



June 27, 2023

El Paso County Planning and Community Development
2880 International Circle, Suite 110
Colorado Springs, CO 80910

RE: Carriage Meadows South Filing No. 1 (SF 17-011)
Certification Letter

Dear El Paso County PCD,

Based upon information gathered from as-built surveys and periodic visits to the project, Core Engineering Group is of the opinion that the subdivision improvements have been constructed in general conformance with the approved design plans as filed with El Paso County.

The site and adjacent properties (as affected by work performed under the County permit) appear to be stable with respect to settlement and subsidence, sloughing of cut and fill slopes, revegetation or other ground cover, and the improvements (public improvements, common development improvements, site grading and paving) visually appear to meet or exceed the minimum design requirements. There have been some service line utility trench settlements but that is currently being addressed as part of the punchlist process.

The sanitary and watermain located in the public ROW has also been completed in accordance with Widefield Water and Sanitation Districts criteria.

In addition, Core Engineering Group has verified that the Extended Detention Basin/WQ Pond G1, G2, and G3 have been constructed and certified and meet the volume and elevation requirements and have been constructed in general compliance with the approved construction plans. The outlet structure for Pond G3 did change slightly from the design so the full spectrum spreadsheet was updated for this pond and it meets the design output as shown in the approved final drainage report.

Based on information gathered during construction and post-construction, Core Engineering Group is of the opinion that the public streets and storm sewer have been constructed in general accordance with the approved construction documents.

Sincerely,
Core Engineering Group, LLC

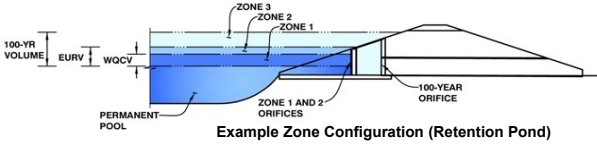
Richard L. Schindler, P.E. 33997

Pond G1/G2, G3 As-builts
Street/storm As-builts

Detention Basin Outlet Structure Design

UD-Detention, Version 3.07 (February 2017)

Project: Carriage Meadows South at Lorson Ranch
Basin ID: Full Spectrum Pond G3 - asbuilt



	Stage (ft)	Zone Volume (ac-ft)	Outlet Type
Zone 1 (WQCV)	2.16	0.111	Orifice Plate
Zone 2 (EURV)	3.52	0.246	Rectangular Orifice
Zone 3 (100-year)	4.45	0.223	Weir&Pipe (Restrict)
		0.580	Total

User Input: Orifice at Underdrain Outlet (typically used to drain WQCV in a Filtration BMP)

Invert of Underdrain Orifice Depth =	N/A	ft (distance below the filtration media surface)
Underdrain Orifice Diameter =	N/A	inches

Calculated Parameters for Underdrain

Underdrain Orifice Area =	N/A	ft ²
Underdrain Orifice Centroid =	N/A	feet

User Input: Orifice Plate with one or more orifices or Elliptical Slot Weir (typically used to drain WQCV and/or EURV in a sedimentation BMP)

Invert of Lowest Orifice =	0.00	ft (relative to basin bottom at Stage = 0 ft)
Depth at top of Zone using Orifice Plate =	2.16	ft (relative to basin bottom at Stage = 0 ft)
Orifice Plate: Orifice Vertical Spacing =	N/A	inches
Orifice Plate: Orifice Area per Row =	0.61	sq. inches (diameter = 7/8 inch)

Calculated Parameters for Plate

WQ Orifice Area per Row =	4.236E-03	ft ²
Elliptical Half-Width =	N/A	feet
Elliptical Slot Centroid =	N/A	feet
Elliptical Slot Area =	N/A	ft ²

User Input: Stage and Total Area of Each Orifice Row (numbered from lowest to highest)

	Row 1 (required)	Row 2 (optional)	Row 3 (optional)	Row 4 (optional)	Row 5 (optional)	Row 6 (optional)	Row 7 (optional)	Row 8 (optional)
Stage of Orifice Centroid (ft)	0.00	0.70	1.45					
Orifice Area (sq. inches)	0.61	0.61	0.61					

	Row 9 (optional)	Row 10 (optional)	Row 11 (optional)	Row 12 (optional)	Row 13 (optional)	Row 14 (optional)	Row 15 (optional)	Row 16 (optional)
Stage of Orifice Centroid (ft)								
Orifice Area (sq. inches)								

User Input: Vertical Orifice (Circular or Rectangular)

	Zone 2 Rectangular	Not Selected	
Invert of Vertical Orifice =	2.16	N/A	ft (relative to basin bottom at Stage = 0 ft)
Depth at top of Zone using Vertical Orifice =	3.80	N/A	ft (relative to basin bottom at Stage = 0 ft)
Vertical Orifice Height =	2.00	N/A	inches
Vertical Orifice Width =	2.00		inches

Calculated Parameters for Vertical Orifice

	Zone 2 Rectangular	Not Selected	
Vertical Orifice Area =	0.03	N/A	ft ²
Vertical Orifice Centroid =	0.08	N/A	feet

User Input: Overflow Weir (Dropbox) and Grate (Flat or Sloped)

	Zone 3 Weir	Not Selected	
Overflow Weir Front Edge Height, H _o =	3.50	N/A	ft (relative to basin bottom at Stage = 0 ft)
Overflow Weir Front Edge Length =	4.00	N/A	feet
Overflow Weir Slope =	0.00	N/A	H:V (enter zero for flat grate)
Horiz. Length of Weir Sides =	5.00	N/A	feet
Overflow Grate Open Area % =	70%	N/A	% grate open area/total area
Debris Clogging % =	50%	N/A	%

Calculated Parameters for Overflow Weir

	Zone 3 Weir	Not Selected	
Height of Grate Upper Edge, H _t =	3.50	N/A	feet
Over Flow Weir Slope Length =	5.00	N/A	feet
Grate Open Area / 100-yr Orifice Area =	7.92	N/A	should be ≥ 4
Overflow Grate Open Area w/o Debris =	14.00	N/A	ft ²
Overflow Grate Open Area w/ Debris =	7.00	N/A	ft ²

User Input: Outlet Pipe w/ Flow Restriction Plate (Circular Orifice, Restrictor Plate, or Rectangular Orifice)

	Zone 3 Restrictor	Not Selected	
Depth to Invert of Outlet Pipe =	2.00	N/A	ft (distance below basin bottom at Stage = 0 ft)
Outlet Pipe Diameter =	18.00	N/A	inches
Restrictor Plate Height Above Pipe Invert =	18.00		inches

Calculated Parameters for Outlet Pipe w/ Flow Restriction Plate

	Zone 3 Restrictor	Not Selected	
Outlet Orifice Area =	1.77	N/A	ft ²
Outlet Orifice Centroid =	0.75	N/A	feet
Half-Central Angle of Restrictor Plate on Pipe =	3.14	N/A	radians

User Input: Emergency Spillway (Rectangular or Trapezoidal)

Spillway Invert Stage =	4.56	ft (relative to basin bottom at Stage = 0 ft)
Spillway Crest Length =	30.00	feet
Spillway End Slopes =	4.00	H:V
Freeboard above Max Water Surface =	1.00	feet

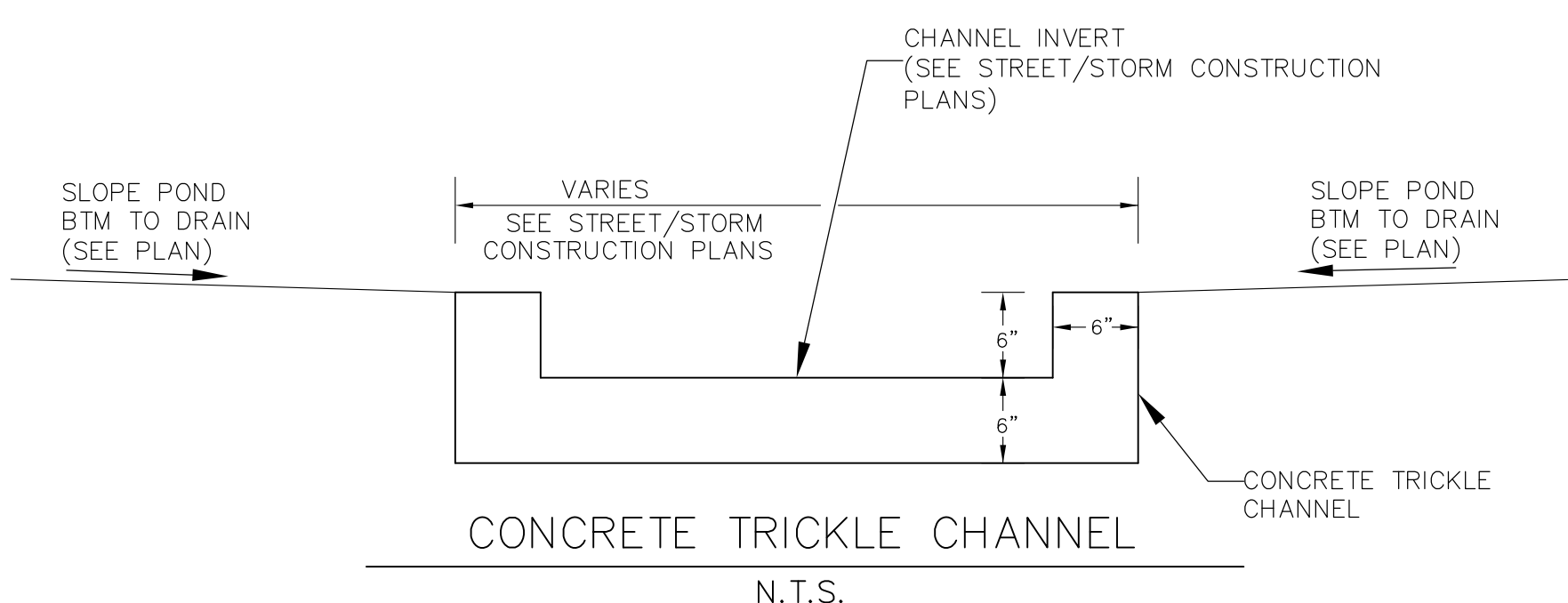
Calculated Parameters for Spillway

Spillway Design Flow Depth =	0.30	feet
Stage at Top of Freeboard =	5.86	feet
Basin Area at Top of Freeboard =	0.32	acres

asblt orifice-82.94

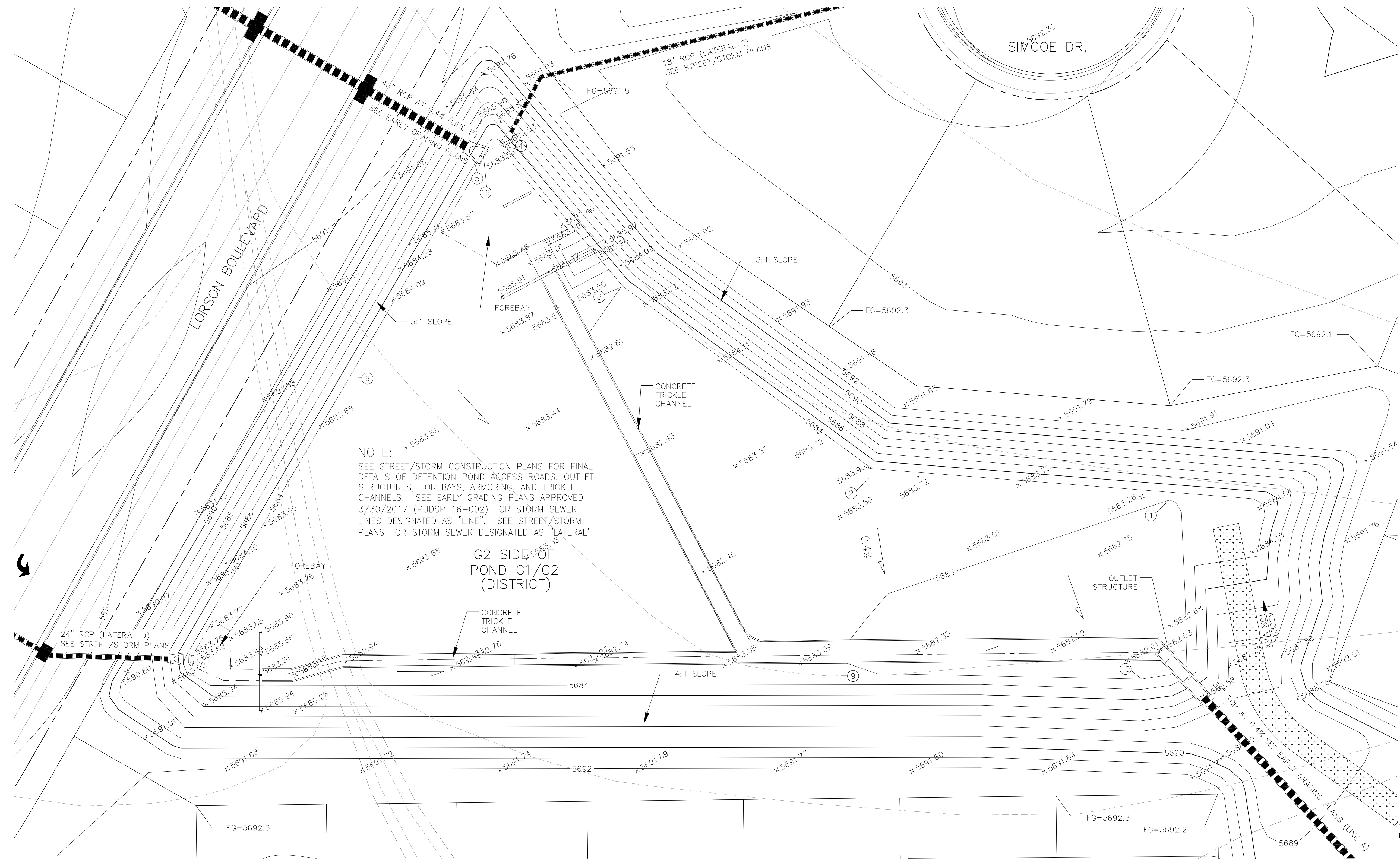
Routed Hydrograph Results

	WQCV	EURV	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year	500 Year
Design Storm Return Period	0.53	1.07	1.16	1.44	1.68	1.92	2.16	2.42	0.00
One-Hour Rainfall Depth (in)									
Calculated Runoff Volume (acre-ft)	0.111	0.357	0.283	0.378	0.501	0.678	0.802	0.966	0.000
OPTIONAL Override Runoff Volume (acre-ft)									
Inflow Hydrograph Volume (acre-ft)	0.110	0.356	0.283	0.377	0.501	0.678	0.802	0.966	#N/A
Predevelopment Unit Peak Flow, q (cfs/acre)	0.00	0.00	0.01	0.02	0.17	0.57	0.80	1.08	0.00
Predevelopment Peak Q (cfs)	0.0	0.0	0.1	0.1	1.0	3.5	4.8	6.5	0.0
Peak Inflow Q (cfs)	1.7	5.4	4.3	5.8	7.6	10.3	12.1	14.6	#N/A
Peak Outflow Q (cfs)	0.1	0.2	0.2	0.2	2.4	5.5	7.4	10.2	#N/A
Ratio Peak Outflow to Predevelopment Q	N/A	N/A	N/A	2.3	2.3	1.6	1.5	1.6	#N/A
Structure Controlling Flow	Plate	Vertical Orifice 1	Vertical Orifice 1	Vertical Orifice 1	Overflow Grate 1	Overflow Grate 1	Overflow Grate 1	Overflow Grate 1	#N/A
Max Velocity through Grate 1 (fps)	N/A	N/A	N/A	N/A	0.1	0.4	0.5	0.7	#N/A
Max Velocity through Grate 2 (fps)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	#N/A
Time to Drain 97% of Inflow Volume (hours)	29	42	39	42	42	40	39	37	#N/A
Time to Drain 99% of Inflow Volume (hours)	31	46	43	47	47	46	45	44	#N/A
Maximum Ponding Depth (ft)	2.07	3.35	3.01	3.44	3.64	3.76	3.82	3.90	#N/A
Area at Maximum Ponding Depth (acres)	0.13	0.21	0.19	0.21	0.22	0.23	0.23	0.23	#N/A
Maximum Volume Stored (acre-ft)	0.098	0.320	0.254	0.342	0.385	0.412	0.426	0.445	#N/A



POINT TABLE				
NUMBER	NORTHING	EASTING	ELEVATION	NOTES
1	20426.91	20695.07	5683.00	POND BOTTOM
2	20435.42	20580.07	5683.19	POND BOTTOM
3	20508.55	20484.61	5683.80	POND BOTTOM
4	20562.75	20440.18	5684.00	POND BOTTOM
5	20556.24	20428.64	5684.00	POND BOTTOM
6	20473.78	20380.35	5684.00	POND BOTTOM
9	20360.30	20583.01	5683.00	POND BOTTOM

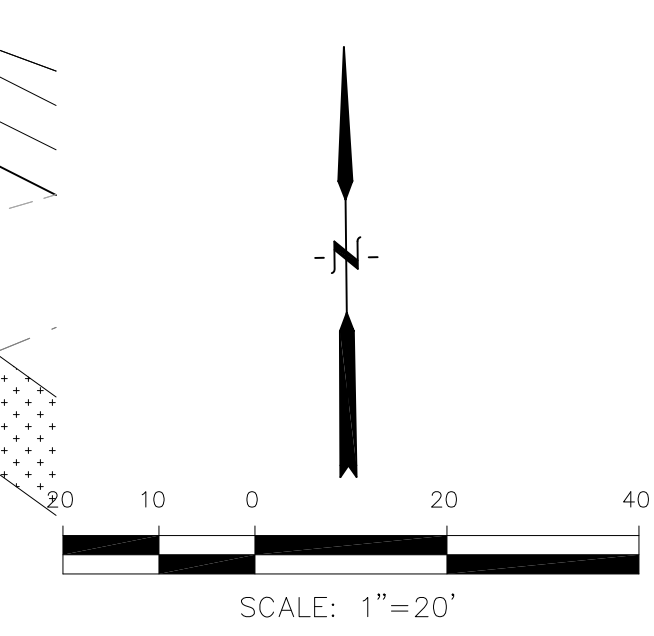
POINT TABLE				
NUMBER	NORTHING	EASTING	ELEVATION	NOTES
10	20358.26	20684.49	5683.00	POND BOTTOM
16	20558.92	20432.02	5683.55	INVERT 48" RCP



NOTE:
SEE STREET/STORM CONSTRUCTION PLANS FOR FINAL DETAILS OF DETENTION POND ACCESS ROADS, OUTLET STRUCTURES, FOREBAYS, ARMORING, AND TRICKLE CHANNELS. SEE EARLY GRADING PLANS APPROVED 3/30/2017 (PUDSP 16-002) FOR STORM SEWER LINES DESIGNATED AS "LINE". SEE STREET/STORM PLANS FOR STORM SEWER DESIGNATED AS "LATERAL"

G2 SIDE OF
POND G1/G2
(DISTRICT)

AS-BUILT
DATE: APRIL 6, 2018



CORE ENGINEERING GROUP
15004 1/2 S. AVE. S. SUITE 301
DENVER, CO 80232
PHONE: 719.570.1100
CONTACT: RICHARD L. SCHINDLER, P.E.
EMAIL: Rich@cegi.com

DATE: _____
DESCRIPTION: _____
NO. _____
DRAWN: RLS
DESIGNED: RLS
CHECKED: RLS

PREPARED FOR:
LORSON, LLC
212 N. WAHSATCH AVE., SUITE 301
COLORADO SPRINGS, COLORADO 80903
(719) 635-3200
CONTACT: JEFF MARK

PROJECT:
**CARRIAGE MEADOWS SOUTH
AT LORSON RANCH FILL NO. 1**
FONTAINE BLVD. - CARRIAGE MEADOWS DR
EL PASO COUNTY, COLORADO

