

**GENERAL NOTES**

ALL WORK SHALL BE DONE IN ACCORDANCE WITH COLORADO DEPARTMENT OF TRANSPORTATION STANDARD CONSTRUCTION SPECIFICATIONS, 2022 EDITION, APPLICABLE TO THIS PROJECT.

LOCAL OWNER CRITERIA INCLUDING CITY OF COLORADO SPRINGS REQUIREMENTS SHALL ALSO APPLY AND WHEN IN CONFLICT WITH CDOT REQUIREMENTS, SHALL SUPERCEDE CDOT REQUIREMENTS AT THE OWNER'S DISCRETION.

STRUCTURE EXCAVATION AND BACKFILL SHALL BE IN ACCORDANCE WITH DETAILS SHOWN IN THESE PLANS AND SECTION 206 OF THE CDOT STANDARD SPECIFICATIONS.

EXPANSION JOINT MATERIAL SHALL MEET AASHTO SPECIFICATION M-213.

THE FINAL FINISH FOR ALL EXPOSED CONCRETE SURFACES SHALL BE CLASS 2 TO 1'-0" BELOW FINISHED GRADE, UNLESS NOTED OTHERWISE.

WHERE SPECIFIED IN THE PLANS, THE FORMLINER FINISH SHALL EXTEND TO 1'-0" MINIMUM BELOW FINISHED GRADE.

GRADE 60 REINFORCING STEEL IS REQUIRED.

ALL CAST-IN-PLACE CONCRETE SHALL BE CLASS D UNLESS NOTED OTHERWISE.

ALL EXPOSED CONCRETE CORNERS SHALL BE CHAMFERED 3/8 INCH, UNLESS NOTED OTHERWISE IN PLANS.

PROVIDE 2 INCH CLEAR COVER TO ALL REINFORCING, UNLESS SHOWN OR NOTED OTHERWISE.

ALL REINFORCING STEEL SHALL BE EPOXY-COATED UNLESS NOTED OTHERWISE.

ALL CONSTRUCTION JOINTS SHALL BE THOROUGHLY CLEANED BEFORE FRESH CONCRETE IS PLACED.

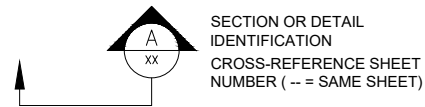
THE CONTRACTOR SHALL NOT BACKFILL STRUCTURES UNTIL RETAINING WALLS HAVE REACHED 80% OF DESIGN STRENGTH.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE STABILITY OF THE STRUCTURES DURING CONSTRUCTION.

E.F. = EACH FACE      O.F. = OUTSIDE FACE  
 F.F. = FAR FACE      T.&B. = TOP AND BOTTOM  
 N.F. = NEAR FACE      T.F. = TOP FACE  
 I.F. = INSIDE FACE      B.F. = BOTTOM FACE  
 O.C. = ON CENTER

STATIONS, ELEVATIONS, AND DIMENSIONS CONTAINED IN THESE PLANS ARE CALCULATED FROM CIVIL PLAN SET. THE CONTRACTOR SHALL VERIFY ALL DEPENDENT DIMENSIONS IN THE FIELD BEFORE ORDERING OR FABRICATING ANY MATERIAL.

THE INFORMATION SHOWN ON THESE PLANS CONCERNING THE TYPE AND LOCATION OF UNDERGROUND UTILITIES IS NOT GUARANTEED TO BE ACCURATE OR ALL INCLUSIVE. THE CONTRACTOR IS RESPONSIBLE FOR MAKING HIS OWN DETERMINATION AS TO THE TYPE AND LOCATION OF UNDERGROUND UTILITIES AS MAY BE NECESSARY TO AVOID DAMAGE THERETO. THE CONTRACTOR SHALL CONTACT THE UTILITY NOTIFICATION CENTER OF COLORADO AT 1-800-922-1987 AT LEAST 2 DAYS (NOT INCLUDING THE DAY OF NOTIFICATION) PRIOR TO ANY EXCAVATION OR OTHER EARTHWORK.



**GENERAL DESIGN DATA**

REINFORCED CONCRETE:  
 CLASS D CONCRETE:  $f_c = 4,500$  psi  
 TYPE II CEMENT REQUIRED  
 REINFORCING STEEL:  $f_y = 60,000$  psi

REFER TO GEOTECHNICAL REPORTING NO. 211647 BY ENTECH ENGINEERING, IN., DATED APRIL 5, 2022 AND ANY AGENDA THERETO, FOR ADDITIONAL INFORMATION AND REQUIREMENTS.

PER GEOTECH REPORT LISTED ABOVE:  
 2400 PSF (NATIVE SAND)  
 3000 PSF (STRUCTURAL FILL)  
 3500 PSF (SANDSTONE BEDROCK)

**DESIGN DATA FOR CULVERTS**

DESIGNED IN ACCORDANCE WITH AASHTO LRFD, 9th EDITION 2020

**ALL BOX CULVERTS**

LIVE LOAD: HL-93  
 LIVE LOAD SURCHARGE: 2 FT DEPTH  
 EQUIVALENT FLUID PRESSURE: 30-90 PCF

**THREE-CELL BOX CULVERT**

INTERIOR FLUID: 8 FT ABOVE TOP SLAB  
 FILL RANGE: 2 FT TO 8 FT  
 MAXIMUM CALCULATED BEARING PRESSURE = 1300 PSF

**10x12 BOX CULVERT**

INTERIOR FLUID: 13.5 FT ABOVE TOP SLAB  
 FILL RANGE: 5.5 FT TO 17.5 FT  
 MAXIMUM CALCULATED BEARING PRESSURE = 3100 PSF

**10x10 BOX CULVERT**

INTERIOR FLUID: 3.5 FT ABOVE TOP SLAB  
 FILL RANGE: 5 FT TO 7 FT  
 MAXIMUM CALCULATED BEARING PRESSURE = 1500 PSF

**DESIGN DATA POND OUTLET STRUCTURES**

DESIGNED IN ACCORDANCE WITH IBC 2018 / ACI 318

**POND STRUCTURE #1**

EQUIVALENT FLUID PRESSURE: 60-90 PCF  
 LIVE LOAD: 100 PSF OR 200 LBS CONCENTRATED LOAD ON STEEL GRATING  
 LIVE LOAD SURCHARGE: N/A  
 INTERIOR FLUID DEPTH: FULL AND EMPTY CONSIDERED FOR STRUCTURAL CAPACITY AND BUOYANCY  
 MAXIMUM CALCULATED BEARING PRESSURE: 2,500 PSF

**POND STRUCTURE #2**

EQUIVALENT FLUID PRESSURE: 60-90 PCF  
 LIVE LOAD: 100 PSF OR 200 LBS CONCENTRATED LOAD ON STEEL GRATING  
 LIVE LOAD SURCHARGE: N/A  
 INTERIOR FLUID DEPTH: FULL AND EMPTY CONSIDERED FOR STRUCTURAL CAPACITY AND BUOYANCY  
 MAXIMUM CALCULATED BEARING PRESSURE: 1,500 PSF

**DESIGN DATA FOR WINGWALLS AND HEADWALLS**

DESIGNED AND DETAILED BY JR ENGINEERING. REFER TO CIVIL SETS FOR DETAILS.

**STRUCTURE DESCRIPTION AND STRUCTURAL SCOPE OF WORK NARRATIVE**

THREE-CELL CAST-IN-PLACE REINFORCED CONCRETE BOX CULVERT CARRYING POND BERM AND CUTOFF WALL OVER SAND CREEK CHANNEL OUTLET FROM POND W-3.

13'-0" INTERIOR WIDTH (ALL CELLS)  
 4'-0" INTERIOR HEIGHT (EXTERIOR CELLS)  
 2'-0" INTERIOR HEIGHT (INTERIOR CELL)  
 93'-0" HEADWALL-TO-END

SINGLE-CELL CAST-IN-PLACE REINFORCED CONCRETE BOX CULVERT CARRYING POND EMERGENCY SPILLWAY AND CUTOFF WALL OVER SAND CREEK CHANNEL OUTLET FROM POND #1.

12'-0" INTERIOR WIDTH  
 10'-0" INTERIOR HEIGHT  
 8'-6" INTERMEDIATE DROP  
 149'-0" HEADWALL TO POND OUTLET RISER

SINGLE-CELL CAST-IN-PLACE REINFORCED CONCRETE BOX CULVERT CARRYING POND EMERGENCY SPILLWAY AND CUTOFF WALL OVER SAND CREEK CHANNEL OUTLET FROM POND #2.

10'-0" INTERIOR WIDTH  
 10'-0" INTERIOR HEIGHT  
 68'-8" HEADWALL TO POND OUTLET RISER

CAST-IN-PLACE REINFORCED CONCRETE VERTICAL OUTLET RISER FROM POND #1.

25'-0" SQUARE INTERIOR WIDTH  
 24'-1 1/2" INTERIOR HEIGHT  
 STEEL-FRAMED GRATED TOP

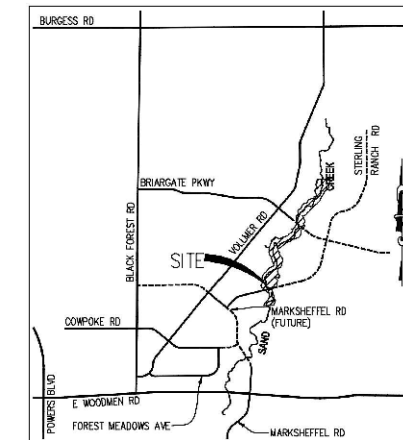
CAST-IN-PLACE REINFORCED CONCRETE VERTICAL OUTLET RISER FROM POND #2.

25'-0" SQUARE INTERIOR WIDTH  
 16'-8 3/4" INTERIOR HEIGHT  
 STEEL-FRAMED GRATED TOP

REFER TO CIVIL PLAN SET BY JR ENGINEERING FOR DETAILS OF HEADWALLS, WINGWALLS AND CUTOFF WALLS.

**STRUCTURAL DRAWING INDEX**

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KEY MAP  
SCALE: 1"=1500'

**STRUCTURAL ENGINEER'S STATEMENT**

PREPARED UNDER MY DIRECT SUPERVISION

90% SUBMITTAL  
NOT FOR CONSTRUCTION

JOHN MIGLIACCIO, P.E. DATE  
 COLORADO NO. 34333  
 FOR AND ON BEHALF OF SAN ENGINEERING, LLC.

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PREPARED FOR  
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 JAMES F. MORLEY  
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 www.sanengineeringllc.com

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DATE	DESIGNED BY	DRAWN BY	CHECKED BY
11/07/22	KSP	JJM	JKH

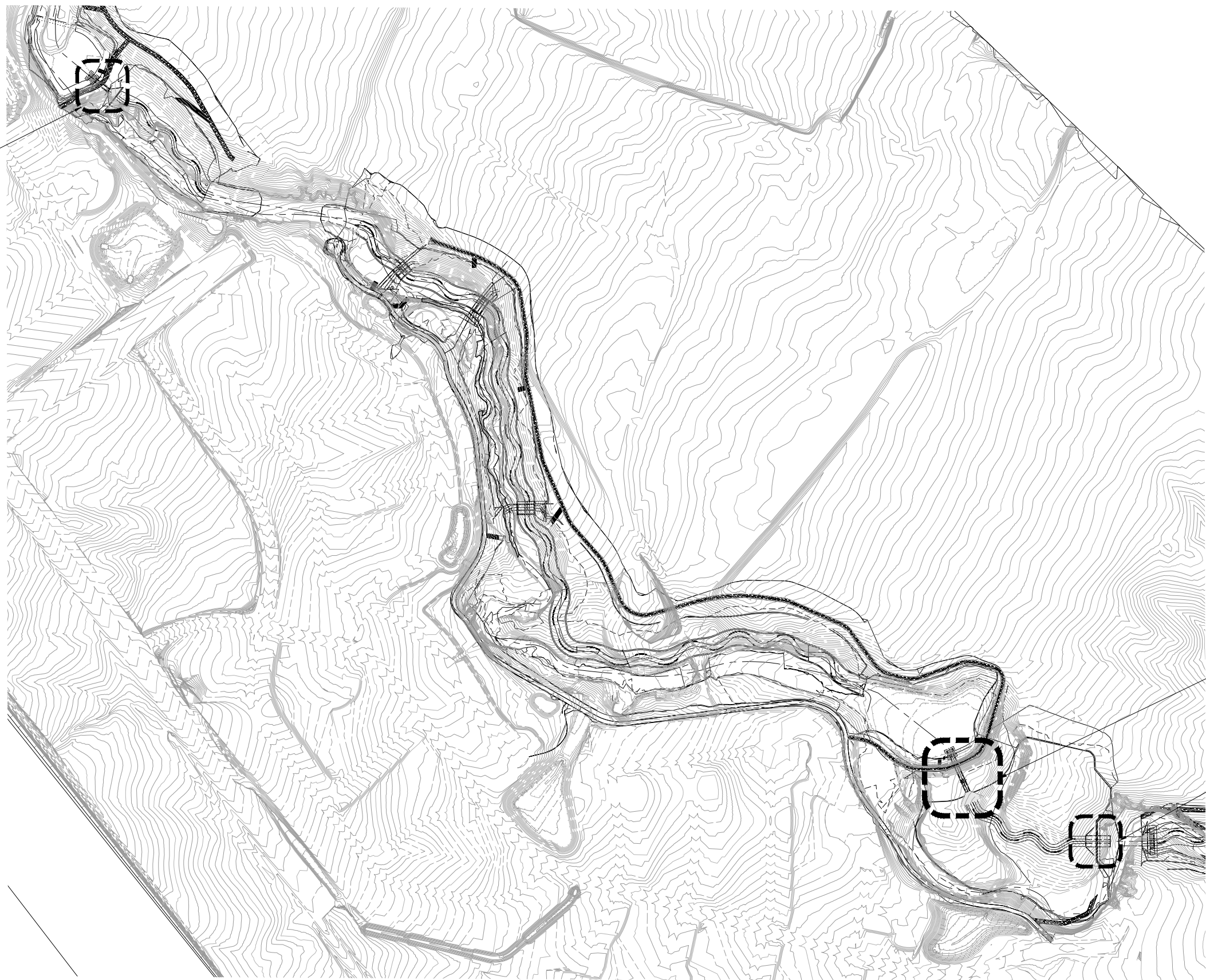
SAND CREEK RESTORATION STERLING RANCH	SHEET S01 OF 24
SITE STRUCTURES GENERAL STRUCTURAL INFORMATION AND INDEX	JOB NO. 25188.04

Provide standard signature blocks including district





SRMD POND #2: 10 x 10' BOX CULVERT WITH POND OUTLET RISER STRUCTURE




SRMD POND #1: 12 x 10' BOX CULVERT WITH INTERMEDIATE DROP STRUCTURE AND POND OUTLET RISER STRUCTURE

POND W-3: 3-CELL BOX CULVERT AND CONCRETE OUTLET BASIN

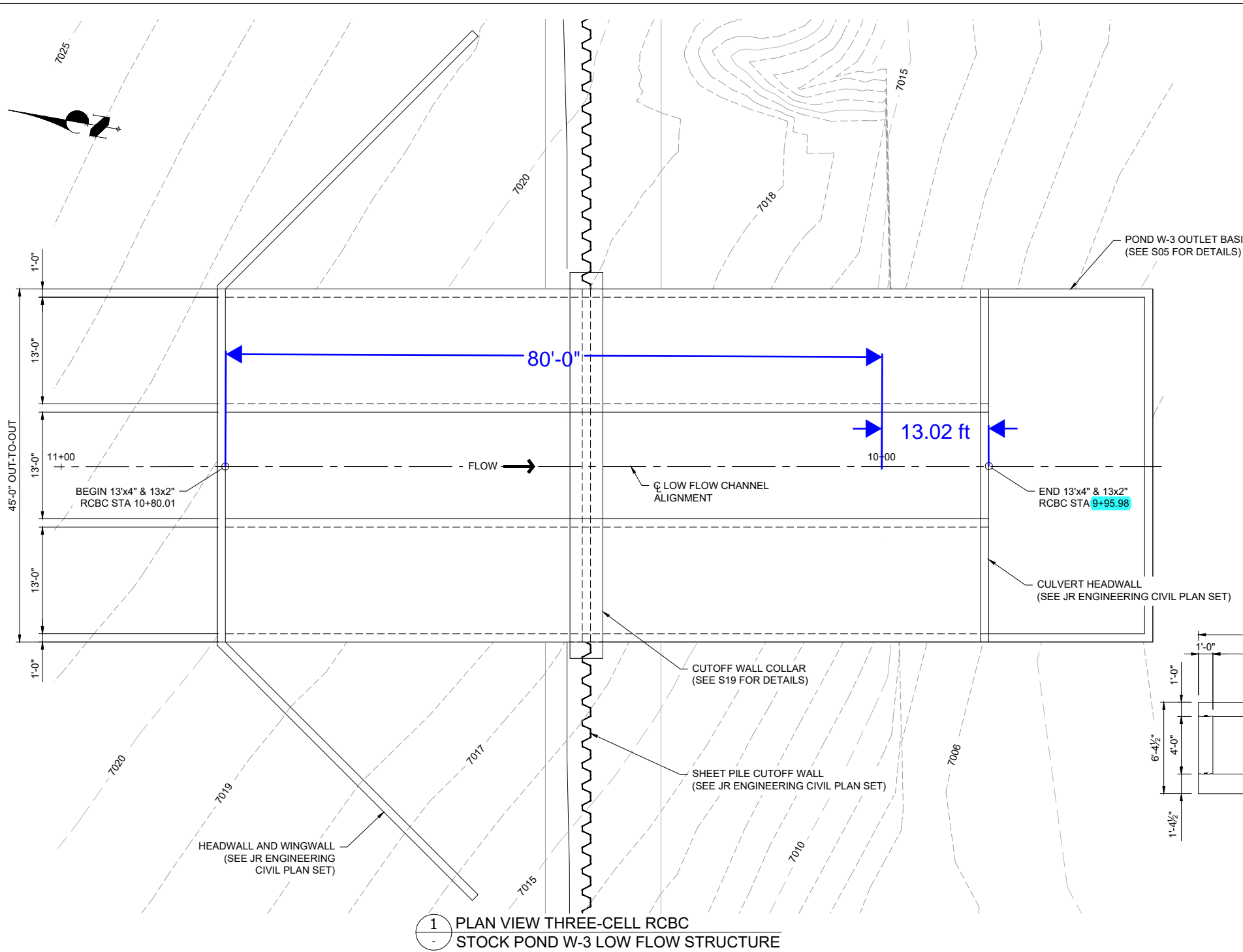
**STRUCTURES KEY PLAN**

**STRUCTURAL ENGINEER'S STATEMENT**  
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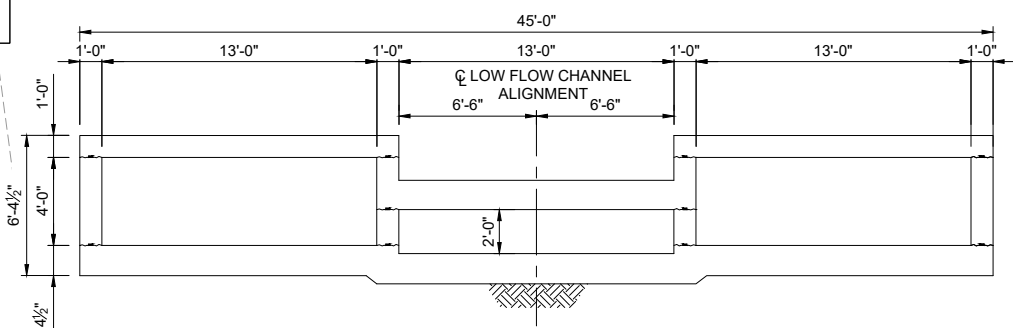
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SAND CREEK RESTORATION STERLING RANCH	
STRUCTURES KEY PLAN	
SHEET	S02 OF 24
JOB NO.	25188.04

