DRAFT
NOT FOR BIDDING
AUGUST 2015

STRUCTURE LOCATION PLAN - CONTRACT T200911308

SCALE: 1" = 800'-0"

IS-04

DELAWARE DEPARTMENT OF TRANSPORTATION

ADDENDUMS / REVISIONS	

800 400 0 800 1600

SCALE: 1" = 800'

US 301, SR 896 TO SR 1

CONTRACT	T200911308
COUNTY	NEW CASTLE

BRIDGE NO.

DESIGNED BY: WRA/MTA

CHECKED BY: P.S.D.

STRUCTURE LOCATION PLAN

SHEET NO.	247
TOTAL SHTS.	875

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PROJECT NOTES:

1. LOCATION
   PROPOSED NEW PRECAST PORTLAND CEMENT CONCRETE ARCH (PRECAST P.C.C. ARCH) STRUCTURE CARRYING US 301 OVER TRIBUTARY TO SCOTT RUN, 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, INCLUDING LATEST REVISIONS.

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

4. LOADING
   DEAD LOAD INCLUDES SOIL FILL, PAVEMENT AND 2" FUTURE WEARING SURFACE. HL-93 AND DELAWARE LEGAL LOADS FOR LIVE LOAD. LATERAL EARTH PRESSURE IN CONFORMANCE WITH AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS WITH 2008 AND 2009 INTERIM PROVISIONS.

5. FOUNDATIONS
   THE FOUNDATION DESIGN PROVIDED IN THE CONTRACT DOCUMENTS IS BASED ON THE FOLLOWING LOADS:

ARCH REACTIONS ON FOOTING		
LOAD	VERTICAL (UNFACTORED)	HORIZONTAL (UNFACTORED)
DL	45.1 KIP/FT	24.0 KIP/FT
LL (HL-93)	5.9 KIP/FT	4.5 KIP/FT

WINGWALL REACTIONS ON FOOTING			
LOAD	VERTICAL (UNFACTORED)	HORIZONTAL (UNFACTORED)	ECCENTRICITY (FROM FRONT FACE)
DL, HORIZONTAL AND VERTICAL EARTH PRESSURE	19.5 KIP/FT	4.9 KIP/FT	2.36 FT

   THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING THAT THE FOOTING LOADS ASSOCIATED WITH THE PRECAST P.C.C. ARCH AND WINGWALL ELEMENTS TO BE PROVIDED UNDER THIS CONTRACT MATCH THE FOOTING DESIGN LOADS. IF THE CONTRACTOR'S PROPOSED PRECAST ARCH AND WINGWALL REACTIONS DO NOT MATCH THOSE SHOWN ABOVE, THE FOOTINGS SHALL BE REVISED BY THE CONTRACTOR TO SUPPORT THOSE LOADS AS REQUIRED BY DESIGN. ALL CALCULATIONS SHALL BE CERTIFIED BY A REGISTERED PROFESSIONAL ENGINEER IN THE STATE OF DELAWARE. A FINAL FOUNDATION REPORT HAS BEEN PREPARED BY WHITMAN, REQUARDT & ASSOCIATES, LLP AND THIS REPORT IS AVAILABLE UPON REQUEST FROM THE DELAWARE DEPARTMENT OF TRANSPORTATION. THE DEPARTMENT DOES NOT GUARANTEE THE INFORMATION PROVIDED IN THE FINAL FOUNDATION REPORT, AND THIS REPORT IS AVAILABLE TO THE CONTRACTOR FOR INFORMATION ONLY.

   ANY MODIFICATIONS TO THE PROVIDED FOOTING DESIGN AND DETAILS WHICH ARE NECESSSARY TO MEET THE REQUIREMENTS OF THE CONTRACTOR'S PROPOSED PRECAST P.C.C. ARCH AND WINGWALL ELEMENTS ARE THE REPONSIBLITY OF THE CONTRACTOR, AND SHALL BE INCIDENTAL TO ITEM 602556 - PRECAST P.C.C. ARCH. ALL FOOTING MODIFICATIONS SHALL SUBMITTED TO THE ENGINEER FOR REVIEW AND APPROVAL. SEE SPECIAL PROVISIONS FOR ADDITIONAL REQUIREMENTS.

   FINAL ELEVATION OF BOTTOM OF FOOTING AND ACCEPTABLILTY OF BEARING STRATA SHALL BE DETERMINED BY THE ENGINEER.

6. PORTLAND CEMENT CONCRETE
   STRUCTURAL ELEMENTS OF PORTLAND CEMENT CONCRETE SHALL BE AS NOTED (f'c = 28 DAY STRENGTH)

   PRECAST P.C.C. ARCH, HEADWALLS AND WINGWALLS (f'c = 5,000 PSI)

   CLASS B - CAST-IN-PLACE FOOTINGS FOR PRECAST P.C.C. ARCH AND WINGWALLS (f'c = 3000 KSI)

   MIX REQUIREMENTS SHALL CONFORM TO SECTION 812 OF THE DELAWARE DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS UNLESS NOTED OTHERWISE.

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

7. BAR REINFORCEMENT
   ALL REINFORCING STEEL SHALL CONFORM TO AASHTO M 31 (ASTM A 615), GRADE 60 AND UNLESS SPECIFIED OTHERWISE ON THE PLANS SHALL BE PROTECTED WITH FUSION BONDED EPOXY CONFORMING TO AASHTO M 284 (ASTM A 775) AND DENOTED WITH A SUFFIX 'E' IN THE BAR MARKS. LONGITUDINAL DISTRIBUTION REINFORCEMENT MAY CONSIST OF WELDED WIRE FABRIC. ALL WELDED WIRE FABRIC SHALL CONFORM TO ASTM A 185 OR A 497. PAYMENT FOR EPOXY COATED BAR REINFORCEMENT IN PRECAST ELEMENTS SHALL BE INCIDENTAL TO ITEM 602556 - PRECAST P.C.C. ARCH.

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

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

   ALL REINFORCING STEEL SHALL HAVE A CLEAR COVER OF 2" UNLESS NOTED OTHERWISE ON THE PLANS, WITH THE EXCEPTION OF BARS AT THE BOTTOM AND SIDES OF FOOTINGS WHICH SHALL HAVE A CLEAR COVER OF 3".

8. POST-TENSIONING STRANDS AND ANCHOR PLATES
   LOW RELAXATION, PLASTIC SHEATHED, GREASED STRAND SHALL CONFORM TO AASHTO M203 (ASTM A 416), GRADE 270. STRUCTURAL STEEL FOR ANCHOR PLATES SHALL CONFORM TO AASHTO M 270 (ASTM A 709), GRADE 36 AND SHALL BE HOT-DIP GALVANIZED. PAYMENT SHALL BE INCIDENTAL TO ITEM 602556 - PRECAST P.C.C. ARCH.

9. CONSTRUCTION
   DO NOT EXCEED A 2'-0" DIFFERENCE IN FILL ELEVATION ON THE SIDES OF THE ARCH DURING PLACEMENT OF THE BACKFILL. DO NOT ALLOW WHEELS OF ROLLERS TO COME CLOSER THAN 1'-0" TO THE FACE OF STRUCTURE DURING COMPACTION OF THE BACKFILL.

10. 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.

11. STRUCTURAL BACKFILL
    SELECT BACKFILL FOR PRECAST P.C.C. ARCH UNITS AND PRECAST WINGWALLS SHALL BE AS REQUIRED BY THE MANUFACTURER. THE COST OF SELECT BACKFILL SHALL BE INCIDENTAL TO ITEM 602556 - PRECAST P.C.C. ARCH. FOR LIMITS OF PAYMENT FOR SELECT BACKFILL, SEE DWG. NO. ST-02.

12. RIPRAP
    RIPRAP SHALL CONFORM WITH THE REQUIREMENTS OF SECTION 712 OF THE DELAWARE DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS. GEOTEXTILE SHALL CONFORM WITH SECTION 713 OF THE DELAWARE DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS. RIPRAP SHALL BE RECESSED, CHOKED, TOPSOILED AND SEEDED IN CONFORMANCE WITH THE NOTES ON DWG. NO. PE-01.

13. 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.

14. STABILIZING STRUCTURAL EXCAVATIONS
    THE CONTRACTOR IS RESPONSIBLE FOR THE STABILITY OF ALL EXCAVATED SLOPES AND THE DESIGN OF ANY TEMPORARY SHORING AND BRACING THAT MAY BE USED. ALL SURFACE RUNOFF SHOULD BE DIVERTED AWAY FROM EXCAVATIONS. PERFORM ALL EXCAVATIONS IN CONFORMANCE WITH OSHA REQUIREMENTS.

    SHORING IS REQUIRED FOR ANY EXCAVATION EXCEEDING 5 FEET IN HEIGHT. COST FOR DESIGN AND CONSTRUCTION OF SHORING SHALL BE INCIDENTAL ITEM 207000 - EXCAVATION AND BACKFILL FOR STRUCTURES. IN LIEU OF SHORING, THE CONTRACTOR MAY USE A 2:1 CUT SLOPE IF PERMITTED BY THE ENGINEER. NO PAYMENT WILL BE MADE FOR ADDITIONAL EXCAVATION AND BACKFILL OUTSIDE THE PAY LIMITS DEFINED IN SECTION 207 OF THE STANDARD SPECIFICATIONS, UNLESS NOTED OTHERWISE ON THE PLANS. SEE DRAWING ST-02 FOR ADDITIONAL INFORMATION.

    BACKFILL AND GRADE ALL EXCAVATIONS AS SOON AS POSSIBLE TO PREVENT SURFACE WATER PONDING AND CONCENTRATED FLOW ENTERENING THE EXCAVATON. KEEP THE EXCAVATION DRY WITH PUMPS AS REQUIRED. DEWATERING OF THE EXCAVATION IS ANTICIPATED SINCE THE BOTTOM OF FOOTING IS BELOW THE WATER TABLE.

15. HYDRAULIC DATA
    DRAINAGE AREA = 0.28 SQ. MI. (179.2 AC.)
    25-YR FLOOD ELEVATION = 28.10
    DESIGN FREQUENCY = 50 YEARS
    DESIGN DISCHARGE = 269 CFS
    DESIGN HEADWATER ELEVATION = 28.37 FT
    DESIGN VELOCITY, CHANNEL = 5.17 FPS
    AVAILABLE FLOW AREA OF PROPOSED OPENING = 530 SF

    NOTE: SEE REPORT TITLED, "HYDROLOGIC AND HYDRAULIC ANALYSES OF SCOTT RUN WATERSHED AND PROPOSED BRIDGES 1-1, 1-2, 1-4 NB & SB, 1-6, AND 1-7 NB & SB FOR US 301 EXTENSION," DATED MAY 2011.

16. SCOUR DATA
    STRUCTURE HAS BEEN ANALYZED FOR THE EFFECTS OF SCOUR IN ACCORDANCE WITH THE PROCEDURES DESCRIBED IN HEC-18, 'EVALUATING SCOUR AT BRIDGES' AND HEC-23, 'BRIDGE SCOUR AND STREAM INSTABILITY COUNTERMEASURES'. SCOUR COUNTERMEASURES HAVE BEEN DESIGNED FOR THE WORST CASE OF THE OVERTOPPING FLOOD OR THE 500-YR FLOOD EVENT.

    DESIGN STORM EVENT = 100 YEAR FLOOD
    DESIGN STORM DISCHARGE = 313 CFS
    DESIGN STORM VELOCITY, CHANNEL = 5.53 FPS
    DESIGN STORM MAXIMUM DEPTH OF FLOW = 1.74 FT
    DESIGN STORM HEADWATER ELEVATION = 28.49 FT

    CHECK STORM EVENT = 500 YEAR FLOOD
    CHECK STORM DISCHARGE = 400 CFS
    CHECK STORM VELOCITY, CHANNEL = 5.61 FPS
    CHECK STORM MAXIMUM DEPTH OF FLOW = 2.09 FT
    CHECK STORM HEADWATER ELEVATION = 28.84 FT

17. LOAD RATINGS
    THE CONTRACTOR SHALL SUBMIT LOAD RATINGS USING THE LOAD AND RESISTANCE FACTOR RATING METHOD IN CONFORMANCE WITH THE LATEST EDITION OF THE AASHTO MANUAL FOR BRIDGE EVALUATION. OPERATING AND INVENTORY RATINGS SHALL BE BASED ON THE HL-93 DESIGN LOAD. LEGAL LOAD RATINGS SHALL BE BASED ON DELAWARE LEGAL LOADS.

18. 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.

