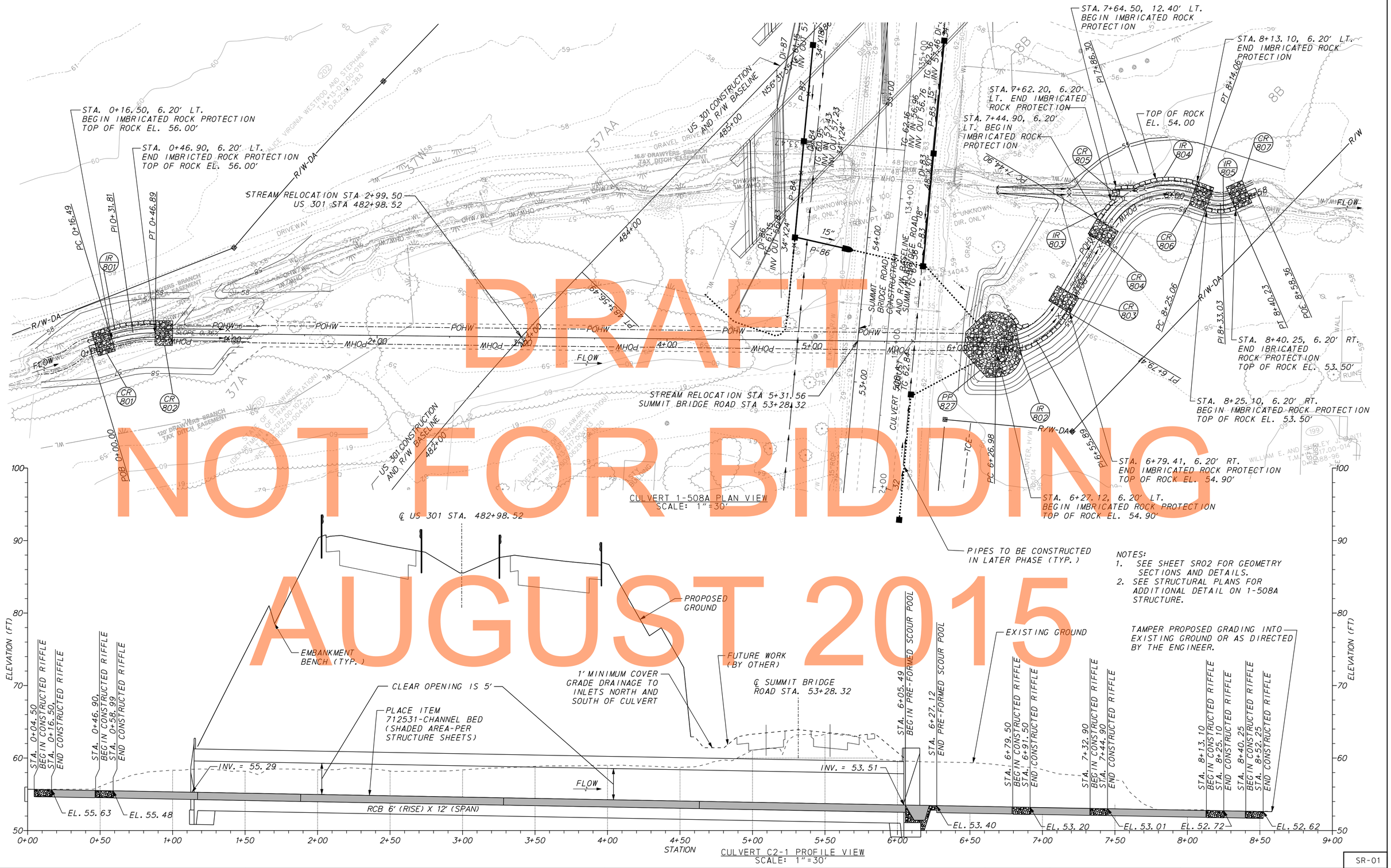


NOTES:
1. SEE SHEET SR02 FOR GEOMETRY SECTIONS AND DETAILS.
2. SEE STRUCTURAL PLANS FOR ADDITIONAL DETAIL ON 1-508A STRUCTURE.

