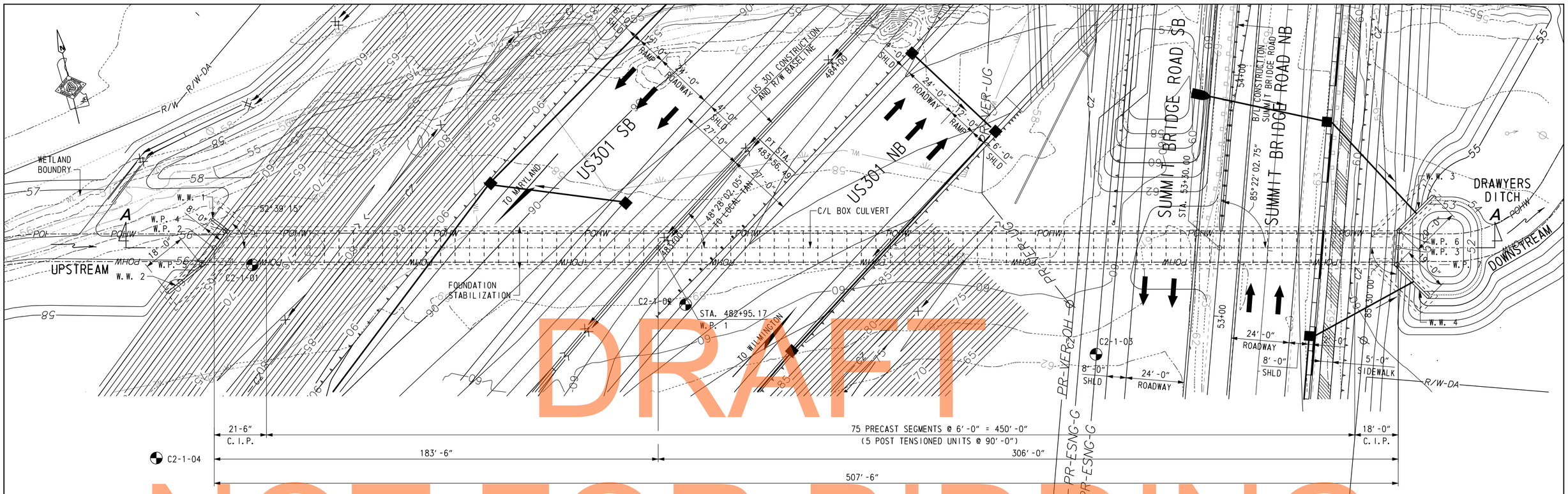
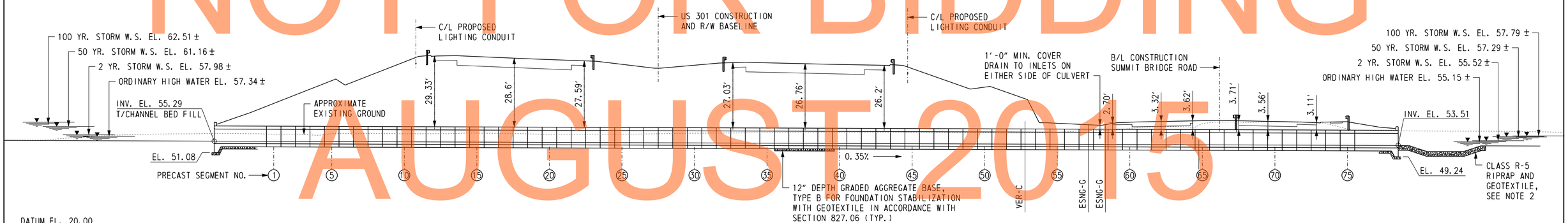


PLAN

SCALE: 1" = 20'-0"

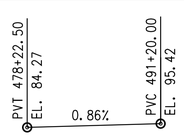


DATUM EL. 20.00

SECTION A-A

SCALE: 1" = 20'-0"

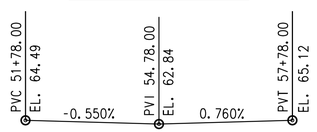
US 301 VERTICAL DATA



US 301 HORIZONTAL DATA

PC STA. 472+26.77
PI STA. 478+05.62
PT STA. 483+56.49
R = 2,103.00'
L = 1,129.73'

SUMMIT BRIDGE ROAD VERTICAL DATA



SUMMIT BRIDGE ROAD HORIZONTAL DATA

TANGENT

WORKING POINTS

W.P. NO.	STATION	OFFSET	COORDINATES	
			NORTHING	EASTING
1	482+95.17	0.00'	542,146.3055	571,010.0733
2	481+80.84	140.68' LT.	542,188.4761	570,831.3031
3	485+04.69	223.92' RT.	542,075.8554	571,307.8471
4	481+88.86	141.47' LT.	542,194.3747	570,837.5455
5	481+72.81	140.54' LT.	542,183.0419	570,824.6724
6	485+10.14	219.55' RT.	542,082.5014	571,309.9868
7	484+99.24	228.39' RT.	542,069.1140	571,305.7651

CROSS REFERENCE NOTES:

1. FOR GENERAL NOTES, SEE DWG. 1-508A PN-1.
2. FOR STREAM RELOCATION PLANS, SEE DWGS. SR01 THRU SR03.

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DELAWARE DEPARTMENT OF TRANSPORTATION

ADDENDUMS / REVISIONS

SCALE 0 20 40 60 FEET

US 301 LEVELS ROAD TO SUMMIT BRIDGE ROAD

CONTRACT T200911303	BRIDGE NO.	1-508A
COUNTY NEW CASTLE	DESIGNED BY: D.D. DIEHL	
	CHECKED BY: T.W. FEROLI	

US 301 MAINLINE OVER DRAWYERS DITCH 12 FOOT X 6 FOOT BOX CULVERT PLAN AND SECTION

1-508A PE-1	
SHEET NO.	667
TOTAL SHTS.	1256

ESTIMATED BRIDGE QUANTITIES

ITEM NO.	DESCRIPTION	UNIT	QUANTITY
207000	EXCAVATION AND BACKFILL FOR STRUCTURES	CY	2,600
302007	GRADED AGGREGATE BASE COURSE, TYPE B (FOR FOUNDATION STABILIZATION)	TON	570
602001	PORTLAND CEMENT CONCRETE MASONRY, CLASS A	CY	140
602506	PRECAST CONCRETE CULVERT	LS	1
604000	BAR REINFORCEMENT, EPOXY COATED	LB	26,000
712531	CHANNEL BED FILL	CY	280
713001	GEOTEXTILE (FOR GRADED AGGREGATE BASE)	SY	1,060
715001	PERFORATED PIPE UNDERDRAIN, 6"	LF	45

INDEX OF DRAWINGS

SHEET NO.	DRAWING NO.	TITLE
667	1-508A PE-1	PLAN AND SECTION
668	1-508A PN-1	INDEX OF DRAWINGS
669	1-508A CU-1	ELEVATIONS AND SECTIONS
670	1-508A CU-2	CAST IN PLACE CULVERT PLAN
671	1-508A CU-3	UPSTREAM FOOTING PLAN
672	1-508A CU-4	WINGWALL REINFORCEMENT 1
673	1-508A CU-5	DOWNSTREAM FOOTING PLAN
674	1-508A CU-6	WINGWALL REINFORCEMENT 2
675	1-508A CU-7	CIP CULVERT REINFORCEMENT 1
676	1-508A CU-8	CIP CULVERT REINFORCEMENT 2
677	1-508A CU-9	REINFORCING BAR LIST 1
678	1-508A CU-10	REINFORCING BAR LIST 2
679	1-508A CU-11	PRECAST BOX REINFORCEMENT
680	1-508A BO-1	BORINGS 1
681	1-508A BO-2	BORINGS 2

GENERAL NOTES

SPECIFICATIONS: DELDOT BRIDGE DESIGN MANUAL, MAY 2005, WITH JANUARY 2008 REVISIONS; DELDOT STANDARD SPECIFICATIONS, 2001, WITH 2009 REVISIONS; AASHTO, LRFD BRIDGE DESIGN SPECIFICATIONS, 4TH EDITION, WITH 2009 INTERIM; US 301 DESIGN MANUAL.

DESIGN: LRFD DESIGN METHOD.

LOADING: HL 93 TRUCK LOADING.

CONCRETE: ALL CAST IN PLACE CONCRETE SHALL BE CLASS A (4,500 PSI). WINGWALLS AND HEADWALLS SHALL BE CAST IN PLACE. ALL PRECAST CONCRETE SHALL BE f'c = 5000 PSI.

REINFORCING STEEL: REINFORCING STEEL SHALL BE AASHTO M31, GRADE 60 UNLESS OTHERWISE NOTED AND SHALL BE PROTECTED WITH FUSION BONDED EPOXY CONFORMING TO AASHTO M284 WHERE INDICATED ON PLANS. ALL REINFORCING STEEL SHALL HAVE A CLEAR COVER OF TWO (2) INCHES UNLESS OTHERWISE SPECIFIED ON THE PLANS.

POST TENSIONING STEEL: FOUR LONGITUDINAL ONE HALF INCH DIAMETER, 270 ksi LOW RELAXATION POLYPROPYLENE SHEATHED PRESTRESSING STRANDS WITH CORROSION INHIBITOR OR OTHER APPROVED POST-TENSIONING DEVICE, SHALL BE PLACED IN POSITION THROUGH PREFORMED HOLES IN THE CORNERS OF PRECAST UNITS. THESE SHEATHED PRESTRESSING STRANDS SHALL BE STRESSED TO A TENSION OF 31 KIPS PER STRAND. THE MINIMUM ULTIMATE STRENGTH OF EACH STRAND SHALL BE 41 KIPS.

POST-TENSIONING NOTES:

1. SHOW ALL POST-TENSIONING DETAILS ON SHOP DRAWINGS.
2. SNUG FIT ALL JOINTS BEFORE POST-TENSIONING.
3. INSTALL STRANDS IN PRECAST SECTIONS. STRESS EACH STRAND TO AN EFFECTIVE FORCE OF 10 PSI OVER THE CROSS SECTION OF ANY SECTION. CHECK RAM AREA AND CALIBRATION CURVES OF EQUIPMENT FURNISHED FOR GAGE PRESSURES.
4. COMPLETE TENSIONING IN THREE PASSES; ONE-THIRD, ONE-HALF AND FULL POST TENSIONING FORCE. FIRST AND SECOND TENSIONINGS MAY BE ALTERED AS REQUIRED TO MAINTAIN PROPER ALIGNMENT OF THE CULVERT. WHERE MORE THAN EIGHT STRANDS ARE REQUIRED, TENSION ADDITIONAL STRANDS SIMILARLY AROUND THE CENTRAL AXIS.
5. AFTER STRESSING, GROUT ALL STRAND DUCTS, RECESSES AND BLOCKOUTS.
6. SUBMIT POST-TENSIONING COMPUTATIONS WITH SHOP DRAWINGS SHOWING THE STRAND PATTERN AND REQUIRED POST-TENSIONING FORCE. BASE DESIGN UPON THE FOLLOWING CRITERIA:
   a. THE TOTAL POST-TENSION FORCE IS THE SUM OF THE FORCE REQUIRED TO OVERCOME SOIL FRICTION PLUS THE FORCE REQUIRED TO CREATE A PRESSURE OF 10 PSI OVER THE CROSS SECTION OF THE CULVERT.
   b. MAXIMUM TOTAL POST-TENSION FORCE SHOULD NOT CREATE A PRESSURE GREATER THAN 100 PSI OVER THE CROSS SECTION OF ANY SEGMENT.
   c. MAXIMUM LOAD ON A ½" DIAMETER STRAND IS 31 KIPS.
   d. USE A COEFFICIENT OF SOIL FRICTION OF 0.6.
   e. PLACE STRANDS SYMMETRICALLY ABOUT BOTH AXES OF THE CULVERT CROSS SECTION.
   f. LOCATE STRANDS SO AS TO NOT INTERFERE WITH REINFORCEMENT DETAILS.
7. ALL POST-TENSIONING MUST BE WITNESSED AND APPROVED BY THE ENGINEER.
8. AFTER POST-TENSIONING IS APPROVED, CUT STRANDS TO PROVIDE A MINIMUM OF 2½" CLEAR FROM OUTSIDE FACE OF CONCRETE AND COAT RECESS WITH EPOXY BONDING COMPOUND. FILL ALL RECESSES WITH NON-SHRINK GROUT.
9. POST-TENSION AND GROUT BEFORE BACKFILLING AND PLACING TRAFFIC OVER THE BOX. AFTER GROUTING, WAIT AT LEAST TWO (2) DAYS BEFORE BACKFILLING.
10. ALL POST-TENSIONING CHUCKS MUST BE OF THE REUSABLE TYPE. OPERATORS MUST EXERCISE PROPER PRECAUTIONS WHEN RE-ALIGNING WEDGES AFTER RELEASE OF TENDONS AND PRIOR TO RETENSIONING AND RE-SEATING.
11. KEEP JOINT CLEAN AT POST-TENSIONING STAGE.
12. POST-TENSIONING DUCTS MAY BE PLACED WITHIN THE WALLS OR SLAB ANYWHERE BETWEEN THE LAYERS OF REINFORCEMENT TO AVOID THE SLOPED PORTION OF THE JOINT SO AS TO PROMOTE SEALING OF THE DUCT.
13. REMOVE A MINIMAL AMOUNT OF POLYSTRAND TO ACCOMMODATE INTERMEDIATE SPLICES AT BOX ENDS.