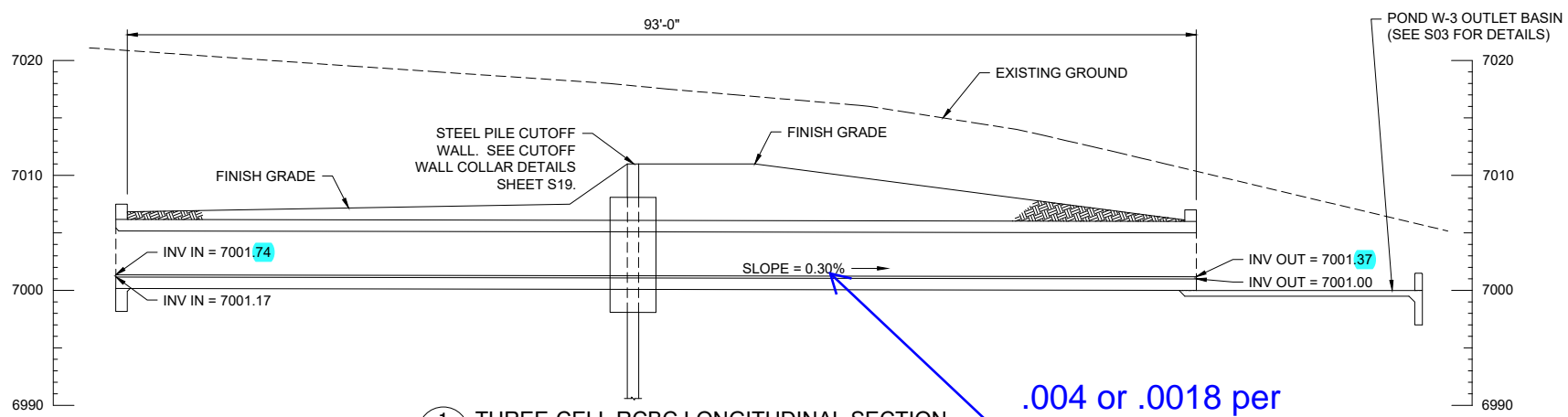




1 PLAN VIEW THREE-CELL RCBC STOCK POND W-3 LOW FLOW STRUCTURE



2 THREE-CELL CULVERT SECTION STOCK POND W-3 LOW FLOW STRUCTURE



1 THREE-CELL RCBC LONGITUDINAL SECTION STOCK POND W-3 LOW FLOW STRUCTURE

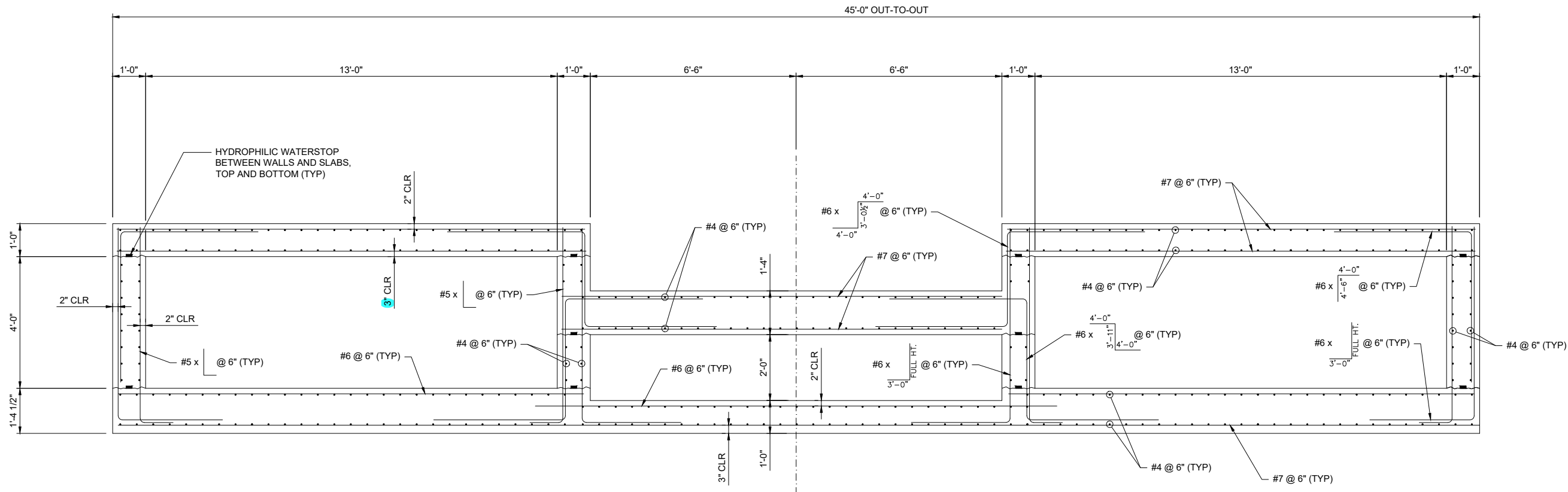
.004 or .0018 per channel CDs?



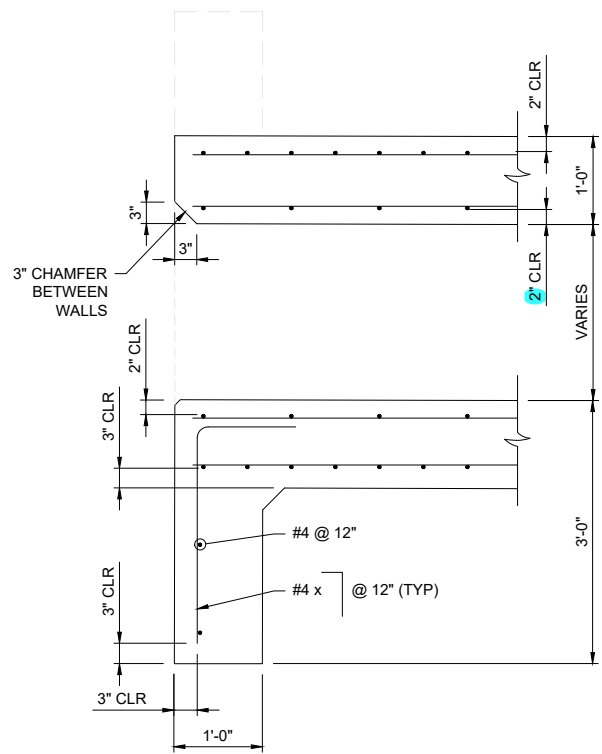
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SAND CREEK RESTORATION STERLING RANCH STOCK POND W-3 OUTLET 3-CELL BOX CULVERT GENERAL LAYOUT	SHEET S03 OF 24 JOB NO. 25188.04

F:\Projects\Sand Creek Channel at Sterling Ranch\02 Drawings\Sand Creek Restoration\_Structural



**A** THREE-CELL RCBC TYPICAL SECTION  
STOCK POND W-3 LOW FLOW STRUCTURE

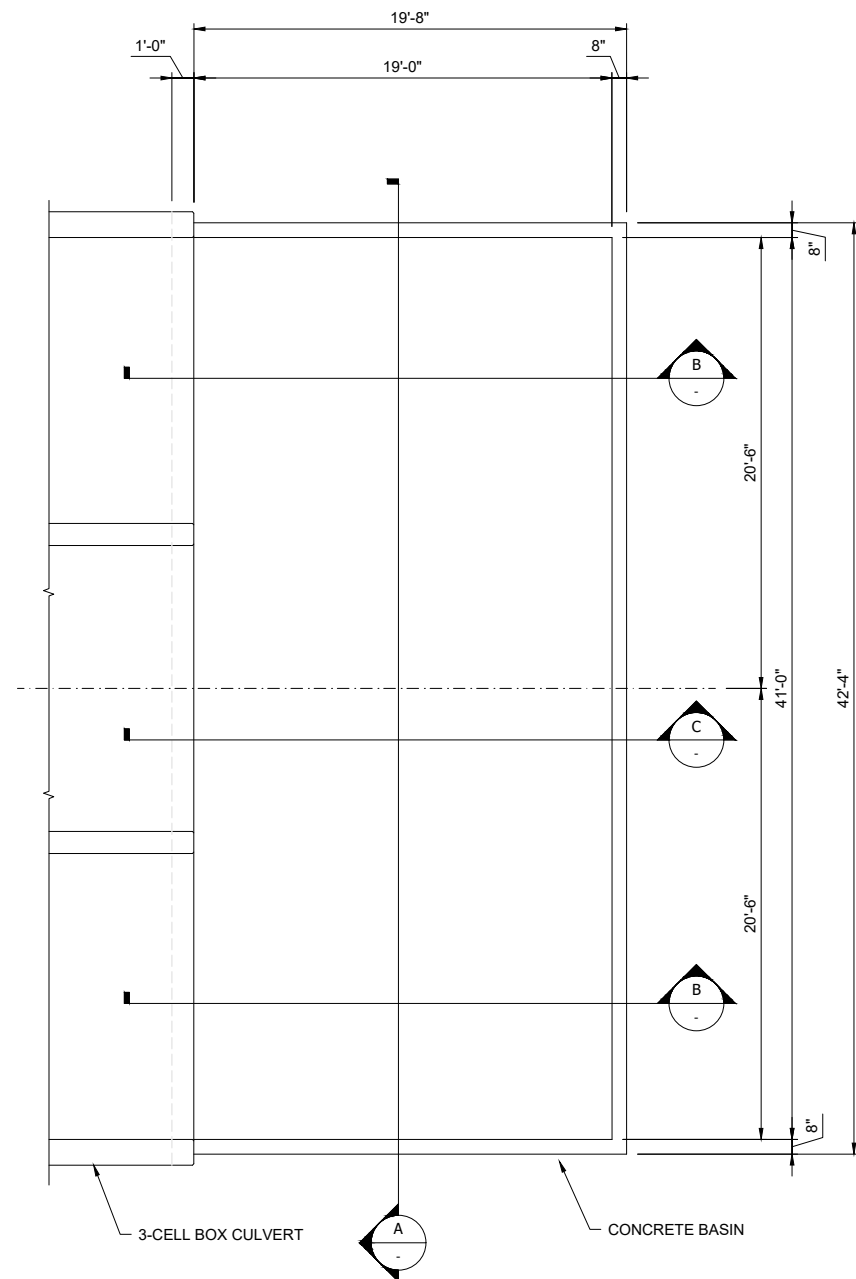


**B** TOE WALL REINFORCING SECTION  
STOCK POND W-3 LOW FLOW STRUCTURE

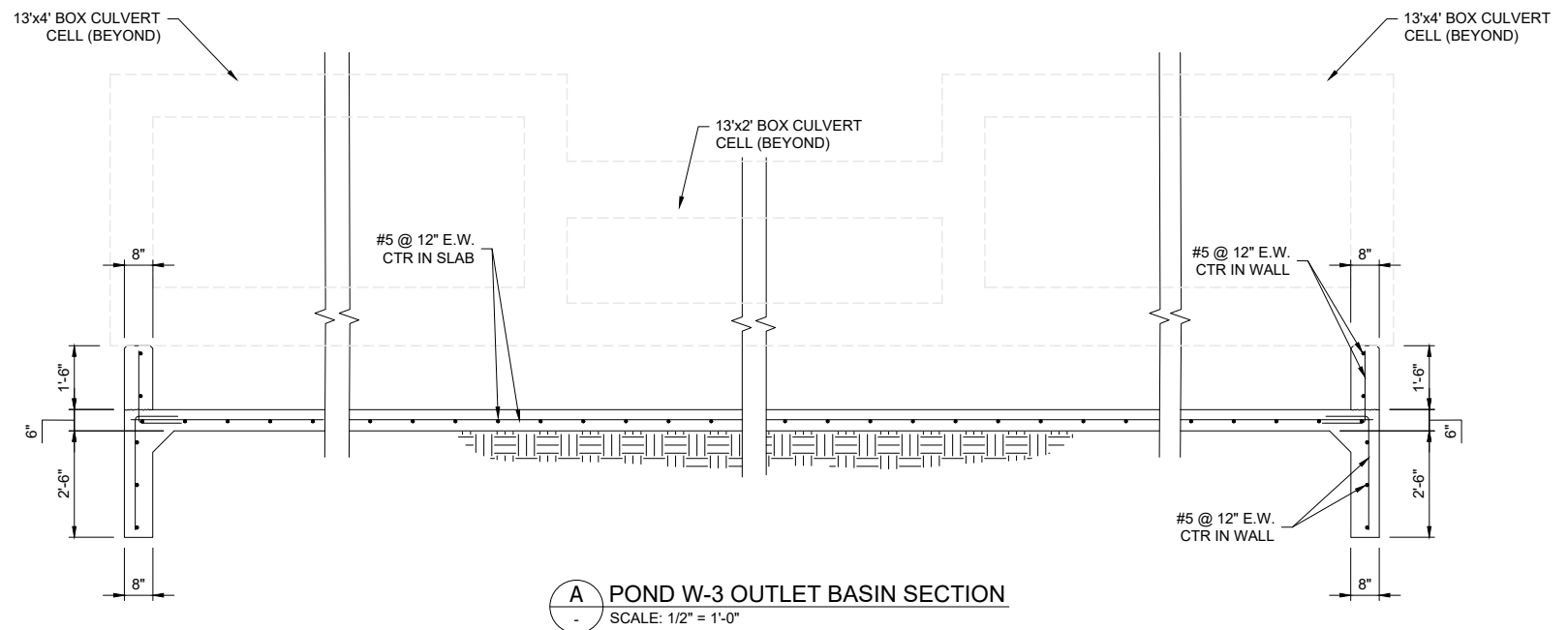
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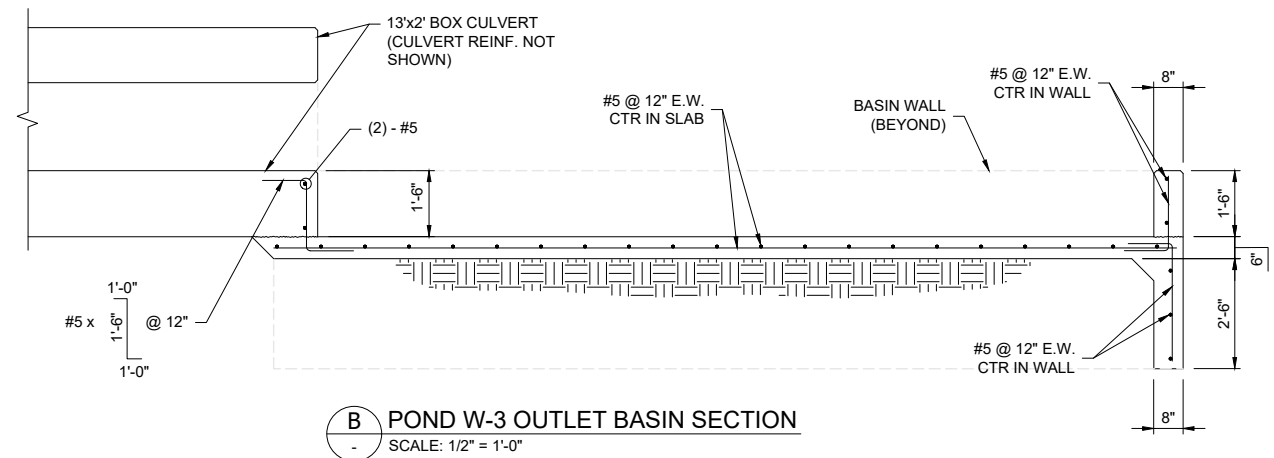
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SHEET S04 OF 24 JOB NO. 25188.04	H-SCALE AS NOTED V-SCALE AS NOTED DATE 11/07/22 DESIGNED BY KSP DRAWN BY JUM CHECKED BY JKH
SAND CREEK RESTORATION STERLING RANCH STOCK POND W-3 OUTLET 3-CELL BOX CULVERT TYPICAL REINFORCING SECTIONS	REVISION No.   DATE



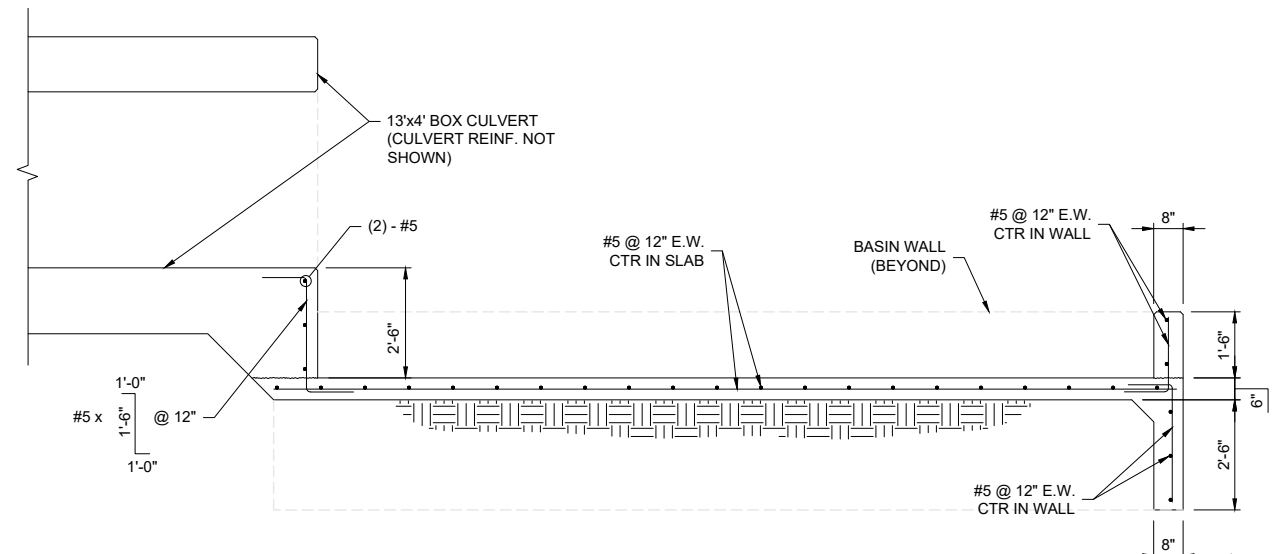
**1 POND W-3 OUTLET BASIN PLAN**  
SCALE: 1/2" = 1'-0"



**A POND W-3 OUTLET BASIN SECTION**  
SCALE: 1/2" = 1'-0"



**B POND W-3 OUTLET BASIN SECTION**  
SCALE: 1/2" = 1'-0"



**C POND W-3 OUTLET BASIN SECTION**  
SCALE: 1/2" = 1'-0"

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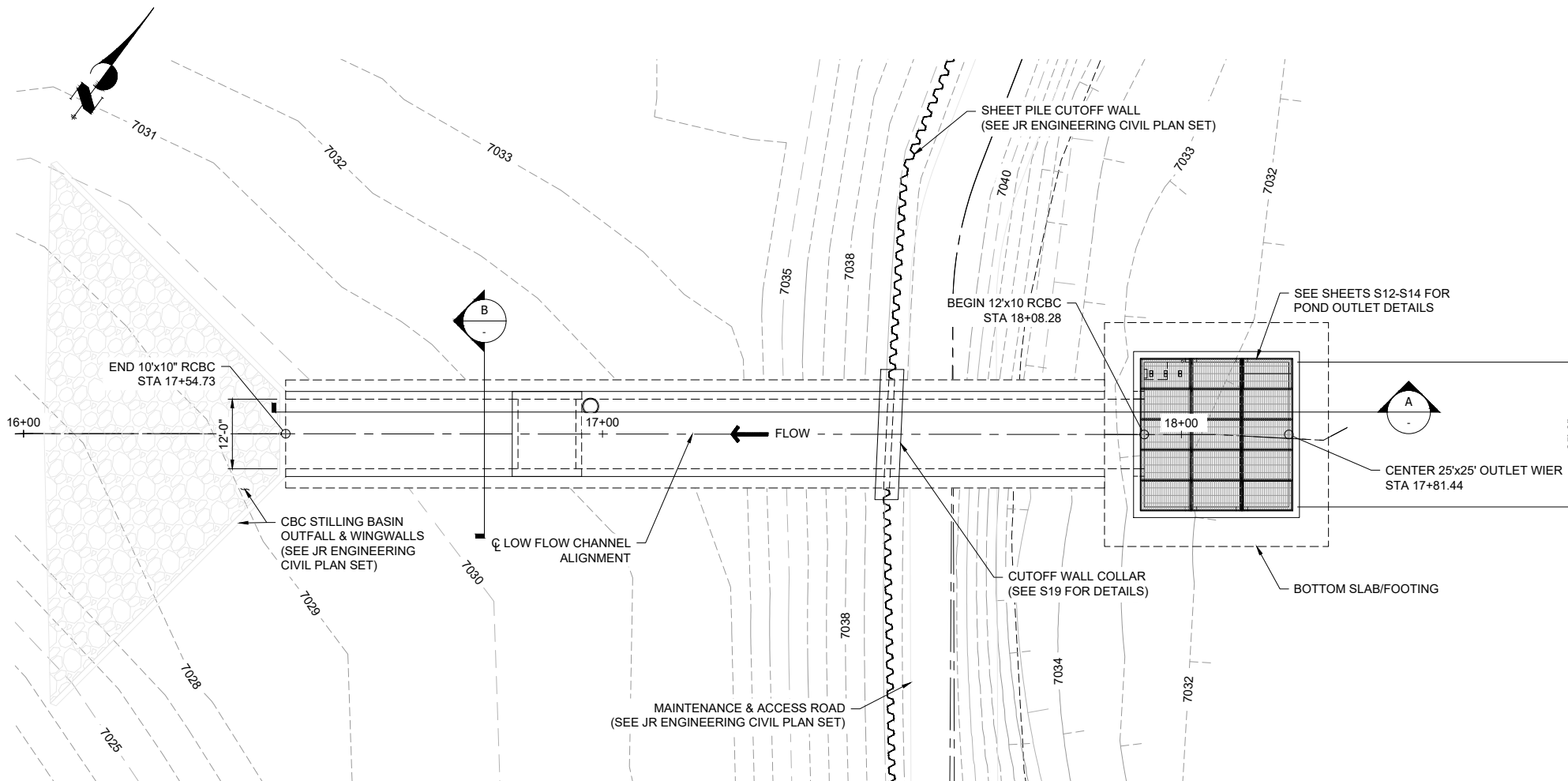
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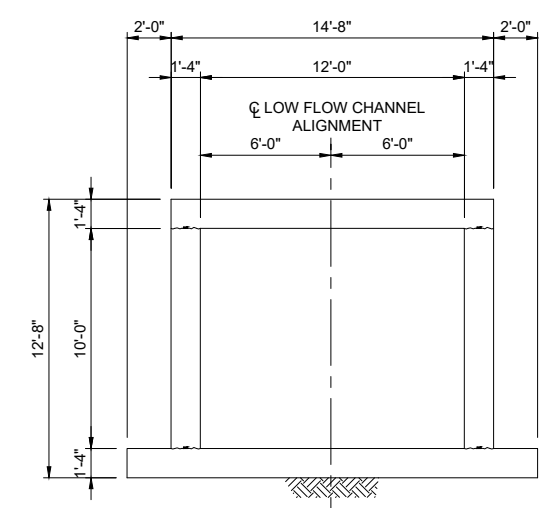
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JOB NO.	25188.04



