



STATE OF DELAWARE
DEPARTMENT OF TRANSPORTATION
PO BOX 778
DOVER, DELAWARE 19903

JACK MARKELL
GOVERNOR

JENNIFER COHAN
SECRETARY

VIA WEBSITE POSTING

(302) 760-2030
FAX (302) 739-2254

February 9, 2016

Contract No. T201207603.01
Hearns Pond Dam Improvements
Sussex County

Ladies and Gentlemen:

Enclosed is Addendum No. 2 for the referenced contract consisting of the following:

1. The Bid Proposal Cover, revised, to be substituted for the same page in the Proposal.
2. Two (2) pages, Bid Proposal Form, pages 4 and 5 revised, to be substituted for the same pages in the Proposal.

The following Line Item Numbers have quantity adjustments: 622006, 713002 & 713003.

3. The following Plan Sheets have been revised, to be substituted for the same pages in the Proposal: 9, 10, 11, 14, 15, 16, 19, 22, 23, 25 & 33.

Please note the revision listed above and submit your bid based upon this information.

Sincerely,

signature on file

James H. Hoagland
Contract Services Administrator

:jhh
Enclosure

STATE OF DELAWARE



DEPARTMENT OF TRANSPORTATION

BID PROPOSAL

for

CONTRACT T201207603.01

HEARNS POND DAM IMPROVEMENTS

SUSSEX COUNTY

ADVERTISEMENT DATE: January 4, 2016

PROSPECTIVE BIDDERS ARE ADVISED THAT THERE WILL BE A MANDATORY PRE-BID MEETING WEDNESDAY JANUARY 27, 2016 AT 1:00 P.M. IN THE SEAFORD LIBRARY AND CULTURAL CENTER, WOODRUFF ROOM, 600 N. MARKET STREET EXTENDED, SEAFORD DELAWARE, 19973.

COMPLETION TIME: 362 Calendar Days

SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION
DELAWARE DEPARTMENT OF TRANSPORTATION
AUGUST 2001

Bids will be received in the Bidder's Room at the Delaware Department of Transportation's Administration Building, 800 Bay Road, Dover, Delaware until 2:00 P.M. local time **February 16, 2016**

DELAWARE DEPARTMENT OF TRANSPORTATION
SCHEDULE OF ITEMS

PAGE: 4
DATE:

CONTRACT ID: T201207603.01 PROJECT(S): T201207603

All figures must be typewritten.

CONTRACTOR : _____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE		BID AMOUNT	
			DOLLARS	CTS	DOLLARS	CTS
0290	619502 TEST PILE RESTRIKE	2.000 EADY	1000.00000		2000.00	
0300	619519 DYNAMIC PILE TESTING BY CONTRACTOR	9.000 EACH				
0310	622006 STEEL SHEET PILES, PS 27.5	7700.000 SF				
0320	622007 STEEL SHEET PILES, PZ 22	2506.000 SF				
0330	622008 STEEL SHEET PILES, PZ 27	2000.000 SF				
0340	712020 RIPRAP, R-4	5.000 TON				
0350	712022 RIPRAP, R-6	100.000 TON				
0360	712517 ARTICULATED PRECAST CONCRETE BLOCKS, TYPE I	13750.000 SF				
0370	712522 ARTICULATED PRECAST CONCRETE BLOCKS, TYPE 2	8535.000 SF				
0380	712531 CHANNEL BED FILL	10.000 CY				

DELAWARE DEPARTMENT OF TRANSPORTATION
SCHEDULE OF ITEMS

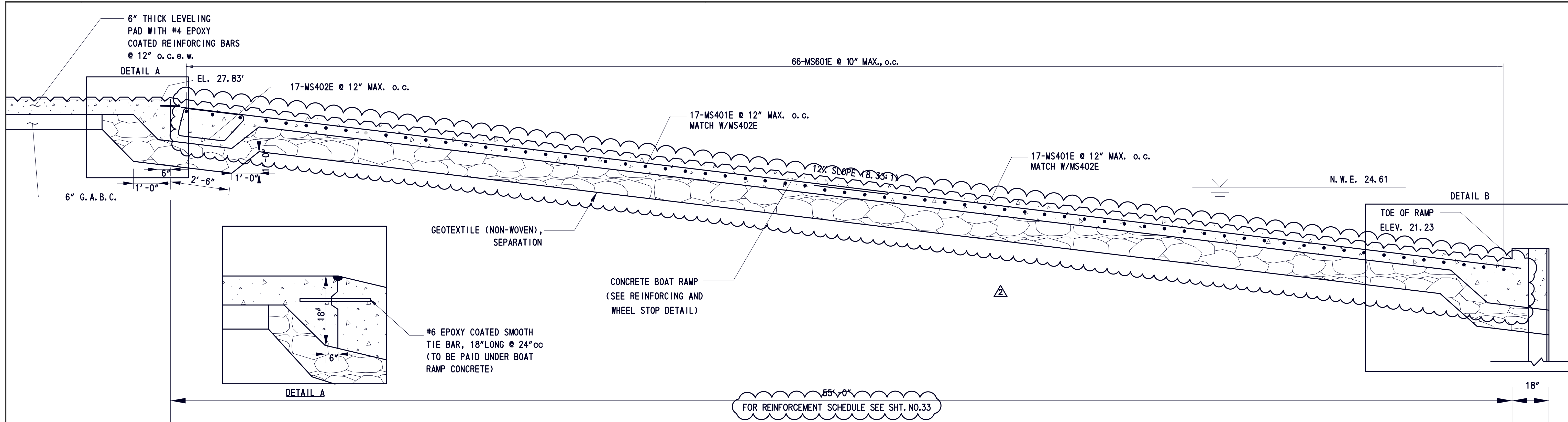
PAGE: 5
DATE:

CONTRACT ID: T201207603.01 PROJECT(S): T201207603

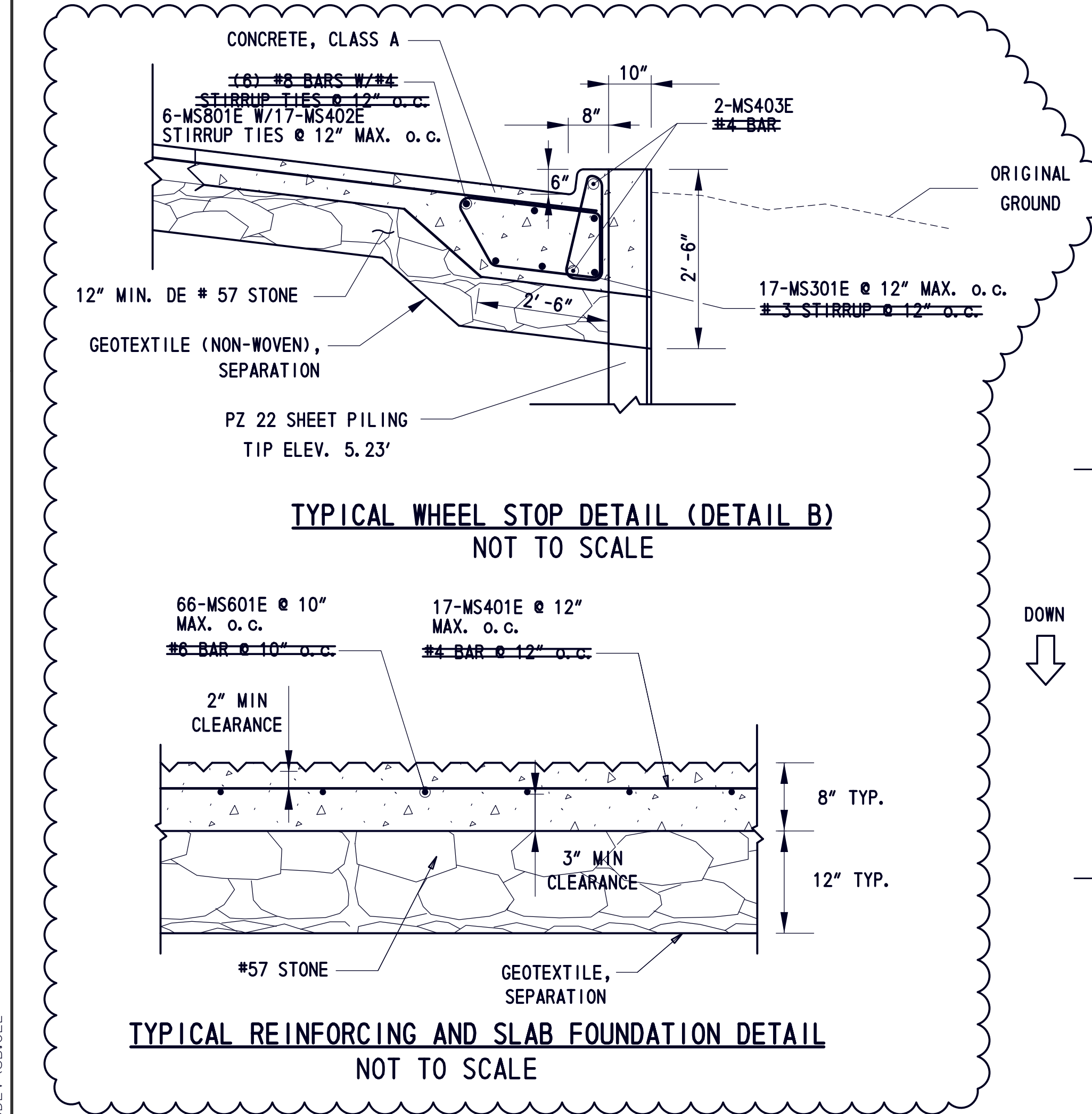
All figures must be typewritten.

CONTRACTOR : _____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE		BID AMOUNT	
			DOLLARS	CTS	DOLLARS	CTS
0390	713002 GEOTEXTILES, SEPARATION	145.000 SY				
0400	713003 GEOTEXTILES, RIPRAP	120.000 SY				
0410	720556 BOLLARD	4.000 EACH				
0420	743000 MAINTENANCE OF TRAFFIC	LUMP	LUMP			
0430	743004 FURNISH AND MAINTAIN PORTABLE CHANGEABLE MESSAGE SIGN	30.000 EADY				
0440	743023 TEMPORARY BARRICADES, TYPE III	17280.000 LFDY				
0450	743024 TEMPORARY WARNING SIGNS AND PLAQUES	2160.000 EADY				
0460	743052 FLAGGER, SUSSEX COUNTY, STATE	160.000 HOUR				
0470	743064 FLAGGER, SUSSEX COUNTY, STATE, OVERTIME	32.000 HOUR				
0480	748548 PERMANENT PAVEMENT STRIPING, EPOXY RESIN PAINT, WHITE/YELLOW, 5"	1110.000 LF				

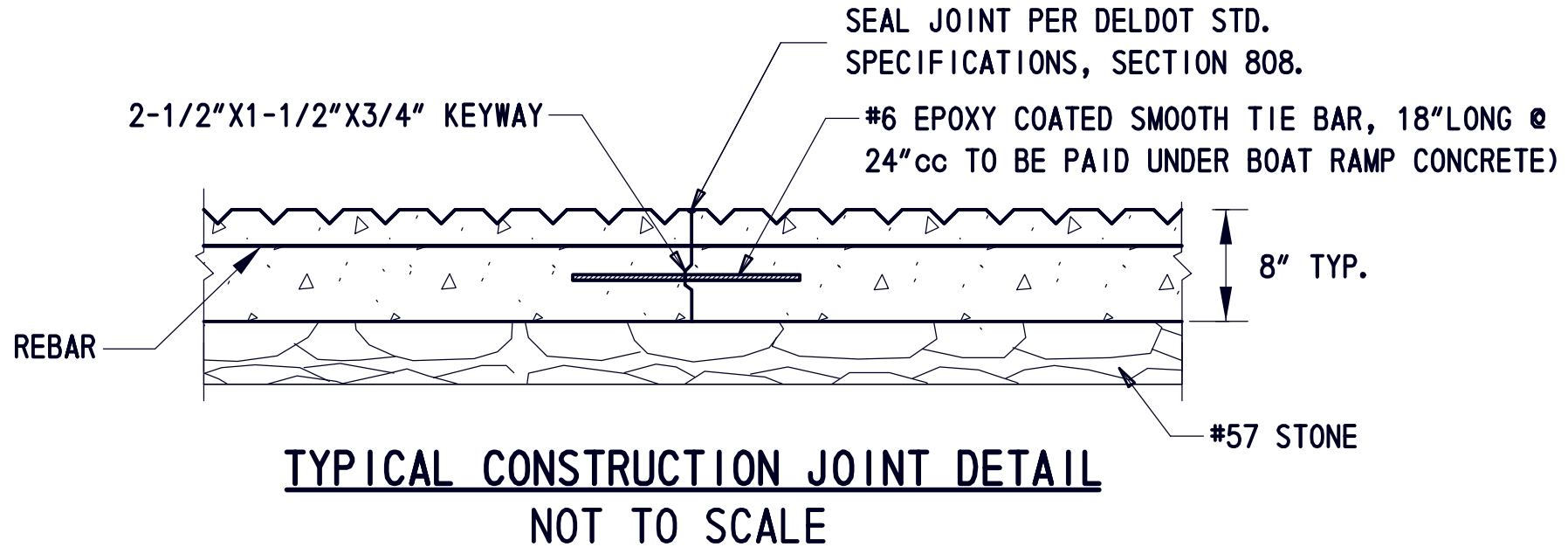


TYPICAL BOAT RAMP PROFILE
NOT TO SCALE

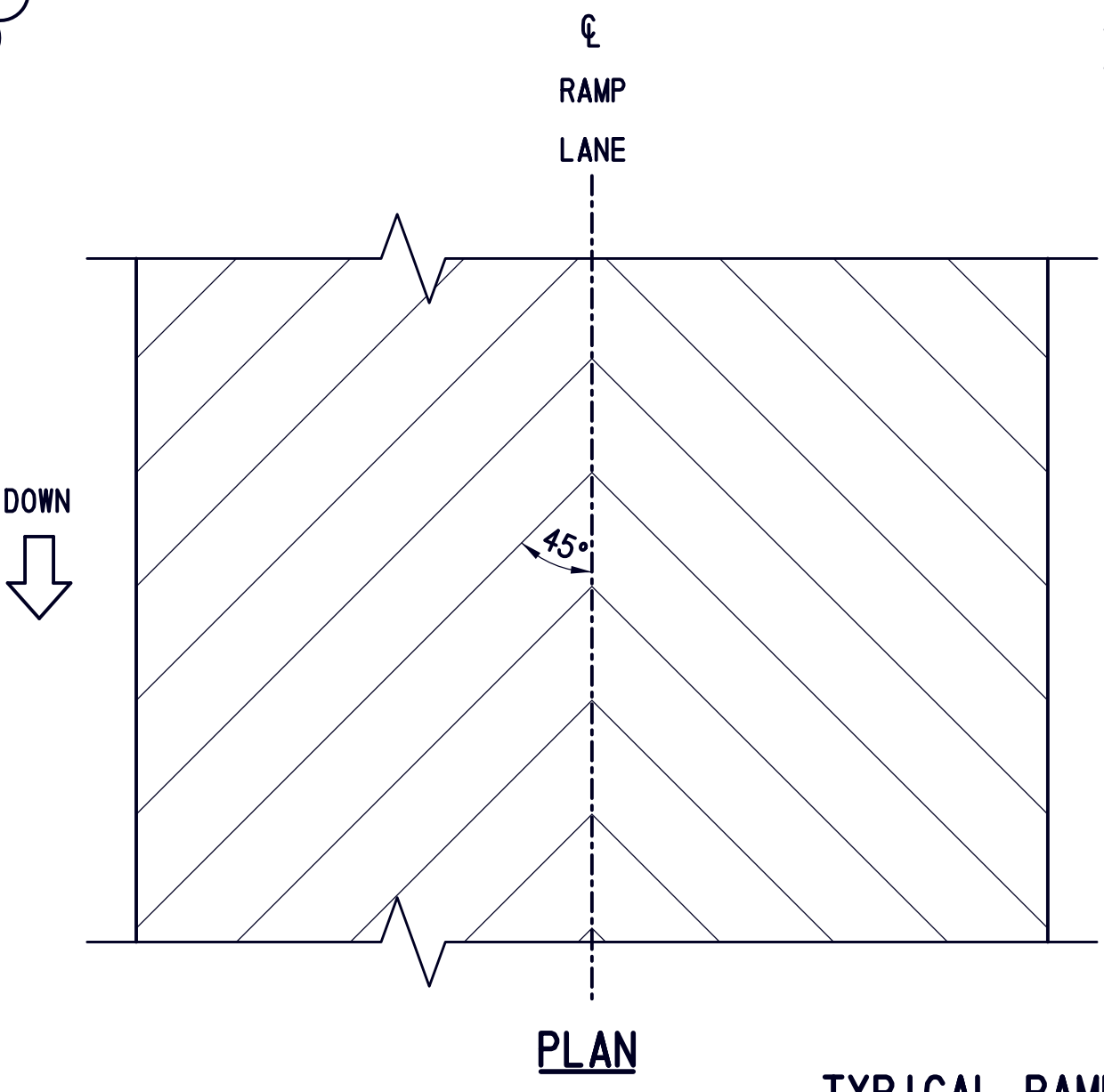


TYPICAL WHEEL STOP DETAIL (DETAIL B)
NOT TO SCALE

TYPICAL REINFORCING AND SLAB FOUNDATION DETAIL
NOT TO SCALE

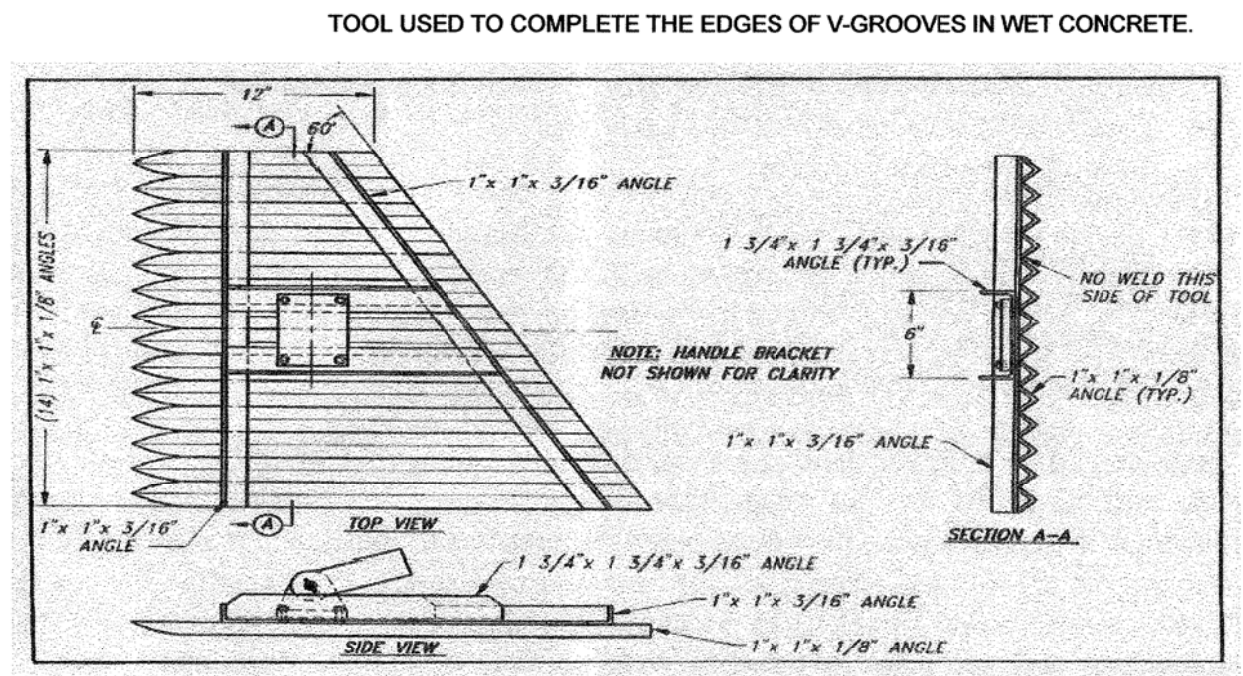
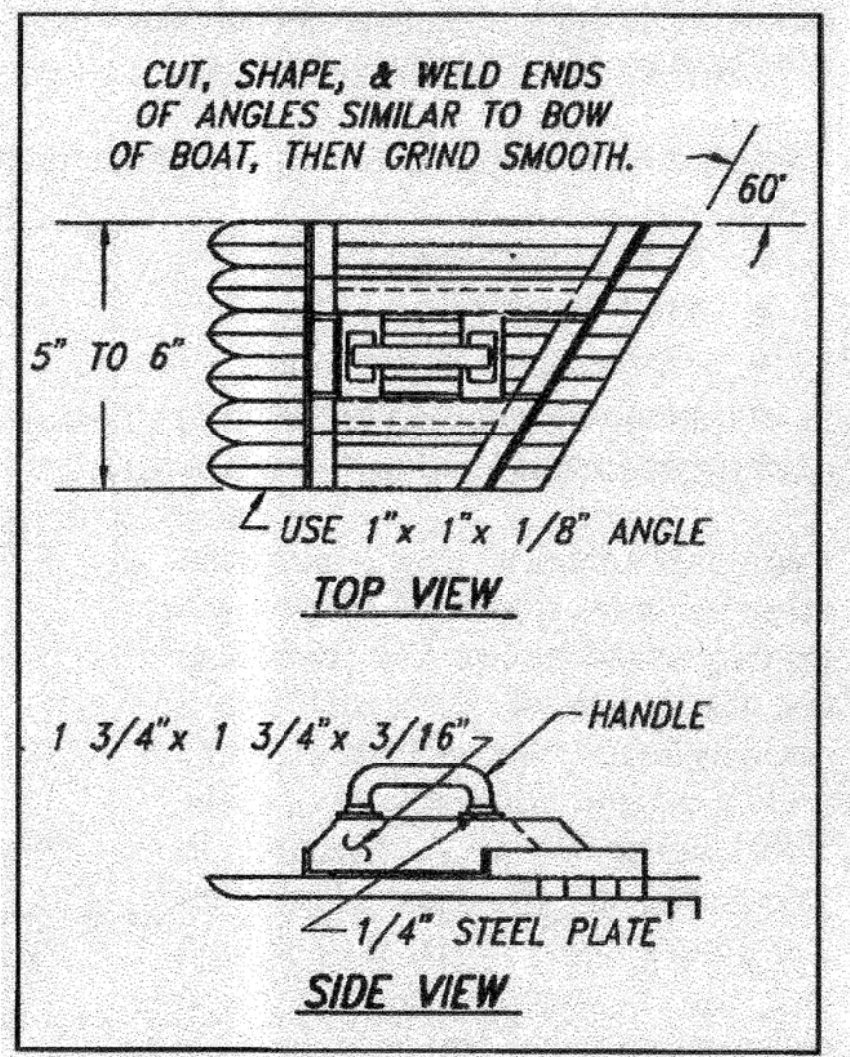


