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. DETAILED ITEMS SHALL GOVERN.

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 <sup>3</sup>/<sub>4</sub> INCH, UNLESS NOTED OTHERWISE IN PLANS.

THE FOLLOWING MINIMUM CONCRETE COVER SHALL BE PROVIDED FOR REINFORCING STEEL UNLESS SHOWN OTHERWISE IN DRAWINGS:

- CONCRETE CAST AGAINST EARTH = 3 IN

 #6 AND LARGER = 2 IN - #5 AND SMALLER = 1 1/2 IN

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.

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.

#### **ABBREVIATIONS:**

AH. = AHEAD ABUT. = ABUTMENT B.F.= BACK FACE BLVD. = BOULEVARD BOT. = BOTTOM C = CENTERLINE CLR. = CLEAR C&G = CURB AND **GUTTER** CONST. = CONSTRUCTION CONT. = **CONTINUOUS** E.F. = EACH FACE ELEV. = ELEVATION

EXP. = EXPANSION HCL = HORIZONTAL CONTROL LINE IB = INBOUND JT. = JOINT MAX. = MAXIMUM MIN. = MINIMUM NO. = NUMBER OB = OUTBOUND PC = POINT OF CURVE PI = POINT OF INTERSECTION PL = PLATE PROJ. = **PROJECTION** PT = POINT OF **TANGENT** 

PVC = POLYVINYL CHLORIDE PVI = POINT OF **VERTICAL** INTERSECTION ROW = RIGHT OF WAY SPA. = SPACED ST = STREET STA. = STATION STD. = STANDARD TYP. = TYPICAL V.I.F = VERIFY IN **FIELD** 

# **GENERAL DESIGN DATA**

REINFORCED CONCRETE:

CLASS D CONCRETE: fc = 4,500 psiTYPE 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 ADDENDA THERETO, FOR ADDITIONAL INFORMATION AND REQUIREMENTS.

PER GEOTECH REPORT LISTED ABOVE BEARING CAPACITIES ARE AS FOLLOWS: 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

MAXIMUM CALCULATED BEARING PRESSURE = 1500 PSF

DESIGNED IN ACCORDANCE WITH IBC 2018 / ACI 318

10x10 BOX CULVERT

INTERIOR FLUID: 3.5 FT ABOVE TOP SLAB FILL RANGE: 5 FT TO 7 FT

DESIGN DATA POND OUTLET STRUCTURES

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

MAXIMUM CALCULATED BEARING PRESSURE: 1,500 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

DESIGN DATA FOR WINGWALLS AND HEADWALLS

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

#### SUBMITTALS AND SUBSTITUTIONS

CONTRACTOR SHALL SUBMIT THE FOLLOWING FOR REVIEW AND APPROVAL OF THE ENGINEER OF RECORD PRIOR TO CONSTRUCTION:

- MANUFACTURED PRODUCTS

REINFORCING SHOP DRAWINGS CONCRETE MIX DESIGN

STRUCTURAL STEEL SHOP DRAWINGS

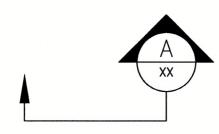
IF THE CONTRACTOR REQUESTS A CHANGE FROM THE STRUCTURAL DRAWINGS, IT SHALL BE APPROVED BY THE ENGINEER AND DESIGNED BY SAN ENGINEERING LLC. PRIOR TO SUBMITTING SHOP DRAWINGS. VARIATION SHALL BE INDICATED ON THE SHOP DRAWINGS. CONTRACTOR SHALL COMPENSATE MARTIN/MARTIN. INC. FOR MAKING THE CHANGE.

CONSTRUCTION DOCUMENTS SHALL NOT BE REPRODUCED FOR USE IN SUBMITTALS

ALL SHOP DRAWINGS SHALL REFERENCE THE STRUCTURAL DRAWING NUMBER AND DETAIL USED TO PREPARE THE SUBMITTAL

SUBSTITUTIONS: ENGINEER'S APPROVAL SHALL BE SECURED FOR ALL **SUBSTITUTIONS** 

### SYMBOLS:



SECTION OR DETAIL IDENTIFICATION **CROSS-REFERENCE SHEET** NUMBER ( -- = SAME SHEET)



# 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.

# OWNER/DEVELOPER STATEMENT

, THE OWNER/DEVELOPER HAVE READ AND WILL COMPLY WITH THE REQUIREMENTS OF THE GRADING AND EROSION CONTROL PLAN.

SR/LAND, LLC 20 BOULDER CRESCENT, SUITE 201 COLORADO SPRINGS, CO 80903

#### DISTRICT APPROVALS

THESE DOCUMENTS HAVE BEEN REVIEWED AND APPROVED FOR STORM DRAIN AND ASSOCIATED UTILITY SERVICE CONSTRUCTION.

FOR AND ON BEHALF OF THE STERLING RANCH METRO DISTRICT NO.3

## PASO COUNTY STATEMENT

COUNTY PLAN REVIEW IS PROVIDED ONLY FOR GENERAL CONFORMANCE WITH COUNTY DESIGN CRITERIA. THE COUNTY IS NOT RESPONSIBLE FOR THE ACCURACY AND ADEQUACY OF THE DESIGN, DIMENSIONS, AND/OR ELEVATIONS WHICH SHALL BE CONFIRMED AT THE JOB SITE. THE COUNTY THROUGH THE APPROVAL OF THIS DOCUMENT ASSUMES NO RESPONSIBILITY FOR COMPLETENESS AND/OR ACCURACY OF THIS DOCUMENT.

FILED IN ACCORDANCE WITH THE REQUIREMENTS OF THE EL PASO COUNTY LAND DEVELOPMENT CODE DRAINAGE CRITERIA MANUAL, VOLUMES 1 AND 2, AND ENGINEERING CRITERIA MANUAL AS AMENDED.

IN ACCORDANCE WITH ECM SECTION 1.12, THESE CONSTRUCTION DOCUMENTS WILL BE VALID FOR CONSTRUCTION FOR A PERIOD OF 2 YEARS FROM THE DATE SIGNED BY THE EL PASO COUNTY ENGINEER. IF CONSTRUCTION HAS NOT STARTED WITHIN THOSE 2 YEARS, THE PLANS WILL NEED TO BE RESUBMITTED FOR APPROVAL, INCLUDING PAYMENT OF REVIEW FEES AT THE PLANNING AND COMMUNITY DEVELOPMENT DIRECTORS DISCRETION.

JOSHUA PALMER, P.E.

COUNTY ENGINEER/ECM ADMINISTRATOR

#### STRUCTURAL DRAWING INDEX

S01 OF 25 SITE STRUCTURES GENERAL NOTES & STRUCTURAL INFORMATION AND INDEX STRUCTURES KEY PLAN STOCK POND W-3 3-CELL BOX CULVERT GENERAL LAYOUT STOCK POND W-3 OUTLET 3-CELL BOX CULVERT TYPICAL REINFORCING SECTIONS

STOCK POND 1 OUTLET 12' x 10" RCBC GENERAL LAYOUT STOCK POND 1 OUTLET 12' x 10 ' RCBC TYPICAL REINFORCING SECTIONS

STOCK POND W-3 OUTLET BASIN STRUCTURAL DETAILS

STOCK POND 1 OUTLET 12' x 10' RCBC DROP STRUCTURE PLANS

STOCK POND 1 OUTLET 12' x 10' RCBC DROP STRUCTURE REINFORCING SECTIONS

STOCK POND 1 OUTLET 12' x 10' RCBC DROP STRUCTURE MISC DETAILS

STOCK POND 2 OUTLET 10' x 10" RCBC GENERAL LAYOUT

STOCK POND 1 OUTLET 10' x 10 ' RCBC TYPICAL REINFORCING SECTIONS S12 OF 25

BOX CULVERT STRUCTURES COLLAR DETAILS S13 OF 25

BOX CULVERT STRUCTURES COLLAR AND HEADWALL DETAILS

STOCK POND #1 OUTLET STRUCTURE BASE SLAB AND WALL PLAN S16 OF 25 STOCK POND #2 OUTLET STRUCTURE BASE SLAB AND WALL PLAN

S17 OF 25 STOCK PONDS #1 & #2 OUTLET STRUCTURES FRAMING PLAN

STOCK PONDS #1 & #2 OUTLET STRUCTURES GRATING PLAN S18 OF 25 STOCK POND #1 OUTLET STRUCTURE REINFORCING SECTIONS S19 OF 25

S20 OF 25 STOCK POND #2 OUTLET STRUCTURE REINFORCING SECTIONS

STOCK PONDS #1 & #2 OUTLET STRUCTURES HAND RAIL DETAILS

STOCK PONDS #1 & #2 OUTLET STRUCTURES MISCELLANEOUS DETAILS STOCK PONDS #1 & #2 OUTLETS MISCELLANEOUS STEEL DETAILS

STOCK PONDS #1 & #2 OUTLETS ACCESSIBLE PANEL DETAILS

BOX CULVERT STRUCTURES MISCELLANEOUS DETAILS

BURGESS RD ARGATE PKWY COWPOKE R E WOODMEN RD FOREST MEADOWS AVE

> KEY MAP SCALE: 1"=1500'

STRUCTURAL ENGINEER'S STATEMENT PREPARED UNDER MY DIRECT SUPERVISION

-MARKSHEFFEL RD

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

SHEET SO1 OF 25 JOB NO. 25188.04

CREEK RESTORAT
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SR LAND, L BOULDER CRES NRADO SPRINGS, JAMES F. MO (719) 419-3

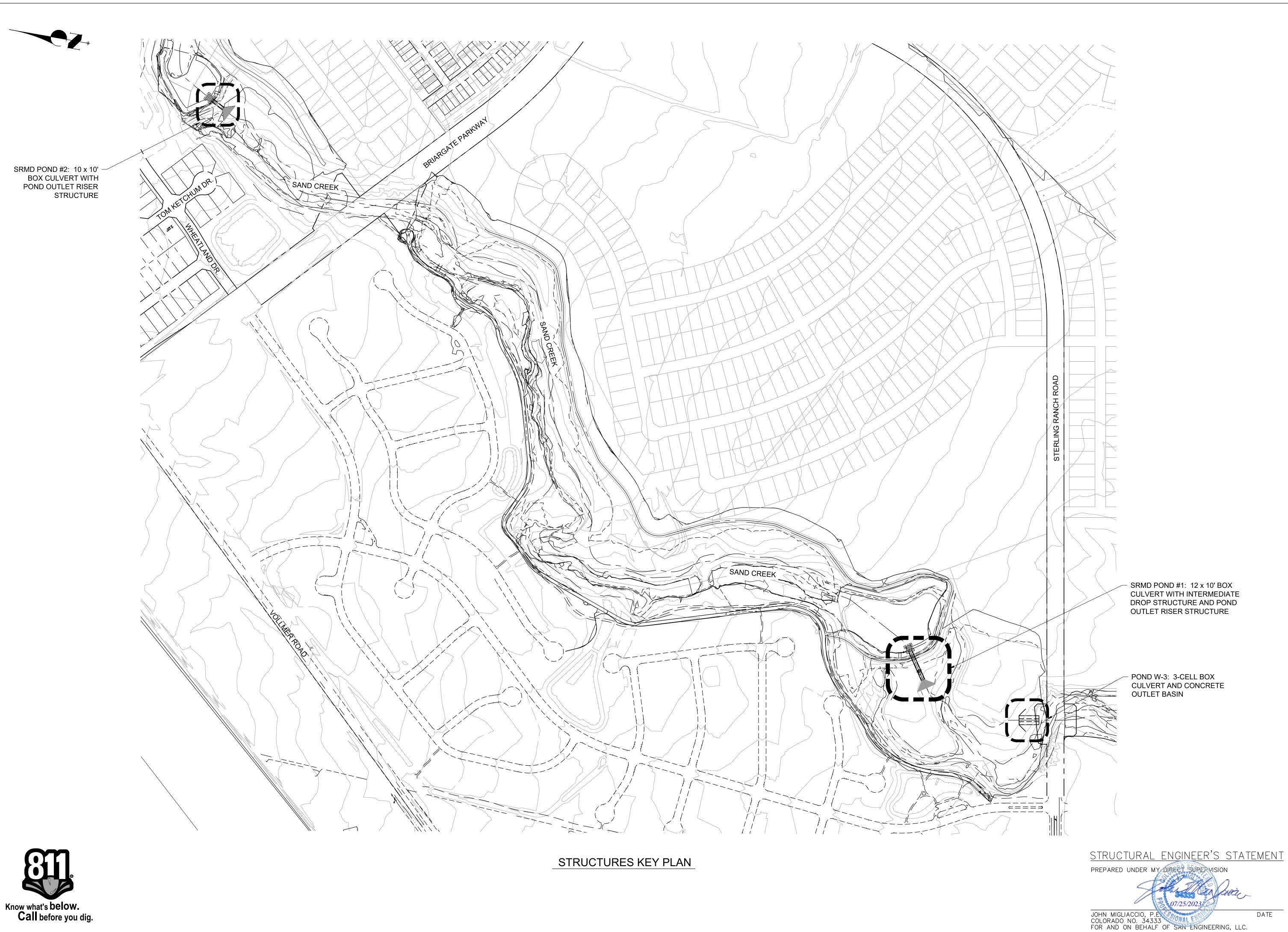
20 OLO

Know what's below Call before you dig.

EMBED. =

**EMEBDMENT** 

EQ. = EQUALLY



UNTIL SUCH TIME AS
THESE DRAWINGS ARE
APPROVED BY THE
APPROPRIATE REVIEWIN
AGENCIES, SAN
ENGINEERING APPROVE
THEIR USE ONLY FOR
PURPOSES DESIGNATED
WRITTEN AUTHORIZATIC