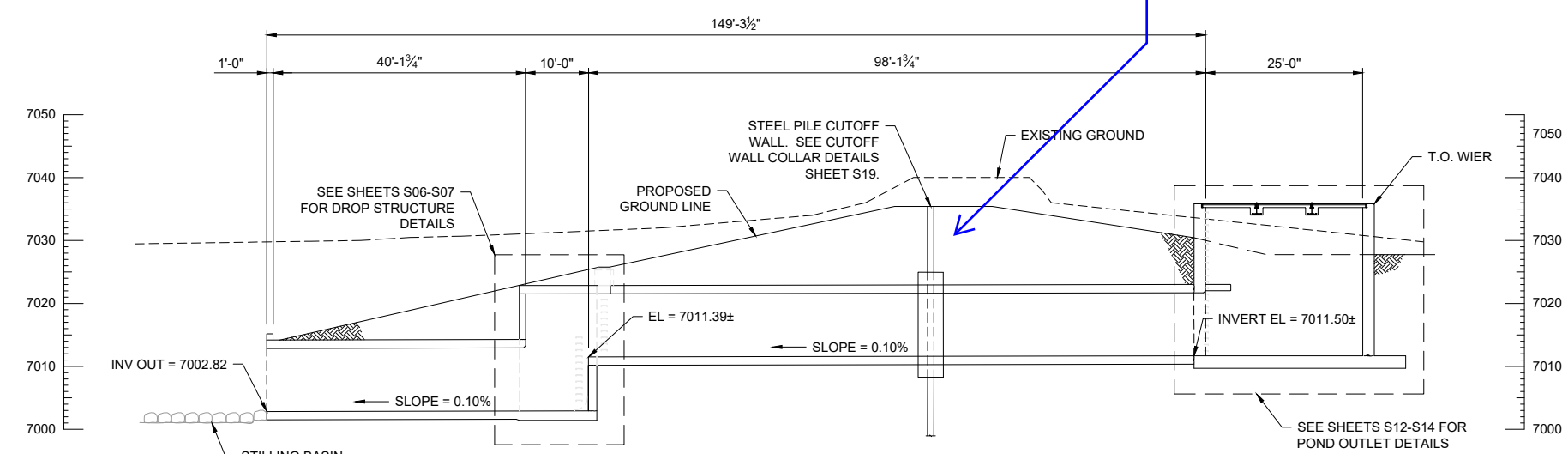


1 PLAN VIEW 12'x10' RCBC  
STOCK POND #1 OUTLET STRUCTURE

Label max cover



B 12'x10' TYPICAL SECTION  
STOCK POND #1 OUTLET STRUCTURE



A 12'x10' RCBC LONGITUDINAL SECTION  
STOCK POND #1 OUTLET STRUCTURE

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CHECKED BY JKH

SAND CREEK RESTORATION  
STERLING RANCH  
STOCK POND 1 OUTLET  
12'x10' RCBC GENERAL LAYOUT

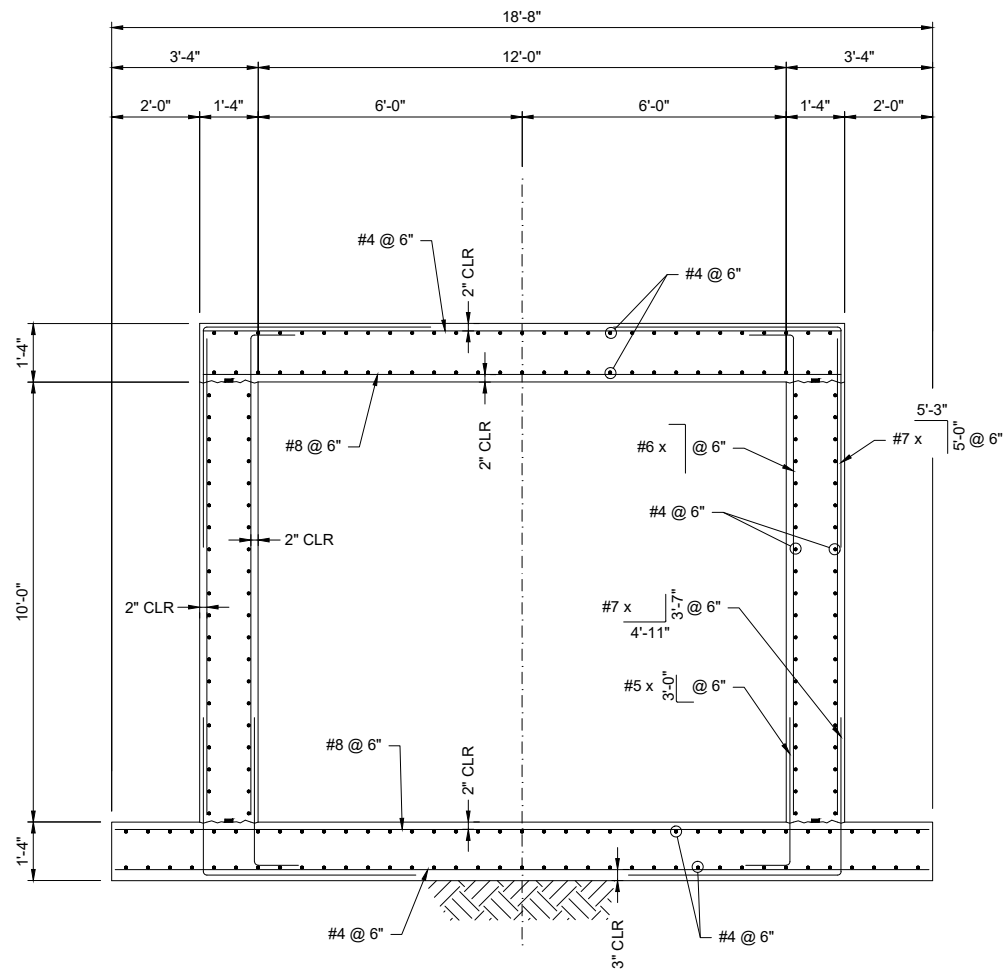
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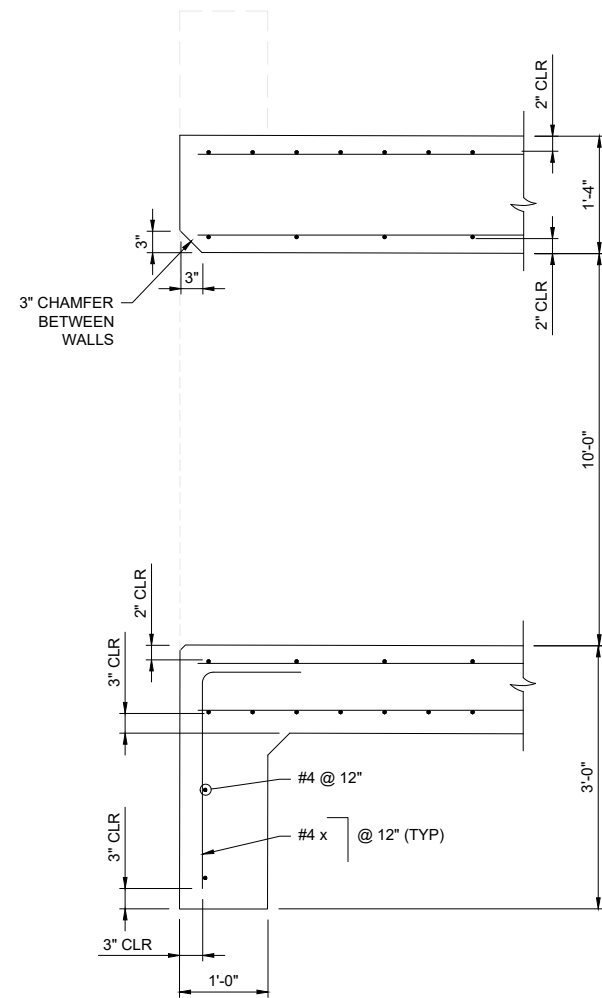




Know what's below.  
Call before you dig.



**B** 12'x10' REINFORCING SECTION  
STOCK POND #1 OUTLET STRUCTURE



**B** TOE WALL REINFORCING SECTION

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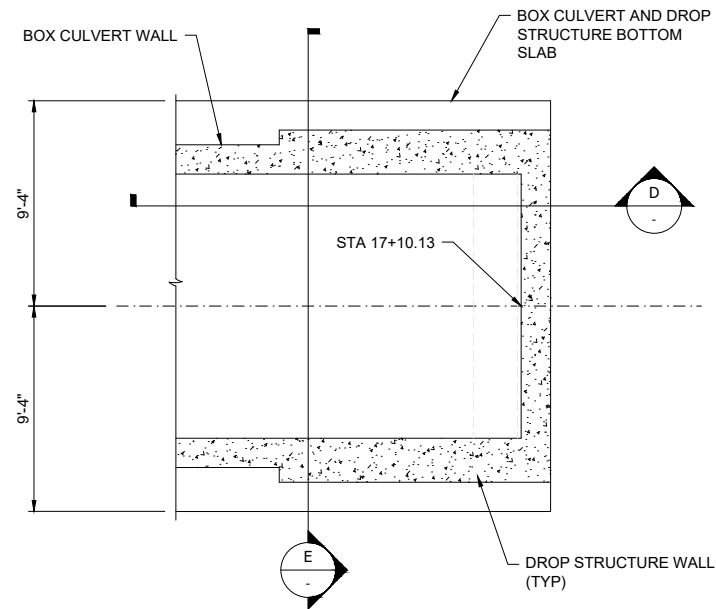
SAND CREEK RESTORATION  
STERLING RANCH  
STOCK POND #1 OUTLET  
12' x 10' BOX CULVERT  
TYPICAL REINFORCING SECTIONS

SHEET S07 OF 24  
JOB NO. 25188.04

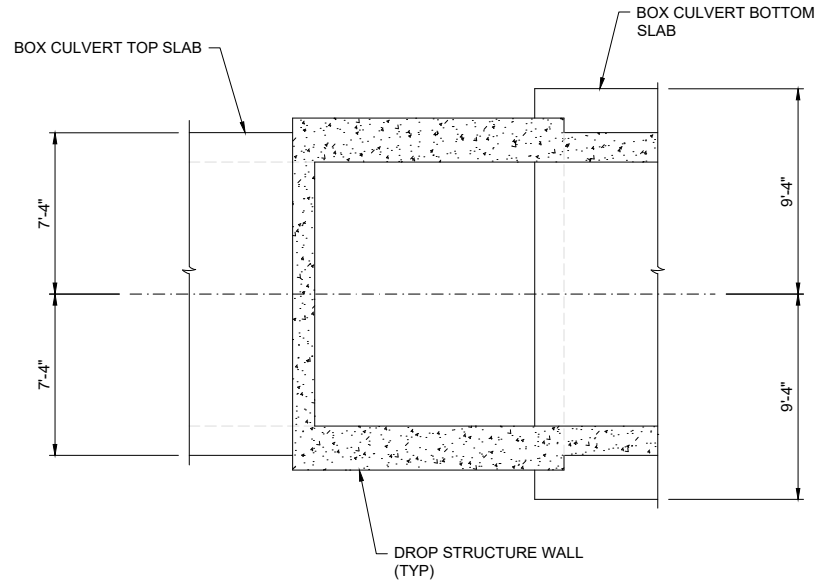
F:\Projects\Sand Creek Channel at Sterling Ranch\02 Drawings\Sand Creek Restoration\_Structural\_Details



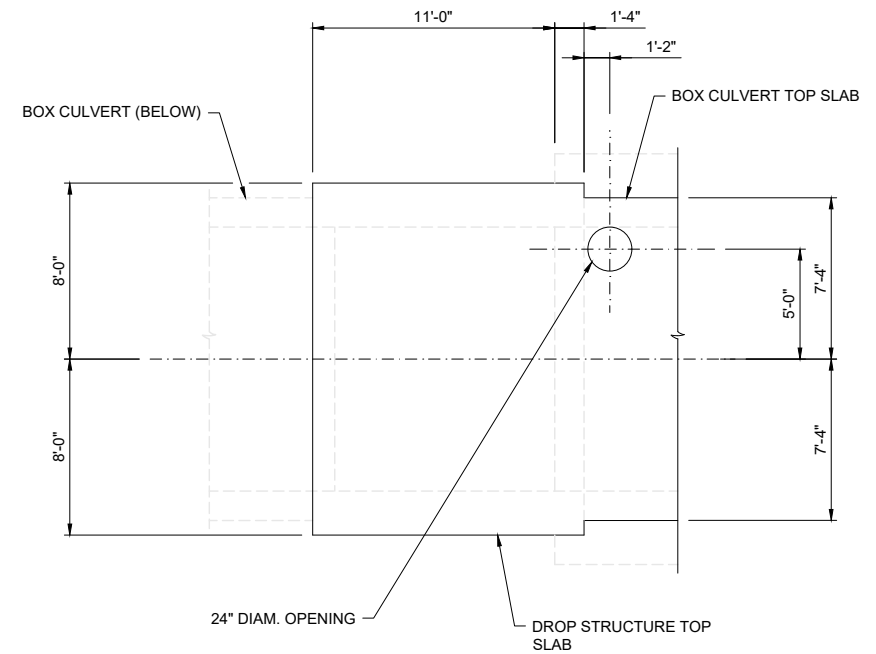
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Call before you dig.



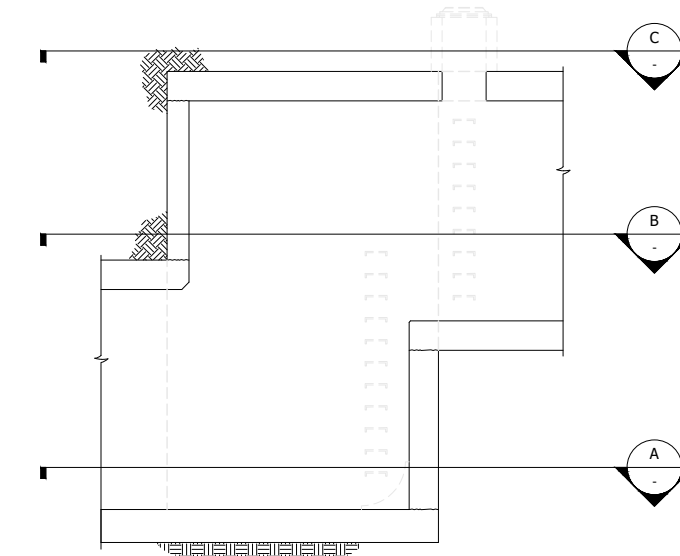
**A** 12'x10' RCBC DROP STRUCTURE PLAN (BOTTOM)  
SCALE: 1/2" = 1'-0"



**B** 12'x10' RCBC DROP STRUCTURE PLAN (MIDDLE)  
SCALE: 1/2" = 1'-0"



**C** 12'x10' RCBC DROP STRUCTURE PLAN (TOP)  
SCALE: 1/2" = 1'-0"



**1** 12'x10' RCBC DROP STRUCTURE SECTION  
SCALE: 1/2" = 1'-0"

UNTIL SUCH TIME AS  
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APPROPRIATE REVIEWING  
AGENCIES, SAN  
ENGINEERING APPROVES  
THEIR USE ONLY FOR THE  
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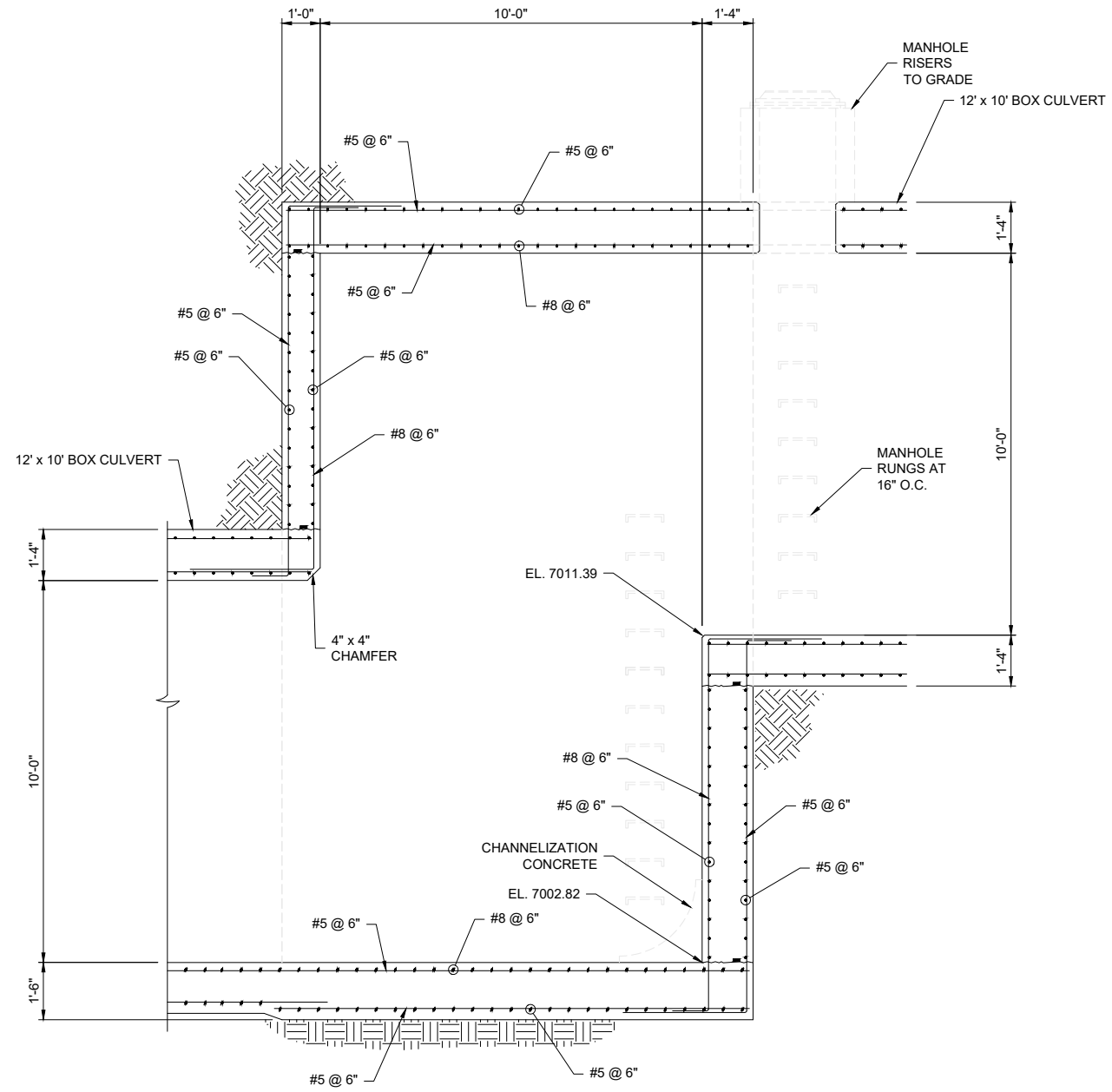
BY	DATE	REVISION

SAND CREEK RESTORATION  
STERLING RANCH  
**STOCK POND 1 OUTLET**  
12'x10' RCBC DROP STRUCTURE  
PLANS

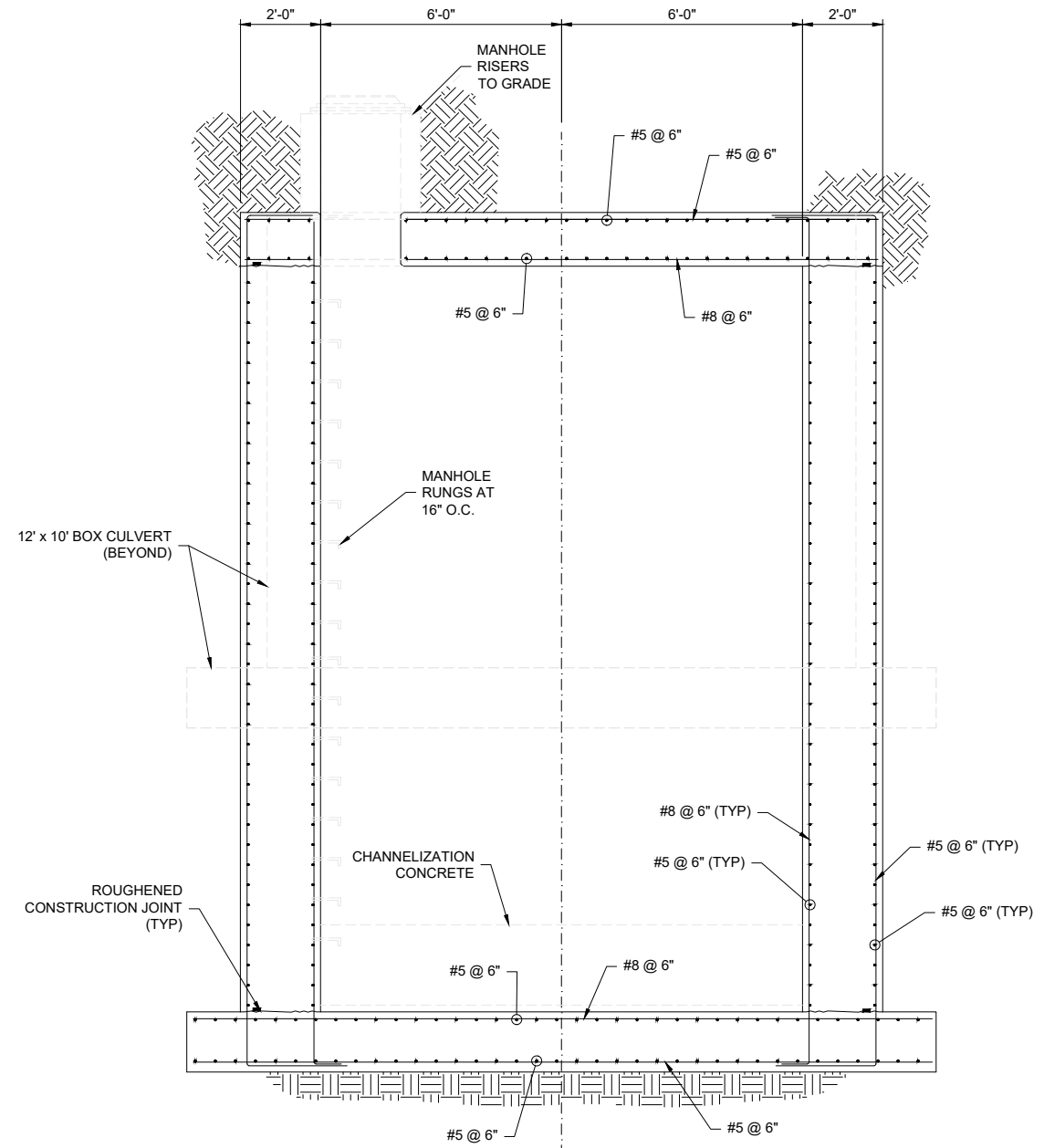
SHEET S08 OF 24  
JOB NO. 25188.04

STRUCTURAL ENGINEER'S STATEMENT  
PREPARED UNDER MY DIRECT SUPERVISION  
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**NOT FOR CONSTRUCTION**  
JOHN MIGLIACCIO, P.E. DATE  
COLORADO NO. 34333  
FOR AND ON BEHALF OF SAN ENGINEERING, LLC.