TYPICAL CONSTRUCTION JOINT DETAIL
NOT TO SCALE



TYPICAL RAMP SURFACING DETAIL
NOT TO SCALE

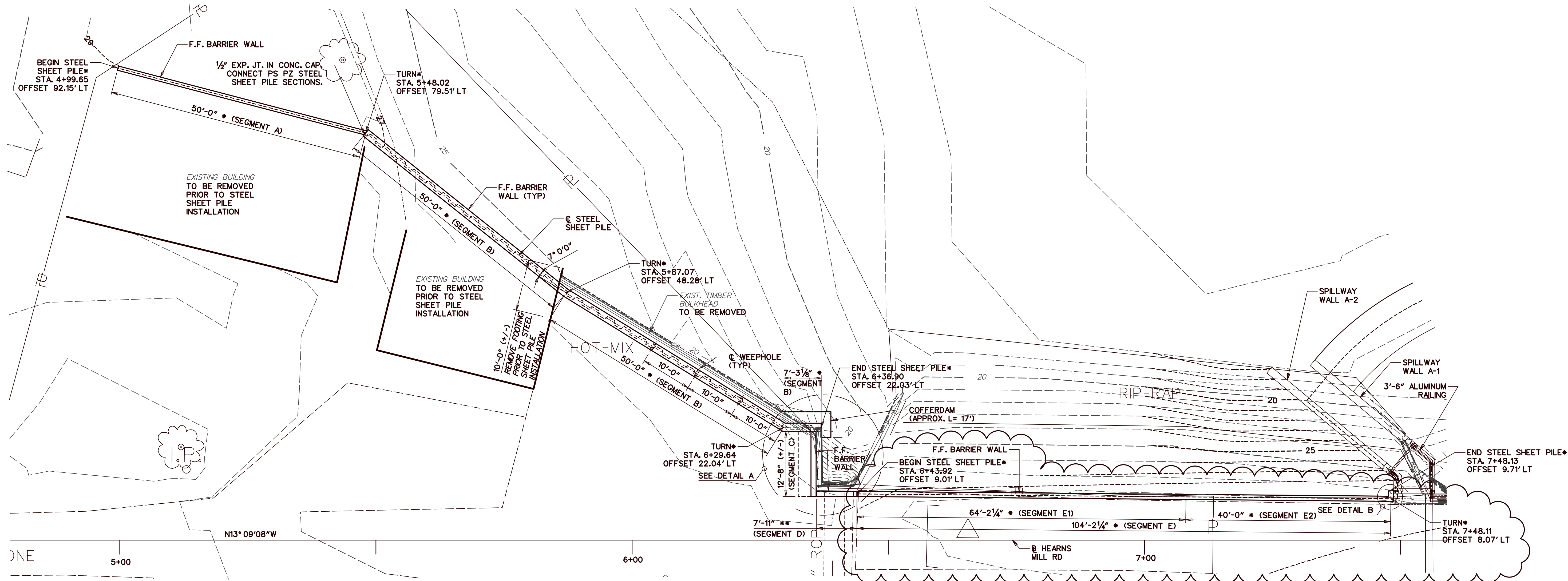
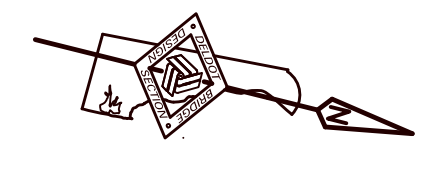
BOAT RAMP DETAILS
NOT TO SCALE



TOOL USED TO IMPART V-GROOVES TO WET CONCRETE
NOTE: DETAILS TAKEN FROM S.O.B.A. HANDBOOK. TOOLS TO BE PROVIDED TO CONTRACTOR BY OWNER.
RAMP SURFACE GROOVING TOOL DETAILS
SCALE: NONE

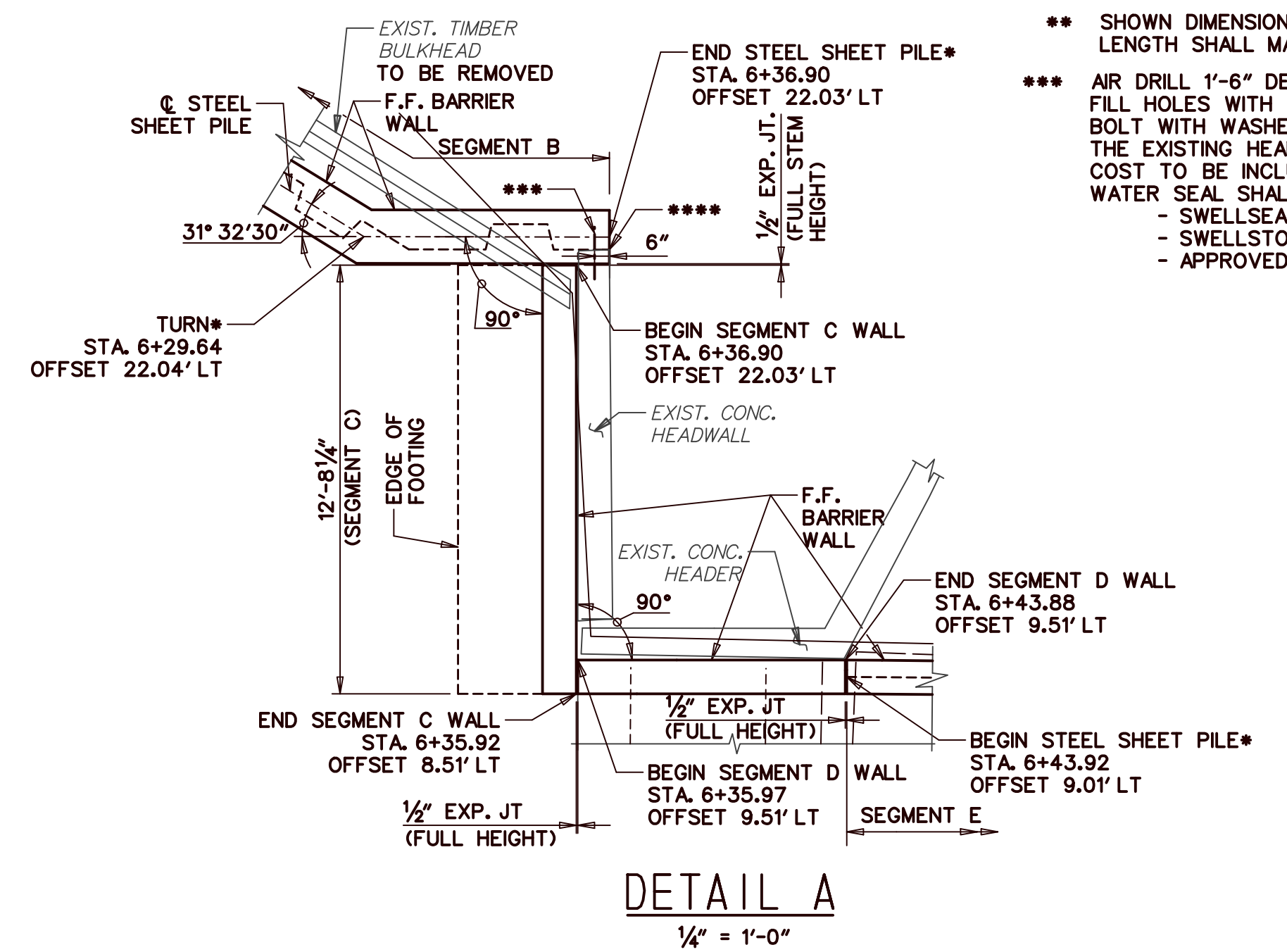
W:\MSVB\CELLS\PROJDEV\SB.CEL

<p>DELAWARE DEPARTMENT OF TRANSPORTATION</p>	<p>ADDENDUMS / REVISIONS</p> <table border="1"> <tr> <td>1</td> <td>ADDED BARS AND BAR MARKS, DS/BTA, 2/5/2016</td> </tr> </table>	1	ADDED BARS AND BAR MARKS, DS/BTA, 2/5/2016	<p>SCALE: AS NOTED</p>	<p>HEARNS POND DAM IMPROVEMENTS</p>	<p>CONTRACT T201207603</p> <p>COUNTY SUSSEX</p>	<p>BRIDGE NO. N/A</p> <p>DESIGNED BY: BTA/LB</p> <p>CHECKED BY: CHC</p>	<p>SHEET NO. 9</p> <p>TOTAL SHTS. 43</p>
	1	ADDED BARS AND BAR MARKS, DS/BTA, 2/5/2016						
	CONSTRUCTION DETAILS-2							

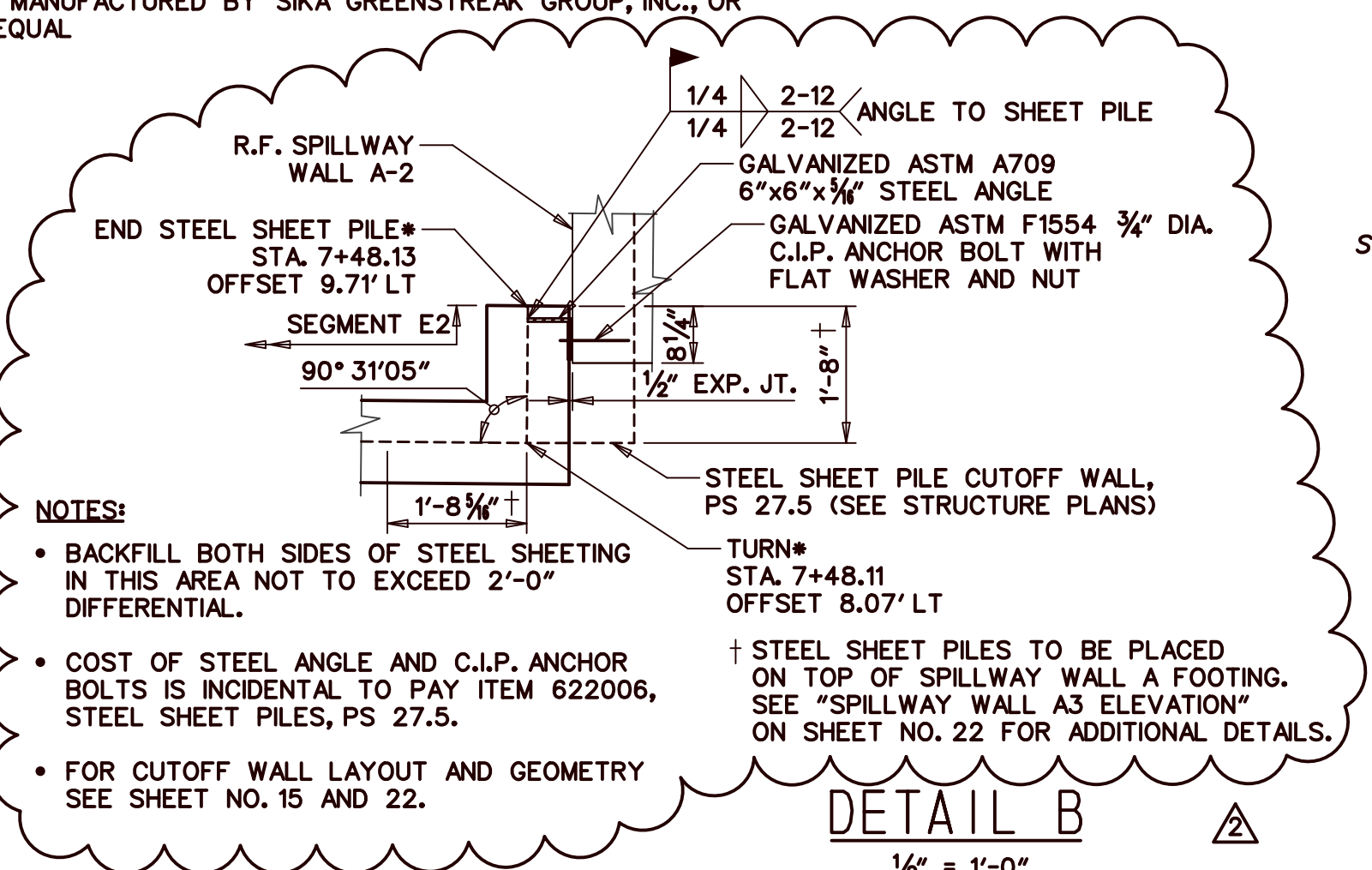


BARRIER WALL PLAN
1" = 10'-0"

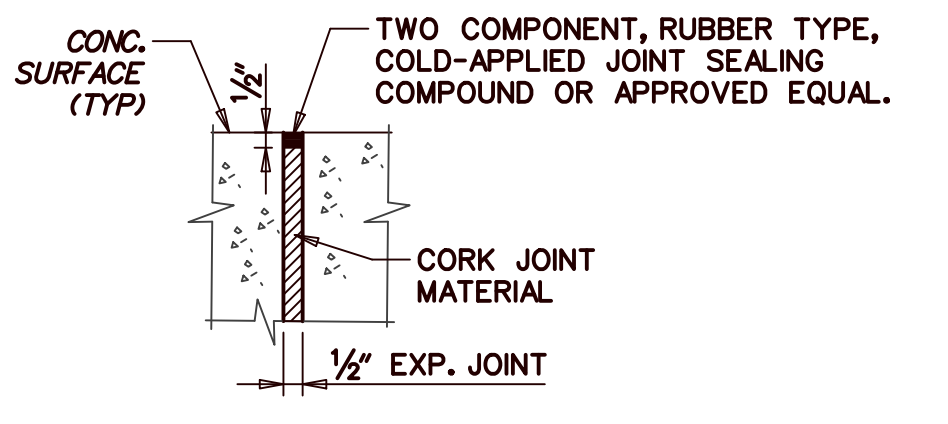
- * ALL INDICATED STATIONS, OFFSETS AND DIMENSIONS ARE ALONG STEEL SHEET PILE CENTERLINE
- ** SHOWN DIMENSION IS APPROXIMATE AND MAY BE FIELD ADJUSTED AS NEEDED. NEW WALL LENGTH SHALL MATCH LENGTH OF EXISTING CONCRETE BLOCK CAT OVER CONCRETE PIPE
- *** AIR DRILL 1'-6" DEEP HOLES @ 2'-0" O.C. ALONG FULL HEIGHT OF EXISTING WALL STEM. FILL HOLES WITH NON-SHRINK GROUT AND INSTALL 1/2" DIA. 1'-9" LONG ASTM A307 ANCHOR BOLT WITH WASHER AND HEX NUT. FIRST ANCHOR TO BE PLACED 9" DOWN FROM TOP OF THE EXISTING HEADWALL. DIA. OF THE HOLE IS AS PER MANUFACTURER'S RECOMMENDATION. COST TO BE INCLUDED IN PAY ITEM "622007 STEEL SHEET PILES, PZ 22." SWELL TYPE WATER SEAL SHALL BE AS FOLLOWS:
 - SWELLSEAL 8, MANUFACTURED BY DE NEEF CONSTRUCTION CHEMICALS, INC., OR
 - SWELLSTOP, MANUFACTURED BY SIKA GREENSTREAK GROUP, INC., OR
 - APPROVED EQUAL
- **** SWELL TYPE WATER SEAL BETWEEN EXISTING CONCRETE WALL AND STEEL SHEET PILE. PLACE ALONG FULL HEIGHT OF EXISTING WALL STEM. PROVIDE SWELL TYPE MATERIAL WITH THE FOLLOWING MINIMUM REQUIREMENTS:
 - EXPANSION AREA IN WATER: 550% IN 1 DAY
 - TENSILE STRENGTH: 1100 PSI
 - SHAPE: PREFORMED IN FLAT RECTANGULAR SHAPE. APPROXIMATE ASPECT RATIO (W:H) OF 6.
 COST TO BE INCLUDED IN PAY ITEM "622007 STEEL SHEET PILES, PZ 22."



DETAIL A
1/4" = 1'-0"



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



EXPANSION JOINT DETAIL

NOT TO SCALE

- NOTES:**
- BACKFILL BOTH SIDES OF STEEL SHEETING IN THIS AREA NOT TO EXCEED 2'-0" DIFFERENTIAL.
 - COST OF STEEL ANGLE AND C.I.P. ANCHOR BOLTS IS INCIDENTAL TO PAY ITEM 622006, STEEL SHEET PILES, PS 27.5.
 - FOR CUTOFF WALL LAYOUT AND GEOMETRY SEE SHEET NO. 15 AND 22.
 - † STEEL SHEET PILES TO BE PLACED ON TOP OF SPILLWAY WALL A FOOTING. SEE "SPILLWAY WALL A3 ELEVATION" ON SHEET NO. 22 FOR ADDITIONAL DETAILS.

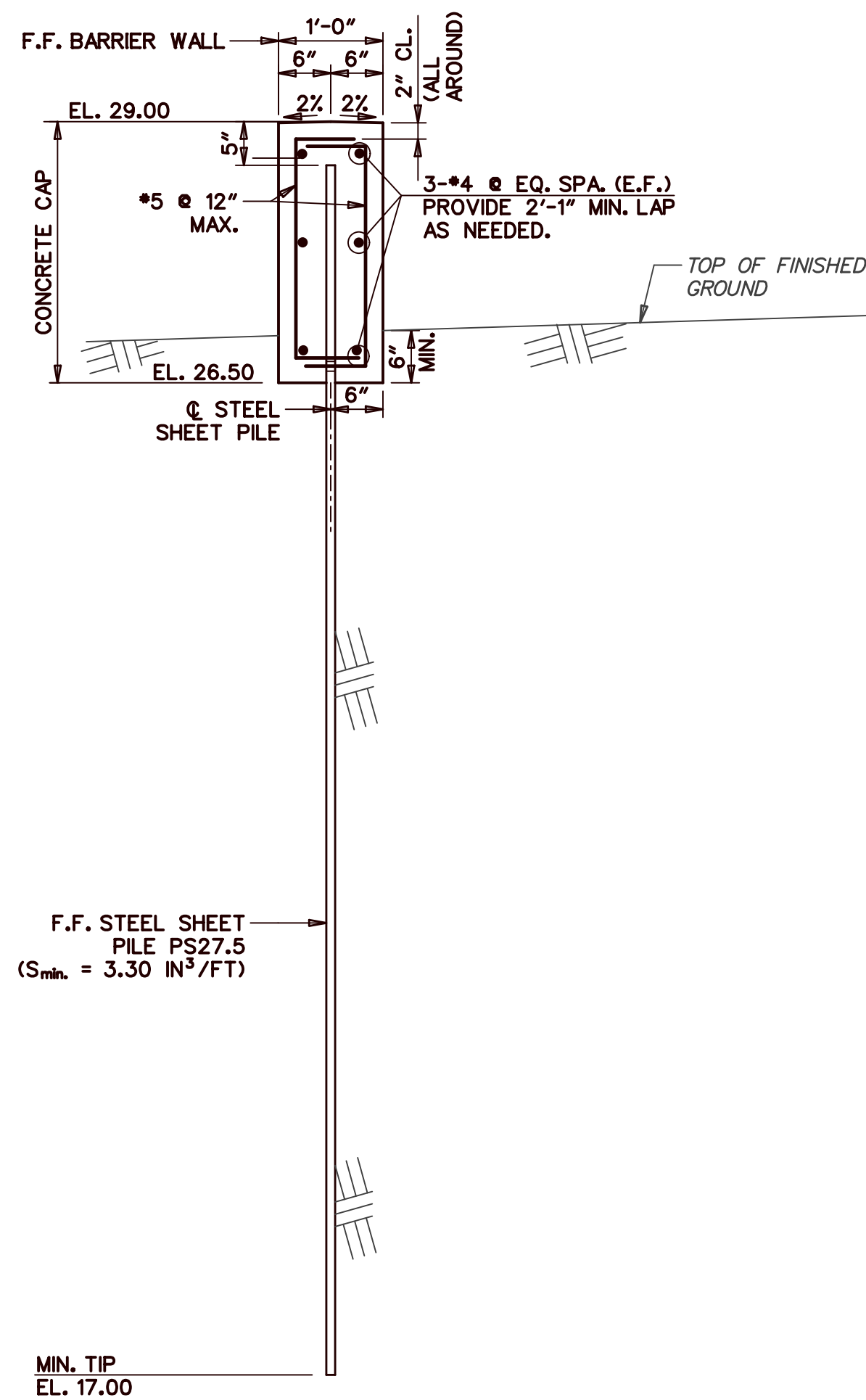
LEGEND

⊕	CENTERLINE
E.F.	EACH FACE
F.F.	FRONT FACE
JT.	JOINT
MAX.	MAXIMUM
MIN.	MINIMUM
R.F.	REAR FACE
TYP.	TYPICAL

- NOTES:**
- FOR PROJECT NOTES, SEE SHEET NO. 3.
 - WORK THIS SHEET WITH SHEET NO. 11.

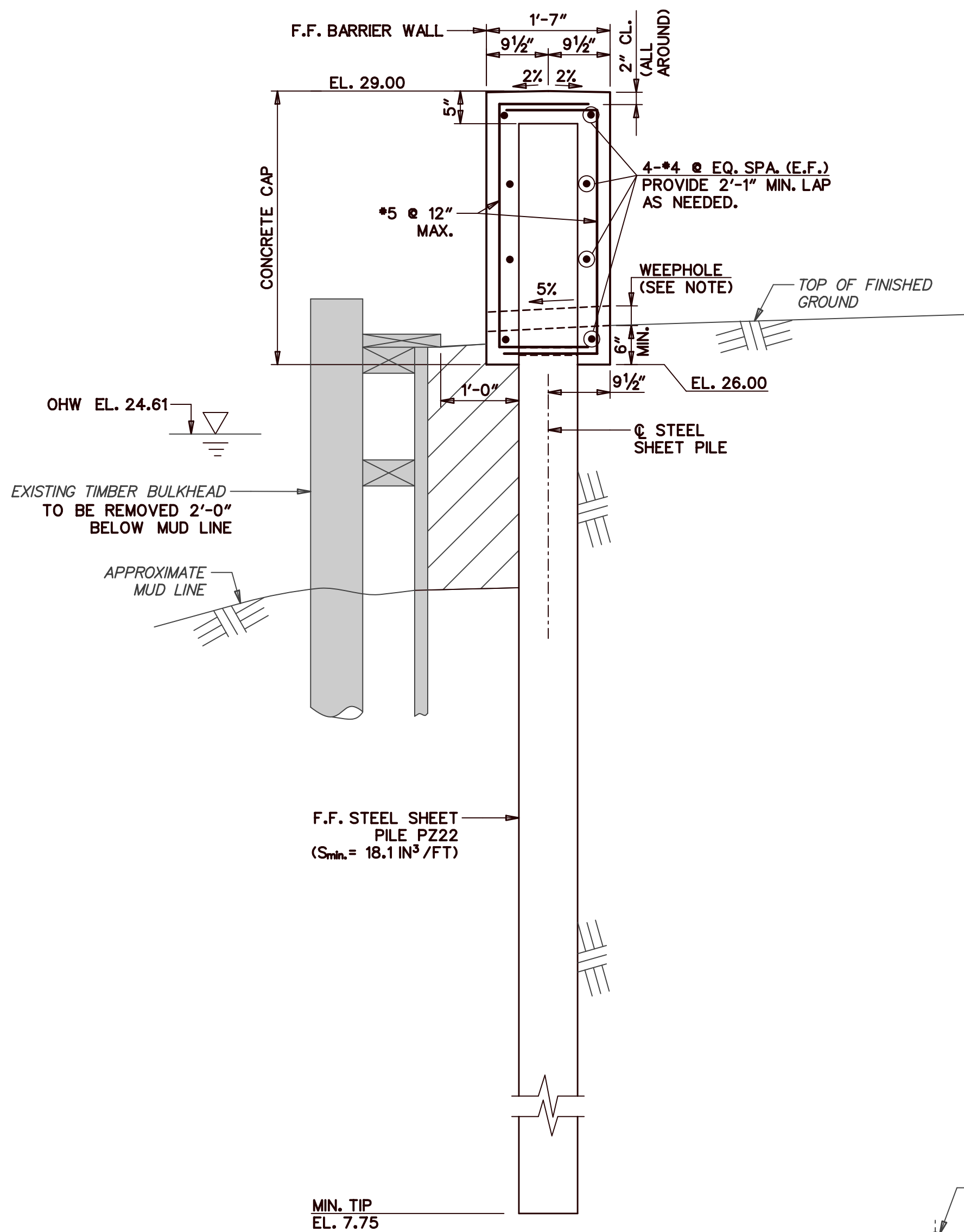
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<p>DELAWARE DEPARTMENT OF TRANSPORTATION</p>	ADDENDUMS / REVISIONS		<p>SCALE: AS NOTED</p>	<p>HEARNS POND DAM IMPROVEMENTS</p>	CONTRACT	BRIDGE NO.	N/A		SHEET NO.
	REVISION 1: REVISE STEEL SHEET PILE TIP ELEVATION, ACL/BTA, 2/5/2016				T201207603	DESIGNED BY: AT	CONSTRUCTION DETAILS-3		10
					SUSSEX	CHECKED BY: CHC			TOTAL SHTS.
									43