DELAWARE DEPARTMENT OF TRANSPORTATION

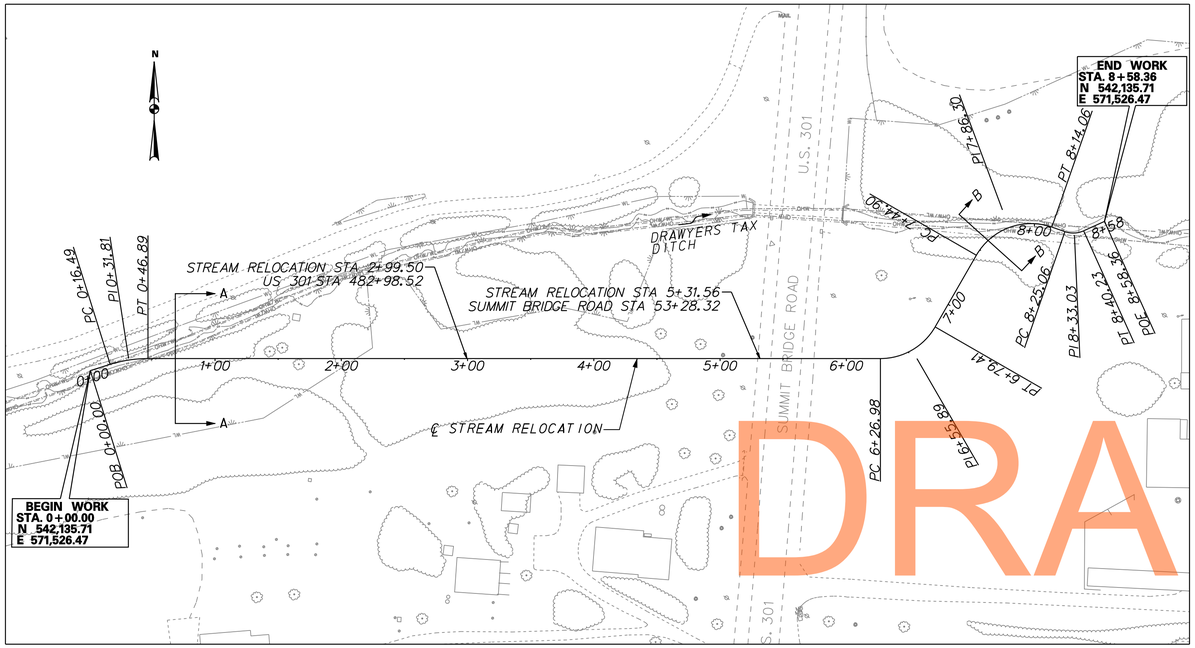
ADDENDUMS / REVISIONS

US 301 LEVELS ROAD TO SUMMIT BRIDGE ROAD

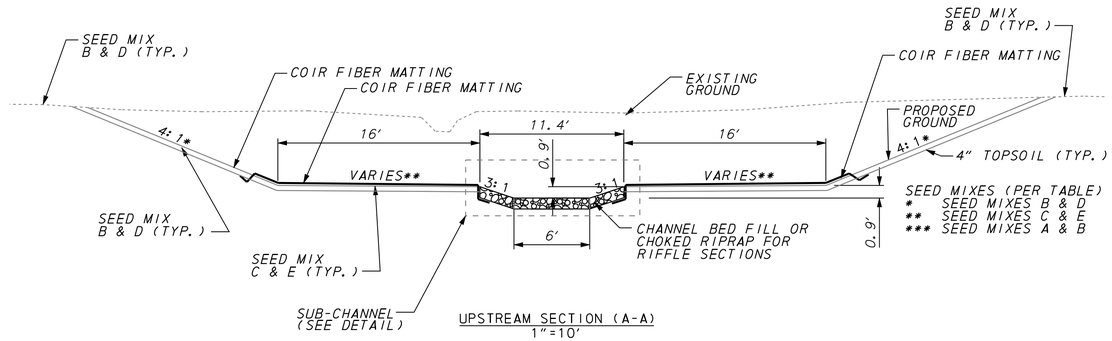
CONTRACT	BRIDGE NO.
T200911303	
COUNTY	DESIGNED BY: B.S.M.
NEW CASTLE	CHECKED BY: A.T.N.

STREAM RELOCATION AND RESTORATION PLANS

SR-01
SHEET NO. 859
TOTAL SHTS. 1256

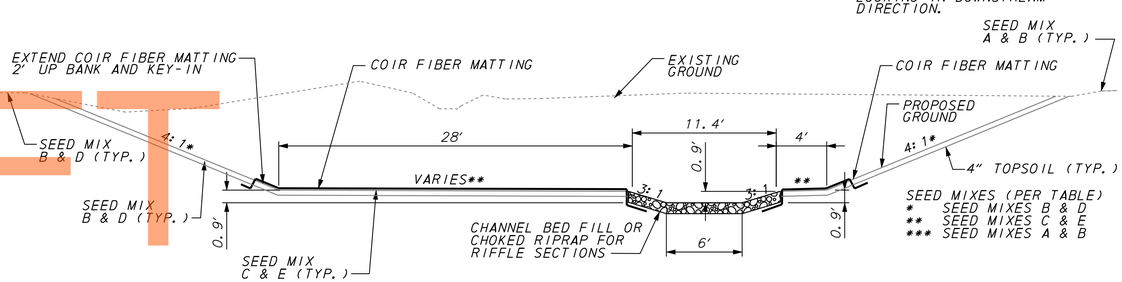


STREAM GEOMETRY
1"=60'



