## PROJECT NOTES:

1. LOCATION
   PROPOSED NEW STRUCTURE CARRYING JAMISON CORNER ROAD OVER US 301 IN NEW CASTLE COUNTY, DELAWARE.

2. ELEVATIONS
   VERTICAL DATUM IS REFERENCED TO NAVD 88.

3. DESIGN CRITERIA AND SPECIFICATIONS
   2007 AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, INCLUDING 2008 AND 2009 INTERIM PROVISIONS AND THE 2005 DELDOT BRIDGE DESIGN MANUAL. PROVIDE MATERIAL AND PERFORM WORK IN ACCORDANCE WITH THE DELDOT STANDARD SPECIFICATIONS AND STANDARD CONSTRUCTION DETAILS AND THE CONTRACT SPECIAL PROVISIONS.

4. LOADING
   HL-93 AND DELAWARE LEGAL LOADS FOR LIVE LOAD WITH PROVISIONS FOR FUTURE 2" WEARING SURFACE AND 15 LBS/FT$^2$ FOR THE USE OF STEEL BRIDGE DECK FORMS WHICH REMAIN IN PLACE.

5. CONCRETE
   ALL CONCRETE PROPERTIES SHALL BE IN ACCORDANCE WITH SECTION 812 OF THE DELAWARE DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS.

   CLASS A - ABUTMENTS, STEMS, BACKWALLS, AND PARAPETS
   (f'c = 4,500 PSI).

   CLASS D - CONCRETE DECK SLAB, SLEEPER SLAB, AND APPROACH SLABS (f'c = 4,500 PSI).

   ALL EXPOSED EDGES SHALL BE CHAMFERED ¾" UNLESS NOTED OTHERWISE.

6. REINFORCING STEEL
   ALL REINFORCING STEEL SHALL BE AASHTO M 31 (ASTM A 615), GRADE 60. EPOXY COATED REINFORCING STEEL SHALL BE PROTECTED WITH FUSION BONDED EPOXY, CONFORMING TO AASHTO M 284 (ASTM A 775).

   EPOXY COATED REINFORCING STEEL SHALL BE USED IN THE FOLLOWING LOCATIONS:

   - SLEEPER SLAB
   - APPROACH SLABS
   - DECK SLAB
   - PARAPETS
   - ABUTMENTS

   ALL REINFORCING STEEL HAS BEEN DETAILED FOR A MAXIMUM LENGTH OF 60 FT.

   ALL SPLICES, NOT SHOWN, SHALL BE LAPPED AS PER THE AASHTO BRIDGE DESIGN SPECIFICATIONS.

   MINIMUM CONCRETE COVER FOR REINFORCING STEEL UNLESS NOTED OTHERWISE SHALL BE:

   FOUNDATION ELEMENTS: 3"
   DECK SLABS: 2½" TOP OF SLAB (INCLUDES ½" INTEGRAL WEARING SURFACE)
   1" BOTTOM OF SLAB WHEN STAY-IN-PLACE FORMS ARE USED

7. STRUCTURAL STEEL
   ALL STRUCTURAL STEEL SHALL BE AASHTO M 270 (ASTM A 709), GRADE 50W INCLUDING THE ADDITIONAL REQUIREMENTS FOR CHARPY V-NOTCH TESTING OF AASHTO M 270 FOR PRIMARY LOAD CARRYING MEMBERS UNDER TENSILE STRESS.

8. ELASTOMERIC BEARINGS AND TFE-STAINLESS STEEL BEARINGS
   FOR REQUIREMENTS OF THE ELASTOMERIC BEARINGS, SEE DWG. NO. BB-01. FOR REQUIREMENTS OF THE TFE-STAINLESS STEEL BEARINGS, SEE DWG. NO. BB-02.

9. PRESTRESSED CONCRETE PILES
   ALL PRESTRESSED CONCRETE PILES SHALL BE IN ACCORDANCE WITH SECTION 618 OF THE DELAWARE DEPARTMENT OF TRANSPORTATION SPECIFICATIONS EXCEPT THAT SEVEN WIRE LOW RELAXATION STRAND SHALL BE USED.

10. STEEL H-PILES
    SEE PILE NOTE 6 ON DWG. NO. PL-01 REGARDING THE STEEL H-PILE ALTERNATIVE. STEEL H-PILES SHALL BE AASHTO M 270 (ASTM A 709), GRADE 50.

11. MSE WALLS
    FOR MSE WALL NOTES, SEE DWG. NO. AB-02.

12. FOUNDATION REQUIREMENTS
    FOR FOUNDATION REQUIREMENTS, SEE DWG. NOS. PL-01 AND PL-02. DELDOT STANDARD SPECIFICATION 619.11 (A)(6) SHALL BE MODIFIED BY REFERENCE TO SPECIAL PROVISIONS 619519 & 619539.

13. TRAFFIC CONTROL REQUIREMENTS
    FOR TRAFFIC CONTROL REQUIREMENTS, SEE DWG. NOS. CS-06 AND CS-08.

14. CONSTRUCTION JOINTS
    KEYED CONSTRUCTION JOINTS SHALL BE 2"x4" OR UNLESS NOTED OTHERWISE. ALL EXPOSED CONSTRUCTION JOINT EDGES SHALL HAVE A ¾" V-NOTCH UNLESS NOTED OTHERWISE.

15. MISCELLANEOUS
    ALL AREAS DISTURBED BY THE CONTRACTOR'S OPERATIONS SHALL BE GRADED BACK TO THE ORIGINAL EXISTING GRADE, TOP SOILED, SEEDED AND MULCHED. PAYMENT SHALL BE INCIDENTAL TO THE CONTRACT. AS DIRECTED BY THE ENGINEER, ALL AREAS DISTURBED BY THE CONTRACTOR'S OPERATION RESULTING FROM UNAUTHORIZED ACTIVITIES OUTSIDE THE LIMIT OF CONSTRUCTION SHALL BE TOP SOILED,SEEDED, AND MULCHED AT THE CONTRACTOR'S EXPENSE.

16. STABILIZING STRUCTURAL EXCAVATIONS
    IN LIEU OF A 2:1 SLOPE, THE CONTRACTOR MAY USE SHORING FOR EXCAVATIONS EXCEEDING 5 FEET IN HEIGHT. THE COST OF THE SHORING SHALL BE INCIDENTAL TO ITEM 207000 - EXCAVATION AND BACKFILL FOR STRUCTURES.

17. LOAD RATINGS
    FOR LOAD AND RESISTANCE FACTOR RATING, SEE BRIDGE NO. 1-460A LOAD RATING SUMMARY ON THIS SHEET.

18. UTILITIES
    BEFORE BEGINNING WORK, THE CONTRACTOR SHALL GIVE NOTIFICATION BY TELEPHONE BY CALLING "MISS UTILITY" AT 1-800-282-8555 A MINIMUM OF 2 WORKING DAYS PRIOR TO START OF WORK. VERIFY AND LOCATE ALL UTILITIES PRIOR TO STARTING WORK.

    COORDINATE THE REQUIREMENTS FOR PROTECTION OF ANY UTILITY WITH THE UTILITY OWNER PRIOR TO STARTING WORK.

    CONDUCT OPERATIONS IN A MANNER WHICH ENSURES THAT THE UTILITIES WILL NOT BE DISTURBED OR ENDANGERED. ANY DAMAGE INCURRED TO THESE UTILITIES OR ANY OTHER UTILITIES, SHOWN OR NOT SHOWN ON THE PLANS, DUE TO THE CONTRACTOR'S OPERATIONS SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE TO THE SATISFACTION OF THE APPROPRIATE UTILITY COMPANY. THE DEPARTMENT DOES NOT ASSUME RESPONSIBILITY FOR REIMBURSEMENT, PARTICIPATION IN DESIGN AND/OR REVISIONS, OR LIABILITY FOR ACCURACY OF TYPE, SIZE AND LOCATION OF ANY UTILITY.

    THE CONTRACTOR IS RESPONSIBLE FOR TEMPORARILY SUPPORTING, PROTECTING, OR RELOCATING ANY UTILITIES DURING CONSTRUCTION. WHERE NECESSARY, THE COST FOR THIS WORK WILL BE INCIDENTAL TO THE CONTRACT.



## BRIDGE NO. 1-460A INDEX OF SHEETS



## *LOAD RATING SUMMARY*

| *DESIGN VEHICLE* | *RATING FACTOR* | *RATING WEIGHT (TON)* | *CONTROLLING MEMBER* | *CONTROLLING POINT* | *LOAD EFFECT* |
|---|---|---|---|---|---|
| *HL-93 TRUCK (INVENTORY)* | *1.29* | *N/A* | *EXTERIOR GIRDER* | *MIDSPAN* | *FLEXURE* |
| *HL-93 TANDEM (INVENTORY)* | *1.53* | *N/A* | *EXTERIOR GIRDER* | *MIDSPAN* | *FLEXURE* |
| *HL-93 TRUCK TRAIN (INVENTORY)* | *N/A* | *N/A* | *N/A* | *N/A* | *N/A* |
| *HS-20 (INVENTORY)* | *1.99* | *71.58* | *EXTERIOR GIRDER* | *MIDSPAN* | *FLEXURE* |
| *HL-93 TRUCK (OPERATING)* | *1.67* | *N/A* | *EXTERIOR GIRDER* | *MIDSPAN* | *FLEXURE* |
| *HL-93 TANDEM (OPERATING)* | *1.98* | *N/A* | *EXTERIOR GIRDER* | *MIDSPAN* | *FLEXURE* |
| *HL-93 TRUCK TRAIN (OPERATING)* | *N/A* | *N/A* | *N/A* | *N/A* | *N/A* |
| *HS-20 (OPERATING)* | *2.58* | *93.06* | *EXTERIOR GIRDER* | *MIDSPAN* | *FLEXURE* |
| *DE S220 & LEGAL-LANE (LEGAL)* | *3.48* | *69.57* | *EXTERIOR GIRDER* | *MIDSPAN* | *FLEXURE* |
| *DE S335 & LEGAL-LANE (LEGAL)* | *1.96* | *68.67* | *EXTERIOR GIRDER* | *MIDSPAN* | *FLEXURE* |
| *DE S437 & LEGAL-LANE (LEGAL)* | *1.87* | *68.48* | *EXTERIOR GIRDER* | *MIDSPAN* | *FLEXURE* |
| *DE S330 & LEGAL-LANE (LEGAL)* | *2.52* | *75.49* | *EXTERIOR GIRDER* | *MIDSPAN* | *FLEXURE* |
| *DE S435 & LEGAL-LANE (LEGAL)* | *2.18* | *76.36* | *EXTERIOR GIRDER* | *MIDSPAN* | *FLEXURE* |
| *DE S540 & LEGAL-LANE (LEGAL)* | *1.92* | *76.72* | *EXTERIOR GIRDER* | *MIDSPAN* | *FLEXURE* |

*NOTE: LOAD RATING INCLUDES FUTURE WEARING SURFACE AS NOTED IN THE PLANS.*

**BR1-8**
**PN-01**

**DELAWARE**
**DEPARTMENT OF TRANSPORTATION**

| ADDENDUMS / REVISIONS | |
|---|---|
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SCALE: NOT TO SCALE

**US 301,**
**SR 896 TO SR 1**

| CONTRACT | BRIDGE NO. 1-460A |
|---|---|
| T200911308 | DESIGNED BY: A.D.D. |
| COUNTY | CHECKED BY: B.K.B. |
| NEW CASTLE | |

**PROJECT NOTES**

| SHEET NO. |
|---|
| 497 |
| TOTAL SHTS. |
| 875 |

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| ITEM NO. | ITEM NAME | UNITS | QUANTITY |
|---|---|---|---|
| 202000 | Excavation and Embankment | CY | 347 |
| 202505 | Settlement Platform | EACH | 4 |
| 202518 | Settlement Monument | EACH | 4 |
| 302011 | Delaware No. 3 Stone | TON | 91 |
| 302012 | Delaware No. 57 Stone | TON | 67 |
| 602003 | Portland Cement Concrete Masonry, Abutment Footing, Class A | C.Y. | 71 |
| 602013 | Portland Cement Concrete Masonry, Superstructure, Class D | C.Y. | 331 |
| 602014 | Portland Cement Concrete Masonry, Approach Slab, Class D | C.Y. | 163 |
| 602015 | Portland Cement Concrete Masonry, Abutment Above Footing, Class A | C.Y. | 37 |
| 602017 | Portland Cement Concrete Masonry, Parapet, Class A | C.Y. | 44 |
| 602772 | Mechanically Stabilized Earth Walls | L.S. | 1 |
| 604000 | Bar Reinforcement, Epoxy Coated | LBS | 117,736 |
| 605001 | Steel Structures | LBS | 354,900 |
| 605512 | Prefabricated Expansion Joint System 4" | L.F. | 56 |
| 605581 | Elastomeric Bearing Pads | EACH | 6 |
| 605639 | TFE Stainless Steel Structural Bearings | EACH | 6 |
| 618062 | Steel H Piles, HP 14x73 | L.F. | 1,158 |
| 618065 | Steel H Test Piles, HP 14x73 | L.F. | 426 |
| 618081 | Furnish Precast Prestressed Concrete Piles, 14" x 14" | L.F. | 874 |
| 618091 | Furnish Precast Prestressed Concrete Test Piles, 14" x 14" | L.F. | 312 |
| 619042 | Install Steel H Piles, HP 14x73 | L.F. | 1,158 |
| 619045 | Install Steel H Test Piles, HP 14x73 | L.F. | 426 |
| 619061 | Install Precast Prestressed Concrete Piles, 14" x 14" | L.F. | 874 |
| 619067 | Install Precast Prestressed Concrete Test Piles, 14" x 14" | L.F. | 312 |
| 619501 | Production Pile Restrike | EACH | 3 |
| 619502 | Test Pile Restrike | EA.DY. | 1 |
| 619519 | Dynamic Pile Testing by Contractor | EACH | 10 |
| 619539 | Signal Matching Analysis by Contractor | EACH | 10 |
| 727507 | Bridge Safety Fence | L.F. | 354 |

NOTES:

1. THE QUANTITY SUMMARY INCLUDES QUANTITIES FOR BRIDGE 1-460A STANDARD ITEMS, PILE ALTERNATIVE 1 (14" PRESTRESSED CONCRETE PILES) ITEMS AND PILE ALTERNATIVE 2 (HP 14X73 PILES) ITEMS. ITEM NOS. 618081, 618091, 619061 AND 619067 ARE APPLICABLE TO PILE ALTERNATIVE 1. ITEM NOS. 618062, 618065, 619042 AND 619045 ARE APPLICABLE TO PILE ALTERNATIVE 2. ALL OTHER ITEMS ARE STANDARD ITEMS. SEE PILE NOTE 6 ON DWG. NO. PL-01 FOR ADDITIONAL INFORMATION REGARDING PILE ALTERNATIVES.

2. ITEM 202000 IS REPRESENTED UNDER TYPE C MATERIAL REQUIRED, "TYPE C BACKFILL FOR STRUCTURES". SEE DRAWING EW-05.

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DELAWARE
DEPARTMENT OF TRANSPORTATION

| ADDENDUMS / REVISIONS | |
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SCALE: AS NOTED

US 301,
SR 896 TO SR 1

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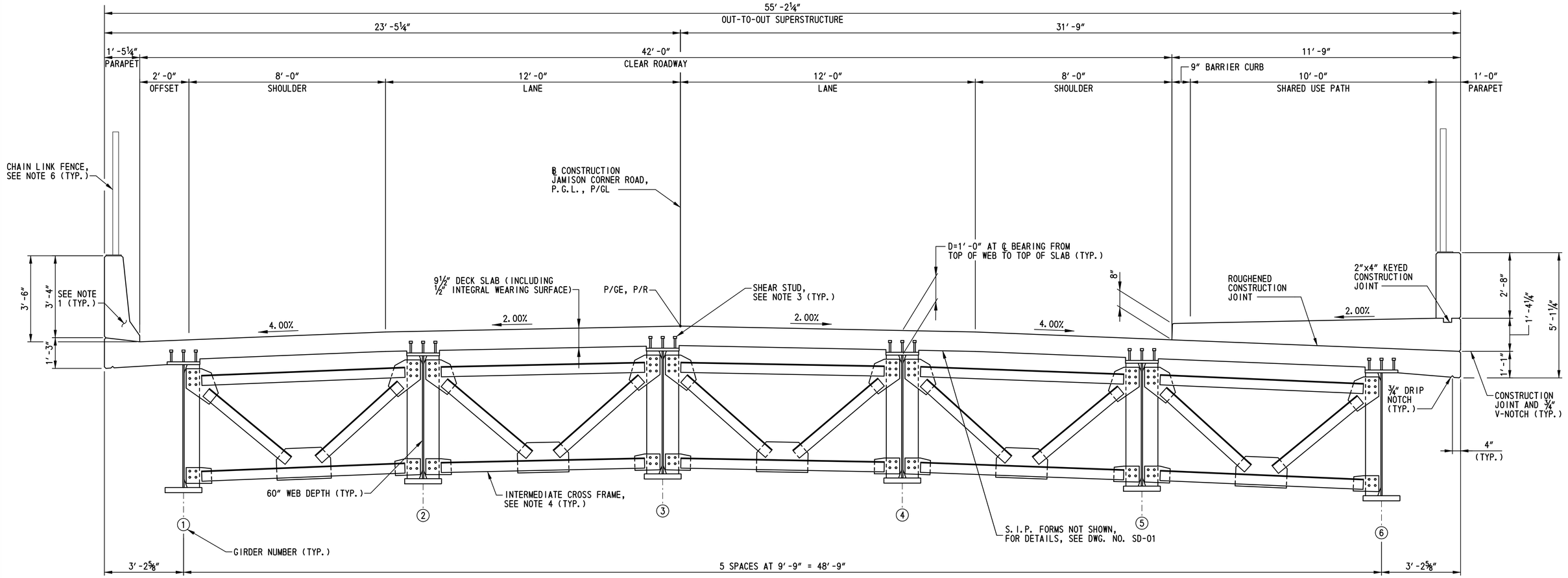
|---|---|
| CONTRACT | T200911308 |
| COUNTY | NEW CASTLE |
| BRIDGE NO. | 1-460A |
| DESIGNED BY: | W.T.R. |
| CHECKED BY: | B.K.B. |

QUANTITY SUMMARY

| | |
|---|---|
| BR1-8 QS-01 | |
| SHEET NO. | 498 |
| TOTAL SHTS. | 875 |




## SUPERSTRUCTURE TYPICAL SECTION

SCALE: ½″=1′-0″

NOTES:

1. PARAPETS SHALL NOT BE SLIP FORMED. FOR PARAPET AND PARAPET REINFORCEMENT DETAILS, SEE DWG. NOS. DK-01 THRU DK-03.
2. FOR DECK SLAB REINFORCEMENT DETAILS, SEE DWG. NOS. DK-01 THRU DK-03.
3. FOR SHEAR STUD DETAILS AND SPACING, SEE DWG. NOS. SD-01 AND BM-01.
4. FOR CONNECTION PLATE AND CROSS FRAME DETAILS (INTERMEDIATE AND ABUTMENT) AND SPACING, SEE DWG. NOS. BM-02 AND FR-01.
5. FOR GIRDER ELEVATION, SEE DWG. NO. BM-01.
6. FOR CHAIN LINK FENCE DETAILS, SEE DWG. NOS. FD-01 AND FD-02.
7. FOR SUPERSTRUCTURE DETAILS, SEE DWG. NO. SD-01.

**DELAWARE DEPARTMENT OF TRANSPORTATION**

| ADDENDUMS / REVISIONS | |
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SCALE: AS NOTED

**US 301, SR 896 TO SR 1**

| | | |
|---|---|---|
| CONTRACT | BRIDGE NO. | 1-460A |
| T200911308 | DESIGNED BY: | A.D.D. |
| COUNTY | CHECKED BY: | B.K.B. |
| NEW CASTLE | | |

**SUPERSTRUCTURE TYPICAL SECTION**

BR1-8
TS-01

| SHEET NO. |
|---|
| 499 |
| TOTAL SHTS. |
| 875 |

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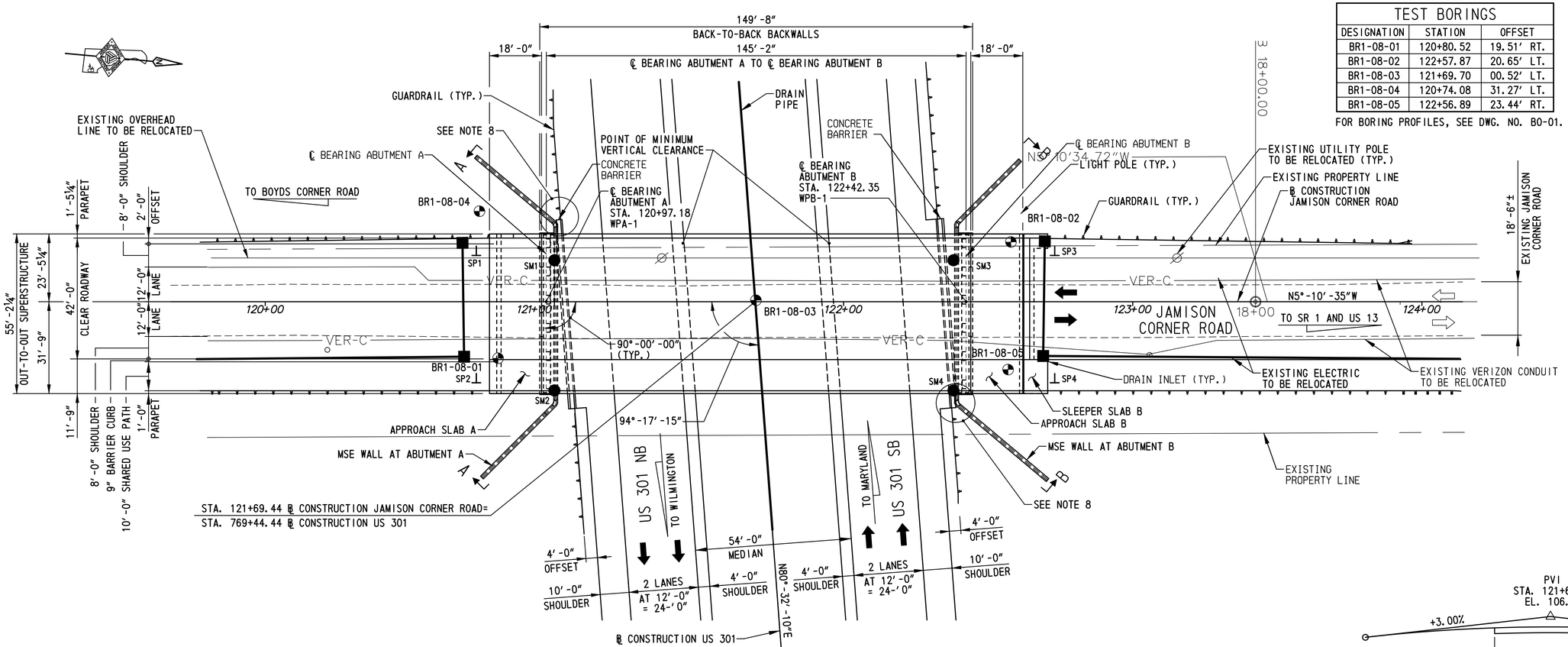
| TEST BORINGS | | |
|---|---|---|
| DESIGNATION | STATION | OFFSET |
| BR1-08-01 | 120+80.52 | 19.51' RT. |
| BR1-08-02 | 122+57.87 | 20.65' LT. |
| BR1-08-03 | 121+69.70 | 00.52' LT. |
| BR1-08-04 | 120+74.08 | 31.27' LT. |
| BR1-08-05 | 122+56.89 | 23.44' RT. |

FOR BORING PROFILES, SEE DWG. NO. BO-01.

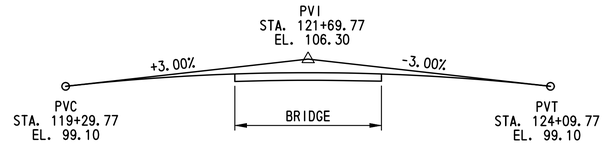
| SETTLEMENT PLATFORMS | | |
|---|---|---|
| DESIGNATION | STATION | OFFSET |
| SP1 | 120+73.00 | 16.00' LT. |
| SP2 | 120+73.00 | 28.00' RT. |
| SP3 | 122+73.00 | 16.00' LT. |
| SP4 | 122+73.00 | 28.00' RT. |

| SETTLEMENT MONUMENTS | | |
|---|---|---|
| DESIGNATION | STATION | OFFSET |
| SM1 | 121+00 | 15.00' LT. |
| SM2 | 121+00 | 30.00' RT. |
| SM3 | 122+38 | 15.00' LT. |
| SM4 | 122+38 | 30.00' RT. |

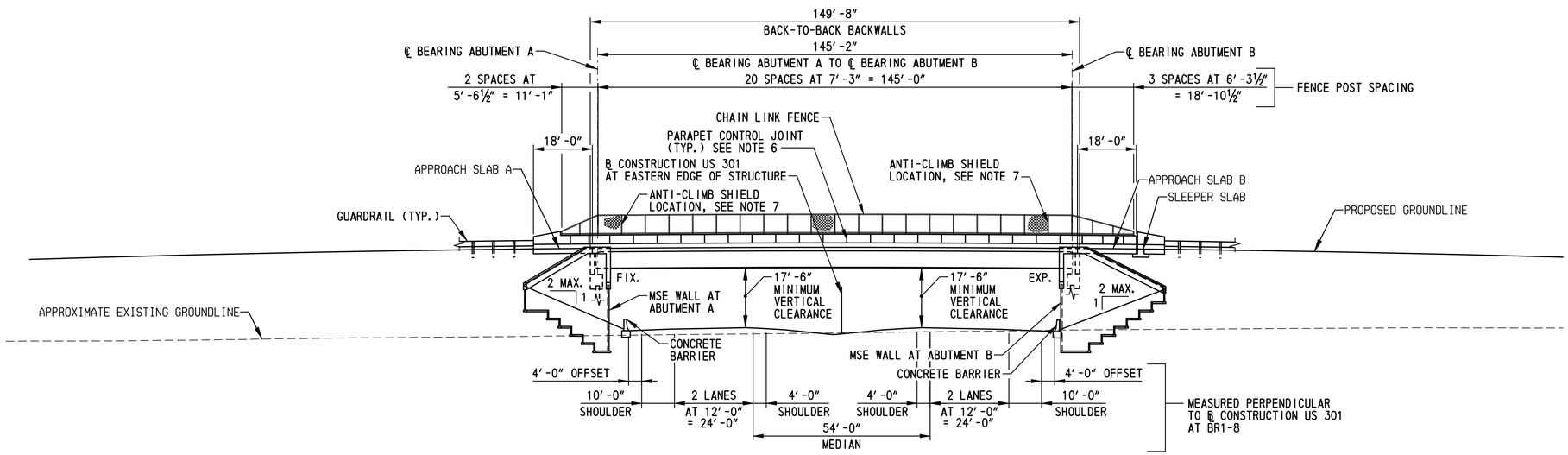
FOR SETTLEMENT PLATFORM DETAILS, SEE DWG. NO. FT-01. FOR SETTLEMENT MONUMENT DETAILS, SEE DWG. NO. PL-02. FOR SETTLEMENT MONITORING REQUIREMENTS, SEE THE SPECIAL PROVISIONS.




PLAN
SCALE: 1"=20'-0"




VERTICAL CURVE DATA
JAMISON CORNER ROAD




ELEVATION
SCALE: 1"=20'-0"

NOTES:

1. FOR DEVELOPED ELEVATIONS A-A AND B-B, SEE DWG. NOS. AB-02 AND AB-04.
2. EXISTING AND PROPOSED CONTOURS NOT SHOWN IN PLAN FOR CLARITY. FOR EXISTING AND PROPOSED CONTOURS, SEE DWG. NO. GR-01.
3. ALL UTILITIES ARE TO BE RELOCATED PRIOR TO BRIDGE CONSTRUCTION. SEE PROJECT NOTE 18 FOR ADDITIONAL INFORMATION.
4. FOR DRAIN INLET, DRAIN PIPE AND MANHOLE INFORMATION, SEE DWG. NO. CP-15.
5. FOR LIGHT POLE INFORMATION, SEE DWG. NO. LI-05.
6. PLACE PARAPET CONTROL JOINTS CENTERED BETWEEN FENCE POSTS. SEE DWG. NOS. FD-01 AND FD-02 FOR DETAILS. REFLECTORS SHALL BE INSTALLED ALONG EACH PARAPET. SEE DWG. NO. DT-17 FOR DETAILS.
7. LOCATE ANTI-CLIMB SHIELD AT THE FOURTH FENCE POST FROM THE SOUTH END OF EACH FENCE AND AT THE FIFTH FENCE POST FROM THE NORTH END OF EACH FENCE.
8. TAPER CONCRETE BARRIER FOOTING FROM 2'-7" (FULL WIDTH) TO 2'-0" AT THE WEST END OF ABUTMENT A AND 2'-0¼" AT THE EAST END OF ABUTMENT B TO FACILITATE MSE WALL CONSTRUCTION.

BR1-8
PE-01

**DELAWARE DEPARTMENT OF TRANSPORTATION**

| ADDENDUMS / REVISIONS | |
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SCALE: AS NOTED

**US 301, SR 896 TO SR 1**

| CONTRACT | BRIDGE NO. | 1-460A |
|---|---|---|
| T200911308 | DESIGNED BY: | A.D.D. |
| COUNTY | CHECKED BY: | B.K.B. |
| NEW CASTLE | | |

**GENERAL PLAN AND ELEVATION**

| SHEET NO. |
|---|
| 500 |
| TOTAL SHTS. |
| 875 |

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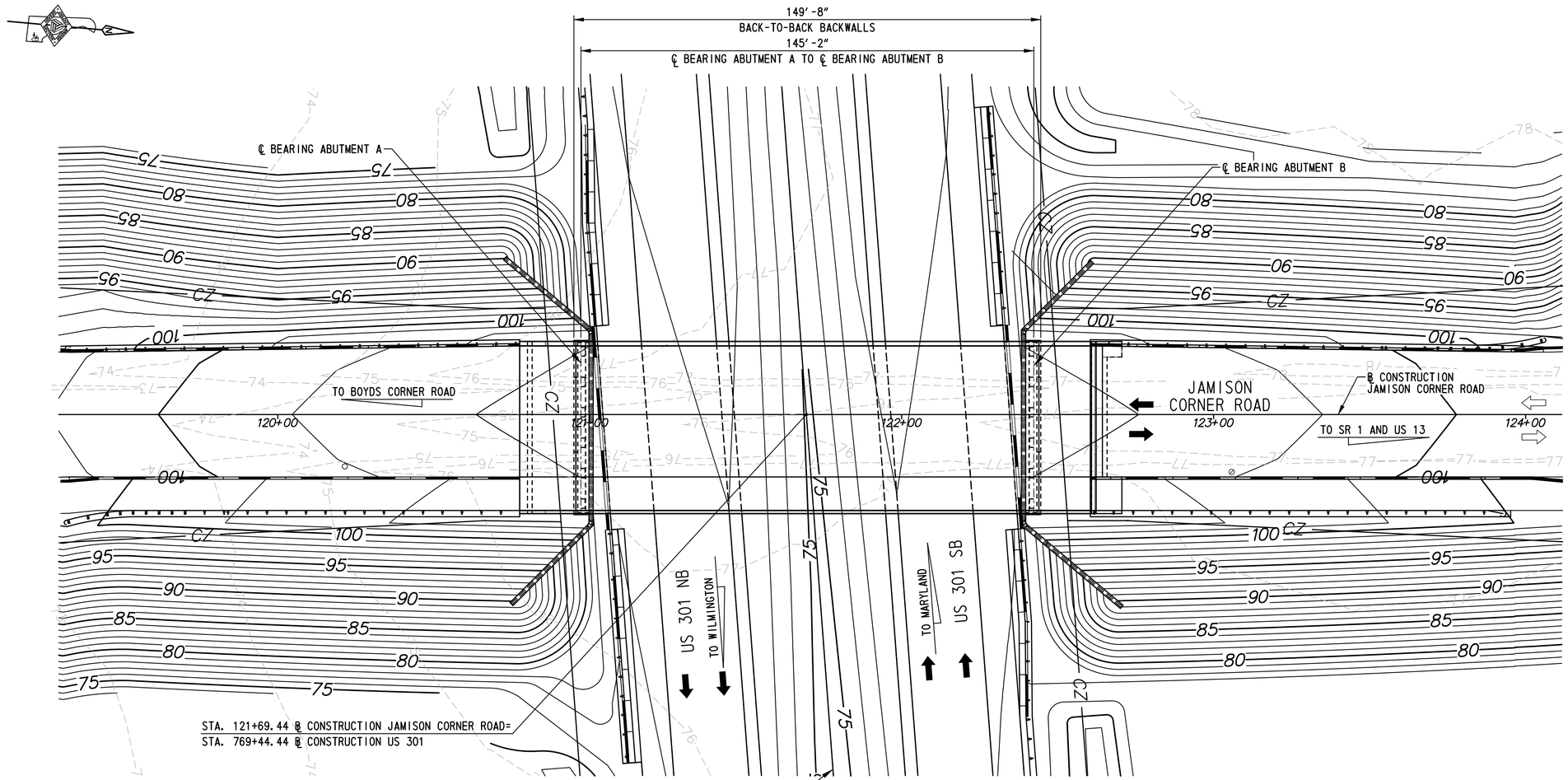


PLAN
SCALE: 1″=20′-0″

NOTE:
FOR ADDITIONAL INFORMATION, SEE DWG. NO. PE-01.

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**DELAWARE**
**DEPARTMENT OF TRANSPORTATION**

| ADDENDUMS / REVISIONS | |
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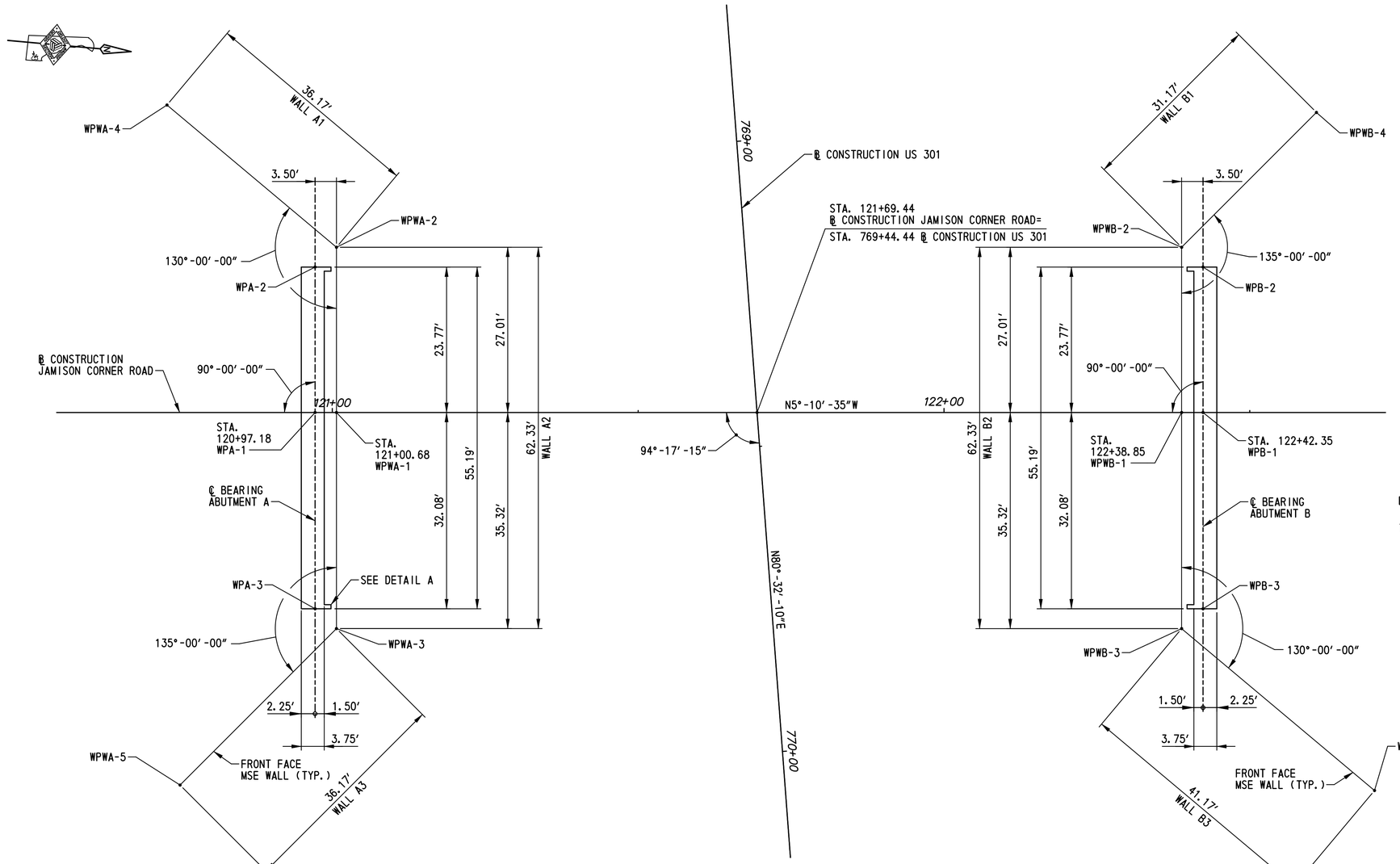
SCALE: AS NOTED

**US 301,**
**SR 896 TO SR 1**

| CONTRACT | BRIDGE NO. | 1-460A |
|---|---|---|
| T200911308 | DESIGNED BY: A.D.D. | |
| COUNTY | CHECKED BY: K.W.F. | |
| NEW CASTLE | | |

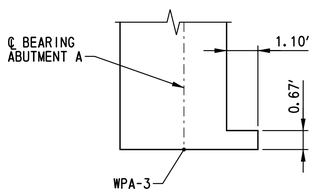
**GRADING PLAN**

| BR1-8 GR-01 |
|---|
| SHEET NO. 501 |
| TOTAL SHTS. 875 |




## GEOMETRIC AND FOOTING LAYOUT PLAN

SCALE: 1"=10'-0"

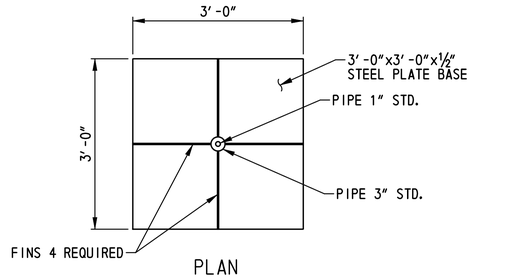



## DETAIL A

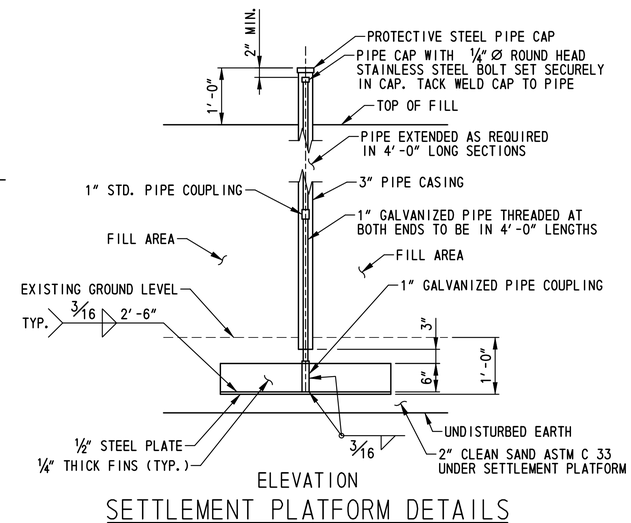
SCALE: 3/8"=1'-0"

**NOTE:**

DETAIL A SHOWN AT EAST END OF ABUTMENT A. WEST END OF ABUTMENT A AND BOTH ENDS OF ABUTMENT B SIMILAR.




PLAN




ELEVATION

## SETTLEMENT PLATFORM DETAILS

SCALE: ¾"=1'-0"

**NOTES:**

1. FOR PILE LAYOUT PLAN, SEE DWG. NO. PL-01.
2. FOR SETTLEMENT PLATFORM LOCATIONS, SEE DWG. NO. PE-01.

### WORKING POINT LOCATION CHART

| WORKING POINT | STATION | OFFSET | NORTHING | EASTING |
|---|---|---|---|---|
| WPA-1 | 120+97.18 | 0.00' | 555141.8265 | 581966.0626 |
| WPA-2 | 120+97.18 | 23.77' LT. | 555139.6819 | 581942.3887 |
| WPA-3 | 120+97.18 | 32.08' RT. | 555144.7211 | 581998.0151 |
| WPWA-1 | 121+00.68 | 0.00' | 555145.3122 | 581965.7468 |
| WPWA-2 | 121+00.68 | 27.01' LT. | 555142.8754 | 581938.8465 |
| WPWA-3 | 121+00.68 | 35.32' RT. | 555148.4991 | 582000.9257 |
| WPWA-4 | 120+72.97 | 50.26' LT. | 555113.1857 | 581918.1934 |
| WPWA-5 | 120+75.11 | 60.90' RT. | 555125.3369 | 582028.7024 |
| WPB-1 | 122+42.35 | 0.00' | 555286.4011 | 581952.9656 |
| WPB-2 | 122+42.35 | 23.77' LT. | 555284.2565 | 581929.2916 |
| WPB-3 | 122+42.35 | 32.08' RT. | 555289.2957 | 581984.9180 |
| WPWB-1 | 122+38.85 | 0.00' | 555282.9154 | 581953.2813 |
| WPWB-2 | 122+38.85 | 27.01' LT. | 555300.4389 | 581902.4479 |
| WPWB-3 | 122+38.85 | 35.33' RT. | 555319.8968 | 582011.9721 |
| WPWB-4 | 122+60.88 | 49.05' LT. | 555300.4389 | 581902.4479 |
| WPWB-5 | 122+70.38 | 61.79' RT. | 555319.8968 | 582011.9721 |

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**DELAWARE**
**DEPARTMENT OF TRANSPORTATION**

| ADDENDUMS / REVISIONS | |
|---|---|
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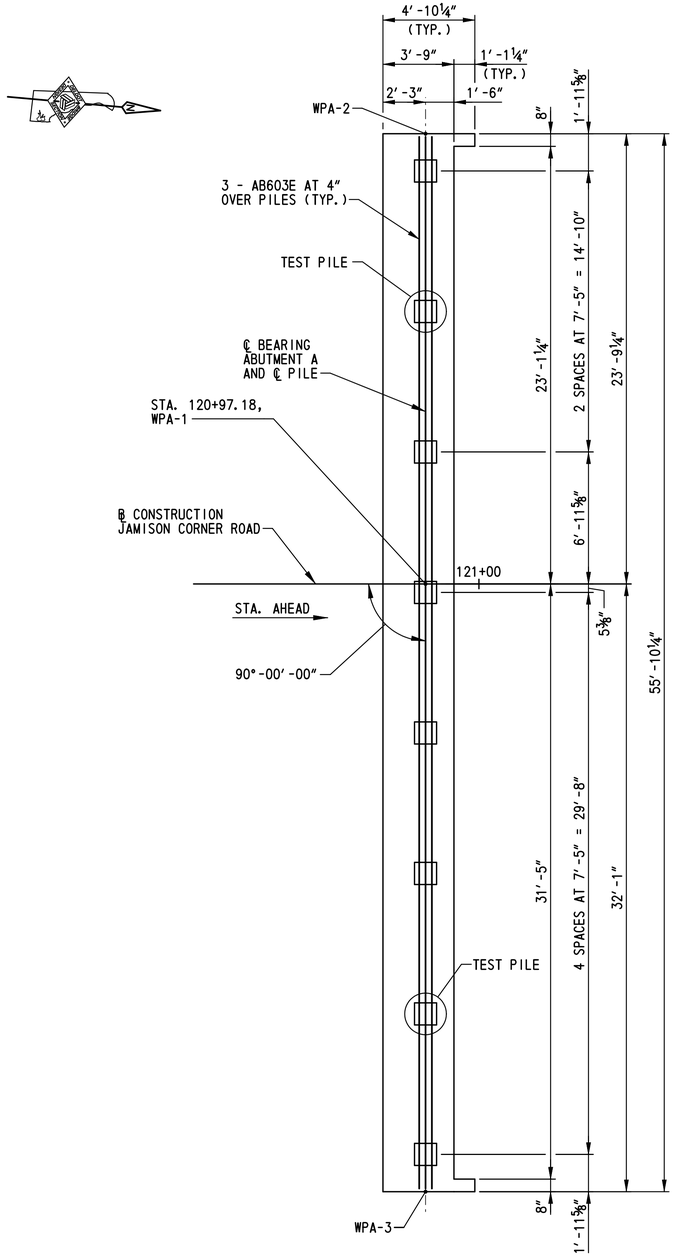
SCALE: AS NOTED

**US 301,**
**SR 896 TO SR 1**

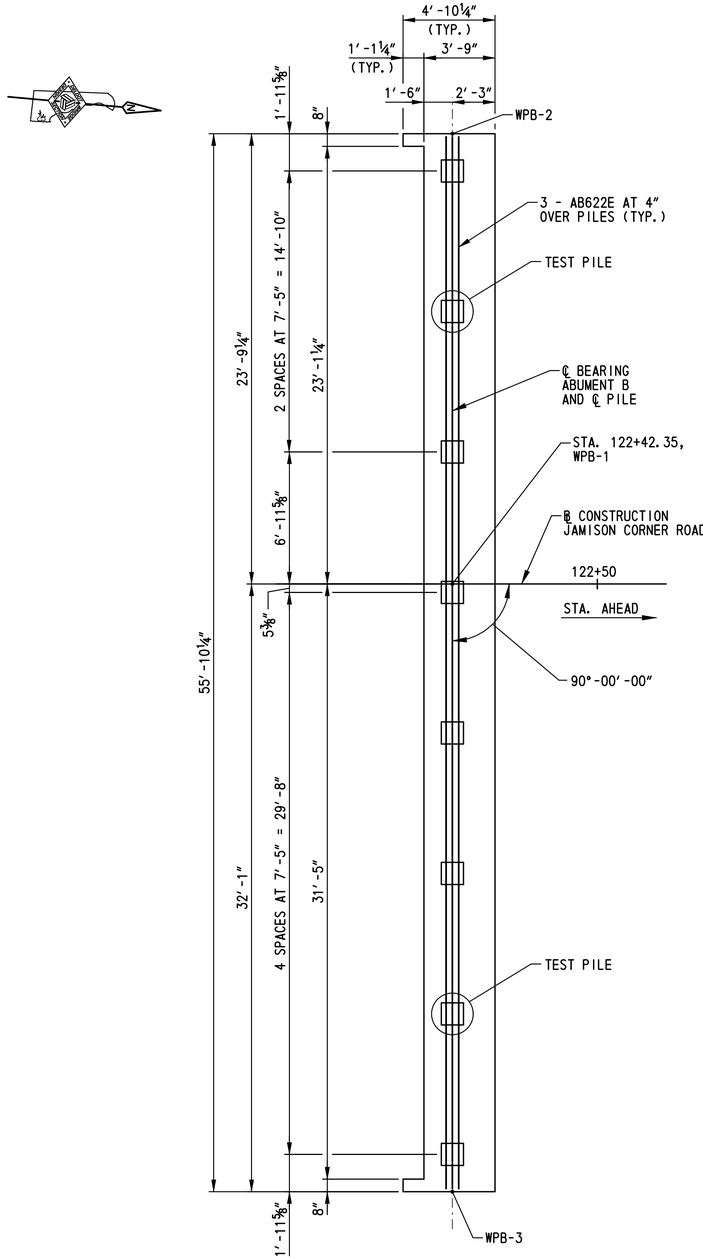
| CONTRACT | BRIDGE NO. | 1-460A |
|---|---|---|
| T200911308 | DESIGNED BY: A.D.D. | |
| COUNTY | CHECKED BY: B.K.B. | |
| NEW CASTLE | | |

**GEOMETRIC AND FOOTING LAYOUT PLAN**

| BR1-8 FT-01 | |
|---|---|
| SHEET NO. | 502 |
| TOTAL SHTS. | 875 |




ABUTMENT A




ABUTMENT B

## PILE LEGEND:

1. □ DENOTES PLUMB 14″ SQUARE PRESTRESSED CONCRETE PILE, SEE PILE NOTE 6
2. ⊡ DENOTES LOCATION OF 14″ SQUARE PRESTRESSED CONCRETE PILE DYNAMIC PILE TESTING AND SIGNAL MATCHING ANALYSIS, SEE PILE NOTE 6

## PILE NOTES:

1. THE FACTORED RESISTANCE OF THE 14″ PRESTRESSED CONCRETE PILING IS 145 TONS. PILES SHALL BE DRIVEN AND TESTED IN ACCORDANCE WITH THE SPECIAL PROVISION FOR DYNAMIC PILE TESTING TO A NOMINAL CAPACITY OF 225 TONS.
2. PILES SHALL BE DRIVEN TO THE DRIVING CRITERIA DEVELOPED FROM DYNAMIC PILE TESTING AND SPECIFIED BY THE ENGINEER TO ACHIEVE A NOMINAL RESISTANCE OF 225 TONS AND TO THE SPECIFIED MINIMUM TIP ELEVATION. PILES MEETING THE AFOREMENTIONED CRITERIA WILL BE CONSIDERED SATISFACTORY.
3. DYNAMIC PILE TESTING SHALL BE PERFORMED AFTER CONSTRUCTION OF THE MSE WALL AND COMPLETION OF THE SETTLEMENT WAITING PERIOD AS DETERMINED BY THE ENGINEER, BASED ON THE RESULTS OF INSTRUMENTATION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SUBMITTING A WAVE EQUATION ANALYSIS AND ALL OTHER INCIDENTALS IN ACCORDANCE WITH THE SPECIAL PROVISIONS. THE WAVE EQUATION ANALYSIS AND DYNAMIC PILE TESTING MUST BE SIGNED AND SEALED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF DELAWARE IN ACCORDANCE WITH THE SPECIAL PROVISIONS. UPON COMPLETION OF THE DYNAMIC PILE TESTING THE CONTRACTOR SHALL SUBMIT A SIGNAL MATCHING ANALYSIS TO THE ENGINEER FOR REVIEW AND APPROVAL IN ACCORDANCE WITH THE SPECIAL PROVISIONS.
4. ALL TEST PILES SHALL BE 10 FEET LONGER THAN THE PILE LENGTH COMPUTED FROM THE PILE TIP DATA TABLE. PILE LENGTHS FOR ORDERING PURPOSES SHALL BE DETERMINED BY THE TEST PILES. DYNAMIC PILE TESTING AND SIGNAL MATCHING ANALYSIS SHALL BE COMPLETED BY THE CONTRACTOR IN ACCORDANCE WITH THE SPECIAL PROVISIONS. TEST AND PRODUCTION PILE RESTRIKES WILL BE PAID FOR AS FOLLOWS:
   A. ALL TEST PILES WILL BE RESTRUCK AFTER A WAITING PERIOD OF AT LEAST 48 HOURS. TEST PILE RESTRIKES SHALL BE INCIDENTAL TO THE INITIAL INSTALLATION OF THE PILE PROVIDED THEY ARE REQUESTED WITHIN FIVE WORKING DAYS FROM THE COMPLETION OF THE INITIAL DRIVE. IF RESTRIKES ARE REQUESTED AFTER FIVE WORKING DAYS FROM THE COMPLETION OF THE INITIAL DRIVE THEN THE TEST PILE RESTRIKE SHALL BE PAID FOR IN ACCORDANCE WITH THE SPECIAL PROVISIONS.
   B. IF DIRECTED BY THE ENGINEER TO RESTRIKE A PRODUCTION PILE, THE RESTRIKE OF THE PRODUCTION PILE SHALL BE PAID SEPARATELY UNDER ITEM NO. 619501 - PRODUCTION PILE RESTRIKE.

   THE DEPARTMENT RESERVES THE RIGHT TO PERFORM DYNAMIC PILE TESTING OF RESTRIKES.
5. SEE DWG. NO. PE-01 FOR SETTLEMENT PLATFORM AND MONUMENT LOCATIONS. READINGS ON THE SETTLEMENT PLATFORMS SHALL BE MADE AFTER THE INITIAL INSTALLATION OF THE RISER AND CASING PIPES AND INSTALLATION RECORD SHEETS ARE APPROVED BY THE ENGINEER AND PRIOR TO FILL PLACEMENT. DURING FILL PLACEMENT, READINGS ON ALL SETTLEMENT PLATFORMS SHALL BE TAKEN AT A MINIMUM OF 3 CALENDAR DAY INTERVALS. AFTER COMPLETION OF THE FILL AND SURCHARGE PLACEMENT, INSTALL SETTLEMENT MONUMENTS IF INDICATED ON THE BRIDGE PLANS AND TAKE INITIAL READINGS. READINGS ON ALL SETTLEMENT MONITORING DEVICES SHALL THEN BE TAKEN AT A MINIMUM OF 3 CALENDAR DAY INTERVALS. IF THE SETTLEMENT HAS CEASED ON ALL MONITORED SETTLEMENT MONITORING DEVICES IN THE VICINITY OF THE SUBSTRUCTURE UNIT BY CALENDAR DAY 6, THAT IS THREE READINGS, AFTER THE COMPLETION OF THE FILL, SURCHARGE AND SETTLEMENT MONUMENT PLACEMENT, THE SUBSTRUCTURE WILL BE RELEASED BY THE ENGINEER FOR REMOVAL OF THE SURCHARGE AND INSTALLATION OF PRODUCTION PILES WITHIN THREE WORKING DAYS OF RECEIPT OF SETTLEMENT MONITORING RESULTS. AFTER COMPLETION OF THE ABUTMENT AND MSE WALL PANEL PLACEMENT, THE CONTRACTOR SHALL ESTABLISH REFERENCE POINTS TO MONITOR SETTLEMENT ON TOP OF THE ABUTMENT SEAT AND EITHER ON TOP OF THE MSE WALL PANELS OR ON TOP OF THE MSE WALL LEVELING PAD AT POINTS WITHIN FIVE FEET OF ALL ENDS AND CORNERS AND AT THE CENTER OF BRIDGES AND THE CENTERLINE OF US301. AFTER THE CONCRETE ABUTMENTS HAVE BEEN CONSTRUCTED AND THE MSE WALL PANELS HAVE BEEN PLACED, READINGS ON ALL SETTLEMENT MONITORING DEVICES AND REFERENCE POINTS SHALL CONTINUE TO BE TAKEN AT A MINIMUM OF 30-DAY INTERVALS FOR THE NEXT 6 MONTHS OR AS DIRECTED BY THE ENGINEER. SEE SPECIAL PROVISIONS FOR ADDITIONAL SETTLEMENT MONITORING REQUIREMENTS.
6. THROUGHOUT THE PLANS 14″ PRESTRESSED CONCRETE PILES ARE DEPICTED. THE CONTRACTOR HAS THE OPTION TO INSTALL HP 14x73 STEEL PILES AS AN ALTERNATIVE TO THE 14″ PRESTRESSED CONCRETE PILES SHOWN. THE HP 14x73 STEEL PILES SHALL BE INSTALLED IN THE SAME LOCATIONS AS THE 14″ PRESTRESSED CONCRETE PILES. PILE NOTES 1 THRU 4 AND THE PILE INSTALLATION SEQUENCE OF CONSTRUCTION ARE APPLICABLE TO THE HP 14x73 STEEL PILE ALTERNATIVE. THE ESTIMATED PILE TIP ELEVATION FOR THE HP 14x73 STEEL PILES IS SHOWN IN THE PILE TIP DATA TABLE. FOR ORIENTATION OF THE HP 14x73 STEEL PILES, SEE DWG. NO. PL-02.
7. FOR ADDITIONAL PILE DETAILS, SEE DWG. NO. PL-02.
8. FOR PILE INSTALLATION SEQUENCE OF CONSTRUCTION, SEE DWG. NO. PL-02.

## PILE LAYOUT PLAN

SCALE: ¼″=1′-0″

| PILE TIP DATA TABLE, SEE PILE NOTE 6 | | | | | |
|---|---|---|---|---|---|
| SUBSTRUCTURE UNIT | DESIGN DATA | | | ACTUAL FIELD DATA | |
| | MINIMUM TIP ELEVATION | 14″ SQ. P.C.P. ESTIMATED TIP ELEVATION | HP 14x73 S.P. ESTIMATED TIP ELEVATION | AVERAGE ACTUAL MINIMUM TIP ELEVATION | AVERAGE ACTUAL MAXIMUM TIP ELEVATION |
| ABUTMENT A | 32.0 | 18.0 | -6.0 | | |
| ABUTMENT B | 38.0 | 18.0 | -5.0 | | |

| ABUTMENT A PILE DRIVING INFORMATION |
|---|
| PILE SIZE AND TYPE: |
| ACTUAL BEARING OBTAINED: |
| HAMMER TYPE: |
| PILE HAMMER ENERGY: 45,000 LB-FT TO 75,000 LB-FT |
| SPECIAL DRIVING CONDITIONS AND COMMENTS: |

| ABUTMENT B PILE DRIVING INFORMATION |
|---|
| PILE SIZE AND TYPE: |
| ACTUAL BEARING OBTAINED: |
| HAMMER TYPE: |
| PILE HAMMER ENERGY: 45,000 LB-FT TO 75,000 LB-FT |
| SPECIAL DRIVING CONDITIONS AND COMMENTS: |

BR1-8
PL-01

**DELAWARE DEPARTMENT OF TRANSPORTATION**

ADDENDUMS / REVISIONS

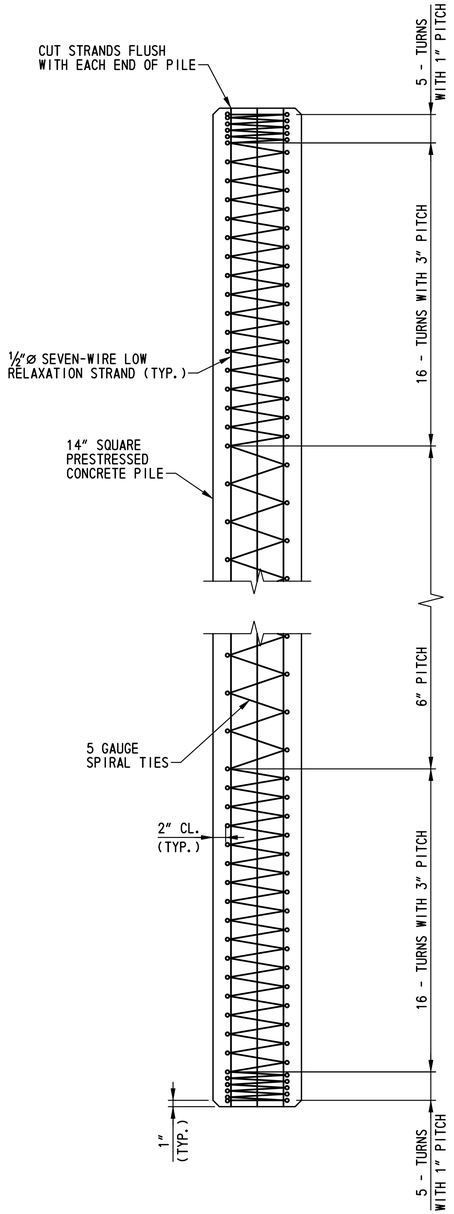
SCALE: AS NOTED

**US 301, SR 896 TO SR 1**

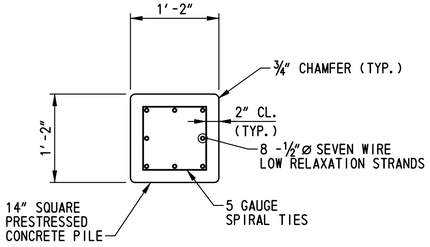
| CONTRACT | BRIDGE NO. 1-460A |
|---|---|
| T200911308 | DESIGNED BY: A.D.D. |
| COUNTY | CHECKED BY: B.K.B. |
| NEW CASTLE | |

**PILE LAYOUT PLAN**

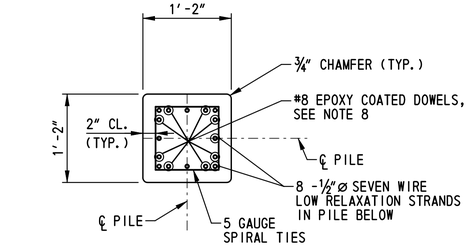
| SHEET NO. |
|---|
| 503 |
| TOTAL SHTS. |
| 875 |



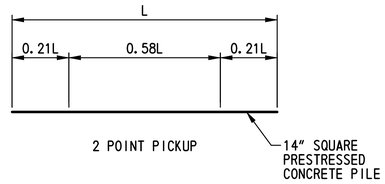

PILE ELEVATION
SCALE: 1"=1'-0"



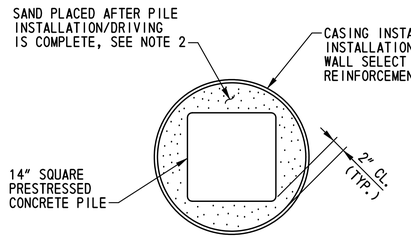

PILE TYPICAL SECTION
SCALE: 1"=1'-0"



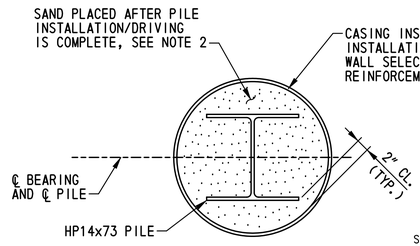

BUILD-UP TYPICAL SECTION
SCALE: 1"=1'-0"




PILE PICKUP DATA
NOT TO SCALE

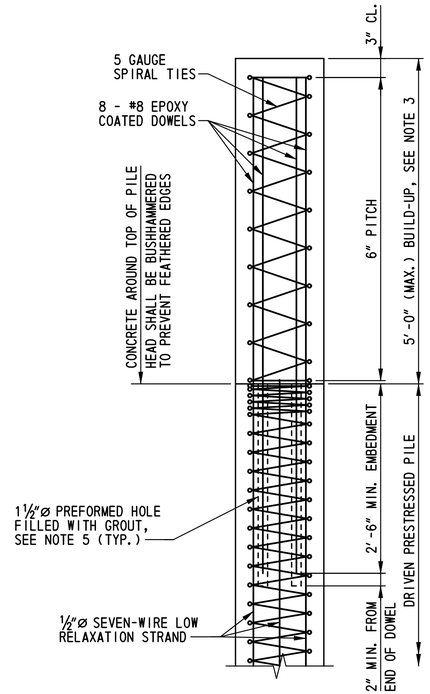



PILE CASING DETAIL
SCALE: 1"=1'-0"




SCALE: AS NOTED

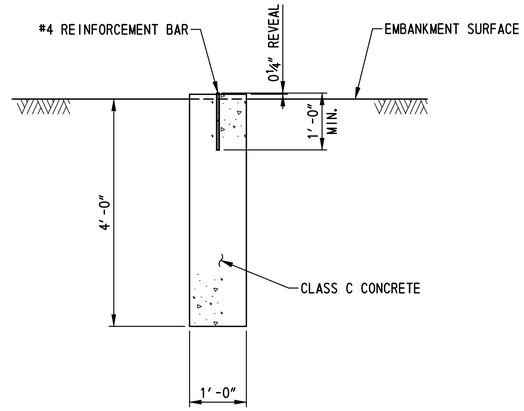
STEEL PILE ALTERNATIVE CASING DETAIL
SCALE: 1"=1'-0"




BUILD-UP WITHOUT DRIVING
SCALE: 1"=1'-0"

## PILE INSTALLATION SEQUENCE OF CONSTRUCTION:

1. PILE CASINGS SHALL BE INSTALLED DURING INSTALLATION OF THE MSE WALL SELECT BACKFILL AND REINFORCEMENT TO THE ELEVATION OF THE BOTTOM OF THE ABUTMENT STEMS.
2. CONSTRUCT MSE WALLS, INCLUDING WIRE FACED MSE WALLS AT REAR FACES OF ABUTMENT STEMS AND BACKWALLS, TO THE REQUIRED ELEVATIONS. A SETTLEMENT WAITING PERIOD OF 60 DAYS IS REQUIRED AFTER THIS CONSTRUCTION.
3. AFTER COMPLETION OF THE SETTLEMENT WAITING PERIOD AS DETERMINED BY THE ENGINEER BASED ON THE INSTRUMENTATION, THE PILES SHALL BE SET AND CENTERED IN THE CASINGS.
4. PILES SHALL BE INSTALLED TO THE MINIMUM TIP ELEVATION AND REQUIRED NOMINAL RESISTANCE SPECIFIED. FOR PILE RESTRIKE REQUIREMENTS SEE SPECIAL PROVISIONS.
5. AFTER PILE INSTALLATION/DRIVING IS COMPLETE, THE CASING SHALL BE FILLED WITH SAND.
6. TEST PILES MAY BE DRIVEN PRIOR TO PLACING EMBANKMENT AND SURCHARGE MATERIAL. RESTRIKES OF THESE TEST PILES SHALL BE PERFORMED PRIOR TO PLACING EMBANKMENT IN ACCORDANCE WITH ITEM 619502 - TEST PILE RESTRIKE. AFTER THE EMBANKMENT HAS BEEN PLACED, SETTLEMENT HAS BEEN ACHIEVED AND THE SUBSTRUCTURE HAS BEEN RELEASED BY THE ENGINEER, THE TEST PILE SHALL BE ACTING AS A PRODUCTION PILE AND IT SHALL BE RE-STRUCK PRIOR TO PLACING ANY OTHER PRODUCTION PILES WITH PAYMENT UNDER ITEM 619501 - PRODUCTION PILE RESTRIKE. ONCE THE TEST PILE HAS BEEN ACCEPTED, THE REMAINING PRODUCTION PILES MAY BE INSTALLED.




SETTLEMENT MONUMENT DETAIL
SCALE: 3/4"=1'-0"

## NOTES:

1. FOR ADDITIONAL PILE INFORMATION, SEE DWG. NO. PL-01.
2. PAYMENT FOR INSTALLATION OF CASING AND SAND WILL BE INCIDENTAL TO ITEM NO. 602772 - MECHANICALY STABILIZED EARTH WALLS. FOR INSTALLATION AND MATERIAL REQUIREMENTS OF SAND/CASING SEE THE SPECIAL PROVISIONS.
3. THE CAST-IN-PLACE CONCRETE PILE BUILD-UP SHALL BE USED WHERE PILES MUST BE DRIVEN TO AN ELEVATION WHICH RESULTS IN THE TOP OF PILE BEING LOWER THAN THE BOTTOM OF CAP TO ACHIEVE THE REQUIRED NOMINAL RESISTANCE. PILE BUILD-UP WILL BE MEASURED AND PAID FOR IN CONFORMANCE WITH SECTION 618 OF THE DELAWARE DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS.
4. FOR SETTLEMENT MONUMENT LOCATIONS, SEE DWG. NO. PE-01.
5. PROVIDE 1 1/2" DIAMETER PREFORMED HOLES IN PILE HEAD AT THE DOWEL LOCATIONS. DOWELS SHALL BE GROUTED INTO PLACE WITH AN APPROVED EPOXY GROUT. PRIOR TO THE GROUTING PROCEDURE, PREFORMED HOLES SHALL REMAIN PLUGGED TO ENSURE THAT WATER AND FOREIGN MATERIAL DOES NOT ENTER THE PREFORMED HOLES. HOLES SHALL BE GROUTED WHEN THE PILE BUILD-UP IS NOT NEEDED.
6. MINIMUM COMPRESSIVE STRENGTH OF EPOXY GROUT SHALL BE f'c=6,000 PSI.
7. THE COMPRESSIVE STRENGTH OF THE PILE BUILD-UP SHALL BE f'c=6,000 PSI.
8. DOWEL HOLES SHALL BE POSITIONED TO MAINTAIN A 1" CLEAR DISTANCE FROM ALL PRESTRESSING STRANDS IN THE PILE.

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**DELAWARE DEPARTMENT OF TRANSPORTATION**

| ADDENDUMS / REVISIONS | |
|---|---|
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| | |
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| | |

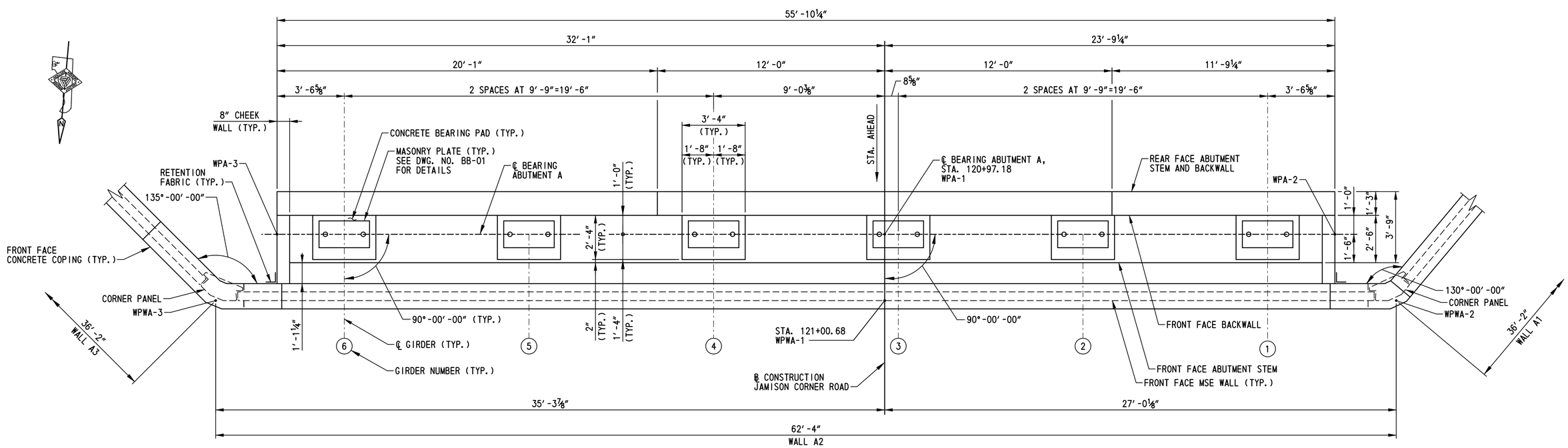
SCALE: AS NOTED

**US 301, SR 896 TO SR 1**

| CONTRACT | BRIDGE NO. | 1-460A |
|---|---|---|
| T200911308 | DESIGNED BY: A.D.D. | |
| COUNTY | CHECKED BY: B.K.B. | |
| NEW CASTLE | | |

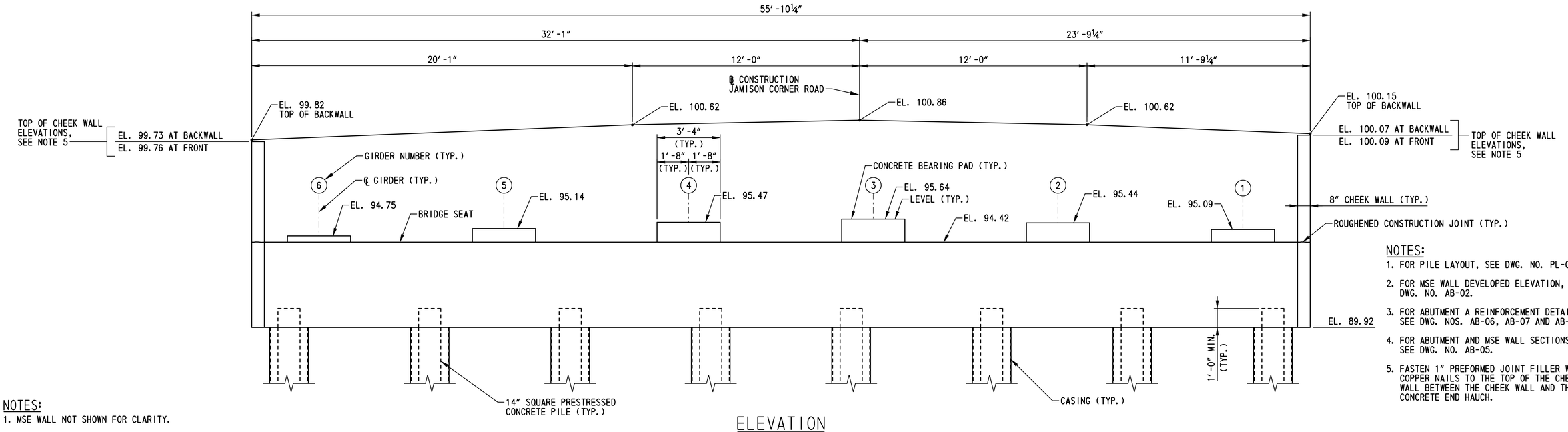
**PILE DETAILS**

| SHEET NO. |
|---|
| 504 |
| TOTAL SHTS. |
| 875 |




PLAN
SCALE: ⅜″=1′-0″

NOTE:
DIMENSIONS SHOWN FOR MSE WALLS ARE MEASURED WORKING POINT TO WORKING POINT ALONG FRONT FACE OF MSE WALL.




ELEVATION
SCALE: ⅜″=1′-0″

NOTES:
1. MSE WALL NOT SHOWN FOR CLARITY.
2. APPROXIMATE EXISTING GROUNDLINE AND PROPOSED GROUNDLINE LOCATED AROUND BOTTOM OF MSE WALL, APPROXIMATELY EL. 76.00 AND 78.00 RESPECTIVELY.

NOTES:
1. FOR PILE LAYOUT, SEE DWG. NO. PL-01.
2. FOR MSE WALL DEVELOPED ELEVATION, SEE DWG. NO. AB-02.
3. FOR ABUTMENT A REINFORCEMENT DETAILS, SEE DWG. NOS. AB-06, AB-07 AND AB-10.
4. FOR ABUTMENT AND MSE WALL SECTIONS, SEE DWG. NO. AB-05.
5. FASTEN 1″ PREFORMED JOINT FILLER WITH COPPER NAILS TO THE TOP OF THE CHEEK WALL BETWEEN THE CHEEK WALL AND THE CONCRETE END HAUCH.

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**DELAWARE DEPARTMENT OF TRANSPORTATION**

ADDENDUMS / REVISIONS

SCALE: AS NOTED

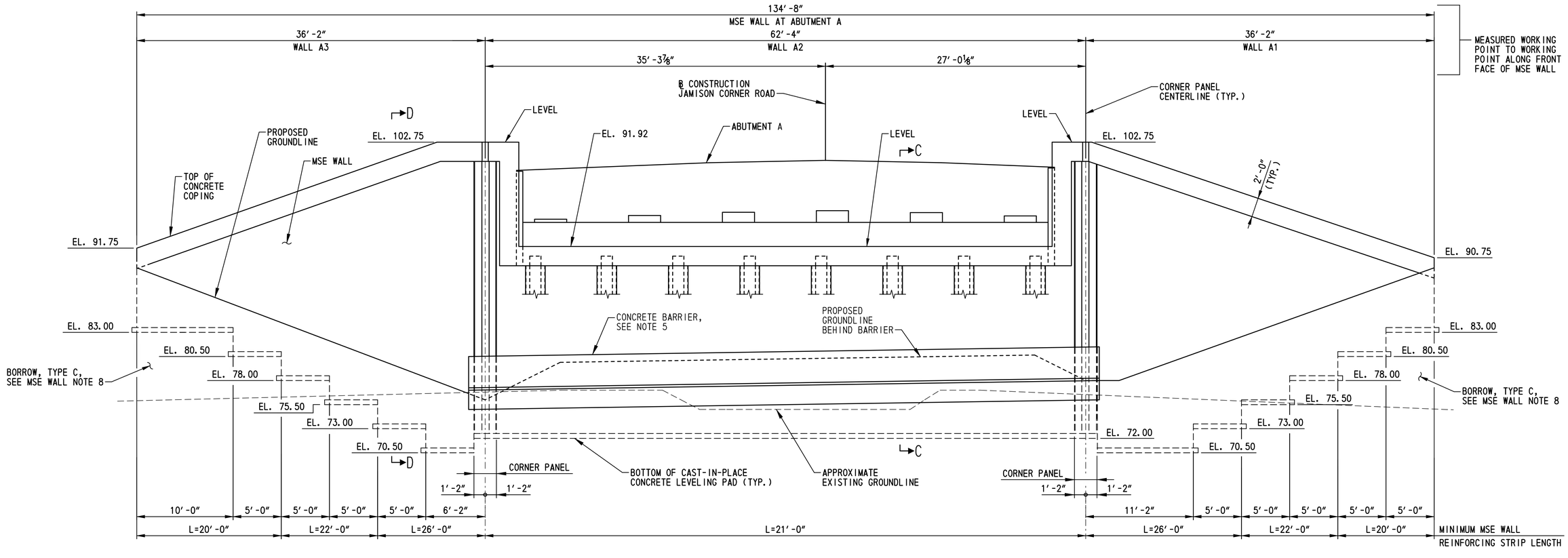
**US 301, SR 896 TO SR 1**

| CONTRACT | BRIDGE NO. 1-460A |
|---|---|
| T200911308 | DESIGNED BY: A.D.D. |
| COUNTY | CHECKED BY: B.K.B. |
| NEW CASTLE | |

**ABUTMENT A PLAN AND ELEVATION**

BR1-8 AB-01

| SHEET NO. | TOTAL SHTS. |
|---|---|
| 505 | 875 |




## DEVELOPED ELEVATION A-A

SCALE: ¾″=1′-0″

## MSE WALL NOTES:

1. DESIGN CRITERIA
   SEE SPECIAL PROVISON FOR ITEM 602772.

2. CONCRETE
   ALL CONCRETE PROPERTIES SHALL BE IN ACCORDANCE WITH SECTION 812 OF THE DELAWARE DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS.

   CLASS A - MSE WALL PANELS AND MSE WALL COPING ( f′c = 4,500 PSI).

   CLASS B - MSE WALL LEVELING PADS ( f′c = 3,000 PSI).

   ALL EXPOSED EDGES SHALL BE CHAMFERED ¾" UNLESS NOTED OTHERWISE.

3. REINFORCING STEEL
   ALL REINFORCING STEEL SHALL BE AASHTO M31 (ASTM A615), GRADE 60 AND SHALL BE PROTECTED WITH FUSION BONDED EPOXY, CONFORMING TO AASHTO M284 (ASTM A 775).

   MINIMUM CONCRETE COVER FOR REINFORCING STEEL SHALL BE 2" UNLESS NOTED OTHERWISE.

4. ARCHITECTURAL FINISH
   THE COMPONENTS OF THE MSE WALL SHALL HAVE THE ARCHITECTURAL TREATMENT AS SPECIFIED IN THE SPECIAL PROVISION FOR ITEM 602772.

5. REINFORCING STRIPS
   REINFORCING STRIPS SHALL BE LOCATED TO CLEAR THE PILE CASING WITH 2" MINIMUM CLEARANCE AND A MAXIMUM 15 DEGREE SKEW.

6. COPING
   THE MSE WALL COPING SHALL BE A PRECAST CONCRETE COPING INSTALLED IN CONFORMANCE WITH THE PROPRIETARY WALL MANUFACTURER'S RECOMMENDATIONS. FOR LOCATIONS ALONG THE MSE WALL WHERE A PRECAST CONCRETE COPING CANNOT BE UTILIZED A CAST-IN-PLACE CONCRETE COPING INSTALLED IN CONFORMANCE WITH THE PROPRIETARY MSE WALL MANUFACTURER'S RECOMMENDATIONS MAY BE UTILIZED.

7. LEVELING PAD
   THE LEVELING PAD STEPS MAY BE LOCATED AT THE DISCRETION OF THE PROPRIETARY WALL MANUFACTURER PROVIDED THAT THE MINIMUM EMBEDMENT IS MAINTAINED IN ACCORDANCE WITH THE SPECIFIED DESIGN CRITERIA. ANY CHANGES TO THE STEP LOCATIONS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL.

8. BACKFILL AND FOUNDATION SOILS
   MSE WALL BACKFILL SHALL CONSIST OF SELECT BACKFILL AND MEET THE REQUIREMENTS PROVIDED IN THE SPECIAL PROVISIONS. FOR ADDITIONAL REQUIREMENTS OF MSE WALL BACKFILL AND FOUNDATION SOILS, SEE THE SOIL PROPERTIES TABLE ON THIS SHEET. THE VERTICAL LIMIT OF BORROW, TYPE C SHALL BE FROM THE EXISTING GROUNDLINE TO THE BOTTOM OF THE LEVELING PAD. THE HORIZONTAL LIMIT OF BORROW, TYPE C SHALL BE FROM 4′-0" IN FRONT OF THE MSE WALL TO 1′-0" BEHIND THE END OF THE MSE WALL REINFORCEMENT. PAYMENT FOR BORROW, TYPE C WILL BE MADE UNDER ITEM NO. 202000 - EXCAVATION AND EMBANKMENT.

9. INTERNAL STABILITY
   THE INTERNAL STABILITY OF THE MSE WALL SHALL BE DESIGNED BY THE PROPRIETARY WALL MANUFACTURER USING THE SOIL PROPERTIES PROVIDED AT EACH MSE WALL LOCATION. THE INTERNAL STABILITY CALCULATIONS SHALL BE SIGNED AND SEALED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF DELAWARE AS INDICATED IN THE PROJECT SPECIFICATIONS.

10. QUARANTINE PERIOD
    ALLOW A MINIMUM OF 60 DAYS QUARANTINE PERIOD FOR SETTLEMENT MONITORING. BEGIN THE QUARANTINE PERIOD WHEN THE FULL HEIGHT OF THE MSE WALL IS ACHIEVED, THE APPROACH EMBANKMENTS ARE AT ITS FINAL ROADWAY SUBGRADE ELEVATION AND THE SETTLEMENT PLATFORMS ARE COMPLETELY CONSTRUCTED. THE ENGINEER WILL DETERMINE THE DURATION OF THE QUARANTINE PERIOD BASED ON THE SETTLEMENT READINGS. THE ENGINEER WILL NOTIFY THE CONTRACTOR, IN WRITING, WHEN THE QUARANTINE PERIOD CAN BE LIFTED BASED ON THE RESULTS OF THE SETTLEMENT READINGS.

11. SETTLEMENT REQUIREMENTS
    THE CONTRACTOR AND MSE WALL MANUFACTURER SHALL DESIGN AND CONSTRUCT THE FINAL WALL FACING SUCH THAT THE FINAL WALL FACING IS AT THE REQUIRED ELEVATIONS AFTER SETTLEMENT IS ACHIEVED. THE ANTICIPATED SETTLEMENT IS 4 INCHES AT THE FACE OF WALL.

12. SERVICE LIFE
    ALL MSE WALL COMPONENTS SHALL BE DESIGNED FOR A MINIMUM SERVICE LIFE OF 100 YEARS.

13. WALL SYSTEM
    ONLY ONE MSE WALL SYSTEM SHALL BE USED ON THIS PROJECT.

14. TEMPORARY SUPPORT OF EMBANKMENT
    TEMPORARY SUPPORT OF EMBANKMENT IS REQUIRED AT THE REAR FACE OF BOTH ABUTMENT STEMS AND BACKWALLS TO ALLOW THE UNDERLYING SOILS TO PRECONSOLIDATE UNDER THE FINAL REQUIRED SOIL PRESSURE PRIOR TO PILE INSTALLATION. THE LIMITS OF THE TEMPORARY SUPPORT OF EMBANKMENT SHALL BE THE FULL ABUTMENT HEIGHT OVER THE FULL ABUTMENT LENGTH. THE TEMPORARY SUPPORT OF EMBANKMENT SHALL BE DESIGNED BY THE MSE WALL DESIGNER TO RESIST THE FULL HORIZONTAL EARTH PRESSURE AND HORIZONTAL SOIL PRESSURE DUE TO SURCHARGE OF SOIL AND THE CONTRACTOR'S EQUIPMENT AND MATERIALS. ALL MSE WALL REINFORCING STRIPS SHALL BE DESIGNED FOR A MINIMUM SERVICE LIFE OF 100 YEARS. THE DESIGN OF THE TEMPORARY SUPPORT OF EMBANKMENT SHALL BE COMPATIBLE WITH THE ABUTMENT ANCHORS SHOWN ON DWG. NO. AB-05. PAYMENT FOR CONSTRUCTION OF THE TEMPORARY SUPPORT OF EMBANKMENT WILL BE MADE UNDER ITEM NO. 602772 - MECHANICALLY STABILIZED EARTH WALLS. SEE THE SPECIAL PROVISIONS FOR ADDITIONAL INFORMATION AND REQUIREMENTS.

### SOIL PROPERTIES TABLE

| SOIL TYPE | UNIT WEIGHT (PCF) | DRAINED ANGLE OF FRICTION (DEGREES) | UNDRAINED SHEAR STRENGTH (PSF) |
|---|---|---|---|
| SELECT BACKFILL | 125 | 34 (MIN.) | 0 |
| FOUNDATION SOIL (BORROW, TYPE C) | 120 | 32 | 0 |
| FOUNDATION SOIL | 120 | 30 | 0 |
| RETAINED FILL | 120 | 30 | 0 |

## NOTES:

1. FOR LOCATION OF DEVELOPED ELEVATION A-A, SEE DWG. NO. PE-01.
2. FOR SECTIONS C-C AND D-D, SEE DWG. NO. AB-05.
3. FOR ABUTMENT A DETAILS, SEE DWG. NO. AB-01.
4. FOR ADDITIONAL INFORMATION ON MSE WALL, SEE DWG. NO. FT-01.
5. FOR CONCRETE BARRIER DETAILS, SEE DWG. NO. DT-17.

BR1-8
AB-02

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**DELAWARE DEPARTMENT OF TRANSPORTATION**

| ADDENDUMS / REVISIONS | |
|---|---|
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| | |
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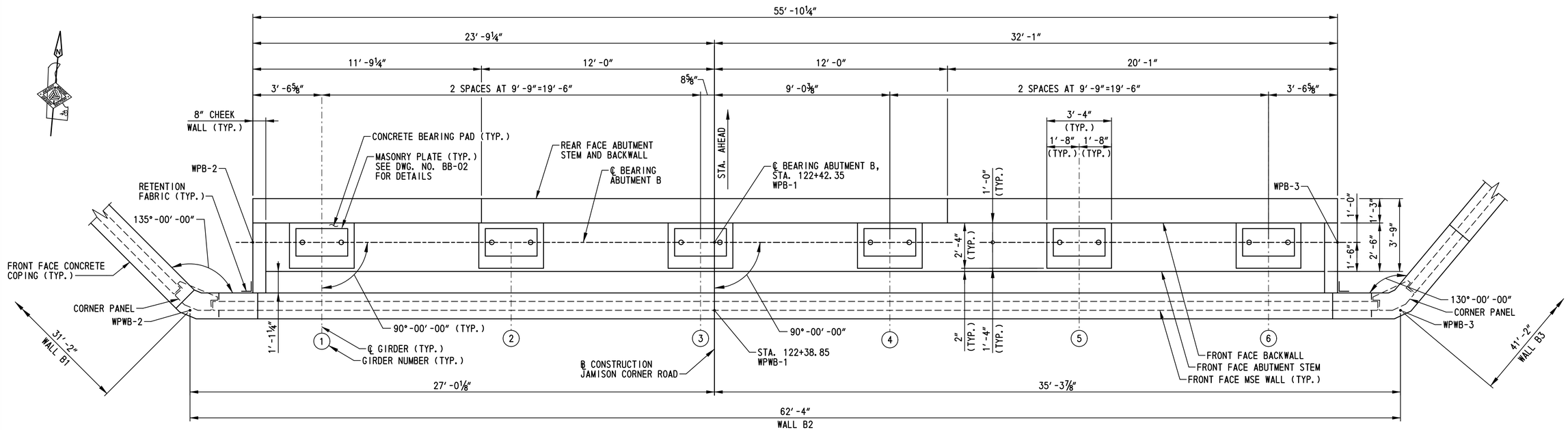
SCALE: AS NOTED

**US 301, SR 896 TO SR 1**

| CONTRACT | T200911308 |
|---|---|
| COUNTY | NEW CASTLE |
| BRIDGE NO. | 1-460A |
| DESIGNED BY: | A.D.D. |
| CHECKED BY: | B.K.B. |

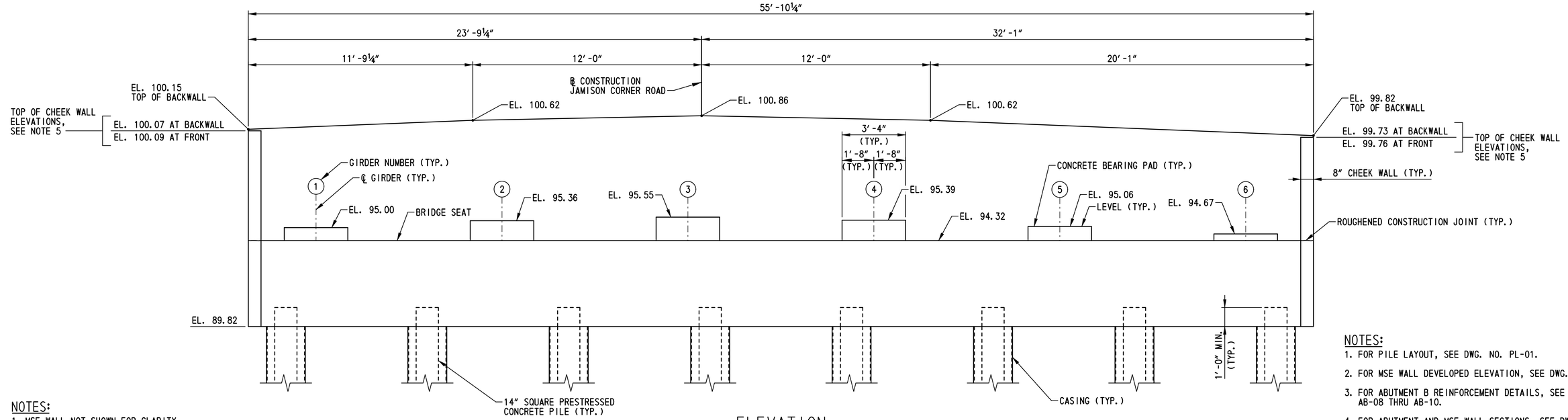
**MSE WALL AT ABUTMENT A**

| SHEET NO. | 506 |
|---|---|
| TOTAL SHTS. | 875 |




PLAN
SCALE: ⅜″=1′-0″

NOTE:
DIMENSIONS SHOWN FOR MSE WALLS ARE MEASURED WORKING POINT TO WORKING POINT ALONG FRONT FACE OF MSE WALL.




ELEVATION
SCALE: ⅜″=1′-0″

NOTES:
1. MSE WALL NOT SHOWN FOR CLARITY.
2. APPROXIMATE EXISTING GROUNDLINE AND PROPOSED GROUNDLINE LOCATED AROUND BOTTOM OF MSE WALL, APPROXIMATELY EL. 76.00 AND 77.00 RESPECTIVELY.

NOTES:
1. FOR PILE LAYOUT, SEE DWG. NO. PL-01.
2. FOR MSE WALL DEVELOPED ELEVATION, SEE DWG. NO. AB-04.
3. FOR ABUTMENT B REINFORCEMENT DETAILS, SEE DWG. NOS. AB-08 THRU AB-10.
4. FOR ABUTMENT AND MSE WALL SECTIONS, SEE DWG. NO. AB-05.
5. FASTEN 1″ PREFORMED JOINT FILLER WITH COPPER NAILS TO THE TOP OF THE CHEEK WALL BETWEEN THE CHEEK WALL AND THE CONCRETE END HAUNCH. POLYETHYLENE FILM CONTINUOUS WITH THE POLYETHYLENE FILM LOCATED ON TOP OF THE BACKWALL AND UNDERNEATH APPROACH SLAB B SHALL BE PLACED ON TOP OF THE PREFORMED JOINT FILLER. FOR POLYETHYLENE FILM INFORMATION, SEE DWG. NO. AS-05.

**DELAWARE DEPARTMENT OF TRANSPORTATION**

ADDENDUMS / REVISIONS

SCALE: AS NOTED

**US 301, SR 896 TO SR 1**

| CONTRACT | BRIDGE NO. | 1-460A |
|---|---|---|
| T200911308 | DESIGNED BY: A.D.D. | |
| COUNTY | CHECKED BY: B.K.B. | |
| NEW CASTLE | | |

**ABUTMENT B PLAN AND ELEVATION**

BR1-8
AB-03

| SHEET NO. | TOTAL SHTS. |
|---|---|
| 507 | 875 |

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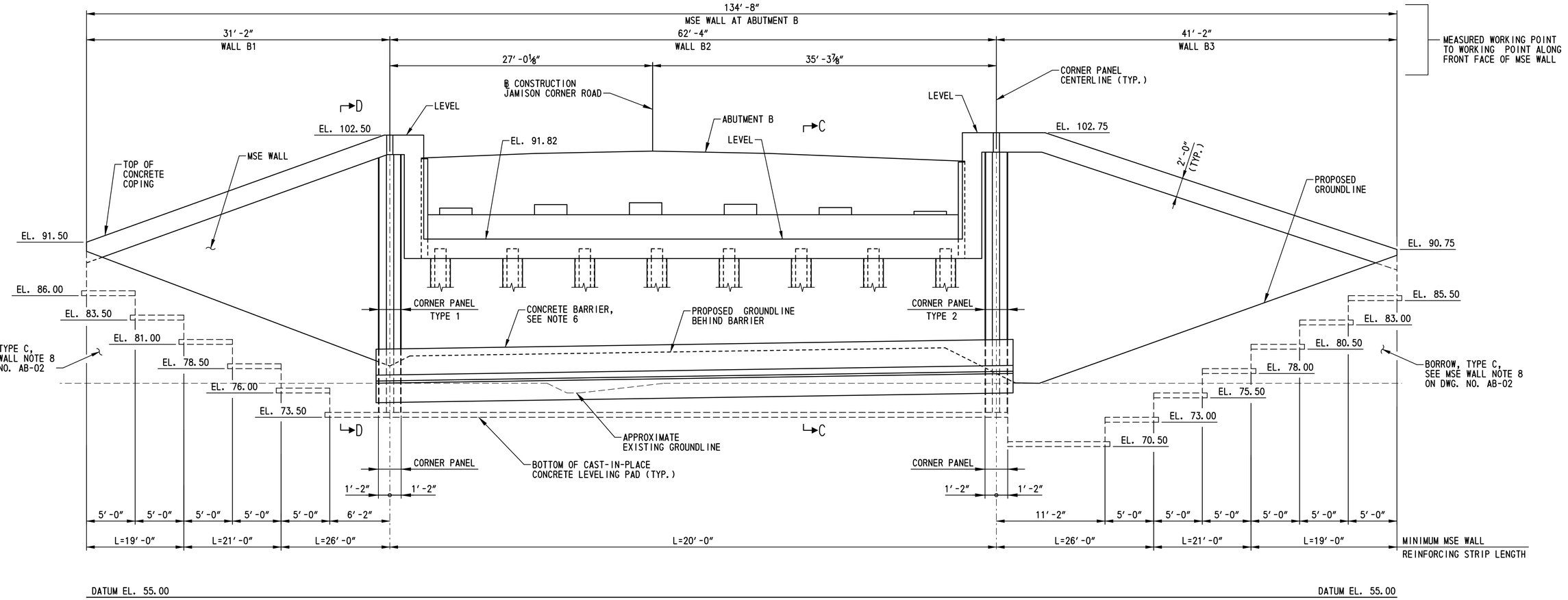


## DEVELOPED ELEVATION B-B

SCALE: 3/16″=1′-0″

NOTES:

1. FOR LOCATION OF DEVELOPED ELEVATION B-B, SEE DWG. NO. PE-01.
2. FOR SECTIONS C-C AND D-D, SEE DWG. NO. AB-05.
3. FOR ABUTMENT B DETAILS, SEE DWG. NO. AB-03.
4. FOR ADDITIONAL INFORMATION ON MSE WALL, SEE DWG. NO. FT-01.
5. FOR MSE WALL NOTES AND SOIL PROPERTIES, SEE DWG. NO. AB-02.
6. FOR CONCRETE BARRIER DETAILS, SEE DWG. NO. DT-17.

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**DELAWARE DEPARTMENT OF TRANSPORTATION**

| ADDENDUMS / REVISIONS | |
|---|---|
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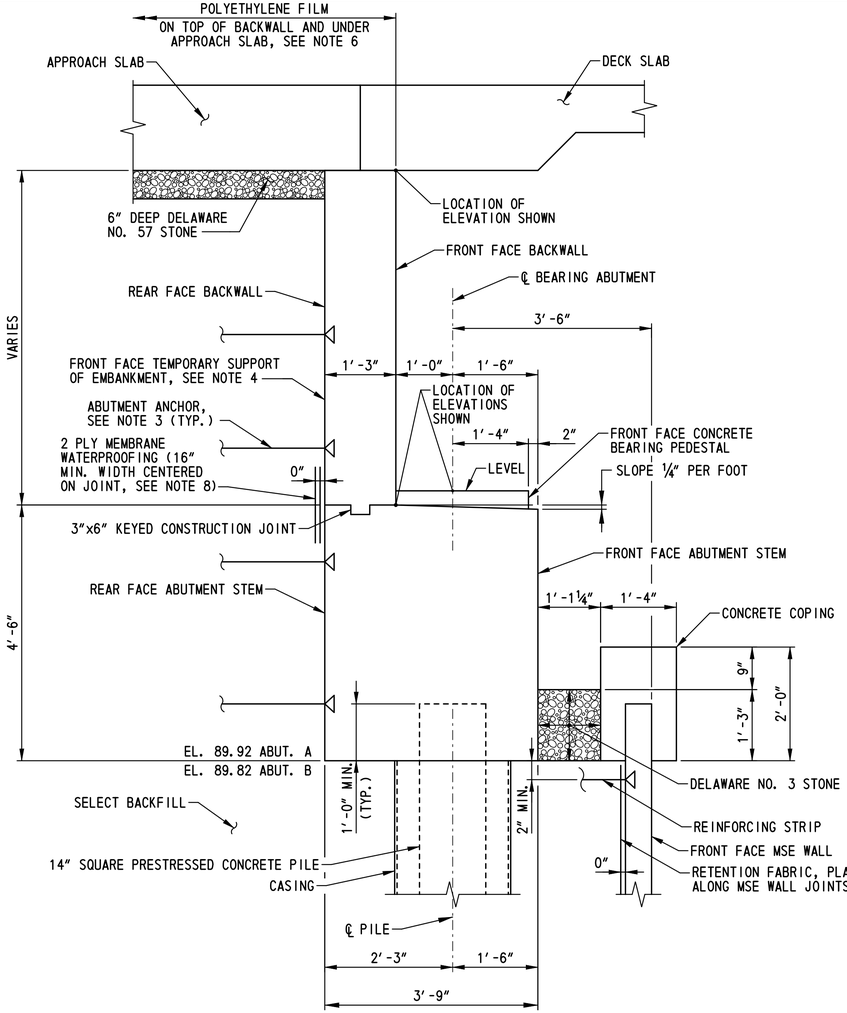
SCALE: AS NOTED

**US 301, SR 896 TO SR 1**

| | | |
|---|---|---|
| CONTRACT | BRIDGE NO. | 1-460A |
| T200911308 | DESIGNED BY: A.D.D. | |
| COUNTY | CHECKED BY: B.K.B. | |
| NEW CASTLE | | |

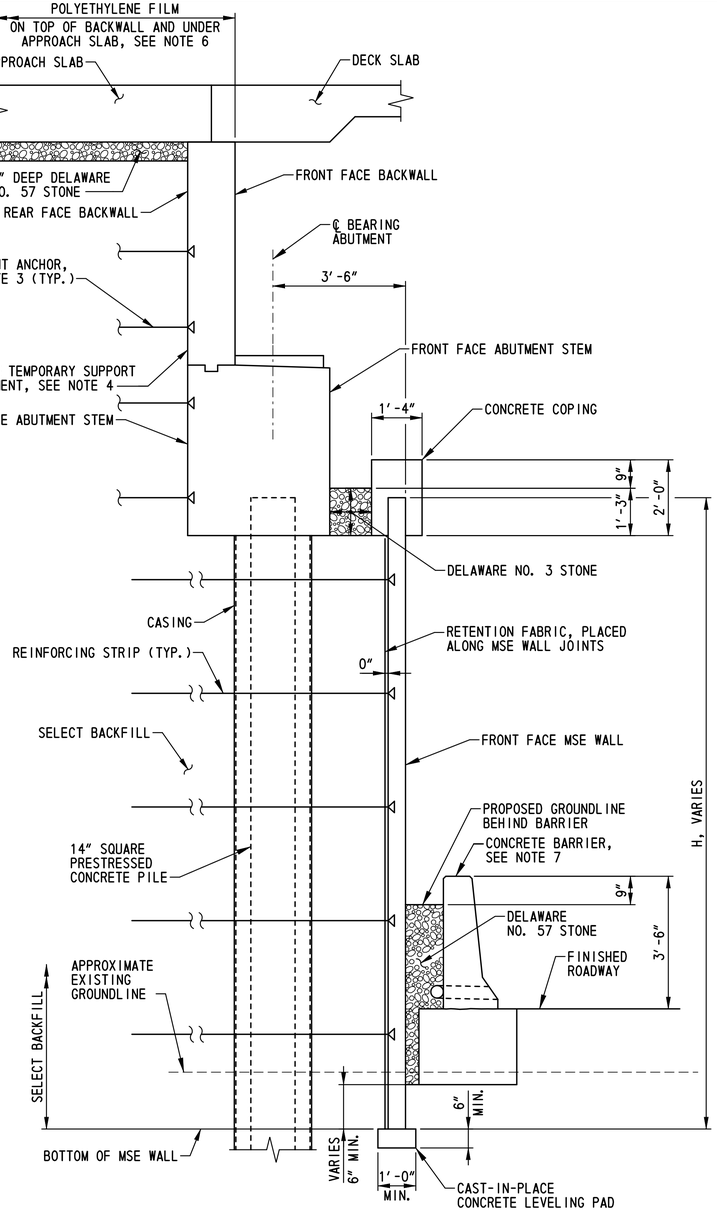
**MSE WALL AT ABUTMENT B**

| | |
|---|---|
| BR1-8 AB-04 | |
| SHEET NO. | 508 |
| TOTAL SHTS. | 875 |



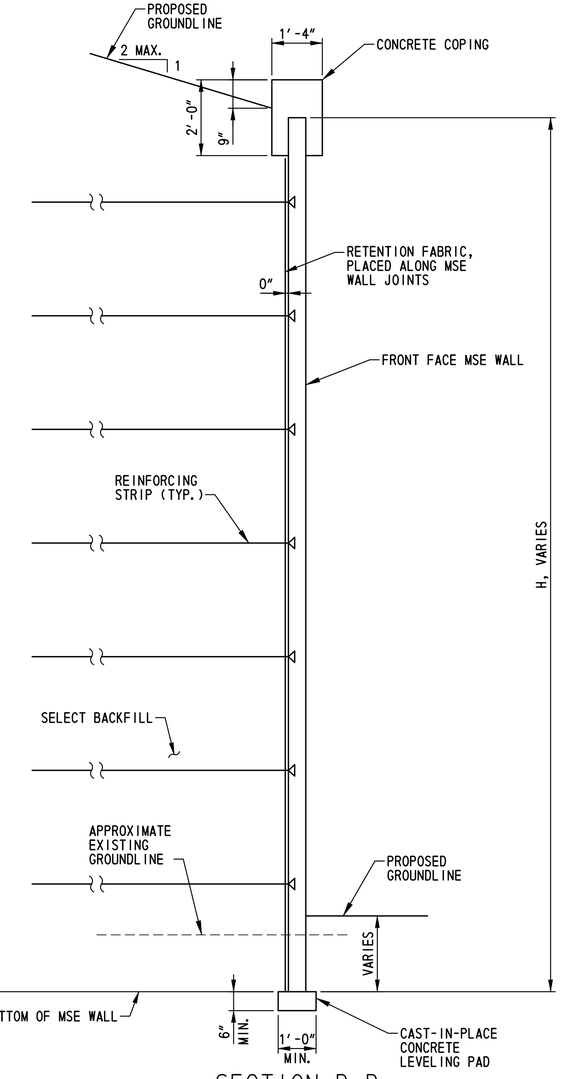

## TYPICAL ABUTMENT SECTION

SCALE: ¾"=1'-0"



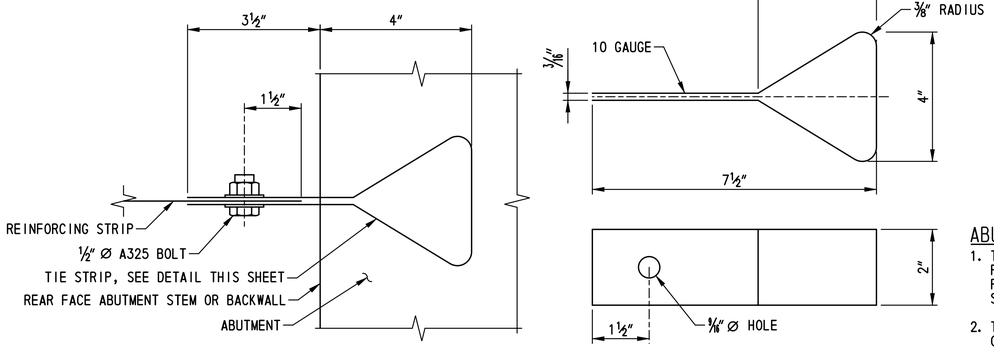

## SECTION C-C

SCALE: ½"=1'-0"




## SECTION D-D

SCALE: ½"=1'-0"




## ABUTMENT ANCHOR DETAIL

NOT TO SCALE




## TIE STRIP DETAIL

NOT TO SCALE

### ABUTMENT ANCHOR NOTES:

1. THE ABUTMENT ANCHOR SHOWN CONSISTING OF A TIE STRIP ATTACHED TO A REINFORCING STRIP MAY BE MODIFIED PER THE MSE WALL MANUFACTURER'S RECOMMENDATIONS. ANY CHANGES TO THE ABUTMENT ANCHOR DETAIL SHOWN SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL.
2. THE ATTACHMENT OF THE ABUTMENT ANCHOR TO THE TEMPORARY SUPPORT OF EMBANKMENT LOCATED AT THE REAR FACE OF THE ABUTMENT STEMS AND BACKWALLS IS NOT SHOWN. THIS ATTACHMENT SHALL BE MADE PER THE MSE WALL MANUFACTURER'S RECOMMENDATIONS AND A DETAIL SUBMITTED TO THE ENGINEER FOR APPROVAL.

### NOTES:

1. FOR LOCATIONS OF SECTIONS C-C AND D-D, SEE DWG. NOS. AB-02 AND AB-04.
2. FOR PILE LAYOUT, SEE DWG. NO. PL-01.
3. PROVIDE ABUTMENT ANCHORS IN SELECT BACKFILL. SEE ABUTMENT ANCHOR DETAIL THIS SHEET. THE ABUTMENT ANCHORS SHALL BE DESIGNED FOR A MINIMUM FACTORED HORIZONTAL FORCE OF 3.25 KLF AT ABUTMENT A AND 1.50 KLF AT ABUTMENT B. THE POINT OF APPLICATION OF FORCES SHALL BE AT THE CENTER OF BEARINGS. DESIGN OF ABUTMENT ANCHORS SHALL BE COMPATIBLE WITH THE TEMPORARY SUPPORT OF EMBANKMENT DESIGN. PAYMENT FOR ABUTMENT ANCHORS WILL BE INCIDENTAL TO ITEM NO. 602772 - MECHANICALLY STABILIZED EARTH WALLS.
4. FOR TEMPORARY SUPPORT OF EMBANKMENT INFORMATION, SEE MSE WALL NOTE 14 ON DWG. NO. AB-02.
5. FOR MSE WALL NOTES AND SOIL PROPERTIES, SEE DWG. NO. AB-02.
6. FOR POLYETHYLENE FILM INFORMATION, SEE DWG. NO. AS-05.
7. FOR CONCRETE BARRIER DETAILS, SEE DWG. NO. DT-17.
8. MEMBRANE WATERPROOFING SHALL BE INCIDENTAL TO ITEM 602015 - PORTLAND CEMENT CONCRETE MASONRY, ABUTMENT ABOVE FOOTING, CLASS A. SEE SPECIAL PROVISION ITEM 602616 - WATERPROOFING P.C.C. MASONRY SURFACES FOR ADDITIONAL REQUIREMENTS.

BR1-8
AB-05

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**DELAWARE**
**DEPARTMENT OF TRANSPORTATION**

ADDENDUMS / REVISIONS

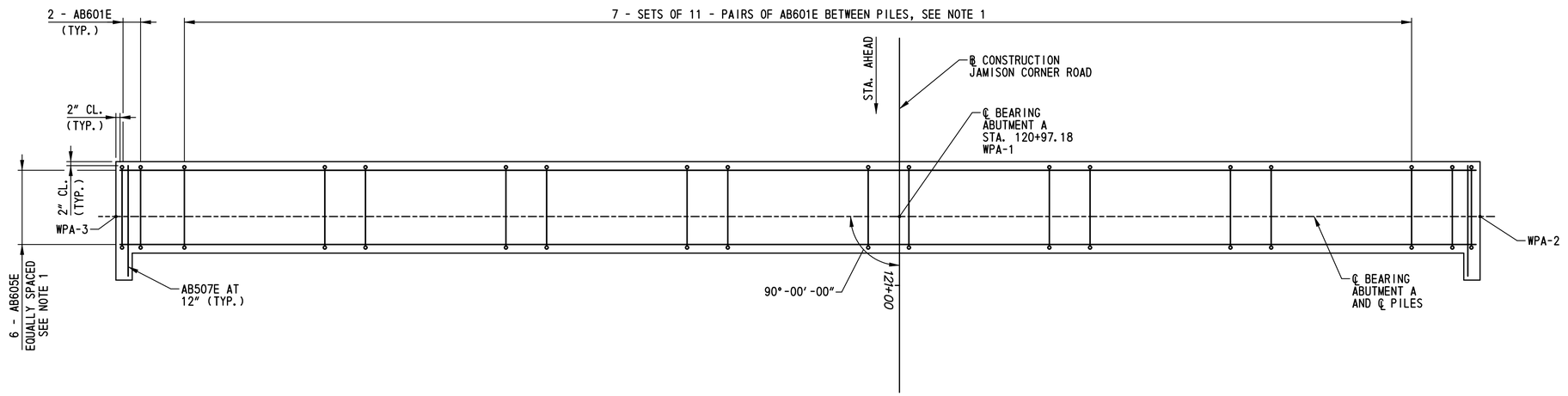
SCALE: AS NOTED

**US 301,**
**SR 896 TO SR 1**

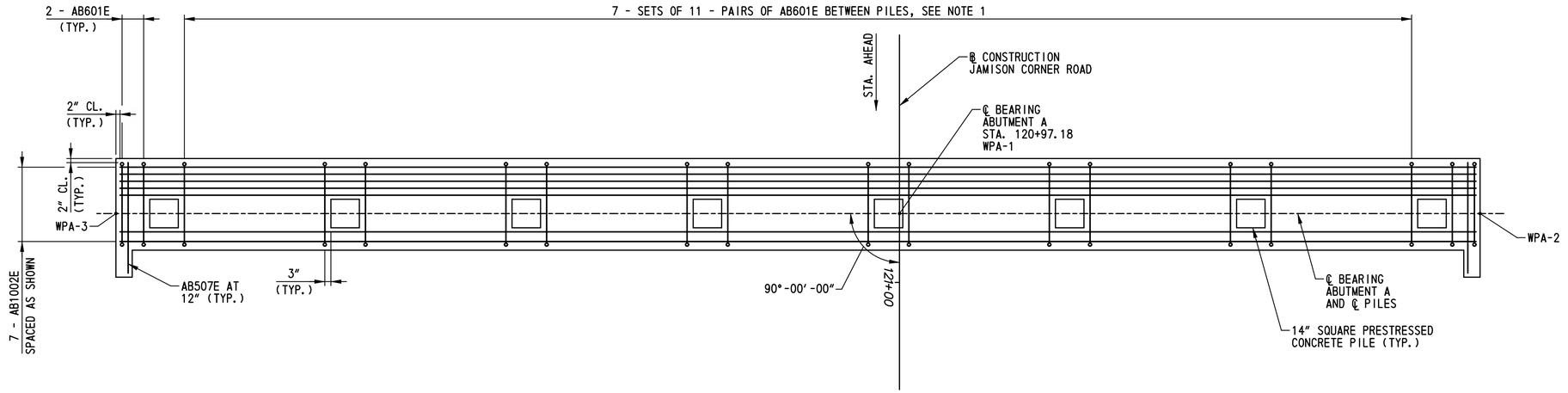
| CONTRACT | BRIDGE NO. | 1-460A |
|---|---|---|
| T200911308 | DESIGNED BY: A.D.D. | |
| COUNTY | CHECKED BY: B.K.B. | |
| NEW CASTLE | | |

**ABUTMENT AND MSE WALL SECTIONS**

| SHEET NO. |
|---|
| 509 |
| TOTAL SHTS. |
| 875 |




## ABUTMENT A STEM
## TOP MAT REINFORCEMENT PLAN
SCALE: ⅜"=1'-0"




## ABUTMENT A STEM
## BOTTOM MAT REINFORCEMENT PLAN
SCALE: ⅜"=1'-0"

NOTES:

1. SPACE REINFORCING STEEL AS NECESSARY TO CLEAR ANCHOR BOLTS. FOR ADDITIONAL INFORMATION, SEE DWG. NOS. BB-01 AND AB-10.
2. FOR ADDITIONAL REINFORCEMENT DETAILS, SEE DWG. NOS. AB-07 AND AB-10.
3. REINFORCING STEEL OVER PILES NOT SHOWN FOR CLARITY. FOR ADDITIONAL INFORMATION, SEE DWG. NO. PL-01.

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**DELAWARE**
**DEPARTMENT OF TRANSPORTATION**

| ADDENDUMS / REVISIONS | |
|---|---|
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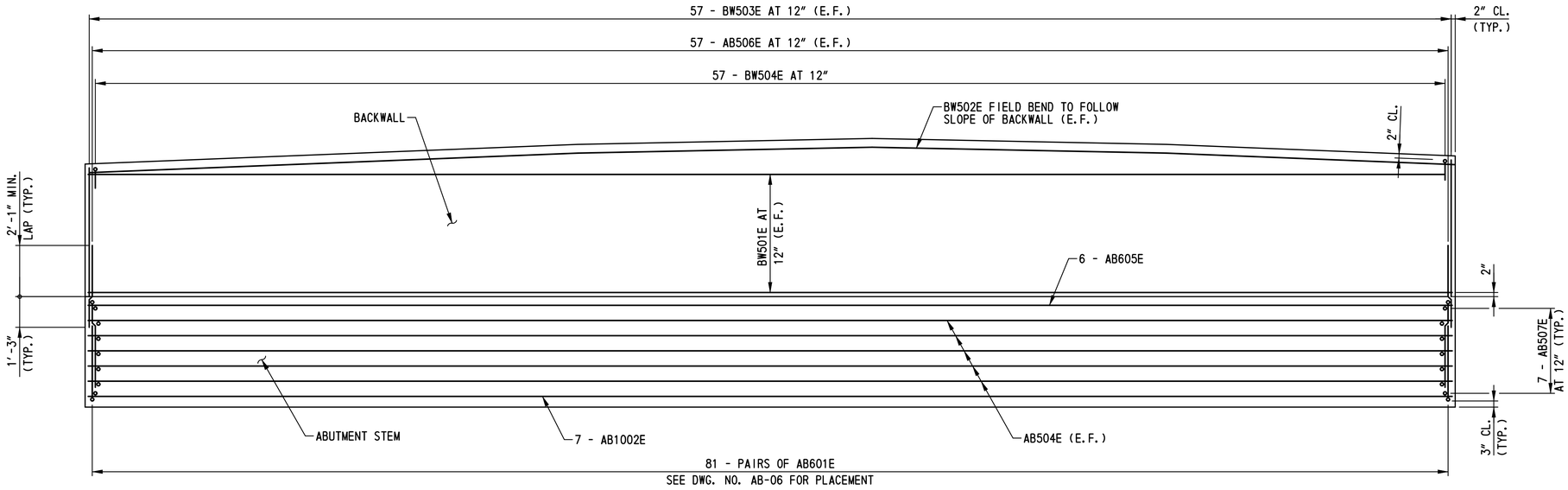
SCALE: AS NOTED

**US 301,**
**SR 896 TO SR 1**

| CONTRACT | BRIDGE NO. | 1-460A |
|---|---|---|
| T200911308 | DESIGNED BY: A.D.D. | |
| COUNTY | CHECKED BY: B.K.B. | |
| NEW CASTLE | | |

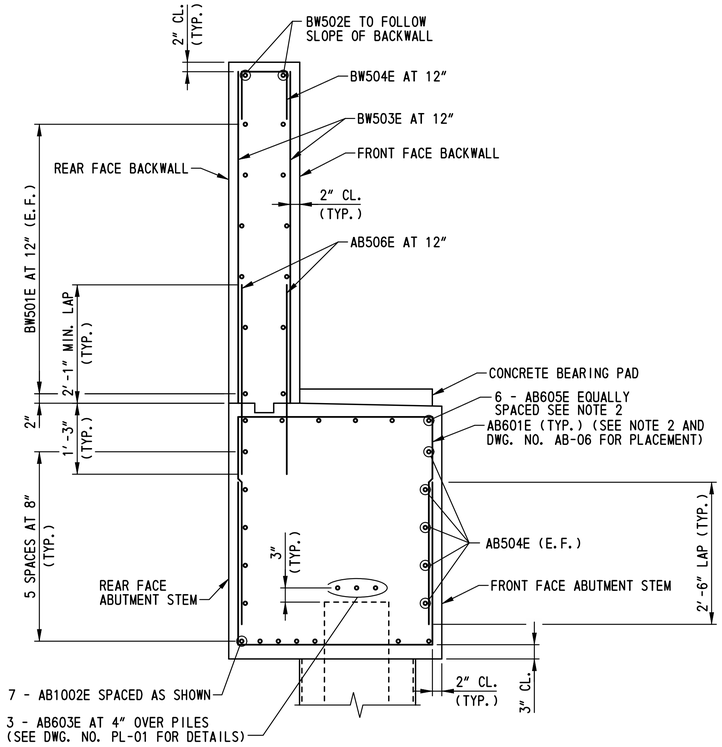
**ABUTMENT A REINFORCEMENT DETAILS - 1**

| BR1-8 AB-06 | |
|---|---|
| SHEET NO. | 510 |
| TOTAL SHTS. | 875 |




## ABUTMENT A REINFORCEMENT ELEVATION

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




## ABUTMENT A TYPICAL REINFORCEMENT SECTION

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

NOTES:

1. PILES NOT SHOWN FOR CLARITY. FOR PLACEMENT OF TRANSVERSE REINFORCEMENT BETWEEN PILES, SEE DWG. NO. AB-06.
2. CHEEK WALLS AND CONCRETE BEARING PADS NOT SHOWN FOR CLARITY. FOR REINFORCEMENT IN CHEEK WALLS AND CONCRETE BEARING PADS, SEE DWG. NO. AB-10.

NOTES:

1. FOR ADDITIONAL REINFORCEMENT DETAILS, SEE DWG NOS. AB-06 AND AB-10.
2. SPACE REINFORCING STEEL AS NECESSARY TO CLEAR ANCHOR BOLTS. FOR ADDITIONAL INFORMATION, SEE DWG. NOS. BB-01 AND AB-10.