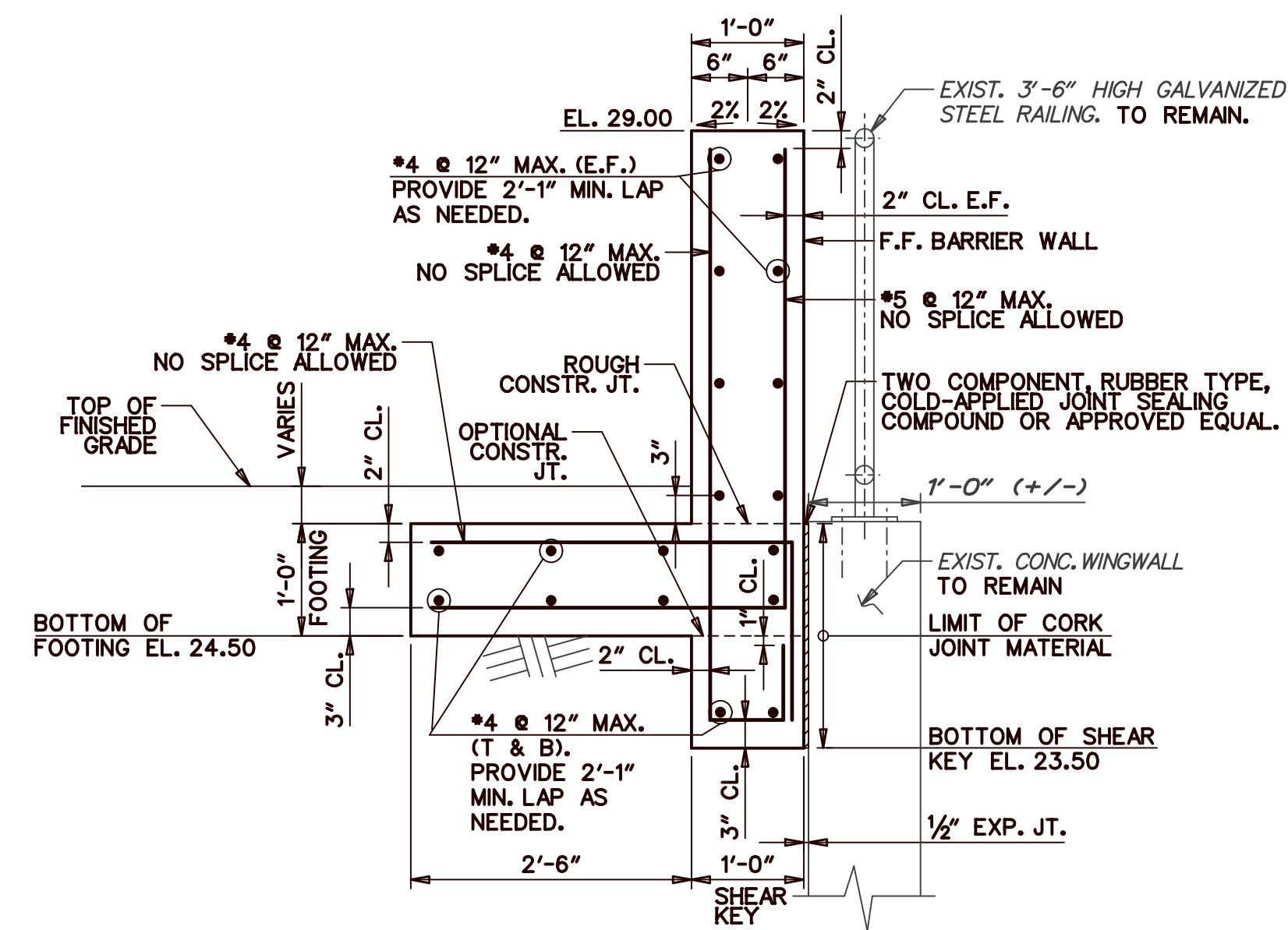


**TYPICAL SECTION -
SEGMENT A**
SCALE: 3/4" = 1'-0"

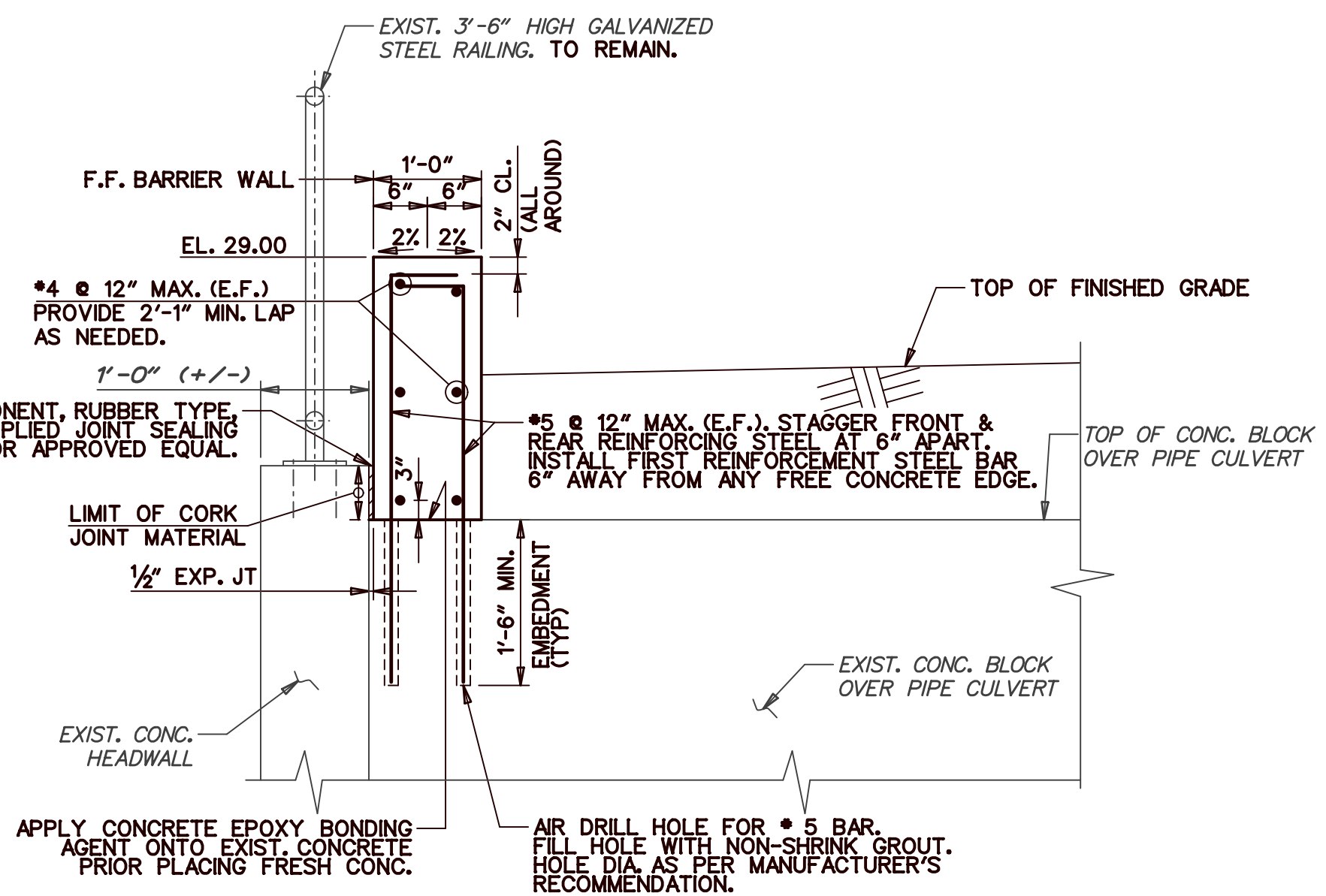
WEEPHOLE NOTE:
WEEPHOLE SIZE SHALL BE 3 1/2" (HIGH) x 4 1/2" (WIDE).
WEEPHOLE SPACING SHALL NOT EXCEED 10'-0". WEEPHOLE
INVERT ELEVATION SHALL MATCH TOP OF THE FINISHED
GRADE ELEVATION AT THE WALL REAR FACE. SEE PLAN
VIEW, FOR WEEPHOLE LOCATIONS.



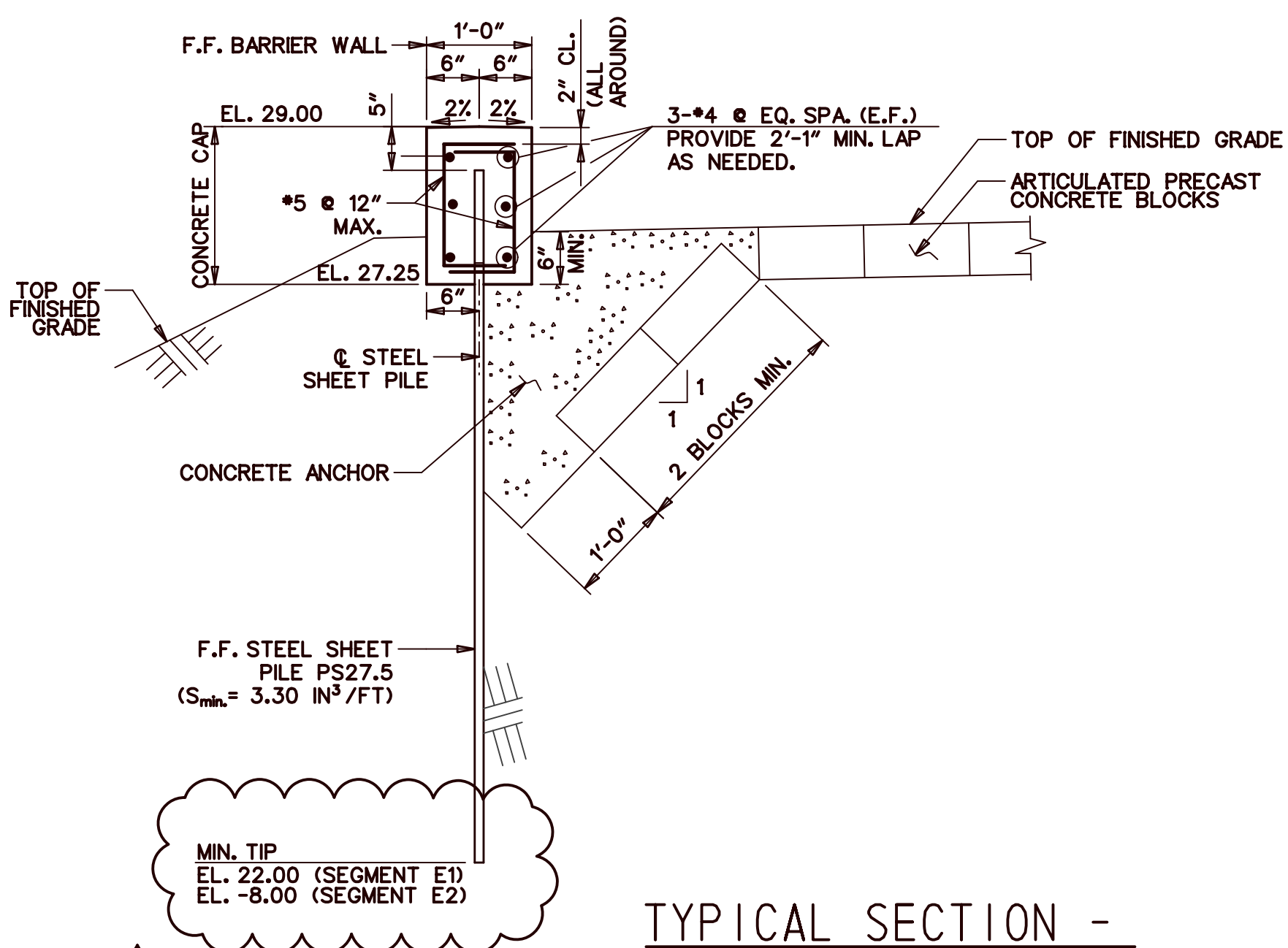
**TYPICAL SECTION -
SEGMENT B**
SCALE: 3/4" = 1'-0"



**TYPICAL SECTION -
SEGMENT C**
SCALE: 3/4" = 1'-0"



**TYPICAL SECTION -
SEGMENT D**
SCALE: 3/4" = 1'-0"

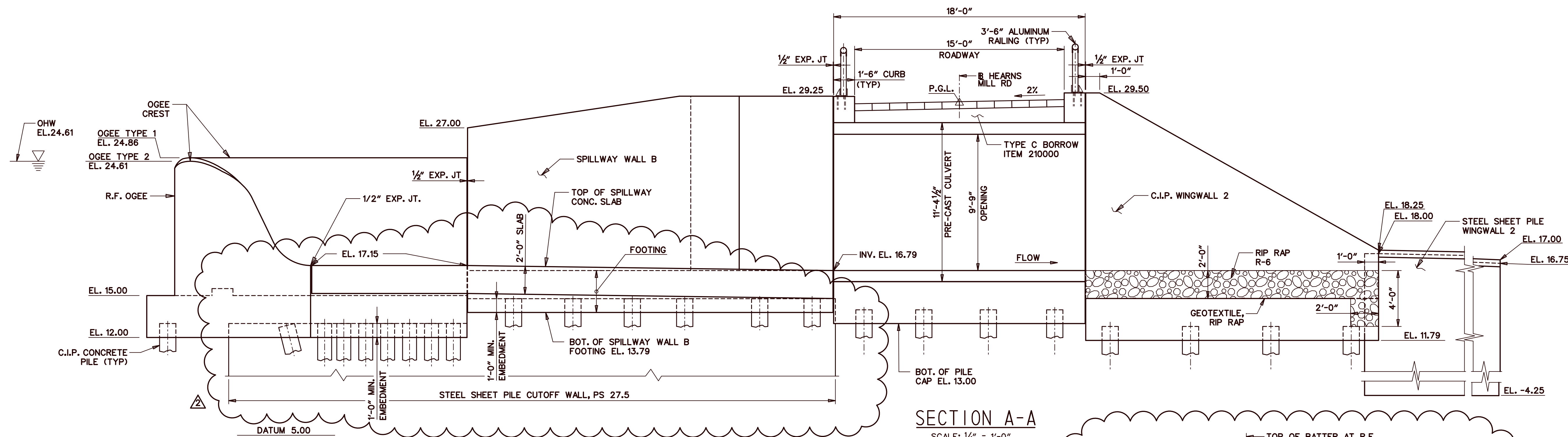


**TYPICAL SECTION -
SEGMENT E**
SCALE: 3/4" = 1'-0"

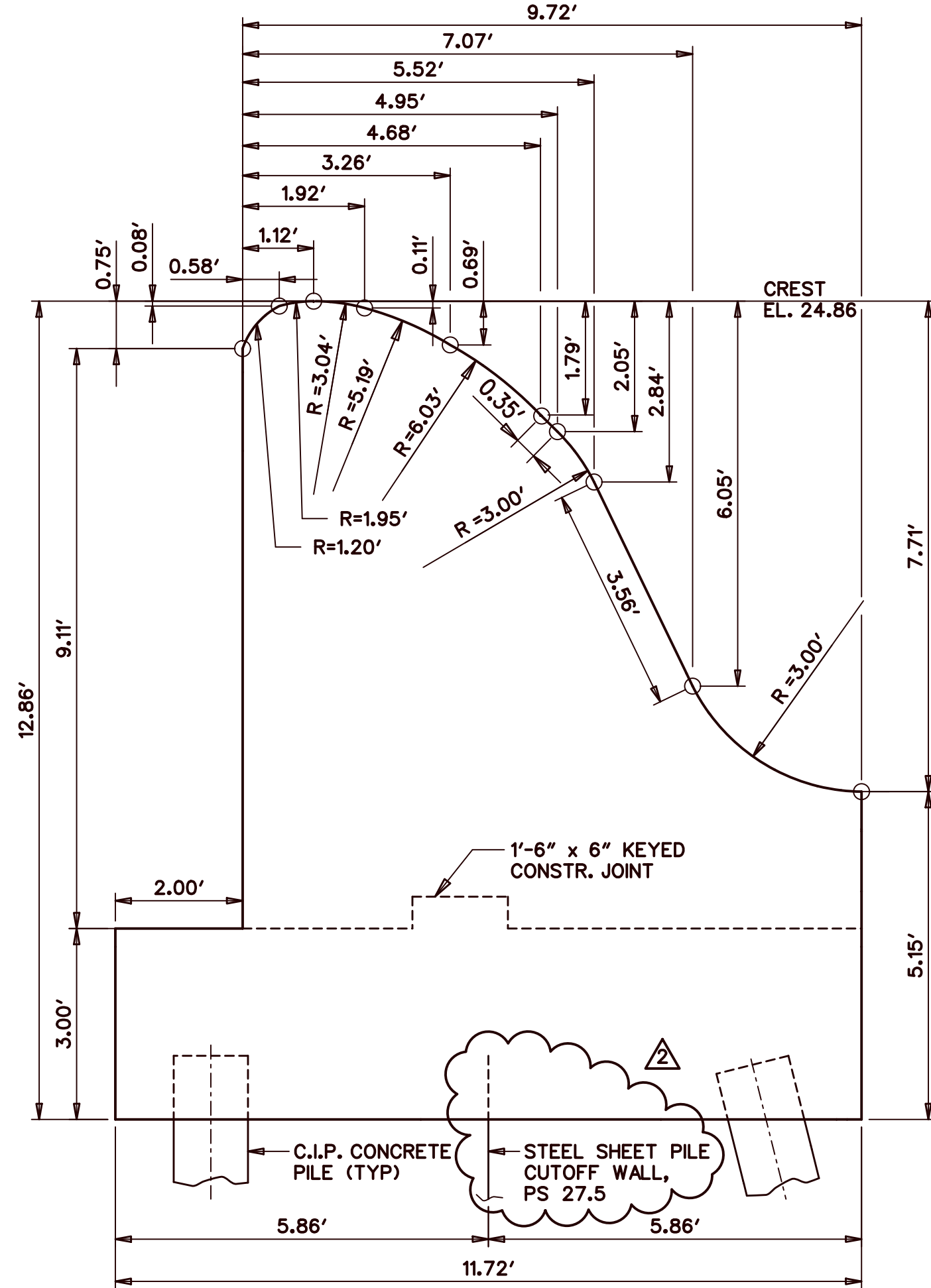
LEGEND

B	BOTTOM
CL	CENTERLINE
CL.	CLEARANCE
CONSTR.	CONSTRUCTION
EL.	ELEVATION
E.F.	EACH FACE
EQ.	EQUAL
F.F.	FRONT FACE
JT.	JOINT
MAX.	MAXIMUM
MIN.	MINIMUM
R.F.	REAR FACE
SPA.	SPACES
T	TOP
TYP.	TYPICAL
[Hatched Box]	DENOTES MUCK EXCAVATION
[Solid Grey Box]	DENOTES BULKHEAD REMOVAL

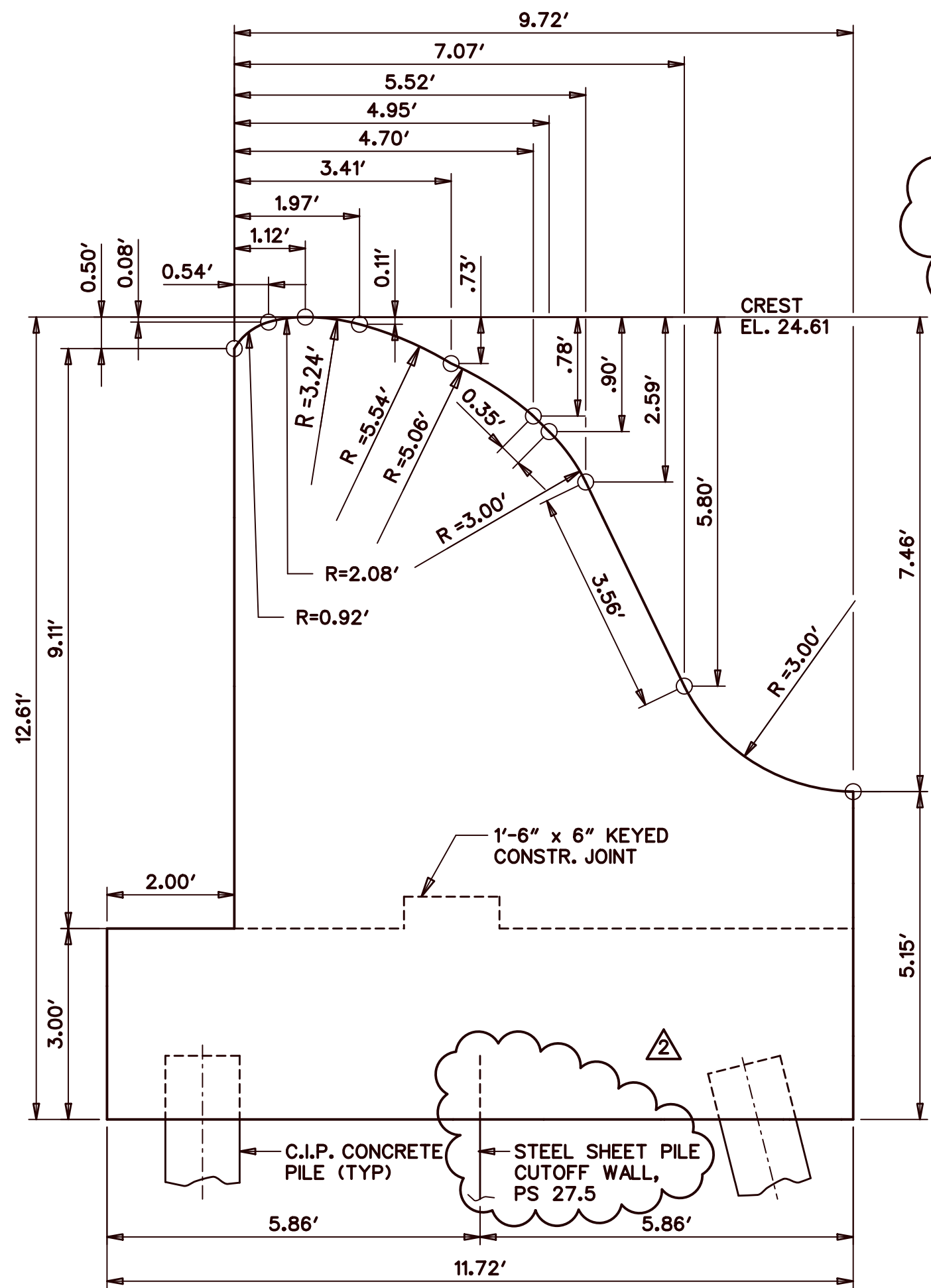
- NOTES:**
- FOR PROJECT NOTES, SEE SHEET NO. 3.
 - WORK THIS SHEET WITH SHEET NO. 10.
 - PROVIDE CONCRETE WITH MINIMUM COMPRESSIVE STRENGTH $f'c = 3,000$ psi.
 - REINFORCEMENT STEEL MUST MEET ASTM A615 (GRADE 60). ALL REINFORCEMENT MUST BE EPOXY COATED.
 - STEEL SHEET PILING MUST CONFIRM TO AASHTO M 202, GRADE 50.



