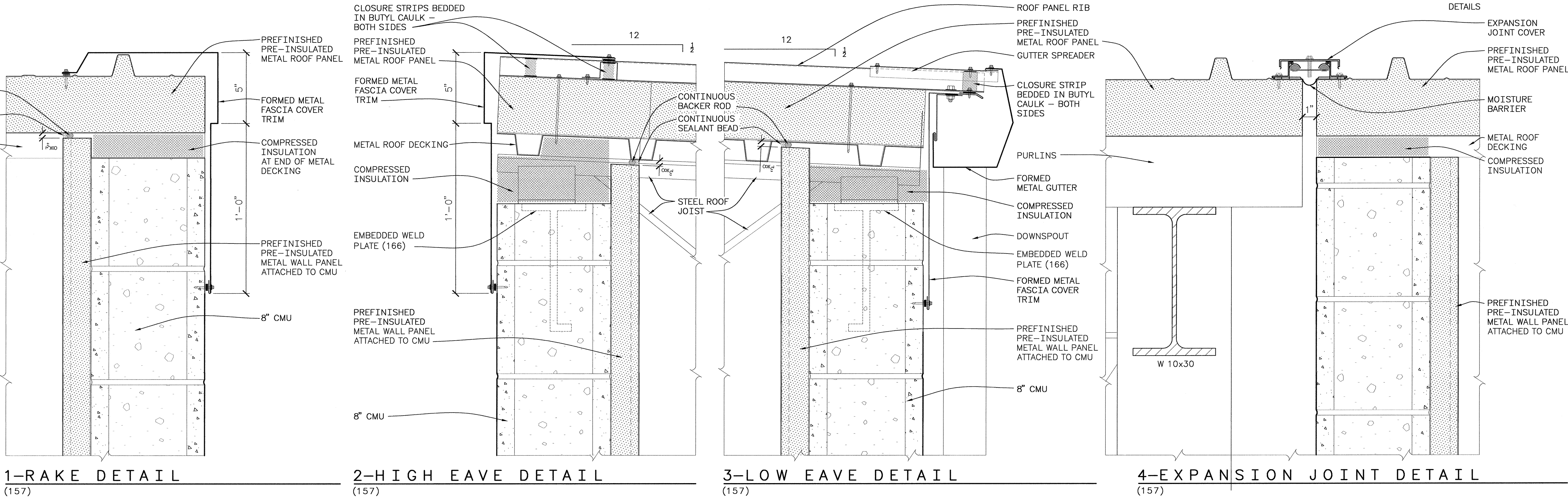
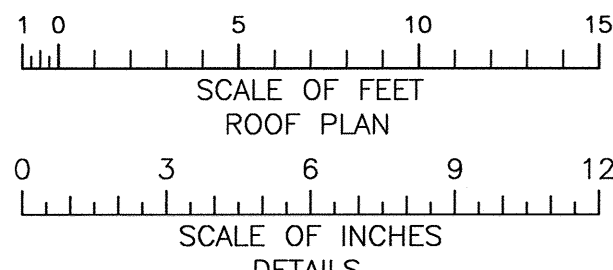
DOOR FRAME TYPES



NOTE: DOOR DETAILS ON DRAWING 159

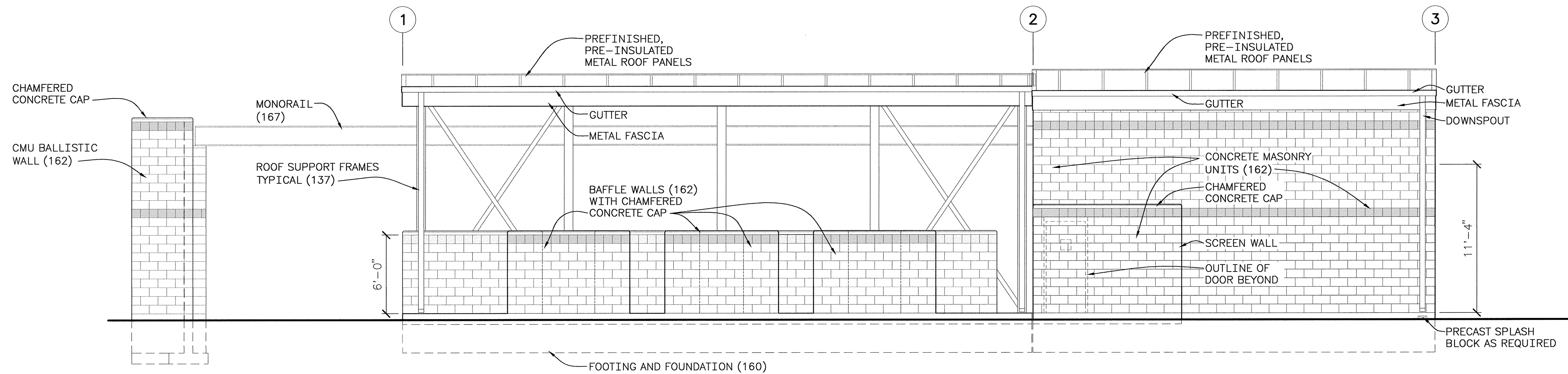
DATE AND TIME PLOTTED: AUGUST 5, 2013 12:03
PLOTTED BY: JNEUMER
CAD SYSTEM: AutoCAD Rev. 13.0s
CAD FILENAME: TOHLAKAI_ARCHITECTURAL_CHLORINE_BUILDING_PLANS.DWG

ROOF PLAN
(154)



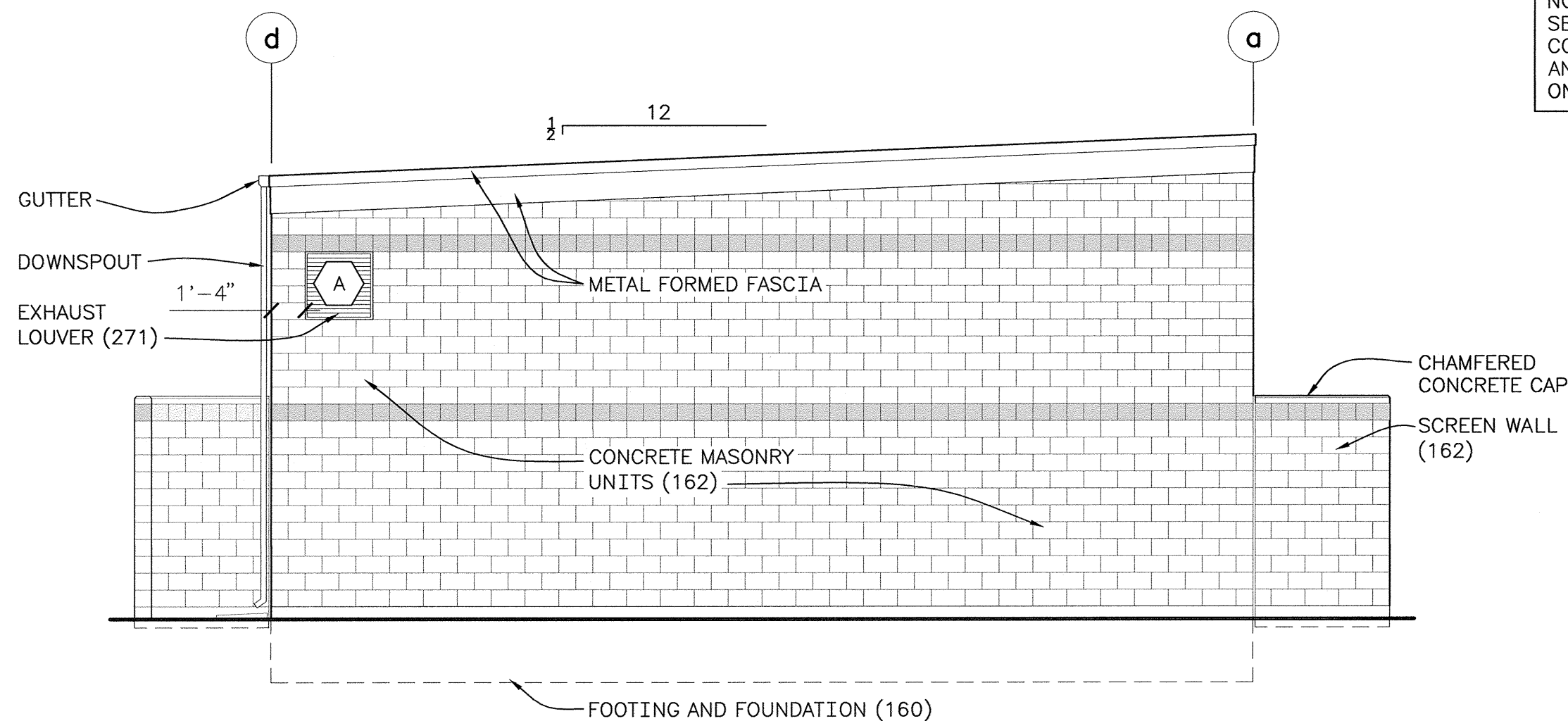
ROOF PLAN AND
ROOF DETAILS

1695-D-155



WEST ELEVATION

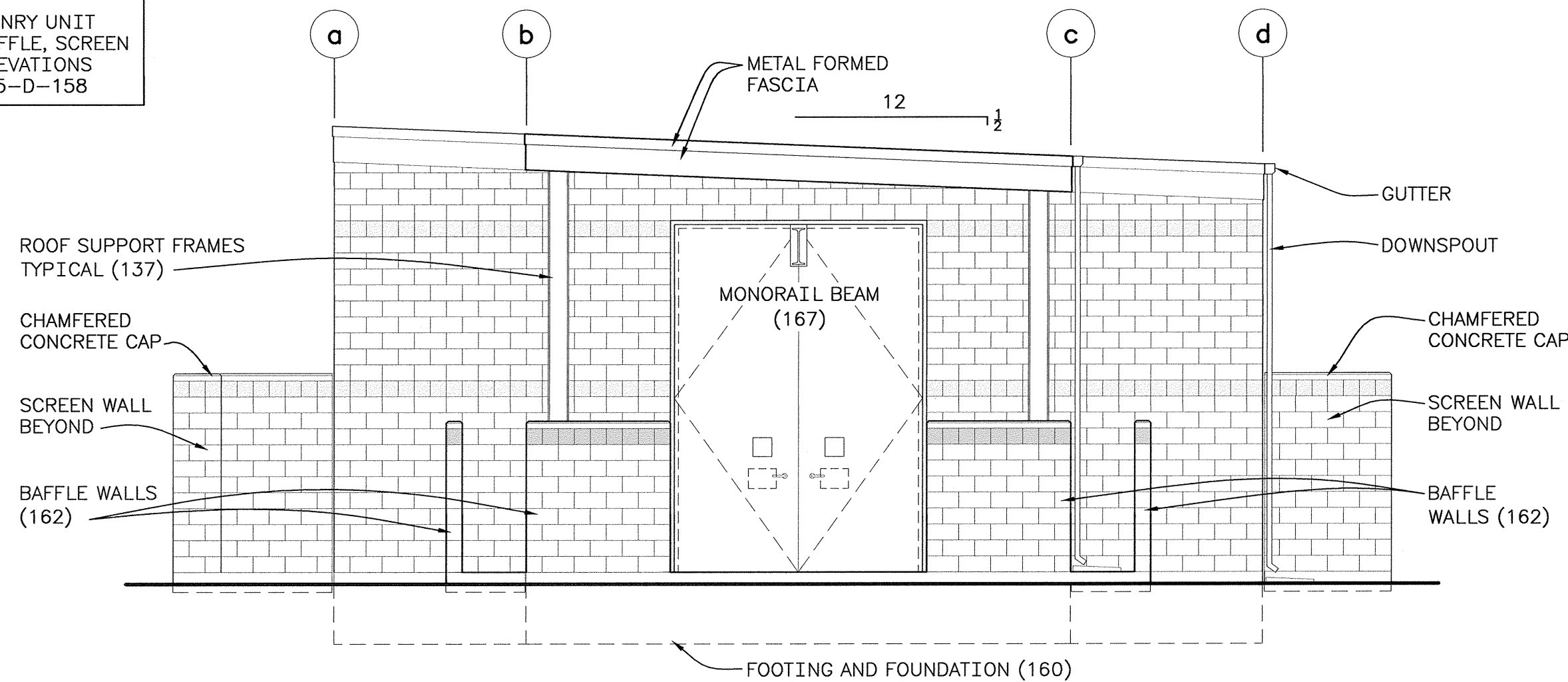
(154) (163)



SOUTH ELEVATION

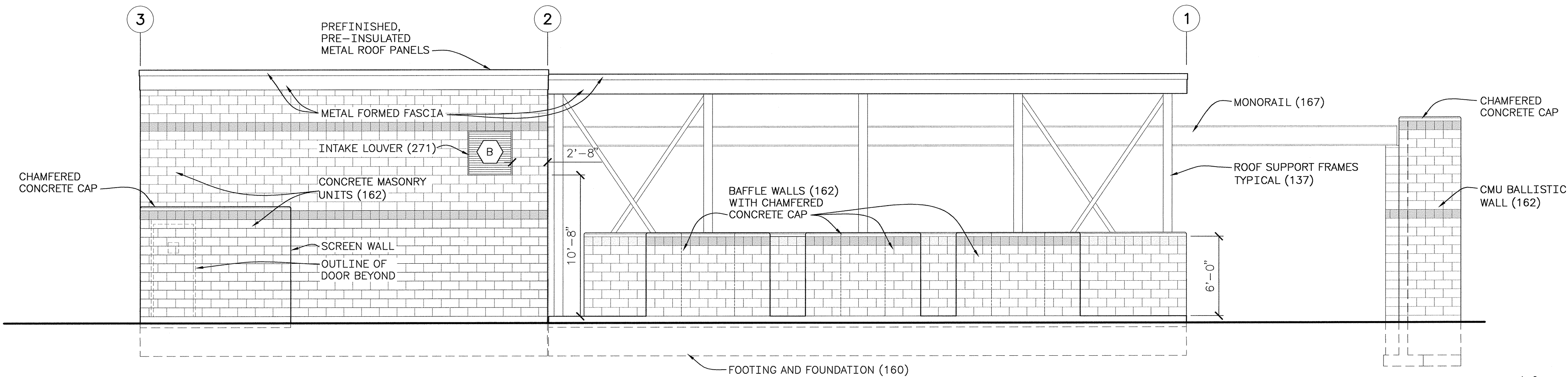
(154) (164)

NOTE:
SEE TYPICAL MASONRY UNIT
COURSING FOR BAFFLE, SCREEN
AND BUILDING ELEVATIONS
ON DRAWING 1695-D-158



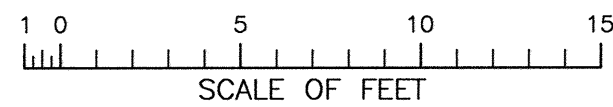
NORTH ELEVATION

(154) (164)



EAST ELEVATION

(154) (163)



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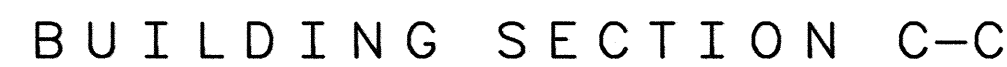
U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
NAVAJO GALLUP WATER SUPPLY PROJECT
NEW MEXICO
**SAN JUAN LATERAL
TOHOKAI PUMPING PLANT**
CHLORINE FEED BUILDING AND OUTDOOR CHLORINE STORAGE
ARCHITECTURAL
ELEVATIONS

DESIGNED *[Signature]*
DRAWN *[Signature]*
CHECKED *[Signature]*
TECH. APPR. *[Signature]*
APPROVED *[Signature]*
PLANT STRUCTURES GROUP
DENVER, COLORADO 2013 08 05

ELEVATIONS

1695-D-156

SHEET 1 OF 1

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATIONBUREAU OF RECLAMATION
NAVAJO GALLUP WATER SUPPLY PROJECT

SAN JUAN LATERAL
NEW MEXICO

TOHLAKAI PUMPING PLANT

DEED BUILDING AND OUTDOOR CHLORINE STORAGE

ARCHITECTURAL
SECTIONS A-A B-B AND C-C

NO COPY TO BE MADE

DESIGNED J. N. W. M. A. P. R.
DRAWN J. N. W. M. A. P. R.
CHECKED [Signature]
TECH. APPR. K. O. G. L. P. E.
APPROVED [Signature]
PLANT STRUCTURES GROUP

DENVER, COLORADO	2013 08 05
------------------	------------

BUILDING SECTIONS
A-A, B-B, AND C-C

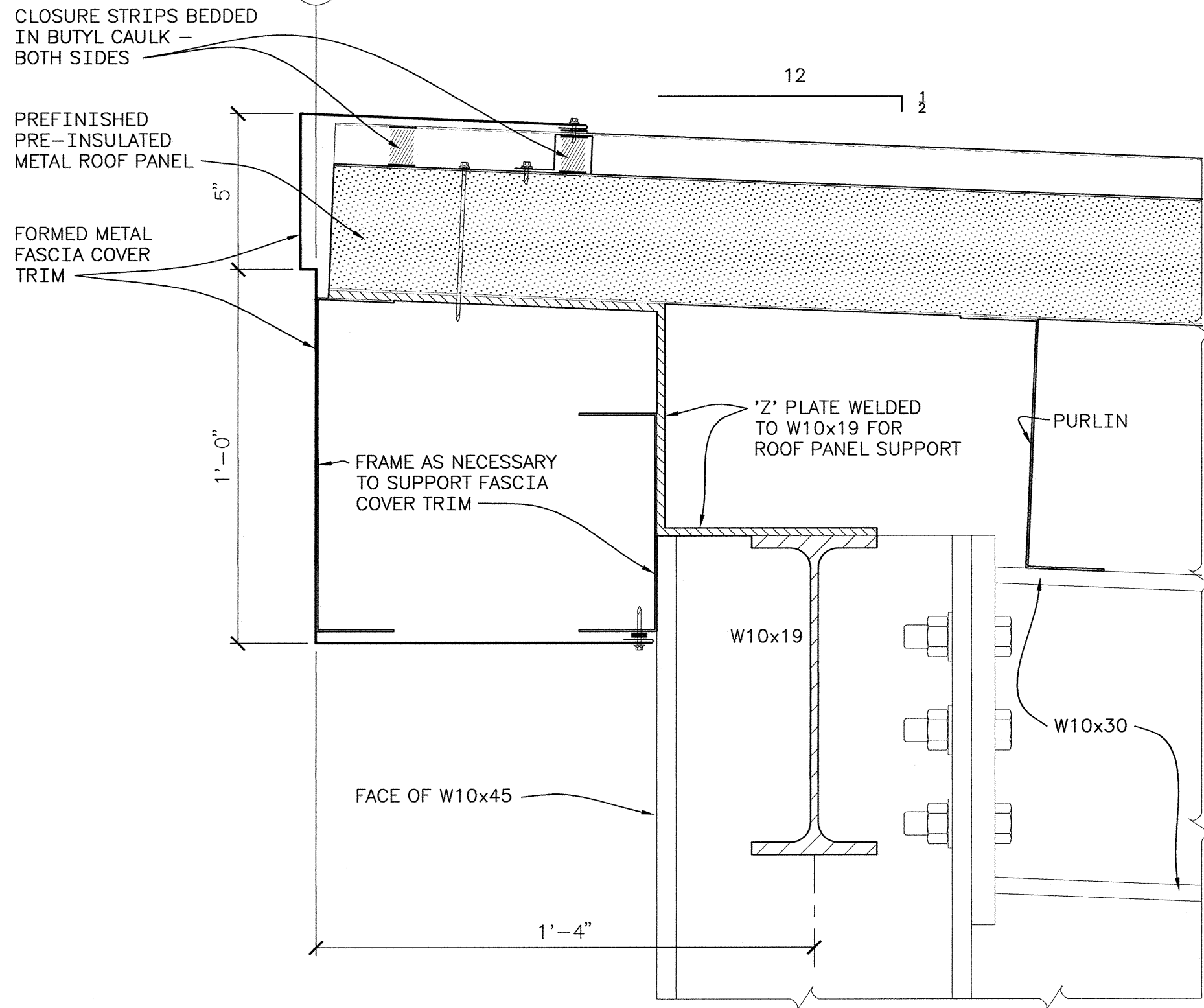
1695-D-157

SHEET 1 OF 1

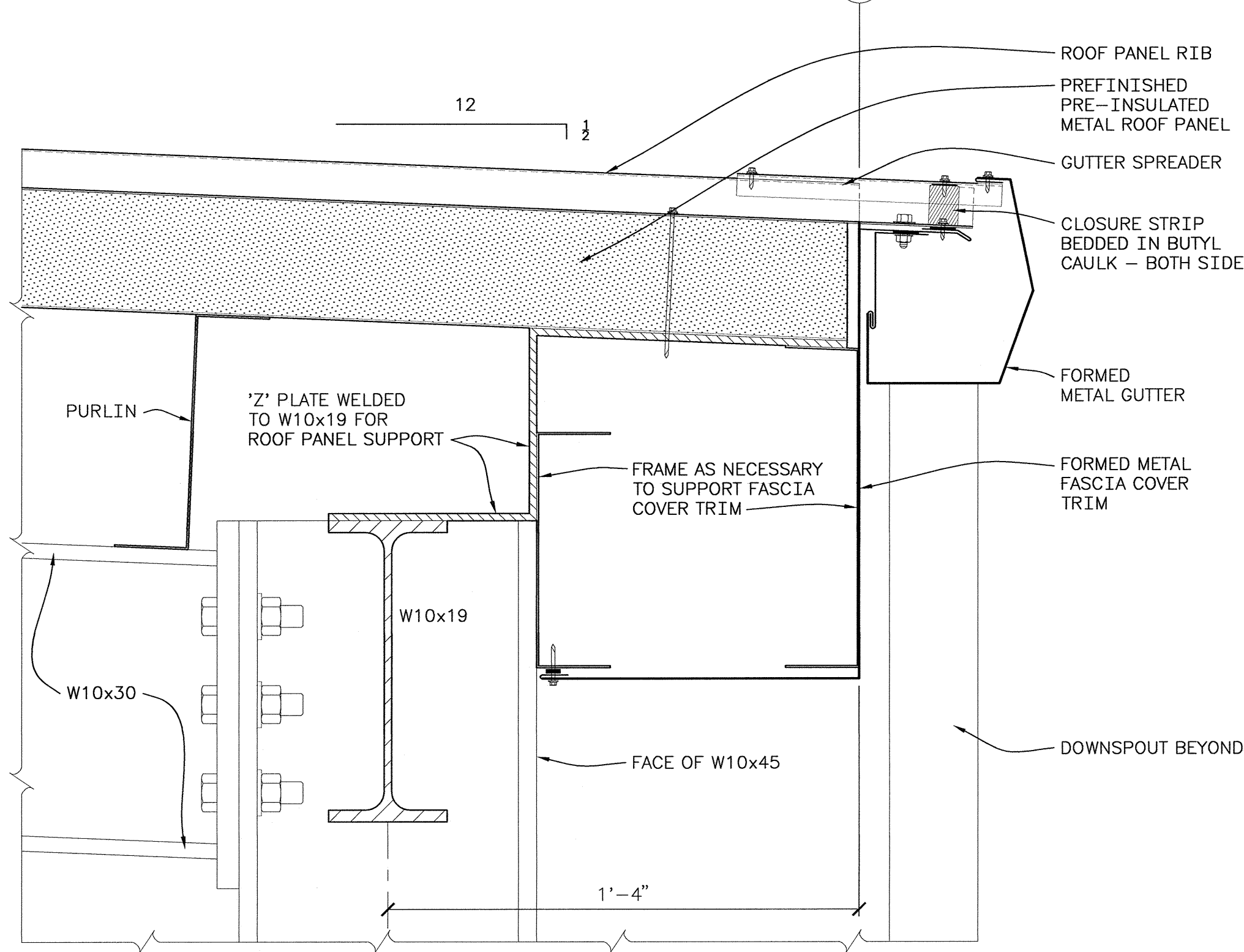
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 CAD FILENAME TOHLAKA_ARCHITECTURAL_CHLORINE_BUILDING_PLANS.DWG
 DATE AND TIME PLOTTED AUGUST 5, 2013 12:03
 PLOTTED BY JNEUMAIR

1 0 5 10 15

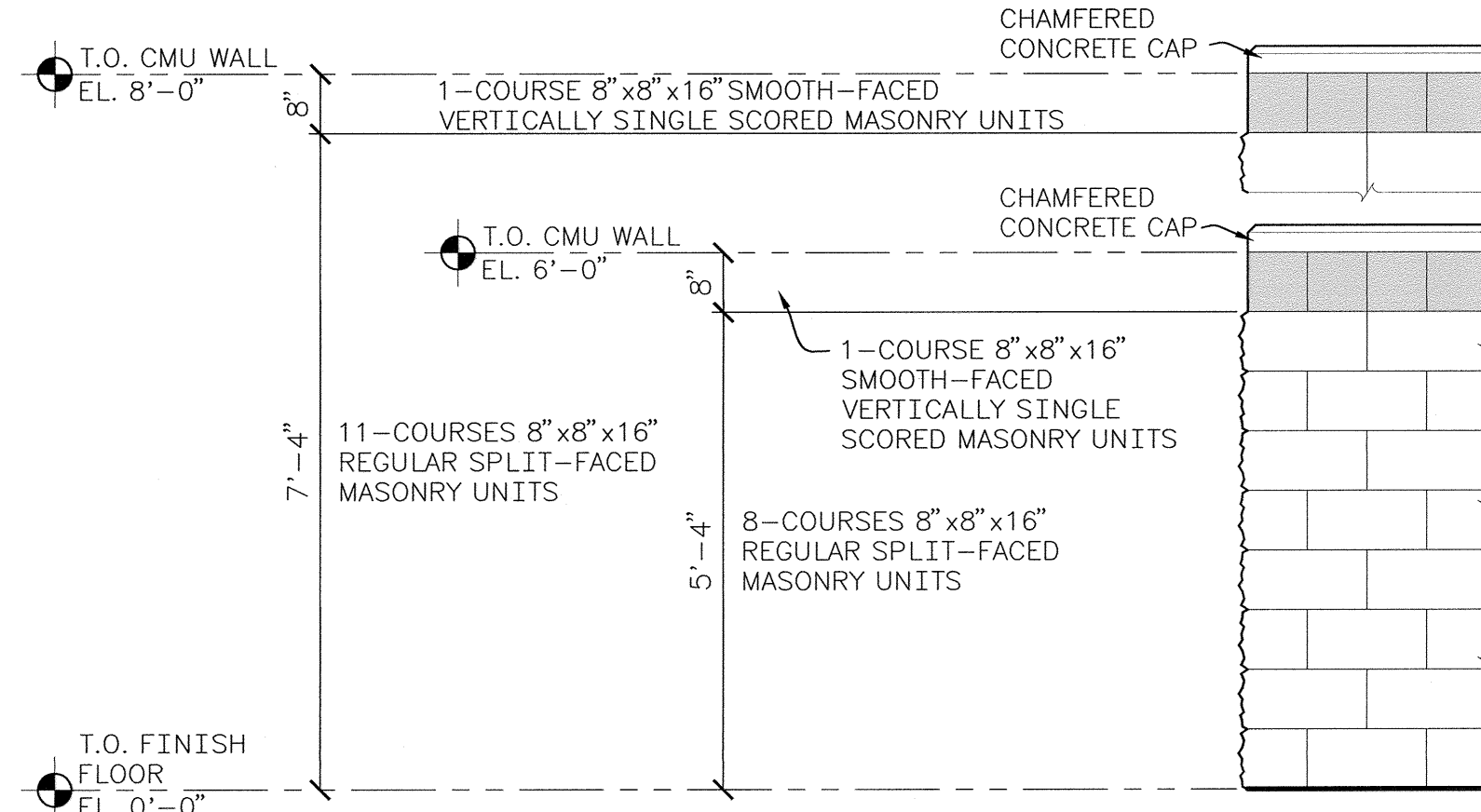
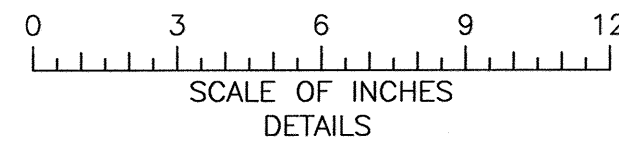
SCALE OF FEET



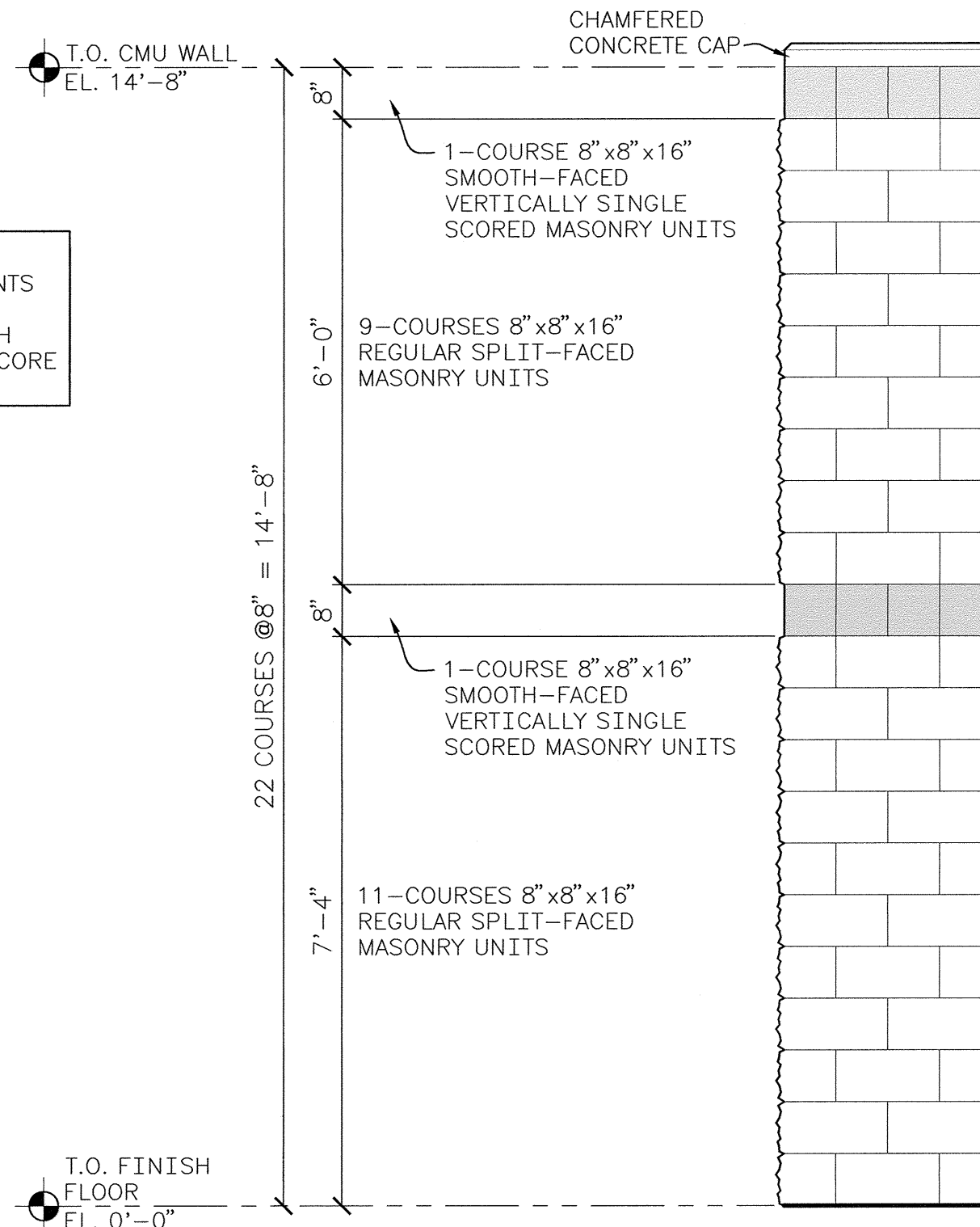
5-HIGH EAVE DETAIL
(155, 157)



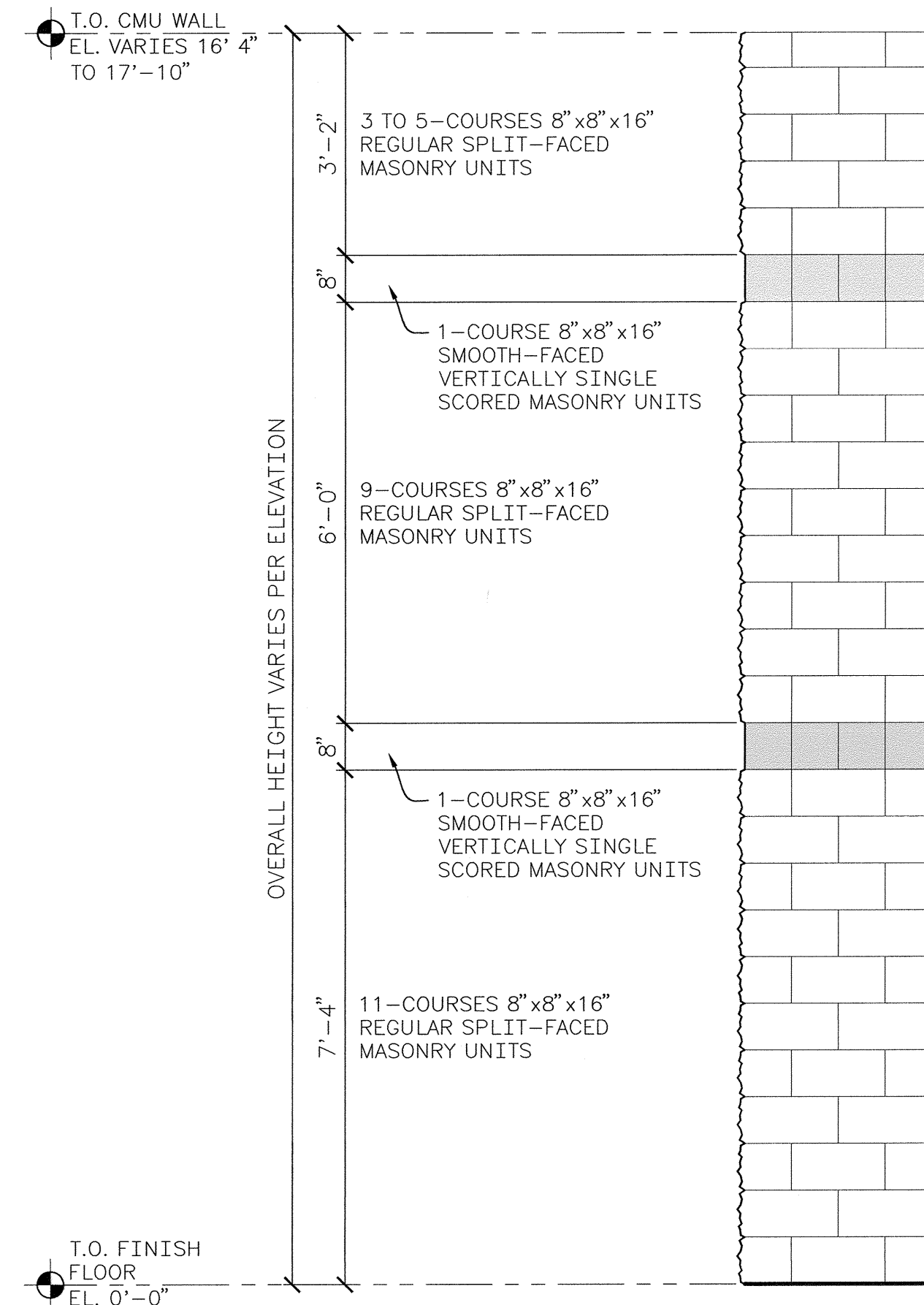
6-LOW EAVE DETAIL
(155, 157)



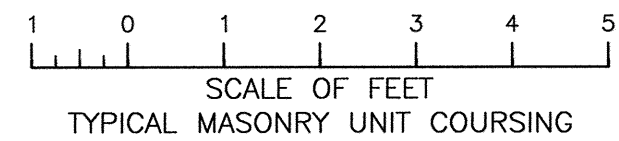
TYPICAL MASONRY UNIT COURSING FOR
BAFFLE & SCREEN WALL ELEVATIONS

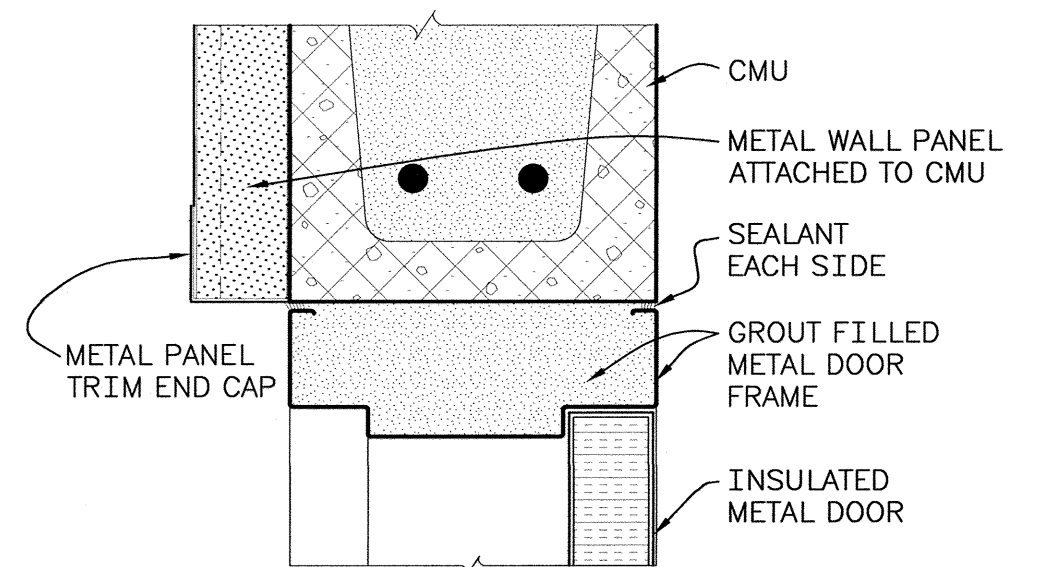


TYPICAL MASONRY UNIT COURSING FOR
BALLISTIC WALL ELEVATION

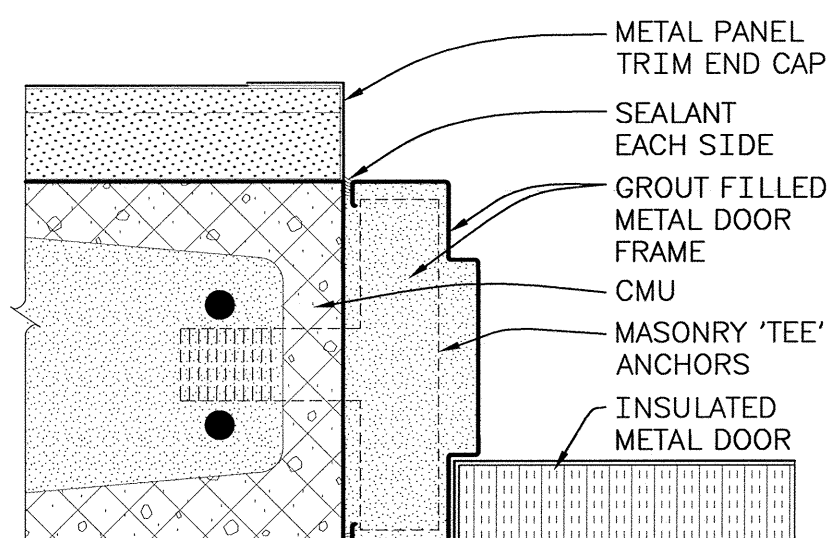


TYPICAL MASONRY UNIT COURSING FOR
BUILDING WALL ELEVATIONS

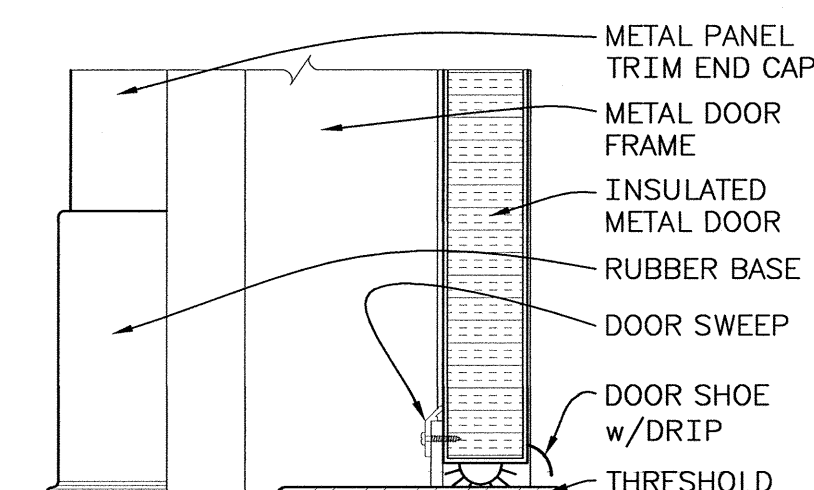




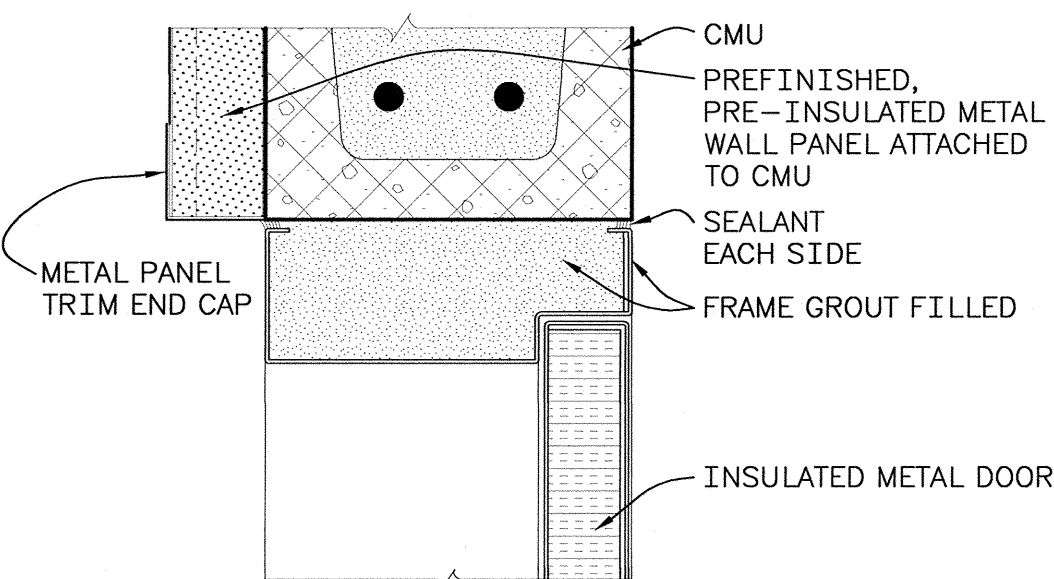
H1 DOOR HEAD
@ CMU WALL (154)



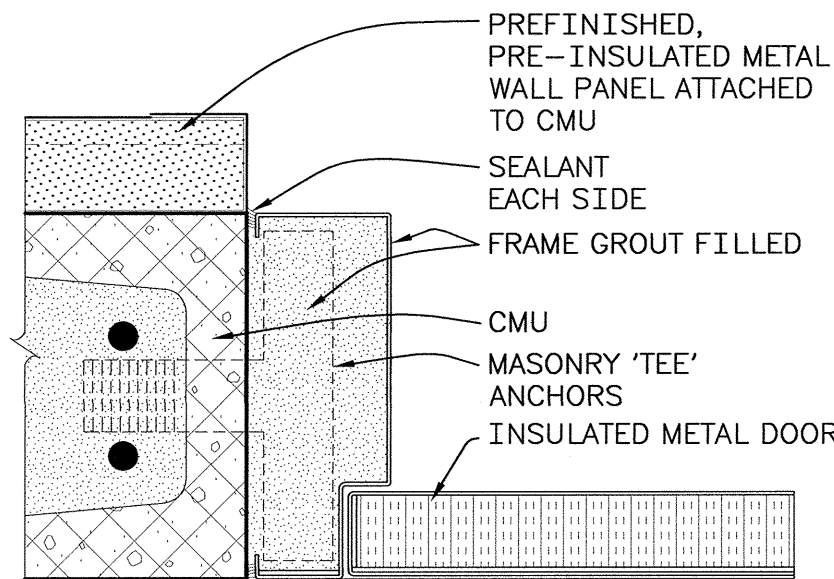
J1 DOOR JAMB
@ CMU WALL (154)



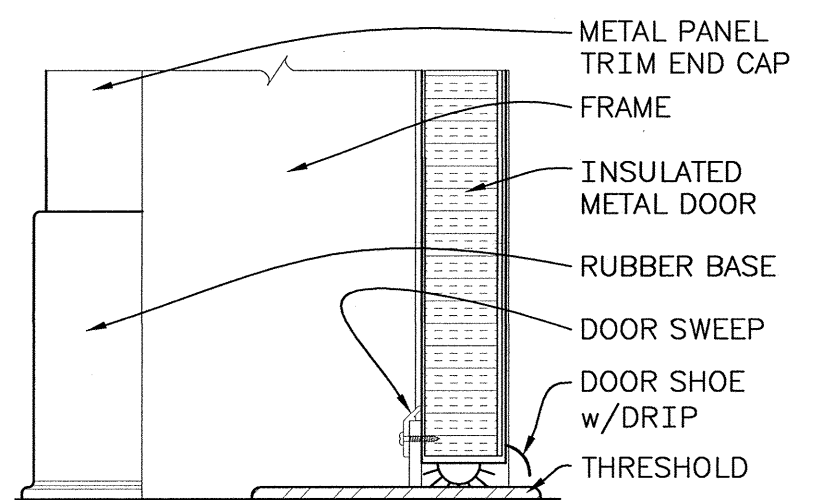
T1 DOOR THRESHOLD
@ CMU WALL (154)



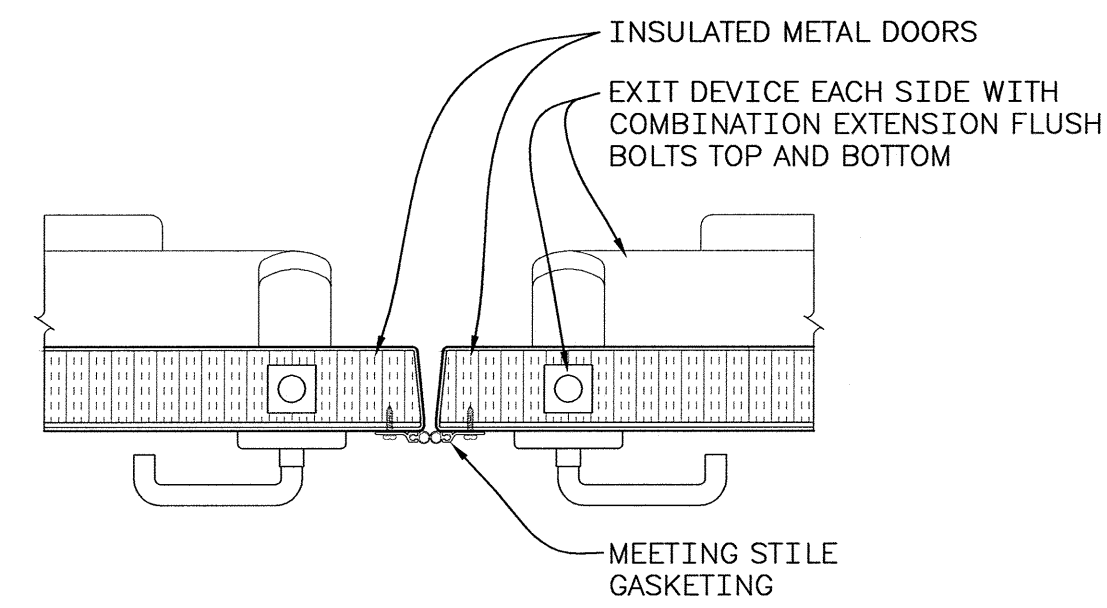
H2 DOOR HEAD
@ CMU WALL (154)



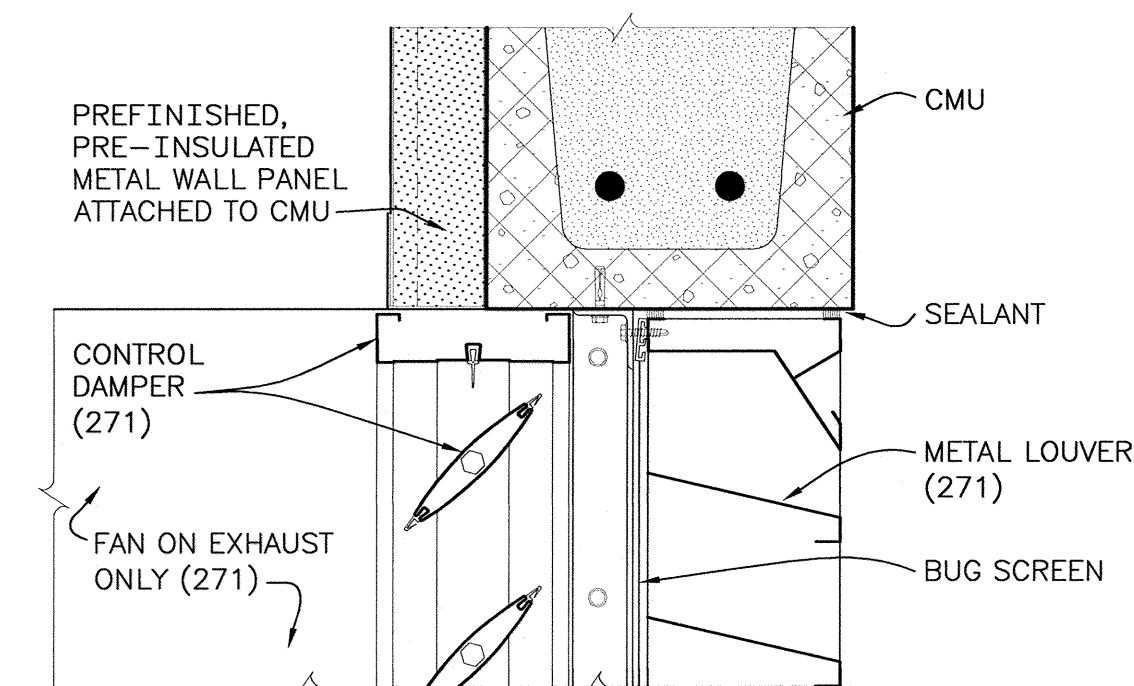
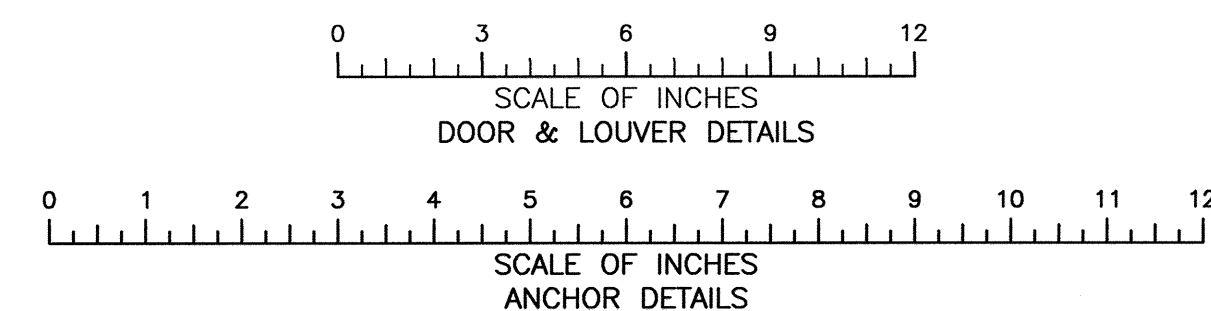
J2 DOOR JAMB
@ CMU WALL (154)



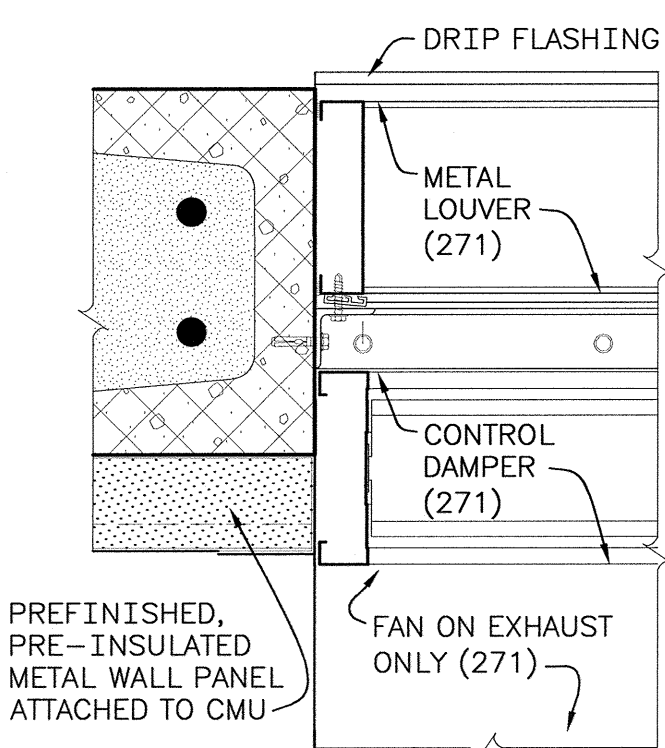
T2 DOOR THRESHOLD
@ CMU WALL (154)



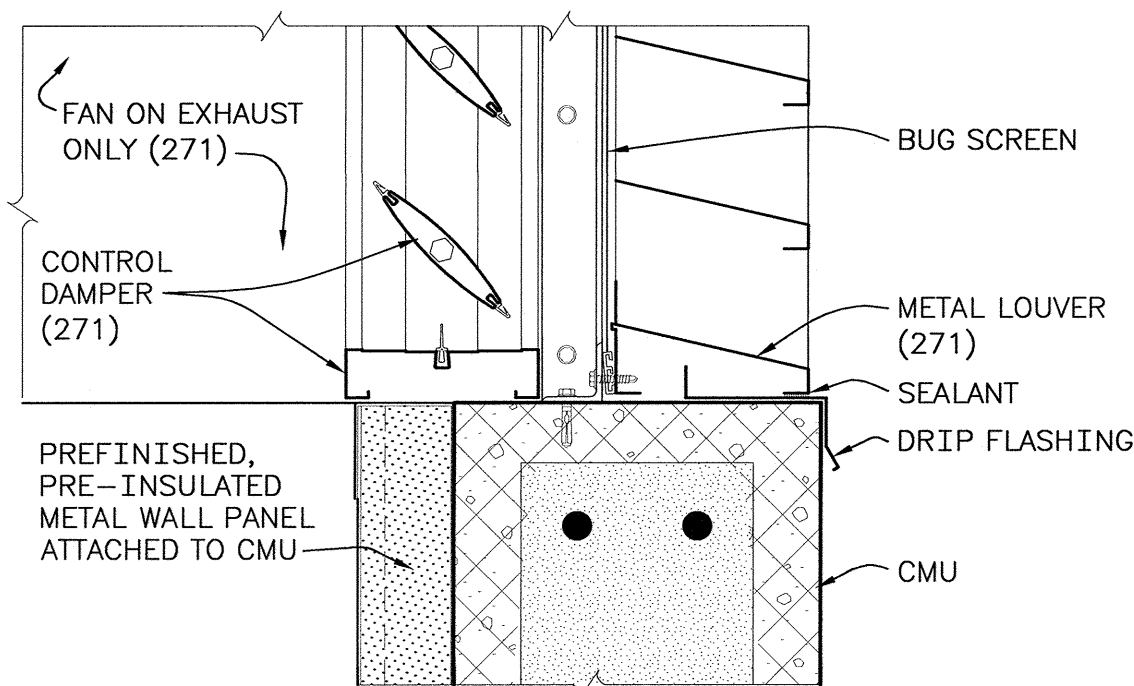
A1 ASTRAGAL WITH
LOCKING BAR LATCH (154)



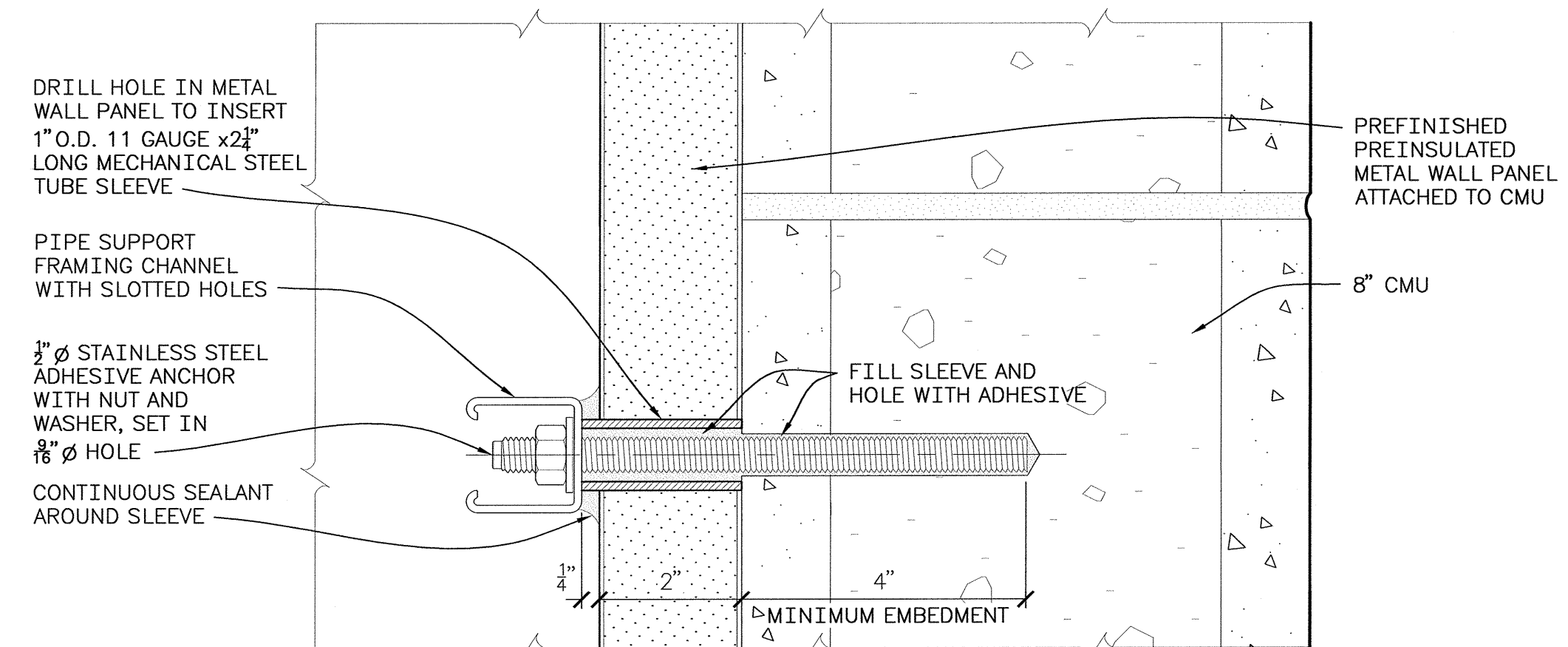
H3 LOUVER HEAD
@ CMU WALL



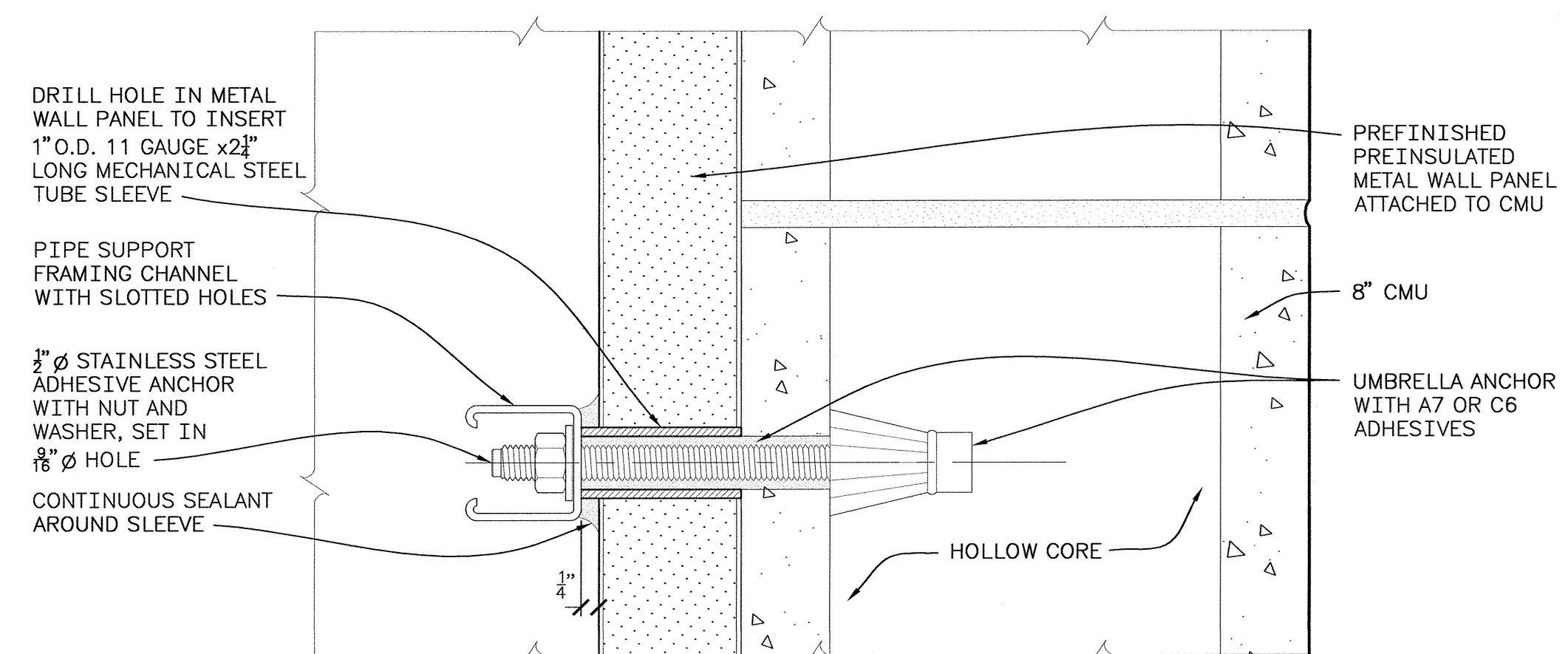
J3 LOUVER JAMB
@ CMU WALL



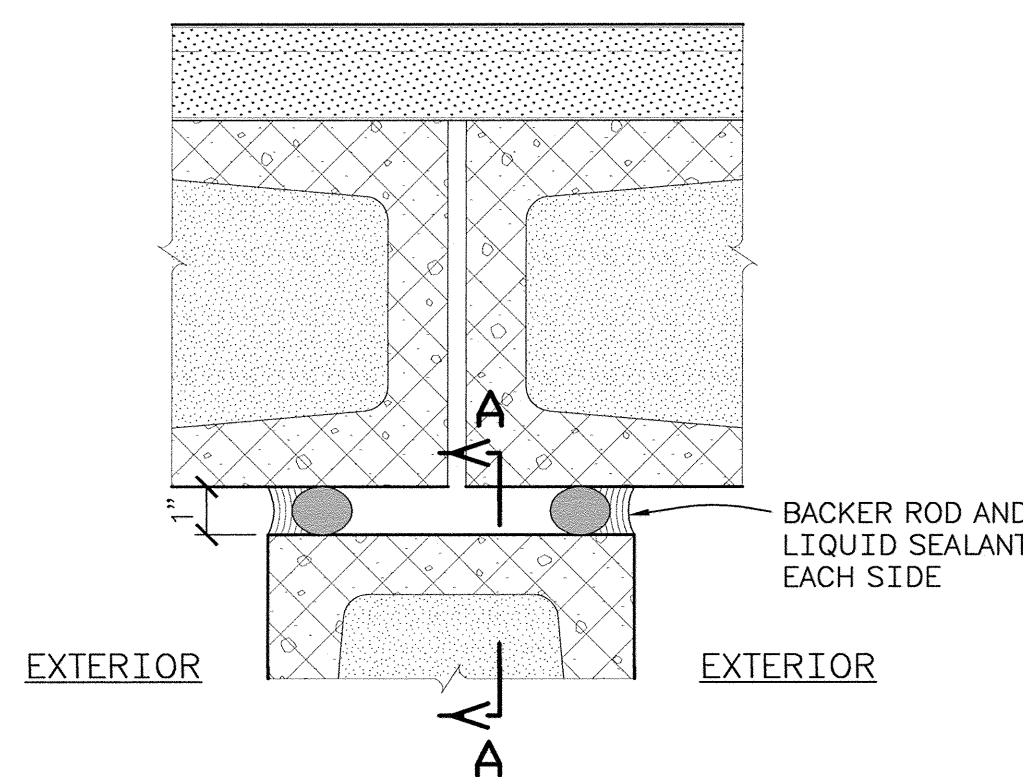
S1 LOUVER SILL
@ CMU WALL



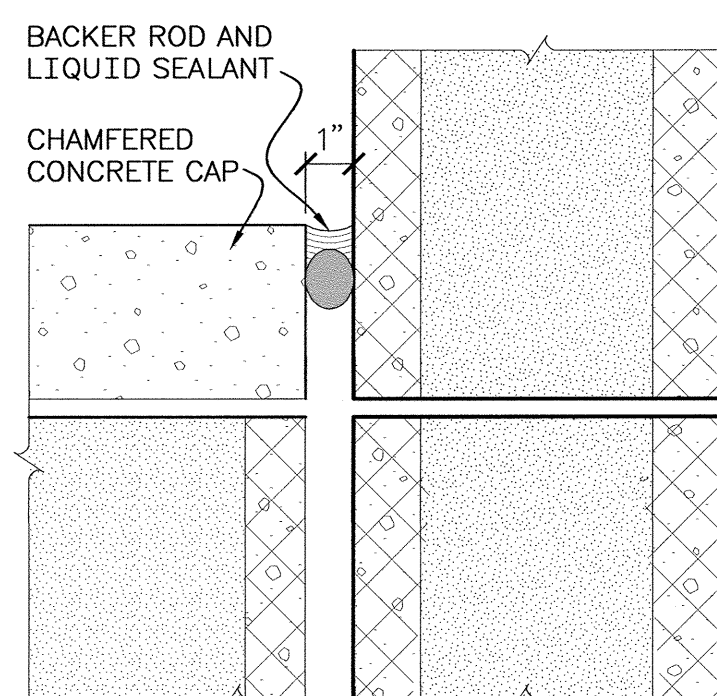
2 TYPICAL THRU WALL PANEL ANCHOR ATTACHMENT DETAIL
GROUT FILLED BLOCKS (183)



3 TYPICAL THRU WALL PANEL ANCHOR ATTACHMENT DETAIL
WITH OUT GROUT FILLED BLOCKS (183)



1 EXPANSION JOINT DETAIL
(154)



A-A EXPANSION JOINT DETAIL

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BUREAU OF RECLAMATION
NAVALO GALLUP WATER SUPPLY PROJECT
NEW MEXICO
**SAN JUAN LATERAL
TOHLAKAI PUMPING PLANT**
CHLORINE FEED BUILDING AND OUTDOOR CHLORINE STORAGE
ARCHITECTURAL
DOOR AND MISCELLANEOUS DETAILS

DESIGNED *J. B. BOWMAN*
DRAWN *J. B. BOWMAN*
CHECKED *W. J. BOWMAN*
TECH. APPR. *K. D. S. L. P. E.*
APPROVED *W. J. B. BOWMAN*
PLANT STRUCTURES GROUP
DENVER, COLORADO 2013 08 05

DOOR AND
MISCELLANEOUS DETAILS

1695-D-159

SHEET 1 OF 1



1. For foundation location, see (99).
2. For Structural Design Data, see (101) and (102).
3. For Concrete Outline General Notes, see (123).
4. For Reinforcement Design General Notes, see (127).
5. For Reference Drawings, see (137).
6. All dowels and vertical and horizontal reinforcement are #5.
7. For coordinates of control points CP-20 and CP-21, see (100).

DESIGNED B. D. Van Otterloo
DRAWN B. D. Van Otterloo
CHECKED K. OSL
TECH. APPR. K. OSL P.E.
allw. pt.
APPROVED
PLANT STRUCTURES GROUP

CONCRETE OUTLINE AND
REINFORCEMENT DESIGN
FOUNDATION PLAN, SECTIONS
AND DETAILS

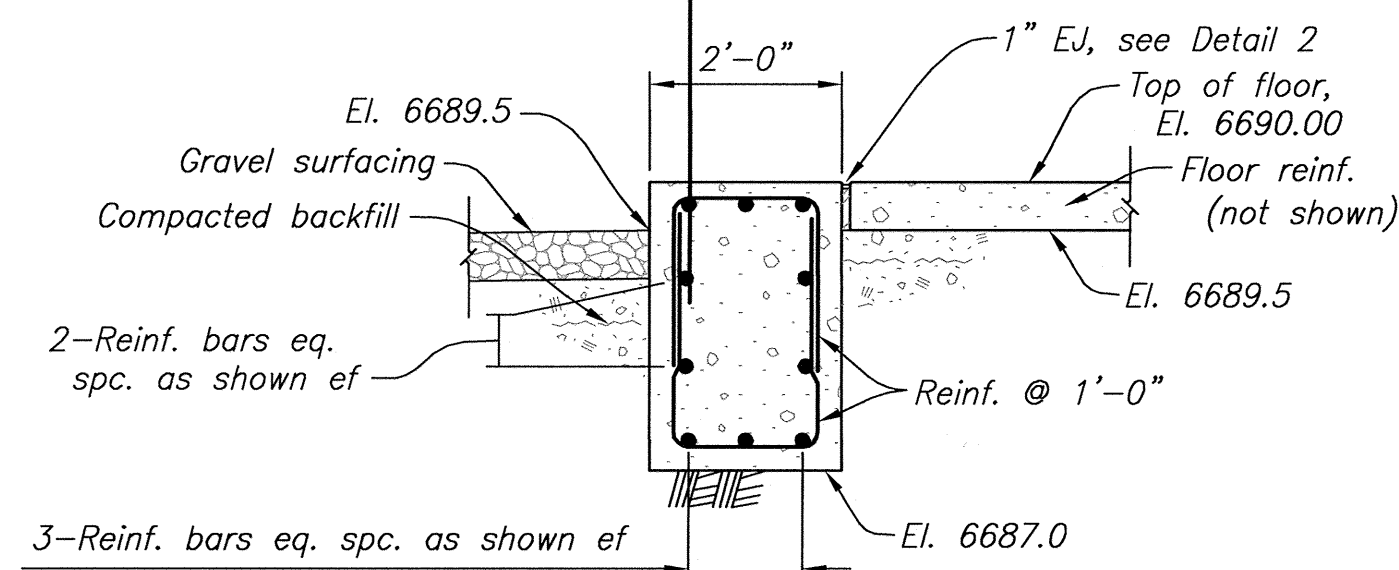
1695-D-160

SHEET 1 OF 2

DATE AND TIME PLOTTED
AUGUST 3, 2013 10:42
PLOTTED BY
KOSHFA

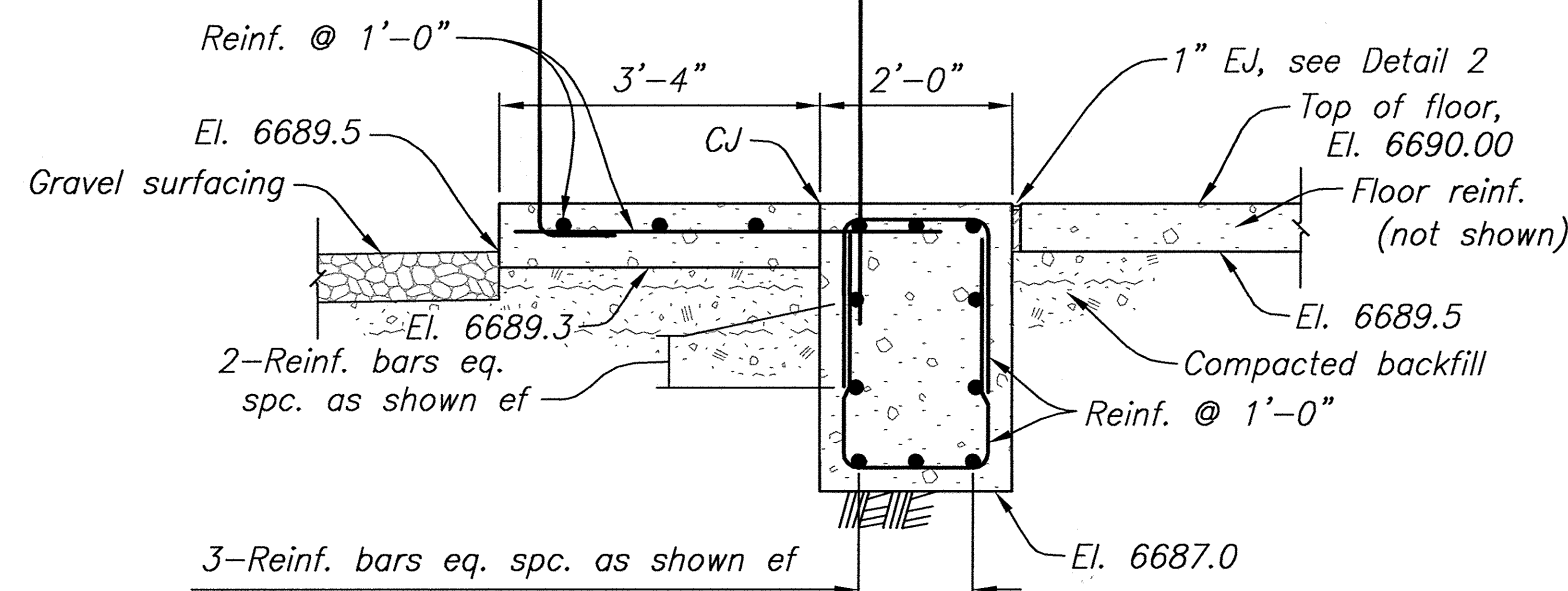
CAD SYSTEM
AutoCAD Rel. 19.0s
CAD FILENAME
1695-D-160 - CO RD - FOUNDATION PLAN AND SECTIONS.DWG

Concrete masonry unit wall
(not shown) (Typ.). For
location of embedded (d)
masonry wall reinf., see (162).



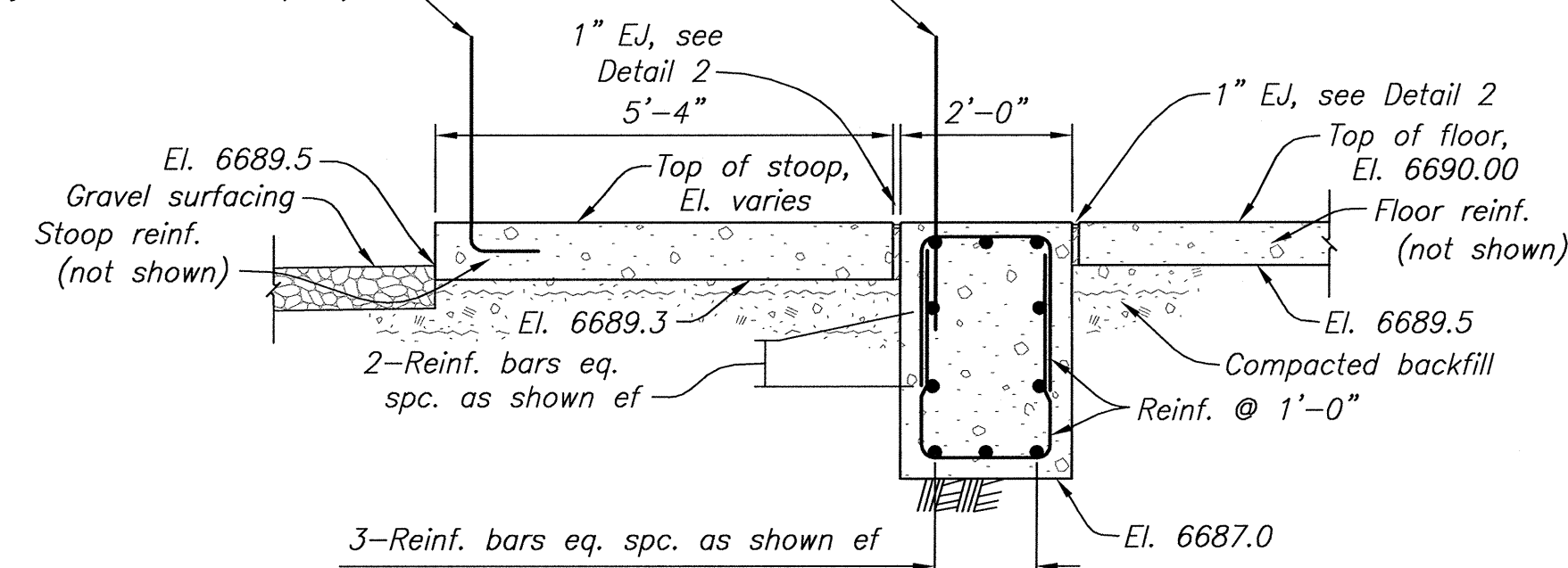
SECTION 1-1 (160)

Concrete masonry unit wall
(not shown) (Typ.). For
location of embedded (d)
masonry wall reinf., see (162).

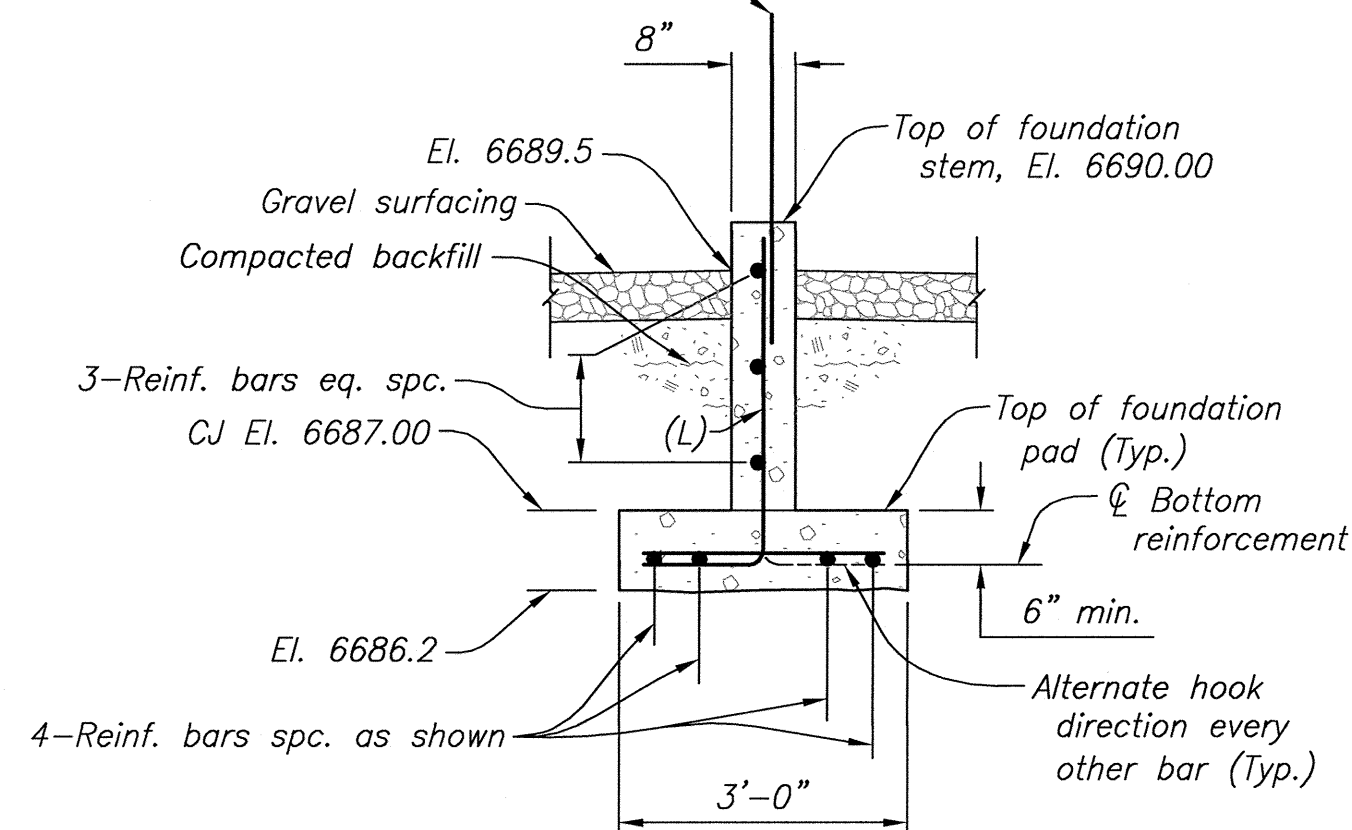


SECTION 2-2 (160)

Concrete masonry unit wall
(not shown) (Typ.). For
location of embedded (d)
masonry wall reinf., see (162).

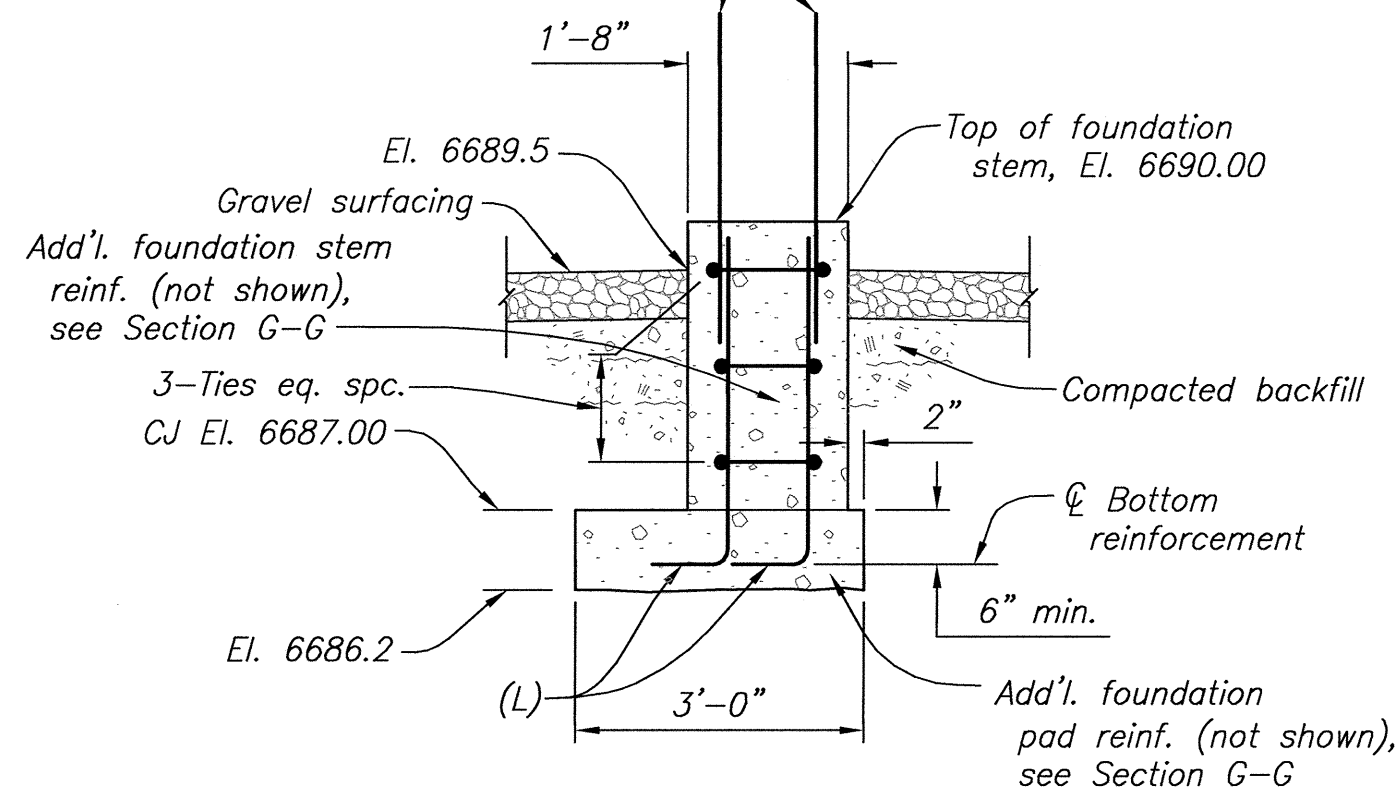
SECTION 3-3 (AS SHOWN)(160)
SECTION 4-4 (SIMILAR)(160)

Concrete masonry unit wall
(not shown) (Typ.). For
location of embedded (d)
masonry wall reinf., see (162).



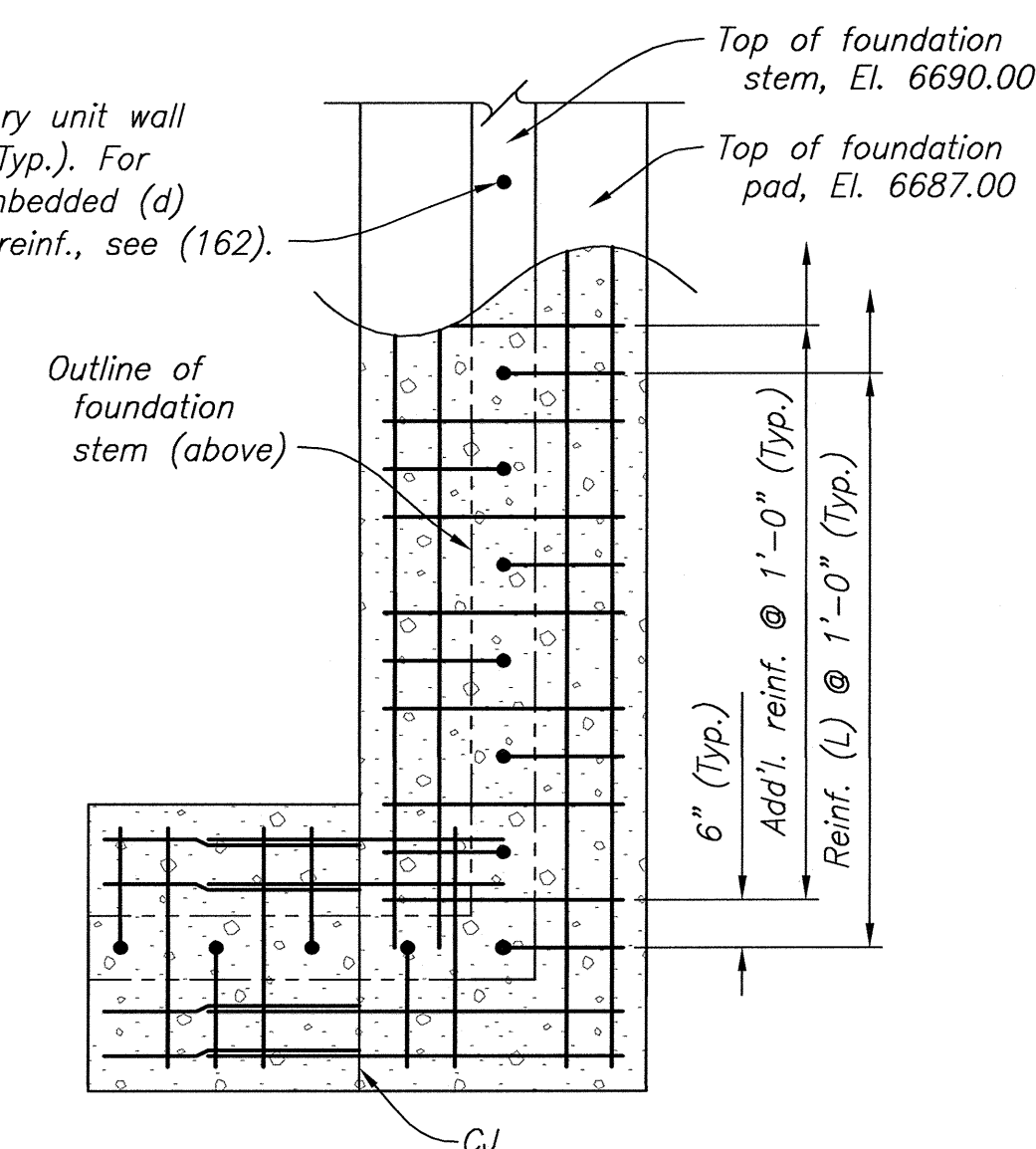
SECTION 5-5 (160)

Concrete masonry unit wall
(not shown) (Typ.). For
location of embedded (d)
masonry wall reinf., see (162).

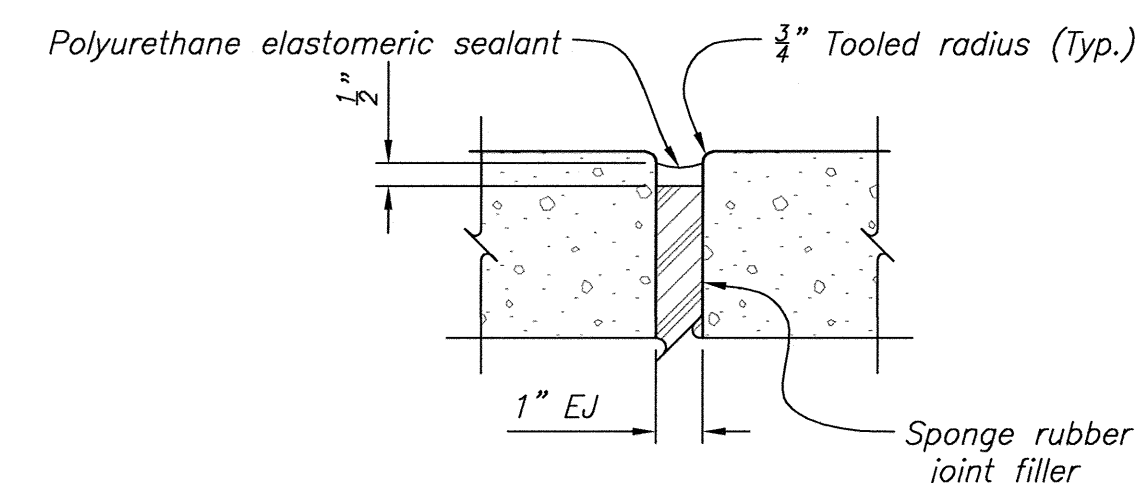


SECTION 6-6 (160)

Concrete masonry unit wall
(not shown) (Typ.). For
location of embedded (d)
masonry wall reinf., see (162).

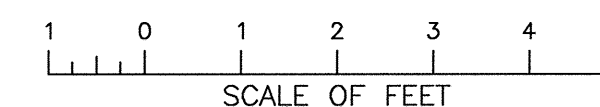


DETAIL 1 (160)

DETAIL 2 (160)
(NOT TO SCALE)

NOTES

1. For Structural Design Data, see (101) and (102).
2. For Concrete Outline General Notes, see (123).
3. For Reinforcement Design General Notes, see (127).
4. For Reference Drawings, see (137).
5. All dowels and vertical and horizontal reinforcement are #5, and all ties are #3.



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TOHLAKAI PUMPING PLANT
CHLORINE FEED BUILDING AND OUTDOOR CHLORINE STORAGE
CONCRETE OUTLINE AND REINFORCEMENT DESIGN
FOUNDATION PLAN, SECTIONS, AND DETAILS

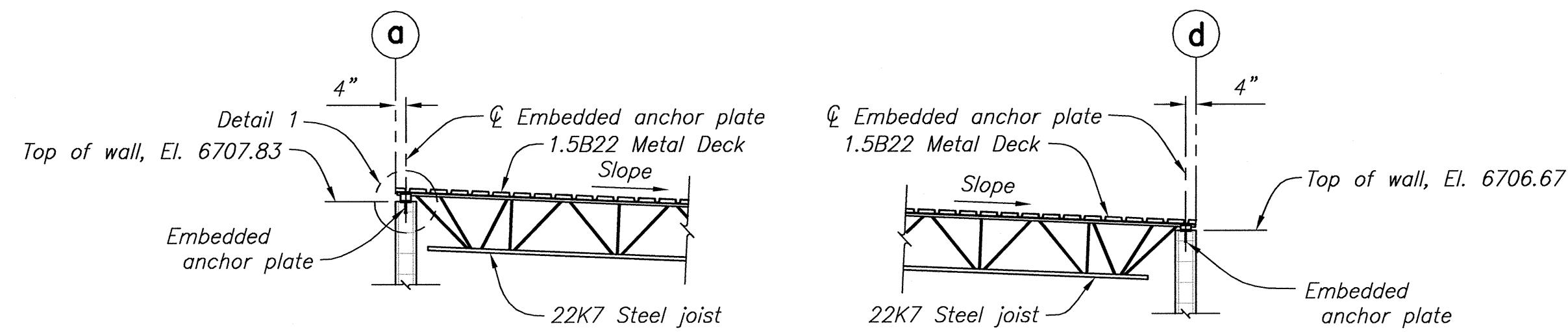
DESIGNED: S. D. VanOrtula
DRAWN: S. D. VanOrtula
CHECKED: S. D. VanOrtula
TECH. APPR. NAME, DATE, ABR. S. D. VanOrtula
APPROVED: S. D. VanOrtula
PLANT STRUCTURES GROUP

DENVER, COLORADO 2013-08-05

CONCRETE OUTLINE AND
REINFORCEMENT DESIGN
FOUNDATION PLAN, SECTIONS,
AND DETAILS

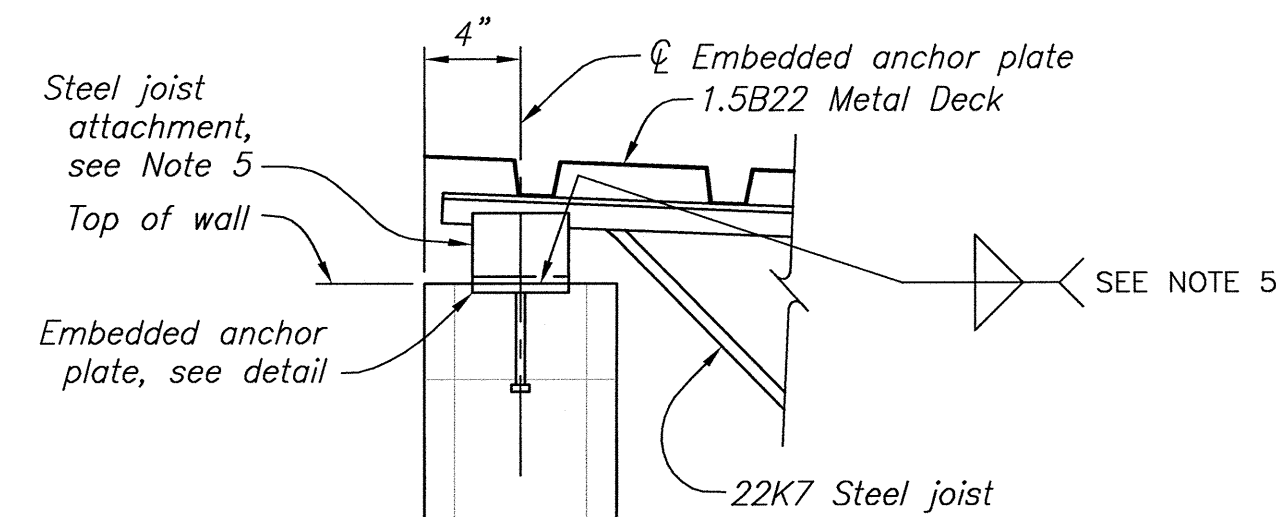
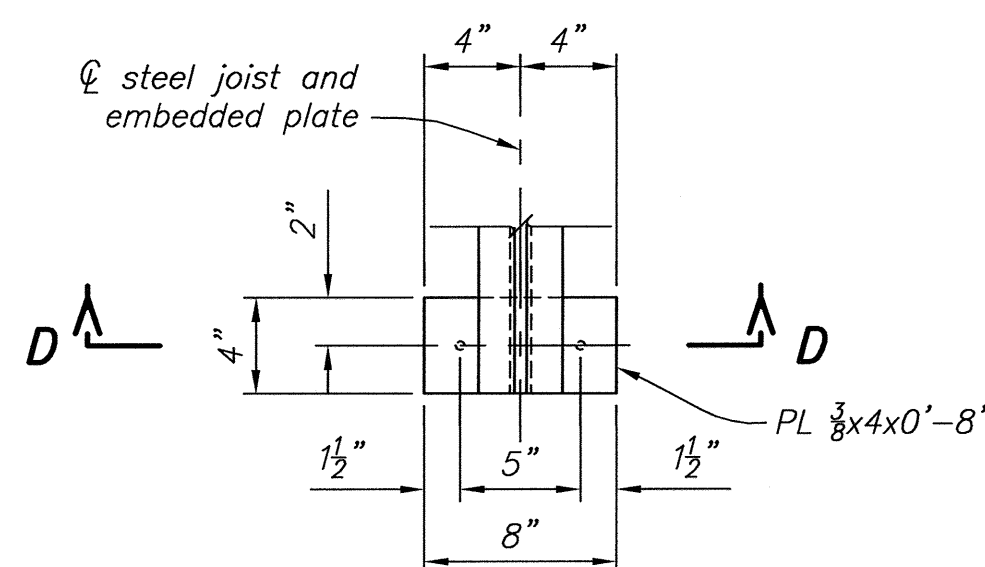
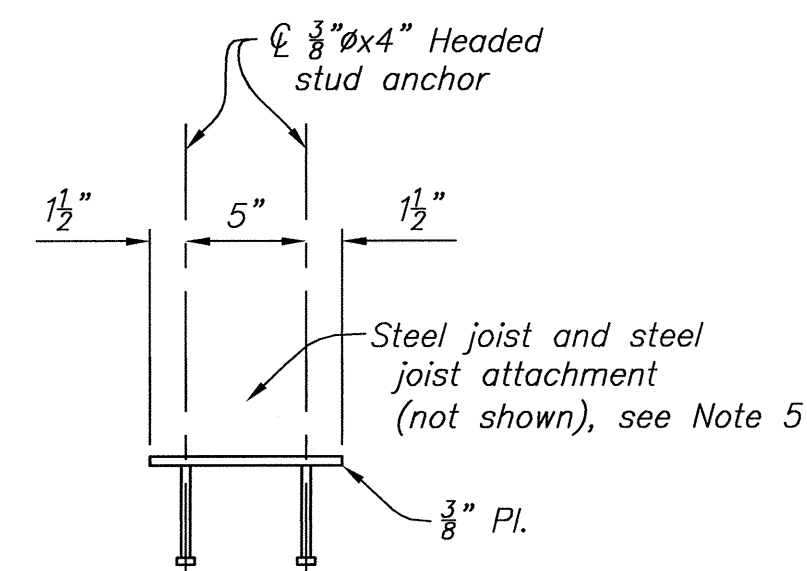
1695-D-161

SHEET 2 OF 2



SECTION B-B

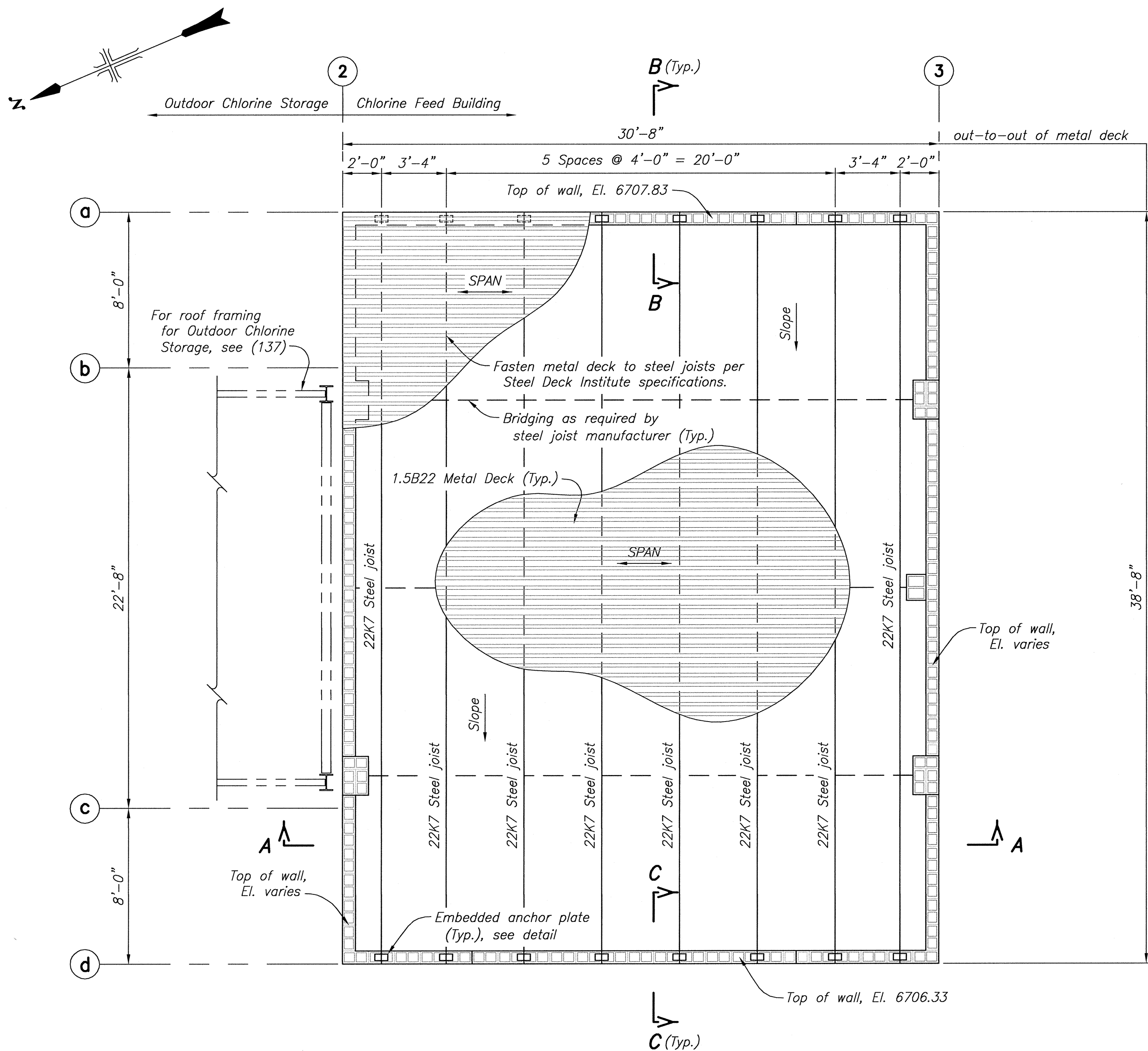
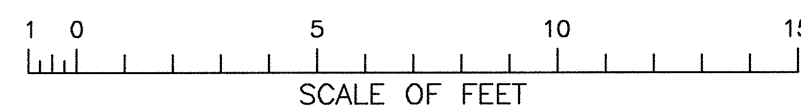
SECTION C-C

DETAIL 1
(NOT TO SCALE)EMBEDDED ANCHOR PLATE DETAIL
(NOT TO SCALE)
(16 REQ'D.)

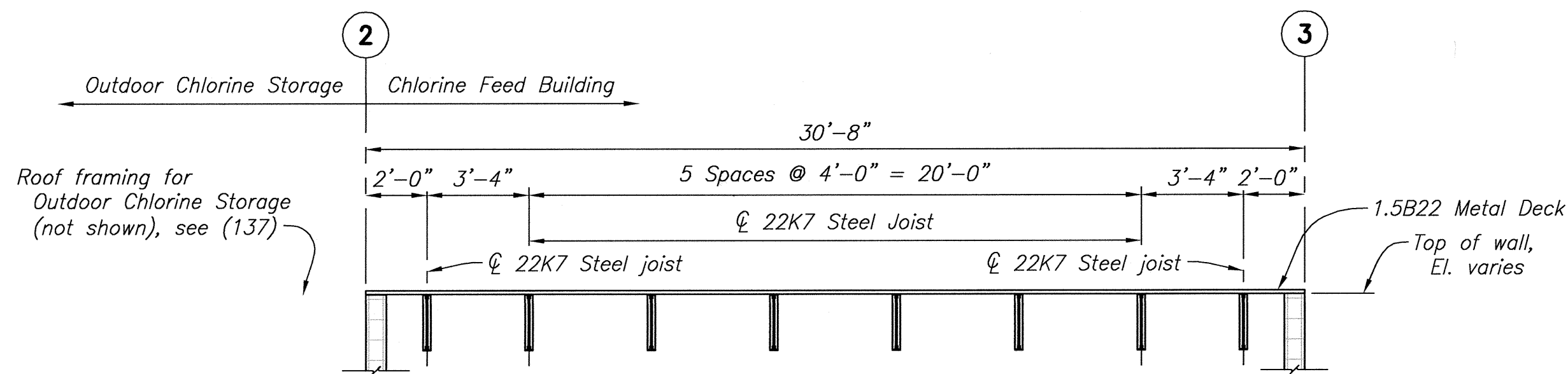
SECTION D-D

NOTES

- For Structural Design Data, see (101) and (102).
- For Reference Drawings, see (137).
- 1.5B22 denotes 1.5-inch Type "B" 22 gage non-composite metal deck as manufactured by Vulcraft or equal. Metal deck design is based on a minimum two span condition.
- 22K7 denotes a 22-inch depth K-Series Type 7 open web steel joist as manufactured by Vulcraft or equal. Joists shall have top chord extensions and sloped seats as required for attachment to embedded anchor plates.
- Attach steel joists to embedded anchor plate recommended by steel joist manufacturer.



ROOF FRAMING PLAN



SECTION A-A

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NEW MEXICO

**SAN JUAN LATERAL
TOHLAKAI PUMPING PLANT**

CHLORINE FEED BUILDING AND OUTDOOR CHLORINE STORAGE
ROOF DESIGN
ROOF FRAMING PLAN, SECTIONS, AND DETAILS

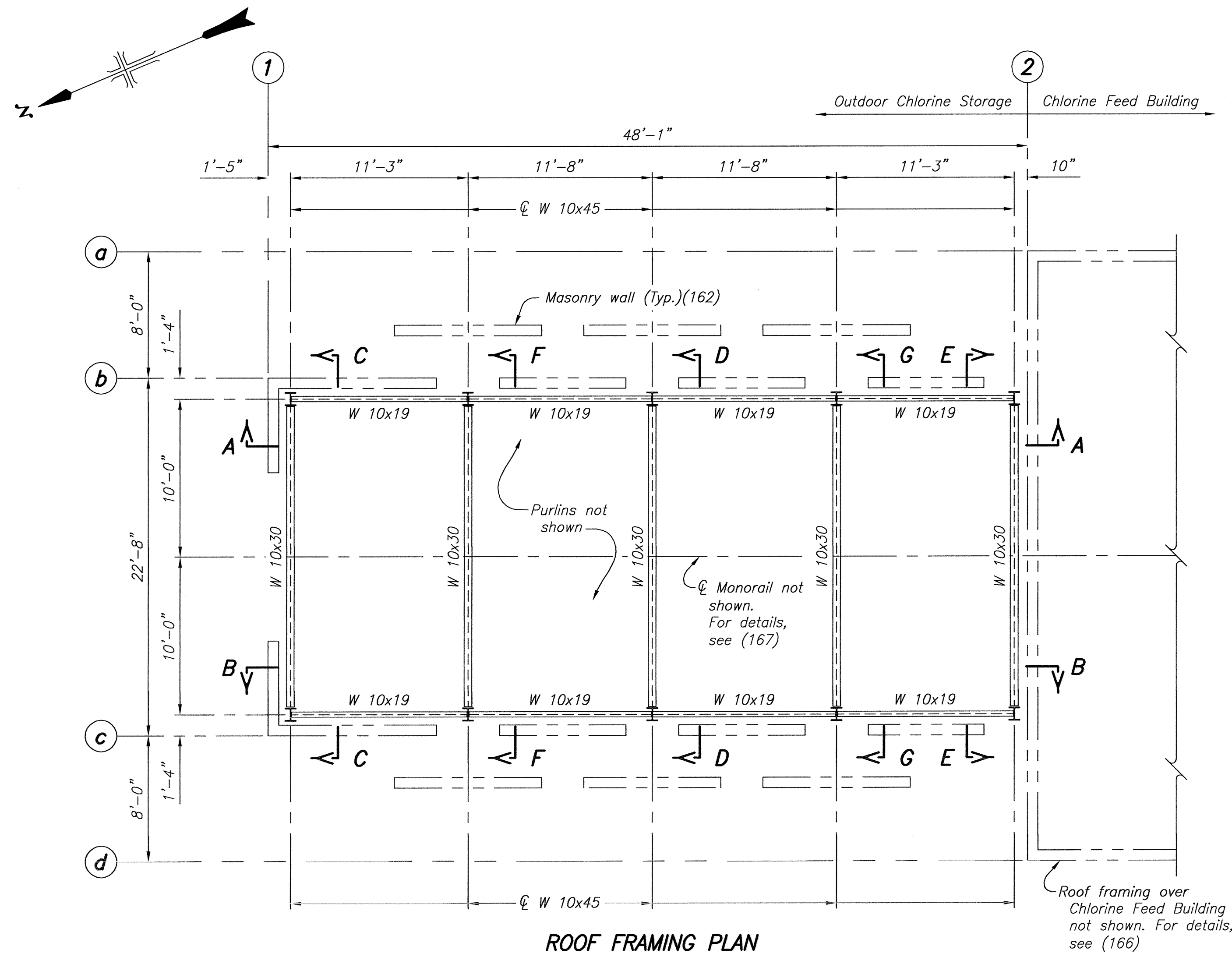
DESIGNED BY *S. D. Van Otterloo*
DRAWN BY *S. D. Van Otterloo*
CHECKED BY *K. C. S. L. D. E.*
TECH. APPR. NAME, PROF. ABBR.
APPROVED
PLANT STRUCTURES GROUP

DENVER, COLORADO 2013-08-05

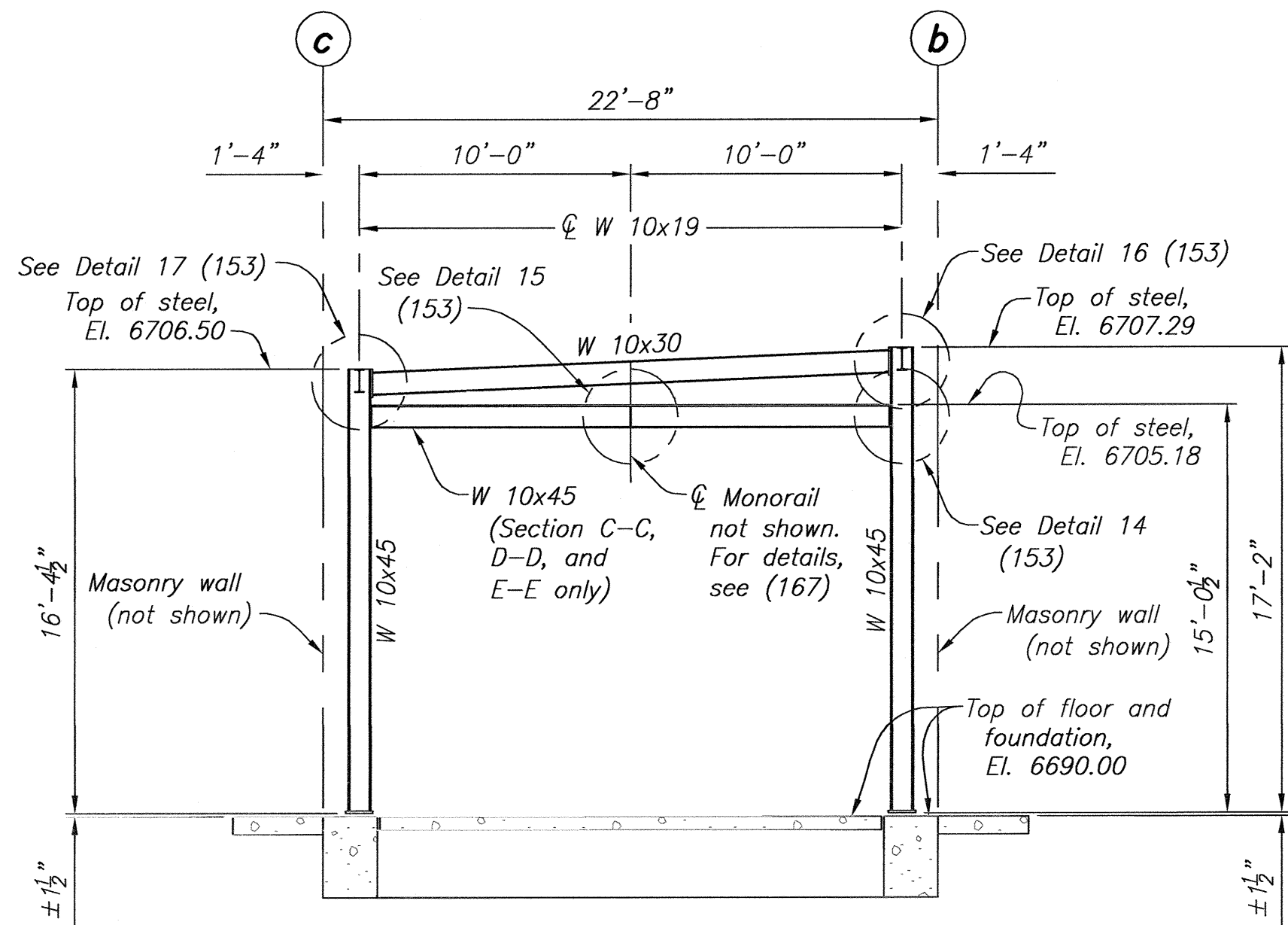
**STRUCTURAL STEEL
ROOF FRAMING PLAN,
SECTIONS, AND DETAILS**

1695-D-166

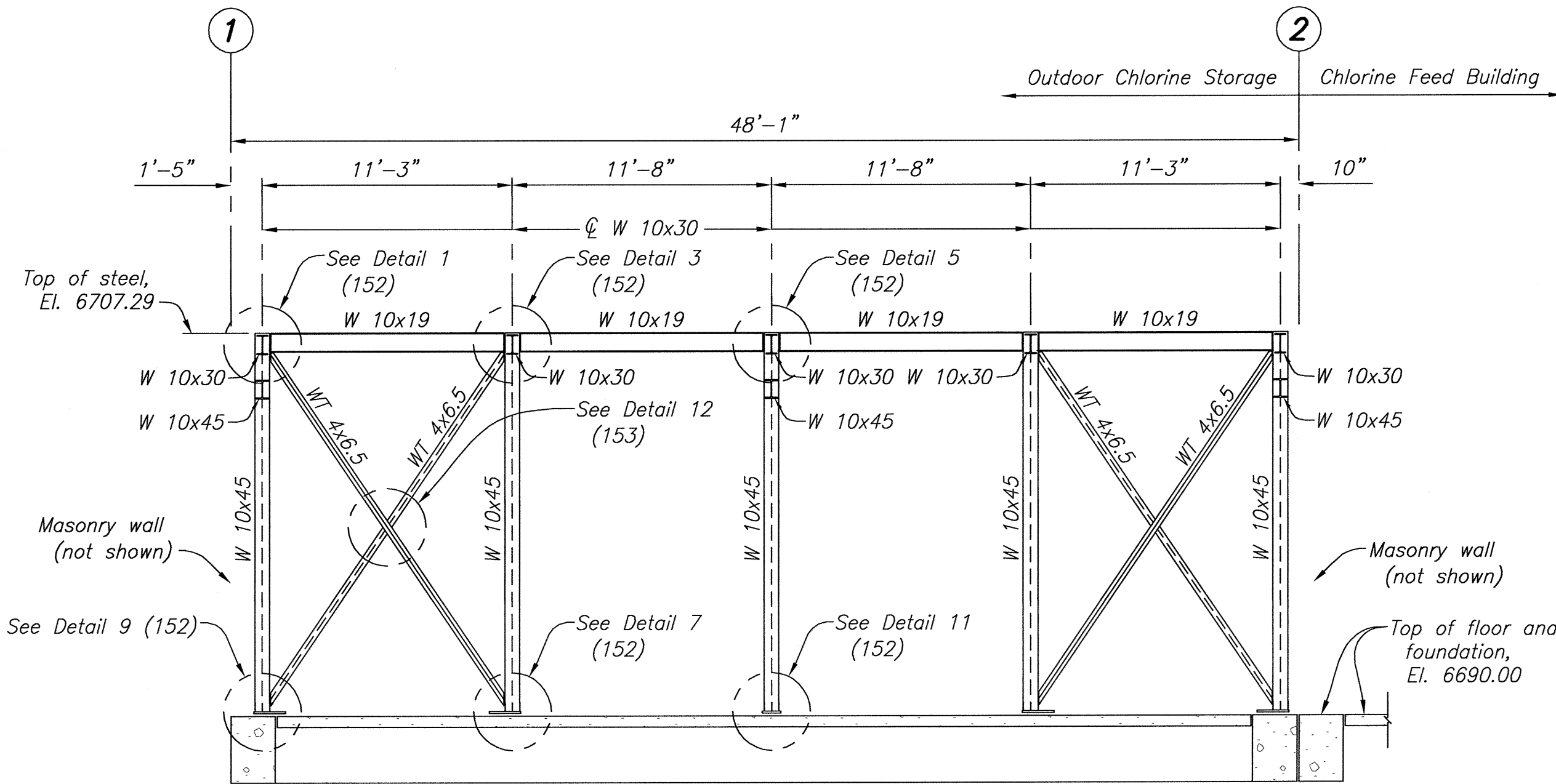
SHEET 1 OF 1



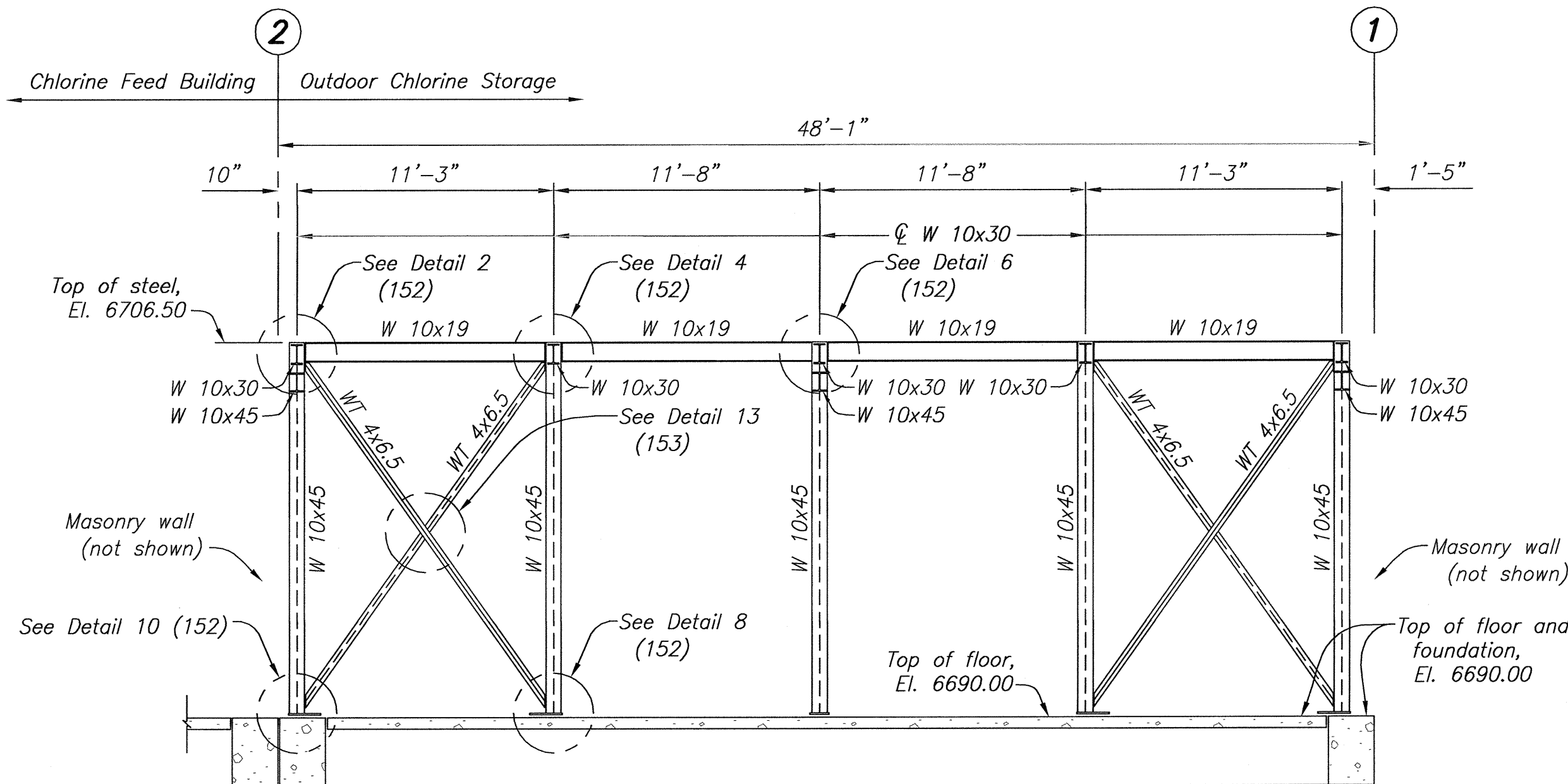
ROOF FRAMING PLAN



SECTION C-C (AS SHOWN)
SECTION D-D (AS SHOWN)
SECTION E-E (OPP. HAND)
SECTION F-F (SIMILAR AS NOTED)
SECTION G-G (SIMILAR AS NOTED)



SECTION A-A



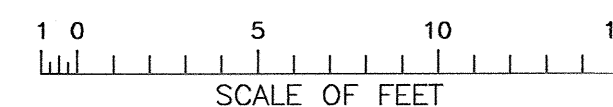
SECTION B-B

REFERENCE DRAWINGS

ARCHITECTURAL FLOOR PLAN AND SCHEDULES	1695-D-154
CONCRETE OUTLINE AND REINFORCEMENT DESIGN FOUNDATION PLAN AND SECTIONS	1695-D-160
MASONRY DESIGN PLAN	1695-D-162
ROOF DESIGN ROOF FRAMING PLAN AND SECTIONS	1695-D-166

NOTES

- For Structural Design Data, see (101).
- For Structural Steel General Notes, see (131).
- Monorail not shown. For Monorail connection to structural steel, see (167).

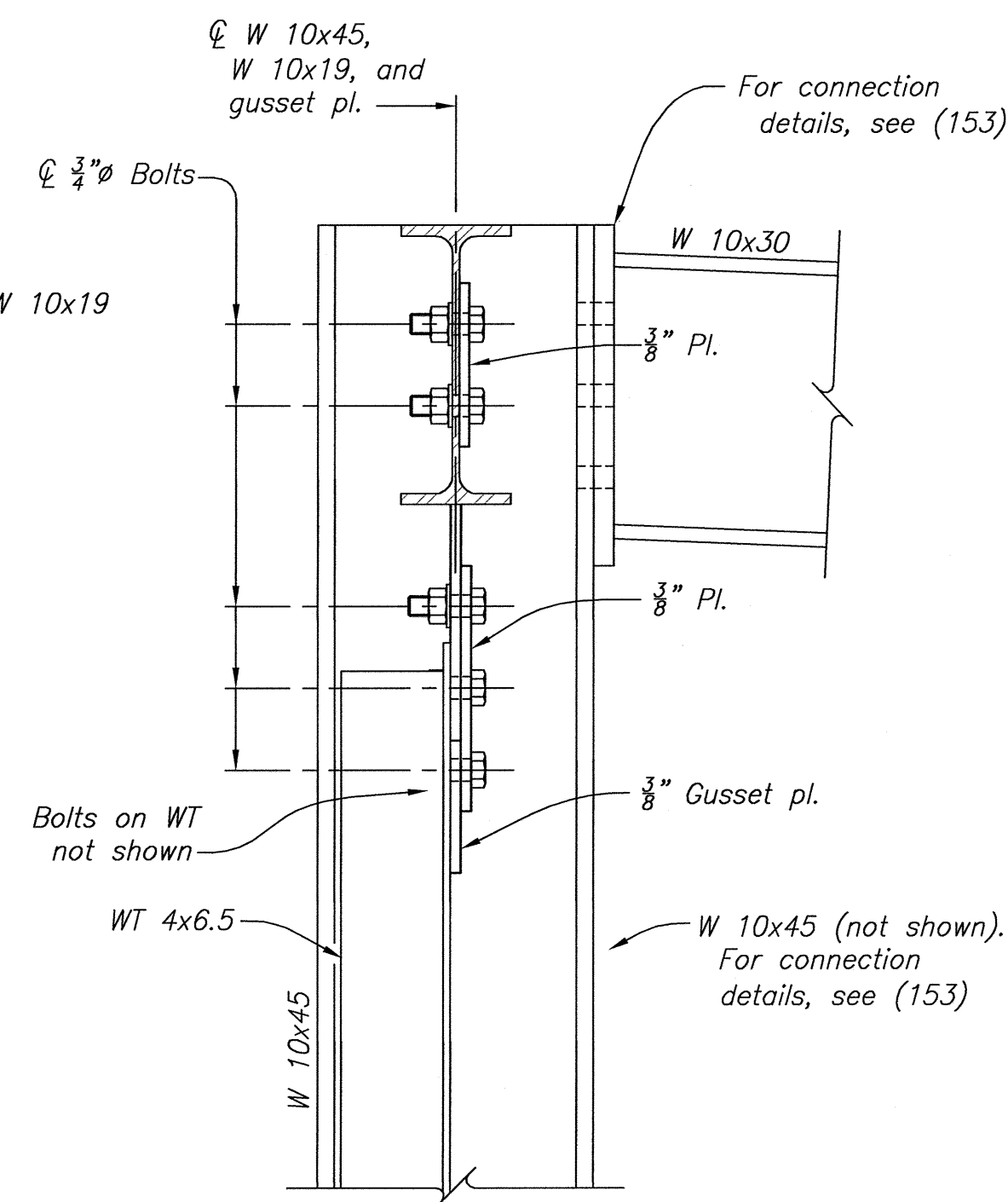


DESIGNED BY *S.D. VanOrman*
 DRAWN BY *S.D. VanOrman*
 CHECKED BY *E. S. Jackson*
 TECH. APPR. *K. O. Olson, P.E.*
 APPROVED *[Signature]*
 PLANT STRUCTURES GROUP
 DENVER, COLORADO 2013-08-05

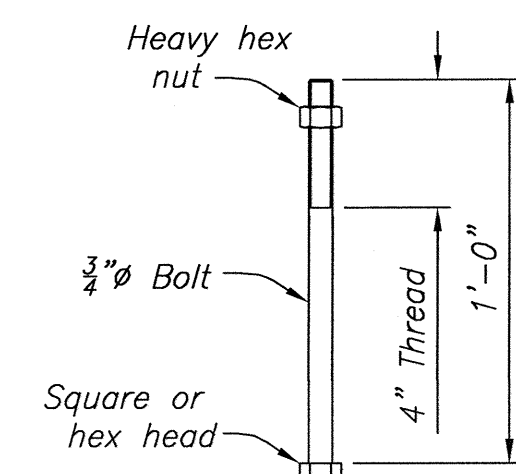
STRUCTURAL STEEL
SECTIONS AND DETAILS

1695-D-152

SHEET 1 OF 2



SECTION B-B



ANCHOR BOLT DETAIL
(40 REQ'D.)

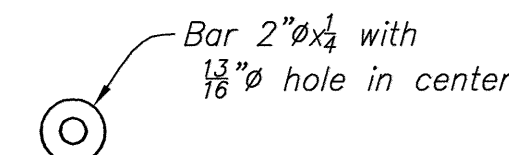
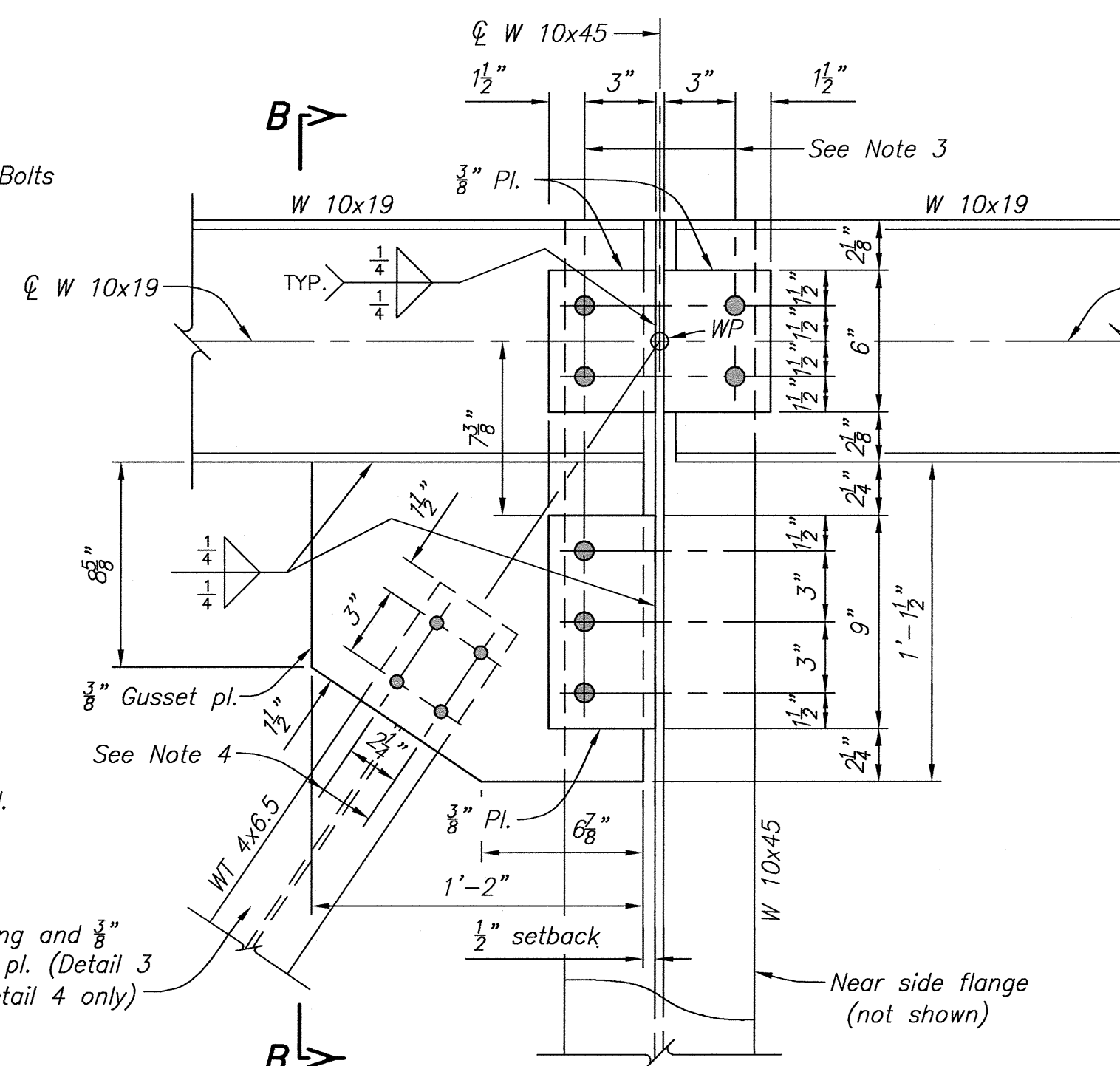


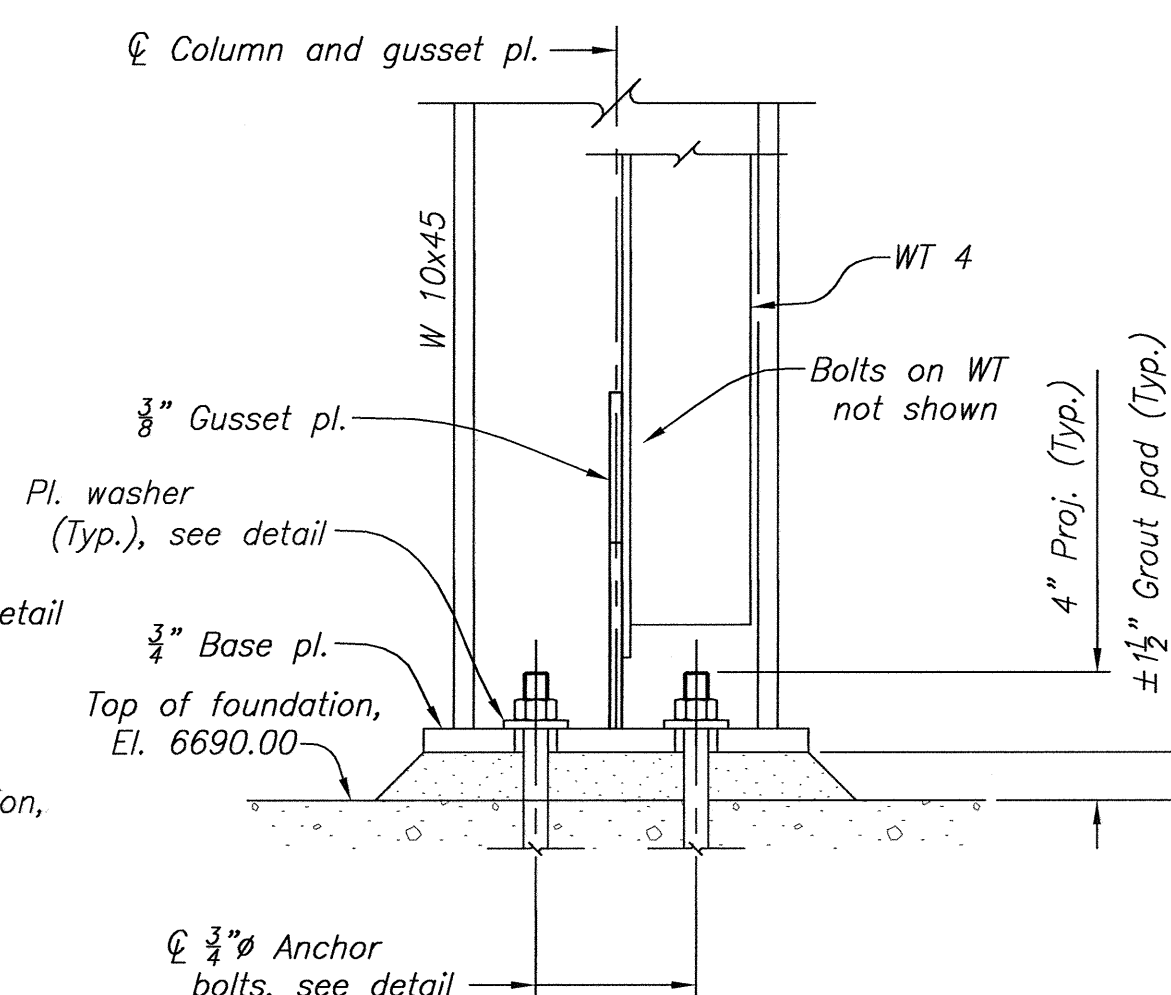
PLATE WASHER DETAIL
(40 REQ'D.)

NOTES

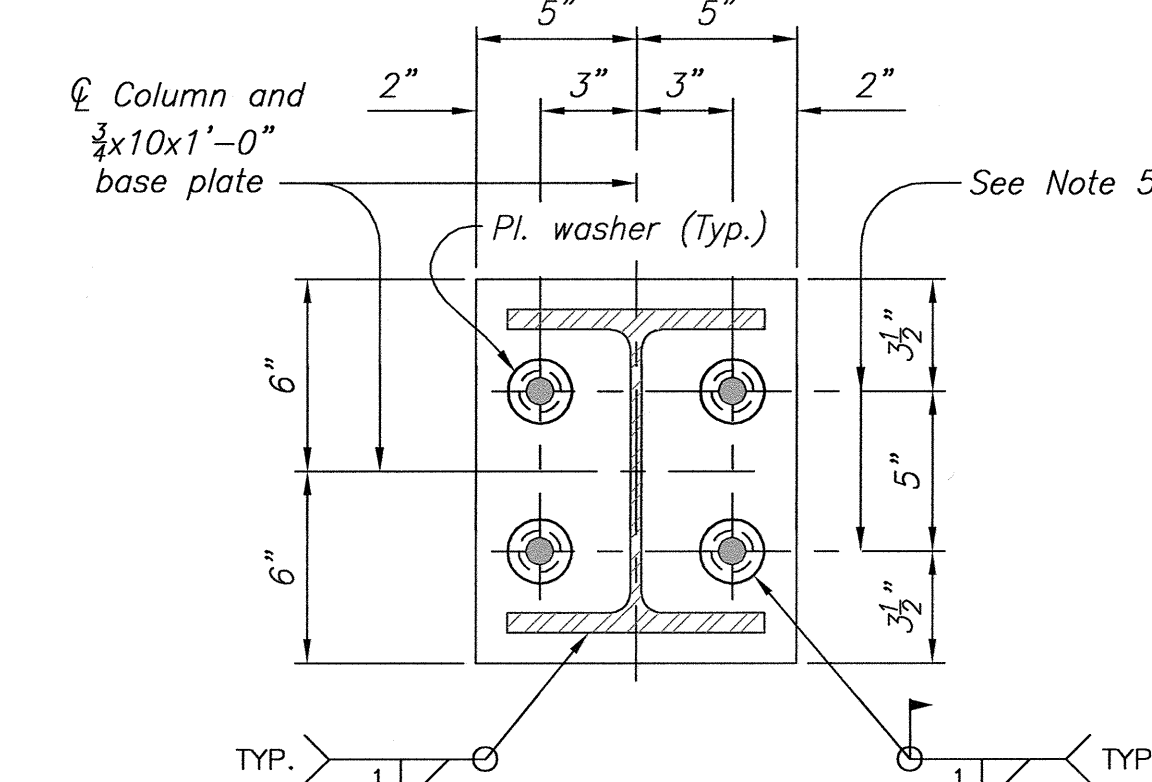
- For Structural Design Data, see (101) and (102).
- For Structural Steel General Notes, see (131).
3. $\phi 1/8"$ Holes for $3/4"$ hex. hd. bolts with hex. nuts and std. washers.
- $\phi 3/8"$ Holes for $1/2"$ hex. hd. bolts with hex. nuts and std. washers.
- $\phi 1 5/8"$ Holes in $3/4"$ base pl. for $3/4"$ anchor bolts. Anchor bolts shall be 12-inch long with 4-inch projection as shown. Field weld plate washers to $3/4"$ base plates after setting base plates.



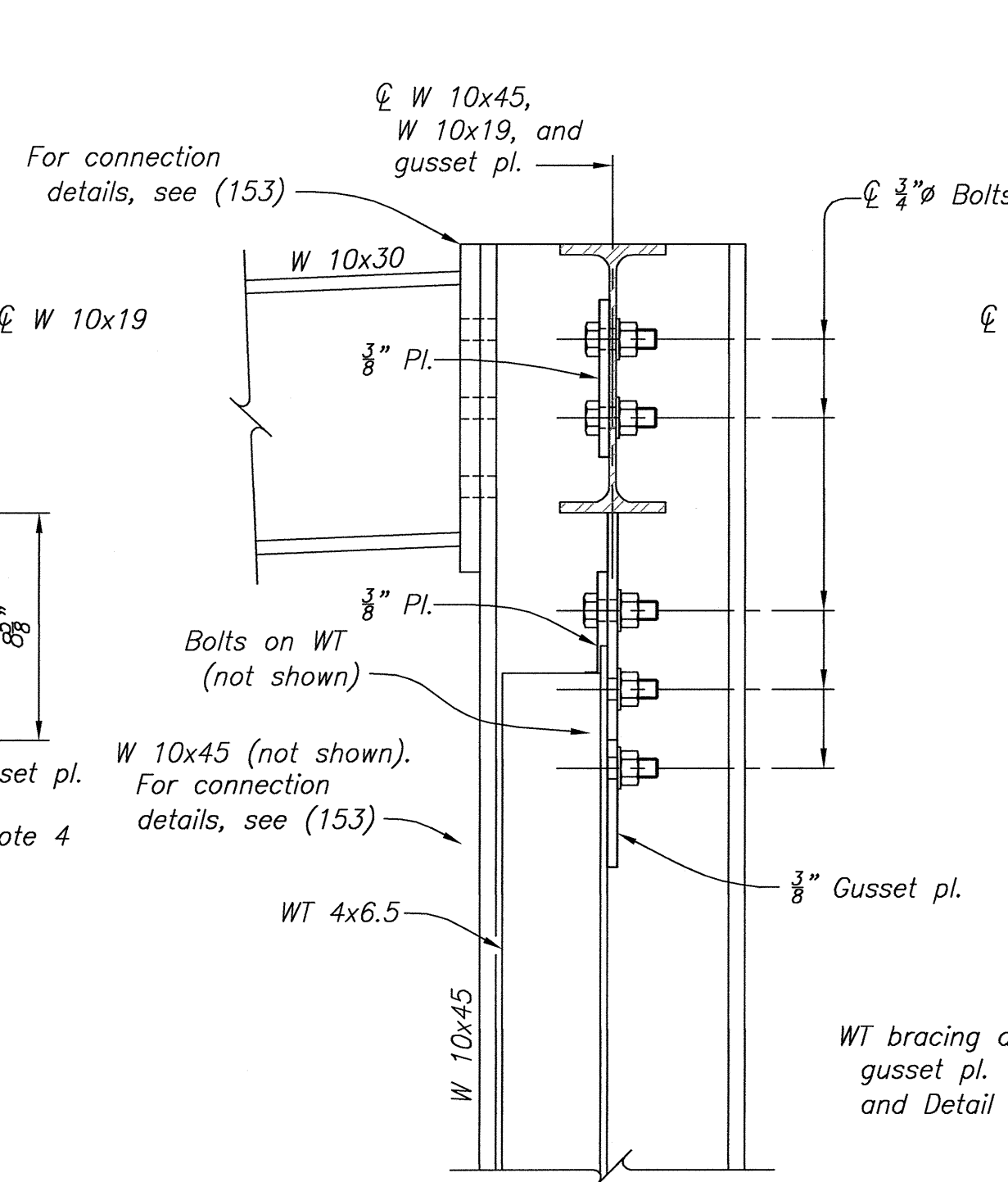
DETAIL 3 AND DETAIL 4 (AS SHOWN)(137)
DETAIL 5 AND DETAIL 6 (SIMILAR AS NOTED)(137)



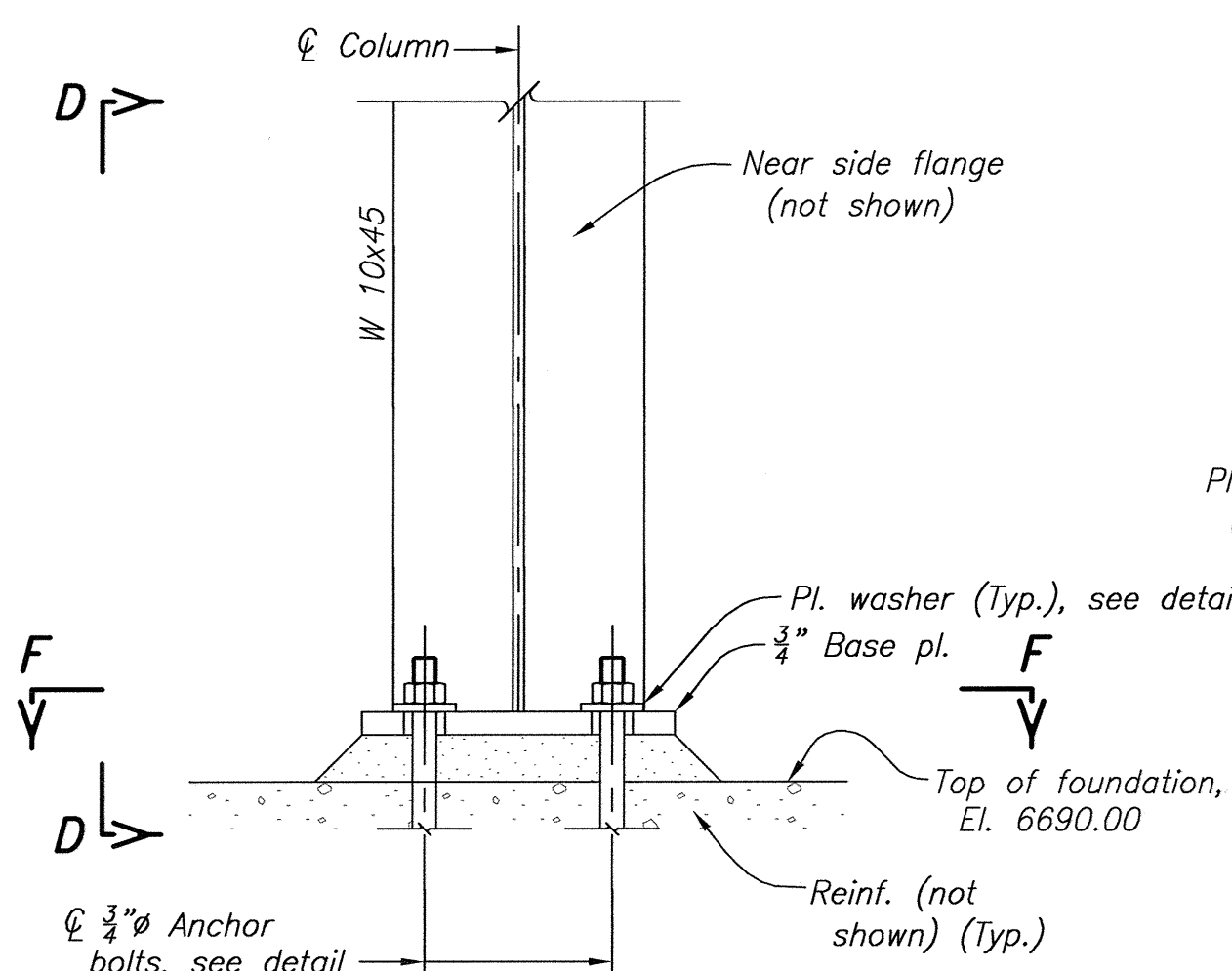
SECTION C-C (AS SHOWN)
SECTION D-D (SIMILAR)



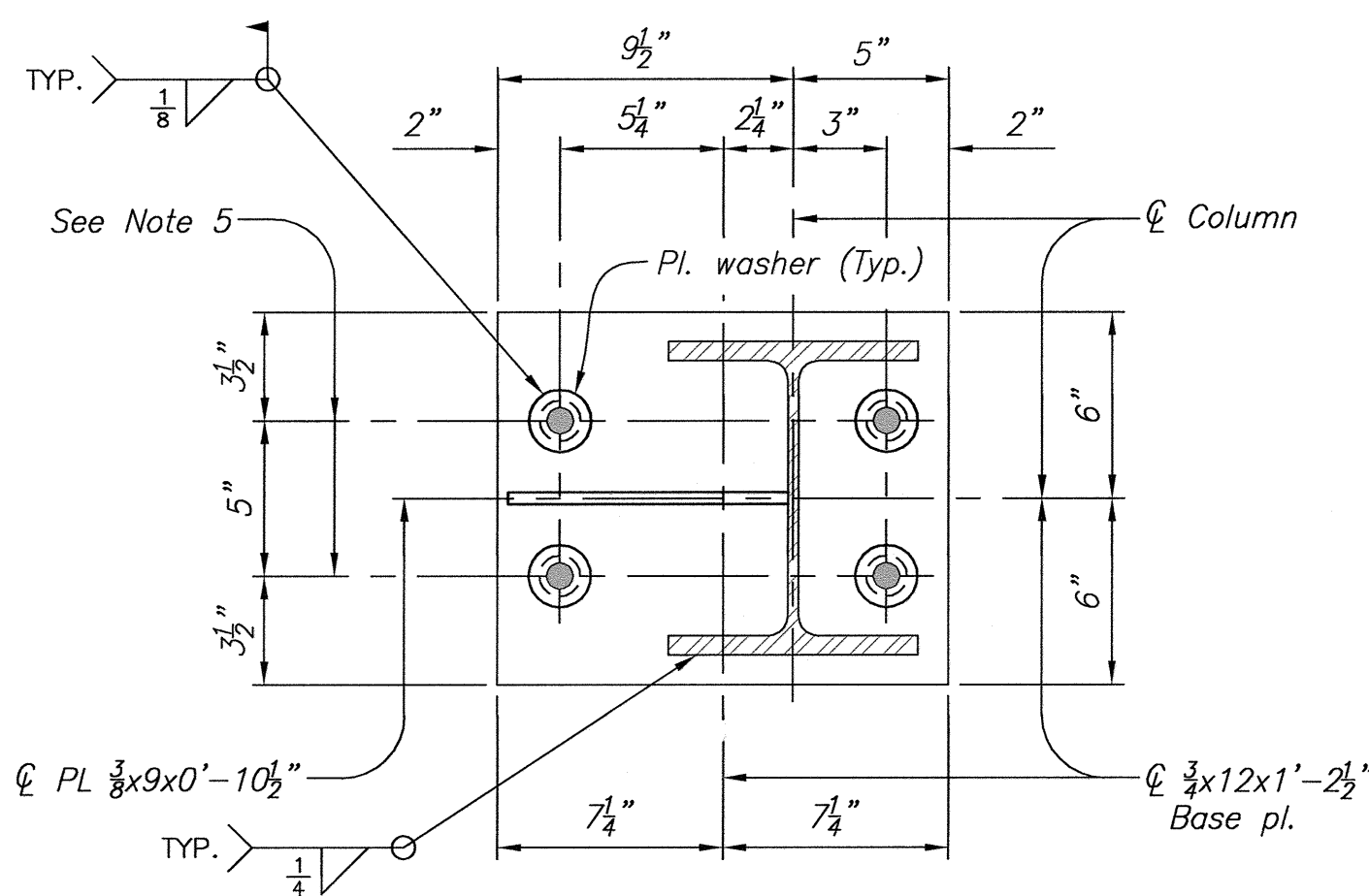
SECTION H-H



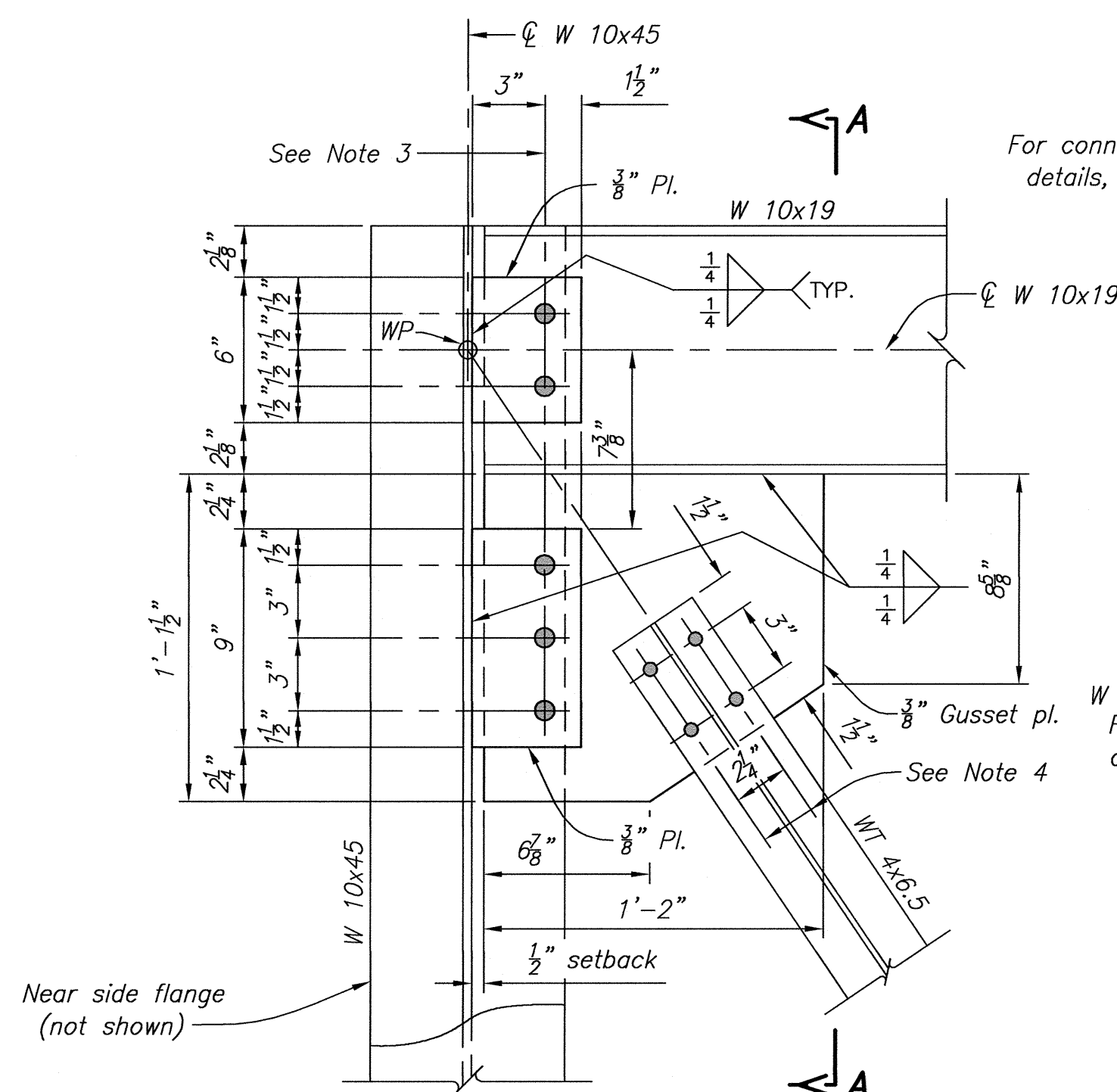
SECTION A-A



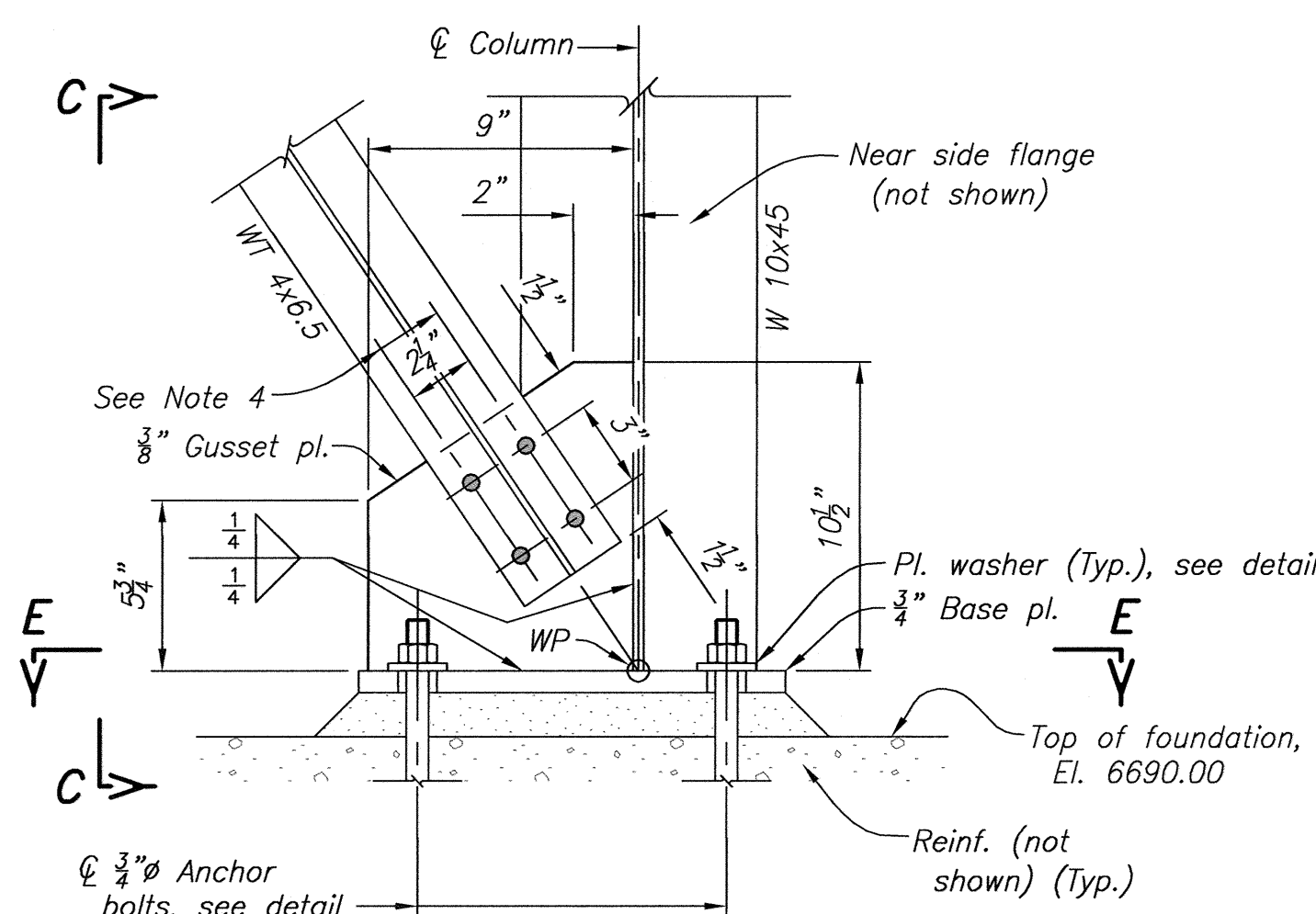
DETAIL 11 (137)



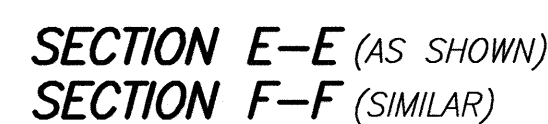
SECTION G-G



DETAIL 1 AND DETAIL 2 (AS SHOWN)(137)



DETAIL 7 AND DETAIL 8 (AS SHOWN)(137)
DETAIL 9 AND DETAIL 10 (OPP. HAND AND SIMILAR)(137)



1. For Structural Design Data, see (101) and (102).
2. For Structural Steel General Notes, see (131).
3. $\varnothing \frac{13}{16}$ Holes for $\frac{3}{4}$ " hex. hd. bolts with hex. nuts and std. washers.
4. $\varnothing \frac{1}{8}$ Holes for $\frac{1}{2}$ " hex. hd. bolts with hex. nuts and std. washers.