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**DELAWARE DEPARTMENT OF TRANSPORTATION**

| ADDENDUMS / REVISIONS | |
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SCALE: AS NOTED

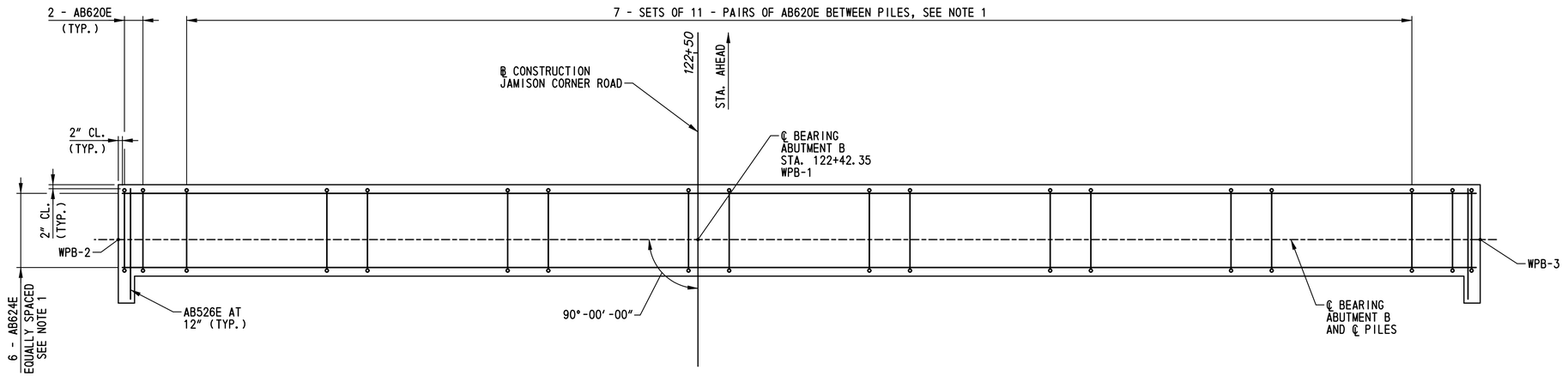
**US 301, SR 896 TO SR 1**

| | | |
|---|---|---|
| CONTRACT | BRIDGE NO. | 1-460A |
| T200911308 | DESIGNED BY: A.D.D. | |
| COUNTY | CHECKED BY: B.K.B. | |
| NEW CASTLE | | |

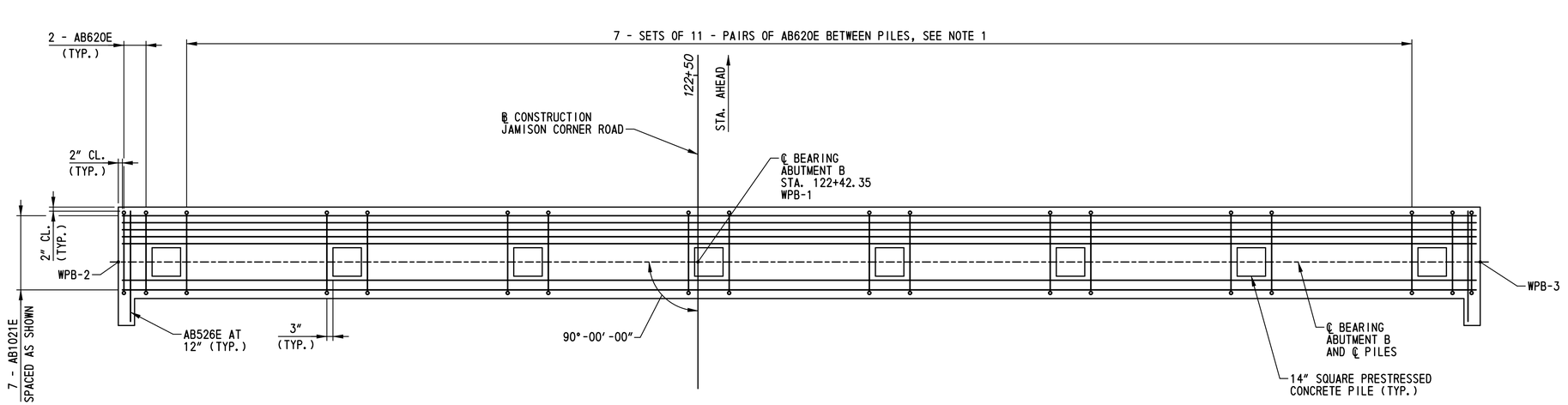
**ABUTMENT A REINFORCEMENT DETAILS – 2**

BR1-8
AB-07

| SHEET NO. |
|---|
| 511 |
| TOTAL SHTS. |
| 875 |




ABUTMENT B STEM
TOP MAT REINFORCEMENT PLAN
SCALE: 3/8"=1'-0"




ABUTMENT B STEM
BOTTOM MAT REINFORCEMENT PLAN
SCALE: 3/8"=1'-0"

NOTES:

1. SPACE REINFORCING STEEL AS NECESSARY TO CLEAR ANCHOR BOLTS. FOR ADDITIONAL INFORMATION, SEE DWG. NOS. BB-02 AND AB-10.
2. FOR ADDITIONAL REINFORCEMENT DETAILS, SEE DWG. NOS. AB-09 AND AB-10.
3. REINFORCING STEEL OVER PILES NOT SHOWN FOR CLARITY. FOR ADDITIONAL INFORMAITON, SEE DWG. NO. PL-01.

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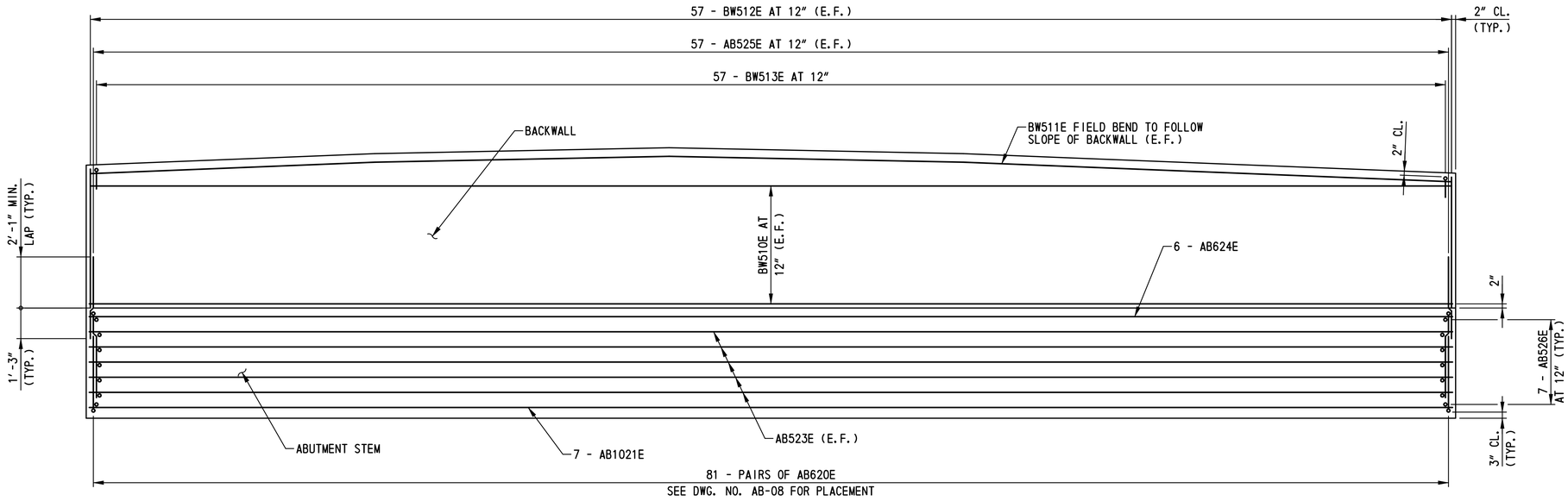
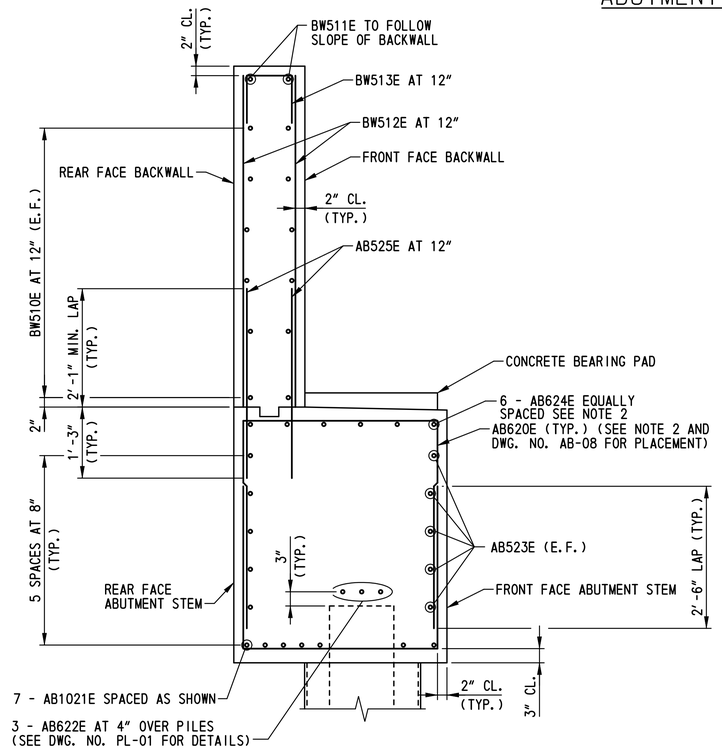
|---|---|---|---|---|---|---|---|
| DELAWARE DEPARTMENT OF TRANSPORTATION | ADDENDUMS / REVISIONS | SCALE: AS NOTED | US 301, SR 896 TO SR 1 | CONTRACT T200911308 | BRIDGE NO. 1-460A | ABUTMENT B REINFORCEMENT DETAILS - 1 | BR1-8 AB-08 |
| | | | | COUNTY NEW CASTLE | DESIGNED BY: A.D.D. | | SHEET NO. 512 |
| | | | | | CHECKED BY: B.K.B. | | TOTAL SHTS. 875 |




## ABUTMENT B REINFORCEMENT ELEVATION

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




## ABUTMENT B TYPICAL REINFORCEMENT SECTION

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

NOTES:

1. PILES NOT SHOWN FOR CLARITY. FOR PLACEMENT OF TRANSVERSE REINFORCEMENT BETWEEN PILES, SEE DWG. NO. AB-08.
2. CHEEK WALLS AND CONCRETE BEARING PADS NOT SHOWN FOR CLARITY. FOR REINFORCEMENT IN CHEEK WALLS AND CONCRETE BEARING PADS, SEE DWG. NO. AB-10.

NOTES:

1. FOR ADDITIONAL REINFORCEMENT DETAILS, SEE DWG NOS. AB-08 AND AB-10.
2. SPACE REINFORCING STEEL AS NECESSARY TO CLEAR ANCHOR BOLTS. FOR ADDITIONAL INFORMATION, SEE DWG. NOS. BB-02 AND AB-10.

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**DELAWARE DEPARTMENT OF TRANSPORTATION**

| ADDENDUMS / REVISIONS | |
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SCALE: AS NOTED

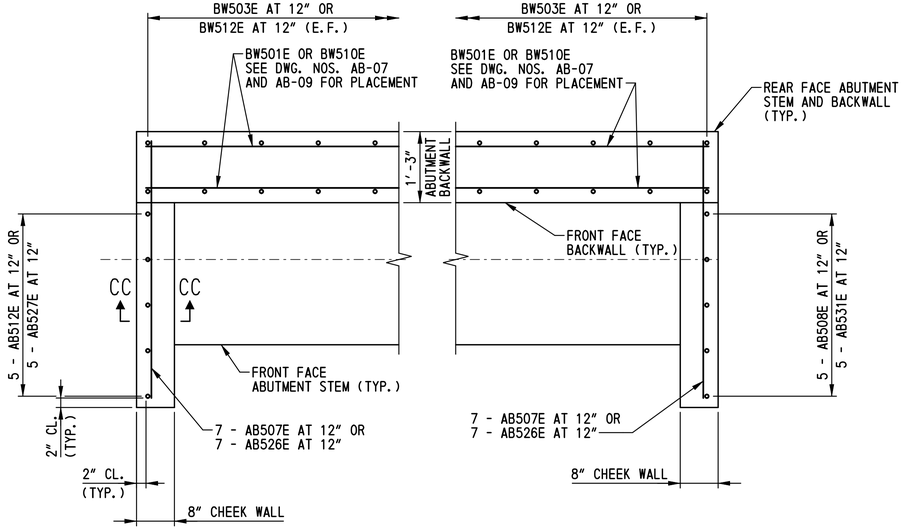
**US 301, SR 896 TO SR 1**

| CONTRACT | BRIDGE NO. 1-460A |
|---|---|
| T200911308 | DESIGNED BY: A.D.D. |
| COUNTY | CHECKED BY: B.K.B. |
| NEW CASTLE | |

**ABUTMENT B REINFORCEMENT DETAILS – 2**

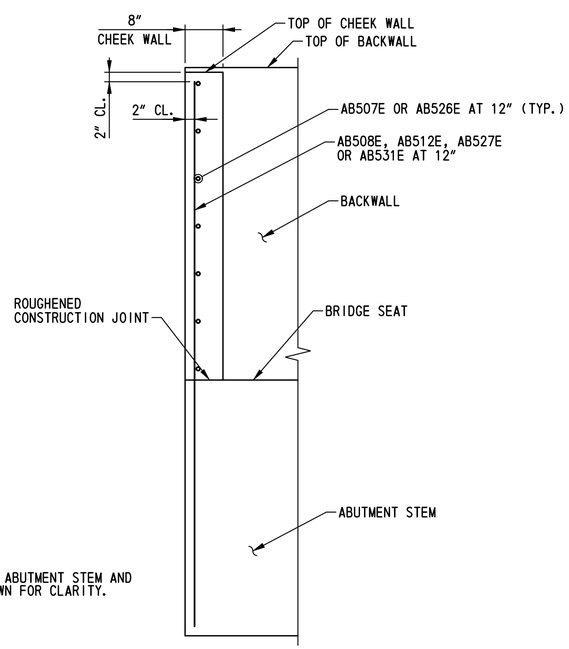
BR1-8
AB-09

| SHEET NO. | TOTAL SHTS. |
|---|---|
| 513 | 875 |




## ABUTMENT REINFORCEMENT PLAN ABOVE BEAM SEAT

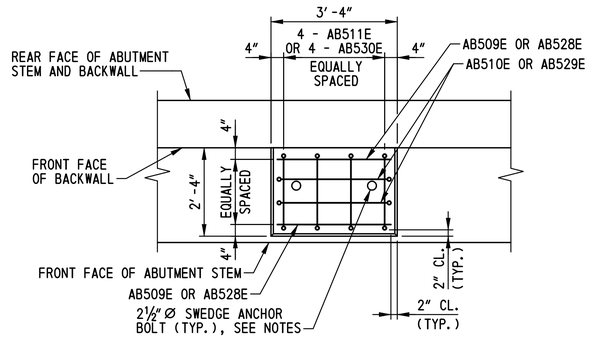
SCALE: ¾"=1'-0"



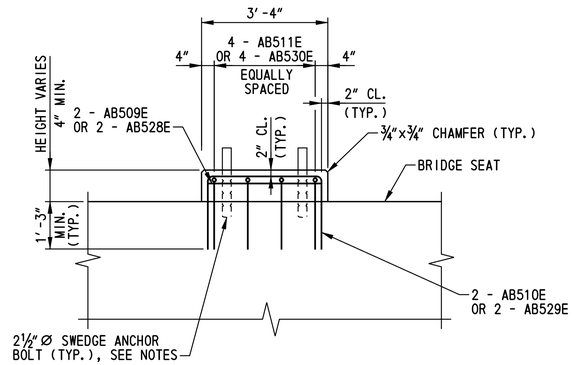

NOTE:
REINFORCEMENT IN ABUTMENT STEM AND BACKWALL NOT SHOWN FOR CLARITY.

## CHEEK WALL TYPICAL REINFORCEMENT SECTION CC-CC

SCALE: ¾"=1'-0"




PLAN




ELEVATION

## ABUTMENT CONCRETE BEARING PAD DETAILS

SCALE: ½"=1'-0"

NOTES:

1. FOR ANCHOR BOLT DIMENSIONS AND LOCATION, SEE DWG. NOS. BB-01 AND BB-02.
2. ANCHOR BOLTS SHALL BE CAST IN PLACE. A TEMPORARY CASTING TEMPLATE SHALL BE USED TO ENSURE THE ANCHOR BOLTS ARE PROPERLY ALIGNED AND PLUMB. THE TEMPLATE SHALL BE REMOVED AFTER THE CONCRETE HAS SET.
3. SPACE REINFORCING STEEL AS NECESSARY TO CLEAR ANCHOR BOLTS.



**DELAWARE**
**DEPARTMENT OF TRANSPORTATION**

ADDENDUMS / REVISIONS

SCALE: AS NOTED

**US 301,**
**SR 896 TO SR 1**

| CONTRACT | BRIDGE NO. | 1-460A |
|---|---|---|
| T200911308 | DESIGNED BY: A.D.D. | |
| COUNTY | CHECKED BY: B.K.B. | |
| NEW CASTLE | | |

**ABUTMENT REINFORCEMENT DETAILS**

BR1-8
AB-10

| SHEET NO. |
|---|
| 514 |
| TOTAL SHTS. |
| 875 |

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) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| QTY. | SIZE | LENGTH | MARK | TYPE | A | B | C | D | E | F/R | G | H | J | K | O |
| ABUTMENT A | | | | | | | | | | | | | | | |
| 162 | 6 | 9-11 2 | AB601E | 17 | | 3-03 1 | 3-05 0 | 3-03 1 | | | | | | | |
| 7 | 10 | 55-06 1 | AB1002E | STR | | 55-06 1 | | | | | | | | | |
| 3 | 6 | 55-06 1 | AB603E | STR | | 55-06 1 | | | | | | | | | |
| 10 | 5 | 55-06 1 | AB504E | STR | | 55-06 1 | | | | | | | | | |
| 6 | 7 | 55-06 1 | AB605E | STR | | 55-06 1 | | | | | | | | | |
| 114 | 5 | 4-04 2 | AB506E | STR | | 4-04 2 | | | | | | | | | |
| 28 | 5 | 4-06 1 | AB507E | STR | | 4-06 1 | | | | | | | | | |
| 5 | 5 | 9-08 3 | AB508E | STR | | 9-08 3 | | | | | | | | | |
| 12 | 5 | 3-00 0 | AB509E | STR | | 3-00 0 | | | | | | | | | |
| 12 | 5 | 7-08 0 | AB510E | 17 | | 2-04 0 | 3-00 0 | 2-04 0 | | | | | | | |
| 24 | 5 | 6-08 0 | AB511E | 17 | | 2-04 0 | 2-00 0 | 2-04 0 | | | | | | | |
| 5 | 5 | 9-04 3 | AB512E | STR | | 9-04 3 | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| 12 | 5 | 55-06 1 | BW501E | STR | | 55-06 1 | | | | | | | | | |
| 2 | 5 | 55-06 2 | BW502E | STR | | 55-06 2 | | | | | | | | | |
| 114 | 5 | 5-02 3 | BW503E | STR | | 5-02 3 | | | | | | | | | |
| 57 | 5 | 2-07 0 | BW504E | 2 | | 0-10 0 | 0-11 0 | 0-10 0 | | | | | | | |

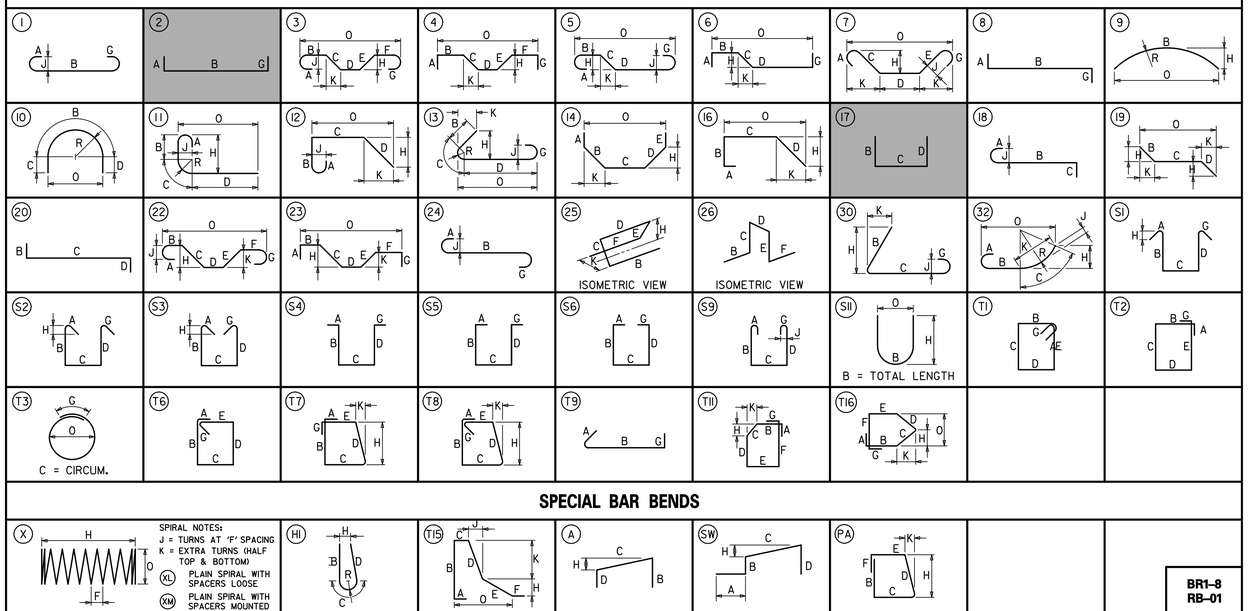
| SPECIFICATIONS | | | | | BENDING DIMENSIONS (FEET-INCHES /QUARTER INCH) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| QTY. | SIZE | LENGTH | MARK | TYPE | A | B | C | D | E | F/R | G | H | J | K | O |
| ABUTMENT B | | | | | | | | | | | | | | | |
| 162 | 6 | 9-11 2 | AB620E | 17 | | 3-03 1 | 3-05 0 | 3-03 1 | | | | | | | |
| 7 | 10 | 55-06 1 | AB1021E | STR | | 55-06 1 | | | | | | | | | |
| 3 | 6 | 55-06 1 | AB622E | STR | | 55-06 1 | | | | | | | | | |
| 10 | 5 | 55-06 1 | AB523E | STR | | 55-06 1 | | | | | | | | | |
| 6 | 7 | 55-06 1 | AB624E | STR | | 55-06 1 | | | | | | | | | |
| 114 | 5 | 4-04 2 | AB525E | STR | | 4-04 2 | | | | | | | | | |
| 28 | 5 | 4-06 1 | AB526E | STR | | 4-06 1 | | | | | | | | | |
| 5 | 5 | 9-10 0 | AB527E | STR | | 9-10 0 | | | | | | | | | |
| 12 | 5 | 3-00 0 | AB528E | STR | | 3-00 0 | | | | | | | | | |
| 12 | 5 | 7-08 0 | AB529E | 17 | | 2-04 0 | 3-00 0 | 2-04 0 | | | | | | | |
| 24 | 5 | 6-08 0 | AB530E | 17 | | 2-04 0 | 2-00 0 | 2-04 0 | | | | | | | |
| 5 | 5 | 9-06 0 | AB531E | STR | | 9-06 0 | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| 12 | 5 | 55-06 1 | BW510E | STR | | 55-06 1 | | | | | | | | | |
| 2 | 5 | 55-06 2 | BW511E | STR | | 55-06 2 | | | | | | | | | |
| 114 | 5 | 5-02 3 | BW512E | STR | | 5-02 3 | | | | | | | | | |
| 57 | 5 | 2-07 0 | BW513E | 2 | | 0-10 0 | 0-11 0 | 0-10 0 | | | | | | | |

| SPECIFICATIONS | | | | | BENDING DIMENSIONS (FEET-INCHES /QUARTER INCH) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| QTY. | SIZE | LENGTH | MARK | TYPE | A | B | C | D | E | F/R | G | H | J | K | O |

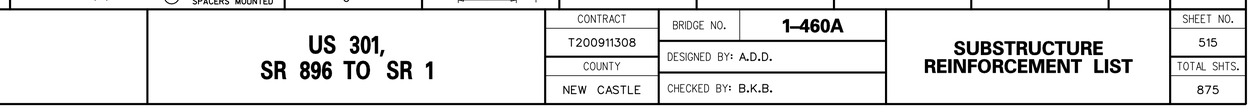
| ASTM STANDARD ENGLISH REINFORCING BARS | | | | RECOMMENDED END HOOKS, APPLICABLE TO ALL GRADES | | | | STIRRUP AND TIE HOOKS, APPLICABLE TO ALL GRADES | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | NOMINAL DIMENSIONS | | | | 180° HOOKS | | 90° HOOKS | | 90° HOOK | 135° HOOK | |
| BAR SIZE | DIAMETER (INCHES) | AREA (INCHES²) | WEIGHT (LBS./FT.) | D | A OR G | J | A OR G | D | A OR G | A OR G | H |
| 3 | 0.375 | 0.110 | 0.376 | 2¼″ | 5″ | 3″ | 6″ | 1½″ | 4″ | 4″ | 2½″ |
| 4 | 0.500 | 0.200 | 0.668 | 3″ | 6″ | 4″ | 8″ | 2″ | 4½″ | 4½″ | 3″ |
| 5 | 0.625 | 0.310 | 1.043 | 3¾″ | 7″ | 5″ | 10″ | 2½″ | 6″ | 5½″ | 3¾″ |
| 6 | 0.750 | 0.440 | 1.502 | 4½″ | 8″ | 6″ | 1-0″ | 4½″ | 1-0″ | 8″ | 4½″ |
| 7 | 0.875 | 0.600 | 2.044 | 5¼″ | 10″ | 7″ | 1-2″ | 5¼″ | 1-2″ | 9″ | 5¼″ |
| 8 | 1.000 | 0.790 | 2.670 | 6″ | 11″ | 8″ | 1-4″ | 6″ | 1-4″ | 10½″ | 6″ |
| 9 | 1.128 | 1.000 | 3.400 | 9½″ | 1-3″ | 11¾″ | 1-7″ | | | | |
| 10 | 1.270 | 1.270 | 4.303 | 10¾″ | 1-5″ | 1-1¼″ | 1-10″ | | | | |
| 11 | 1.410 | 1.560 | 5.313 | 1-0″ | 1-7″ | 1-2¾″ | 2-0″ | | | | |
| 14 | 1.693 | 2.250 | 7.650 | 1-6¼″ | 2-3″ | 1-9¾″ | 2-7″ | | | | |
| 18 | 2.257 | 4.000 | 13.600 | 2-0″ | 3-0″ | 2-4½″ | 3-5″ | | | | |

NOTES:
1. FIGURES SHOWN IN CIRCLES REPRESENT BAR BEND TYPES.
2. STANDARD BAR BENDS INCLUDE ONLY THOSE TYPES BELOW, INDICATED AS SUCH.
3. ALL DIMENSIONS OUT-TO-OUT, EXCEPT "A" AND "G" ON STD. 180° AND 135° HOOKS.
4. "J" DIMENSIONS ON 180° HOOKS TO BE SHOWN ONLY WHERE NECESSARY TO RESTRICT HOOK SIZE, OTHERWISE STANDARD 'ACI' HOOKS ARE TO BE USED.
5. 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.
6. "H" DIMENSIONS OF STIRRUPS TO BE SHOWN AS NEEDED TO FIT WITHIN THE CONCRETE.
7. UNLESS OTHERWISE NOTED, DIAMETER "D" IS THE SAME FOR ALL BENDS AND HOOKS ON A BAR (EXCEPT FOR BEND TYPES 11 AND 13).
8. WHERE SLOPE DIFFERS FROM 45° OFFSET, "H" AND "K" MUST BE SHOWN.
9. WHERE BARS ARE TO BE BENT MORE ACCURATELY THAN STANDARD BENDING TOLERANCES, BENDING DIMENSIONS REQUIRING CLOSER FABRICATION SHOULD HAVE LIMITS INDICATED.
10. FOR RECOMMENDED DIAMETER "D", OF BENDS, HOOKS, ETC., REFER TO TABLE ABOVE, 'CRSI' OR 'ACI' TABLES WHERE APPLICABLE AND REQUIRED.
11. TYPE S1-S6, S11, T1-T3 AND T6-T9 APPLICABLE TO BAR SIZES #3 THROUGH #8.

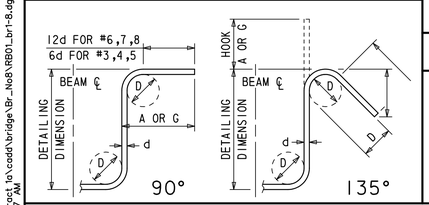
## STANDARD BAR BENDS



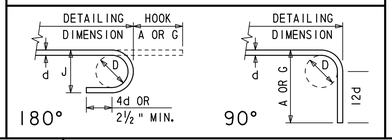

## SPECIAL BAR BENDS

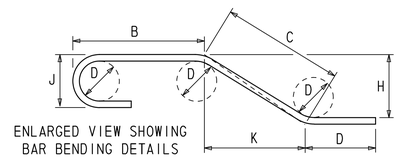



## STIRRUP AND TIE HOOKS




## 180° AND 90° END HOOKS




| ADDENDUMS / REVISIONS | | | |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |

**DELAWARE DEPARTMENT OF TRANSPORTATION**

**US 301, SR 896 TO SR 1**

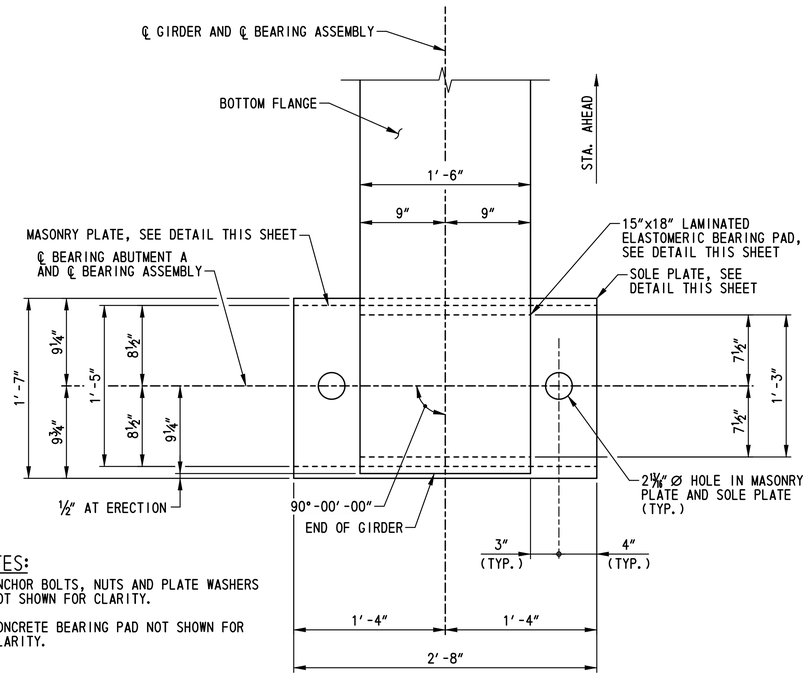
| CONTRACT | T200911308 |
|---|---|
| COUNTY | NEW CASTLE |
| BRIDGE NO. | 1-460A |
| DESIGNED BY: | A.D.D. |
| CHECKED BY: | B.K.B. |

**SUBSTRUCTURE REINFORCEMENT LIST**

BR1-8
RB-01

SHEET NO. 515
TOTAL SHTS. 875

n:\36536-000\contract_to\cadd\bridge\Br_No8\RB01_br1-8.dgn
10/24/2012 1h03:37 AM

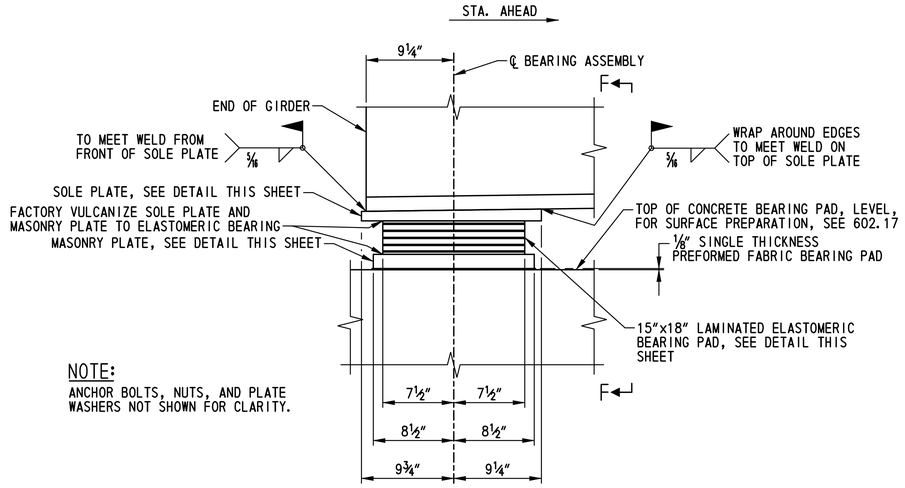



NOTES:

1. ANCHOR BOLTS, NUTS AND PLATE WASHERS NOT SHOWN FOR CLARITY.
2. CONCRETE BEARING PAD NOT SHOWN FOR CLARITY.

## FIXED BEARING PLAN

SCALE: 1½″=1′-0″

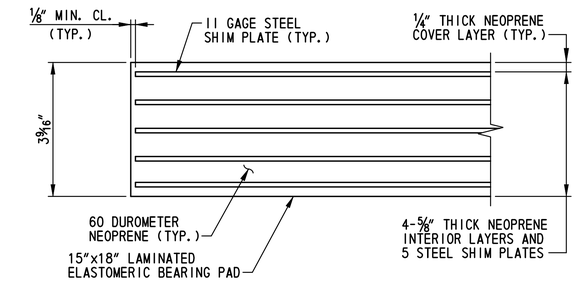



NOTE:

ANCHOR BOLTS, NUTS, AND PLATE WASHERS NOT SHOWN FOR CLARITY.

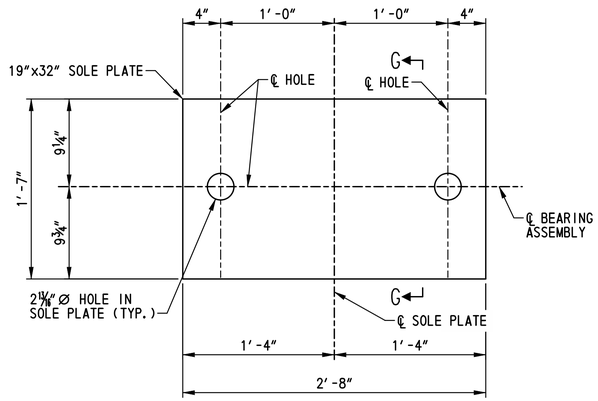
## FIXED BEARING ELEVATION

SCALE: 1½″=1′-0″



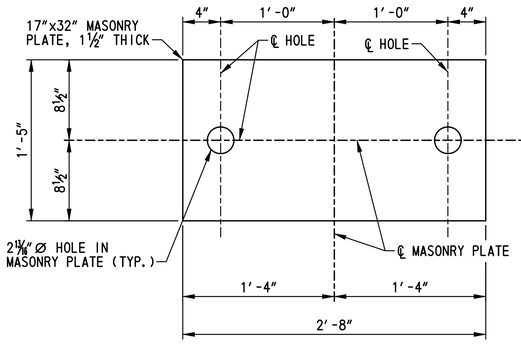

## LAMINATED ELASTOMERIC BEARING PAD DETAIL

NOT TO SCALE



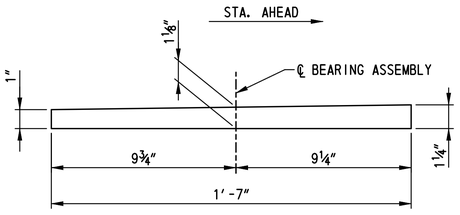

## SOLE PLATE

SCALE: 1½″=1′-0″




## MASONRY PLATE

SCALE: 1½″=1′-0″

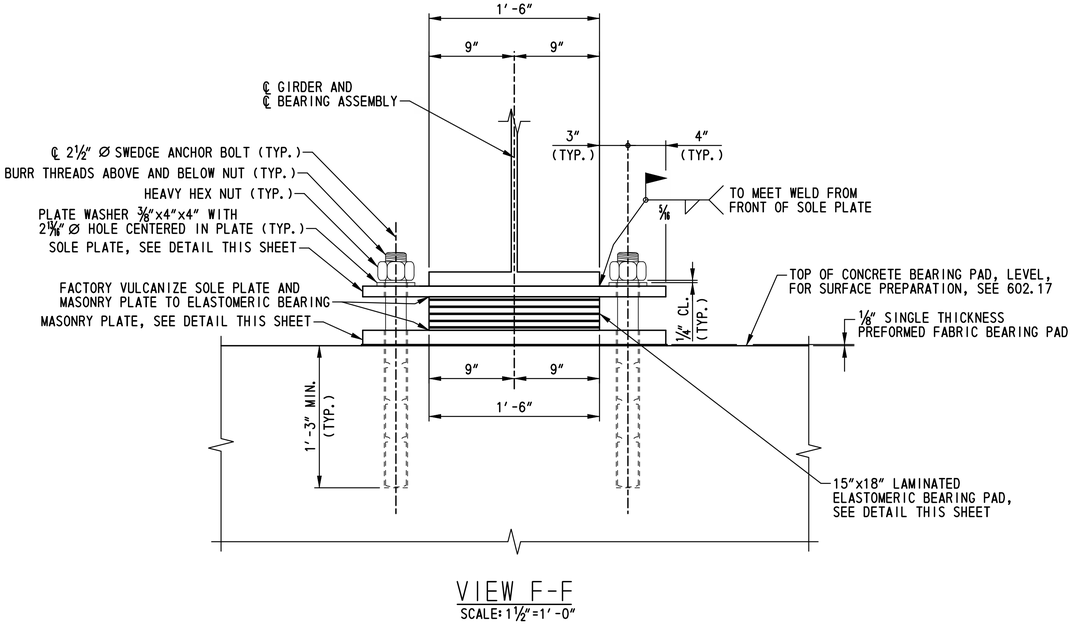



## SECTION G-G

SCALE: 3″=1′-0″

### ABUTMENT A FIXED BEARING NOTES:

1. BEARING ASSEMBLIES SHALL BE PLACED PERPENDICULAR TO THE CENTERLINE OF GIRDER.
2. SOLE PLATES AND MASONRY PLATES SHALL BE ASTM A 709, GRADE 36 STEEL. PLATES SHALL BE PAINTED WITH A URETHANE PAINT SYSTEM IN ACCORDANCE WITH SPECIAL PROVISION ITEM 605537 - URETHANE PAINT SYSTEM, NEW STEEL. TOPCOAT COLOR SHALL BE STANDARD COLOR NO. 10076 (BROWN) OF FEDERAL STANDARD NO. 595B. THE COST OF PAINTING SHALL BE INCIDENTAL TO ITEM 605581 - ELASTOMERIC BEARING PADS.
3. FILL HOLES AROUND ANCHOR BOLTS WITH NONHARDENING CAULKING COMPOUND OR ELASTIC JOINT SEALER.
4. 1000 RMS FINISH ON ALL STEEL PLATES.
5. ANCHOR BOLTS SHALL BE UNPAINTED ASTM F 1554, GRADE 105 GALVANIZED STEEL. PLATE WASHERS SHALL BE UNPAINTED ASTM A 709, GRADE 36 GALVANIZED STEEL. NUTS SHALL BE UNPAINTED ASTM A 563 GALVANIZED STEEL.
6. ELASTOMERIC BEARINGS SHALL CONFORM TO M 251 AND THE ELASTOMER SHALL BE 60 DUROMETER NEOPRENE. SHIMS SHALL BE 11 GAGE MILD STEEL CONFORMING TO ASTM A 36.
7. THE SOLE PLATE AND MASONRY PLATE SHALL BE FACTORY VULCANIZED TO THE ELASTOMERIC BEARING, AND BEARINGS ARE TO BE SHIPPED ASSEMBLED AS UNITS.
8. BEARING MAXIMUM DESIGN LOAD: 290 KIPS.
9. CONTRACTOR SHALL TOUCH UP SOLE PLATE PAINT SYSTEM, IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS, AFTER WELDING THE SOLE PLATE TO THE GIRDER.
10. PAYMENT FOR ABUTMENT A FIXED BEARINGS WILL BE MADE UNDER ITEM NO. 605581 - ELASTOMERIC BEARING PADS.




## VIEW F-F

SCALE: 1½″=1′-0″

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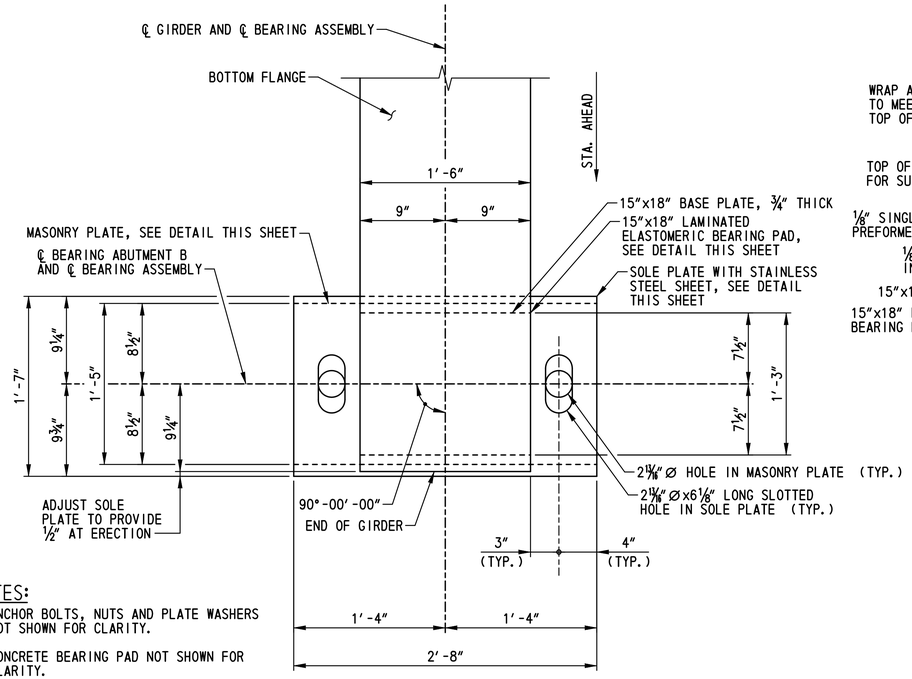
5/1/2015 12:05:27 PM

| DELAWARE DEPARTMENT OF TRANSPORTATION | ADDENDUMS / REVISIONS | SCALE: AS NOTED | US 301, SR 896 TO SR 1 | CONTRACT T200911308 | BRIDGE NO. 1-460A | FIXED BEARING DETAILS - ABUTMENT A | BR1-8 BB-01 |
|---|---|---|---|---|---|---|---|
| | | | | COUNTY NEW CASTLE | DESIGNED BY: A.D.D. | | SHEET NO. 516 |
| | | | | | CHECKED BY: B.K.B. | | TOTAL SHTS. 875 |

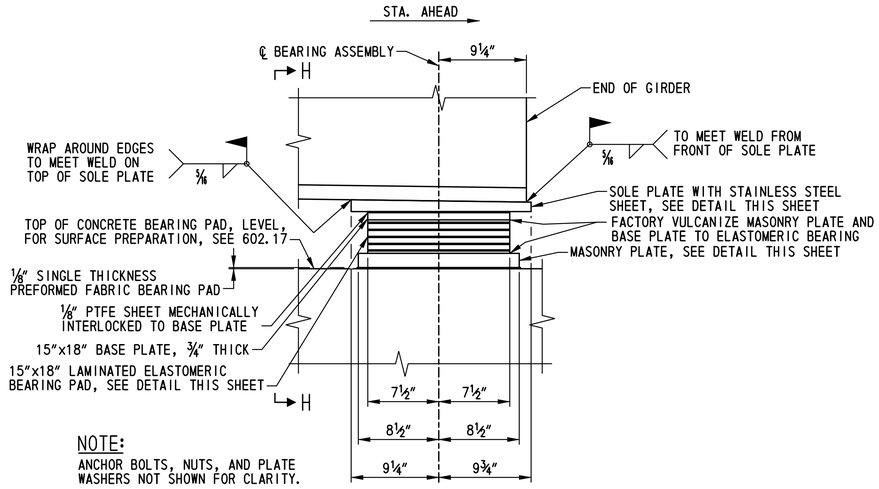



NOTES:

1. ANCHOR BOLTS, NUTS AND PLATE WASHERS NOT SHOWN FOR CLARITY.
2. CONCRETE BEARING PAD NOT SHOWN FOR CLARITY.

## EXPANSION BEARING PLAN

SCALE: 1½″=1′-0″

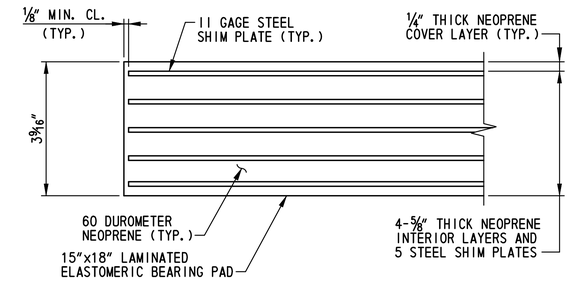



NOTE:

ANCHOR BOLTS, NUTS, AND PLATE WASHERS NOT SHOWN FOR CLARITY.

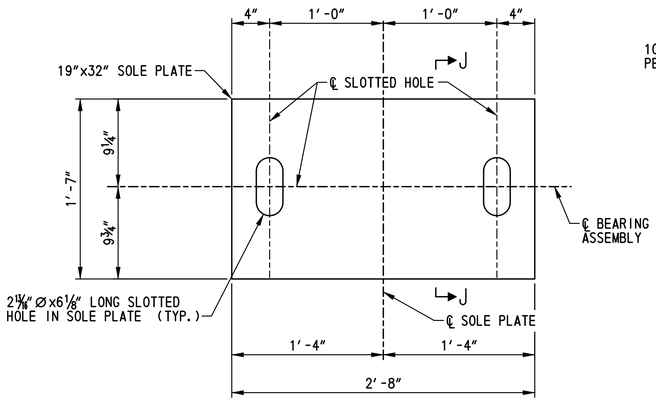
## EXPANSION BEARING ELEVATION

SCALE: 1½″=1′-0″



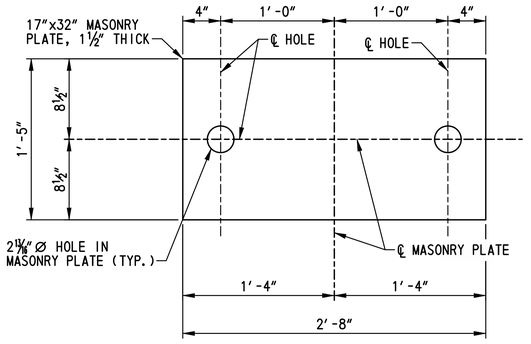

## LAMINATED ELASTOMERIC BEARING PAD DETAIL

NOT TO SCALE



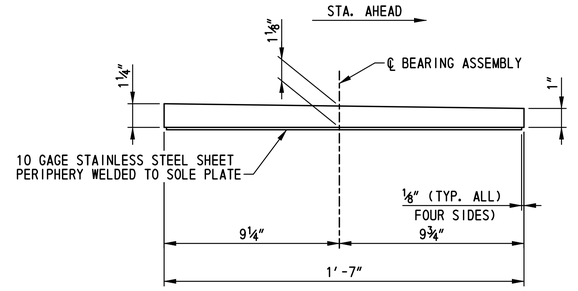

## SOLE PLATE

SCALE: 1½″=1′-0″



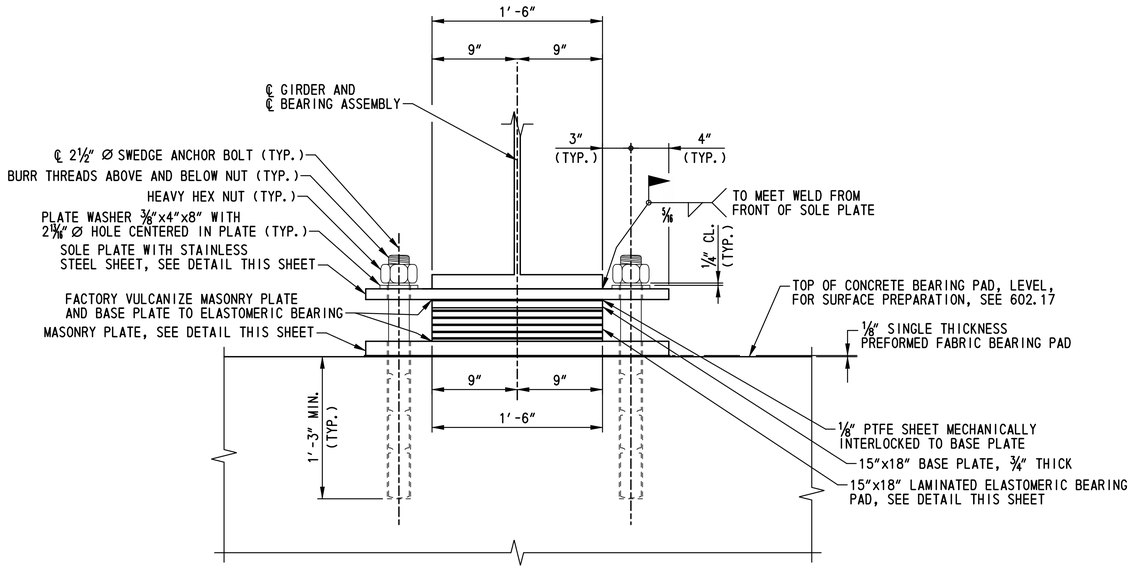

## MASONRY PLATE

SCALE: 1½″=1′-0″




## SECTION J-J

SCALE: 3″=1′-0″




## VIEW H-H

SCALE: 1½″=1′-0″

### ABUTMENT B EXPANSION BEARING NOTES:

1. BEARING ASSEMBLIES SHALL BE PLACED PERPENDICULAR TO THE CENTERLINE OF GIRDER.
2. SOLE PLATES, BASE PLATES AND MASONRY PLATES SHALL BE ASTM A 709, GRADE 36 STEEL. PLATES SHALL BE PAINTED WITH A URETHANE PAINT SYSTEM IN ACCORDANCE WITH SPECIAL PROVISION ITEM 605537 - URETHANE PAINT SYSTEM, NEW STEEL. TOPCOAT COLOR SHALL BE STANDARD COLOR NO. 10076 (BROWN) OF FEDERAL STANDARD NO. 595B. THE COST OF PAINTING SHALL BE INCIDENTAL TO ITEM 605639 - TFE STAINLESS STEEL STRUCTURAL BEARINGS.
3. FILL SLOTS AND HOLES AROUND ANCHOR BOLTS WITH NONHARDENING CAULKING COMPOUND OR ELASTIC JOINT SEALER.
4. 1000 RMS FINISH ON ALL STEEL PLATES.
5. ANCHOR BOLTS SHALL BE UNPAINTED ASTM F 1554, GRADE 105 GALVANIZED STEEL. PLATE WASHERS SHALL BE UNPAINTED ASTM A 709, GRADE 36 GALVANIZED STEEL. NUTS SHALL BE UNPAINTED ASTM A 563 GALVANIZED STEEL.
6. ELASTOMERIC BEARINGS SHALL CONFORM TO M 251 AND THE ELASTOMER SHALL BE 60 DUROMETER NEOPRENE. SHIMS SHALL BE 11 GAGE MILD STEEL CONFORMING TO ASTM A 36.
7. STAINLESS STEEL SHEET SHALL BE ASTM A 167 OR A 264, TYPE 304, #8 MIRROR FINISH.
8. PTFE SHEET SHALL BE DIMPLED LUBRICATED MEETING THE REQUIREMENTS OF ASTM D 4894 OR D 4895. PTFE SHEET SHALL HAVE THE SAME PLAN AREA AS THE BASE PLATE.
9. THE BASE PLATE AND MASONRY PLATE SHALL BE FACTORY VULCANIZED TO THE ELASTOMERIC BEARING, AND BEARINGS ARE TO BE SHIPPED ASSEMBLED AS UNITS.
10. BEARING MAXIMUM DESIGN LOAD: 290 KIPS.
    BEARING DESIGN COEFFICIENT OF FRICTION: 0.04.
11. CONTRACTOR SHALL TOUCH UP SOLE PLATE PAINT SYSTEM, IN ACCORDANCE WITH THE MANUFACTURER'S REQUIREMENTS, AFTER WELDING THE SOLE PLATE TO THE GIRDER.
12. PAYMENT FOR ABUTMENT B EXPANSION BEARINGS WILL BE MADE UNDER ITEM NO. 605639 - TFE STAINLESS STEEL STRUCTURAL BEARINGS.

BR1-8
BB-02

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**DELAWARE DEPARTMENT OF TRANSPORTATION**

ADDENDUMS / REVISIONS

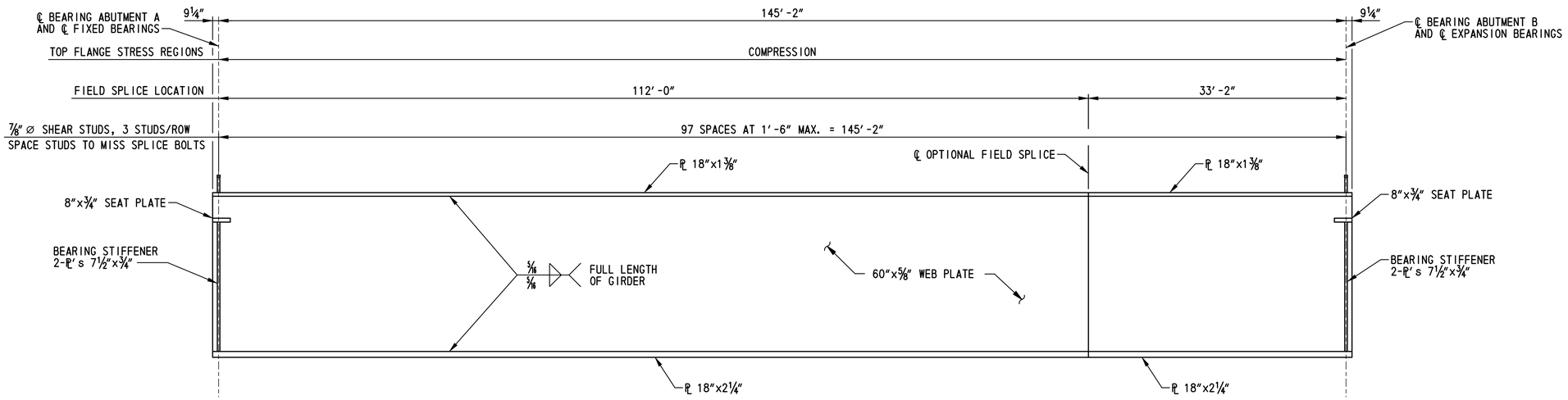
SCALE: AS NOTED

**US 301, SR 896 TO SR 1**

| CONTRACT | BRIDGE NO. | 1-460A |
|---|---|---|
| T200911308 | DESIGNED BY: A.D.D. | |
| COUNTY | CHECKED BY: B.K.B. | |
| NEW CASTLE | | |

**EXPANSION BEARING DETAILS - ABUTMENT B**

| SHEET NO. | TOTAL SHTS. |
|---|---|
| 517 | 875 |




## GIRDER ELEVATION
NOT TO SCALE

NOTES:

1. THE GIRDERS ARE REQUIRED TO BE PLUMB UNDER FULL DEAD LOAD.
2. THE CONTRACTOR IS RESPONSIBLE FOR THE ENTIRE ERECTION OF THE BRIDGE. THE CONTRACTOR SHALL SUBMIT DRAWINGS SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF DELAWARE, ILLUSTRATING FULLY THE PROPOSED METHOD OF ERECTION. THE DRAWINGS SHALL SHOW DETAILS OF ALL TEMPORARY SHORING, FALSEWORK, BRACING, GUYS, DEAD-MEN, LIFTING DEVICES, HOLD-DOWN DEVICES AND ATTACHMENTS TO THE BRIDGE MEMBERS. THE DRAWINGS SHALL ALSO INCLUDE THE SEQUENCE OF ERECTION, LOCATION OF CRANES, CRANE CAPACITIES, LOCATION OF LIFTING POINTS ON THE BRIDGE MEMBERS AND WEIGHTS OF MEMBERS. THE PLAN AND DRAWINGS SHALL BE COMPLETE IN DETAIL FOR ALL ANTICIPATED PHASES AND CONDITIONS DURING ERECTION. CALCULATIONS SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF DELAWARE ARE REQUIRED TO DEMONSTRATE THAT ALLOWABLE STRESSES ARE NOT EXCEEDED AND THAT MEMBER CAPACITIES AND FINAL GEOMETRY WILL BE CORRECT.
3. CROSS FRAME CONNECTION PLATE SPACING NOT SHOWN. FOR LOCATION OF CROSS FRAME CONNECTION PLATES, SEE DWG. NO. FR-01.
4. FOR BEARING STIFFENER AND CONNECTION PLATE DETAILS, SEE DWG. NO. BM-02.
5. FOR OPTIONAL FIELD SPLICE DETAILS, SEE DWG. NO. BM-03.
6. FOR SHEAR STUD DETAILS, SEE DWG. NO. SD-01.

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**DELAWARE DEPARTMENT OF TRANSPORTATION**

| ADDENDUMS / REVISIONS | |
|---|---|
| | |
| | |
| | |
| | |

SCALE: AS NOTED

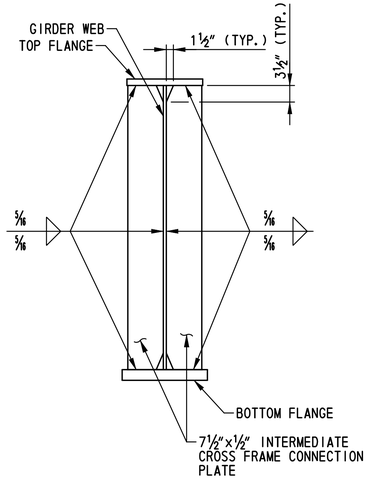
**US 301, SR 896 TO SR 1**

| CONTRACT | BRIDGE NO. | 1-460A |
|---|---|---|
| T200911308 | DESIGNED BY: A.D.D. | |
| COUNTY | | |
| NEW CASTLE | CHECKED BY: B.K.B. | |

**GIRDER ELEVATION**

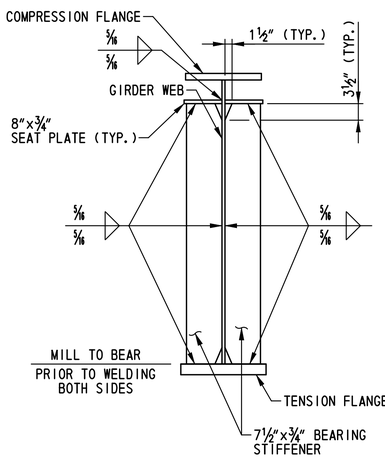
BR1-8
BM-01

| SHEET NO. |
|---|
| 518 |
| TOTAL SHTS. |
| 875 |



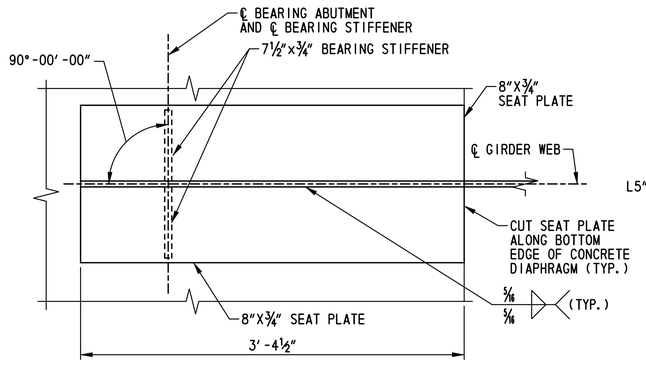

## INTERMEDIATE CROSS FRAME CONNECTION PLATES

SCALE: ¾"=1'-0"



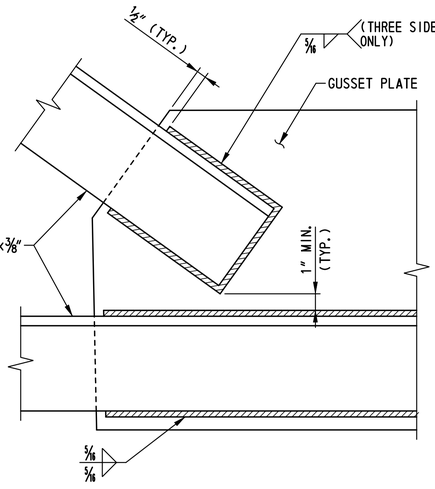

## ABUTMENT BEARING STIFFENERS/ CROSS FRAME CONNECTION PLATES

SCALE: ¾"=1'-0"



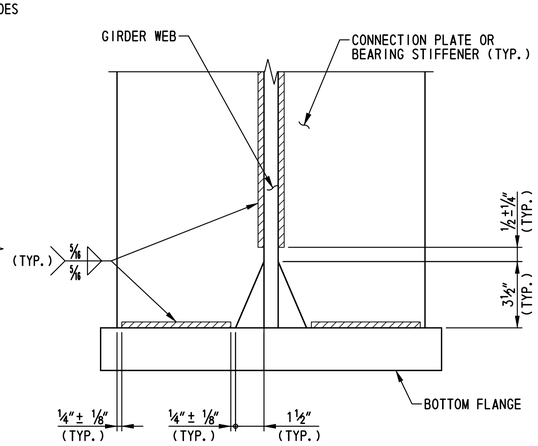

## SEAT PLATE DETAIL

SCALE: 1½"=1'-0"



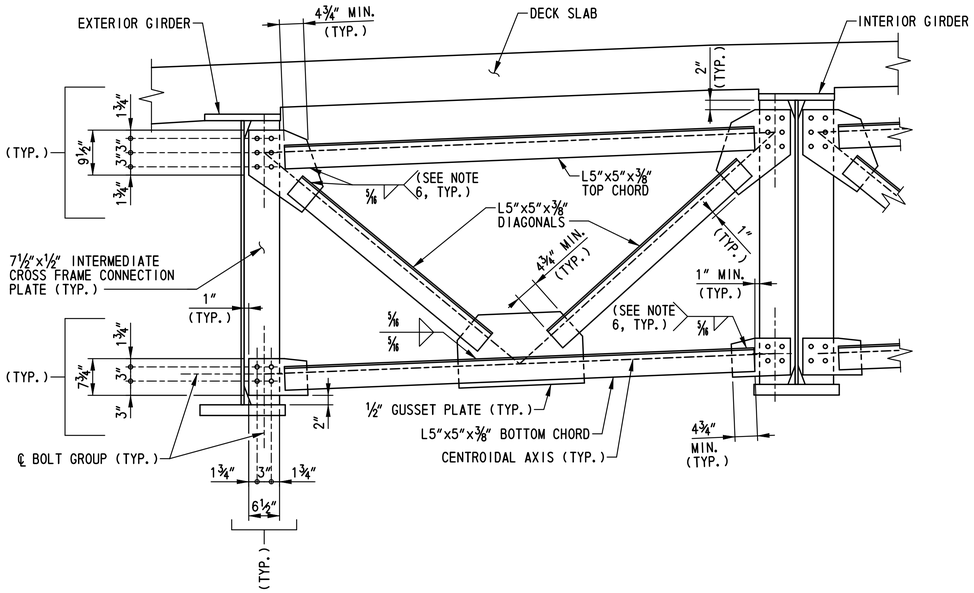

## CROSS FRAME WELD DETAIL

SCALE: 3"=1'-0"



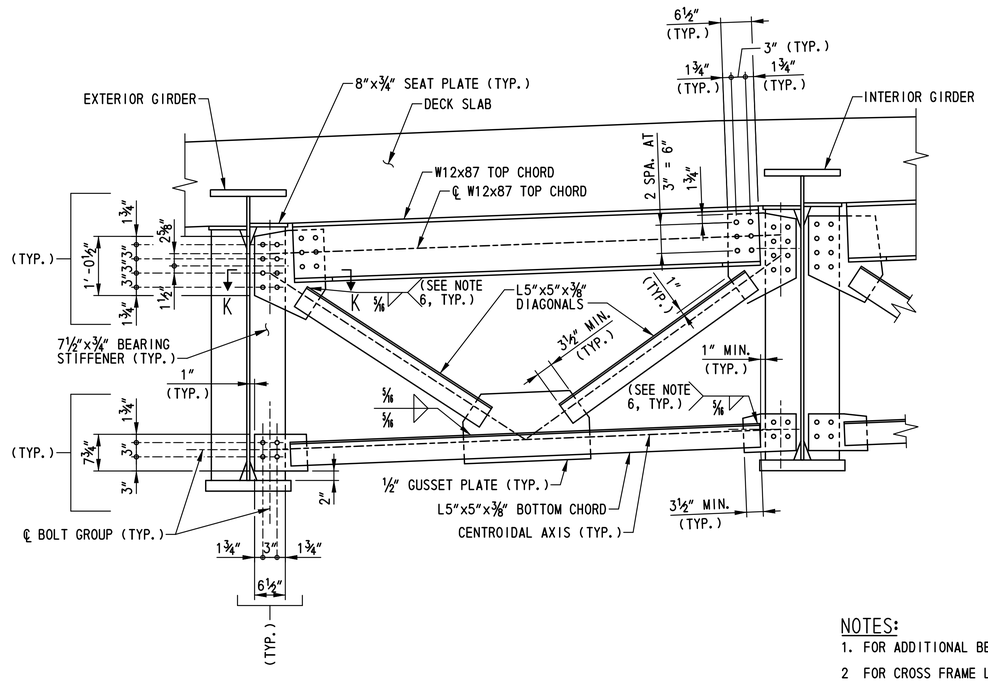

## CONNECTION PLATE OR STIFFENER WELD TERMINATION DETAIL

SCALE: 3"=1'-0"



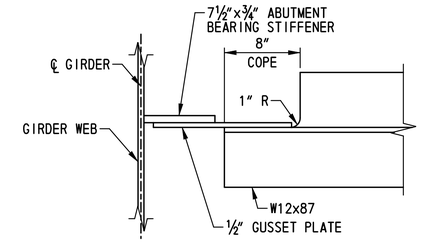

## INTERMEDIATE CROSS FRAME DETAIL

SCALE: ¾"=1'-0"




## ABUTMENT CROSS FRAME DETAIL

SCALE: ¾"=1'-0"




## SECTION K-K

SCALE: 1½"=1'-0"

NOTES:

1. FOR ADDITIONAL BEARING STIFFENER INFORMATION, SEE DWG. NO. BM-01.
2. FOR CROSS FRAME LOCATIONS, SEE DWG. NO. FR-01.
3. ALL BOLTS TO BE ⅞" Ø HIGH STRENGTH BOLTS CONFORMING TO A 325, TYPE 3. ALL BOLTS HOLES SHALL BE 15/16" Ø. ALL BOLTS SHALL BE FABRICATED WITH THREADS THAT ARE EXCLUDED FROM THE SHEAR PLANE.
4. THE MINIMUM ACCEPTABLE EDGE DISTANCE FOR ANY HOLE SHALL BE 1½".
5. THE GIRDERS ARE REQUIRED TO BE PLUMB UNDER FULL DEAD LOAD.
6. ENDS OF TOP CHORD (INTERMEDIATE CROSS FRAME ONLY), DIAGONALS AND BOTTOM CHORD SHALL BE WELDED ALONG ALL THREE SIDES ON THE NEAR FACE OF THE GUSSET PLATES.

BR1-8
BM-02

**DELAWARE DEPARTMENT OF TRANSPORTATION**

| ADDENDUMS / REVISIONS | |
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SCALE: AS NOTED

**US 301, SR 896 TO SR 1**

| CONTRACT | BRIDGE NO. | 1-460A |
|---|---|---|
| T200911308 | DESIGNED BY: A.D.D. | |
| COUNTY | CHECKED BY: B.K.B. | |
| NEW CASTLE | | |

**STRUCTURAL STEEL DETAILS**

| SHEET NO. |
|---|
| 519 |
| TOTAL SHTS. |
| 875 |

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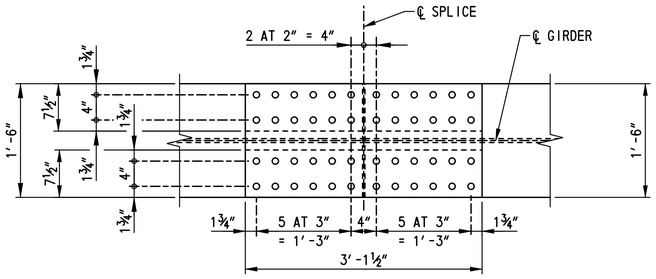
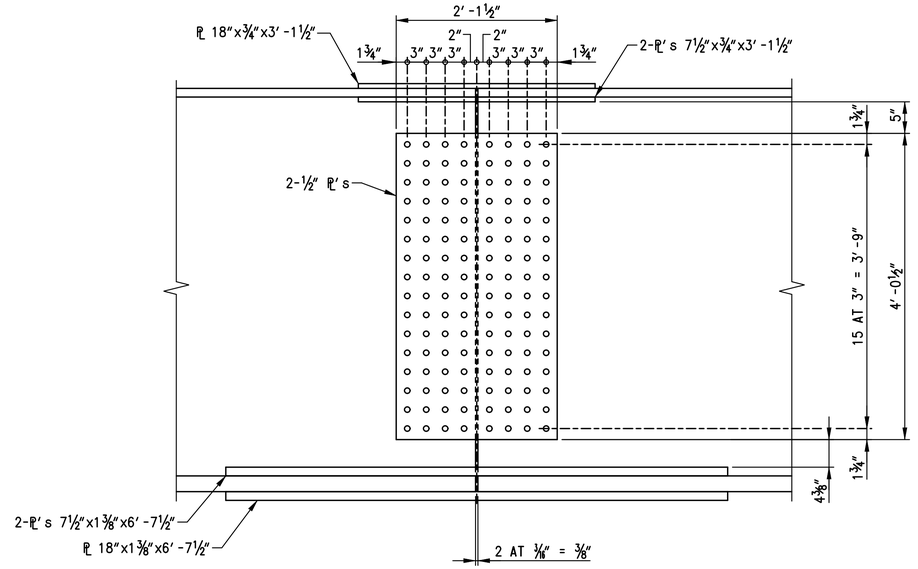
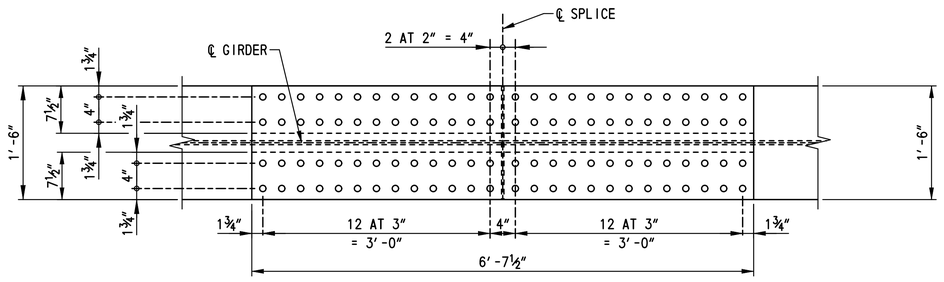



TOP FLANGE




WEB




BOTTOM FLANGE

## FIELD SPLICE DETAIL

SCALE: 1″=1′-0″

### SPLICE NOTES:

1. FOR LOCATION OF OPTIONAL FIELD SPLICE, SEE DWG. NOS. BM-01 AND FR-01.
2. THE CONTRACTOR HAS THE OPTION OF FABRICATING THE GIRDERS IN ONE PIECE, OR USING THE FIELD SPLICE SHOWN; HOWEVER, NO ADDITIONAL COMPENSATION TO THE CONTRACTOR WILL BE ALLOWED FOR WHICHEVER ALTERNATIVE IS SELECTED. THE CONTRACTOR AND FABRICATOR SHALL ENSURE THAT THE GIRDER IS NOT OVERSTRESSED AND REMAINS STABLE DURING FABRICATION, SHIPPING AND ERECTION IF THE OPTIONAL FIELD SPLICE IS NOT USED.
3. FIELD SPLICE DESIGNED AS A SLIP CRITICAL CONNECTION WITH CLASS A SURFACE CONDITIONS.
4. ALL BOLTS TO BE ⅞″ ⌀ HIGH STRENGTH BOLTS CONFORMING TO A 325, TYPE 3. ALL BOLT HOLES SHALL BE 15/16″ ⌀ . ALL BOLTS SHALL BE FABRICATED WITH THREADS THAT ARE EXCLUDED FROM THE SHEAR PLANE.
5. THE MINIMUM ACCEPTABLE EDGE DISTANCE FOR ANY HOLE SHALL BE 1½″.
6. BOLT HEADS SHALL BE ON THE EXTERIOR FACE OF THE EXTERIOR GIRDERS AND THE BOTTOM OF THE BOTTOM FLANGES.
7. BOLTS NOT SHOWN IN SPLICE.
8. SPACE SHEAR STUDS TO MISS TOP FLANGE SPLICE BOLTS.
9. ON EACH SIDE OF THE ℄ OF SPLICE A MINIMUM OF 50 PERCENT OF THE WEB, TOP FLANGE, AND BOTTOM FLANGE SPLICE BOLTS SHALL BE IN PLACE BEFORE THE GIRDER IS LEFT UNSUPPORTED.
10. FIELD SPLICES SHALL BE COMPLETELY SHOP ASSEMBLED AND MATCH MARKED AFTER ALL SHOP WELDING HAS BEEN COMPLETED. CONTACT SURFACES SHALL BE FREE OF ALL OIL AND DIRT.

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**DELAWARE DEPARTMENT OF TRANSPORTATION**

| ADDENDUMS / REVISIONS | |
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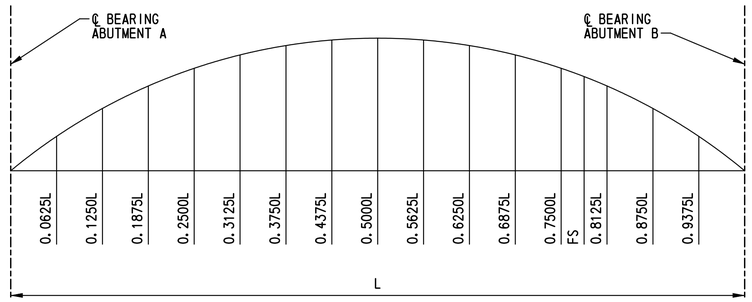
SCALE: AS NOTED

**US 301, SR 896 TO SR 1**

| CONTRACT | BRIDGE NO. | 1-460A |
|---|---|---|
| T200911308 | DESIGNED BY: A.D.D. | |
| COUNTY | CHECKED BY: B.K.B. | |
| NEW CASTLE | | |

**SPLICE DETAILS**

| BR1-8 BM-03 | |
|---|---|
| SHEET NO. | 520 |
| TOTAL SHTS. | 875 |




## DEFLECTION AND TOTAL CAMBERS (IN.)

| LOCATION | | ℄ BRG. ABUT. A | 0.0625L | 0.1250L | 0.1875L | 0.2500L | 0.3125L | 0.3750L | 0.4375L | 0.5000L | 0.5625L | 0.6250L | 0.6875L | 0.7500L | FS | 0.8125L | 0.8750L | 0.9375L | ℄ BRG. ABUT. B |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GIRDERS 1 AND 6 | DLS | 0 | 3/8 | 3/4 | 1 1/16 | 1 3/16 | 1 1/16 | 1 3/4 | 1 7/8 | 1 7/8 | 1 7/8 | 1 3/4 | 1 11/16 | 1 5/16 | 1 1/4 | 1 1/16 | 3/4 | 3/8 | 0 |
| | DLC | 0 | 1 1/8 | 2 3/16 | 3 1/4 | 4 1/16 | 4 13/16 | 5 5/16 | 5 5/8 | 5 3/4 | 5 5/8 | 5 5/16 | 4 13/16 | 4 1/16 | 3 15/16 | 3 1/4 | 2 3/16 | 1 1/8 | 0 |
| | SDL | 0 | 3/8 | 3/4 | 1 1/16 | 1 3/16 | 1 1/16 | 1 3/4 | 1 13/16 | 1 7/8 | 1 13/16 | 1 3/4 | 1 11/16 | 1 5/16 | 1 1/4 | 1 1/16 | 3/4 | 3/8 | 0 |
| | TD&C | 0 | 1 7/8 | 3 11/16 | 5 3/8 | 6 11/16 | 7 15/16 | 8 13/16 | 9 3/16 | 9 1/2 | 9 3/16 | 8 13/16 | 7 15/16 | 6 11/16 | 6 5/16 | 5 3/8 | 3 11/16 | 1 7/8 | 0 |
| | VCO | 0 | 1 5/16 | 1 3/4 | 2 1/16 | 2 5/16 | 3 3/8 | 3 11/16 | 3 7/8 | 3 15/16 | 3 7/8 | 3 11/16 | 3 3/8 | 2 5/16 | 2 5/8 | 2 1/16 | 1 3/4 | 1 5/16 | 0 |
| | TRC | 0 | 2 13/16 | 5 7/16 | 7 15/16 | 9 5/8 | 11 5/16 | 12 1/2 | 13 3/16 | 13 7/16 | 13 3/16 | 12 1/2 | 11 5/16 | 9 5/8 | 8 15/16 | 7 15/16 | 5 7/16 | 2 13/16 | 0 |

| LOCATION | | ℄ BRG. ABUT. A | 0.0625L | 0.1250L | 0.1875L | 0.2500L | 0.3125L | 0.3750L | 0.4375L | 0.5000L | 0.5625L | 0.6250L | 0.6875L | 0.7500L | FS | 0.8125L | 0.8750L | 0.9375L | ℄ BRG. ABUT. B |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GIRDERS 2 - 5 | DLS | 0 | 3/8 | 3/4 | 1 1/16 | 1 3/16 | 1 1/16 | 1 3/4 | 1 7/8 | 1 15/16 | 1 7/8 | 1 3/4 | 1 11/16 | 1 3/8 | 1 1/4 | 1 1/16 | 3/4 | 3/8 | 0 |
| | DLC | 0 | 1 5/16 | 2 5/16 | 3 15/16 | 4 11/16 | 5 1/2 | 6 1/16 | 6 3/16 | 6 5/8 | 6 3/16 | 6 1/16 | 5 1/2 | 4 11/16 | 4 5/16 | 3 15/16 | 2 5/16 | 1 5/16 | 0 |
| | SDL | 0 | 3/8 | 11/16 | 1 | 1 1/4 | 1 1/2 | 1 5/8 | 1 11/16 | 1 3/4 | 1 11/16 | 1 5/8 | 1 1/2 | 1 1/4 | 1 3/16 | 1 | 11/16 | 3/8 | 0 |
| | TD&C | 0 | 2 1/16 | 4 | 5 3/4 | 7 1/4 | 8 3/16 | 9 1/16 | 10 | 10 5/16 | 10 | 9 1/16 | 8 3/16 | 7 3/16 | 6 3/4 | 5 3/4 | 4 | 2 1/16 | 0 |
| | VCO | 0 | 1 5/16 | 1 3/4 | 2 1/16 | 2 5/16 | 3 3/8 | 3 11/16 | 3 7/8 | 3 15/16 | 3 7/8 | 3 11/16 | 3 3/8 | 2 5/16 | 2 3/4 | 2 1/16 | 1 3/4 | 1 5/16 | 0 |
| | TRC | 0 | 3 | 5 3/4 | 8 3/16 | 10 3/16 | 11 15/16 | 13 1/16 | 13 7/8 | 14 1/4 | 13 7/8 | 13 1/16 | 11 15/16 | 10 1/4 | 9 1/2 | 8 3/16 | 5 3/4 | 3 | 0 |

### NOTES:

1. ALL GIRDERS OF ALL SPANS SHALL BE CAMBERED FOR DEAD LOAD DEFLECTION TO THE DIMENSIONS SHOWN ON THIS PLAN. THE CAMBER TOLERANCE IS NOTHING UNDER TO 3/4 INCH OVER.
2. CAMBERS ARE SHOWN IN INCHES.
3. POSITIVE DEFLECTIONS ARE MEASURED IN THE DOWNWARD DIRECTION. POSITIVE VERTICAL CURVE ORDINATE AND POSITIVE CAMBER ARE MEASURED IN THE UPWARD DIRECTION.

### LEGEND:

DLS- DENOTES DEFLECTION DUE TO STRUCTURAL STEEL

DLC- DENOTES DEFLECTION DUE TO CONCRETE SLAB

SDL- DENOTES DEFLECTION DUE TO PARAPET AND FUTURE WEARING SURFACE

TD&C- DENOTES TOTAL DEAD LOAD DEFLECTION AND CAMBER

VCO- DENOTES CAMBER FOR VERTICAL CURVE ORDINATE DUE TO ROADWAY PROFILE

TRC- TOTAL REQUIRED CAMBER = TD&C + VCO

FS- FIELD SPLICE (OPTIONAL)

BR1-8
CT-01

**DELAWARE**
**DEPARTMENT OF TRANSPORTATION**

| ADDENDUMS / REVISIONS | |
|---|---|
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SCALE: AS NOTED

**US 301,**
**SR 896 TO SR 1**

| CONTRACT | BRIDGE NO. 1-460A |
|---|---|
| T200911308 | DESIGNED BY: A.D.D. |
| COUNTY | CHECKED BY: B.K.B. |
| NEW CASTLE | |

**CAMBER DIAGRAM**

| SHEET NO. |
|---|
| 521 |
| TOTAL SHTS. |
| 875 |

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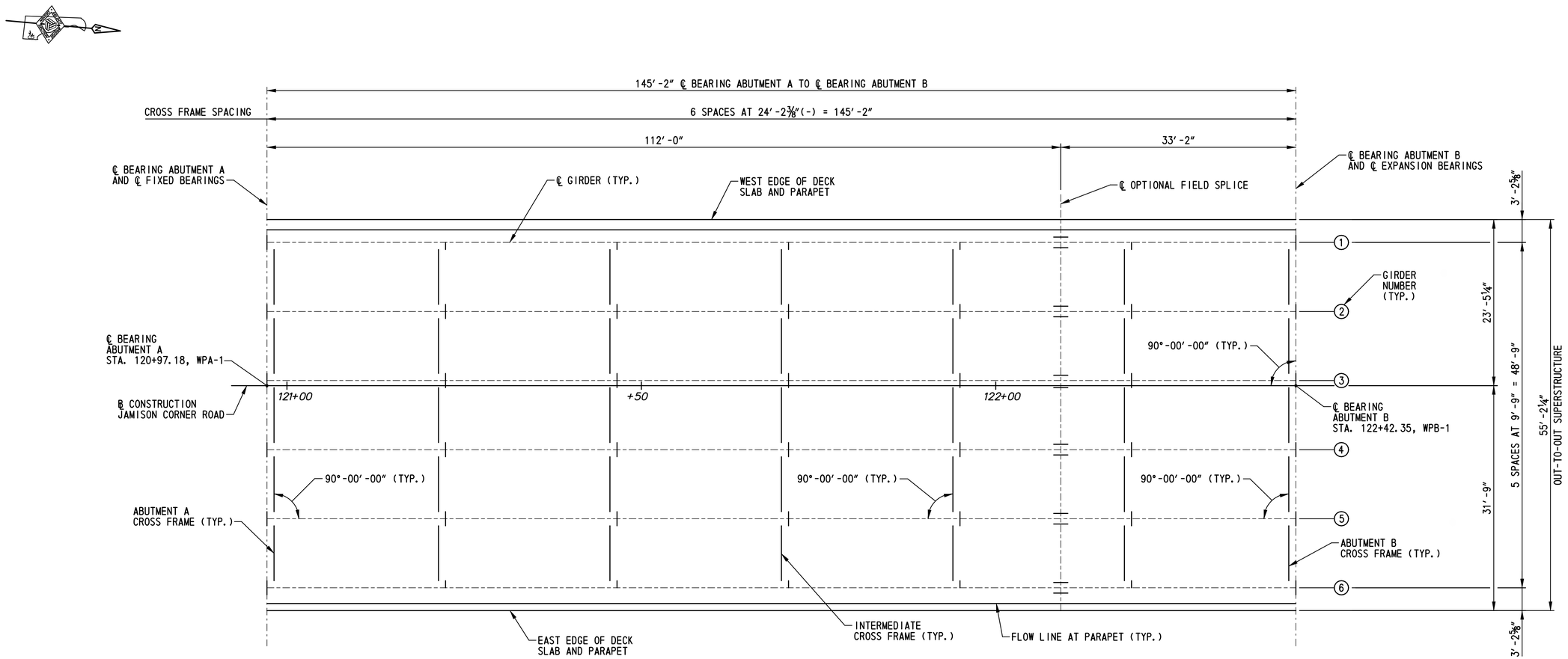


## FRAMING PLAN

SCALE: ⅛″=1′-0″

NOTES:

1. FOR CROSS FRAME DETAILS, SEE DWG. NO. BM-02.
2. FOR OPTIONAL FIELD SPLICE DETAILS, SEE DWG. NO. BM-03.

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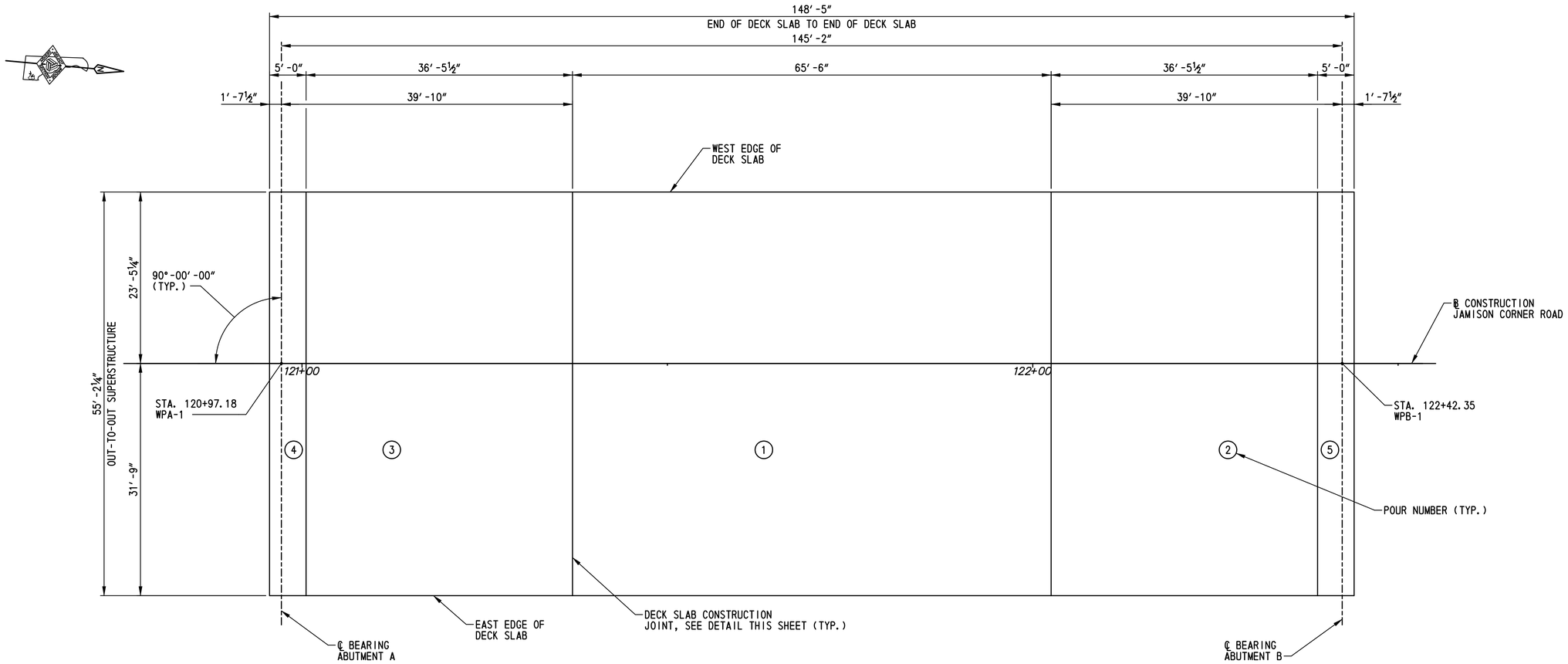
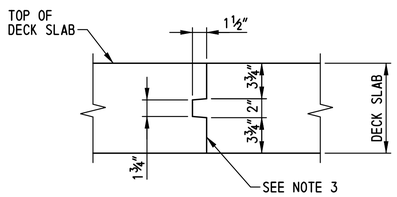
| DELAWARE DEPARTMENT OF TRANSPORTATION | ADDENDUMS / REVISIONS | SCALE: AS NOTED | US 301, SR 896 TO SR 1 | CONTRACT T200911308 | BRIDGE NO. 1-460A | FRAMING PLAN | BR1-8 FR-01 |
| | | | | COUNTY NEW CASTLE | DESIGNED BY: A.D.D. | | SHEET NO. 522 |
| | | | | | CHECKED BY: B.K.B. | | TOTAL SHTS. 875 |




## DECK SLAB POURING SEQUENCE PLAN

SCALE: ⅛″=1′-0″




## DECK SLAB CONSTRUCTION JOINT DETAIL

SCALE: 1½″=1′-0″

### NOTES:

1. THE POURING SEQUENCE FOR THE DECK SLAB SHALL BE MADE IN THE NUMBERED ORDER INDICATED. THERE MUST BE AT LEAST FORTY (40) HOURS BETWEEN THE COMPLETION OF ONE NUMBERED POUR AND THE START OF THE NEXT NUMBERED POUR. THE CONTRACTOR MAY REVERSE THE ORDER OF POURS NUMBERED 2 AND 3 AND 4 AND 5. THE CONTRACTOR MAY MAKE POURS NUMBERED 2 AND 3 AND 4 AND 5 WITHOUT ANY DELAY BETWEEN THEM.
2. THE CONTRACTOR SHALL FOLLOW THE POURING SEQUENCE SHOWN ON THESE PLANS. NO OTHER ALTERNATIVE POURING SEQUENCE WILL BE ALLOWED FOR THIS PROJECT.
3. ENTIRE FACE OF CONSTRUCTION JOINT SHALL BE COATED WITH AN APPROVED EPOXY BONDING COMPOUND.
4. FOR FINISHED ROADWAY ELEVATIONS, SEE DWG. NO. RE-01.
5. FOR DECK SLAB REINFORCEMENT, SEE DWG. NOS. DK-01 THRU DK-03.

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**DELAWARE DEPARTMENT OF TRANSPORTATION**

| ADDENDUMS / REVISIONS | |
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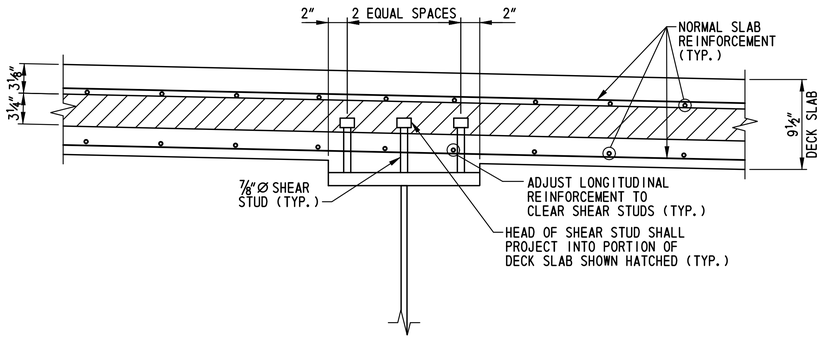
SCALE: AS NOTED

**US 301, SR 896 TO SR 1**

| CONTRACT | BRIDGE NO. | 1-460A |
|---|---|---|
| T200911308 | DESIGNED BY: | A.D.D. |
| COUNTY | CHECKED BY: | B.K.B. |
| NEW CASTLE | | |

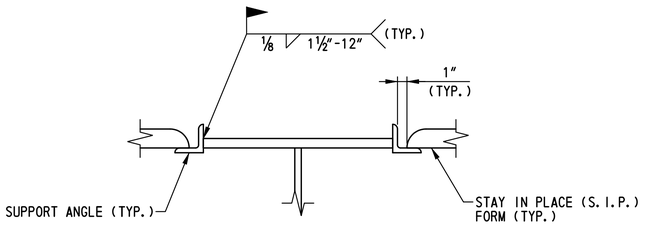
**DECK SLAB POURING SEQUENCE**

| BR1-8 PS-01 | |
|---|---|
| SHEET NO. | 523 |
| TOTAL SHTS. | 875 |

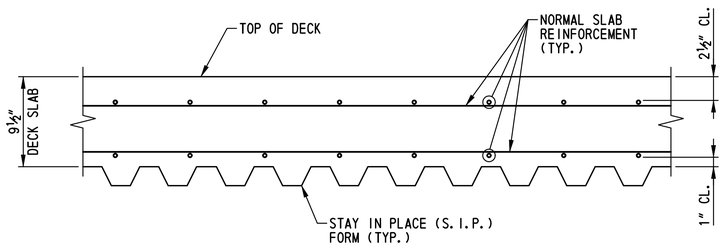



## SHEAR STUD DETAIL
SCALE: 1½"=1'-0"

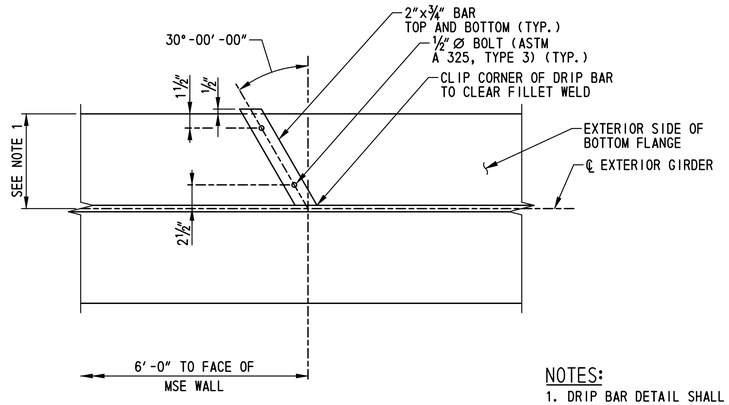
**NOTES:**
1. S.I.P. FORMS NOT SHOWN FOR CLARITY.
2. FOR LONGITUDINAL SPACING OF SHEAR STUDS SEE DWG. NO. BM-01.




## S.I.P. FORM ATTACHMENT DETAIL
SCALE: 1½"=1'-0"



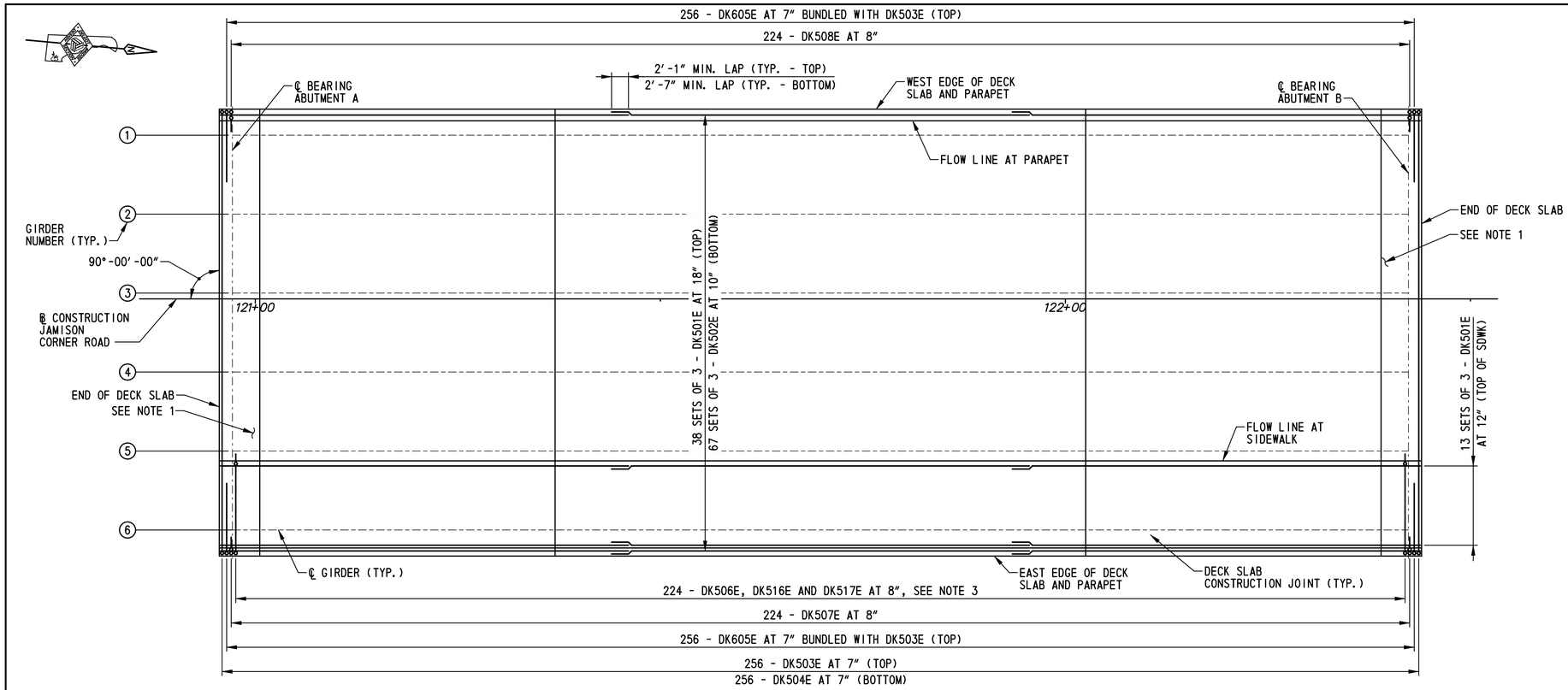

## S.I.P. FORM PLACEMENT DETAIL
SCALE: 1½"=1'-0"




## DRIP BAR DETAIL
SCALE: 1½"=1'-0"

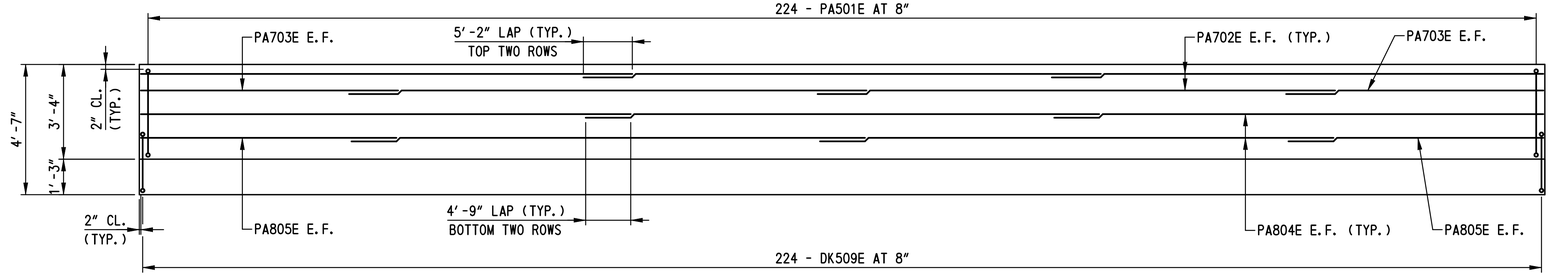
**NOTES:**
1. DRIP BAR DETAIL SHALL BE PLACED ON BOTTOM FLANGE. PROVIDE DRIP BAR FOR EXTERIOR FACE OF GIRDER NOS. 1 AND 6 ONLY.
2. DRIP BARS ARE PLACED ADJACENT TO SUPPORTS TO PREVENT WATER FLOW ONTO SUPPORT.
3. DRIP BARS SHALL BE CAULKED AGAINST FLANGE, WEB AND FILLET WELD WITH AN APPROVED NONHARDENING CAULKING COMPOUND.

**STAY IN PLACE FORM NOTES:**
1. STAY IN PLACE FORMS SHALL CONFORM TO 602.03.
2. STAY IN PLACE FORMS SHALL BE VERTICALLY ADJUSTED TO ATTAIN FINISHED LINES AND GRADES REQUIRED ON THE PLANS.
3. ANY PERMANENTLY EXPOSED FORM METAL WHERE THE GALVANIZED COATING HAS BEEN DAMAGED SHALL BE THOROUGHLY CLEANED, WIRE BRUSHED, AND PAINTED WITH TWO COATS OF ZINC-OXIDE DUST PRIMER, FEDERAL SPECIFICATION TT-P-641D, TYPE II, NO COLOR ADDED, TO THE SATISFACTION OF THE ENGINEER. MINOR HEAT DISCOLORATION IN AREAS OF WELDS NEED NOT BE TOUCHED UP.



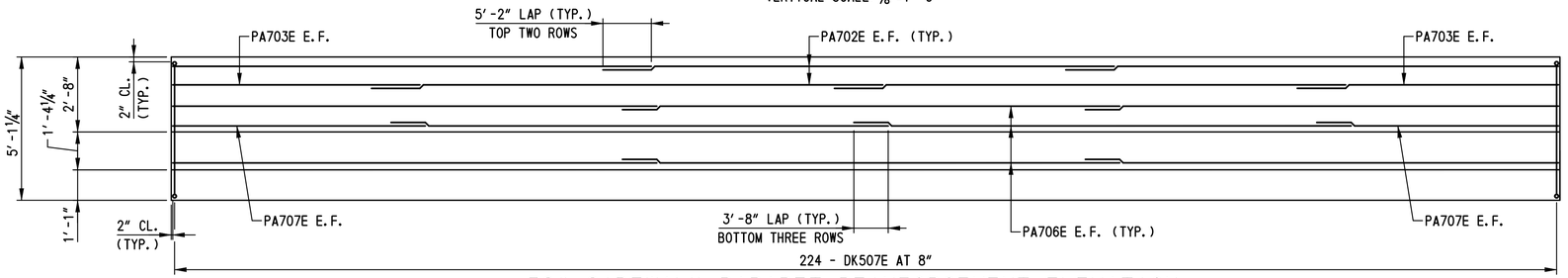

## DECK SLAB REINFORCEMENT PLAN

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




## 42" F-SHAPE PARAPET REINFORCEMENT ELEVATION

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




## 32" SIDEWALK PARAPET REINFORCEMENT ELEVATION

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

NOTES:

1. FOR ADDITIONAL REINFORCEMENT IN END HAUNCH, SEE DWG. NO. DK-03.
2. FOR ADDITIONAL DECK SLAB AND PARAPET REINFORCEMENT DETAILS, SEE DWG. NOS. DK-02 AND DK-03.
3. FOR INFORMATION ON DK506E, DK516E AND DK517E AND ASSOCIATED MECHANICAL COUPLER, SEE DWG. NO. DK-02.
4. FOR DECK SLAB CONSTRUCTION JOINT LOCATIONS AND DECK SLAB POURING SEQUENCE, SEE DWG. NO. PS-01.
5. PARAPET CONTROL JOINTS NOT SHOWN FOR CLARITY. FOR PARAPET CONTROL JOINT LOCATIONS, SEE DWG. NO. PE-01. FOR PARAPET CONTROL JOINT DETAILS, SEE DWG. NO. FD-01.

**DELAWARE DEPARTMENT OF TRANSPORTATION**

ADDENDUMS / REVISIONS

SCALE: AS NOTED

**US 301, SR 896 TO SR 1**

| CONTRACT | BRIDGE NO. 1-460A |
|---|---|
| T200911308 | DESIGNED BY: A.D.D. |
| COUNTY | CHECKED BY: B.K.B. |
| NEW CASTLE | |

**DECK SLAB AND PARAPET REINFORCEMENT**

| BR1-8 DK-01 | |
|---|---|
| SHEET NO. | 525 |
| TOTAL SHTS. | 875 |

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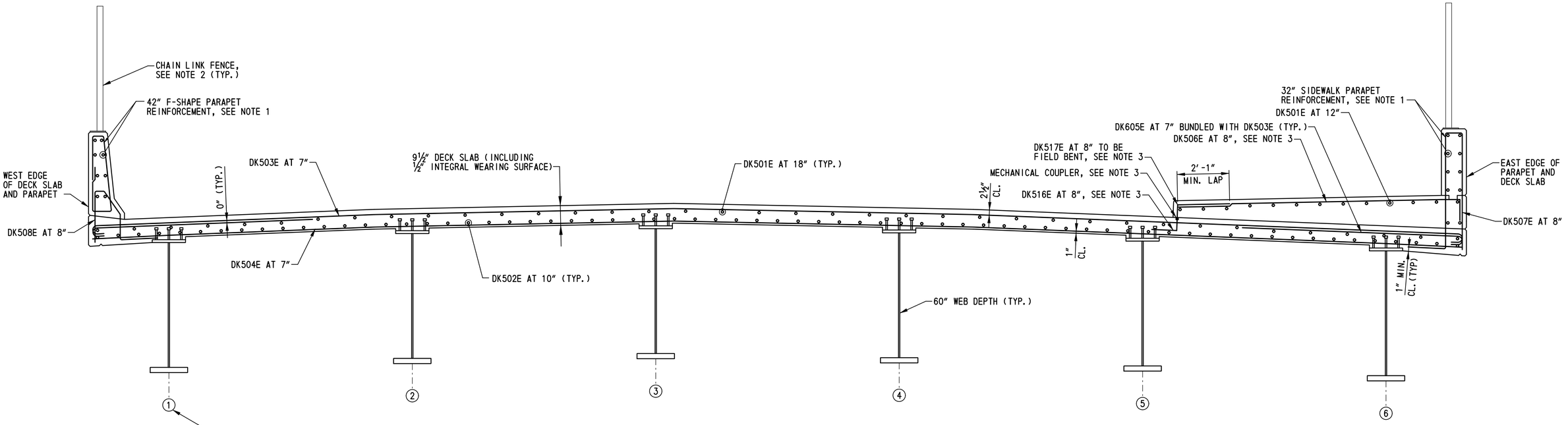


## DECK SLAB TYPICAL REINFORCEMENT SECTION

SCALE: ½"=1'-0"

NOTES:

1. FOR 42" F-SHAPE PARAPET AND 32" SIDEWALK PARAPET REINFORCEMENT, SEE DWG. NO. DK-03.
2. FOR CHAIN LINK FENCE DETAILS, SEE DWG. NOS. FD-01 AND FD-02.
3. THE CONTRACTOR HAS THE OPTION OF UTILIZING ONE REINFORCEMENT BAR RATHER THAN A DK506E, DK516E, DK517E AND A MECHANICAL COUPLER. HOWEVER NO ADDITIONAL COMPENSATION TO THE CONTRACTOR WILL BE ALLOWED FOR WHICHEVER ALTERNATIVE IS SELECTED.

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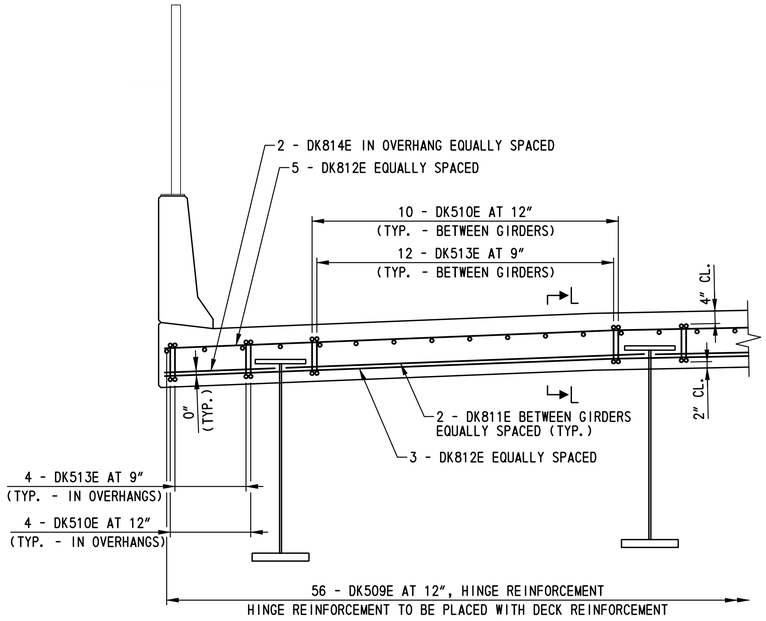
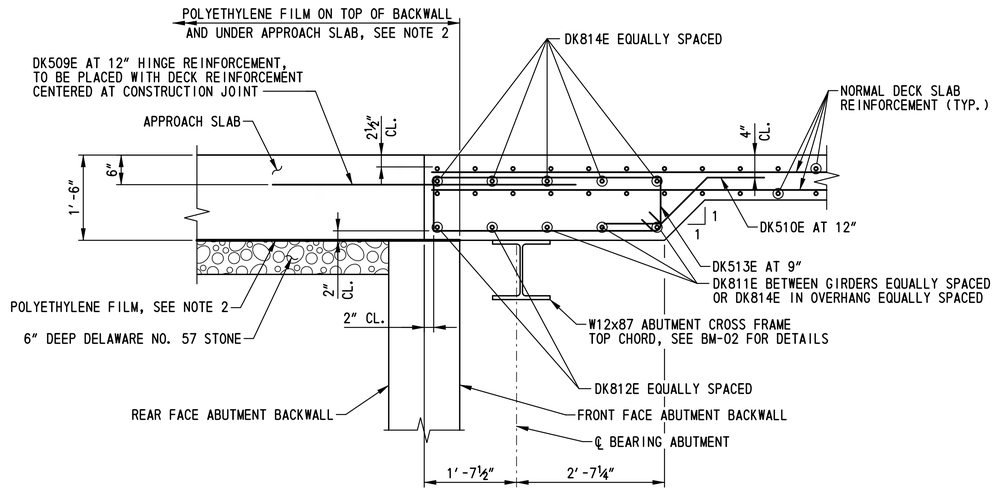
| **DELAWARE DEPARTMENT OF TRANSPORTATION** | ADDENDUMS / REVISIONS | SCALE: AS NOTED | **US 301, SR 896 TO SR 1** | CONTRACT T200911308 | BRIDGE NO. **1-460A** | **DECK SLAB AND PARAPET REINFORCEMENT DETAILS - 1** | BR1-8 DK-02 |
| | | | | COUNTY NEW CASTLE | DESIGNED BY: A.D.D. | | SHEET NO. 526 |
| | | | | | CHECKED BY: B.K.B. | | TOTAL SHTS. 875 |



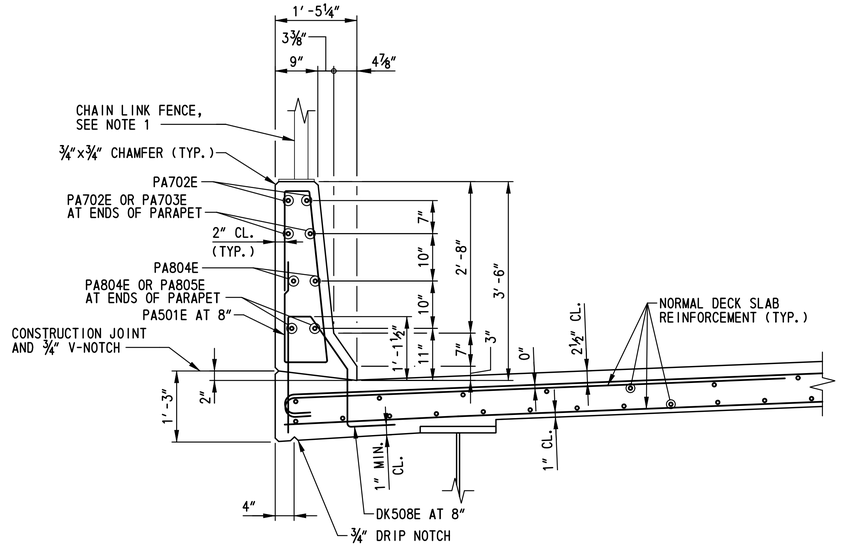

NOTE:
NORMAL SLAB AND PARAPET REINFORCEMENT
NOT SHOWN FOR CLARITY.

## CONCRETE END HAUNCH TYPICAL REINFORCEMENT SECTION
SCALE: ½"=1'-0"

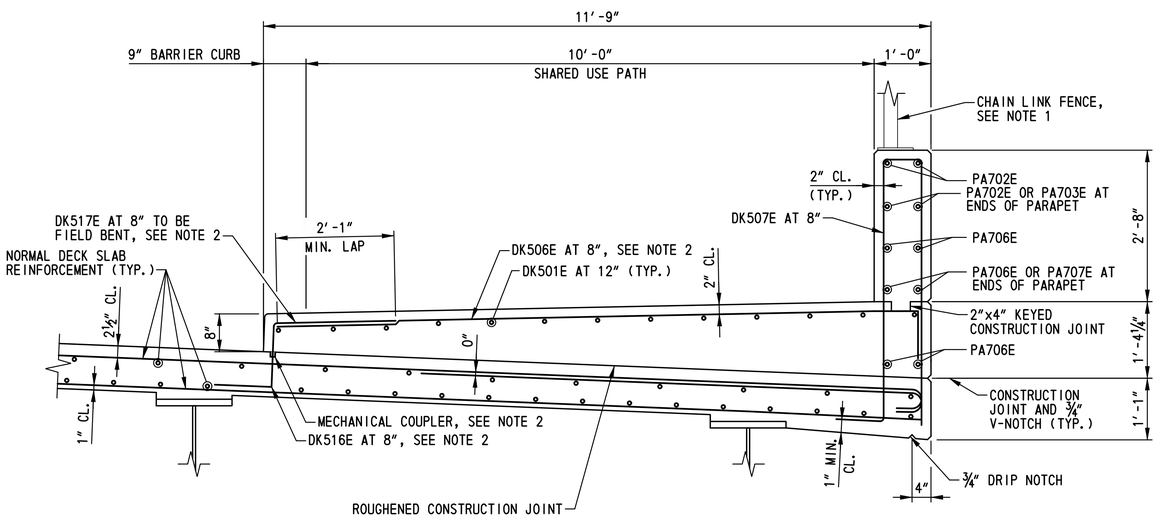



## SECTION L-L
SCALE: ¾"=1'-0"

NOTES:
1. APPROACH SLAB REINFORCEMENT NOT SHOWN FOR CLARITY.
2. POLYETHYLENE FILM LOCATED AT ABUTMENT B BACKWALL AND APPROACH SLAB B ONLY. FOR POLYETHYLENE FILM INFORMATION, SEE DWG. NO. AS-05.




## 42" F-SHAPE PARAPET REINFORCEMENT TYPICAL SECTION
SCALE: ¾"=1'-0"




## 32" SIDEWALK PARAPET TYPICAL REINFORCEMENT SECTION
SCALE: ¾"=1'-0"

NOTES:
1. FOR CHAIN LINK FENCE DETAILS, SEE DWG. NOS. FD-01 THRU FD-02.
2. THE CONTRACTOR HAS THE OPTION OF UTILIZING ONE REINFORCEMENT BAR RATHER THAN A DK506E, DK516E, DK517E AND A MECHANICAL COUPLER. HOWEVER NO ADDITIONAL COMPENSATION TO THE CONTRACTOR WILL BE ALLOWED FOR WHICHEVER ALTERNATIVE IS SELECTED.