UPSTREAM SECTION (A-A)
1"=10'

NOTE:
SECTIONS A-A AND B-B ARE LOOKING IN DOWNSTREAM DIRECTION.



DOWNSTREAM SECTION (B-B)
1"=10'

B/L CONSTRUCTION - STREAM RELOCATION

CURVE	POINT NO.	STATION	NORTH	EAST	BEARING
	101	POB 0+00.00	542,205.790	570,717.640	N 85°54'04" E
100	102	PC 0+16.49	542,206.970	570,734.090	N 85°54'04" E
	103	PI 0+31.81	542,208.060	570,749.370	
	104	PT 0+46.89	542,204.530	570,764.270	S 76°40'51" E
101	105	PC 6+26.98	542,070.900	571,328.750	S 76°40'51" E
	106	PI 6+55.89	542,064.240	571,356.890	
	107	PT 6+79.41	542,085.300	571,376.700	N 43°14'09" E
102	108	PC 7+44.90	542,133.010	571,421.560	N 43°14'09" E
	109	PI 7+86.30	542,163.180	571,449.920	
	110	PT 8+14.06	542,140.940	571,484.850	S 57°30'15" E
103	111	PC 8+25.06	542,135.030	571,494.120	S 57°30'15" E
	112	PI 8+33.03	542,130.750	571,500.840	
	113	PT 8+40.23	542,132.260	571,508.670	N 79°02'37" E
	114	POE 8+58.36	542,135.710	571,526.470	N 79°02'37" E

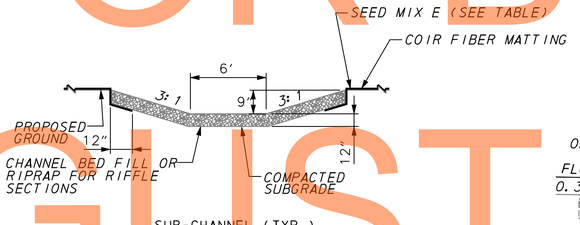
CURVE DATA

CURVE	DELTA	Dc	RADIUS	TANGENT	LENGTH	EXTERNAL
100	17°25'05" Right	57°17'45"	100.00'	15.32'	30.40'	1.17
101	60°05'00" Left	114°35'30"	50.00'	28.92'	52.43'	7.76
102	79°15'37" Right	114°35'30"	50.00'	41.41'	69.17'	14.92
103	43°27'08" Left	286°28'44"	20.00'	7.97'	15.17'	1.53

GENERAL NOTES:

1. KEY IN FOR MATTING SHALL BE A MINIMUM OF 1 FOOT FROM GRADE BREAK AND SHALL BE 8" DEEP X 8" WIDE (MIN.) UNLESS OTHERWISE NOTED OR DIRECTED BY THE ENGINEER.

SEED MIX.	ITEM AND DESCRIPTION
A.	734013-PERMANENT GRASS SEEDING, DRY GROUND (SY)
B.	734017-TEMPORARY GRASS SEEDING, DRY GROUND (SY)
C.	734018-TEMPORARY GRASS SEEDING, WET GROUND (SY)
D.	734551-NATIVE GRASS SEEDING: NO MOW MIX (SY)
E.	734552-WET GROUND EROSION CONTROL GRASS SEEDING-FLATS (SY)



SUB-CHANNEL (TYP.)
1"=10'

SUB CHANNEL:

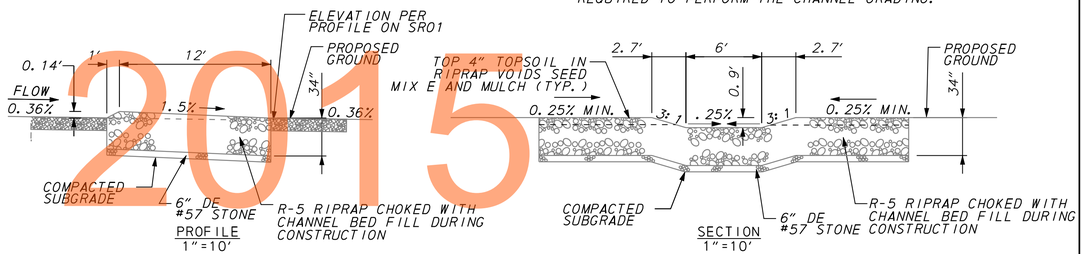
1. EXCAVATION OF SUB-CHANNEL SHALL REQUIRE AN ADDITIONAL 12 INCHES OF EXVATION FOR PLACEMENT OF CHANNEL BED FILL OR 34" FOR CONSTRUCTED RIFFLES (PER SEPARATE DETAIL).
2. COMPACT SUBGRADE WITHIN THE EXCAVATED AREA AND BACKFILL WITH CHANNEL BED FILL. IN THE EVENT THAT ADEQUATE CHANNEL BED FILL IS NOT AVAILABLE ON-SITE, THE CONTRACTOR SHALL SUPPLEMENT AVAILABLE MATERIALS WITH ROUNDED RIVER GRAVEL FROM OFF-SITE SOURCES. ADDITIONAL MATERIALS SHALL CONFORM WITH ITEM 712531. THE CONTRACTOR SHALL BE REQUIRED TO PROVE TO THE ENGINEER THAT ADEQUATE CHANNEL BED FILL IS NOT AVAILABLE ON SITE AND PROVIDE A QUANTITY FOR THE ENGINEERS APPROVAL. WRITTEN APPROVAL BY THE ENGINEER SHALL BE REQUIRED PRIOR TO PLACEMENT OF THE OFF-SITE MATERIALS.
3. THE 3:1 SLOPES SHALL BE COVERED WITH COIR FIBER MATTING.
4. THE SUB CHANNEL SHALL BE PAID AT THE UNIT BID PRICE PER SQUARE YARD FOR CHANNEL BED FILL. THE UNIT PRICE SHALL INCLUDE EXCAVATION, STOCKPILE OF CHANNEL BED FILL, SUBGRADE COMPACTION, AND PLACEMENT OF CHANNEL BED FILL.
5. THE UNIT BID PRICE SHALL INCLUDE ALL MATERIALS, EQUIPMENT, LABOR, AND INCIDENTALS REQUIRED TO INSTALL THE SUB-CHANNEL.

CHANNEL GRADING

1. EXCAVATE SECTION TO ELEVATION FOR OVER BANK AREA AND SUB-CHANNEL.
2. CONSTRUCT SUB-CHANNEL WITH BED FEATURES INCLUDING IMBRICATED ROCK (IR) PROTECTION, CONSTRUCTED RIFFLES(CR), AND PRE-FORMED SCOUR HOLE PER THE DETAILS.
3. UPON COMPLETION OF BED FEATURES, PLACE 4" OF TOPSOIL ON THE SLOPES AND OVERBANK AREAS.
4. INSTALL COIR FIBER MATTING FROM EDGE OF STREAM, ACROSS OVERBANK AREA, AND 2' UP EXTERIOR SLOPE AS SHOWN IN DETAIL. MATTING SHALL BE INSTALLED PER DELDOT STANDARDS (OR MANUFACTURERS AS APPROVED BY ENGINEER)

CHANNEL GRADING (CONT):

4. SEED AND MULCH ALL SURFACES AS INDICATED ON SECTIONS A-A AND B-B.
5. THE ITEMS IN CHANNEL GRADING SHALL BE PAID AT THE UNIT BID PRICE FOR EACH ITEM:
   A. 203000-CHANNEL EXCAVATION (CY)
   B. 733001-TOPSOIL, 4" DEPTH (SY)
   C. 735538-COIR FIBER MATTING (SY)
   D. 737509-PLANTING EMERGENT MARSH(LS)
   E. GRASSES (SEE SEED MIX TABLE)
   F. CHANNEL FEATURES SHALL BE PAID AS OUTLINED IN THE FOLLOWING DETAILS
5. THE UNIT BID PRICE FOR EACH ITEM SHALL INCLUDE ALL MATERIALS, EQUIPMENT, LABOR, AND INCIDENTALS REQUIRED TO PERFORM THE CHANNEL GRADING.



