

GENERAL NOTES

DESIGN SPECIFICATION

THIS STRUCTURE CONFORMS TO "STANDARD SPECIFICATION FOR HIGHWAY BRIDGES" ADOPTED BY THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS, 2002, AND THE 2004 O.D.O.T. BRIDGE DESIGN MANUAL.

DESIGN LOADING

HS25-44 AND THE ALTERNATE MILITARY LOADING

DESIGN STRESSES

CONCRETE CLASS C – COMPRESSIVE STRENGTH 4000 P.S.I. (DRILLED SHAFT AND CONCRETE LAGGIN)

REINFORCING STEEL: ASTM A615 OR A996 GRADE 60 MINIMUM YIELD STRENGTH 60,000 P.S.I.

STRUCTURAL STEEL: ASTM A572, GRADE 50, YIELD STRENGTH 50,000 P.S.I.

UNCLASSIFIED EXCAVATION

EXCAVATION LIMITS FOR THE PROPOSED STRUCTURE SHALL BE AS DEFINED IN 503.11. EXCAVATION OUTSIDE THESE LIMITS NECESSARY TO REMOVE THE EXISTING STRUCTURE SHALL BE INCLUDED IN ITEM 202 FOR PAYMENT. BOTH WILL BE HELD TO A MINIMUM.

FASTENERS

ALL ANCHOR BOLTS SHALL CONFORM TO ASTM A449

ITEM 507, STEEL PILES, MISC.: SOLDIER PILES

THIS WORK CONSISTS OF FURNISHING AND PLACING STEEL SOLDIER PILES INTO DRILLED HOLES. FURNISH SOLDIER PILES CONSISTING OF STRUCTURAL STEEL MEMBERS THAT MEET THE PLAN REQUIREMENTS AND COMFORM TO ASTM A572, GRADE 50. GALVANIZE SOLDIER PILES AS SHOWN ON THE PLANS AND IN ACCORDANCE WITH CMS 711.02. DO NOT FIELD WELD OR SPLICE STEEL SOLDIER PILES.

MEASUREMENT FOR PAYMENT WILL BE LIMITED TO THE DISTANCE BETWEEN THE TOP OF WALL ELEVATION AND THE BOTTOM OF THE DRILLED SHAFT, AS DETERMINED BY THE ENGINEER. THE DEPARTMENT WILL PAY FOR THE SOLDIER PILES AT THE CONTRACT UNIT PRICE FOOT FOR ITEM 507, STEEL PILES, MISC.: SOLDIER PILES.

ITEM 524, DRILLED SHAFTS, – 30” DIAMETER, ABOVE BEDROCK, AS PER PLAN

ITEM 524, DRILLED SHAFTS, – 30” DIAMETER, INTO BEDROCK, AS PER PLAN

THIS WORK CONSISTS OF FURNISHING AND INSTALLING DRILLED SHAFTS FOR SOLDIER PILE AND LAGGING WALLS. THE DRILLED SHAFTS ARE REINFORCED WITH SOLDIER PILES INSTEAD OF REINFORCING STEEL CAGES. THE SOLDIER PILES EXTEND ABOVE THE TOP OF THE DRILLED SHAFT. FURNISH AND INSTALL THE DRILLED SHAFTS IN ACCORDANCE WITH CMS 524 EXCEPT AS MODIFIED AND SUPPLEMENTED BELOW.

EXCAVATE THE HOLE FOR THE DRILLED SHAFT WITHIN 3 INCHES OF THE PLAN LOCATION. THE DESIGN IS BASED ON A MAXIMUM DEPTH FROM GROUND SURFACE TO BEDROCK OF VARIABLE DEPTH. IF FIELD CONDITIONS INDICATE GREATER DEPTHS, NOTIFY THE ENGINEER FOR FURTHER EVALUATION.

PLACE THE SOLDIER PILE VERTICALLY WITHIN THE HOLE. PLACE THE SOLDIER PILE SO THAT THE FLANGES ARE PARALLEL TO THE CENTERLINE OF THE ROW OF DRILLED SHAFTS. SUPPORT THE SOLDIER PILE SO THAT IT DOES NOT MOVE DURING CONCRETE PLACEMENT. DO NOT ALLOW THE VERTICAL ALIGNMENT OF THE SOLDIER PILE TO VARY BY MORE THAN 1/4 INCH PER FOOT OF DEPTH. DO NOT ALLOW THE ORIENTATION OF THE FLANGES TO VARY BY MORE THAN 10 DEGREES.

USE CLASS C CONCRETE ACCORDING TO CMS 511. PLACE CONCRETE TO THE ELEVATION FOR THE BOTTOM OF THE PRECAST LAGGING. THE CONTRACTOR MAY PLACE CONCRETE USING THE FREE FALL METHOD PROVIDED THE DEPTH OF WATER IS LESS THAN 6 INCHES AND THE CONCRETE FALLS WITHOUT STRIKING THE SIDES OF THE HOLE. POURING CONCRETE ALONG THE WEB OF THE SOLDIER PILE IS ACCEPTABLE.

CHECK THE POSITION, THE VERTICAL ALIGNMENT AND ORIENTATION OF THE SOLDIER PILE IMMEDIATELY AFTER CONCRETE PLACEMENT. MAKE THE CORRECTIONS AS NECESSARY TO MEET THE ABOVE TOLERANCES.

FILL THE HOLE ABOVE THE BOTTOM OF THE PRECAST LAGGING TO THE EXISTING GROUND SURFACE WITH ITEM 613 LOW STRENGTH MORTAR BACKFILL (LSM). REMOVE CONCRETE AND LSM AS NECESSARY FROM AROUND THE SOLDIER PILE IN ORDER TO PLACE THE PRECAST LAGGING.

MEASUREMENT FOR PAYMENT FOR DRILLED SHAFTS ABOVE BEDROCK, AS PER PLAN, WILL BE LIMITED TO THE DISTANCE BETWEEN THE EXISTING GROUND SURFACE AND THE TOP OF BEDROCK (OR MINIMUM TIPO), AS DETERMINED BY THE ENGINEER. MEASUREMENT FOR PAYMENT FOR DRILLED SHAFTS INTO BEDROCK, AS PER PLAN, WILL BE LIMITED TO THE DISTANCE BETWEEN THE TOP OF BEDROCK AND THE BOTTOM OF THE DRILLED SHAFT, AS DETERMINED BY THE ENGINEER.

PAYMENT IS FULL COMPENSATION FOR CONSTRUCTING THE DRILLED SHAFTS, INCLUDING FURNISHING AND PLACING CONCRETE AND LSM, AND REMOVAL OF CONCRETE OR LSM FROM AROUND THE SOLDIER PILE IN ORDER TO PLACE PRECAST LAGGING (OR OTHER LAGGING).

ITEM 511, CONCRETE, MISC.: PRECAST CONCRETE LAGGING

THIS WORK CONSISTS OF FURNISHING AND PLACING PRECAST REINFORCED CONCRETE PANELS BETWEEN THE SOLDIER PILES TO FUNCTION AS LAGGING FOR THE RETAINING WALL. PROVIDE PRECAST CONCRETE LAGGING FROM A PRECAST CONCRETE MANUFACTURER CERTIFIED UNDER SUPPLEMENT 1073. PROVIDE CONCRETE ACCORDING TO CMS 499 EXCEPT WITH A 28-DAY DESIGN STRENGTH OF AT LEAST 4000 PSI AND AIR ENTRAINMENT OF 4 TO 8 PERCENT. PROVIDE EPOXY COATED REINFORCING STEEL ACCORDING TO CMS 709.00.