PRECAST BOX CULVERT NOTES:

1. SUGGESTED PLACEMENT OF PRECAST SEGMENTS: CONTRACTOR SHALL UTILIZE A CRANE TO LIFT EACH UNIT FROM TRAILER HOLDING IN PLACE WHILE INSTALLATION CREW PULLS THE UNITS TOGETHER WITH COME-ALONGS OR AN INTERNALLY ANCHORED SYSTEM.
2. AS AN ALTERNATE TO A POST-TENSIONING STRAND SYSTEM, THE CONTRACTOR MAY USE AN EQUIVALENT POST-TENSIONING TREADED BAR SYSTEM WITH EACH UNIT TENSIONED AND COUPLE NUTS PROVIDED TO LINK THE ADJACENT UNITS TOGETHER.
3. FLEXIBLE PREFORMED GASKET MATERIAL IN ACCORDANCE WITH ASTM C990 SHALL BE PROVIDED AT THE JOINTS BETWEEN THE UNITS.
4. FOR PRECAST UNITS ADJACENT TO THE CAST IN PLACE BOX SEGMENTS, #5 @12" EPOXY COATED CONNECTING DOWELS, WITH 1'-3" MINIMUM EMBEDMENT, SHALL BE PROVIDED AT THE CENTER OF THE TOP, BOTTOM AND SIDES OF THE BOX CULVERT SECTION.

CROSS REFERENCE NOTE:

FOR SEQUENCE OF CONSTRUCTION, SEE CONSTRUCTION PHASING, MOT AND EROSION AND SEDIMENT CONTROL PLANS FOR PHASE 1-1 AND PHASE 1-2, SEE DWGS. CS-92 AND CS-94 .

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DELAWARE
DEPARTMENT OF TRANSPORTATION

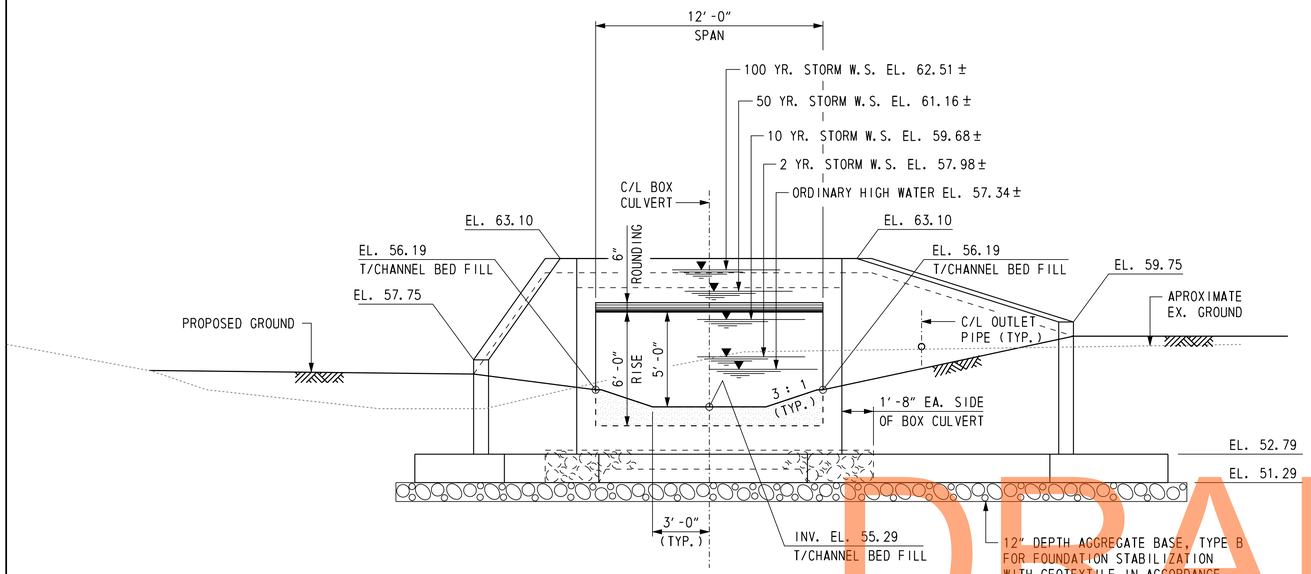
ADDENDUMS / REVISIONS	

US 301
LEVELS ROAD
TO SUMMIT BRIDGE ROAD

CONTRACT T200911303	BRIDGE NO.	1-508A
COUNTY NEW CASTLE	DESIGNED BY: K. D. BEAVER	
	CHECKED BY: J. S. LI	

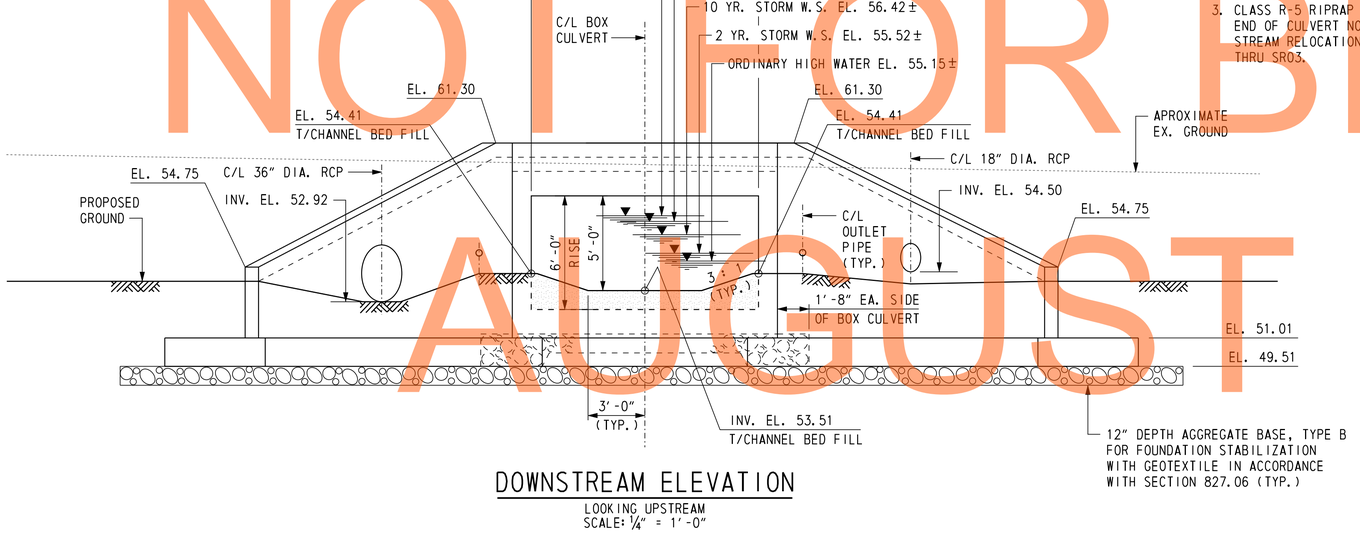
US 301 MAINLINE
OVER DRAWYERS DITCH
INDEX OF DRAWINGS

1-508A PN-1	
SHEET NO.	668
TOTAL SHTS.	1256



UPSTREAM ELEVATION

LOOKING DOWNSTREAM
SCALE: ¼″ = 1′-0″

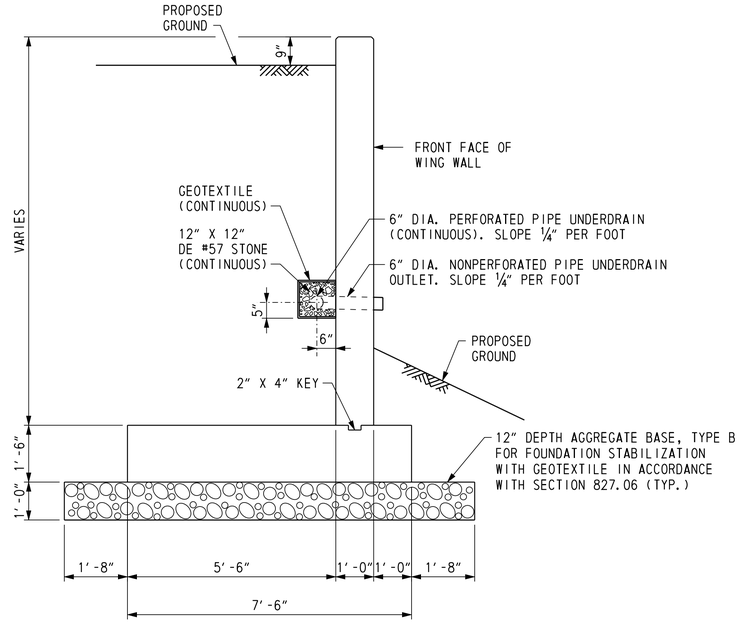


DOWNSTREAM ELEVATION

LOOKING UPSTREAM
SCALE: ¼″ = 1′-0″

NOTES:

1. GRADE CHANNEL USING CHANNEL BED FILL (712531).
2. RECESS AND CHOKE RIPRAP WITH CHANNEL BED FILL (712531).
3. CLASS R-5 RIPRAP AT DOWNSTREAM END OF CULVERT NOT SHOWN, SEE STREAM RELOCATION DWGS. SR01 THRU SR03.



TYPICAL WINGWALL SECTION

SCALE: ½″ = 1′-0″

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11/6/2012
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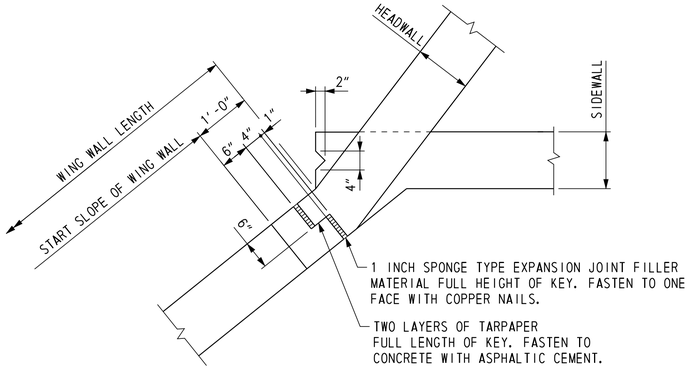
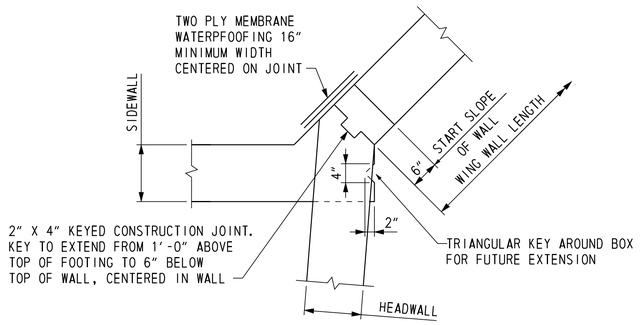
DELAWARE DEPARTMENT OF TRANSPORTATION	ADDENDUMS / REVISIONS		US 301 LEVELS ROAD TO SUMMIT BRIDGE ROAD	CONTRACT T200911303	BRIDGE NO. 1-508A	US 301 MAINLINE OVER DRAWYERS DITCH 12 FOOT X 6 FOOT BOX CULVERT ELEVATIONS AND SECTIONS	1-508A CU-1
				COUNTY NEW CASTLE	DESIGNED BY: K. D. BEAVER		SHEET NO. 669
					CHECKED BY: J. S. LI		TOTAL SHTS. 1256