SR LAND, LLC BOULDER CRESCENT ST. RADO SPRINGS, CO 80903 JAMES F. MORLEY

San Engineering LLC
Civil and Structural Engineering
W. Littleton Blvd. #200

 AS NOTED
 No. REVISION
 BY DA

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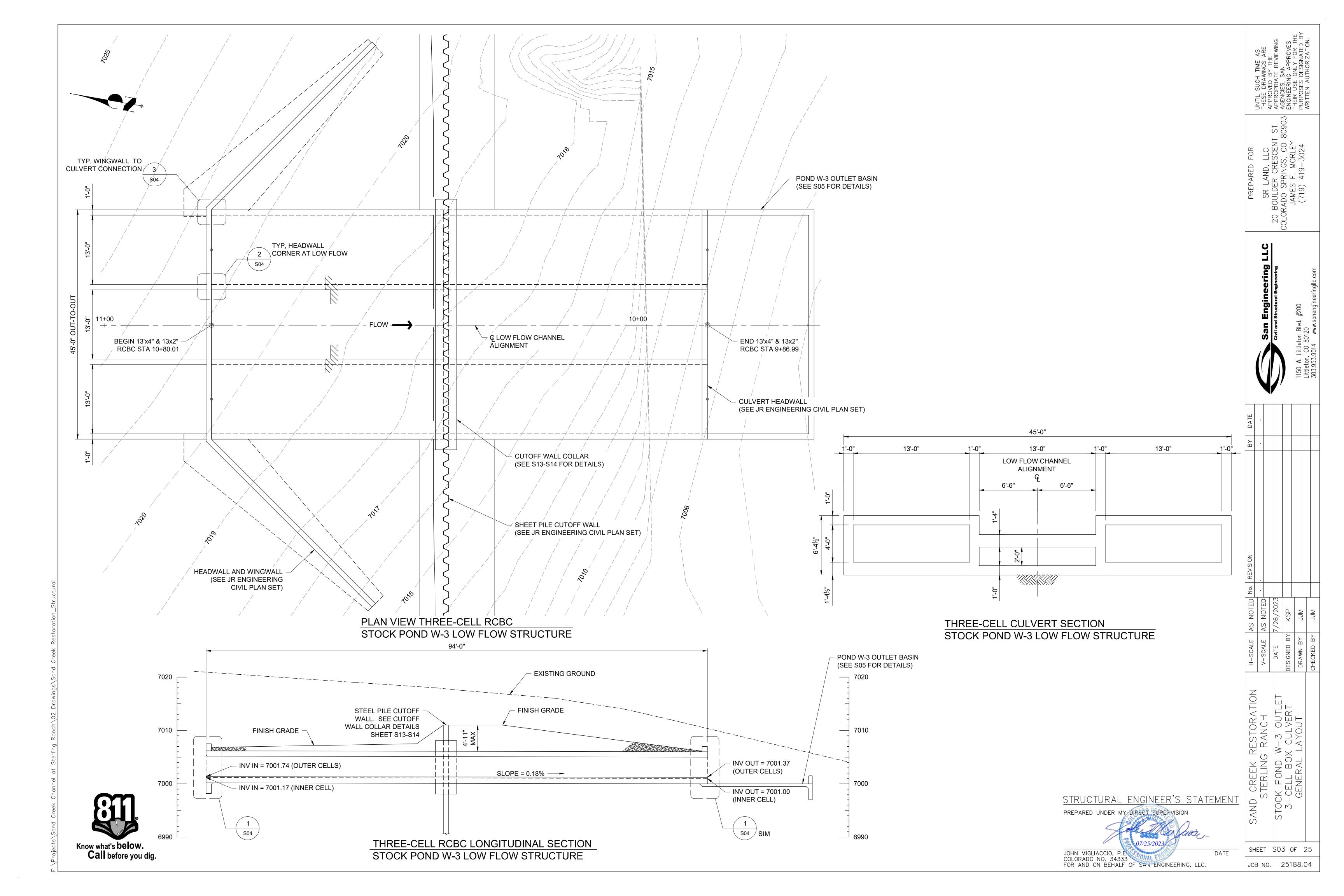
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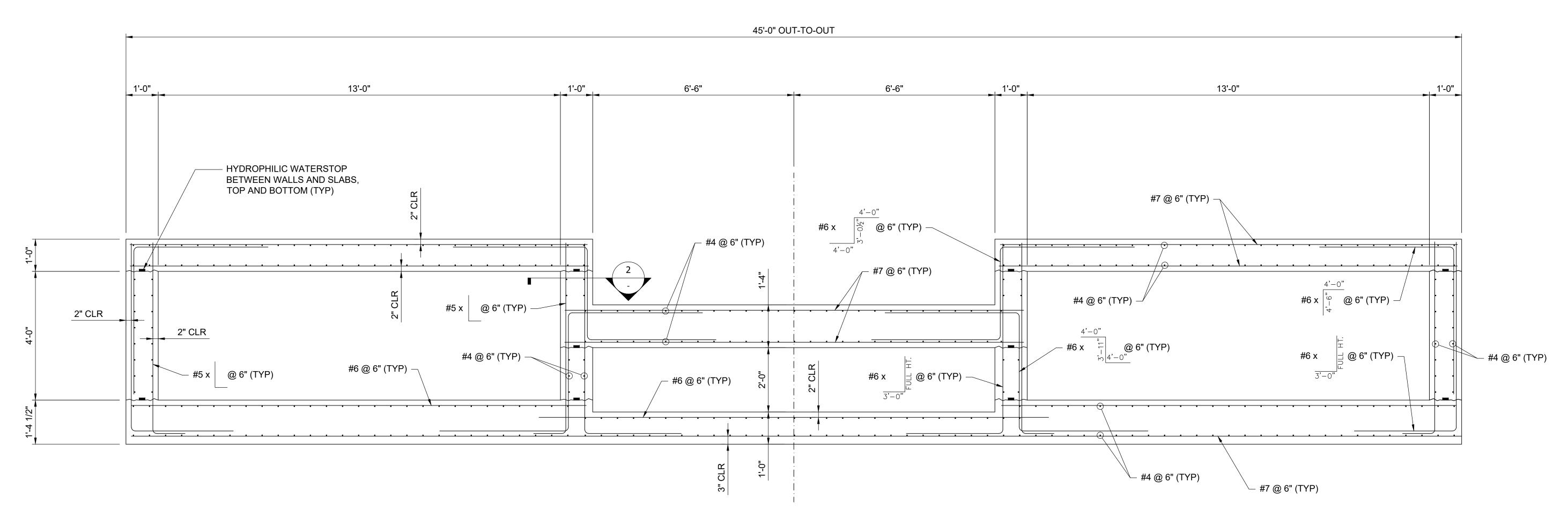
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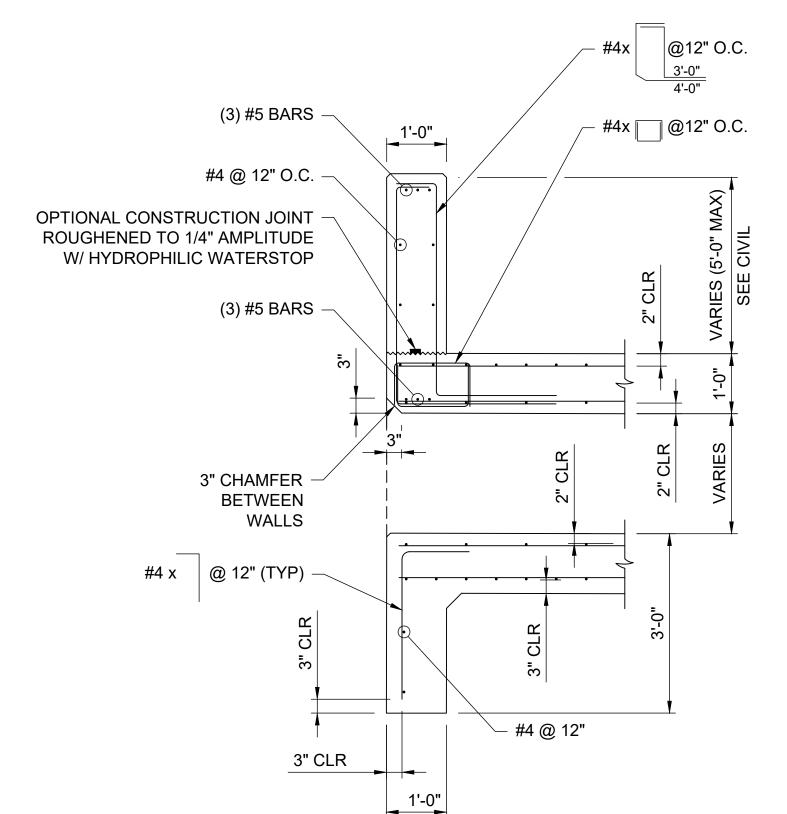
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SHEET SO2 OF 25

JOB NO. 25188.04

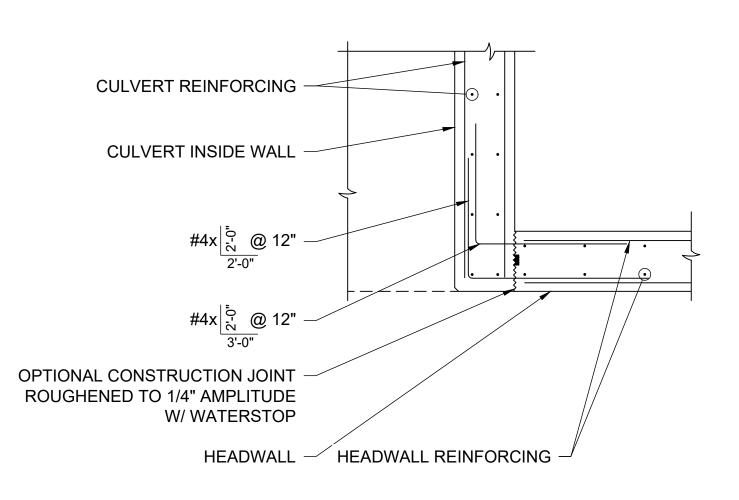




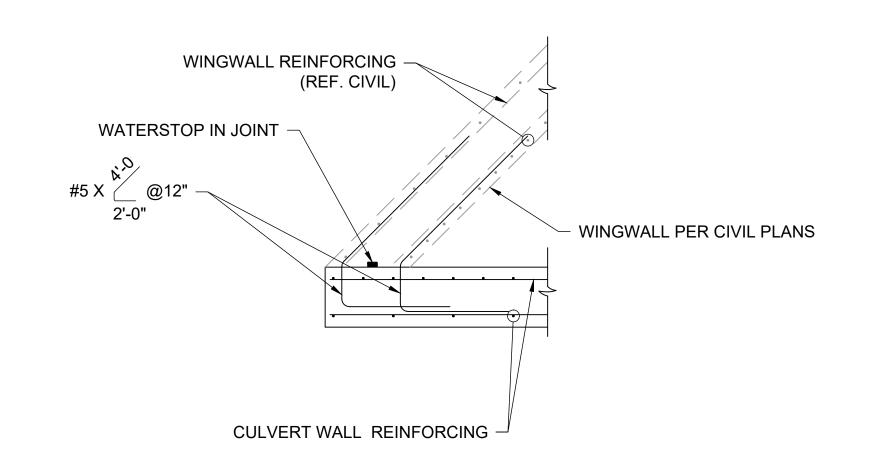


NOTE: OUTLET REINFORCING AT HEADWALL MATCHES DETAILING SHOWN.
TOEWALL AT OUTLET END VARIES AT "SIM". SEE SHEET S05.

1 INLET REINFORCING SECTION STOCK POND W-3 LOW FLOW STRUCTURE A THREE-CELL RCBC TYPICAL SECTION - STOCK POND W-3 LOW FLOW STRUCTURE



2 MIDDLE CELL HEADWALL CORNER DETAIL STOCK POND W-3 LOW FLOW STRUCTURE



3 CULVERT TO WINGWALL CONNECTION

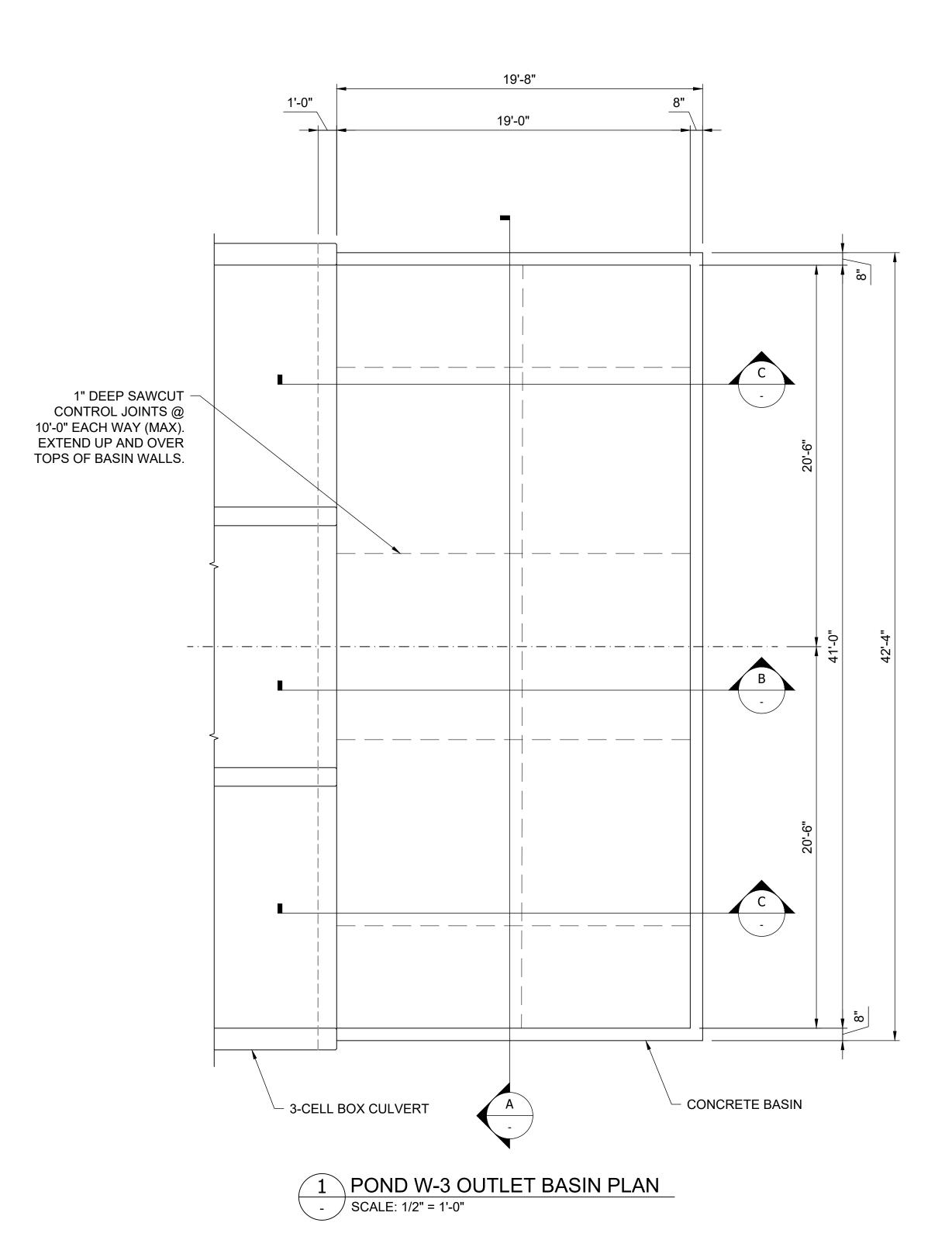
STRUCTURAL ENGINEER'S STATEMENT PREPARED UNDER MY DIRECT SUPERVISION

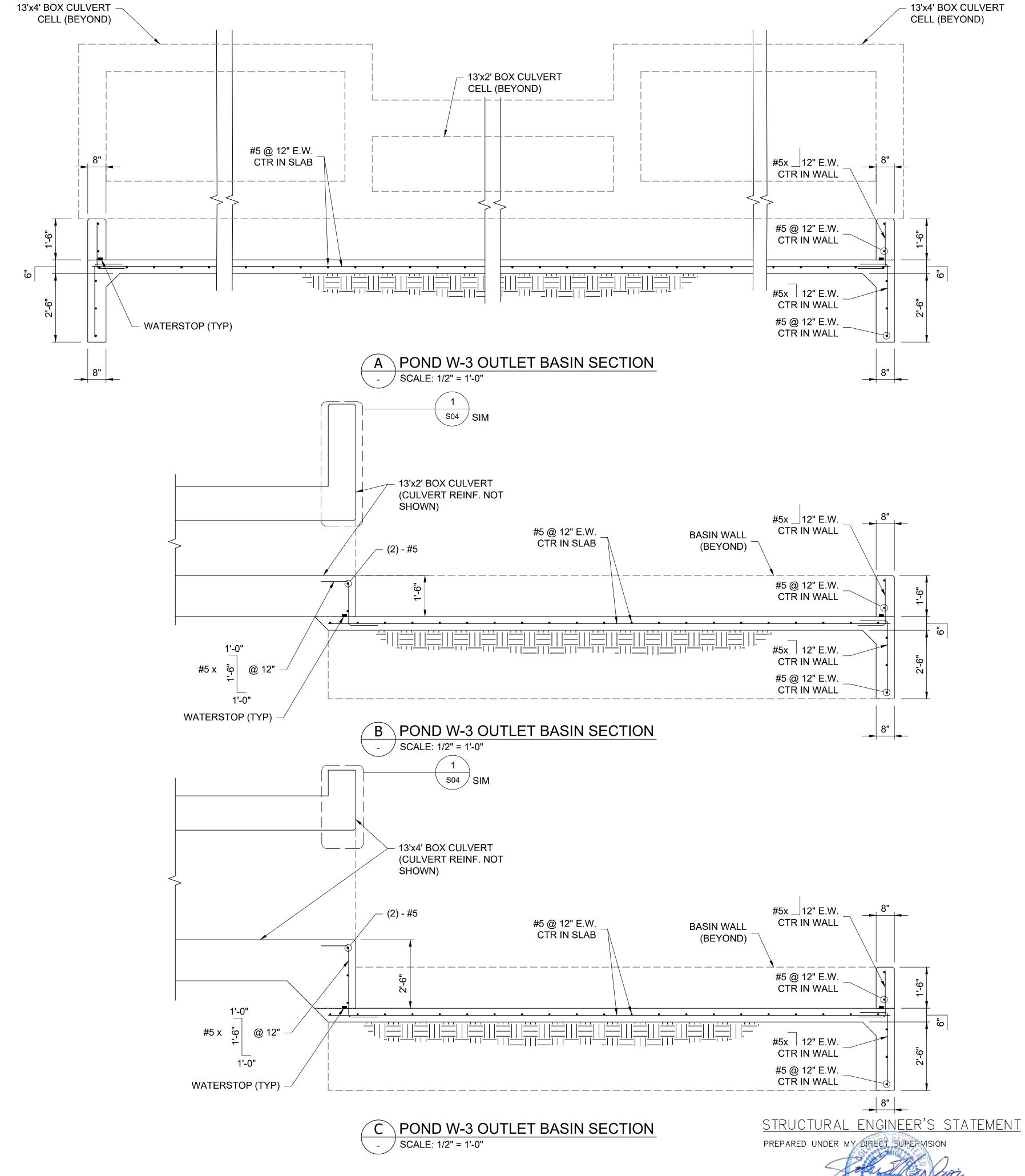
JOHN MIGLIACCIO, P.E. COLORADO NO. 34333 FOR AND ON BEHALF OF SAN ENGINEERING, LLC.