**D** 12'x10' RCBC DROP STRUCTURE SECTION  
SCALE: 1/2" = 1'-0"



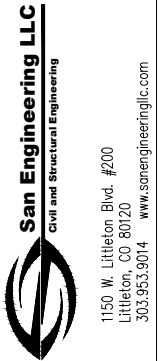
**E** 12'x10' RCBC DROP STRUCTURE SECTION  
SCALE: 1/2" = 1'-0"

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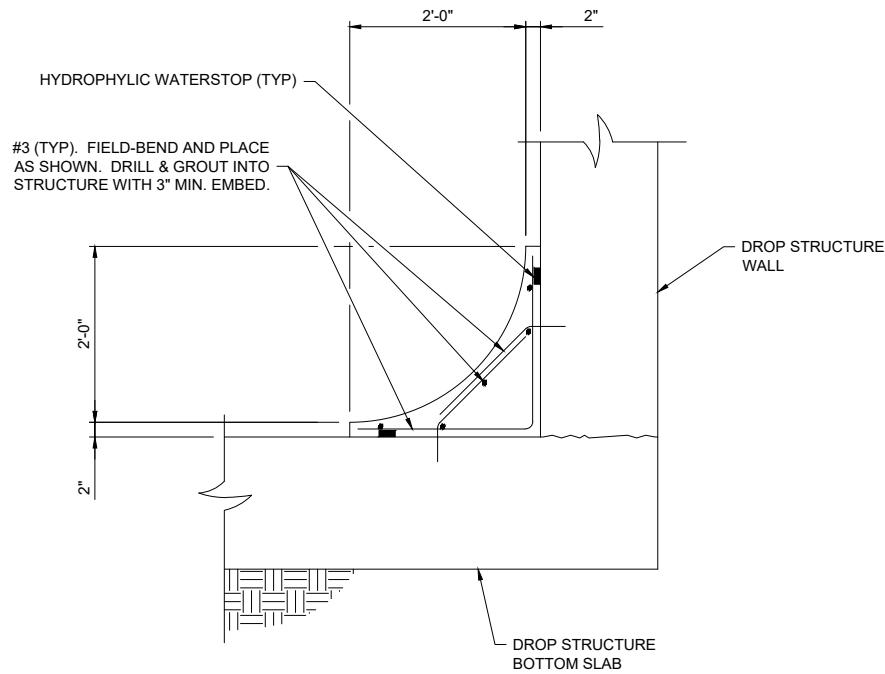
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PREPARED FOR  
SR LAND, LLC  
20 BOULDER CRESCENT ST.  
COLORADO SPRINGS, CO 80903  
JAMES F. MORLEY  
(719) 419-3024

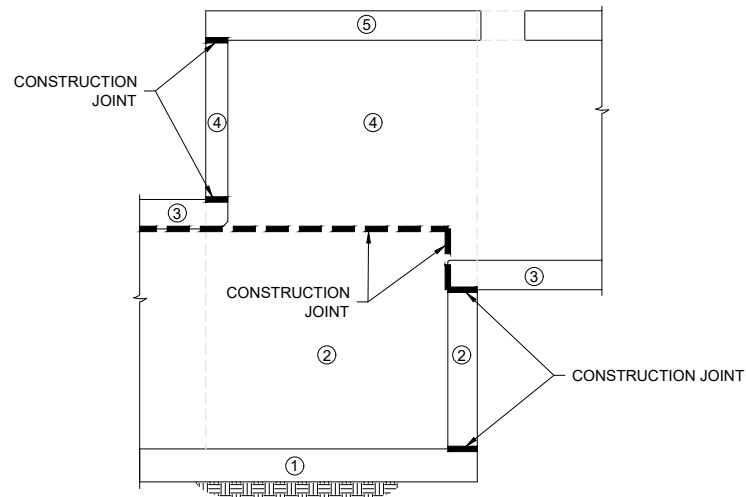


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V-SCALE	AS NOTED		
DATE	11/07/22		
DESIGNED BY	KSP		
DRAWN BY	JJM		
CHECKED BY	JKH		



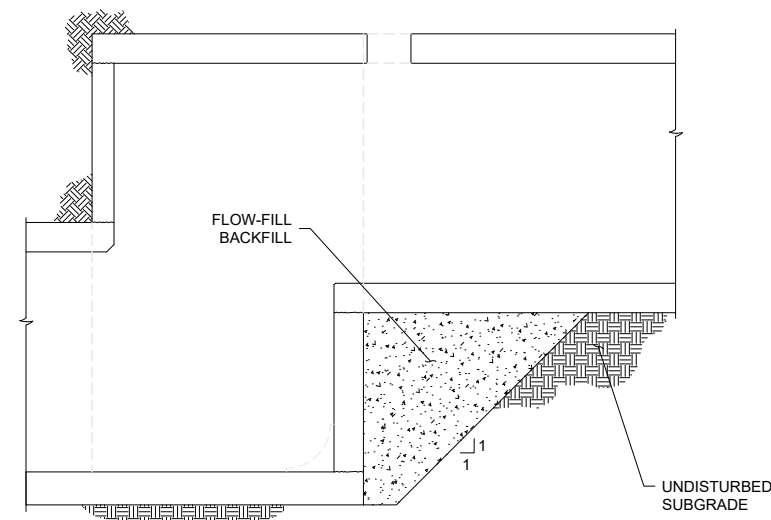
**1** CHANNELIZATION CONCRETE DETAIL  
SCALE: 1/2" = 1'-0"



**2** SEQUENCE OF SLAB AND WALL CONSTRUCTION

PHASING AND CONSTRUCTION JOINT LOCATIONS ARE SUGGESTED. ACTUAL CONSTRUCTION PHASING AND MEANS AND METHODS ARE THE RESPONSIBILITY OF THE CONTRACTOR.

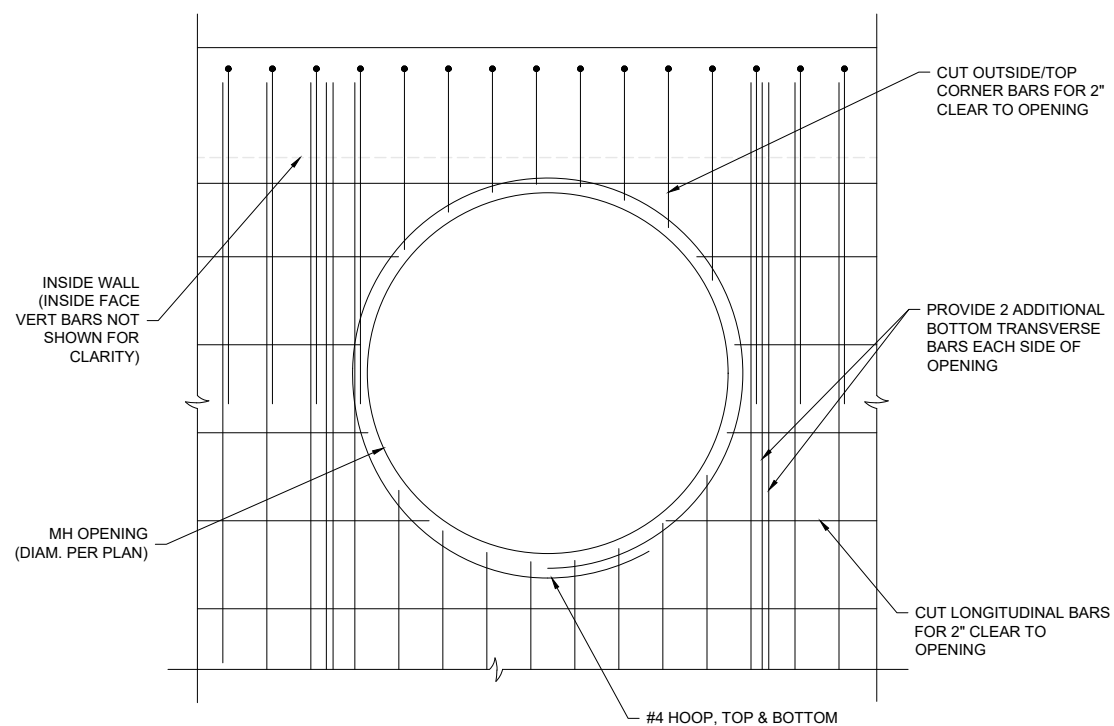
**2** CONSTRUCTION JOINT DIAGRAM  
SCALE: 1/2" = 1'-0"



WALLS SHALL BE ADEQUATELY BRACED FOR TEMPORARY HYDROSTATIC PRESSURES FROM FLOW-FILL BACKFILL.

CONTRACTOR MAY PROPOSE AN ALTERNATE METHOD OF BACKFILL OR TEMPORARY EXCAVATION SUPPORT. ANY METHOD SHALL ELIMINATE THE POTENTIAL FOR SETTLEMENT OF UPPER BOX CULVERT.

**3** BACKFILL REQUIREMENTS AT STEP  
SCALE: 1/2" = 1'-0"



**4** MANHOLE REINFORCING DETAIL  
SCALE: 1/2" = 1'-0"

**1** WALL AND CORNER REINFORCING DETAIL  
SCALE: 1/2" = 1'-0"

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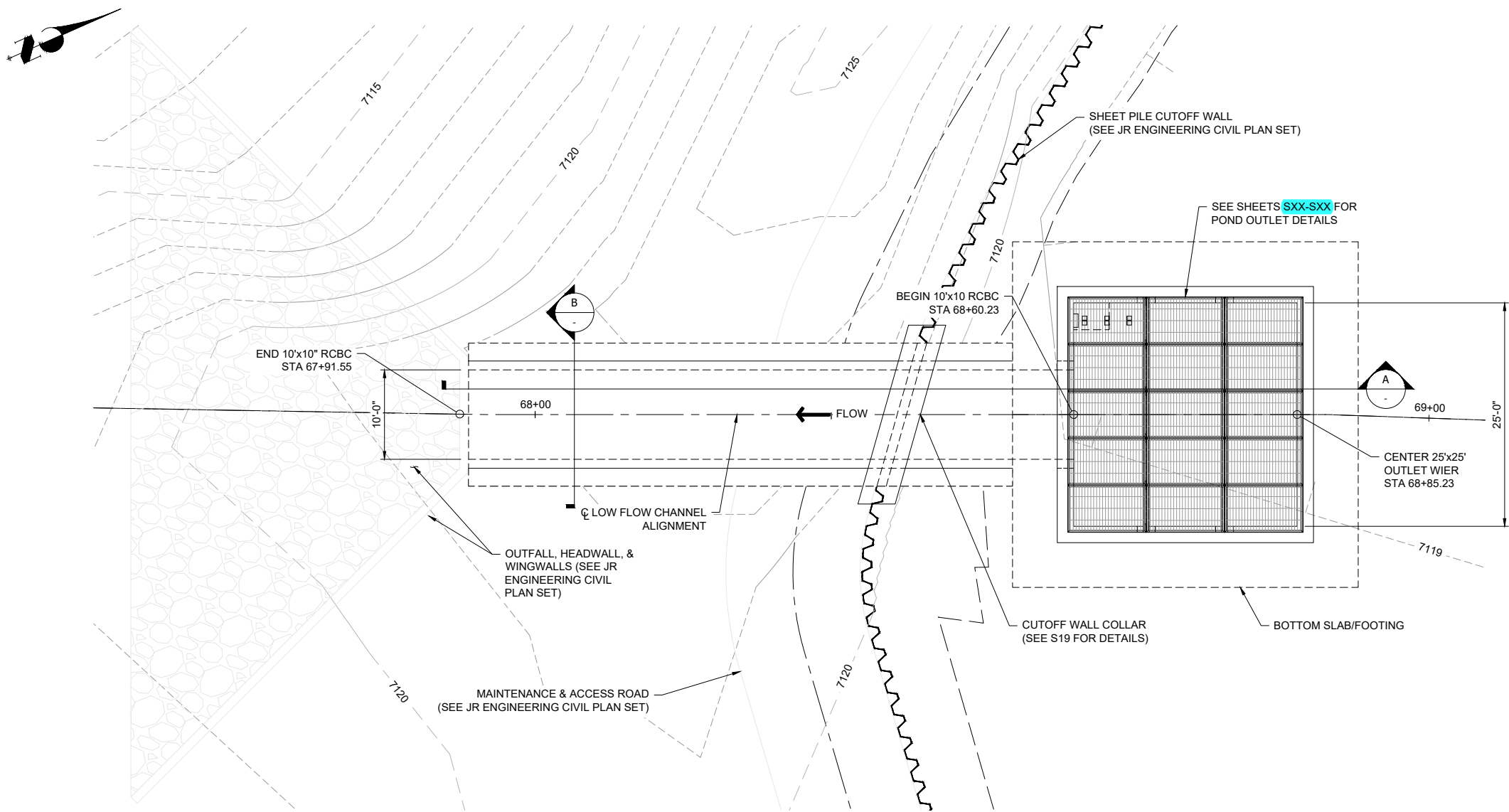
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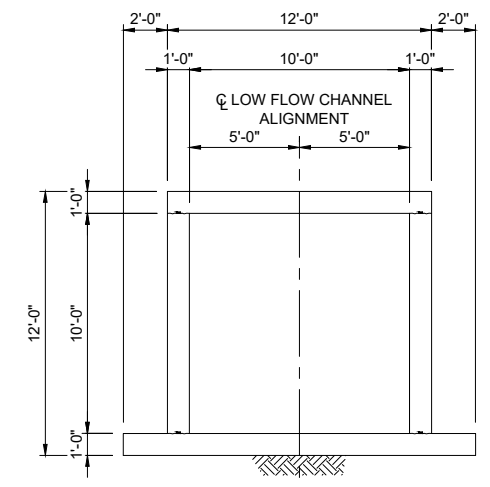
DATE	BY	REVISION	AS NOTED	NO.	AS NOTED	DATE	DESIGNED BY	DRAWN BY	CHECKED BY
			AS NOTED		AS NOTED	11/07/22	KSP	JJM	JKH
SHEET S10 OF 24		JOB NO. 25188.04							

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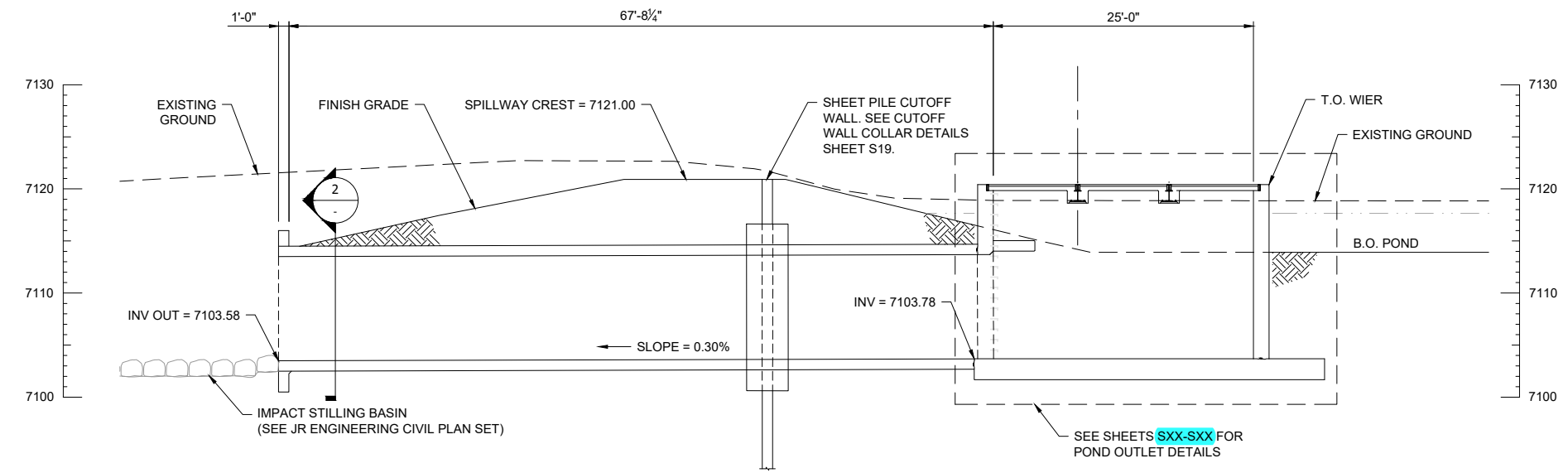




1 PLAN VIEW 10'x10' RCBC STOCK POND #2 OUTLET STRUCTURE



B 10'x10' TYPICAL SECTION STOCK POND #2 OUTLET STRUCTURE



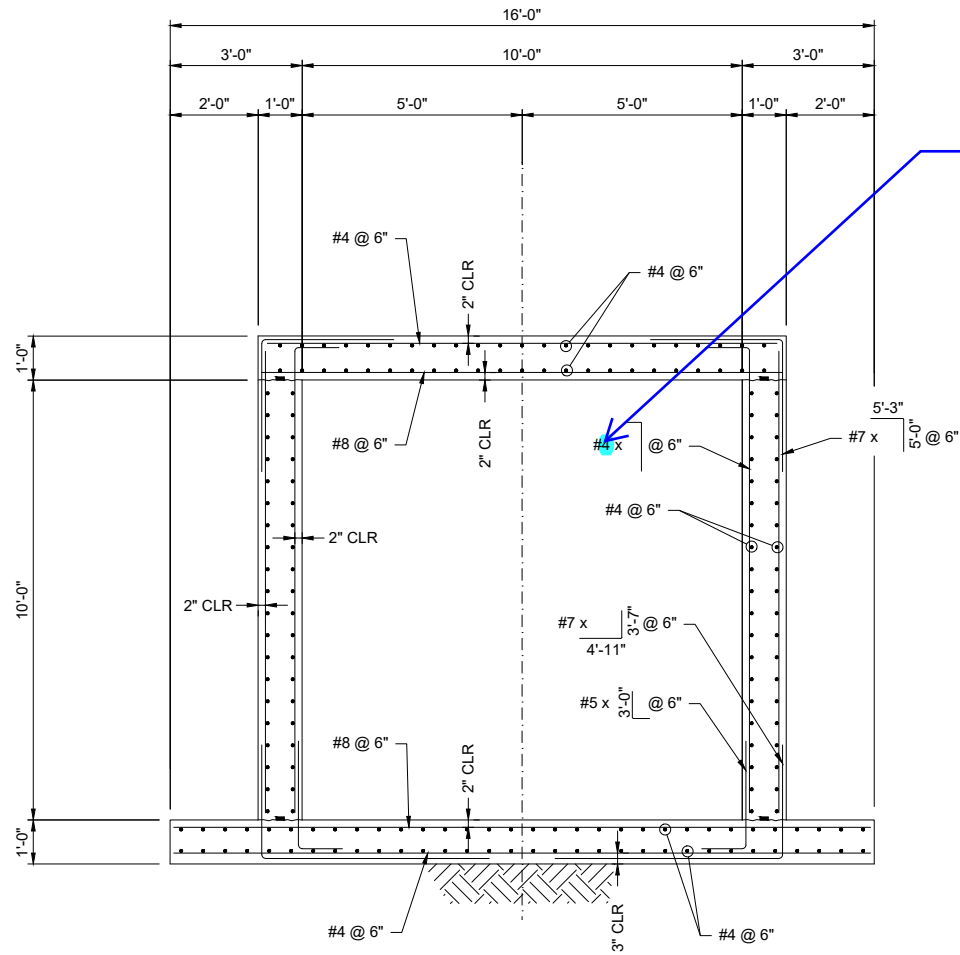
A 10'x10' RCBC LONGITUDINAL SECTION STOCK POND #2 OUTLET STRUCTURE

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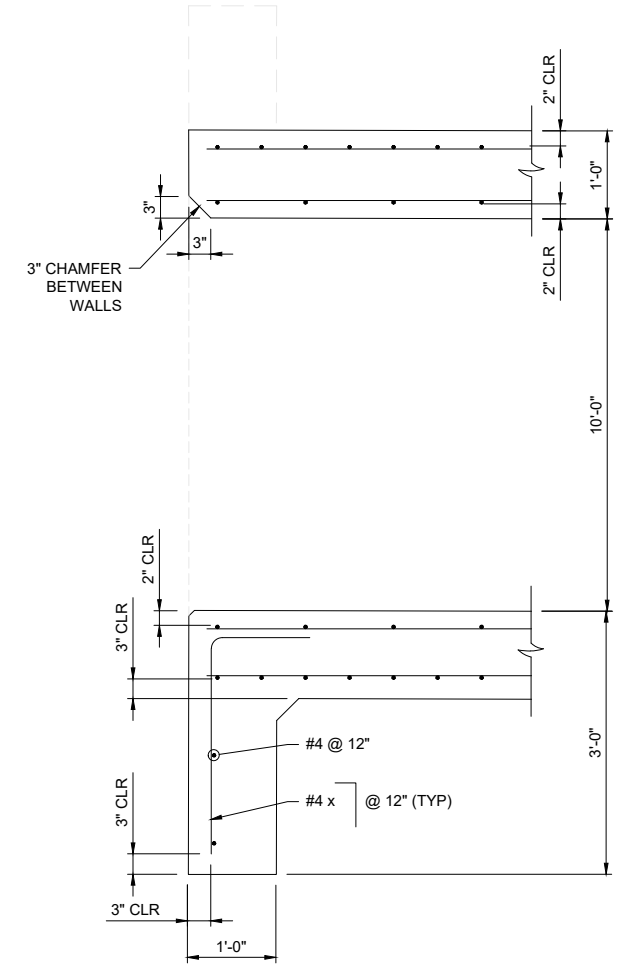
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H-SCALE V-SCALE DATE DESIGNED BY DRAWN BY CHECKED BY	AS NOTED AS NOTED 11/07/22 KSP JUM JKH
SAND CREEK RESTORATION STERLING RANCH STOCK POND 2 OUTLET 10'x10' RCBC GENERAL LAYOUT	SHEET S11 OF 24 JOB NO. 25188.04