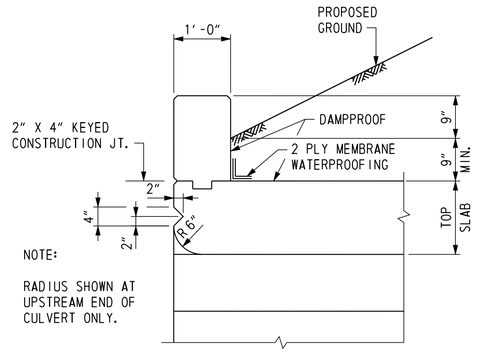
WING WALL EXPANSION JOINT

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



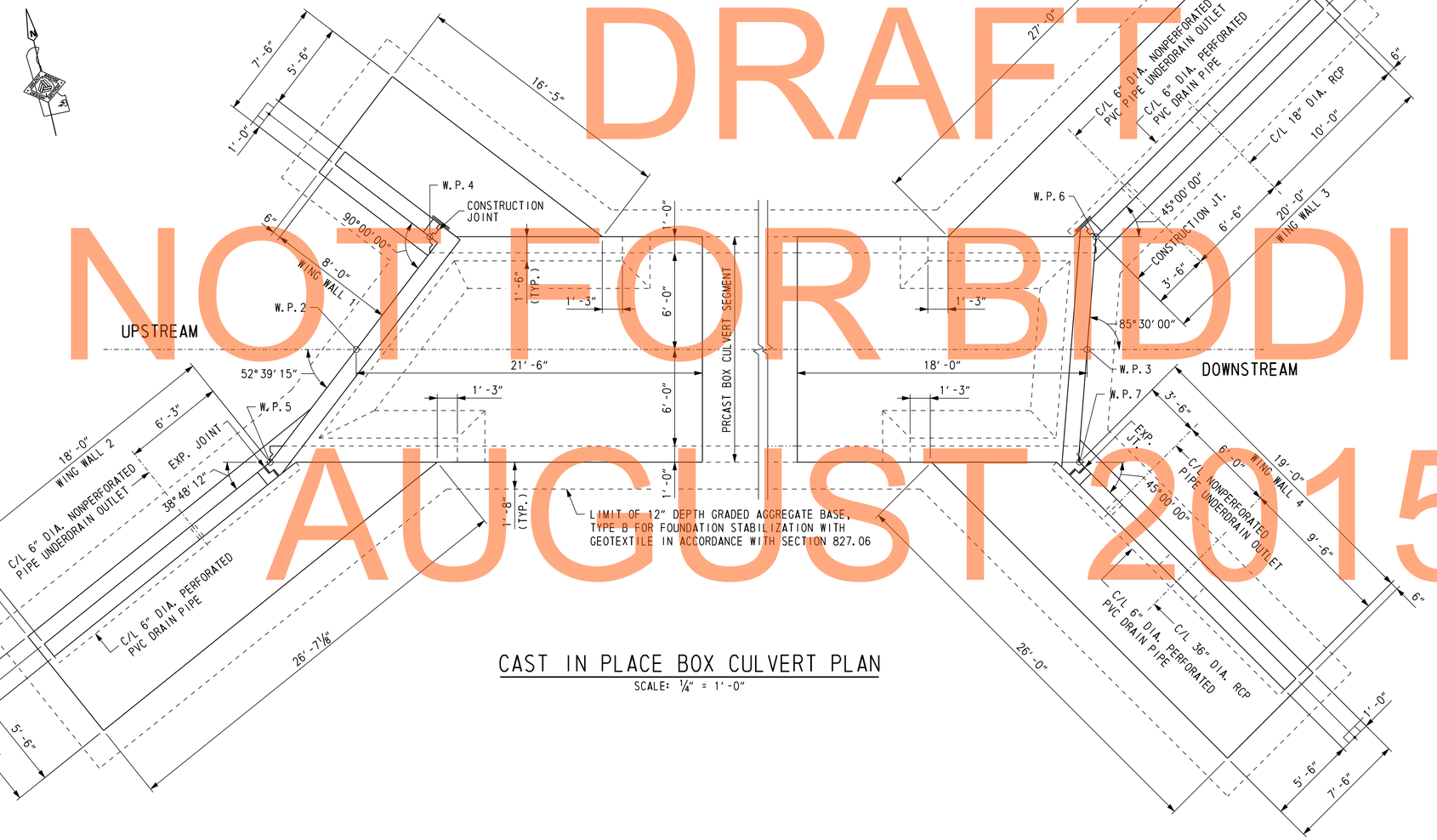
WING WALL CONSTRUCTION JOINT

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



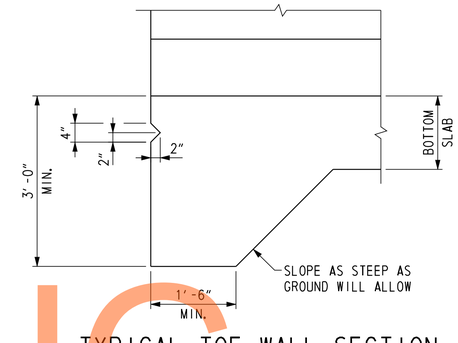
TYPICAL HEADWALL SECTION

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



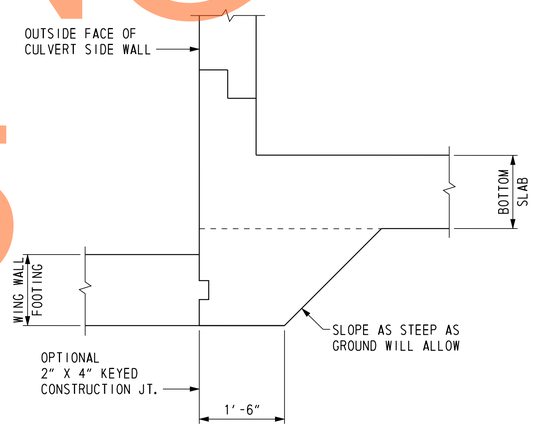
CAST IN PLACE BOX CULVERT PLAN

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



TYPICAL TOE WALL SECTION

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



WINGWALL FOOTING TIE-IN SECTION

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

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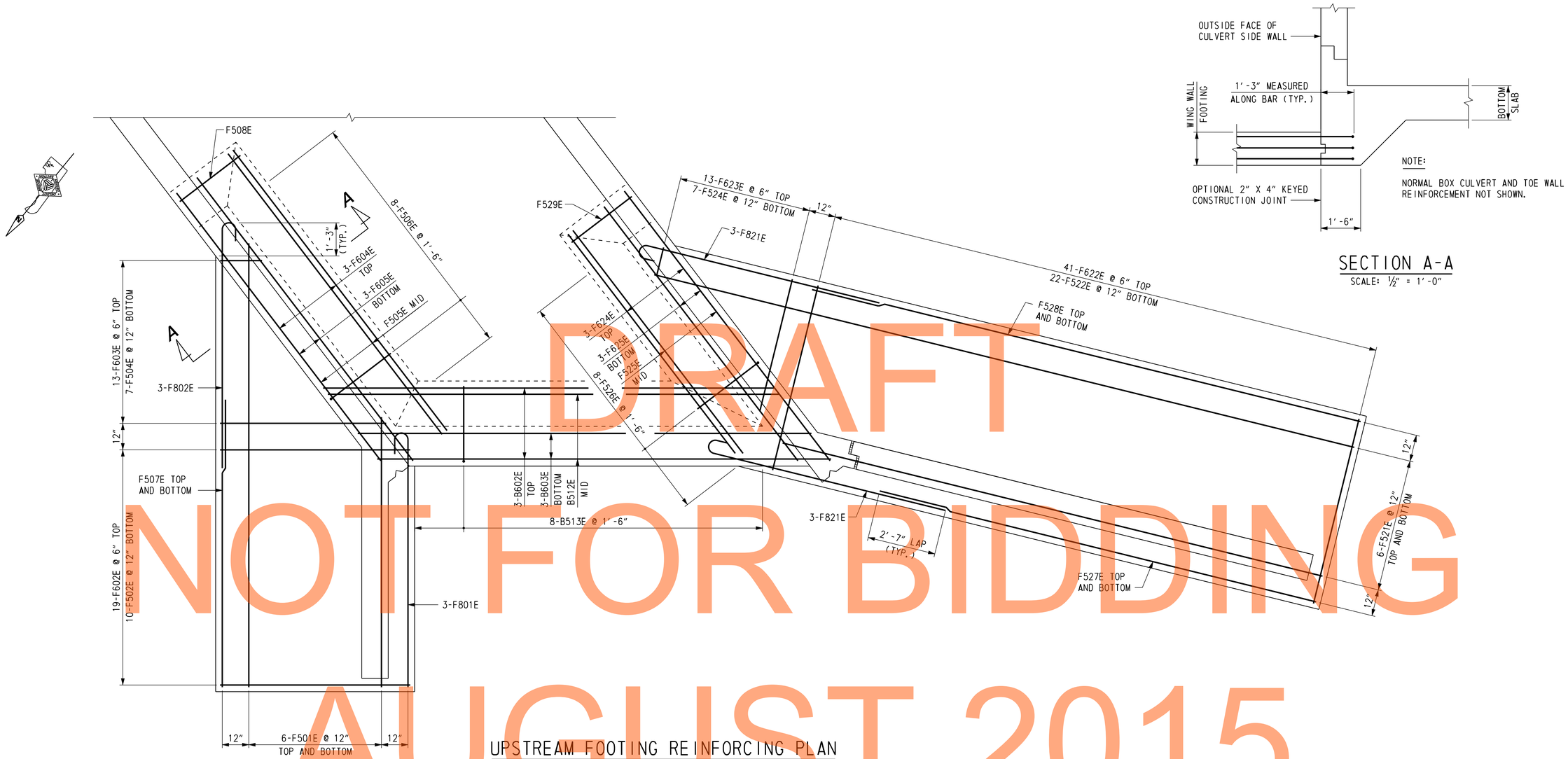
DELAWARE DEPARTMENT OF TRANSPORTATION	ADDENDUMS / REVISIONS		US 301 LEVELS ROAD TO SUMMIT BRIDGE ROAD	CONTRACT T200911303	BRIDGE NO. 1-508A	US 301 MAINLINE OVER DRAWYERS DITCH 12 FOOT X 6 FOOT BOX CULVERT CAST IN PLACE CULVERT PLAN
				COUNTY NEW CASTLE	DESIGNED BY: K. D. BEAVER	
					CHECKED BY: J. S. LI	

1-508A CU-2	
SHEET NO.	670
TOTAL SHTS.	1256



UPSTREAM FOOTING REINFORCING PLAN

SCALE: ½" = 1'-0"

NOTE:

NORMAL BOX CULVERT AND TOE WALL REINFORCEMENT NOT SHOWN.

SECTION A-A

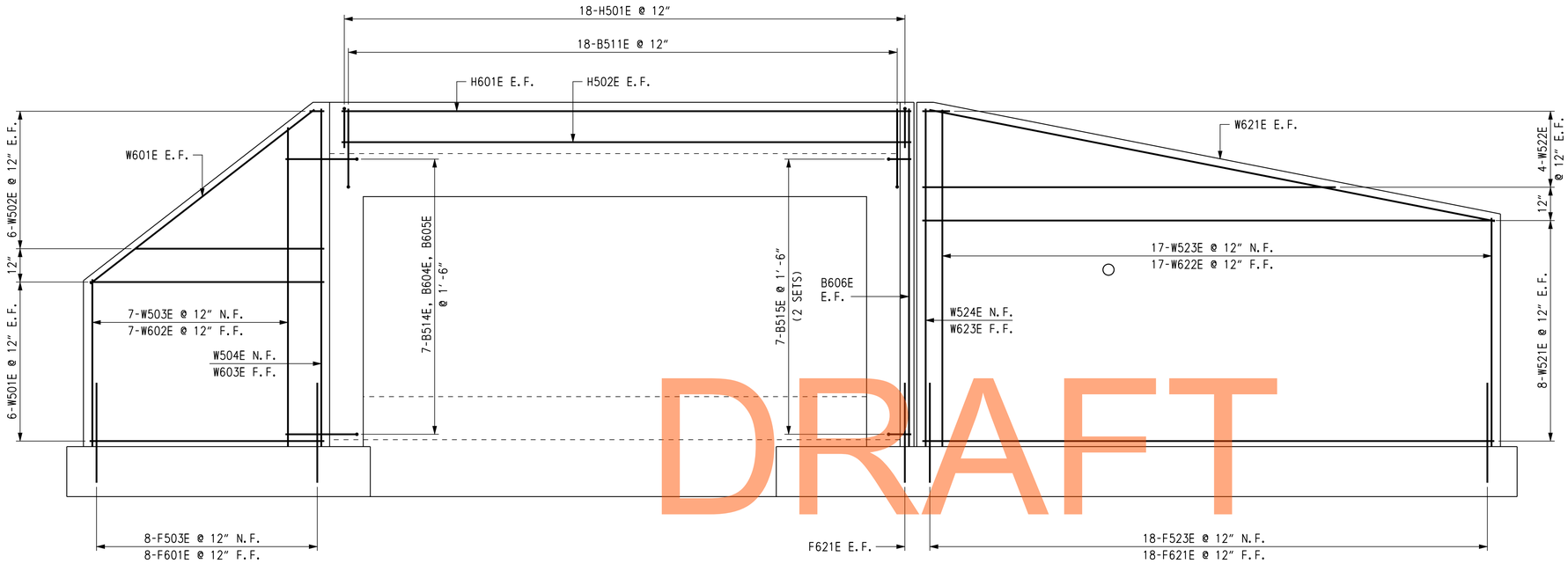
SCALE: ½" = 1'-0"

CROSS REFERENCE NOTES:

1. FOR CAST IN PLACE BOX CULVERT PLAN, SEE DWG. 1-508A CU-2.
2. FOR UPSTREAM WINGWALL REINFORCEMENT, SEE DWG. 1-508A CU-4.
3. FOR REINFORCING BAR LIST, SEE DWG. 1-508A CU-9 AND 1-508A CU-10.