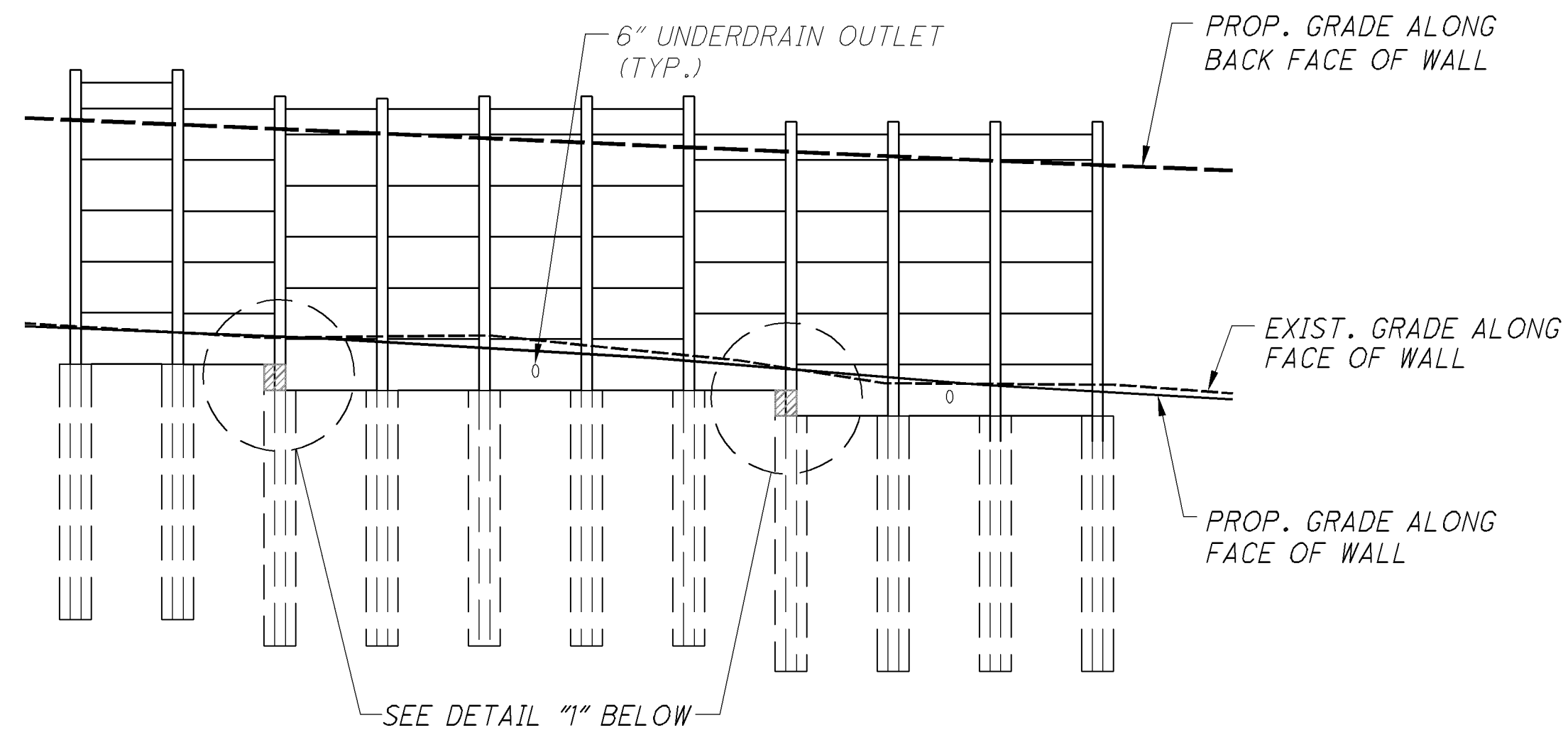
THE REINFORCING STEEL FOR CONCRETE LAGGING SHALL BE INCLUDED WITH ITEM 511, CONCRETE, MISC.: PRECAST CONCRETE LAGGING, FOR PAYMENT.

PERMANENTLY MARK EACH PANEL TO INDICATE WHICH FACE WILL BE PLACED AGAINST THE SOIL. PLACE THE PANEL BETWEEN FLANGES OF THE SOLDIER PILES AND BEARING AGAINST THE FLANGES ON THE EXPOSED SIDE OF THE WALL.

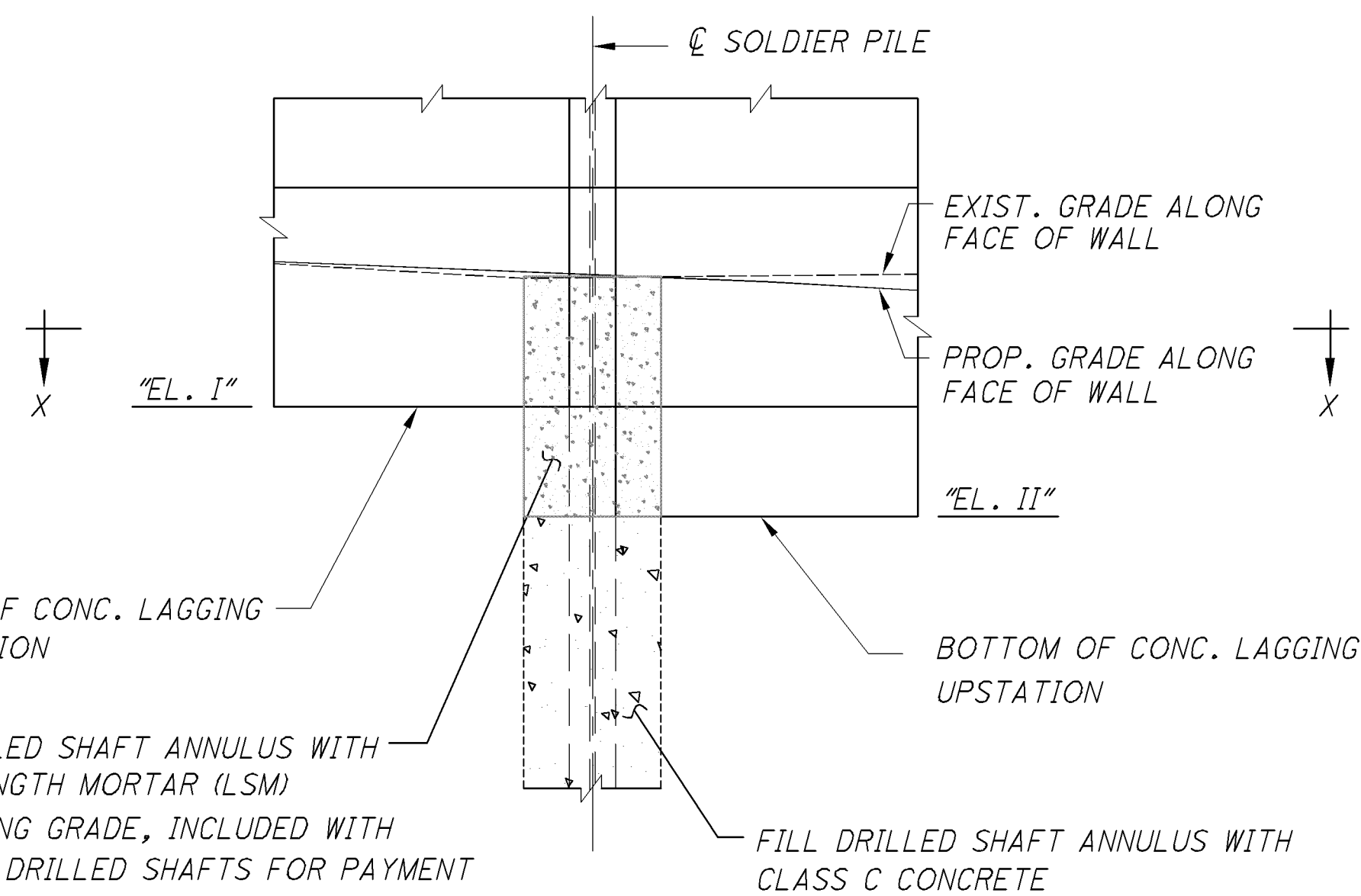
THE DEPARTMENT WILL PAY FOR PRECAST CONCRETE LAGGING AT THE CONTRACT UNIT PRICE PER EACH FOR ITEM 511, CONCRETE, MISC.: PRECAST CONCRETE LAGGING.