BRIDGE NO. 1-436 INDEX OF SHEETS

SHEET NO.	DWG. NO.	TABLE OF CONTENTS
248	PN-01	PROJECT NOTES
249	QS-01	QUANTITY SUMMARY
250	PE-01	GENERAL PLAN AND ELEVATION
251	GR-01	GRADING PLAN
252	TS-01	PRECAST ARCH SECTIONS
253	WW-01	WINGWALL ELEVATIONS
254	ST-01	PRELOAD FILL DETAILS - 1
255	ST-02	PRELOAD FILL DETAILS - 2
256	FT-01	GEOMETRIC AND FOOTING LAYOUT PLAN
257	FT-02	FOOTING A REINFORCEMENT PLAN
258	FT-03	FOOTING B REINFORCEMENT PLAN
259	RB-01	FOOTING A REINFORCEMENT LIST
260	RB-02	FOOTING B REINFORCEMENT LIST
261	BO-01	BORING PROFILE

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AUGUST 2015

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DELAWARE
DEPARTMENT OF TRANSPORTATION

ADDENDUMS / REVISIONS	

SCALE: AS NOTED

US 301,
SR 896 TO SR 1

CONTRACT	BRIDGE NO. 1-436
T200911308	DESIGNED BY: A.J.F.
COUNTY	CHECKED BY: P.S.D.
NEW CASTLE	

PROJECT NOTES

BR1-4
PN-01

SHEET NO.	TOTAL SHTS.
248	875

ITEM NO.	ITEM NAME	UNITS	QUANTITY
202000	Excavation and Embankment	C.Y.	15,240
202505	Settlement Platform	EA	8
202518	Settlement Monument	EA	4
207000	Excavation and Backfill for Structures	C.Y.	10,060
207501	Sheeting and Shoring	L.S.	1
302007	Graded Aggregate Base Course	C.Y.	300
302011	Delaware No. 3 Stone	TON	205
302012	Delaware No. 57 Stone	TON	221
601506	Maintenance of Streamflow	L.S.	1
602004	Portland Cement Concrete Masonry, Abutment Footing, Class B	C.Y.	923
602556	Precast P.C.C. Arch	L.S.	1
603000	Bar Reinforcement	LBS	79,900
712021	Riprap, R-5	TON	736
713003	Geotextiles, Riprap	S.Y.	1,044
733001	Topsoiling, 4" Depth	S.Y.	1,400
734531	Streambank Seed Mix	S.Y.	252
735535	Soil Retention Blanket Mulch, Type 5	S.Y.	252

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NOTES:

1. ITEM 202000 IS REPRESENTED UNDER TYPE F MATERIAL REQUIRED, "PLUS EMBANKMENT FOR STRUCTURES". SEE DRAWING EW-06.
2. ITEM 207000 IS REPRESENTED ON DRAWING EW-06 UNDER EXCAVATION AVAILABLE FOR EMBANKMENT, "PLUS EXCAVATION AND BACKFILLING FOR STRUCTURES".

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DELAWARE
DEPARTMENT OF TRANSPORTATION

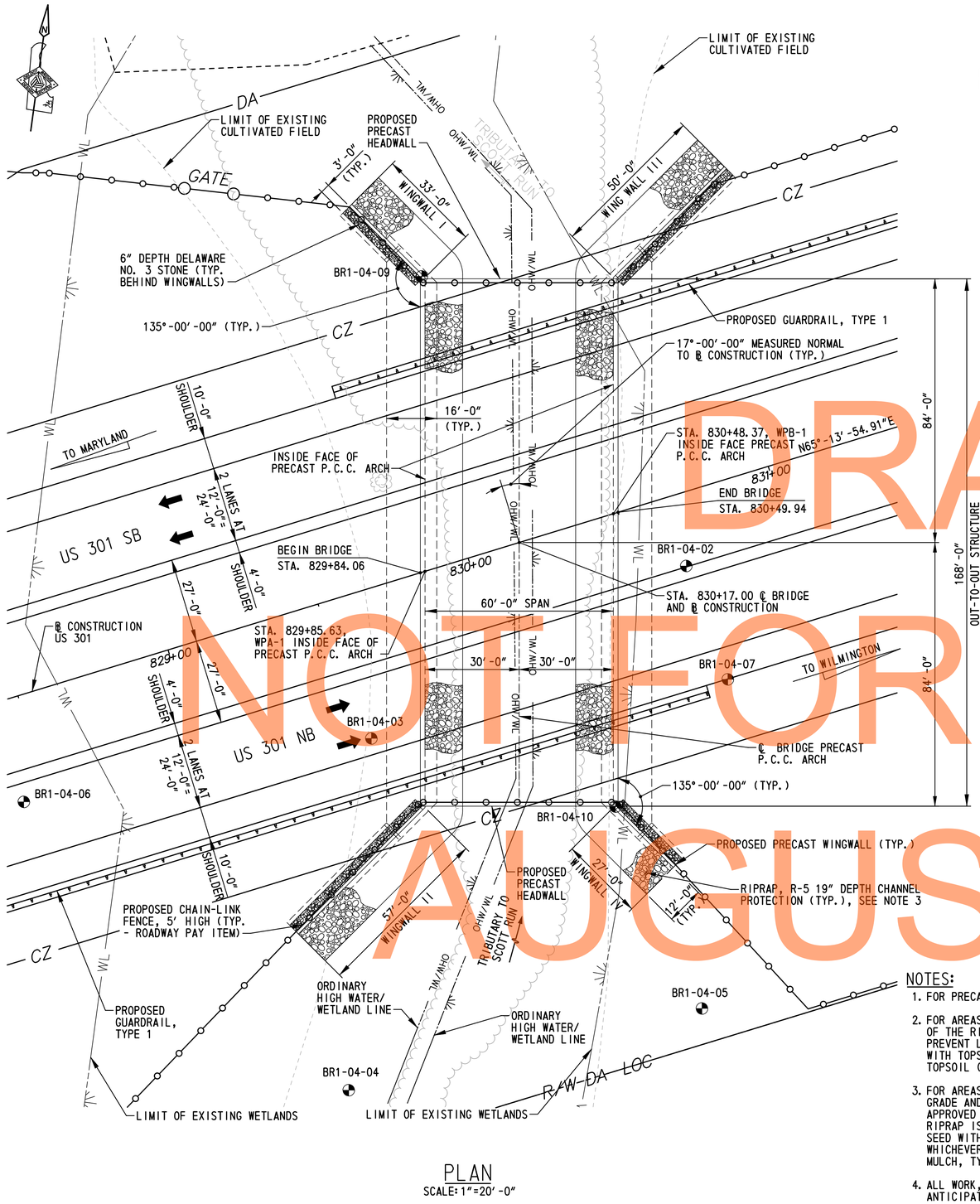
ADDENDUMS / REVISIONS

US 301,
SR 896 TO SR 1

CONTRACT T200911308
COUNTY NEW CASTLE
BRIDGE NO. 1-436
DESIGNED BY: M.P.U.
CHECKED BY: P.S.D.

QUANTITY SUMMARY

BR1-4
QS-01
SHEET NO. 249
TOTAL SHTS. 875



PLAN
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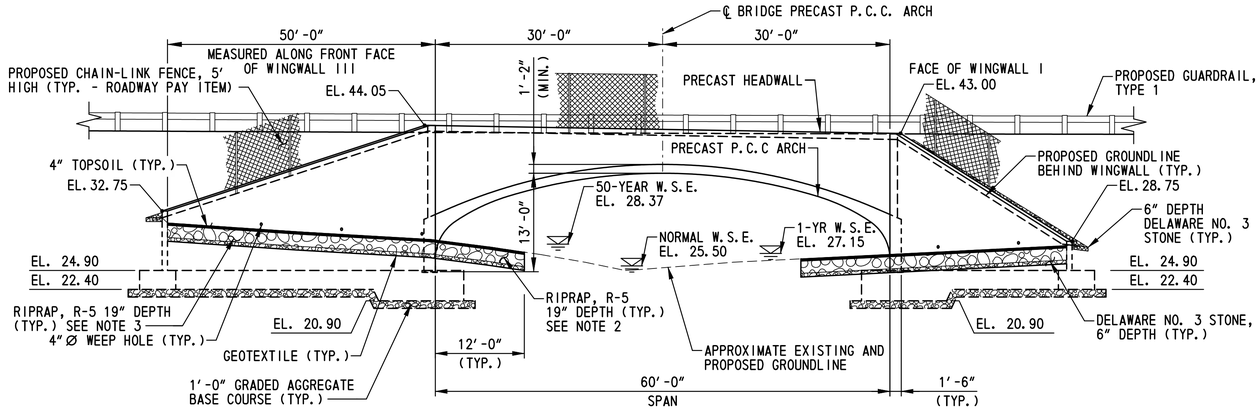

NORTH ELEVATION
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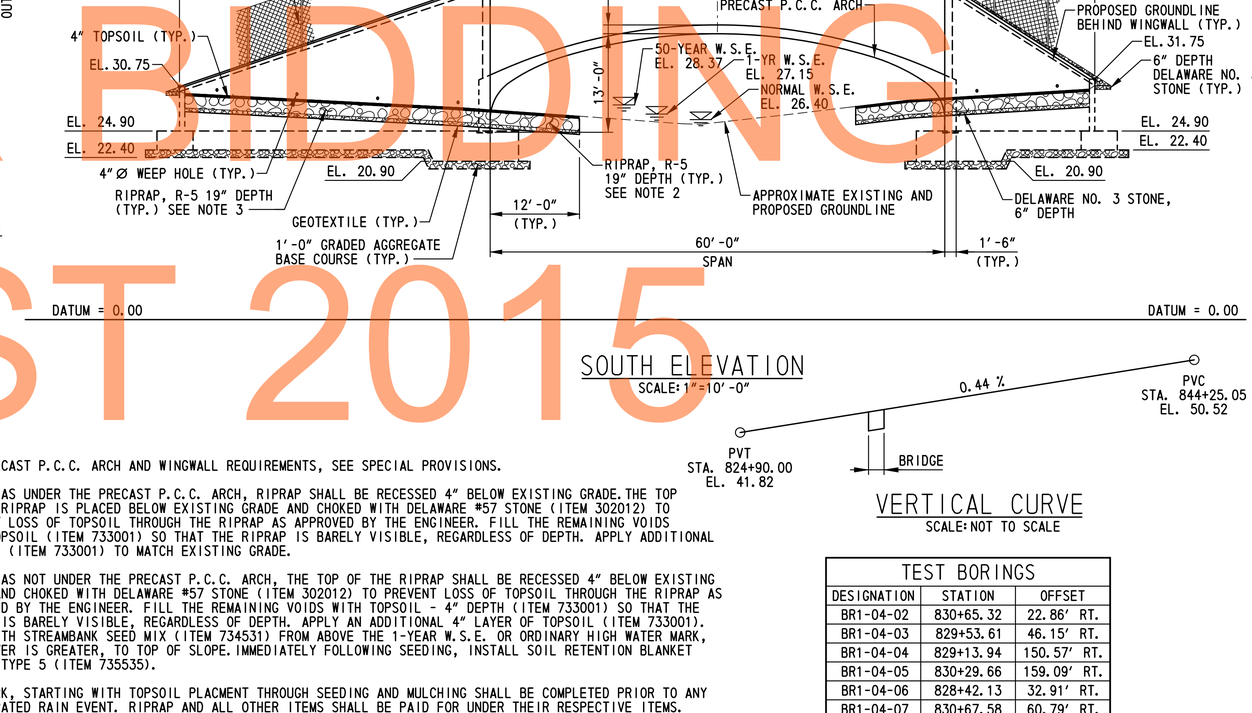

SOUTH ELEVATION
SCALE: 1"=10'-0"

VERTICAL CURVE
SCALE: NOT TO SCALE

NOTES:

1. FOR PRECAST P.C.C. ARCH AND WINGWALL REQUIREMENTS, SEE SPECIAL PROVISIONS.
2. FOR AREAS UNDER THE PRECAST P.C.C. ARCH, RIPRAP SHALL BE RECESSED 4" BELOW EXISTING GRADE. THE TOP OF THE RIPRAP IS PLACED BELOW EXISTING GRADE AND CHOKED WITH DELAWARE #57 STONE (ITEM 302012) TO PREVENT LOSS OF TOPSOIL THROUGH THE RIPRAP AS APPROVED BY THE ENGINEER. FILL THE REMAINING VOIDS WITH TOPSOIL (ITEM 733001) SO THAT THE RIPRAP IS BARELY VISIBLE, REGARDLESS OF DEPTH. APPLY ADDITIONAL TOPSOIL (ITEM 733001) TO MATCH EXISTING GRADE.
3. FOR AREAS NOT UNDER THE PRECAST P.C.C. ARCH, THE TOP OF THE RIPRAP SHALL BE RECESSED 4" BELOW EXISTING GRADE AND CHOKED WITH DELAWARE #57 STONE (ITEM 302012) TO PREVENT LOSS OF TOPSOIL THROUGH THE RIPRAP AS APPROVED BY THE ENGINEER. FILL THE REMAINING VOIDS WITH TOPSOIL - 4" DEPTH (ITEM 733001) SO THAT THE RIPRAP IS BARELY VISIBLE, REGARDLESS OF DEPTH. APPLY AN ADDITIONAL 4" LAYER OF TOPSOIL (ITEM 733001). SEED WITH STREAMBANK SEED MIX (ITEM 734531) FROM ABOVE THE 1-YEAR W.S.E. OR ORDINARY HIGH WATER MARK, WHICHEVER IS GREATER, TO TOP OF SLOPE. IMMEDIATELY FOLLOWING SEEDING, INSTALL SOIL RETENTION BLANKET MULCH, TYPE 5 (ITEM 735535).
4. ALL WORK, STARTING WITH TOPSOIL PLACMENT THROUGH SEEDING AND MULCHING SHALL BE COMPLETED PRIOR TO ANY ANTICIPATED RAIN EVENT. RIPRAP AND ALL OTHER ITEMS SHALL BE PAID FOR UNDER THEIR RESPECTIVE ITEMS.
5. THE CONTRACTOR SHALL NOT ACCESS THE STREAM. FOR ADDITIONAL REQUIREMENTS, SEE MAINTENANCE OF STREAM FLOW PLANS ON DWG. NOS. MS-01 AND MS-02.

TEST BORINGS

DESIGNATION	STATION	OFFSET
BR1-04-02	830+65.32	22.86' RT.
BR1-04-03	829+53.61	46.15' RT.
BR1-04-04	829+13.94	150.57' RT.
BR1-04-05	830+29.66	159.09' RT.
BR1-04-06	828+42.13	32.91' RT.
BR1-04-07	830+67.58	60.79' RT.
BR1-04-09	830+12.00	90.00' LT.
BR1-04-10	830+22.00	90.00' RT.