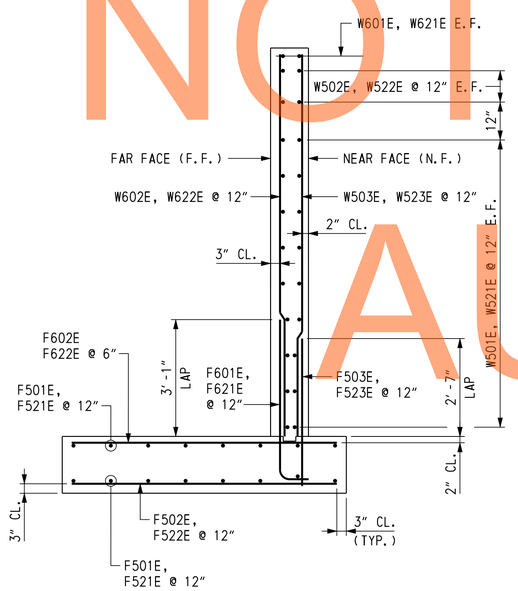
DELAWARE DEPARTMENT OF TRANSPORTATION	ADDENDUMS / REVISIONS		US 301 LEVELS ROAD TO SUMMIT BRIDGE ROAD	CONTRACT T200911303	BRIDGE NO. 1-508A	US 301 MAINLINE OVER DRAWYERS DITCH 12 FOOT X 6 FOOT BOX CULVERT UPSTREAM FOOTING PLAN
				COUNTY NEW CASTLE	DESIGNED BY: K. D. BEAVER	
					CHECKED BY: J. S. LI	

1-508A CU-3
SHEET NO.
671
TOTAL SHTS.
1256



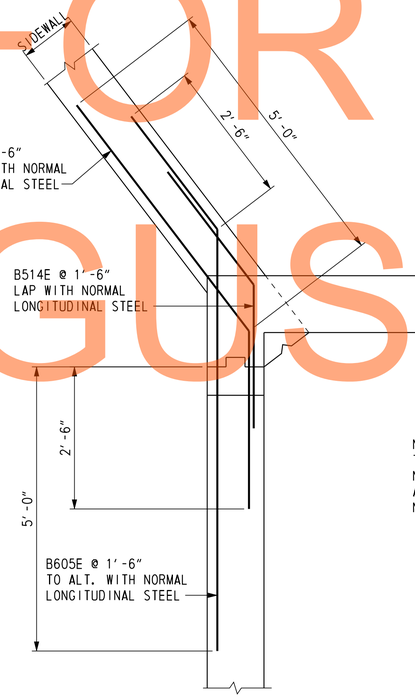
DEVELOPED UPSTREAM WINGWALL ELEVATION

SCALE: ½" = 1'-0"



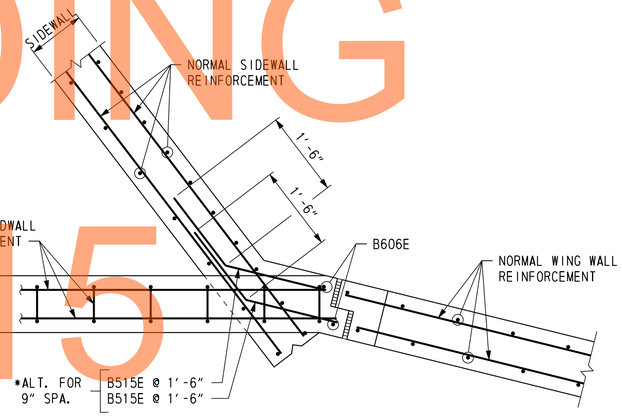
TYPICAL UPSTREAM WINGWALL SECTION

SCALE: ½" = 1'-0"



NOTE:

NORMAL SIDEWALL, WING WALL AND HEADWALL REINFORCEMENT NOT SHOWN.



UPSTREAM WALL PLAN

SCALE: ¾" = 1'-0"

* LAP WITH NORMAL LONGITUDINAL SIDEWALL REINFORCEMENT

CROSS REFERENCE NOTES:

1. FOR CAST IN PLACE BOX CULVERT PLAN, SEE DWG. 1-508A CU-2.
2. FOR WINGWALL FOOTING PLAN, SEE DWG. 1-508A CU-3.
3. FOR REINFORCING BAR LIST, SEE DWG. 1-508A CU-9 AND 1-508A CU-10.

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11/8/2012

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DELAWARE
DEPARTMENT OF TRANSPORTATION

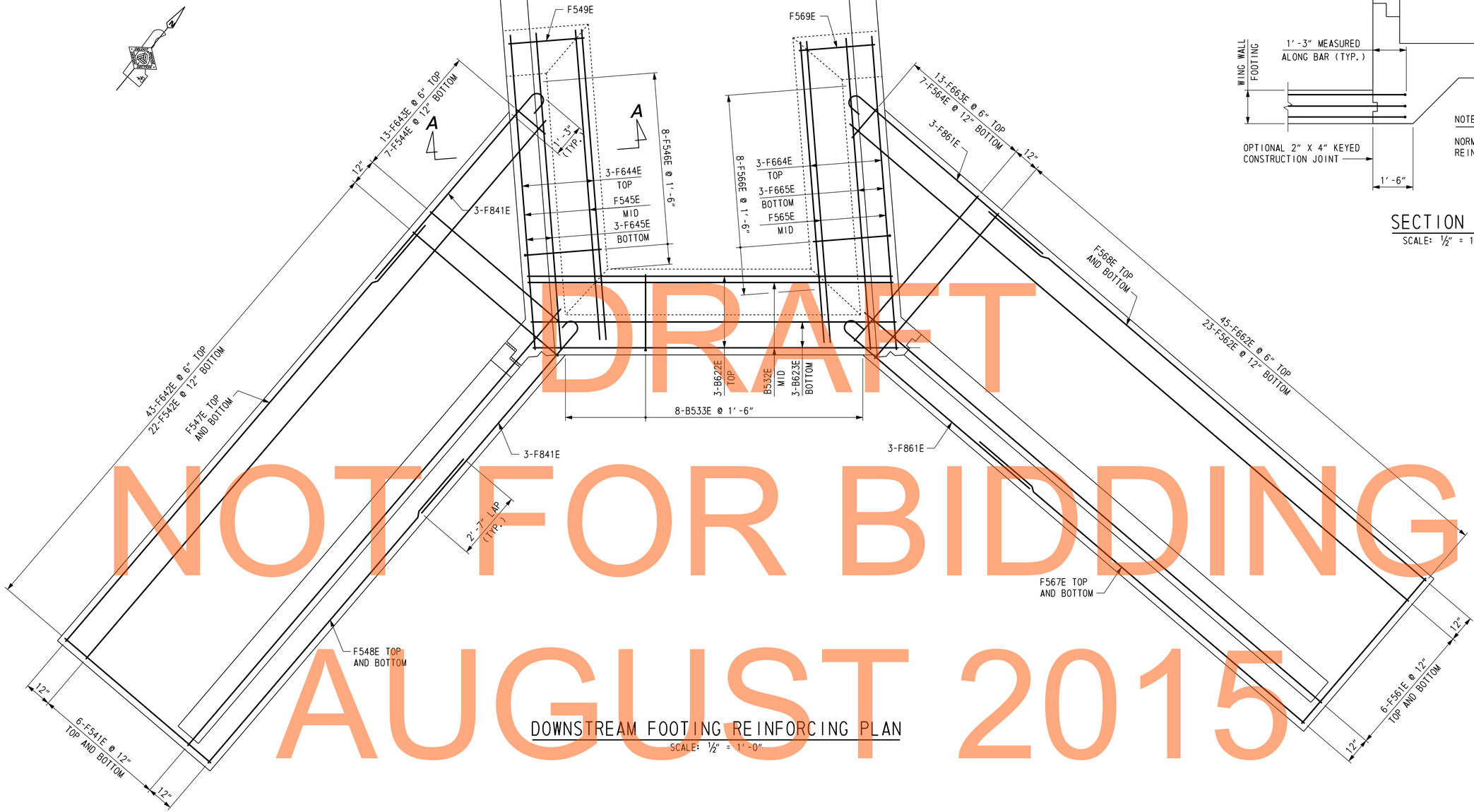
ADDENDUMS / REVISIONS

US 301
LEVELS ROAD
TO SUMMIT BRIDGE ROAD

CONTRACT	BRIDGE NO.	1-508A
T200911303	DESIGNED BY: K. D. BEAVER	
COUNTY	CHECKED BY: J. S. LI	
NEW CASTLE		

US 301 MAINLINE
OVER DRAWYERS DITCH
12 FOOT X 6 FOOT BOX CULVERT
WINGWALL REINFORCEMENT 1

1-508A CU-4
SHEET NO. 672
TOTAL SHTS. 1256



DOWNSTREAM FOOTING REINFORCING PLAN

SCALE: ½" = 1'-0"

SECTION A-A

SCALE: ½" = 1'-0"

CROSS REFERENCE NOTES:

1. FOR CAST IN PLACE BOX CULVERT PLAN, SEE DWG. 1-508A CU-2.
2. FOR DOWNSTREAM WINGWALL REINFORCEMENT, SEE DWG. 1-508A CU-6.
3. FOR REINFORCING BAR LIST, SEE DWG. 1-508A CU-9 AND 1-508A CU-10.

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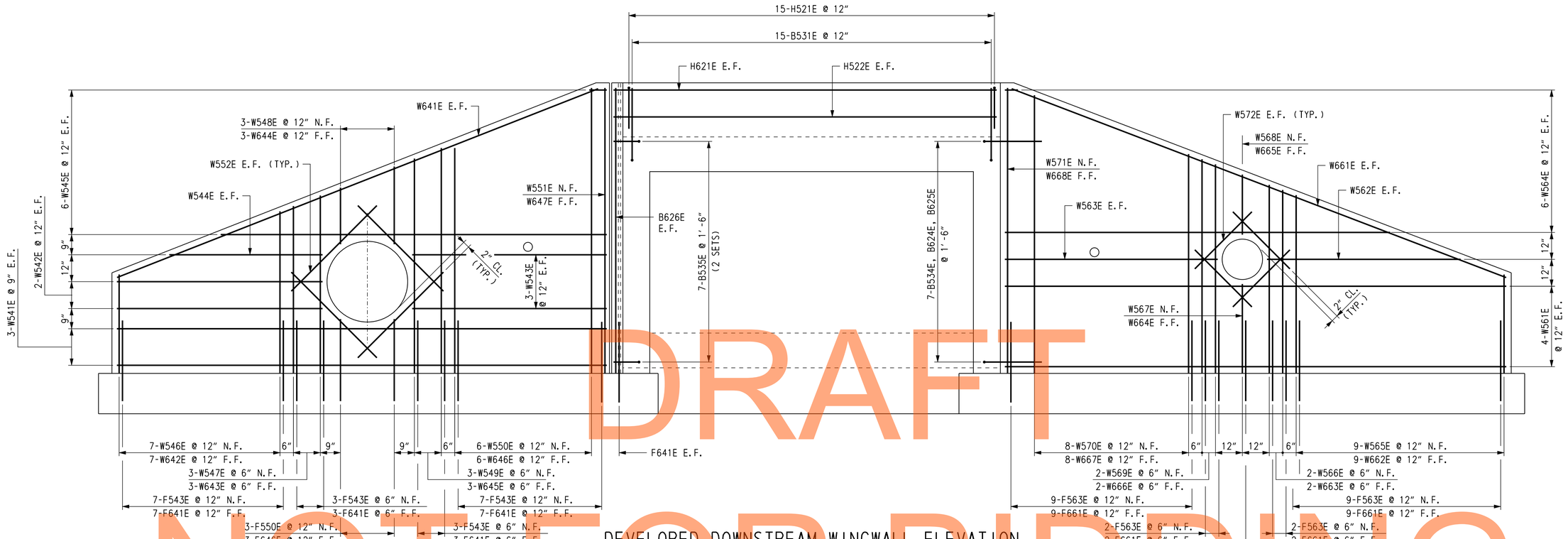
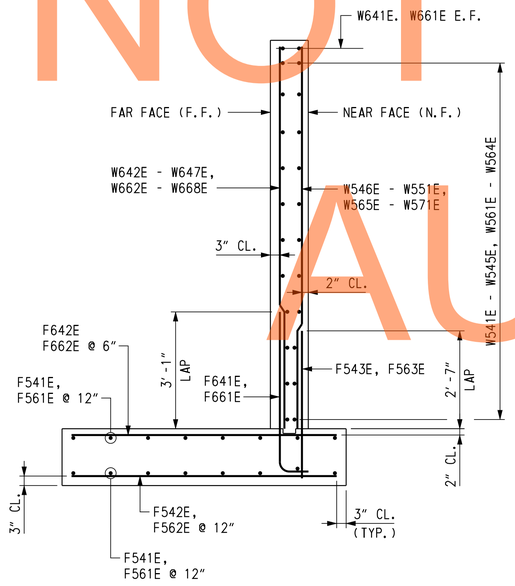
DELAWARE DEPARTMENT OF TRANSPORTATION	ADDENDUMS / REVISIONS	US 301 LEVELS ROAD TO SUMMIT BRIDGE ROAD	CONTRACT T200911303	BRIDGE NO. 1-508A	US 301 MAINLINE OVER DRAWYERS DITCH 12 FOOT X 6 FOOT BOX CULVERT DOWNSTREAM FOOTING PLAN	1-508A CU-5
			COUNTY NEW CASTLE	DESIGNED BY: K. D. BEAVER		SHEET NO. 673
				CHECKED BY: J. S. LI		TOTAL SHTS. 1256