COMPUTED BY : JJ    DATE : 03/09  
CHECKED BY : SS    DATE : 03/09

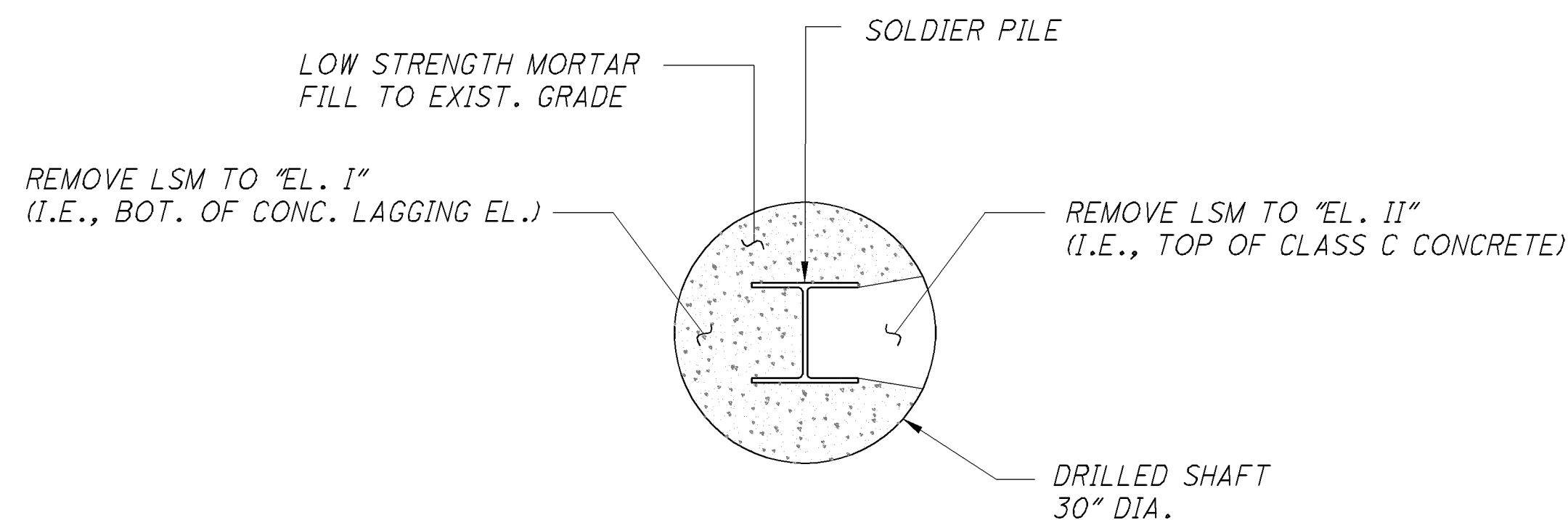
| ESTIMATED QUANTITIES |          |       |         |                                                              |                       |
|----------------------|----------|-------|---------|--------------------------------------------------------------|-----------------------|
| ITEM                 | ITEM EXT | TOTAL | UNIT    | DESCRIPTION                                                  | AS PER PLAN SHEET NO. |
| 503                  | 21302    | LUMP  |         | UNCLASSIFIED EXCAVATION INCLUDING SHALE                      |                       |
|                      |          |       |         |                                                              |                       |
| 507                  | 00400    | 3036  | FT      | STEEL PILES, MISC.: SOLDIER PILES (HP14x89)                  |                       |
| 507                  | 00400    | 2566  | FT      | STEEL PILES, MISC.: SOLDIER PILES (W14x109)                  |                       |
| 507                  | 00400    | 29    | FT      | STEEL PILES, MISC.: SOLDIER PILES (MC13x50)                  |                       |
|                      |          |       |         |                                                              |                       |
| 511                  | 81300    | 619   | EACH    | CONCRETE, MISC.: 8"x24"x93" PRECAST CONCRETE LAGGING         |                       |
| 511                  | 81300    | 51    | EACH    | CONCRETE, MISC.: 8"x12"x93" PRECAST CONCRETE LAGGING         |                       |
| 511                  | 81300    | 695   | EACH    | CONCRETE, MISC.: 8"x24"x69" PRECAST CONCRETE LAGGING         |                       |
| 511                  | 81300    | 48    | EACH    | CONCRETE, MISC.: 8"x12"x69" PRECAST CONCRETE LAGGING         |                       |
| 511                  | 81300    | 7     | EACH    | CONCRETE, MISC.: 8"x24"x38" PRECAST CONCRETE LAGGING         |                       |
|                      |          |       |         |                                                              |                       |
| 524                  | 94603    | 1010  | FT.     | DRILLED SHAFTS, 30" DIAMETER, ABOVE BEDROCK, AS PER PLAN     | 113 & 113A            |
| 524                  | 94605    | 2185  | FT.     | DRILLED SHAFTS, 30" DIAMETER, INTO BEDROCK, AS PER PLAN      | 113 & 113A            |
|                      |          |       |         |                                                              |                       |
| 512                  | 10100    | 711   | SQ. YD. | SEALING OF CONCRETE SURFACES (EPOXY-URETHANE)                |                       |
|                      |          |       |         |                                                              |                       |
| 516                  | 13600    | 25    | SQ. FT. | 1" PREFORMED EXPANSION JOINT FILLER                          |                       |
|                      |          |       |         |                                                              |                       |
| 518                  | 21200    | 1211  | CU. YD. | POROUS BACKFILL WITH FILTER FABRIC                           |                       |
|                      |          |       |         |                                                              |                       |
| 518                  | 40000    | 1238  | FT.     | 6" PERFORATED CORRUGATED PLASTIC PIPE                        |                       |
| 518                  | 40010    | 252   | FT.     | 6" NON-PERFORATED CORRUGATED PLASTIC PIPE INCLUDING SPECIALS |                       |
|                      |          |       |         |                                                              |                       |
|                      |          |       |         |                                                              |                       |
|                      |          |       |         |                                                              |                       |
|                      |          |       |         |                                                              |                       |



**RETAINING WALL STEP DETAILS**



**DETAIL "1"**



**SECTION X-X**

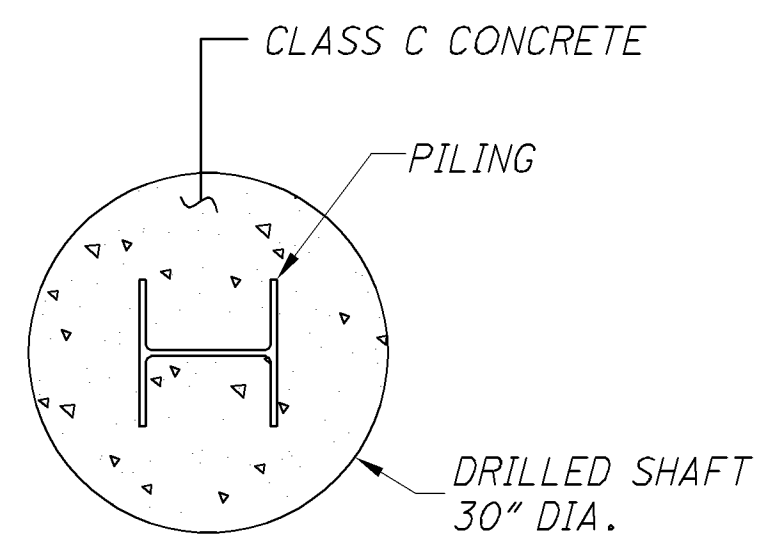
**LEGEND**

P.C.P.P. - PERFORATED CORRUGATED PLASTIC PIPE  
N.P.C.P.P. - NON-PERFORATED CORRUGATED PLASTIC PIPE

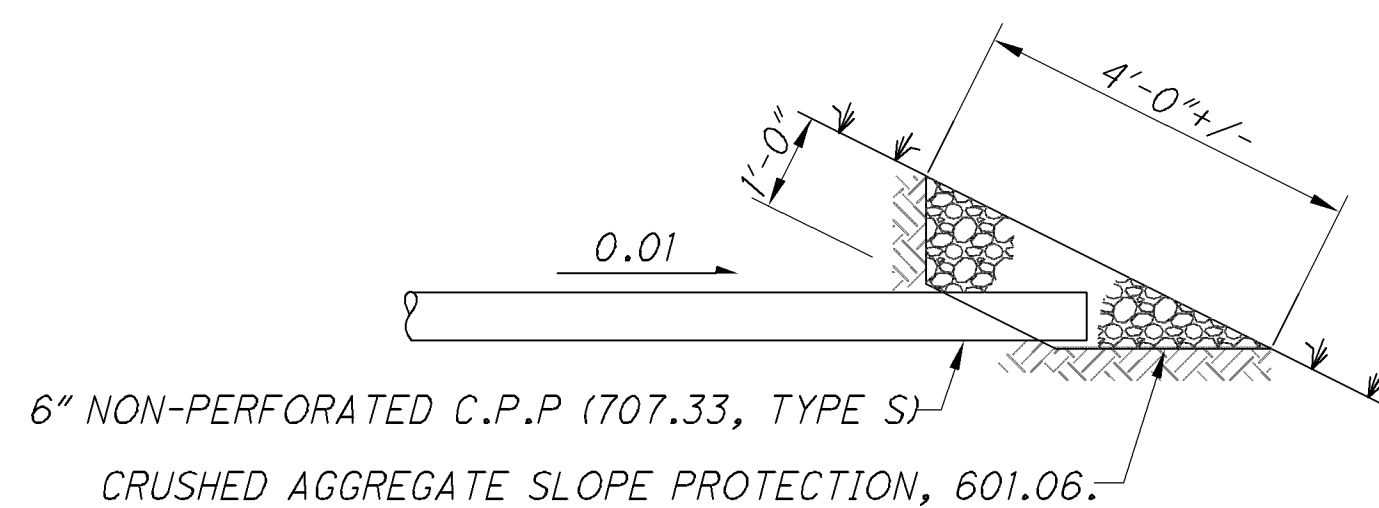
- EXCAVATION, INCLUDING SHALE
- CLASS C CONCRETE
- LOW STRENGTH MORTAR (LSM)