DATE

SHEET SO4 OF 25 JOB NO. 25188.04

Know what's **below. Call** before you dig.





OUTLET EDETAILS

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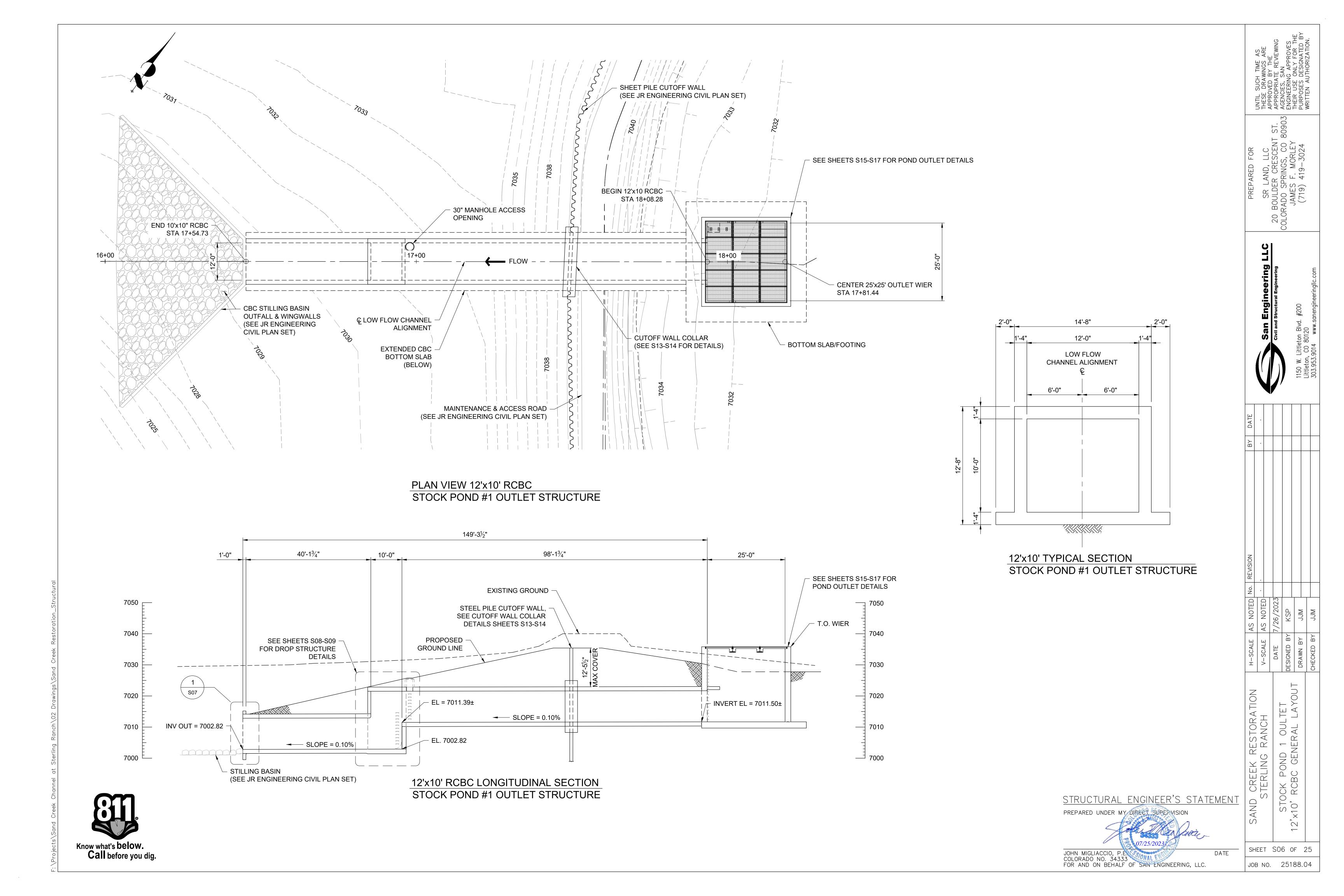
SHEET SO5 OF 25

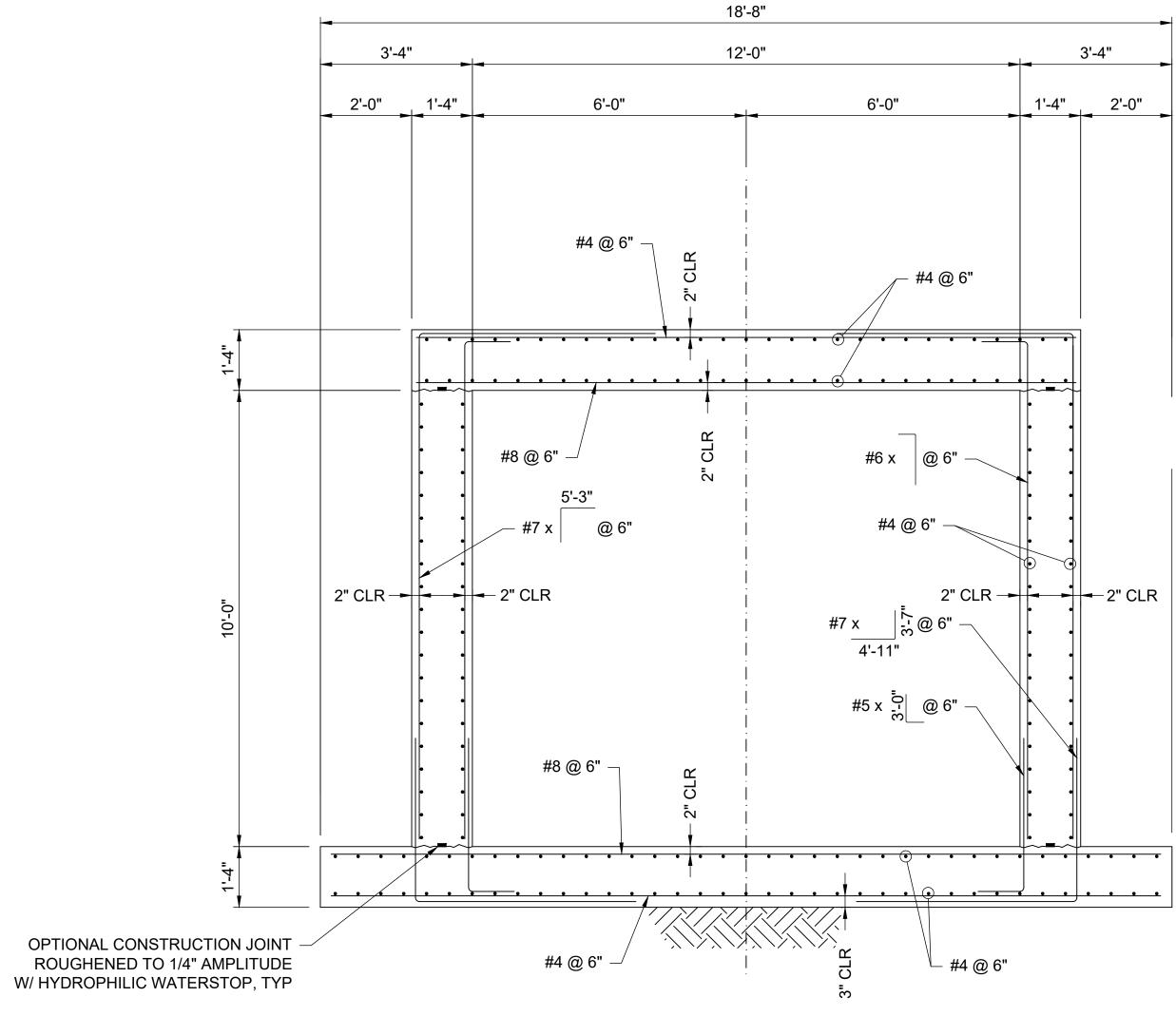
JOB NO. 25188.04

DATE

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







HEADWALL PER COD'T STANDARD DRAWING M-801-1

HEADWALL REINFORCING FER COD'T STANDARD DRAWING M-601-1

STANDARD DRAWING M-601-1

HEADWALL REINFORCING FER COD'T STANDARD DRAWING M-601-1

STANDARD DRAWING M-601-1

WHYDROPHILIC WATERSTOP IN JOINT

WINGWALL REINFORCING

WATERSTOP IN JOINT

WATERSTOP IN JOINT

CULLVERT WALL REINFORCING

A 12'x10' REINFORCING SECTION
- STOCK POND #1 OUTLET STRUCTURE

1 INLET/ OUTLET REINFORCING SECTION

2 CULVERT TO WINGWALL CONNECTION

Know what's below.
Call before you dig.

STRUCTURAL ENGINEER'S STATEMENT PREPARED UNDER MY DIRECT SUPERVISION

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

SHEET S07 OF 25

JOB NO. 25188.04

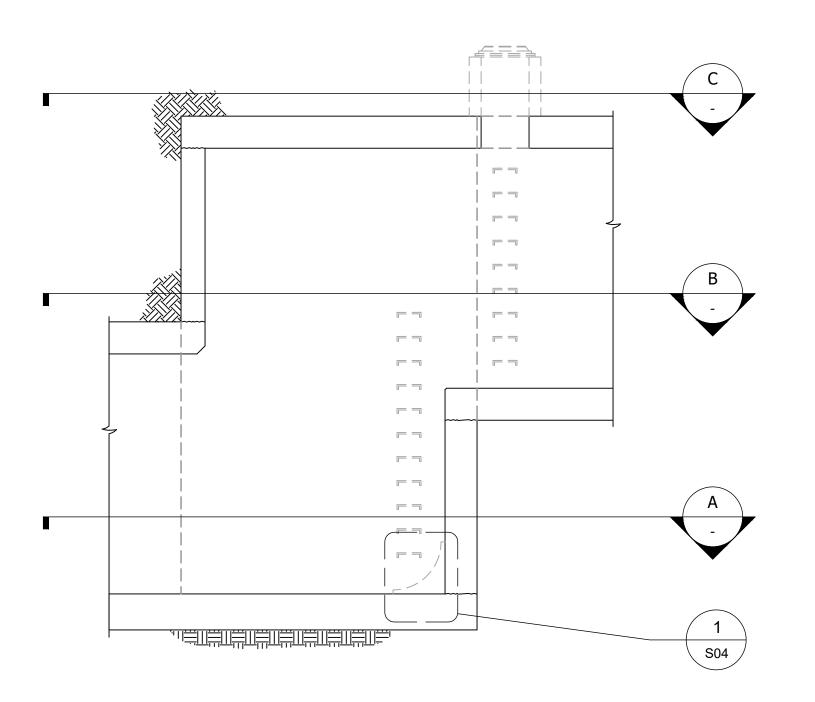
MICONSTRUCTION JOINT
ENED TO 1/4" AMPLITUDE
PHILIC WATERSTOP, TYP

WATERSTOP IN JOINT

WATERSTOP IN JOINT

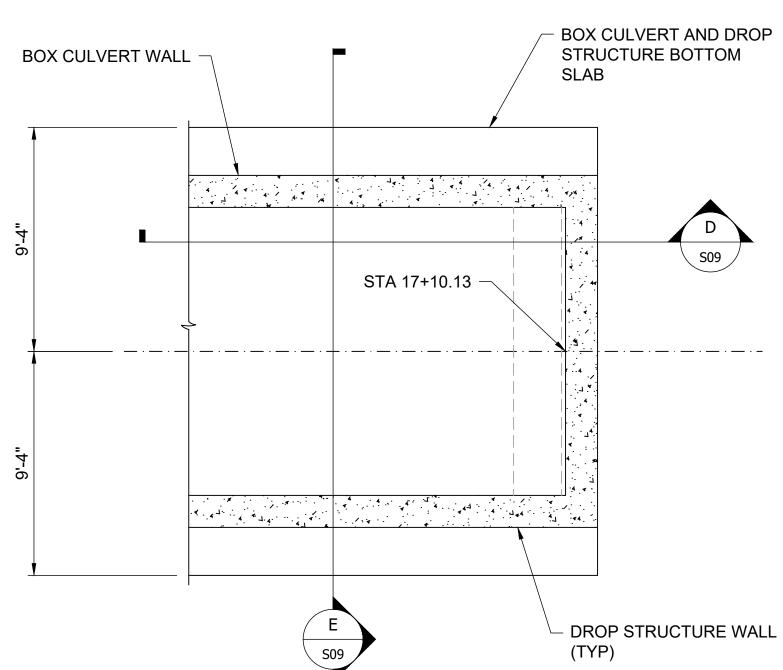
CULVERT WALL REINFORCING

CULVERT WALL REINFORCING

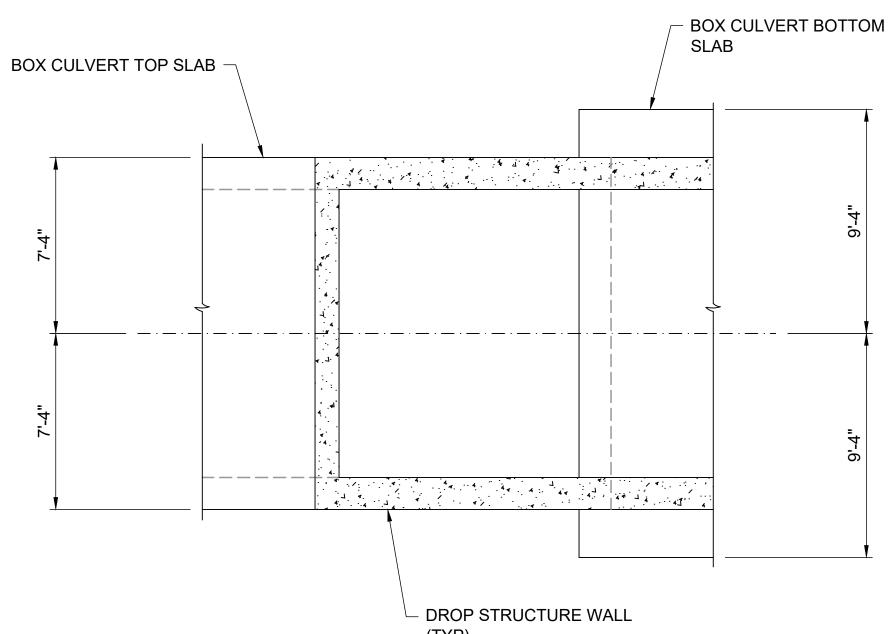


SEE 3/S10 FOR BACKFILL REQUIREMENTS AT DROP STRUCTURE. 2. SEE 2/S10 FOR OPTIONAL CONSTRUCTION JOINT REQUIREMENTS.