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

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AUGUST 2015

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DELAWARE DEPARTMENT OF TRANSPORTATION

ADDENDUMS / REVISIONS

SCALE: AS NOTED

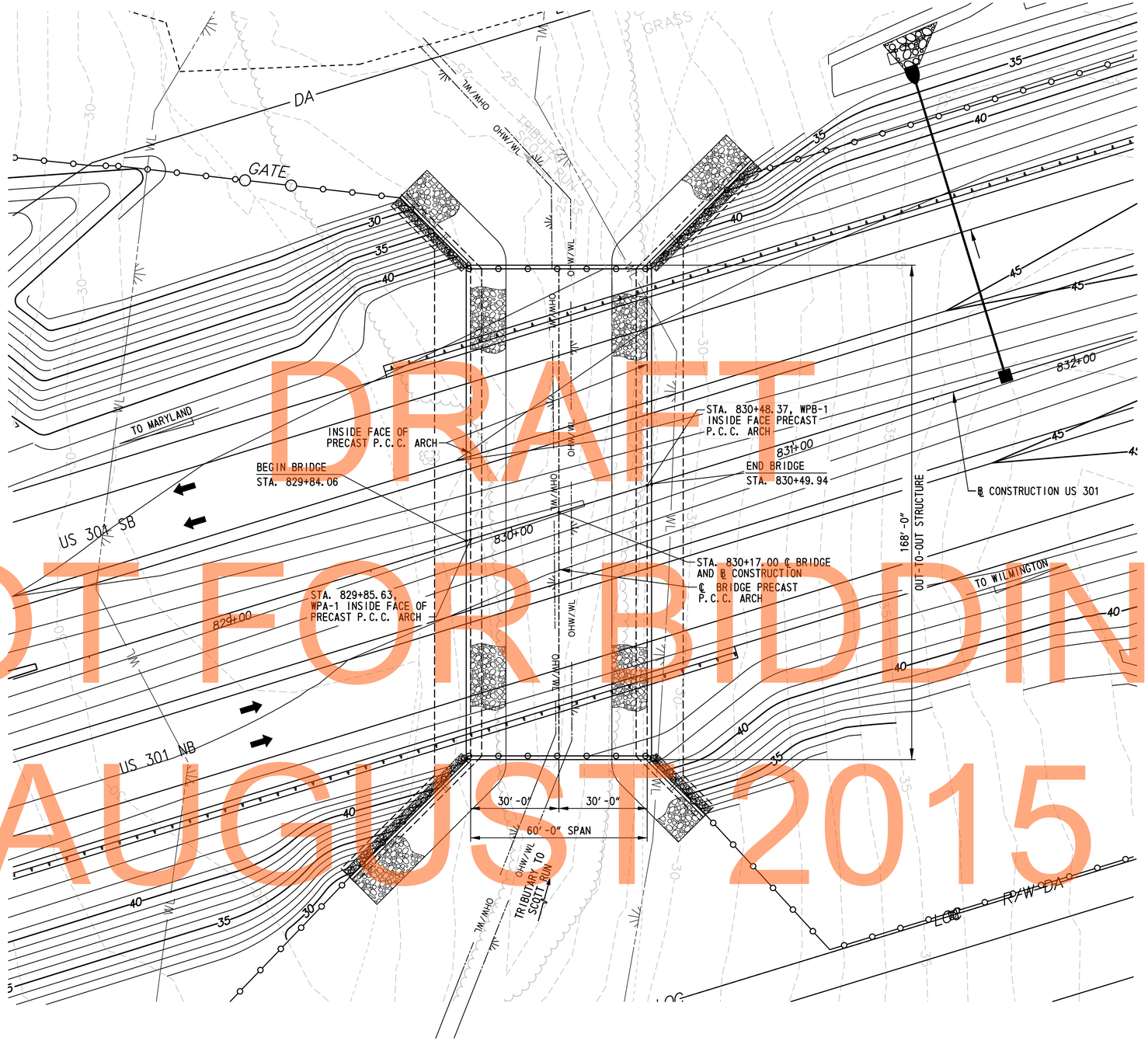
US 301, SR 896 TO SR 1

CONTRACT	BRIDGE NO.	1-436
T200911308	DESIGNED BY: M.P.U.	
COUNTY	CHECKED BY: P.S.D.	
NEW CASTLE		

GENERAL PLAN AND ELEVATIONS

BR1-4
PE-01

SHEET NO. 250
TOTAL SHTS. 875



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AUGUST 2015

LEGEND
EXISTING CONTOURS
PROPOSED CONTOURS

PLAN
SCALE: 1"=20'-0"

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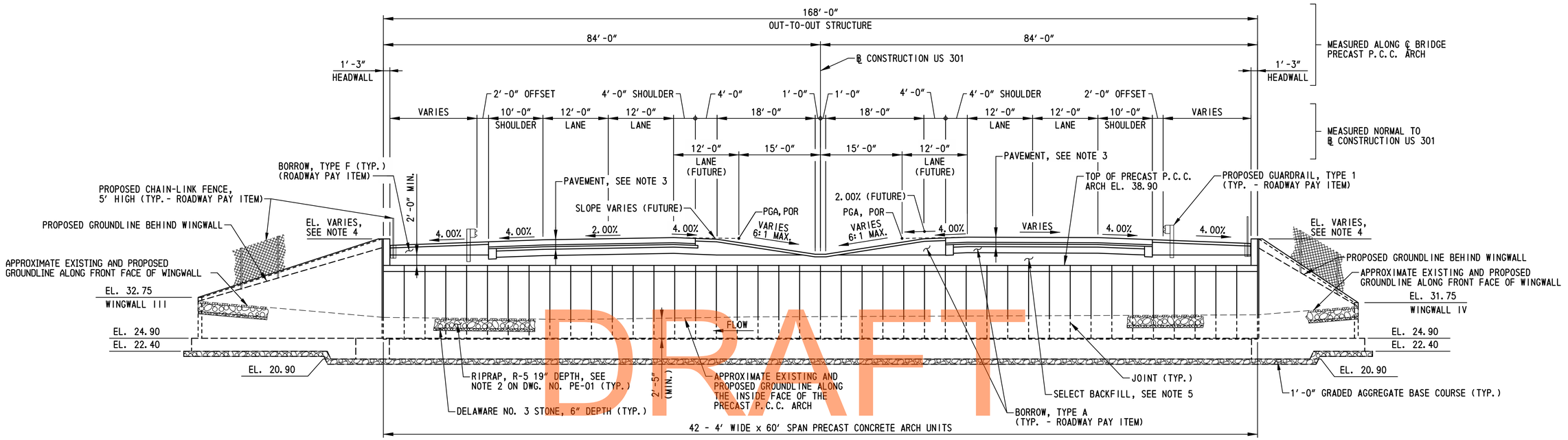
DELAWARE DEPARTMENT OF TRANSPORTATION	ADDENDUMS / REVISIONS	SCALE: AS NOTED	US 301, SR 896 TO SR 1	CONTRACT T200911308	BRIDGE NO. 1-436	GRADING PLAN	BR1-4 GR-01
				COUNTY NEW CASTLE	DESIGNED BY: M.P.U.		SHEET NO. 251
					CHECKED BY: P.S.D.		TOTAL SHTS. 875



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LONGITUDINAL SECTION (LOOKING STATION AHEAD)
SCALE: 1″=10′-0″

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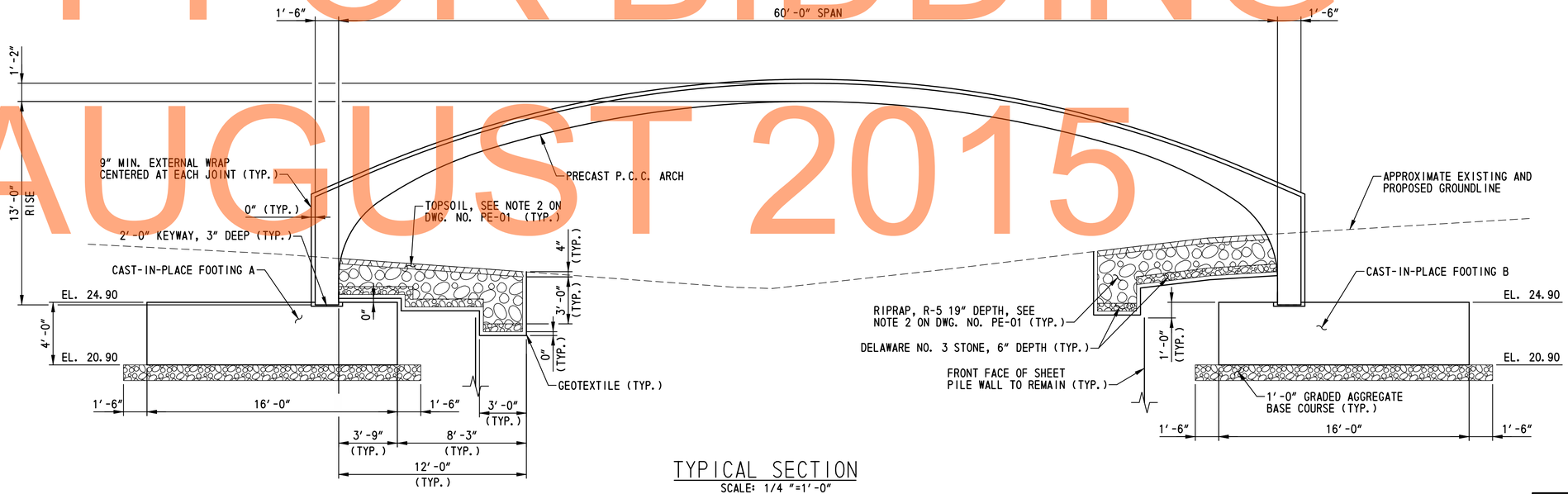
AUGUST 2015

NOTES:

1. ALL ROADWAY DIMENSIONS AND CROSS SLOPES ARE MEASURED NORMAL TO BASELINE CONSTRUCTION US 301.
2. LONGITUDINAL SECTION TAKEN LOOKING STATION AHEAD AT CENTERLINE OF PRECAST ARCH.
3. FOR PAVEMENT ITEMS, SEE ROADWAY TYPICAL SECTIONS.
4. FOR HEADWALL ELEVATIONS, SEE DWG. NO. PE-01.
5. FOR STRUCTURAL BACKFILL REQUIREMENTS, SEE NOTE 11 ON DWG. NO. PN-01.



TYPICAL SECTION
SCALE: 1/4 ″=1′-0″

BR1-4
TS-01

DELAWARE DEPARTMENT OF TRANSPORTATION	ADDENDUMS / REVISIONS	SCALE: AS NOTED	US 301, SR 896 TO SR 1	CONTRACT T200911308	BRIDGE NO. 1-436	PRECAST ARCH SECTIONS
				COUNTY NEW CASTLE	DESIGNED BY: M.P.U.	SHEET NO. 252
					CHECKED BY: P.S.D.	TOTAL SHTS. 875

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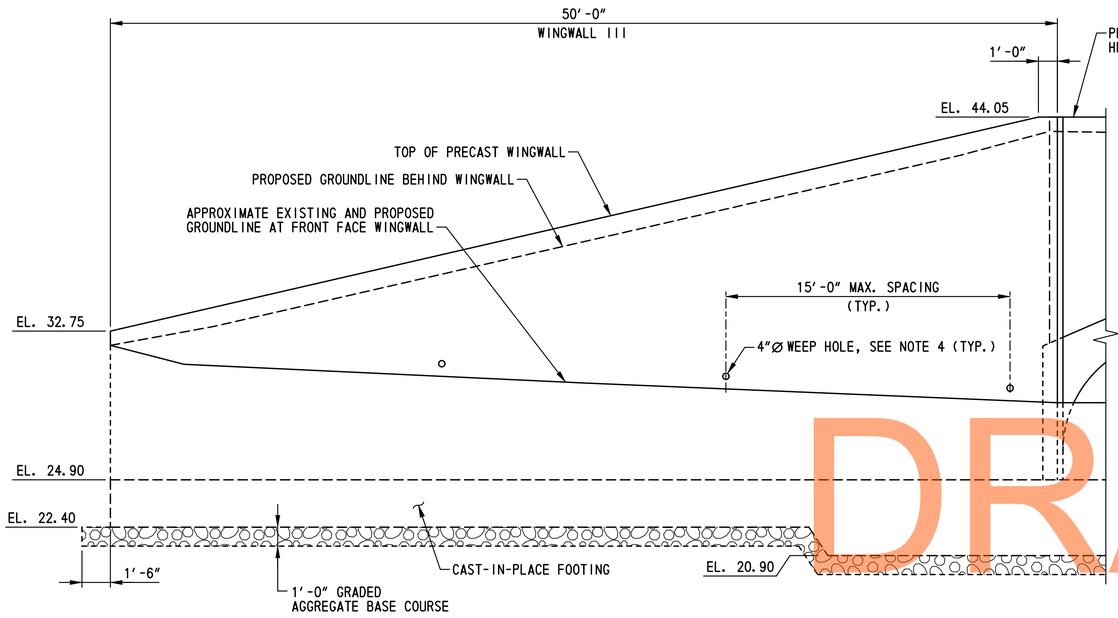
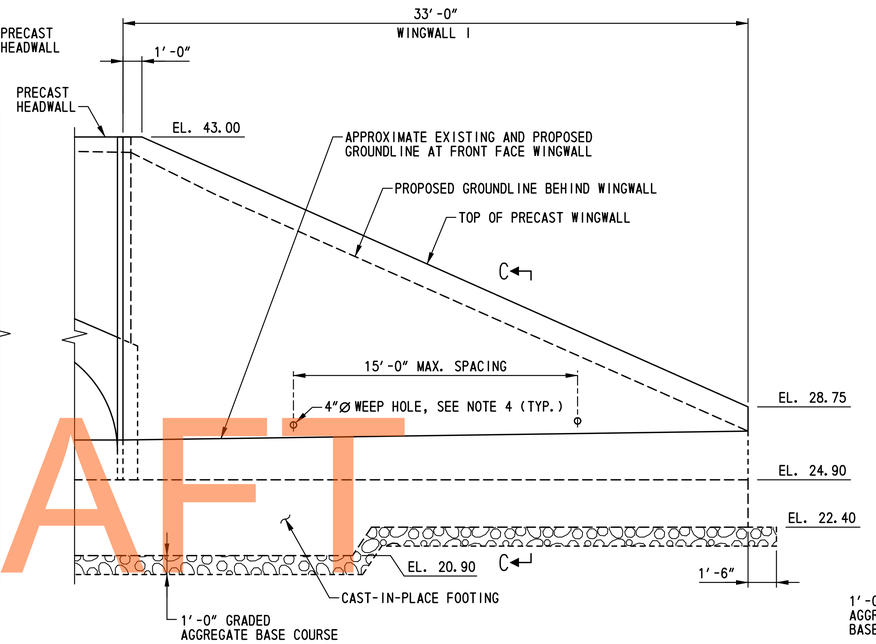
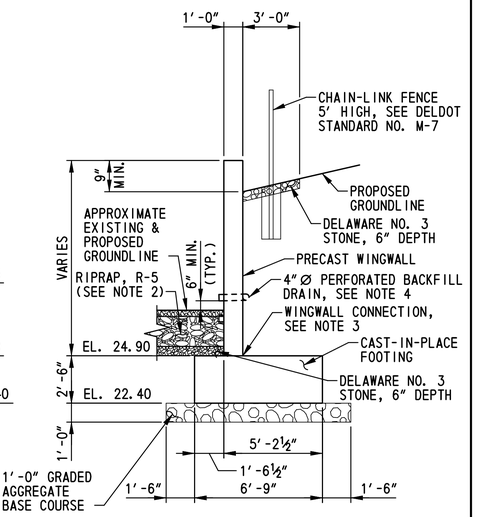
AUGUST 2015