**NOTES:**

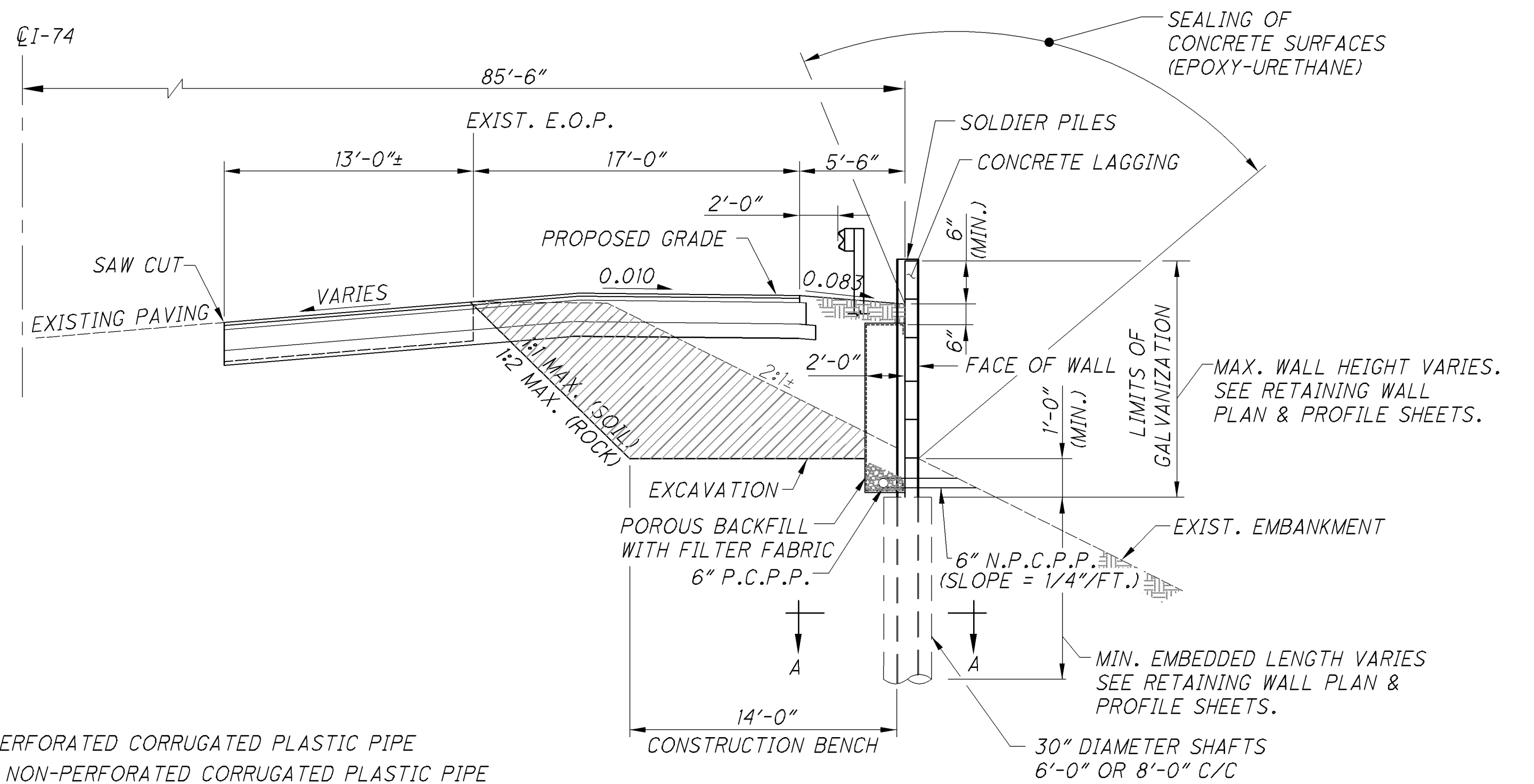
1. EMBANKMENT TO BE INCLUDED W/ROADWAY QUANTITY FOR ITEM 203, EMBANKMENT.



**SECTION A-A**

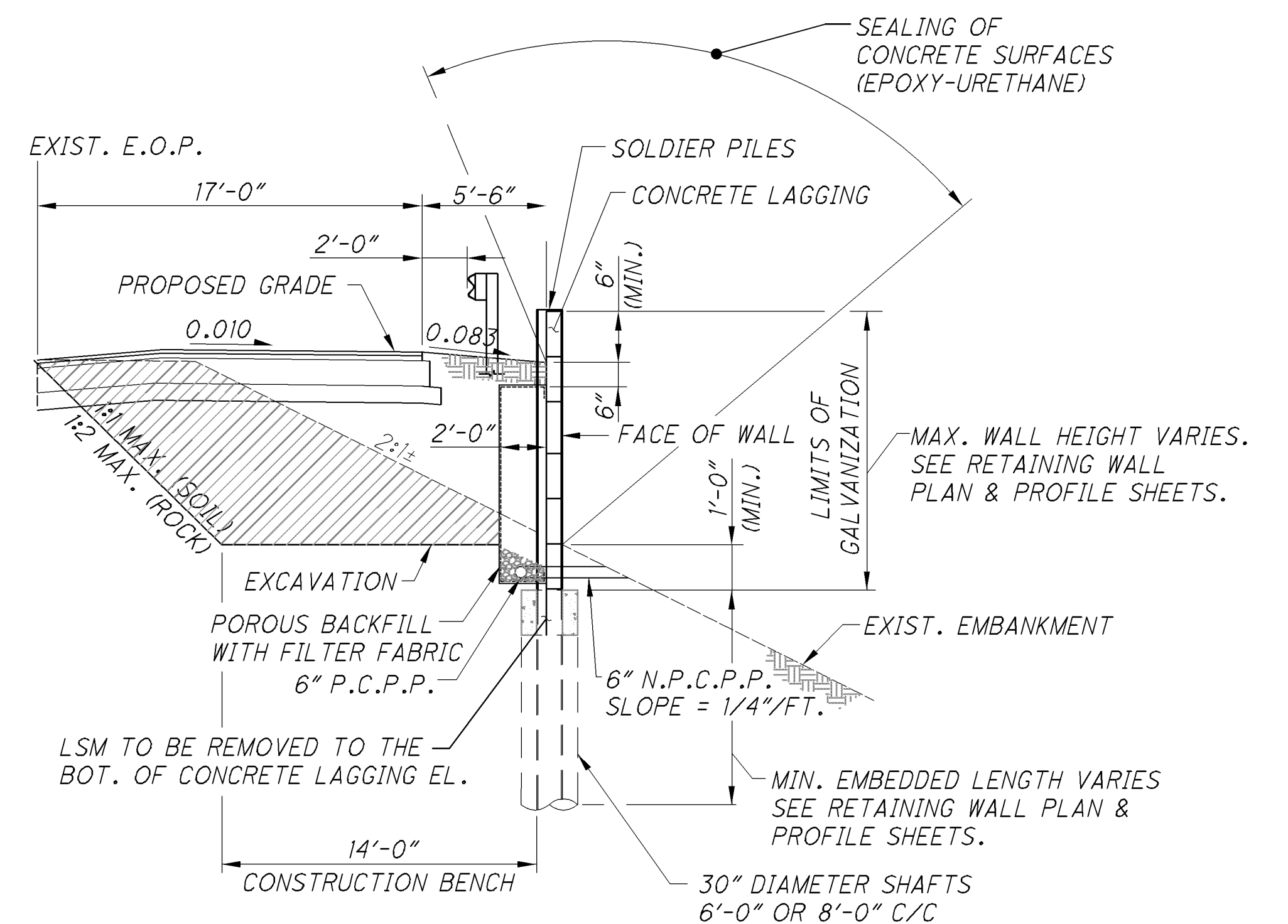


**TERMINATION OF 6" C.P.P. DETAIL**

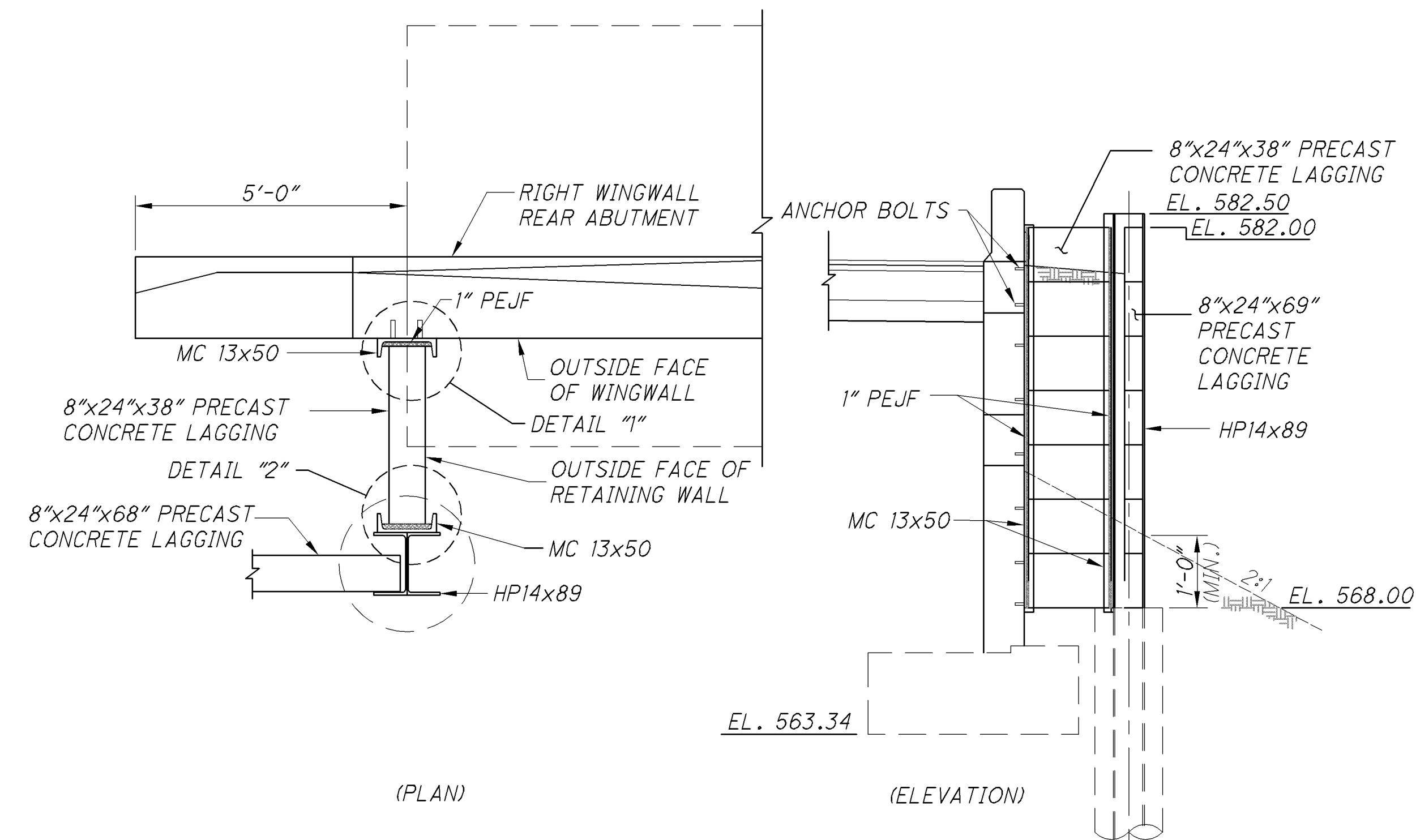


**TYPICAL SECTION BETWEEN STEPS**

(SEE SECTION A-A ON SHEET 114)