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NEW MEXICO

**SAN JUAN LATERAL
TOHLAKAI PUMPING PLANT
CHLORINE FEED BUILDING AND OUTDOOR CHLORINE STORAGE
STRUCTURAL STEEL
SECTIONS AND DETAILS**

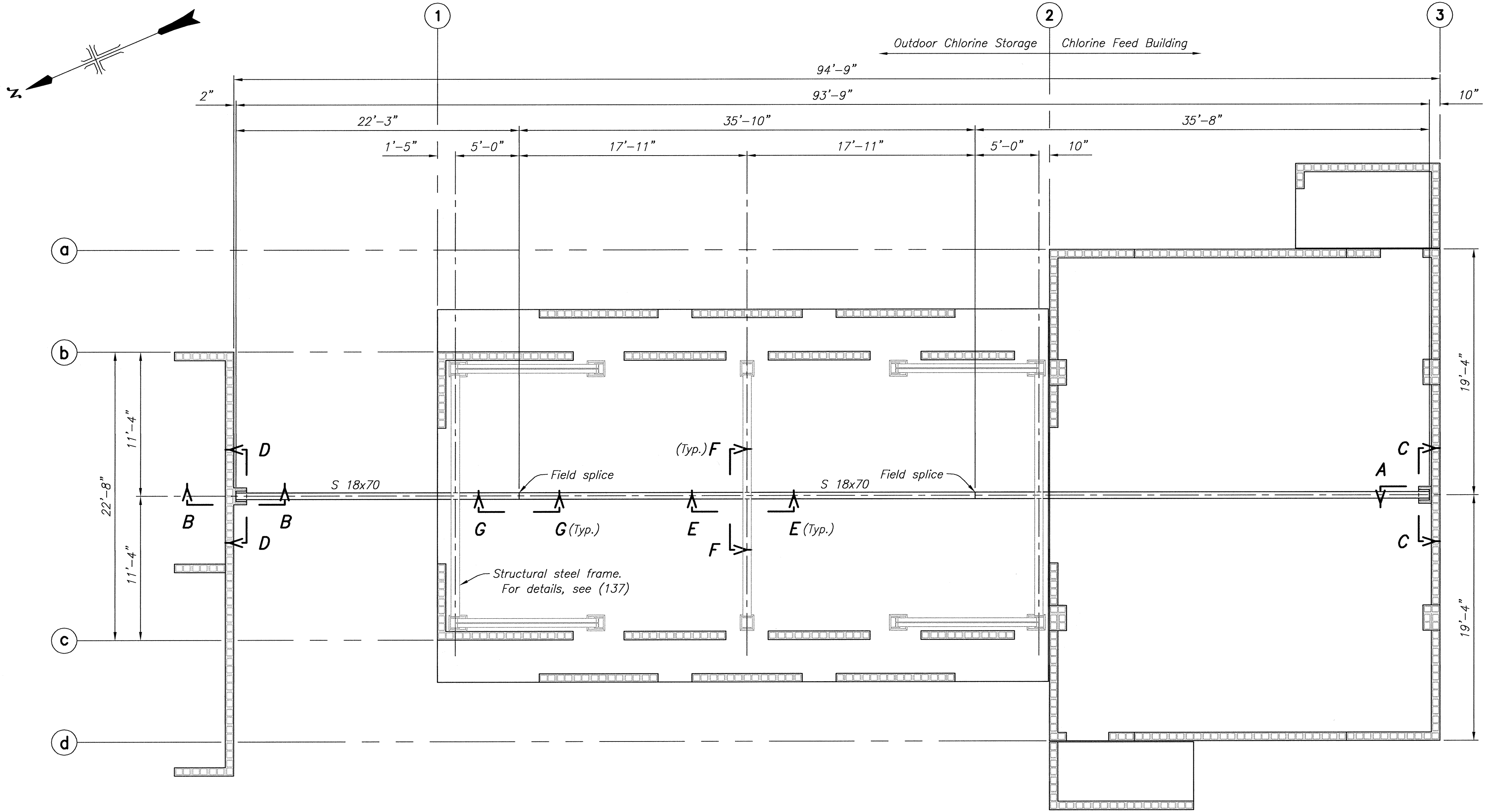
DENVER, COLORADO 2013-08-05

STRUCTURAL STEEL SECTIONS AND DETAILS

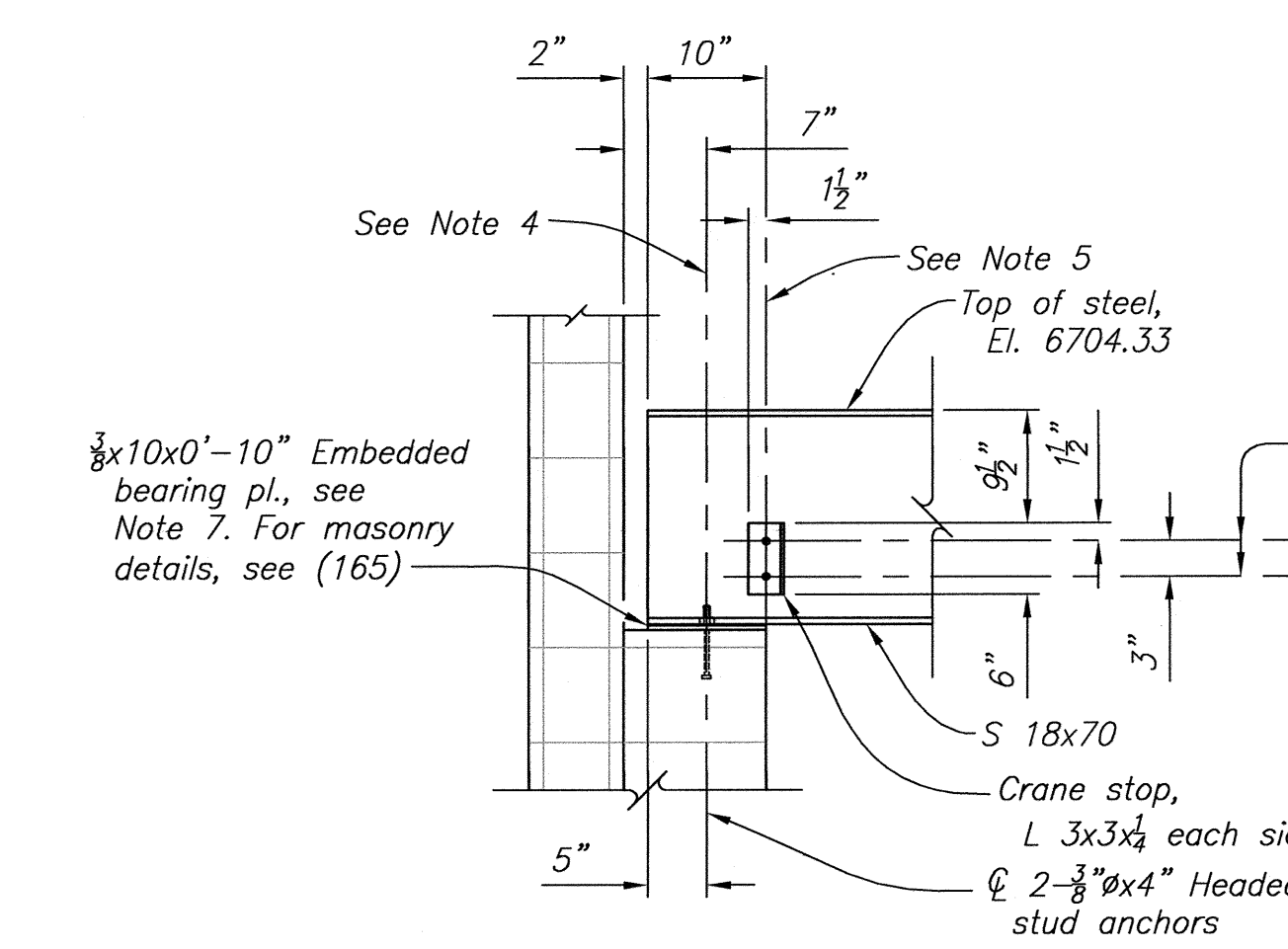
1695-D-153

SHEET 2 OF 2

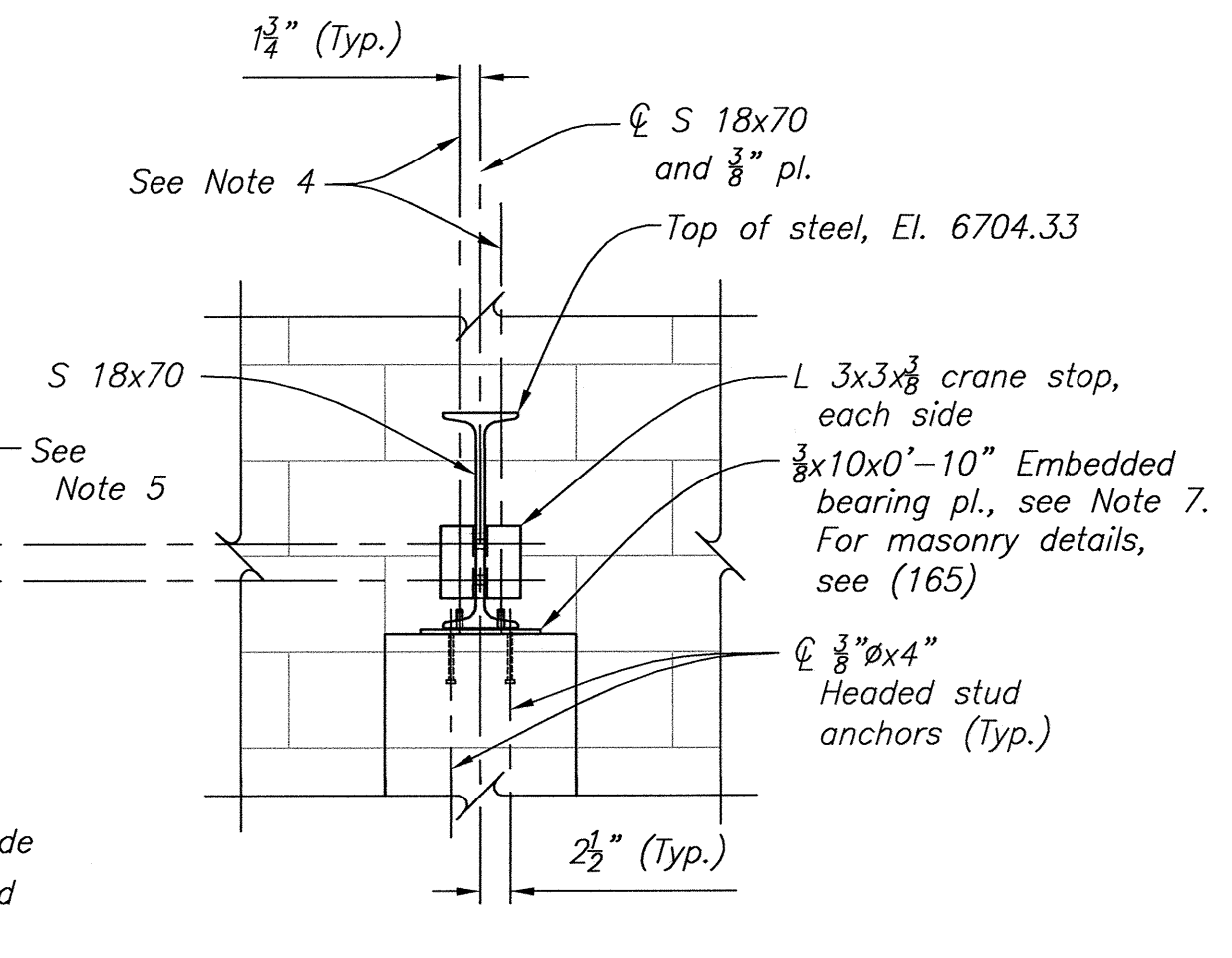
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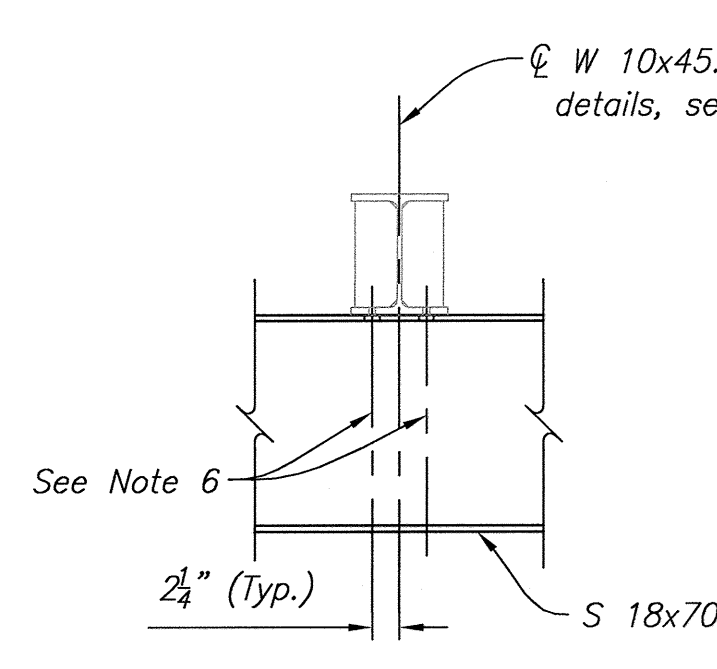
MONORAIL CRANE FRAMING PLAN - EL. 6704.33



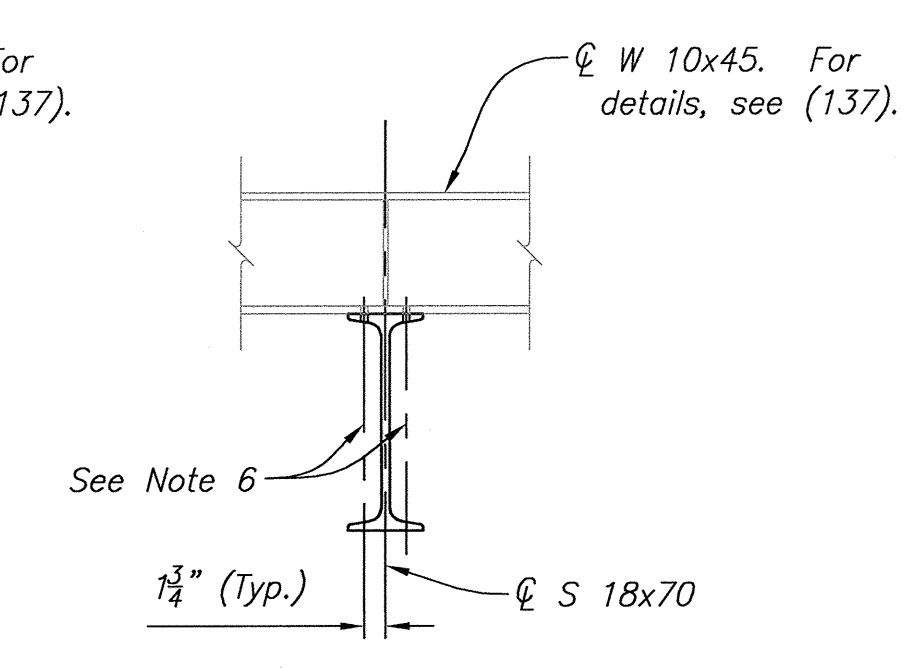
SECTION A-A (AS SHOWN)
SECTION B-B (SIMILAR)



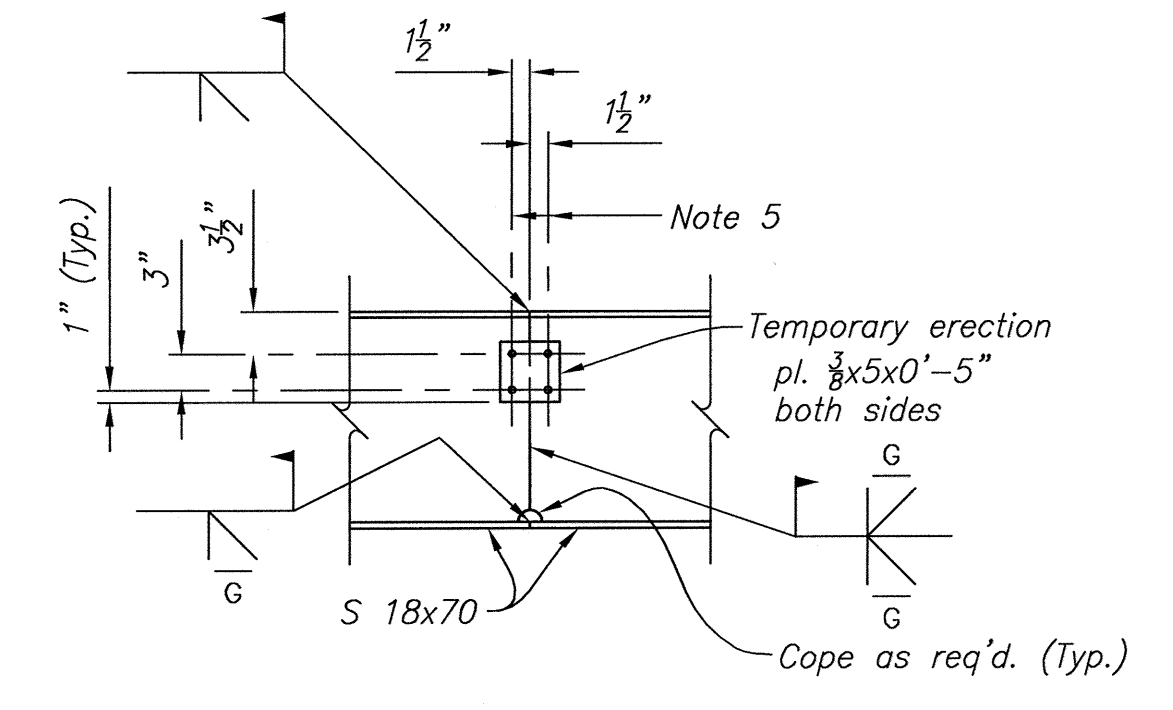
SECTION C-C (AS SHOWN)
SECTION D-D (SIMILAR)



SECTION E-E



SECTION F-F



SECTION G-G
NOTES

1. For Structural Design Data, see (101) and (102).
2. For Structural Steel General Notes, see (131).
3. For Reference Drawings, see (137).
4. $\varnothing \frac{9}{16} \times 1 \frac{1}{4}$ Slotted holes in flange for $\frac{1}{2}$ " $\varnothing$ fully threaded stud with hex. nut and beveled washer. Slot holes parallel to monorail beam.
5. $\varnothing \frac{9}{16}$ Holes for $\frac{1}{2}$ " $\varnothing$ hex. hd. bolt with hex. nut and washer.
6. $\varnothing \frac{9}{16} \times 1 \frac{1}{4}$ slotted holes in S-section flange for $\frac{1}{2}$ " $\varnothing$ hex. hd. bolt with hex. nut, washer and beveled washer. Slot holes parallel to monorail beam.
7. Shim as required under monorail beam.

CAD SYSTEM
AutoCAD Rev. 19.0s
CAD FILENAME
1695-D-167 - 2-TON MONORAIL CRANE - PLAN AND SECTIONS.DWG
DATE AND TIME PLOTTED
JULY 25, 2013 17:14
PLOTTED BY
BMANOTERLOO



1 0 5 10 15

SCALE OF FEET

1. For Structural Design Data, see (101) and (102).
2. For Reference Drawings, see (137).
3. For Masonry Design General Notes and Typical Details, see (146).
4. All dowels and vertical reinforcement are #5.
5. For coordinates of control points CP-20 and CP-21, see (100).

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NAVAJO GALLUP WATER SUPPLY PROJECT
NEW MEXICO

AN JUAN LATERAL

TOHLAKAI PUMPING PLANT

BUILDING AND OUTDOOR CHLOR
MASONRY DESIGN

MANAGEMENT DESIGN PLAN

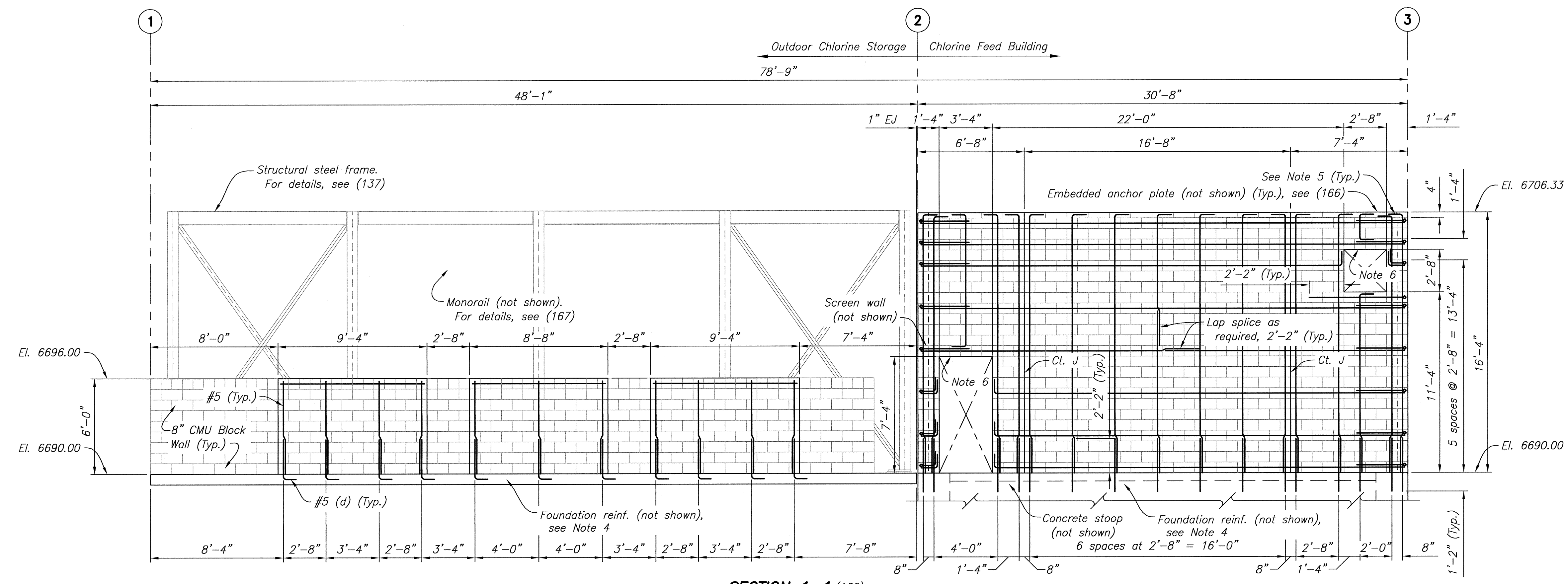
C

DESIGNED B. D. Van Otterloo
DRAWN B. Jackson
CHECKED R. OSL P.E.
TECH. APPR. NAME, PROF. ABBR.
A.W. B.
APPROVED
PLANT STRUCTURES GROUP

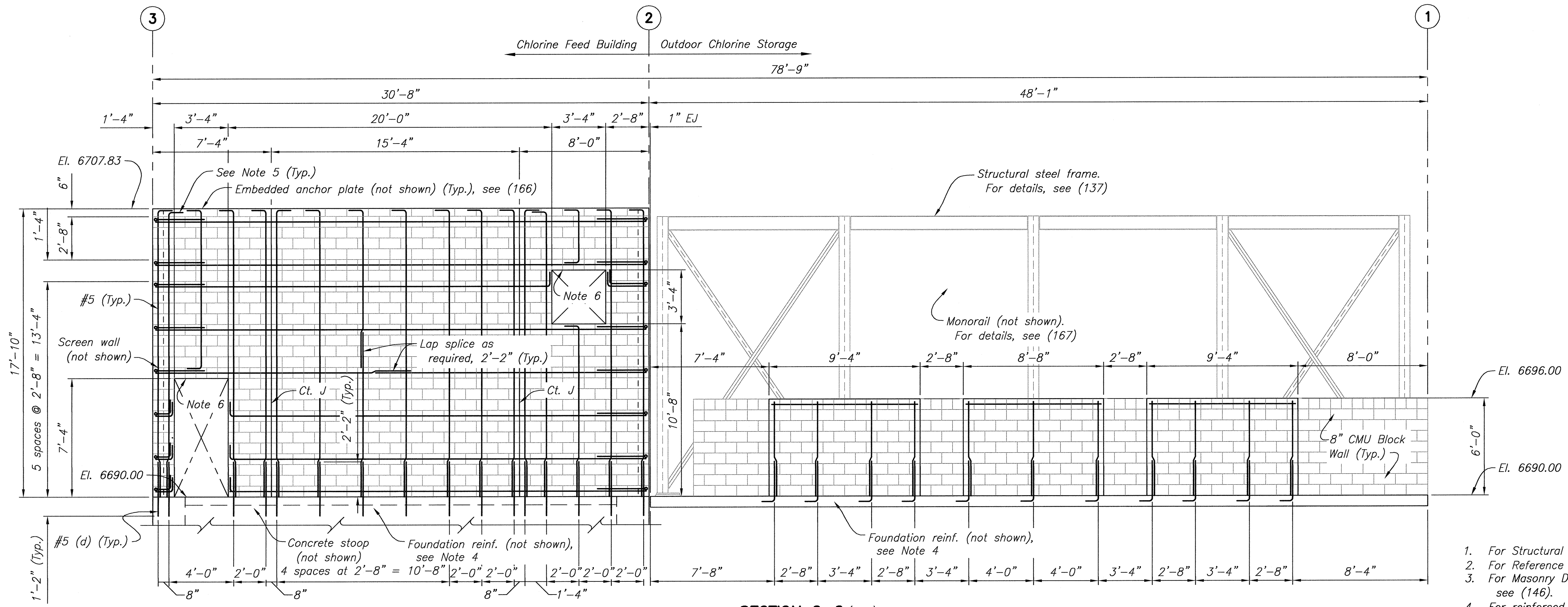
DENVER, COLORADO 2013-08-0

**MASONRY DESIGN
PLAN**

1695-D-162

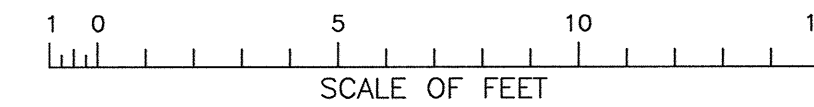


SECTION 1-1 (162)

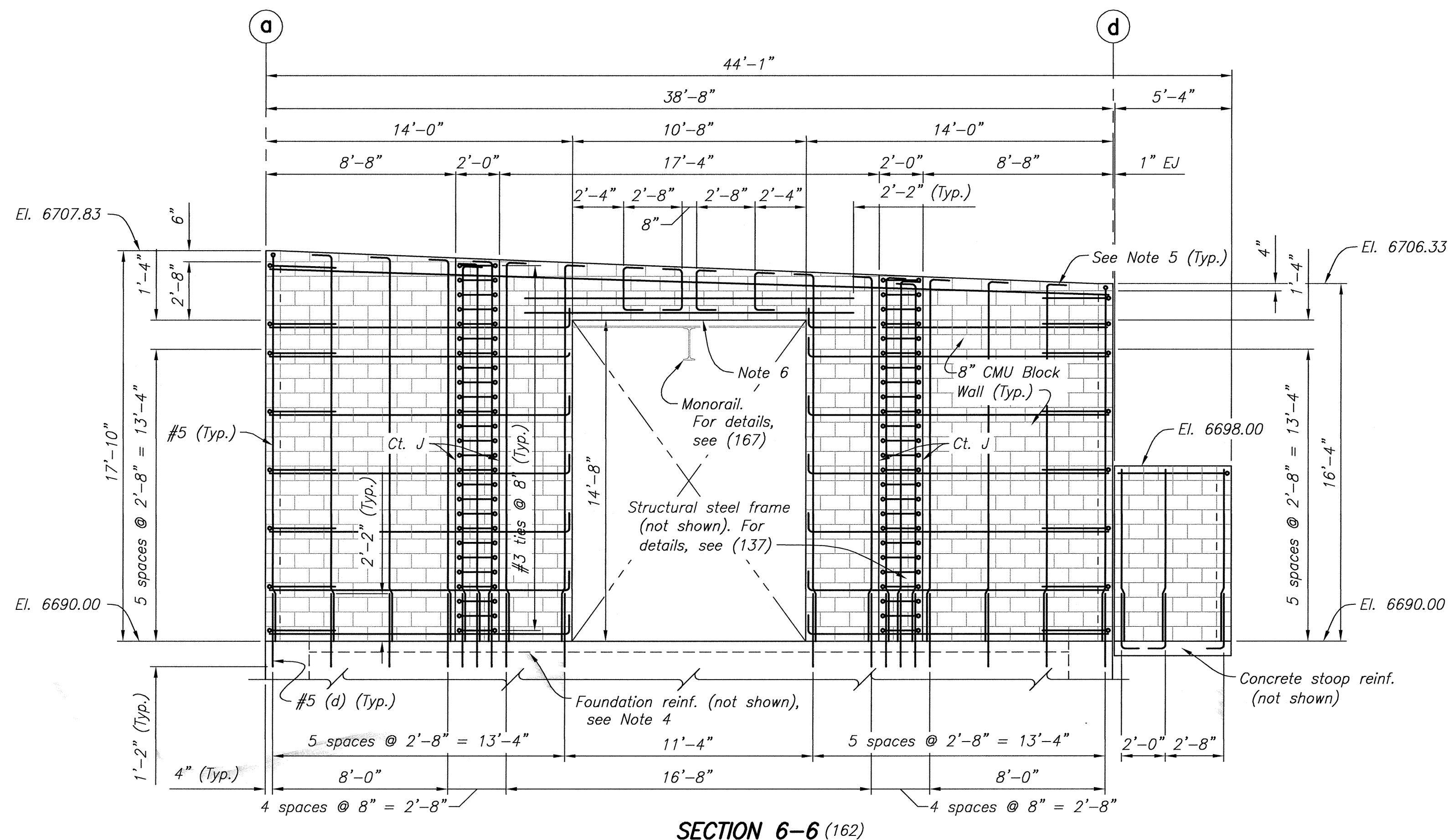
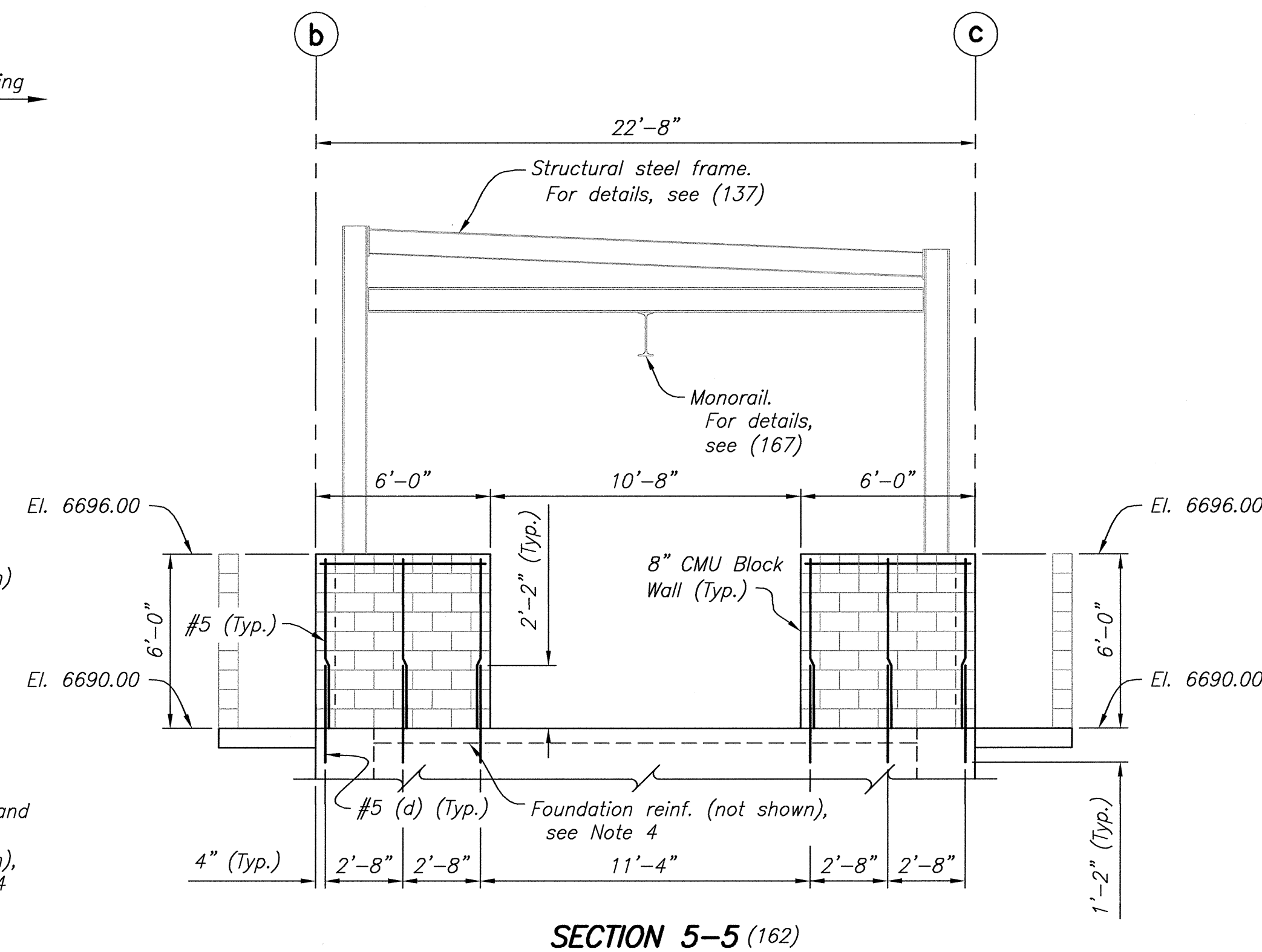
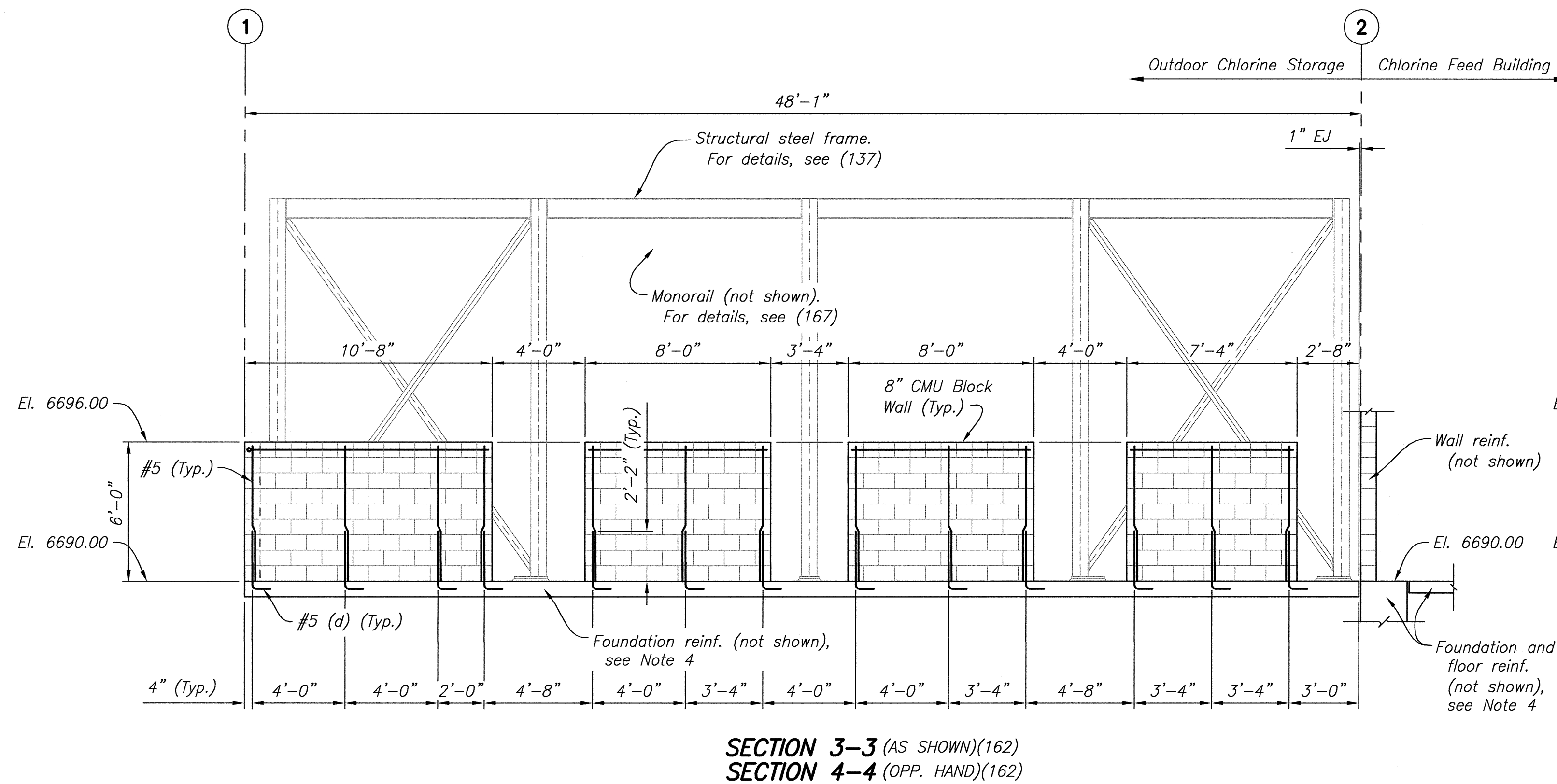


SECTION 2-2 (162)

- NOTES**
- For Structural Design Data, see (101) and (102).
 - For Reference Drawings, see (137).
 - For Masonry Design General Notes and Typical Details, see (146).
 - For reinforced concrete building foundation, see (160).
 - Extension for a 90° standard hook shall not be less than 8 $\frac{1}{2}$."
 - Use lintel block over openings.
 - All dowels and vertical and horizontal reinforcement are #5.

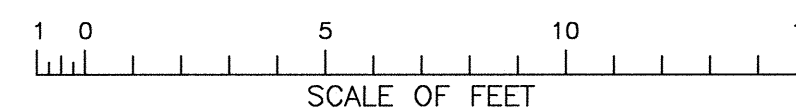


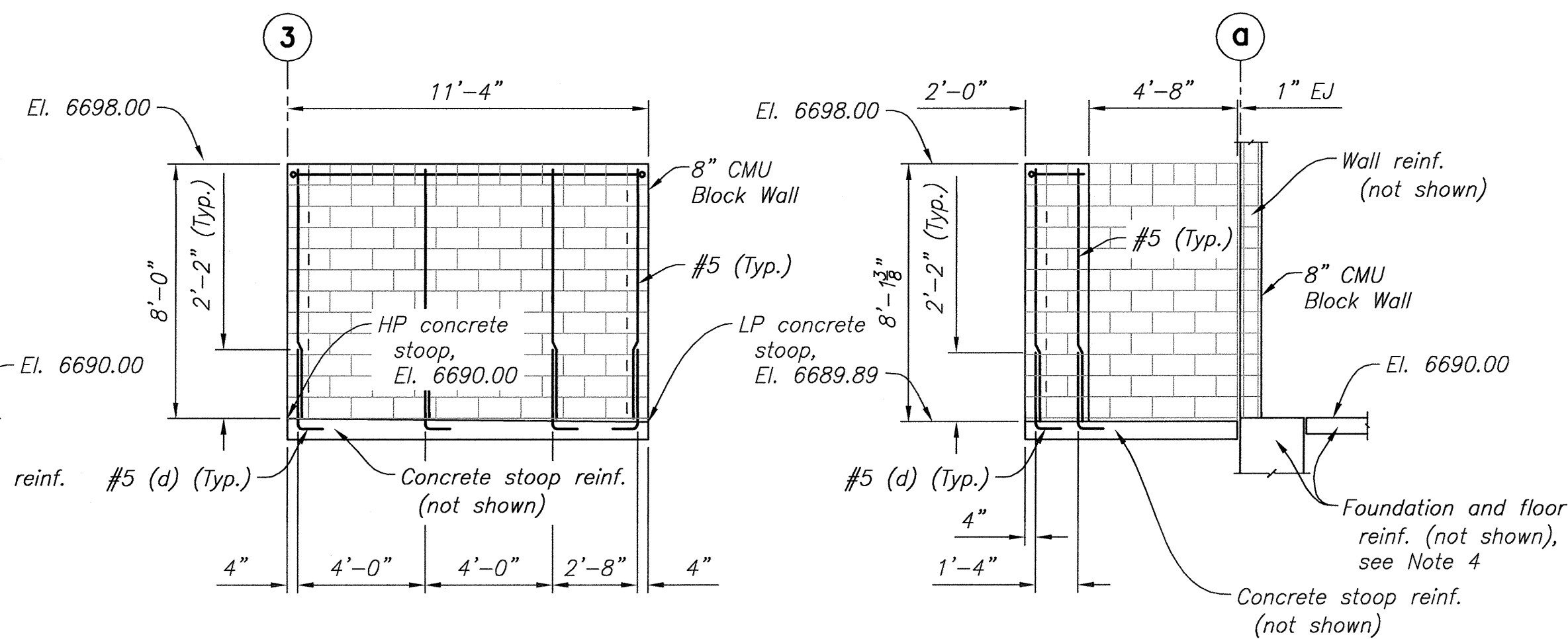
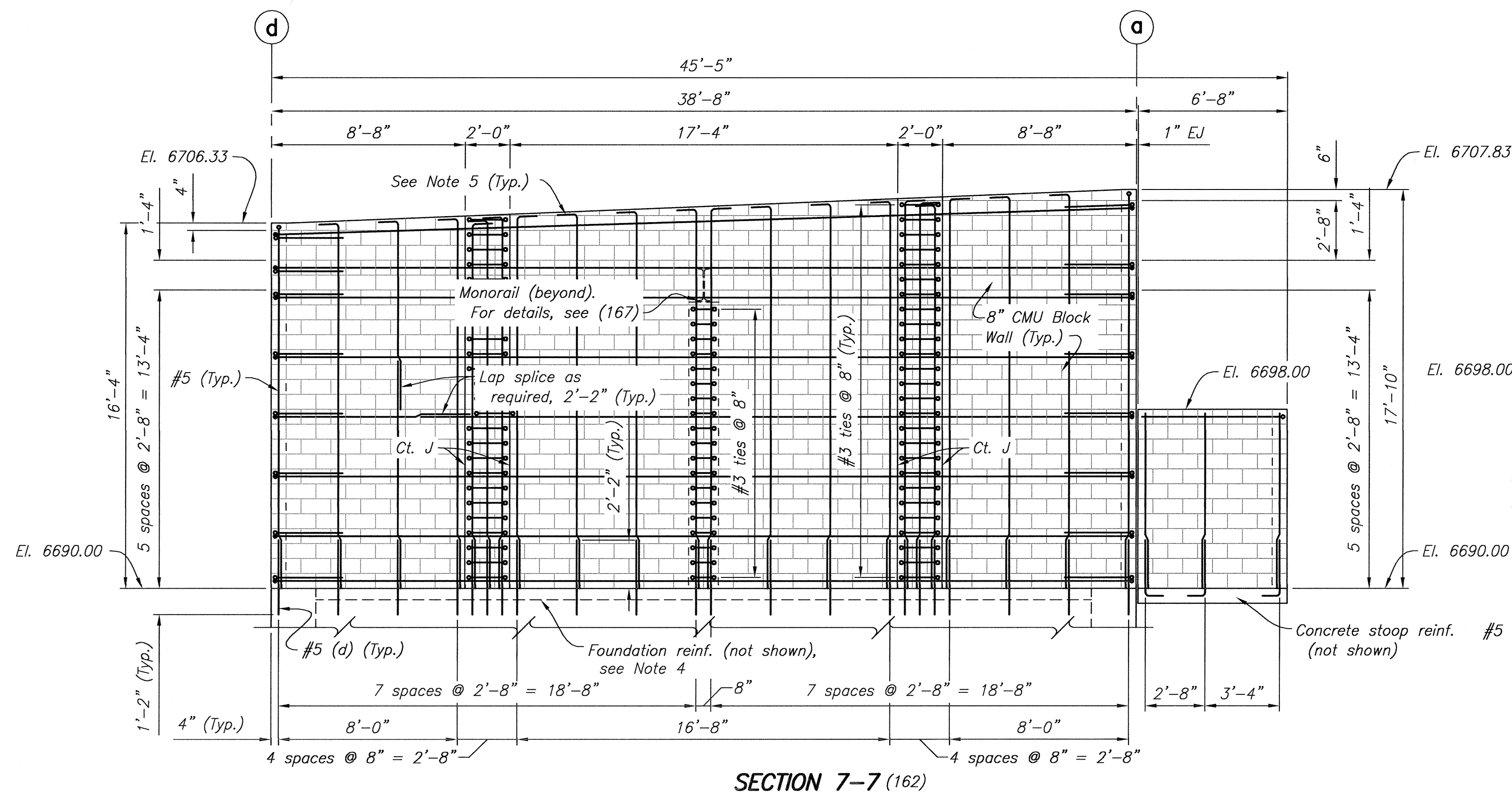
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AUGUST 3, 2013 10:44
PLOTTED BY
KOSHEA
CAD SYSTEM
AutoCAD Rev. 13.03
CAD FILENAME
1695-D-163 - MASONRY - SECTIONS - SHEET 1 OF 3.DWG



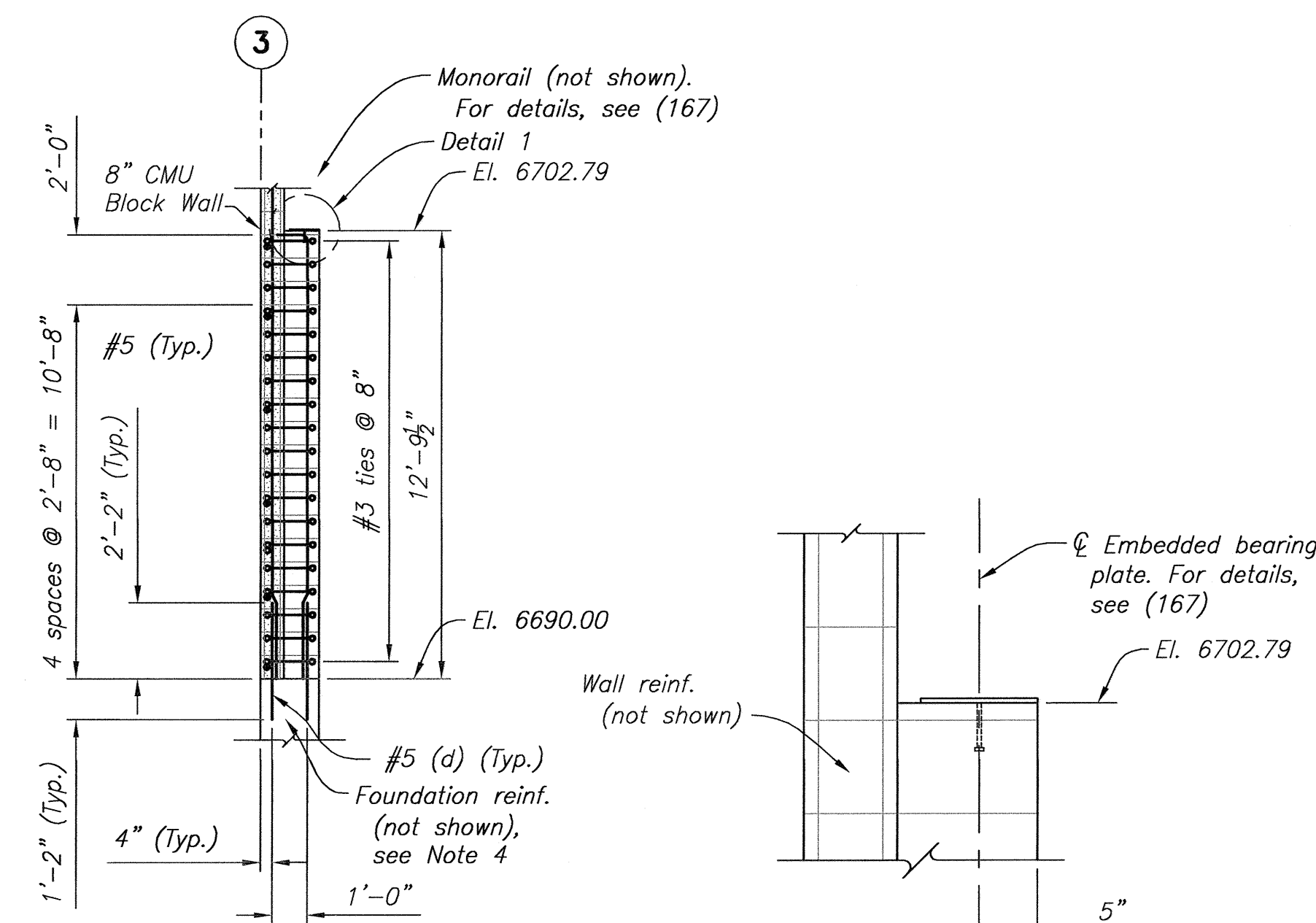
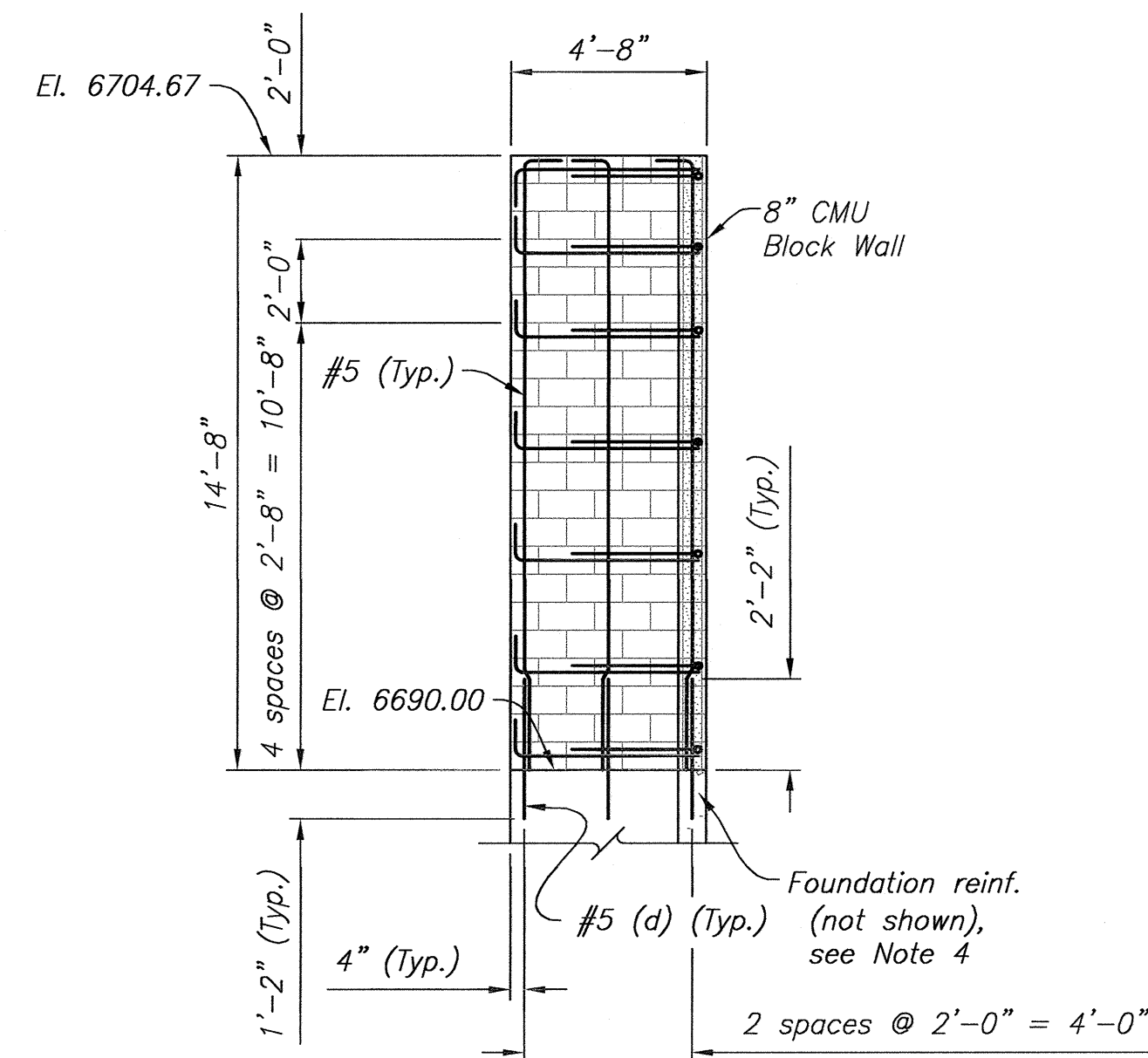
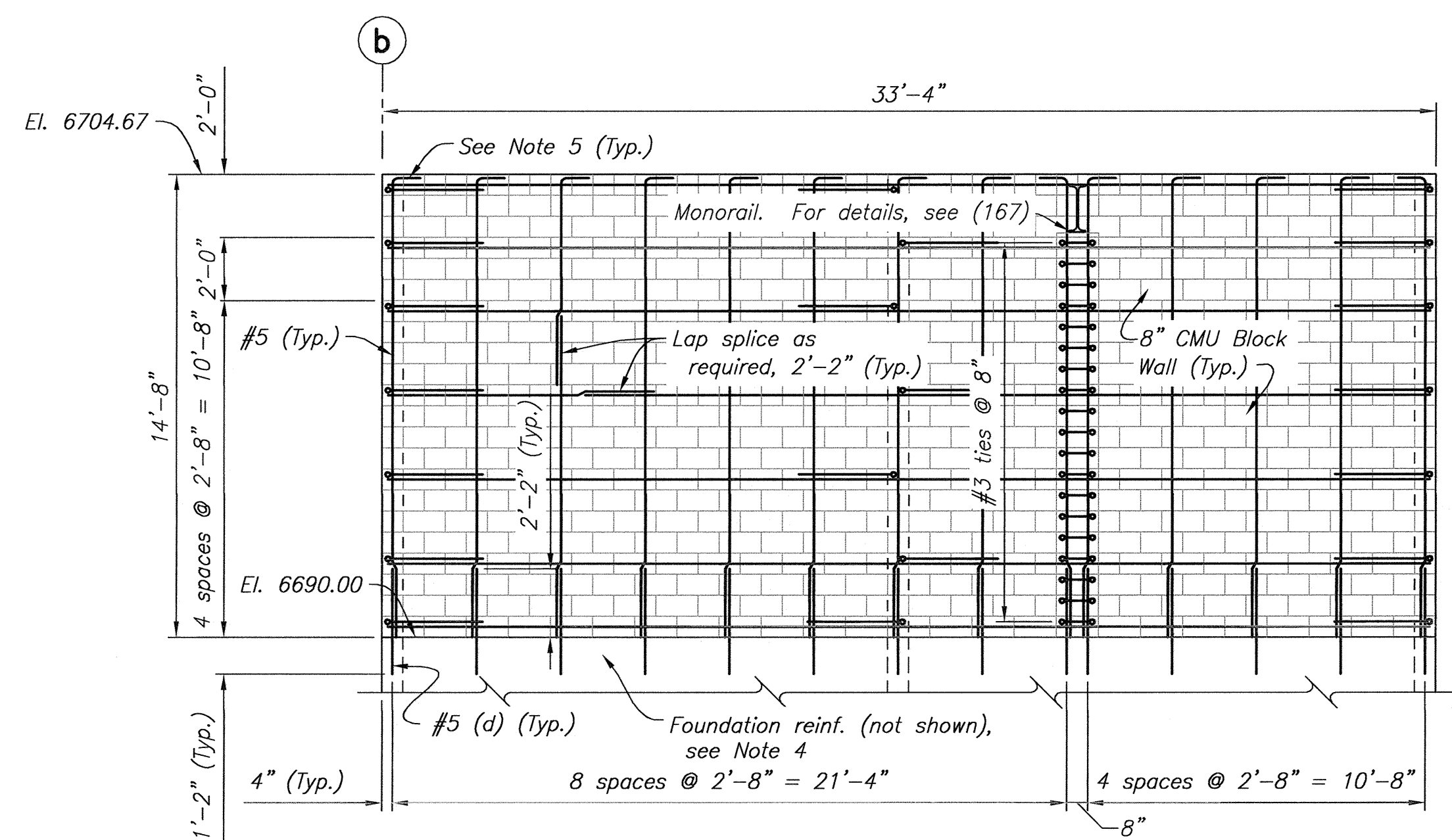
NOTES

- For Structural Design Data, see (101) and (102).
- For Reference Drawings, see (137).
- For Masonry Design General Notes and Typical Details, see (146).
- For reinforced concrete building foundation, see (160).
- Extension for a 90° standard hook shall not be less than $8\frac{1}{2}$ ".
- Use lintel block over openings.
- All dowels and vertical and horizontal reinforcement are #5, and all ties are #3.



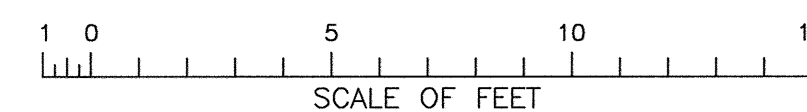


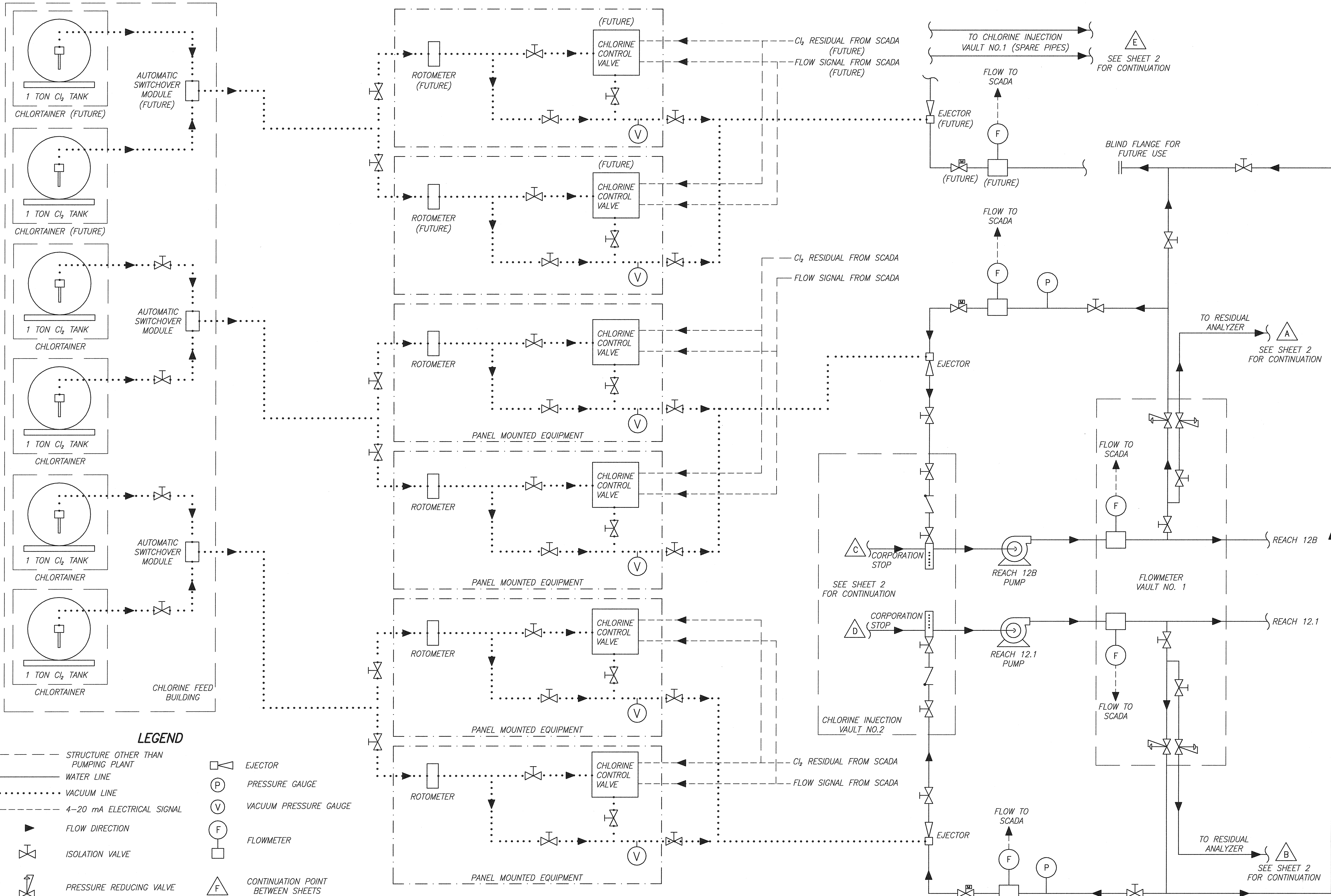
SECTION 10-10 (162)

DETAIL 1
(NOT TO SCALE)

NOTES

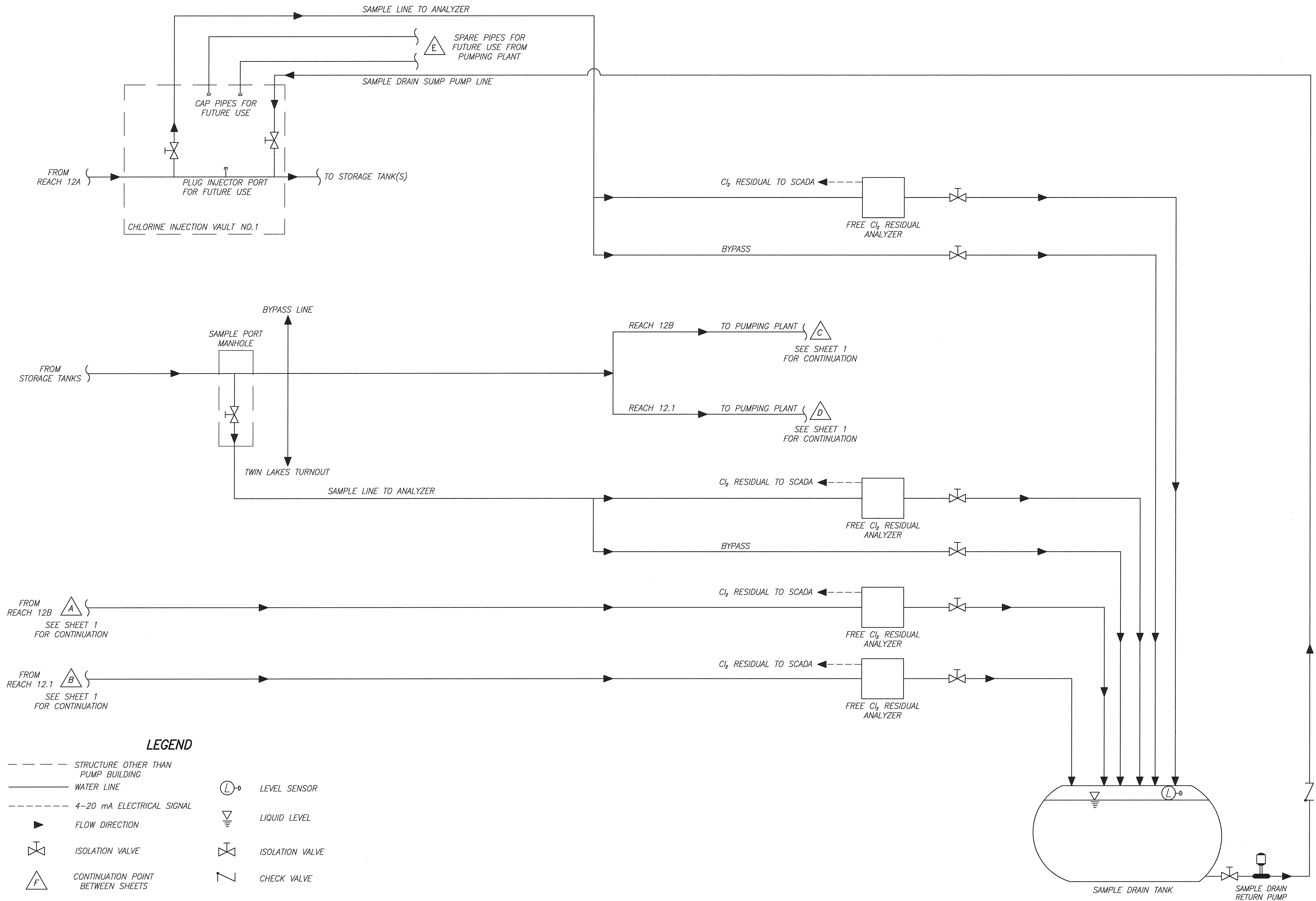
- For Structural Design Data, see (101) and (102).
- For Reference Drawings, see (137).
- For Masonry Design General Notes and Typical Details, see (146).
- For reinforced concrete building foundation, see (160).
- Extension for a 90° standard hook shall not be less than $\frac{8}{2}$.
- All dowels and vertical and horizontal reinforcement are #5, and all ties are #3.





DATE AND TIME PLOTTED: AUGUST 2, 2013 10:44
PLOTTED BY: JMWLP
CADD FILENAME: 1695-D-173 - CHLORINATION SYSTEM - PROCESS SCHEMATIC 1.DWG
CADD SYSTEM: AutoCAD Rev. 18.0s

CAD SYSTEM
AutoCAD Rev. 19.0b
FILE NAME: 1695-D-174 - CHLORINATION SYSTEM - PROCESS SCHEMATIC 2.DWG
DATE AND TIME PLOTTED:
AUGUST 2, 2015 10:42
PLOT BY:
JWJ

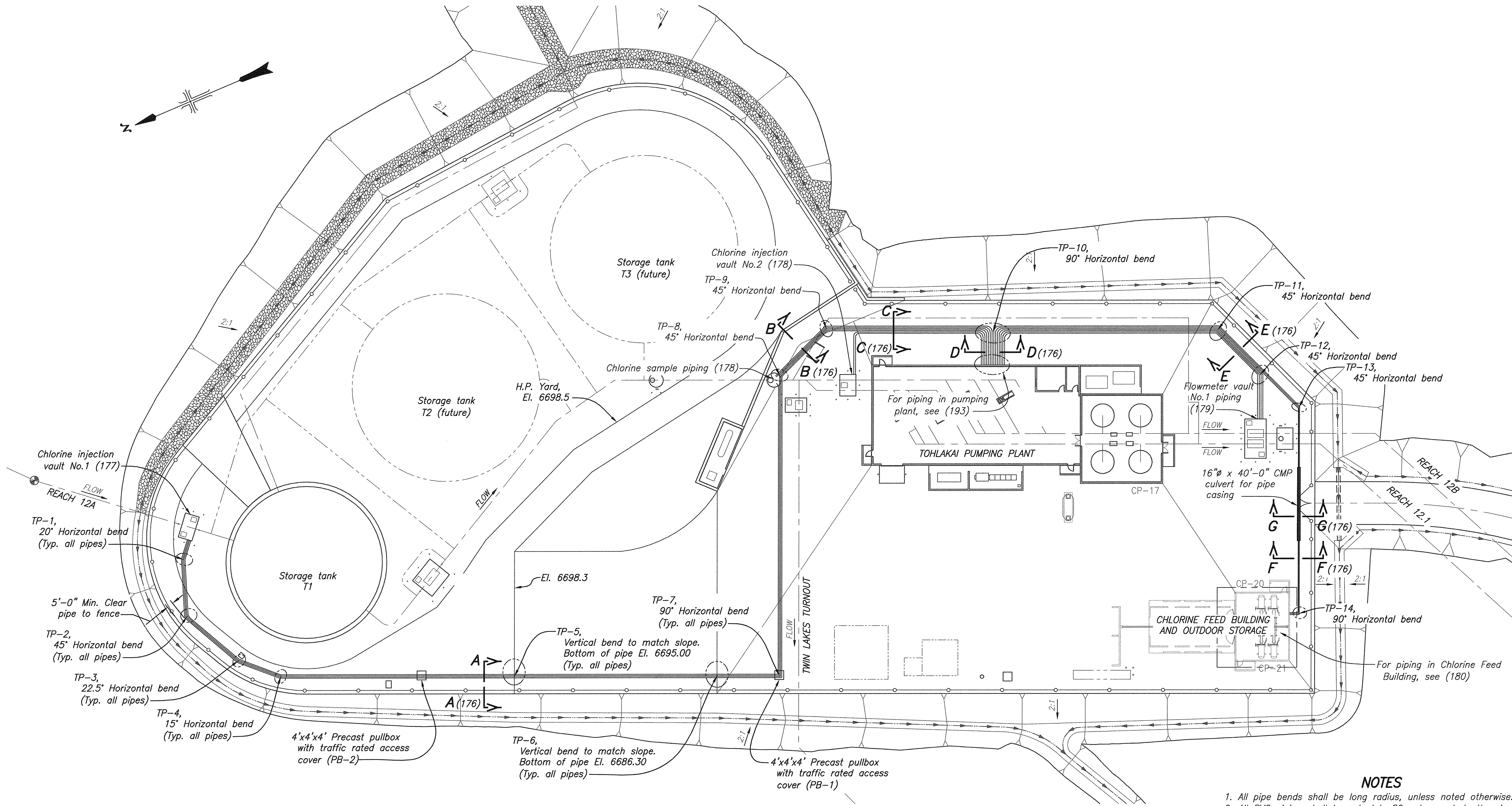


LEGEND

- STRUCTURE OTHER THAN PUMP BUILDING
- WATER LINE
- - - - - 4-20 mA ELECTRICAL SIGNAL
- FLOW DIRECTION
- ✕ ISOLATION VALVE
- △ CONTINUATION POINT BETWEEN SHEETS
- VACUUM REGULATOR
- LEVEL SENSOR
- ▽ LIQUID LEVEL
- ✕ ISOLATION VALVE
- ∩ CHECK VALVE
- PIPE CAP OR PLUG

DESIGNED: *John A. Walz, P.E.*
DRAWN: *John A. Walz, P.E.*
CHECKED: *John A. Walz, P.E.*
TECH. APPR.: *John A. Walz, P.E.*
APPROVED: *John A. Walz, P.E.*
PLANT STRUCTURES GROUP
DENVER, COLORADO 2013-08-05

CHLORINATION SYSTEM
PROCESS &
INSTRUMENTATION DIAGRAM



NOTES

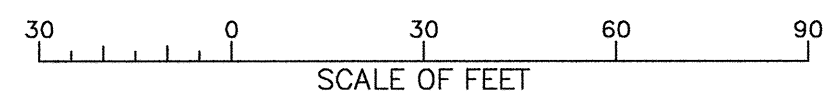
1. All pipe bends shall be long radius, unless noted otherwise.
2. All PVC piping shall be schedule 80 unless noted otherwise.
3. All valves shall be PVC unless noted otherwise.
4. For control points and coordinates, see (99).
5. For process diagram of gas, sample, and water supply lines, see (173) and (174).

REFERENCE DRAWINGS

SITE PLAN	1695-D-99
CHLORINE SAMPLE TAP MANHOLE	1695-D-192
STEEL PIPE	
GENERAL PLAN	1695-D-205
SITE PIPING	
PLAN	1695-D-175
SITE PIPING	
TRENCH SECTIONS	1695-D-176
CHLORINE INJECTION VAULT 1	
CHLORINE PIPING, PLAN- SECTIONS-DETAILS	1695-D-177
CHLORINE INJECTION VAULT 2 & SAMPLE TAP MANHOLE	
CHLORINE PIPING	1695-D-178
FLOWMETER VAULT 1	
CHLORINE PIPING	1695-D-179
CHLORINE FEED BUILDING	
CHLORINE PIPING, PLAN	1695-D-180
CHLORINE PIPING, SECTIONS	1695-D-181
PUMPING PLANT	
CHLORINE PIPING	1695-D-193

TRENCH POINT COORDINATES		
POINT	NORTHING	EASTING
TP-1	1,691,993.50	2,444,647.48
TP-2	1,692,004.21	2,444,617.20
TP-3	1,691,987.44	2,444,583.19
TP-4	1,691,969.04	2,444,565.79
TP-5	1,691,848.81	2,444,514.44
TP-6	1,691,744.69	2,444,470.01
TP-7	1,691,712.41	2,444,456.40
TP-8	1,691,646.67	2,444,611.05
TP-9	1,691,612.40	2,444,624.83
TP-10	1,691,527.35	2,444,586.86
TP-11	1,691,411.36	2,444,538.32
TP-12	1,691,399.41	2,444,505.79
TP-13	1,691,386.65	2,444,480.41
TP-14	1,691,431.91	2,444,374.33

SITE PLAN



DATE AND TIME PLOTTED
AUGUST 2, 2013 10:06
PLOTTED BY
JWWLP

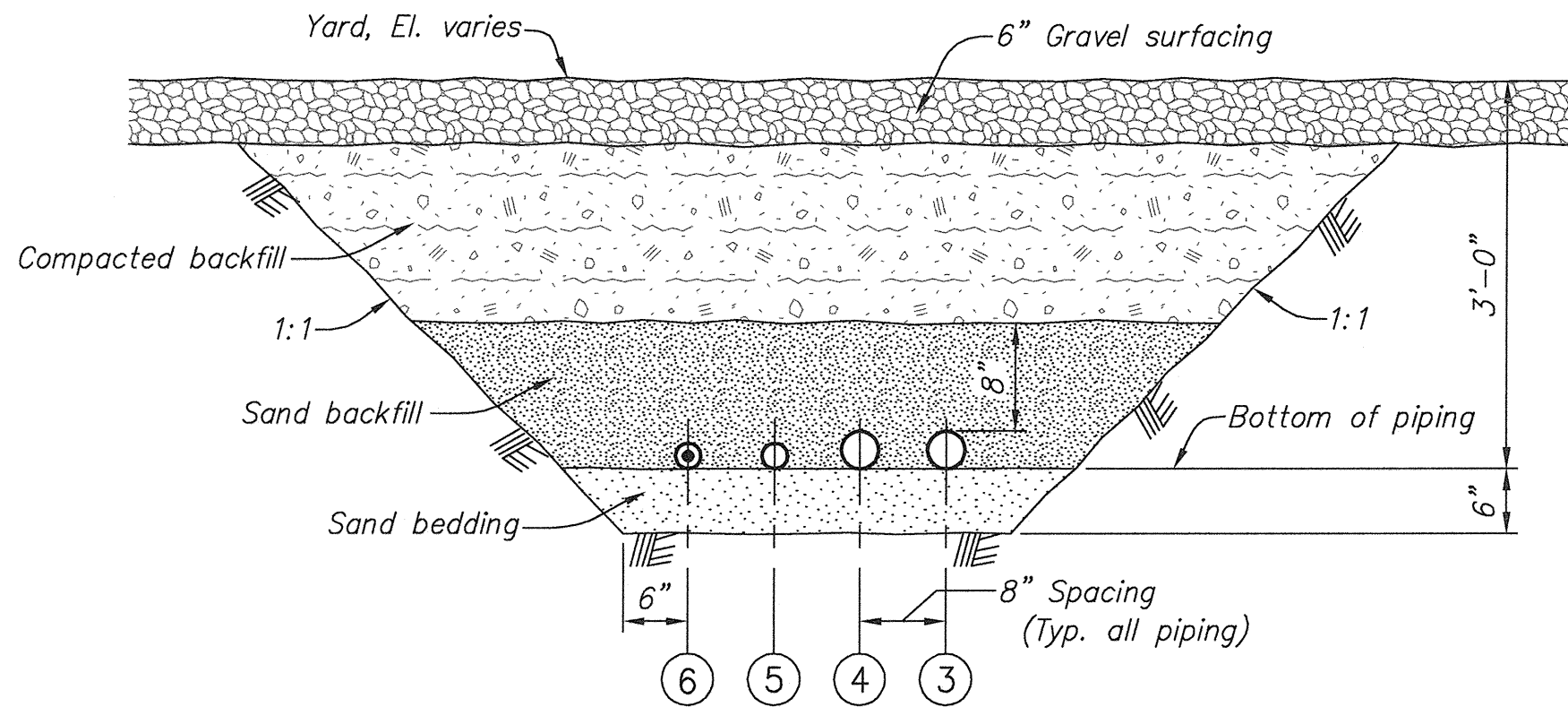
CAD SYSTEM
AutoCAD Rel. 19.0s
CAD FILENAME
1695-D-175 - SITE CHLORINE PIPING.DWG

DESIGNED
DRAWN
CHECKED
TECH. APPR.
PEER REVIEW
PLANT STRUCTURES GROUP
DENVER, COLORADO 2013-08-05

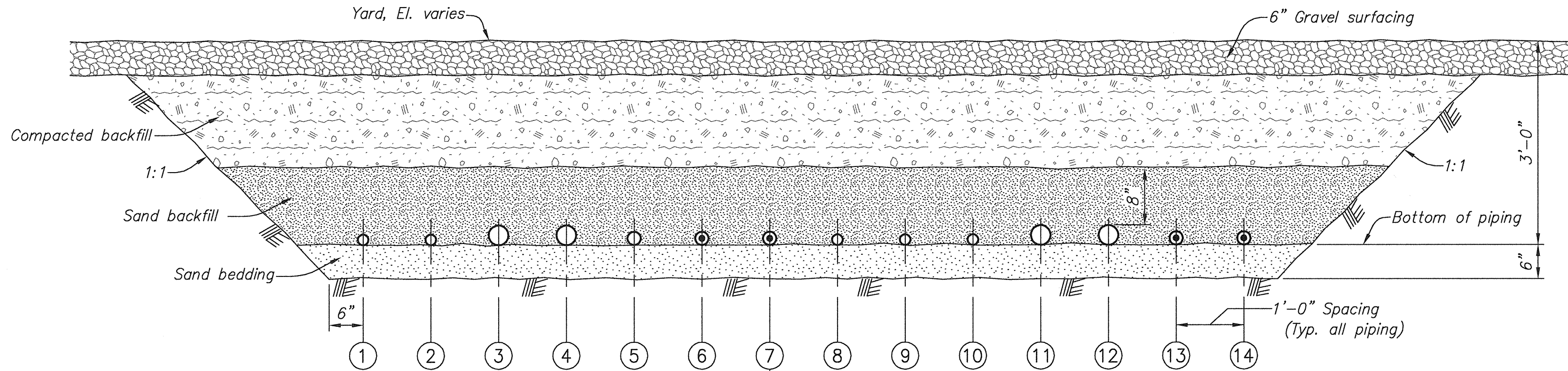
CHLORINATION SYSTEM PIPING
SITE PLAN

1695-D-175

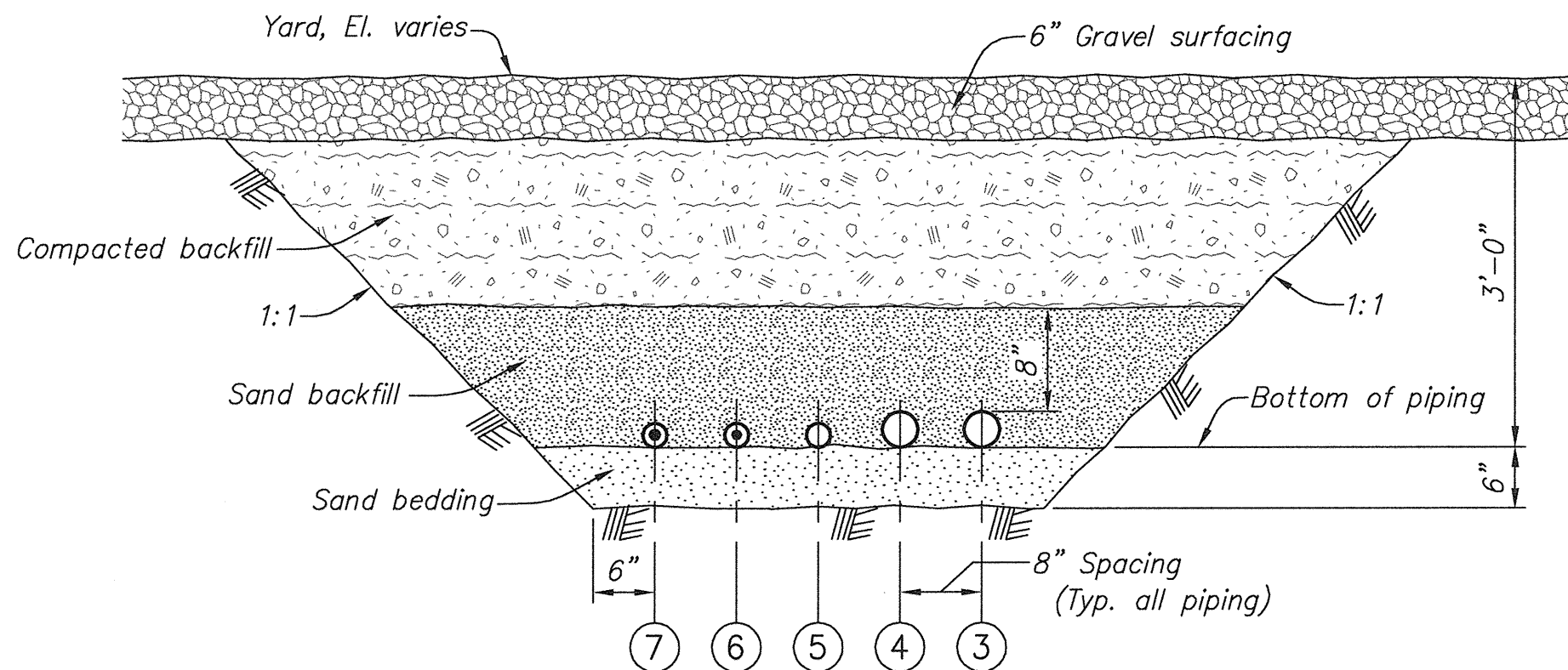
SHEET 1 OF 8



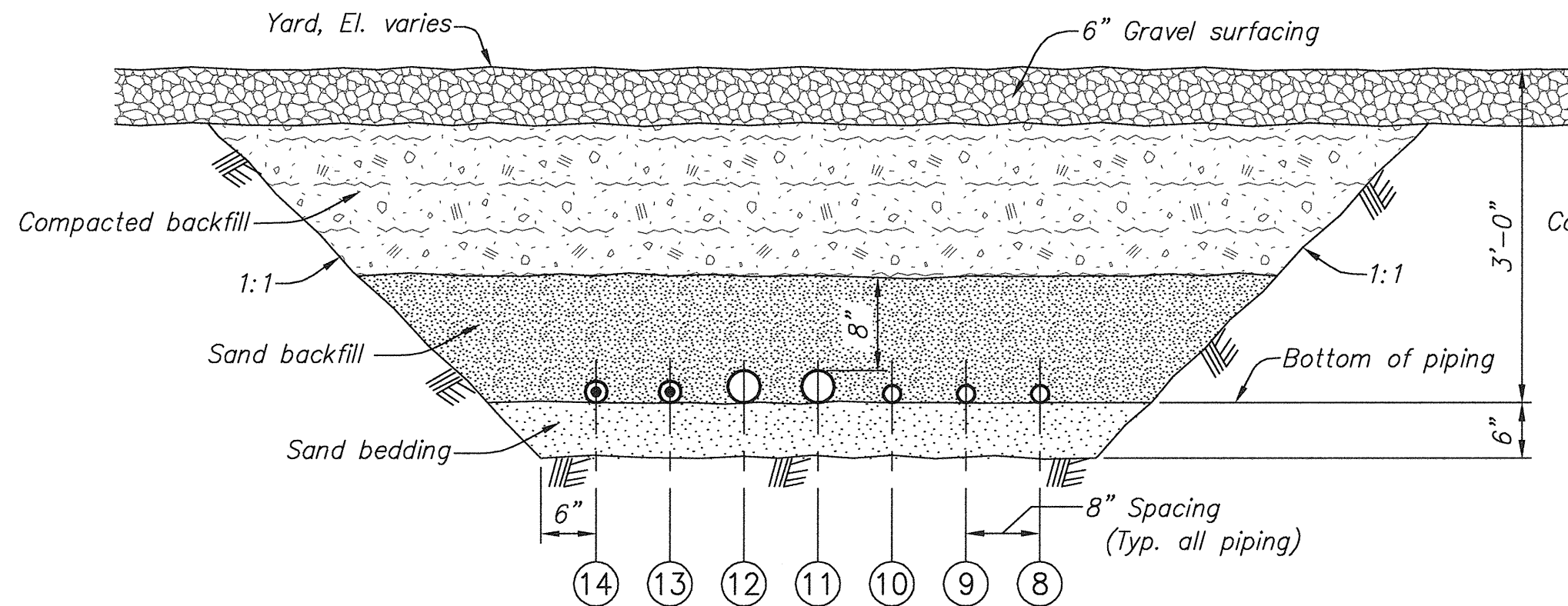
SECTION A-A (175)



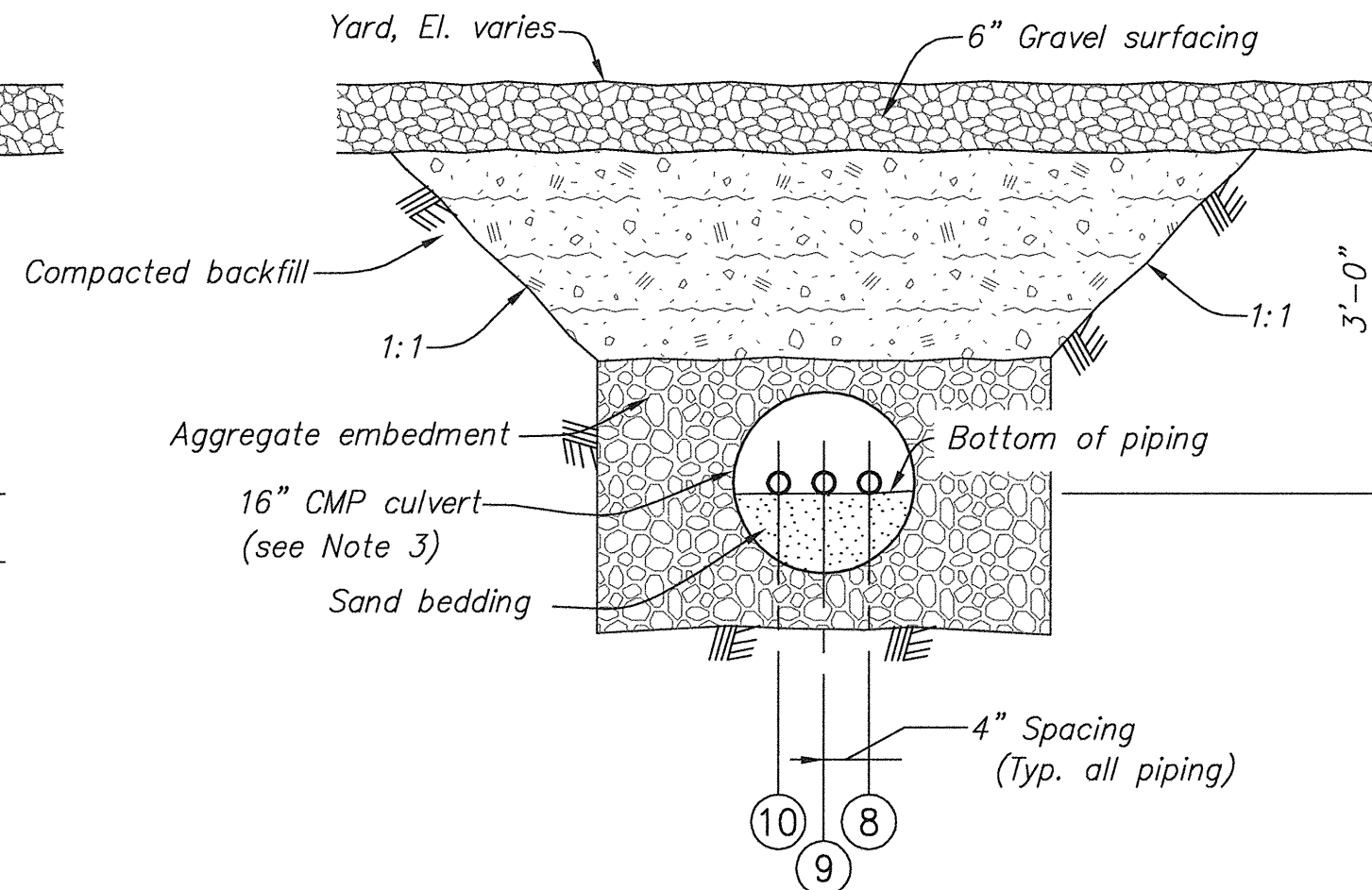
SECTION D-D (175)



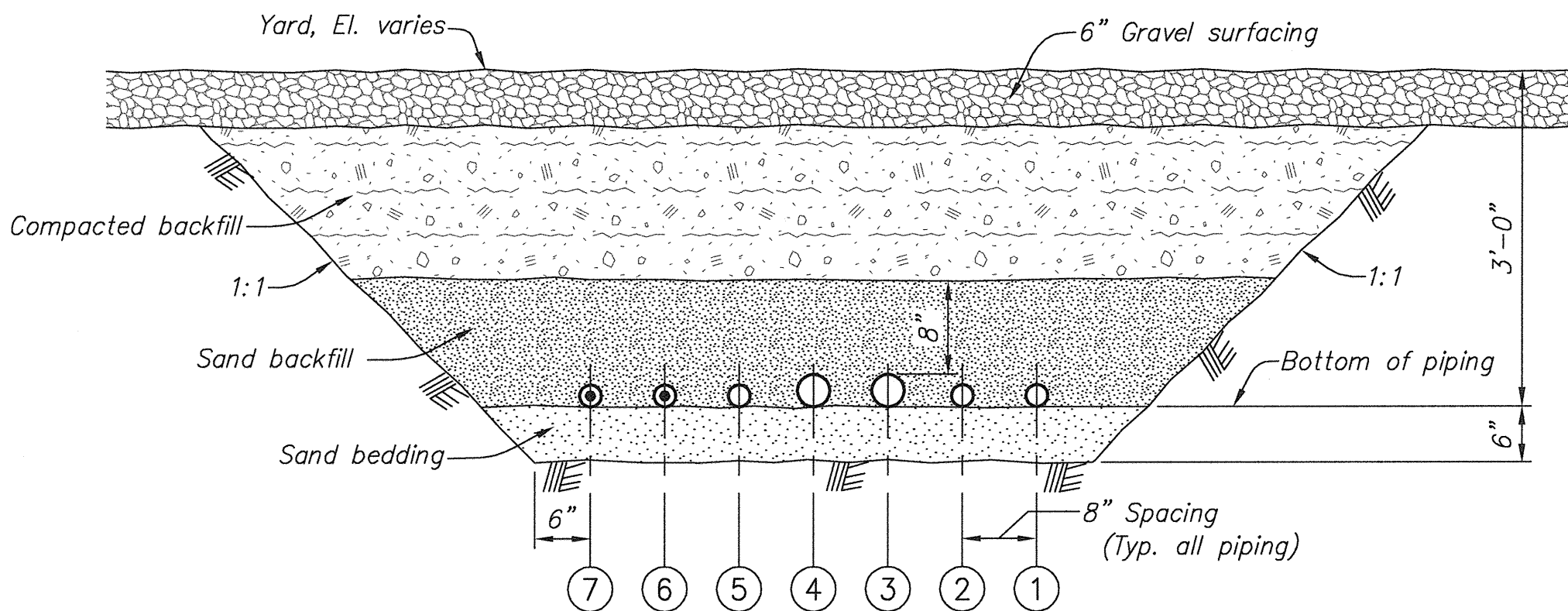
SECTION B-B (175)



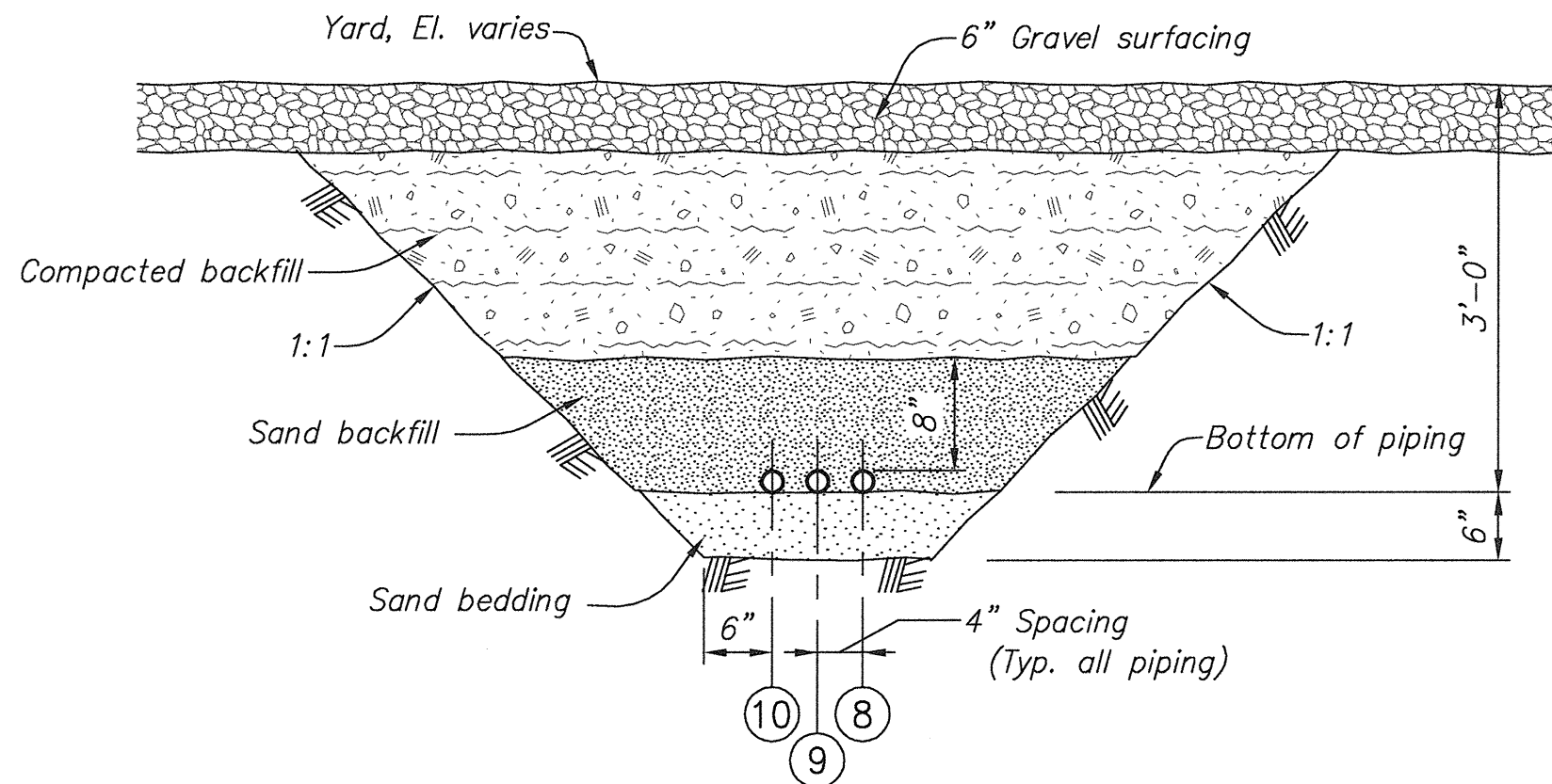
SECTION E-E (175)



SECTION G-G (175)



SECTION C-C (175)



SECTION F-F (175)

PIPE LEGEND

No.	Description	No.	Description
①	12.1 Chlorine solution injection pipe to Chlorine Injection Vault No. 2, 1-1/2" Sch. 80 PVC	⑧	Pre-storage Chlorine gas vacuum line (future) from Chlorine Feed Building, 1-1/2" Sch. 80 PVC
②	12B Chlorine solution injection pipe to Chlorine Injection Vault No. 2, 1-1/2" Sch. 80 PVC	⑨	12B Chlorine gas vacuum line from Chlorine Feed Building, 1-1/2" Sch. 80 PVC
③	Pre-storage Chlorine solution injection pipe (future) to Chlorine Injection Vault No. 1, 3" Sch. 80 PVC	⑩	12.1 Chlorine gas vacuum line from Chlorine Feed Building, 1-1/2" Sch. 80 PVC
④	Pre-storage Chlorine solution injection pipe (future) to Chlorine Injection Vault No. 1, 3" Sch. 80 PVC	⑪	12.1 Chlorine solution water supply pipe from Flowmeter Vault No. 1, 3" Sch. 80 PVC
⑤	Sample drain tank pump discharge to Chlorine Injection Vault No. 1, 2" Sch. 80 PVC	⑫	12B Chlorine solution water supply pipe from Flowmeter Vault No. 1, 3" Sch. 80 PVC
⑥	Pre-storage Chlorine residual sample from Chlorine Injection Vault No. 1, 2" Sch. 80 PVC conduit with 1/2" ID PVC tubing	⑬	12B Chlorine residual sample from Flowmeter Vault No. 1, 2" Sch. 80 PVC conduit with 3/8" ID PVC tubing
⑦	Post-storage Chlorine residual sample from Chlorine Sample Tap Manhole, 2" Sch. 80 PVC conduit with 1/2" ID PVC tubing	⑭	12.1 Chlorine residual sample from Flowmeter Vault No. 1, 2" Sch. 80 PVC conduit with 3/8" ID PVC tubing

NOTES

- For general notes and reference drawings, see (175).
- Install detectable warning tape 1'-6" above each buried pipe.
- Install 16" CMP for carrier pipe per Specification Section 33 42 30. Install sand bedding inside CMP to maintain elevation of piping. Install bulkheads at ends of CMP to prevent entry of backfill.
- Nonwoven geotextile under gravel surfacing not shown; see (196) for detail.
- All pipe spacings are center to center.



1 0 1 2 3 4

SCALE OF FEET

1. For general notes and reference drawings, see (175).
2. For trench and backfill details, see (176).
3. For pipe designations, see PIPE LEGEND on drawing (176).
4. Provide separate case for breathing apparatus on exterior of building as directed by COR.
5. Locate 500 lb/day automatic switchover valve midway between containment vessels.



U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
NAVAJO GALLUP WATER SUPPLY PROJECT
NEW MEXICO

**SAN JUAN LATERAL
TOHLAKAI PUMPING PLANT
CHLORINATION SYSTEM PIPING
CHLORINE FEED BUILDING
PLAN**

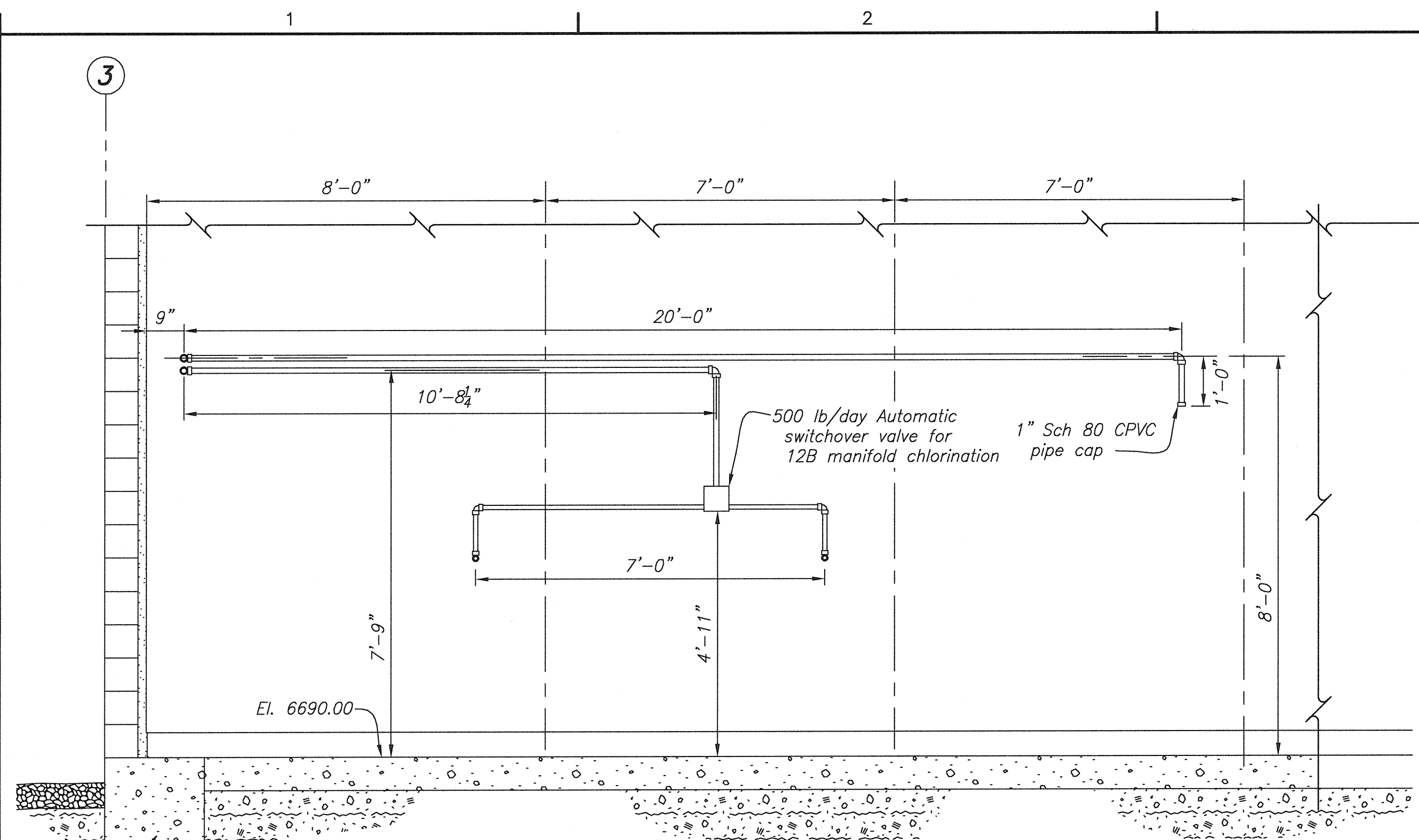
DESIGNED *John Z W. G. PE*
DRAWN *John Z W. G. PE*
CHECKED *T. G. Smith*
TECH. APPR. *M. G. P. E.*
PEER REVIEW *Colly. B. J.*
PLANT STRUCTURES GROUP
DENVER, COLORADO 2013-08-06

CHLORINATION SYSTEM PIPING
CHLORINE FEED BUILDING
PLAN

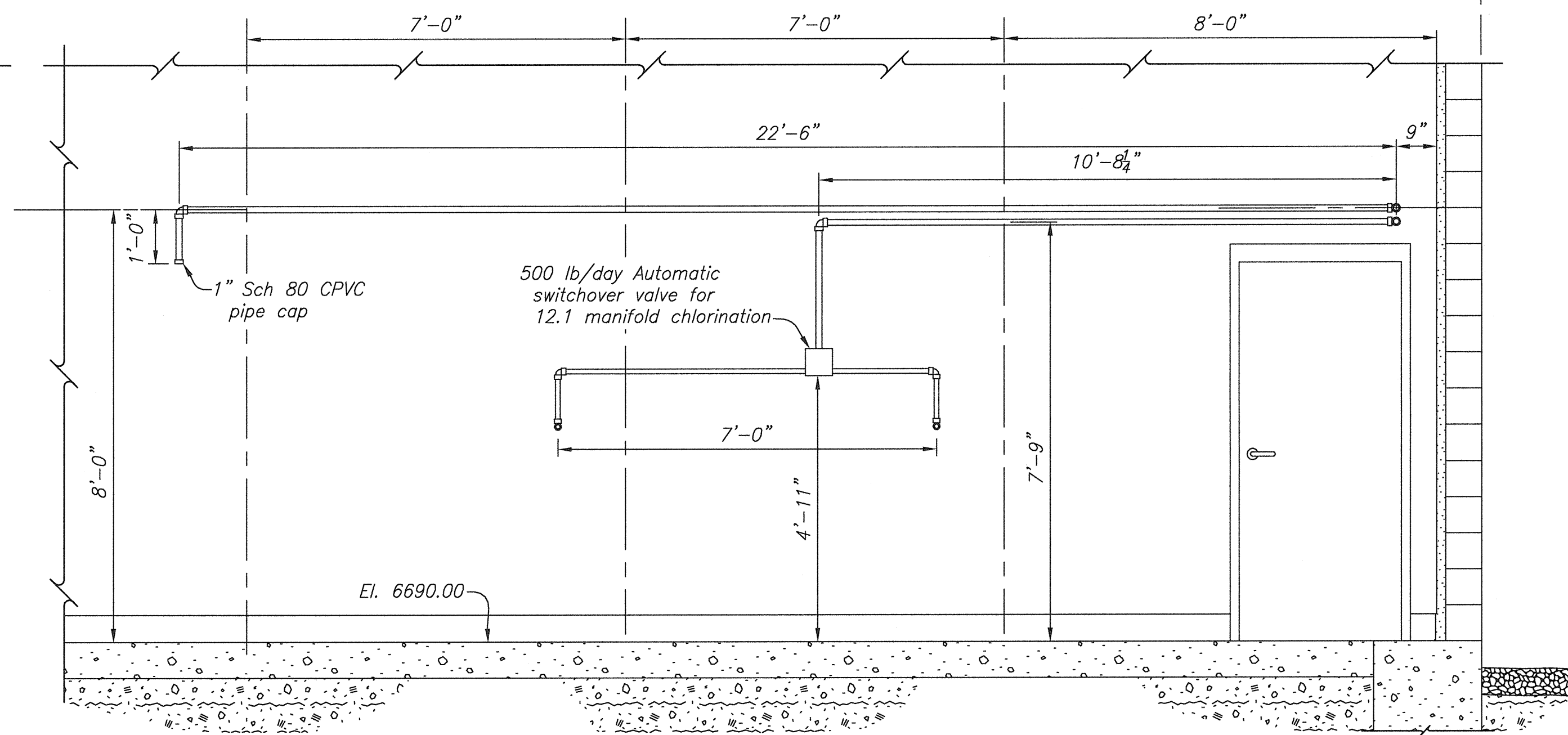
1695-D-180

SHEET 6 OF 8

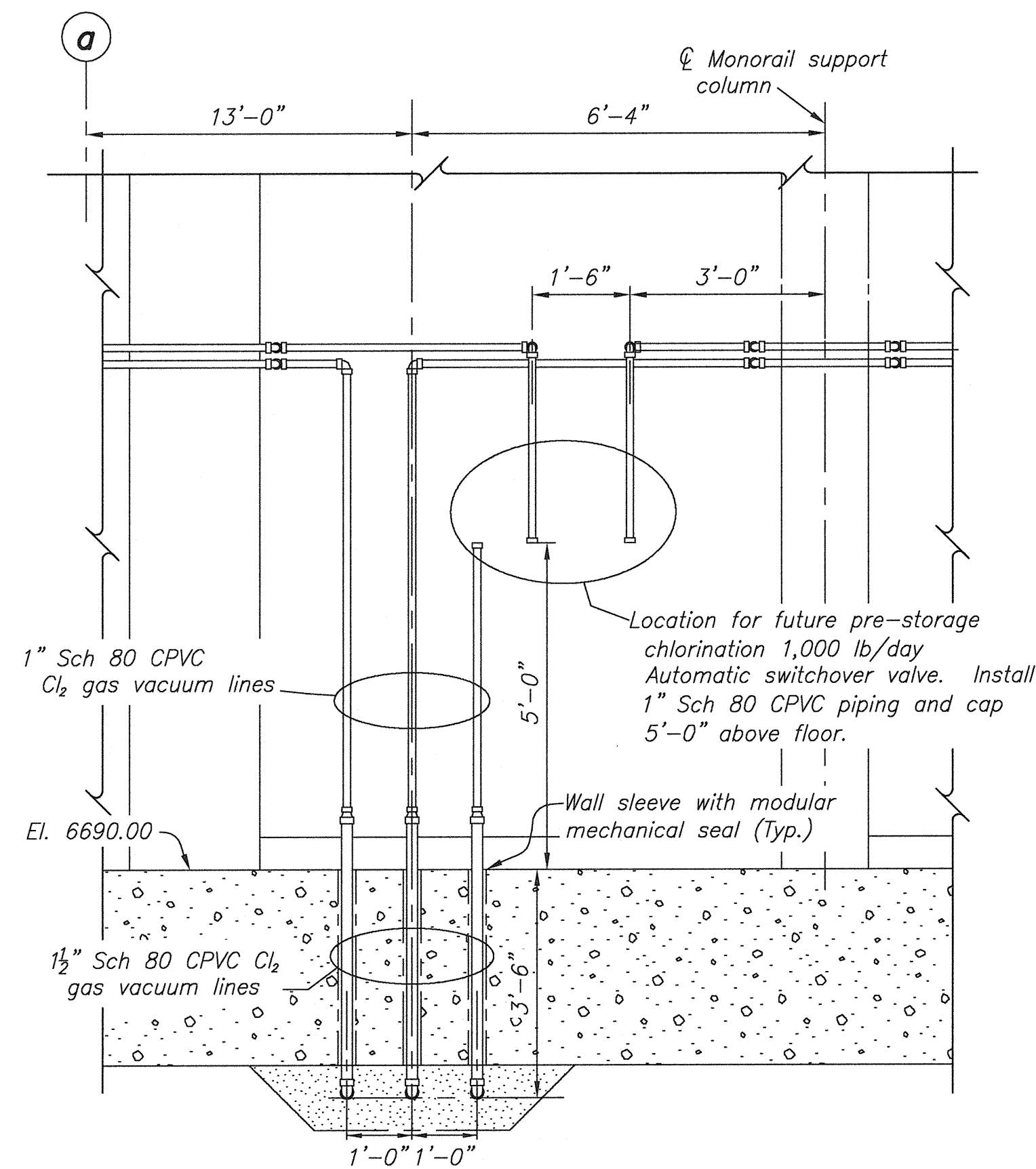
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 AUGUST 2, 2013 12:44
 PLOTTED BY
 PLAN\WGJWLP
 CHLORINATION SYSTEM - PIPING - CHLORINE FEED BUILDING -



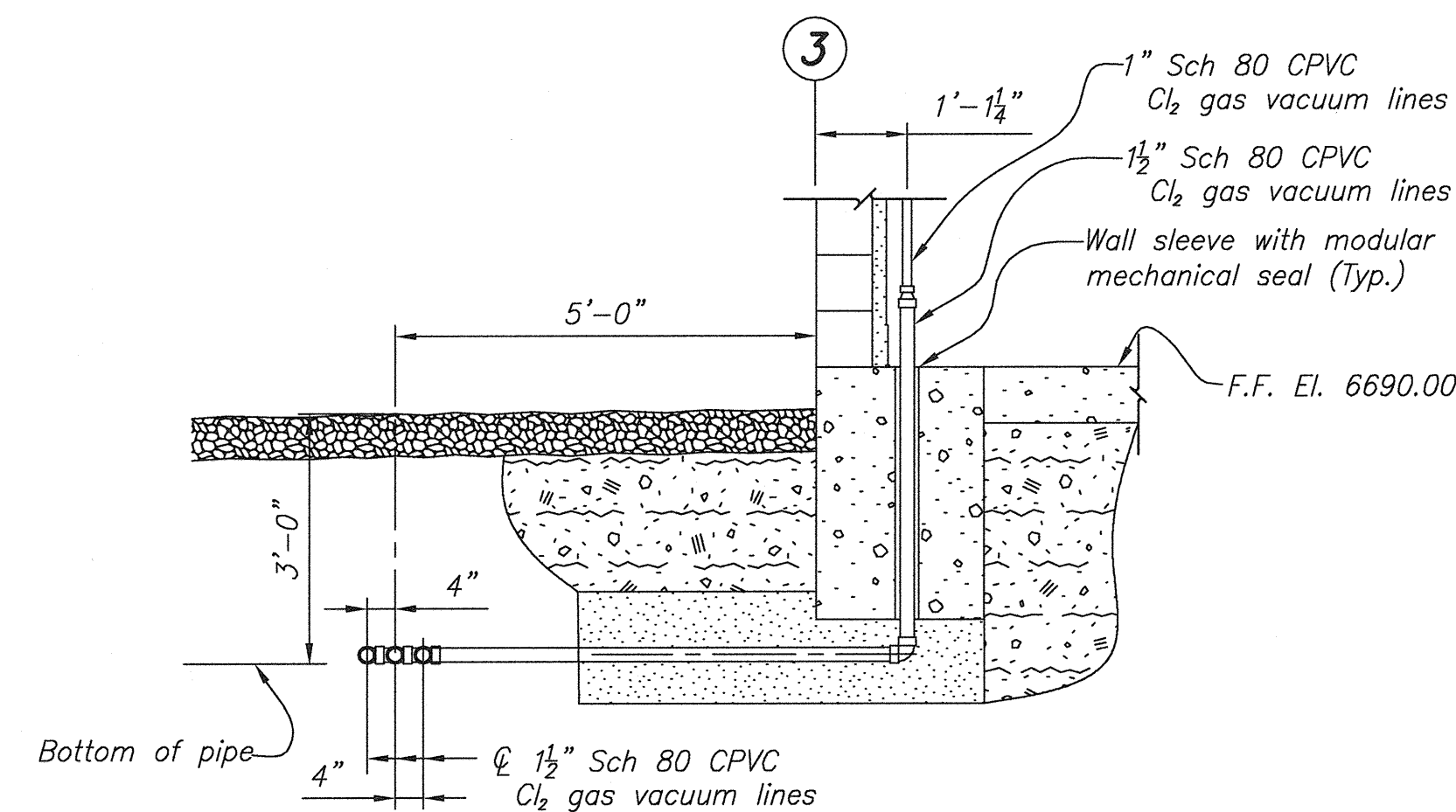
SECTION B-B (12B FEED) (180)



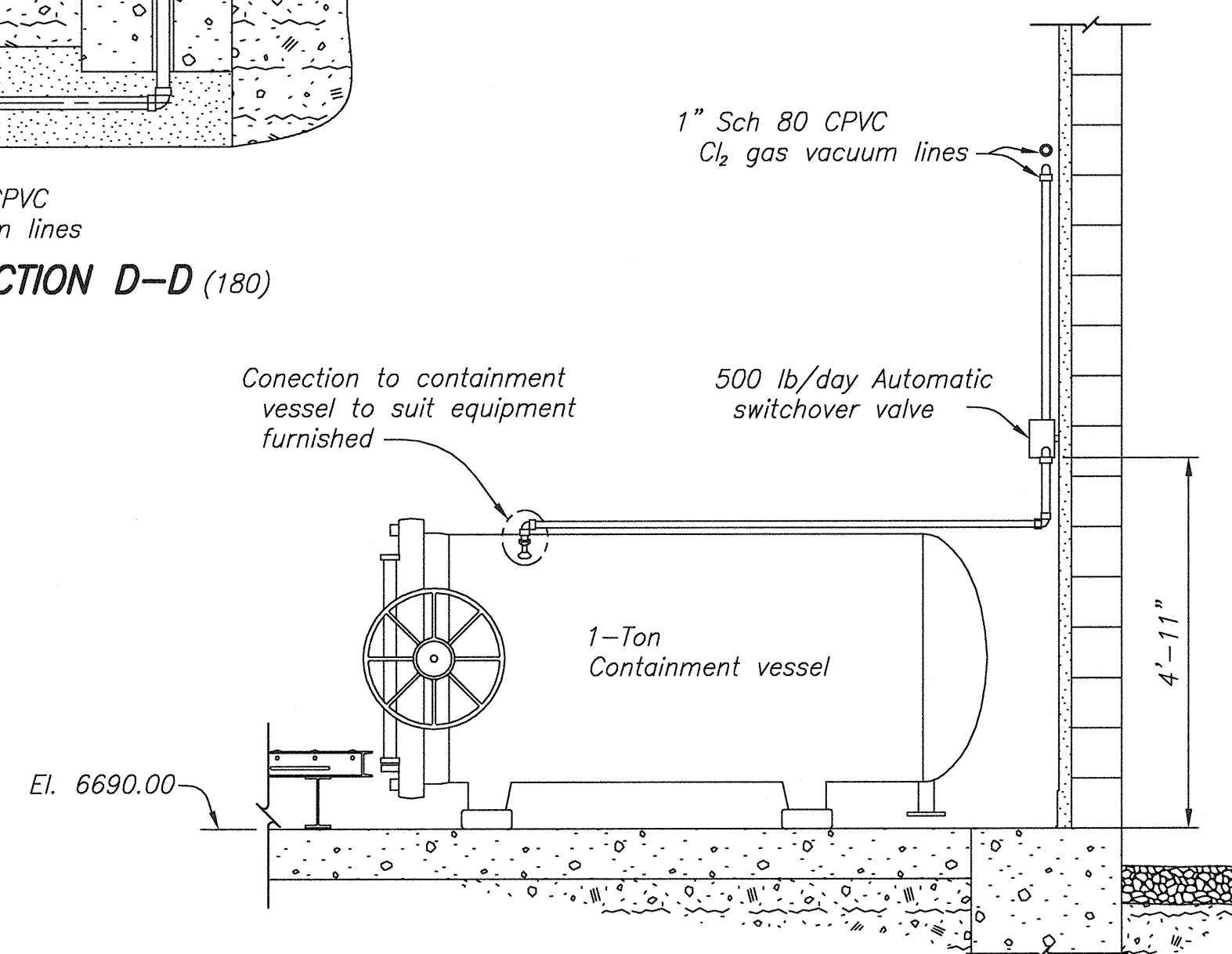
SECTION A-A (12.1 FEED) (180)



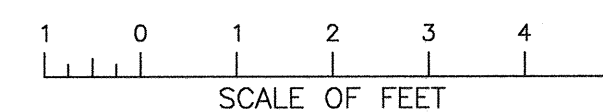
SECTION C-C (180)



SECTION D-D (180)

SECTION E-E (12.1 FEED) (180)
SECTION F-F (12B FEED) (180)

- NOTES**
1. For general notes and reference drawings, see (175).
 2. For trench and backfill details, see (176).
 3. For pipe designations, see PIPE LEGEND on drawing (176).
 4. For wall mount pipe and equipment supports, see (159).



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BUREAU OF RECLAMATION
NAVAJO GALLUP WATER SUPPLY PROJECT
NEW MEXICO

**SAN JUAN LATERAL
TOHLAKAI PUMPING PLANT**
CHLORINATION SYSTEM PIPING
CHLORINE FEED BUILDING
SECTIONS

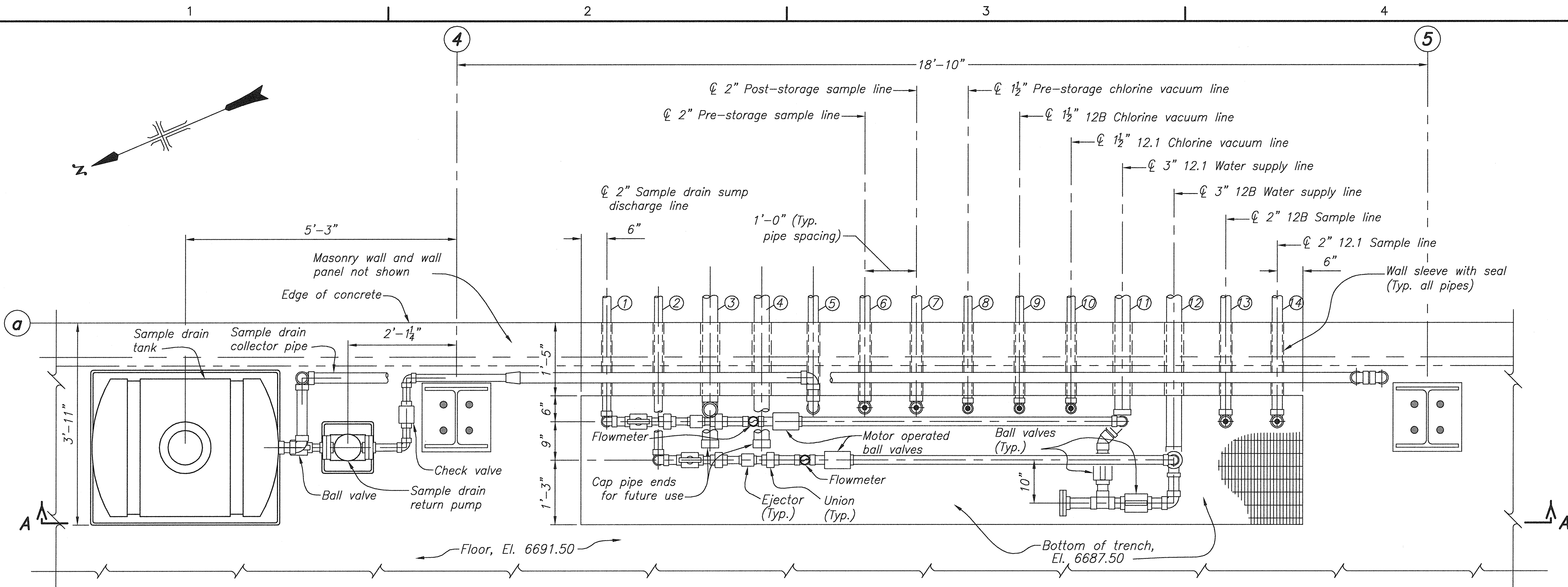
DESIGNED: *John Z. W. P. E.*
DRAWN: *John Z. W. P. E.*
CHECKED: *Robert G. Lunn*
TECH. APPR.: *John Z. W. P. E.*
PEER REVIEW: *John Z. W. P. E.*
PLANT STRUCTURES GROUP
DENVER, COLORADO 2013-08-05

CHLORINATION SYSTEM PIPING
CHLORINE FEED BUILDING
SECTIONS

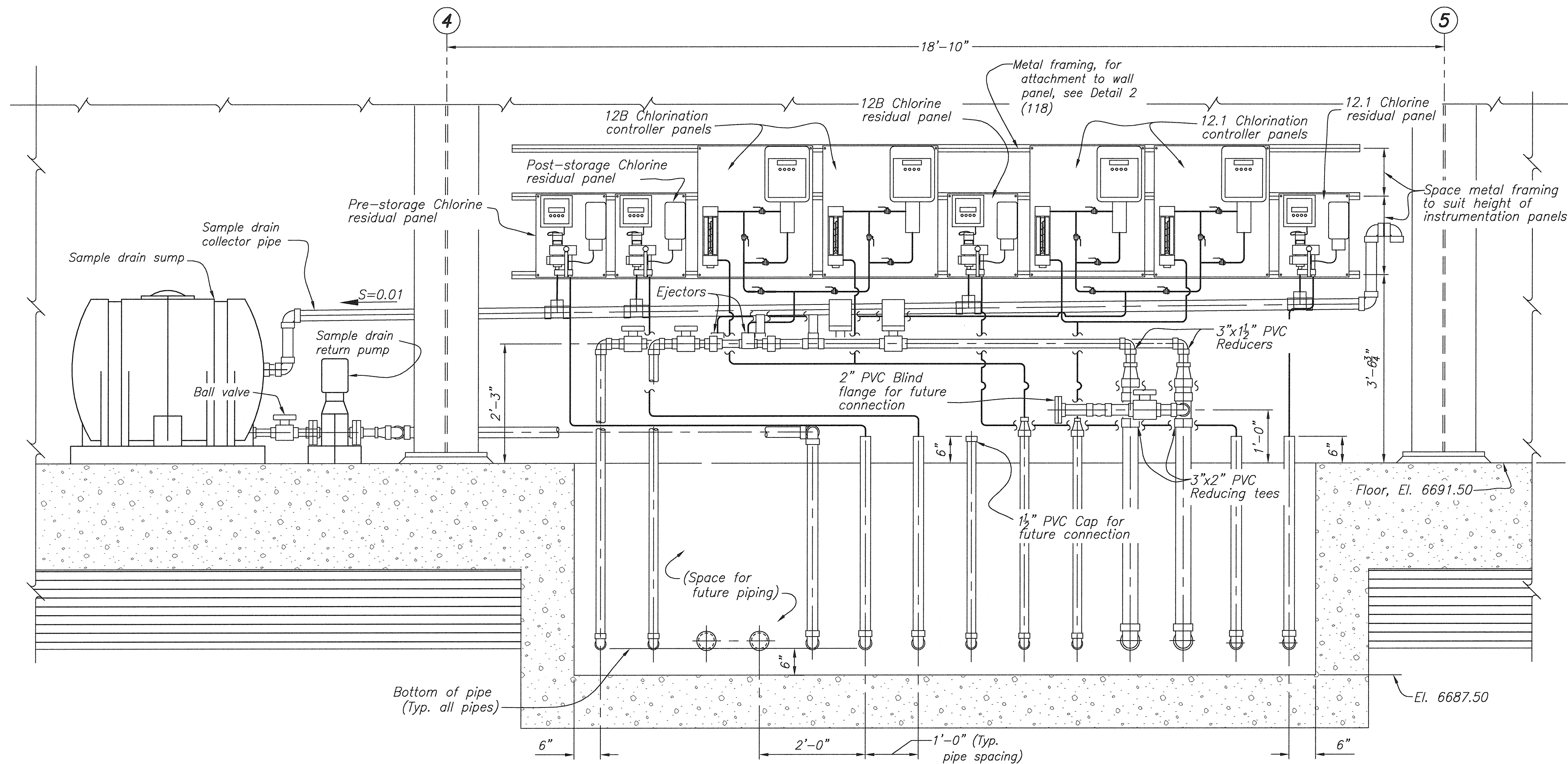
1695-D-181

SHEET 7 OF 8

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U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
NAVAJO GALLUP WATER SUPPLY PROJECT
NEW MEXICOSAN JUAN LATERAL
TOHLAKAI PUMPING PLANT
CHLORINATION SYSTEM PIPING
PUMPING PLANT EQUIPMENT
PARTIAL PLAN AND SECTIONS

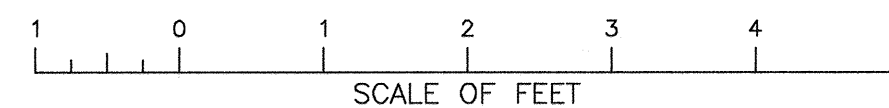
PARTIAL PLAN



SECTION A-A

NOTES

1. For general notes and reference drawings, see (175).
2. This is a general layout of the instrumentation and controller panels. Support off wall with metal framing supports. Spacing to suit equipment furnished. Route piping and tubing as necessary to avoid interference with other piping and tubing.
3. For trench and backfill details, see (176).
4. For pipe designations, see PIPE LEGEND on drawing (176).
5. For process diagram of gas, sample, and water supply lines, see (173) and (174).
6. Piping shown as single line is $\frac{1}{2}$ " and smaller.

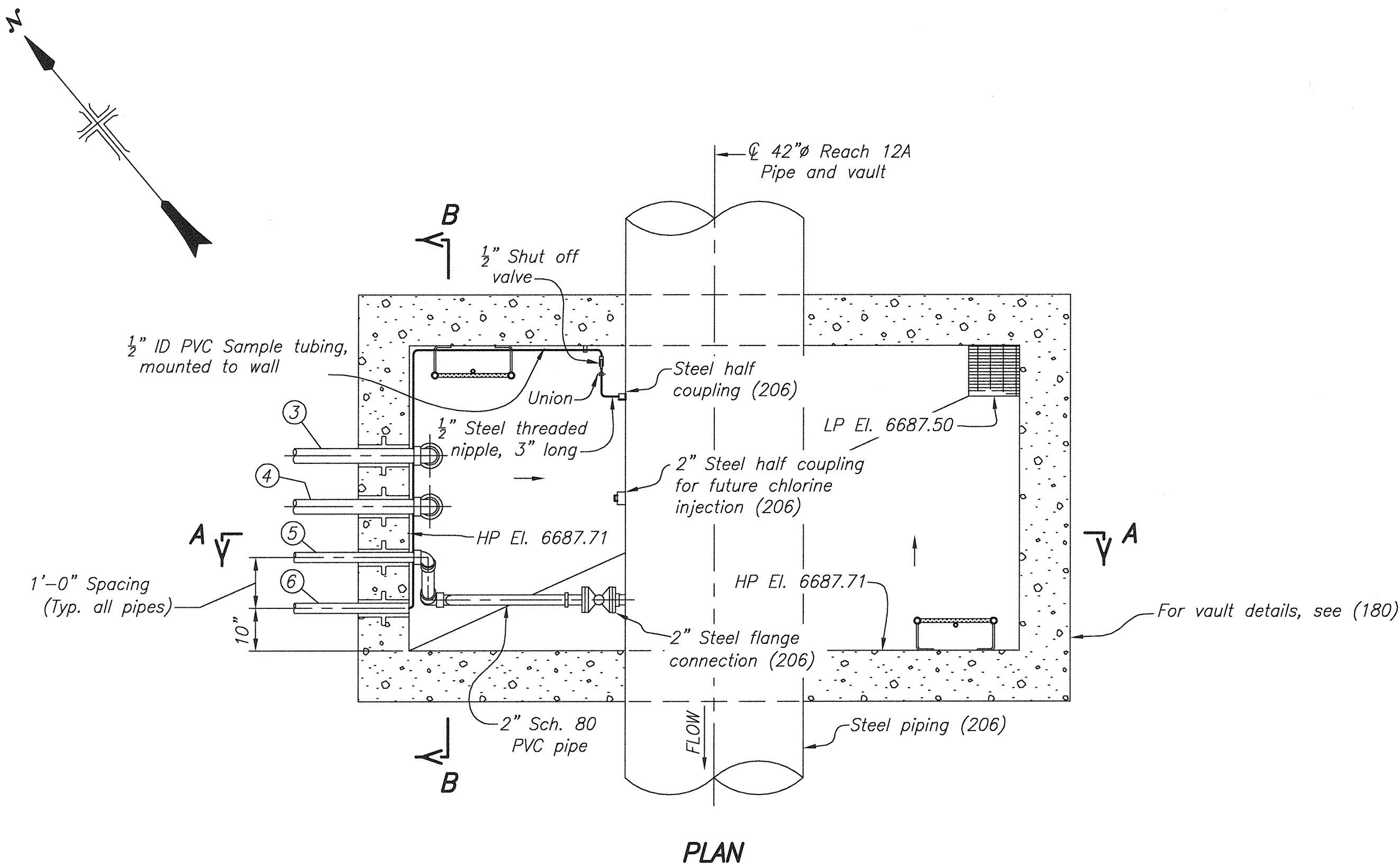


DESIGNED BY *John Z. Walz, P.E.*
 DRAWN BY *John Z. Walz, P.E.*
 CHECKED BY *Robert G. Gifford, P.E.*
 TECH. APPR. *AWJ, P.E.*
 PEER REVIEW
 PLANT STRUCTURES GROUP
 DENVER, COLORADO 2013-08-05

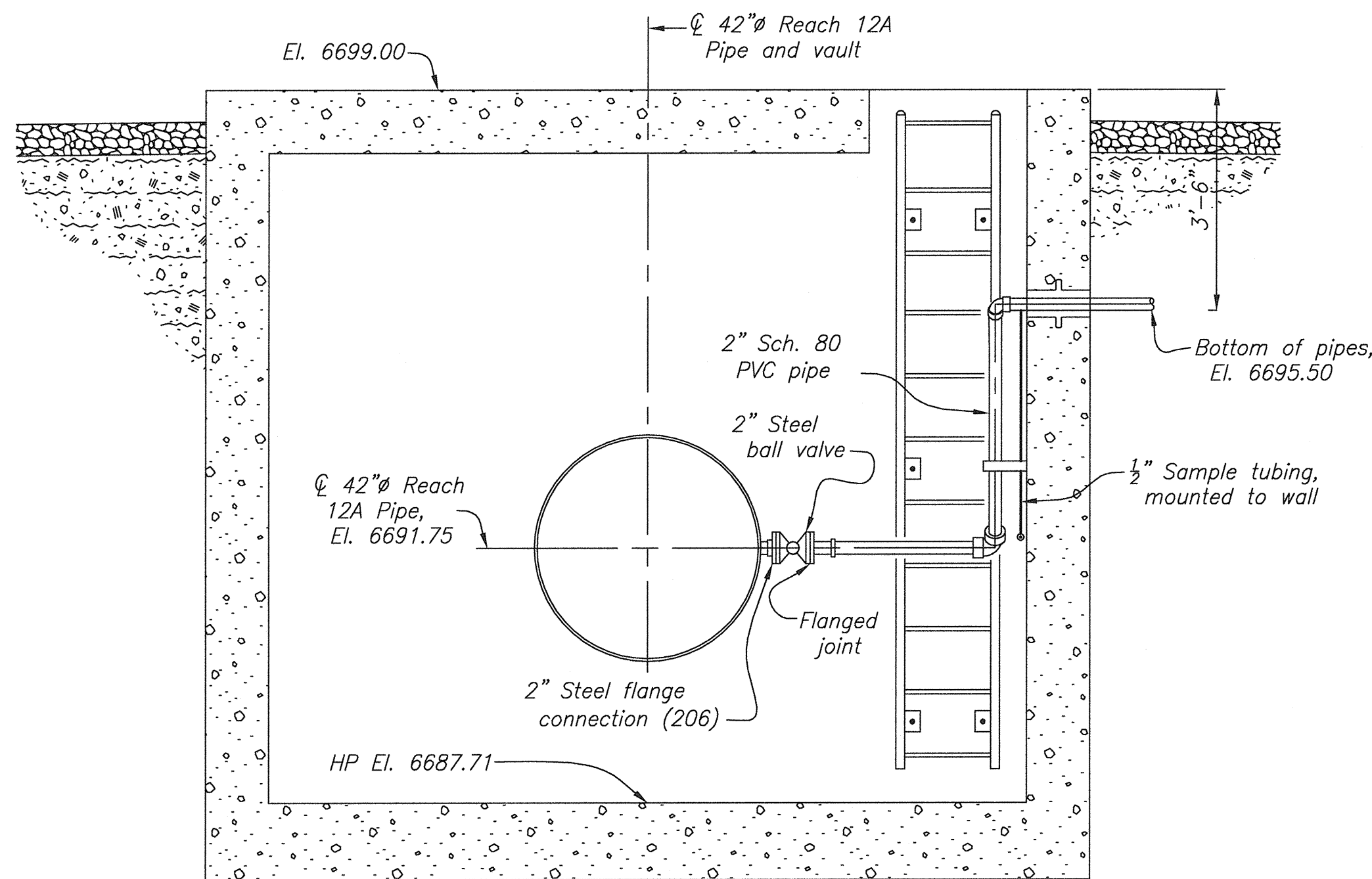
CHLORINATION SYSTEM PIPING
PUMPING PLANT EQUIPMENT
PARTIAL PLAN AND SECTIONS

1695-D-193

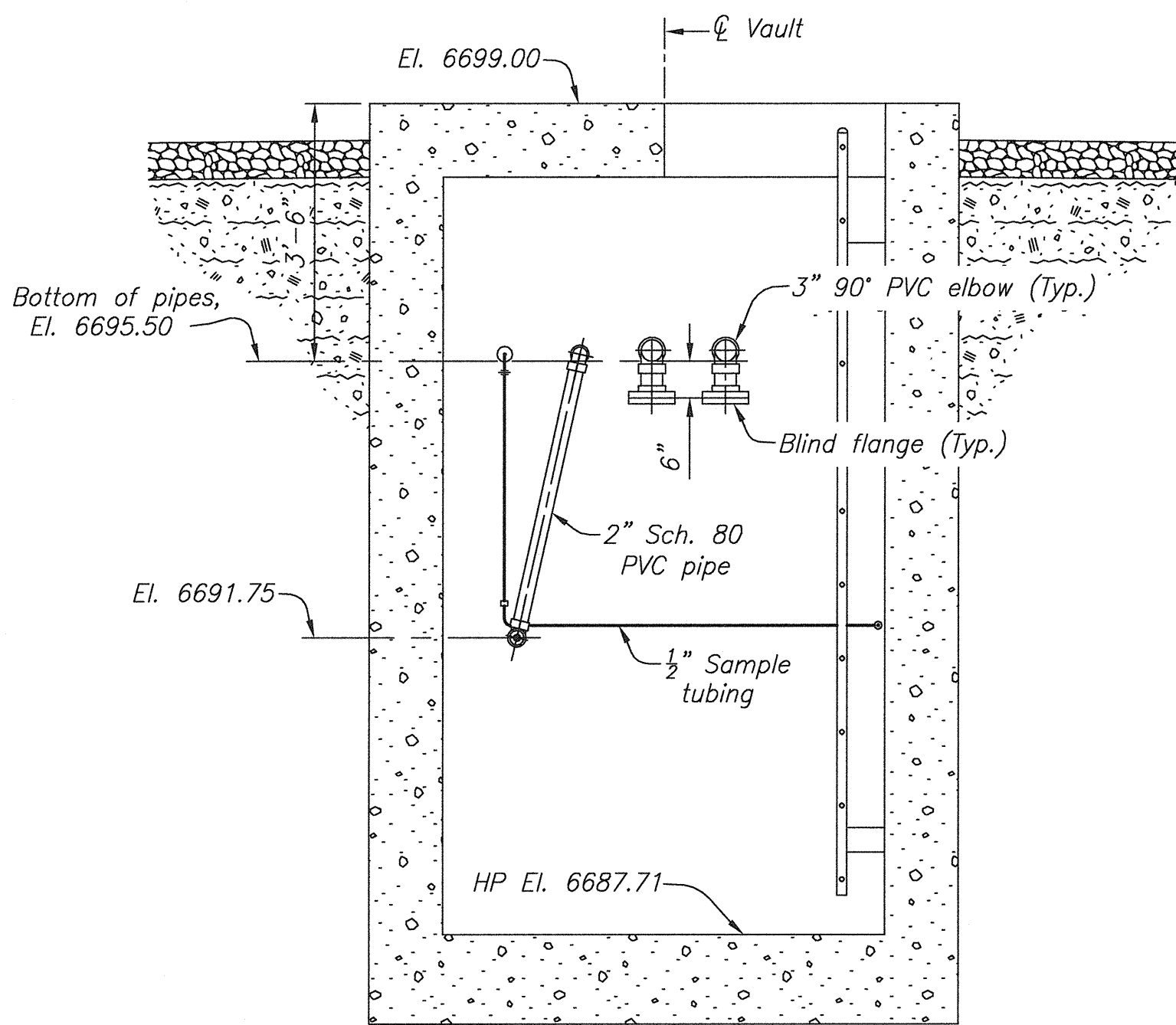
SHEET 8 OF 8



PLAN



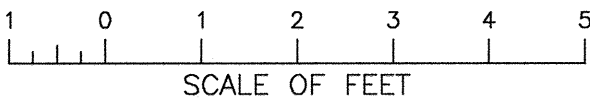
SECTION A-A

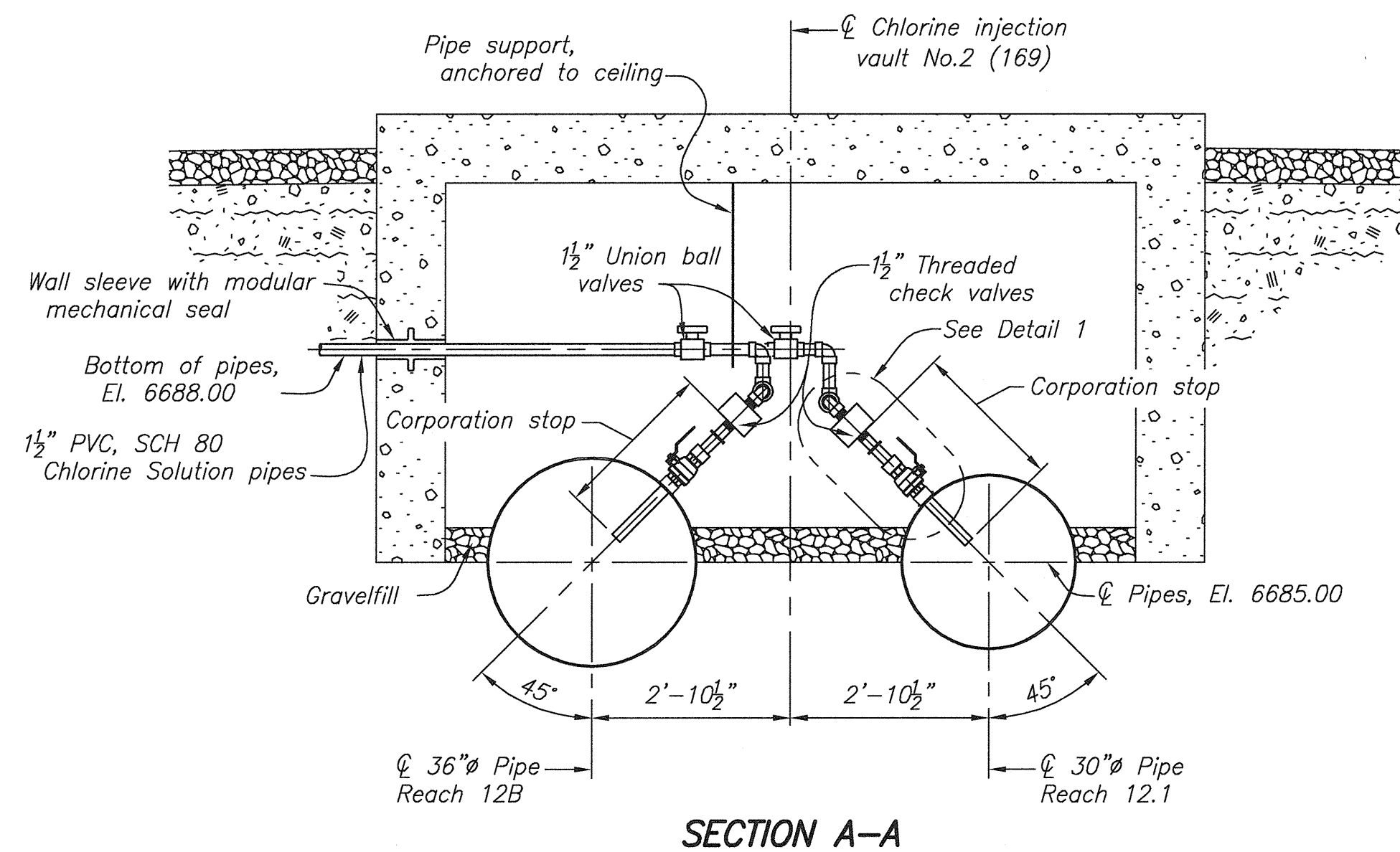
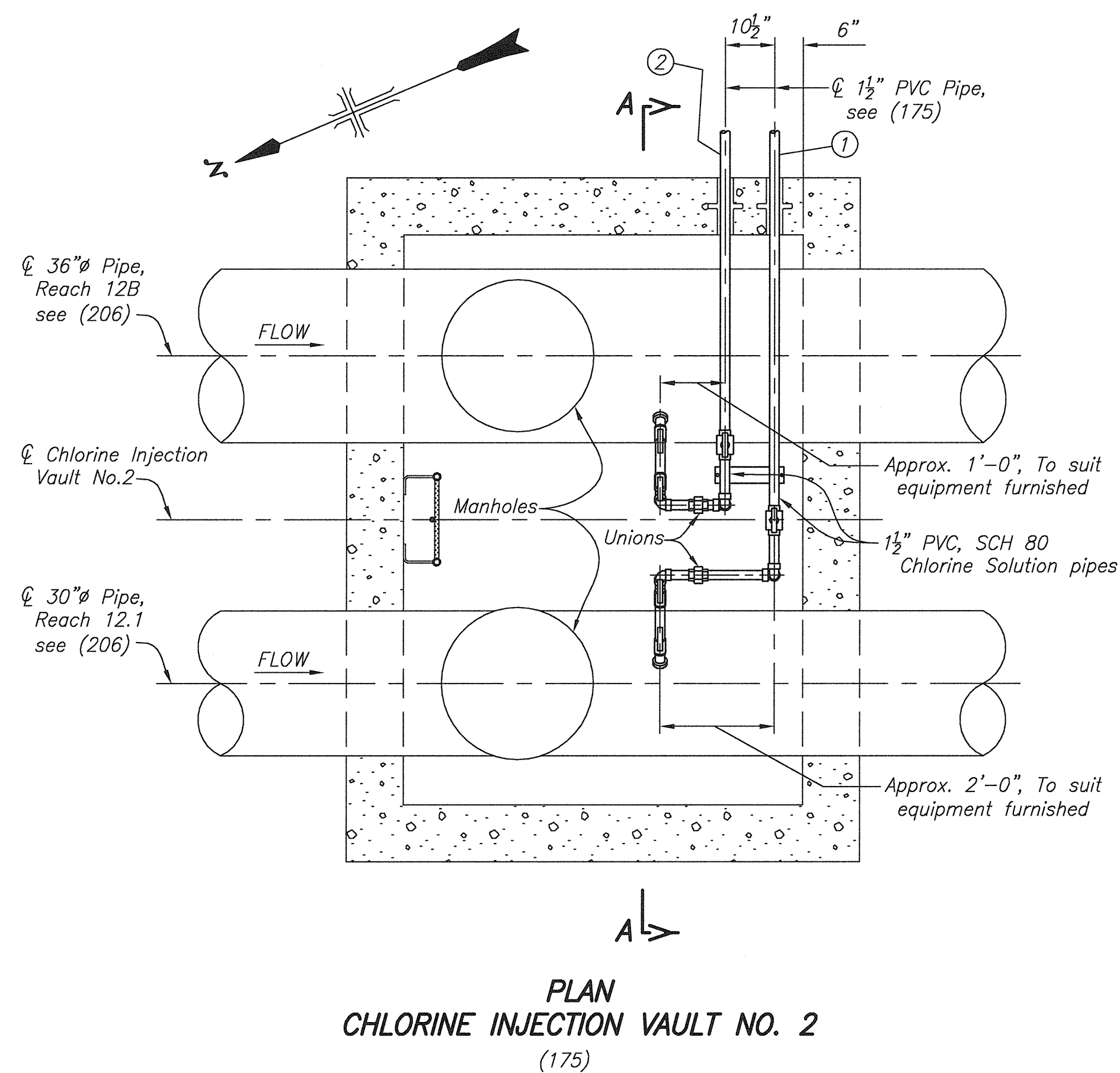
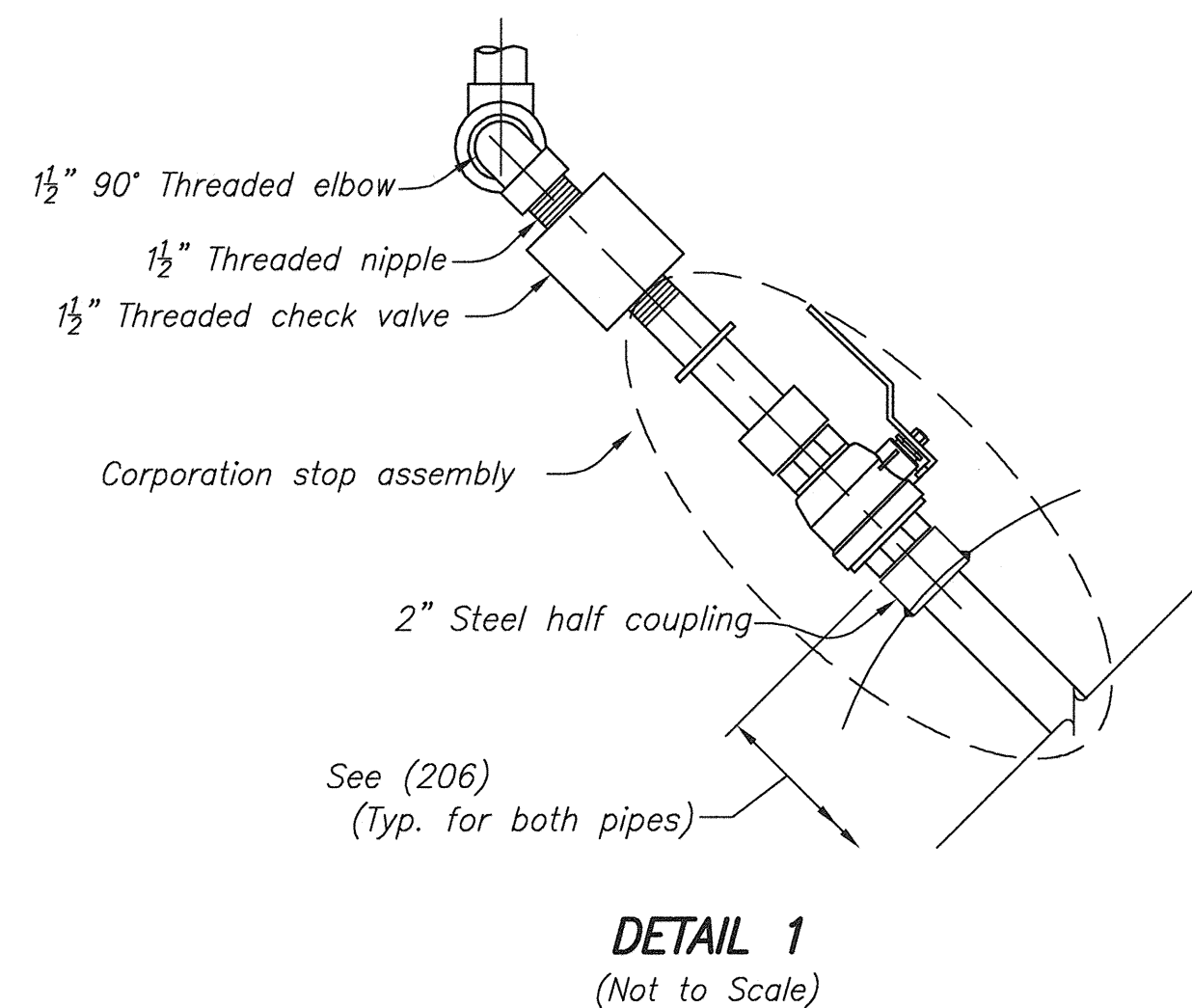
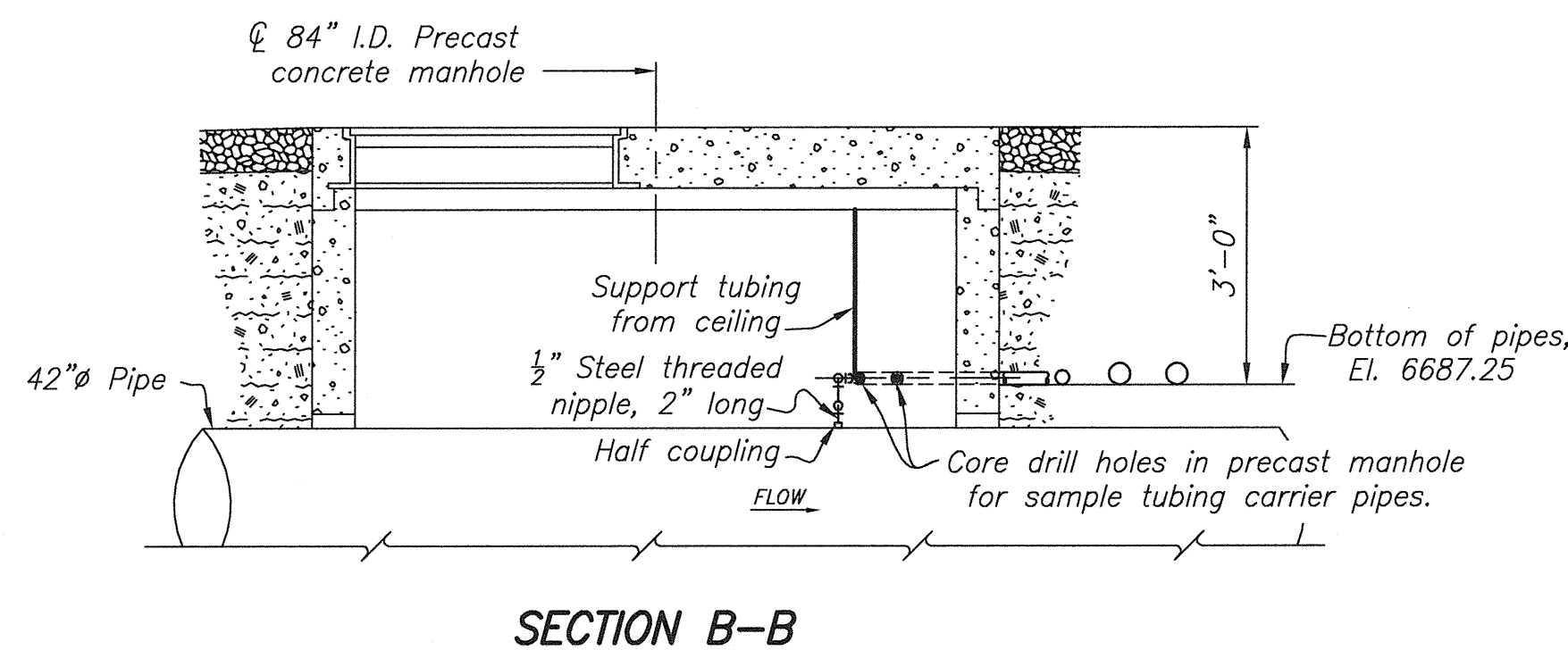
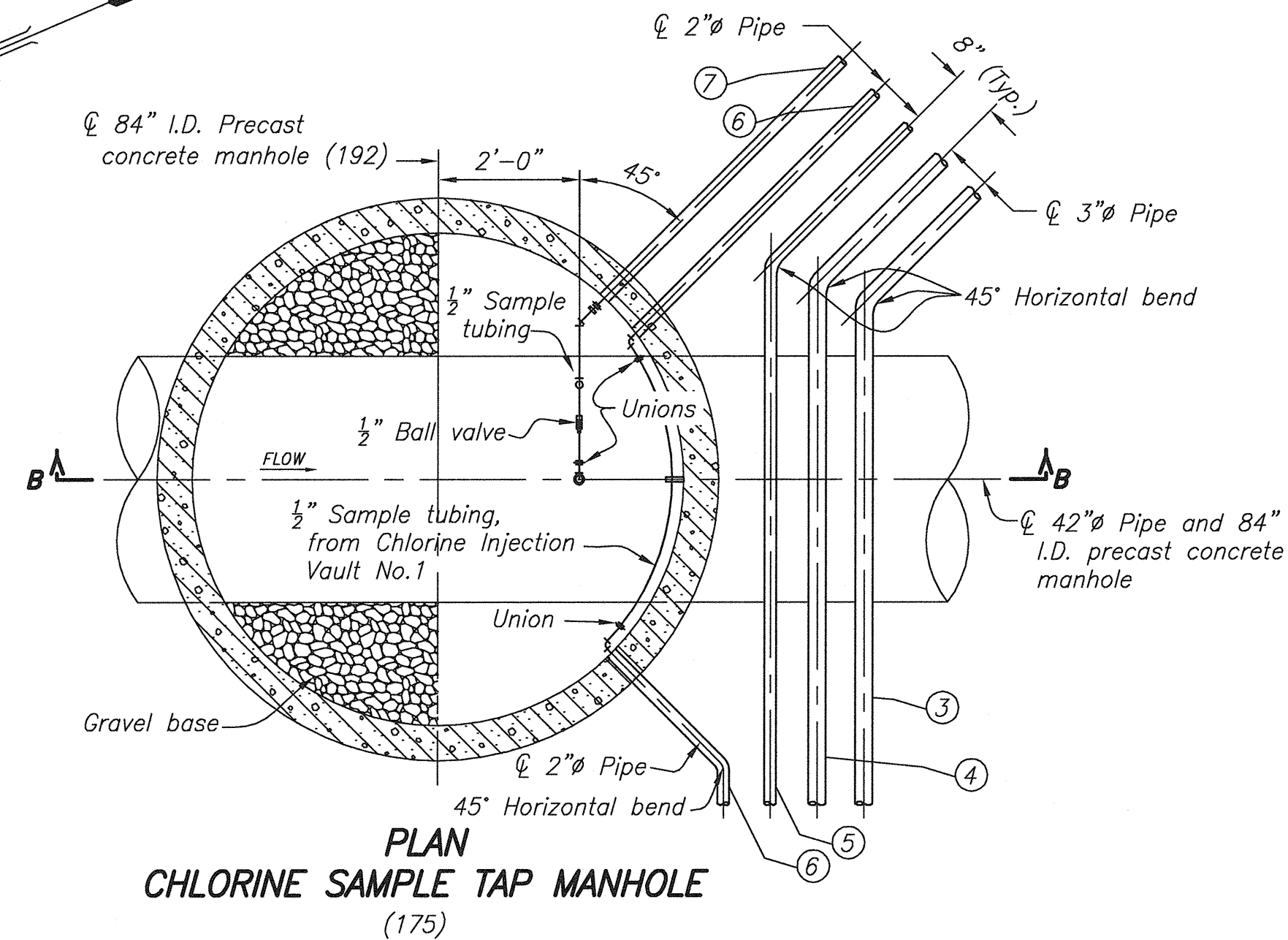


SECTION B-B

NOTES

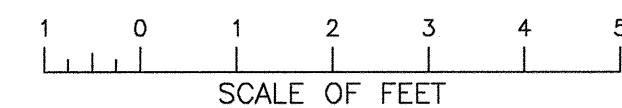
1. For general notes and reference drawings, see (175).
2. For trench and backfill details, see (176).
3. For pipe designations, see PIPE LEGEND on drawing (176).
4. For Chlorine Injection Vault No. 1 dimensions, see (168).
5. For steel pipe connections, see (206).
6. All pipe spacing is center to center.





NOTES

- For general notes and reference drawings, see (175).
- For trench and backfill details, see (176).
- For pipe designations, see PIPE LEGEND on drawing (176).
- For Chlorine Injection Vault No. 2 and Chlorine Sample Tap Manhole dimensions, see (169 and 192).
- For steel pipe connections, see (206).



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NAVALO GALLUP WATER SUPPLY PROJECT
NEW MEXICO

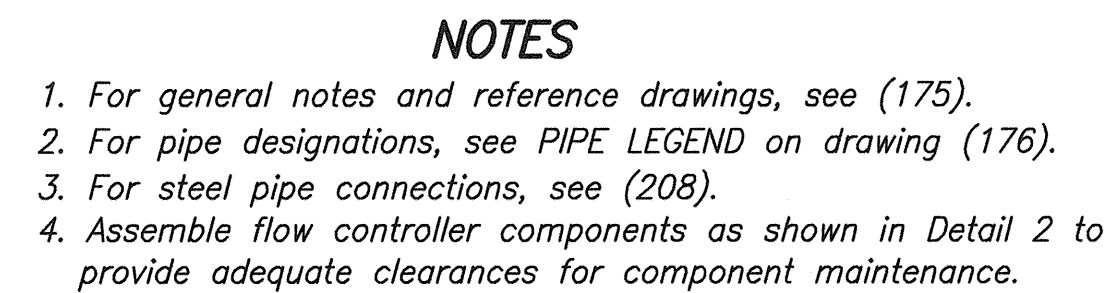
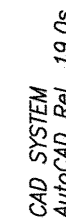
**SAN JUAN LATERAL
TO-HLAKAI PUMPING PLANT**
CHLORINATION SYSTEM PIPING
CHLORINE INJECTION VAULT NO.2 AND
CHLORINE SAMPLE TAP MANHOLE
PLANS - EL. 6688.25, SECTIONS, AND DETAIL 1

DESIGNED BY: *John Z. W. [Signature]*
DRAWN BY: *John Z. W. [Signature]*
CHECKED BY: *John Z. W. [Signature]*
TECH. APPR. BY: *John Z. W. [Signature]*
PEER REVIEW BY: *John Z. W. [Signature]*
PLANT STRUCTURES GROUP
DENVER, COLORADO 2013-08-05

CHLORINATION SYSTEM PIPING
CHLORINE INJ. VAULT NO.2
AND SAMPLE TAP MANHOLE
PLANS, SECTIONS, & DETAIL 1

1695-D-178

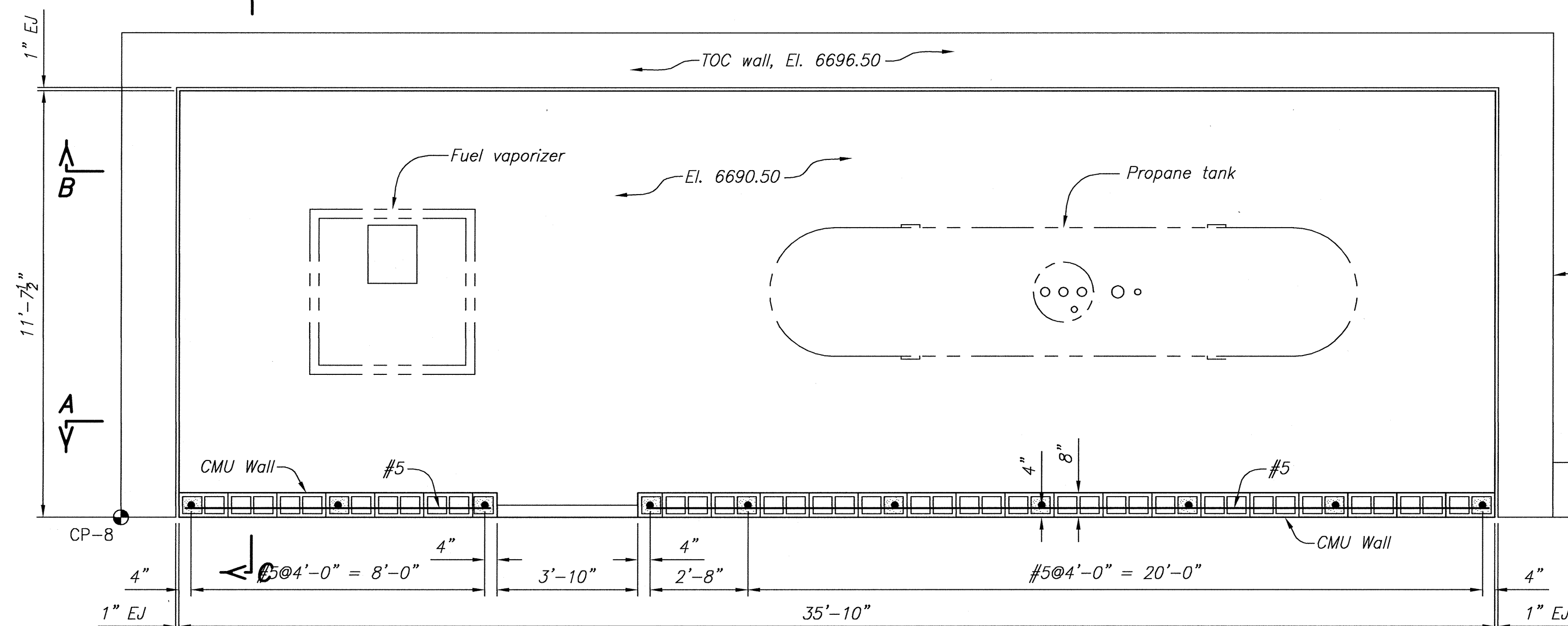
SHEET 4 OF 8



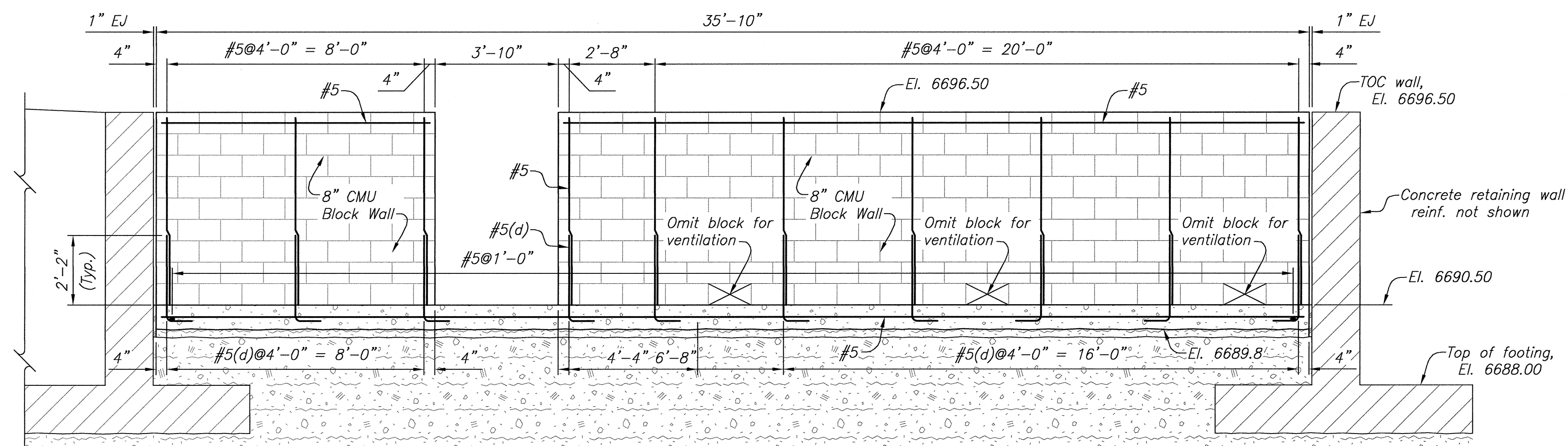
DESIGNED John Z. Walz, PE
DRAWN John Z. Walz, PE
CHECKED Robert Colvick
TECH. APPR. M. J. [Signature] P.E.
PEER REVIEW Colvick, R.E.
PLANT STRUCTURES GROUP
DENVER, COLORADO 2013-08-01

CHLORINATION SYSTEM PIPING
FLOWMETER VAULT #1 PIPING
PLAN, SECTIONS
AND DETAILS

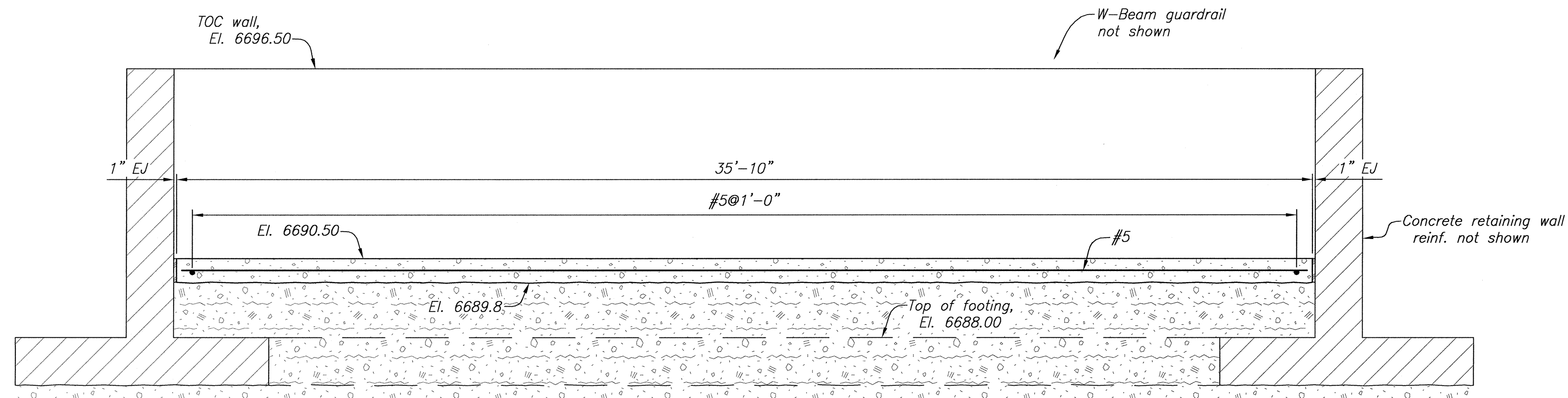
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SHEET 5 OF 8



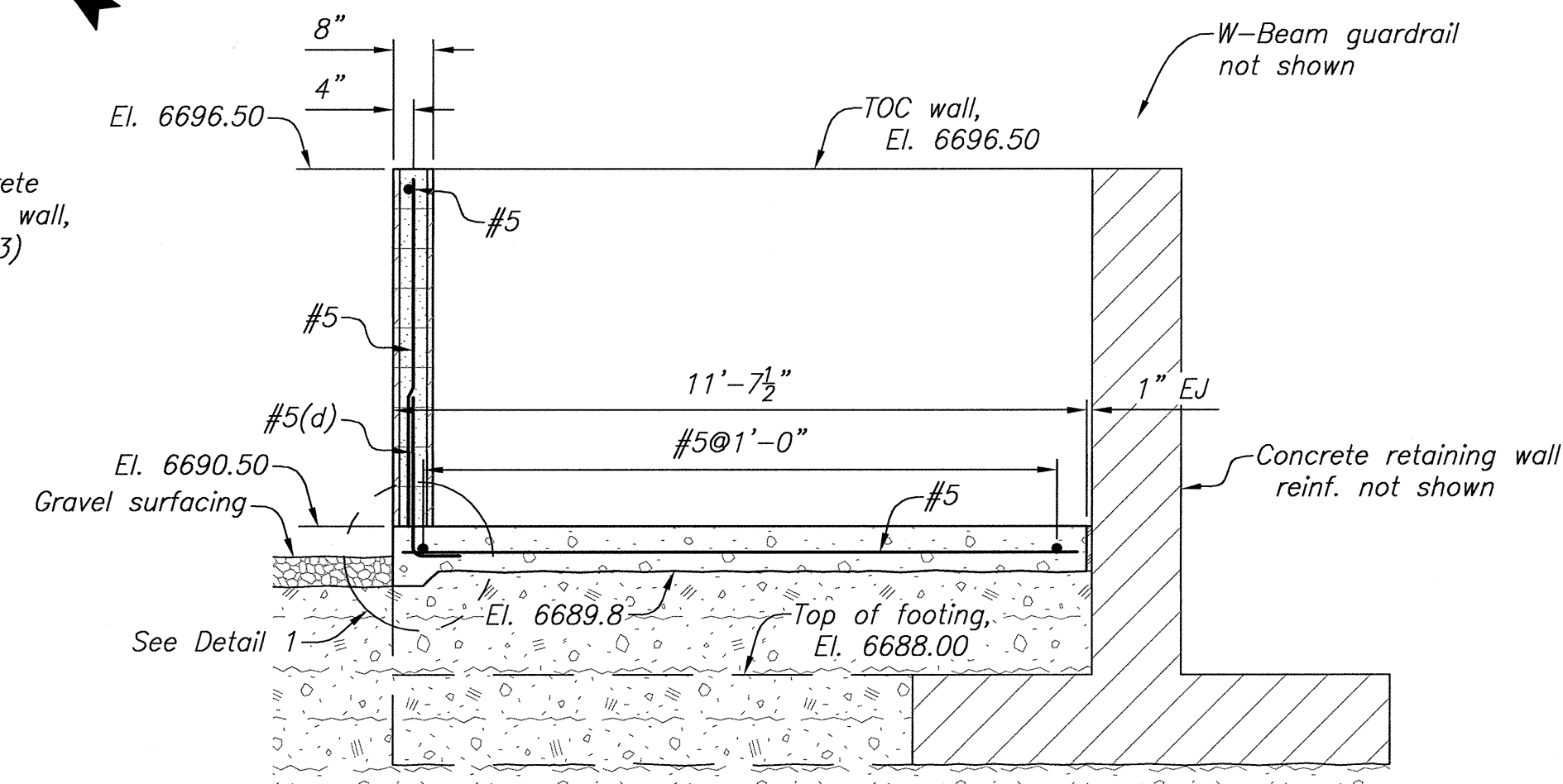
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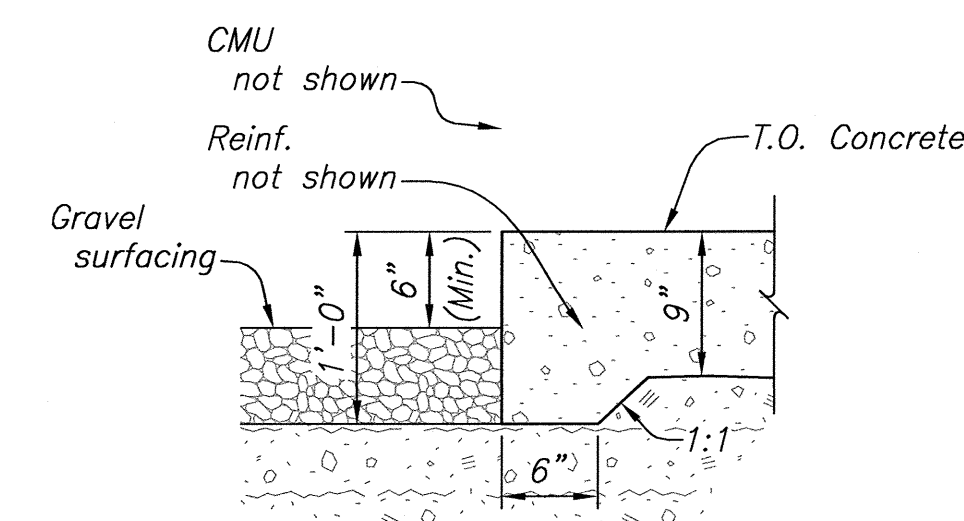
SECTION A-A



SECTION B-B

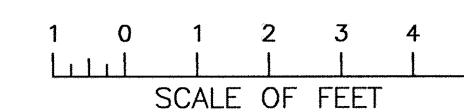


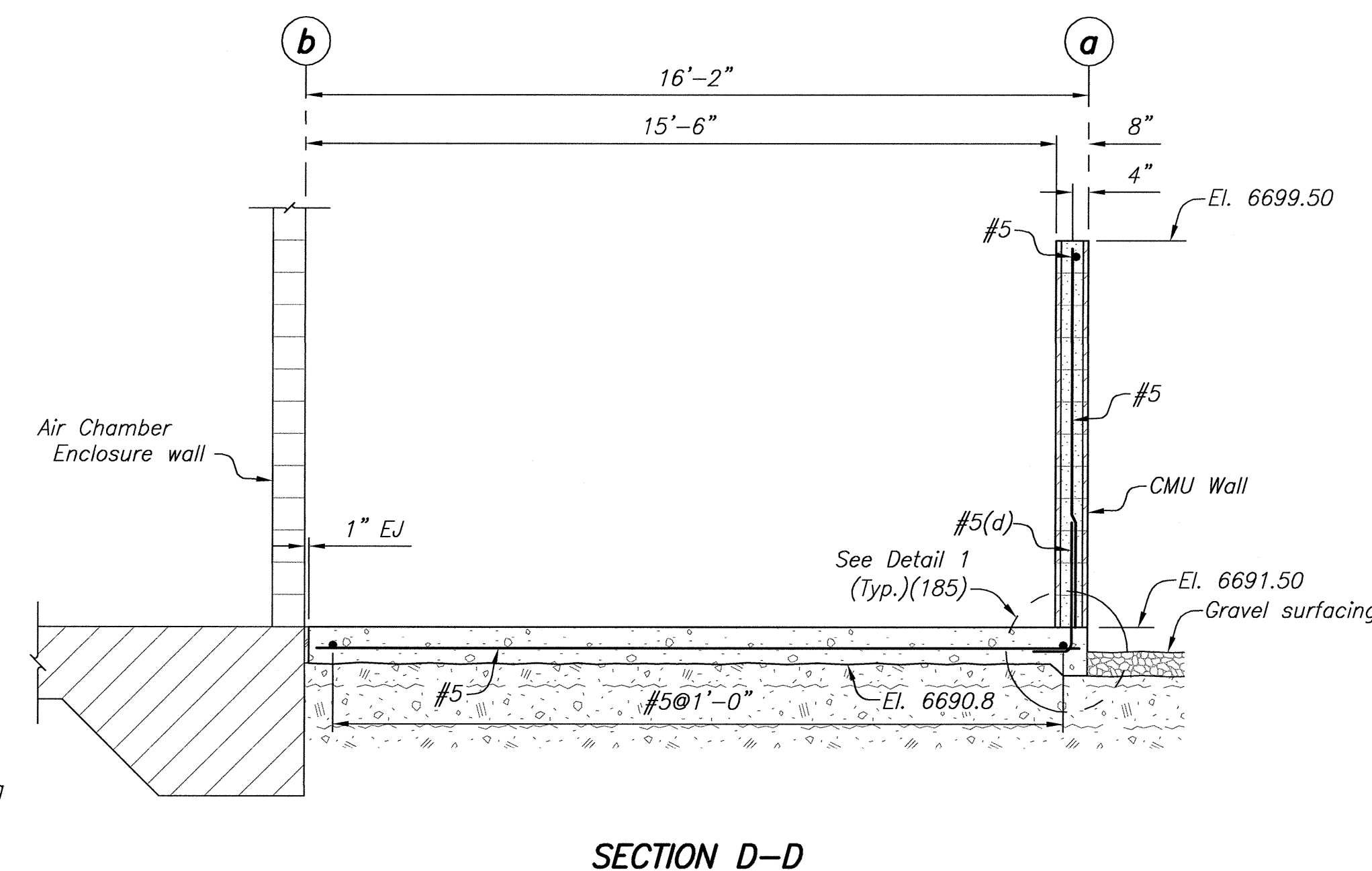
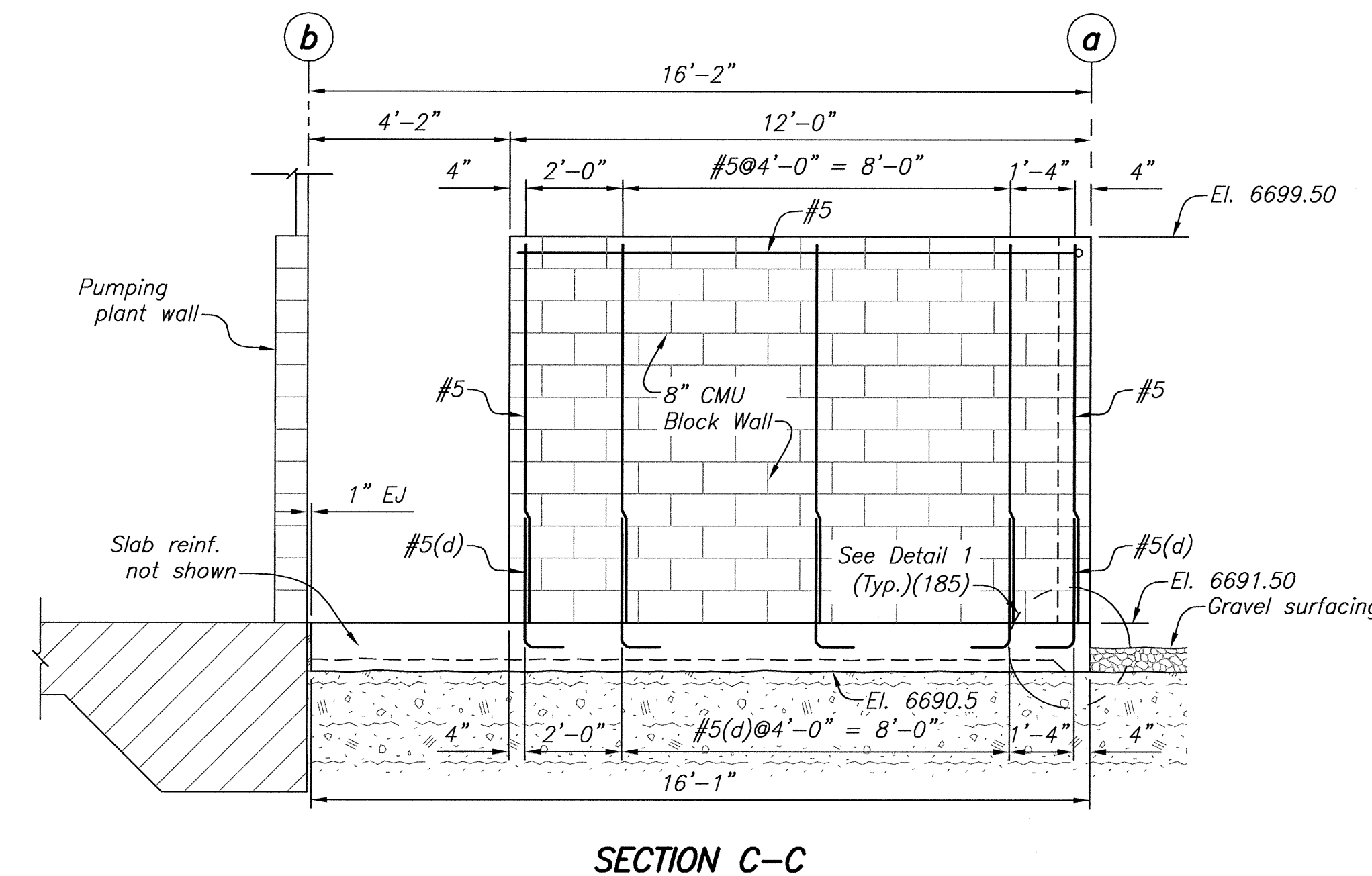
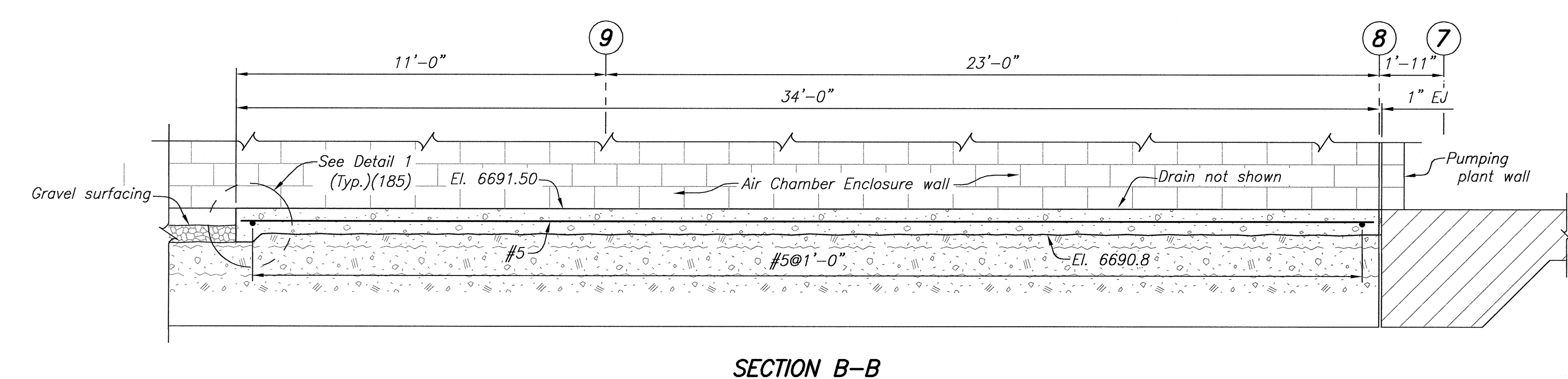
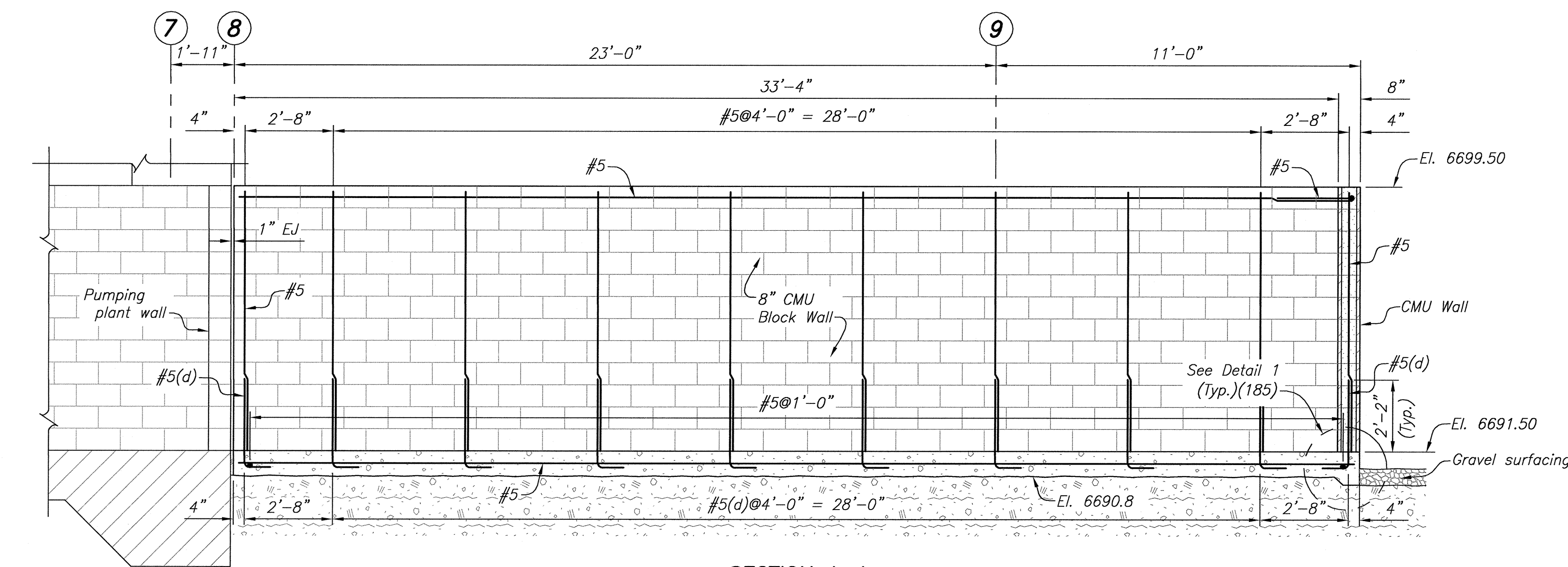
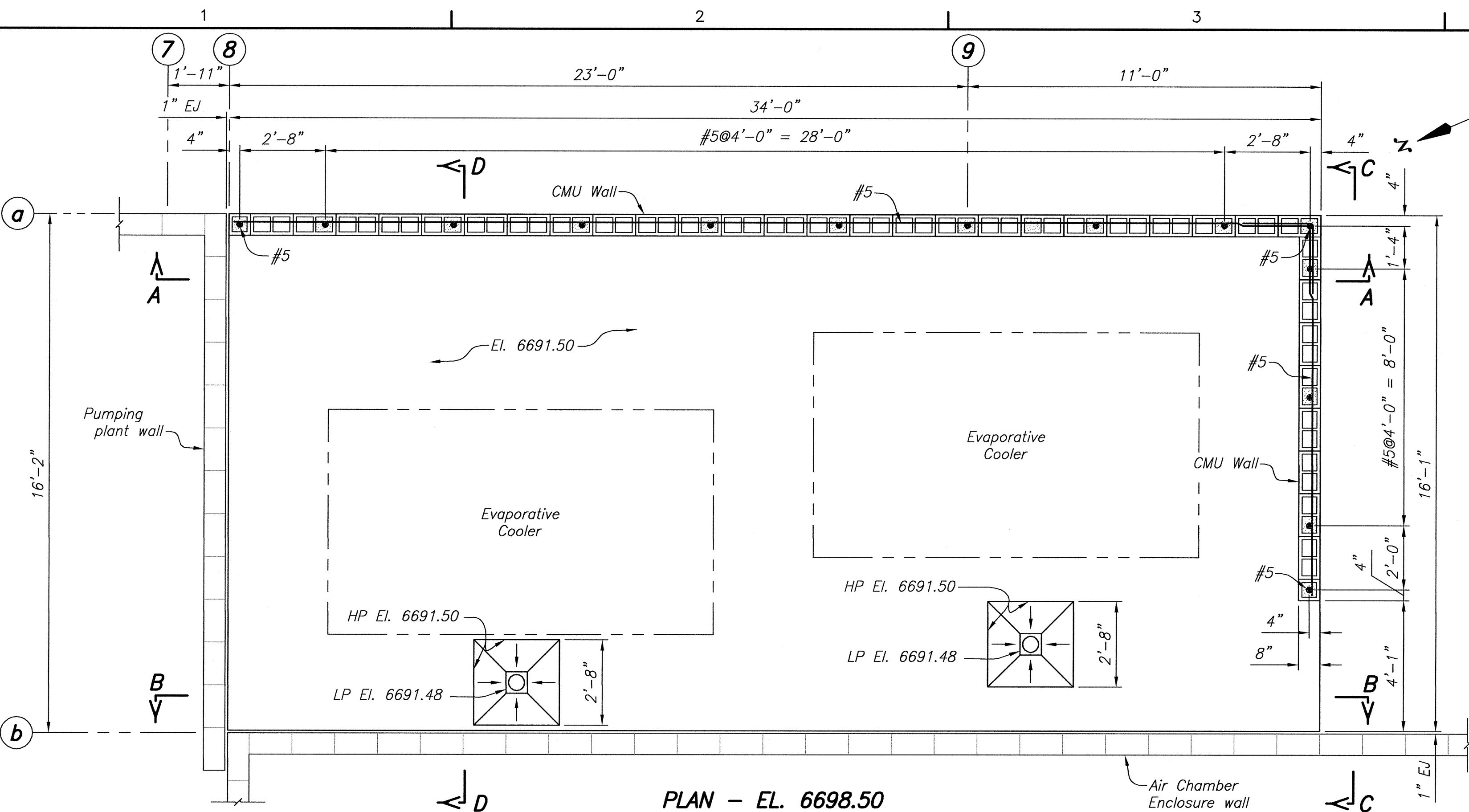
SECTION C-C

DETAIL 1
(NO SCALE)

NOTES

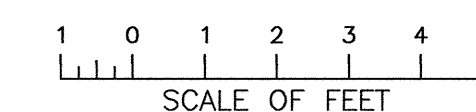
- For Concrete General Notes, see (123).
- For Reinforcement Design General Notes, see (127).
- For Masonry Design General Notes, see (146).
- For Structural Design Data, see (101) and (102).
- For location of Propane Tank and Fuel Vaporizer foundation, see (99).
- All vertical elevations are based on NAVD88 vertical datum.





