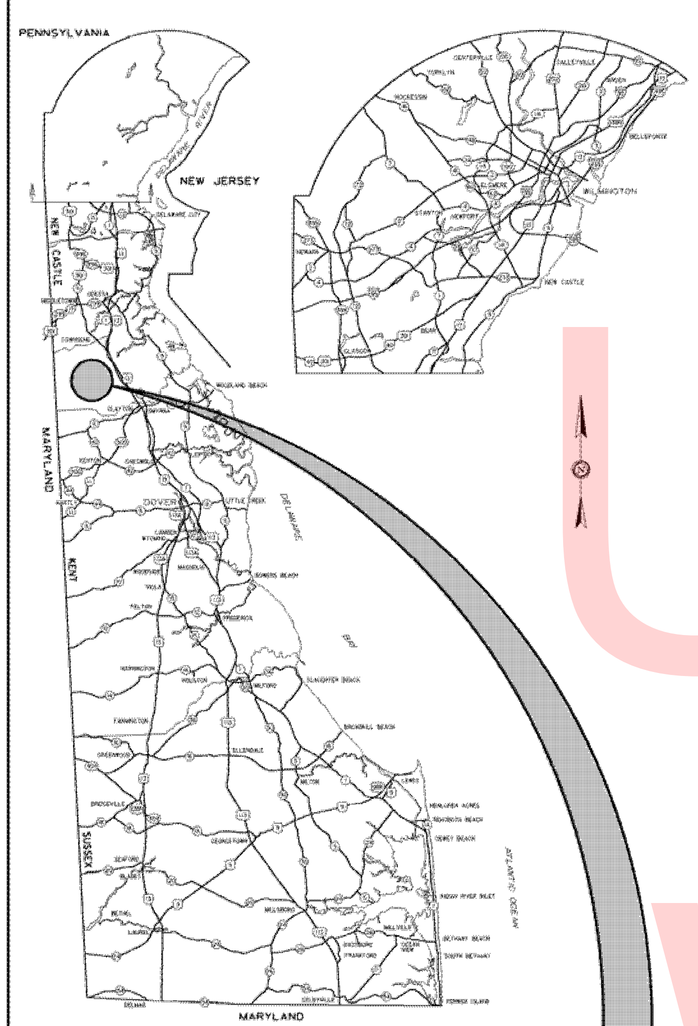


GENERAL LOCATION OF CONTRACT

THE STATE OF DELAWARE DEPARTMENT OF TRANSPORTATION

U.S. CUSTOMARY UNITS

CONSTRUCTION & RIGHT-OF-WAY PLANS FOR:

BR 1-438 ON N463 BLACKBIRD STATION ROAD OVER BLACKBIRD CREEK

CONTRACT NUMBER: T201407104

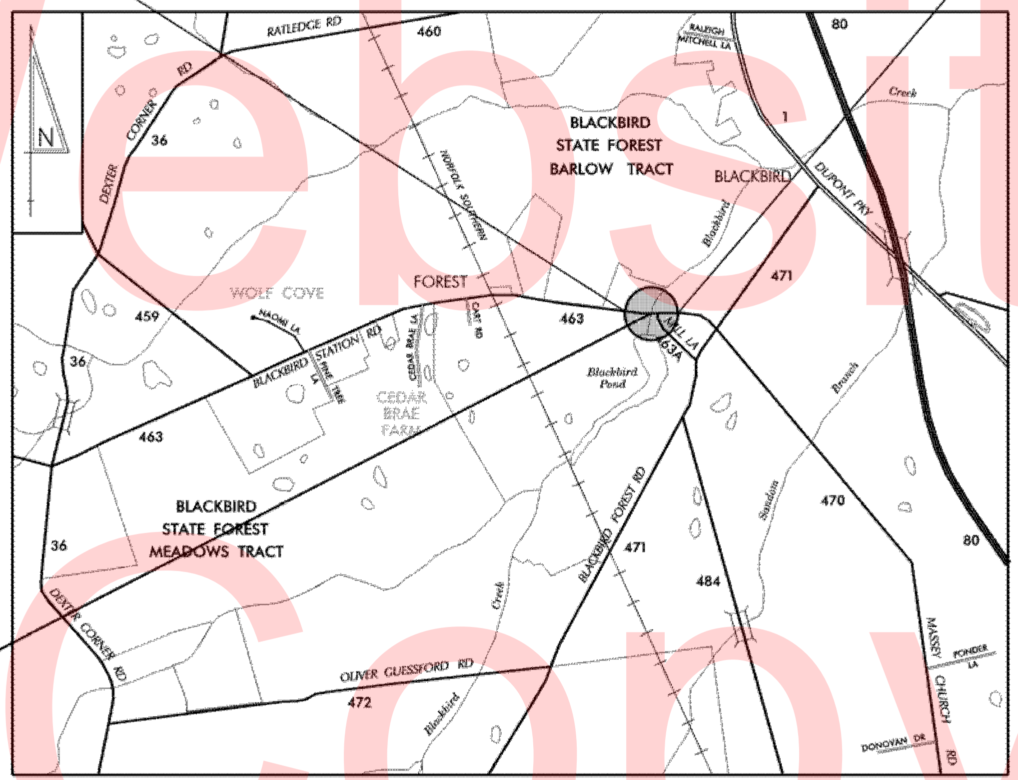
FEDERAL AID PROJECT NUMBER: EBROS-N463(01)