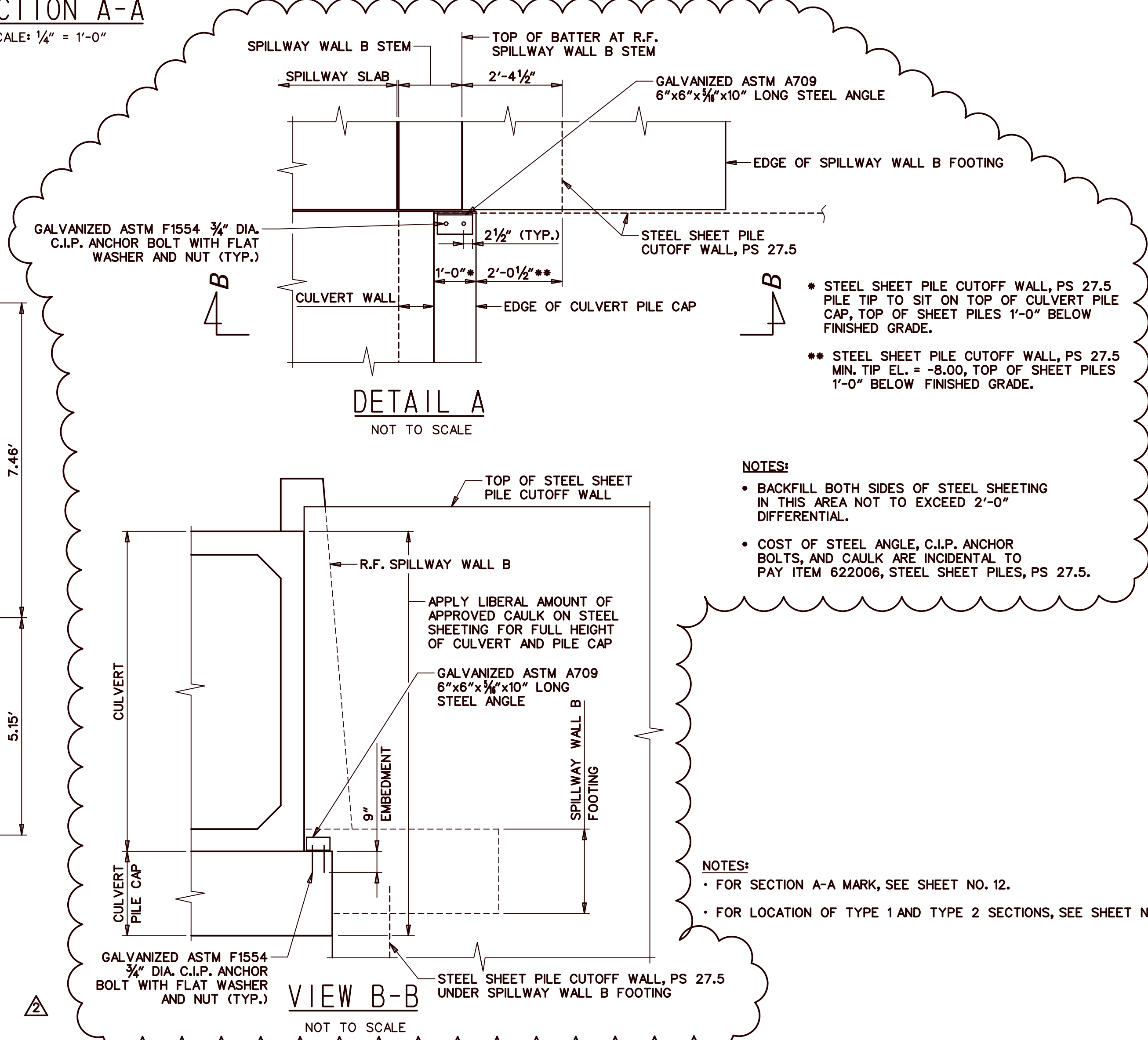
SECTION A-A
SCALE: 1/4" = 1'-0"



TYPICAL SECTION - OGEE TYPE 1
SCALE: 1/2" = 1'-0"



TYPICAL SECTION - OGEE TYPE 2
SCALE: 1/2" = 1'-0"



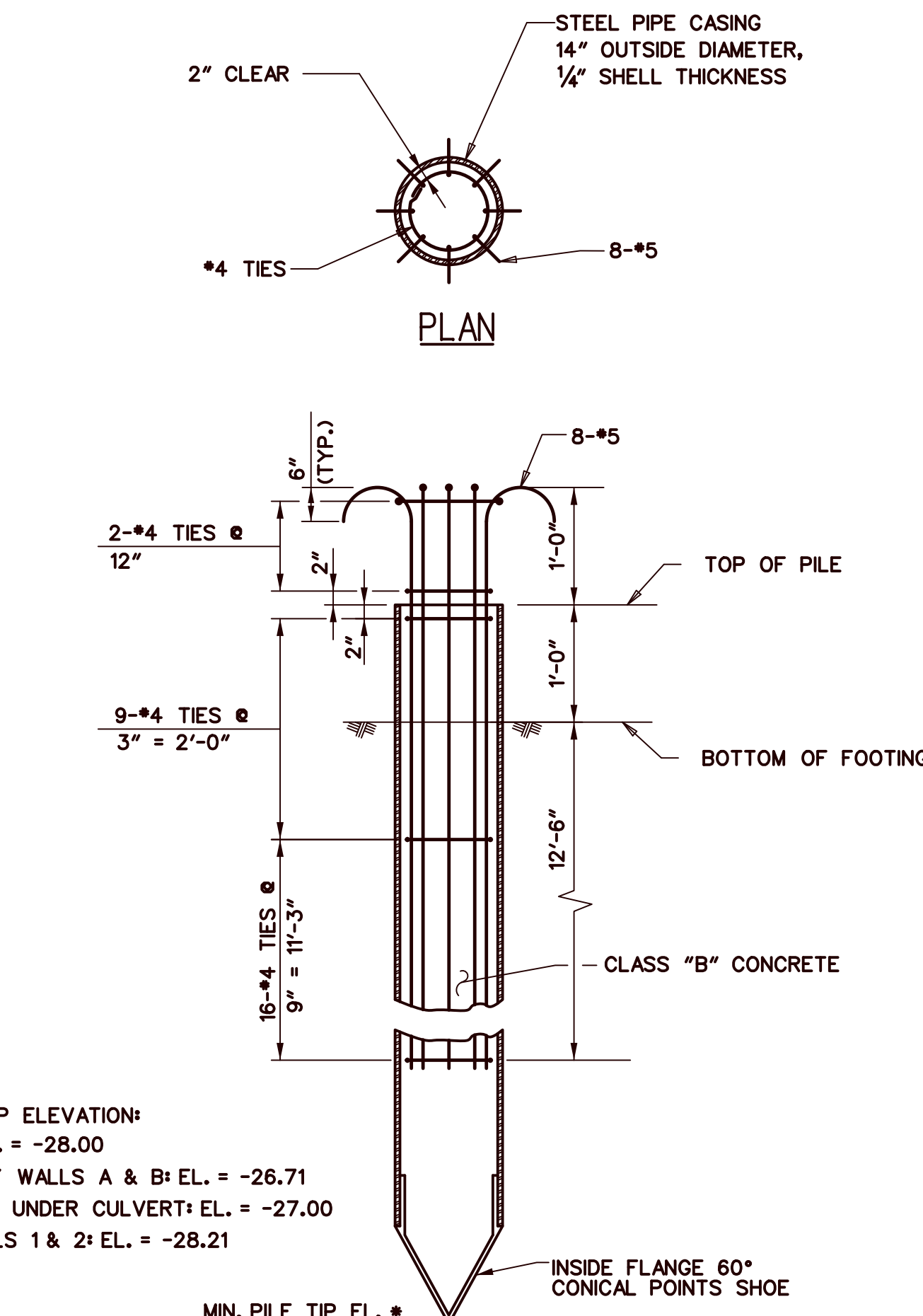
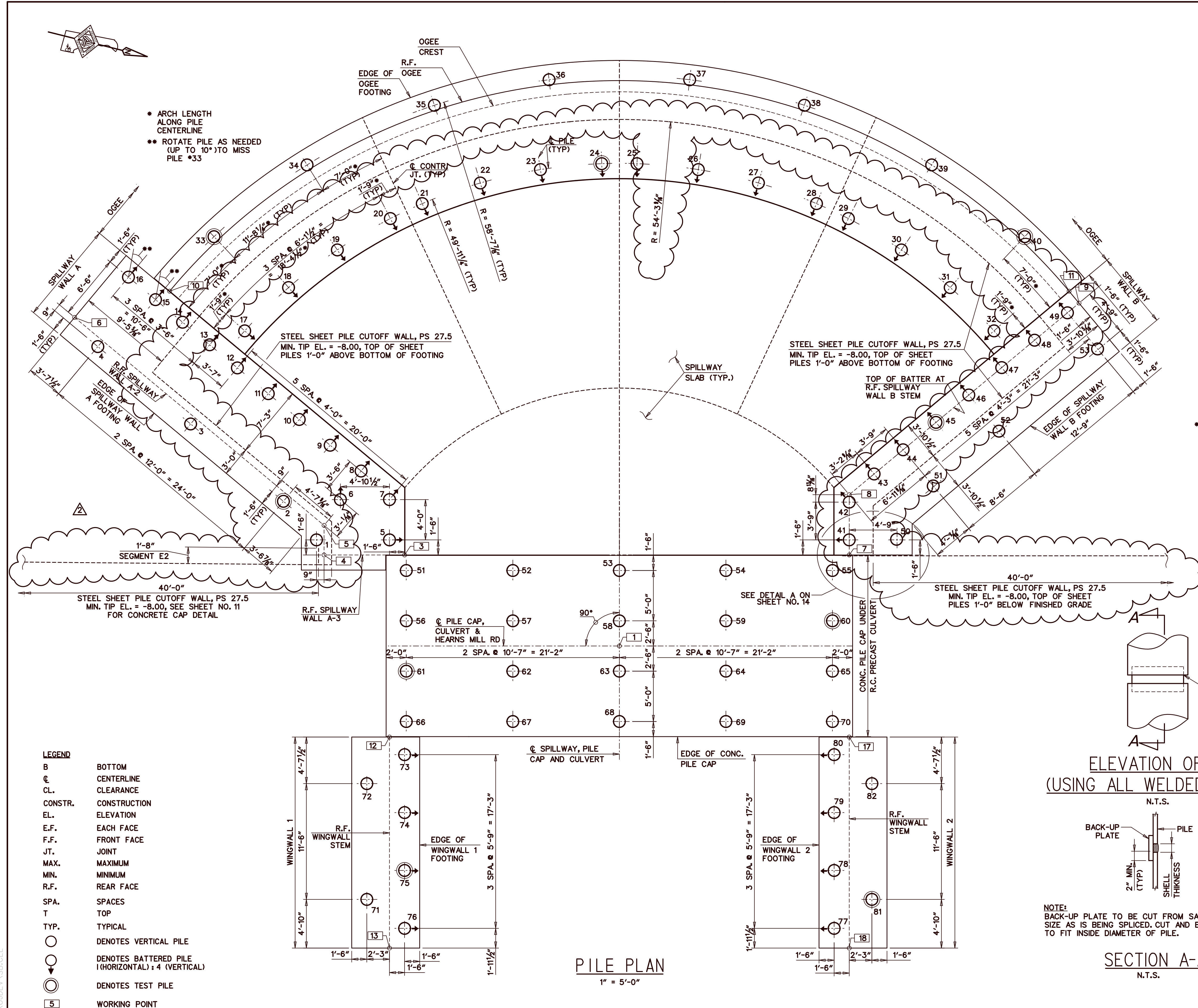
DETAIL A
NOT TO SCALE

VIEW B-B
NOT TO SCALE

- * STEEL SHEET PILE CUTOFF WALL, PS 27.5 PILE TIP TO SIT ON TOP OF CULVERT PILE CAP, TOP OF SHEET PILES 1'-0" BELOW FINISHED GRADE.
- ** STEEL SHEET PILE CUTOFF WALL, PS 27.5 MIN. TIP EL. = -8.00, TOP OF SHEET PILES 1'-0" BELOW FINISHED GRADE.

- NOTES:**
- BACKFILL BOTH SIDES OF STEEL SHEETING IN THIS AREA NOT TO EXCEED 2'-0" DIFFERENTIAL.
 - COST OF STEEL ANGLE, C.I.P. ANCHOR BOLTS, AND CAULK ARE INCIDENTAL TO PAY ITEM 622006, STEEL SHEET PILES, PS 27.5.

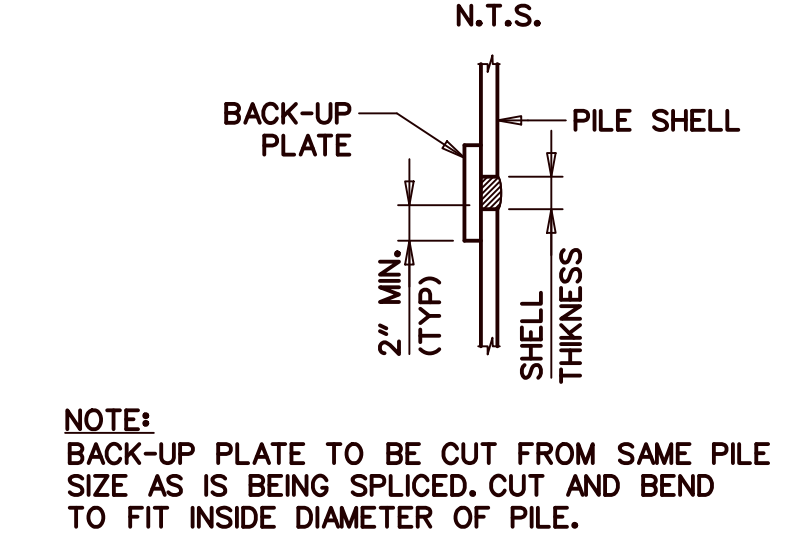
- NOTES:**
- FOR SECTION A-A MARK, SEE SHEET NO. 12.
 - FOR LOCATION OF TYPE 1 AND TYPE 2 SECTIONS, SEE SHEET NO. 13.



- * MINIMUM PILE TIP ELEVATION:**
- OGEE EL. = -28.00
 - SPILLWAY WALLS A & B EL. = -26.71
 - PILE CAP UNDER CULVERT EL. = -27.00
 - WINGWALLS 1 & 2 EL. = -28.21

- LEGEND**
- B BOTTOM
 - CL CENTERLINE
 - CL. CLEARANCE
 - CONSTR. CONSTRUCTION
 - EL. ELEVATION
 - E.F. EACH FACE
 - F.F. FRONT FACE
 - JT. JOINT
 - MAX. MAXIMUM
 - MIN. MINIMUM
 - R.F. REAR FACE
 - SPA. SPACES
 - T TOP
 - TYP. TYPICAL
 - DENOTES VERTICAL PILE
 - DENOTES BATTERED PILE (HORIZONTAL) : 4 (VERTICAL)
 - DENOTES TEST PILE
 - WORKING POINT

ELEVATION OF SPLICE (USING ALL WELDED ALTERNATE)



SECTION A-A

- NOTES:**
- PILES CONSIST OF 14" DIAMETER, CLASS "B" CONCRETE FILLED STEEL PIPE PILES. STEEL PIPE PILES SHALL CONFORM TO ASTM A252, GRADE 3, MODIFIED FOR A 50 KSI MINIMUM YIELD STRENGTH. SHELL THICKNESS TO BE 1/4".
 - FOUNDATION DESIGN CRITERIA:
 - NOMINAL AXIAL COMPRESSION RESISTANCE (SERVICE LIMIT): 398 KIPS
 - FACTORED AXIAL COMPRESSION RESISTANCE (STRENGTH LIMIT): 181 KIPS
 - NOMINAL UPLIFT RESISTANCE (SERVICE LIMIT): 99 KIPS
 - FACTORED UPLIFT RESISTANCE (STRENGTH LIMIT): 51 KIPS
 - LATERAL RESISTANCE (SERVICE & STRENGTH LIMITS):
 - VERTICAL PILE: 27 KIPS
 - BATTERED PILE: 45 KIPS
 - NO PILE SPLICING TO BE ALLOWED ON ANY PORTION OF PILE THAT IS TO REMAIN EXPOSED IN COMPLETE STRUCTURE.
 - WORK THIS SHEET WITH SHEET NOS. 15, 19, 21, 25 AND 26.
 - COST OF REINFORCEMENT AND CONCRETE TO BE INCLUDED UNDER THE CORRESPONDING C.I.P. PILE PAY ITEM.
 - IF STEEL PIPE PILES ARE USED, THE STEEL PIPE PILE SHELL SHALL CONFORM TO THE REQUIREMENTS OF ASTM A 252, GRADE 3, MODIFIED TO HAVE MINIMUM YIELD STRENGTH OF 50 KSI (2.4 MPA), WITH A MINIMUM WALL THICKNESS OF 1/4". FOR WELDED PIPE PILES, ALL SEAMS SHALL BE STRAIGHT OR SPIRAL-BUTT WELDED HAVING FULL STRENGTH WELDED JOINTS. SEAMLESS STEEL PIPE PILES ARE ALSO ACCEPTABLE. ALL PILES SHALL BE EQUIPPED WITH CAST STEEL, INSIDE-FLANGE, EXTRA STRONG, RIBBED 60 DEGREE CONICAL POINTS. THESE CONICAL POINTS SHALL BE SECURELY FITTED TO THE BOTTOM OF THE PILE SHELLS BY WELDING WITH A 30 DEGREE BEVELED GROOVE WELD ALL AROUND AND IN SUCH A MANNER TO MINIMIZE ANY EXTRUSION 238 BEYOND THE OUTSIDE SURFACE OF THE STEEL CASINGS. A MAXIMUM PROTRUSION OF 1/4" IS PERMISSIBLE. IF THE PROTRUSION EXCEEDS 1/4", THE CONTRACTOR SHALL GRIND THE PROTRUDING WELD FLUSH WITH THE OUTSIDE SURFACE OF THE PILE SHELL.