NOTES

1. For Concrete General Notes, see (123).
2. For Reinforcement Design General Notes, see (127).
3. For Masonry Design General Notes, see (146).
4. For Structural Design Data, see (101) and (102).
5. For location of Evaporative Coolers foundation, see (99).
6. All vertical elevations are based on NAVD88 vertical datum.

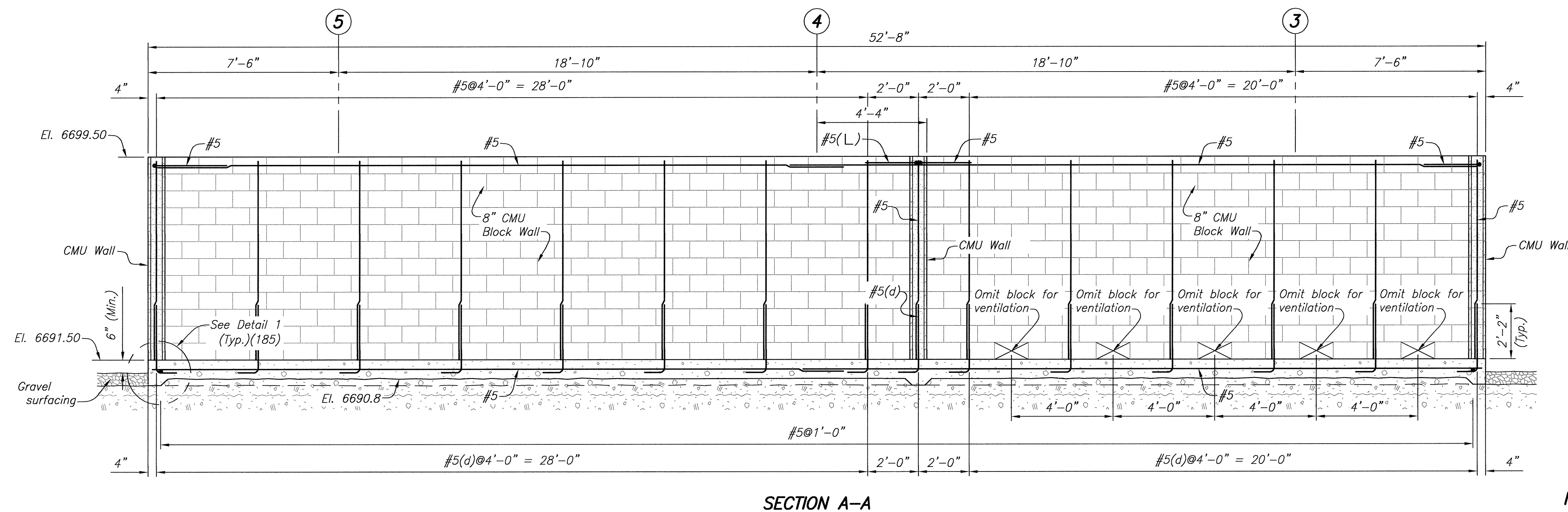
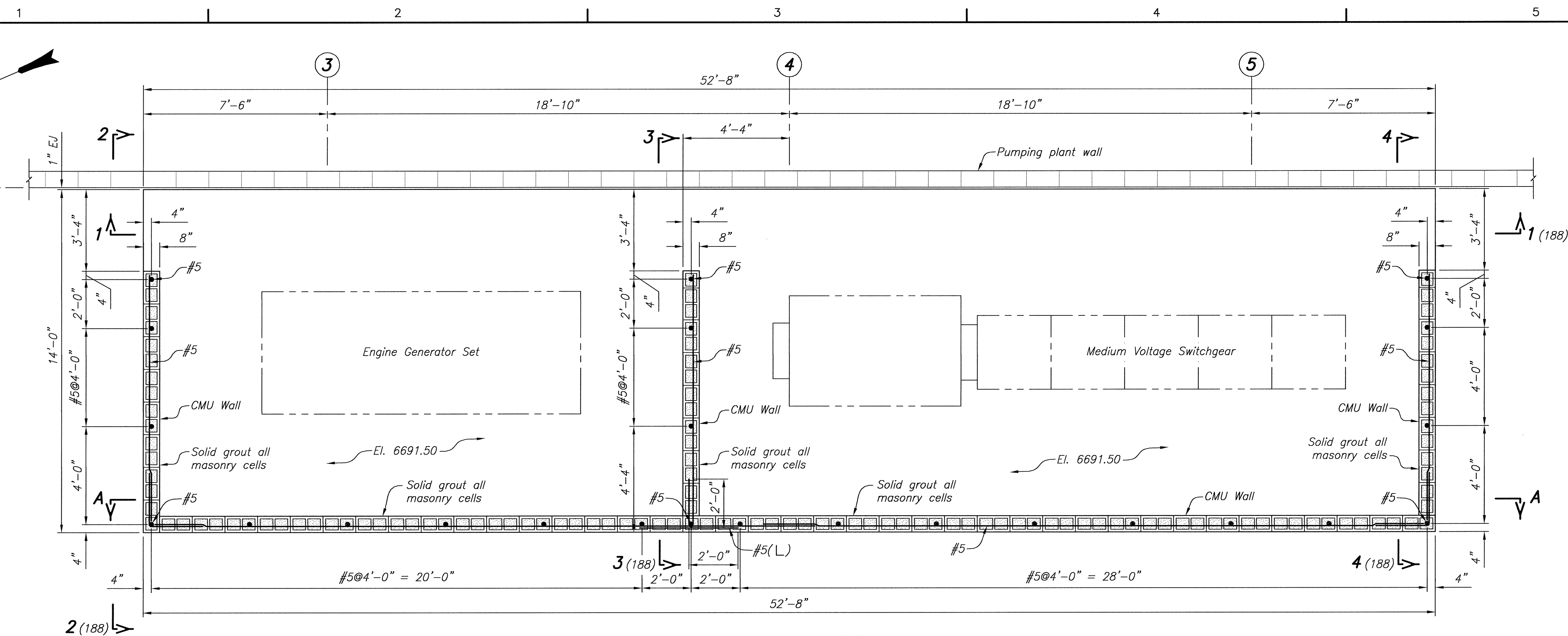


HP EL.
LP EL.

EVAPORATIVE COOLERS
FOUNDATION & ENCLOSURE
PLAN AND SECTIONS

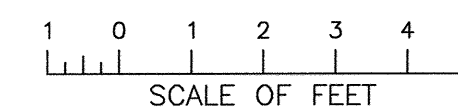
1695-D-186

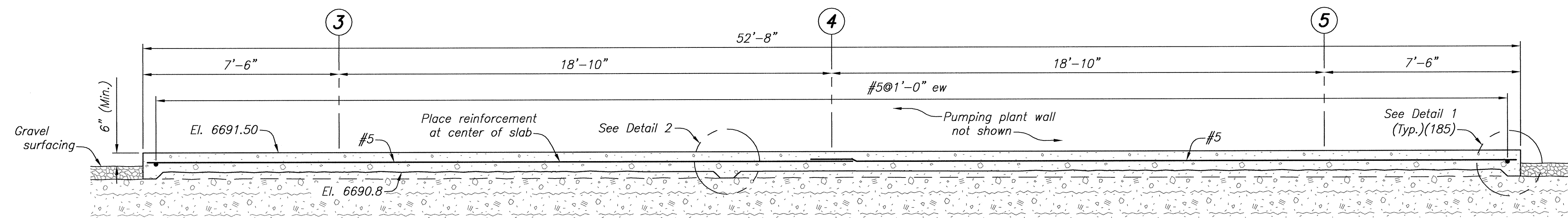
SHEET 1 OF 1



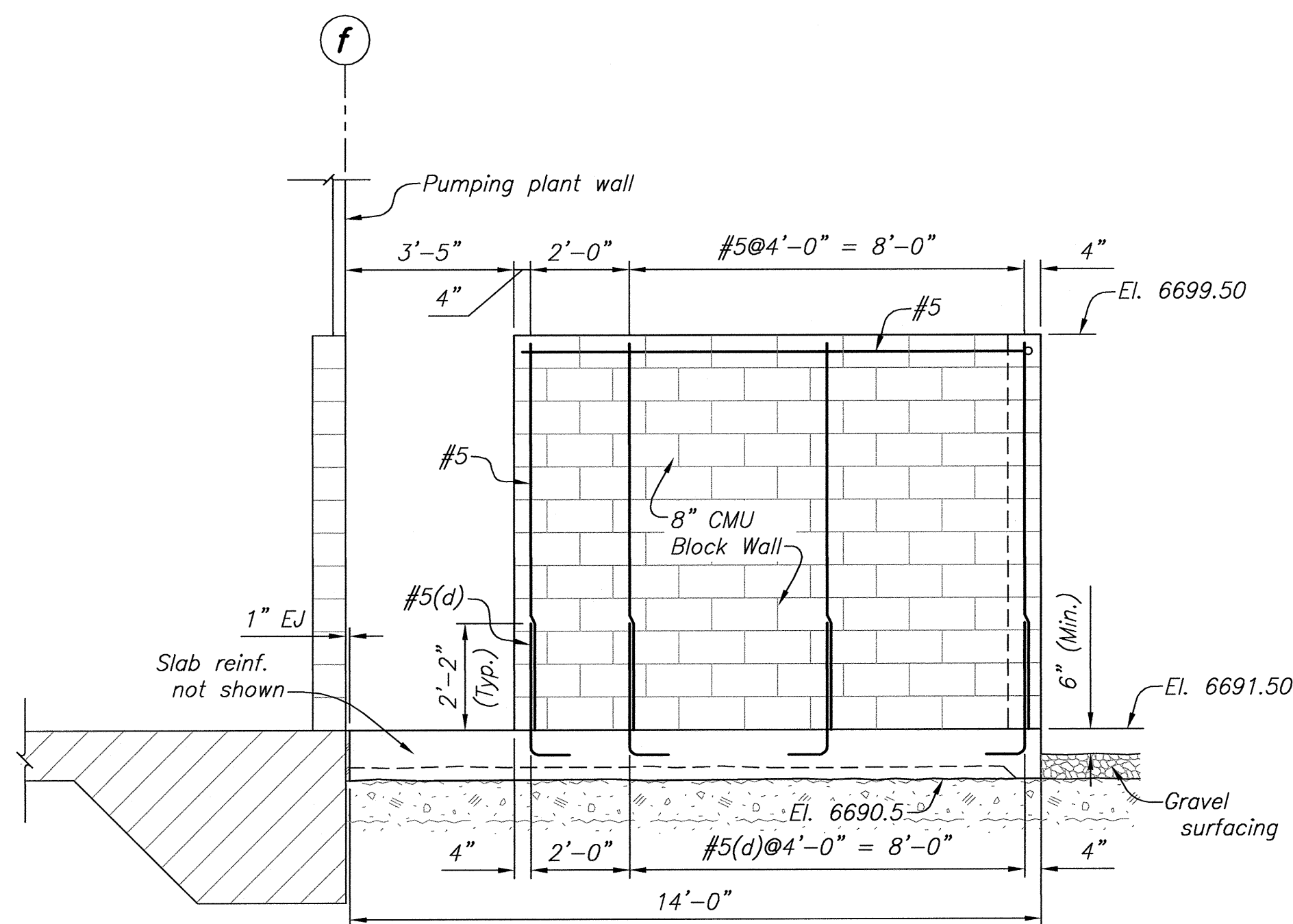
NOTES

- For Concrete General Notes, see (123).
- For Reinforcement Design General Notes, see (127).
- For Masonry Design General Notes and Typical Details, see (146).
- For Structural Design Data, see (101) and (102).
- For location of Engine Generator Set foundation, see (99).
- All vertical elevations are based on NAVD88 vertical datum.

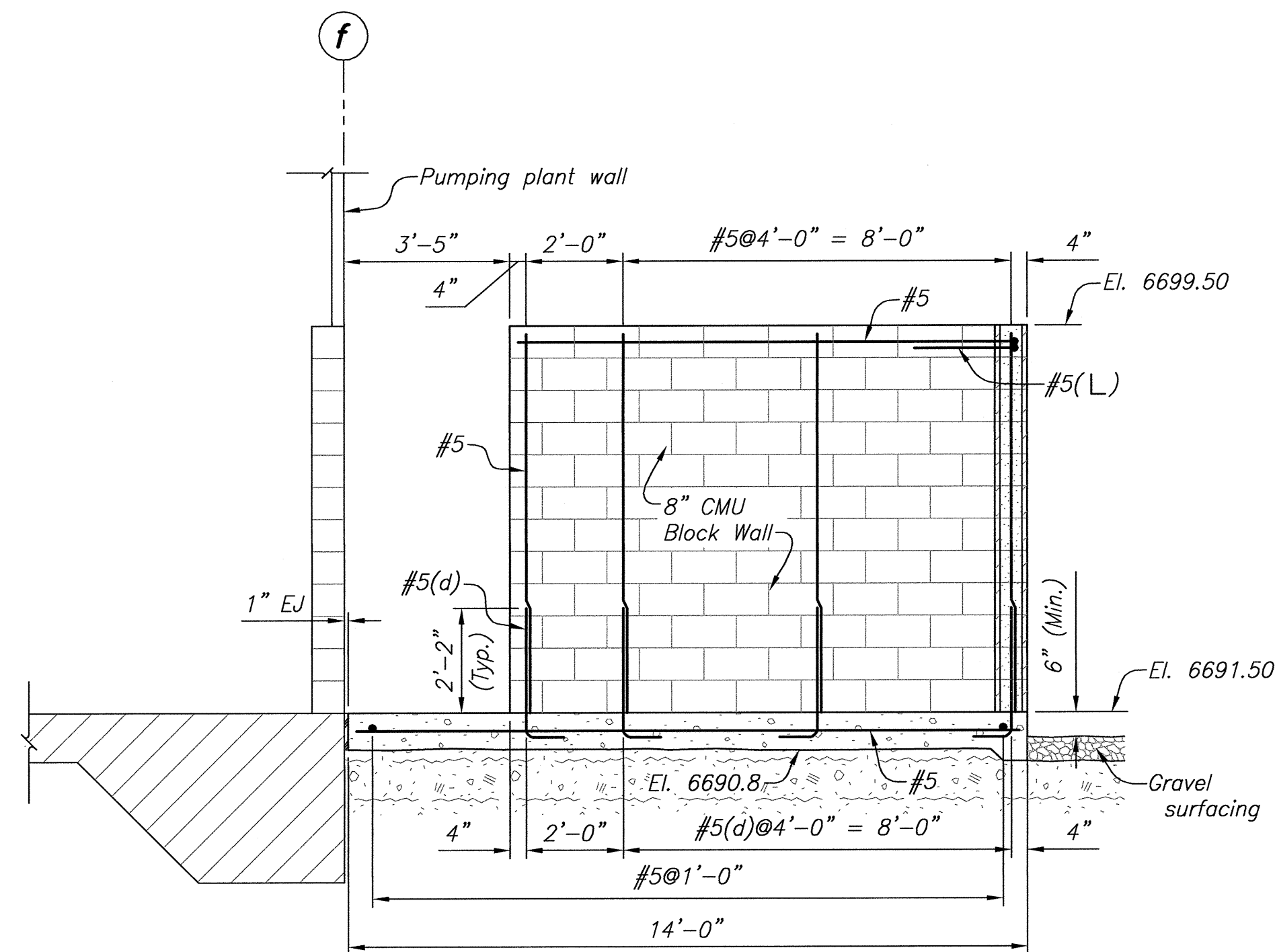
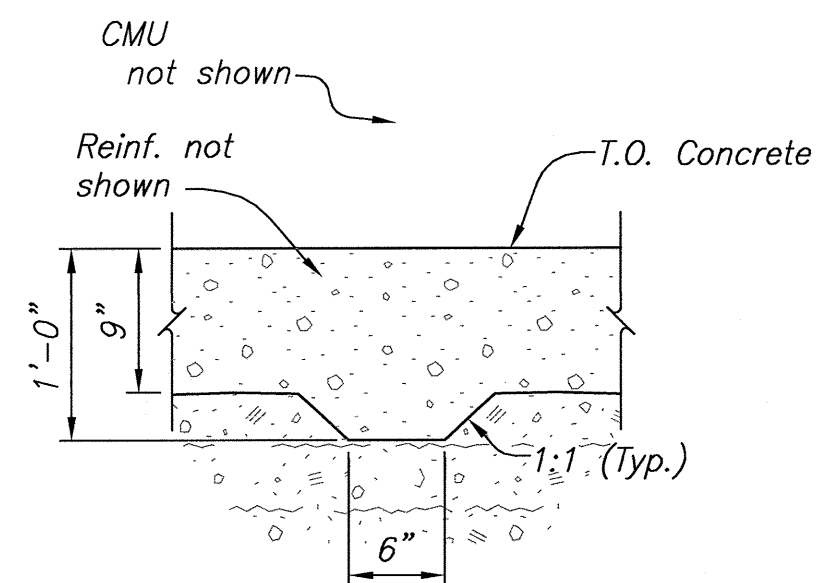




SECTION 1-1 (187)

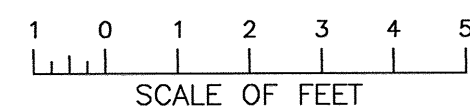


SECTION 2-2 (187)

SECTION 3-3 (AS SHOWN)(187)
SECTION 4-4 (SIMILAR)(187)DETAIL 2
(NOT TO SCALE)

NOTES

- For Concrete General Notes, see (123).
- For Reinforcement Design General Notes, see (127).
- For Masonry Design General Notes and Typical Details, see (146).
- For Structural Design Data, see (101) and (102).
- For location of Medium Voltage Switch foundation, see (99).
- All vertical elevations are based on NAVD88 vertical datum.



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BUREAU OF RECLAMATION

NAVAJO GALLUP WATER SUPPLY PROJECT
NEW MEXICO

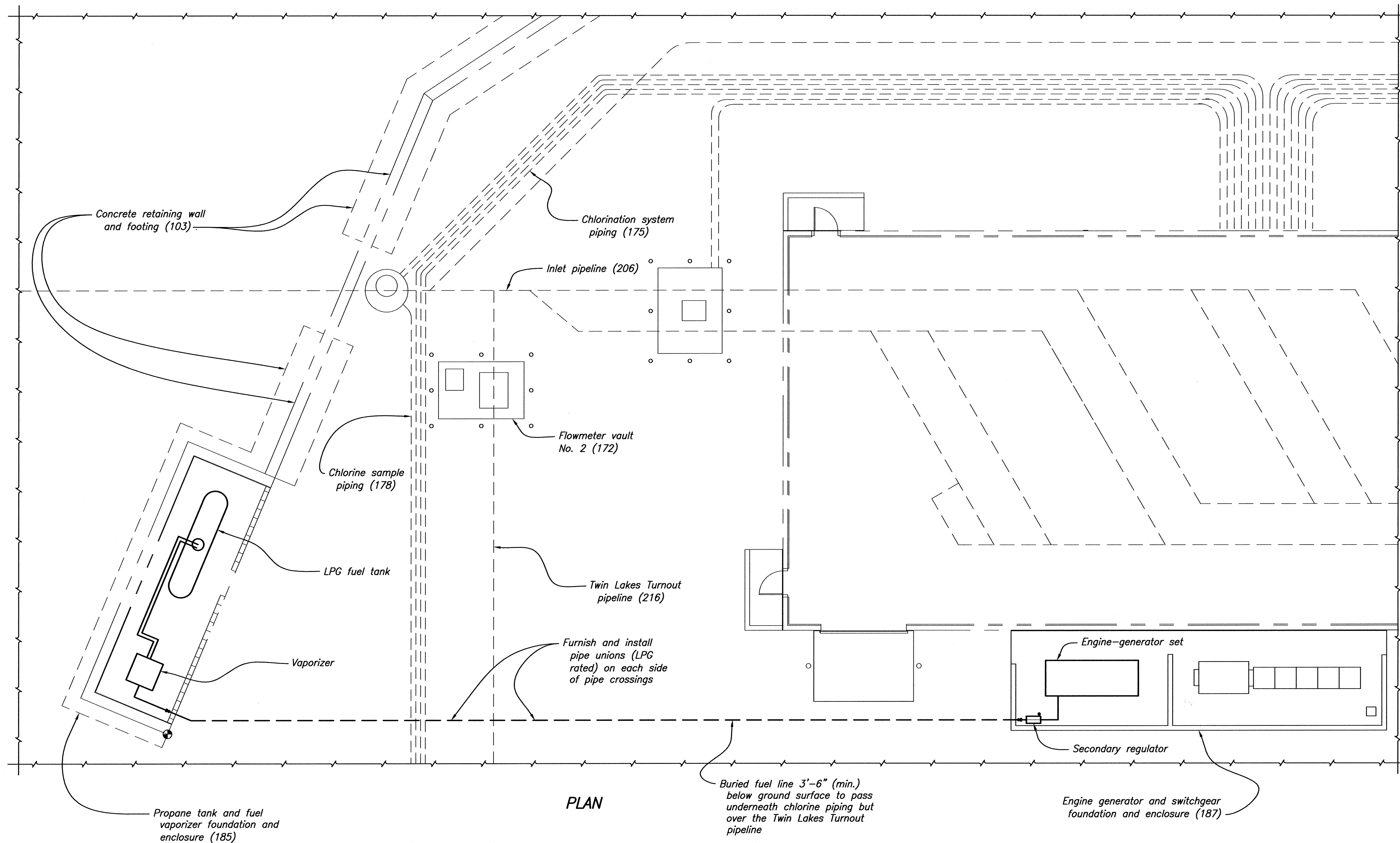
**SAN JUAN LATERAL
TOHLAKAI PUMPING PLANT**
ENGINE GENERATOR AND SWITCHGEAR FOUNDATION AND ENCLOSURE
SECTIONS

DESIGNED: *K. D. Sh...*
DRAWN: *B. D. VanOtterloo*
CHECKED: *B. D. VanOtterloo, P.E.*
TECH. APPR.: *B. D. VanOtterloo*
APPROVED: *B. D. VanOtterloo*
PLANT STRUCTURES GROUP

ENGINE GENERATOR AND
SWITCHGEAR FOUNDATION &
ENCLOSURE
SECTIONS

1695-D-188

SHEET 2 OF 2



NOTES

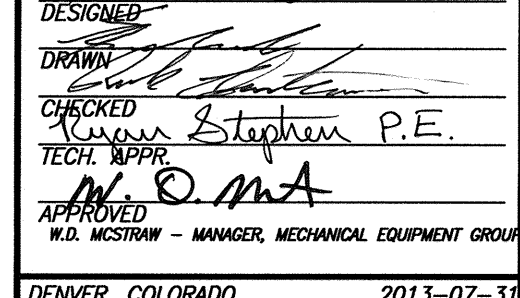
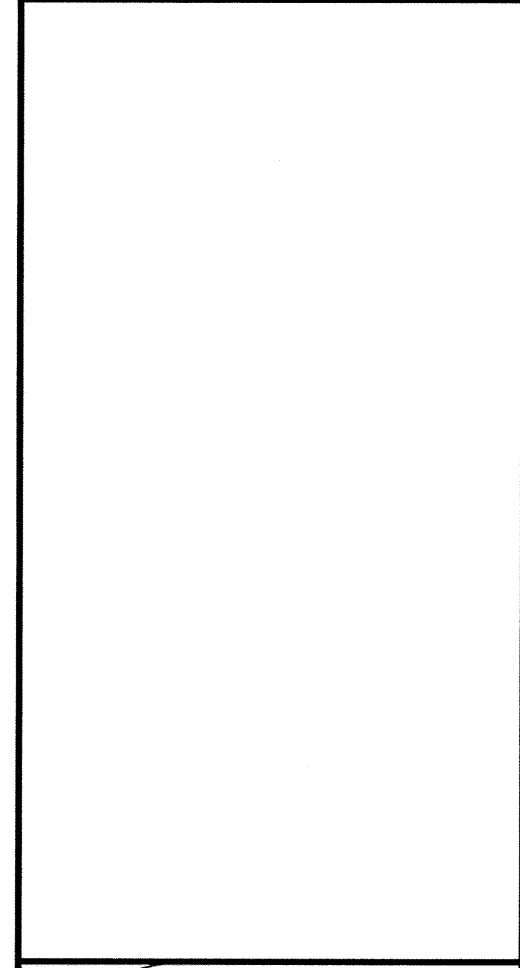
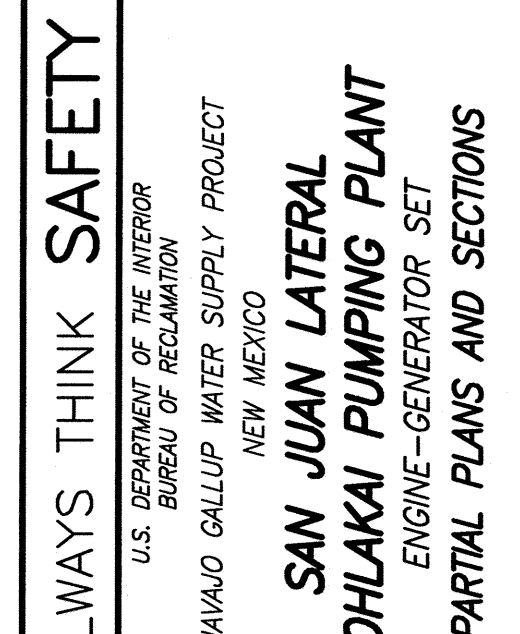
Fuel piping shown in approximate location.

LIST OF DRAWINGS

ENGINE-GENERATOR SET	
PLAN	1695-D-273
PARTIAL PLANS AND SECTIONS	1695-D-274

REFERENCE DRAWINGS

SITE PLAN	1695-D-99
CONCRETE RETAINING WALL	
SITE PLAN	1695-D-103
FLOWMETER VAULT NO. 2	
CONCRETE OUTLINE AND REINFORCEMENT DESIGN	
PLANS AND SECTIONS	1695-D-172
CHLORINATION SYSTEM PIPING	
SITE PLAN	1695-D-175
CHLORINE INJECTION VAULT NO. 2 AND CHLORINE SAMPLE TAP MANHOLE	
PLANS - EL. 6688.25, SECTIONS, AND DETAIL 1	1695-D-178
PROPANE TANK AND FUEL VAPORIZER FOUNDATION & ENCLOSURE	
PLAN AND SECTIONS	1695-D-185
ENGINE GENERATOR AND SWITCHGEAR FOUNDATION & ENCLOSURE	
PLAN AND SECTIONS	1695-D-187
STEEL MANIFOLD	
PLAN, SECTION, AND DETAILS	1695-D-206
STEEL MANIFOLD - TWIN LAKES TURNOUT	
PLAN AND SECTIONS	1695-D-216



- ### ENGINE-GENERATOR SET PARTIAL PLANS AND SECTIONS

CAD SYSTEM
AutoCAD Rel. 19.0s
CAD FILENAME
1695-D-274

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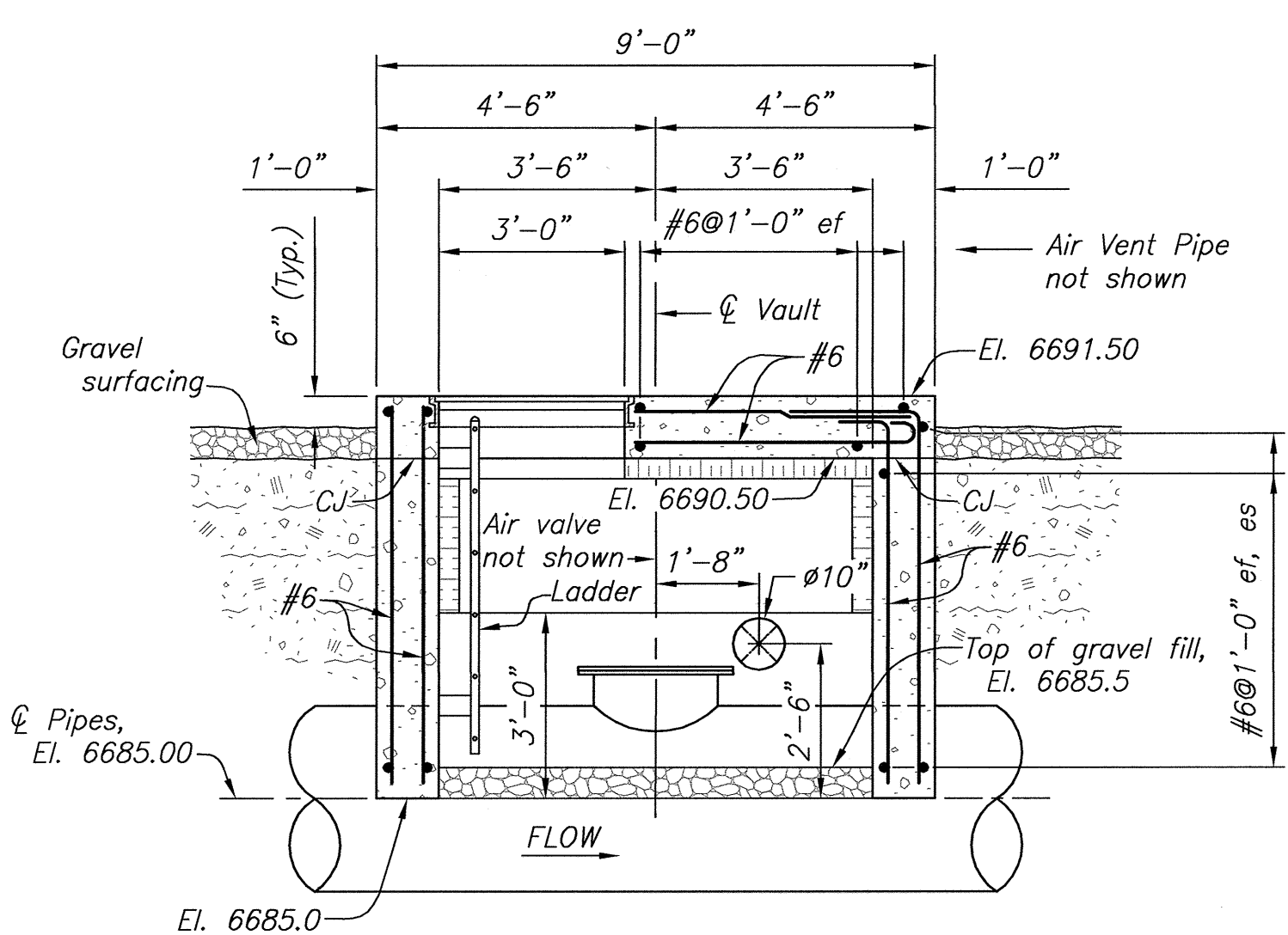
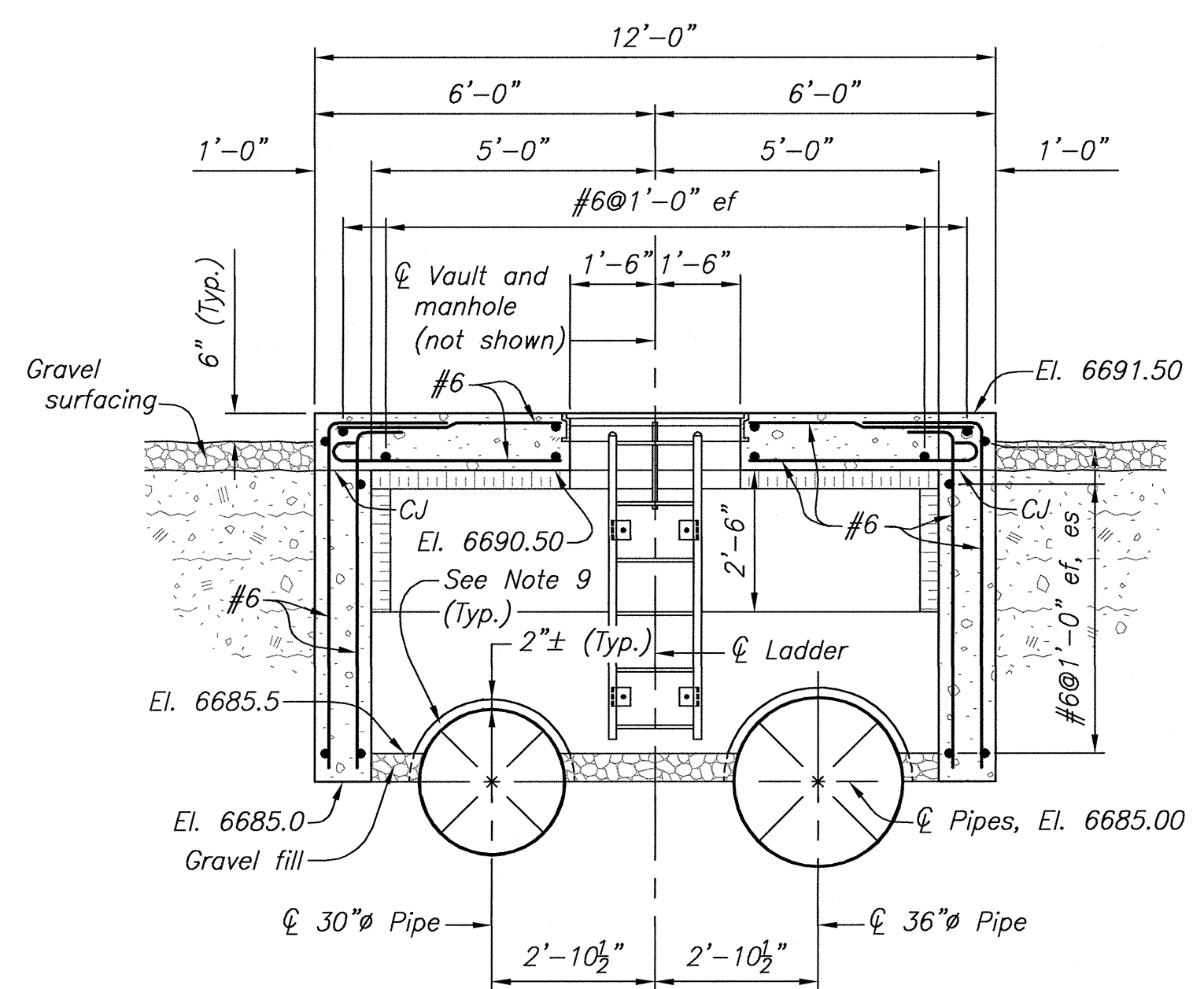
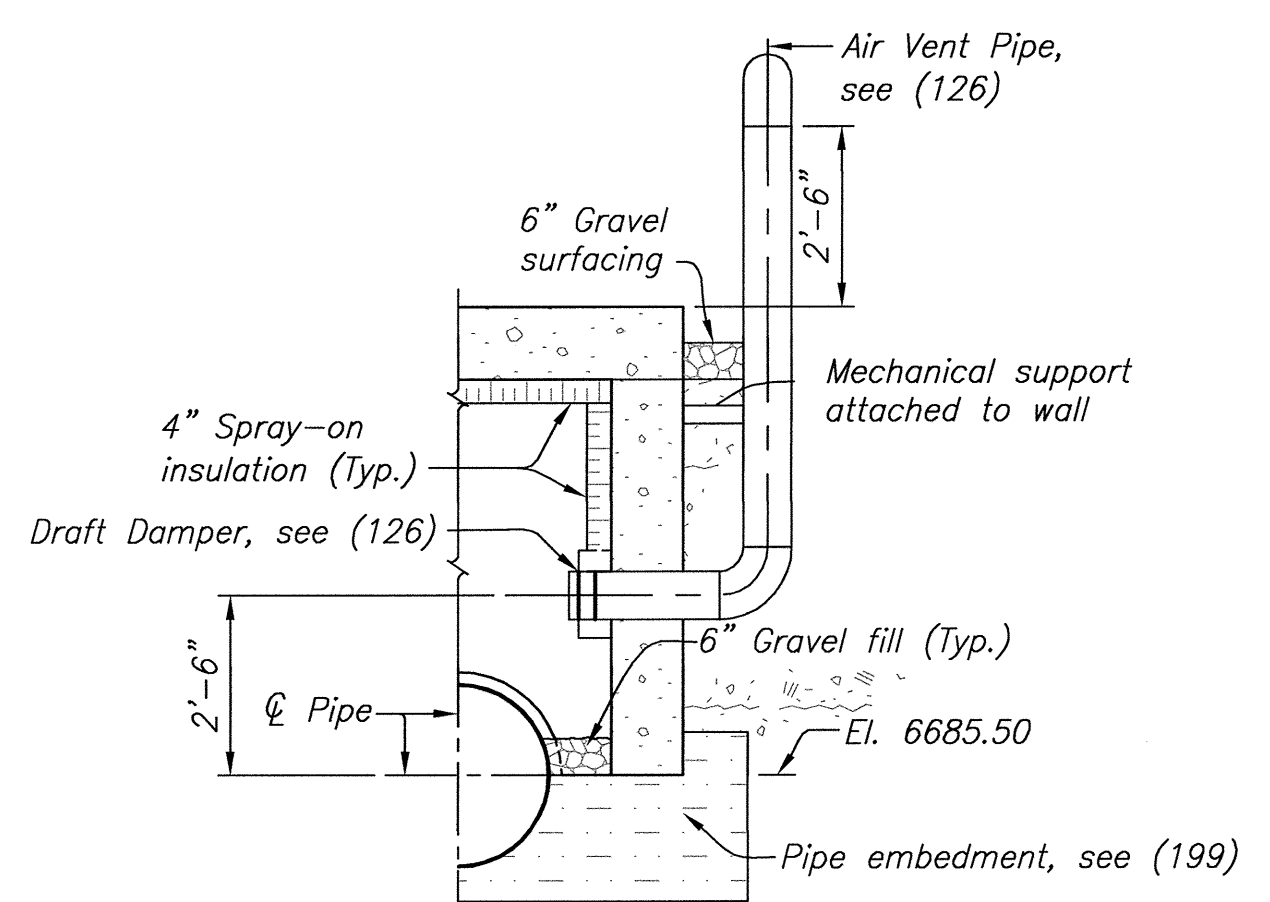
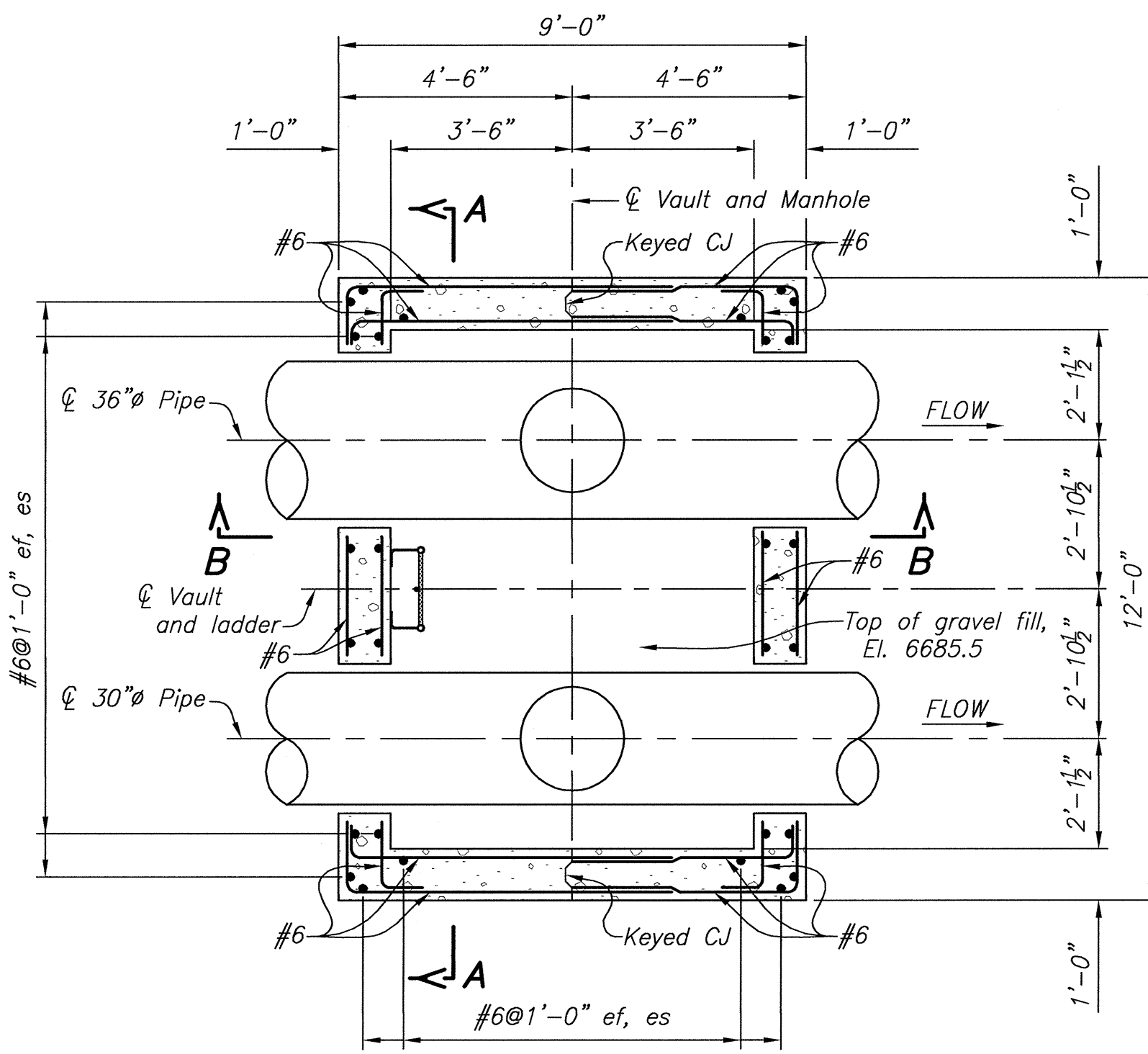
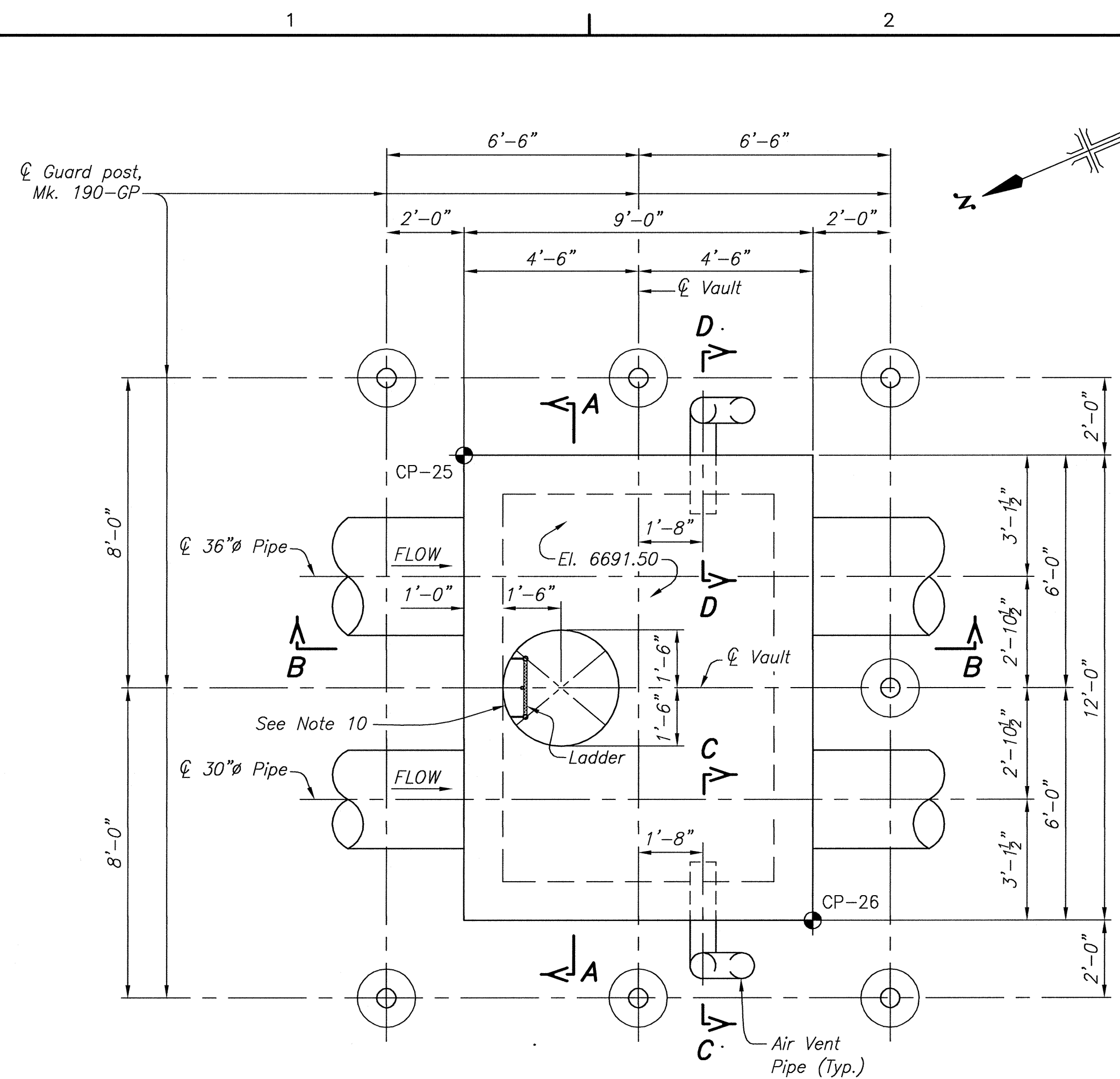
U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
NAVALO GALLUP WATER SUPPLY PROJECT
NEW MEXICO
**SAN JUAN LATERAL
TOHLAKAI PUMPING PLANT**
AIR VALVE VAULT
CONCRETE OUTLINE AND REINFORCEMENT DESIGN
PLANS AND SECTIONS

DESIGNED: *K. O. S.*
DRAWN: *S. D. V. O. S.*
CHECKED: *S. D. V. O. S.*
TECH. APPR.: *S. D. V. O. S.*
PEER REVIEW: *S. D. V. O. S.*
PLANT STRUCTURES GROUP
DENVER, COLORADO 2013-06-06

CONCRETE OUTLINE AND REINFORCEMENT DESIGN
PLANS AND SECTIONS

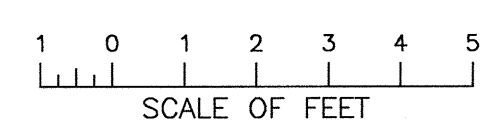
1695-D-105

SHEET 1 OF 1



- NOTES**
- For Concrete General Notes, see (123).
 - For Reinforcement Design General Notes, see (127).
 - For Structural Design Data, see (101) and (102).
 - For location of the Air Valve Vault, see (99).
 - For ladder details, see (40-D-6601).
 - For control points and coordinates, see (100).
 - All vertical elevations are based on NAVD88 vertical datum.
 - For foundation excavation requirements, see (108).
 - After installation and prior to backfilling, place FN109 RAM-NEK FR, or equal, joint sealant in the void between the steel pipeline and concrete vault.
 - Flush mounted (cast-in) 36" $\emptyset$ Cast iron foundry ring and cover.

REFERENCE DRAWINGS
STEEL MANIFOLD
PLAN AND SECTIONS - - - - - 1695-D-208



CAD SYSTEM
AutoCAD Rev. 19.0s
CAD FILENAME
1695-D-105 - COL RD - AIR VALVE VAULT - PLANS, SECTIONS AND DETAILS
DATE AND TIME PLOTTED
AUGUST 3, 2013 08:14
PLOTTED BY
KOSHEA

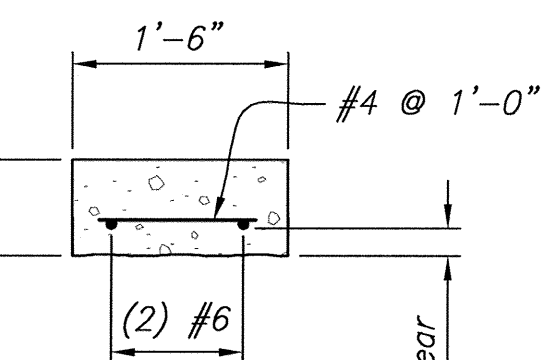
84" I.D. Precast concrete
flat top with 36" eccentric,
access openingGuard post,
Mk. 190-GP

PLAN VIEW

42"Ø PIPELINE AIR VALVE MANHOLE

BASE RING SUPPORT

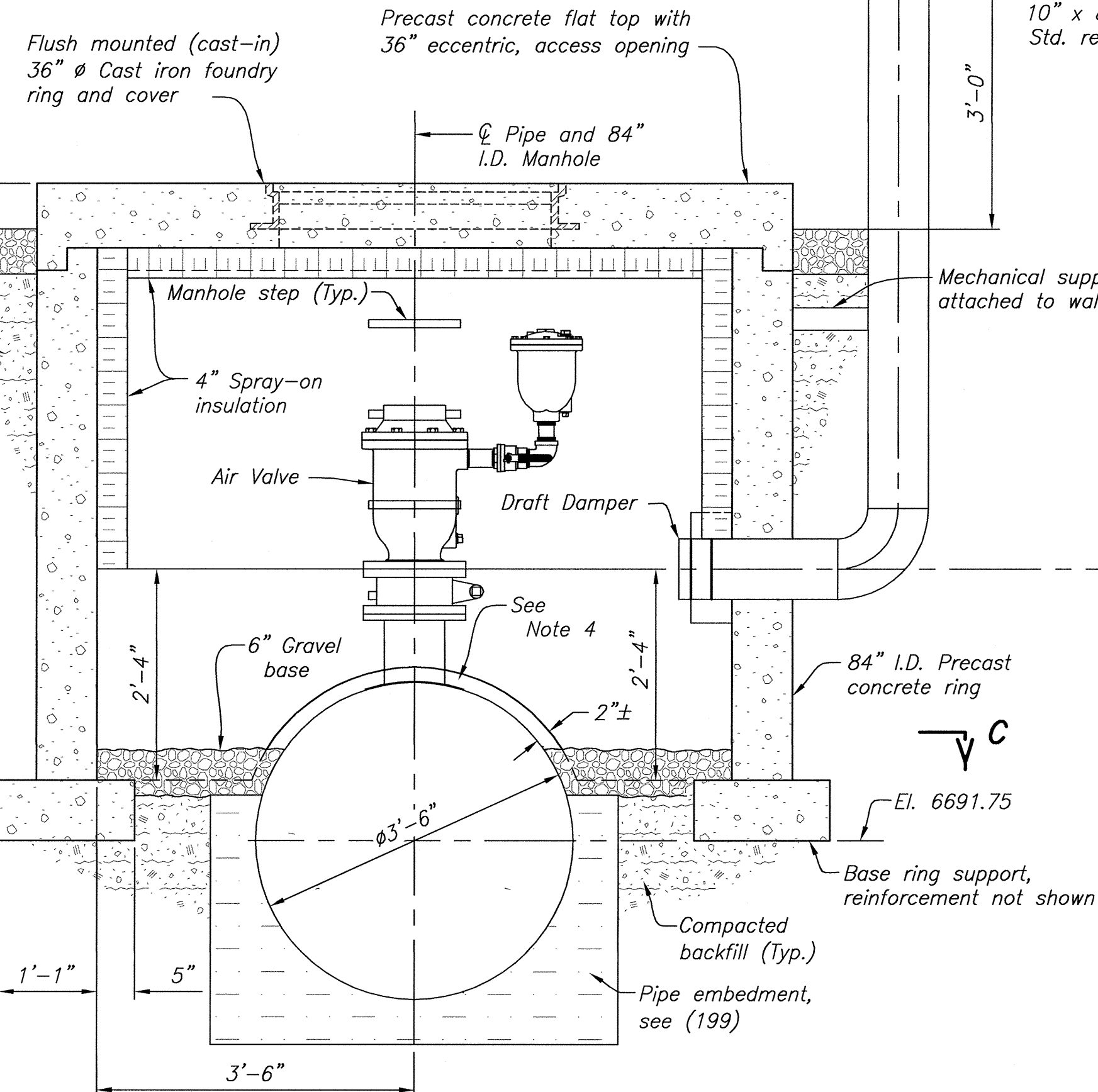
6 REQ'D



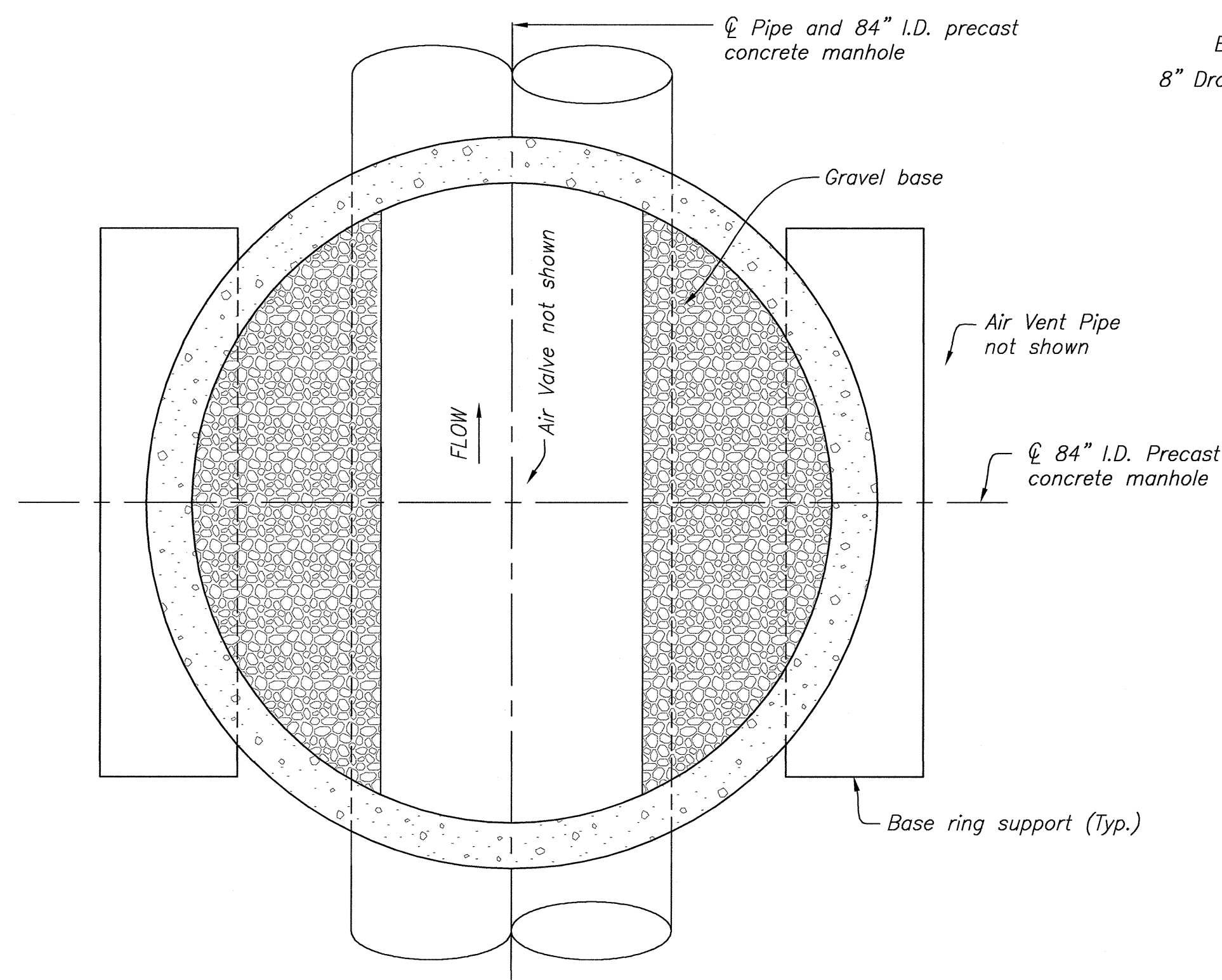
SECTION D-D

El. 6698.5
Gravel surfacing
Compacted
backfill (Typ.)

C



SECTION A-A



SECTION C-C

Air Vent Pipe, paint
safety yellow
3'-0"Mechanical support
attached to wall84" I.D. Precast
concrete ring

El. 6691.75

Base ring support,
reinforcement not shownCompacted
backfill (Typ.)Pipe embedment,
see (199)

3'-6"

5"

1'-1"

2'-4"

2"±

6" Gravel base

See Note 4

Air Valve

Draft Damper

4" Spray-on
insulation

Manhole step (Typ.)

Flush mounted (cast-in)
36" Ø Cast iron foundry
ring and cover

6" Min.

Precast concrete flat top with
36" eccentric, access opening

Pipe and 84" I.D. Manhole

10" x 8" Std. reducer

Short radius std. wall return bend

Provide stainless steel wire cloth, see Detail A

8" Std. steel pipe

Stainless steel wire cloth, 2x2 meshes per liner inch 0.063 dia. wire

Tack weld every other strand

Pipe

AIR VENT PIPE (TYPICAL)

DETAIL B

8" Std. steel pipe

Provide clearance between shaft pivot and insulation

Draft control damper shaft with adjusting weights. Provide clearance from insulation.

Control damper leaf

8" Draft control damper

TYPICAL DRAFT DAMPER

8" Dia. blackout (Typ.)

84" I.D. precast concrete manhole

Insulation not shown

End 8" Std. steel pipe

8" Draft control damper

Machine screws. Typical of 4 at 45° from vertical.

SECTION E-E

Epoxy grout in 10" Dia. blackout around 8" std. steel pipe

8" Std. steel pipe

8" Galv. steel draft control damper

Drill holes and attach damper to steel pipe with min. 4 machine screws, or attach per manufacturer's instructions

4" Spray-on insulation

84" I.D. precast concrete manhole

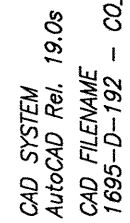
SECTION F-F

NOTES

- All vertical elevations are based on NAVD88 vertical datum.
- For Structural Design Data, see (101) and (102).
- The height of the precast manhole shall be high enough to allow enough clearance between the top of the air valve and the bottom of the insulation on the corer as per the air valve manufacturer's recommendations.
- After installation of the manhole and prior to backfilling, place FN109 RAM-NEK FR, or equal, joint sealant in the void between the steel pipeline and precast concrete manhole.

REFERENCE DRAWINGS

STEEL MANIFOLD
PLAN, SECTIONS AND DETAILS_ _ _ _ _ 1695-D-206



— *Base ring support (Typ.)*



-Pipe embedment,
see (199)



2 REQ'D



NOTES

1. All vertical elevations are based on NAVD88 vertical datum.
2. For Structural Design Data, see (101) and (102).
3. For Chlorination System Piping, see (178).
4. For Control Point coordinates, see (100).
5. After installation of the manhole and prior to backfilling, place FN109 RAM-NEK FR, or equal, joint sealant in the void between the steel pipeline and precast concrete manhole.

CHLORINATION SYSTEM PIPING
CHLORINE SAMPLE TAP MANHOLE _ _ _ _ _ 1695-D-178

STEEL MANIFOLD
PLAN, SECTIONS AND DETAILS_ _ _ _ _ 1695-D-206

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BUREAU OF RECLAMATION

NAVALO GALLUP WATER SUPPLY PROJECT
NEW MEXICO

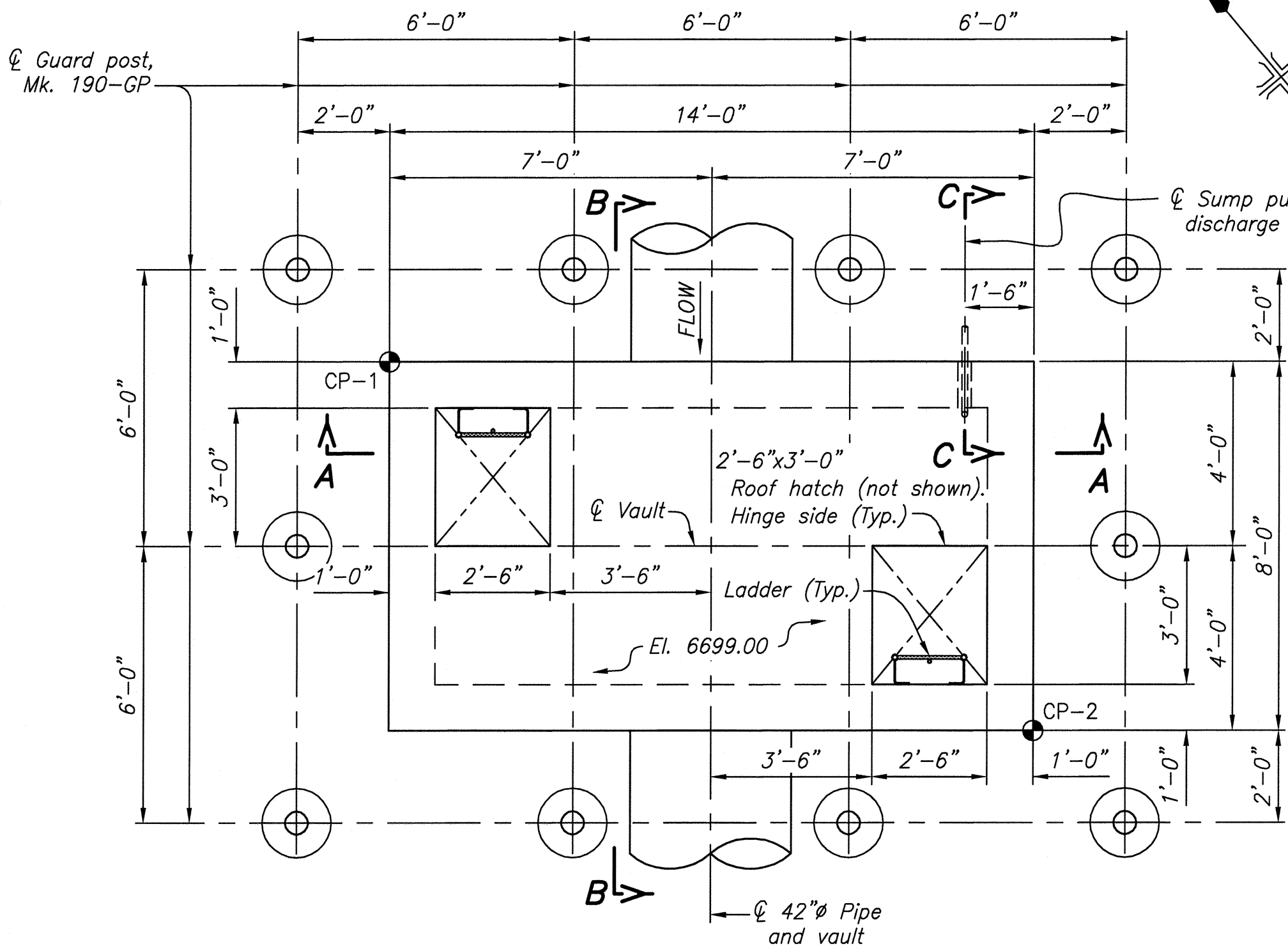
**SAN JUAN LATERAL
TOTOHLAKAI PUMPING PLANT**

CHLORINE SAMPLE TAP MANHOLE
PLAN AND SECTIONS

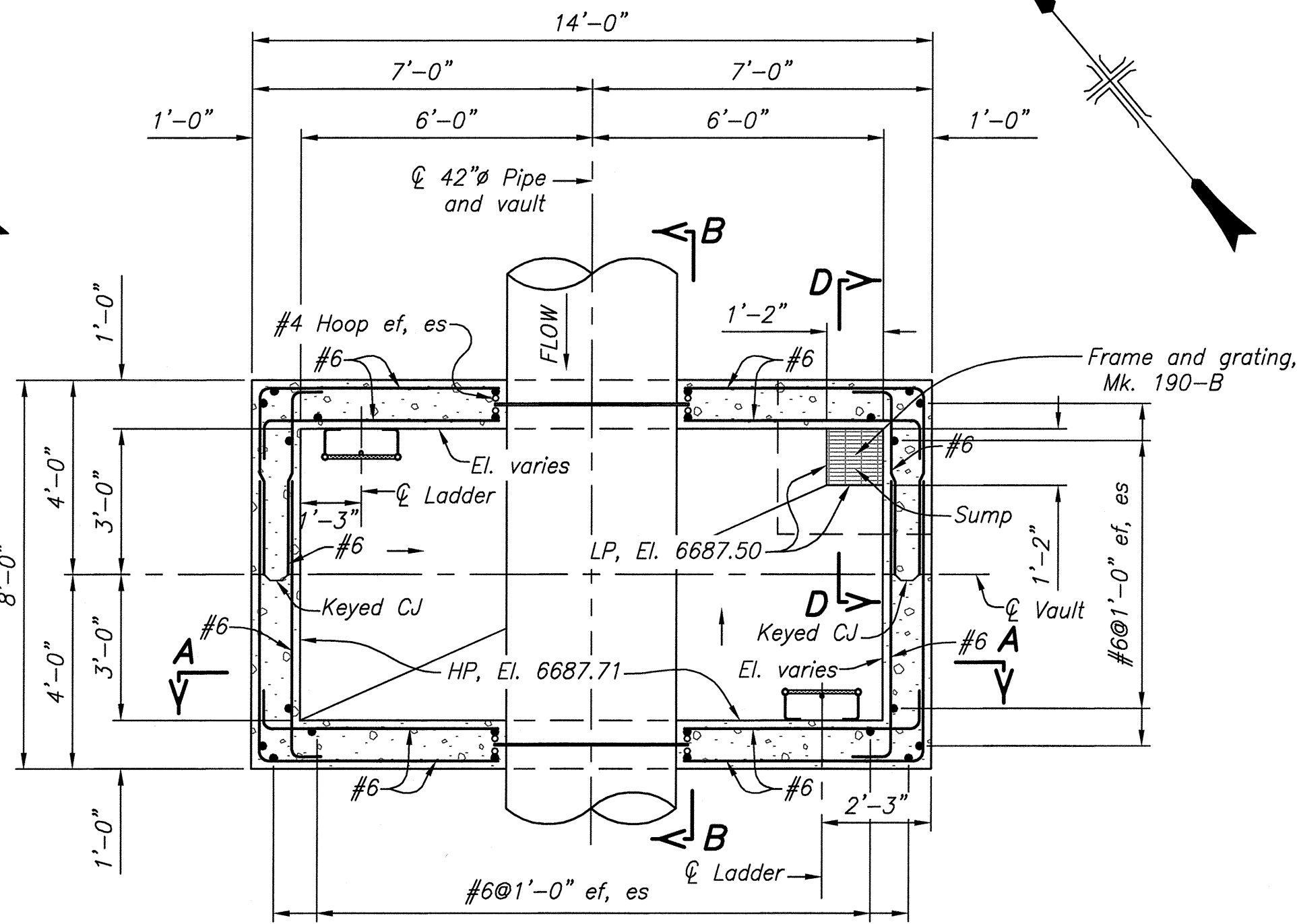
CHLORINE SAMPLE TAP MANHOLE PLAN AND SECTIONS

1695-D-192

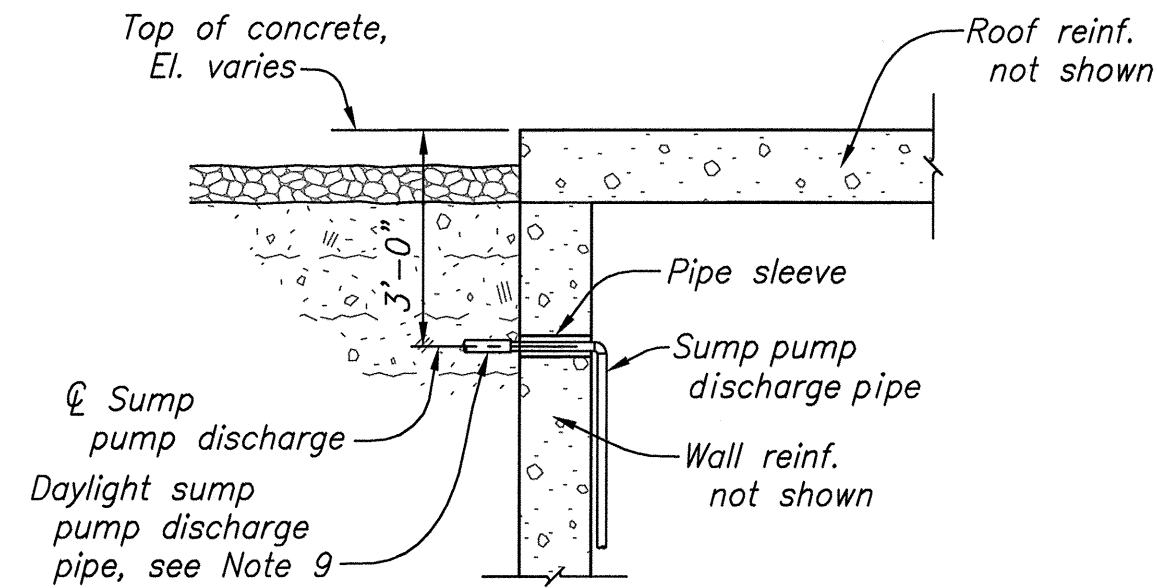
SHEET 1 OF 1



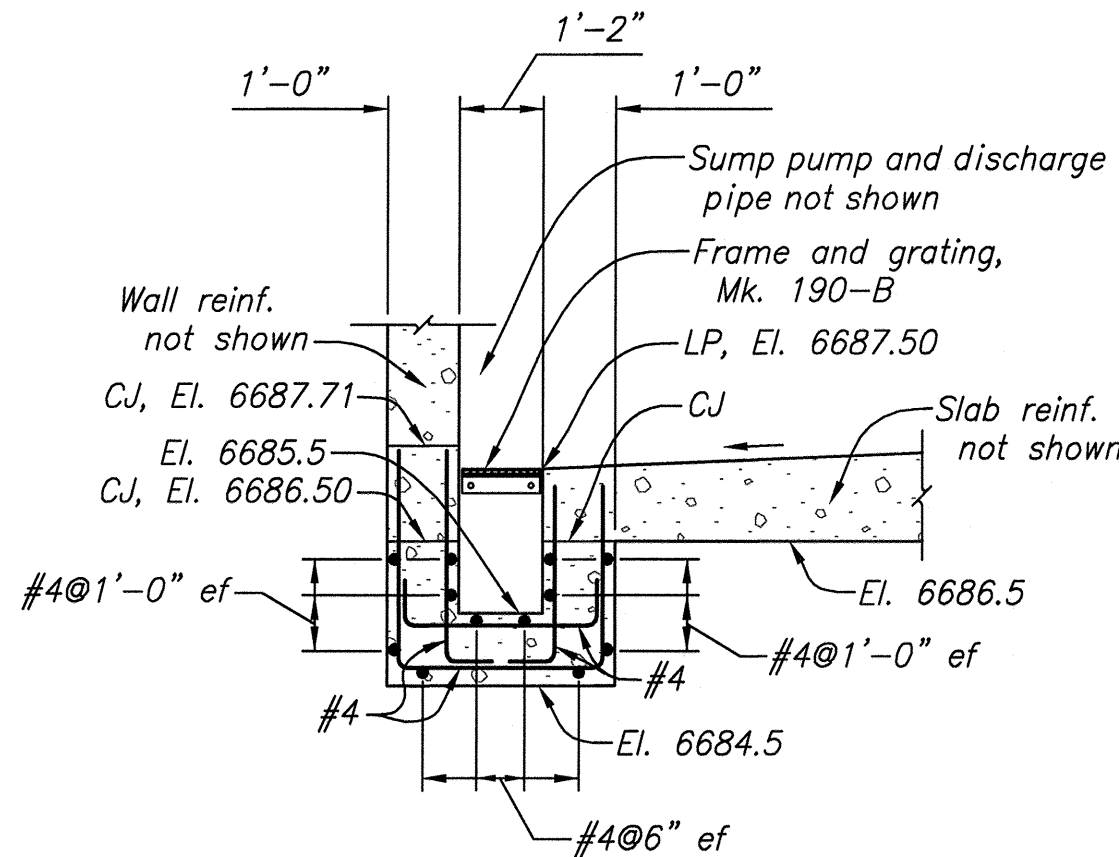
PLAN - EL. 6699.00



PLAN - EL. 6691.75



SECTION C-C (170, 171, 172)



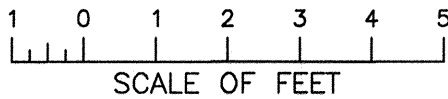
SECTION D-D

NOTES

1. For Concrete General Notes, see (123).
2. For Reinforcement Design General Notes, see (127).
3. For Structural Design Data, see (101) and (102).
4. For location of Chlorine Injection Vault No.1, see (99).
5. For ladder details, see (40-D-6601).
6. For control points and coordinates, see (100).
7. All vertical elevations are based on NAVD88 vertical datum.
8. For foundation excavation requirements, see (108).
9. Install piping transition and continue sump pump discharge pipe to daylight in site perimeter drainage ditch in accordance with Specifications Section 33 11 16.

REFERENCE DRAWINGS

- CHLORINATION SYSTEM PIPING
CHLORINE INJECTION VAULT NO. 1 - - - - - 1695-D-177
- STEEL MANIFOLD
PLAN, SECTION, AND DETAILS - - - - - 1695-D-206
- EQUIPMENT VAULTS SUMP PUMP AND DISCHARGE PIPING
PLAN AND SECTION - - - - - 1695-D-259



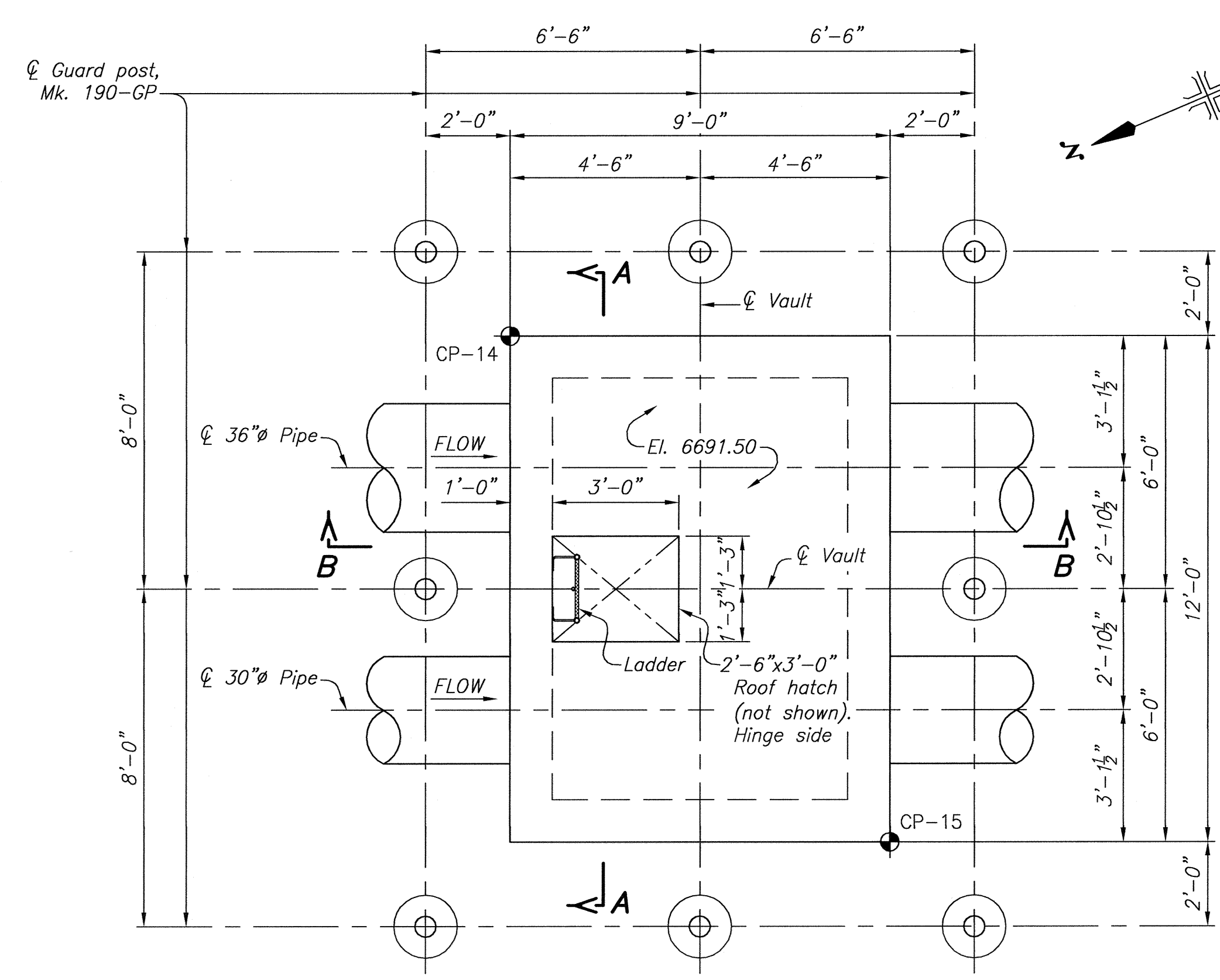
CAD SYSTEM
AutoCAD Rel. 19.0s
CAD FILENAME
1695-D-168 - COL RD - CHLORINE INJECTION VAULT NO.1 - PLANS AND SECTIONS
PLOTTED BY
KOSHEA
DATE AND TIME PLOTTED
AUGUST 3, 2013 11:13

DESIGNED	R. J. Jackson
DRAWN	R. J. Jackson
CHECKED	R. J. Jackson
TECH. APPR.	R. J. Jackson, P.E.
PEER REVIEW	R. J. Jackson
PLANT STRUCTURES GROUP	
DENVER, COLORADO	2013-08-05

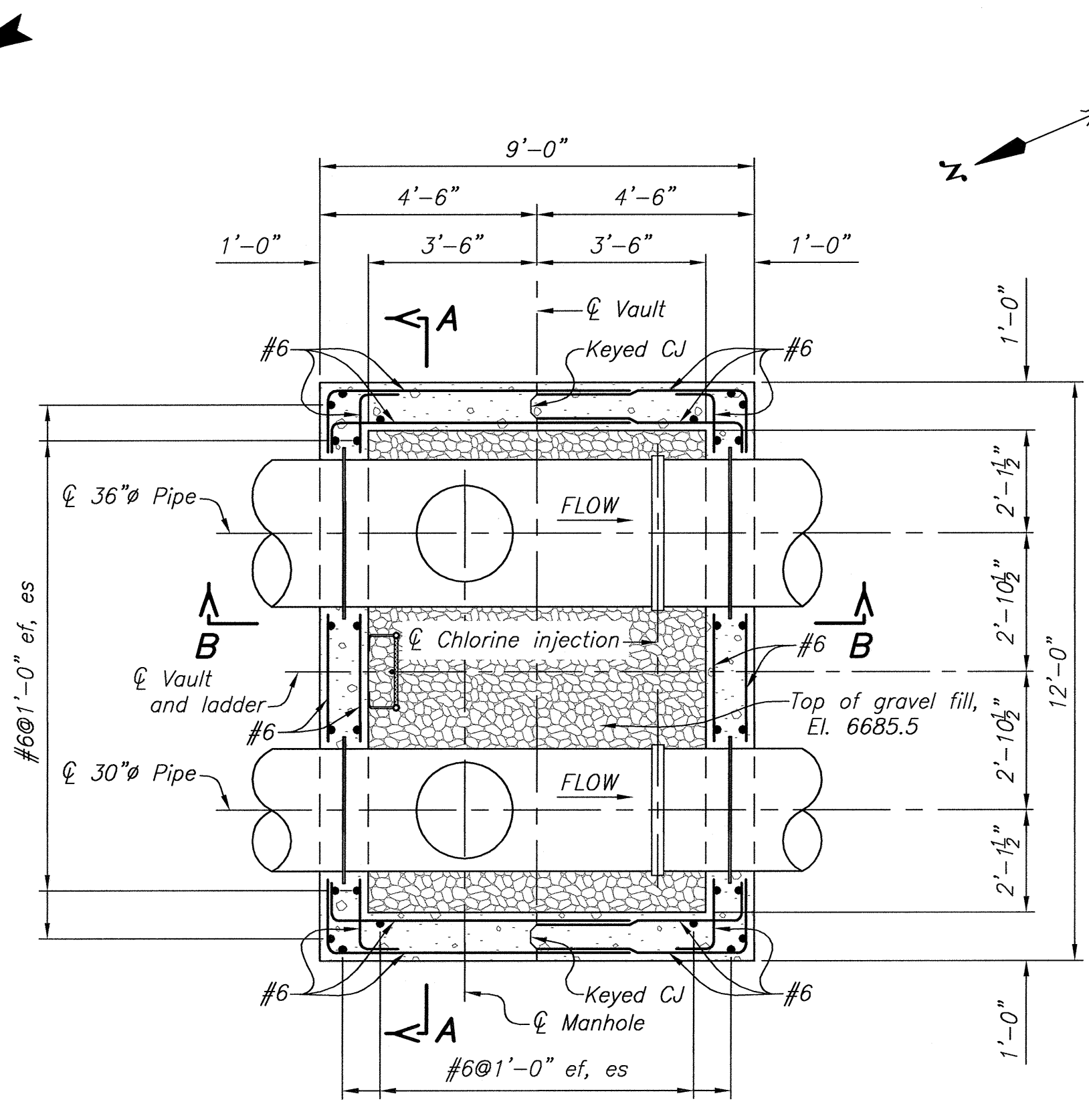
CONCRETE OUTLINE AND
REINFORCEMENT DESIGN
PLANS, SECTIONS,
AND DETAILS

1695-D-168

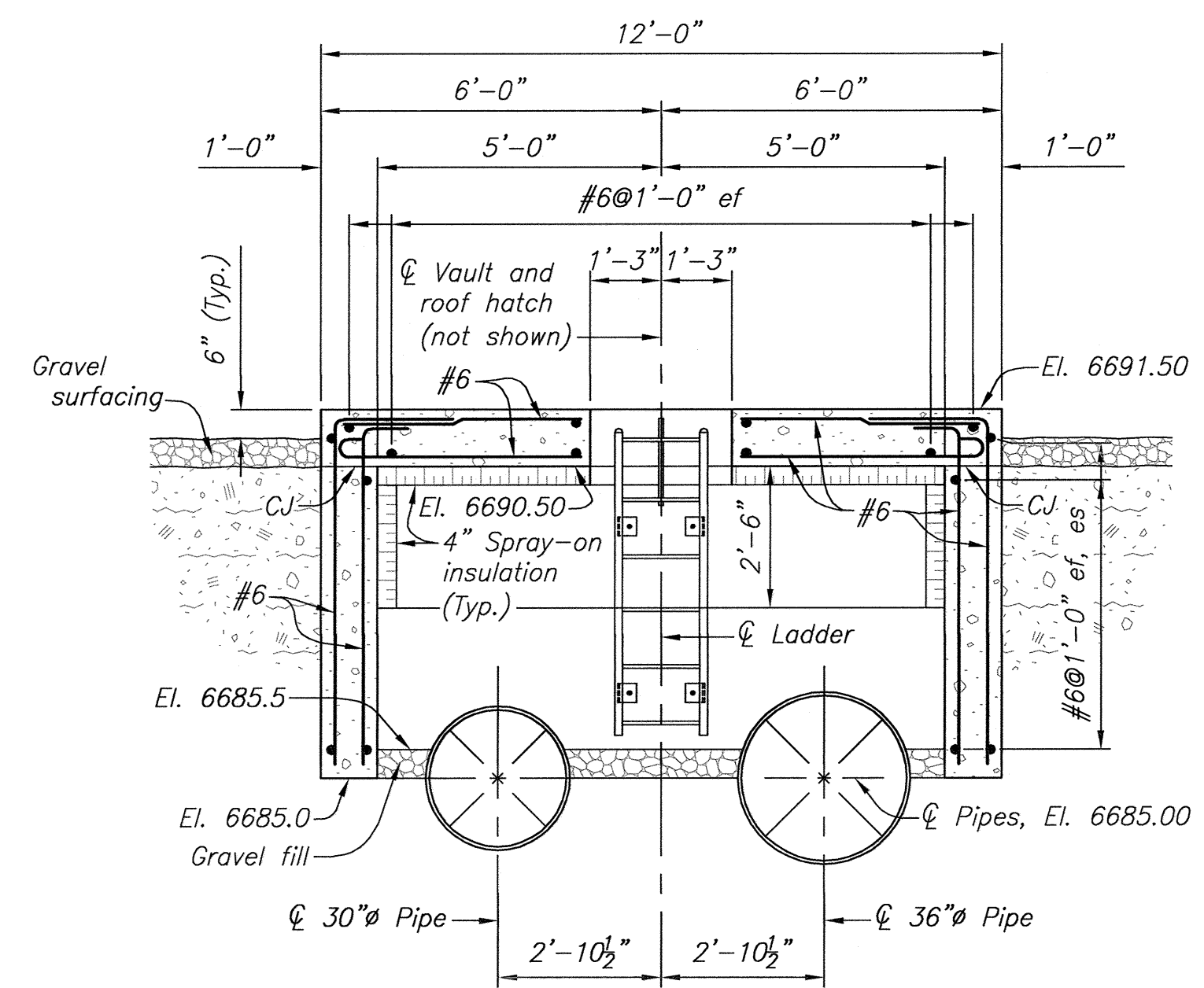
SHEET 1 OF 1



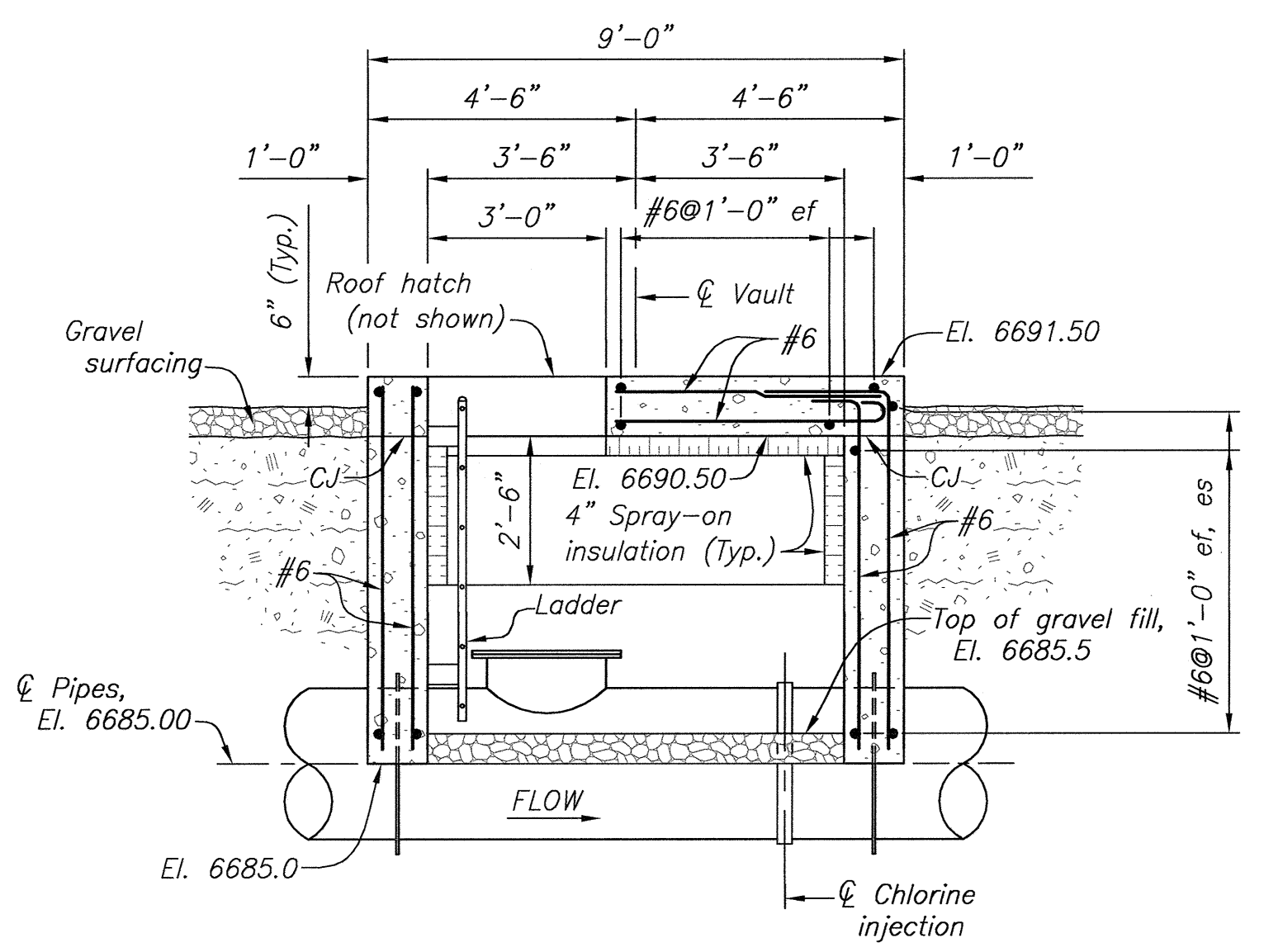
PLAN - EL. 6691.50



PLAN - EL. 6685.00



SECTION A-A



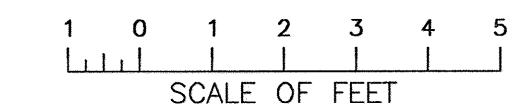
SECTION B-B

- NOTES**
1. For Concrete General Notes, see (123).
 2. For Reinforcement Design General Notes, see (127).
 3. For Structural Design Data, see (101) and (102).
 4. For location of Chlorine Injection Vault No.2, see (99).
 5. For ladder details, see (40-D-6601).
 6. For control points and coordinates, see (100).
 7. All vertical elevations are based on NAVD88 vertical datum.
 8. For foundation excavation requirements, see (108).

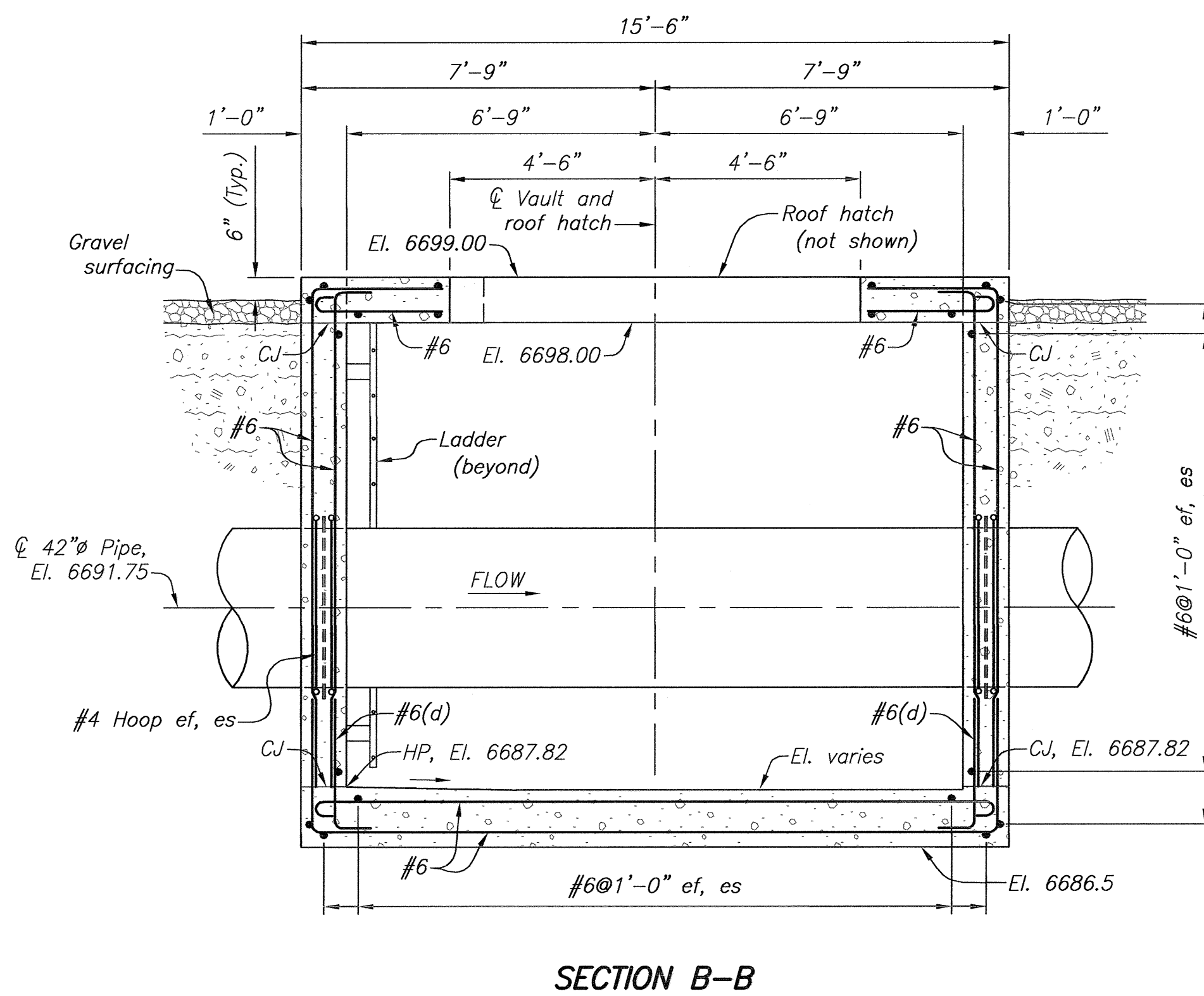
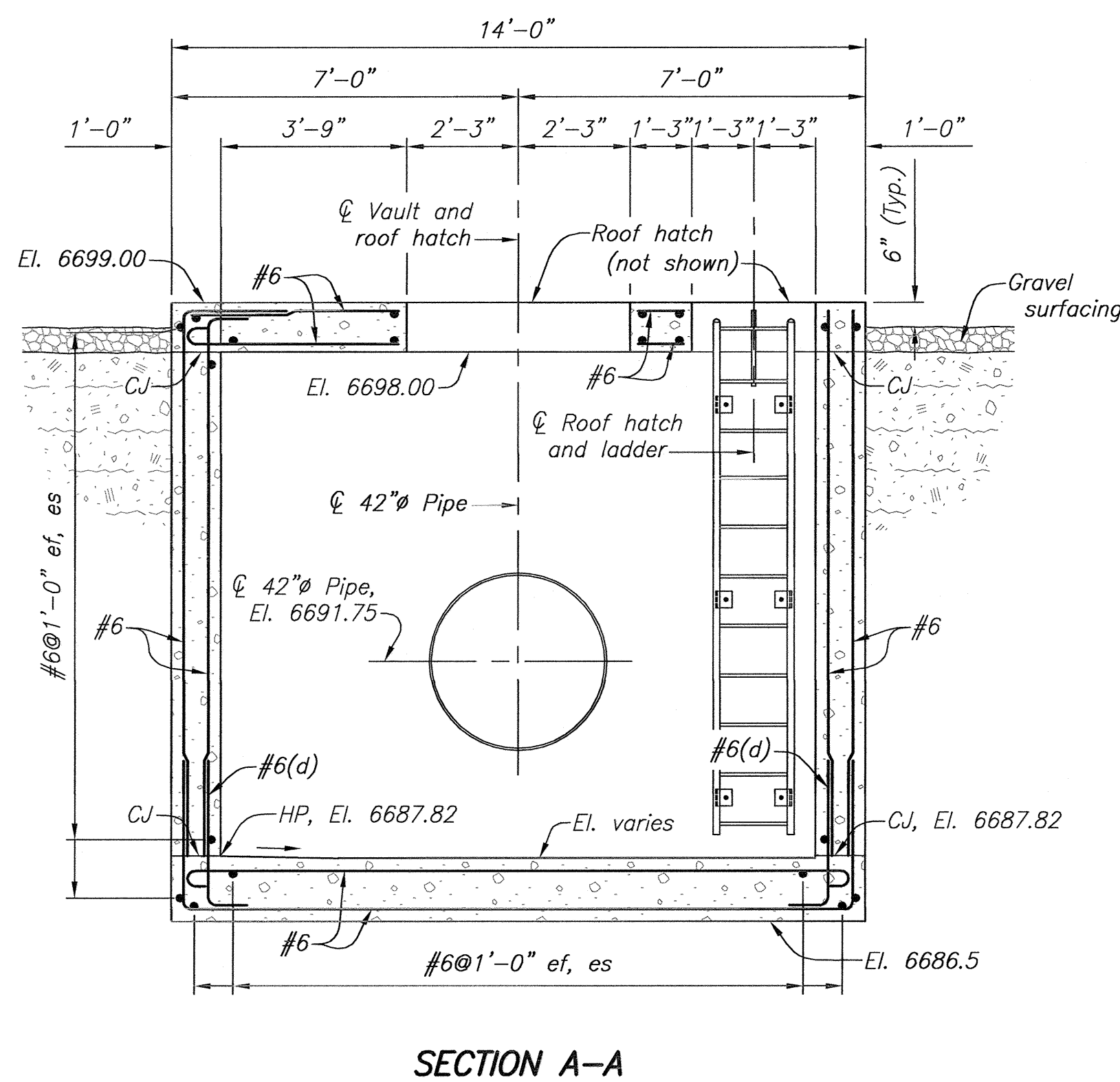
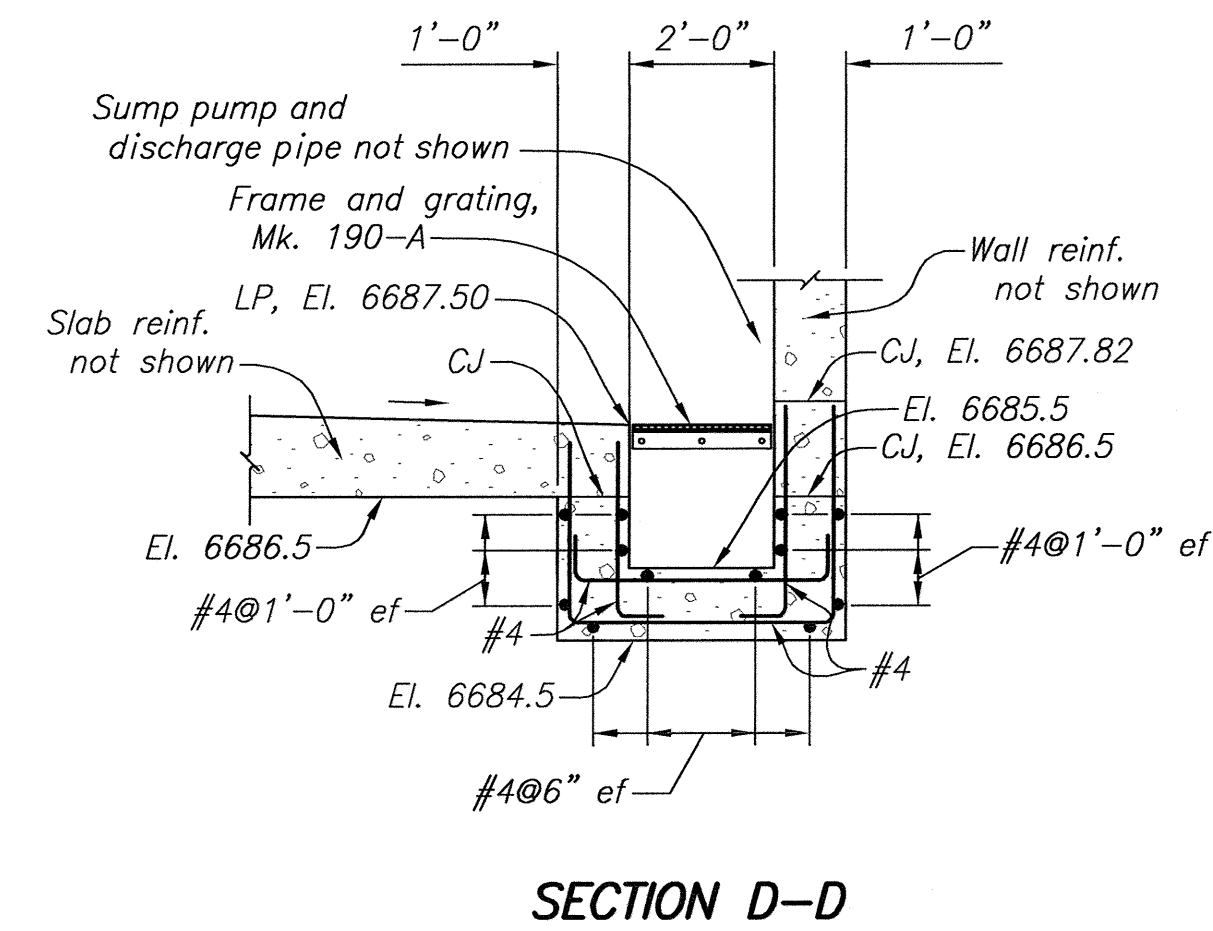
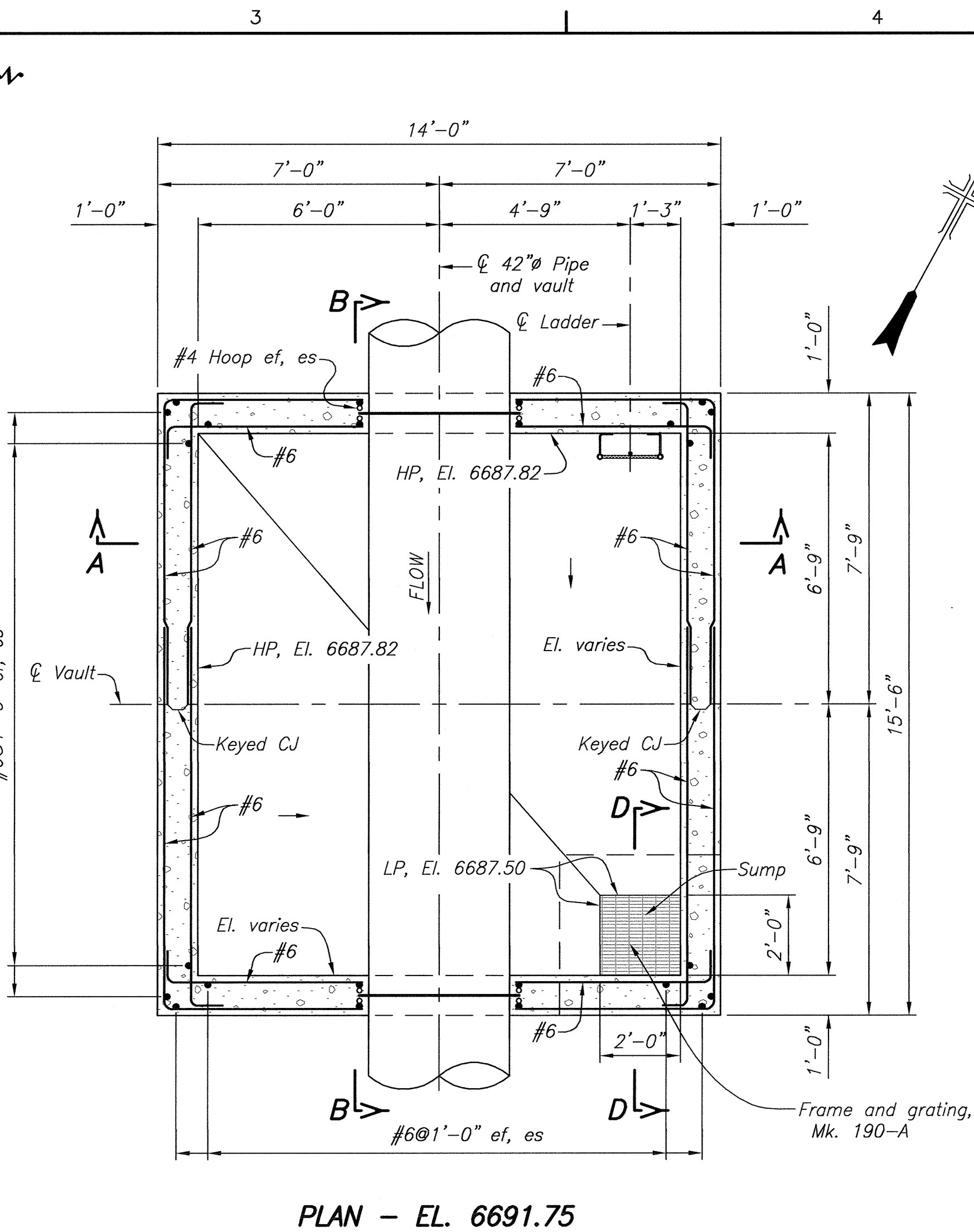
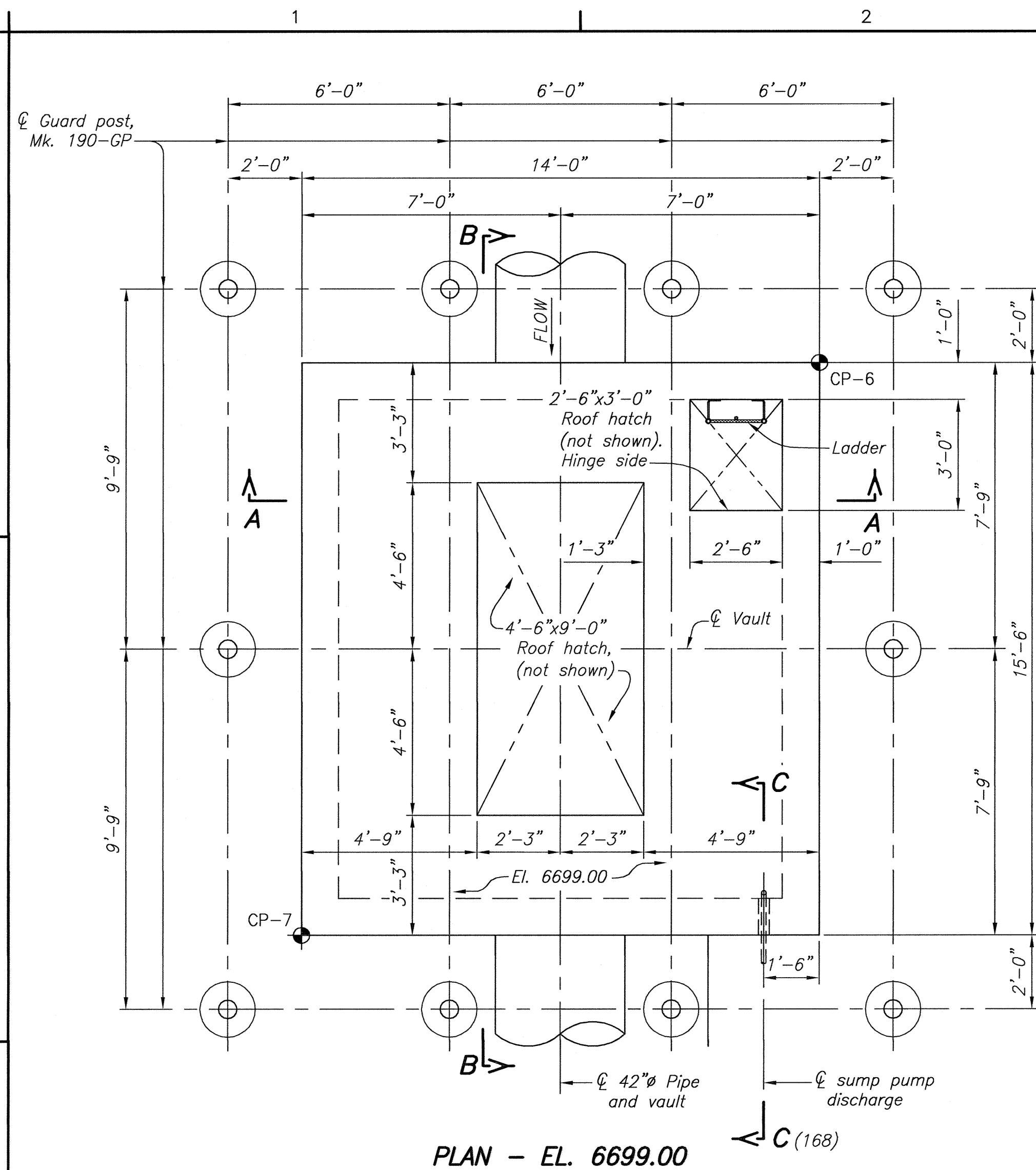
REFERENCE DRAWINGS

CHLORINATION SYSTEM PIPING
CHLORINE INJECTION VAULT NO. 2 _____ 1695-D-178

STEEL MANIFOLD
PLAN, SECTION, AND DETAILS _____ 1695-D-206



CAD SYSTEM
AutoCAD Rev. 19.0s
CAD FILENAME
1695-D-169 - CO. RD - CHLORINE INJECTION VAULT NO.2 - PLANS AND SECTIONS
PLOTTED BY
KOSIEA
DATE AND TIME PLOTTED
AUGUST 3, 2013 11:13

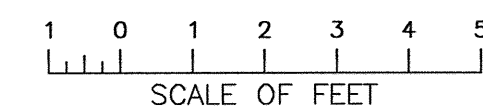


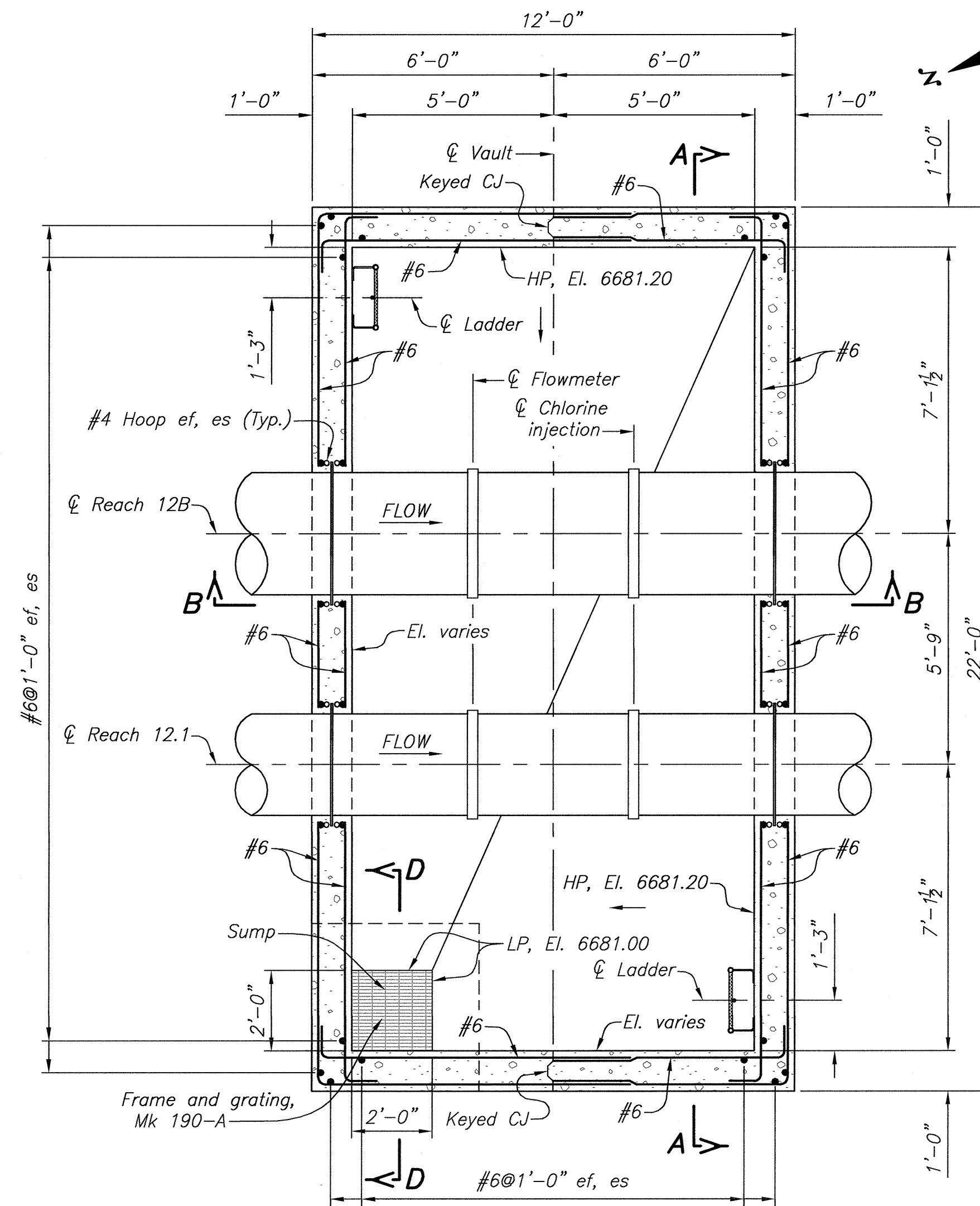
- NOTES**
- For Concrete General Notes, see (123).
 - For Reinforcement Design General Notes, see (127).
 - For Structural Design Data, see (101) and (102).
 - For location of Valve Vault No.1, see (99).
 - For ladder details, see (40-D-6601).
 - For control points and coordinates, see (100).
 - All vertical elevations are based on NAVD88 vertical datum.
 - For foundation excavation requirements, see (108).

REFERENCE DRAWINGS

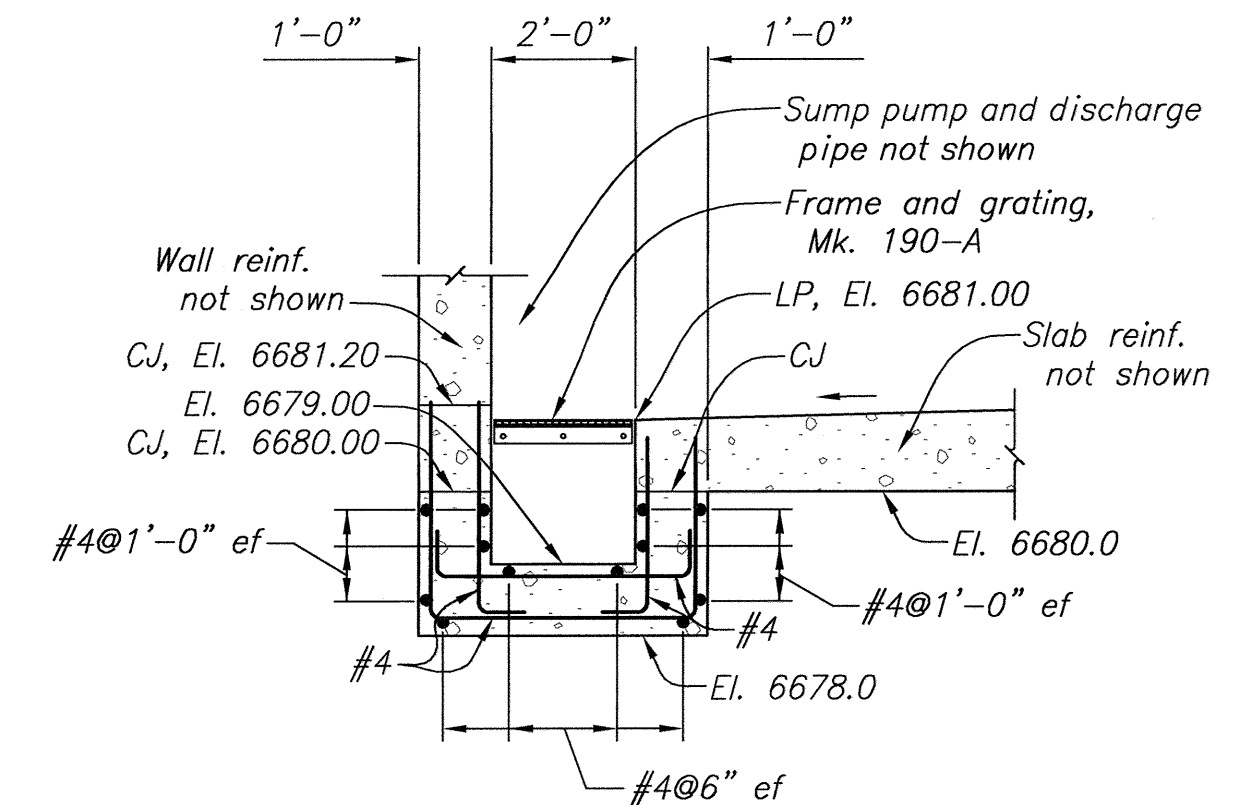
STEEL MANIFOLD
PLAN, SECTION, AND DETAILS 1695-D-206

EQUIPMENT VAULTS SUMP PUMP AND DISCHARGE PIPING
PLAN AND SECTION 1695-D-259

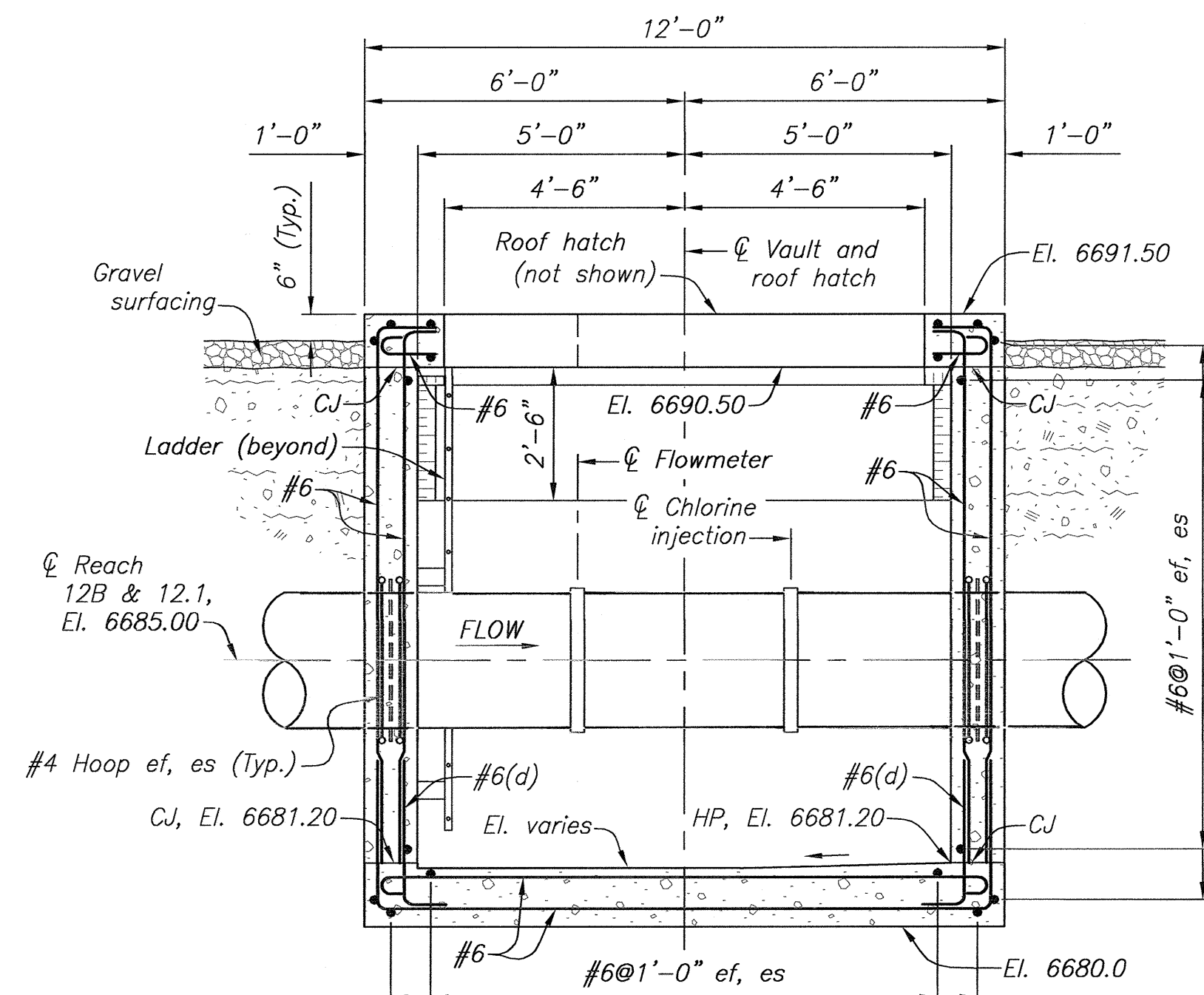




PLAN - EL. 6685.00



SECTION D-D



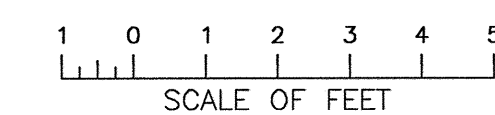
SECTION B-B

- ## NOTES
1. For Concrete General Notes, see (123).
 2. For Reinforcement Design General Notes, see (127).
 3. For Structural Design Data, see (101) and (102).
 4. For location of Flowmeter Vault No.1, see (99).
 5. For ladder details, see (40-D-6601).
 6. For control points and coordinates, see (100).
 7. All vertical elevations are based on NAVD88 vertical datum.
 8. For foundation excavation requirements, see (108).

REFERENCE DRAWINGS

CHLORINATION SYSTEM PIPING
FLOWMETER VAULT NO. 1_ _ _ _ _ 1695-D-179

STEEL MANIFOLD
PLAN AND SECTIONS_ _ _ _ _ 1695-D-208

EQUIPMENT VAULTS SUMP PUMP AND DISCHARGE PIPING
PLAN AND SECTION _ _ _ _ _ 1695-D-259

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NEW MEXICO

**SAN JUAN LATERAL
TOHLAKAI PUMPING PLANT
FLOWMETER VAULT NO.1**

**CONCRETE OUTLINE AND REINFORCEMENT DESIGN
PLANS AND SECTIONS**

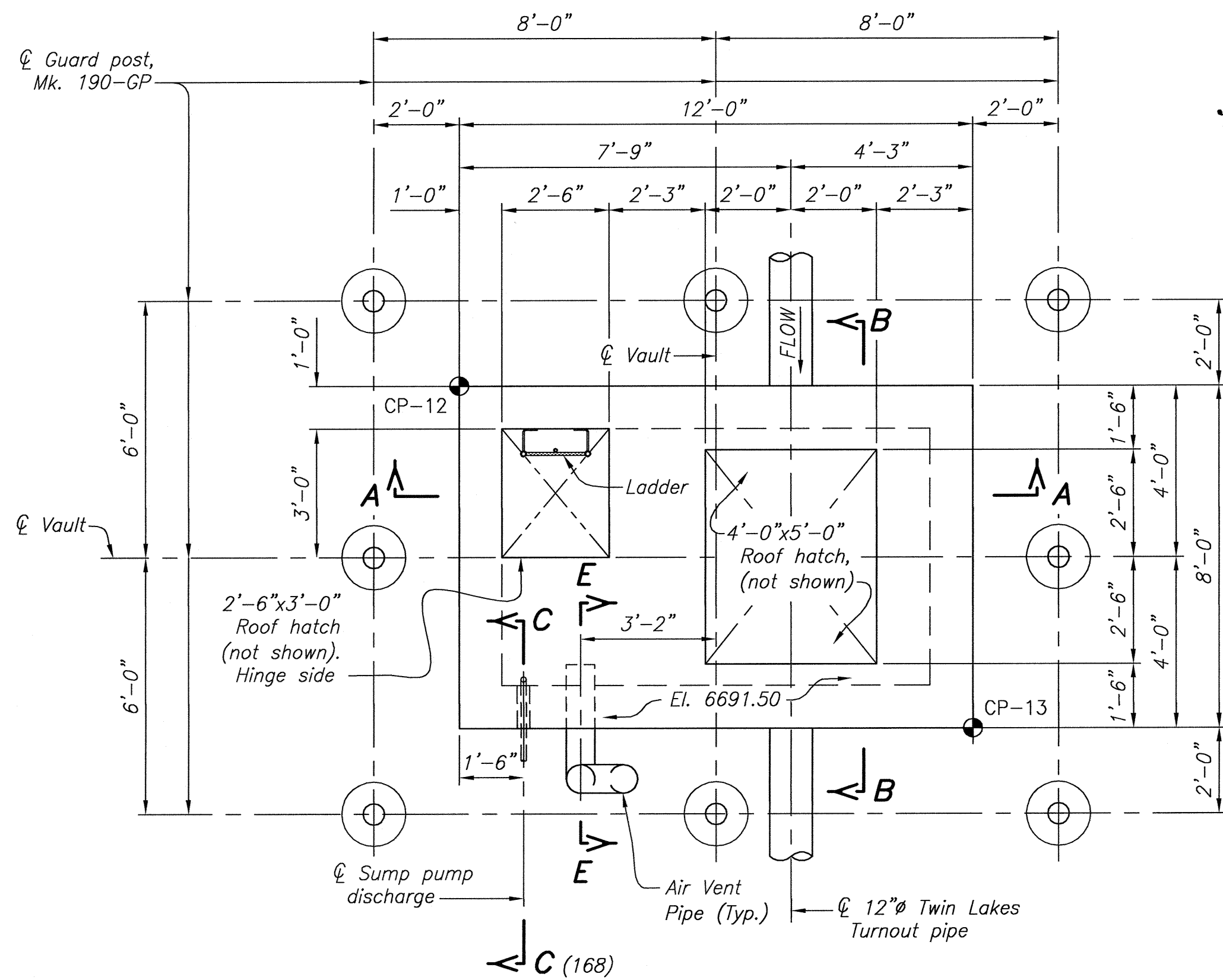
DESIGNED E. J. Jackson
DRAWN B. D. Van Ottersloo
CHECKED K. O. S. L. P.E.
TECH. APPR. Depp. Etc
APPROVED _____
PLANT STRUCTURES GROUP
DENVER, COLORADO 2013-08-05

**CONCRETE OUTLINE AND
REINFORCEMENT DESIGN
PLANS AND SECTIONS**

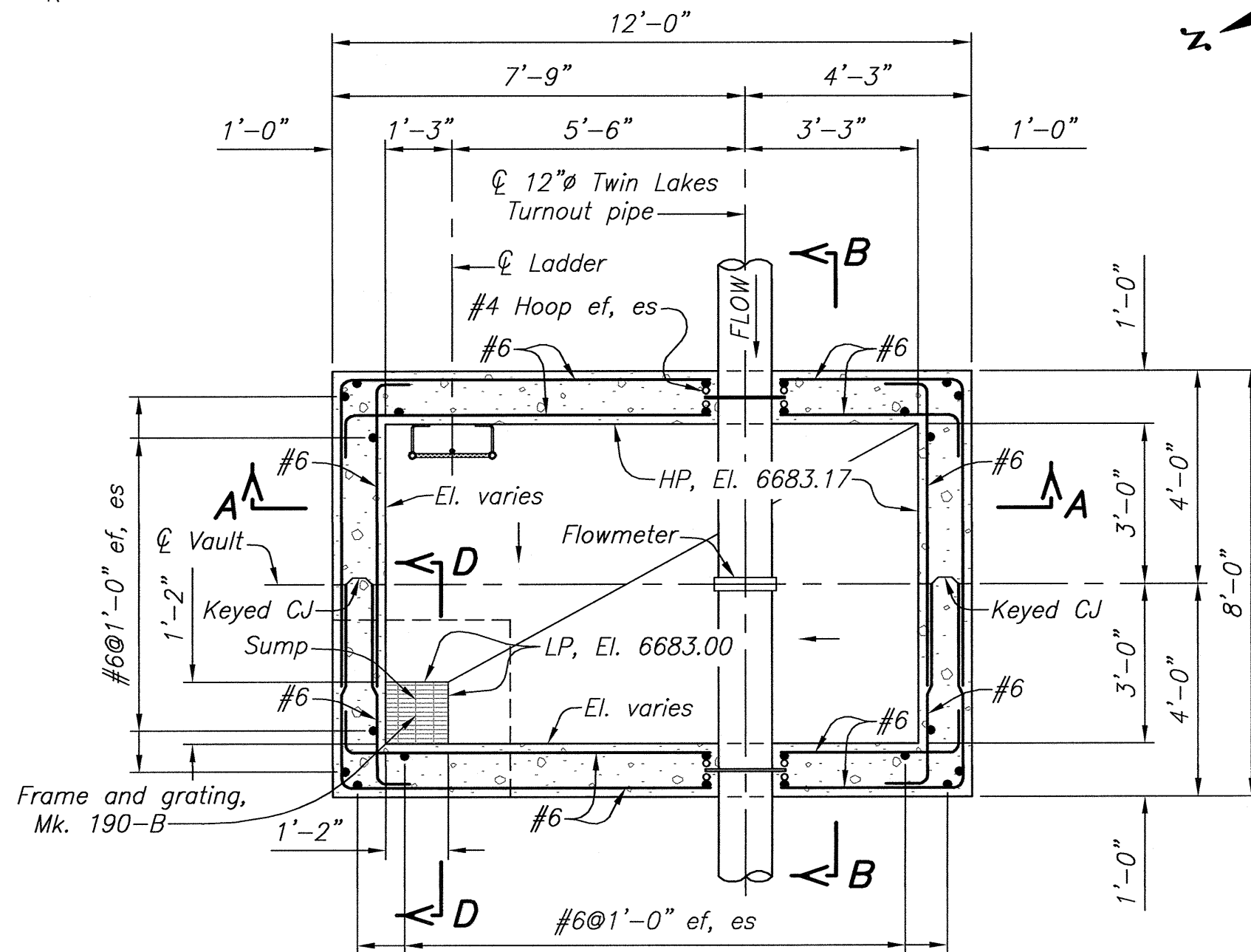
1695-D-171

SHEET 1 OF 1

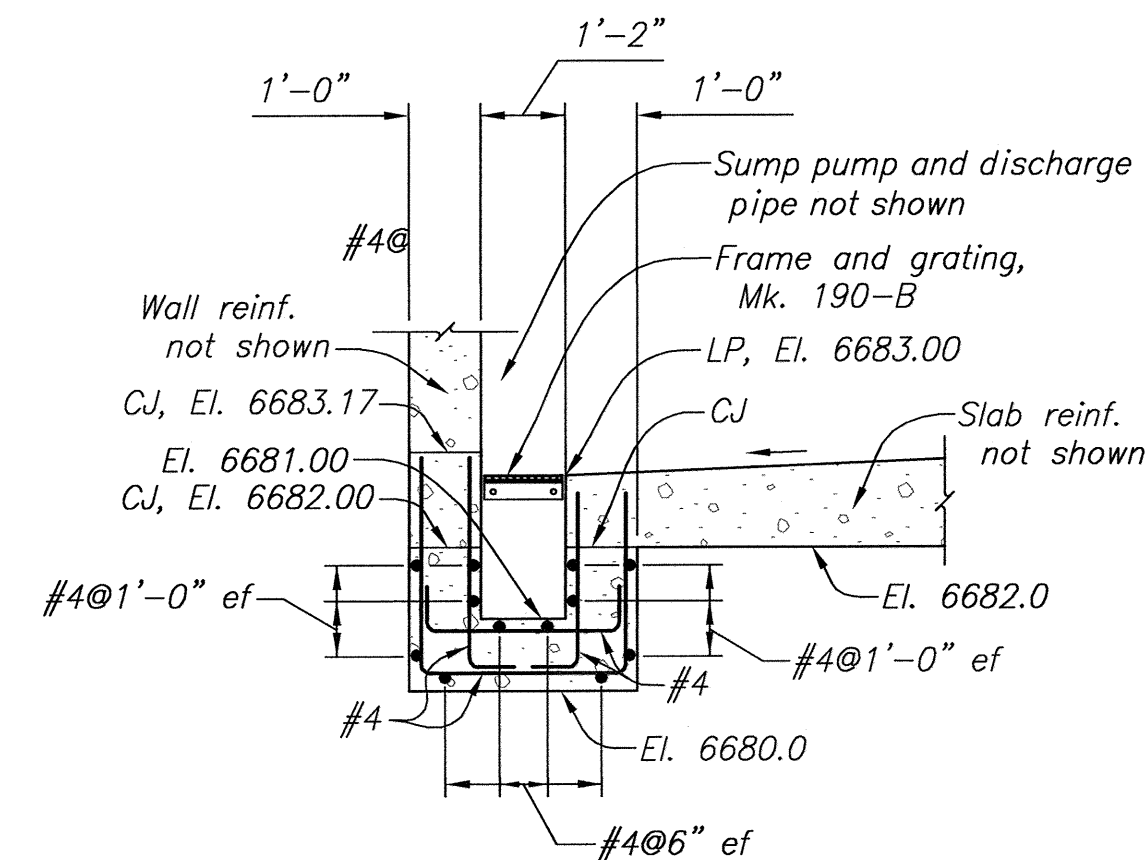
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 DATE AND TIME PLOTTED MAY 8, 2013 10:14
 PLOTTED BY



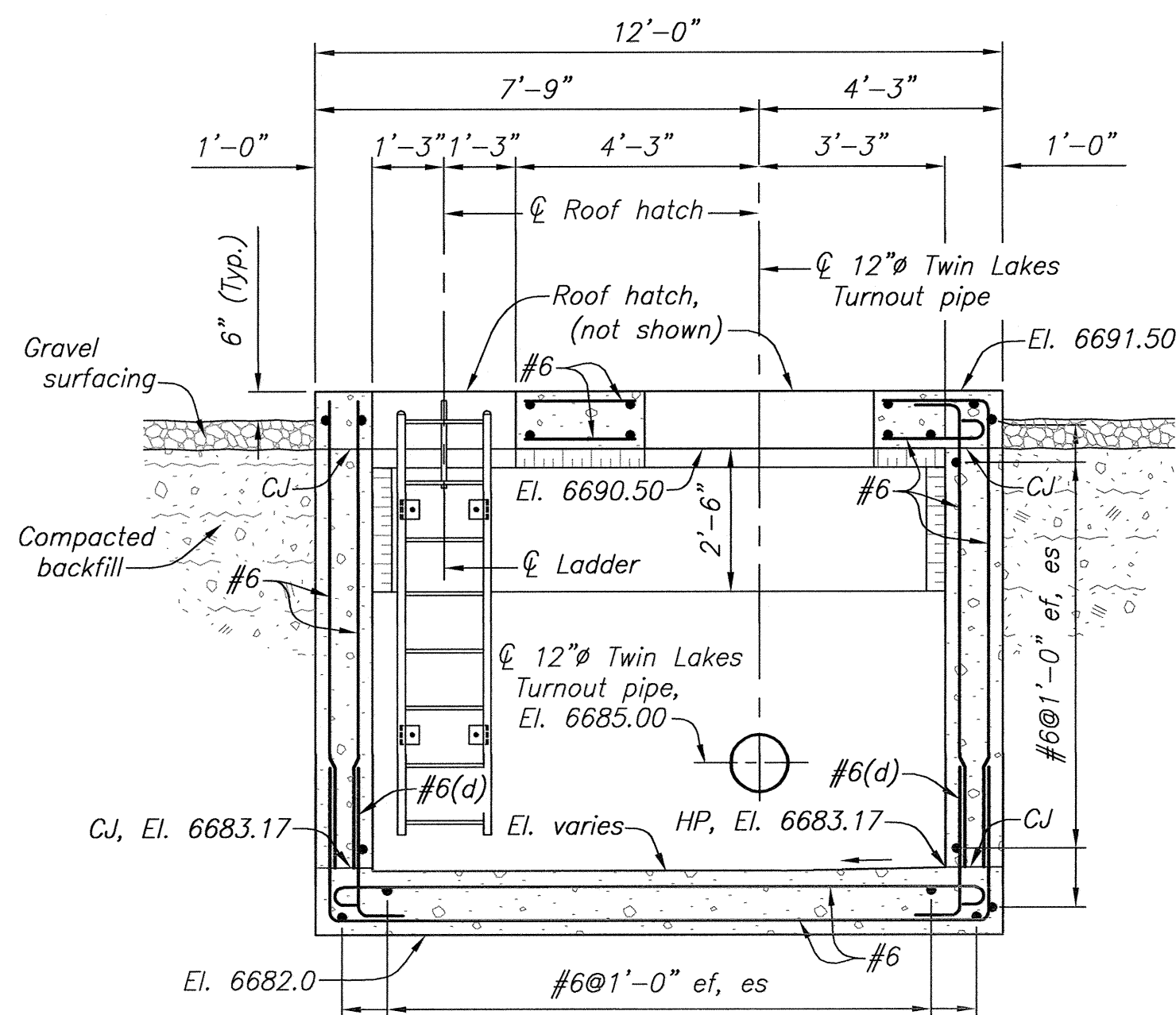
PLAN - EL. 6691.50



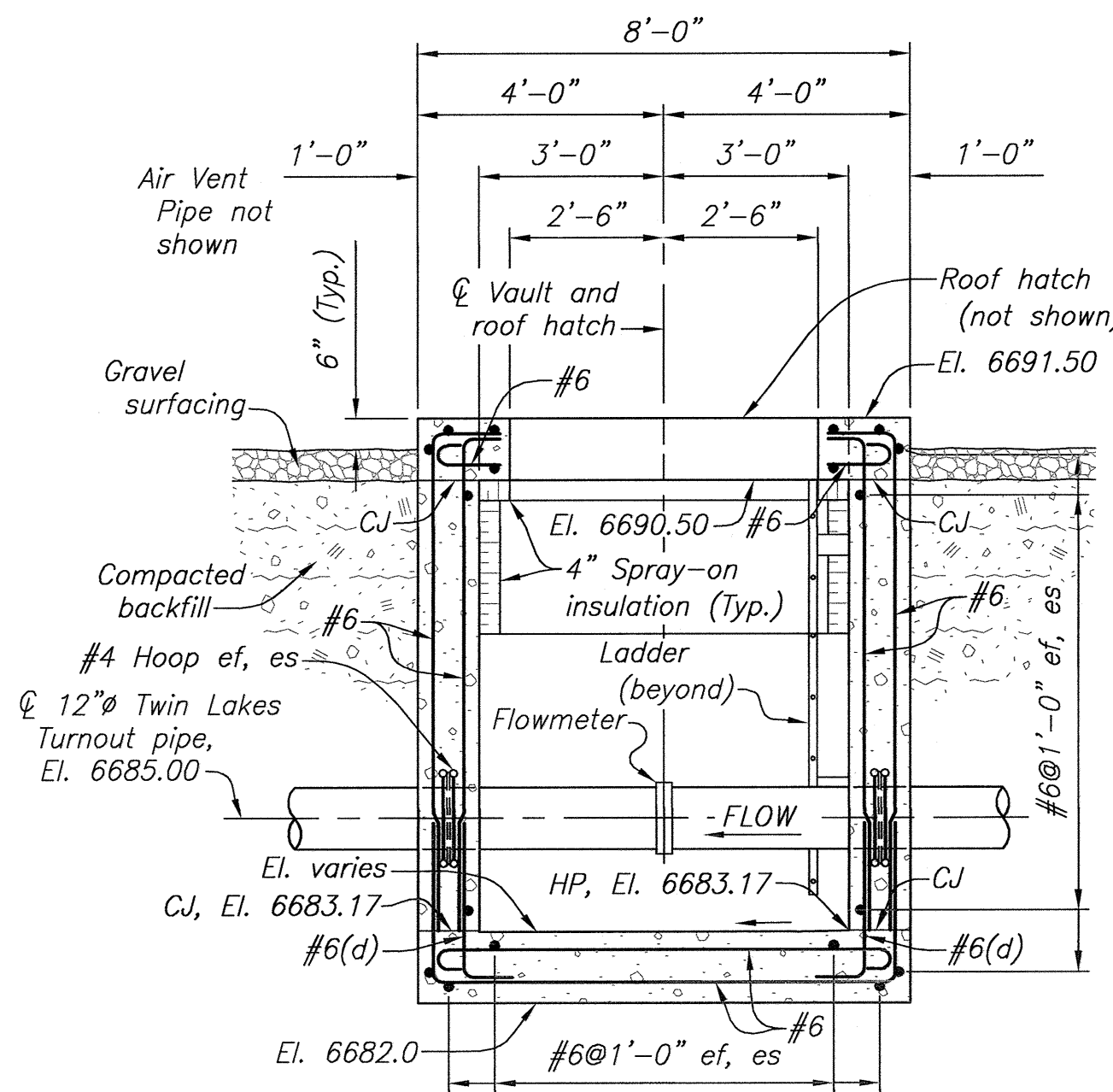
PLAN - EL. 6685.00



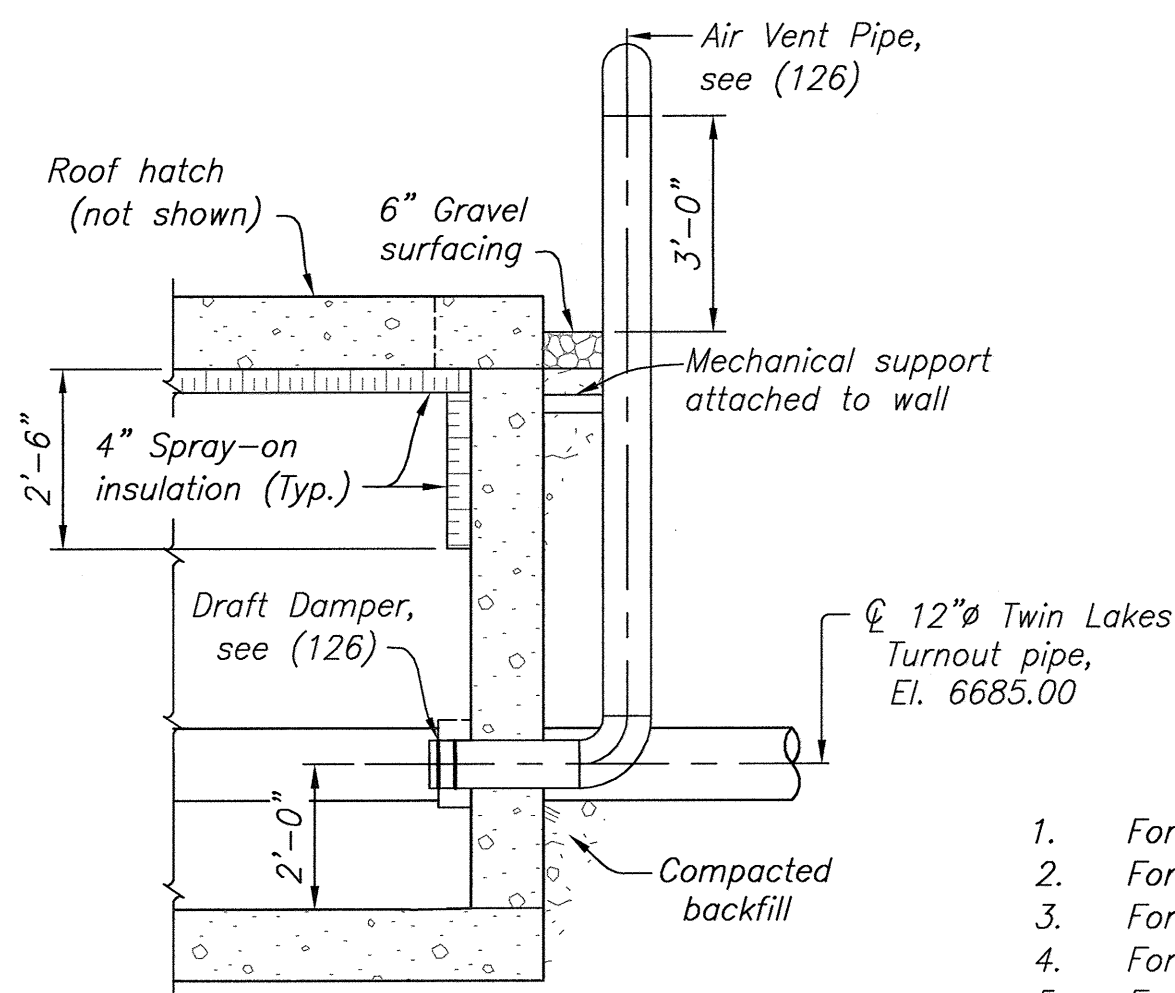
SECTION D-D



SECTION A-A



SECTION B-B



SECTION E-E

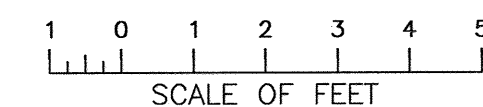
NOTES

1. For Concrete General Notes, see (123).
2. For Reinforcement Design General Notes, see (127).
3. For Structural Design Data, see (101) and (102).
4. For location of Flowmeter Vault No.2, see (99).
5. For ladder details, see (40-D-6601).
6. For control points and coordinates, see (100).
7. All vertical elevations are based on NAVD88 vertical datum.
8. For foundation excavation requirements, see (108).

REFERENCE DRAWINGS

STEEL MANIFOLD - TWIN LAKES TURNOUT
PLAN AND SECTIONS _____ 1695-D-216

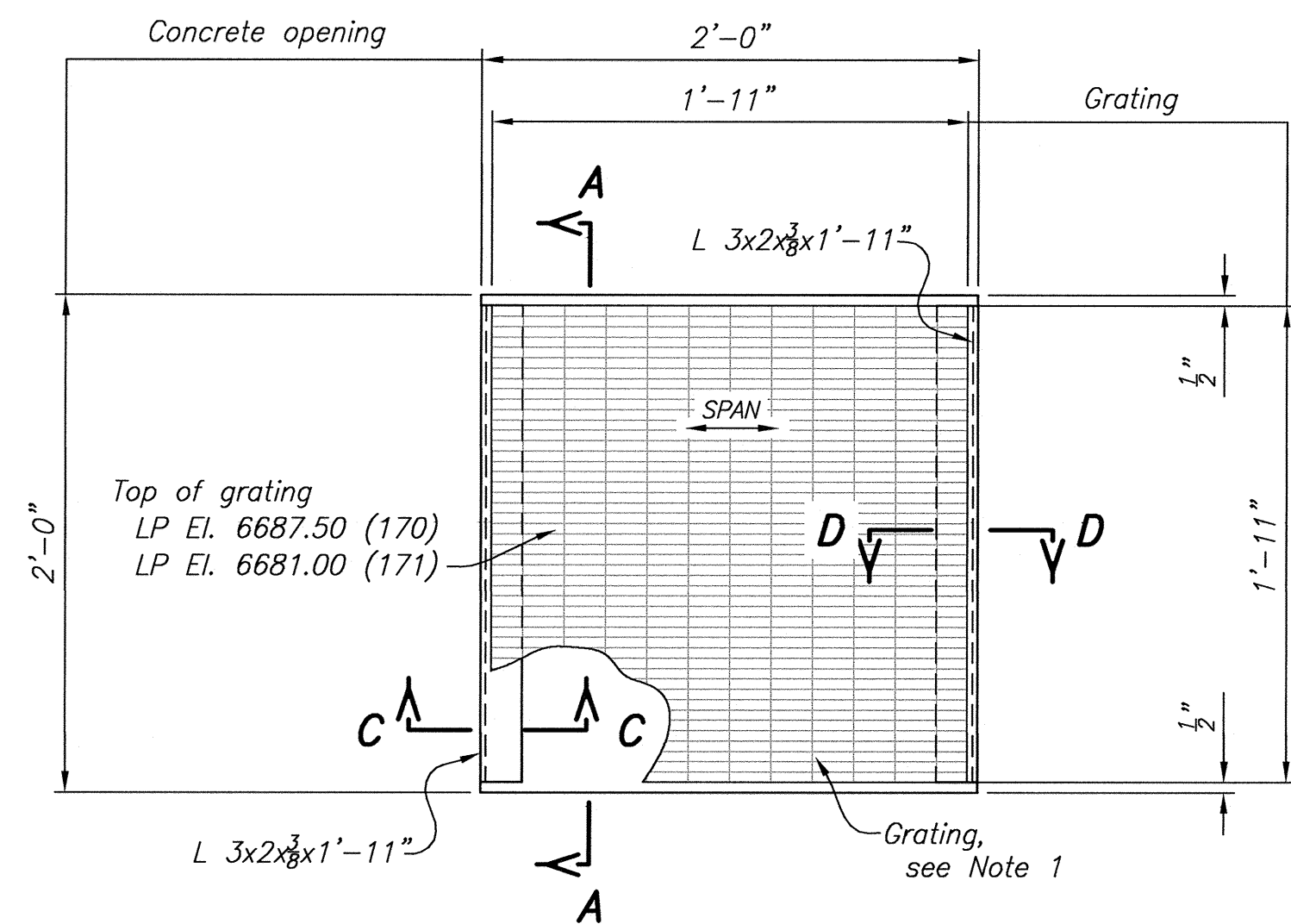
EQUIPMENT VAULTS SUMP PUMP AND DISCHARGE PIPING
PLAN AND SECTION _____ 1695-D-259



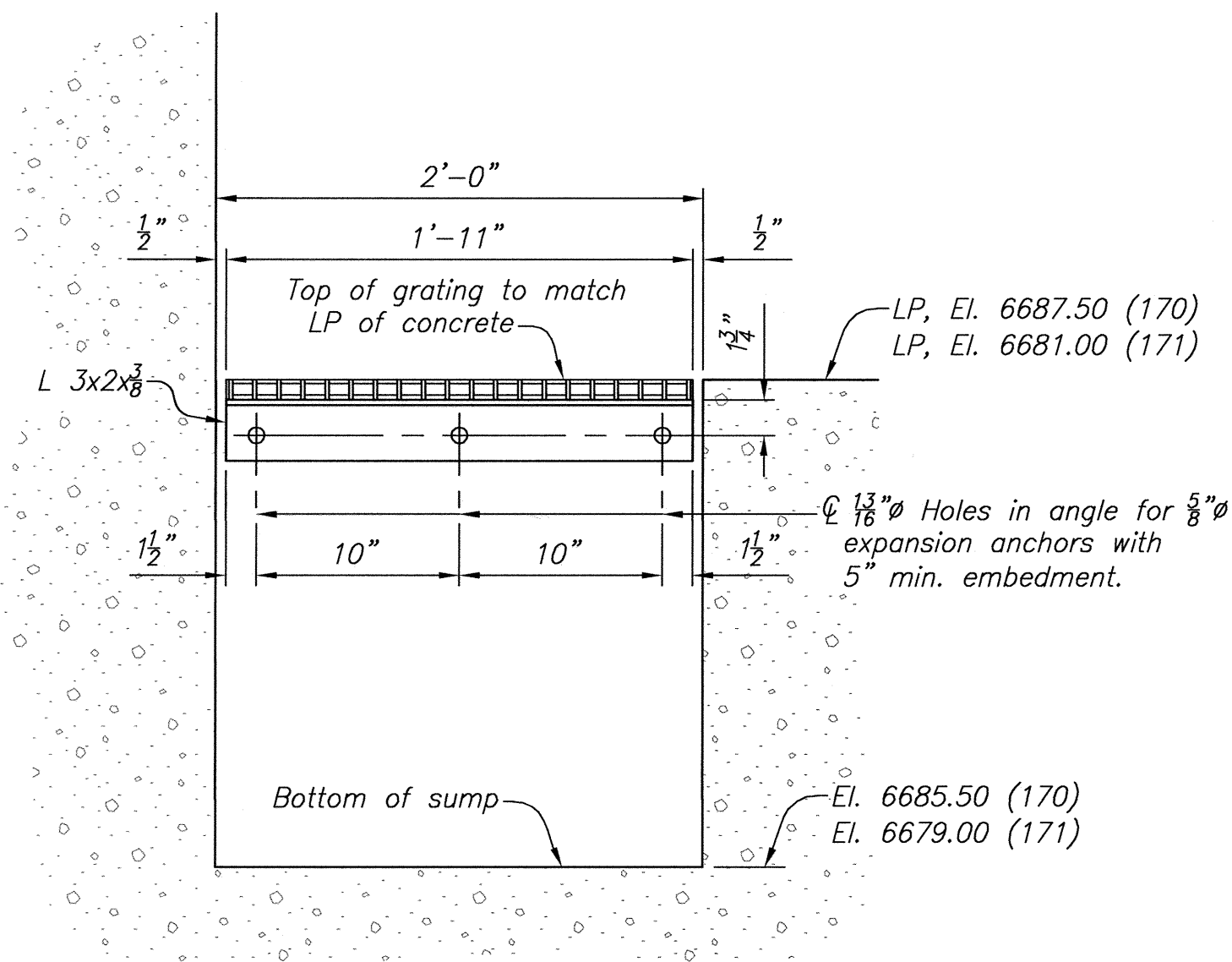
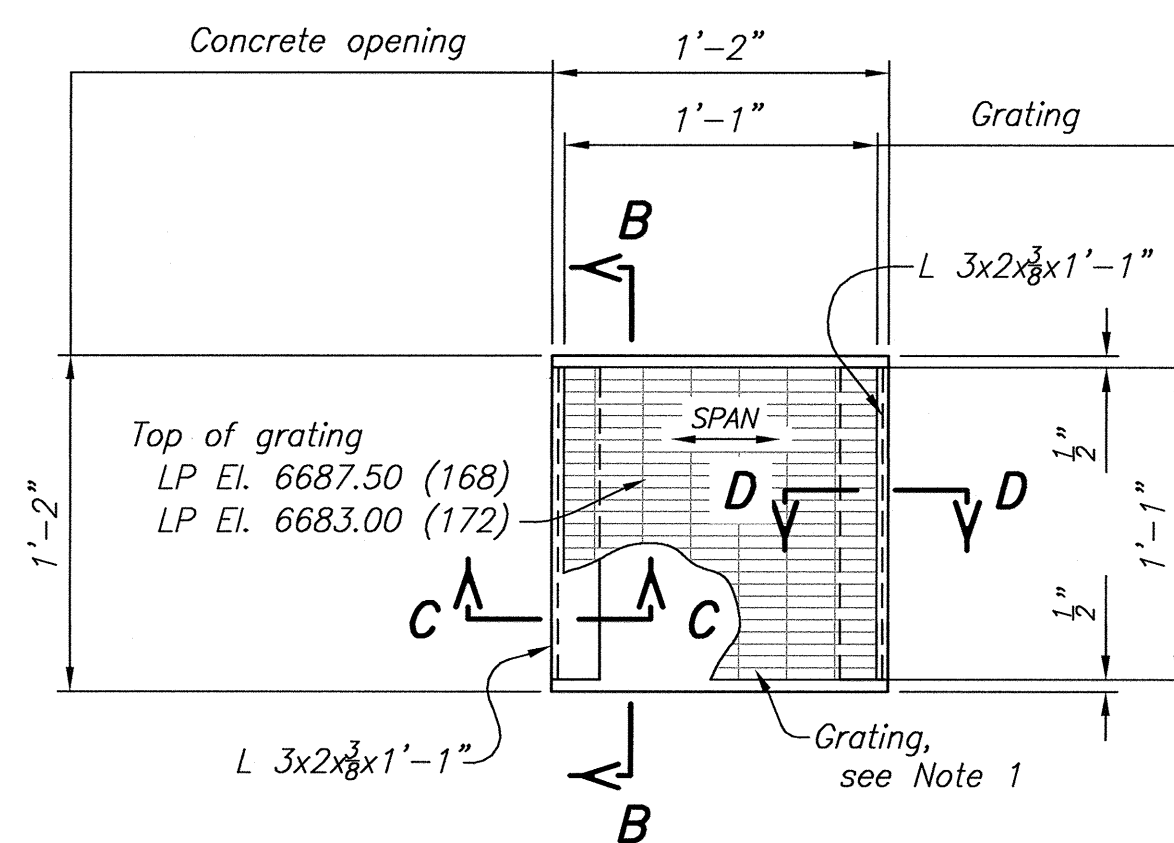
CONCRETE OUTLINE AND
REINFORCEMENT DESIGN
PLANS AND SECTIONS

1695-D-172

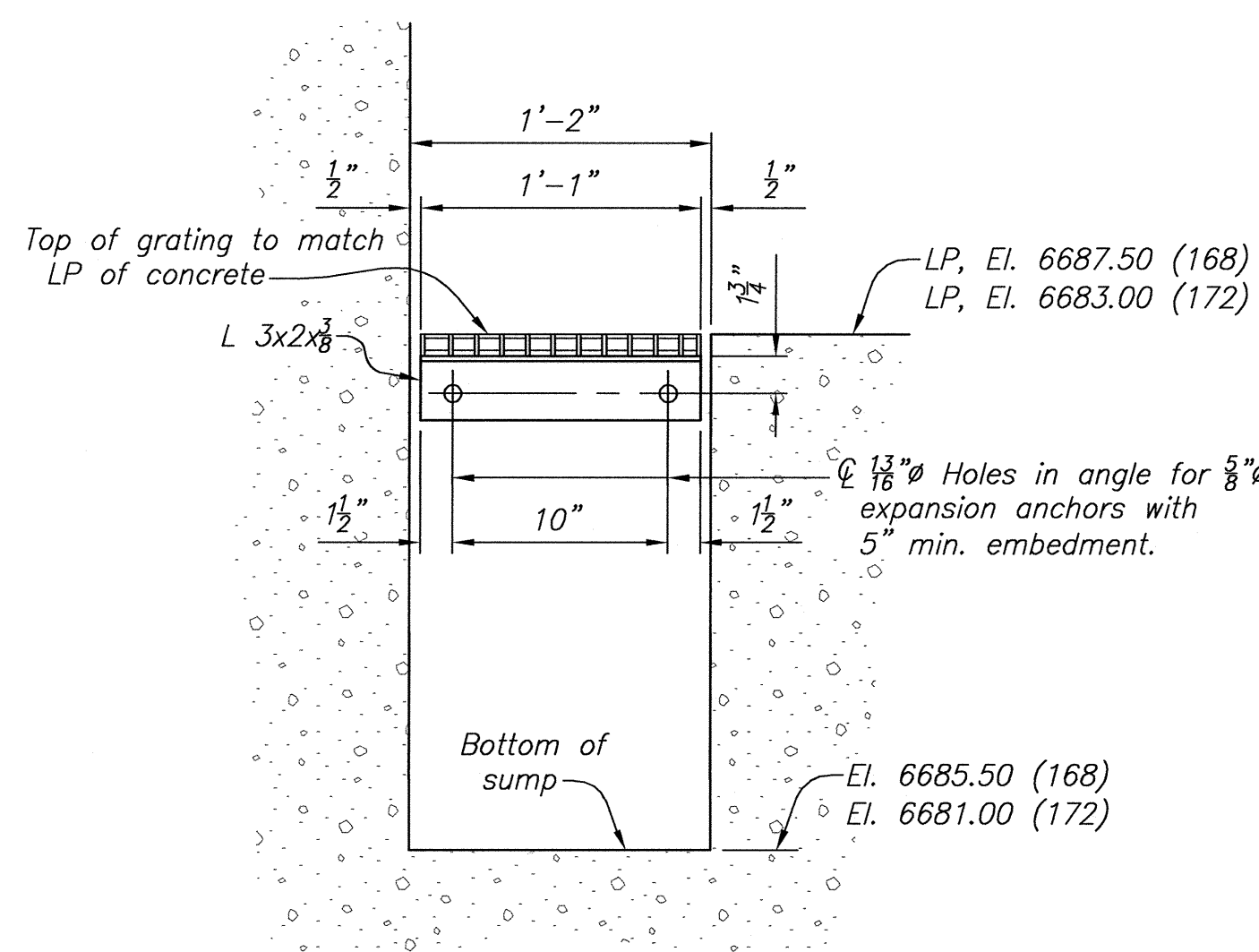
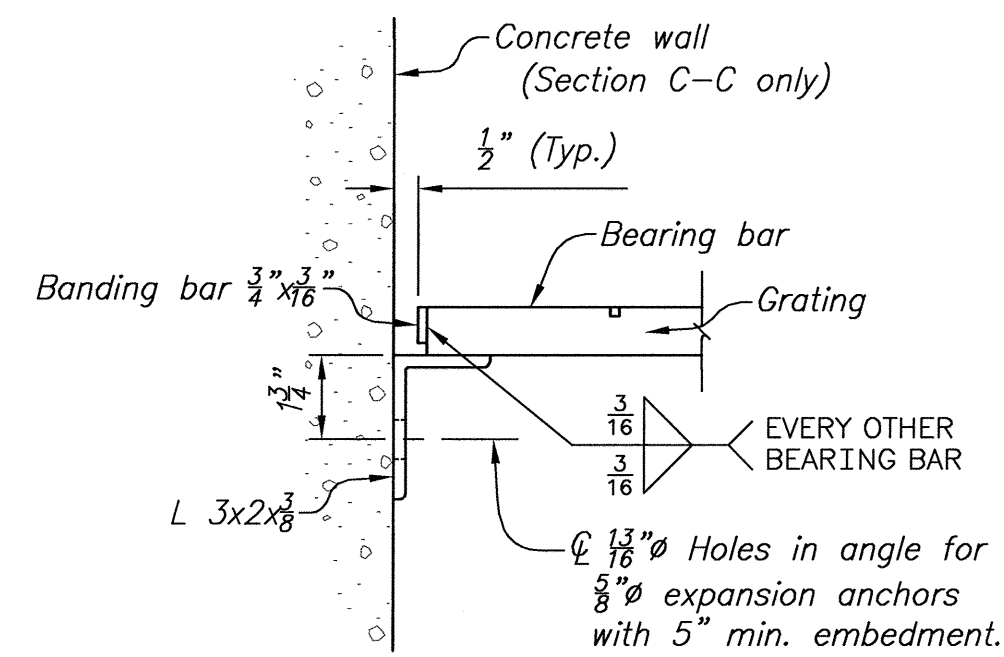
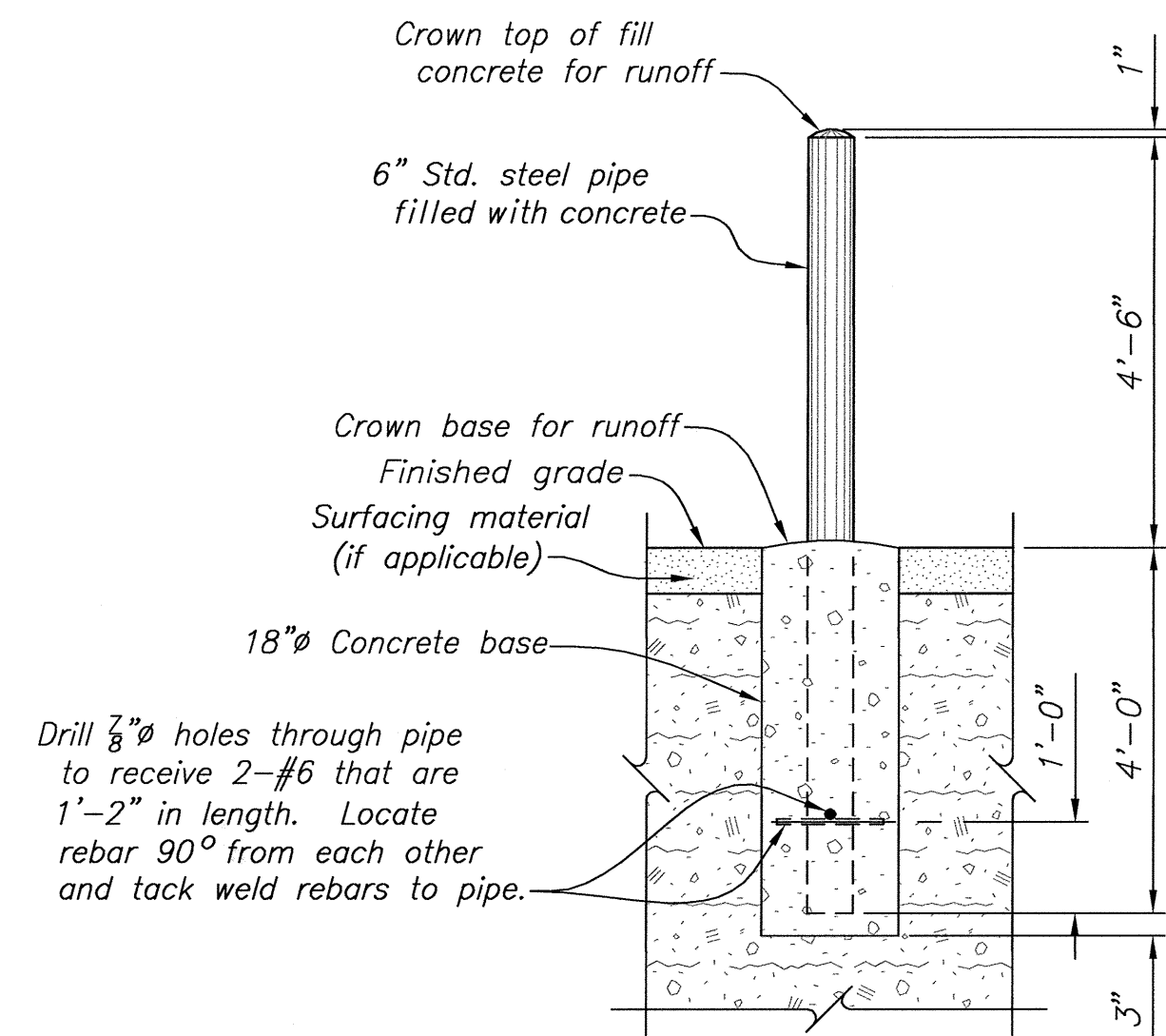
SHEET 1 OF 1

**ANGLES AND GRATING FOR SUMP PIT**

TWO REQ'D, MK. 190-A
Design Live Load = 100 Lbs/sq. ft.
For location, see (170) and (171).