COUNTY: NEW CASTLE M.R. #: N463

BEGIN CONTRACT STATION 2+30

END CONTRACT STATION 7+70

BR 1-438



DESIGN DESIGNATION

FUNCTIONAL CLASS: RURAL LOCAL ROAD		D.H.V. PROJECTED: 102	YEAR: 2040
TYPE OF CONSTRUCTION: BRIDGE REPLACEMENT		DESIGN SPEED: 40 M.P.H.	
A.A.D.T. CURRENT: 1145	YEAR: 2011	TRUCKS: 7 %	
A.A.D.T. PROJECTED: 1700	YEAR: 2040	DIRECTION OF DISTRIBUTION: 60 %	

INDEX OF SHEETS

TOTAL SHEETS: 27

APPROVED DESIGN EXCEPTIONS

DESIGN PARAMETER	REQUIRED	PROVIDED	DATE
STOPPING SIGHT DISTANCE	305 FT	249.92 FT	04/16/15
MINIMUM K (SAG)	64 FT / %	49 FT / %	04/16/15

ADDENDA & REVISIONS

DESCRIPTION	NAME & DATE

ASSOCIATED CONTRACTS

CONTRACT NO.	CONTRACT NAME
84-071-04	REPLACEMENT OF BRIDGE NO. 438 ON ROAD NO. 463
64-01-014	RD. 471 & 463, BRIDGE REPLACEMENT *454 ON ROAD 465

RECOMMENDED

SQUAD MANAGER, CONSTRUCTION — DATE 12/08/2016

GROUP ENGINEER, CONSTRUCTION — DATE 12/07/2016

ASSISTANT DIRECTOR, CONSTRUCTION — DATE 12/08/2016

RECOMMENDED

STORMWATER ENGINEER

DATE 12/07/2016

VINCENT W. DAVIS REGISTERED No. 12898 DELAWARE PROFESSIONAL ENGINEER

SEAL

RECOMMENDED

SQUAD MANAGER, BRIDGE DESIGN

DATE 12/13/2016

CRAIG A. STEVENS LICENSE No. 15250 DELAWARE PROFESSIONAL ENGINEER

SEAL

RECOMMENDED

BRIDGE DESIGN ENGINEER

DATE 12/13/2016

JASON N. HASTINGS REGISTERED No. 13545 DELAWARE PROFESSIONAL ENGINEER

SEAL

RECOMMENDED

ASSISTANT DIRECTOR, BRIDGE

DATE 12/13/2016

BARRY A. BENTON REGISTERED No. 10774 DELAWARE PROFESSIONAL ENGINEER

SEAL

APPROVED

CHIEF ENGINEER

DATE 12/13/2016

ROBERT BRIAN McCLEARY REGISTERED No. 8567 DELAWARE PROFESSIONAL ENGINEER

SEAL

Y:\NEWCASTL\BRIDGE\T201407104\PLANS\T001.DGN

EXISTING SYMBOLS

DRAINAGE

—ᵈᵉ—	DITCH OR STREAM CENTERLINE
—→—	DIRECTIONAL STREAM FLOW ARROW
C.B. / D.I.	DRAINAGE INLET
J.B.	DRAINAGE JUNCTION BOX
Ⓓ	DRAINAGE MANHOLE
SIZE/TYPE LABEL	DRAINAGE PIPE AND FLOW ARROW
	DRAINAGE PIPE HEADWALL
	RIPRAP - AREA FEATURE
	RIPRAP - LINEAR FEATURE