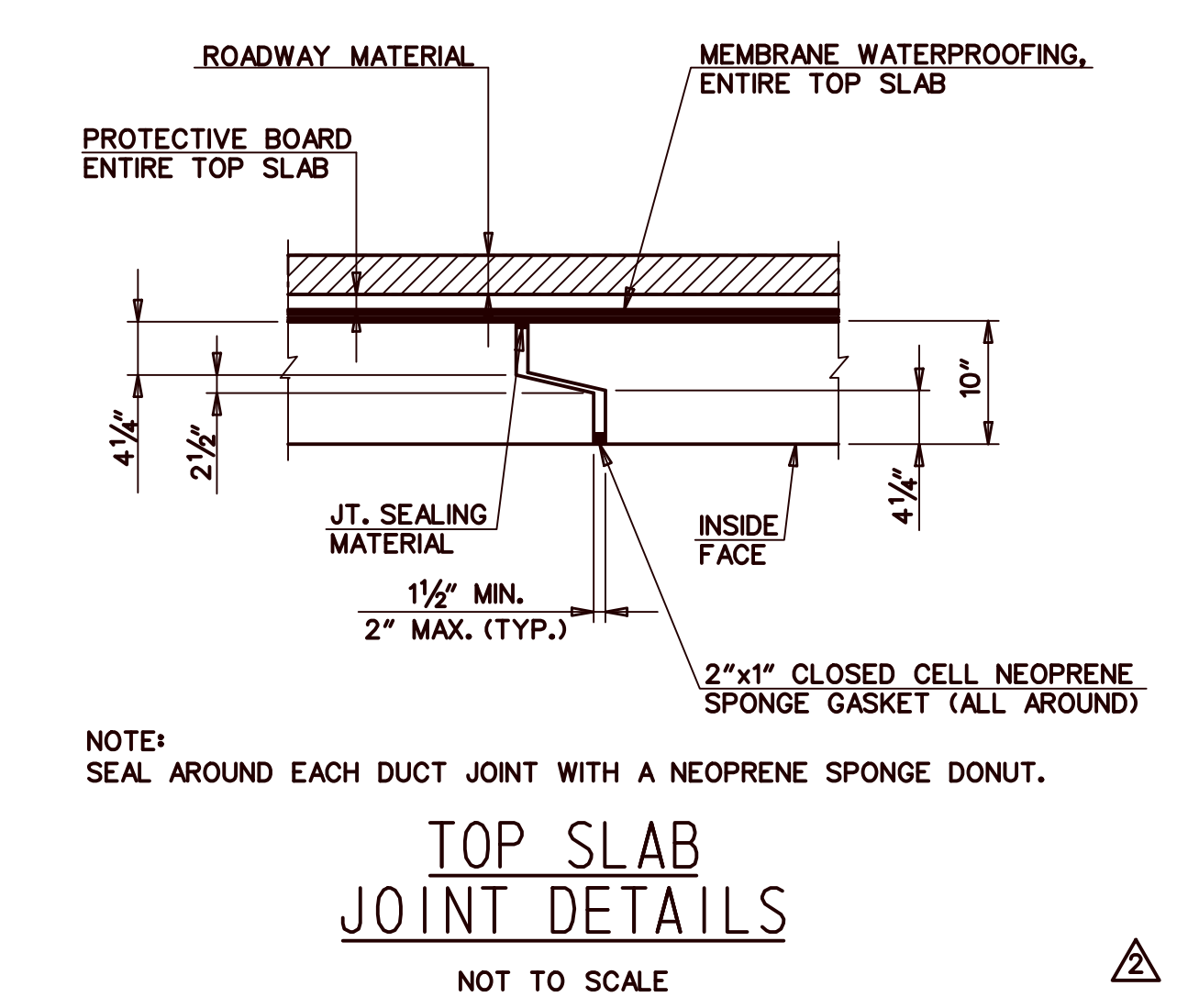
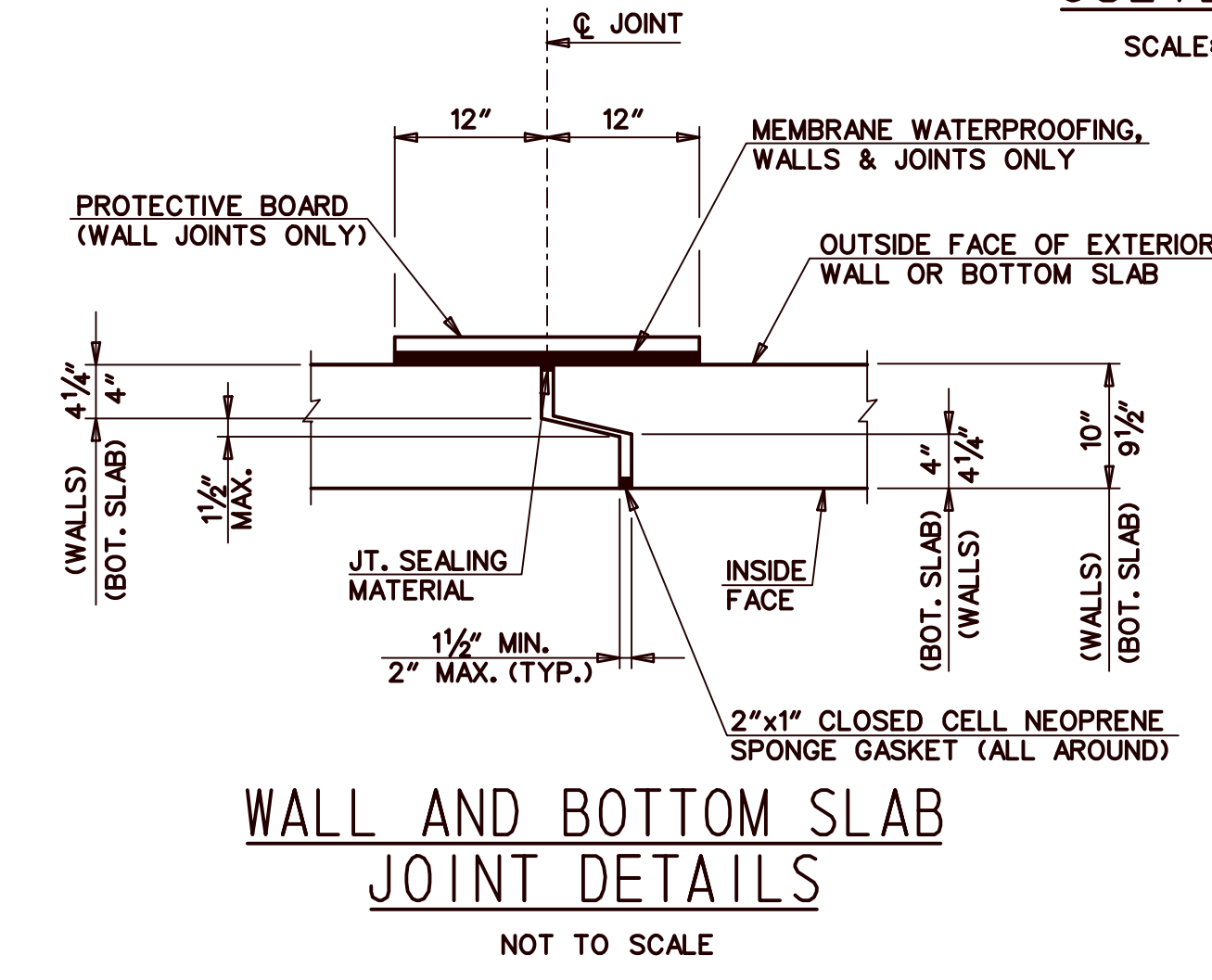
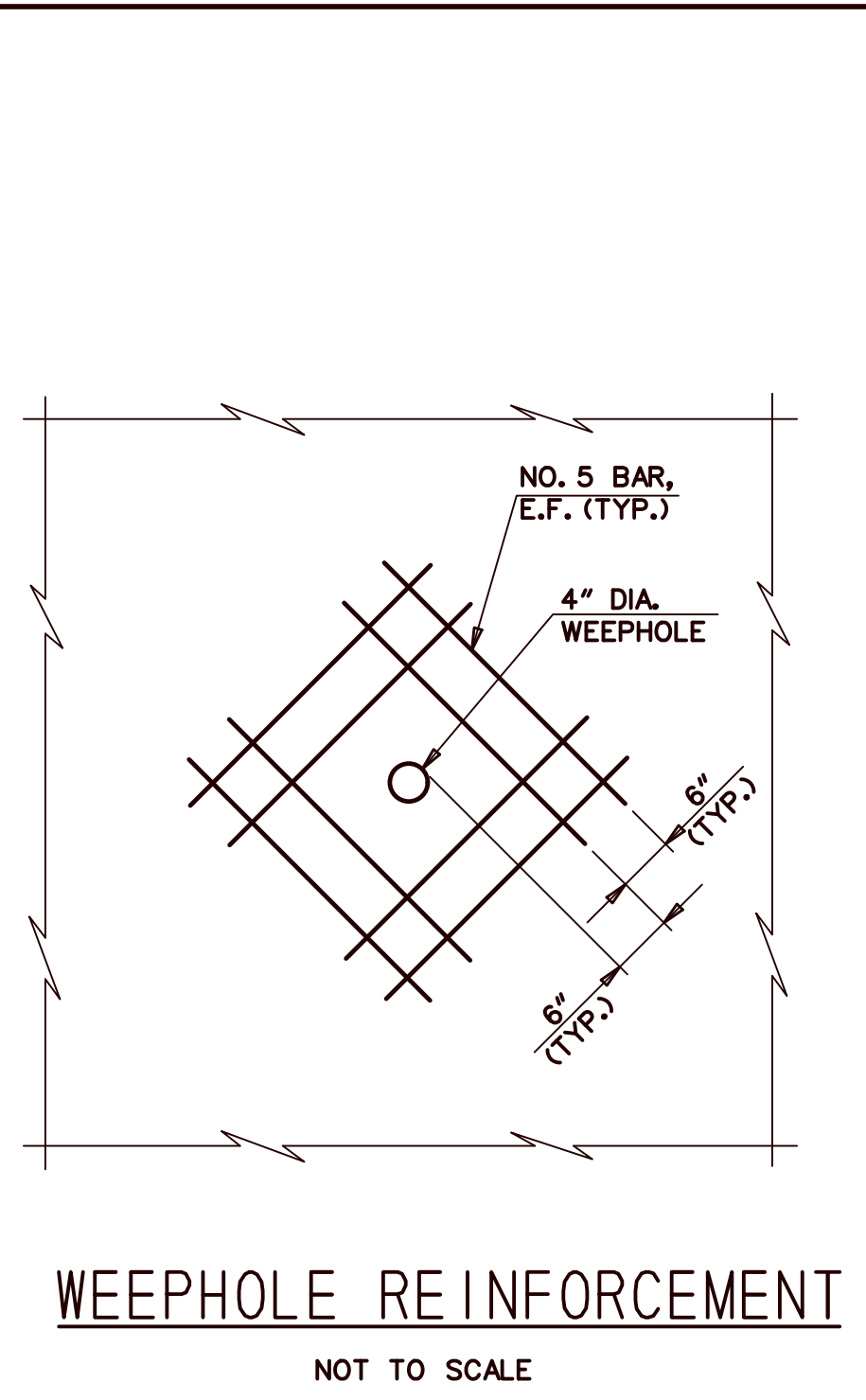
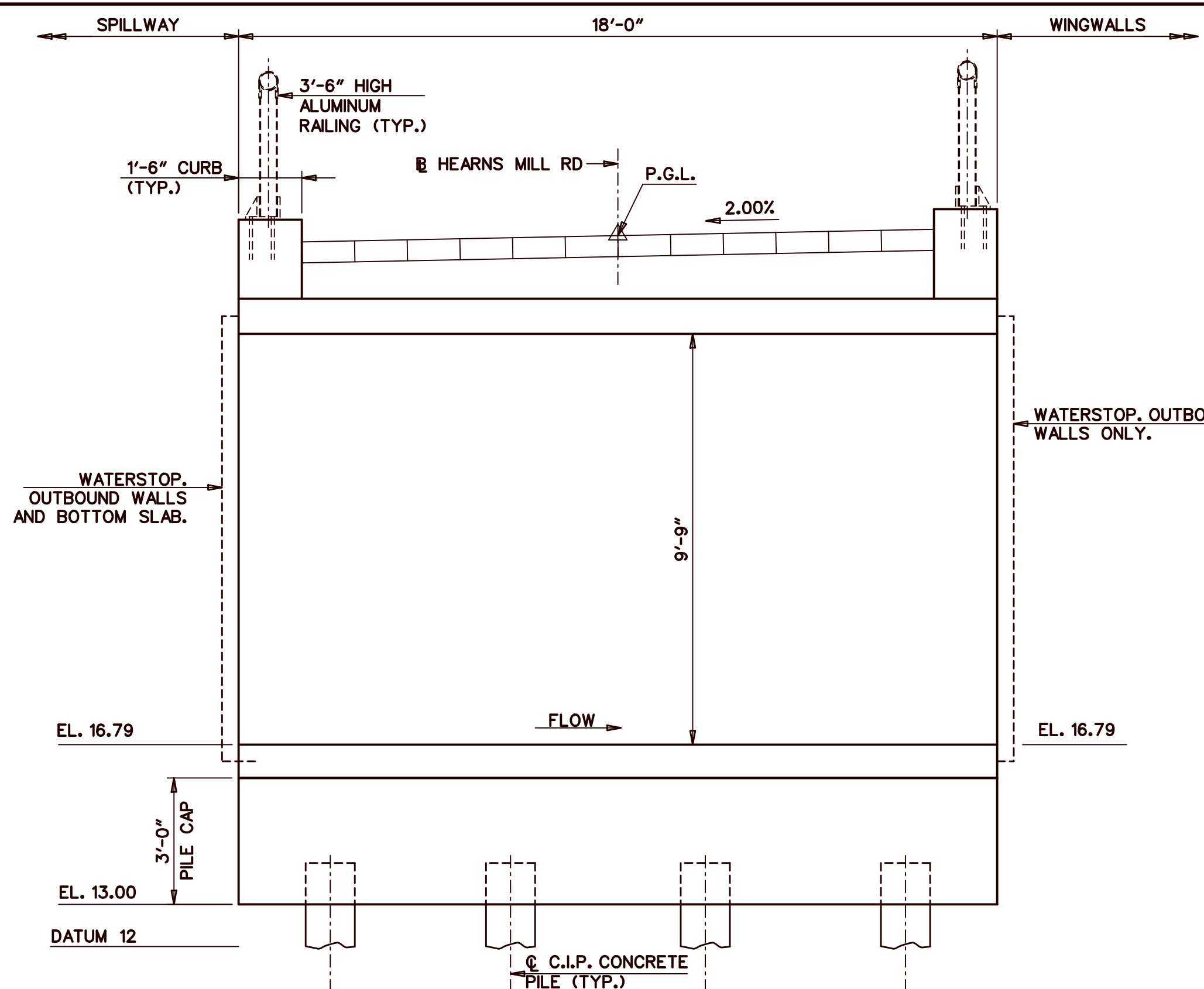
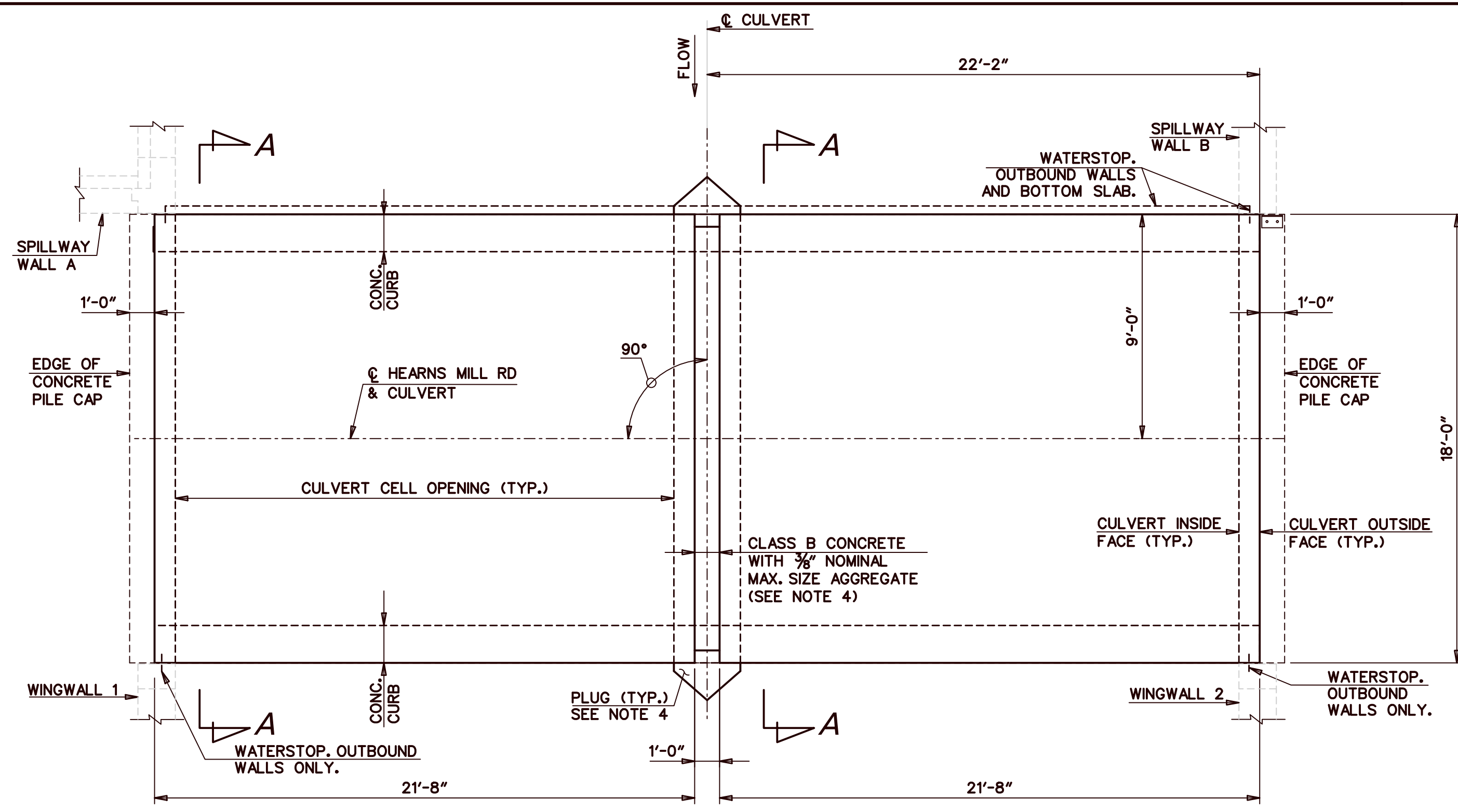
ADDENDUMS / REVISIONS	
ADD STEEL SHEET PILE CUTOFF WALL, ACL/BTA, 2/5/2016	

SCALE: AS NOTED

HEARNS POND DAM IMPROVEMENTS

CONTRACT	BRIDGE NO.	N/A
T201207603	DESIGNED BY: AT	
COUNTY	CHECKED BY: CHC	
SUSSEX		

PILE PLAN, DETAILS AND NOTES	SHEET NO.	15
	TOTAL SHTS.	43



WATERPROOFING NOTES:

THE COST OF THE MEMBRANE WATERPROOFING AND PROTECTIVE BOARD WILL BE INCIDENTAL TO ITEM 602736, PRECAST CONCRETE CULVERT. THE FOLLOWING IS A MATERIAL SPECIFICATION FOR THE TWO ITEMS:

PROTECTIVE BOARD/COVERS. PROVIDE A 1/8-INCH THICK ASPHALT PROTECTIVE BOARD OR 65-POUND ROOFING MATERIAL WITHOUT MICA COATING, OR APPROVED EQUAL THAT FURNISHES EQUIVALENT PROTECTION TO THE MEMBRANE FROM BEING CUT, SCRATCHED, OR OTHERWISE DAMAGED FROM THE BACKFILL OR EQUIPMENT.

ADHESIVE-BACKED PREFORMED MEMBRANE SHEET. FURNISH ADHESIVE-BACKED PREFORMED MEMBRANE SHEET CONSISTING OF A SHEET OF RUBBERIZED ASPHALT OR POLYMER MODIFIED BITUMEN PERMANENTLY APPLIED TO A POLYETHYLENE FILM, OR REINFORCED WITH A STITCH-BONDED POLYESTER/POLYPROPYLENE FABRIC, OR REINFORCED WITH A FIBERGLASS MESH AND CONFORMING TO THE MINIMUM REQUIREMENTS SPECIFIED BELOW.

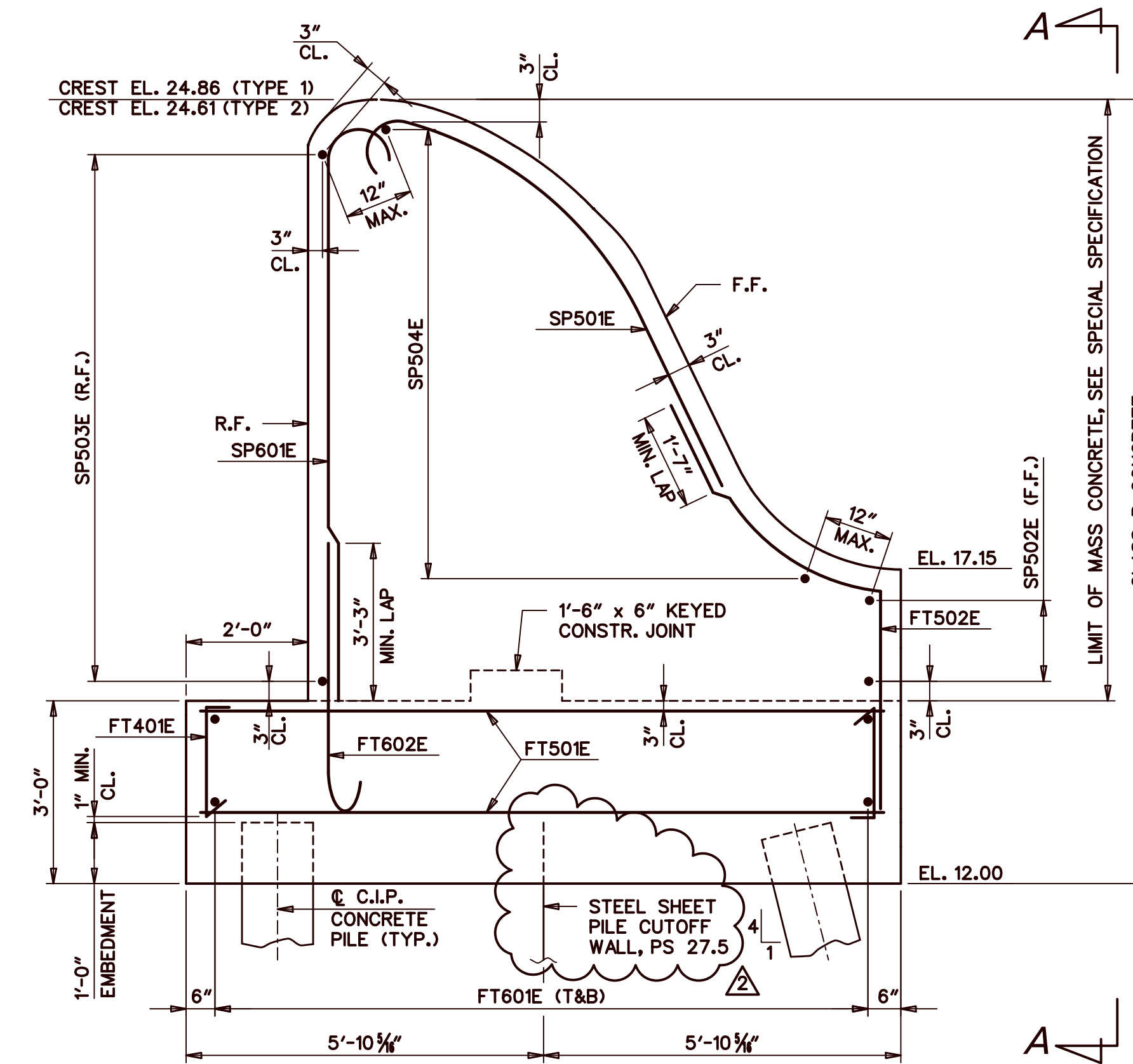
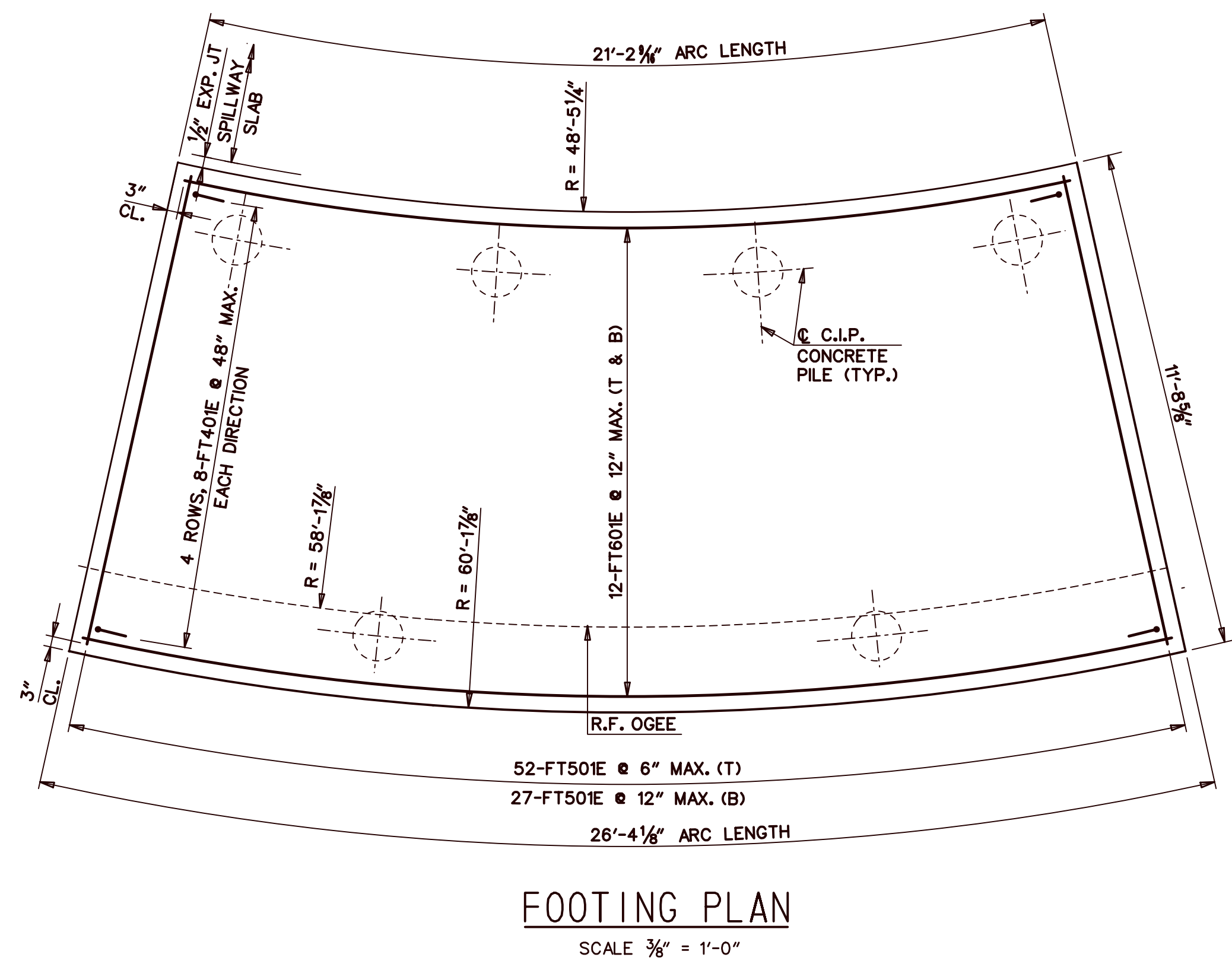
PROPERTY	TEST	RUBBERIZED ASPHALT TYPE	MODIFIED BITUMEN TYPE
TENSILE STRENGTH, LBS/IN (MINIMUM) ⁽¹⁾⁽³⁾	ASTM D 882 ⁽²⁾	20	20
% ELONGATION AT BREAK, (MIN) ⁽³⁾⁽⁴⁾	ASTM D 882 ⁽²⁾	25	25
PLIABILITY	ASTM D 146 ⁽⁵⁾	NO CRACKS	NO CRACKS
THICKNESS, MILS (MINIMUM) ⁽⁶⁾	ASTM D 1000	60	60
SOFTENING POINT, F (MINIMUM)	ASTM D 36	190	210
PERMEANCE, PERMS (MAXIMUM)	ASTM E 96, METHOD B	0.1	0.1
PUNCTURE RESISTANCE, LBS. (MIN)	ASTM E 154	40	40

NOTES:
 (1) BREAKING FACTOR IN MACHINE DIRECTION.
 (2) METHOD A, 1-INCH WIDE STRIP WITH 4-INCH MINIMUM INITIAL SEPARATION AND 4-INCH GAGE LENGTH AT 2 INCHES PER MINUTE. AVERAGE 5 SAMPLES.
 (3) AT 73.4F +/- 3.6F.
 (4) MACHINE DIRECTION.
 (5) 180-DEGREE BEND OVER A 1-INCH MANDREL AT -15F.
 (6) TOTAL THICKNESS OF PREFORMED MEMBRANE SHEET AND POLYETHYLENE FILM OR FABRIC REINFORCEMENT.