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DELAWARE
DEPARTMENT OF TRANSPORTATION

| ADDENDUMS / REVISIONS | |
|---|---|
| | |
| | |
| | |

SCALE: AS NOTED

**US 301,**
**SR 896 TO SR 1**

| CONTRACT | BRIDGE NO. | 1-460A |
|---|---|---|
| T200911308 | DESIGNED BY: | A.D.D. |
| COUNTY | CHECKED BY: | B.K.B. |
| NEW CASTLE | | |

**DECK SLAB AND PARAPET REINFORCEMENT DETAILS - 2**

| BR1-8 DK-03 | |
|---|---|
| SHEET NO. | 527 |
| TOTAL SHTS. | 875 |

(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) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| QTY. | SIZE | LENGTH | MARK | TYPE | A | B | C | D | E | F/R | G | H | J | K | O |
| DECK SLAB | | | | | | | | | | | | | | | |
| 153 | 5 | 50-09 0 | DK501E | STR | | 50-09 0 | | | | | | | | | |
| 201 | 5 | 51-01 0 | DK502E | STR | | 51-01 0 | | | | | | | | | |
| 256 | 5 | 56-00 1 | DK503E | 1 | 0-07 0 | 54-10 1 | | | | | 0-07 0 | | 0-05 0 | | |
| 256 | 5 | 54-10 1 | DK504E | STR | | 54-10 1 | | | | | | | | | |
| 512 | 6 | 9-05 3 | DK605E | 1 | 0-08 0 | 8-09 3 | | | | | | | 0-06 0 | | |
| 224 | 5 | 11-05 0 | DK506E | 2 | | 11-05 0 | | | | | | | | | |
| 224 | 5 | 11-02 2 | DK507E | T15 | | 4-09 1 | 0-08 0 | 4-09 1 | 1-00 0 | | | | | 4-09 1 | 1-08 0 |
| 224 | 5 | 5-07 1 | DK508E | T15 | | 2-00 1 | 0-05 2 | 1-01 2 | 1-00 0 | 1-00 0 | | | 0-07 3 | 0-11 0 | 1-01 1 |
| 112 | 5 | 6-00 0 | DK509E | STR | | 6-00 0 | | | | | | | | | |
| 116 | 5 | 3-02 3 | DK510E | 6 | | 1-00 0 | 1-02 3 | 1-00 0 | | | | 0-10 2 | | 0-10 2 | 2-10 2 |
| 30 | 8 | 9-04 2 | DK811E | STR | | 9-04 2 | | | | | | | | | |
| 14 | 8 | 54-10 1 | DK812E | STR | | 54-10 1 | | | | | | | | | |
| 136 | 5 | 10-08 2 | DK513E | T1 | 0-05 2 | 3-10 3 | 1-00 0 | 3-10 3 | 1-00 0 | | 0-05 2 | | | | |
| 12 | 8 | 2-10 1 | DK814E | STR | | 2-10 1 | | | | | | | | | |
| 224 | 5 | 1-05 1 | DK515E | 2 | | 0-10 0 | 0-07 1 | | | | | | | | |
| 224 | 5 | 2-08 1 | DK516E | STR | | 2-08 1 | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| 224 | 5 | 9-03 1 | PA501E | PA | | 2-06 2 | 0-09 0 | 3-00 1 | 0-05 0 | 2-06 2 | | 3-00 0 | | 0-04 0 | |
| 20 | 7 | 52-09 3 | PA702E | STR | | 52-09 3 | | | | | | | | | |
| 8 | 7 | 28-11 3 | PA703E | STR | | 28-11 3 | | | | | | | | | |
| 10 | 8 | 52-06 2 | PA804E | STR | | 52-06 2 | | | | | | | | | |
| 4 | 8 | 28-07 2 | PA805E | STR | | 28-07 2 | | | | | | | | | |
| 16 | 7 | 51-09 3 | PA706E | STR | | 51-09 3 | | | | | | | | | |
| 4 | 7 | 27-08 3 | PA707E | STR | | 27-08 3 | | | | | | | | | |

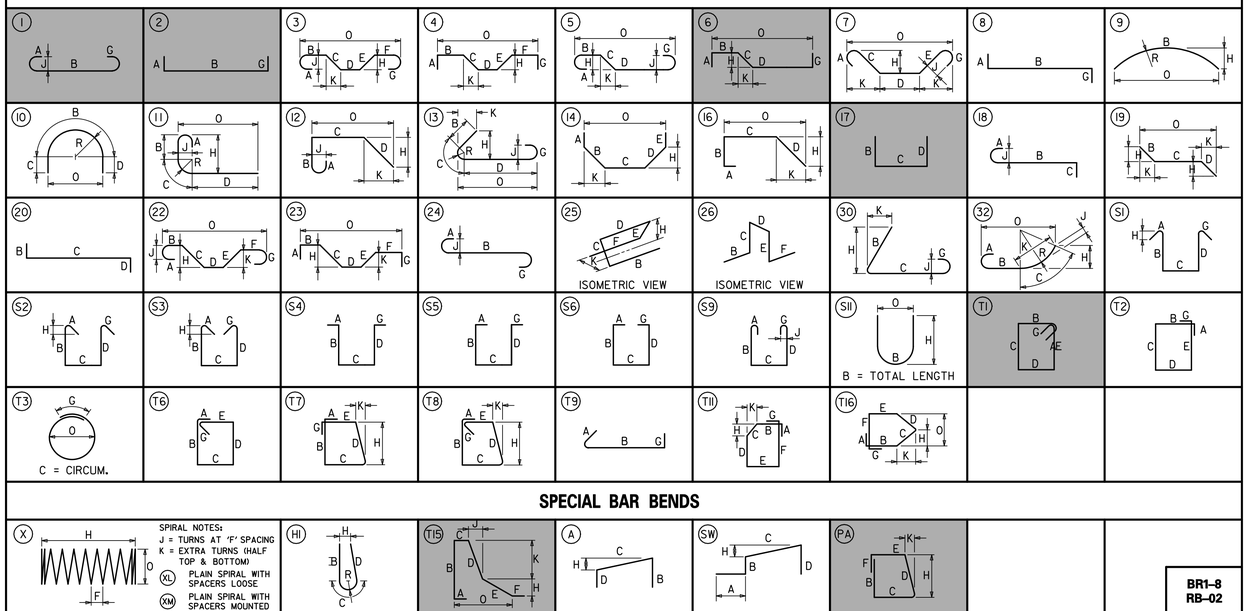
| SPECIFICATIONS | | | | | BENDING DIMENSIONS (FEET-INCHES /QUARTER INCH) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| QTY. | SIZE | LENGTH | MARK | TYPE | A | B | C | D | E | F/R | G | H | J | K | O |

| SPECIFICATIONS | | | | | BENDING DIMENSIONS (FEET-INCHES /QUARTER INCH) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| QTY. | SIZE | LENGTH | MARK | TYPE | A | B | C | D | E | F/R | G | H | J | K | O |

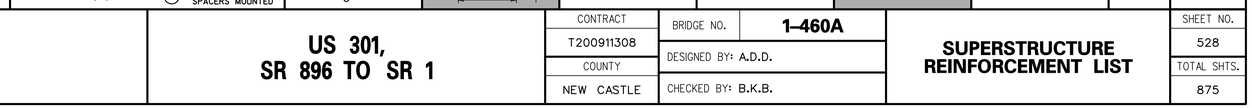
| ASTM STANDARD ENGLISH REINFORCING BARS | | | | RECOMMENDED END HOOKS, APPLICABLE TO ALL GRADES | | | | STIRRUP AND TIE HOOKS, APPLICABLE TO ALL GRADES | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | NOMINAL DIMENSIONS | | | | 180° HOOKS | | 90° HOOKS | | 90° HOOK | 135° HOOK | |
| BAR SIZE | DIAMETER (INCHES) | AREA (INCHES²) | WEIGHT (LBS./FT.) | D | A OR G | J | A OR G | D | A OR G | A OR G | H |
| 3 | 0.375 | 0.110 | 0.376 | 2¼″ | 5″ | 3″ | 6″ | 1½″ | 4″ | 4″ | 2½″ |
| 4 | 0.500 | 0.200 | 0.668 | 3″ | 6″ | 4″ | 8″ | 2″ | 4½″ | 4½″ | 3″ |
| 5 | 0.625 | 0.310 | 1.043 | 3¾″ | 7″ | 5″ | 10″ | 2½″ | 6″ | 5½″ | 3¾″ |
| 6 | 0.750 | 0.440 | 1.502 | 4½″ | 8″ | 6″ | 1-0″ | 4½″ | 1-0″ | 8″ | 4½″ |
| 7 | 0.875 | 0.600 | 2.044 | 5¼″ | 10″ | 7″ | 1-2″ | 5¼″ | 1-2″ | 9″ | 5¼″ |
| 8 | 1.000 | 0.790 | 2.670 | 6″ | 11″ | 8″ | 1-4″ | 6″ | 1-4″ | 10½″ | 6″ |
| 9 | 1.128 | 1.000 | 3.400 | 9½″ | 1-3″ | 11¾″ | 1-7″ | | | | |
| 10 | 1.270 | 1.270 | 4.303 | 10¾″ | 1-5″ | 1-1¼″ | 1-10″ | | | | |
| 11 | 1.410 | 1.560 | 5.313 | 1-0″ | 1-7″ | 1-2¾″ | 2-0″ | | | | |
| 14 | 1.693 | 2.250 | 7.650 | 1-6¼″ | 2-3″ | 1-9¾″ | 2-7″ | | | | |
| 18 | 2.257 | 4.000 | 13.600 | 2-0″ | 3-0″ | 2-4½″ | 3-5″ | | | | |

NOTES:
1. FIGURES SHOWN IN CIRCLES REPRESENT BAR BEND TYPES.
2. STANDARD BAR BENDS INCLUDE ONLY THOSE TYPES BELOW, INDICATED AS SUCH.
3. ALL DIMENSIONS OUT-TO-OUT, EXCEPT "A" AND "G" ON STD. 180° AND 135° HOOKS.
4. "J" DIMENSIONS ON 180° HOOKS TO BE SHOWN ONLY WHERE NECESSARY TO RESTRICT HOOK SIZE, OTHERWISE STANDARD 'ACI' HOOKS ARE TO BE USED.
5. 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.
6. "H" DIMENSIONS OF STIRRUPS TO BE SHOWN AS NEEDED TO FIT WITHIN THE CONCRETE.
7. UNLESS OTHERWISE NOTED, DIAMETER "D" IS THE SAME FOR ALL BENDS AND HOOKS ON A BAR (EXCEPT FOR BEND TYPES 11 AND 13).
8. WHERE SLOPE DIFFERS FROM 45° OFFSET, "H" AND "K" MUST BE SHOWN.
9. WHERE BARS ARE TO BE BENT MORE ACCURATELY THAN STANDARD BENDING TOLERANCES, BENDING DIMENSIONS REQUIRING CLOSER FABRICATION SHOULD HAVE LIMITS INDICATED.
10. FOR RECOMMENDED DIAMETER "D", OF BENDS, HOOKS, ETC., REFER TO TABLE ABOVE, 'CRSI' OR 'ACI' TABLES WHERE APPLICABLE AND REQUIRED.
11. TYPE S1-S6, S11, T1-T3 AND T6-T9 APPLICABLE TO BAR SIZES #3 THROUGH #8.

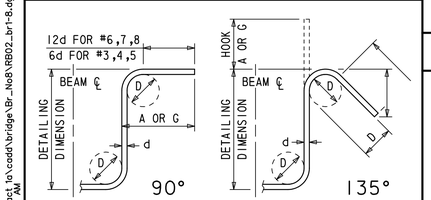
## STANDARD BAR BENDS



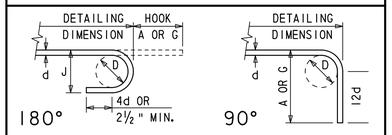

## SPECIAL BAR BENDS

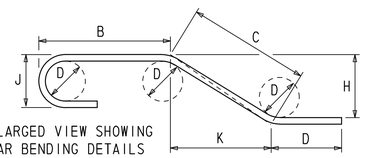



## STIRRUP AND TIE HOOKS




## 180° AND 90° END HOOKS




ADDENDUMS / REVISIONS

**DELAWARE DEPARTMENT OF TRANSPORTATION**

**US 301, SR 896 TO SR 1**

| CONTRACT | T200911308 |
|---|---|
| COUNTY | NEW CASTLE |
| BRIDGE NO. | 1-460A |
| DESIGNED BY: | A.D.D. |
| CHECKED BY: | B.K.B. |

**SUPERSTRUCTURE REINFORCEMENT LIST**

BR1-8
RB-02

| SHEET NO. | 528 |
|---|---|
| TOTAL SHTS. | 875 |

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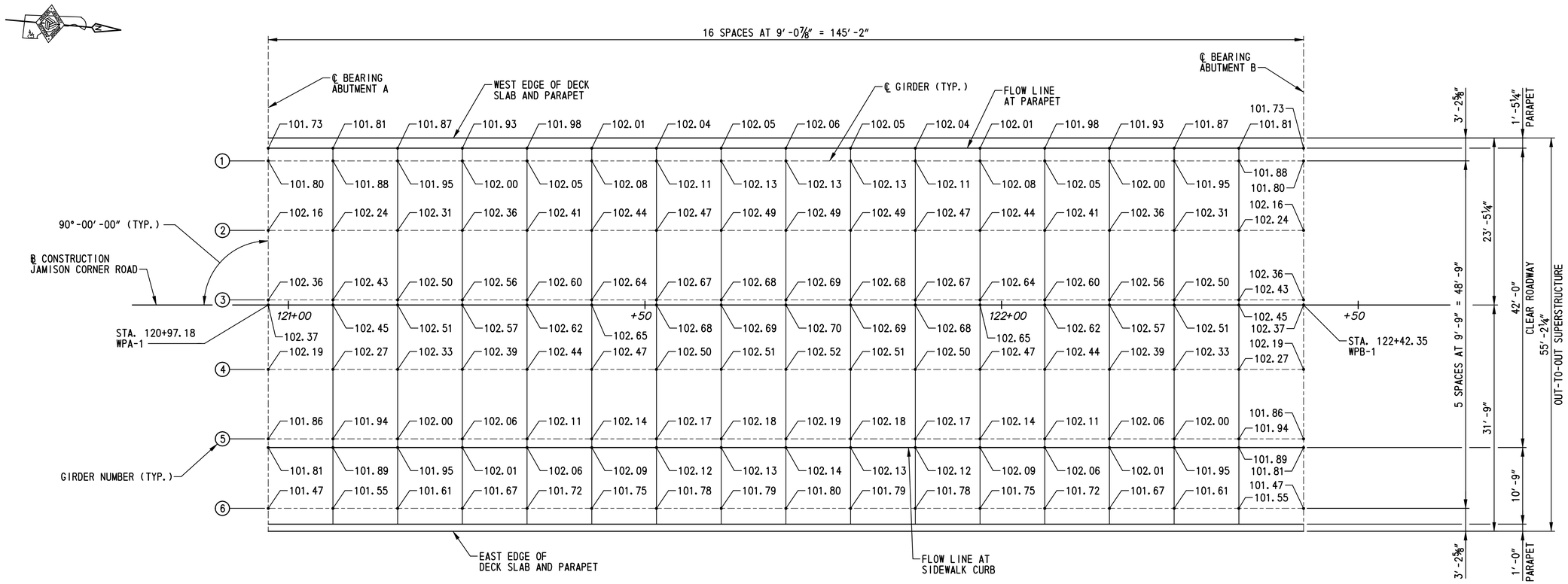
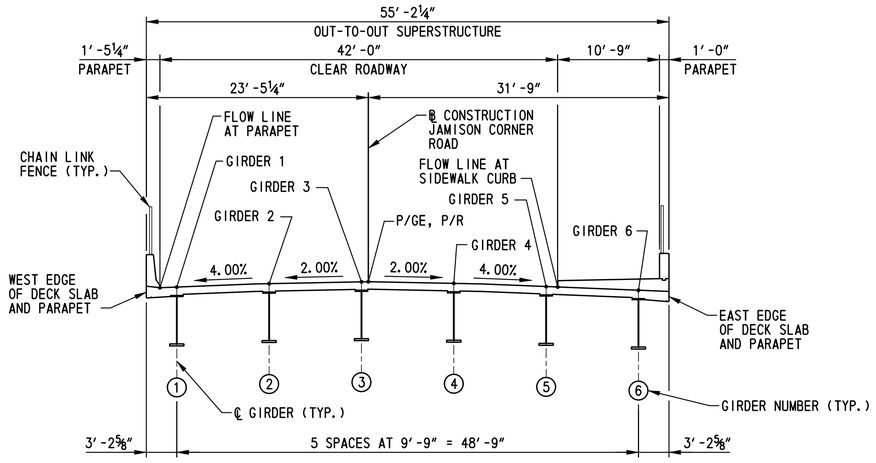



## FINISHED ROADWAY ELEVATIONS

SCALE: ⅛″=1′-0″




## LOCATIONS OF FINISHED ROADWAY ELEVATIONS

SCALE: ⅛″=1′-0″

NOTES:

1. FINISHED ROADWAY ELEVATIONS SHOWN ARE TOP OF PROPOSED CONCRETE DECK SLAB.
2. FOR VERTICAL CURVE DATA, SEE DWG. NO. PE-01.

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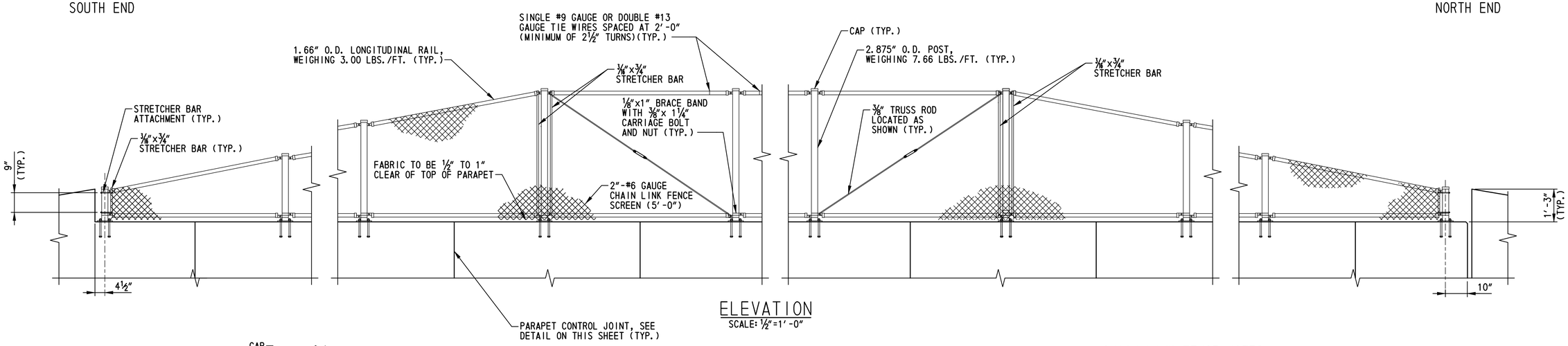
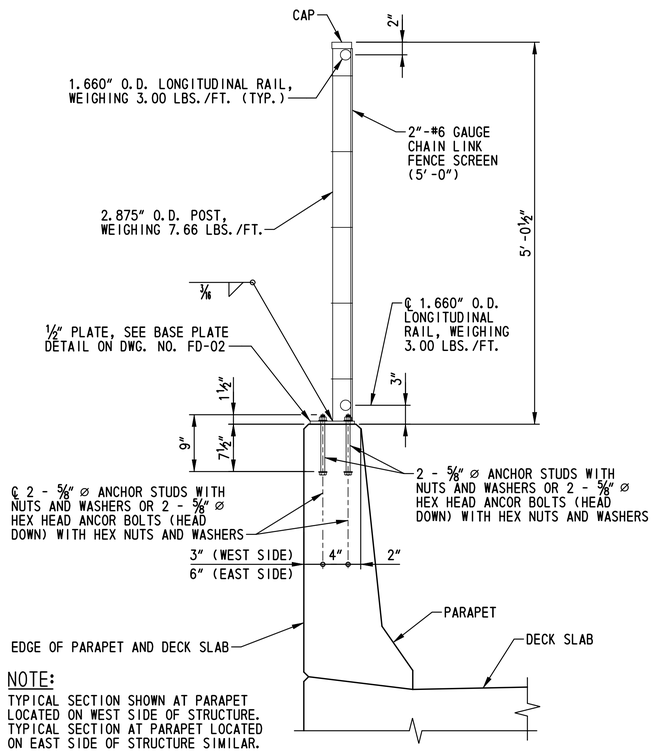
| | | | | | | | |
|---|---|---|---|---|---|---|---|
| DELAWARE DEPARTMENT OF TRANSPORTATION | ADDENDUMS / REVISIONS | SCALE: AS NOTED | US 301, SR 896 TO SR 1 | CONTRACT T200911308 | BRIDGE NO. 1-460A | FINISHED ROADWAY ELEVATIONS | BR1-8 RE-01 |
| | | | | COUNTY NEW CASTLE | DESIGNED BY: A.D.D. | | SHEET NO. 529 |
| | | | | | CHECKED BY: B.K.B. | | TOTAL SHTS. 875 |




ELEVATION

SCALE: ½"=1'-0"

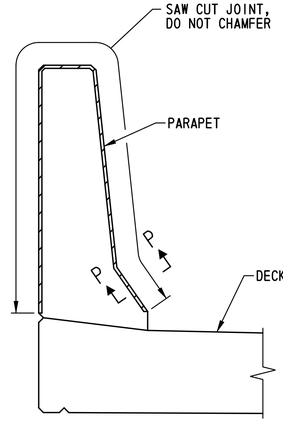



NOTE:

TYPICAL SECTION SHOWN AT PARAPET LOCATED ON WEST SIDE OF STRUCTURE. TYPICAL SECTION AT PARAPET LOCATED ON EAST SIDE OF STRUCTURE SIMILAR.

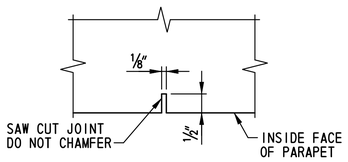
TYPICAL SECTION

SCALE: 1"=1'-0"




PARAPET CONTROL JOINT DETAIL

SCALE: 1"=1'-0"




SECTION P-P

NOT TO SCALE

NOTE:

PLACE PARAPET CONTROL JOINT CENTERED BETWEEN FENCE POSTS.

## CHAIN LINK FENCE NOTES:

1. FOR FENCE POST SPACING, SEE DWG. NO. PE-01. FOR ADDITIONAL FENCE POST DETAILS, SEE DWG. NO. FD-02.
2. POSTS AND RAILS SHALL CONFORM TO ASTM F 1083, SCHEDULE 80. FABRIC SHALL BE 2"-#6 GAUGE CHAIN LINK FENCE (5'-0") IN CONFORMANCE WITH AASHTO M 181.
3. ALL POSTS, BRACES, FITTINGS AND HARDWARE SHALL BE GALVANIZED.
4. ALL PLATES SHALL BE STEEL CONFORMING TO ASTM A 709, GRADE 36.
5. ANCHOR STUDS OR ANCHOR BOLTS SHALL CONFORM TO ASTM A 276, TYPE 430 OR TYPE 304 STAINLESS STEEL ANNEALED, HOT-FINISHED, ULTIMATE STRENGTH 70,000 psi MIN., 20% MIN. ELONGATION. THREADS MAY BE ROLLED OR CUT.
6. EPOXY GROUT FOR ANCHOR STUDS IN CORED HOLES SHALL BE A SAND AND EPOXY MIXED BY VOLUME IN CONFORMANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. THE GROUT SHALL BE CAPABLE OF DEVELOPING A MINIMUM COMPRESSIVE STRENGTH OF 6500 PSI IN 72 HOURS WHEN TESTED IN CONFORMANCE WITH ASTM C 579.
7. ALL LONGITUDINAL RAILS SHALL BE PARALLEL TO TOP OF PARAPET.
8. ALL POSTS SHALL BE SET NORMAL TO TOP OF PARAPET.
9. THE CHAIN LINK FENCE SHALL BE TRUE TO LINE, TAUT, TIGHT FIT TO TOP OF PARAPET, WITH ½" TO 1" CLEAR TO TOP OF PARAPET, AND SHALL COMPLY WITH THE BEST PRACTICE FOR FENCE CONTRUCTION OF THIS TYPE.
10. POSTS AND RAILS SHALL BE PERMANENTLY POSITIONED BEFORE FABRIC IS PLACED.
11. BEFORE PLACING FENCING, PLACE ½" TO 1" THICK MATERIAL (WOOD, ETC.) ON TOP OF PARAPET TO ENSURE THE DESIRED GAP IS ACHIEVED. AFTER FENCE IS RIGIDLY ATTACHED, THIS TEMPORARY BLOCKING SHALL BE REMOVED.
12. AS AN OPTION, THE CONTRACTOR MAY SET THE ANCHOR STUDS AFTER PLACING CONCRETE BARRIER USING ⅞" DIA. CORED HOLES AND AN APPROVED EPOXY GROUT. NUTS AND WASHERS SHALL BE OMITTED FROM THE EMBEDDED ENDS OF ANCHOR STUDS. IF CONTRACTOR ELECTS TO PLACE ANCHOR STUDS AFTER PLACING CONCRETE PARAPET, NEWLY PLACED REBARS SHALL BE LOCATED SO THAT CORING DOES NOT DAMAGE THE REBAR. NO ADDITIONAL COMPENSATION WILL BE ALLOWED FOR THIS OPTION.
13. COAT ALL SURFACES OF BASE PLATES IN CONTACT WITH CONCRETE WITH A CAULKING COMPOUND JUST PRIOR TO BASE PLATE INSTALLATION. AFTER POSTS AND RAILS ARE PERMANENTLY POSITIONED SEAL THE ENTIRE PERIMETER OF THE BASE PLATE BETWEEN METAL SURFACES AND THE CONCRETE WITH A CAULKING COMPOUND. CAULKING COMPOUND SHALL ADHERE TO STEEL AND CONCRETE SURFACES AND MEET THE REQUIREMENTS OF ASTM C 834 OR ASTM C 920. PAYMENT FOR THE CAULKING COMPOUND SHALL BE INCIDENTAL TO ITEM 727507 - BRIDGE SAFETY FENCE.
14. FOR ANTI-CLIMB SHIELD LOCATIONS, SEE DWG. NO. PE-01. FOR ANTI-CLIMB SHIELD DETAILS, SEE DWG. NO. FD-02. PAYMENT FOR INSTALLATION OF ANTI-CLIMB SHIELDS WILL BE INCIDENTAL TO ITEM NO. 727507 - BRIDGE SAFETY FENCE.

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**DELAWARE**
**DEPARTMENT OF TRANSPORTATION**

| ADDENDUMS / REVISIONS | |
|---|---|
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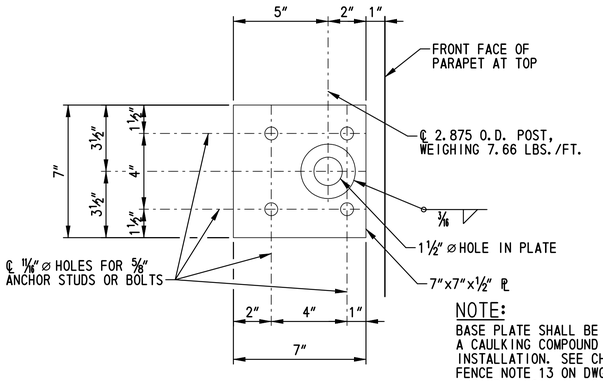
SCALE: AS NOTED

**US 301,**
**SR 896 TO SR 1**

| CONTRACT | BRIDGE NO. | 1-460A |
|---|---|---|
| T200911308 | DESIGNED BY: B.K.B. | |
| COUNTY | CHECKED BY: W.A.G. | |
| NEW CASTLE | | |

**FENCE DETAILS – 1**

| BR1-8 FD-01 | |
|---|---|
| SHEET NO. | 530 |
| TOTAL SHTS. | 875 |

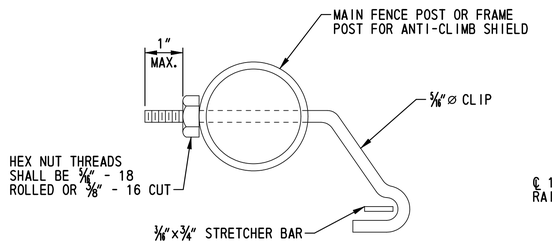



## BASE PLATE DETAIL

SCALE: 3"=1'-0"

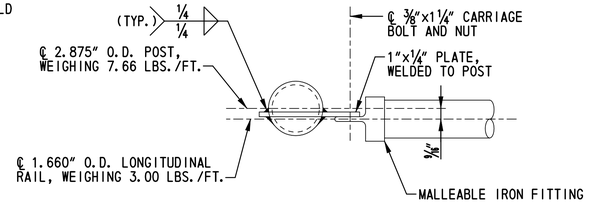
**NOTE:**

BASE PLATE SHALL BE COATED WITH A CAULKING COMPOUND PRIOR TO INSTALLATION. SEE CHAIN LINK FENCE NOTE 13 ON DWG. NO. FD-01 FOR ADDITIONAL INFORMATION.

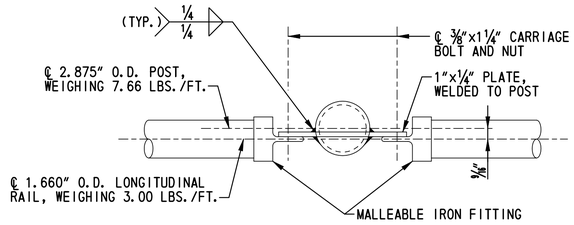



## STRETCHER BAR ATTACHMENT

NOT TO SCALE



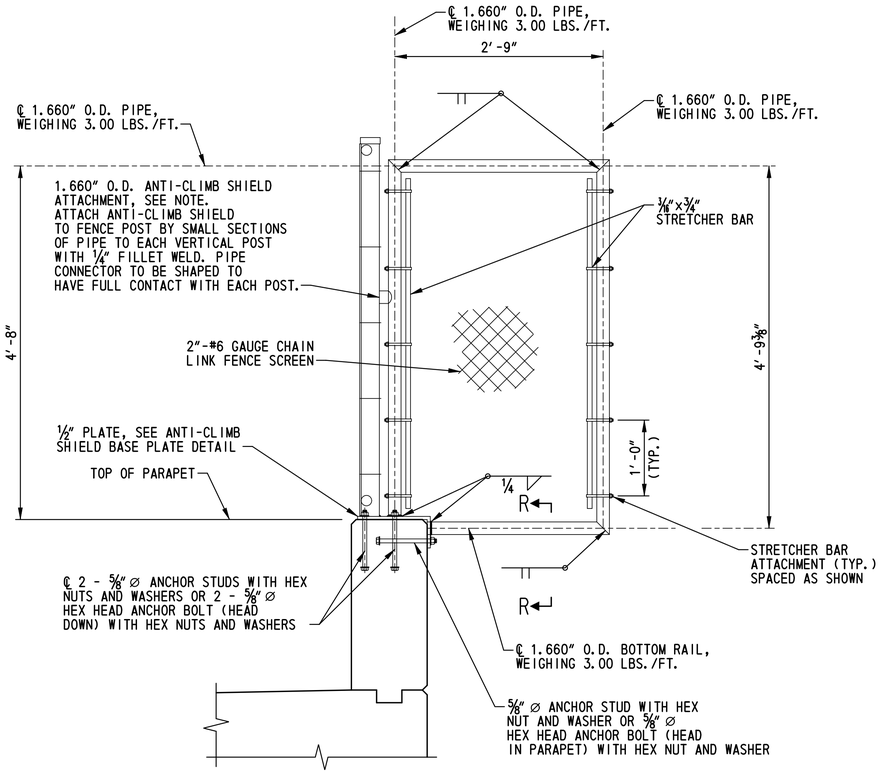

END POST




INTERMEDIATE POST

## TOP LONGITUDINAL RAIL - POST ATTACHMENT

SCALE: 3"=1'-0"

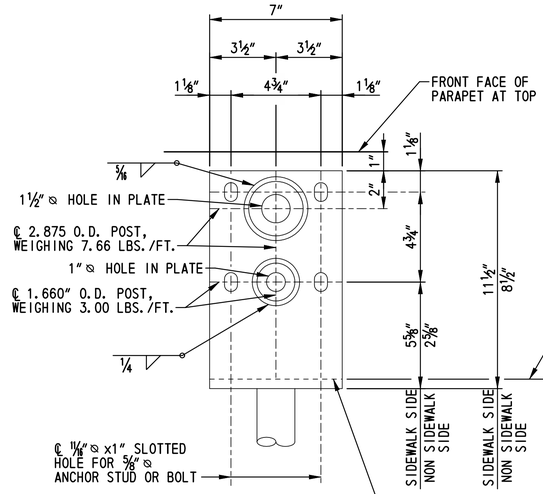



## ANTI-CLIMB SHIELD DETAIL

SCALE: 1"=1'-0"

**NOTE:**

FOR LOCATIONS OF ANTI-CLIMB SHIELD, SEE DWG. NO. PE-01.

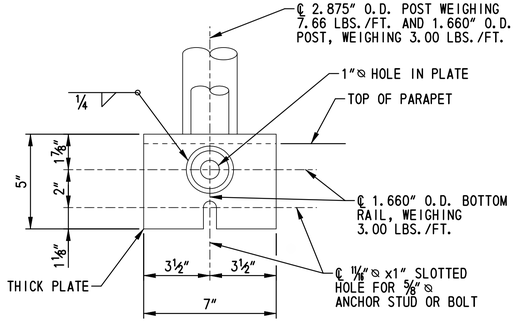



## ANTI-CLIMB SHIELD BASE PLATE DETAIL

SCALE: 3"=1'-0"

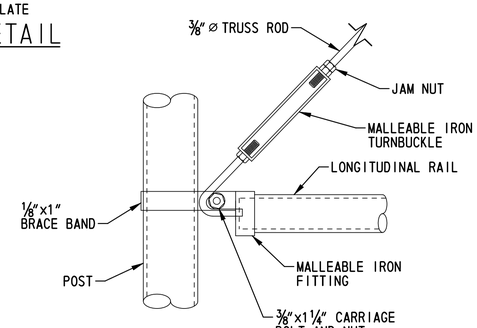
**NOTE:**

BASE PLATE SHALL BE COATED WITH A CAULKING COMPOUND PRIOR TO INSTALLATION. SEE CHAIN LINK FENCE NOTE 13 ON DWG. NO. FD-01 FOR ADDITIONAL INFORMATION.




## SECTION R-R

SCALE: 3"=1'-0"




## TRUSS ROD ATTACHMENT

SCALE: 3"=1'-0"

**NOTE:**

FOR CHAIN LINK FENCE NOTES, SEE DWG. NO. FD-01.

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**DELAWARE DEPARTMENT OF TRANSPORTATION**

| ADDENDUMS / REVISIONS | |
|---|---|
| | |
| | |
| | |

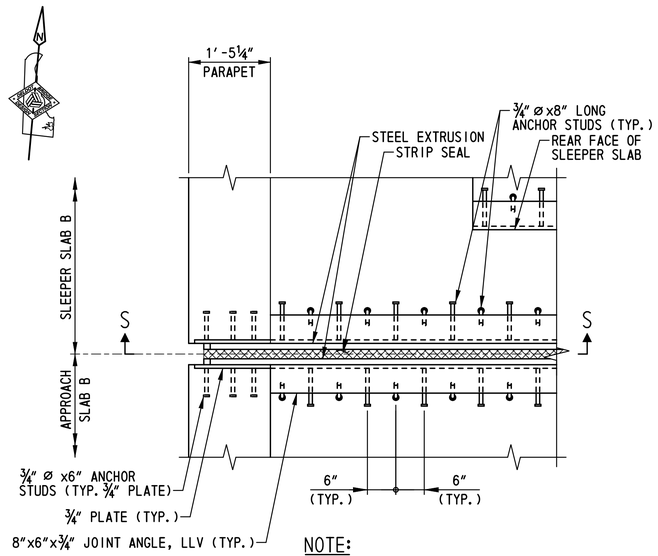
SCALE: AS NOTED

**US 301, SR 896 TO SR 1**

| CONTRACT | BRIDGE NO. | 1-460A |
|---|---|---|
| T200911308 | DESIGNED BY: B.K.B. | |
| COUNTY | CHECKED BY: W.A.G. | |
| NEW CASTLE | | |

**FENCE DETAILS - 2**

| BR1-8 FD-02 |
|---|
| SHEET NO. 531 |
| TOTAL SHTS. 875 |

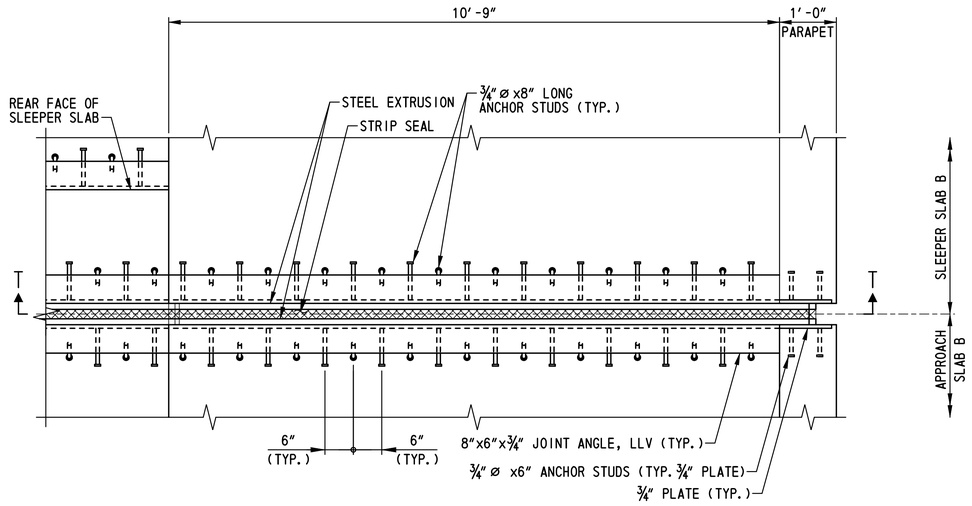


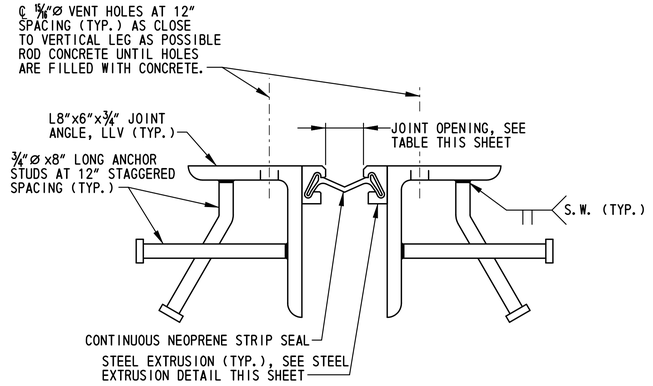

NOTE:

FOR APPROACH B AND SLEEPER SLAB B TYPICAL SECTION, SEE DWG. NO. AS-05. FOR DETAIL OF JOINT ANGLE AT REAR FACE OF SLEEPER SLAB, SEE DWG. NO. AS-02.

## ARMORED STRIP SEAL JOINT PLAN

SCALE: ¾″=1′-0″

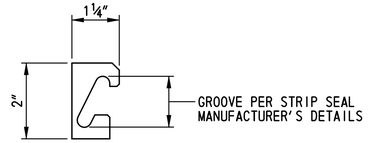



## ARMORED STRIP SEAL JOINT ASSEMBLY DETAIL

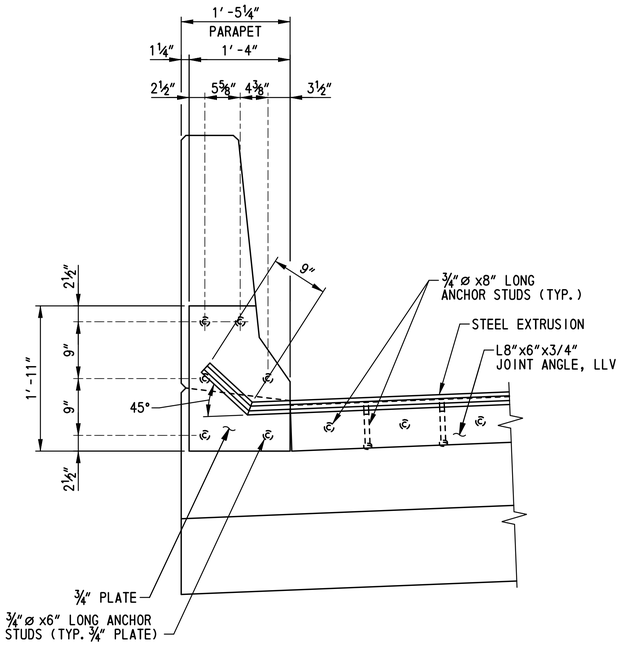
SCALE: 3″=1′-0″

| JOINT OPENING TABLE | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| LOCATION | TEMPERATURE (°F) | | | | | | | | | |
| | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 |
| APPROACH SLAB B | 2 1/16″ | 2 1/16″ | 2 1/16″ | 2 3/16″ | 2 1/4″ | 2 1/8″ | 2″ | 1 7/8″ | 1 3/4″ | 1 11/16″ | 1 5/8″ |



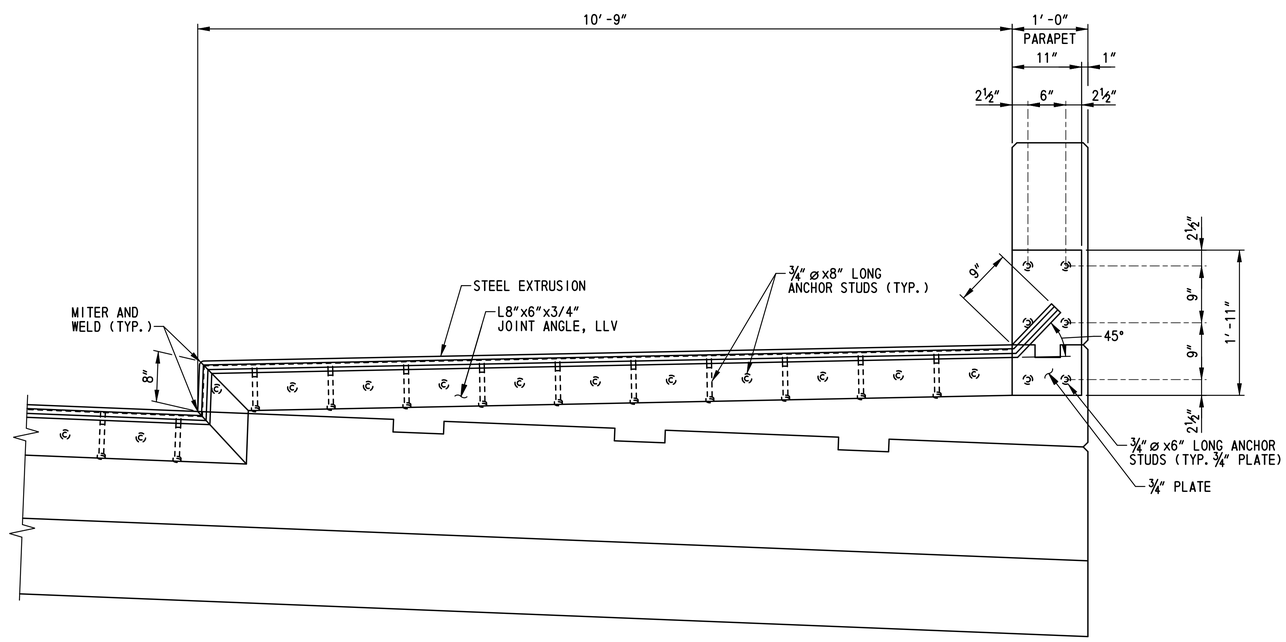

## STEEL EXTRUSION DETAIL

NOT TO SCALE




## SECTION S-S

SCALE: 1″=1′-0″




## SECTION T-T

SCALE: 1″=1′-0″

NOTE:

PAYMENT FOR CONSTRUCTION OF THE ARMORED STRIP SEAL JOINT WILL BE MADE UNDER ITEM NO. 605512 - PREFABRICATED EXPANSION JOINT SYSTEM 4″. SEE THE SPECIAL PROVISIONS FOR ADDITIONAL INFORMATION AND REQUIREMENTS.

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**DELAWARE**
**DEPARTMENT OF TRANSPORTATION**

ADDENDUMS / REVISIONS

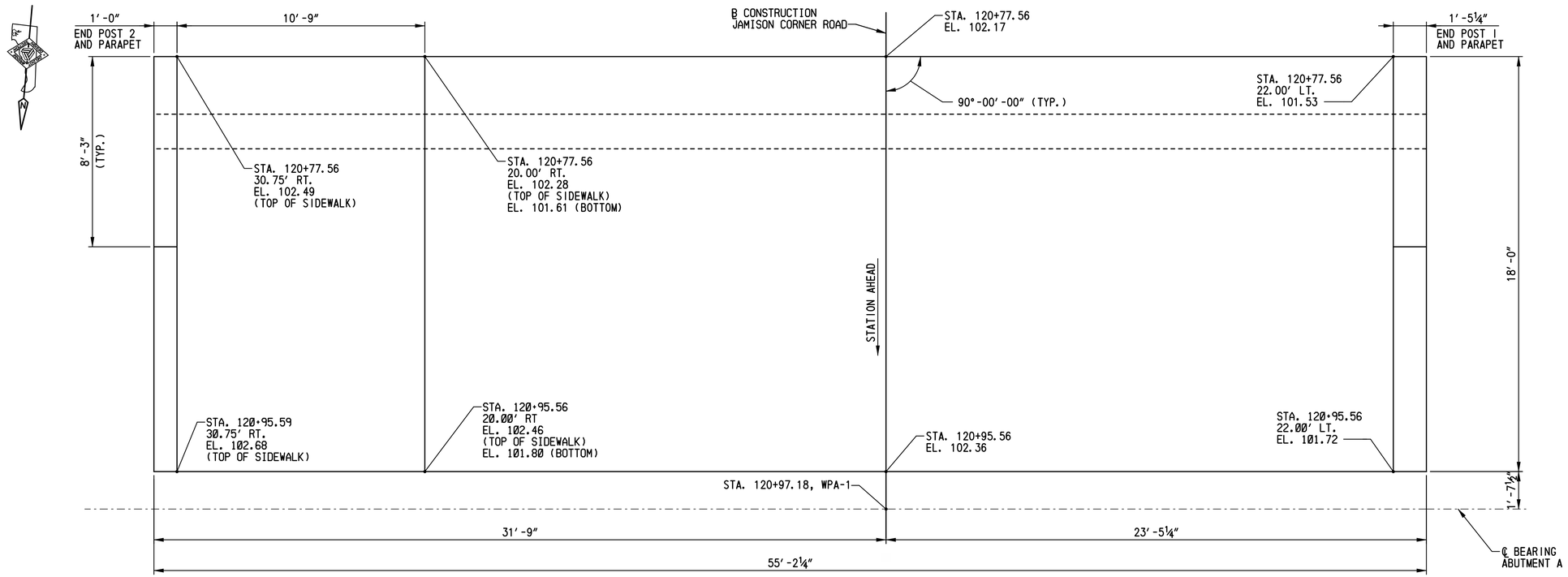
SCALE: AS NOTED

**US 301,**
**SR 896 TO SR 1**

| CONTRACT | BRIDGE NO. | 1-460A |
|---|---|---|
| T200911308 | DESIGNED BY: A.D.D. | |
| COUNTY | CHECKED BY: B.K.B. | |
| NEW CASTLE | | |

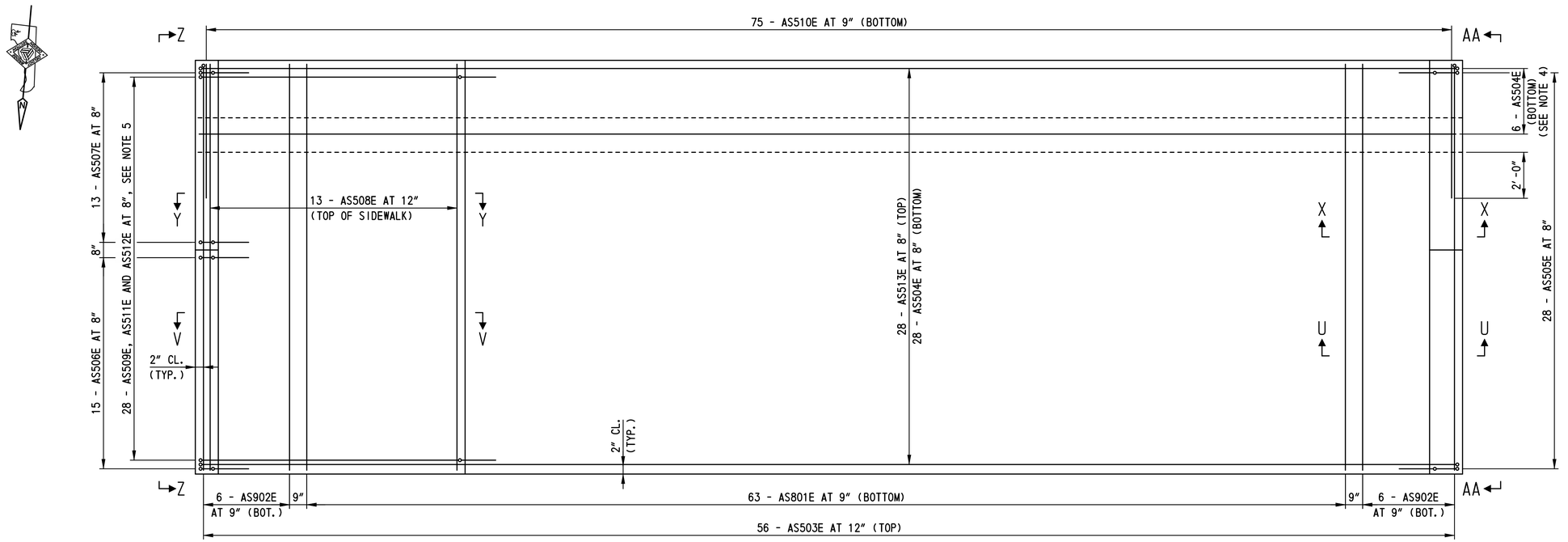
**ARMORED STRIP SEAL JOINT DETAILS**

| BR1-8 EX-01 | |
|---|---|
| SHEET NO. | 532 |
| TOTAL SHTS. | 875 |




## APPROACH SLAB A PLAN

SCALE: ⅜″=1′-0″




## APPROACH SLAB A REINFORCEMENT PLAN

SCALE: ⅜″=1′-0″

NOTES:

1. FOR APPROACH SLAB A TYPICAL SECTION, SEE DWG. NO. AS-02.
2. FOR SECTIONS U-U, V-V, X-X AND Y-Y, SEE DWG. NO. AS-06.
3. FOR VIEWS Z-Z AND AA-AA, SEE DWG. NO. AS-02.
4. FOR ADDITIONAL REINFORCEMENT DETAILS, SEE DWG. NOS. AS-02 AND AS-06.
5. FOR INFORMATION ON AS509E, AS511E AND AS512E AND ASSOCIATED MECHANICAL COUPLER, SEE DWG.NO. AS-06. THE CONTRACTOR HAS THE OPTION OF UTILIZING ONE REINFORCEMENT BAR RATHER THAN A AS509E, AS511E, AS512E AND A MECHANICAL COUPLER. HOWEVER NO ADDITIONAL COMPENSATION WILL BE ALLOWED FOR WHICHEVER ALTERNATIVE IS SELECTED.

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**DELAWARE**
**DEPARTMENT OF TRANSPORTATION**

| ADDENDUMS / REVISIONS | |
|---|---|
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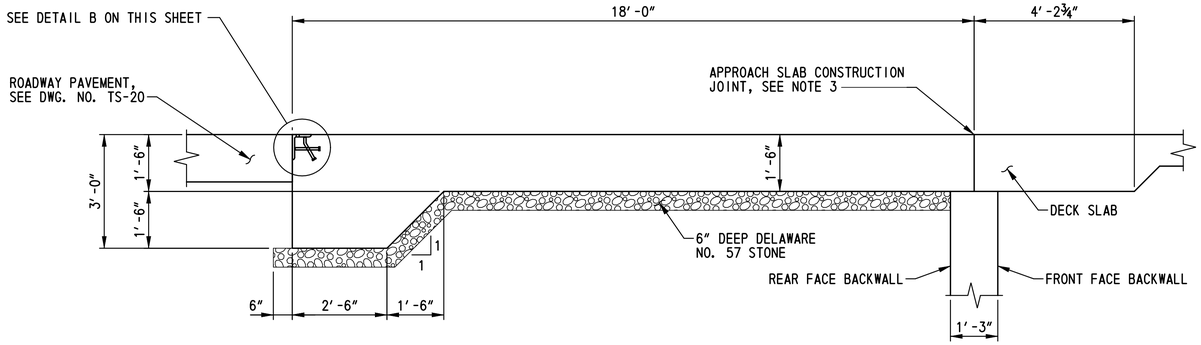
SCALE: AS NOTED

**US 301,**
**SR 896 TO SR 1**

| CONTRACT | BRIDGE NO. 1-460A |
|---|---|
| T200911308 | DESIGNED BY: L.M.B. |
| COUNTY | CHECKED BY: B.K.B. |
| NEW CASTLE | |

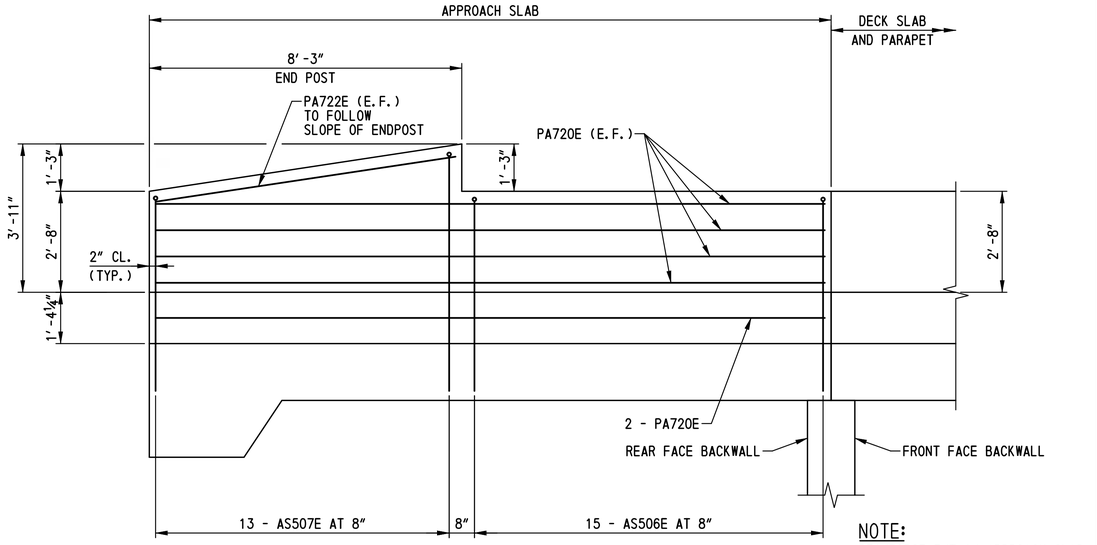
**APPROACH SLAB A PLAN AND REINFORCEMENT PLAN**

| BR1-8 AS-01 | |
|---|---|
| SHEET NO. | 533 |
| TOTAL SHTS. | 875 |




## APPROACH SLAB A TYPICAL SECTION

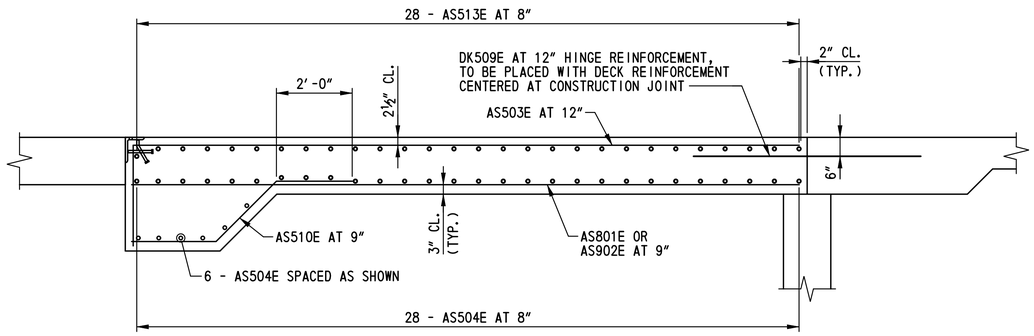
SCALE: ½″=1′-0″




NOTE:
REINFORCEMENT IN APPROACH SLAB NOT SHOWN FOR CLARITY. FENCING NOT SHOWN FOR CLARITY.

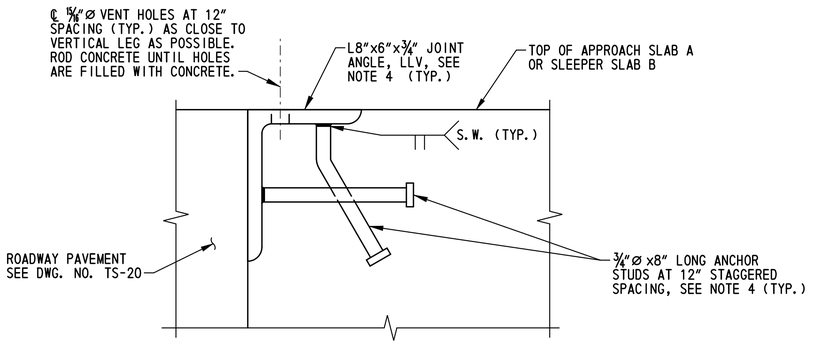
## VIEW Z-Z

SCALE: ½″=1′-0″



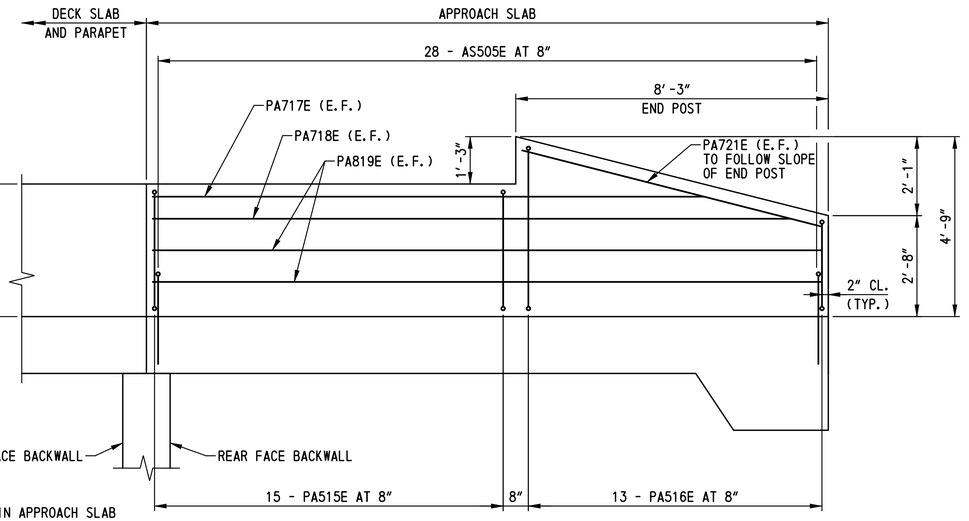

## APPROACH SLAB A TYPICAL REINFORCEMENT SECTION

SCALE: ½″=1′-0″




## DETAIL B

SCALE: 3″=1′-0″




NOTE:
REINFORCEMENT IN APPROACH SLAB NOT SHOWN FOR CLARITY. FENCING NOT SHOWN FOR CLARITY.

## VIEW AA-AA

SCALE: ½″=1′-0″

NOTES:

1. FOR ADDITIONAL REINFORCEMENT DETAILS, SEE DWG. NOS. AS-01 AND AS-06.
2. FOR LOCATION OF VIEWS Z-Z AND AA-AA, SEE DWG. NO. AS-01.
3. THE APPROACH SLAB SHALL BE POURED AFTER THE DECK SLAB. THE APPROACH SLAB SHALL BE POURED STARTING AT THE ROADWAY PAVEMENT END. THE APPROACH SLAB CONSTRUCTION JOINT SHALL CONSIST OF A 3″ DEEP SAWCUT MADE WITHIN 36 HOURS OF APPROACH SLAB CONCRETE PLACEMENT. THE SAWCUT SHALL BE SEALED WITH AN APPROVED COLD APPLIED SILICONE SEALER PLACED IN A CLEAN AIR-BLOWN NOTCH FREE OF MOISTURE. PAYMENT FOR INSTALLATION OF CONSTRUCTION JOINT WILL BE INCIDENTAL TO ITEM NO. 602014 - PORTLAND CEMENT CONCRETE MASONRY, APPROACH SLAB, CLASS D.
4. FOR LIMITS OF ANGLES AND STUDS AT APPROACH PAVEMENT EDGE OF SLEEPER SLAB B, SEE DWG. NO. EX-01. LIMITS OF ANGLES AND STUDS AT APPROACH PAVEMENT EDGE OF APPROACH SLAB A SHALL BE FROM THE FRONT OF THE WEST PARAPET TO THE FRONT OF THE BARRIER CURB. PAYMENT FOR INSTALLATION OF ANGLES AND STUDS AT APPROACH PAVEMENT EDGE OF SLEEPER SLAB B AND APPROACH SLAB A WILL BE INCIDENTAL TO ITEM NO. 602014 - PORTLAND CEMENT CONCRETE MASONRY, APPROACH SLAB, CLASS D.

BR1-8
AS-02

**DELAWARE DEPARTMENT OF TRANSPORTATION**

| ADDENDUMS / REVISIONS | |
|---|---|
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SCALE: AS NOTED

**US 301, SR 896 TO SR 1**

| CONTRACT | BRIDGE NO. 1-460A |
|---|---|
| T200911308 | DESIGNED BY: L.M.B. |
| COUNTY | CHECKED BY: B.K.B. |
| NEW CASTLE | |

**APPROACH SLAB A DETAILS**

| SHEET NO. |
|---|
| 534 |
| TOTAL SHTS. |
| 875 |

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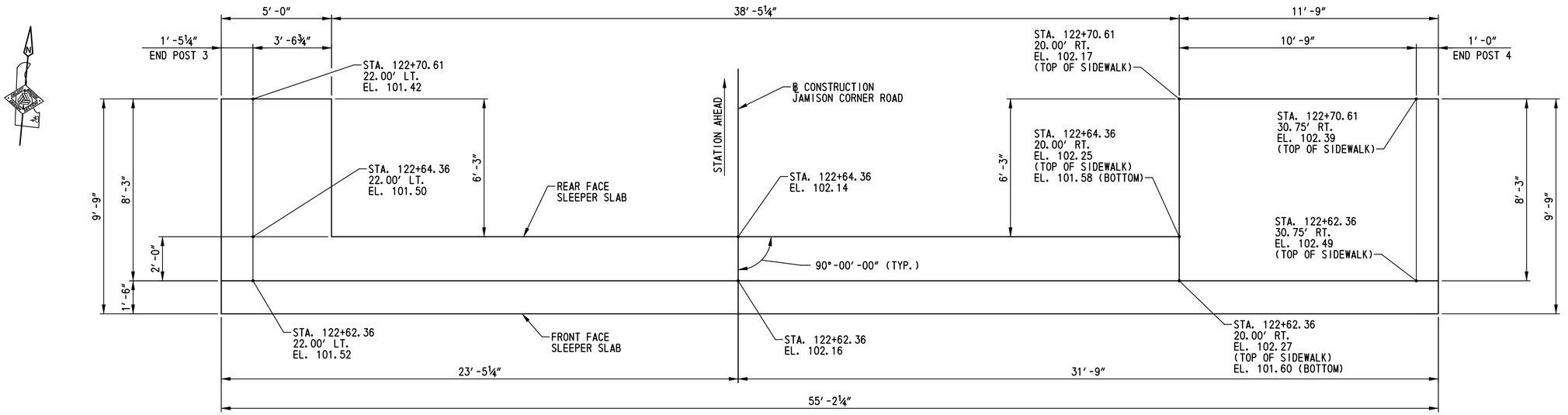
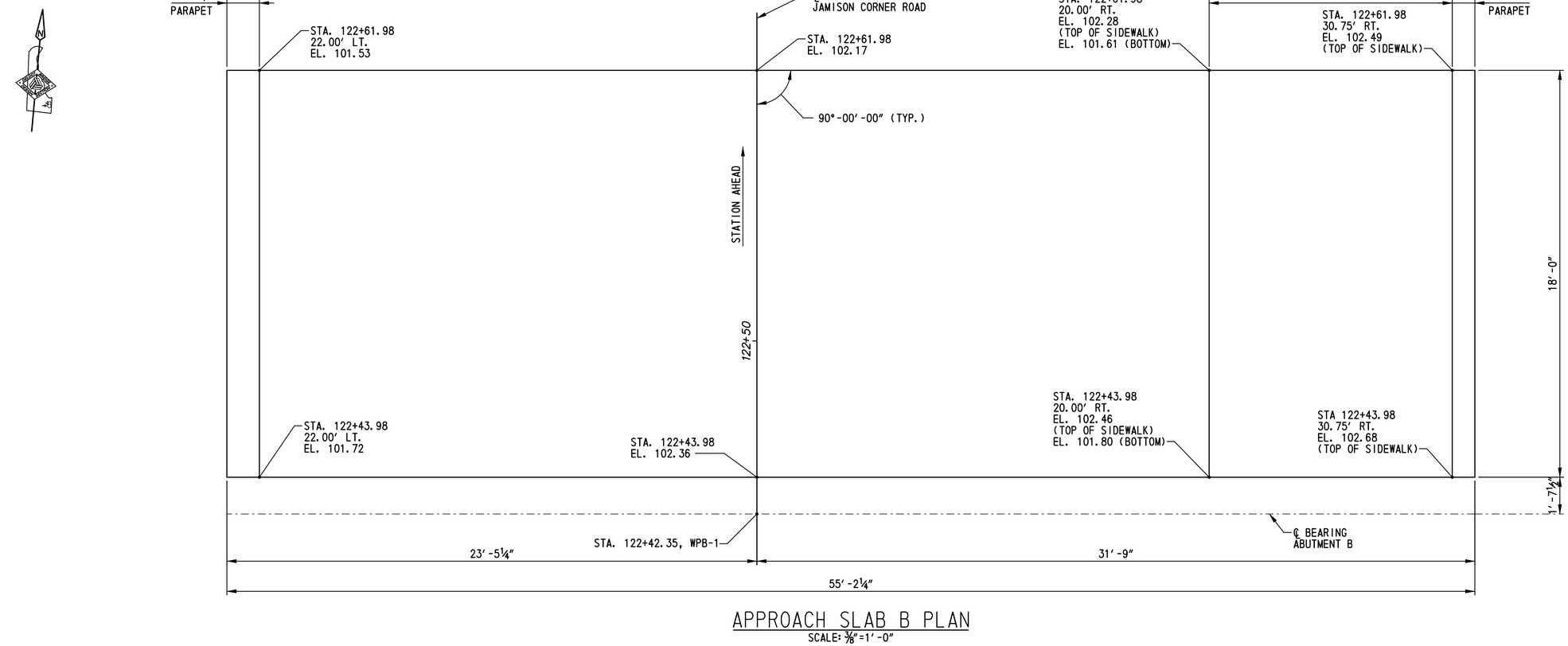



## SLEEPER SLAB B PLAN

SCALE: ⅜″=1′-0″




## APPROACH SLAB B PLAN

SCALE: ⅜″=1′-0″

NOTES:

1. FOR APPROACH SLAB B AND SLEEPER SLAB REINFORCEMENT, SEE DWG. NOS. AS-04 THRU AS-06.
2. FOR APPROACH SLAB B AND SLEEPER SLAB TYPICAL SECTIONS, SEE DWG. NO. AS-05.
3. PAYMENT FOR CONSTRUCTION OF SLEEPER SLAB WILL BE MADE UNDER ITEM NO. 602014 - PORTLAND CEMENT CONCRETE MASONRY, APPROACH SLAB, CLASS D.

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**DELAWARE**
**DEPARTMENT OF TRANSPORTATION**

| ADDENDUMS / REVISIONS | |
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SCALE: AS NOTED

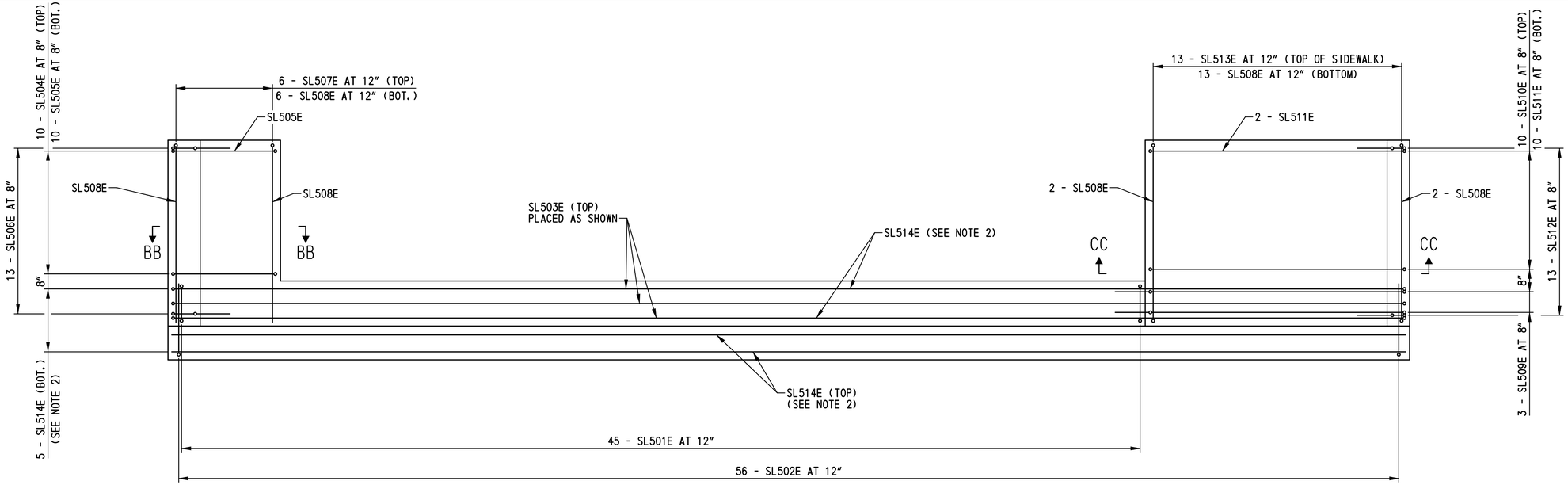
**US 301,**
**SR 896 TO SR 1**

| CONTRACT | BRIDGE NO. | 1-460A |
|---|---|---|
| T200911308 | DESIGNED BY: L.M.B. | |
| COUNTY | CHECKED BY: B.K.B. | |
| NEW CASTLE | | |

**APPROACH SLAB B AND SLEEPER SLAB B PLAN**

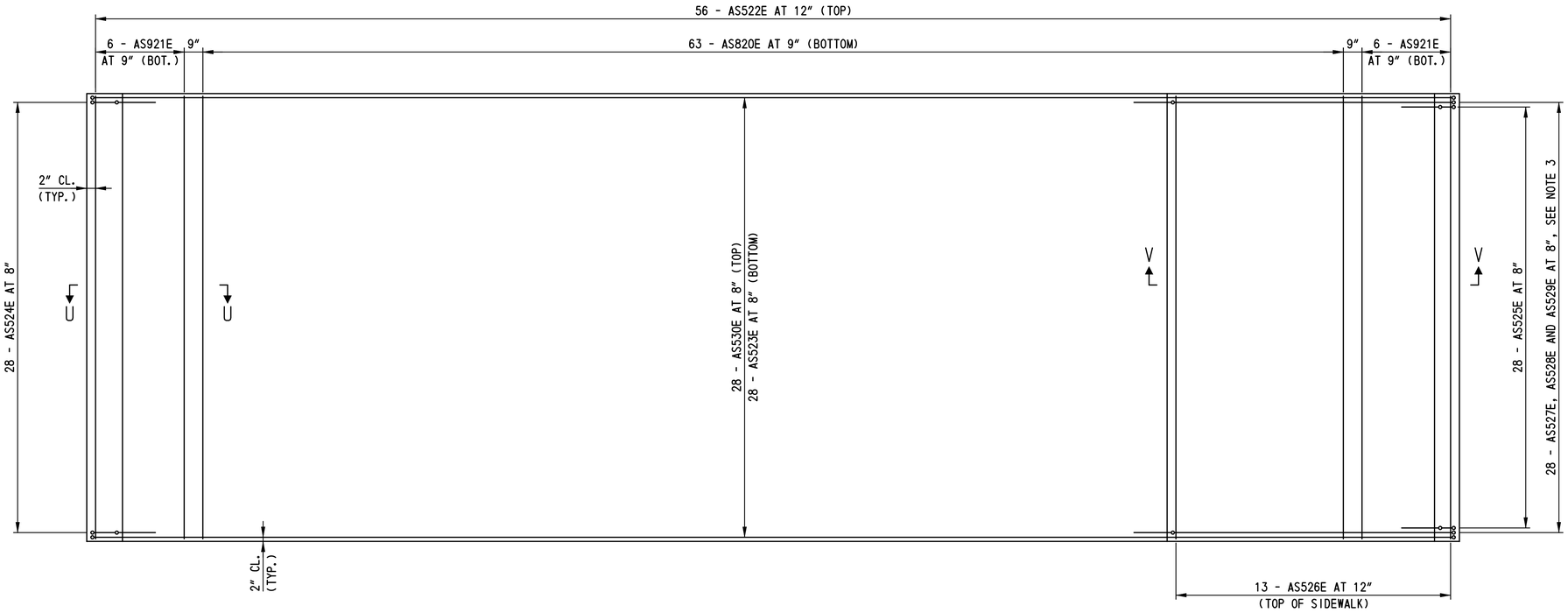
**BR1-8**
**AS-03**

| SHEET NO. | TOTAL SHTS. |
|---|---|
| 535 | 875 |




## SLEEPER SLAB B REINFORCEMENT PLAN

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




## APPROACH SLAB B REINFORCEMENT PLAN

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

NOTES:

1. FOR SECTIONS U-U, V-V, BB-BB AND CC-CC, SEE DWG. NO. AS-06.
2. FOR ADDITIONAL REINFORCEMENT DETAILS, SEE DWG. NOS. AS-05 AND AS-06.
3. FOR INFORMATION ON AS527E, AS528E AND AS529E AND ASSOCIATED MECHANICAL COUPLER, SEE DWG. NO. AS-06. THE CONTRACTOR HAS THE OPTION OF UTILIZING ONE REINFORCEMENT BAR RATHER THAN A AS527E, AS528E, AS529E AND A MECHANICAL COUPLER. HOWEVER NO ADDITIONAL COMPENSATION WILL BE ALLOWED FOR WHICHEVER ALTERNATIVE IS SELECTED.

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**DELAWARE DEPARTMENT OF TRANSPORTATION**

| ADDENDUMS / REVISIONS | |
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SCALE: AS NOTED

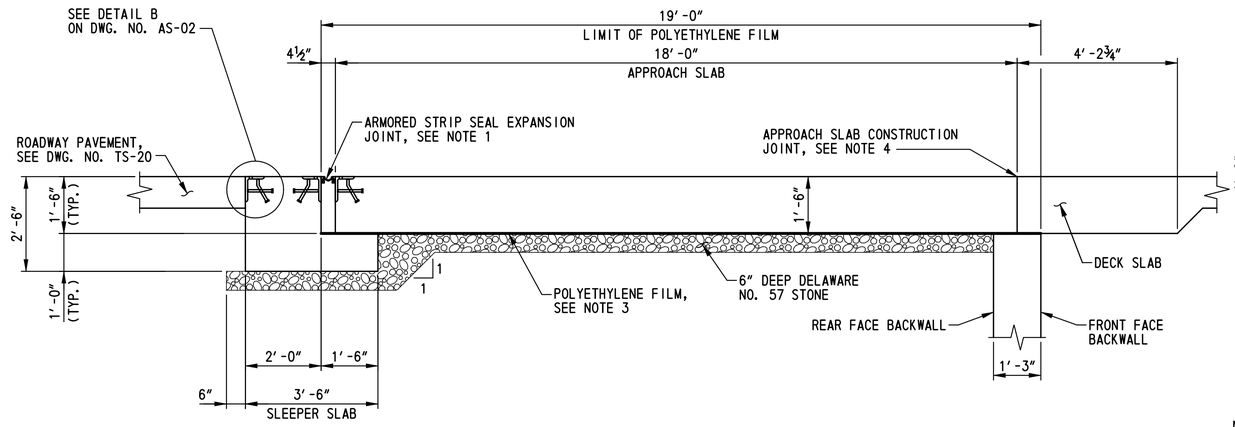
**US 301, SR 896 TO SR 1**

| | | |
|---|---|---|
| CONTRACT | BRIDGE NO. | 1-460A |
| T200911308 | DESIGNED BY: L.M.B. | |
| COUNTY | CHECKED BY: B.K.B. | |
| NEW CASTLE | | |

**APPROACH SLAB B AND SLEEPER SLAB B REINFORCEMENT PLANS**

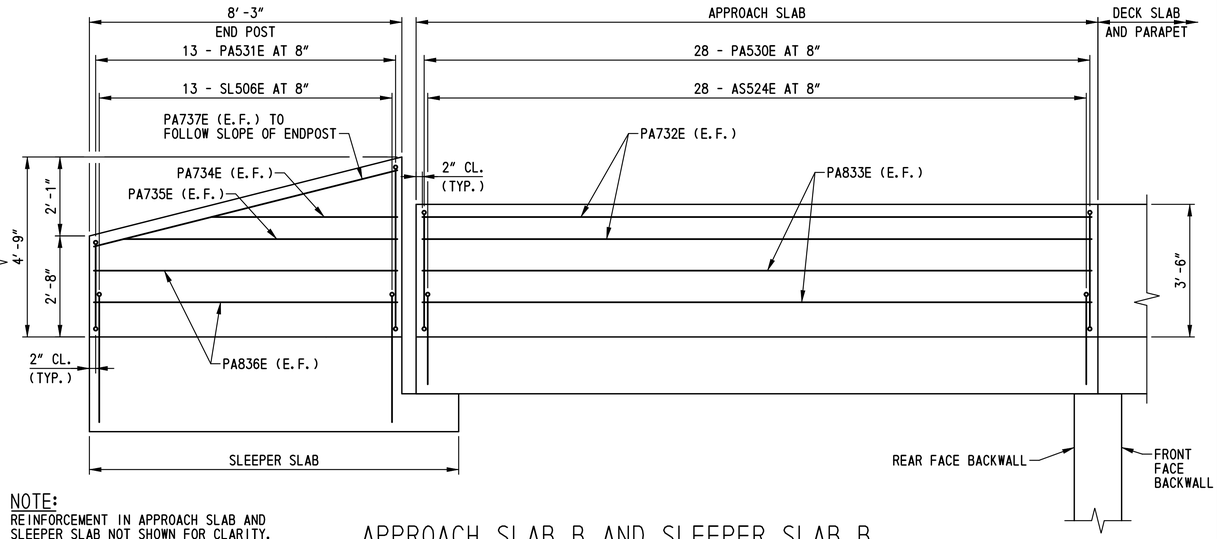
BR1-8
AS-04

| SHEET NO. | TOTAL SHTS. |
|---|---|
| 536 | 875 |




## APPROACH SLAB B AND SLEEPER SLAB B TYPICAL SECTION

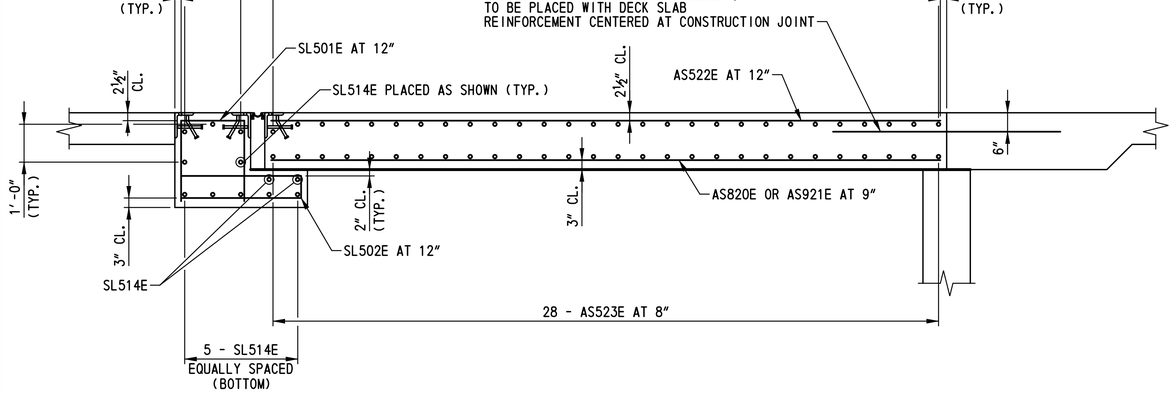
SCALE: ½″=1′-0″




NOTE:
REINFORCEMENT IN APPROACH SLAB AND SLEEPER SLAB NOT SHOWN FOR CLARITY.
FENCING NOT SHOWN FOR CLARITY.

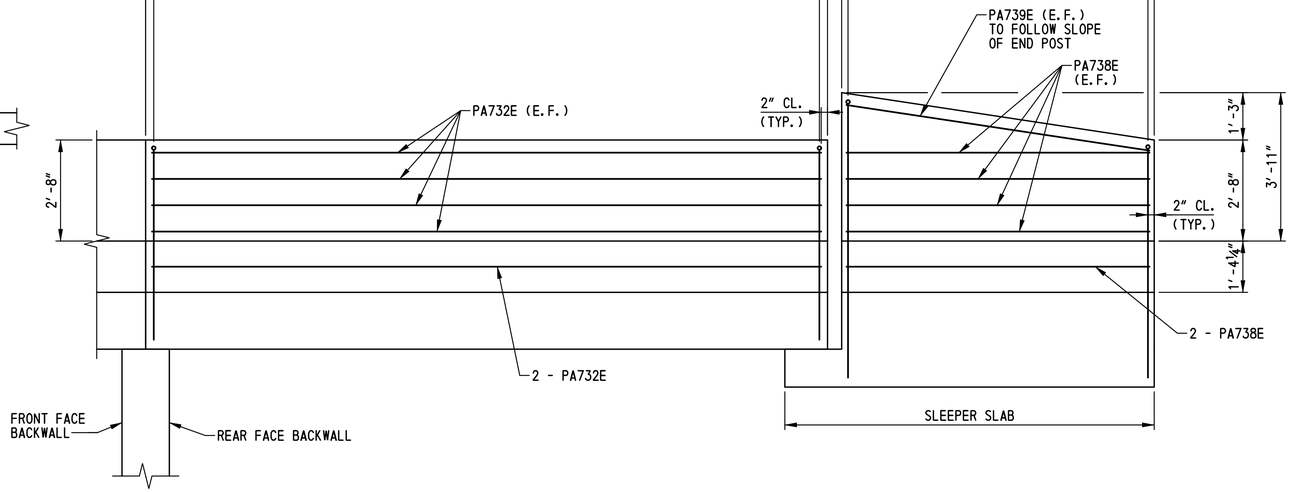
## APPROACH SLAB B AND SLEEPER SLAB B WEST SIDE REINFORCEMENT ELEVATION

SCALE: ½″=1′-0″




## APPROACH SLAB B AND SLEEPER SLAB B TYPICAL REINFORCEMENT SECTION

SCALE: ½″=1′-0″




NOTE:
REINFORCEMENT IN APPROACH SLAB AND SLEEPER SLAB NOT SHOWN FOR CLARITY.
FENCING NOT SHOWN FOR CLARITY.

## APPROACH SLAB B AND SLEEPER SLAB B EAST SIDE REINFORCEMENT ELEVATION

SCALE: ½″=1′-0″

NOTES:

1. FOR ARMORED STRIP SEAL EXPANSION JOINT DETAILS, SEE DWG. NO. EX-01.
2. FOR ADDITIONAL REINFORCEMENT DETAILS, SEE DWG. NOS. AS-04 AND AS-06.
3. POLYETHYLENE FILM SHALL BE A WHITE OPAQUE POLYETHYLENE FILM CONFORMING TO ASTM C 171 AND SHALL BE PLACED IN TWO LAYERS PRIOR TO THE PLACEMENT FOR THE APPROACH SLAB AND DECK SLAB REINFORCEMENT. THE POLYETHYLENE FILM SHALL BE FASTENED TO THE FRONT OF THE BACKWALL AND LAPPED 2′-0″ MINIMUM WITH THE FILM PLACED ON THE FINISHED SUBGRADE FOR THE APPROACH SLAB. PAYMENT FOR INSTALLATION OF POLYETHYLENE FILM WILL BE INCIDENTAL TO ITEM NO. 602014 - PORTLAND CEMENT CONCRETE MASONRY, APPROACH SLAB, CLASS D.
4. THE APPROACH SLAB SHALL BE POURED AFTER THE DECK SLAB. THE APPROACH SLAB SHALL BE POURED STARTING AT THE SLEEPER SLAB END. THE APPROACH SLAB CONSTRUCTION JOINT SHALL CONSIST OF A 3″ DEEP SAWCUT MADE WITHIN 36 HOURS OF APPROACH SLAB CONCRETE PLACEMENT. THE SAWCUT SHALL BE SEALED WITH AN APPROVED COLD APPLIED SILICONE SEALER PLACED IN A CLEAN AIR-BLOWN NOTCH FREE OF MOISTURE. PAYMENT FOR INSTALLATION OF CONSTRUCTION JOINT WILL BE INCIDENTAL TO ITEM NO. 602014 - PORTLAND CEMENT CONCRETE MASONRY, APPROACH SLAB, CLASS D.
5. PAYMENT FOR CONSTRUCTION OF SLEEPER SLAB WILL BE MADE UNDER ITEM NO. 602014 - PORTLAND CEMENT CONCRETE MASONRY, APPROACH SLAB, CLASS D.

**DELAWARE DEPARTMENT OF TRANSPORTATION**

ADDENDUMS / REVISIONS

SCALE: AS NOTED

**US 301, SR 896 TO SR 1**

| CONTRACT | BRIDGE NO. 1-460A |
|---|---|
| T200911308 | DESIGNED BY: L.M.B. |
| COUNTY: NEW CASTLE | CHECKED BY: B.K.B. |

**APPROACH SLAB B AND SLEEPER SLAB B DETAILS**

BR1-8
AS-05

SHEET NO. 537
TOTAL SHTS. 875

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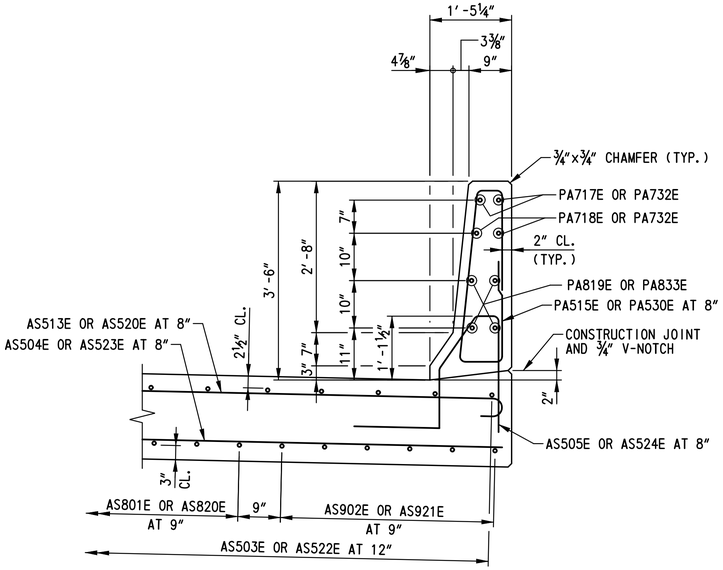
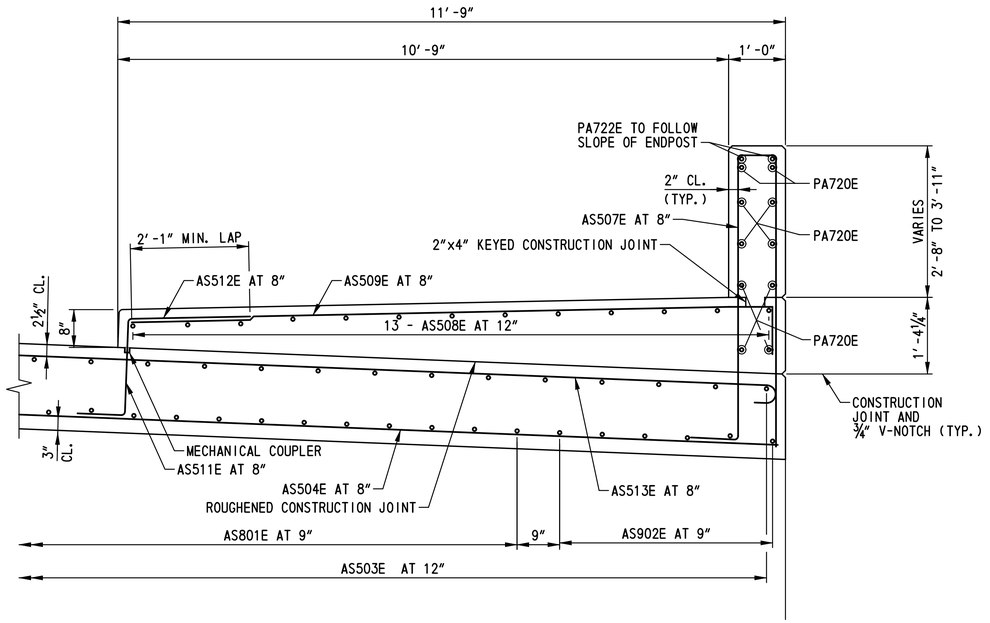
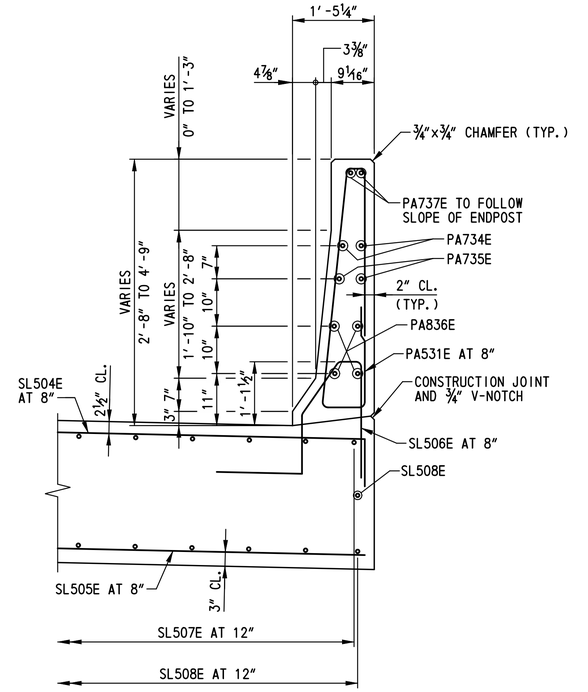


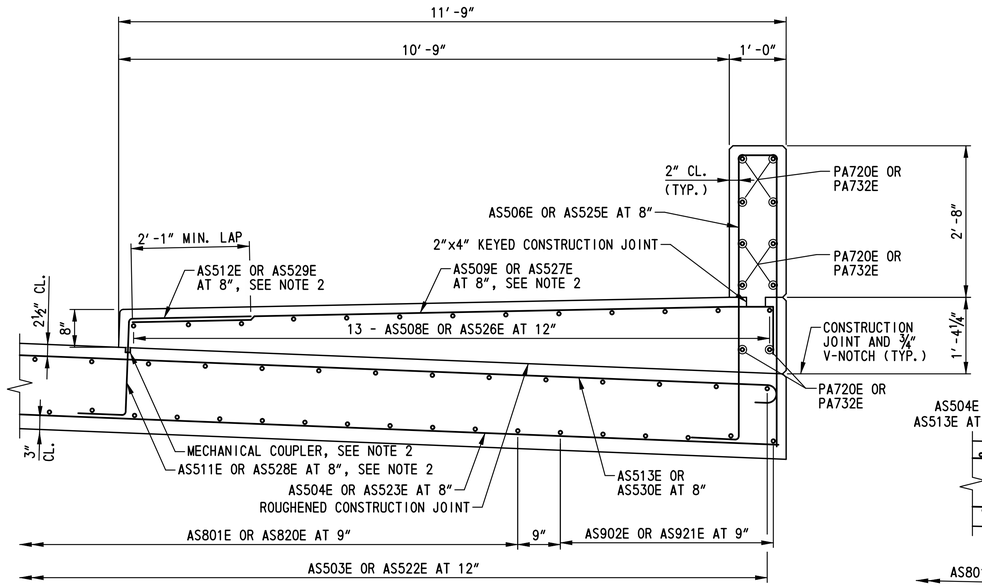

SECTION U-U
SCALE: ¾″=1′-0″



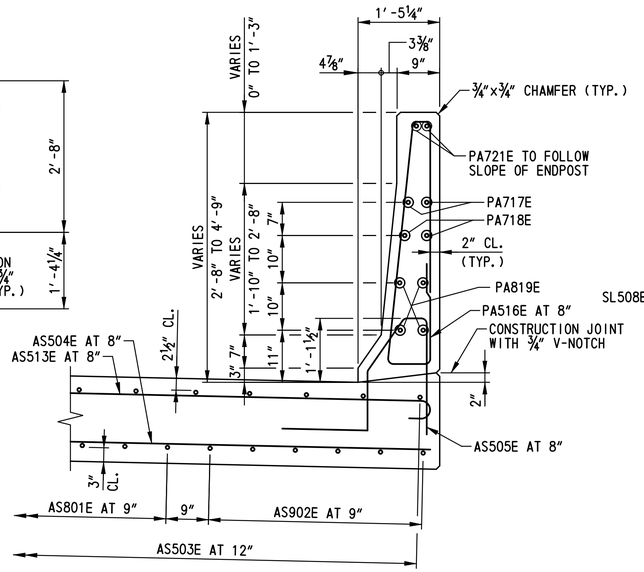

SECTION Y-Y
SCALE: ¾″=1′-0″



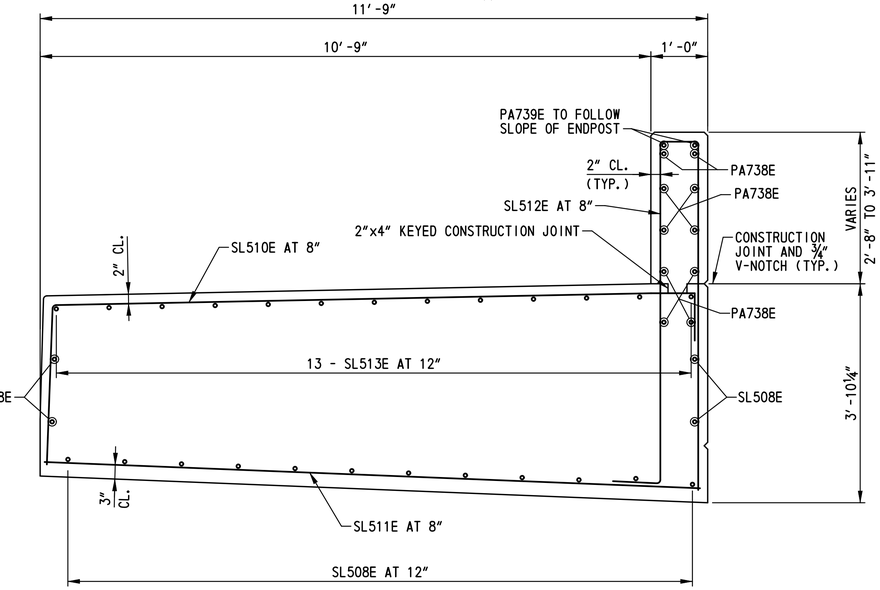

SECTION BB-BB
SCALE: ¾″=1′-0″




SECTION V-V
SCALE: ¾″=1′-0″




SECTION X-X
SCALE: ¾″=1′-0″




SECTION CC-CC
SCALE: ¾″=1′-0″

NOTES:

1. FOR LOCATIONS OF SECTIONS U-U, V-V, X-X, Y-Y, BB-BB AND CC-CC, SEE DWG. NOS. AS-01 AND AS-04.
2. THE CONTRACTOR HAS THE OPTION OF UTILIZING ONE REINFORCEMENT BAR RATHER THAN A AS509E, AS511E, AS512E AND A MECHANICAL COUPLER. HOWEVER NO ADDITIONAL COMPENSATION WILL BE ALLOWED FOR WHICHEVER ALTERNATIVE IS SELECTED.

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**DELAWARE DEPARTMENT OF TRANSPORTATION**

| ADDENDUMS / REVISIONS | |
|---|---|
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SCALE: AS NOTED

**US 301, SR 896 TO SR 1**

| CONTRACT | BRIDGE NO. | 1-460A |
|---|---|---|
| T200911308 | DESIGNED BY: L.M.B. | |
| COUNTY | | |
| NEW CASTLE | CHECKED BY: B.K.B. | |

**APPROACH SLAB AND SLEEPER SLAB DETAILS**

| BR1-8 AS-06 |
|---|
| SHEET NO. 538 |
| TOTAL SHTS. 875 |

(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) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| QTY. | SIZE | LENGTH | MARK | TYPE | A | B | C | D | E | F/R | G | H | J | K | O |
| APPROACH SLAB A | | | | | | | | | | | | | | | |
| 63 | 8 | 17-08 0 | AS801E | STR | | 17-08 0 | | | | | | | | | |
| 12 | 9 | 17-08 0 | AS902E | STR | | 17-08 0 | | | | | | | | | |
| 56 | 5 | 20-03 0 | AS503E | 17 | | 2-07 0 | 17-08 0 | | | | | | | | |
| 34 | 5 | 54-10 1 | AS504E | STR | | 54-10 1 | | | | | | | | | |
| 28 | 5 | 5-01 1 | AS505E | T15 | | 2-00 1 | 0-05 2 | 1-01 2 | 1-00 0 | 0-06 0 | | | 0-07 3 | 0-11 0 | 1-01 1 |
| 15 | 5 | 11-10 2 | AS506E | T15 | | 5-01 1 | 0-08 0 | 5-01 1 | 1-00 0 | | | | | 5-01 1 | 1-08 0 |
| 13* | 5 | 11-09 0 | AS507E | T15 | | 5-00 2 | 0-08 0 | 5-00 2 | 1-00 0 | | | | | 5-00 2 | 1-08 0 |
| | | T0 | | | | T0 | | T0 | | | | | | T0 | |
| | | 12-07 0 | | | | 6-03 2 | | 6-03 2 | | | | | | 6-03 2 | |
| 13 | 5 | 17-08 0 | AS508E | STR | | 17-08 0 | | | | | | | | | |
| 28 | 5 | 12-03 0 | AS509E | 2 | 0-10 0 | 11-05 0 | | | | | | 0-02 3 | | | |
| 75 | 5 | 6-04 1 | AS510E | 6 | | 2-00 0 | 2-01 2 | 2-02 3 | | | | 1-06 0 | | 1-06 0 | 5-08 3 |
| 28 | 5 | 1-11 3 | AS511E | 2 | | 0-10 0 | 1-01 3 | | | | | | | | |
| 28 | 5 | 2-08 1 | AS512E | STR | | 2-08 1 | | | | | | | | | |
| 28 | 5 | 56-00 1 | AS513E | 1 | 0-07 0 | 54-10 1 | | | | | 0-07 0 | | 0-05 0 | | |
| | | | | | | | | | | | | | | | |
| 15 | 5 | 9-03 1 | PA515E | PA | | 2-06 2 | 0-09 0 | 3-00 1 | 0-05 0 | 2-06 2 | | 3-00 0 | | 0-04 0 | |
| 13* | 5 | 7-08 2 | PA516E | PA | | 2-01 2 | 0-09 0 | 2-02 1 | 0-06 1 | 2-01 2 | | 2-02 0 | | 0-02 3 | |
| | | T0 | | | | T0 | | T0 | T0 | T0 | | T0 | | T0 | |
| | | 10-11 0 | | | | 3-02 0 | | 4-03 1 | 0-03 3 | 3-02 0 | | 4-03 0 | | 0-05 1 | |
| 2 | 7 | 14-11 2 | PA717E | STR | | 14-11 2 | | | | | | | | | |
| 2 | 7 | 17-03 1 | PA718E | STR | | 17-03 1 | | | | | | | | | |
| 4 | 8 | 17-08 0 | PA819E | STR | | 17-08 0 | | | | | | | | | |
| 10 | 7 | 17-08 0 | PA720E | STR | | 17-08 0 | | | | | | | | | |
| 2 | 7 | 8-02 0 | PA721E | STR | | 8-02 0 | | | | | | | | | |
| 2 | 7 | 8-00 1 | PA722E | STR | | 8-00 1 | | | | | | | | | |

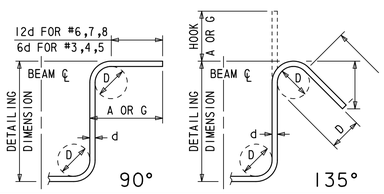
| SPECIFICATIONS | | | | | BENDING DIMENSIONS (FEET-INCHES /QUARTER INCH) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| QTY. | SIZE | LENGTH | MARK | TYPE | A | B | C | D | E | F/R | G | H | J | K | O |
| APPROACH SLAB B | | | | | | | | | | | | | | | |
| 63 | 8 | 17-08 0 | AS820E | STR | | 17-08 0 | | | | | | | | | |
| 12 | 9 | 17-08 0 | AS921E | STR | | 17-08 0 | | | | | | | | | |
| 56 | 5 | 17-08 0 | AS522E | STR | | 17-08 0 | | | | | | | | | |
| 28 | 5 | 54-10 1 | AS523E | STR | | 54-10 1 | | | | | | | | | |
| 28 | 5 | 5-01 1 | AS524E | T15 | | 2-00 1 | 0-05 2 | 1-01 2 | 1-00 0 | 0-06 0 | | | 0-07 3 | 0-11 0 | 1-01 1 |
| 28 | 5 | 11-10 2 | AS525E | T15 | | 5-01 1 | 0-08 0 | 5-01 1 | 1-00 0 | | | | | 5-01 1 | 1-08 0 |
| 13 | 5 | 17-08 0 | AS526E | STR | | 17-08 0 | | | | | | | | | |
| 28 | 5 | 12-03 0 | AS527E | 2 | 0-10 0 | 11-05 0 | | | | | | | | | |
| 28 | 5 | 1-11 3 | AS528E | 2 | | 0-10 0 | 1-01 3 | | | | | | | | |
| 28 | 5 | 2-08 1 | AS529E | STR | | 2-08 1 | | | | | | | | | |
| 28 | 5 | 56-00 1 | AS530E | 1 | 0-07 0 | 54-10 1 | | | | | 0-07 0 | | 0-05 0 | | |
| | | | | | | | | | | | | | | | |
| 45 | 5 | 5-09 0 | SL501E | 17 | | 2-00 2 | 1-08 0 | 2-00 2 | | | | | | | |
| 56 | 5 | 6-11 0 | SL502E | 17 | | 3-02 0 | 0-07 0 | 3-02 0 | | | | | | | |
| 3 | 5 | 56-00 1 | SL503E | 1 | 0-07 0 | 54-10 1 | | | | | 0-07 0 | | 0-05 0 | | |
| 10 | 5 | 8-09 0 | SL504E | 17 | | 2-00 2 | 4-08 0 | 2-00 2 | | | | | | | |
| 10 | 5 | 4-08 0 | SL505E | STR | | 4-08 0 | | | | | | | | | |
| 13 | 5 | 5-01 1 | SL506E | T15 | | 2-00 1 | 0-05 2 | 1-01 2 | 1-00 0 | 0-06 0 | | | 0-07 3 | 0-11 0 | 1-01 1 |
| 6 | 5 | 9-11 2 | SL507E | 17 | | 2-00 2 | 7-11 0 | | | | | | | | |
| 25 | 5 | 7-11 0 | SL508E | STR | | 7-11 0 | | | | | | | | | |
| 3 | 5 | 15-10 2 | SL509E | SW | 1-00 0 | 2-08 2 | 11-04 0 | 0-10 0 | | | | | | | |
| 10 | 5 | 15-11 0 | SL510E | 17 | | 0-10 0 | 11-04 0 | 3-09 0 | | | | | | | |
| 11 | 5 | 11-05 0 | SL511E | STR | | 11-05 0 | | | | | | | | | |
| 13* | 5 | 13-09 0 | SL512E | T15 | | 6-00 2 | 0-08 0 | 6-00 2 | 1-00 0 | | | | | 6-00 2 | 1-08 0 |
| | | T0 | | | | T0 | | T0 | | | | | | T0 | |
| | | 14-07 0 | | | | 7-03 2 | | 7-03 2 | | | | | | 7-03 2 | |
| 13 | 5 | 13-04 0 | SL513E | 17 | | 2-08 2 | 7-11 0 | 2-08 2 | | | | | | | |
| 9 | 5 | 54-10 1 | SL514E | STR | | 54-10 1 | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| 28 | 5 | 9-03 1 | PA530E | PA | | 2-06 2 | 0-09 0 | 3-00 1 | 0-05 0 | 2-06 2 | | 3-00 0 | | 0-04 0 | |
| 13* | 5 | 7-08 2 | PA531E | PA | | 2-01 2 | 0-09 0 | 2-02 1 | 0-06 1 | 2-01 2 | | 2-02 0 | | 0-02 3 | |
| | | T0 | | | | T0 | | T0 | T0 | T0 | | T0 | | T0 | |
| | | 10-11 0 | | | | 3-02 0 | | 4-03 1 | 0-03 3 | 3-02 0 | | 4-03 0 | | 0-05 1 | |
| 14 | 7 | 17-08 0 | PA732E | STR | | 17-08 0 | | | | | | | | | |
| 4 | 8 | 17-08 0 | PA833E | STR | | 17-08 0 | | | | | | | | | |
| 2 | 7 | 5-03 0 | PA734E | STR | | 5-03 0 | | | | | | | | | |
| 2 | 7 | 7-06 2 | PA735E | STR | | 7-06 2 | | | | | | | | | |
| 4 | 8 | 7-11 0 | PA836E | STR | | 7-11 0 | | | | | | | | | |
| 2 | 7 | 8-02 0 | PA737E | STR | | 8-02 0 | | | | | | | | | |

| SPECIFICATIONS | | | | | BENDING DIMENSIONS (FEET-INCHES /QUARTER INCH) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| QTY. | SIZE | LENGTH | MARK | TYPE | A | B | C | D | E | F/R | G | H | J | K | O |
| 10 | 7 | 7-11 0 | PA738E | STR | | 7-11 0 | | | | | | | | | |
| 2 | 7 | 8-00 1 | PA739E | STR | | 8-00 1 | | | | | | | | | |

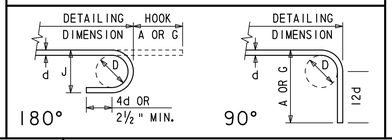
| ASTM STANDARD ENGLISH REINFORCING BARS | | | | RECOMMENDED END HOOKS, APPLICABLE TO ALL GRADES | | | | STIRRUP AND TIE HOOKS, APPLICABLE TO ALL GRADES | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | NOMINAL DIMENSIONS | | | | 180° HOOKS | | 90° HOOKS | | 90° HOOK | 135° HOOK | |
| BAR SIZE | DIAMETER (INCHES) | AREA (INCHES²) | WEIGHT (LBS./FT.) | D | A OR G | J | A OR G | D | A OR G | A OR G | H |
| 3 | 0.375 | 0.110 | 0.376 | 2¼″ | 5″ | 3″ | 6″ | 1½″ | 4″ | 4″ | 2½″ |
| 4 | 0.500 | 0.200 | 0.668 | 3″ | 6″ | 4″ | 8″ | 2″ | 4½″ | 4½″ | 3″ |
| 5 | 0.625 | 0.310 | 1.043 | 3¾″ | 7″ | 5″ | 10″ | 2½″ | 6″ | 5½″ | 3¾″ |
| 6 | 0.750 | 0.440 | 1.502 | 4½″ | 8″ | 6″ | 1-0″ | 4½″ | 1-0″ | 8″ | 4½″ |
| 7 | 0.875 | 0.600 | 2.044 | 5¼″ | 10″ | 7″ | 1-2″ | 5¼″ | 1-2″ | 9″ | 5¼″ |
| 8 | 1.000 | 0.790 | 2.670 | 6″ | 11″ | 8″ | 1-4″ | 6″ | 1-4″ | 10½″ | 6″ |
| 9 | 1.128 | 1.000 | 3.400 | 9½″ | 1-3″ | 11¾″ | 1-7″ | | | | |
| 10 | 1.270 | 1.270 | 4.303 | 10¾″ | 1-5″ | 1-1¼″ | 1-10″ | | | | |
| 11 | 1.410 | 1.560 | 5.313 | 1-0″ | 1-7″ | 1-2¾″ | 2-0″ | | | | |
| 14 | 1.693 | 2.250 | 7.650 | 1-6¼″ | 2-3″ | 1-9¾″ | 2-7″ | | | | |
| 18 | 2.257 | 4.000 | 13.600 | 2-0″ | 3-0″ | 2-4½″ | 3-5″ | | | | |

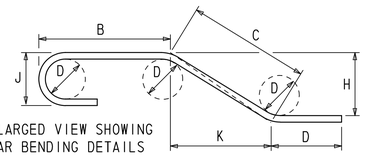
NOTES:
1. FIGURES SHOWN IN CIRCLES REPRESENT BAR BEND TYPES.
2. STANDARD BAR BENDS INCLUDE ONLY THOSE TYPES BELOW, INDICATED AS SUCH.
3. ALL DIMENSIONS OUT-TO-OUT, EXCEPT "A" AND "G" ON STD. 180° AND 135° HOOKS.
4. "J" DIMENSIONS ON 180° HOOKS TO BE SHOWN ONLY WHERE NECESSARY TO RESTRICT HOOK SIZE, OTHERWISE STANDARD 'ACI' HOOKS ARE TO BE USED.
5. 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.
6. "H" DIMENSIONS OF STIRRUPS TO BE SHOWN AS NEEDED TO FIT WITHIN THE CONCRETE.
7. UNLESS OTHERWISE NOTED, DIAMETER "D" IS THE SAME FOR ALL BENDS AND HOOKS ON A BAR (EXCEPT FOR BEND TYPES 11 AND 13).
8. WHERE SLOPE DIFFERS FROM 45° OFFSET, "H" AND "K" MUST BE SHOWN.
9. WHERE BARS ARE TO BE BENT MORE ACCURATELY THAN STANDARD BENDING TOLERANCES, BENDING DIMENSIONS REQUIRING CLOSER FABRICATION SHOULD HAVE LIMITS INDICATED.
10. FOR RECOMMENDED DIAMETER "D", OF BENDS, HOOKS, ETC., REFER TO TABLE ABOVE, 'CRSI' OR 'ACI' TABLES WHERE APPLICABLE AND REQUIRED.
11. TYPE S1-S6, S11, T1-T3 AND T6-T9 APPLICABLE TO BAR SIZES #3 THROUGH #8.

## STIRRUP AND TIE HOOKS

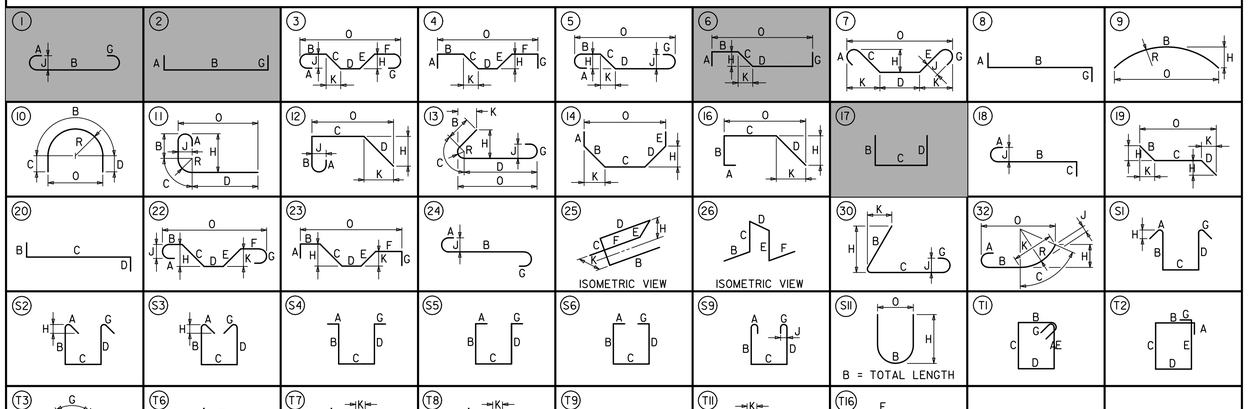



## 180° AND 90° END HOOKS

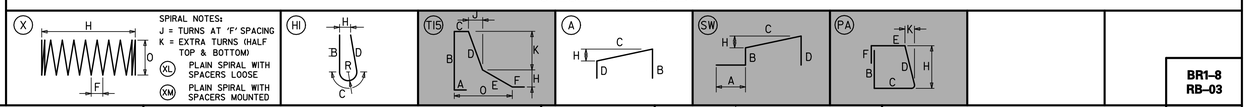



## STANDARD BAR BENDS




## SPECIAL BAR BENDS




**DELAWARE DEPARTMENT OF TRANSPORTATION**

ADDENDUMS / REVISIONS

**US 301, SR 896 TO SR 1**

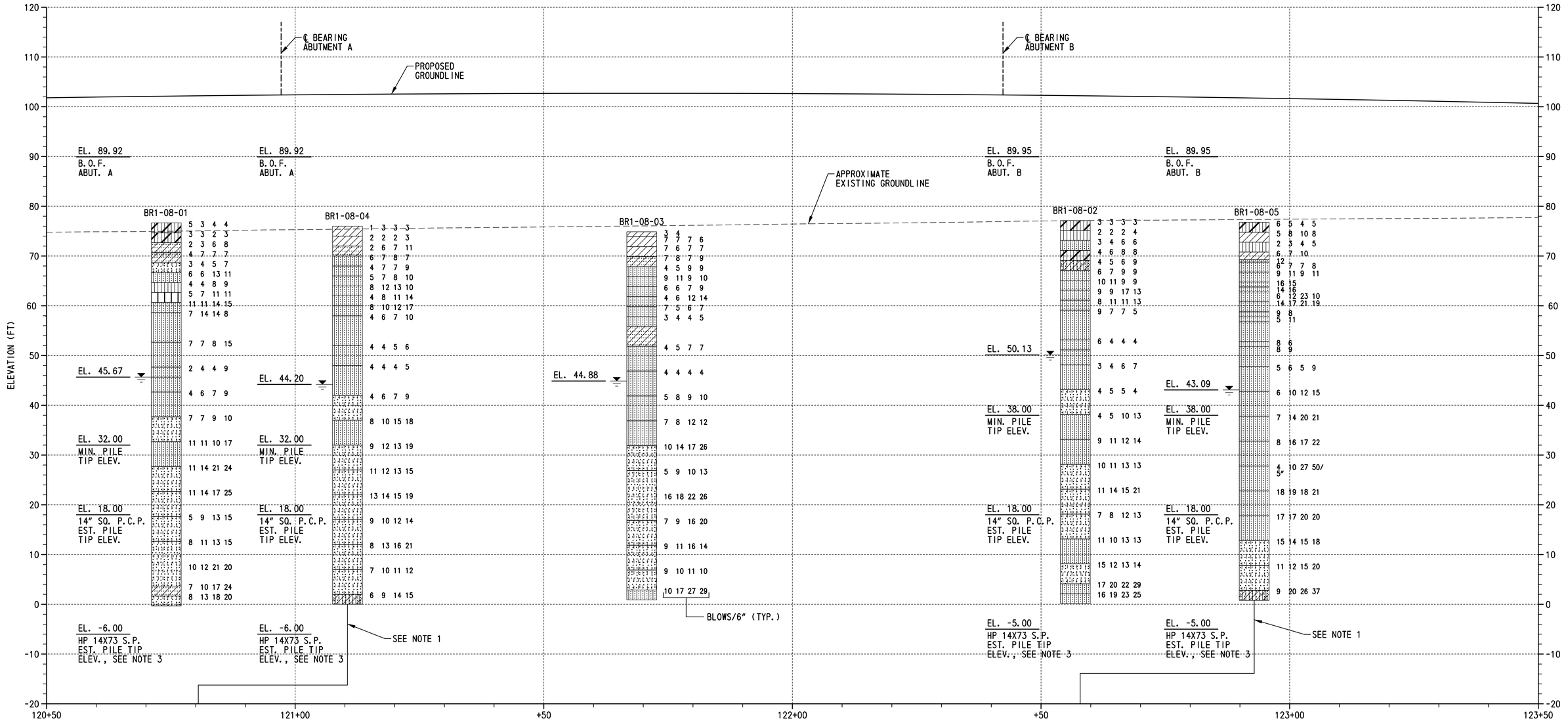
| CONTRACT | BRIDGE NO. | 1-460A |
|---|---|---|
| T200911308 | DESIGNED BY: A.D.D. | |
| COUNTY | CHECKED BY: B.K.B. | |
| NEW CASTLE | | |

**APPROACH SLAB AND SLEEPER SLAB REINFORCEMENT LIST**

BR1-8
RB-03

SHEET NO. 539
TOTAL SHTS. 875

n:\36536-000\contract 1a\cadd\bridge\Br_Ns8\RB03_br1-8.dgn
10/24/2012 1h04:11 AM




## BORING PROFILE

SCALE: 1" = 10'-0"

LEGEND:

- SILTY LOW PLASTICITY CLAY
- CLAYEY SNAD
- POORLY GRADED SAND WITH SILT
- SILTY SAND
- SILT
- ELASTIC SILT
- POORLY GRADED CLAYEY SILTY SAND
- LOW PLASTICITY CLAY
- WATER TABLE AT BORING COMPLETION

| TEST BORINGS | | | | |
|---|---|---|---|---|
| DESIGNATION | STATION | OFFSET | NORTHING | EASTING |
| BR1-08-01 | 120+80.52 | 19.51' RT. | 555127 | 581987 |
| BR1-08-02 | 122+57.87 | 20.65' LT. | 555300 | 581931 |
| BR1-08-03 | 121+69.70 | 00.52' LT. | 555214 | 581959 |
| BR1-08-04 | 120+74.08 | 31.27' LT. | 555116 | 581937 |
| BR1-08-05 | 122+56.89 | 23.44' RT. | 555303 | 581975 |

NOTES:

1. BORINGS BR1-08-01 AND BR1-08-02 ARE SHOWN 30'-0" AND 35'-0" DOWNSTATION FROM ACTUAL BORING LOCATIONS FOR CLARITY.
2. FOR ADDITIONAL BORING INFORMATION, SEE DWG. NO. PE-01.
3. SEE PILE NOTE 6 ON DWG. NO. PL-01 REGARDING THE STEEL H-PILE ALTERNATIVE.

BR1-8
BO-01

**DELAWARE DEPARTMENT OF TRANSPORTATION**

ADDENDUMS / REVISIONS

SCALE: NOT TO SCALE

**US 301, SR 896 TO SR 1**

| CONTRACT | BRIDGE NO. 1-460A |
|---|---|
| T200911308 | DESIGNED BY: A.D.D. |
| COUNTY | CHECKED BY: B.K.B. |
| NEW CASTLE | |

**BORING PROFILE**

| SHEET NO. | TOTAL SHTS. |
|---|---|
| 540 | 875 |

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10/24/2012 11:00:37 AM

# PROJECT NOTES:

1. LOCATION
   PROPOSED NEW STRUCTURE CARRYING US301 OVER SR 896 (BOYDS CORNER ROAD) IN NEW CASTLE COUNTY, DELAWARE.

2. ELEVATIONS
   VERTICAL DATUM IS REFERENCED TO NAVD 88.

3. DESIGN CRITERIA
   2007 AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, INCLUDING 2008 AND 2009 INTERIMS, AND SUPPLEMENTED BY THE DELAWARE DEPARTMENT OF TRANSPORTATION 2005 BRIDGE DESIGN MANUAL, INCLUDING REVISIONS THROUGH 2009. PROVIDE MATERIAL AND PERFORM WORK IN ACCORDANCE TO THE DELAWARE DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS AND CONSTRUCTION DETAILS AND CONTRACT SPECIAL PROVISIONS.

4. LOADING
   LIVE LOAD: AASHTO HL-93 AND DELAWARE LEGAL LOADS.
   FUTURE OVERLAY = 25 P.S.F.
   S.I.P. DECK FORMS = 15 P.S.F.
   FILL SOIL = 120 P.C.F.

5. CONCRETE
   ALL CONCRETE PROPERTIES SHALL BE IN ACCORDANCE WITH SECTION 812 OF THE DELAWARE DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS.
   CLASS A - ABUTMENTS, STEMS, BACKWALLS, WINGWALLS AND PARAPETS (f'c = 4,500 PSI).
   CLASS A - ABUTMENT FOOTING (f'c = 4,500 PSI).
   CLASS D - CONCRETE DECK SLAB, APPROACH SLAB, MOMENT SLAB, SLEEPER SLAB, HEADER SLAB, SHEAR BLOCKS, PEDESTALS AND DIAPHRAGMS (f'c = 4,500 PSI).
   CLASS A - M.S.E. WALL PANELS AND M.S.E. WALL COPING (f'c = 4,500 PSI).
   CLASS B - M.S.E. WALL LEVELING PADS (f'c = 3,000 PSI)
   ALL EXPOSED EDGES SHALL BE CHAMFERED ¾" UNLESS NOTED OTHERWISE.

6. REINFORCING STEEL
   ALL REINFORCING STEEL SHALL BE AASHTO M31 (ASTM A615), GRADE 60 AND UNLESS NOTED OTHERWISE SHALL BE PROTECTED WITH FUSION BONDED EPOXY, CONFORMING TO AASHTO M284 (ASTM D3963). MINIMUM CONCRETE COVER FOR REINFORCING STEEL SHALL BE:
   FOUNDATION ELEMENTS: 3"
   DECK SLABS: 2½" TOP OF SLAB (INCLUDES ½" INTEGRAL WEARING SURFACE)
   1" BOTTOM OF SLAB WHEN STAY-IN-PLACE FORMS ARE USED
   MINIMUN CONCRETE COVER FOR REINFORCING STEEL SHALL BE 2" UNLESS NOTED OTHERWISE.

7. PRESTRESSED REINFORCED CONCRETE GIRDERS
   PRESTRESSED CONCRETE DESIGN: DESIGN CONSISTENT WITH 2007 AASHTO LRFD, WITH 2008 AND 2009 INTERIMS. THE PRECAST CONCRETE BEAMS ARE DESIGNED AS COMPOSITE FOR LIVE LOAD, PARAPET AND FUTURE WEARING SURFACE.THE PRECAST CONCRETE BEAMS ARE DESIGNED AS NON-COMPOSITE FOR ALL OTHER DEAD LOADS.

   PRESTRESSED CONCRETE: THE MINIMUM COMPRESSIVE STRENGTH FOR PRESTRESSED CONCRETE AT THE AGE OF 28 DAYS SHALL BE f'c = 8,000 PSI. THE MINIMUM COMPRESSIVE STRENGTH AT THE TRANSFER OF PRESTRESS SHALL BE f'ci = 6,800 PSI.