MANMADE ROADSIDE FEATURES

⊙	BOLLARD - STEEL POLE
⊠	BOLLARD - WOOD POST
(TYPE LABEL)	CURB
(TYPE LABEL)	CURB AND GUTTER
—x—	FENCE - CHAINLINK OR STRANDED
—ₒ—	FENCE - STOCKADE OR SPLIT RAIL
FP	FLAG POLE
—ₙ—	GUARDRAIL - STEEL BEAM
—ₒ—	GUARDRAIL - WIRE ROPE
LAMP	LAMP AND POST - RESIDENTIAL
MB	MAILBOX
PM	PARKING METER AND POST
— — — — — — —	PAVEMENT - FLEXIBLE
———————	PAVEMENT - RIGID
□	PILE - BRIDGE
○	PILLAR OR MISCELLANEOUS POST
	TRAFFIC SIGN AND POST
	WALL - BRICK OR BLOCK
	WALL - STONE

NATURAL ROADSIDE FEATURES

	GRASS LAWN
	HEDGEROW OR THICKET
	MARSH BOUNDARY LINE
	TREE - CONIFEROUS
	TREE - DECIDUOUS
	TREE STUMP
	SHRUBBERY
— WL —	DELINEATED WETLAND BOUNDARY LINE
	WOODS LINE BOUNDARY

RIGHT-OF-WAY SYMBOLS

C.M.	PROPERTY MARKER - CONCRETE MON.
I.P.	PROPERTY MARKER - IRON PIPE
100+00	HISTORIC RIGHT-OF-WAY BASELINE
—— -- ——	EXISTING RIGHT-OF-WAY
—— PP ——	EXISTING PROPERTY LINE
— EASEMENT TYPE —	EXISTING EASEMENT
—— DA ——	EXISTING DENIAL OF ACCESS
— R/W-DA —	EXISTING R/W & DENIAL OF ACCESS

SURVEY CONTROL & MONUMENTATION

B.M.	SURVEY BENCHMARK LOCATION
T.P.	SURVEY TIE POINT LOCATION
△	SURVEY TRAVERSE POINT
⊙	POINT OF CURVATURE OR TANGENCY
⊙	POINT OF INTERSECTING TANGENTS

UTILITY

	SOIL BORING LOCATION
	UTILITY TEST HOLE LOCATION
TV	CABLE TV DISTRIBUTION BOX
Ⓔ	ELECTRIC MANHOLE
EM	ELECTRIC METER
E	ELECTRIC TRANSFORMER
	POLE MOUNTED LUMINAIRE
Ⓖ	GAS MANHOLE
G.M.	GAS METER
G.V.	GAS VALVE
G.P.	GAS PUMP - SERVICE STATION
	RAILROAD TRACKS
Ⓢ	SANITARY SEWER MANHOLE
S.V.	SANITARY SEWER VALVE
VENT	SANITARY SEWER VENT OR CLEANOUT
S.D.F.	SEPTIC DRAIN FIELD
B	TELEPHONE BOOTH
Ⓣ	TELEPHONE MANHOLE
T	TELEPHONE TEST POINT
J.W.	TRAFFIC - CONDUIT JUNCTION WELL
◎	TRAFFIC - LIGHT POLE AND BASE
◎	TRAFFIC - PEDESTRIAN POLE & BASE
	TRAFFIC - SIGNAL CABINET & BASE
⊗	TRAFFIC - SIGNAL POLE AND BASE
U	UTILITY BOX
	UTILITY POLE GUY WIRE ANCHOR
	UTILITY POLE
F.H.	WATER - FIRE HYDRANT
W.M.	WATER METER
W.V.	WATER VALVE
WELL	WELL HEAD
?	MANHOLE - UNDETERMINED OWNER