CONSTRUCTED RIFFLE (CR) DETAIL
1"=10'

CONSTRUCTED RIFFLE :

1. EXCAVATE SUB-CHANNEL TO GRADE AND EXCAVATE FOR PLACEMENT OF CONSTRUCTED RIFFLE (CR).
2. COMPACT SUBGRADE WITHIN THE EXCAVATED AREA AND BACKFILL WITH RIPRAP (PER PLAN - LOW POINT SHALL BE IN THE CENTER OF THE CHANNEL).
3. THE CONTRACTOR SHALL PROVIDE ITEM 712531 -CHANNEL BED FILL TO CHOKE THE RIPRAP WITHIN THE CONSTRUCTED RIFFLE. THE CHOKE MATERIAL SHALL CONSIST OF WELL GRADED ROUNDED RIVER GRAVEL WITH SAND. NO MORE THAN 15% OF THE GRADATION SHALL CONSIST OF SAND. APPLICATION OF THE CHOKE MATERIAL MAY BE INSTALLED AS A SLURRY, IN LIFTS, OR AS DIRECTED BY THE ENGINEER. COMPLETE FILL OF VOIDS SHALL BE REQUIRED WITH ANY APPLICATION.

CONSTRUCTED RIFFLE (CONT):

4. THE CONSTRUCTED RIFFLE (CR) SHALL BE PAID AT THE UNIT BID PRICE FOR SPECIAL RIPRAP (CONSTRUCTED RIFFLE) PER SQUARE YARD. THE UNIT PRICE SHALL INCLUDE EXCAVATION, SUBGRADE COMPACTION, NO. 57 STONE, TOPSOIL (WITHIN RIPRAP), RIPRAP, STRAW MULCH, SEED, AND CHANNEL BED FILL (CHOKE MATERIAL).
5. THE UNIT BID PRICE SHALL INCLUDE ALL MATERIALS, EQUIPMENT, LABOR, AND INCIDENTALS REQUIRED TO INSTALL THE CONSTRUCTED RIFFLE.

DELAWARE
DEPARTMENT OF TRANSPORTATION

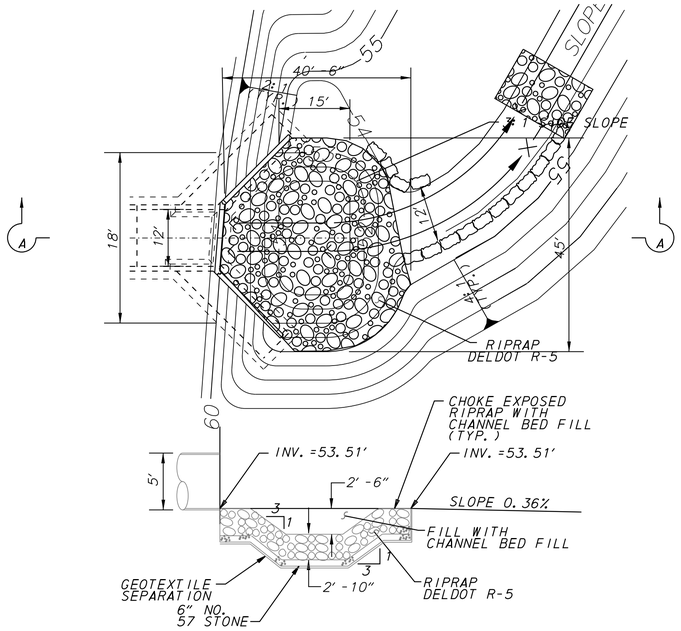
ADDENDUMS / REVISIONS

US 301
LEVELS ROAD
TO SUMMIT BRIDGE ROAD

CONTRACT	T200911303
COUNTY	NEW CASTLE
BRIDGE NO.	
DESIGNED BY:	B.S.M.
CHECKED BY:	A.T.N.

STREAM RELOCATION AND RESTORATION PLANS

SR-02	
SHEET NO.	860
TOTAL SHTS.	1256



PLUNGE POOL(PP)
NOT TO SCALE

PLUNGE POOL:

1. EXCAVATE SUB-CHANNEL TO GRADE AND EXCAVATE FOR PLACEMENT OF PLUNGE POOL.
2. PLACE GEOTEXTILE (RIPRAP) WITHIN EXCAVATED AREA AND PLACE 6" LAYER OF DE NO. 57 STONE.
3. INSTALL RIPRAP TO THE DIMENSIONS OF THE DETAIL AND THE CONTOURS SHOWN PER PLAN. CHOKE RIPRAP WITH CHANNEL BED FILL AFTER INSPECTION OF PLUNGE POOL DIMENSIONS BY DELDOT INSPECTOR. BACKFILL PLUNGE POOL WITH CHANNEL BED FILL.
4. PLUNGE POOL SHALL BE PAID AT THE UNIT PRICE PER SQUARE YARD FOR RIPRAP SPECIAL (PLUNGE POOL). UNIT PRICE SHALL INCLUDE EXCAVATION, GEOTEXTILE, NO. 57 STONE, CHANNEL BED FILL (CHOKE AND BACKFILL MATERIAL), AND RIPRAP AS SHOWN PER DETAIL.
5. THE UNIT BID PRICE SHALL INCLUDE ALL MATERIALS, EQUIPMENT, LABOR, AND INCIDENTALS REQUIRED TO INSTALL THE PLUNGE POOL.