**SECTION A-A****ANGLES AND GRATING FOR SUMP PIT**

TWO REQ'D, MK. 190-B
Design Live Load = 100 Lbs/sq. ft.
For location, see (168) and (172).

**SECTION B-B****SECTION C-C (AS SHOWN)****SECTION D-D (SIMILAR AND AS NOTED)****GUARD POST**

55 REQ'D, MK. 190-GP
Do Not Galvanize

GENERAL NOTES

These General Notes pertain to miscellaneous metalwork drawings.

All material is steel unless otherwise noted.

Details, welds, and other connections shown are typical for all similar conditions.

Dimensions shown are typical for similar details.

Galvanize all ferrous metalwork after fabrication unless noted otherwise. Provide vent holes in pipe or tube as required for galvanizing.

Design live load for gratings is 100 pounds per square foot (psf) unless noted otherwise.

NOTES

- Grating: Bearing bars $1\frac{1}{8}" @ 1\frac{1}{8}"$ on centers. Cross bars @ 4" on centers. Banding bars size as shown. Fasten each grating panel with 4 standard saddle clips and $\frac{1}{2}"$ threaded stud bolt with hex. nut and standard washers.

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**SAN JUAN LATERAL
TOHLAKAI PUMPING PLANT**
MISCELLANEOUS METALWORK
SUMP GRATING AND GUARD POST
PLANS AND SECTIONS

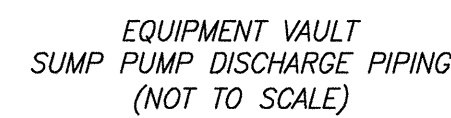
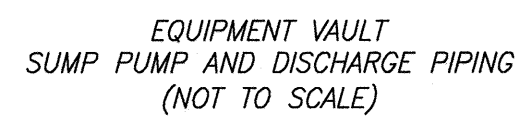
DESIGNED *Ronald J. Jaramila*
DRAWN *Ronald J. Jaramila*
CHECKED *R. J. Jaramila*
TECH. APPR. *R. J. Jaramila*
APPROVED *R. J. Jaramila*
PLANT STRUCTURES GROUP

DENVER, COLORADO 2013-08-05

**SUMP GRATINGS AND
GUARD POST
PLANS AND SECTIONS**

1695-D-190

SHEET 1 OF 2



1. *Typical drawing for equipment vault sumps. See reference drawings for specific sump dimensions, locations and elevations.*
2. *Sump pump unit discharge piping shall not interfere with removal of valve pit sump grating.*
3. *Wall supports for sump pump discharge piping shall be of galvanized steel construction with dielectric insulators.*
4. *Route discharge piping in accordance with Specification Section 33 11 16 – Site Water Utility Distribution Piping.*
5. *Adjust pump alarm and float switches in field as needed.*
6. *Pump high level alarm shall be located 1'–8" above finished floor. Pump on setting shall be 1'–6" above finished floor. Pump shut off shall be 6" above finished floor or per pump manufacturer's recommendation.*

TOHLAKAI PUMPING PLANT -	
SITE PLAN _____	1695-D-99
CHLORINE INJECTION VAULT NO.1 _____	1695-D-168
VALVE VAULT NO.1 _____	1695-D-170
FLOWMETER VAULT NO. 1 _____	1695-D-171
FLOWMETER VAULT NO.2 _____	1695-D-172
EQUIPMENT VAULTS, MISCELLANEOUS METAL	WORK -
SUMP GRATING & SUPPORT ANGLES -	1695-D-190
ELECTRICAL INSTALLATION -	
SITE CONDUIT LAYOUT _____	1695-D-247

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NEW MEXICO

**SAN JUAN LATERAL
TOHLAKAI PUMPING PLANT
EQUIPMENT VAULTS SUMP PUMP AND DISCHARGE PIPING
PLAN AND SECTION**

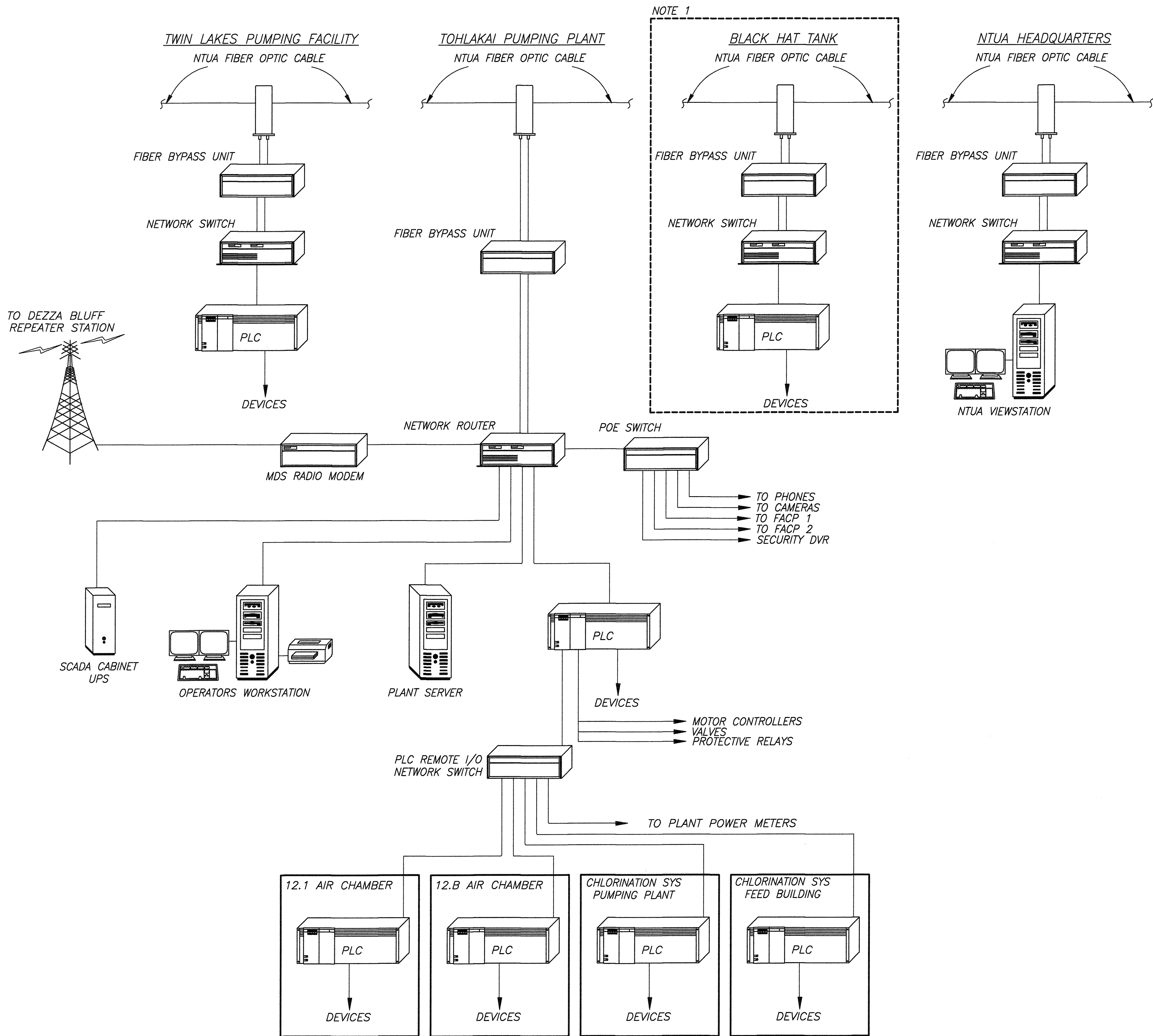
DESIGNED *[Signature]*
DRAWN *[Signature]*
CHECKED *[Signature]*
ECH. APPR. *[Signature]* PATRICK DAWSON, P.E.
APPROVAL *[Signature]*
WILLIAM G. McSTRAW, P.E.
MANAGER, MECHANICAL EQUIPMENT GROUP
DENVER, COLORADO July 30, 2013

**EQUIPMENT VAULTS
SUMP PUMP AND DISCHARGE
PIPING**

1695-D-259

SHEET 1 OF 1

CAD SYSTEM
AutoCAD Rel. 19.0s
CAD FILENAME
1695-D-259.dwg



NOTES

1. Installed under another contract.
2. Drawing shows general equipment arrangement only.

REFERENCE DRAWINGS

PHONE SYSTEM LAYOUT _____ 1695-D-283
SUB-MASTERSTATION CABINET LAYOUT _____ 1695-D-284
PUMPING PLANT PLC RACK 1 AND RACK 2 _____ 1695-D-313
CHLORINE FEED FACILITY PLC RACK 3 _____ 1695-D-314
AIR CHAMBER PLC RACK 4 AND RACK 5 _____ 1695-D-315

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NEW MEXICO
**SAN JUAN LATERAL
TOHLAKAI PUMPING PLANT**
ELECTRICAL SYSTEMS
SCADA SYSTEM
PUMPING PLANT OVERVIEW

DESIGNED R.P. TINETTI
DRAWN R.P. TINETTI
CHECKED S.M. COBERLY
TECH. APPR. [Signature]
APPROVED [Signature]
MANAGER, HYDROPOWER DIAG. AND SCADA GROUP
DENVER, COLORADO 2013-08-02

SCADA SYSTEM
PUMPING PLANT OVERVIEW

1695-D-282

SHEET 1 OF 1

NOTES

1. Phone communication system shall be Ethernet. All phone connections shall be through a central POE switch located in the server rack.
2. Provide Ethernet outlets for future Internet access.

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NEW MEXICO
**SAN JUAN LATERAL
TOHLAKAI PUMPING PLANT**
ELECTRICAL SYSTEMS
SCADA SYSTEM OVERVIEW
TELEPHONE SYSTEM OVERVIEW

DESIGNED R.P. TINETTI
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TECH. APPR. [Signature] P.E.
APPROVED [Signature]
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REFERENCE DRAWINGS

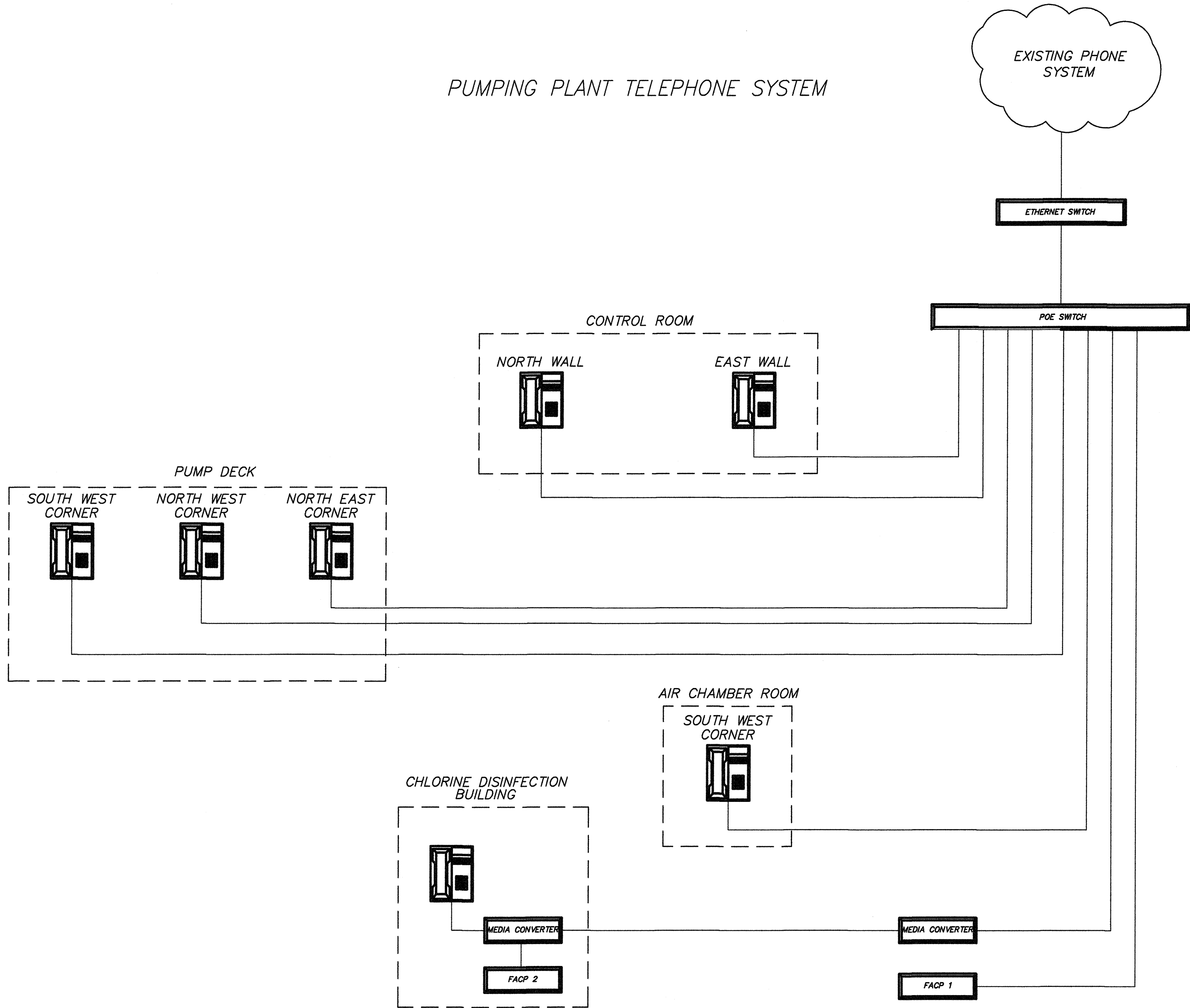
SCADA SYSTEM OVERVIEW _____ 1695-D-282
SUB-MASTERSTATION CABINET LAYOUT _____ 1695-D-284
ELECTRICAL INSTALLATION, WIRING DEVICES _____ 1695-D-293

TELEPHONE SYSTEM OVERVIEW

1695-D-283

SHEET 1 OF 1

PUMPING PLANT TELEPHONE SYSTEM



EQUIPMENT DESCRIPTION

- 1. Terminal Blocks
- 2. Ground Bus Bar
- 3. 4-20 mA Signal Splitters
- 4. I/O Transient Protection Devices
- 5. 24 VDC Power Supply
- 6. Modicon PLC
- 7. Uninterruptible Power Supply
- 8. Fiber Optic Splice Panel
- 9. CAT 6 Patch Panel
- 10. Managed Ethernet Switch with Fiber Ports
- 11. MDS Radio Modem
- 12. Secure Router with Firewall/NAT and VPN
- 13. Digital Video Recorder
- 14. Pumping Plant Server
- 15. Outlet Strip

NOTES

- 1. Drawing shows general equipment arrangement only. Exact layout shall be determined by the Contractor to meet the specification requirements.
- 2. Numbers enclosed in a circle designates equipment descriptions.

REFERENCE DRAWINGS

SCADA SYSTEM OVERVIEW _____ 1695-D-282
PHONE SYSTEM LAYOUT _____ 1695-D-283

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SAN JUAN LATERAL
TOHLAKAI PUMPING PLANT
ELECTRICAL SYSTEMS
SCADA SYSTEM
SUB-MASTERSTATION CABINET LAYOUT

DESIGNED R.P. TINETTI
DRAWN R.P. TINETTI
CHECKED S.M. COBERLY
TECH. APPR. [Signature] R.E.
APPROVED [Signature]
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DENVER, COLORADO 2013-08-02

SUB-MASTERSTATION
CABINET LAYOUT

1695-D-284

SHEET 1 OF 1

CITY OF GALLUP CABINET

(Populated By Others)

I/O TERMINATION CABINET
(SHARED)

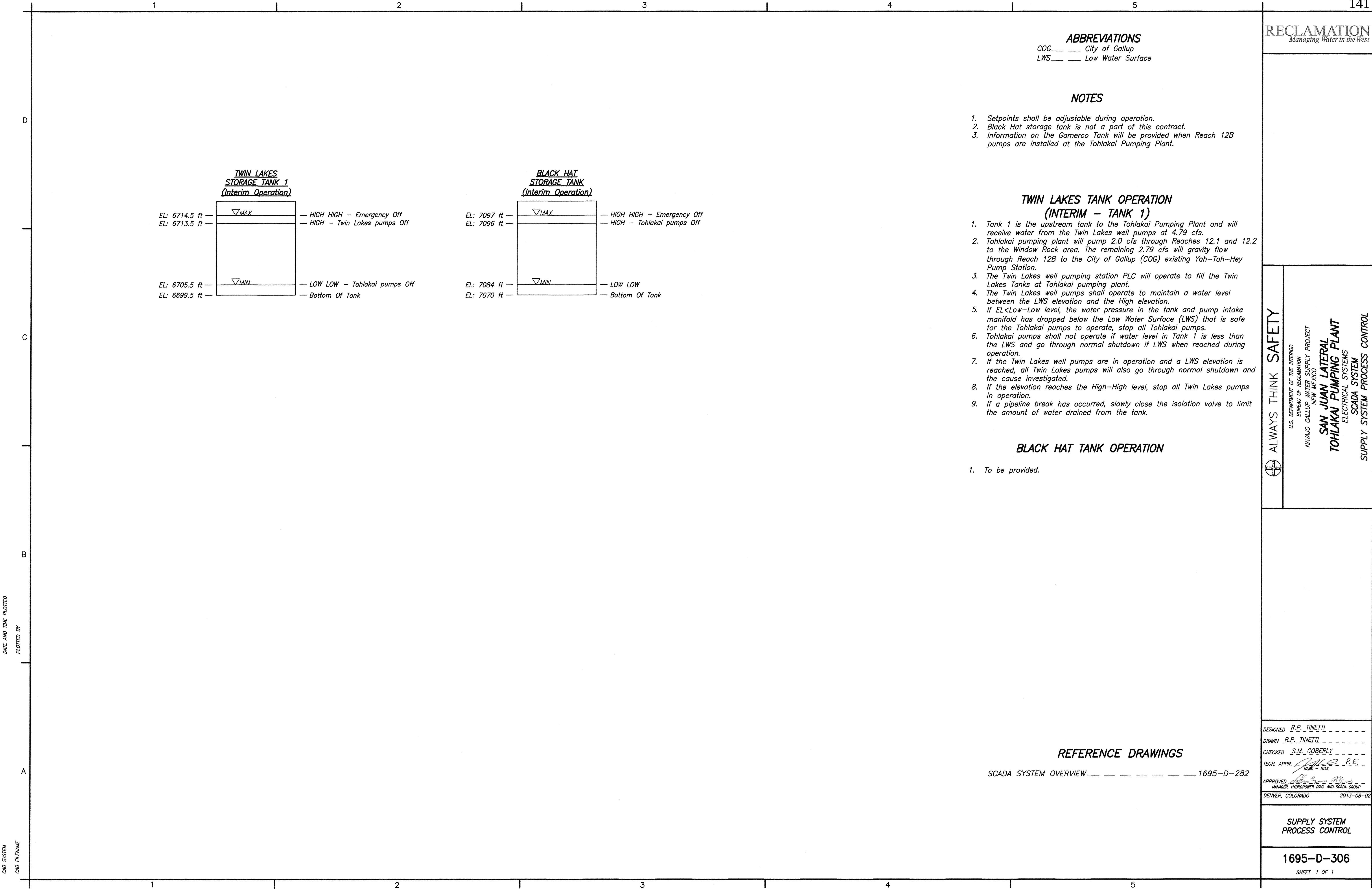
NTUA SCADA CABINET

NETWORK CABINET

DATE AND TIME PLOTTED
PLOTTED BY

A

CAD SYSTEM
CAD FILENAME



RECLAMATION

Managing Water in the West

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BUREAU OF RECLAMATION

NAVAJO GALLUP WATER SUPPLY PROJECT

NEW MEXICO

SAN JUAN LATERAL

TOHLAKAI PUMPING PLANT

ELECTRICAL SYSTEMS

SCADA SYSTEM

SUPPLY SYSTEM PROCESS CONTROL

DESIGNED R.P. TINETTI

DRAWN R.P. TINETTI

CHECKED S.M. COBERLY

TECH. APPR. [Signature] P.E.

APPROVED [Signature] P.E.

MANAGER, HYDROPOWER DIAG. AND SCADA GROUP

DENVER, COLORADO

2013-08-02

SUPPLY SYSTEM

PROCESS CONTROL

1695–D–306

SHEET 1 OF 1

DATE AND TIME PLOTTED

PLOTTED BY

CAD SYSTEM

CAD FILENAME

NOTES

1. Cable coiling assemblies shall be anchored in the walls of the splice enclosure pullbox.
2. Pullboxes shall be located a minimum of 6 feet from the base of the transmission line structure (pole).
3. Exact pullbox location to be coordinated with Contracting Officer's Representative. See drawing 1695-D-247 Electrical Site Plan.
4. Pole mounted conduit systems shall be in accordance with drawings referenced below.
5. All-dielectric fiber optic cable shall be coiled, on each cable coiling system, in each pullbox, in accordance with the specifications paragraph
6. Replace gravel surfacing where required to match existing surfacing
7. Do not compact gravelfill in pullboxes.
8. PVC conduit.

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SAN JUAN LATERAL
TOHLAKAI PUMPING PLANT
ELECTRICAL SYSTEMS
FIBER OPTIC CABLE PULLBOX
PLAN, SECTION, AND DETAIL

REV NO

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CHECKED S.M. COBERLY
TECH. APPR. [Signature]
APPROVED [Signature]
MANAGER, HYDROPOWER DIAG. AND SCADA GROUP
DENVER, COLORADO 2013-08-02

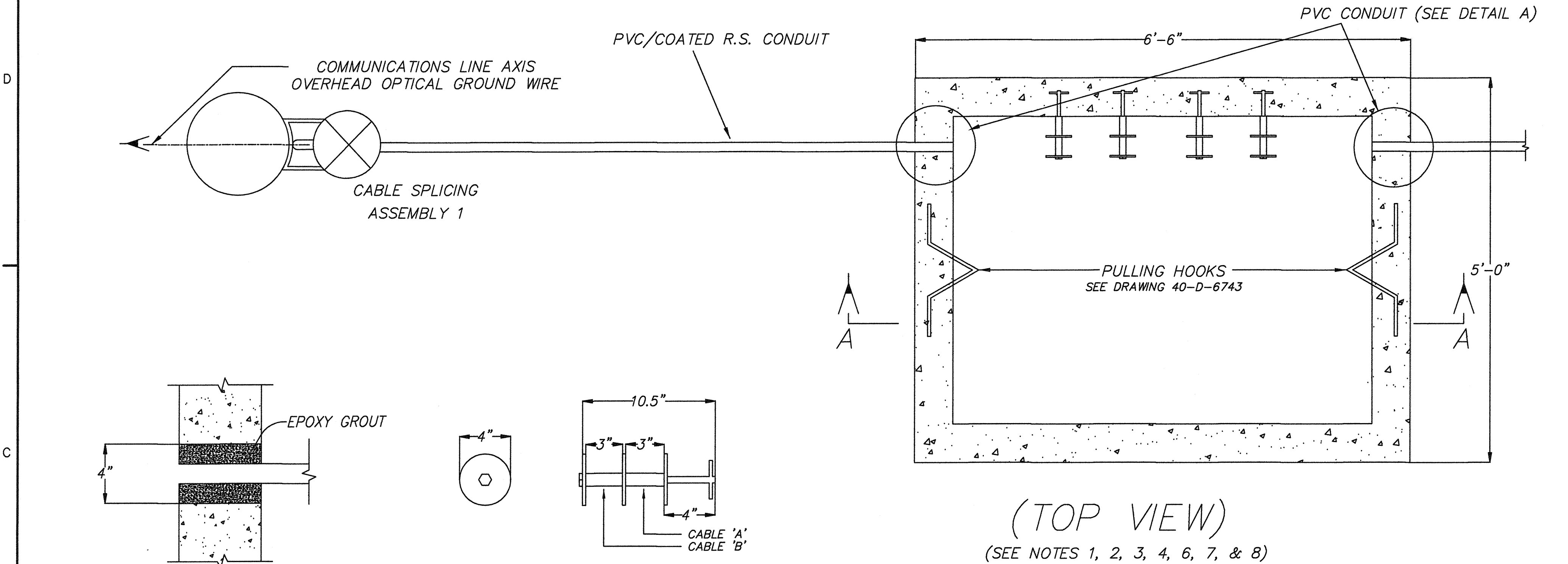
FIBER OPTIC CABLE PULLBOX
PLAN, SECTION, AND DETAIL

1695-D-307

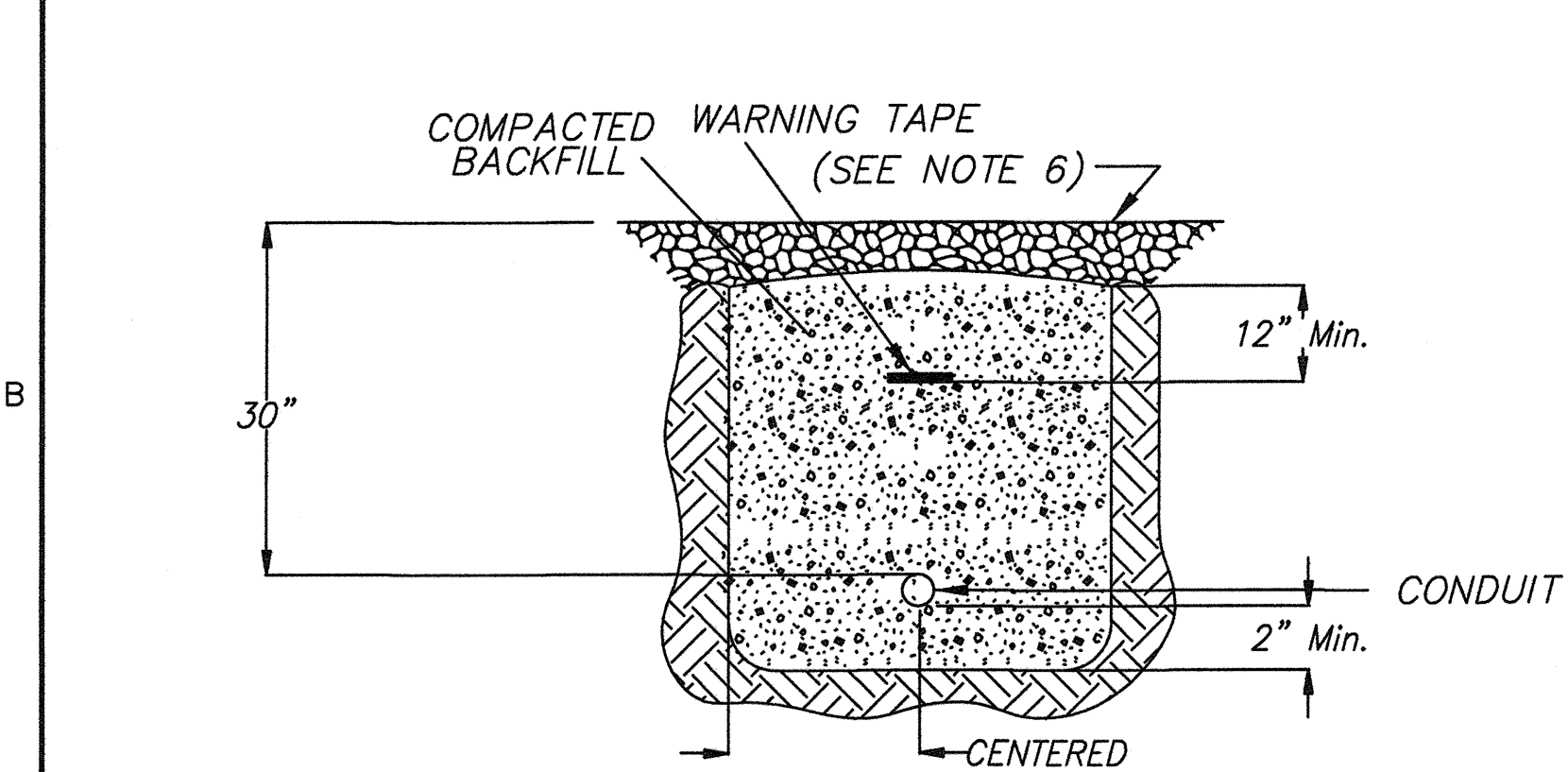
SHEET 1 OF 1

REFERENCE DRAWINGS

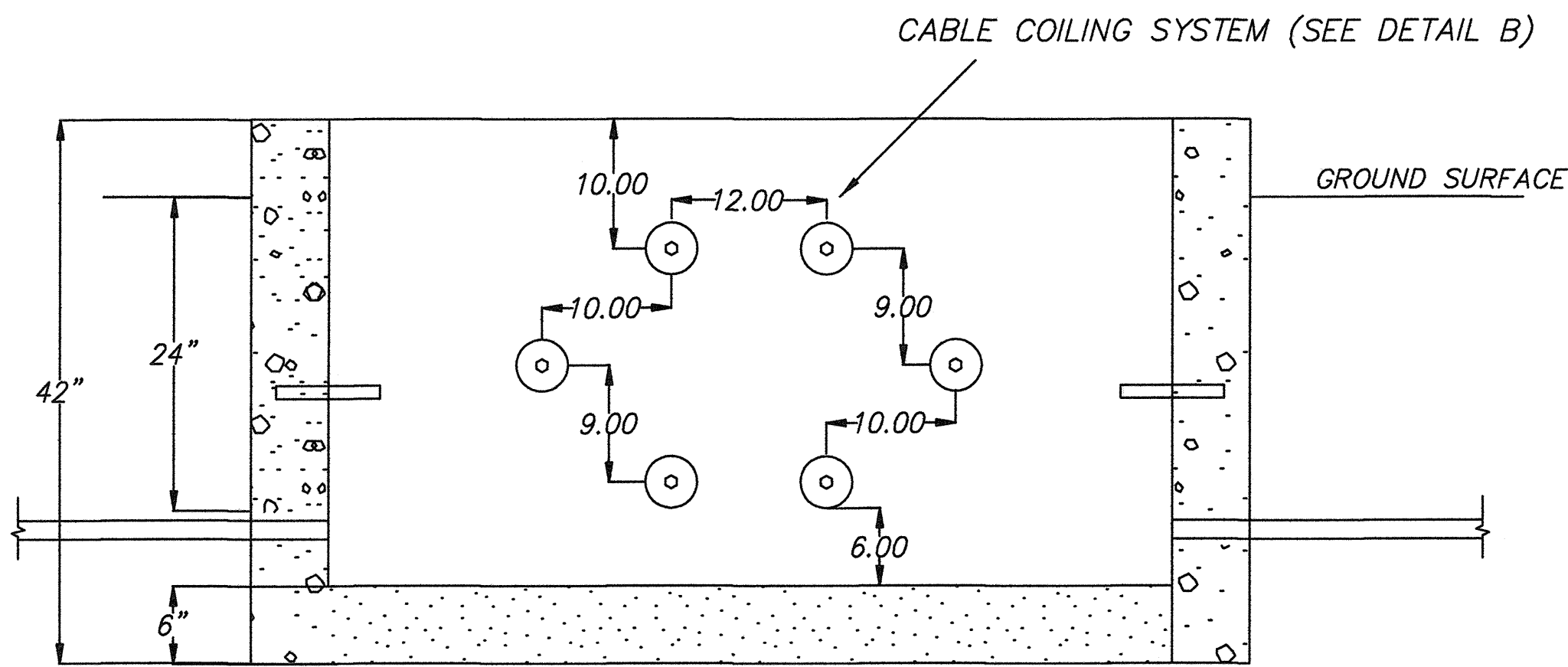
ELECTRICAL SITE PLAN _____ 1695-D-247
POLE-MOUNTED CABLE SPLICING ASSEMBLY _____ 1695-D-308



(TOP VIEW)
(SEE NOTES 1, 2, 3, 4, 6, 7, & 8)



TYPICAL CONDUIT TRENCH



SECTION A-A
(SIDE VIEW)
(SEE NOTES 1, 2, 3, 4, 5, 7, & 8)

DATE AND TIME PLOTTED _____
PLOTTED BY _____
CAD SYSTEM _____
CAD FILENAME _____

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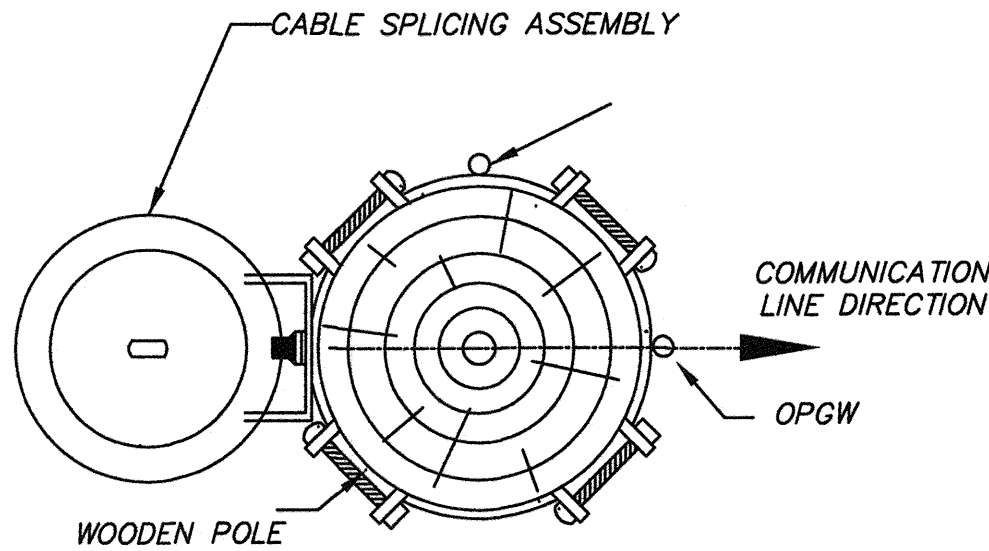


NOTES

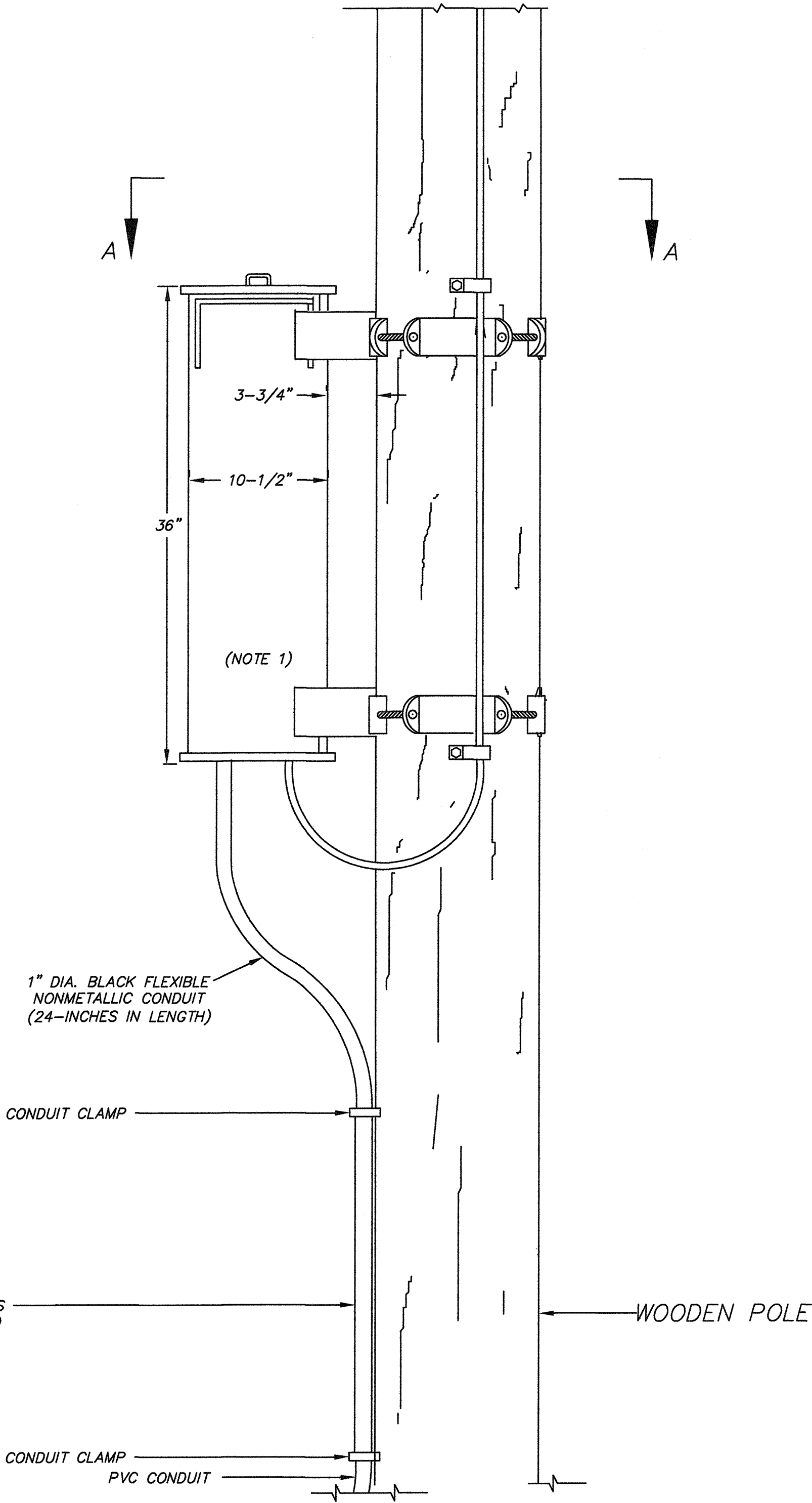
- For information only. Provided by others.
- The contractor shall furnish and install conduit systems to splice into existing pole-mounted splice closure. Conduit shall be installed from splice closure to pullbox inside the plant facility yard fence.

REFERENCE DRAWINGS

ELECTRICAL SITE PLAN — — — — — 1695-D-247
FIBER OPTIC CABLE PULLBOX — — — — — 1695-D-307



TOP VIEW A-A
(WOODEN POLE)
(NOTE 1)

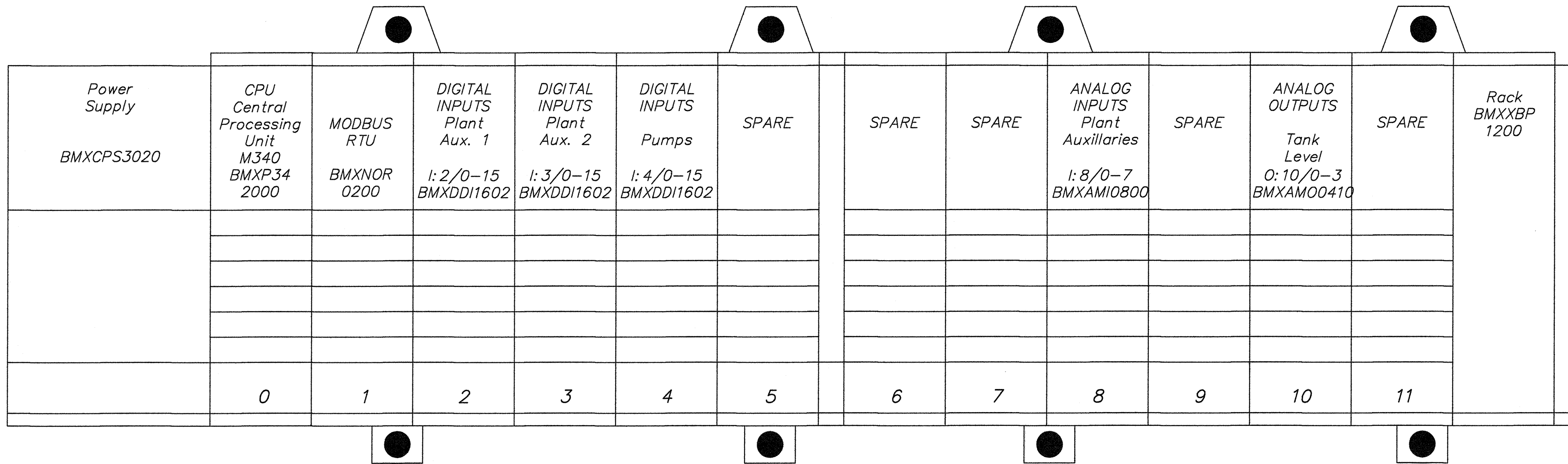


1" DIA. RIGID STEEL CONDUIT (STARTS 24-INCHES BELOW EACH BULLET RESISTANT ENCLOSURE AND CONTINUES TO 12-INCHES ABOVE THE GROUND SURFACE)

DATE AND TIME PLOTTED
PLOTTED BY

CAD SYSTEM
CAD FILENAME

PUMPING PLANT RACK 1
PLANT SYSTEMS
PLC CHASSIS LAYOUT



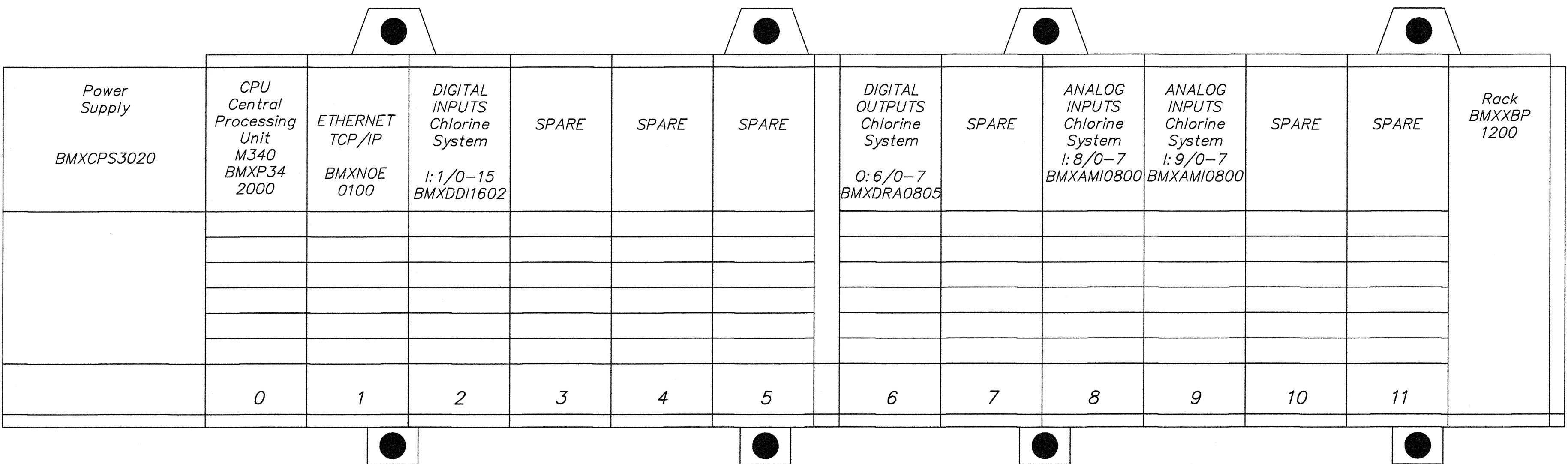
NOTES

1. PLC's are Government-Furnished equipment.
2. PLC's are Modicon M340 series PLCs
3. The Air Chamber chassis' are remote I/O for the Plant Systems PLC.
4. The Chlorine feed facility chassis is remote I/O for the Chlorine Systems PLC.

REFERENCE DRAWING LIST

PUMPING PLANT RACK 1		
SLOT	TYPE	CARD SCHEMATIC
0	CPU	N/A
1	COM	N/A
2	DI	1695-D-316
3	DI	1695-D-316
4	DI	1695-D-317
5	DI	NOT POPULATED
6	DO	NOT POPULATED
7	DO	NOT POPULATED
8	AI	1695-D-318
9	AI	NOT POPULATED
10	AO	1695-D-319
11	AO	NOT POPULATED

PUMPING PLANT RACK 2
CHLORINE SYSTEM
PLC CHASSIS LAYOUT



PUMPING PLANT RACK 2

SLOT	TYPE	CARD SCHEMATIC
0	CPU	N/A
1	COM	N/A
2	DI	1695-D-320
3	DI	NOT POPULATED
4	DI	NOT POPULATED
5	DI	NOT POPULATED
6	DO	1695-D-321
7	DO	NOT POPULATED
8	AI	1695-D-322
9	AI	1695-D-322
10	AO	NOT POPULATED
11	AO	NOT POPULATED

REFERENCE DRAWINGS

- UNIT CONTROL SCHEMATIC — — — — — 1695-D-231
MECHANICAL SEAL WATER PUMP SCHEMATIC — — — — — 1695-D-232
12.1 AIR CHAMBER CONTROL SCHEMATIC — — — — — 1695-D-233
CHLORINATION SYSTEM P&ID (1 OF 2) — — — — — 1695-D-174
CHLORINATION SYSTEM P&ID (2 OF 2) — — — — — 1695-D-175
SCADA SYSTEM OVERVIEW — — — — — 1695-D-282
SUB-MASTERSTATION CABINET LAYOUT — — — — — 1695-D-284
CHLORINE FEED FACILITY PLC RACK 3 — — — — — 1695-D-314
AIR CHAMBER PLC RACK 4 AND RACK 5 — — — — — 1695-D-315

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NAVAJO GALLUP WATER SUPPLY PROJECT
NEW MEXICO

SAN JUAN LATERAL
TOHLAKAI PUMPING PLANT
ELECTRICAL SYSTEMS
SCADA SYSTEM

PUMPING PLANT PLC RACK 1 AND RACK 2

DESIGNED R.P. TINETTI
DRAWN R.P. TINETTI
CHECKED S.M. COBERLY
TECH. APPR. [Signature] R.E.

APPROVED [Signature]
MANAGER, HYDROPOWER DIAG. AND SCADA GROUP
DENVER, COLORADO 2013-08-02

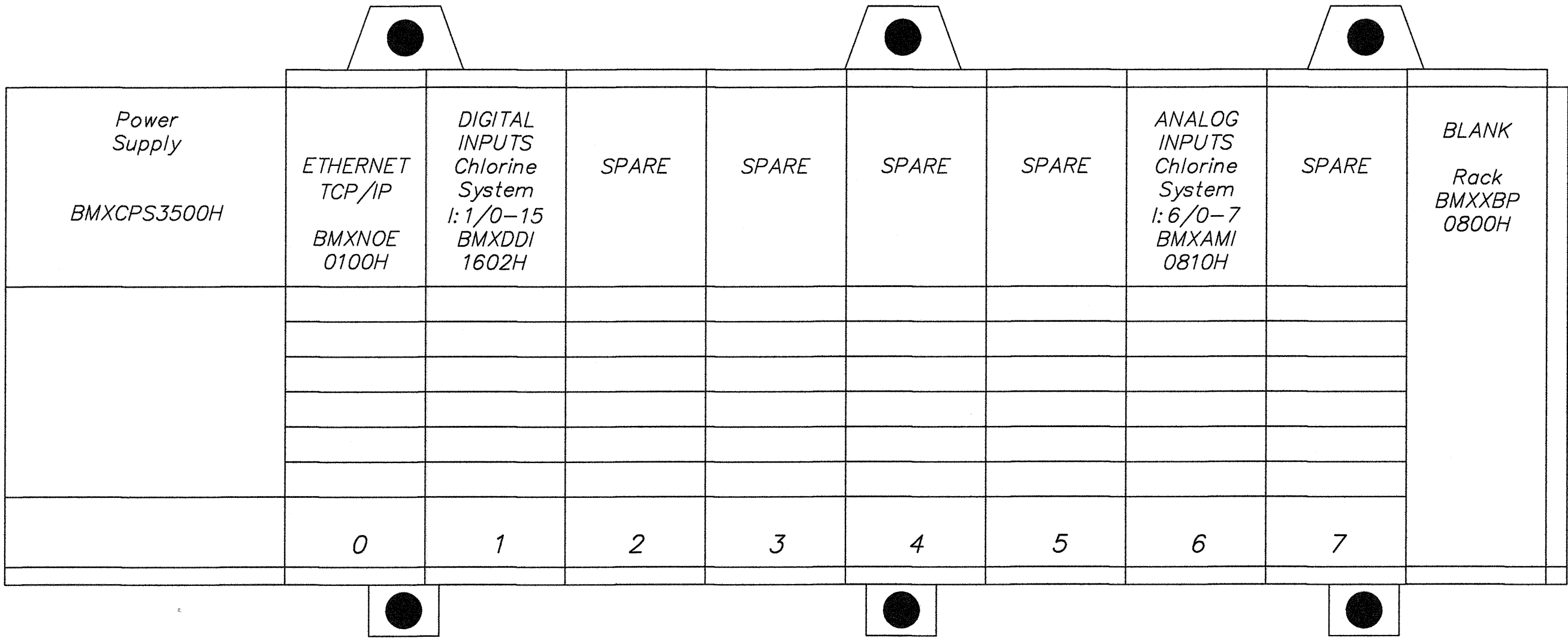
PUMPING PLANT PLC
PUMPING PLANT
PLC
RACK 1 AND RACK 2

1695-D-313

SHEET 1 OF 1

CAD SYSTEM
2013
CAD FILENAME
1695-D-314
PLC Layout Diagram Rack 3
DATE AND TIME PLOTTED
PLOTTED BY

CHLORINE FEED FACILITY RACK 3
CHLORINE SYSTEM
PLC CHASSIS LAYOUT



NOTES

1. PLC's are Government-Furnished equipment.
2. PLC's are Modicon M340 series PLCs
3. The Chlorination Feed Building chassis is a remote I/O for the Chlorine System Pumping Plant PLC.

REFERENCE DRAWING LIST

PUMPING PLANT RACK 3		
SLOT	TYPE	CARD SCHEMATIC
0	COM	N/A
1	DI	1695-D-323
2	DI	NOT POPULATED
3	DI	NOT POPULATED
4	DO	NOT POPULATED
5	DO	NOT POPULATED
6	AI	1695-D-324
7	AI	NOT POPULATED

REFERENCE DRAWINGS

- CHLORINATION SYSTEM P&ID (1 of 2) — — — — — 1695-D-174
CHLORINATION SYSTEM P&ID (2 of 2) — — — — — 1695-D-175
SCADA SYSTEM OVERVIEW — — — — — 1695-D-282
PUMPING PLANT PLC RACK 2 — — — — — 1695-D-313

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NEW MEXICO
SAN JUAN LATERAL
TOHLAKAI PUMPING PLANT
ELECTRICAL SYSTEMS
SCADA SYSTEM
CHLORINE FEED FACILITY PLC RACK 3

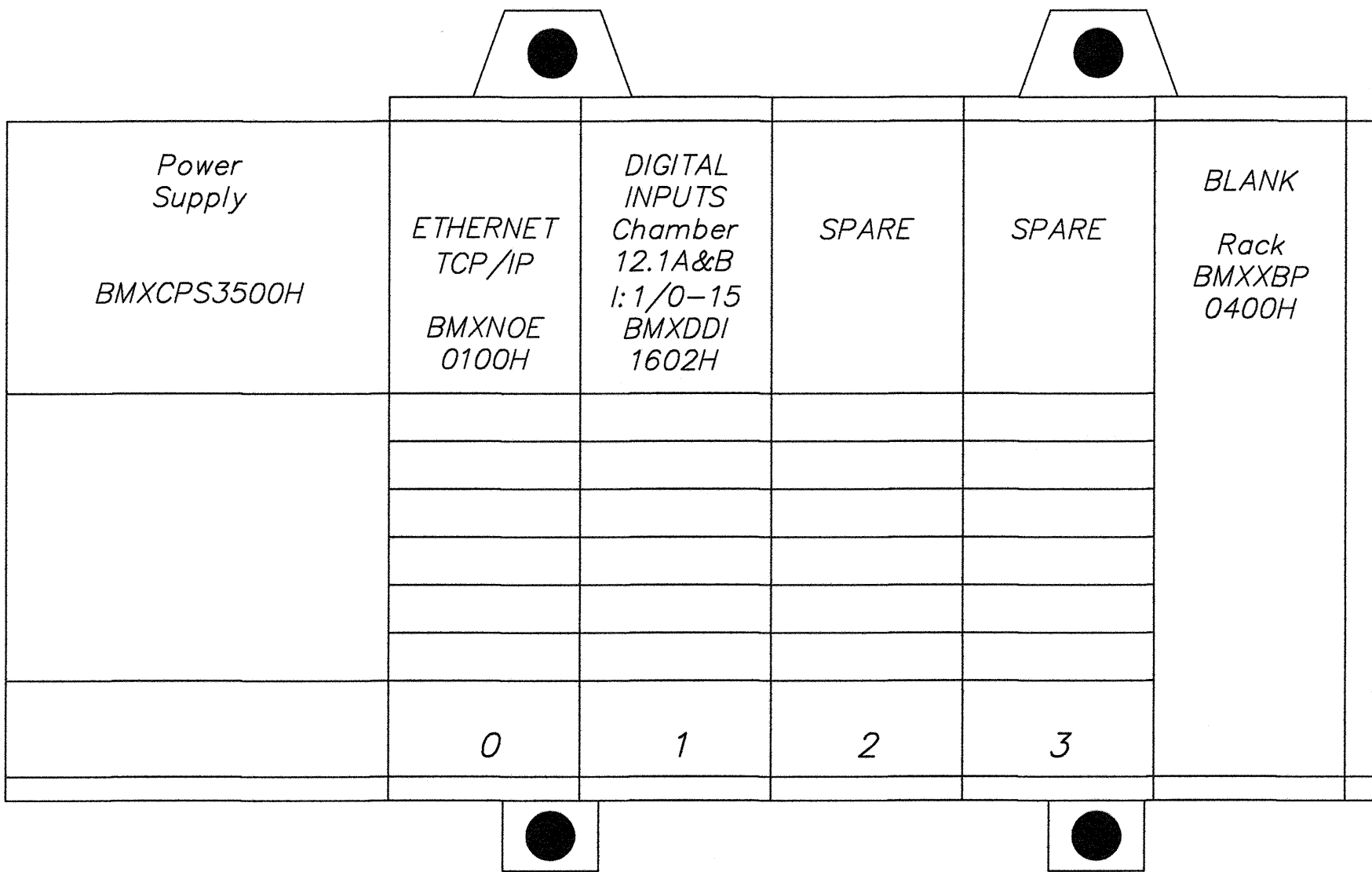
DESIGNED R.P. TINETTI
DRAWN R.P. TINETTI
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TECH. APPR. [Signature] P.E.
APPROVED [Signature]
MANAGER, HYDROPOWER DIAG. AND SCADA GROUP
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CHLORINE FEED FACILITY
PLC RACK 3

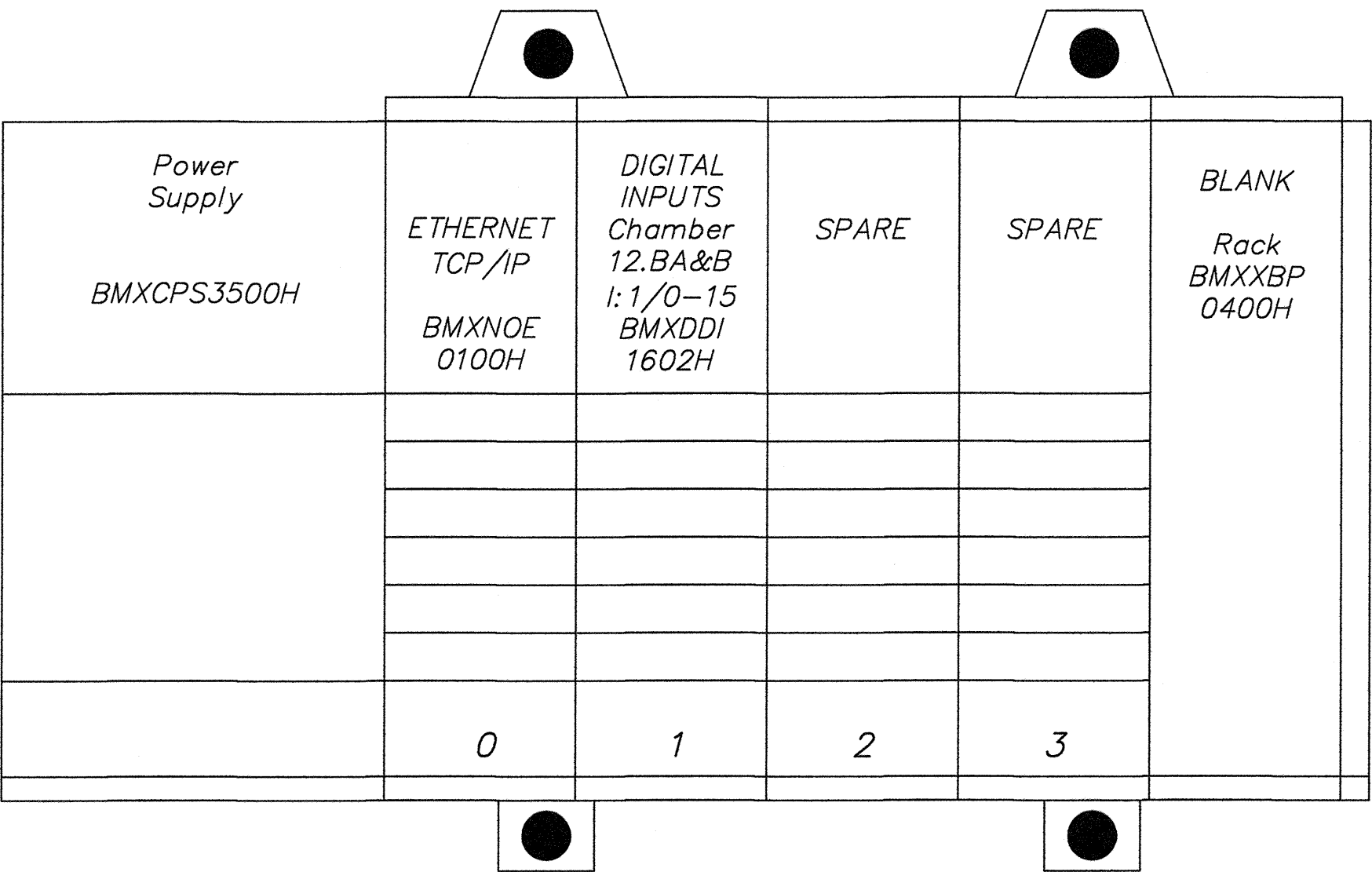
1695-D-314

CAD SYSTEM
2013
CADD FILENAME
1695-D-315
PLC Layout Diagram Rack 4 & 5
DATE AND TIME PLOTTED
PLOTTED BY

AIR CHAMBER RACK 4
AIR COMPRESSOR/VALVES 12.1A & 12.1B
PLC CHASSIS LAYOUT



AIR CHAMBER RACK 5
AIR COMPRESSOR/VALVES 12.BA & 12.BB
PLC CHASSIS LAYOUT



NOTES

1. PLC's are Government-Furnished equipment.
2. PLC's are Modicon M340 series PLCs
3. Both of the Air Chambers chassis are remote I/O for the Plant Systems PLC.

REFERENCE DRAWING LIST

PUMPING PLANT RACK 4		
SLOT	TYPE	CARD SCHEMATIC
0	COM	N/A
1	DI	1695-D-233
2	DO	NOT POPULATED
3	AI	NOT POPULATED

PUMPING PLANT RACK 5		
SLOT	TYPE	CARD SCHEMATIC
0	COM	N/A
1	DI	1695-D-233
2	DO	NOT POPULATED
3	AI	NOT POPULATED

REFERENCE DRAWINGS

12.1 AIR CHAMBER CONTROL SCHEMATIC _ _ _ _ 1695-D-233
SCADA SYSTEM OVERVIEW _ _ _ _ 1695-D-282
PUMPING PLANT PLC RACK 1 _ _ _ _ 1695-D-313

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NAVAJO GALLUP WATER SUPPLY PROJECT
NEW MEXICO
SAN JUAN LATERAL
TOHLAKAI PUMPING PLANT
ELECTRICAL SYSTEMS
SCADA SYSTEM
AIR CHAMBER PLC RACK 4 AND RACK 5

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DRAWN R.P. TINETTI
CHECKED S.M. COBERLY
TECH. APPR. [Signature] P.E.
APPROVED [Signature]
MANAGER, HYDROPOWER DMG. AND SCADA GROUP
DENVER, COLORADO 2013-08-02

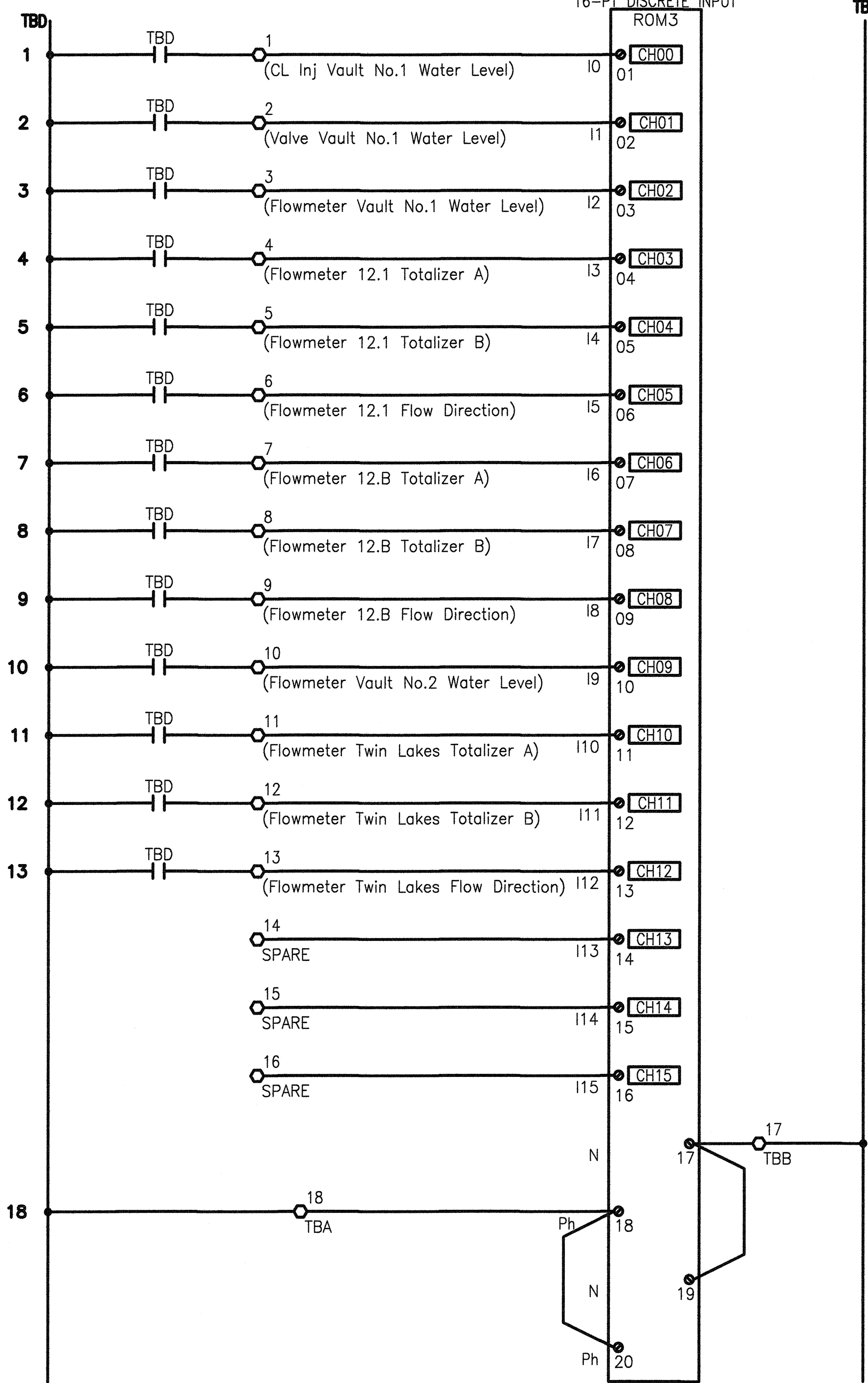
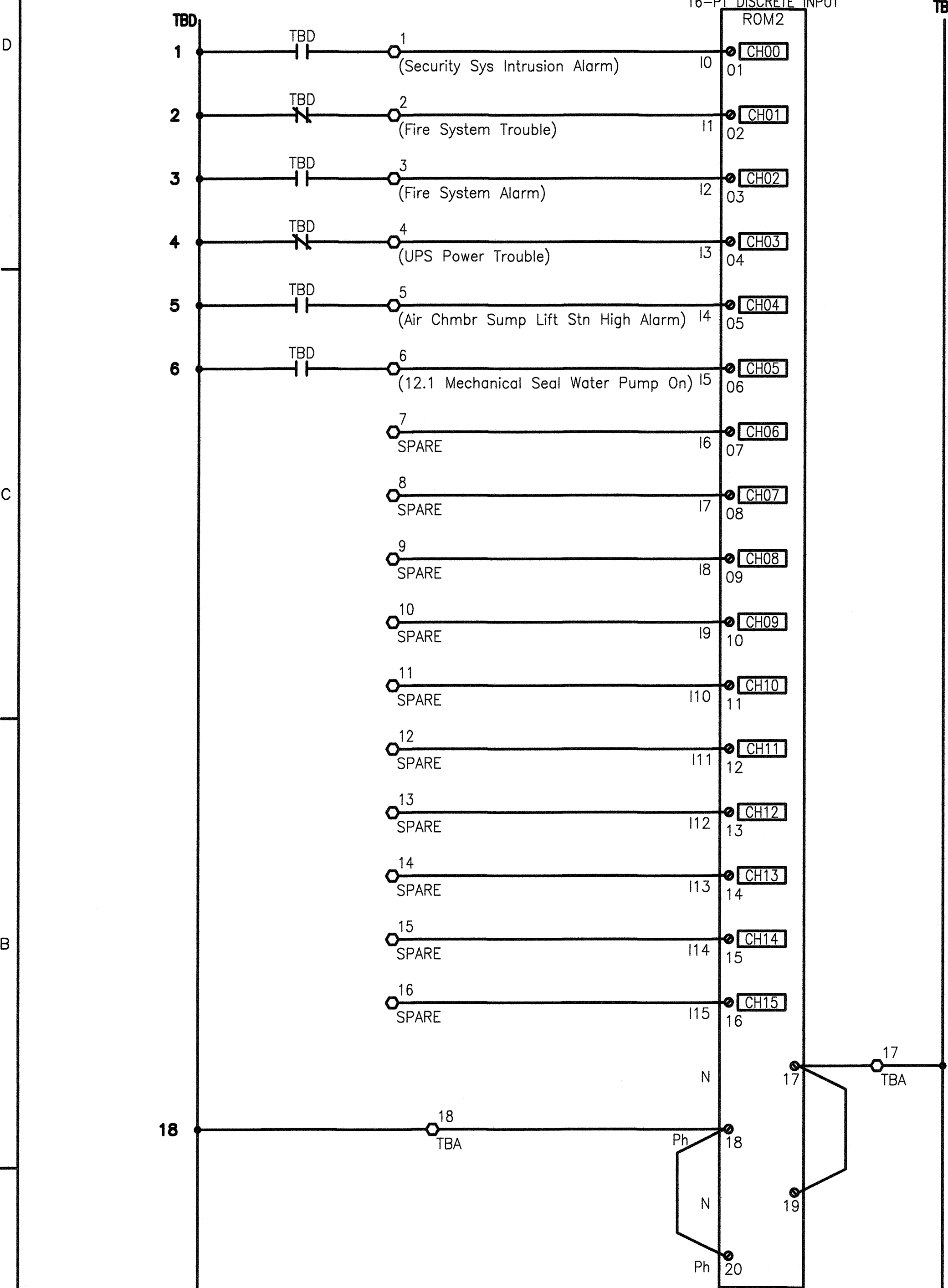
AIR CHAMBER PLC
RACK 4 AND RACK 5

NOTES

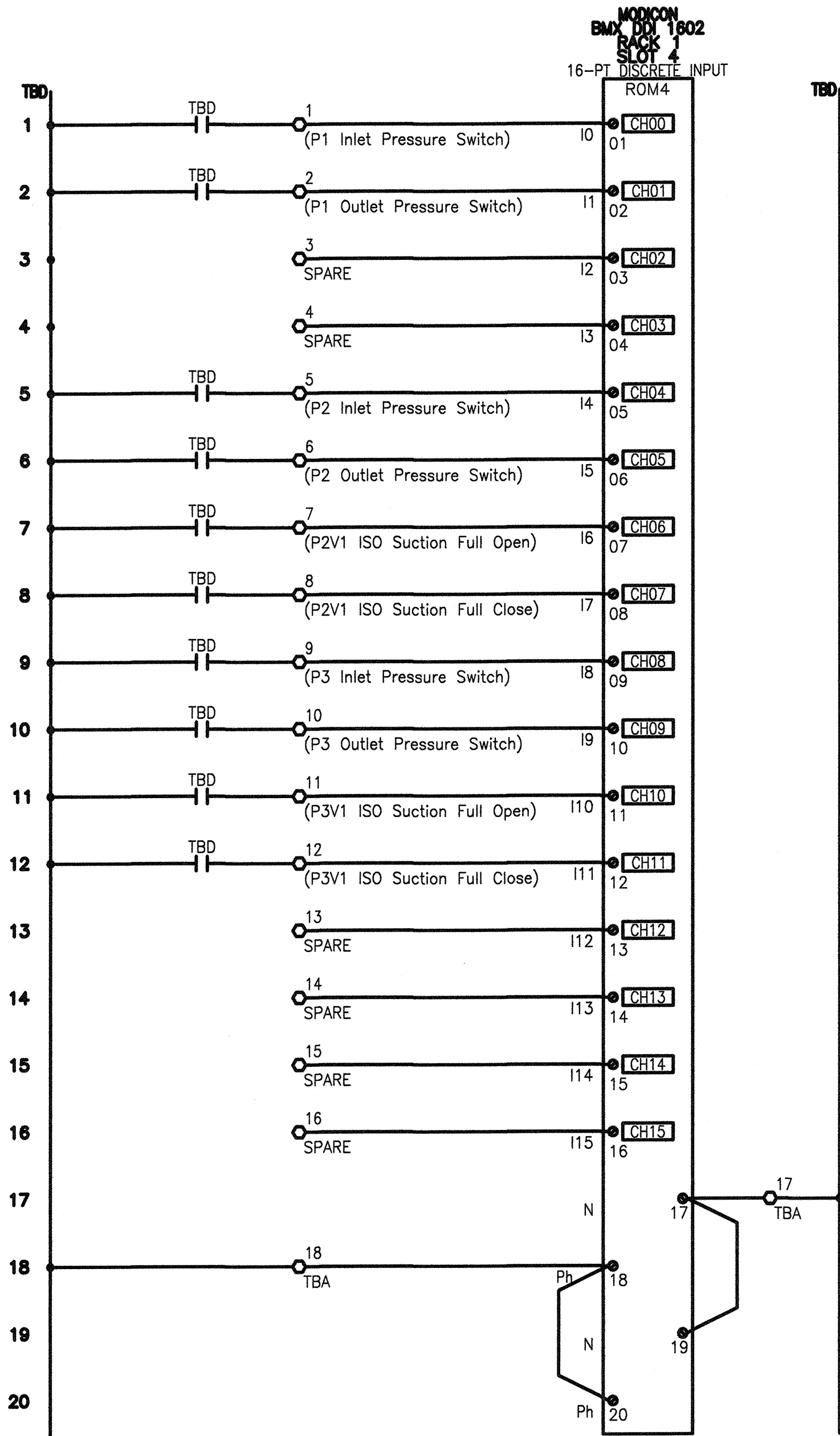
1. PLC's are Government-Furnished equipment.
2. PLC's are Modicon M340 series PLCs
3. TBD: Contractor to determine wiring device and labels based on specification requirements and installed equipment.

REFERENCE DRAWINGS

UNIT CONTROL SCHEMATIC _____ 1695-D-231
MECHANICAL SEAL WATER PUMP SCHEMATIC _____ 1695-D-232
PUMPING PLANT PLC RACK 1 _____ 1695-D-313



CAD SYSTEM
2013
CAD FILENAME
1695-D-317 PLC Signal Def- Digital Inputs U1U2U3
DATE AND TIME PLOTTED
PLOTTED BY



NOTES

1. PLC's are Government-Furnished equipment.
2. PLC's are Modicon M340 series PLCs
3. TBD: Contractor to determine wiring device and labels based on specification requirements and installed equipment.

REFERENCE DRAWINGS
UNIT CONTROL SCHEMATIC — — — — — 1695-D-231
PUMPING PLANT PLC RACK 1 — — — — — 1695-D-313

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U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
NAVAJO GALLUP WATER SUPPLY PROJECT
NEW MEXICO
**SAN JUAN LATERAL
TOHLAKAI PUMPING PLANT**
ELECTRICAL SYSTEM
SCADA SYSTEM
PLANT SYSTEMS DIGITAL INPUTS

DESIGNED R.P. TINETTI

DRAWN R.P. TINETTI

CHECKED S.M. COBERLY

TECH. APPR. [Signature] P.E.

APPROVED [Signature]
MANAGER, HYDROPOWER DIAG. AND SCADA GROUP

DENVER, COLORADO 2013-08-02

PLANT SYSTEMS
DIGITAL INPUTS

1695-D-317

SHEET 2 OF 2

NOTES

- 1. PLC's are Government-Furnished equipment.
- 2. PLC's are Modicon M340 series PLCs
- 3. TBD: Contractor to determine wiring device and labels based on specification requirements and installed equipment.
- 4. TPM: Transient Protection Module.

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BUREAU OF RECLAMATION
NAVAJO GALLUP WATER SUPPLY PROJECT
NEW MEXICO
**SAN JUAN LATERAL
TOHLAKAI PUMPING PLANT**
ELECTRICAL SYSTEMS
SCADA SYSTEM ANALOG INPUTS
PLANT SYSTEMS ANALOG INPUTS

DESIGNED R.P. TINETTI
DRAWN R.P. TINETTI
CHECKED S.M. COBERLY
TECH. APPR. *[Signature]*
APPROVED *[Signature]*
MANAGER, HYDROPOWER DIAG. AND SCADA GROUP
DENVER, COLORADO 2013-08-02

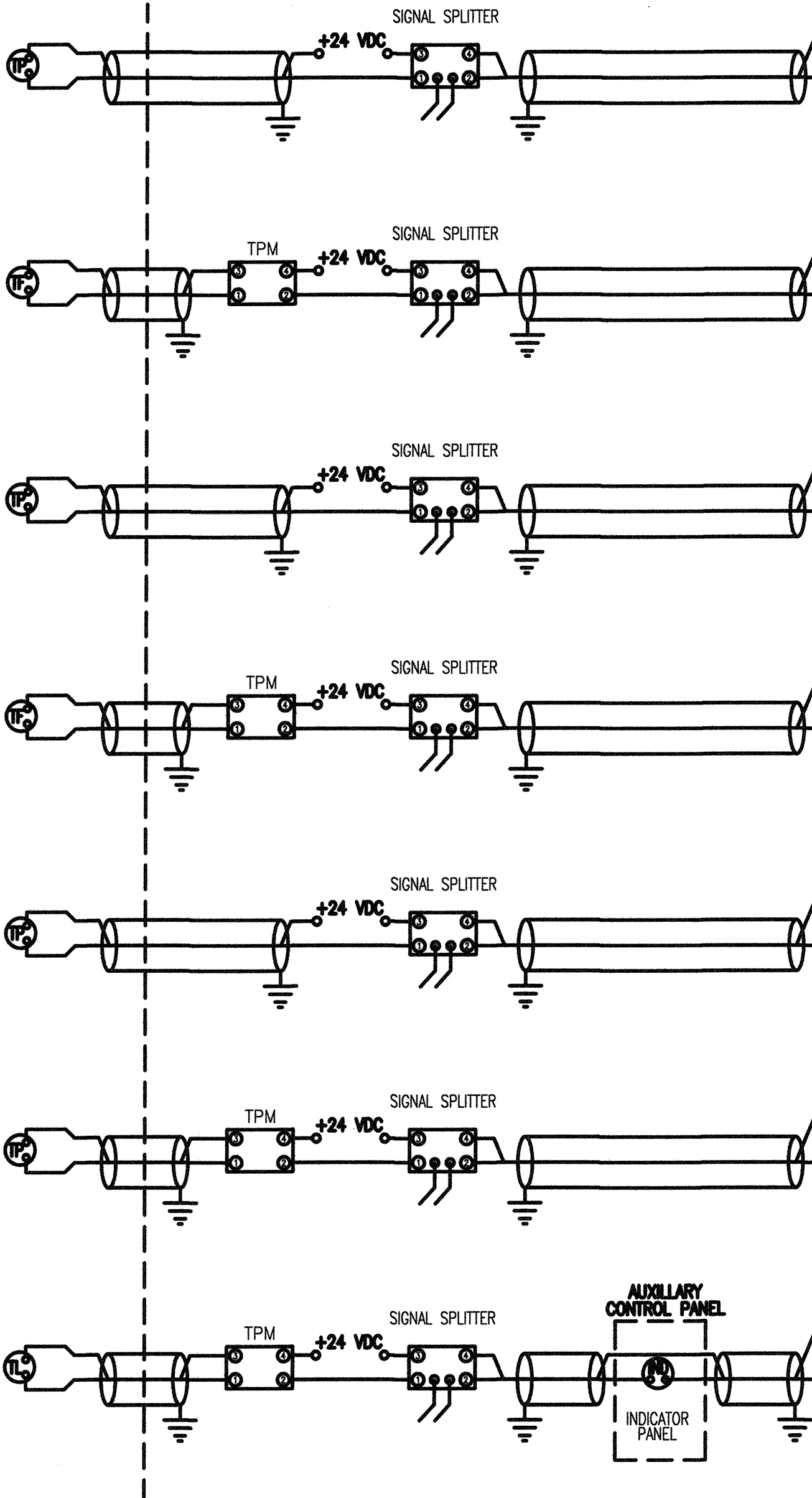
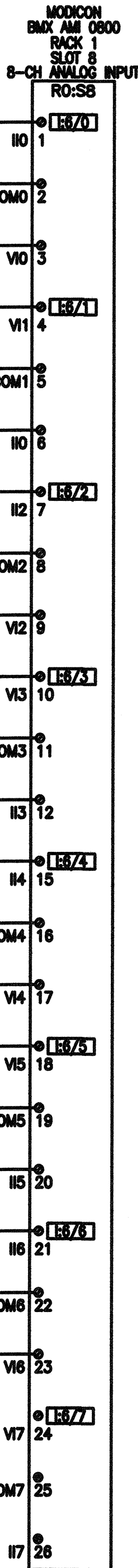
PLANT SYSTEMS
ANALOG INPUTS

1695-D-318

SHEET 1 OF 1

REFERENCE DRAWINGS

PUMPING PLANT PLC RACK 1 1695-D-313
SCADA SYSTEM OVERVIEW 1695-D-282



TBD
Inlet Manifold
12 Pressure

TBD
Inlet Manifold
12 Flow

TBD
Outlet Manifold
12.B Pressure

TBD
Outlet Manifold
12.B Flow

TBD
Outlet Manifold
12.1 Pressure

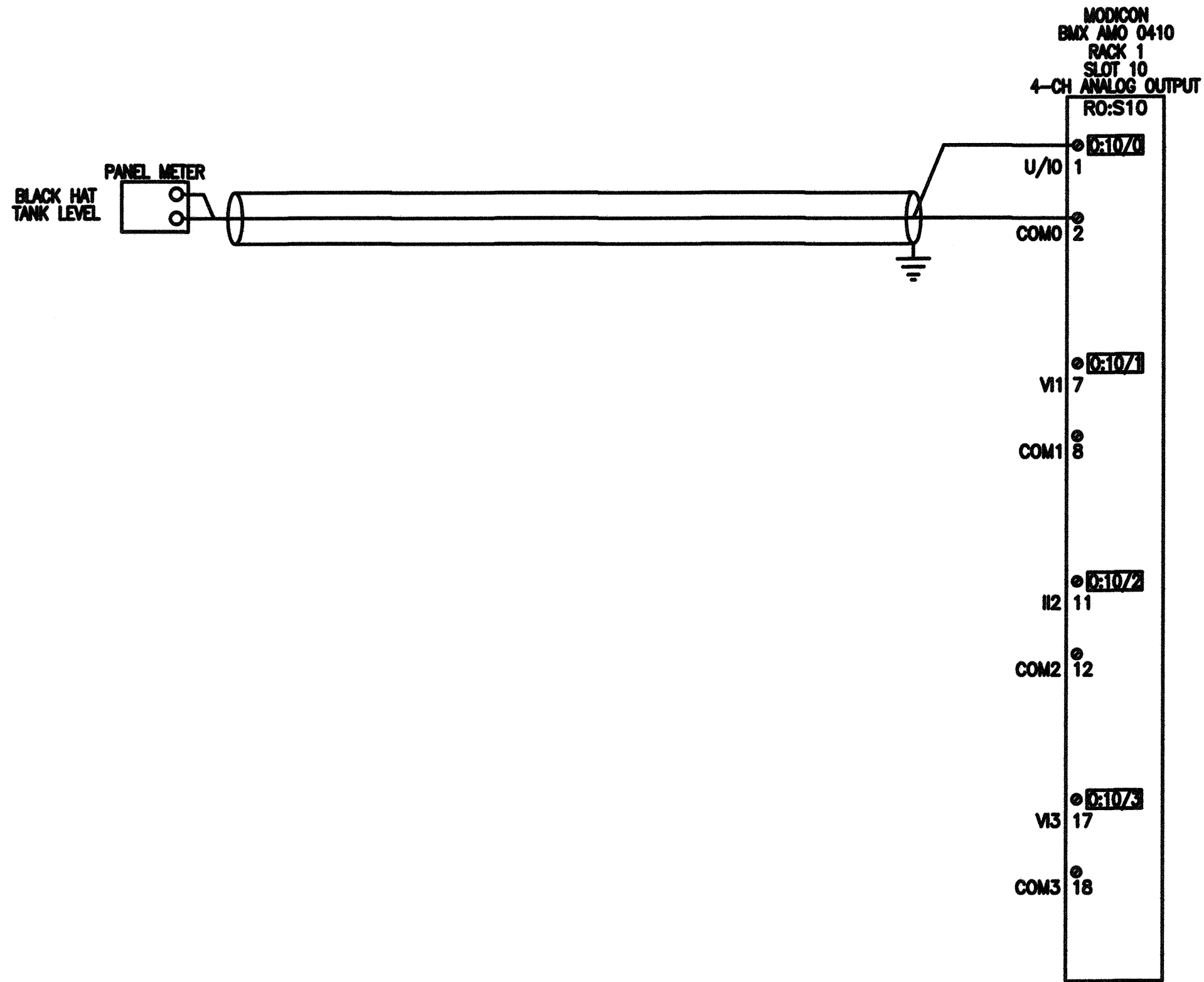
TBD
Outlet Manifold
12.1 Flow

TBD
Tank 1
Level

DATE AND TIME PLOTTED
PLOTTED BY

CAD SYSTEM
2013
CAD FILENAME
1695-D-318 PLC Signal Det - AI - Flow-Aux

CAD SYSTEM
2013
CAD FILENAME
1695-D-319 PLC Signal Def - AD - Tank Level
DATE AND TIME PLOTTED
PLOTTED BY



NOTES

1. PLC's are Government-Furnished equipment.
2. PLC's are Modicon M340 series PLCs
3. TBD: Contractor to determine wiring device and labels based on specification requirements and installed equipment.

REFERENCE DRAWINGS

SCADA SYSTEM OVERVIEW _____ 1695-D-282
PUMPING PLANT PLC RACK 1 _____ 1695-D-313

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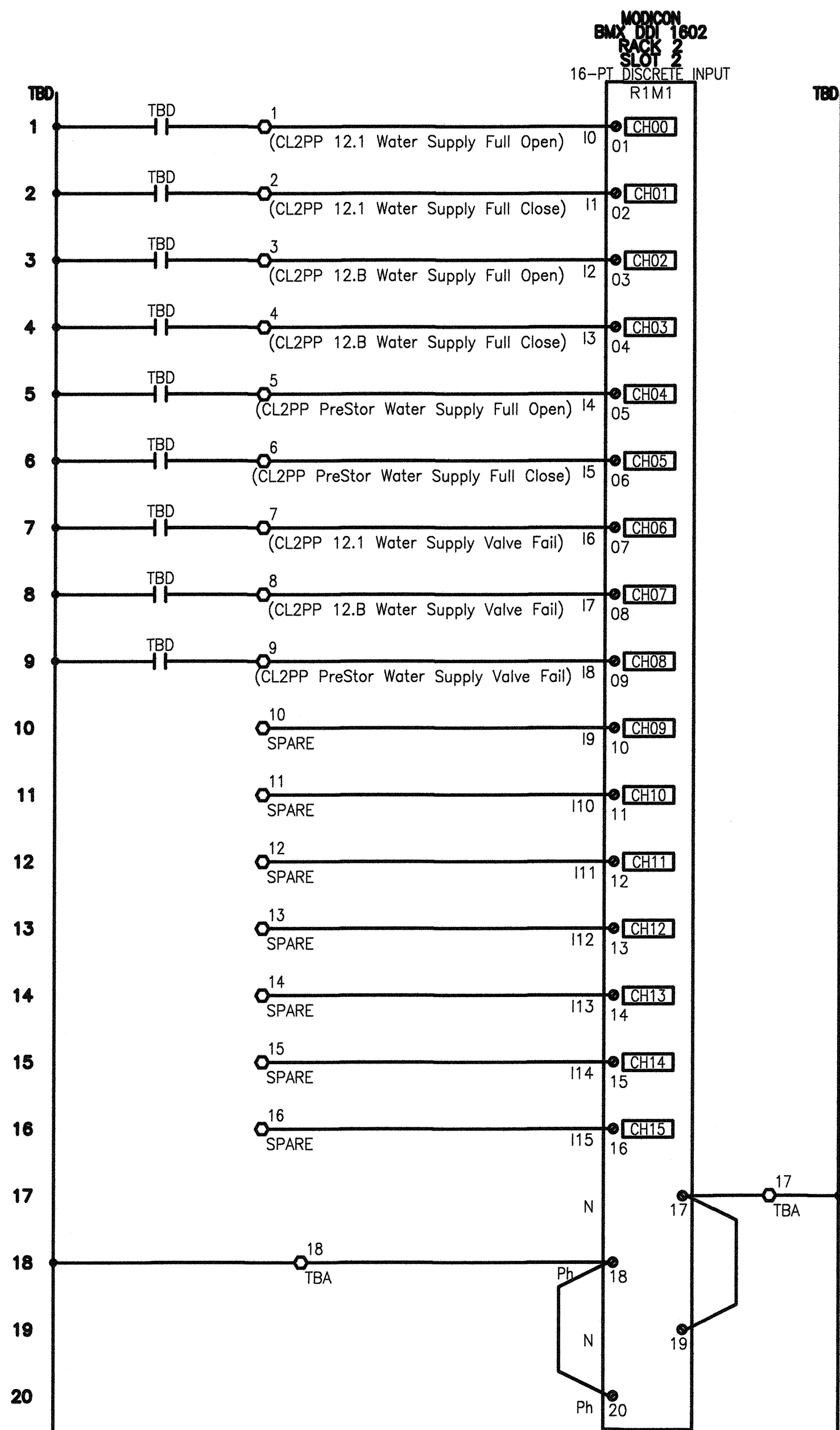
U.S. DEPARTMENT OF THE INTERIOR
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NEW MEXICO
**SAN JUAN LATERAL
TOHLAKAI PUMPING PLANT**
ELECTRICAL SYSTEMS
SCADA SYSTEM
PLANT SYSTEMS ANALOG OUTPUTS

DESIGNED R.P. TINETTI
DRAWN R.P. TINETTI
CHECKED S.M. COBERLY
TECH. APPR. [Signature]
APPROVED [Signature]
MANAGER, HYDROPOWER DIAG. AND SCADA GROUP
DENVER, COLORADO 2013-08-02

PLANT SYSTEMS
ANALOG OUTPUTS

1695-D-319

CAD SYSTEM
2013
CAD FILENAME
1695-D-320 PLC Signal Def- Digital Inputs Chlorination System
DATE AND TIME PLOTTED
PLOTTED BY



NOTES

- PLC's are Government-Furnished equipment.
- PLC's are Modicon M340 series PLCs
- TBD: Contractor to determine wiring device and labels based on specification requirements and installed equipment.

REFERENCE DRAWINGS

CHLORINATION SYSTEM P&ID (1 OF 2) — — — 1695-D-174
CHLORINATION SYSTEM P&ID (2 OF 2) — — — 1695-D-175
PUMPING PLANT PLC RACK 2 — — — — — 1695-D-313

RECLAMATION
Managing Water in the West

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NEW MEXICO
SAN JUAN LATERAL
TOHLAKAI PUMPING PLANT
ELECTRICAL SYSTEMS
SCADA SYSTEM
CHLORINE SYSTEM DIGITAL INPUTS

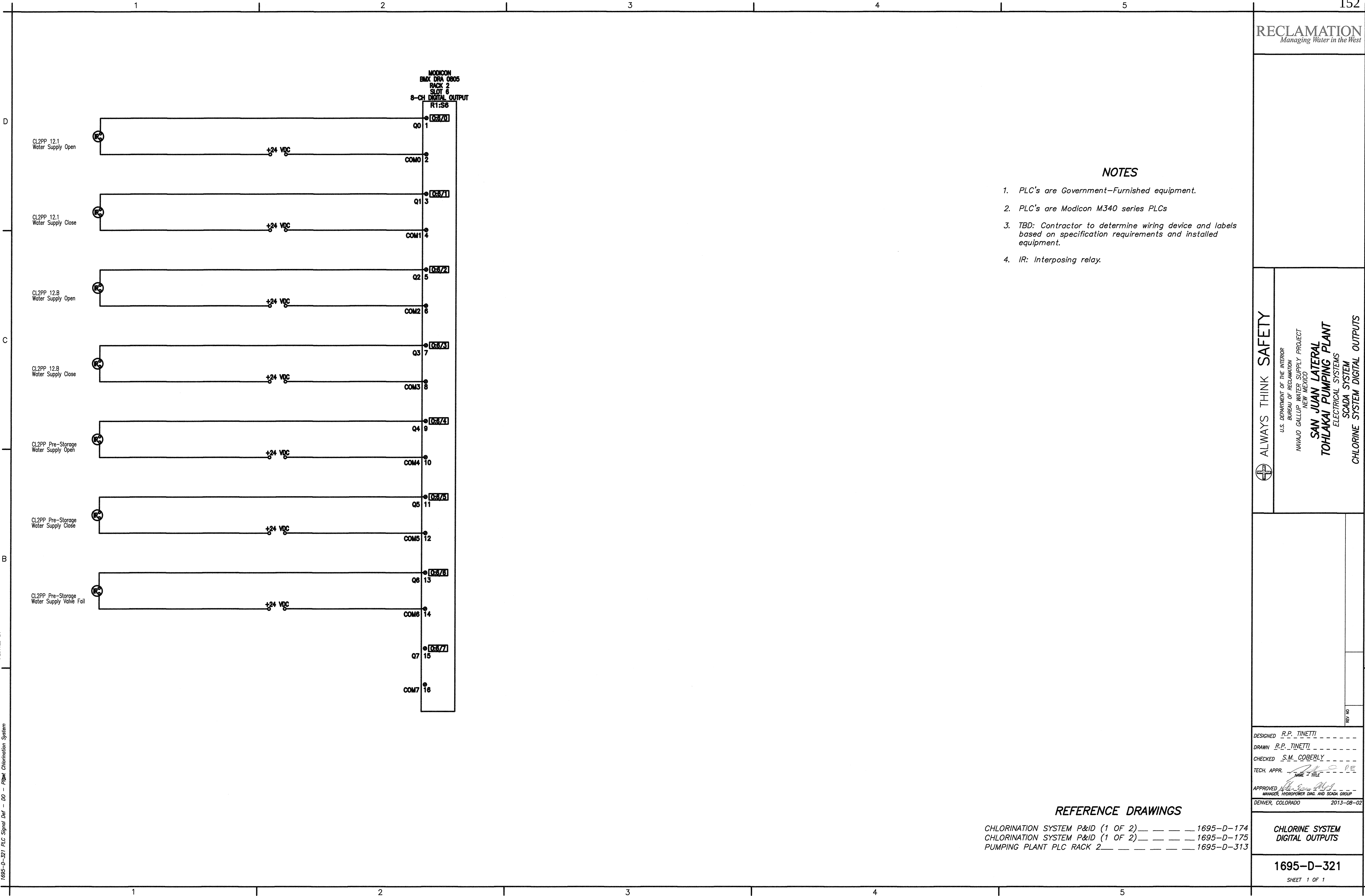
DESIGNED R.P. TINETTI
DRAWN R.P. TINETTI
CHECKED S.M. COBERLY
TECH. APPR. C.E.
APPROVED [Signature]
MANAGER, HYDROPOWER DIAG. AND SCADA GROUP
DENVER, COLORADO 2013-08-02

CHLORINE SYSTEM
DIGITAL INPUTS

1695-D-320

SHEET 1 OF 1

CAD SYSTEM 2013
CAD FILENAME 1695-D-321
DATE AND TIME PLOTTED
PLOTTED BY
1695-D-321 PLC Signal Def - DO - Pump Chlorination System



NOTES

- 1. PLC's are Government-Furnished equipment.
- 2. PLC's are Modicon M340 series PLCs
- 3. TBD: Contractor to determine wiring device and labels based on specification requirements and installed equipment.
- 4. IR: Interposing relay.

REFERENCE DRAWINGS

CHLORINATION SYSTEM P&ID (1 OF 2) — — — 1695-D-174
CHLORINATION SYSTEM P&ID (1 OF 2) — — — 1695-D-175
PUMPING PLANT PLC RACK 2 — — — — — 1695-D-313

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NEW MEXICO
SAN JUAN LATERAL
TOHLAKAI PUMPING PLANT
ELECTRICAL SYSTEMS
SCADA SYSTEM
CHLORINE SYSTEM DIGITAL OUTPUTS

DESIGNED R.P. TINETTI
DRAWN R.P. TINETTI
CHECKED S.M. COBERLY
TECH. APPR. S.M. COBERLY
APPROVED [Signature]
MANAGER, HYDROPOWER DIAG. AND SCADA GROUP
DENVER, COLORADO 2013-08-02

CHLORINE SYSTEM
DIGITAL OUTPUTS

DESIGNED R.P. TINETTI
DRAWN R.P. TINETTI
CHECKED S.M. COBERLY
TECH. APPR. [Signature]
APPROVED [Signature]
MANAGER, HYDROPOWER DIAG. AND SCADA GROUP
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CHLORINE SYSTEM
ANALOG INPUTS

1695-D-322

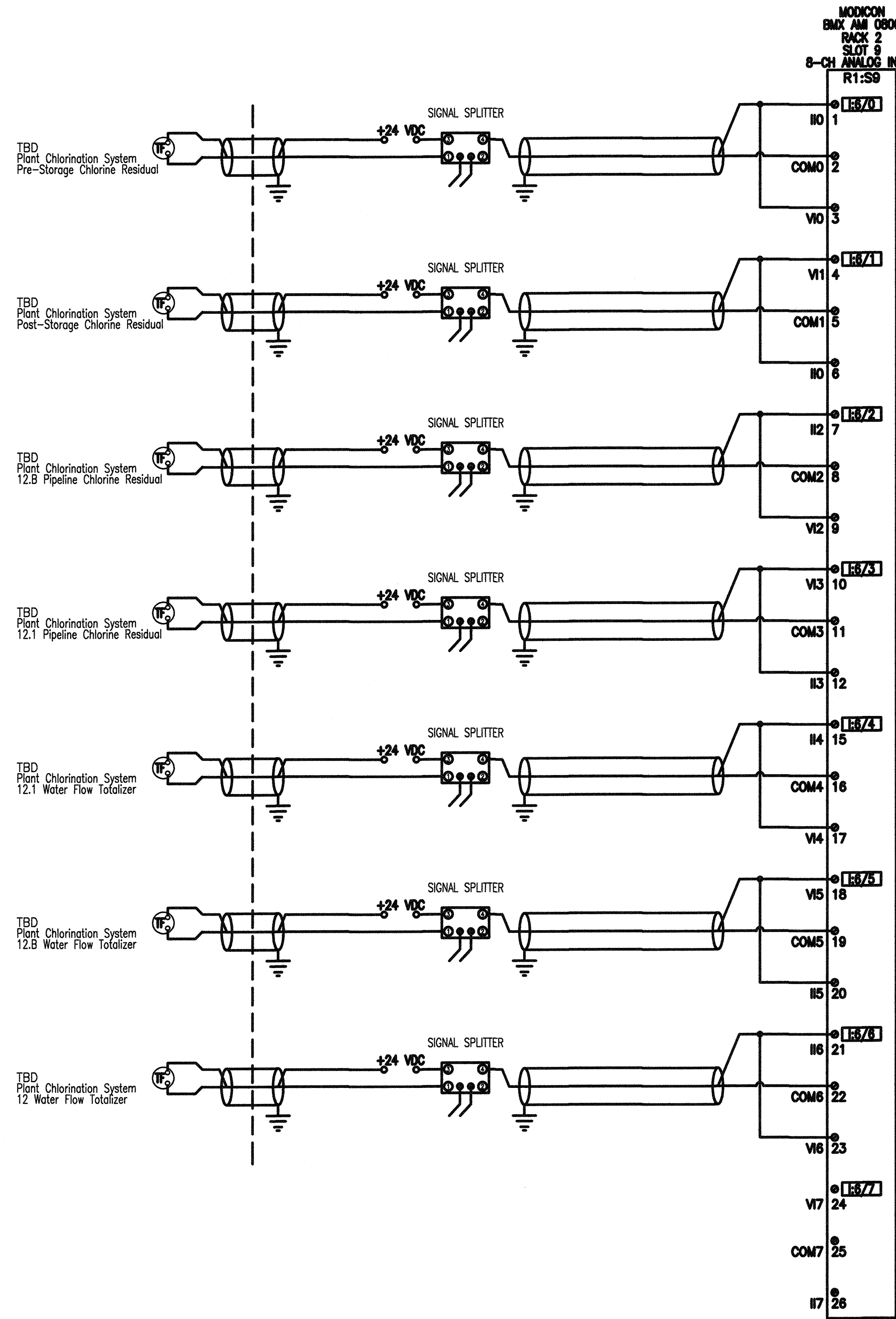
SHEET 1 OF 1

NOTES

1. PLC's are Government-Furnished equipment.
2. PLC's are Modicon M340 series PLCs
3. TBD: Contractor to determine wiring device and labels based on specification requirements and installed equipment.

REFERENCE DRAWINGS

CHLORINATION SYSTEM P&ID (1 OF 2) — — — 1695-D-174
CHLORINATION SYSTEM P&ID (2 OF 2) — — — 1695-D-175
PUMPING PLANT PLC RACK 2 — — — 1695-D-313



TBD
Plant Chlorination System
Pre-Storage Chlorine Residual

TBD
Plant Chlorination System
Post-Storage Chlorine Residual

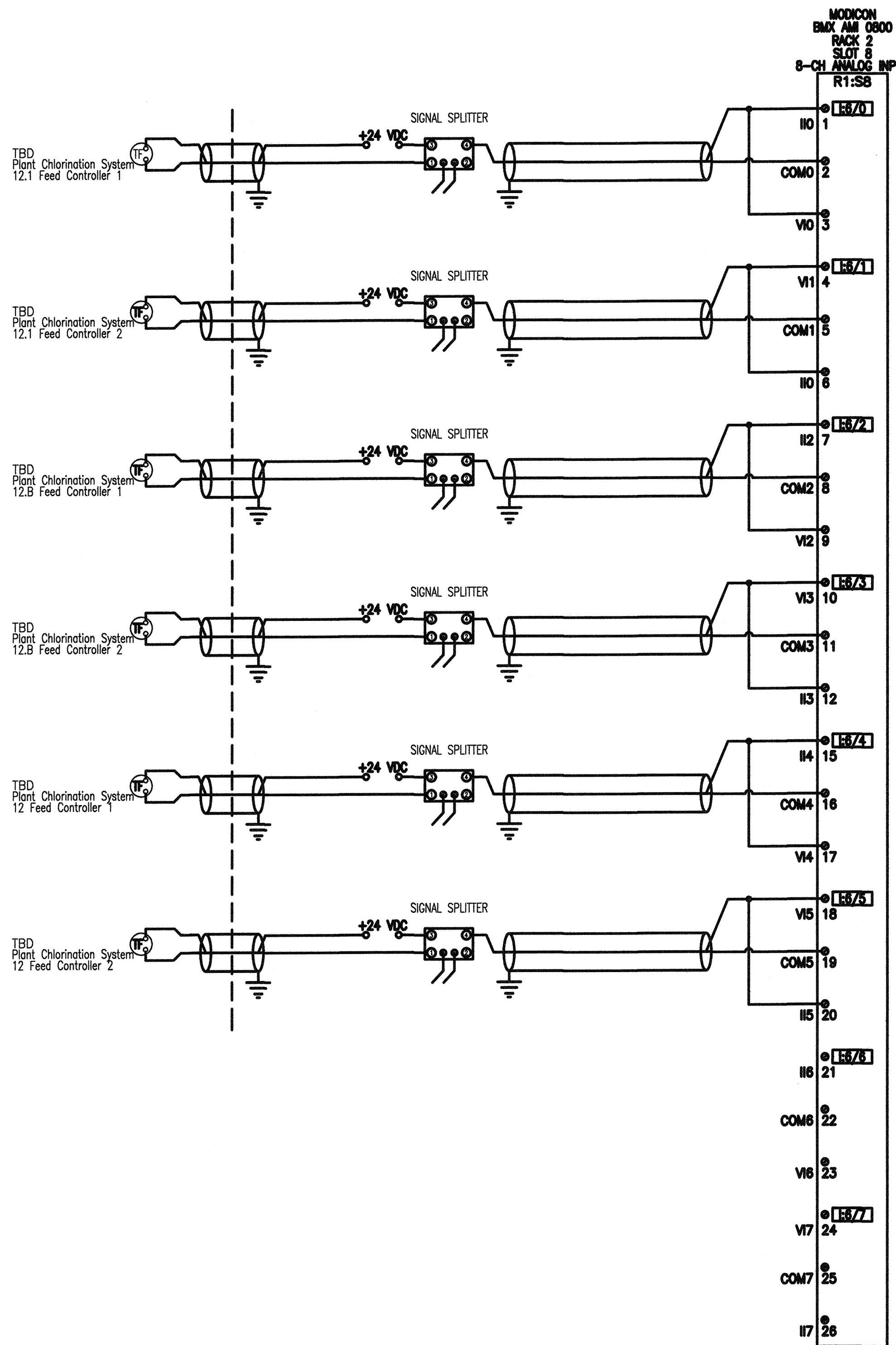
TBD
Plant Chlorination System
12.B Pipeline Chlorine Residual

TBD
Plant Chlorination System
12.1 Pipeline Chlorine Residual

TBD
Plant Chlorination System
12.1 Water Flow Totalizer

TBD
Plant Chlorination System
12.B Water Flow Totalizer

TBD
Plant Chlorination System
12 Water Flow Totalizer



TBD
Plant Chlorination System
12.1 Feed Controller 1

TBD
Plant Chlorination System
12.1 Feed Controller 2

TBD
Plant Chlorination System
12.B Feed Controller 1

TBD
Plant Chlorination System
12.B Feed Controller 2

TBD
Plant Chlorination System
12 Feed Controller 1

TBD
Plant Chlorination System
12 Feed Controller 2

DATE AND TIME PLOTTED
PLOTTED BY

CAD SYSTEM
2013
CAD FILENAME
1695-D-322 PLC Signal Def - AI - Play Chlorination System

NOTES

1. PLC's are Government–Furnished equipment.
2. PLC's are Modicon M340 series PLCs
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NEW MEXICO
**SAN JUAN LATERAL
TOHLAKAI PUMPING PLANT**
ELECTRICAL SYSTEMS
SCADA SYSTEM
CHLORINE FEED FACILITY DIGITAL INPUTS

DESIGNED R.P. TINETTI
DRAWN R.P. TINETTI
CHECKED S.M. COBERLY
TECH. APPR. [Signature] P.E.
APPROVED [Signature]
MANAGER, HYDROPOWER DIV. AND SCADA GROUP
DENVER, COLORADO 2013-08-02

REFERENCE DRAWINGS

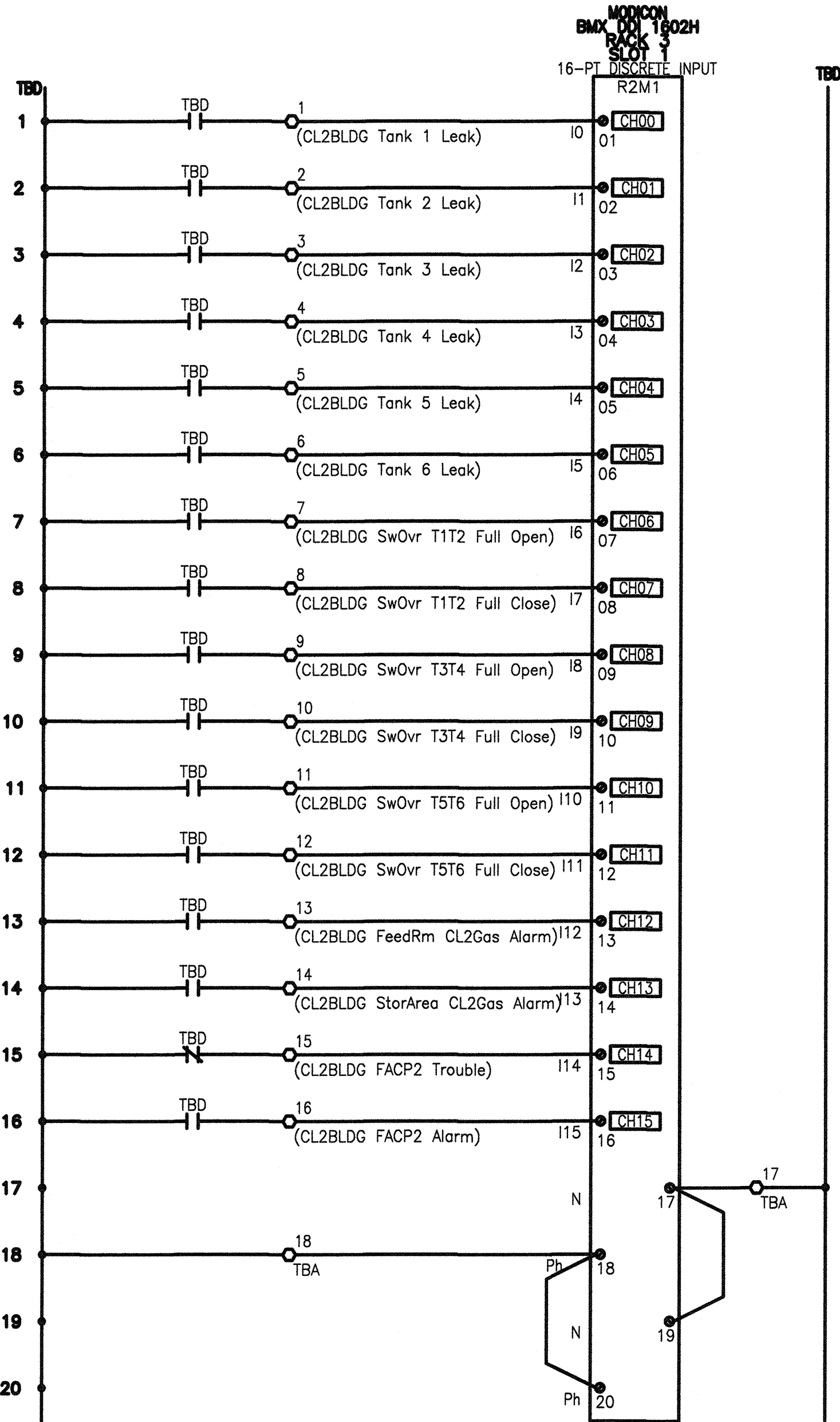
CHLORINATION SYSTEM P&ID (1 OF 2) — — — 1695–D–174
CHLORINATION SYSTEM P&ID (2 OF 2) — — — 1695–D–175
PLC LAYOUT DIAGRAM RACK 3 — — — 1695–D–314

CHLORINE FEED FACILITY
DIGITAL INPUTS

1695–D–323

SHEET 2 OF 3

CAD SYSTEM 2013
CAD FILENAME 1695-D-323 PLC Signal Dev - DI Chlorine Facility
DATE AND TIME PLOTTED
PLOTTED BY



NOTES

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NEW MEXICO
**SAN JUAN LATERAL
TOHLAKAI PUMPING PLANT**
ELECTRICAL SYSTEMS
SCADA SYSTEM
CHLORINE FEED FACILITY ANALOG INPUTS

DESIGNED R.P. TINETTI
DRAWN R.P. TINETTI
CHECKED S.M. COBERLY
TECH. APPR. [Signature] P.E.
APPROVED [Signature]
MANAGER, HYDROPOWER DIAG. AND SCADA GROUP
DENVER, COLORADO 2013-08-02

REFERENCE DRAWINGS

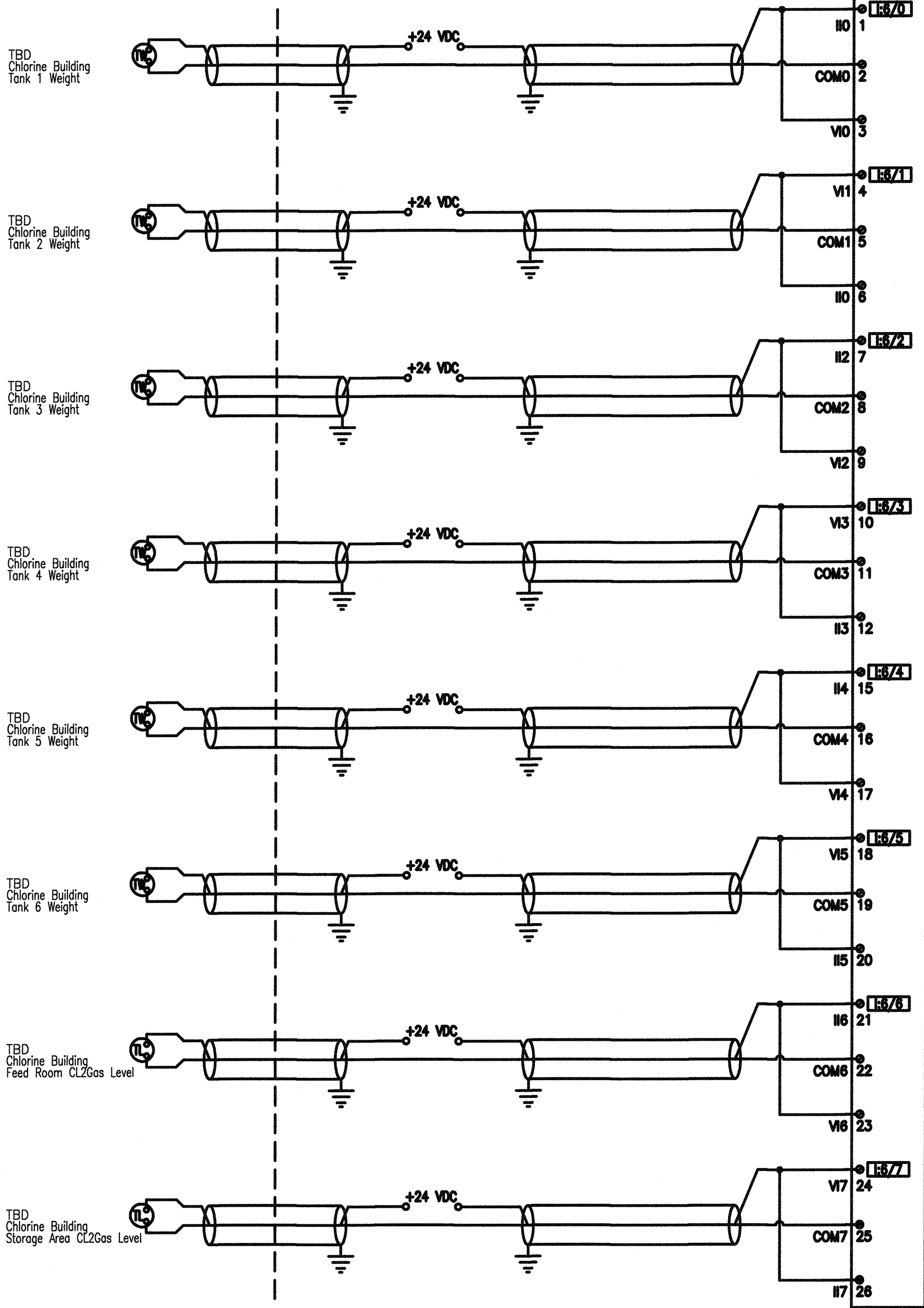
CHLORINATION SYSTEM P&ID (1 OF 2) — — — 1695-D-174
CHLORINATION SYSTEM P&ID (2 OF 2) — — — 1695-D-175
PLC LAYOUT DIAGRAM RACK 3 — — — 1695-D-314

CHLORINE FEED FACILITY
ANALOG INPUTS

1695-D-324

SHEET 1 OF 1

MODICON
BMX AMI 0810H
RACK 3
SLOT 6
8-CH ANALOG INPUT
R2:S6



DATE AND TIME PLOTTED
PLOTTED BY

CAD SYSTEM
2013
CAD FILENAME
1695-D-318 PLC Signal Def - AI - Pro-Aux



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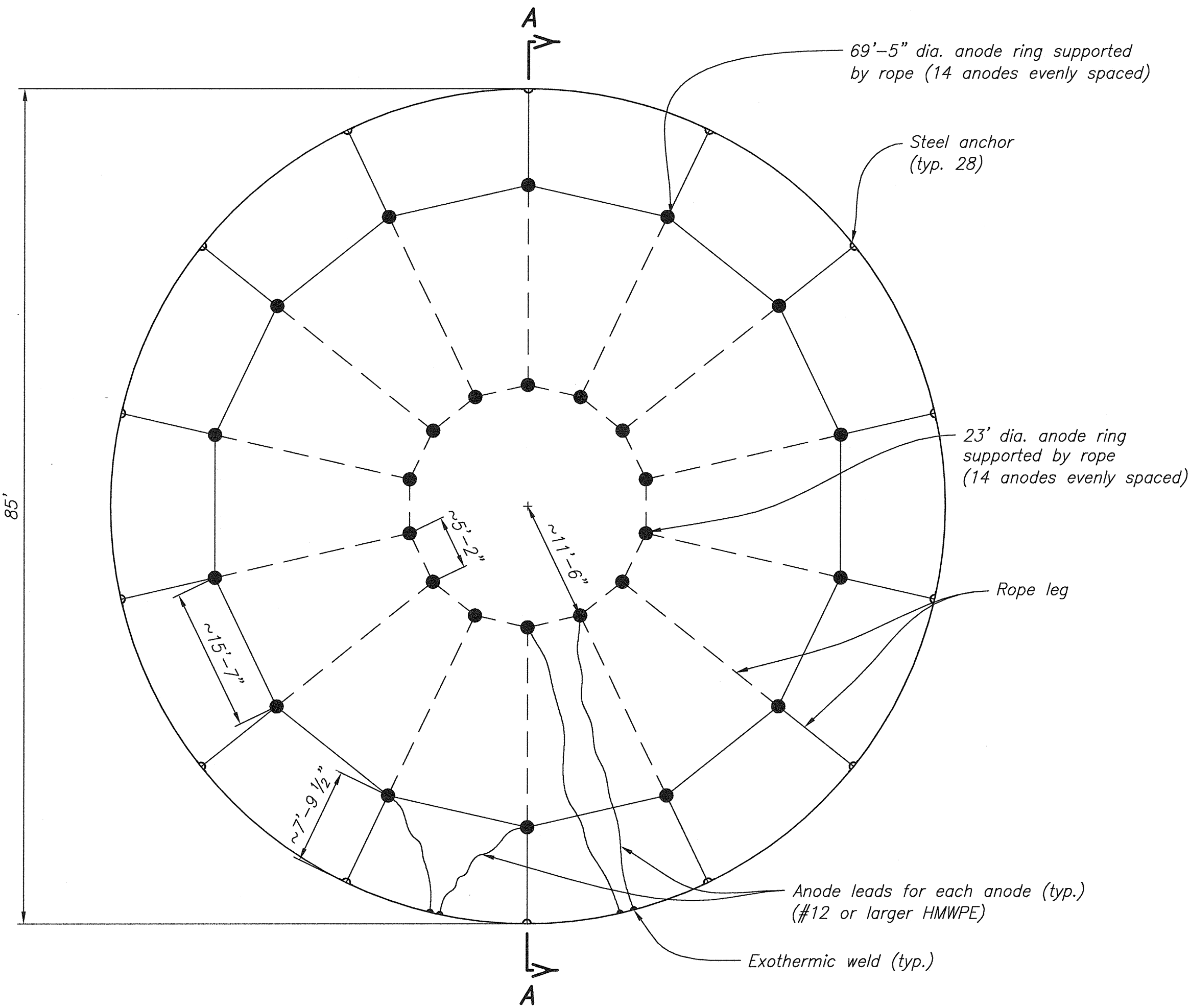
NOTES

1. One anode lead from top end of each stub anode in small anode ring (14 each).
2. One anode lead from top and bottom end of each anode in large anode ring (28 each).
3. Anode cables shall be installed with sufficient length and without stress.
4. Loosely wrap anode leads around rope.
5. Exothermic weld anode leads directly to tank wall.
6. Steel anchors shall be welded to tank wall for rope tie-off (28 each).
7. Rope legs shall be tied to center rope rings and steel anchors (28 each).
8. Cathodic protection items drawn larger for identification.

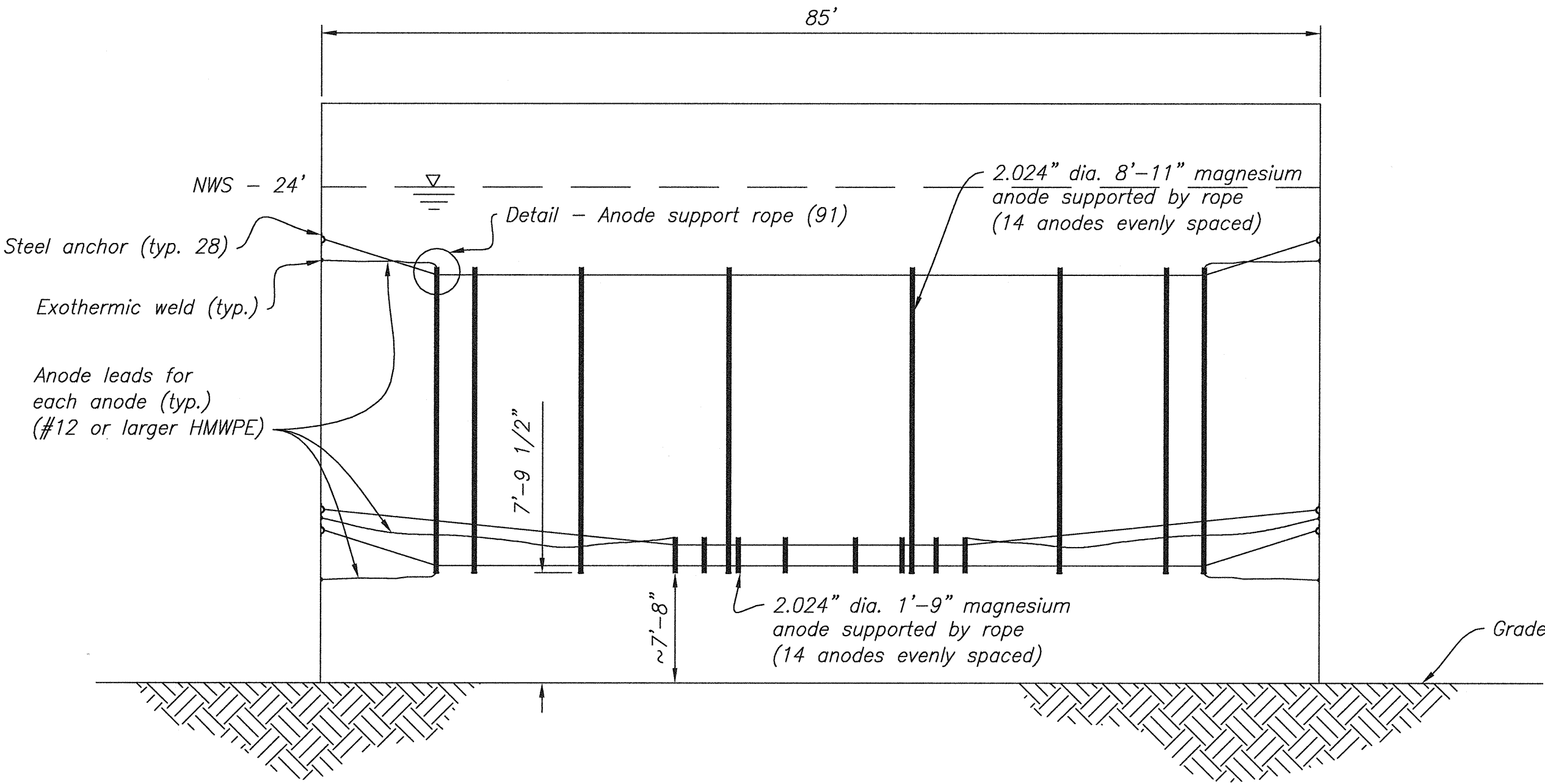
REFERENCE DRAWINGS

DETAIL - ANODE SUPPORT ROPE _____ 1695-D-91
DETAIL - STEEL ANCHOR ROPE SUPPORT _____ 1695-D-94
WELDING AND CABLE I.D. DETAILS _____ 1695-D-95

DESIGNED: *West T.S.*
DRAWN: *TS*
CHECKED: *TS*
TECH. APPR.: *Jessica Torrey*
PEER REVIEW: *Roger Throckmole*
ROGER THROCKMOLE
OP. SPECIALIST
DENVER, COLORADO 2013-08-02



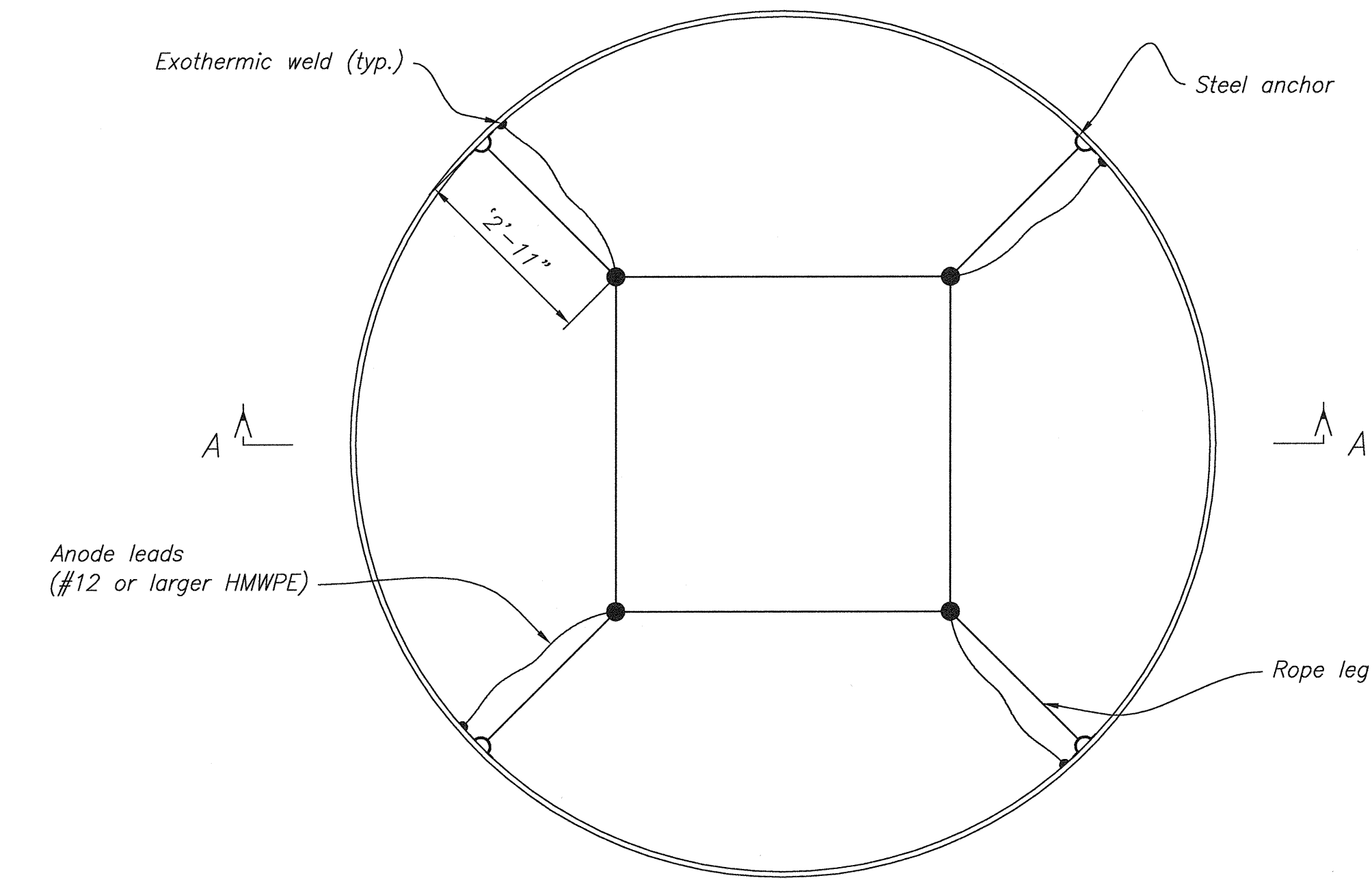
PLAN
(NOT-TO-SCALE)



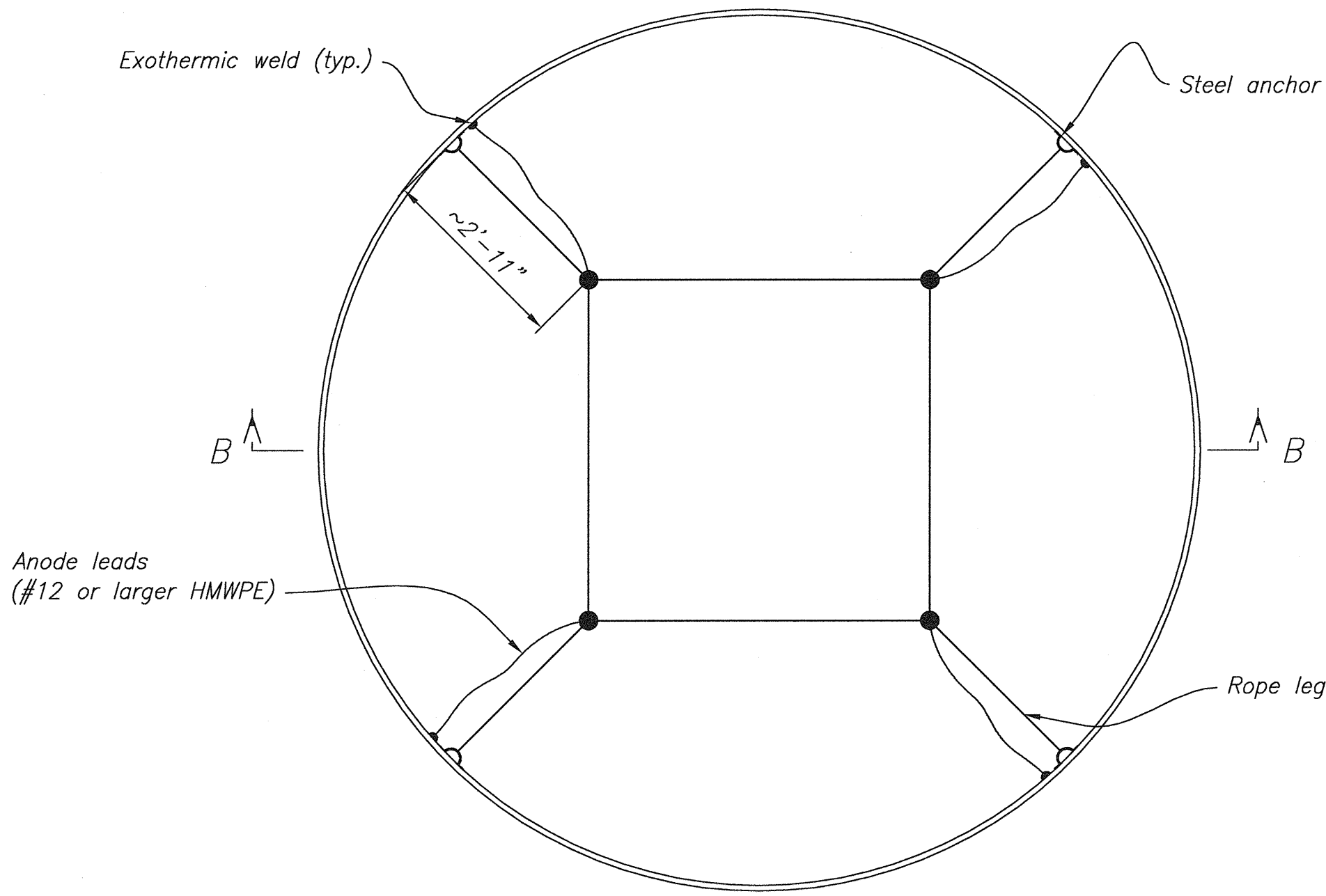
SECTION A-A
(NOT-TO-SCALE)

DATE AND TIME PLOTTED
August 6, 2013 12:32
PLOTTED BY
WJW

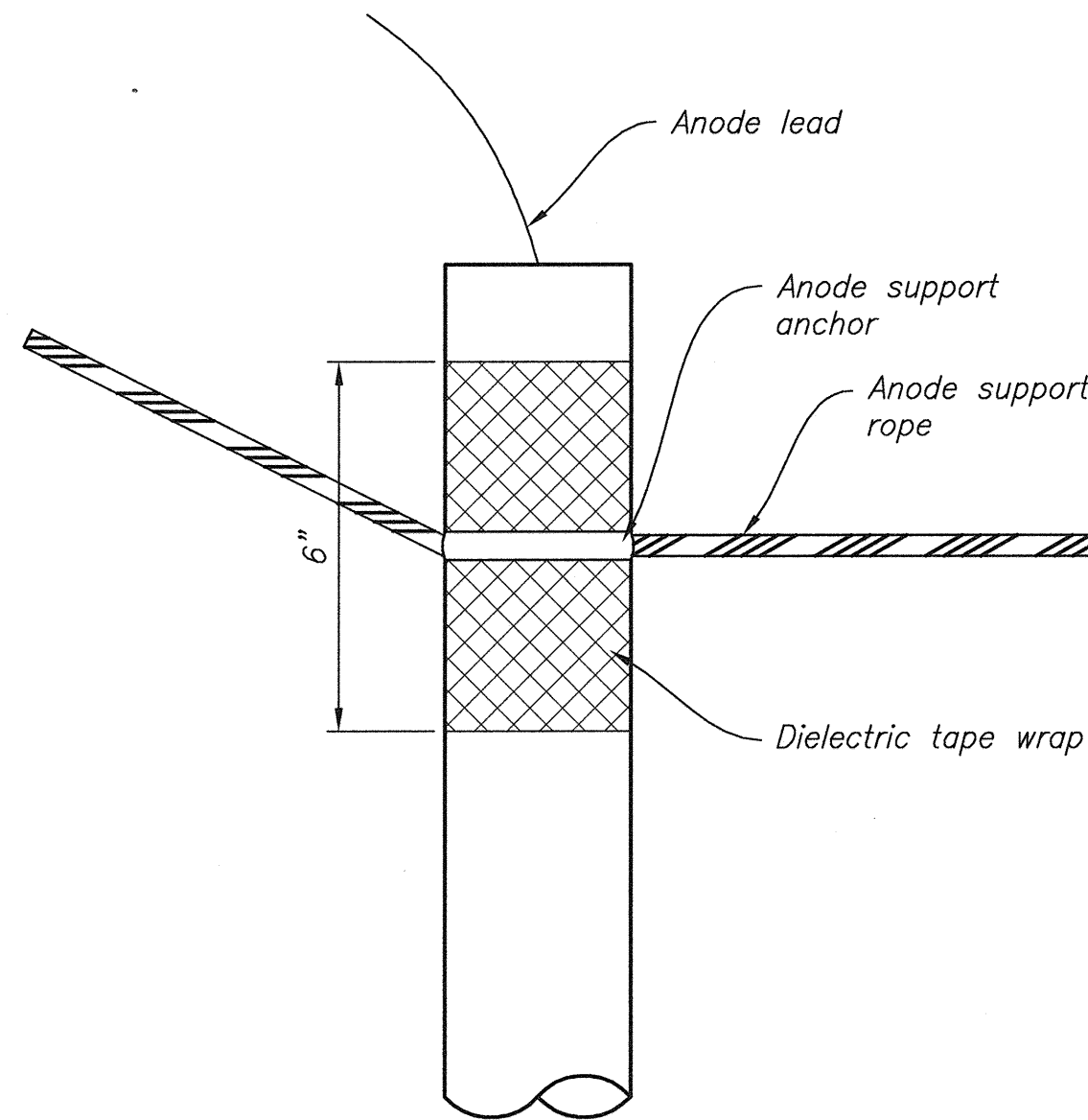
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AutoCAD Rel. 19.0s (LMS Tech)
Tohlakai PP 2013-08-06.dwg



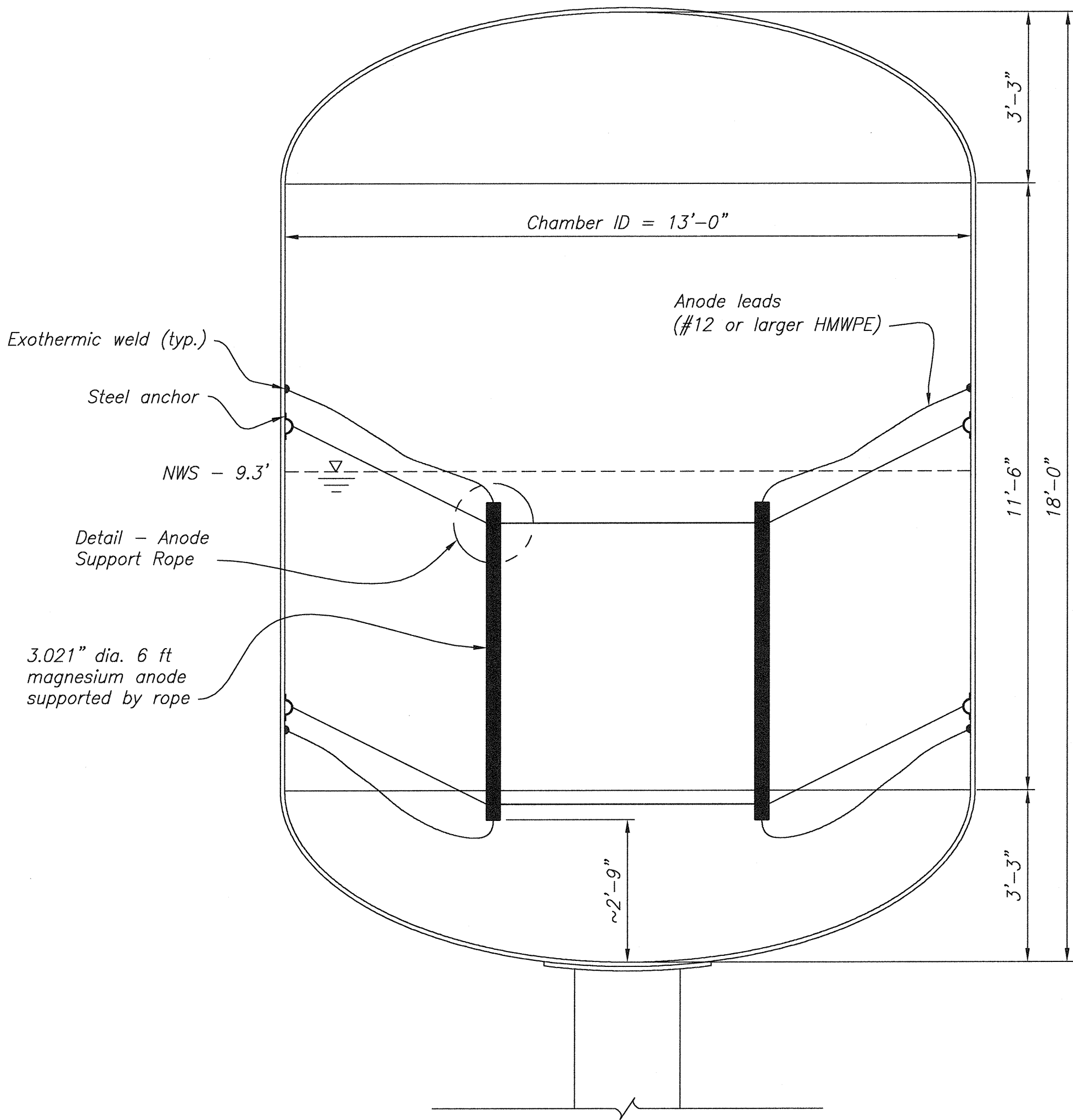
PLAN - 12.1 AIR CHAMBER
(NOT TO SCALE)



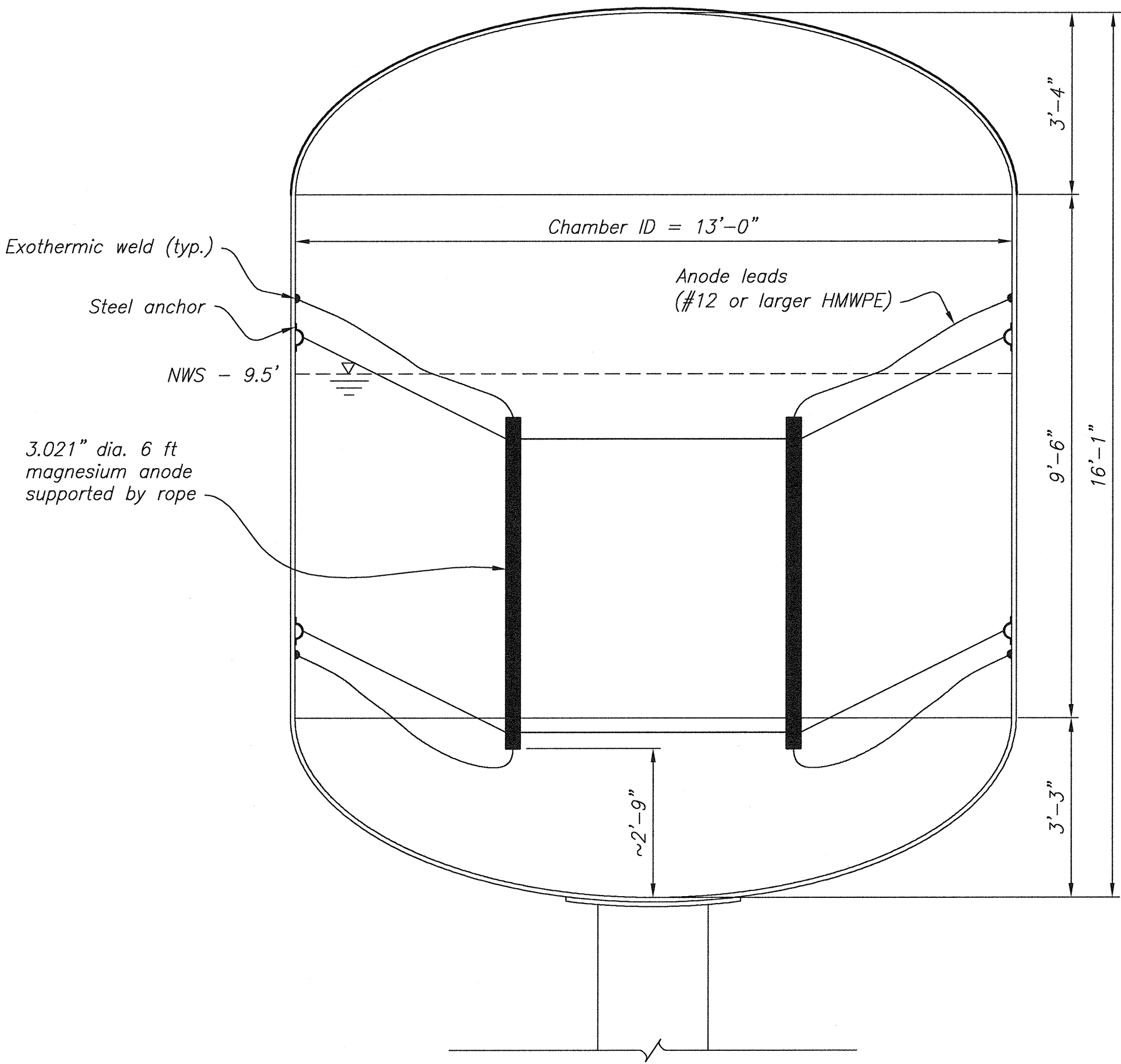
PLAN - 12B AIR CHAMBER
(NOT TO SCALE)



DETAIL - ANODE SUPPORT ROPE
(NOT TO SCALE)



SECTION A-A - 12.1 AIR CHAMBER
(NOT TO SCALE)



SECTION B-B - 12B AIR CHAMBER
(NOT TO SCALE)

NOTES

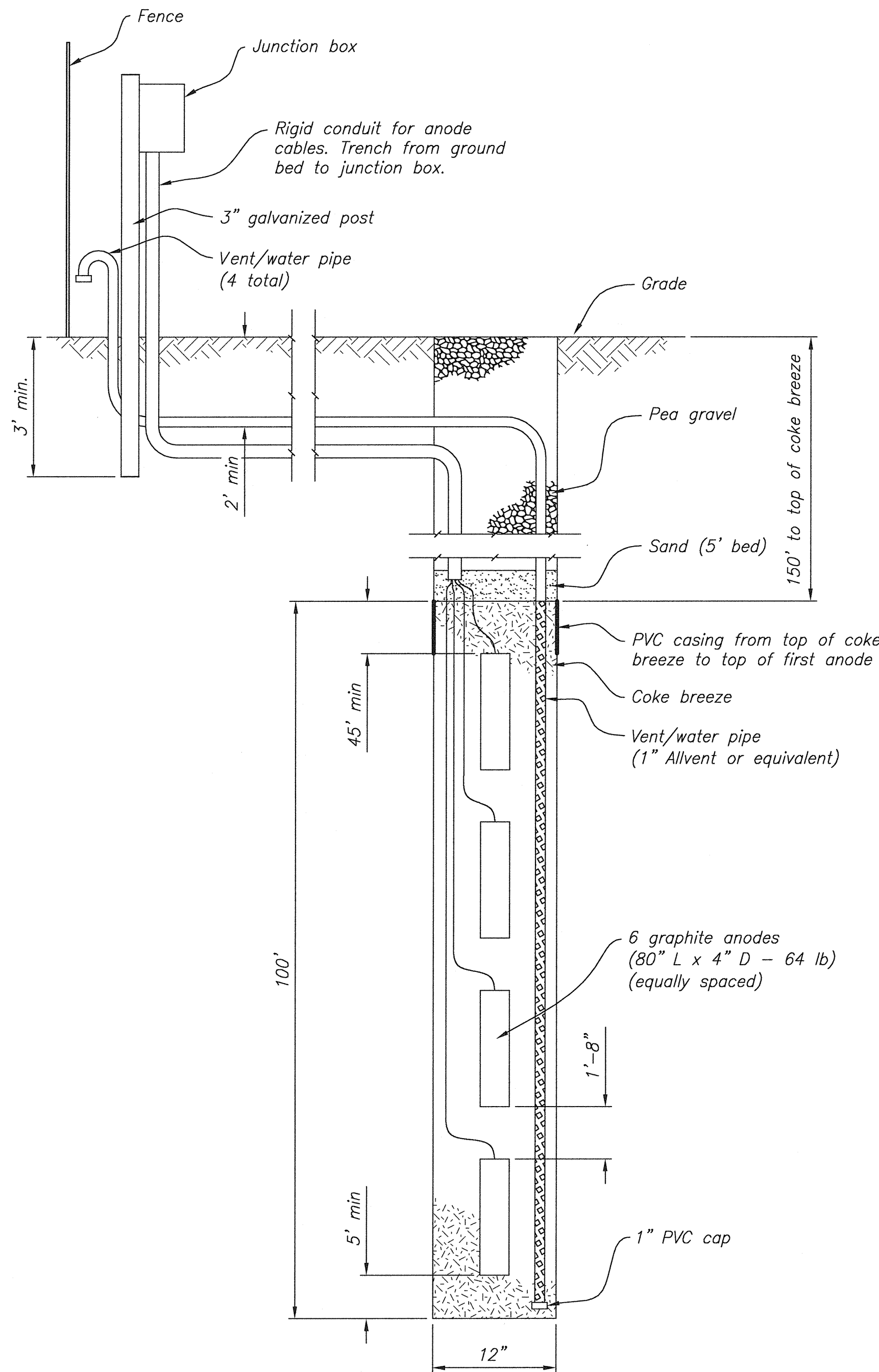
1. One anode lead from top and bottom end of each anode.
2. Loosely wrap anode leads around rope.
3. Exothermic weld anode leads directly to air chamber wall. Two in each air chamber.
4. Anode cables shall be installed with sufficient length and without stress.
5. Steel anchors shall be welded to air chamber wall for rope tie-off. Eight in each air chamber.
6. Rope legs shall be tied to anode and steel anchors. Eight in each air chamber.
7. Cathodic protection items drawn larger for identification.

REFERENCE DRAWINGS

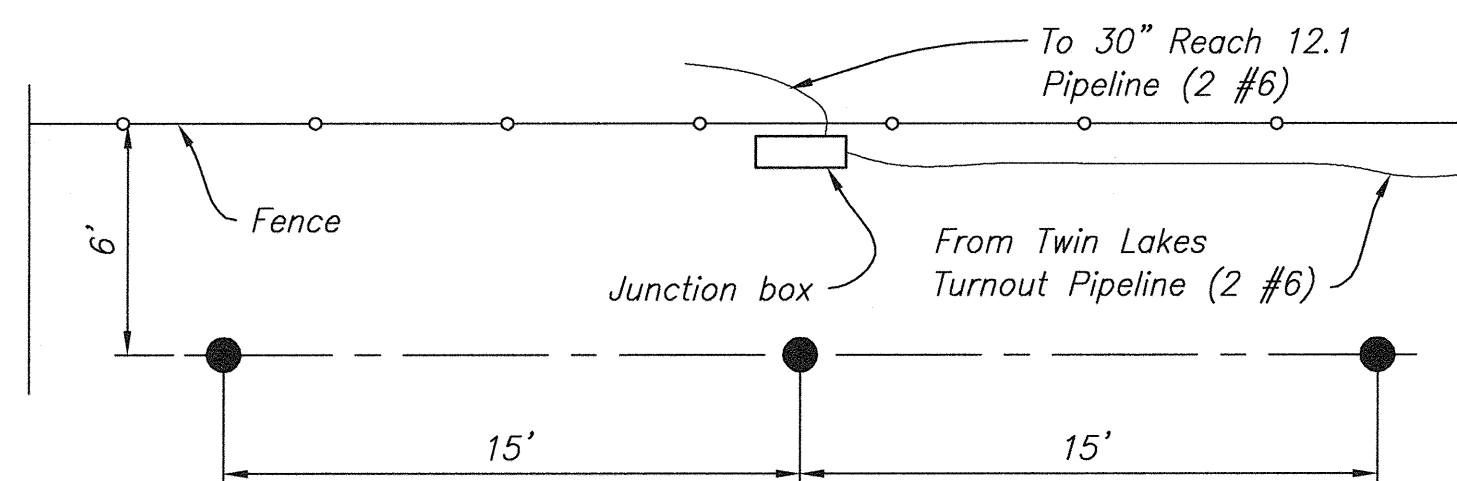
STEEL ANCHOR ROPE SUPPORT DETAIL 1695-D-94
WELDING AND CABLE I.D. DETAILS 1695-D-95

DATE AND TIME PLOTTED
August 6, 2013 12:32
PLOTTED BY
WUDY

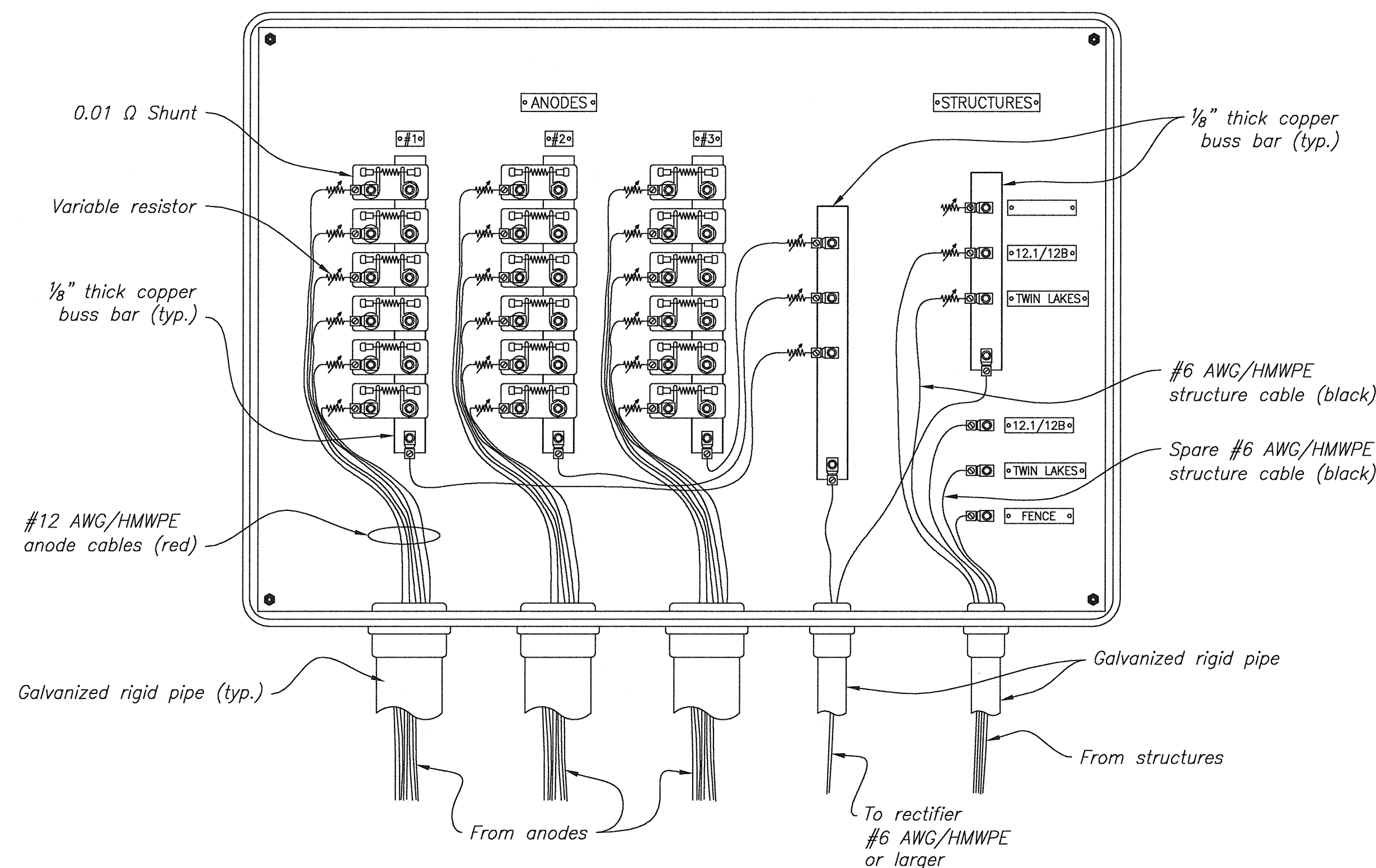
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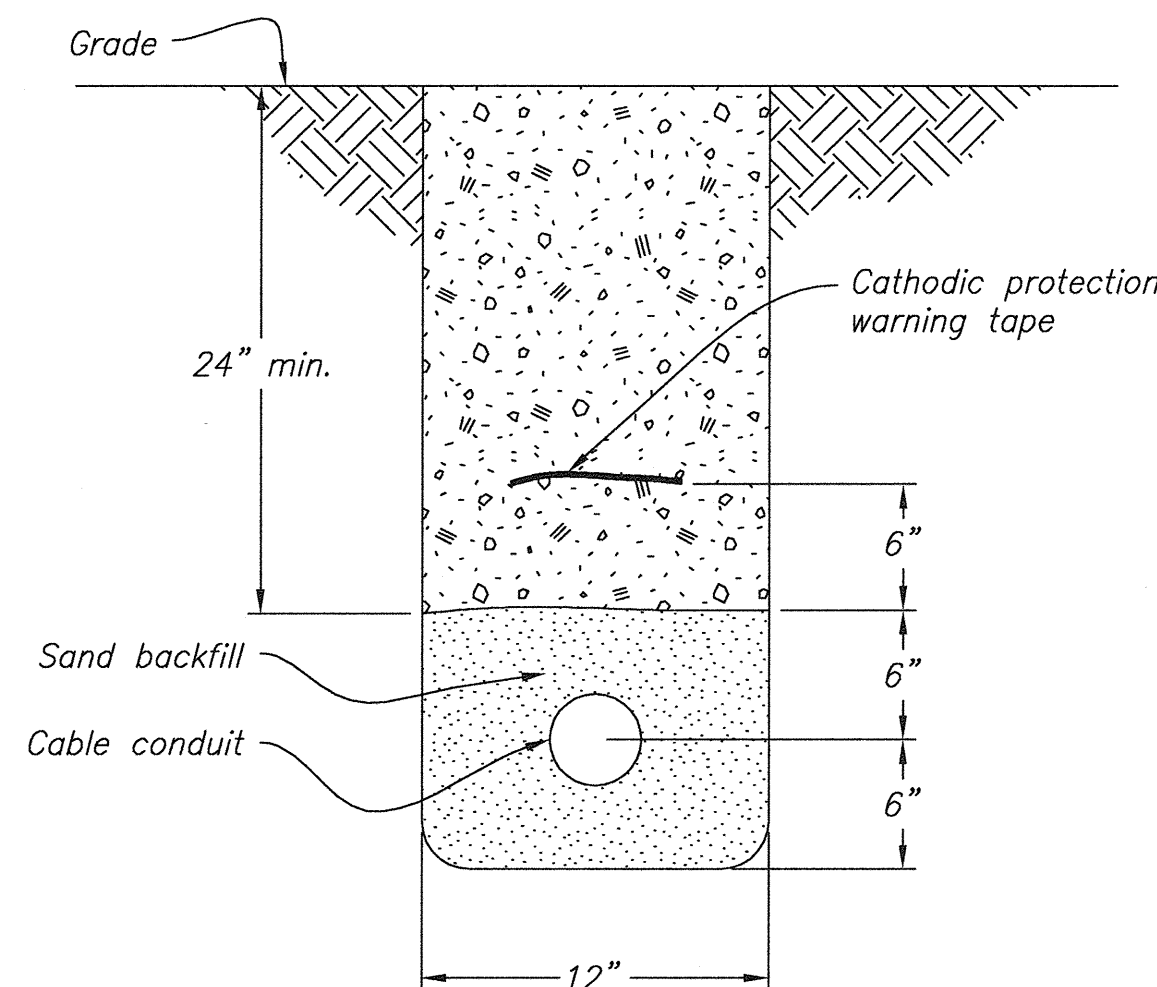
DEEP WELL IMPRESSED CURRENT ANODE BED
(NOT-TO-SCALE)



PLAN - DEEP WELL ANODE BED LOCATIONS
(NOT-TO-SCALE)



ANODE JUNCTION BOX
(NOT-TO-SCALE)



CABLE CONDUIT TRENCH
(NOT-TO-SCALE)

NOTES

1. The required HMWPE insulation is black for structure and test cables and red (if available) for anode cables.
2. Junction box mounted directly to pole.
3. Vent/water pipes for deep well impressed current anode beds located against fence near junction box.
4. Anodes centered in hole using centralizers.
5. Anode bed details listed in Table 26 42 10-B in Specification section 26 42 10.
6. Anode bed locations shown on Drawing 1695-D-99.
7. Polyethylene or polypropylene rope used to lower anodes into anode bed.
8. Rigid conduit/pipe from anode bed shall be sch. 40 PVC below grade.
9. Trench details to be used for all horizontal segments of conduit.