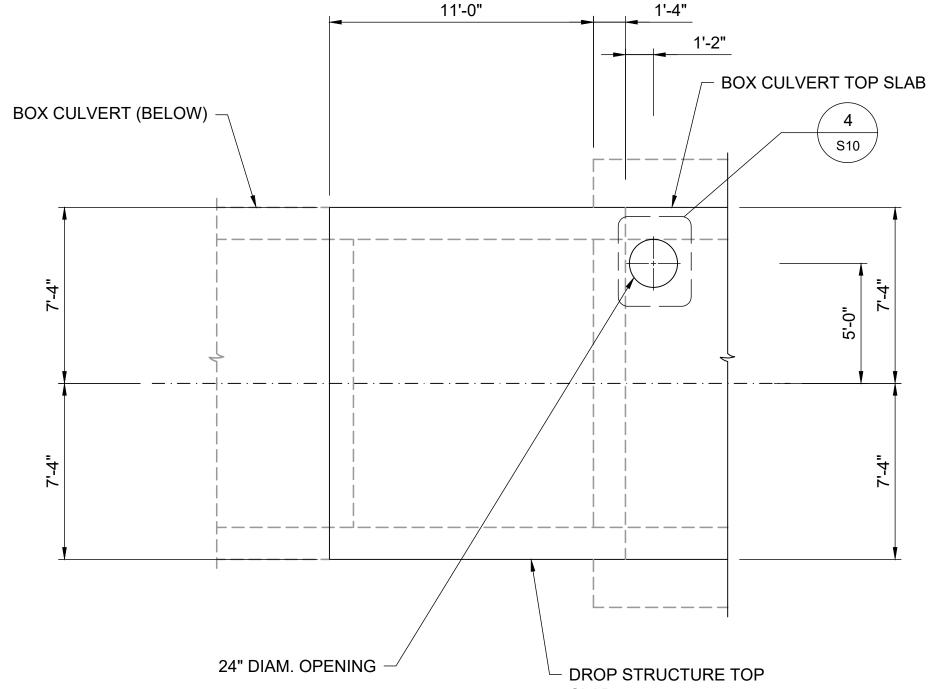
12'x10' RCBC DROP STRUCTURE SECTION SCALE: 1/4" = 1'-0"



A 12'x10' RCBC DROP STRUCTURE PLAN (BOTTOM) - SCALE: 1/4" = 1'-0"



B 12'x10' RCBC DROP STRUCTURE PLAN (MIDDLE)



C 12'x10' RCBC DROP STRUCTURE PLAN (TOP) - SCALE: 1/4" = 1'-0"



STRUCTURAL ENGINEER'S STATEMENT PREPARED UNDER MY DIRECT SUPERVISION

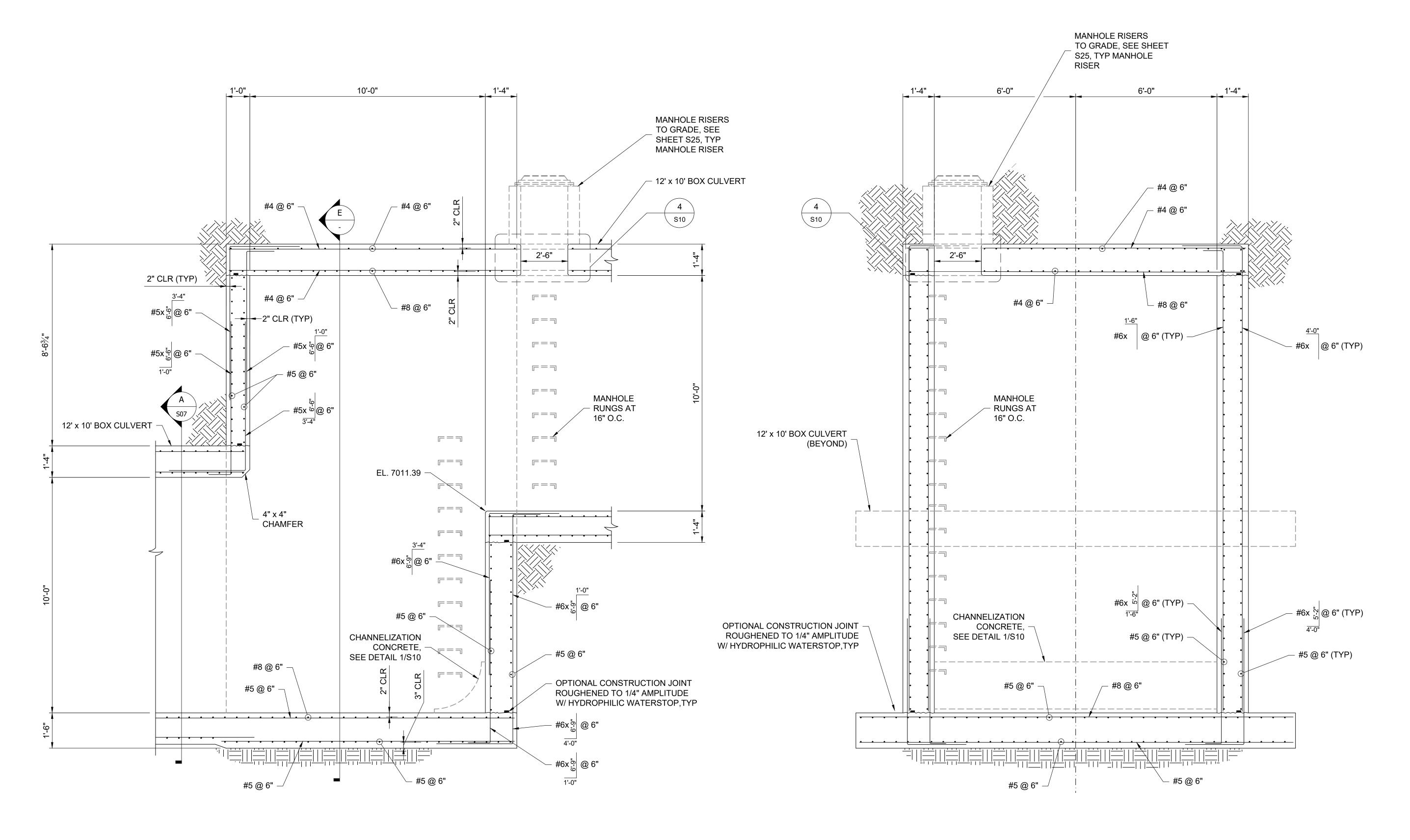
JOHN MIGLIACCIO, P.E. COLORADO NO. 34333 FOR AND ON BEHALF OF SAN ENGINEERING, LLC.

DATE

SHEET SO8 OF 25 JOB NO. 25188.04

12,×1(

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



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

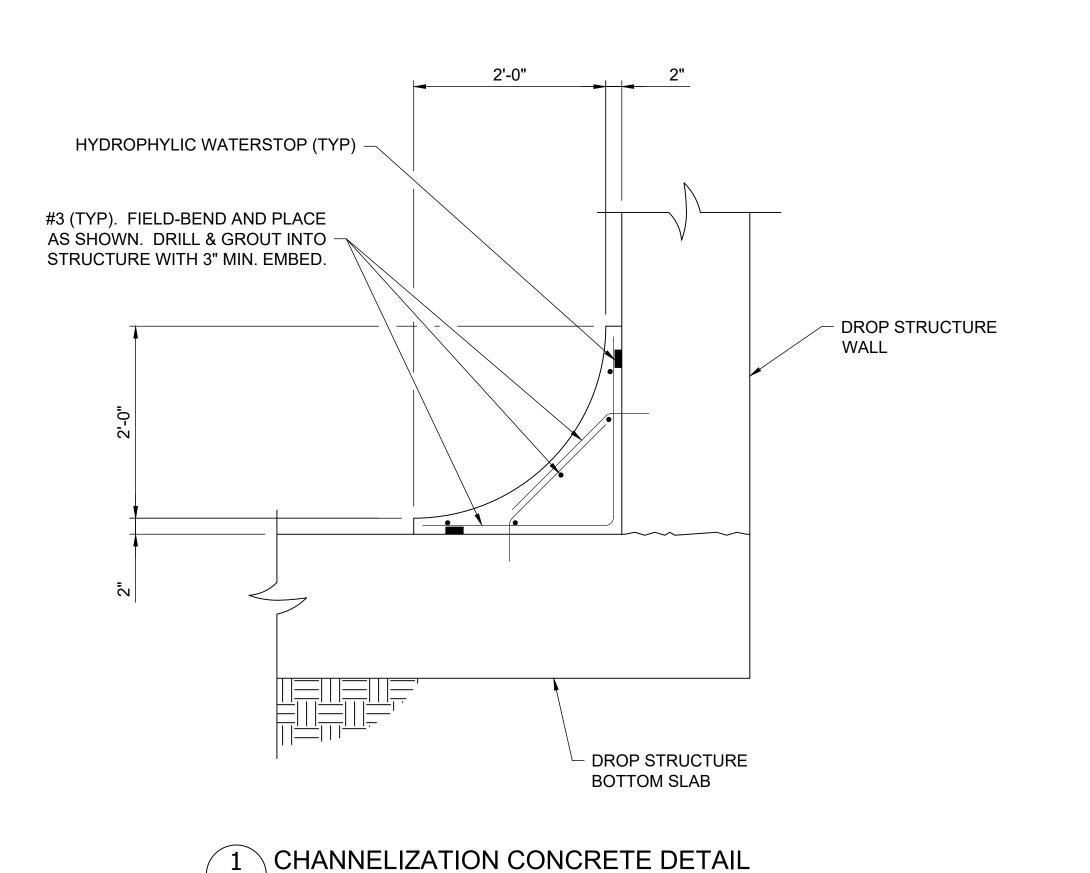
E 12'x10' RCBC DROP STRUCTURE REINFORCING SECTION - SCALE: 1/2" = 1'-0"



STRUCTURAL ENGINEER'S STATEMENT PREPARED UNDER MY DIRECT SUPERVISION JOHN MIGLIACCIO, P.E. COLORADO NO. 34333 FOR AND ON BEHALF OF SAN ENGINEERING, LLC. DATE

SHEET SO9 OF 25 JOB NO. 25188.04

SAND CREEK RESTORATION
STERLING RANCH
STOCK POND 1 OUTLET
12'x10' RCBC DROP STRUCTURE
REINFORCING SECTIONS



**(5)** CONSTRUCTION JOINT 4 OPTIONAL CONSTRUCTION JOINT - CONSTRUCTION JOINT

(#) 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.

OPTIONAL CONSTRUCTION JOINT DIAGRAM

STABILIZED -SUBGRADE, SEE SHEET S24 FOR ADDITIONAL REQUIREMENTS

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

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

@ 3" (EACH SIDE) - MH STEPS BOX CULVERT (BELOW) -\_\_\_\_\_\_ ─ 30" DIAMETER MH ACCESS - #4 x 3'-0" TRIM BARS - (3) #5 x 5'-0" - (3) #8 BOTTOM SLAB (EACH SIDE)

Know what's below.

Call before you dig.

4 12'x10' RCBC ADDITIONAL REINFORCING AT MANHOLE OPENING SCALE: 1/2" = 1'-0"