**B** 10'x10' REINFORCING SECTION  
STOCK POND #2 OUTLET STRUCTURE



**B** TOE WALL REINFORCING SECTION

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SAND CREEK RESTORATION STERLING RANCH POND #2 OUTLET 10' x 10' BOX CULVERT TYPICAL REINFORCING SECTIONS		H-SCALE	AS NOTED	No.	REVISION	BY	DATE
		V-SCALE	AS NOTED				
		DATE	11/07/22				
		DESIGNED BY	KSP				
		DRAWN BY	JJM				
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SHEET S12 OF 24		JOB NO. 25188.04					
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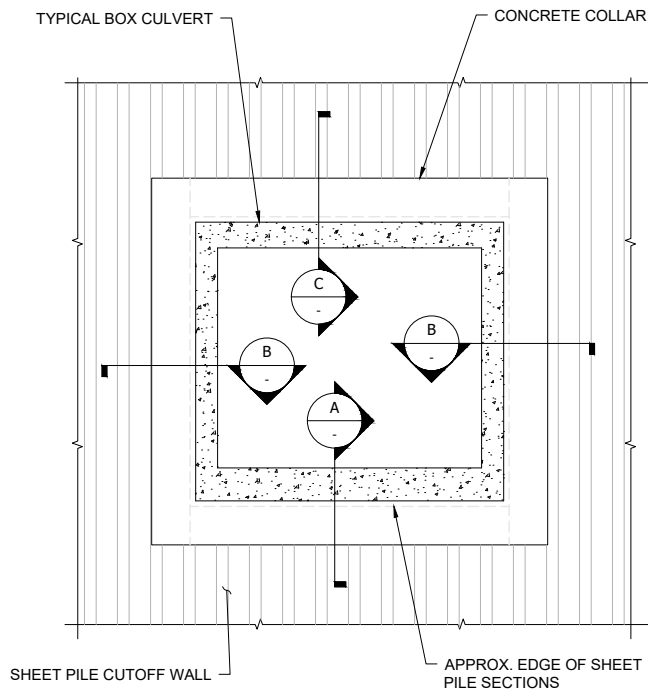
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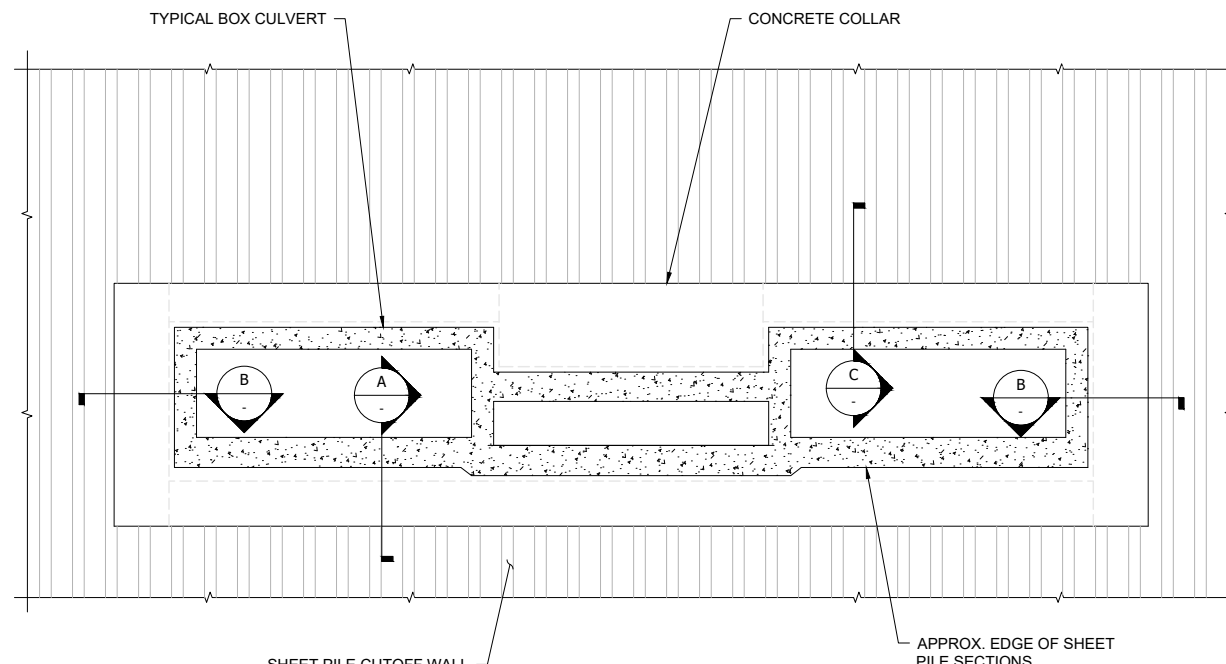
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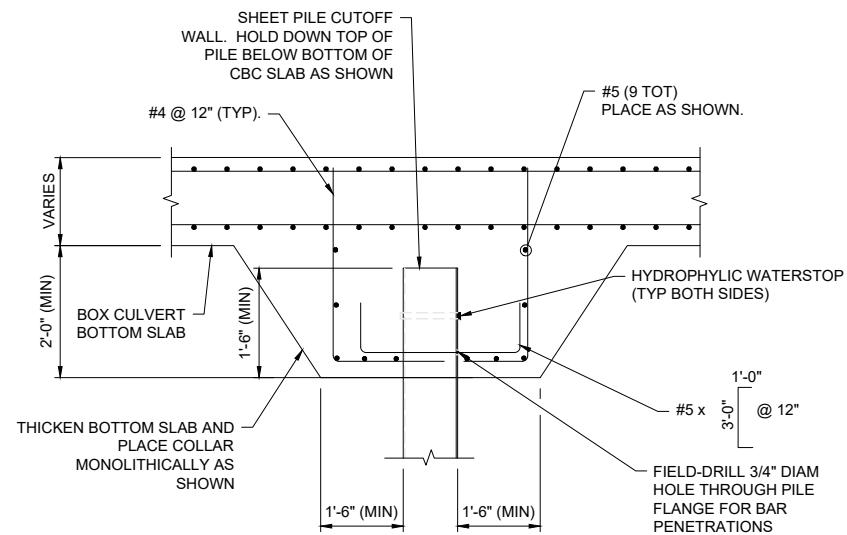
**CUTOFF WALL COLLAR AT STOCK POND #2 CBC**  
 SCALE: N.T.S.  
 (SIMILAR AT STOCK POND #1)



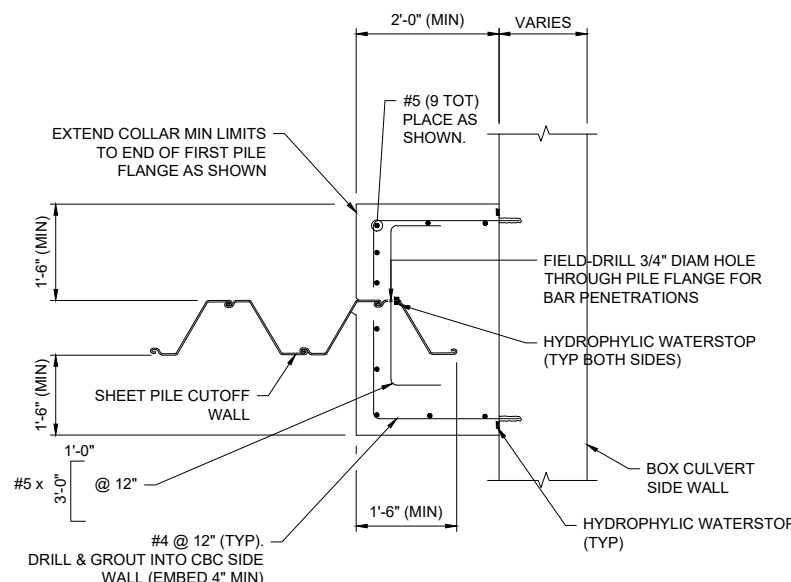
**CUTOFF WALL COLLAR AT POND #3 CBC**  
 SCALE: N.T.S.

**SHEET PILE CUTOFF WALL COLLAR NOTES**

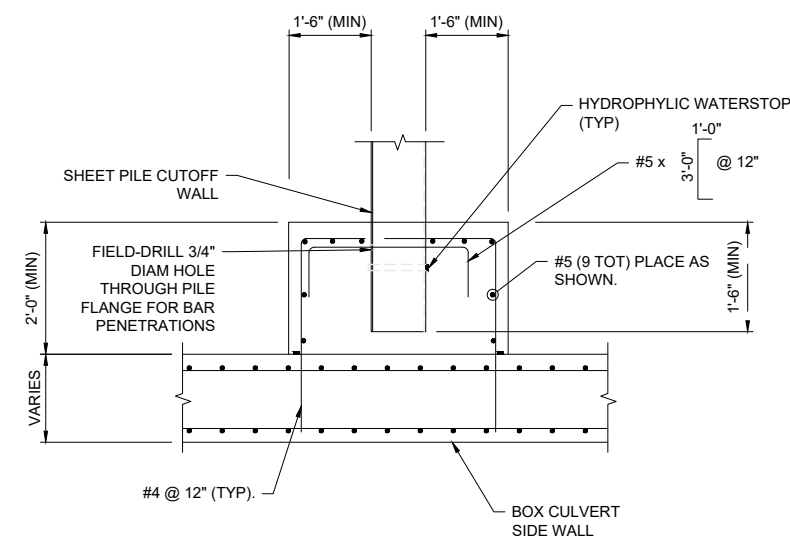
- REFER TO CIVIL PLAN SET BY JR ENGINEERING FOR ALL SHEET PILE CUTOFF WALL HORIZONTAL LAYOUTS, DEPTHS, MATERIALS AND OTHER REQUIREMENTS FOR THE CUTOFF WALLS. FOLLOW THESE DETAILS AT INTERFACES OF CUTOFF WALLS AND BOX CULVERTS.
- WATERSTOPS SHALL BE CONTINUOUS WITHOUT GAPS ALONG ALL CONCRETE AND STEEL SURFACES INDICATED IN THE COLLAR.
- STANDARD HOOKS SHALL BE PROVIDED AT CORNERS OF ALL COLLAR PERIMETER REINFORCING BARS.
- MEANS AND METHODS, SEQUENCE OF CONSTRUCTION, AND STABILITY OF STRUCTURES DURING CONSTRUCTION SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR DURING ALL PHASES OF CONSTRUCTION.
- CONTRACTOR MAY CONSIDER THE FOLLOWING SUGGESTED SEQUENCE OF INSTALLATION OF CUTOFF WALL COLLARS:
  - DRIVE SHEET PILING BELOW CBC BOTTOM SLAB. CUT OFF PILES 3" +/- BELOW BOTTOM OF BOTTOM SLAB.
  - PLACE BOTTOM SLAB OF BOX CULVERT, INCLUDING CUTOFF WALL COLLAR AT BOTTOM SLAB.
  - DRIVE SHEET PILING BESIDE BOX CULVERT BOTTOM SLAB. SUPPORT IN-PLACE.
  - PLACE WALLS AND TOP SLAB OF BOX CULVERT.
  - SET SHEET PILING ABOVE TOP SLAB OF BOX CULVERT. SUPPORT IN-PLACE.
  - PLACE CONCRETE COLLARS AT SIDE WALLS AND TOP SLAB OF BOX CULVERT.
  - BACKFILL CULVERT AND CUTOFF WALL. PLACE LIFTS ON EACH SIDE OF CUTOFF WALL EQUALLY DURING BACKFILL.



**A CUTOFF WALL COLLAR AT CBC BOTTOM SLAB**  
 SCALE: 3/4" = 1'-0"



**B CUTOFF WALL COLLAR AT CBC WALL**  
 SCALE: 3/4" = 1'-0"



**C CUTOFF WALL COLLAR AT CBC TOP SLAB**  
 SCALE: 3/4" = 1'-0"

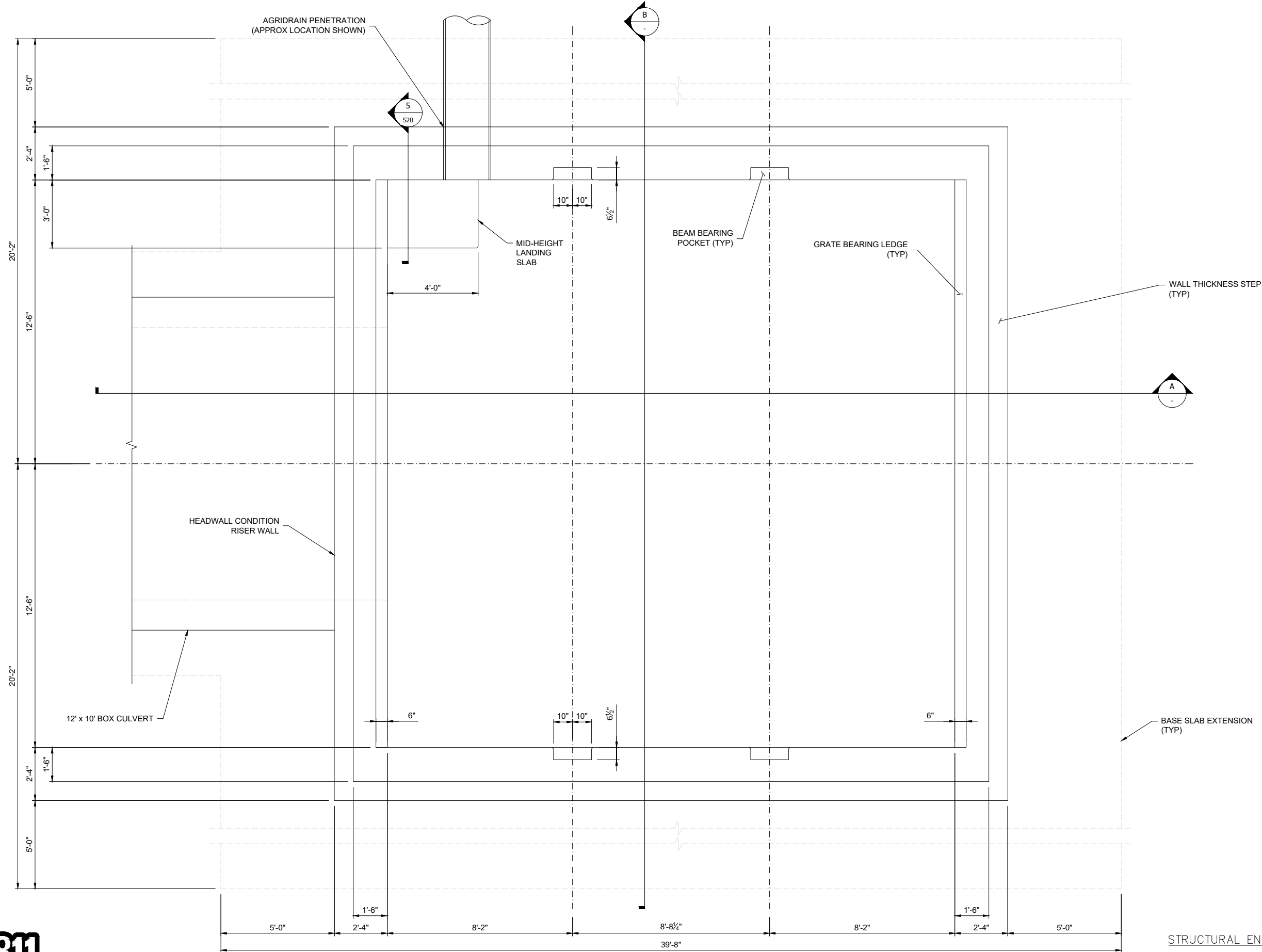
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 COLORADO NO. 34333  
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**1** BASE SLAB AND WALL PLAN  
**STOCK POND #1**  
 SCALE: 1/2" = 1'-0"

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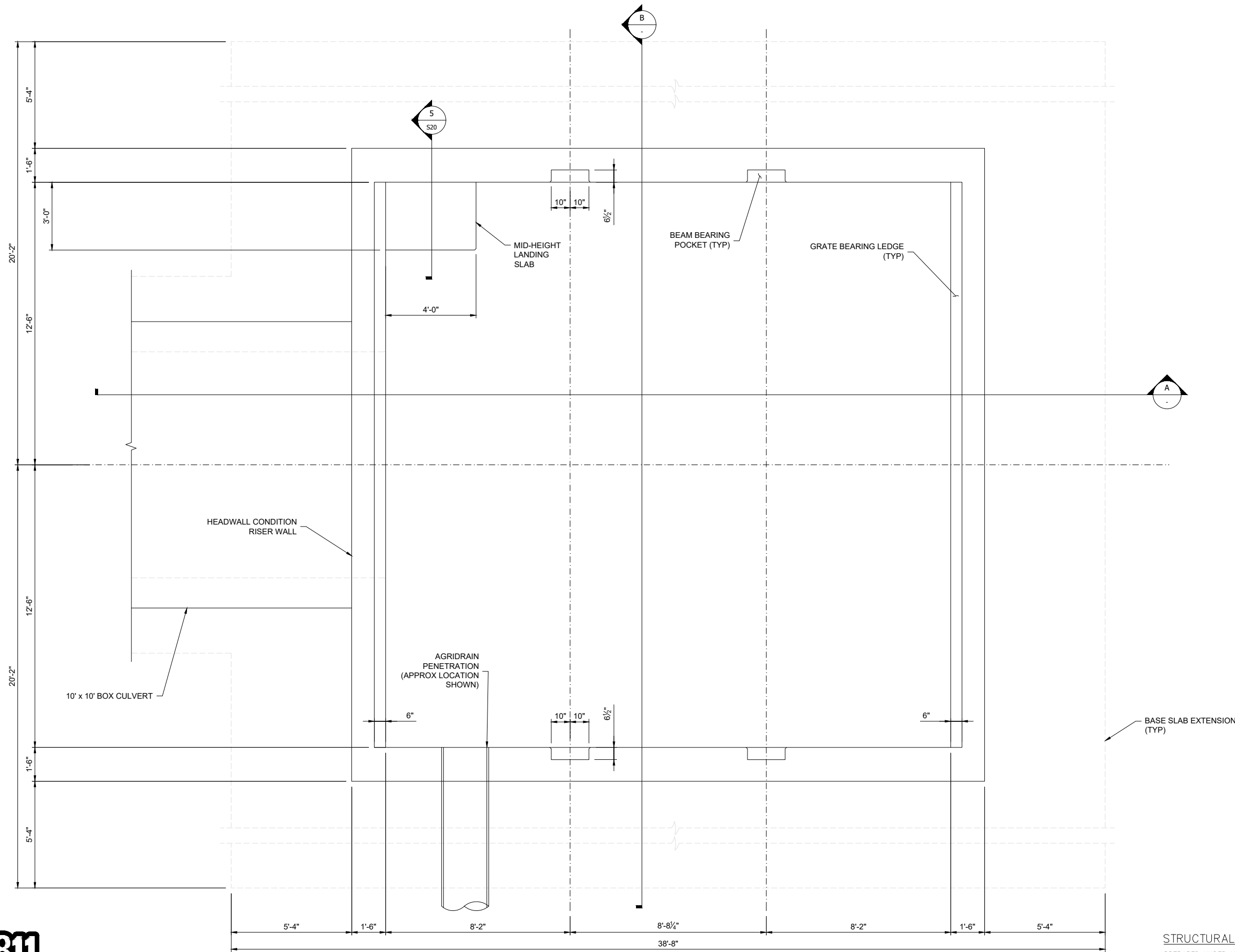
SAND CREEK RESTORATION STERLING RANCH STOCK POND #1 OUTLET STRUCTURE BASE SLAB AND WALL PLAN	DESIGNED BY	KSP	DATE	11/07/22	AS NOTED	NO.	REVISION	BY	DATE
	DRAWN BY	JJM							
	CHECKED BY	JKH							
SHEET		S14 OF 24		JOB NO.		25188.04			