REFERENCE DRAWINGS

SITE PLAN _____ 1695-D-99
ELECTRICAL INSTALLATION
CONDUIT LAYOUT DETAIL 1 _____ 1695-D-248
CONDUIT LAYOUT DETAIL 5 & 6 _____ 1695-D-252

DESIGNED *West T. S.*
DRAWN *West T. S.*
CHECKED *West T. S.*
TECH. APPR. *Jessica Tenney - ELD*
PEER REVIEW *Roger C. Murillo*
ROBERT FURUTATE
CP SPECIALIST
DENVER, COLORADO 2013-08-06

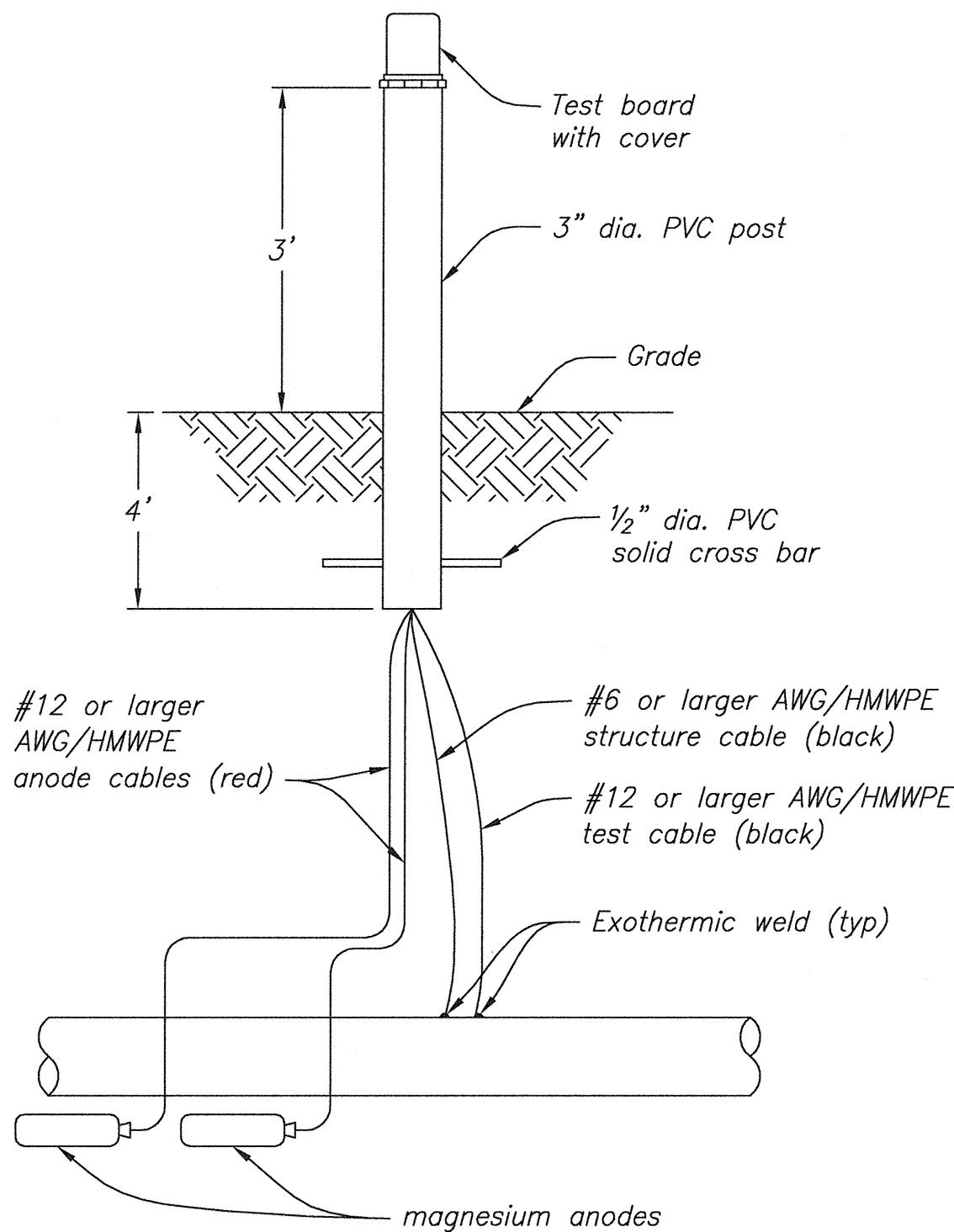
NOTES

1. Place anode at the same depth as the bottom of the structure.
2. Anodes are to be installed a minimum distance of 35 feet from the structure.
3. One shunt for each anode installed at location.

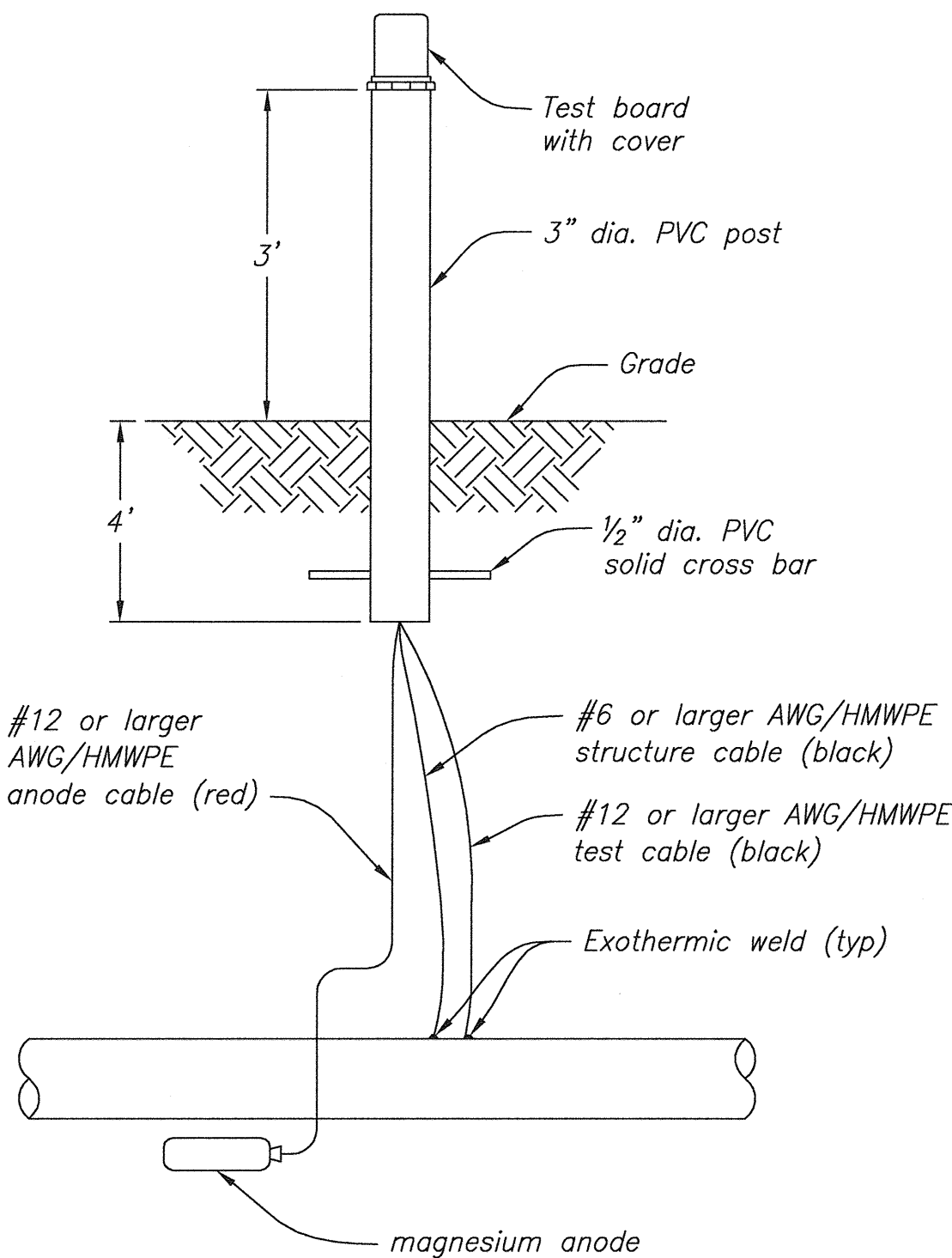
REFERENCE DRAWINGS

WELDING AND CABLE I.D. DETAILS _____ 1695-D-95
TEST STATION PROTECTION BARRIERS _____ 1695-D-109

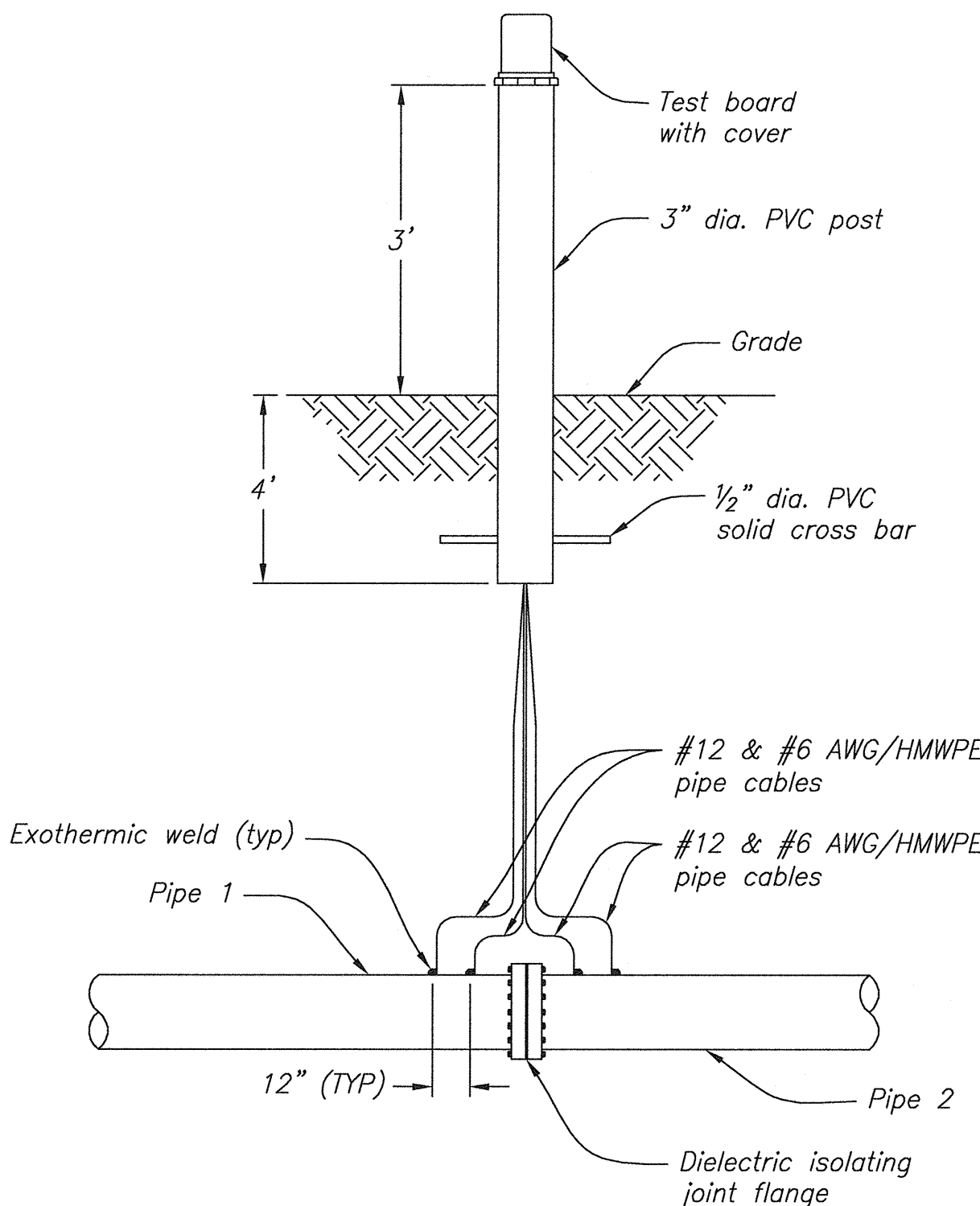
DESIGNED	<i>[Signature]</i>
DRAWN	<i>[Signature]</i>
CHECKED	<i>[Signature]</i>
TECH. APPR.	JESSICA TORREY - PLS
PEER REVIEW	<i>[Signature]</i>
ROGER TURCOTTE OP SPECIALIST	
DENVER, COLORADO	2013-08-05



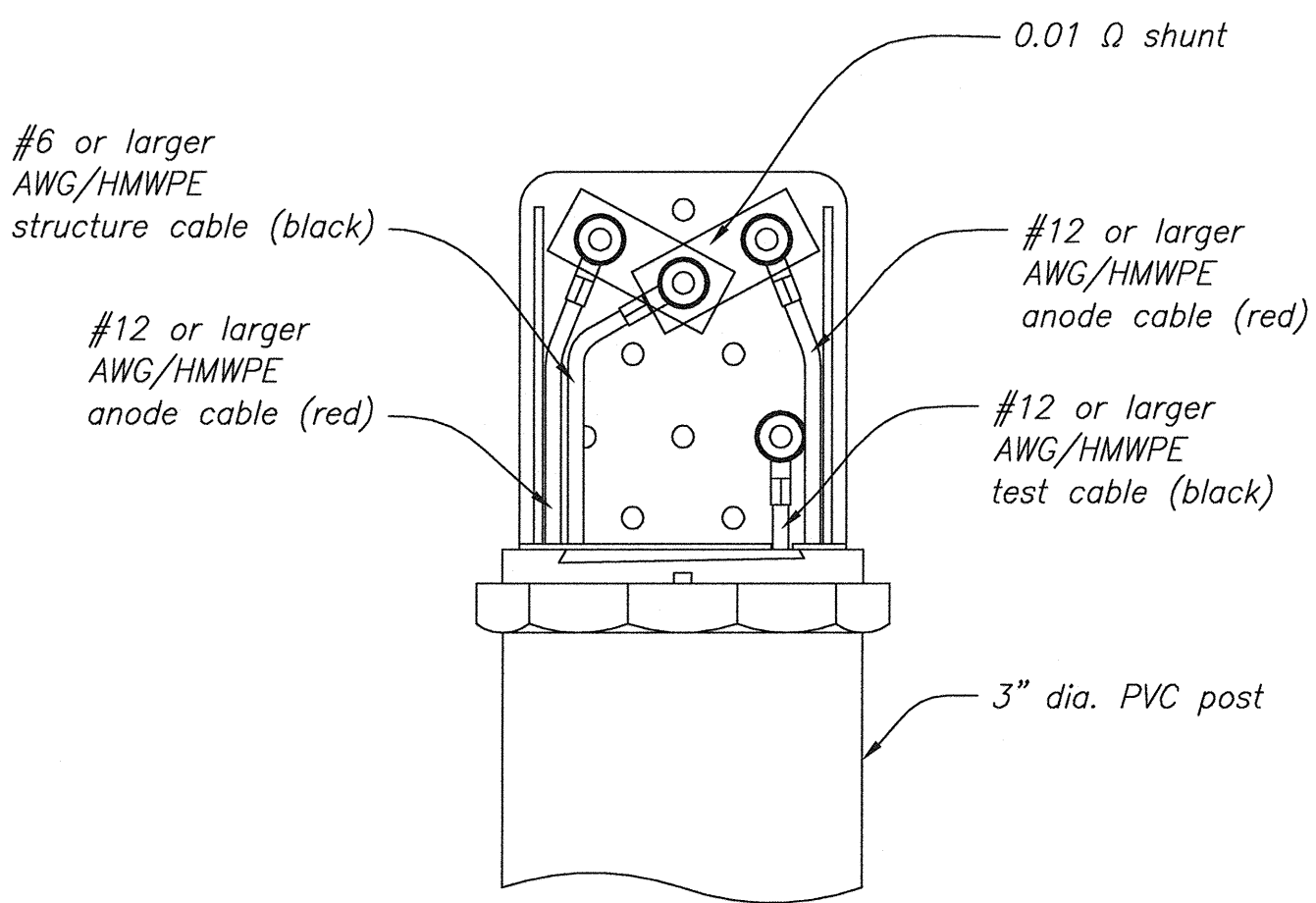
ANODE TEST STATION (ATS) - MULTIPLE ANODE
(NOT-TO-SCALE)



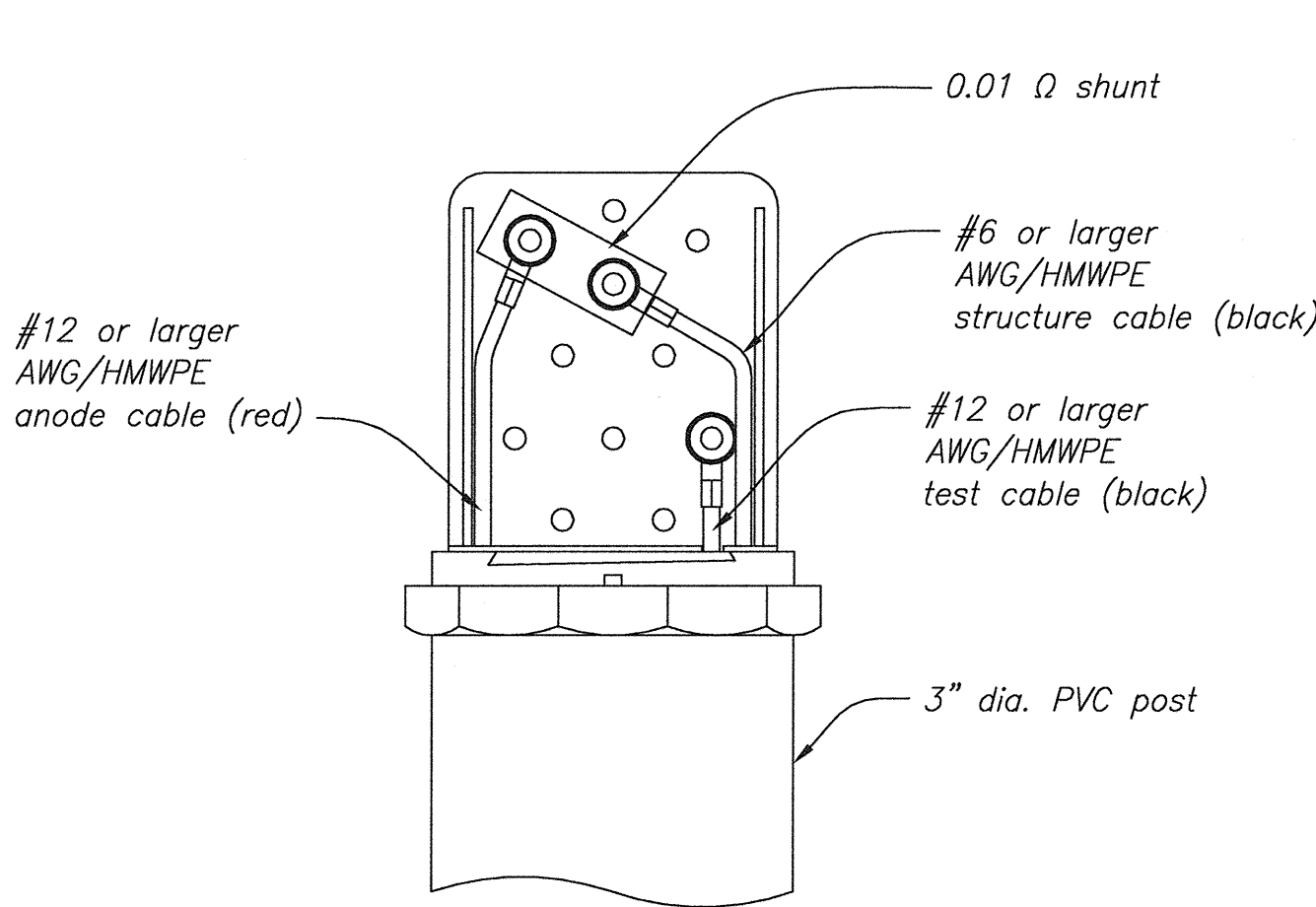
ANODE TEST STATION (ATS) - SINGLE ANODE
(NOT-TO-SCALE)



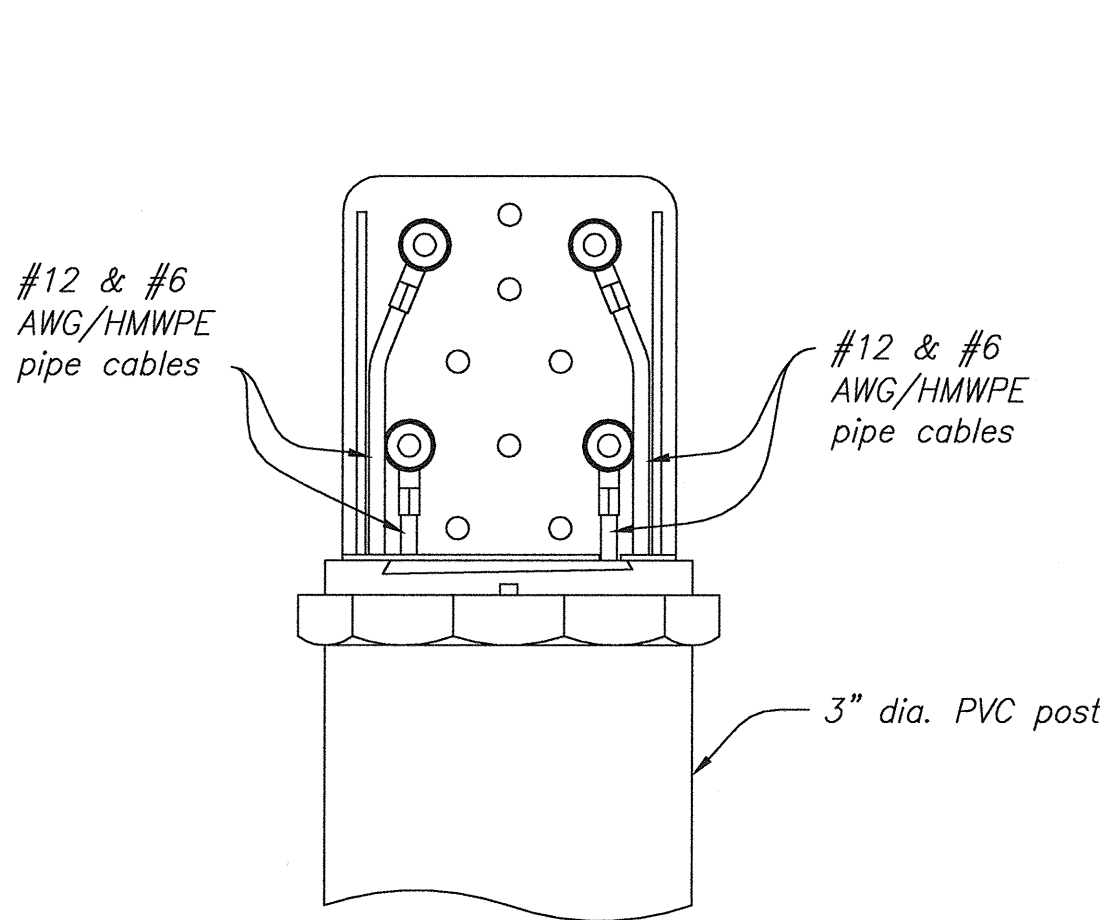
ISOLATING JOINT TEST STATION (IJTS)
(NOT-TO-SCALE)



TEST BOARD - ATS - MULTIPLE ANODE
(NOT-TO-SCALE)



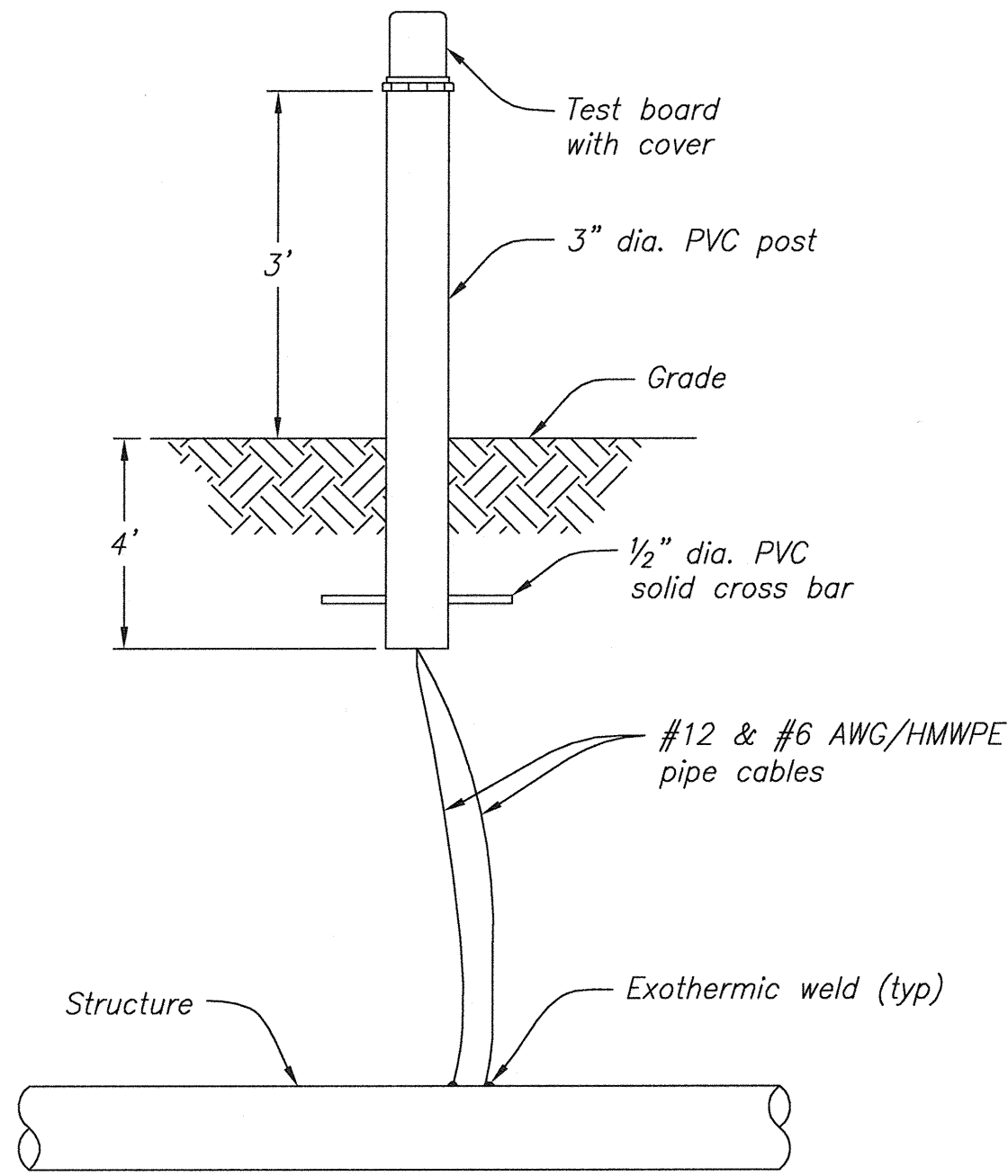
TEST BOARD - ATS - SINGLE ANODE
(NOT-TO-SCALE)



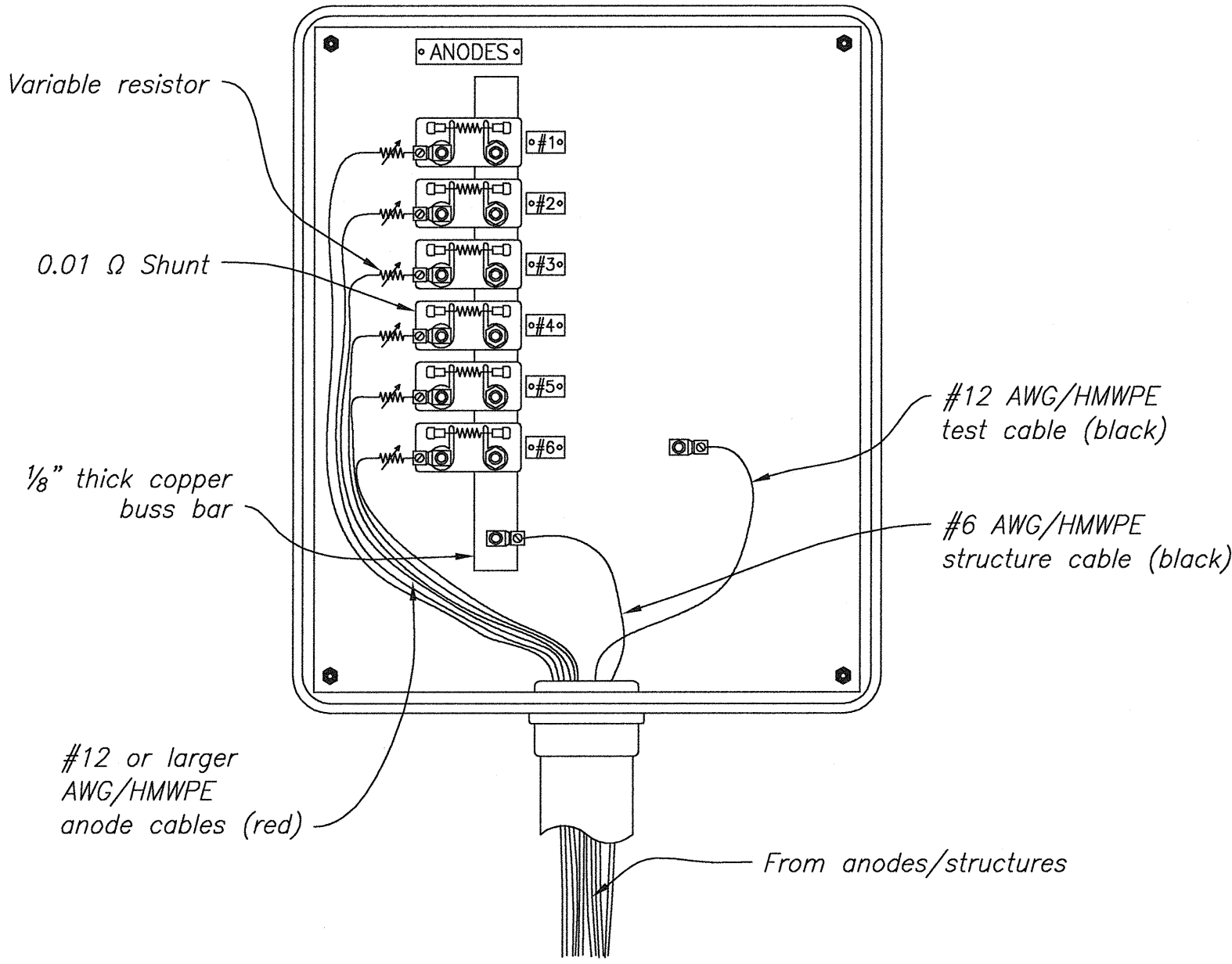
TEST BOARD - IJTS
(NOT-TO-SCALE)

DATE AND TIME PLOTTED
August 6, 2013 12:33
PLOTTED BY
MUR

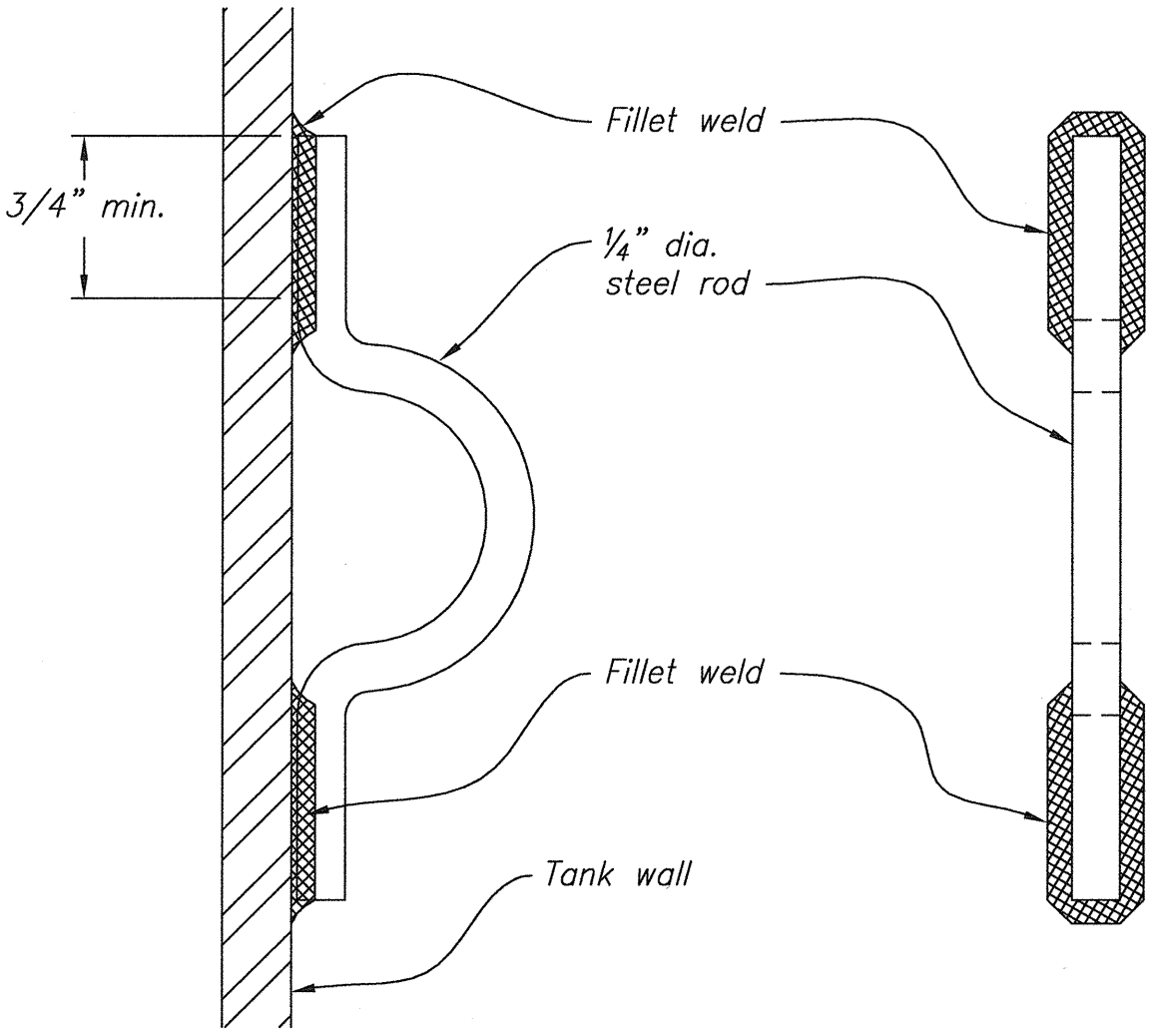
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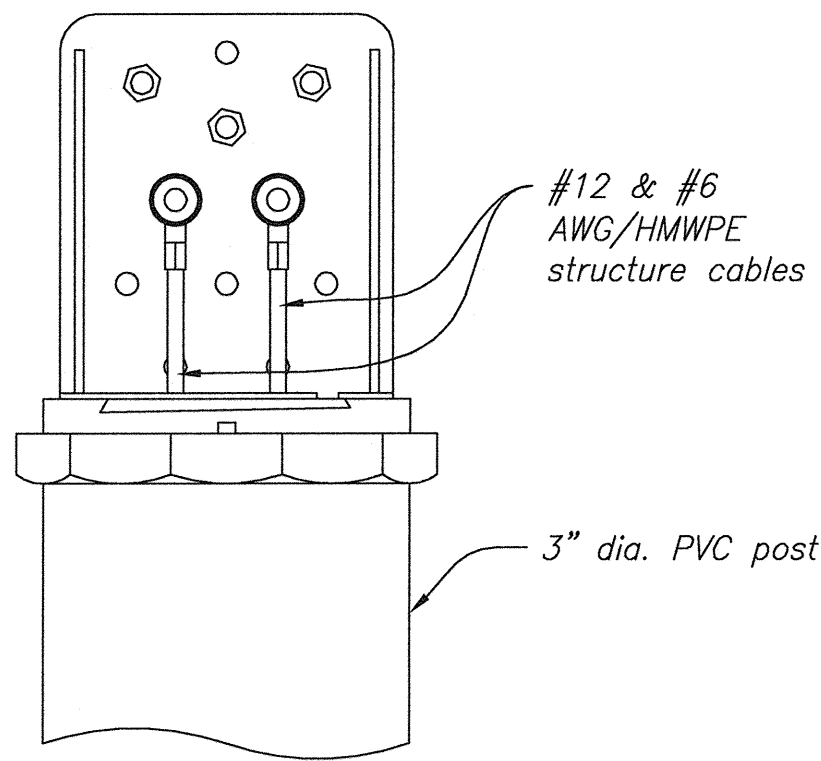
CORROSION TEST STATION (CTS)
(NOT-TO-SCALE)



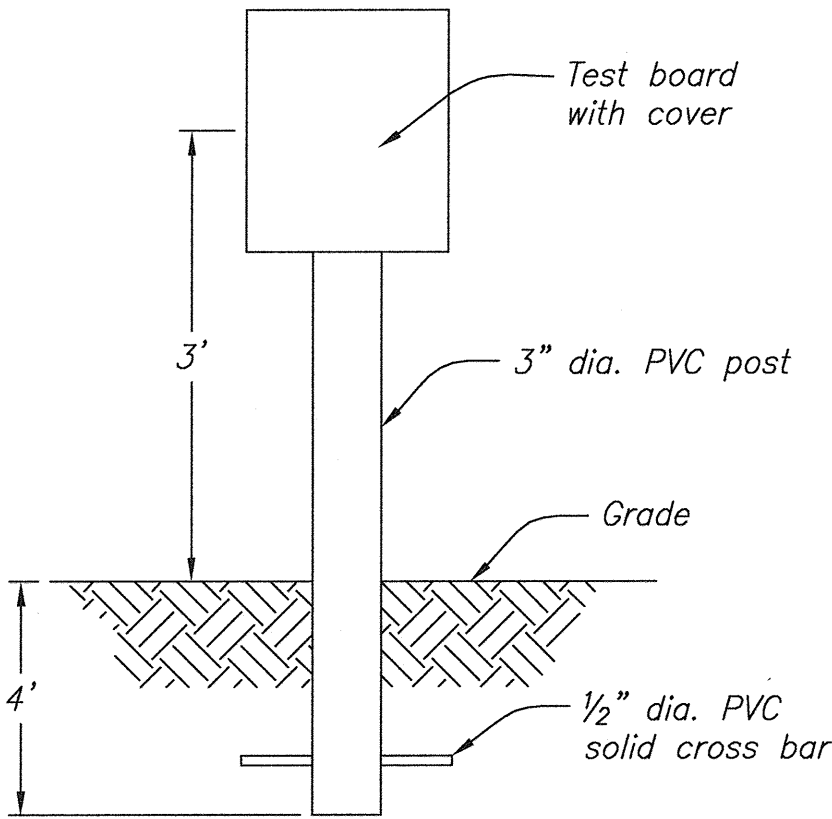
GALVANIC ANODE JUNCTION BOX
(NOT-TO-SCALE)



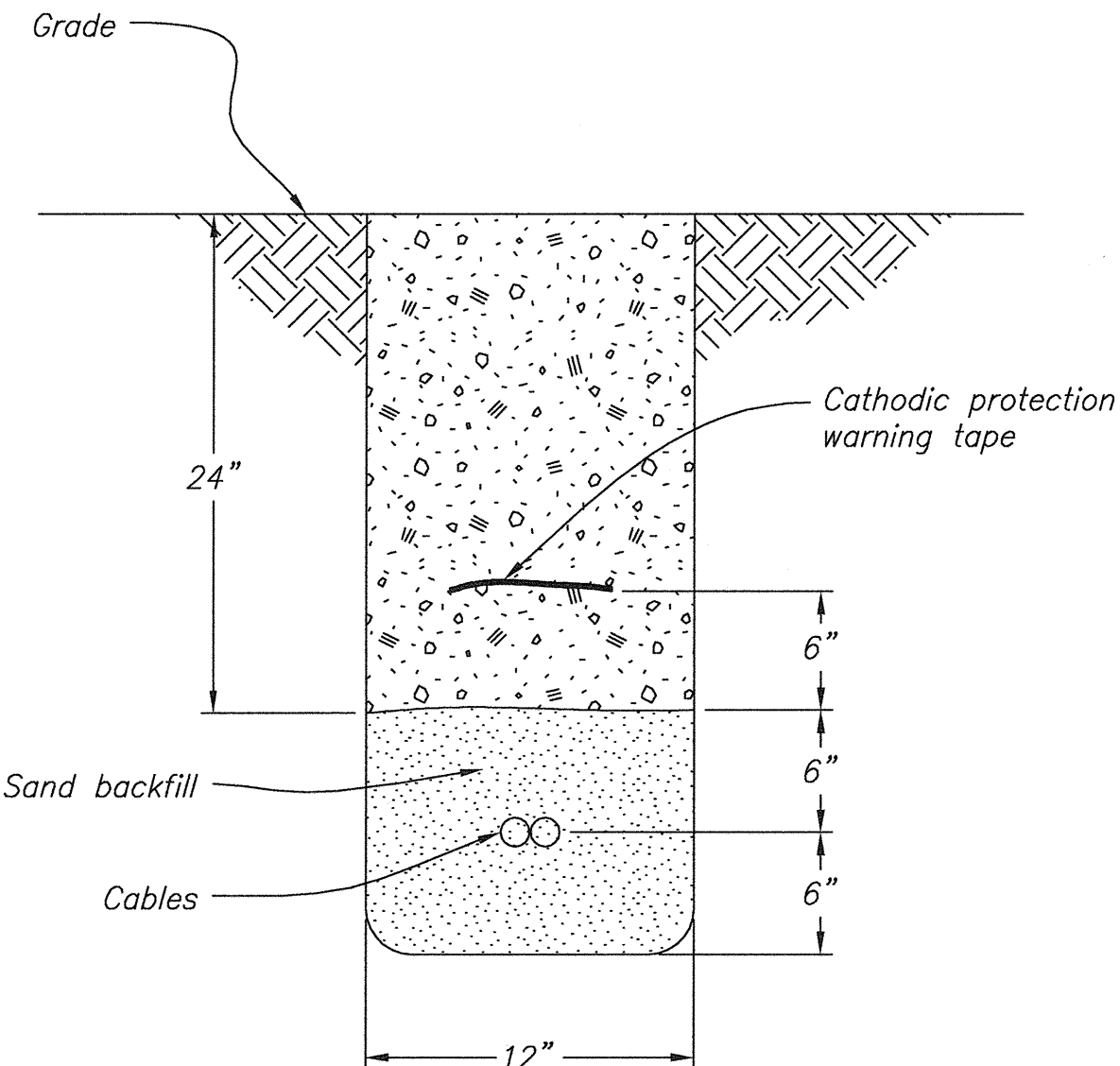
DETAIL - STEEL ANCHOR ROPE SUPPORT
(NOT-TO-SCALE)



TEST BOARD - CTS
(NOT-TO-SCALE)



JUNCTION BOX
(NOT-TO-SCALE)



CABLE TRENCH
(NOT-TO-SCALE)

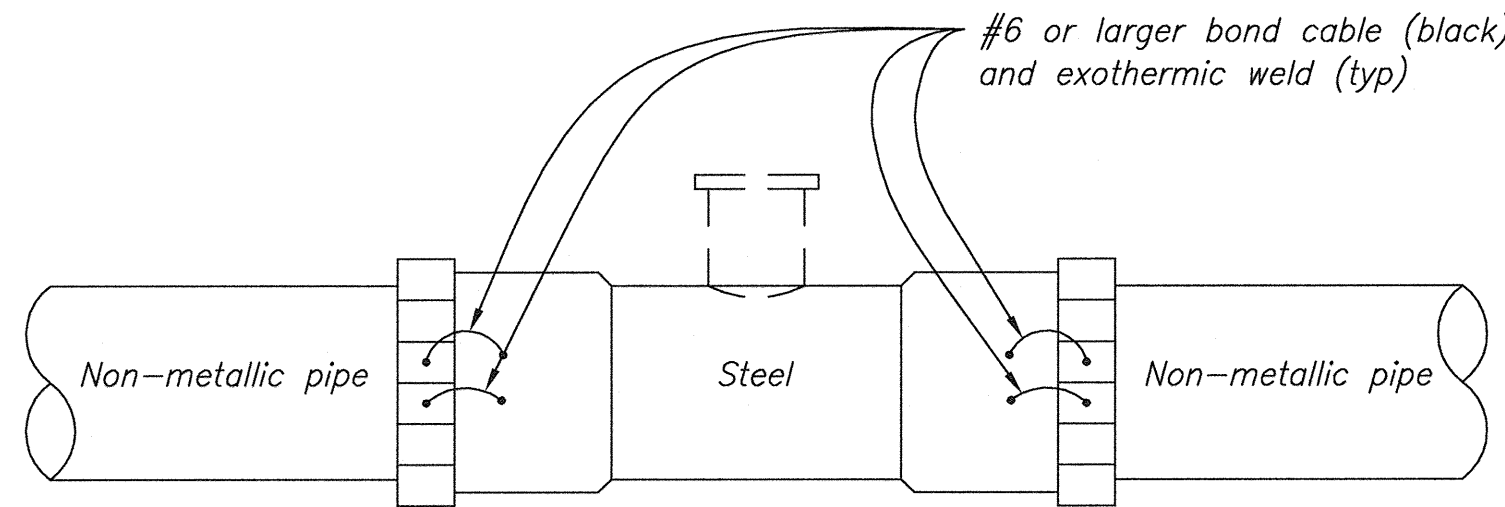
NOTES

- 1. Place anode at the same depth as the bottom of the structure.
- 2. Anodes are to be installed a minimum distance of 35 feet from the structure.
- 3. One shunt for each anode installed at location.

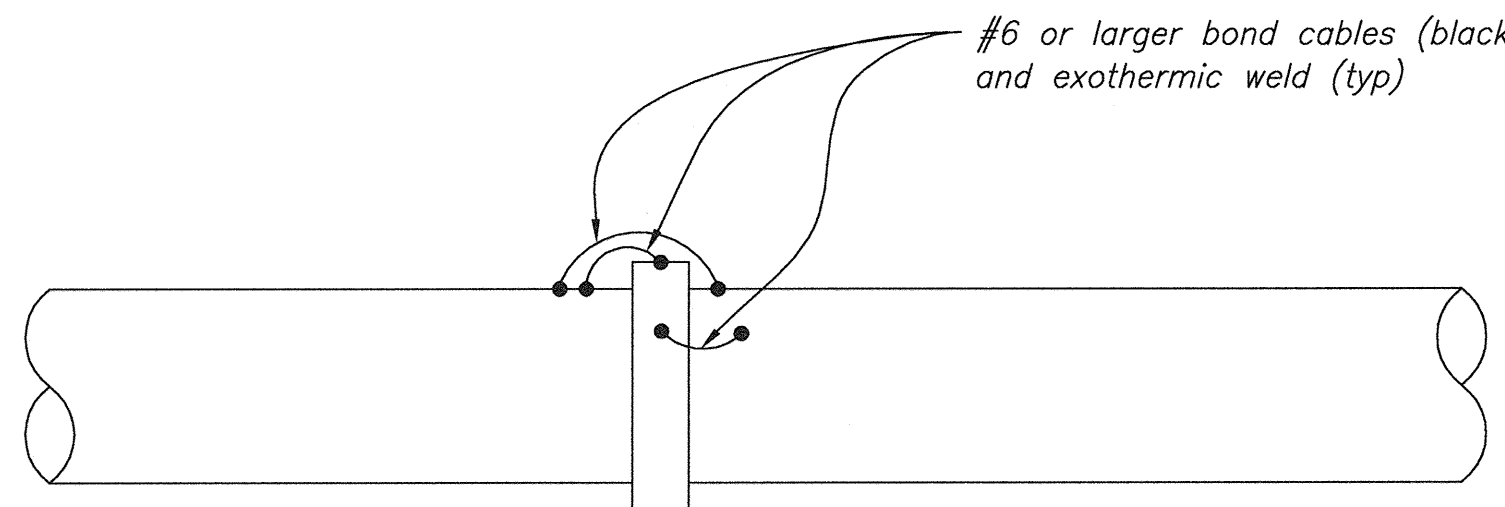
REFERENCE DRAWINGS

WELDING AND CABLE I.D. DETAILS 1695-D-95
TEST STATION PROTECTION BARRIERS 1695-D-109

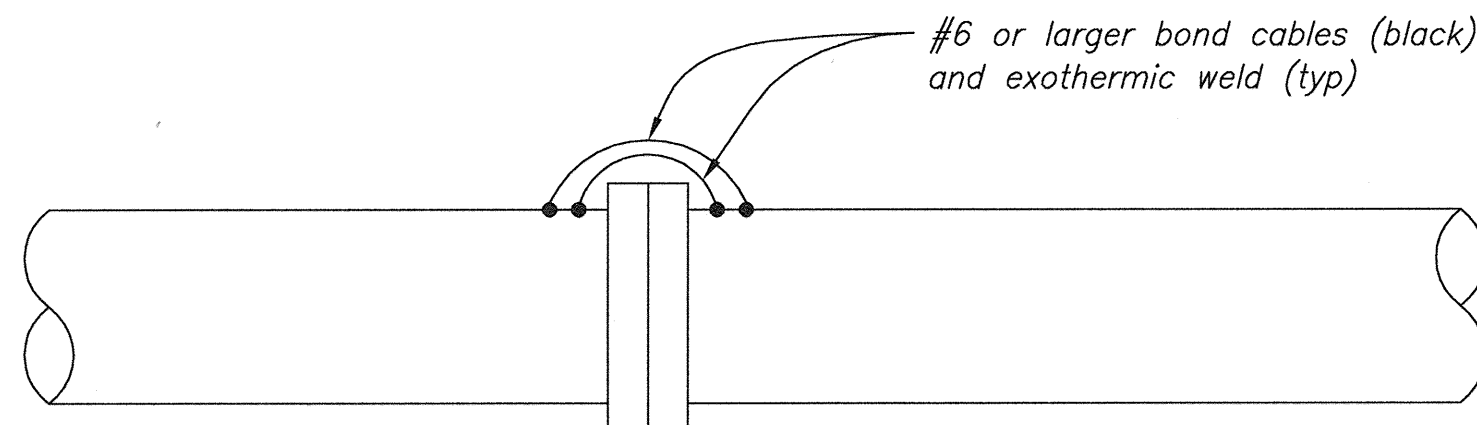
DESIGNED	West JS
DRAWN	West JS
CHECKED	West JS
TECH. APPR.	JESSICA TERRY - P.E.
PEER REVIEW	ROBERT TURCOTTE - P.E.
OP SPECIALIST	
DENVER, COLORADO	2013-08-05



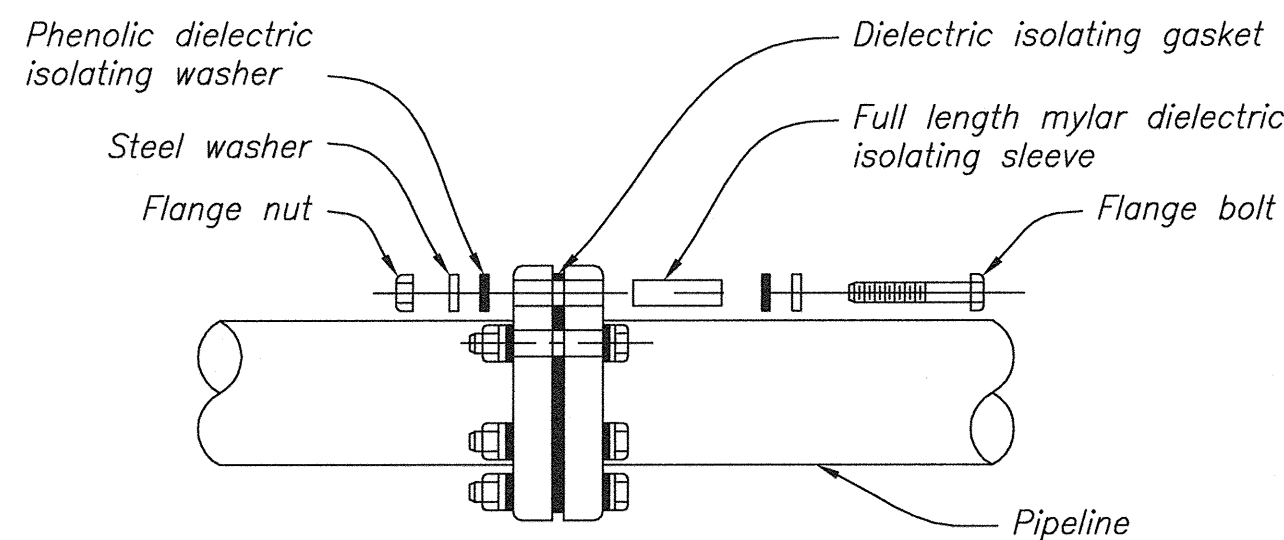
PVC-TO-STEEL BOND DETAIL



VICTAULIC BOND DETAIL

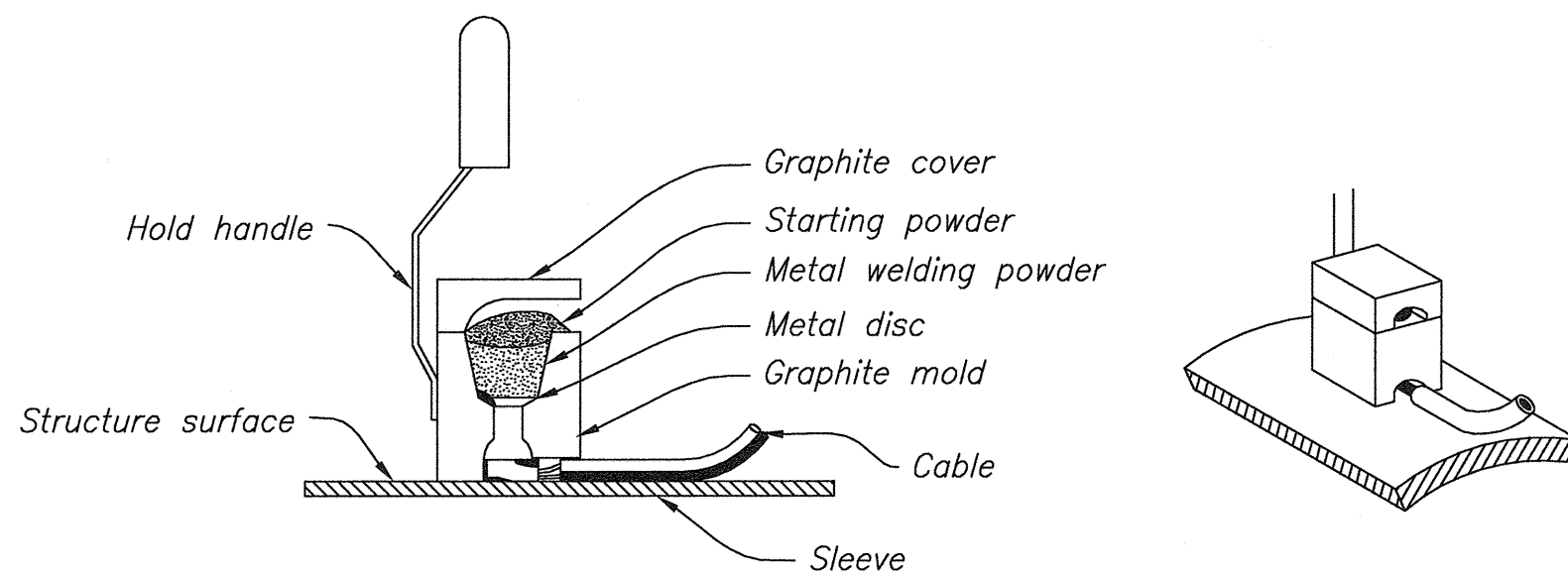


FLANGE-TO-FLANGE BOND DETAIL



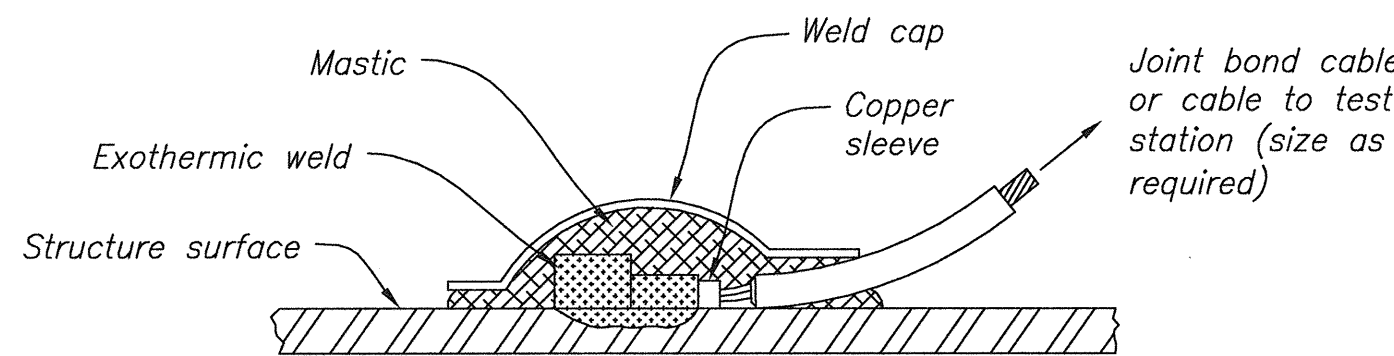
NOTE:
If flange is buried, coat
flange w/ wax tape wrap system.

IJFK - DIELECTRIC ISOLATING JOINT FLANGE KIT

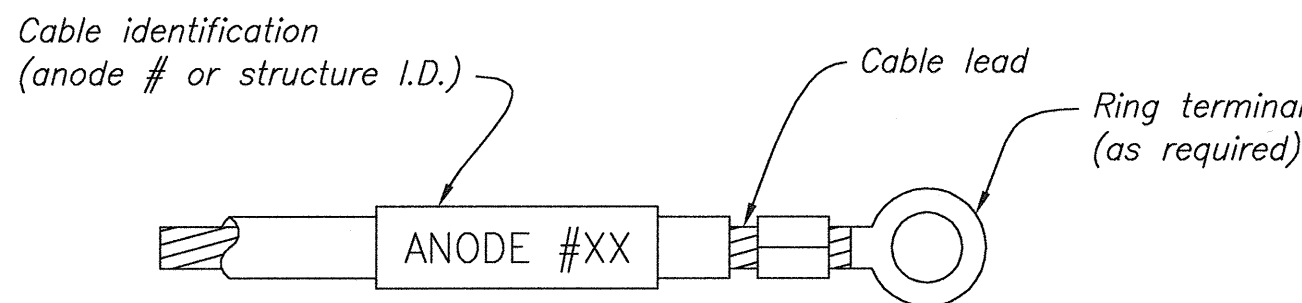


- STEP 1. Grind structure connection area (3"x3") to bare shiny metal and clean.
- STEP 2. Strip insulation from wire. Attach sleeve.
- STEP 3. Hold mold firmly with opening away from operator & ignite with flint gun.
- STEP 4. Remove slag from connection and peen weld for soundness.
- STEP 5. Cover connection and exposed structure surface with a bituminous coating compound.

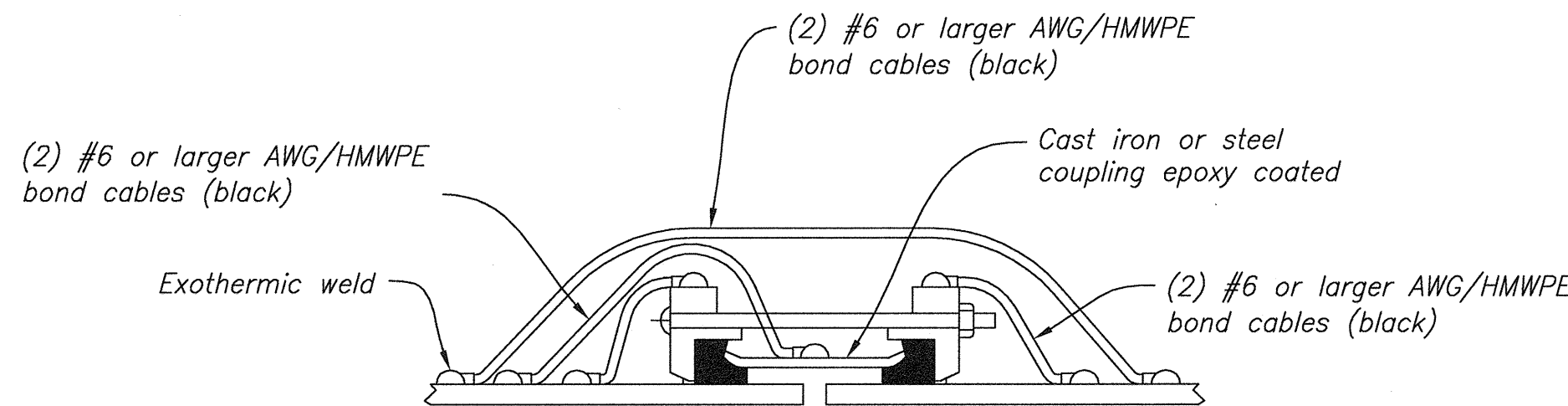
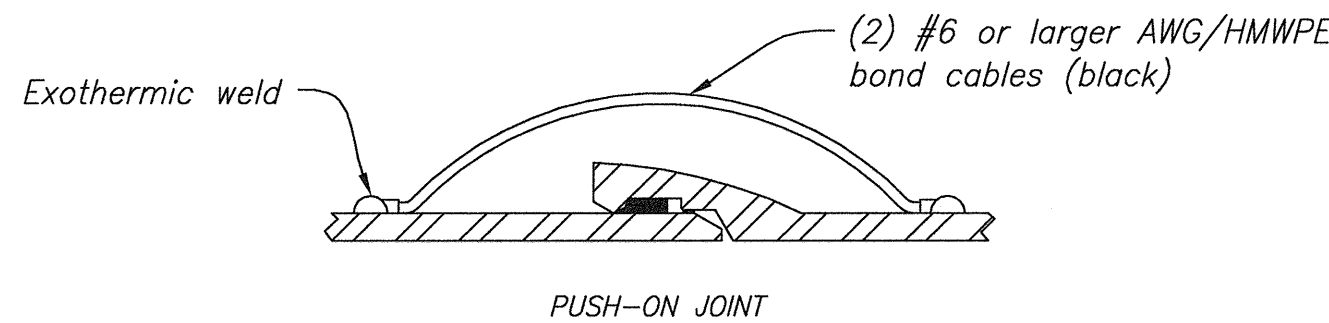
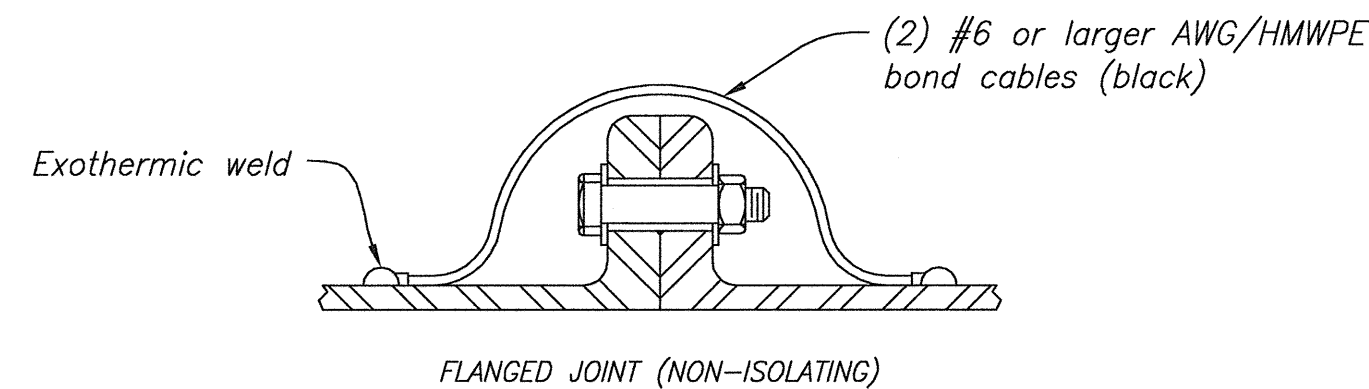
NOTE:
Procedure shown above is to be used as a general
guide only. Consult manufacturer's literature for
specific installation instructions.



EXOTHERMIC WELDING



CABLE IDENTIFICATION



NOTE:
Bond each individual metallic component.

BONDING JUMPER INSTALLATION

NOTES

1. All pipe joints are to be electrically bonded with cables, exothermically welded to the top portion of the pipe.
2. Number and size of bond cables in accordance with Specification Section 26 42 10, article 3.01F.
3. Do not install joint bonds on welded joints and/or joints called out to be electrically isolated.
4. If isolating joint flange is buried, coat flange with wax tape wrap system.
5. Cover cable I.D. with piece of clear heat shrink tubing.
6. Any non-welded, non-isolating joints, valves & fittings require bonding to achieve electrical continuity.
7. Coat exposed copper, weld nugget, and ferrous material at weld with approved dielectric coating.

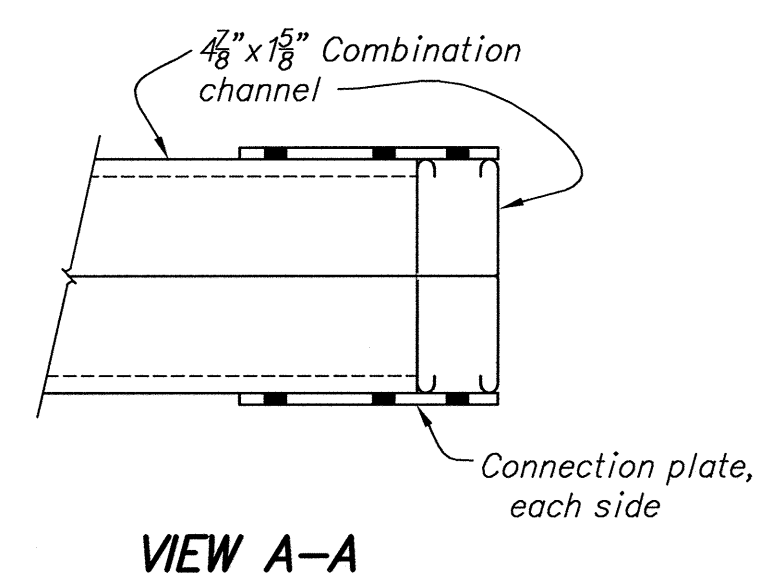
REFERENCE DRAWINGS

STEEL MANIFOLD
SECTIONS - SHEET 2 OF 6
SECTIONS - SHEET 3 OF 6
SECTIONS - SHEET 4 OF 6
BYPASS AND INTERIE - PLAN - SHEET 1 OF 2

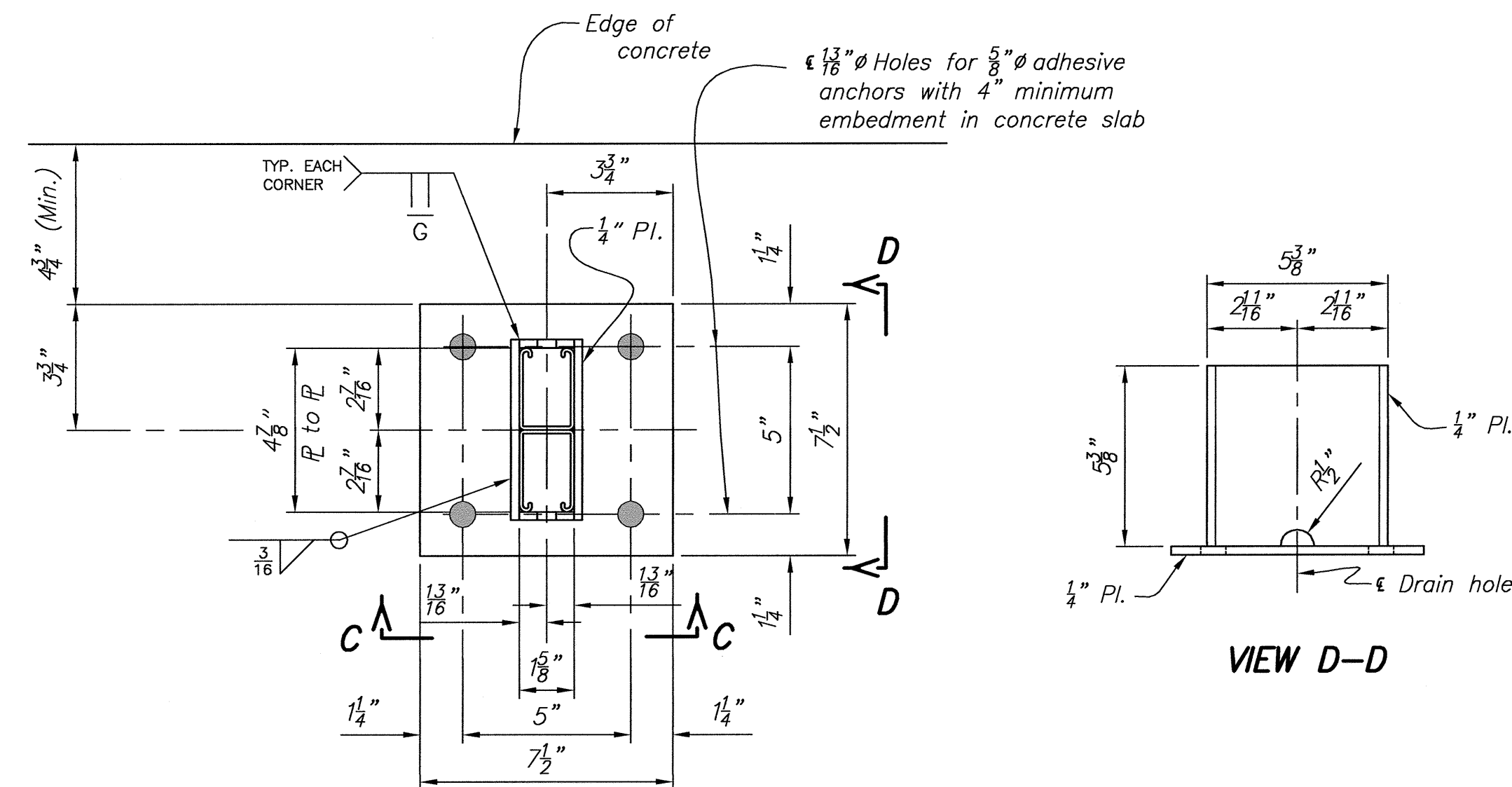
ALWAYS THINK SAFETY

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
NAVAJO GALLUP WATER SUPPLY PROJECT
NEW MEXICO
SAN JUAN LATERAL
TOHLAKAI (FEIS #08) PUMPING PLANT
CATHODIC PROTECTION
JOINT BONDS, IJFK, WELDING, CABLE I.D.
AND BONDING JUMPER

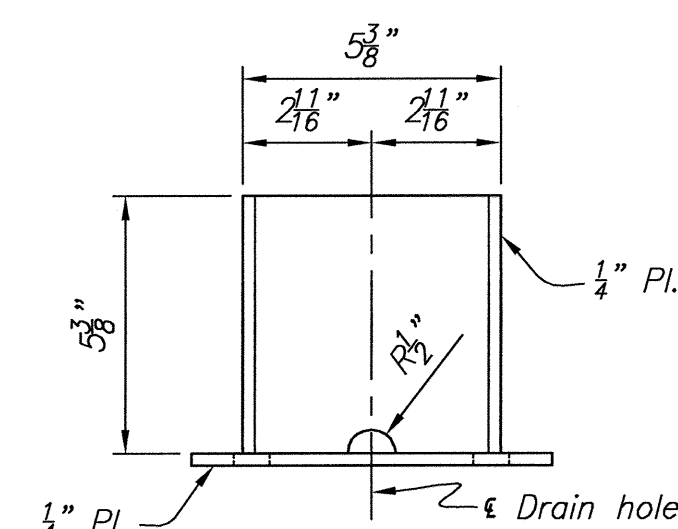
DESIGNED
DRAWN
CHECKED
TECH. APPR.
PEER REVIEW
DENVER, COLORADO
2013-08-05



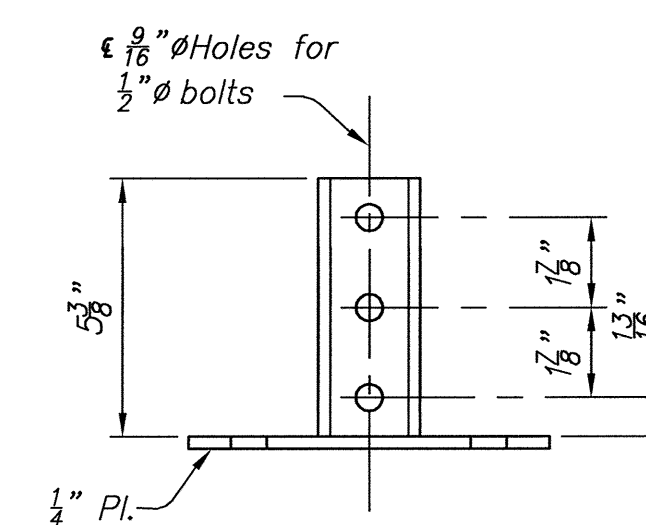
VIEW A-A



VIEW D-D

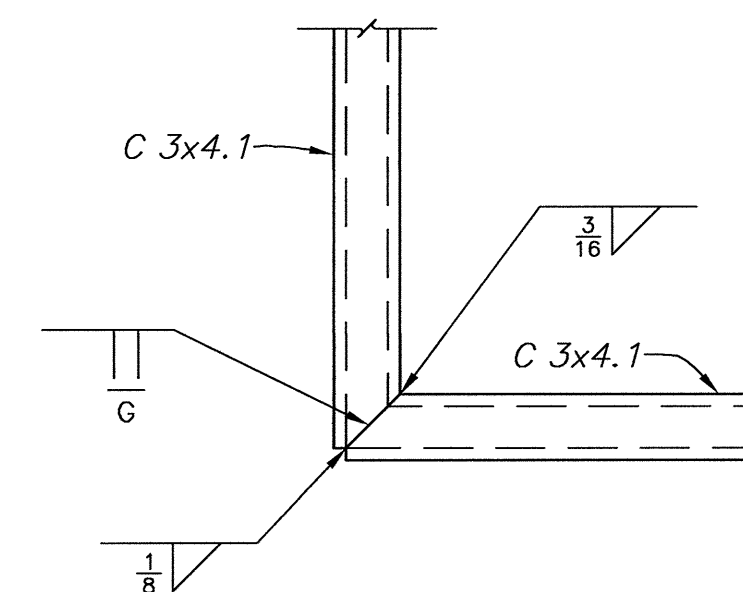


SECTION B-B



VIEW C-C

MK. 197-A



DETAIL 1

1. For General Notes, see (190).
2. All bolts are $\frac{1}{2}" \phi$ unless noted otherwise.
3. For frame and hardware material requirements, see specifications.
4. Electrical equipment supports shall be designed to withstand wind and seismic loads in accordance with the structural design parameters identified on drawing 1695-D-101. It is assumed that all electrical equipment panels will be installed at least 3'-0" above the concrete slab.
5. Electrical equipment supports are to be installed at the locations shown on the specified drawings. Relocation of supports in the field is subject to approval by COR.
6. * Denotes approximate dimension. Contractor determines final dimensions of frames based on electrical equipment furnished.
7. Equipment widths "L" and "W" to be coordinated with actual equipment provided.

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BUREAU OF RECLAMATION

BUREAU OF RECLAMATION
NAVAJO GALLUP WATER SUPPLY PROJECT
NEW MEXICO

NEW MEXICO
SAN JUAN LATERAL

**SAN JUAN LATERAL
TOHLAKAI PUMPING PLANT
MISCELLANEOUS METAL WORK**

MISCELLANEOUS METALWORK
ELECTRICAL EQUIPMENT SUPPORTS
ELEVATION, PLAN, SECTIONS, VIEWS AND DETAIL

DESIGNED *Kin Ogha*
DRAWN *Kin Ogha*
CHECKED *Bernard Tajimodiele*
TECH. APPR. *Bernard Tajimodiele P.E.*
W. B. T.
APPROVED _____
PLUMBING DEPT. GROUP _____

DENVER, COLORADO 2013-08-01

**ELECTRICAL EQUIPMENT
SUPPORTS
ELEVATION, PLAN, SECTIONS,
VIEWS AND DETAIL**

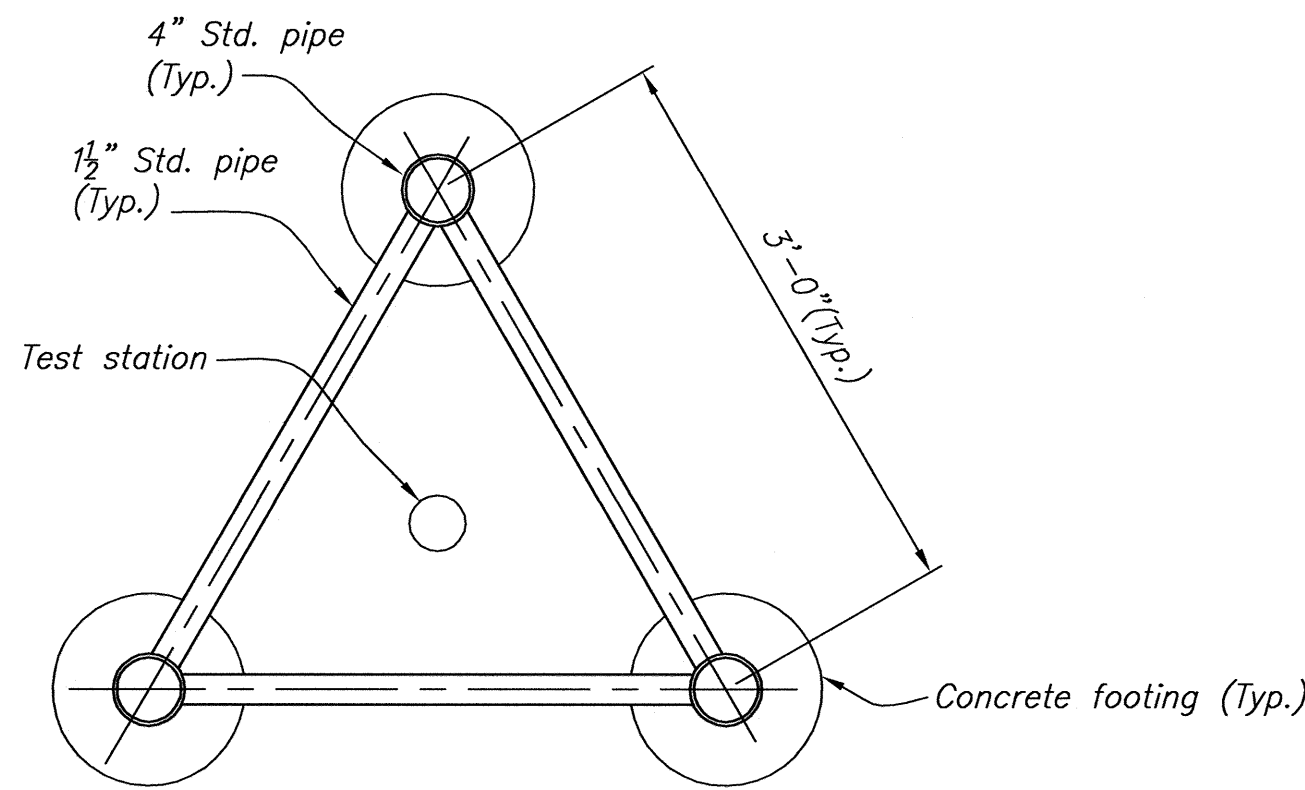
1695-D-197

SHEET 1 OF 1

DATE AND TIME PLOTTED
August 5, 2013 03:07
PLOTTED BY
KOSHEA

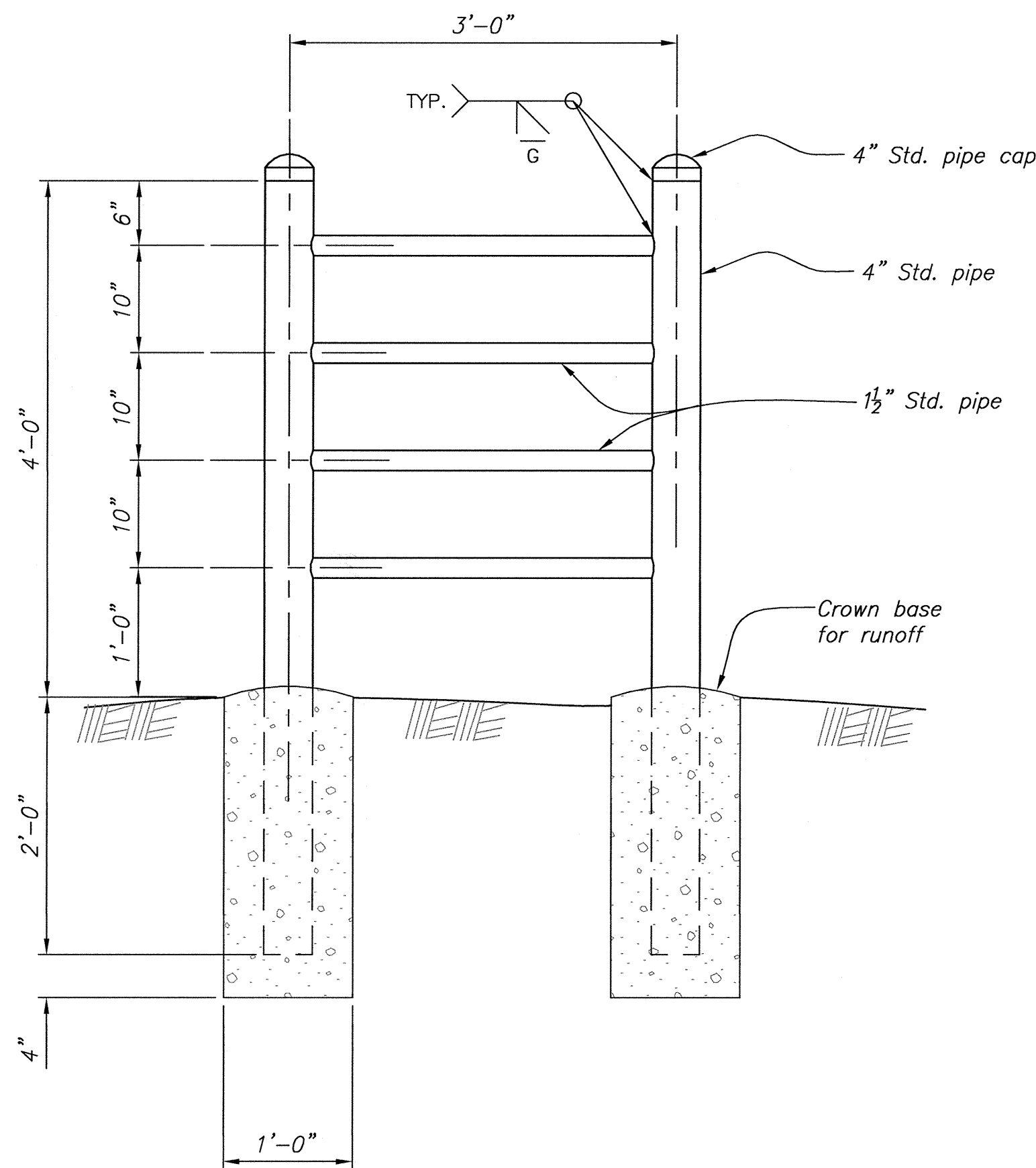
CADD SYSTEM
AutoCAD Rel. 19.0s (LMS Tech)
CADD FILENAME
695-D-197 - MM - Electrical Equipment Supports - Elevations, Sections And
Details.dwg

CAD SYSTEM
AutoCAD Rev. 19.06
CAD FILENAME
1695-D-109 - TEST STATION PROTECTION BARRIER.DWG
DATE AND TIME PLOTTED
AUGUST 5, 2013 13:21
PLOTTED BY
KOSHEA



PLAN - TEST STATION PROTECTION BARRIER

6 REQ'D FOR ALL METAL OPTION - TRIANGULAR BARRIERS
8 REQ'D FOR 12B PVC, 12.1 METAL, TURNOUT METAL
16 REQ'D FOR 12B METAL, 12.1 METAL, TURNOUT PVC
18 REQ'D FOR 12B PVC, 12.1 METAL, TURNOUT PVC
For reference, see Specifications



ELEVATION

NOTES

1. All material on this drawing is steel.
2. Dimensions shown are typical for similar details.
3. Galvanize all ferrous metalwork after fabrication. Provide vent holes in pipe as required for galvanizing.

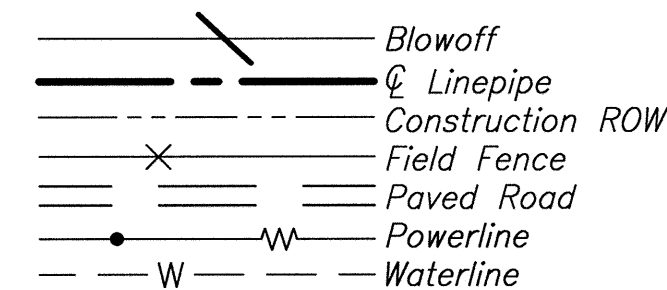
PIPELINE GENERAL NOTES

1. At angle points that do not require miter bends, long radius curves (vertical and horizontal) shall be constructed by pulling joints.
2. Stations are approximate and may be varied as directed.
3. Minimum earth cover over the top of the pipe shall be 3.5 feet unless the line pipe is at an existing wash, or at a roadway, and then the minimum cover is 5 feet, unless otherwise noted.
4. Grid based on New Mexico State Coordinate System West Zone NAD 83. Vertical datum based on on NAVD 88.
5. Ground to grid conversion factor is 0.999694573004.

PIPE CLASSIFICATION

The line pipe is designated as 12DR25(75), 12DR25(100), etc. The 12 indicates the nominal pipe diameter in inches. The alphanumeric beginning with DR, denotes the dimension ratio as defined by AWWA C900. The number in parenthesis is the maximum allowable hydrostatic pressure head, in feet, measured at the centerline of the pipe. See specifications for further details on different pipe material types allowed.

SYMBOLS



NOTES

1. Hydraulic grade line elevations (H.G.L. El.) shown are for the design flow (Q) of 1.88 cubic feet/second (cfs) at steady state. Tank water levels were taken to be at a water surface elevation which was assumed to be 6715 ft for the Tohlokai Tank and 6676 ft for the Twin Lakes Tank.
2. For pipe trench installation see (199).
3. Compacted backfill shall be used at all road crossings and locations shown.
4. For pumping plant site plan see (99).
5. For access road, see (204).
6. For manifold pipe, see (205) and (216).
7. For Geology General Notes, Geology Notes, abbreviations and symbols see 1695-529-513.
8. For Blowoff, see (201).
9. For connection at Station 28+03.29, see specification paragraph.
10. For Reach 12B pipe see (309).
11. For Reach 12.1 pipe see (310).
12. Contractor to verify all utilities ground clearances and buried depths.

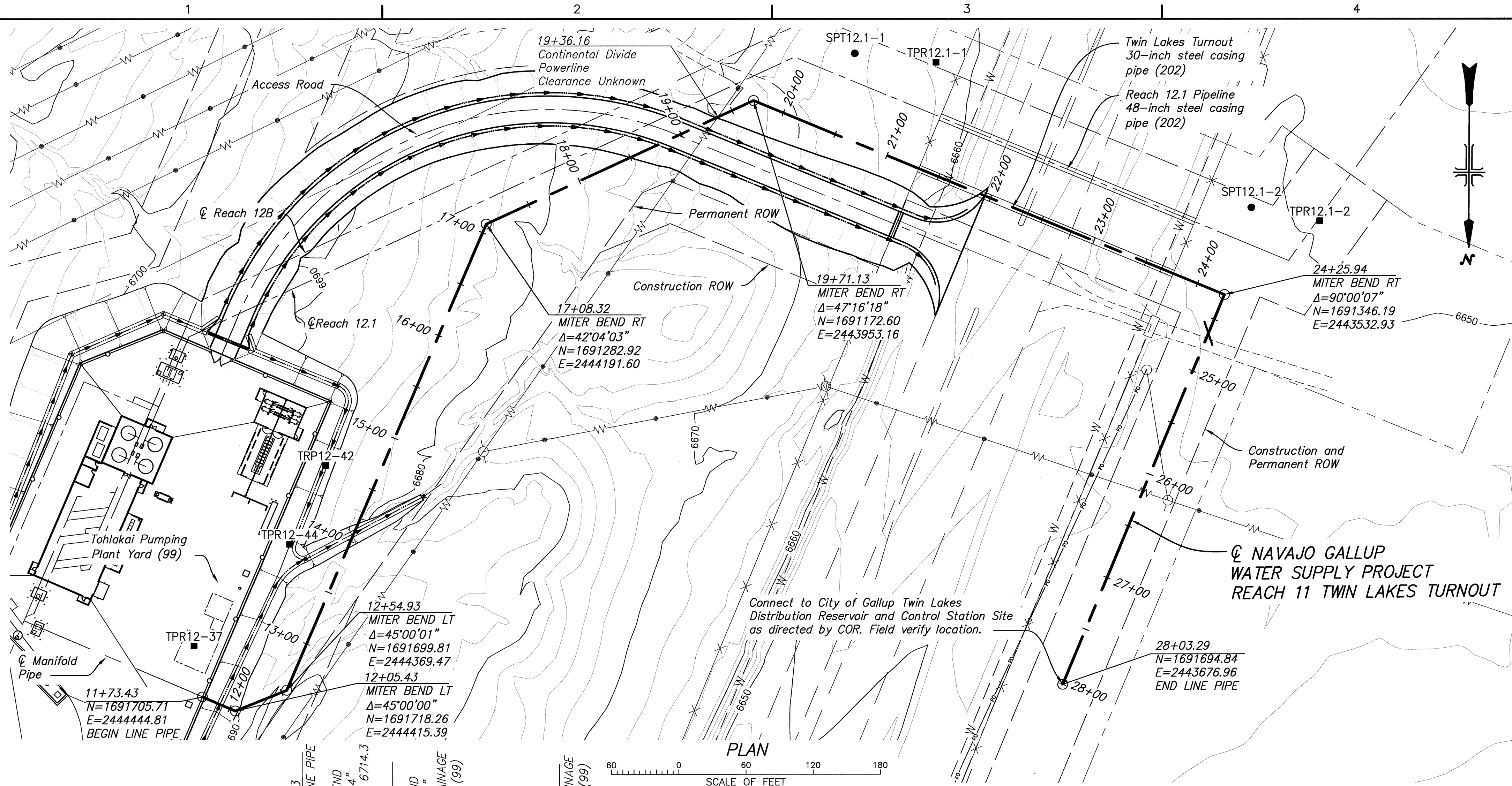
ALWAYS THINK SAFETY

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
NAVAJO GALLUP WATER SUPPLY PROJECT
NEW MEXICOSAN JUAN LATERAL
TOHLAKAI PUMPING PLANT
REACH 11 TWIN LAKES TURNOUT
PLAN AND PROFILEREV NO 1 2013-08-28 D- CHANGED STATION NUMBERS IN PROFILE FOR CASING PIPE
KEN YOKOYAMA P.E.
KEN YOKOYAMA

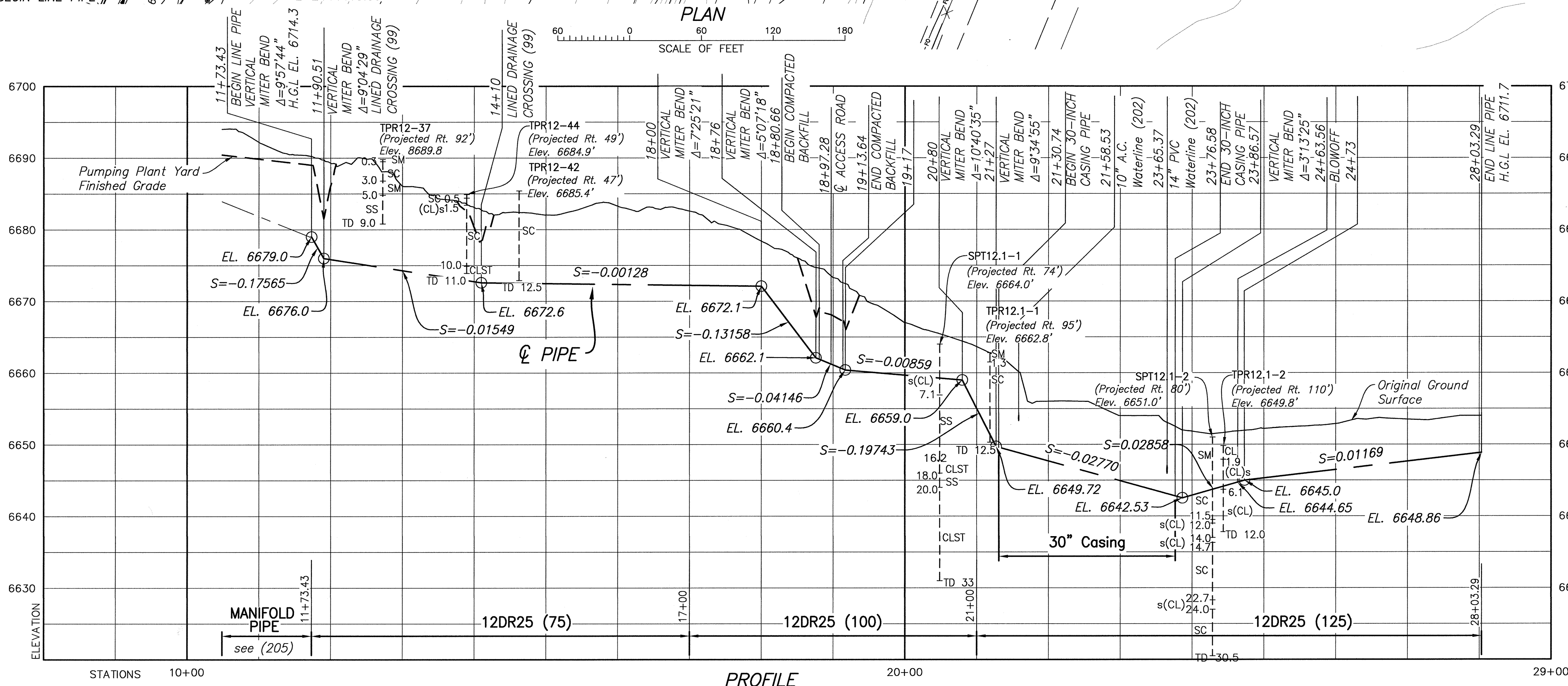
GEOLOGY	
Date	
DESIGNED	KEN YOKOYAMA
DRAWN	DAVID GESUNDHEIT
CHECKED	CHOU CHA P.E.
TECH. APPR.	LINDA M. BOWLES
PEER REVIEW	LINDA M. BOWLES, P.E.
DENVER, COLORADO 2013-08-02	
TWIN LAKES TURNOUT PLAN AND PROFILE	

1695-D-198

SHEET 1 OF 1



PLAN

SCALE OF FEET
0 60 120 180

PROFILE

DATE AND TIME PLOTTED
August 28, 2013 11:04
PLOTTED BY
KYOYAMACADD SYSTEM
AutoCAD Rev. 19.0s (LIS Tech)
CADD FILENAME
1695D198 REV1.dwg

PIPE CLASSIFICATION

The line pipe is designated as 36B400, 36C375, etc. The 36 indicates the nominal pipe diameter in inches. The letters B, C, and D denote the cover class of 10, 15, and 20 feet, respectively, of the design earth cover over the top of the pipe. The number 400, 375, etc. denotes the maximum allowable hydrostatic pressure head, in feet, measured at the centerline of the pipe. See specifications for further details on allowable pipe material types.

NOTES

1. For Pipeline General Notes and Symbols, see (198).
2. Hydraulic grade line elevations (H.G.L. El.) shown are for the design flow (Q) of 21.83 cubic feet/second (cfs) at steady state.
3. For pipe trench installation see drawing (199).
4. Compacted backfill shall be used at all road crossings and locations shown.
5. For pumping plant site plan see (99).
6. For access road, see (204).
7. For manifold pipe, see (210).
8. For Reach 12.1 pipe plan and profile, see (310).
9. For Twin Lakes Turnout pipe plan and profile, see (198).
10. For Geology General Notes, Geology Notes, abbreviations and symbols see 1695-529-513.
11. For thrust collar at end of pipeline, see (311).
12. Field verify location of utilities.
13. Contractor to verify all utilities ground clearance and buried depth.
14. Geologic drill logs not projected onto profile. For geologic drill logs, see specifications.

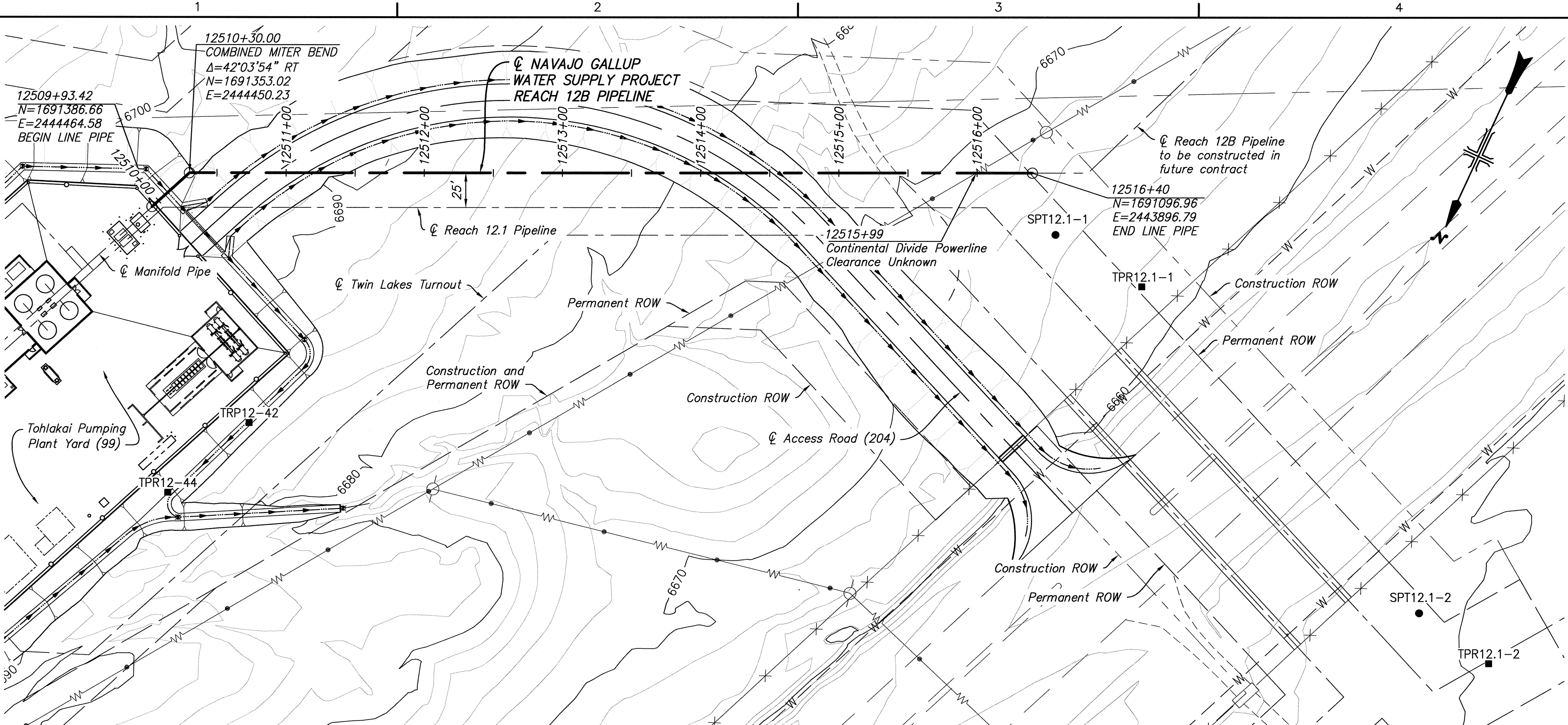
DESIGNED *Mark Bennett*
DRAWN *Mark Bennett*
CHECKED *Mark Bennett*
TECH. APPR. *CHOU, CHA, P.E.*
PEER REVIEW *LINDA M. BOWLES, P.E.*

DENVER, COLORADO 2013-08-02

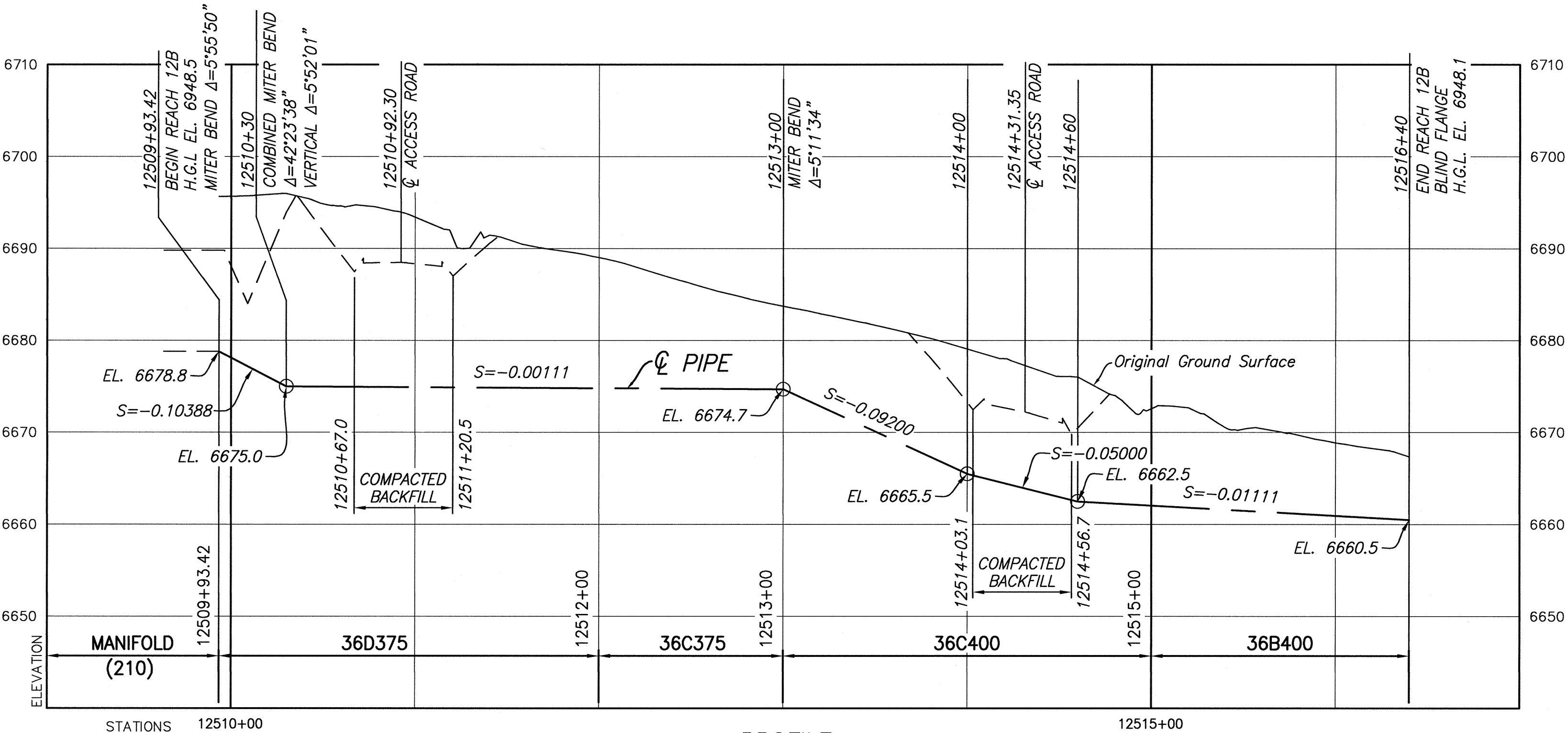
REACH 12B PIPELINE
PLAN AND PROFILE

1695-D-309

SHEET 1 OF 1



PLAN
SCALE OF FEET



PROFILE

DATE AND TIME PLOTTED
August 2, 2013 04:38
PLOTTED BY
MELMINT

CADD SYSTEM
AutoCAD Rel. 19.0s (LMS Tech)
CADD FILENAME
1695-D-309.310 - 12B & 12.1 Pipelines.dwg

PIPE CLASSIFICATION

The line pipe is designated as 30B550, 30C575, etc. The 30 indicates the nominal pipe diameter in inches. The letters B, and C denote the cover class of 10 and 15 feet, respectively, of the design earth cover over the top of the pipe. The number 550, 575, etc. denotes the maximum allowable hydrostatic pressure head, in feet, measured at the centerline of the pipe. See specifications for further details on allowable pipe material types.

NOTES

1. For Pipeline General Notes and Symbols, see (198).
2. Hydraulic grade line elevations (H.G.L. El.) shown are for the design flow (Q) of 14.70 cubic feet/second (cfs) at steady state.
3. For pipe trench installation see (199).
4. Compacted backfill shall be used at all road crossings and locations shown.
5. For pumping plant site plan see (99).
6. For access road, see (204).
7. For manifold pipe, see (211).
8. For Reach 12B pipe plan and profile, see (309).
9. For Twin Lakes Turnout pipe plan and profile, see (198).
10. For Geology General Notes, Geology Notes, abbreviations and symbols see 1695-529-513.
11. For thrust collar at end of pipeline, see (311).
12. Field verify location of utilities.
13. Contractor to verify all utilities ground clearance and buried depth.

ALWAYS THINK SAFETY

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
NAVAJO GALLUP WATER SUPPLY PROJECT
NEW MEXICO

SAN JUAN LATERAL
TOHLAKAI PUMPING PLANT
REACH 12.1 PIPELINE
PLAN AND PROFILE

REV NO 2013-08-28
2013-08-28
D REVISION PIPE PROFILE.
RE
DAVID GESUNDHEIT, P.E.

GEOLOGY	
Date	
TECHNICAL APPROVAL	MARK VANDERBERG
SUBMITTED	JARED VAUK
APPROVED	LES STONE

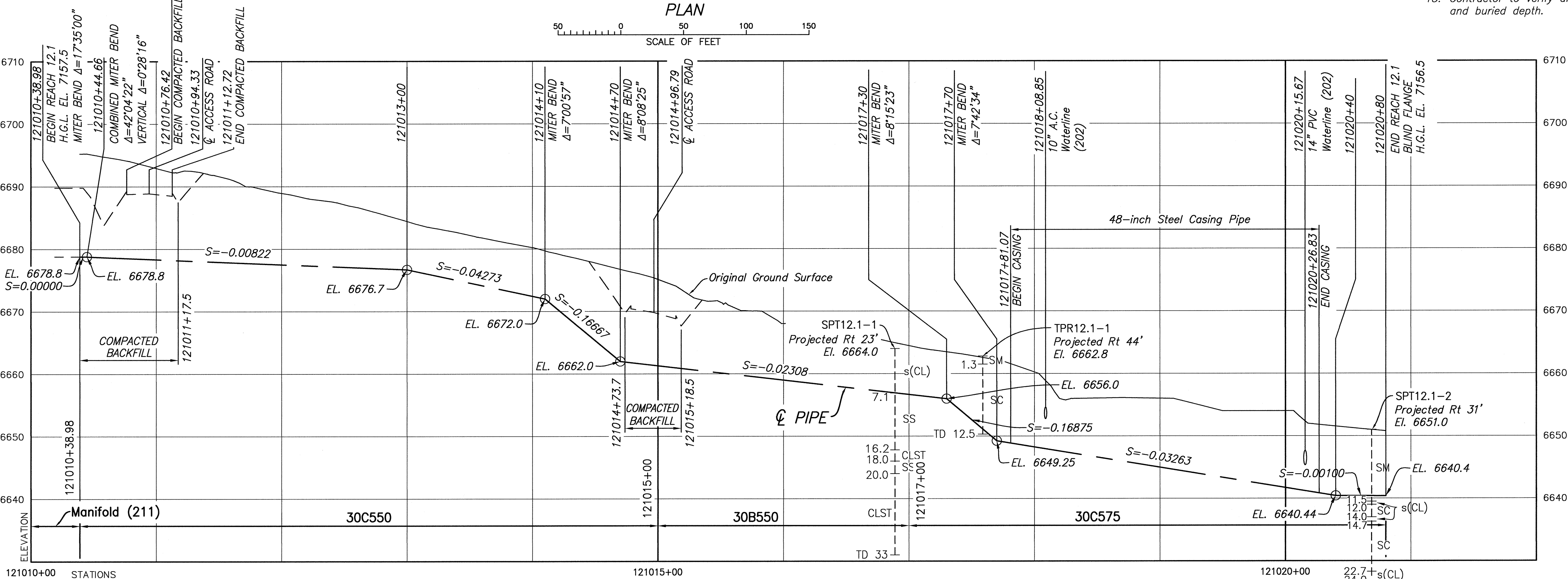
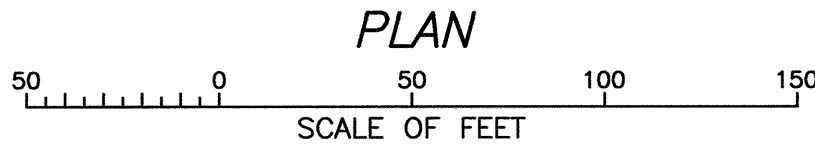
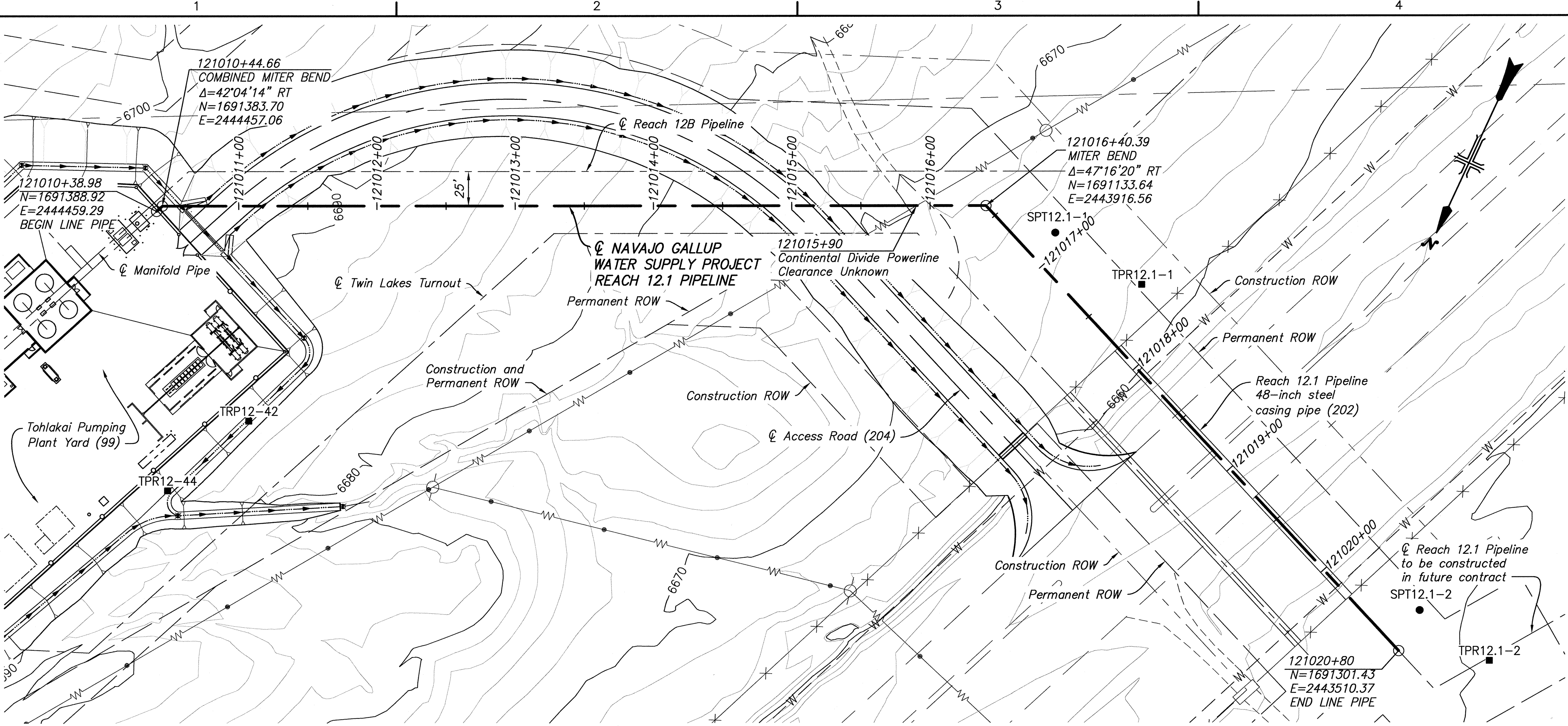
DESIGNED	MARK LEAVITT
DRAWN	DAVID GESUNDHEIT
CHECKED	CHOU CHA, P.E.
TECH. APPR.	CHOU CHA, P.E.
PEER REVIEW	LINDA M. BOWLES, P.E.

DENVER, COLORADO 2013-08-02

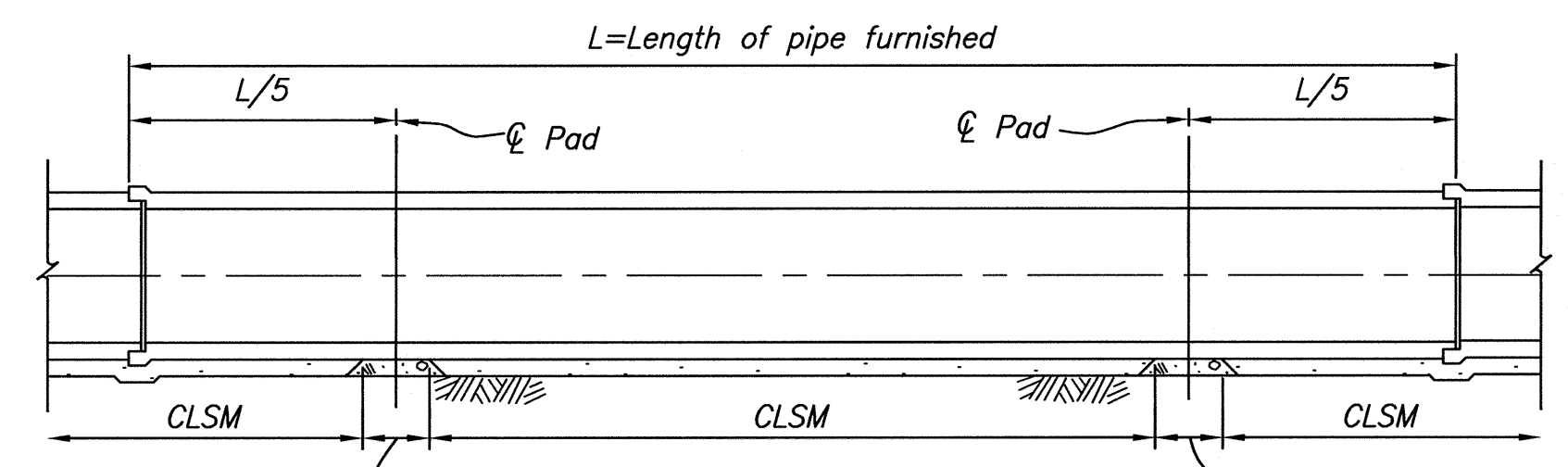
REACH 12.1 PIPELINE
PLAN AND PROFILE

1695-D-310

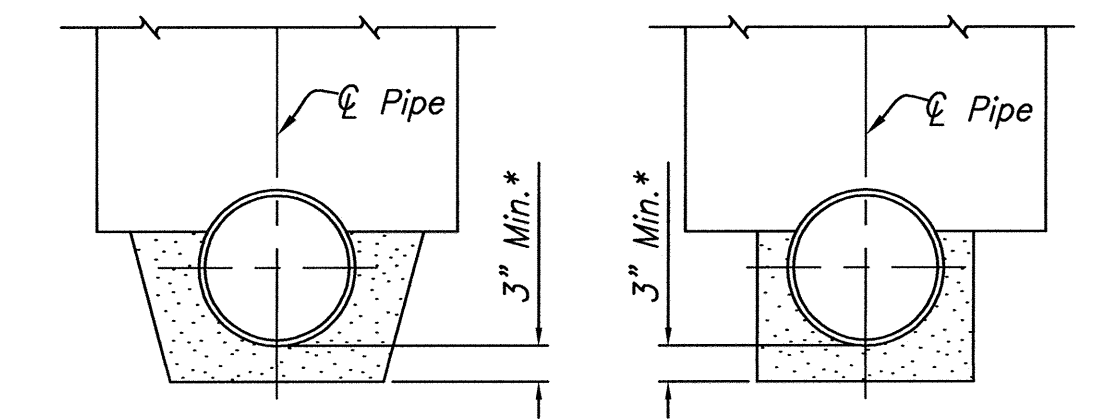
SHEET 1 OF 1



CADD SYSTEM
AutoCAD Rev. 19.0s (LMS Tech)
September 3, 2013 03:02
DATE AND TIME PLOTTED
PLOTTED BY
MELNITT
1695-D-310 - 12B & 12.1 Pipelines.dwg



CLSM INSTALLATION WITH SOIL PADS
TYPICAL FOR ALL PIPE TYPES



ALTERNATE A
ALTERNATE B
ACCEPTABLE TRENCH BOTTOMS FOR CLSM
* 6" Min required between bottom of pipe and rock surfaces

NOTES

1. Drawing not to scale
2. Dp and Wp are used for calculating pay quantities for all pipe and trench types. Quantity calculations are based on vertical walls.
3. O.D. is the outside diameter, in inches, of the pipe actually installed.
4. Dn is the nominal pipe diameter.
5. CLSM is Controlled Low Strength Material. See specifications for details.
6. Sloping, shoring, and benching shall be in accordance with Reclamation Safety and Health Standards.
7. Warning tape not shown, but is required. See specifications for details.
8. Other material may be submitted in lieu of soil pads for approval. Soil pad materials must not exceed the compressive strength of the CLSM.
9. Compact backfill for all yard pipe.

NATIVE MATERIAL PROPERTIES

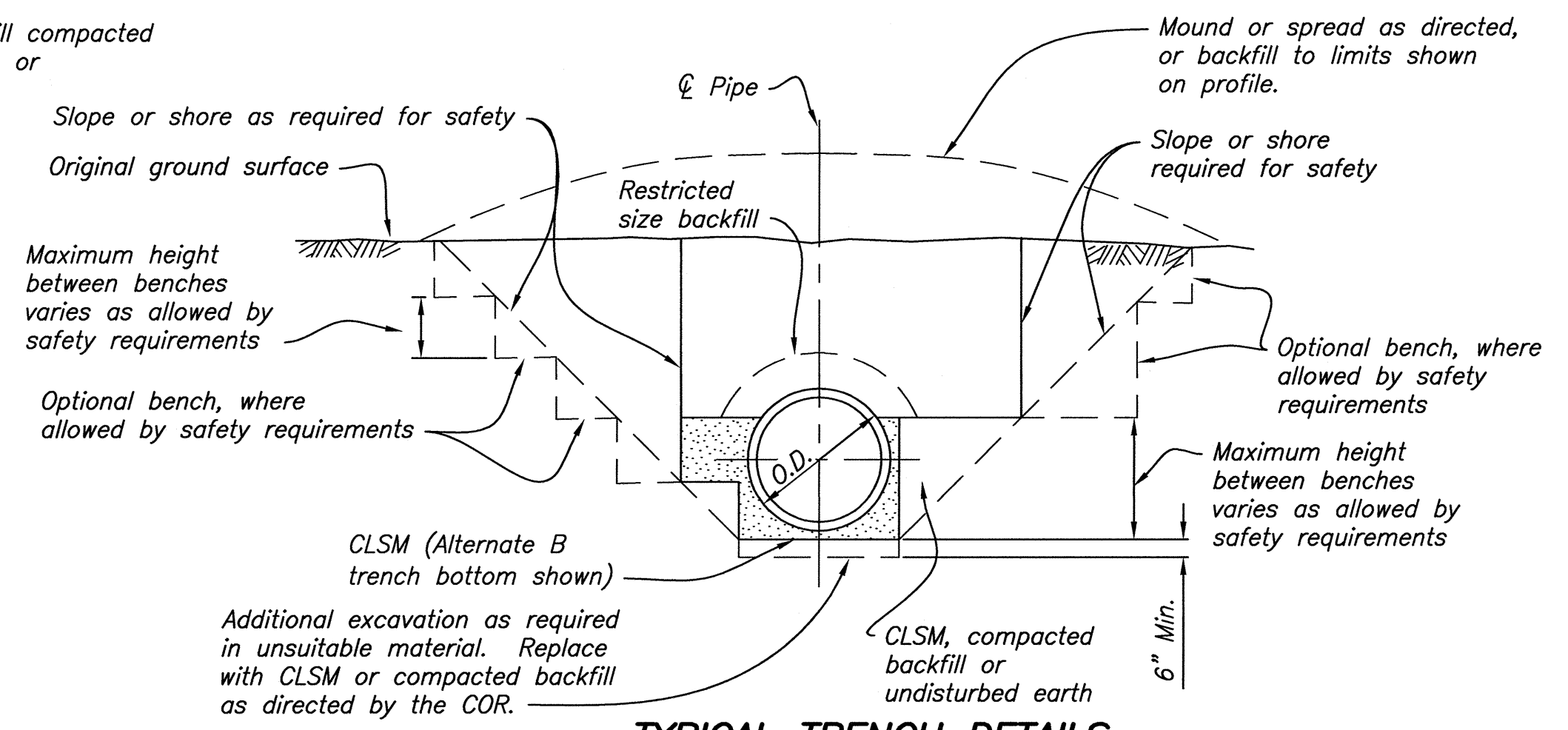
MATERIAL TYPE 1 – Typical trench wall materials would be rock; materials described as claystone, mudstone, or siltstone; highly cemented soils even if low density; sands and gravels with in-place relative densities 70% or higher; and silty or clayey material with in-place densities 95% Standard Proctor or higher.

MATERIAL TYPE 2 – Typical trench wall materials would include silty or clayey material with in-place densities between 85% Standard Proctor or higher but less than 95%; or sands and gravels with in-place relative densities between 40% and 70%.

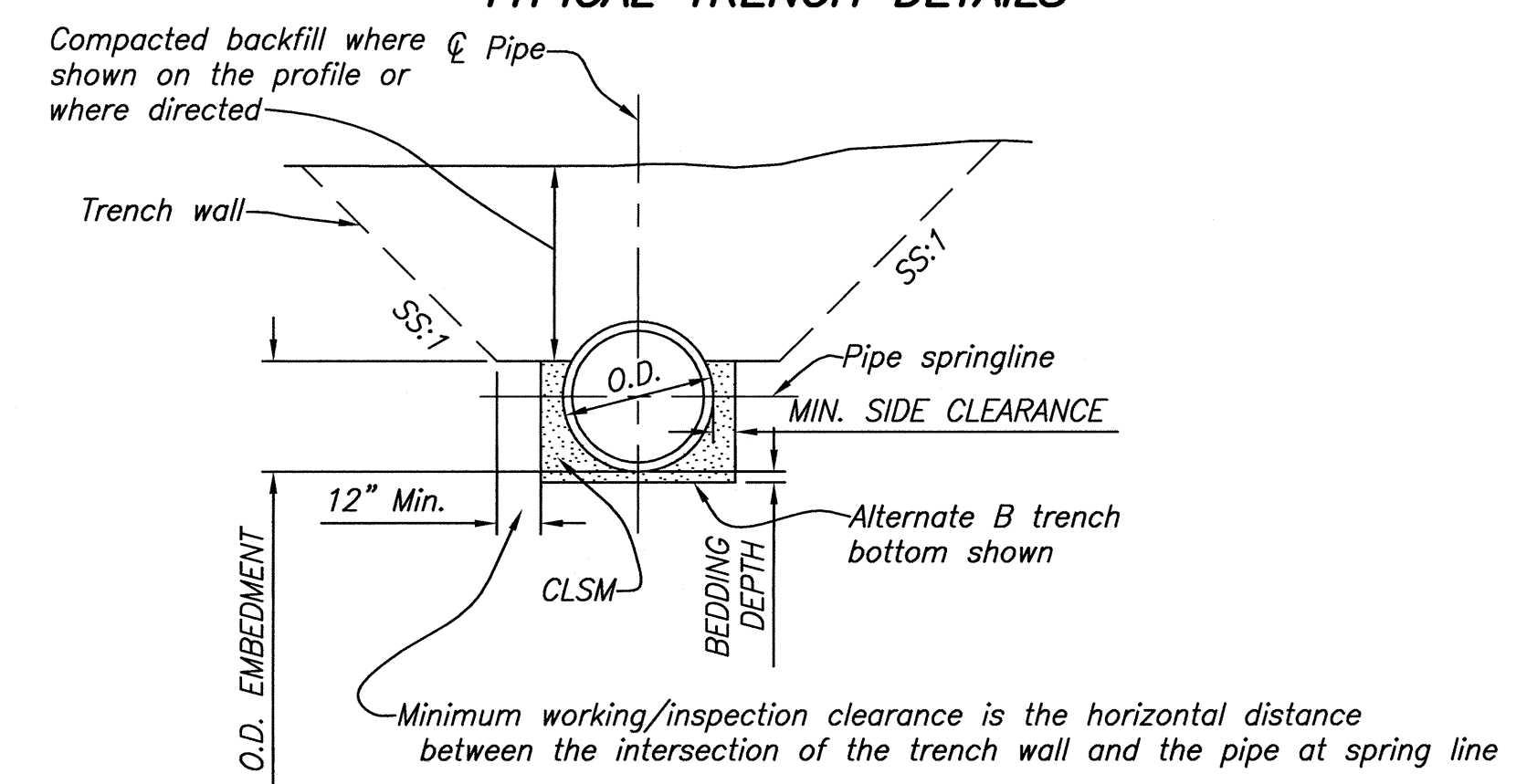
MATERIAL TYPE 3 – Typical trench wall materials would include elastic silts, low density silty or clayey soils with a density below 85% Standard Proctor and low-density cohesionless soils with an in-place density below 40% relative density.

CONSTRUCTION CONSIDERATIONS

1. Instability of the native material may cause difficulties when excavating trench slopes around the pipe.
2. Backfill cannot exceed 5' until CLSM obtains an unconfined compressive strength of 30 psi.

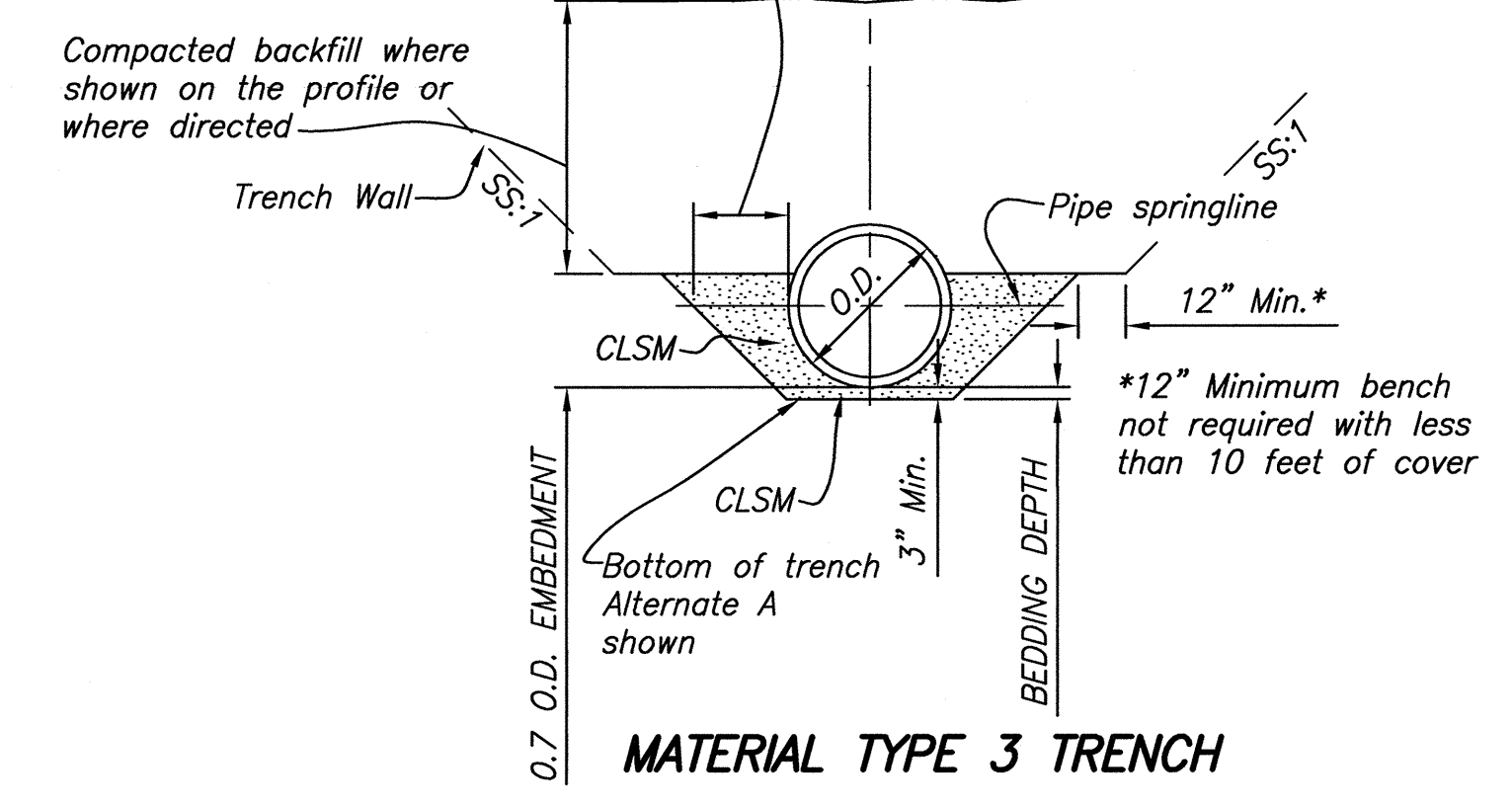


TYPICAL TRENCH DETAILS



MATERIAL TYPE 1 & 2 TRENCH

Minimum side clearance is the horizontal distance between the trench wall and the pipe measured at the springline, see Side Clearance Tables



MATERIAL TYPE 3 TRENCH

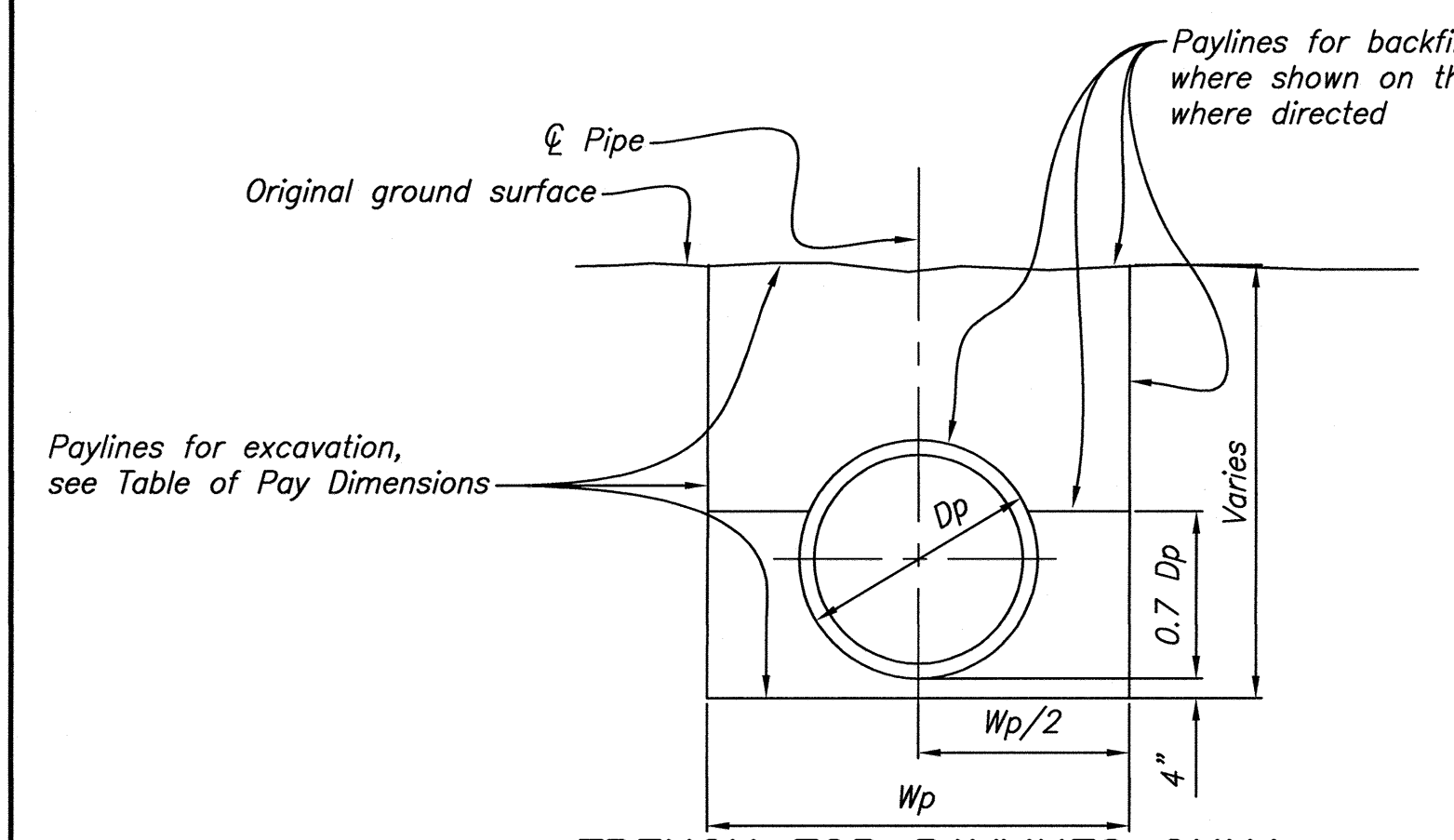
REACH 12B AND 12.1 PIPELINE INSTALLATION IN MATERIAL TYPES 1, 2 & 3 TRENCH

SIDE CLEARANCE TABLE					
MATERIAL TYPE	NATIVE MATERIAL	BEDDING DEPTH	MAXIMUM COVER	SS	MINIMUM SIDE CLEARANCE
1	Rock	6"	25'	1:1	6"
2	Soil	3"	15'	1½:1	12"
3	Soil	3"	15'	2:1	24"

36" & 30" Ductile Iron Pipe with Mortar Lining
36" & 30" Steel Pipe with Mortar Lining

SIDE CLEARANCE TABLE					
MATERIAL TYPE	NATIVE MATERIAL	BEDDING DEPTH	MAXIMUM COVER	SS	MINIMUM SIDE CLEARANCE
1	Rock	6"	25'	1:1	6"
2	Soil	3"	15'	1½:1	6"
3	Soil	3"	15'	2:1	24"

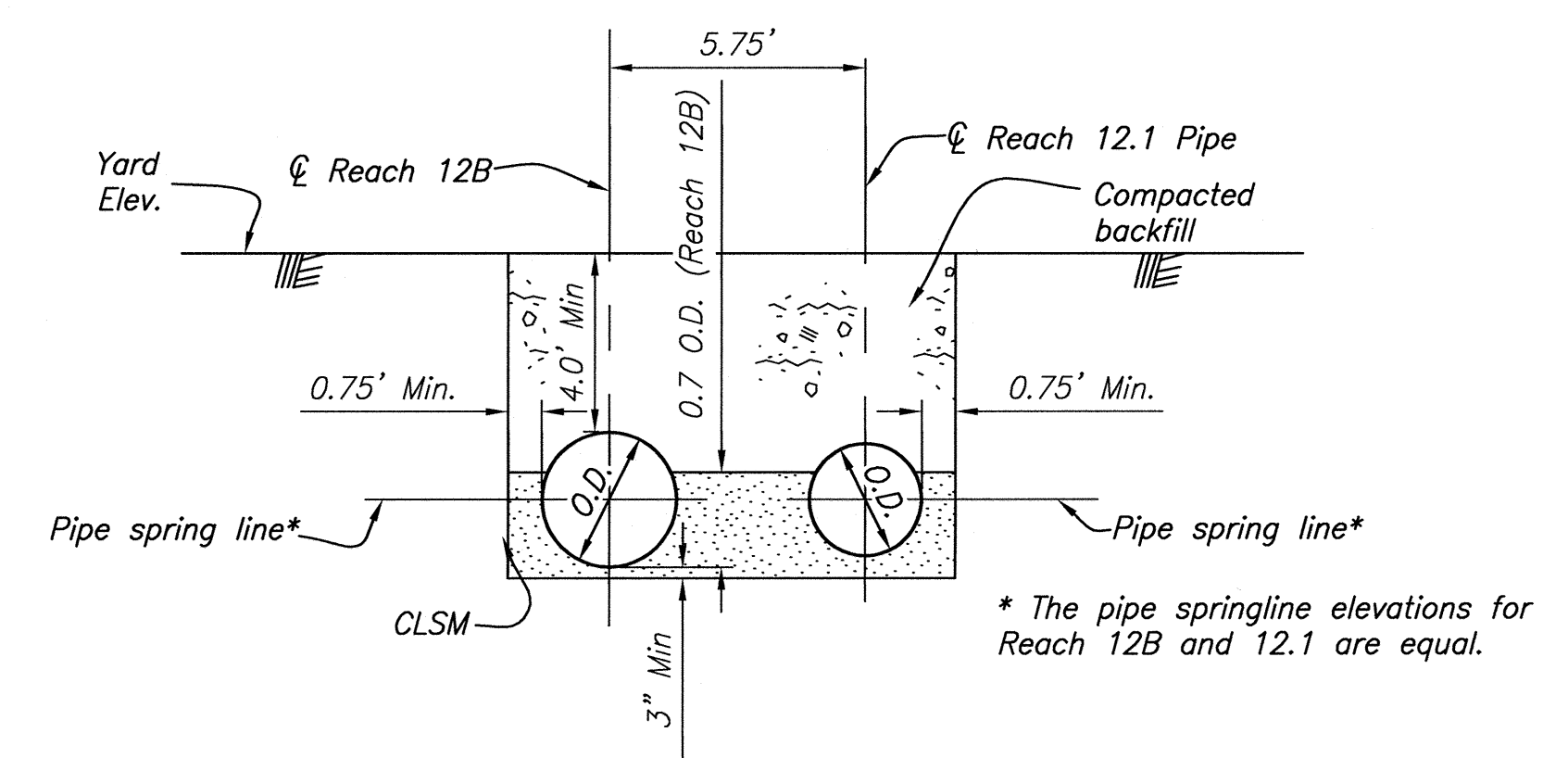
42", 36" & 30" Steel Pipe with Flexible Lining
36" PVC Pipe



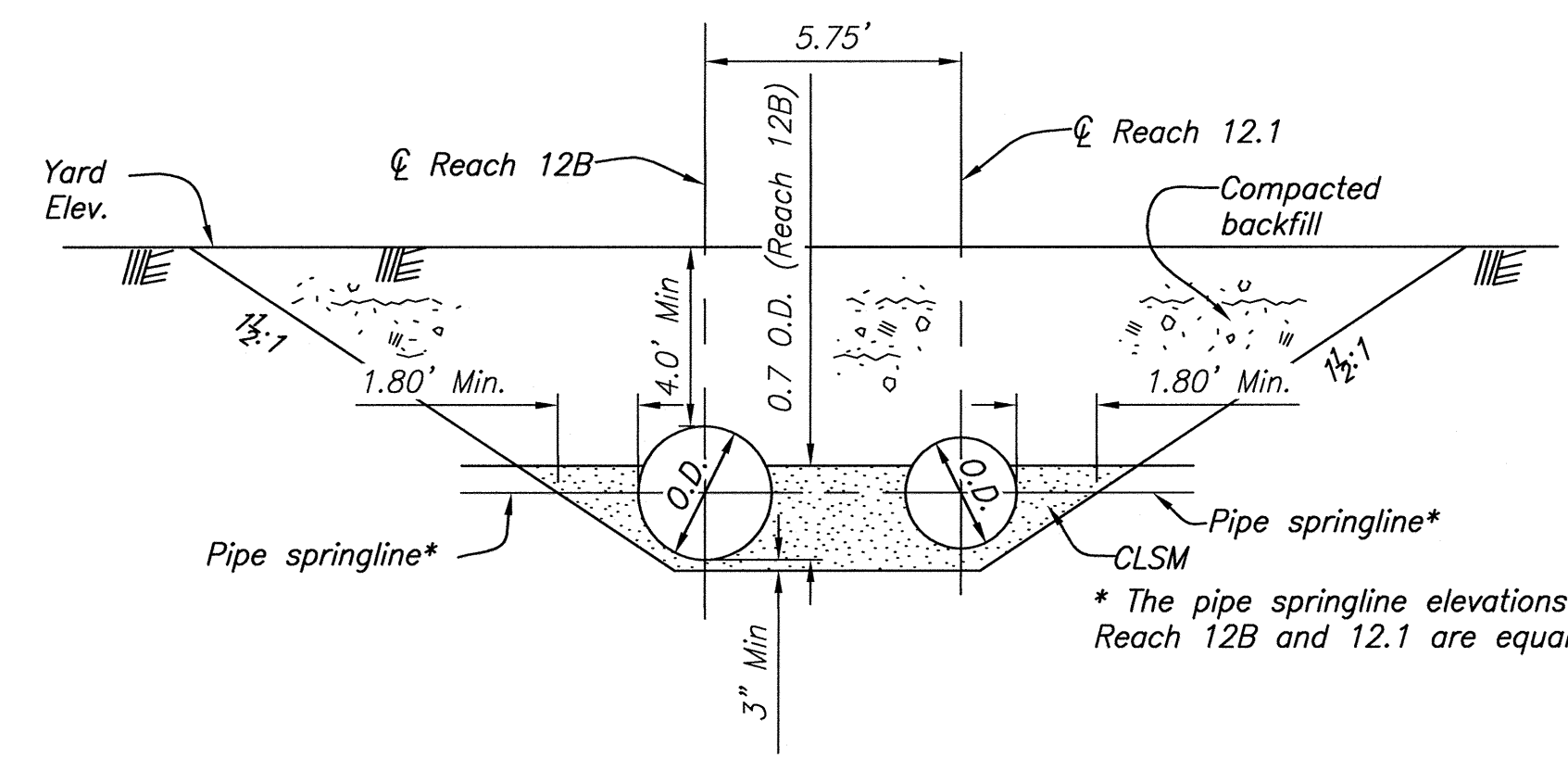
TRENCH FOR PAYLINES ONLY

ALL TYPES OF PIPE

TABLE OF PAY DIMENSIONS		
PIPE Dn (inches)	Dp (inches)	Wp (feet)
12	Dn+4	½ (Dn+24)
42, 30, 36	1.167 Dn	½ (Dn+36)



MATERIAL TYPE 2 DOUBLE PIPE TRENCH FOR REACHES 12B AND 12.1 YARD PIPING PAYLINES ONLY



MATERIAL TYPE 2 DOUBLE PIPE TRENCH FOR REACHES 12B AND 12.1 YARD PIPING

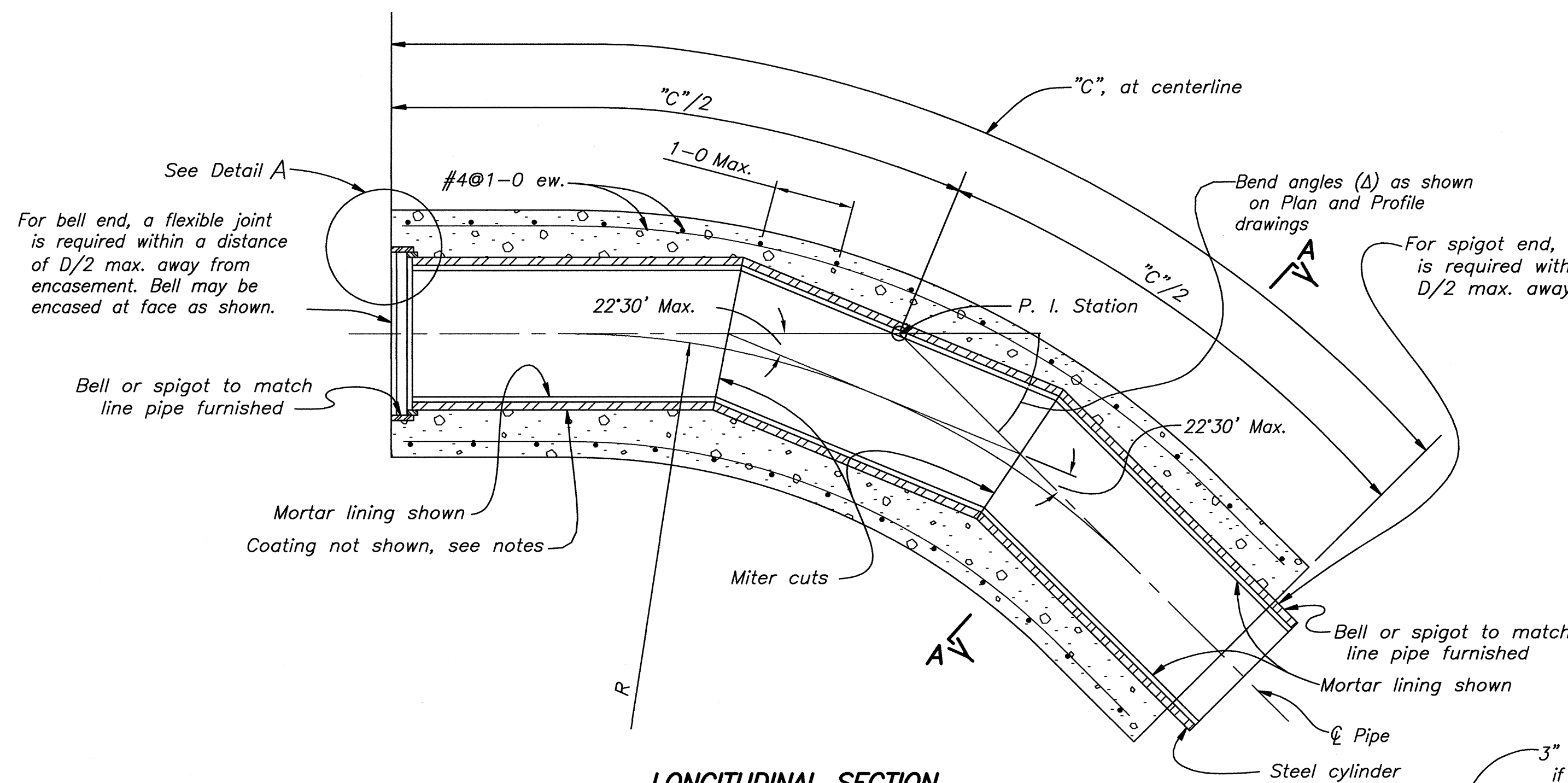
TWIN LAKES PIPELINE INSTALLATION IN MATERIAL TYPES 1, 2 & 3 TRENCH

SIDE CLEARANCE TABLE					
MATERIAL TYPE	NATIVE MATERIAL	BEDDING DEPTH	MAXIMUM COVER	SS	MINIMUM SIDE CLEARANCE
1	Rock	6"	25'	1:1	6"
2	Soil	3"	15'	1½:1	6"
3	Soil	3"	15'	2:1	18"

12" Ductile Iron Pipe
12" Steel Pipe with Mortar Lining
12" Steel Pipe with Flexible Lining
12" PVC & HDPE Pipe

DATE AND TIME PLOTTED
September 11, 2013 10:32
PLOTTER
KYOJIMA

CADD SYSTEM
AutoCAD Rel. 19.0s (LMS Tech)
CADD FILENAME
1695D199.dwg



LONGITUDINAL SECTION
ENCASED HORIZONTAL, VERTICAL CONVEX UP (∩) OR
COMBINED BEND

REACH 11 TWIN LAKES TURNOUT MITER BENDS

P.I. STATION	HEAD (ft.)	ANGLE	DIRECTION	T1	T2	D (in.)	R (ft.)	C (ft.)	W (ft.)*
11+73.43	75	9°57'44"	Convex Up	N/A	N/A	12	N/A	N/A	1
11+90.51	75	9°04'29"	Convex Down	N/A	N/A	12	N/A	N/A	1
12+05.43	75	45°00'00"	Horizontal	N/A	N/A	12	N/A	N/A	11
12+54.93	75	45°00'01"	Horizontal	N/A	N/A	12	N/A	N/A	11
17+08.32	100	42°04'03"	Horizontal	N/A	N/A	12	N/A	N/A	13
18+00.00	100	7°25'21"	Convex Up	N/A	N/A	12	N/A	N/A	1
18+76.00	100	5°07'18"	Convex Down	N/A	N/A	12	N/A	N/A	1
19+71.13	100	47°16'18"	Horizontal	N/A	N/A	12	N/A	N/A	16
20+80.00	100	10°40'35"	Convex Up	N/A	N/A	12	N/A	N/A	1
21+27.00	125	9°34'55"	Convex Down	N/A	N/A	12	N/A	N/A	1
23+86.57	125	3°13'25"	Convex Down	N/A	N/A	12	N/A	N/A	1
24+25.94	125	90°00'07"	Horizontal	9"	9"	12	3	5	N/A

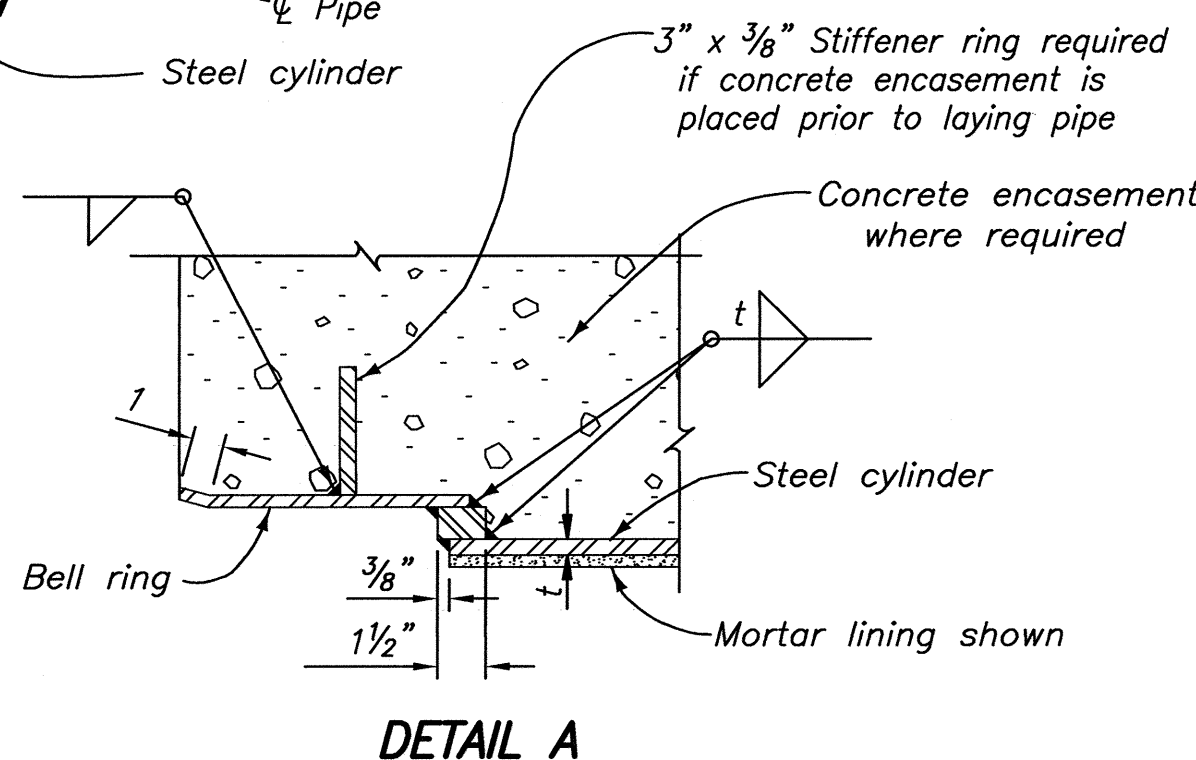
* There is no encasement for miter bends that have a length (W) specified. See Miter Welded Pipe Detail.

REACH 12B MITER BENDS

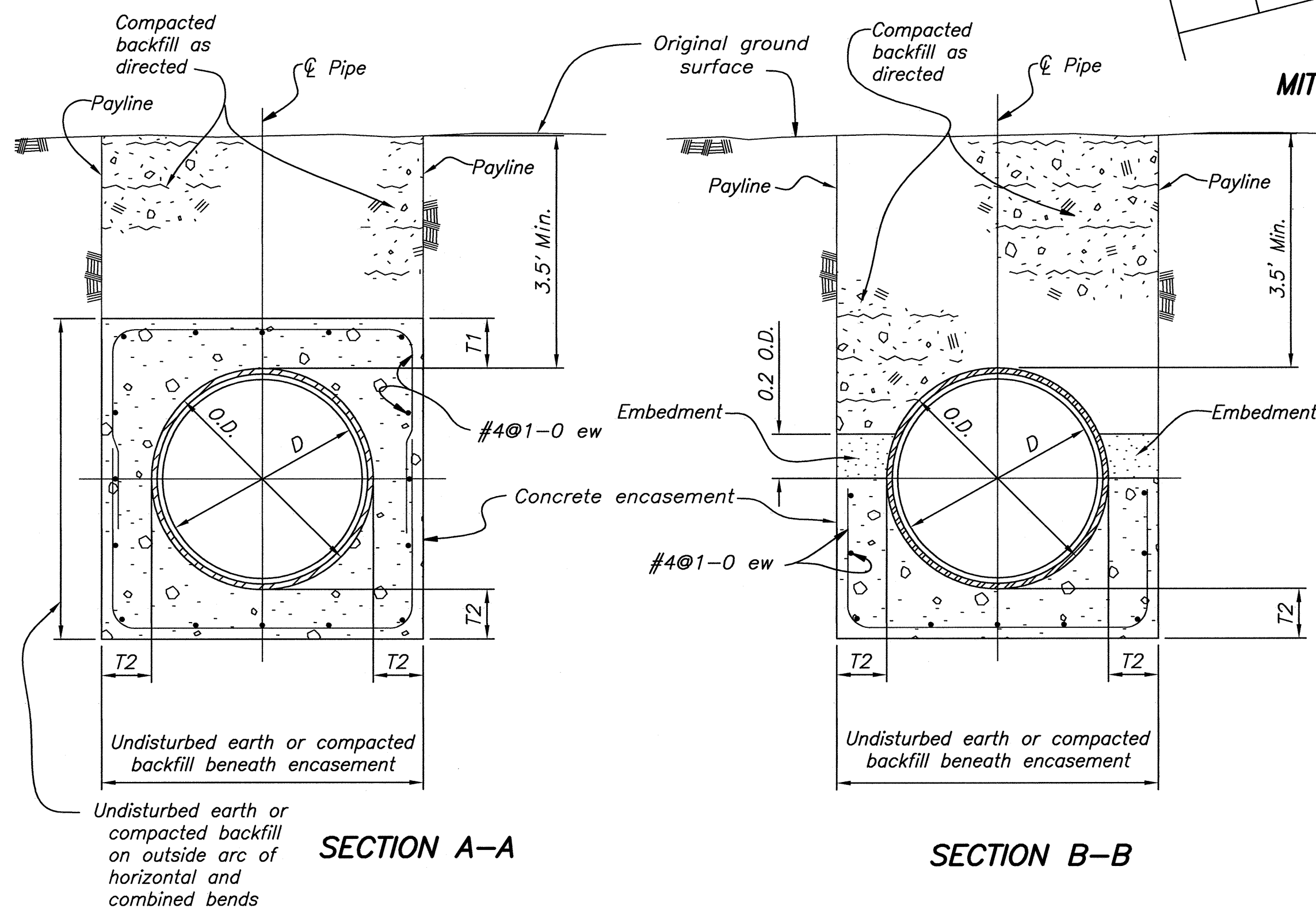
P.I. STATION	HEAD (ft.)	ANGLE	DIRECTION	T1	T2	D (in.)	R (ft.)	C (ft.)	W (ft.)*
12509+93.42	375	5°55'50"	Convex Up	N/A	N/A	36	N/A	N/A	3
12510+30.00	375	42°23'38"	Combined	1'-0"	1'-0"	36	31	23	N/A
12513+00.00	400	5°11'34"	Convex Up	9"	9"	36	77	7	N/A

REACH 12.1 MITER BENDS

P.I. STATION	HEAD (ft.)	ANGLE	DIRECTION	T1	T2	D (in.)	R (ft.)	C (ft.)	W (ft.)
121010+44.66	550	42°04'22"	Combined	1'-3"	1'-3"	30	33	24	N/A
121014+10.00	550	7°00'57"	Convex Up	9"	9"	30	82	10	N/A
121014+70.00	550	8°08'25"	Convex Down	N/A	9"	30	21	3	N/A
121016+40.39	550	47°16'20"	Horizontal	1'-6"	1'-6"	30	29	24	N/A
121017+30.00	575	8°15'23"	Convex Up	9"	9"	30	90	13	N/A
121017+70.00	575	7°42'34"	Convex Down	N/A	9"	30	22	3	N/A



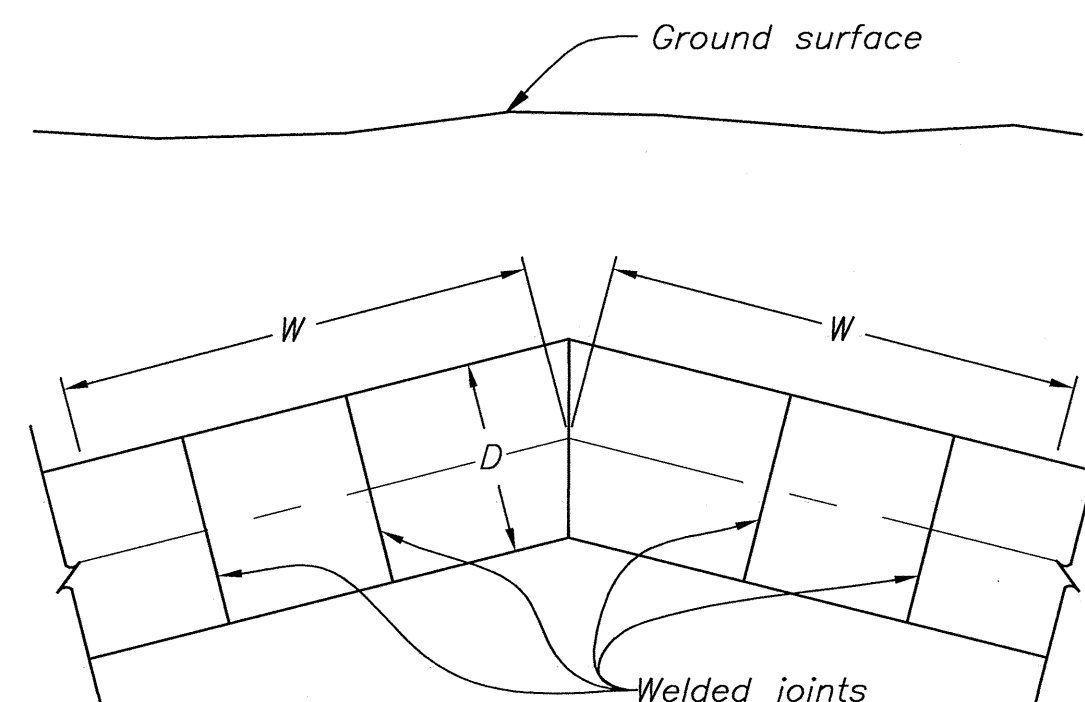
DETAIL A



SECTION A-A

SECTION B-B

LONGITUDINAL SECTION
CONVEX DOWN (∪) VERTICAL BEND



MITER WELDED PIPE DETAIL

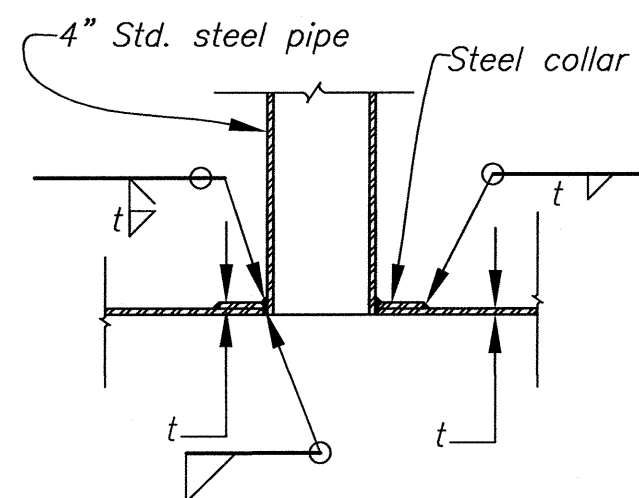
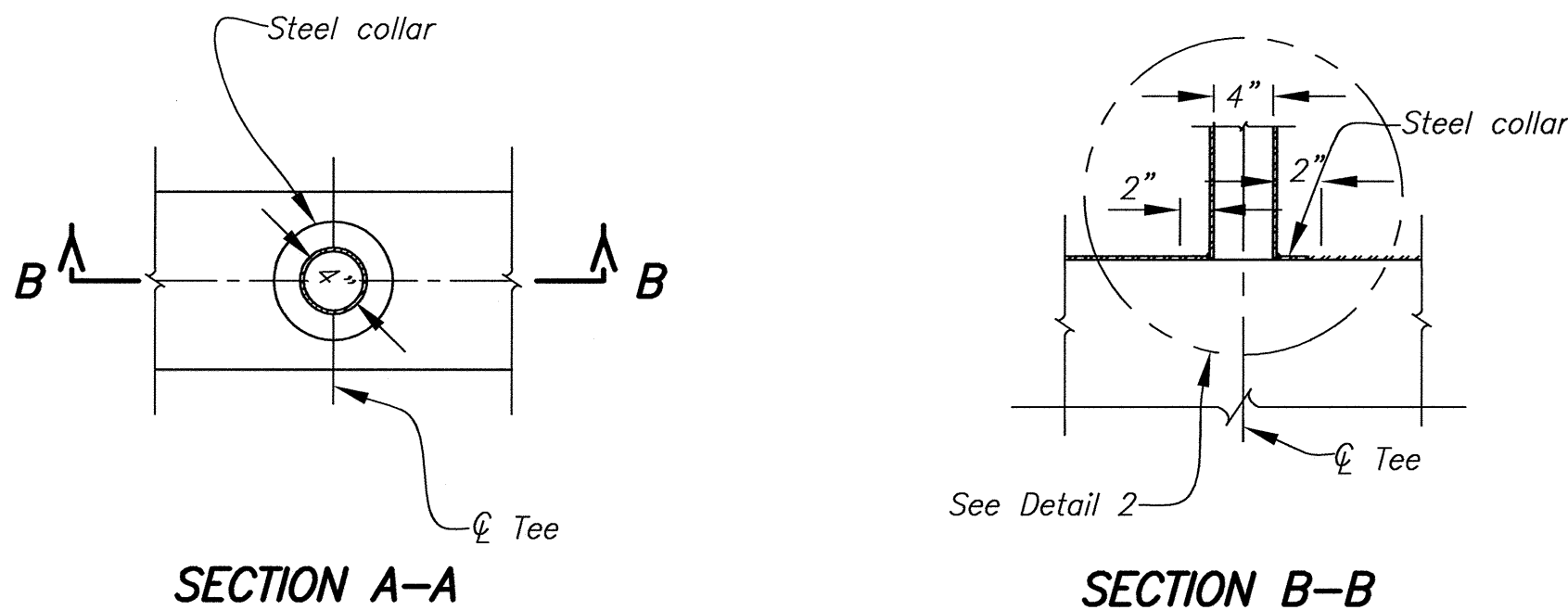
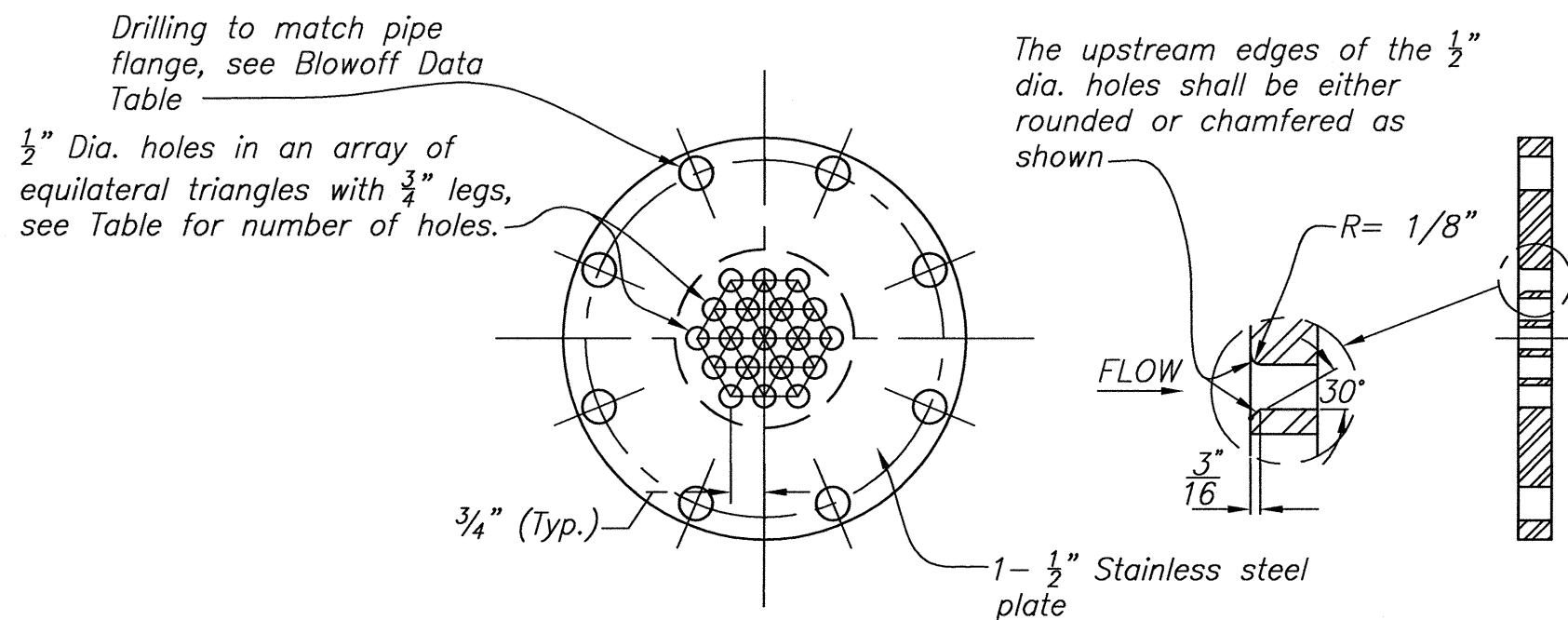
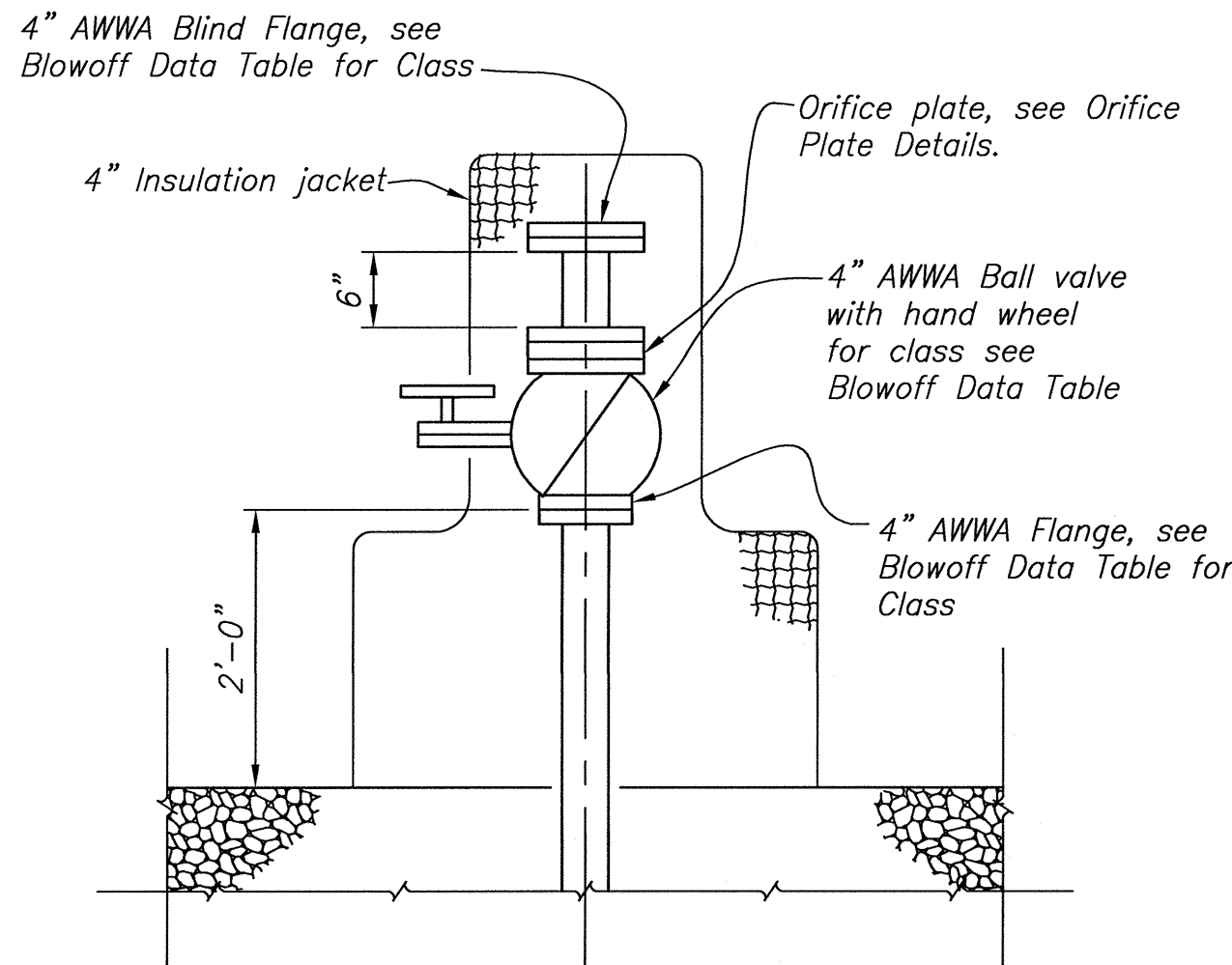
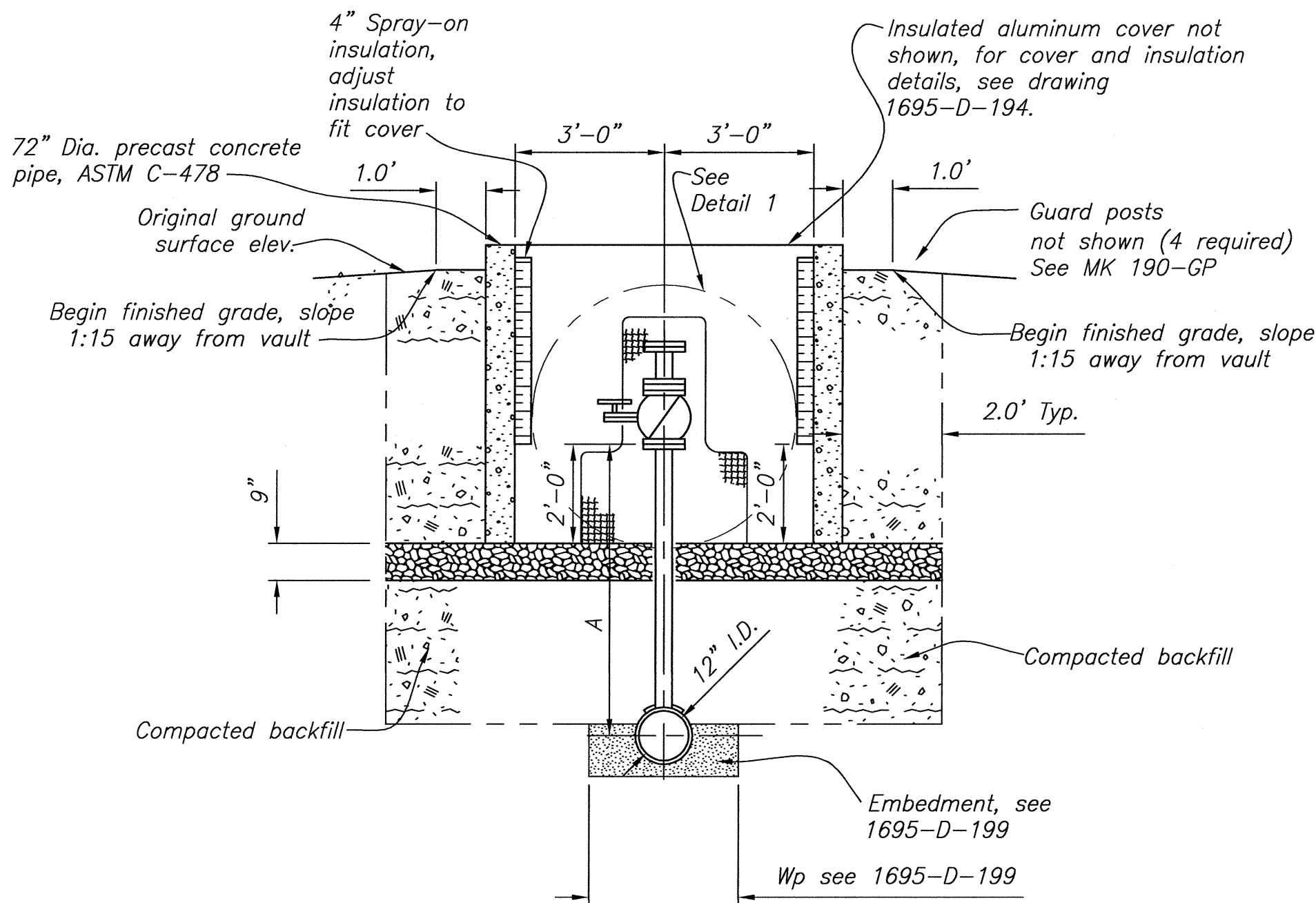
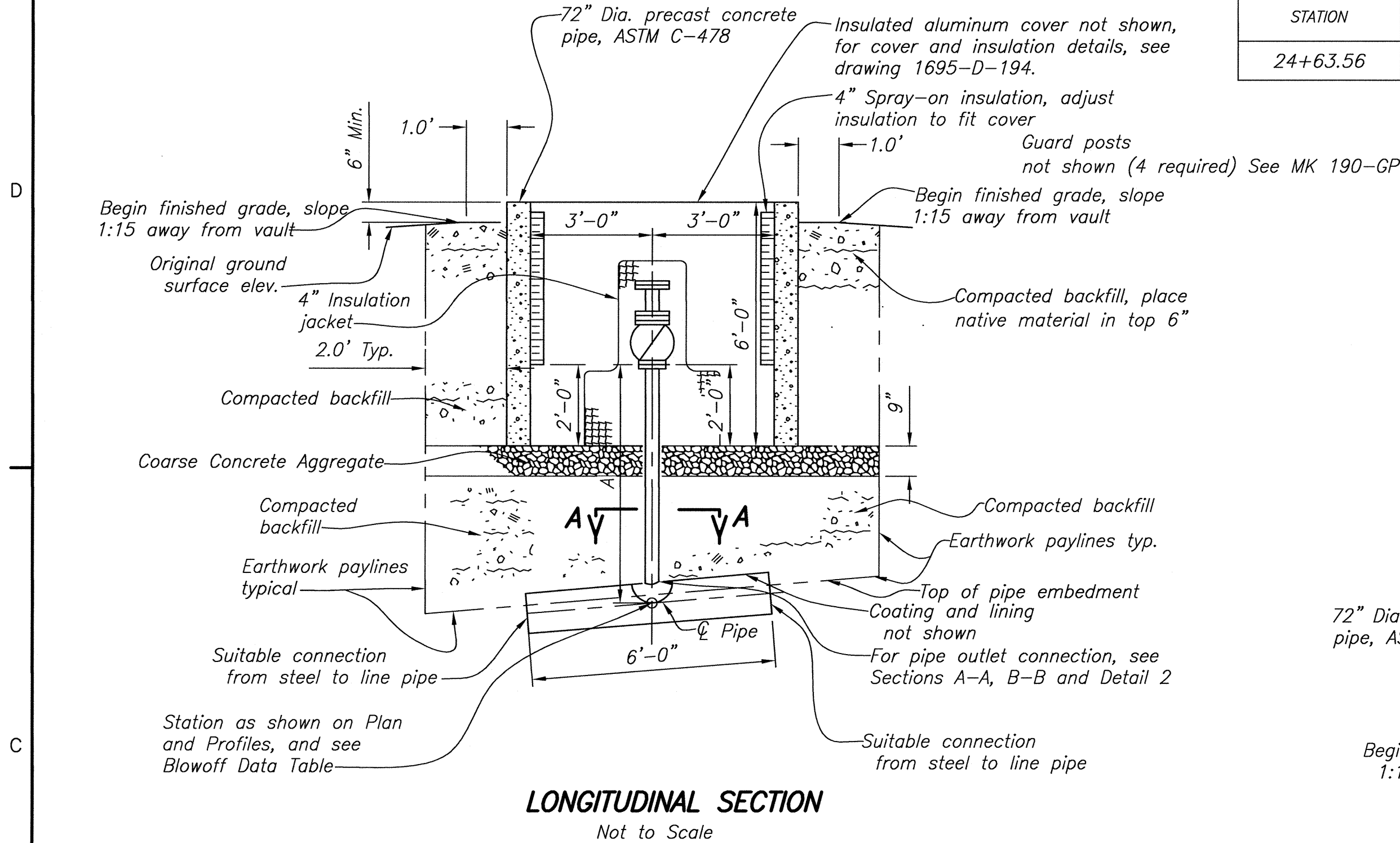
OPERATING CRITERIA

- Excavation around the encasement shall not occur when the pipeline is under hydrostatic pressure.