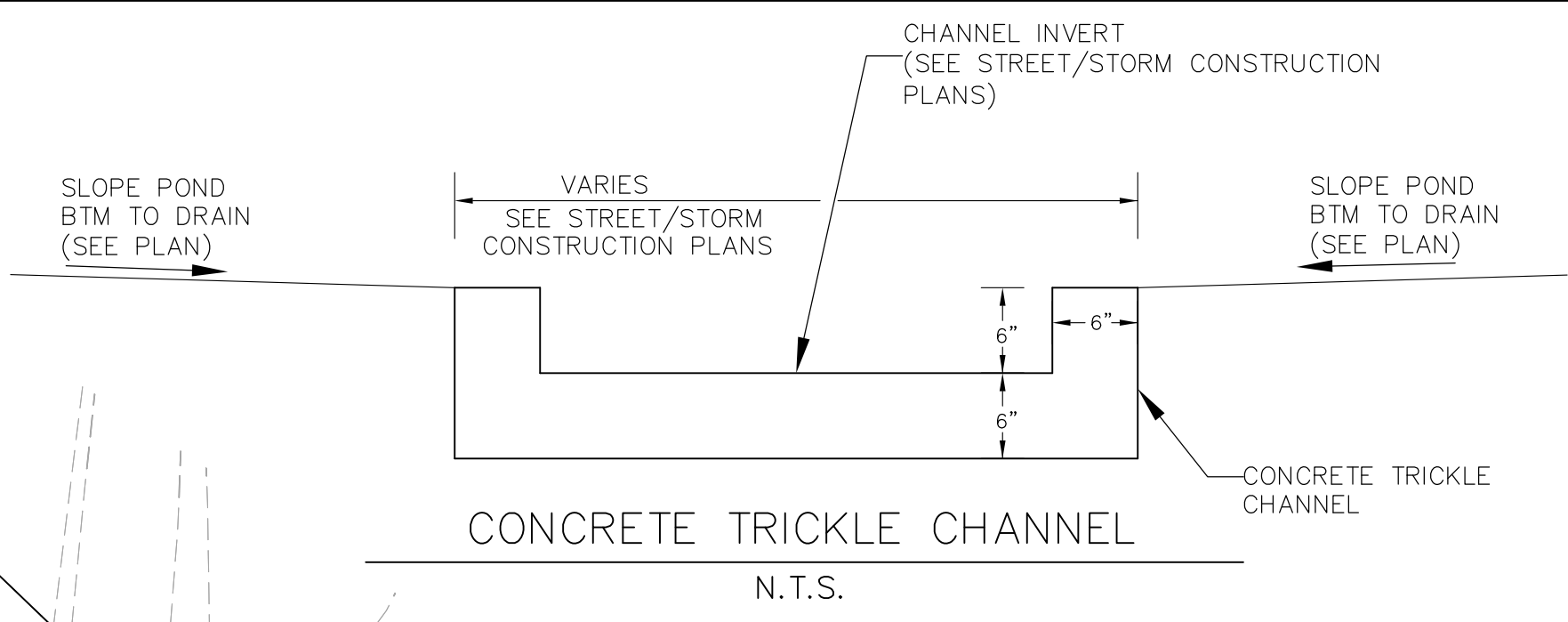
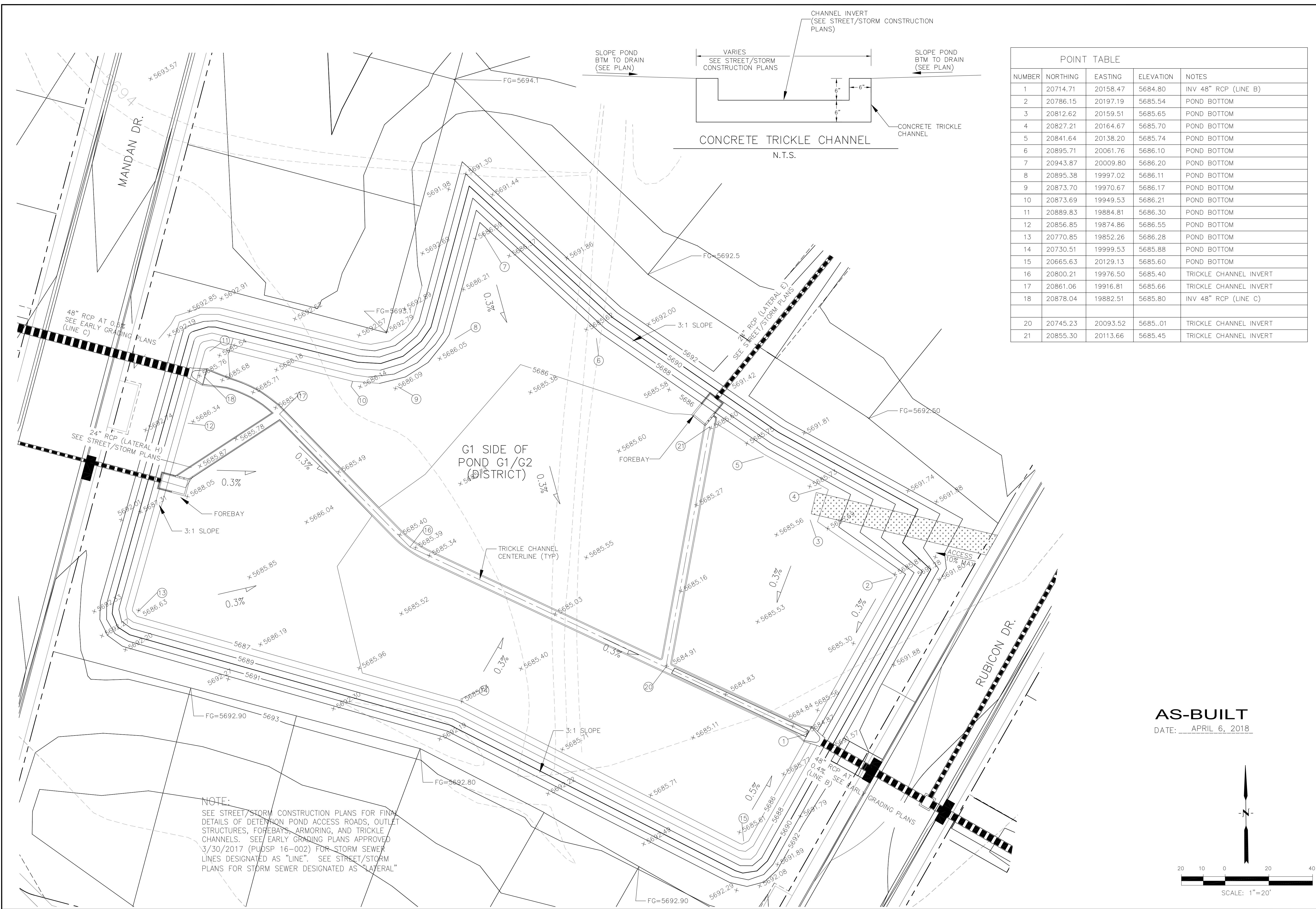
**G2 SIDE OF
DETENTION POND G1/G2 (DISTRICT)
CARRIAGE MEADOWS SOUTH**

DATE: **AUGUST 10, 2017**

PROJECT NO.: **100.030**

SHEET NUMBER: **C4.4**

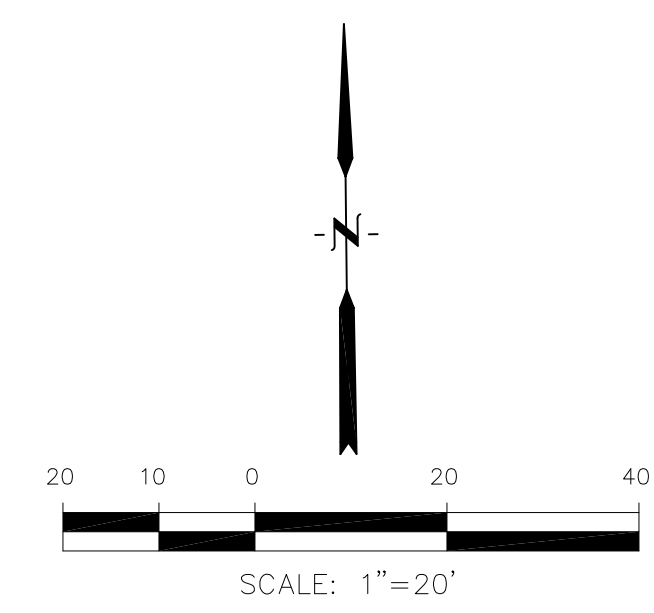
TOTAL SHEETS: **12**



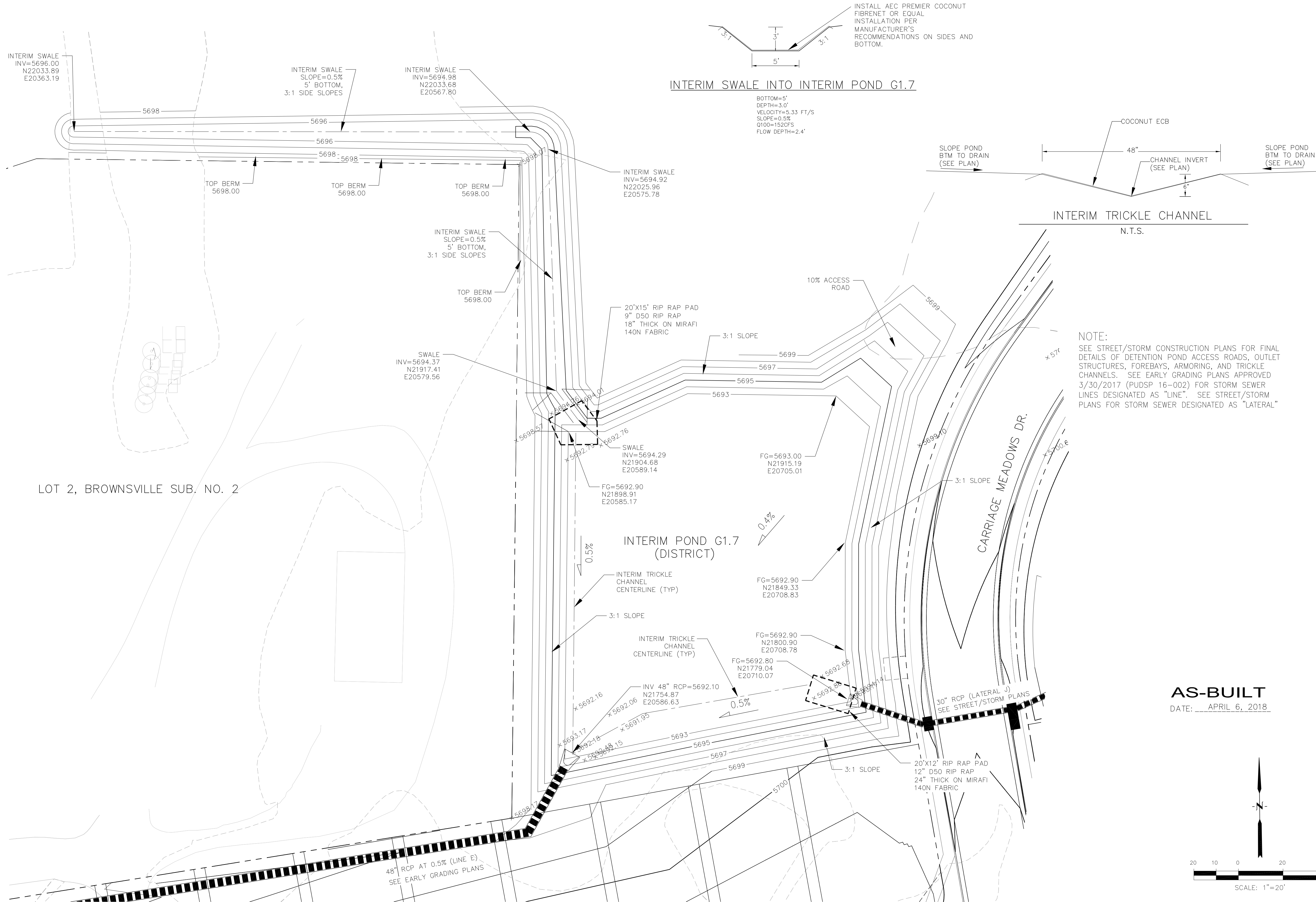
POINT TABLE				
NUMBER	NORTHING	EASTING	ELEVATION	NOTES
1	20714.71	20158.47	5684.80	INV 48" RCP (LINE B)
2	20786.15	20197.19	5685.54	POND BOTTOM
3	20812.62	20159.51	5685.65	POND BOTTOM
4	20827.21	20164.67	5685.70	POND BOTTOM
5	20841.64	20138.20	5685.74	POND BOTTOM
6	20895.71	20061.76	5686.10	POND BOTTOM
7	20943.87	20009.80	5686.20	POND BOTTOM
8	20895.38	19997.02	5686.11	POND BOTTOM
9	20873.70	19970.67	5686.17	POND BOTTOM
10	20873.69	19949.53	5686.21	POND BOTTOM
11	20889.83	19884.81	5686.30	POND BOTTOM
12	20856.85	19874.86	5686.55	POND BOTTOM
13	20770.85	19852.26	5686.28	POND BOTTOM
14	20730.51	19999.53	5685.88	POND BOTTOM
15	20665.63	20129.13	5685.60	POND BOTTOM
16	20800.21	19976.50	5685.40	TRICKLE CHANNEL INVERT
17	20861.06	19916.81	5685.66	TRICKLE CHANNEL INVERT
18	20878.04	19882.51	5685.80	INV 48" RCP (LINE C)
20	20745.23	20093.52	5685.01	TRICKLE CHANNEL INVERT
21	20855.30	20113.66	5685.45	TRICKLE CHANNEL INVERT

NOTE:
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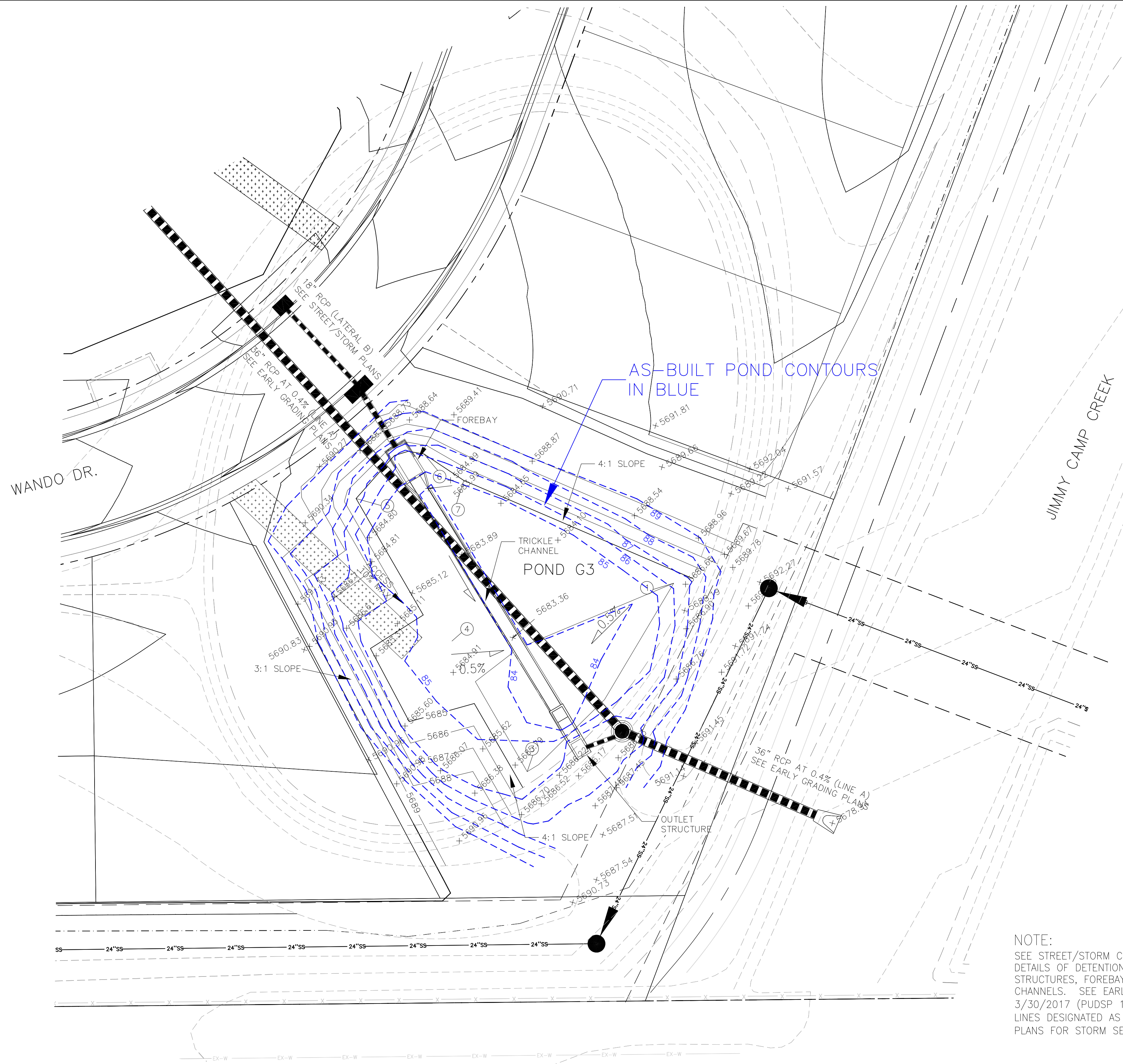
AS-BUILT
 DATE: APRIL 6, 2018



**G1 SIDE OF
 DETENTION POND G1/G2 (DISTRICT)
 CARRIAGE MEADOWS SOUTH**



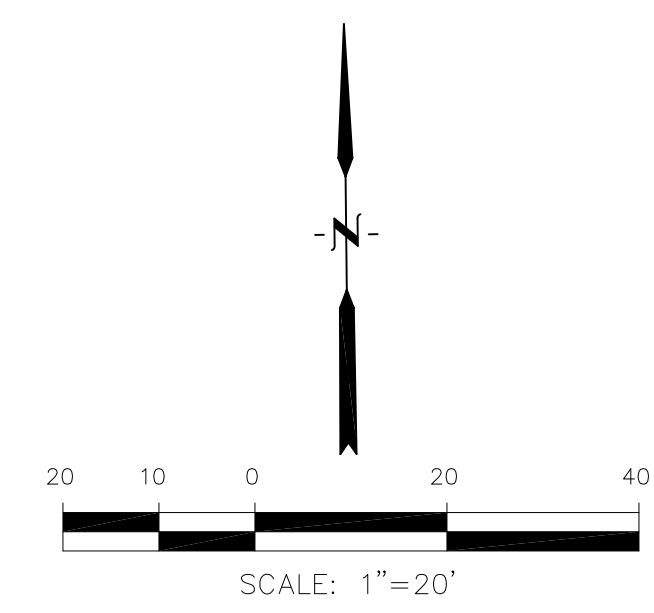
(DISTRICT)
INTERIM DETENTION POND G1.7
CARRIAGE MEADOWS SOUTH



AS-BUILT POND CONTOURS
IN BLUE

POINT TABLE				
NUMBER	NORTHING	EASTING	ELEVATION	NOTES
1	20152.70	20951.65	5684	POND BOTTOM
3	20088.79	20901.93	5684	POND BOTTOM
4	20133.08	20876.39	5684.20	POND BOTTOM
5	20181.43	20843.88	5685	POND BOTTOM
6	20196.53	20866.94	5685	POND BOTTOM
7	20187.57	20880.42	5685	POND BOTTOM