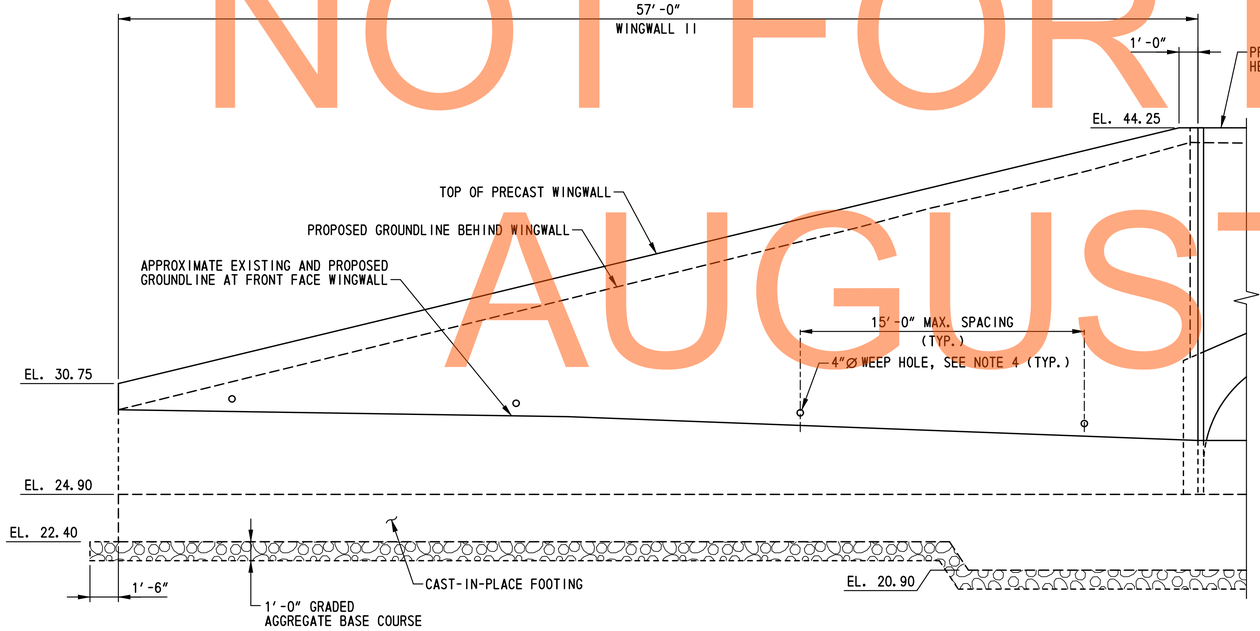
WINGWALL III ELEVATION
SCALE: ¼″=1′-0″



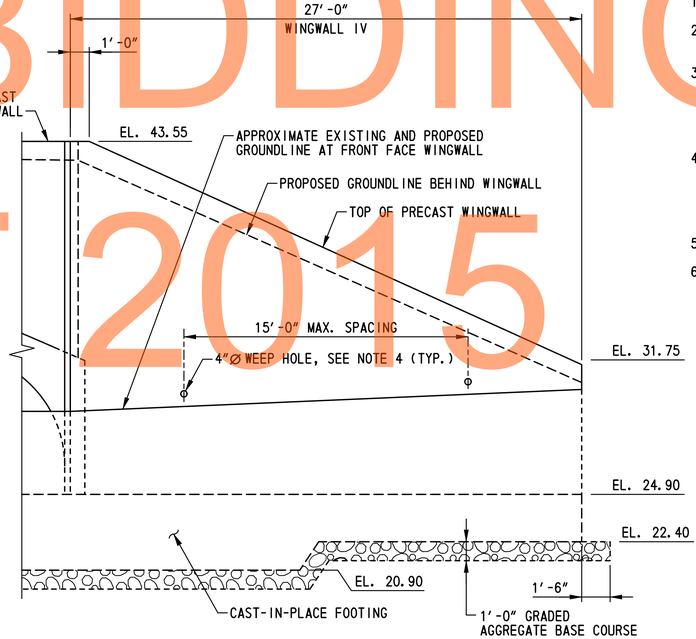
WINGWALL I ELEVATION
SCALE: ¼″=1′-0″



SECTION C-C
SCALE: 1/4 ″=1′-0″



WINGWALL II ELEVATION
SCALE: ¼″=1′-0″



WINGWALL IV ELEVATION
SCALE: ¼″=1′-0″

NOTES:

1. FOR WINGWALL LOCATIONS, SEE DWG. NO. PE-01.
2. FOR RIPRAP DETAILS, SEE NOTES 2 AND 3 ON DWG. NO. PE-01 AND TYPICAL SECTION ON DWG. NO. TS-01.
3. THE CONNECTION OF THE PRECAST WINGWALL TO THE CAST-IN-PLACE FOOTING SHALL BE DESIGNED BY THE CONTRACTOR. THE CONTRACTOR SHALL SUBMIT DETAILS FOR THIS CONNECTION WITH THE SHOP DRAWINGS FOR REVIEW AND APPROVAL.
4. PROVIDE BACKFILL DRAIN AND WEEPHOLES COMPATIABLE WITH THE PRECAST WINGWALL SYSTEM. THE CONTRACTOR SHALL SUBMIT DRAIN DETAILS WITH THE SHOP DRAWINGS FOR REVIEW AND APPROVAL, COST SHALL BE INCIDENTAL TO ITEM 602556 - PRECAST P.C.C. ARCH.
5. FENCING NOT SHOWN IN ELEVATION VIEWS FOR CLARITY.
6. THE LOCATION OF WINGWALL EXPANSION AND CONTRACTION JOINTS SHALL BE DETERMINED BY THE CONTRACTOR. THE CONTRACTOR SHALL SUBMIT THE JOINT LOCATIONS WITH THE SHOP DRAWINGS FOR REVIEW AND APPROVAL.

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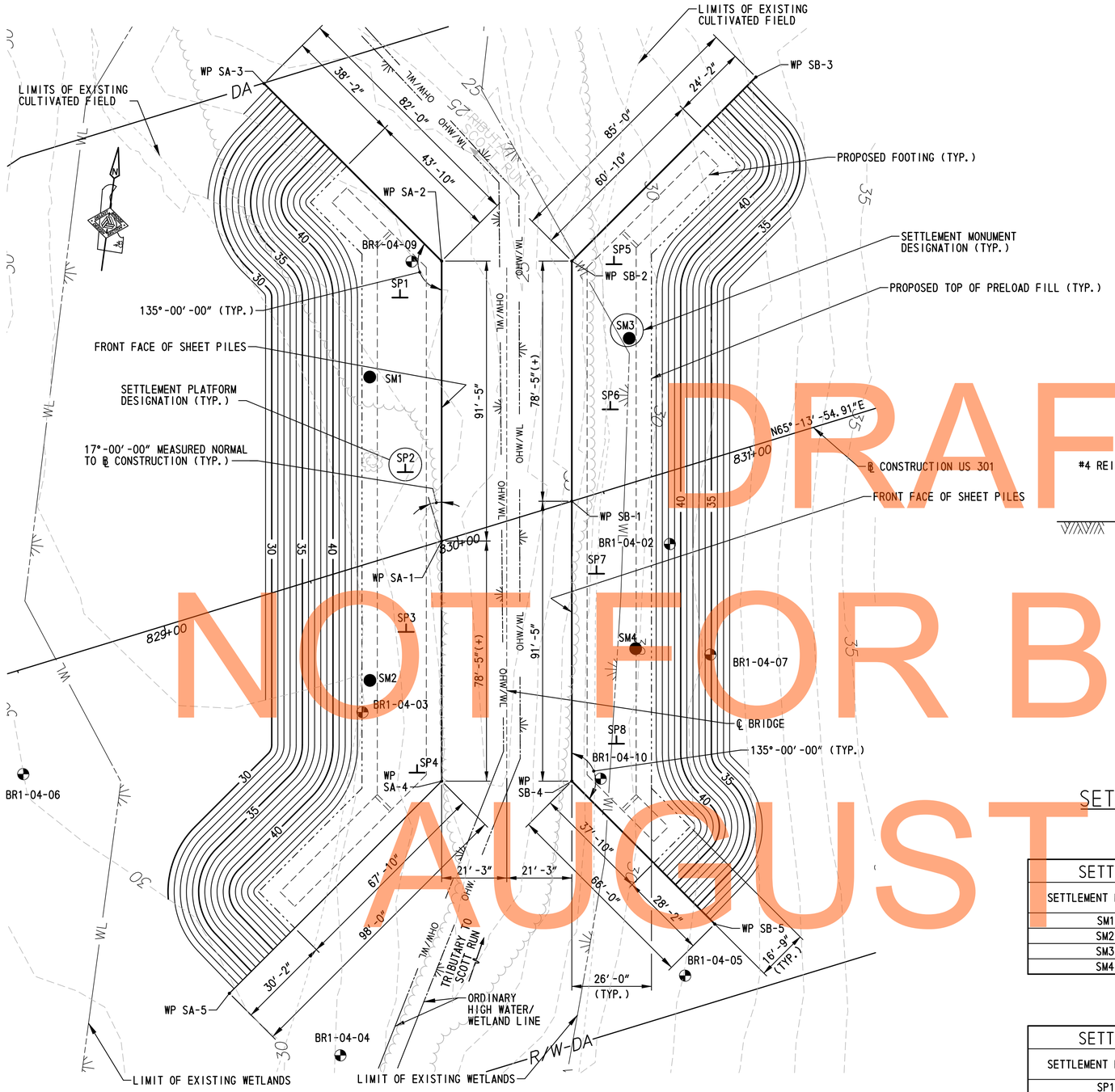
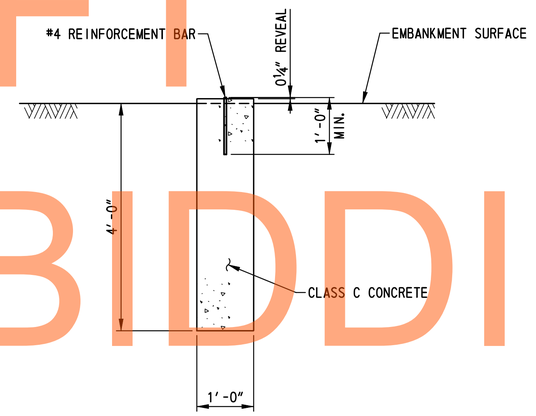
DELAWARE DEPARTMENT OF TRANSPORTATION	ADDENDUMS / REVISIONS	SCALE: AS NOTED	**US 301, SR 896 TO SR 1**	CONTRACT T200911308	BRIDGE NO. **1-436**	**WINGWALL ELEVATIONS**	**BR1-4 WW-01**
				COUNTY NEW CASTLE	DESIGNED BY: A.J.F.		SHEET NO. 253
					CHECKED BY: P.S.D.		TOTAL SHTS. 875



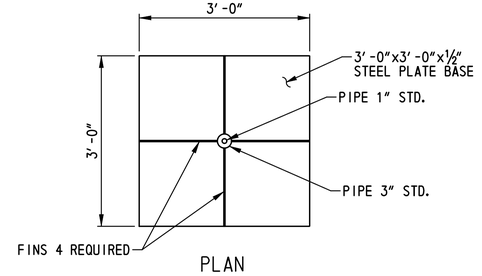
PLAN
SCALE: 1"=20'-0"

NOTES:

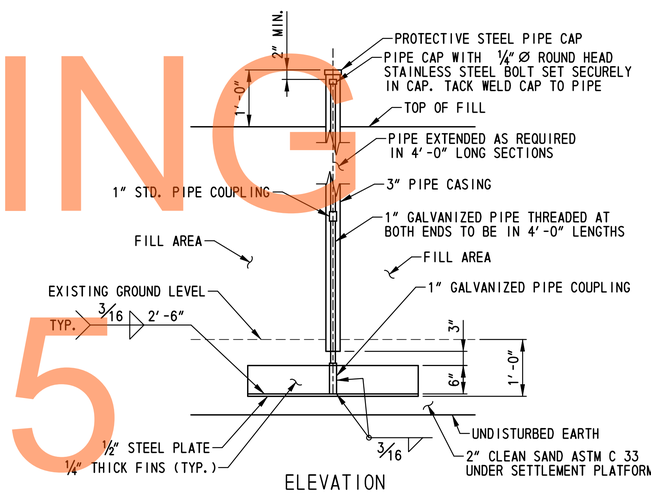
1. FOR SEQUENCE OF CONSTRUCTION AND TYPICAL SECTIONS, SEE DWG. NO. ST-02.
2. PERMANENT SHEET PILES SHALL BE PAID UNDER ITEM 207501 - SHEETING AND SHORING. THE CONTRACTOR SHALL DESIGN THE SHEET PILE WALL SUCH THAT THE MAXIMUM DEFLECTION AT THE TOP OF THE SHEETING IS 1" OR LESS. DESIGN SHALL INCLUDE A 2-FOOT LIVE LOAD SURCHAGE.
3. A SETTLEMENT QUARANTINE PERIOD OF APPROXIMATELY 60-DAYS IS REQUIRED AFTER CONSTRUCTION OF THE FULL HEIGHT OF THE PRELOAD FILL IS ACHIEVED. THE ENGINEER SHALL APPROVE THE COMPLETION OF THE SETTLEMENT QUARANTINE PERIOD PRIOR TO EXCAVATION FOR BRIDGE FOOTING CONSTRUCTION.
4. 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 PRELOAD FILL PLACEMENT. DURING PRELOAD FILL PLACEMENT, READINGS ON ALL SETTLEMENT PLATFORMS SHALL BE TAKEN AT A MINIMUM OF 3 CALENDAR DAY INTERVALS. AFTER COMPLETION OF THE PRELOAD FILL PLACEMENT, INSTALL SETTLEMENT MONUMENTS AS 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. ONCE THE SETTLEMENT HAS CEASED ON ALL MONITORED SETTLEMENT MONITORING DEVICES IN THE VICINITY OF THE SUBSTRUCTURE UNIT AFTER CALENDAR DAY 6, THAT IS THREE READINGS, AFTER THE COMPLETION OF THE PRELOAD FILL AND SETTLEMENT MONUMENT PLACEMENT, THE SUBSTRUCTURE WILL BE RELEASED BY THE ENGINEER FOR REMOVAL OF THE PRELOAD FILL WITHIN THREE WORKING DAYS OF RECEIPT OF SETTLEMENT MONITORING RESULTS. THE SETTLEMENT QUARANTINE PERIOD IS CONSIDERED TO BE COMPLETE AFTER THREE CONSECUTIVE READINGS THAT ARE WITHIN 0.01 FEET FOR ALL SETTLEMENT MONITORING DEVICES AT EACH FOOTING. FOR ADDITIONAL SETTLEMENT PLATFORM AND MONUMENT REQUIREMENTS, SEE SPECIAL PROVISIONS.



SETTLEMENT MONUMENT DETAIL
SCALE: ¾"=1'-0"



PLAN



ELEVATION

SETTLEMENT PLATFORM DETAILS
SCALE: ¾"=1'-0"

SETTLEMENT MONUMENT COORDINATES

SETTLEMENT MONUMENT	COORDINATES	
	NORTHING	EASTING
SM1	555666.7868	587888.5435
SM2	555568.6226	587902.0074
SM3	555690.7617	587970.7952
SM4	555590.6285	587986.5646

SETTLEMENT PLATFORM COORDINATES

SETTLEMENT PLATFORM	COORDINATES	
	NORTHING	EASTING
SP1	555693.8160	587894.8204
SP2	555637.5912	587904.2423
SP3	555585.9065	587911.5695
SP4	555540.8565	587921.3419
SP5	555714.0622	587962.5707
SP6	555666.9175	587967.8031
SP7	555613.1380	587970.5902
SP8	555559.0079	587984.5521

WORKING POINT COORDINATES

WORKING POINT	COORDINATES	
	NORTHING	EASTING
WP SA-1	555616.8932	587919.0555
WP SA-2	555707.4711	587906.6994
WP SA-3	555757.0840	587841.4125
WP SA-4	555539.1894	587929.6554
WP SA-5	555461.1614	587870.3602
WP SB-1	555635.5119	587959.4093
WP SB-2	555713.2159	587948.8093
WP SB-3	555780.8922	588000.2380
WP SB-4	555544.9337	587971.7654
WP SB-5	555505.0003	588024.3149

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AUGUST 2015

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DELAWARE
DEPARTMENT OF TRANSPORTATION

ADDENDUMS / REVISIONS	

SCALE: AS NOTED

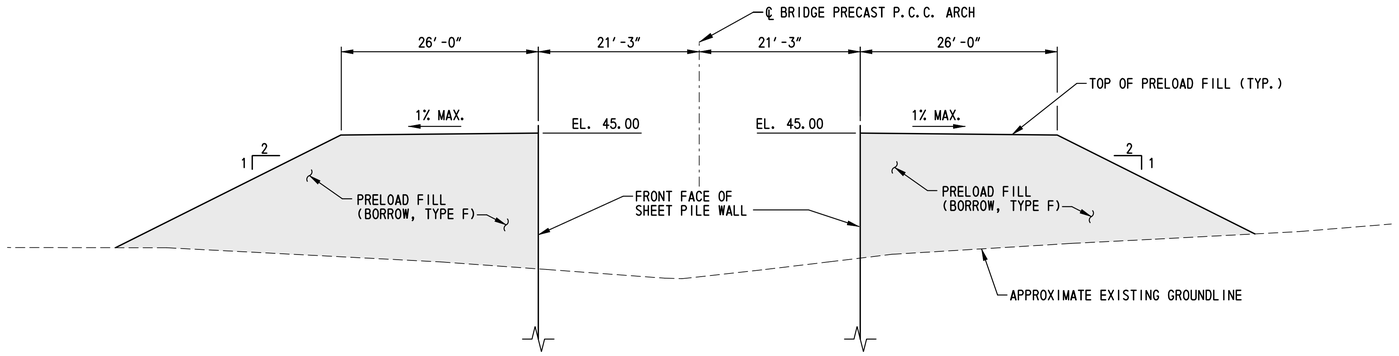
US 301,
SR 896 TO SR 1

CONTRACT	BRIDGE NO.	1-436
T200911308	DESIGNED BY: M.R.P.	
COUNTY	CHECKED BY: P.S.D.	
NEW CASTLE		

PRELOAD FILL DETAILS – 1

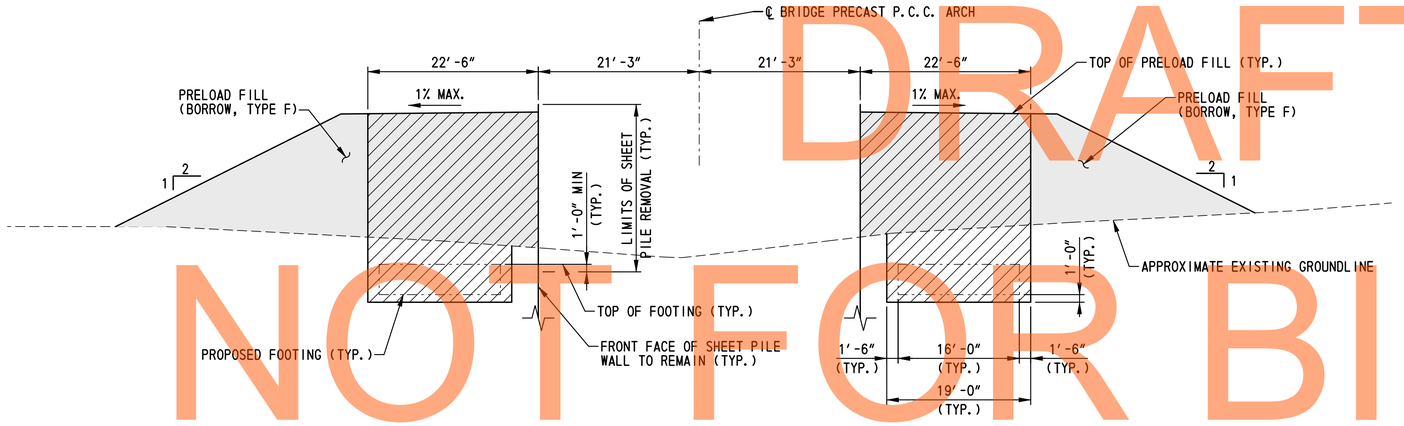
BR1-4
ST-01

SHEET NO.
254
TOTAL SHTS.
875



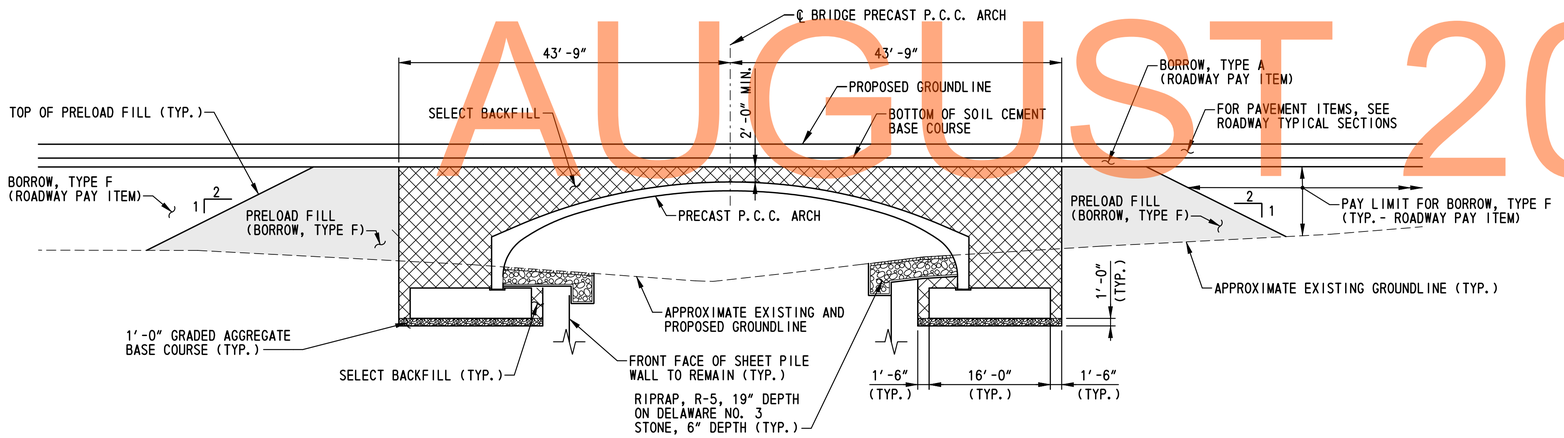
TYPICAL SECTION - SHEET PILE AND PRELOAD FILL

SCALE: 1″=10′-0″



TYPICAL SECTION - EXCAVATION

SCALE: 1″=10′-0″



TYPICAL SECTION - BACKFILL

SCALE: 1″=10′-0″

SEQUENCE OF CONSTRUCTION:

1. INSTALL PERMANENT STEEL SHEET PILES USING THE VIBRATORY METHOD ONLY AS SHOWN ON DWG. NO. ST-01, ITEM 207501 - SHEETING AND SHORING. SEE SPECIAL PROVISIONS.
2. INSTALL SETTLEMENT PLATFORMS AT LOCATIONS SHOWN ON DWG. NO. ST-01, ITEM 202505 - SETTLEMENT PLATFORM. SEE SPECIAL PROVISIONS.
3. CONSTRUCT PRELOAD FILL (BORROW, TYPE F), ITEM 202000 - EXCAVATION AND EMBANKMENT.
4. INSTALL SETTLEMENT MONUMENTS AT LOCATIONS SHOWN ON DWG. NO. ST-01, ITEM 202518 - SETTLEMENT MONUMENT. SEE SPECIAL PROVISIONS.
5. AFTER COMPLETION OF THE SETTLEMENT QUARANTINE PERIOD AS DETERMINED BY THE ENGINEER, EXCAVATE FOR FOOTINGS AS SHOWN, ITEM 207000 - EXCAVATION AND BACKFILL FOR STRUCTURES. REMOVAL OF ADDITIONAL PRELOAD FILL MATERIAL AT THE ENDS OF THE WINGWALLS TO PROPOSED GRADE SHALL BE INCIDENTAL TO ITEM 207000 - EXCAVATION AND BACKFILL FOR STRUCTURES.
6. CUT AND REMOVE STEEL SHEET PILES IN CONFORMANCE WITH THE SPECIAL PROVISIONS TO THE LIMITS SHOWN. REMOVAL OF SHEET PILES SHALL BE INCIDENTAL TO ITEM 207501 - SHEETING AND SHORING. SEE DWG. NO. TS-01 FOR SHEET PILE REMOVAL LIMITS.
7. PLACE GRADED AGGREGATE FOR BASE COURSE, ITEM 302007 - GRADED AGGREGATE BASE COURSE, TYPE B. CONSTRUCT FOOTINGS.
8. CONSTRUCT PRECAST P.C.C. ARCH AND WINGWALLS. BACKFILL STRUCTURE WITH SELECT BACKFILL, AS SHOWN. INSTALL RIPRAP, R-5 19″ DEPTH ON DELAWARE NO. 3 STONE, 6″ DEPTH, AS SHOWN. SEE NOTE 2 ON DWG. NO. PE-01 FOR ADDITIONAL INFORMATION.

LEGEND

- LIMITS OF PRELOAD FILL (BORROW, TYPE F), ITEM 202000 - EXCAVATION AND EMBANKMENT
- LIMITS OF PAYMENT FOR EXCAVATION, ITEM 207000 - EXCAVATION AND BACKFILL FOR STRUCTURES
- LIMITS OF SELECT BACKFILL, INCIDENTAL TO ITEM 602556 - PRECAST P.C.C. ARCH
- RIPRAP, R-5 19″ DEPTH, ITEM 712021 - RIPRAP, R-5 AND DELAWARE NO. 3 STONE, 6″ DEPTH, ITEM - 302011 DELAWARE NO. 3 STONE.
- GRADED AGGREGATE BASE COURSE, ITEM 302007 - GRADED AGGREGATE BASE COURSE, TYPE B

NOTES:

1. FOR PRELOAD FILL PLAN AND NOTES, SEE DWG. NO. ST-01.
2. FOR ARCH AND WINGWALL FOOTING DIMENSIONS, SEE DWG. NO. FT-01.
3. DEWATER FOOTING EXCAVATIONS AS REQUIRED. FOR ADDITIONAL REQUIREMENTS, SEE DWG. NOS. MS-01 AND MS-02.
4. FOR SHORING AND BRACING REQUIREMENTS, SEE NOTE 14 ON DWG.NO. PN-01.