NOTES

- Drawing not to scale.
- No flexible rubber gasketed joints will be allowed within the concrete encasement, except for the bell encased at the face of the structure.
- Connections shown are for steel line pipe. For other types, submit connection plan for approval.
- For general notes and minimum requirements for detailing reinforcement, see 40-D-6263.
- Structural design of concrete encasement is based on a specified minimum concrete strength (f'_c) at 28 days of 4,500 psi and reinforcement with a specified minimum yield strength (f_y) of 60,000 psi.
- For general concrete outline notes, see 40-D-7012.
- For mortar lining thickness, see specifications paragraphs.
- All coatings shall be continuous through blocking.
- The minimum steel cylinder thickness, t , for the bend shall conform to that given in the specifications paragraphs as designated by the classification of the adjacent pipe symbol as shown in the plan and profile drawings or 10 gauge whichever is greater.
- D is nominal pipe diameter.
- Contractor may submit alternative designs for approval.
- For pressure pipe trench installation, see 1695-D-199.
- Miter Welded Pipe Detail is for steel pipe. Restrained joints for other pipe types must be submitted for approval.

BLOWOFF DATA TABLE							
STATION	HEAD CLASS (FT)	AWWA FLANGE RATING	BALL VALVE CLASS	ORIFICE PLATE # HOLES	PIPE Ø ELEVATION (FT)	GROUND SURFACE ELEVATION (FT)	DISTANCE A (FT)
24+63.56	125	CLASS D	150	19	6644.65	6652.0	3.9



- NOTES**
1. The minimum steel cylinder thickness, *t*, is 10 gauge for 12" pipe.
 2. For coating and lining requirements for std. steel pipe and fittings, see specification paragraphs.
 3. Contractor may submit alternative designs (e.g. other types of pipe and fittings) for approval.
 4. Install four guard posts around each vault as directed by COR. Install posts in accordance with the Guard Post Installation Detail on drawing 1695-D-190.
 5. Keep ball valve operator free to move outside of insulation jacket.

DESIGNED BY
DRAWN BY
CHECKED BY
TECH. APPR. BY
PEER REVIEW BY

DENVER, COLORADO 2013-08-02

TWIN LAKES TURNOUT
BLOWOFF DETAILS

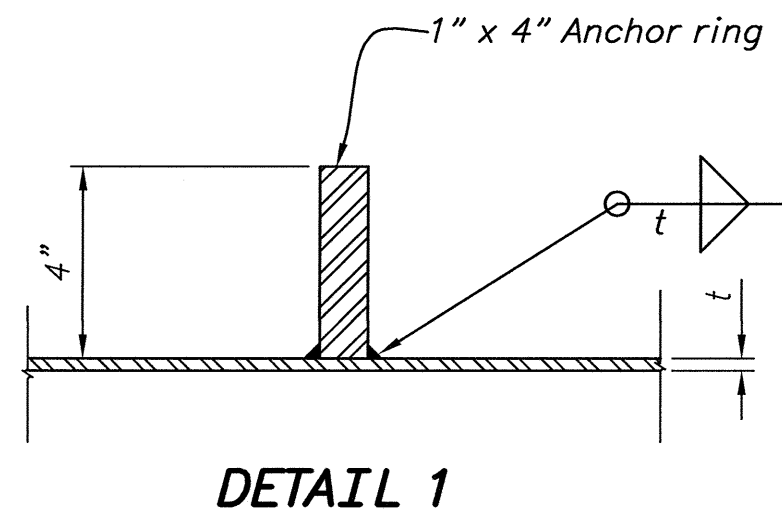
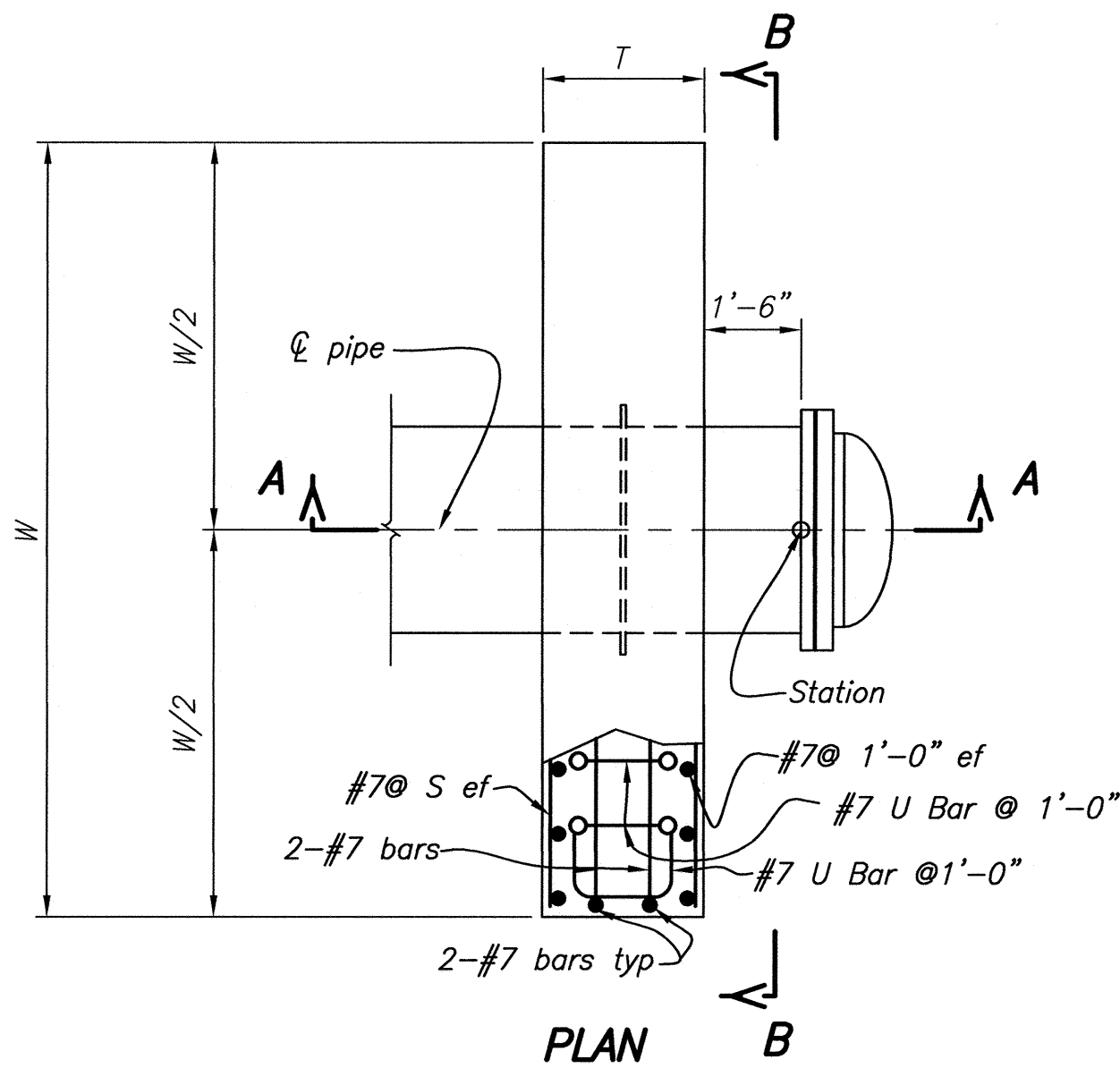
1695-D-201

SHEET 1 OF 1

DATE AND TIME PLOTTED
August 3, 2013 05:02
PLOTTER
KRONHARDT

CADD SYSTEM
AutoCAD Rel. 19.0s (LMS Tech)
CADD TELENAME
1695201.dwg

0 6 12 18 24
SCALE OF FEET



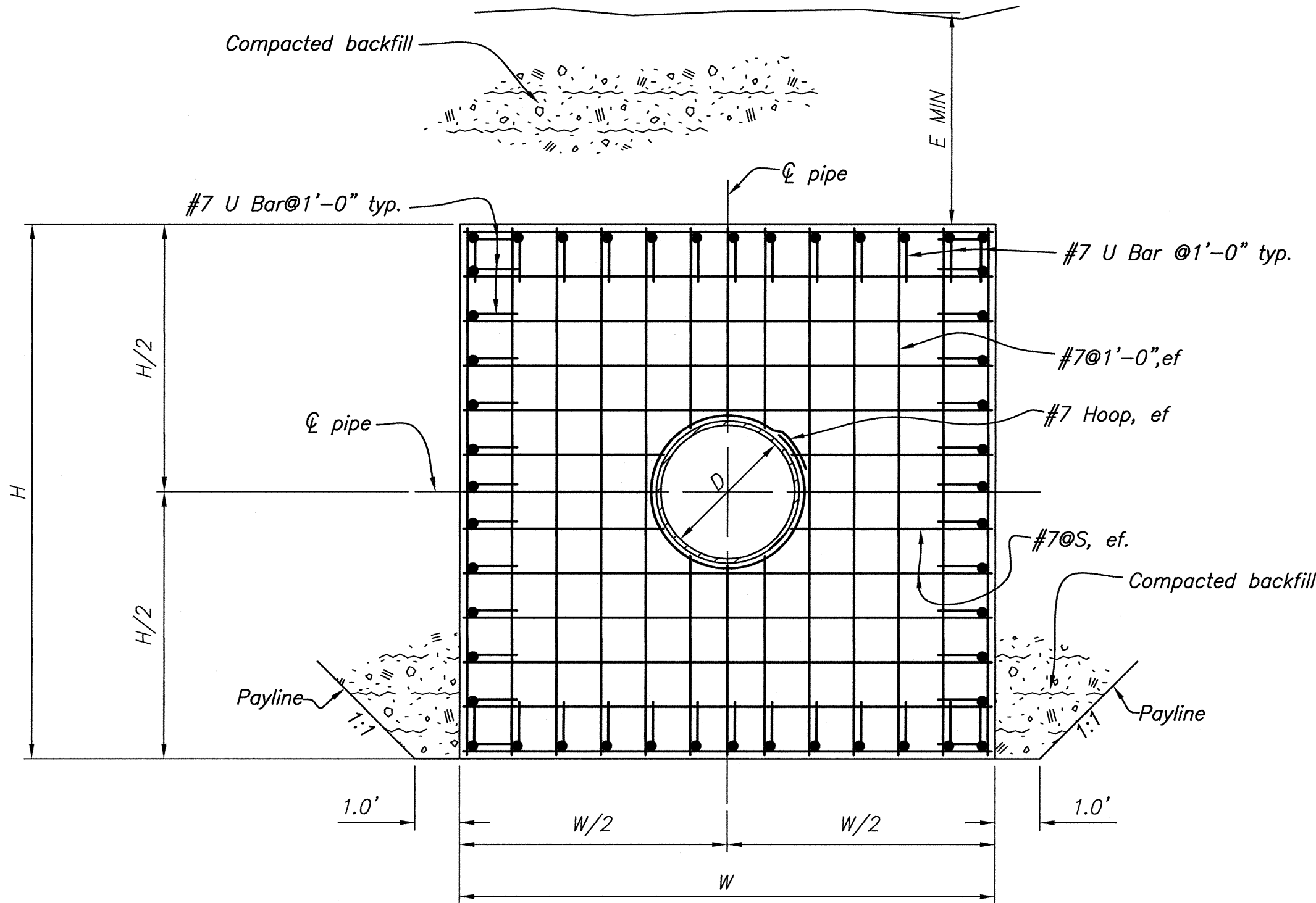
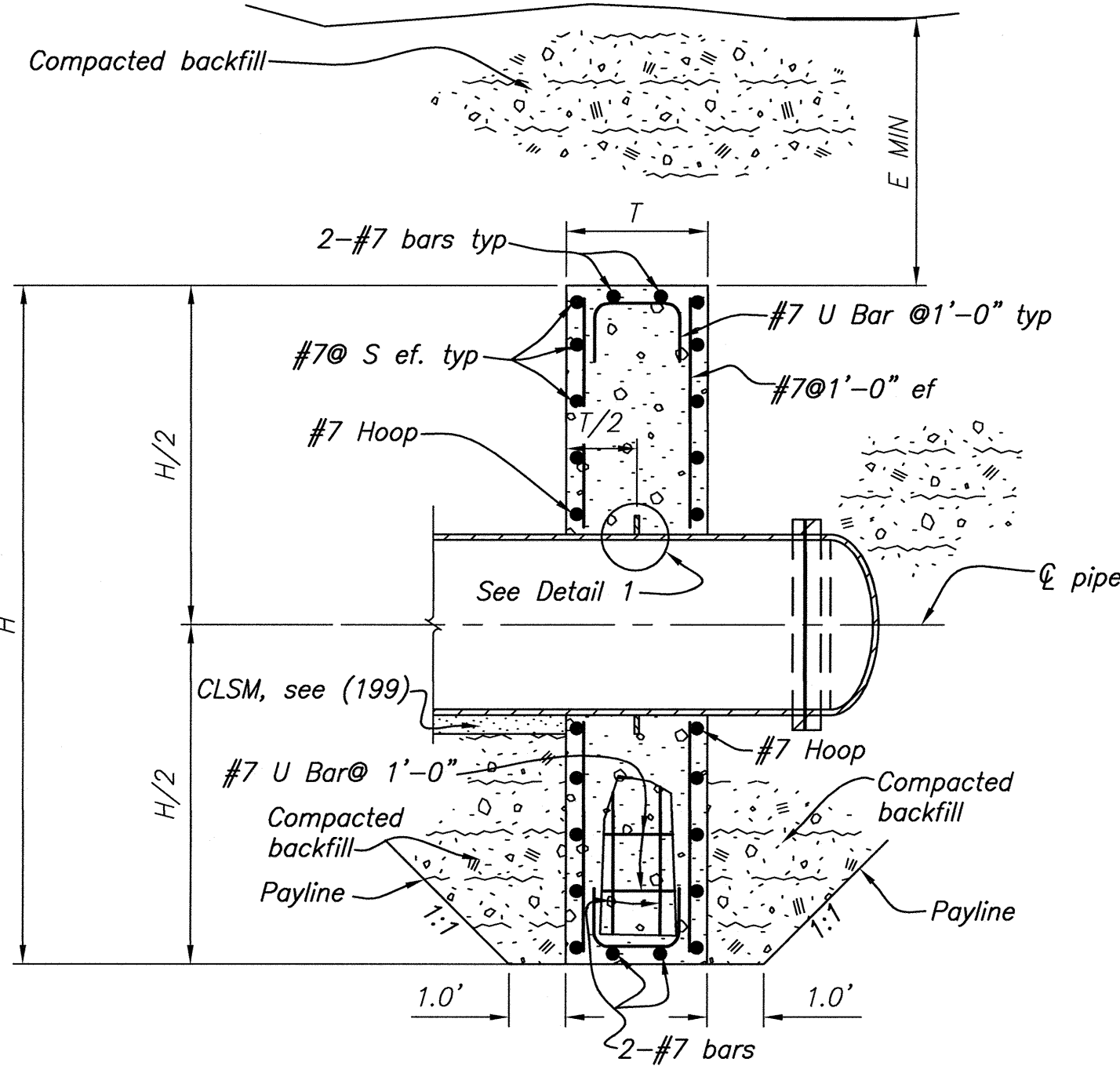
THRUST COLLAR DATA								
LATERAL	STATION	H	W	T	D (INCHES)	S (HORIZONTAL BAR SPACING)	E MIN. (FT)	HEAD (FT)
12B	12516+40	10'-0"	20'-0"	2'-6"	36	6"	2.0	400
12.1	121020+80	11'-6"	11'-6"	2'-9"	30	1'-0"	4.8	575

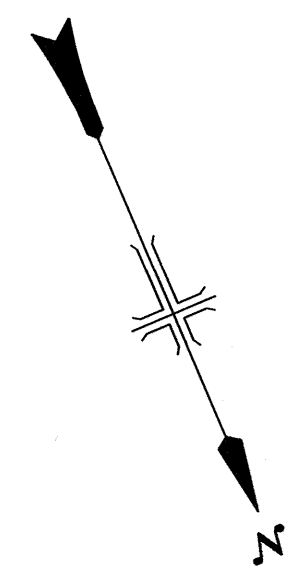
OPERATING CRITERIA

- Excavation around the blocking shall not occur when the pipeline is under hydrostatic pressure.

NOTES

- Drawing not to scale.
- For plan and profiles see drawings 1695-D-309 and 1695-D-310 for Reaches 12B and 12.1 respectively.
- Contractor may submit alternative plans for approval.
- The minimum steel cylinder thickness, t, for the pipe shall conform to that given in the specifications paragraphs as designated by the classification of the adjacent pipe symbol as shown in the plan and profile drawings.
- For general notes and minimum requirements for detailing reinforcement, see 40-D-6263. Concrete compressive strength, f'c, is 4,500 psi and specified yield point for reinforcement, fy, is 60,000 psi.
- For general concrete outline notes, see 40-D-7012.
- For coating and lining options, see specification paragraphs.
- CLSM is controlled low strength material.





A horizontal scale bar labeled "SCALE OF FEET". The bar has major tick marks at 30, 0, 30, 60, and 90. There are also minor tick marks between the major ones, indicating increments of 10 feet.



1. Reach 12.1 carrier pipe see (310).
2. Twin Lakes Turnout carrier pipe see (198).
3. For casing pipe wall thickness, see specifications.
4. For General Notes, Geology Note, abbreviations and symbols, see drawing (513).
5. For installation of carrier pipe through casing pipe, see specifications.
6. Field verify location and depth of all utilities.

GEOLOGY	
Date _____	
TECHNICAL APPROVAL	MARK VANDERG
SUBMITTED	JARED VAUK
APPROVED	LES STONE

	JAMES W. SANDERS
DESIGNED	JAMES W. SANDERS
DRAWN	CHOU CHA
CHECKED	CHOU CHA, P.E.
TECH. APPR.	CHOU CHA, P.E.
	LINDA M. BOWLES, P.E.
PEER REVIEW	LINDA M. BOWLES P.E.

DENVER, COLORADO	2013-08-02
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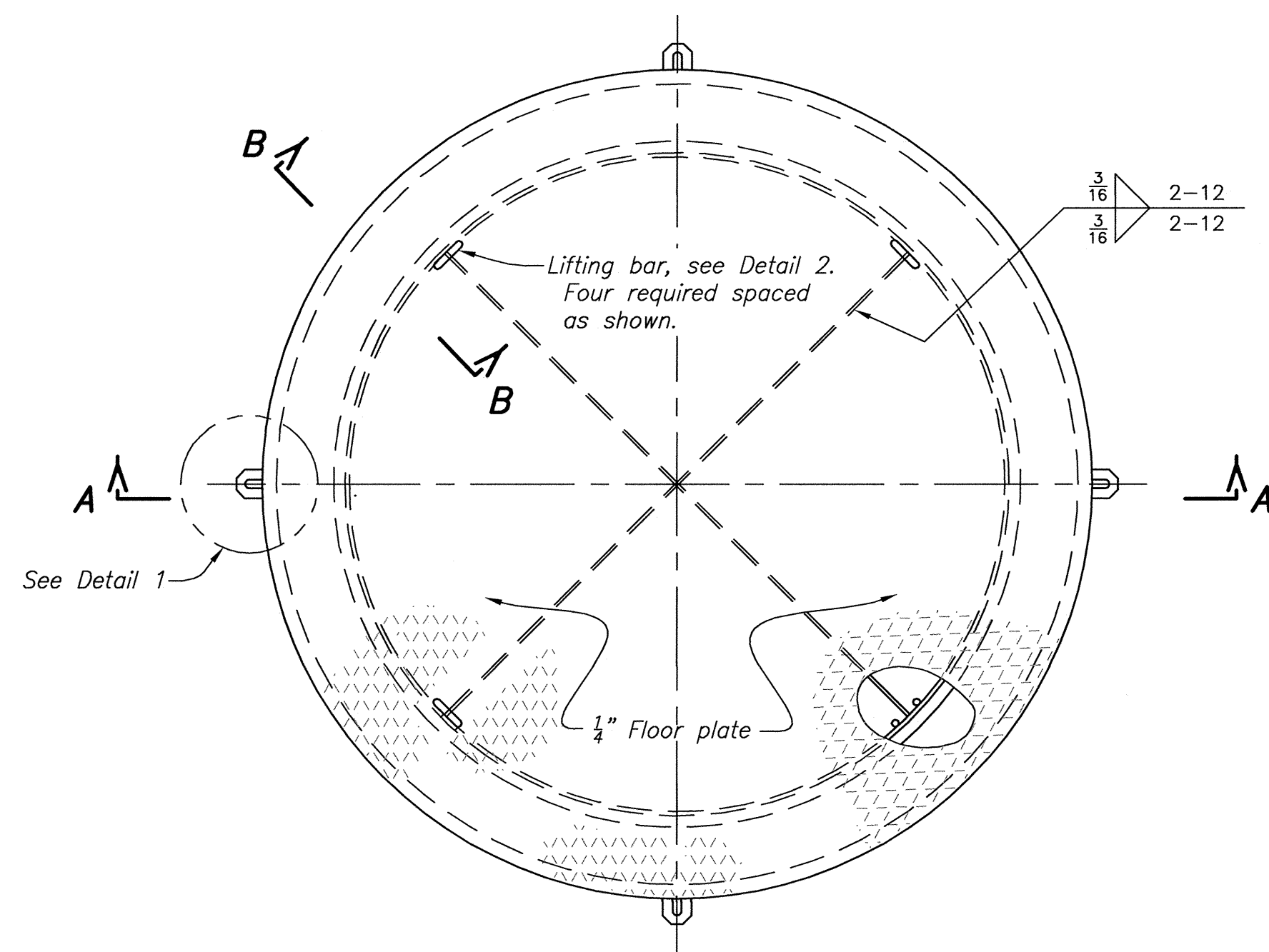
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BORE CROSSINGS*

1695-D-202

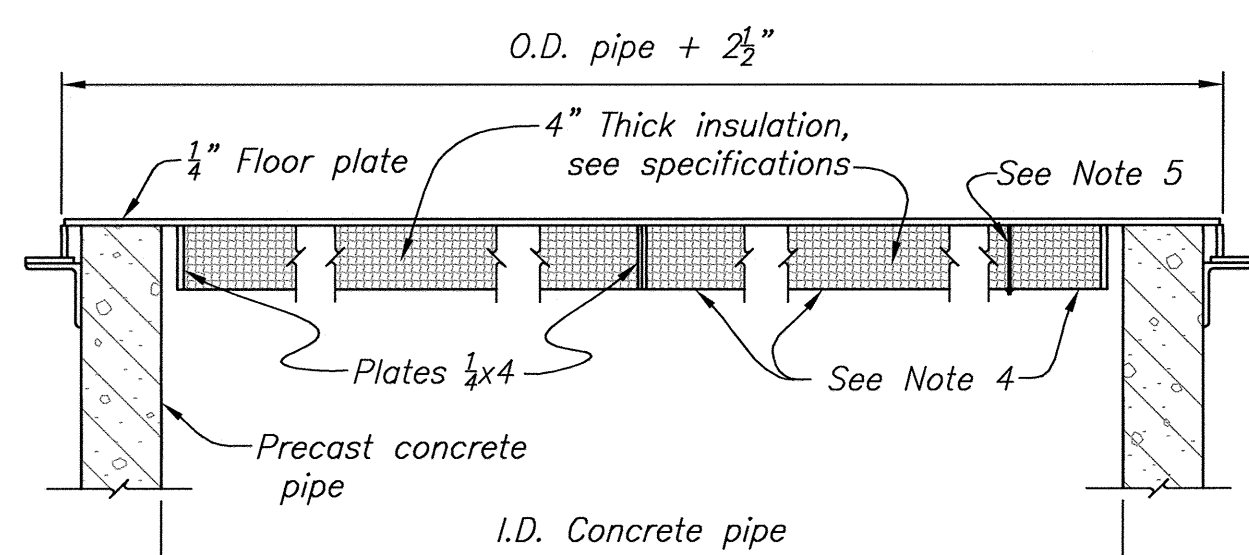
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PLOTTED BY
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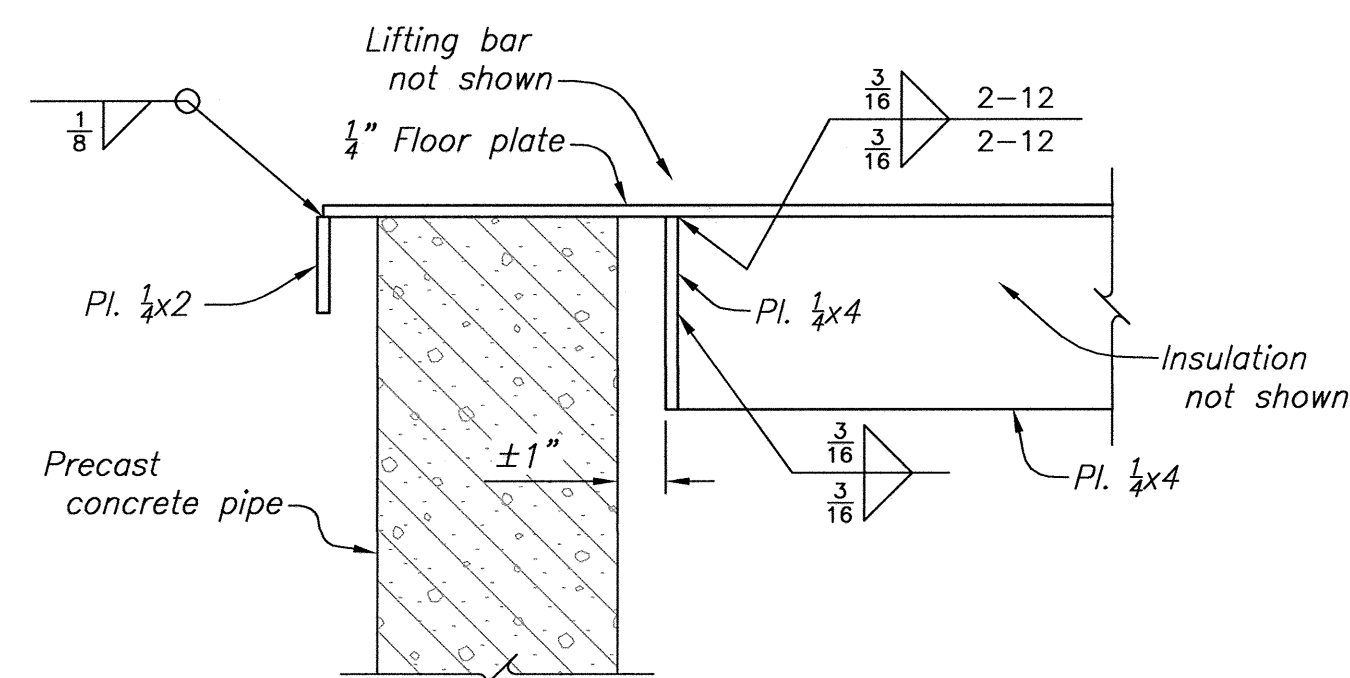
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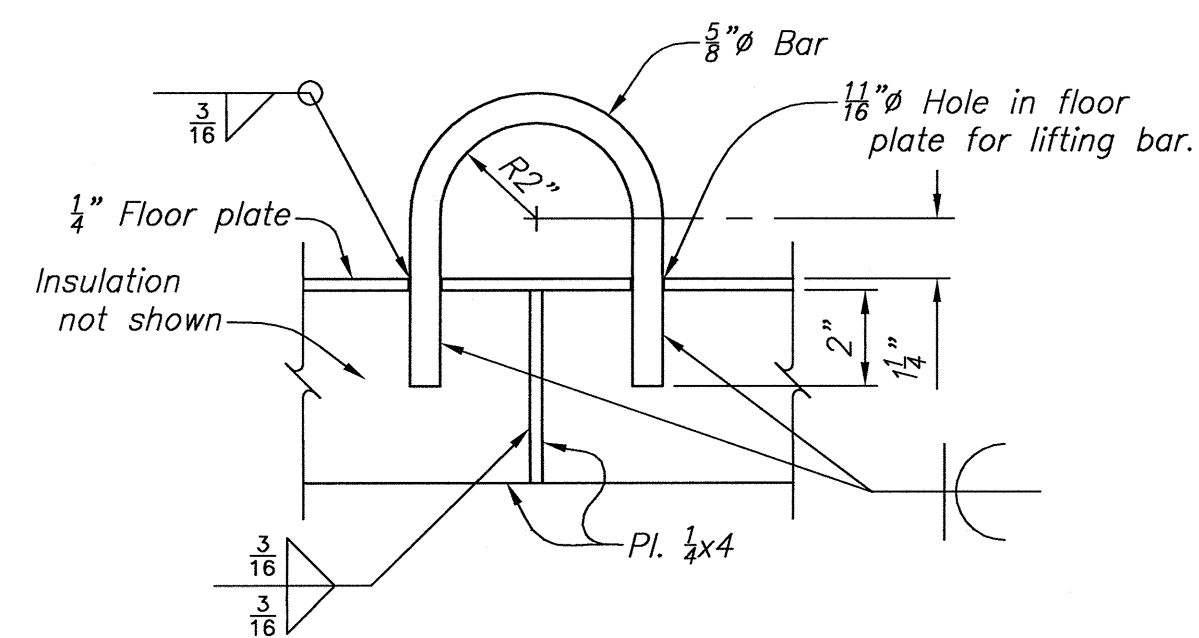
PLAN - COVER
ALUMINUM
Design live load: 50 psf
ONE REQ'D. (6'-0" I.D. Est Wt. 230 lbs.)



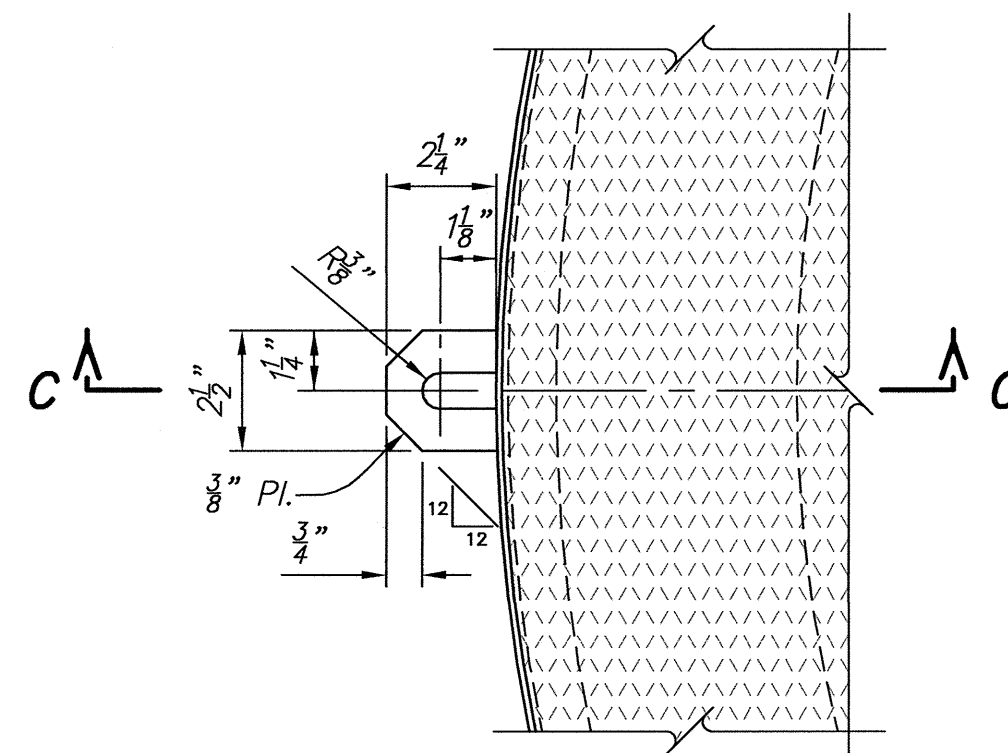
SECTION A-A



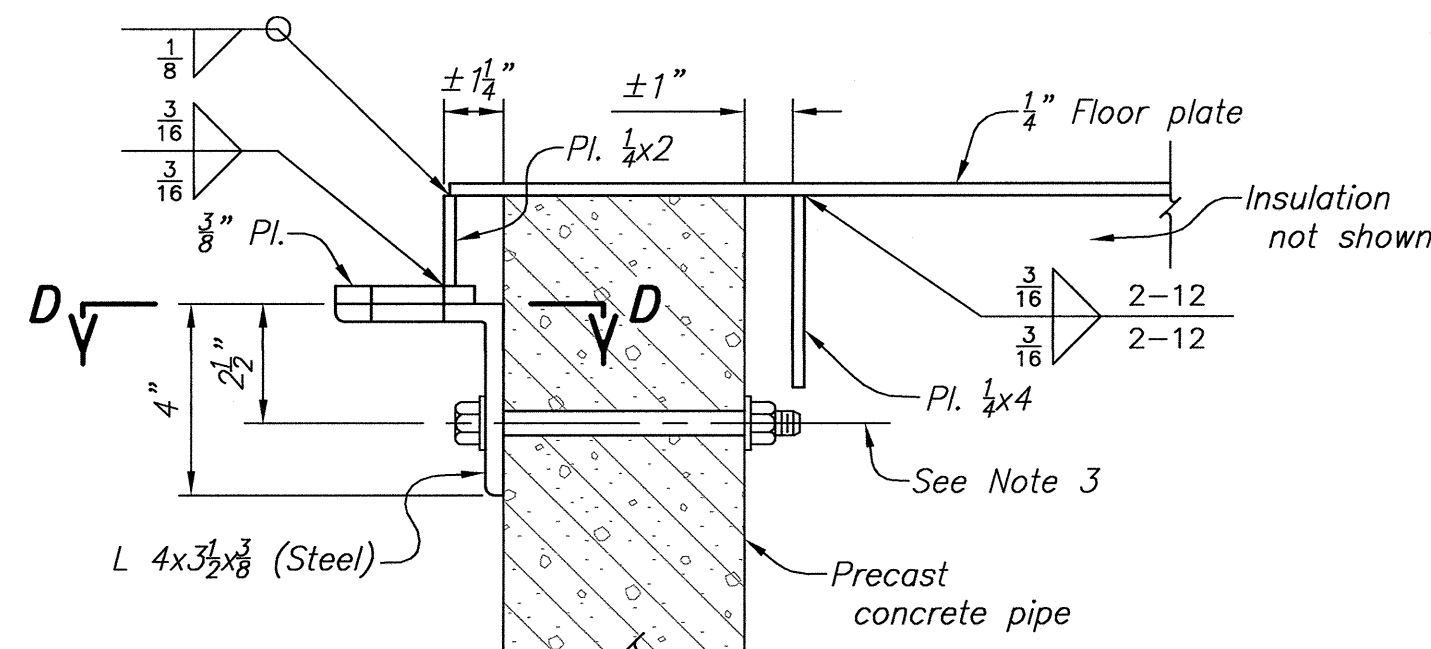
SECTION B-B



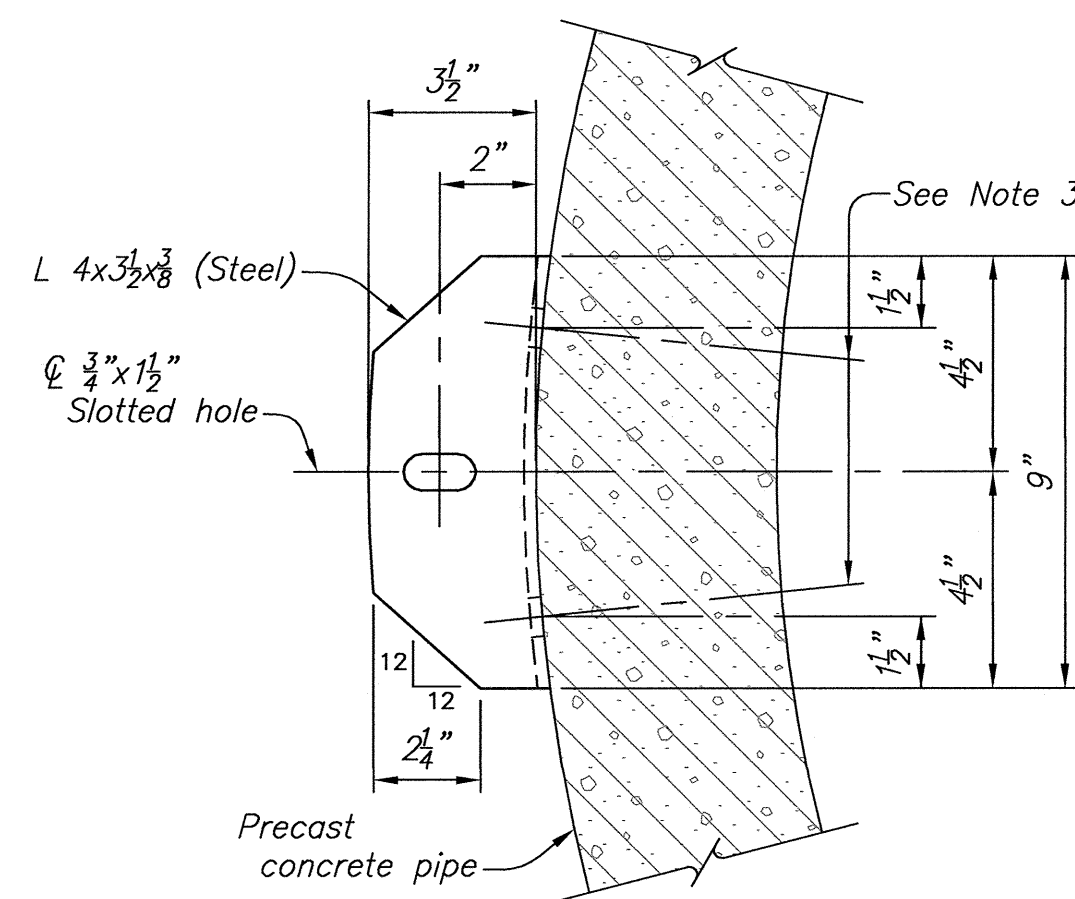
DETAIL 2
LIFTING BAR



DETAIL 1



SECTION C-C



SECTION D-D

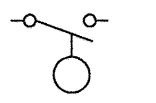
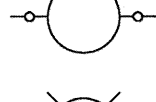
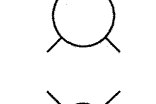
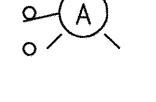
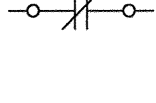
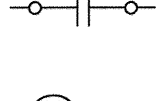
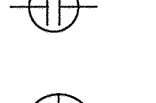
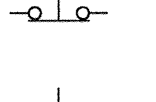
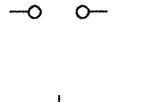
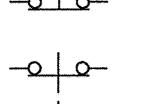
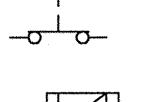
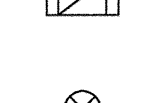
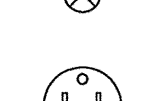
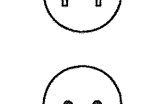
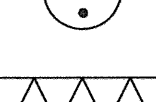
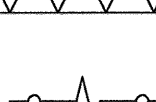
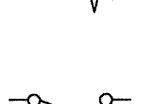
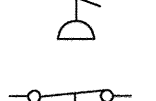
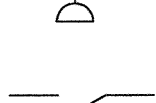
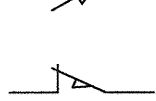
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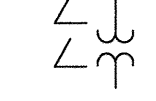
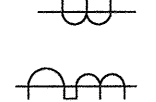
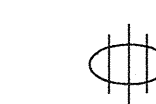
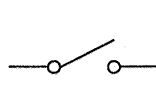
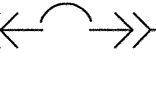
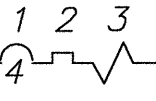
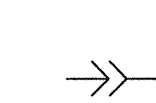
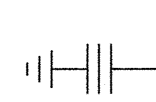
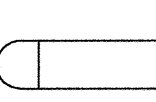
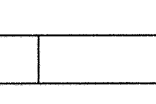
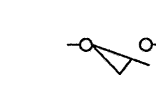
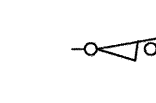
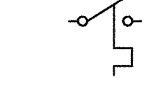
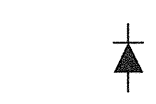
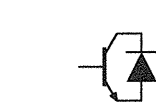
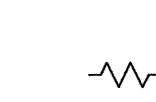
1. For General Notes, see (190).
2. All material on this drawing is aluminum unless noted otherwise.
3. $\phi \frac{1}{8}$ " Hole in angle for $\frac{5}{8}$ " steel thru bolt, nut, and std. washer. Field drill holes in concrete. Tack weld nut or burr threads.
4. Use $\frac{3}{4}$ " x 0.081 flattened expanded metal.
5. Use $\frac{1}{8}$ " Rod with hex. nut and std. washer as required at 2'-0" max. spacing. Weld rod to $\frac{1}{4}$ " floor plate.

REFERENCE DRAWINGS

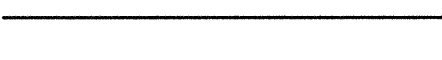
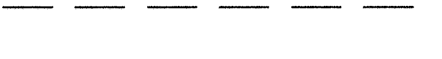
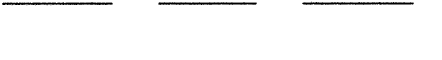
BLOWOFF - - - - - 1695-D-201

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AutoCAD Rel. 19.0s
CAD FILENAME
1695-D-227 DESIGNATIONS AND SYMBOLS.dwg
DATE AND TIME PLOTTED
AUGUST 19, 2013 13:41
PLOTTED BY
JBRADSHAW

SYMBOL	DESCRIPTION
	Normally open float switch
	Time delay contact
	Relay coil
	Indicating lamp
	Push-to-test indicating lamp
	Normally closed contact
	Normally open contact
	Normally open vacuum contact
	Mushroom head pushbutton
	Momentary pushbutton NO
	Momentary pushbutton NC
	Dual purpose pushbutton
	Current-limiting fuse
	Terminal block connection
	Female adapter plug
	Male adapter plug
	Resistive heater element
	Solenoid
	Pressure Switch NO
	Pressure Switch NC
	Pressure Switch NO
	Pressure Switch NC

SYMBOL	DESCRIPTION
	Transformer
	Open delta potential transformer connection
	Current transformer
	Bushing-type current transformer
	Ground sensing current transformer
	Disconnect switch
	Vacuum circuit breaker, draw-out type
	Molded-case circuit breaker, 1: Frame size, 2: Thermal trip, 3: Magnetic trip, 4: No. of poles
	Separable connection
	Surge arrester
	PLC output
	PLC input
	Limit switch NO
	Limit switch NC
	Thermal switch NO
	Diode
	Insulated gate bipolar transistor
	Resistor

GROUNDING SYSTEM & CONDUIT PLAN

	Ground cable embedded in concrete
	Ground cable buried in earth
	Ground cable exposed
	Grounding plate
	Welded or bolted connection
	Riser or grounding electrode conductor
	Ground rod
	Embedded or buried low-voltage conduit
	Embedded or buried medium-voltage conduit
	Direct buried conduit
	Encased burial medium-voltage conduit

<u>DESIGNATIONS</u>	
BC	Bypass contactor
CPT	Control power transformer
CR	Control relay
CT	Current transformer
EB	Encased burial
FACP	Fire Alarm Control Panel
FASP	Fire Alarm Suppression Panel
FAX	Fault _____
FDT	Fault _____
FS	Float switch
FU	Fuse
GCT	Ground current transformer
IC	Isolation contactor
ISW	Isolation switch
LS	Limit Switch
M	Motor or Main Contact
MPR	Motor protection relay
MTS	Manual Transfer Switch
PCRS	Plastic coated rigid steel
PFC	Power factor contactor
PLC	Programmable logic controller
PT	Potential transformer
RMC	Rigid metal conduit
RTD	Resistance temperature detector
RVSS	Reduced voltage soft start
SA	Surge Arrester
SCR ASSY	Silicon-controlled rectifier assembly
SR	Spring release (Closing Coil)
SS	Selector switch
ST	Shunt trip
TR	Timing relay
VFD	Variable frequency drive
Y	Anti-Pump coil

EQUIPMENT IDENTIFIERS

PPCP	Pumping Plant Control Panel
FCP	Fish Screen Control Panel
SCP-FS	Screen Cleaning Control Panel
MCC	Motor Control Center
Comm. Cab.	Communications Cabinet
KCC	Lighting Transformer
DCA	480 Volt Distribution Panel
DCB	208/120 Volt Distribution Panel
FACP	Fire Alarm Control Panel
KCA & KCB	Station Service Transformers
UCA1-UCA7	5kV Switchboards
EPx	Pumping Plant Pull Boxes
EYx	Switchyard Pull Boxes

ALWAYS THINK SAFETY

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

NAVALO GALLUP WATER SUPPLY PROJECT
NEW MEXICO

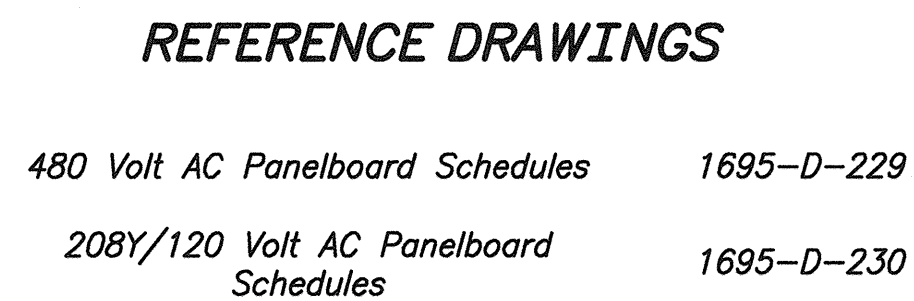
SAN JUAN LATERAL
TOHLAKAI PUMPING PLANT
ELECTRICAL INSTALLATION
DESIGNATIONS AND SYMBOLS

DESIGNED	Darryl Liscomb
DRAWN	Darryl Liscomb
CHECKED	Michel Schuh, P.E.
TECH. APPR.	Michel Schuh, P.E.
ADMIN. APPROVAL	Ray Higgins, P.E.
Electrical Design Group Manager	
DENVER, COLORADO	2013-08-19

DESIGNATIONS AND
SYMBOLS

1695-D-227

SHEET 1 OF 1



NEW MEXICO
SAN JUAN LATERAL
TOHLAKAI PUMPING PLANT
ELECTRICAL INSTALLATION
SINGLE-LINE DIAGRAM

	Darryl Liscomb
DESIGNED	Darryl Liscomb
DRAWN	Michel Schuh <i>Michel Schuh</i>
CHECKED	<i>Michel Schuh P.E.</i>
TECH. APPR.	Michel Schuh, P.E.
ADMIN. APPROVAL	<i>J. Boggess P.E.</i>
Joy Boggess, P.E. Electrical Design Group Manager	
DENVER, COLORADO	2013-08-15

SINGLE-LINE DIAGRAM

1695-D-228

SHEET 1 OF 1

GENERAL NOTES

1. Circuit breaker ratings are estimated. Actual ratings to be determined by contractor based on equipment furnished.

Electrical Power Panel Schedule																
Project: Tohlakai Pumping Plant										PANEL ID: DCA1						
Location: Tohlakai Pumping Plant										Power Source: Switchgear UXA via Transformer KXA						
Voltage		480		Bus Size		400		Input Type		MAIN CB		TVSS		Yes		
Current		400		Main Size		400		Output Type		N/A						
No. of Phases		3 PHASE		AIC		14000		Mounting		FLOOR MOUNTED						
No. of Wires		3						Ground Bus		Yes						
DESCRIPTION		Poles	Bkr Rating	Load VA			No.	PHASE	No.	Load VA			Bkr Rating	Poles	DESCRIPTION	
Pump 1 Discharge Valve 2		3	20	1163.94			1	A	2	1163.94			20	3	Pump 1 Discharge Valve 4	
---		---	---	---	---	---	3	B	4	---	---	---	---	---	---	
---		---	---	---	---	---	5	C	6	---	---	---	---	---	---	
Pump 1 Discharge Valve 5		3	20	1163.94			7	A	8	1163.94			20	3	Pump 1 Discharge Valve 7	
---		---	---	---	---	---	9	B	10	---	---	---	---	---	---	
---		---	---	---	---	---	11	C	12	---	---	---	---	---	---	
Pump 2 Discharge Valve 2		3	20	1163.94			13	A	14	1163.94			20	3	Pump 3 Discharge Valve 2	
---		---	---	---	---	---	15	B	16	---	---	---	---	---	---	
---		---	---	---	---	---	17	C	18	---	---	---	---	---	---	
Pump 4 Discharge Valve 2		3	20	1163.94			19	A	20	1163.94			20	3	Pump 5 Discharge Valve 2	
---		---	---	---	---	---	21	B	22	---	---	---	---	---	---	
---		---	---	---	---	---	23	C	24	---	---	---	---	---	---	
Pump 6 Discharge Valve 2		3	20	1163.94			25	A	26	1163.94			20	3	Pump 7 Discharge Valve 2	
---		---	---	---	---	---	27	B	28	---	---	---	---	---	---	
---		---	---	---	---	---	29	C	30	---	---	---	---	---	---	
Pump 7 Discharge Valve 4		3	20	1163.94			31	A	32	1163.94			20	3	Pump 7 Discharge Valve 5	
---		---	---	---	---	---	33	B	34	---	---	---	---	---	---	
---		---	---	---	---	---	35	C	36	---	---	---	---	---	---	
Pump 7 Discharge Valve 7		3	20	1163.94			37	A	38	---	---	---	20	3	Spare	
---		---	---	---	---	---	39	B	40	---	---	---	---	---	---	
---		---	---	---	---	---	41	C	42	---	---	---	---	---	---	
Spare		3	20	-			43	A	44	---	---	---	20	3	Spare	
---		---	---	---	---	---	45	B	46	---	---	---	---	---	---	
---		---	---	---	---	---	47	C	48	---	---	---	---	---	---	
Spare		3	20	-			49	A	50	---	---	---	---	---	Space	
---		---	---	---	---	---	51	B	52	---	---	---	---	---	Space	
---		---	---	---	---	---	53	C	54	---	---	---	---	---	Space	
Space							55	A	56	---	---	---	---	---	Space	
Space							57	B	58	---	---	---	---	---	Space	
Space							59	C	60	---	---	---	---	---	Space	
TOTAL		8147.57					LOADS IN			6983.63			TOTAL			
							VOLT-AMPERES									



Electrical Power Panel Schedule																	
Project: Tohlakai Pumping Plant										PANEL ID: DCA2							
Location: Tohlakai Pumping Plant										Power Source: Switchgear UXA via Transformer KXA							
Voltage 480			Bus Size 400			Input Type MAIN CB			TVSS Yes								
Current 400			Main Size 350			Output Type N/A											
No. of Phases 3 PHASE			AIC 14000			Mounting FLOOR MOUNTED											
No. of Wires 3						Ground Bus Yes											
DESCRIPTION		Poles	Bkr Rating	Load VA			No.	PHASE	No.	Load VA			Bkr Rating	Poles	DESCRIPTION		
Water Heater-PP Emergency Shower		3	200	120000	A	B	C	1	A	2	120000	A	B	C	200	3	Water Heater-CB Emergency Shower
---		-	-	-	-	-	-	3	B	4	-	-	-	-	-	-	---
---		-	-	-	-	-	-	5	C	6	-	-	-	-	-	-	---
UH-2		3	25	15625	-	-	-	7	A	8	15625	-	-	-	25	3	UH-3
---		-	-	-	-	-	-	9	B	10	-	-	-	-	-	-	---
---		-	-	-	-	-	-	11	C	12	-	-	-	-	-	-	---
UH-4		3	25	15625	-	-	-	13	A	14	11154.4	-	-	-	35	3	ECU-1
---		-	-	-	-	-	-	15	B	16	-	-	-	-	-	-	---
---		-	-	-	-	-	-	17	C	18	-	-	-	-	-	-	---
ECU-2		3	35	11154.4	-	-	-	19	A	20	11154.4	-	-	-	35	3	EF-3
---		-	-	-	-	-	-	21	B	22	-	-	-	-	-	-	---
---		-	-	-	-	-	-	23	C	24	-	-	-	-	-	-	---
UH-9		3	20	6250	-	-	-	25	A	26	6250	-	-	-	20	3	UH-10
---		-	-	-	-	-	-	27	B	28	-	-	-	-	-	-	---
---		-	-	-	-	-	-	29	C	30	-	-	-	-	-	-	---
Spare		3	20	-	-	-	-	31	A	32	-	-	-	-	20	3	Spare
---		-	-	-	-	-	-	33	B	34	-	-	-	-	-	-	---
---		-	-	-	-	-	-	35	C	36	-	-	-	-	-	-	---
Space		-	-	-	-	-	-	37	A	38	-	-	-	-	20	3	Spare
Space		-	-	-	-	-	-	39	B	40	-	-	-	-	-	-	---
Space		-	-	-	-	-	-	41	C	42	-	-	-	-	-	-	---
TOTAL				168654				LOADS IN			164184			TOTAL			
								VOLT-AMPERES									

Electrical Power Panel Schedule														
Project: Tohlakai Pumping Plant										PANEL ID: DCA3				
Location: Tohlakai Pumping Plant										Power Source: Switchgear UXA via Transformer KXA				
Voltage		480	Bus Size		400	Input Type		MAIN CB		TVSS		Yes		
Current		400	Main Size		350	Output Type		N/A						
No. of Phases		3 PHASE	AIC		14000	Mounting		FLOOR MOUNTED						
No. of Wires		3				Ground Bus		Yes						
DESCRIPTION	Poles	Bkr Rating	Load VA			No.	PHASE	No.	Load VA			Bkr Rating	Poles	DESCRIPTION
Recep-PP 480V North Wall	3	80	49883.1			1	A	2	49883.1			80	3	Recep-PP 480V South Wall
---	---	---	---	---	---	3	B	4	---	---	---	---	---	---
---	---	---	---	---	---	5	C	6	---	---	---	---	---	---
12.1 Air Compressor 1	3	100	31869.7			7	A	8	31869.7			100	3	12.1 Air Compressor 2
---	---	---	---	---	---	9	B	10	---	---	---	---	---	---
---	---	---	---	---	---	11	C	12	---	---	---	---	---	---
12.B Air Compressor 1	3	60	16731.6			13	A	14	16731.6			60	3	12.B Air Compressor 2
---	---	---	---	---	---	15	B	16	---	---	---	---	---	---
---	---	---	---	---	---	17	C	18	---	---	---	---	---	---
Air Compressor-Service Air	3	30	8764.18			19	A	20	8764.18			30	3	Bridge Crane
---	---	---	---	---	---	21	B	22	---	---	---	---	---	---
---	---	---	---	---	---	23	C	24	---	---	---	---	---	---
Sliding Door Operator	3	20	1115.44			25	A	26	---	---	---	20	3	Spare
---	---	---	---	---	---	27	B	28	---	---	---	---	---	---
---	---	---	---	---	---	29	C	30	---	---	---	---	---	---
Spare	3	20	---	---	---	31	A	32	---	---	---	20	3	Spare
---	---	---	---	---	---	33	B	34	---	---	---	---	---	---
---	---	---	---	---	---	35	C	36	---	---	---	---	---	---
Space						37	A	38						Space
Space						39	B	40						Space
Space						41	C	42						Space
TOTAL			108364			LOADS IN			107249			TOTAL		
						VOLT-AMPERES								



Electrical Power Panel Schedule																		
Project: Tohlakai Pumping Plant										PANEL ID: DCA4								
Location: Tohlakai Pumping Plant										Power Source: Automatic Transfer Switch								
Voltage		480Y/277		Bus Size		400		Input Type		MAIN CB		TVSS		Yes				
Current		400		Main Size		350		Output Type		N/A								
No. of Phases		3 PHASE		AIC		14000		Mounting		FLOOR MOUNTED								
No. of Wires		4						Ground Bus		Yes								
DESCRIPTION				Poles	Bkr Rating	Load VA			No.	PHASE	No.	Load VA			Bkr Rating	Poles	DESCRIPTION	
Transformer KCA				3	125	75000			1	A	2	75000			125	3	Transformer KCB	
---				--	--	--	--	--	3	B	4	---	--	--	--	--	---	
---				--	--	--	--	--	5	C	6	---	--	--	--	--	---	
UH-1				3	25	15625			7	A	8	15625			25	3	UH-5	
---				--	--	--	--	--	9	B	10	---	--	--	--	--	---	
---				--	--	--	--	--	11	C	12	---	--	--	--	--	---	
UH-6				3	25	15625			13	A	14	6250			20	3	UH-7	
---				--	--	--	--	--	15	B	16	--	--	--	--	--	---	
---				--	--	--	--	--	17	C	18	---	--	--	--	--	---	
UH-8				3	20	6250			19	A	20	5540			25	1	Lighting Control Panel (LCP)	
---				--	--	--	--	--	21	B	22	---	4038	--	20	1	Lighting-PP Bays 5 & 6 and Interior Rooms	
---				--	--	--	--	--	23	C	24	---	---	3376	20	1	Lighting-Air Chamber	
Lighting-PP Emergency and Exit Lights				1	20	146			25	A	26	---	---	20	---	---	Spare	
Spare				1	20	---			27	B	28	---	3000	20	1	---	Lighting-PP Bays 3 & 4	
Lighting-PP Bays 1 & 2				1	20	---	3000	---	29	C	30	---	---	20	1	---	Spare	
Spare				3	20	--	--	--	31	A	32	--	--	20	3	---	Spare	
---				--	--	--	--	--	33	B	34	--	--	--	--	--	---	
---				--	--	--	--	--	35	C	36	--	--	--	--	--	---	
Space									37	A	38	--	--	20	3	---	Spare	
Space									39	B	40	--	--	--	--	--	---	
Space									41	C	42	--	--	--	--	--	---	
TOTAL						112646		3000	LOADS IN VOLT-AMPERES				102415	7038	3376	TOTAL		

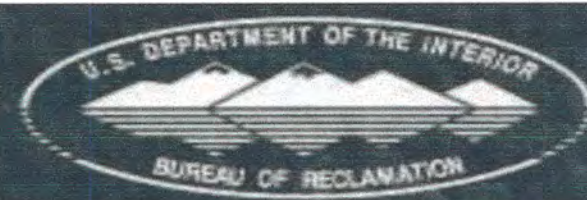


GENERAL NOTES

1. Circuit breaker ratings are estimated. Actual ratings to be determined by contractor based on equipment furnished.

Electrical Power Panel Schedule														
Project: Tohlakai Pumping Plant					PANEL ID: DCB1									
Location: Tohlakai Pumping Plant					Power Source: DCA4 via Transformer KCA									
Voltage	208Y/120	Bus Size	225	Input Type	MAIN LUGS ONLY			TVSS	No					
Current	225	Main Size	225	Output Type	N/A									
No. of Phases	3 PHASE	AIC	14000	Mounting	SURFACE MOUNTED									
No. of Wires	4			Ground Bus	Yes									
DESCRIPTION	Poles	Bkr Rating	Load VA			No.	PHASE	No.	Load VA			Bkr Rating	Poles	DESCRIPTION
Water Heater - Restroom Sink	2	25	4160			1	A	2	1095			20	1	UH-11 and EF-1
Engine Generator Auxiliaries	1	40		4160		3	B	4		3150		20	2	Recep-PTHP-1
Motor Operated Louvers	1	45	2160			5	C	6						
Recep-PP East Wall	1	20		900		7	A	8	900			20	1	Recep-PP Exterior
Recep-AC Exterior and Room 102	1	20			770	9	B	10		744		20	1	Fire Alarm Control Panel (FACP)
Recep-PP West Wall	1	20	720			11	C	12		900		20	1	Recep-PP South and AC East Walls
Recep-Sump Pump Valve Vault 1	1	20		720		13	A	14	720			20	1	Recep-Sump Pump Flowmeter Vault 2
Recep-Sump Pump Flowmeter Vault 1	1	20			720	15	B	16		720		20	1	Recep-PP Room 101
12.1 Air Chamber Control	1	20	600			17	C	18		720	720	20	1	Recep-Sump Pump Chlorine Injection Vault 1
SCADA UPS No. 3	1	20		600		19	A	20	600			20	1	Fire Alarm Suppression Panel (FASP)
Recep-AC West Wall	1	20		600		21	B	22		600		20	1	12.B Air Chamber Control
Recep-PP North Wall	1	20			720	23	C	24			600	20	1	SCADA UPS No. 4
Recep-Room 101 Dedicated 3	1	20	540			25	A	26	600			20	1	SCADA UPS No. 2
SCADA UPS No. 1	1	20		360		27	B	28		500		20	1	MV Switchgear Space Heaters
Security Panel	1	20	360			29	C	30		360	360	20	1	Recep-Room 101 Dedicated 2
Flowmeter Vault 1-Lighting and Recep	1	20		274		31	A	32	360			20	1	Recep-Room 101 Dedicated 4
Recep-Room 101 Dedicated 1	1	20			360	33	B	34		360		20	1	Recep-Room 101 Dedicated 6
EF-2	1	20	95			35	C	36			274	20	1	Valve Vault 1-Lighting and Recep
12.B Flow Meters	1	20		120		37	A	38	227			20	1	Chlorine Injection Vault 1-Lighting and Recep
Recep-Room 101 Dedicated 5	1	20			360	39	B	40				20		Spare
Spare		20				41	C	42			120	20	1	LP Tank Level Instrument
Propane Vaporizer	1	20		120		43	A	44	120			20	1	12.1 Flow Meters
Flowmeter Vault 2-Lighting and Recep	1	20			227	45	B	46				20	1	Spare
Spare	1	20				47	C	48				20	1	Spare
Spare	1	20				49	A	50	120			20	1	Storage Tank 1 Level Meter
Spare		20				51	B	52						Spare
Spare		20				53	C	54						Spare
Spare		20				55	A	56						Spare
Spare		20				57	B	58						Spare
Spare		20				59	C	60						Spare
TOTAL			8635	7254	7207	LOADS IN VOLT-AMPERES			4742	6074	2974	TOTAL		

Electrical Power Panel Schedule																
Project: Tohlakai Pumping Plant										PANEL ID: DCB2						
Location: Tohlakai Pumping Plant										Power Source: DCB1 via Feed Thru Lugs						
Voltage		208Y/120		Bus Size		225		Input Type		MAIN LUGS ONLY		TVSS			No	
Current		225		Main Size		225		Output Type		N/A						
No. of Phases		3 PHASE		AIC		14000		Mounting		SURFACE MOUNTED						
No. of Wires		4						Ground Bus		Yes						
DESCRIPTION		Poles	Bkr Rating	Load VA			No.	PHASE	No.	Load VA			Bkr Rating	Poles	DESCRIPTION	
Seal Water Pump 2 (12.B)		3	20	2390.23			1	A	2	1673.16			20	3	Seal Water Pump 1 (12.1)	
---		---	---	---	---	---	3	B	4	---	---	---	---	---	---	
---		---	---	---	---	---	5	C	6	---	---	---	---	---	---	
Cathodic Protection		1	80	7200			7	A	8				20	1	Spare	
UXA3 Control Power		1	20		1500		9	B	10				40	1	Chlorine Sample Pump	
UXA1 Control Power		1	20			1500	11	C	12		1920	1500	20	1	UXA2 Control Power	
Spare		1	20				13	A	14				20	1	Spare	
UXA5 Control Power		1	20		1500		15	B	16		696		20	1	Sump Pump-Air Chamber	
Bus Protection Circuit		1	20			600	17	C	18			1500	20	1	UXA4 Control Power	
Spare		1	20				19	A	20				20	1	Spare	
Chlorine Injection Equipment		1	20		900		21	B	22				20	1	Spare	
Space							23	C	24			1392	30	1	Seal Water Strainers	
Space							25	A	26						Space	
Space							27	B	28						Space	
Space							29	C	30			184	20	1	SF-1, SF-2, SF-3, SF-4	
Space							31	A	32						Space	
Space							33	B	34						Space	
Space							35	C	36						Space	
Space							37	A	38						Space	
Space							39	B	40						Space	
Space							41	C	42						Space	
TOTAL				9590.23	3900	2100	LOADS IN VOLT-AMPERES			1673.16	2616	4576	TOTAL			

Electrical Power Panel Schedule														
Project: Tohlakai Pumping Plant							PANEL ID: DDA							
Location: Tohlakai Pumping Plant							Power Source: DCA4 via Transformer KCB							
Voltage	208Y/120	Bus Size	225	Input Type	MAIN CB		TVSS	Yes		Current	225	Main Size	225	
No. of Phases	3 PHASE	AIC	14000	Output Type	N/A		Mounting	SURFACE MOUNTED		No. of Wires	4	Ground Bus	Yes	
DESCRIPTION	Poles	Bkr Rating	Load VA			No.	PHASE	No.	Load VA			Bkr Rating	Poles	DESCRIPTION
UH-12	3	25	6250			1	A	2	6250			25	3	UH-13
---	-	-	-	-	-	3	B	4	-	-	-	-	-	---
---	-	-	-	-	-	5	C	6	-	-	-	-	-	---
UH-14	3	25	6250			7	A	8	6250			25	3	UH-15
---	-	-	-	-	-	9	B	10	-	-	-	-	-	---
---	-	-	-	-	-	11	C	12	-	-	-	-	-	---
EF-4	3	30	3824.37			13	A	14	2882.13			25	3	Monorail Crane
---	-	-	-	-	-	15	B	16	-	-	-	-	-	---
---	-	-	-	-	-	17	C	18	-	-	-	-	-	---
Lighting-Chlorine Building	1	20	1020			19	A	20	26			20	1	Lighting-Emergency and Exit
Spare	1	20				21	B	22	900			20	1	Recep-CB Exterior
Lighting-Chlorine Storage	1	20			476	23	C	24			360	20	1	Fire Alarm Control Panel (FACP2)
VF-1	1	20	60			25	A	26				20	1	Spare
Spare	1	20				27	B	28	300			20	1	Chlorine Injection Control Equipment
Recep-Gas Detection and SCADA Systems	1	20			360	29	C	30				20	1	Spare
TOTAL			17404.4		836	LOADS IN VOLT-AMPERES			15408.1	1200	360	TOTAL		

ALWAYS THINK SAFETY

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
NAVAJO GALLUP WATER SUPPLY PROJECT
NEW MEXICO

SAN JUAN LATERAL

TOHLAKAI PUMPING PLANT

ELECTRICAL INSTALLATION

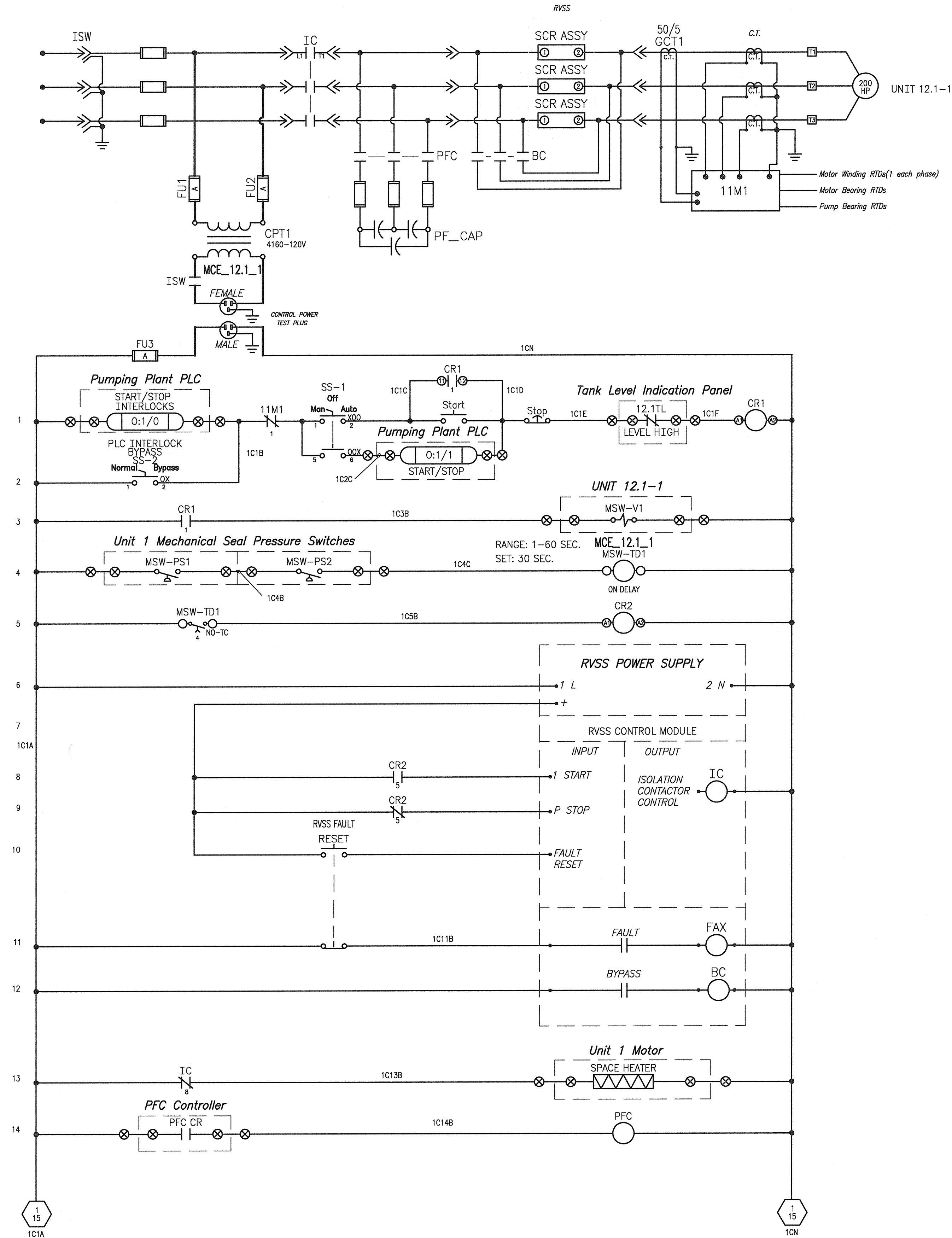
208/120 VOLT AC PANELBOARD SCHEDULES

Darryl Liscomb
DESIGNED
Darryl Liscomb
DRAWN
Michel Schuh
CHECKED
TECH. APPR. Jeremiah Bragdon
ADMIN. APPROVAL
Jay Rogers
Electrical Design Group Manager
DENVER, COLORADO 2013-08-16

208/120 VOLT AC
PANELBOARD
SCHEDULES

1695-D-230

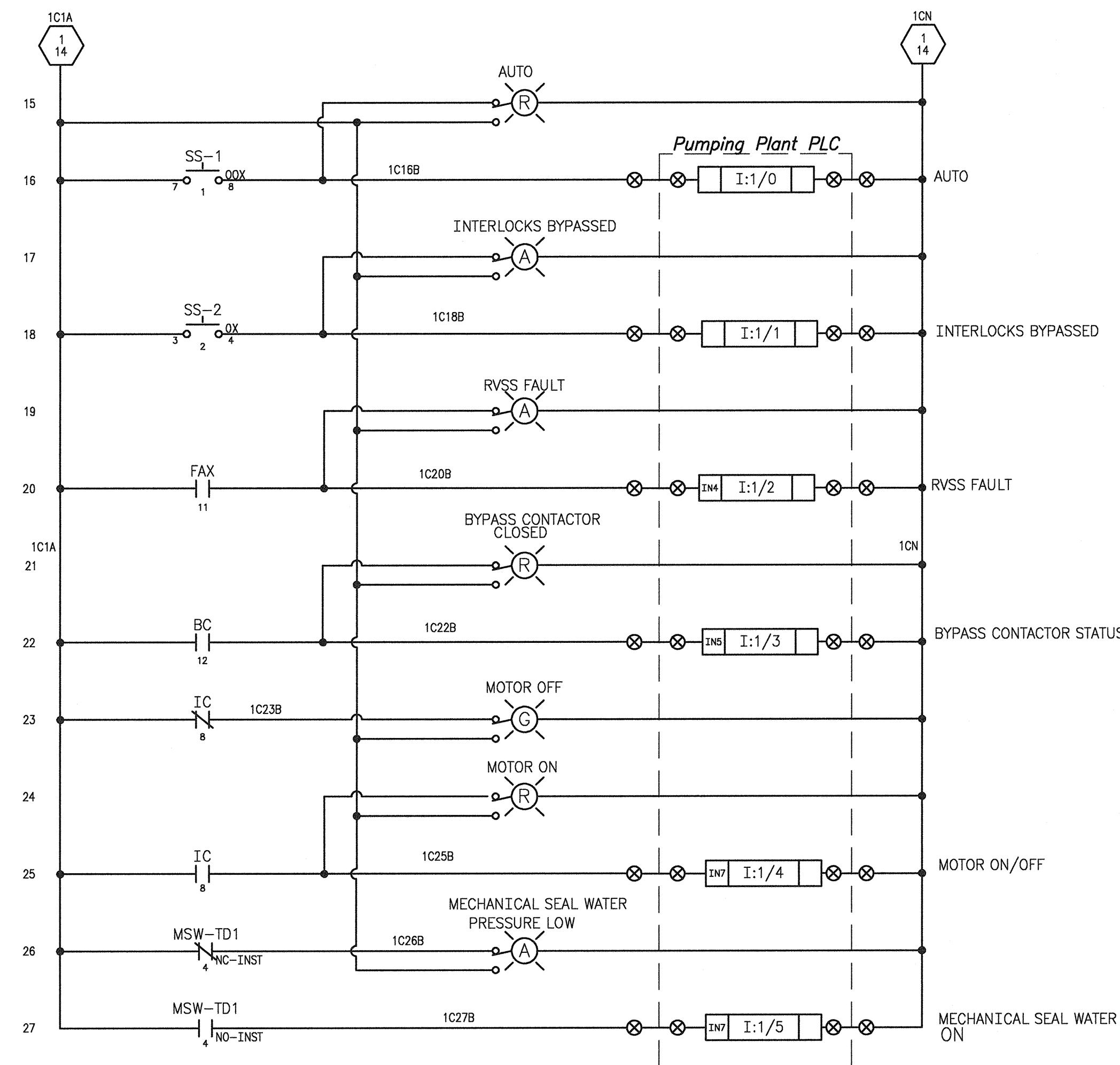
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AUGUST 19, 2013 13:44
PLOTTED BY
JBRUSHAW
CAD FILENAME
1695-D-231 UNIT 1 CONTROL.DWG



- NOTES**
1. All devices shown in the de-energized state.
 2. Motor Starter will communicate with PLC via modbus. PLC I/O shown for monitor/control interface information only. Separate conductors are not required for each signal.
 3. Motor protection relay 11Mx will communicate with PLC via modbus.
 4. Controls for Units 2 through 7 will be similar. Component and wire labels to match the respective unit.

REFERENCE DRAWINGS

Single-Line Diagram 1695-D-229
Designations and Symbols 1695-D-227



DESIGNED Darryl Liscumb
DRAWN Darryl Liscumb
CHECKED Michel Schuh, P.E.
TECH. APPR. Michel Schuh, P.E.
ADMIN. APPROVAL Jay Bergman, P.E.
Electrical Design Group Manager
DENVER, COLORADO 2013-08-09

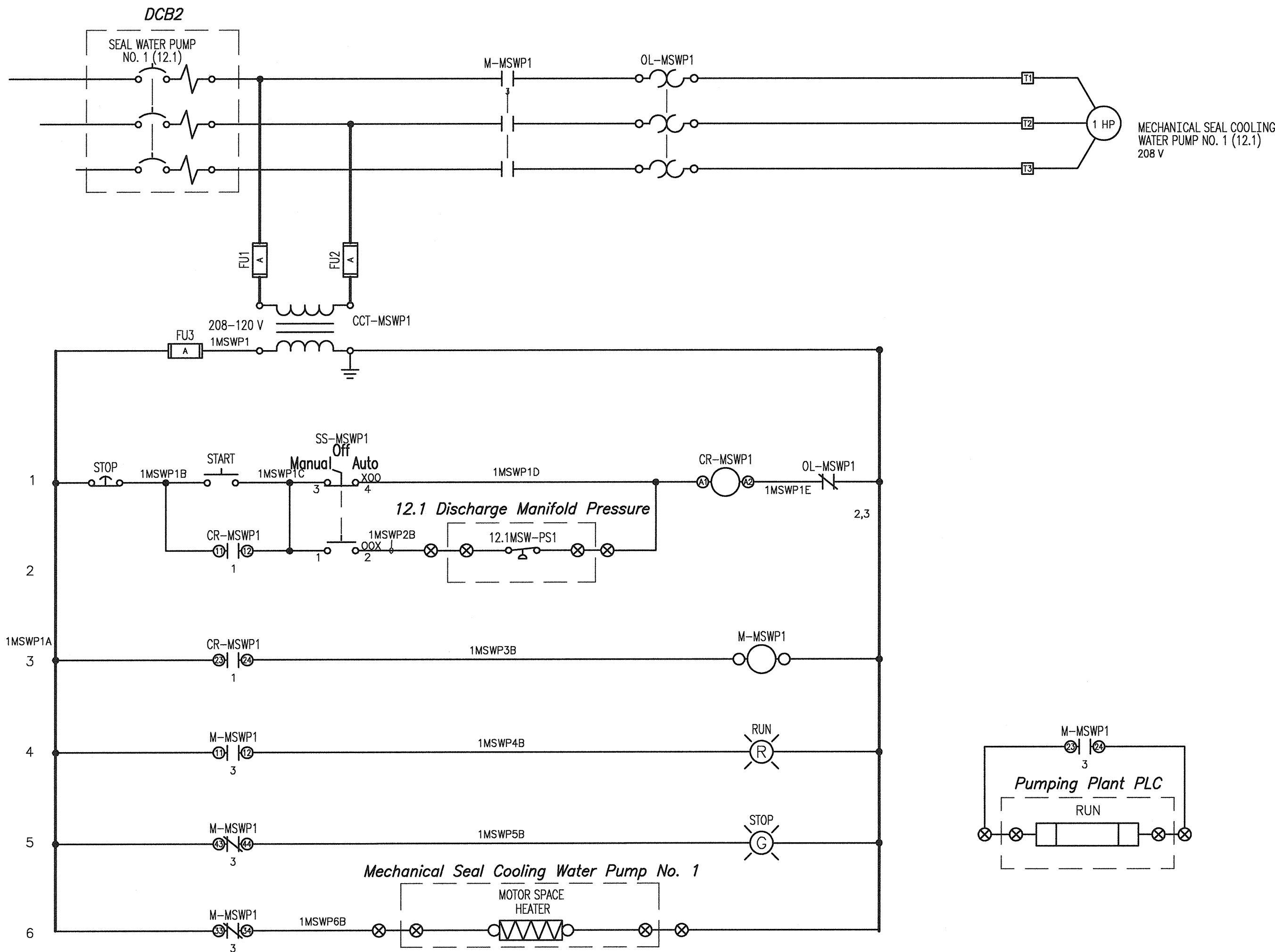
**UNIT CONTROL
SCHEMATIC DIAGRAM**

1695-D-231
SHEET 1 OF 1

- NOTES**
1. All devices shown in the de-energized state.
 2. 12B Mechanical Seal Cooling Water Pump Control Schematic Diagram will be similar. Component and wire labels to match the respective pump.
 3. Mechanical seal cooling water system operation:
 - 3.1. Mechanical seal cooling water pumps are only used to provide seal water during the respective system fill operation. Unit 1(12.1) and Unit 2(12B).
 - 3.2. During plant startup and fill operations, the controller mode selector switch should be in Auto.
 - 3.3. The manual mode is only for system testing and should not be used during normal operation.
 - 3.4. Pressure switch 12.1MSW-PS1 will turn off the seal water pump when the plant discharge manifold pressure is sufficient to supply all seal water needs.

REFERENCE DRAWINGS

- | | |
|--------------------------------------|------------|
| 208Y/120 Volt AC Panelboard Schedule | 1695-D-230 |
| Designations and Symbols | 1695-D-227 |



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NEW MEXICO
SAN JUAN LATERAL
TOHLAKAI PUMPING PLANT
ELECTRICAL INSTALLATION
MECHANICAL SEAL COOLING WATER PUMP
CONTROL SCHEMATIC DIAGRAM

DESIGNED: Darryl Liscomb
DRAWN: Michel Schuh
CHECKED: Michel Schuh
TECH. APPR.: Michel Schuh, P.E.
ADMIN. APPROVAL: Jay Rodgers, P.E.
Electrical Design Group, Mahogon
DENVER, COLORADO 2013-08-09

MECHANICAL SEAL WATER
PUMP SCHEMATIC

1695-D-232

SHEET 1 OF 1

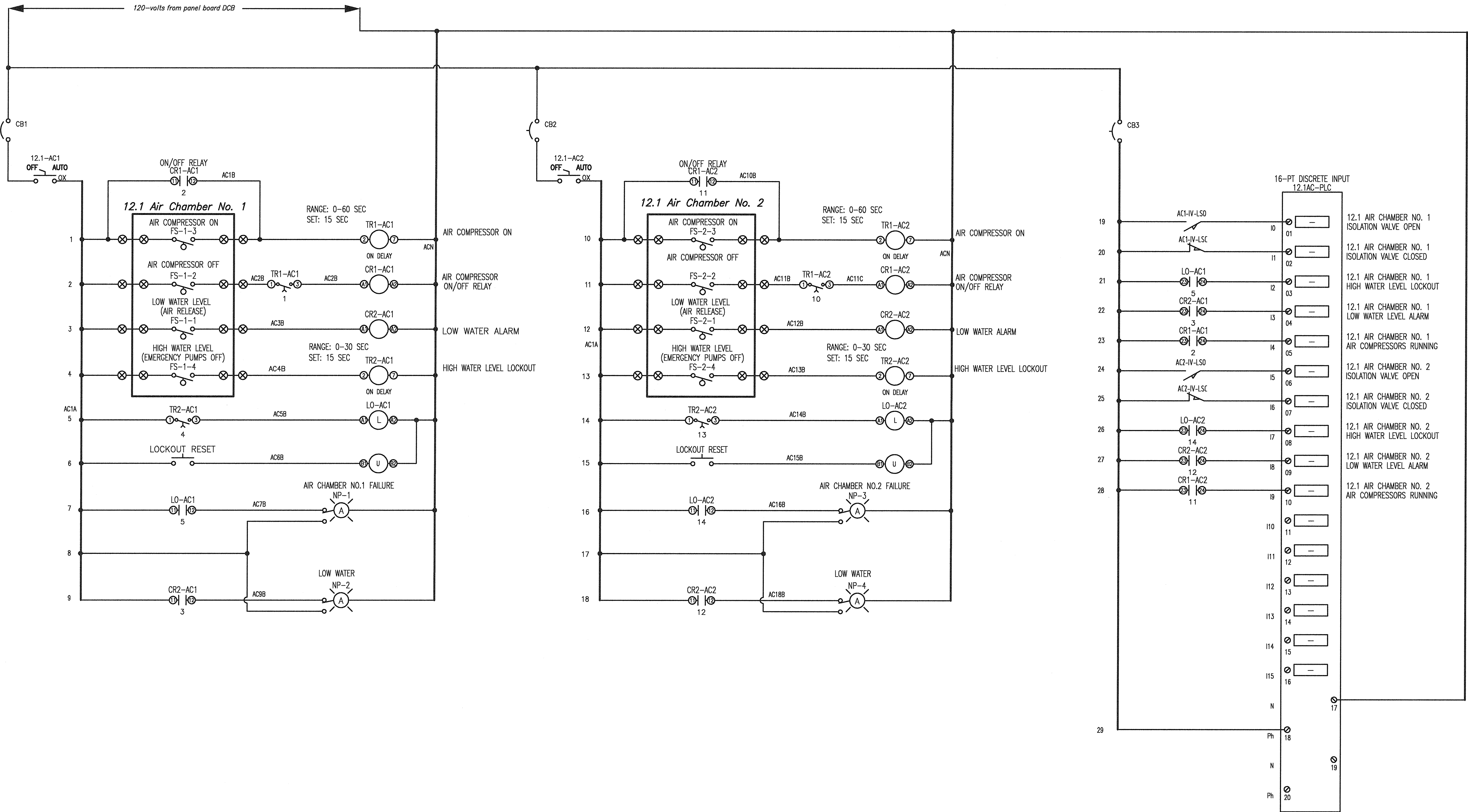
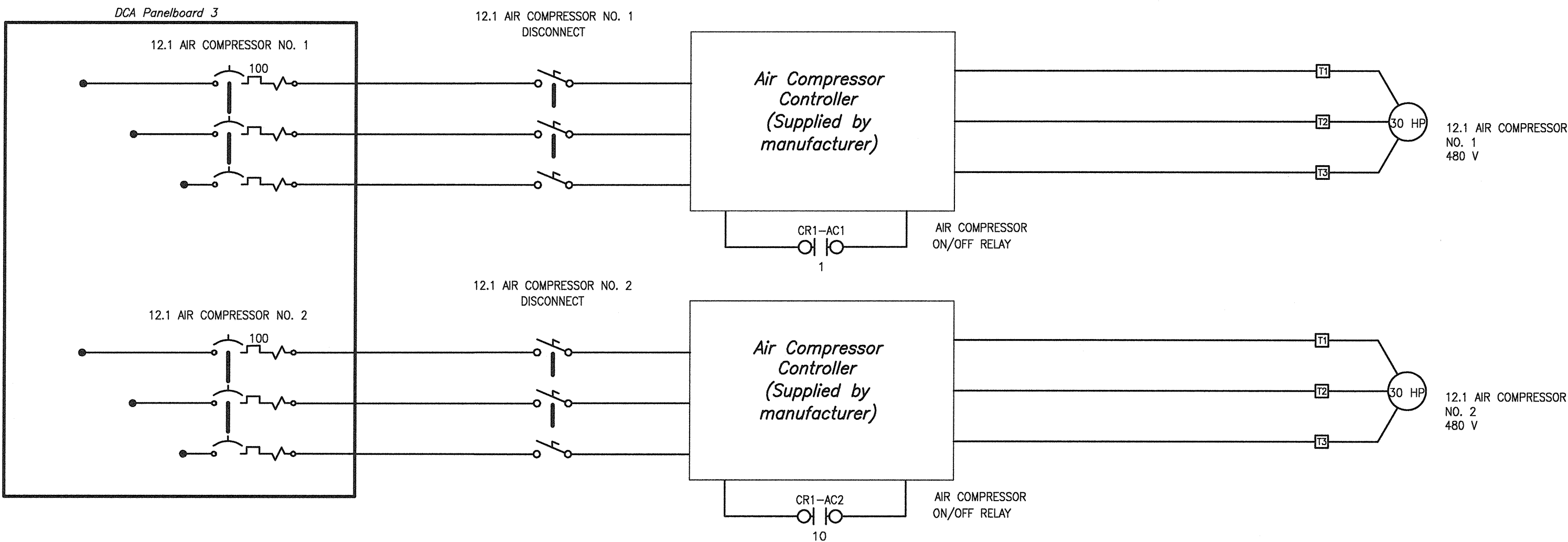
NOTES

1. Air chamber control relay CR1-ACx will provide a control signal to the air compressor control circuit. Revise air chamber level and compressor controls as required to interface with the selected air compressor START/STOP circuits.
2. See drawing 1695-D-227 for other designations and symbols.
3. Remote I/O output to pumping plant PLC not shown.

REFERENCE DRAWINGS

480 Volt AC Panelboard Schedules 1695-D-229
208Y/120 Volt AC Panelboard Schedules 1695-D-230

NAMEPLATE SCHEDULE	
Number	Legend
NP-1	AIR CHAMBER NO. 1 FAILURE
NP-2	AIR CHAMBER NO. 1 LOW WATER
NP-3	AIR CHAMBER NO. 2 FAILURE
NP-4	AIR CHAMBER NO. 2 LOW WATER



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**SAN JUAN LATERAL
TOHLAKAI PUMPING PLANT**
ELECTRICAL INSTALLATION
12.1 AIR CHAMBER CONTROLS
SCHEMATIC

DESIGNED Darryl Liscomb
DRAWN Darryl Liscomb
CHECKED Michel Schuh
TECH. APPR. Michel Schuh, P.E.
ADMIN. APPROVAL Jay Rogers, P.E.
Electrical Design Group Manager
DENVER, COLORADO 2013-08-09

12.1 AIR CHAMBER
CONTROL SCHEMATIC

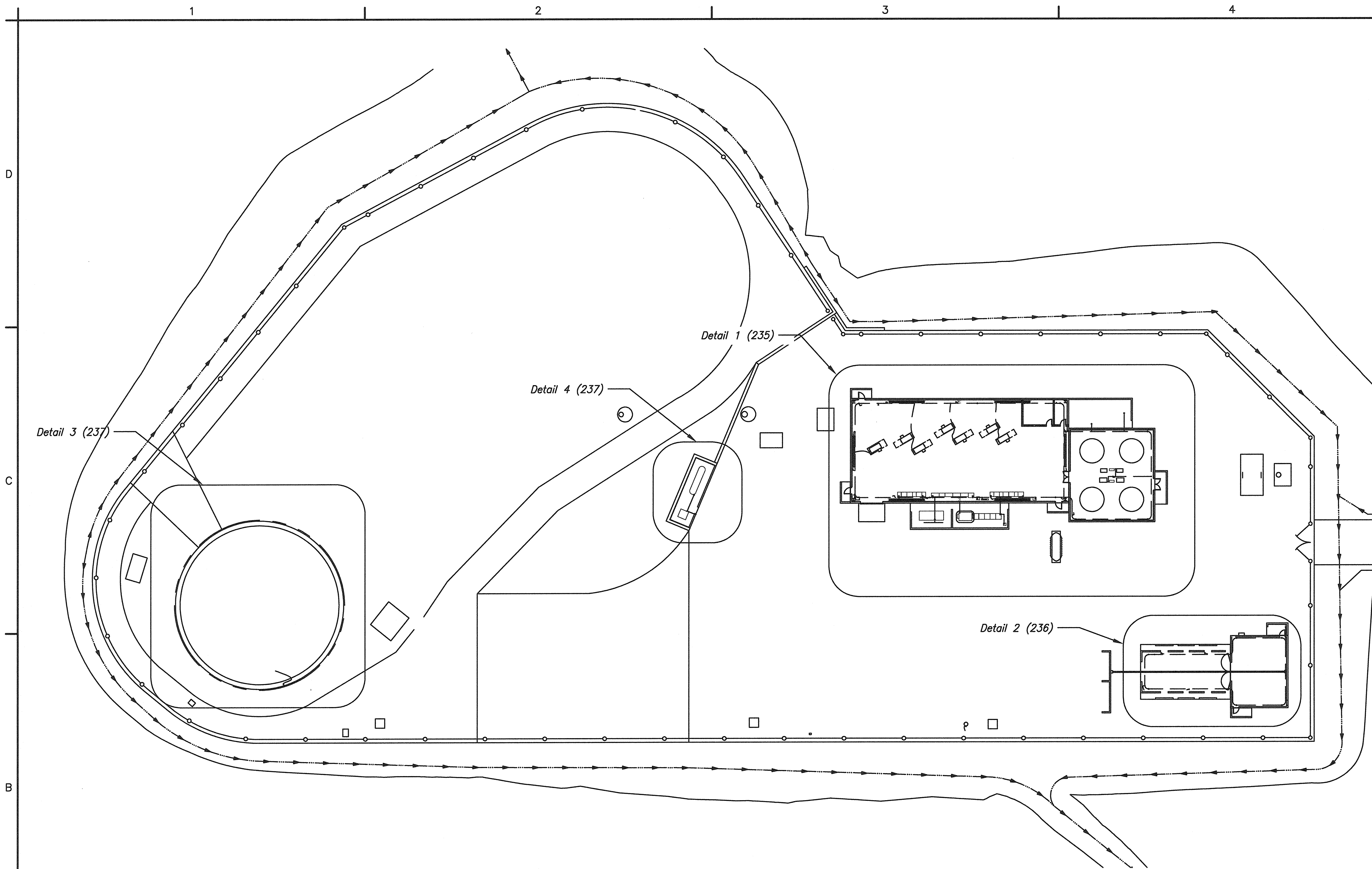
1695-D-233

SHEET 1 OF 1

DATE AND TIME PLOTTED
AUGUST 19, 2013 13:47
PLOTTED BY
JBRUSHAW

CAD SYSTEM 19.0a
AutoCAD 2013
CAD FILENAME
1695-D-233 AIR CHAMBER CONTROLS 12.1.DWG

CAD SYSTEM
AutoCAD Rev. 19.0s
1695-D-234 - ELECTRICAL SITE PLAN
DATE AND TIME PLOTTED
AUGUST 15, 2013 13:21
PLOTTED BY
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GROUNDING SYSTEM CONDUCTORS	
Pumping plant embedded ground bus	4/0 AWG
Chlorine Building foundation embedded ground ring	4/0 AWG
Storage tank ground rings	4/0 AWG
LP tank ground bus	4/0 AWG
Steel column grounding jumper	4 AWG
Riser	4/0 AWG
Wireways	2 AWG

JUMPER BETWEEN GROUNDING PLATE AND EQUIPMENT	
4160V Switchboard UXA	4/0 AWG
Transformer KXA	4/0 AWG
4160V MCE 12.1	4/0 AWG
4160V MCE 12B	4/0 AWG
4160V Motors	4/0 AWG
600V Switchboard DCA	4/0 AWG
Transformer KCA	2 AWG
208Y/120 Volt Distribution Equipment	2 AWG
HVAC Equipment	2 AWG
Plant PLC & Comm. Panels	2 AWG
480V Motors	2 AWG

- NOTES**
1. Grounding system conductors are stranded bare copper.
 2. The pumping plant embedded ground ring is to be attached to supply and discharge piping encasement reinforcement steel via risers as shown.
 3. The chlorine building embedded ground ring is to be attached to footing reinforcement steel via risers as shown.
 3. All embedded ground terminations to be performed using Coldweld, Thermoweld, or an equivalent exothermic process.
 4. Location of ground cable terminations to be determined by the Contractor, except where terminations are dimensioned on the drawings.
 5. Grounding layout drawings show typical locations of grounding plates.
 6. Connect Storage Tank T1 steel structures to the tank ground ring.
 7. Connect structural steel columns to embedded ground ring.
 8. Connect steel roof structure for the Air Chamber Room and Chlorine Feed Building to the building ground ring using risers in locations shown. Risers to be fed through the concrete masonry units.

REFERENCE DRAWINGS

Grounding Detail 1	1695-D-235
Grounding Detail 2	1695-D-236
Grounding Detail 3 & 4	1695-D-237

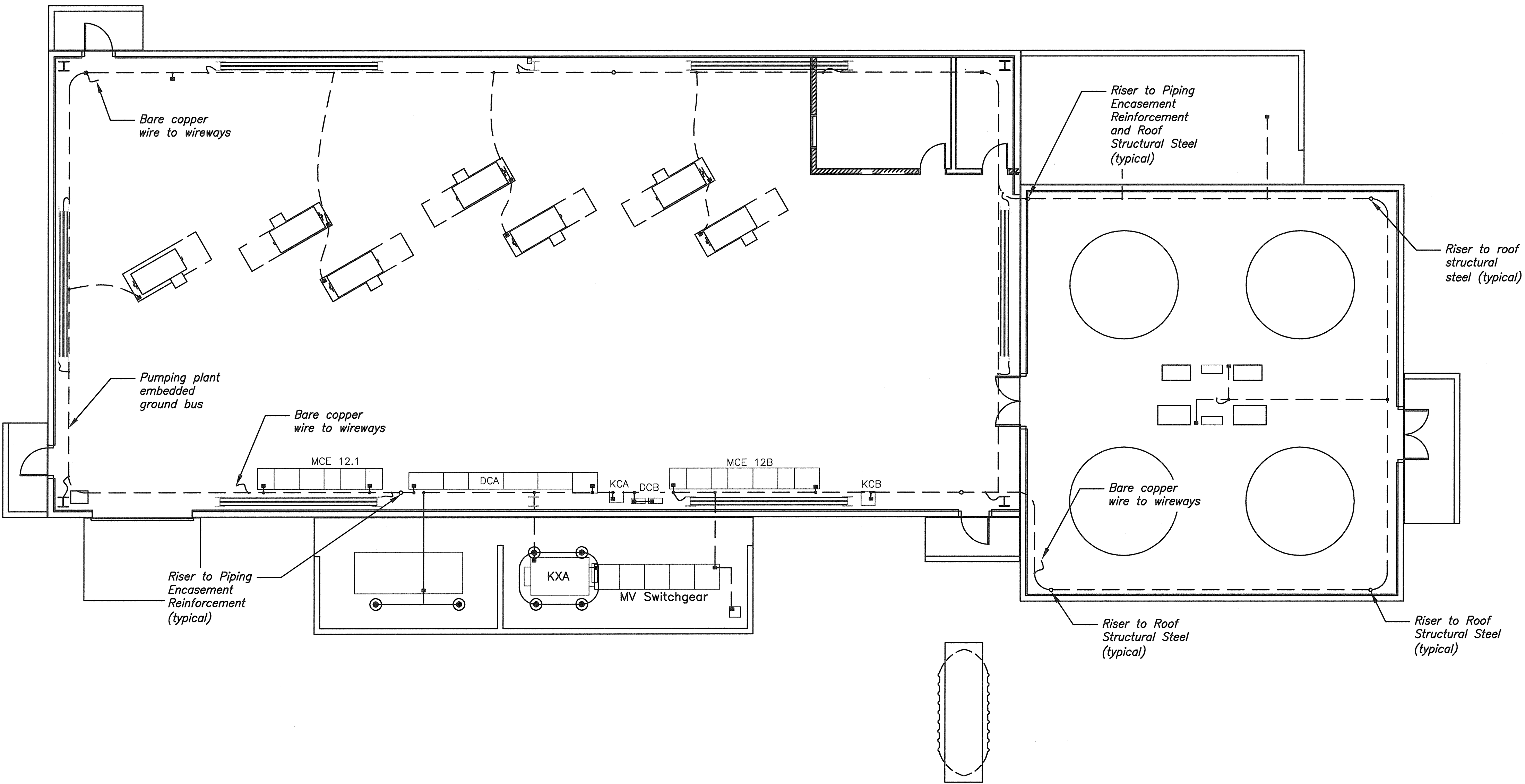
SYMBOLS

- Ground cable embedded in concrete
- Ground cable buried in earth
- Ground cable exposed
- Grounding plate
- Welded or bolted connection
- Riser or grounding electrode conductor
- Ground rod

DESIGNED	Darryl Liscomb
DRAWN	Darryl Liscomb
CHECKED	Michel Schuh
TECH. APPR.	Michel Schuh, P.E.
ADMIN. APPROVAL	Joy Boggs, P.E.
Electrical Design Group, Manager	
DENVER, COLORADO 2013-08-15	

REFERENCE DRAWINGS

Site Grounding Plan 1695-D-234



DETAIL 1

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NAVAJO GALLUP WATER SUPPLY PROJECT
NEW MEXICO
**SAN JUAN LATERAL
TOHLAKAI PUMPING PLANT**
ELECTRICAL INSTALLATION
GROUNDING DETAIL 1

DESIGNED	Darryl Liscomb
DRAWN	Darryl Liscomb
CHECKED	Michel Schult
TECH. APPR.	Michel Schult, P.E.
ADMIN. APPROVAL	Ray Boggs, P.E.
Electrical Design Group, Inc.	
DENVER, COLORADO 2013-08-15	

GROUNDING DETAIL 1

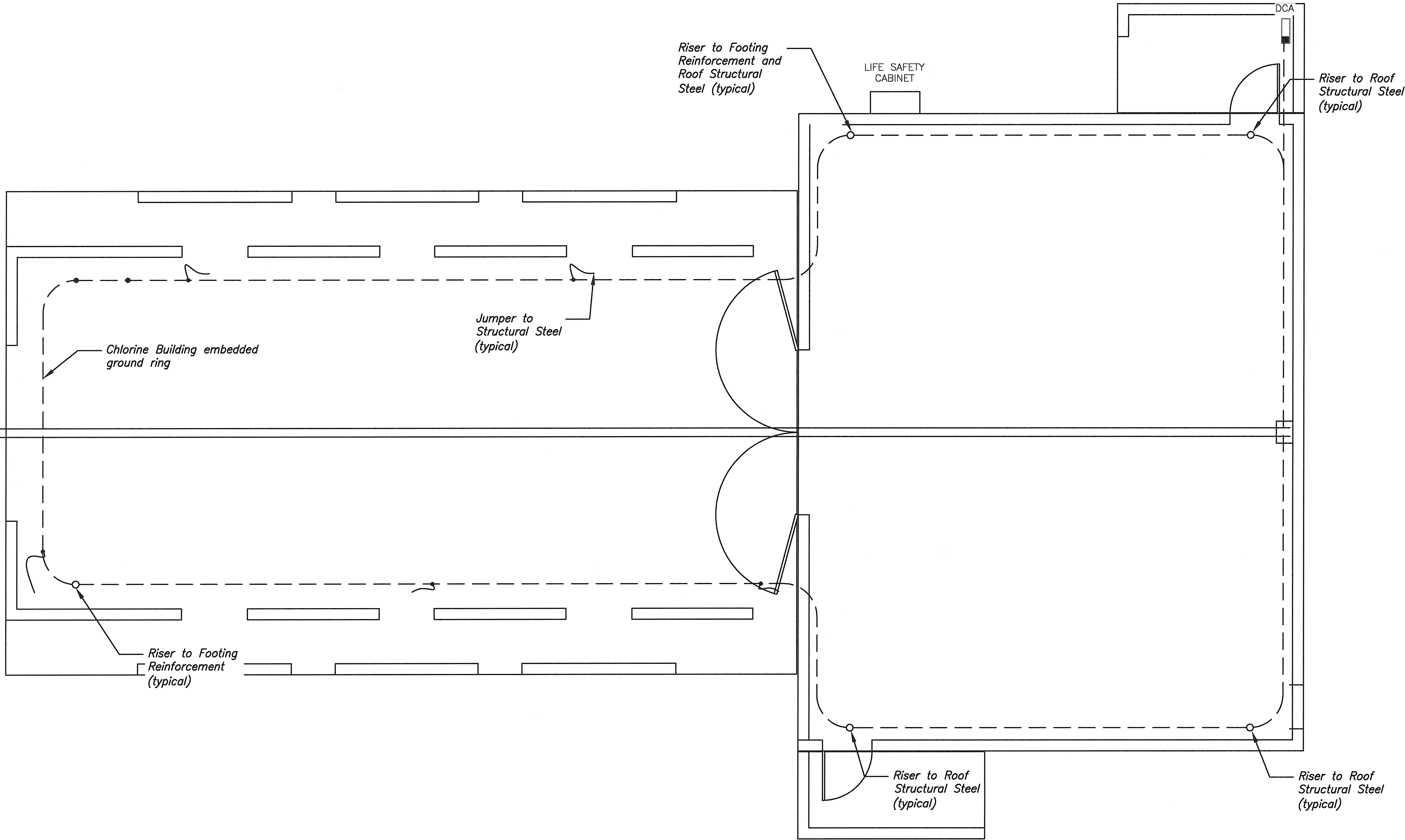
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SHEET 1 OF 1

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1695-D-234 - GROUNDING LAYOUT REV 15.13.DWG

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DETAIL 2

REFERENCE DRAWINGS
Site Grounding Plan 1695-D-234

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NAVAJO GALLUP WATER SUPPLY PROJECT
NEW MEXICO

SAN JUAN LATERAL
TOHLAKAI PUMPING PLANT
ELECTRICAL INSTALLATION
GROUNDING DETAIL
2

DESIGNED Darryl Liscomb
DRAWN Darryl Liscomb
CHECKED Michel Schuh
TECH. APPR. Michel Schuh, P.E.
ADMIN. APPROVAL Jay Engelen, P.E.
Electrical Design Group
DENVER, COLORADO 2013-08-15

GROUNDING DETAIL 2

1695-D-236

SHEET 1 OF 1

REFERENCE DRAWINGS

Site Grounding Plan 1695-D-234

DETAIL 3

DETAIL 4

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NAVAJO GALLUP WATER SUPPLY PROJECT
NEW MEXICO
**SAN JUAN LATERAL
TOHLAKAI PUMPING PLANT**
ELECTRICAL INSTALLATION
GROUNDING DETAIL
3 & 4

Darryl Liscomb
DESIGNED Darryl Liscomb
DRAWN Michel Schuh
CHECKED Michel Schuh, P.E.
TECH. APPR. Michel Schuh, P.E.
ADMIN. APPROVAL Jay Boggess, P.E.
Electrical Design Group, Manager
DENVER, COLORADO 2013-08-15

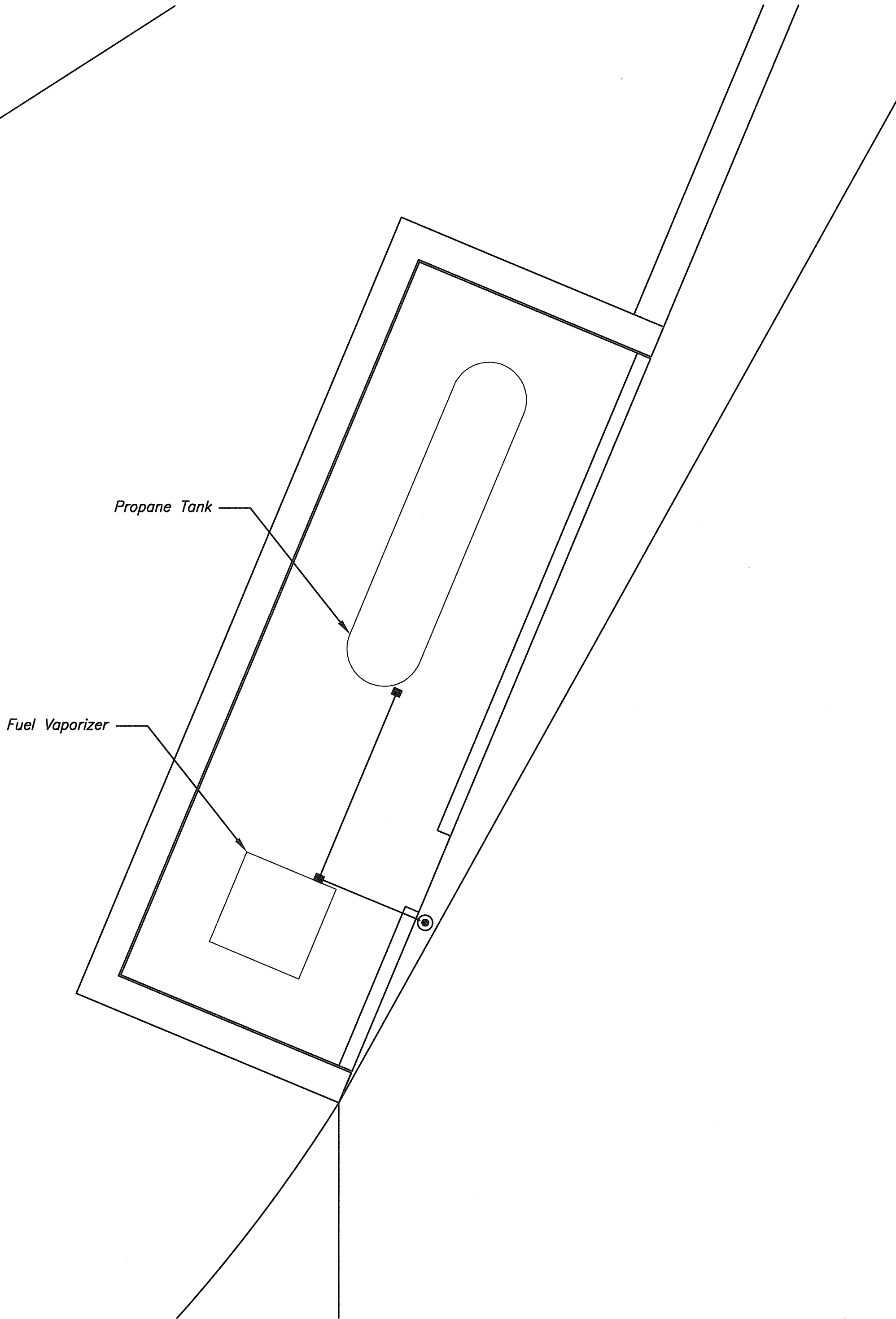
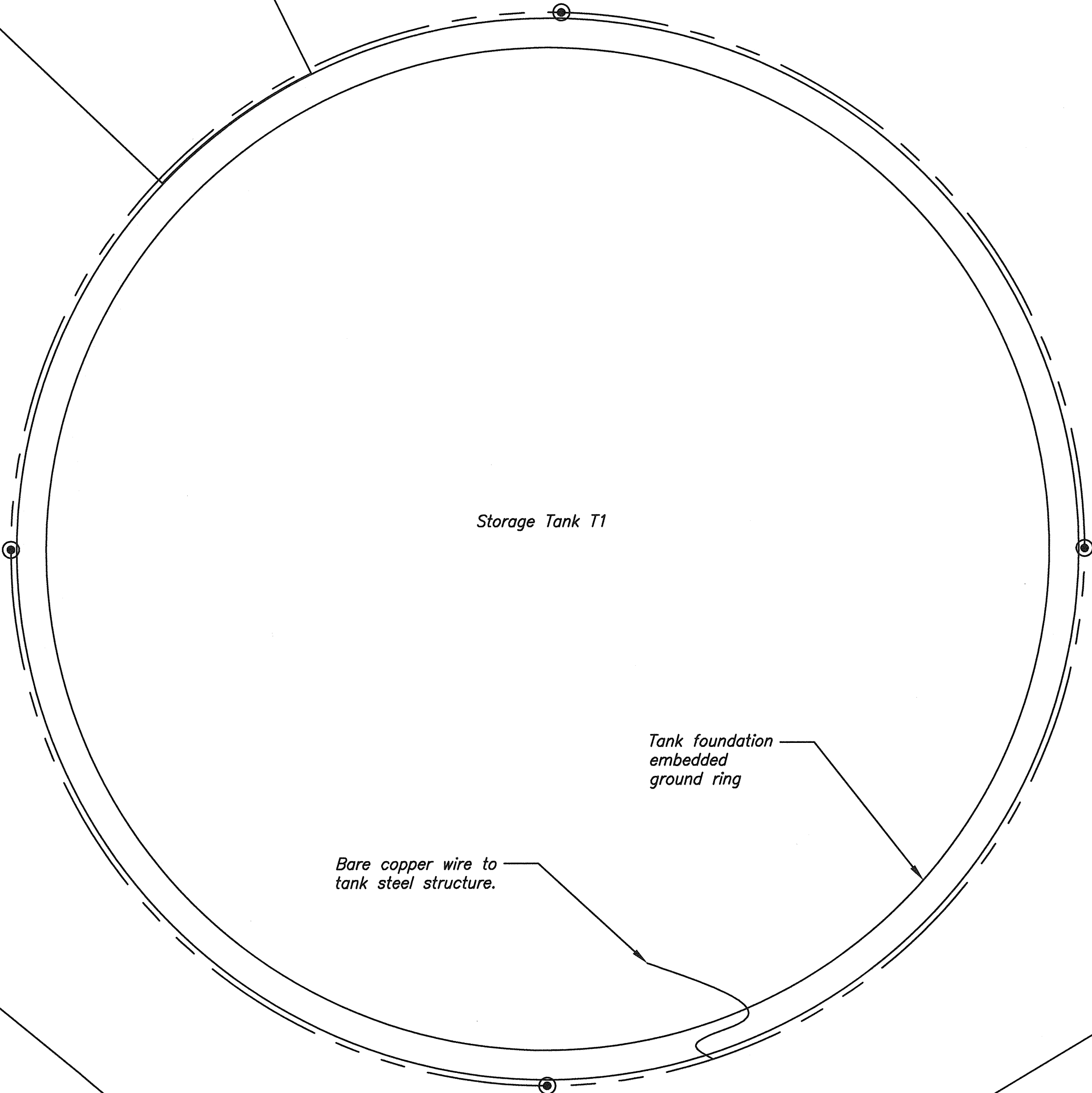
GROUNDING DETAIL
3 & 4

1695-D-237

SHEET 1 OF 1

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AUGUST 15, 2013 13:54
PLOTTED BY
DLS/COMB

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CAD FILENAME
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DESIGN PHASE

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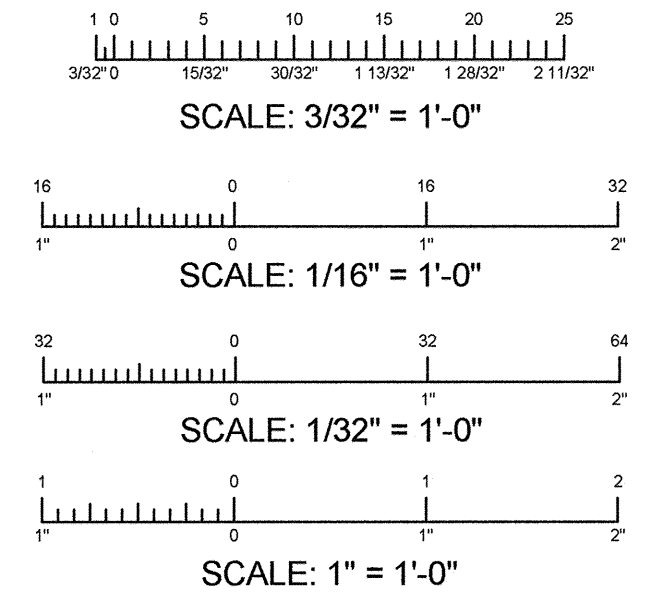
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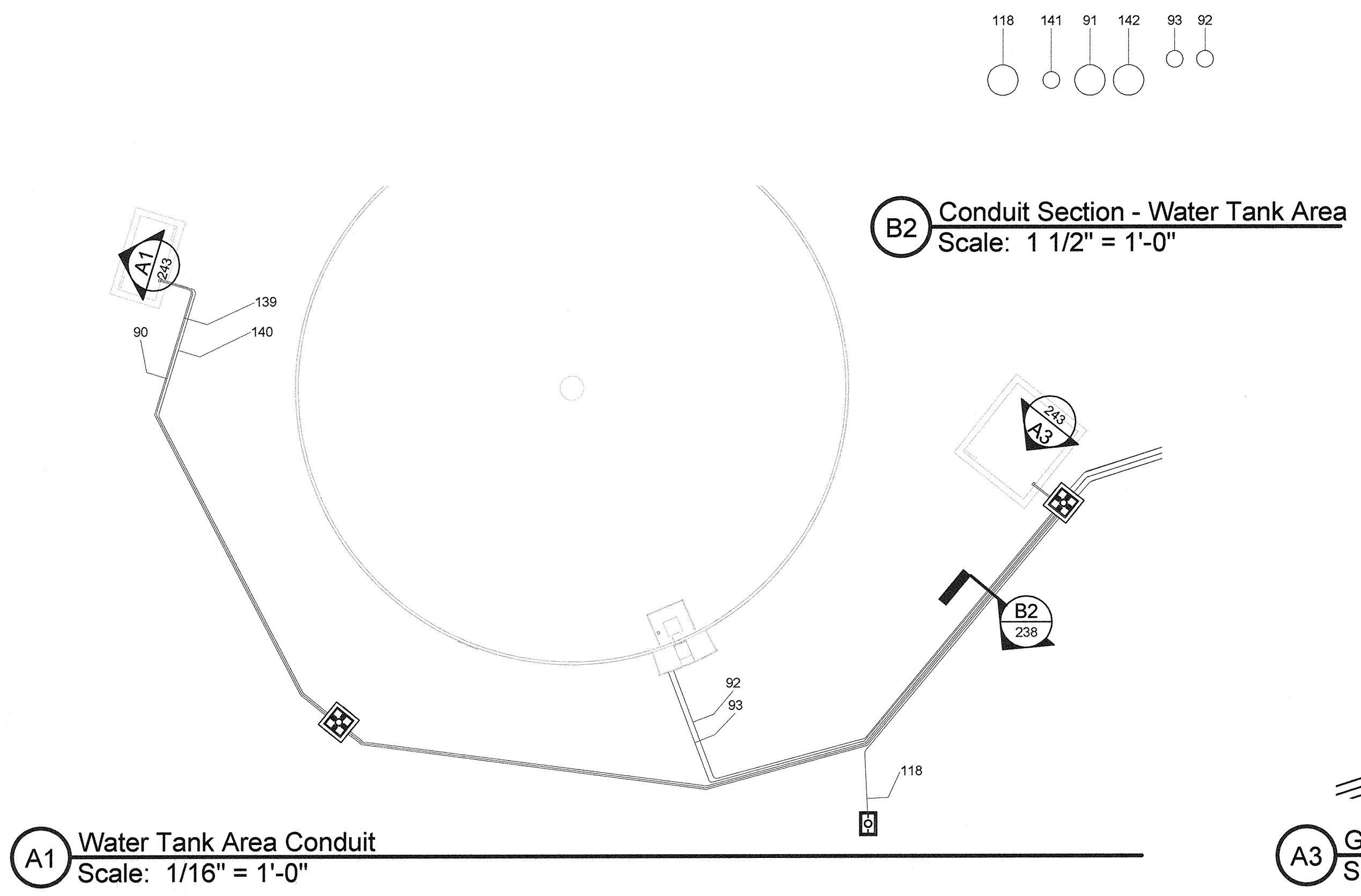
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GENERAL NOTES

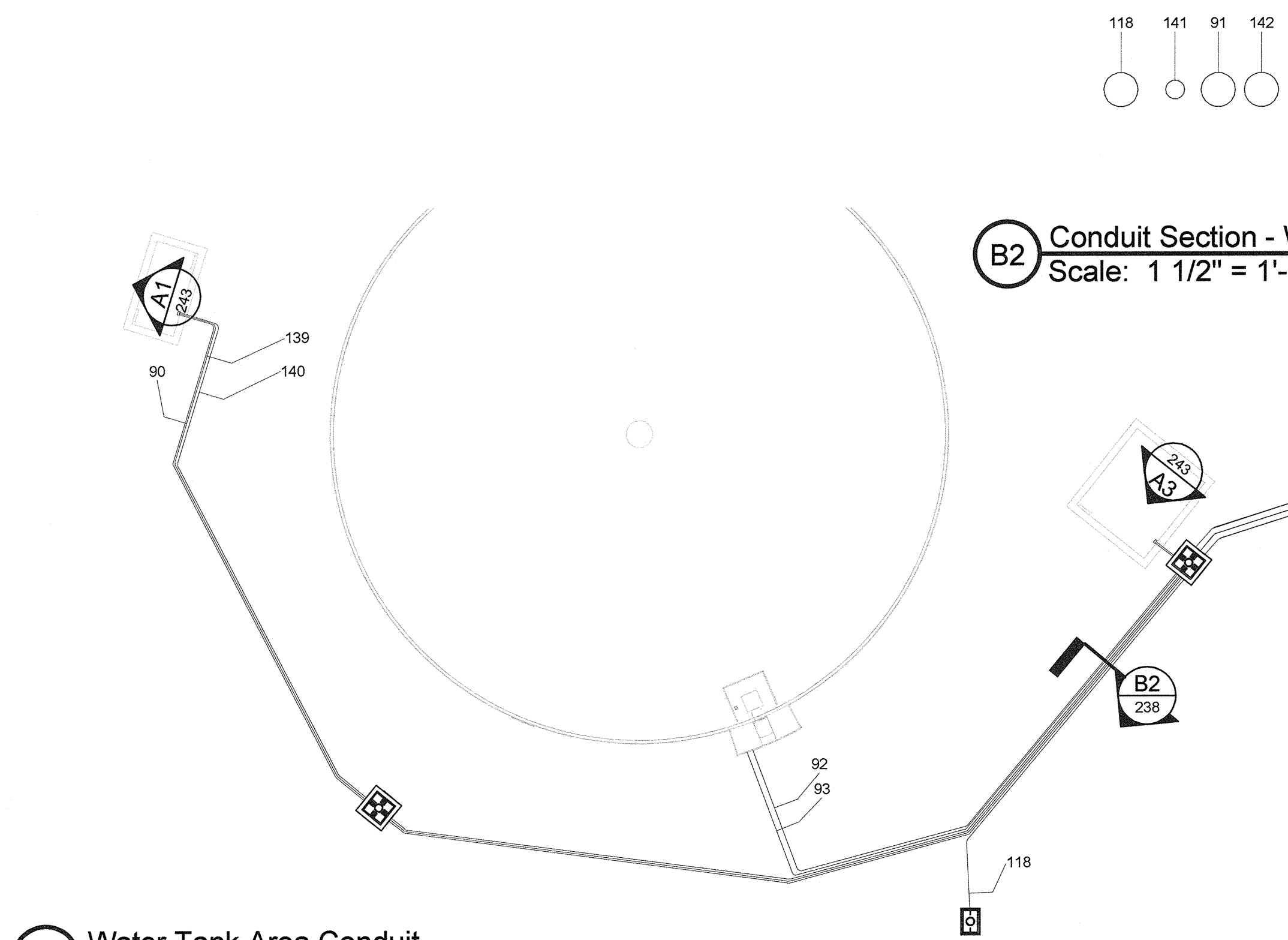
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2. Cable and conductors to be routed via conduit from equipment to the wireway.
3. The minimum cover for exterior conduit to be 24" to top of highest conduit.
4. Coordinate conduit placement under building slabs with piping systems. Conduit to be placed between piping and slab to the maximum extent practical.
5. Ventilation system conduit shown as an example only. Determine cable and conduit size and routing based on approved equipment.
6. Lighting equipment conduit is not shown. Route lighting and receptacle conductors via wireway, raceway channel, or conduit.
7. Communication equipment conduit is not shown. Route communication conductors via wireway, raceway channel, or conduit.
8. Fire protection system conduit shall be installed via dedicated conduit only and factory painted red.



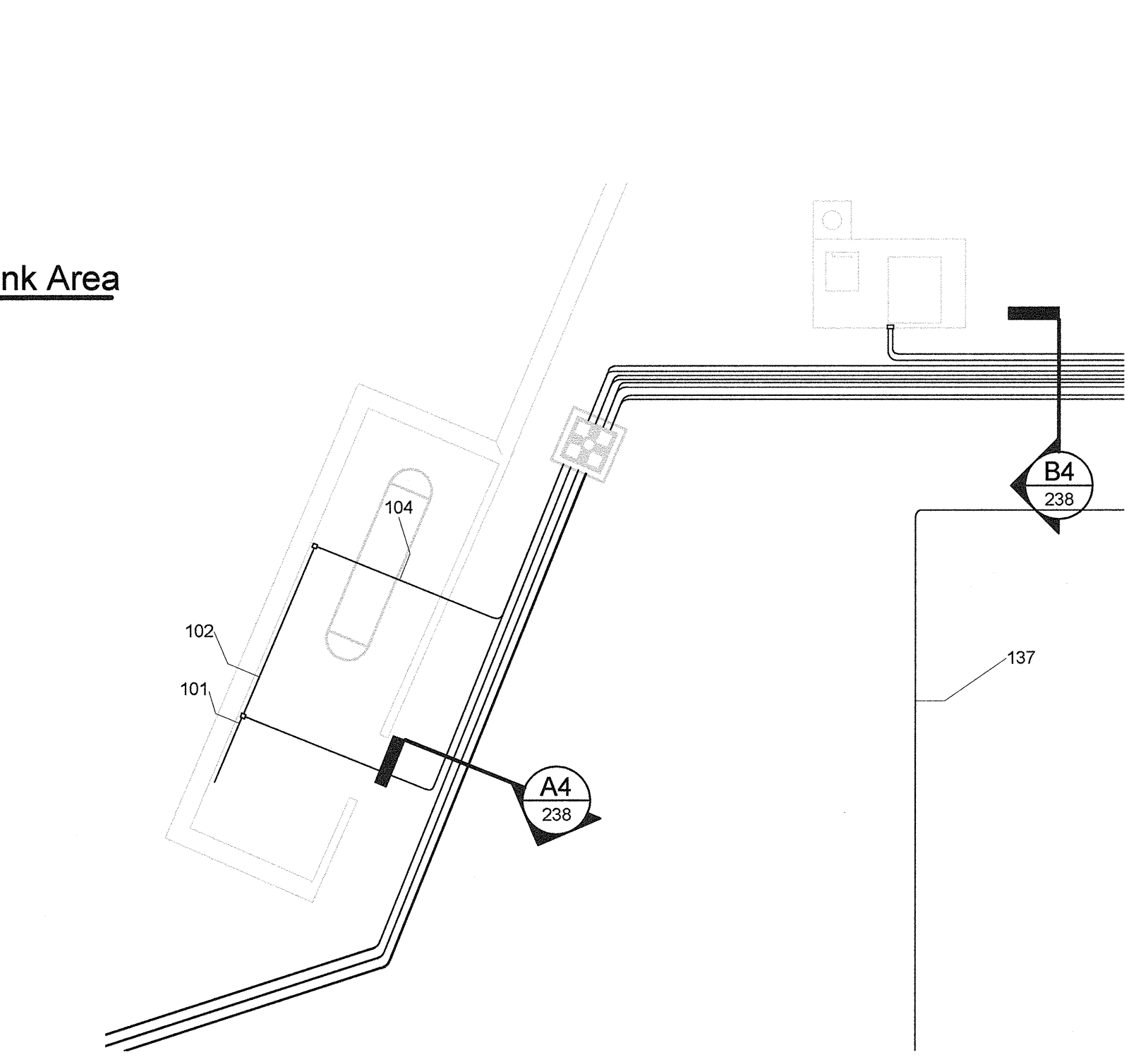
C1 Site Conduit
Scale: 1/32" = 1'-0"



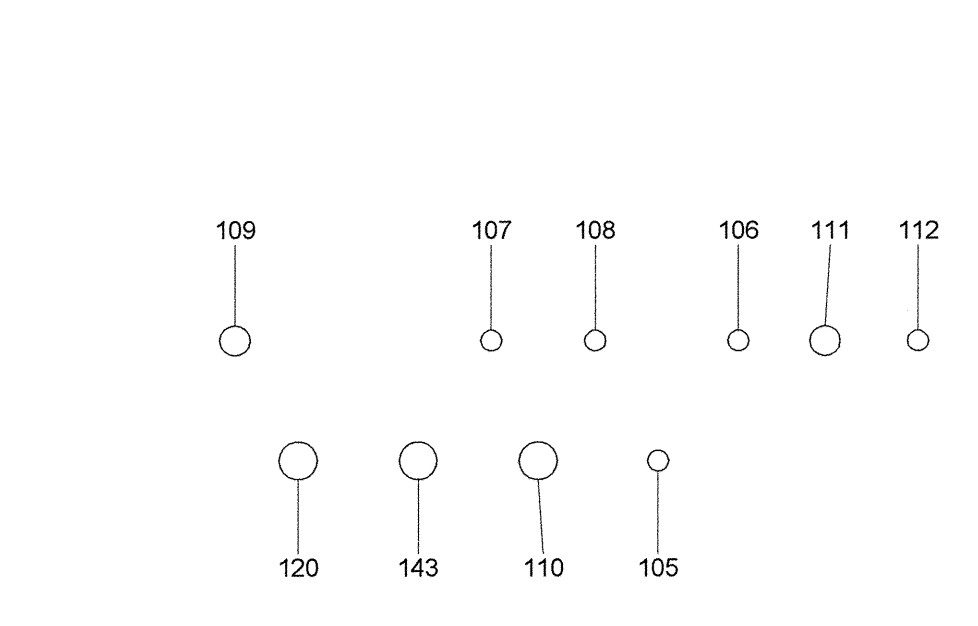
A1 Water Tank Area Conduit
Scale: 1/16" = 1'-0"



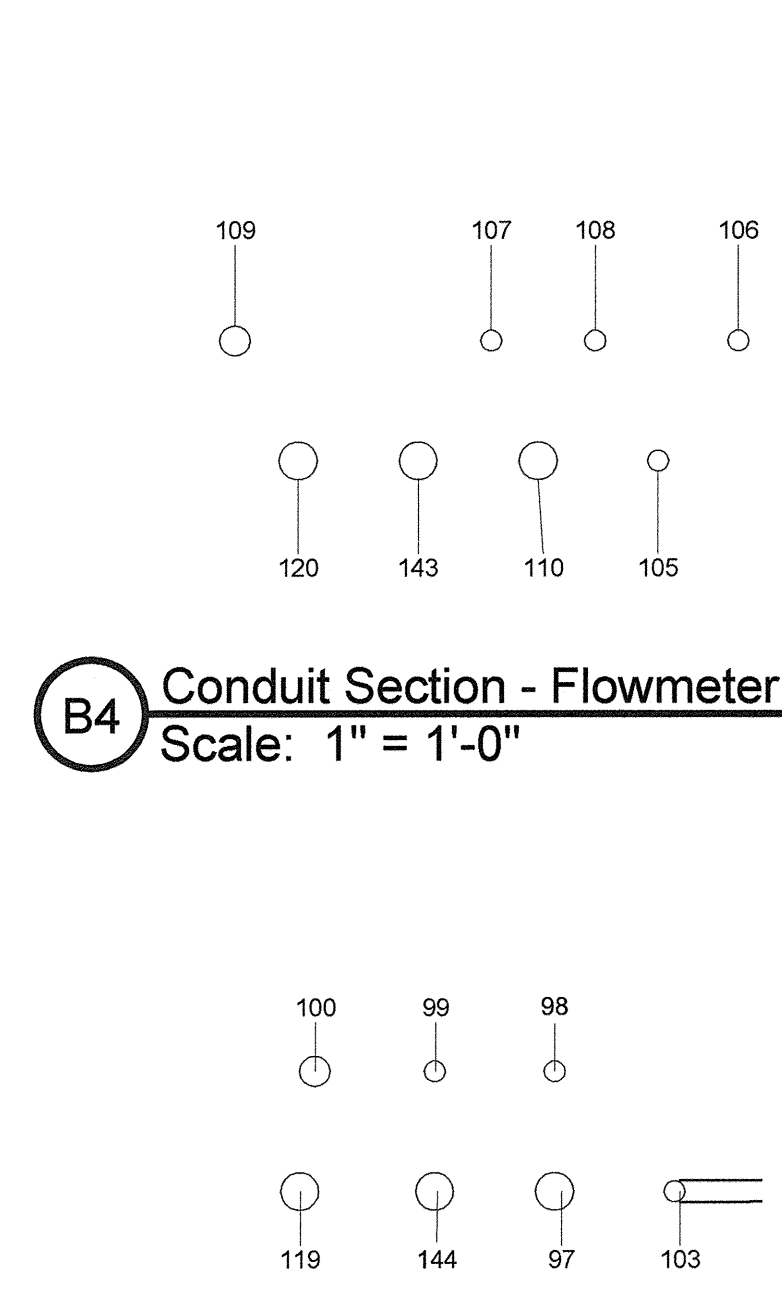
A3 Generator Fuel Tank and Flowmeter Vault 2 Conduit
Scale: 3/32" = 1'-0"



B4 Conduit Section - Flowmeter Vault 2
Scale: 1" = 1'-0"



A4 Conduit Section - Generator Fuel Tank
Scale: 1" = 1'-0"



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NAVAJO GALLUP WATER SUPPLY PROJECT
NEW MEXICO
SAN JUAN LATERAL
TOHLAKAI PUMPING PLANT
ELECTRICAL INSTALLATION
SITE CONDUIT PLAN

DESIGNED
Darryl Liscomb
DRAWN
Michel Schuh
CHECKED
Michel Schuh, P.E.
TECH. APPR.
Michel Schuh, P.E.
ADMIN. APPROVAL
Jay Boggs
Electrical Design Group, Manager
DENVER, COLORADO 2013-08-16

SITE CONDUIT PLAN

1695-D-238

GENERAL NOTES

1. Conduit routings are typical. Determine actual location for conduit and stub-ups in the field. Utilize routing via wireway to the maximum extent practical.
2. Cable and conductors to be routed via conduit from equipment to the wireway.
3. The minimum cover for exterior conduit to be 24" to top of highest conduit.
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7. Communication equipment conduit is not shown. Route communication conductors via wireway, raceway channel, or conduit.
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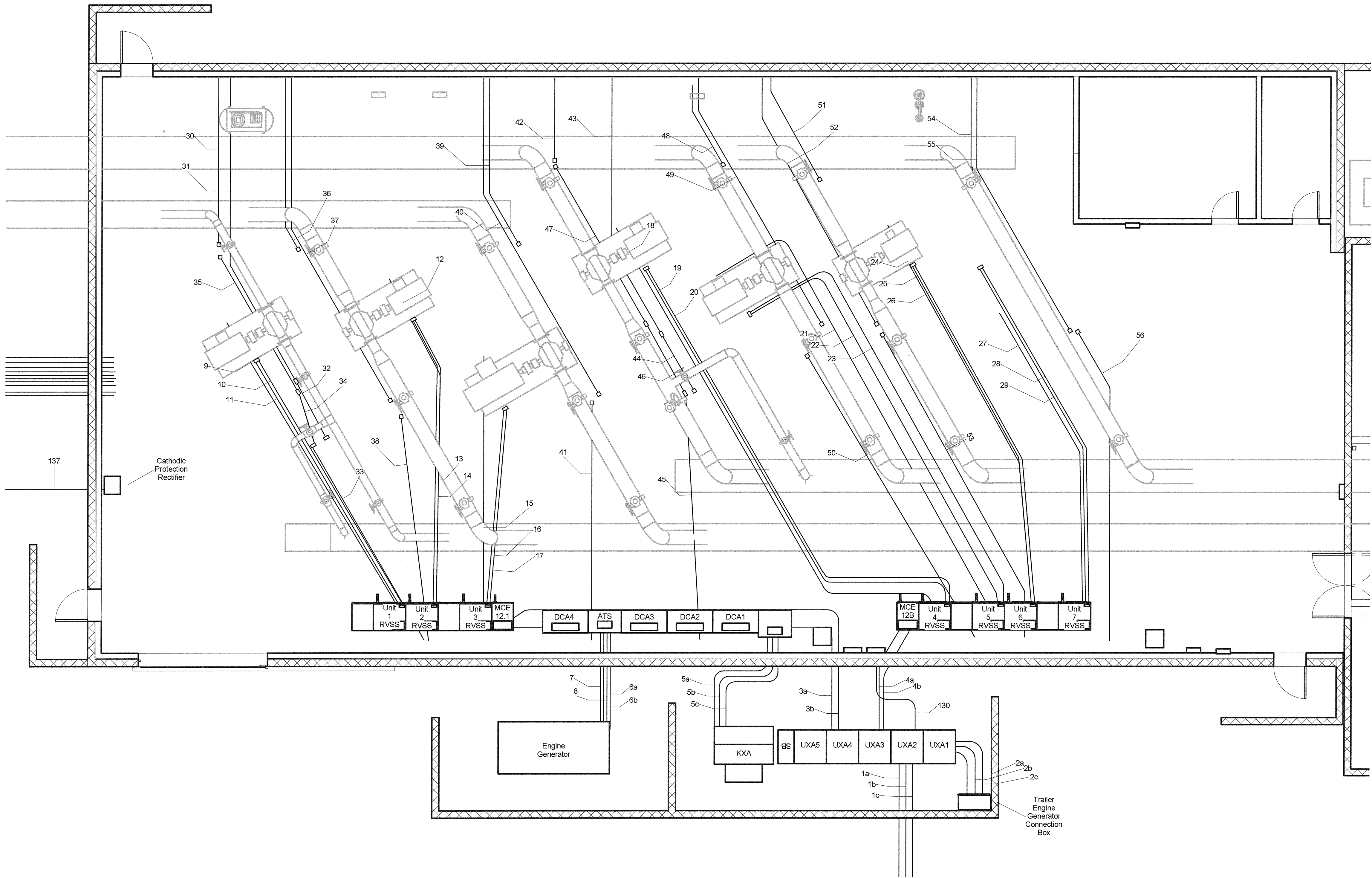
SAN JUAN LATERAL
TOHLAKAI PUMPING PLANT

ELECTRICAL INSTALLATION
PUMPING PLANT - SUBSURFACE CONDUIT PLAN

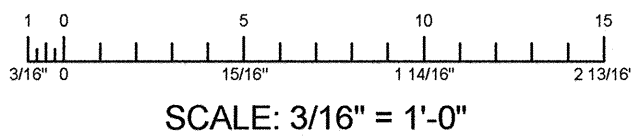
DESIGNED
Darryl Liscomb
DRAWN
Michel Schuh
CHECKED
Michel Schuh, P.E.
TECH. APPR.
ADMIN. APPROVAL
Jay Boggs
Electrical Design Group, Manager
DENVER, COLORADO
2013-08-16

PUMPING PLANT -
SUBSURFACE CONDUIT
PLAN

1695-D-239



A1 Pumping Plant Subsurface Conduit
Scale: 3/16" = 1'-0"



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DESIGN PHASE
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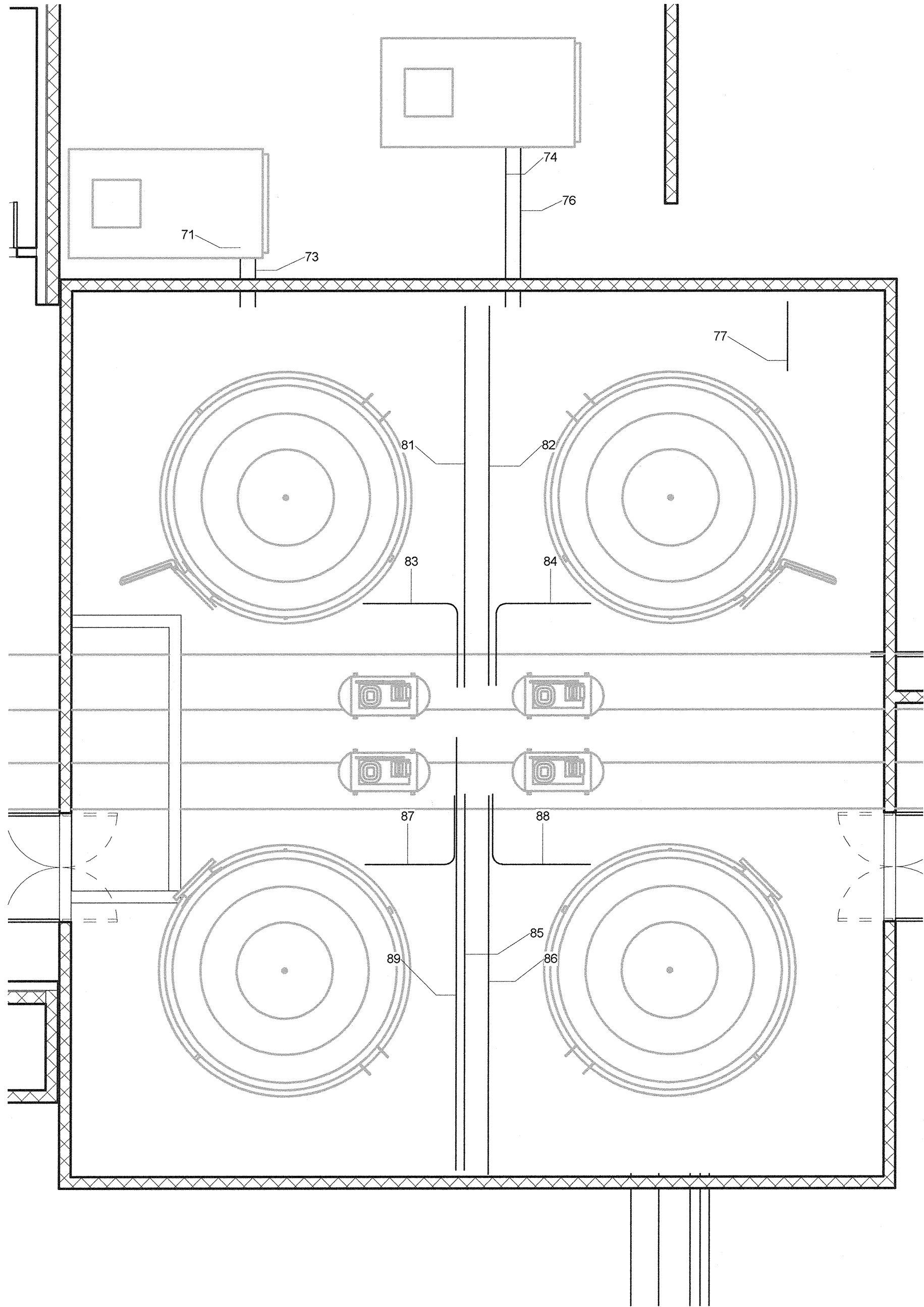
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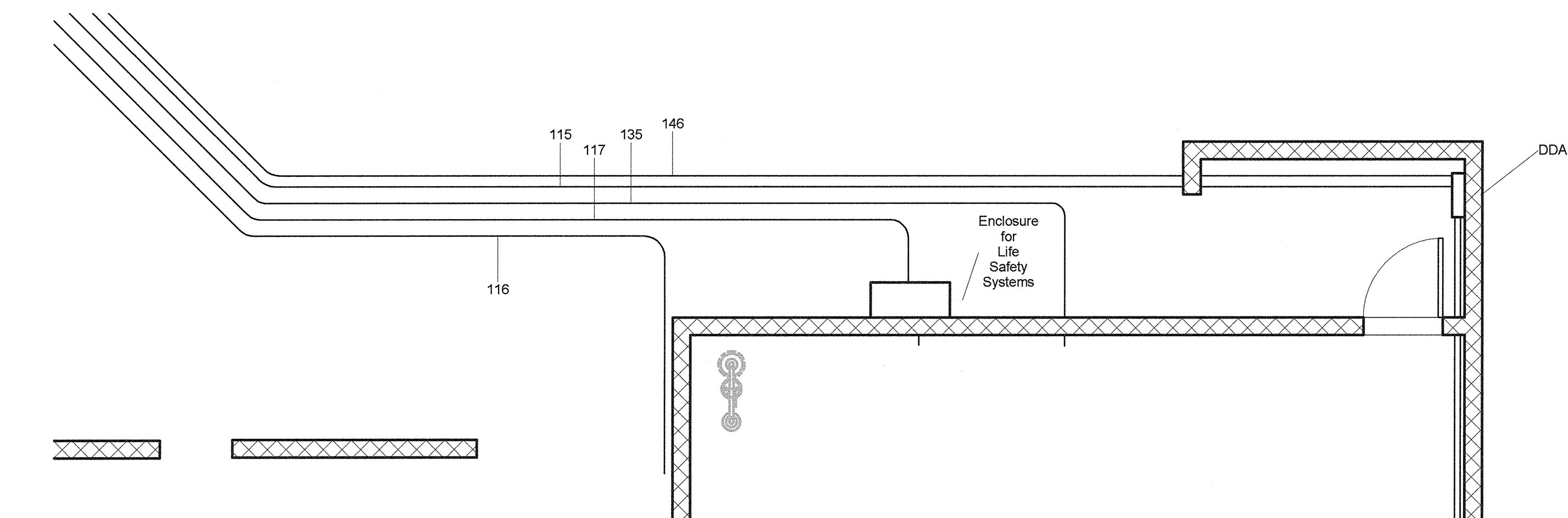
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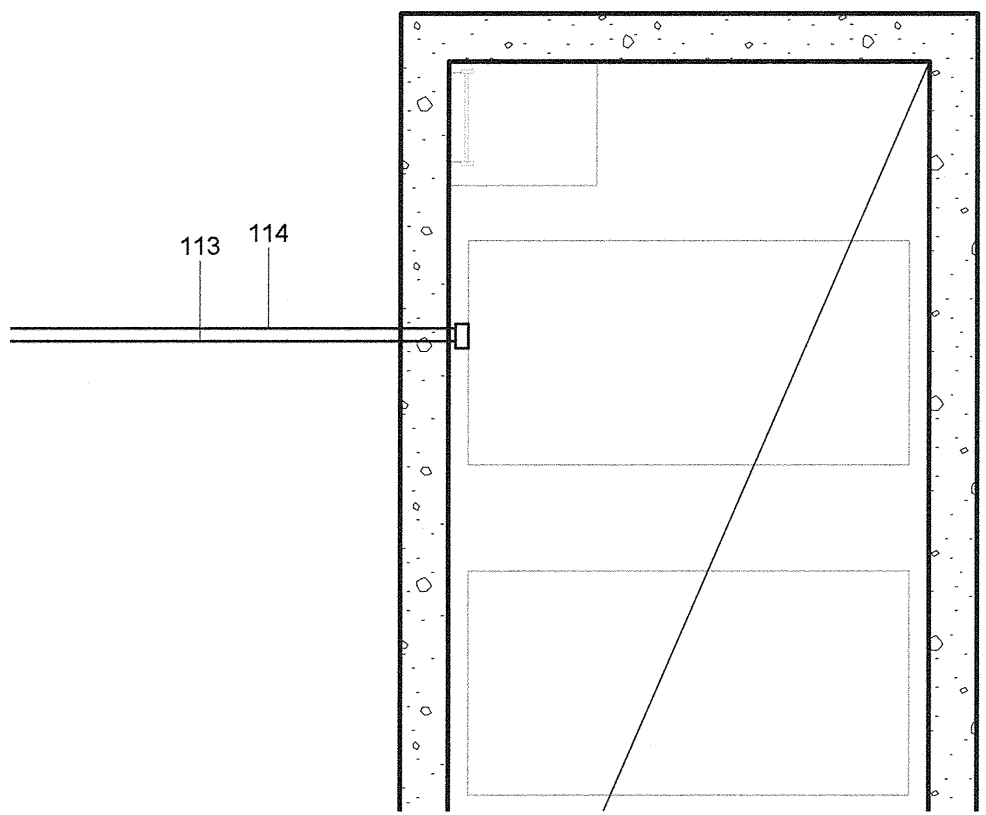
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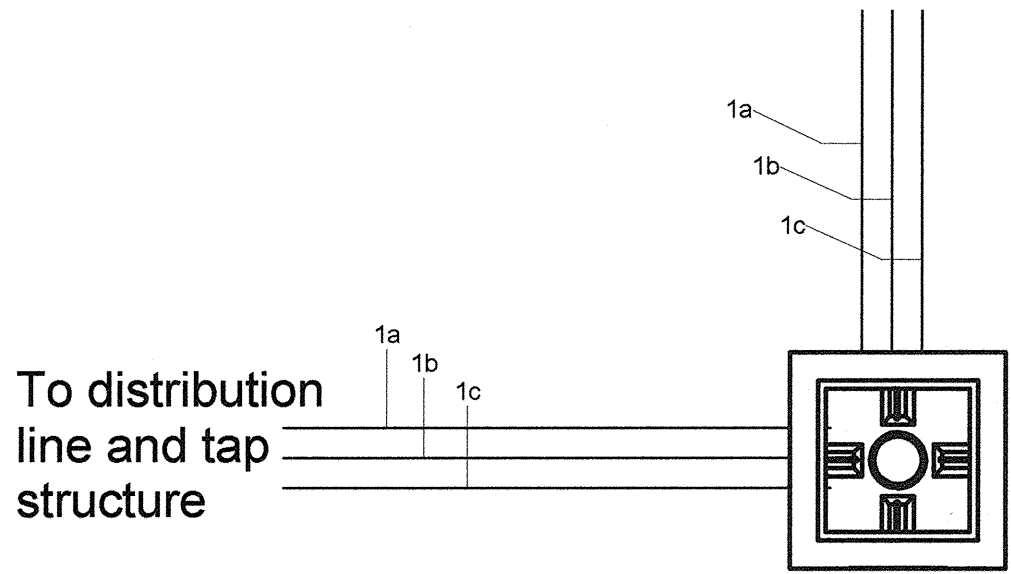
B1 Air Chamber Subsurface Conduit
Scale: 3/16" = 1'-0"



A2 Chlorine Building Subsurface Conduit
Scale: 1/4" = 1'-0"



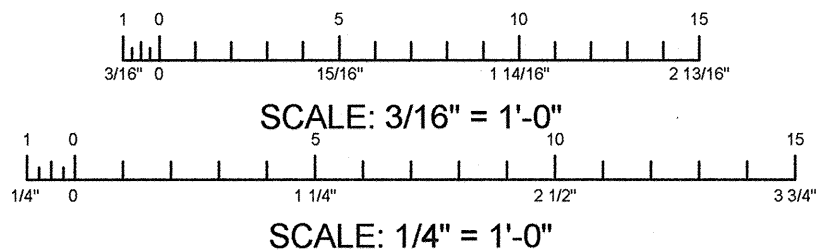
B3 Flowmeter Vault 1 Conduit
Scale: 1/4" = 1'-0"



B4 Pull Box-EYA Conduit
Scale: 1/4" = 1'-0"

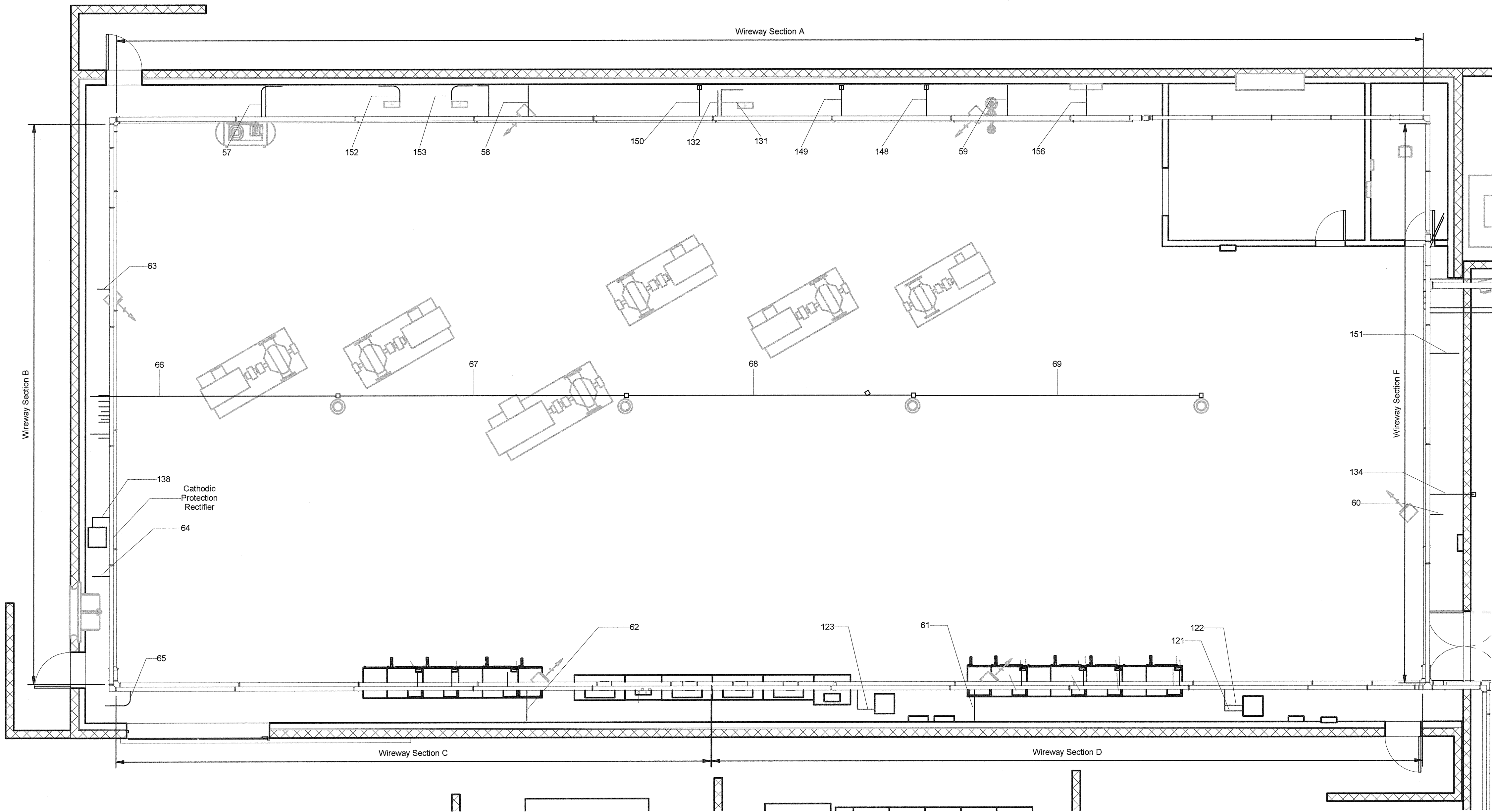
GENERAL NOTES

1. Conduit routings are typical. Determine actual location for conduit and stub-ups in the field. Utilize routing via wireway to the maximum extent practical.
2. Cable and conductors to be routed via conduit from equipment to the wireway.
3. The minimum cover for exterior conduit to be 24" to top of highest conduit.
4. Coordinate conduit placement under building slabs with piping systems. Conduit to be placed between piping and slab to the maximum extent practical.
5. Ventilation system conduit shown as an example only. Determine cable and conduit size and routing based on approved equipment.
6. Lighting equipment conduit is not shown. Route lighting and receptacle conductors via wireway, raceway channel, or conduit.
7. Communication equipment conduit is not shown. Route communication conductors via wireway, raceway channel, or conduit.
8. Fire protection system conduit shall be installed via dedicated conduit only and factory painted red.

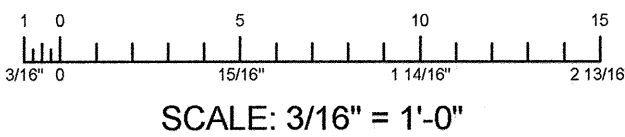


GENERAL NOTES

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8. Fire protection system conduit shall be installed via dedicated conduit only and factory painted red.