   PRETENSIONING STEEL: PRETENSIONING STEEL SHALL CONSIST OF 6/10" DIAMETER 7-WIRE BRIGHT LOW RELAXATION STRANDS CONFORMING TO THE REQUIREMENTS OF AASHTO M203 GRADE 270. EACH 6/10" STRAND SHALL BE PRETENSIONED TO 43,950 LBS (0.75 f's). AFTER ESTIMATED LOSSES OF 59,696 PSI, THE FINAL EFFECTIVE PRESTRESS FORCE PER STRAND IS 30,996 LBS. CAMBER GROWTH IN PRETENSIONED BEAMS BETWEEN THE TIME OF STRESSING AND THE TIME OF SLAB PLACEMENT IS ASSUMED TO BE 80% FOR CAMBER CALCULATIONS.

8. ELASTOMERIC BEARINGS
   ELASTOMERIC BEARINGS SHALL CONFORM TO AASHTO M251. ELASTOMER SHALL BE 50 DUROMETER. SHIMS SHALL BE 11 GAGE MILD STEEL CONFORMING TO AASHTO M270, GRADE 36.

9. CONSTRUCTION JOINTS
   KEYED CONSTRUCTION JOINTS SHALL BE 2" X 4" OR AS NOTED. ALL EXPOSED CONSTRUCTION JOINT EDGES SHALL HAVE A ¾" V-NOTCH UNLESS NOTED OTHERWISE.

10. MISCELLANEOUS
    ALL AREAS DISTURBED BY THE CONTRACTOR'S OPERATIONS SHALL BE GRADED BACK TO THE ORIGINAL EXISTING GRADE, TOP SOILED, SEEDED AND MULCHED. PAYMENT SHALL BE INCIDENTAL TO THE CONTRACT. AS DIRECTED BY THE ENGINEER, ALL AREAS DISTURBED BY THE CONTRACTOR'S OPERATION OUTSIDE THE LIMIT OF CONSTRUCTION SHALL BE TOP SOILED, SEEDED, AND MULCHED AT THE CONTRACTOR'S EXPENSE.

11. STABILIZING STRUCTURAL EXCAVATIONS
    THE CONTRACTOR IS RESPONSIBLE FOR STABILITY OF EXCAVATED SLOPES. DIRECT SURFACE RUNOFF AWAY FROM THE EXCAVATION. ALL EXCAVATION SAFETY MEASURES, INCLUDING SLOPING AND SHORING, SHALL CONFORM TO CURRENT OSHA AND LOCAL STANDARDS. A QUALIFIED ENGINEER REGISTERED IN THE STATE OF DELAWARE SHOULD DESIGN ALL TEMPORARY SHEETING AND SHORING.
    THE CONTRACTOR IS ALSO RESPONSIBLE FOR PROVIDING DEWATERING OF THE EXCAVATION TO ALLOW FOR INSPECTION AND CONSTRUCTION. ANY DEWATERING SUMPS OR WELLS SHALL BE LOCATED AT LEAST 3-ft AWAY FROM THE FOOTING EXCAVATION.

12. PILE FOUNDATIONS
    PRESTRESSED CONCRETE PILES SHALL CONFORM TO THE REQUIREMENTS OF SECTION 618 OF THE DELAWARE DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS EXCEPT THAT LOW RELAXATION STRANDS SHALL BE USED. STEEL H-PILES ALTERNATE SHALL BE AASHTO M270, GRADE 50. PERFORM WAVE EQUATION ANALYSIS TO SIZE THE PILE HAMMER USING NOMINAL RESISTANCE. CONTROL PILE DRIVING USING HIGH STRAIN DYNAMIC TESTING WITH SIGNAL MATCHING.
    THE CONTRACTOR IS TO CONDUCT THE HIGH STRAIN DYNAMIC TESTING WITH SIGNAL MATCHING DURING CONSTRUCTION AND IS ALSO RESPONSIBLE FOR DEVELOPING THE DRIVING CRITERIA WITH APPROVAL OF THE ENGINEER. PERFORM DYNAMIC PILE MONITORING ON THE TEST PILES AND IF DIRECTED, ON SELECTED BEARING PILES, AT THE LOCATIONS DETERMINED BY THE ENGINEER. DRIVE PRODUCTION PILES TO SATISFY THE DRIVING CRITERIA DEVELOPED FROM THE TEST PILES AND THE MINIMUM TIP ELEVATION REQUIREMENTS.

13. LOAD RATINGS
    LOAD AND RESISTANCE FACTOR RATING METHOD

## LOAD RATING SUMMARY

| DESIGN VEHICLE | RATING FACTOR | RATING WEIGHT (TON) | CONTROLLING MEMBER | CONTROLLING POINT (FT.) | LOAD EFFECT |
|---|---|---|---|---|---|
| HL-93 TRUCK (INVENTORY) | 1.05 | N/A | 1ST INT. BEAM | 105 | CONCRETE STRESS |
| HL-93 TANDEM (INVENTORY) | 1.25 | N/A | 1ST INT. BEAM | 105 | CONCRETE STRESS |
| HS-20 (INVENTORY) | 1.54 | 55.42 | 1ST INT. BEAM | 105 | CONCRETE STRESS |
| HL-93 TRUCK (OPERATING) | 2.09 | N/A | 1ST INT. BEAM | 105 | LONG. REINFORCEMENT |
| HL-93 TANDEM (OPERATING) | 2.49 | N/A | 1ST INT. BEAM | 105 | LONG. REINFORCEMENT |
| HS-20 (OPERATING) | 2.98 | 107.14 | 1ST INT. BEAM | 104 | LONG. REINFORCEMENT |
| DE S220 (LEGAL) | 2.67 | 53.49 | 1ST INT. BEAM | 105 | CONCRETE STRESS |
| DE S335 (LEGAL) | 1.50 | 52.66 | 1ST INT. BEAM | 105 | CONCRETE STRESS |
| DE S437 (LEGAL) | 1.43 | 52.49 | 1ST INT. BEAM | 105 | CONCRETE STRESS |
| DE T330 (LEGAL) | 1.97 | 59.11 | 1ST INT. BEAM | 105 | CONCRETE STRESS |
| DE T435 (LEGAL) | 1.71 | 60.01 | 1ST INT. BEAM | 105 | CONCRETE STRESS |
| DE T540 (LEGAL) | 1.51 | 60.45 | 1ST INT. BEAM | 105 | CONCRETE STRESS |

NOTE: LOAD RATING INCLUDES FUTURE WEARING SURFACE AS NOTED IN THE PLANS.

14. UTILITIES
    BEFORE BEGINNING WORK, THE CONTRACTOR SHALL GIVE NOTIFICATION BY TELEPHONE BY CALLING "MISS UTILITY" AT 1-800-282-8555 A MINIMUM OF 2 WORKING DAYS PRIOR TO START OF WORK. VERIFY AND LOCATE ALL UTILITIES PRIOR TO STARTING WORK.

    COORDINATE THE REQUIREMENTS FOR PROTECTION OF ANY UTILITY WITH THE UTILITY OWNER PRIOR TO STARTING WORK.

    CONDUCT OPERATIONS IN A MANNER WHICH ENSURES THAT THE UTILITIES WILL NOT BE DISTURBED OR ENDANGERED. ANY DAMAGE INCURRED TO THESE UTILITIES OR ANY OTHER UTILITIES, SHOWN OR NOT SHOWN ON THE PLANS, DUE TO THE CONTRACTOR'S OPERATIONS SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE TO THE SATISFACTION OF THE APPROPRIATE UTILITY COMPANY. THE DEPARTMENT DOES NOT ASSUME RESPONSIBILITY FOR REIMBURSEMENT, PARTICIPATION IN DESIGN AND/OR REVISIONS, OR LIABILITY FOR ACCURACY OF TYPE, SIZE AND LOCATION OF ANY UTILITY.

    THE CONTRACTOR IS RESPONSIBLE FOR TEMPORARILY SUPPORTING, PROTECTING, OR RELOCATING ANY UTILITIES DURING CONSTRUCTION. WHERE NECESSARY, THE COST FOR THIS WORK WILL BE INCIDENTAL TO THE CONTRACT.

15. PERFORM WORK IN ACCORDANCE WITH DELAWARE DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS AND CONSTRUCTION DETAILS AND CONTRACT SPECIAL PROVISIONS.
    DELDOT STANDARD SPECIFICATION 619.11(a)(6) SHALL BE MODIFIED BY REFERENCE TO SPECIAL PROVISIONS 619519 AND 619539.
16. PROVIDE A MINIMUM TEMPORARY VERTICAL CLEARANCE OF 16'-11" AT ALL TIMES DURING CONSTRUCTION.
17. DO NOT PICK OR LIFT OVER LANES AND/OR SHOULDERS OPEN TO TRAFFIC.
18. DO NOT PERFORM ANY WORK DIRECTLY OVER OPEN LANES OF TRAFFIC WITHOUT ADEQUATE SHIELDING OR WORK PLATFORMS, LANE CLOSURES, OR DETOURS IN ACCORDANCE WITH THE CONTRACT PLANS AND SPECIFICATIONS.
19. INSTALL STAY-IN-PLACE FORMS, ADDITIONAL PROTECTIVE SHIELD SYSTEM, WORK PLATFORMS, AND/OR OVERHANG FALSEWORK BEFORE BEGINNING ANY CONSTRUCTION OPERATIONS OVER TRAFFIC.
20. IF THE CONTRACTOR DETERMINES THAT ADDITIONAL PROTECTIVE SHIELDING OR WORK PLATFORMS ARE NEEDED TO PROTECT TRAFFIC, SUBMIT PLANS AND CALCULATIONS FOR REVIEW AND APPROVAL FOR PROTECTING TRAFFIC WHILE WORKING OVER TRAVELWAYS. HAVE THE DRAWINGS AND DESIGN CALCULATIONS PREPARED, SIGNED, AND SEALED BY A DELAWARE REGISTERED PROFESSIONAL ENGINEER. THE APPROVAL OF THE ENGINEER WILL NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY FOR THE SAFETY OF THE METHOD OR EQUIPMENT. BASED ON CONTRACTOR MEANS AND METHODS, DETERMINE AND CLEARLY DEFINE ALL DEAD AND LIVE LOADS FOR THIS SYSTEM, WHICH, AT A MINIMUM, SHALL BE INSTALLED BETWEEN BEAMS OR GIRDERS OVER ANY TRAVEL WAY OR SHOULDER AREA WHERE TRAFFIC IS MAINTAINED. NO SEPARATE PAYMENT WILL BE MADE FOR ADDITIONAL PROTECTIVE SHIELDING OR WORK PLATFORMS.
21. ALL FORMWORK, INCLUDING STAY-IN-PLACE FORMS, SHALL BE MORTAR TIGHT.
22. WHILE PLACING DECK, DECK OVERHANG, AND PARAPET CONCRETE OVER LANES OPEN TO TRAFFIC, NO CLOSURE OR DETOURS WILL BE ALLOWED DURING THESE OPERATIONS.
23. THE MAINTENANCE OF TRAFFIC REQUIRED FOR THE INSTALLATION OF THESE ITEMS WILL BE PAID UNDER THE MAINTENANCE OF TRAFFIC UNIT BID ITEMS. CONTRACTOR SHALL ADHERE TO THE TRAFFIC CONTROL PLAN, DELAWARE MUTCD, AND TRAFFIC LANE CLOSURE AND WORK RESTRICTIONS PROVIDED IN THE CONTRACT DOCUMENTS.

## INDEX OF DRAWINGS



## QUANTITIES

| ITEM NO. | ITEM TITLE | UNIT | QUANTITY |
|---|---|---|---|
| 202505 | SETTLEMENT PLATFORM | EACH | 8 |
| 602003 | P.C.C. MASONRY, ABUTMENT FOOTING, CLASS A | C.Y. | 104 |
| 602013 | P.C.C. MASONRY, SUPERSTRUCTURE, CLASS D | C.Y. | 463 |
| 602014 | P.C.C. MASONRY, APPROACH SLAB, CLASS D | C.Y. | 478 |
| 602015 | P.C.C. MASONRY, ABUTMENT ABOVE FOOTING, CLASS A | C.Y. | 92 |
| 602017 | P.C.C. MASONRY, PARAPET, CLASS A | C.Y. | 106 |
| 602772 | MECHANICALLY STABILIZED EARTH WALLS | L.S. | 1 |
| 604000 | BAR REINFORCEMENT, EPOXY COATED | LB | 262,700 |
| 605512 | PREFABRICATED EXPANSION JOINT SYSTEM 4" | L.F. | 104 |
| 618062 (ALTERNATE) | STEEL H PILES, HP 14X73 | L.F. | 2,632 |
| 618065 (ALTERNATE) | STEEL H TEST PILES, HP 14X73 | L.F. | 369 |
| 618081 | FURNISH PRECAST PRESTRESSED CONCRETE PILE, 14X14 | L.F. | 1,864 |
| 618091 | FURNISH PRECAST PRESTRESSED CONCRETE TEST PILE, 14X14 | L.F. | 273 |
| 619042 (ALTERNATE) | INSTALL STEEL H PILES, HP 14X73 | L.F. | 2,632 |
| 619045 (ALTERNATE) | INSTALL STEEL H TEST PILES, HP 14X73 | L.F. | 369 |
| 619061 | INSTALL PRECAST PRESTRESSED CONCRETE PILE, 14X14 | L.F. | 1,864 |
| 619067 | INSTALL PRECAST PRESTRESSED CONCRETE TEST PILE, 14X14 | L.F. | 273 |
| 619501 | PRODUCTION PILE RESTRIKE | EACH | 1 |
| 619502 | TEST PILE RESTRIKE | EA. DAY | 1 |
| 619519 | DYNAMIC PILE TESTING BY CONTRACTOR | EACH | 8 |
| 619539 | SIGNAL MATCHING ANALYSIS BY CONTRACTOR | EACH | 8 |
| 623003 | PRESTRESSED REINFORCED CONCRETE MEMBERS, BULB-TEE BEAM | L.S. | 1 |



DELAWARE DEPARTMENT OF TRANSPORTATION

ADDENDUMS / REVISIONS

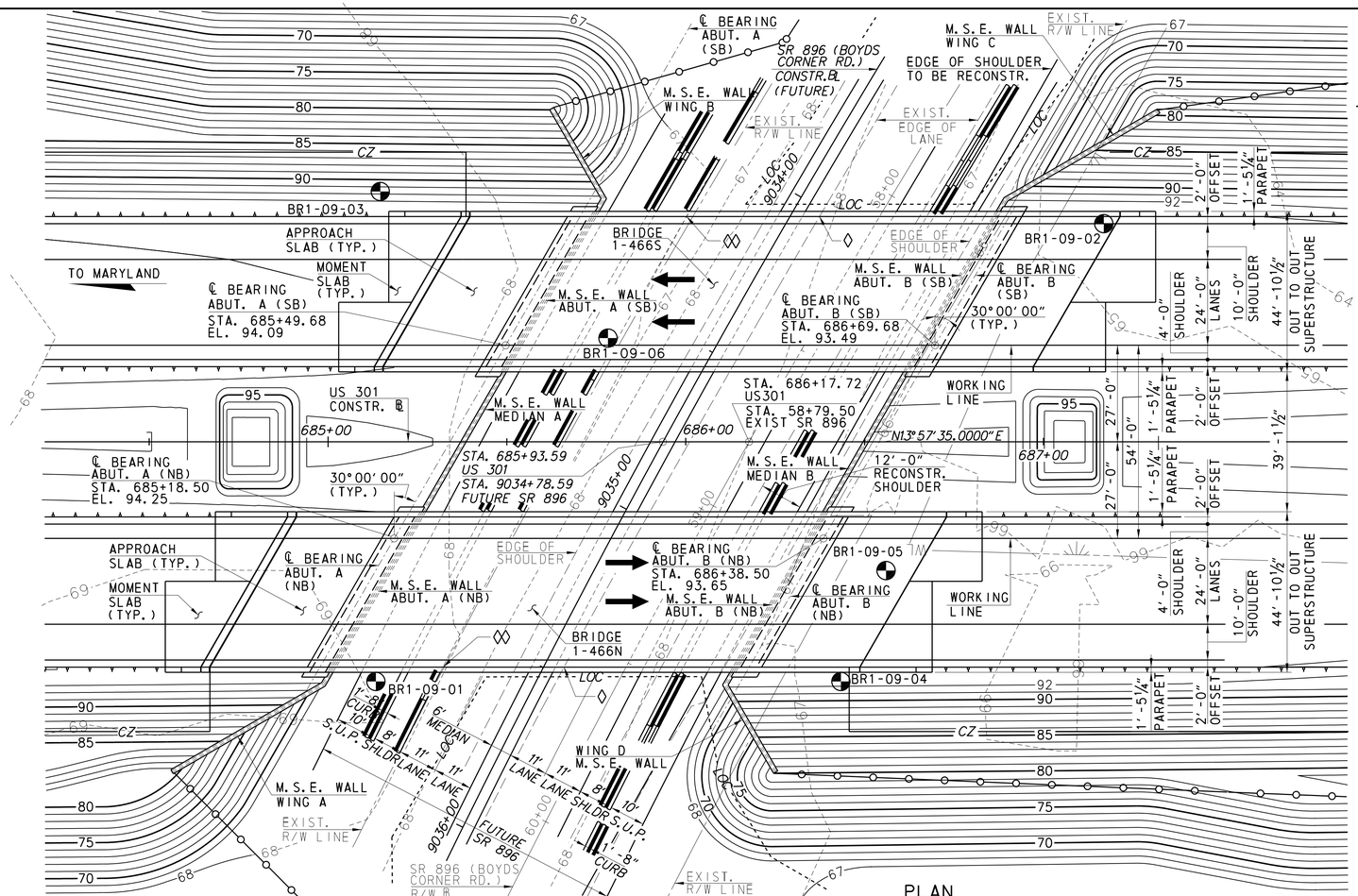
NO SCALE

US 301, SR 896 TO SR 1

CONTRACT T200911308
COUNTY NEW CASTLE
BRIDGE NO. 1-466 N&S
DESIGNED BY: BK
CHECKED BY: ZAA

PROJECT NOTES AND QUANTITIES

SHEET NO. 541
TOTAL SHTS. 875

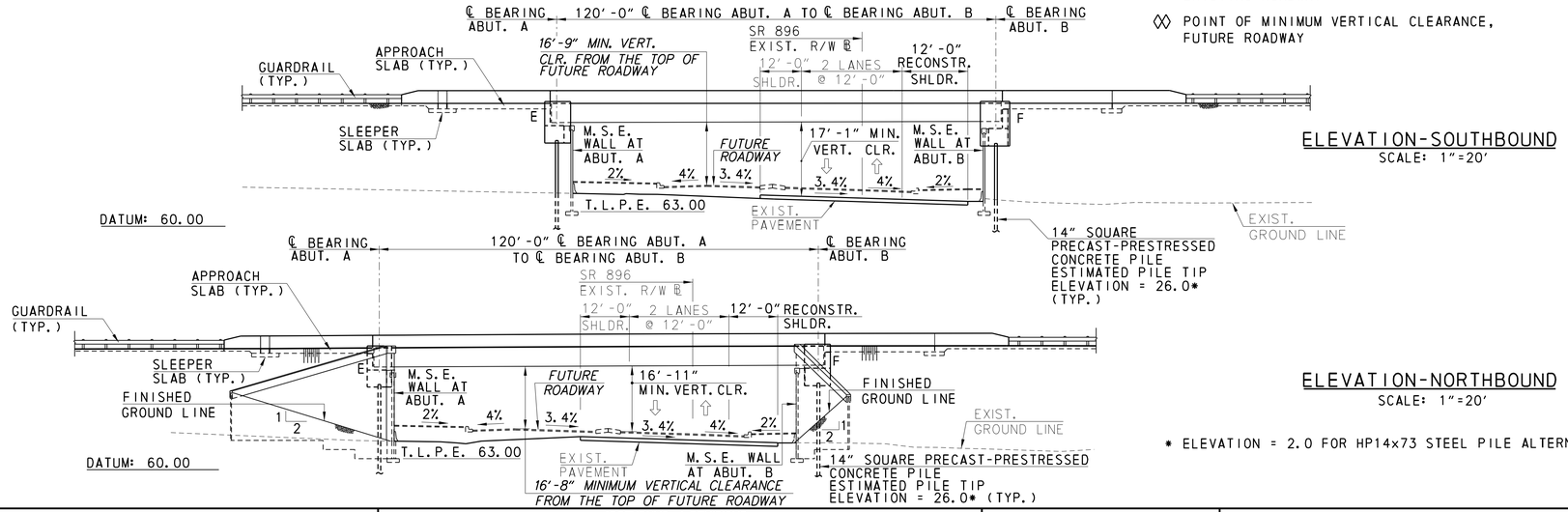



## PLAN

SCALE: 1"=20'

◊ POINT OF MINIMUM VERTICAL CLEARANCE, EXISTING ROADWAY

◊◊ POINT OF MINIMUM VERTICAL CLEARANCE, FUTURE ROADWAY




## ELEVATION-SOUTHBOUND

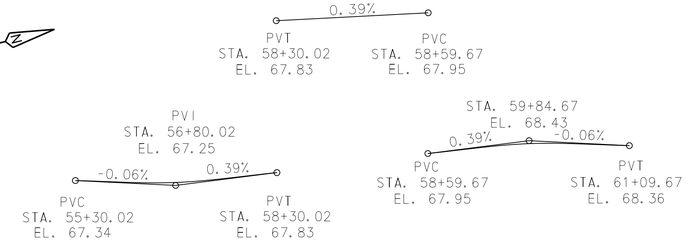
SCALE: 1"=20'




## ELEVATION-NORTHBOUND

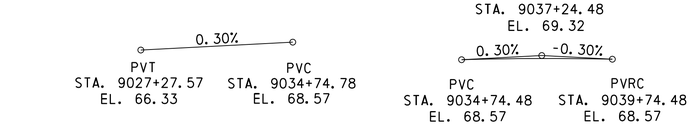
SCALE: 1"=20'

* ELEVATION = 2.0 FOR HP14x73 STEEL PILE ALTERNATE




## VERTICAL CURVE DATA EXISTING SR 896

NOT TO SCALE




## VERTICAL CURVE DATA FUTURE SR 896

NOT TO SCALE


## VERTICAL GEOMETRY DATA U.S 301

NOT TO SCALE

LEGEND:

| | | |
|---|---|---|
| ABUT. | = | ABUTMENT |
| APPROX. | = | APPROXIMATE |
| CONSTR. | = | CONSTRUCTION |
| CLR. | = | CLEAR |
| CZ | = | CLEAR ZONE |
| DA | = | DENIAL OF ACCESS |
| E | = | EXPANSION |
| EL. | = | ELEVATION |
| F | = | FIXED |
| LT. | = | LEFT |
| MIN. | = | MINIMUM |
| M.S.E. | = | MECHANICALLY STABILIZED EARTH |
| NB | = | NORTHBOUND |
| P/S | = | PRESTRESSED |
| RECONSTR. | = | RECONSTRUCTED |
| RT. | = | RIGHT |
| R/W | = | RIGHT-OF-WAY |
| SB | = | SOUTHBOUND |
| SHLDR | = | SHOULDER |
| STA. | = | STATION |
| S.U.P. | = | SHARED USE PATH |
| TYP. | = | TYPICAL |
| T.L.P.E. | = | TOP OF LEVELING PAD ELEVATION |
| VERT. | = | VERTICAL |
| W.S. | = | WATER SURFACE |



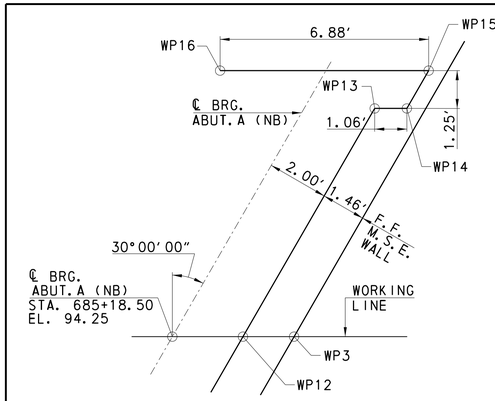
**DELAWARE DEPARTMENT OF TRANSPORTATION**

ADDENDUMS / REVISIONS

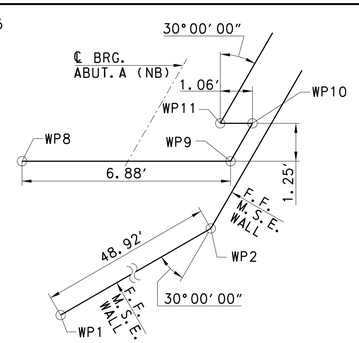
SCALE: AS NOTED

**US 301, SR 896 TO SR 1**

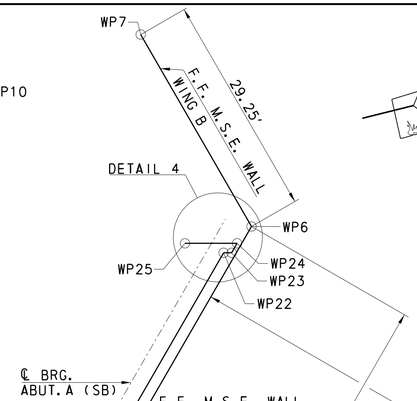
| | | | |
|---|---|---|---|
| CONTRACT T200911308 | BRIDGE NO. | 1-466 N&S | BRIDGE PLAN AND ELEVATION |
| COUNTY NEW CASTLE | DESIGNED BY: BK | | SHEET NO. 542 |
| | CHECKED BY: ZAA | | TOTAL SHTS. 875 |

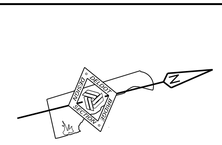



DETAIL 2
NOT TO SCALE




DETAIL 1
NOT TO SCALE



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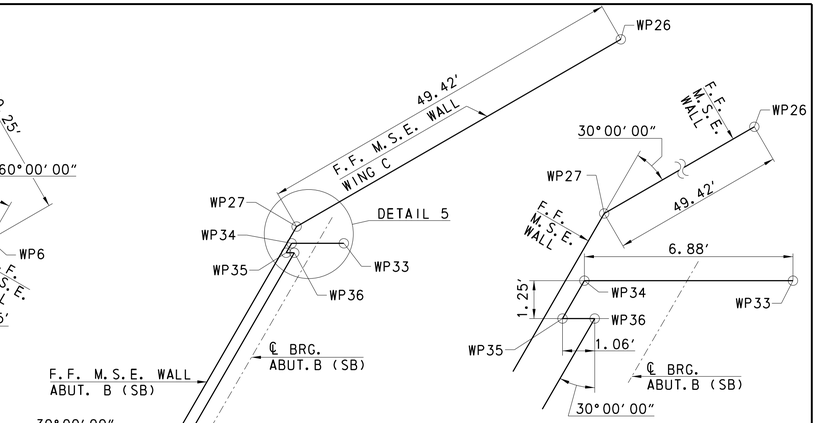





DETAIL 5
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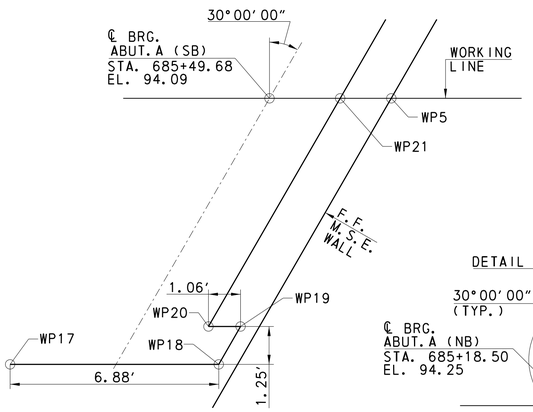
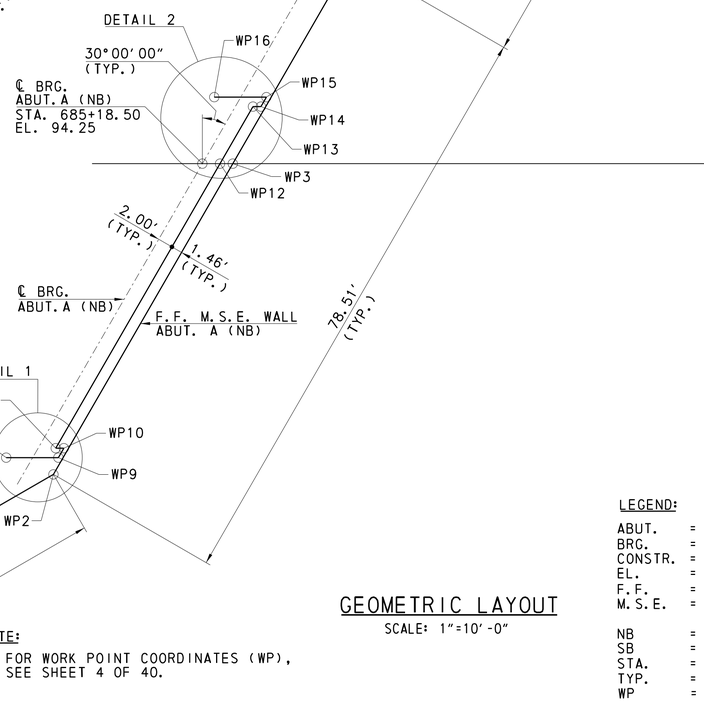
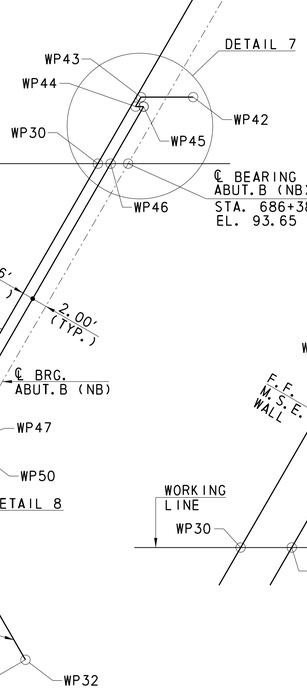
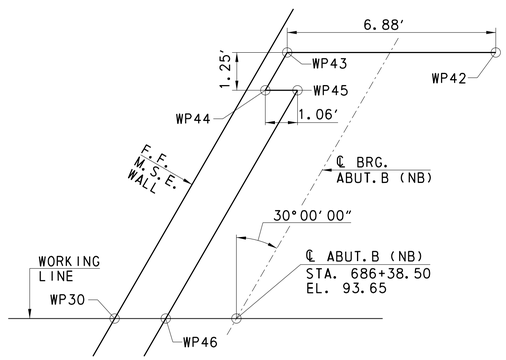


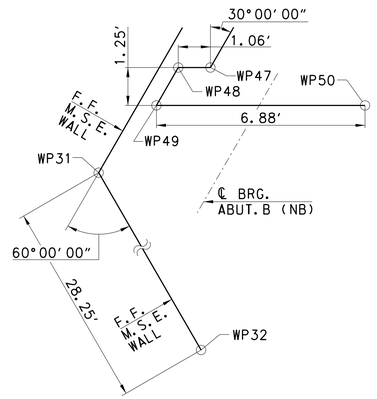

DETAIL 3
NOT TO SCALE




DETAIL 7
NOT TO SCALE




DETAIL 8
NOT TO SCALE

GEOMETRIC LAYOUT
SCALE: 1"=10'-0"

NOTE:
1. FOR WORK POINT COORDINATES (WP), SEE SHEET 4 OF 40.

LEGEND:

| | | |
|---|---|---|
| ABUT. | = | ABUTMENT |
| BRG. | = | BEARING |
| CONSTR. | = | CONSTRUCTION |
| EL. | = | ELEVATION |
| F.F. | = | FRONT FACE |
| M.S.E. | = | MECHANICALLY STABILIZED EARTH |
| NB | = | NORTHBOUND |
| SB | = | SOUTHBOUND |
| STA. | = | STATION |
| TYP. | = | TYPICAL |
| WP | = | WORK POINT |



BR1-466GL-01

DELAWARE
DEPARTMENT OF TRANSPORTATION

ADDENDUMS / REVISIONS

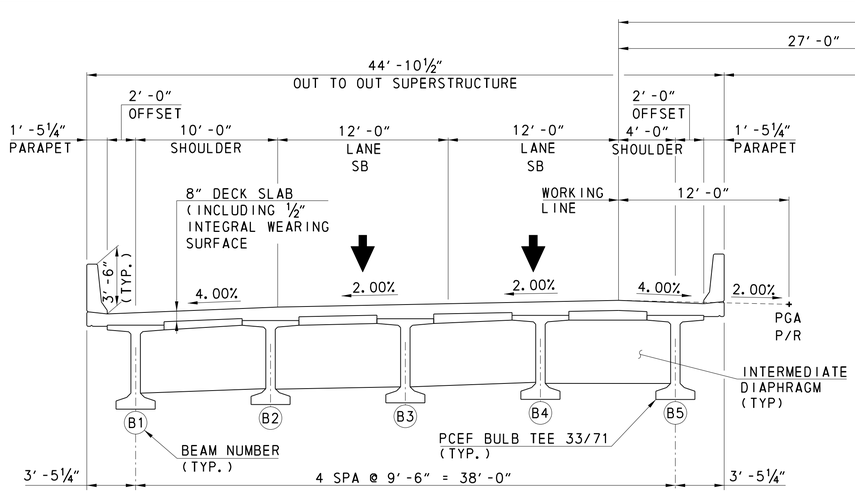
SCALE: AS NOTED

**US 301,**
**SR 896 TO SR 1**

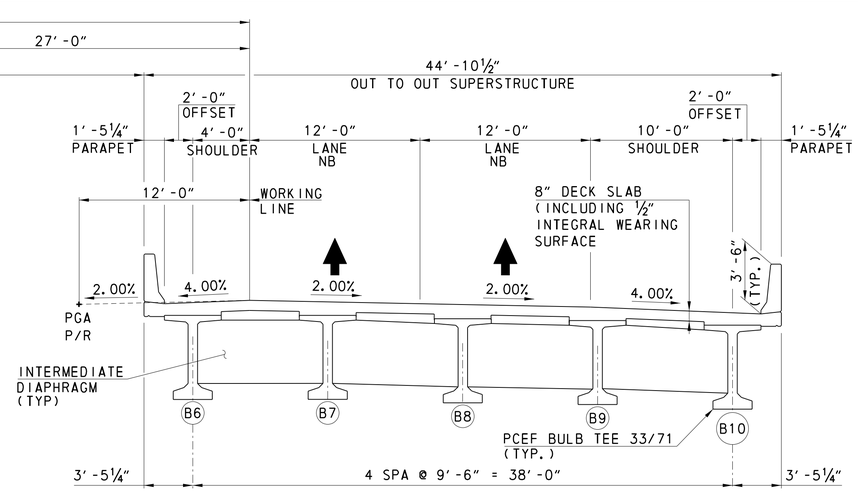
| | | | |
|---|---|---|---|
| CONTRACT | T200911308 | BRIDGE NO. | 1-466 N&S |
| COUNTY | NEW CASTLE | DESIGNED BY: BJH | |
| | | CHECKED BY: BSW | |

**GEOMETRIC LAYOUT PLAN**

| | |
|---|---|
| SHEET NO. | 543 |
| TOTAL SHTS. | 875 |



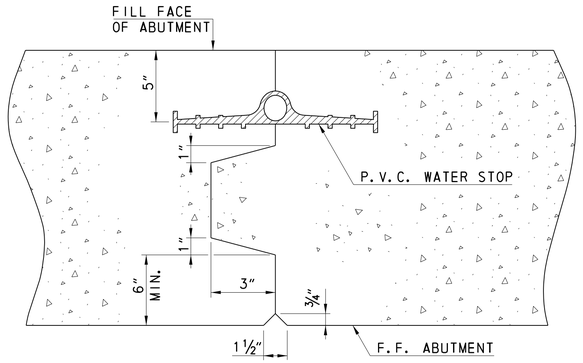

1-466S




1-466N

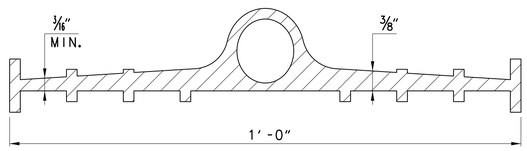
## TYPICAL SECTION

SCALE: 3/16″ = 1′-0″

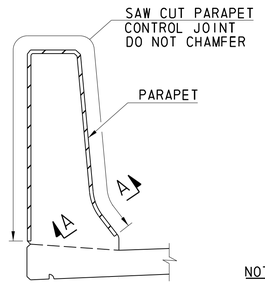



NOTE:
REINFORCING SHALL PASS THROUGH CONSTRUCTION JOINT.

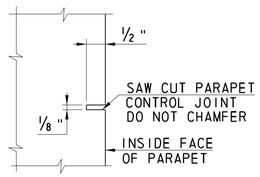
CONSTRUCTION JOINT DETAIL
NOT TO SCALE




P.V.C. WATER STOP
NOT TO SCALE




PARAPET CONTROL JOINT DETAIL
NOT TO SCALE




SECTION A-A
NOT TO SCALE

NOTES:
1. SAW CUT PARAPET CONTROL JOINT SHALL BE SAWED SAME DAY AS CONCRETE IS POURED.
2. FOR LOCATION OF PARAPET CONTROL JOINTS, SEE SHEETS 22 AND 30 OF 40.
3. REFLECTORS SHALL BE INSTALLED ALONG EACH PARAPET. SEE CONSTRUCTION DETAILS, DT-17 FOR DETAILS.

LEGEND:

| | | |
|---|---|---|
| CONSTR. | = | CONSTRUCTION |
| F.F. | = | FRONT FACE |
| LT. | = | LEFT |
| MIN. | = | MINIMUM |
| NB | = | NORTHBOUND |
| RT. | = | RIGHT |
| SB | = | SOUTHBOUND |
| SPA. | = | SPACES |
| TYP. | = | TYPICAL |

## WORK POINT COORDINATES

| WP | NORTHING | EASTING | STATION | OFFSET (FT) |
|---|---|---|---|---|
| 1 | 548808.6847 | 578265.0207 | 684+56.46 | 92.45 RT. |
| 2 | 548855.7002 | 578251.5035 | 684+98.83 | 67.99 RT. |
| 3 | 548888.5544 | 578217.4340 | 685+22.50 | 27.00 RT. |
| 4 | 548910.1974 | 578194.9924 | 685+38.09 | 0.00 |
| 5 | 548931.8404 | 578172.5507 | 685+53.68 | 27.00 LT. |
| 6 | 548964.6947 | 578138.4813 | 685+77.34 | 67.99 LT. |
| 7 | 548956.6125 | 578110.3700 | 685+62.72 | 93.32 LT. |
| 8 | 548850.1930 | 578247.8500 | 684+92.60 | 65.77 RT. |
| 9 | 548856.8698 | 578249.5097 | 684+99.48 | 65.77 RT. |
| 10 | 548857.8694 | 578248.4732 | 685+00.20 | 64.52 RT. |
| 11 | 548856.8407 | 578248.2175 | 684+99.14 | 64.52 RT. |
| 12 | 548886.9183 | 578217.0273 | 685+20.81 | 27.00 RT. |
| 13 | 548892.9505 | 578210.7720 | 685+25.15 | 19.47 RT. |
| 14 | 548893.9792 | 578211.0277 | 685+26.21 | 19.47 RT. |
| 15 | 548894.9788 | 578209.9912 | 685+26.93 | 18.23 RT. |
| 16 | 548888.3020 | 578208.3314 | 685+20.05 | 18.23 RT. |
| 17 | 548917.5245 | 578178.0319 | 685+41.10 | 18.23 LT. |
| 18 | 548924.2013 | 578179.6916 | 685+47.98 | 18.23 LT. |
| 19 | 548925.2009 | 578178.6550 | 685+48.70 | 19.47 LT. |
| 20 | 548924.1722 | 578178.3993 | 685+47.64 | 19.47 LT. |
| 21 | 548930.2044 | 578172.1440 | 685+51.99 | 27.00 LT. |
| 22 | 548960.2820 | 578140.9539 | 685+73.65 | 64.52 LT. |
| 23 | 548961.3107 | 578141.2096 | 685+74.71 | 64.52 LT. |
| 24 | 548962.3103 | 578140.1730 | 685+75.43 | 65.77 LT. |
| 25 | 548955.6335 | 578138.5133 | 685+68.55 | 65.77 LT. |
| 26 | 549120.8920 | 578151.8470 | 687+32.15 | 92.70 LT. |
| 27 | 549073.3960 | 578165.5024 | 686+89.35 | 67.99 LT. |
| 28 | 549040.5418 | 578199.5718 | 686+65.68 | 27.00 LT. |
| 29 | 549018.8988 | 578222.0135 | 686+50.09 | 0.00 |
| 30 | 548997.2557 | 578244.4551 | 686+34.50 | 27.00 RT. |
| 31 | 548964.4015 | 578278.5246 | 686+10.84 | 67.99 RT. |
| 32 | 548972.2073 | 578305.6747 | 686+24.96 | 92.45 RT. |
| 33 | 549078.9032 | 578169.1558 | 686+95.58 | 65.77 LT. |
| 34 | 549072.2264 | 578167.4961 | 686+88.70 | 65.77 LT. |
| 35 | 549071.2268 | 578168.5327 | 686+87.98 | 64.52 LT. |
| 36 | 549072.2555 | 578168.7884 | 686+89.04 | 64.52 LT. |
| 37 | 549042.1779 | 578199.9785 | 686+67.37 | 27.00 LT. |
| 38 | 549036.1457 | 578206.2338 | 686+63.03 | 19.47 LT. |
| 39 | 549035.1170 | 578205.9781 | 686+61.97 | 19.47 LT. |
| 40 | 549034.1174 | 578207.0147 | 686+61.25 | 18.23 LT. |
| 41 | 549040.7942 | 578208.6744 | 686+68.13 | 18.23 LT. |
| 42 | 549011.5717 | 578238.9740 | 686+47.08 | 18.23 RT. |
| 43 | 549004.8949 | 578237.3143 | 686+40.20 | 18.23 RT. |
| 44 | 549003.8953 | 578238.3508 | 686+39.48 | 19.47 RT. |
| 45 | 549004.9240 | 578238.6065 | 686+40.54 | 19.47 RT. |
| 46 | 548998.8918 | 578244.8618 | 686+36.19 | 27.00 RT. |
| 47 | 548968.8142 | 578276.0520 | 686+14.53 | 64.52 RT. |
| 48 | 548967.7855 | 578275.7963 | 686+13.47 | 64.52 RT. |
| 49 | 548966.7859 | 578276.8328 | 686+12.75 | 65.77 RT. |
| 50 | 548973.4627 | 578278.4925 | 686+19.63 | 65.77 RT. |



DELAWARE
DEPARTMENT OF TRANSPORTATION

ADDENDUMS / REVISIONS

SCALE: AS NOTED

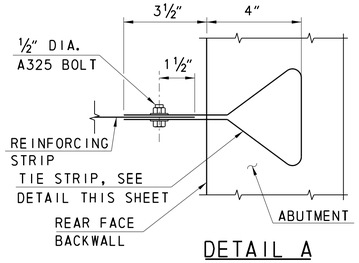
**US 301,
SR 896 TO SR 1**

CONTRACT T200911308
COUNTY NEW CASTLE

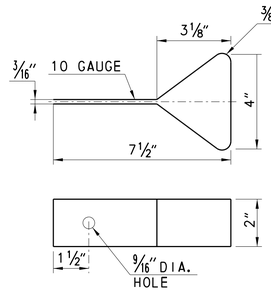
BRIDGE NO. 1-466 N&S
DESIGNED BY: ZAA
CHECKED BY: BSW

**TYPICAL SECTION**

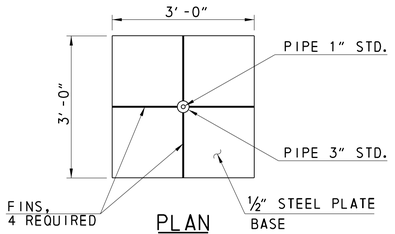
SHEET NO. 544
TOTAL SHTS. 875



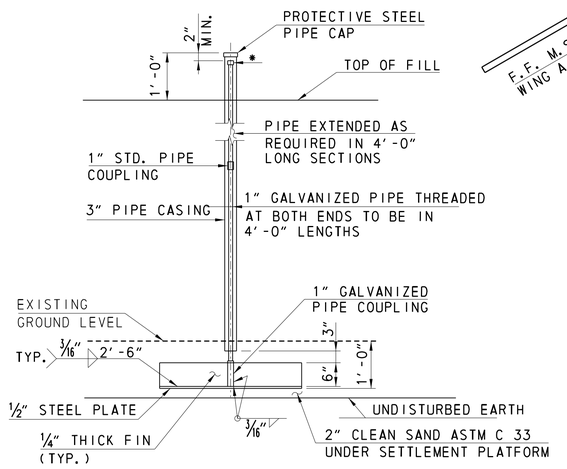

## DETAIL A
NOT TO SCALE




## TIE STRIP DETAIL
NOT TO SCALE




## PLAN



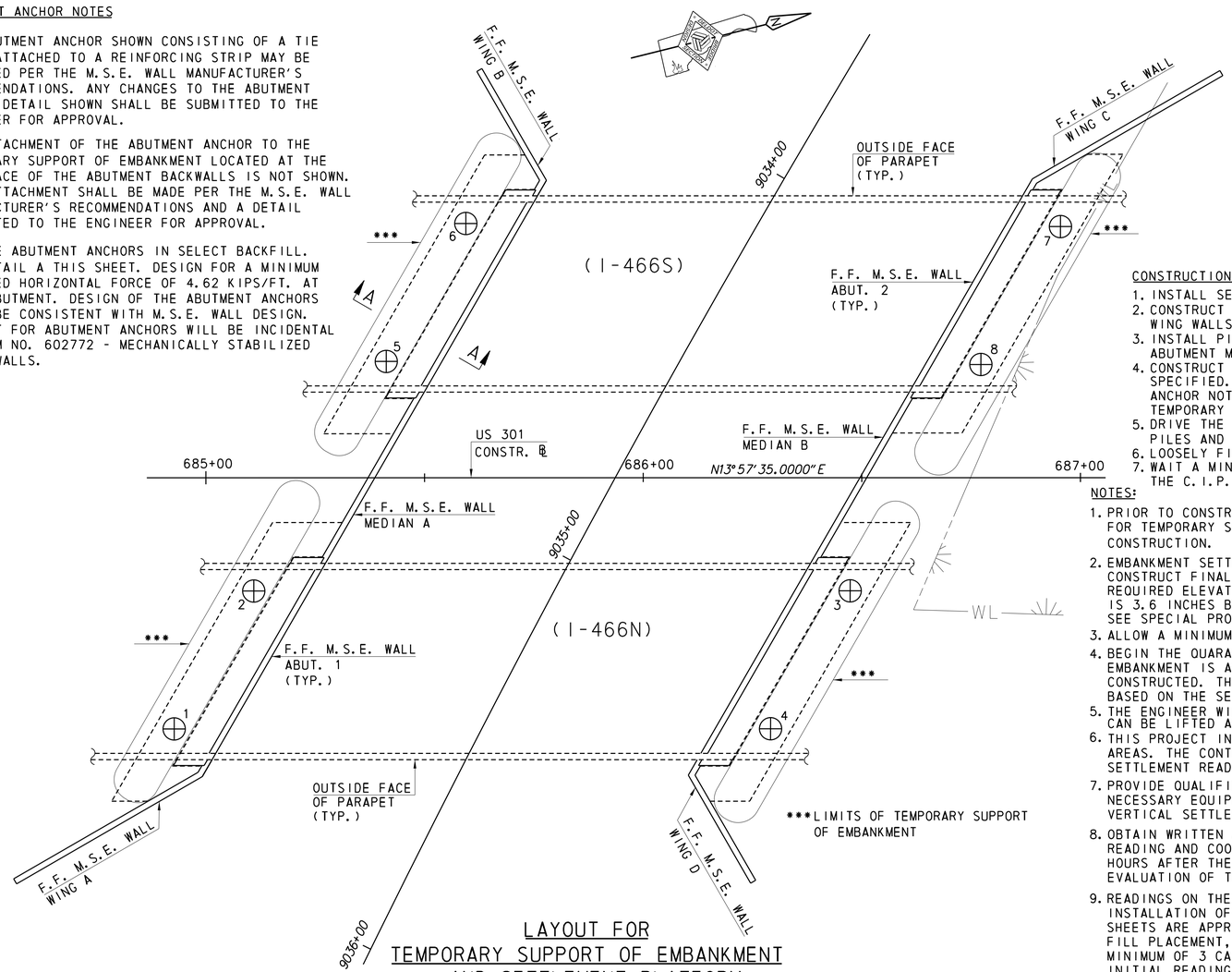

## ELEVATION

## SETTLEMENT PLATFORM DETAIL
NOT TO SCALE

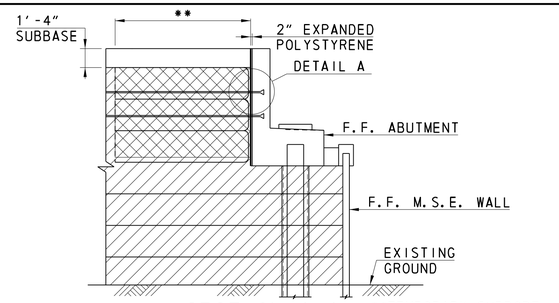
* PIPE CAP WITH ¼" DIA. ROUND HEAD STAINLESS STEEL BOLT SET SECURELY IN CAP. TACK WELD CAP TO PIPE.

### ABUTMENT ANCHOR NOTES

1. THE ABUTMENT ANCHOR SHOWN CONSISTING OF A TIE STRIP ATTACHED TO A REINFORCING STRIP MAY BE MODIFIED PER THE M.S.E. WALL MANUFACTURER'S RECOMMENDATIONS. ANY CHANGES TO THE ABUTMENT ANCHOR DETAIL SHOWN SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL.
2. THE ATTACHMENT OF THE ABUTMENT ANCHOR TO THE TEMPORARY SUPPORT OF EMBANKMENT LOCATED AT THE REAR FACE OF THE ABUTMENT BACKWALLS IS NOT SHOWN. THIS ATTACHMENT SHALL BE MADE PER THE M.S.E. WALL MANUFACTURER'S RECOMMENDATIONS AND A DETAIL SUBMITTED TO THE ENGINEER FOR APPROVAL.
3. PROVIDE ABUTMENT ANCHORS IN SELECT BACKFILL. SEE DETAIL A THIS SHEET. DESIGN FOR A MINIMUM FACTORED HORIZONTAL FORCE OF 4.62 KIPS/FT. AT EACH ABUTMENT. DESIGN OF THE ABUTMENT ANCHORS SHALL BE CONSISTENT WITH M.S.E. WALL DESIGN. PAYMENT FOR ABUTMENT ANCHORS WILL BE INCIDENTAL TO ITEM NO. 602772 - MECHANICALLY STABILIZED EARTH WALLS.




## LAYOUT FOR TEMPORARY SUPPORT OF EMBANKMENT AND SETTLEMENT PLATFORM
NOT TO SCALE




## SECTION A-A
NOT TO SCALE

**TEMPORARY SUPPORT OF EMBANKMENT.

### CONSTRUCTION SEQUENCE:

1. INSTALL SETTLEMENT PLATFORMS, SEE SPECIAL PROVISION 202505.
2. CONSTRUCT M.S.E. WALL AT ABUTMENTS. M.S.E. WALL AT MEDIANS AND WING WALLS MAY ALSO BE CONSTRUCTED AT THE SAME TIME.
3. INSTALL PIPE CASINGS AT THE PROPOSED PILE LOCATIONS DURING THE ABUTMENT M.S.E. WALL CONSTRUCTION.
4. CONSTRUCT TEMPORARY SUPPORT OF EMBANKMENT AS INDICATED AND AS SPECIFIED. INSTALL THE BACKWALL STRAPS AS REQUIRED; SEE ABUTMENT ANCHOR NOTES, THIS SHEET. SEE SPECIAL PROVISIONS 602772 (MATERIALS: TEMPORARY SUPPORT OF EMBANKMENT).
5. DRIVE THE PILES AFTER THE QUARANTINE PERIOD. FOR INSTALLATION OF TEST PILES AND PRODUCTION PILES, SEE SHEET 17 OF 40 PILE NOTES 6a AND 6b.
6. LOOSELY FILL THE CORRUGATED STEEL PIPE WITH FINE AGGREGATE OR SAND.
7. WAIT A MINIMUM OF 30 DAYS AFTER THE QUARANTINE PERIOD BEFORE INSTALLING THE C.I.P. LEVEL-UP CONCRETE AND COPING FOR THE M.S.E. WALL.

### NOTES:

1. PRIOR TO CONSTRUCTION THE CONTRACTOR SHALL SUBMIT PLANS AND SHOP DRAWINGS FOR TEMPORARY SUPPORT OF EMBANKMENT AND M.S.E. WALL INCLUDING SEQUENCE OF CONSTRUCTION.
2. EMBANKMENT SETTLEMENT IS ANTICIPATED. THE PROPRIETARY WALL MANUFACTURER SHALL CONSTRUCT FINAL WALL AND FACING SUCH THAT THE FINAL WALL FACING IS AT THE REQUIRED ELEVATION AFTER SETTLEMENT HAS TAKEN PLACE. THE ANTICIPATED SETTLEMENT IS 3.6 INCHES BEHIND THE FACE OF THE WALL AND WILL OCCUR DURING FILL PLACEMENT. SEE SPECIAL PROVISIONS FOR SETTLEMENT MONITORING REQUIEMENTS.
3. ALLOW A MINIMUM OF 60 DAYS QUARANTINE PERIOD FOR SETTLEMENT MONITORING.
4. BEGIN THE QUARANTINE PERIOD WHEN THE M.S.E. WALL AND TEMPORARY SUPPORT OF EMBANKMENT IS AT FINAL SUBGRADE AND THE SETTLEMENT PLATFORMS ARE COMPLETELY CONSTRUCTED. THE ENGINEER WILL DETERMINE THE DURATION OF THE QUARANTINE PERIOD BASED ON THE SETTLEMENT READINGS.
5. THE ENGINEER WILL NOTIFY THE CONTRACTOR, IN WRITING, WHEN THE QUARANTINE PERIOD CAN BE LIFTED AND WILL BE BASED ON THE RESULTS OF THE SETTLEMENT READINGS.
6. THIS PROJECT INCLUDES THE INSTALLATION OF SETTLEMENT PLATFORMS IN EMBANKMENT AREAS. THE CONTRACTOR IS REQUIRED TO OBTAIN, RECORD, COMPILE AND ANALYZE THE SETTLEMENT READINGS.
7. PROVIDE QUALIFIED PERSONNEL WITH EXPERIENCE IN SETTLEMENT MONITORING AND THE NECESSARY EQUIPMENT AND MATERIALS TO OBTAIN, RECORD, COMPILE AND ANALIZE THE VERTICAL SETTLEMENT READINGS AS SPECIFIED OR DIRECTED.
8. OBTAIN WRITTEN APPROVAL OF THE ENGINEER BEFORE FIRST (INITIAL) SETTLEMENT READING AND COORDINATE SUBSEQUENT READINGS. PROVIDE THE RESULTS WITHIN 24 HOURS AFTER THE READINGS ARE OBTAINED IN A FORMAT SUCH THAT IMMEDIATE EVALUATION OF THE CONDITIONS CAN BE MADE.
9. READINGS ON THE SETTLEMENT PLATFORMS SHALL BE MADE AFTER THE INITIAL INSTALLATION OF THE RISER AND CASING PIPES AND INSTALLATION RECORD SHEETS ARE APPROVED BY THE ENGINEER AND PRIOR TO FILL REPLACEMENT. DURING FILL PLACEMENT, READINGS ON ALL SETTLEMENT PLATFORMS SHALL BE TAKEN AT A MINIMUM OF 3 CALENDAR DAY INTERVALS. AFTER COMPLETION OF THE FILL, TAKE AN INITIAL READING. READINGS ON ALL SETTLEMENT PLATFORMS SHALL THEN BE TAKEN AT A MINIMUM OF 3 CALENDAR DAY INTERVALS. IF THE SETTLEMENT HAS CEASED BY CALENDAR DAY 6, THAT IS 3 READINGS AFTER THE COMPLETION OF THE FILL, THE SUBSTRUCTURE WILL BE RELEASED BY THE ENGINEER FOR THE INSTALLATION OF PRODUCTION PILES WITHIN 3 WORKING DAYS OF RECEIPT OF SETTLEMENT MONITORING RESULTS.
10. AFTER COMPLETION OF THE ABUTMENT AND M.S.E. WALL PANEL PLACEMENT, THE CONTRACTOR SHALL ESTABLISH REFERENCE POINTS TO MONITOR SETTLEMENT ON TOP OF THE ABUTMENT SEAT AND EITHER ON TOP OF THE M.S.E. WALL PANELS OR ON TOP OF M.S.E. WALL LEVELING PAD AT POINTS WITHIN FIVE FEET OF ALL ENDS AND CORNERS AND AT THE CENTER OF BRIDGES AND THE CENTERLINE OF U.S. 301. READINGS ON ALL SETTLEMENT PLATFORMS AND REFERENCE POINTS SHALL CONTINUE TO BE TAKEN AT A MINIMUM OF 30-DAY INTERVALS FOR THE NEXT 6 MONTHS OR AS DIRECTED BY THE ENGINEER. SEE SPECIAL PROVISIONS FOR ADDITIONAL SETTLEMENT MONITORING REQUIREMENTS.
11. DO NOT ALLOW CONSTRUCTION ACTIVITY, OTHER THAN MONITORING, WITHIN THE QUARANTINE AREAS DURING THE QUARANTINE TIME PERIOD.
12. LOCATE SETTLEMENT PLATFORMS HORIZONTALLY AND VERTICALLY AT THE DIRECTION OF THE ENGINEER. PROVIDE A BENCHMARK FOR THE MONITORING OF THIS WORK. THE BENCHMARK SHALL BE LOCATED IN A PROTECTED AREA OUTSIDE OF THE THE AREA OF ANTICIPATED SETTLEMENT.
13. EXPANDED POLYSTYRENE SHALL CONFORM TO ASTM C 578, EXCEPT THAT THE MAXIMUM ALLOWABLE WATER ABSORPTION SHALL BE 2%. COST SHALL BE INCIDENTAL TO ITEM 602014 - PORTLAND CEMENT CONCRETE MASONRY, APPROACH SLAB, CLASS D.

## SOIL PARAMETERS
## TEMPORARY SUPPORT OF EMBANKMENT

| | |
|---|---|
| REINFORCEMENT ZONE | |
| IN-SITU SOIL DENSITY, (lb/ft³) | 130 |
| IN-SITU SOIL COHESION, (psf) | 0 |
| IN-SITU SOIL FRICTION ANGLE, (deg) | 34 |
| RETAINED ZONE | |
| IN-SITU SOIL DENSITY, (lb/ft³) | 130 |
| IN-SITU SOIL COHESION, (psf) | 0 |
| IN-SITU SOIL FRICTION ANGLE, (deg) | 34 |
| FOUNDATION ZONE | |
| IN-SITU SOIL DENSITY, (lb/ft³) | 130 |
| IN-SITU SOIL COHESION, (psf) | 0 |
| IN-SITU SOIL FRICTION ANGLE, (deg) | 34 |
| BEARING RESISTANCE FACTOR | 0.65 |

## SETTLEMENT PLATFORM LOCATION

| | | STATION | OFFSET (FT.) |
|---|---|---|---|
| NB | 1 | 684+93 | 57.0 RT. |
| | 2 | 685+11 | 26.0 RT. |
| | 3 | 686+48 | 26.0 RT. |
| | 4 | 686+30 | 57.0 RT. |
| SB | 5 | 685+41 | 26.0 LT. |
| | 6 | 685+59 | 57.0 LT. |
| | 7 | 686+96 | 57.0 LT. |
| | 8 | 686+78 | 26.0 LT. |

### LEGEND

| | | |
|---|---|---|
| ABUT. | = | ABUTMENT |
| CONSTR. | = | CONSTRUCTION |
| DA | = | DENIAL OF ACCESS |
| DIA. | = | DIAMETER |
| EL. | = | ELEVATION |
| F.F. | = | FRONT FACE |
| LT. | = | LEFT |
| M.S.E. | = | MECHANICALLY STABILIZED EARTH |
| RT. | = | RIGHT |
| R/W | = | RIGHT-OF-WAY |
| STA. | = | STATION |
| STD. | = | STANDARD |
| WL | = | WETLAND |
| ⊕ | = | SETTLEMENT PLATFORMS |
| | = | M.S.E. WALL |
| | = | TEMPORARY SUPPORT OF EMBANKMENT |

SHEET 5 OF 40 | BR1-466DT-01

**DELAWARE DEPARTMENT OF TRANSPORTATION**

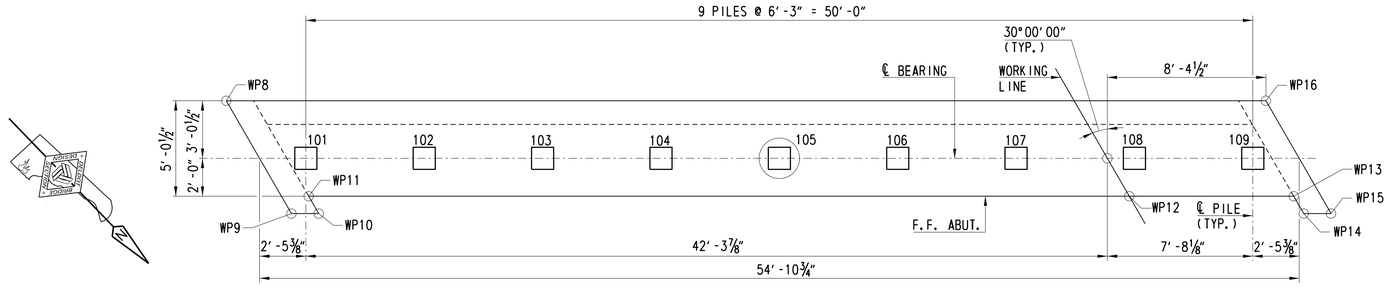
ADDENDUMS / REVISIONS

NOT TO SCALE

**US 301, SR 896 TO SR 1**

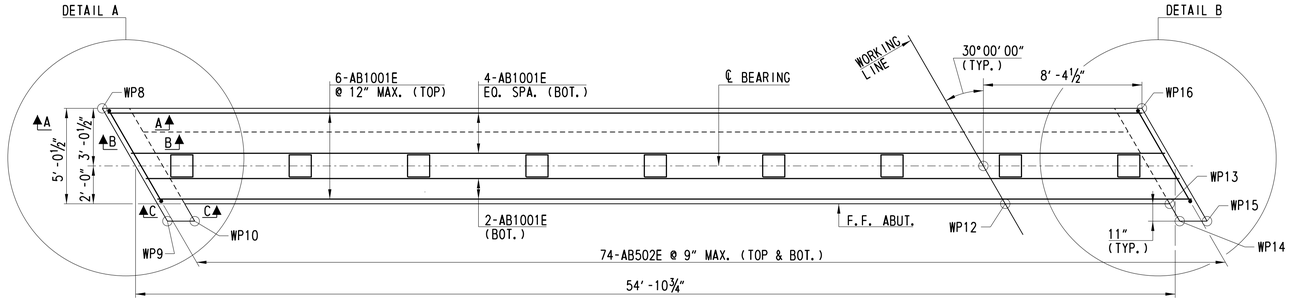
| | | |
|---|---|---|
| CONTRACT T200911308 | BRIDGE NO. 1-466 N&S | SHEET NO. 545 |
| COUNTY NEW CASTLE | DESIGNED BY: SJM | TOTAL SHTS. 875 |
| | CHECKED BY: ZAA | |

**CONSTRUCTION SEQUENCE AT ABUTMENTS**

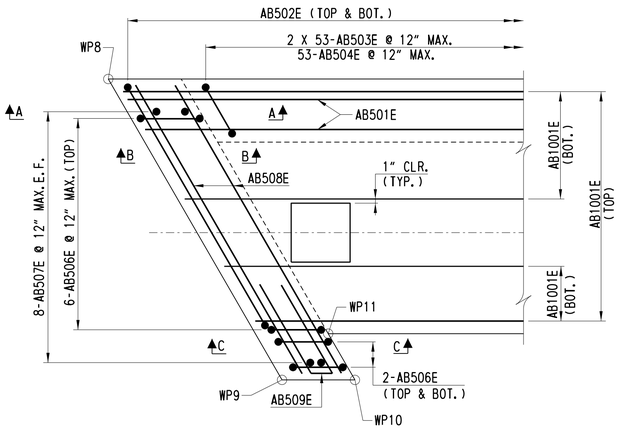



NOTES:
- 14" SQUARE PRECAST P/S CONCRETE PILE IS RECOMMENDED.
- ONE TO ONE SUBSTITUTION ALLOWED FOR HP 14X73 STEEL PILE.
- FOR PILE NOTES AND DETAILS, SEE SHEET 17 OF 40.

## PILE LAYOUT PLAN
SCALE: ¼"=1'-0"

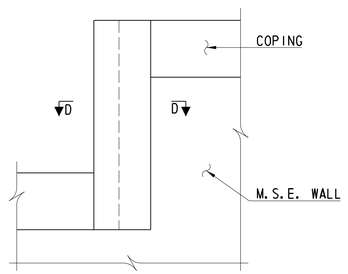



## PLAN
## TOP AND BOTTOM REINFORCEMENT
SCALE: ¼"=1'-0"

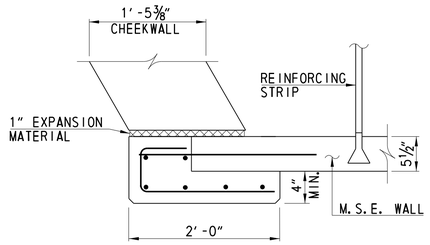



## DETAIL A
## (DETAIL B SIMILAR)
N.T.S.

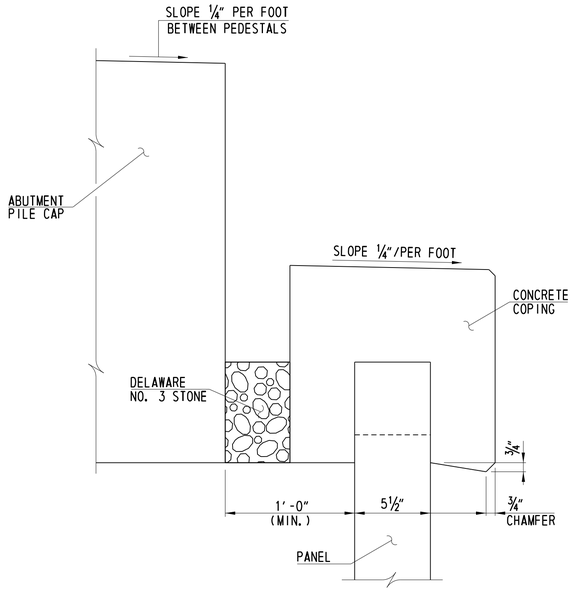
NOTES:
1. FOR LOCATION OF VIEW 1-1, SEE SHEET 7 OF 40.
2. FOR REINFORCEMENT BAR LIST, SEE SHEET 10 OF 40.
3. MEMBRANE WATERPROOFING SHALL BE INCIDENTAL TO ITEM 602015 - PORTLAND CEMENT CONCRETE MASONRY, ABUTMENT ABOVE FOOTING, CLASS A. SEE SPECIAL PROVISION ITEM 602616 - WATERPROOFING P.C.C. MASONRY SURFACES FOR ADDITIONAL REQUIREMENTS.



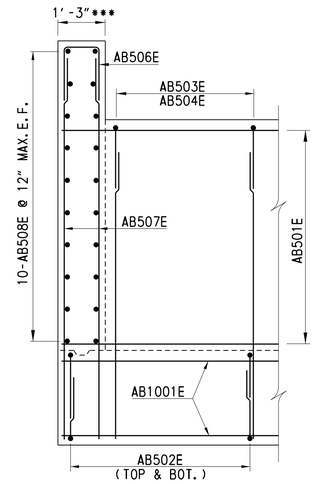

## VIEW 1-1
N.T.S.



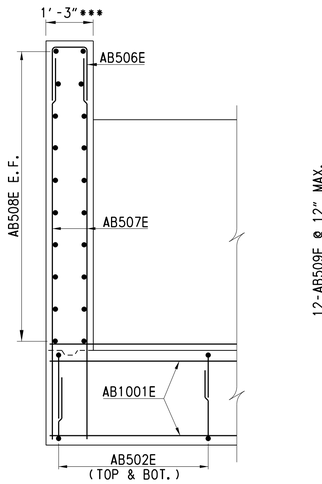

## SECTION D-D
N.T.S.



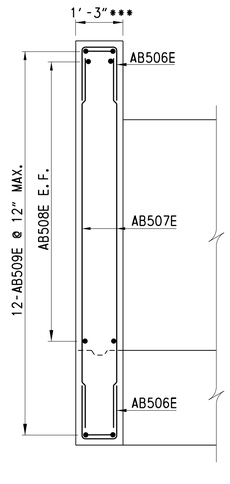

## ABUTMENT DETAIL
N.T.S.




## SECTION A-A
SCALE: ½"=1'-0"

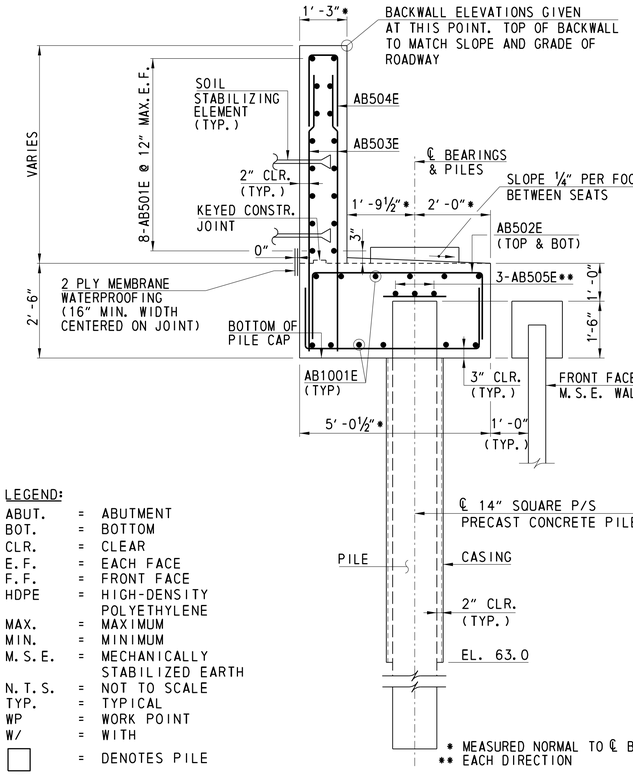



## SECTION B-B
SCALE: ½"=1'-0"




## SECTION C-C
SCALE: ½"=1'-0"

*** MEASURED NORMAL TO WORKING LINE.




* MEASURED NORMAL TO ℄ BEARING
** EACH DIRECTION

## TYPICAL SECTION
SCALE: ½"=1'-0"

LEGEND:

| | | |
|---|---|---|
| ABUT. | = | ABUTMENT |
| BOT. | = | BOTTOM |
| CLR. | = | CLEAR |
| E.F. | = | EACH FACE |
| F.F. | = | FRONT FACE |
| HDPE | = | HIGH-DENSITY POLYETHYLENE |
| MAX. | = | MAXIMUM |
| MIN. | = | MINIMUM |
| M.S.E. | = | MECHANICALLY STABILIZED EARTH |
| N.T.S. | = | NOT TO SCALE |
| TYP. | = | TYPICAL |
| WP | = | WORK POINT |
| W/ | = | WITH |
| □ | = | DENOTES PILE |
| ⊡ | = | DENOTES TEST PILE |



**DELAWARE DEPARTMENT OF TRANSPORTATION**

ADDENDUMS / REVISIONS

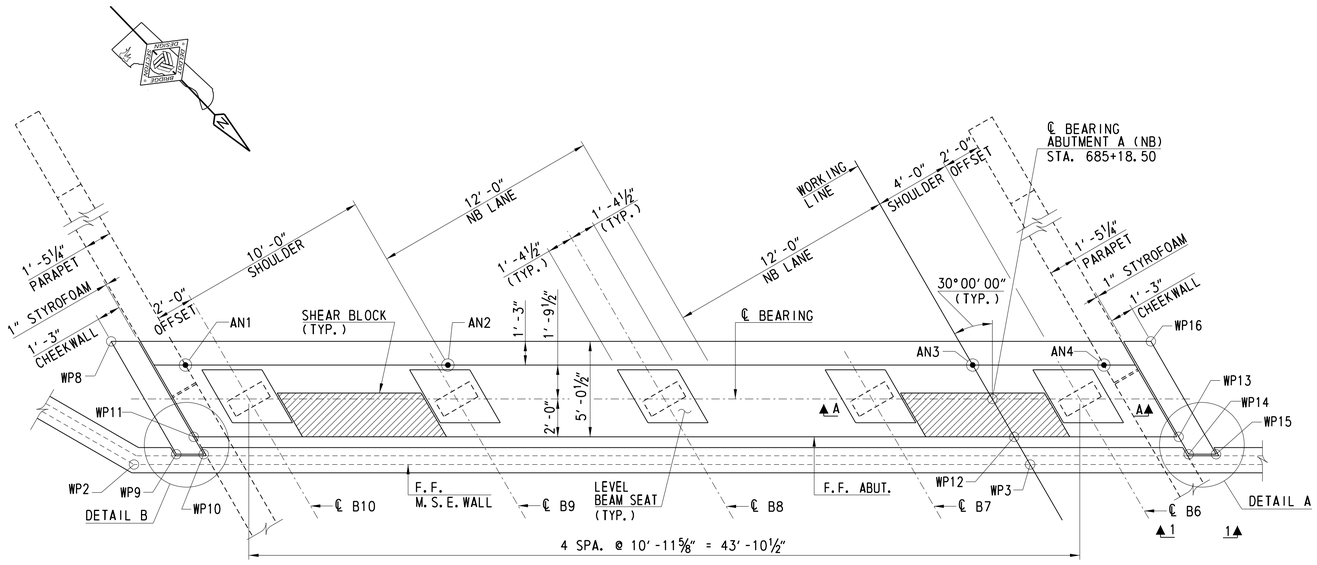
SCALE: AS NOTED

**US 301, SR 896 TO SR 1**

| CONTRACT | BRIDGE NO. | 1-466 N&S |
|---|---|---|
| T200911308 | DESIGNED BY: MDM/ZAA | |
| COUNTY | CHECKED BY: BJH | |
| NEW CASTLE | | |

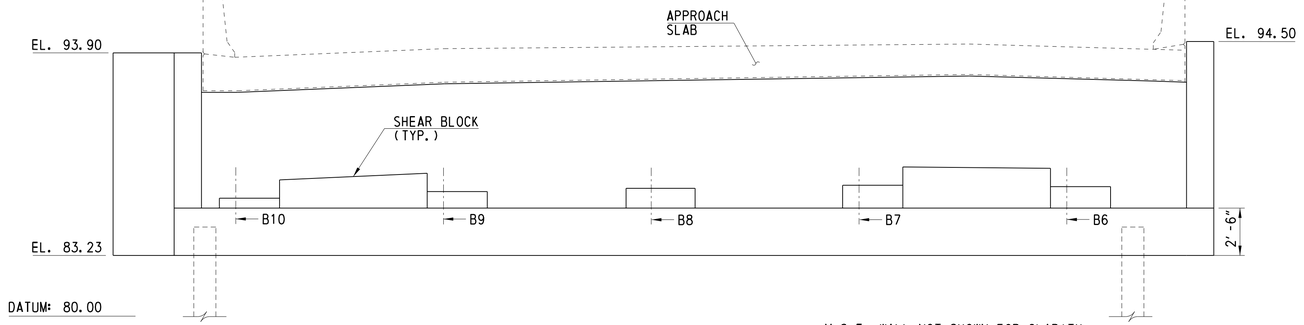
**ABUTMENT A (NB) FOOTING PLAN**

| SHEET NO. |
|---|
| 546 |
| TOTAL SHTS. |
| 875 |




PLAN

SCALE : ¼"=1'-0"




M.S.E. WALL NOT SHOWN FOR CLARITY.

ELEVATION

SCALE: ¼"=1'-0"

TABLE OF BACKWALL ELEVATIONS

| LOCATION | ELEVATION |
|---|---|
| AN1 | 91.82 |
| AN2 | 92.27 |
| AN3 | 92.68 |
| AN4 | 92.42 |

TABLE OF BEAM SEAT ELEVATIONS

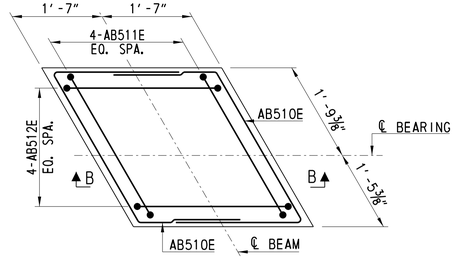
| LOCATION | ELEVATION |
|---|---|
| B6 | 86.84 |
| B7 | 86.91 |
| B8 | 86.75 |
| B9 | 86.58 |
| B10 | 86.23 |

NOTES:

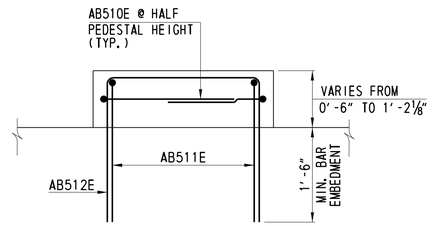
1. FOR LOCATION OF BACKWALL ELEVATIONS, SEE TYPICAL SECTION ON SHEET 6 OF 40.
2. FOR VIEW 1-1, SEE SHEET 6 OF 40.
3. FOR REINFORCEMENT BAR LIST, SEE SHEET 10 OF 40.
4. STYROFOAM AND P.V.C. SCHEDULE 40 WEEP HOLE PAYMENT SHALL BE INCIDENTAL TO CONCRETE CONSTRUCTION.
5. BEARING MATERIAL SHALL BE NEOPRENE WITH A DUROMETER OF 50 ± 5. PAYMENT SHALL BE INCIDENTAL TO CONCRETE CONSTRUCTION.

LEGEND:

| | | |
|---|---|---|
| ABUT. | = | ABUTMENT |
| BOT. | = | BOTTOM |
| E.F. | = | EACH FACE |
| EL. | = | ELEVATION |
| F.F. | = | FRONT FACE |
| GALV. | = | GALVANIZED |
| MAX. | = | MAXIMUM |
| M.S.E. | = | MECHANICALLY STABILIZED EARTH |
| NB | = | NORTHBOUND |
| N.T.S. | = | NOT TO SCALE |
| P.C.P. | = | PREFORMED CELLULAR POLYSTYRENE |
| STA. | = | STATION |
| TYP. | = | TYPICAL |
| WP | = | WORK POINT |



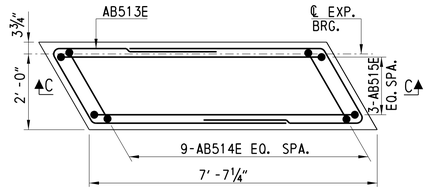

PLAN



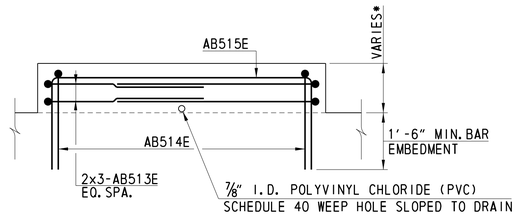

SECTION B-B

TYPICAL PEDESTAL DETAIL

NOT TO SCALE




PLAN

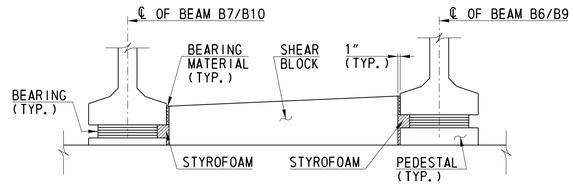



* EXTEND 8" ABOVE BOTTOM OF BEAM.

SECTION C-C

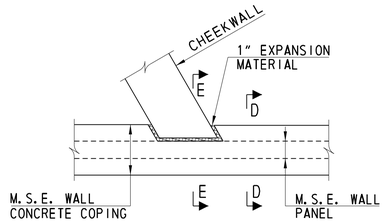
TYPICAL SHEAR BLOCK DETAIL

NOT TO SCALE



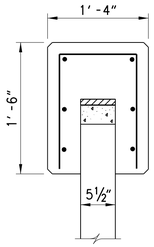

SECTION A-A

NOT TO SCALE



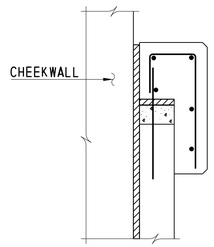

DETAIL A
(DETAIL B SIMILAR)

NOT TO SCALE




SECTION D-D

NOT TO SCALE




SECTION E-E

NOT TO SCALE



DELAWARE DEPARTMENT OF TRANSPORTATION

ADDENDUMS / REVISIONS

SCALE: AS NOTED

**US 301, SR 896 TO SR 1**

CONTRACT T200911308

COUNTY NEW CASTLE

BRIDGE NO. **1-466 N&S**

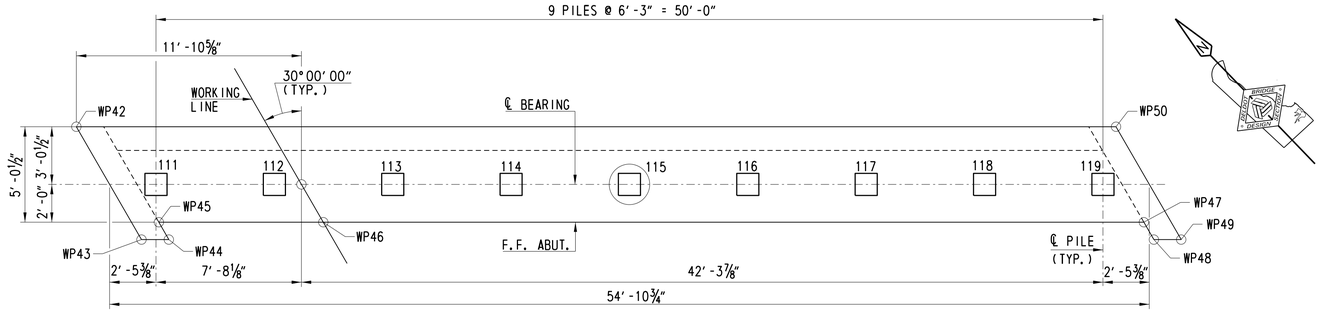
DESIGNED BY: MDM/ZAA

CHECKED BY: BJH

**ABUTMENT A (NB) PLAN AND ELEVATION**

SHEET NO. 547

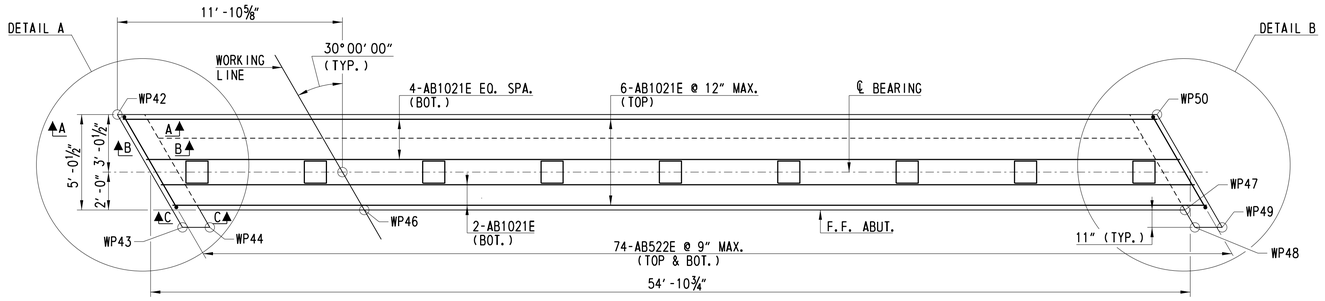
TOTAL SHTS. 875




NOTES:
- 14" SQUARE PRECAST P/S CONCRETE PILE IS RECOMMENDED.
- ONE TO ONE SUBSTITUTION ALLOWED FOR HP 14X73 STEEL PILE.
- FOR PILE NOTES AND DETAILS, SEE SHEET 17 OF 40.

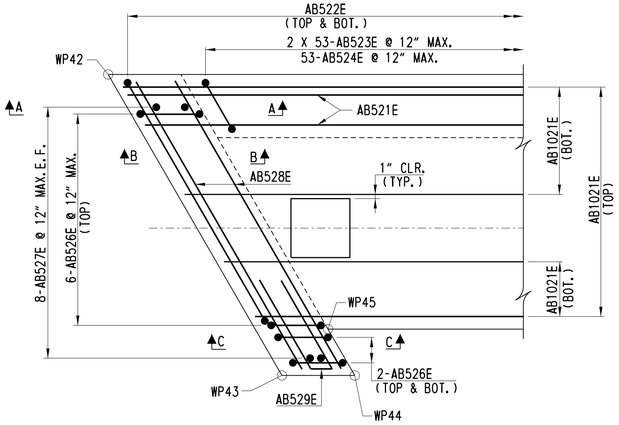
## PILE LAYOUT PLAN

SCALE: ¼"=1'-0"



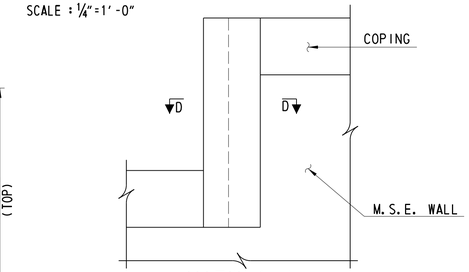

## PLAN
## TOP AND BOTTOM REINFORCEMENT

SCALE: ¼"=1'-0"



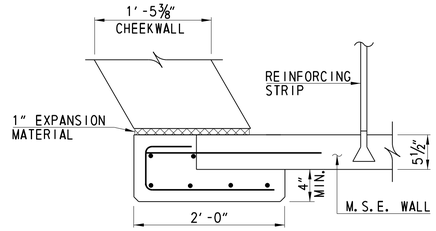

## DETAIL A
## (DETAIL B SIMILAR)

NOT TO SCALE



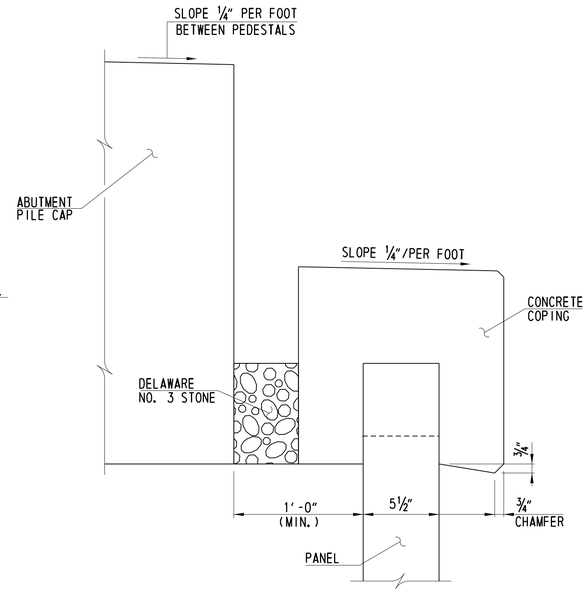

## VIEW 1-1

NOT TO SCALE



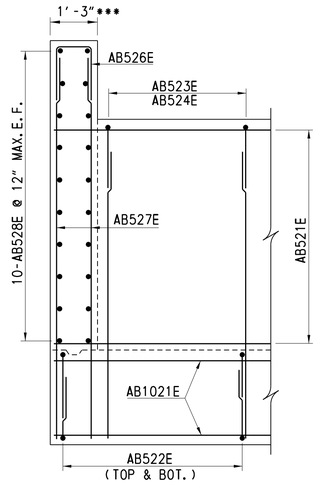

## SECTION D-D

NOT TO SCALE




## ABUTMENT DETAIL

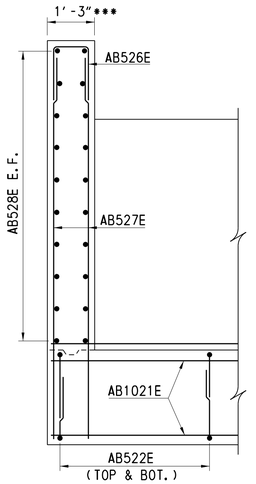
NOT TO SCALE




## SECTION A-A

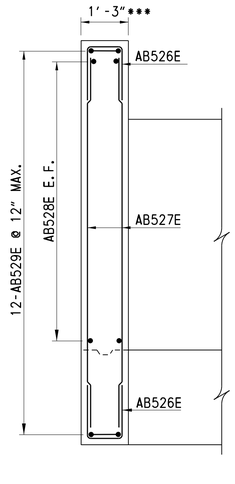
SCALE: ½"=1'-0"

*** MEASURED NORMAL TO WORKING LINE.



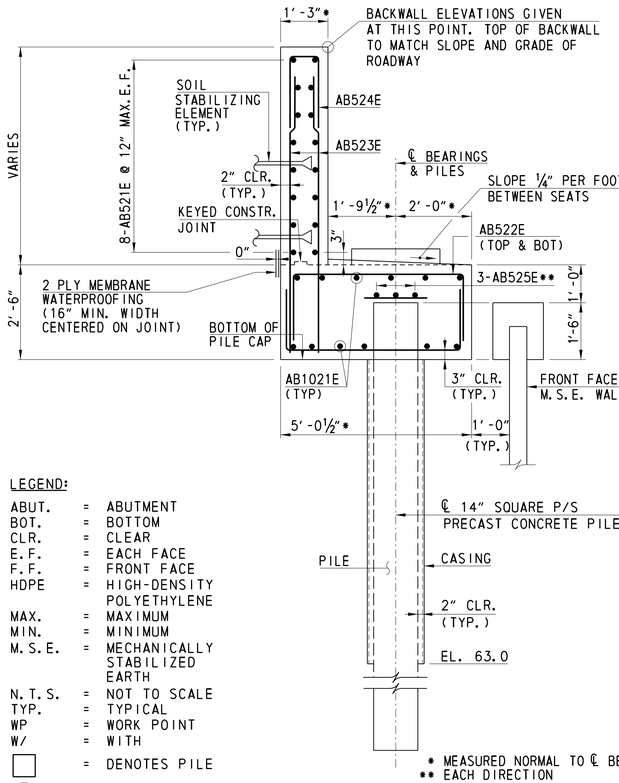

## SECTION B-B

SCALE: ½"=1'-0"




## SECTION C-C

SCALE: ½"=1'-0"




LEGEND:

| | | |
|---|---|---|
| ABUT. | = | ABUTMENT |
| BOT. | = | BOTTOM |
| CLR. | = | CLEAR |
| E.F. | = | EACH FACE |
| F.F. | = | FRONT FACE |
| HDPE | = | HIGH-DENSITY POLYETHYLENE |
| MAX. | = | MAXIMUM |
| MIN. | = | MINIMUM |
| M.S.E. | = | MECHANICALLY STABILIZED EARTH |
| N.T.S. | = | NOT TO SCALE |
| TYP. | = | TYPICAL |
| WP | = | WORK POINT |
| W/ | = | WITH |
| □ | = | DENOTES PILE |
| ◯ | = | DENOTES TEST PILE |

* MEASURED NORMAL TO ℄ BEARING
** EACH DIRECTION

## TYPICAL SECTION

SCALE: ½"=1'-0"

NOTES:
1. FOR LOCATION OF VIEW 1-1, SEE SHEET 9 OF 40.
2. FOR REINFORCEMENT BAR LIST, SEE SHEET 10 OF 40.
3. MEMBRANE WATERPROOFING SHALL BE INCIDENTAL TO ITEM 602015 - PORTLAND CEMENT CONCRETE MASONRY, ABUTMENT ABOVE FOOTING, CLASS A. SEE SPECIAL PROVISION ITEM 602616 - WATERPROOFING P.C.C. MASONRY SURFACES FOR ADDITIONAL REQUIREMENTS.



**DELAWARE DEPARTMENT OF TRANSPORTATION**

ADDENDUMS / REVISIONS

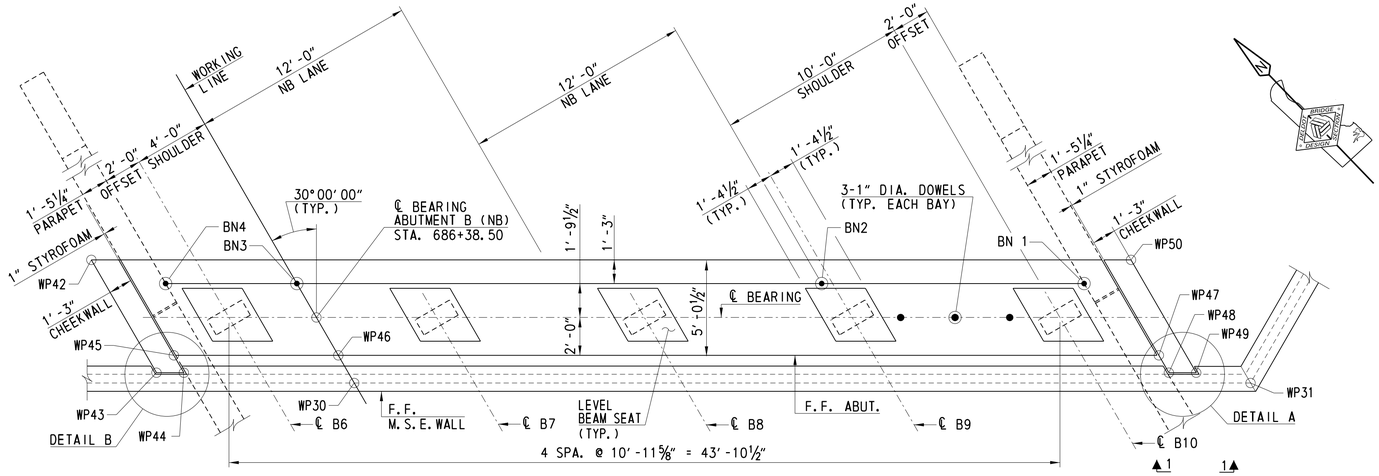
SCALE: AS NOTED

**US 301, SR 896 TO SR 1**

| CONTRACT | BRIDGE NO. | 1-466 N&S |
|---|---|---|
| T200911308 | DESIGNED BY: MDM/ZAA | |
| COUNTY: NEW CASTLE | CHECKED BY: BJH | |

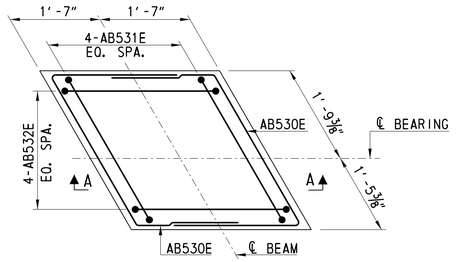
**ABUTMENT B (NB) FOOTING PLAN**

SHEET NO. 548
TOTAL SHTS. 875

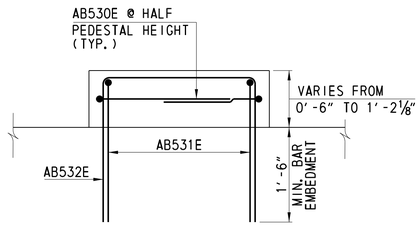



## PLAN

SCALE : ¼"=1'-0"



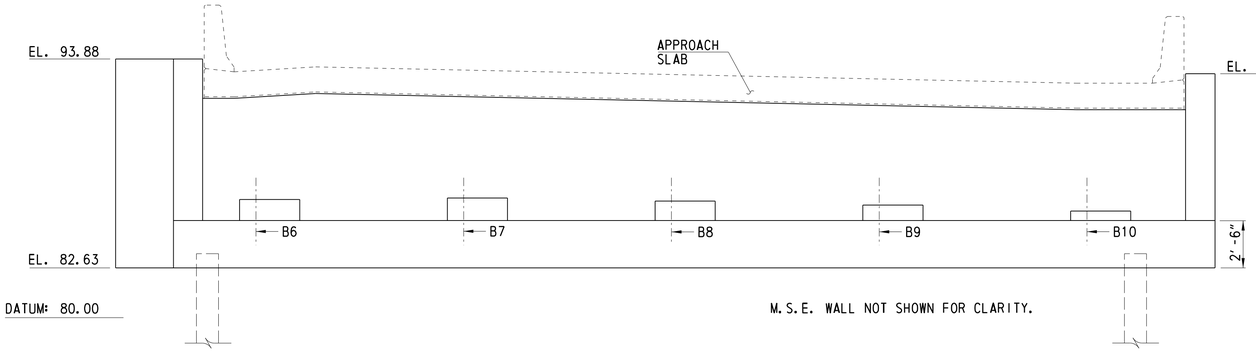

## PLAN




## SECTION A-A

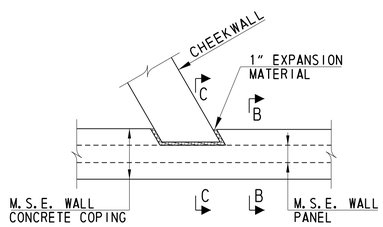
## TYPICAL PEDESTAL DETAIL

NOT TO SCALE



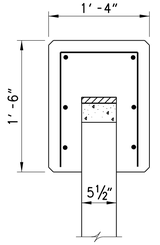

## ELEVATION

SCALE: ¼"=1'-0"



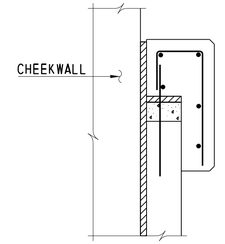

## DETAIL A (DETAIL B SIMILAR)

NOT TO SCALE




## SECTION B-B

NOT TO SCALE




## SECTION C-C

NOT TO SCALE

### TABLE OF BACKWALL ELEVATIONS

| LOCATION | ELEVATION |
|---|---|
| BN1 | 91.20 |
| BN2 | 91.65 |
| BN3 | 92.06 |
| BN4 | 91.80 |

### TABLE OF BEAM SEAT ELEVATIONS

| LOCATION | ELEVATION |
|---|---|
| B6 | 86.24 |
| B7 | 86.31 |
| B8 | 86.15 |
| B9 | 85.98 |
| B10 | 85.63 |

NOTES:

1. FOR LOCATION OF BACKWALL ELEVATIONS, SEE TYPICAL SECTION ON SHEET 8 OF 40.
2. FOR VIEW 1-1, SEE SHEET 8 OF 40.
3. FOR REINFORCEMENT BAR LIST, SEE SHEET 10 OF 40.
4. FOR DIAPHRAGM DETAILS, SEE SHEETS 23 AND 24 OF 40.
5. STYROFOAM AND DOWEL PAYMENT SHALL BE INCIDENTAL TO CONCRETE CONSTRUCTION.
6. SEE DELDOT STANDARD SPECIFICATION 824.02 (g) FOR CIP DOWEL MATERIAL REQUIREMENTS. FOR DOWEL DETAIL, SEE SHEET 23 OF 40.

LEGEND:

| | | |
|---|---|---|
| ABUT. | = | ABUTMENT |
| BOT. | = | BOTTOM |
| C.I.P. | = | CAST-IN-PLACE |
| E.F. | = | EACH FACE |
| EL. | = | ELEVATION |
| F.F. | = | FRONT FACE |
| GALV. | = | GALVANIZED |
| MAX. | = | MAXIMUM |
| M.S.E. | = | MECHANICALLY STABILIZED EARTH |
| NB | = | NORTHBOUND |
| P.C.P. | = | PREFORMED CELLULAR POLYSTYRENE |
| STA. | = | STATION |
| TYP. | = | TYPICAL |
| WP | = | WORK POINT |



DELAWARE DEPARTMENT OF TRANSPORTATION

ADDENDUMS / REVISIONS

SCALE: AS NOTED

**US 301, SR 896 TO SR 1**

CONTRACT T200911308

COUNTY NEW CASTLE

BRIDGE NO. **1-466 N&S**

DESIGNED BY: MDM/ZAA

CHECKED BY: BJH

**ABUTMENT B (NB) PLAN AND ELEVATION**

SHEET NO. 549

TOTAL SHTS. 875

(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

**ABUTMENT A (NB)**

| SPECIFICATIONS | | | | | BENDING DIMENSIONS (FEET-INCHES /QUARTER INCH) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| QTY. | SIZE | LENGTH | MARK | TYPE | A | B | C | D | E | F/R | G | H | J | K | O |
| 16 | 5 | 54-4 3 | AB501E | STR | | 54-4 3 | | | | | | | | | |
| 148 | 5 | 9-3 0 | AB502E | 17 | | 2-0 0 | 5-3 0 | 2-0 0 | | | | | | | |
| 106 | 5 | 8-2 0 | AB503E | STR | | 8-2 0 | | | | | | | | | |
| 53 | 5 | 5-11 2 | AB504E | 17 | | 2-6 0 | 0-11 0 | 2-6 0 | | | | | | | |
| 54 | 5 | 2-2 0 | AB505E | STR | | 2-2 0 | | | | | | | | | |
| 20 | 5 | 4-8 2 | AB506E | 17 | | 1-11 0 | 0-10 2 | 1-11 0 | | | | | | | |
| 32 | 5 | 10-3 0 | AB507E | STR | | 10-3 0 | | | | | | | | | |
| 40 | 5 | 6-6 0 | AB508E | STR | | 6-6 0 | | | | | | | | | |
| 24 | 5 | 4-11 0 | AB509E | 27 | | 2-1 0 | 0-9 0 | 2-1 0 | | | | 1-9 3 | | 1-0 2 | |
| 10 | 5 | 7-0 0 | AB510E | 27 | | 2-1 0 | 2-10 0 | 2-1 0 | | | | 1-9 3 | | 1-0 2 | |
| 20 | 5 | 7-10 2 | AB511E | 17 | | 2-7 0 | 2-8 2 | 2-7 0 | | | | | | | |
| 20 | 5 | 7-9 3 | AB512E | 17 | | 2-7 0 | 2-7 3 | 2-7 0 | | | | | | | |
| 12 | 5 | 10-11 1 | AB513E | 27 | | 4-4 0 | 2-3 1 | 4-4 0 | | | | 3-9 0 | | 2-2 0 | |
| 18 | 5 | 9-1 3 | AB514E | 17 | | 3-6 0 | 2-1 3 | 3-6 0 | | | | | | | |
| 6 | 5 | 14-1 0 | AB515E | 17 | | 3-6 0 | 7-1 0 | 3-6 0 | | | | | | | |
| 12 | 10 | 54-4 3 | AB1001E | STR | | 54-4 3 | | | | | | | | | |

**ABUTMENT B (NB)**

| SPECIFICATIONS | | | | | BENDING DIMENSIONS (FEET-INCHES /QUARTER INCH) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| QTY. | SIZE | LENGTH | MARK | TYPE | A | B | C | D | E | F/R | G | H | J | K | O |
| 16 | 5 | 54-4 3 | AB521E | STR | | 54-4 3 | | | | | | | | | |
| 148 | 5 | 9-3 0 | AB522E | 17 | | 2-0 0 | 5-3 0 | 2-0 0 | | | | | | | |
| 106 | 5 | 8-2 0 | AB523E | STR | | 8-2 0 | | | | | | | | | |
| 53 | 5 | 5-11 2 | AB524E | 17 | | 2-6 0 | 0-11 0 | 2-6 0 | | | | | | | |
| 54 | 5 | 2-2 0 | AB525E | STR | | 2-2 0 | | | | | | | | | |
| 20 | 5 | 4-8 2 | AB526E | 17 | | 1-11 0 | 0-10 2 | 1-11 0 | | | | | | | |
| 32 | 5 | 10-3 0 | AB527E | STR | | 10-3 0 | | | | | | | | | |
| 40 | 5 | 6-6 0 | AB528E | STR | | 6-6 0 | | | | | | | | | |
| 24 | 5 | 4-11 0 | AB529E | 27 | | 2-1 0 | 0-9 0 | 2-1 0 | | | | 1-9 3 | | 1-0 2 | |
| 10 | 5 | 7-0 0 | AB530E | 27 | | 2-1 0 | 2-10 0 | 2-1 0 | | | | 1-9 3 | | 1-0 2 | |
| 20 | 5 | 7-10 2 | AB531E | 17 | | 2-7 0 | 2-8 2 | 2-7 0 | | | | | | | |
| 20 | 5 | 7-9 3 | AB532E | 17 | | 2-7 0 | 2-7 3 | 2-7 0 | | | | | | | |
| 12 | 10 | 54-4 3 | AB1021E | STR | | 54-4 3 | | | | | | | | | |

| SPECIFICATIONS | | | | | BENDING DIMENSIONS (FEET-INCHES /QUARTER INCH) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| QTY. | SIZE | LENGTH | MARK | TYPE | A | B | C | D | E | F/R | G | H | J | K | O |

**ASTM STANDARD ENGLISH REINFORCING BARS**

| BAR SIZE | NOMINAL DIMENSIONS DIAMETER (INCHES) | NOMINAL DIMENSIONS AREA (INCHES²) | NOMINAL DIMENSIONS WEIGHT (LBS./FT.) |
|---|---|---|---|
| 3 | 0.375 | 0.110 | 0.376 |
| 4 | 0.500 | 0.200 | 0.668 |
| 5 | 0.625 | 0.310 | 1.043 |
| 6 | 0.750 | 0.440 | 1.502 |
| 7 | 0.875 | 0.600 | 2.044 |
| 8 | 1.000 | 0.790 | 2.670 |
| 9 | 1.128 | 1.000 | 3.400 |
| 10 | 1.270 | 1.270 | 4.303 |
| 11 | 1.410 | 1.560 | 5.313 |
| 14 | 1.693 | 2.250 | 7.650 |
| 18 | 2.257 | 4.000 | 13.600 |

**RECOMMENDED END HOOKS, APPLICABLE TO ALL GRADES**

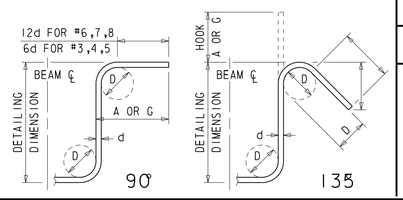
| | 180° HOOKS | | 90° HOOKS |
|---|---|---|---|
| D | A OR G | J | A OR G |
| 2¼" | 5" | 3" | 6" |
| 3" | 6" | 4" | 8" |
| 3¾" | 7" | 5" | 10" |
| 4½" | 8" | 6" | 1-0" |
| 5¼" | 10" | 7" | 1-2" |
| 6" | 11" | 8" | 1-4" |
| 9½" | 1-3" | 11¾" | 1-7" |
| 10¾" | 1-5" | 1-1¼" | 1-10" |
| 1-0" | 1-7" | 1-2¾" | 2-0" |
| 1-6¼" | 2-3" | 1-9¾" | 2-7" |
| 2-0" | 3-0" | 2-4½" | 3-5" |

**STIRRUP AND TIE HOOKS, APPLICABLE TO ALL GRADES**

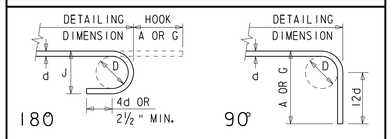
| | 90° HOOK | 135° HOOK | |
|---|---|---|---|
| D | A OR G | A OR G | A OR G |
| 1½" | 4" | 4" | 2½" |
| 2" | 4½" | 4½" | 3" |
| 2½" | 6" | 5½" | 3¾" |
| 3" | 8" | 6" | 4½" |
| 4½" | 1-0" | 8" | 5¼" |
| 5¼" | 1-2" | 9" | 6" |
| 6" | 1-4" | 10½" | |

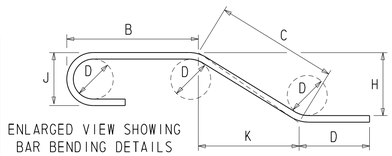
NOTES:
1. FIGURES SHOWN IN CIRCLES REPRESENT BAR BEND TYPES.
2. STANDARD BAR BENDS INCLUDE ONLY THOSE TYPES BELOW, INDICATED AS SUCH.
3. ALL DIMENSIONS OUT-TO-OUT, EXCEPT "A" AND "G" ON STD. 180° AND 135° HOOKS.
4. "J" DIMENSIONS ON 180° HOOKS TO BE SHOWN ONLY WHERE NECESSARY TO RESTRICT HOOK SIZE, OTHERWISE STANDARD 'ACI' HOOKS ARE TO BE USED.
5. 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.
6. "H" DIMENSIONS OF STIRRUPS TO BE SHOWN AS NEEDED TO FIT WITHIN THE CONCRETE.
7. UNLESS OTHERWISE NOTED, DIAMETER "D" IS THE SAME FOR ALL BENDS AND HOOKS ON A BAR (EXCEPT FOR BEND TYPES 11 AND 13).
8. WHERE SLOPE DIFFERS FROM 45° OFFSET, "H" AND "K" MUST BE SHOWN.
9. WHERE BARS ARE TO BE BENT MORE ACCURATELY THAN STANDARD BENDING TOLERANCES, BENDING DIMENSIONS REQUIRING CLOSER FABRICATION SHOULD HAVE LIMITS INDICATED.
10. FOR RECOMMENDED DIAMETER "D", OF BENDS, HOOKS, ETC., REFER TO TABLE ABOVE, 'CRSI' OR 'ACI' TABLES WHERE APPLICABLE AND REQUIRED.
11. TYPE S1-S6, S11, T1-T3 AND T6-T9 APPLICABLE TO BAR SIZES #3 THROUGH #8.

## STIRRUP AND TIE HOOKS

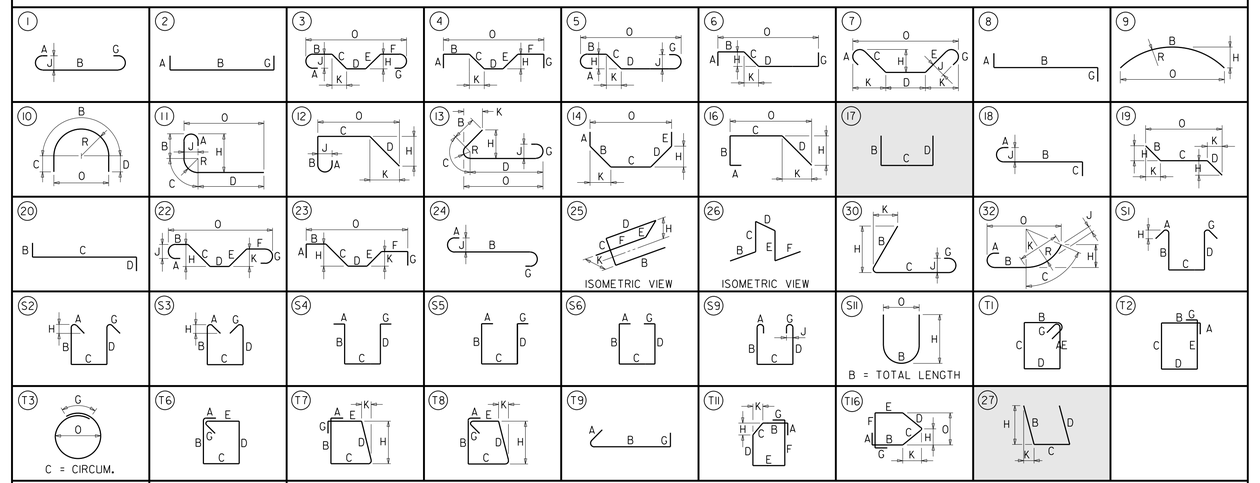



## 180° AND 90° END HOOKS




## STANDARD BAR BENDS




## SPECIAL BAR BENDS


SHEET 10 OF 40

BR1-466BR-01

**DELAWARE DEPARTMENT OF TRANSPORTATION**

ADDENDUMS / REVISIONS

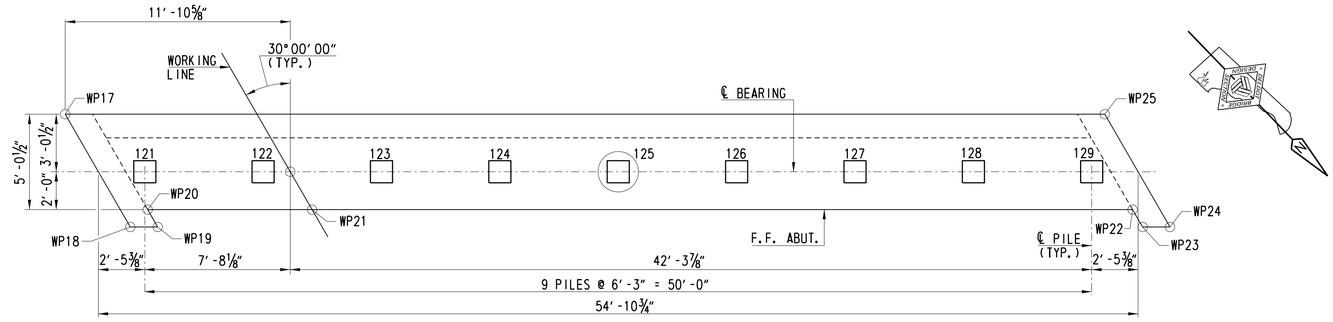
NOT TO SCALE

**US 301, SR 896 TO SR 1**

| CONTRACT | BRIDGE NO. | 1-466 N&S |
|---|---|---|
| T200911308 | DESIGNED BY: AKW | |
| COUNTY | CHECKED BY: MDM | |
| NEW CASTLE | | |

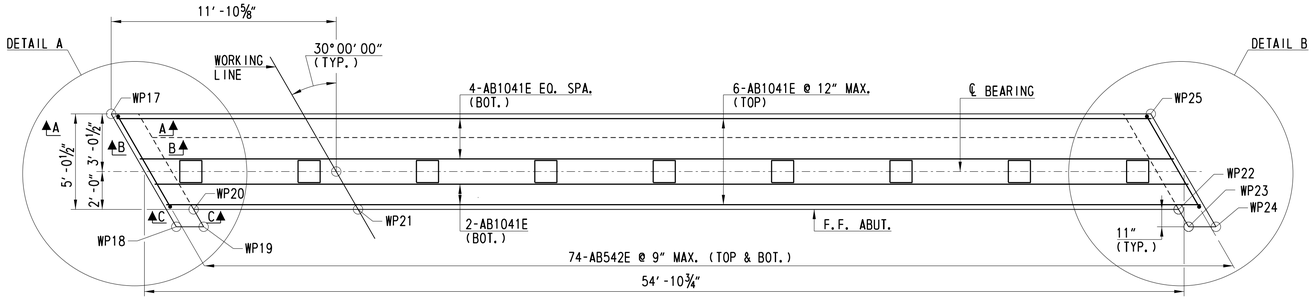
**ABUTMENT REINFORCEMENT BAR LIST (NB)**

| SHEET NO. | TOTAL SHTS. |
|---|---|
| 550 | 875 |

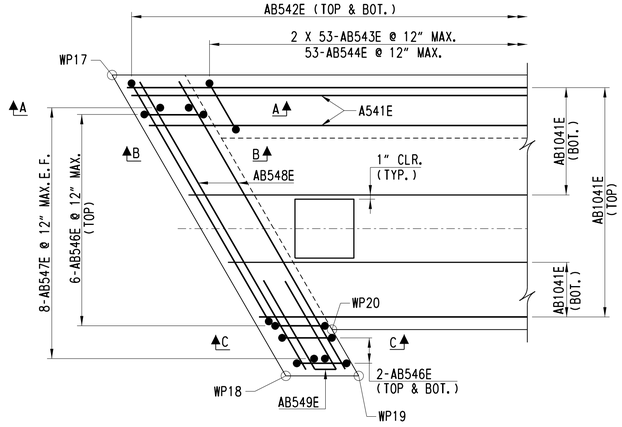



NOTES:
- 14″ SQUARE PRECAST P/S CONCRETE PILE IS RECOMMENDED.
- ONE TO ONE SUBSTITUTION ALLOWED FOR HP 14X73 STEEL PILE.
- FOR PILE NOTES AND DETAILS, SEE SHEET 17 OF 40.

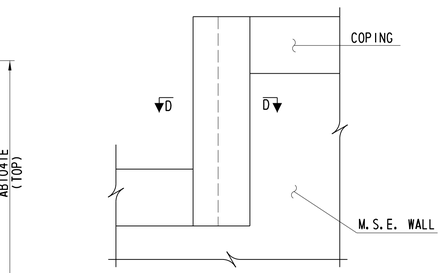
## PILE LAYOUT PLAN
SCALE: ¼″=1′-0″



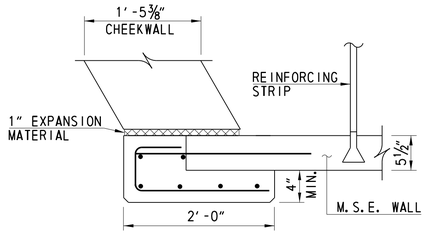

## PLAN
## TOP AND BOTTOM REINFORCEMENT
SCALE : ¼″=1′-0″



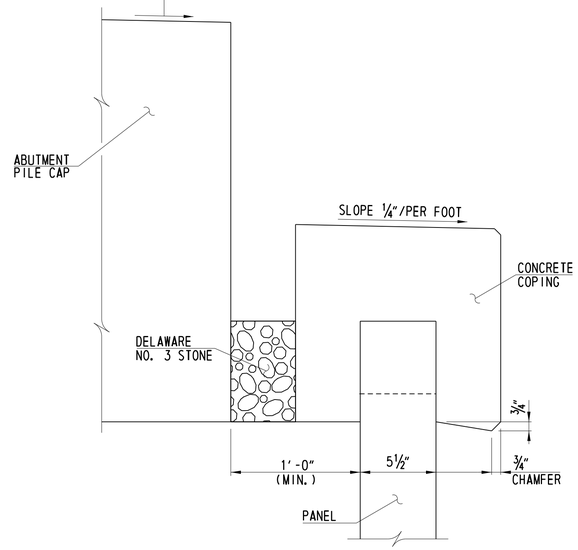

## DETAIL A
## DETAIL B SIMILAR)
NOT TO SCALE



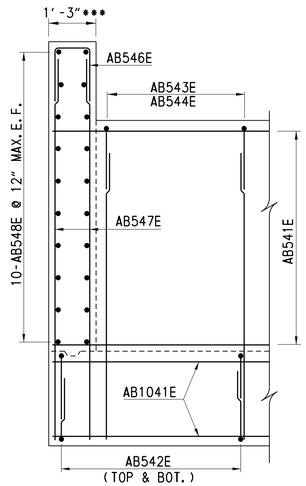

## VIEW 1-1
NOT TO SCALE



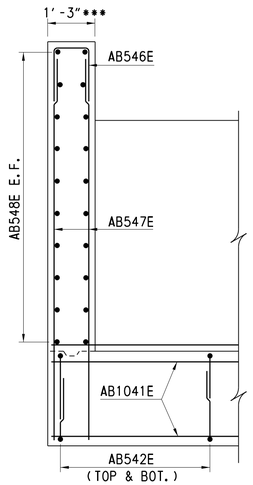

## SECTION D-D
NOT TO SCALE



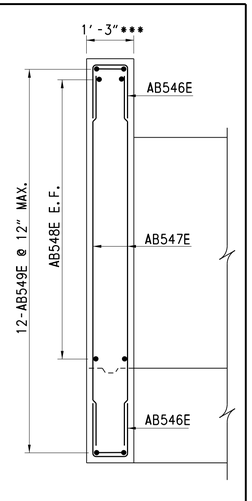

## ABUTMENT DETAIL
NOT TO SCALE




## SECTION A-A
SCALE : ½″=1′-0″

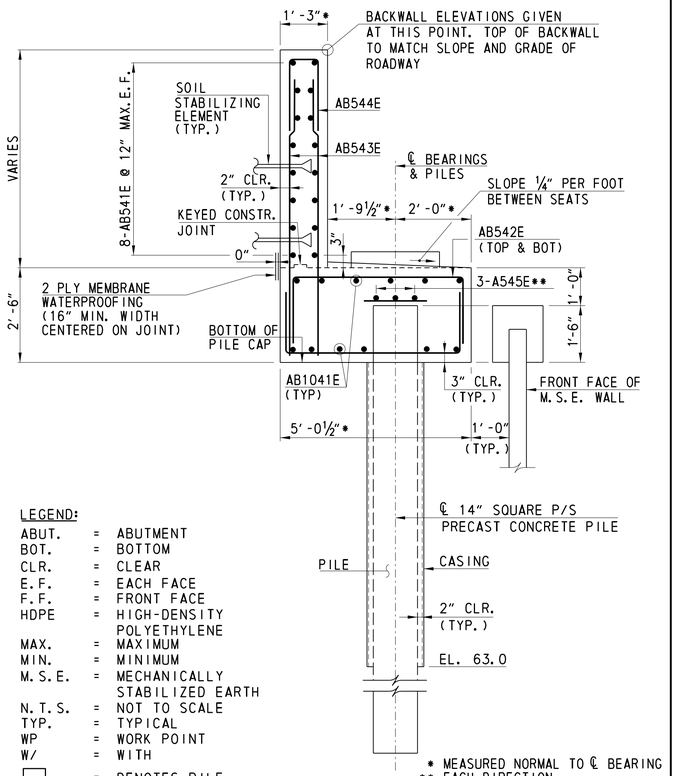



## SECTION B-B
SCALE : ½″=1′-0″




## SECTION C-C
SCALE : ½″=1′-0″

*** MEASURED NORMAL TO WORKING LINE.




LEGEND:

| | | |
|---|---|---|
| ABUT. | = | ABUTMENT |
| BOT. | = | BOTTOM |
| CLR. | = | CLEAR |
| E.F. | = | EACH FACE |
| F.F. | = | FRONT FACE |
| HDPE | = | HIGH-DENSITY POLYETHYLENE |
| MAX. | = | MAXIMUM |
| MIN. | = | MINIMUM |
| M.S.E. | = | MECHANICALLY STABILIZED EARTH |
| N.T.S. | = | NOT TO SCALE |
| TYP. | = | TYPICAL |
| WP | = | WORK POINT |
| W/ | = | WITH |
| □ | = | DENOTES PILE |
| ◻ | = | DENOTES TEST PILE |

* MEASURED NORMAL TO ℄ BEARING
** EACH DIRECTION

## TYPICAL SECTION
SCALE: ½″=1′-0″

NOTES:
1. FOR LOCATION OF VIEW 1-1, SEE SHEET 12 OF 40.
2. FOR REINFORCEMENT BAR LIST, SEE SHEET 15 OF 40.
3. MEMBRANE WATERPROOFING SHALL BE INCIDENTAL TO ITEM 602015 - PORTLAND CEMENT CONCRETE MASONRY, ABUTMENT ABOVE FOOTING, CLASS A. SEE SPECIAL PROVISION ITEM 602616 - WATERPROOFING P.C.C. MASONRY SURFACES FOR ADDITIONAL REQUIREMENTS.