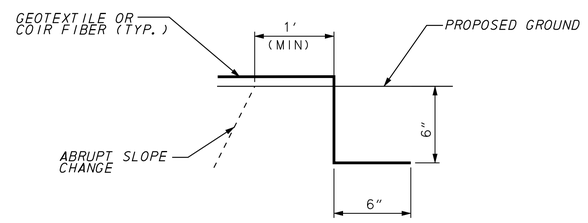
GENERAL ROCK CHARACTERISTICS:

1. GENERAL ROCK CHARACTERISTICS SHALL APPLY TO ALL ROCK UTILIZED FOR STREAM RESTORATION ON SHEETS SR-01 TO SR-03.
2. ROCK SHALL HAVE A MIMIMUM UNIT WEIGHT OF 165 LB/FT3.
3. ROCK SHALL BE BROWN TO GRAY/GREEN IN COLOR. OTHER COLORS SHALL BE APPROVED BY SAMPLE PRIOR TO DELIVERY TO SITE. USE OF VERY LIGHT COLORED ROCK (WHITE, LIGHT GRAY, ETC...) SHALL NOT BE APPROVED.
4. ROCK SHALL BE NON-WEATHERING ROCK THAT WILL NOT EASILY ERODE OR CRUMBLE.
5. ROCKS SHALL BE PROTECTED FROM FAILURE DURING CONSTRUCTION. CONTRACTOR SHALL BRACE OR SHORE ROCK PRIOR TO COMPLETION OF CHANNEL WORK. THE COST OF BRACING AND/OR SHORING SHALL BE CONSIDERED INCIDENTAL TO THE ITEMS REQUIRING ROCK AND RIPRAP. FAILURE OF CHANNEL FEATURES SHALL BE REPAIRED AT THE CONTRACTORS EXPENSE PRIOR TO FINAL APPROVAL BY THE ENGINEER.
6. ACCEPTANCE OF ROCK FEATURES, PLUNGE POOL, IMBRICATED ROCK, AND CONSTRUCTED RIFFLES SHALL NOT BE APPROVED PRIOR TO INSTALLATION OF COIR FIBER MATTING, 90% STABILIZATION OF WET GROUND EROSION CONTROL SEEDING-FLATS AND NATIVE GRASS SEEDING: NO MOW MIX, AND PLANTING OF EMERGENT MARSH.
7. WHERE IMBRICATED (BLOCKY) ROCK IS REQUIRED, TRIANGULAR OR ROUNDED ROCK SHALL NOT BE ACCEPTED BY THE ENGINEER. CHINKING ROCKS SHALL BE INCIDENTAL TO THE PLACEMENT AND TIGHT FIT OF THE IMBRICATED ROCKS. CHINKING MATERIAL SHALL BE PLACED FROM BEHIND IMBRICATED ROCKS PRIOR TO PLACEMENT OF BACKFILL.

PLANTING, SMOOTH ALDER 737523 (PART OF LUMP SUM (LS) ITEM)

QUANTITY	KEY	BOTANICAL NAME	COMMON NAME	SIZE AND ROOT CONDITION	COMMENTS
720	ALSE2	ALNUS SERRULATA	SMOOTH ALDER	24" HEIGHT, B.R.	SPACE 10' OC

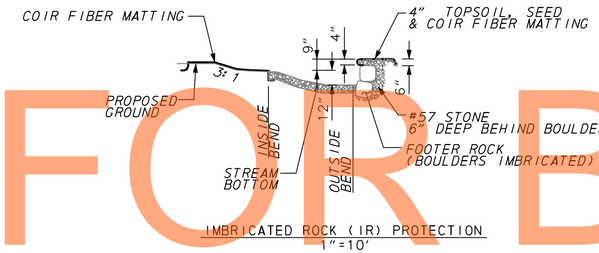
B.R. = BARE ROOT



MATTING, GEOTEXTILE, AND FABRIC
KEY-IN DETAIL
NOT TO SCALE

MATTING KEY-IN

1. DIMENSIONS SHOWN FOR KEY-INS ARE MINIMUMS.
2. KEY-IN SHALL BE INCIDENTAL TO THE INSTALLATION OF ALL GEOTEXTILE, MATTINGS, AND FABRICS SHOWN ON THE PLANS.