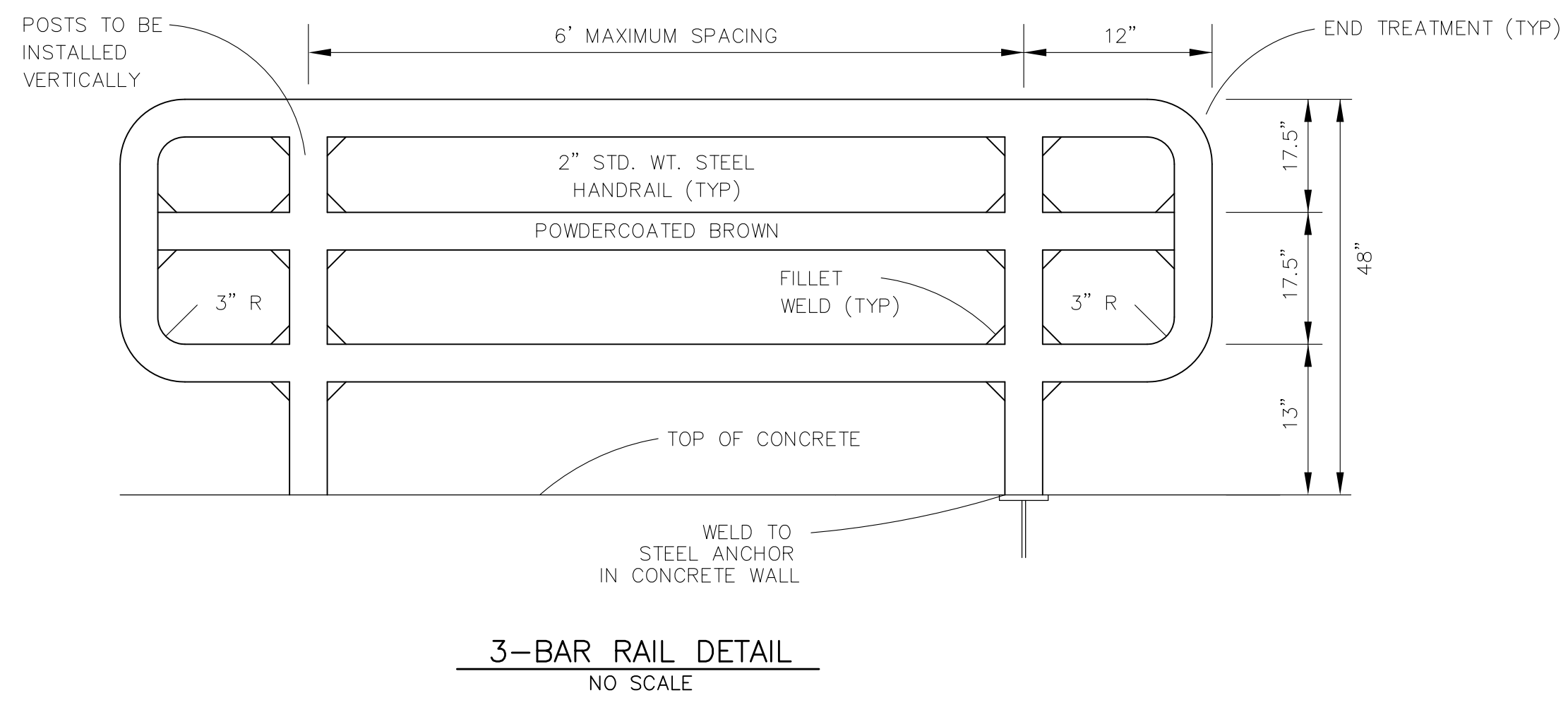
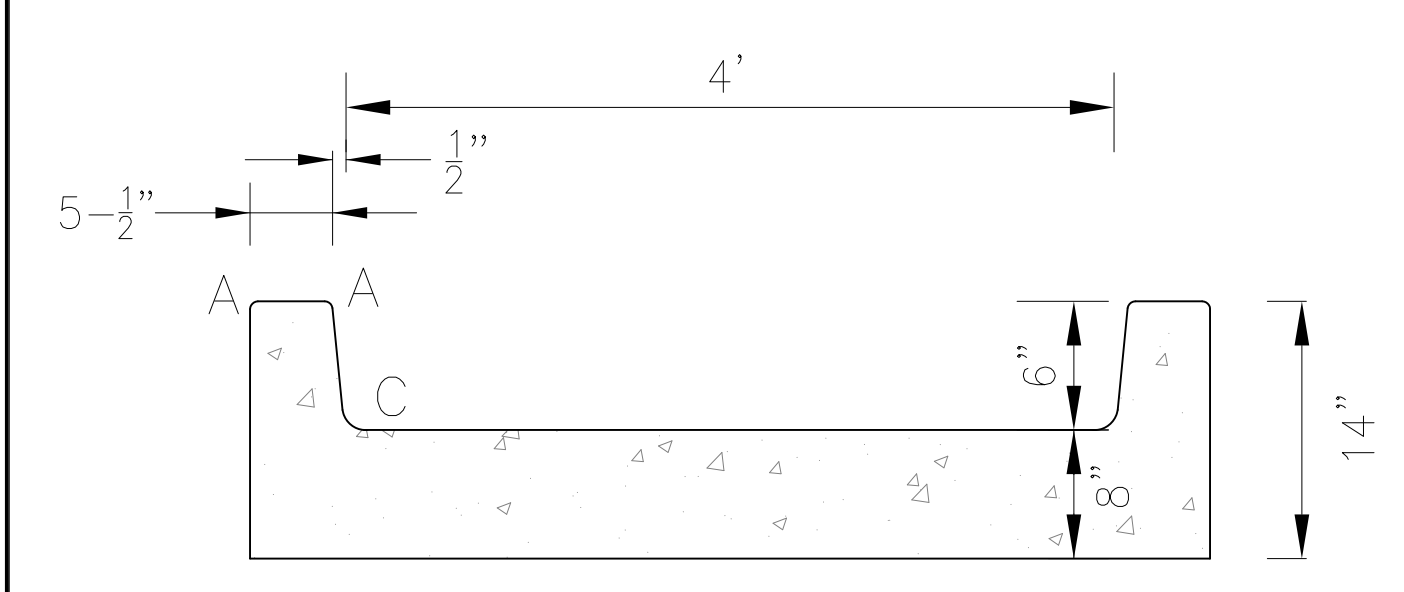
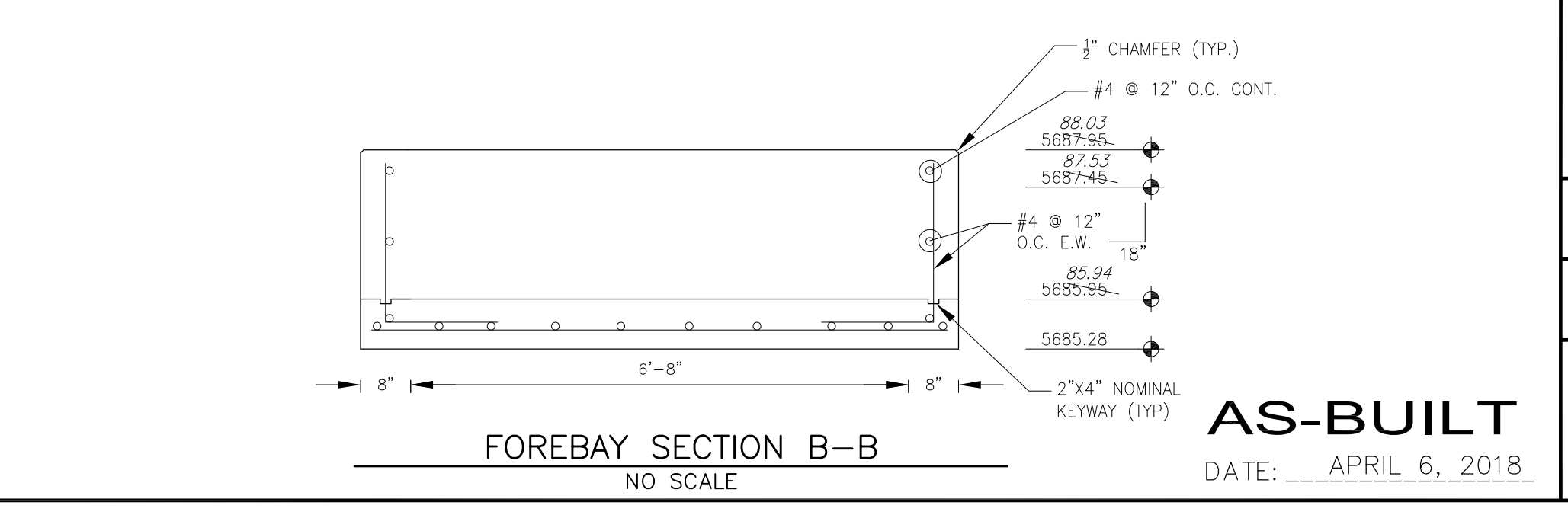
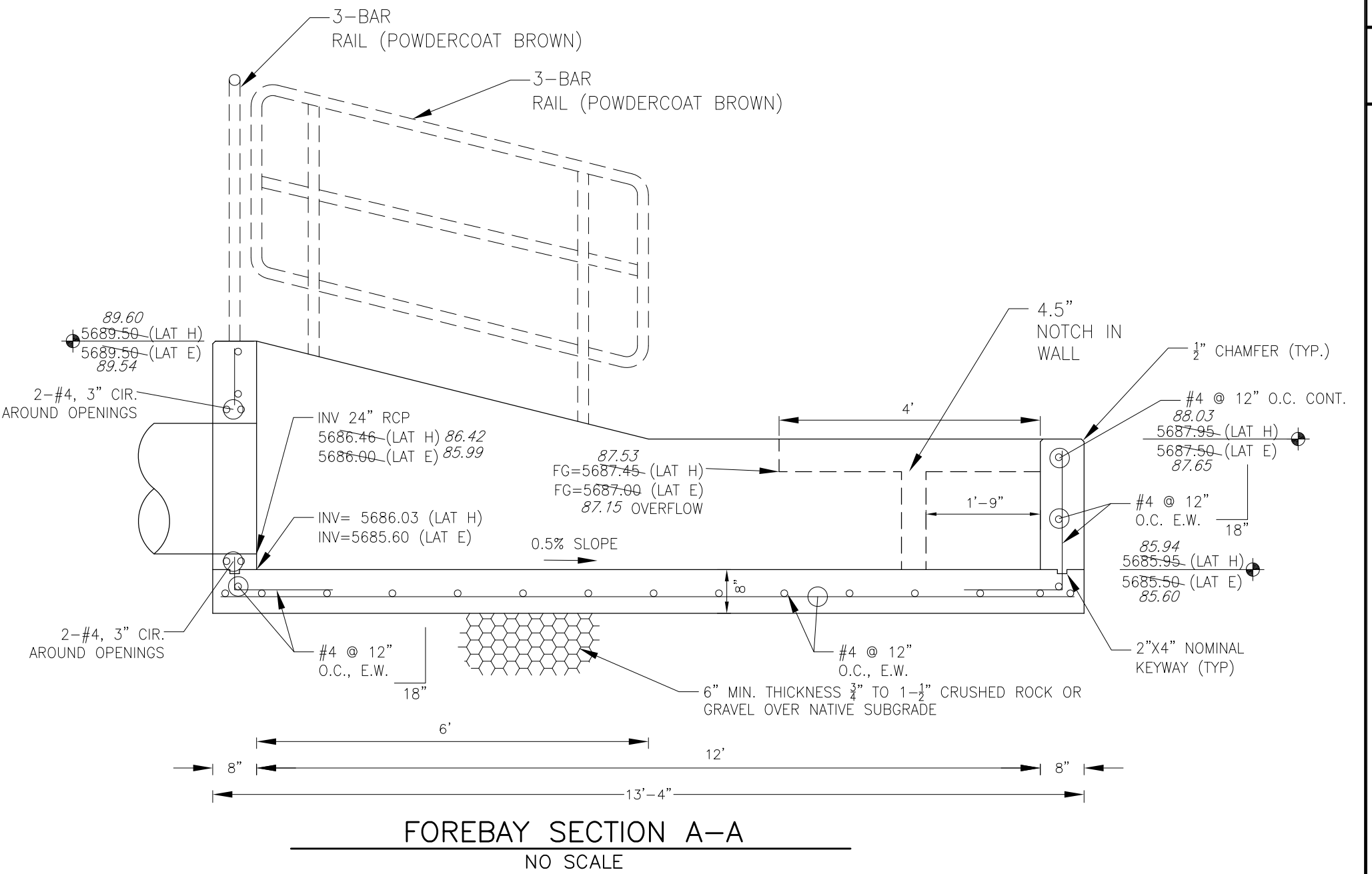
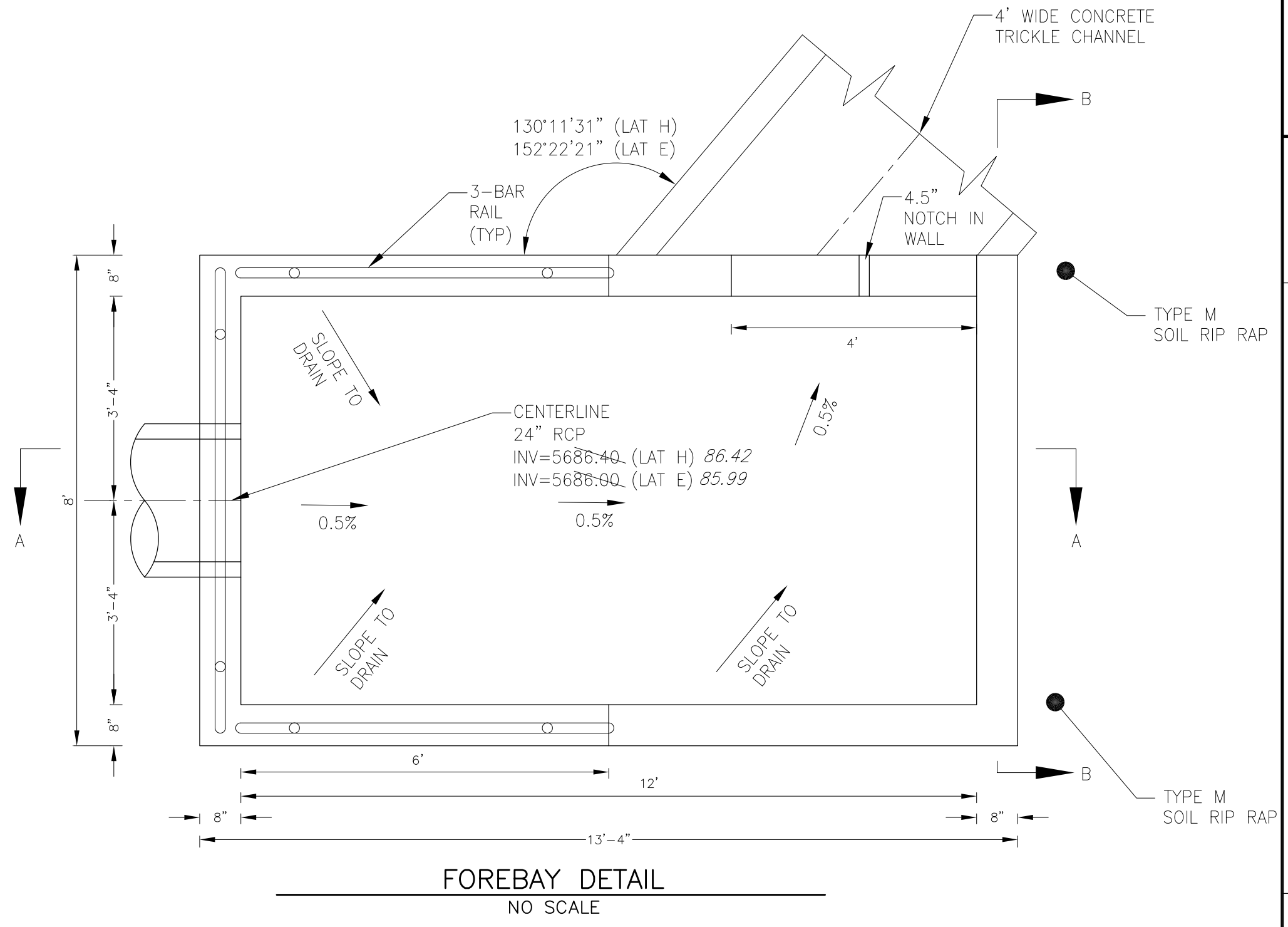
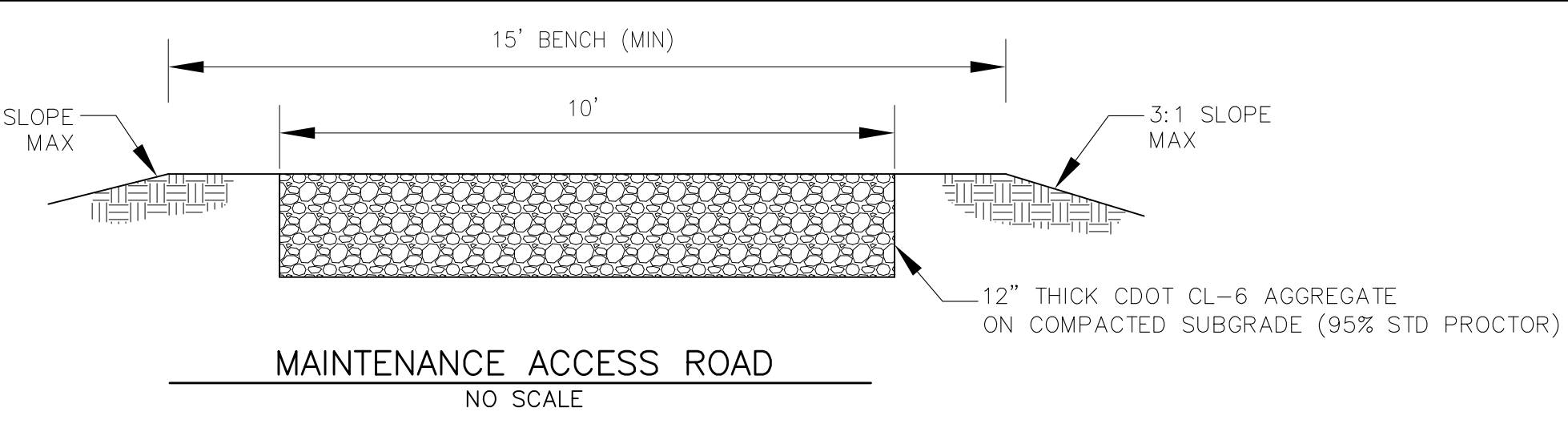
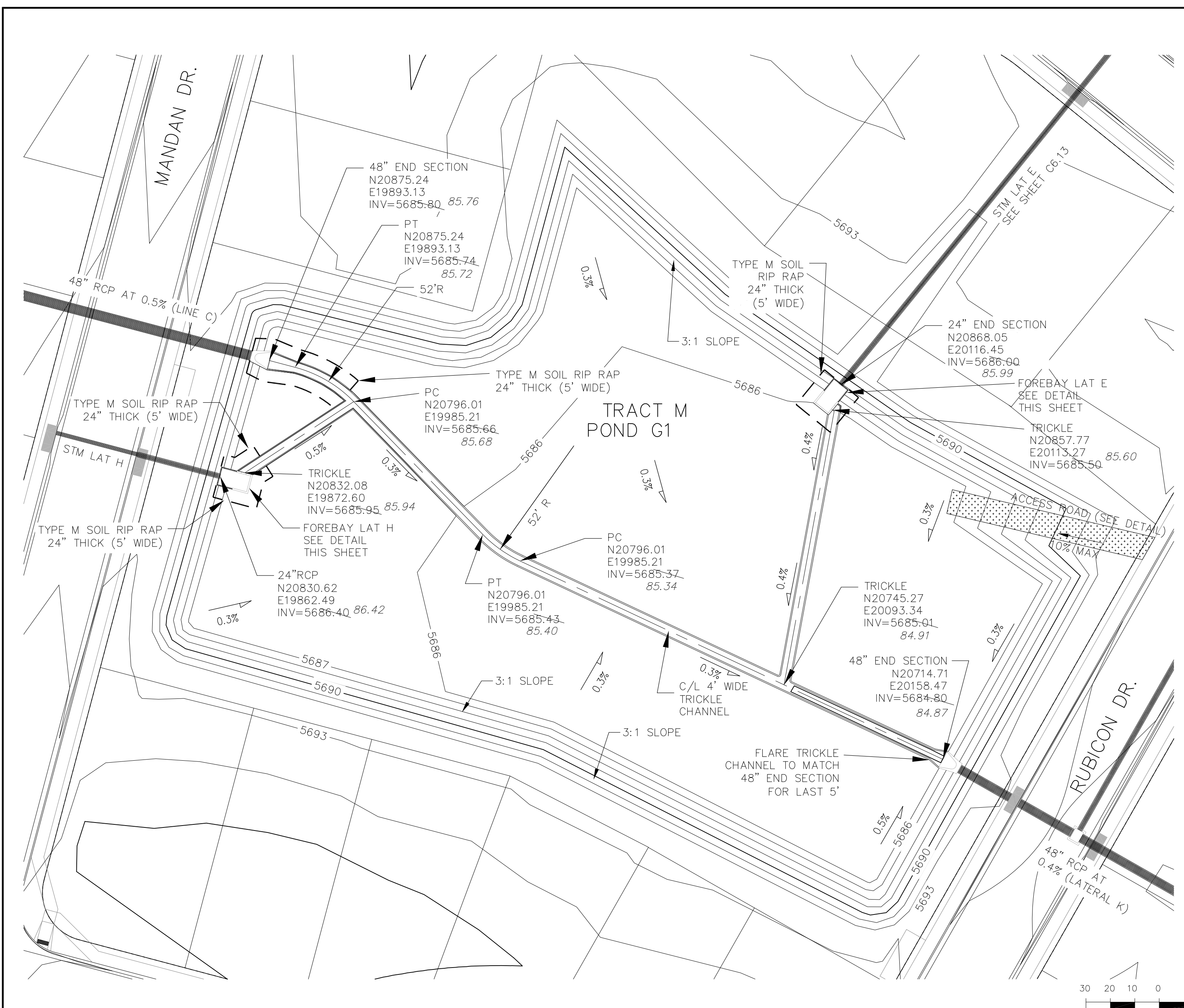
NOTE:
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APPLE TREE GOLF COURSE

AS-BUILT
DATE: APRIL 6, 2018

**DETENTION POND G3 (DISTRICT)
CARRIAGE MEADOWS SOUTH**



LENGTH FOR RADII

A = 1/2"

C = 1-1/2"

CORE ENGINEERING GROUP

15004 15TH AVE. S. SUITE 30506
PH: 719.570.1100
CONTACT: RICHARD L. SCHINDLER, P.E.
EMAIL: Rich@ceg1.com

DATE

DESCRIPTION

NO.

PROJECT: CARRIAGE MEADOWS SOUTH AT LORSON RANCH FILL NO. 1 FONTAINE BLVD. - CARRIAGE MEADOWS DR EL PASO COUNTY, COLORADO

PREPARED FOR: LORSON, LLC 212 N. WAHSATCH AVE., SUITE 301 COLORADO SPRINGS, COLORADO 80903

CONTACT: JEFF MARK

DRAWN: RLS

DESIGNED: RLS

CHECKED: RLS

POND G1/G2 (DISTRICT)

G1 SIDE OF POND

TRICKLE AND FOREBAY DETAILS

DATE

AUGUST 28, 2017

PROJECT NO.