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DELAWARE
DEPARTMENT OF TRANSPORTATION

ADDENDUMS / REVISIONS	

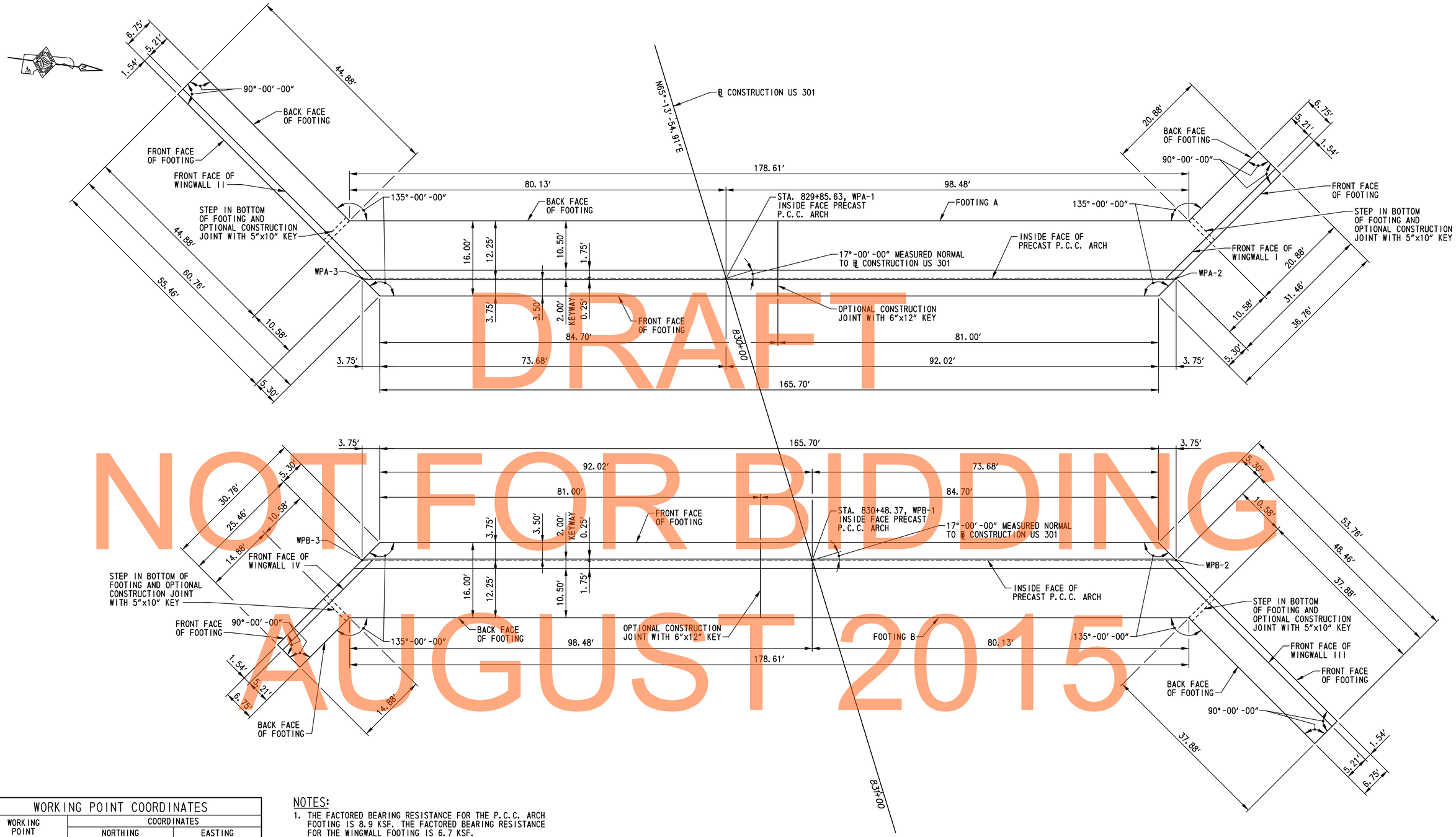
SCALE: AS NOTED

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

CONTRACT	BRIDGE NO.	1-436
T200911308	DESIGNED BY: M.R.P.	
COUNTY	CHECKED BY: P.S.D.	
NEW CASTLE		

PRELOAD FILL DETAILS – 2

| BR1-4
ST-02 |
|---|
| SHEET NO. |
| 255 |
| TOTAL SHTS. |
| 875 |



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NOT FOR BIDDING
AUGUST 2015

WORKING POINT COORDINATES		
WORKING POINT	COORDINATES	
	NORTHING	EASTING
WPA-1	555613.0599	587910.7473
WPA-2	555707.9521	587897.8026
WPA-3	555536.3432	587921.2126
WPB-1	555639.3452	587967.7173
WPB-2	555716.0619	587957.2520
WPB-3	555544.4529	587980.6620

NOTES:

1. THE FACTORED BEARING RESISTANCE FOR THE P.C.C. ARCH FOOTING IS 8.9 KSF. THE FACTORED BEARING RESISTANCE FOR THE WINGWALL FOOTING IS 6.7 KSF.
2. SEE DWG. NO. ST-01 FOR SETTLEMENT QUARANTINE PERIOD AND MONITORING REQUIREMENTS.
3. FOR ADDITIONAL FOUNDATION REQUIREMENTS, SEE NOTE 5 ON DWG. NO. PN-01.

GEOMETRIC AND FOOTING LAYOUT PLAN

SCALE: 1″=10′-0″

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DELAWARE
DEPARTMENT OF TRANSPORTATION

ADDENDUMS / REVISIONS	

SCALE: AS NOTED

US 301,
SR 896 TO SR 1

CONTRACT	BRIDGE NO.	1-436
T200911308	DESIGNED BY: M.P.U.	
COUNTY	CHECKED BY: P.S.D.	
NEW CASTLE		

GEOMETRIC AND FOOTING LAYOUT PLAN

BR1-4 FT-01	
SHEET NO.	256
TOTAL SHTS.	875

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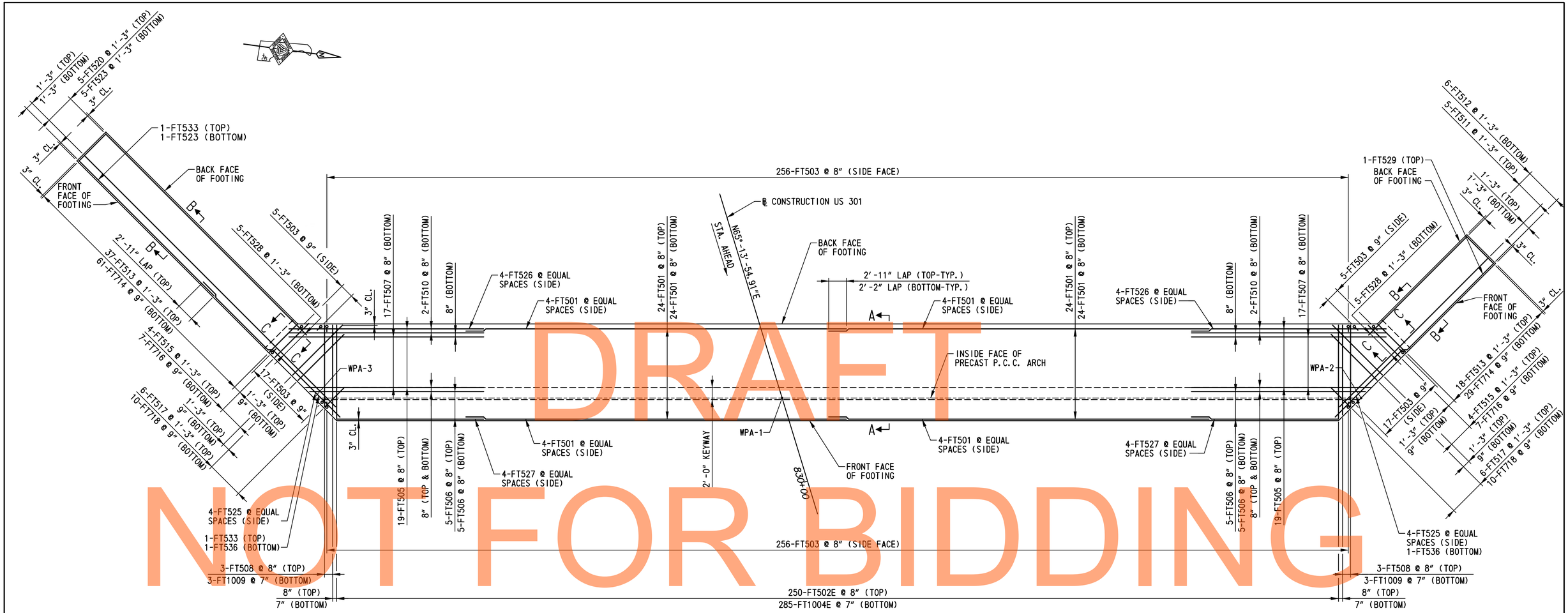
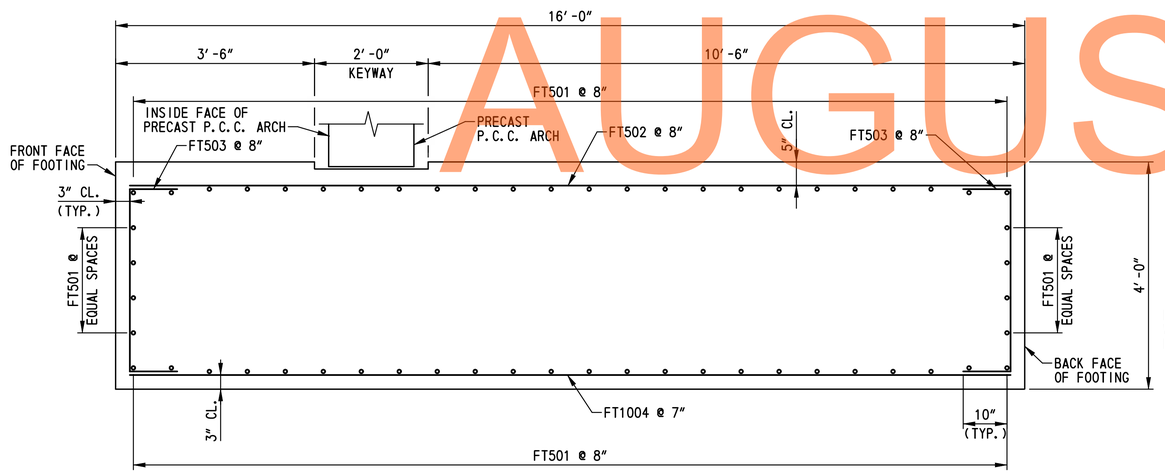
AUGUST 2015



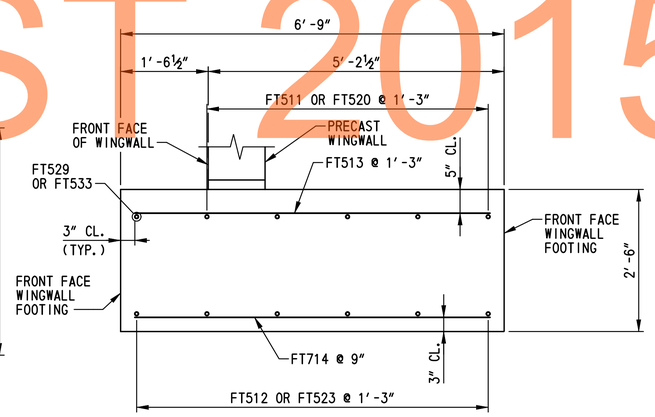
FOOTING A REINFORCEMENT PLAN

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



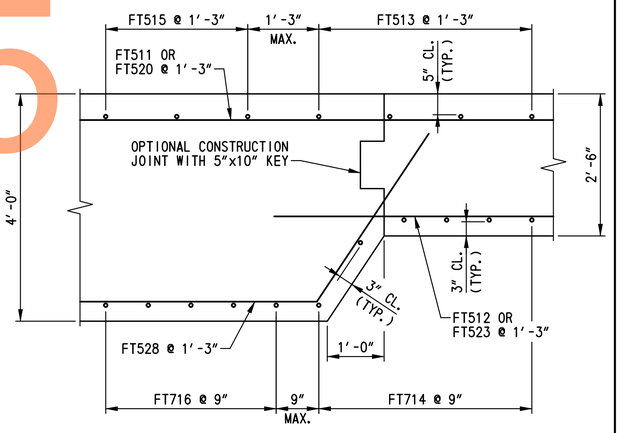
SECTION A-A

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



SECTION B-B

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



SECTION C-C

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

DELAWARE DEPARTMENT OF TRANSPORTATION	ADDENDUMS / REVISIONS	SCALE: AS NOTED	US 301, SR 896 TO SR 1	CONTRACT T200911308 / COUNTY NEW CASTLE	BRIDGE NO. 1-436 / DESIGNED BY: M.P.U. / CHECKED BY: P.S.D.