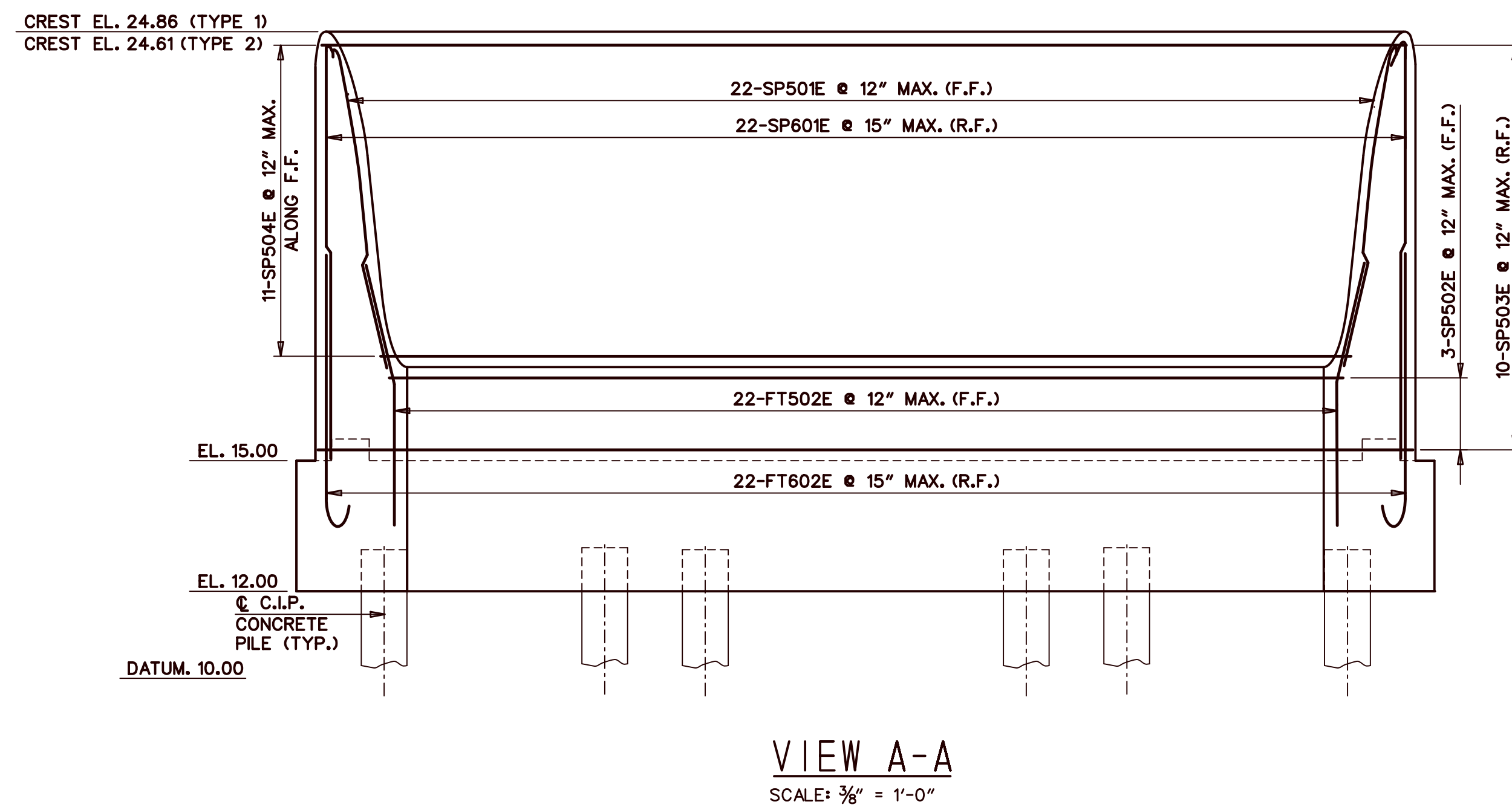
PRECAST ELEMENT NOTES:

- MATERIAL:**
 - CONCRETE $F_c=5,000$ PSI (28 DAYS COMPRESSIVE STRENGTH).
 - REINFORCING STEEL $F_y=60,000$ PSI.
 - STRUCTURAL STEEL FOR ANCHOR PLATES SHALL CONFORM TO AASHTO M270 (ASTM A709), GRADE 36 AND SHALL BE HOT-DIP GALVANIZED.
 - 1/2" DIAMETER (YIELD STRENGTH OF 270 PSI) LOW RELAXATION POLYPROPYLENE-SHEATHED PRESTRASSING STRANDS WITH CORROSION INHIBITOR.
- DESIGN PLANS / WORKING DRAWINGS:**
 - INFORMATION PERTAINING TO THE PRECAST REINFORCED CONCRETE CULVERT IS INTENDED TO SERVE AS AN INDICATION OF THE TYPE OF CONSTRUCTION ACCEPTABLE FOR USE. THE CONTRACTOR WILL BE REQUIRED TO PREPARE AND SUBMIT FOR APPROVAL. A COMPLETE SET OF DETAILED SHOP DRAWINGS FOR THE PRECAST CONCRETE UNITS THEY PROPOSE TO FURNISH. THE SHOP DRAWINGS SHALL INCLUDE:
 - AN OVERALL PLAN SHOWING ALL UNITS TOGETHER AND DETAILS OF EACH TYPE OF UNIT.
 - A PLAN VIEW OF REINFORCEMENT FOR ANY IRREGULAR SHAPED (SKEWED, CURVED, ETC.) SECTIONS.
 - REINFORCING BAR LIST.
 - BILL OF MATERIALS INCLUDING ALL ACCESSORIES.
 - METHOD AND SEQUENCE OF POST-TENSIONING.
- PRECAST ELEMENTS, ACCESSORIES AND INSTALLATION:**
 - PAYMENT FOR ITEM 602736 PRECAST CONCRETE CULVERT SHALL INCLUDE:
 - ALL PRECAST ELEMENTS.
 - ALL ASSOCIATED REINFORCEMENT.
 - ALL ACCESSORIES (INCLUDING, BUT NOT LIMITED TO, WEEP HOLES, CONCRETE FINISH, POST-TENSIONING TENDONS, CONNECTION PLATES, GROUT, JOINT WRAP, THREADED INSERTS) MENTIONED IN THE FOLLOWING NOTES UNLESS NOTED OTHERWISE.
 - DELIVERY AND INSTALLATION OF ALL PRECAST ELEMENTS AND ALL ACCESSORIES.
 - INSTALL WEEPHOLES AT EVERY OTHER PRECAST SEGMENT SEGMENT ON THE OUTBOUND WALL ONLY.
- MISCELLANEOUS CONCRETE NOTES:**
 - ALL EXPOSED SURFACES SHALL BE PROTECTED WITH A WATER MISCIBLE, PENETRATING SILANE SEALER.
 - ALL EXPOSED EDGES SHALL BE CHAMFERED 3/4" - UNLESS OTHERWISE NOTED.

- BOX CULVERT POST-TENSIONING:**
 - THE PRECAST BOX CULVERT SECTIONS SHALL BE POST-TENSIONED TOGETHER WITH A MINIMUM OF FOUR POST-TENSIONING TENDONS. THE CULVERT SHALL BE POST-TENSIONED SUCH THAT THE NEOPRENE GASKETS ARE COMPRESSED ALL AROUND AND THERE IS A 1/2" MAXIMUM GAP BETWEEN SECTIONS. MAXIMUM POST-TENSIONING FORCE SHALL BE 28,900 LBS. POST-TENSIONING DETAILS (PLACEMENT, SEQUENCE OF TENSIONING, ETC.) SHALL BE SHOWN IN THE SUBMITTED SHOP DRAWINGS. ALL POCKETS AND DUCTS FOR POST-TENSIONING SHALL BE FILLED WITH NON-SHRINK GROUT.
 - JOINTS BETWEEN PRECAST SECTIONS:**
 - NEOPRENE GASKETS SHALL BE PROVIDED AT THE JOINTS BETWEEN ALL PRECAST UNITS IN ORDER TO MAKE THE JOINTS WATERTIGHT. AFTER INSTALLATION, THE GASKETS SHALL BE COMPRESSED SUCH THAT GAPS ARE NOT VISIBLE.
 - ALL JOINTS BETWEEN PRECAST CULVERT SECTIONS SHALL HAVE A SHEAR KEY ALL AROUND.
 - THE LOCATIONS OF THE JOINTS IN THE PRECAST SECTIONS SHALL BE DETERMINED BY THE PRECASTER AND SUBMITTED IN THE SHOP DRAWINGS FOR APPROVAL.
 - THE REINFORCEMENT SHALL HAVE 2" COVER AT THE END OF EACH SECTION AND MEET OR EXCEED THE MINIMUM AREA OF STEEL PER FOOT NOTED ON THE PLANS.
 - CAST APPROVED WATERSTOP IN PORTION OF CULVERT SEGMENTS THAT WILL BE FACING SPILLWAY WALLS, SPILLWAY SLAB AND WINGWALLS.
 - CONSTRUCTION:**
 - ALL POST-TENSIONING MUST BE WITNESSED AND APPROVED BY THE ENGINEER.
 - AFTER POST-TENSIONING IS APPROVED, CUT STRANDS TO PROVIDE A MINIMUM OF 2 1/2" CLEAR FROM THE OUTSIDE FACE OF CONCRETE AND COAT RECESS WITH EPOXY BONDING COMPOUND AND FILL WITH NON-SHRINK GROUT.
 - POST-TENSION AND GROUT BEFORE BACKFILLING. ALLOW GROUT TO ACHIEVE MINIMUM STRENGTH BEFORE BACKFILLING.
 - END CHUCKS AND SPLICE CHUCKS MUST BE OF THE REUSABLE TYPE. OPERATORS MUST EXERCISE PROPER PRECAUTIONS WHEN REALIGNING WEDGES AFTER THE RELEASE OF TENDONS AND PRIOR TO RETENSIONING AND RESEATING.
- LEGEND**
- | | | |
|------|------------|--|
| CL | CENTERLINE | |
| DIA. | DIAMETER | |
| EL. | ELEVATION | |
| E.F. | EACH FACE | |
| JT. | JOINT | |
| MAX. | MAXIMUM | |
| MIN. | MINIMUM | |
| NO. | NUMBER | |
| TYP. | TYPICAL | |
- NOTES:**
- FOR PROJECT NOTES, SEE SHEET NO. 3.
 - WORK THIS SHEET WITH SHEET NOS. 17 & 18.
 - COST FOR CLASS B CONCRETE AND PLUGS TO BE INCIDENTAL TO ITEM 602002, PORTLAND CEMENT CONCRETE MASONRY, CLASS B.



TYPICAL SECTION -
OGEE TYPE 1 & 2
SCALE: 1/2" = 1'-0"



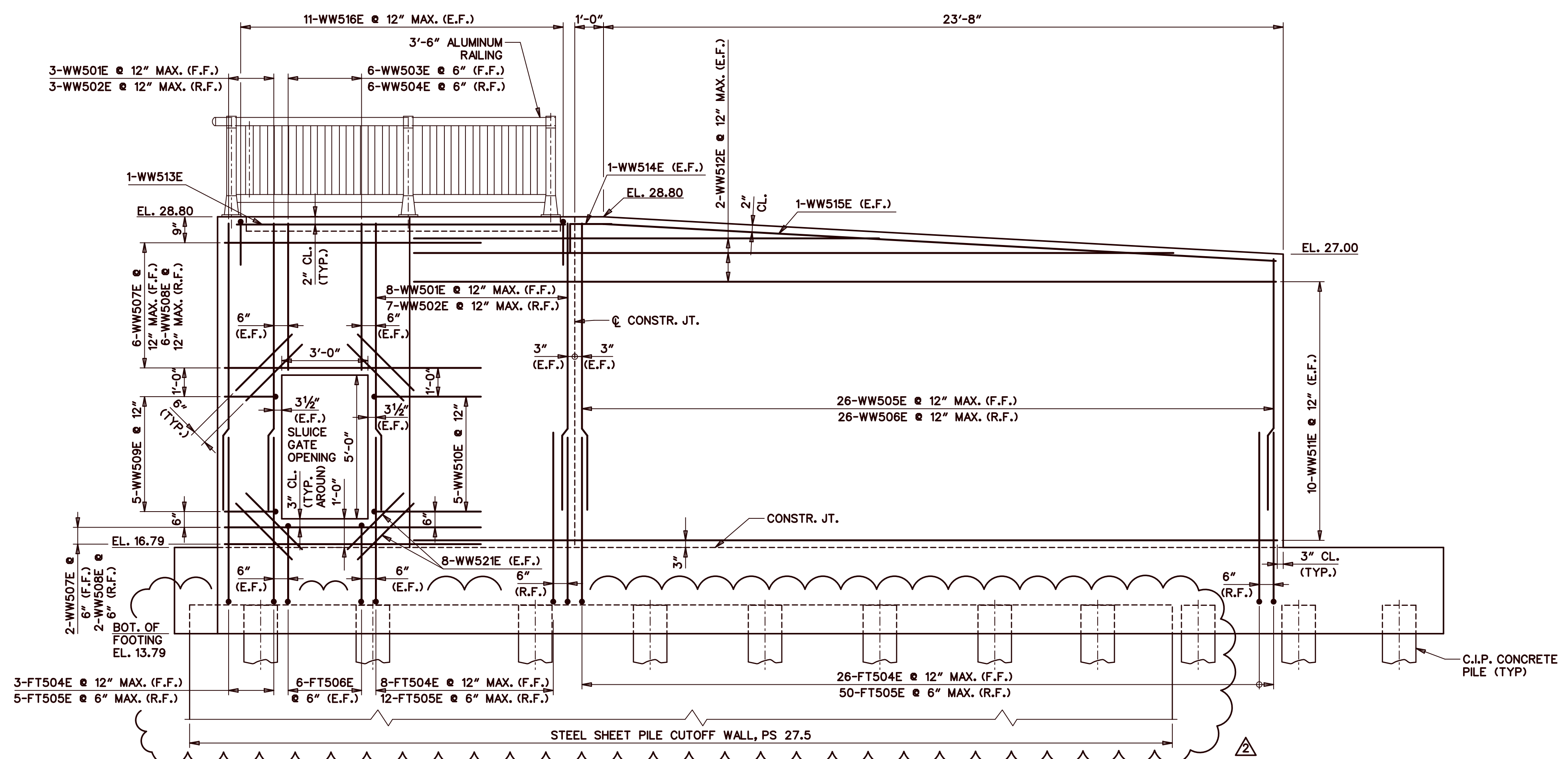
LEGEND

B	BOTTOM
C	CENTERLINE
CL.	CLEARANCE
CONSTR.	CONSTRUCTION
EL.	ELEVATION
E.F.	EACH FACE
F.F.	FRONT FACE
JT.	JOINT
MAX.	MAXIMUM
MIN.	MINIMUM
R.F.	REAR FACE
SPA.	SPACES
T	TOP
TYP.	TYPICAL

- NOTES:**
- FOR PROJECT NOTES, SEE SHEET NO. 3.
 - FOR PILE LOCATIONS, DETAILS AND MINIMUM PILE TIP ELEVATION, SEE SHEET NO. 15.
 - FOR LOCATION OF TYPE 1 & TYPE 2 OGEE, SEE SHEET NO. 13.
 - FOR OGEE GEOMETRY, SEE SHEET NO. 14.
 - FOR REINFORCEMENT BAR SCHEDULE, SEE SHEET NO. 31.

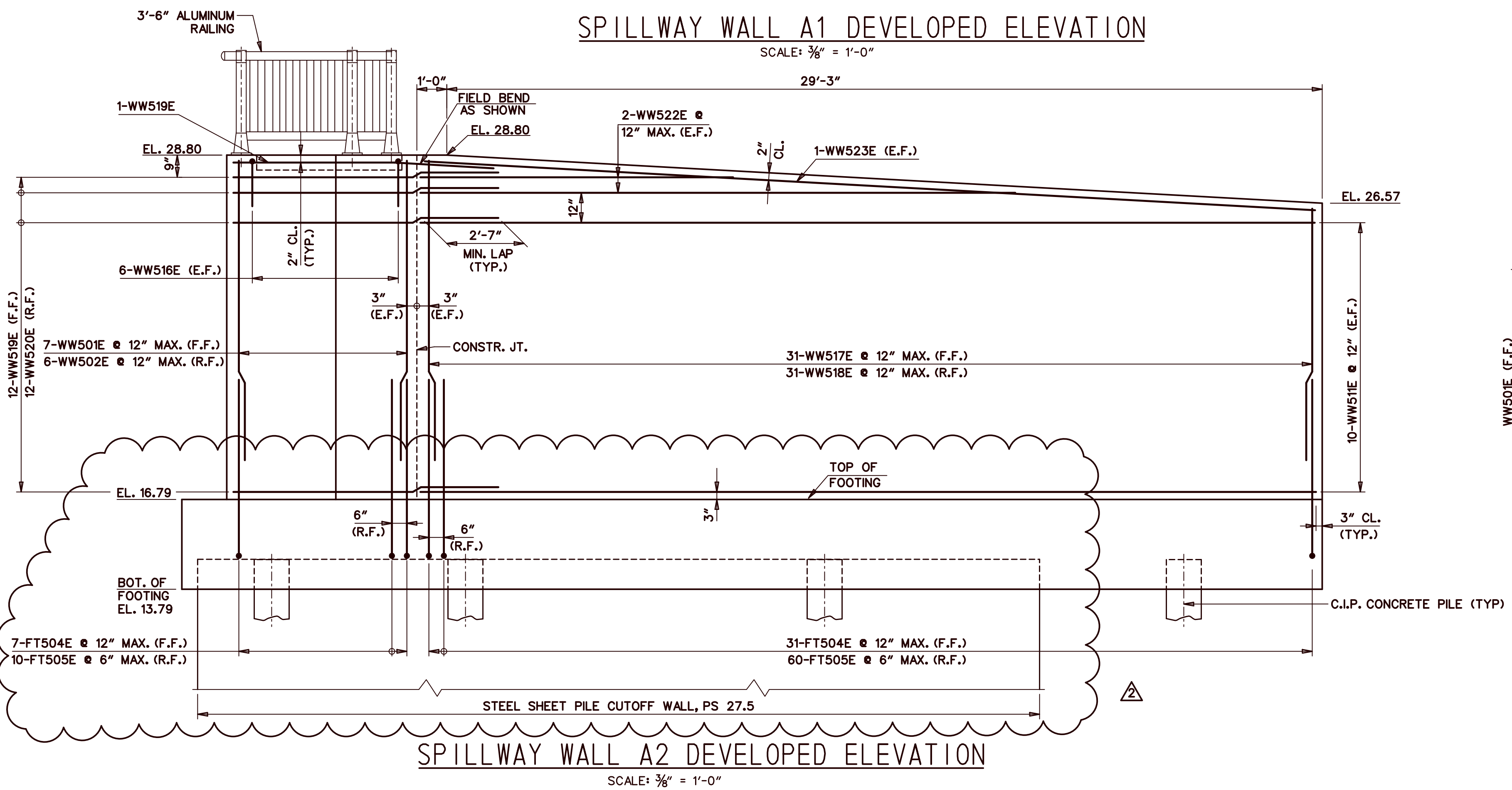
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	DELWARE DEPARTMENT OF TRANSPORTATION		ADDENDUMS / REVISIONS ▲ ADD STEEL SHEET PILE CUTOFF WALL, ACL/BTA, 2/5/2016	SCALE: AS NOTED	HEARNS POND DAM IMPROVEMENTS	CONTRACT T201207603 COUNTY SUSSEX	BRIDGE NO. N/A DESIGNED BY: AT CHECKED BY: CHC	OGEE WALL	SHEET NO. 19 TOTAL SHTS. 43	



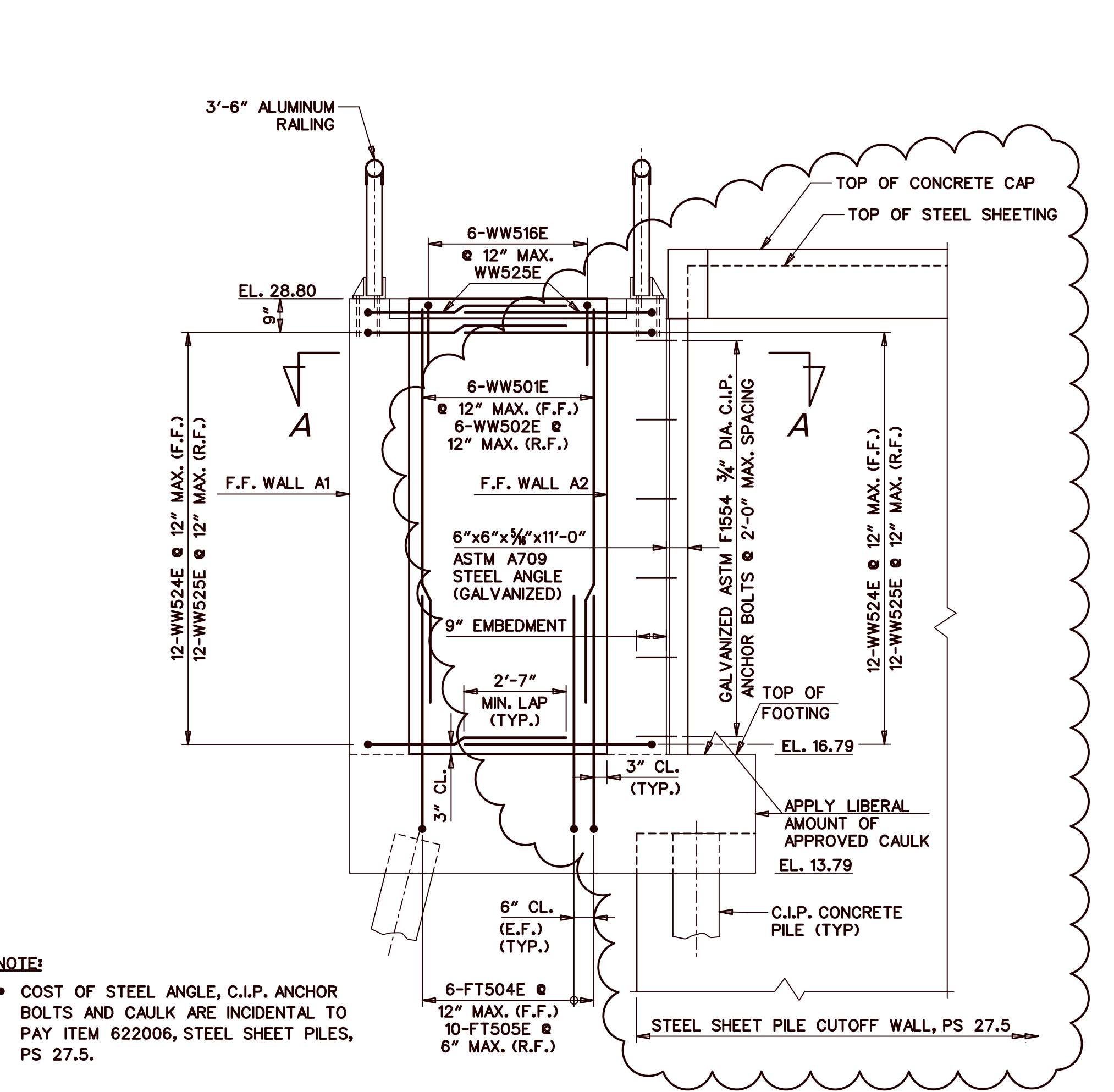
SPILLWAY WALL A1 DEVELOPED ELEVATION

SCALE: 3/8" = 1'-0"



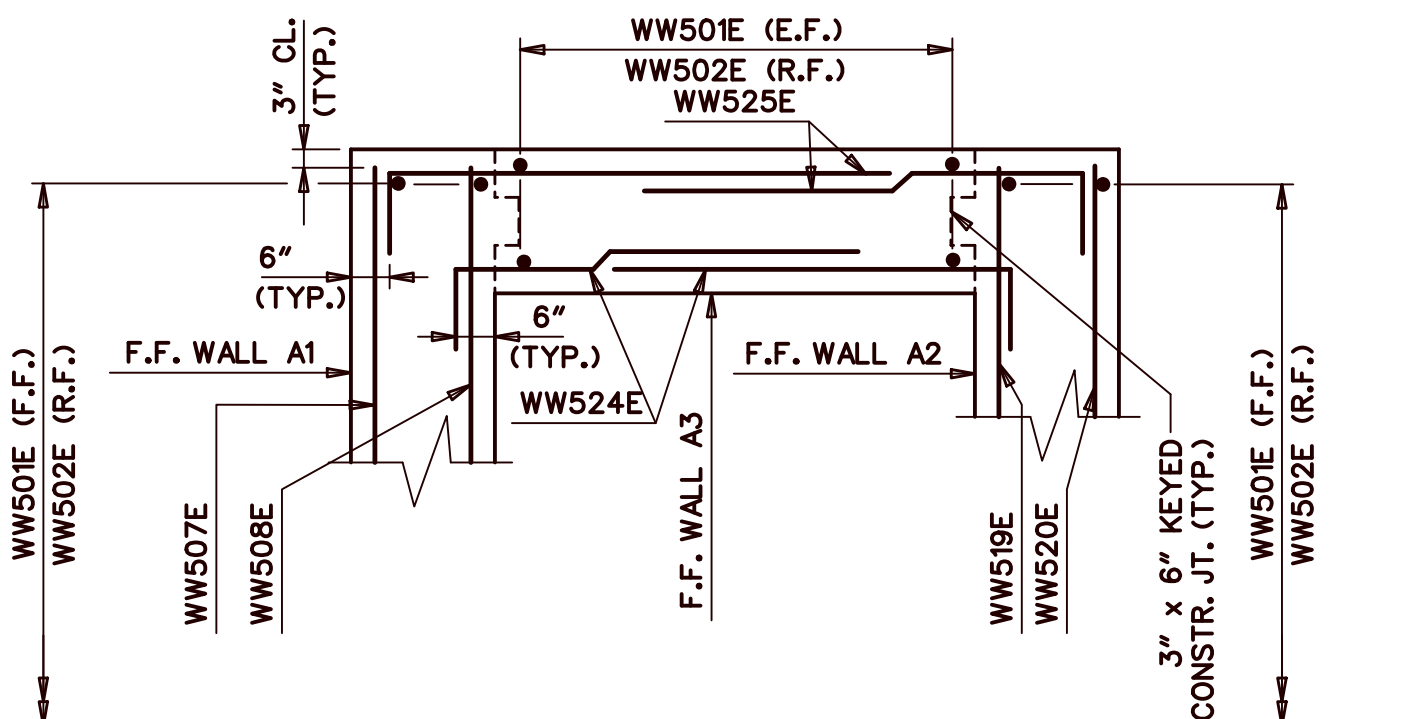
SPILLWAY WALL A2 DEVELOPED ELEVATION

SCALE: 3/8" = 1'-0"