100.030

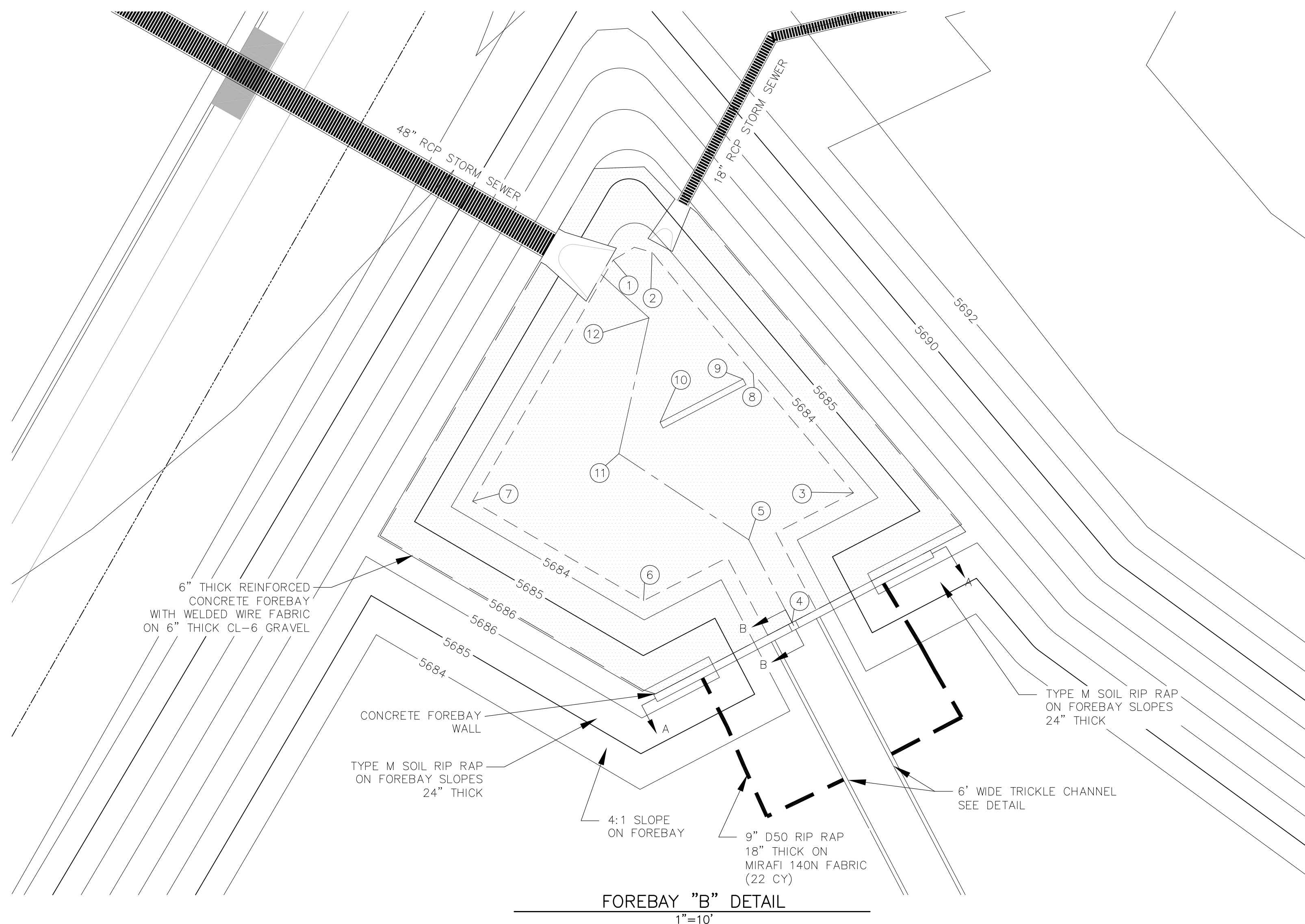
SHEET NUMBER

C9.1

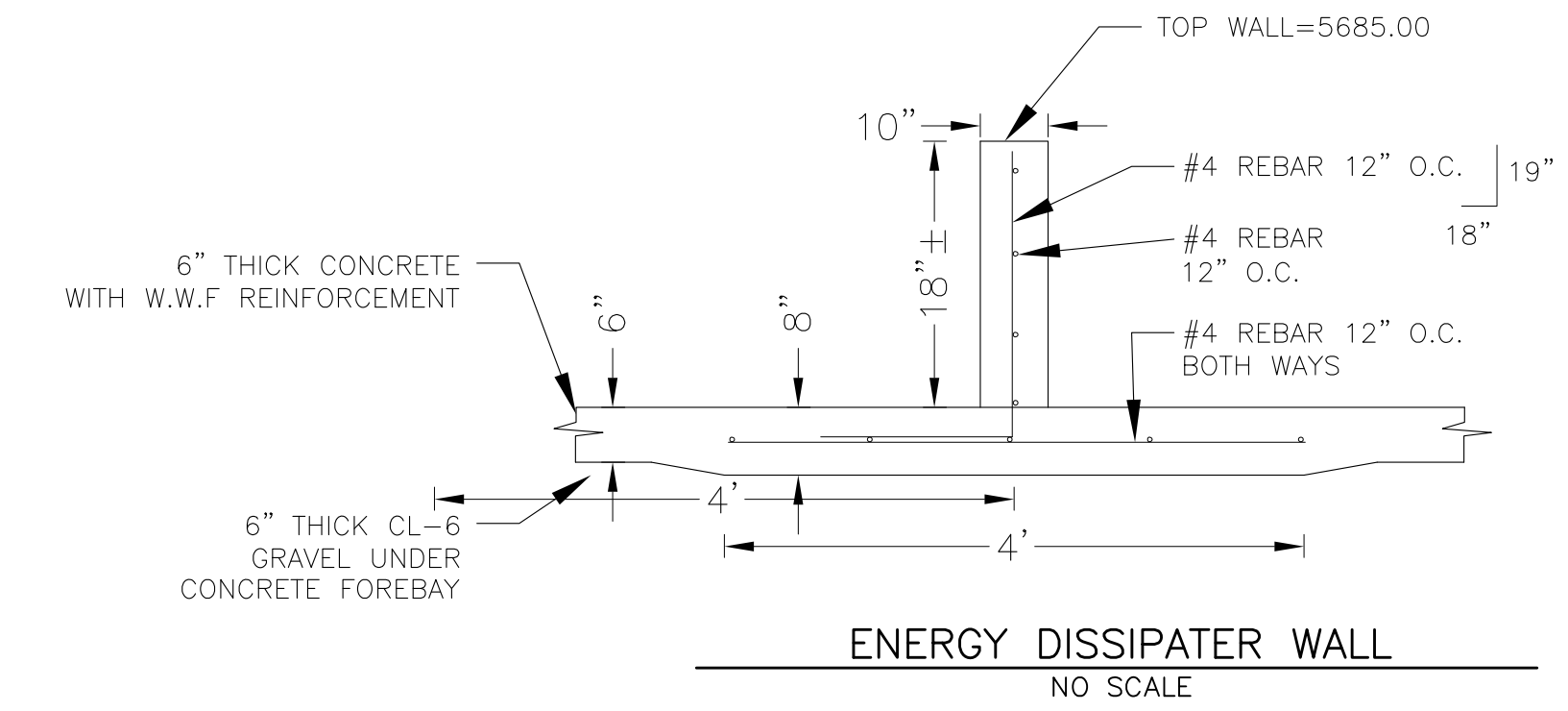
AS-BUILT

DATE: APRIL 6, 2018

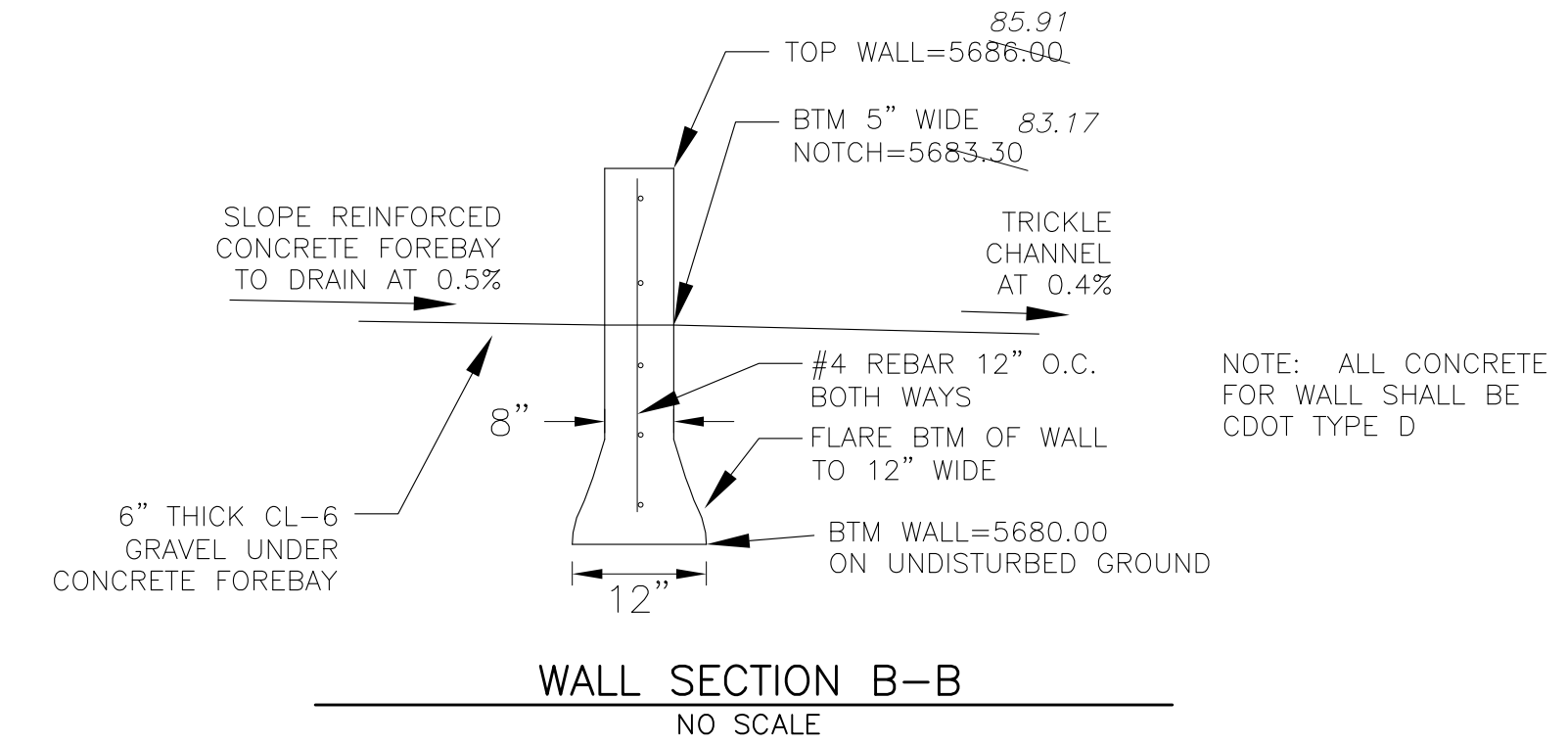
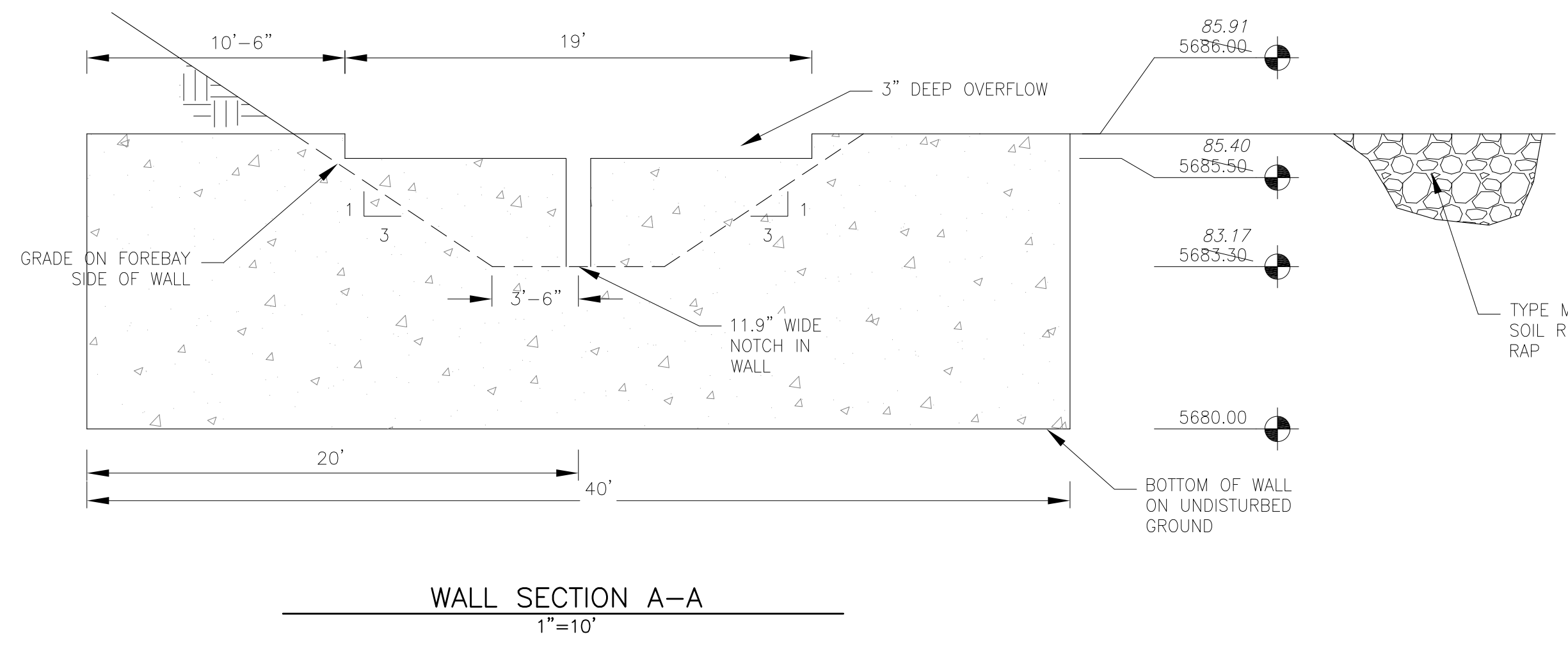
TOTAL SHEETS: 39



POINT TABLE				
NUMBER	NORTHING	EASTING	ELEVATION	NOTES
1	20560.79	20433.55	5683.54	FOREBAY BOTTOM
2	20561.80	20438.53	5683.54	FOREBAY BOTTOM
3	20530.94	20464.35	5683.54	FOREBAY BOTTOM
4	20514.32	20456.47	5683.30	FOREBAY BOTTOM
5	20524.93	20450.92	5683.35	FOREBAY BOTTOM
6	20517.12	20437.44	5683.54	FOREBAY BOTTOM
7	20529.87	20415.52	5683.54	FOREBAY BOTTOM
8	20546.23	20451.50	5683.54	FOREBAY BOTTOM
9	20545.54	20450.19	5683.53	ENERGY DISSIPATER WALL
10	20539.98	20439.55	5683.48	ENERGY DISSIPATER WALL
11	20535.97	20434.28	5683.43	FOREBAY BOTTOM
12	20553.38	20438.13	5683.50	FOREBAY BOTTOM

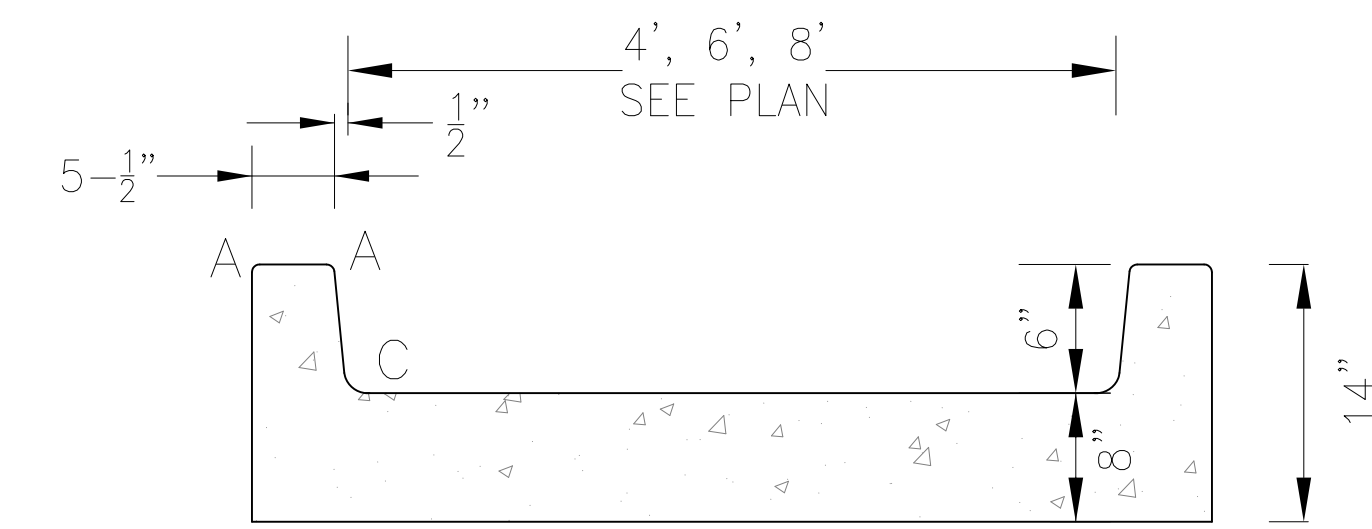
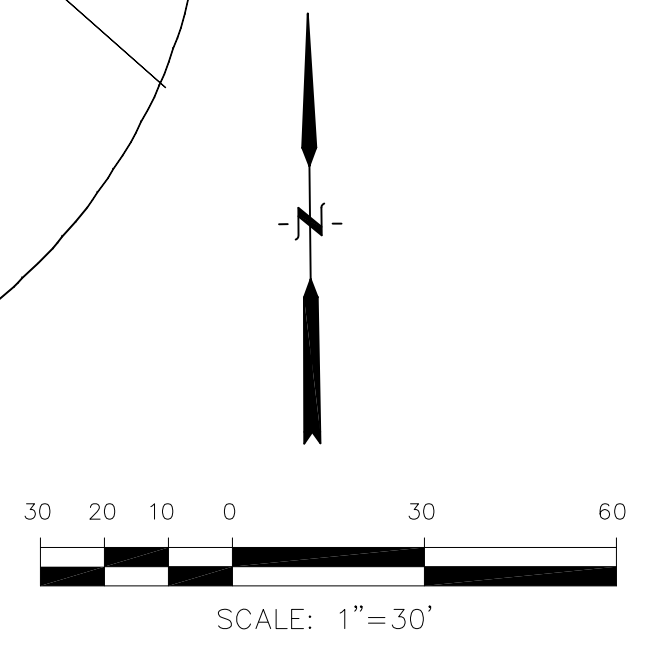
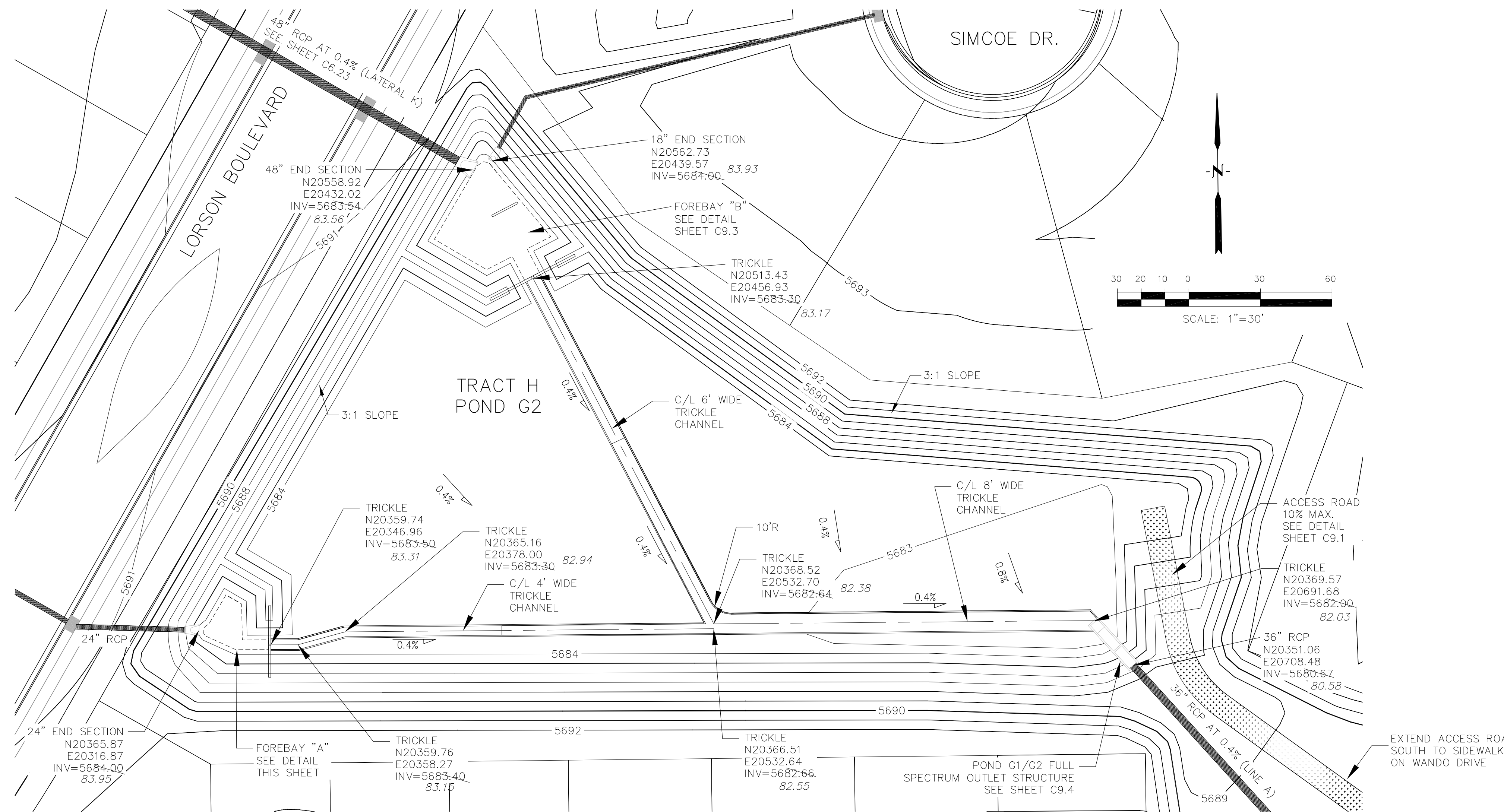