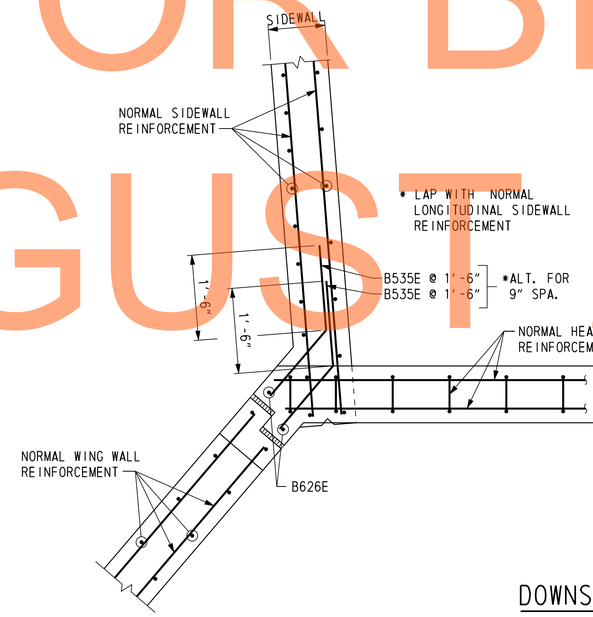
DEVELOPED DOWNSTREAM WINGWALL ELEVATION

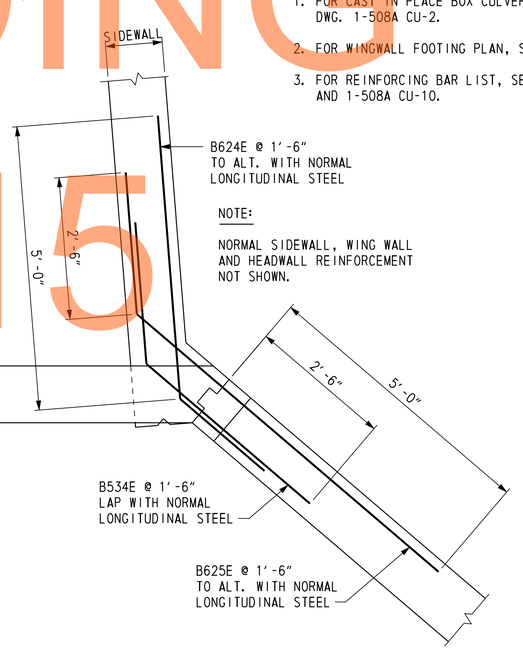
SCALE: ½" = 1'-0"



TYPICAL DOWNSTREAM WINGWALL SECTION

SCALE: ½" = 1'-0"





DOWNSTREAM WINGWALL PLAN

SCALE: ¾" = 1'-0"

CROSS REFERENCE NOTES:

1. FOR CAST IN PLACE BOX CULVERT PLAN, SEE DWG. 1-508A CU-2.
2. FOR WINGWALL FOOTING PLAN, SEE DWG. 1-508A CU-5.
3. FOR REINFORCING BAR LIST, SEE DWG. 1-508A CU-9 AND 1-508A CU-10.

NOTE:

NORMAL SIDEWALL, WING WALL AND HEADWALL REINFORCEMENT NOT SHOWN.

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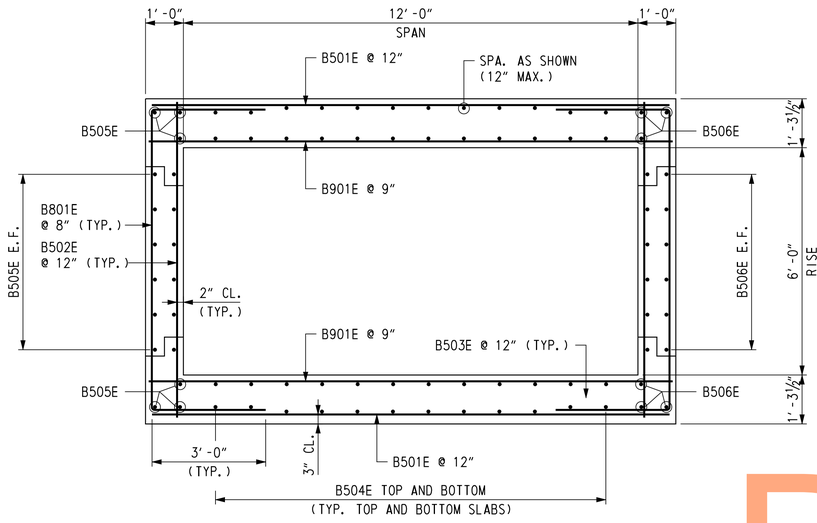
11/6/2012
Steve_Lambert

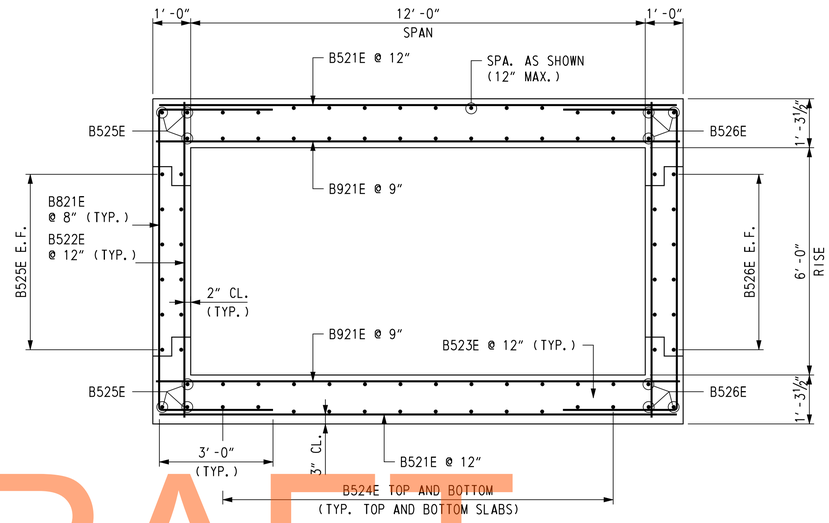
DELAWARE DEPARTMENT OF TRANSPORTATION	ADDENDUMS / REVISIONS	US 301 LEVELS ROAD TO SUMMIT BRIDGE ROAD	CONTRACT T200911303	BRIDGE NO. 1-508A	US 301 MAINLINE OVER DRAWYERS DITCH 12 FOOT X 6 FOOT BOX CULVERT WINGWALL REINFORCEMENT 2
			COUNTY NEW CASTLE	DESIGNED BY: K. D. BEAVER	
				CHECKED BY: J. S. LI	

1-508A CU-6	
SHEET NO.	674
TOTAL SHTS.	1256



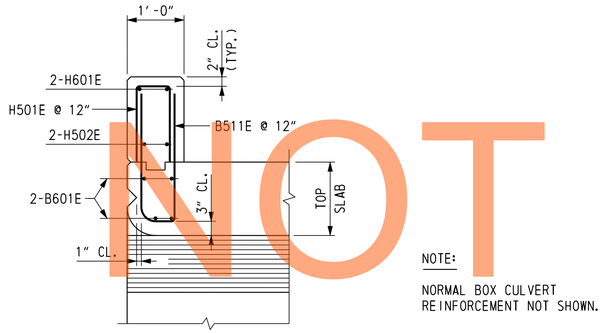
UPSTREAM CAST IN PLACE BOX CULVERT SECTION

SCALE: ½″ = 1′-0″



DOWNSTREAM CAST IN PLACE BOX CULVERT SECTION

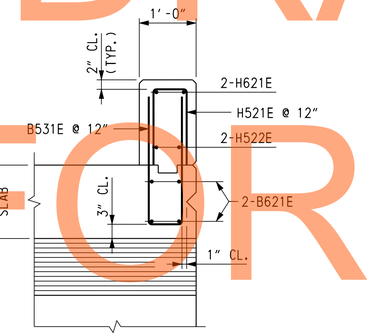
SCALE: ½″ = 1′-0″



NOTE:
NORMAL BOX CULVERT
REINFORCEMENT NOT SHOWN.

UPSTREAM HEADWALL REINFORCING SECTION

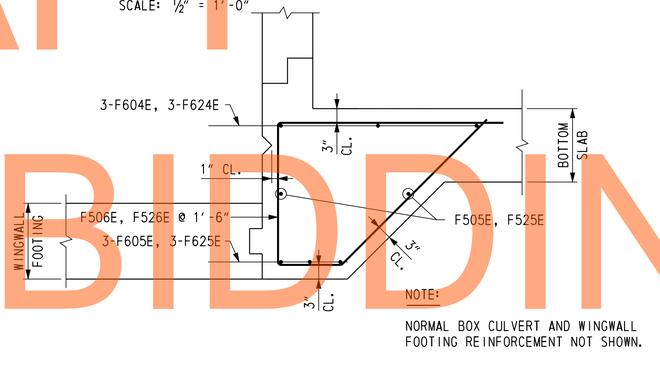
SCALE: ¾″ = 1′-0″



NOTE:
NORMAL BOX CULVERT
REINFORCEMENT NOT SHOWN.

DOWNSTREAM HEADWALL REINFORCING SECTION

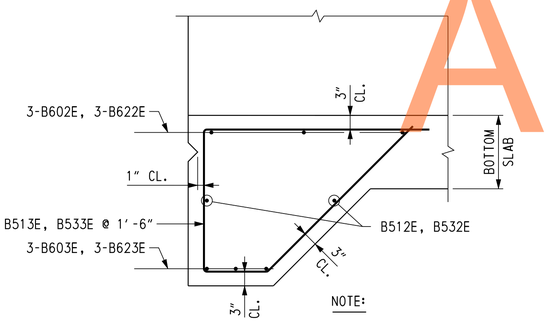
SCALE: ¾″ = 1′-0″



NOTE:
NORMAL BOX CULVERT AND WINGWALL
FOOTING REINFORCEMENT NOT SHOWN.

UPSTREAM WINGWALL FOOTING TIE-IN REINFORCING

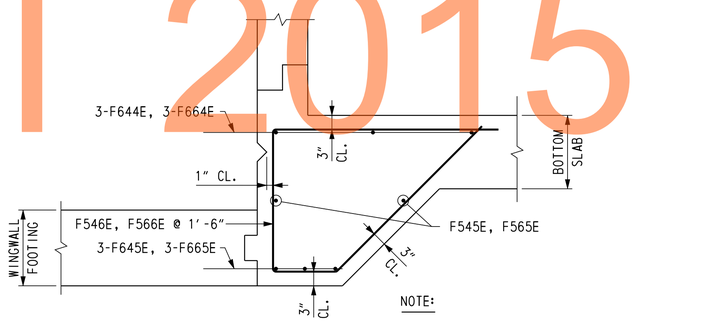
SCALE: ¾″ = 1′-0″



NOTE:
NORMAL BOX CULVERT
REINFORCEMENT NOT SHOWN.

CAST IN PLACE TOE WALL REINFORCING

SCALE: ¾″ = 1′-0″



NOTE:
NORMAL BOX CULVERT AND WINGWALL
FOOTING REINFORCEMENT NOT SHOWN.

DOWNSTREAM WINGWALL FOOTING TIE-IN REINFORCING

SCALE: ¾″ = 1′-0″

CROSS REFERENCE NOTES:

1. FOR CAST IN PLACE BOX CULVERT PLAN, SEE DWG. 1-508A CU-2.
2. FOR WINGWALL FOOTING REINFORCING PLANS, SEE DWG. 1-508A CU-3 AND 1-508A CU-5.
3. FOR WINGWALL REINFORCING, SEE DWG. 1-508A CU-4 AND 1-508A CU-6.
4. FOR REINFORCING BAR LIST, SEE DWGS. 1-508A CU-9 AND 1-508A CU-10.