SPILLWAY WALL A3 ELEVATION

SCALE: 3/8" = 1'-0"



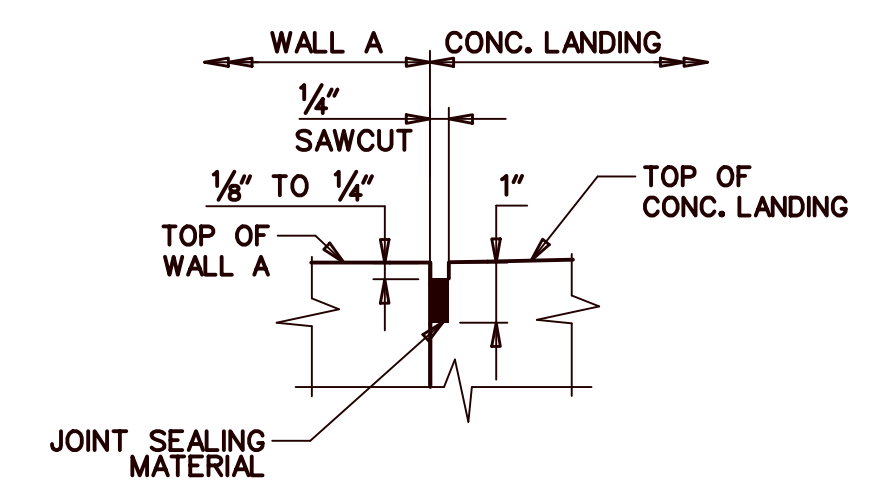
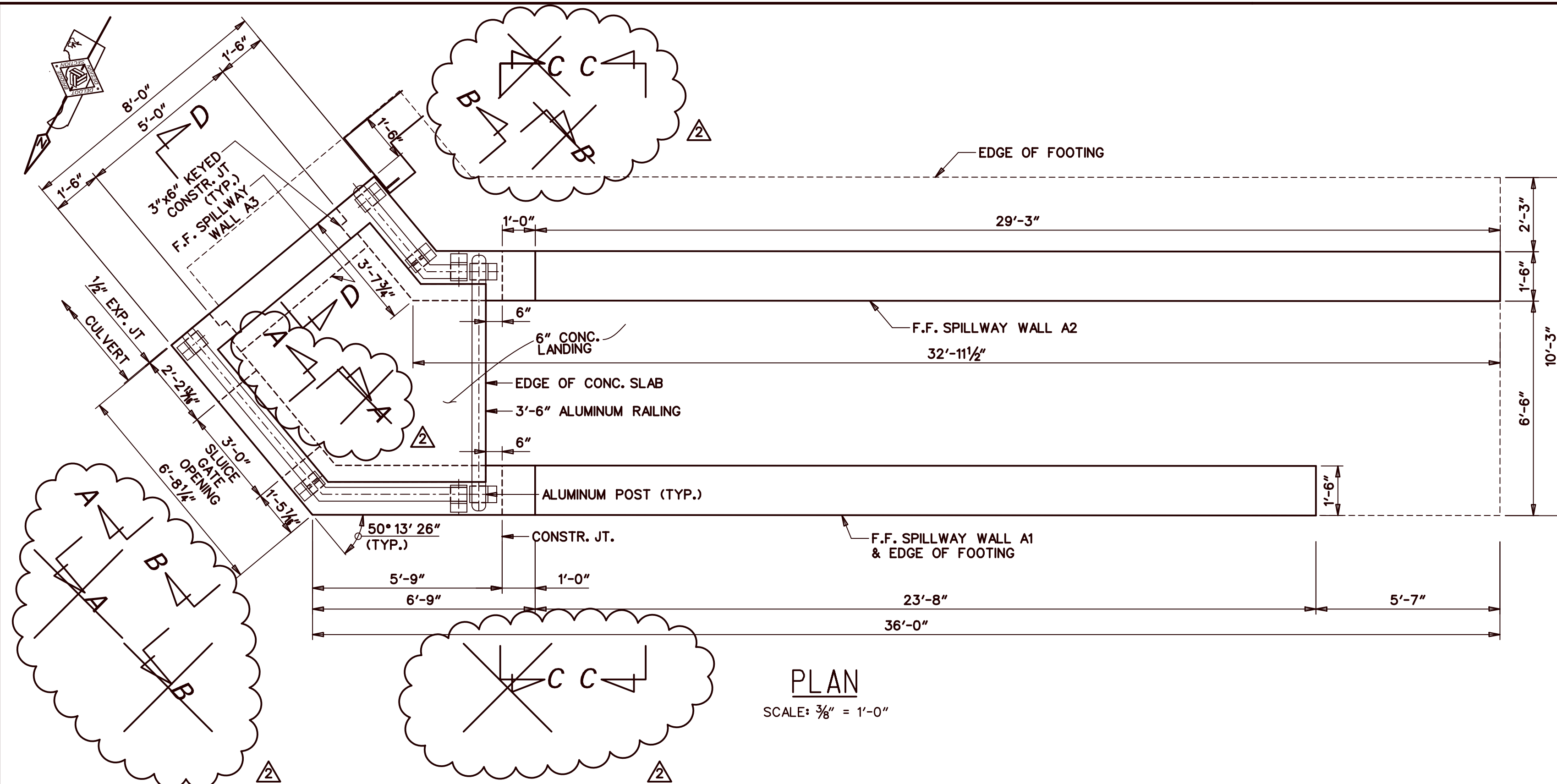
SECTION A-A

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

Legend	Definition
B	BOTTOM
CL	CENTERLINE
CL.	CLEARANCE
CONSTR.	CONSTRUCTION
EL.	ELEVATION
E.F.	EACH FACE
F.F.	FRONT FACE
JT.	JOINT
MAX.	MAXIMUM
MIN.	MINIMUM
R.F.	REAR FACE
SPA.	SPACES
T	TOP
TYP.	TYPICAL

NOTE:
 • COST OF STEEL ANGLE, C.I.P. ANCHOR BOLTS AND CAULK ARE INCIDENTAL TO PAY ITEM 622006, STEEL SHEET PILES, PS 27.5.

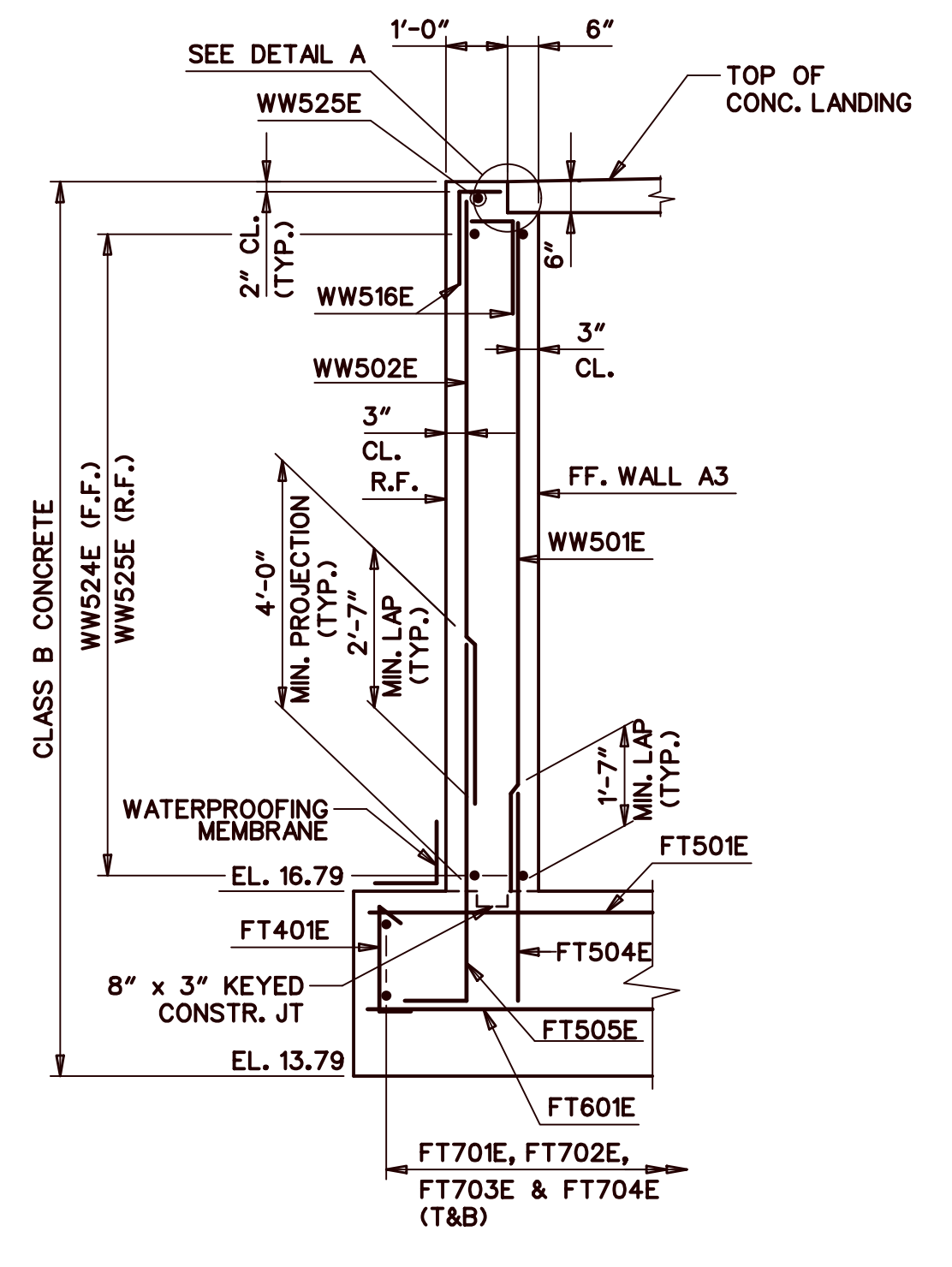
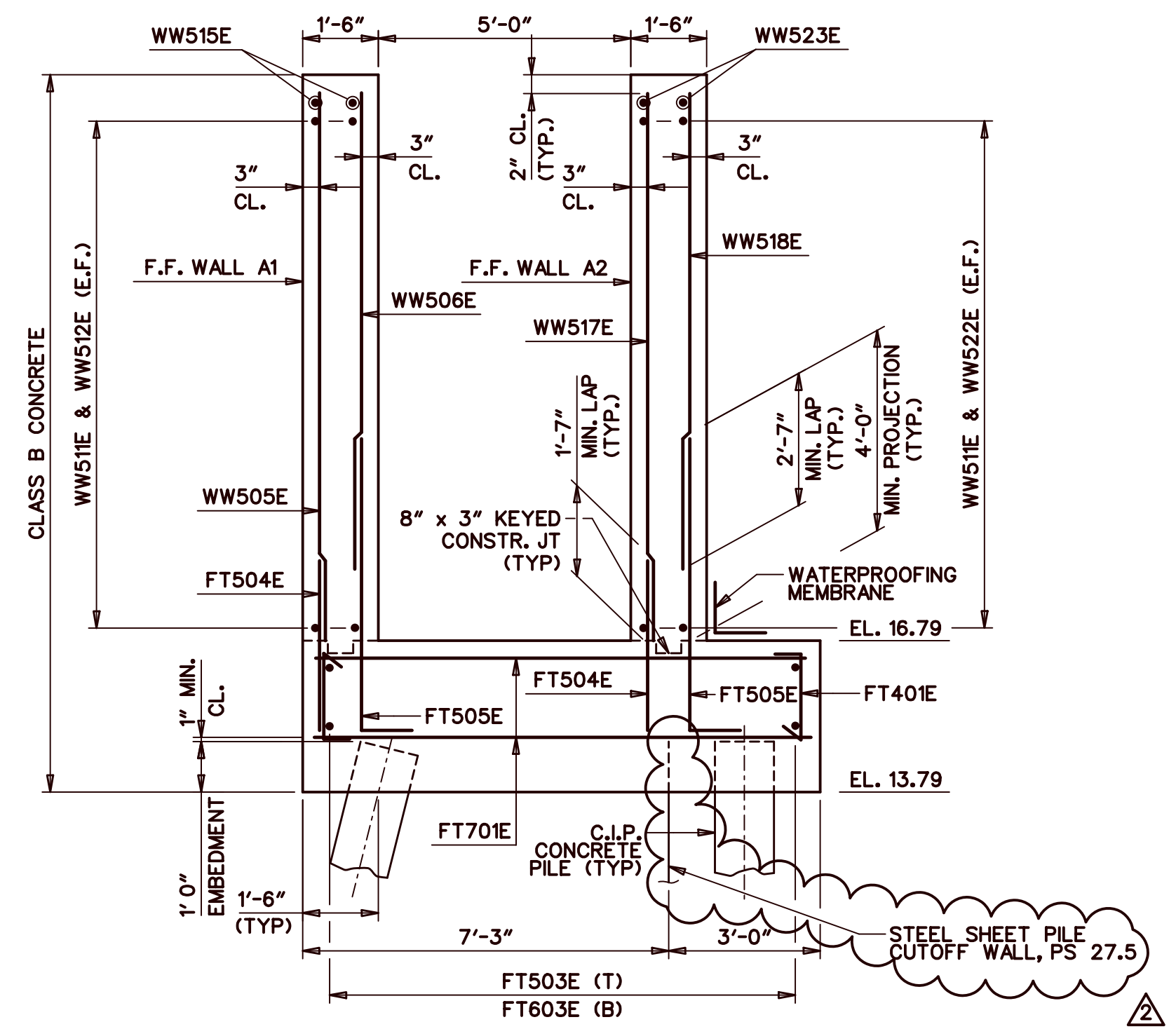
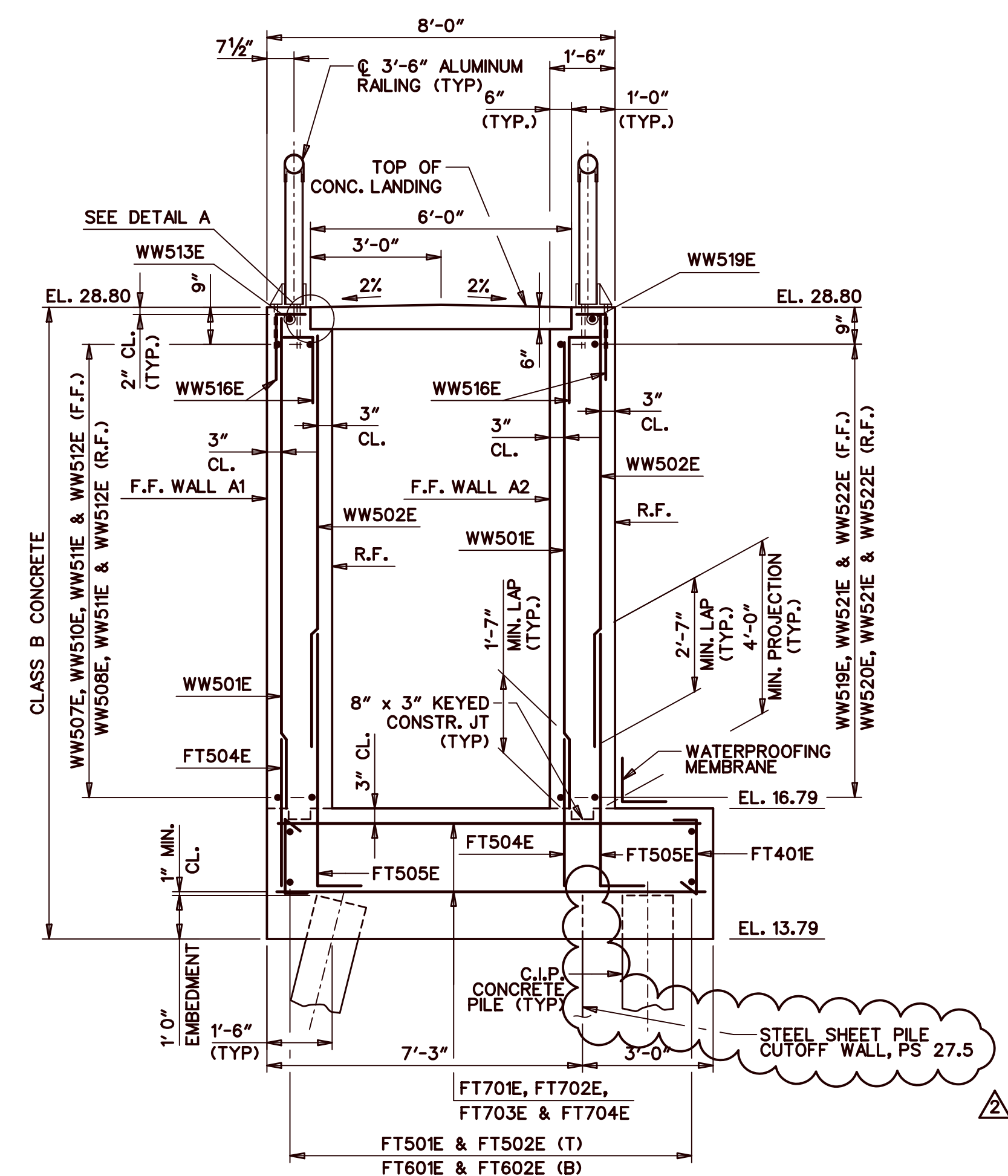
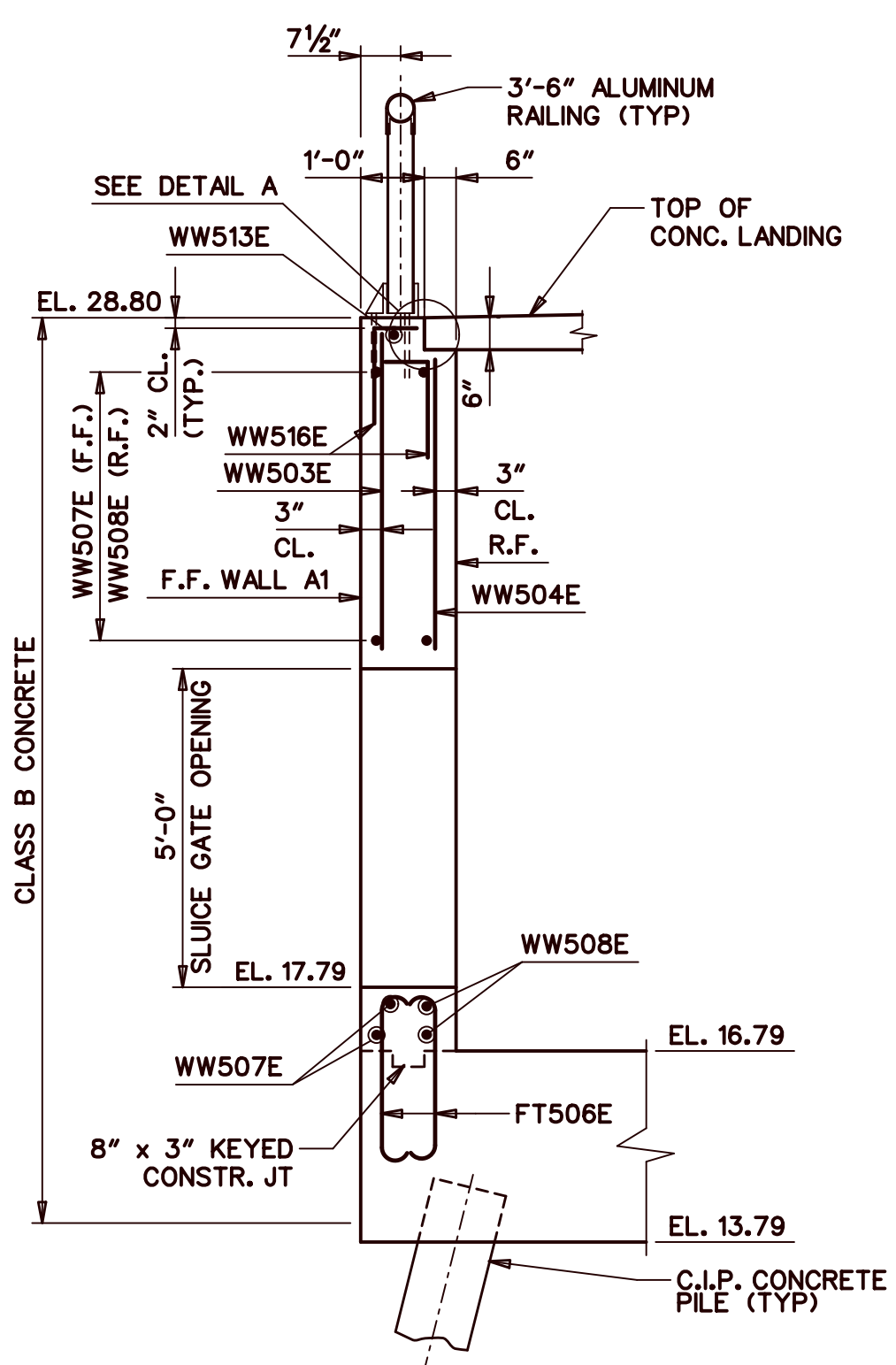
NOTES:
 • FOR PROJECT NOTES, SEE SHEET NO. 3.
 • WORK THIS SHEET WITH SHEET NOS. 21 & 23.
 • FOR REINFORCEMENT BAR SCHEDULE, SEE SHEET NO. 32.
 • FOR ALUMINUM RAILING DETAILS, SEE SHEET NOS. 24, 27 & 28.