**San Engineering LLC**  
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 Littleton, CO 80120  
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 20 BOULDER CRESCENT ST.  
 COLORADO SPRINGS, CO 80903  
 JAMES F. MORLEY  
 (719) 419-3024

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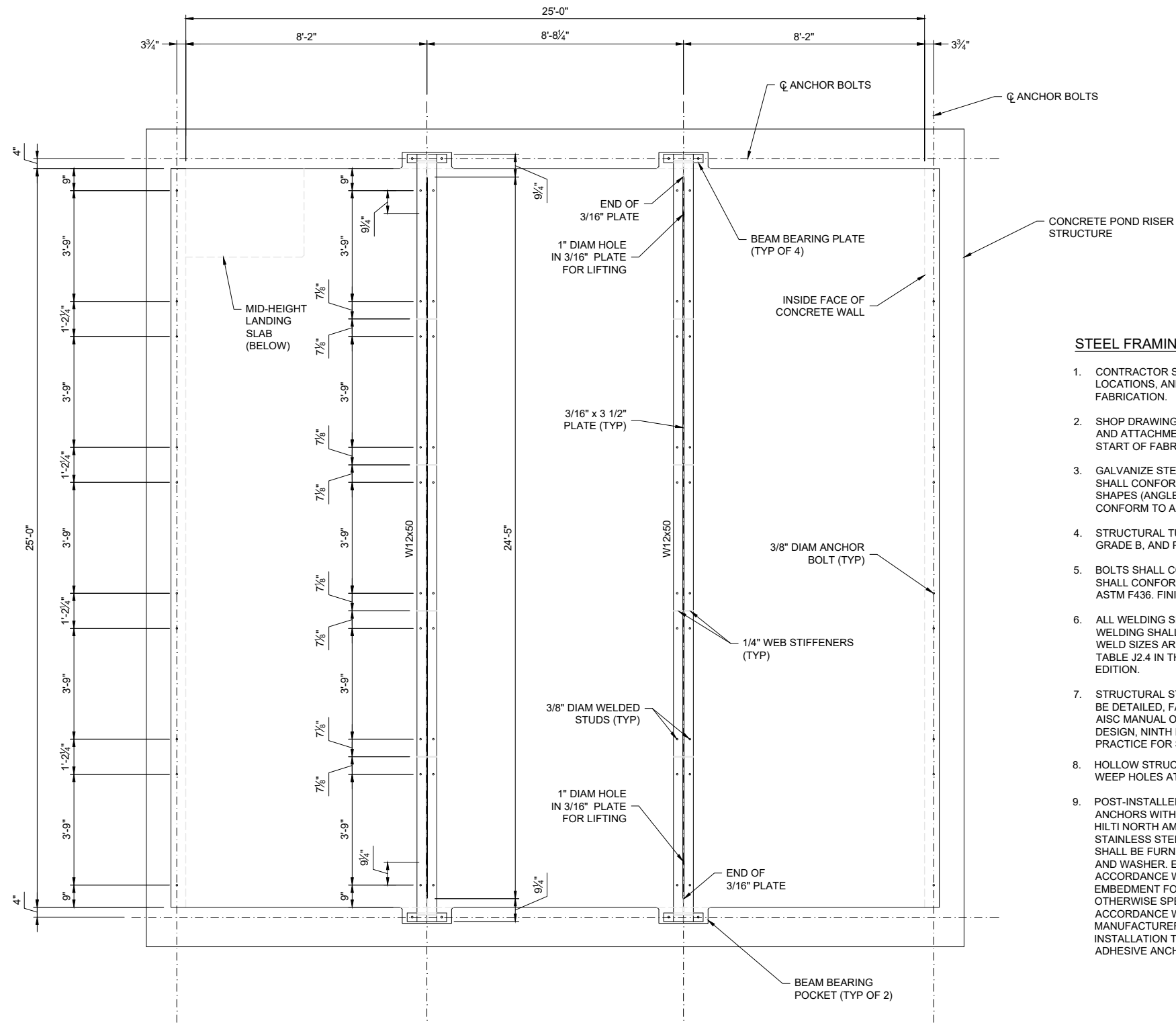
1 BASE SLAB AND WALL PLAN  
STOCK POND #2  
SCALE: 1/2" = 1'-0"

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BY	DATE
AS NOTED	REVISION
AS NOTED	
DATE	11/07/22
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DRAWN BY	JJM
CHECKED BY	JKH
<p>SAND CREEK RESTORATION STERLING RANCH STOCK POND #2 OUTLET STRUCTURE BASE SLAB AND WALL PLAN</p>	
SHEET	S15 OF 24
JOB NO.	25188.04

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**1 FRAMING PLAN**  
**STOCK PONDS #1 AND #2 OUTLET WIERS**  
 SCALE: 1/2" = 1'-0"

**STEEL FRAMING AND GRATE NOTES**

- CONTRACTOR SHALL VERIFY ALL CONCRETE DIMENSIONS, LOCATIONS, AND ELEVATIONS PRIOR TO START OF GRATE FABRICATION.
- SHOP DRAWINGS FOR ALL STRUCTURAL STEEL FRAMING, GRATING, AND ATTACHMENTS SHALL BE SUBMITTED FOR APPROVAL PRIOR TO START OF FABRICATION.
- GALVANIZE STEEL UNLESS NOTED OTHERWISE. STEEL W SHAPES SHALL CONFORM TO ASTM A992, OR ASTM A-572 GRADE 50. L SHAPES (ANGLES), AND STRUCTURAL PLATES AND BARS, SHALL CONFORM TO ASTM A36.
- STRUCTURAL TUBING MEMBERS SHALL CONFORM TO ASTM A500, GRADE B, AND PIPE ASTM A53, GRADE B.
- BOLTS SHALL CONFORM TO ASTM 325, TYPE 1, HEAVY HEX. NUTS SHALL CONFORM TO ASTM A563. WASHERS SHALL CONFORM TO ASTM F436. FINISH SHALL BE HOT DIPPED GALVANIZED.
- ALL WELDING SHALL BE DONE USING E7013 ELECTRODES AND WELDING SHALL CONFORM TO AISC AND AWS D1.1. WHERE FILLET WELD SIZES ARE NOT SHOWN, PROVIDE THE MINIMUM SIZE PER TABLE J2.4 IN THE AISC "MANUAL OF STEEL CONSTRUCTION" 13TH EDITION.
- STRUCTURAL STEEL BEAMS, COLUMNS, AND CONNECTIONS SHALL BE DETAILED, FABRICATED, AND ERECTED IN ACCORDANCE WITH AISC MANUAL OF STEEL CONSTRUCTION, ALLOWABLE STRESS DESIGN, NINTH EDITION (INCLUDING AISC CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES).
- HOLLOW STRUCTURAL STEEL TUBES SHALL BE FABRICATED WITH WEEP HOLES AT LOW ENDS FOR DRAINAGE.
- POST-INSTALLED ANCHORS SHALL BE HILTI HIT-RE-500-SD ADHESIVE ANCHORS WITH HILTI HAS THREADED RODS AS MANUFACTURED BY HILTI NORTH AMERICA. ANCHORS IN EXTERIOR LOCATIONS SHALL BE STAINLESS STEEL HILTI HAS THREADED RODS. ADHESIVE ANCHORS SHALL BE FURNISHED AS A COMPLETE ASSEMBLY WITH ROD, NUTS, AND WASHER. EMBEDMENT OF ADHESIVE ANCHORS SHALL BE IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATION FOR MINIMUM EMBEDMENT FOR ROD DIAMETER SHOWN ON DRAWINGS, UNLESS OTHERWISE SPECIFIED. ANCHORS SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. OBSERVE MANUFACTURER RECOMMENDATIONS WITH RESPECT TO INSTALLATION TEMPERATURES FOR CARTRIDGE INJECTION ADHESIVE ANCHORS.

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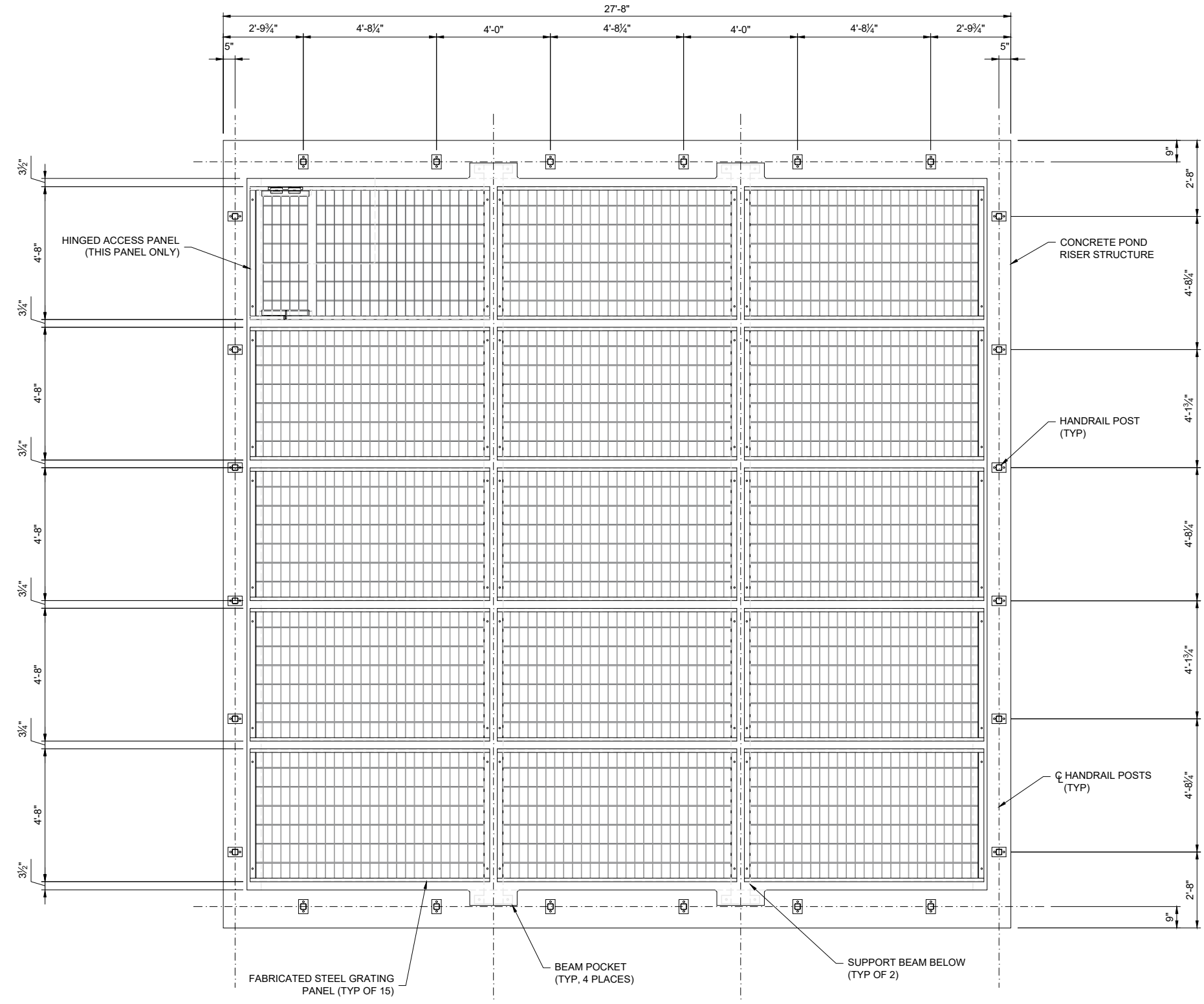
BY	DATE	REVISION

SAND CREEK RESTORATION  
 STERLING RANCH  
 STOCK PONDS #1 & #2  
 OUTLET STRUCTURES  
 FRAMING PLAN

STRUCTURAL ENGINEER'S STATEMENT  
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JOHN MIGLIACCO, P.E. DATE  
 COLORADO NO. 34333  
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1 GRATING AND HANDRAIL PLAN  
 STOCK PONDS #1 AND #2 OUTLET WIERS  
 SCALE: 1/2" = 1'-0"

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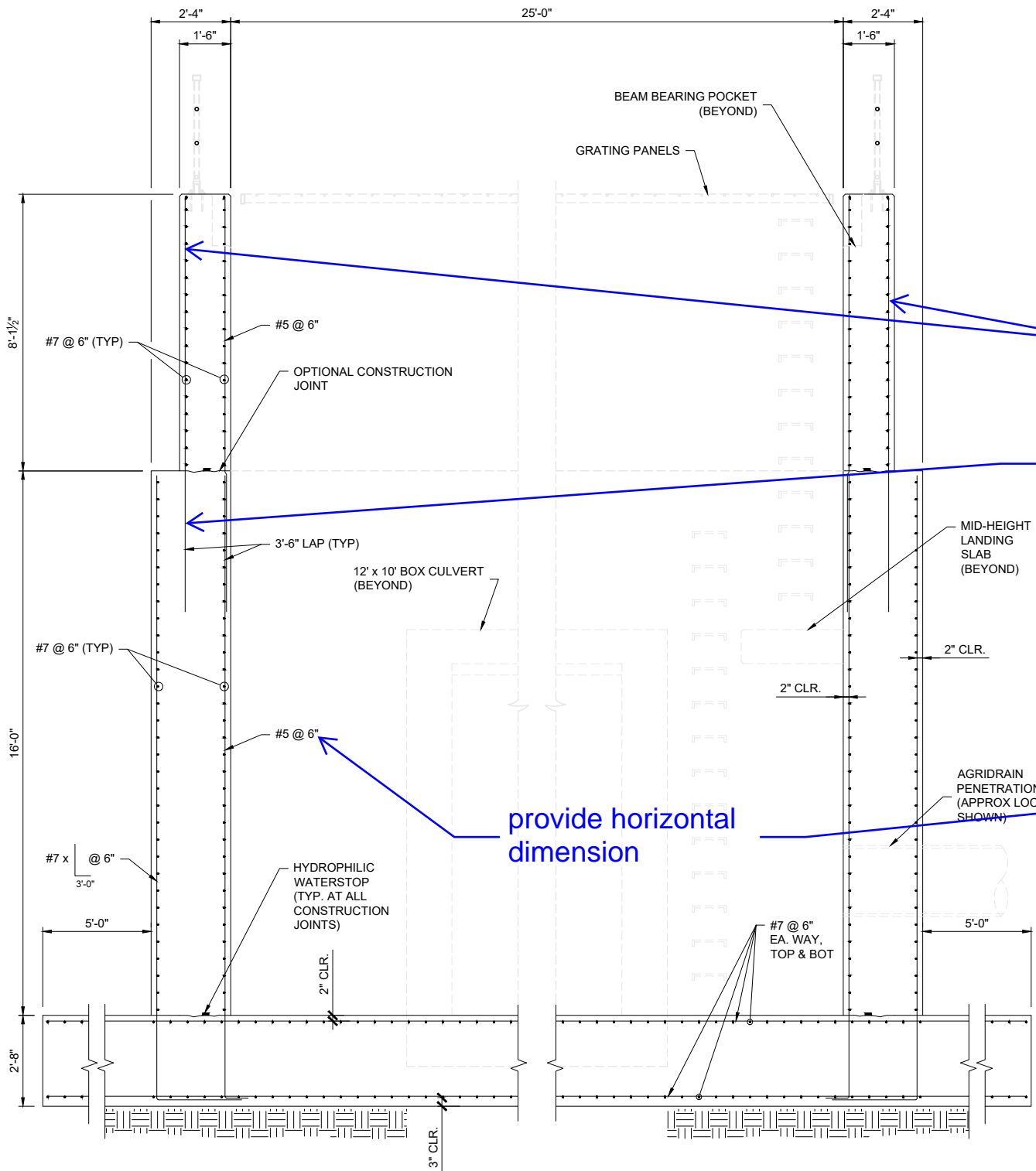


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SAND CREEK RESTORATION STERLING RANCH STOCK PONDS #1 & #2 OUTLET STRUCTURES GRATING PLAN	
SHEET S17 OF 24 JOB NO. 25188.04	

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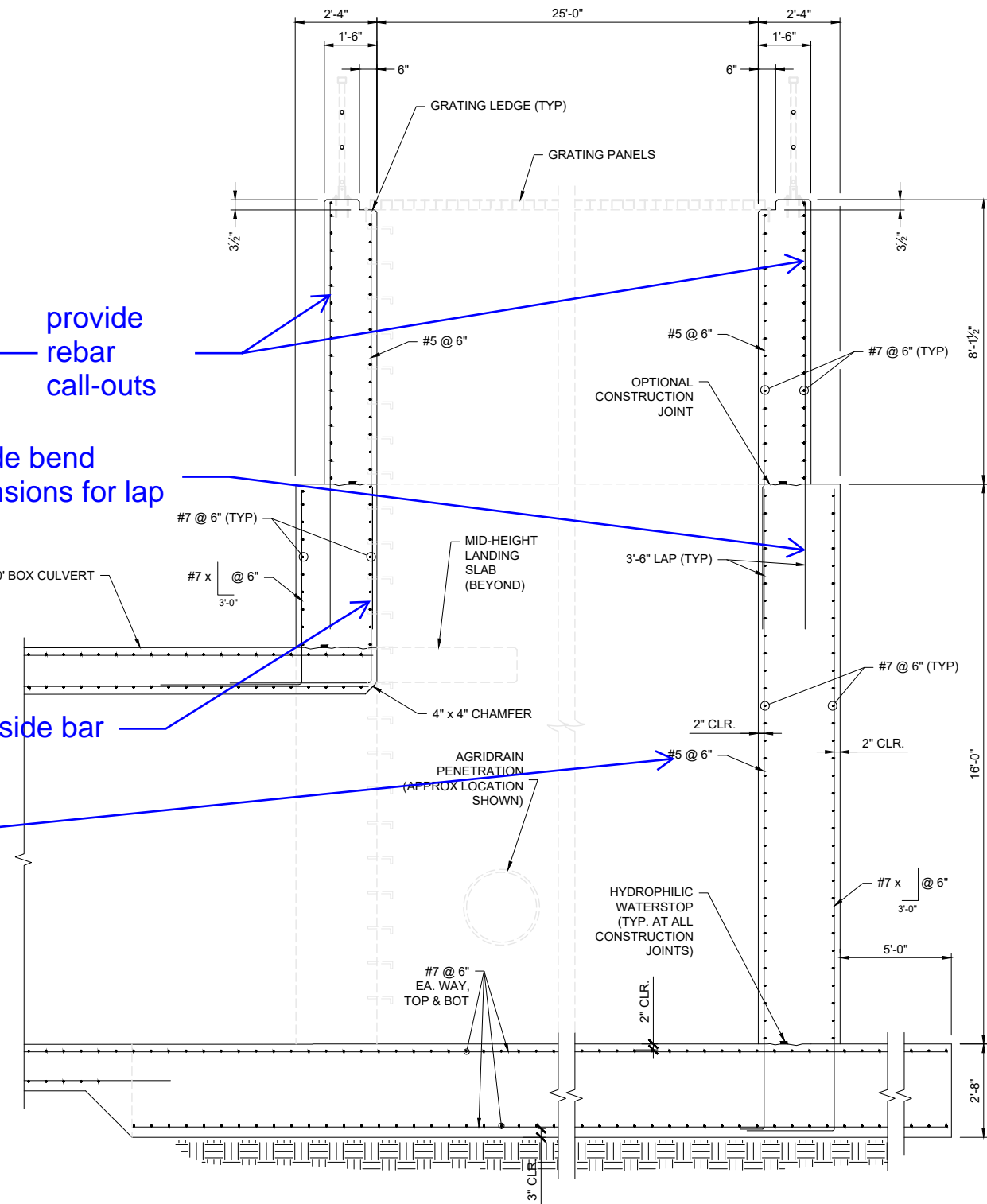
**A** STRUCTURE REINFORCING SECTION  
 STOCK POND #1  
 SCALE: 1/2" = 1'-0"