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11/8/2012
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DELAWARE DEPARTMENT OF TRANSPORTATION

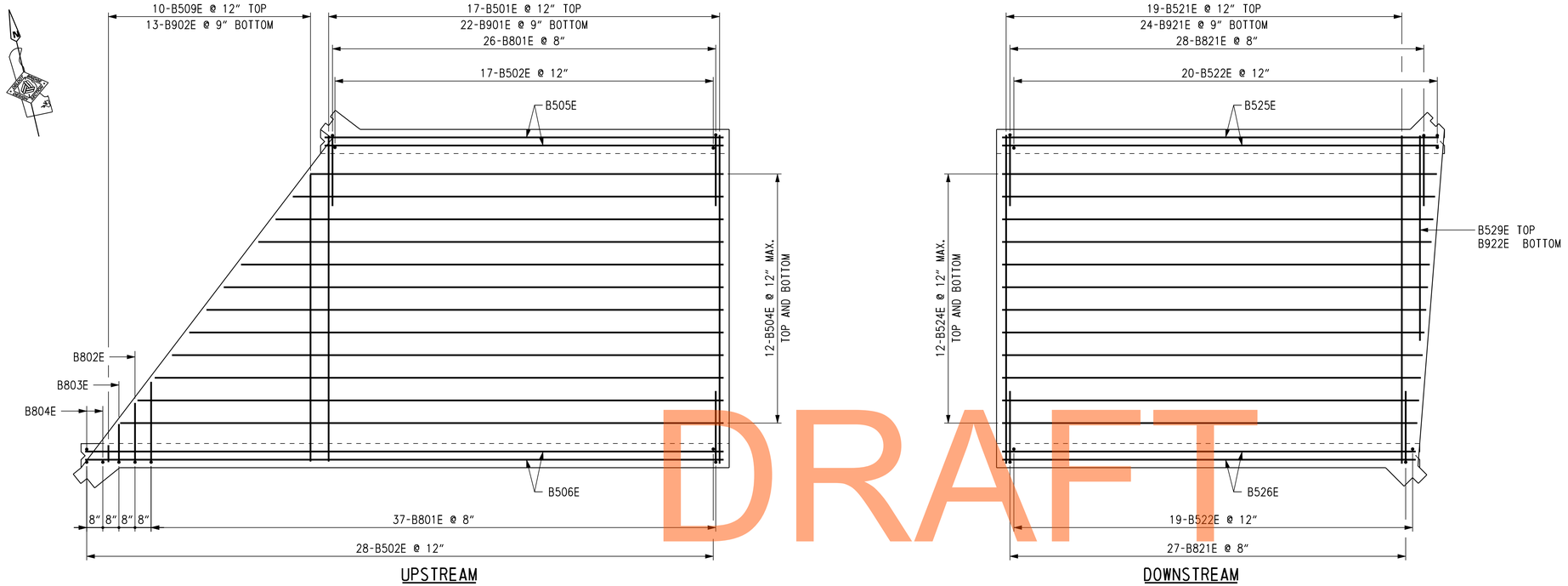
ADDENDUMS / REVISIONS	

US 301
LEVELS ROAD
TO SUMMIT BRIDGE ROAD

CONTRACT T200911303	BRIDGE NO.	1-508A
COUNTY NEW CASTLE	DESIGNED BY: D. D. DIEHL	
	CHECKED BY: B. C. MEHTA	

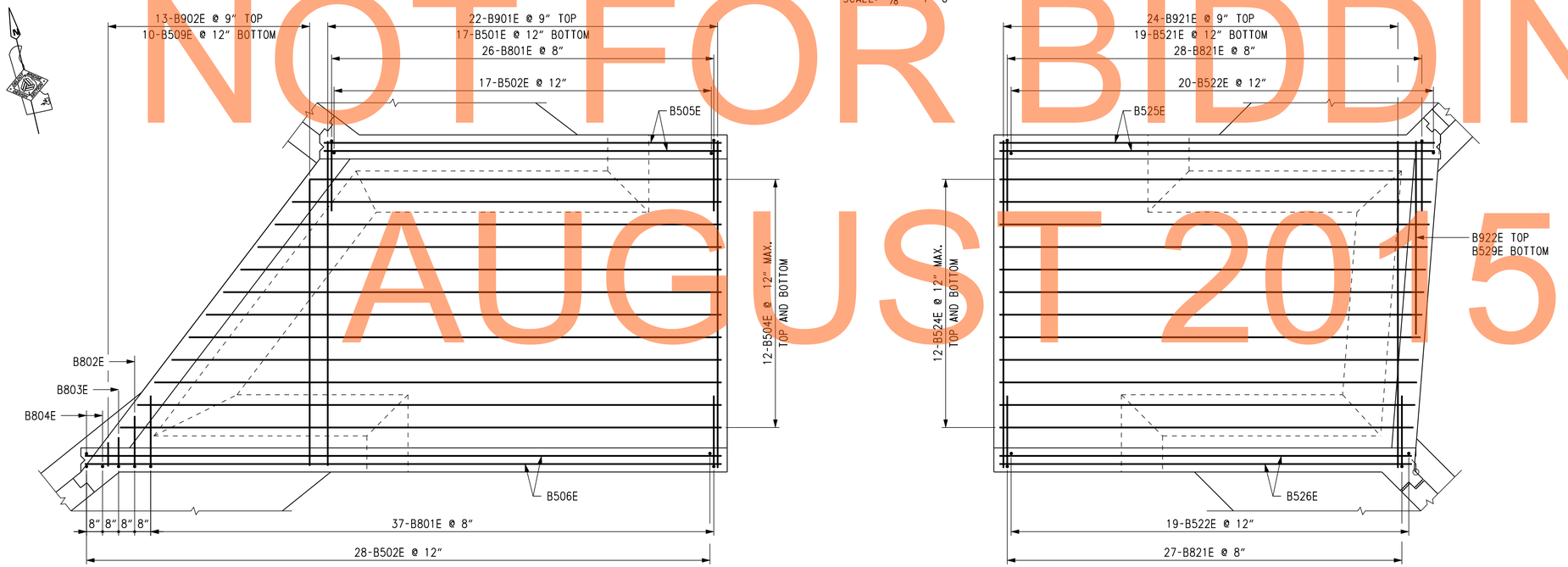
US 301 MAINLINE
OVER DRAWYERS DITCH
12 FOOT X 6 FOOT BOX CULVERT
CIP CULVERT REINFORCEMENT 1

1-508A CU-7	
SHEET NO.	675
TOTAL SHTS.	1256



CAST IN PLACE BOX CULVERT TOP SLAB REINFORCEMENT PLAN

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



CAST IN PLACE BOX CULVERT BOTTOM SLAB REINFORCEMENT PLAN

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

CROSS REFERENCE NOTES:

1. FOR TYPICAL CAST IN PLACE BOX CULVERT SECTION, SEE DWG. 1-508A CU-7.
2. FOR WINGWALL FOOTING REINFORCING PLANS, SEE DWG. 1-508A CU-3 AND 1-508A CU-5.
3. FOR TOE WALL AND WINGWALL FOOTING TIE IN REINFORCING, SEE DWG. 1-508A CU-7.
4. FOR REINFORCING BAR LIST, SEE DWGS. 1-508A CU-9 AND 1-508A CU-10.

DELAWARE
DEPARTMENT OF TRANSPORTATION

ADDENDUMS / REVISIONS

US 301
LEVELS ROAD
TO SUMMIT BRIDGE ROAD

CONTRACT T200911303
COUNTY NEW CASTLE

BRIDGE NO. 1-508A
DESIGNED BY: K. D. BEAVER
CHECKED BY: J. S. LI

US 301 MAINLINE
OVER DRAWYERS DITCH
12 FOOT X 6 FOOT BOX CULVERT
CIP CULVERT REINFORCEMENT 2

1-508A CU-9
SHEET NO. 676
TOTAL SHTS. 1256

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REINFORCING BAR LIST

12 FOOT X 6 FOOT BOX CULVERT - UPSTREAM

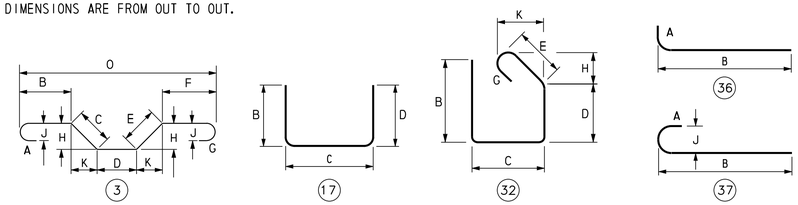
MARK	LENGTH	NO. BARS	TYPE	A	B	C	D	E	G	H	J	K	R	REMARKS
B501E	13′-8″	34	STR.											
B502E	8′-2″	45	STR.											
B504E	17′-2½″ TO 25′-0″	48	STR.											△ = 8½″, 4 SETS
B505E	16′-7″	18	STR.											
B506E	26′-4″	18	STR.											
B509E	0′-6″ TO 12′-4″	20	STR.											△ = 1′-3¾″, 2 SETS
B511E	4′-2″	18	17		1′-9½″	0′-7″	1′-9½″							
B512E	17′-2″	2	STR.											
B513E	10′-10″	8	32		3′-9″	2′-6″	1′-0″	3′-7″		2′-6″		2′-6″		
B514E	5′-2″	7	3			2′-7″	2′-7″			1′-7″		2′-1″		
B515E	3′-0″	14	3			1′-6″	1′-6″			0′-11″		1′-2″		
B601E	17′-11″	4	STR.											
B602E	17′-2″	3	STR.											
B603E	17′-2″	3	STR.											
B604E	8′-2″	7	3			5′-0″	3′-2″			3′-0″		4′-0″		
B605E	9′-10″	7	3			2′-6″	7′-4″			1′-6″		2′-0″		
B606E	10′-2″	2	STR.											
B801E	14′-2″	63	17		3′-0″	8′-2″	3′-0″							
B802E	18′-2″	1	17		2′-3″	13′-8″	2′-3″							
B803E	16′-8″	1	17		1′-6″	13′-8″	1′-6″							
B804E	13′-8″	2	STR.											
B901E	13′-8″	44	STR.											
B902E	0′-6″ TO 12′-4″	26	STR.											△ = 1′-0″, 2 SETS
F501E	10′-0″ TO 16′-5″	12	STR.											△ = 1′-3½″, 2 SETS
F502E	7′-0″	10	STR.											
F503E	3′-10″	8	STR.											
F504E	1′-6″ TO 6′-0″	7	STR.											△ = 9″
F505E	12′-3″	2	STR.											
F506E	10′-10″	8	32		3′-9″	2′-6″	1′-0″	3′-7″		2′-6″		2′-6″		
F507E	10′-9″	2	STR.											
F508E	2′-8½″	1	STR.											
F601E	5′-4″	8	36	1′-0″	4′-4″									
F602E	7′-0″	19	STR.											
F603E	1′-6″ TO 6′-0″	13	STR.											△ = 4½″
F604E	13′-2″	3	STR.											
F605E	13′-11″	3	3			2′-8″	10′-11″			1′-10½″		1′-10½″		
F801E	10′-5″	3	37	0′-11″	9′-6″						0′-8″			
F802E	10′-2″	3	37	0′-11″	9′-3″						0′-8″			
F521E	20′-3″ TO 27′-0″	12	STR.											△ = 1′-4¼″, 2 SETS
F522E	7′-0″	22	STR.											
F523E	3′-10″	18	STR.											
F524E	1′-6″ TO 5′-0″	7	STR.											△ = 7″
F525E	10′-4″ TO 12′-2″	2	STR.											△ =1′-10″, 2 SETS
F526E	10′-10″	8	32		3′-9″	2′-6″	1′-0″	3′-7″		2′-6″		2′-6″		
F527E	16′-10″	2	STR.											
F528E	20′-11″	2	STR.											
F529E	2′-8½″	1	STR.											