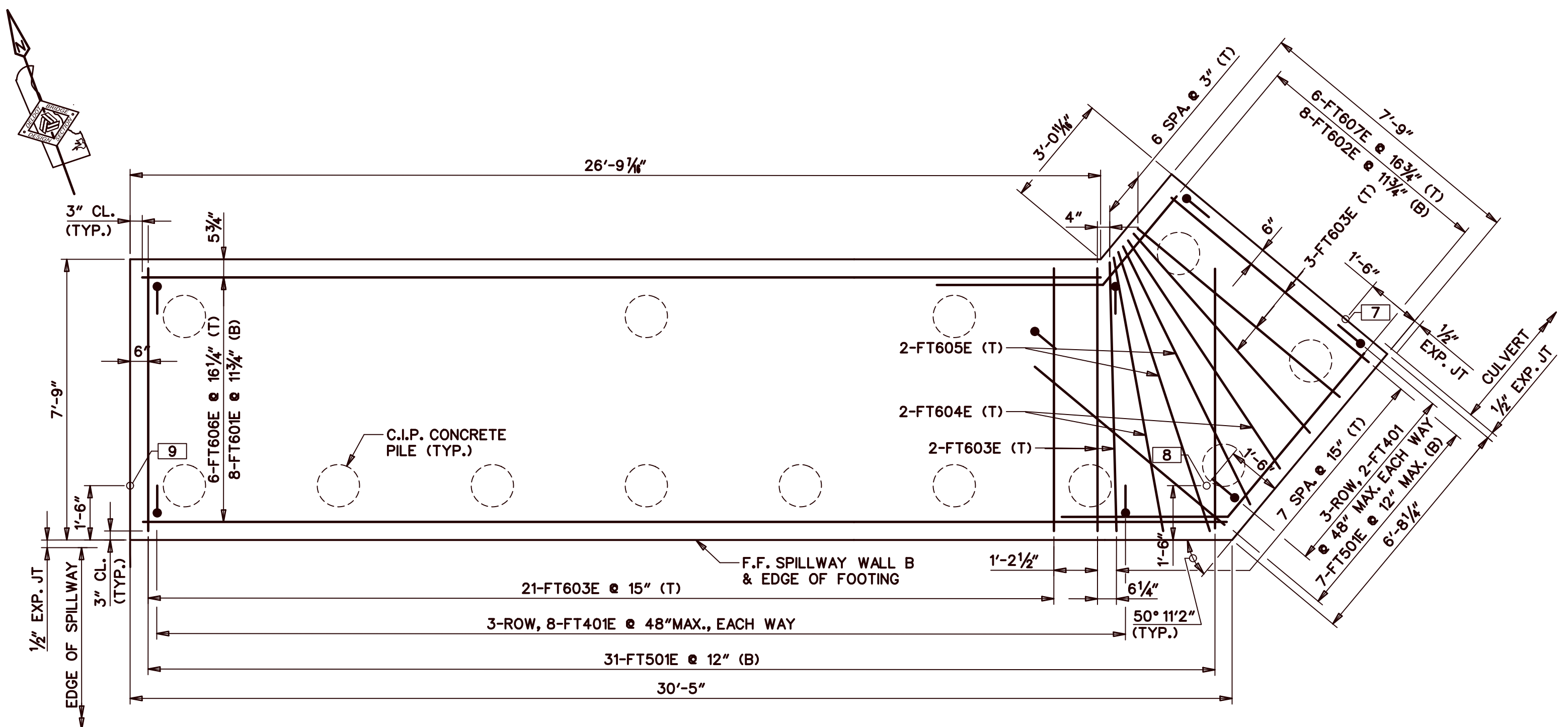


LEGEND

B	BOTTOM
CL	CENTERLINE
CONSTR.	CONSTRUCTION
EL.	ELEVATION
E.F.	EACH FACE
F.F.	FRONT FACE
JT.	JOINT
MAX.	MAXIMUM
MIN.	MINIMUM
R.F.	REAR FACE
SPA.	SPACES
T	TOP
TYP.	TYPICAL

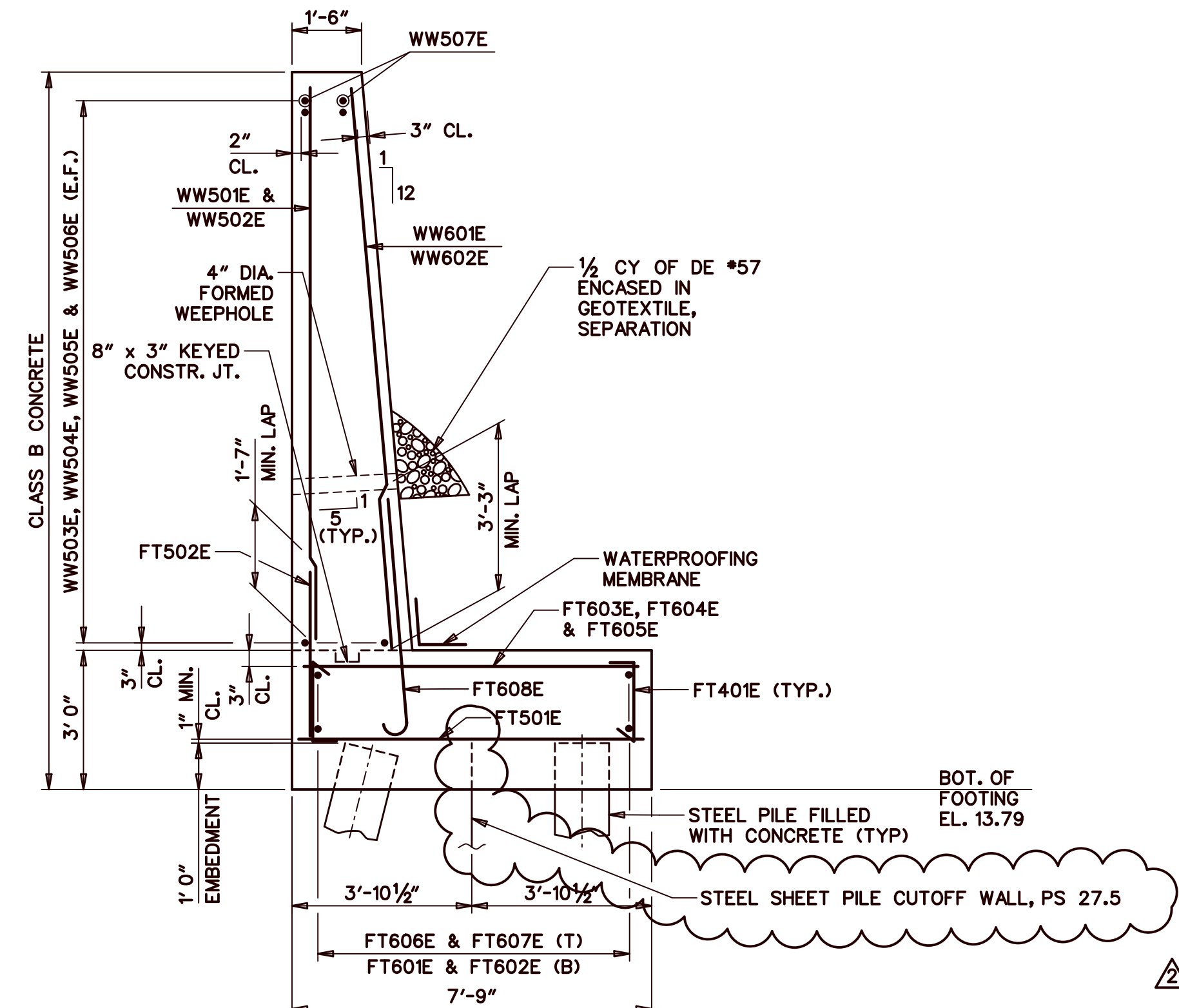
- NOTES:**
- FOR PROJECT NOTES, SEE SHEET NO. 3.
 - WORK THIS SHEET WITH SHEET NOS 21, 22 & 24.
 - FOR ALUMINUM RAIL DETAILS, SEE SHEET NOS. 27 & 28.
 - FOR WATERPROOFING MEMBRANE DETAILS, SEE SHEET NO. 29.
 - FOR REINFORCEMENT BAR SCHEDULE, SEE SHEET NO. 32.





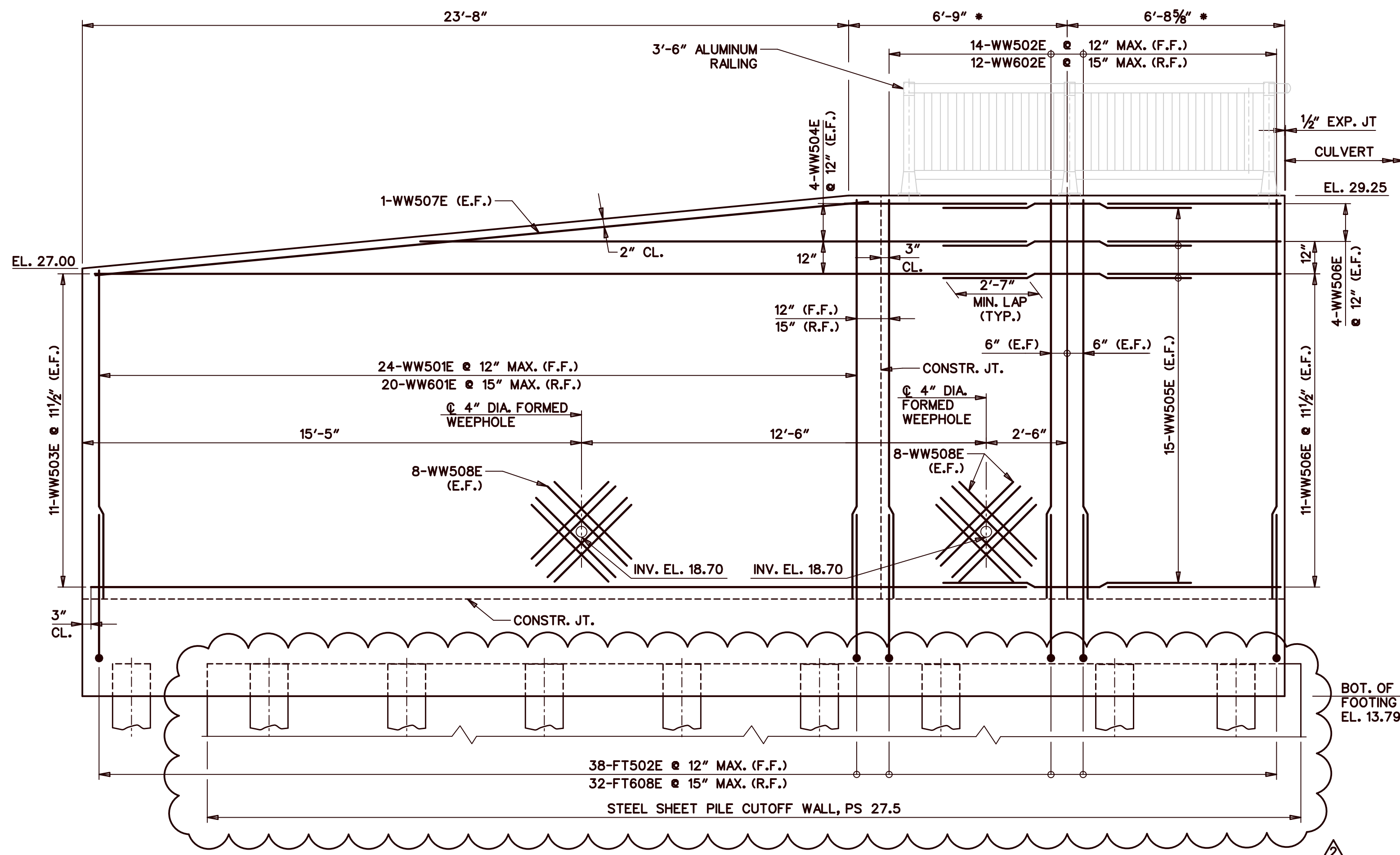
FOOTING PLAN

SCALE: 3/8" = 1'-0"



TYPICAL SECTION

SCALE: 3/8" = 1'-0"



DEVELOPED ELEVATION

SCALE: 3/8" = 1'-0"

LEGEND

B	BOTTOM
CL	CENTERLINE
CL.	CLEARANCE
CONSTR.	CONSTRUCTION
EL.	ELEVATION
E.F.	EACH FACE
F.F.	FRONT FACE
JT.	JOINT
MAX.	MAXIMUM
MIN.	MINIMUM
R.F.	REAR FACE
SPA.	SPACES
T	TOP
TYP.	TYPICAL

- NOTES:**
- FOR PROJECT NOTES, SEE SHEET NO. 3.
 - FOR WEEPHOLE REINFORCEMENT DETAILS, SEE SHEET NO. 16.
 - FOR ALUMINUM RAILING LOCATION AND DETAILS, SEE SHEET NOS. 24, 27 & 28.
 - FOR PILE LOCATIONS, DETAILS AND MINIMUM PILE TIP ELEVATION, SEE SHEET NO. 15.
 - FOR WATERPROOFING MEMBRANE DETAILS, SEE SHEET NO. 29.

ADDENDUMS / REVISIONS	
ADD STEEL SHEET PILE CUTOFF WALL, ACL/BTA, 2/5/2016	

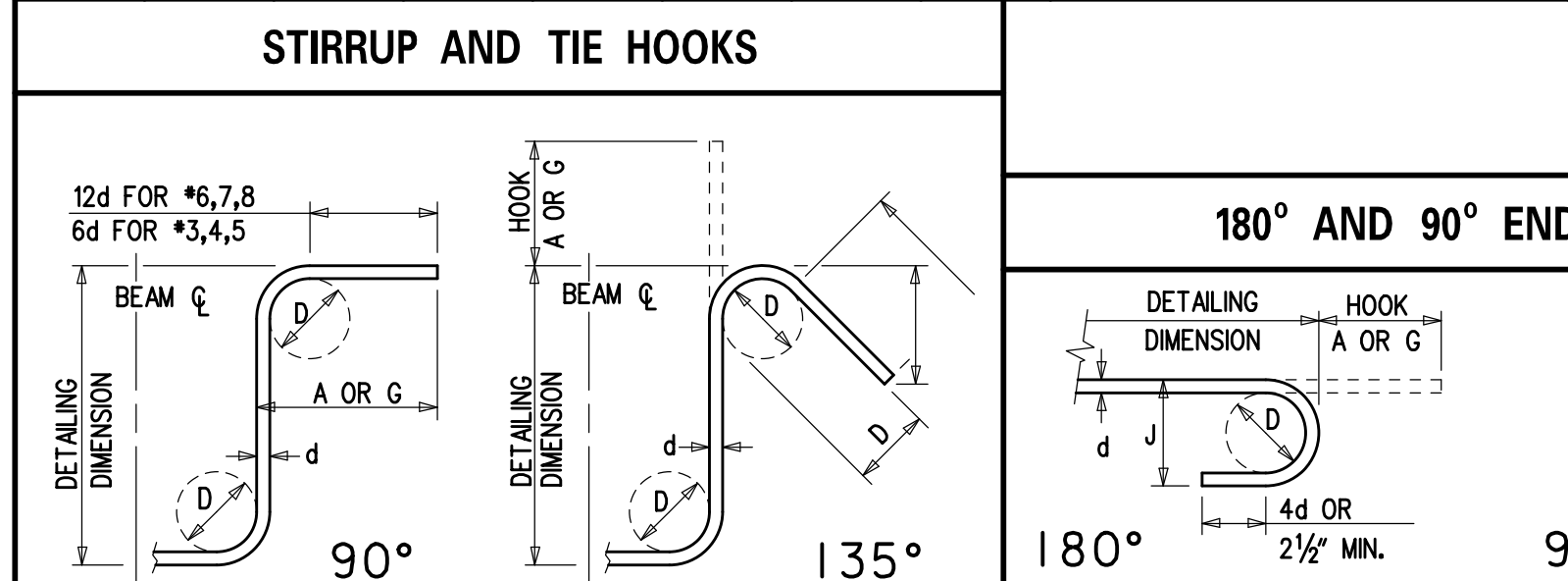
CONTRACT T201207603	BRIDGE NO. N/A
COUNTY SUSSEX	DESIGNED BY: AT CHECKED BY: CHC

- ① ANY MARK NUMBER WITH SUFFIX 'E' DENOTES EPOXY COATED REINFORCING STEEL.
- ② ALL MARK 'LOCATION PREFIXES' SHALL CONSIST OF TWO LETTERS AND ARE AS FOLLOWS: AB = ABUTMENT, AS = APPROACH SLAB, BC = BOX CULVERT, BW = BACKWALL, CL = COLUMN, DK = DECK, DL = DOWEL, FT = FOOTING, HW = HEADWALL, MS = MISC. BARS, PA = PARAPET, PR = PIER, SC = SHEETPILE CAP, SL = SLAB, TW = TOEWALL, WL = WALL (UNIQUE LOCATION), WW = WINGWALL

SPECIFICATIONS				BENDING DIMENSIONS (FEET-INCHES / QUARTER INCH)													REMARKS
QTY.	SIZE	LENGTH	MARK	TYPE	A	B	C	D	E	F/R	G	H	J	K	O		
WINGWALL 1																	
21	4	2-4 0	FT401E	T9	0-4 0	1-8 0					0-4 0						
22	5	4-0 0	FT501E	STR		4-0 0											
3	5	5-10 0 TO 6-7 0	FT502E	2	0-6 0	5-4 0 TO 6-1 0					0-0 0						
26	5	4-8 0	FT503E	2	0-6 0	4-2 0					0-0 0						
12	6	20-5 0	FT601E	2	0-6 0	20-5 0											
37	6	6-3 0	FT602E	2	0-6 0	6-3 0											
22	5	3-3 0 TO 14-3 0	WW501E	STR		3-3 0 TO 14-3 0											
13	5	4-0 0 TO 13-5 0	WW502E	STR		4-0 0 TO 13-5 0											
1	5	14-4 0	WW503E	STR		14-4 0											
8	5	20-6 0	WW504E	STR		20-6 0											
22	5	1-0 0 TO 18-6 0	WW505E	STR		1-0 0 TO 18-6 0									(2 SETS OF 11)		
2	5	22-11 0	WW506E	STR		22-11 0											
16	5	3-6 0	WW507E	STR		3-6 0											
WINGWALL 2																	
21	4	2-4 0	FT401E	T9	0-4 0	1-8 0					0-4 0						
22	5	4-0 0	FT501E	STR		4-0 0											
3	5	5-10 0 TO 6-7 0	FT502E	2	0-6 0	5-4 0 TO 6-1 0					0-0 0						
26	5	4-8 0	FT503E	2	0-6 0	4-2 0					0-0 0						
12	6	20-5 0	FT601E	2	0-6 0	20-5 0											
37	6	6-3 0	FT602E	2	0-6 0	6-3 0											
22	5	3-3 0 TO 14-3 0	WW501E	STR		3-3 0 TO 14-3 0											
13	5	4-0 0 TO 13-5 0	WW502E	STR		4-0 0 TO 13-5 0											
1	5	14-4 0	WW503E	STR		14-4 0											
8	5	20-6 0	WW504E	STR		20-6 0											
22	5	1-0 0 TO 18-6 0	WW505E	STR		1-0 0 TO 18-6 0									(2 SETS OF 11)		
2	5	22-11 0	WW506E	STR		22-11 0											
16	5	3-6 0	WW507E	STR		3-6 0											

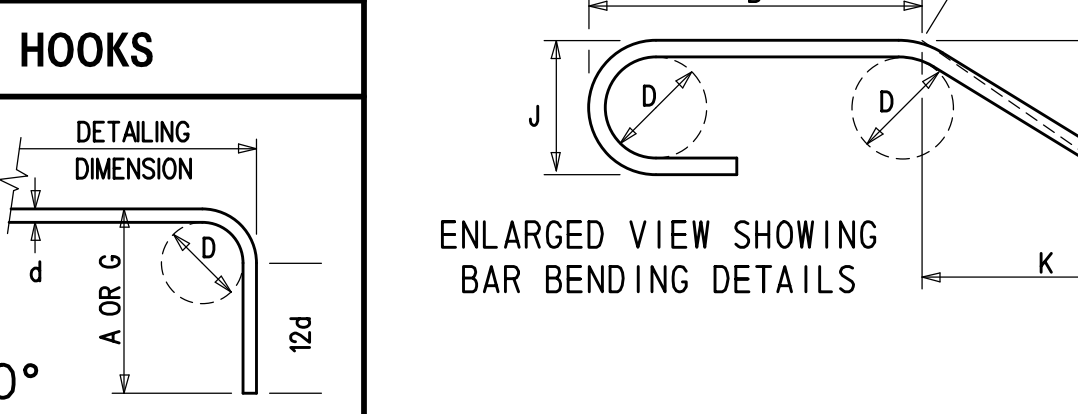
SPECIFICATIONS				BENDING DIMENSIONS (FEET-INCHES / QUARTER INCH)													REMARKS
QTY.	SIZE	LENGTH	MARK	TYPE	A	B	C	D	E	F/R	G	H	J	K	O		
BOATRAMP																	
17	3	5-0 1	MS301E	T7	0-4 0	1-8 0	0-8 0	1-8 1	0-4 0		0-4 0	1-8 0		0-4 0			
34	4	28-1 0	MS401E	STR													
34	4	8-0 1	MS402E	T7	0-4 2	1-2 0	2-8 0	1-3 1	2-2 0		0-4 2	1-2 0		0-6 0			
2	4	15-8 0	MS403E	STR													
66	6	15-8 0	MS601E	STR													
8	6	1-6 0	MS602E	STR													
6	8	15-8 0	MS801E	STR													

ASTM STANDARD ENGLISH REINFORCING BARS				RECOMMENDED END HOOKS, APPLICABLE TO ALL GRADES				STIRRUP AND TIE HOOKS, APPLICABLE TO ALL GRADES			
BAR SIZE	NOMINAL DIMENSIONS			180° HOOKS		90° HOOKS		90° HOOK		135° HOOK	
	DIAMETER (INCHES)	AREA (INCHES ²)	WEIGHT (LBS./FT.)	D	A OR G	J	A OR G	D	A OR G	A OR G	A OR G
3	0.375	0.110	0.376	2 1/4"	5"	3"	6"	1 1/2"	4"	4"	2 1/2"
4	0.500	0.200	0.668	3"	6"	4"	8"	2"	4 1/2"	4 1/2"	3"
5	0.625	0.310	1.043	3 3/4"	7"	5"	10"	2 1/2"	6"	5 1/2"	3 3/4"
6	0.750	0.440	1.502	4 1/2"	8"	6"	1-0"	4 1/2"	1-0"	8"	4 1/2"
7	0.875	0.600	2.044	5 1/4"	10"	7"	1-2"	5 1/4"	1-2"	9"	5 1/4"
8	1.000	0.790	2.670	6"	11"	8"	1-4"	6"	1-4"	10 1/2"	6"
9	1.128	1.000	3.400	9 1/2"	1-3"	11 3/4"	1-7"				
10	1.270	1.270	4.303	10 3/4"	1-5"	1-1 1/4"	1-10"				
11	1.410	1.560	5.313	1-0"	1-7"	1-2 3/4"	2-0"				
14	1.693	2.250	7.650	1-6 1/4"	2-3"	1-9 3/4"	2-7"				
18	2.257	4.000	13.600	2-0"	3-0"	2-4 1/2"	3-5"				



NOTES:

- FIGURES SHOWN IN CIRCLES REPRESENT BAR BEND TYPES.
- STANDARD BAR BENDS INCLUDE ONLY THOSE TYPES BELOW, INDICATED AS SUCH.
- ALL DIMENSIONS OUT-TO-OUT, EXCEPT "A" AND "G" ON STD. 180° AND 135° HOOKS.
- "J" DIMENSIONS ON 180° HOOKS TO BE SHOWN ONLY WHERE NECESSARY TO RESTRICT HOOK SIZE, OTHERWISE STANDARD 'ACY' HOOKS ARE TO BE USED.
- WHERE "J" IS NOT SHOWN, "J" WILL BE KEPT EQUAL TO OR LESS THAN "H" ON TYPES 3, 5 AND 22. WHERE "J" CAN EXCEED "H", IT SHALL BE SHOWN.
- "H" DIMENSIONS OF STIRRUPS TO BE SHOWN AS NEEDED TO FIT WITHIN THE CONCRETE.
- UNLESS OTHERWISE NOTED, DIAMETER "D" IS THE SAME FOR ALL BENDS AND HOOKS ON A BAR (EXCEPT FOR BEND TYPES 11 AND 13).
- WHERE SLOPE DIFFERS FROM 45° OFFSET, "H" AND "K" MUST BE SHOWN.
- WHERE BARS ARE TO BE BENT MORE ACCURATELY THAN STANDARD BENDING TOLERANCES, BENDING DIMENSIONS REQUIRING CLOSER FABRICATION SHOULD HAVE LIMITS INDICATED.
- FOR RECOMMENDED DIAMETER "D", OF BENDS, HOOKS, ETC., REFER TO TABLE ABOVE, 'CRS' OR 'ACY' TABLES WHERE APPLICABLE AND REQUIRED.
- TYPE S1-S6, S11, T1-T3 AND T6-T9 APPLICABLE TO BAR SIZES *3 THROUGH *8.



STANDARD BAR BENDS

1-36: Standard bar bend types. Includes 180°, 90°, and 135° hooks, and various bent bar configurations with dimensions A, B, C, D, E, F, G, H, J, K, O.

ISOMETRIC VIEW: Includes diagrams 25 and 26 showing 3D representations of bent bars.

SPECIAL BAR BENDS

(X) SPIRAL NOTES:
 J = TURNS AT 'F' SPACING
 K = EXTRA TURNS (HALF TOP & BOTTOM)
 (XL) PLAIN SPIRAL WITH SPACERS LOOSE
 (XM) PLAIN SPIRAL WITH SPACERS MOUNTED