**DELAWARE**
**DEPARTMENT OF TRANSPORTATION**

ADDENDUMS / REVISIONS

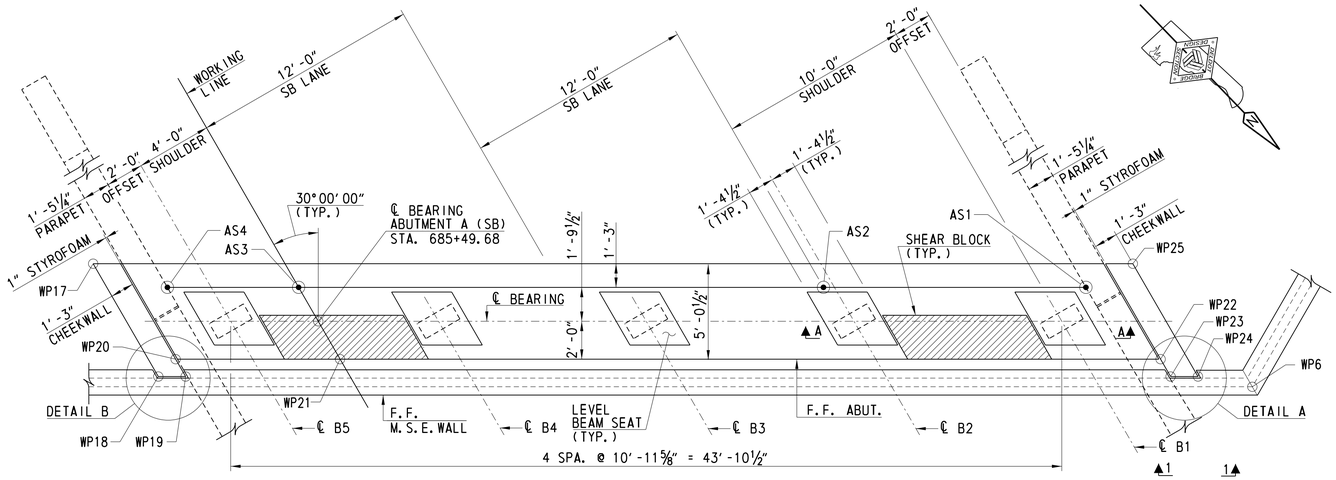
SCALE: AS NOTED

**US 301,**
**SR 896 TO SR 1**

| CONTRACT | BRIDGE NO. | 1-466 N&S |
|---|---|---|
| T200911308 | DESIGNED BY: MDM/ZAA | |
| COUNTY | CHECKED BY: BJH | |
| NEW CASTLE | | |

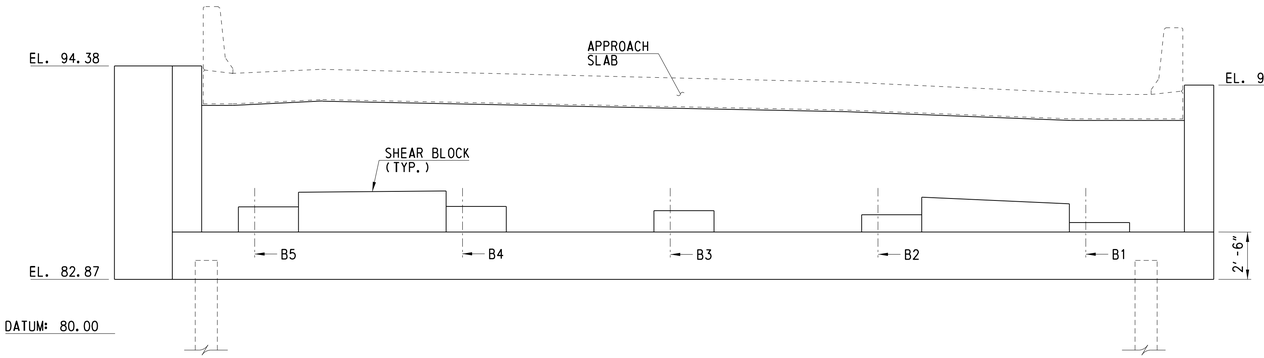
**ABUTMENT A (SB)**
**FOOTING PLAN**

| SHEET NO. | TOTAL SHTS. |
|---|---|
| 551 | 875 |




## PLAN

SCALE : ¼"=1'-0"




* M.S.E. WALL NOT SHOWN.

## ELEVATION

SCALE: ¼"=1'-0"

### TABLE OF BACKWALL ELEVATIONS

| LOCATION | ELEVATION |
|---|---|
| AS1 | 91.45 |
| AS2 | 91.97 |
| AS3 | 92.52 |
| AS4 | 92.29 |

### TABLE OF BEAM SEAT ELEVATIONS

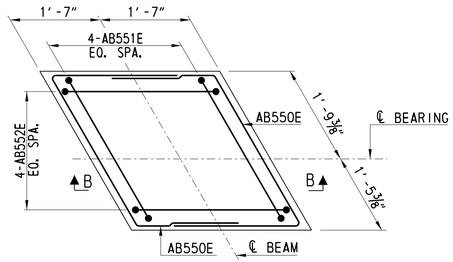
| LOCATION | ELEVATION |
|---|---|
| B1 | 85.87 |
| B2 | 86.28 |
| B3 | 86.51 |
| B4 | 86.73 |
| B5 | 86.70 |

NOTES:

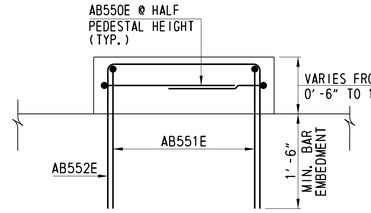
1. FOR LOCATION OF BACKWALL ELEVATIONS, SEE TYPICAL SECTION ON SHEET 11 OF 40.
2. FOR VIEW 1-1, SEE SHEET 11 OF 40.
3. FOR REINFORCEMENT BAR LIST, SEE SHEET 15 OF 40.
4. STYROFOAM AND P.V.C. SCHEDULE 40 WEEP HOLE PAYMENT SHALL BE INCIDENTAL TO CONCRETE CONSTRUCTION.
5. BEARING MATERIAL SHALL BE NEOPRENE WITH A DUROMETER OF 50 + 5. PAYMENT SHALL BE INCIDENTAL TO CONCRETE CONSTRUCTION.

LEGEND:

| | | |
|---|---|---|
| ABUT. | = | ABUTMENT |
| BOT. | = | BOTTOM |
| E.F. | = | EACH FACE |
| EL. | = | ELEVATION |
| F.F. | = | FRONT FACE |
| GALV. | = | GALVANIZED |
| MAX. | = | MAXIMUM |
| M.S.E. | = | MECHANICALLY STABILIZED EARTH |
| NB | = | NORTHBOUND |
| N.T.S. | = | NOT TO SCALE |
| P.C.P. | = | PREFORMED CELLULAR POLYSTYRENE |
| STA. | = | STATION |
| TYP. | = | TYPICAL |
| WP | = | WORK POINT |



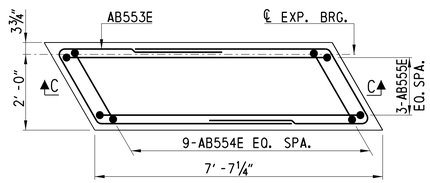

PLAN



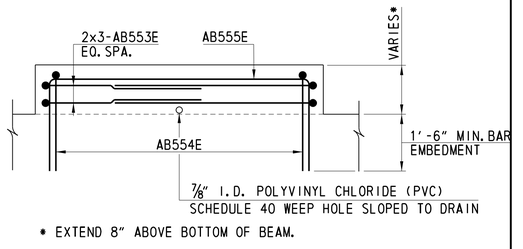

SECTION B-B

## TYPICAL PEDESTAL DETAIL

NOT TO SCALE




PLAN

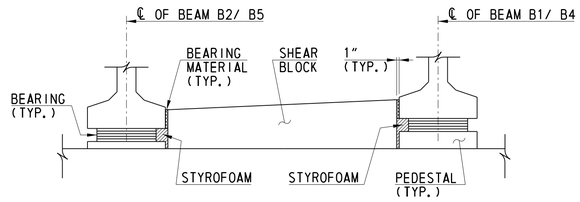



* EXTEND 8" ABOVE BOTTOM OF BEAM.

SECTION C-C

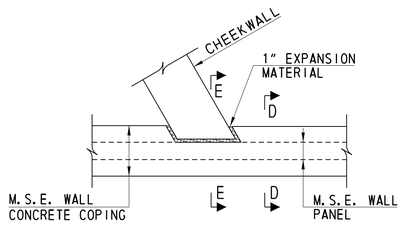
## TYPICAL SHEAR BLOCK DETAIL

NOT TO SCALE



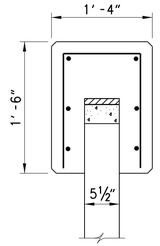

SECTION A-A

NOT TO SCALE



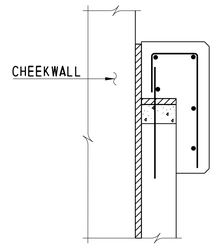

DETAIL A
(DETAIL B SIMILAR)

NOT TO SCALE




SECTION D-D

NOT TO SCALE




SECTION E-E

NOT TO SCALE



DELAWARE DEPARTMENT OF TRANSPORTATION

ADDENDUMS / REVISIONS

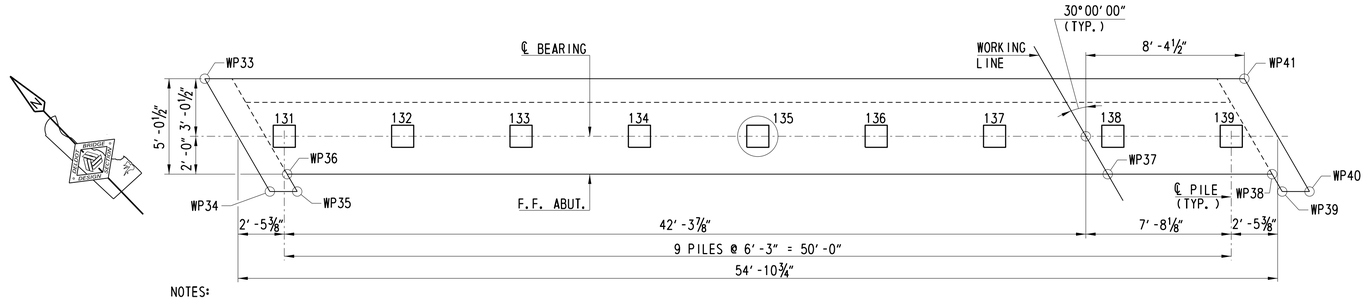
SCALE: AS NOTED

**US 301, SR 896 TO SR 1**

| | |
|---|---|
| CONTRACT | T200911308 |
| COUNTY | NEW CASTLE |
| BRIDGE NO. | 1-466 N&S |
| DESIGNED BY: | MDM/ZAA |
| CHECKED BY: | BJH |

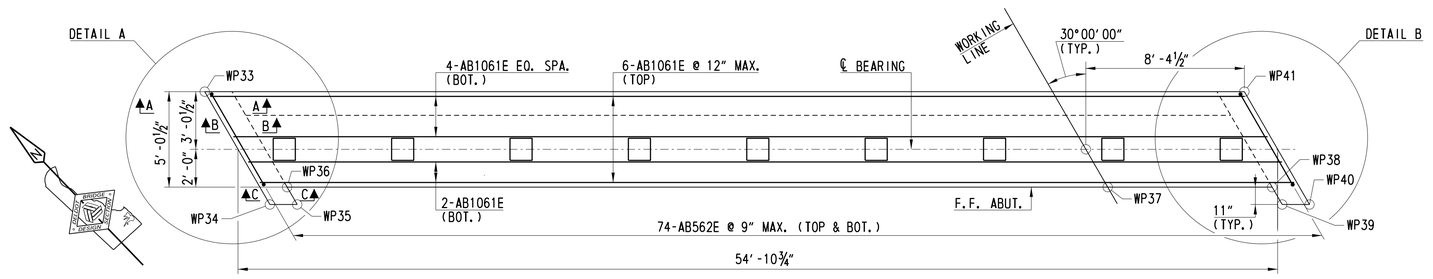
**ABUTMENT A (SB) PLAN AND ELEVATION**

| | |
|---|---|
| SHEET NO. | 552 |
| TOTAL SHTS. | 875 |

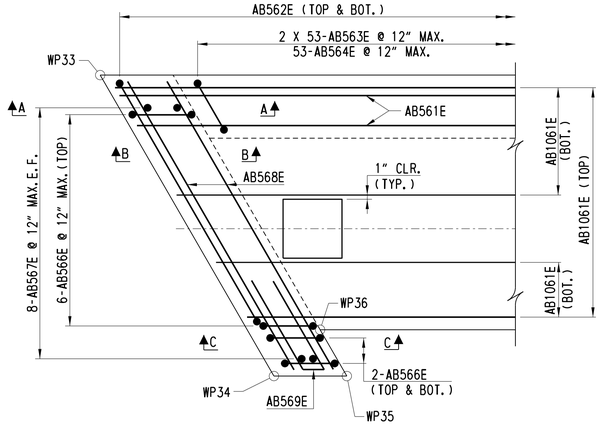



NOTES:
- 14" SQUARE PRECAST P/S CONCRETE PILE IS RECOMMENDED.
- ONE TO ONE SUBSTITUTION ALLOWED FOR HP 14X73 STEEL PILE.
- FOR PILE NOTES AND DETAILS, SEE SHEET 17 OF 40.

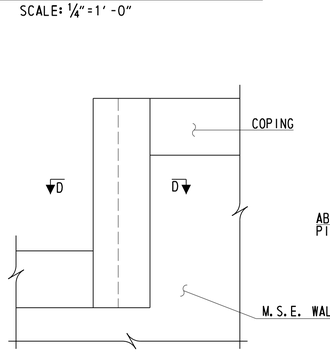
## PILE LAYOUT PLAN
SCALE: ¼"=1'-0"



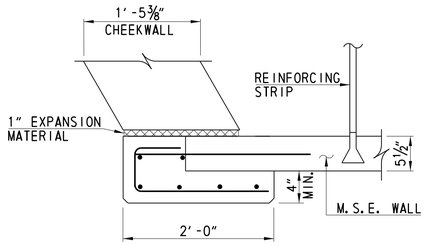

## PLAN
## TOP AND BOTTOM REINFORCEMENT
SCALE: ¼"=1'-0"



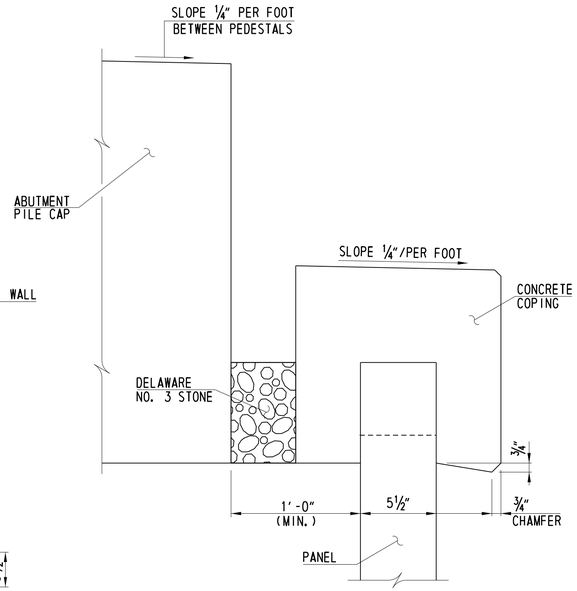

## DETAIL A
## (DETAIL B SIMILAR)
NOT TO SCALE




## VIEW 1-1
NOT TO SCALE

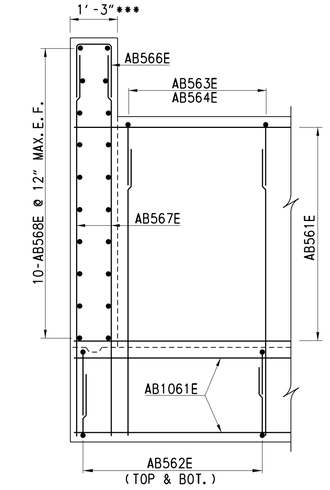



## SECTION D-D
NOT TO SCALE

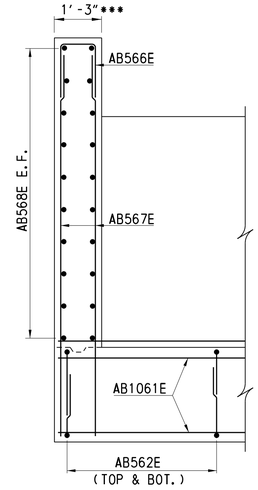



## ABUTMENT DETAIL
NOT TO SCALE

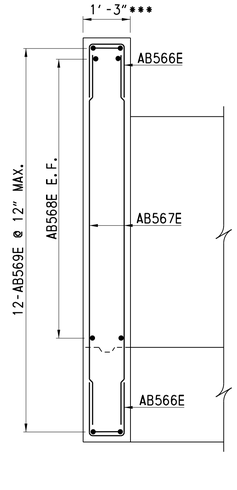
NOTES:
1. FOR LOCATION OF VIEW 1-1, SEE SHEET 14 OF 40.
2. FOR REINFORCEMENT BAR LIST, SEE SHEET 15 OF 40.
3. MEMBRANE WATERPROOFING SHALL BE INCIDENTAL TO ITEM 602015 - PORTLAND CEMENT CONCRETE MASONRY, ABUTMENT ABOVE FOOTING, CLASS A. SEE SPECIAL PROVISION ITEM 602616 - WATERPROOFING P.C.C. MASONRY SURFACES FOR ADDITIONAL REQUIREMENTS.




## SECTION A-A
SCALE: ½"=1'-0"

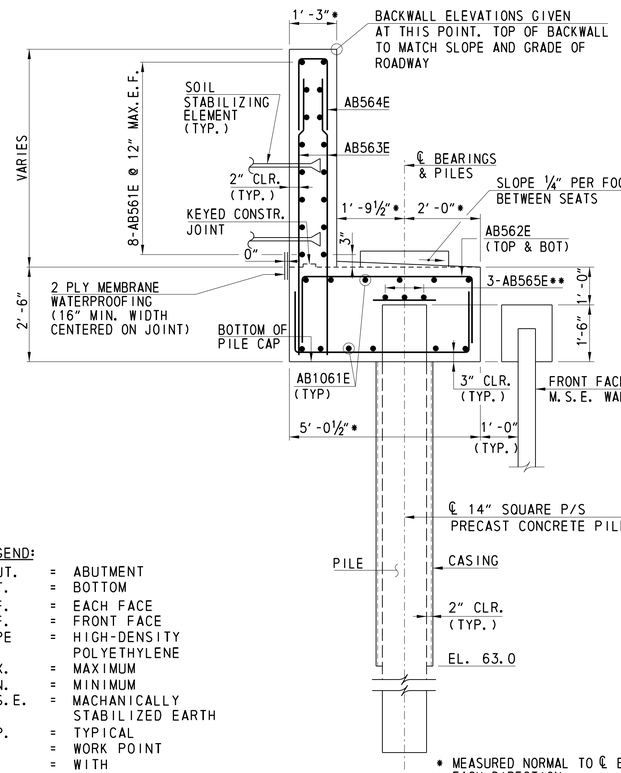



## SECTION B-B
SCALE: ½"=1'-0"




## SECTION C-C
SCALE: ½"=1'-0"

*** MEASURED NORMAL TO WORKING LINE.




LEGEND:

| | | |
|---|---|---|
| ABUT. | = | ABUTMENT |
| BOT. | = | BOTTOM |
| E.F. | = | EACH FACE |
| F.F. | = | FRONT FACE |
| HDPE | = | HIGH-DENSITY POLYETHYLENE |
| MAX. | = | MAXIMUM |
| MIN. | = | MINIMUM |
| M.S.E. | = | MACHANICALLY STABILIZED EARTH |
| TYP. | = | TYPICAL |
| WP | = | WORK POINT |
| W/ | = | WITH |
| □ | = | DENOTES PILE |
| ▢ | = | DENOTES TEST PILE |

* MEASURED NORMAL TO ℄ BEARING
** EACH DIRECTION

## TYPICAL SECTION
SCALE: ½"=1'-0"

SHEET 13 OF 40 | BR1-466FT-04

**DELAWARE DEPARTMENT OF TRANSPORTATION**

ADDENDUMS / REVISIONS

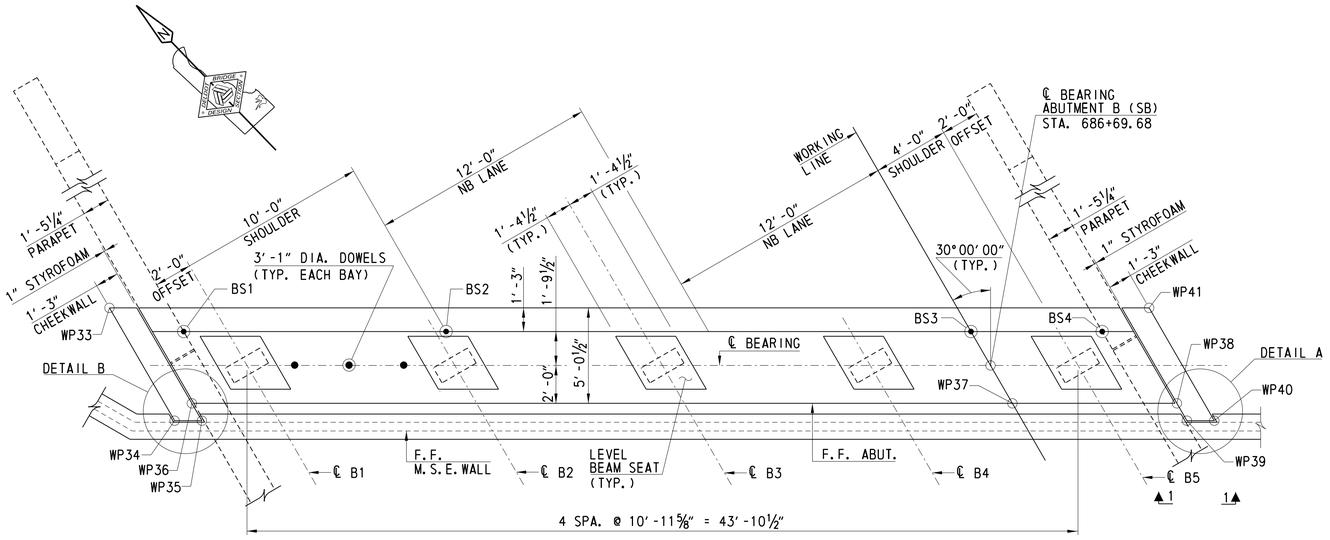
SCALE: AS NOTED

**US 301, SR 896 TO SR 1**

| | | | |
|---|---|---|---|
| CONTRACT | T200911308 | BRIDGE NO. | 1-466 N&S |
| COUNTY | NEW CASTLE | DESIGNED BY: | MDM/ZAA |
| | | CHECKED BY: | BJH |

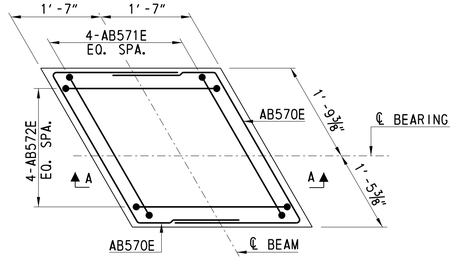
**ABUTMENT B (SB) FOOTING PLAN**

| | |
|---|---|
| SHEET NO. | 553 |
| TOTAL SHTS. | 875 |

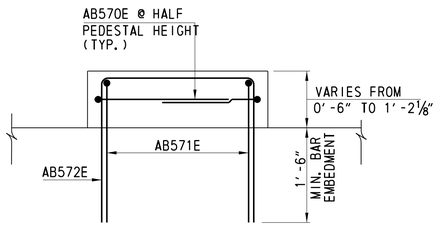



## PLAN

SCALE : ¼"=1'-0"



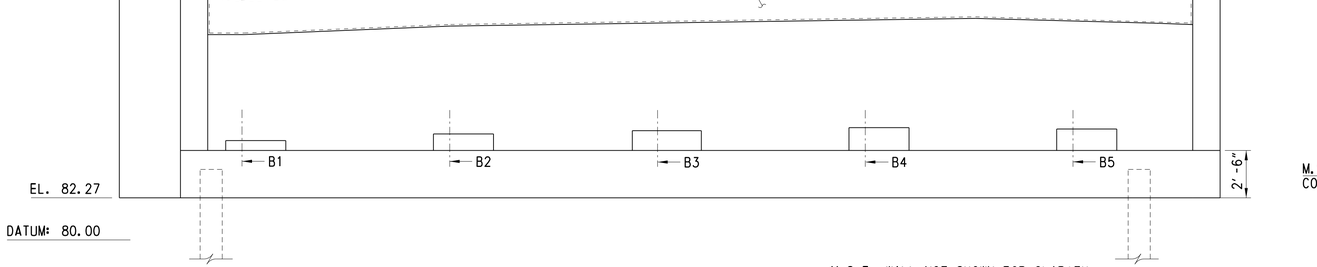

PLAN




SECTION A-A

## TYPICAL PEDESTAL DETAIL

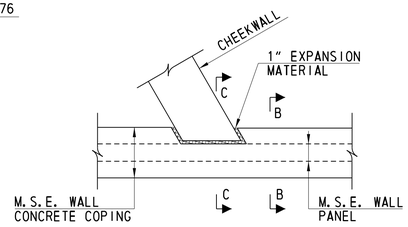
NOT TO SCALE




M.S.E. WALL NOT SHOWN FOR CLARITY.

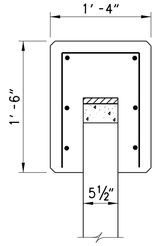
## ELEVATION

SCALE: ¼"=1'-0"



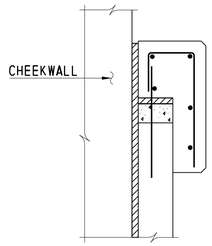

DETAIL A
(DETAIL B SIMILAR)

NOT TO SCALE




SECTION B-B

NOT TO SCALE




SECTION C-C

NOT TO SCALE

### TABLE OF BACKWALL ELEVATIONS

| LOCATION | ELEVATION |
|---|---|
| BS1 | 90.83 |
| BS2 | 91.35 |
| BS3 | 91.90 |
| BS4 | 91.67 |

### TABLE OF BEAM SEAT ELEVATIONS

| LOCATION | ELEVATION |
|---|---|
| B1 | 85.27 |
| B2 | 85.68 |
| B3 | 85.91 |
| B4 | 86.13 |
| B5 | 86.10 |

NOTES:

1. FOR LOCATION OF BACKWALL ELEVATIONS, SEE TYPICAL SECTION ON SHEET 13 OF 40.
2. FOR VIEW 1-1, SEE SHEET 13 OF 40.
3. FOR REINFORCEMENT BAR LIST, SEE SHEET 15 OF 40.
4. FOR DIAPHRAGM DETAILS, SEE SHEETS 31 AND 32 OF 40.
5. STYROFOAM AND DOWEL PAYMENT SHALL BE INCIDENTAL TO CONCRETE CONSTRUCTION.
6. SEE DELDOT STANDARD SPECIFICATION 824.02 (g) FOR CIP DOWEL MATERIAL REQUIREMENTS. FOR DOWEL DETAIL, SEE SHEET 31 OF 40.

LEGEND:

| | | |
|---|---|---|
| ABUT. | = | ABUTMENT |
| BOT. | = | BOTTOM |
| C.I.P. | = | CAST-IN-PLACE |
| E.F. | = | EACH FACE |
| EL. | = | ELEVATION |
| F.F. | = | FRONT FACE |
| GALV. | = | GALVANIZED |
| MAX. | = | MAXIMUM |
| M.S.E. | = | MECHANICALLY STABILIZED EARTH |
| NB | = | NORTHBOUND |
| P.C.P. | = | PREFORMED CELLULAR POLYSTYRENE |
| STA. | = | STATION |
| TYP. | = | TYPICAL |
| WP | = | WORK POINT |



DELAWARE DEPARTMENT OF TRANSPORTATION

ADDENDUMS / REVISIONS

SCALE: AS NOTED

**US 301, SR 896 TO SR 1**

CONTRACT T200911308
COUNTY NEW CASTLE
BRIDGE NO. 1-466 N&S
DESIGNED BY: MDM/ZAA
CHECKED BY: BJH

**ABUTMENT B (SB) PLAN AND ELEVATION**

SHEET NO. 554
TOTAL SHTS. 875

(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) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| QTY. | SIZE | LENGTH | MARK | TYPE | A | B | C | D | E | F/R | G | H | J | K | O |
| **ABUTMENT A (SB)** | | | | | | | | | | | | | | | |
| 16 | 5 | 54-4 3 | AB541E | STR | | 54-4 3 | | | | | | | | | |
| 148 | 5 | 9-3 0 | AB542E | 17 | | 2-0 0 | 5-3 0 | 2-0 0 | | | | | | | |
| 106 | 5 | 8-2 0 | AB543E | STR | | 8-2 0 | | | | | | | | | |
| 53 | 5 | 5-11 2 | AB544E | 17 | | 2-6 0 | 0-11 0 | 2-6 0 | | | | | | | |
| 54 | 5 | 2-2 0 | AB545E | STR | | 2-2 0 | | | | | | | | | |
| 20 | 5 | 4-8 2 | AB546E | 17 | | 1-11 0 | 0-10 2 | 1-11 0 | | | | | | | |
| 32 | 5 | 10-3 0 | AB547E | STR | | 10-3 0 | | | | | | | | | |
| 40 | 5 | 6-6 0 | AB548E | STR | | 6-6 0 | | | | | | | | | |
| 24 | 5 | 4-11 0 | AB549E | 27 | | 2-1 0 | 0-9 0 | 2-1 0 | | | | 1-9 3 | | 1-0 2 | |
| 10 | 5 | 7-0 0 | AB550E | 27 | | 2-1 0 | 2-10 0 | 2-1 0 | | | | 1-9 3 | | 1-0 2 | |
| 20 | 5 | 7-10 2 | AB551E | 17 | | 2-7 0 | 2-8 2 | 2-7 0 | | | | | | | |
| 20 | 5 | 7-9 3 | AB552E | 17 | | 2-7 0 | 2-7 3 | 2-7 0 | | | | | | | |
| 12 | 5 | 10-11 1 | AB553E | 27 | | 4-4 0 | 2-3 1 | 4-4 0 | | | | 3-9 0 | | 2-2 0 | |
| 18 | 5 | 9-1 3 | AB554E | 17 | | 3-6 0 | 2-1 3 | 3-6 0 | | | | | | | |
| 6 | 5 | 14-1 0 | AB555E | 17 | | 3-6 0 | 7-1 0 | 3-6 0 | | | | | | | |
| 12 | 10 | 54-4 3 | AB1041E | STR | | 54-4 3 | | | | | | | | | |

| SPECIFICATIONS | | | | | BENDING DIMENSIONS (FEET-INCHES /QUARTER INCH) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| QTY. | SIZE | LENGTH | MARK | TYPE | A | B | C | D | E | F/R | G | H | J | K | O |
| **ABUTMENT B (SB)** | | | | | | | | | | | | | | | |
| 16 | 5 | 54-4 3 | AB561E | STR | | 54-4 3 | | | | | | | | | |
| 148 | 5 | 9-3 0 | AB562E | 17 | | 2-0 0 | 5-3 0 | 2-0 0 | | | | | | | |
| 106 | 5 | 8-2 0 | AB563E | STR | | 8-2 0 | | | | | | | | | |
| 53 | 5 | 5-11 2 | AB564E | 17 | | 2-6 0 | 0-11 0 | 2-6 0 | | | | | | | |
| 54 | 5 | 2-2 0 | AB565E | STR | | 2-2 0 | | | | | | | | | |
| 20 | 5 | 4-8 2 | AB566E | 17 | | 1-11 0 | 0-10 2 | 1-11 0 | | | | | | | |
| 32 | 5 | 10-3 0 | AB567E | STR | | 10-3 0 | | | | | | | | | |
| 40 | 5 | 6-6 0 | AB568E | STR | | 6-6 0 | | | | | | | | | |
| 24 | 5 | 4-11 0 | AB569E | 27 | | 2-1 0 | 0-9 0 | 2-1 0 | | | | 1-9 3 | | 1-0 2 | |
| 10 | 5 | 7-0 0 | AB570E | 27 | | 2-1 0 | 2-10 0 | 2-1 0 | | | | 1-9 3 | | 1-0 2 | |
| 20 | 5 | 7-10 2 | AB571E | 17 | | 2-7 0 | 2-8 2 | 2-7 0 | | | | | | | |
| 20 | 5 | 7-9 3 | AB572E | 17 | | 2-7 0 | 2-7 3 | 2-7 0 | | | | | | | |
| 12 | 10 | 54-4 3 | AB1061E | STR | | 54-4 3 | | | | | | | | | |

| SPECIFICATIONS | | | | | BENDING DIMENSIONS (FEET-INCHES /QUARTER INCH) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| QTY. | SIZE | LENGTH | MARK | TYPE | A | B | C | D | E | F/R | G | H | J | K | O |

## ASTM STANDARD ENGLISH REINFORCING BARS

| BAR SIZE | NOMINAL DIMENSIONS: DIAMETER (INCHES) | NOMINAL DIMENSIONS: AREA (INCHES²) | NOMINAL DIMENSIONS: WEIGHT (LBS./FT.) |
|---|---|---|---|
| 3 | 0.375 | 0.110 | 0.376 |
| 4 | 0.500 | 0.200 | 0.668 |
| 5 | 0.625 | 0.310 | 1.043 |
| 6 | 0.750 | 0.440 | 1.502 |
| 7 | 0.875 | 0.600 | 2.044 |
| 8 | 1.000 | 0.790 | 2.670 |
| 9 | 1.128 | 1.000 | 3.400 |
| 10 | 1.270 | 1.270 | 4.303 |
| 11 | 1.410 | 1.560 | 5.313 |
| 14 | 1.693 | 2.250 | 7.650 |
| 18 | 2.257 | 4.000 | 13.600 |

## RECOMMENDED END HOOKS, APPLICABLE TO ALL GRADES

| | 180° HOOKS | | 90° HOOKS | |
|---|---|---|---|---|
| | D | A OR G | J | A OR G |
| 3 | 2¼" | 5" | 3" | 6" |
| 4 | 3" | 6" | 4" | 8" |
| 5 | 3¾" | 7" | 5" | 10" |
| 6 | 4½" | 8" | 6" | 1-0" |
| 7 | 5¼" | 10" | 7" | 1-2" |
| 8 | 6" | 11" | 8" | 1-4" |
| 9 | 9½" | 1-3" | 11¾" | 1-7" |
| 10 | 10¾" | 1-5" | 1-1¼" | 1-10" |
| 11 | 1-0" | 1-7" | 1-2¾" | 2-0" |
| 14 | 1-6¼" | 2-3" | 1-9¾" | 2-7" |
| 18 | 2-0" | 3-0" | 2-4½" | 3-5" |

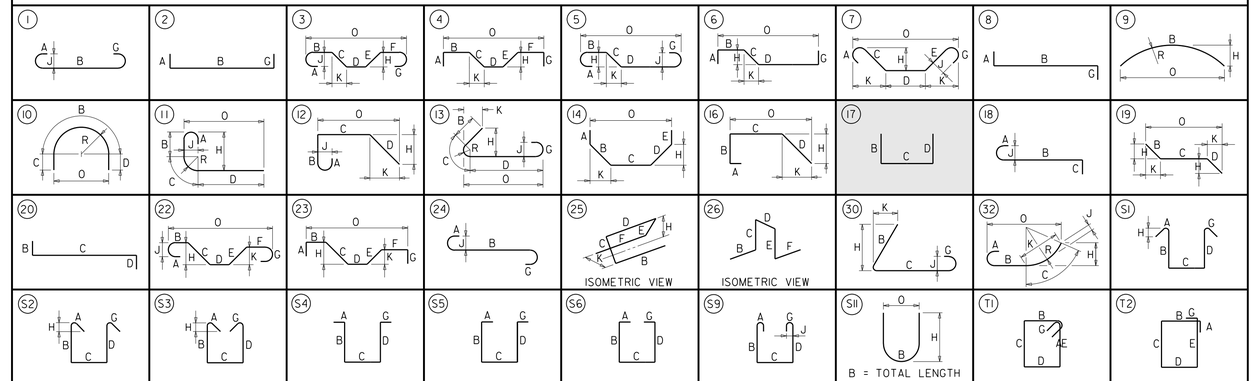
## STIRRUP AND TIE HOOKS, APPLICABLE TO ALL GRADES

| | 90° HOOK | 135° HOOK | |
|---|---|---|---|
| | D | A OR G | A OR G |
| 3 | 1½" | 4" | 4" | 2½" |
| 4 | 2" | 4½" | 4½" | 3" |
| 5 | 2½" | 6" | 5½" | 3¾" |
| 6 | 4½" | 1-0" | 8" | 4½" |
| 7 | 5¼" | 1-2" | 9" | 5¼" |
| 8 | 6" | 1-4" | 10½" | 6" |

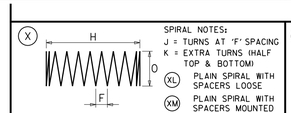
NOTES:

1. FIGURES SHOWN IN CIRCLES REPRESENT BAR BEND TYPES.
2. STANDARD BAR BENDS INCLUDE ONLY THOSE TYPES BELOW, INDICATED AS SUCH.
3. ALL DIMENSIONS OUT-TO-OUT, EXCEPT "A" AND "G" ON STD. 180° AND 135° HOOKS.
4. "J" DIMENSIONS ON 180° HOOKS TO BE SHOWN ONLY WHERE NECESSARY TO RESTRICT HOOK SIZE, OTHERWISE STANDARD 'ACI' HOOKS ARE TO BE USED.
5. 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.
6. "H" DIMENSIONS OF STIRRUPS TO BE SHOWN AS NEEDED TO FIT WITHIN THE CONCRETE.
7. UNLESS OTHERWISE NOTED, DIAMETER "D" IS THE SAME FOR ALL BENDS AND HOOKS ON A BAR (EXCEPT FOR BEND TYPES 11 AND 13).
8. WHERE SLOPE DIFFERS FROM 45° OFFSET, "H" AND "K" MUST BE SHOWN.
9. WHERE BARS ARE TO BE BENT MORE ACCURATELY THAN STANDARD BENDING TOLERANCES, BENDING DIMENSIONS REQUIRING CLOSER FABRICATION SHOULD HAVE LIMITS INDICATED.
10. FOR RECOMMENDED DIAMETER "D", OF BENDS, HOOKS, ETC., REFER TO TABLE ABOVE, 'CRSI' OR 'ACI' TABLES WHERE APPLICABLE AND REQUIRED.
11. TYPE S1-S6, S11, T1-T3 AND T6-T9 APPLICABLE TO BAR SIZES #3 THROUGH #8.

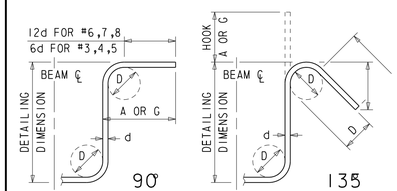
## STANDARD BAR BENDS



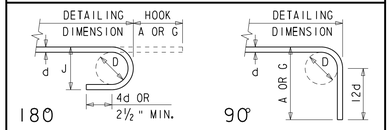

## SPECIAL BAR BENDS

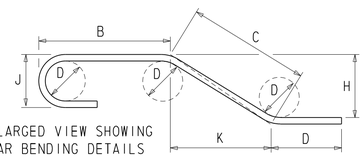



## STIRRUP AND TIE HOOKS




## 180° AND 90° END HOOKS




ADDENDUMS / REVISIONS

NOT TO SCALE

**DELAWARE DEPARTMENT OF TRANSPORTATION**

**US 301, SR 896 TO SR 1**

| CONTRACT | BRIDGE NO. | 1-466 N&S |
|---|---|---|
| T200911308 | DESIGNED BY: AKW | |
| COUNTY | CHECKED BY: ZAA | |
| NEW CASTLE | | |

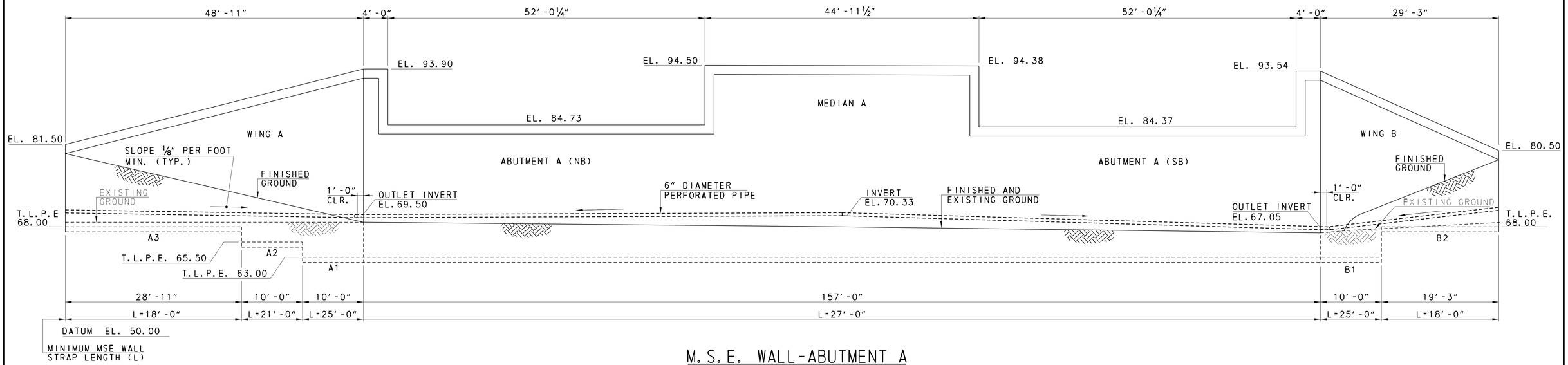
**ABUTMENT REINFORCEMENT BAR LIST (SB)**

SHEET NO. 555

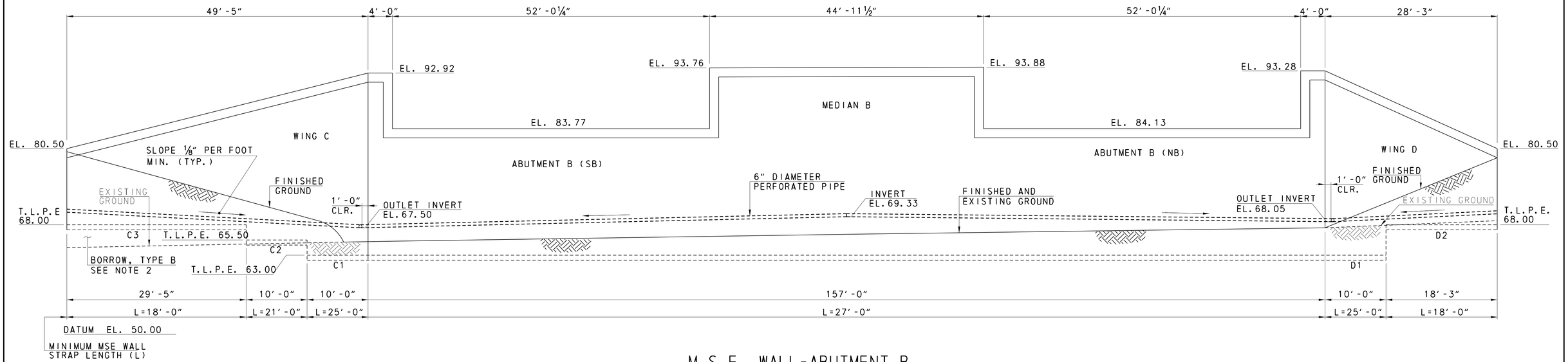
TOTAL SHTS. 875

SHEET 15 OF 40

BR1-466BR-02




## M.S.E. WALL-ABUTMENT A
(DEVELOPED ELEVATION)
SCALE: ⅛″=1′-0″




## M.S.E. WALL-ABUTMENT B
(DEVELOPED ELEVATION)
SCALE: ⅛″=1′-0″

NOTES:

1. LOCATIONS OF EXPANSION AND CONTRACTION JOINTS TO BE DETERMINED BY THE MANUFACTURER.
2. THE VERTICAL LIMIT OF FOUNDATION SOIL (BORROW, TYPE B) SHALL BE FROM THE EXISTING GROUNDLINE TO THE BOTTOM OF THE LEVELING PAD.
   THE HORIZONTAL LIMIT OF BORROW, TYPE B SHALL BE 4′-0″ IN FRONT OF THE M.S.E. WALL TO 1′-0″ BEHIND THE M.S.E. WALL STRAP.
   PAYMENT FOR BORROW TYPE B WILL BE MADE UNDER ITEM 202000-EXCAVATION AND EMBANKMENT.
3. FOR ADDITIONAL M.S.E. WALL NOTES, SEE SHEET 17 OF 40.

LEGEND

| | | |
|---|---|---|
| CLR. | = | CLEAR |
| EL. | = | ELEVATION |
| NB | = | NORTHBOUND |
| SB | = | SOUTHBOUND |
| TYP. | = | TYPICAL |
| T.L.P.E. | = | TOP OF LEVELING PAD ELEVATION |



DELAWARE DEPARTMENT OF TRANSPORTATION

ADDENDUMS / REVISIONS

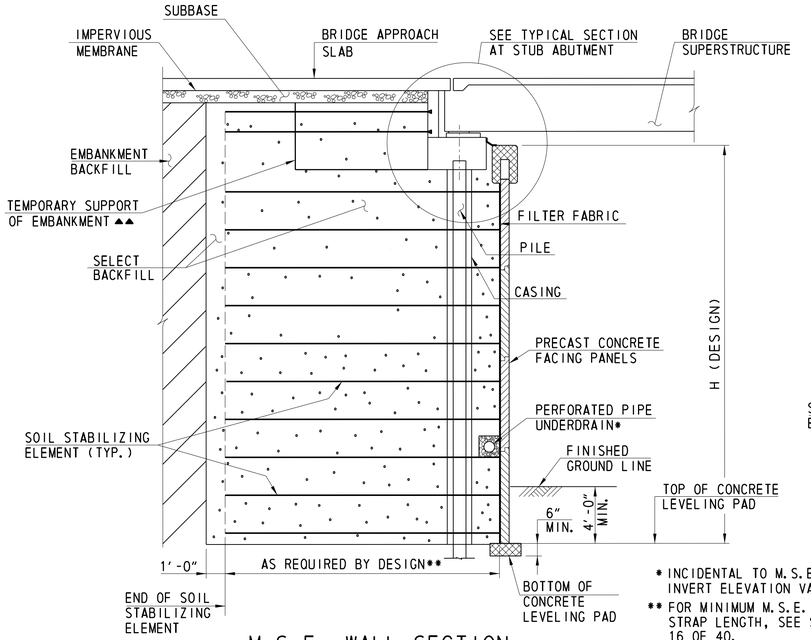
SCALE: AS NOTED

**US 301, SR 896 TO SR 1**

| | |
|---|---|
| CONTRACT | T200911308 |
| COUNTY | NEW CASTLE |
| BRIDGE NO. | 1-466 N&S |
| DESIGNED BY: | ZAA |
| CHECKED BY: | BJH |

**M.S.E. WALLS**

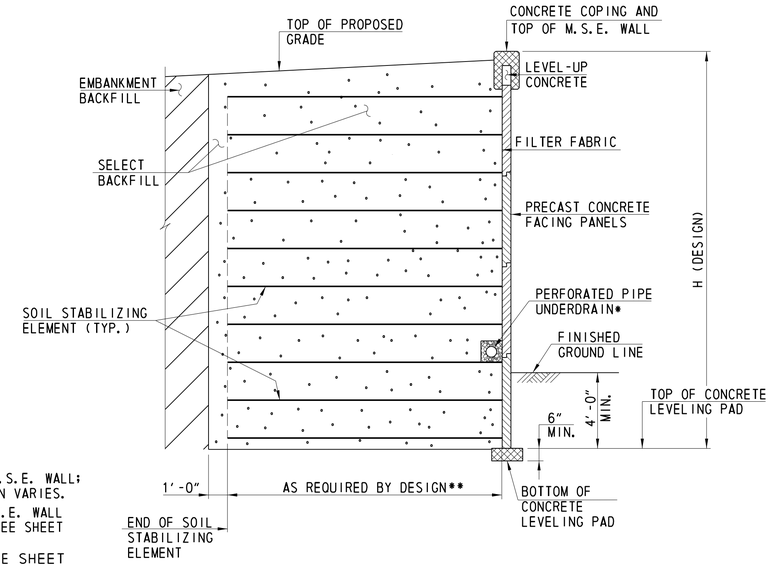
| | |
|---|---|
| SHEET NO. | 556 |
| TOTAL SHTS. | 875 |




* INCIDENTAL TO M.S.E. WALL; INVERT ELEVATION VARIES.
** FOR MINIMUM M.S.E. WALL STRAP LENGTH, SEE SHEET 16 OF 40.
▲▲ FOR DETAILS, SEE SHEET 5 OF 40.

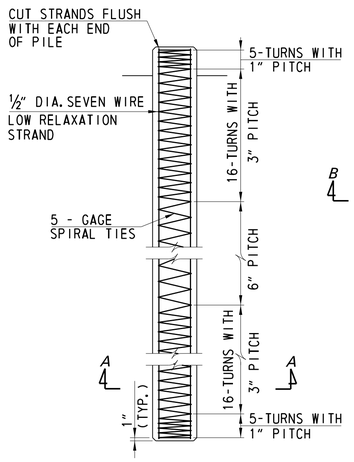
## M.S.E. WALL SECTION AT ABUTMENT

NOT TO SCALE

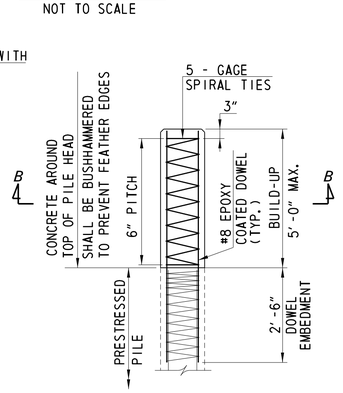



## M.S.E. WALL SECTION AT MEDIAN AND WINGWALL

NOT TO SCALE

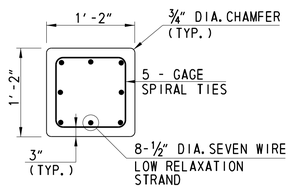



## PILE ELEVATION

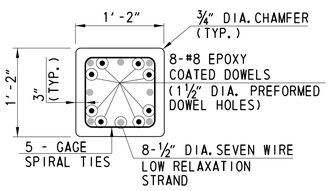



## PILE BUILD-UP DETAIL NON-DRIVING

SCALE: ½"=1'-0"



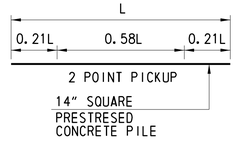

## SECTION A-A




## SECTION B-B

## PRECAST PRESTRESSED CONCRETE PILE DETAILS

NOT TO SCALE




## PILE PICKUP DATA

NOT TO SCALE

## M.S.E. WALL SOIL PARAMETERS

| REINFORCEMENT ZONE (BORROW, TYPE B) | |
|---|---|
| SOIL UNIT WEIGHT, (lb/ft³) | 125 |
| SOIL COHESION, (psf) | 0 |
| SOIL FRICTION ANGLE, (deg) | 34 |
| RETAINED ZONE | |
| SOIL UNIT WEIGHT, (lb/ft³) | 120 |
| SOIL COHESION, (psf) | 0 |
| SOIL FRICTION ANGLE, (deg) | 30 |
| FOUNDATION ZONE | |
| IN-SITU SOIL UNIT WEIGHT, (lb/ft³) | 115 |
| IN-SITU SOIL COHESION, (psf) | 0 |
| IN-SITU SOIL FRICTION ANGLE, (deg) | 30 |
| FOUNDATION SOIL (BORROW , TYP B) | |
| SOIL UNIT WEIGHT, (lb/ft³) | 125 |
| SOIL COHESION, (psf) | 0 |
| SOIL FRICTION ANGLE, (deg) | 34 |
| BEARING RESISTANCE FACTOR | 0.65 |
| ALLOWABLE SETTLEMENT (inch) | 1.0 |

### PILE INSTALLATION DATA***

| SUBSTR. UNIT | PILE TYPE | NOMINAL PILE DRIVING RESISTANCE (Rndr)(KIPS) | ESTIMATED TIP ELEVATION | MINIMUM TIP ELEVATION | AVERAGE ACTUAL MINIMUM TIP ELEVATION | AVERAGE ACTUAL MAXIMUM TIP ELEVATION |
|---|---|---|---|---|---|---|
| ABUT. A | 14" S.P.P.C.P. | 420 | 26.00 | 35.00 | | |
| | HP 14X73 | | 2.00 | 2.00 | | |
| ABUT. B | 14" S.P.P.C.P. | 420 | 26.00 | 35.00 | | |
| | HP 14X73 | | 2.00 | 2.00 | | |

### PILE DRIVING INFORMATION***

| PILE SIZE AND TYPE | | 14" S.P.P.C.P. | HP 14X73 |
|---|---|---|---|
| ACTUAL BEARING OBTAINED | ABUT A | | |
| | ABUT B | | |
| HAMMER TYPE | ABUT A | | |
| | ABUT B | | |
| PILE HAMMER ENERGY | ABUT A | | |
| | ABUT B | | |
| SPECIAL DRIVING CONDITIONS AND COMMENTS | ABUT A | | |
| | ABUT B | | |

***CONTRACTOR SHALL PROVIDE DATA FOR BOTH NB AND SB BRIDGES

LEGEND:

| | | |
|---|---|---|
| B.F.E. | = | BOTTOM OF FOOTING ELEVATION |
| CLR. | = | CLEAR |
| DIA. | = | DIAMETER |
| EL. | = | ELEVATION |
| MAX. | = | MAXIMUM |
| MIN. | = | MINIMUM |
| M.S.E. | = | MECHANICALLY STABILIZED EARTH |
| S.P.P.C.P. | = | SQUARE PRECAST PRESTRESSED CONCRETE PILE |
| SUBSTR. | = | SUBSTRUCTURE |
| TYP. | = | TYPICAL |

## M.S.E. WALL NOTES

1. PROVIDE MECHANICALLY STABILIZED EARTH WALLS IN ACCORDANCE WITH SPECIAL PROVISION 602771.
2. DESIGN CRITERIA: SEE SPECIAL PROVISION FOR ITEM 602772.
3. ALL EXPOSED CORNERS OF CONCRETE SHALL BE CHAMFERED WITH ¾"x¾" MILLED CHAMFER STRIPS, UNLESS OTHERWISE NOTED, EXCEPT ON UNEXPOSED FOOTINGS OR WHERE INDICATED BY THE FOLLOWING NOTATION ON THE PLANS: "DO NOT CHAMFER".
4. THE PROPRIETARY WALL MANUFACTURER MAY RELOCATE THE LEVELING PAD STEPS AT THEIR DISCRETION PROVIDED THAT THE MINIMUM EMBEDMENT IS MAINTAINED. ANY CHANGE TO THE STEP LOCATIONS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL.
5. THE PROPRIETARY WALL MANUFACTURER SHALL ASSURE THAT PROPOSED PROPRIETARY WALL COMPONENTS ARE POSITIONED SUCH THAT THE DESIGNATED ROADWAY LIMITS ARE NOT ENCROACHED UPON.
6. CONTRACTOR AND PROPRIETARY WALL MANUFACTURER SHALL COORDINATE LOCATIONS OF ALL APPURTENANCES WITH LOCATIONS OF PROPRIETARY WALL TIE BACK SYSTEM.
7. ALL RETAINING WALL COMPONENTS SHALL BE DESIGNED FOR A MINIMUM SERVICE LIFE OF 100 YEARS.
8. ONLY ONE M.S.E. WALL SYSTEM MAY BE USED ON THIS PROJECT.
9. WAIT A MINIMUM OF 30 DAYS AFTER COMPLETING M.S.E. WALL PLACEMENT BEFORE INSTALLING C.I.P. LEVEL-UP CONCRETE AND COPING.
10. PLACE TOE OF EARTH MOUND IN THE MEDIAN ON THE WALL SIDE, A MINIMUM OF 20' FROM THE FACE OF THE M.S.E. WALL.

## PILE NOTES

1. ALL PILES SHALL BE EITHER 14" SQUARE PRECAST PRESTRESSED CONCRETE PILES OR HP 14X73 STEEL PILES.
2. ALL PILES SHALL BE DRIVEN TO THE NOMINAL PILE DRIVING RESISTANCE (Rndr), LISTED IN THE PILE INSTALLATION DATA TABLE, OR REFUSAL AS DEFINED IN SECTION 619 OF SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, DELAWARE DEPARTMENT OF TRANSPORTATION, AUGUST 2001, AND ADDENDUMS, THE CONTRACTOR SHALL ORDER THE PILE LENGTHS BASED ON THE TEST PILES DRIVEN AT EACH ABUTMENT.
3. TEST PILES SHALL BE DYNAMICALLY TESTED BY THE CONTRACTOR IN ACCORDANCE WITH SPECIAL PROVISION 619519 AND 619539. THE NEED TO RESTRIKE EITHER A TEST PILE OR A PRODUCTION PILE SHALL BE THE SOLE DECISION OF THE ENGINEER.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SUBMITTING A WAVE EQUATION ANALYSIS AND ALL OTHER INCIDENTALS IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS. THE WAVE EQUATION AND HIGH-STRAIN DYNAMIC PILE TESTING MUST BE SIGNED AND STAMPED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF DALAWARE IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS.
5. UPON COMPLETION OF THE HIGH-STRAIN DYNAMIC PILE TESTING THE CONTRACTOR SHALL SUBMIT A SIGNAL MATCHING ANALYSIS TO THE ENGINEER FOR REVIEW AND APPROVAL IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS.

6a. A QUARANTINE PERIOD IS REQUIRED AFTER THE CONSTRUCTION OF THE FULL HEIGHT OF THE FILL AT THE ABUTMENTS IS ACHIEVED. SEE SHEET 5 OF 40. PILES MAY NOT BE DRIVEN UNTIL AFTER COMPLETION OF THE QUARANTINE PERIOD.

SHALL BE PERFORMED PRIOR TO PLACING ANY EMBANKMENT IN ACCORDANCE WITH ITEM 619502-TEST PILE RESTRIKE. TEST PILES BEHIND M.S.E. WALLS SHALL THEN BE CASED PRIOR TO PLACING EMBANKMENT. AFTER THE SETTLEMENT HAS BEEN ACHIEVED AND THE SUBSTRUCTURE HAS BEEN RELEASED BY THE ENGINEER, PRODUCTION PILES MAY BE INSTALLED. AT THIS POINT, THE TEST PILE SHALL BE ACTING AS A PRODUCTION PILE AND IT SHALL BE RE-STRUCK AS DIRECTED BY THE ENGINEER PRIOR TO PLACING ANY OTHER PRODUCTION PILES WITH PAYMENT UNDER ITEM 619501-PRODUCTION PILE RESTRIKE.

7. PILE LENGTHS FOR ORDERING PURPOSES SHALL BE DETERMINED BY TEST PILES. A MINIMUM OF ONE (1) PILE PER SUBSTRUCTURE, AS SHOWN ON THE PLANS, SHALL BE DYNAMICALLY TESTED WITH SIGNAL MATCHING ANALYSIS BY THE CONTRACTOR IN ACCORDANCE WITH SPECIAL PROVISIONS 619519 AND 619539. TEST AND PRODUCTION PILE RESTRIKES WILL BE PAID AS FOLLOWS:
   a). ALL TEST PILE(S) WILL BE RESTRUCK AFTER A WAITING PERIOD OF AT LEAST 48 HOURS. TEST PILE RESTRIKES SHALL BE INCIDENTAL TO THE INITIAL INSTALLATION OF THE PILE PROVIDED THEY ARE REQUESTED WITHIN FIVE WORKING DAYS FROM THE COMPLETION OF THE INITIAL DRIVE. IF TEST PILE RESTRIKES ARE REQUESTED AFTER THE FIVE WORKING DAYS FROM THE COMPLETION OF THE INITIAL DRIVE THEN THE TEST PILE RESTIKE SHALL BE PAID AS NOTED IN SPECIAL PROVISION 619502.
   b). IF DIRECTED BY THE ENGINEER TO RESTRIKE A PRODUCTION PILE, THE RESTRIKE OF THE PRODUCTION PILE SHALL BE PAID SEPARATELY UNDER ITEM 619501.
   c). RESTRIKES ON PRODUCTION PILES WHICH ARE DESIGNATED TO BE DYNAMICALLY TESTED WILL NOT BE PAID UNDER ITEM NO. 619501 PRODUCTION PILE RESTRIKE. THESE PRODUCTION PILE RESTRIKES ARE INCIDENTAL TO ITEM NO. 619519 DYNAMIC PILE TESTING BY CONTRACTOR.
   d). THE FIRST TEN (10) PRODUCTION PILE RESTRIKES FOR THE BRIDGE SHALL BE PERFORMED AT NO COST TO THE DEPARTMENT. SUBSEQUENT RESTRIKES SHALL BE UNDER ITEM NO. 619501 PRODUCTION PILE RESTRIKES AT THE FIXED PRICE OF $ 500.00 EACH.
8. THE DEPARTMENT RESERVES THE RIGHT TO PERFORM DYNAMIC TESTING OF RESTRIKES.

**14" SQUARE PRECAST PRESTRESSED CONCRETE PILES**

A. THE ESTIMATED PILE LENGTH = 58'-0"
B. THE ESTIMATED TEST PILE LENGTH = 68'-0"
C. THE ESTIMATED RATED HAMMER ENERGY RANGE REQUIRED TO DRIVE THE PILES IS BETWEEN 59.70 AND 74.50 kip-ft.
D. MINIMUM GROUT COMPRESSIVE STRENGTH F'c = 6,000 psi.
   DOWEL HOLES SHALL BE POSITIONED TO MAINTAIN 1" CLEAR TO ALL PRESTRESSING STRANDS IN THE CONCRETE PILE.
   PREFORMED HOLES SHALL BE FREE OF ANY OBSTRUCTIONS BEFORE GROUTING WITH AN APPROVED NON-SHRINK GROUT. HOLES SHALL ALSO BE GROUTED WHEN PILE BUILD-UP IS NOT NEEDED.
E. THE CAST-IN-PLACE CONCRETE PILE BUILD-UP SHALL BE USED WHERE PILES MUST BE DRIVEN TO AN ELEVATION WHICH RESULTS IN THE TOP OF PILE BEING LOWER THAN THE BOTTOM OF CAP TO ACHIEVE THE REQUIRED NOMINAL RESISTANCE. PILE BUILD-UP WILL BE MEASURED AND PAID FOR IN CONFORMANCE WITH SECTION 618 OF THE DELAWARE DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS. MINIMUM CONCRETE COMPRESSIVE STRENGTH F'c = 6,000 psi.

**HP 14X73 STEEL PILES**

A CONTRACTOR'S ALTERNATE USING AN HP14X73 STEEL PILE IS ALLOWED. ASSUME A ONE TO ONE PILE SUBSTITUTION. STEEL H-PILES SHALL MEET THE REQUIREMENTS OF AASHTO M270, GRADE 50. ORIENT STRONG AXIS OF STEEL H-PILES PARALLEL TO CENTERLINE OF BEARINGS.
A. THE ESTIMATED PILE LENGTH = 82'-0"
B. THE ESTIMATED TEST PILE LENGTH = 92'-0"
C. USE A HAMMER ENERGY RANGE BETWEEN 59.70 AND 74.50 kip-ft.



DELAWARE DEPARTMENT OF TRANSPORTATION

ADDENDUMS / REVISIONS

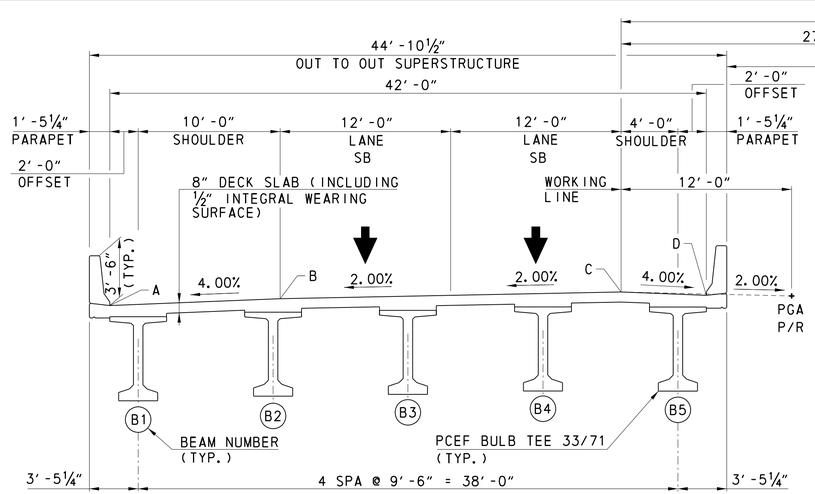
SCALE: AS NOTED

US 301, SR 896 TO SR 1

| CONTRACT | BRIDGE NO. | 1-466 N&S |
|---|---|---|
| T200911308 | DESIGNED BY: SJM | |
| COUNTY | CHECKED BY: ZAA | |
| NEW CASTLE | | |

MISCELLANEOUS DETAILS

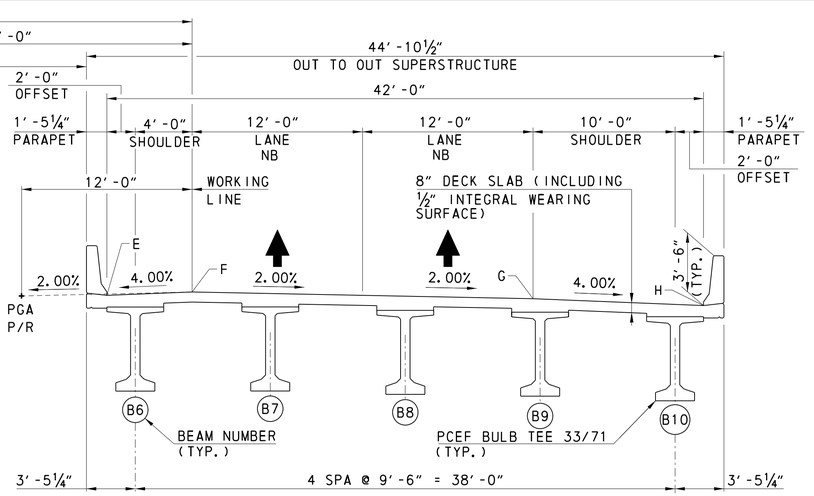
| SHEET NO. |
|---|
| 557 |
| TOTAL SHTS. |
| 875 |




1-466S

US 301
CONSTR. ℄

NOTE:
1. DIAPHRAGMS NOT SHOWN FOR CLARITY.




1-466N

## TYPICAL SECTION

SCALE: ⅛" = 1' -0"

| TOP OF DECK ELEVATIONS ALONG ℄ BEAM | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| BRIDGE 1-466S | | | | | | | | | |
| BEAM B1 | | BEAM B2 | | BEAM B3 | | BEAM B4 | | BEAM B5 | |
| STATION | ELEVATION | STATION | ELEVATION | STATION | ELEVATION | STATION | ELEVATION | STATION | ELEVATION |
| * 685+69.31 | 93.12 | 685+63.83 | 93.52 | 685+58.34 | 93.75 | 685+52.86 | 93.97 | 685+47.37 | 93.95 |
| 685+79.31 | 93.07 | 685+73.83 | 93.47 | 685+68.34 | 93.70 | 685+62.86 | 93.92 | 685+57.37 | 93.90 |
| 685+89.31 | 93.02 | 685+83.83 | 93.42 | 685+78.34 | 93.65 | 685+72.86 | 93.87 | 685+67.37 | 93.85 |
| 685+99.31 | 92.97 | 685+93.83 | 93.37 | 685+88.34 | 93.60 | 685+82.86 | 93.82 | 685+77.37 | 93.80 |
| 686+09.31 | 92.92 | 686+03.83 | 93.32 | 685+98.34 | 93.55 | 685+92.86 | 93.77 | 685+87.37 | 93.75 |
| 686+19.31 | 92.87 | 686+13.83 | 93.27 | 686+08.34 | 93.50 | 686+02.86 | 93.72 | 685+97.37 | 93.70 |
| 686+29.31 | 92.82 | 686+23.83 | 93.22 | 686+18.34 | 93.45 | 686+12.86 | 93.67 | 686+07.37 | 93.65 |
| 686+39.31 | 92.77 | 686+33.83 | 93.17 | 686+28.34 | 93.40 | 686+22.86 | 93.62 | 686+17.37 | 93.60 |
| 686+49.31 | 92.72 | 686+43.83 | 93.12 | 686+38.34 | 93.35 | 686+32.86 | 93.57 | 686+27.37 | 93.55 |
| 686+59.31 | 92.67 | 686+53.83 | 93.07 | 686+48.34 | 93.30 | 686+42.86 | 93.52 | 686+37.37 | 93.50 |
| 686+69.31 | 92.62 | 686+63.83 | 93.02 | 686+58.34 | 93.25 | 686+52.86 | 93.47 | 686+47.37 | 93.45 |
| 686+79.31 | 92.57 | 686+73.83 | 92.97 | 686+68.34 | 93.20 | 686+62.86 | 93.42 | 686+57.37 | 93.40 |
| ** 686+89.31 | 92.52 | 686+83.83 | 92.92 | 686+78.34 | 93.15 | 686+72.86 | 93.37 | 686+67.37 | 93.35 |

| TOP OF DECK ELEVATIONS ALONG ℄ BEAM | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| BRIDGE 1-466N | | | | | | | | | |
| BEAM B6 | | BEAM B7 | | BEAM B8 | | BEAM B9 | | BEAM B10 | |
| STATION | ELEVATION | STATION | ELEVATION | STATION | ELEVATION | STATION | ELEVATION | STATION | ELEVATION |
| * 685+20.81 | 94.08 | 685+15.32 | 94.16 | 685+09.84 | 93.99 | 685+04.35 | 93.82 | 684+98.87 | 93.47 |
| 685+30.81 | 94.03 | 685+25.32 | 94.11 | 685+19.84 | 93.94 | 685+14.35 | 93.77 | 685+08.87 | 93.42 |
| 685+40.81 | 93.98 | 685+35.32 | 94.06 | 685+29.84 | 93.89 | 685+24.35 | 93.72 | 685+18.87 | 93.37 |
| 685+50.81 | 93.93 | 685+45.32 | 94.01 | 685+39.84 | 93.84 | 685+34.35 | 93.67 | 685+28.87 | 93.32 |
| 685+60.81 | 93.88 | 685+55.32 | 93.96 | 685+49.84 | 93.79 | 685+44.35 | 93.62 | 685+38.87 | 93.27 |
| 685+70.81 | 93.83 | 685+65.32 | 93.91 | 685+59.84 | 93.74 | 685+54.35 | 93.57 | 685+48.87 | 93.22 |
| 685+80.81 | 93.78 | 685+75.32 | 93.86 | 685+69.84 | 93.69 | 685+64.35 | 93.52 | 685+58.87 | 93.17 |
| 685+90.81 | 93.73 | 685+85.32 | 93.81 | 685+79.84 | 93.64 | 685+74.35 | 93.47 | 685+68.87 | 93.12 |
| 686+00.81 | 93.68 | 685+95.32 | 93.76 | 685+89.84 | 93.59 | 685+84.35 | 93.42 | 685+78.87 | 93.07 |
| 686+10.81 | 93.63 | 686+05.32 | 93.71 | 685+99.84 | 93.54 | 685+94.35 | 93.37 | 685+88.87 | 93.02 |
| 686+20.81 | 93.58 | 686+15.32 | 93.66 | 686+09.84 | 93.49 | 686+04.35 | 93.32 | 685+98.87 | 92.97 |
| 686+30.81 | 93.53 | 686+25.32 | 93.61 | 686+19.84 | 93.44 | 686+14.35 | 93.27 | 686+08.87 | 92.92 |
| ** 686+40.81 | 93.48 | 686+35.32 | 93.56 | 686+29.84 | 93.39 | 686+24.35 | 93.22 | 686+18.87 | 92.87 |

*℄ BRG. ABUT. A
**℄ BRG. ABUT. B

| TOP OF DECK ELEVATIONS AT 10 FT. INTERVALS | | | | | |
|---|---|---|---|---|---|
| BRIDGE 1-466S | | | | | |
| STATION | PGL ELEVATION AT CONSTR. ℄ | DECK ELEVATION @ A (GUTTER) | DECK ELEVATION @ B | DECK ELEVATION @ C (WORKING LINE SB) | DECK ELEVATION @ D (GUTTER) |
| 684+80.00 | 94.20 | 93.48 | 93.96 | 94.44 | 94.20 |
| 684+90.00 | 94.15 | 93.43 | 93.91 | 94.39 | 94.15 |
| 685+00.00 | 94.10 | 93.38 | 93.86 | 94.34 | 94.10 |
| 685+10.00 | 94.05 | 93.33 | 93.81 | 94.29 | 94.05 |
| 685+20.00 | 94.00 | 93.28 | 93.76 | 94.24 | 94.00 |
| 685+30.00 | 93.95 | 93.23 | 93.71 | 94.19 | 93.95 |
| 685+40.00 | 93.90 | 93.18 | 93.66 | 94.14 | 93.90 |
| 685+50.00 | 93.85 | 93.13 | 93.61 | 94.09 | 93.85 |
| 685+60.00 | 93.80 | 93.08 | 93.56 | 94.04 | 93.80 |
| 685+70.00 | 93.75 | 93.03 | 93.51 | 93.99 | 93.75 |
| 685+80.00 | 93.70 | 92.98 | 93.46 | 93.94 | 93.70 |
| 685+90.00 | 93.65 | 92.93 | 93.41 | 93.89 | 93.65 |
| 686+00.00 | 93.60 | 92.88 | 93.36 | 93.84 | 93.60 |
| 686+10.00 | 93.55 | 92.83 | 93.31 | 93.79 | 93.55 |
| 686+20.00 | 93.50 | 92.78 | 93.26 | 93.74 | 93.50 |
| 686+30.00 | 93.45 | 92.73 | 93.21 | 93.69 | 93.45 |
| 686+40.00 | 93.40 | 92.68 | 93.16 | 93.64 | 93.40 |
| 686+50.00 | 93.35 | 92.63 | 93.11 | 93.59 | 93.35 |
| 686+60.00 | 93.30 | 92.58 | 93.06 | 93.54 | 93.30 |
| 686+70.00 | 93.25 | 92.53 | 93.01 | 93.49 | 93.25 |
| 686+80.00 | 93.20 | 92.48 | 92.96 | 93.44 | 93.20 |
| 686+90.00 | 93.15 | 92.43 | 92.91 | 93.39 | 93.15 |
| 687+00.00 | 93.10 | 92.38 | 92.86 | 93.34 | 93.10 |
| 687+10.00 | 93.05 | 92.33 | 92.81 | 93.29 | 93.05 |
| 687+20.00 | 93.00 | 92.28 | 92.76 | 93.24 | 93.00 |
| 687+30.00 | 92.95 | 92.23 | 92.71 | 93.19 | 92.95 |

| TOP OF DECK ELEVATIONS AT 10 FT. INTERVALS | | | | | |
|---|---|---|---|---|---|
| BRIDGE 1-466N | | | | | |
| STATION | PGL ELEVATION AT CONSTR. ℄ | DECK ELEVATION @ E (GUTTER) | DECK ELEVATION @ F (WORKING LINE NB) | DECK ELEVATION @ G | DECK ELEVATION @ H (GUTTER) |
| 684+80.00 | 94.20 | 94.20 | 94.44 | 93.96 | 93.48 |
| 684+90.00 | 94.15 | 94.15 | 94.39 | 93.91 | 93.43 |
| 685+00.00 | 94.10 | 94.10 | 94.34 | 93.86 | 93.38 |
| 685+10.00 | 94.05 | 94.05 | 94.29 | 93.81 | 93.33 |
| 685+20.00 | 94.00 | 94.00 | 94.24 | 93.76 | 93.28 |
| 685+30.00 | 93.95 | 93.95 | 94.19 | 93.71 | 93.23 |
| 685+40.00 | 93.90 | 93.90 | 94.14 | 93.66 | 93.18 |
| 685+50.00 | 93.85 | 93.85 | 94.09 | 93.61 | 93.13 |
| 685+60.00 | 93.80 | 93.80 | 94.04 | 93.56 | 93.08 |
| 685+70.00 | 93.75 | 93.75 | 93.99 | 93.51 | 93.03 |
| 685+80.00 | 93.70 | 93.70 | 93.94 | 93.46 | 92.98 |
| 685+90.00 | 93.65 | 93.65 | 93.89 | 93.41 | 92.93 |
| 686+00.00 | 93.60 | 93.60 | 93.84 | 93.36 | 92.88 |
| 686+10.00 | 93.55 | 93.55 | 93.79 | 93.31 | 92.83 |
| 686+20.00 | 93.50 | 93.50 | 93.74 | 93.26 | 92.78 |
| 686+30.00 | 93.45 | 93.45 | 93.69 | 93.21 | 92.73 |
| 686+40.00 | 93.40 | 93.40 | 93.64 | 93.16 | 92.68 |
| 686+50.00 | 93.35 | 93.35 | 93.59 | 93.11 | 92.63 |
| 686+60.00 | 93.30 | 93.30 | 93.54 | 93.06 | 92.58 |
| 686+70.00 | 93.25 | 93.25 | 93.49 | 93.01 | 92.53 |
| 686+80.00 | 93.20 | 93.20 | 93.44 | 92.96 | 92.48 |
| 686+90.00 | 93.15 | 93.15 | 93.39 | 92.91 | 92.43 |
| 687+00.00 | 93.10 | 93.10 | 93.34 | 92.86 | 92.38 |
| 687+10.00 | 93.05 | 93.05 | 93.29 | 92.81 | 92.33 |
| 687+20.00 | 93.00 | 93.00 | 93.24 | 92.76 | 92.28 |
| 687+30.00 | 92.95 | 92.95 | 93.19 | 92.71 | 92.23 |

LEGEND
CONSTR. = CONSTRUCTION
NB = NORTHBOUND
SB = SOUTHBOUND
SPA. = SPACES
TYP. = TYPICAL



DELAWARE
DEPARTMENT OF TRANSPORTATION

ADDENDUMS / REVISIONS

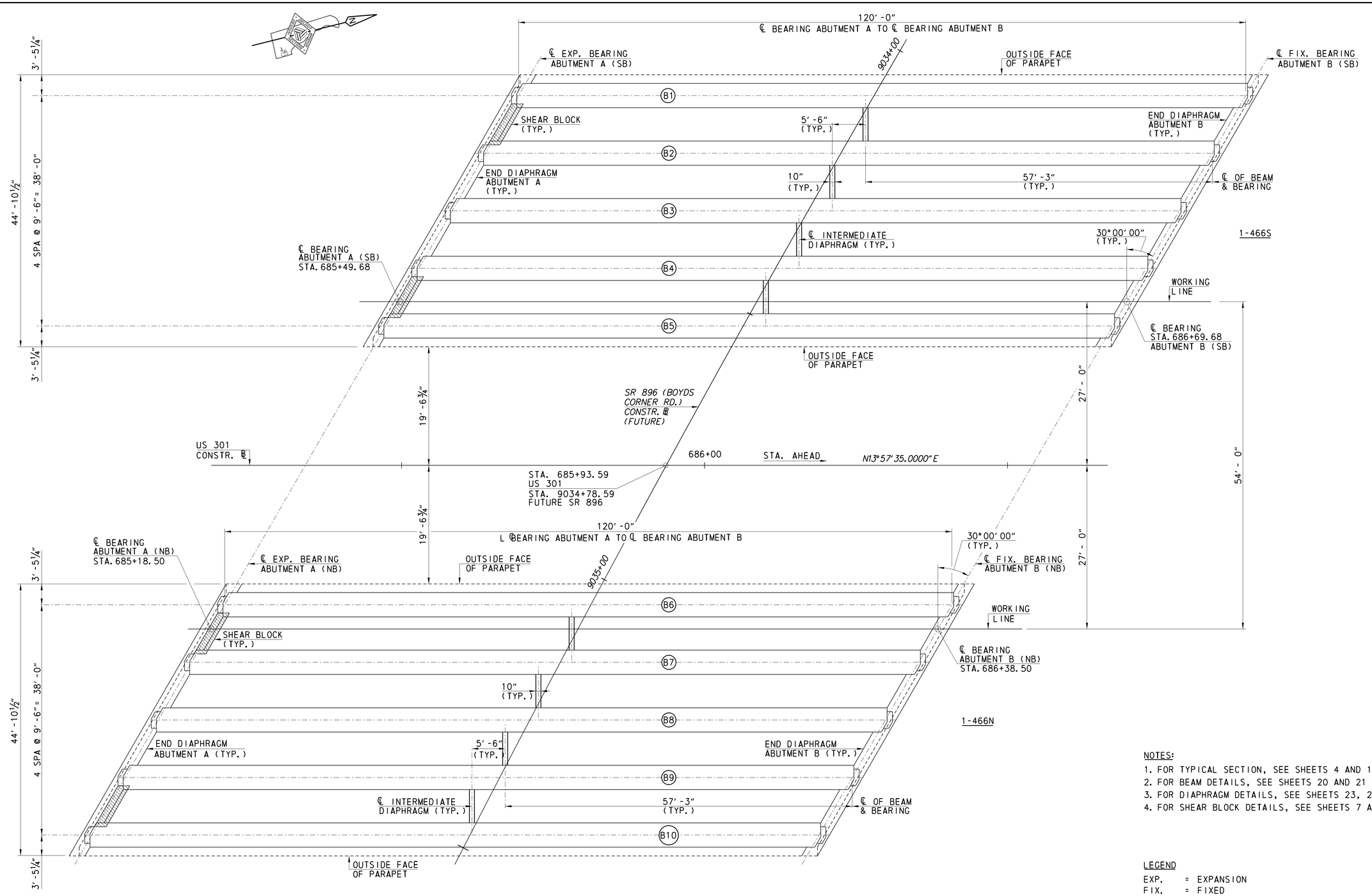
SCALE: AS NOTED

**US 301,
SR 896 TO SR 1**

CONTRACT T200911308
COUNTY NEW CASTLE
BRIDGE NO. 1-466 N&S
DESIGNED BY: ZAA
CHECKED BY: BSW

**FINISHED
BRIDGE DECK ELEVATIONS**

SHEET NO. 558
TOTAL SHTS. 875




PLAN

SCALE: ⅛″ = 1′-0″

NOTES:

1. FOR TYPICAL SECTION, SEE SHEETS 4 AND 18 OF 40.
2. FOR BEAM DETAILS, SEE SHEETS 20 AND 21 OF 40.
3. FOR DIAPHRAGM DETAILS, SEE SHEETS 23, 24, 31 AND 32 OF 40.
4. FOR SHEAR BLOCK DETAILS, SEE SHEETS 7 AND 12 OF 40.

LEGEND

EXP. = EXPANSION
FIX. = FIXED
NB = NORTHBOUND
SB = SOUTHBOUND
STA. = STATION
TYP. = TYPICAL



DELAWARE DEPARTMENT OF TRANSPORTATION

ADDENDUMS / REVISIONS

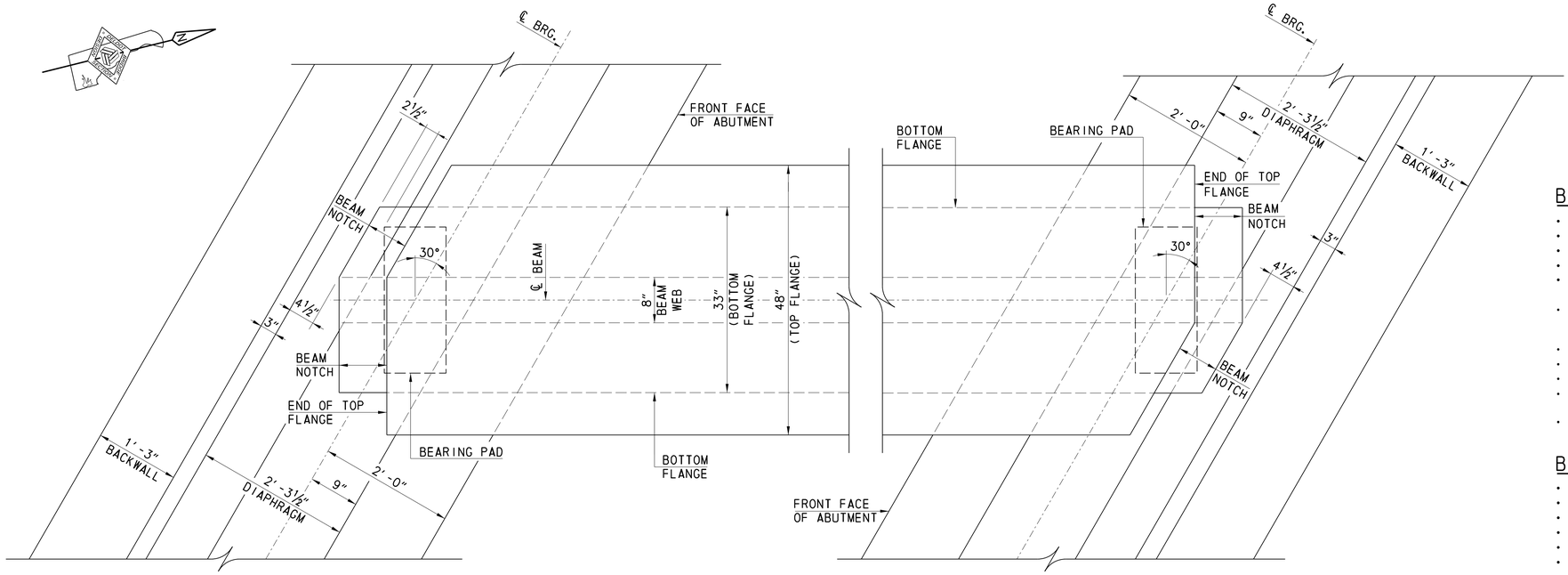
SCALE: AS NOTED

US 301, SR 896 TO SR 1

CONTRACT T200911308
COUNTY NEW CASTLE
BRIDGE NO. 1-466 N&S
DESIGNED BY: ZAA
CHECKED BY: BK

FRAMING PLAN

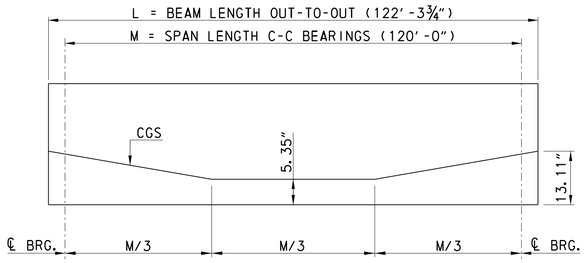
SHEET NO. 559
TOTAL SHTS. 875



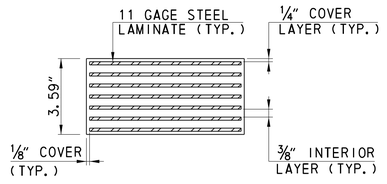

ABUTMENT A

ABUTMENT B

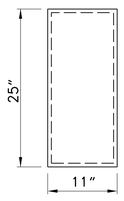
## PLAN
## STRUCTURE AT END OF BEAM
SCALE: 1"=1'-0"




## STRAND PROFILE, CGS
NOT TO SCALE




## ELEVATION




PLAN

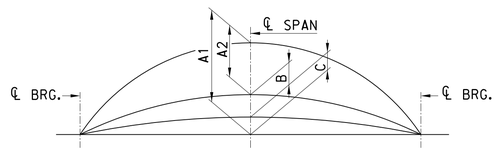
NOTE:
11"x25"x3.59" LAMINATED BEARING PAD
20 REQUIRED FOR STRUCTURE.

## BEARING PAD DETAILS
## (EXP. AND FIX. BEARINGS)
NOT TO SCALE

LEGEND

| | | |
|---|---|---|
| ABUT. | = | ABUTMENT |
| BRG. | = | BEARING |
| CGS | = | CENTER OF GRAVITY, STRANDS |
| EXP. | = | EXPANSION |
| FIX. | = | FIXED |
| MIN. | = | MINIMUM |
| TYP. | = | TYPICAL |

| CAMBER TABLE | | | | |
|---|---|---|---|---|
| BEAM | A1(In) | A2(In) | B(In) | C(In) |
| B1, B5, B6, B10 | 6⅞ | 2½ | 1½ | 2⅞ |
| B2, B4, B7, B9 | 6⅞ | 2½ | 1¾ | 2⅝ |
| B3, B8 | 6⅞ | 2½ | 1⁹⁄₁₆ | 2¹³⁄₁₆ |




## BEAM CAMBER DESIGN
NOT TO SCALE

## CAMBER NOTES
A1 = ESTIMATED PRESTRESS CAMBER TIMES CREEP FACTOR OF 1.6 AND INITIAL P/S LOSS OF 10%.
A2 = DEFLECTION DUE TO DEAD LOAD TIMES CREEP FACTOR OF 1.6
A = A1-A2.
B = DEFLECTION DUE TO DEAD LOAD OF SLAB, PERMANENT METAL FORMS AND SUPERIMPOSED DEAD LOAD.
C = NET FINAL CAMBER ( A-B ).
- CAMBER VALUES ARE THEORETICAL AND MAY VARY WITH ACTUAL CONCRETE STRENGTH (AGE), VARIOUS PRESTRESSING CONDITIONS, CREEP FACTOR AND PRESTRESS LOSSES.
- BEARING SEAT ELEVATIONS AND HAUNCH THICKNESS HAVE BEEN CALCULATED USING THE NET FINAL CAMBER "C".

## BEARING PAD NOTES
- THE MAXIMUM DESIGN LOAD FOR THE FIXED BEARINGS = 263 KIPS.
- THE MAXIMUM DESIGN LOAD FOR THE EXPANSION BEARINGS = 263 KIPS
- SMOOTH CUT AND DEBURR METAL SHIMS.
- GRIT BLAST AND DEGREASE METAL SHIMS.
- ALL BEARING PADS ARE TO BE MOLDED TO DESIGN DIMENSIONS. CUTTING TO SIZE AFTER FABRICATION IS PROHIBITED.
- MEET THE MATERIAL SPECIFICATIONS FOR ELASTOMERIC BEARING REQUIREMENTS OF AASHTO M251. BEARING PADS SHALL BE SAMPLED FOR TESTING ACCORDING TO AASHTO M254, AS DIRECTED.
- PROVIDE NEOPRENE 50 ±5 DUROMETER.
- PROVIDE INTERNAL SHIMS PER AASHTO M270, GRADE 36.
- VULCANIZE PATCH PIN GROOVES.
- SANDBLAST CLEAN THE CONCRETE BEARING SURFACES TO ACHIEVE A ROUGH TEXTURE. DO NOT EPOXY COAT BEARING SURFACES.
- BEARING PADS ARE TO BE PLACED NORMAL TO THE CENTERLINE OF BEAM.

## BEAM NOTES
- GIRDERS ARE BULB TEE TYPE PCEF (33/71).
- CONCRETE STRENGTH AT STRAND RELEASE (f'ci) = 6.8 Ksi
- CONCRETE STRENGTH AT 28 DAYS (f'c) = 8.0 Ksi
- JACKING PRESTRESS STRESS (f pj) PER STRAND = 202.50 ksi
- USE LOW RELAXATION 270 ksi, 0.6" DIAMETER STRANDS (A = 0.217 $in^2$)
- MINIMUM COVER ON REINFORCEMENT BARS:
  STIRRUPS - 1" MIN.
  ALL OTHERS - 1½" MIN. UNLESS OTHERWISE NOTED
- PROVIDE MILD STEEL REINFORCEMENT CONFORMING TO AASHTO M31, GRADE 60.
- PROVIDE THREADED INSERTS IN P/S BEAMS FOR DIAPHRAGM REINFORCEMENT. DETAILS TO BE SHOWN ON SHOP DRAWINGS.
- END ZONE REINFORCEMENT MAY BE INCREASED BY FABRICATOR TO REFLECT FABRICATOR'S EXPERIENCE AND/OR TO CONTROL CRACKING. WIRE MESH OF EQUIVALENT AREA IS PERMISSIBLE FOR CRACK CONTROL REINFORCEMENT.
- CAST ENDS OF BEAMS TO BE TRULY VERTICAL WHEN ERECTED.
- CLEAN TOP OF BEAMS BEFORE DECK SLAB IS PLACED.
- SHOW PLAN, ELEVATION, SECTIONS AND ALL REINFORCEMENT DETAILS ON SHOP DRAWINGS.
- SHOW DESIGN LENGTH AND CASTING LENGTH ON SHOP DRAWINGS.
- SHOW DETAILS OF GIRDER LIFTING DEVICES WITH ITS TYPE, SIZE AND LOCATION ON THE SHOP DRAWINGS.
- AT THE SHOP DRAWING STAGE PROVIDE CRACK CONTROL DEBONDING.
- SHOW ON THE SHOP DRAWINGS THE TYPE AND LOCATION OF TEMPORARY STORAGE SUPPORT AND THE TYPE AND LOCATION OF TEMPORARY TRANSPORTATION BRACING AND SUPPORTS.
- SHOW ANY MODIFICATIONS TO REINFORCEMENT SPLICE AND BENDING DETAILS ON SHOP DRAWINGS.
- ALL MILD STEEL REINFORCEMENT IN GIRDERS SHALL BE EPOXY COATED.
- GIRDER LENGTHS IN CASTING BED SHALL BE DETERMINED AND DEPICTED IN SHOP DRAWINGS TO COMPENSATE FOR GRADE SHORTENING DUE TO PRESTRESS EFFECT.
- TOP SURFACE OF ALL GIRDERS SHALL BE ROUGH FINISHED TO A FULL AMPLITUDE OF 1/4" AND SCRUBBED TRANSVERSELY WITH A COARSE WIRE BRUSH TO REMOVE ALL LAITANCE AND TO PRODUCE A ROUGHENED SURFACE FOR BONDING.
- NO CLEAR COVER LESS THAN AS SHOWN ON THESE PLANS WILL BE ACCEPTED.
- FOR PERMANENT STEEL BRIDGE DECK FORM DETAILS, SEE SHEET 22 OF 40.
- SHOW FORM ANCHOR DETAIL ON THE SHOP DRAWINGS. SUPPORT SYSTEM AND THE GALVANIZED ANCHOR INSERT ARE TO BE FROM AN APPROVED MANUFACTURER. THE ANCHOR INSERT IS TO BE PROVIDED AT EACH WELD REQUIRED ALONG THE DECK FORM AND SHALL NOT BE CONTINUOUS.
- PERMANENT STEEL DECK FORMS AND SUPPORTS SHALL CONFORM TO SECTION 602 OF THE STANDARD SPECIFICATIONS. THESE FORMS SHALL BE THE PROPER GAGE TO SUPPORT, WITHIN SPECIFIED DEFLECTIONS, THE SPECIFIED WEIGHTS FOR THE PARTICULAR SPAN INVOLVED. THE DESIGN SPAN SHALL BE THE CLEAR DISTANCE BETWEEN GIRDER FLANGES LESS 2".
  ANY PERMANENTLY EXPOSED FORM METAL WHERE THE GALVANIZED COATING HAS BEEN DAMAGED SHALL BE THOROUGHLY CLEANED, WIRE BRUSHED AND PAINTED WITH TWO COATS OF ZINC DUST-ZINC OXIDE PAINT, NO COLOR ADDED, TO THE SATISFACTION OF THE ENGINEER. MINOR HEAT DISCOLORATION IN AREAS OF WELDS NEED NOT BE TOUCHED UP.



BR1-466BM-01

DELAWARE DEPARTMENT OF TRANSPORTATION

ADDENDUMS / REVISIONS

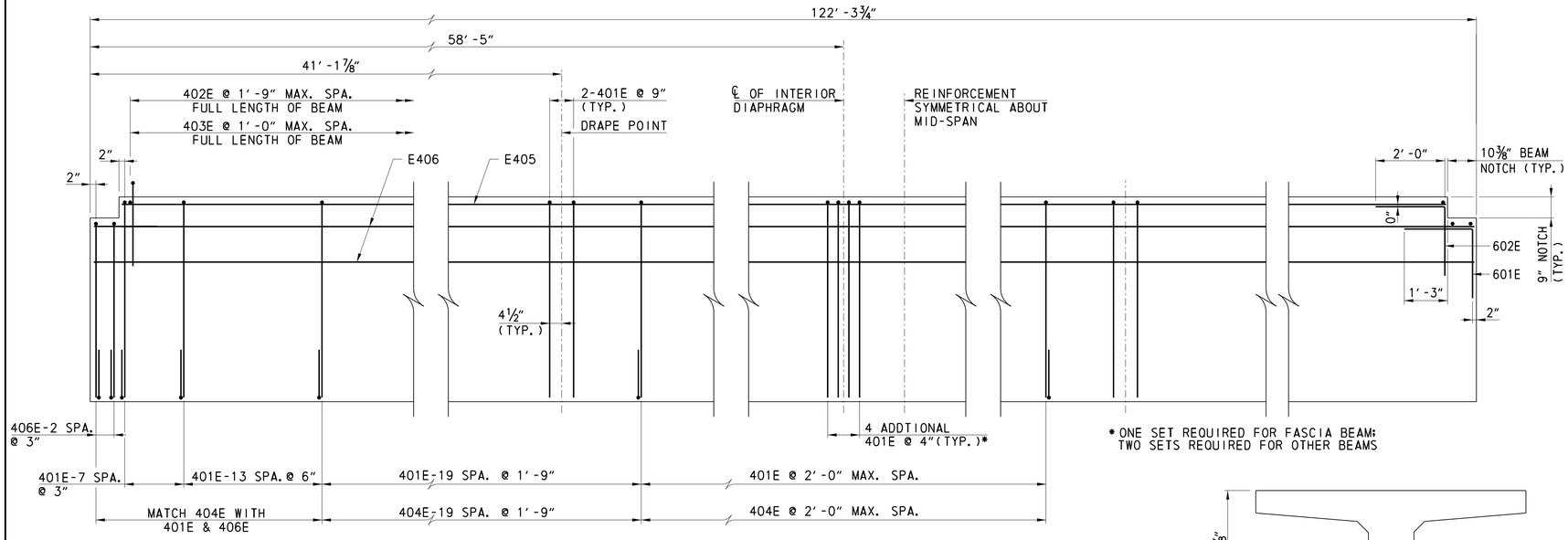
SCALE: AS NOTED

**US 301, SR 896 TO SR 1**

CONTRACT T200911308
COUNTY NEW CASTLE
BRIDGE NO. 1-466 N&S
DESIGNED BY: ZAA
CHECKED BY: BK

**BEAM PLAN AND BEARING DETAILS**

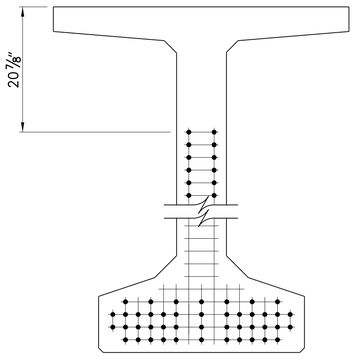
SHEET NO. 560
TOTAL SHTS. 875




* ONE SET REQUIRED FOR FASCIA BEAM; TWO SETS REQUIRED FOR OTHER BEAMS

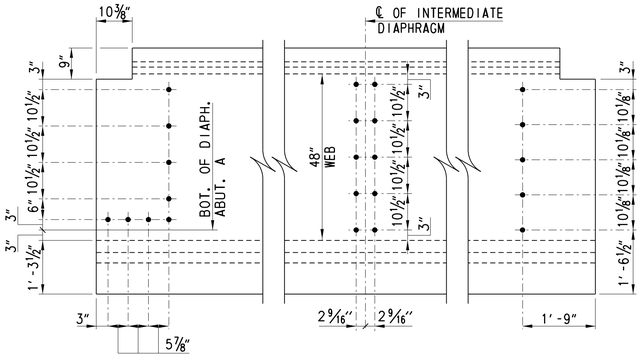
## PCEF 8″ WEB BULB-TEE BEAM ELEVATION

SCALE: ½″=1′-0″



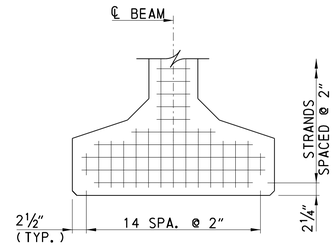

## STRAND LOCATION AT ENDS

NOT TO SCALE



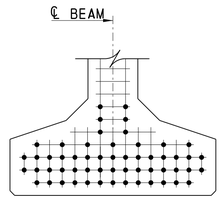

## THREADED INSERT LOCATION

NOT TO SCALE




## TYPICAL STRAND GRID PATTERN

NOT TO SCALE

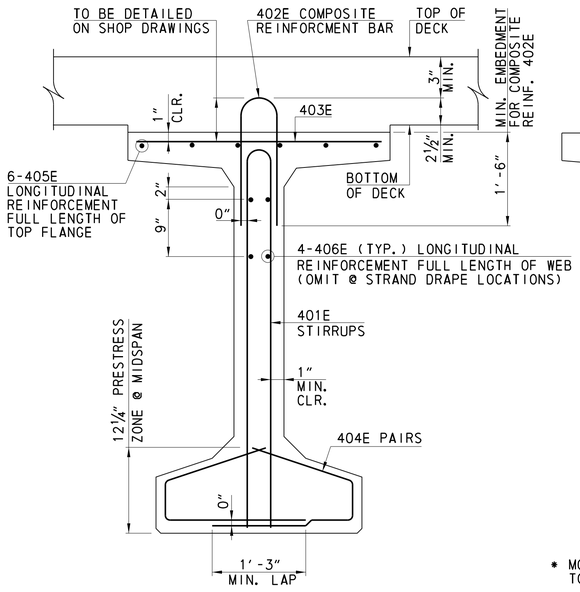



## STRAND LOCATION AT MIDSPAN

NOT TO SCALE

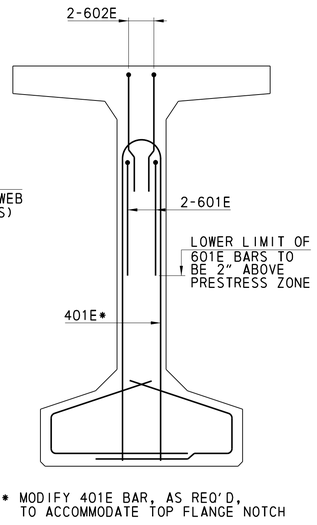
LEGEND

| | | |
|---|---|---|
| CLR. | = | CLEAR |
| MAX. | = | MAXIMUM |
| MIN. | = | MINIMUM |
| REINF. | = | REINFORCEMENT |
| REQ'D. | = | REQUIRED |
| SPA. | = | SPACING |
| TYP. | = | TYPICAL |




## TYPICAL BEAM REINFORCEMENT

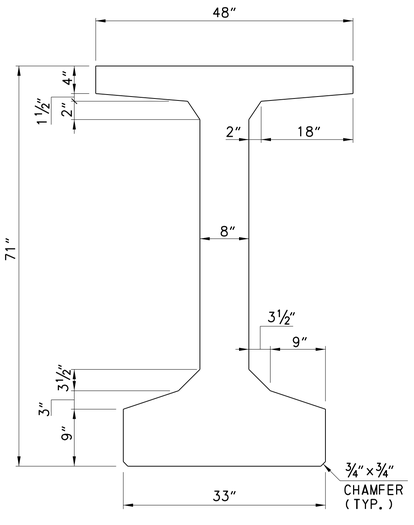
NOT TO SCALE




* MODIFY 401E BAR, AS REQ'D, TO ACCOMMODATE TOP FLANGE NOTCH

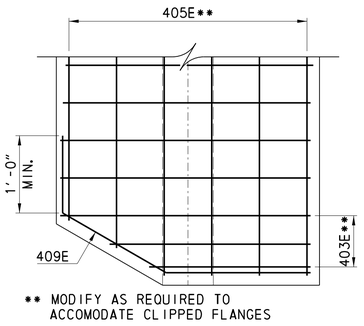
## NOTCHED END REINFORCEMENT

NOT TO SCALE



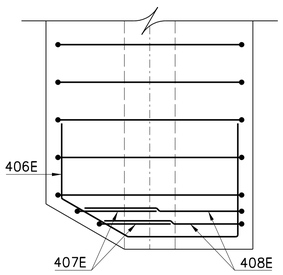

## TYPICAL BEAM SECTION (PCEF BULB TEE BEAM 33x71)

NOT TO SCALE

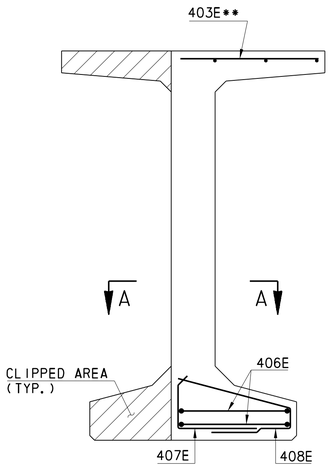



** MODIFY AS REQUIRED TO ACCOMODATE CLIPPED FLANGES

## PLAN TOP FLANGE




## SECTION A-A BOTTOM FLANGE




## BEAM END VIEW

NOTES:

1. FOR DIAPHRAGM DETAILS, SEE SHEETS 23, 24, 31 AND 32 OF 40.

## TYPICAL CLIPPED FLANGE REINFORCEMENT DETAILS

SCALE: 1″=1′-0″

NOTE:
USE EPOXY COATED MILD STEEL IN ALL BEAMS.



BR1-466BM-02

**DELAWARE DEPARTMENT OF TRANSPORTATION**

ADDENDUMS / REVISIONS

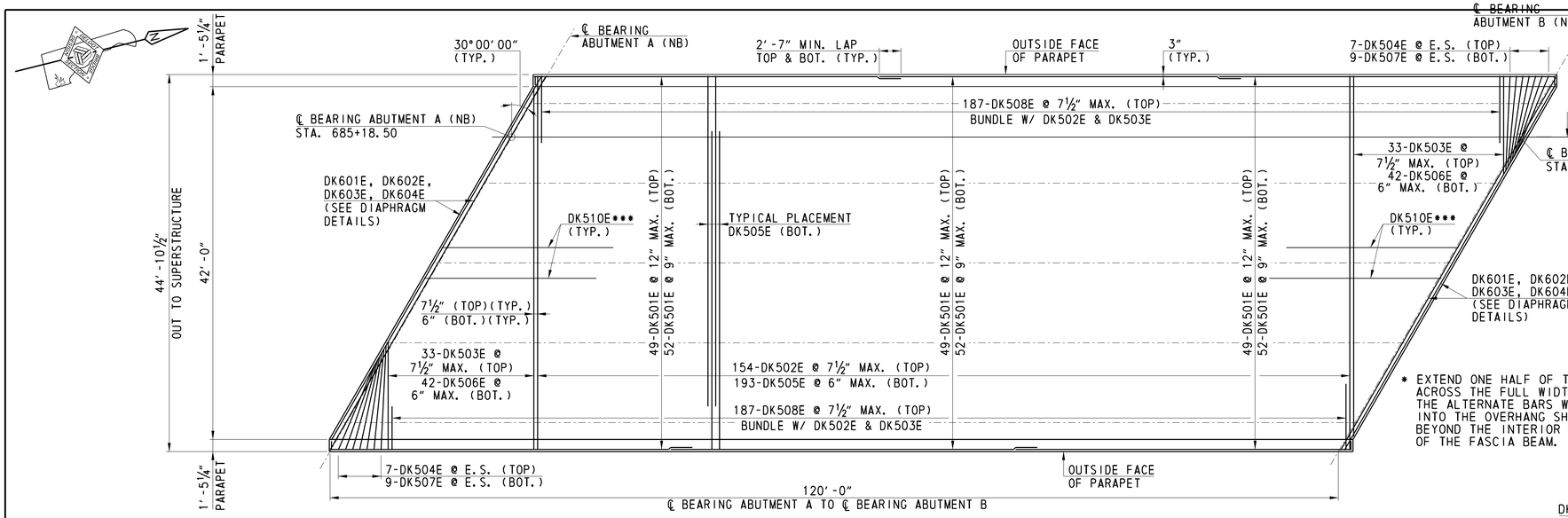
SCALE: AS NOTED

**US 301, SR 896 TO SR 1**

| | | | |
|---|---|---|---|
| CONTRACT | T200911308 | BRIDGE NO. | 1-466 N&S |
| COUNTY | NEW CASTLE | DESIGNED BY: ZAA | |
| | | CHECKED BY: BK | |

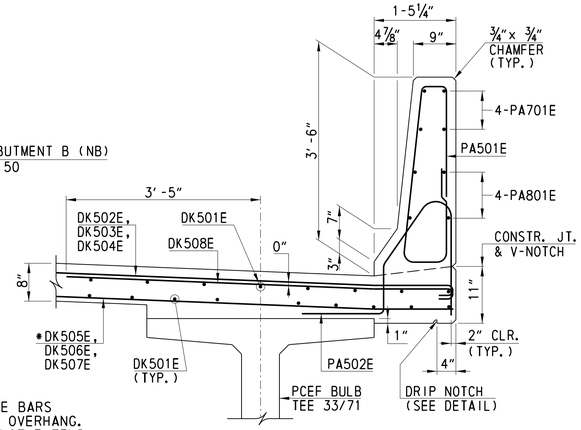
**BEAM ELEVATION AND SECTIONS**

| | |
|---|---|
| SHEET NO. | 561 |
| TOTAL SHTS. | 875 |




## 1-466N DECK PLAN

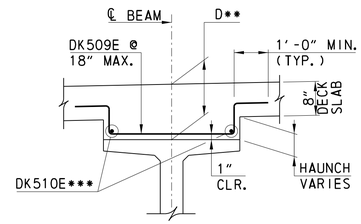
SCALE: ⅛"=1'-0"

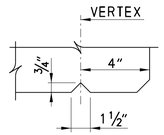



* EXTEND ONE HALF OF THE DK505E BARS ACROSS THE FULL WIDTH OF THE OVERHANG. THE ALTERNATE BARS WHICH DO NOT EXTEND INTO THE OVERHANG SHALL EXTEND 6" MIN. BEYOND THE INTERIOR EDGE OF THE FLANGE OF THE FASCIA BEAM.

## PARAPET DETAIL (NB)

SCALE: ¾"=1'-0"




## DRIP NOTCH DETAIL

NOT TO SCALE

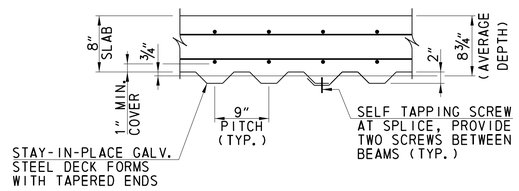
NOTES:
- DECK SLAB REINFORCEMENT NOT SHOWN FOR CLARITY.
- FIELD VERIFY ACTUAL HAUNCH DIMENSIONS.

** DECK THICKNESS @ ℄ OF BRG. AND ℄ OF BEAM, D = 1'-0⅜"

*** PLACE HAUNCH REINFORCEMENT AT BOTH ENDS OF BEAMS B6 THRU B10

## HAUNCH REINFORCEMENT

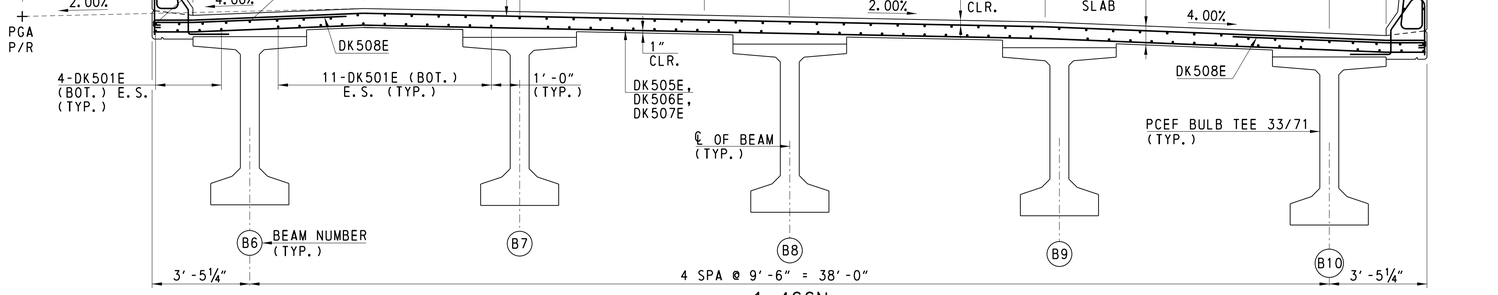
NOT TO SCALE




NOTES:
- SHOP DRAWINGS SHALL BE SUBMITTED FOR REVIEW AND APPROVAL BY THE ENGINEER. METAL FORMS MUST BE GALVANIZED, MORTAR TIGHT AND STEEL METAL SCREWS MUST BE NON-CORROSIVE. SELF TAPPING SCREWS SHALL BE INSTALLED AT THE SIDE LAP OF THE SHEETS AT MID-SPAN BETWEEN SUPPORTS. NO WELD WILL BE PERMITTED AT NEGATIVE MOMENT ZONE.
- FOR ADDITIONAL NOTES, SEE SHEET 20 OF 40.

## STAY-IN-PLACE FORM CONNECTION

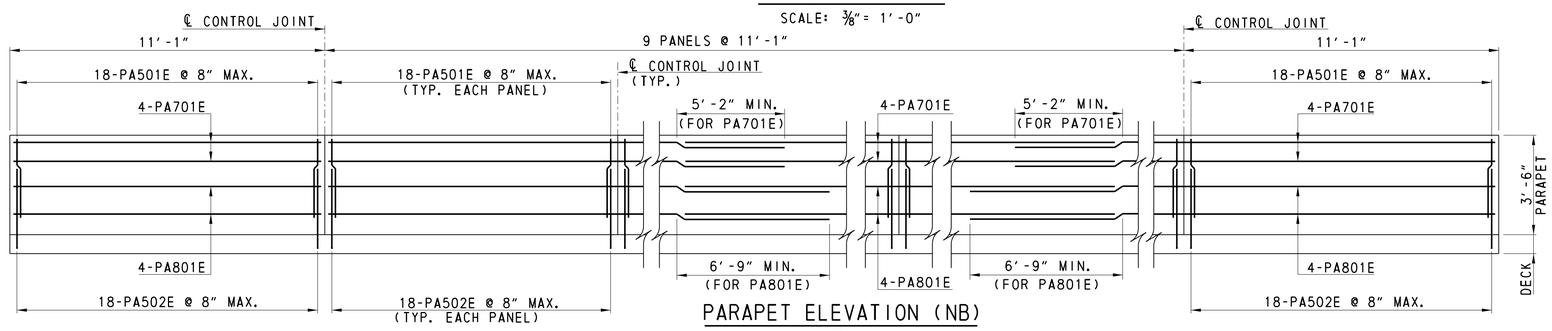
NOT TO SCALE




## 1-466N TYPICAL SECTION

SCALE: ⅜"= 1'-0"

NOTE:
1. DIAPHRAGMS NOT SHOWN FOR CLARITY.




## PARAPET ELEVATION (NB)

SCALE: ⅜"= 1'-0"

LEGEND:

| | | |
|---|---|---|
| CLR. | = | CLEAR |
| CONSTR. | = | CONSTRUCTION |
| BOT. | = | BOTTOM |
| BRG. | = | BEARING |
| E.S. | = | EQUAL SPACING |
| JT. | = | JOINT |
| MAX. | = | MAXIMUM |
| MIN. | = | MINIMUM |
| NB | = | NORTHBOUND |
| PGA | = | PROFILE GRADE APPLICATION |
| P/R | = | POINT OF ROTATION |
| SPA. | = | SPACE |
| TYP. | = | TYPICAL |

NOTES:
1. FOR DIAPHRAGM DETAILS, SEE SHEETS 23 AND 24 OF 40.
2. FOR REINFORCEMENT BAR LIST, SEE SHEETS 28 AND 29 OF 40.
3. SLIP FORMING FOR PARAPETS IS NOT PERMITTED.
4. POUR END AND INTERMEDIATE DIAPHRAGMS BEFORE POURING DECK.
5. FOR DECK PARAPET/ APPROACH SLAB PARAPET JOINT DETAILS, SEE SHEET 24 OF 40.
6. FOR PARAPET CONTROL JOINT DETAILS, SEE SHEET 4 OF 40.