NOTE: ALL CONCRETE FOR WALL SHALL BE CDOT TYPE D



NOTE: ALL CONCRETE FOR WALL SHALL BE CDOT TYPE D

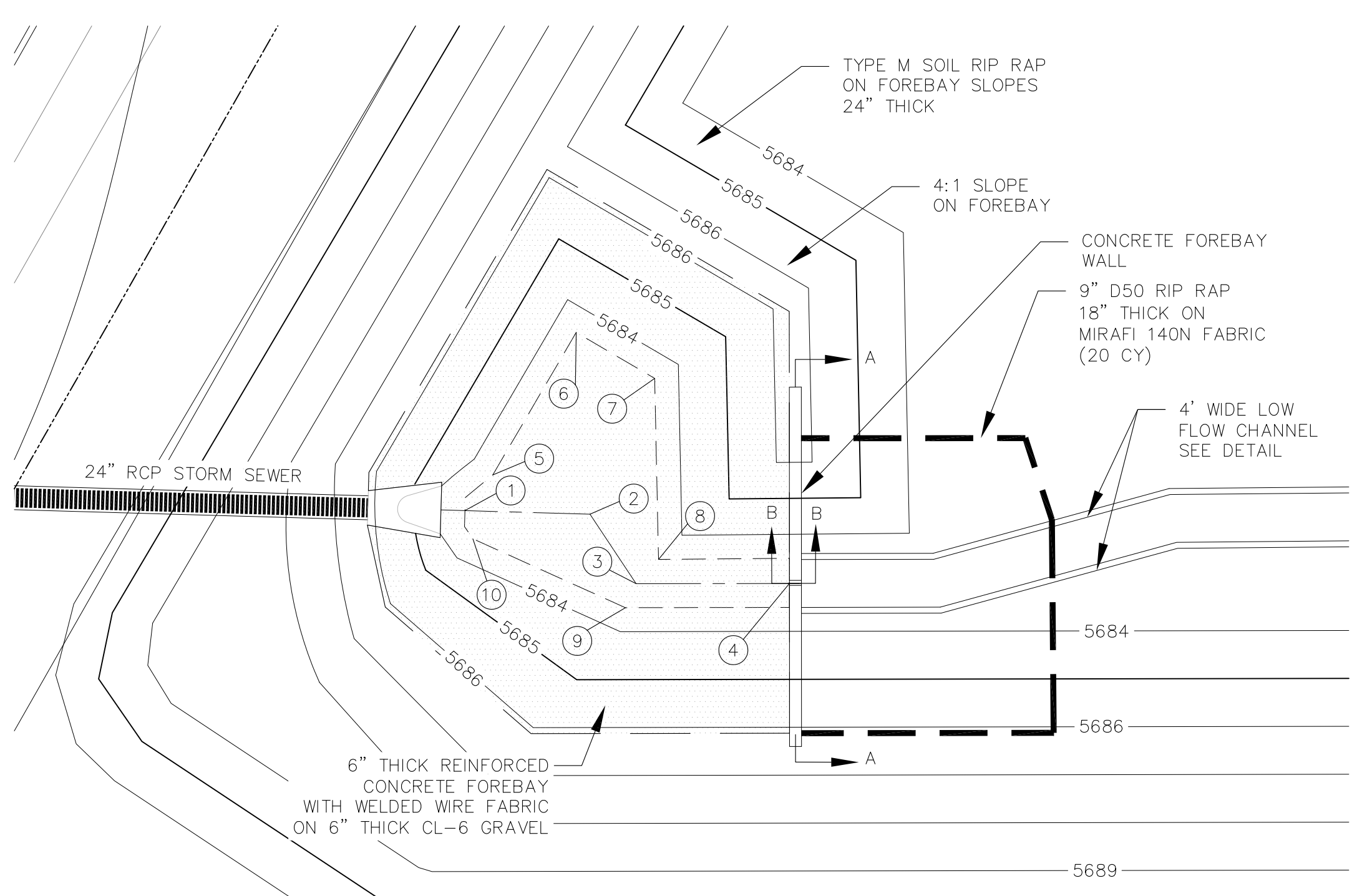
**POND G1/G2 (DISTRICT)
 G2 SIDE OF POND - FOREBAY "B"
 TRICKLE AND FOREBAY DETAILS**



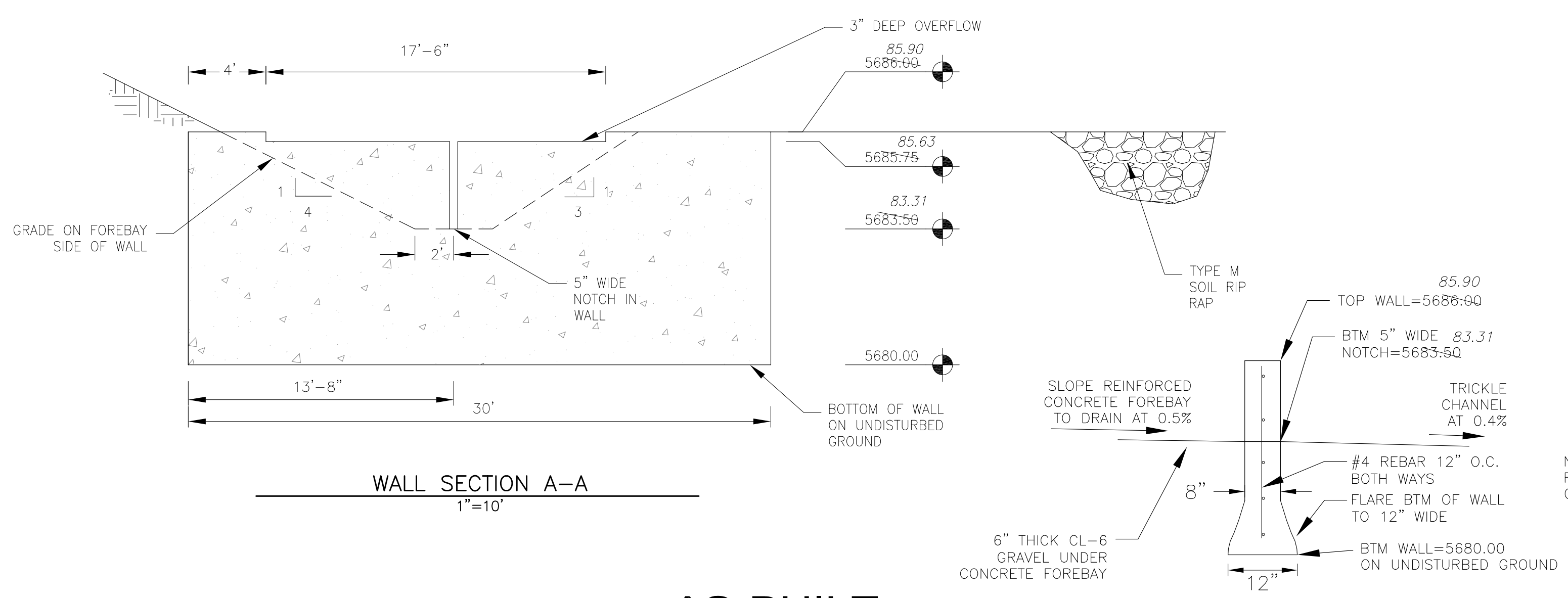
TRICKLE CHANNEL DETAIL
NO SCALE

LENGTH FOR RADII	
A	= 1/2"
C	= 1-1/2"

POINT TABLE				
NUMBER	NORTHING	EASTING	ELEVATION	NOTES
1	20365.82	20318.86	5683.65	FOREBAY BOTTOM
2	20365.52	20329.30	5683.60	FOREBAY BOTTOM
3	20359.71	20333.16	5683.57	FOREBAY BOTTOM
4	20359.74	20345.96	5683.50	FOREBAY BOTTOM
5	20368.80	20321.19	5683.67	FOREBAY BOTTOM
6	20380.69	20328.16	5683.67	FOREBAY BOTTOM
7	20376.85	20334.70	5683.66	FOREBAY BOTTOM
8	20361.75	20335.03	5683.58	FOREBAY BOTTOM
9	20357.71	20332.26	5683.58	FOREBAY BOTTOM
10	20363.46	20319.53	5683.67	FOREBAY BOTTOM



FOREBAY "A" DETAIL
1"=10'

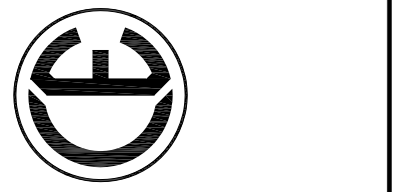


WALL SECTION A-A
1"=10'

WALL SECTION B-B
NO SCALE

NOTE: ALL CONCRETE FOR WALL SHALL BE CDOT TYPE D

AS-BUILT
DATE: APRIL 6, 2018

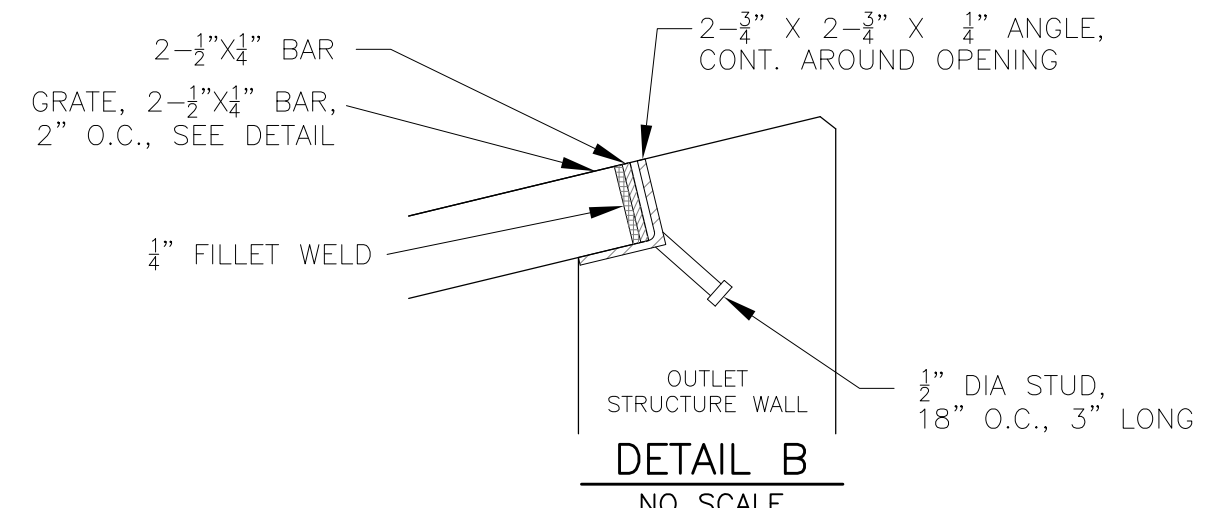
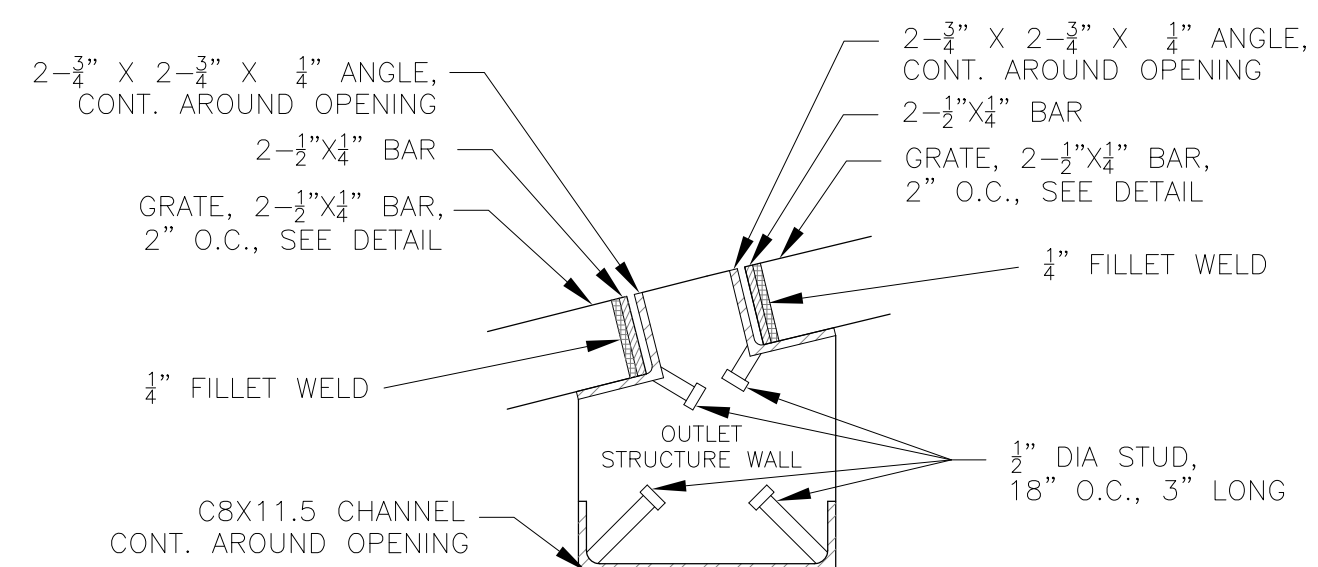


DATE: _____
DESCRIPTION: _____
NO. _____
DRAWN: RLS
DESIGNED: RLS
CHECKED: RLS

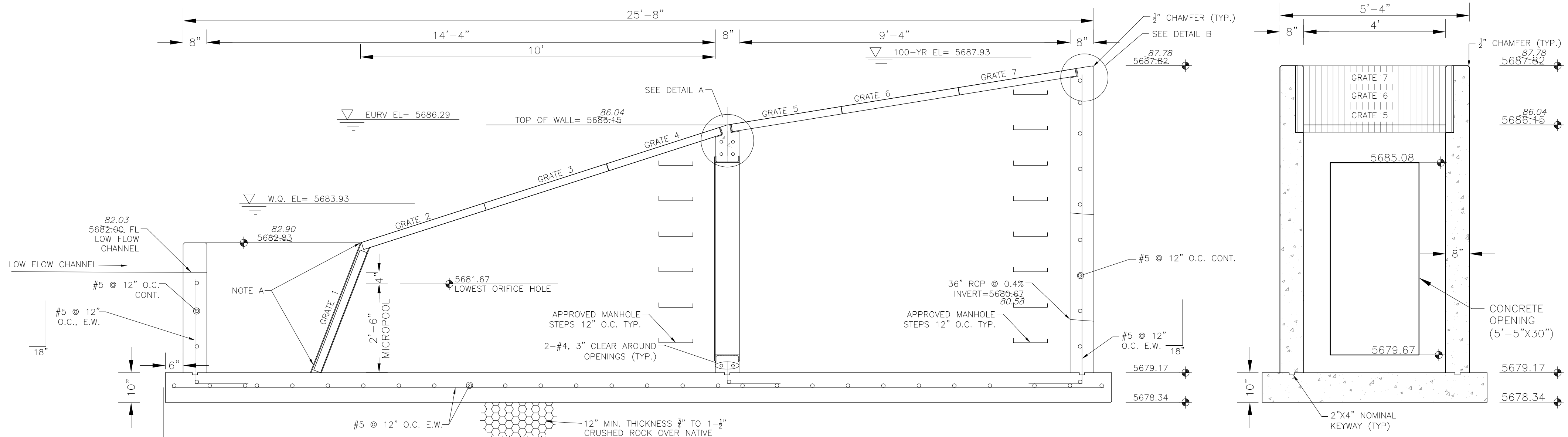
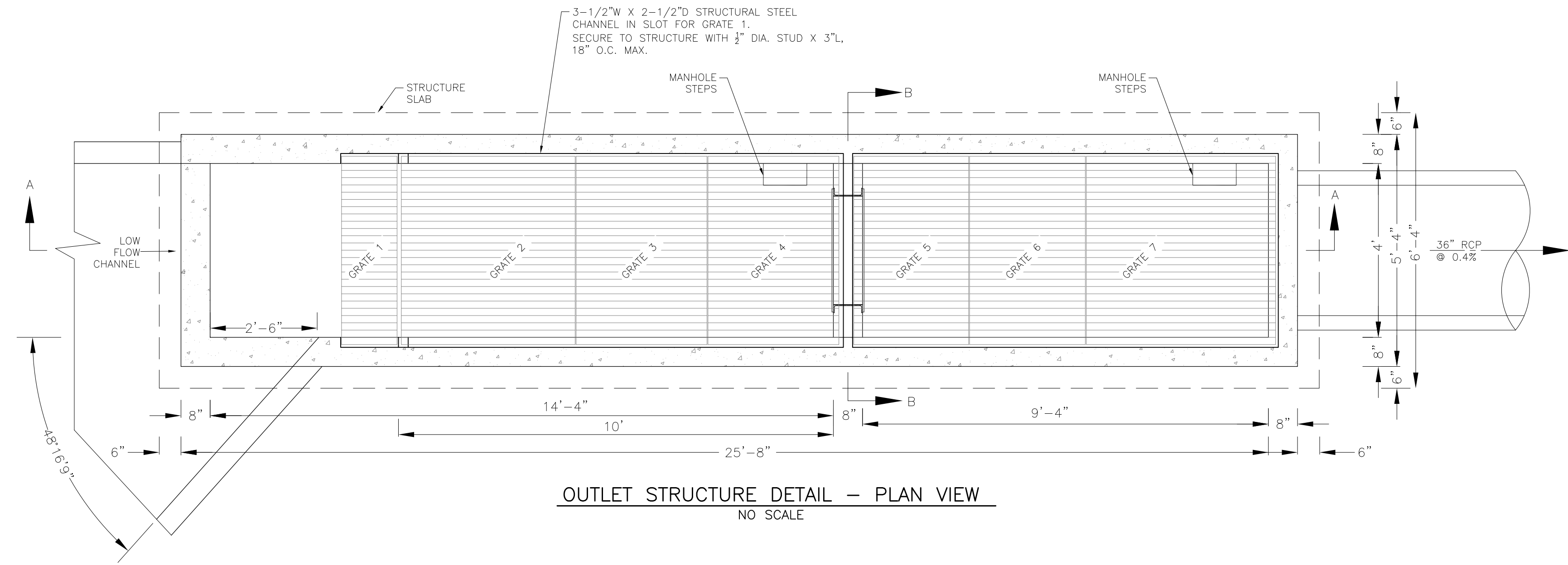
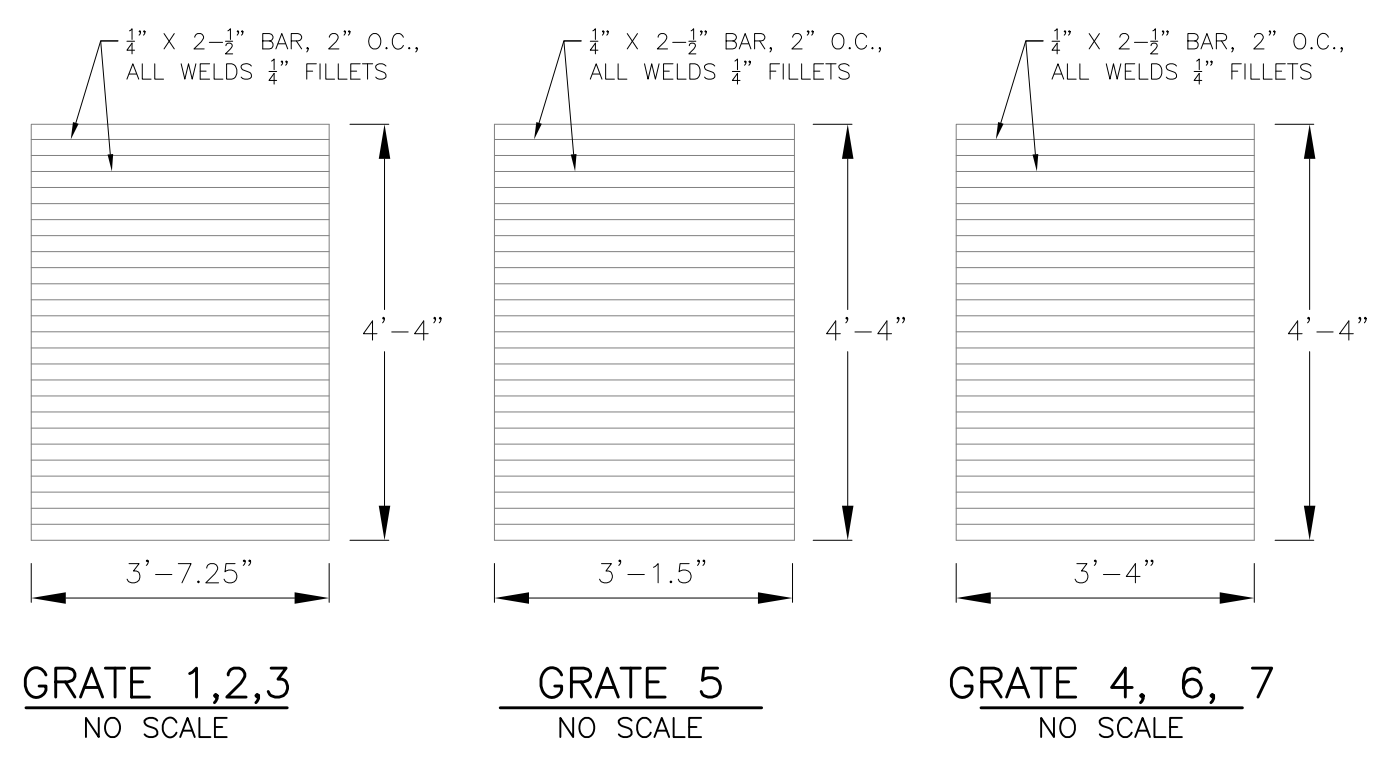
PROJECT: CARRIAGE MEADOWS SOUTH AT LORSON RANCH FILL NO. 1 FONTAINE BLVD. - CARRIAGE MEADOWS DR EL PASO COUNTY, COLORADO