FOOTING A REINFORCEMENT PLAN

BR1-4 FT-02 | SHEET NO. 257 | TOTAL SHTS. 875

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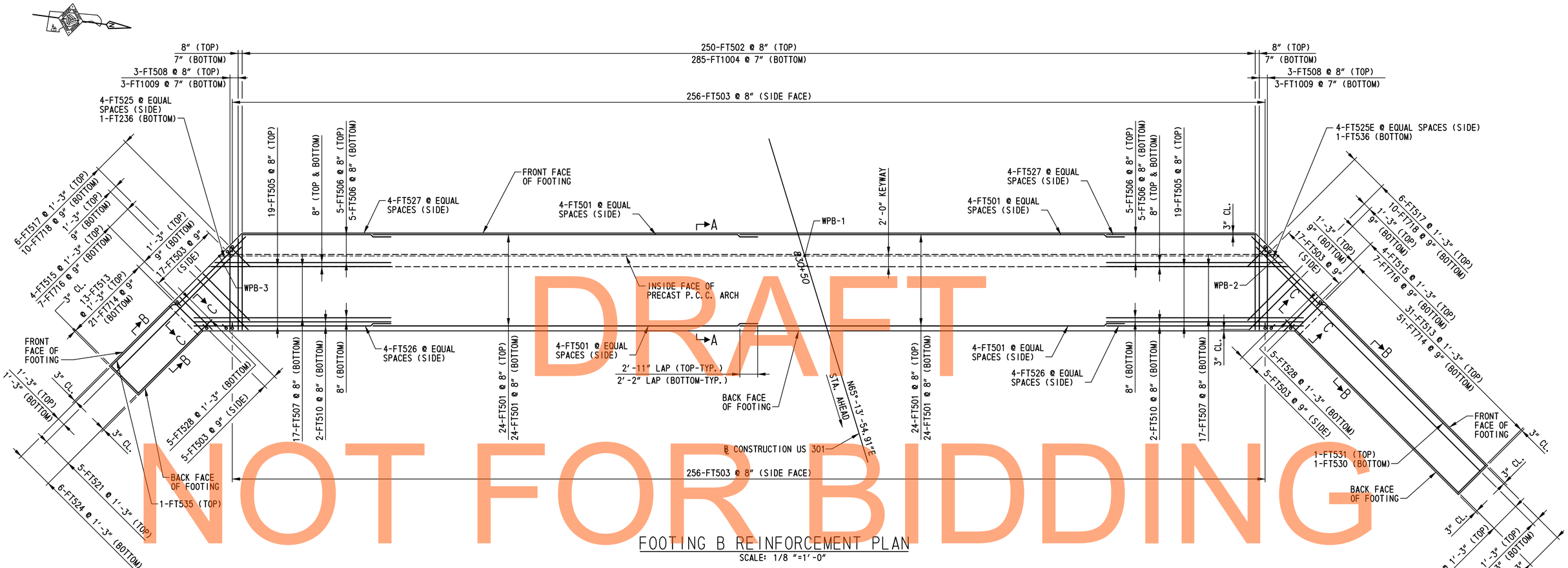
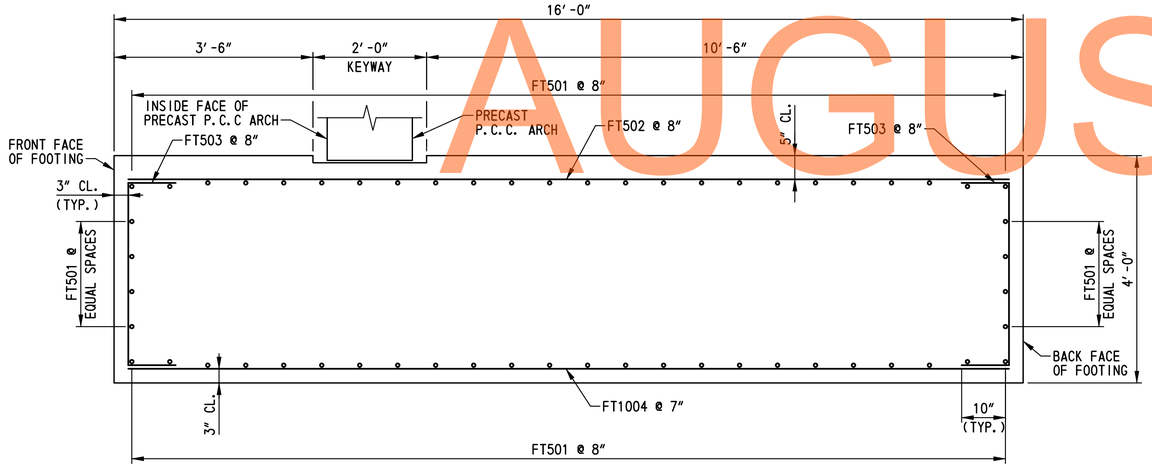
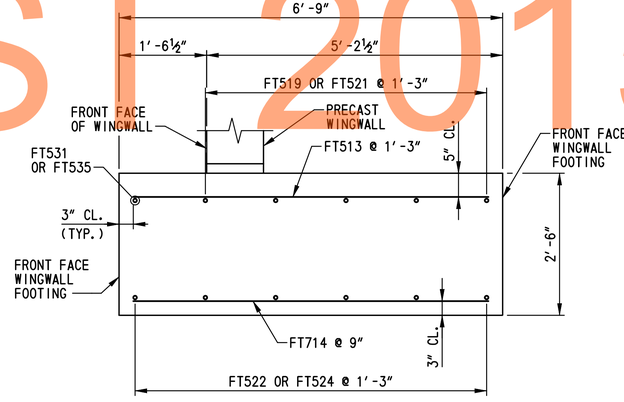
AUGUST 2015



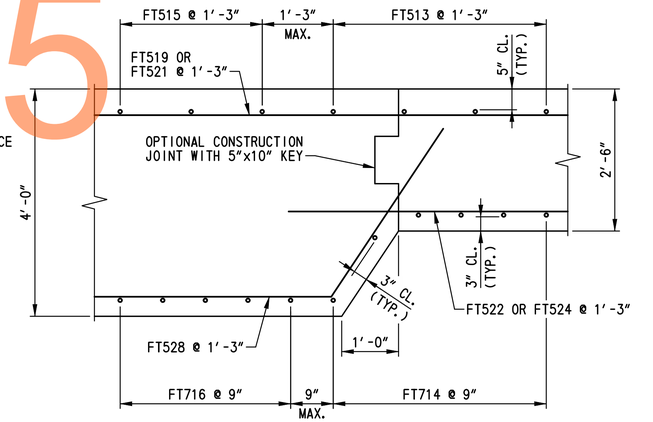
FOOTING B REINFORCEMENT PLAN
SCALE: 1/8 "=1'-0"



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



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



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

DELAWARE DEPARTMENT OF TRANSPORTATION	ADDENDUMS / REVISIONS	SCALE: AS NOTED	US 301, SR 896 TO SR 1	CONTRACT T200911308	BRIDGE NO. 1-436	FOOTING B REINFORCEMENT PLAN	BR1-4 FT-03
				COUNTY NEW CASTLE	DESIGNED BY: M.P.U.		SHEET NO. 258
					CHECKED BY: P.S.D.		TOTAL SHTS. 875

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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
FOOTING A															
104	5	60-00 0	FT501	STR		60-00 0									
250	5	15-06 0	FT502	STR		15-06 0									
556	5	5-00 0	FT503	2	0-10 0	3-04 0	0-10 0								
285	10	15-06 0	FT1004	STR		15-06 0									
38*	5	30-05 3	FT505	STR		30-05 3									
		TO				TO									
		35-03 3				35-03 3									
			*2 SETS OF	19											
20*	5	27-02 2	FT506	STR		27-02 2									
		TO				TO									
		29-10 2				29-10 2									
			*4 SETS OF	5											
34*	5	30-05 3	FT507	STR		30-05 3									
		TO				TO									
		34-09 1				34-09 1									
			*2 SETS OF	17											
6*	5	13-04 3	FT508	STR		13-04 3									
		TO				TO									
		14-08 3				14-08 3									
			*2 SETS OF	3											
6*	10	13-07 3	FT1009	STR		13-07 3									
		TO				TO									
		14-09 3				14-09 3									
			*2 SETS OF	3											
4	5	36-07 0	FT510	6			1-11 0	34-08 0				1-04 3		1-03 3	35-11 3
5*	5	23-00 1	FT511	STR		23-00 1									
		TO				TO									
		34-08 1				34-08 1									
			*1 SET OF	5											
6	5	21-09 3	FT512	STR		21-09 3									
55	5	6-03 0	FT513	STR		6-03 0									
90	7	6-03 0	FT714	STR		6-03 0									
8*	5	7-04 1	FT515	STR		7-04 1									
		TO				TO									
		11-00 0				11-00 0									
			*2 SETS OF	4											

SPECIFICATIONS					BENDING DIMENSIONS (FEET-INCHES /QUARTER INCH)										
QTY.	SIZE	LENGTH	MARK	TYPE	A	B	C	D	E	F/R	G	H	J	K	O
14*	7	6-10 3	FT716	STR		6-10 3									
		TO				TO									
		11-04 3				11-04 3									
			*2 SETS OF	7											
12*	5	5-03 0	FT517	STR		5-03 0									
		TO				TO									
		11-03 3				11-03 3									
			*2 SETS OF	6											
20*	7	4-11 2	FT718	STR		4-11 2									
		TO				TO									
		11-08 2				11-08 2									
			*2 SETS OF	10											
5*	5	47-00 1	FT520	STR		47-00 1									
		TO				TO									
		58-08 1				58-08 1									
			*1 SET OF	5											
6	5	45-09 3	FT523	STR		45-09 3									
8	5	16-01 3	FT525	STR		16-01 3									
8	5	34-07 1	FT526	STR		34-07 1									
8	5	27-02 2	FT527	STR		27-02 2									
10*	5	17-05 1	FT528	6				3-06 3	13-10 2				2-11 2	1-11 3	15-10 1
		TO						TO	TO				TO	TO	TO
		5-09 1						3-06 3	2-02 2				2-11 2	1-11 3	4-02 1
			*2 SETS OF	5											
1	5	36-05 1	FT529	STR		36-05 1									
2	5	31-08 0	FT533	STR		31-08 0									
2	5	19-02 0	FT536	6				3-06 3	15-07 1				2-11 2	1-11 3	17-07 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

DRAFT
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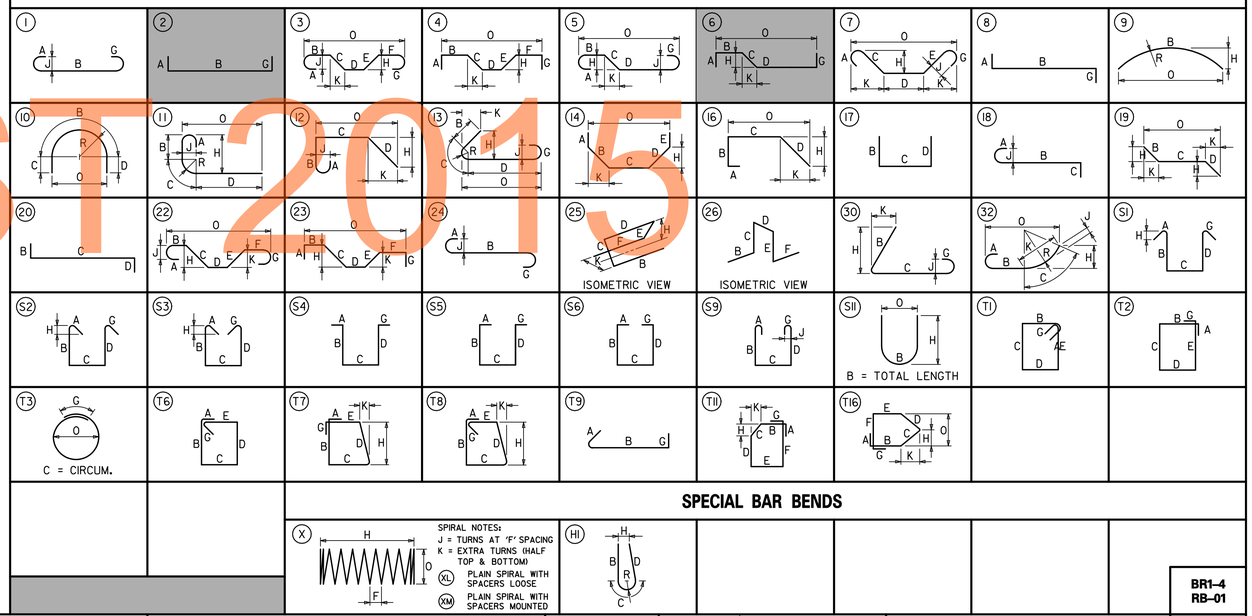
AUGUST 2015

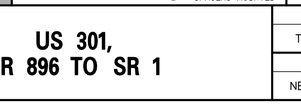
ASTM STANDARD ENGLISH REINFORCING BARS				RECOMMENDED END HOOKS, APPLICABLE TO ALL GRADES				STIRRUP AND TIE HOOKS, APPLICABLE TO ALL GRADES			
	NOMINAL DIMENSIONS				180° HOOKS		90° HOOKS		90° HOOK	135° HOOK	
BAR SIZE	DIAMETER (INCHES)	AREA (INCHES²)	WEIGHT (LBS./FT.)	D	A OR G	J	A OR G	D	A OR G	A OR G	A OR G
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.