STRUCTURAL ENGINEER'S STATEMENT PREPARED UNDER MY DIRECT SUPERVISION

- STABILIZED

REQUIREMENTS

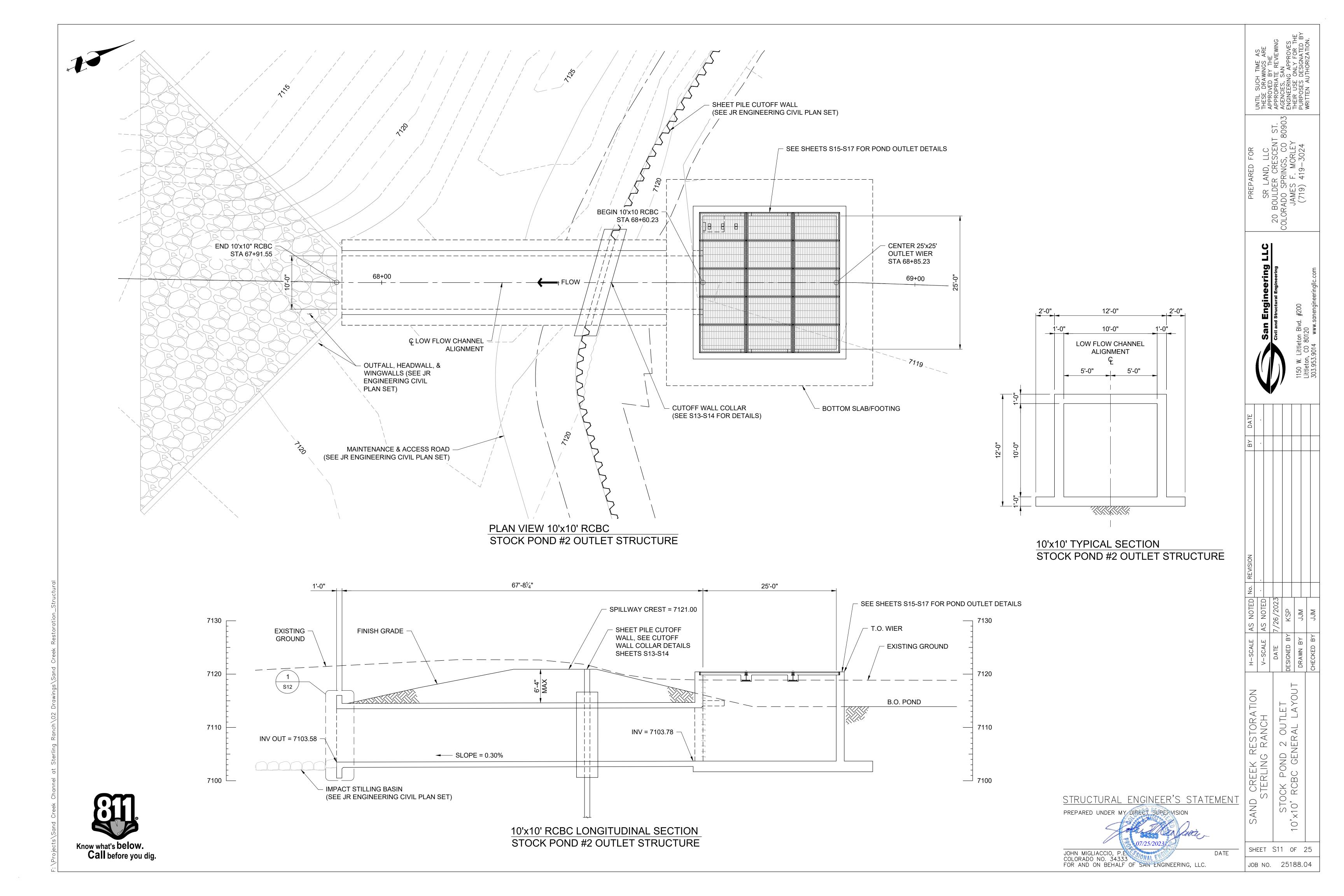
SUBGRADE, SEE SHEET S24 FOR ADDITIONAL

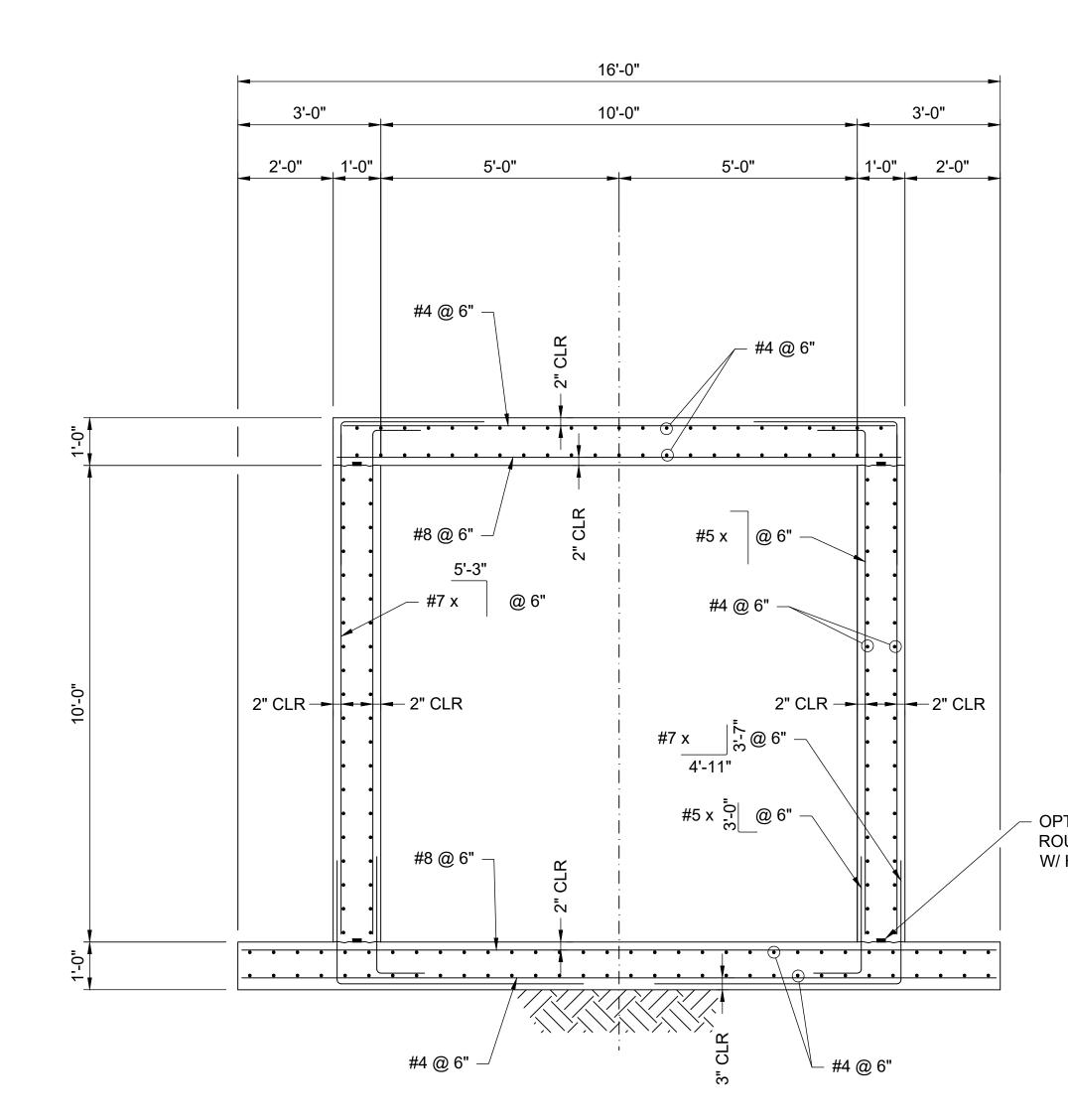
San Civil and

12,×10' MISC SHEET S10 OF 25 DATE

JOB NO. 25188.04

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





A 10'x10' REINFORCING SECTION

- STOCK POND #2 OUTLET STRUCTURE

- OPTIONAL CONSTRUCTION JOINT ROUGHENED TO 1/4" AMPLITUDE W/ HYDROPHILIC WATERSTOP, TYP

OPTIONAL CONSTRUCTION JOINT

ROUGHENED TO 1/4" AMPLITUDE W/ HYDROPHILIC WATERSTOP

3" CHAMFER BETWEEN

WALLS

3" CLR

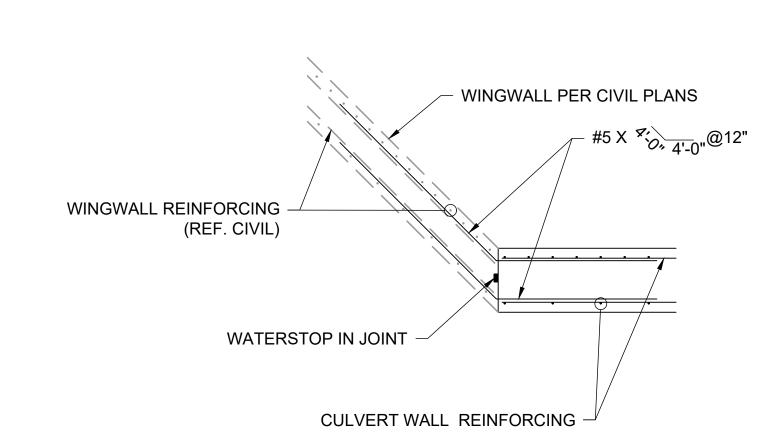
1 INLET/ OUTLET REINFORCING SECTION

HEADWALL PER CDOT

STANDARD DRAWING M-601-1

HEADWALL REINFORCING PER

CDOT STANDARD DRAWING M-601-1



2 CULVERT TO WINGWALL CONNECTION

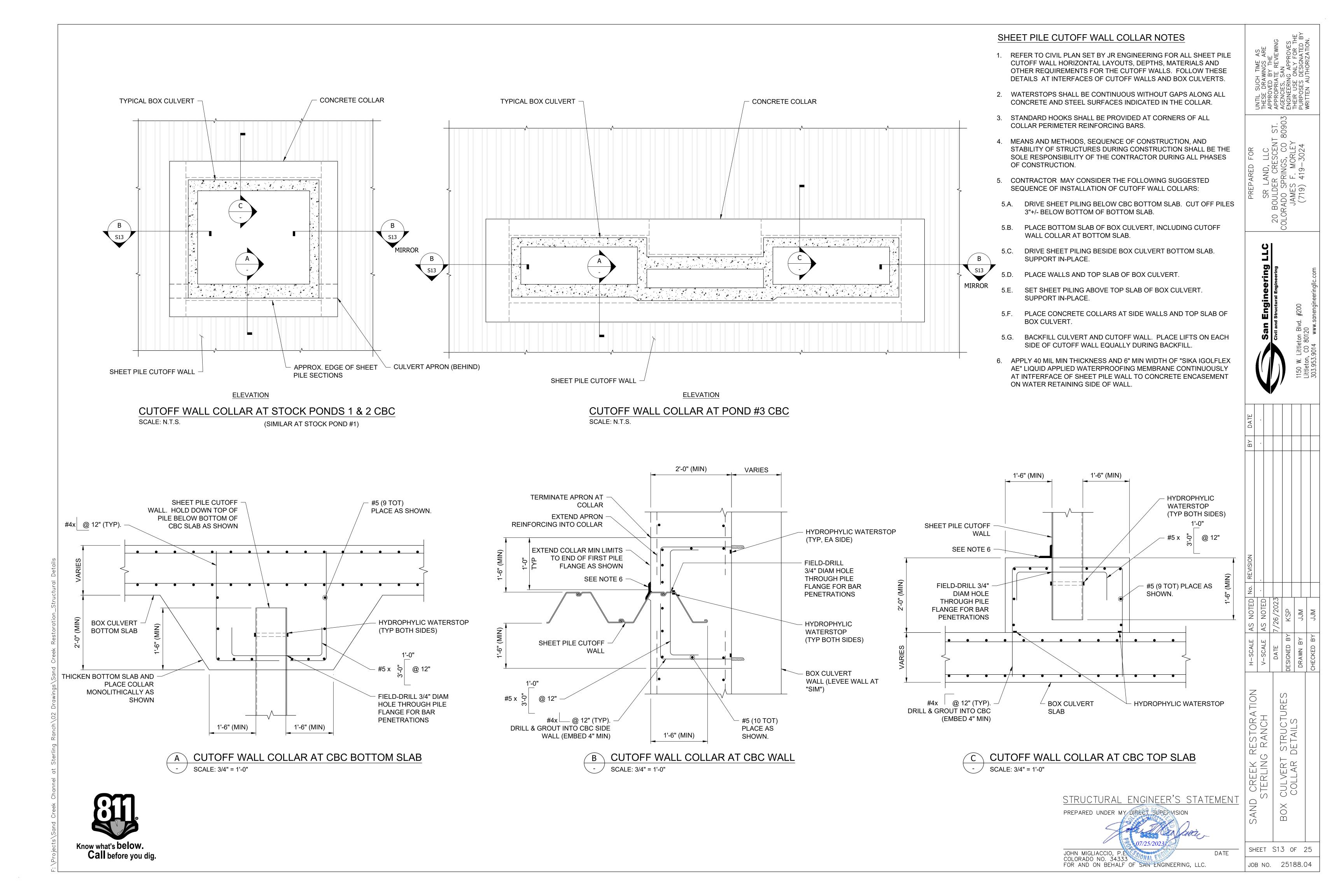
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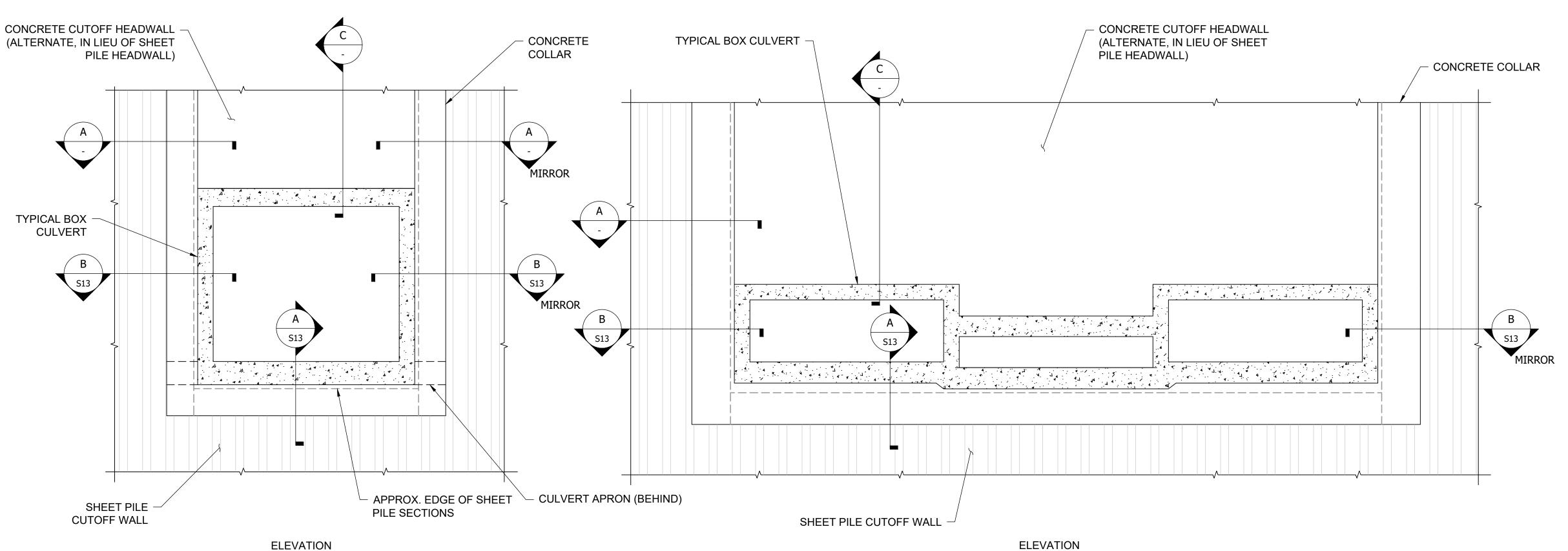
STRUCTURAL ENGINEER'S STATEMENT

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

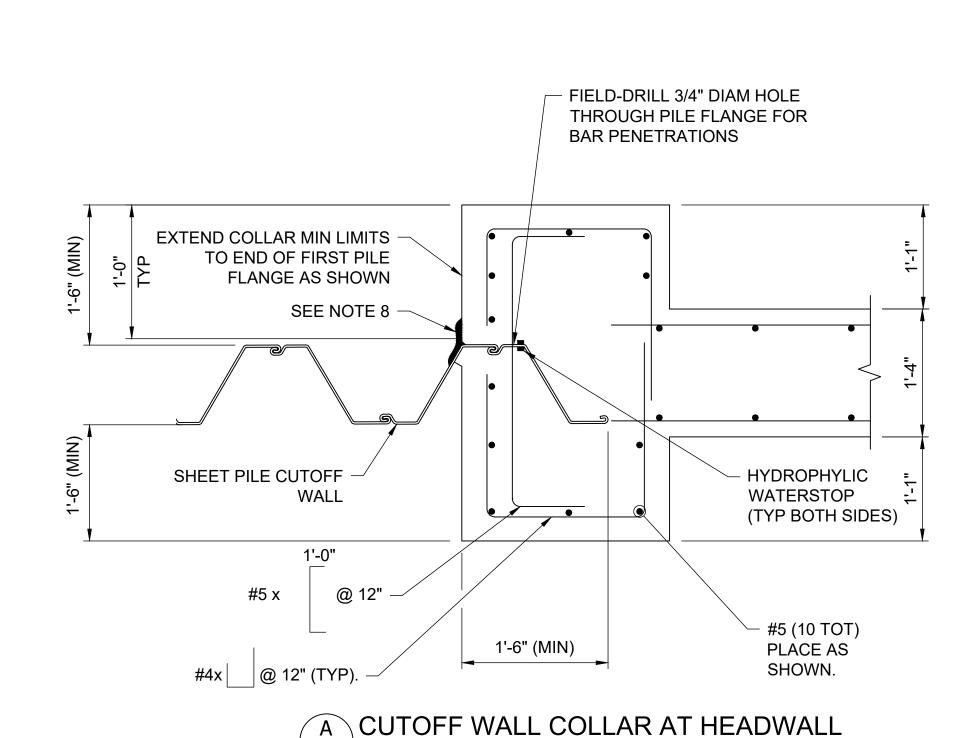
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SHEET S12 OF 25 JOB NO. 25188.04





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



SCALE: 3/4" = 1'-0"

CUTOFF WALL COLLAR AT STOCK PONDS 1 & 2 CBC

(SIMILAR AT STOCK POND #1)

SCALE: N.T.S.

1'-4" **CUTOFF HEADWALL** WATER RETENTION **FACE** #5x @ 6" #4 @ 12" (TYP). #4x @ 12" HYDROPHYLIC WATERSTOP CONSTRUCTION JOINT, **ROUGHENED TO 1/4"** (TYP, EA SIDE) **AMPLITUDE** - CULVERT **CULVERT** REINFORCEMENT REINFORCEMENT **BOX CULVERT** 

C CUTOFF HEADWALL AT CBC TOP SLAB

SCALE: 3/4" = 1'-0"

SHEET PILE CUTOFF WALL ALTERNATE COLLAR NOTES

1. DETAILS SHOWN ARE AN ALTERNATE CONFIGURATION TO THOSE SHOWN ON S-13. CONTRACTOR SHALL SELECT APPROPRIATE CONFIGURATION BASED ON CONSTRUCTABILITY PREFERENCES.

2. 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.

3. WATERSTOPS SHALL BE CONTINUOUS WITHOUT GAPS ALONG ALL CONCRETE AND STEEL SURFACES INDICATED IN THE COLLAR.

4. STANDARD HOOKS SHALL BE PROVIDED AT CORNERS OF ALL COLLAR PERIMETER REINFORCING BARS.

5. 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.

6. 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.

PLACE CONCRETE COLLARS AT SIDE WALLS OF BOX CULVERT AND HEADWALL WITH END COLLARS. SUPPORT IN-PLACE.

BACKFILL CULVERT AND CUTOFF WALL.

7. BACKFILL EACH SIDE OF THE WALL IN EQUAL LIFTS AND NO GREATER THAN 2'-0" DIFFERENCE.

8. APPLY 40 MIL MIN THICKNESS AND 6" MIN WIDTH OF "SIKA IGOLFLEX AE" LIQUID APPLIED WATERPROOFING MEMBRANE CONTINUOUSLY AT INTFERFACE OF SHEET PILE WALL TO CONCRETE ENCASEMENT ON WATER RETAINING SIDE OF WALL.

r ST. 80903

SR LAND, LLC
20 BOULDER CRESCENT S
COLORADO SPRINGS, CO 8C
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San Civil and