PREPARED FOR: LORSON, LLC
212 N. WAHSATCH AVE., SUITE 301
COLORADO SPRINGS, COLORADO 80903
(719) 635-3200
CONTACT: JEFF MARK

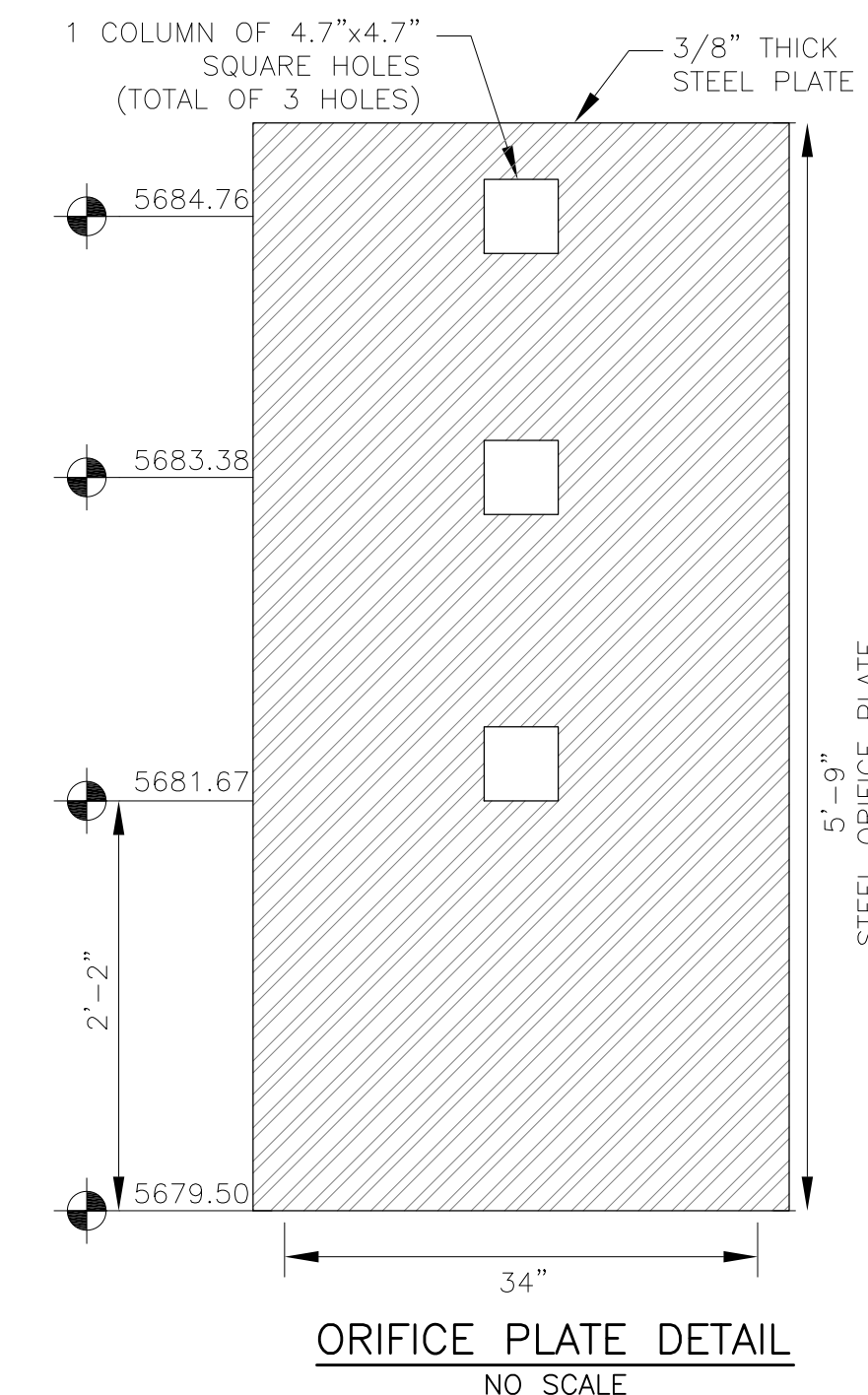
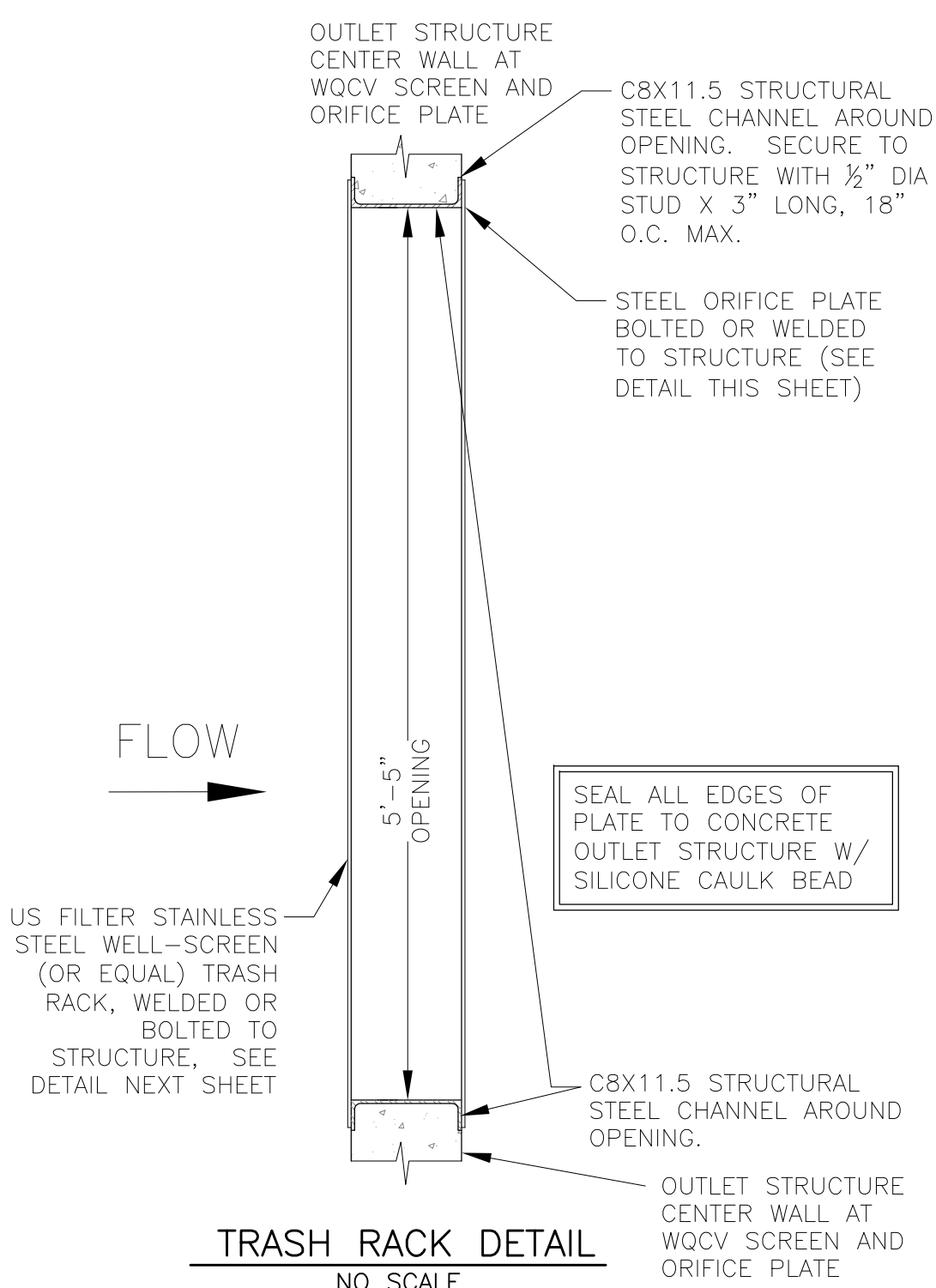
**POND G1/G2 (DISTRICT)
G2 SIDE OF POND
TRICKLE AND FOREBAY DETAILS**



NOTE:
AFTER CONCRETE STRUCTURE HAS BEEN POURED
ALL GRATE DIMENSIONS SHALL BE FIELD VERIFIED
PRIOR TO GRATE CONSTRUCTION



OUTLET STRUCTURE DETAIL - SECTION B-B
NO SCALE



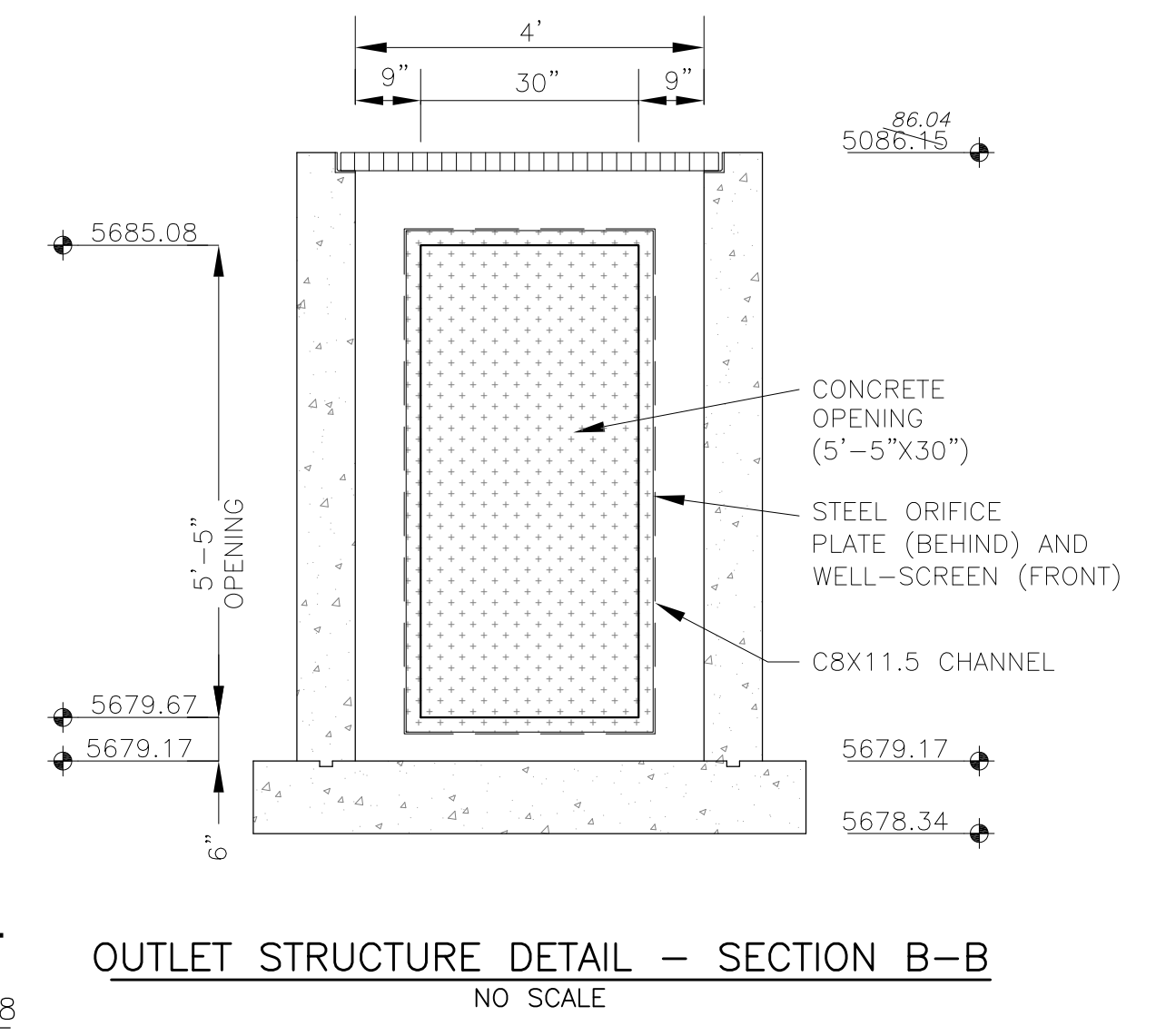
OUTLET STRUCTURE DETAIL - SECTION A-A
NO SCALE

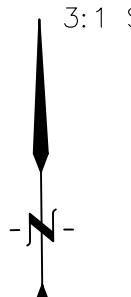
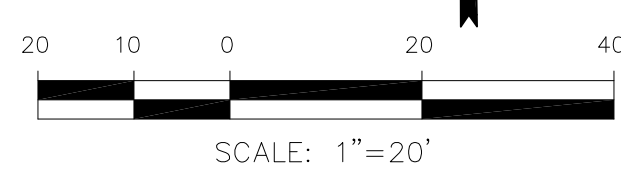
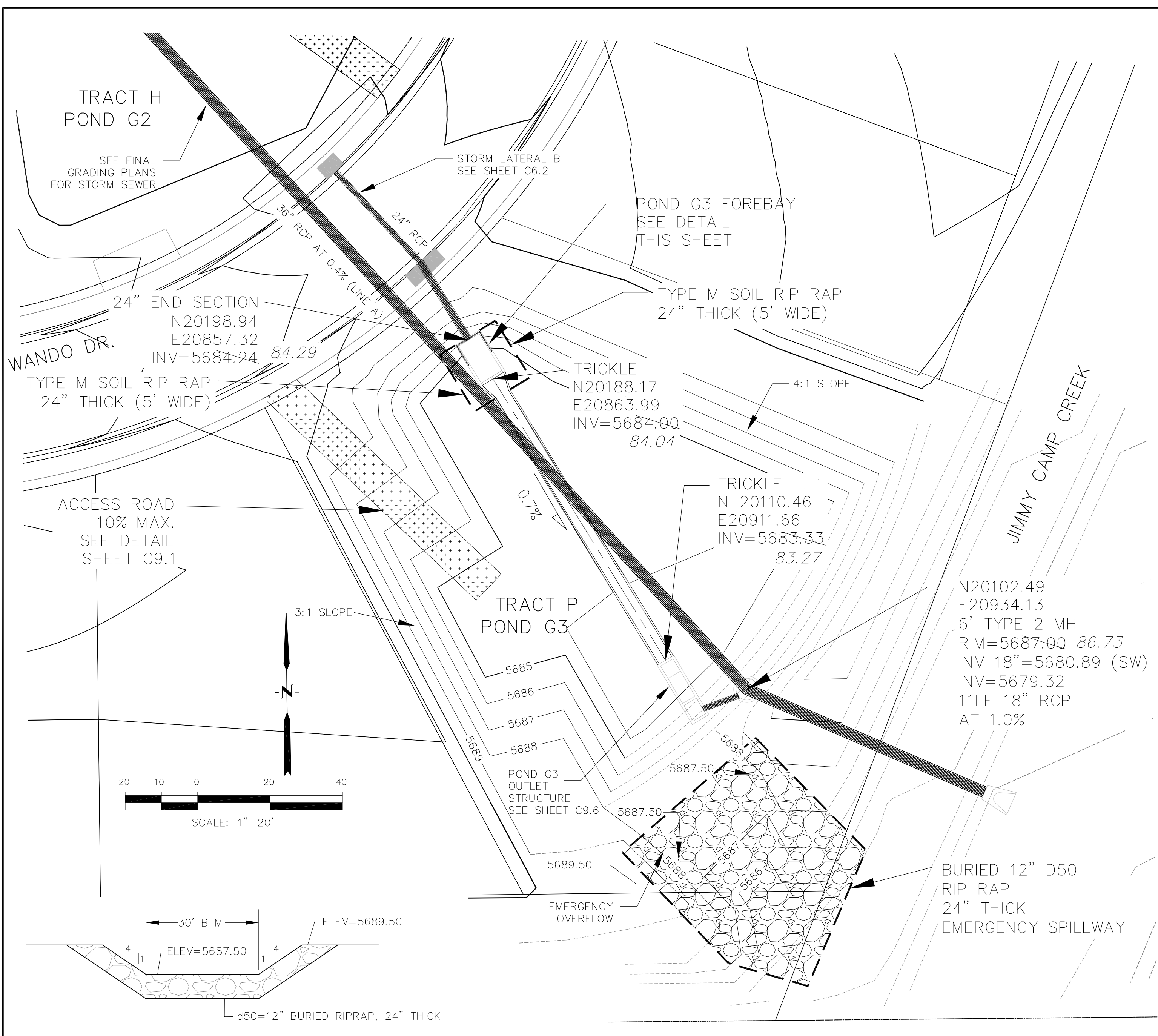
OUTLET STRUCTURE, FOREBAY, AND DRAIN CHANNEL NOTES:

- PRIOR TO CONSTRUCTION, CONTRACTOR SHALL PROVIDE SHOP DRAWINGS FOR ALL COMPONENTS OF THE OUTLET STRUCTURE.
- GRADE 60 REINFORCING STEEL REQUIRED. SEE TABLE FOR THE MINIMUM LAP SPLICE LENGTH FOR REINFORCING BARS. ALL REINFORCING STEEL SHALL HAVE A TWO-INCH MINIMUM CLEARANCE FROM EDGE OF CONCRETE, UNLESS OTHERWISE NOTED.
- CONCRETE FOR THE OUTLET STRUCTURE AND FOREBAY SHALL BE CDOT CLASS D CONCRETE.
- CONCRETE FOR DRAIN CHANNELS SHALL BE CDOT CLASS B CONCRETE
- EXPANSION JOINT MATERIAL SHALL MEET AASHTO SPECIFICATION M-213. EXPANSION JOINT MATERIAL SHALL BE 1/2" THICK, SHALL EXTEND THE FULL DEPTH OF CONTACT SURFACE AND THE JOINT SHALL BE SEALED, REFER TO DETAILS.
- ALL EXPOSED CONCRETE CORNERS SHALL HAVE A 3/8" CHAMFER UNLESS OTHERWISE NOTED.
- SUBGRADE TO BE 12" THICK CLEAN FILL COMPACTED TO 95% STANDARD PROCTOR DENSITY PER ASTM M698 UNDER STRUCTURE.
- REFER TO SHEET XX FOR PRESEDIMENTATION/FOREBAY DESIGN.
- ENGINEER SHALL BE NOTIFIED PRIOR TO BEGINNING CONSTRUCTION OF OUTLET STRUCTURE TO SCHEDULE OBSERVATION VISITS FOR STRUCTURES.