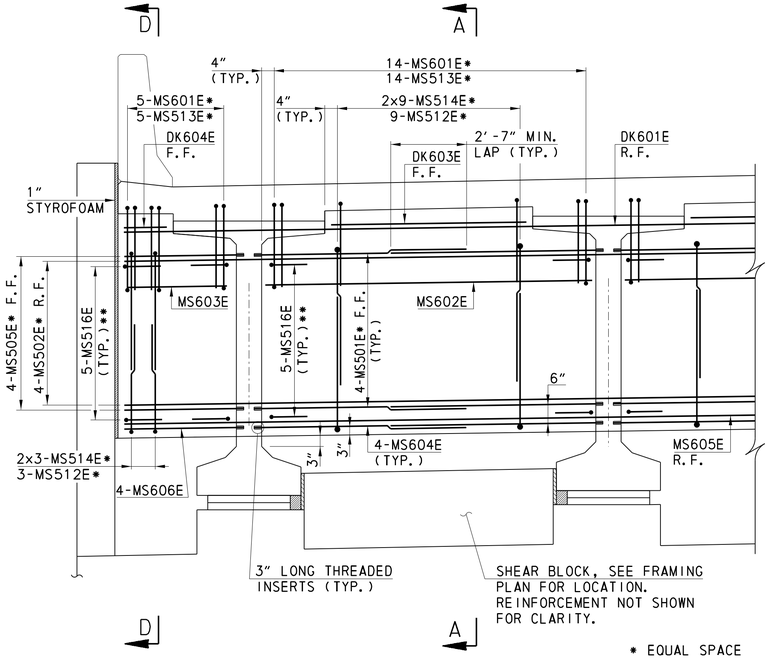
DELAWARE DEPARTMENT OF TRANSPORTATION

ADDENDUMS / REVISIONS

SCALE: AS NOTED

**US 301, SR 896 TO SR 1**

| | | | |
|---|---|---|---|
| CONTRACT T200911308 | BRIDGE NO. 1-466 N&S | DECK PLAN, SECTION AND DETAILS (NB) | SHEET NO. 562 |
| COUNTY NEW CASTLE | DESIGNED BY: BSW | | TOTAL SHTS. 875 |
| | CHECKED BY: BJH | | |

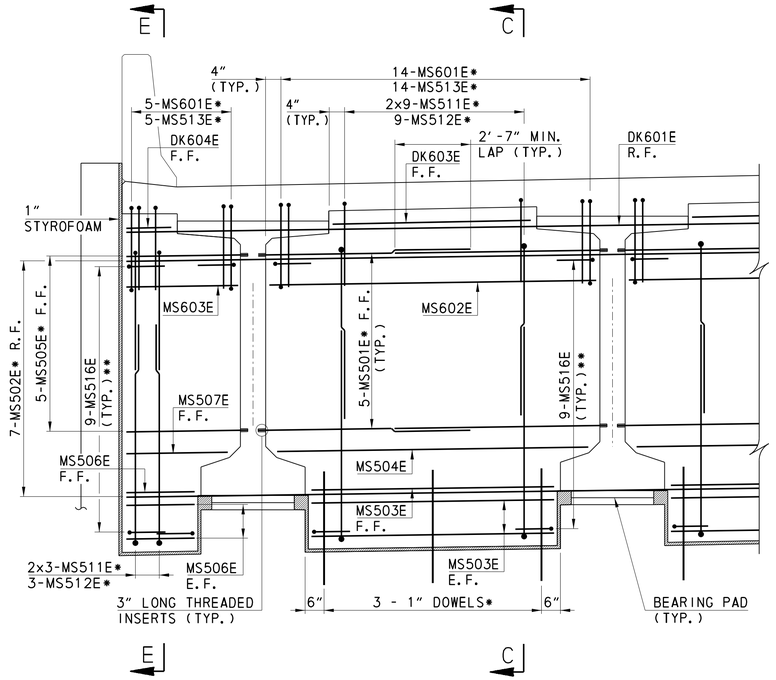



* EQUAL SPACE

** MATCH WITH LONGITUDINAL DIAPHRAGM BARS

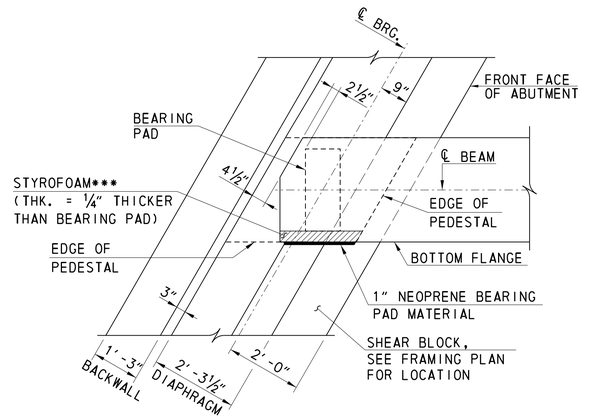
## END ABUTMENT A DIAPHRAGM ELEVATION (NB)

SCALE: ½"=1'-0"

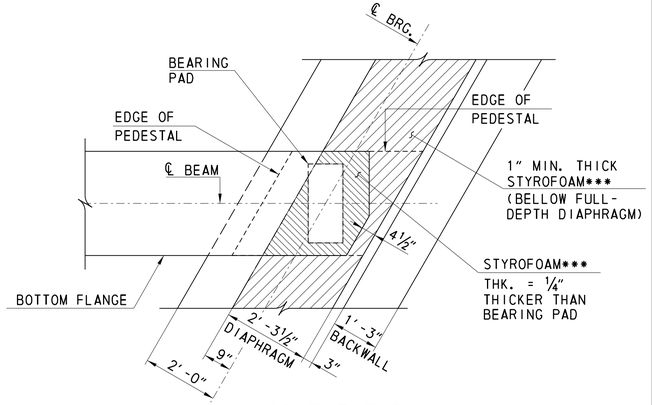



## END ABUTMENT B DIAPHRAGM ELEVATION (NB)

SCALE: ½"=1'-0"




## ABUTMENT A

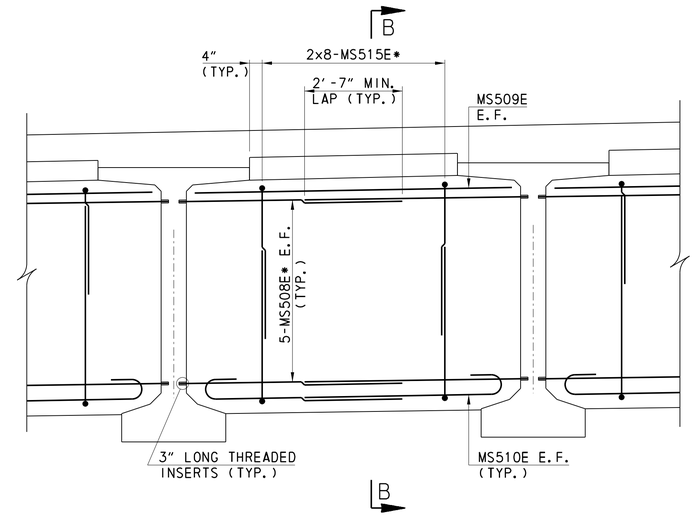



## ABUTMENT B

***STYROFOAM SHALL MEET ASTM C-578 TYPE 1 MATERIAL REQUIREMENTS, EXCEPT THE MAXIMUM ALLOWABLE WATER ABSORPTION SHALL BE 2%.

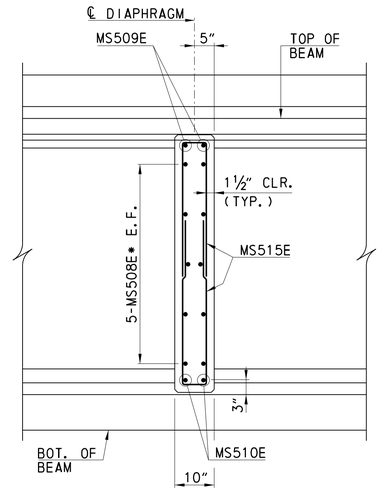
## WATERPROOFING LIMITS PLAN

SCALE: ½"=1'-0"



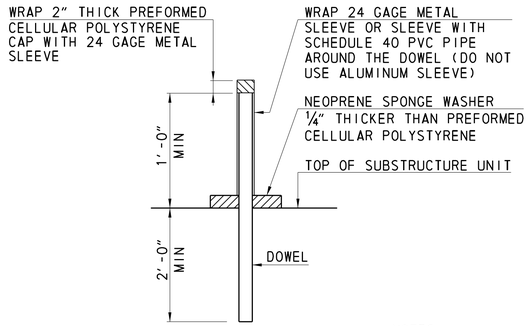

## INTERMEDIATE DIAPHRAGM ELEVATION (NB)

SCALE: ½"=1'-0"




## SECTION B-B

SCALE: ¾"=1'-0"




## DOWEL DETAIL

N.T.S.

NOTES:

1. FOR SECTIONS A-A, C-C, D-D, AND E-E, SEE SHEET 24 OF 40.
2. BITUMINOUS TAR PAPER OR SCHEDULE 40 P.V.C. PIPE ARE PERMITTED TO BE USED AS ALTERNATIVE BOND BREAKER MATERIALS IN LIEU OF THE METAL SLEEVE. OTHER BOND BREAKER MATERIALS MAY BE USED AROUND THE DOWEL ONLY WITH THE APPROVAL OF THE ENGINEER.
3. FOR SHEAR BLOCK DETAILS, SEE SHEET 7 OF 40.
4. FOR FRAMING PLAN, SEE SHEET 19 OF 40.
5. FOR BEARING PAD DETAILS, SEE SHEET 20 OF 40.
6. FOR BEAM DETAILS, SEE SHEET 21 OF 40.
7. FOR REINFORCEMENT BAR LIST, SEE SHEETS 28 AND 29 OF 40.
8. FOR LAYOUT OF DOWELS AND DOWEL REQUIREMENTS, SEE SHEET 9 OF 40.

LEGEND

| | | |
|---|---|---|
| BOT. | = | BOTTOM |
| CLR. | = | CLEAR |
| DIA. | = | DIAMETER |
| E.F. | = | EACH FACE |
| EQ. | = | EQUAL |
| F.F. | = | FRONT FACE |
| MIN. | = | MINIMUM |
| R.F. | = | REAR FACE |
| SPA | = | SPACING |
| THK. | = | THICKNESS |
| TYP. | = | TYPICAL |



BR1-466DPH-01

DELAWARE DEPARTMENT OF TRANSPORTATION

ADDENDUMS / REVISIONS

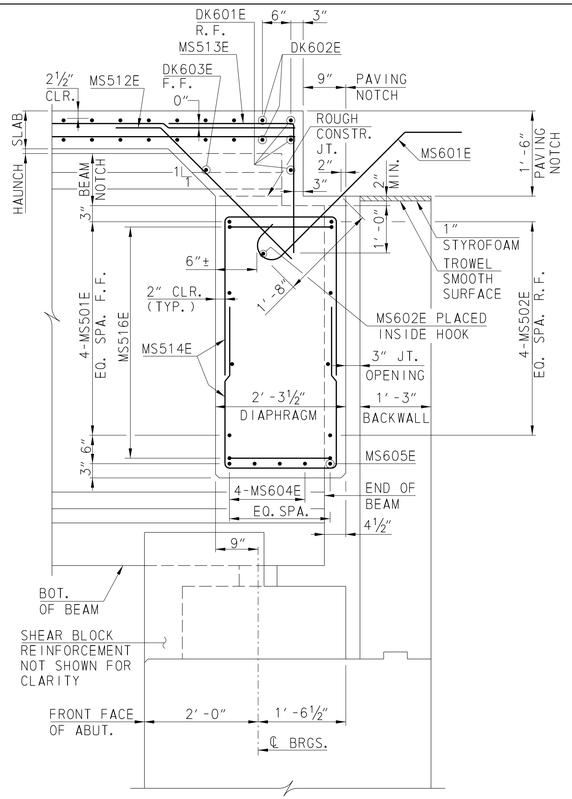
SCALE: AS NOTED

**US 301, SR 896 TO SR 1**

| | | | |
|---|---|---|---|
| CONTRACT | T200911308 | BRIDGE NO. | 1-466 N&S |
| COUNTY | NEW CASTLE | DESIGNED BY: MDM/ZAA | |
| | | CHECKED BY: BJH | |

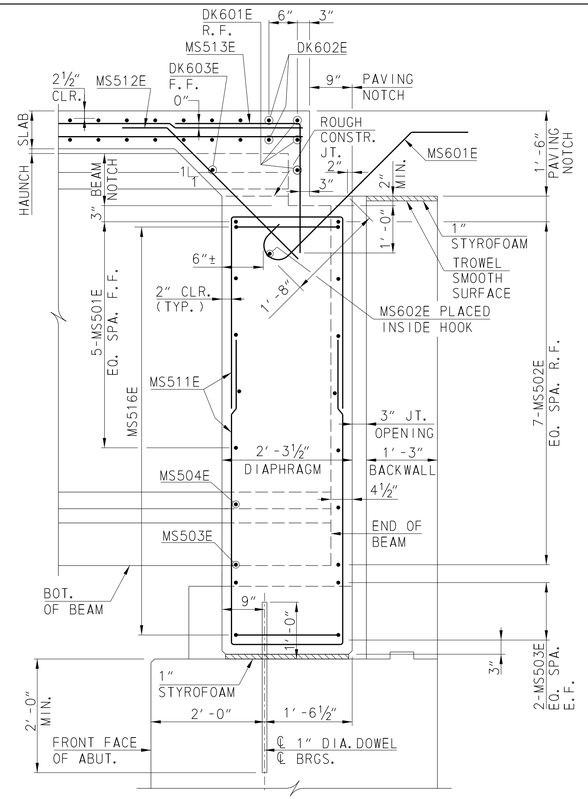
**DIAPHRAGM DETAILS – 1 (NB)**

| | |
|---|---|
| SHEET NO. | 563 |
| TOTAL SHTS. | 875 |



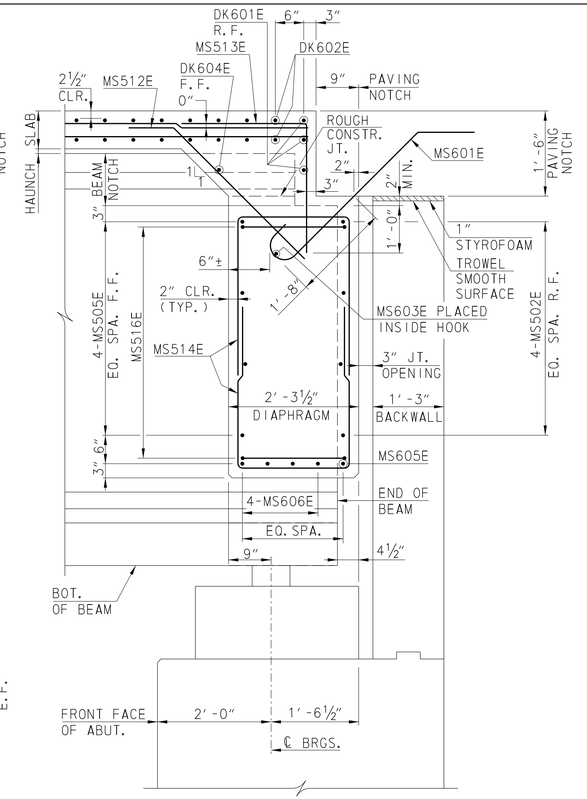

## SECTION A-A

SCALE: ¾"=1'-0"



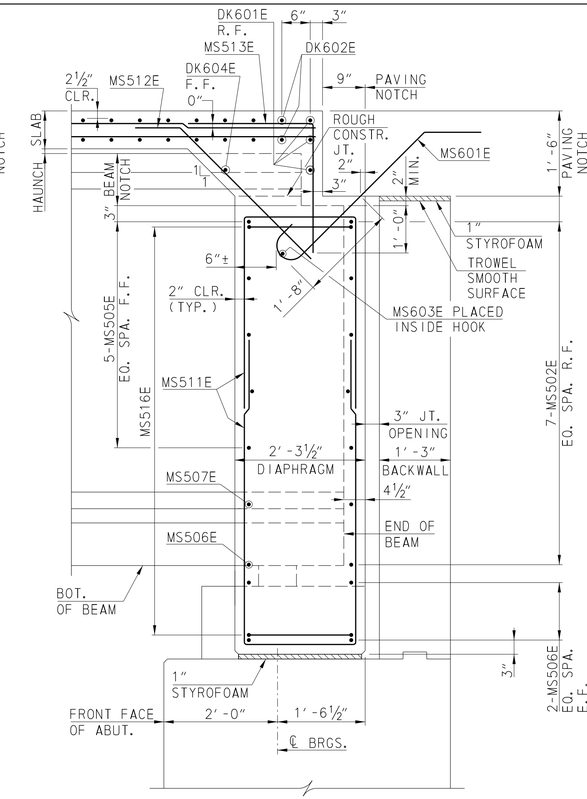

## SECTION C-C

SCALE: ¾"=1'-0"



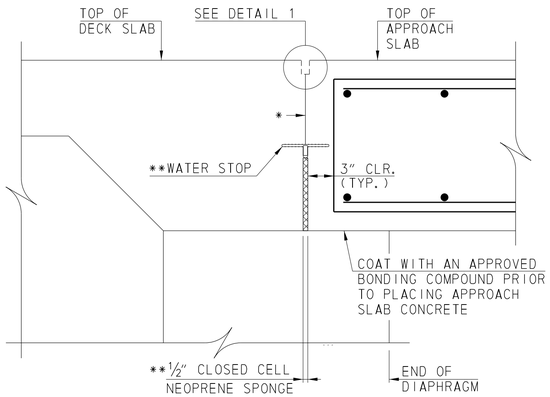

## SECTION D-D

SCALE: ¾"=1'-0"




## SECTION E-E

SCALE: ¾"=1'-0"

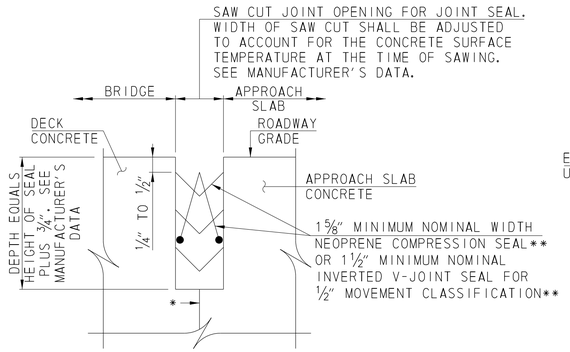



* COAT WITH PARAFIN OR ASPHALT BOND BREAKER PRIOR TO PLACING APPROACH SLAB CONCRETE

** INCIDENTAL TO APPROACH SLAB CONCRETE

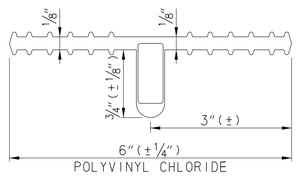
## APPROACH SLAB JOINT DETAIL

NOT TO SCALE




## DETAIL 1

NOT TO SCALE

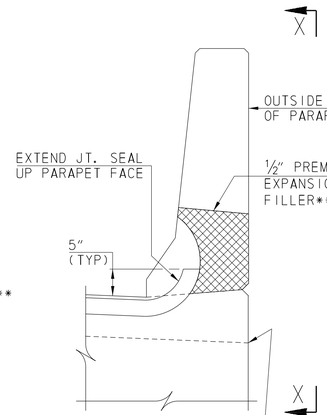



## WATERSTOP DETAIL

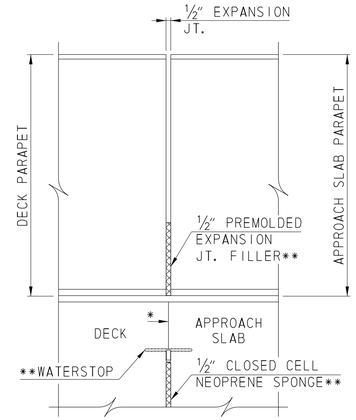
NOT TO SCALE

LEGEND

| | | |
|---|---|---|
| ABUT. | = | ABUTMENT |
| BOT. | = | BOTTOM |
| BRG. | = | BEARING |
| CLR. | = | CLEAR |
| CONSTR. | = | CONSTRUCTION |
| DIA. | = | DIAMETER |
| EQ. | = | EQUAL |
| JT. | = | JOINT |
| MIN. | = | MINIMUM |
| R.F. | = | REAR FACE |
| SPA. | = | SPACING |
| TYP. | = | TYPICAL |




## ELEVATION




## SECTION X-X

## JOINT SEAL AND WATERSTOP TERMINATION DETAIL

NOT TO SCALE

JOINT PREPARATION NOTES:

1. THE JOINT OPENING IS TO BE FORMED BY A TWO-STAGE SAWING OPERATION WHERE ACCESSIBLE AND FORMED ELSEWHERE. THE FIRST SAW CUT IS DESIGNED TO CONTROL CRACKING. THE SECOND SAW CUT IS MADE USING A DOUBLE-BLADED WATER-COOLED SAW CAPABLE OF HOLDING A TOLERANCE OF ±1/16" TO CREATE THE PROPER OPENING FOR THE PREFORMED NEOPRENE COMPRESSION SEAL OR INVERTED V-JOINT SEAL.
2. WATER BLAST OPENING IMMEDIATELY FOLLOWING SAW CUTTING OPERATION TO REMOVE ANY RESIDUAL SLURRY BEFORE IT DRIES.
3. THE DEPTH OF THE SEAL OPENING EQUALS THE HEIGHT OF THE SEAL PLUS ¾". THE WIDTH OF THE SECOND SAW CUT SHALL BE ADJUSTED TO ACCOUNT FOR THE CONCRETE SURFACE TEMPERATURE AT THE TIME OF SAWING, SEE MANUFACTURE'S PRODUCT INFORMATION.
4. BEFORE INSTALLING THE SEAL, ABRASIVE BLAST THE BONDING SURFACES TO THOROUGHLY CLEAN THE JOINT OPENING AND REMOVE FOREIGN MATERIAL, INCLUDING BROKEN CONCRETE. USE WATER AND OIL FREE COMPRESSED AIR TO BLOW OUT RESIDUE FROM THE SEAL GROOVE OPENING.
5. PREPARE BONDING SURFACES AND INSTALL JOINT SEAL IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
6. DO NOT EXCEED 3% ELONGATION OF SEAL, IF STRETCHING OCCURS.

NOTES:

1. FOR LOCATION OF SECTIONS A-A, C-C, D-D AND E-E, SEE SHEET 23 OF 40.
2. FOR DECK DETAILS, SEE SHEET 22 OF 40.
3. FOR REINFORCEMENT BAR LIST, SEE SHEETS 28 AND 29 OF 40.
4. FOR APPROACH SLAB DETAILS, SEE SHEETS 25 AND 26 OF 40.
5. FOR DOWEL DETAIL, SEE SHEET 23 OF 40.



**DELAWARE DEPARTMENT OF TRANSPORTATION**

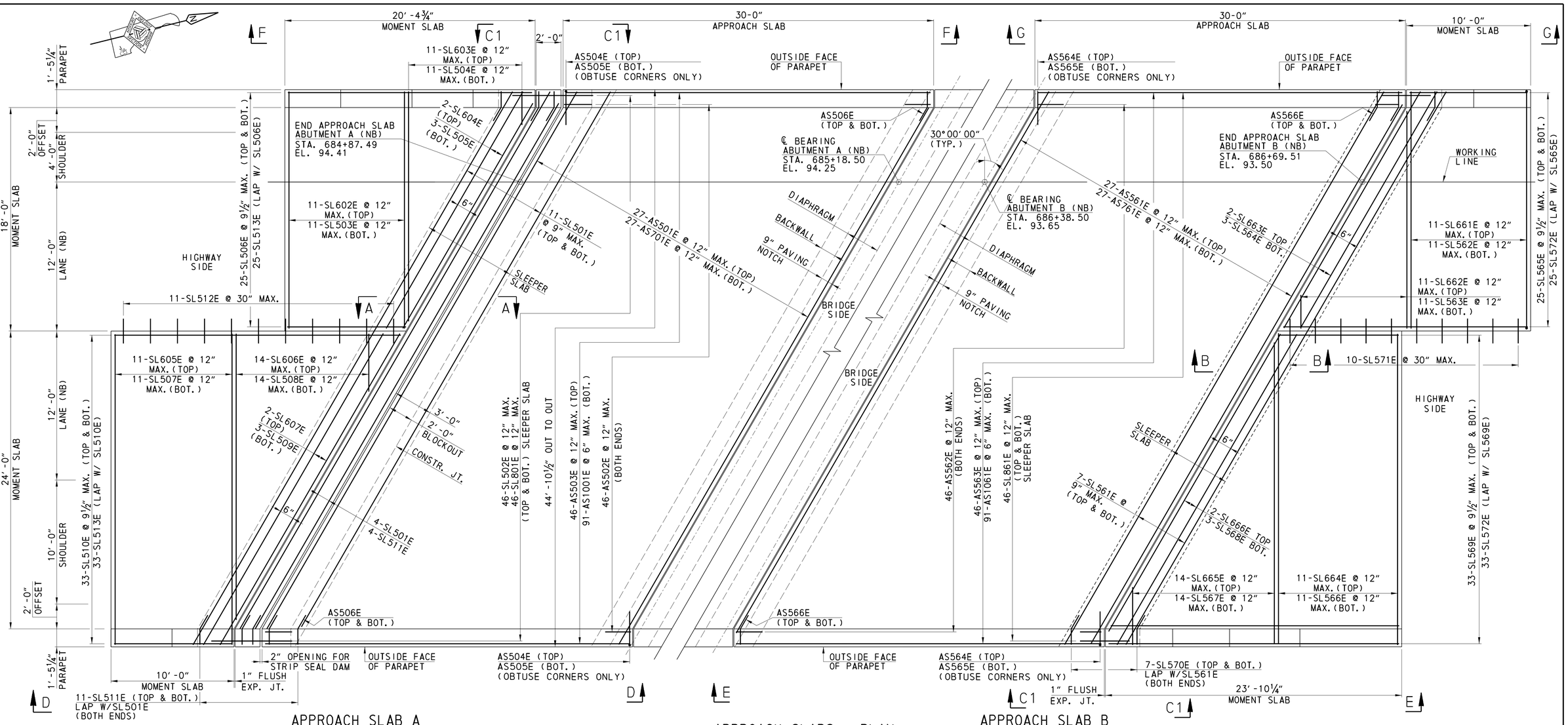
ADDENDUMS / REVISIONS

SCALE: AS NOTED

**US 301, SR 896 TO SR 1**

| | | | |
|---|---|---|---|
| CONTRACT T200911308 | BRIDGE NO. | 1-466 N&S | SHEET NO. 564 |
| COUNTY NEW CASTLE | DESIGNED BY: MDM/ZAA | | TOTAL SHTS. 875 |
| | CHECKED BY: BJH | | |

**DIAPHRAGM DETAILS – 2 (NB)**

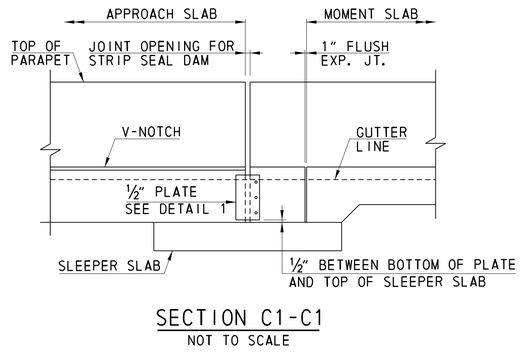



## APPROACH SLAB A

## APPROACH SLABS - PLAN (NB)

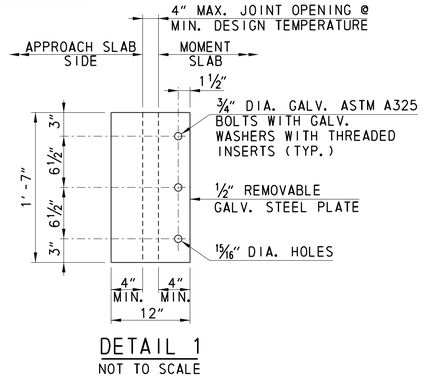
SCALE: ¼"=1'-0"

## APPROACH SLAB B




## SECTION C1-C1

NOT TO SCALE




## DETAIL 1

NOT TO SCALE

### APPROACH SLAB NOTES

- PROVIDE CLASS D CONCRETE IN APPROACH SLAB, HEADER SLAB, SLEEPER SLAB AND MOMENT SLAB.
- PROVIDE CLASS A CONCRETE IN PARAPETS.
- A HIGHER CLASS OF CONCRETE MAY BE SUBSTITUTED FOR A LOWER CLASS OF CONCRETE AT NO ADDITIONAL COST TO THE DEPARTMENT.
- PLACE APPROACH SLAB CONCRETE WITH A MOTORIZED, MECHANICAL FINISHING MACHINE.
- PLACE CONCRETE IN ONE CONTINUOUS OPERATION, UNLESS OTHERWISE INDICATED OR DIRECTED.
- LONGITUDINAL KEYED CONSTRUCTION JOINTS ARE PERMITTED IN THE APPROACH SLAB BETWEEN THE SHOULDER AND THE LANE LINE.
- CONSTRUCT BRIDGE APPROACH SLAB AFTER THE BRIDGE DECK SLAB IS CONSTRUCTED.
- PROVIDE GRADE 60 DEFORMED REINFORCING BARS THAT MEET THE REQUIREMENTS OF AASHTO M31.
- EPOXY COAT ALL REINFORCEMENT BARS.

### NOTES:

1. FOR SECTIONS A-A AND B-B, SEE SHEET 26 OF 40.
2. FOR SECTIONS D-D, E-E, F-F AND G-G, SEE SHEET 27 OF 40.
3. FOR REINFORCEMENT BAR LIST, SEE SHEET 29 OF 40.
4. FOR APPROACH SLAB JOINT DETAILS AT END OF BRIDGE DECK, SEE SHEET 24 OF 40.
5. FOR TYPICAL APPROACH SLAB SECTIONS, SEE SHEET 26 OF 40.
6. PAYMENT FOR GALVANIZED STEEL PLATE AND HARDWARE SHALL BE INCIDENTAL TO APPROACH SLAB CONSTRUCTION.

### LEGEND

| | | | | | |
|---|---|---|---|---|---|
| BOT. | = | BOTTOM | MAX. | = | MAXIMUM |
| GALV. | = | GALVANIZED | MIN. | = | MINIMUM |
| CONSTR. | = | CONSTRUCTION | NB | = | NORTHBOUND |
| DIA. | = | DIAMETER | STA. | = | STATION |
| EL. | = | ELEVATION | TYP. | = | TYPICAL |
| EXP. | = | EXPANSION | W/ | = | WITH |
| JT. | = | JOINT | | | |



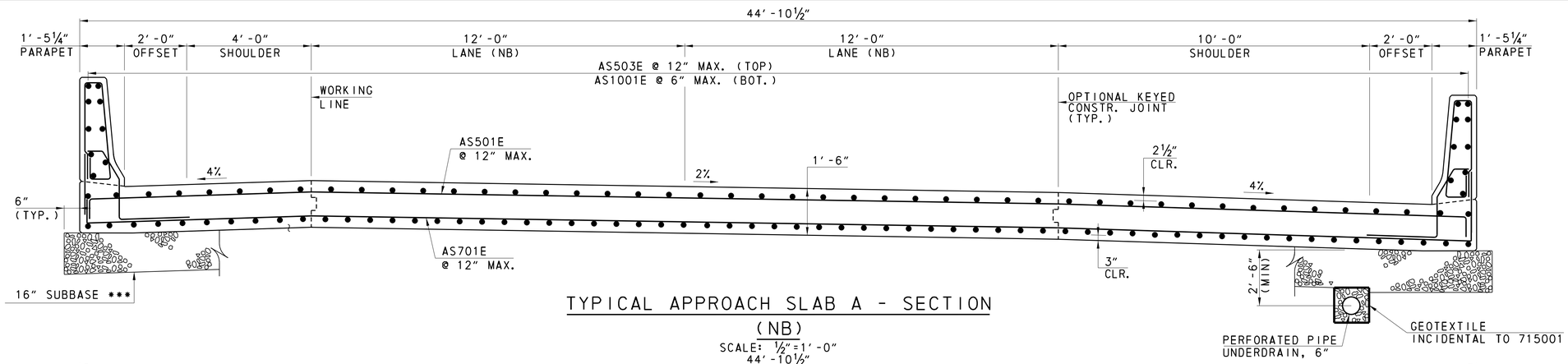
**DELAWARE DEPARTMENT OF TRANSPORTATION**

ADDENDUMS / REVISIONS

SCALE: AS NOTED

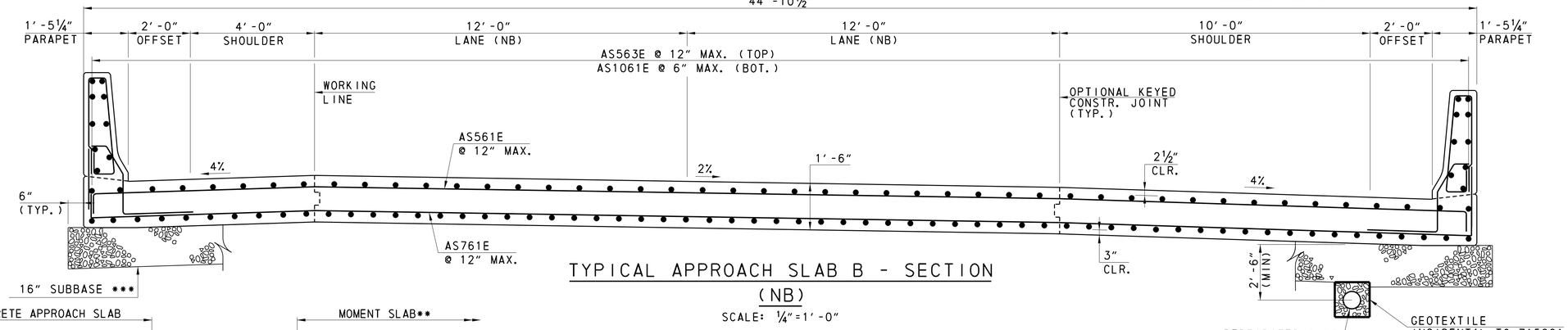
**US 301, SR 896 TO SR 1**

| | | | |
|---|---|---|---|
| CONTRACT T200911308 | BRIDGE NO. 1-466 N&S | **APPROACH SLAB - 1 (NB)** | SHEET NO. 565 |
| COUNTY NEW CASTLE | DESIGNED BY: AKW | | TOTAL SHTS. 875 |
| | CHECKED BY: MDM | | |



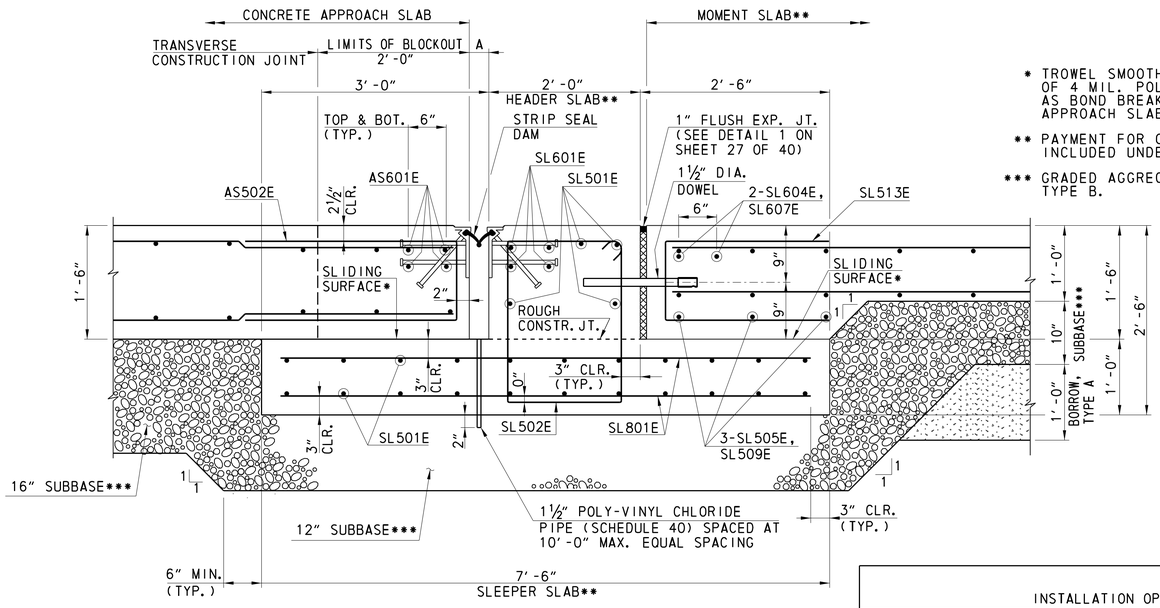

## TYPICAL APPROACH SLAB A - SECTION (NB)

SCALE: ½″=1′-0″




## TYPICAL APPROACH SLAB B - SECTION (NB)

SCALE: ¼″=1′-0″




## SECTION A-A

SCALE: ¾″=1′-0″

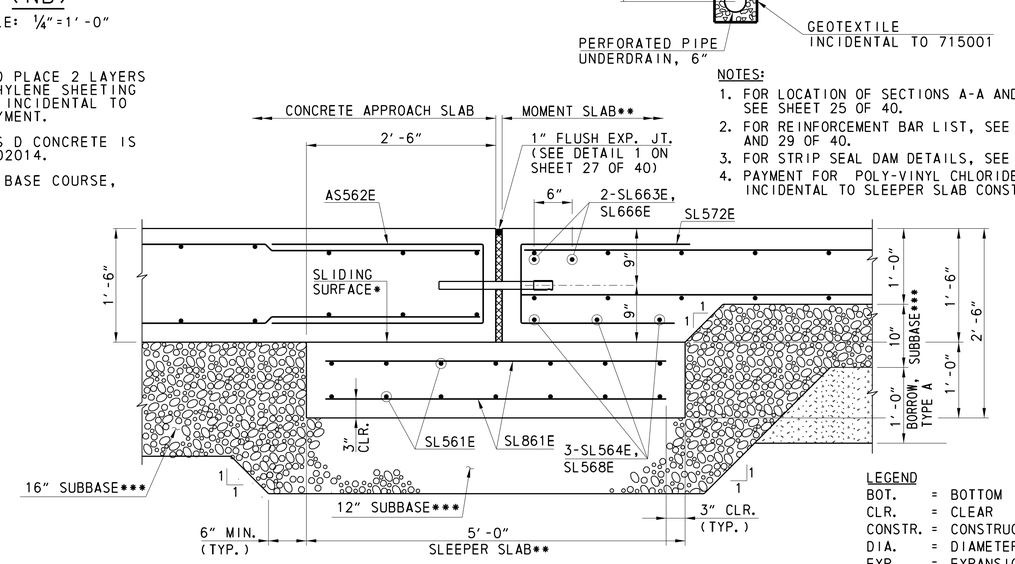
* TROWEL SMOOTH AND PLACE 2 LAYERS OF 4 MIL. POLYETHYLENE SHEETING AS BOND BREAKER. INCIDENTAL TO APPROACH SLAB PAYMENT.

** PAYMENT FOR CLASS D CONCRETE IS INCLUDED UNDER 602014.

*** GRADED AGGREGATE BASE COURSE, TYPE B.

TABLE - 1
INSTALLATION OPENING "A" @ VARIOUS TEMPERATURES

| TEMPERATURE (°F) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10 | 20 | 30 | 32 | 40 | 50 | 60 | 68 | 70 | 80 | 90 | 100 |
| 0′-2⅝″ | 0′-2½″ | 0′-2⅛″ | 0′-2⅜″ | 0′-2⅛″ | 0′-2⅛″ | 0′-2⅛″ | 0′-2″ | 0′-1⅝″ | 0′-1⅞″ | 0′-1¾″ | 0′-1⅛″ |




## SECTION B-B

SCALE: ¾″=1′-0″

NOTES:
1. FOR LOCATION OF SECTIONS A-A AND B-B, SEE SHEET 25 OF 40.
2. FOR REINFORCEMENT BAR LIST, SEE SHEETS 28 AND 29 OF 40.
3. FOR STRIP SEAL DAM DETAILS, SEE SHEET 38 OF 40.
4. PAYMENT FOR POLY-VINYL CHLORIDE PIPE SHALL BE INCIDENTAL TO SLEEPER SLAB CONSTRUCTION.

LEGEND

| | | |
|---|---|---|
| BOT. | = | BOTTOM |
| CLR. | = | CLEAR |
| CONSTR. | = | CONSTRUCTION |
| DIA. | = | DIAMETER |
| EXP. | = | EXPANSION |
| JT. | = | JOINT |
| MAX. | = | MAXIMUM |
| MIN. | = | MINIMUM |
| NB | = | NORTHBOUND |
| TYP. | = | TYPICAL |



DELAWARE DEPARTMENT OF TRANSPORTATION

ADDENDUMS / REVISIONS

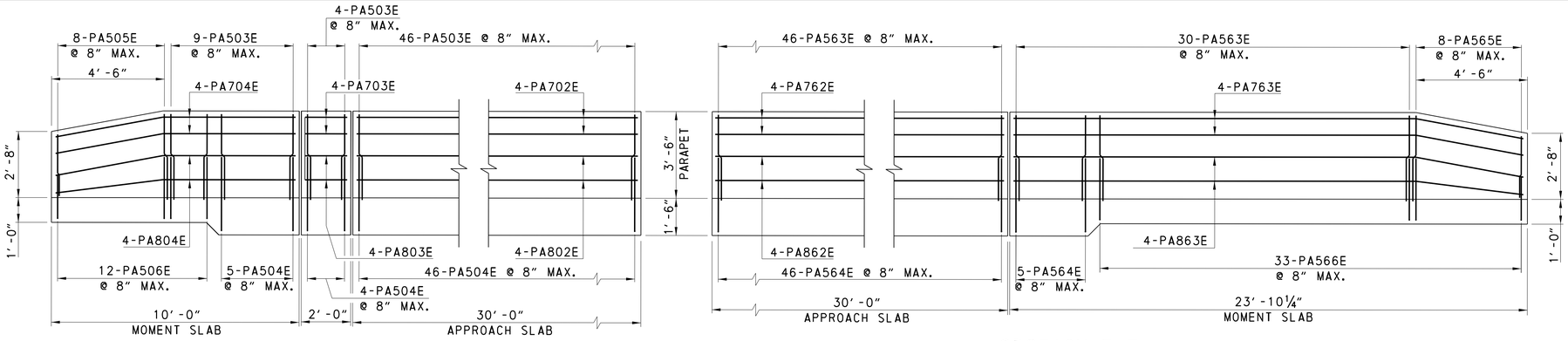
SCALE: AS NOTED

US 301, SR 896 TO SR 1

CONTRACT T200911308
COUNTY NEW CASTLE
BRIDGE NO. 1-466 N&S
DESIGNED BY: AKW
CHECKED BY: MDM

APPROACH SLAB - 2 (NB)

SHEET NO. 566
TOTAL SHTS. 875

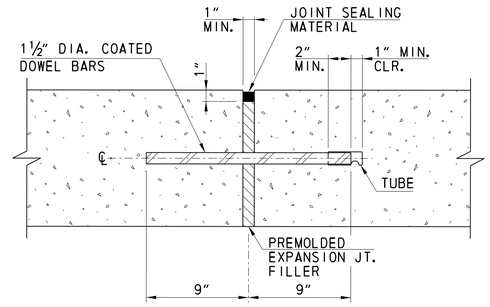



## SECTION D-D

## SECTION E-E

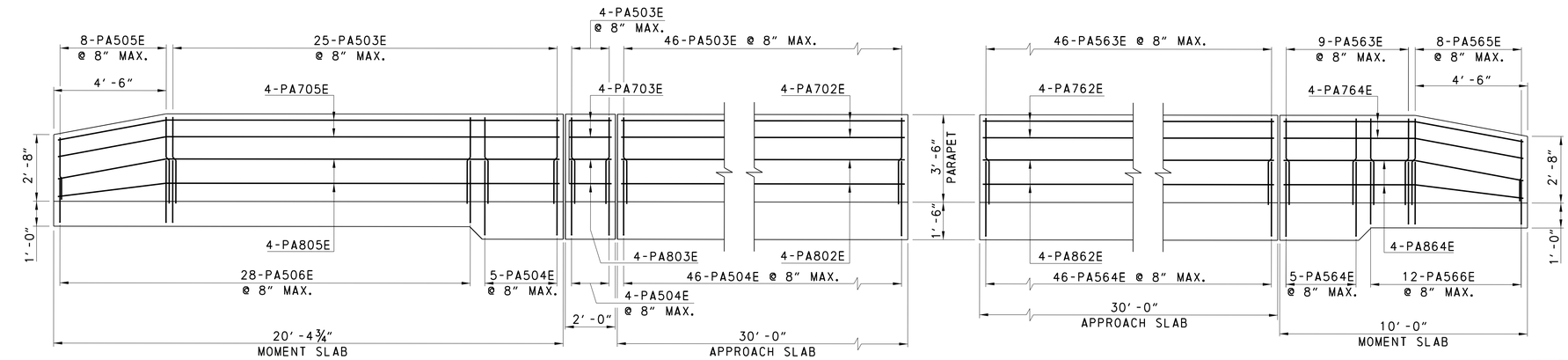
## PARAPET ELEVATION

SCALE: ⅜" = 1'-0"



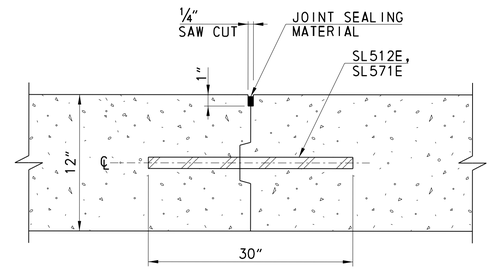

## DETAIL 1

NOT TO SCALE



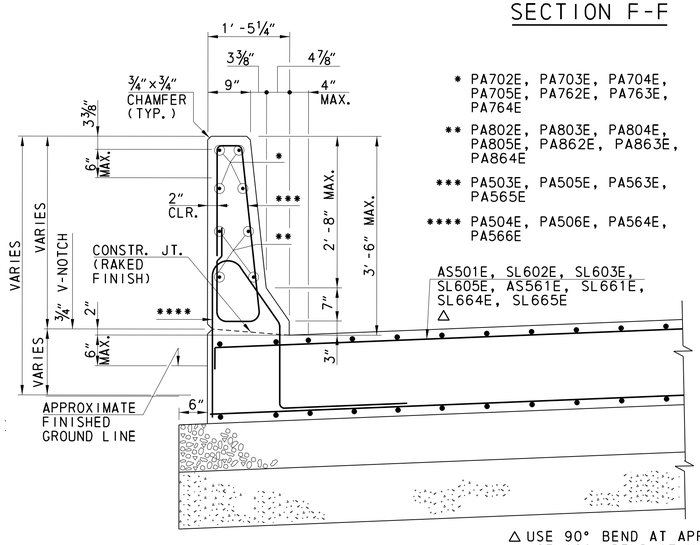

## SECTION F-F

## SECTION G-G




## DETAIL 2

NOT TO SCALE



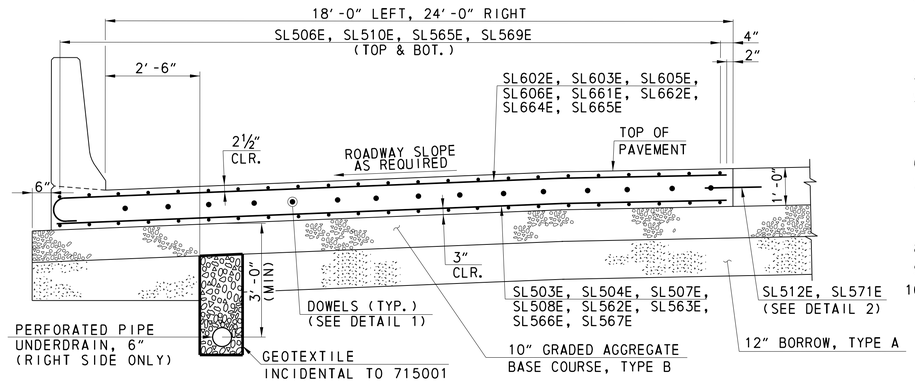

△ USE 90° BEND AT APPROACH SLABS.
USE 180° BEND AT MOMENT SLABS.

## PARAPET DETAIL

SCALE: ¾" = 1'-0"

## PARAPET ELEVATION

SCALE: ⅜" = 1'-0"




## MOMENT SLAB (AT GRADE) WITH TYPICAL C.I.P. BARRIER

SCALE: ½" = 1'-0"

NOTES:

1. PROVIDE DOWELS AT EXPANSION JOINTS.
2. PLACE A TUBE FROM AN APPROVED MANUFACTURER OVER THE LUBRICATED END OF ALL DOWEL BARS AND PROVIDE A MINIMUM 1" CLEARANCE POCKET ASSURED BY MEANS OF A POSITIVE SPACING DEVICE.
3. CUT EXPANSION JOINT FILLER MATERIAL TO CONFORM TO CROSS SECTION OF THE PAVEMENT AND FURNISH IN STRIPS EQUAL TO THE WIDTH OF THE PAVEMENT SLAB. MAKE THE TOP SURFACE SMOOTH AND HAVE HOLES PUNCHED FOR THE DOWEL BARS. PROVIDE A SNUG FIT WITHOUT LOSS IN THICKNESS OF THE MATERIAL. PAYMENT SHALL BE INCIDENTAL TO APPROACH SLAB CONSTRUCTION.
4. CONSTRUCT ALL TRANSVERSE JOINTS PERPENDICULAR TO THE CENTERLINE.
5. USE 1½" DIA. x 18" LONG DOWEL BARS. APPROVED ALTERNATE DOWEL BARS HAVING EQUIVALENT PROPERTIES TO CONVENTIONAL ROUND DOWEL BARS MAY BE USED. COATED DOWEL BARS SHALL CONFORM TO DELDOT STANDARD SPECIFICATION 824.02 (g). PAYMENT SHALL BE INCIDENTAL TO APPROACH SLAB CONSTRUCTION.
6. PLACE DOWEL BARS PARALLEL TO THE CENTERLINE AND SURFACE OF THE SLAB.
7. MAKE THE TOP OF THE JOINT SEALING MATERIAL FROM ⅛" TO ¼" BELOW THE SURFACE OF THE PAVEMENT. USE HEAT RESISTANT JOINT BACKING MATERIAL FOR HOT POURED JOINTS. PAYMENT SHALL BE INCIDENTAL TO APPROACH SLAB AND MOMENT SLAB CONSTRUCTION.
8. FOR REINFORCEMENT BAR LIST, SEE SHEETS 28 AND 29 OF 40.
9. SLIP FORMING FOR PARAPETS IS NOT PERMITTED.
10. FOR LOCATION OF SECTIONS D-D, E-E, F-F AND G-G, SEE SHEET 25 OF 40.

LEGEND

| | | |
|---|---|---|
| BOT. | = | BOTTOM |
| C.I.P. | = | CAST-IN-PLACE |
| CLR. | = | CLEAR |
| DIA. | = | DIAMETER |
| JT. | = | JOINT |
| MAX. | = | MAXIMUM |
| MIN. | = | MINIMUM |
| NB | = | NORTHBOUND |
| TYP. | = | TYPICAL |



DELAWARE
DEPARTMENT OF TRANSPORTATION

ADDENDUMS / REVISIONS

SCALE: AS NOTED

**US 301,**
**SR 896 TO SR 1**

CONTRACT T200911308
COUNTY NEW CASTLE
BRIDGE NO. 1-466 N&S
DESIGNED BY: AKW
CHECKED BY: MDM

**APPROACH SLAB - 3 (NB)**

SHEET NO. 567
TOTAL SHTS. 875

(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) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| QTY. | SIZE | LENGTH | MARK | TYPE | A | B | C | D | E | F/R | G | H | J | K | O |
| **DECK, DIAPHRAGM, BRIDGE PARAPET (NB)** | | | | | | | | | | | | | | | |
| 303 | 5 | 42-3Ø | DK501E | STR | | 42-3Ø | | | | | | | | | |
| 154 | 5 | 45-8½ | DK502E | 1 | 0-7Ø | 44-6½ | | | | | 0-7Ø | | 0-5Ø | | |
| 2X33 | 5 | 9-5Ø | DK503E | 1 | 0-Ø0 | 8-1Ø0 | | | | | 0-7Ø | | 0-5Ø | | |
| | | TO 44-3Ø | | | TO 0-Ø0 | TO 43-8Ø | | | | | TO 0-7Ø | | TO 0-5Ø | | |
| 2X7 | 5 | 3-1Ø | DK504E | 1 | 0-Ø0 | 2-6Ø | | | | | 0-7Ø | | 0-5Ø | | |
| | | TO 8-4Ø | | | TO 0-Ø0 | TO 7-9Ø | | | | | TO 0-7Ø | | TO 0-5Ø | | |
| 193 | 5 | 39-1Ø0 | DK505E | STR | | 39-1Ø0 | | | | | | | | | |
| 2X42 | 5 | 8-8Ø | DK506E | STR | | 8-8Ø | | | | | | | | | |
| | | TO 43-1Ø2 | | | | TO 43-1Ø2 | | | | | | | | | |
| 2X9 | 5 | 2-6Ø | DK507E | STR | | 2-6Ø | | | | | | | | | |
| | | TO 7-1Ø0 | | | | TO 7-1Ø0 | | | | | | | | | |
| 374 | 5 | 7-4Ø | DK508E | 1 | 0-Ø0 | 6-9Ø | | | | | 0-7Ø | | 0-5Ø | | |
| 150 | 5 | 6-8½ | DK509E | S4 | 1-Ø0 | 0-61 | 3-8Ø | 0-61 | | | 1-Ø0 | | | | |
| 2Ø | 5 | 2Ø-Ø0 | DK51ØE | STR | | 2Ø-Ø0 | | | | | | | | | |
| 6 | 6 | 49-9Ø | DK6Ø1E | STR | | 49-9Ø | | | | | | | | | |
| 4 | 6 | 51-5Ø | DK6Ø2E | STR | | 51-5Ø | | | | | | | | | |
| 8 | 6 | 5-11½ | DK6Ø3E | STR | | 5-11½ | | | | | | | | | |
| 4 | 6 | 1-31 | DK6Ø4E | STR | | 1-31 | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| 72 | 5 | 6-8Ø | MS5Ø1E | STR | | 6-8Ø | | | | | | | | | |
| 11 | 5 | 51-52 | MS5Ø2E | STR | | 51-52 | | | | | | | | | |
| 2Ø | 5 | 7-3Ø | MS5Ø3E | STR | | 7-3Ø | | | | | | | | | |
| 4 | 5 | 9-12 | MS5Ø4E | STR | | 9-12 | | | | | | | | | |
| 36 | 5 | 3-72 | MS5Ø5E | STR | | 3-72 | | | | | | | | | |
| 1Ø | 5 | 1-111 | MS5Ø6E | STR | | 1-111 | | | | | | | | | |
| 2 | 5 | 2-1Ø3 | MS5Ø7E | STR | | 2-1Ø3 | | | | | | | | | |
| 8Ø | 5 | 6-ØØ | MS5Ø8E | STR | | 6-ØØ | | | | | | | | | |
| 8 | 5 | 8-2Ø | MS5Ø9E | STR | | 8-2Ø | | | | | | | | | |
| 16 | 5 | 5-1ØØ | MS51ØE | 1 | 0-ØØ | 5-3Ø | | | | | 0-7Ø | | 0-5Ø | | |
| 84 | 5 | 1Ø-11½ | MS511E | 17 | | 4-6Ø | 1-11½ | 4-6Ø | | | | | | | |
| 84 | 5 | 4-9Ø | MS512E | 16 | 0-ØØ | 0-ØØ | 1-3Ø | 3-6Ø | | | | 2-5½ | | 2-5½ | 3-8½ |
| 132 | 5 | 5-ØØ | MS513E | 17 | | 2-6Ø | 2-6Ø | 0-ØØ | | | | | | | |
| 84 | 5 | 6-5½ | MS514E | 17 | | 2-3Ø | 1-11½ | 2-3Ø | | | | | | | |
| 64 | 5 | 6-3Ø | MS515E | 17 | | 2-1ØØ | 0-7Ø | 2-1ØØ | | | | | | | |
| 14Ø | 5 | 3-1Ø1 | MS516E | 17 | | 1-ØØ | 1-1Ø1 | 1-ØØ | | | | | | | |
| 132 | 6 | 5-2Ø | MS6Ø1E | 31 | | 1-ØØ | 3-6Ø | | | | 0-8Ø | 0-91 | 0-6Ø | 0-73 | |
| 8 | 6 | 9-11Ø | MS6Ø2E | STR | | 9-11Ø | | | | | | | | | |
| 4 | 6 | 3-5Ø | MS6Ø3E | STR | | 3-5Ø | | | | | | | | | |

| SPECIFICATIONS | | | | | BENDING DIMENSIONS (FEET–INCHES /QUARTER INCH) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| QTY. | SIZE | LENGTH | MARK | TYPE | A | B | C | D | E | F/R | G | H | J | K | O |
| 32 | 6 | 6-8Ø | MS6Ø4E | STR | | 6-8Ø | | | | | | | | | |
| 1 | 6 | 51-52 | MS6Ø5E | STR | | 51-52 | | | | | | | | | |
| 8 | 6 | 3-72 | MS6Ø6E | STR | | 3-72 | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| 396 | 5 | 7-72 | PA5Ø1E | 28 | | 2-91 | 0-12 | 2-92 | | | | | | | |
| 396 | 5 | 5-22 | PA5Ø2E | 29 | | 0-63 | 1-72 | | | | | | | | |
| 24 | 7 | 44-ØØ | PA7Ø1E | STR | | 44-ØØ | | | | | | | | | |
| 24 | 8 | 45-1Ø | PA8Ø1E | STR | | 45-1Ø | | | | | | | | | |

| SPECIFICATIONS | | | | | BENDING DIMENSIONS (FEET–INCHES /QUARTER INCH) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| QTY. | SIZE | LENGTH | MARK | TYPE | A | B | C | D | E | F/R | G | H | J | K | O |

## ASTM STANDARD ENGLISH REINFORCING BARS

| BAR SIZE | NOMINAL DIMENSIONS: DIAMETER (INCHES) | NOMINAL DIMENSIONS: AREA (INCHES²) | NOMINAL DIMENSIONS: WEIGHT (LBS./FT.) |
|---|---|---|---|
| 3 | 0.375 | 0.110 | 0.376 |
| 4 | 0.500 | 0.200 | 0.668 |
| 5 | 0.625 | 0.310 | 1.043 |
| 6 | 0.750 | 0.440 | 1.502 |
| 7 | 0.875 | 0.600 | 2.044 |
| 8 | 1.000 | 0.790 | 2.670 |
| 9 | 1.128 | 1.000 | 3.400 |
| 10 | 1.270 | 1.270 | 4.303 |
| 11 | 1.410 | 1.560 | 5.313 |
| 14 | 1.693 | 2.250 | 7.650 |
| 18 | 2.257 | 4.000 | 13.600 |

## RECOMMENDED END HOOKS, APPLICABLE TO ALL GRADES

| BAR SIZE | 180° HOOKS: D | 180° HOOKS: A OR G | 180° HOOKS: J | 90° HOOKS: A OR G |
|---|---|---|---|---|
| 3 | 2¼" | 5" | 3" | 6" |
| 4 | 3" | 6" | 4" | 8" |
| 5 | 3¾" | 7" | 5" | 1Ø" |
| 6 | 4½" | 8" | 6" | 1-Ø" |
| 7 | 5¼" | 1Ø" | 7" | 1-2" |
| 8 | 6" | 11" | 8" | 1-4" |
| 9 | 9½" | 1-3" | 11¾" | 1-7" |
| 10 | 1Ø¾" | 1-5" | 1-1¼" | 1-1Ø" |
| 11 | 1-Ø" | 1-7" | 1-2¾" | 2-Ø" |
| 14 | 1-6¼" | 2-3" | 1-9¾" | 2-7" |
| 18 | 2-Ø" | 3-Ø" | 2-4½" | 3-5" |

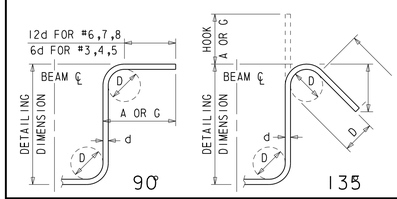
## STIRRUP AND TIE HOOKS, APPLICABLE TO ALL GRADES

| BAR SIZE | 90° HOOK: D | 90° HOOK: A OR G | 135° HOOK: A OR G | 135° HOOK: A OR G |
|---|---|---|---|---|
| 3 | 1½" | 4" | 4" | 2½" |
| 4 | 2" | 4½" | 4½" | 3" |
| 5 | 2½" | 6" | 5½" | 3¾" |
| 6 | 4½" | 1-Ø" | 8" | 4½" |
| 7 | 5¼" | 1-2" | 9" | 5¼" |
| 8 | 6" | 1-4" | 1Ø½" | 6" |

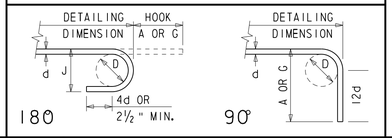
NOTES:

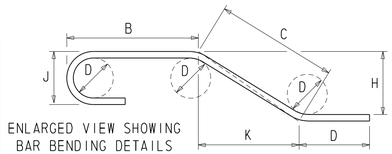
1. FIGURES SHOWN IN CIRCLES REPRESENT BAR BEND TYPES.
2. STANDARD BAR BENDS INCLUDE ONLY THOSE TYPES BELOW, INDICATED AS SUCH.
3. ALL DIMENSIONS OUT-TO-OUT, EXCEPT "A" AND "G" ON STD. 18Ø° AND 135° HOOKS.
4. "J" DIMENSIONS ON 18Ø° HOOKS TO BE SHOWN ONLY WHERE NECESSARY TO RESTRICT HOOK SIZE, OTHERWISE STANDARD 'ACI' HOOKS ARE TO BE USED.
5. 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.
6. "H" DIMENSIONS OF STIRRUPS TO BE SHOWN AS NEEDED TO FIT WITHIN THE CONCRETE.
7. UNLESS OTHERWISE NOTED, DIAMETER "D" IS THE SAME FOR ALL BENDS AND HOOKS ON A BAR (EXCEPT FOR BEND TYPES 11 AND 13).
8. WHERE SLOPE DIFFERS FROM 45° OFFSET, "H" AND "K" MUST BE SHOWN.
9. WHERE BARS ARE TO BE BENT MORE ACCURATELY THAN STANDARD BENDING TOLERANCES, BENDING DIMENSIONS REQUIRING CLOSER FABRICATION SHOULD HAVE LIMITS INDICATED.
10. FOR RECOMMENDED DIAMETER "D", OF BENDS, HOOKS, ETC., REFER TO TABLE ABOVE, 'CRSI' OR 'ACI' TABLES WHERE APPLICABLE AND REQUIRED.
11. TYPE S1-S6, S11, T1-T3 AND T6-T9 APPLICABLE TO BAR SIZES #3 THROUGH #8.

## STIRRUP AND TIE HOOKS

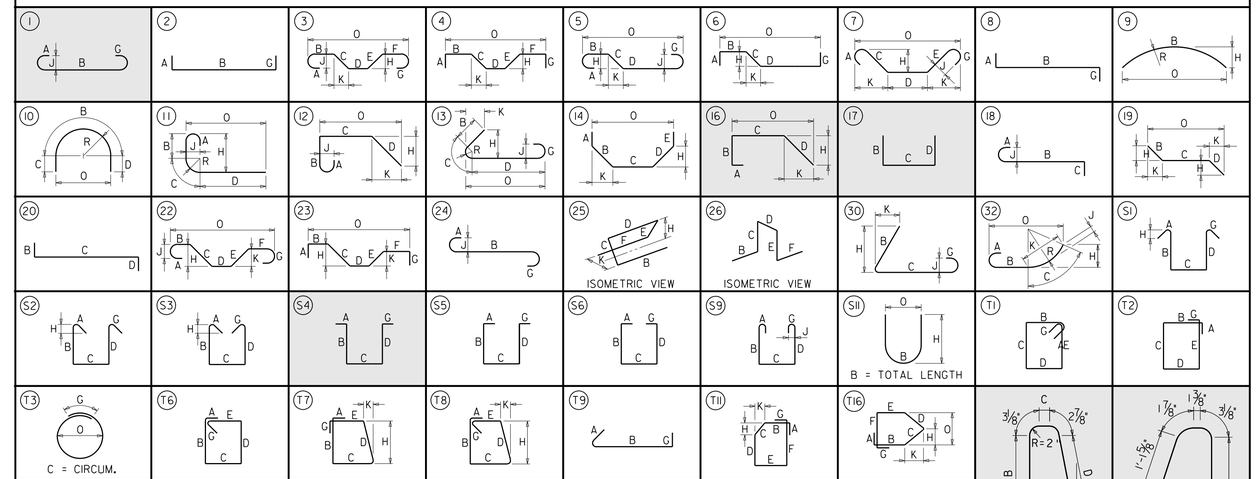



## 180° AND 90° END HOOKS

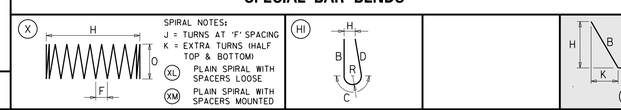


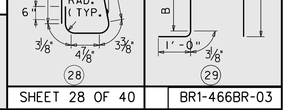




## STANDARD BAR BENDS




## SPECIAL BAR BENDS




SHEET 28 OF 40

BR1-466BR-03

**DELAWARE DEPARTMENT OF TRANSPORTATION**

ADDENDUMS / REVISIONS

NOT TO SCALE

**US 301, SR 896 TO SR 1**

| CONTRACT | BRIDGE NO. | 1–466 N&S |
|---|---|---|
| T2ØØ911308 | DESIGNED BY: AKW | |
| COUNTY | CHECKED BY: MDM | |
| NEW CASTLE | | |

**SUPERSTRUCTURE REINFORCEMENT BAR LIST – 1 (NB)**

| SHEET NO. | TOTAL SHTS. |
|---|---|
| 568 | 875 |

(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

* VARY AT EQUAL INCREMENTS

| SPECIFICATIONS | | | | | BENDING DIMENSIONS (FEET–INCHES /QUARTER INCH) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| QTY. | SIZE | LENGTH | MARK | TYPE | A | B | C | D | E | F/R | G | H | J | K | O |
| **APPROACH SLAB, MOMENT SLAB, SLEEPER SLAB, HEADER SLAB, PARAPET AT ABUTMENT A (NB)** | | | | | | | | | | | | | | | |
| 27 | 5 | 53-5 0 | AS501E | 17 | | 1-00 | 51-5 0 | 1-00 | | | | | | | |
| 92 | 5 | 6-6 2 | AS502E | 17 | | 2-90 | 1-0 2 | 2-90 | | | | | | | |
| 46 | 5 | 29-80 | AS503E | STR | | 29-80 | | | | | | | | | |
| 2 | 5 | 4-11 3 | AS504E | 17 | | 0-11 3 | 4-00 | 0-00 | | | | | | | |
| 2 | 5 | 4-00 | AS505E | STR | | 4-00 | | | | | | | | | |
| 4 | 5 | 3-31 | AS506E | 16 | 0-00 | 0-00 | 1-31 | 2-00 | | | | 1-00 | | 1-83 | 3-00 |
| 4 | 6 | 51-5 0 | AS601E | STR | | 51-5 0 | | | | | | | | | |
| 27 | 7 | 51-5 0 | AS701E | STR | | 51-5 0 | | | | | | | | | |
| 91 | 10 | 29-80 | AS1001E | STR | | 29-80 | | | | | | | | | |
| 26 | 5 | 51-5 0 | SL501E | STR | | 51-5 0 | | | | | | | | | |
| 46 | 5 | 8-00 | SL502E | T1 | 0-52 | 1-60 | 2-02 | 1-60 | 2-02 | | 0-52 | | | | |
| 11 | 5 | 19-11 | SL503E | STR | | 19-11 | | | | | | | | | |
| 1X11 | 5 | 2-60<br>TO 17-60 | SL504E | STR | | 2-60<br>TO 17-60 | | | | | | | | | |
| 3 | 5 | 20-7 3 | SL505E | STR | | 20-7 3 | | | | | | | | | |
| 2X25 | 5 | 9-80<br>TO 20-03 | SL506E | STR | | 9-80<br>TO 20-03 | | | | | | | | | |
| 11 | 5 | 25-11 | SL507E | STR | | 25-11 | | | | | | | | | |
| 1X14 | 5 | 2-60<br>TO 22-03 | SL508E | STR | | 2-60<br>TO 22-03 | | | | | | | | | |
| 3 | 5 | 28-11 3 | SL509E | STR | | 28-11 3 | | | | | | | | | |
| 2X33 | 5 | 9-80<br>TO 23-33 | SL510E | STR | | 9-80<br>TO 23-33 | | | | | | | | | |
| 52 | 5 | 3-31 | SL511E | 16 | 0-00 | 0-00 | 1-31 | 2-00 | | | | 1-00 | | 1-83 | 3-00 |
| 11 | 5 | 2-60 | SL512E | STR | | 2-60 | | | | | | | | | |
| 58 | 5 | 5-82 | SL513E | 17 | | 2-40 | 1-0 2 | 2-40 | | | | | | | |
| 4 | 6 | 51-5 0 | SL601E | STR | | 51-5 0 | | | | | | | | | |
| 11 | 6 | 19-91 | SL602E | 1 | 0-80 | 19-11 | | | | | 0-00 | | 0-60 | | |
| 1X11 | 6 | 3-20<br>TO 18-20 | SL603E | 1 | 0-80<br>TO 0-80 | 2-60<br>TO 17-60 | | | | | 0-00<br>TO 0-00 | | 0-60<br>TO 0-60 | | |
| 2 | 6 | 20-7 3 | SL604E | STR | | 20-7 3 | | | | | | | | | |
| 11 | 6 | 25-91 | SL605E | 1 | 0-80 | 25-11 | | | | | 0-00 | | 0-60 | | |
| 1X14 | 6 | 3-20<br>TO 22-83 | SL606E | 1 | 0-80<br>TO 0-80 | 2-60<br>TO 22-03 | | | | | 0-00<br>TO 0-00 | | 0-60<br>TO 0-60 | | |
| 2 | 6 | 28-11 3 | SL607E | STR | | 28-11 3 | | | | | | | | | |
| 92 | 8 | 7-00 | SL801E | STR | | 7-00 | | | | | | | | | |

| SPECIFICATIONS | | | | | BENDING DIMENSIONS (FEET–INCHES /QUARTER INCH) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| QTY. | SIZE | LENGTH | MARK | TYPE | A | B | C | D | E | F/R | G | H | J | K | O |
| 134 | 5 | 7-7 2 | PA503E | 28 | | 2-91 | 0-1 2 | 2-92 | | | | | | | |
| 110 | 5 | 6-10 2 | PA504E | 29 | | 1-43 | 2-52 | | | | | | | | |
| 2X8 | 5<br>TO | •6-02<br>•7-72 | PA505E | 28 | | •1-111<br>TO •2-91 | •0-22<br>TO •0-12 | •1-112<br>TO •2-92 | | | | | | | |
| 40 | 5 | 5-10 2 | PA506E | 29 | | 0-103 | 1-112 | | | | | | | | |
| 8 | 7 | 29-80 | PA702E | STR | | 29-80 | | | | | | | | | |
| 8 | 7 | 1-80 | PA703E | STR | | 1-80 | | | | | | | | | |
| 4 | 7 | 9-80 | PA704E | 16 | 0-00 | 0-00 | 5-30 | 4-50 | | | | 0-80 | | 4-40 | 9-70 |
| 4 | 7 | 20-11 3 | PA705E | 16 | 0-00 | 0-00 | 15-83 | 4-50 | | | | 0-80 | | 4-40 | 20-03 |
| 8 | 8 | 29-80 | PA802E | STR | | 29-80 | | | | | | | | | |
| 8 | 8 | 1-80 | PA803E | STR | | 1-80 | | | | | | | | | |
| 4 | 8 | 9-80 | PA804E | 16 | 0-00 | 0-00 | 5-30 | 4-50 | | | | 0-80 | | 4-40 | 9-70 |
| 4 | 8 | 20-11 3 | PA805E | 16 | 0-00 | 0-00 | 15-83 | 4-50 | | | | 0-80 | | 4-40 | 20-03 |
| **APPROACH SLAB, MOMENT SLAB, SLEEPER SLAB, HEADER SLAB, PARAPET AT ABUTMENT B (NB)** | | | | | | | | | | | | | | | |
| 27 | 5 | 53-5 0 | AS561E | 17 | | 1-00 | 51-5 0 | 1-00 | | | | | | | |
| 92 | 5 | 6-6 2 | AS562E | 17 | | 2-90 | 1-0 2 | 2-90 | | | | | | | |
| 46 | 5 | 29-80 | AS563E | STR | | 29-80 | | | | | | | | | |
| 2 | 5 | 4-11 3 | AS564E | 17 | | 0-11 3 | 4-00 | 0-00 | | | | | | | |
| 2 | 5 | 4-00 | AS565E | STR | | 4-00 | | | | | | | | | |
| 4 | 5 | 3-31 | AS566E | 16 | 0-00 | 0-00 | 1-31 | 2-00 | | | | 1-00 | | 1-83 | 3-00 |
| 27 | 7 | 51-5 0 | AS761E | STR | | 51-5 0 | | | | | | | | | |
| 91 | 10 | 29-80 | AS1061E | STR | | 29-80 | | | | | | | | | |
| 14 | 5 | 51-5 0 | SL561E | STR | | 51-5 0 | | | | | | | | | |
| 11 | 5 | 19-11 | SL562E | STR | | 19-11 | | | | | | | | | |
| 1X11 | 5<br>TO 16-03 | 2-60 | SL563E | STR | | 2-60<br>TO 16-03 | | | | | | | | | |
| 3 | 5 | 22-10 | SL564E | STR | | 22-10 | | | | | | | | | |
| 2X25 | 5<br>TO | 9-80<br>19-110 | SL565E | STR | | 9-80<br>TO 19-110 | | | | | | | | | |
| 11 | 5 | 25-11 | SL566E | STR | | 25-11 | | | | | | | | | |
| 1X14 | 5<br>TO 23-62 | 2-60 | SL567E | STR | | 2-60<br>TO 23-62 | | | | | | | | | |
| 3 | 5 | 27-63 | SL568E | STR | | 27-63 | | | | | | | | | |
| 2X33 | 5<br>TO 23-61 | 9-80 | SL569E | STR | | 9-80<br>TO 23-61 | | | | | | | | | |
| 28 | 5 | 3-31 | SL570E | 16 | 0-00 | 0-00 | 1-31 | 2-00 | | | | 1-00 | | 1-83 | 3-00 |
| 10 | 5 | 2-60 | SL571E | STR | | 2-60 | | | | | | | | | |
| 58 | 5 | 5-82 | SL572E | 17 | | 2-40 | 1-02 | 2-40 | | | | | | | |

| SPECIFICATIONS | | | | | BENDING DIMENSIONS (FEET–INCHES /QUARTER INCH) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| QTY. | SIZE | LENGTH | MARK | TYPE | A | B | C | D | E | F/R | G | H | J | K | O |
| 11 | 6 | 19-91 | SL661E | 1 | 0-80 | 19-11 | | | | | 0-00 | | 0-60 | | |
| 1X11 | 6<br>TO | 3-20<br>16-83 | SL662E | 1 | 0-80<br>TO 0-80 | 2-60<br>TO 16-03 | | | | | 0-00<br>TO 0-00 | | 0-60<br>TO 0-60 | | |
| 2 | 6 | 22-10 | SL663E | STR | | 22-10 | | | | | | | | | |
| 11 | 6 | 25-91 | SL664E | 1 | 0-80 | 25-11 | | | | | 0-00 | | 0-60 | | |
| 1X14 | 6<br>TO | 3-20<br>24-22 | SL665E | 1 | 0-80<br>TO 0-80 | 2-60<br>TO 23-62 | | | | | 0-00<br>TO 0-00 | | 0-60<br>TO 0-60 | | |
| 2 | 6 | 27-63 | SL666E | STR | | 27-63 | | | | | | | | | |
| 92 | 8 | 4-60 | SL861E | STR | | 4-60 | | | | | | | | | |
| 131 | 5 | 7-72 | PA563E | 28 | | 2-91 | 0-12 | 2-92 | | | | | | | |
| 102 | 5 | 6-10 2 | PA564E | 29 | | 1-43 | 2-52 | | | | | | | | |
| 2X8 | 5<br>TO | •6-02<br>•7-72 | PA565E | 28 | | •1-111<br>TO •2-91 | •0-22<br>TO •0-12 | •1-112<br>TO •2-92 | | | | | | | |
| 45 | 5 | 5-10 2 | PA566E | 29 | | 0-103 | 1-112 | | | | | | | | |
| 8 | 7 | 29-80 | PA762E | STR | | 29-80 | | | | | | | | | |
| 4 | 7 | 23-71 | PA763E | 16 | 0-00 | 0-00 | 19-21 | 4-50 | | | | 0-80 | | 4-40 | 23-61 |
| 4 | 7 | 9-80 | PA764E | 16 | 0-00 | 0-00 | 5-30 | 4-50 | | | | 0-80 | | 4-40 | 9-70 |
| 8 | 8 | 29-80 | PA862E | STR | | 29-80 | | | | | | | | | |
| 4 | 8 | 23-71 | PA863E | 16 | 0-00 | 0-00 | 19-21 | 4-50 | | | | 0-80 | | 4-40 | 23-61 |
| 4 | 8 | 9-80 | PA864E | 16 | 0-00 | 0-00 | 5-30 | 4-50 | | | | 0-80 | | 4-40 | 9-70 |

**ASTM STANDARD ENGLISH REINFORCING BARS**

| BAR SIZE | NOMINAL DIMENSIONS: DIAMETER (INCHES) | AREA (INCHES²) | WEIGHT (LBS./FT.) |
|---|---|---|---|
| 3 | 0.375 | 0.110 | 0.376 |
| 4 | 0.500 | 0.200 | 0.668 |
| 5 | 0.625 | 0.310 | 1.043 |
| 6 | 0.750 | 0.440 | 1.502 |
| 7 | 0.875 | 0.600 | 2.044 |
| 8 | 1.000 | 0.790 | 2.670 |
| 9 | 1.128 | 1.000 | 3.400 |
| 10 | 1.270 | 1.270 | 4.303 |
| 11 | 1.410 | 1.560 | 5.313 |
| 14 | 1.693 | 2.250 | 7.650 |
| 18 | 2.257 | 4.000 | 13.600 |

**RECOMMENDED END HOOKS, APPLICABLE TO ALL GRADES**

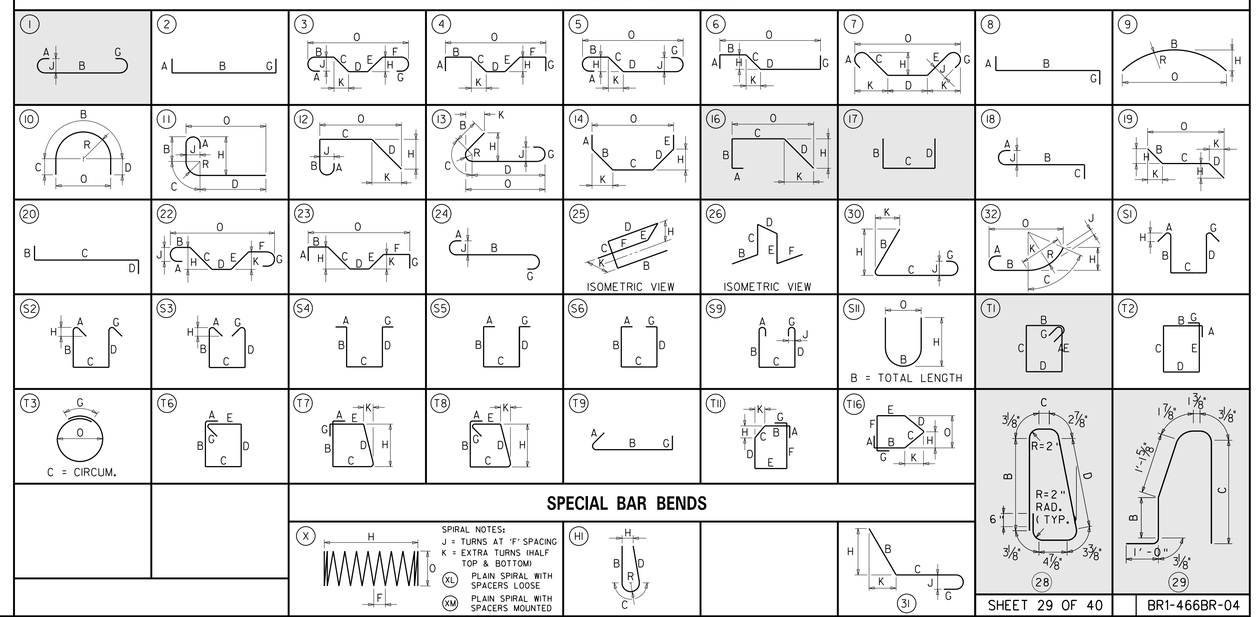
| | 180° HOOKS | | 90° HOOKS |
|---|---|---|---|
| | D | A OR G | J | A OR G |
| 3 | 2¼" | 5" | 3" | 6" |
| 4 | 3" | 6" | 4" | 8" |
| 5 | 3¾" | 7" | 5" | 10" |
| 6 | 4½" | 8" | 6" | 1-0" |
| 7 | 5¼" | 10" | 7" | 1-2" |
| 8 | 6" | 11" | 8" | 1-4" |
| 9 | 9½" | 1-3" | 11¾" | 1-7" |
| 10 | 10¾" | 1-5" | 1-1¼" | 1-10" |
| 11 | 1-0" | 1-7" | 1-2¾" | 2-0" |
| 14 | 1-6¼" | 2-3" | 1-9¾" | 2-7" |
| 18 | 2-0" | 3-0" | 2-4½" | 3-5" |

**STIRRUP AND TIE HOOKS, APPLICABLE TO ALL GRADES**

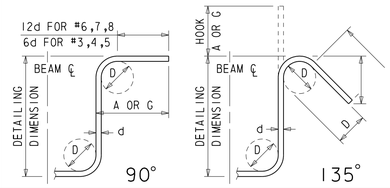
| | 90° HOOK | 135° HOOK | |
|---|---|---|---|
| | D | A OR G | A OR G | A OR G |
| 3 | 1½" | 4" | 4" | 2½" |
| 4 | 2" | 4½" | 4½" | 3" |
| 5 | 2½" | 6" | 5½" | 3¾" |
| 6 | 3" | 8" | 8" | 4½" |
| 7 | 5¼" | 1-2" | 9" | 5¼" |
| 8 | 6" | 1-4" | 10½" | 6" |

NOTES:
1. FIGURES SHOWN IN CIRCLES REPRESENT BAR BEND TYPES.
2. STANDARD BAR BENDS INCLUDE ONLY THOSE TYPES BELOW, INDICATED AS SUCH.
3. ALL DIMENSIONS OUT-TO-OUT, EXCEPT "A" AND "G" ON STD. 180° AND 135° HOOKS.
4. "J" DIMENSIONS ON 180° HOOKS TO BE SHOWN ONLY WHERE NECESSARY TO RESTRICT HOOK SIZE, OTHERWISE STANDARD 'ACI' HOOKS ARE TO BE USED.
5. 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.
6. "H" DIMENSIONS OF STIRRUPS TO BE SHOWN AS NEEDED TO FIT WITHIN THE CONCRETE.
7. UNLESS OTHERWISE NOTED, DIAMETER "D" IS THE SAME FOR ALL BENDS AND HOOKS ON A BAR (EXCEPT FOR BEND TYPES 11 AND 13).
8. WHERE SLOPE DIFFERS FROM 45° OFFSET, "H" AND "K" MUST BE SHOWN.
9. WHERE BARS ARE TO BE BENT MORE ACCURATELY THAN STANDARD BENDING TOLERANCES, BENDING DIMENSIONS REQUIRING CLOSER FABRICATION SHOULD HAVE LIMITS INDICATED.
10. FOR RECOMMENDED DIAMETER "D", OF BENDS, HOOKS, ETC., REFER TO TABLE ABOVE, 'CRSI' OR 'ACI' TABLES WHERE APPLICABLE AND REQUIRED.
11. TYPE S1-S6, S11, T1-T3 AND T6-T9 APPLICABLE TO BAR SIZES #3 THROUGH #8.

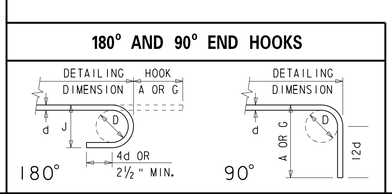
## STANDARD BAR BENDS

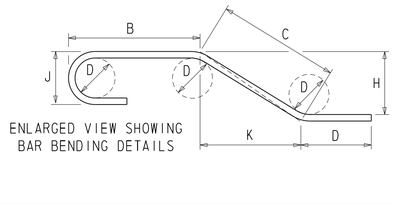



## STIRRUP AND TIE HOOKS




## 180° AND 90° END HOOKS




**DELAWARE DEPARTMENT OF TRANSPORTATION**

ADDENDUMS / REVISIONS

NOT TO SCALE

**US 301, SR 896 TO SR 1**

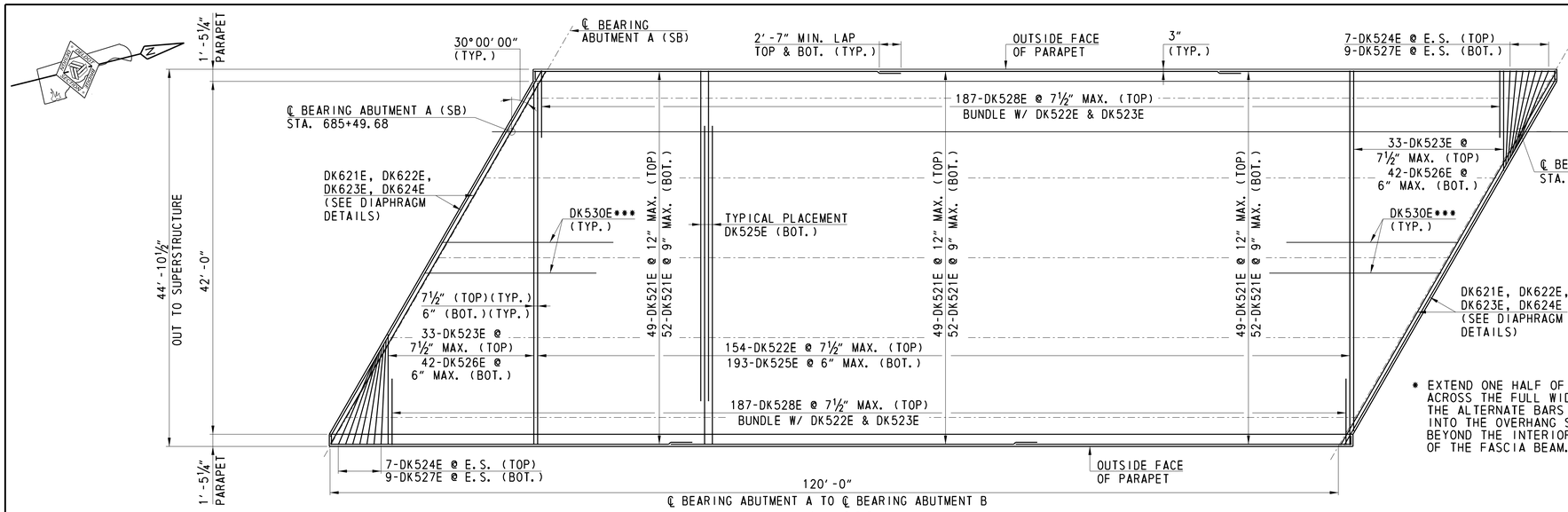
| | |
|---|---|
| CONTRACT | T200911308 |
| COUNTY | NEW CASTLE |
| BRIDGE NO. | 1–466 N&S |
| DESIGNED BY: | AKW |
| CHECKED BY: | MDM |

**SUPERSTRUCTURE REINFORCEMENT BAR LIST – 2 (NB)**

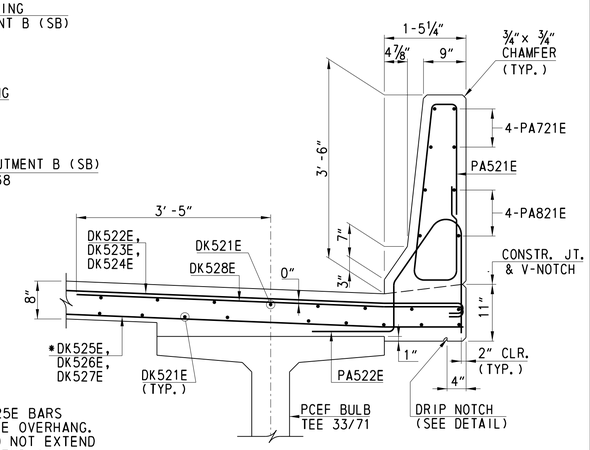
| | |
|---|---|
| SHEET NO. | 569 |
| TOTAL SHTS. | 875 |

SHEET 29 OF 40

BR1-466BR-04

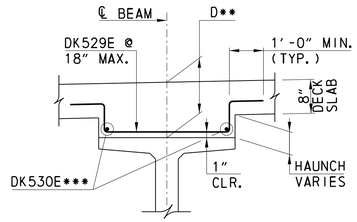



## 1-466S
## DECK PLAN
SCALE: ⅛"=1'-0"




* EXTEND ONE HALF OF THE DK525E BARS ACROSS THE FULL WIDTH OF THE OVERHANG. THE ALTERNATE BARS WHICH DO NOT EXTEND INTO THE OVERHANG SHALL EXTEND 6" MIN. BEYOND THE INTERIOR EDGE OF THE FLANGE OF THE FASCIA BEAM.

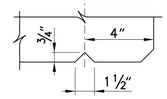
## PARAPET DETAIL (SB)
SCALE: ¾"=1'-0"




NOTES:
- DECK SLAB REINFORCEMENT NOT SHOWN FOR CLARITY.
- FIELD VERIFY ACTUAL HAUNCH DIMENSIONS.

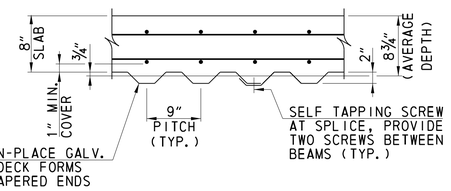
** DECK THICKNESS @ ℄ OF BRG. AND ℄ OF BEAM, D = 1'-0⅜"

*** PLACE HAUNCH REINFORCEMENT AT BOTH ENDS OF BEAMS B1 THRU B5



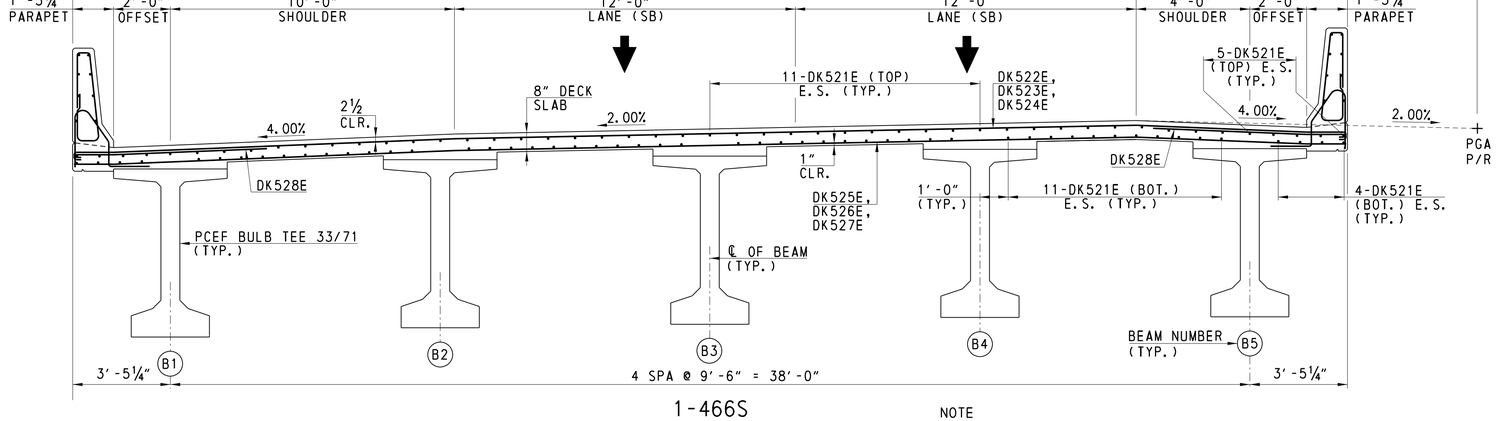

## DRIP NOTCH DETAIL
NOT TO SCALE

## HAUNCH REINFORCEMENT
NOT TO SCALE



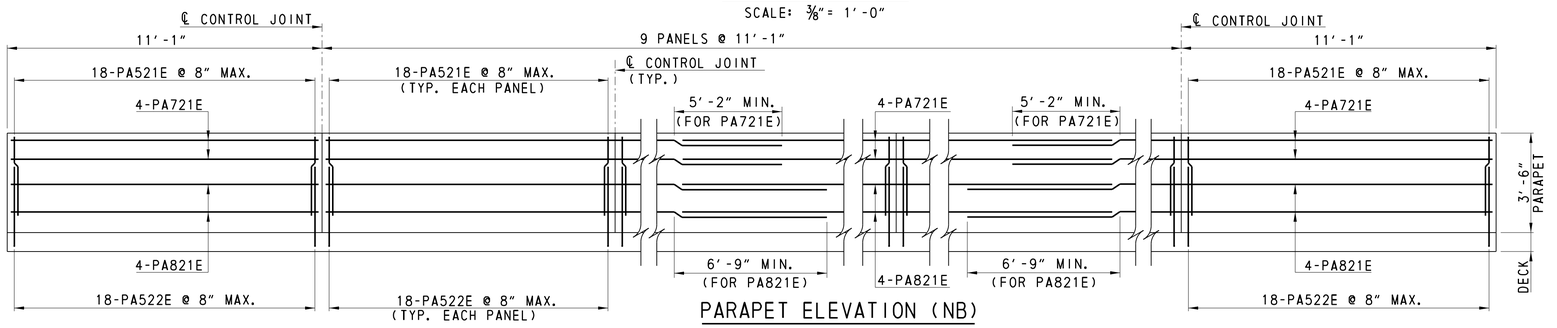

NOTES:
- SHOP DRAWINGS SHALL BE SUBMITTED FOR REVIEW AND APPROVAL BY THE ENGINEER. METAL FORMS MUST BE GALVANIZED, MORTAR TIGHT AND STEEL METAL SCREWS MUST BE NON-CORROSIVE. SELF TAPPING SCREWS SHALL BE INSTALLED AT THE SIDE LAP OF THE SHEETS AT MID-SPAN BETWEEN SUPPORTS. NO WELD WILL BE PERMITTED AT NEGATIVE MOMENT ZONE.
- FOR ADDITIONAL NOTES, SEE SHEET 20 OF 40.

## STAY-IN-PLACE FORM CONNECTION
NOT TO SCALE




## 1-466S
## TYPICAL SECTION
SCALE: ⅜"= 1'-0"

NOTE
1. DIAPHRAGMS NOT SHOWN FOR CLARITY.




## PARAPET ELEVATION (NB)
SCALE: ⅜"= 1'-0"

LEGEND:

| | | |
|---|---|---|
| CLR. | = | CLEAR |
| CONSTR. | = | CONSTRUCTION |
| BOT. | = | BOTTOM |
| BRG. | = | BEARING |
| E.S. | = | EQUAL SPACING |
| JT. | = | JOINT |
| MAX. | = | MAXIMUM |
| MIN. | = | MINIMUM |
| SB | = | SOUTHBOUND |
| PGA | = | PROFILE GRADE APPLICATION |
| P/R | = | POINT OF ROTATION |
| SPA. | = | SPACE |
| TYP. | = | TYPICAL |

NOTES:
1. FOR DIAPHRAGM DETAILS, SEE SHEETS 31 AND 32 OF 40.
2. FOR REINFORCEMENT BAR LIST, SEE SHEETS 36 AND 37 OF 40.
3. SLIP FORMING FOR PARAPETS IS NOT PERMITTED.
4. POUR END AND INTERMEDIATE DIAPHRAGMS BEFORE POURING DECK.
5. FOR DECK PARAPET/ APPROACH SLAB PARAPET JOINT DETAILS, SEE SHEET 32 OF 40.
6. FOR PARAPET CONTROL JOINT DETAILS, SEE SHEET 4 OF 40.



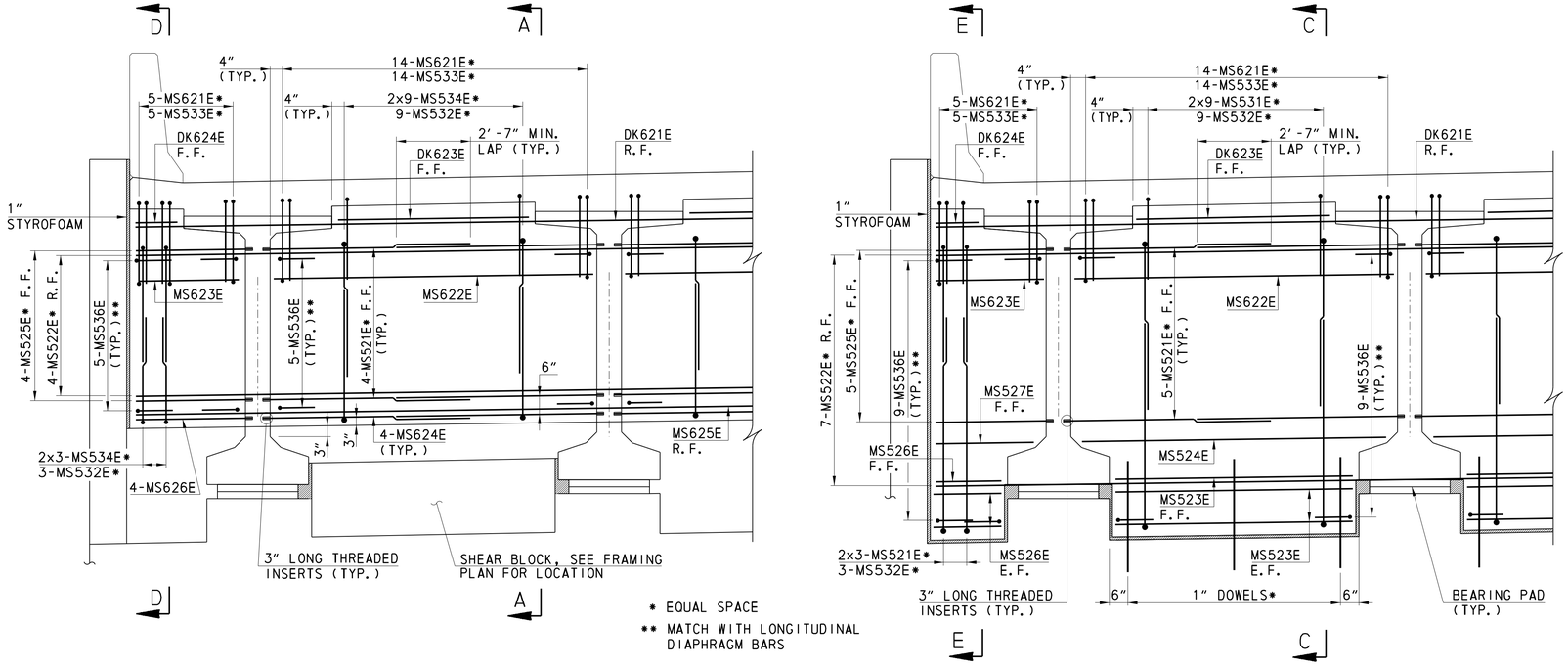
DELAWARE DEPARTMENT OF TRANSPORTATION

ADDENDUMS / REVISIONS

SCALE: AS NOTED

**US 301, SR 896 TO SR 1**

| | | | |
|---|---|---|---|
| CONTRACT T200911308 | BRIDGE NO. 1-466 N&S | DECK PLAN, SECTION AND DETAILS (SB) | SHEET NO. 570 |
| COUNTY NEW CASTLE | DESIGNED BY: BSW | | TOTAL SHTS. 875 |
| | CHECKED BY: BJH | | |




* EQUAL SPACE

** MATCH WITH LONGITUDINAL DIAPHRAGM BARS

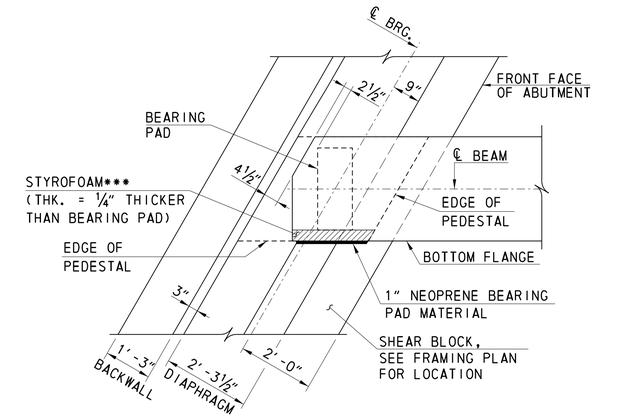
## END ABUTMENT A DIAPHRAGM ELEVATION (SB)

SCALE: ½"=1'-0"

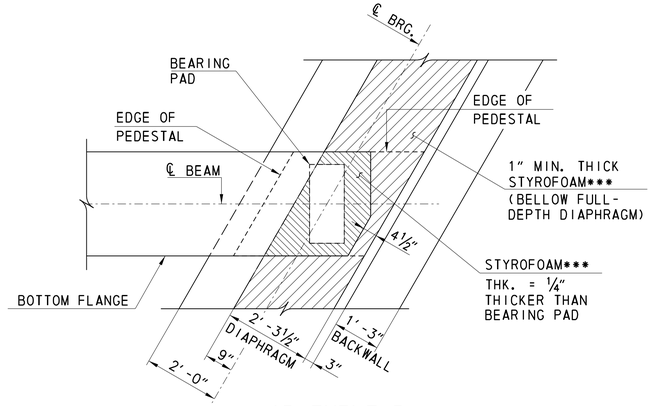



## END ABUTMENT B DIAPHRAGM ELEVATION (SB)

SCALE: ½"=1'-0"




## ABUTMENT A

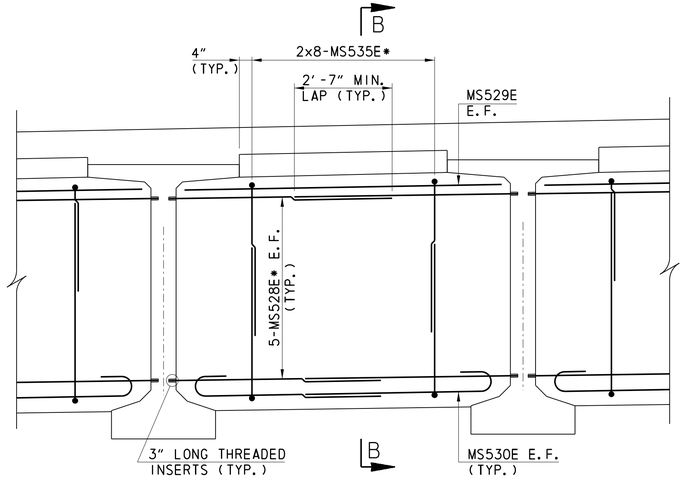



## ABUTMENT B

***STYROFOAM SHALL MEET ASTM C-578 TYPE 1 MATERIAL REQUIREMENTS, EXCEPT THE MAXIMUM ALLOWABLE WATER ABSORPTION SHALL BE 2%.

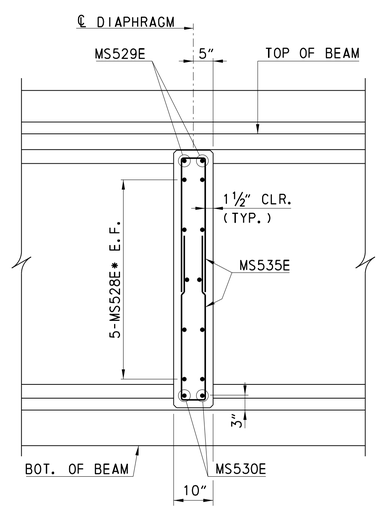
## WATERPROOFING LIMITS PLAN

SCALE: ½"=1'-0"



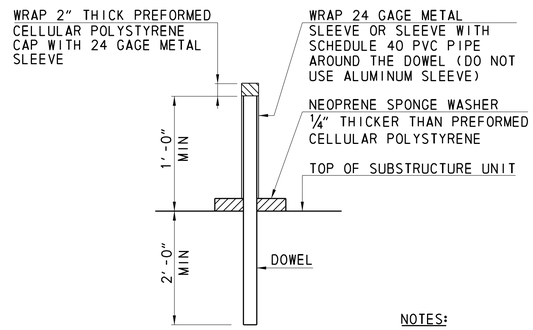

## INTERMEDIATE DIAPHRAGM ELEVATION (SB)

SCALE: ½"=1'-0"




## SECTION B-B

SCALE: ¾"=1'-0"




## DOWEL DETAIL

N.T.S.

NOTES:

1. FOR SECTIONS A-A, C-C, D-D, AND E-E, SEE SHEET 32 OF 40.
2. BITUMINOUS TAR PAPER OR SCHEDULE 40 P.V.C. PIPE ARE PERMITTED TO BE USED AS ALTERNATIVE BOND BREAKER MATERIALS IN LIEU OF THE METAL SLEEVE. OTHER BOND BREAKER MATERIALS MAY BE USED AROUND THE DOWEL ONLY WITH THE APPROVAL OF THE ENGINEER.
3. FOR SHEAR BLOCK DETAILS, SEE SHEET 12 OF 40.
4. FOR FRAMING PLAN, SEE SHEET 19 OF 40.
5. FOR BEARING PAD DETAILS, SEE SHEET 20 OF 40.
6. FOR BEAM DETAILS, SEE SHEET 21 OF 40.
7. FOR REINFORCEMENT BAR LIST, SEE SHEETS 36 AND 37 OF 40.
8. FOR LAYOUT OF DOWELS AND DOWEL REQUIREMENTS, SEE SHEET 14 OF 40.

LEGEND

| | | |
|---|---|---|
| BOT. | = | BOTTOM |
| CLR. | = | CLEAR |
| DIA. | = | DIAMETER |
| E.F. | = | EACH FACE |
| EQ. | = | EQUAL |
| F.F. | = | FRONT FACE |
| MIN. | = | MINIMUM |
| R.F. | = | REAR FACE |
| SPA | = | SPACING |
| THK. | = | THICKNESS |
| TYP. | = | TYPICAL |



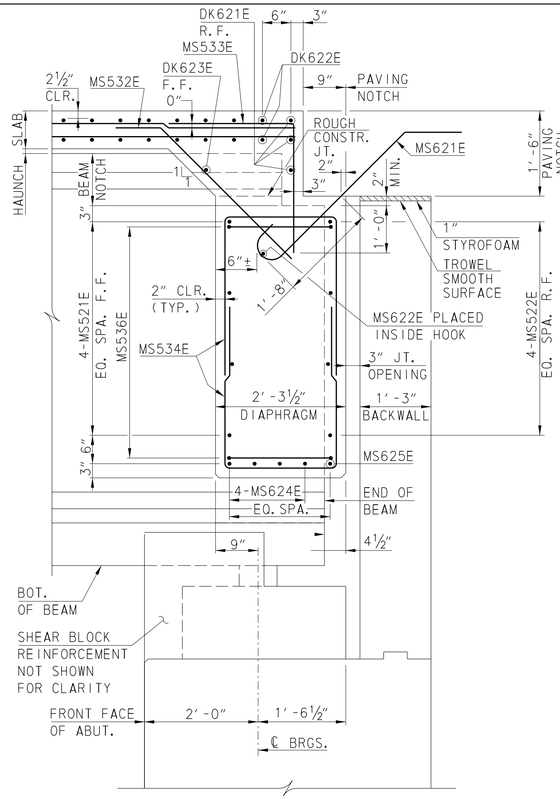
DELAWARE DEPARTMENT OF TRANSPORTATION

ADDENDUMS / REVISIONS

SCALE: AS NOTED

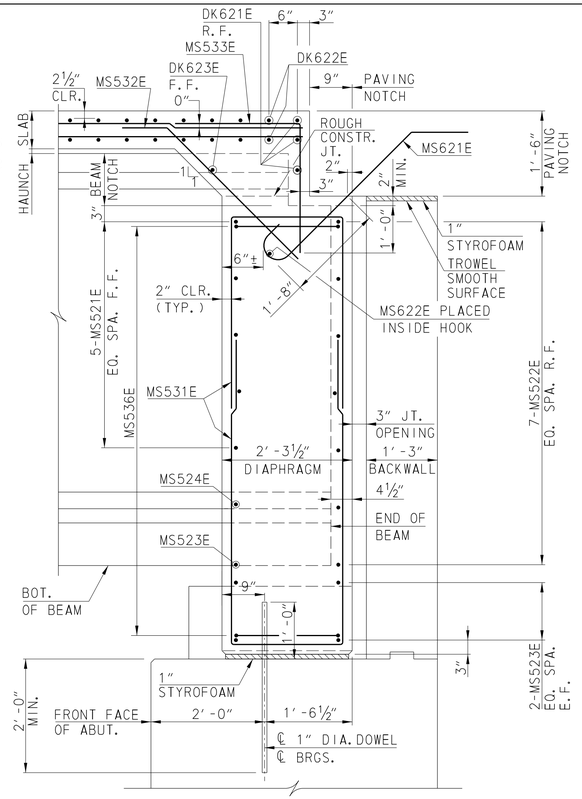
**US 301, SR 896 TO SR 1**

| | | | |
|---|---|---|---|
| CONTRACT T200911308 | BRIDGE NO. 1-466 N&S | DIAPHRAGM DETAILS – 1 (SB) | SHEET NO. 571 |
| COUNTY NEW CASTLE | DESIGNED BY: MDM/ZAA | | TOTAL SHTS. 875 |
| | CHECKED BY: BJH | | |



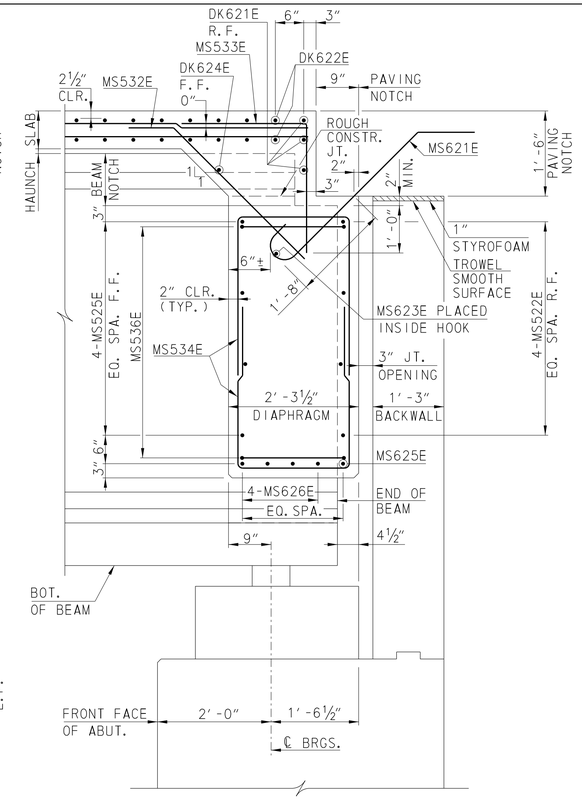

## SECTION A-A

SCALE: ¾"=1'-0"



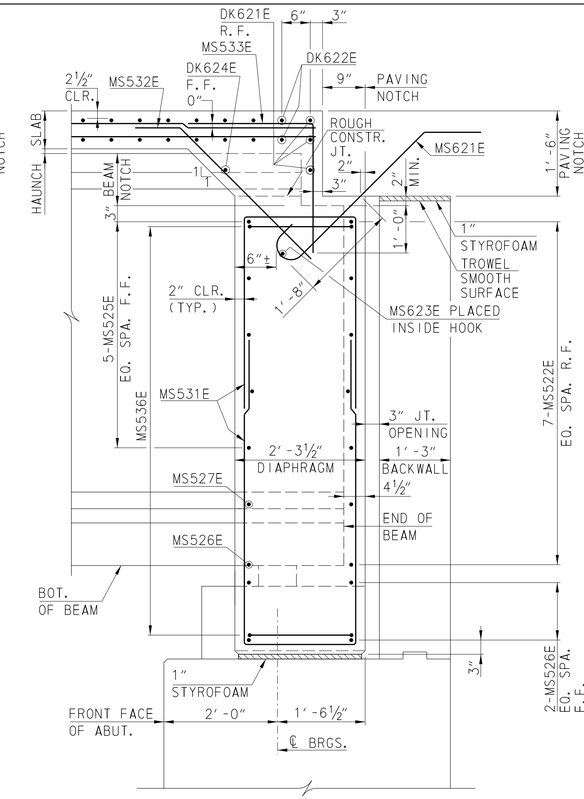

## SECTION C-C

SCALE: ¾"=1'-0"



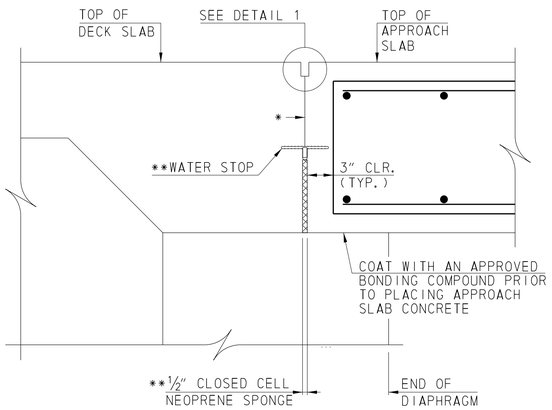

## SECTION D-D

SCALE: ¾"=1'-0"




## SECTION E-E

SCALE: ¾"=1'-0"

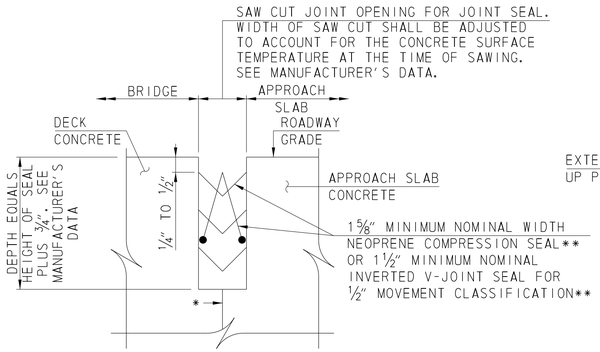



## APPROACH SLAB JOINT DETAIL

NOT TO SCALE

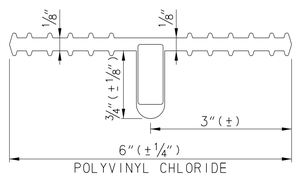
* COAT WITH PARAFIN OR ASPHALT BOND BREAKER PRIOR TO PLACING APPROACH SLAB CONCRETE

** INCIDENTAL TO APPROACH SLAB CONCRETE




## DETAIL 1

NOT TO SCALE

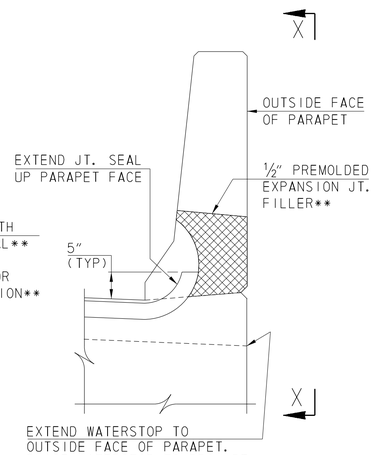



## WATERSTOP DETAIL

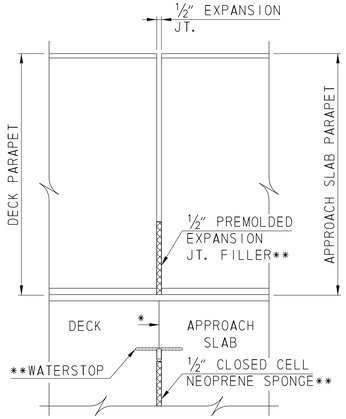
NOT TO SCALE

LEGEND:

| | | | | | |
|---|---|---|---|---|---|
| ABUT. | = | ABUTMENT | EQ. | = | EQUAL |
| BOT. | = | BOTTOM | JT. | = | JOINT |
| BRG. | = | BEARING | MIN. | = | MINIMUM |
| CLR. | = | CLEAR | R.F. | = | REAR FACE |
| CONSTR. | = | CONSTRUCTION | SPA. | = | SPACING |
| DIA. | = | DIAMETER | TYP. | = | TYPICAL |




ELEVATION




SECTION X-X

## JOINT SEAL AND WATERSTOP TERMINATION DETAIL

JOINT PREPARATION NOTES:

1. THE JOINT OPENING IS TO BE FORMED BY A TWO-STAGE SAWING OPERATION WHERE ACCESSIBLE AND FORMED ELSEWHERE. THE FIRST SAW CUT IS DESIGNED TO CONTROL CRACKING. THE SECOND SAW CUT IS MADE USING A DOUBLE-BLADED WATER-COOLED SAW CAPABLE OF HOLDING A TOLERANCE OF ±⅛" TO CREATE THE PROPER OPENING FOR THE PREFORMED NEOPRENE COMPRESSION SEAL OR INVERTED V-JOINT SEAL.
2. WATER BLAST OPENING IMMEDIATELY FOLLOWING SAW CUTTING OPERATION TO REMOVE ANY RESIDUAL SLURRY BEFORE IT DRIES.
3. THE DEPTH OF THE SEAL OPENING EQUALS THE HEIGHT OF THE SEAL PLUS ¾". THE WIDTH OF THE SECOND SAW CUT SHALL BE ADJUSTED TO ACCOUNT FOR THE CONCRETE SURFACE TEMPERATURE AT THE TIME OF SAWING, SEE MANUFACTURE'S PRODUCT INFORMATION.
4. BEFORE INSTALLING THE SEAL, ABRASIVE BLAST THE BONDING SURFACES TO THOROUGHLY CLEAN THE JOINT OPENING AND REMOVE FOREIGN MATERIAL, INCLUDING BROKEN CONCRETE. USE WATER AND OIL FREE COMPRESSED AIR TO BLOW OUT RESIDUE FROM THE SEAL GROOVE OPENING.
5. PREPARE BONDING SURFACES AND INSTALL JOINT SEAL IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
6. DO NOT EXCEED 3X ELONGATION OF SEAL, IF STRETCHING OCCURS.

NOTES:

1. FOR LOCATION OF SECTIONS A-A, C-C, D-D AND E-E, SEE SHEET 31 OF 40.
2. FOR DECK DETAILS, SEE SHEET 30 OF 40.
3. FOR REINFORCEMENT BAR LIST, SEE SHEETS 36 AND 37 OF 40.
4. FOR APPROACH SLAB DETAILS, SEE SHEETS 33 AND 34 OF 40.
5. FOR DOWEL DETAIL, SEE SHEET 23 OF 40.