**TYPICAL SECTION AT STEPS**

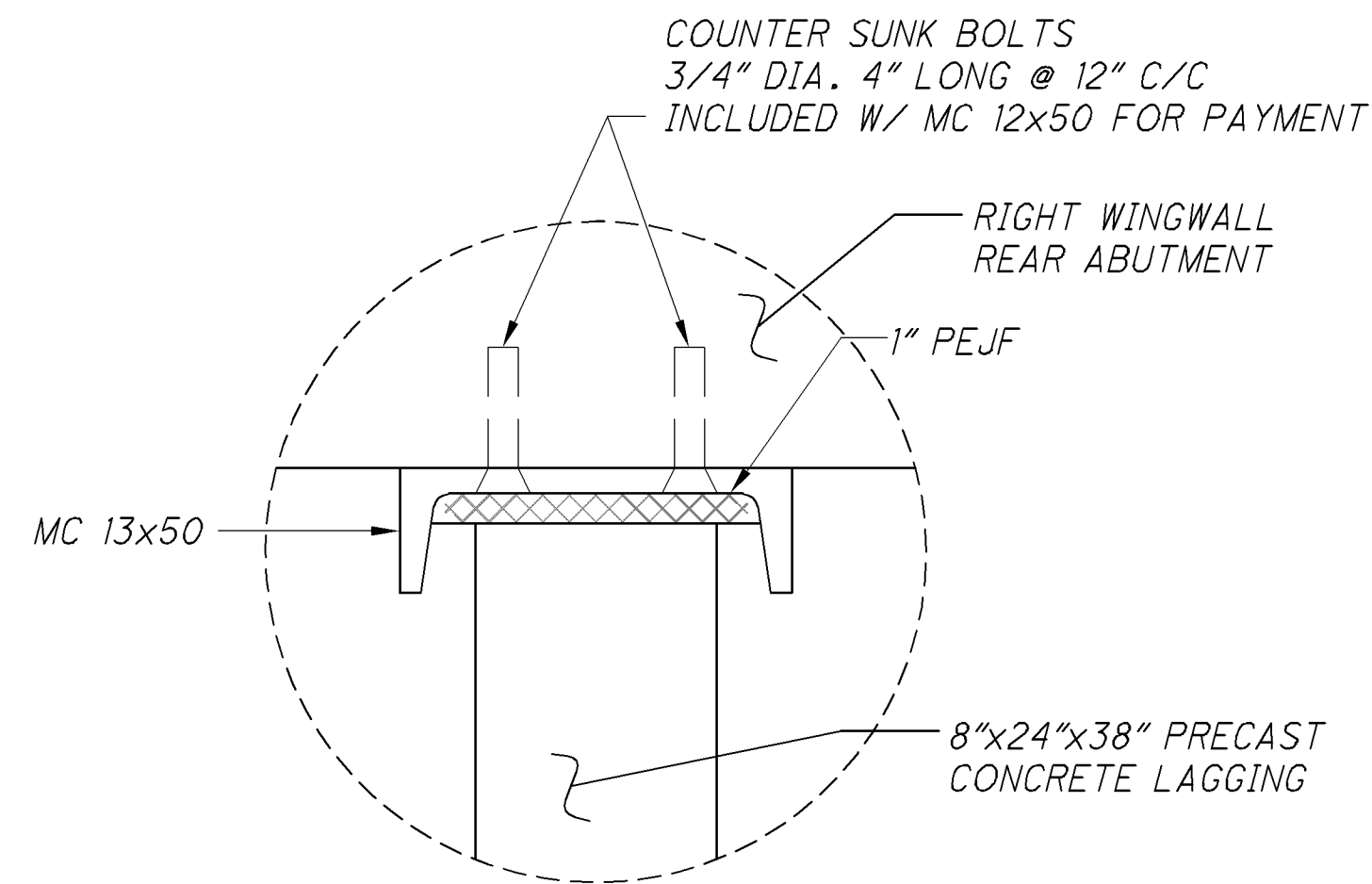


### WINGWALL CONNECTION DETAIL

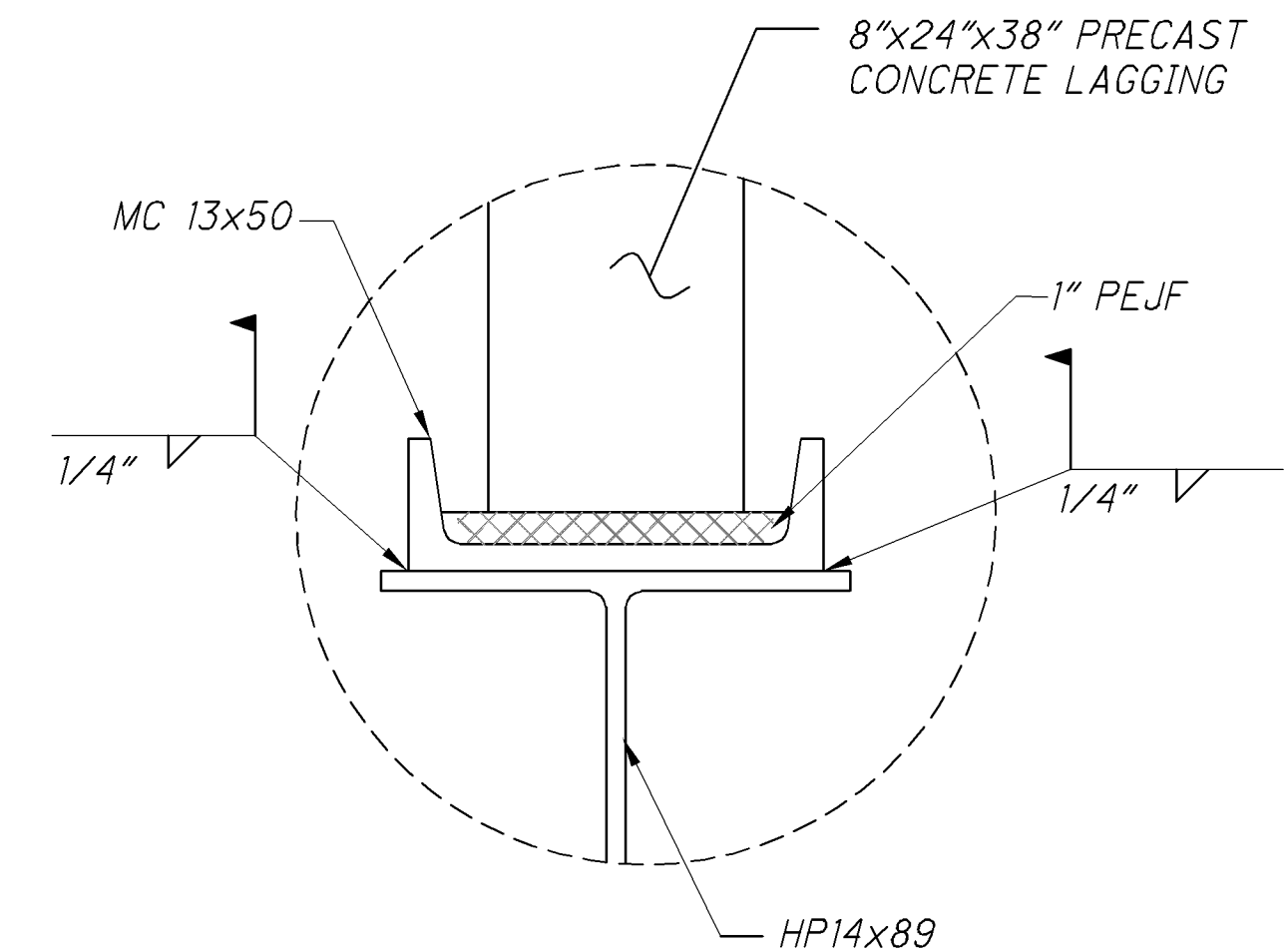
(AT STA. 22+33.21 ALONG FACE OF THE WALL)