STRUCTURES LLAR DETAILS

BOX CULVERT S Alternate coli

SHEET S14 OF 25

JOB NO. 25188.04

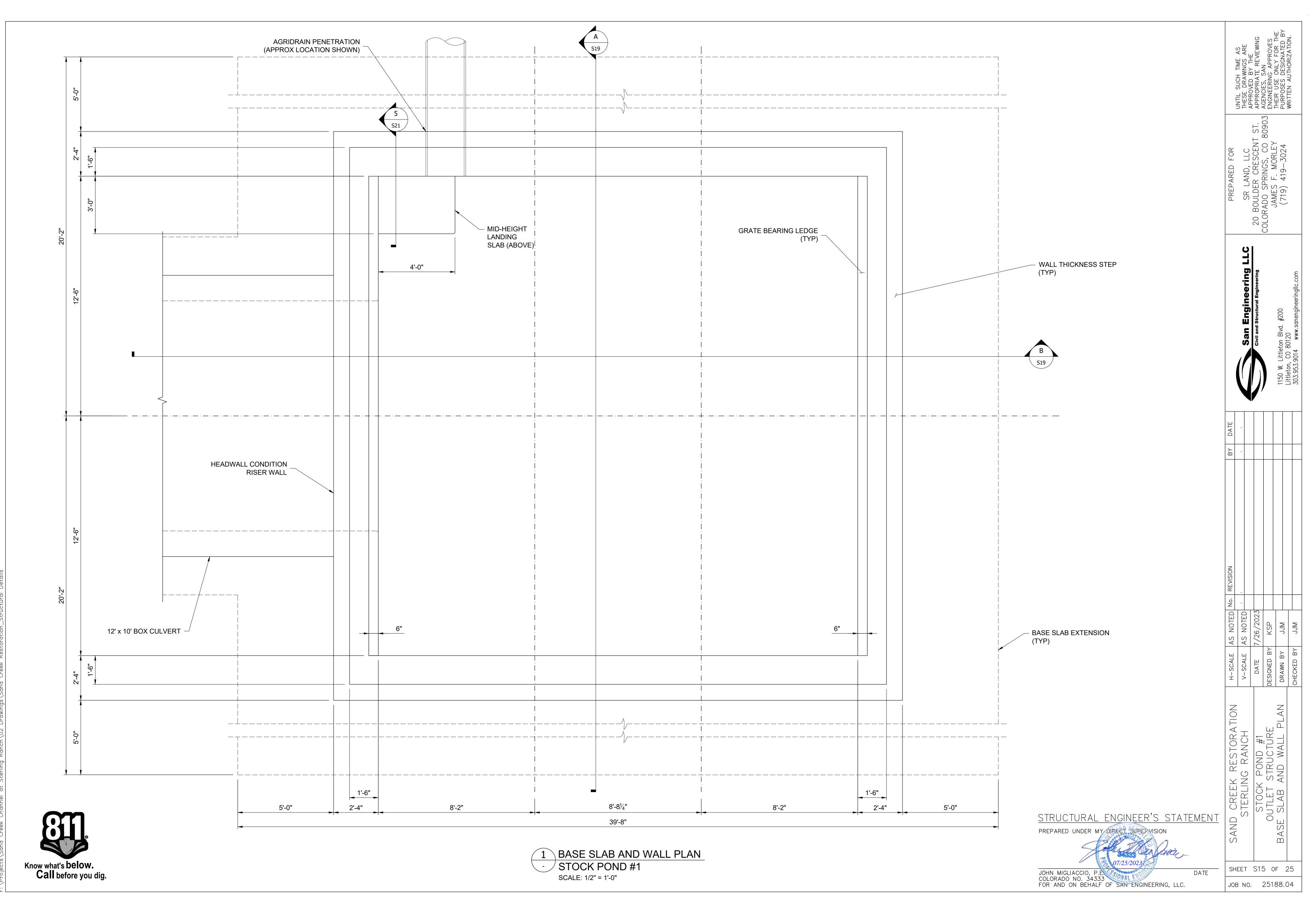
STRUCTURAL ENGINEER'S STATEMENT

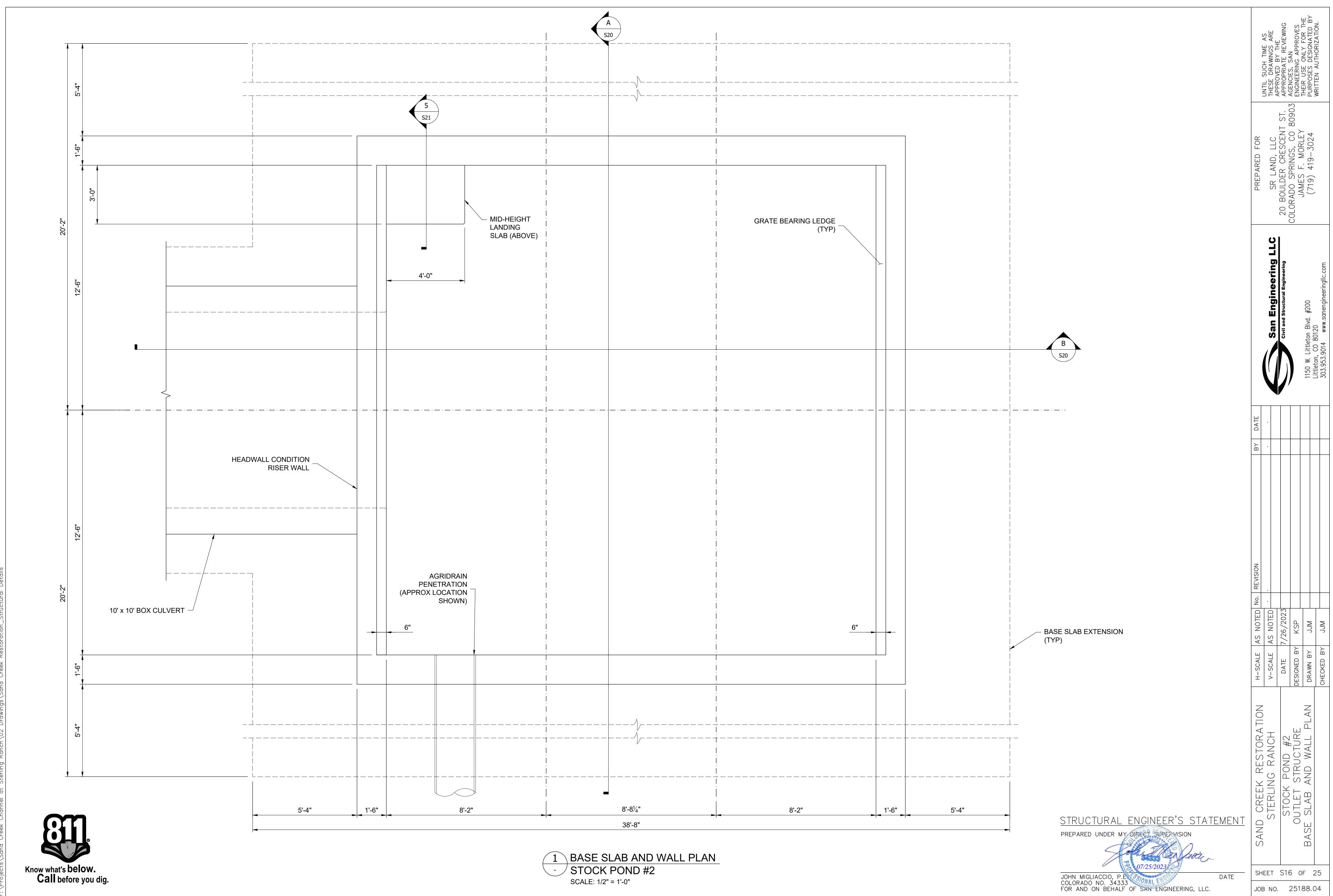
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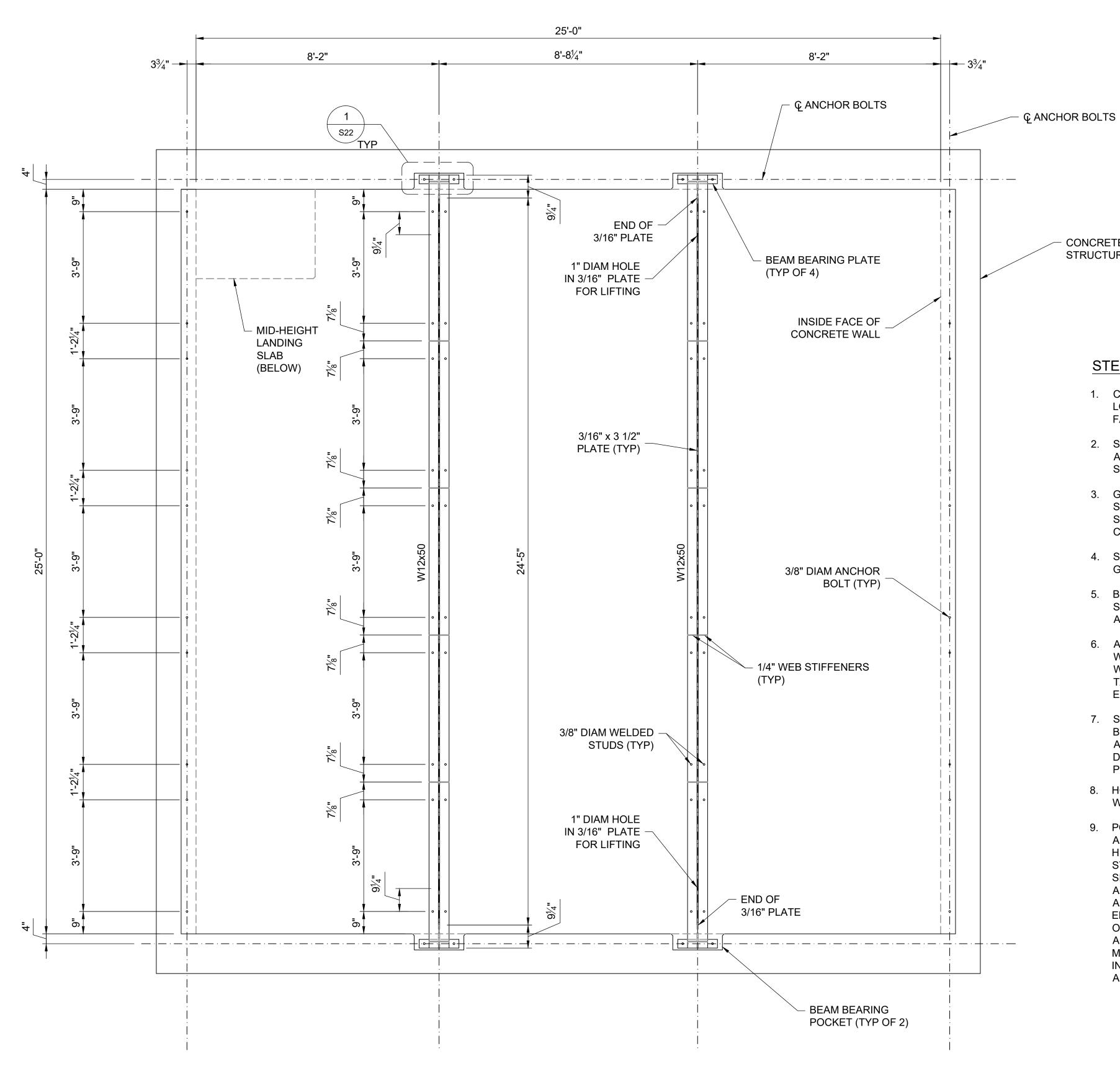
JOHN MIGLIACCIO, P.E. COLORADO NO. 34333 FOR AND ON BEHALF OF SAN ENGINEERING, LLC.







Projects\Sand Creek Channel at Sterling Ranch\02 Drawings



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

STEEL FRAMING AND GRATE NOTES

CONCRETE POND RISER

STRUCTURE

- 1. CONTRACTOR SHALL VERIFY ALL CONCRETE DIMENSIONS, LOCATIONS, AND ELEVATIONS PRIOR TO START OF GRATE
- 2. SHOP DRAWINGS FOR ALL STRUCTURAL STEEL FRAMING, GRATING, AND ATTACHMENTS SHALL BE SUBMITTED FOR APPROVAL PRIOR TO START OF FABRICATION.
- 3. 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.
- 4. STRUCTURAL TUBING MEMBERS SHALL CONFORM TO ASTM A500, GRADE B, AND PIPE ASTM A53, GRADE B.
- 5. 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.
- 6. 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
- 7. 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).
- 8. HOLLOW STRUCTURAL STEEL TUBES SHALL BE FABRICATED WITH WEEP HOLES AT LOW ENDS FOR DRAINAGE.
- 9. 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.

STRUCTURAL ENGINEER'S STATEMENT PREPARED UNDER MY DIRECT SUPERVISION

JOHN MIGLIACCIO, P.E.

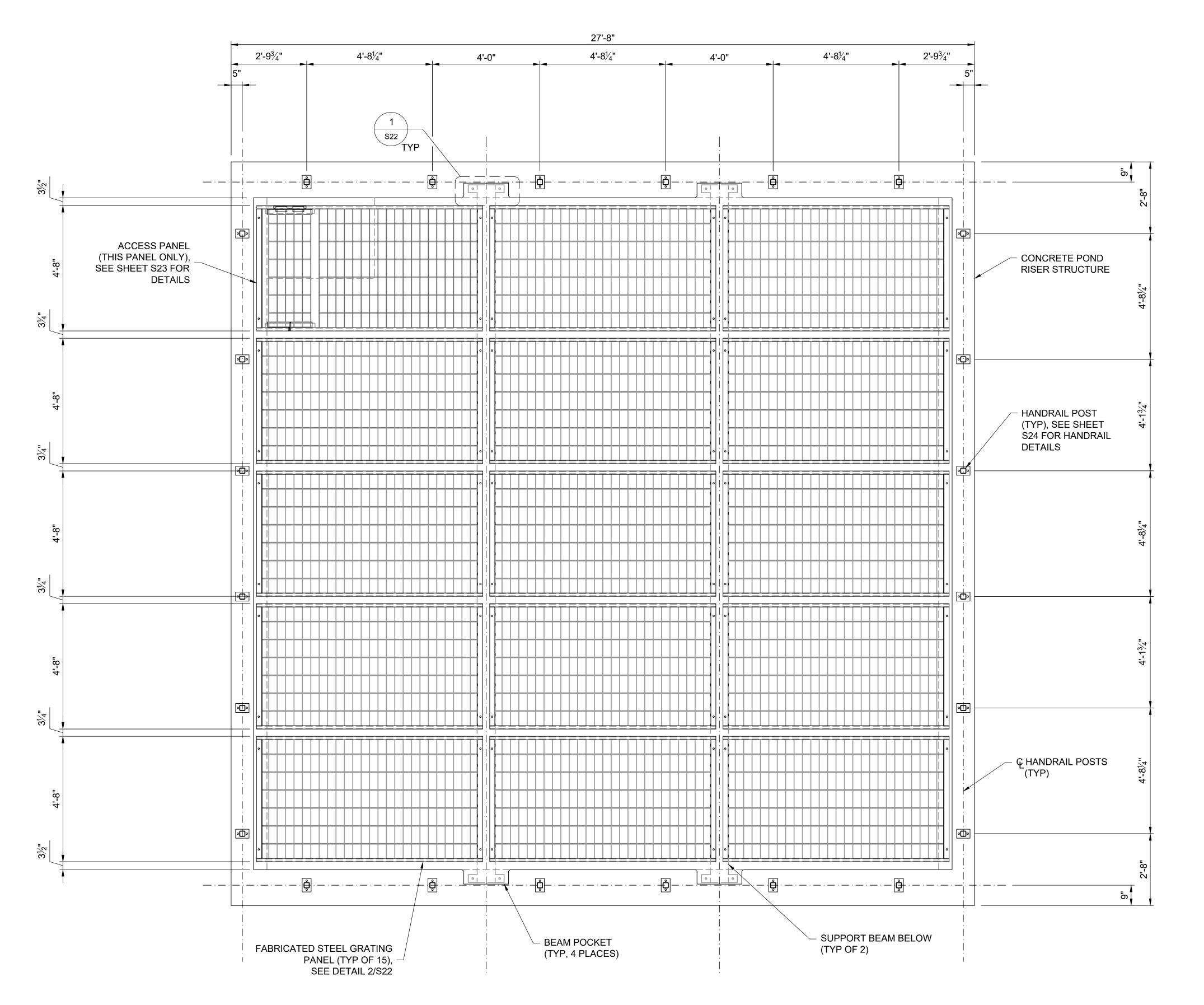
DATE COLORADO NO. 34333 FOR AND ON BEHALF OF SAN ENGINEERING, LLC.

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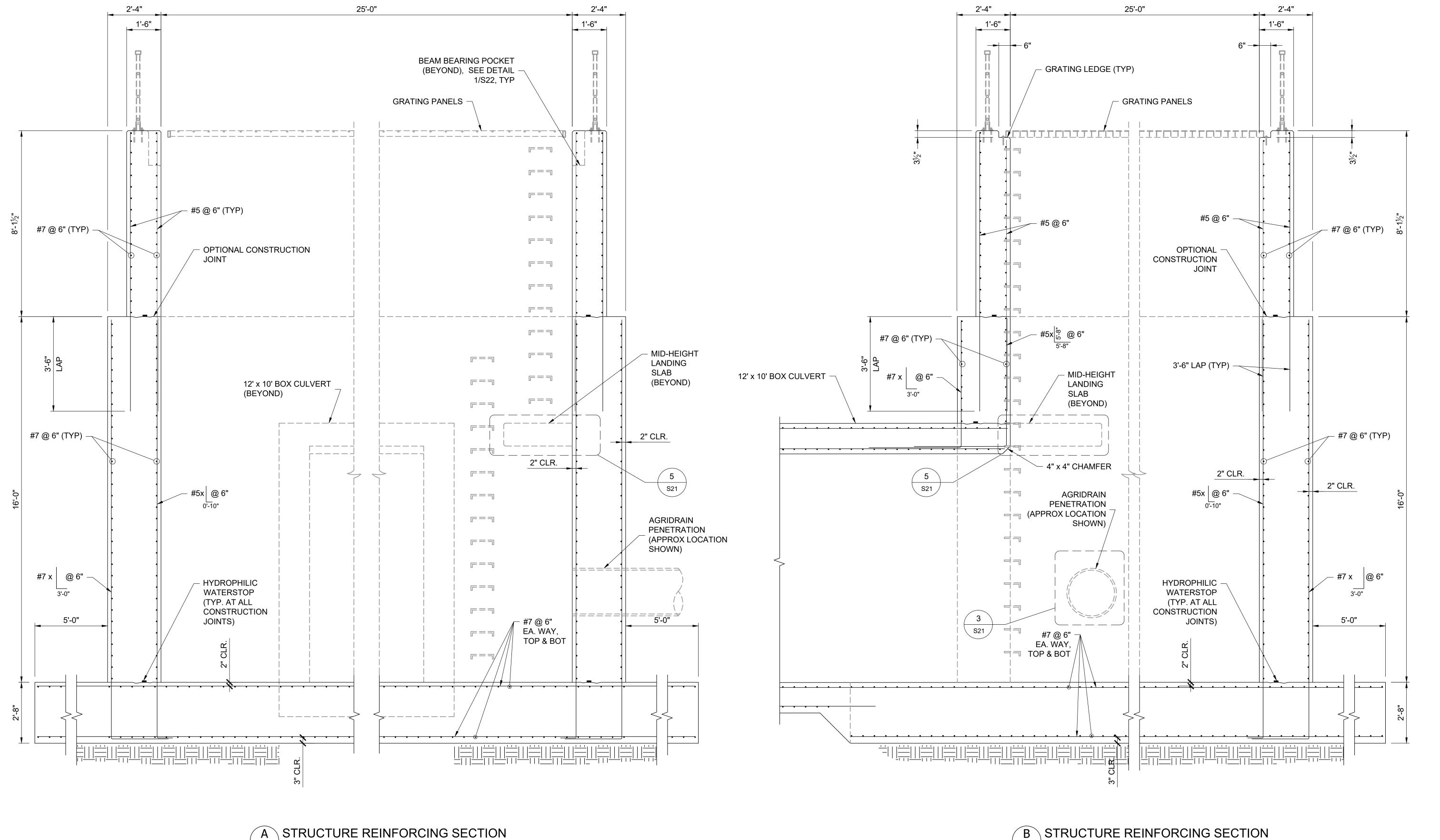