A1 Pumping Plant Interior Conduit
Scale: 3/16" = 1'-0"



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NAVAJO GALLUP WATER SUPPLY PROJECT
NEW MEXICO
SAN JUAN LATERAL
TOHLAKAI PUMPING PLANT
ELECTRICAL INSTALLATION
PUMPING PLANT - INTERIOR CONDUIT PLAN

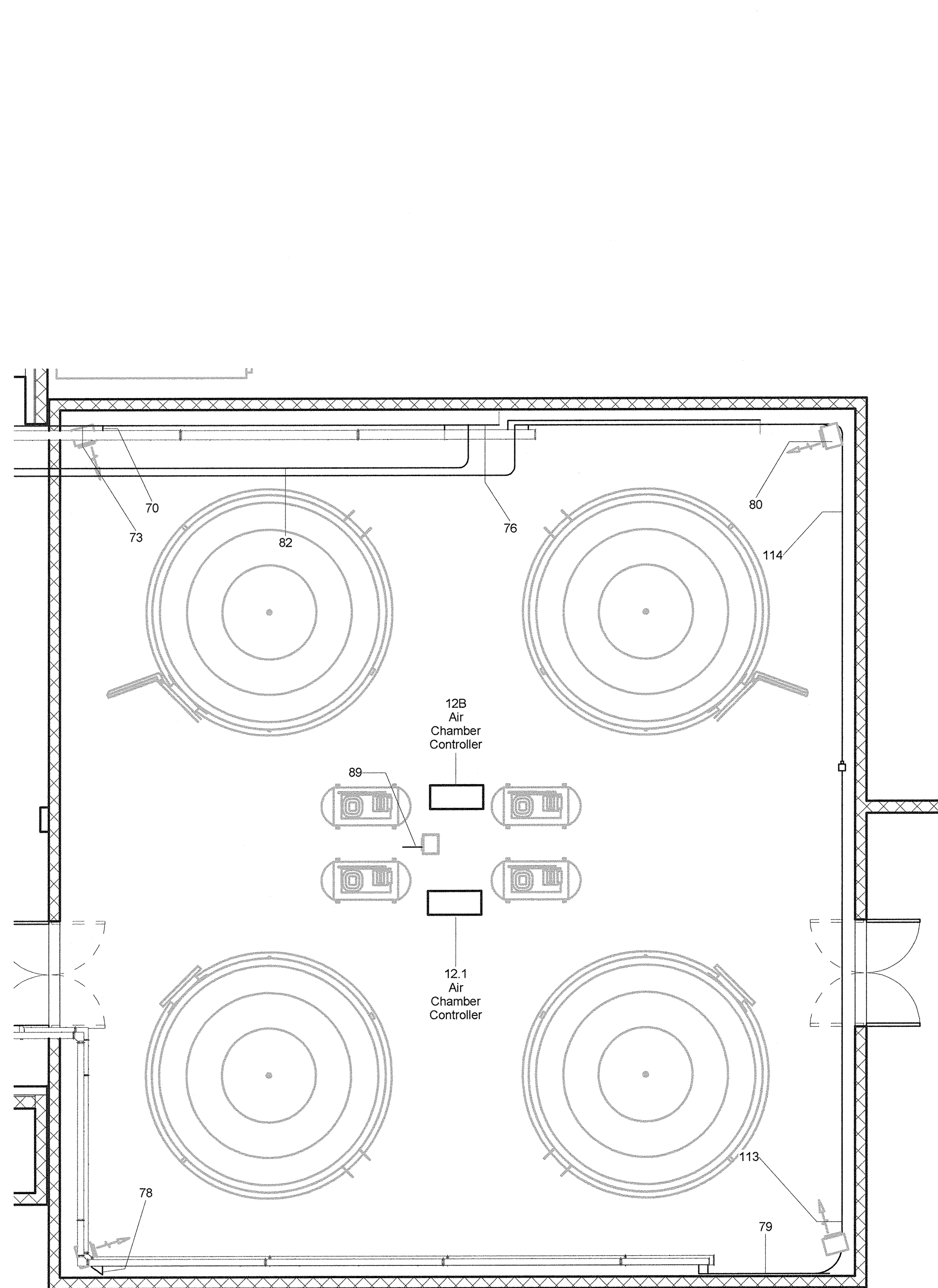
REV. NO.	DATE	NAME	PROF.	ABBR.	STA.	DESCRIPTION
DESIGNED		Darryl Liscomb				
DRAWN		Darryl Liscomb				
CHECKED		Michel Schuh				
TECH. APPR.		Michel Schuh, P.E.				
ADMIN. APPROVAL		Jay Brogna, P.E.				
DENVER, COLORADO						2013-08-16

PUMPING PLANT -
INTERIOR CONDUIT
PLAN

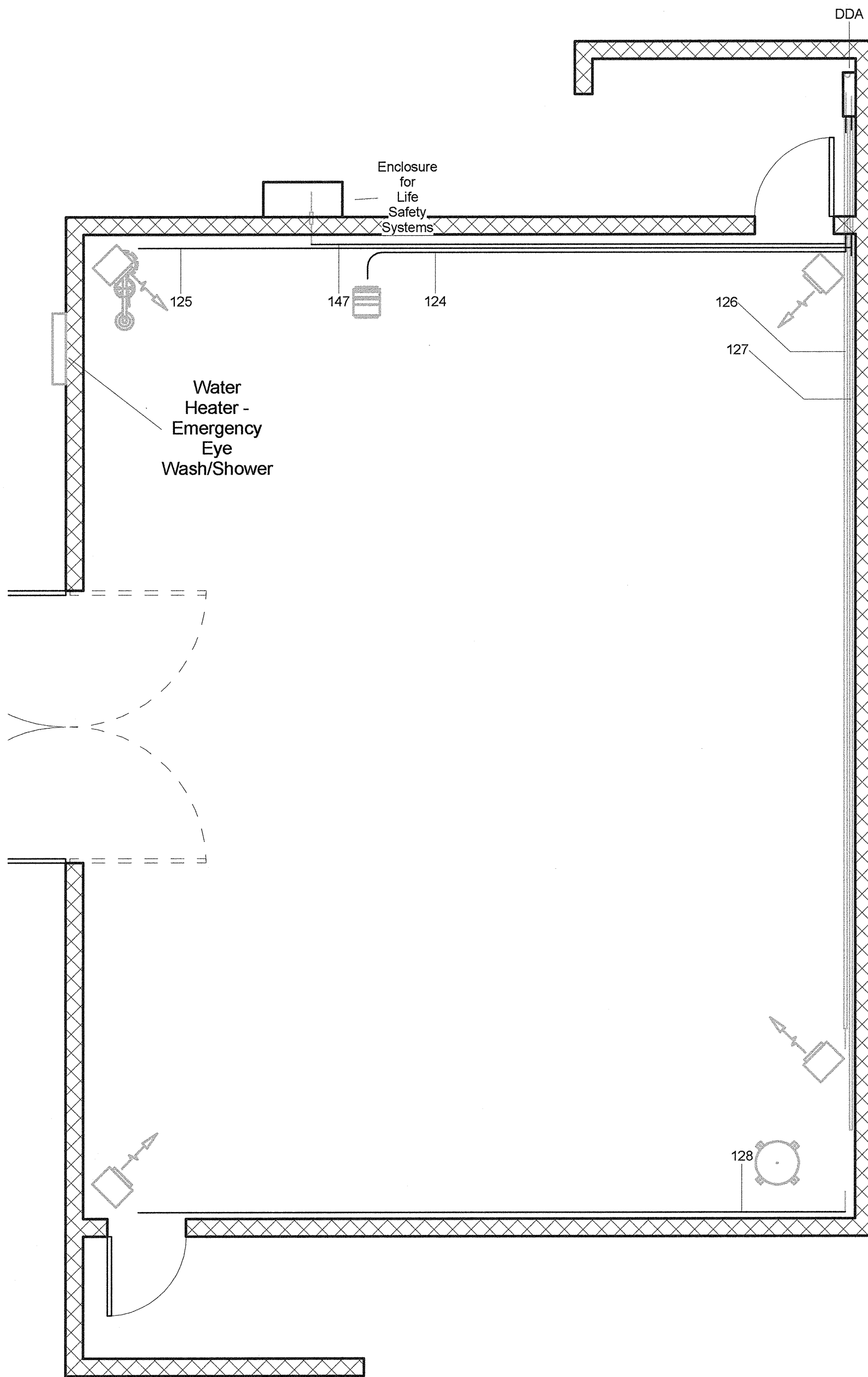
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GENERAL NOTES

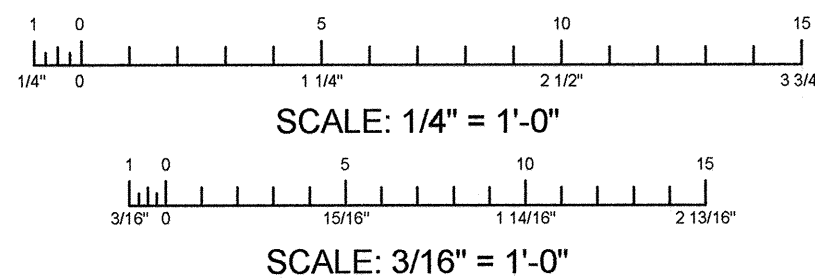
1. Conduit routings are typical. Determine actual location for conduit and stub-ups in the field. Utilize routing via wireway to the maximum extent practical.
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A1 Air Chamber Interior Conduit
Scale: 3/16" = 1'-0"



A3 Chlorine Building Interior Conduit
Scale: 1/4" = 1'-0"



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NAVAJO GALLUP WATER SUPPLY PROJECT
NEW MEXICO
SAN JUAN LATERAL
TOHLAKAI PUMPING PLANT
ELECTRICAL INSTALLATION
AIR CHAMBER AND CHLORINE BUILDING - INTERIOR
CONDUIT PLAN

DESIGNED
Darryl Liscomb
DRAWN
Michael Schuh
CHECKED
Michael Schuh, P.E.
TECH. APPR.
Michael Schuh, P.E.
ADMIN. APPROVAL
Jay Boggs
Electrical Design Group Manager
DENVER, COLORADO 2013-08-16

**AIR CHAMBER AND
CHLORINE BUILDING -
INTERIOR CONDUIT
PLAN**

1695-D-242

GENERAL NOTES

1. ALL ELECTRICAL LOADS IN VAULTS SHALL BE 120V.
2. RECEPTACLES IN VAULTS SHALL BE GFCI EQUIPPED AND ALL SUMP PUMP OPERATION SHALL BE MONITORED BY THE SCADA SYSTEM.
3. SEE CONDUIT SCHEDULES FOR WIRE SIZING TO THE VAULT LOCATIONS.
4. SEE ADDITIONAL DRAWINGS FOR INFORMATION ON THE VAULTS.
 - 1695-D-168 - Chlorine Injection Vault 1
 - 1695-D-170 - Valve Vault 1

SAFETY

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
MAYALO GALLUP WATER SUPPLY PROJECT
NEW MEXICO
SAN JUAN LATERAL
TOHLAKAI PUMPING PLANT
ELECTRICAL INSTALLATION
CHLORINE AND VALVE VAULTS



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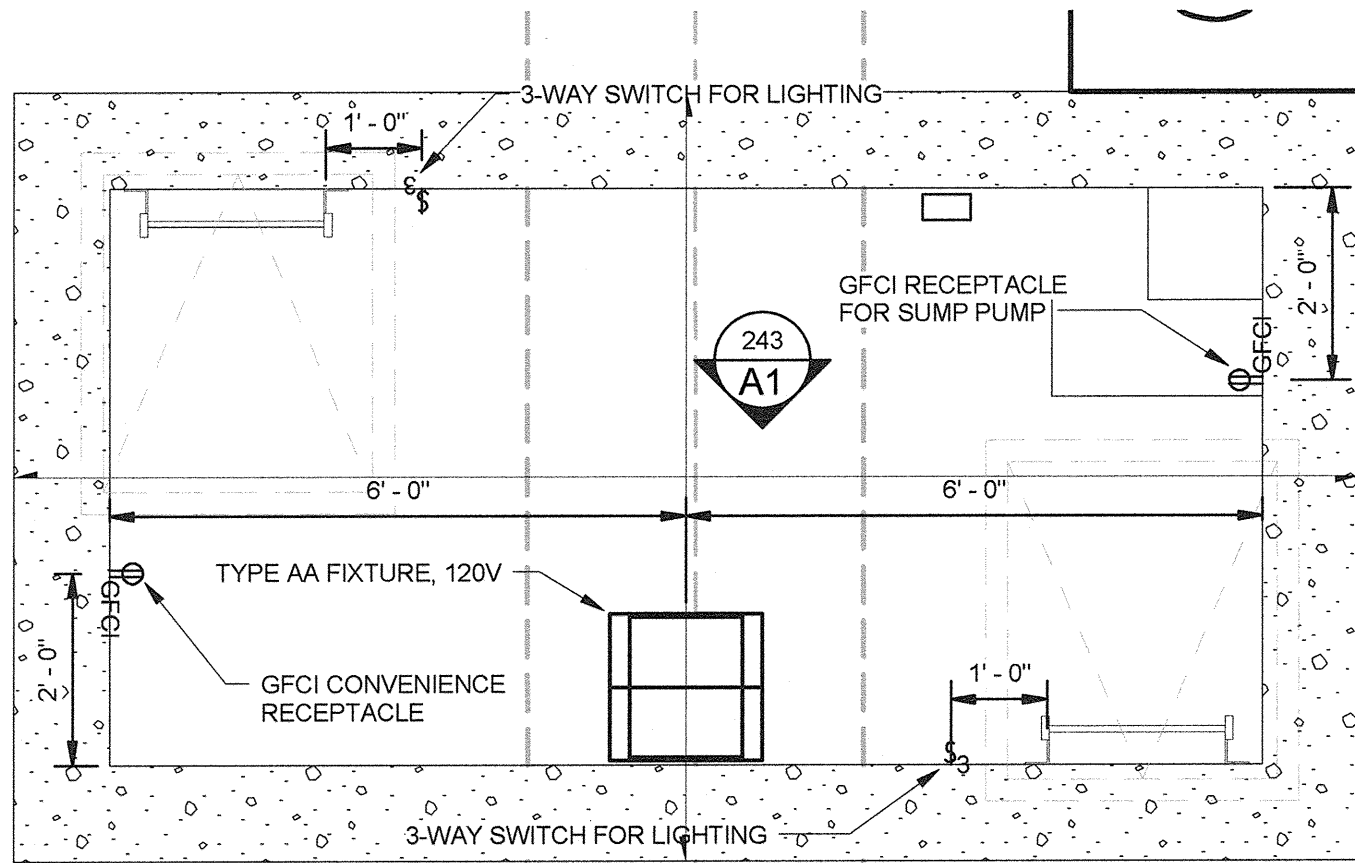
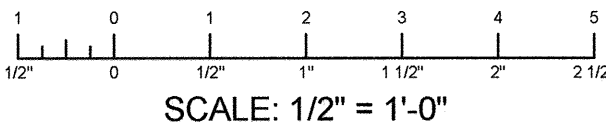
Jeremiah Bradshaw
DESIGNED
Jeremiah Bradshaw
DRAWN
Michel Schuh
CHECKED
TECH. APPR. Jeremiah Bradshaw, P.E.
ADMIN. APPROVAL
Jay Rodgers
Electrical Design Group, Manager
DENVER, COLORADO 2013-08-16

CHLORINE AND VALVE
VAULTS

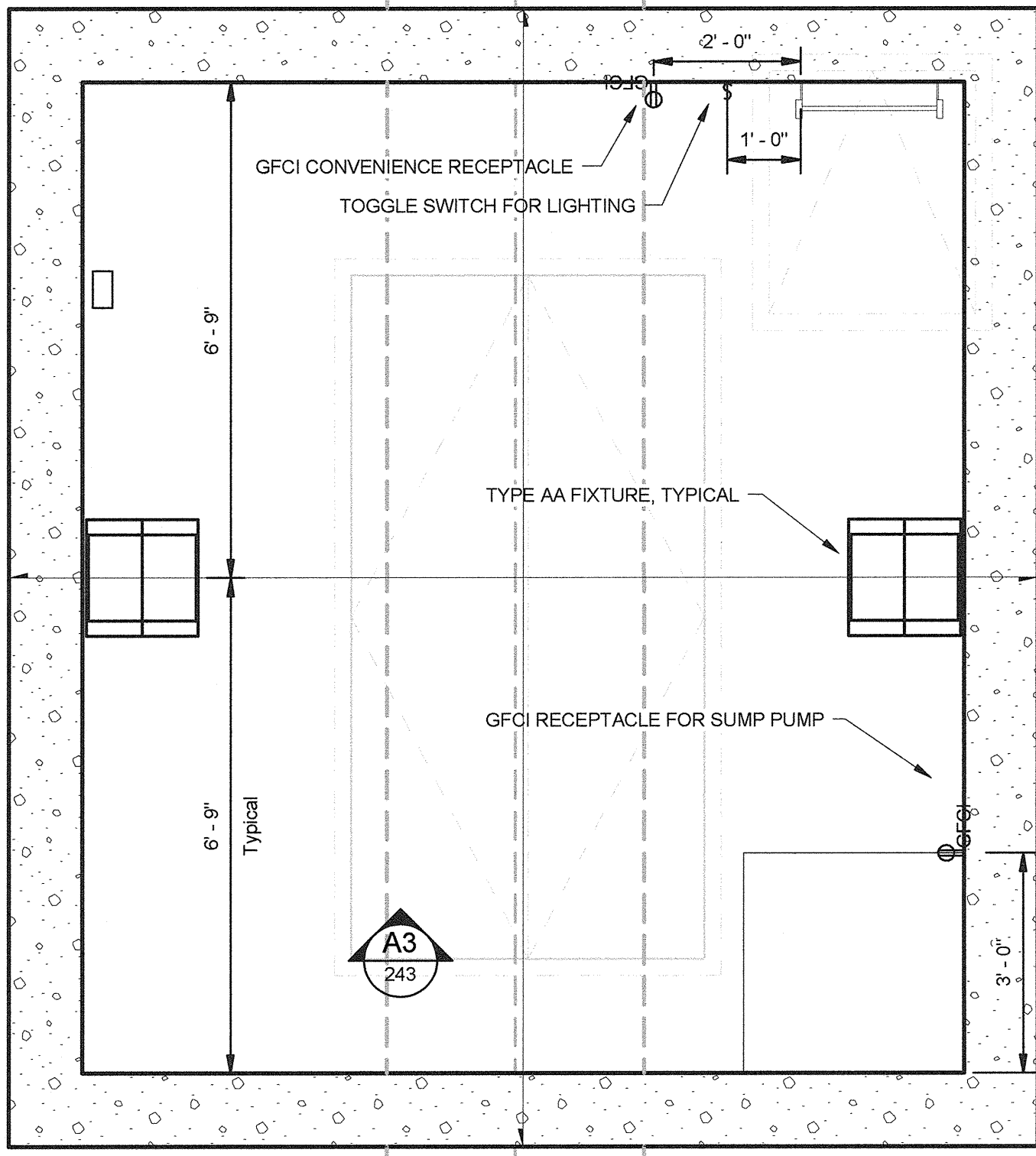
1695-D-243

GENERAL LEGEND

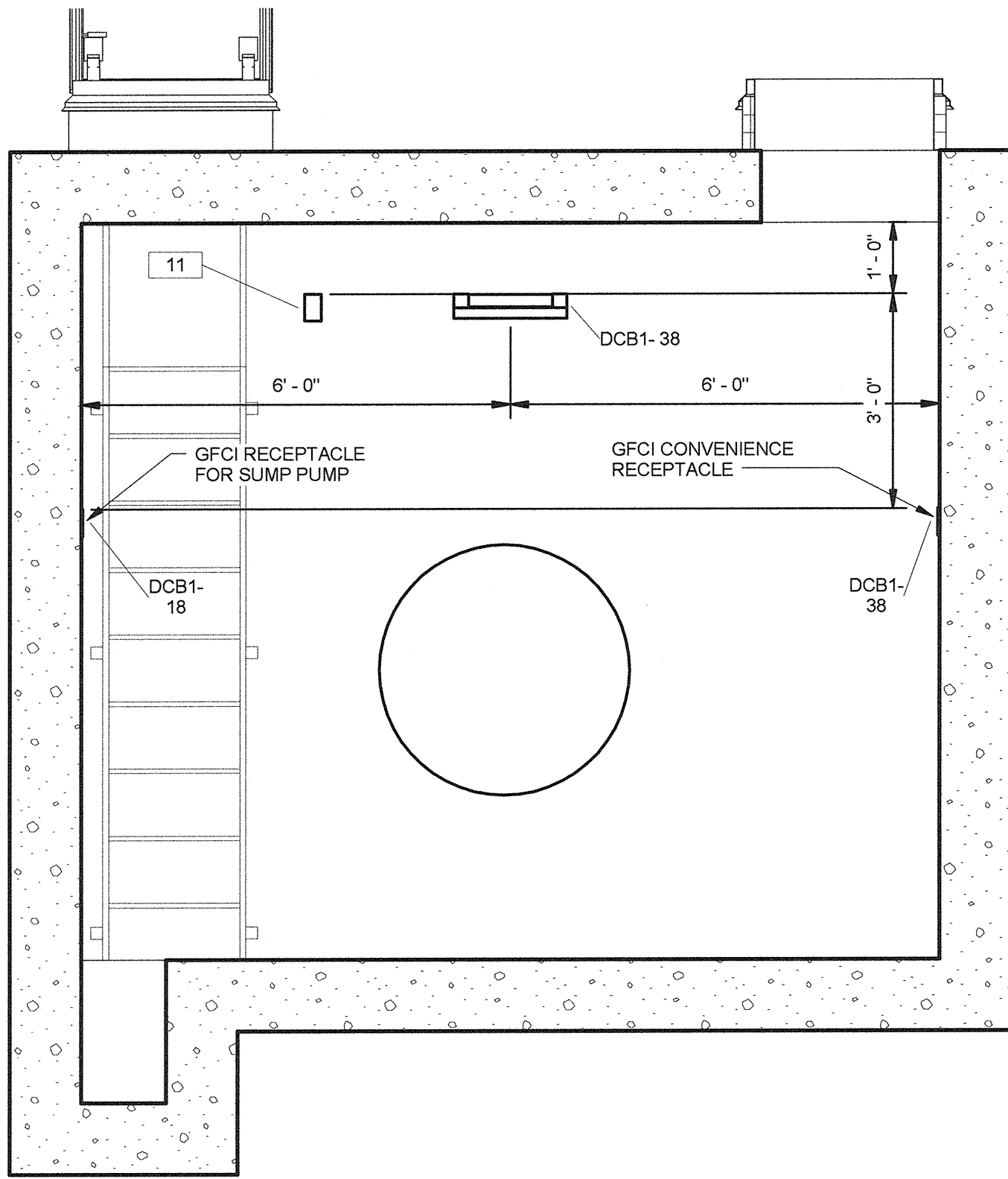
- X DEVICE TAG - SEE SCHEDULE FOR INFORMATION.
- XXX-## SUPPLY CIRCUIT INFORMATION. PANEL XXX,
CIRCUIT ##.



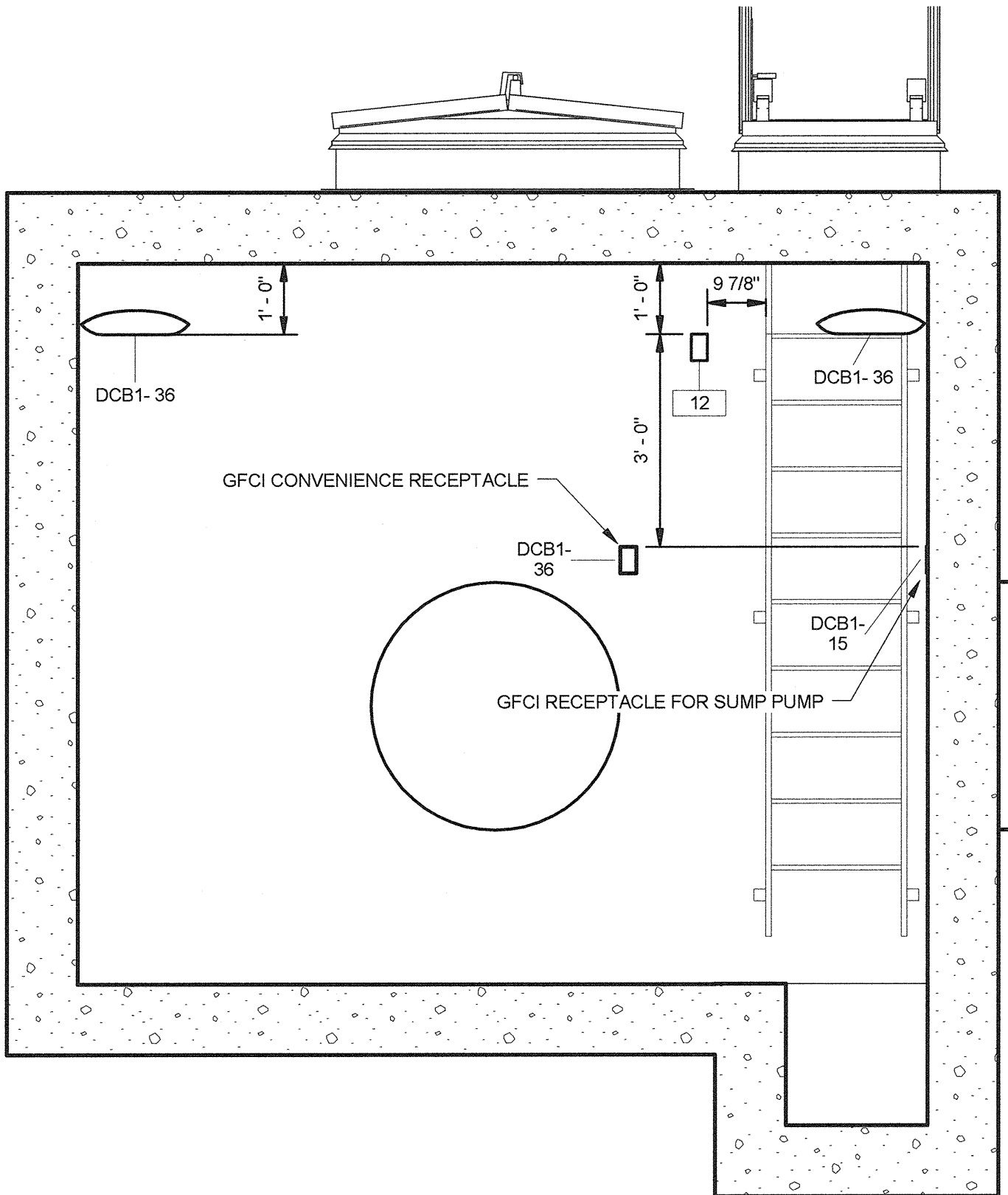
C1 Chlorine Injection Vault 1 - Plan View
Scale: 1/2" = 1'-0"



C3 Valve Vault 1 - Plan View
Scale: 1/2" = 1'-0"



A1 Chlorine Injection Vault 1
Scale: 1/2" = 1'-0"



A3 Valve Vault 1
Scale: 1/2" = 1'-0"

DESIGN PHASE

DATE AND TIME PLOTTED
8/19/2013 10:51:10 AM

CAD FILE NAME
C:\Users\jbradshaw\Desktop\Sync Folder\Tohlakai-Feyl\Tohlakai-Electrical-Bradshaw.rvt

GENERAL NOTES

1. ALL ELECTRICAL LOADS IN VAULTS SHALL BE 120V.
2. RECEPTACLES IN VAULTS SHALL BE GFCI EQUIPPED AND ALL SUMP PUMP OPERATION SHALL BE MONITORED BY THE SCADA SYSTEM.
3. SEE CONDUIT SCHEDULES FOR WIRE SIZING TO THE VAULT LOCATIONS.
4. SEE ADDITIONAL DRAWINGS FOR INFORMATION ON THE VAULTS.
 - 1695-D-171 - Flowmeter Vault 1
 - 1695-D-172 - Flowmeter Vault 2

RECLAMATION
Managing Water in the West

ALWAYS THINK SAFETY

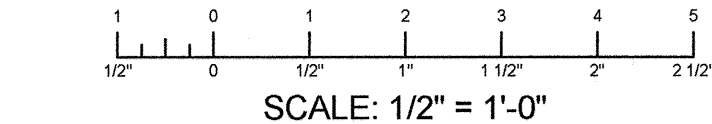
U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
NAVAJO GALLUP WATER SUPPLY PROJECT
NEW MEXICO
SAN JUAN LATERAL
TOHLAKAI PUMPING PLANT
ELECTRICAL INSTALLATION
FLOWMETER VAULTS

REV/NO | DATE | NAME | PROF. ABBR. | STA | DESCRIPTION

Jeremiah Bradshaw
DESIGNED
Jeremiah Bradshaw
DRAWN
Michel Schuh
CHECKED
TECH. APPR. Jeremiah Bradshaw, P.E.
ADMIN. APPROVAL
Jay Rogness
Electrical Design Group, Maitland
DENVER, COLORADO 2013-08-16

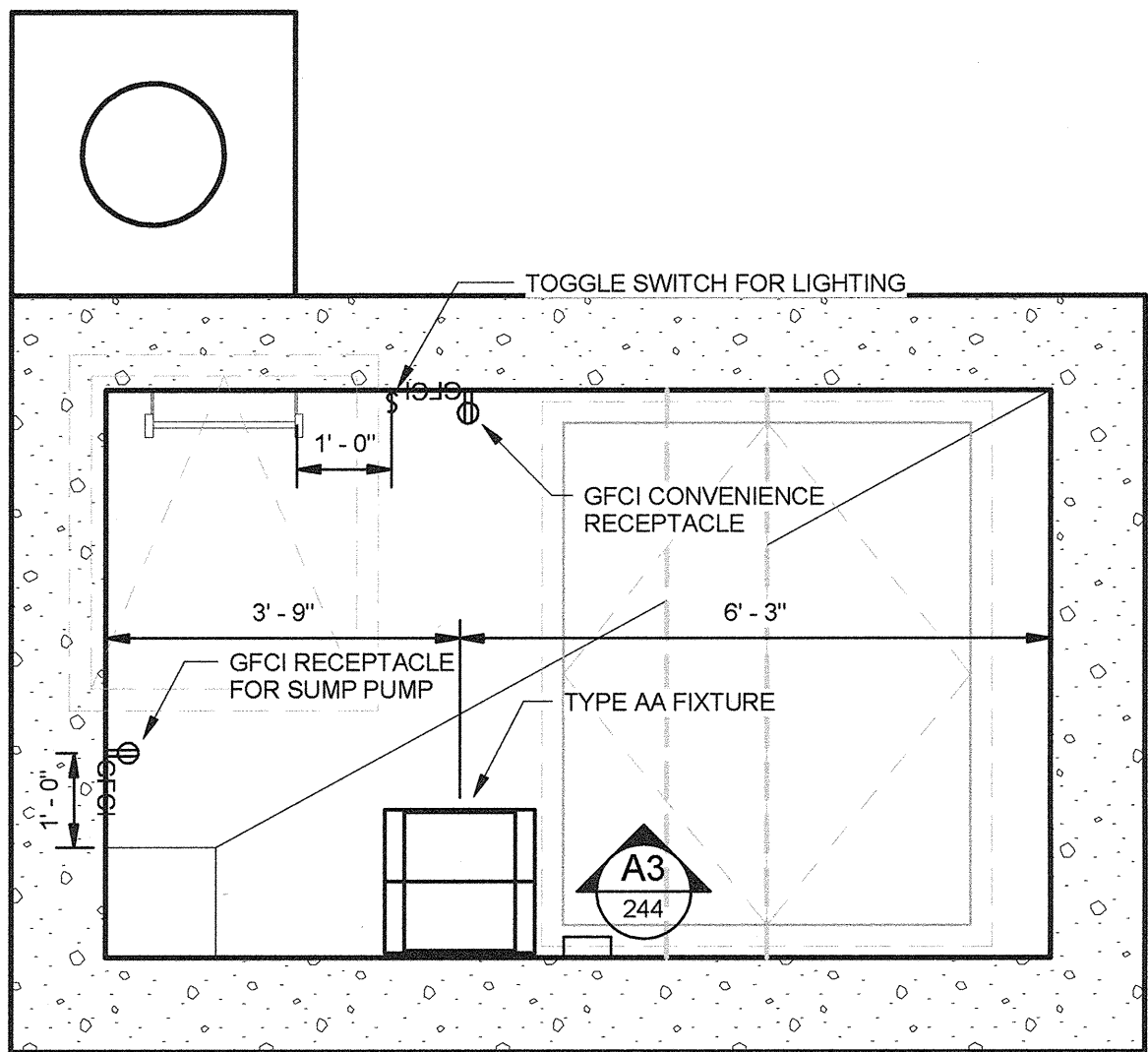
FLOWMETER VAULTS

1695-D-244

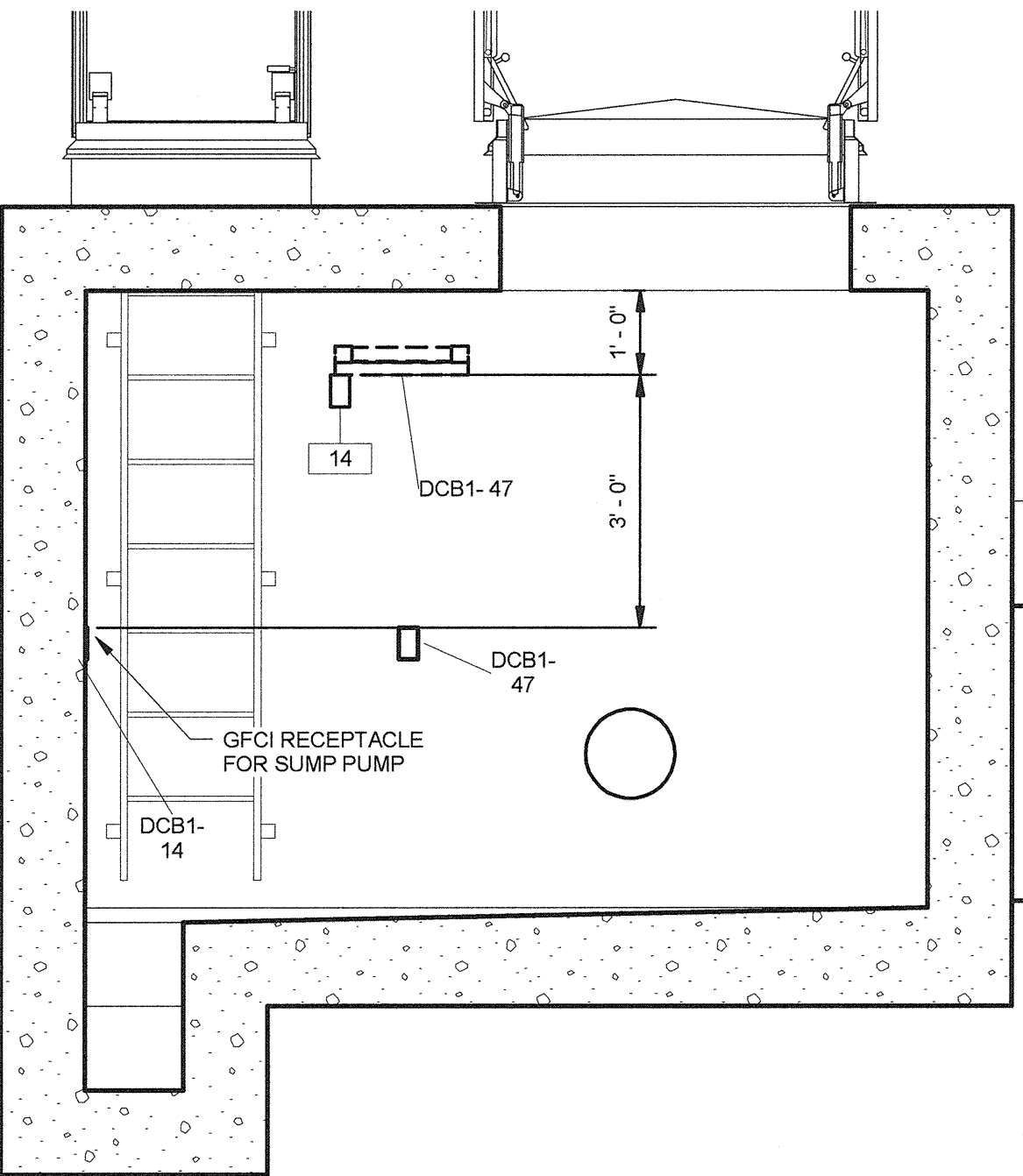


GENERAL LEGEND

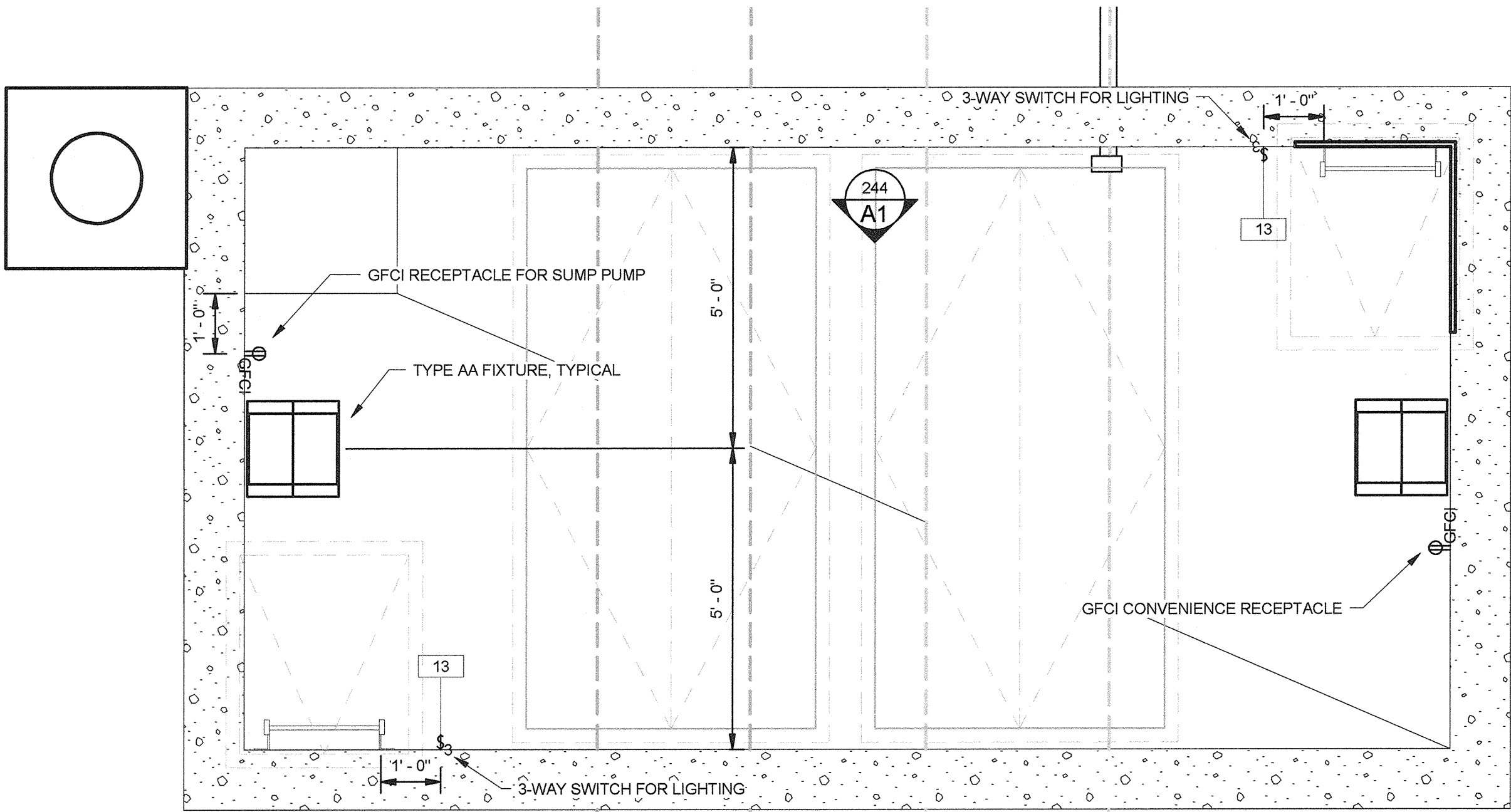
- ☐ X DEVICE TAG - SEE SCHEDULE FOR INFORMATION.
- XXX-## SUPPLY CIRCUIT INFORMATION. PANEL XXX, CIRCUIT ##.



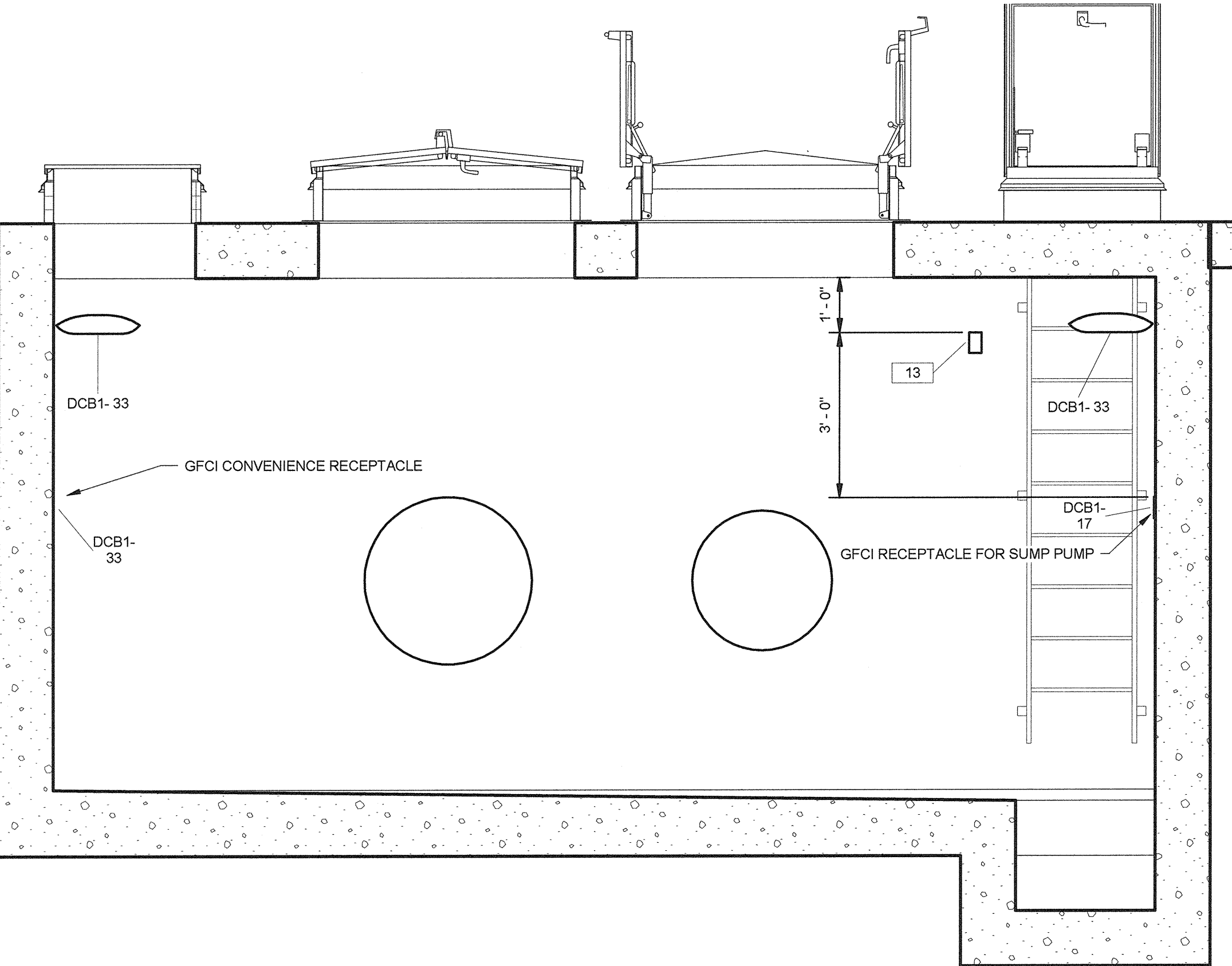
C3 Flowmeter Vault 2
Scale: 1/2" = 1'-0"



A3 Flowmeter Vault 2
Scale: 1/2" = 1'-0"



C1 Flowmeter Vault 1 - Ceiling
Scale: 1/2" = 1'-0"



A1 Flowmeter Vault 1
Scale: 1/2" = 1'-0"

DESIGN PHASE

DATE AND TIME PLOTTED
8/19/2013 10:51:16 AM

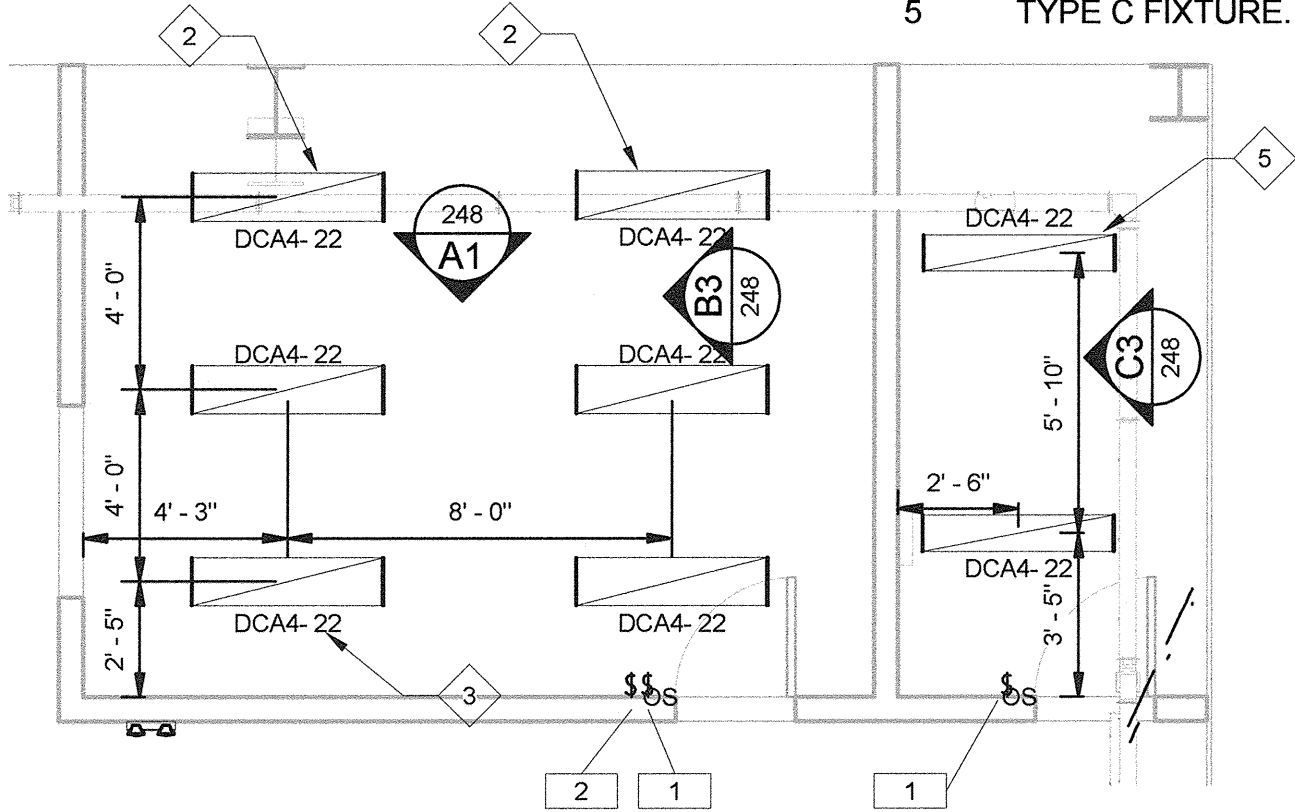
CAD FILE NAME
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GENERAL NOTES

1. SEE LIGHTING SWITCHING SCHEDULE FOR CONTROL OF FIXTURES.
2. SEE LIGHTING FIXTURE SCHEDULE FOR FIXTURE CHARACTERISTICS.
3. SEE PANELBOARD SCHEDULES FOR ALL CIRCUIT INFORMATION.
4. SEE ELEVATION VIEWS FOR MOUNTING HEIGHTS.

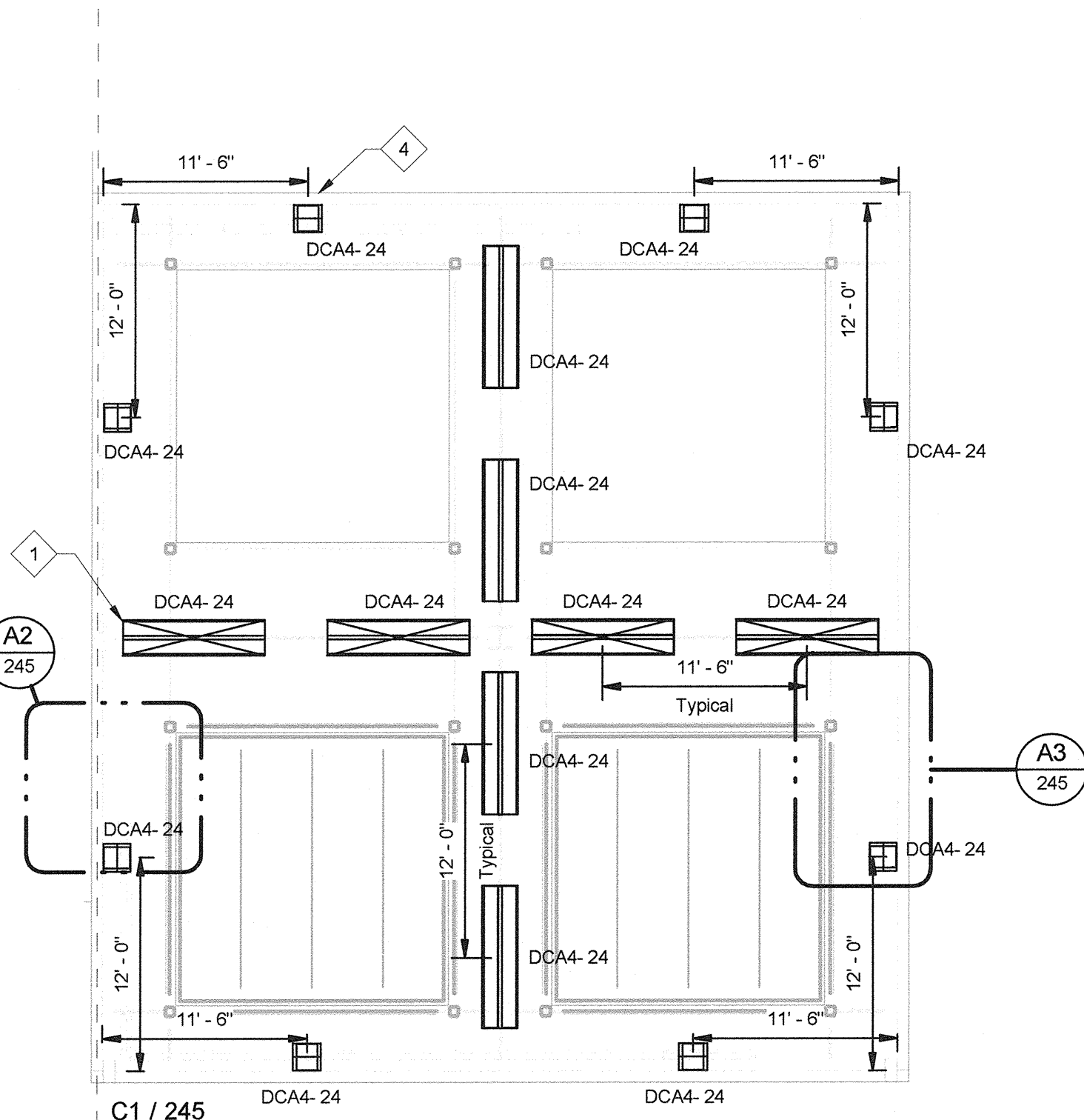
ELECTRICAL KEYNOTES

Value	Text
1	TYPE A FIXTURE. MOUNT TO BUILDING ROOF AT LOCATIONS SHOWN. SEE LIGHTING SWITCHING SCHEDULE FOR CONTROLLING DEVICES.
2	TYPE B FIXTURE. CONTROLLED BY TOGGLE SWITCH.
3	TYPE B FIXTURE. TYPICAL OF ROOM 101. CONTROLLED BY VACANCY SENSOR SWITCH.
4	TYPE AA FIXTURE. TYPICAL OF WALL MOUNTED FIXTURES IN ROOM 103.
5	TYPE C FIXTURE. TYPICAL OF ROOM 102.

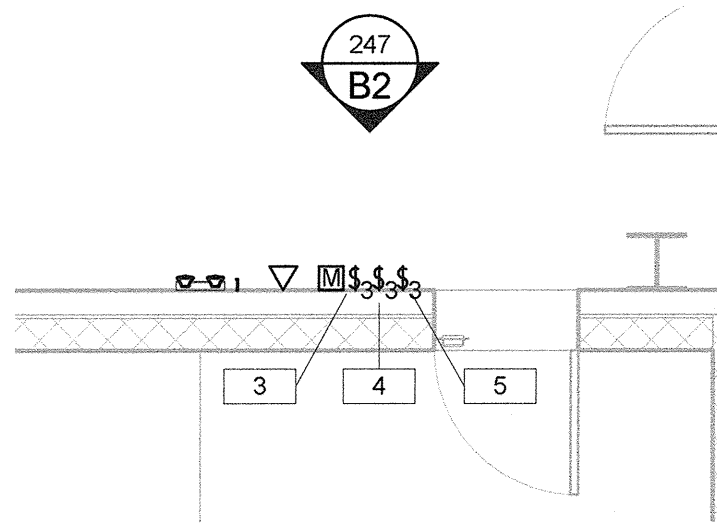


C4 Callout of Rooms 101 and 102 Interior Lighting
Scale: 1/4" = 1'-0"

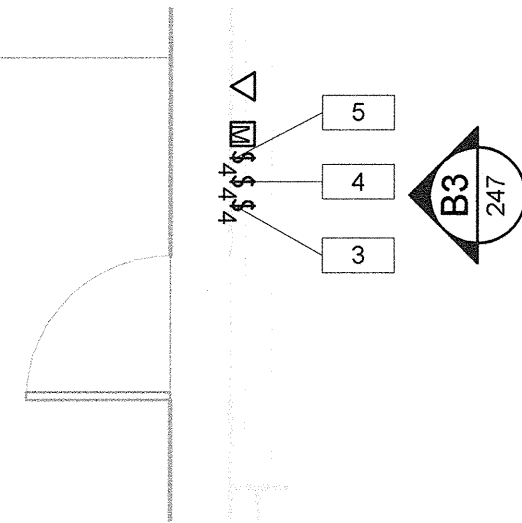
C1 Pumping Plant - Room 100 - Interior Lighting
Scale: 1/8" = 1'-0"



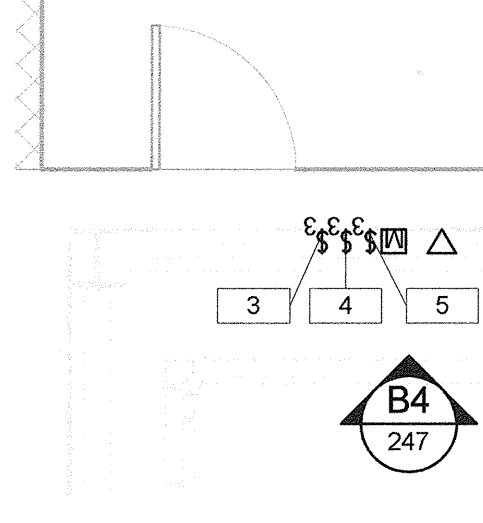
A1 Pumping Plant - Room 103 - Interior Lighting
Scale: 1/8" = 1'-0"



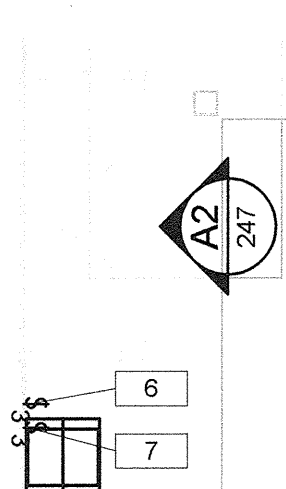
B2 Callout of Door 100
Scale: 1/4" = 1'-0"



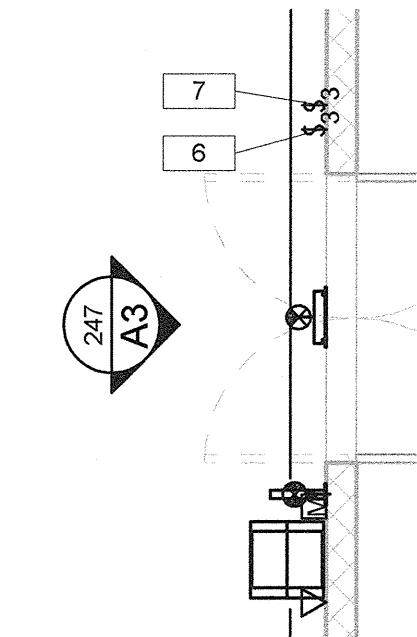
B3 Callout of Door 101
Scale: 1/4" = 1'-0"



B4 Callout of Door 102
Scale: 1/4" = 1'-0"



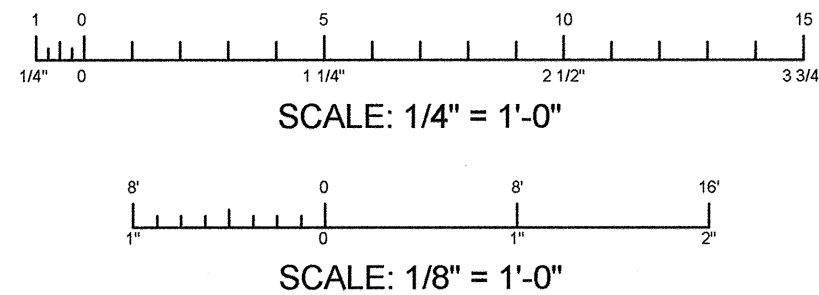
A2 Callout of Door 106
Scale: 1/4" = 1'-0"



A3 Callout of Door 107
Scale: 1/4" = 1'-0"

GENERAL LEGEND

- X DEVICE TAG - SEE SCHEDULE FOR INFORMATION.
- XX KEYNOTE - SEE ELECTRICAL KEYNOTE INFORMATION ON THIS SHEET.
- XXX.## SUPPLY CIRCUIT INFORMATION. PANEL XXX, CIRCUIT ##.



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U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

NAVAJO GALLUP WATER SUPPLY PROJECT
NEW MEXICO

SAN JUAN LATERAL

TOHLAKAI PUMPING PLANT

ELECTRICAL INSTALLATION
PUMPING PLANT - INTERIOR LIGHTING

DESCRIPTION
REV NO
DATE
NAME
PROF
ABBR
STA

Jeremiah Bradshaw
DESIGNED
Jeremiah Bradshaw
DRAWN
Michel Schuh
CHECKED
TECH. APPR. Jeremiah Bradshaw P.E.
ADMIN. APPROVAL
Jay Propp
Electrical Design Group Manager
DENVER, COLORADO 2013-08-16

PUMPING PLANT -
INTERIOR LIGHTING

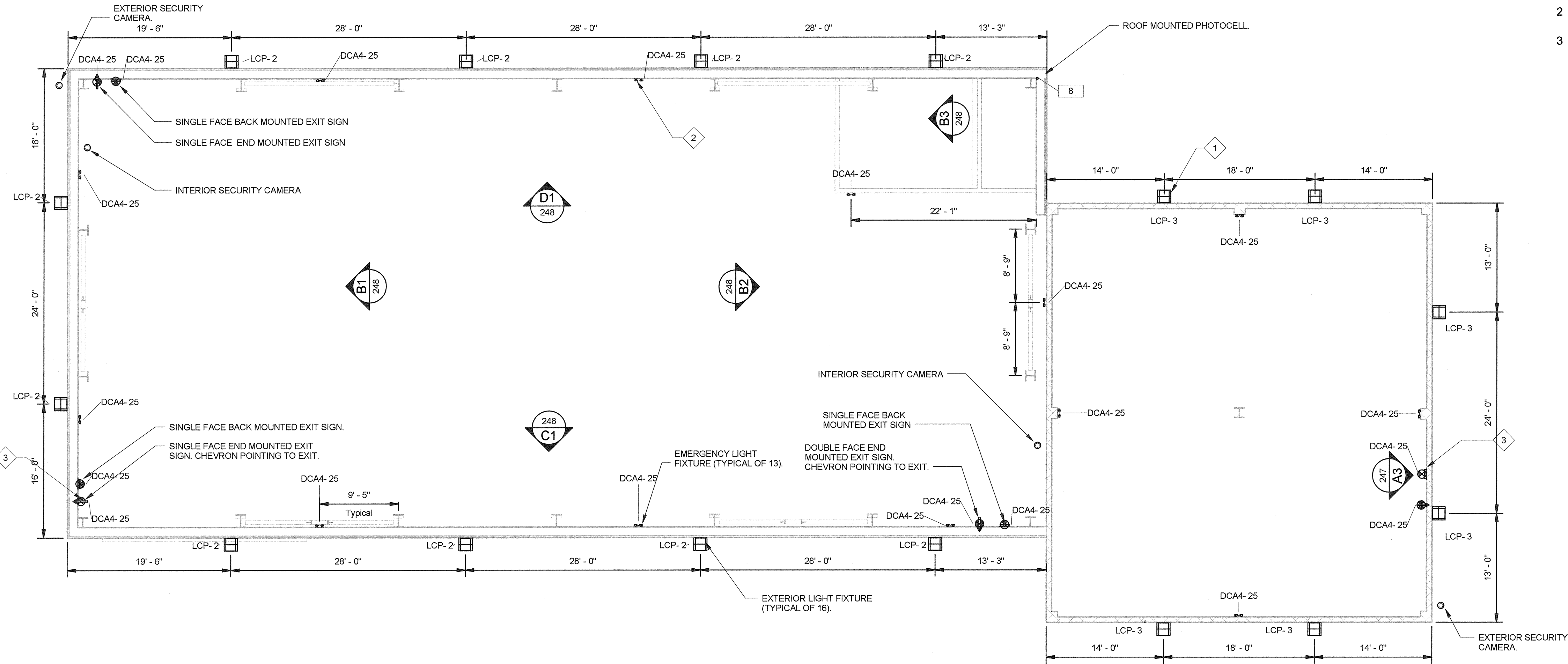
1695-D-245

GENERAL NOTES

- 1. SEE LIGHTING SWITCHING SCHEDULE FOR CONTROL OF FIXTURES.
- 2. SEE LIGHTING FIXTURE SCHEDULE FOR FIXTURE CHARACTERISTICS.
- 3. SEE PANELBOARD SCHEDULES FOR ALL CIRCUIT INFORMATION.
- 4. SEE ELEVATION VIEWS FOR MOUNTING HEIGHTS.

ELECTRICAL KEYNOTES

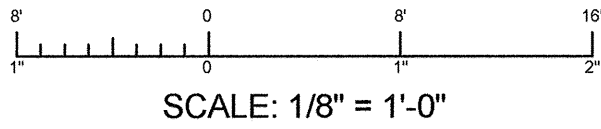
Value	Text
1	TYPE AA FIXTURE. TYPICAL OF EXTERIOR FIXTURES. CONTROLLED BY PHOTOCELL VIA PANEL LCP.
2	TYPE E1 FIXTURE. TYPICAL OF EMERGENCY FIXTURES.
3	TYPE E2 FIXTURE. MOUNTING AS SHOWN. END MOUNTED FIXTURES TO HAVE CHEVRONS INDICATING EXITS.



B1 Pumping Plant - Security Cameras and Exterior/Emergency Lighting
Scale: 1/8" = 1'-0"

GENERAL LEGEND

- X DEVICE TAG - SEE SCHEDULE FOR INFORMATION.
- XX KEYNOTE - SEE ELECTRICAL KEYNOTE INFORMATION ON THIS SHEET.
- XXX-## SUPPLY CIRCUIT INFORMATION. PANEL XXX, CIRCUIT ##.



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U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
NAVAJO GALLUP WATER SUPPLY PROJECT
NEW MEXICO
SAN JUAN LATERAL
TOHLAKAI PUMPING PLANT
ELECTRICAL INSTALLATION - SECURITY CAMERAS, EXTERIOR AND EMERGENCY LIGHTING

Jeremiah Bradshaw
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Jeremiah Bradshaw
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Michel Schuh
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TECH. APPR. Jeremiah Bradshaw, P.E.
ADMIN. APPROVAL
Jay Boggs
Electrical Design Group, Manager
DENVER, COLORADO 2013-08-16
PUMPING PLANT - SECURITY CAMERAS, EXTERIOR AND EMERGENCY LIGHTING

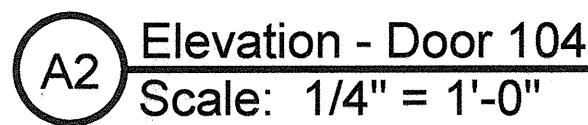
1695-D-246



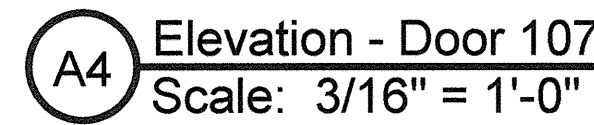
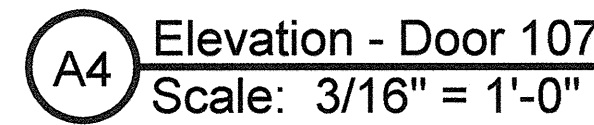
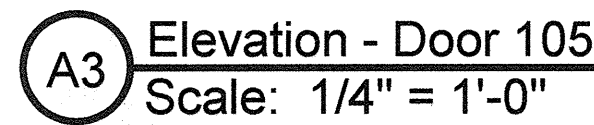
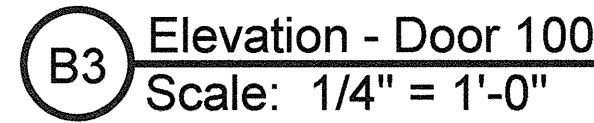
DATE AND TIME PLOTTED
8/19/2013 8:38:30 AM



CAD FILENAME



A3 Elevation - Door 105
Scale: 1/4" = 1'-0"



C4 Callout of Interior Office Wiring Devices
Scale: 1/4" = 1'-0"

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BUREAU OF RECLAMATION

NAVALO GALLUP WATER SUPPLY PROJECT

NEW MEXICO

SAN JUAN LATERAL

TOHLAKAI PUMPING PLANT

ELECTRICAL INSTALLATION

PUMPING PLANT - WIRING DEVICES

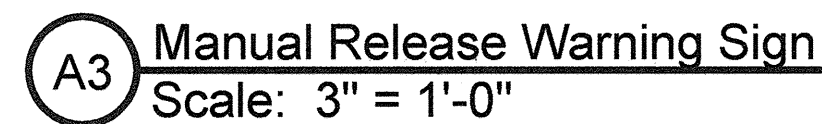
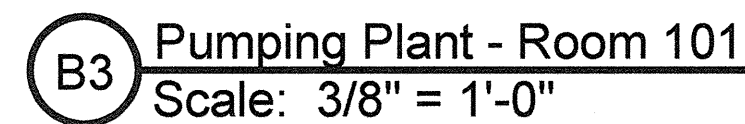
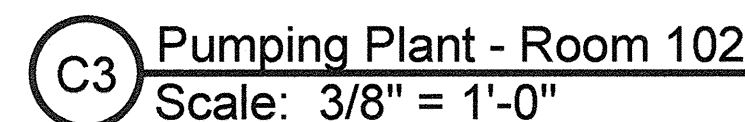
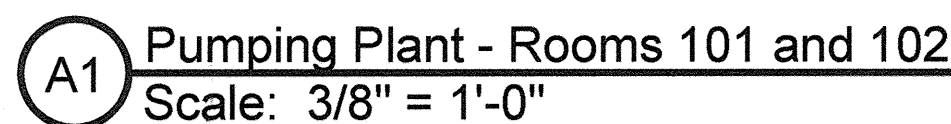
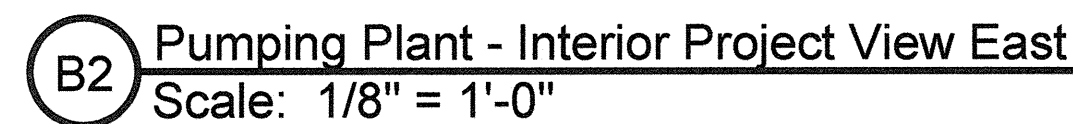
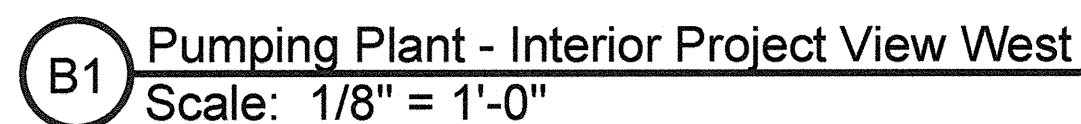
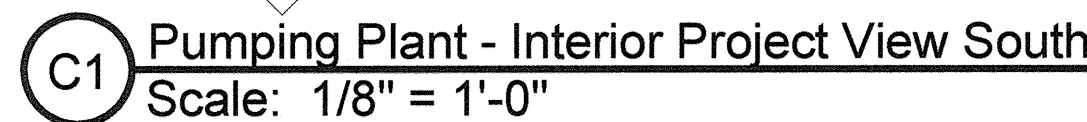
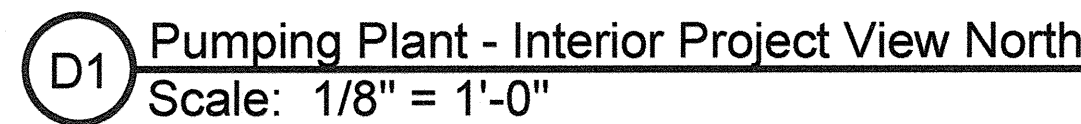


REV NO	DATE	NAME, PROF. ABBR.	STA	DESCRIPTION
				B

Jeremiah Bradshaw
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2013-08-16

PUMPING PLANT - WIRING DEVICES

1695-D-247



1. COORDINATE LOCATIONS OF EQUIPMENT WITH OTHER SYSTEM INSTALLERS (MECHANICAL, PLUMBING, FIRE PROTECTION, ETC.).

ELECTRICAL KEYNOTES	
Value	Text
1	FIRE ALARM PANEL AUX POWER/BATTERY BOX SHALL BE SUPPLIED FROM SAME CIRCUIT AS FIRE ALARM PANEL.
2	FIRE NOTIFICATION BLUE LENS STROBE. SEE FIRE CONTROL SEQUENCE OF OPERATIONS SHEET.
3	FIRE NOTIFICATION CLEAR LENS HORN/STROBE, TYPICAL. CANDELA RATING AS SHOWN.
4	TYPE E2 FIXTURE. MOUNTING AS SHOWN. END MOUNTED FIXTURES TO HAVE CHEVRONS INDICATING EXITS.
5	MANUAL RELEASE STATION WARNING SIGN. SEE DETAILED INFORMATION, THIS SHEET.

X XX XXX-##	DEVICE TAG - SEE SCHEDULE FOR INFORMATION KEYNOTE - SEE ELECTRICAL KEYNOTE INFORMATION ON THIS SHEET. SUPPLY CIRCUIT INFORMATION. PANEL XXX, CIRCUIT ##.
--	---

 ALWAYS THINK **SAFETY**

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

NAVAJO GALLUP WATER SUPPLY PROJECT
NEW MEXICO

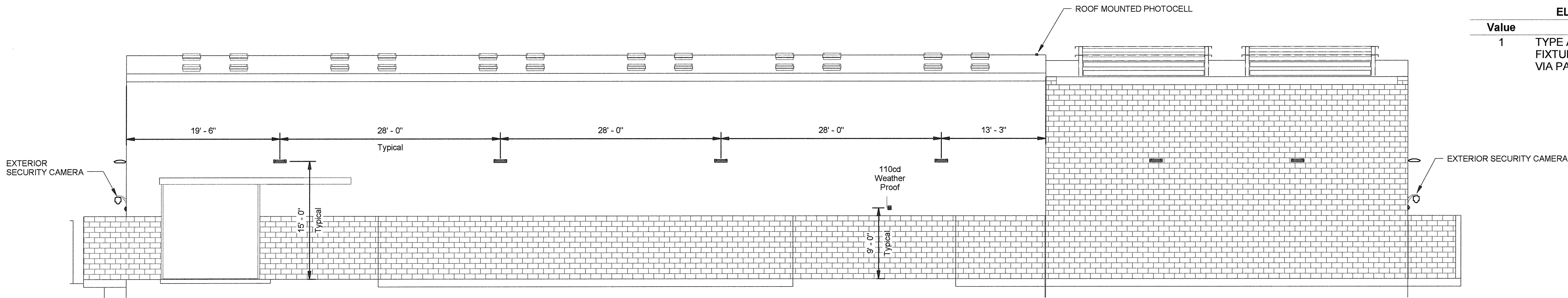
SAN JUAN LATERAL
TOHLAKAI PUMPING PLANT
ELECTRICAL INSTALLATION
PUMPING PLANT - INTERIOR ELEVATIONS

Jeremiah Bradshaw
DESIGNED
Jeremiah Bradshaw
DRAWN
Michel Schuhs *Michel Schuhs*
CHECKED
TECH. APPR. Jeremiah Bradshaw, P.E.
ADMIN. APPROVAL
Ray Bogges *Ray Bogges*
Electrical Design Group, Manager
DENVER, COLORADO
2013-08-16

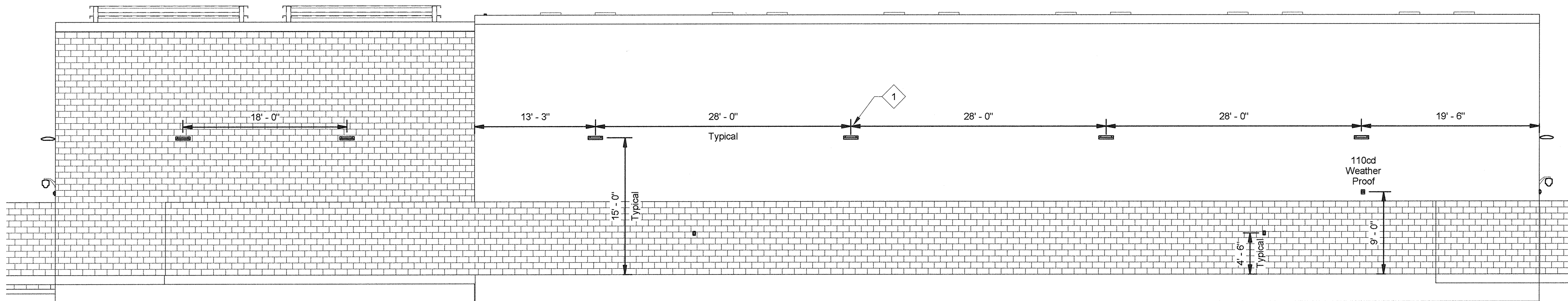
**PUMPING PLANT -
INTERIOR ELEVATIONS**

1695-D-248

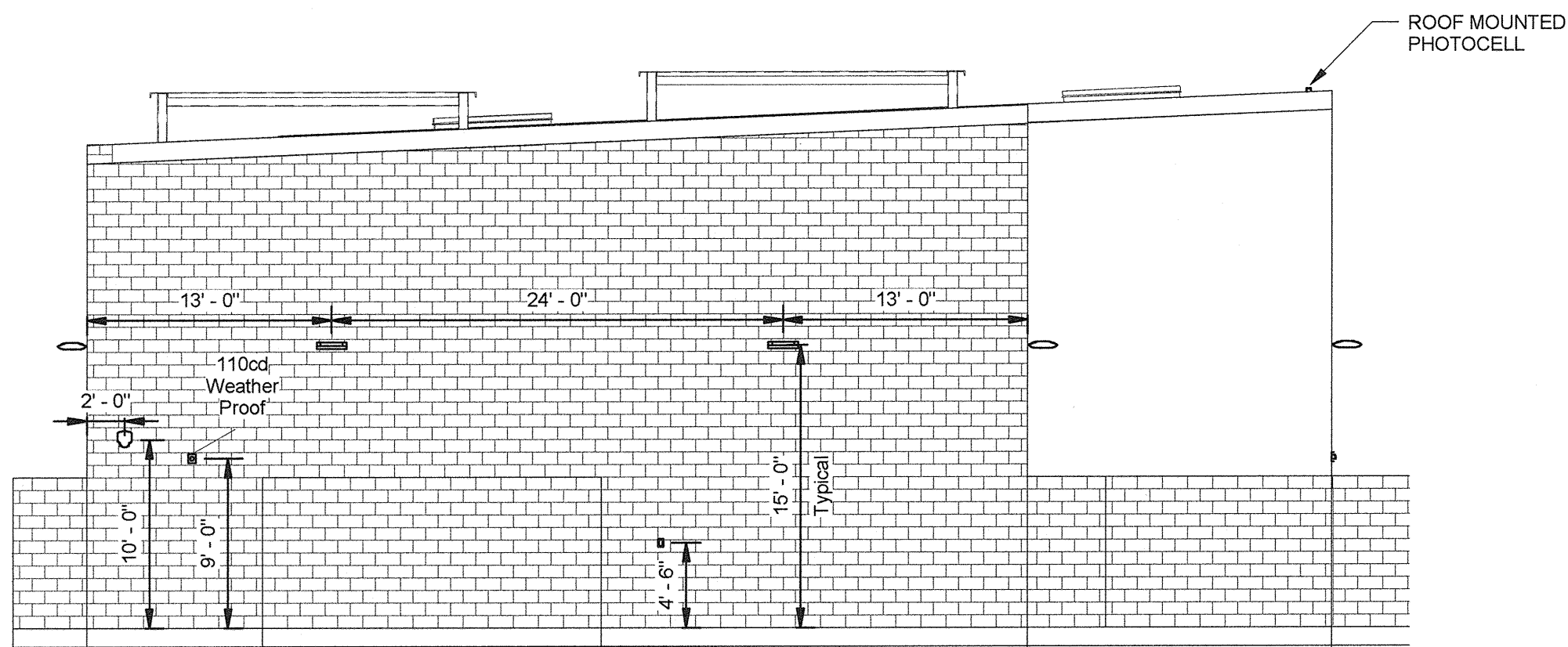
ELECTRICAL KEYNOTES	
Value	Text
1	TYPE AA FIXTURE, TYPICAL OF EXTERIOR FIXTURES. CONTROLLED BY PHOTOCELL VIA PANEL LCP.



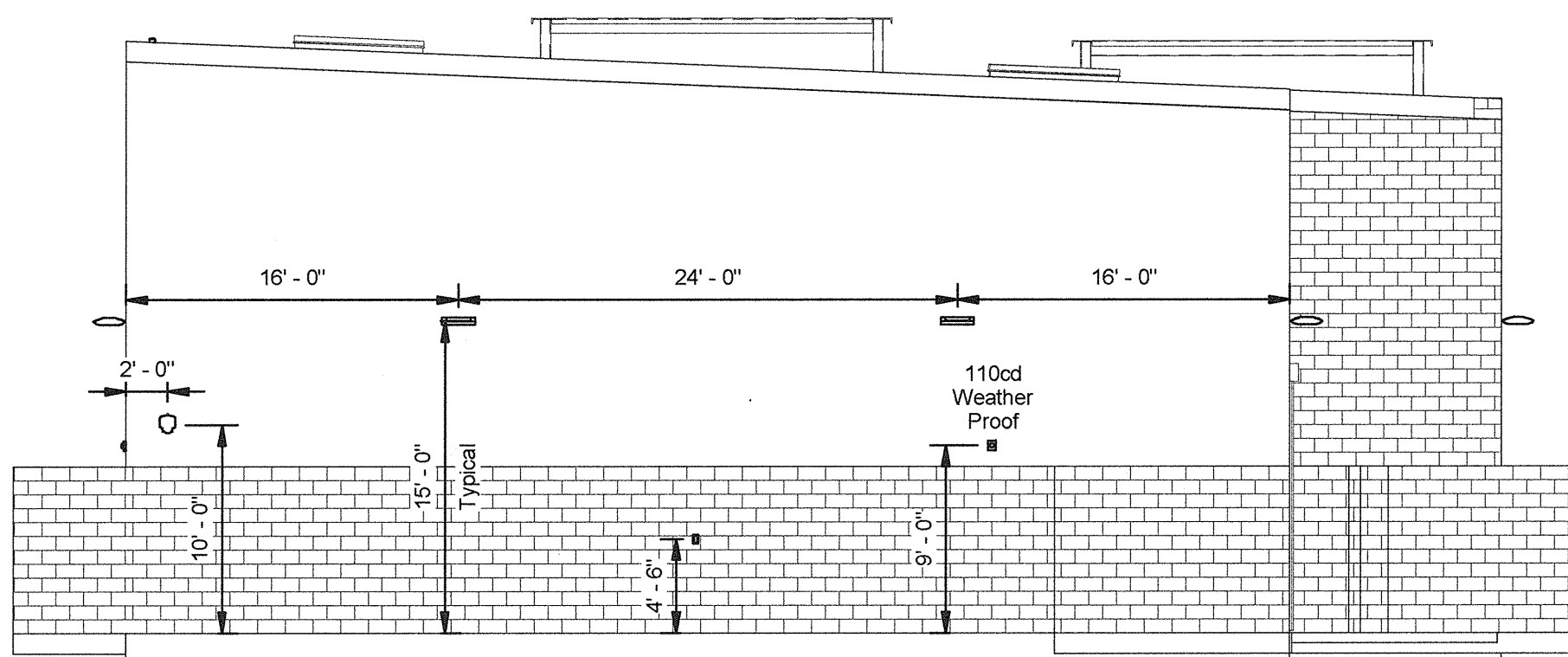
C1 Pumping Plant - Exterior Project View North
Scale: 1/8" = 1'-0"



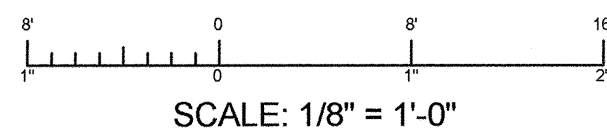
B1 Pumping Plant - Exterior Project View South
Scale: 1/8" = 1'-0"



A1 Pumping Plant - Exterior Project View West
Scale: 1/8" = 1'-0"



A3 Pumping Plant - Exterior Project View East
Scale: 1/8" = 1'-0"



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U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
NAVAJO GALLUP WATER SUPPLY PROJECT
NEW MEXICO

SAN JUAN LATERAL
TOHLAKAI PUMPING PLANT
ELECTRICAL INSTALLATION

PUMPING PLANT - EXTERIOR ELEVATIONS

Jeremiah Bradshaw
DESIGNED
Jeremiah Bradshaw
DRAWN
Michel Schuh
CHECKED

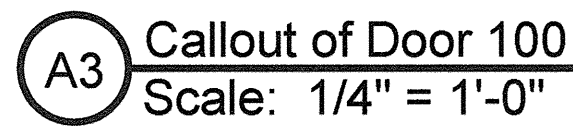
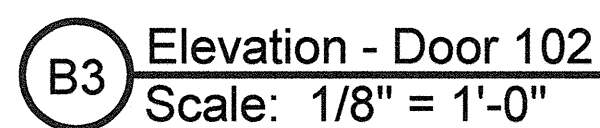
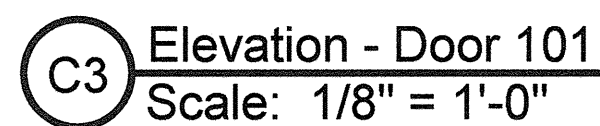
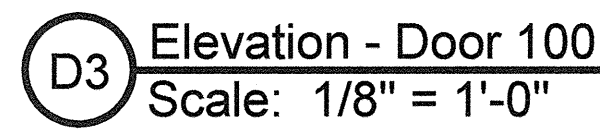
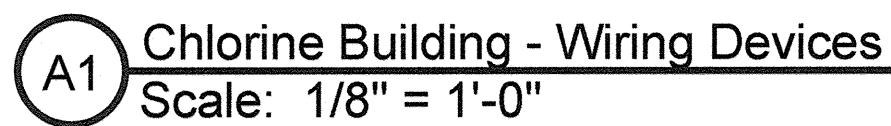
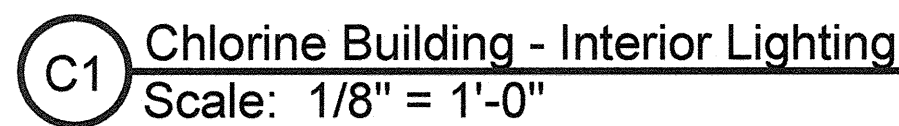
TECH. APPR. Jeremiah Bradshaw, P.E.

ADMIN. APPROVAL
Jay Boggs
Electrical Design Group, Manager

DENVER, COLORADO 2013-08-16

**PUMPING PLANT -
EXTERIOR ELEVATIONS**

1695-D-249



1. SEE LIGHTING SWITCHING SCHEDULE FOR CONTROL OF FIXTURES.
2. SEE LIGHTING FIXTURE SCHEDULE FOR FIXTURE CHARACTERISTICS.
3. SEE PANELBOARD SCHEDULES FOR ALL CIRCUIT INFORMATION.
4. SEE ELEVATION VIEWS FOR MOUNTING HEIGHTS.
5. SEE PANELBOARD SCHEDULES FOR ALL CIRCUIT INFORMATION.
6. SEE ELEVATIONS FOR MOUNTING HEIGHTS.
7. FOR INFORMATION ON MECHANICAL DEVICES, SEE MECHANICAL DRAWINGS.

ELECTRICAL KEYNOTES	
Value	Text
1	TYPE D FIXTURE. MOUNT TO BUILDING ROOF AT LOCATIONS SHOWN. FIXTURES LOCATED WITHIN THE CHLORINE FEED BUILDING ARE CONTROLLED BY SWITCH #9. FIXTURES LOCATED IN THE OUTDOOR STORAGE AREA ARE CONTROLLED BY SWITCH #10.
2	DOOR SECURITY DEVICES. TYPICAL OF ALL EXTERIOR DOORS.
3	NEMA5-20R DUPLEX RECEPTACLE, TYPICAL. GFCI INDICATES GROUND FAULT PROTECTION.
4	FIRE NOTIFICATION CLEAR LENS HORN/STROBE, TYPICAL. CANDELA RATING AS SHOWN.

ALWAYS THINK **SAFETY**

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
NAVAJO GALLUP WATER SUPPLY PROJECT
NEW MEXICO

SAN JUAN LATERAL
TOHLAKAI PUMPING PLANT

ELECTRICAL INSTALLATION

CHLORINE BUILDING - LIGHTING AND WIRING DEVICES

	DEVICE TAG - SEE SCHEDULE FOR INFORMATION.
	KEYNOTE - SEE ELECTRICAL KEYNOTE INFORMATION ON THIS SHEET.
XXX-##	SUPPLY CIRCUIT INFORMATION. PANEL XXX, CIRCUIT ##.

Jeremiah Bradshaw
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Jeremiah Bradshaw
DRAWN
Michel Schuh
CHECKED

TECH. APPR. Jeremiah Bradshaw, P.E.

ADMIN. APPROVAL Jay Boggs
Electrical Design Group, Manager

DENVER, COLORADO 2013-08-16

CHLORINE BUILDING - LIGHTING AND WIRING DEVICES

1695-D-250

REV/NO	DATE	NAME	PROF.	ABBR	15A	DESCRIPTION

Jeremiah Bradshaw
DESIGNED
Jeremiah Bradshaw
DRAWN
Michel Schuh
CHECKED

TECH. APPR. Jeremiah Bradshaw, P.E.

ADMIN. APPROVAL
Jay Rogers
Electrical Design Group, Manager

DENVER, COLORADO 2013-08-16

**CHLORINE BUILDING -
EXTERIOR/EMERGENCY
LIGHTING AND FIRE
PROTECTION SYSTEM**

1695-D-251

FIRE PROTECTION NOTES

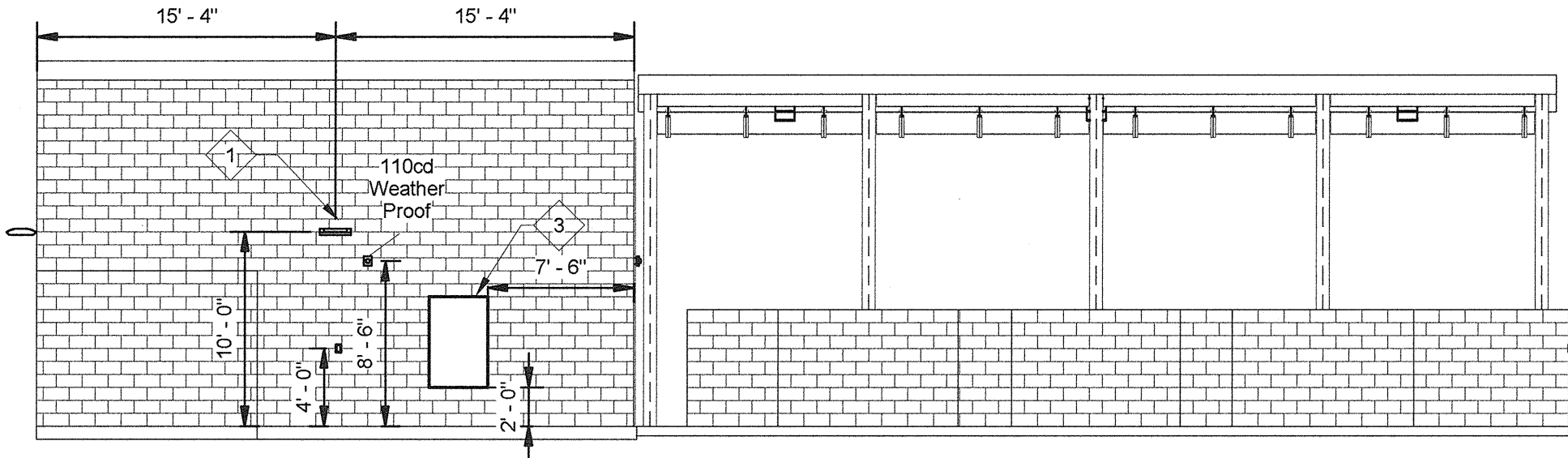
1. INITIATING AND NOTIFICATION SIGNALS CAN BE FOUND ON THE FIRE CONTROL SEQUENCE OF OPERATIONS SHEET.
2. SEE INTERIOR ELEVATIONS SHEET FOR LOCATION OF MANUAL RELEASE WARNING SIGN.
3. SEE ELEVATION VIEW SHEETS FOR MOUNTING HEIGHTS OF DEVICES.

GENERAL NOTES

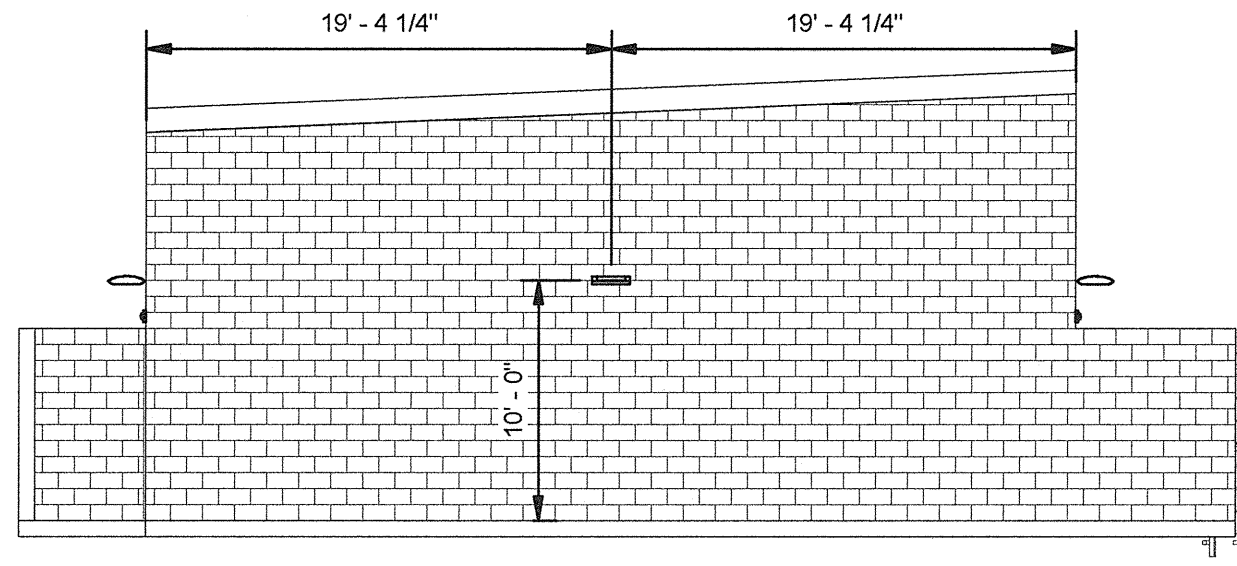
1. SEE LIGHTING SWITCHING SCHEDULE FOR CONTROL OF FIXTURES.
2. SEE LIGHTING FIXTURE SCHEDULE FOR FIXTURE CHARACTERISTICS.
3. SEE PANELBOARD SCHEDULES FOR ALL CIRCUIT INFORMATION.
4. SEE ELEVATION VIEWS FOR MOUNTING HEIGHTS.

ELECTRICAL KEYNOTES

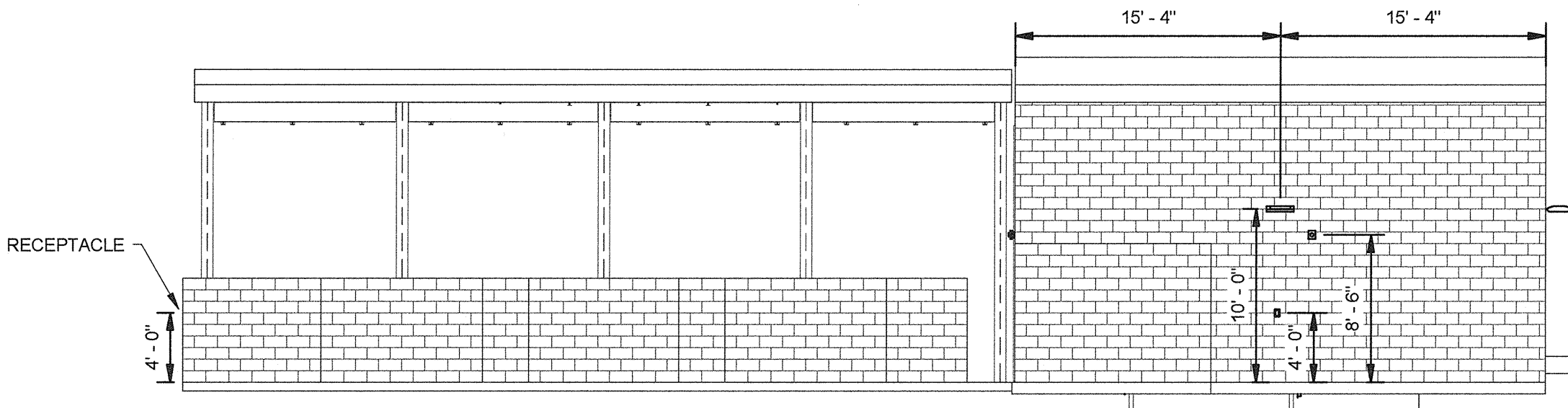
Value	Text
1	TYPE AA FIXTURE. TYPICAL OF EXTERIOR FIXTURES. CONTROLLED BY PHOTOCELL VIA PANEL LCP.
2	TYPE E1 FIXTURE. TYPICAL OF EMERGENCY FIXTURES.
3	ENCLOSURE CONTAINING LIFE SAFETY SYSTEMS: FIRE ALARM CONTROL PANEL (FACP2), CHLORINE GAS DETECTION SYSTEM, AND COMMUNICATIONS EQUIPMENT. SEE SPECIFICATION 26 27 16 - ELECTRICAL CABINETS AND ENCLOSURES FOR INFORMATION.
4	FIRE NOTIFICATION CLEAR LENS HORN/STROBE, TYPICAL. CANDELA RATING AS SHOWN.



C3 Chlorine Building - Exterior Project View South
Scale: 1/8" = 1'-0"



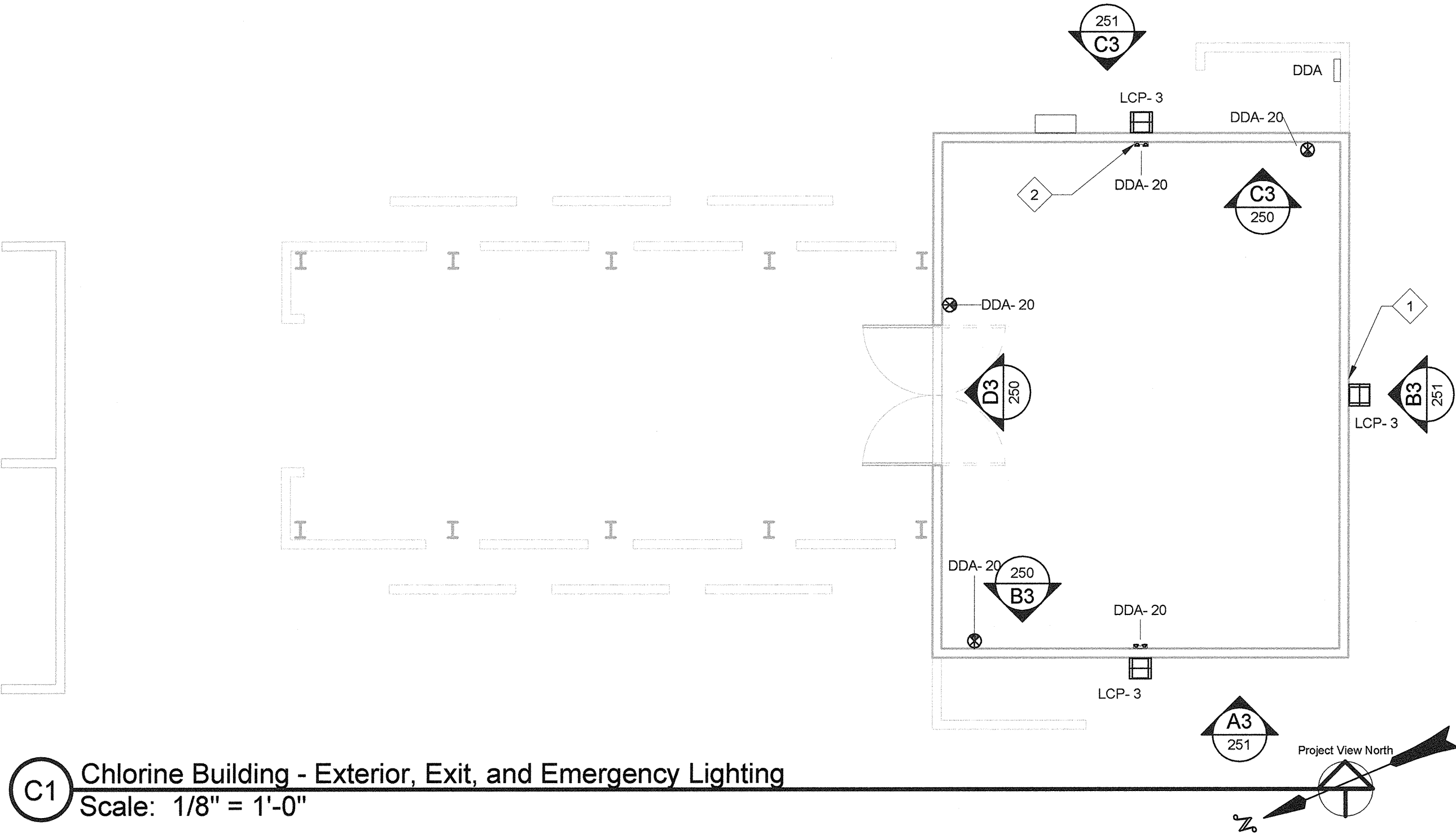
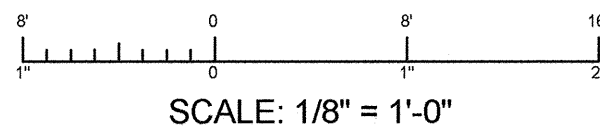
B3 Chlorine Building - Exterior Project View West
Scale: 1/8" = 1'-0"



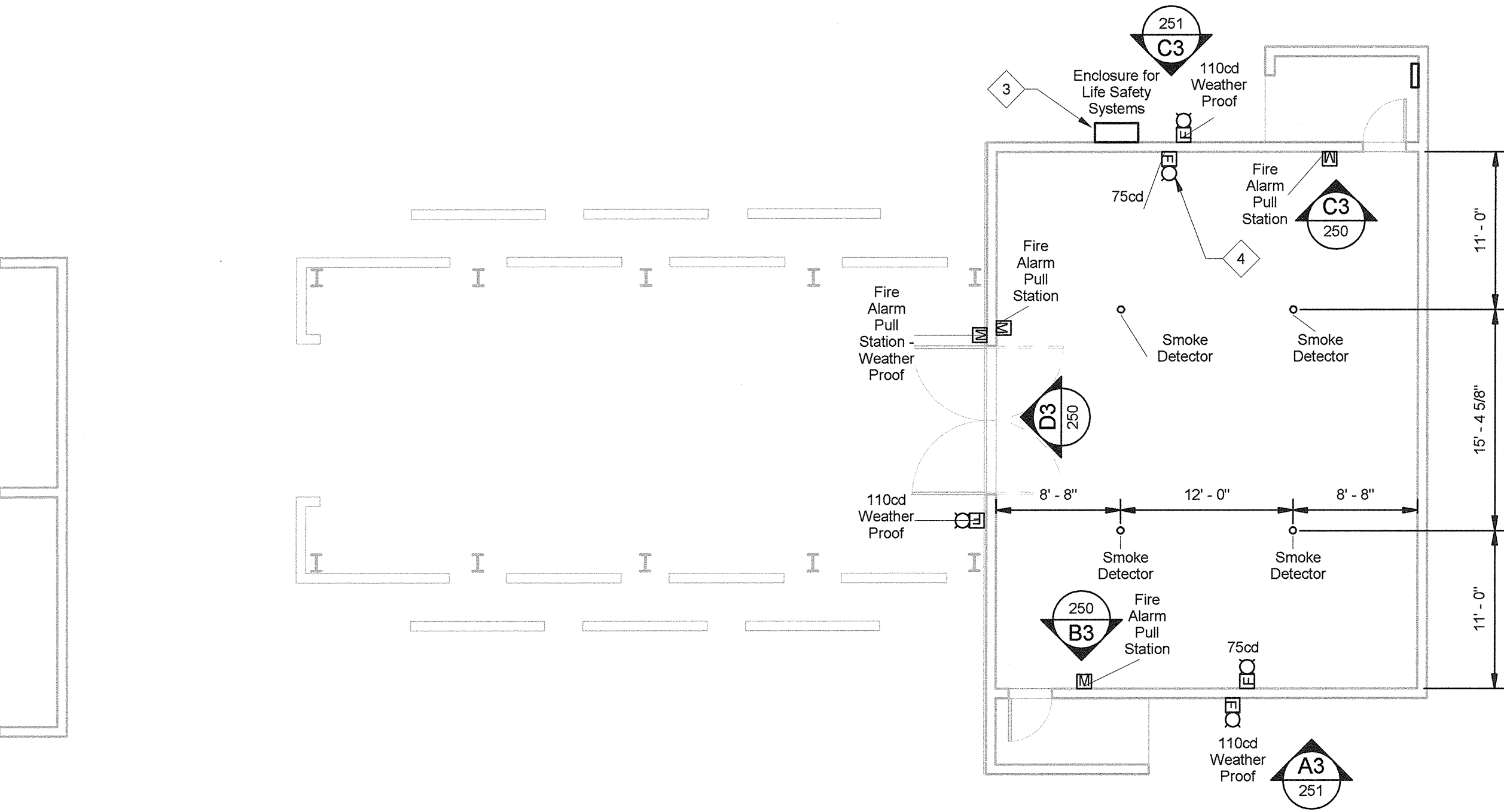
A3 Chlorine Building - Exterior Project View North
Scale: 1/8" = 1'-0"

GENERAL LEGEND

- X DEVICE TAG - SEE SCHEDULE FOR INFORMATION.
- XX KEYNOTE - SEE ELECTRICAL KEYNOTE INFORMATION ON THIS SHEET.
- XXX-## SUPPLY CIRCUIT INFORMATION. PANEL XXX, CIRCUIT ##.



C1 Chlorine Building - Exterior, Exit, and Emergency Lighting
Scale: 1/8" = 1'-0"



A1 Chlorine Building - Fire Protection System
Scale: 1/8" = 1'-0"

DESIGN PHASE

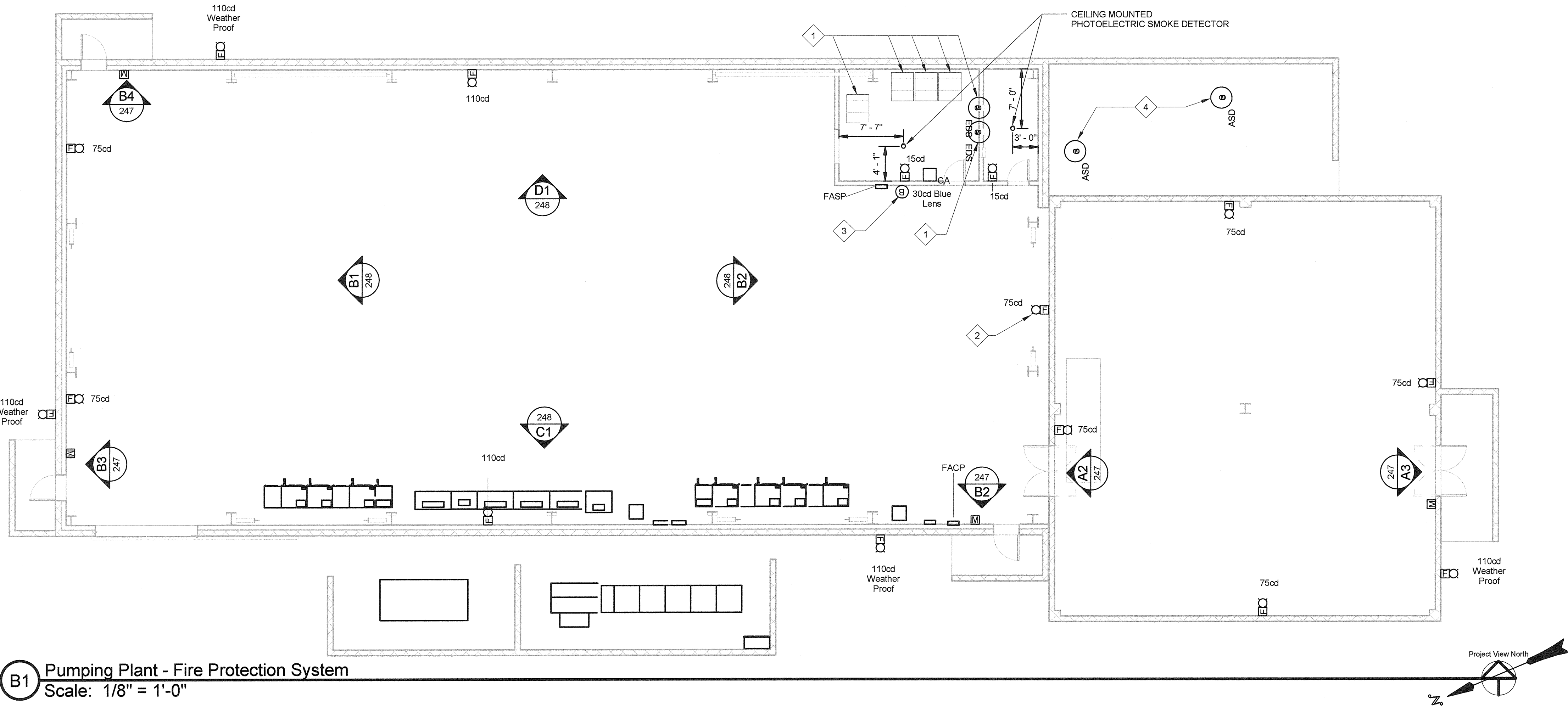
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DESIGN PHASE



B1 Pumping Plant - Fire Protection System
Scale: 1/8" = 1'-0"

FIRE PROTECTION NOTES

1. INITIATING AND NOTIFICATION SIGNALS CAN BE FOUND ON THE FIRE CONTROL SEQUENCE OF OPERATIONS SHEET.
2. SEE INTERIOR ELEVATIONS SHEET FOR LOCATION OF MANUAL RELEASE WARNING SIGN.
3. SEE ELEVATION VIEW SHEETS FOR MOUNTING HEIGHTS OF DEVICES.

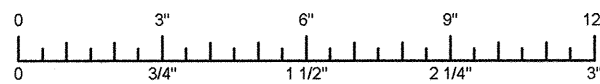
ELECTRICAL KEYNOTES

Value	Text
1	ASPIRATING SMOKE DETECTION PIPING SHALL BE INSTALLED IN ALL RACKS. CONNECT TO EARLY DETECTION SYSTEM (EDS).
2	FIRE NOTIFICATION CLEAR LENS HORN/STROBE, TYPICAL. CANDELA RATING AS SHOWN.
3	FIRE NOTIFICATION BLUE LENS STROBE. SEE FIRE CONTROL SEQUENCE OF OPERATIONS SHEET.
4	ASPIRATING SMOKE DUCT DETECTOR (ASD). INSTALL IN EVAPORATIVE COOLER DUCTWORK PER MANUFACTURERS RECOMMENDATIONS.

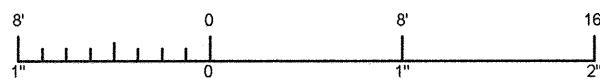
GENERAL LEGEND



KEYNOTE - SEE ELECTRICAL KEYNOTE INFORMATION ON THIS SHEET.



SCALE: 3" = 1'-0"



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

SAFETY

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
NAVAJO GALLOP WATER SUPPLY PROJECT
NEW MEXICO
SAN JUAN LATERAL
TOHLAKAI PUMPING PLANT
ELECTRICAL INSTALLATION
PUMPING PLANT - FIRE PROTECTION SYSTEM

Jeremiah Bradshaw
DESIGNED
Jeremiah Bradshaw
DRAWN
Michel Schuh
CHECKED
TECH. APPR. Jeremiah Bradshaw P.E.
ADMIN. APPROVAL
Jay Rodgers
Electrical Design Group, Mesa
DENVER, COLORADO 2013-08-16

PUMPING PLANT - FIRE PROTECTION SYSTEM

1695-D-252

REV NO	DATE	NAME	PROF.	ABBR.	STA	DESCRIPTION
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CAD SYSTEM
AutoCAD Rev. 19.0s
CAD FILENAME
1695-D-XXXX CABLE & CONDUIT SCHEDULE REV 1.DWG
DATE AND TIME PLOTTED
AUGUST 19, 2013 11:41
PLOTTED BY
JBR405AHW

D

C

B

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C

B

A

CONDUIT NO.	CONDUIT SIZE (INCHES)	CONDUCTOR SIZE	CONDUIT MATERIAL	PURPOSE	ORIGINATING POINT	TERMINATING POINT
1a	3	3-1/c 2/0 AWG 5/8kV	PVC/RMC	WAPA power to MV Switchgear UCA2.	EYA	MV Switchgear UCA2
1b	3	3-1/c 2/0 AWG 5/8kV	PVC/RMC	WAPA power to MV Switchgear UCA2.	EYA	MV Switchgear UCA2
1c	3	3-1/c 2/0 AWG 5/8kV	PVC/RMC	WAPA power to MV Switchgear UCA2.	EYA	MV Switchgear UCA2
2a	3	3-1/c 2/0 AWG 5/8kV	PVC/RMC	Emergency Power Connectors	Eng Gen Term Box	MV Switchgear UCA1
2b	3	3-1/c 2/0 AWG 5/8kV	PVC/RMC	Emergency Power Connectors	Eng Gen Term Box	MV Switchgear UCA1
2c	3	3-1/c 2/0 AWG 5/8kV	PVC/RMC	Emergency Power Connectors	Eng Gen Term Box	MV Switchgear UCA1
3a	3	3-1/c 2 AWG 5/8kV	PVC/RMC	MCE 12.1 4160V Power	UXA4	MCE 12.1
3b	3	3-1/c 2 AWG 5/8kV	PVC/RMC	MCE 12.1 4160V Power	UXA4	MCE 12.1
4a	3	3-1/c 2 AWG 5/8kV	PVC/RMC	MCE 12B 4160V Power	UXA3	MCE 12B
4b	3	3-1/c 2 AWG 5/8kV	PVC/RMC	MCE 12B 4160V Power	UXA3	MCE 12B
5a	2.5	4-1/c 4/0 AWG	RMC	KXA Secondary feed to DCA	KXA	DCA
5b	2.5	4-1/c 4/0 AWG	RMC	KXA Secondary feed to DCA	KXA	DCA
5c	2.5	4-1/c 4/0 AWG	RMC	KXA Secondary feed to DCA	KXA	DCA
6a	2	4-1/c 1/0 AWG	RMC	Engine Gen to DCA	Engine Gen Term Box	DCA ATS
6b	2	4-1/c 1/0 AWG	RMC	Engine Gen to DCA	Engine Gen Term Box	DCA ATS
7	1.5	1-3/c 12 AWG	RMC	EG Coolant Heater Power	Engine Gen 120V Term Box	Power Wireway Section C
		1-3/c 12 AWG		EG Battery Charger Power	Engine Gen 120V Term Box	Power Wireway Section C
		1-3/c 12 AWG		EG Battery Heater	Engine Gen 120V Term Box	Power Wireway Section C
8	1	1-5/c 14 AWG	RMC	EG Annunciator and ATS Control Signals	EG Signal Box	Instrument Wireway Section C
		2- TSP 16 AWG		EG Annunciator and ATS Control Signals	EG Signal Box	Instrument Wireway Section C
9	2.5	3-1/c 6 AWG 5/8kV	PVC/RMC	Unit 1 4160V Power	Unit 1 RVSS	Unit 1 MV Terminal Box
10	1	1-3/c 12 AWG	PVC/RMC	Unit 1 Space Heater Power	Unit 1 RVSS	Unit 1 LV Terminal Box
		1-3/c 12 AWG		Unit 1 Seal Water Solenoid	Unit 1 RVSS	Unit 1 LV Terminal Box
11	1.5	10 Triads 16 AWG	PVC/RMC	Unit 1 Motor RTDs	Unit 1 RVSS	Unit 1 LV Terminal Box
12	2.5	3-1/c 4 AWG 5/8kV	PVC/RMC	Unit 2 4160V Power	Unit 2 RVSS	Unit 2 MV Terminal Box
13	1	1-3/c 12 AWG	PVC/RMC	Unit 2 Space Heater Power	Unit 2 RVSS	Unit 2 LV Terminal Box
		1-3/c 12 AWG		Unit 2 Seal Water Solenoid	Unit 2 RVSS	Unit 2 LV Terminal Box
14	1.5	10 Triads 16 AWG	PVC/RMC	Unit 2 Motor RTDs	Unit 2 RVSS	Unit 2 LV Terminal Box
15	2.5	3-1/c 4 AWG 5/8kV	PVC/RMC	Unit 3 4160V Power	Unit 3 RVSS	Unit 3 MV Terminal Box
16	1	1-3/c 12 AWG	PVC/RMC	Unit 3 Space Heater Power	Unit 3 RVSS	Unit 3 LV Terminal Box
		1-3/c 12 AWG		Unit 3 Seal Water Solenoid	Unit 3 RVSS	Unit 3 LV Terminal Box
17	1.5	10 Triads 16 AWG	PVC/RMC	Unit 3 Motor RTDs	Unit 3 RVSS	Unit 3 LV Terminal Box
18	2.5	3-1/c 6 AWG 5/8kV	PVC/RMC	Unit 4 4160V Power	Unit 4 RVSS	Unit 4 MV Terminal Box
19	1	1-3/c 12 AWG	PVC/RMC	Unit 4 Space Heater Power	Unit 4 RVSS	Unit 4 LV Terminal Box
		1-3/c 12 AWG		Unit 4 Seal Water Solenoid	Unit 4 RVSS	Unit 4 LV Terminal Box
20	1.5	10 Triads 16 AWG	PVC/RMC	Unit 4 Motor RTDs	Unit 4 RVSS	Unit 4 LV Terminal Box
21	2.5	3-1/c 6 AWG 5/8kV	PVC/RMC	Unit 5 4160V Power	Unit 5 RVSS	Unit 5 MV Terminal Box
22	1	1-3/c 12 AWG	PVC/RMC	Unit 5 Space Heater Power	Unit 5 RVSS	Unit 5 LV Terminal Box
		1-3/c 12 AWG		Unit 5 Seal Water Solenoid	Unit 5 RVSS	Unit 5 LV Terminal Box
23	1.5	10 Triads 16 AWG	PVC/RMC	Unit 5 Motor RTDs	Unit 5 RVSS	Unit 5 LV Terminal Box
24	2.5	3-1/c 6 AWG 5/8kV	PVC/RMC	Unit 6 4160V Power	Unit 6 RVSS	Unit 6 MV Terminal Box
25	1	1-3/c 12 AWG	PVC/RMC	Unit 6 Space Heater Power	Unit 6 RVSS	Unit 6 LV Terminal Box
		1-3/c 12 AWG		Unit 6 Seal Water Solenoid	Unit 6 RVSS	Unit 6 LV Terminal Box
26	1.5	10 Triads 16 AWG	PVC/RMC	Unit 6 Motor RTDs	Unit 6 RVSS	Unit 6 LV Terminal Box
27	2.5	3-1/c 6 AWG 5/8kV	PVC/RMC	Unit 7 4160V Power	Unit 7 RVSS	Unit 7 MV Terminal Box
28	1	1-3/c 12 AWG	PVC/RMC	Unit 7 Space Heater Power	Unit 7 RVSS	Unit 7 LV Terminal Box
		1-3/c 12 AWG		Unit 7 Seal Water Solenoid	Unit 7 RVSS	Unit 7 LV Terminal Box
29	1.5	10 Triads 16 AWG	PVC/RMC	Unit 7 Motor RTDs	Unit 7 RVSS	Unit 7 LV Terminal Box
30	1	1-5/c 14 AWG	PVC/RMC	Unit 1 V1.1 Position	Instrument Wireway Section A	Unit 1 V1.1 JBox
		1-3/c 14 AWG		Unit 1 Suction Pressure	Instrument Wireway Section A	Unit 1 Suction Pressure Switch
31	1	2-RS-485 (TSP 16 AWG)	PVC/RMC	Unit 1 V1.2, V1.4, V1.5, & V1.7 Position/Control	Instrument Wireway Section A	Unit 1 V1.2 JBox
		1-3/c 14 AWG		Unit 1 Discharge Pressure	Instrument Wireway Section A	Unit 1 Discharge Pressure Switch
32	1	2-RS-485 (TSP 16 AWG)	PVC/RMC	Unit 1 V1.2, V1.4, V1.5, & V1.7 Position/Control	Unit 1 V1.2 Jbox	Unit 1 V1.4, V1.5, & V1.7 JBox
33	1.5	5-4/c 12 AWG	PVC/RMC	Unit 1 V1.1, V1.2, V1.4, V1.5, & V1.7 Power	DCA	Unit 1 V1.4, V1.5, & V1.7 JBox
34	1.5	2-4/c 12 AWG	PVC/RMC	Unit 1 V1.1 & V1.2 Power	Unit 1 V1.4, V1.5, & V1.7 JBox	Unit 1 V1.2 JBox
35	1	1-4/c 12 AWG	PVC/RMC	Unit 1 V1.2 Power	Unit 1 V1.4, V1.5, & V1.7 JBox	Unit 1 V1.2 JBox
36	1	1-5/c 14 AWG	PVC/RMC	Unit 2 V2.1 Position	Instrument Wireway Section A	Unit 2 V2.1 JBox
		1-3/c 14 AWG		Unit 2 Suction Pressure	Instrument Wireway Section A	Unit 2 Suction Pressure Switch
37	1	2-RS-485 (TSP 16 AWG)	PVC/RMC	Unit 2 V2.2 Position/Control	Instrument Wireway Section A	Unit 2 V2.2 JBox
		1-3/c 14 AWG		Unit 2 Discharge Pressure	Instrument Wireway Section A	Unit 2 Discharge Pressure Switch

NOTES

1. Buried conduit to be Schedule 80 PVC conduit.
2. PVC conduit to transition to RMC at stub-up per specification.

REFERENCE DRAWINGS

- Site Conduit Plan 1695-D-238
Pumping Plant - Subsurface Conduit Plan 1695-D-239
Air Chamber and Chlorine Building - Subsurface Conduit Plan 1695-D-240
Pumping Plant - Interior Conduit Plan 1695-D-241
Air Chamber and Chlorine Building - Interior Conduit Plan 1695-D-242

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U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
NAVAJO GALLUP WATER SUPPLY PROJECT
NEW MEXICO

SAN JUAN LATERAL
TOHLAKAI PUMPING PLANT
ELECTRICAL INSTALLATION
CABLE AND CONDUIT
SCHEDULE

DESIGNED Darryl Liscomb
DRAWN Darryl Liscomb
CHECKED Michel Schuh
TECH. APPR. Michel Schuh, P.E.
ADMIN. APPROVAL Jay Higgins, P.E.
Electrical Design Group, Manning
DENVER, COLORADO 2010-08-16

CABLE & CONDUIT

1695-D-253

SHEET 1 OF 4

CAD SYSTEM
10/20/2016
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1695-D-254X
CABLE & CONDUIT SCHEDULE REV 1.DWG
DATE AND TIME PLOTTED
AUGUST 19, 2015 11:41
PLOTTED BY
JBRADSHAW

CONDUIT NO.	CONDUIT SIZE (INCHES)	CONDUCTOR SIZE	CONDUIT MATERIAL	PURPOSE	ORIGINATING POINT	TERMINATING POINT
38	1	1-4/c 12 AWG	PVC/RMC	Unit 2 V2.2 Power	DCA	Unit 2 V2.2 JBox
39	1	1-5/c 14 AWG	PVC/RMC	Unit 3 V3.1 Position	Instrument Wireway Section A	Unit 3 V3.1 JBox
		1-3/c 14 AWG		Unit 3 Suction Pressure	Instrument Wireway Section A	Unit 3 Suction Pressure Switch
40	1	2-RS-485 (TSP 16 AWG)	PVC/RMC	Unit 3 V3.2 Position/Control	Instrument Wireway Section A	Unit 3 V3.2 JBox
		1-3/c 14 AWG		Unit 3 Discharge Pressure	Instrument Wireway Section A	Unit 3 Discharge Pressure Switch
41	1	1-4/c 12 AWG	PVC/RMC	Unit 3 V3.2 Power	DCA	Unit 3 V3.2 JBox
42	1	1-5/c 14 AWG	PVC/RMC	Unit 4 V4.1 Position	Instrument Wireway Section A	Unit 4 V2.1 JBox
		1-3/c 14 AWG		Unit 4 Suction Pressure	Instrument Wireway Section A	Unit 4 Suction Pressure Switch
43	1	2-RS-485 (TSP 16 AWG)	PVC/RMC	Unit 4 V142, V4.4, V4.5, & V4.7 Position/Control	Instrument Wireway Section A	Unit 4 V4.2 Jbox
		1-3/c 14 AWG		Unit 4 Discharge Pressure	Instrument Wireway Section A	Unit 4 Discharge Pressure Switch
44	1	2-RS-485 (TSP 16 AWG)	PVC/RMC	Unit 4 V142, V4.4, V4.5, & V4.7 Position/Control	Unit 1 V1.2 Jbox	Unit 1 V1.4, V1.5, & V1.7 JBox
45	1.5	5-4/c 12 AWG	PVC/RMC	Unit 4 V4.1, V4.2, V4.4, V4.5, & V4.7 Power	DCA	Unit 4 V4.2 Jbox
46	1.5	2-4/c 12 AWG	PVC/RMC	Unit 4 V4.1 & V4.2 Power	DCA	Unit 4 V4.2 Jbox
47	1	1-4/c 12 AWG	PVC/RMC	Unit 4 V4.1 Power	DCA	Unit 4 V4.2 Jbox
48	1	1-5/c 14 AWG	PVC/RMC	Unit 5 V5.1 Position	Instrument Wireway Section A	Unit 5 V5.1 JBox
		1-3/c 14 AWG		Unit 5 Suction Pressure	Instrument Wireway Section A	Unit 5 Suction Pressure Switch
49	1	2-RS-485 (TSP 16 AWG)	PVC/RMC	Unit 5 V5.2 Position/Control	Instrument Wireway Section A	Unit 5 V5.2 Jbox
		1-3/c 14 AWG		Unit 5 Discharge Pressure	Instrument Wireway Section A	Unit 5 Discharge Pressure Switch
50	1	1-4/c 12 AWG	PVC/RMC	Unit 5 V5.2 Power	DCA	Unit 5 V5.2 Jbox
51	1	1-5/c 14 AWG	PVC/RMC	Unit 6 V6.1 Position	Instrument Wireway Section A	Unit 6 V6.1 JBox
		1-3/c 14 AWG		Unit 6 Suction Pressure	Instrument Wireway Section A	Unit 6 Suction Pressure Switch
52	1	2-RS-485 (TSP 16 AWG)	PVC/RMC	Unit 6 V6.2 Position/Control	Instrument Wireway Section A	Unit 6 V6.2 JBox
		1-3/c 14 AWG		Unit 6 Discharge Pressure	Instrument Wireway Section A	Unit 6 Discharge Pressure Switch
53	1	1-4/c 12 AWG	PVC/RMC	Unit 6 V6.2 Power	DCA	Unit 6 V6.2 JBox
54	1	1-5/c 14 AWG	PVC/RMC	Unit 7 V7.7 Position	Instrument Wireway Section A	Unit 7 V7.7 JBox
		1-3/c 14 AWG		Unit 7 Suction Pressure	Instrument Wireway Section A	Unit 7 Suction Pressure Switch
55	1	2-RS-485 (TSP 16 AWG)	PVC/RMC	Unit 7 V7.2 Position/Control	Instrument Wireway Section A	Unit 7 V7.2 JBox
		1-3/c 14 AWG		Unit 7 Discharge Pressure	Instrument Wireway Section A	Unit 7 Discharge Pressure Switch
56	1	1-4/c 12 AWG	PVC/RMC	Unit 7 V7.2 Power	Unit 7 V7.4, V7.5, & V7.7 JBox	Unit 7 V7.2 JBox
57	1	1-4/c 12 AWG	RMC	Service Air Compressor Power	Power Wireway Section A	Service Air Compressor
58	1	1-4/c 12 AWG	RMC	UH-5 Power	Power Wireway Section A	UH-5
59	1	1-4/c 12 AWG	RMC	UH-6 Power	Power Wireway Section A	UH-6
60	1	1-4/c 12 AWG	RMC	UH-4 Power	Power Wireway Section F	UH-4
61	1	1-4/c 12 AWG	RMC	UH-3 Power	Power Wireway Section D	UH-3
62	1	1-4/c 12 AWG	RMC	UH-2 Power	Power Wireway Section C	UH-2
63	1	1-4/c 12 AWG	RMC	UH-1 Power	Power Wireway Section B	UH-1
64	1	1-4/c 12 AWG	RMC	EF-3 Power	Power Wireway Section B	EF-3
65	1	1-4/c 12 AWG	RMC	Garage Door Motor Operator Power	Power Wireway Section C	Garage Door Motor Operator
66	1	1-3/c 12 AWG	RMC	SF-1, SF-2, SF-3, & SF-4 Power	Power Wireway Section B	SF-1 Jbox
67	1	1-3/c 12 AWG	RMC	SF-2, SF-3, & SF-4 Power	SF-1 Jbox	SF-2 Jbox
68	1	1-3/c 12 AWG	RMC	SF-3 & SF-4 Power	SF-2 Jbox	SF-3 Jbox
69	1	1-3/c 12 AWG	RMC	SF-4 Power	SF-3 Jbox	SF-4 Jbox
70	1	1-4/c 12 AWG	RMC	UH-7 Power	Power Wireway Section G	UH-7
71	1	1-4/c 10 AWG	PVC/RMC	ECU-1 Power	Power Wireway Section G	ECU-1
72	NOT USED					
73	1	1-8/c 18 AWG	PVC/RMC	ECU-1 Control	Instrument Wireway Section F	ECU-1
74	1	1-4/c 10 AWG	PVC/RMC	ECU-2 Power	Power Wireway Section G	ECU-1
75	NOT USED					
76	1	1-8/c 18 AWG	PVC/RMC	ECU-2 Control	Instrument Wireway Section F	ECU-1
77	1	1-4/c 12 AWG	RMC	Building Sump Pump Power	Power Wireway Section G	Building Sump Pump
78	1	1-4/c 12 AWG	RMC	UH-8 Power	Power Wireway Section E	UH-8
79	1	1-4/c 12 AWG	RMC	UH-9 Power	Power Wireway Section E	UH-4
80	1	1-4/c 12 AWG	RMC	UH-10 Power	Power Wireway Section G	UH-3
81	1.5	2-4/c 10 AWG	PVC/RMC	12B Air Comp No. 1 & No. 2 Power	Power Wireway Section G	12B Air Chamber Controller
		1-3/c 12 AWG		12B Air Chamber Control Power	Power Wireway Section G	12B Air Chamber Controller
82	1	2-TSP 16 AWG	PVC/RMC	12B Air Chamber Control	Instrument Wireway Section F	12B Air Chamber Controller
83	1	1-9/c 14	PVC/RMC	12B Air Chamber No. 1 Control Signals	12B Air Chamber Controller	12B Air Chamber No. 1

NOTES
1. Buried conduit to be Schedule 80 PVC conduit.
2. PVC conduit to transition to RMC at stub-up per specification.

REFERENCE DRAWINGS

Site Conduit Plan 1695-D-238
Pumping Plant – Subsurface Conduit Plan 1695-D-239
Air Chamber and Chlorine Building – Subsurface Conduit Plan 1695-D-240
Pumping Plant – Interior Conduit Plan 1695-D-241
Air Chamber and Chlorine Building – Interior Conduit Plan 1695-D-242

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NAVAJO GALLUP WATER SUPPLY PROJECT
NEW MEXICO
SAN JUAN LATERAL
TOHLAKAI PUMPING PLANT
ELECTRICAL INSTALLATION
CABLE AND CONDUIT
SCHEDULE

Darryl Liscomb
DESIGNED Darryl Liscomb
DRAWN Michel Schuh
CHECKED Michel Schuh, P.E.
TECH. APPR. Michel Schuh, P.E.
ADMIN. APPROVAL Jay Rogers, P.E.
Electrical Design Group Manager
DENVER, COLORADO 2013-08-16

CABLE & CONDUIT

1695-D-254

SHEET 2 OF 4

87	1	1-9/c 14	PVC/RMC	121 Air Chamber No. 1 Control Signals	12.1 Air Chamber Controller	12.1 Air Chamber No. 1
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1. Buried conduit to be Schedule 80 PVC conduit.
2. PVC conduit to transition to RMC at stub-up per specification.

<i>Site Conduit Plan</i>	<i>1695-D-238</i>
<i>Pumping Plant – Subsurface Conduit Plan</i>	<i>1695-D-239</i>
<i>Air Chamber and Chlorine Building – Subsurface Conduit Plan</i>	<i>1695-D-240</i>
<i>Pumping Plant – Interior Conduit Plan</i>	<i>1695-D-241</i>
<i>Air Chamber and Chlorine Building – Interior Conduit Plan</i>	<i>1695-D-242</i>



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ELECTRICAL INSTALLATION CABLE AND CONDUIT SCHEDULE

1695-D-255

SHEET 3 OF 4

CAD SYSTEM
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CAD FILENAME
1695-D-XXXX CABL

1. Buried conduit to be Schedule 80 PVC conduit.
2. PVC conduit to transition to RMC at stub-up per specification.

<i>Site Conduit Plan</i>	<i>1695-D-236</i>
<i>Pumping Plant – Subsurface Conduit Plan</i>	<i>1695-D-239</i>
<i>Air Chamber and Chlorine Building – Subsurface Conduit Plan</i>	<i>1695-D-240</i>
<i>Pumping Plant – Interior Conduit Plan</i>	<i>1695-D-241</i>
<i>Air Chamber and Chlorine Building – Interior Conduit Plan</i>	<i>1695-D-242</i>

DATE AND TIME PLOTTED
AUGUST 19, 2013 11:41
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JBRADSHAW

CAD SYSTEM
AutoCAD Rel. 19.0s
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1695-D-XXXX CABLE & CONDUIT SCHEDULE REV 1.DWG

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NEW MEXICO

**SAN JUAN LATERAL
TOHLAKAI PUMPING PLANT
ELECTRICAL INSTALLATION
CABLE AND CONDUIT
SCHEDULE**

CABLE & CONDUIT

SHEET 4 OF 4

CAD SYSTEM
AutoCAD 2013
DATE, AND TIME PLOTTED
AUGUST 19, 2013 12:51
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J.BROUSHAW
CAD FILENAME
1695-D-XXXX WIREWAY SCHEDULING

WIREWAY SECTION	WIREWAY SIZE	CONDUCTOR SIZE	PURPOSE	CABLE ORIGINATING POINT	TERMINATING POINT
Instrument A	4" X 4"	2-TSP 16 AWG	Chlorine Sample Pump Signal	Control Room	Chlorine Sample Pump Controller
		1-TSP 16 AWG	LP Tank Level Inst Signal	Control Room	LP Tank Level Inst
		1-TSP 16 AWG	Metering Vault 2 Flow Meter Signal	Control Room	Metering Vault 2 Flow Meter
		1-8/c 18 AWG	ECU-1 Control	ECU-1 Controller	ECU-1
		1-TSP 16 AWG	Chlorine Vault 1 Sump Level Alarm Signal	Control Room	Chlorine Vault 1 Sump Level Alarm
		1-TSP 16 AWG	Valve Vault 1 Sump Level Alarm Signal	Control Room	Valve Vault 1 Sump Level Alarm
		1-TSP 16 AWG	Metering Vault 2 Sump Level Alarm Signal	Control Room	Metering Vault 2 Sump Level Alarm
		1-TSP 16 AWG	Storage Tank T1 Level Inst Signal	Control Room	Storage Tank T1 Level Inst
		1-3/c 14 AWG	Unit 1 Discharge Pressure	Control Room	Unit 1 Discharge Pressure Switch
		1-3/c 14 AWG	Unit 1 Suction Pressure	Control Room	Unit 1 Suction Pressure Switch
		1-5/c 14 AWG	Unit 1 V1.1 Position	Control Room	Unit 1 V1.1 JBox
		2-RS-485 (TSP 16 AWG)	Unit 1 V1.2, V1.4, V1.5, & V1.7 Position/Control	Control Room	Unit 1 V1.2 JBox
		1-3/c 14 AWG	Unit 2 Discharge Pressure	Control Room	Unit 2 Discharge Pressure Switch
		1-3/c 14 AWG	Unit 2 Suction Pressure	Control Room	Unit 2 Suction Pressure Switch
		1-5/c 14 AWG	Unit 2 V2.1 Position	Control Room	Unit 2 V2.1 JBox
		2-RS-485 (TSP 16 AWG)	Unit 2 V2.2 Position/Control	Control Room	Unit 2 V2.2 JBox
		1-3/c 14 AWG	Unit 3 Discharge Pressure	Control Room	Unit 3 Discharge Pressure Switch
		1-3/c 14 AWG	Unit 3 Suction Pressure	Control Room	Unit 3 Suction Pressure Switch
		1-5/c 14 AWG	Unit 3 V3.1 Position	Control Room	Unit 3 V3.1 JBox
		2-RS-485 (TSP 16 AWG)	Unit 3 V3.2 Position/Control	Control Room	Unit 3 V3.2 JBox
		1-3/c 14 AWG	Unit 4 Discharge Pressure	Control Room	Unit 4 Discharge Pressure Switch
		1-3/c 14 AWG	Unit 4 Suction Pressure	Control Room	Unit 4 Suction Pressure Switch
		1-5/c 14 AWG	Unit 4 V4.1 Position	Control Room	Unit 4 V2.1 JBox
		2-RS-485 (TSP 16 AWG)	Unit 4 V4.2, V4.4, V4.5, & V4.7 Position/Control	Control Room	Unit 4 V4.2 Jbox
		1-3/c 14 AWG	Unit 5 Discharge Pressure	Control Room	Unit 5 Discharge Pressure Switch
		1-3/c 14 AWG	Unit 5 Suction Pressure	Control Room	Unit 5 Suction Pressure Switch
		1-5/c 14 AWG	Unit 5 V5.1 Position	Control Room	Unit 5 V5.1 JBox
		2-RS-485 (TSP 16 AWG)	Unit 5 V5.2 Position/Control	Control Room	Unit 5 V5.2 Jbox
		1-3/c 14 AWG	Unit 6 Discharge Pressure	Control Room	Unit 6 Discharge Pressure Switch
		1-3/c 14 AWG	Unit 6 Suction Pressure	Control Room	Unit 6 Suction Pressure Switch
		1-5/c 14 AWG	Unit 6 V6.1 Position	Control Room	Unit 6 V6.1 JBox
		2-RS-485 (TSP 16 AWG)	Unit 6 V6.2 Position/Control	Control Room	Unit 6 V6.2 JBox
		1-3/c 14 AWG	Unit 7 Discharge Pressure	Control Room	Unit 7 Discharge Pressure Switch
		1-3/c 14 AWG	Unit 7 Suction Pressure	Control Room	Unit 7 Suction Pressure Switch
		2-RS-485 (TSP 16 AWG)	Unit 7 V7.2 Position/Control	Control Room	Unit 7 V7.2 JBox
		1-5/c 14 AWG	Unit 7 V7.1 Position	Control Room	Unit 7 V7.7 JBox
		Fiber Optic	Fiber Optic Service to facility	EYB	Control Room
Power A	6" X 6"	1-4/c 12 AWG	Service Air Compressor Power	DCA	Service Air Compressor
		1-4/c 12 AWG	UH-5 Power	DCA	UH-5
		1-4/c 12 AWG	UH-6 Power	DCA	UH-6
		1-3/c 12 AWG	12.1 Chlorine Injection Equipment Power	DCB	12.1 Chlorine Injectors
		1-3/c 12 AWG	12.1 Seal Water Pump Power	DCB	12.1 Seal Water Pump
		1-3/c 12 AWG	12B Chlorine Injection Equipment Power	DCB	12B Chlorine Injectors
		1-3/c 12 AWG	12B Seal Water Pump Power	DCB	12B Seal Water Pump
		1-3/c 12 AWG	Chlorine Sample Pump Power	DCB	Chlorine Sample Pump Controller
		1-3/c 12 AWG	Pre/Post Chlorine Injection Equipment Power	DCB	Pre/Post Chlorine Injectors
		4-1/c 1/0 AWG	480V 3 Phase for Tankless Water Heater	DCA	Pumping Plant Tankless Water Heater

NOTES
1. Color sequence for the 4-conductor control cable shall be BLACK, WHITE, RED, GREEN.

REFERENCE DRAWINGS

Site Conduit Plan 1695-D-238
Pumping Plant - Subsurface Conduit Plan 1695-D-239
Air Chamber and Chlorine Building - Subsurface Conduit Plan 1695-D-240
Pumping Plant - Interior Conduit Plan 1695-D-241
Air Chamber and Chlorine Building - Interior Conduit Plan 1695-D-242

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U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
NAVAJO GALLUP WATER SUPPLY PROJECT
NEW MEXICO

SAN JUAN LATERAL
TOHLAKAI PUMPING PLANT
ELECTRICAL INSTALLATION
WIREWAY SCHEDULE

Darryl Liscomb
DESIGNED Darryl Liscomb
DRAWN Michel Schuh
CHECKED Michel Schuh, P.E.
TECH. APPR. Michel Schuh, P.E.
ADMIN. APPROVAL Jay Rogers, P.E.
Electrical Design Group Manager
DENVER, COLORADO 2013-08-16

WIREWAY SCHEDULE

1695-D-285

SHEET 1 OF 6

CAD SYSTEM
AutoCAD 2013
1695-D-286
WIREWAY SCHEDULE
DATE AND TIME PLOTTED
AUGUST 18, 2015 12:51
PLOTTER
JBRUSHAW

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WIREWAY SECTION	WIREWAY SIZE	CONDUCTOR SIZE	PURPOSE	CABLE ORIGINATING POINT	TERMINATING POINT
Instrument B	4" X 4"	1-TSP 16 AWG	LP Tank Level Inst Signal	Control Room	LP Tank Level Inst
		1-8/c 18 AWG	ECU-1 Control	ECU-1 Controller	ECU-1
		1-8/c 18 AWG	ECU-2 Control	ECU-2 Controller	ECU-1
		1-TSP 16 AWG	Metering Vault 2 Flow Meter Signal	Control Room	Metering Vault 2 Flow Meter
		1-TSP 16 AWG	Storage Tank T1 Level Inst Signal	Control Room	Storage Tank T1 Level Inst
		1-TSP 16 AWG	Chlorine Vault 1 Sump Level Alarm Signal	Control Room	Chlorine Vault 1 Sump Level Alarm
		1-TSP 16 AWG	Valve Vault 1 Sump Level Alarm Signal	Control Room	Valve Vault 1 Sump Level Alarm
		1-TSP 16 AWG	Metering Vault 2 Sump Level Alarm Signal	Control Room	Metering Vault 2 Sump Level Alarm
		Fiber Optic	Fiber Optic Service to facility	EYB	Control Room
Power B	6" X 6"	1-4/c 12 AWG	EF-3 Power	DCA	EF-3
		1-4/c 12 AWG	Service Air Compressor Power	DCA	Service Air Compressor
		1-4/c 12 AWG	UH-1 Power	DCA	UH-1
		1-4/c 12 AWG	UH-5 Power	DCA	UH-5
		1-4/c 12 AWG	UH-6 Power	DCA	UH-6
		1-3/c 12 AWG	12.1 Chlorine Injection Equipment Power	DCB	12.1 Chlorine Injectors
		1-3/c 12 AWG	12.1 Seal Water Pump Power	DCB	12.1 Seal Water Pump
		1-3/c 12 AWG	12B Chlorine Injection Equipment Power	DCB	12B Chlorine Injectors
		1-3/c 12 AWG	12B Seal Water Pump Power	DCB	12B Seal Water Pump
		1-3/c 12 AWG	Chlorine Sample Pump Power	DCB	Chlorine Sample Pump Controller
		1-3/c 6 AWG	Chlorine Vault 1 Lighting	DCB	Chlorine Vault 1 Lighting
		1-3/c 6 AWG	Chlorine Vault 1 Sump Pump	DCB	Chlorine Vault 1 Sump Pump
		1-3/c 12 AWG	LP Tank Level Inst Power	DCB	LP Tank Level Inst
		1-3/c 12 AWG	Metering Vault 2 Flow Meter Power	DCB	Metering Vault 2 Flow Meter
		1-3/c 10 AWG	Metering Vault 2 Lighting	DCB	Metering Vault 2 Lighting
		1-3/c 10 AWG	Metering Vault 2 Sump Pump	DCB	Metering Vault 2 Sump Pump
		1-3/c 12 AWG	Pre/Post Chlorine Injection Equipment Power	DCB	Pre/Post Chlorine Injectors
		4-3/c 12 AWG	SF-1, SF-2, SF-3, & SF-4 Power	DCB	SF-1 Jbox
		1-3/c 12 AWG	Storage Tank T1 Level Power	DCB	Storage Tank T1 Level Inst
		1-3/c 10 AWG	Valve Vault 1 Lighting	DCB	Valve Vault 1 Lighting
		1-3/c 8 AWG	Valve Vault 1 Sump Pump	DCB	Valve Vault 1 Sump Pump
		1-3/c 12 AWG	Vaporizer Power	DCB	LP Vaporizer
		4-1/c 1/0 AWG	480V 3 Phase for Tankless Water Heater	DCA	Pumping Plant Tankless Water Heater
		1-3/c 4 AWG	Cathodic Protection Rectifier Power	DCB	Cathodic Protection Rectifier

NOTES
1. Color sequence for the 4-conductor control cable shall be BLACK, WHITE, RED, GREEN.

REFERENCE DRAWINGS
Site Conduit Plan 1695-D-238
Pumping Plant - Subsurface Conduit Plan 1695-D-239
Air Chamber and Chlorine Building - Subsurface Conduit Plan 1695-D-240
Pumping Plant - Interior Conduit Plan 1695-D-241
Air Chamber and Chlorine Building - Interior Conduit Plan 1695-D-242

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BUREAU OF RECLAMATION
NAVAJO GALLUP WATER SUPPLY PROJECT
NEW MEXICO
SAN JUAN LATERAL
TOHLAKAI PUMPING PLANT
ELECTRICAL INSTALLATION
WIREWAY SCHEDULE

DESIGNED Darryl Liscomb
DRAWN Michel Schuh
CHECKED Michel Schuh, P.E.
TECH. APPR. Michel Schuh, P.E.
ADMIN. APPROVAL Jay Boggess, P.E.
Electrical Design Group, Manager
DENVER, COLORADO 2013-08-16

WIREWAY SCHEDULE

1695-D-286

SHEET 2 OF 6

D

C

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CAD SYSTEM
AutoCAD Rel. 19.0a
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J.BROUSHAU
CAD FILENAME
1695-D-XXXX WIREWAY SCHEDULING

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WIREWAY SECTION	WIREWAY SIZE	CONDUCTOR SIZE	PURPOSE	CABLE ORIGINATING POINT	TERMINATING POINT
Instrument C	4" X 4"	Cat 6	MCE 12.1 Motor Controller Signals	Control Room	MCE 12.1
		Cat 6	MCE 12.1 Power Monitor Signal	Control Room	MCE 12.1
		1-8/c 18 AWG	ECU-1 Control	ECU-1 Controller	ECU-1
		1-8/c 18 AWG	ECU-2 Control	ECU-2 Controller	ECU-1
Power C	8" X 8"	1-4/c 12 AWG	EF-3 Power	DCA	EF-3
		1-4/c 12 AWG	Garage Door Motor Operator	DCA	Garage Door Motor Operator
		1-4/c 12 AWG	Service Air Compressor Power	DCA	Service Air Compressor
		1-4/c 12 AWG	UH-1 Power	DCA	UH-1
		1-4/c 12 AWG	UH-2 Power	DCA	UH-2
		1-4/c 12 AWG	UH-5 Power	DCA	UH-5
		1-4/c 12 AWG	UH-6 Power	DCA	UH-6
		1-3/c 12 AWG	12.1 Chlorine Injection Equipment Power	DCB	12.1 Chlorine Injectors
		1-3/c 12 AWG	12.1 Seal Water Pump Power	DCB	12.1 Seal Water Pump
		1-3/c 12 AWG	12B Chlorine Injection Equipment Power	DCB	12B Chlorine Injectors
		1-3/c 12 AWG	12B Seal Water Pump Power	DCB	12B Seal Water Pump
		1-3/c 12 AWG	Chlorine Sample Pump Power	DCB	Chlorine Sample Pump Controller
		1-3/c 6 AWG	Chlorine Vault 1 Lighting	DCB	Chlorine Vault 1 Lighting
		1-3/c 6 AWG	Chlorine Vault 1 Sump Pump	DCB	Chlorine Vault 1 Sump Pump
		1-3/c 12 AWG	EG Battery Charger Power	DCB	Engine Gen 120V Term Box
		1-3/c 12 AWG	EG Battery Heater	DCB	Engine Gen 120V Term Box
		1-3/c 12 AWG	EG Coolant Heater Power	DCB	Engine Gen 120V Term Box
		1-3/c 12 AWG	LP Tank Level Inst Power	DCB	LP Tank Level Inst
		1-3/c 12 AWG	Metering Vault 2 Flow Meter Power	DCB	Metering Vault 2 Flow Meter
		1-3/c 10 AWG	Metering Vault 2 Lighting	DCB	Metering Vault 2 Lighting
		1-3/c 10 AWG	Metering Vault 2 Sump Pump	DCB	Metering Vault 2 Sump Pump
		1-3/c 12 AWG	Pre/Post Chlorine Injection Equipment Power	DCB	Pre/Post Chlorine Injectors
		1-3/c 12 AWG	SF-1, SF-2, SF-3, & SF-4 Power	DCB	SF-1 Jbox
		1-3/c 12 AWG	Storage Tank T1 Level Power	DCB	Storage Tank T1 Level Inst
		1-3/c 10 AWG	Valve Vault 1 Lighting	DCB	Valve Vault 1 Lighting
		1-3/c 8 AWG	Valve Vault 1 Sump Pump	DCB	Valve Vault 1 Sump Pump
		1-3/c 12 AWG	Vaporizer Power	DCB	LP Vaporizer
		1-5/c 14 AWG	EG Annunciator and ATS Control Signals	EG Signal Box	DCA
		2-TSP 16 AWG	EG Annunciator and ATS Control Signals	EG Signal Box	DCA
		1-3/c 12 AWG	MV Bus Protection Equipment	DCB	MV Switchgear
		1-3/c 12 AWG	MV Switchgear Space Heater Power	DCB	MV Switchgear
		1-3/c 12 AWG	UXA1 Breaker Control Power	DCB	MV Switchgear
		1-3/c 12 AWG	UXA2 Breaker Control Power	DCB	MV Switchgear
		1-3/c 12 AWG	UXA3 Breaker Control Power	DCB	MV Switchgear
		1-3/c 12 AWG	UXA4 Breaker Control Power	DCB	MV Switchgear
		1-3/c 12 AWG	UXA5 Breaker Control Power	DCB	MV Switchgear
		4-4/c 12 AWG	Unit 1 V1.2, V1.4, V1.5, & V1.7 Power	DCA	Unit 1 V1.5, & V1.7 JBox
		1-4/c 12 AWG	Unit 2 V2.2 Power	DCA	Unit 2 V2.2 JBox
		1-4/c 12 AWG	Unit 3 V3.2 Power	DCA	Unit 3 V3.2 JBox
		4-4/c 12 AWG	Unit 4 V4.2, V4.4, V4.5, & V4.7 Power	DCA	Unit 4 V4.5, & V4.7 JBox
		4-1/c 1/0 AWG	480V 3 Phase for Tankless Water Heater	DCA	Pumping Plant Tankless Water Heater
		1-3/c 4 AWG	Cathodic Protection Rectifier Power	DCB	Cathodic Protection Rectifier

NOTES

1. Color sequence for the 4-conductor control cable shall be BLACK, WHITE, RED, GREEN.

REFERENCE DRAWINGS

Site Conduit Plan 1695-D-238
Pumping Plant - Subsurface Conduit Plan 1695-D-239
Air Chamber and Chlorine Building - Subsurface Conduit Plan 1695-D-240
Pumping Plant - Interior Conduit Plan 1695-D-241
Air Chamber and Chlorine Building - Interior Conduit Plan 1695-D-242

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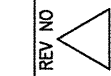
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NAVAJO GALLUP WATER SUPPLY PROJECT
NEW MEXICO
SAN JUAN LATERAL
TOHLAKAI PUMPING PLANT
ELECTRICAL INSTALLATION
WIREWAY SCHEDULE

Darryl Liscomb
DESIGNED Darryl Liscomb
DRAWN Michel Schuh
CHECKED Michel Schuh, P.E.
TECH. APPR. Michel Schuh, P.E.
ADMIN. APPROVAL Jay Boggs, P.E.
Electrical Design Group Manager
DENVER, COLORADO 2013-08-16

WIREWAY SCHEDULE

1695-D-287

SHEET 3 OF 6



CAD SYSTEM
AutoCAD 2013
1695-D-XXXX WIREWAY SCHEDULE.DWG
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JBRADSHAW

WIREWAY SECTION	WIREWAY SIZE	CONDUCTOR SIZE	PURPOSE	CABLE ORIGINATING POINT	TERMINATING POINT
Instrument D	4"X 4"	Cat 6	MCE 12.1 Motor Controller Signals	MCE 12.1	Control Room
		Cat 6	MCE 12.1 Power Monitor Signal	MCE 12.1	Control Room
		Cat 6	MCE 12B Motor Controller Signals	MCE 12B	Control Room
		Cat 6	MCE 12B Power Monitor Signal	MCE 12B	Control Room
		1-8/c 18 AWG	ECU-1 Control	ECU-1 Controller	ECU-1
		1-8/c 18 AWG	ECU-2 Control	ECU-2 Controller	ECU-1
		Cat 6	480Volt Power Monitor Signal	DCA	Control Room
		Cat 6	ATS Control/Monitor Signal	DCA	Control Room
Power D	8" X 8"	1-4/c 10 AWG	12.1 Air Comp No. 1 & No. 2 Power	DCA	12.1 Air Chamber Controller
		1-4/c 10 AWG	12B Air Comp No. 1 & No. 2 Power	DCA	12B Air Chamber Controller
		3-1/c 2/0 AWG	480 Volts to KCA	DCA	KCA
		3-1/c 1/0 AWG	480 Volts to KCB	DCA	KCB
		4-1/c 1/0 AWG	480V 3 Phase for Tankless Water Heater	DCA	C12 Bldg Tankless Water Heater
		1-4/c 10 AWG	ECU-1 Power	DCA	ECU-1
		1-4/c 10 AWG	ECU-2 Power	DCA	ECU-1
		1-4/c 12 AWG	UH-10 Power	DCA	UH-10
		1-4/c 12 AWG	UH-3 Power	DCA	UH-3
		1-4/c 12 AWG	UH-4 Power	DCA	UH-4
		1-4/c 12 AWG	UH-7 Power	DCA	UH-7
		1-4/c 12 AWG	UH-8 Power	DCA	UH-8
		1-4/c 12 AWG	UH-9 Power	DCA	UH-9
		1-3/c 12 AWG	12.1 Air Chamber Control Power	DCB	12.1 Air Chamber Controller
		1-3/c 12 AWG	12.1 Chlorine Injection Equipment Power	DCB	12.1 Chlorine Injectors
		1-3/c 12 AWG	12.1 Seal Water Pump Power	DCB	12.1 Seal Water Pump
		1-3/c 12 AWG	12.1 Seal Water Strainer Power	DCB	12.1 Seal Water Strainer
		1-3/c 12 AWG	12B Air Chamber Control Power	DCB	12B Air Chamber Controller
		1-3/c 12 AWG	12B Chlorine Injection Equipment Power	DCB	12B Chlorine Injectors
		1-3/c 12 AWG	12B Seal Water Pump Power	DCB	12B Seal Water Pump
		1-3/c 12 AWG	12B Seal Water Strainer Power	DCB	12B Seal Water Strainer
		1-4/c 12 AWG	Building Sump Pump Power	DCB	Building Sump Pump
		1-3/c 4 AWG	Cathodic Protection Rectifier Power	DCB	Cathodic Protection Rectifier
		1-3/c 12 AWG	Chlorine Sample Pump Power	DCB	Chlorine Sample Pump Controller
		1-3/c 6 AWG	Chlorine Vault 1 Lighting	DCB	Chlorine Vault 1 Lighting
		1-3/c 6 AWG	Chlorine Vault 1 Sump Pump	DCB	Chlorine Vault 1 Sump Pump
		1-3/c 10 AWG	ECU-1 Heat Tape Power Receptacle	DCB	ECU-1
		1-3/c 10 AWG	ECU-2 Heat Tape Power Receptacle	DCB	ECU-1
		1-3/c 12 AWG	EF-1 Power	DCB	Toilet (EF-1)
		1-3/c 12 AWG	EF-2 Power	DCB	Air Chamber Room (EF-2)
		1-3/c 12 AWG	EG Battery Charger Power	DCB	Engine Gen 120V Term Box
		1-3/c 12 AWG	EG Battery Heater	DCB	Engine Gen 120V Term Box
		1-3/c 12 AWG	EG Coolant Heater Power	DCB	Engine Gen 120V Term Box
		1-3/c 12 AWG	Fire Alarm Control Panel 1	DCB	FACP 1
		1-3/c 12 AWG	Fire Alarm Control Panel 2	DCB	FACP 2
		1-3/c 12 AWG	LP Tank Level Inst Power	DCB	LP Tank Level Inst
		1-3/c 12 AWG	Metering Vault 1 12.1 Flow Meter Power	DCB	Flow Meter Vault 1 Pwr Jbox
		1-3/c 12 AWG	Metering Vault 1 12B Flow Meter Power	DCB	Flow Meter Vault 1 Pwr Jbox
		1-3/c 8 AWG	Metering Vault 1 Lighting	DCB	Flow Meter Vault 1 Pwr Jbox
		1-3/c 6 AWG	Metering Vault 1 Sump Pump	DCB	Flow Meter Vault 1 Pwr Jbox
		1-3/c 12 AWG	Metering Vault 2 Flow Meter Power	DCB	Metering Vault 2 Flow Meter
		1-3/c 10 AWG	Metering Vault 2 Lighting	DCB	Metering Vault 2 Lighting
		1-3/c 10 AWG	Metering Vault 2 Sump Pump	DCB	Metering Vault 2 Sump Pump
		1-3/c 12 AWG	MV Bus Protection Equipment	DCB	MV Switchgear
		1-3/c 12 AWG	MV Switchgear Space Heater Power	DCB	MV Switchgear
		1-3/c 12 AWG	Pre/Post Chlorine Injection Equipment Power	DCB	Pre/Post Chlorine Injectors
		1-3/c 12 AWG	PTAC-1 Power	DCB	Control Room
		1-3/c 10 AWG	Restroom Hot Water Heater	DCB	Toilet
		1-3/c 12 AWG	SCADA System Power 1	DCB	Control Room
		1-3/c 12 AWG	SCADA System Power 2	DCB	Control Room
		1-3/c 12 AWG	SCADA System Power 3	DCB	Control Room
		1-3/c 12 AWG	SCADA System Power 4	DCB	Control Room
		4-3/c 12 AWG	SF-1, SF-2, SF-3, & SF-4 Power	DCB	SF-1 Jbox
		1-3/c 12 AWG	Storage Tank T1 Level Power	DCB	Storage Tank T1 Level Inst
		1-3/c 12 AWG	UH-11 Power	DCB	UH-11 Restroom
		1-3/c 12 AWG	UXA1 Breaker Control Power	DCB	MV Switchgear
		1-3/c 12 AWG	UXA2 Breaker Control Power	DCB	MV Switchgear
		1-3/c 12 AWG	UXA3 Breaker Control Power	DCB	MV Switchgear
		1-3/c 12 AWG	UXA4 Breaker Control Power	DCB	MV Switchgear
		1-3/c 12 AWG	UXA5 Breaker Control Power	DCB	MV Switchgear
		1-3/c 10 AWG	Valve Vault 1 Lighting	DCB	Valve Vault 1 Lighting
		1-3/c 8 AWG	Valve Vault 1 Sump Pump	DCB	Valve Vault 1 Sump Pump
		1-3/c 12 AWG	Vaporizer Power	DCB	LP Vaporizer
		1-3/c 10 AWG	Lighting Controller Power	DCA	Lighting Controller
		1-4/c 12 AWG	Unit 5 V5.2 Power	DCA	Unit 5 V5.2 JBox
		1-4/c 12 AWG	Unit 6 V6.2 Power	DCA	Unit 6 V6.2 JBox
		1-4/c 12 AWG	Unit 7 V7.2 Power	DCA	Unit 7 V7.2 JBox
		4-1/c 4/0 AWG	208/120 Volts From KCB	KCB	DDA (C12 Bldg)

NOTES
1. Color sequence for the 4-conductor control cable shall be BLACK, WHITE, RED, GREEN.

REFERENCE DRAWINGS

Site Conduit Plan 1695-D-238
Pumping Plant - Subsurface Conduit Plan 1695-D-239
Air Chamber and Chlorine Building - Subsurface Conduit Plan 1695-D-240
Pumping Plant - Interior Conduit Plan 1695-D-241
Air Chamber and Chlorine Building - Interior Conduit Plan 1695-D-242

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BUREAU OF RECLAMATION
NAVAJO GALLUP WATER SUPPLY PROJECT
NEW MEXICO
**SAN JUAN LATERAL
TOHLAKAI PUMPING PLANT**
ELECTRICAL INSTALLATION
WIREWAY SCHEDULE

Darryl Liscomb
DESIGNED Darryl Liscomb
DRAWN Michel Schuh
CHECKED Michel Schuh P.E.
TECH. APPR. Michel Schuh, P.E.
ADMIN. APPROVAL Jay Boggs, P.E.
Electrical Design Group Manager
DENVER, COLORADO 2013-08-16

WIREWAY SCHEDULE

1695-D-288

SHEET 4 OF 6

CAD SYSTEM
AutoCAD Rev. 19.0s
CAD FILENAME
1695-D-XXXX WIREWAY SCHEDULE.DWG
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WIREWAY SECTION	WIREWAY SIZE	CONDUCTOR SIZE	PURPOSE	CABLE ORIGINATING POINT	TERMINATING POINT
Instrument E	4" X 4"	1-TSP 16 AWG	12.1 Air Chamber Control	Control Room	12.1 Air Chamber Controller
		2-TSP 16 AWG	Fiber Optic & Signal Cable from CI2 Bldg	Control Room	CI2 Bldg
		1-5/c 14 AWG	Fiber Optic & Signal Cable from CI2 Bldg	Control Room	CI2 Bldg
		Fiber Optic	Fiber Optic & Signal Cable from CI2 Bldg	Control Room	CI2 Bldg
Power E	6" X 6"	1-3/c 12 AWG	12.1 Air Chamber Control Power	DCB	12.1 Air Chamber Controller
		2-4/c 10 AWG	12.1 Air Comp No. 1 & No. 2 Power	DCA	12.1 Air Chamber Controller
		4-1/c 1/0 AWG	480V 3 Phase for Tankless Water Heater	DCA	CI2 Bldg Tankless Water Heater
		1-4/c 12 AWG	UH-8 Power	DCA	UH-8
		1-4/c 12 AWG	UH-9 Power	DCA	UH-9
		1-3/c 12 AWG	Metering Vault 1 12.1 Flow Meter Power	DCB	Flow Meter Vault 1 Pwr Jbox
		1-3/c 12 AWG	Metering Vault 1 12B Flow Meter Power	DCB	Flow Meter Vault 1 Pwr Jbox
		1-3/c 8 AWG	Metering Vault 1 Lighting	DCB	Flow Meter Vault 1 Pwr Jbox
		1-3/c 6 AWG	Metering Vault 1 Sump Pump	DCB	Flow Meter Vault 1 Pwr Jbox
		4-1/c 4/0 AWG	208/120 Volts From KCB	KCB	DDA (CI2 Bldg)
		1-3/c 12 AWG	277 Volts for CI2 Bldg Exterior Lighting	Lighting Controller	CI2 Bldg Exterior Lights

WIREWAY SECTION	WIREWAY SIZE	CONDUCTOR SIZE	PURPOSE	CABLE ORIGINATING POINT	TERMINATING POINT
Instrument F	4" X 4"	1-TSP 16 AWG	12.1 Air Chamber Control	Control Room	12.1 Air Chamber Controller
		1-TSP 16 AWG	12B Air Chamber Control	Control Room	12B Air Chamber Controller
		2-TSP 16 AWG	Fiber Optic & Signal Cable from CI2 Bldg	Control Room	CI2 Bldg
		1-5/c 14 AWG	Fiber Optic & Signal Cable from CI2 Bldg	Control Room	CI2 Bldg
		Fiber Optic	Fiber Optic & Signal Cable from CI2 Bldg	Control Room	CI2 Bldg
		Cat 6	MCE 12.1 Motor Controller Signals	Control Room	MCE 12.1
		Cat 6	MCE 12.1 Power Monitor Signal	Control Room	MCE 12.1
		Cat 6	MCE 12B Motor Controller Signals	Control Room	MCE 12B
		Cat 6	MCE 12B Power Monitor Signal	Control Room	MCE 12B
		2-TSP 16 AWG	Metering Vault 1 Flow Meter Signal	Control Room	Flow Meter Vault 1 Instruments
		Cat 6	480Volt Power Monitor Signal	DCA	Control Room
		Cat 6	ATS Control/Monitor Signal	DCA	Control Room
		1-8/c 18 AWG	ECU-1 Control	ECU-1 Controller	ECU-1
		1-8/c 18 AWG	ECU-2 Control	ECU-2 Controller	ECU-1
		1-TSP 16 AWG	12.1 Discharge Manifold Pressure Signal	Control Room	12.1 Discharge Manifold Pressure Transducer
		1-TSP 16 AWG	12B Discharge Manifold Pressure Signal	Control Room	12B Discharge Manifold Pressure Transducer
Power F	6" X 6"	2-4/c 10 AWG	12B Air Comp No. 1 & No. 2 Power	DCA	12B Air Chamber Controller
		1-4/c 10 AWG	ECU-1 Power	DCA	ECU-1
		1-4/c 10 AWG	ECU-2 Power	DCA	ECU-1
		1-4/c 12 AWG	UH-10 Power	DCA	UH-10
		1-4/c 12 AWG	UH-4 Power	DCA	UH-4
		1-4/c 12 AWG	UH-7 Power	DCA	UH-7
		1-3/c 12 AWG	12.1 Seal Water Strainer Power	DCB	12.1 Seal Water Strainer
		1-3/c 12 AWG	12B Air Chamber Control Power	DCB	12B Air Chamber Controller
		1-3/c 12 AWG	12B Seal Water Strainer Power	DCB	12B Seal Water Strainer
		1-4/c 12 AWG	Building Sump Pump Power	DCB	Building Sump Pump
		1-3/c 12 AWG	EF-1 Power	DCB	Toilet (EF-1)
		1-3/c 12 AWG	EF-2 Power	DCB	EF-2
		1-3/c 12 AWG	277 Volts for CI2 Bldg Exterior Lighting	Lighting Controller	CI2 Bldg Exterior Lights
		1-3/c 10 AWG	Lighting Controller Power	DCA	Lighting Controller
		1-3/c 12 AWG	Fire Alarm Control Panel 2	DCB	FACP 2
		1-3/c 12 AWG	PTAC-1 Power	DCB	Office
		1-3/c 10 AWG	Restroom Hot Water Heater	DCB	Toilet
		1-3/c 12 AWG	SCADA System Power 1	DCB	Control Room
		1-3/c 12 AWG	SCADA System Power 2	DCB	Control Room
		1-3/c 12 AWG	SCADA System Power 3	DCB	Control Room
		1-3/c 12 AWG	SCADA System Power 4	DCB	Control Room
		1-3/c 12 AWG	UH-11 Power	DCB	UH-11 Restroom

NOTES
1. Color sequence for the 4-conductor control cable shall be BLACK, WHITE, RED, GREEN.

REFERENCE DRAWINGS

Site Conduit Plan	1695-D-238
Pumping Plant – Subsurface Conduit Plan	1695-D-239
Air Chamber and Chlorine Building – Subsurface Conduit Plan	1695-D-240
Pumping Plant – Interior Conduit Plan	1695-D-241
Air Chamber and Chlorine Building – Interior Conduit Plan	1695-D-242

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BUREAU OF RECLAMATION
NAVAJO GALLUP WATER SUPPLY PROJECT
NEW MEXICO
**SAN JUAN LATERAL
TOHLAKAI PUMPING PLANT**
ELECTRICAL INSTALLATION
WIREWAY SCHEDULE

DESIGNED Darryl Liscomb
DRAWN
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TECH. APPR. Michael Schult, P.E.
ADMIN. APPROVAL Jay Boggs, P.E.
Electrical Design Group Manager
DENVER, COLORADO 2013-08-16

WIREWAY SCHEDULE

1695-D-289

SHEET 5 OF 6

CAD SYSTEM
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1695-D-290-WIREWAY SCHEDULING
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AUGUST 19, 2013 12:51
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JBRKUSHAW

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WIREWAY SECTION	WIREWAY SIZE	CONDUCTOR SIZE	PURPOSE	CABLE ORIGINATING POINT	TERMINATING POINT
Power G	6" X 6"	2-4/c 10 AWG	12B Air Comp No. 1 & No. 2 Power	DCA	12B Air Chamber Controller
		1-4/c 10 AWG	ECU-1 Power	DCA	ECU-1
		1-4/c 10 AWG	ECU-2 Power	DCA	ECU-1
		1-4/c 12 AWG	UH-10 Power	DCA	UH-3
		1-4/c 12 AWG	UH-7 Power	DCA	UH-7
		1-3/c 12 AWG	12B Air Chamber Control Power	DCB	12B Air Chamber Controller
		1-4/c 12 AWG	Building Sump Pump Power	DCB	Building Sump Pump

NOTES
1. Color sequence for the 4-conductor control cable shall be BLACK, WHITE, RED, GREEN.

REFERENCE DRAWINGS

- Site Conduit Plan1695-D-238
- Pumping Plant – Subsurface Conduit Plan1695-D-239
- Air Chamber and Chlorine Building – Subsurface Conduit Plan1695-D-240
- Pumping Plant – Interior Conduit Plan1695-D-241
- Air Chamber and Chlorine Building – Interior Conduit Plan1695-D-242

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NEW MEXICO
SAN JUAN LATERAL
TOHLAKAI PUMPING PLANT
ELECTRICAL INSTALLATION
WIREWAY SCHEDULE

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WIREWAY SCHEDULE

1695-D-290

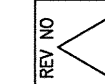
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DESIGN PHASE

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B

A

Lighting Switching Schedule						
Switch ID	Description	Panel	Circuit Number	Type	Family	Count
1	Room 101 Manual On/Vacancy Sensor Off	DCA4	22	Dual Technology - 277 V	Wall Vacancy Sensor - Regular Voltage	1
1	Room 102 Manual On/Vacancy Sensor Off	DCA4	22	Dual Technology - 277 V	Wall Vacancy Sensor - Regular Voltage	1
2	Control Room Rack Lighting	DCA4	22	Single Pole	Lighting Switches	1
3	Bay 1 & 2 Control Switch	DCA4	29	Four Way	Lighting Switches	1
3	Bay 1 & 2 Control Switch	DCA4	29	Three Way	Lighting Switches	2
4	Bay 3 & 4 Control Switch	DCA4	28	Four Way	Lighting Switches	1
4	Bay 3 & 4 Control Switch	DCA4	28	Three Way	Lighting Switches	2
5	Bay 5 & 6 Control Switch	DCA4	22	Four Way	Lighting Switches	1
5	Bay 5 & 6 Control Switch	DCA4	22	Three Way	Lighting Switches	2
6	Air Chamber Main Lighting Control Switch	DCA4	24	Three Way	Lighting Switches	2
7	Air Chamber Wall Lighting Control Switch	DCA4	24	Three Way	Lighting Switches	2
8	Exterior Lighting Dawn to Dusk Photocell	LCP	1	Standard	Photocell	1
9	Chlorine Feed Building	DDA	19	Four Way	Lighting Switches	1
9	Chlorine Feed Building	DDA	19	Three Way	Lighting Switches	2
10	Chlorine Storage	DDA	23	Single Pole	Lighting Switches	1
11	Chlorine Injection Vault 1	DCB1	38	Three Way	Lighting Switches	2
12	Valve Vault 1	DCB1	36	Single Pole	Lighting Switches	1
13	Flowmeter Vault 1	DCB1	33	Three Way	Lighting Switches	2
14	Flowmeter Vault 2	DCB1	47	Single Pole	Lighting Switches	1

Lighting Fixture Schedule											
Type Comments	Comments	Description	Lamp	LED Count	Lamp Quantity	Switch ID	Type	Total Input Wattage	Panel	Circuit Number	Count
Type A	PP-Room 100 - Bay 1	High Bay	T5HO		6	3	6 Lamp High Bay 54W	375 W	DCA4	29	4
Type A	PP-Room 100 - Bay 2	High Bay	T5HO		6	3	6 Lamp High Bay 54W	375 W	DCA4	29	4
Type A	PP-Room 100 - Bay 3	High Bay	T5HO		6	4	6 Lamp High Bay 54W	375 W	DCA4	28	4
Type A	PP-Room 100 - Bay 4	High Bay	T5HO		6	4	6 Lamp High Bay 54W	375 W	DCA4	28	4
Type A	PP-Room 100 - Bay 5	High Bay	T5HO		6	5	6 Lamp High Bay 54W	375 W	DCA4	22	4
Type A	PP-Room 100 - Bay 6	High Bay	T5HO		6	5	6 Lamp High Bay 54W	375 W	DCA4	22	4
Type A	PP-Room 103 - Roof Mounted	High Bay	T5HO		6	6	6 Lamp High Bay 54W	375 W	DCA4	24	8
Type AA	CB-Exterior Wall Mounted	Wall Pack	LED	40		8	40 LED	47 W	LCP	3	3
Type AA	Chlorine Injection Vault 1	Wall Pack	LED	40		11	40 LED-120	47 W	DCB1	38	1
Type AA	Flowmeter Vault 1	Wall Pack	LED	40		13	40 LED-120	47 W	DCB1	33	2
Type AA	Flowmeter Vault 2	Wall Pack	LED	40		14	40 LED-120	47 W	DCB1	47	1
Type AA	PP-Exterior Wall Mounted	Wall Pack	LED	40		8	40 LED	47 W	LCP		16
Type AA	PP-Room 103 - Wall Mounted	Wall Pack	LED	40		7	40 LED	47 W	DCA4	24	8
Type AA	Valve Vault 1	Wall Pack	LED	40		12	40 LED-120	47 W	DCB1	36	2
Type B	PP-Room 101	Suspended Direct/Indirect	T8		4	1	12" x 48" 4 Lamp 32W	148 W	DCA4	22	4
Type B	PP-Room 101	Suspended Direct/Indirect	T8		4	2	12" x 48" 4 Lamp 32W	148 W	DCA4	22	2
Type C	PP-Room 102	Suspended Direct/Indirect	T8		2	1	9" x 48" 2 Lamp 32W	74 W	DCA4	22	2
Type D	CB-Room 100	Surface Flood	LED	60		10	1x1- 60 LED	68 W	DDA	23	6
Type D	CB-Room 101	Surface Flood	LED	60		9	1x1- 60 LED	68 W	DDA	19	12
Type E1	CB-Room 101	Emergency Lighting	Incandescent		2		120V Input	19 W	DDA	20	2
Type E1	PP-Room 100	Emergency Lighting	Incandescent		2		277V Input	19 W	DCA4	25	9
Type E1	PP-Room 103	Emergency Lighting	Incandescent		2		277V Input	19 W	DCA4	25	4
Type E2	CB-Room 101	Exit Sign	LED				Back Mount-Single Face-120V Input	1 W	DDA	20	3
Type E2	PP-Room 100 - Door 100	Exit Sign	LED				Back Mount-Single Face-277V Input	1 W	DCA4	25	1
Type E2	PP-Room 100 - Door 100	Exit Sign	LED				End Mount-Double Face-277V Input	1 W	DCA4	25	1
Type E2	PP-Room 100 - Door 101	Exit Sign	LED				Back Mount-Single Face-277V Input	1 W	DCA4	25	1
Type E2	PP-Room 100 - Door 101	Exit Sign	LED				End Mount-Single Face-277V Input	1 W	DCA4	25	1
Type E2	PP-Room 100 - Door 102	Exit Sign	LED				Back Mount-Single Face-277V Input	1 W	DCA4	25	1
Type E2	PP-Room 100 - Door 102	Exit Sign	LED				End Mount-Single Face-277V Input	1 W	DCA4	25	1
Type E2	PP-Room 103 - Door 107	Exit Sign	LED				Back Mount-Single Face-277V Input	1 W	DCA4	25	1
Type E2	PP-Room 103 - Door 107	Exit Sign	LED				End Mount-Double Face-277V Input	1 W	DCA4	25	1

LIGHTING CONTROL PANEL NOTES

1. THE LIGHTING CONTROL PANEL (LCP) SHALL CONTROL ALL EXTERIOR LIGHT FIXTURES FOR THE PUMPING PLANT, AIR CHAMBER, AND CHLORINE BUILDING.
2. THE PHOTOCELL WILL CONTROL WHEN OPERATION OF THE LIGHTING FIXTURES OCCURS WHILE WITHIN THE OPERATING TIME ZONE PROVIDED BY LCP.
3. LCP WILL HAVE A TIMED SCHEDULE THAT ALLOWS OPERATION OF LIGHTING DEVICES BETWEEN THE HOURS OF 1600 AND 0300.
4. LCP WILL BE CAPABLE OF MANUAL OVERRIDE OF THE LISTED TIME SCHEDULE FOR A DURATION OF ONE FULL DAY. IF MANUAL OVERRIDE OCCURS FOR ENERGIZING LIGHTING FIXTURES OUTSIDE OF ALLOWABLE TIME SCHEDULE, LCP WILL DEENERGE FIXTURES UPON PHOTOCELL 'DAYLIGHT' INDICATION.