### NOTES:

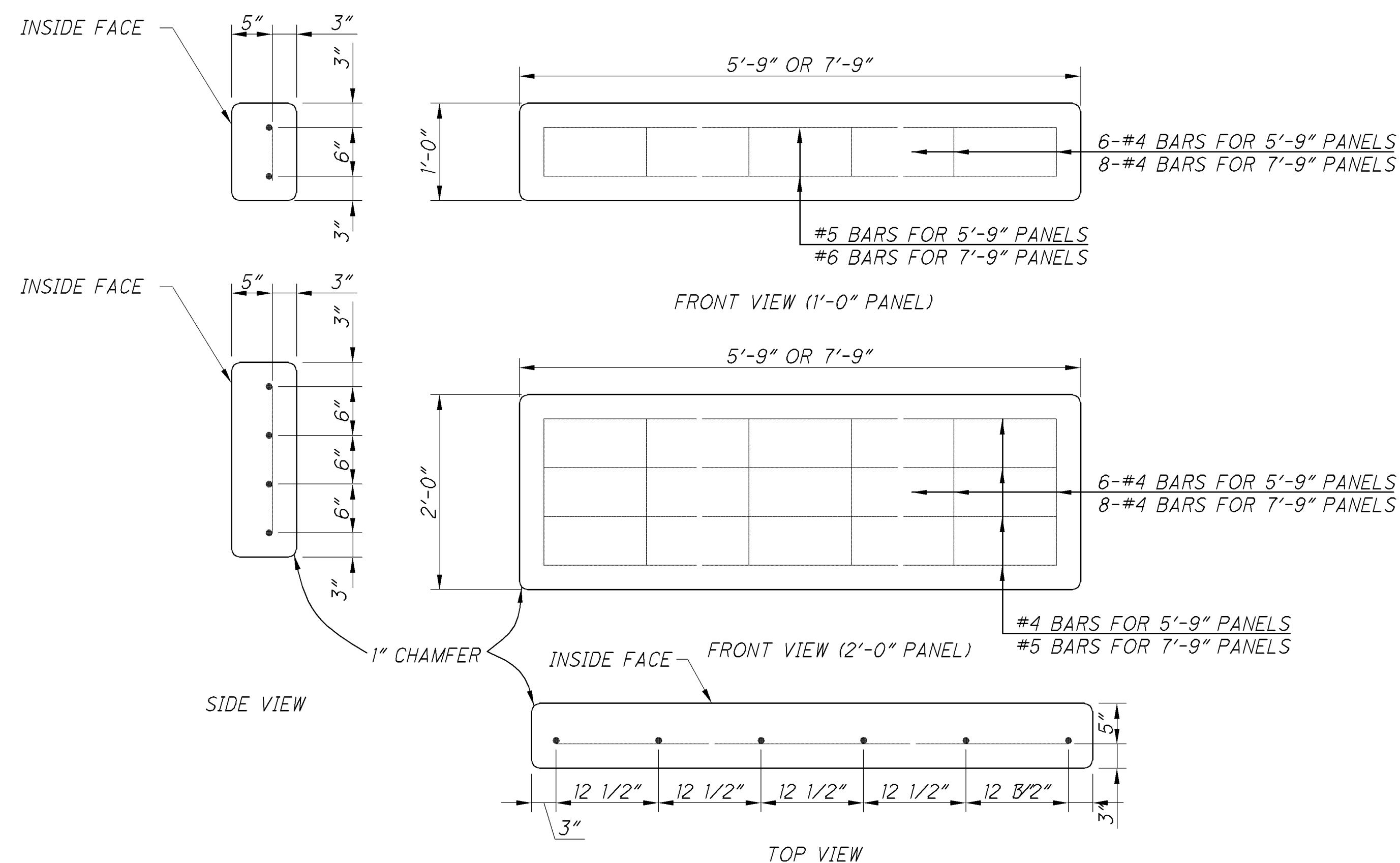
1. THE REINFORCING STEEL FOR CONCRETE LAGGING IS INCLUDED WITH ITEM 511, MISC: PRECAST CONCRETE LAGGING, FOR PAYMENT.



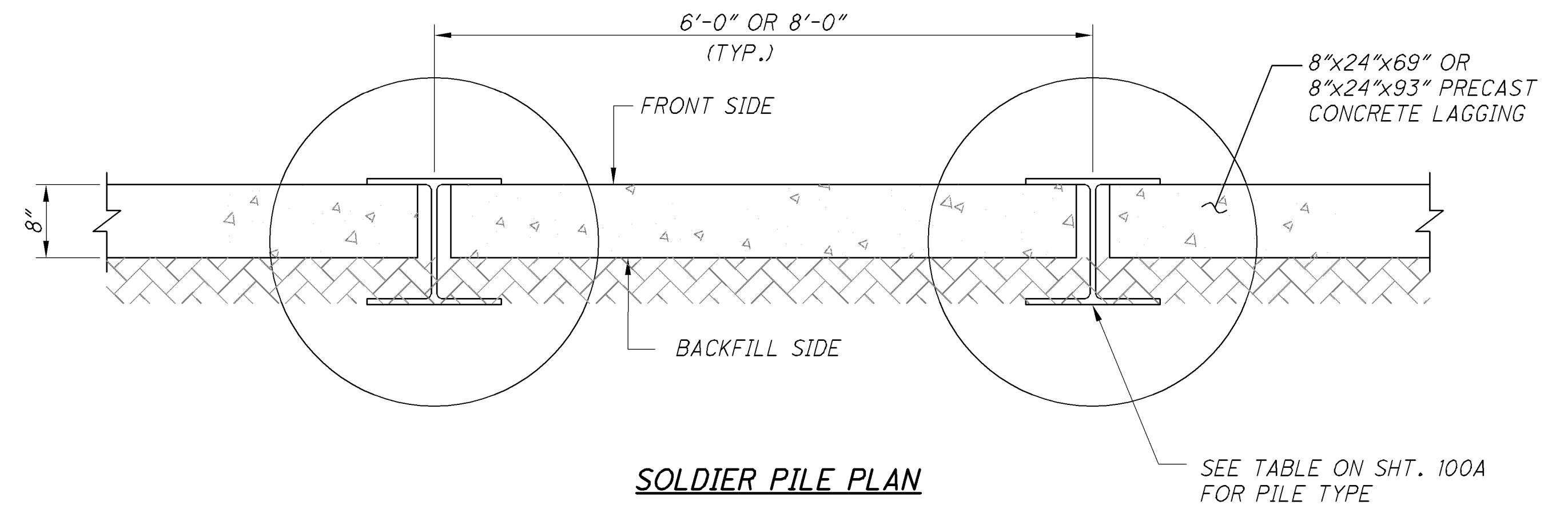
### DETAIL "1"



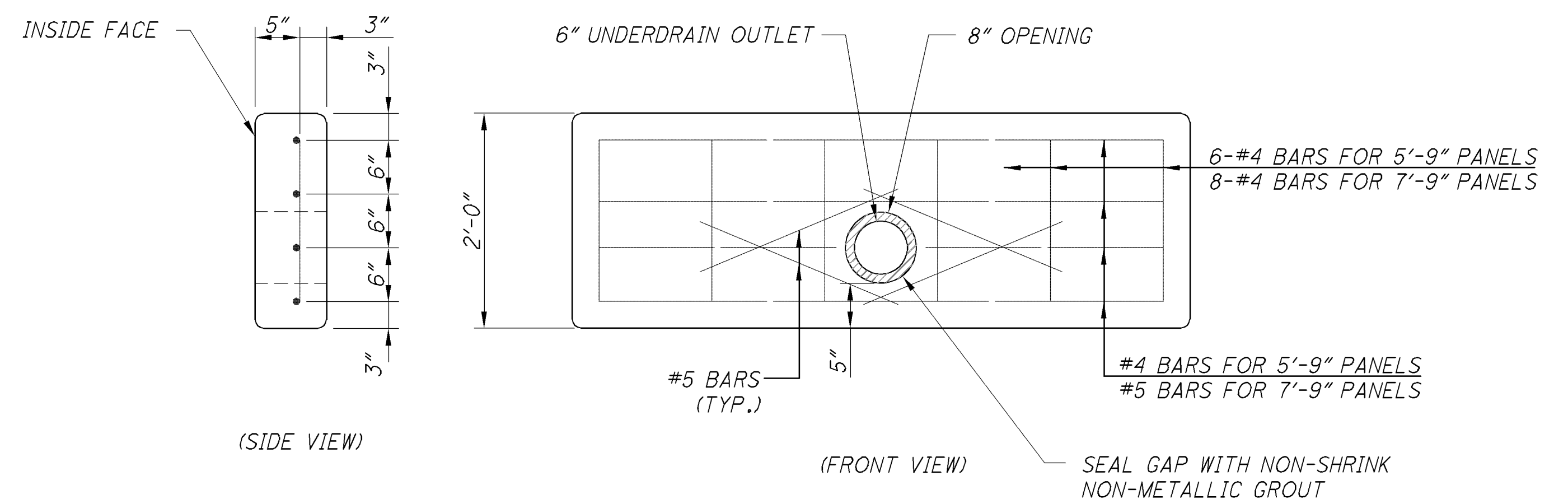
### DETAIL "2"