GRATING AND HANDRAIL PLAN STOCK PONDS #1 AND #2 OUTLET WIERS SCALE: 1/2" = 1'-0"



STRUCTURAL ENGINEER'S STATEMENT PREPARED UNDER MY DIRECT SUPERVISION JOHN MIGLIACCIO, P.E. COLORADO NO. 34333 FOR AND ON BEHALF OF SAN ENGINEERING, LLC. DATE

SHEET S18 OF 25 JOB NO. 25188.04



A STRUCTURE REINFORCING SECTION

- STOCK POND #1

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

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



STRUCTURAL ENGINEER'S STATEMENT

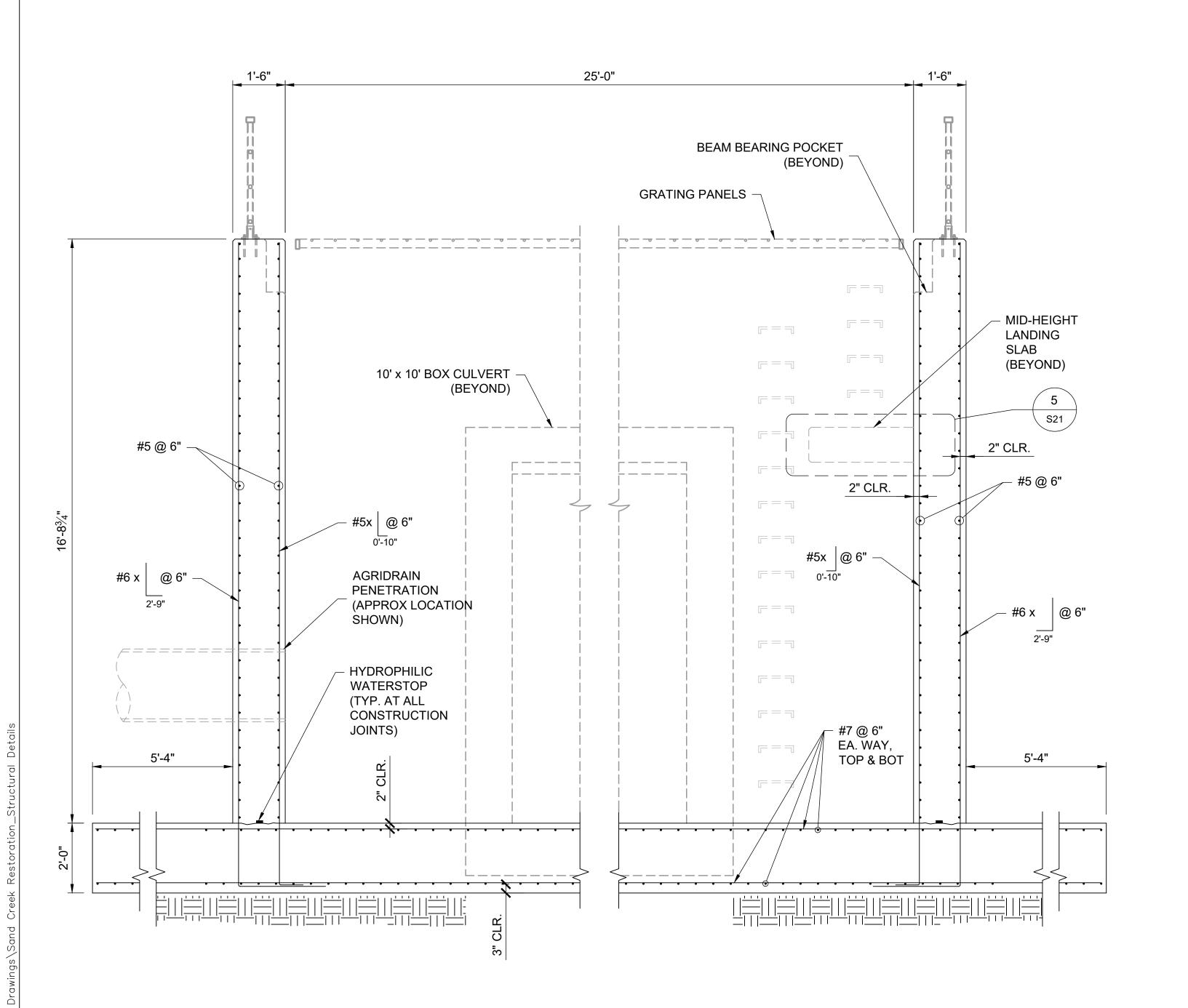
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07/25/2023

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

SHEET S19 OF 25

JOB NO. 25188.04



25'-0" 1'-6" - GRATING LEDGE (TYP) - GRATING PANELS #5 @ 6" (TYP) 10' x 10' BOX CULVERT MID-HEIGHT LANDING @ 6" (BEYOND) 2" CLR. 2" CLR. HYDROPHILIC WATERSTOP (TYP. AT ALL CONSTRUCTION JOINTS) 5'-4" ■ EA. WAY, TOP & BOT • • •

A STRUCTURE REINFORCING SECTION

- STOCK POND #2

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

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



STRUCTURAL ENGINEER'S STATEMENT

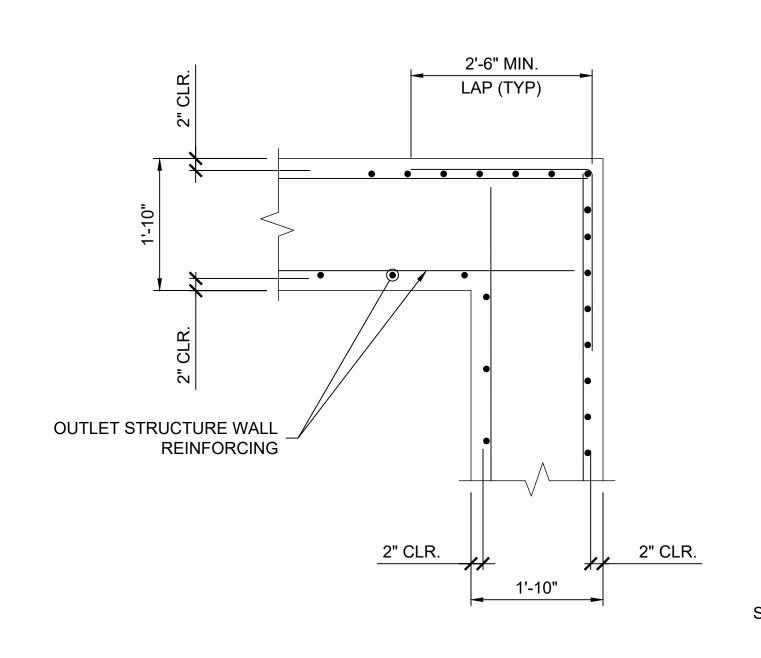
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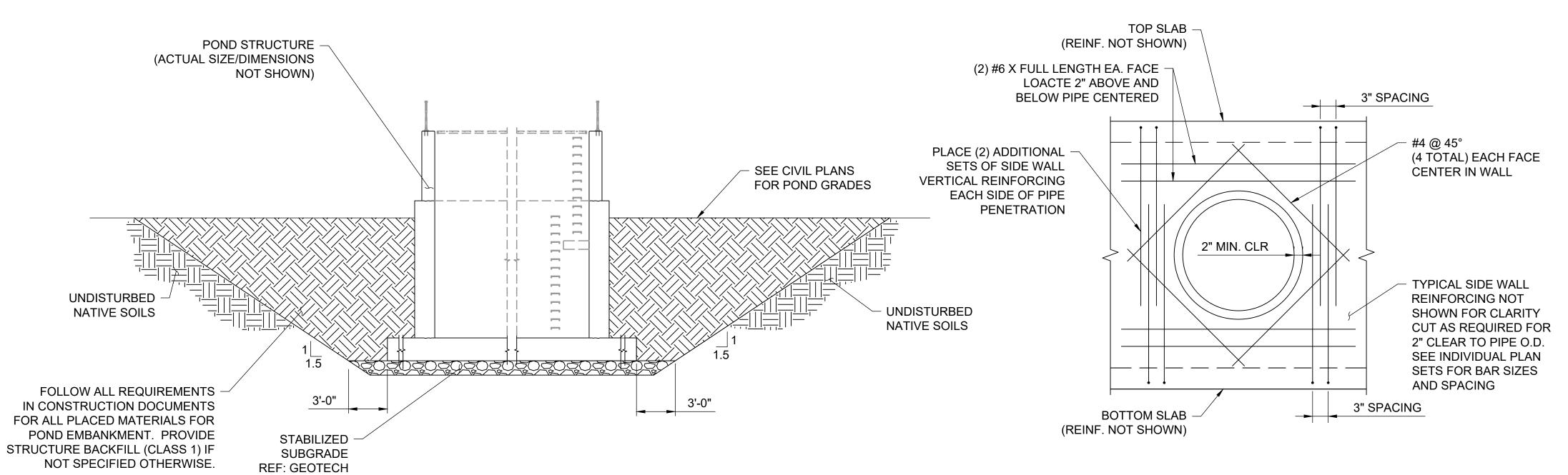
07/25/2023

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

SHEET S20 OF 25

JOB NO. 25188.04





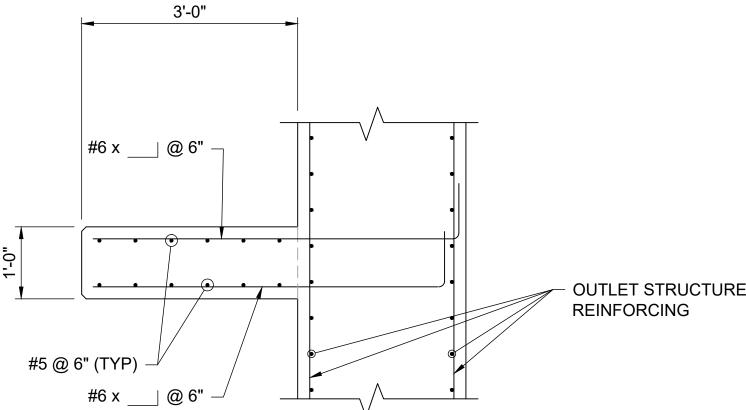
1 TYPICAL CORNER DETAIL SCALE: 1/2" = 1'-0"

4 NOT USED

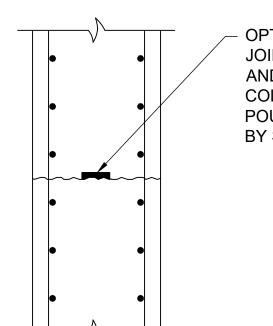
SCALE: N/A

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

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



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



OPTIONAL HORIZONTAL CONSTRUCTION JOINT (IN TALL WALLS). ROUGHEN JOINT AND PROVIDE WATER STOP IN
COLD JOINT PRIOR TO SUBSEQUENT POUR. REINFORCEMENT TO PROJECT BY SPLICE LENGTH (MIN).

HORIZONTAL WALL **CONSTRUCTION JOINT** 

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

SHEET S21 OF 25

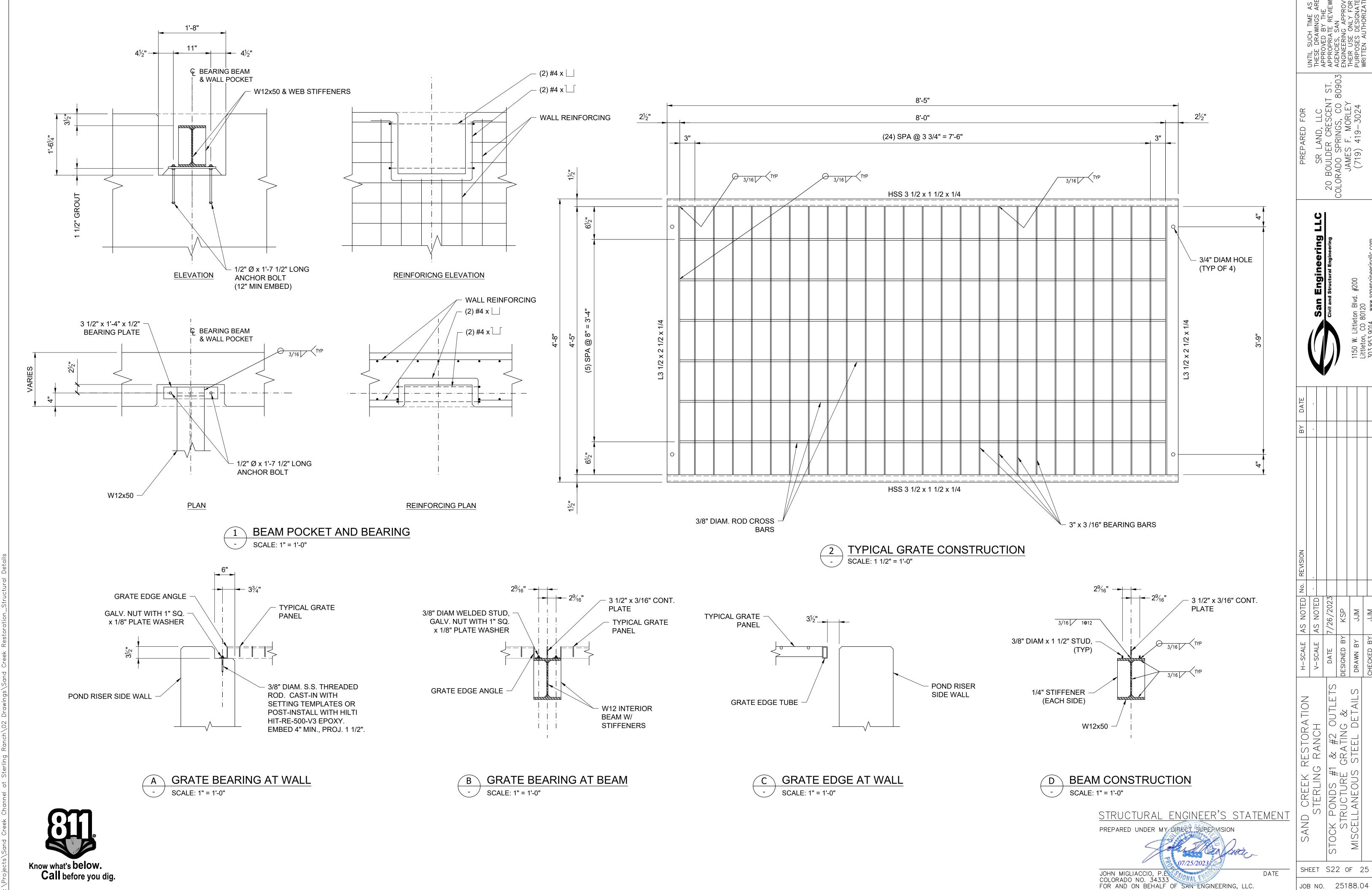
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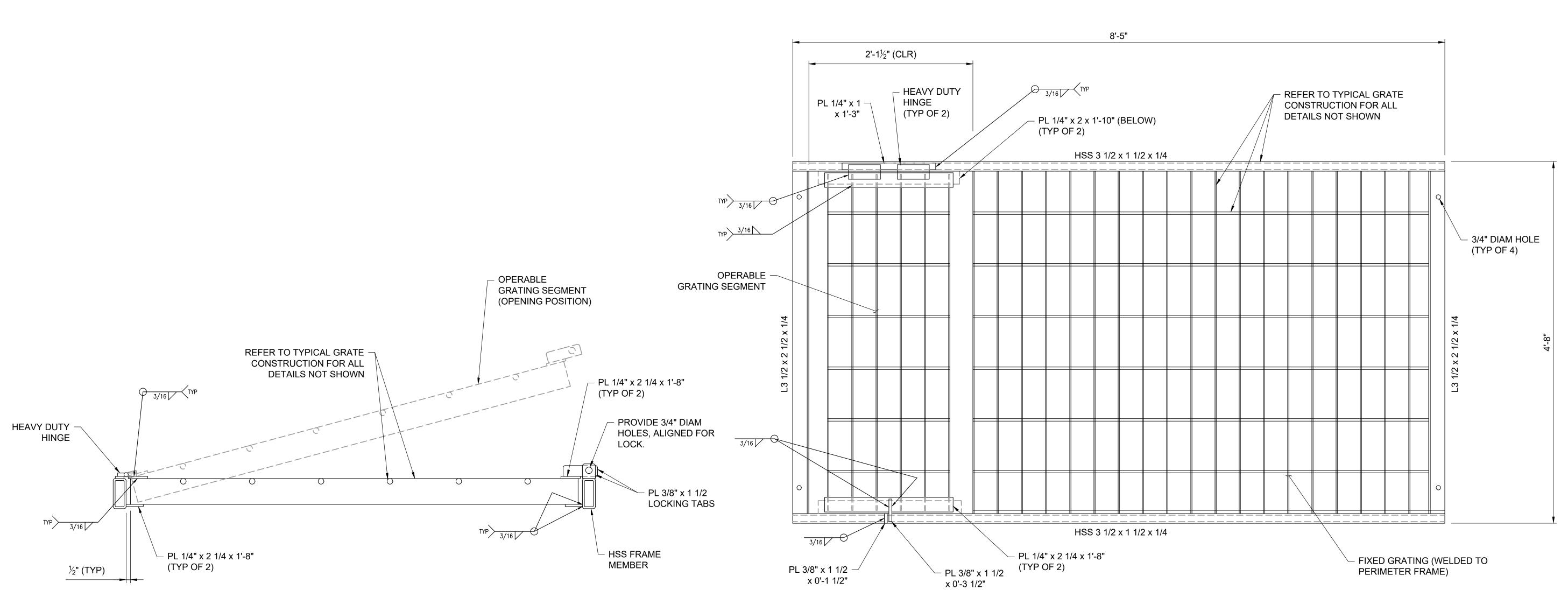
OUTLET STRUCTURE