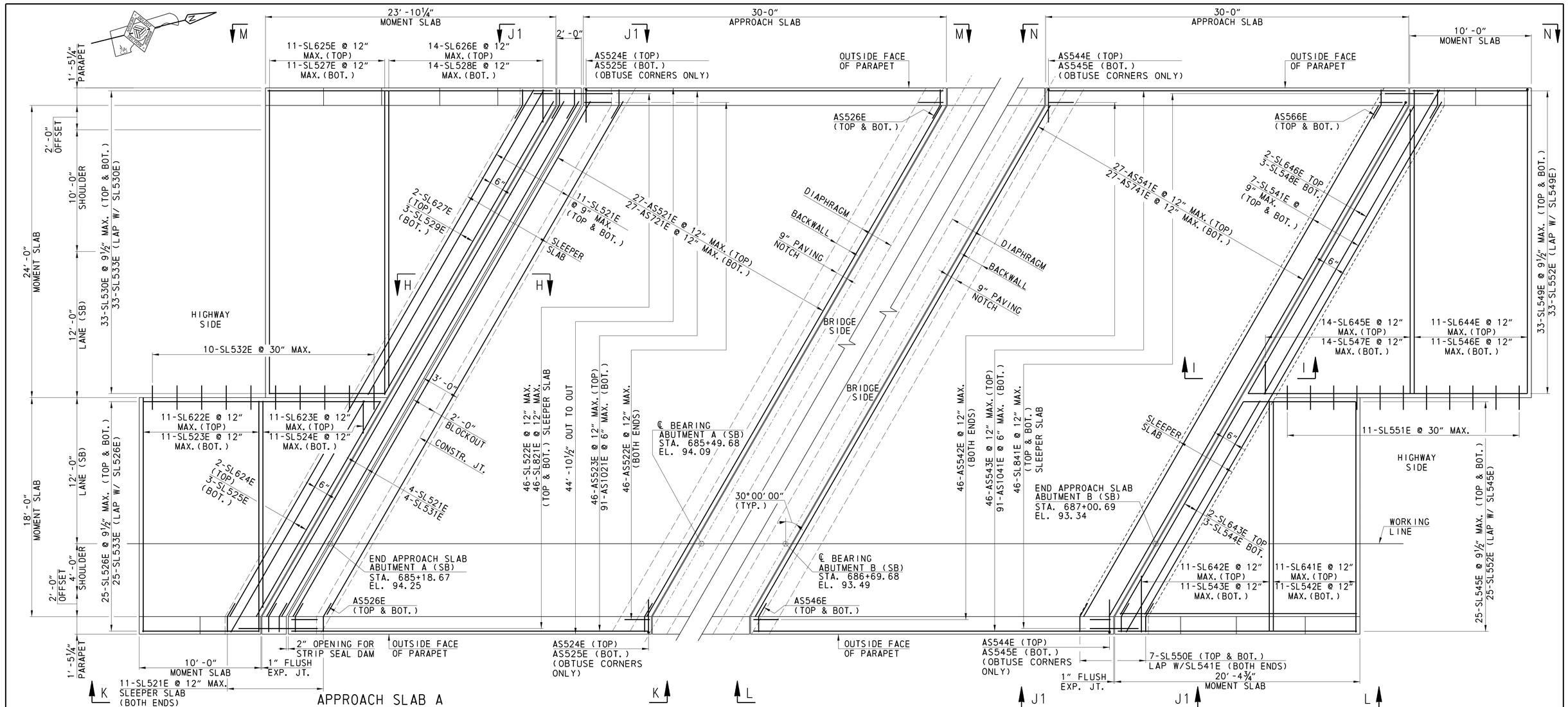
**DELAWARE DEPARTMENT OF TRANSPORTATION**

ADDENDUMS / REVISIONS

SCALE: AS NOTED

**US 301, SR 896 TO SR 1**

| | | | |
|---|---|---|---|
| CONTRACT T200911308 | BRIDGE NO. 1-466 N&S | DIAPHRAGM DETAILS – 2 (SB) | SHEET NO. 572 |
| COUNTY NEW CASTLE | DESIGNED BY: MDM/ZAA | | TOTAL SHTS. 875 |
| | CHECKED BY: BJH | | |

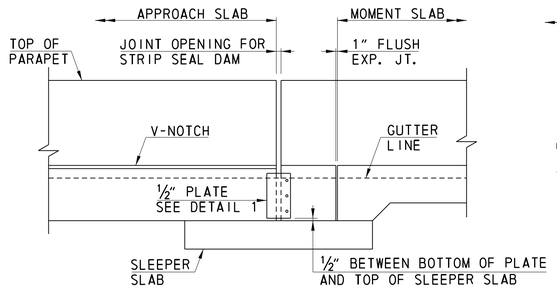



## APPROACH SLAB A

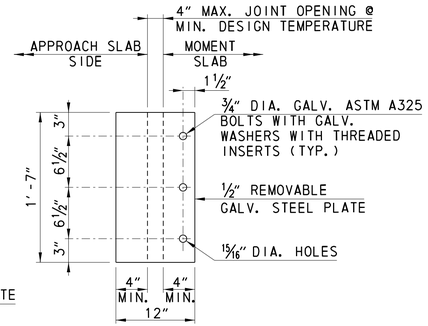
## APPROACH SLAB B

## APPROACH SLABS - PLAN (SB)

SCALE: ¼" = 1'-0"




SECTION J1-J1
NOT TO SCALE




DETAIL 1
NOT TO SCALE

### APPROACH SLAB NOTES

- PROVIDE CLASS D CONCRETE IN APPROACH SLAB, HEADER SLAB, SLEEPER SLAB AND MOMENT SLAB.
- PROVIDE CLASS A CONCRETE IN PARAPETS.
- A HIGHER CLASS OF CONCRETE MAY BE SUBSTITUTED FOR A LOWER CLASS OF CONCRETE AT NO ADDITIONAL COST TO THE DEPARTMENT.
- PLACE APPROACH SLAB CONCRETE WITH A MOTORIZED, MECHANICAL FINISHING MACHINE.
- PLACE CONCRETE IN ONE CONTINUOUS OPERATION, UNLESS OTHERWISE INDICATED OR DIRECTED.
- LONGITUDINAL KEYED CONSTRUCTION JOINTS ARE PERMITTED IN THE APPROACH SLAB BETWEEN THE SHOULDER AND THE LANE LINE.
- CONSTRUCT BRIDGE APPROACH SLAB AFTER THE BRIDGE DECK SLAB IS CONSTRUCTED.
- PROVIDE GRADE 60 DEFORMED REINFORCING BARS THAT MEET THE REQUIREMENTS OF AASHTO M31.
- EPOXY COAT ALL REINFORCEMENT BARS.

### NOTES:

1. FOR SECTIONS H-H AND I-I, SEE SHEET 34 OF 40.
2. FOR SECTIONS K-K, L-L, M-M AND N-N, SEE SHEET 35 OF 40.
3. FOR REINFORCEMENT BAR LIST, SEE SHEET 37 OF 40.
4. FOR APPROACH SLAB JOINT DETAILS AT END OF BRIDGE DECK, SEE SHEET 32 OF 40.
5. PAYMENT FOR GALVANIZED STEEL PLATE AND HARDWARE SHALL BE INCIDENTAL TO APPROACH SLAB CONSTRUCTION.

### LEGEND

| | | | |
|---|---|---|---|
| BOT. | = BOTTOM | JT. | = JOINT |
| GALV. | = GALVANIZED | MAX. | = MAXIMUM |
| CONSTR. | = CONSTRUCTION | MIN. | = MINIMUM |
| DIA. | = DIAMETER | SB | = SOUTHBOUND |
| EL. | = ELEVATION | STA. | = STATION |
| EXP. | = EXPANSION | TYP. | = TYPICAL |



DELAWARE DEPARTMENT OF TRANSPORTATION

ADDENDUMS / REVISIONS

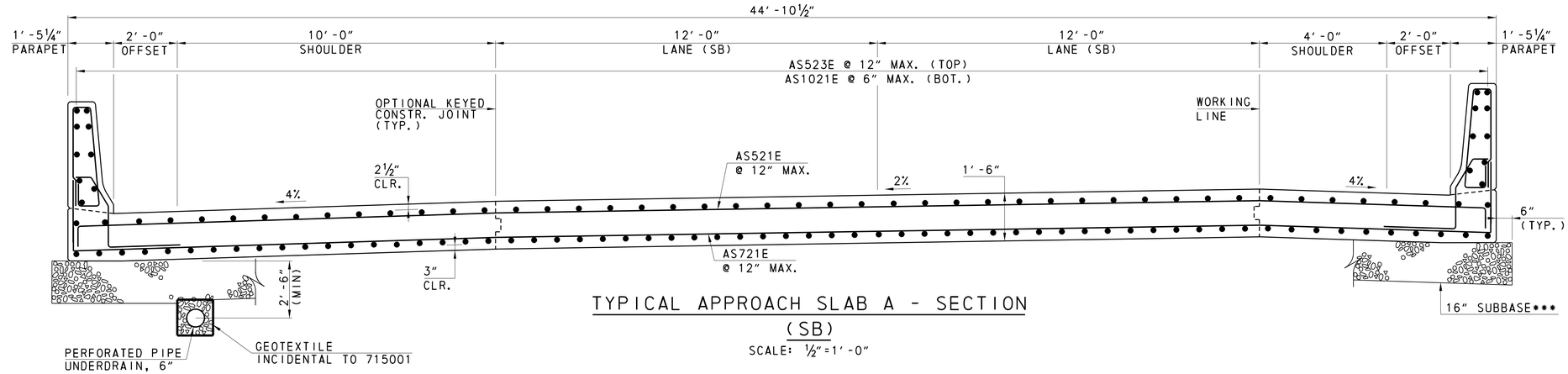
SCALE: AS NOTED

**US 301, SR 896 TO SR 1**

| CONTRACT | BRIDGE NO. 1-466 N&S |
|---|---|
| T200911308 | DESIGNED BY: AKW |
| COUNTY | CHECKED BY: MDM |
| NEW CASTLE | |

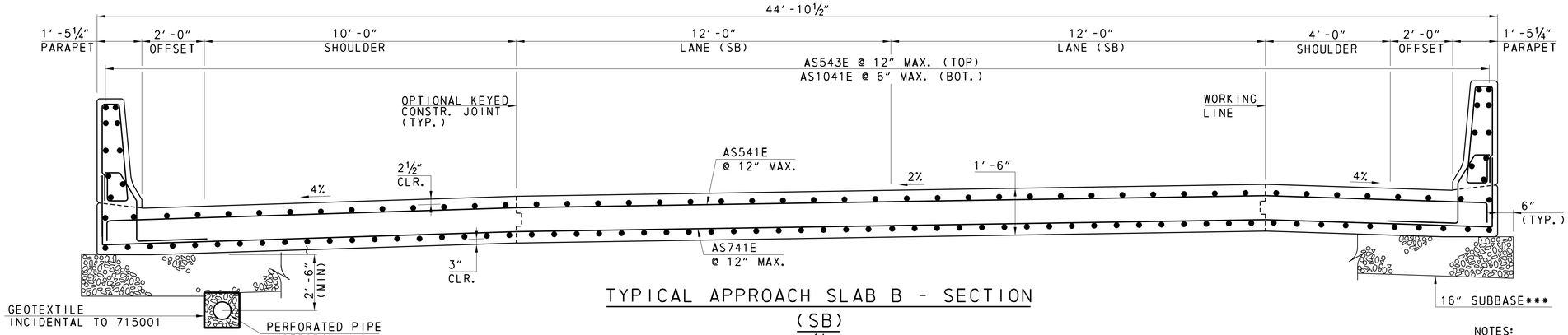
**APPROACH SLAB – 1 (SB)**

| SHEET NO. |
|---|
| 573 |
| TOTAL SHTS. |
| 875 |



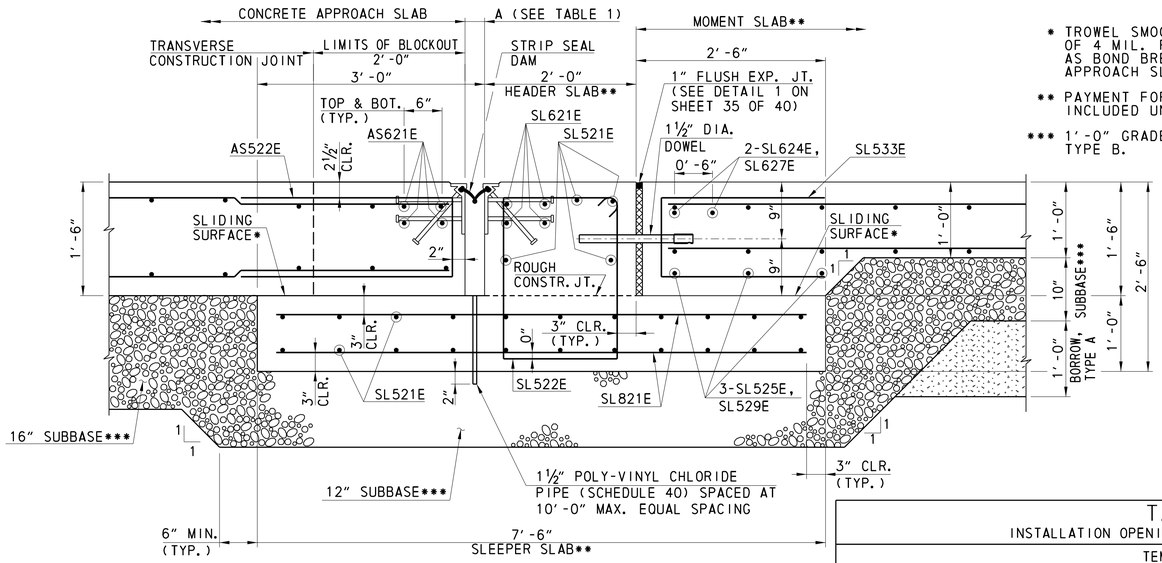

## TYPICAL APPROACH SLAB A - SECTION (SB)

SCALE: ½″=1′-0″



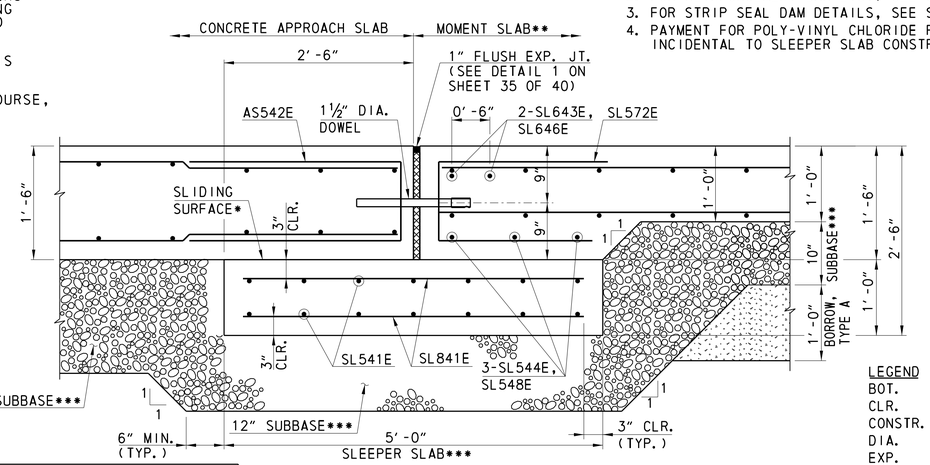

## TYPICAL APPROACH SLAB B - SECTION (SB)

SCALE: ¼″=1′-0″




## SECTION H-H

SCALE: ¾″=1′-0″




## SECTION I-I

SCALE: ¾″=1′-0″

* TROWEL SMOOTH AND PLACE 2 LAYERS OF 4 MIL. POLYETHYLENE SHEETING AS BOND BREAKER. INCIDENTAL TO APPROACH SLAB PAYMENT.

** PAYMENT FOR CLASS D CONCRETE IS INCLUDED UNDER 602014.

*** 1′-0″ GRADED AGGREGATE BASE COURSE, TYPE B.

### TABLE - 1

INSTALLATION OPENING "A" @ VARIOUS TEMPERATURES

| TEMPERATURE (°F) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10 | 20 | 30 | 32 | 40 | 50 | 60 | 68 | 70 | 80 | 90 | 100 |
| 0′-2⅝″ | 0′-2½″ | 0′-2⅜″ | 0′-2⅜″ | 0′-2⅛″ | 0′-2⅛″ | 0′-2⅛″ | 0′-2″ | 0′-1⅝″ | 0′-1⅞″ | 0′-1¾″ | 0′-1⅝″ |

NOTES:

1. FOR LOCATION OF SECTIONS H-H AND I-I, SEE SHEET 33 OF 40.
2. FOR REINFORCEMENT BAR LIST, SEE SHEET 37 OF 40.
3. FOR STRIP SEAL DAM DETAILS, SEE SHEET 38 OF 40.
4. PAYMENT FOR POLY-VINYL CHLORIDE PIPE SHALL BE INCIDENTAL TO SLEEPER SLAB CONSTRUCTION.

LEGEND

| | | |
|---|---|---|
| BOT. | = | BOTTOM |
| CLR. | = | CLEAR |
| CONSTR. | = | CONSTRUCTION |
| DIA. | = | DIAMETER |
| EXP. | = | EXPANSION |
| JT. | = | JOINT |
| MAX. | = | MAXIMUM |
| MIN. | = | MINIMUM |
| SB | = | SOUTHBOUND |
| TYP. | = | TYPICAL |



DELAWARE DEPARTMENT OF TRANSPORTATION

ADDENDUMS / REVISIONS

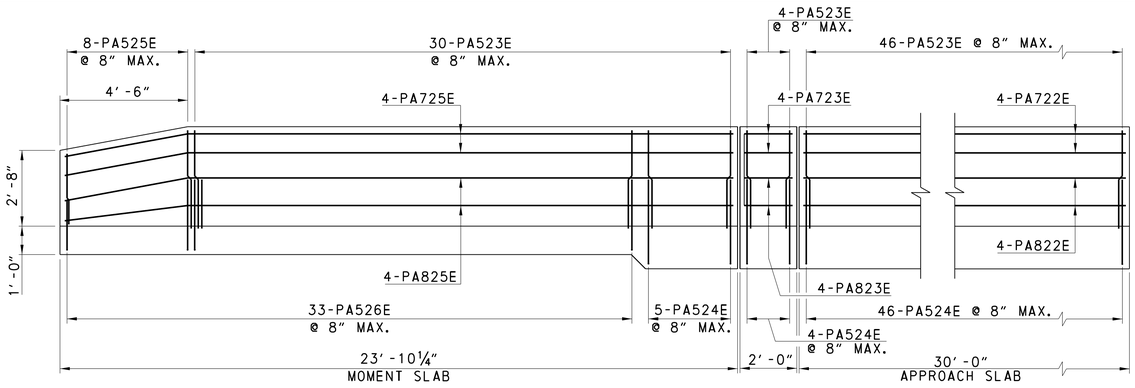
SCALE: AS NOTED

**US 301, SR 896 TO SR 1**

| CONTRACT | BRIDGE NO. 1-466 N&S |
|---|---|
| T200911308 | DESIGNED BY: AKW |
| COUNTY | CHECKED BY: MDM |
| NEW CASTLE | |

**APPROACH SLAB - 2 (SB)**

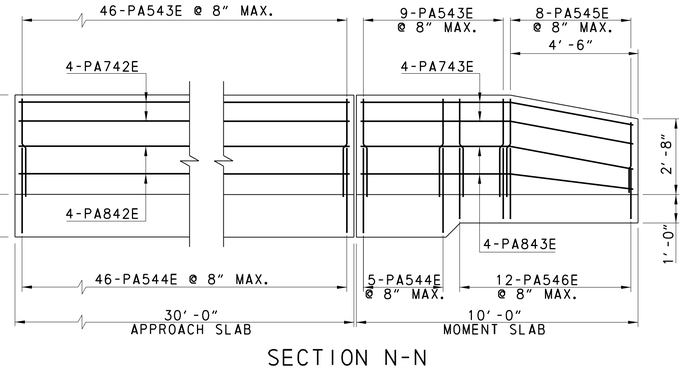
| SHEET NO. | |
|---|---|
| 574 | |
| TOTAL SHTS. | |
| 875 | |



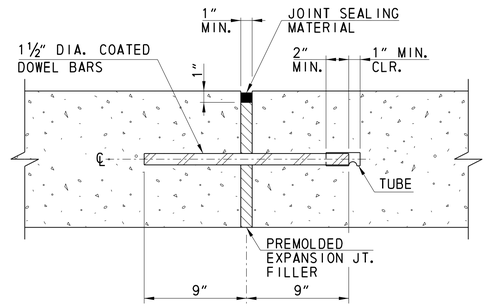

## SECTION M-M

## PARAPET ELEVATION

SCALE: ⅜" = 1'-0"

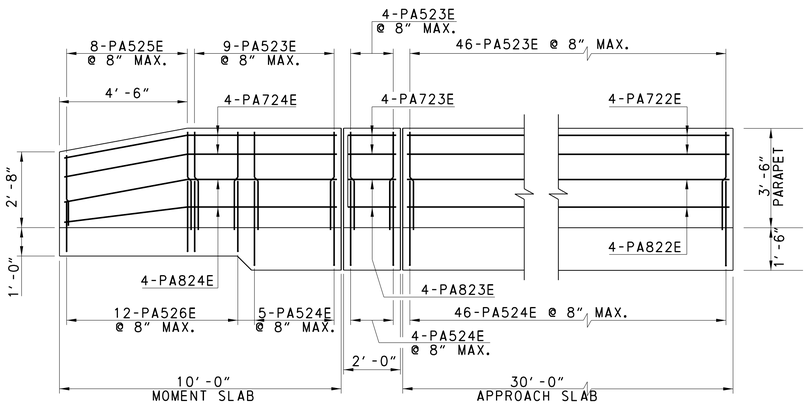



## SECTION N-N

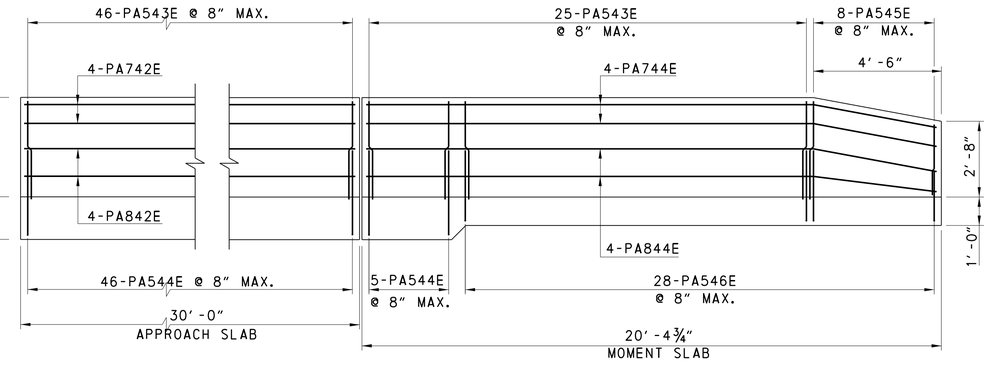



## DETAIL 1

NOT TO SCALE



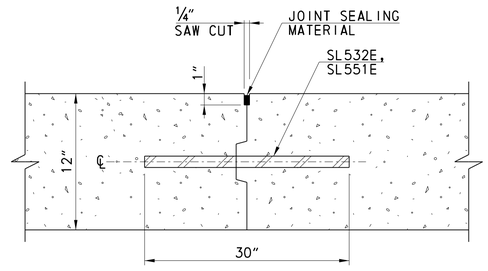

## SECTION K-K




## PARAPET ELEVATION

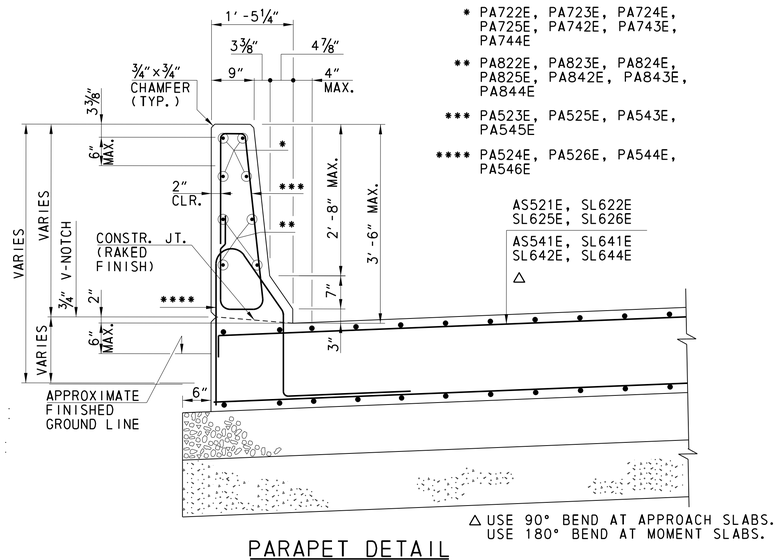
SCALE: ⅜" = 1'-0"

## SECTION L-L




## DETAIL 2

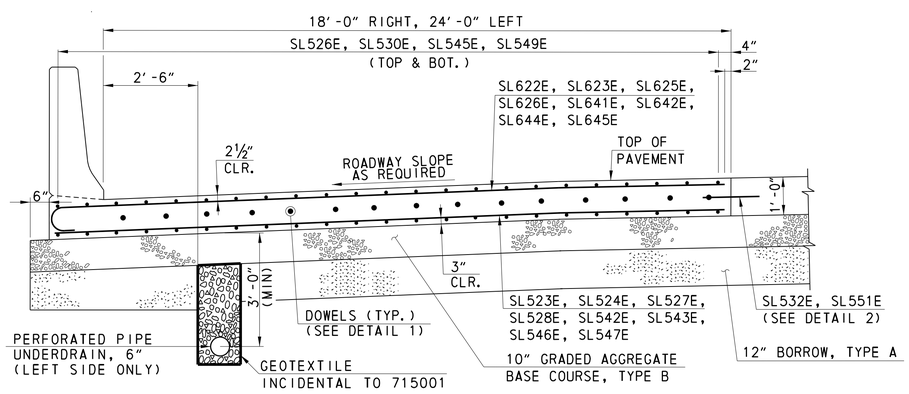
NOT TO SCALE




△ USE 90° BEND AT APPROACH SLABS.
USE 180° BEND AT MOMENT SLABS.

## PARAPET DETAIL

SCALE: ¼" = 1'-0"




## MOMENT SLAB (AT GRADE) WITH TYPICAL C.I.P. BARRIER

SCALE: ½" = 1'-0"

NOTES:

1. PROVIDE DOWELS AT EXPANSION JOINTS.
2. PLACE A TUBE FROM AN APPROVED MANUFACTURER OVER THE LUBRICATED END OF ALL DOWEL BARS AND PROVIDE A MINIMUM 1" CLEARANCE POCKET ASSURED BY MEANS OF A POSITIVE SPACING DEVICE.
3. CUT EXPANSION JOINT FILLER MATERIAL TO CONFORM TO CROSS SECTION OF THE PAVEMENT AND FURNISH IN STRIPS EQUAL TO THE WIDTH OF THE PAVEMENT SLAB. MAKE THE TOP SURFACE SMOOTH AND HAVE HOLES PUNCHED FOR THE DOWEL BARS. PROVIDE A SNUG FIT WITHOUT LOSS IN THICKNESS OF THE MATERIAL. PAYMENT SHALL BE INCIDENTAL TO APPROACH SLAB CONSTRUCTION.
4. CONSTRUCT ALL TRANSVERSE JOINTS PERPENDICULAR TO THE CENTERLINE.
5. USE 1½" DIA. x 18" LONG DOWEL BARS. APPROVED ALTERNATE DOWEL BARS HAVING EQUIVALENT PROPERTIES TO CONVENTIONAL ROUND DOWEL BARS MAY BE USED. COATED DOWEL BARS SHALL CONFORM TO DELDOT STANDARD SPECIFICATION 824.02 (g). PAYMENT SHALL BE INCIDENTAL TO APPROACH SLAB CONSTRUCTION.
6. PLACE DOWEL BARS PARALLEL TO THE CENTERLINE AND SURFACE OF THE SLAB.
7. MAKE THE TOP OF THE JOINT SEALING MATERIAL FROM ⅛" TO ¼" BELOW THE SURFACE OF THE PAVEMENT. USE HEAT RESISTANT JOINT BACKING MATERIAL FOR HOT POURED JOINTS. PAYMENT SHALL BE INCIDENTAL TO APPROACH SLAB AND MOMENT SLAB CONSTRUCTION.
8. FOR REINFORCEMENT BAR LIST, SEE SHEETS 28 AND 29 OF 40.
9. SLIP FORMING FOR PARAPETS IS NOT PERMITTED.
10. FOR LOCATION OF SECTIONS D-D, E-E, F-F AND G-G, SEE SHEET 25 OF 40.

LEGEND

| | | |
|---|---|---|
| BOT. | = | BOTTOM |
| C.I.P. | = | CAST-IN-PLACE |
| CLR. | = | CLEAR |
| DIA. | = | DIAMETER |
| JT. | = | JOINT |
| MAX. | = | MAXIMUM |
| MIN. | = | MINIMUM |
| NB | = | NORTHBOUND |
| TYP. | = | TYPICAL |



**DELAWARE DEPARTMENT OF TRANSPORTATION**

ADDENDUMS / REVISIONS

SCALE: AS NOTED

**US 301, SR 896 TO SR 1**

| | | | |
|---|---|---|---|
| CONTRACT T200911308 | BRIDGE NO. | 1-466 N&S | SHEET NO. 575 |
| COUNTY NEW CASTLE | DESIGNED BY: AKW | | TOTAL SHTS. 875 |
| | CHECKED BY: MDM | | |

**APPROACH SLAB - 3 (SB)**

(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) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| QTY. | SIZE | LENGTH | MARK | TYPE | A | B | C | D | E | F/R | G | H | J | K | O |
| **DECK, DIAPHRAGM, BRIDGE PARAPET (SB)** | | | | | | | | | | | | | | | |
| 303 | 5 | 42-30 | DK521E | STR | | 42-30 | | | | | | | | | |
| 154 | 5 | 45-82 | DK522E | 1 | 0-70 | 44-62 | | | | | 0-70 | | 0-50 | | |
| 2X33 | 5 | 9-50 | DK523E | 1 | 0-00 | 8-100 | | | | | 0-70 | | 0-50 | | |
| | | TO 44-30 | | | TO 0-00 | TO 43-80 | | | | | TO 0-70 | | TO 0-50 | | |
| 2X7 | 5 | 3-10 | DK524E | 1 | 0-00 | 2-60 | | | | | 0-70 | | 0-50 | | |
| | | TO 8-40 | | | TO 0-00 | TO 7-90 | | | | | TO 0-70 | | TO 0-50 | | |
| 193 | 5 | 39-100 | DK525E | STR | | 39-100 | | | | | | | | | |
| 2X42 | 5 | 8-80 | DK526E | STR | | 8-80 | | | | | | | | | |
| | | TO 43-102 | | | | TO 43-102 | | | | | | | | | |
| 2X9 | 5 | 2-60 | DK527E | STR | | 2-60 | | | | | | | | | |
| | | TO 7-100 | | | | TO 7-100 | | | | | | | | | |
| 374 | 5 | 7-40 | DK528E | 1 | 0-00 | 6-90 | | | | | 0-70 | | 0-50 | | |
| 150 | 5 | 6-82 | DK529E | S4 | 1-00 | 0-61 | 3-80 | 0-61 | | | 1-00 | | | | |
| 20 | 5 | 20-00 | DK530E | STR | | 20-00 | | | | | | | | | |
| 6 | 6 | 49-90 | DK621E | STR | | 49-90 | | | | | | | | | |
| 4 | 6 | 51-50 | DK622E | STR | | 51-50 | | | | | | | | | |
| 8 | 6 | 5-112 | DK623E | STR | | 5-112 | | | | | | | | | |
| 4 | 6 | 1-31 | DK624E | STR | | 1-31 | | | | | | | | | |
| 72 | 5 | 6-80 | MS521E | STR | | 6-80 | | | | | | | | | |
| 11 | 5 | 51-52 | MS522E | STR | | 51-52 | | | | | | | | | |
| 20 | 5 | 7-30 | MS523E | STR | | 7-30 | | | | | | | | | |
| 4 | 5 | 9-12 | MS524E | STR | | 9-12 | | | | | | | | | |
| 36 | 5 | 3-72 | MS525E | STR | | 3-72 | | | | | | | | | |
| 10 | 5 | 1-111 | MS526E | STR | | 1-111 | | | | | | | | | |
| 2 | 5 | 2-103 | MS527E | STR | | 2-103 | | | | | | | | | |
| 80 | 5 | 6-00 | MS528E | STR | | 6-00 | | | | | | | | | |
| 8 | 5 | 8-20 | MS529E | STR | | 8-20 | | | | | | | | | |
| 16 | 5 | 5-100 | MS530E | 1 | 0-00 | 5-30 | | | | | 0-70 | | 0-50 | | |
| 84 | 5 | 10-112 | MS531E | 17 | | 4-60 | 1-112 | 4-60 | | | | | | | |
| 84 | 5 | 4-90 | MS532E | 16 | 0-00 | 0-00 | 1-30 | 3-60 | | | | 2-53 | | 2-53 | 3-83 |
| 132 | 5 | 5-00 | MS533E | 17 | | 2-60 | 2-60 | 0-00 | | | | | | | |
| 84 | 5 | 6-52 | MS534E | 17 | | 2-30 | 1-112 | 2-30 | | | | | | | |
| 64 | 5 | 6-30 | MS535E | 17 | | 2-100 | 0-70 | 2-100 | | | | | | | |
| 140 | 5 | 3-101 | MS536E | 17 | | 1-00 | 1-101 | 1-00 | | | | | | | |
| 132 | 6 | 5-20 | MS621E | 31 | | 1-00 | 3-60 | | | | 0-80 | 0-91 | 0-60 | 0-73 | |
| 8 | 6 | 9-110 | MS622E | STR | | 9-110 | | | | | | | | | |
| 4 | 6 | 3-50 | MS623E | STR | | 3-50 | | | | | | | | | |
| 32 | 6 | 6-80 | MS624E | STR | | 6-80 | | | | | | | | | |

| SPECIFICATIONS | | | | | BENDING DIMENSIONS (FEET-INCHES /QUARTER INCH) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| QTY. | SIZE | LENGTH | MARK | TYPE | A | B | C | D | E | F/R | G | H | J | K | O |
| 1 | 6 | 51-52 | MS625E | STR | | 51-52 | | | | | | | | | |
| 8 | 6 | 3-72 | MS626E | STR | | 3-72 | | | | | | | | | |
| 396 | 5 | 7-72 | PA521E | 28 | | 2-91 | 0-12 | 2-92 | | | | | | | |
| 396 | 5 | 5-22 | PA522E | 29 | | 0-63 | 1-72 | | | | | | | | |
| 24 | 7 | 44-00 | PA721E | STR | | 44-00 | | | | | | | | | |
| 24 | 8 | 45-10 | PA821E | STR | | 45-10 | | | | | | | | | |

| SPECIFICATIONS | | | | | BENDING DIMENSIONS (FEET-INCHES /QUARTER INCH) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| QTY. | SIZE | LENGTH | MARK | TYPE | A | B | C | D | E | F/R | G | H | J | K | O |

### ASTM STANDARD ENGLISH REINFORCING BARS

| BAR SIZE | NOMINAL DIMENSIONS: DIAMETER (INCHES) | NOMINAL DIMENSIONS: AREA (INCHES²) | NOMINAL DIMENSIONS: WEIGHT (LBS./FT.) |
|---|---|---|---|
| 3 | 0.375 | 0.110 | 0.376 |
| 4 | 0.500 | 0.200 | 0.668 |
| 5 | 0.625 | 0.310 | 1.043 |
| 6 | 0.750 | 0.440 | 1.502 |
| 7 | 0.875 | 0.600 | 2.044 |
| 8 | 1.000 | 0.790 | 2.670 |
| 9 | 1.128 | 1.000 | 3.400 |
| 10 | 1.270 | 1.270 | 4.303 |
| 11 | 1.410 | 1.560 | 5.313 |
| 14 | 1.693 | 2.250 | 7.650 |
| 18 | 2.257 | 4.000 | 13.600 |

### RECOMMENDED END HOOKS, APPLICABLE TO ALL GRADES

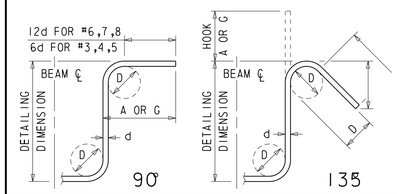
| BAR SIZE | 180° HOOKS: D | 180° HOOKS: A OR G | 180° HOOKS: J | 90° HOOKS: A OR G |
|---|---|---|---|---|
| 3 | 2¼" | 5" | 3" | 6" |
| 4 | 3" | 6" | 4" | 8" |
| 5 | 3¾" | 7" | 5" | 10" |
| 6 | 4½" | 8" | 6" | 1-0" |
| 7 | 5¼" | 10" | 7" | 1-2" |
| 8 | 6" | 11" | 8" | 1-4" |
| 9 | 9½" | 1-3" | 11¾" | 1-7" |
| 10 | 10¾" | 1-5" | 1-1¼" | 1-10" |
| 11 | 1-0" | 1-7" | 1-2¾" | 2-0" |
| 14 | 1-6¼" | 2-3" | 1-9¾" | 2-7" |
| 18 | 2-0" | 3-0" | 2-4½" | 3-5" |

### STIRRUP AND TIE HOOKS, APPLICABLE TO ALL GRADES

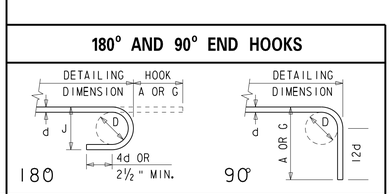
| BAR SIZE | 90° HOOK: D | 90° HOOK: A OR G | 135° HOOK: A OR G | 135° HOOK: A OR G |
|---|---|---|---|---|
| 3 | 1½" | 4" | 4" | 2½" |
| 4 | 2" | 4½" | 4½" | 3" |
| 5 | 2½" | 6" | 5½" | 3¾" |
| 6 | 4½" | 1-0" | 8" | 4½" |
| 7 | 5¼" | 1-2" | 9" | 5¼" |
| 8 | 6" | 1-4" | 10½" | 6" |

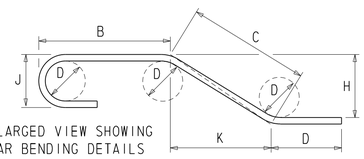
NOTES:
1. FIGURES SHOWN IN CIRCLES REPRESENT BAR BEND TYPES.
2. STANDARD BAR BENDS INCLUDE ONLY THOSE TYPES BELOW, INDICATED AS SUCH.
3. ALL DIMENSIONS OUT-TO-OUT, EXCEPT "A" AND "G" ON STD. 180° AND 135° HOOKS.
4. "J" DIMENSIONS ON 180° HOOKS TO BE SHOWN ONLY WHERE NECESSARY TO RESTRICT HOOK SIZE, OTHERWISE STANDARD 'ACI' HOOKS ARE TO BE USED.
5. 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.
6. "H" DIMENSIONS OF STIRRUPS TO BE SHOWN AS NEEDED TO FIT WITHIN THE CONCRETE.
7. UNLESS OTHERWISE NOTED, DIAMETER "D" IS THE SAME FOR ALL BENDS AND HOOKS ON A BAR (EXCEPT FOR BEND TYPES 11 AND 13).
8. WHERE SLOPE DIFFERS FROM 45° OFFSET, "H" AND "K" MUST BE SHOWN.
9. WHERE BARS ARE TO BE BENT MORE ACCURATELY THAN STANDARD BENDING TOLERANCES, BENDING DIMENSIONS REQUIRING CLOSER FABRICATION SHOULD HAVE LIMITS INDICATED.
10. FOR RECOMMENDED DIAMETER "D", OF BENDS, HOOKS, ETC., REFER TO TABLE ABOVE, 'CRSI' OR 'ACI' TABLES WHERE APPLICABLE AND REQUIRED.
11. TYPE S1-S6, S11, T1-T3 AND T6-T9 APPLICABLE TO BAR SIZES #3 THROUGH #8.

### STIRRUP AND TIE HOOKS

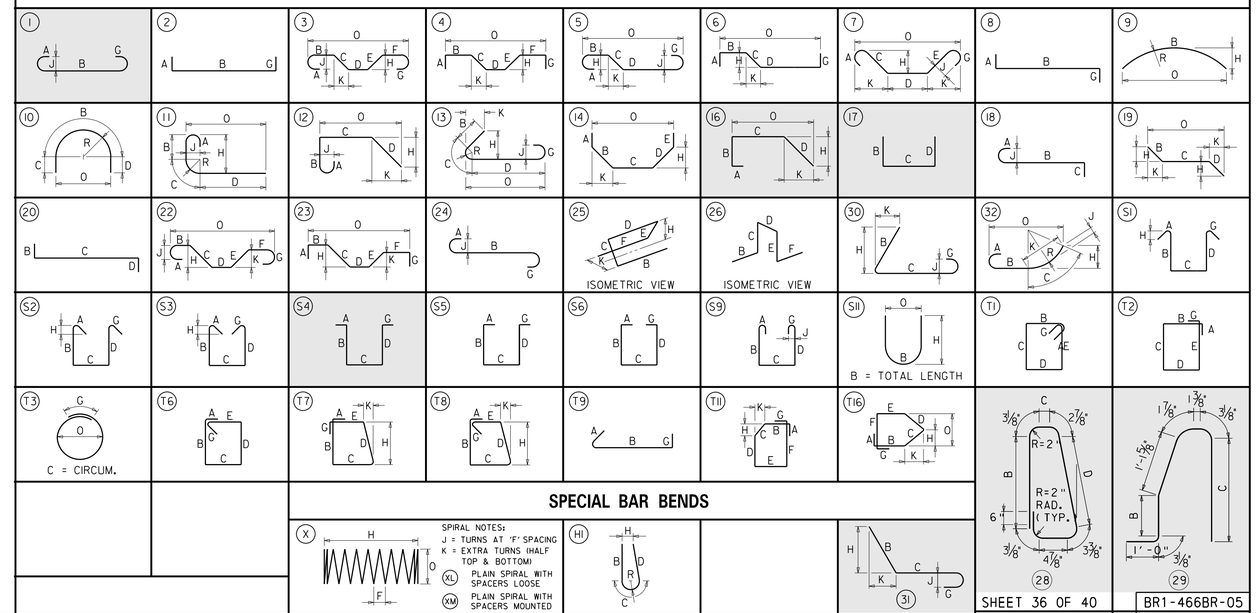



### 180° AND 90° END HOOKS




### STANDARD BAR BENDS




### SPECIAL BAR BENDS







SHEET 36 OF 40

BR1-466BR-05

**DELAWARE DEPARTMENT OF TRANSPORTATION**

ADDENDUMS / REVISIONS

NOT TO SCALE

**US 301, SR 896 TO SR 1**

| CONTRACT | BRIDGE NO. | 1-466 N&S |
|---|---|---|
| T200911308 | DESIGNED BY: AKW | |
| COUNTY | CHECKED BY: ZAA | |
| NEW CASTLE | | |

**SUPERSTRUCTURE REINFORCEMENT BAR LIST - 1 (SB)**

| SHEET NO. |
|---|
| 576 |
| TOTAL SHTS. |
| 875 |

(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

* VARY AT EQUAL INCREMENTS

| SPECIFICATIONS | | | | | BENDING DIMENSIONS (FEET-INCHES /QUARTER INCH) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| QTY. | SIZE | LENGTH | MARK | TYPE | A | B | C | D | E | F/R | G | H | J | K | O |
| **APPROACH SLAB, MOMENT SLAB, SLEEPER SLAB, HEADER SLAB, PARAPET AT ABUTMENT A (SB)** | | | | | | | | | | | | | | | |
| 27 | 5 | 53-50 | AS521E | 17 | | 1-00 | 51-50 | 1-00 | | | | | | | |
| 92 | 5 | 6-62 | AS522E | 17 | | 2-90 | 1-02 | 2-90 | | | | | | | |
| 46 | 5 | 29-80 | AS523E | STR | | 29-80 | | | | | | | | | |
| 2 | 5 | 4-113 | AS524E | 17 | | 0-113 | 4-00 | 0-00 | | | | | | | |
| 2 | 5 | 4-00 | AS525E | STR | | 4-00 | | | | | | | | | |
| 4 | 5 | 3-31 | AS526E | 16 | 0-00 | 0-00 | 1-31 | 2-00 | | | | 1-00 | | 1-83 | 3-00 |
| 4 | 6 | 51-50 | AS621E | STR | | 51-50 | | | | | | | | | |
| 27 | 7 | 51-50 | AS721E | STR | | 51-50 | | | | | | | | | |
| 91 | 10 | 29-80 | AS1021E | STR | | 29-80 | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| 22 | 5 | 51-50 | SL521E | STR | | 51-50 | | | | | | | | | |
| 46 | 5 | 8-00 | SL522E | T1 | 0-52 | 1-60 | 2-02 | 1-60 | 2-02 | | 0-52 | | | | |
| 11 | 5 | 19-11 | SL523E | STR | | 19-11 | | | | | | | | | |
| 1X11 | 5 | 2-60 | SL524E | STR | | 2-60 | | | | | | | | | |
| | | TO 16-03 | | | | TO 16-03 | | | | | | | | | |
| 3 | 5 | 22-10 | SL525E | STR | | 22-10 | | | | | | | | | |
| 2X25 | 5 | 9-80 | SL526E | STR | | 9-80 | | | | | | | | | |
| | | TO19-111 | | | | TO19-111 | | | | | | | | | |
| 11 | 5 | 25-11 | SL527E | STR | | 25-11 | | | | | | | | | |
| 1X14 | 5 | 2-60 | SL528E | STR | | 2-60 | | | | | | | | | |
| | | TO 23-42 | | | | TO 23-42 | | | | | | | | | |
| 3 | 5 | 27-63 | SL529E | STR | | 27-63 | | | | | | | | | |
| 2X33 | 5 | 9-83 | SL530E | STR | | 9-80 | | | | | | | | | |
| | | TO 23-61 | | | | TO 23-61 | | | | | | | | | |
| 52 | 5 | 3-31 | SL531E | 16 | 0-00 | 0-00 | 1-31 | 2-00 | | | | 1-00 | | 1-83 | 3-00 |
| 10 | 5 | 2-60 | SL532E | STR | | 2-60 | | | | | | | | | |
| 58 | 5 | 5-82 | SL533E | 17 | | 2-40 | 1-02 | 2-40 | | | | | | | |
| 4 | 6 | 51-50 | SL621E | STR | | 51-50 | | | | | | | | | |
| 11 | 6 | 19-91 | SL622E | 1 | 0-80 | 19-11 | | | | | 0-00 | | 0-60 | | |
| 1X11 | 6 | 3-20 | SL623E | 1 | 0-80 | 2-60 | | | | | 0-00 | | 0-60 | | |
| | | TO 16-83 | | | TO 0-80 | TO 16-03 | | | | | TO 0-00 | | TO 0-60 | | |
| 2 | 6 | 22-10 | SL624E | STR | | 22-10 | | | | | | | | | |
| 11 | 6 | 25-91 | SL625E | 1 | 0-80 | 25-11 | | | | | 0-00 | | 0-60 | | |
| 1X14 | 6 | 3-20 | SL626E | 1 | 0-80 | 2-60 | | | | | 0-00 | | 0-60 | | |
| | | TO 24-02 | | | TO 0-80 | TO 23-42 | | | | | TO 0-00 | | TO 0-60 | | |
| 2 | 6 | 27-63 | SL627E | STR | | 27-63 | | | | | | | | | |
| 92 | 8 | 7-00 | SL821E | STR | | 7-00 | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| 139 | 5 | 7-72 | PA523E | 28 | | 2-91 | 0-12 | 2-92 | | | | | | | |
| 110 | 5 | 6-102 | PA524E | 29 | | 1-43 | 2-52 | | | | | | | | |
| 2X8 | 5 | *6-02 | PA525E | 28 | | *1-111 | *0-22 | *1-112 | | | | | | | |
| | | TO *7-72 | | | | TO *2-91 | *0-12 | *2-92 | | | | | | | |
| 45 | 5 | 5-102 | PA526E | 29 | | 0-103 | 1-112 | | | | | | | | |
| 8 | 7 | 29-80 | PA722E | STR | | 29-80 | | | | | | | | | |
| 8 | 7 | 1-80 | PA723E | STR | | 1-80 | | | | | | | | | |
| 4 | 7 | 9-80 | PA724E | 16 | 0-00 | 0-00 | 5-30 | 4-50 | | | | 0-80 | | 4-40 | 9-70 |
| 4 | 7 | 23-71 | PA725E | 16 | 0-00 | 0-00 | 19-21 | 4-50 | | | | 0-80 | | 4-40 | 23-61 |
| 8 | 8 | 29-80 | PA822E | STR | | 29-80 | | | | | | | | | |
| 8 | 8 | 1-80 | PA823E | STR | | 1-80 | | | | | | | | | |
| 4 | 8 | 9-80 | PA824E | 16 | 0-00 | 0-00 | 5-30 | 4-50 | | | | 0-80 | | 4-40 | 9-70 |
| 4 | 8 | 23-71 | PA825E | 16 | 0-00 | 0-00 | 19-21 | 4-50 | | | | 0-80 | | 4-40 | 23-61 |
| | | | | | | | | | | | | | | | |
| **APPROACH SLAB, MOMENT SLAB, SLEEPER SLAB, HEADER SLAB, PARAPET AT ABUTMENT B (SB)** | | | | | | | | | | | | | | | |
| 27 | 5 | 53-50 | AS541E | 17 | | 1-00 | 51-50 | 1-00 | | | | | | | |
| 92 | 5 | 6-62 | AS542E | 17 | | 2-90 | 1-02 | 2-90 | | | | | | | |
| 46 | 5 | 29-80 | AS543E | STR | | 29-80 | | | | | | | | | |
| 2 | 5 | 4-113 | AS544E | 17 | | 0-113 | 4-00 | 0-00 | | | | | | | |
| 2 | 5 | 4-00 | AS545E | STR | | 4-00 | | | | | | | | | |
| 4 | 5 | 3-31 | AS546E | 16 | 0-00 | 0-00 | 1-31 | 2-00 | | | | 1-00 | | 1-83 | 3-00 |
| 27 | 7 | 51-50 | AS741E | STR | | 51-50 | | | | | | | | | |
| 91 | 10 | 29-80 | AS1041E | STR | | 29-80 | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| 14 | 5 | 51-50 | SL541E | STR | | 51-50 | | | | | | | | | |
| 11 | 5 | 19-11 | SL542E | STR | | 19-11 | | | | | | | | | |
| 1X11 | 5 | 2-60 | SL543E | STR | | 2-60 | | | | | | | | | |
| | | TO 17-42 | | | | TO 17-42 | | | | | | | | | |
| 3 | 5 | 20-73 | SL544E | STR | | 20-73 | | | | | | | | | |
| 2X25 | 5 | 9-83 | SL545E | STR | | 9-80 | | | | | | | | | |
| | | TO 20-03 | | | | TO 20-03 | | | | | | | | | |
| 11 | 5 | 25-11 | SL546E | STR | | 25-11 | | | | | | | | | |
| 1X14 | 5 | 2-60 | SL547E | STR | | 2-60 | | | | | | | | | |
| | | TO 22-03 | | | | TO 22-03 | | | | | | | | | |
| 3 | 5 | 28-113 | SL548E | STR | | 28-113 | | | | | | | | | |
| 2X33 | 5 | 9-80 | SL549E | STR | | 9-80 | | | | | | | | | |
| | | TO 23-43 | | | | TO 23-43 | | | | | | | | | |
| 28 | 5 | 3-31 | SL550E | 16 | 0-00 | 0-00 | 1-31 | 2-00 | | | | 1-00 | | 1-83 | 3-00 |
| 11 | 5 | 2-60 | SL551E | STR | 0-00 | 2-60 | | | | | | | 0-00 | | |
| 11 | 5 | 2-60 | SL552E | 17 | 0-80 | 2-40 | 1-02 | 2-40 | | | | | | | |
| 11 | 6 | 19-91 | SL641E | 1 | 0-80 | 19-11 | | | | | | 0-00 | | | 0-60 |
| | | | | | | | | | | | | | | | |
| 1X11 | 6 | 3-20 | SL642E | 1 | 0-80 | 2-60 | | | | | | 0-00 | | 0-60 | |
| | | | | | TO 0-80 | TO 17-42 | | | | | | TO 0-00 | | TO 0-60 | |
| 2 | 6 | 20-73 | SL643E | STR | | 20-73 | | | | | | | | | |
| 11 | 6 | 25-91 | SL644E | 1 | 0-80 | 25-11 | | | | | | 0-00 | | 0-60 | |
| 1X14 | 6 | 3-20 | SL645E | 1 | 0-80 | 2-60 | | | | | | 0-00 | | 0-60 | |
| | | TO 22-83 | | | TO 0-80 | TO 22-03 | | | | | | TO 0-00 | | TO 0-60 | |
| 2 | 6 | 28-113 | SL646E | STR | | 28-113 | | | | | | | | | |
| 92 | 8 | 4-60 | SL841E | STR | | 4-60 | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| 126 | 5 | 7-72 | PA543E | 28 | 2-91 | 0-12 | 2-92 | | | | | | | | |
| 102 | 5 | 6-102 | PA544E | 29 | 1-43 | 2-52 | | | | | | | | | |
| 2X8 | 5 | *6-02 | PA545E | 28 | *1-111 | *0-22 | *1-112 | | | | | | | | |
| | | TO *7-72 | | | TO *2-91 | TO *0-12 | TO *2-92 | | | | | | | | |
| 40 | 5 | 5-102 | PA546E | 29 | 0-103 | 1-112 | | | | | | | | | |
| 8 | 7 | 29-80 | PA742E | STR | | 29-80 | | | | | | | | | |
| 4 | 7 | 20-113 | PA743E | 16 | 0-00 | 0-00 | 15-83 | 4-50 | | | | 0-80 | | 4-40 | 20-03 |
| 4 | 7 | 9-80 | PA744E | 16 | 0-00 | 0-00 | 5-30 | 4-50 | | | | 0-80 | | 4-40 | 9-70 |
| 8 | 8 | 29-80 | PA842E | STR | | 29-80 | | | | | | | | | |
| 4 | 8 | 20-113 | PA843E | 16 | 0-00 | 0-00 | 15-83 | 4-50 | | | | 0-80 | | 4-40 | 20-03 |
| 4 | 8 | 9-80 | PA844E | 16 | 0-00 | 0-00 | 5-30 | 4-50 | | | | 0-80 | | 4-40 | 9-70 |

## ASTM STANDARD ENGLISH REINFORCING BARS

| BAR SIZE | NOMINAL DIMENSIONS: DIAMETER (INCHES) | NOMINAL DIMENSIONS: AREA (INCHES²) | NOMINAL DIMENSIONS: WEIGHT (LBS./FT.) |
|---|---|---|---|
| 3 | 0.375 | 0.110 | 0.376 |
| 4 | 0.500 | 0.200 | 0.668 |
| 5 | 0.625 | 0.310 | 1.043 |
| 6 | 0.750 | 0.440 | 1.502 |
| 7 | 0.875 | 0.600 | 2.044 |
| 8 | 1.000 | 0.790 | 2.670 |
| 9 | 1.128 | 1.000 | 3.400 |
| 10 | 1.270 | 1.270 | 4.303 |
| 11 | 1.410 | 1.560 | 5.313 |
| 14 | 1.693 | 2.250 | 7.650 |
| 18 | 2.257 | 4.000 | 13.600 |

## RECOMMENDED END HOOKS, APPLICABLE TO ALL GRADES

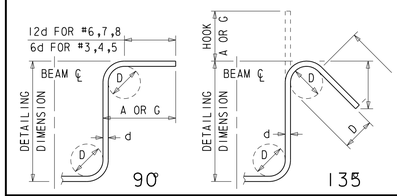
| BAR SIZE | 180° HOOKS: D | 180° HOOKS: A OR G | 180° HOOKS: J | 90° HOOKS: A OR G |
|---|---|---|---|---|
| 3 | 2¼" | 5" | 3" | 6" |
| 4 | 3" | 6" | 4" | 8" |
| 5 | 3¾" | 7" | 5" | 10" |
| 6 | 4½" | 8" | 6" | 1-0" |
| 7 | 5¼" | 10" | 7" | 1-2" |
| 8 | 6" | 11" | 8" | 1-4" |
| 9 | 9½" | 1-3" | 11¾" | 1-7" |
| 10 | 10¾" | 1-5" | 1-1¼" | 1-10" |
| 11 | 1-0" | 1-7" | 1-2¾" | 2-0" |
| 14 | 1-6¼" | 2-3" | 1-9¾" | 2-7" |
| 18 | 2-0" | 3-0" | 2-4½" | 3-5" |

## STIRRUP AND TIE HOOKS, APPLICABLE TO ALL GRADES

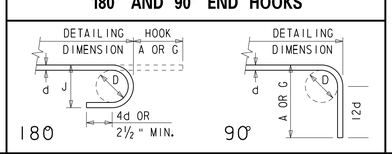
| BAR SIZE | 90° HOOK: D | 90° HOOK: A OR G | 135° HOOK: A OR G | 135° HOOK: A OR G |
|---|---|---|---|---|
| 3 | 1½" | 4" | 4" | 2½" |
| 4 | 2" | 4½" | 4½" | 3" |
| 5 | 2½" | 6" | 5½" | 3¾" |
| 6 | 4½" | 1-0" | 8" | 4½" |
| 7 | 5¼" | 1-2" | 9" | 5¼" |
| 8 | 6" | 1-4" | 10½" | 6" |

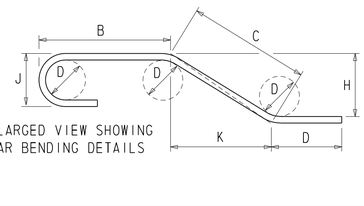
NOTES:
1. FIGURES SHOWN IN CIRCLES REPRESENT BAR BEND TYPES.
2. STANDARD BAR BENDS INCLUDE ONLY THOSE TYPES BELOW, INDICATED AS SUCH.
3. ALL DIMENSIONS OUT-TO-OUT, EXCEPT "A" AND "G" ON STD. 180° AND 135° HOOKS.
4. "J" DIMENSIONS ON 180° HOOKS TO BE SHOWN ONLY WHERE NECESSARY TO RESTRICT HOOK SIZE, OTHERWISE STANDARD 'ACI' HOOKS ARE TO BE USED.
5. 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.
6. "H" DIMENSIONS OF STIRRUPS TO BE SHOWN AS NEEDED TO FIT WITHIN THE CONCRETE.
7. UNLESS OTHERWISE NOTED, DIAMETER "D" IS THE SAME FOR ALL BENDS AND HOOKS ON A BAR (EXCEPT FOR BEND TYPES 11 AND 13).
8. WHERE SLOPE DIFFERS FROM 45° OFFSET, "H" AND "K" MUST BE SHOWN.
9. WHERE BARS ARE TO BE BENT MORE ACCURATELY THAN STANDARD BENDING TOLERANCES, BENDING DIMENSIONS REQUIRING CLOSER FABRICATION SHOULD HAVE LIMITS INDICATED.
10. FOR RECOMMENDED DIAMETER "D", OF BENDS, HOOKS, ETC., REFER TO TABLE ABOVE, 'CRSI' OR 'ACI' TABLES WHERE APPLICABLE AND REQUIRED.
11. TYPE S1-S6, S11, T1-T3 AND T6-T9 APPLICABLE TO BAR SIZES #3 THROUGH #8.

## STIRRUP AND TIE HOOKS

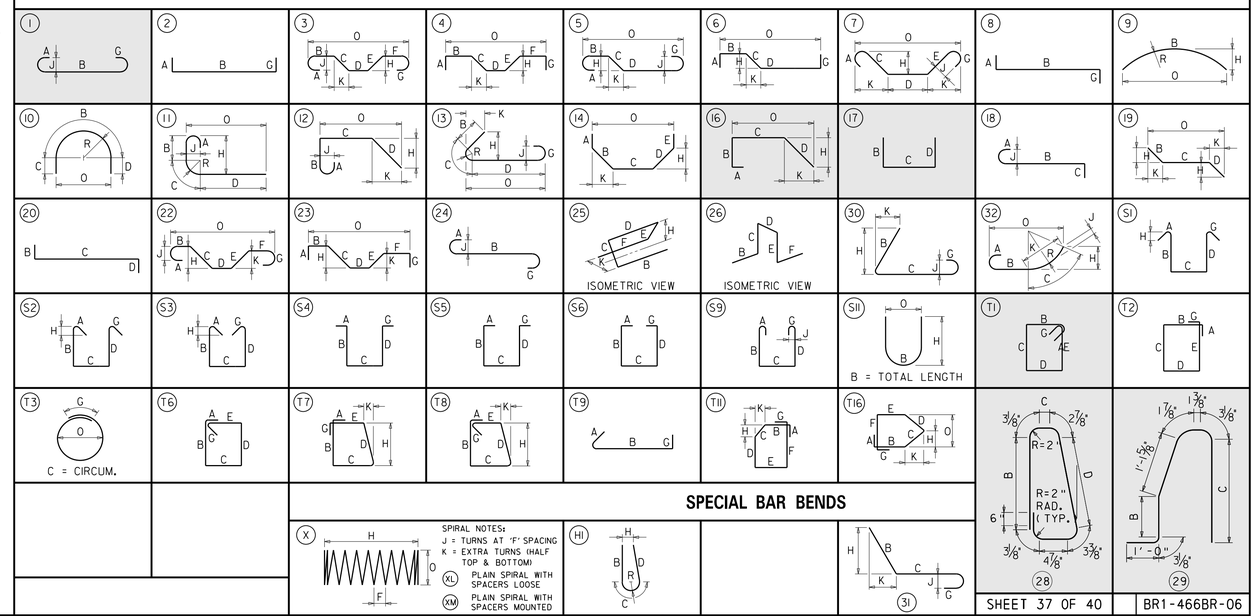



## 180° AND 90° END HOOKS

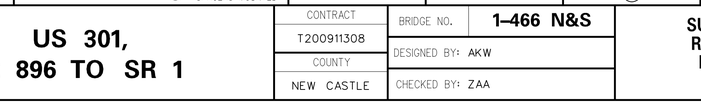



## STANDARD BAR BENDS




## SPECIAL BAR BENDS







ADDENDUMS / REVISIONS

NOT TO SCALE

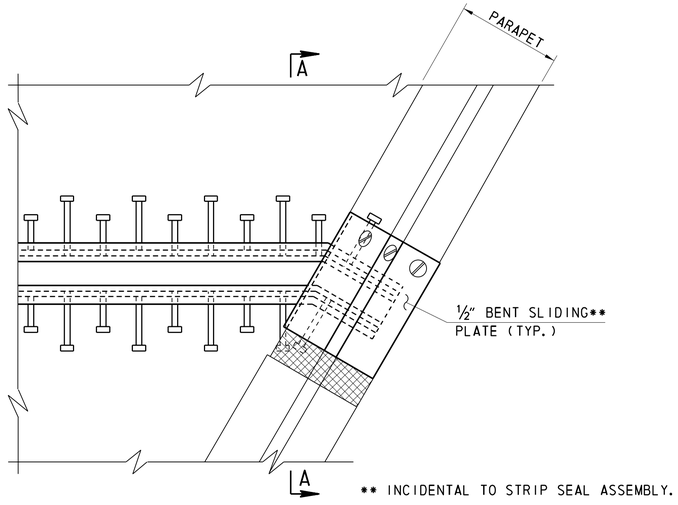
**DELAWARE DEPARTMENT OF TRANSPORTATION**

**US 301, SR 896 TO SR 1**

| CONTRACT | BRIDGE NO. | 1-466 N&S |
|---|---|---|
| T200911308 | DESIGNED BY: AKW | |
| COUNTY | CHECKED BY: ZAA | |
| NEW CASTLE | | |

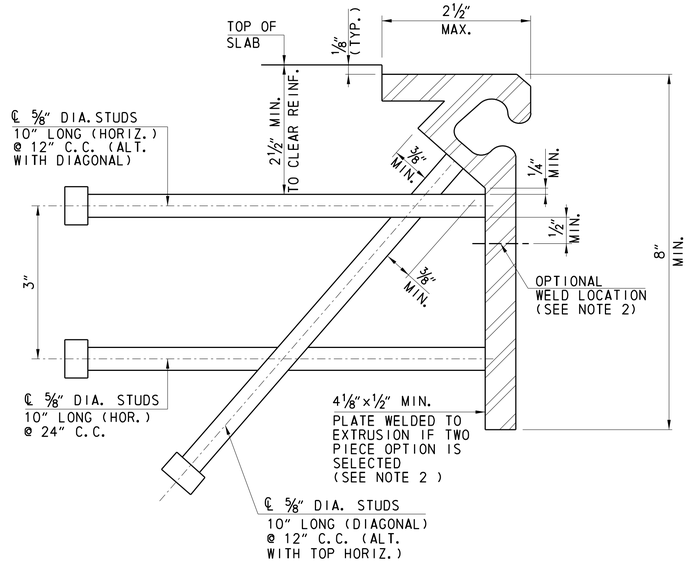
**SUPERSTRUCTURE REINFORCEMENT BAR LIST - 2 (SB)**

| SHEET NO. | TOTAL SHTS. |
|---|---|
| 577 | 875 |




** INCIDENTAL TO STRIP SEAL ASSEMBLY.

## PLAN AT PARAPET
SCALE: 1½"=1'-0"




## EXTRUSION SCHEMATIC
NOT TO SCALE

EXTRUSION NOTES:
1. EXTRUSION THICKNESS IS ½".
2. TWO PIECE MEMBER (EXTRUSION AND PLATE COMBINATION) IN LIEU OF ONE PIECE EXTRUSION IS PERMITTED. WELD IN ACCORDANCE WITH AASHTO/AWS SPECIFICATIONS. (FULL PENETRATION WELD AND N.D.T. REQUIRED)

## STRIP SEAL INSTALLATION NOTES
- THE FRAME RAILS SHALL BE CLEANED THOROUGHLY AND SEAL CHANNELS SHALL BE INSPECTED TO ASCERTAIN THE ABSENCE OF CONCRETE AND DEBRIS. THE SEAL CHANNEL SHALL ALSO BE INSPECTED AT ALL FIELD SPLICES, AND ALL WELD SPLATTER AND/OR SHARP EDGES SHALL BE REMOVED.
- LIBERALLY COAT THE STRIP SEAL LUGS WITH LUBRICANT ADHESIVE. COAT ONLY 3'-0" TO 4'-0" PRECEDING THE INSTALLATION.
- COLLAPSE THE STRIP SEAL INTO THE THE JOINT OPENING UNTIL THE LUG IS ALIGNED WITH THE FRAME RAIL CHANNEL. (SEE FIGURE 1)
- PUSH THE LUG INTO THE CHANNEL AND THEN USE A BENT BAR TO FORCE THE LUG INTO THE CHANNEL (MAKE SURE THAT THE BAR IS DULL TO PREVENT PUNCTURING OF THE SEAL) (SEE FIGURE 2)
- AFTER THE SEAL LOCKS INTO PLACE, PUSH THE TOP OF THE LUG AGAINST THE FRAME RAIL TO INSURE PROPER SEATING. (SEE FIGURE 3)
- AS THE WORK PROGRESSES DOWN THE LENGTH OF THE JOINT, WORK BOTH SIDES OF THE STRIP SEAL INTO THE RAIL CHANNEL.

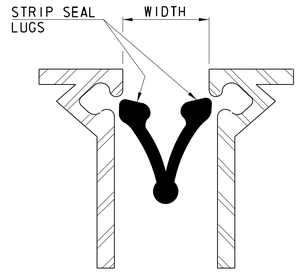



FIGURE 1

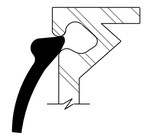


FIGURE 2

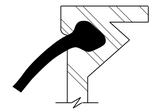
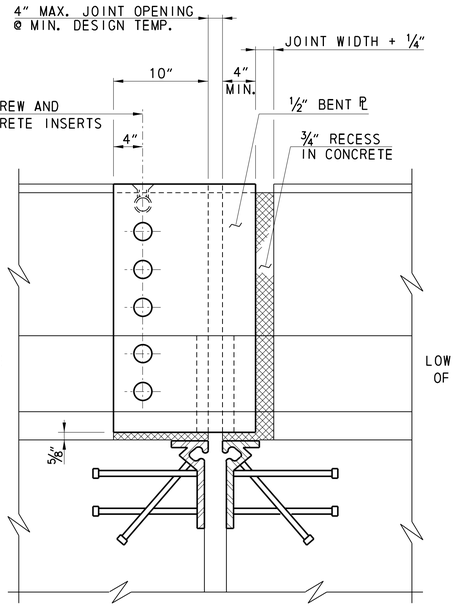


FIGURE 3




NOTE
FORM CONCRETE RECESS AREA IN BARRIER AND GRIND TO PROVIDE SMOOTH SURFACE. APPLY ONE COAT OF ASPHALT CEMENT PAINT OR PERFORMANCE GRADED ASPHALT CEMENT PG 64-22 TO ALLOW BENT SLIDING PLATE TO MOVE FREELY WITHOUT FRICTION.

## SECTION A-A
NOT TO SCALE

## STRIP SEAL INSTALLATION PROCEDURE
NOT TO SCALE

NOTES:
1. INSTALL CONTINUOUS NEOPRENE STRIP SEAL IN THE FIELD. SPLICING OF SEAL IS NOT PERMITTED. TEMPORARY SEAL MAY BE REQUIRED DEPENDING ON STAGES OF CONSTRUCTION.
2. CONSTRUCT EXPANSION DAM TO MATCH ROADWAY GRADE AND CROSS SLOPE.
3. FABRICATOR TO PROVIDE A CHART SHOWING JOINT OPENING FOR TEMPERATURES BETWEEN 10°F TO 100°F IN 10°F INTERVALS ON SHOP DRAWINGS. SET WIDTH @ 68°F.
4. BOND NEOPRENE STRIP SEAL TO EXTRUSION WITH APPROVED ADHESIVE.
5. GRIND ALL STEEL EDGES EXPOSED TO TRAFFIC OR PEDESTRIANS TO 1/16" MIN. RADIUS.
6. FOR ADDITIONAL DETAILS AND LOCATION OF EXPANSION JOINT, SEE SHEETS 25, 26, 33 AND 34 OF 40.
7. FOR JOINT OPENING TABLE, SEE SHEETS 26 AND 34 OF 40.

LEGEND:
ALT. = ALTERNATE
C.C. = CENTER TO CENTER
DIA. = DIAMETER
HOR. = HORIZONTAL
MAX. = MAXIMUM
MIN. = MINIMUM
N.D.T. = NONDESTRUCTIVE TESTING



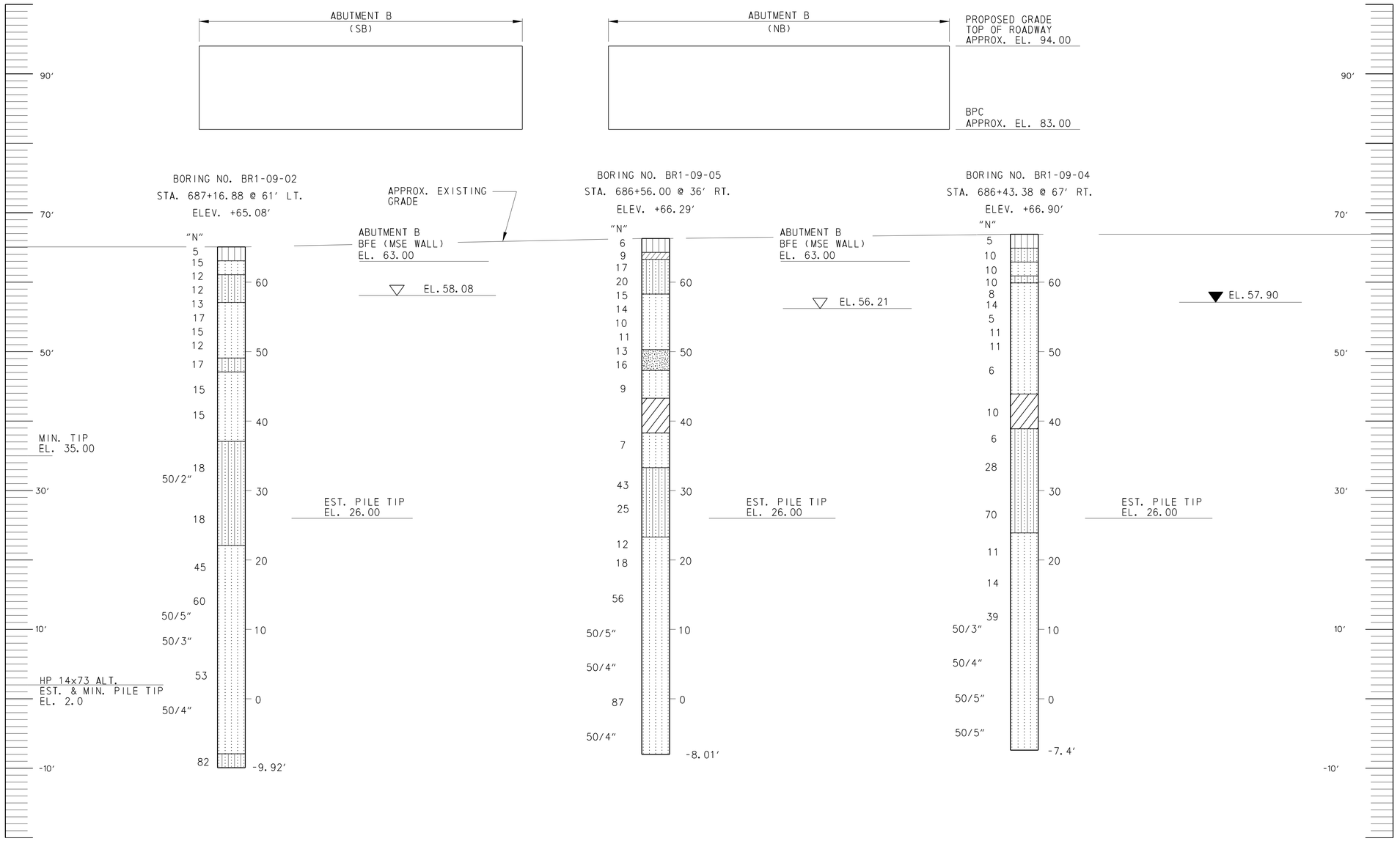
DELAWARE
DEPARTMENT OF TRANSPORTATION

ADDENDUMS / REVISIONS

SCALE: AS NOTED

**US 301,**
**SR 896 TO SR 1**

| CONTRACT | BRIDGE NO. | 1-466 N&S | EXPANSION JOINT DETAILS | SHEET NO. |
|---|---|---|---|---|
| T200911308 | DESIGNED BY: ZAA | | | 578 |
| COUNTY | CHECKED BY: MDM | | | TOTAL SHTS. |
| NEW CASTLE | | | | 875 |




## LEGEND

SILT

SAND

SILTY SAND

LOW PLASTICITY CLAY

HIGH PLASTICITY CLAY

GRAVEL

SCALE VERTICAL: 1/8" = 1′-0"
SCALE HORIZONTAL: NTS

LEGEND:
ALT. = ALTERNATE
BFE = BOTTOM OF FOOTING ELEVATION
EST. = ESTIMATED
MIN. = MINIMUM
NB = NORTHBOUND
SB = SOUTHBOUND
TOLPE = TOP OF LEVELING PAD ELEVATION
▽ = GROUND WATER TABLE @ 0 HR
▼ = GROUND WATER TABLE @ 96 HR

| LOCATION | SEGMENT | TOLPE |
|---|---|---|
| WING C | C1 | 63.0 |
| WING C | C2 | 65.5 |
| WING C | C3 | 68.0 |
| WING D | D1 | 63.0 |
| WING D | D2 | 68.0 |
| MEDIAN B WALL | MB | 68.0 |



DELAWARE
DEPARTMENT OF TRANSPORTATION

ADDENDUMS / REVISIONS

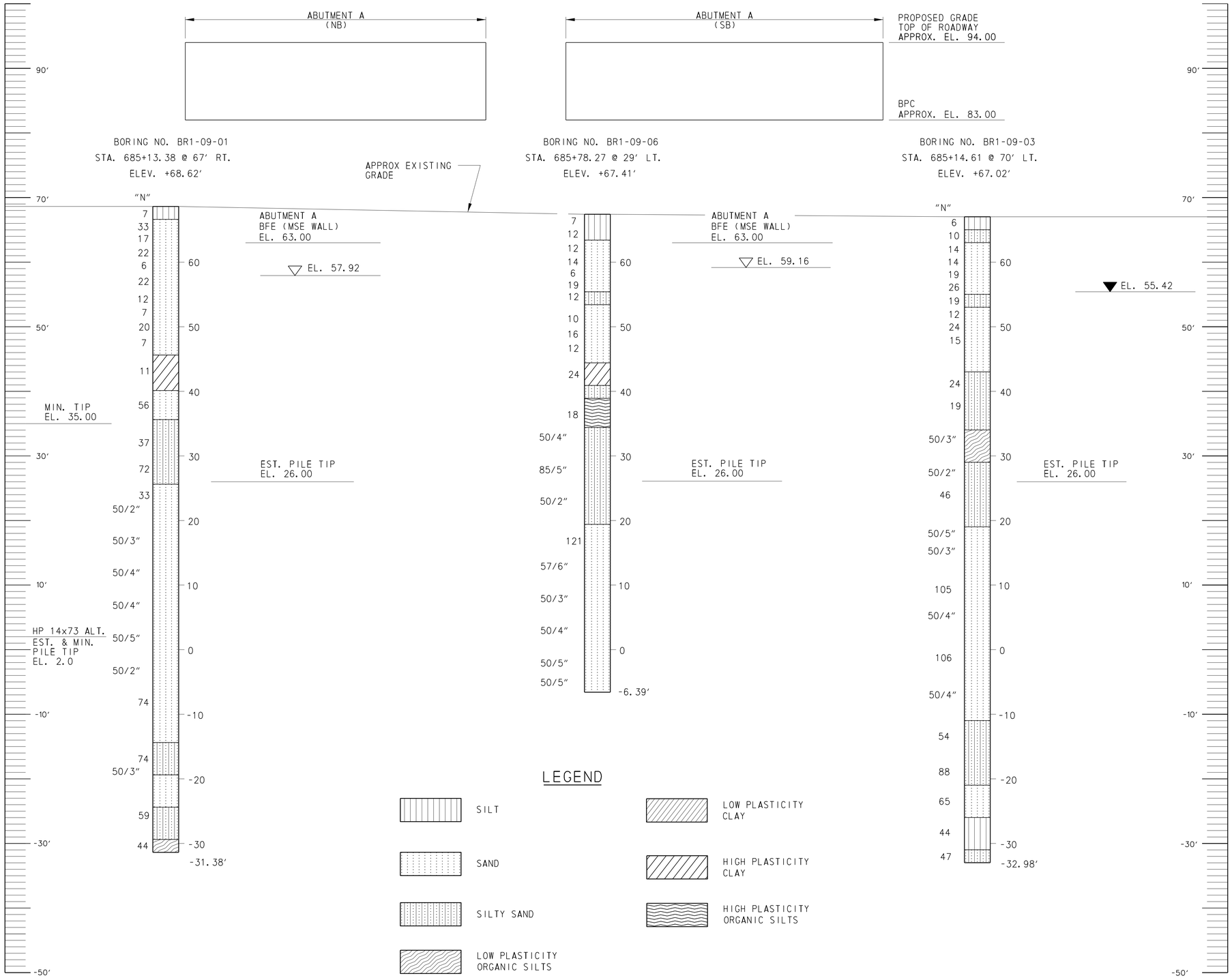
SCALE: AS NOTED

**US 301,
SR 896 TO SR 1**

CONTRACT T200911308
COUNTY NEW CASTLE
BRIDGE NO. 1-466 N&S
DESIGNED BY: SJM
CHECKED BY: ZAA

**SOIL BORINGS – 1**

SHEET NO. 579
TOTAL SHTS. 875




| LOCATION | SEGMENT | TOLPE |
|---|---|---|
| WING A | A1 | 63.0 |
| WING A | A2 | 65.0 |
| WING A | A3 | 68.0 |
| WING B | B1 | 63.0 |
| WING B | B2 | 68.0 |
| MEDIAN A WALL | MA | 63.0 |

SCALE VERTICAL: 1/8" = 1'-0"
SCALE HORIZONTAL: NTS

LEGEND:
ALT. = ALTERNATE
BFE = BOTTOM OF FOOTING ELEVATION
EST. = ESTIMATED
MIN. = MINIMUM
NB = NORTHBOUND
SB = SOUTHBOUND
TOLPE = TOP OF LEVELING PAD ELEVATION
▽ = GROUND WATER TABLE @ 0 HR
▼ = GROUND WATER TABLE @ 24 HR



DELAWARE DEPARTMENT OF TRANSPORTATION

ADDENDUMS / REVISIONS

SCALE: AS NOTED

**US 301, SR 896 TO SR 1**

CONTRACT T200911308
COUNTY NEW CASTLE
BRIDGE NO. 1-466 N&S
DESIGNED BY: SJM
CHECKED BY: ZAA

**SOIL BORINGS - 2**

SHEET NO. 580
TOTAL SHTS. 875

# PROJECT NOTES

1. LOCATION
INSTALLATION OF NEW RIGID FRAME CULVERT CARRYING US301 OVER WILDLIFE CROSSING AND CHANNEL IN NEW CASTLE COUNTY, DELAWARE.

2. ELEVATIONS
VERTICAL DATUM IS RFERENCED TO NAVD 1988.

3. DESIGN CRITERIA
2007 AASHTO LRFD DESIGN SPECIFICATIONS, INCLUDING 2008 AND 2009 INTERIMS, AND SUPPLEMENTED BY THE DELAWARE DEPARTMENT OF TRANSPORTATION 2005 BRIDGE DESIGN MANUAL, INCLUDING REVISIONS THROUGH 2009.

4. LOADING
LIVE LOAD: AASHTO HL-93 AND DELAWARE LEGAL LOADS.
FUTURE OVERLAY = 25 P.S.F.
FILL SOIL = 120 P.C.F.

5. FOUNDATIONS
FOUNDATION DESIGN AND QUANTITIES ARE BASED ON A STUDY OF THE SUBSOIL BORINGS MADE AT THE SITE. THE BORING INFORMATION SHOWN ON THE SOIL BORING SHEET IS BASED ON LIMITED INVESTIGATIONS AND IS IN NO WAY WARRANTED TO BE INDICATIVE OF ACTUAL CONDITIONS THAT MAY BE ENCOUNTERED DURING CONSTRUCTION. SEE SECTION 102.05 OF THE STANDARD SPECIFICATIONS FOR MORE DETAIL. THIS BORING INFORMATION, THE ACCURACY OF WHICH THE STATE DOES NOT GUARANTEE, IS PRESENTED ON THESE PLANS TO THE CONTRACTOR FOR HIS INFORMATION ONLY.

THE CRITICAL APPLIED PRESSURE FOR THE CONTROLLING LOAD CASES FOR THE PEDESTALS AND WINGWALLS ARE 6.66 KSF AND 5.18 KSF RESPECTIVELY WHICH IS LESS THAN THE BEARING RESISTANCES OF 7.09 KSF AND 5.70 KSF RESPECTIVELY.

6. RIGID FRAME
FACTORED BEARING RESISTANCE (STR 1) = 7.09 ksf
MAXIMUM BEARING PRESSURE (STR 1) = 6.66 ksf
PHI (BEARING CAPACITY) = 0.45

WINGWALL:
FACTORED BEARING RESISTANCE (STR 1) = 5.70 ksf
MAXIMUM BEARING PRESSURE (STR 1) = 5.18 ksf
PHI (BEARING CAPACITY) = 0.45
MAXIMUM HORIZONTAL FORCE AT FULL HEIGHT (STR 1) = 19.7k
FACTORED SLIDING RESISTANCE AT FULL HEIGHT (STR 1) = 21.6k
PHI (SLIDING) = 0.8

FOOTINGS MAY BE ORDERED BY THE ENGINEER TO BE AT ANY ELEVATION OR OF ANY DIMENSION NECESSARY TO PROVIDE PROPER FOUNDATION.

7. CONCRETE

ALL CONCRETE PROPERTIES SHALL BE IN ACCORDANCE WITH DIVISION 812 OF THE DELAWARE DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS.

CLASS A - HEADWALLS, PEDESTAL WALLS, AND WINGWALLS (f'c = 4,500 PSI).

CLASS B - WINGWALL FOOTING AND PEDESTAL WALL FOOTING (f'c = 3,000 PSI).

PRECAST RIGID FRAME CULVERT CONCRETE (f'c = 5000 PSI).

ALL EXPOSED EDGES SHALL BE CHAMFERED ¾" UNLESS NOTED OTHERWISE.

8. REINFORCING STEEL

ALL REINFORCING STEEL SHALL BE AASHTO M31 (ASTM A615), GRADE 60 AND UNLESS SPECIFIED OTHERWISE ON THE PLANS SHALL BE PROTECTED WITH FUSION BONDED EPOXY, CONFORMING TO AASHTO M284 (ASTM D3963) AND DENOTED WITH A PREFIX 'E' IN THE BAR MARKS.

MINIMUM CONCRETE COVER FOR REINFORCING STEEL SHALL BE:

PRECAST CULVERT: 2"
FOUNDATION ELEMENTS: 3"
OTHER ELEMENTS: AS NOTED

9. POST-TENSIONING TENDONS AND ANCHOR PLATE
LOW RELAXATION POLY PROPYLENE-SHEATHED PRESTRESSING STRAND WITH CORROSION INHIBITOR SHALL CONFORM TO AASHTO M203 (ASTM A416), GRADE 270. STRUCTURAL STEEL FOR ANCHOR PLATES SHALL CONFORM TO AASHTO M270 (ASTM A709), GRADE 36 AND SHALL BE FUSION BONDED EPOXY COATED. THREADS ON TIE RODS SHALL BE CUT TO COARSE SERIES 2A. PAYMENT SHALL BE INCIDENTAL TO ITEM 602522 - PRECAST CONCRETE CULVERT.

10. THREADED INSERTS
PROVIDE THREADED INSERTS AS INDICATED. THREADED INSERTS ARE TO BE INCORPORATED INTO THE PRECAST BOX SEGMENTS BY THE FABRICATOR.

11. CONSTRUCTION
FOR CONSTRUCTION SEQUENCE, SEE DRAWING DT-04.

POST TENSION PRECAST CULVERT SEGMENTS IN ACCORDANCE WITH DETAILS AND NOTES ON DRAWINGS DT-06 AND DT-08.

POST TENSION THE PRECAST SEGMENTS PRIOR TO BACKFILLING AND PRIOR TO ALLOWING TRAFFIC ON THE CULVERT.

TREAT CULVERT SURFACES WITH SILANE SEALER PRIOR TO BACKFILLING.

APPLY WATERPROOFING TO THE JOINTS OF THE PRECAST CULVERT AS INDICATED.

USE EPOXY BONDING COMPOUND BETWEEN PRECAST AND CAST-IN-PLACE ELEMENTS. EPOXY BONDING COMPOUND IS TO BE TYPE 2, GRADE 2 AS DESCRIBED IN ASTM-C881.

DO NOT EXCEED A 2'-0" DIFFERENCE IN FILL ELEVATIONS ON THE SIDES OF THE CULVERT DURING PLACEMENT OF THE BACKFILL.

DO NOT ALLOW WHEELS OF ROLLERS TO COME CLOSER THAN 1'-0" TO FACE OF STRUCTURE DURING COMPACTION OF THE BACKFILL.

PROVIDE MATERIAL AND PERFORM WORK IN ACCORDANCE TO THE DELAWARE DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS AND CONSTRUCTION DETAILS AND CONTRACT SPECIAL PROVISIONS.

12. CONSTRUCTION JOINTS
KEYED CONSTRUCTION JOINTS SHALL BE 2"x4" OR AS NOTED.
ALL EXPOSED CONSTRUCTION JOINT EDGES SHALL HAVE ¾" V-NOTCH.

13. STABILIZING STRUCTURAL EXCAVATIONS
IN LIEU OF A 2:1 SLOPE THE CONTRACTOR MAY USE SHORING FOR ANY EXCAVATIONS EXCEEDING 5 FEET IN HEIGHT. THE COST OF SHORING SHALL BE INCIDENTAL TO ITEM 207000 - EXCAVATION AND BACKFILL FOR STRUCTURES.
THE CONTRACTOR IS RESPONSIBLE FOR THE STABILITY OF ALL EXCAVATED SLOPES. DIRECT ALL SURFACE RUNOFF AWAY FROM EXCAVATION USING CURBING OR A BARRIER ALONG TOP OF SLOPE. IF REQUIRED, COVER THE EXCAVATED SLOPES WITH PLASTIC TO PROTECT AGAINST INFILTRATION.
PERFORM EXCAVATION IN ACCORDANCE WITH O.S.H.A. REQUIREMENTS.

14. UTILITIES
BEFORE BEGINNING WORK, THE CONTRACTOR SHALL GIVE NOTIFICATION BY TELEPHONE BY CALLING "MISS UTILITY" AT 1-800-282-8555 A MINIMUM OF 48 HOURS PRIOR TO START OF WORK. VERIFY AND LOCATE ALL UTILITIES PRIOR TO STARTING WORK.

COORDINATE THE REQUIREMENTS FOR PROTECTION OF ANY UTILITY WITH THE UTILITY OWNER PRIOR TO STARTING WORK.

CONDUCT OPERATIONS IN A MANNER WHICH ENSURES THAT THE UTILITIES WILL NOT BE DISTURBED OR ENDANGERED. ANY DAMAGE INCURRED TO THESE UTILITIES OR ANY OTHER UTILITIES, SHOWN OR NOT SHOWN ON THE PLANS, DUE TO THE CONTRACTOR'S OPERATIONS SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE TO THE SATISFACTION OF THE APPROPRIATE UTILITY COMPANY. THE DEPARTMENT DOES NOT ASSUME RESPONSIBILITY FOR REIMBURSEMENT, PARTICIPATION IN DESIGN AND/OR REVISIONS, OR LIABILITY FOR ACCURACY OF TYPE, SIZE AND LOCATION OF ANY UTILITY.

THE CONTRACTOR IS RESPONSIBLE FOR TEMPORARILY SUPPORTING, PROTECTING, OR RELOCATING ANY UTILITIES DURING CONSTRUCTION. WHERE NECESSARY, THE COST FOR THIS WORK WILL BE INCIDENTAL TO THE CONTRACT.

15. LOAD RATINGS
THE LOAD AND RESISTANCE FACTOR METHOD WAS USED TO LOAD RATE THIS STRUCTURE SEE LOAD RATING TABLE, THIS SHEET.

16. DEL NO. 3/57 STONE MIX
USE A MIX OF 50% DEL NO.3 STONE, ITEM 302011 AND 50% DEL NO. 57 STONE, ITEM 302012. PAYMENT FOR MIXING AND PLACING DEL NO. 3/57 STONE MIX SHALL BE INCIDENTAL TO EACH ITEM.

17. PRECAST ELEMENT NOTES.
SEE DRAWING DT-08.

## INDEX OF DRAWINGS



## QUANTITIES

| ITEM NO. | ITEM TITLE | UNIT | QUANTITY |
|---|---|---|---|
| 207000 | EXCAVATION AND BACKFILL FOR STRUCTURES | C.Y. | 2413 |
| 302011 | DEL NO. 3 STONE | TON | 155 |
| 302012 | DEL NO. 57 STONE | TON | 337 |
| 602001 | PORTLAND CEMENT CONCRETE MASONRY, CLASS A | C.Y. | 283 |
| 602002 | PORTLAND CEMENT CONCRETE MASONRY, CLASS B | C.Y. | 458 |
| 602522 | PRECAST CONCRETE CULVERT | L.F. | 160.5 |
| 604000 | BAR REINFORCEMENT, EPOXY COATED | LB | 82600 |
| 608000 | COARSE AGGREGATE FOR FOUNDATION STABILIZATION AND SUBFOUNDATION BACKFILL | TON | 835 |
| 712021 | RIPRAP, R-5 | TON | 985 |
| 712531 | CHANNEL BED FILL | C.Y. | 69 |
| 715001 | PERFORATED PIPE UNDERDRAIN, 6" | L.F. | 463 |

## LEGEND

SHEET NOS. REFERENCE STRUCTURE PLAN SHEETS UNLESS NOTED OTHERWISE

| | | | | | |
|---|---|---|---|---|---|
| ARCH. | = | ARCHITECTURAL | F.F. | = | FRONT FACE |
| ℄ | = | BASELINE | GALV. | = | GALVANIZED |
| B.F.E. | = | BOTTOM OF FOOTING ELEVATION | MAX. | = | MAXIMUM |
| | | | MIN. | = | MINIMUM |
| BOT. | = | BOTTOM | NOM. | = | NOMINAL |
| ℄ | = | CENTERLINE | N.T.S. | = | NOT TO SCALE |
| C.I.P. | = | CAST-IN-PLACE | P.G.L. | = | PROPOSED GRADE LINE |
| CLR. | = | CLEAR | R.C. | = | REINFORCED CONCRETE |
| CONC. | = | CONCRETE | R.F. | = | REAR FACE |
| CONSTR. | = | CONSTRUCTION | S.E. | = | SUPERELEVATION |
| CVR. | = | COVER | SHLDR. | = | SHOULDER |
| DIA. | = | DIAMETER | STA. | = | STATION |
| E.F. | = | EACH FACE | THICK. | = | THICKNESS |
| EL. | = | ELEVATION | THRD. | = | THREADED |
| E.S. | = | EQUAL SPACING | TYP. | = | TYPICAL |
| | | | W.P. | = | WORK POINT |

## LOAD RATING SUMMARY

| DESIGN VEHICLE | RATING FACTOR | RATING WEIGHT (TON) | CONTROLLING MEMBER | CONTROLLING POINT | LOAD EFFECT |
|---|---|---|---|---|---|
| HL-93 TRUCK (INVENTORY) | 1.64 | N/A | TOP SLAB | LEFT END | SHEAR |
| HL-93 TANDEM (INVENTORY) | 1.50 | N/A | TOP SLAB | LEFT END | SHEAR |
| HL-93 TRUCK (OPERATING) | 2.12 | N/A | TOP SLAB | LEFT END | SHEAR |
| HL-93 TANDEM (OPERATING) | 1.95 | N/A | TOP SLAB | LEFT END | SHEAR |
| DE S220 (LEGAL) | 2.95 | 59.07 | TOP SLAB | LEFT END | SHEAR |
| DE S335 (LEGAL) | 1.62 | 56.82 | TOP SLAB | LEFT END | SHEAR |
| DE S437 (LEGAL) | 1.62 | 59.48 | TOP SLAB | LEFT END | SHEAR |
| DE T330 (LEGAL) | 2.84 | 85.17 | TOP SLAB | LEFT END | SHEAR |
| DE T435 (LEGAL) | 2.24 | 78.42 | TOP SLAB | LEFT END | SHEAR |
| DE T540 (LEGAL) | 2.19 | 87.50 | TOP SLAB | LEFT END | SHEAR |

NOTE: LOAD RATING INCLUDES FUTURE WEARING SURFACE AS NOTED IN THE PLANS.

BR1-444DT-01

DELAWARE
DEPARTMENT OF TRANSPORTATION

ADDENDUMS / REVISIONS

NOT TO SCALE

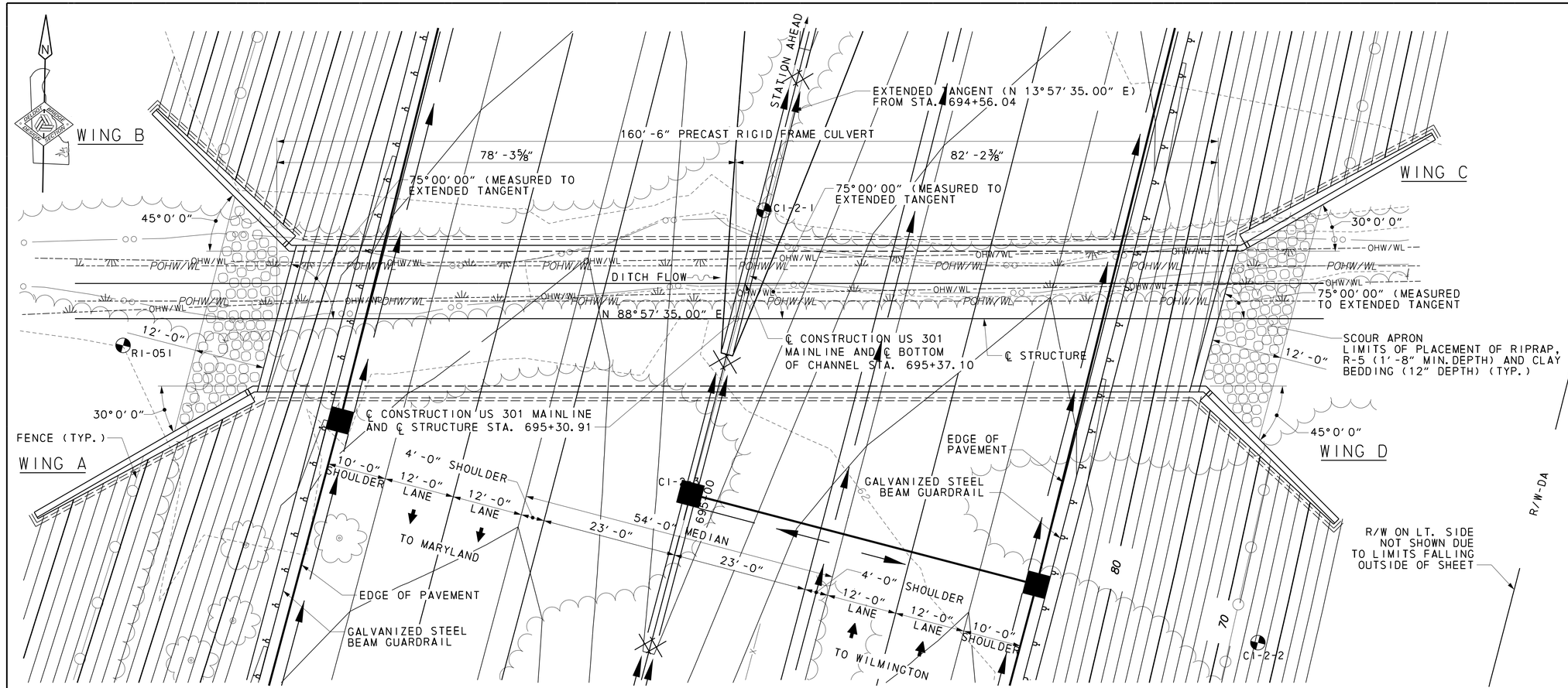
US 301,
SR 896 TO SR 1

CONTRACT T200911308
COUNTY NEW CASTLE
BRIDGE NO. 1-444
DESIGNED BY: CCJ
CHECKED BY: JFM

PROJECT NOTES AND QUANTITIES

SHEET NO. 581
TOTAL SHTS. 875

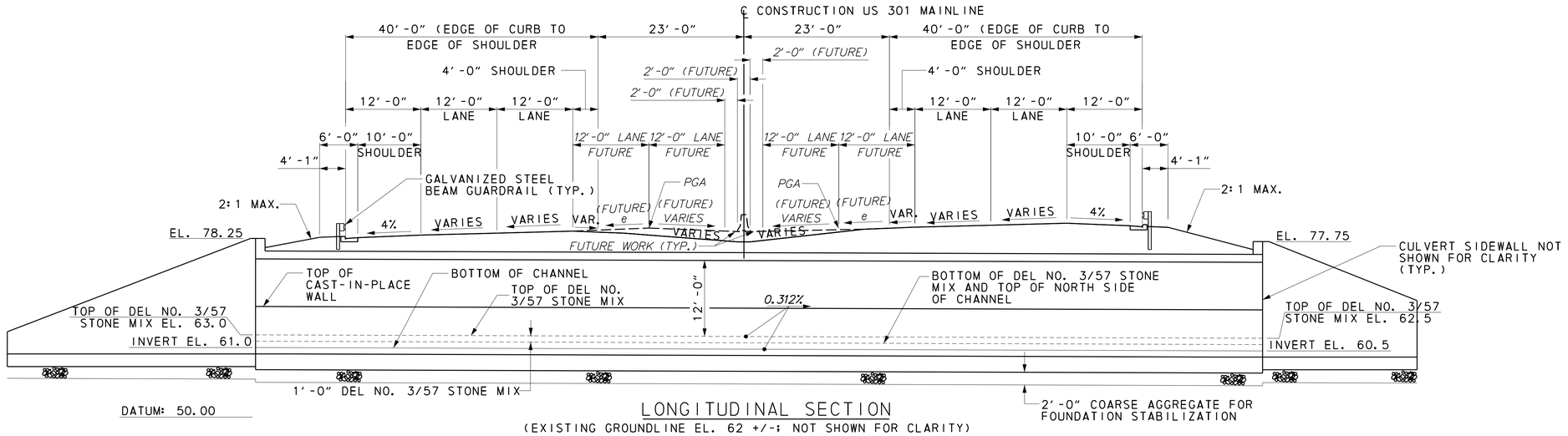
$DGNNAME$ $DATE$ 11:59:55 AM




PLAN

10' 0' 10'

SCALE: 1" = 10'




LONGITUDINAL SECTION

(EXISTING GROUNDLINE EL. 62 +/-: NOT SHOWN FOR CLARITY)

## HYDRAULIC DATA

2 YEAR FLOOD ELEVATION = 62.9
2 YEAR DESIGN DISCHARGE = 65 C.F.S.
10 YEAR FLOOD ELEVATION = 63.4
10 YEAR DESIGN DISCHARGE = 130 C.F.S.
25 YEAR FLOOD ELEVATION = 63.7
25 YEAR DESIGN DISCHARGE = 180 C.F.S.
50 YEAR FLOOD ELEVATION = 63.9
50 YEAR DESIGN DISCHARGE = 220 C.F.S.
DRAINAGE AREA = 0.22 SQ. MILES

## TEST BORINGS

| BORING DESIGNATION | STATION | OFFSET |
|---|---|---|
| R1-051 | 695+00 | 100' L |
| C1-2-1 | 695+50 | 0' |
| C1-2-2 | 695+00 | 100' R |
| C1-2-3 | 695+00 | 0' |

PC STA. 694+56.04
PI STA. 703+18.35
PT STA. 711+74.02
RADIUS: 8000.00
DEGREE OF CURVE: 0°42'58.31"
ARC LENGTH: 1717.99
DELTA: 12°18'15.00"
TANGENT LENGTH: 862.31
EXTERNAL DISTANCE: 46.34

## HORIZONTAL CURVE DATA

PVI
STA. 691+09.70
EL. 91.05
-0.50% -2.06%
PVC STA. 687+34.70 EL. 92.93
PVT STA. 694+84.70 EL. 83.32

-2.06%
PVT STA. 694+84.70 EL. 83.32
PVC STA. 695+00.00 EL. 83.00

PVI
STA. 697+00.00
EL. 78.88
-2.06% -0.50%
PVC STA. 695+00.00 EL. 83.00
PVT STA. 699+00.00 EL. 77.88

## VERTICAL CURVE DATA US 301

NOT TO SCALE

## LEGEND

- BORING LOCATION
- —65— PROPOSED CONTOURS, 1' INT.
- --62-- EXISTING CONTOURS, 1' INT.

| | |
|---|---|
| ℄ | = BASELINE |
| ℄ | = CENTERLINE |
| EL. | = ELEVATION |
| F.F. | = FRONT FACE |
| INT. | = INTERVALS |
| MIN. | = MINIMUM |
| R/W | = RIGHT-OF-WAY |
| SHLDR. | = SHOULDER |
| STA. | = STATION |
| TYP. | = TYPICAL |
| VERT. | = VERTICAL |

BR1-444DT-02

$DGNNAME$
$SDATE$ 333922 PM

DELAWARE DEPARTMENT OF TRANSPORTATION

ADDENDUMS / REVISIONS

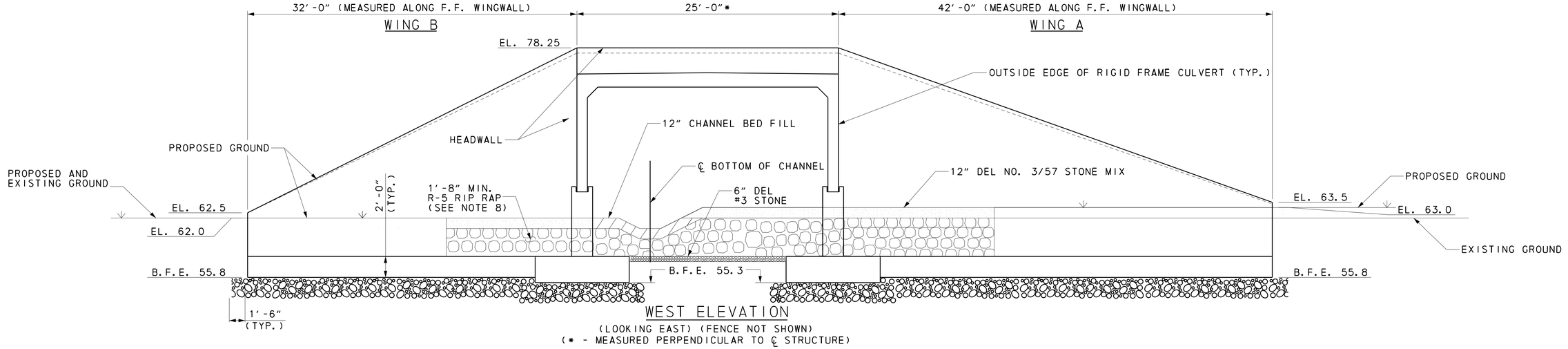
SCALE: AS NOTED

US 301, SR 896 TO SR 1

| CONTRACT | BRIDGE NO. 1-444 |
|---|---|
| T200911308 | DESIGNED BY: CCJ |
| COUNTY | CHECKED BY: JFM |
| NEW CASTLE | |

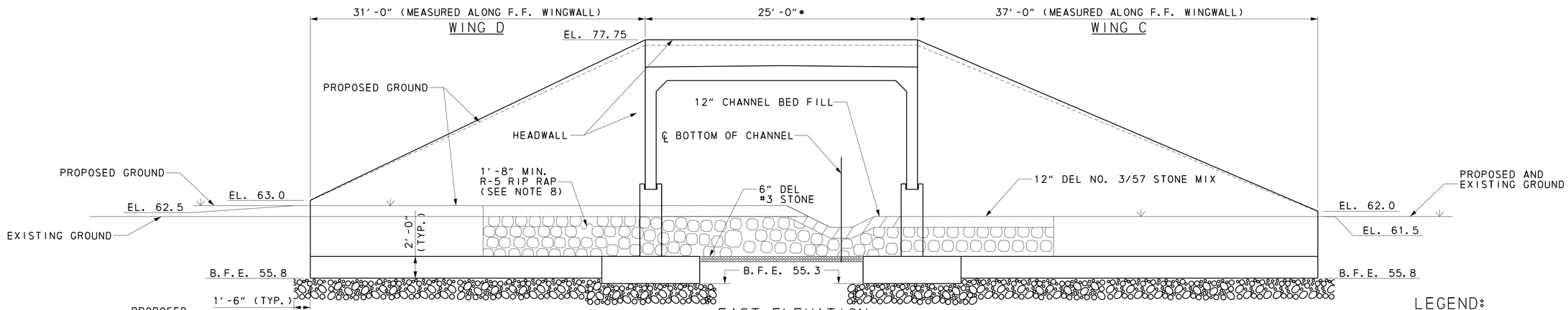
GENERAL PLAN AND ELEVATION

SHEET NO. 582
TOTAL SHTS. 875



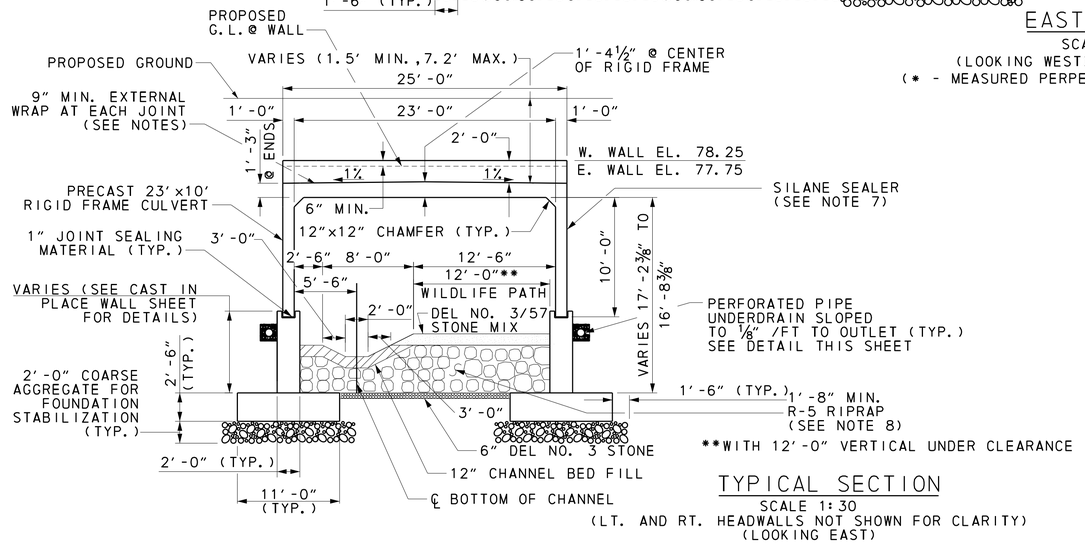

## WEST ELEVATION

(LOOKING EAST) (FENCE NOT SHOWN)
(* - MEASURED PERPENDICULAR TO ℄ STRUCTURE)




## EAST ELEVATION

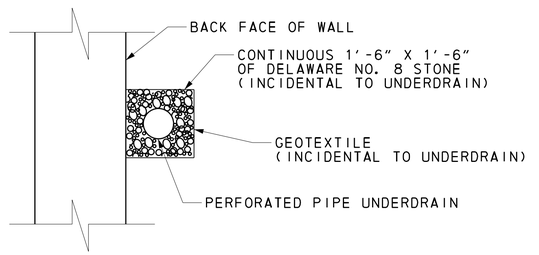
SCALE 1:20
(LOOKING WEST) (FENCE NOT SHOWN)
(* - MEASURED PERPENDICULAR TO C STRUCTURE)




**WITH 12′-0″ VERTICAL UNDER CLEARANCE

## TYPICAL SECTION

SCALE 1:30
(LT. AND RT. HEADWALLS NOT SHOWN FOR CLARITY)
(LOOKING EAST)




## PERFORATED PIPE UNDERDRAIN DETAIL

## LEGEND:

| | | |
|---|---|---|
| ℄ | = | BASELINE |
| B.F.E. | = | BOTTOM OF FOOTING ELEVATION |
| ℄ | = | CENTERLINE |
| EL. | = | ELEVATION |
| EXIST. | = | EXISTING |
| G.L. | = | GROUND LINE |
| INT. | = | INTERVALS |
| MIN. | = | MINIMUM |
| R/W | = | RIGHT-OF-WAY |
| SHLDR. | = | SHOULDER |
| STA. | = | STATION |
| TYP. | = | TYPICAL |
| VERT. | = | VERTICAL |

## NOTES:

1. FOR STAKE OUT PLAN, SEE DRAWING DT-04.
2. FOR CULVERT HEADWALL DETAILS, SEE DRAWING DT-09.
3. FOR WINGWALL FOUNDATION PLAN, SEE DRAWING DT-07.
4. FOR WINGWALL ELEVATION AND SECTION VIEWS, SEE DRAWINGS DT-10 AND DT-11.
5. FOR WINGWALL REINFORCEMENT BAR SCHEDULE, SEE DRAWINGS DT-12 AND DT-13.
6. FOR JOINT WRAP DETAILS, SEE DRAWING DT-08.
7. FOR SILANE SEALER DETAILS, SEE DRAWING DT-08.
8. FOR CAST-IN-PLACE WALL FOUNDATION PLAN, SEE DRAWING DT-05.
9. CHOKE RIPRAP VOIDS WITH DE NO. 57 STONE.