IMBRICATED ROCK (IR) PROTECTION
1"=10'

IMBRICATED ROCK PROTECTION:

1. EXCAVATE SUB-CHANNEL TO GRADE AND EXCAVATE FOR PLACEMENT OF IMBRICATED FOOTER ROCK.
2. PLACE GEOTEXTILE (RIPRAP) WITHIN EXCAVATED AREA.
3. INSTALL FOOTER ROCK AT A 10-20 DEGREE ANGLE WITH TOP SLOPE AWAY FROM CHANNEL.
4. PLACE #57 STONE BEHIND FOOTER ROCK AND LEVEL WITH TOP ROCK.
5. BACKFILL CHANNEL BED FILL ALONG TOE OF FOOTER ROCK AND COMPACT
6. PLACE TOP ROCK ON FOOTER ROCK (CONNECTIONS FOR TOP ROCKS SHALL BE OFFSET FROM FOOTER ROCK CONNECTIONS - IN BRICK FASHION) AND BACKFILL REMAINING #57 STONE.
7. INSTALL COIR MATTING OVER TOP ROCK. PLACE 4" OF TOPSOIL OVER ROCK AND #57 STONE. FOLD COIR MAT OVER TOPSOIL AND KEY COIR MATTING INTO EXISTING GROUND. SEED AND MULCH. SEED SHALL CONSIST OF BOTH TEMPORARY AND NATIVE GRASS SEEDING: NO MOW MIX.
8. FOOTER AND TOP ROCKS SHALL BE BLOCKY ANGULAR IMBRICATED ROCKS THAT FIT TIGHTLY TOGETHER. MINIMUM ROCK DIMENSIONS ARE 3.5'(L) X3.0'(W)X2'(D).
9. IMBRICATED ROCK (IR) PROTECTION SHALL BE PAID AT THE UNIT PRICE PER TON FOR ROCK SPECIAL, (IMBRICATED ROCK). UNIT PRICE SHALL INCLUDE EXCAVATION, GEOTEXTILE, FOOTER ROCK, AND TOP ROCK.
10. THE UNIT BID PRICE SHALL INCLUDE ALL MATERIALS, EQUIPMENT, LABOR, AND INCIDENTALS REQUIRED TO INSTALL THE IMBRICATED ROCK TOE PROTECTION.

RIPRAP SPECIAL: CONSTRUCTED RIFFLE (CR) SCHEDULE ITEM 712521

NO.	TYPE	AREA (SY)	LENGTH	WIDTH
801	R-5	25	13	17
802	R-5	25	13	17
803	R-5	25	13	17
804	R-5	25	13	17
805	R-5	25	13	17
806	R-5	25	13	17
807	R-5	25	13	17

ROCK SPECIAL: IMBRICATED ROCK (IR) PROTECTION SCHEDULE ITEM 712528

NO.	TYPE	WT (TON)	LENGTH	WIDTH	HEIGHT
801	Block	30	35	2.5	4
802	Block	55	65	2.5	4
803	Block	22	25	2.5	4
804	Block	51	60	2.5	4
805	Block	22	25	2.5	4

COIR FIBER MATTING 735538	
TOTAL	AREA (SY)
(SR ONLY)	3880

WET GROUND EROSION CONTROL GRASS SEEDING - FLATS 734552	
TOTAL	AREA (SY)
(SR ONLY)	2100

CHANNEL EXCAVATION 203000	
TOTAL	VOLUME (CY)
(SR ONLY)	1900

PERMANENT GRASS SEEDING DRY GROUND 734013	
TOTAL	AREA (SY)
(SR ONLY)	2100

CHANNEL BED FILL OUTSIDE CULVERT		
	(in)	(mm)
D_5	0.079	2
D_{16}	3.50	89
D_{50}	5.00	127
D_{84}	7.00	178
D_{95}	9.50	241

CHANNEL BED FILL INSIDE CULVERT		
	(in)	(mm)
D_5	0.079	2
D_{16}	4.20	107
D_{50}	6.00	152
D_{84}	8.40	213
D_{95}	11.40	290