REPORT



JOB NO. 25188.04

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

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

#### **GRATING NOTES:**

- 1. ALL TUBES (HSS) SHALL BE ASTM A-500 GRADE B.
- 2. ALL BASE PLATES SHALL BE ASTM A-572 GRADE 50.
- 3. ALL WIDE FLANGE MEMBERS SHALL BE ASTM A-992 GRADE 50.
- 4. ALL OTHER STEEL SHALL BE ASTM A-36 UNLESS OTHERWISE NOTED.
- 5. THE ABOVE MATERIAL AND ALL MISCELLANEOUS BOLTS, NUTS, AND WASHERS SHALL BE HOT-DIPPED GALVANIZED AFTER FABRICATION.
- 6. CAST-IN ANCHOR BOLTS AND THREADED RODS SHALL BE STAINLESS STEEL.
- 7. POST-INSTALLED ANCHORS, SHALL BE AN APPROVED PRODUCT, INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS. POST-INSTALLED ANCHORS SHALL BE STAINLESS STEEL
- 8. ALL WELDS SHALL BE E70xx.
- 9. PRIOR TO FABRICATION, SHOP DRAWINGS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL.

STRUCTURAL ENGINEER'S STATEMENT PREPARED UNDER MY DIRECT SUPERVISION

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

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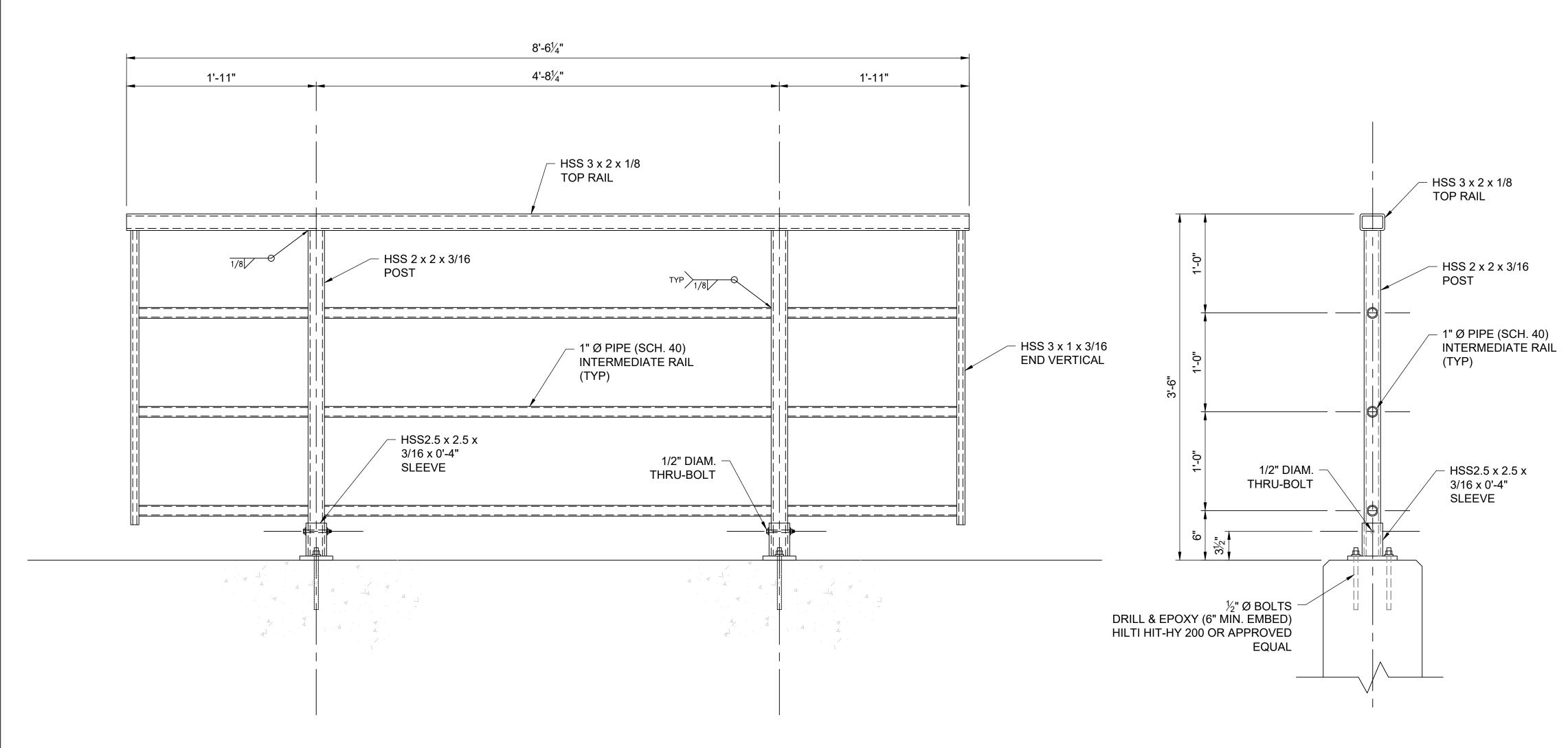
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SAND CREEK REST STERLING RAN OCK PONDS #1 & # ACCESSIBLE GRA PANEL DETAIL S

SHEET S23 OF 25

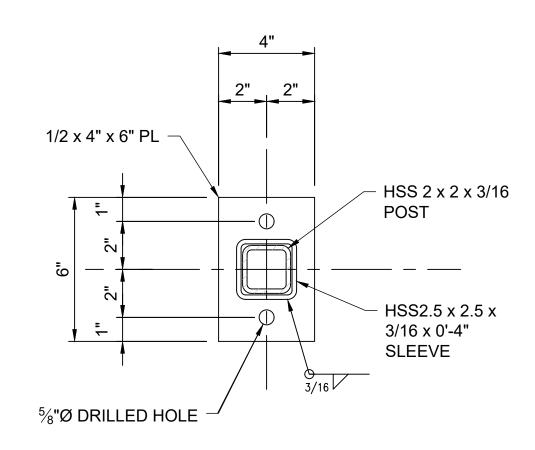
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HANDRAIL ELEVATION - TYPICAL SEGMENT

HANDRAIL NOTES

- 1. ALL TUBES (HSS) SHALL BE ASTM A-500 GRADE B.
- 2. ALL BASE PLATES SHALL BE ASTM A-572 GRADE 50.
- 3. ALL OTHER STEEL SHALL BE ASTM A-36 UNLESS OTHERWISE NOTED.
- 4. 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.
- 5. CAST-IN ANCHOR BOLTS, IF UTILIZED, SHALL BE HOT-DIPPED GALVANIZED.
- 6. POST-INSTALLED ANCHORS, SHALL BE AN APPROVED PRODUCT, INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS. POST-INSTALLED ANCHORS SHALL BE STAINLESS STEEL
- 7. TUBES AND OTHER HORIZONTAL MEMBERS SHALL BE SHOP BENT OR FABRICATED TO FIT HORIZONTAL CURVES.
- 8. VERTICAL SLOPES AND GRADES OF WINGWALLS AND GROUND NOT SHOWN FOR SIMPLICITY. POSTS SHALL BE VERTICALLY PLUMB.
- 9. 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
- 10. ALL WELDS SHALL BE GROUND SMOOTH.
- 11. PRIOR TO FABRICATION, SHOP DRAWINGS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL.



BASE PLATE DETAIL

STRUCTURAL ENGINEER'S STATEMENT

DATE

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

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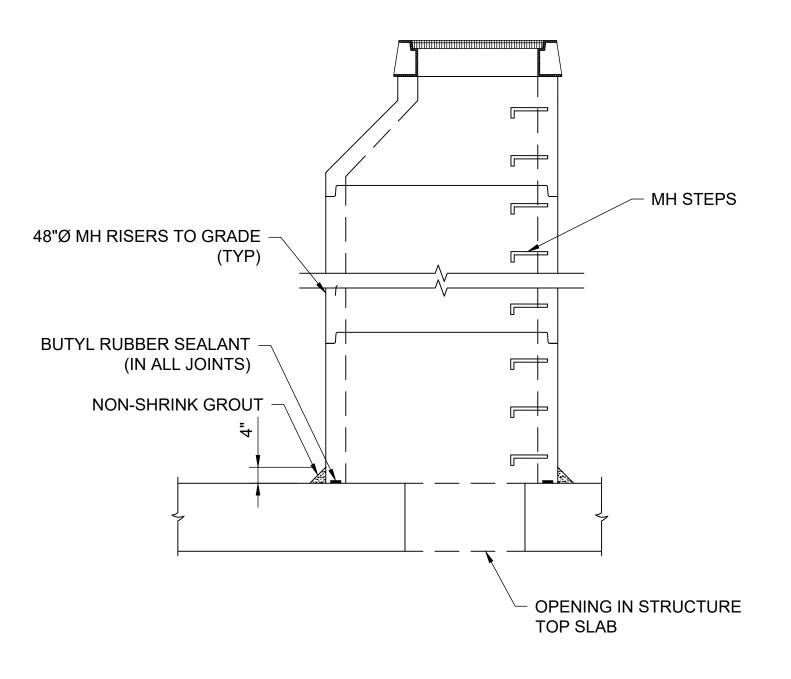
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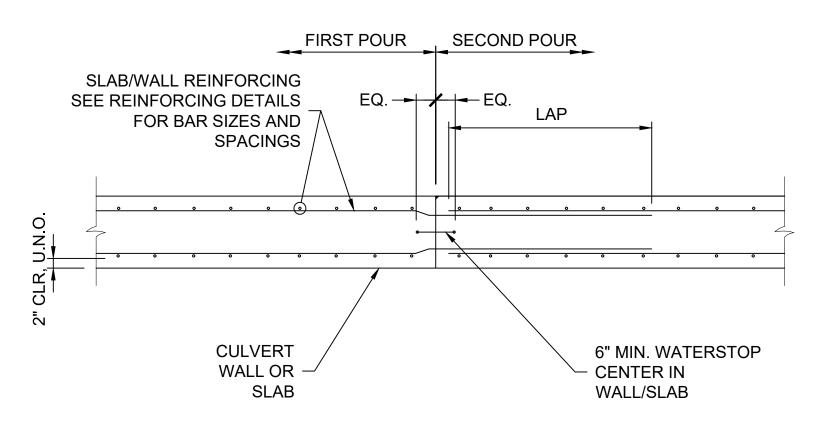
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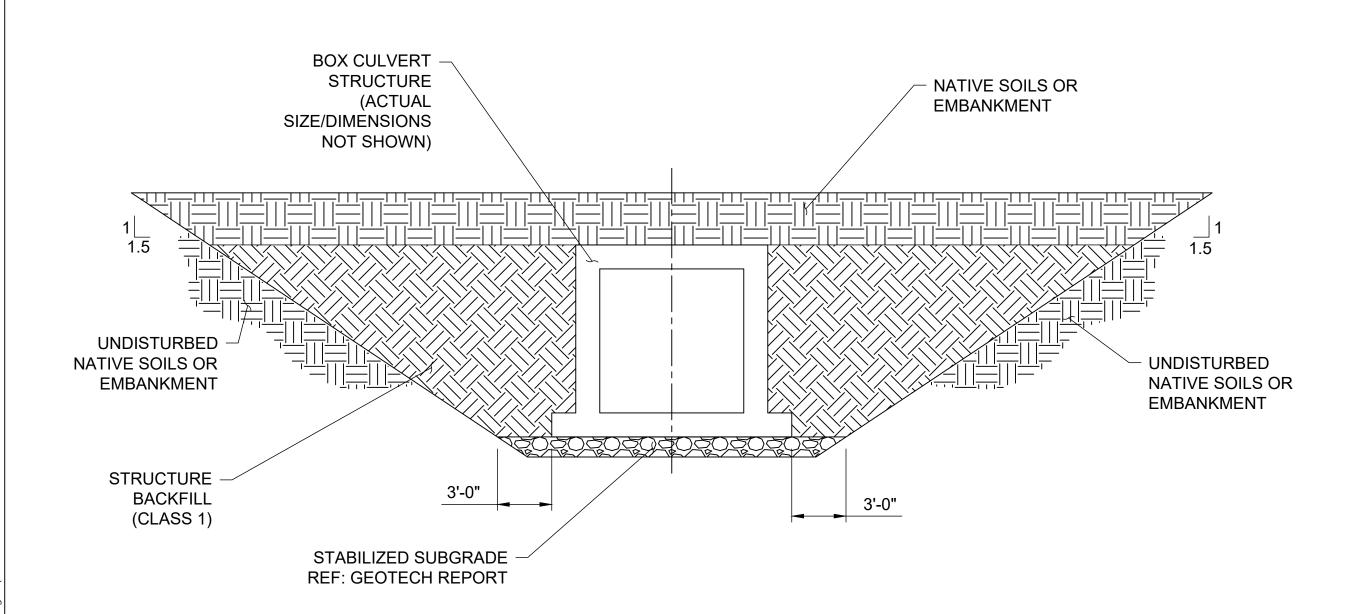
HANDRAIL SECTION



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.
- 2. 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.
- 3. UNDISTURBED SUBGRADE, ONLY IF DEEMED ACCEPTABLE BY GEOTECHNICAL ENGINEER MAY BE UTILIZED FOR PLACEMENT OF SLABS AND FOOTINGS.
- 4. 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.
- 5. 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.
- 2. 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.
- 3. WATERSTOPS SHALL BE CONTINUOUS AROUND ALL CORNERS.
- 4. 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.
- 5. ALL LONGITUDINAL AND HORIZONTAL REINFORCING SHALL BE CONTINUOUS THROUGH JOINTS UNLESS NOTED OTHERWISE.
- ALL CONSTRUCTION JOINTS SHALL BE ROUGH AND THOROUGHLY CLEANED FOR BOND.

HESE DRAWINGS ARE
PPROVED BY THE
PPROPRIATE REVIEWING
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HEIR USE ONLY FOR THURPOSES DESIGNATED

SR LAND, LLC
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San Engineering LLC

Civil and Structural Engineering

M. Littleton Blvd. #200

SAND CREEK RESTORATION
STERLING RANCH
BOX CULVERT STRUCTURES
MISCELLANEOUS DETAILS

DATE SHEET S25 OF 25

LLC. JOB NO. 25188.04

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JOHN MIGLIACCIO, P.E. COLORADO NO. 34333
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