12 FOOT X 6 FOOT BOX CULVERT - UPSTREAM

MARK	LENGTH	NO. BARS	TYPE	A	B	C	D	E	G	H	J	K	R	REMARKS
F621E	5′-4″	20	36	1′-0″	4′-4″									
F622E	7′-0″	41	STR											
F623E	1′-6″ TO 5′-0″	13	STR											△ = 3½″
F624E	10′-6″ TO 13′-0″	3	STR											△ = 1′-3″
F625E	13′-0″ TO 13′-10″	3	3			2′-8″	10′-4″ TO 11′-2″			1′-10½″		1′-10½″		△ = 5″
F821E	10′-2″	6	37	0′-11″	9′-3″						0′-8″			
H501E	3′-3″	18	17		1′-4″	0′-7″	1′-4″							
H502E	17′-11″	2	STR											
H601E	17′-11″	2	STR											
W501E	7′-0″	12	STR											
W502E	0′-6″ TO 6′-1″	12	STR											△ = 1′-1½″, 2 SETS
W503E	4′-10″ TO 9′-5″	7	STR											△ = 9″
W504E	10′-2″	1	STR											
W601E	8′-10″	2	STR											
W602E	4′-10″ TO 9′-5″	7	STR											△ = 9″
W603E	10′-2″	1	STR											
W521E	17′-0″	16	STR											
W522E	0′-9″ TO 12′-8″	8	STR											△ = 4′-0″, 2 SETS
W523E	6′-10″ TO 10′-0″	16	STR											△ = 2⅜″
W524E	10′-2″	1	STR											
W621E	17′-4″	2	STR											
W622E	6′-10″ TO 10′-0″	17	STR											△ = 2⅜″
W623E	10′-2″	1	STR											

BENDING DIAGRAMS

ALL DIMENSIONS ARE FROM OUT TO OUT.



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DELAWARE
DEPARTMENT OF TRANSPORTATION

ADDENDUMS / REVISIONS	

US 301
LEVELS ROAD
TO SUMMIT BRIDGE ROAD

CONTRACT	BRIDGE NO.	**1-508A**
T200911303	DESIGNED BY: K. D. BEAVER	
COUNTY	CHECKED BY: J. S. LI	
NEW CASTLE		

US 301 MAINLINE
OVER DRAWYERS DITCH
12 FOOT X 6 FOOT BOX CULVERT
REINFORCING BAR LIST

1-508A CU-9	
SHEET NO.	677
TOTAL SHTS.	1256

REINFORCING BAR LIST

12 FOOT X 6 FOOT BOX CULVERT - DOWNSTREAM

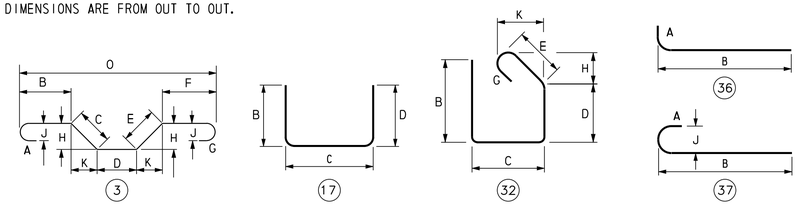
MARK	LENGTH	NO. BARS	TYPE	A	B	C	D	E	G	H	J	K	R	REMARKS
B521E	13′-8″	38	STR.											
B522E	8′-2″	39	STR.											
B524E	17′-2″ TO 18′-1″	48	STR.											△ = 1″, 4 SETS
B525E	18′-2″	18	STR.											
B526E	17′-2″	18	STR.											
B529E	8′-6″	2	STR.											
B531E	4′-2″	15	17		1′-9½″	0′-7″	1′-9½″							
B532E	13′-8″	2	STR.											
B533E	10′-10″	8	32		3′-9″	2′-6″	1′-0″	3′-7″		2′-6″		2′-6″		
B534E	5′-2″	7	3			2′-7″	2′-7″			1′-10″		1′-10″		
B535E	3′-0″	14	3			1′-6″	1′-6″			1′-1″		1′-1″		
B621E	14′-1″	4	STR.											
B622E	13′-8″	3	STR.											
B623E	13′-8″	3	STR.											
B624E	7′-11″	7	3			5′-0″	2′-11″			3′-6½″		3′-6½″		
B625E	9′-6″	7	3			2′-6	7′-0″			1′-9″		1′-9″		
B626E	10′-1″	2	STR.											
B821E	14′-2″	55	17		3′-0″	8′-2″	3′-0″							
B921E	13′-8″	48	STR.											
B922E	8′-6″	2	STR.											
W541E	18′-2″	6	STR.											
W542E	7′-8″	4	STR.											
W543E	7′-2″	6	STR.											
W544E	5′-3″	2	STR.											
W545E	0′-7″ TO 13′-6″	12	STR.											△ = 2′-7″, 2 SETS
W546E	3′-7″ TO 5′-10″	7	STR.											△ = 4½″
W547E	6′-0″ TO 6′-4½″	3	STR.											△ = 2¼″
W548E	1′-7″ TO 2′-4″	3	STR.											△ = 4½″
W549E	7′-7½″ TO 8′-0″	3	STR.											△ = 2¼″
W550E	8′-2¼″ TO 10′-0¾″	6	STR.											△ = 4½″
W551E	10′-1½″	1	STR.											
W552E	4′-4″	8	STR.											
W641E	19′-2″	2	STR.											
W642E	3′-7″ TO 5′-10″	7	STR.											△ = 4½″
W643E	6′-0″ TO 6′-4½″	3	STR.											△ = 2¼″
W644E	1′-7″ TO 2′-4″	3	STR.											△ = 4½″
W645E	7′-7½″ TO 8′-0″	3	STR.											△ = 2¼″
W646E	8′-2¼″ TO 10′-0¾″	6	STR.											△ = 4½″
W647E	10′-1½″	1	STR.											
W561E	19′-8″	8	STR.											
W562E	7′-0″	2	STR.											
W563E	8′-11″	2	STR.											
W564E	0′-7″ TO 14′-9″	12	STR.											△ = 2′-10″, 2 SETS
W565E	3′-7″ TO 6′-3″	9	STR.											△ = 4″
W566E	6′-5″ TO 6′-7″	2	STR.											△ = 2″
W567E	3′-4″	1	STR.											
W568E	1′-9″	1	STR.											
W569E	7′-3″ TO 7′-5″	2	STR.											△ = 2″
W570E	7′-7″ TO 9′-11″	8	STR.											△ = 4″
W571E	10′-1″	1	STR.											
W572E	2′-10″	8	STR.											
W661E	20′-7″	2	STR.											
W662E	3′-7″ TO 6′-3″	9	STR.											△ = 4″
W663E	6′-5″ TO 6′-7″	2	STR.											△ = 2″

12 FOOT X 6 FOOT BOX CULVERT - DOWNSTREAM

MARK	LENGTH	NO. BARS	TYPE	A	B	C	D	E	G	H	J	K	R	REMARKS
W664E	3′-4″	1	STR.											
W665E	1′-9″	1	STR.											
W666E	7′-3″ TO 7′-5″	2	STR.											△ = 2″
W667E	7′-7″ TO 9′-11″	8	STR.											△ = 4″
W668E	10′-1″	1	STR.											
F541E	21′-3″ TO 26′-3″	12	STR.											△ = 12″, 2 SETS
F542E	7′-0″	22	STR.											
F543E	3′-10″	20	STR.											
F544E	1′-6″ TO 6′-0″	7	STR.											△ = 9″
F545E	11′-3″	2	STR.											
F546E	10′-10″	8	36		3′-9″	2′-6″	1′-0″	3′-7″		2′-6″		2′-6″		
F547E	20′-4″	2	STR.											
F548E	14′-10″	2	STR.											
F549E	2′-8½″	1	STR.											
F550E	3′-0″	3	STR.											
F641E	5′-4″	22	36	1′-0″	4′-4″									
F642E	7′-0″	43	STR.											
F643E	1′-6″ TO 6′-0″	13	STR.											△ = 4½″
F644E	12′-2″	3	STR.											
F645E	12′-11″	3	3			2′-8″	10′-3″			1′-10½″		1′-10½″		
F646E	4′-0″	3	36	1′-0″	3′-0″									
F841E	10′-2″	6	37	0′-11″	9′-3″						0′-8″			
F561E	22′-6″ TO 27′-6″	12	STR.											△ = 12″, 2 SETS
F562E	7′-0″	23	STR.											
F563E	3′-10″	23	STR.											
F564E	1′-6″ TO 7′-0″	7	STR.											△ = 11″
F565E	11′-2″	2	STR.											
F566E	10′-10″	8	32		3′-9″	2′-6″	1′-0″	3′-7″		2′-6″		2′-6″		
F567E	16′-7″	2	STR.											
F568E	21′-4″	2	STR.											
F569E	2′-8½″	1	STR.											
F661E	5′-4″	23	36	1′-0″	4′-4″									
F662E	7′-0″	45	STR.											
F663E	1′-6″ TO 7′-0″	13	STR.											△ = 5½″
F664E	12′-1″	3	STR.											
F665E	12′-10″	3	3			2′-8″	10′-2″			1′-10½″		1′-10½″		
F861E	10′-2″	6	37	0′-11″	9′-3″						0′-8″			
H521E	3′-3″	15	17			1′-4″	0′-7″	1′-4″						
H522E	14′-1″	2	STR.											
H621E	14′-1″	2	STR.											

BENDING DIAGRAMS

ALL DIMENSIONS ARE FROM OUT TO OUT.



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11/8/2012
Steve_Lambert

DELAWARE
DEPARTMENT OF TRANSPORTATION

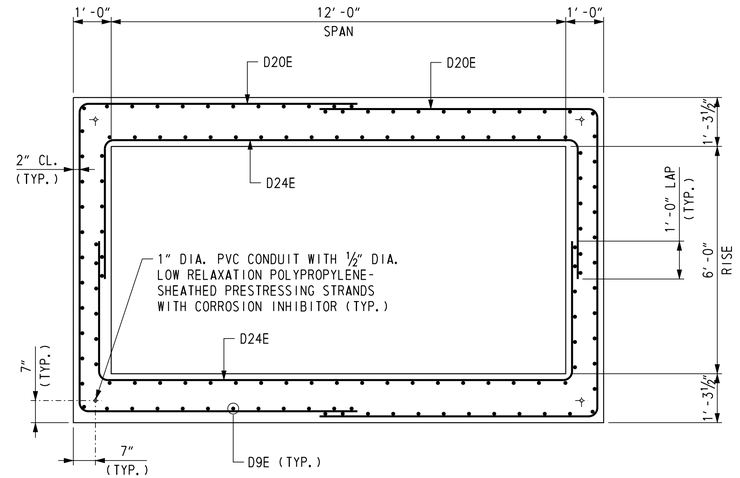
ADDENDUMS / REVISIONS	

US 301
LEVELS ROAD
TO SUMMIT BRIDGE ROAD

CONTRACT	BRIDGE NO.	1-508A
T200911303	DESIGNED BY: K. D. BEAVER	
COUNTY	CHECKED BY: J. S. LI	
NEW CASTLE		

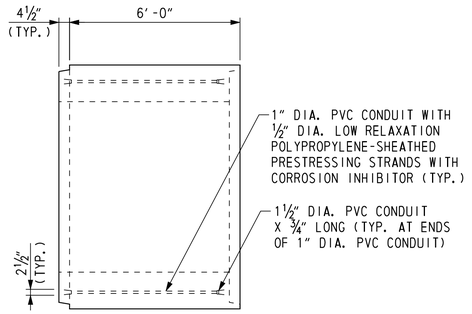
US 301 MAINLINE
OVER DRAWYERS DITCH
12 FOOT X 6 FOOT BOX CULVERT
REINFORCING BAR LIST

1-508A CU-10	
SHEET NO.	678
TOTAL SHTS.	1256

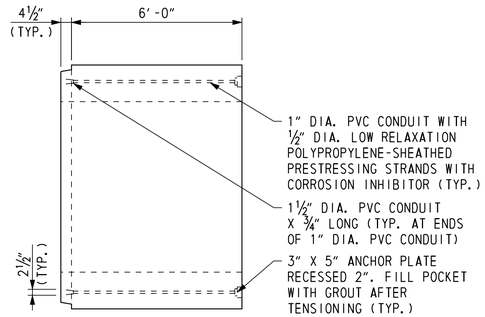


TYPICAL SECTION - PRECAST BOX CULVERT SEGMENT

SCALE: ½″ = 1′-0″



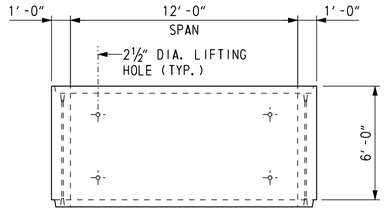
INTERIOR SEGMENT



END SEGMENT

ELEVATION VIEWS - POST TENSIONING COMPONENTS DETAIL

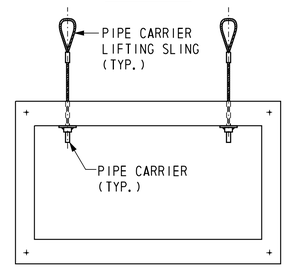
SCALE: ⅜″ = 1′-0″



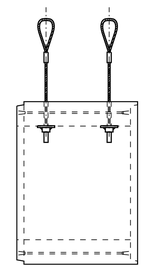
NOTE:

AT THE CONTRACTOR'S OPTION ALTERNATE LIFTING DETAILS WILL BE CONSIDERED SUBJECT TO THE APPROVAL OF THE ENGINEER.