provide rebar call-outs

provide bend dimensions for lap

label inside bar

provide horizontal dimension



**B** STRUCTURE REINFORCING SECTION  
 STOCK POND #1  
 SCALE: 1/2" = 1'-0"

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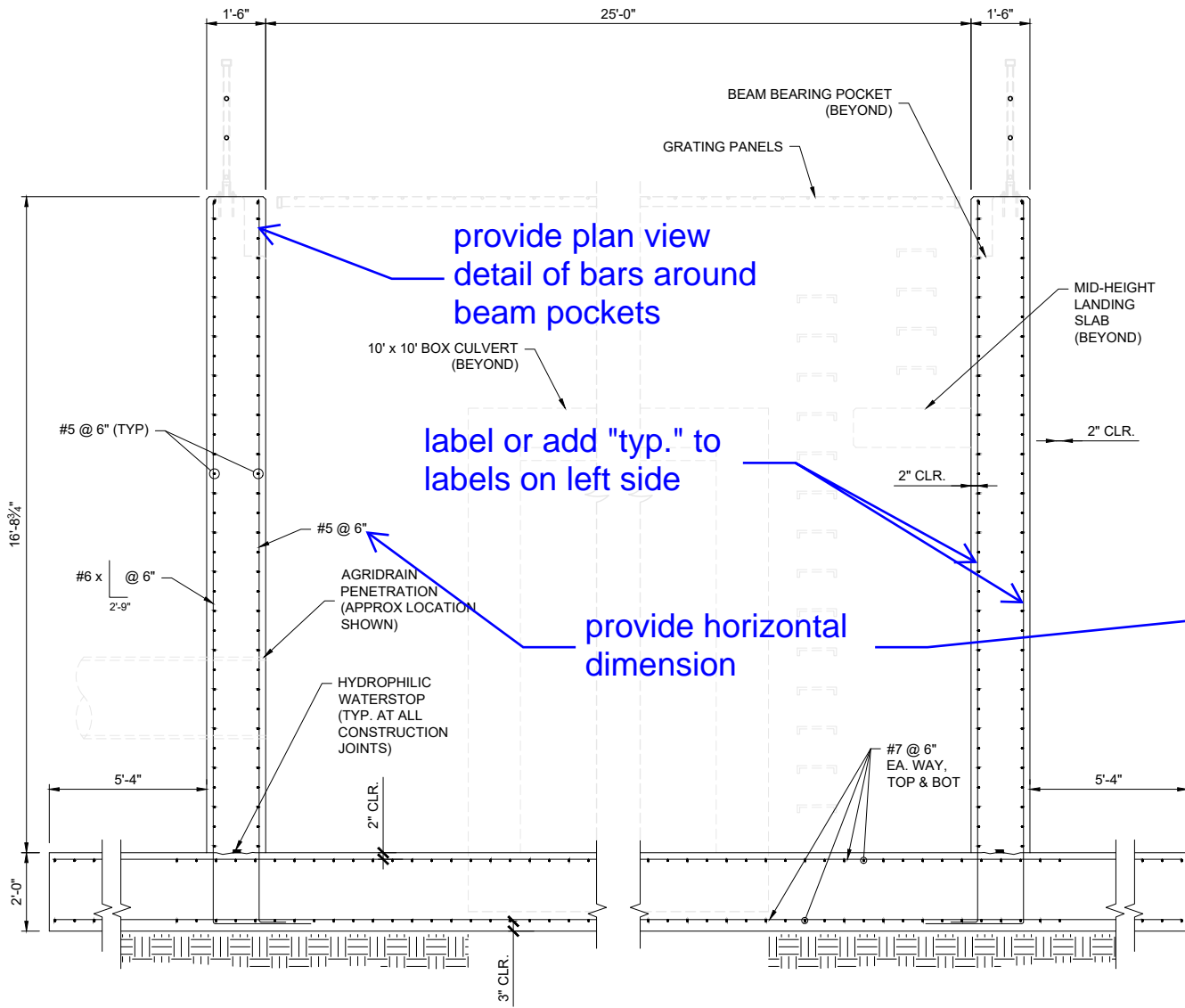
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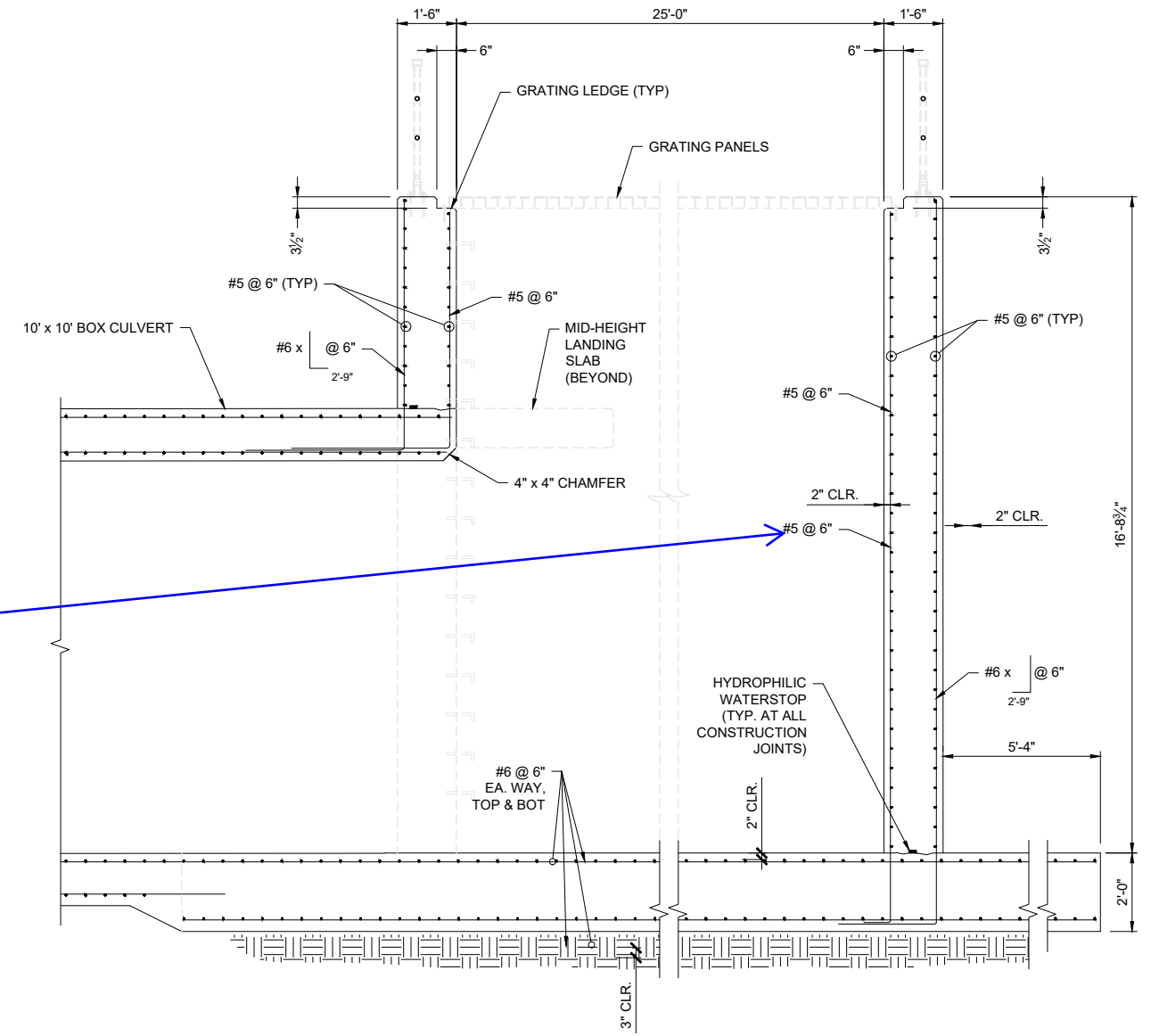
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**A** STRUCTURE REINFORCING SECTION  
 STOCK POND #2  
 SCALE: 1/2" = 1'-0"



**B** STRUCTURE REINFORCING SECTION  
 STOCK POND #2  
 SCALE: 1/2" = 1'-0"

provide plan view detail of bars around beam pockets

label or add "typ." to labels on left side

provide horizontal dimension

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PREPARED FOR  
 SR LAND, LLC  
 20 BOULDER CRESCENT ST.  
 COLORADO SPRINGS, CO 80903  
 JAMES F. MORLEY  
 (719) 419-3024

**San Engineering LLC**  
 Civil and Structural Engineering  
  
 1150 W. Littleton Blvd. #200  
 Littleton, CO 80120  
 303.953.9014 www.sanengineeringllc.com

H-SCALE	AS NOTED	No.	REVISION
V-SCALE	AS NOTED		
DATE	DESIGNED BY	DRAWN BY	CHECKED BY
11/07/22	KSP	JJM	JKH

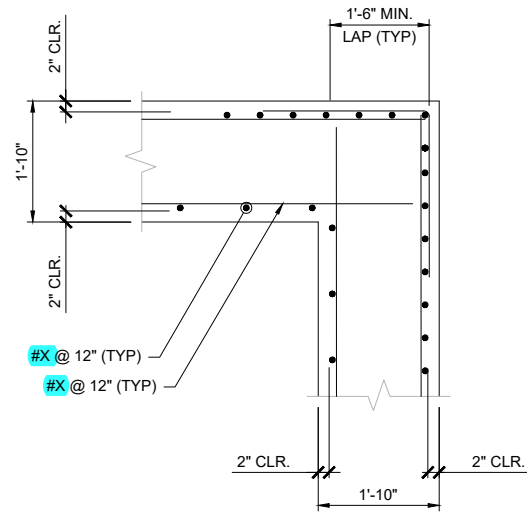
SAND CREEK RESTORATION  
 STERLING RANCH  
 STOCK POND #2  
 OUTLET STRUCTURE  
 REINFORCING SECTIONS

SHEET S19 OF 24  
 JOB NO. 25188.04

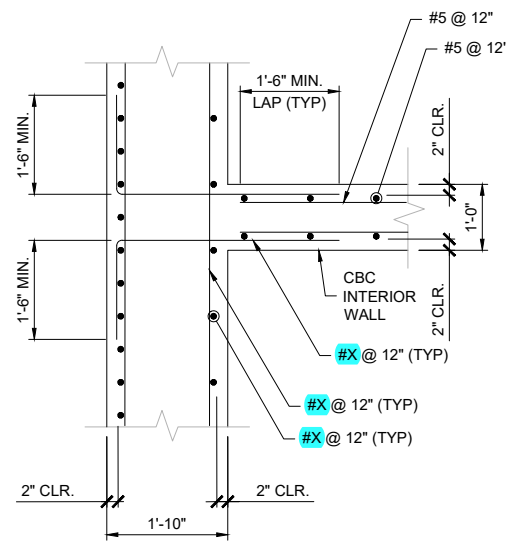
STRUCTURAL ENGINEER'S STATEMENT  
 PREPARED UNDER MY DIRECT SUPERVISION  
 90% SUBMITTAL  
 NOT FOR CONSTRUCTION

JOHN MIGLIACCIO, P.E.  
 COLORADO NO. 34333  
 FOR AND ON BEHALF OF SAN ENGINEERING, LLC. DATE



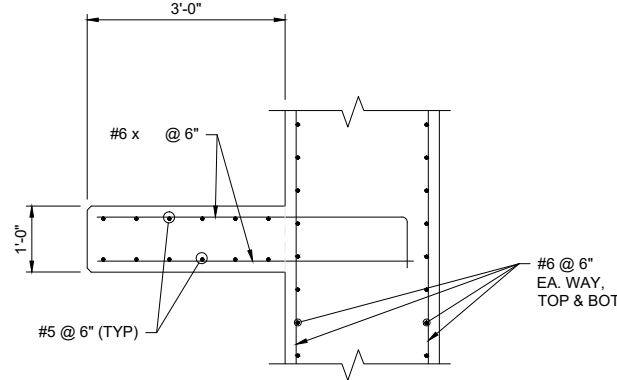


1 TYPICAL CORNER DETAIL  
SCALE: 1/2" = 1'-0"



1 WALL INTERSECTION DETAIL  
SCALE: 1/2" = 1'-0"

1 EXCAVATION REQUIREMENTS  
SCALE: 1/2" = 1'-0"



5 MID-HEIGHT LANDING SECTION  
SCALE: 1/2" = 1'-0"

1 PIPE PENETRATION DETAIL  
SCALE: 1/2" = 1'-0"

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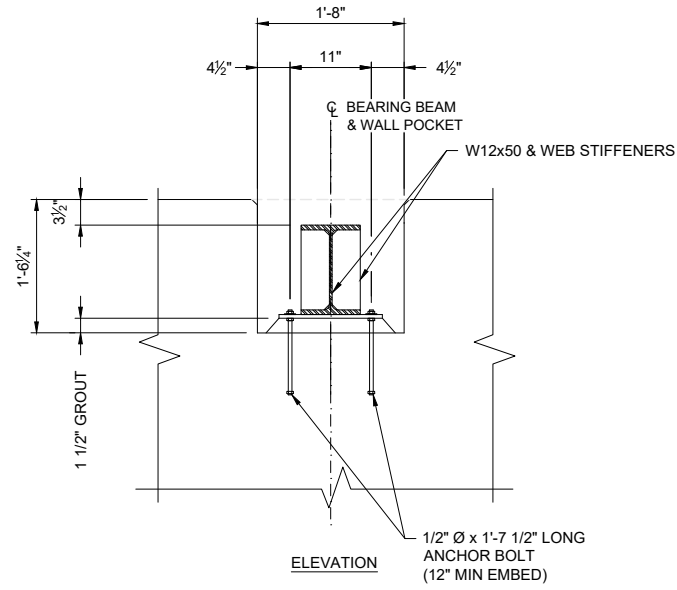
REVISION	DATE	BY
AS NOTED		
AS NOTED		
11/07/22		
KSP		
JJM		
JKH		

SAND CREEK RESTORATION  
STERLING RANCH  
STOCK PONDS #1 & #2  
OUTLET STRUCTURES  
MISCELLANEOUS DETAILS

SHEET S20 OF 24  
JOB NO. 25188.04

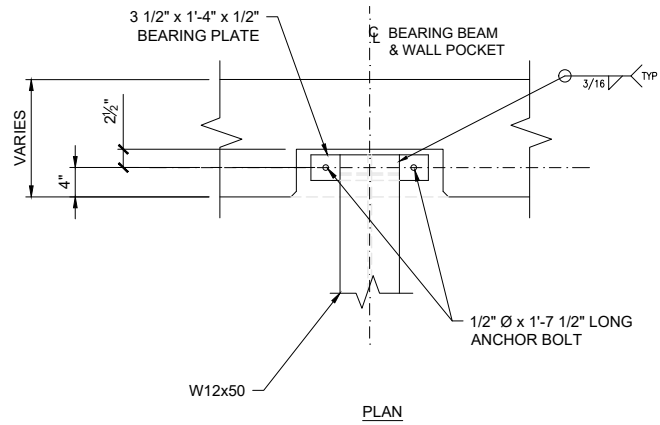
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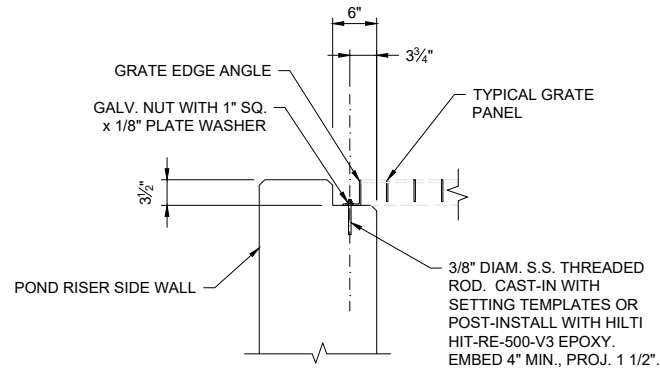
ELEVATION

1 1/2" Ø x 1'-7 1/2" LONG ANCHOR BOLT (12" MIN EMBED)

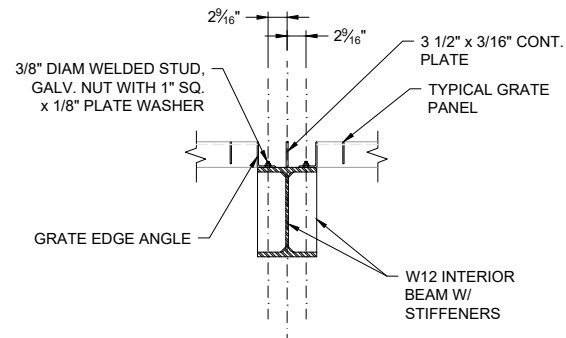


PLAN

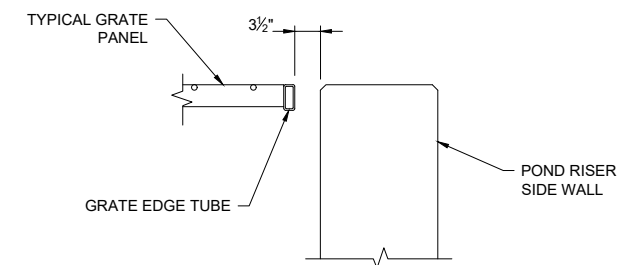
**A BEAM POCKET AND BEARING**  
SCALE: 1" = 1'-0"



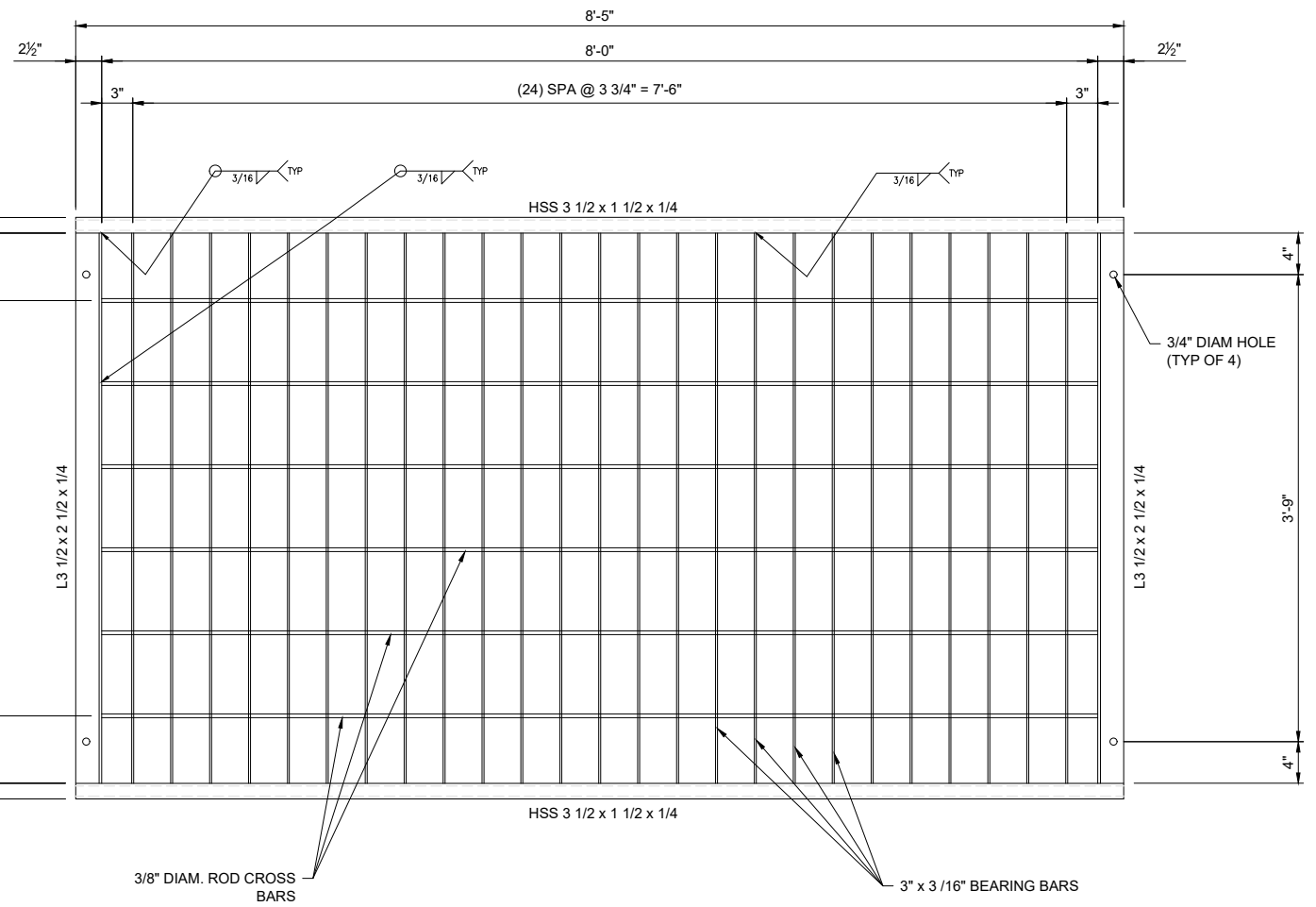
**A GRATE BEARING AT WALL**  
SCALE: 1" = 1'-0"



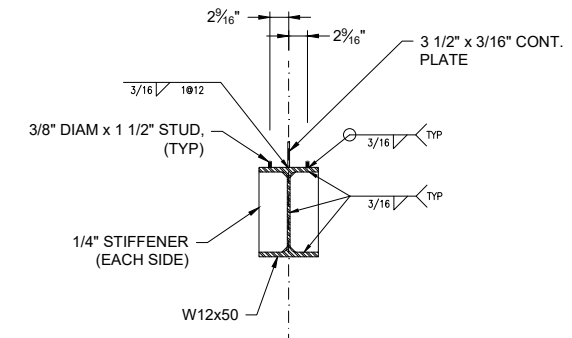
**B GRATE BEARING AT BEAM**  
SCALE: 1" = 1'-0"