RIPRAP SPECIAL: PLUNGE POOL (PP) SCHEDULE 712521

NO.	TYPE	AREA (SY)	LENGTH	WIDTH
801	R-5	150	SEE DETAIL	

CHANNEL BED FILL 712531	
TOTAL	VOLUME (CY)
(SR ONLY)	110

GEOTEXTILE: RIPRAP 713003	
TOTAL	AREA (SY)
(SR ONLY)	620

DELAWARE NO. 57 STONE 302012	
TOTAL	WEIGHT (TON)
(SR ONLY)	40

TEMP. GRASS SEED: DRY GROUND 734017	
TOTAL	AREA (SY)
(SR ONLY)	1500

TEMP. GRASS SEED: WET GROUND 734018	
TOTAL	AREA (SY)
(SR ONLY)	2100

TOPSOIL: 4" DEPTH 732000	
TOTAL	AREA (SY)
(SR ONLY)	3880

NATIVE GRASS SEEDING: NO MOW MIX 734551	
TOTAL	AREA (SY)
(SR ONLY)	1500

REM. AND DISPOSE OF EXCESS MAT'L*	
TOTAL	VOLUME (CY)
(SR ONLY)	2100

* - USE ONLY AS DIRECTED BY ENGINEER

PLANTING SMOOTH ALDER:

1. PLANTING OF SMOOTH ALDER SHALL BE PAID UNDER ITEM 737523 PLANTING FOR CULVERTS 1-508A AND 1-508B AND MEET ALL REQUIREMENTS OF SECTION 737-PLANTING.
2. PLANTING SHALL CONSIST OF ALNUS SERRULATA (SMOOTH ALDER) AT A 10 FOOT SPACING ON CENTER THROUGHOUT THE GRADED OVERBANK AND AREAS WITH 4:1 SIDE SLOPES.
3. PLANTS SHALL BE 12- TO 24-INCH BARE-ROOT SEEDLINGS.
4. NO MEASUREMENT SHALL BE MADE AND PAYMENT SHALL BE LUMP SUM AND INCLUDES ALL MATERIALS, EQUIPMENT, LABOR, AND INCIDENTALS (FERTILIZER, STAKING, DEER PROTECTION, ETC...PER SECTION 737) REQUIRED FOR PLANTING.

BACKFILL OF EXISTING CHANNEL:

1. THE EXISTING CHANNEL SHALL BE EXCAVATED AND BACKFILLED BY THE CONTRACTOR.
2. DURING EXISTING CHANNEL EXCAVATION, CONTRACTOR SHALL REMOVE EXISTING CHANNEL BED FILL TO A MINIMUM DEPTH OF 2 FEET. STREAM BANKS SHALL BE EXCAVATED A MINIMUM OF 6 INCHES. REMOVAL OF SATURATED/WET SOILS GREATER THAN THE MINIMUMS SHOWN SHALL BE ALLOWED ONLY AS DIRECTED BY THE ENGINEER. THE EXISTING STREAM BED MATERIAL SHALL BE STOCKPILED FOR USE UNDER ITEM CHANNEL BED FILL OR STOCKPILED FOR USE IN PROPOSED ROADWAY EMBANKMENT AS DIRECTED BY THE ENGINEER. ANY MATERIAL DEEMED UNSUITABLE SHALL BE DISPOSED OF OFFSITE OR PLACED IN UPLAND AREA AND SEEDED AS DIRECTED BY THE ENGINEER. REMOVAL OF UNSUITABLE MATERIAL SHALL BE INCIDENTAL TO CHANNEL EXCAVATION.
3. EXISTING CHANNEL SHALL BE BACKFILLED AND COMPACTED TO MEET THE CONSTRUCTION REQUIREMENTS FOR ROADWAY EMBANKMENT. CHANNEL EXCAVATION, BACKFILL, AND STOCKPILE SHALL BE PAID AT THE UNIT BID PRICE FOR CHANNEL EXCAVATION.

CHOKING RIPRAP:

1. CHOKE RIPRAP IN ACCORDANCE WITH THE STREAM RESTORATION AND SLOPE RIPRAP TREATMENT NOTES FOUND ON SHEET EC-05.
2. FOR ESTIMATING PURPOSES CONTRACTOR SHALL ASSUME 40% VOID SPACE IN THE RIPRAP.
3. WITHIN STREAM RESTORATION PLANS (SR-01 TO SR-03), CHOKING OF RIPRAP SHALL BE CONSIDERED INCIDENTAL TO RIPRAP UNLESS OTHERWISE INDICATED ON THE PLANS OR SPECIFICATIONS.

DELAWARE
DEPARTMENT OF TRANSPORTATION

ADDENDUMS / REVISIONS

US 301
LEVELS ROAD
TO SUMMIT BRIDGE ROAD

CONTRACT	T200911303
COUNTY	NEW CASTLE
BRIDGE NO.	
DESIGNED BY:	B.S.M.
CHECKED BY:	A.T.N.

STREAM RELOCATION AND RESTORATION PLANS

SR-03	
SHEET NO.	861
TOTAL SHTS.	1256