TOP VIEW



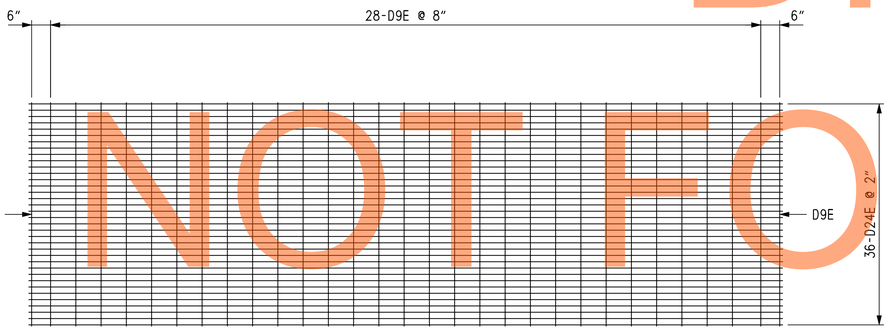
SECTION



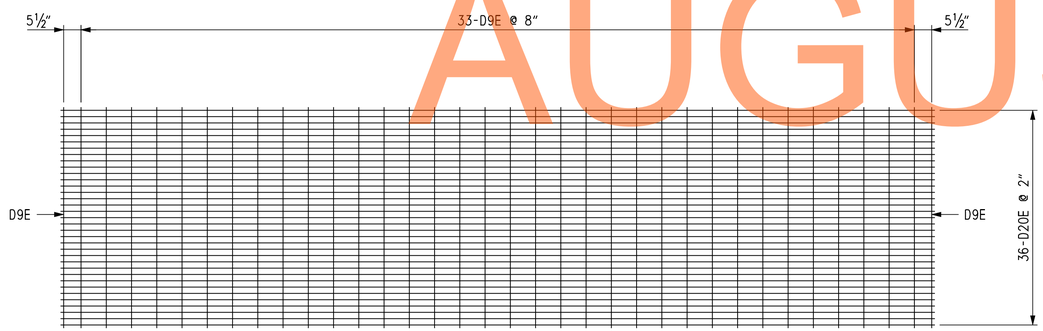
SIDE VIEW

LIFTING DETAIL

SCALE: ¼″ = 1′-0″



TOP AND BOTTOM CAGE REINFORCEMENT



SIDE CAGE REINFORCEMENT

PRECAST BOX CULVERT SEGMENT

SCALE: ½″ = 1′-0″

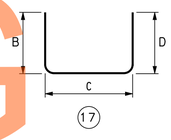
REINFORCING BAR LIST (WELDED WIRE FABRIC)

PRECAST BOX CULVERT

MARK	LENGTH	NO. BARS	TYPE	A	B	C	D	E	F	REMARKS
D20E	23′-1″	75 X 72	17		7′-5″	8′-3″	7′-5″			
D24E	19′-10″	75 X 72	17		3′-9″	12′-4″	3′-9″			
D9E	5′-10″	75 X 130	STR.							

BENDING DIAGRAMS

ALL DIMENSIONS ARE FROM OUT TO OUT.



CROSS REFERENCE NOTE:

FOR PRECAST BOX CULVERT NOTES, SEE DWG. 1-508A PN-1.

DELAWARE DEPARTMENT OF TRANSPORTATION	ADDENDUMS / REVISIONS		US 301 LEVELS ROAD TO SUMMIT BRIDGE ROAD	CONTRACT T200911303	BRIDGE NO. 1-508A	US 301 MAINLINE OVER DRAWYERS DITCH 12 FOOT X 6 FOOT BOX CULVERT PRECAST BOX REINFORCEMENT
				COUNTY NEW CASTLE	DESIGNED BY:	
					CHECKED BY:	

1-508A CU-11 | SHEET NO. 679 | TOTAL SHTS. 1256

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11/8/2012

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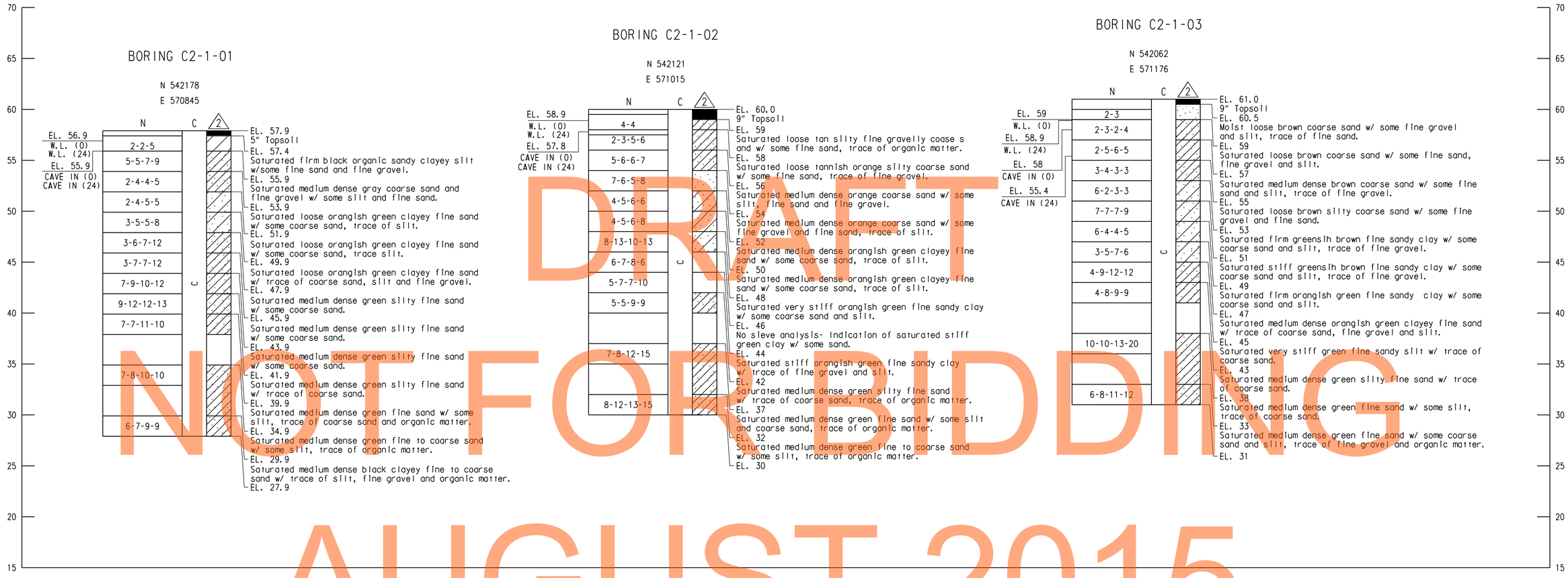

BORINGS
SCALE: 1" = 10'-0"

NOTES:

1. THE BORINGS AND STANDARD PENETRATION TESTS WERE TAKEN IN DECEMBER 2009 BY THE WALTON CORPORATION.
2. N = BLOWS ON A 2 INCH O.D. SAMPLING SPOON BY 140 LB. DRIVE-WEIGHT FALLING 30 INCHES INDICATING SUCCESSIVE SIX (6) INCH INCREMENTS OF PEENTRATION IN LIEU OF BLOWS PER FOOT. BLOWS RESULTING IN LESS THAN SIX (6) INCHES OF PENETRATION ARE SO INDICATED.
3. BORINGS AND SAMPLINGS CONFORM TO AASHTO DESIGNATION T-206.

DELAWARE
DEPARTMENT OF TRANSPORTATION

ADDENDUMS / REVISIONS

SCALE
0 5 10 15
FEET

US 301
LEVELS ROAD
TO SUMMIT BRIDGE ROAD

CONTRACT	T200911303
COUNTY	NEW CASTLE
BRIDGE NO.	1-508A
DESIGNED BY:	P. M. DALONI
CHECKED BY:	R. C. KRHOUNEK

US 301 MAINLINE
OVER DRAWYERS DITCH

BORINGS 1

1-508A BO-1	
SHEET NO.	680
TOTAL SHTS.	1256

BORING C2-1-04

N 542110

E 570788

	N	C
EL. 59 W.L. (24)		
	1-2-2	
EL. 58 W.L. (0)	8-13-13-13	
	4-7-7-4	
EL. 57.5 CAVE IN (0)	3-4-5-3	
	5-5-3-6	
EL. 52.6 CAVE IN (24)	3-3-6-7	
	8-8-9-10	
	4-3-4-6	
	4-3-7-7	
	6-5-4-6	
	6-7-8-7	
	9-10-10-11	
	9-7-8-7	

EL. 59.5
6" Topsiol

EL. 57.5
Saturated medium dense brown coarse sand w/ some fine sand, fine gravel and silt.

EL. 55.5
Satrurated medium dense orange coarse sand w/ some silt and fine sand, trace of fine gravel.

EL. 53.5
Saturated loose tannish orange fine gravel and coarse sand w/ some fine sand, trace of silt.

EL. 51.5
Saturated loose oranglsh green silty fine sand w/ some coarse sand and fine gravel.

EL. 49.5
Saturated loose oranglsh green clayey fine sand w/ some coarse sand, trace of silt.

EL. 47.5
Saturated very stiff oranglsh green fine sandy clay w/ some silt, trace of coarse sand.

EL. 45.5
Saturated loose green clayey fine sand w/ some coarse sand, trace of silt.

EL. 43.5
Saturated loose oranglsh green silty fine sand w/ some coarse sand.

EL. 41.5
Saturated stiff oranglsh green fine sandy silt w/ trace of coarse sand.

EL. 36.5
Saturated medium dense green fine sand w/ some coarse sand, trace of silt and organic matter.

EL. 31.5
Saturated medium dense green fine to coarse sand w/ some silt, trace of organic matter.

EL. 26.5
Saturated medium dense green silty fine to coarse sand w/ some organic matter, trace of fine gravel.

EL. 24.5

BORING C2-1-05

N 541982

E 570959

	N	C
EL. 55.6 W.L. (24)		
	3-3-6	
EL. 55.1 W.L. (0)	5-9-11-12	
	7-8-10-12	
EL. 53.6 CAVE IN (0)	10-10-12-13	
EL. 50.7 CAVE IN (24)	2-3-4-4	
	6-8-6-5	
	2-3-3-4	
	4-5-4-5	
	5-9-11-11	
	9-10-9-10	
	7-8-7-7	
	7-9-10-11	

EL. 56.6
6" Topsiol

EL. 56.1
Saturated stiff brown clayey silt w/ some coarse sand and fine gravel, trace of fine sand.

EL. 54.6
Saturated medium dense brown coarse sand w/ some fine sand and fine gravel, trace of silt.

EL. 52.6
Saturated medium dense brown coarse to fine sand w/ some silt, trace of fine gravel.

EL. 50.6
Saturated medium dense orange coarse to fine sand w/ some silt, trace of fine gravel.

EL. 48.6
Saturated loose tan coarse to fine sand w/ some silt, trace of fine gravel.

EL. 46.6
Saturated medium dense orange fine gravel and coarse to fine sand w/ some silt.

EL. 44.6
Saturated loose tan coarse to fine sand w/ some silt and fine gravel.

EL. 42.6
Saturated stiff greenish orange fine sandy clay w/ some coarse sand and silt.

EL. 40.6
Saturated very stiff greenish orange fine andy clay w/ some silt, trace of coarse sand.

EL. 38.6
Saturated medium dense oranglsh green clayey fine sand w/ trace of coarse sand, fine gravel and silt.

EL. 32.6
Saturated medium dense green silty fine sand w/ trace of coarse sand.

EL. 28.6
Saturated medium dense grenn clayey fine sand w/ some coarse sand, trace of organic matter.

EL. 26.6

BORINGS
SCALE: 1" = 10'-0"

NOTES:

1. THE BORINGS AND STANDARD PENETRATION TESTS WERE TAKEN IN MARCH 2011 BY THE WALTON CORPORATION.
2. N = BLOWS ON A 2 INCH O.D. SAMPLING SPOON BY 140 LB. DRIVE-WEIGHT FALLING 30 INCHES INDICATING SUCCESSIVE SIX (6) INCH INCREMENTS OF PEENTRATION IN LIEU OF BLOWS PER FOOT. BLOWS RESULTING IN LESS THAN SIX (6) INCHES OF PENETRATION ARE SO INDICATED.
3. BORINGS AND SAMPLINGS CONFORM TO AASHTO DESIGNATION T-206.

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DELAWARE
DEPARTMENT OF TRANSPORTATION

ADDENDUMS / REVISIONS

SCALE
0 5 10 15
FEET

US 301
LEVELS ROAD
TO SUMMIT BRIDGE ROAD

CONTRACT	BRIDGE NO.	1-508A
T200911303	DESIGNED BY: R. C. KRHOUNEK	
COUNTY	CHECKED BY: J. E. SHERRING	
NEW CASTLE		

US 301 MAINLINE
OVER DRAWYERS DITCH

BORINGS 2

1-508A BO-2
SHEET NO.
681
TOTAL SHTS.
1256