**C GRATE EDGE AT WALL**  
SCALE: 1" = 1'-0"



**TYPICAL GRATE CONSTRUCTION**  
SCALE: 1 1/2" = 1'-0"



**D BEAM CONSTRUCTION**  
SCALE: 1" = 1'-0"

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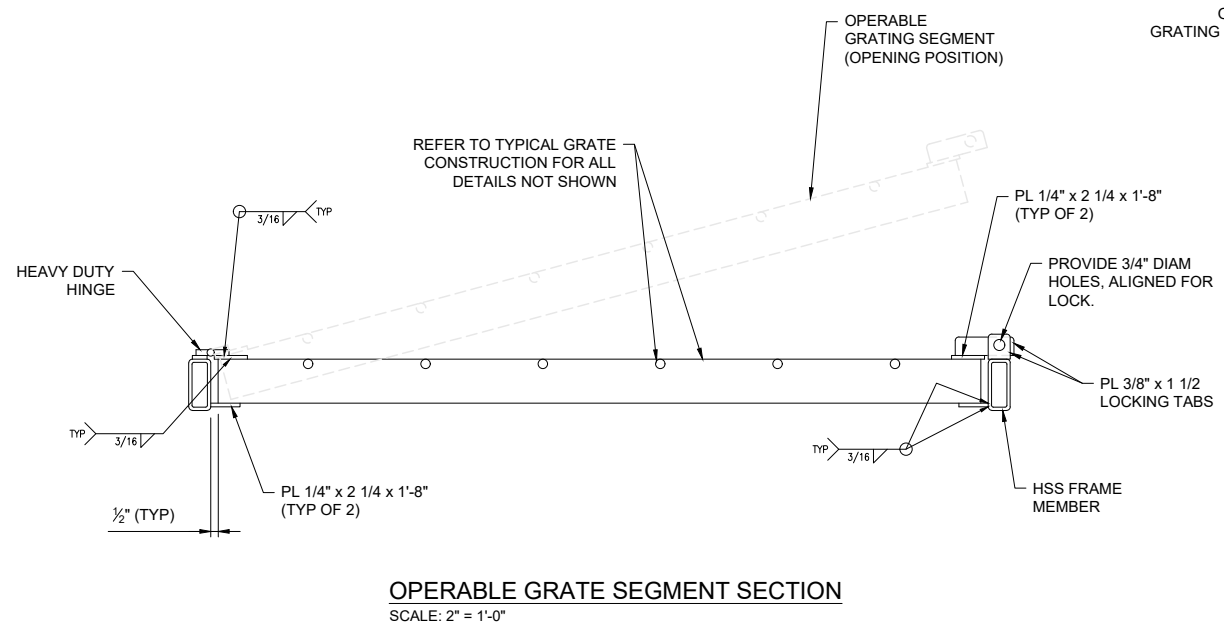
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AS NOTED	AS NOTED	11/07/22	KSP
			JJM
			JKH

SAND CREEK RESTORATION STERLING RANCH	H-SCALE	V-SCALE	DESIGNED BY	CHECKED BY
			KSP	JKH

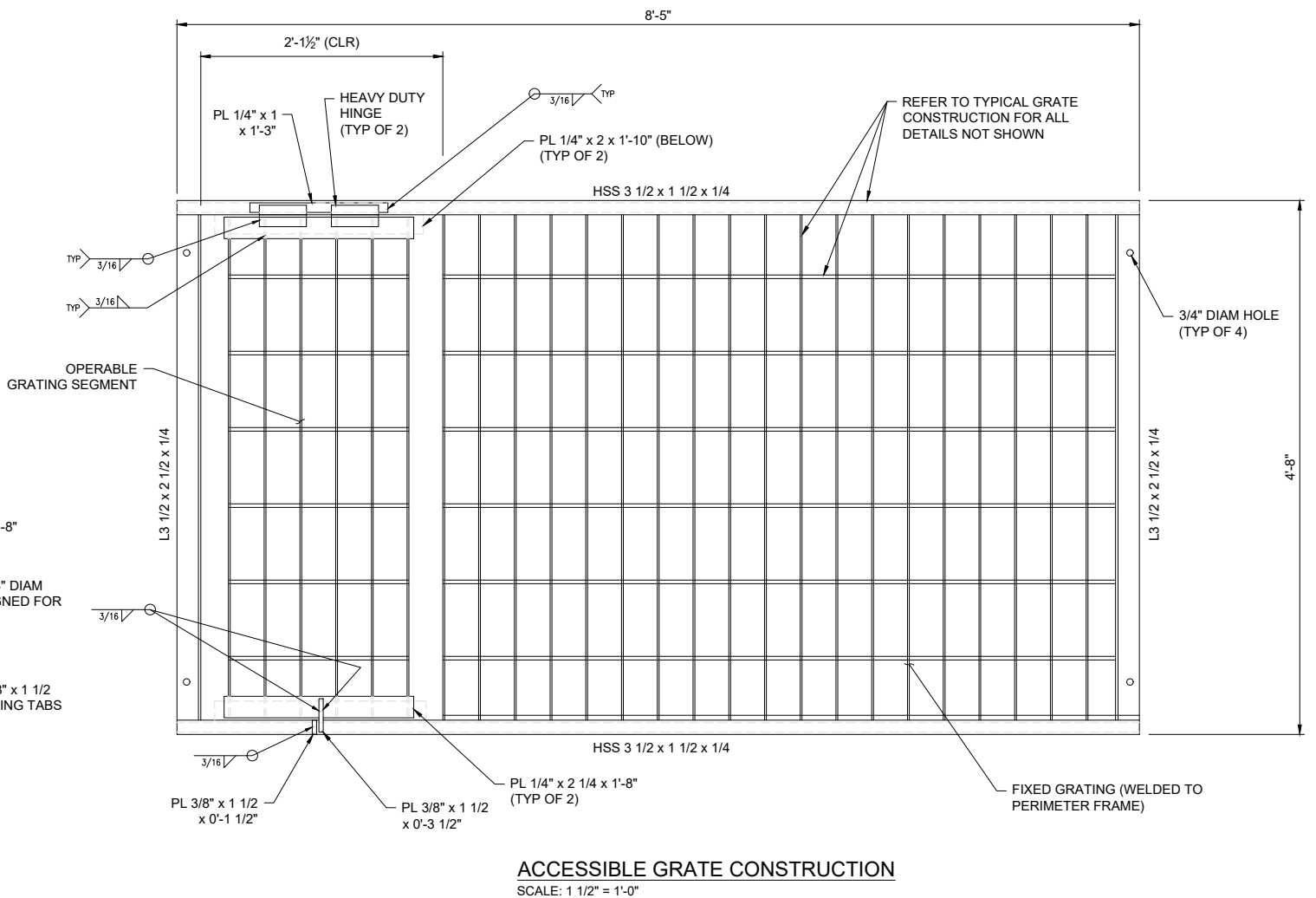
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F:\Projects\Sand Creek Channel at Sterling Ranch\02 Drawings\Sand Creek Restoration\_Structural Details



**OPERABLE GRATE SEGMENT SECTION**  
SCALE: 2" = 1'-0"



**ACCESSIBLE GRATE CONSTRUCTION**  
SCALE: 1 1/2" = 1'-0"

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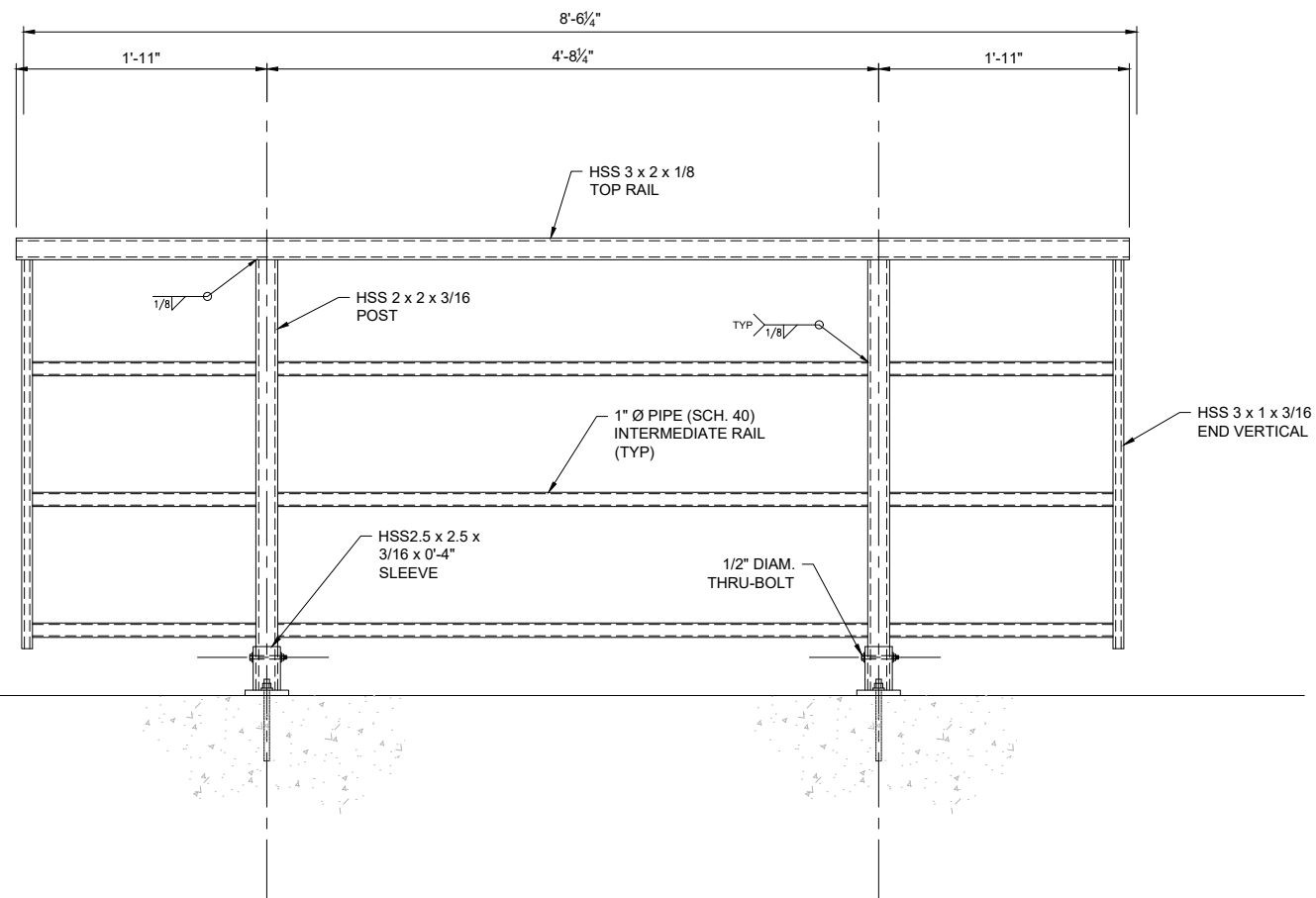
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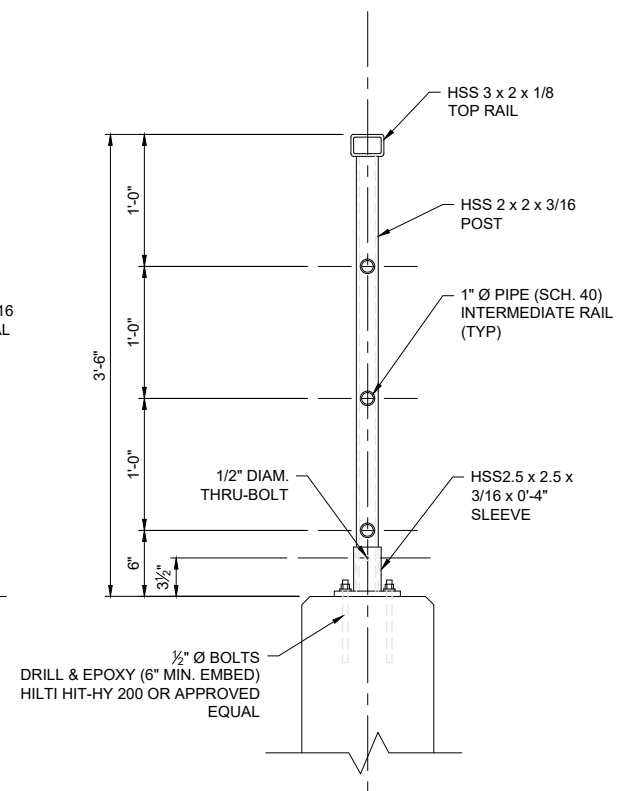
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SAND CREEK RESTORATION  
STERLING RANCH  
STOCK PONDS #1 & #2 OUTLETS  
ACCESSIBLE GRATING  
PANEL DETAILS

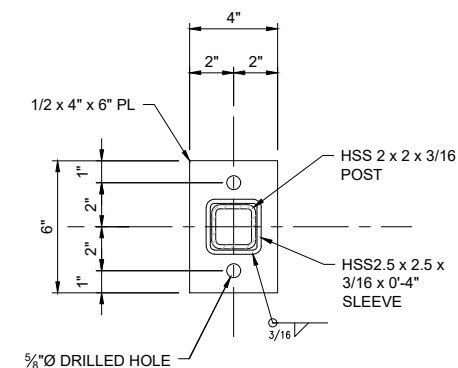
F:\Projects\Sand Creek Channel at Sterling Ranch\02 Drawings\Sand Creek Restoration\_Structural\_Details



HANDRAIL ELEVATION - TYPICAL SEGMENT



HANDRAIL SECTION



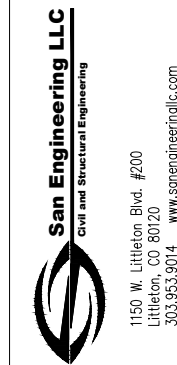
BASE PLATE DETAIL

**HANDRAIL NOTES**

- ALL TUBES SHALL BE ASTM A-500 GRADE B.
- ALL POSTS AND BASE PLATES SHALL BE ASTM A-572 GRADE 50.
- ALL OTHER STEEL SHALL BE ASTM A-36 UNLESS OTHERWISE NOTED.
- THE ABOVE MATERIAL AND ALL MISCELLANEOUS BOLTS, NUTS, AND WASHERS SHALL BE HOT-DIPPED GALVANIZED AND DUPLEX-COATED BLACK WITH AN EXTERIOR COATING SYSTEM COMPATIBLE WITH GALVANIZED MATERIAL. A SAMPLE SHALL BE SUBMITTED TO THE OWNER FOR APPROVAL PRIOR TO FABRICATION.
- CAST-IN ANCHOR BOLTS, IF UTILIZED, SHALL BE HOT-DIPPED GALVANIZED.
- POST-INSTALLED ANCHORS, SHALL BE AN APPROVED PRODUCT, INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS. POST-INSTALLED ANCHORS SHALL BE STAINLESS STEEL.
- TUBES AND OTHER HORIZONTAL MEMBERS SHALL BE SHOP BENT OR FABRICATED TO FIT HORIZONTAL CURVES.
- VERTICAL SLOPES AND GRADES OF WINGWALLS AND GROUND NOT SHOWN FOR SIMPLICITY. POSTS SHALL BE VERTICALLY PLUMB.
- HANDRAILS INSTALLED IN SEGMENTS SHALL BE PROVIDED WITH SPLICE JOINTS GROUND SMOOTH, OR ARRANGED SUCH THAT THE GAPS BETWEEN HANDRAIL SEGMENTS ARE A MAXIMUM OF 3 INCHES. JOINT AND GAP DETAILS SHALL BE CLEARLY SHOWN ON SHOP DRAWINGS.
- ALL WELDS SHALL BE GROUND SMOOTH.
- PRIOR TO FABRICATION, SHOP DRAWINGS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL.

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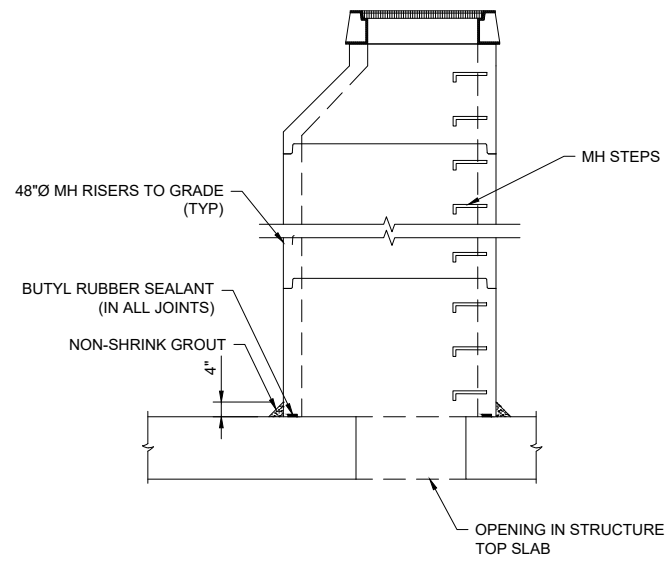
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	JJM <td>DRAWN BY</td>	DRAWN BY
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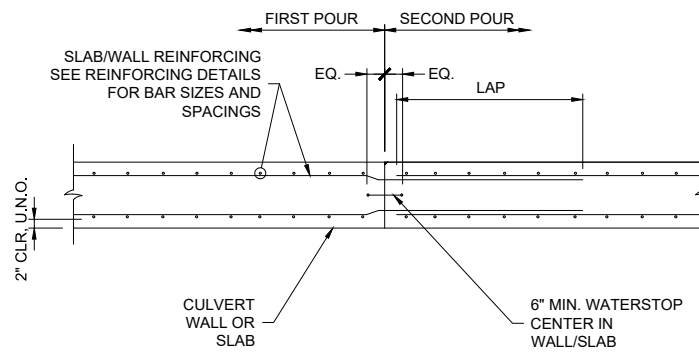
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SAND CREEK RESTORATION  
STERLING RANCH  
STOCK PONDS #1 & #2  
OUTLET STRUCTURES  
HAND RAIL DETAILS

SHEET S23 OF 24  
JOB NO. 25188.04



TYPICAL MH RISER DETAILS



TYPICAL BOX CULVERT CONSTRUCTION JOINT



BOX CULVERT BACKFILL REQUIREMENTS

**SUBGRADE REQUIREMENTS**

- EXPOSED SUBGRADE FOR ALL FOOTINGS AND BOTTOM SLABS SHALL BE OBSERVED BY THE GEOTECHNICAL ENGINEER UPON EXCAVATION.
- FOOTINGS AND BOTTOM SLABS SHALL BE UNDERLAIN BY FIRM, UNDISTURBED NATURAL SOILS, OR STRUCTURAL FILL EXTENDING TO UNDISTURBED NATURAL SOILS. STRUCTURAL FILL SHOULD MEET THE REQUIREMENTS IN THE GEOTECHNICAL REPORT AND SHOULD EXTEND DOWN FROM THE EDGES OF FOOTINGS AT A 1 TO 1 VERTICAL PROJECTION. EXISTING FILL, SOFT OR LOOSE SOILS, OR OTHER DELETERIOUS MATERIALS ENCOUNTERED AT THE BASE OF THE EXCAVATION SHOULD BE REMOVED AND REPLACED WITH STRUCTURAL FILL.
- UNDISTURBED SUBGRADE, ONLY IF DEEMED ACCEPTABLE BY GEOTECHNICAL ENGINEER MAY BE UTILIZED FOR PLACEMENT OF SLABS AND FOOTINGS.
- REFER ALSO TO GEOTECHNICAL REPORT NO. DN49,705-125-R1 BY CTL / THOMPSON, DATED JANUARY 31, 2018, AND ANY ADDENDA THERETO, WHICH SHALL BE CONSIDERED A PART OF THE CONSTRUCTION DOCUMENTS, FOR ADDITIONAL EARTHWORK REQUIREMENTS.
- CONTRACTOR IS ADVISED THAT DEWATERING MAY BE REQUIRED.

**CONCRETE JOINT AND WATERSTOP NOTES**

- CONSTRUCTION JOINTS SHOWN ARE TYPICAL OF ALL LOCATIONS UNLESS NOTED OTHERWISE. WATERSTOPS AT PRECAST CONSTRUCTION INTERFACES ARE DETAILED SEPARATELY IN THESE PLANS.
- WATERSTOPS SHALL BE PVC OR RUBBER END-BELL OR FLAT-STRIP TYPE. PRODUCT DATA FOR PROPOSED WATERSTOP SYSTEMS SHALL BE SUBMITTED FOR APPROVAL PRIOR TO CONSTRUCTION.
- WATERSTOPS SHALL BE CONTINUOUS AROUND ALL CORNERS.
- CONSTRUCTION JOINTS ARE RECOMMENDED TO BE LOCATED AT 80'-0" ON-CENTER MAXIMUM. ALL JOINT LOCATIONS SHALL BE APPROVED BY ENGINEER, OWNER AND CONSTRUCTION MANAGER PRIOR TO CONCRETE CONSTRUCTION.
- ALL LONGITUDINAL AND HORIZONTAL REINFORCING SHALL BE CONTINUOUS THROUGH JOINTS UNLESS NOTED OTHERWISE.
- ALL CONSTRUCTION JOINTS SHALL BE ROUGH AND THOROUGHLY CLEANED FOR BOND.

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BOX CULVERT STRUCTURES MISCELLANEOUS DETAILS			
SHEET S24 OF 24			
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