BR1-444DT-03

$DGNNAME
$SDATE$ 2:19:41 PM

**DELAWARE DEPARTMENT OF TRANSPORTATION**

ADDENDUMS / REVISIONS

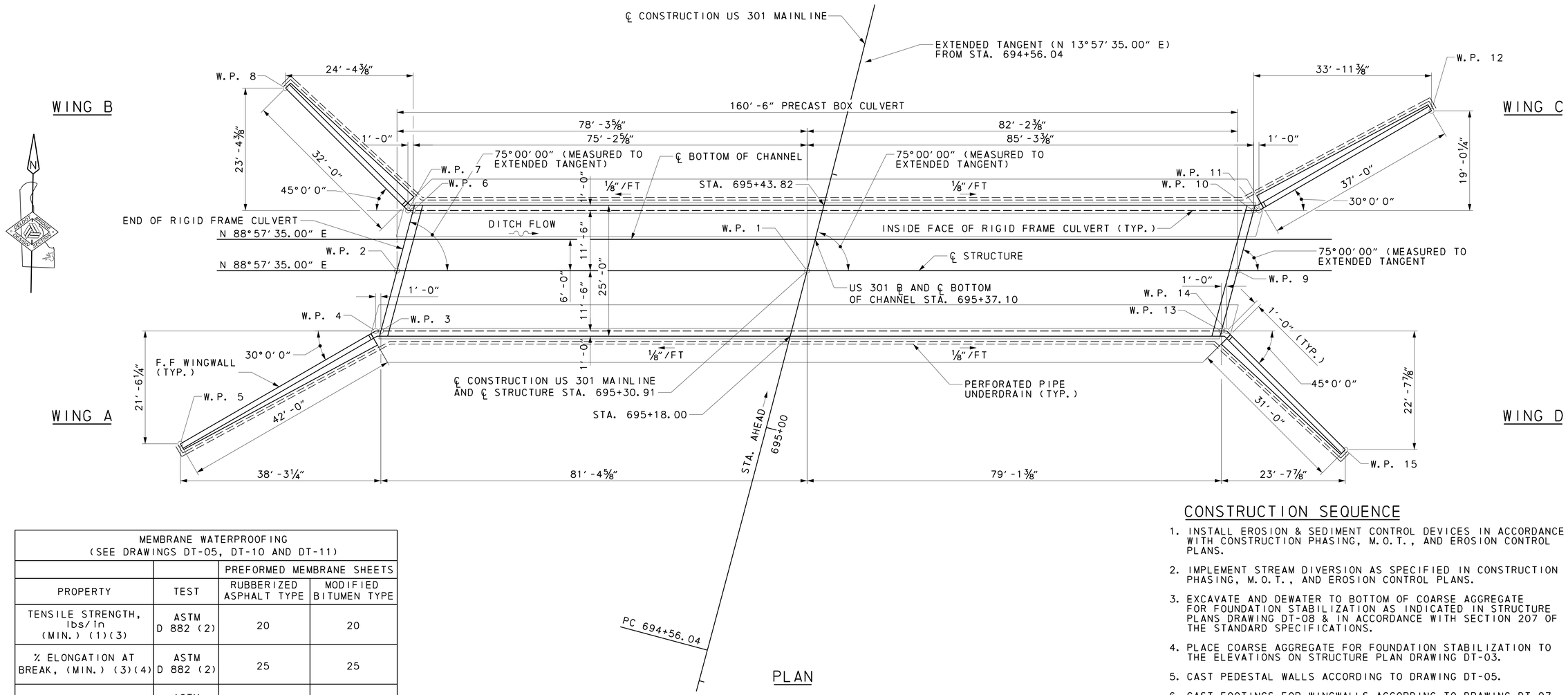
SCALE: AS NOTED

**US 301, SR 896 TO SR 1**

| CONTRACT | BRIDGE NO. 1-444 |
|---|---|
| T200911308 | DESIGNED BY: CCJ |
| COUNTY | CHECKED BY: JFM |
| NEW CASTLE | |

**CULVERT END ELEVATION VIEWS AND TYPICAL SECTION**

| SHEET NO. | TOTAL SHTS. |
|---|---|
| 583 | 875 |




PLAN

## CONSTRUCTION SEQUENCE

1. INSTALL EROSION & SEDIMENT CONTROL DEVICES IN ACCORDANCE WITH CONSTRUCTION PHASING, M.O.T., AND EROSION CONTROL PLANS.
2. IMPLEMENT STREAM DIVERSION AS SPECIFIED IN CONSTRUCTION PHASING, M.O.T., AND EROSION CONTROL PLANS.
3. EXCAVATE AND DEWATER TO BOTTOM OF COARSE AGGREGATE FOR FOUNDATION STABILIZATION AS INDICATED IN STRUCTURE PLANS DRAWING DT-08 & IN ACCORDANCE WITH SECTION 207 OF THE STANDARD SPECIFICATIONS.
4. PLACE COARSE AGGREGATE FOR FOUNDATION STABILIZATION TO THE ELEVATIONS ON STRUCTURE PLAN DRAWING DT-03.
5. CAST PEDESTAL WALLS ACCORDING TO DRAWING DT-05.
6. CAST FOOTINGS FOR WINGWALLS ACCORDING TO DRAWING DT-07.
7. PLACE RIGID FRAME CULVERT IN ACCORDANCE WITH PRECAST CONCRETE CULVERT SPECIAL PROVISIONS & MANUFACTURER'S SPECIFICATIONS. POST TENSION IN ACCORDANCE WITH DRAWINGS DT-06 AND DT-08 AND APPROVED ERECTION PLANS.
8. CONSTRUCT HEADWALLS & WINGWALLS ACCORDING TO STRUCTURE PLAN DRAWINGS DT-09, DT-10, AND DT-11.
9. PLACE RIPRAP, CHANNEL BED FILL AND DEL NO. 3/DEL NO. 57 STONE MIX IN CULVERT AND AT WINGWALLS IN ACCORDANCE WITH STRUCTURE PLAN DRAWING DT-08 AND EROSION AND SEDIMENT CONSTRUCTION SEQUENCE. PRIOR TO PLACING THE DEL NO. 3/57 STONE MIX, FILL THE VOIDS IN THE RIPRAP ABOVE THE DEL NO. 3/57 STONE MIX WITH DEL NO. 3 STONES. THE VOIDS SHALL BE FILLED UNTIL THE PEAKS OF THE RIPRAP ARE BARELY VISIBLE. USE A MIX OF 50% DEL NO. 3 STONE AND 50% DEL NO. 57 STONE AT LOCATIONS WHERE "DEL NO. 3/57 STONE MIX" IS SPECIFIED. SEE PROJECT NOTES FOR PAYMENT.
10. WHEN BACKFILLING RIGID FRAME CULVERT DO NOT LET THE DIFFERENCES IN GROUND ELEVATION ON OTHER SIDE OF RIGID FRAME CULVERT EXCEED 2′.
11. RESTORE STREAM FLOW INTO RIGID FRAME CULVERT.

| MEMBRANE WATERPROOFING (SEE DRAWINGS DT-05, DT-10 AND DT-11) | | | |
|---|---|---|---|
| | | PREFORMED MEMBRANE SHEETS | |
| PROPERTY | TEST | RUBBERIZED ASPHALT TYPE | MODIFIED BITUMEN TYPE |
| TENSILE STRENGTH, lbs/in (MIN.) (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 (MIN.) (6) | ASTM D 1000 | 60 | 60 |
| SOFTENING POINT, F (MIN.) | ASTM D 36 | 190 | 210 |
| PERMEANCE, PERMS (MAX.) | ASTM D 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.

| WORK POINT COORDINATES | | | | |
|---|---|---|---|---|
| W.P. | NORTHING | EASTING | ℄ CONSTRUCTION US 301 MAINLINE | |
| | | | STATION | OFFSET |
| 1 | 549874.8819 | 578435.3175 | 695+30.91 | 0.00′ |
| 2 | 549873.4603 | 578357.0264 | 695+11.17 | 75.80′L |
| 3 | 549861.9062 | 578354.1543 | 694+99.15 | 75.87′L |
| 4 | 549861.8881 | 578353.1545 | 694+98.89 | 76.84′L |
| 5 | 549839.6940 | 578316.2761 | 694+68.21 | 107.39′L |
| 6 | 549885.0143 | 578359.8986 | 695+23.19 | 75.71′L |
| 7 | 549884.9962 | 578358.8987 | 695+22.93 | 76.68′L |
| 8 | 549907.9321 | 578335.1144 | 695+39.91 | 105.13′L |
| 9 | 549876.3742 | 578517.5000 | 695+51.24 | 79.62′R |
| 10 | 549887.9283 | 578520.3721 | 695+63.03 | 79.77′R |
| 11 | 549887.9464 | 578521.3719 | 695+63.27 | 80.74′R |
| 12 | 549907.5622 | 578553.9662 | 695+89.45 | 108.04′R |
| 13 | 549864.8202 | 578514.6279 | 695+39.45 | 79.48′R |
| 14 | 549864.8383 | 578515.6277 | 695+39.70 | 80.45′R |
| 15 | 549842.5965 | 578538.6922 | 695+23.60 | 108.05′R |

## LEGEND

| | |
|---|---|
| ℄ | = BASELINE |
| ℄ | = CENTERLINE |
| F.F. | = FRONT FACE |
| MAX. | = MAXIMUM |
| MIN. | = MINIMUM |
| STA. | = STATION |
| TYP. | = TYPICAL |
| W.P. | = WORK POINT |

## NOTES

1. FOR CAST IN PLACE PEDESTAL WALL FOOTING PLAN AND WORK POINTS, SEE DRAWING DT-05.

BR1-444DT-04

$SIGNNAME$ $SIGNDATE$ 3:34:24 PM

**DELAWARE DEPARTMENT OF TRANSPORTATION**

ADDENDUMS / REVISIONS

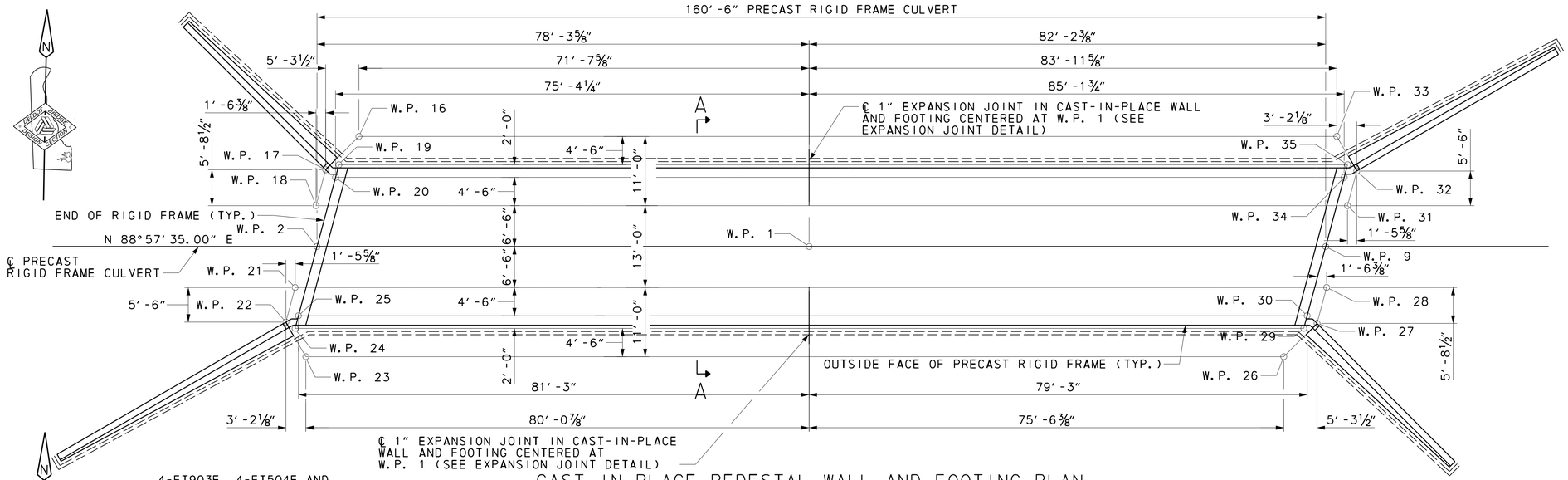
NOT TO SCALE

**US 301, SR 896 TO SR 1**

| CONTRACT | BRIDGE NO. | 1-444 |
|---|---|---|
| T200911308 | DESIGNED BY: CCJ | |
| COUNTY | CHECKED BY: JFM | |
| NEW CASTLE | | |

**STAKE-OUT PLAN**

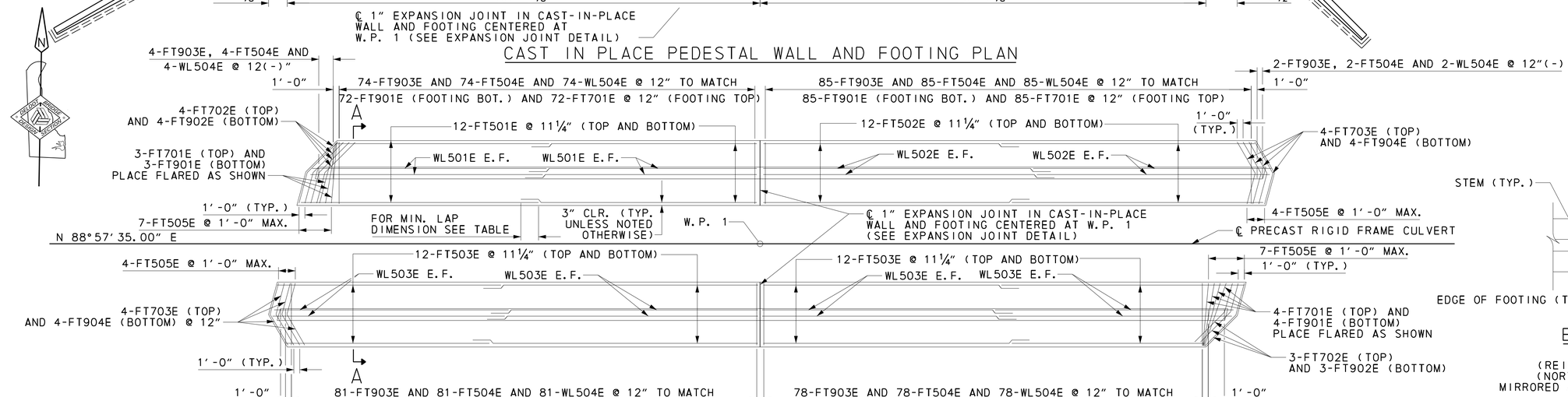
| SHEET NO. |
|---|
| 584 |
| TOTAL SHTS. |
| 875 |




## CAST IN PLACE PEDESTAL WALL AND FOOTING PLAN

NOTES:

1. FOR STAKE OUT PLAN AND WORK POINTS NOT SHOWN ON THIS SHEET, SEE DRAWING DT-04.
2. FOR CAST-IN-PLACE WALL ELEVATION, SEE DRAWING DT-06.
3. FOR CAST-IN-PLACE WALL BAR SCHEDULE, SEE DRAWING DT-12.
4. FOR WINGWALL FOUNDATION PLAN, SEE DRAWING DT-07.
5. FOR REBAR PROTRUDING FROM THE ENDS OF THE PEDESTAL INTO THE HEADWALL SEE DRAWING DT-09. NOT SHOWN ON THIS SHEET FOR CLARITY.
6. PLACE 2′-0″ WIDE MEMBRANE WATERPROOFING CENTERED AT WALL/FOOTING INTERFACE. LAP SPLICES BY A MINIMUM OF 6″. PAYMENT FOR MEMBRANE WATERPROOFING IS INCIDENTAL TO ITEM 602002. FURNISH ADHESIVE-BACKED PREFORMED MEMBRANE SHEET. SEE DRAWING DT-04 FOR MINIMUM REQUIREMENTS.
7. EXTERNAL JOINT WRAP MATERIAL SHALL COMPLY WITH ASTM C877. PAYMENT SHALL BE INCIDENTAL TO WALL AND FOOTING CONSTRUCTION.




## CAST IN PLACE PEDESTAL WALL AND FOOTING REINFORCING PLAN

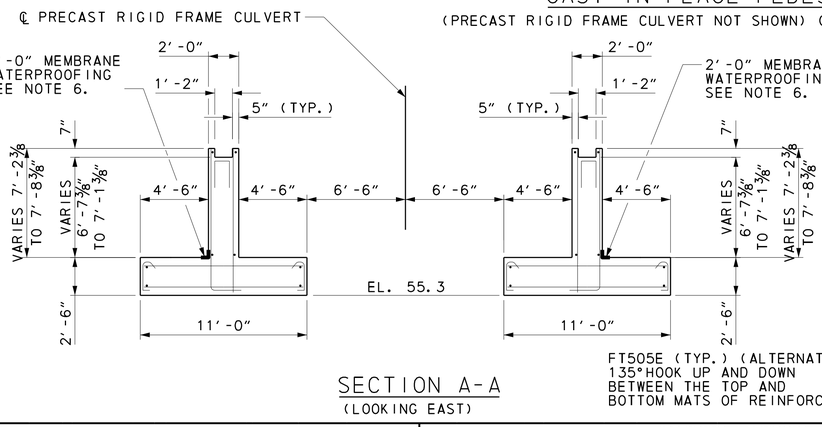
(PRECAST RIGID FRAME CULVERT NOT SHOWN) (FOR CLARITY FT505E NOT SHOWN IN PLAN VIEW, EXCEPT LABELED AT BOTH ENDS)

| BAR NO. | MIN. LAP LENGTH |
|---|---|
| 5 | 3′-0″ |



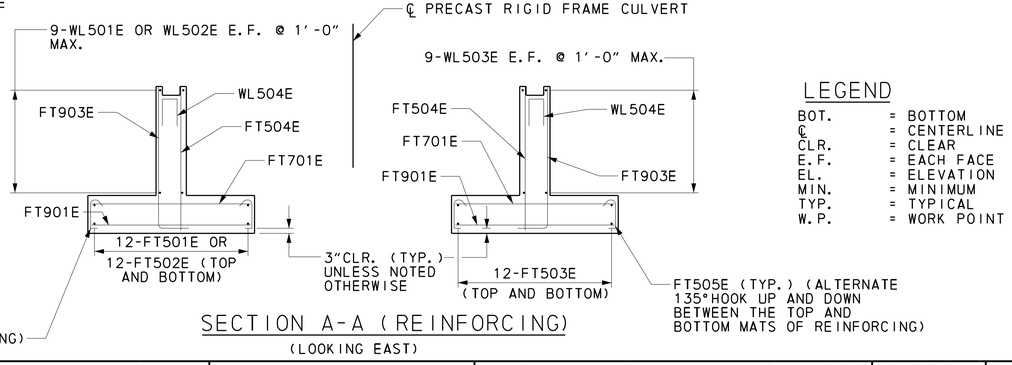

## EXPANSION JOINT DETAIL

NOT TO SCALE
(REINFORCING NOT SHOWN FOR CLARITY)
(NORTH SECTION SHOWN: SOUTH SECTION MIRRORED ABOUT ℄ PRECAST RIGID FRAME CULVERT)




## SECTION A-A

(LOOKING EAST)




## SECTION A-A (REINFORCING)

(LOOKING EAST)

## LEGEND

| | | |
|---|---|---|
| BOT. | = | BOTTOM |
| ℄ | = | CENTERLINE |
| CLR. | = | CLEAR |
| E.F. | = | EACH FACE |
| EL. | = | ELEVATION |
| MIN. | = | MINIMUM |
| TYP. | = | TYPICAL |
| W.P. | = | WORK POINT |

| WORK POINT COORDINATES | | | | |
|---|---|---|---|---|
| W.P. | NORTHING | EASTING | ℄ CONSTRUCTION US 301 MAINLINE | |
| | | | STATION | OFFSET |
| 16 | 549891.0785 | 578363.3748 | 695+29.95 | 73.74′L |
| 17 | 549885.6903 | 578358.1789 | 695+23.44 | 77.54′L |
| 18 | 549879.9564 | 578356.7535 | 695+17.48 | 77.58′L |
| 19 | 549886.5214 | 578360.2732 | 695+24.75 | 75.69′L |
| 20 | 549884.5120 | 578359.7737 | 695+22.66 | 75.71′L |
| 21 | 549866.8983 | 578353.6713 | 695+03.93 | 77.52′L |
| 22 | 549861.3724 | 578352.2977 | 694+98.18 | 77.55′L |
| 23 | 549855.9310 | 578355.5724 | 694+93.62 | 73.08′L |
| 24 | 549860.3992 | 578353.7797 | 694+97.58 | 75.88′L |
| 25 | 549862.4086 | 578354.2792 | 694+99.67 | 75.87′L |
| 26 | 549858.7561 | 578511.1516 | 695+32.81 | 77.51′R |
| 27 | 549864.1442 | 578516.3475 | 695+39.19 | 81.31′R |
| 28 | 549869.8781 | 578517.7729 | 695+45.04 | 81.38′R |
| 29 | 549863.3131 | 578514.2532 | 695+37.91 | 79.47′R |
| 30 | 549865.3225 | 578514.7527 | 695+39.96 | 79.49′R |
| 31 | 549882.9362 | 578520.8551 | 695+58.32 | 81.38′R |
| 32 | 549888.4621 | 578522.2287 | 695+63.96 | 81.45′R |
| 33 | 549893.9035 | 578518.9540 | 695+68.47 | 77.02′R |
| 34 | 549887.2472 | 578520.2472 | 695+62.51 | 79.76′R |
| 35 | 549889.4353 | 578520.7467 | 695+64.56 | 79.79′R |

BR1-444DT-05

$DGNNAME
$SDATE$ 9:42:54 AM

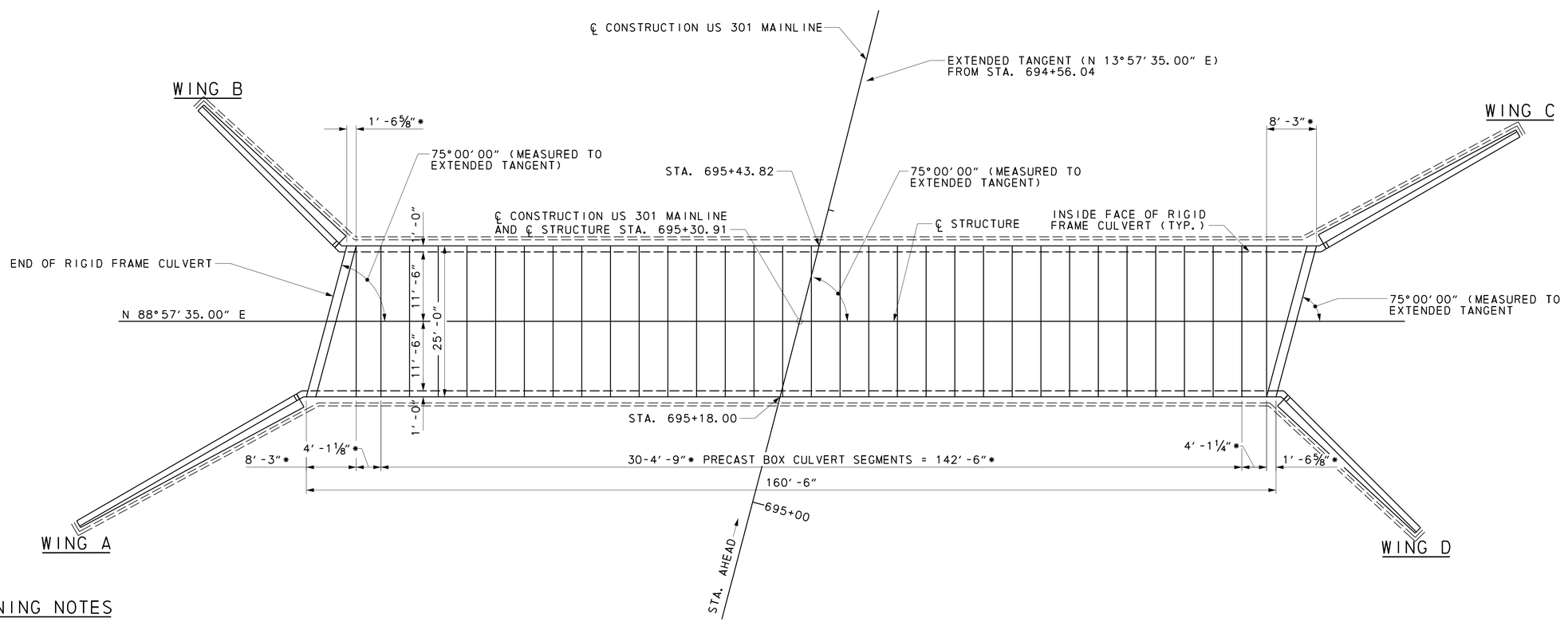
**DELAWARE DEPARTMENT OF TRANSPORTATION**

ADDENDUMS / REVISIONS

NOT TO SCALE

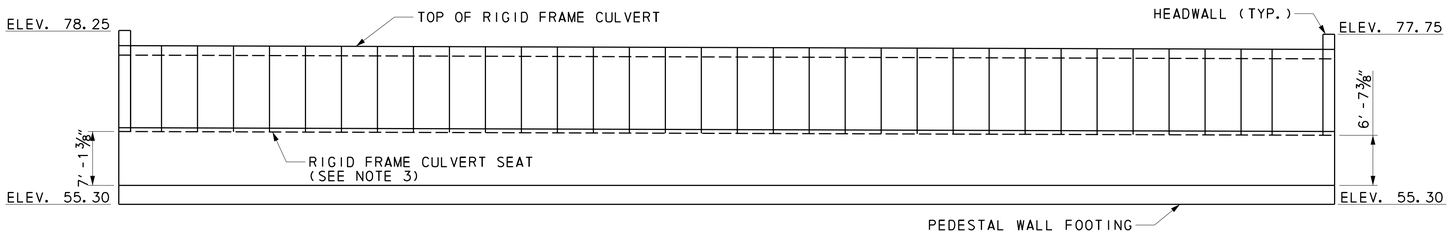
**US 301, SR 896 TO SR 1**

| | | | |
|---|---|---|---|
| CONTRACT T200911308 | BRIDGE NO. 1-444 | **CAST IN PLACE WALL FOUNDATION PLAN** | SHEET NO. 585 |
| COUNTY NEW CASTLE | DESIGNED BY: CCJ | | TOTAL SHTS. 875 |
| | CHECKED BY: JFM | | |

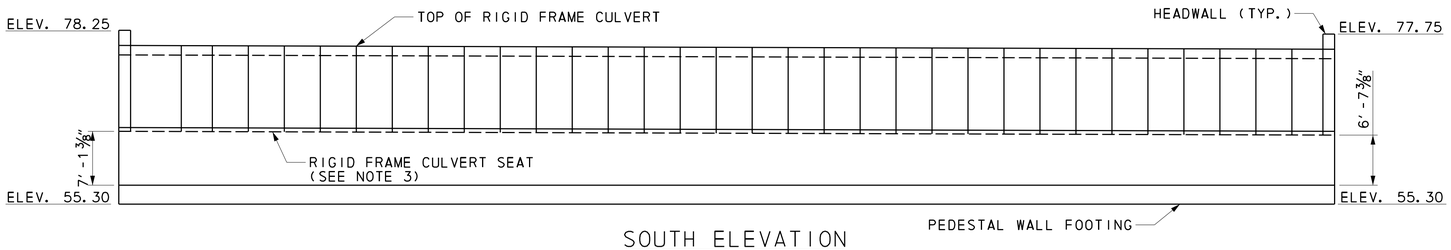



PLAN

(CAST IN PLACE WALL AND FOOTING NOT SHOWN FOR CLARITY)
(* - INCLUDES FIT-UP AND THICKNESS OF NEOPRENE SPONGE GASKET)




NORTH ELEVATION




SOUTH ELEVATION

## POST-TENSIONING NOTES

1. SHOP DRAWINGS ARE REQUIRED FOR POST-TENSIONING OPERATIONS AND MATERIALS.
2. PROVIDE ½″ DIA. STRANDS HAVING A YIELD STRENGTH OF 270 KSI.
3. SNUG FIT ALL JOINTS BEFORE POST TENSIONING.
4. INSTALL STRANDS IN PRECAST SECTIONS. CHECK RAM AREA AND CALIBRATION CURVES OF EQUIPMENT FURNISHED FOR GAGE PRESSURES. MAXIMUM POST-TENSIONING FORCE SHALL BE 28,900 lbs.
5. AFTER STRESSING, GROUT ALL STRAND VOIDS. PLACE GROUT MIX INTO TUBING USING PRESSURE GROUT.
6. USE A MINIMUM OF 4 POST-TENSIONING TENDONS.
7. STRAND LOCATIONS SHALL NOT INTERFERE WITH REINFORCEMENT DETAILS.
8. PROVIDE SEALS OR GASKETS AROUND THE DUCTS AT THE JOINTS TO MAKE THE JOINTS GROUT TIGHT.
9. PRECISE ALIGNMENT OF DUCTS AT JOINTS IS CRITICAL.
10. ALL POST-TENSIONING MUST BE WITNESSED AND APPROVED BY THE ENGINEER.
11. AFTER POST-TENSIONING IS APPROVED, CUT STRANDS TO PROVIDE A MINIMUM OF 2 ½″ CLEAR FROM THE OUTSIDE FACE OF CONCRETE AND COAT RECESS WITH EPOXY BONDING COMPOUND AND FILL WITH NON-SHRINK GROUT.
12. POST-TENSION AND GROUT BEFORE BACKFILLING. ALLOW GROUT TO ACHIEVE MINIMUM STRENGTH BEFORE BACKFILLING.
13. 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.
14. KEEP JOINT CLEAN AT POST-TENSIONING STAGE.

## NOTES

1. FOR TYPICAL SECTION, SEE DRAWING DT-03.
2. FOR CAST IN PLACE PEDESTAL WALL FOOTING PLAN AND WORK POINTS AND PEDESTAL WALL TYPICAL SECTIONS, SEE DRAWING DT-05.
3. FOR DETAILS OF CONNECTION OF RIGID FRAME TO THE PEDESTAL WALL, SEE DRAWING DT-08.

## LEGEND

| | | |
|---|---|---|
| ℄ | = | BASELINE |
| ELEV. | = | ELEVATION |
| ℄ | = | CENTERLINE |
| STA. | = | STATION |
| TYP. | = | TYPICAL |

BR1-444DT-06

$DONAME$ $DATE$ 9:50:25 AM

**DELAWARE DEPARTMENT OF TRANSPORTATION**

ADDENDUMS / REVISIONS

NOT TO SCALE

**US 301, SR 896 TO SR 1**

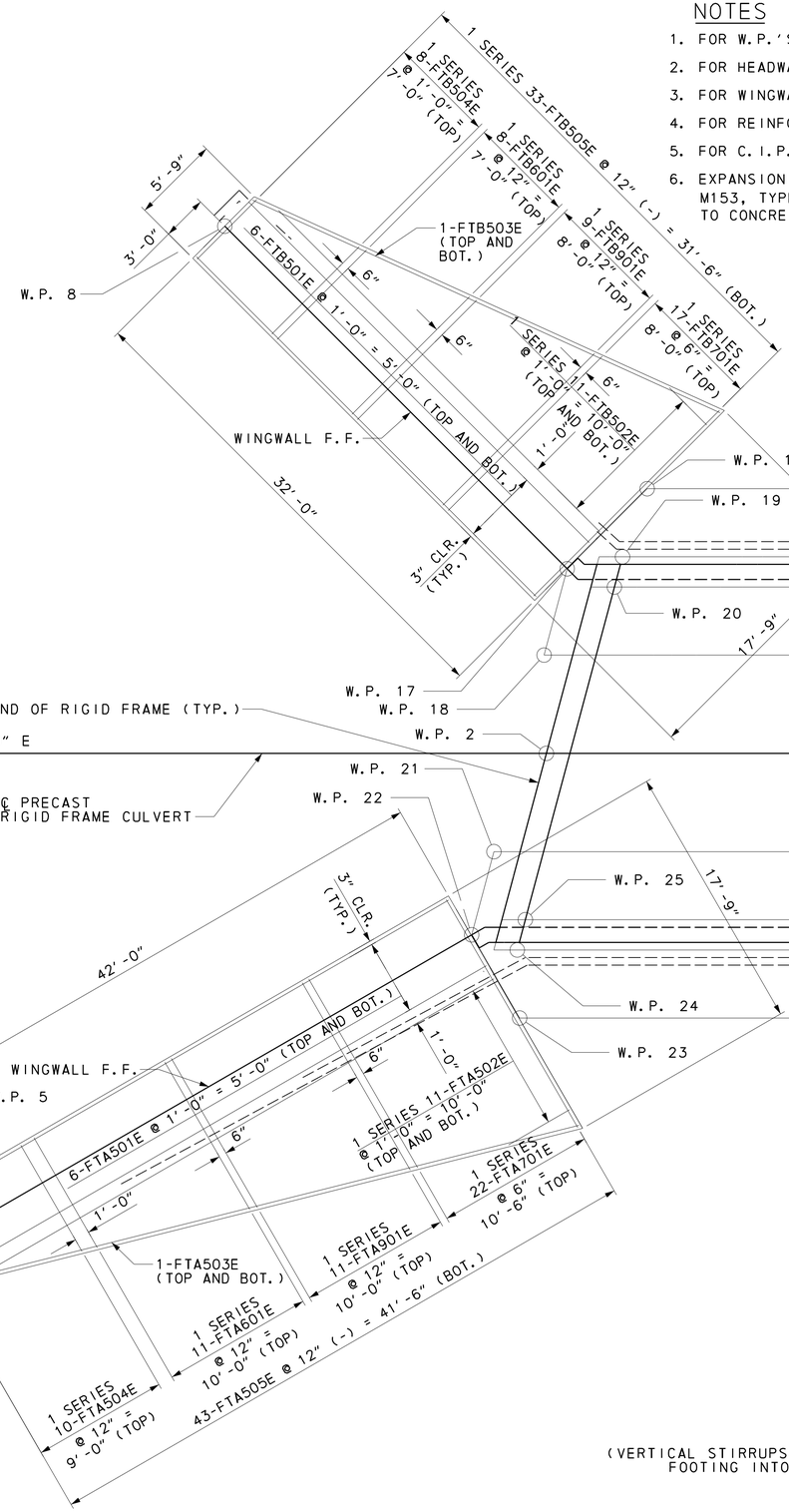
| CONTRACT | BRIDGE NO. 1-444 |
|---|---|
| T200911308 | DESIGNED BY: CCJ |
| COUNTY | CHECKED BY: JFM |
| NEW CASTLE | |

**CAST IN PLACE WALL AND SEGMENT PLAN AND ELEVATIONS**

| SHEET NO. |
|---|
| 586 |
| TOTAL SHTS. |
| 875 |

## NOTES

1. FOR W.P.'S STATIONS AND OFFSETS, SEE DRAWINGS DT-04 AND DT-05.
2. FOR HEADWALL DETAILS, SEE DRAWING DT-09.
3. FOR WINGWALL ELEVATION VIEW AND SECTIONS, SEE DRAWINGS DT-10 AND DT-11.
4. FOR REINFORCEMENT BAR SCHEDULE, SEE DRAWINGS DT-12 AND DT-13.
5. FOR C.I.P. PEDESTAL WALL FOUNDATION PLAN, DRAWING DT-05.
6. EXPANSION JOINT MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M153, TYPE III, SELF-EXPANDING CORK. PAYMENT SHALL BE INCIDENTAL TO CONCRETE CONSTRUCTION.


## PLAN

(VERTICAL STIRRUPS ON SIDES OF FOOTING AND REBAR EXTENDING FROM FOOTING INTO STEM NOT SHOWN IN DRAWING FOR CLARITY)

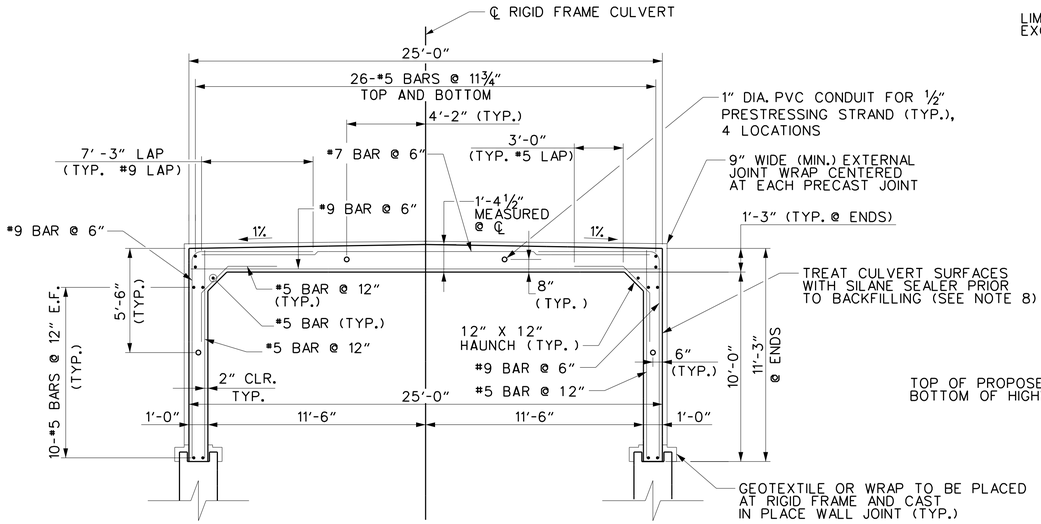
## LEGEND

| | | |
|---|---|---|
| BOT. | = | BOTTOM |
| ℄ | = | CENTERLINE |
| FTA | = | FOOTING A REINFORCEMENT |
| FTB | = | FOOTING B REINFORCEMENT |
| FTC | = | FOOTING C REINFORCEMENT |
| FTD | = | FOOTING D REINFORCEMENT |
| F.F. | = | FRONT FTACE |
| TYP. | = | TYPICAL |
| W.P. | = | WORK POINT |

BR1-444DT-07

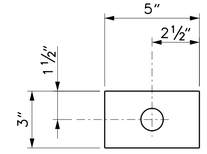
| | | | | | | |
|---|---|---|---|---|---|---|
| DELAWARE DEPARTMENT OF TRANSPORTATION | ADDENDUMS / REVISIONS | NOT TO SCALE | US 301, SR 896 TO SR 1 | CONTRACT T200911308 | BRIDGE NO. 1-444 | WINGWALL FOUNDATION PLAN |
| | | | | COUNTY NEW CASTLE | DESIGNED BY: CCJ | SHEET NO. 587 |
| | | | | | CHECKED BY: JFM | TOTAL SHTS. 875 |

$DONAME$ $DATE$ 9:51:22 AM



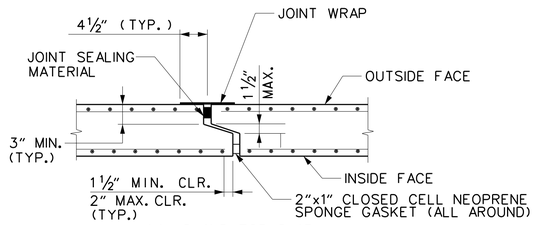

NOTE:
PAYMENT FOR ALL GROUTING ASSOCIATED WITH PRECAST MEMBERS (INCLUDING MISCELLANEOUS HARDWARE) SHALL BE INCIDENTAL TO ITEM 602522, PRECAST CONCRETE CULVERT.
EPOXY-COAT ALL REINFORCEMENT IN PRECAST ELEMENTS.

## TYPICAL SECTION RIGID FRAME




## ½ " THICK PLATE WASHER
## ( M270 GR. 345)

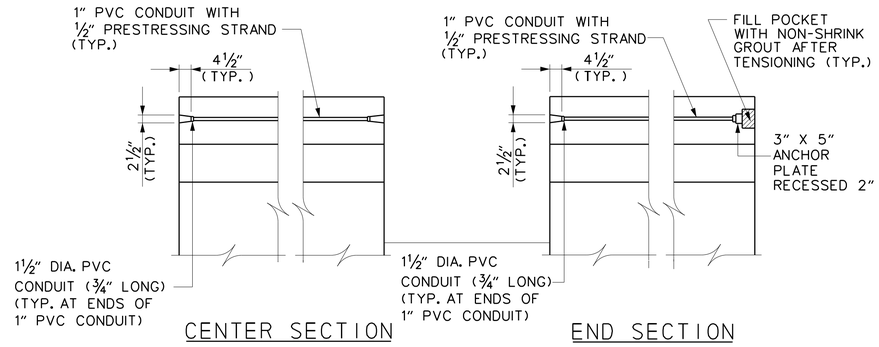
(PROTECTED WITH FUSION BONDED EPOXY)
(NOT TO SCALE)



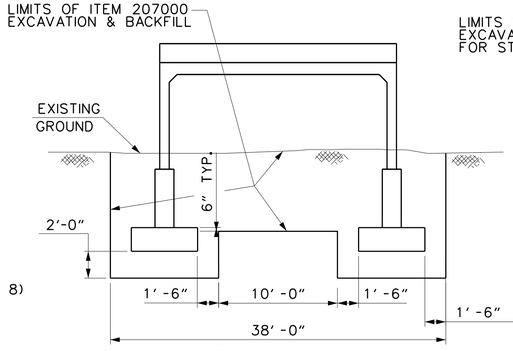

WALLS AND TOP SLAB

## PRECAST RIGID FRAME SEGMENT JOINT DETAIL

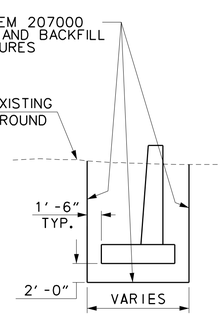
N.T.S.
SEAL AROUND EACH DUCT JOINT WITH A NEOPRENE SPONGE DONUT.



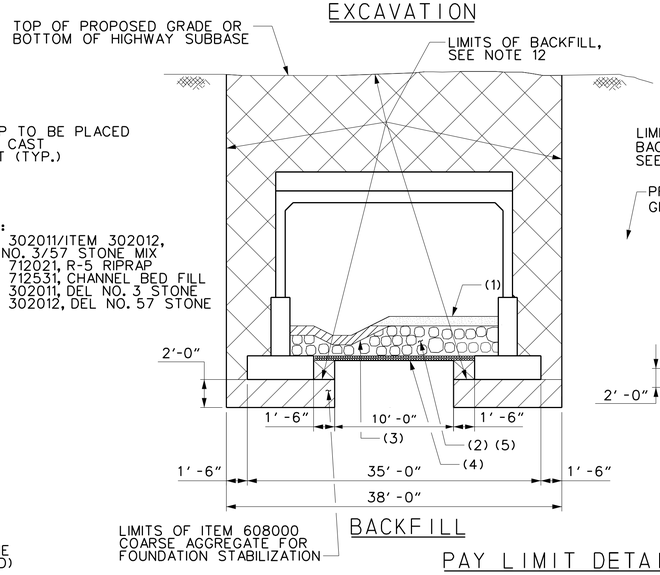

## POST TENSIONING COMPONENT DETAIL



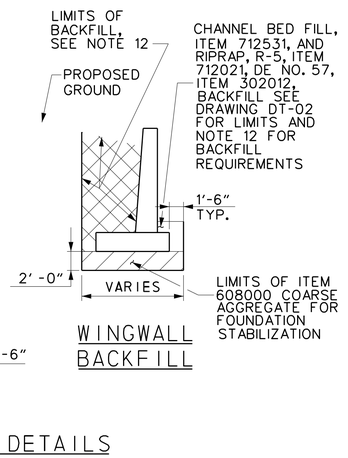

EXCAVATION




WINGWALL EXCAVATION




BACKFILL

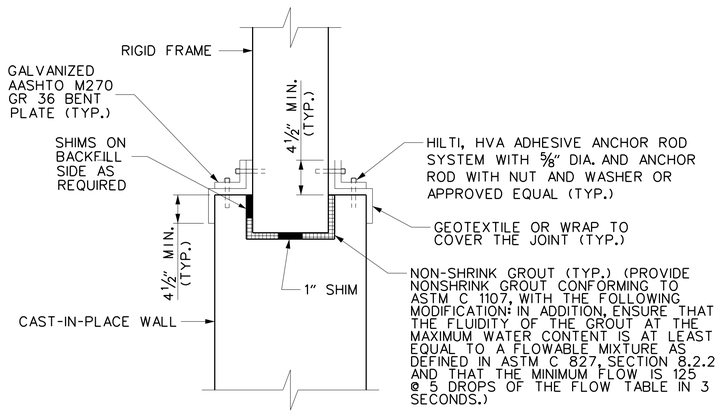



WINGWALL BACKFILL

LIMITS OF:
(1) ITEM 302011/ITEM 302012, DEL NO. 3/57 STONE MIX
(2) ITEM 712021, R-5 RIPRAP
(3) ITEM 712531, CHANNEL BED FILL
(4) ITEM 302011, DEL NO. 3 STONE
(5) ITEM 302012, DEL NO. 57 STONE

## PAY LIMIT DETAILS

NOT TO SCALE




## RIGID FRAME AND CAST-IN-PLACE JOINT DETAIL

N.T.S.
(LEFT SIDE SHOWN; RIGHT SIDE SIMILAR)
(REINFORCING NOT SHOWN)

## LEGEND

E.F. = EACH FACE
MIN. = MINIMUM
TYP.= TYPICAL

## PRECAST ELEMENT NOTES

1. DESIGN PLANS/ WORKING DRAWINGS
   INFORMATION PERTAINING TO THE PRECAST REINFORCED CONCRETE RIGID FRAME 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:
   A. AN OVERALL PLAN SHOWING ALL UNITS TOGETHER AND DETAILS OF EACH TYPE OF UNIT.
   B. A PLAN VIEW OF REINFORCEMENT FOR ANY IRREGULAR SHAPED SECTIONS (SKEWED, CURVED, ETC.).
   C. REINFORCING BAR LIST.
   D. BILL OF MATERIALS INCLUDING ALL ACCESSORIES.
   E. METHOD AND SEQUENCE OF POST-TENSIONING.
2. PRECAST ELEMENTS, ACCESSORIES AND INSTALLATION
   PAYMENT FOR ITEM 602522 - PRECAST CONCRETE CULVERT SHALL INCLUDE:
   A. ALL PRECAST ELEMENTS FOR THE RIGID FRAME.
   B. ALL ASSOCIATED REINFORCEMENT.
   C. ALL ACCESSORIES (INCLUDING, BUT NOT LIMITED TO, CONCRETE FINISH, POST-TENSIONING TENDONS, CONNECTION PLATES, GROUT, JOINT WRAP, JOINT SEALING MATERIAL, NEOPRENE GASKET, THREADED INSERTS) MENTIONED IN THE FOLLOWING NOTES UNLESS NOTED OTHERWISE.
   D. DELIVERY AND INSTALLATION OF ALL PRECAST ELEMENTS AND ALL ACCESSORIES.
3. MISCELLANEOUS CONCRETE NOTES
   A. ALL EXPOSED SURFACES SHALL BE PROTECTED WITH A WATER MISCIBLE, PENETRATING SILANE SEALER.
   B. ALL EXPOSED EDGES SHALL BE CHAMFERED 3/4" UNLESS OTHERWISE NOTED.
4. RIGID FRAME POST-TENSIONING
   THE PRECAST RIGID FRAME SECTIONS SHALL BE POST-TENSIONED TOGETHER WITH A MINIMUM OF FOUR POST-TENSIONING TENDONS. THE RIGID FRAME 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.
5. JOINTS BETWEEN PRECAST SECTIONS
   A. 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.
   B. ALL JOINTS BETWEEN RIGID FRAME SECTIONS SHALL HAVE A SHEAR KEY ALL AROUND.
   C. THE LOCATIONS OF THE JOINTS IN THE RIGID FRAME SHALL BE DETERMINED BY THE PRECASTER AND SUBMITTED IN THE SHOP DRAWINGS FOR APPROVAL.
   D. THE REINFORCEMENT SHALL HAVE 2" COVER AT THE END OF EACH SECTION AND MEET OR EXCEED THE MINIMUM AREA OF STEEL PER FOOT DENOTED IN THE PLANS.
   E. ALL JOINT EXTERIORS SHALL BE COVERED WITH A MINIMUM 9" WIDE WRAP CENTERED ON THE JOINT AS PER THE SPECIAL PROVISIONS.

## NOTES

1. FOR PROJECT NOTES SEE DRAWING DT-01.
2. FOR CONSTRUCTION SEQUENCE, SEE DRAWING DT-04.
3. PAYMENT FOR PRECAST CONCRETE RIGID FRAME IS UNDER ITEM 602522, PRECAST CONCRETE CULVERT.
4. PRECISE ALIGNMENT OF DUCTS AT JOINTS IS CRITICAL.
5. SEE DRAWING DT-06 FOR RIGID FRAME POST TENSIONING NOTES.
6. EXPOSED END OF POLYSTRAND SHALL BE REMOVED. FINAL COVER ON THE STRAND SHALL BE 2 INCHES MINIMUM AT ENDS. POCKET SHALL BE FILLED WITH NON-SHRINK GROUT.
7. PLACE 9" WIDE JOINT WRAP ALONG THE TOP SLAB AND SIDE JOINTS OF THE PRECAST RIGID FRAME CULVERT. ALSO PLACE 15" WIDE GEOTEXTILE OR WRAP ALONG THE FULL LENGTH OF JOINT AT PRECAST RIGID FRAME CULVERT AND CAST IN PLACE PEDESTAL WALL. PAYMENT FOR JOINT WRAP IS INCIDENTAL TO ITEM 602522.
8. PAYMENT FOR SILANE SEALER IS INCIDENTAL TO ITEM 602522.
9. PROVIDE THREADED INSERTS IN END PRECAST RIGID FRAME CULVERT SEGMENTS AS INDICATED ON DRAWING DT-09. SPACE INSERTS TO AVOID POST-TENSION REINFORCING STRANDS.
10. SUBMIT SHOP DRAWINGS FOR PRECAST ELEMENTS. INCLUDE ALL CULVERT DETAILS, POST-TENSIONING DETAILS AND PROCEDURES, AND HANDLING, TRANSPORTATION, AND CONSTRUCTION PROCEDURES. SUBMIT ERECTION PLAN TO ENGINEER FOR APPROVAL PRIOR TO CONSTRUCTION.
11. CHOKE RIPRAP VOIDS WITH DE NO. 57 STONE.
12. BACKFILL WITH MATERIAL CONFORMING TO THE REQUIREMENTS OF SUBSECTION 209.04, BORROW TYPE C.

BR1-444DT-08

$DONAME$ $$DATE$$ 4:20:36 PM

DELAWARE
DEPARTMENT OF TRANSPORTATION

ADDENDUMS / REVISIONS

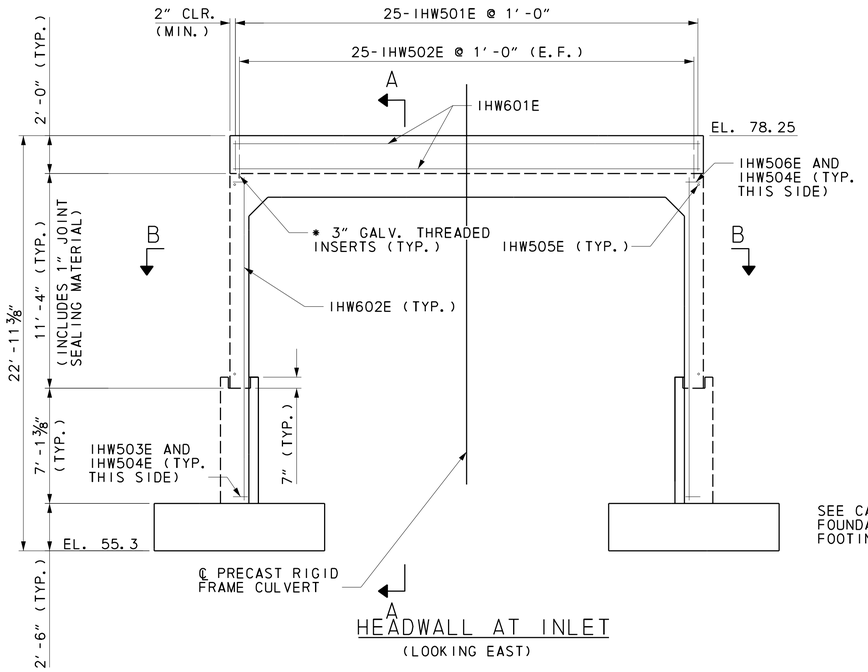
NOT TO SCALE

US 301,
SR 896 TO SR 1

| CONTRACT | BRIDGE NO. | 1-444 |
|---|---|---|
| T200911308 | DESIGNED BY: CCJ | |
| COUNTY | CHECKED BY: JFM | |
| NEW CASTLE | | |

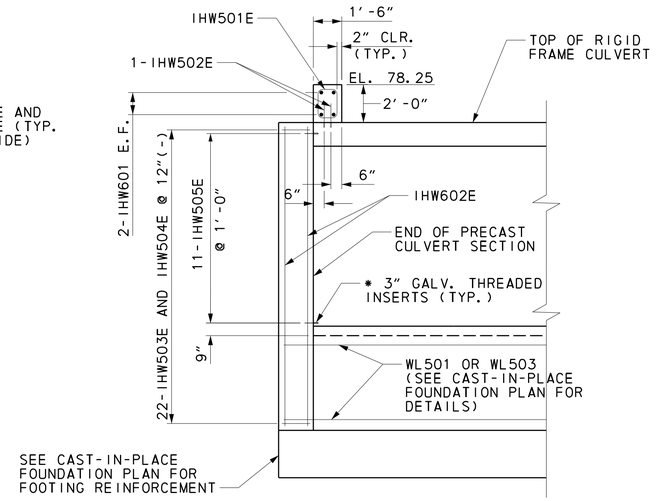
PRECAST RIGID FRAME CULVERT DETAILS

| SHEET NO. |
|---|
| 588 |
| TOTAL SHTS. |
| 875 |




HEADWALL AT INLET

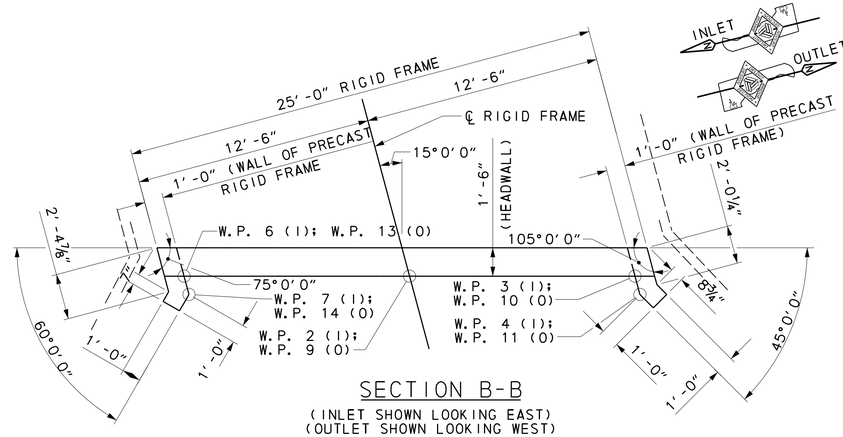
(LOOKING EAST)




* - THREADED INSERTS TO BE INCORPORATED IN PRECAST RIGID FRAME CULVERT BY THE FABRICATOR

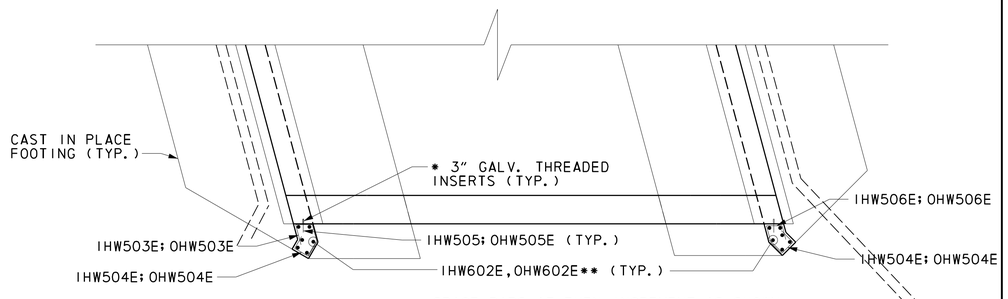
SECTION A-A

(NORTH SHOWN; SOUTH SIMILAR)




SECTION B-B

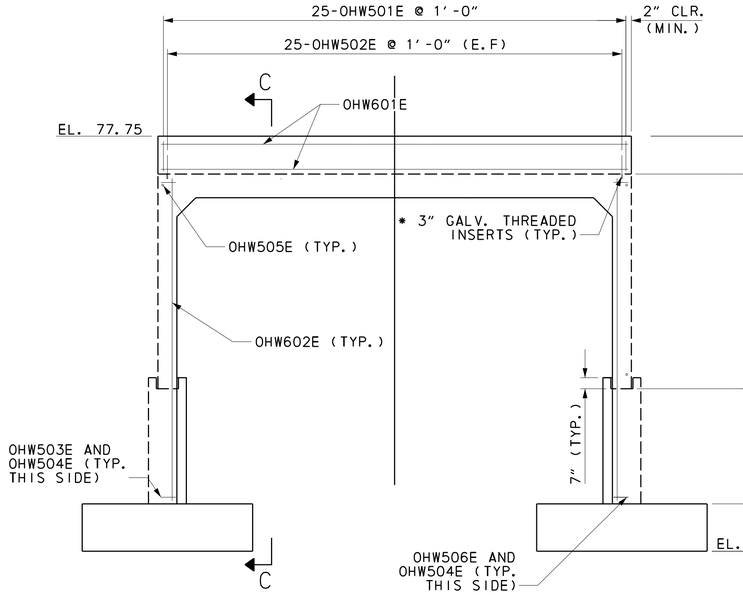
(INLET SHOWN LOOKING EAST)
(OUTLET SHOWN LOOKING WEST)




** - SPACE BARS AT EVEN INCREMENT AS SHOWN

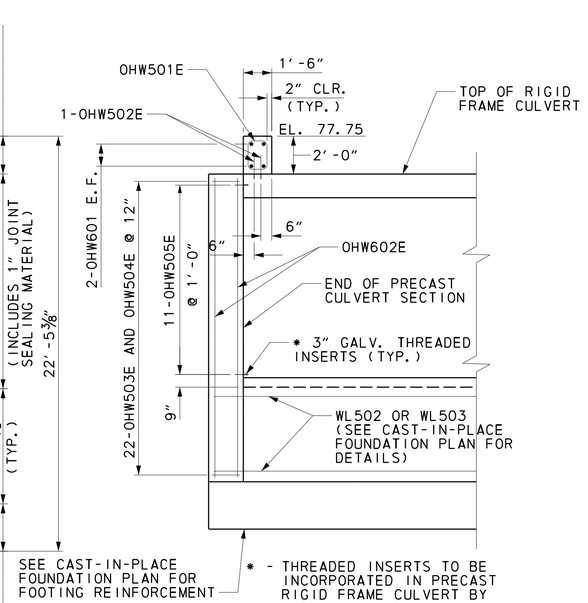
SECTION B-B (REINFORCING)

(INLET SHOWN LOOKING EAST)
(OUTLET SHOWN LOOKING WEST)




HEADWALL AT OUTLET

(LOOKING WEST)




* - THREADED INSERTS TO BE INCORPORATED IN PRECAST RIGID FRAME CULVERT BY THE FABRICATOR

SECTION C-C

(SOUTH SHOWN; NORTH SIMILAR)

NOTES:

1. FOR PROJECT NOTES, SEE DRAWING DT-01.
2. FOR CONSTRUCTION SEQUENCE, SEE DRAWING DT-04.
3. FOR REINFORCEMENT BAR SCHEDULE, SEE DRAWING DT-13.
4. FOR HEADWALL W.P.'S, SEE DRAWING DT-04.

LEGEND:

| | | |
|---|---|---|
| BOT | = | BOTTOM |
| CLR. | = | CLEAR |
| CONSTR. | = | CONSTRUCTION |
| E.F. | = | EACH FACE |
| EL. | = | ELEVATION |
| GALV. | = | GALVANIZED |
| F.F. | = | FRONT FACE |
| I | = | INLET |
| INV. | = | INVERT |
| JT. | = | JOINT |
| MAX. | = | MAXIMUM |
| MIN. | = | MINIMUNM |
| O | = | OUTLET |
| PROJ. | = | PROJECT |
| R.F. | = | REAR FACE |
| TYP. | = | TYPICAL |

BR1-444DT-09

$DONNAME$
$SDATE$ 8:59:11 AM

DELAWARE
DEPARTMENT OF TRANSPORTATION

ADDENDUMS / REVISIONS

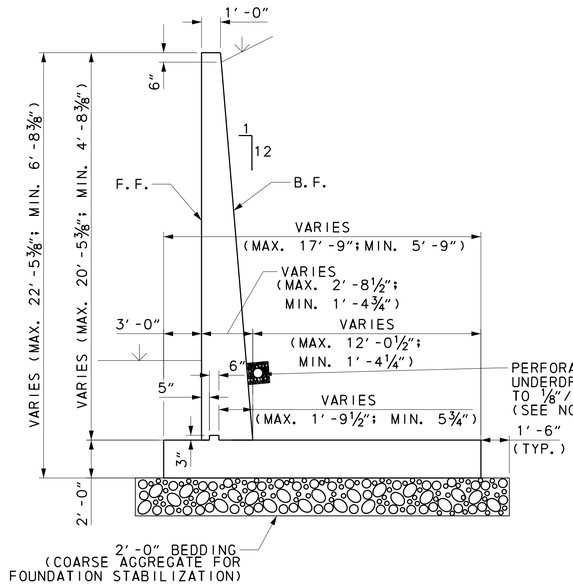
NOT TO SCALE

US 301,
SR 896 TO SR 1

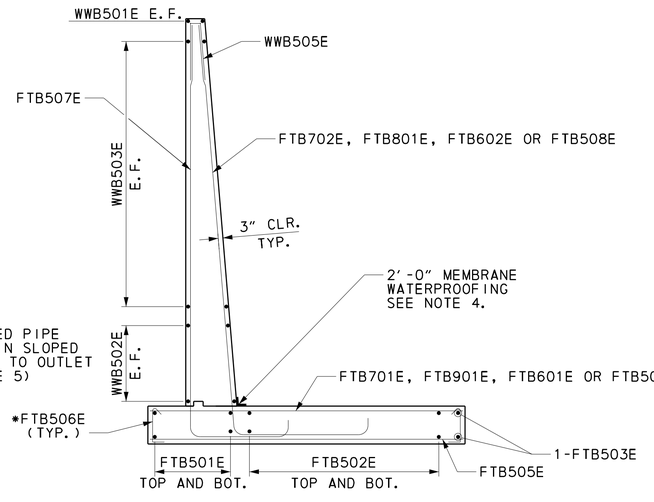
| CONTRACT | BRIDGE NO. 1-444 |
|---|---|
| T200911308 | DESIGNED BY: CCJ |
| COUNTY | CHECKED BY: JFM |
| NEW CASTLE | |

HEADWALL DETAILS

| SHEET NO. | |
|---|---|
| 589 | |
| TOTAL SHTS. | |
| 875 | |

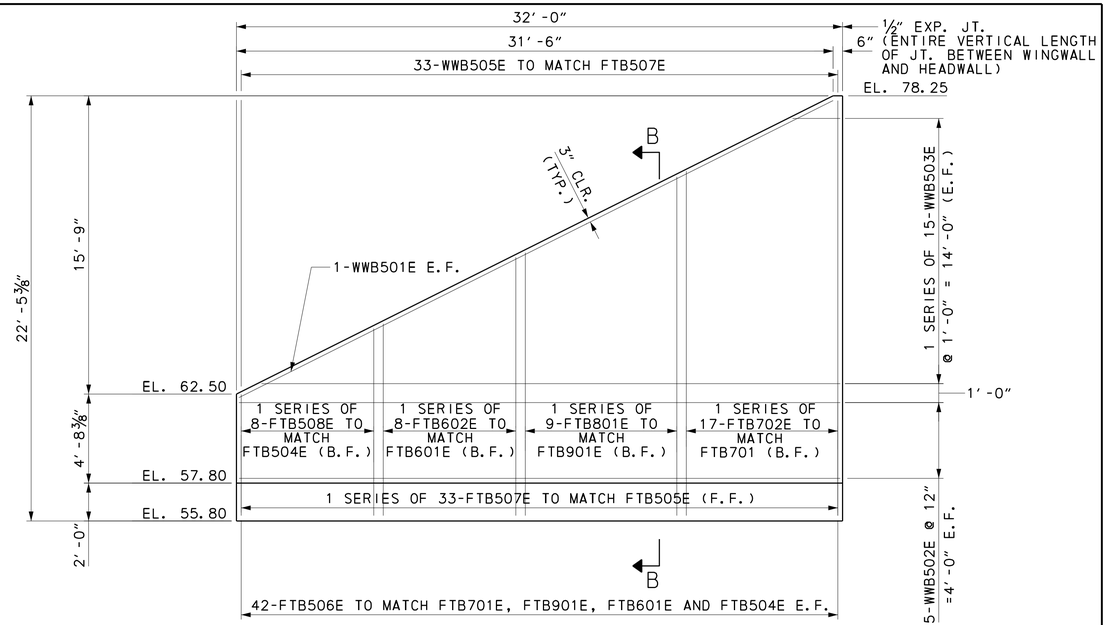



SECTION B-B




SECTION B-B REINFORCEMENT

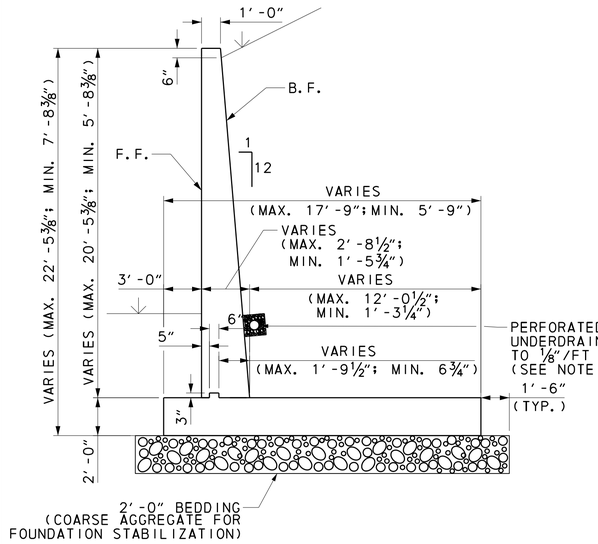
*ALTERNATE 135 HOOK UP AND DOWN BETWEEN THE TOP AND BOTTOM MATS OF REINFORCING.



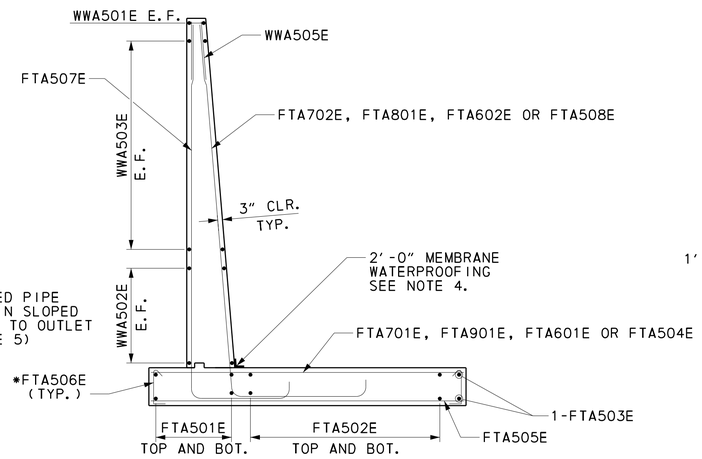

ELEVATION - WING B

(LOOKING NORTH)

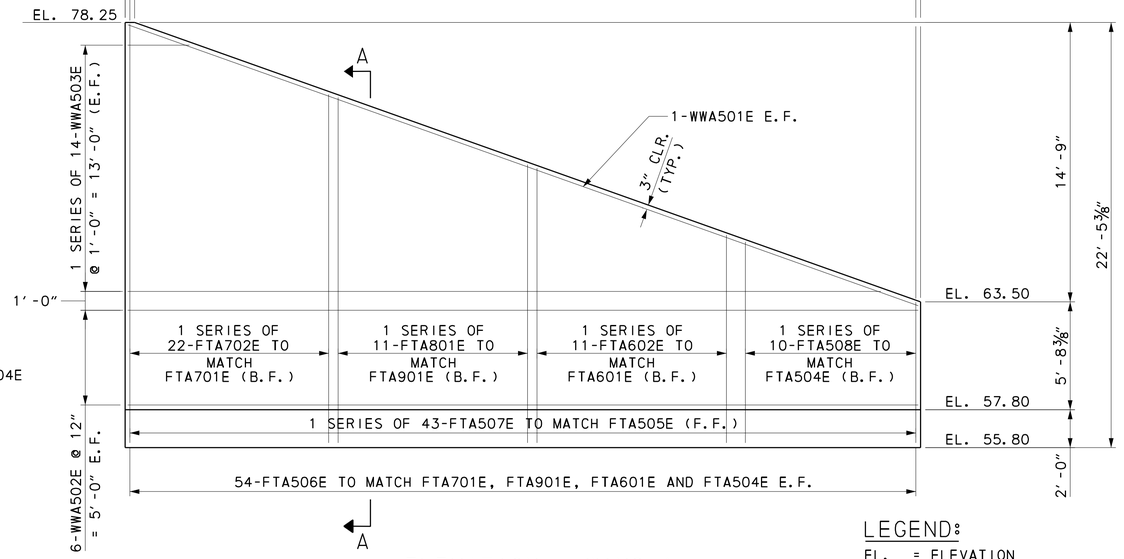
(CONSTRUCTION KEY AND PIPE UNDERDRAIN NOT SHOWN FOR CLARITY)




SECTION A-A




SECTION A-A REINFORCEMENT




ELEVATION - WING A

(LOOKING SOUTH)

(CONSTRUCTION KEY AND PIPE UNDERDRAIN NOT SHOWN FOR CLARITY)

## NOTES:

1. FOR WINGWALL FOUNDATION PLAN, SEE DRAWING DT-07.
2. FOR WINGWALL REINFORCEMENT BAR SCHEDULE, SEE DRAWING DT-12.
3. PLACE 2′-0″ WIDE MEMBRANE WATERPROOFING CENTERED AT WALL/FOOTING INTERFACE. LAP SPLICES BY A MINIMUM 6″.

PAYMENT FOR MEMBRANE WATERPROOFING IS INCIDENTAL TO ITEM 602002. FURNISH ADHESIVE-BACKED PREFORMED MEMBRANE SHEET. SEE DRAWING DT-04 FOR MINIMUM REQUIREMENTS.

4. FOR PERFORATED PIPE UNDERDRAIN DETAIL, SEE DRAWING DT-03.

| PERFORATED PIPE UNDERDRAIN | |
|---|---|
| WINGWALL | INVERT EL. OF OUTLET AT END OF THE WALL |
| A | 63.25 |
| B | 62.25 |

## LEGEND:

EL. = ELEVATION
EXP. = EXPANSION
FTA = FOOTING A REINFORCEMENT
FTB = FOOTING B REINFORCEMENT
JT. = JOINT
MAX. = MAXIMUM
MIN. = MINIMUM
TYP. = TYPICAL
WWA = WINGWALL A REINFORCEMENT
WWB = WINGWALL B REINFORCEMENT

BR1-444DT-10

$DGNNAME$
$SDATE$ 9:21:05 AM

DELAWARE DEPARTMENT OF TRANSPORTATION

ADDENDUMS / REVISIONS

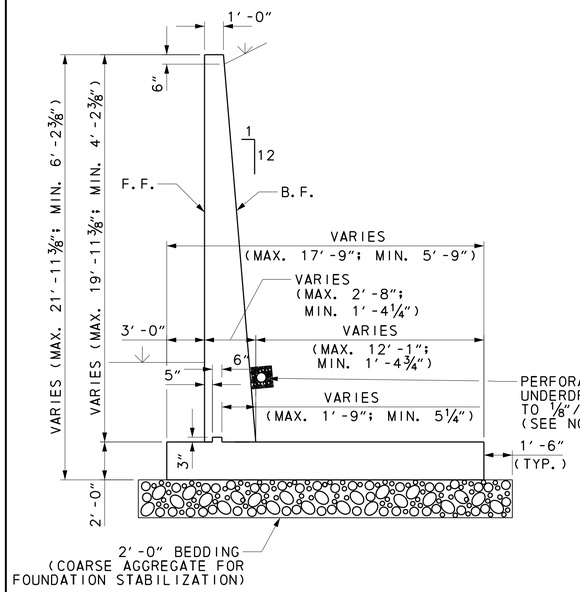
NOT TO SCALE

US 301, SR 896 TO SR 1

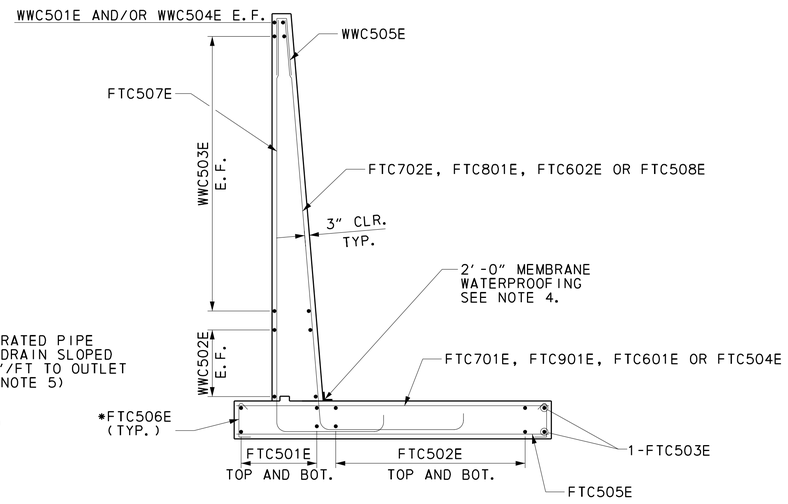
| CONTRACT | BRIDGE NO. 1-444 |
|---|---|
| T200911308 | DESIGNED BY: CCJ |
| COUNTY | CHECKED BY: JFM |
| NEW CASTLE | |

WINGWALLS A & B DETAILS

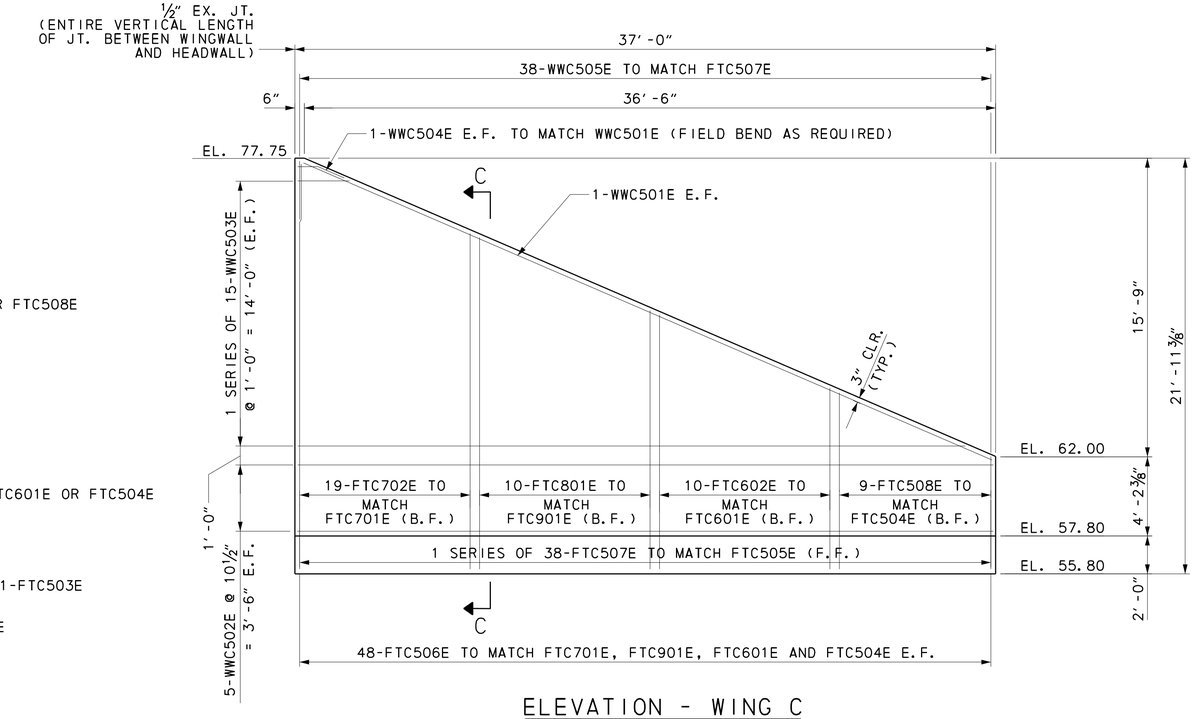
| SHEET NO. | TOTAL SHTS. |
|---|---|
| 590 | 875 |




SECTION C-C



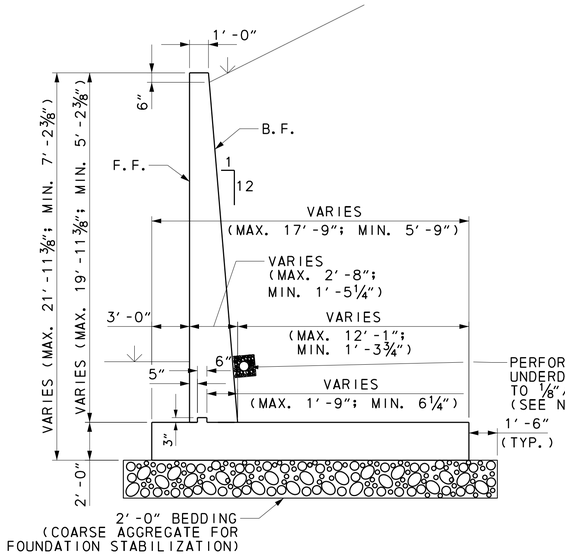

SECTION C-C REINFORCEMENT



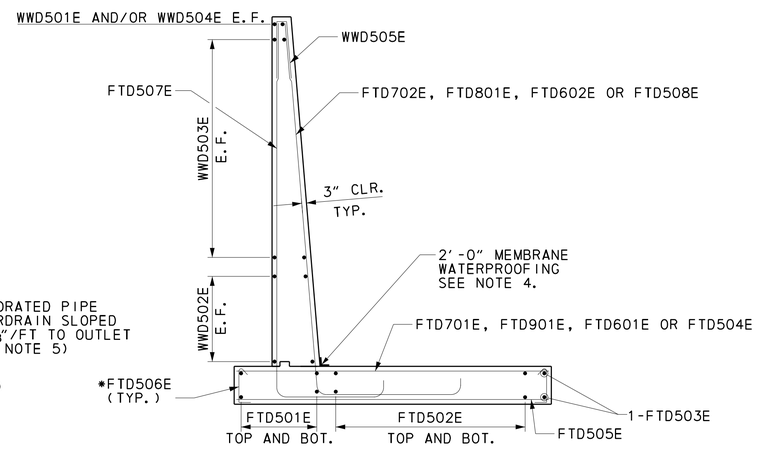

ELEVATION - WING C

(LOOKING NORTH)
(CONSTRUCTION KEY AND PIPE UNDERDRAIN NOT SHOWN FOR CLARITY)

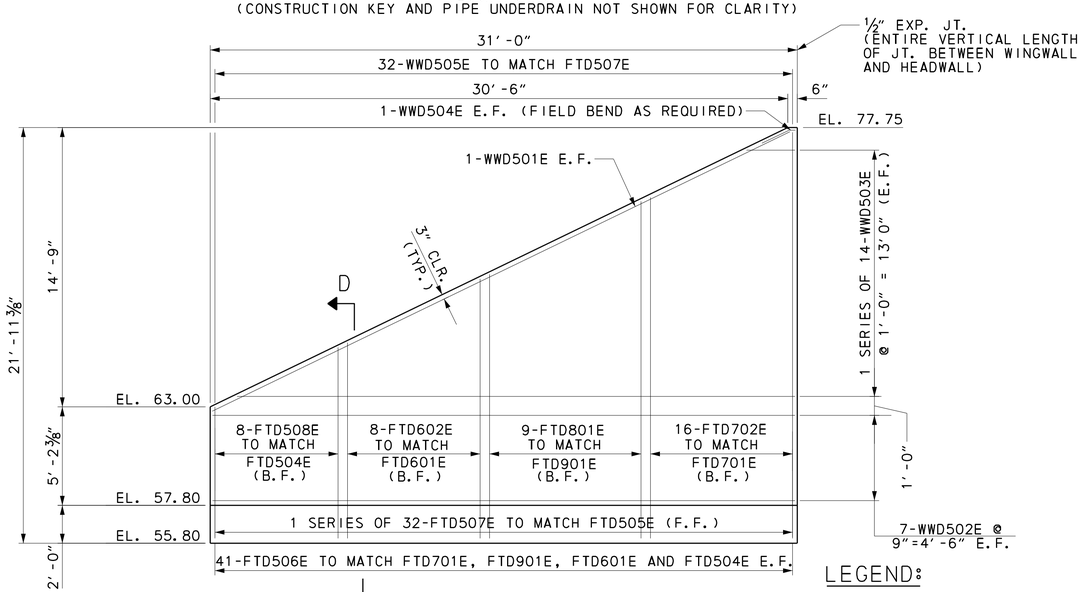
* ALTERNATE 135 HOOK UP AND DOWN BETWEEN THE TOP AND BOTTOM MATS OF REINFORCING.




SECTION D-D




SECTION D-D REINFORCEMENT




D ELEVATION - WING D

(LOOKING SOUTH)
(CONSTRUCTION KEY AND PIPE UNDERDRAIN NOT SHOWN FOR CLARITY)

| PERFORATED PIPE UNDERDRAIN | |
|---|---|
| WINGWALL | INVERT EL. OF OUTLET AT END OF THE WALL |
| C | 61.75 |
| D | 62.75 |

NOTES:

1. FOR WINGWALL FOUNDATION PLAN, SEE DRAWING DT-07.
2. FOR WINGWALL REINFORCEMENT BAR SCHEDULE, SEE DRAWING DT-13.
3. PLACE 2′-0″ WIDE MEMBRANE WATERPROOFING CENTERED AT WALL/FOOTING INTERFACE. LAP SPLICES BY A MINIMUM 6″. PAYMENT FOR MEMBRANE WATERPROOFING IS INCIDENTAL TO ITEM 602002. FURNISH ADHESIVE-BACKED PREFORMED MEMBRANE SHEET. SEE DRAWING DT-04 FOR MINIMUM REQUIREMENTS.
4. FOR PERFORATED PIPE UNDERDRAIN DETAIL, SEE DRAWING DT-03.

LEGEND:

EL. = ELEVATION
EXP. = EXPANSION
FTC = FOOTING C REINFORCEMENT
FTD = FOOTING D REINFORCEMENT
JT. = JOINT
MAX. = MAXIMUM
MIN. = MINIMUM
TYP. = TYPICAL
WWC = WINGWALL C REINFORCEMENT
WWD = WINGWALL D REINFORCEMENT

BR1-444DT-11

$DGNNAME
$SDATE$ 9:37:15 AM

**DELAWARE DEPARTMENT OF TRANSPORTATION**

ADDENDUMS / REVISIONS

NOT TO SCALE

**US 301, SR 896 TO SR 1**

| CONTRACT | BRIDGE NO. 1-444 |
|---|---|
| T200911308 | DESIGNED BY: CCJ |
| COUNTY | CHECKED BY: JFM |
| NEW CASTLE | |

**WINGWALLS C & D DETAILS**

| SHEET NO. |
|---|
| 591 |
| TOTAL SHTS. |
| 875 |

(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

(3) LETTER FOLLOWING 'LOCATION PREFIXES' INDICATES:
A - WINGWALL A
B - WINGWALL B
C - WINGWALL C
D - WINGWALL D

**CAST IN PLACE PEDESTAL WALL**

**WINGWALL A**

| SPECIFICATIONS | | | | | BENDING DIMENSIONS (FEET-INCHES /QUARTER INCH) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| QTY. | SIZE | LENGTH | MARK | TYPE | A | B | C | D | E | F/R | G | H | J | K | O |
| 48 | 5 | 40-6 | FT501E | STR | | 40-6 | | | | | | | | | |
| 48 | 5 | 45-0 | FT502E | STR | | 45-0 | | | | | | | | | |
| 96 | 5 | 43-0 | FT503E | STR | | 43-0 | | | | | | | | | |
| 2X165 | 5 | 9-2 | FT504E | STR | | 9-2 | | | | | | | | | |
| | | TO | | | | TO | | | | | | | | | |
| | | 9-8 | | | | 9-8 | | | | | | | | | |
| 658 | 5 | 2-11 | FT505E | T9 | 0-5 | 2-0 | | | | | 0-6 | | | | |
| | | | | | | | | | | | | | | | |
| 321 | 7 | 10-6 | FT701E | STR | | 10-6 | | | | | | | | | |
| 7 | 7 | 12-9 | FT702E | 33 | | 5-6 | 6-4 | 3-8 | | | | | | | |
| 8 | 7 | 11-4 | FT703E | 33 | | 6-1 | 3-9 | 3-9 | | | | | | | |
| | | | | | | | | | | | | | | | |
| 321 | 9 | 10-6 | FT901E | STR | | 10-6 | | | | | | | | | |
| 7 | 9 | 12-9 | FT902E | 33 | | 5-6 | 6-4 | 3-8 | | | | | | | |
| 2X165 | 9 | 10-8 | FT903E | 17 | | 1-6 | 9-2 | 0 | | | | | | | |
| | | TO | | | | TO | TO | TO | | | | | | | |
| | | 11-2 | | | | 1-6 | 9-8 | 0 | | | | | | | |
| 8 | 9 | 11-4 | FT904E | 33 | | 6-1 | 3-9 | 3-9 | | | | | | | |
| | | | | | | | | | | | | | | | |
| 36 | 5 | 40-0 | WL501E | STR | | 40-0 | | | | | | | | | |
| 36 | 5 | 45-0 | WL502E | STR | | 45-0 | | | | | | | | | |
| 72 | 5 | 43-0 | WL503E | STR | | 43-0 | | | | | | | | | |
| 330 | 5 | 7-6 | WL504E | 17 | | 3-0 | 1-6 | 3-0 | | | | | | | |

**WINGWALL A**

| SPECIFICATIONS | | | | | BENDING DIMENSIONS (FEET-INCHES /QUARTER INCH) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| QTY. | SIZE | LENGTH | MARK | TYPE | A | B | C | D | E | F/R | G | H | J | K | O |
| 12 | 5 | 41-6 | FTA501E | STR | | 41-6 | | | | | | | | | |
| 2X11 | 5 | 4-10 | FTA502E | STR | | 4-10 | | | | | | | | | |
| | | TO | | | | TO | | | | | | | | | |
| | | 39-10 | | | | 39-10 | | | | | | | | | |
| 2 | 5 | 43-2 | FTA503E | STR | | 43-2 | | | | | | | | | |
| 1X10 | 5 | 5-3 | FTA504E | STR | | 5-3 | | | | | | | | | |
| | | TO | | | | TO | | | | | | | | | |
| | | 7-9 | | | | 7-9 | | | | | | | | | |
| 1X43 | 5 | 5-3 | FTA505E | STR | | 5-3 | | | | | | | | | |
| | | TO | | | | TO | | | | | | | | | |
| | | 17-2 | | | | 17-2 | | | | | | | | | |
| 108 | 5 | 2-5 | FTA506E | T9 | 0-5 | 1-6 | | | | | 0-6 | | | | |
| 1X43 | 5 | 10-11 | FTA507E | 17 | | 7-3 | 2-2 | 1-6 | | | | | | | |
| | | TO | | | | TO | TO | TO | | | | | | | |
| | | 25-7 | | | | 21-11 | 2-2 | 1-6 | | | | | | | |
| 1X10 | 5 | 10-0 | FTA508E | 34 | 1-6 | 1-3 | 0-7 | 7-3 | | | | | | | |

**WINGWALL A CONTINUED**

| SPECIFICATIONS | | | | | BENDING DIMENSIONS (FEET-INCHES /QUARTER INCH) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| QTY. | SIZE | LENGTH | MARK | TYPE | A | B | C | D | E | F/R | G | H | J | K | O |
| | | TO | | | TO | TO | TO | TO | | | | | | | |
| | | 13-3 | | | 1-6 | 1-3 | 0-10 | 10-5 | | | | | | | |
| | | | | | | | | | | | | | | | |
| 1X11 | 6 | 8-2 | FTA601E | STR | | 8-2 | | | | | | | | | |
| | | TO | | | | TO | | | | | | | | | |
| | | 11-0 | | | | 11-0 | | | | | | | | | |
| 1X11 | 6 | 15-4 | FTA602E | 34 | 1-6 | 3-0 | 0-11 | 10-10 | | | | | | | |
| | | TO | | | TO | TO | TO | TO | | | | | | | |
| | | 18-10 | | | 1-6 | 3-0 | 1-2 | 14-4 | | | | | | | |
| | | | | | | | | | | | | | | | |
| 1X22 | 7 | 14-2 | FTA701E | STR | | 14-2 | | | | | | | | | |
| | | TO | | | | TO | | | | | | | | | |
| | | 17-2 | | | | 17-2 | | | | | | | | | |
| 1X22 | 7 | 22-9 | FTA702E | 34 | 1-6 | 3-0 | 1-6 | 18-3 | | | | | | | |
| | | TO | | | TO | TO | TO | TO | | | | | | | |
| | | 26-7 | | | 1-6 | 3-0 | 1-10 | 22-0 | | | | | | | |
| | | | | | | | | | | | | | | | |
| 1X11 | 8 | 19-0 | FTA801E | 34 | 1-6 | 3-0 | 1-2 | 14-6 | | | | | | | |
| | | TO | | | TO | TO | TO | TO | | | | | | | |
| | | 22-7 | | | 1-6 | 3-0 | 1-6 | 18-1 | | | | | | | |
| | | | | | | | | | | | | | | | |
| 1X11 | 9 | 11-2 | FTA901E | STR | | 11-2 | | | | | | | | | |
| | | TO | | | | TO | | | | | | | | | |
| | | 14-0 | | | | 14-0 | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| 2 | 5 | 44-0 | WWA501E | STR | | 44-0 | | | | | | | | | |
| 12 | 5 | 41-6 | WWA502E | STR | | 41-6 | | | | | | | | | |
| 2X14 | 5 | 2-10 | WWA503E | STR | | 2-10 | | | | | | | | | |
| | | TO | | | | TO | | | | | | | | | |
| | | 39-5 | | | | 39-5 | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| 43 | 5 | 6-6 | WWA505E | 17 | | 3-0 | 0-6 | 3-0 | | | | | | | |

**WINGWALL B**

| SPECIFICATIONS | | | | | BENDING DIMENSIONS (FEET-INCHES /QUARTER INCH) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| QTY. | SIZE | LENGTH | MARK | TYPE | A | B | C | D | E | F/R | G | H | J | K | O |
| 12 | 5 | 31-6 | FTB501E | STR | | 31-6 | | | | | | | | | |
| 2X11 | 5 | 3-0 | FTB502E | STR | | 3-0 | | | | | | | | | |
| | | TO | | | | TO | | | | | | | | | |
| | | 29-8 | | | | 29-8 | | | | | | | | | |
| 2 | 5 | 33-7 | FTB503E | STR | | 33-7 | | | | | | | | | |
| 1X8 | 5 | 5-2 | FTB504E | STR | | 5-2 | | | | | | | | | |
| | | TO | | | | TO | | | | | | | | | |
| | | 7-11 | | | | 7-11 | | | | | | | | | |

**WINGWALL B CONTINUED**

| SPECIFICATIONS | | | | | BENDING DIMENSIONS (FEET-INCHES /QUARTER INCH) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| QTY. | SIZE | LENGTH | MARK | TYPE | A | B | C | D | E | F/R | G | H | J | K | O |
| 1X33 | 5 | 5-4 | FTB505E | STR | | 5-4 | | | | | | | | | |
| | | TO | | | | TO | | | | | | | | | |
| | | 17-1 | | | | 17-1 | | | | | | | | | |
| 84 | 5 | 2-5 | FTB506E | T9 | 0-5 | 1-6 | | | | | 0-6 | | | | |
| 1X33 | 5 | 9-11 | FTB507E | 17 | | 6-3 | 2-2 | 1-6 | | | | | | | |
| | | TO | | | | TO | TO | TO | | | | | | | |
| | | 25-7 | | | | 21-11 | 2-2 | 1-6 | | | | | | | |
| 1X8 | 5 | 9-0 | FTB508E | 34 | 1-6 | 1-3 | 0-6 | 6-3 | | | | | | | |
| | | TO | | | TO | TO | TO | TO | | | | | | | |
| | | 12-6 | | | 1-6 | 1-3 | 0-9 | 9-9 | | | | | | | |
| | | | | | | | | | | | | | | | |
| 1X8 | 6 | 8-1 | FTB601E | STR | | 8-1 | | | | | | | | | |
| | | TO | | | | TO | | | | | | | | | |
| | | 10-9 | | | | 10-9 | | | | | | | | | |
| 1X8 | 6 | 14-6 | FTB602E | 34 | 1-6 | 3-0 | 0-10 | 10-0 | | | | | | | |
| | | TO | | | TO | TO | TO | TO | | | | | | | |
| | | 18-0 | | | 1-6 | 3-0 | 1-12 | 13-6 | | | | | | | |
| | | | | | | | | | | | | | | | |
| 1X17 | 7 | 14-1 | FTB701E | STR | | 14-1 | | | | | | | | | |
| | | TO | | | | TO | | | | | | | | | |
| | | 17-1 | | | | 17-1 | | | | | | | | | |
| 1X17 | 7 | 22-6 | FTB702E | 34 | 1-6 | 3-0 | 1-6 | 18-0 | | | | | | | |
| | | TO | | | TO | TO | TO | TO | | | | | | | |
| | | 26-6 | | | 1-6 | 3-0 | 1-10 | 21-11 | | | | | | | |
| | | | | | | | | | | | | | | | |
| 1X9 | 8 | 18-3 | FTB801E | 34 | 1-6 | 3-0 | 1-1 | 13-9 | | | | | | | |
| | | TO | | | TO | TO | TO | TO | | | | | | | |
| | | 22-3 | | | 1-6 | 3-0 | 1-5 | 17-9 | | | | | | | |
| | | | | | | | | | | | | | | | |
| 1X9 | 9 | 10-11 | FTB901E | STR | | 10-11 | | | | | | | | | |
| | | TO | | | | TO | | | | | | | | | |
| | | 13-11 | | | | 13-11 | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| 2 | 5 | 35-2 | WWB501E | STR | | 35-2 | | | | | | | | | |
| 10 | 5 | 31-6 | WWB502E | STR | | 31-6 | | | | | | | | | |
| 2X15 | 5 | 2-6 | WWB503E | STR | | 2-6 | | | | | | | | | |
| | | TO | | | | TO | | | | | | | | | |
| | | 30-1 | | | | 30-1 | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| 33 | 5 | 6-6 | WWB505E | 17 | | 3-0 | 0-6 | 3-0 | | | | | | | |

**ASTM STANDARD ENGLISH REINFORCING BARS**

| BAR SIZE | NOMINAL DIMENSIONS: DIAMETER (INCHES) | AREA (INCHES²) | WEIGHT (LBS./FT.) |
|---|---|---|---|
| 3 | 0.375 | 0.110 | 0.376 |
| 4 | 0.500 | 0.200 | 0.668 |
| 5 | 0.625 | 0.310 | 1.043 |
| 6 | 0.750 | 0.440 | 1.502 |
| 7 | 0.875 | 0.600 | 2.044 |
| 8 | 1.000 | 0.790 | 2.670 |
| 9 | 1.128 | 1.000 | 3.400 |
| 10 | 1.270 | 1.270 | 4.303 |
| 11 | 1.410 | 1.560 | 5.313 |
| 14 | 1.693 | 2.250 | 7.650 |
| 18 | 2.257 | 4.000 | 13.600 |

**RECOMMENDED END HOOKS, APPLICABLE TO ALL GRADES**

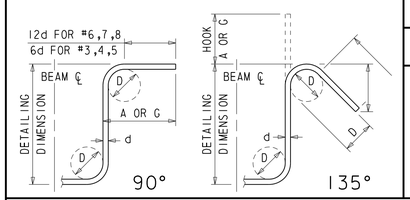
| BAR SIZE | 180° HOOKS: D | 180° HOOKS: A OR G | 180° HOOKS: J | 90° HOOKS: A OR G |
|---|---|---|---|---|
| 3 | 2¼" | 5" | 3" | 6" |
| 4 | 3" | 6" | 4" | 8" |
| 5 | 3¾" | 7" | 5" | 10" |
| 6 | 4½" | 8" | 6" | 1-0" |
| 7 | 5¼" | 10" | 7" | 1-2" |
| 8 | 6" | 11" | 8" | 1-4" |
| 9 | 9½" | 1-3" | 11¾" | 1-7" |
| 10 | 10¾" | 1-5" | 1-1¼" | 1-10" |
| 11 | 1-0" | 1-7" | 1-2¾" | 2-0" |
| 14 | 1-6¼" | 2-3" | 1-9¾" | 2-7" |
| 18 | 2-0" | 3-0" | 2-4½" | 3-5" |

**STIRRUP AND TIE HOOKS, APPLICABLE TO ALL GRADES**

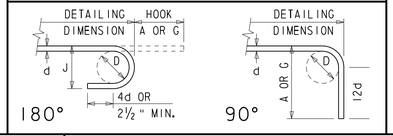
| BAR SIZE | 90° HOOK: D | 90° HOOK: A OR G | 135° HOOK: A OR G | 135° HOOK: A OR G |
|---|---|---|---|---|
| 3 | 1½" | 4" | 4" | 2½" |
| 4 | 2" | 4½" | 4½" | 3" |
| 5 | 2½" | 6" | 5½" | 3¾" |
| 6 | 4½" | 1-0" | 8" | 4½" |
| 7 | 5¼" | 1-2" | 9" | 5¼" |
| 8 | 6" | 1-4" | 10½" | 6" |

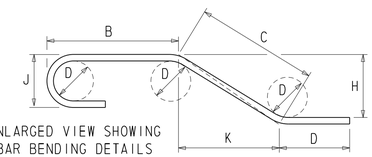
NOTES:
1. FIGURES SHOWN IN CIRCLES REPRESENT BAR BEND TYPES.
2. STANDARD BAR BENDS INCLUDE ONLY THOSE TYPES BELOW, INDICATED AS SUCH.
3. ALL DIMENSIONS OUT-TO-OUT, EXCEPT "A" AND "G" ON STD. 180° AND 135° HOOKS.
4. "J" DIMENSIONS ON 180° HOOKS TO BE SHOWN ONLY WHERE NECESSARY TO RESTRICT HOOK SIZE, OTHERWISE STANDARD 'ACI' HOOKS ARE TO BE USED.
5. 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.
6. "H" DIMENSIONS OF STIRRUPS TO BE SHOWN AS NEEDED TO FIT WITHIN THE CONCRETE.
7. UNLESS OTHERWISE NOTED, DIAMETER "D" IS THE SAME FOR ALL BENDS AND HOOKS ON A BAR (EXCEPT FOR BEND TYPES 11 AND 13).
8. WHERE SLOPE DIFFERS FROM 45° OFFSET, "H" AND "K" MUST BE SHOWN.
9. WHERE BARS ARE TO BE BENT MORE ACCURATELY THAN STANDARD BENDING TOLERANCES, BENDING DIMENSIONS REQUIRING CLOSER FABRICATION SHOULD HAVE LIMITS INDICATED.
10. FOR RECOMMENDED DIAMETER "D", OF BENDS, HOOKS, ETC., REFER TO TABLE ABOVE, 'CRSI' OR 'ACI' TABLES WHERE APPLICABLE AND REQUIRED.
11. TYPE S1-S6, S11, T1-T3 AND T6-T9 APPLICABLE TO BAR SIZES #3 THROUGH #8.

## STIRRUP AND TIE HOOKS

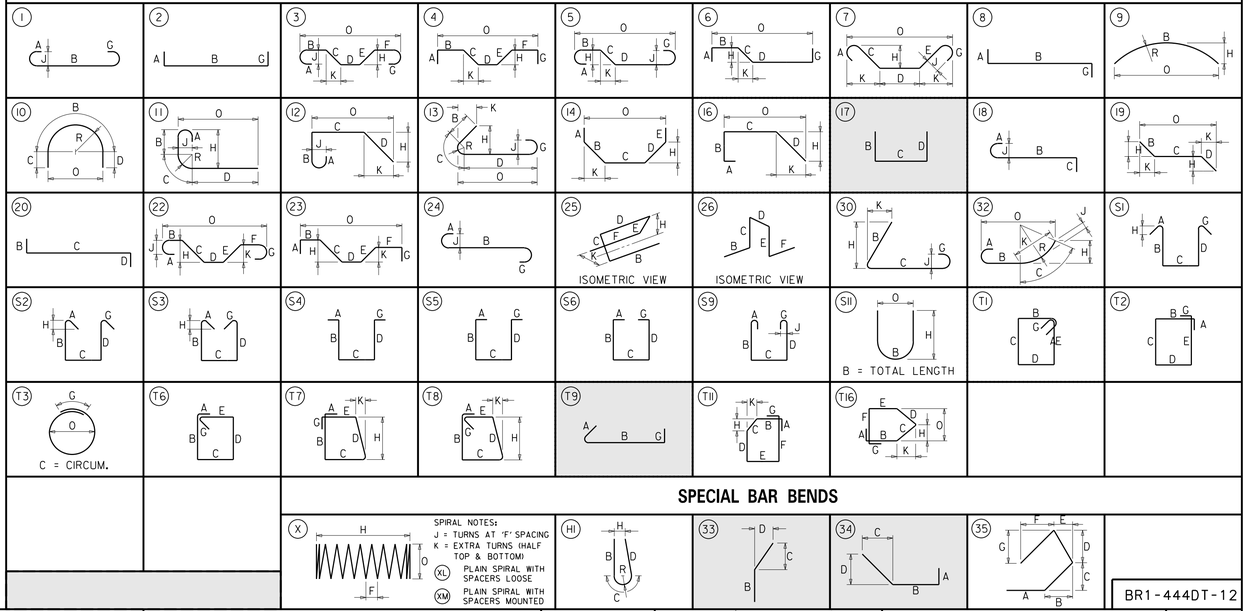



## 180° AND 90° END HOOKS




## STANDARD BAR BENDS




## SPECIAL BAR BENDS




BR1-444DT-12

**DELAWARE DEPARTMENT OF TRANSPORTATION**

ADDENDUMS / REVISIONS

NOT TO SCALE

**US 301, SR 896 TO SR 1**

| CONTRACT | BRIDGE NO. | SHEET NO. |
|---|---|---|
| T200911308 | 1-444 | 592 |
| COUNTY | DESIGNED BY: KWR | TOTAL SHTS. |
| NEW CASTLE | CHECKED BY: JFM | 875 |

**REINFORCEMENT BAR LIST 1 OF 2**

(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

(3) LETTER FOLLOWING 'LOCATION PREFIXES' INDICATES: A - WINGWALL A, B - WINGWALL B, C - WINGWALL C, D - WINGWALL D

## WINGWALL C

| SPECIFICATIONS | | | | | BENDING DIMENSIONS (FEET-INCHES /QUARTER INCH) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| QTY. | SIZE | LENGTH | MARK | TYPE | A | B | C | D | E | F/R | G | H | J | K | O |
| 12 | 5 | 36-60 | FTC501E | STR | | 36-60 | | | | | | | | | |
| 2X11 | 5 | 3-60 | FTC502E | STR | | 3-60 | | | | | | | | | |
| | | TO | | | | TO | | | | | | | | | |
| | | 34-40 | | | | 34-40 | | | | | | | | | |
| 2 | 5 | 38-40 | FTC503E | STR | | 38-40 | | | | | | | | | |
| 1X9 | 5 | 5-30 | FTC504E | STR | | 5-30 | | | | | | | | | |
| | | TO | | | | TO | | | | | | | | | |
| | | 7-100 | | | | 7-100 | | | | | | | | | |
| 1X38 | 5 | 5-30 | FTC505E | STR | | 5-30 | | | | | | | | | |
| | | TO | | | | TO | | | | | | | | | |
| | | 17-10 | | | | 17-10 | | | | | | | | | |
| 96 | 5 | 2-52 | FTC506E | T9 | 0-52 | 1-60 | | | | | 0-60 | | | | |
| 1X38 | 5 | 9-50 | FTC507E | 17 | | 5-90 | 2-20 | 1-60 | | | | | | | |
| | | TO | | | | TO | TO | TO | | | | | | | |
| | | 25-10 | | | | 21-50 | 2-20 | 1-60 | | | | | | | |
| 1X9 | 5 | 8-61 | FTC508E | 34 | 1-60 | 1-30 | 0-53 | 5-90 | | | | | | | |
| | | TO | | | TO | TO | TO | TO | | | | | | | |
| | | 11-112 | | | 1-60 | 1-30 | 0-91 | 9-20 | | | | | | | |
| 1X10 | 6 | 8-00 | FTC601E | STR | | 8-00 | | | | | | | | | |
| | | TO | | | | TO | | | | | | | | | |
| | | 11-00 | | | | 11-00 | | | | | | | | | |
| 1X10 | 6 | 13-112 | FTC602E | 34 | 1-60 | 3-00 | 0-92 | 9-50 | | | | | | | |
| | | TO | | | TO | TO | TO | TO | | | | | | | |
| | | 17-102 | | | 1-60 | 3-00 | 1-12 | 13-40 | | | | | | | |
| 1X19 | 7 | 14-20 | FTC701E | STR | | 14-20 | | | | | | | | | |
| | | TO | | | | TO | | | | | | | | | |
| | | 17-10 | | | | 17-10 | | | | | | | | | |
| 1X19 | 7 | 22-13 | FTC702E | 34 | 1-60 | 3-00 | 1-53 | 17-70 | | | | | | | |
| | | TO | | | TO | TO | TO | TO | | | | | | | |
| | | 26-00 | | | 1-60 | 3-00 | 1-92 | 21-50 | | | | | | | |
| 1X10 | 8 | 18-02 | FTC801E | 34 | 1-60 | 3-00 | 1-12 | 13-60 | | | | | | | |
| | | TO | | | TO | TO | TO | TO | | | | | | | |
| | | 21-113 | | | 1-60 | 3-00 | 1-52 | 17-50 | | | | | | | |
| 1X10 | 9 | 11-10 | FTC901E | STR | | 11-10 | | | | | | | | | |
| | | TO | | | | TO | | | | | | | | | |
| | | 14-00 | | | | 14-00 | | | | | | | | | |

## WINGWALL C CONTINUED

| SPECIFICATIONS | | | | | BENDING DIMENSIONS (FEET-INCHES /QUARTER INCH) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| QTY. | SIZE | LENGTH | MARK | TYPE | A | B | C | D | E | F/R | G | H | J | K | O |
| 2 | 5 | 39-60 | WWC501E | STR | | 39-60 | | | | | | | | | |
| 10 | 5 | 36-60 | WWC502E | STR | | 36-60 | | | | | | | | | |
| 2X15 | 5 | 2-40 | WWC503E | STR | | 2-40 | | | | | | | | | |
| | | TO | | | | TO | | | | | | | | | |
| | | 34-100 | | | | 34-100 | | | | | | | | | |
| 38 | 5 | 6-60 | WWC505E | 17 | | 3-00 | 0-60 | 3-00 | | | | | | | |

## WINGWALL D

| SPECIFICATIONS | | | | | BENDING DIMENSIONS (FEET-INCHES /QUARTER INCH) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| QTY. | SIZE | LENGTH | MARK | TYPE | A | B | C | D | E | F/R | G | H | J | K | O |
| 12 | 5 | 30-60 | FTD501E | STR | | 30-60 | | | | | | | | | |
| 2X11 | 5 | 2-110 | FTD502E | STR | | 2-110 | | | | | | | | | |
| | | TO | | | | TO | | | | | | | | | |
| | | 28-90 | | | | 28-90 | | | | | | | | | |
| 2 | 5 | 32-80 | FTD503E | STR | | 32-80 | | | | | | | | | |
| 1X8 | 5 | 5-40 | FTD504E | STR | | 5-40 | | | | | | | | | |
| | | TO | | | | TO | | | | | | | | | |
| | | 7-100 | | | | 7-100 | | | | | | | | | |
| 1X32 | 5 | 5-30 | FTD505E | STR | | 5-30 | | | | | | | | | |
| | | TO | | | | TO | | | | | | | | | |
| | | 17-10 | | | | 17-10 | | | | | | | | | |
| 82 | 5 | 2-52 | FTD506E | T9 | 0-52 | 1-60 | | | | | 0-60 | | | | |
| 1X32 | 5 | 10-50 | FTD507E | 17 | | 6-90 | 2-20 | 1-60 | | | | | | | |
| | | TO | | | | TO | TO | TO | | | | | | | |
| | | 25-10 | | | | 21-50 | 2-20 | 1-60 | | | | | | | |
| 1X8 | 5 | 9-31 | FTD508E | 34 | 1-60 | 1-30 | 0-62 | 6-60 | | | | | | | |
| | | TO | | | TO | TO | TO | TO | | | | | | | |
| | | 12-52 | | | 1-60 | 1-30 | 0-93 | 9-80 | | | | | | | |
| 1X8 | 6 | 8-00 | FTD601E | STR | | 8-00 | | | | | | | | | |
| | | TO | | | | TO | | | | | | | | | |
| | | 10-90 | | | | 10-90 | | | | | | | | | |
| 1X8 | 6 | 14-52 | FTD602E | 34 | 1-60 | 3-00 | 0-100 | 9-110 | | | | | | | |
| | | TO | | | TO | TO | TO | TO | | | | | | | |
| | | 17-102 | | | 1-60 | 3-00 | 1-12 | 13-40 | | | | | | | |
| 1X16 | 7 | 14-20 | FTD701E | STR | | 14-20 | | | | | | | | | |
| | | TO | | | | TO | | | | | | | | | |
| | | 17-10 | | | | 17-10 | | | | | | | | | |
| 1X16 | 7 | 22-33 | FTD702E | 34 | 1-60 | 3-00 | 1-53 | 17-90 | | | | | | | |
| | | TO | | | TO | TO | TO | TO | | | | | | | |
| | | 26-00 | | | 1-60 | 3-00 | 1-92 | 21-50 | | | | | | | |

## WINGWALL D CONTINUED

| SPECIFICATIONS | | | | | BENDING DIMENSIONS (FEET-INCHES /QUARTER INCH) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| QTY. | SIZE | LENGTH | MARK | TYPE | A | B | C | D | E | F/R | G | H | J | K | O |
| 1X9 | 8 | 18-12 | FTD801E | 34 | 1-60 | 3-00 | 1-13 | 13-70 | | | | | | | |
| | | TO | | | TO | TO | TO | TO | | | | | | | |
| | | 22-03 | | | 1-60 | 3-00 | 1-52 | 17-60 | | | | | | | |
| 1X9 | 9 | 10-110 | FTD901E | STR | | 10-110 | | | | | | | | | |
| | | TO | | | | TO | | | | | | | | | |
| | | 14-00 | | | | 14-00 | | | | | | | | | |
| 2 | 5 | 33-100 | WWD501E | STR | | 33-100 | | | | | | | | | |
| 14 | 5 | 30-60 | WWD502E | STR | | 30-60 | | | | | | | | | |
| 2X14 | 5 | 2-00 | WWD503E | STR | | 2-00 | | | | | | | | | |
| | | TO | | | | TO | | | | | | | | | |
| | | 29-00 | | | | 29-00 | | | | | | | | | |
| 32 | 5 | 6-60 | WWD505E | 17 | | 3-00 | 0-60 | 3-00 | | | | | | | |

## INLET HEADWALL

| SPECIFICATIONS | | | | | BENDING DIMENSIONS (FEET-INCHES /QUARTER INCH) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| QTY. | SIZE | LENGTH | MARK | TYPE | A | B | C | D | E | F/R | G | H | J | K | O |
| 25 | 5 | 6-70 | IHW501E | T1 | 0-52 | 1-20 | 1-80 | 1-20 | 1-80 | | 0-52 | | | | |
| 50 | 5 | 2-00 | IHW502E | STR | | 2-00 | | | | | | | | | |
| 22 | 5 | 2-113 | IHW503E | 35 | 0-90 | 0-62 | 0-63 | 0-70 | 0-40 | 0-62 | 0-62 | | | | |
| 44 | 5 | 2-20 | IHW504E | 17 | | 0-90 | 0-80 | 0-90 | | | | | | | |
| 22 | 5 | 1-30 | IHW505E | 17 | | 0-90 | 0-60 | | | | | | | | |
| 22 | 5 | 2-101 | IHW506E | 35 | 0-90 | 0-72 | 0-42 | 0-53 | 0-53 | 0-71 | 0-40 | | | | |
| 4 | 6 | 25-60 | IHW601E | STR | | 25-60 | | | | | | | | | |
| 12 | 6 | 18-00 | IHW602E | STR | | 18-00 | | | | | | | | | |

## OUTLET HEADWALL

| SPECIFICATIONS | | | | | BENDING DIMENSIONS (FEET-INCHES /QUARTER INCH) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| QTY. | SIZE | LENGTH | MARK | TYPE | A | B | C | D | E | F/R | G | H | J | K | O |
| 25 | 5 | 6-70 | OHW501E | T1 | 0-52 | 1-20 | 1-80 | 1-20 | 1-80 | | 0-52 | | | | |
| 50 | 5 | 2-00 | OHW502E | STR | | 2-00 | | | | | | | | | |
| 22 | 5 | 2-113 | OHW503E | 35 | 0-90 | 0-62 | 0-63 | 0-70 | 0-40 | 0-62 | 0-62 | | | | |
| 44 | 5 | 2-20 | OHW504E | 17 | | 0-90 | 0-80 | 0-90 | | | | | | | |
| 22 | 5 | 1-30 | OHW505E | 17 | | 0-90 | 0-60 | | | | | | | | |
| 22 | 5 | 2-101 | OHW506E | 35 | 0-90 | 0-72 | 0-42 | 0-53 | 0-53 | 0-71 | 0-40 | | | | |
| 4 | 6 | 25-60 | OHW601E | STR | | 25-60 | | | | | | | | | |
| 12 | 6 | 17-80 | OHW602E | STR | | 17-80 | | | | | | | | | |

## ASTM STANDARD ENGLISH REINFORCING BARS

| BAR SIZE | NOMINAL DIMENSIONS: DIAMETER (INCHES) | AREA (INCHES²) | WEIGHT (LBS./FT.) |
|---|---|---|---|
| 3 | 0.375 | 0.110 | 0.376 |
| 4 | 0.500 | 0.200 | 0.668 |
| 5 | 0.625 | 0.310 | 1.043 |
| 6 | 0.750 | 0.440 | 1.502 |
| 7 | 0.875 | 0.600 | 2.044 |
| 8 | 1.000 | 0.790 | 2.670 |
| 9 | 1.128 | 1.000 | 3.400 |
| 10 | 1.270 | 1.270 | 4.303 |
| 11 | 1.410 | 1.560 | 5.313 |
| 14 | 1.693 | 2.250 | 7.650 |
| 18 | 2.257 | 4.000 | 13.600 |

## RECOMMENDED END HOOKS, APPLICABLE TO ALL GRADES

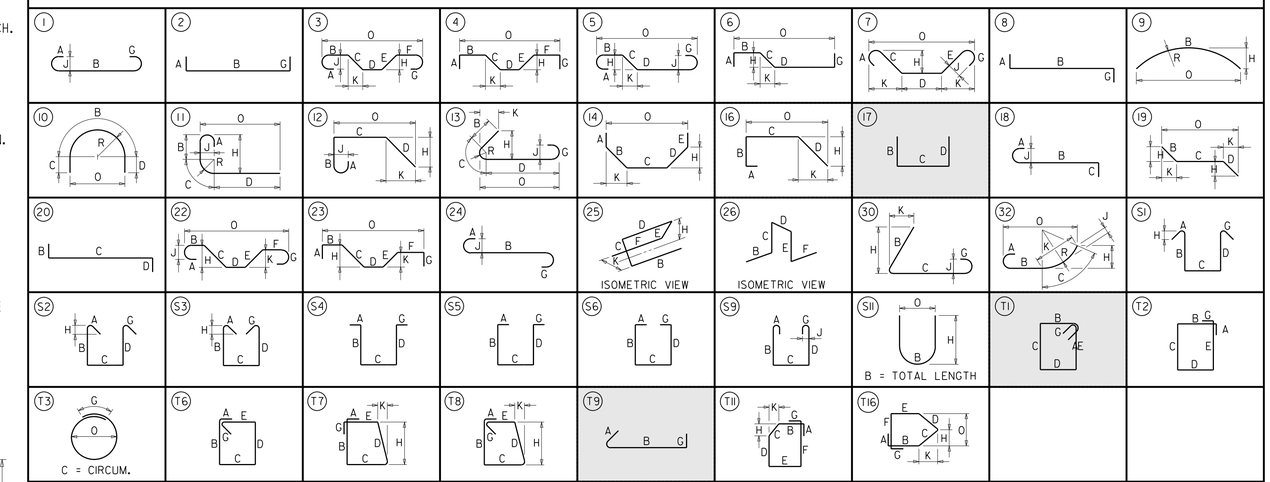
| BAR SIZE | 180° HOOKS: D | 180° HOOKS: A OR G | 180° HOOKS: J | 90° HOOKS: A OR G |
|---|---|---|---|---|
| 3 | 2¼" | 5" | 3" | 6" |
| 4 | 3" | 6" | 4" | 8" |
| 5 | 3¾" | 7" | 5" | 10" |
| 6 | 4½" | 8" | 6" | 1-0" |
| 7 | 5¼" | 10" | 7" | 1-2" |
| 8 | 6" | 11" | 8" | 1-4" |
| 9 | 9½" | 1-3" | 11¾" | 1-7" |
| 10 | 10¾" | 1-5" | 1-1¼" | 1-10" |
| 11 | 1-0" | 1-7" | 1-2¾" | 2-0" |
| 14 | 1-6¼" | 2-3" | 1-9¾" | 2-7" |
| 18 | 2-0" | 3-0" | 2-4½" | 3-5" |

## STIRRUP AND TIE HOOKS, APPLICABLE TO ALL GRADES

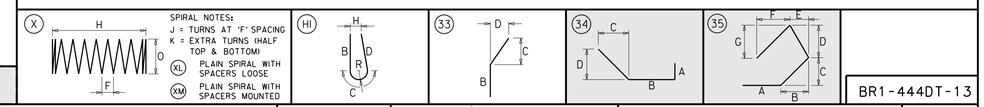
| BAR SIZE | 90° HOOK: D | 90° HOOK: A OR G | 135° HOOK: A OR G | 135° HOOK: A OR G |
|---|---|---|---|---|
| 3 | 1½" | 4" | 4" | 2½" |
| 4 | 2" | 4½" | 4½" | 3" |
| 5 | 2½" | 6" | 5½" | 3¾" |
| 6 | 4½" | 1-0" | 8" | 4½" |
| 7 | 5¼" | 1-2" | 9" | 5¼" |
| 8 | 6" | 1-4" | 10½" | 6" |

NOTES:
1. FIGURES SHOWN IN CIRCLES REPRESENT BAR BEND TYPES.
2. STANDARD BAR BENDS INCLUDE ONLY THOSE TYPES BELOW, INDICATED AS SUCH.
3. ALL DIMENSIONS OUT-TO-OUT, EXCEPT "A" AND "G" ON STD. 180° AND 135° HOOKS.
4. "J" DIMENSIONS ON 180° HOOKS TO BE SHOWN ONLY WHERE NECESSARY TO RESTRICT HOOK SIZE, OTHERWISE STANDARD 'ACI' HOOKS ARE TO BE USED.
5. 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.
6. "H" DIMENSIONS OF STIRRUPS TO BE SHOWN AS NEEDED TO FIT WITHIN THE CONCRETE.
7. UNLESS OTHERWISE NOTED, DIAMETER "D" IS THE SAME FOR ALL BENDS AND HOOKS ON A BAR (EXCEPT FOR BEND TYPES 11 AND 13).
8. WHERE SLOPE DIFFERS FROM 45° OFFSET, "H" AND "K" MUST BE SHOWN.
9. WHERE BARS ARE TO BE BENT MORE ACCURATELY THAN STANDARD BENDING TOLERANCES, BENDING DIMENSIONS REQUIRING CLOSER FABRICATION SHOULD HAVE LIMITS INDICATED.
10. FOR RECOMMENDED DIAMETER "D", OF BENDS, HOOKS, ETC., REFER TO TABLE ABOVE, 'CRSI' OR 'ACI' TABLES WHERE APPLICABLE AND REQUIRED.
11. TYPE S1-S6, S11, T1-T3 AND T6-T9 APPLICABLE TO BAR SIZES #3 THROUGH #8.

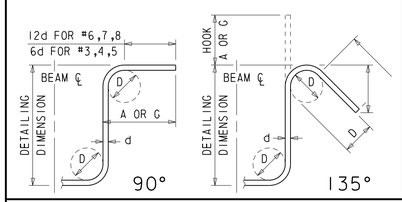
## STANDARD BAR BENDS



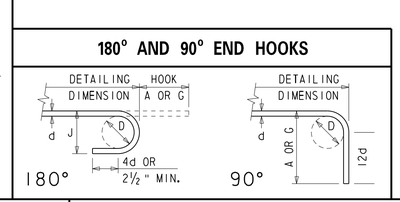

## SPECIAL BAR BENDS

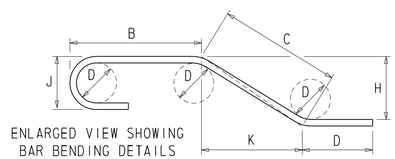



## STIRRUP AND TIE HOOKS



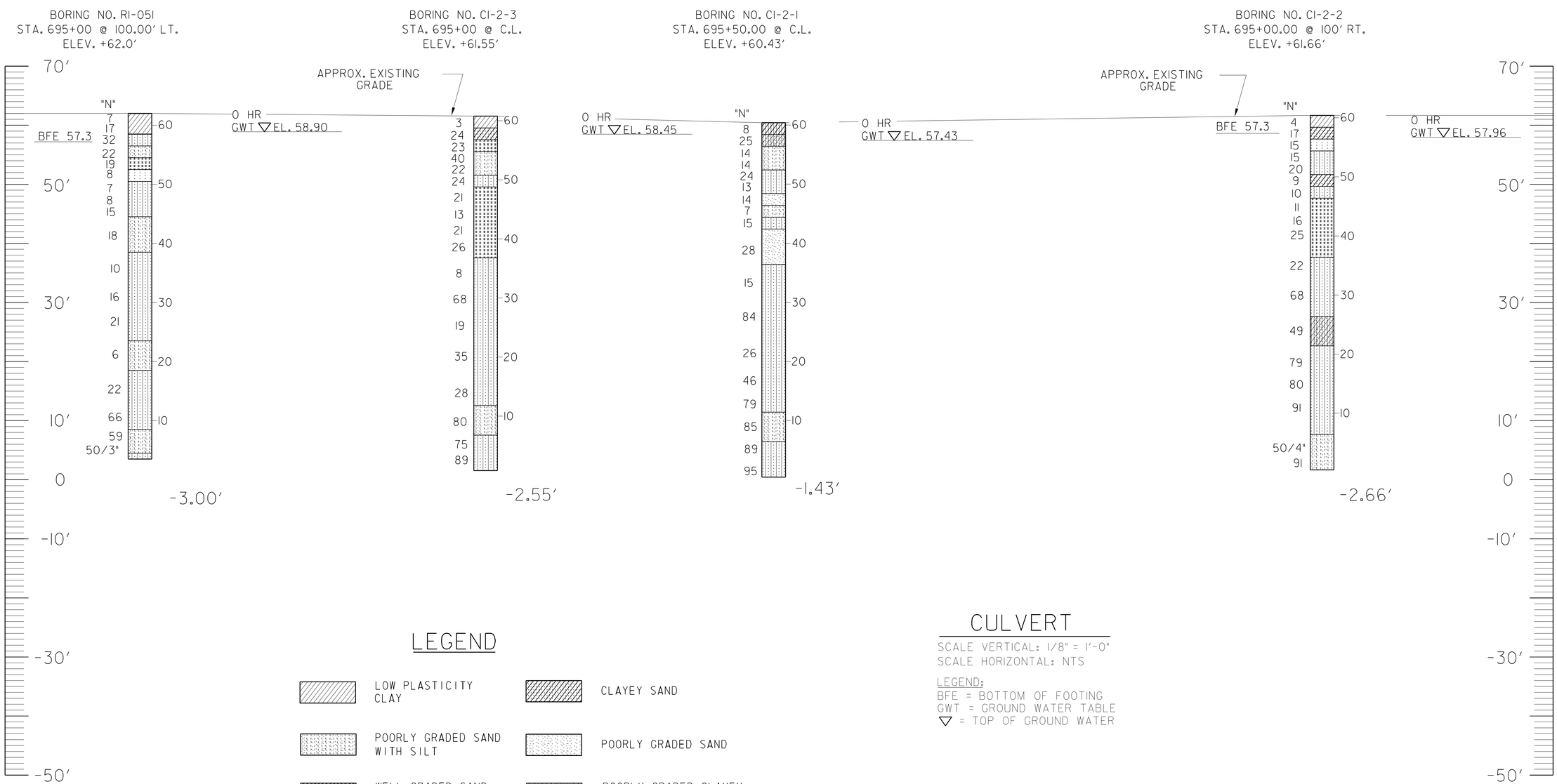

## 180° AND 90° END HOOKS




BR1-444DT-13

| DELAWARE DEPARTMENT OF TRANSPORTATION | ADDENDUMS / REVISIONS | NOT TO SCALE | US 301, SR 896 TO SR 1 | CONTRACT T200911308 | BRIDGE NO. 1-444 | DESIGNED BY: KWR | CHECKED BY: JFM | COUNTY NEW CASTLE | REINFORCEMENT BAR LIST 2 OF 2 | SHEET NO. 593 | TOTAL SHTS. 875 |
|---|---|---|---|---|---|---|---|---|---|---|---|




## LEGEND

- LOW PLASTICITY CLAY
- CLAYEY SAND
- POORLY GRADED SAND WITH SILT
- POORLY GRADED SAND
- WELL GRADED SAND WITH SILT
- POORLY GRADED CLAYEY SILTY SAND
- SILTY SAND
- SILTY LOW PLASTICITY CLAY
- WELL GRADED SAND

## CULVERT

SCALE VERTICAL: 1/8" = 1'-0"
SCALE HORIZONTAL: NTS

LEGEND:
BFE = BOTTOM OF FOOTING
GWT = GROUND WATER TABLE
▽ = TOP OF GROUND WATER

BR1-444DT-14

| DELAWARE DEPARTMENT OF TRANSPORTATION | ADDENDUMS / REVISIONS | NOT TO SCALE | US 301, SR 896 TO SR 1 | CONTRACT T200911308 | BRIDGE NO. 1-444 | SOIL BORINGS | SHEET NO. 594 |
|---|---|---|---|---|---|---|---|
| | | | | COUNTY NEW CASTLE | DESIGNED BY: | | TOTAL SHTS. 875 |
| | | | | | CHECKED BY: | | |