### PRECAST CONCRETE LAGGING DETAIL



### SOLDIER PILE PLAN



### REINFORCING DETAILS FOR PANELS WITH UNDERDRAIN OUTLET OPENING

| PIER NUMBER | WALL GROUP | STATION              | D.S. DIAMETER | TOP ELEV. OF D.S. | D.S. LENGTH | SOLDIER PILE TYPE | TOP ELEV. OF PILE | PILE LENGTH | TOP OF LAGGING ELEV. |
|-------------|------------|----------------------|---------------|-------------------|-------------|-------------------|-------------------|-------------|----------------------|
| 1 - 6       | A          | 10+00.00 TO 10+40.00 | 30"           | EL . 603.00       | 10'         | HP14x89           | EL . 614.50       | 21.50'      | EL . 614.00          |
| 7 - 11      | A          | 10+48.00 TO 10+80.00 | 30"           | EL . 602.00       | 10'         | HP14x89           | EL . 613.50       | 21.50"      | EL . 613.00          |
| 12 - 18     | A          | 10+88.00 TO 11+36.00 | 30"           | EL . 600.00       | 10'         | HP14x89           | EL . 612.50       | 22.50"      | EL . 612.00          |
| 19 - 21     | A          | 11+44.00 TO 11+60.00 | 30"           | EL . 599.00       | 10'         | HP14x89           | EL . 611.50       | 22.50'      | EL . 611.00          |
| 22 - 23     | A          | 11+68.00 TO 11+76.00 | 30"           | EL . 598.00       | 10'         | HP14x89           | EL . 611.50       | 23.50'      | EL . 611.00          |
| 24 - 25     | A          | 11+84.00 TO 11+92.00 | 30"           | EL . 598.00       | 10'         | HP14x89           | EL . 610.50       | 22.50'      | EL . 610.00          |
| 26 - 29     | A          | 12+00.00 TO 12+24.00 | 30"           | EL . 597.00       | 10'         | HP14x89           | EL . 610.50       | 23.50'      | EL . 610.00          |
| 30 - 33     | A          | 12+32.00 TO 12+56.00 | 30"           | EL . 596.00       | 10'         | HP14x89           | EL . 609.50       | 23.50'      | EL . 609.00          |
| 34 - 36     | A          | 12+64.00 TO 12+80.00 | 30"           | EL . 595.00       | 10'         | HP14x89           | EL . 609.50       | 24.50'      | EL . 609.00          |
| 37 - 41     | A          | 12+88.00 TO 13+20.00 | 30"           | EL . 594.00       | 10'         | HP14x89           | EL . 608.50       | 24.50'      | EL . 608.00          |
| 42 - 43     | A          | 13+28.00 TO 13+36.00 | 30"           | EL . 593.00       | 10'         | HP14x89           | EL . 607.50       | 24.50'      | EL . 607.00          |
| 44 - 46     | A          | 13+44.00 TO 13+60.00 | 30"           | EL . 592.00       | 10'         | HP14x89           | EL . 607.50       | 25.50'      | EL . 607.00          |
| 47 - 49     | A          | 13+68.00 TO 13+84.00 | 30"           | EL . 591.00       | 10'         | HP14x89           | EL . 607.50       | 26.50'      | EL . 607.00          |
| 50 - 53     | A          | 13+92.00 TO 14+16.00 | 30"           | EL . 589.00       | 10'         | HP14x89           | EL . 606.50       | 27.50'      | EL . 606.00          |
| 54 - 55     | A          | 14+24.00 TO 14+32.00 | 30"           | EL . 588.00       | 10'         | HP14x89           | EL . 605.50       | 27.50'      | EL . 605.00          |
| 56 - 60     | B          | 14+38.00 TO 14+62.00 | 30"           | EL . 587.00       | 14'         | W14x109           | EL . 605.50       | 32.50'      | EL . 605.00          |
| 61 - 65     | B          | 14+68.00 TO 14+92.00 | 30"           | EL . 585.00       | 14'         | W14x109           | EL . 604.50       | 33.50'      | EL . 604.00          |
| 66 - 70     | B          | 14+98.00 TO 15+22.00 | 30"           | EL . 584.00       | 14'         | W14x109           | EL . 603.50       | 33.50'      | EL . 603.00          |
| 71 - 72     | B          | 15+28.00 TO 15+34.00 | 30"           | EL . 584.00       | 14'         | W14x109           | EL . 602.50       | 32.50'      | EL . 602.00          |
| 73 - 74     | B          | 15+40.00 TO 15+46.00 | 30"           | EL . 583.00       | 14'         | W14x109           | EL . 602.50       | 33.50'      | EL . 602.00          |
| 75 - 77     | B          | 15+52.00 TO 15+64.00 | 30"           | EL . 582.00       | 14'         | W14x109           | EL . 602.50       | 34.50'      | EL . 602.00          |
| 78 - 82     | B          | 15+70.00 TO 15+94.00 | 30"           | EL . 581.00       | 14'         | W14x109           | EL . 601.50       | 34.50'      | EL . 601.00          |
| 83 - 87     | B          | 16+00.00 TO 16+24.00 | 30"           | EL . 580.00       | 14'         | W14x109           | EL . 600.50       | 34.50'      | EL . 600.00          |
| 88 - 93     | B          | 16+30.00 TO 16+60.00 | 30"           | EL . 579.00       | 14'         | W14x109           | EL . 599.50       | 34.50'      | EL . 599.00          |
| 94 - 98     | B          | 16+66.00 TO 16+90.00 | 30"           | EL . 579.00       | 14'         | W14x109           | EL . 598.50       | 33.50'      | EL . 598.00          |
| 99 - 104    | B          | 16+96.00 TO 17+26.00 | 30"           | EL . 578.00       | 14'         | W14x109           | EL . 597.50       | 33.50'      | EL . 597.00          |
| 105 - 109   | B          | 17+32.00 TO 17+56.00 | 30"           | EL . 578.00       | 14'         | W14x109           | EL . 596.50       | 32.50'      | EL . 596.00          |
| 110 - 115   | B          | 17+62.00 TO 17+92.00 | 30"           | EL . 578.00       | 14'         | W14x109           | EL . 595.50       | 31.50'      | EL . 595.00          |
| 116 - 122   | B          | 17+98.00 TO 18+34.00 | 30"           | EL . 577.00       | 14'         | W14x109           | EL . 594.50       | 31.50'      | EL . 594.00          |
| 123 - 127   | B          | 18+40.00 TO 18+64.00 | 30"           | EL . 576.00       | 14'         | W14x109           | EL . 593.50       | 31.50'      | EL . 593.00          |
| 128 - 133   | B          | 18+70.00 TO 19+00.00 | 30"           | EL . 576.00       | 14'         | W14x109           | EL . 592.50       | 30.50'      | EL . 592.00          |
| 134 - 138   | C          | 19+06.00 TO 19+38.00 | 30"           | EL . 576.00       | 10'         | HP14x89           | EL . 591.50       | 25.50'      | EL . 591.00          |
| 139 - 143   | C          | 19+46.00 TO 19+78.00 | 30"           | EL . 574.00       | 10'         | HP14x89           | EL . 590.50       | 26.50'      | EL . 590.00          |
| 144 - 148   | D-1        | 19+86.00 TO 20+18.00 | 30"           | EL . 574.00       | 25'         | HP14x89           | EL . 589.50       | 40.50'      | EL . 589.00          |
| 149 - 152   | D-1        | 20+26.00 TO 20+50.00 | 30"           | EL . 574.00       | 25'         | HP14x89           | EL . 588.50       | 39.50'      | EL . 588.00          |
| 153 - 156   | D-1        | 20+58.00 TO 20+82.00 | 30"           | EL . 573.00       | 25'         | HP14x89           | EL . 587.50       | 39.50'      | EL . 587.00          |
| 157 - 159   | D-2        | 20+90.00 TO 21+06.00 | 30"           | EL . 572.00       | 35.5'       | HP14x89           | EL . 586.50       | 50.00'      | EL . 586.00          |
| 160 - 163   | D-2        | 21+14.00 TO 21+38.00 | 30"           | EL . 571.00       | 35.5'       | HP14x89           | EL . 585.50       | 50.00'      | EL . 585.00          |
| 164 - 167   | D-2        | 21+46.00 TO 21+70.00 | 30"           | EL . 570.00       | 35.5'       | HP14x89           | EL . 584.50       | 50.00'      | EL . 584.00          |
| 168 - 171   | D-2        | 21+78.00 TO 22+02.00 | 30"           | EL . 569.00       | 35.5'       | HP14x89           | EL . 583.50       | 50.00'      | EL . 583.00          |
| 172 - 175   | D-2        | 22+10.00 TO 22+34.00 | 30"           | EL . 568.00       | 35.5'       | HP14x89           | EL . 582.50       | 50.00'      | EL . 582.00          |