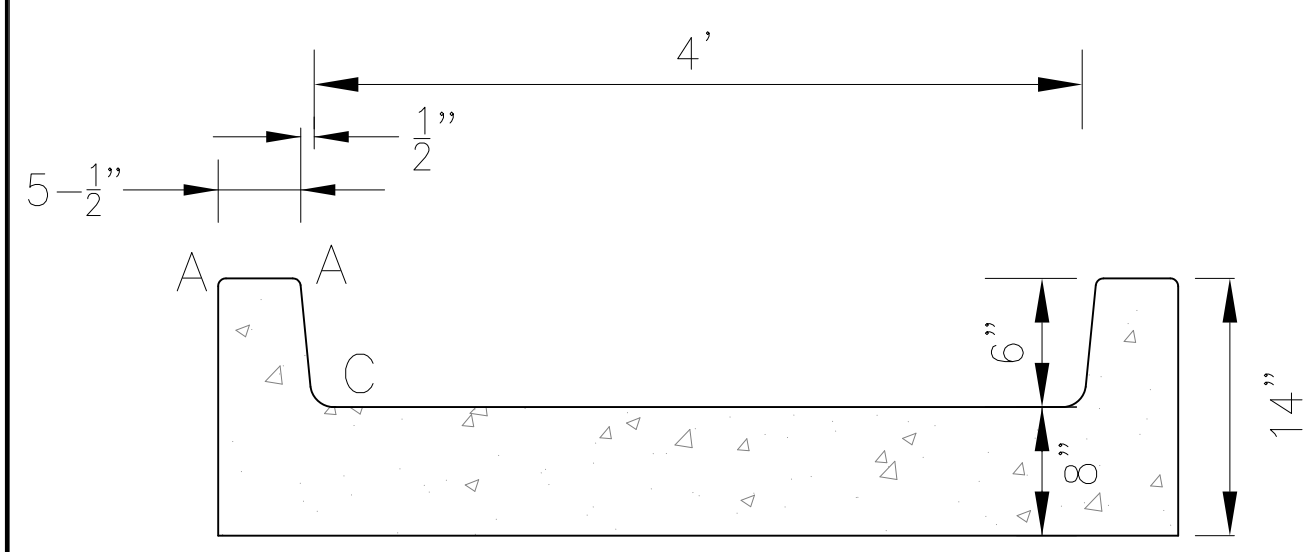
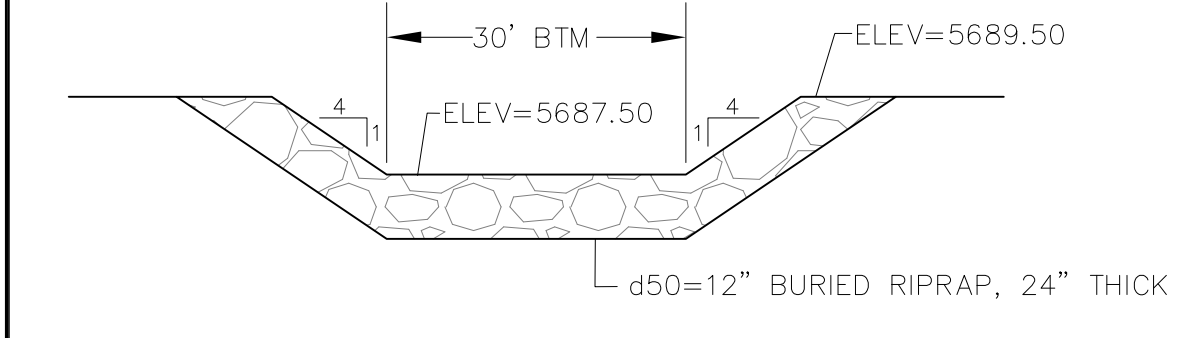
BAR SIZE	#4	#5	#6
MIN. SPLICE LENGTH	1'-3"	1'-7"	2'-0"

AS-BUILT
DATE: APRIL 6, 2018



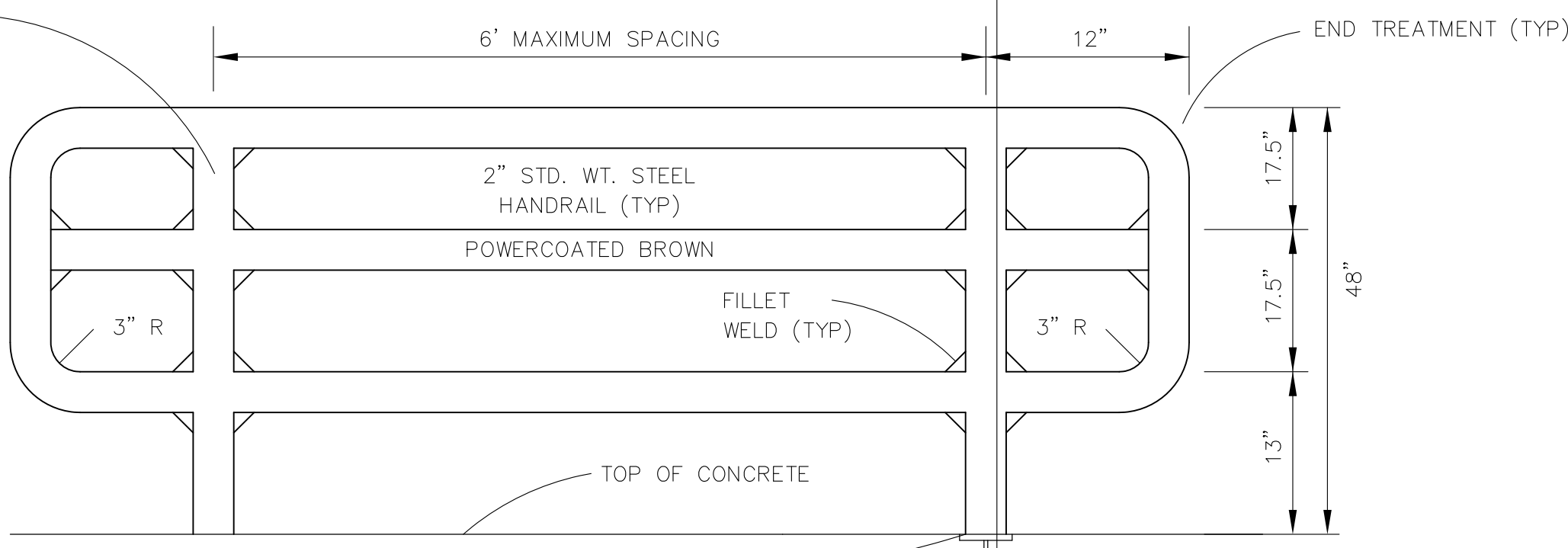


EMERGENCY SPILLWAY DETAIL
SCALE: NTS

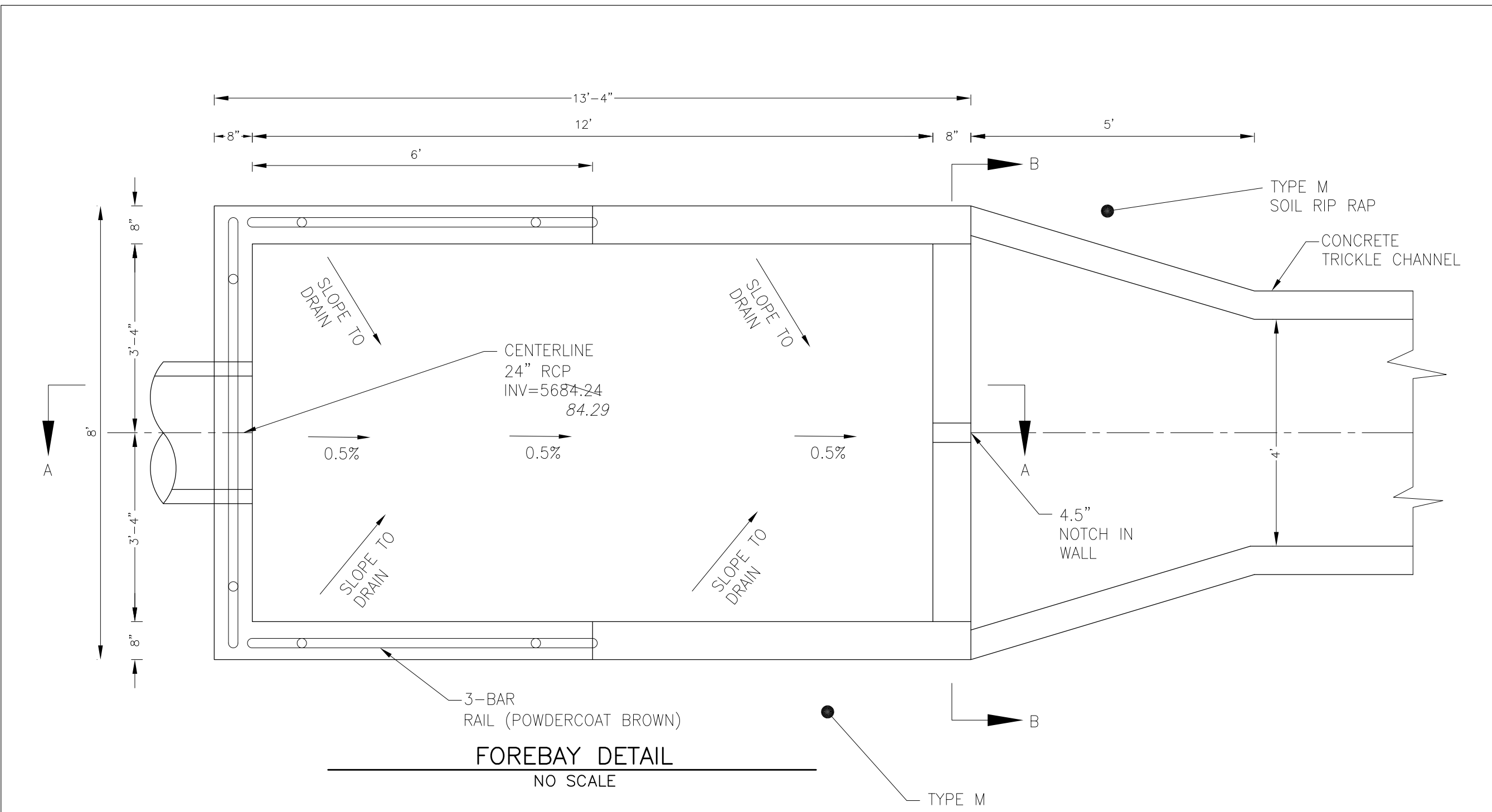


TRICKLE CHANNEL DETAIL
NO SCALE

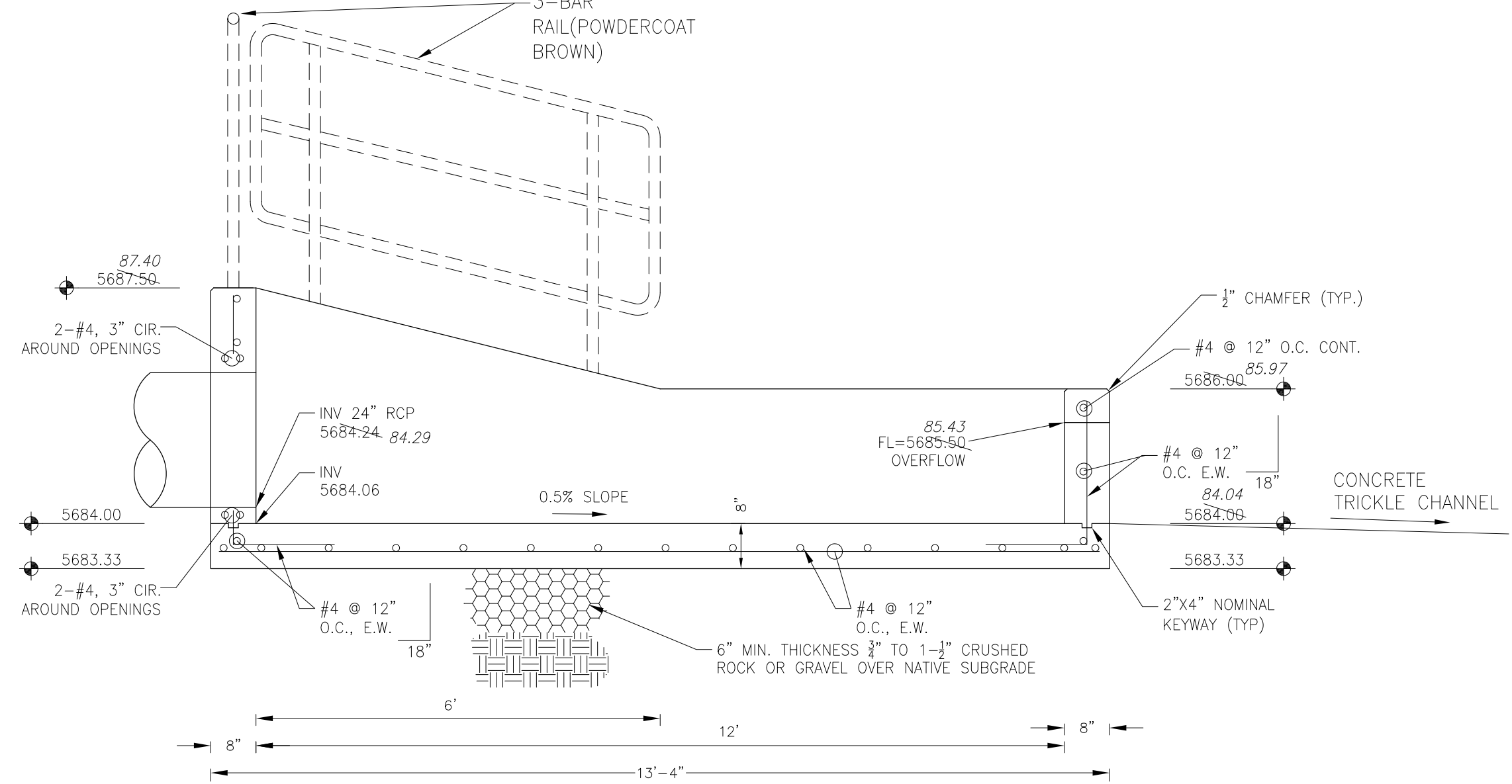
LENGTH FOR RADII	
A	= 1/2"
C	= 1-1/2"