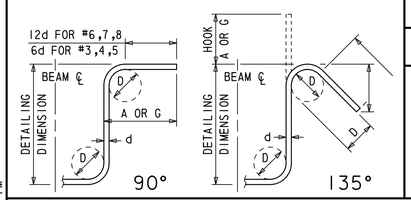
STANDARD BAR BENDS



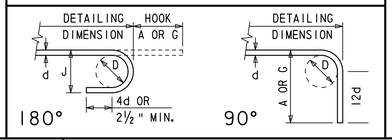
SPECIAL BAR BENDS

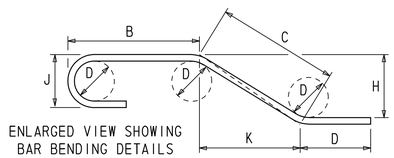


STIRRUP AND TIE HOOKS



180° AND 90° END HOOKS





BR1-4
RB-01

DELAWARE DEPARTMENT OF TRANSPORTATION

ADDENDUMS / REVISIONS

SCALE: AS NOTED

US 301, SR 896 TO SR 1

CONTRACT	BRIDGE NO.	1-436
T200911308	DESIGNED BY: M.P.U.	
COUNTY	CHECKED BY: P.S.D.	
NEW CASTLE		

FOOTING A REINFORCEMENT LIST

SHEET NO.
259
TOTAL SHTS.
875

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(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
FOOTING B															
104	5	60-00 0	FT501	STR		60-00 0									
250	5	15-06 0	FT502	STR		15-06 0									
556	5	5-00 0	FT503	2	0-10 0	3-04 0	0-10 0								
285	10	15-06 0	FT1004	STR		15-06 0									
38*	5	30-05 3	FT505	STR		30-05 3									
		TO				TO									
		35-03 3				35-03 3									
			*2 SETS OF	19											
20*	5	27-02 2	FT506	STR		27-02 2									
		TO				TO									
		29-10 2				29-10 2									
			*4 SETS OF	5											
34*	5	30-05 3	FT507	STR		30-05 3									
		TO				TO									
		34-09 1				34-09 1									
			*2 SETS OF	17											
6*	5	13-04 3	FT508	STR		13-04 3									
		TO				TO									
		14-08 3				14-08 3									
			*2 SETS OF	3											
6*	10	13-07 3	FT1009	STR		13-07 3									
		TO				TO									
		14-09 3				14-09 3									
			*2 SETS OF	3											
4	5	36-07 0	FT510	6			1-11 0	34-08 0				1-04 3		1-03 3	35-11 3
44	5	6-03 0	FT513	STR		6-03 0									
72	7	6-03 0	FT714	STR		6-03 0									
8*	5	7-04 1	FT515	STR		7-04 1									
		TO				TO									
		11-00 0				11-00 0									
			*2 SETS OF	4											
14*	7	6-10 3	FT716	STR		6-10 3									
		TO				TO									
		11-04 3				11-04 3									
			*2 SETS OF	7											
12*	5	5-03 0	FT517	STR		5-03 0									
		TO				TO									
		11-03 3				11-03 3									
			*2 SETS OF	6											

SPECIFICATIONS					BENDING DIMENSIONS (FEET-INCHES /QUARTER INCH)									
QTY.	SIZE	LENGTH	MARK	TYPE	A	B	C	D	E	F/R	G	H	J	K	O
20*	7	4-11 2	FT718	STR		4-11 2									
		TO				TO									
		11-08 2				11-08 2									
			*2 SETS OF	10											
5*	5	40-00 1	FT519	STR		40-00 1									
		TO				TO									
		51-08 1				51-08 1									
			*1 SET OF	5											
5*	5	17-00 1	FT521	STR		17-00 1									
		TO				TO									
		28-08 1				28-08 1									
			*1 SET OF	5											
6	5	38-09 3	FT522	STR		38-09 3									
6	5	15-09 3	FT524	STR		15-09 3									
8	5	16-01 3	FT525	STR		16-01 3									
8	5	34-07 1	FT526	STR		34-07 1									
8	5	27-02 2	FT527	STR		27-02 2									
10*	5	17-05 1	FT528	6			3-06 3	13-10 2				2-11 2		1-11 3	15-10 1
		TO					TO	TO				TO		TO	TO
		5-09 1					3-06 3	2-02 2				2-11 2		1-11 3	4-02 1
			*2 SETS OF	5											
1	5	53-05 1	FT531	STR		53-05 1									
1	5	30-05 1	FT535	STR		30-05 1									
2	5	19-02 0	FT536	6			3-06 3	15-07 1				2-11 2		1-11 3	17-07 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

DRAFT
NOT FOR BIDDING
AUGUST 2015

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.
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10. FOR RECOMMENDED DIAMETER "D", OF BENDS, HOOKS, ETC., REFER TO TABLE ABOVE, 'CRSI' OR 'ACI' TABLES WHERE APPLICABLE AND REQUIRED.
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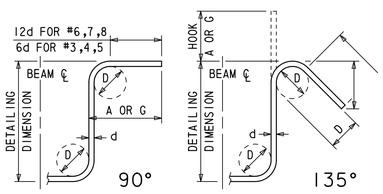
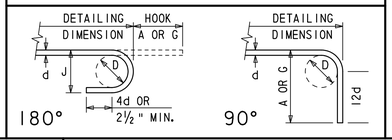
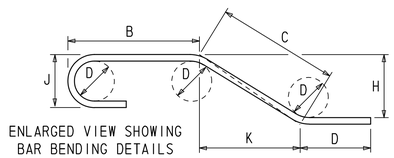
STIRRUP AND TIE HOOKS

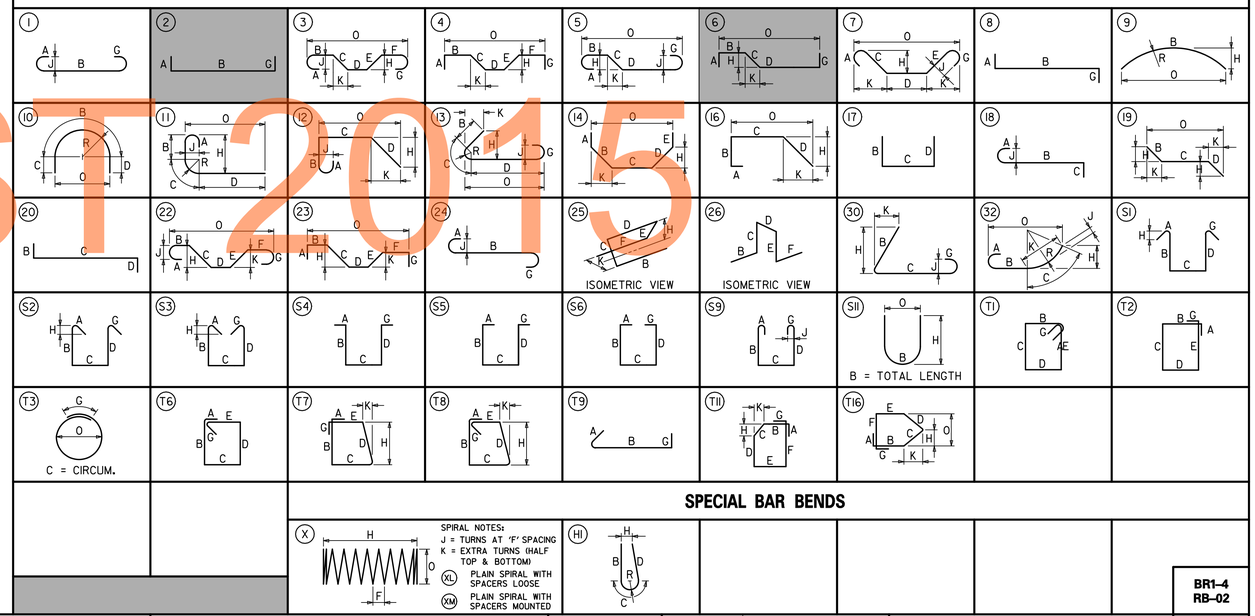


180° AND 90° END HOOKS





STANDARD BAR BENDS



SPECIAL BAR BENDS

BR1-4
RB-02

DELAWARE
DEPARTMENT OF TRANSPORTATION

ADDENDUMS / REVISIONS

SCALE: AS NOTED

US 301,
SR 896 TO SR 1

CONTRACT	T200911308
COUNTY	NEW CASTLE
BRIDGE NO.	1-436
DESIGNED BY:	M.P.U.
CHECKED BY:	P.S.D.

FOOTING B
REINFORCEMENT LIST

SHEET NO.	260
TOTAL SHTS.	875

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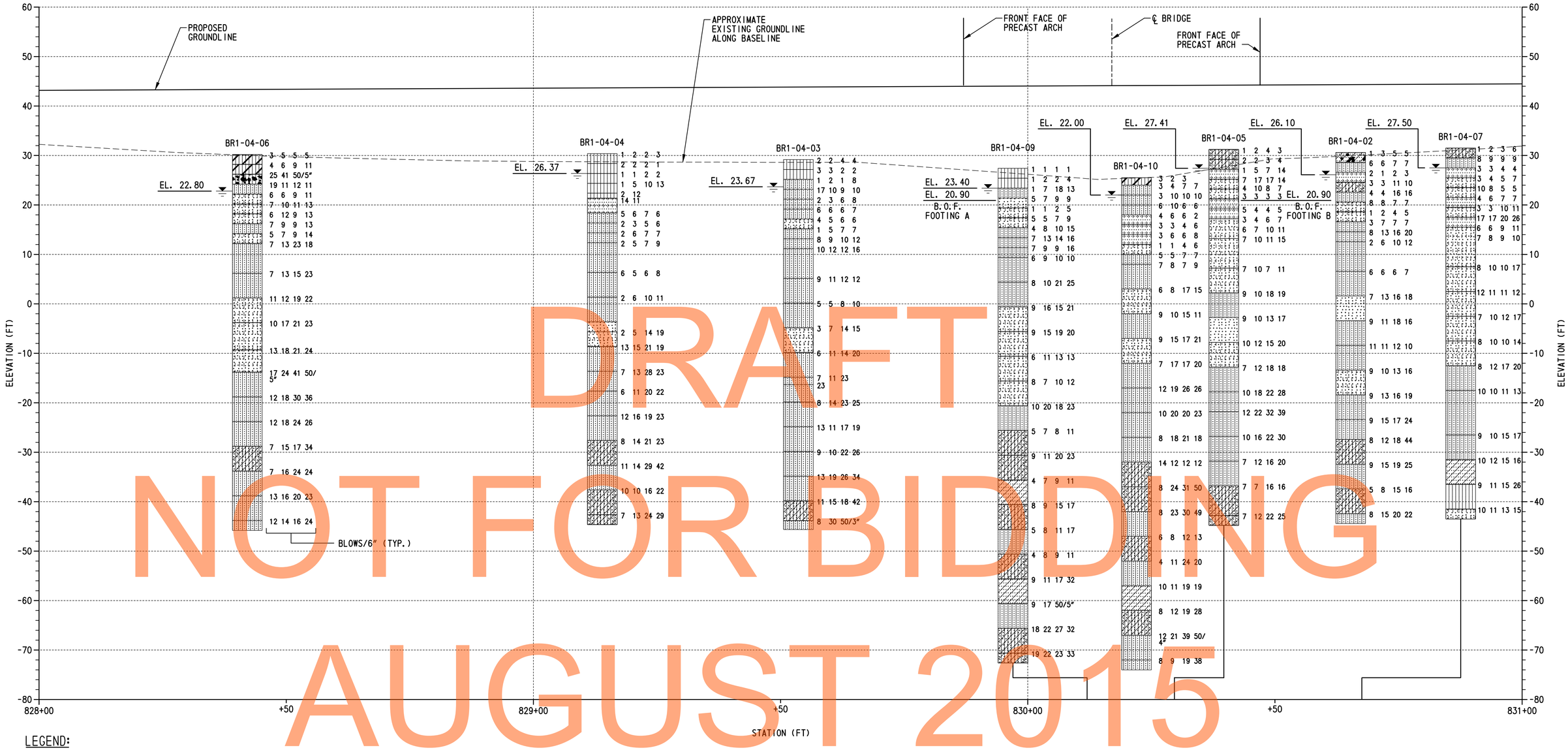
AUGUST 2015



BORING PROFILE

SCALE: 1"=10'-0"

LEGEND:

- SILT
- WELL GRADED GRAVEL WITH SILT
- POORLY GRADED SAND WITH SILT
- SILTY LOW PLASTICITY CLAY
- POORLY GRADED CLAYEY SILTY SAND
- POOLY GRADED GRAVEL WITH SILT
- POORLY GRADED GRAVEL WITH CLAY
- CLAYEY SAND
- SILTY SAND
- WELL GRADED SAND WITH SILT
- POORLY GRADED SAND
- WATER TABLE AT BORING COMPLETION

TEST BORINGS

DESIGNATION	STATION	OFFSET	NORTHING	EASTING
BR1-04-02	830+65.32	22.86' RT.	555626	587993
BR1-04-03	829+53.61	46.15' RT.	555558	587901
BR1-04-04	829+13.94	150.57' RT.	555446	587909
BR1-04-05	830+29.66	159.09' RT.	555487	588017
BR1-04-06	828+42.13	32.91' RT.	555523	587794
BR1-04-07	830+67.58	60.79' RT.	555592	588011
BR1-04-09	830+12.00	90.00' LT.	555706	587897
BR1-04-10	830+22.00	90.00' RT.	555547	587981

NOTES:

1. FOR BORING LOCATIONS, SEE DWG. NO. PE-01.
2. BORINGS BR1-04-05, BR1-04-07, AND BR1-04-09 ARE SHOWN OFFSET AS INDICATED FOR CLARITY.
3. RESULTS OF TESTS CONDUCTED ON SAMPLES RECOVERED ARE REPORTED ON THE BORING LOGS. LOGS AND LABRATORY TESTING ARE INCLUDED AS PART OF THE CONTRACT DOCUMENTS, SEE CD.

VERTICAL SCALE FEET 0 10 20 30

BR1-4
BO-01

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DELAWARE DEPARTMENT OF TRANSPORTATION

ADDENDUMS / REVISIONS

SCALE 0 10 20 30 FEET

US 301, SR 896 TO SR 1

CONTRACT	T200911308
COUNTY	NEW CASTLE
BRIDGE NO.	1-436
DESIGNED BY:	M.P.U.
CHECKED BY:	P.S.D.

BORING PROFILE

SHEET NO.	261
TOTAL SHTS.	875