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NEW MEXICO

SAN JUAN LATERAL
TOHLAKAI PUMPING PLANT
ELECTRICAL INSTALLATION
LIGHTING FIXTURE AND SWITCHING SCHEDULES

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2013-08-16

1695-D-291

LIGHTING FIXTURE AND SWITCHING SCHEDULES

PUMPING PLANT FIRE ALARM CONTROL PANEL (FACP) SEQUENCE OF OPERATIONS											
'X' INDICATES ACTIVATION OF OPERATION		NOTIFICATION DEVICES		MECHANICAL SHUTDOWN		LOCAL DISPLAY ON FACP			REPORTING SIGNALS TO CENTRAL STATION		
		HORN/STROBES CONNECTED TO FACP	HORN/STROBES CONNECTED TO FCPS	SHUTDOWN EVAPORATIVE COOLER 1	SHUTDOWN EVAPORATIVE COOLER 2	ALARM DISPLAY AND ALERT	SUPERVISORY DISPLAY AND ALERT	TROUBLE DISPLAY AND ALERT	ALARM SIGNAL	SUPERVISORY SIGNAL	TROUBLE SIGNAL
INITIATING SIGNAL DEVICE	MANUAL PULL STATION	X	X			X			X		
	PHOTOELECTRIC SMOKE DETECTOR	X	X			X			X		
	DUCT DETECTOR EVAPORATIVE COOLER 1			X			X			X	
	DUCT DETECTOR EVAPORATIVE COOLER 2				X		X			X	
	FACP PRIMARY POWER FAILURE							X			X
	FACP/CIRCUIT FAULT							X			X
	FACP/NAC GROUND FAULT							X			X
	INITIATING DEVICE FAILURE							X			X
	FASP ALARM SIGNAL	X	X			X			X		
	FASP SUPERVISORY SIGNAL						X			X	
	FASP TROUBLE SIGNAL							X			X

CHLORINE BUILDING FIRE ALARM CONTROL PANEL (FACP2)SEQUENCE OF OPERATIONS							
'X' INDICATES ACTIVATION OF OPERATION		NOTIFICATION DEVICES	LOCAL DISPLAY ON FACP2			REPORTING SIGNALS TO CENTRAL STATION	
		HORN/STROBES CONNECTED TO FACP2	ALARM DISPLAY AND ALERT	SUPERVISORY DISPLAY AND ALERT	TROUBLE DISPLAY AND ALERT	ALARM SIGNAL	TROUBLE SIGNAL
INITIATING SIGNAL DEVICE	MANUAL PULL STATION	X	X			X	
	PHOTOELECTRIC SMOKE DETECTOR	X	X			X	
	FACP2 PRIMARY POWER FAILURE				X		X
	FACP2/CIRCUIT FAULT				X		X
	FACP2/NAC GROUND FAULT				X		X
	INITIATING DEVICE FAILURE				X		X

PUMPING PLANT FIRE ALARM SUPPRESSION PANEL (FASP) SEQUENCE OF OPERATIONS												
'X' INDICATES ACTIVATION OF OPERATION		NOTIFICATION DEVICE		PRE-DISCHARGE DELAY			RELEASE CIRCUIT	LOCAL DISPLAY ON FASP			REPORTING SIGNALS TO FACP	
		ACTIVATE PRE-DISCHARGE NAC PULSE BLUE LENS STROBE	ACTIVATE DISCHARGE NAC STEADY-ON BLUE LENS STROBE	START 30 SECOND DISCHARGE TIME DELAY	HOLD TIME DELAY AT 10 SECOND	START 10 SECOND TIME DELAY	DISCHARGE SUPPRESSION	ALARM DISPLAY AND ALERT	SUPERVISORY DISPLAY AND ALERT	TROUBLE DISPLAY AND ALERT	ALARM SIGNAL	TROUBLE SIGNAL
INITIATING SIGNAL DEVICE	MANUAL RELEASE STATION *		X				X	X			X	
	SPOT TYPE PHOTOELECTRIC SMOKE DETECTOR							X			X	
	ASPIRATING SMOKE DETECTORS	X		X				X			X	
	ABORT PUSH BUTTON DEPRESSED				X							
	ABORT PUSH BUTTON RELEASED					X						
	EXPIRATION OF TIME DELAY		X				X	X			X	
	FASP PRIMARY POWER FAILURE									X		X
	FASP/CIRCUIT FAULT									X		X
	FASP/NAC GROUND FAULT									X		X
	INITIATING DEVICE FAILURE									X		X
	SUPPRESSION PRESSURE SWITCH		X					X			X	
	SUPPRESSION LOW PRESSURE								X		X	
	SUPPRESSION DISABLED VIA KEYED MAINTENANCE SWITCH								X		X	
	SUPPRESSION TAMPER SWITCH (IF REQUIRED)								X		X	

*ACTIVATION OF MANUAL RELEASE STATION WILL DISABLE ABORT SWITCH FUNCTIONS.

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NAVAJO GALLUP WATER SUPPLY PROJECT
NEW MEXICO

SAN JUAN LATERAL
TOHLAKAI PUMPING PLANT
ELECTRICAL INSTALLATION

FIRE CONTROL SEQUENCE OF OPERATIONS

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DRAWN
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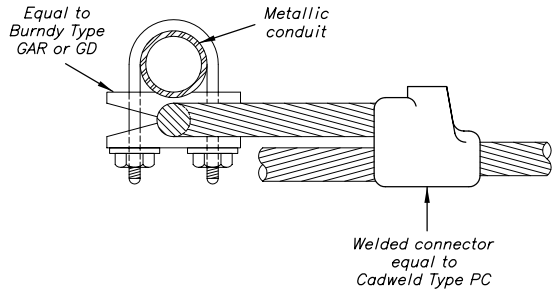
ADMIN. APPROVAL
Jay Boggs
Electrical Design Group, Inc.

DENVER, COLORADO 2013-08-16

FIRE CONTROL
SEQUENCE OF
OPERATIONS

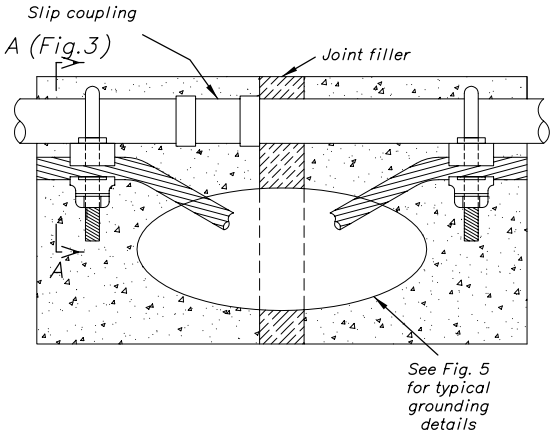
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FIGURE 1
GROUNDING METAL CONDUITS



METAL CONDUIT GROUNDING TABLE			
CONDUIT SIZE	MINIMUM SIZE OF GROUND CABLE	NUMBER OF TAPS	CLAMP SIMILAR TO BURNDY TYPE
$\frac{3}{4}$ " to $1\frac{1}{2}$ "	No. 4 A.W.G.	1	GAR
2" to 3"	No. 1 A.W.G.	1	GAR
Above 3"	No. 1 A.W.G.	2	GD

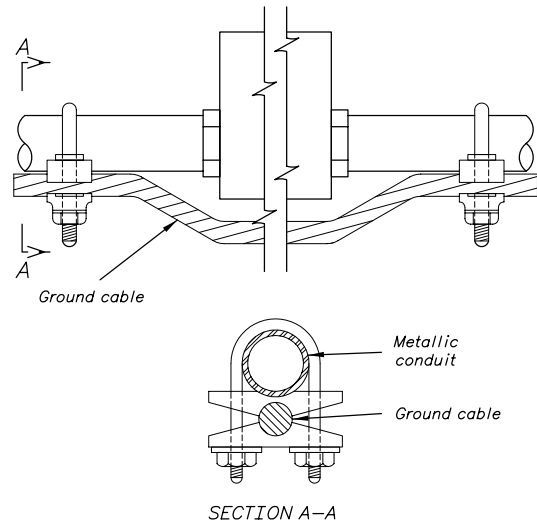
FIGURE 2
BONDING CONDUITS AT EXPANSION JOINTS



NOTE

CLAMPS SHALL BE EQUAL TO BURNDY TYPE GAR OR GD AND BARE COPPER CABLE IN ACCORDANCE WITH THE TABLE IN FIGURE 1 OR A BONDING JUMPER EQUAL TO O.Z. TYPE BJ (WITH BRONZE FITTINGS) MAY BE USED.

FIGURE 3
BONDING CONDUITS AROUND JUNCTION BOXES



NOTE

CLAMPS SHALL BE EQUAL TO BURNDY TYPE GAR OR GD AND BARE COPPER CABLE IN ACCORDANCE WITH THE TABLE IN FIGURE 1 OR A BONDING JUMPER EQUAL TO O.Z. TYPE BJ (WITH BRONZE FITTINGS) MAY BE USED.

NOTES

1. Ground cables for connection to equipment shall be of sufficient length to bolt to equipment when ultimately installed. Terminations as shown in Figure 4 Dwg 40-D-4334 shall be used in lieu of stubouts. Approximate locations only are shown on drawings. Exact locations to be determined in field.
2. Refer to conduit drawings or general arrangement drawings whenever available, for more exact location of equipment.
3. Metal conduits shall be grounded at both ends. If a break occurs in a run of metal conduit, the conduit shall be bonded across the break. In case the above is not feasible, the each section shall be grounded separately. Each contractor shall ground each metal conduit run, or portion thereof, that he installs. Junction or pull boxes not containing protective equipment in which the conduits are installed with a locknut and bondnut shall not be considered a break when the voltage is below 240 volts to ground, but shall be so considered for higher voltages. All junction or pull boxes in runs of non-metallic conduit shall be individually grounded. All boxes containing overload protective devices shall be individually grounded.
4. Ground cable shall be No. 4 A.W.G. or larger.
5. All paint, enamel, and scale shall be removed from point of contact on metal surfaces before applying ground connections.
6. All bolts, machine screws, nuts and washers used in making grounding connections shall be silicon bronze.
7. Cable shields and one conductor of multiconductor cable shall be grounded at both ends.
8. Thermoweld, Cadweld, or an approved equivalent process shall be used in making connections between cables where embedded in concrete, direct buried, or under plant superstructure.
9. Where Thermoweld, Cadweld, or an approved equivalent process is used it shall be performed with heavy duty welding equipment in accordance with manufacturer's instructions and the material shall be new fresh stock.
10. All ground connectors shall be UL listed. All below grade connectors to be in accordance with IEEE 837.

REFERENCE DRAWINGS

TYPICAL GROUNDING DETAILS (SHT 2 OF 2)	40-D-4335
SWITCHYARDS & SUBSTATIONS - GROUNDING DETAILS	40-D-4753
PLATFORM GROUNDING DETAILS	40-D-4874
CABLE TRENCH GROUNDING	40-D-6182
GROUNDING SUPPORTS ON TUBULAR STEEL STRUCTURES	40-D-6309
FENCE GROUNDING DETAILS	40-D-6376

REV NO 3	2004-07-06	CHANGED NOTE 10, ADDED FIG. 4 CONNECTOR REF., ADDED REF. D - J. R. Z.
3	10 - 00	REDRAWN IN AUTOCAD R.14 FORMAT
D - L.G.		
12 - 2 - 85		REVISED TO SHOW CURRENT PRODUCTS OR PRACTICES.
D - G.D.O.		

THIS DRAWING SUPERSEDES
IN PART DRAWING 40-D-4336, 01-14-2003

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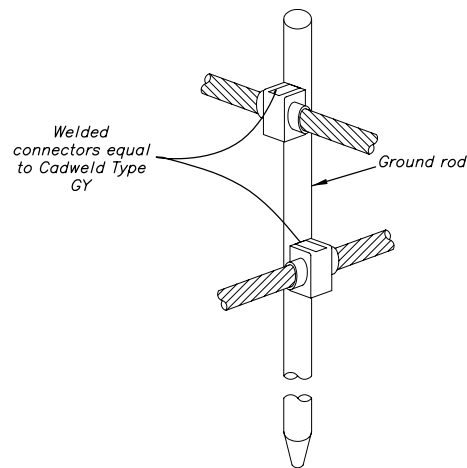
UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
STANDARD DESIGNS

ELECTRICAL INSTALLATION
TYPICAL GROUNDING DETAILS

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CHECKED	BY: N. P. - R. F. H.	APPROVED	BY: L. N. McCLELLAN

DENVER, COLORADO	MAY 1, 1947	40-D-4334
SHEET 1 OF 2		

FIGURE 1
GROUND MATS



GROUND ROD DETAILS

FIGURE 2
GROUND MATS

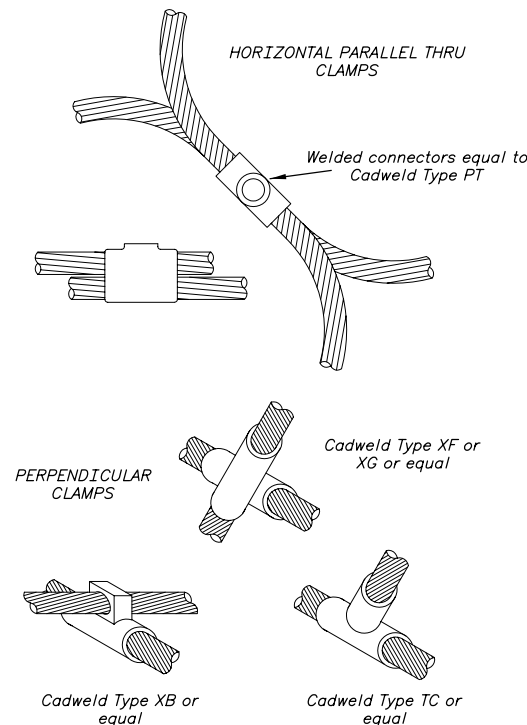
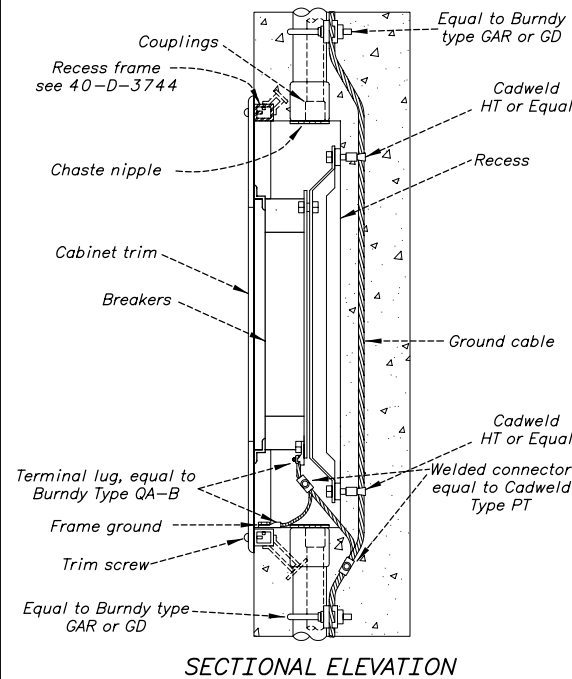
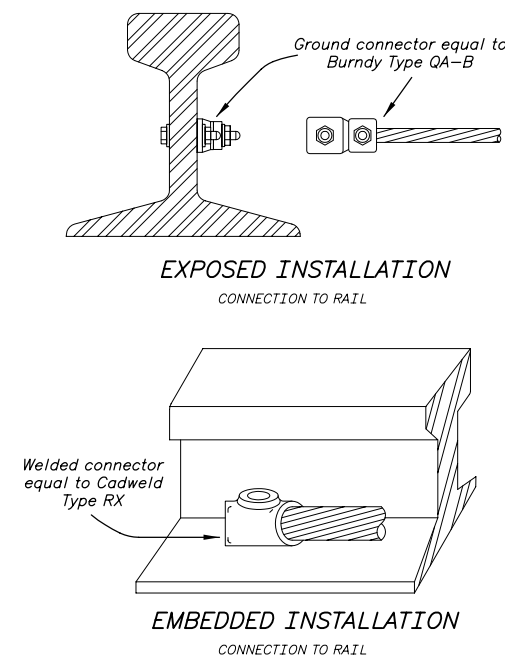


FIGURE 3
LIGHTING OR MISC POWER CABINETS



SECTIONAL ELEVATION

FIGURE 4
RAILS



NOTES

1. See drawing 40-D-4334 for notes and list of reference drawings.

GROUND SYMBOLS
(Used on Plan Drawings)

- — — Indicates ground cable embedded in concrete
- — — Indicates ground cable concealed but not embedded in concrete
- — — Indicates ground cable exposed
- Indicates ground rod
- Indicates ground connection
- Indicates ground cable riser
- Indicates embedded ground plate

FIGURE 5
FLOOR FRAMES

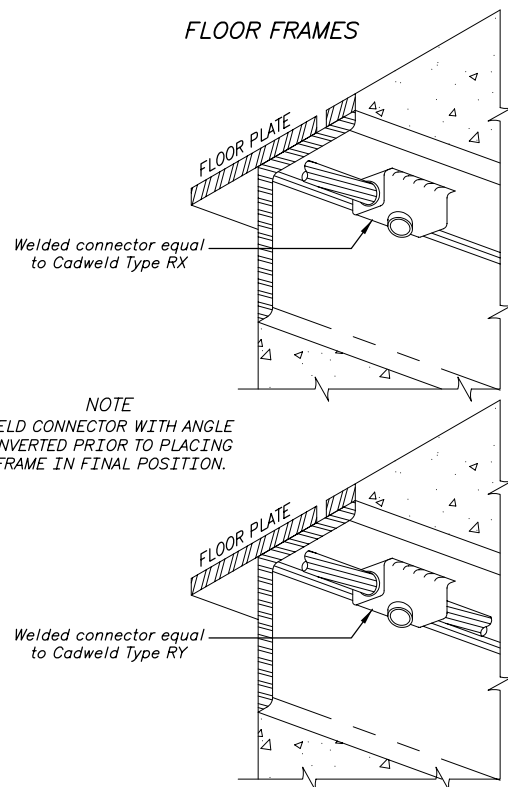


FIGURE 6
RAILING POST BASES AND HANDRAIL SUPPORTS

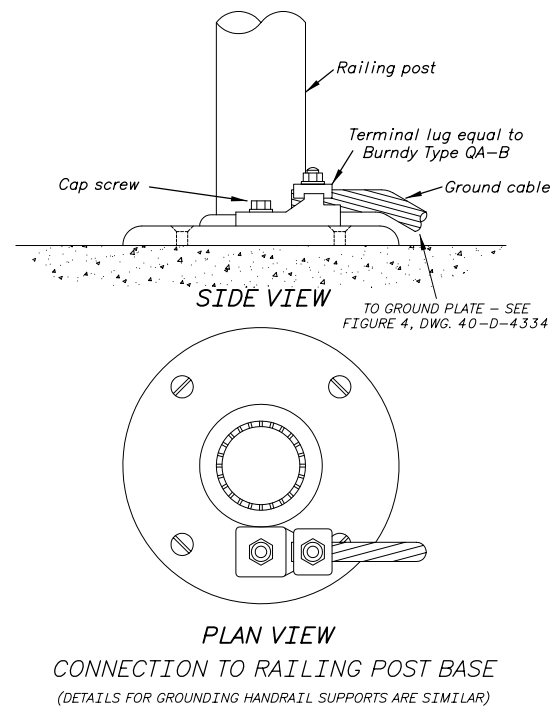


FIGURE 7
OIL TANK GROUNDING DETAILS

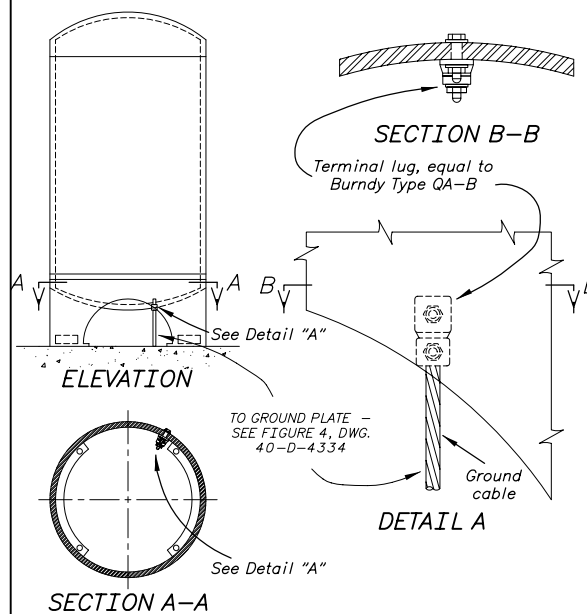
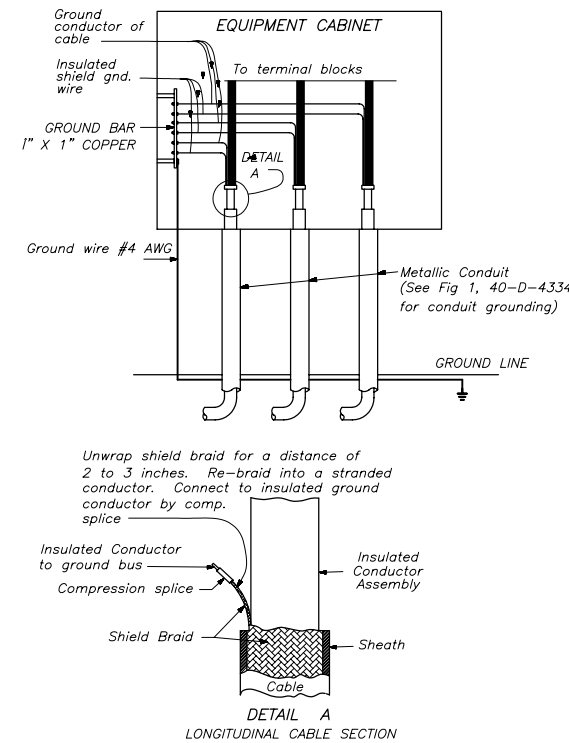


FIGURE 8
CONTROL CABLE SHIELD



REFERENCE DRAWINGS

ELECTRICAL INSTALLATION - TYPICAL
GROUNDING DETAILS (SHT 1 OF 2) 40-D-4334

REV. NO.	2004-07-06	MINOR REVISIONS; ADDED FIG. S 2 AND 8.
3	D - J. R. Z.	
3 - 10 - 00	REDRAWN IN AUTOCAD R.14 FORMAT	
D - L.G.		
12 - 2 - 85	REVISED TO SHOW CURRENT PRODUCTS OR PRACTICES.	
D - G.D.O.		

THIS DRAWING SUPERSEDES DRAWING
40-D-4336 IN PART (2003-01-14);
AND DRAWING 104-D-944 (2004-07-06)

⊕ ALWAYS THINK SAFETY

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
STANDARD DESIGNS

ELECTRICAL INSTALLATION
TYPICAL GROUNDING DETAILS

DRAWN - R.Y.N. - S.J.S.	SUBMITTED - D. CLARK
TRACED - J.M.H.	RECOMMENDED - H.H. PLUMB
CHECKED - V.N.P. - R.F.H. - T.J.L.	APPROVED - L.N. McLELLAN
	ACTING CHIEF ENGINEER

DENVER, COLORADO	APRIL 24, 1947	40-D-4335
SHEET 2 OF 2		

FIGURE 1

GROUNDING TO FLAT SURFACE

Use ⑧ or ④ on approx. 5'-0" centers when ground wire continues to other equipment.

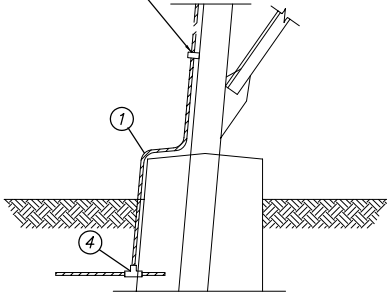


FIGURE 2

GROUNDING TO FENCE POST OR PIPE-TYPE SWITCHYARD LIGHTING POLE

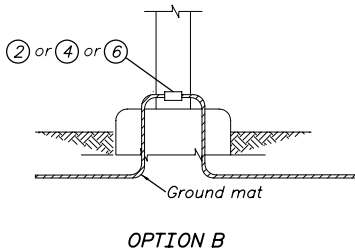
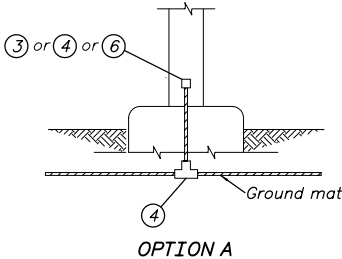


FIGURE 3

GROUNDING TO CABLE TRENCH OR RACK

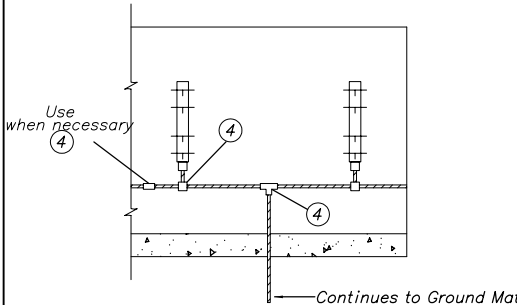
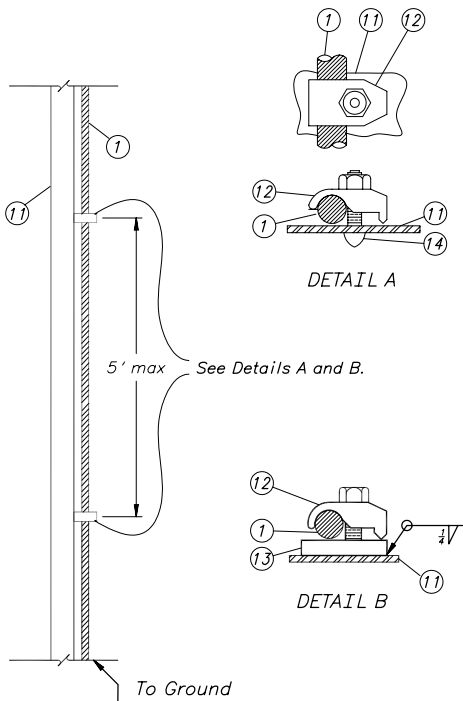


FIGURE 4

GROUNDING TO TUBULAR STEEL STRUCTURE



LIST OF MATERIALS

ITEM NO.	DESCRIPTION
1	Copper cable, bare, 4/0 AWG minimum
2	Bolted ground connector similar to Burndy type GB
3	Bolted ground clamp similar to Penn-Union type GWL
4	Exothermic welded ground connector similar to Cadweld or ThermOweld
5	Bolt: 3/8" silicon-bronze with nut and lock washer. Length as required for Item 8.
6	Bolted ground connector similar to Burndy type GAR
7	Compression-type ground connector
8	Cable to flat bar connector similar to Burndy QA or GB
9	Ground rod, 10'x3/4", copper-clad steel
10	Copper-clad steel stranded cable, bare, 7 No. 5
11	Tubular steel structure
12	Bolted ground connector similar to Burndy type GBM
13	Steel plate, 1-inch thick (Notes 5, 7)
14	3/8" stud, power driven (Note 6)
15	Copper-clad steel stranded cable, bare, 7 No. 9

NOTES

- See drawing 40-D-4334 for general notes and list of reference drawings.
- See drawing 40-D-4335 for typical ground system symbols.
- All ground cables to be stubbed out approx. where indicated on plan drawings and be of sufficient length to bolt to equipment.
- Ground all metal gates or each half of all double gates to the gate post with flexible metal braid installed across gate hinges.
- Steel plate size to be larger than projected area of clamp.
- Power driven stud equal to Ramset Fastening System as manufactured by Illinois Tool Works, Wood Dale, IL.
- Plate to be welded to structure and be drilled and tapped for a 3/8" US standard bolt.
- All grounding connections shall be as close as possible to the fence post.
- Weave ground cable thru fencing and attach to fence with at least three (3) connectors.

REFERENCE DRAWINGS

TYPICAL GROUNDING DETAILS (SHT 1 OF 2) . . . 40-D-4334
TYPICAL GROUNDING DETAILS (SHT 2 OF 2) . . . 40-D-4335

FIGURE 5

GROUND ROD CONNECTIONS

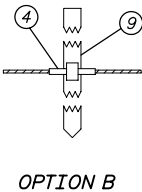
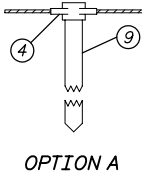


FIGURE 6

GROUNDING TO CABLE TUNNEL CABLE TRAYS

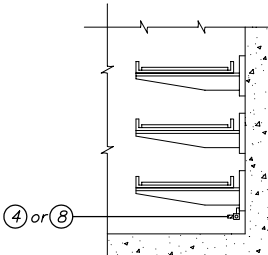
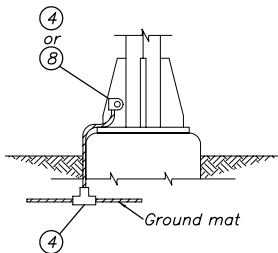


FIGURE 7

GROUNDING TO STRUCTURE BASES



TYPICAL PIPE BUS SUPPORT OR PIPE TIE DOWN CONNECTION

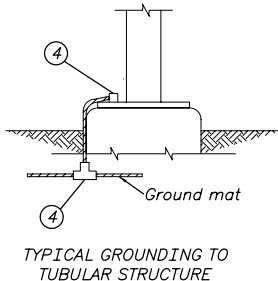
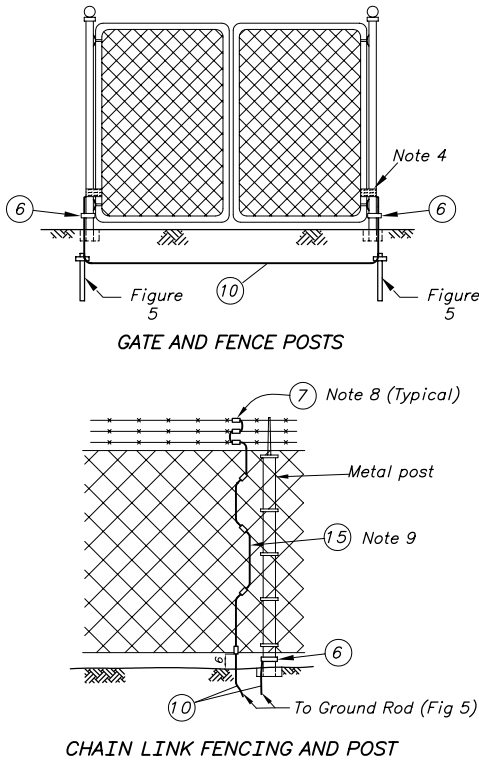


FIGURE 8

FENCE GROUNDING



THIS DRAWING SUPERSEDES DRAWING
40-D-6309, 2004-09-30 IN PART

REV NO. 4	2004-09-30	D - J. R. Z.	ADDED FIGURES 4 AND 8; RENUMBERED FIGURES ACCORDINGLY; ADDED NOTES 8 & 9; ADDED ITEMS 7 & 15.
REV NO. 3	2004-07-06	D - J. R. Z.	ADDED ITEMS 2 & 3 TO FIG. 2 AND GROUND CABLE SIZE (ITEM 1); REPLACED 'DETAIL' VIEWS w/ 'FIGURES'; OTHER MINOR REVISIONS.
3 - 8 - 00		D - L. G.	REDRAWN IN AUTOCAD R.14 FORMAT
04-20-70		D - G. W. C.	ADDED DETAIL H

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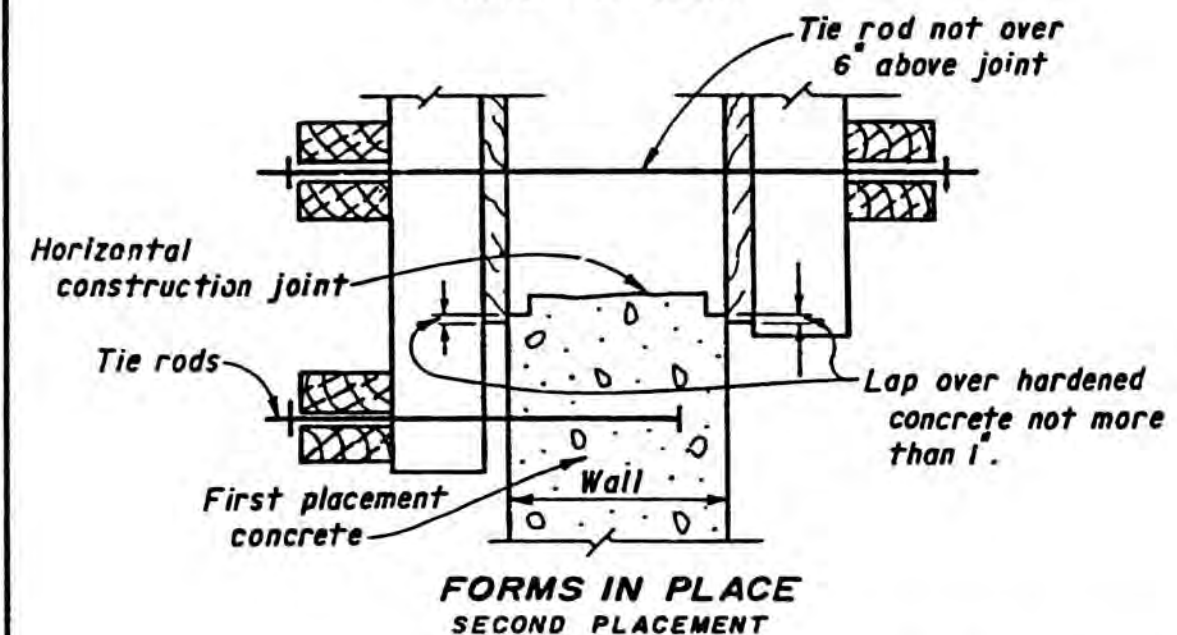
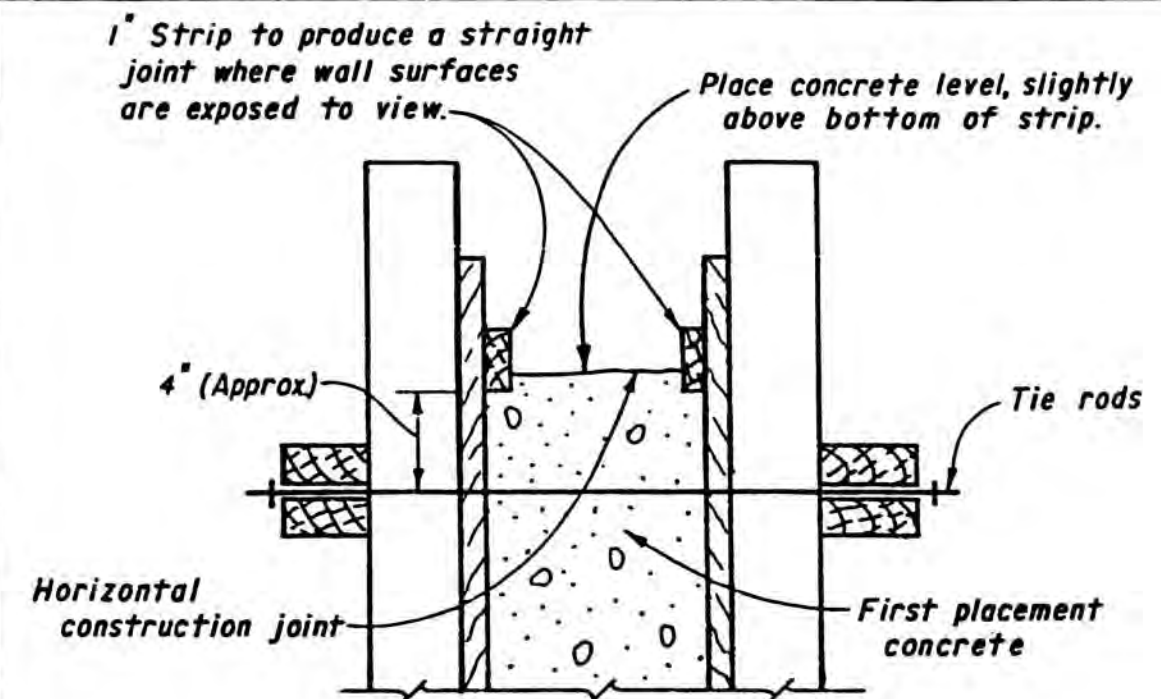
UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
STANDARD DESIGNS

ELECTRICAL INSTALLATION

TYPICAL GROUNDING DETAILS
FOR SWITCHYARDS AND SUBSTATIONS

DRAWN	J. L. L.	P. J. S.	CHECKED	H. H. PLUMB
TRACED	J. W. G.		RECOMMENDED	O. L. RICE
CHECKED	J. A. W.	D. C. M.	APPROVED	L. N. McCLELLAN

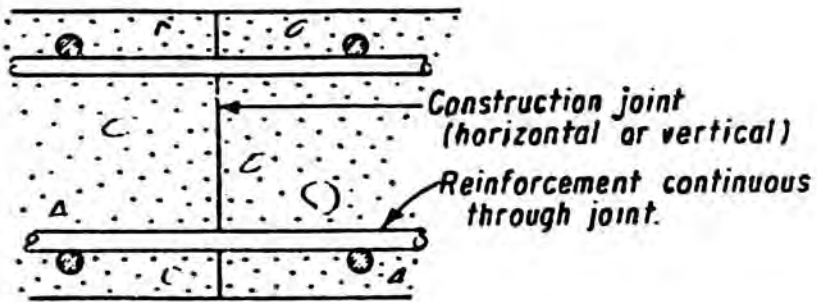
DENVER, COLORADO	APRIL 5, 1949	40-D-4753
SHEET 1 OF 1		



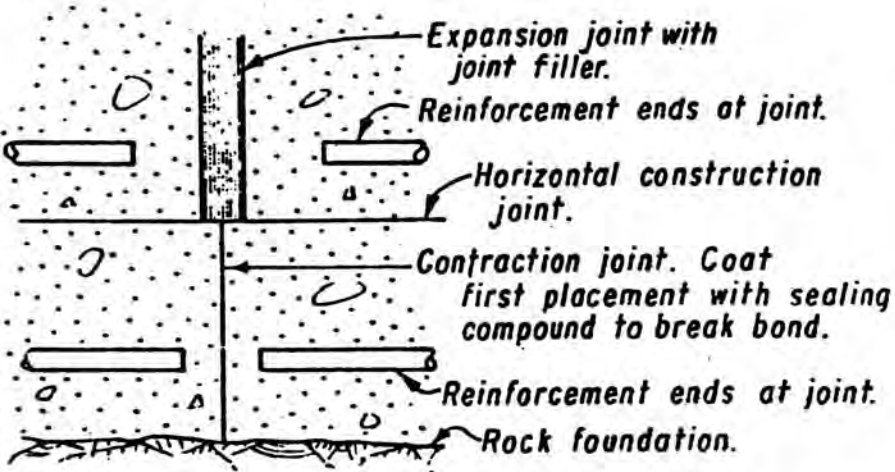
NOTES
A 1" overlap produces a far tighter contact than a much larger overlap, and results in prevention of form spread with consequent offset at the joint.

DRAWING NOT TO SCALE

5-28-85 D- <i>JK</i>	REDRAWN AND DELETED V-BROOVE
ALWAYS THINK SAFETY	
UNITED STATES DEPARTMENT OF THE INTERIOR BUREAU OF RECLAMATION STANDARD DESIGNS BUILDINGS METHOD OF BUILDING FORMS FOR SUCCESSIVE LIFTS	
DESIGNED _____	TECHNICAL APPROVAL <i>A. Taylor</i>
DRAWN <i>By</i> <i>JK</i>	SUBMITTED <i>JK</i>
CHECKED <i>JK</i>	APPROVED <i>JK</i>
CHIEF, STRUCT & ARCH BRANCH DENVER, COLO. MAY 28, 1985 40-D-5246	



CONSTRUCTION JOINT

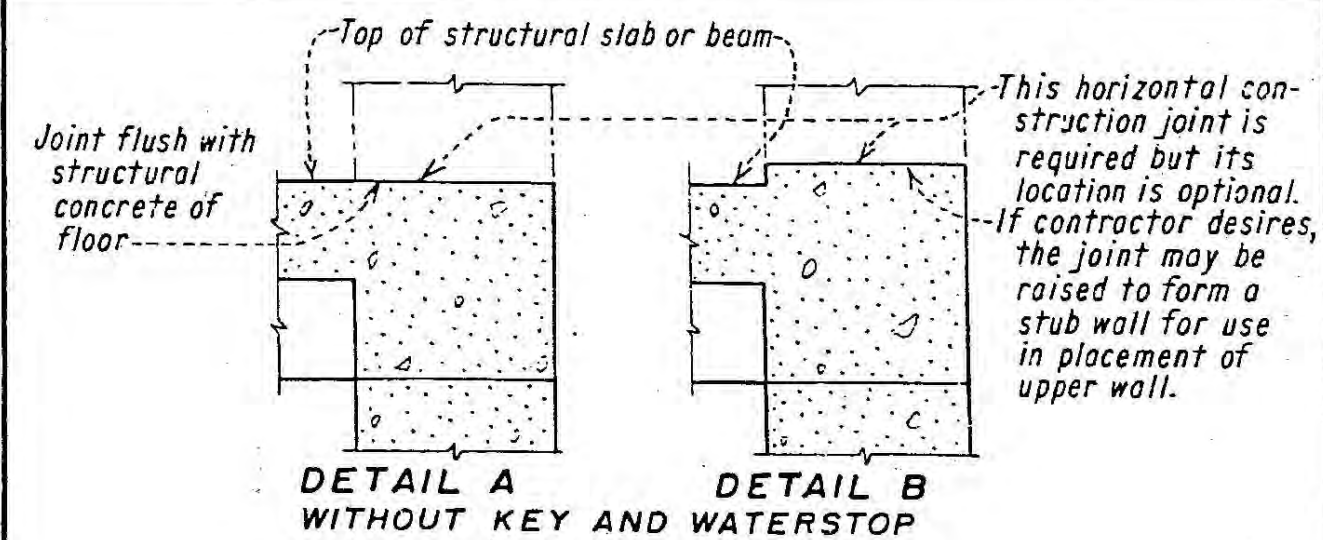


EXPANSION AND CONTRACTION JOINTS

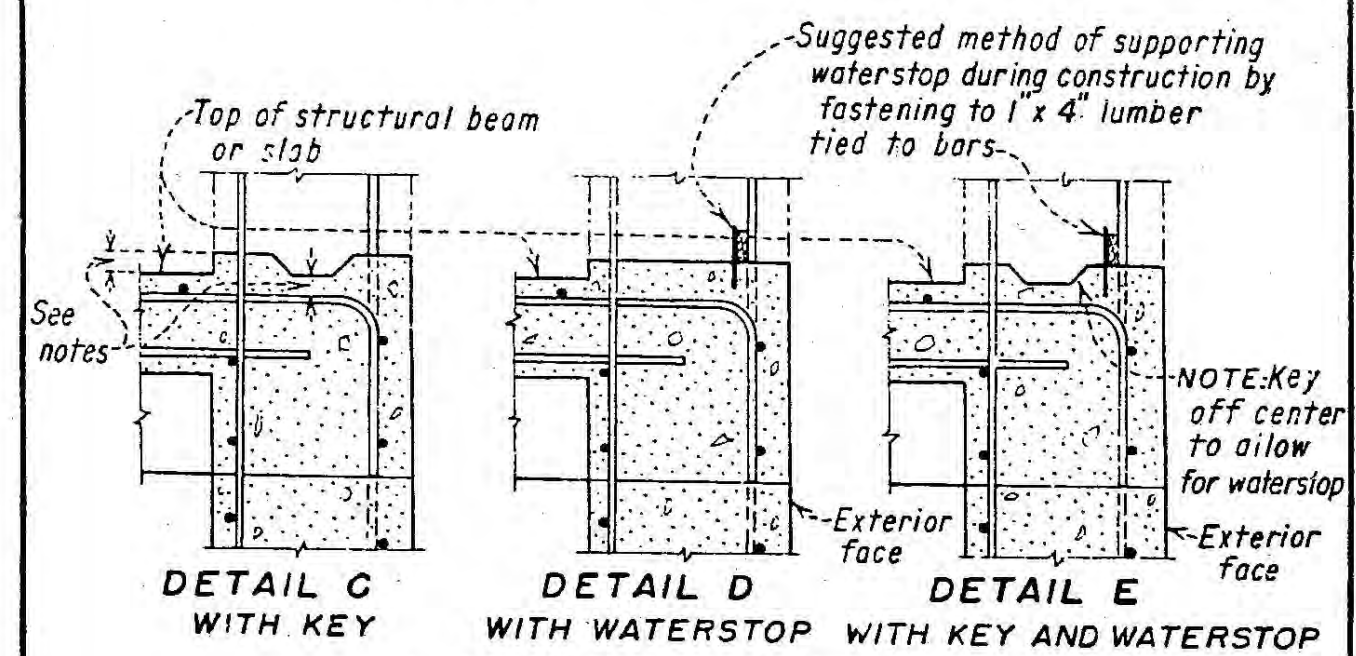
NOTE: Construction joint keys and waterstops required if shown on construction dwgs.

FORMERLY 103-D-219

2-11-71 D-N.O.B.	DELETED "CORK" AND REFERENCE TO SEALS
NEEDS THINK SAFETY	
UNITED STATES DEPARTMENT OF THE INTERIOR BUREAU OF RECLAMATION STANDARD DESIGNS BUILDINGS	
JOINTS IN CONCRETE STRUCTURES	
DESIGNED: H.M.B.	SUBMITTED: <i>[Signature]</i>
DRAWN: S.A.P.	RECOMMENDED: <i>[Signature]</i>
CHECKED: <i>[Signature]</i>	APPROVED: <i>[Signature]</i>
GENVER, COLO., DEC. 4, 1982	
40-D-5247	



STUB WALL OPTIONAL
 (Except as otherwise noted on construction dwgs.)
 SECTIONAL ELEVATION OF EXTERIOR WALLS SHOWN
 SIMILAR FOR INTERIOR WALLS

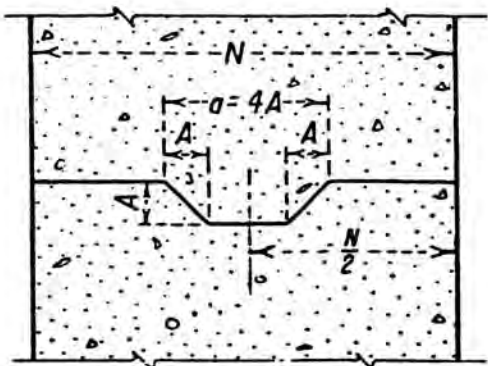


STUB WALL REQUIRED
 SECTIONAL ELEVATION OF EXTERIOR WALLS SHOWN

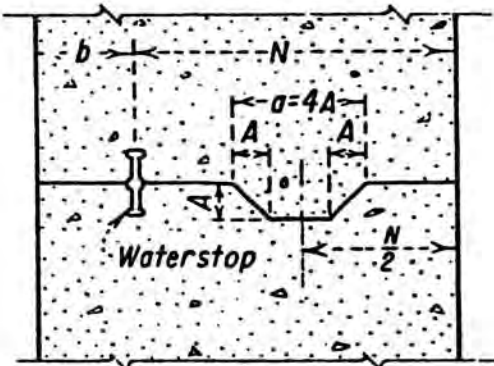
NOTES: Height of stub wall shall be sufficient for bottom of key or waterstop to clear slab or beam top reinforcement by 1" min. See construction drawings for required waterstops and construction joint keys.

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2-11-71 O- H.O.B.	CHANGED "SEAL" TO "WATERSTOP".
UNITED STATES DEPARTMENT OF THE INTERIOR BUREAU OF RECLAMATION STANDARD DESIGNS BUILDINGS	
STUB WALL CONSTRUCTION JOINTS	
DRAWN <u>M.H.B.</u>	SUBMITTED <u>[Signature]</u>
TRACED <u>V.M.M.</u>	RECOMMENDED <u>[Signature]</u>
CHECKED <u>W.P.</u>	APPROVED <u>[Signature]</u>
DENVER, COLO., DEC. 4, 1952	
40-D-5248	



MEMBERS WITHOUT WATERSTOPS



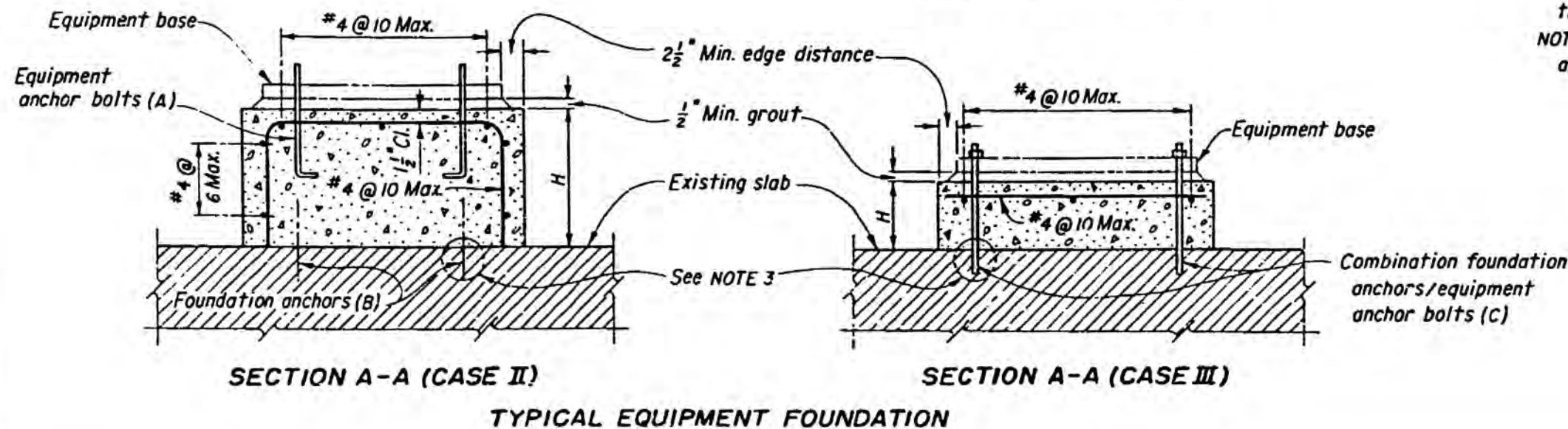
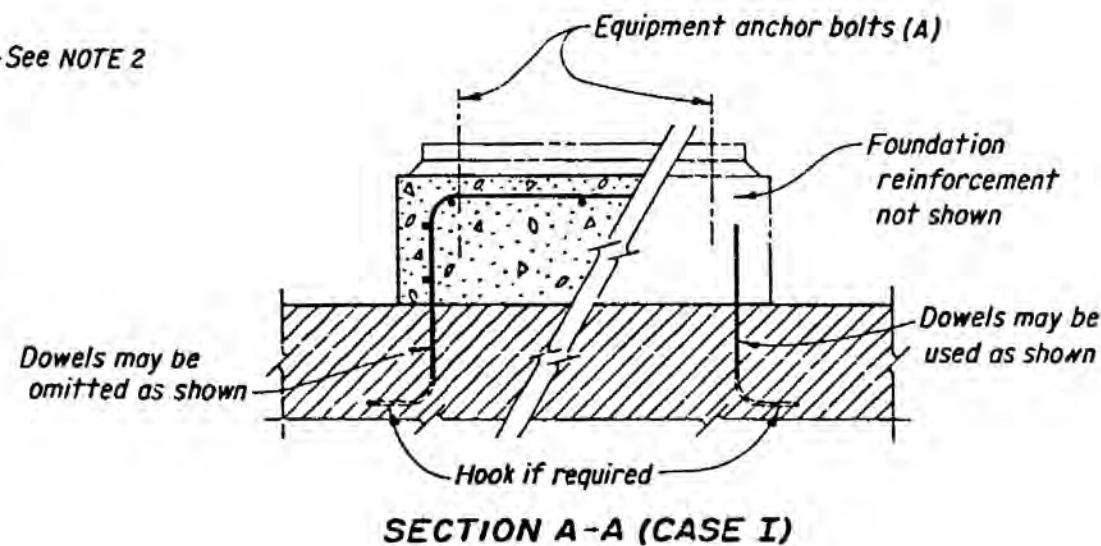
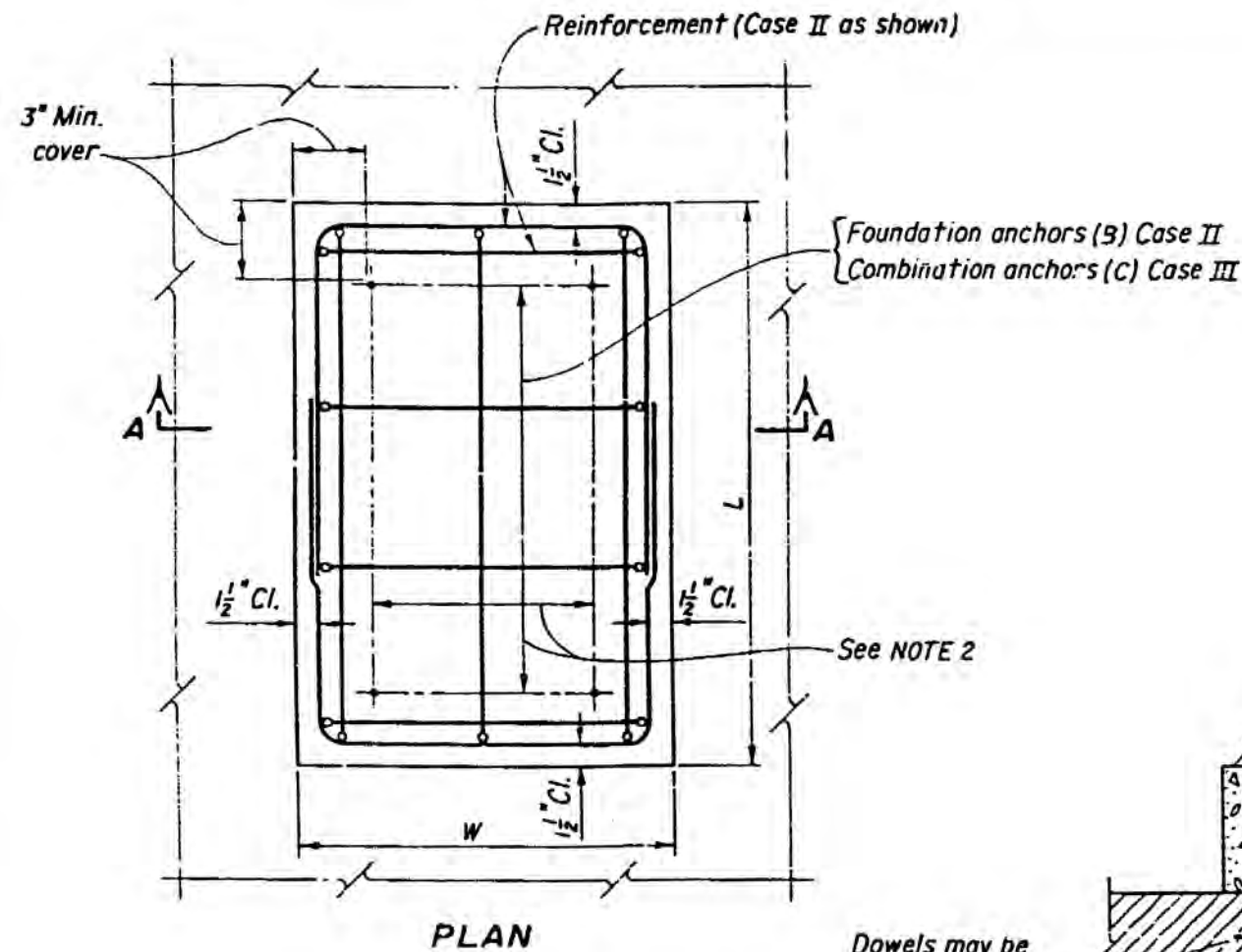
MEMBERS WITH WATERSTOPS

DIMENSION OF KEYS	
N	A
12" to 17"	1.5"
18" to 22"	2.0"
23" to 27"	2.5"
28" to 32"	3.0"
33" to 37"	3.5"
38" to 42"	4.0"
43" to 47"	4.5"
48" to 52"	5.0"
53" to 57"	5.5"
58" to 62"	6.0"
63" to 67"	6.5"
68" to 72"	7.0"
73" to 77"	7.5"

NOTES

This standard may be used for walls or slabs where shown on the drawings. Dimension "b" varies with bar cover, bar sizes, and method of support during installation. One or more keys may be used for members 6'-0" thick or over. For multiple keys, use key with dimension "A" = 4 inches.

2-11-71 D-N.O.B.	REMOVED RESTRICTION ON WATERSTOP MATERIAL.
10-21-55 D-I.G.T.	RETRACED AND REDRAWN
UNITED STATES DEPARTMENT OF THE INTERIOR BUREAU OF RECLAMATION STANDARD DESIGNS CONSTRUCTION JOINT KEYS	
DRAWN T.R.	SUBMITTED Samuel Judd
TRACED L.E.H.	RECOMMENDED K.B. Keener
CHECKED R.A.H.	APPROVED W.E. Blomgren
	CHIEF ENGINEER
DENVER, COLORADO 12-4-52 40-D-5249	



NOTES

For general notes, see 40-D-6263 and 7006.

Foundation sizes (L, W, H), may be shown elsewhere or establish actual dimensions to accommodate equipment furnished.

Locate equipment anchor bolts (A) and combination foundation anchors/ equipment anchor bolts (C) from equipment and set them by template.

If equipment anchor bolts (A) are too long for foundation height (H) or if H is less than 8 inches, use combination foundation anchors/ equipment anchor bolts (C); see Case III.

Roughen existing concrete under all foundations.

For foundations of larger equipment see construction drawings.

NOTE 1: Case I foundations can be used if the reinforcement is designed and positioned before the underlying concrete is placed. The final loads, location, and dimensions L, W, and H must be known for design. Design the reinforcement size, spacing, and embedment lengths in accordance with the latest edition of ACI Standard 318, Building Code Requirements for Reinforced Concrete.

NOTE 2: Size and space the foundation anchors for Case II and Case III foundations so that all loads are transferred from the foundation to the floor with a safety factor of four.

NOTE 3: Drill holes for expansion-type bolts or anchors to the diameter and depth recommended by the manufacturer.

DRAWING NOT TO SCALE

4-28-83 REVISED AND REDRAWN TO SHOW STATE-OF-THE-ART
D-ANCHORAGE AND GENERAL UPDATING.

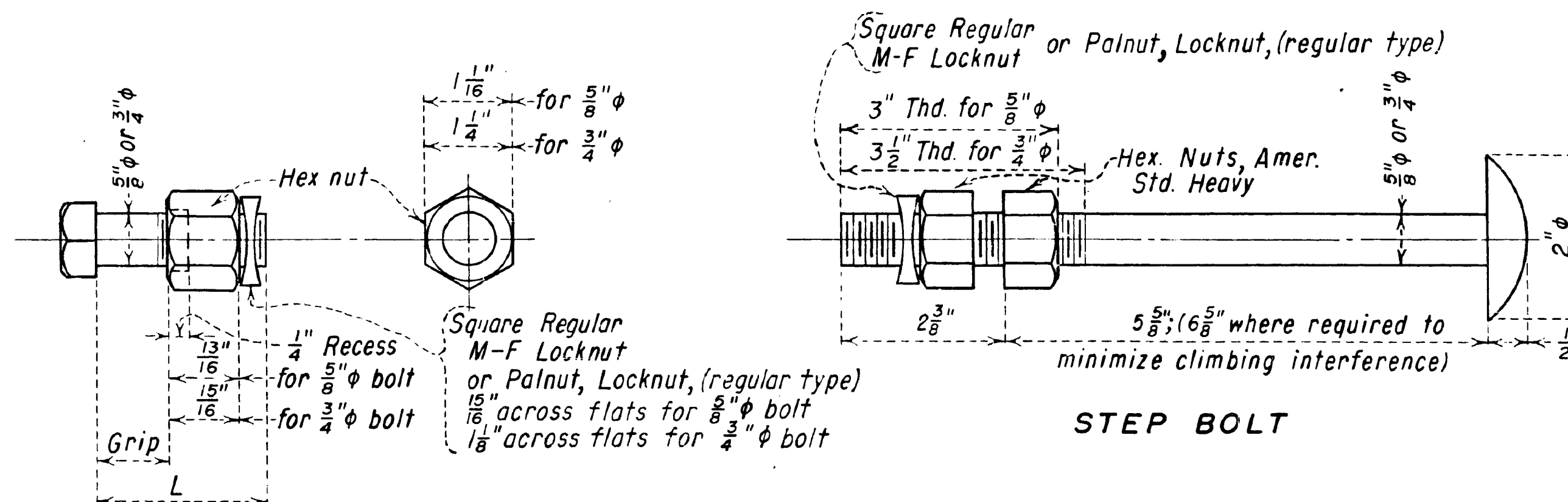
ALWAYS THINK SAFETY

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

STANDARD DESIGNS
SMALL EQUIPMENT FOUNDATIONS

DESIGNED: _____ TECH. APPROVAL: _____
DRAWN: _____ SUBMITTED: _____
CHECKED: _____ APPROVED: _____
CHIEF, STRUCT. AND ARCH. BRANCH

DENVER, COLO. APRIL 28, 1983 40-D-5599



CONNECTION BOLT

STEP BOLT

MINIMUM BOLT LENGTHS REQUIRED FOR VARIOUS GRIPS

L for $\frac{3}{4}$ " ϕ Bolts	$1\frac{3}{4}$				2				$2\frac{1}{4}$				$2\frac{1}{2}$				$2\frac{3}{4}$				3				$3\frac{1}{4}$				$3\frac{1}{2}$				$3\frac{3}{4}$				4
GRIP	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{9}{16}$	$\frac{5}{8}$	$\frac{11}{16}$	$\frac{3}{4}$	$\frac{13}{16}$	$\frac{7}{8}$	$\frac{15}{16}$	1	$1\frac{1}{16}$	$1\frac{1}{8}$	$1\frac{3}{16}$	$1\frac{1}{4}$	$1\frac{5}{16}$	$1\frac{3}{8}$	$1\frac{7}{16}$	$1\frac{1}{2}$	$1\frac{9}{16}$	$1\frac{5}{8}$	$1\frac{11}{16}$	$1\frac{3}{4}$	$1\frac{13}{16}$	$1\frac{7}{8}$	$1\frac{15}{16}$	2	$2\frac{1}{16}$	$2\frac{1}{8}$	$2\frac{3}{16}$	$2\frac{1}{4}$	$2\frac{5}{16}$	$2\frac{3}{8}$	$2\frac{7}{16}$	$2\frac{1}{2}$
L for $\frac{5}{8}$ " ϕ Bolts	$1\frac{1}{2}$				$1\frac{3}{4}$				2				$2\frac{1}{4}$				$2\frac{1}{2}$				$2\frac{3}{4}$				3				$3\frac{1}{4}$				$3\frac{1}{2}$				$3\frac{3}{4}$

NOTE

Grip includes fills and bevel washers where used.

1-15-68	REVISED STEPBOLT INSTALLATION DIMENSIONS.
2-15-65	ADDED DIMENSION ACROSS FLATS TO PALNUT
8-12-63	DELETE BOLT HEAD VIEW AND THREAD LENGTH; ADD "MINIMUM" TO TABLE TITLE; ADD "LOCKNUT, REGULAR" TO PALNUT DESIGNATION.
4-17-62	PERMIT HEX. HEAD ON BOLTS AND USE OF PALNUTS
1-31-61	ADDED REQUIREMENT THAT LOCKNUTS BE "SQUARE, REGULAR."

THIS DRAWING SUPERSEDES DWG. 40-D-5600

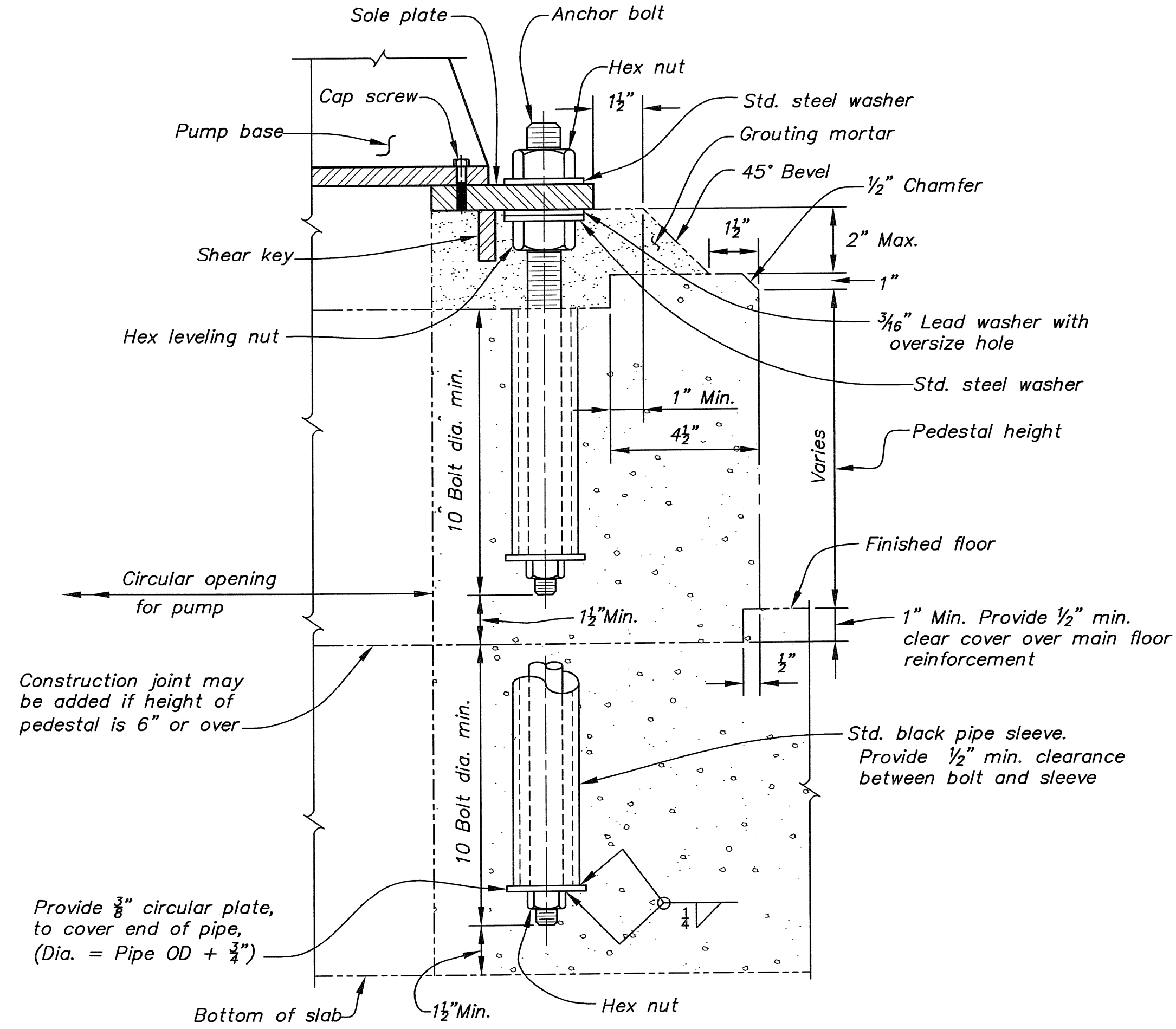
UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
STANDARD DESIGNS
TRANSMISSION LINES
TOWER BOLTS

DRAWN R.H.J. SUBMITTED *Samuel Duddy*
TRACED H.T.J. RECOMMENDED *W. G. Bull*
CHECKED *R.L.S.* APPROVED *W. G. Bull*
ACT. ASST. COMM. AND CHIEF ENGR.

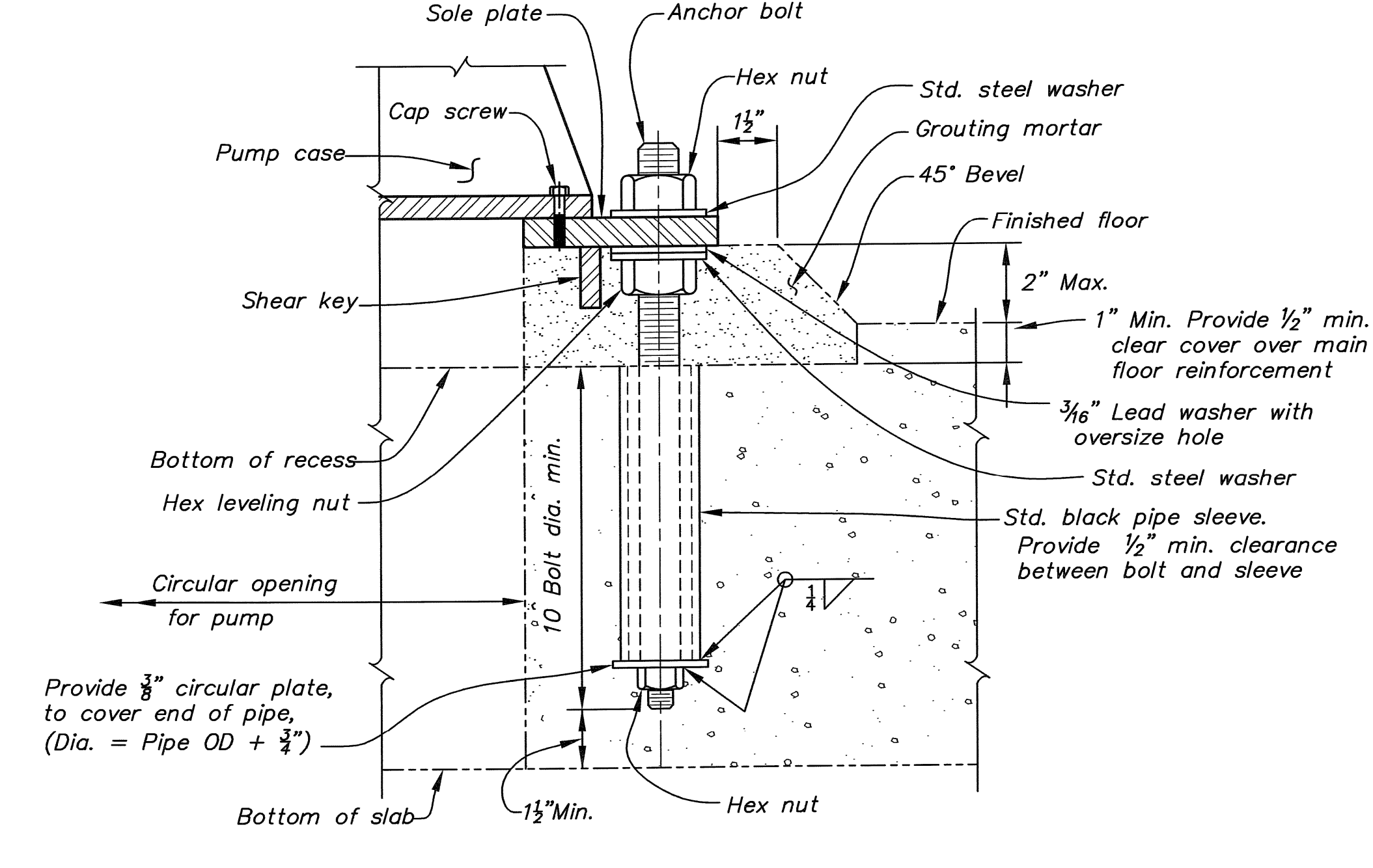
DENVER, CO. O. AUG. 25, 1959

40-D-5672

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*VERTICAL UNIT
(PUMP MOUNTED ON PEDESTAL)*



VERTICAL UNIT
(PUMP MOUNTED IN RECESS)

Pumps may be mounted on pedestals or in recesses depending on final dimensions supplied by pump manufacture. Dimension of anchor bolts shall conform to the pump manufacturers' requirements. Mounting and notes shown hereon for pumps apply equally to horizontal turbines.

REV NO 3	2009-01-01 D - <i>RVF</i>	REDRAWN AND UPDATED IN AUTOCAD
REV NO 2	1984-09-10 D - D.M.D	ADDED NOTE REGARDING HORIZONTAL TURBINES
REV NO 1	1967-07-03 D - J.P.C.	GROUT CHANGES TO GROUTING MORTAR.
THIS DRAWING SUPERSEDES DWG. 40-D-5364 AND 5641		
 ALWAYS THINK SAFETY		
UNITED STATES DEPARTMENT OF THE INTERIOR BUREAU OF RECLAMATION STANDARD DESIGN PUMP MOUNTING HORIZONTAL AND VERTICAL UNITS		
DRAWN <u>C.H.I.</u> _____ SUBMITTED <u>EDWIN ROSE</u> _____ TRACED <u>J.L.P.</u> _____ RECOMMENDED <u>H.A.A.</u> _____ CHECKED <u>T.B.</u> _____ APPROVED <u>K. B. KEENER</u> _____ CADD SYSTEM AutoCAD Rel. 17.1s DENVER, COLORADO CADD FILENAME 40D8006 R3.DWG AUG. 10, 1964 CHIEF ENGINEER DATE AND TIME PLOTTED APRIL 1, 2009 08:01		
40-D-6006 40-D-6006		

LINE	Identification of motor (Unit No., Item No., etc as applicable) (Note 2)						
1	Manufacturer (Nameplate)						
2	Horsepower rating (Nameplate)						
3	Time rating (Nameplate)						
4	Temperature rise of windings by resistance (Not ambient temperature)						
5	Calculated starting time of the pumping unit under specified conditions, seconds (Note 1)						
6	Rated load speed. R.P.M. (Nameplate)						
7	Number of phases (Nameplate)						
8	Armature connected (delta or wye)						
9	Voltage (Nameplate)						
10	Rated load amperes (Nameplate)						
11	Code letter for locked-rotor Kva/hp. (Nameplate)						
12	Design letter						
13	Power factor at nameplate rated load						
	Power factor at 3/4 load (Note 4)						
	Power factor at 1/2 load (Note 4)						
14	Capacitor KVAR rating to correct power factor over range of pump (Notes 3 and 4)						
15	Corrected power factor (minimum) (Note 4)						
16	Efficiency at nameplate rated load						
	Efficiency at 3/4 load (Note 4)						
	Efficiency at 1/2 load (Note 4)						
17	Type of enclosure (open, drip-proof, TEFC)						
18	Stator insulation, class						
19	Type of stator windings (form wound or random wound)						
20	Type of bearings (ball, roller, sleeve)						
21	Net weight each motor, lbs.						
22	Motor WR^2 - (lb-ft ²)						

NOTES

1. Applicable only to pumping units with motors above 20 hp.
2. Provide column for each different size motor at each plant or structure. All reference to nameplates means the date shall be as it appears on the nameplate furnished.
3. Capacitor KVAR rating should be at capacitor rated voltage but capacitor must be sized for operation at motor rated voltage.
4. Applicable only to units where power factor correction is specified.

Specifications or Solicitation No. _____
Project _____
Name of structure _____

2 - 19 - 99 D - L.J.R.	REVISED AND REDRAWN INTO AUTOCAD FORMAT.	
8 - 1 - 73 D - P.L.A.	GENERAL REVISIONS, RETRACED	
 ALWAYS THINK SAFETY		
UNITED STATES DEPARTMENT OF THE INTERIOR BUREAU OF RECLAMATION STANDARD DESIGNS INDUCTION MOTORS DESIGN AND NAMEPLATE DATA TO BE FURNISHED BY THE CONTACTOR		
DESIGNED <u>R.S.N.</u> SUBMITTED <u>J.V BAPTIST</u>		
TRACED <u>L. Mc Farlane</u> RECOMMENDED <u>H.G. ARTHUR</u>		
CHECKED <u>E.M.J. - P.L.A.</u> APPROVED <u>B.P. BELLPORT</u> CHIEF ENGINEER		
CADD SYSTEM AutoCAD Rel. 15.05 DENVER, COLORADO	CADD FILENAME 40D6032.DWG MARCH 18, 1965	DATE AND TIME PLOTTED NOVEMBER 20, 2001 13:42
40-D-6032		

SAMPLE NAMEPLATES

SIZES AND LETTER SPACING OF NAMEPLATES

NAMEPLATE MATERIAL

NOTE – All nameplate material shall be suitable for exposure to direct sunlight without detrimental fading.

TYPE A – Material shall be laminated phenolic resin sheets 1/16" or 3/32" thick (as specified) opaque black surface, white layer adjacent to surface layer, buffed or satin finish. Sheets to be cut to size with square edges. Engraving to cut through black surface to white layer. Shall conform to Military Specification MIL – P – 78A and Federal Specification L–P–509a.

TYPE B – Same as Type A except Chinese red surface or equivalent.

TYPE C – Same as Type A except 1/8", 3/16", or 1/4" thick (as specified).

TYPE D – Same as Type A except Chinese red surface or equivalent and 1/8", 3/16", or 1/4" thick (as specified).

NAMEPLATE USES

TYPE A – For panel mounting with self-tapping screws. For concrete wall or other flat mounting to identify valves, equipment, etc. Mount with epoxy cement–indoors or outdoors.

TYPE B – Red nameplates are restricted to uses such as fire protection equipment, warning inscriptions, and emergency devices. Methods of mounting shall be the same as for Type A.

TYPE C – For mounting on non-flat surface with epoxy cement.

TYPE D – Restricted to uses such as fire protection, equipment warning inscriptions, and emergency devices. For mounting on non-flat surfaces with epoxy cement.

LETTERING

Use normal or condensed letter types shown on the Gothic Lettering Chart. The normal size of lettering shall be not less than 3/16" high (1/4" preferred), except that 5/32" and smaller may be used for information and instructions that may be read at close range. Larger size lettering may be specified for out-of-doors installations or where necessary.

NOTES

This drawing supersedes Drawings No. 40–D–5173, 106–D–341, and 106–D–342.

This drawing and Drawings No. 40–D–6124, –6130, and –6187 supersede Drawing No. 40–D–2567.

Table 3 for ELECTRICAL EQUIPMENT ONLY, Tables 1 and 2 for all other equipment.

10 – 13 – 00
D – L.G.

Redrawn in AutoCAD

12 – 11 – 79
D – L.H.

Redrawn

11 – 6 – 70
D – D.A.W.

Add Table 3 and Note

ALWAYS THINK

SAFETY

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

STANDARD DESIGNS

STANDARD NAMEPLATES

DESIGNED D.A.W.

TECHNICAL APPROVAL C.G. Bates

DRAWN J.M.F.

SUBMITTED Jack W. Hill

CHECKED D.M.B. – S.X.K. – E.M.J.

APPROVED B.P. Bellport
CHIEF ENGINEER

CADD SYSTEM
AutoCAD Release 12_c2-a

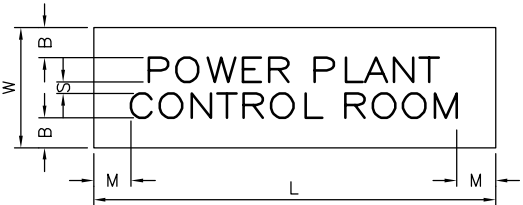
CADD FILENAME
40D6324.DWG

DATE AND TIME PLOTTED
NOVEMBER 29, 1994 12:28

DENVER, COLORADO

MAY 1970

40-D-6234



FOR DIMENSIONS SEE TABLES 1 & 2

TABLE 1
WIDTH

TABLE FOR ALL LETTERING THE SAME SIZE

GOTHIC LETTER SIZE	NO. OF LINES								
	1			2			3		
	W	B		W	S	B	W	S	B
1/4	1.00	.375		1.25	.15	.30	1.75	.15	.35
3/16	.75	.28		1.00	.11	.26	1.25	.11	.23
5/32	.50	.17		.75	.08	.18	1.00	.09	.18
1/8	.50	.19		.75	.08	.21	1.00	.08	.23
3/32	.50	.20		.50	.07	.12	.75	.08	.15

For other lettering sizes, more than three lines, or various size lettering on same nameplate, arrange width as follows:

Space(S)=Average of letter sizes on each side of space x 0.6.

Border(B)=Largest lettering size on nameplate x 1.2 + half of odd amounts to give total width(W) to even 1/4".

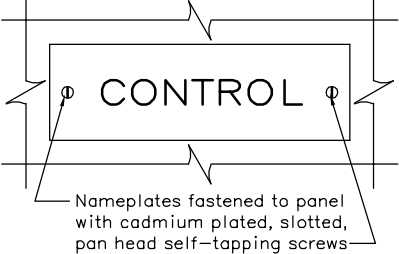
TABLE 3
STANDARD NAMEPLATES
FOR ELECTRICAL EQUIPMENT ONLY

NAMEPLATE SIZE NO.	NAMEPLATE DIMENSIONS			LETTERING SIZE
	L	W	B	
1	1 1/8	7/16	1/16	3/32
2	1 1/2	9/16	1/8	3/32
3	1 3/4	5/8	1/8	1/8
4	2 1/4	3/4	1/8	3/16
5	3	1	7/32	3/16
6	4	1 1/4	1/4	1/4
7	6	1 3/4	1/4	1/2

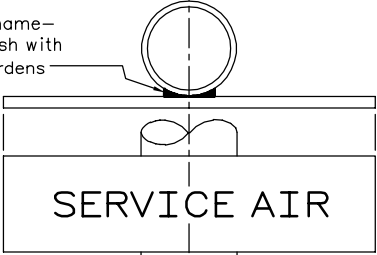
Above nameplates shall be used for electrical equipment unless otherwise specified.

MOUNTING OF NAMEPLATES

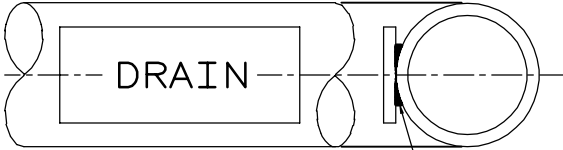
Use epoxy on full width of nameplate and scrape excess flush with nameplate before epoxy hardens



TYPICAL MOUNTING ON PANEL



TYPICAL MOUNTING ON VERTICAL PIPE



TYPICAL MOUNTING ON HORIZONTAL PIPE



TYPICAL MOUNTING ON CONCRETE WALL

TABLE 2
LENGTH

NO.OF LETTERS AND SPACES	LETTERING SIZE ON LONGEST LINE (NORM=NORMAL; COND=CONDENSED)							
	Dim. in inches							
	1/4	3/16	5/32	1/8	3/32			
1								
2								
3								
4								
5								
6								
7								
8	3 1/2							
9		3 1/2						
10	4							
11	4 1/2							
12		4	3 1/2					
13	5	4 1/2		3 1/2				
14	5 1/2							
15		5	4 1/2	4	3 1/2	3 1/2		
16				4				
17	6	5 1/2	5	4 1/2				
18	6 1/2				4		3 1/2	
19		6	5 1/2	5				
20						4		
21	7	6 1/2			5	4 1/2		3 1/2
22			6	5 1/2			4	
23	7 1/2					4 1/2		
24	8	7						
25			6 1/2	6	5 1/2	5	5	4 1/2
26	8 1/2	7 1/2						4
								3 1/2

For other lettering sizes or longer nameplates, use the following formula:

$L = A(N+n) + 2M$ (Nameplate length cut to nearest 1/2").

L – Length of nameplate.

A – Average letter width on longest line.

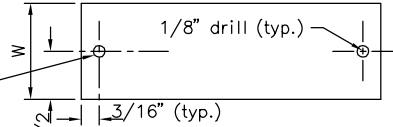
N – Number of letters on longest line.

n – Number of spaces on longest line

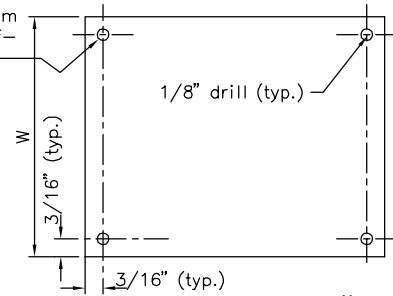
M – Margin=Average letter width plus 5/8".

DRILLING OF NAMEPLATES

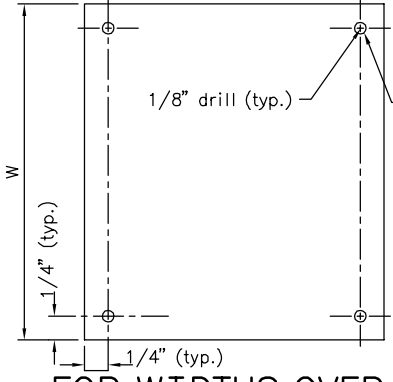
(For panel mounting only)



FOR WIDTHS UP TO 1 3/4"



FOR WIDTHS OF 2" TO 3"



FOR WIDTHS OVER 3"

All lettering to be done with flat groove type tool

Laminated nameplate material

Groove width of letters to be approximately 0.025" for lettering sizes up to and including 1/4". For larger lettering, groove width to be approximately one-tenth of letter size.

LETTERING DETAIL

GENERAL NOTES 1/

UNLESS OTHERWISE SHOWN ON THE REINFORCEMENT SPECIFICATIONS DRAWINGS, THE DETAILS AND NOTES SHOWN ARE MINIMUM REQUIREMENTS AND TYPICAL FOR ALL REINFORCEMENT DRAWINGS THAT REFER TO THIS DRAWING

ABBREVIATIONS :

bf = bottom face
tf = top face
nf = near face
ff = far face
ef = each face
if = inside face
of = outside face

br = bottom row
tr = top row
nr = near row
fr = far row
er = each row
ir = inside row
or = outside row
mr = middle row

bl = bottom layer
tl = top layer
ml = middle layer
ns = near side
fs = far side
es = each side
ew = each way
ec = each corner

spc. = space or spaces
eq. spc. = equally spaced, equal spaces
 d_b = nominal diameter of reinforcing bar
uv = uniformly varying lengths of bars between lengths shown
cl. = clear
ctr. = center or centers
add'l = additional
 ℓ_d = development length

SYMBOLS :

Bars shown thus indicate a group of the same size bars equally spaced.
An open circle at the end of a bar indicates a bend with the bar turned away from the observer.
A closed circle at the end of a bar indicates a bend with the bar turned towards the observer.
Splices shown thus indicate a lap splice, not a bend in the bar.
 Mechanical splice
 Headed deformed bar

DIMENSIONS :

Dimensions are to the centerline of the bars except for embedment of hooks, which are dimensioned to the outside of the bar.

Clear cover dimensions are marked "cl." and are dimensioned to the outside of the bar.

COVER :

Place the reinforcement so that the clear distance between face of concrete and nearest reinforcement is 2" for #8 bars and smaller, and 3" for #9 bars through #11 bars. Provide 3" clear distance from face of concrete for all bars when the concrete is placed against earth or rock. Clear distance is to the design dimension line.

Reinforcement parallel to construction joints shall have a minimum of 2" clear cover.

PLACING :

Reinforcement at small openings (max 1'-6") in walls and slabs may be spread apart not more than 1.50 times the bar spacing.

Reinforcement shall be adjusted laterally to maintain a clear distance of at least 1" between the reinforcement and keys, waterstops, anchor bolts, form ties, conduits, and other embedded materials. In heavily reinforced areas, relocation of the embedded material or cutting of reinforcement must be approved.

When bars are bent due to offsets less than 3" and recesses less than 3" deep, the slope of the inclined portion must not exceed 6 to 1.

Reinforcement parallel to anchor bolts or other embedded material shall be placed to maintain a clear distance of at least 1.33 times the maximum size aggregate.

SPACING :

The first and last bars in walls and slabs, stirrups in beams, and ties in columns are to start and end at a maximum of one half of the adjacent bar spacing. The minimum edge spacing shall be $2.5d_b$. For #9 through #11 bars where minimum centerline bar spacing is 6" and the lap splice lengths requiring staggered placement shown in Tables 4-60 and 4.5-60 are used, the minimum edge spacing shall be 3".

ACCESSORIES :

Bar supports, spacers, and other accessories are not shown on the design drawings. The recommendations of the ACI Detailing Manual-2004 (SP-66), or other approved supporting systems shall be used.

DRAWING REFERENCES :

Numerals in parentheses () following notes and section letters or numbers indicate the number of the drawing upon which the section or detail is shown; for example (524) denotes Drawing No. 557-D-524.

1/

Unless otherwise shown on the reinforcement specifications drawings or this drawing, follow the recommendations established by the ACI Detailing Manual - 2004 (SP-66).

STANDARD HOOKS :

- 180-degree bend plus $4d_b$ extension, but not less than $2\frac{1}{2}$ " at the free end of the bar.
- 90-degree bend plus $12d_b$ extension at free end of the bar.

STIRRUP AND TIE HOOKS :

- #5 bar and smaller, 90-degree bend plus $6d_b$ extension at the free end of the bar.
- #6, #7, and #8 bars, 90-degree bend plus $12d_b$ extension at the free end of the bar.
- #8 bars and smaller, 135-degree bend plus $6d_b$ extension at the free end of the bar, but not less than 3".

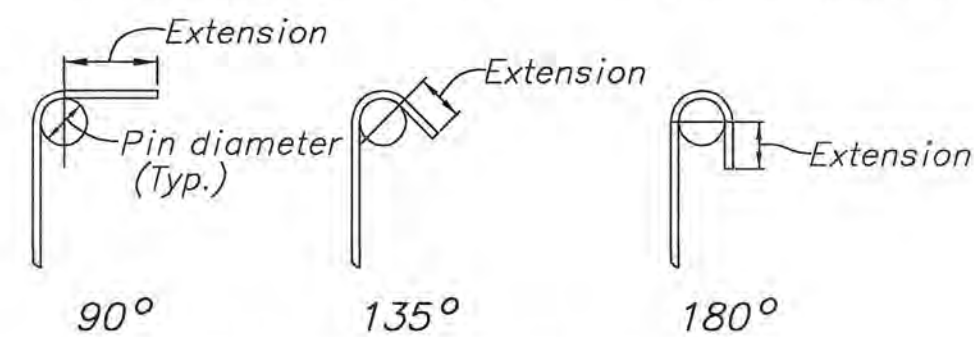


TABLE OF PIN DIAMETERS IN INCHES

BAR NO.	3	4	5	6	7	8	9	10	11
Standard bends	$2\frac{1}{4}$	3	$3\frac{3}{4}$	$4\frac{1}{2}$	$5\frac{1}{4}$	6	$9\frac{1}{2}$	$10\frac{3}{4}$	12
Stirrup and tie bends	$1\frac{1}{2}$	2	$2\frac{1}{2}$	$4\frac{1}{2}$	$5\frac{1}{4}$	6			

REINFORCEMENT DOWELS :

Dowels indicated on the drawing, such as #8(d), shall be embedded a length equal to ℓ_d and shall have a projection equal to that required for lap splicing to a bar of the same diameter.

PLAIN DOWELS :

Plain dowels across contraction joints shall be smooth bars uniformly coated with a film of oil before concrete placement. Viscosity of the oil shall have a SAE rating of not less than 250.

CODE AND DETAILING REFERENCES :

ACI Building Code Requirements for Structural Concrete (ACI 318-11).
ACI Detailing Manual - 2004 (SP-66).
ACI Code Requirements for Environmental Engineering Concrete Structures (ACI 350-06).

NOTES TO DESIGNERS AND DETAILERS :

Splice lengths shown in the tables on this drawing are for Class B tension lap splices in accordance with ACI 318 and ACI 350. Assumed conditions for these tables in addition to the requirements shown on this drawing are uncoated reinforcement, normal weight concrete, and the transverse reinforcement index (K_{tr}) equal to zero. Splices or development lengths other than those shown in the tables must be detailed on the reinforcement specifications drawings.

Some factors which require additional consideration are: Beams or columns with ties, lightweight aggregate concrete, epoxy-coated reinforcement, excess reinforcement, bars in compression, bundled bars, and special seismic provisions.

The centerline to centerline spacing requirements shown in Tables 4-60 and 4.5-60 may not be applicable when using the provisions of ACI 318 Section 10.6 or ACI 350 Section 10.6 for distribution of flexural reinforcement to control flexural cracking.

Recalculation of lap splice lengths and development lengths by the designer may be required for changes in combinations of controlling variables per ACI 318 Section 12.2, or ACI 350 Section 12.2.

Lap splices and development lengths for horizontal bars in walls are designated as top bar splices and development lengths unless otherwise noted or detailed on the reinforcement specifications drawings.

Development lengths for deformed bars in tension terminating in a standard hook shall be calculated by the designer in accordance with ACI 318 Section 12.5 or ACI 350 Section 12.5. In cases where a restricted member thickness does not allow for the full development length, the designer shall use a reduced tensile capacity.

SPICES :

The minimum length of lap for splicing parallel bars shall be as given in TABLES 4-60 and 4.5-60.
Staggered lap splices shall be separated to give 12 inches clear between ends of adjacent splices.
Bars spliced by noncontact lap splices shall not be spaced transversely farther apart than one-fifth the required lap splice length, nor 6" on centers.
When reinforcing bars of different size are to be spliced, splice length shall be the larger of ℓ_d of larger bar and tension lap splice length of smaller bar.
Splices are to be made so that the required clear distances to face of concrete will be maintained.

Bar size No. *** IP (SM)	$f'_c = 4,000 \text{ psi}$ MINIMUM € to € BAR SPACING (INCHES)	TABLE 4 - 60		$f_y = 60,000 \text{ psi}$	
		LAP SPICE LENGTH (INCHES)		DEVELOPMENT LENGTH ℓ_d (INCHES)	
		TOP BARS *	OTHER BARS	TOP BARS *	OTHER BARS
3 (10)	3	15	12	12	12
4 (13)	3	20	15	15	12
5 (16)	3.5	25	19	19	15
6 (19)	4	29	23	23	18
7 (22)	4.5	43	33	33	25
8 (25)	5	49	37	37	29
9 (29)	6	55	42	42	33
10 (32)	6.5	62	47	47	37
11 (36)	7.5	68	53	53	41
10 (32)	6	65**	50**	50	39
11 (36)	6	80**	62**	62	48

Bar size No. *** IP (SM)	$f'_c = 4,500 \text{ psi}$ MINIMUM € to € BAR SPACING (INCHES)	TABLE 4.5 - 60		$f_y = 60,000 \text{ psi}$	
		LAP SPICE LENGTH (INCHES)		DEVELOPMENT LENGTH ℓ_d (INCHES)	
		TOP BARS *	OTHER BARS	TOP BARS *	OTHER BARS
3 (10)	3	14	12	12	12
4 (13)	3	19	14	14	12
5 (16)	3.5	23	18	18	14
6 (19)	4	28	21	21	17
7 (22)	4.5	40	31	31	24
8 (25)	5	46	35	35	27
9 (29)	6	52	40	40	31
10 (32)	6.5	58	45	45	35
11 (36)	7.5	64	50	50	38
10 (32)	6	61**	47**	47	37
11 (36)	6	76**	58**	58	45

TABLES 4-60 and 4.5-60 generated using ACI 318 Eq. 12-1 and ACI 350 Eq. 12-1.

* Top bars are all horizontal bars so placed that more than 12 inches of fresh concrete is cast below the development length or splice. (See NOTES TO DESIGNERS AND DETAILERS)

** Splices must be staggered.

*** IP = Inch-Pound Bar Size Designation.

SM = Soft Metric Bar Size Designation.

9-15-12 D - A1B, PE	REVISED TO CONFORM TO ACI 318-11 AND ACI 350-06.
9-1-10 D - A1B, PE	REVISED TO CONFORM TO ACI 318-08 AND ACI 350-06. REMOVED TABLE 3-60 AND ADDED TABLE 4.5-60. OTHER MINOR REVISIONS.
7-23-07 D - A1B, PE	REVISED TO CONFORM TO ACI 318-05. ADDED THREE NOTES TO NOTES TO DESIGNERS AND DETAILERS. OTHER MINOR REVISIONS.
6-1-03 D - A1B, PE	REVISED TO CONFORM TO ACI 318-99. REVISED SYMBOLS, SPACING, NOTES TO DESIGNERS AND DETAILERS. ADDED SOFT METRIC BAR SIZES IN TABLES. MINOR REVISIONS.
6-1-97 D - GPG	CONVERTED TO AUTOCAD DRAWING. REVISED TO CONFORM TO ACI 318-95. OTHER MINOR REVISIONS.
2-29-92 D - R.O.A.	TOP BAR DEFINITION REVISED AND MINOR PUNCTUATION REVISION IN PLACING NOTE.
12-7-90 D - J.D.S.	REDRAWN TO NEW DRAFTING STANDARDS. REVISED CONCRETE COVER, NOTES TO DESIGNERS, TABLES, REINFORCEMENT AROUND OPENINGS, AND OTHER MINOR REVISIONS. REVISED TO CONFORM TO ACI 318-89.
9-27-84 D - NFP DG	REVISED PIN DIAMETER TABLE, REFERENCED THE ACI DETAILING MANUAL 1980, ADDED NOTES UNDER PLACING AND STANDARD HOOKS.
12-8-76 D - WRW	MINOR REVISIONS



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UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
STANDARD DESIGNS

GENERAL NOTES AND MINIMUM REQUIREMENTS FOR DETAILING REINFORCEMENT

DESIGNED <u>M. F. WARD</u>	J. G. STARBUCK	TECHNICAL APPROVAL <u>E. D. MORGAN</u>
DRAWN <u>M. CAMPBELL</u>		SUBMITTED <u>JACK W. HILF</u>
CHECKED <u>GAYLE A. ERICKSON</u>		APPROVED <u>H. G. ARTHUR</u>
ACTING DIRECTOR, DESIGN AND CONSTRUCTION		
CADD SYSTEM AutoCAD Rel. 18.1s	CADD FILENAME 40-D-6263 REV9.DWG	DATE AND TIME PLOTTED SEPTEMBER 6, 2012 10:14
DENVER, COLORADO	JUNE 12, 1972	40-D-6263

D

C

B

A

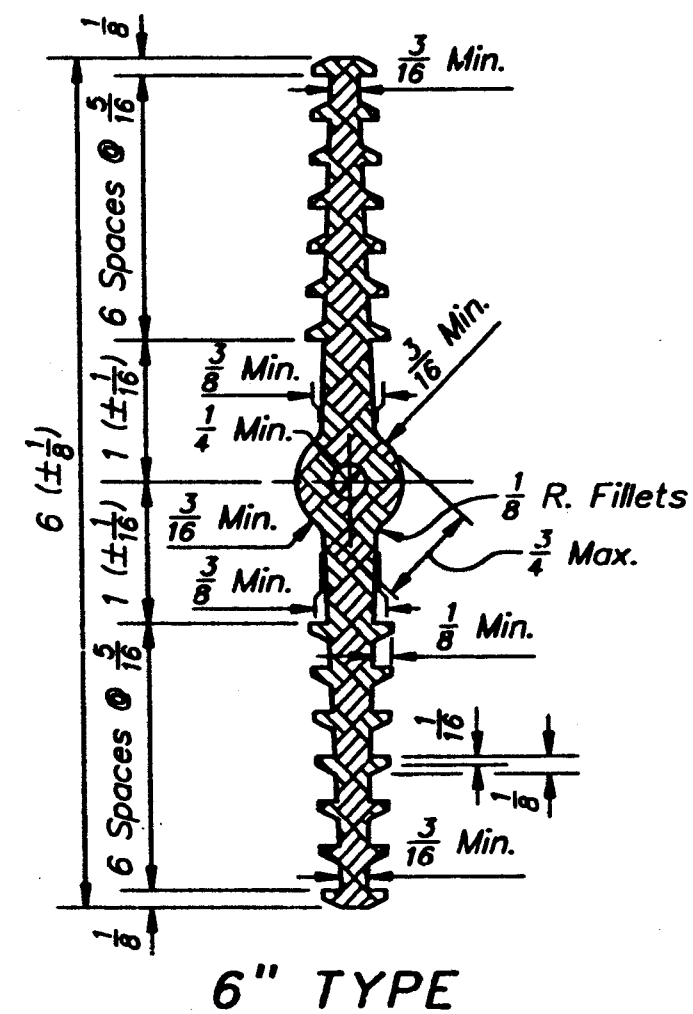
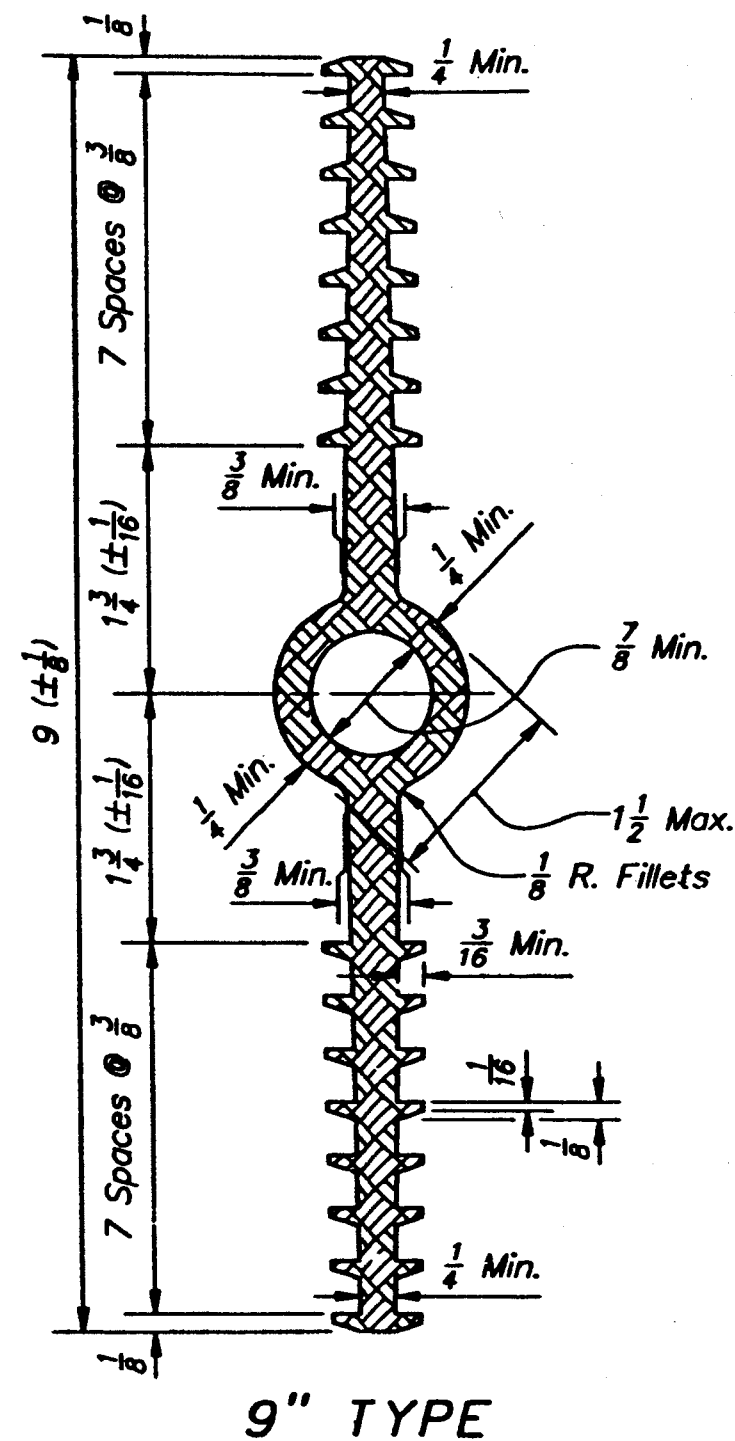
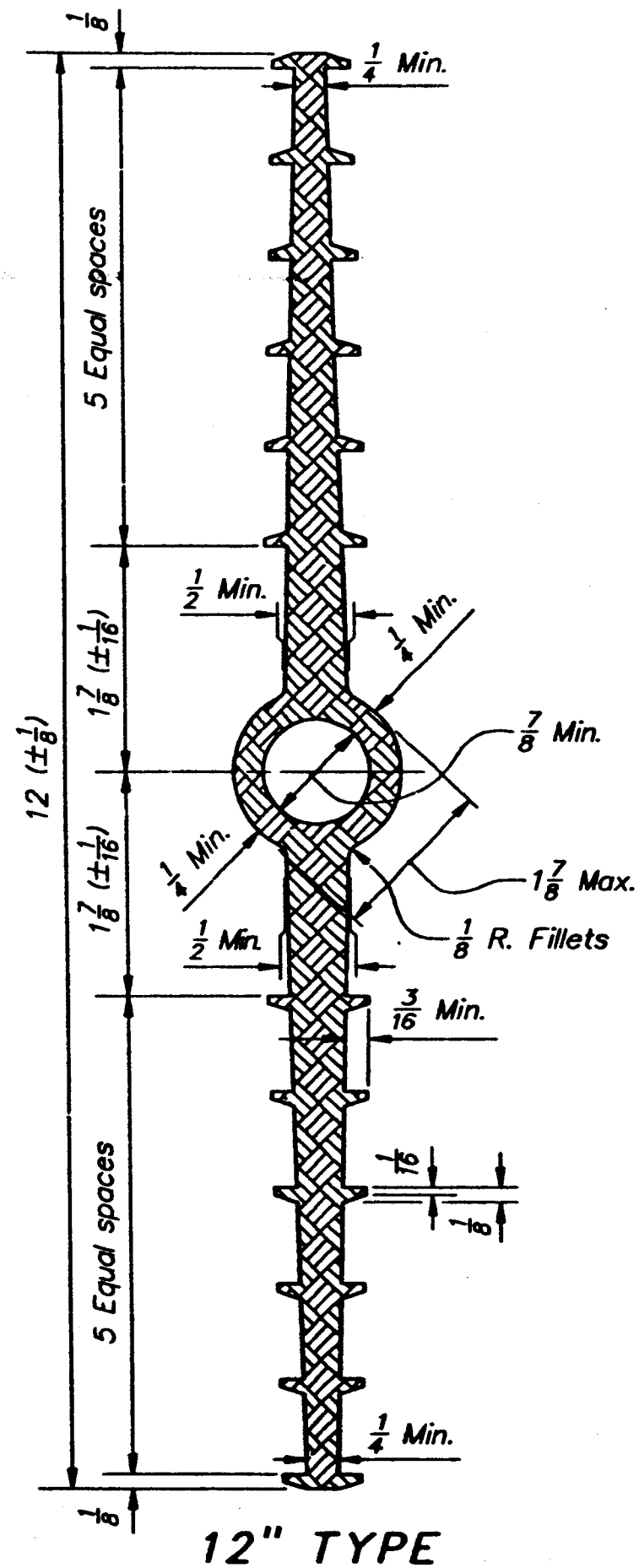
D

C

B

A

ACI 318-11 (4-0-D)

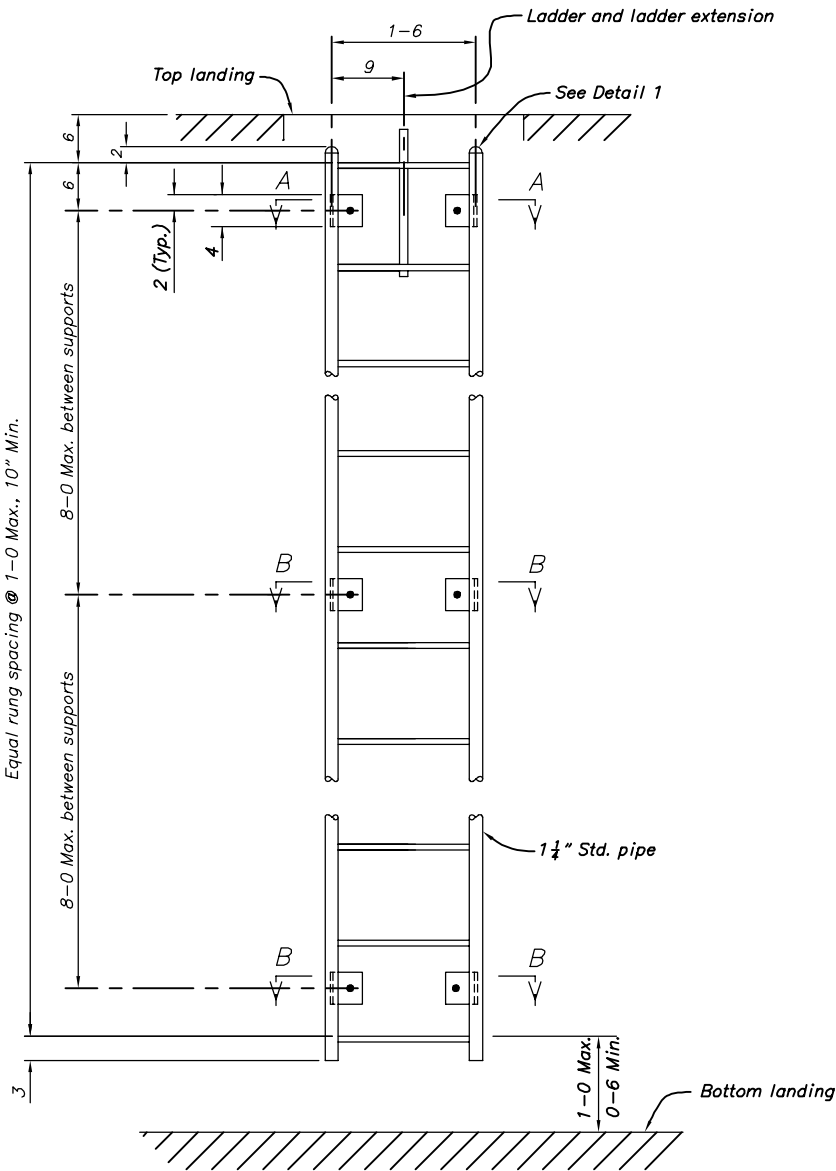


NOTE

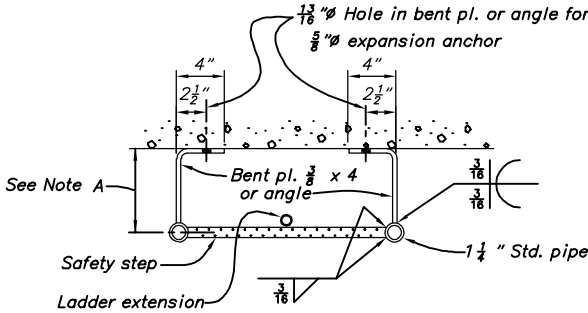
Tips of fins may be rounded provided they meet the minimum dimensions shown.

9-15-82	REDRAWN TO INCLUDE 12" TYPE
8-15-81	AS BUILT BY 303, LTR. 7-26-81.
8-15-81	REVISOR
12-9-80	REVISED FINES ON 6" TYPE
8-15-80	REVISOR
ALWAYS THINK SAFETY	
UNITED STATES DEPARTMENT OF THE INTERIOR BUREAU OF RECLAMATION STANDARD DESIGNS PVC WATERSTOPS 6" TYPE, 9" TYPE AND 12" TYPE	
DESIGNED BY E. C. STEVENSON	REVIEWED BY M. J. ANDERSON
DRAWN BY B. B. ANDERSON/ALB	REVIEWED BY M. R. ANDERSON
CHECKED BY E. C. STEVENSON	APPROVED BY M. R. ANDERSON
ACT. CHIEF, DIVISION OF DESIGN DATE 12, 1979	

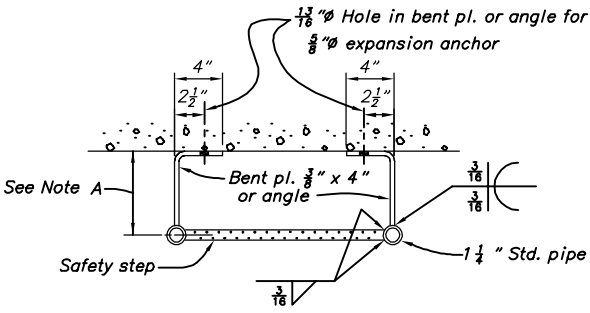
Note A: 7 inches unless noted otherwise on structure drawing.



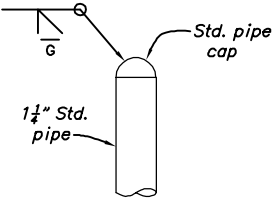
LADDER – TYPE 2



SECTION A-A



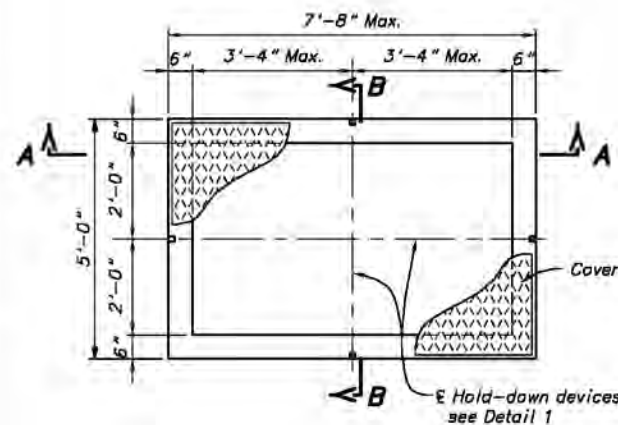
SECTION B-B



DETAIL 1

NOTES
All material is steel unless otherwise noted.
Details, welds and other connections shown are typical for all similar conditions.
Dimensions shown are typical for similar details.
Galvanize all ferrous metalwork after fabrication. Provide vent holes as required.
Contractor determines length of ladders and rung spacings based of elevation difference. See structure drawings.
Grind all welds smooth.

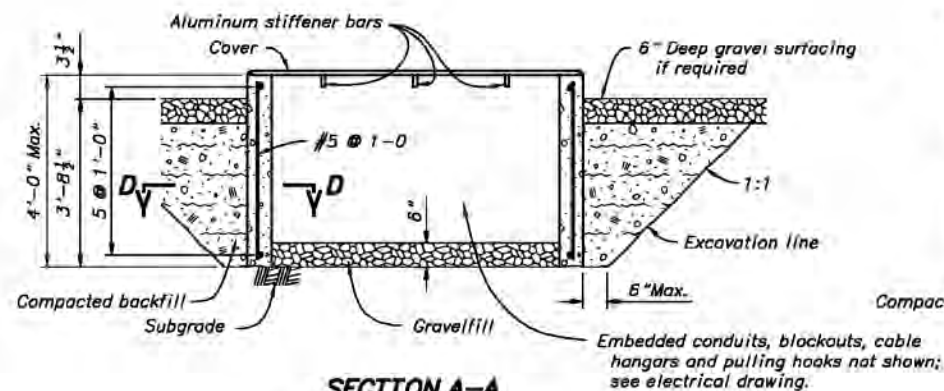
⊕ ALWAYS THINK SAFETY		
UNITED STATES DEPARTMENT OF THE INTERIOR BUREAU OF RECLAMATION		
STANDARD DESIGN		
MISCELLANEOUS METALWORK		
LADDER – TYPE 2		
DESIGN _ A. M. TUCKER _	TECH. APPR. _ T. C. GRABER _	
DRAWN _ A. M. TUCKER _	SUBMITTED _ JAMES W. HILL _	
CHECKED _ T. E. SADUSKY/DCD _	APPROVED _ JOHN D. SMART _	
CADD SYSTEM AutoCAD Rev. 15.05 DENVER, COLORADO		DATE AND TIME PLOTTED DECEMBER 20, 2001 11:25 40-D-6601



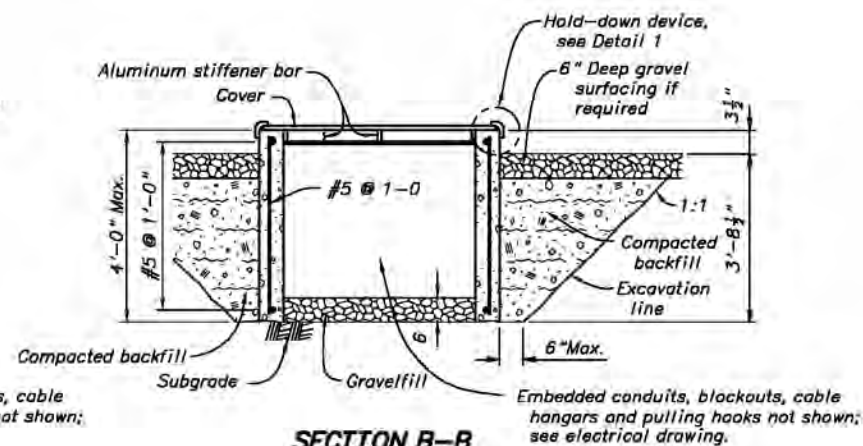
PLAN

PB1 — PULLBOX, TYPE I

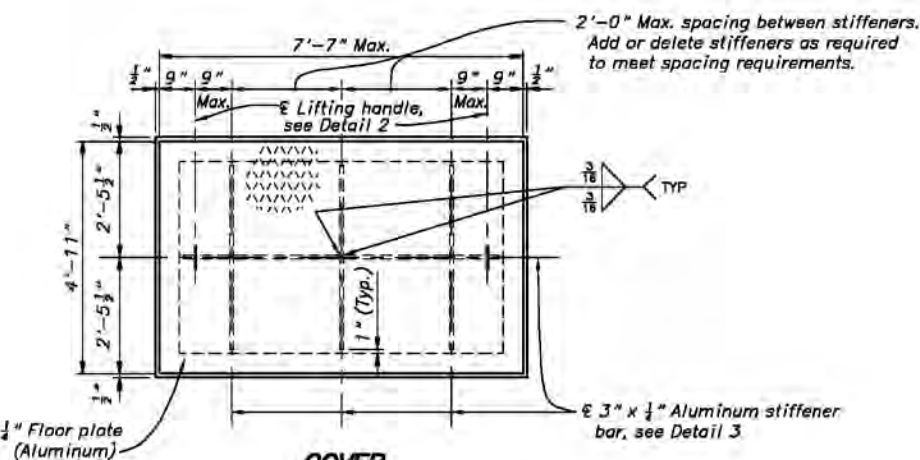
For location and box size, see electrical drawing



SECTION A-A

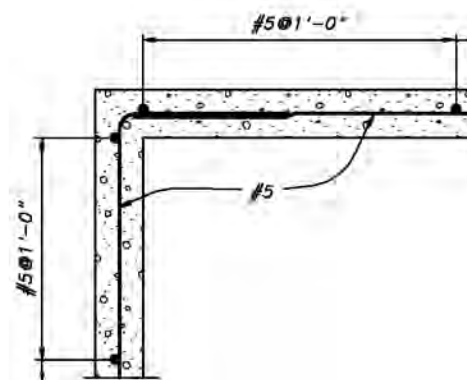


SECTION B-B

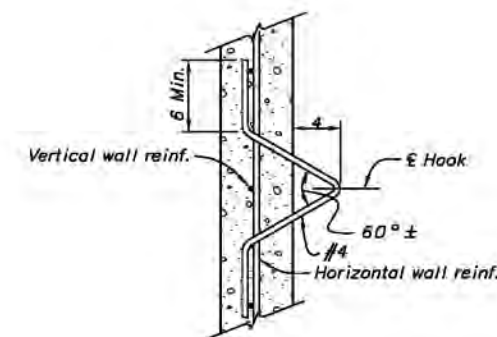


COVER

Live Load=100 LBS/SQ. FT.

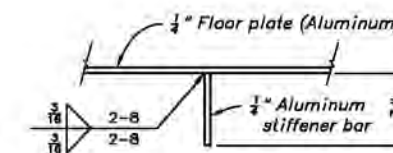


SECTION D-D

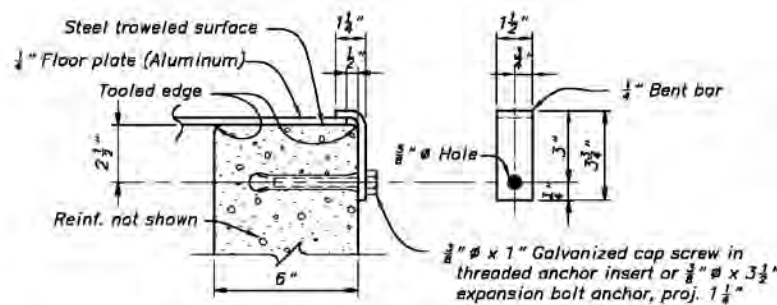


PULLING HOOK

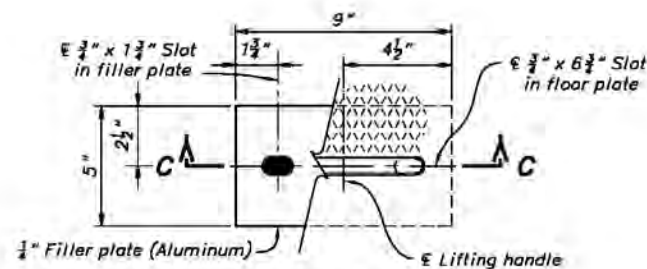
PROVIDE 5" MINIMUM CLEARANCE FROM CENTERLINE OF HOOK TO EDGE OF CONCRETE



DETAIL 3

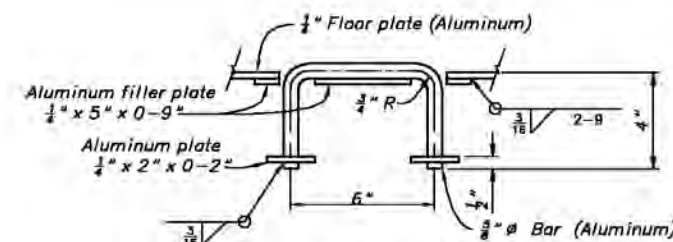


DETAIL 1

HOLD-DOWN DEVICE
GALVANIZE BARS AFTER FABRICATION

DETAIL 2

LIFTING HANDLE



SECTION C-C

Quantities based on maximum dimensions shown:

Excavation (common) 15 yd.³Concrete 1.7 yd.³

Reinforcement bars 220 lbs.

Compacted backfill 11 yd.³Compacted gravel fill 0.5 yd.³

DESIGN LOADS

Pullbox concrete — Lateral earth pressures (equivalent fluid pressure) of 80 psi per foot of depth with a 2 ft. surcharge to account for adjacent wheel loads.

Pulling eye and anchor — 4,000 lbs. tension working capacity.
Lifting inserts — Designed in accordance with loads required to handle and install the pullbox.

GENERAL NOTES

Concrete structural design is based on concrete with a compressive strength of 4,000 psi at 28 days and reinforcement with a minimum yield strength of 60,000 psi.

NOTES

Minimum clear space inside pullbox is 3'-0" x 3'-0".

For pullbox dimensions, embed conduit, blockouts, and pulling hook locations, see electrical drawings.

All metalwork is steel unless otherwise noted.

Grind smooth all burred edges of cover.

Aluminum in contact with concrete shall be coated in accordance with specifications paragraphs.

Cut slope for common excavation may require flatter slopes depending on soil conditions. Cut slopes in rock will typically be more vertical.

REFERENCE DRAWINGS

GENERAL CONCRETE OUTLINE NOTES — 40-D-7012

GENERAL NOTES AND MINIMUM REQUIREMENTS

FOR DETAILING REINFORCEMENT — 40-D-6263

ALWAYS THINK SAFETY

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
STANDARD DESIGNMISCELLANEOUS METALWORK
CONCRETE STRUCTURES
PULLBOXES

OUTLINE AND REINFORCEMENT DESIGN

DESIGNED — G. E. SHEPARD — TECH. APPR. — B. K. GOPLIN

DRAWN — D. BORING

CHECKED — B. K. GOPLIN

APPROVED — M. R. O'SHEA

CADD SYSTEM

ARCHD. BY — J. L. O.

DENVER, COLORADO

DATE AND TIME PLOTTED

1/27/75 10:00

FEBRUARY 2, 1993

40-D-6743

GENERAL NOTES

UNLESS OTHERWISE SHOWN, THESE NOTES ARE TYPICAL FOR ALL DRAWINGS THAT REFER TO THIS DRAWING.

ABBREVIATIONS

- El. = Elevation

HP = High point

LP = Low point

WP = Working point

bf = bottom face

ef = each face

ff = far face

nf = near face

tf = top face

SP = Sewer pipe

TW = Tailwater

WS = Water surface, waterstop

CJ = Construction joint

EJ = Expansion joint

OCJ = Optional construction joint

VCJ = Vertical construction joint

Cr.J = Contraction joint

Ct.J = Control joint
- WSA = Waterstop—Type A

WSB = Waterstop—Type B

WSD = Waterstop—Type D

WSE = Waterstop—Type E

WSF = Waterstop—Type F

WSG = Waterstop—Type G

WSH = Waterstop—Type H

MSN1 = Metal seal—Type N1

MSN2 = Metal seal—Type N2

MSZ = Metal seal—Type Z

EMBEDDED MATERIALS

Before placing concrete, care shall be taken that all embedded items are in position and securely fastened in place. Anchor bolt locations and settings are shown on the structural steel, miscellaneous metal, concrete, and equipment drawings. Conduits and grounding cables are shown on the manufacturer's drawings and the electrical drawings. All projecting waterstops and metal seats shall be supported and protected from damage and exposure.

FINISHES

For location and classes of finishes for formed and unformed concrete surfaces, see the specifications drawings and/or paragraphs.

JOINTS

All construction joints, identified as CJ, shall be provided where shown on the drawings. All optional construction joints, identified as OCJ, are to reduce the volume of placements or to facilitate construction. If optional joints are provided they shall be only at the locations shown. Additional construction joints may be used subject to approval.

REFERENCES

Numerals in parentheses that follow notes, details and section letters or numbers indicate the number of the drawing upon which the section or detail is indicated or shown. For example, (524) denotes Drawing No. XXX-D-524. The letters XXX shown here will be numbers denoting the project.

CHAMFER

Chamfer edges of permanently exposed concrete surfaces with a 45° bevel, 3/4" x 3/4".

CONCRETE PLACEMENT

Before placing concrete, see all drawings released to the contractor as suitable for construction, including manufacturer's drawings, for all embedded material which is required in the placement.

CONCRETE SYMBOLS

The different concrete placements are indicated by the following symbols:

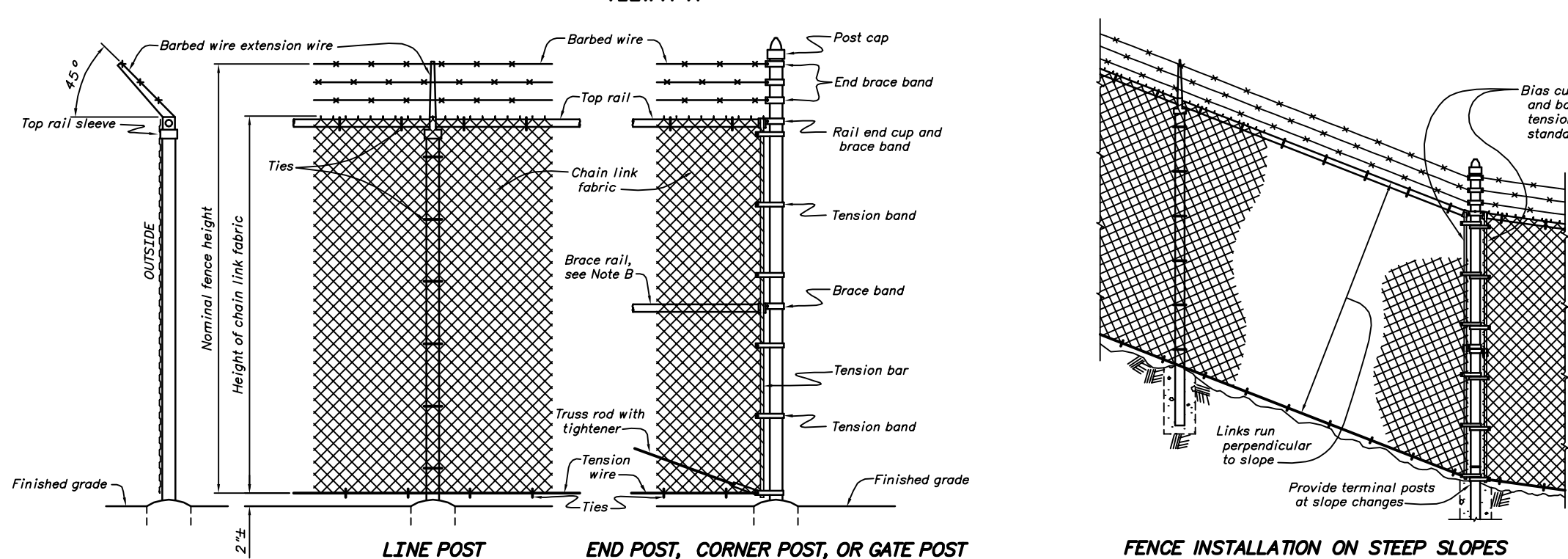
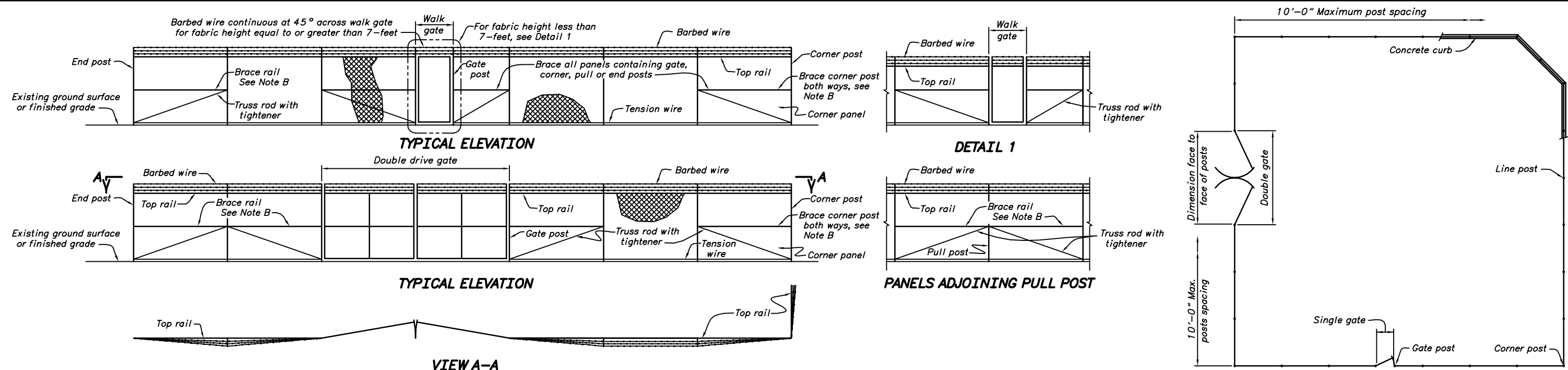
- Concrete -- First stage
- Concrete -- Second stage
- Concrete -- Blockout
- Existing concrete or concrete in adjacent structures
- Grout

DIMENSIONS

All dimensions to a joint are to the centerline of the joint unless otherwise shown.
Dimensions to beams, columns, and walls are from reference lines or other control points.
Dimensions in parentheses () on plans are beam depths.
Beam and slab depths shall be measured from the top of the structural slab. Dimensions given for the depth of recesses are from the surface of the structural concrete.
Thicknesses shown for walls and slabs placed against soil or rock are minimum dimensions.

THIS DRAWING SUPERSEDES DRAWING 40-D-7006

REV NO	1	2004- 12 -28	REDRAWN IN AUTOCAD.
	D	R.S.D.	
ALWAYS THINK SAFETY			
UNITED STATES DEPARTMENT OF THE INTERIOR BUREAU OF RECLAMATION			
STANDARD DESIGN			
GENERAL CONCRETE OUTLINE NOTES			
DESIGNED DL BORING		TECH. APPR.	
DRAWN DL BORING			
CHECKED GARY SNIDER		APPROVED	
CADD SYSTEM AUTOCAD Ver. 16.0s DENVER, COLORADO		CADD FILE NAME 40-D-7012.DWG MARCH 23, 1998	
		STRUCTURAL AND ARCHITECTURAL GROUP DATE AND TIME PLOTTED JANUARY 6, 2005, 1:3:47	
		40-D-7012	



NOTES

See specific site plan for overall fence dimensions and size, location and swing of gates.

Install pull posts at the end of each run, at maximum intervals of 500 feet, and at vertical and horizontal changes in alignment greater than 30 degrees.

Weld all joints between tubular gate frame members or use heavy fittings to provide rigid and watertight connections.

Gate dimensions are face to face of gate posts.

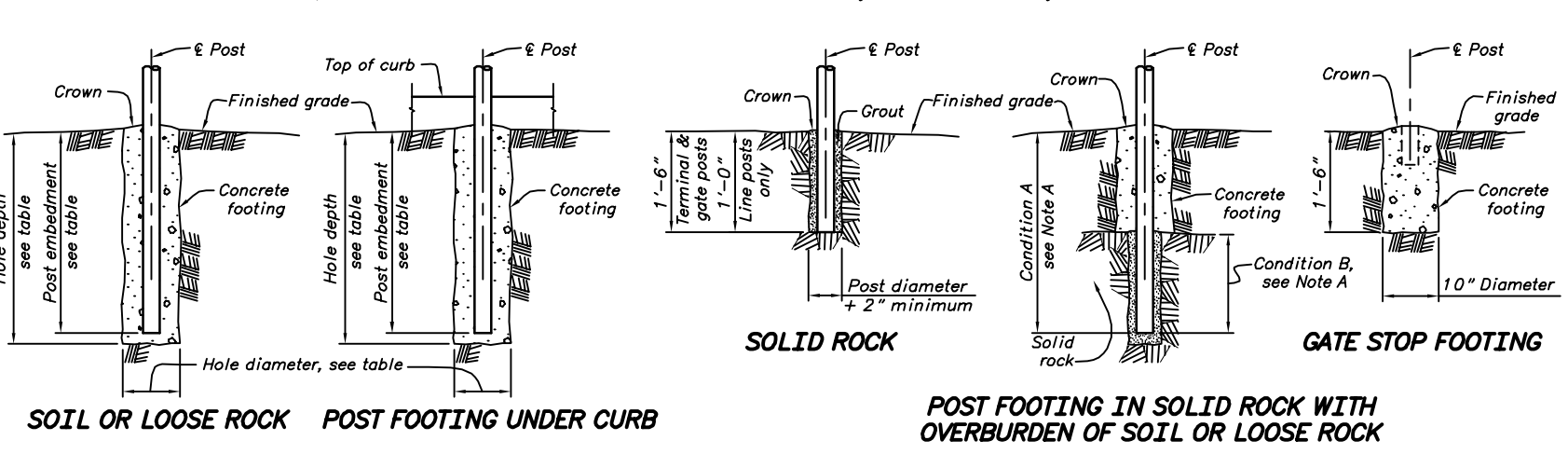
Provide latches, stops and keepers for all gates as specified.

End post, corner posts, and pull posts, are designated as terminal posts.

See site plans for curb details and locations where curb is required.

Chain link fabric shall be attached to fence framework in accordance with the Chain Link Fence Manufacturer's Institute (CLFMI) Product Manual.

Chain link fences are 6 foot high fabric unless otherwise noted on specific site plans.



POST FOOTING SIZES IN SOIL OR LOOSE ROCK				
POST	FABRIC HEIGHT OR GATE LEAF WIDTH	HOLE DIAMETER	HOLE DEPTH	POST EMBEDMENT
Line	3 ft. to 4 ft.	6 inches	24 inches	22 inches
Line	5 ft.	8 inches	30 inches	28 inches
Line	6 ft. to 12 ft.	9 inches	38 inches	36 inches
Terminal	3 ft. to 5 ft.	10 inches	32 inches	30 inches
Terminal	6 ft. to 12 ft.	12 inches	38 inches	36 inches
Gate	≤ 6 ft.	12 inches	38 inches	36 inches
Gate	6 ft. to 13 ft.	16 inches	44 inches	42 inches
Gate	> 13 ft.	26 inches	50 inches	48 inches

Condition A: Depth required for footing in soil or loose rock.
Condition B: Depth required for embedment in rock.
Note A: Satisfy the minimum requirements for Condition A or Condition B.
Note B: Brace rails and truss rods are not required for fabric height of 6 feet or less.

ALWAYS THINK SAFETY

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
STANDARD DESIGN

CHAIN LINK FENCING
CHAIN LINK FENCING REQUIREMENTS
SOIL INSTALLATION

DESIGNED G E SHERARD

TECH. APPR.

DRAWN DL BORING

CHECKED T C GRABER

APPROVED

STRUCTURAL AND ARCHITECTURAL GROUP

CADD SYSTEM

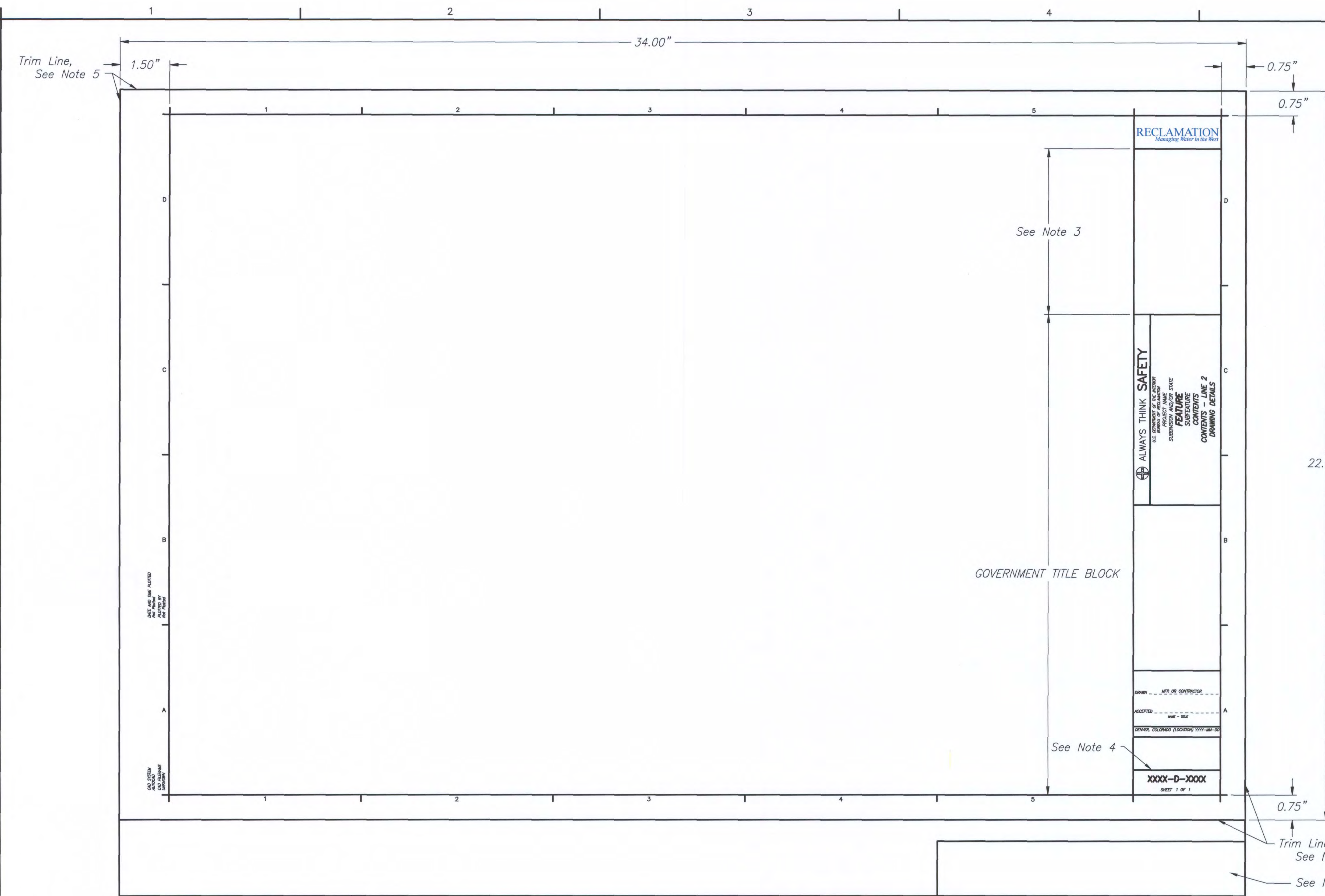
DATE AND TIME PLOTTED

NOVEMBER 20, 2001 1:3:57

DENVER, COLORADO

MAY 1, 1999

40-D-7016



ALWAYS THINK SAFETY
U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
YAKIMA PROJECT
KENNEWICK DIVISION - WASHINGTON
CHANDLER POWER AND PUMPING PLANT
SWITCHYARD
STEEL STRUCTURES
115 KV - CIRCUIT SWITCHER SUPPORT
PLAN - ELEVATIONS - SECTIONS

DRAWN --- MFR OR CONTRACTOR
ACCEPTED --- NAME - TITLE

SAMPLE SIGNATURE LINES

SAMPLE TITLE

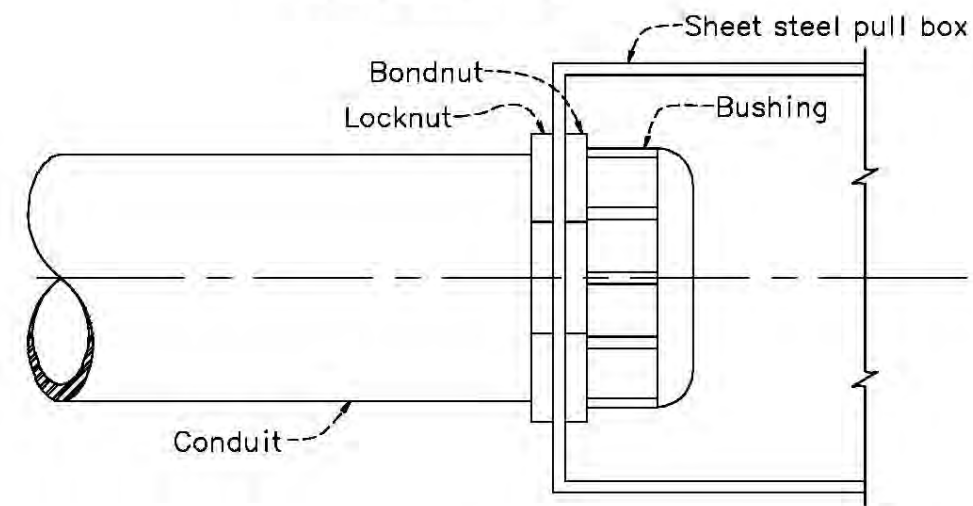
DRAWING BORDER

- NOTES**
1. Government will provide contractor with an electronic AutoCAD template to be used by manufacturer for submittal of manufacturer's/contractors drawing in Government format.
 2. The manufacturer's title block and drawing revisions as a result of the submittal process, may be located anywhere outside of the trim lines. The location shown on this drawing is the Government's preferred area.
 3. The manufacturer shall show the Government solicitation/specification number, the manufacturer's name, drawing and sheet number in this area.
 4. Government drawing number(s) will be issued at the end of the submittal process and drawing will be entered into the Government's electronic drawing system by the Government.
 5. Trim lines shall be shown on all submitted drawings.

DATE AND TIME PLOTTED
SEPTEMBER 22, 2009 1:09
PLOTTED BY
SNUTA

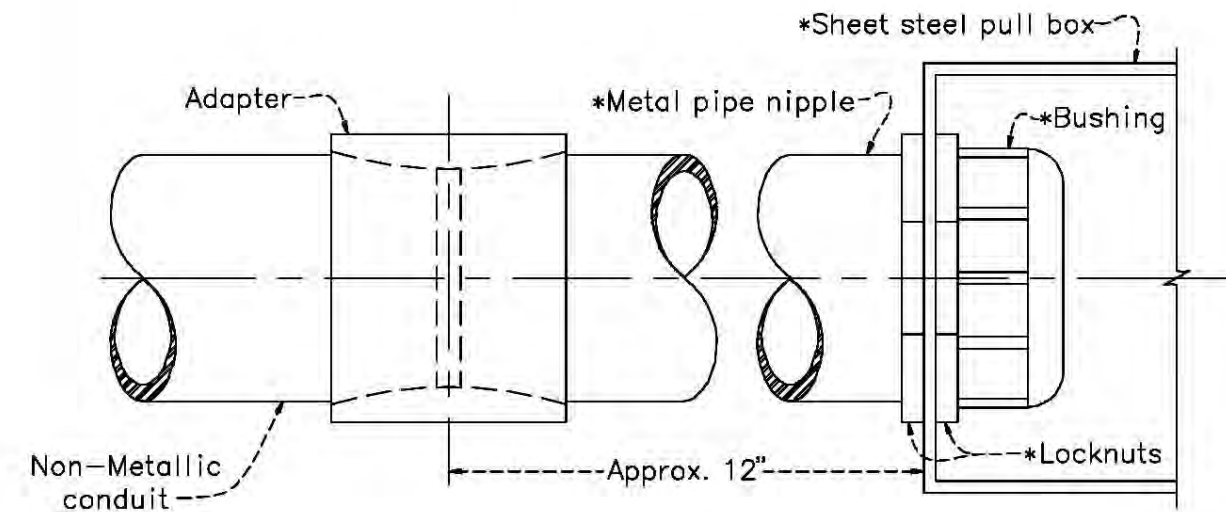
CAD SYSTEM
AutoCAD Ver. 17.2s
CADD FILE
40-D-7102.DWG

BOX TERMINATION



DETAIL "C"

TERMINATING METAL CONDUIT IN SHEET STEEL PULL BOXES



DETAIL "D"

TERMINATING NON-METALLIC CONDUIT IN SHEET STEEL PULL BOXES

*Use aluminum or brass and slot steel box between knockouts for single phase.

⊕ ALWAYS THINK SAFETY

REV. 3-25-46		FORMERLY X-D-1523-7	
REV. 4-1-42		DEPARTMENT OF THE INTERIOR	
		BUREAU OF RECLAMATION	
		DENVER OFFICE	
		ELECTRICAL STANDARDS	
		DENVER, COLO.	6-14-38 104-D-254

MISCELLANEOUS DESIGNATIONS

ALT	Alternator
A	Suffix designation for auxilliary control circuit
ASC	Adjustable speed controller
BFV	Butterfly valve
C or CAP	Capacitor
CB	Circuit breaker
CLF	Current limiting fuse
CNT	Counter
DV	Discharge valve
EXC	Exciter
FU	Fuse
GFCI	Ground fault circuit interrupter
GRD	Ground
GRS	Galvanized rigid steel conduit
GV	Gate or guard valve
HR	Hand reset (Use as suffix)
I	Input
IL	Indicating lamp, add prefix for color
IMC	Intermediate steel conduit
MCE	Motor control equipment (2500 – 5000 volts)
M	Motor
MCC	Motor control center (600 – volts and lower)
NP	Nameplate
NC	Normally closed
NO	Normally opened
NSPB	Nonsegregated phase bus
O	Output
PB	Pushbutton (Momentary contact type)
PBM	Pushbutton (Maintaining contact type)
PC	Programmable controller
PR	Probe operated relay (Refer to FS for suffix)
REC	Rectifier
R/I	Resistance to current transducer
SF	Service factor
SO	Solenoid oiler
SV	Solenoid operated valve
TE	Time delay on energization
TD	Time delay on deenergization
TT	Thermal switch
V/I	Voltage to current transducer
VLV	Valve
WL	Water level contact on telemeter receiver (Refer to FS for suffix)
WRM	Wound rotor motor
X,Y,X	Suffix for auxiliary relay, switch, or contactor (ALX,CSX,FLX, ect.)
-1,-2,-3, etc.	Suffix for unit number for pumping units, gates, valves, ect.
1,2,3, etc.	Suffix for electrical device numbering, such as TR1, TR2, ect.
*	Estimated rating

RELAY DESIGNATIONS

AL	Alarm relay
BG	Bearing temperature relay
CR	Control relay
FL	Field loss relay
FR	Field application relay
GP	Ground protective relay
IS	Incomplete sequence relay
LO	Lockout relay
OC	Overcurrent relay
OL	Overload relay
OV	Overvoltage relay
PO	Pullout (Loss of synchronism relay)
RC	Remote control relay
RSR	Remote sensing relay
SC	Squirrel cage (damper winding(relay
SR	Shift register
TR	Time delay relay
UF	Under frequency relay
UV-OPR	Undervoltage single and reverse phase relay
WT	Winding temperature relay

CONTACTOR DESIGNATIONS

FC	Field contactor
LC	Lighting contactor
M	Main contactor
MA	Air compressor motor contactor
MF	Vent fan motor contactor
MG*	Gate motor contactor
MO*	Oil pump motor contactor
MV*	Valve motor contactor
*Use suffix as application	
-C	Closing function
-L	Lowering function
-O	Opening function
-R	Rasing function
S	Starting contractor
1S	Start contactor
2S	Start transition contactor
R	Run contactor

SWITCH DESIGNATIONS

CS	Control switch
FCD	Foreign circuit disconnect switch
FS	Float switch (Use suffix letter— C—canal, P—pipe, R—reservoir, S—sump, T—tank)
LS	Limit switch
PS	Pressure switch
SS	Selector switch
TQ	Torque switch
TSW	Transfer switch

TRANSFORMER DESIGNATIONS

CCT	Control circuit transformer
CT	Current transformer
PT	Potential transformer
T	Transformer
TH	Transformer oil temperature
TL	Transformer oil level
TP	Transformer pressure relief
SST	Station service transformer

INSTRUMENT AND METER DESIGNATIONS

AM	Ammeter
AS	Ammeter transfer switch
CNT	Start counter
INT	Integrating instrument
PF	Power-factor meter
PST	Phase shifting transformer
RDM	Recording demand meter
TM	Time meter
V	Voltmeter
VAR	Varmeter
VARH	Varhour meter
VS	Voltmeter transfer switch
W	Wattmeter
WH	Watthour meter
WHD	Watthour demand meter
Ⓡ	Indicates recording instruments The asterisk is not part of the symbol. Replace the asterisk with letter or letters depending on the function of the instrument.

DEVICE SYMBOLS

CS	Control switch
AS	Ammeter transfer switch
VS	Voltmeter transfer switch
⚡	Surge arrester
⚡	Capacitor
⚡	Reactor
⚡	Potential transformer
⚡	Current transformer
⚡	Power or distribution transformer
⚡	3ø, Wye grounded connection
⚡	3ø, Delta connection
⚡	3ø, Broken delta connection
⚡	3ø, Open delta connection (corner grounded)



Disconnecting switch



Liquid level switch (Normally open)



Vacuum and pressure switch (Normally closed)



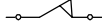
Temperature actuated switch (Normally open)



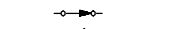
Flow actuated switch (Normally open)



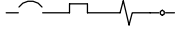
Limit switch—direct actuated (Normally open)



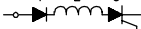
Torque switch (Normally closed)



3-Position selector switch



Air circuit breaker thermomagnetic trip 1 Frame size,
2 Inverse time trip, 3 Instantaneous trip



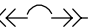
1 Rectifier, 2 Reactor, 3 Inverter



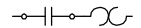
Silicon controlled rectifier (Solid state DC switch)



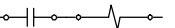
Air circuit breaker, electrically operated



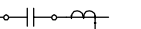
Air circuit breaker, withdraw type



Contactor with thermal trip



Contactor with magnetic trip



Contactor with CT and magnetic trip relay



Contactor (Normally open)



Contactor (Normally closed)



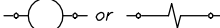
Auxiliary contactor (Closes when main device is closed)



Auxiliary contactor (Open when main device is closed)



Relay contact number



Relay coil, contactor coil



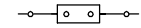
Horn-gap disconnecting switch



Fuse



Fuse, current limiting type



Instrument shunt



Resistor



Rheostat, or potentiometer



Separable connector



Indicating lamp W-white, R-red, G-green,
Y-yellow, A-amber, B-blue



Battery



Bell



Horn



Pushbutton (Normally open, momentary contact)



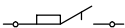
Pushbutton (Normally closed, momentary contact)



Maintained contact pushbutton



Probe, water level detector



Load interrupter switch



Motor

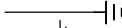


Triac (Solid state AC switch)

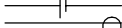


Wound rotor motor

WIRING SYMBOLS



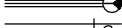
Ground connection



Interconnection between separately owned systems



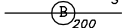
Duplex single-gang plug receptacle



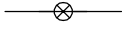
Single weatherproof plug receptacle



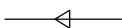
Watertight three-phase power receptacle



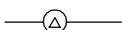
Single pole switch



Three way switch



Luminaire, letter indicates type, number indicates wattage



Represents connection from external equipment. Does not
necessarily represent a terminal block.



High voltage cable termination

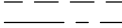


Represents connection from external equipment
via-multi-pair control (signal) cable.

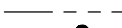
GROUND SYMBOLS



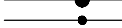
Cable exposed



Cable embedded in concrete



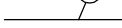
Cable concealed but not embedded



Cable buried directly in earth



Ground rod



Welded or bolted connection



Cable riser



Indicates ground when required for clarity



Ground connector per 40-D-4334, Fig. 4

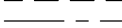


Ground ring

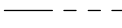
CONDUIT SYMBOLS



Exposed



Embedded in concrete



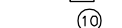
Concealed but not embedded



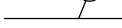
Buried directly in earth



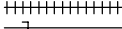
Bending toward observer



Bending away from observer



Capped



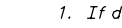
Pull box or junction box



Designation number



Liquid tight flexible metal conduit

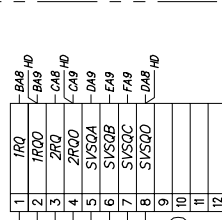
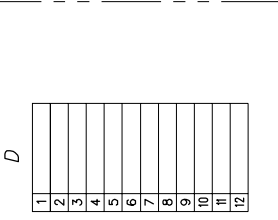
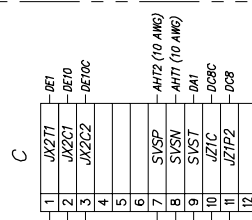
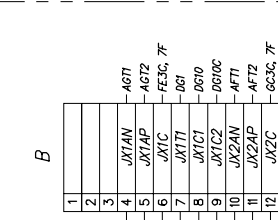
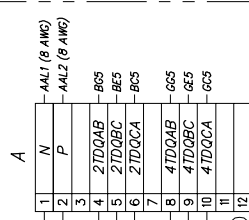
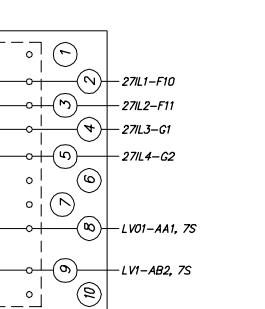
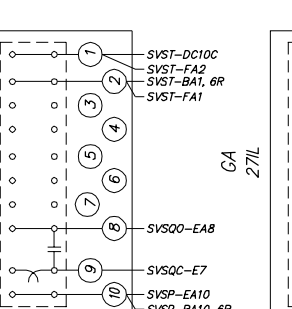
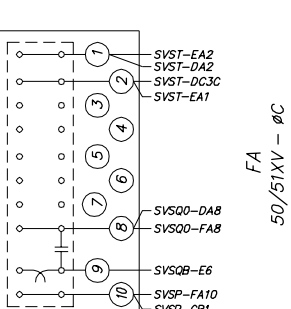
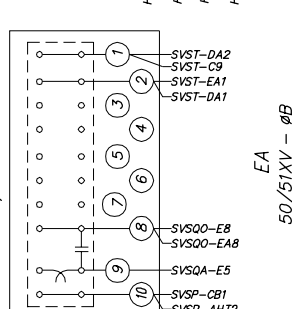
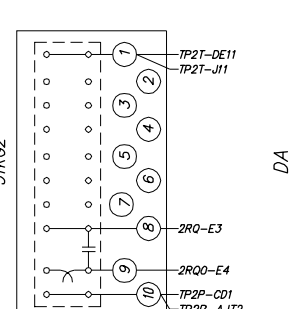
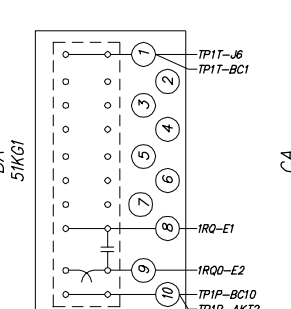
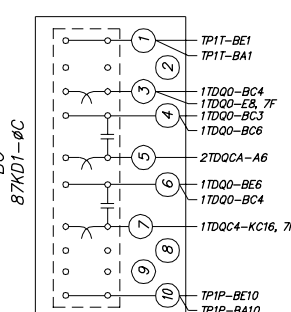
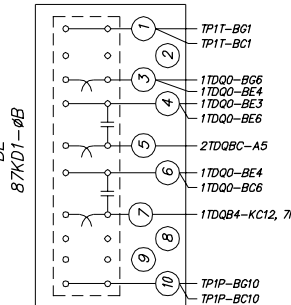
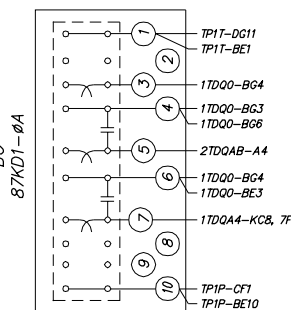
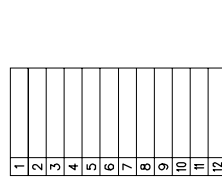
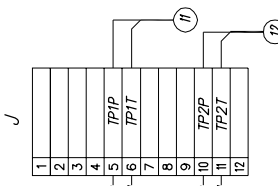
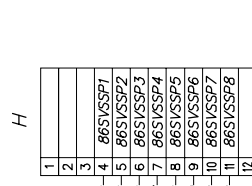
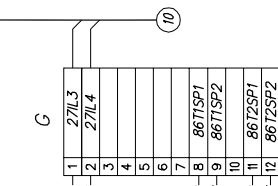
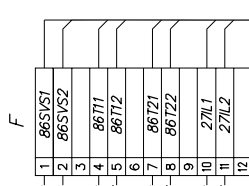
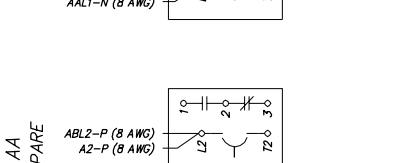
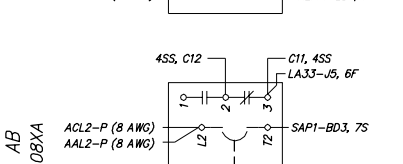
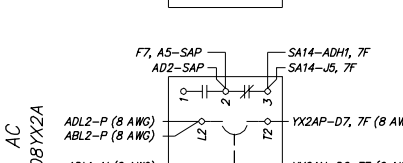
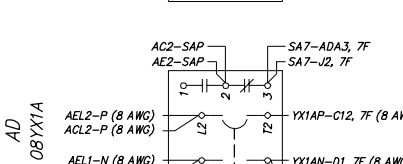
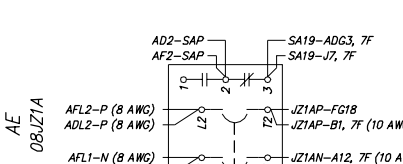
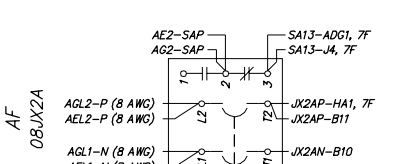
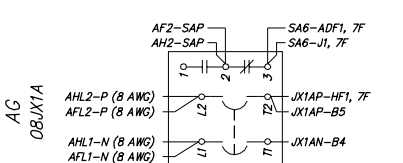
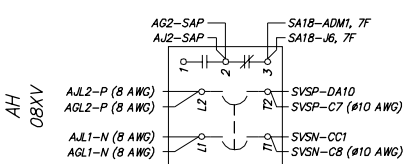
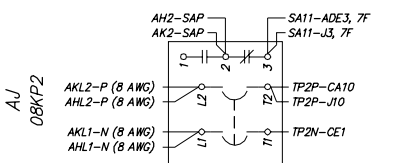
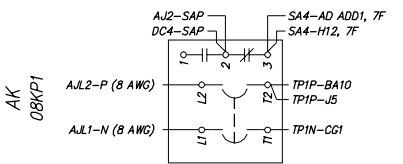


Sealing bushing, conduit to cable

NOTES

1. If designations and symbols other than the ones shown on this drawing used, they shall be shown on the appropriate drawing.
2. For additional designations and symbols refer to NEMA Standards Pub, ICS-1970.
3. Contacts in control circuits are shown in the deenergized position. Liquid level switches are shown with liquid container empty. Vacuum and pressure switches are shown at ambient pressure. Temperature switches are shown at ambient temperature.

3 - 24 - 00 D - L.G.	REVISED TITLE BLOCK AND REDRAWN IN AUTOCAD 14.		
3 - 11 - 81 D - D.G.	MINOR REVISIONS		
 ALWAYS THINK SAFETY			
UNITED STATES DEPARTMENT OF THE INTERIOR BUREAU OF RECLAMATION STANDARD DESIGNS			
PUMPING PLANT ELECTRICAL INSTALLATIONS DESIGNATIONS AND SYMBOLS			
DESIGNED	N.J.B.	TECH. APPR.	P.L. ANNA
DRAWN	D.D. DROULLARD	SUBMITTED	S.M. DENTON
CHECKED	E.M.T.	APPROVED	M.H. KIGHT
CHIEF, ELECTRICAL BRANCH			
CADD SYSTEM AutoCAD Rel. 15.05 DENVER, COLORADO	CADD FILENAME 104-D-757.DWG FEBRUARY 13, 1962	DATE AND TIME PLOTTED NOVEMBER 20, 2001 13:02	
104-D-757			



MANUFACTURER'S NAME
MANUFACTURER'S DRAWING NUMBER
SPECIFICATIONS NUMBER

CABLE LIST

CABLE NUMBER	CABLE DESIGNATION	DESTINATION REFERENCE DRAWING	CABLE SIZE
①	9BSA-CSA7R	(6300)	2-1/C-8
②	1JX1A-CSA7R	(6121)	1-5/C-10
③	1JX2A-CSA7R	(6230)	1-5/C-10
④	1CSA7R-JX1A	(6121)	1-9/C-10
⑤	2CSA7R-JX2A	(6230)	1-9/C-10
⑥	3CSA7R-JZ1A	(6249)	1-12/C-10
⑦	1KX1A-CSA7R	(6097)	1-3/C-10
⑧	1KX2A-CSA7R	(6201)	1-3/C-10
⑨	1JX1A-CSA7R	(6249)	1-5/C-10
⑩	4CSA7R-RTU	(6599)	1-12/C-16
⑪	5CSA7R-KX1A	(6097)	1-5/C-10
⑫	6CSA7R-KX2A	(6201)	1-5/C-10

EXPLANATION OF POINT-TO-POINT WIRING DIAGRAMS

A. Double letters in bold face, such as **AA**, indicate the location of each device on the wiring diagram except for terminal blocks.

B. Single letters in bold face, such as **A**, indicate the location of each terminal block on the wiring diagram.

C. A control board is made of many sections which in turn are made of different panels. The sections are designated numerically 1 through "n" with "n" being the last section of the control board. The different panels are designated alphabetically as follows:

1. F - Indicates the front panel.
2. R - Indicates the rear panel.
3. S - Indicates the swing panel when there is only one swing panel per section.
4. FS and RS - Indicate the front and the rear swing panels, respectively, when there are two swing panels per section.
5. SS - Indicates the shipping split terminal block panel/section location.

D. All point-to-point wiring diagrams shall be drawn as follows:

1. All devices shown on the drawing shall represent the relative physical location of the devices.
2. Circuit (wire) designations shall be located next to the device stud (pin).
3. The circuit (wire) termination point shall be placed second from the device stud with a hyphen between the circuit designation and the circuit termination point.
4. The panel destination (number) of the wire shall be placed in the last position from the device stud with a comma between the circuit termination point and the panel destination. All panel wiring within the same panel will not require a panel destination.
5. Therefore, an example of point-to-point wiring is "LBCP4-HC4, 6F" which is located at device **BE4D 8** on this drawing. The circuit (wire) designation is LBCP4. The circuit (wire) termination point is at device **HC**, stud (pin) number 4, located on the front panel of section 6.

NOTES

1. All cable shields and spare conductors shall be connected to the ground bus.
2. An internal wiring diagram of each type of protective relay, except lockout relays, shall be shown on a separate drawing. All other devices, including lockout relays, shall have their internal wiring diagrams shown on their external point-to-point wiring diagrams.

4-3-00 D-L.G.	REDRAWN IN AUTOCAD.
3-1-91 D-JMR	REVISED TO NEW DRAFTING STANDARDS.
THIS DRAWING SUPERSEDES 104-D-873 AND 1032.	
ALWAYS THINK SAFETY	
UNITED STATES DEPARTMENT OF THE INTERIOR BUREAU OF RECLAMATION DESIGN DATA TYPICAL POWERPLANT / PUMPING PLANT ELECTRICAL INSTALLATION MAIN CONTROL BOARD CSA - PANEL 7R WIRING DIAGRAM	
DESIGNED <u>R.W. MC ALEE</u>	TECHNICAL APPROVAL <u>G.D. OSBURN</u>
DRAWN <u>M.E. JOJOLA</u>	SUBMITTED <u>J.W. REIF</u>
CHECKED <u>R.W. MC ALEE</u>	APPROVED <u>F.W. COOK, SR.</u>
CHIEF, ELECTRICAL BRANCH	
CADD SYSTEM AutoCAD Rev. 15.05 DENVER, COLORADO	DATE AND TIME PLOTTED NOVEMBER 20, 2001 1:3:11 104-D-1165

RIGHT SIDE SHEET

REAR PANEL - REAR VIEW

LEFT SIDE SHEET