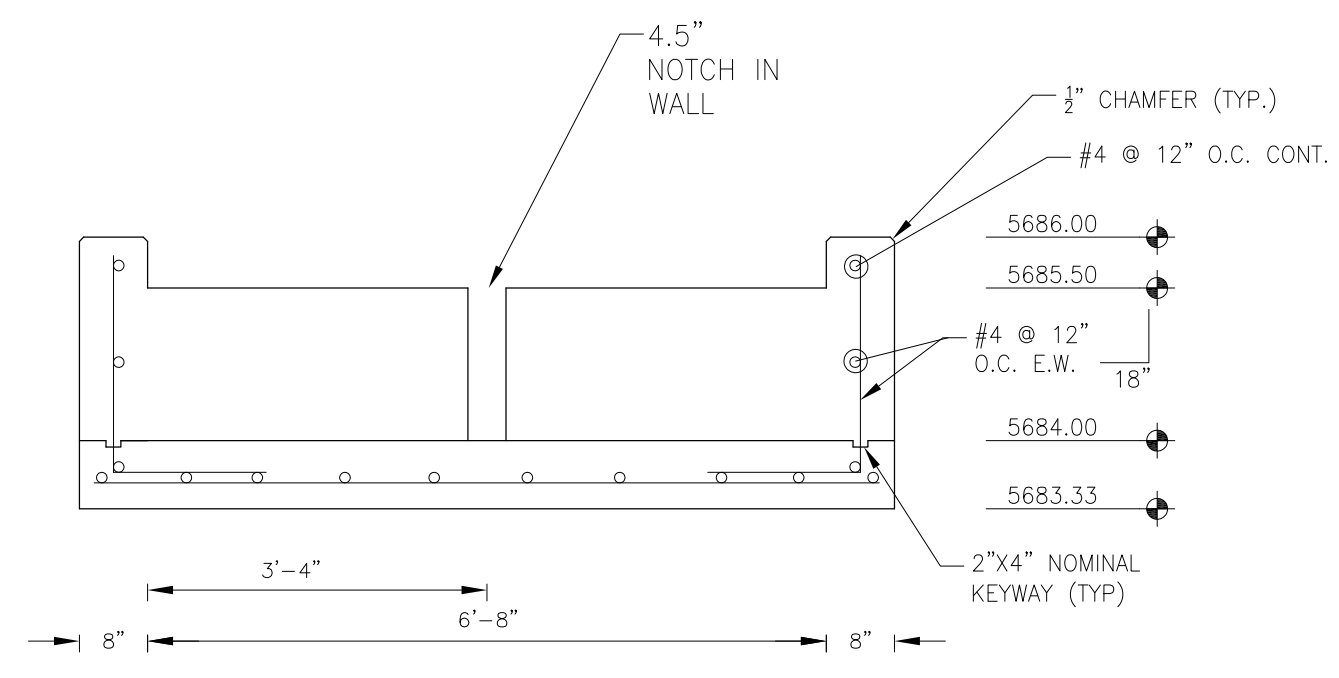
3-BAR RAIL DETAIL
NO SCALE



FOREBAY DETAIL
NO SCALE



FOREBAY SECTION A-A
NO SCALE

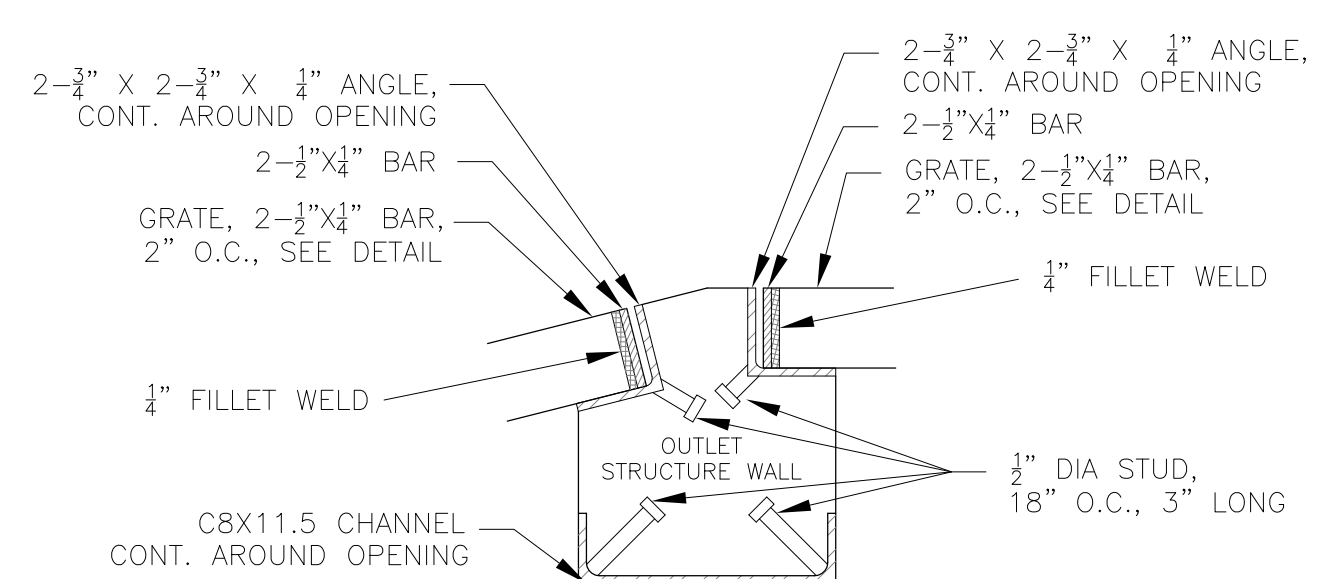


FOREBAY SECTION B-B
NO SCALE

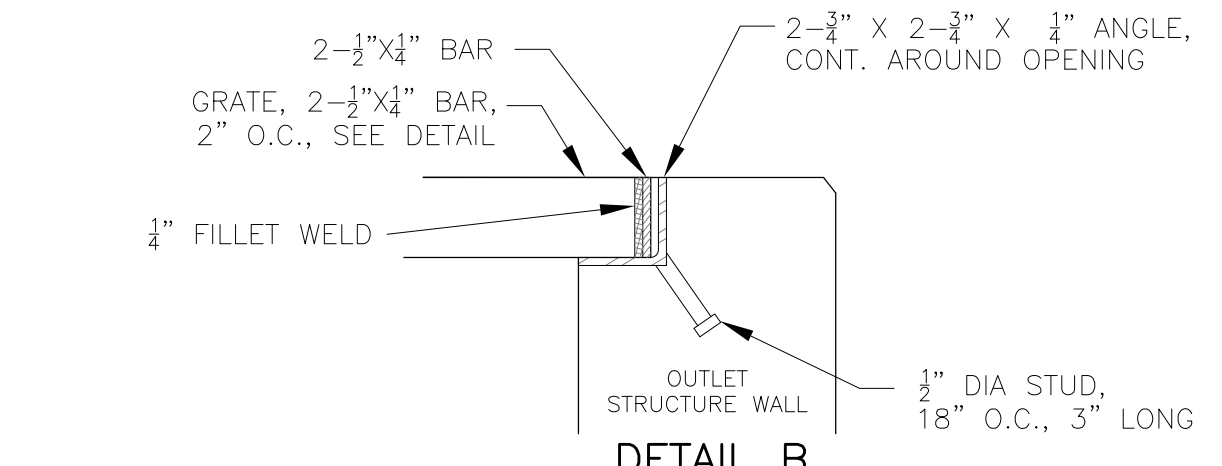
NO.	DESCRIPTION	DATE

AS-BUILT
DATE: APRIL 6, 2018

POND G3 (DISTRICT) TRICKLE AND FOREBAY DETAILS

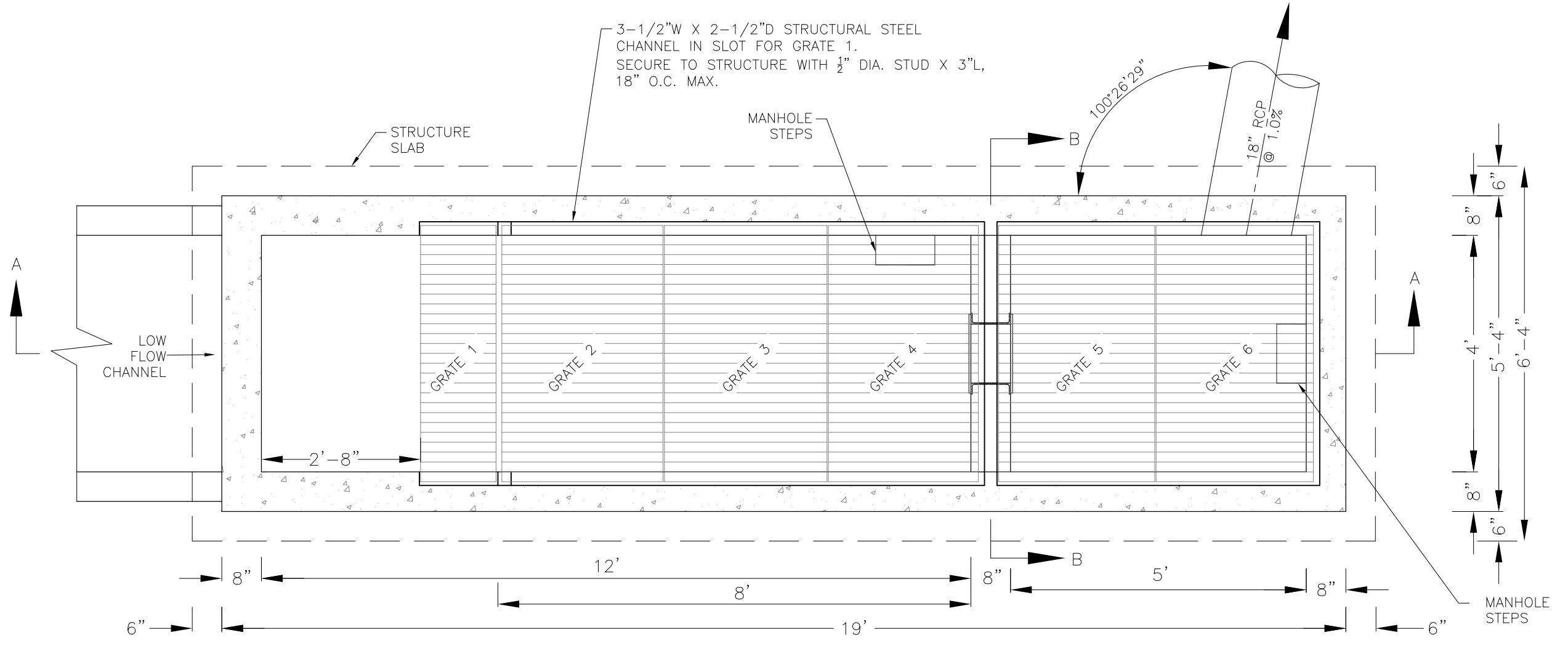
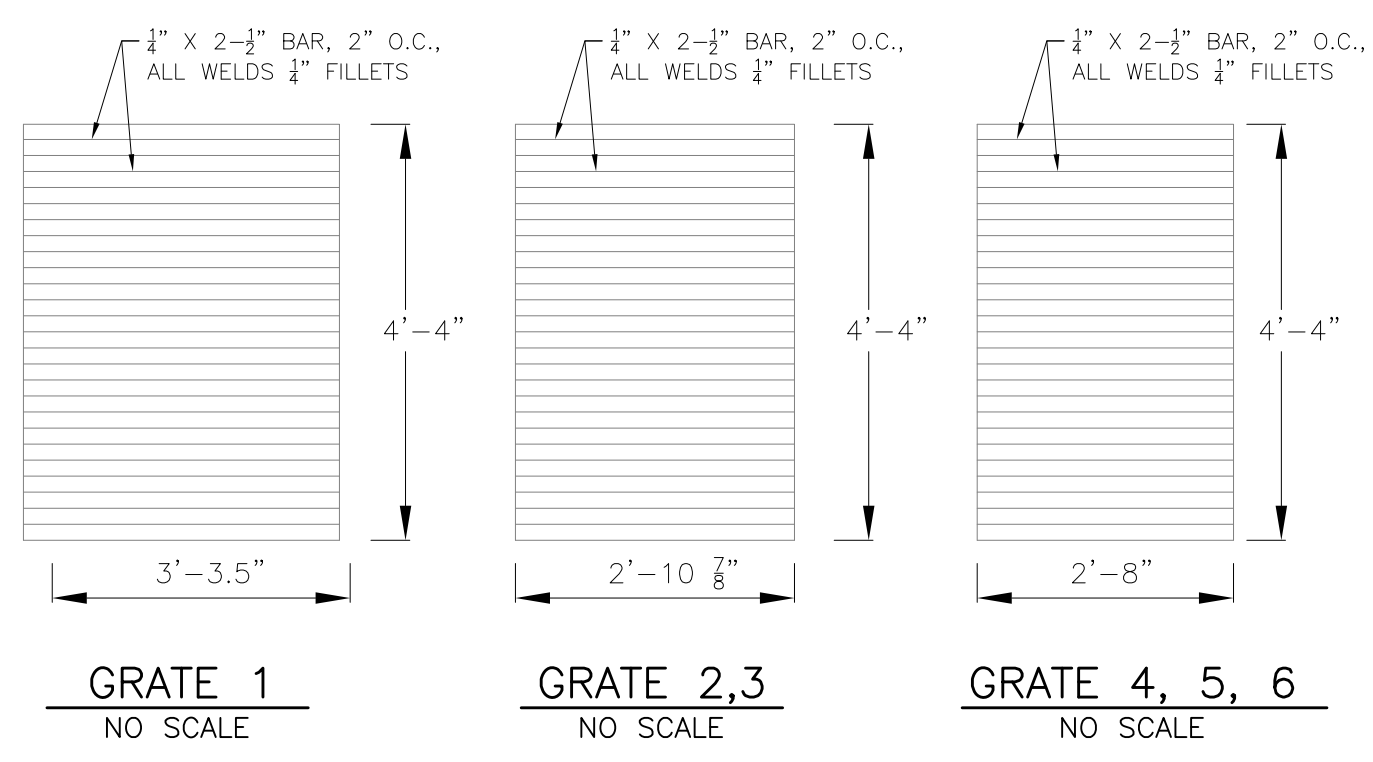


DETAIL A
NO SCALE

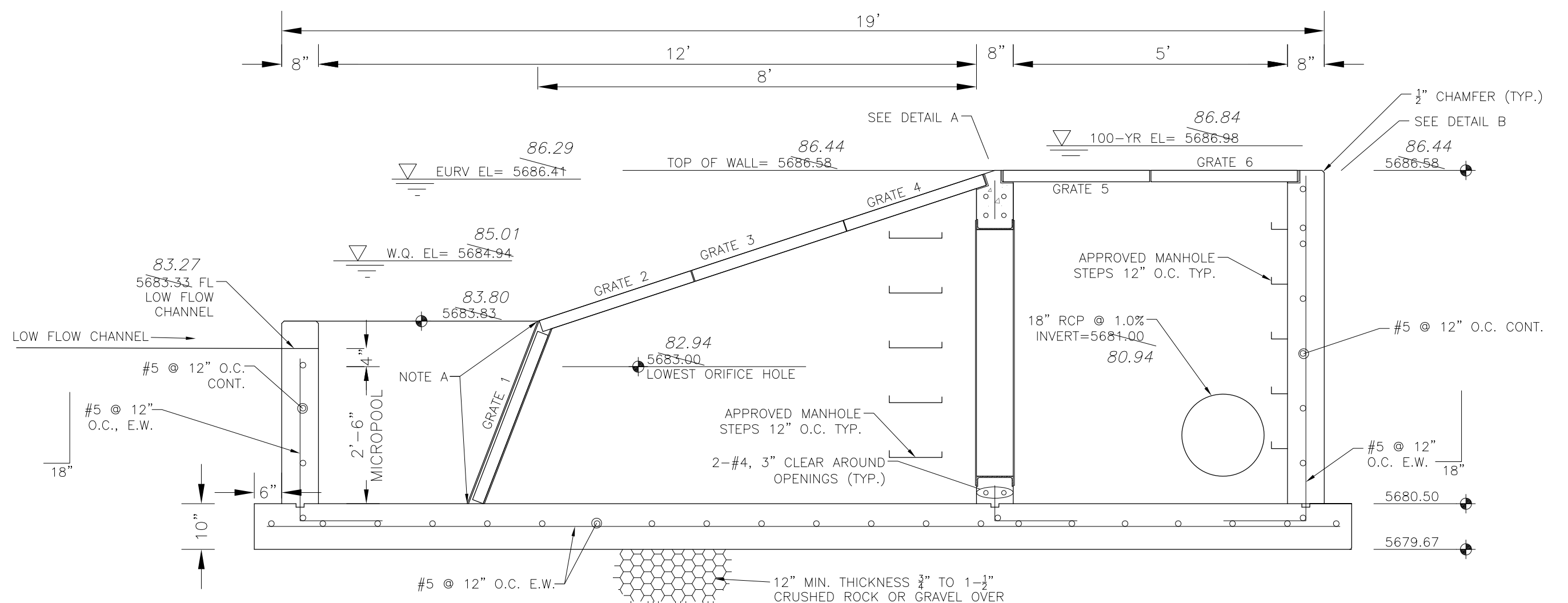


DETAIL B
NO SCALE

NOTE:
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PRIOR TO GRATE CONSTRUCTION

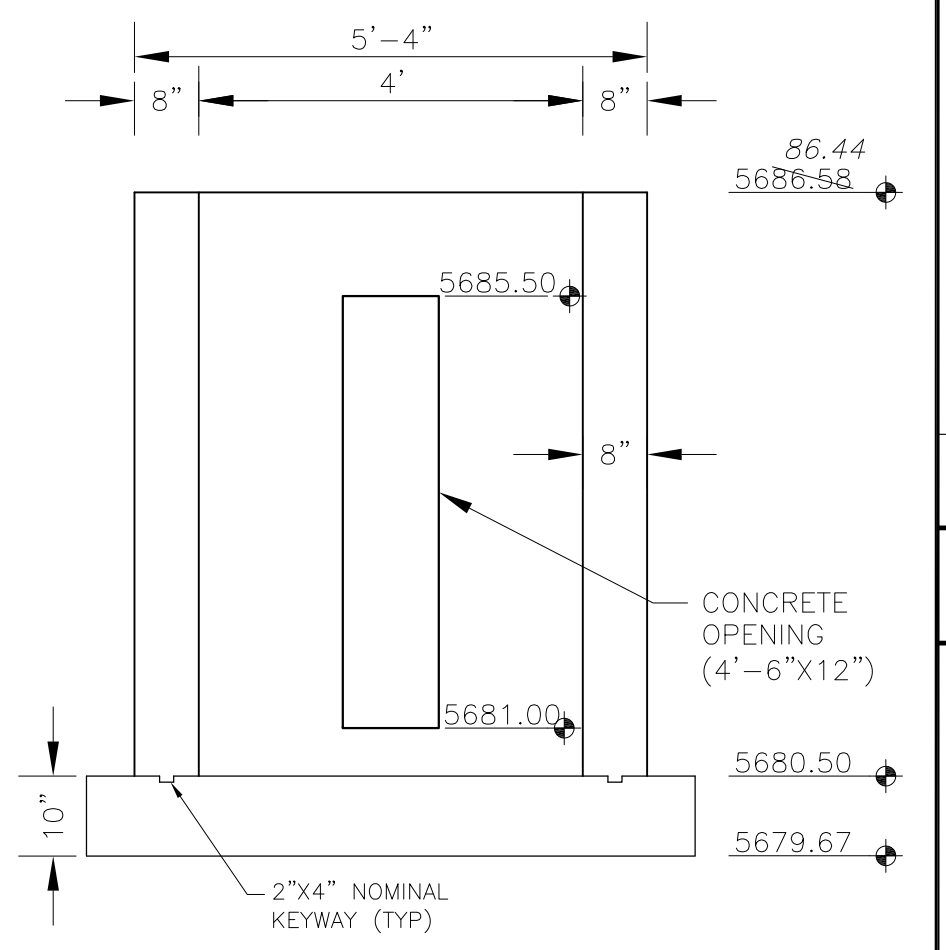


OUTLET STRUCTURE DETAIL - PLAN VIEW
NO SCALE

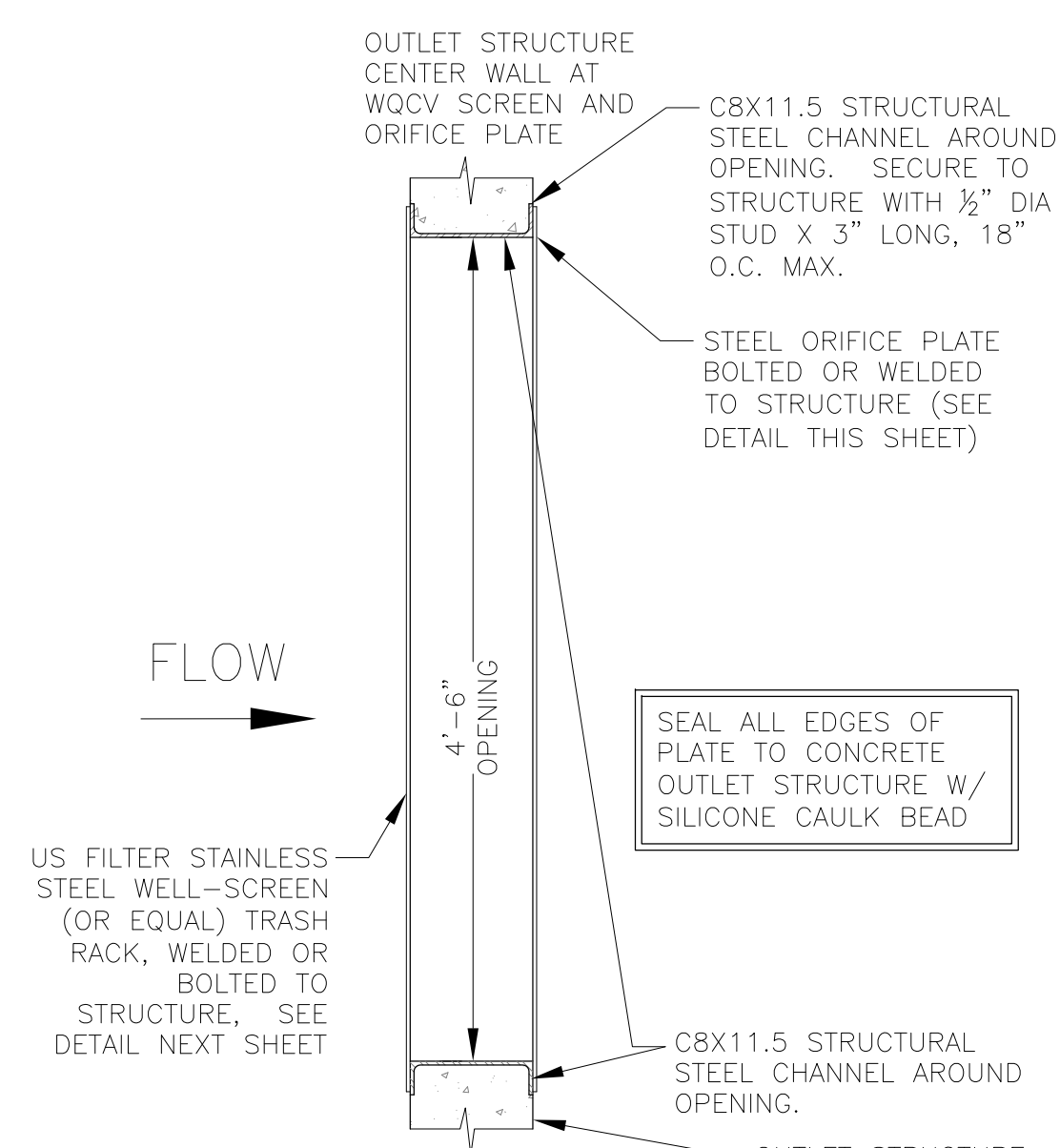


NOTE A:
3-1/2\"/>

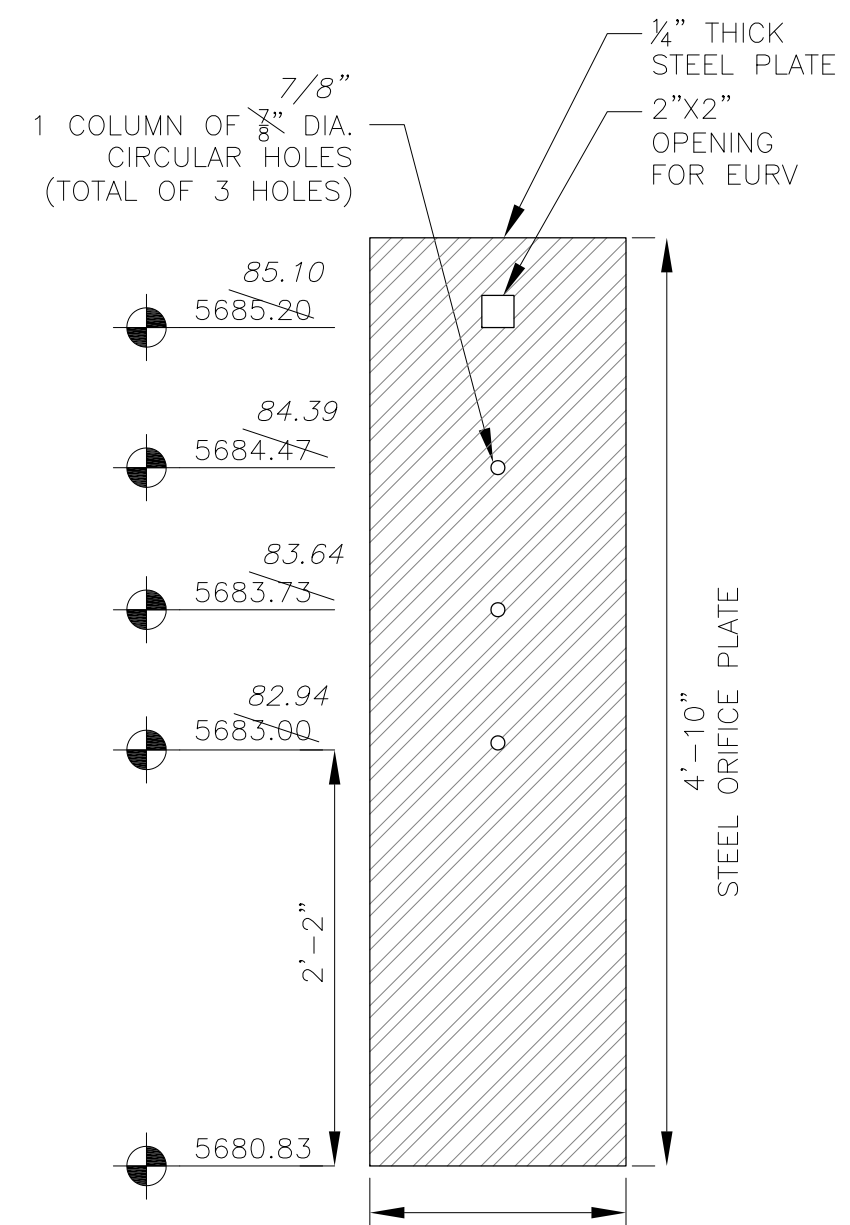
OUTLET STRUCTURE DETAIL - SECTION A-A
NO SCALE



OUTLET STRUCTURE DETAIL - SECTION B-B
NO SCALE



TRASH RACK DETAIL
NO SCALE

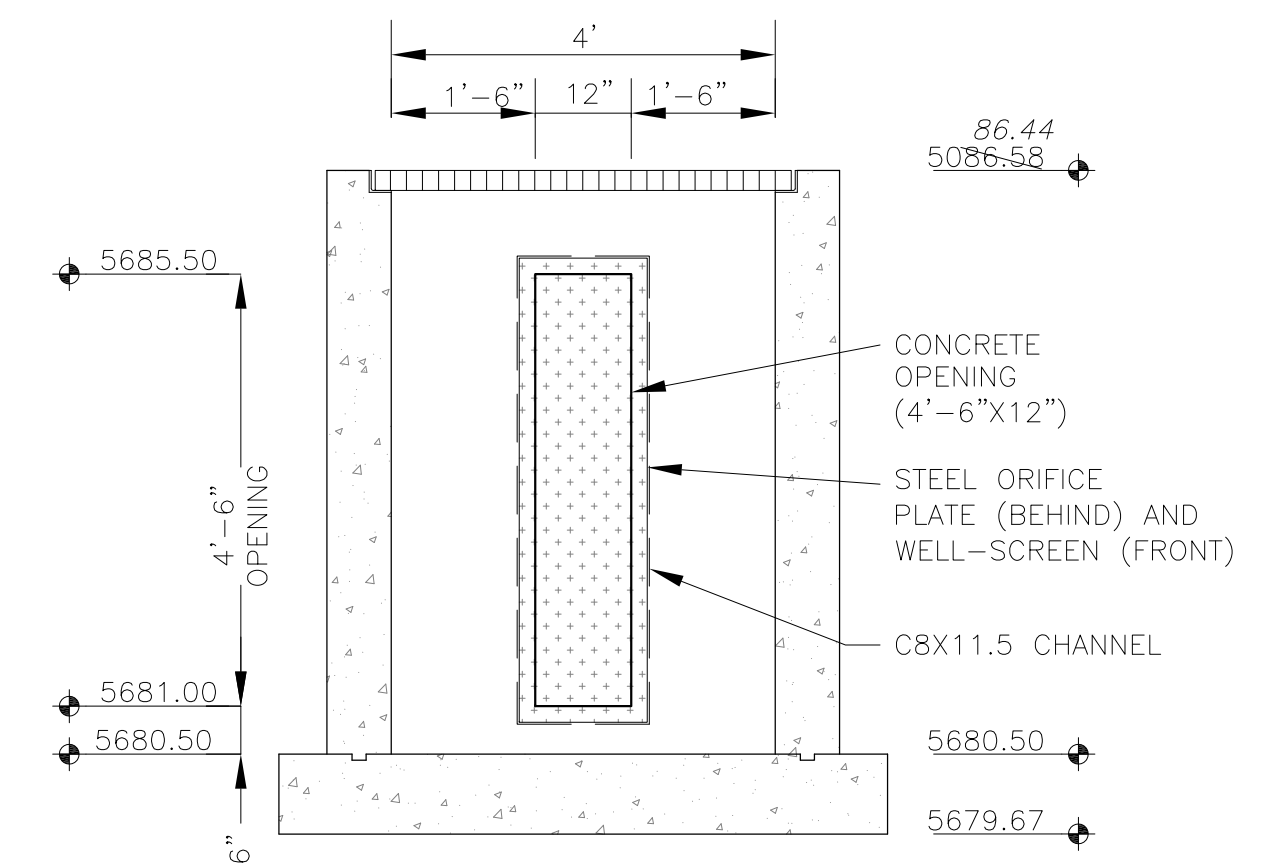


ORIFICE PLATE DETAIL
NO SCALE

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OUTLET STRUCTURE DETAIL - SECTION B-B
NO SCALE