SOLDIER PILE & DRILLED SHAFT SIZE TABLE

DESIGN AGENCY  
COLUMBUS ENGINEERING  
CONSULTANTS, INC.  
840 MICHIGAN AVENUE, COLUMBUS, OH 43215  
TEL: (614) 228-3500

DATE  
01/09

REVIEWED  
JJ

DRAWN  
CEC

DESIGNED  
CCU

STRUCTURE FILE NUMBER  
L3108201/R3108236

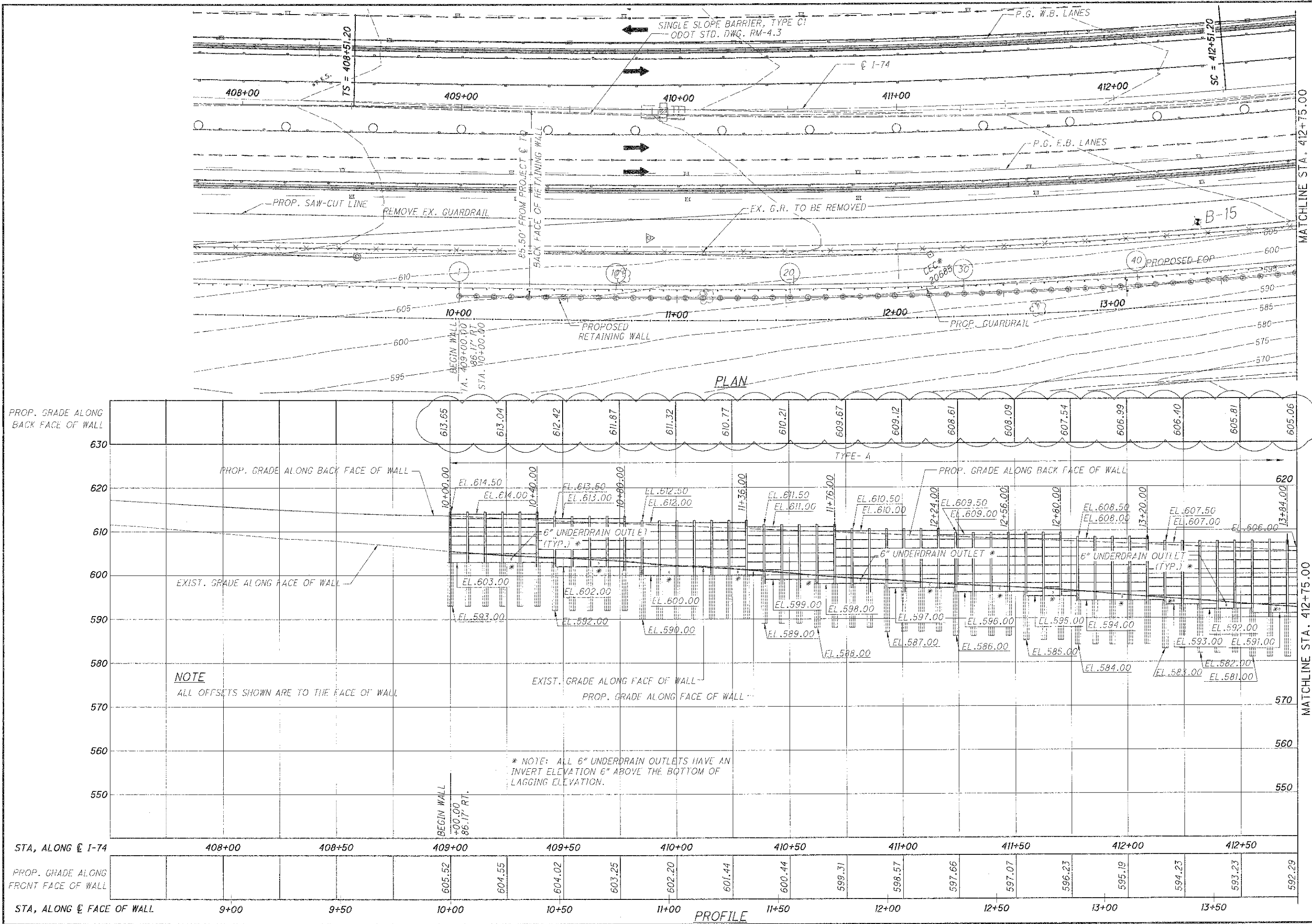
REVISED  
.

CHECKED  
KVB-RPM

DRILLED SHAFT WALL DETAILS - III

HAM-74-7.76

115  
201



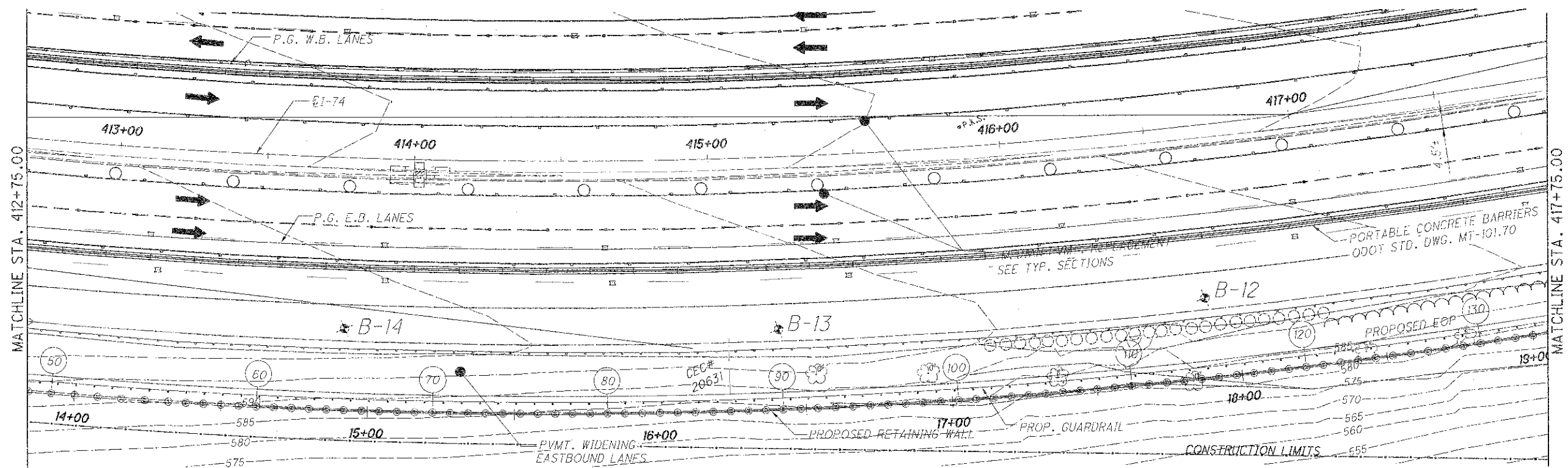
DATE: 01/09  
REVIEWED: JJ  
DRAWN: CEC  
DESIGNED: CCJ  
CHECKED: SS

STRUCTURE FILE NUMBER: L3108201/R3108236

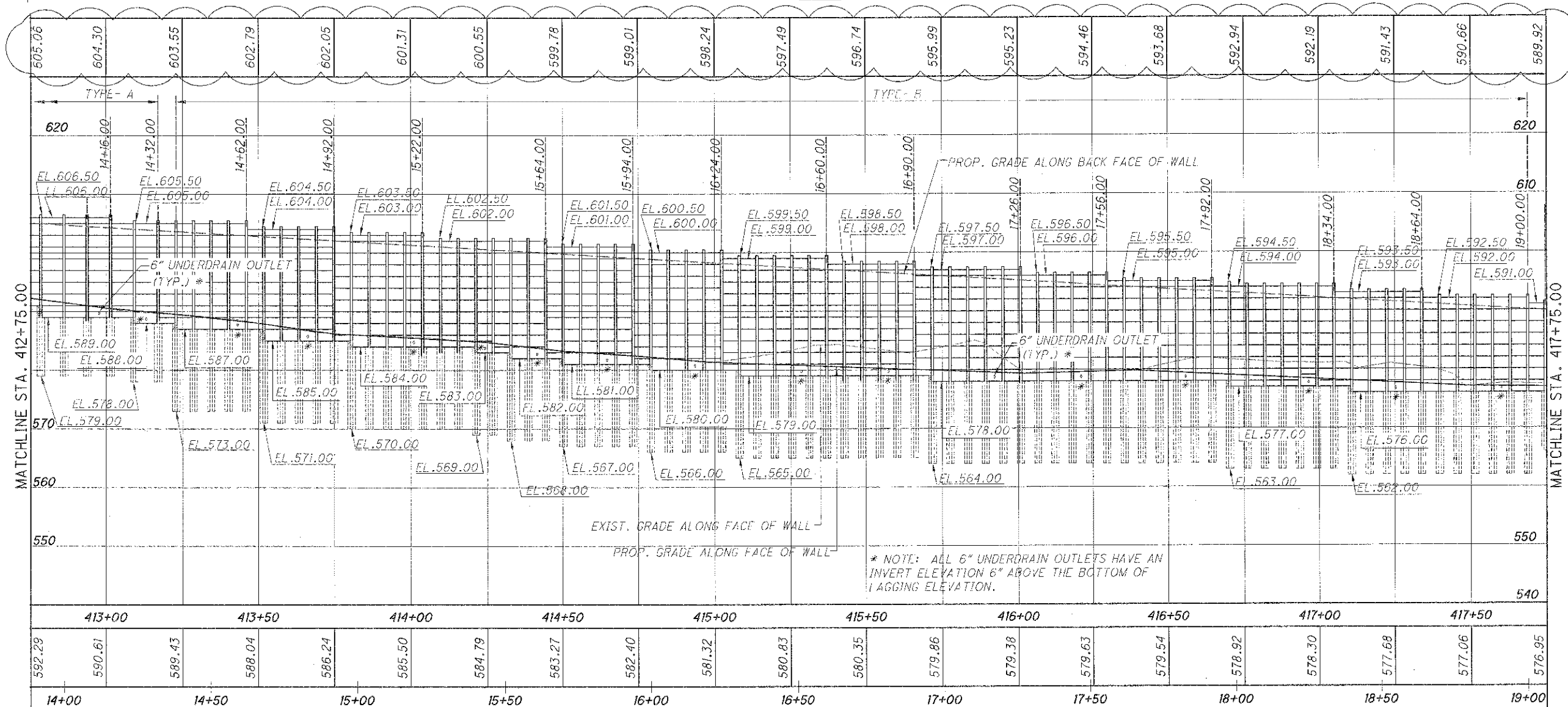
**RETAINING WALL PLAN AND PROFILE**

**HAM-74-7.76**

116  
201



PLAN



PROFILE

\* NOTE: ALL 6" UNDERDRAIN OUTLETS HAVE AN INVERT ELEVATION 6" ABOVE THE BOTTOM OF LAGGING ELEVATION.