UTILITY COMPANY FACILITIES

—DP-E-OH—	DELMARVA POWER - ELECTRIC
—VER-C-OH—	VERIZON
—ABB-OH—	ATLANTIC BROADBAND

PROPOSED SYMBOLS

CONSTRUCTION

	CONCRETE SAFETY BARRIER - PERMANENT
×—BFS—×	BIOFILTRATION SWALE
	BRICK PATTERNED SURFACE
	BUTT JOINT
100+00	CONSTRUCTION BASELINE
—CSF—	CONSTRUCTION SAFETY FENCE
	CURB, TYPE 1 & TYPE 3
	CURB, TYPE 2
	CURB & GUTTER, TYPE 1
	CURB & GUTTER, TYPE 2
	CURB & GUTTER, TYPE 3
	CURB & GUTTER, TYPE 4
—CZ—	CLEAR ZONE
■	DRAINAGE INLET
×——×	DITCH
	FENCE - METAL
	FENCE - WOOD
	FLARED END SECTION
	GUARDRAIL, TYPE 1
	GUARDRAIL, TYPE 2
	GUARDRAIL, TYPE 3
	GUARDRAIL END ANCHORAGE
	GUARDRAIL END TREATMENT, TYPE 1
	GUARDRAIL END TREATMENT, TYPE 2
	GUARDRAIL END TREATMENT, TYPE 3
	IMPACT ATTENUATOR
■	JUNCTION BOX - DRAINAGE
—— LO ——	LATERAL OFFSET
------LOC------	LIMIT OF CONSTRUCTION
MB	MAILBOX
●	MANHOLE
	PAVEMENT PATCH
	PAVEMENT REMOVAL - TOPSOIL, SEED AND MULCH
	PIPE & DIRECTIONAL FLOW ARROW
	RIPRAP
	P.C.C. SIDEWALK - 4"
	P.C.C. SIDEWALK - 6" (USE 8" DEPTH FOR CHANNELIZATION ISLANDS.)
	UNDERDRAIN
	UNDERDRAIN OUTLET

RIGHT-OF-WAY SYMBOLS

▣	PROPOSED RIGHT-OF-WAY MONUMENT
—— DA ——	PROPOSED DENIAL OF ACCESS
- - - - PE - - - -	PROPOSED PERMANENT EASEMENT
—— R/W ——	PROPOSED RIGHT-OF-WAY
— R/W-DA —	PROPOSED R/W & DENIAL OF ACCESS
- - - TCE - - -	TEMPORARY CONSTRUCTION EASEMENT
100+00	PROPOSED RIGHT-OF-WAY BASELINE

IDENTIFIERS

(A/C)	ADJUST BY CONTRACTOR
(A/O)	ADJUST BY OTHERS
(B)	CONCRETE SAFETY BARRIER
(C)	CURB OR CURB & GUTTER
(C/JB)	CONVERT TO JUNCTION BOX
(C/MH)	CONVERT TO DRAINAGE MANHOLE
(C/O)	CURB OPENING
(CR)	CURB RAMP / TYPE
(CR-N)	CURB RAMP / TYPE - WITHOUT SIDEWALK SURFACE DETECTABLE WARNING SYSTEM
(CSF)	CONSTRUCTION SAFETY FENCE
(DI)	DRAINAGE INLET
(DND)	DO NOT DISTURB
(ED)	ENERGY DISSIPATOR
(F)	FENCE
(FES)	FLARED END SECTION
(FF/C)	FILL WITH FLOWABLE FILL
(FS)	FILTRATION STRUCTURE
(GR)	GUARDRAIL
(JB)	JUNCTION BOX
(MH)	MANHOLE
(M)	MONUMENT - RIGHT-OF-WAY
(P)	PIPE
(RL/C)	RELOCATE BY CONTRACTOR
(RL/O)	RELOCATE BY OTHERS
(RM/C)	REMOVE BY CONTRACTOR
(RM/O)	REMOVE BY OTHERS
(UD)	UNDERDRAIN / LENGTH
(UDO)	UNDERDRAIN OUTLET PIPE

LANDSCAPING

(LS)	LANDSCAPE PLANTINGS
	SHRUBBERY
	CONIFEROUS TREE
	DECIDUOUS TREE

TRAFFIC

— ITMS-CON —	ITMS CONDUIT
— SIG-CON —	SIGNAL CONDUIT
■	CONDUIT JUNCTION WELL
	LUMINAIRE
	PAVEMENT MARKINGS
	PAVEMENT STRIPING
	TRAFFIC SIGN

PAVEMENT SECTION(S)

	2" SUPERPAVE TYPE C, PG 64-22, 160 GYR. 6" GABC
	2" SUPERPAVE TYPE C, PG 64-22, 160 GYR. 2¼" SUPERPAVE TYPE B, PG 64-22, 160 GYR. 8" GABC

UTILITY COMPANY FACILITIES

—DP-E-OH—	DELMARVA POWER - ELECTRIC
—VER-C-OH—	VERIZON
—ABB-OH—	ATLANTIC BROADBAND

EROSION & SEDIMENT CONTROL

DWBAG	DEWATERING BAG
DWB	DEWATERING BASIN
ED	EARTH DIKE
	INLET SEDIMENT CONTROL
	PERIMETER DIKE/SWALE
PST	PORTABLE SEDIMENT TANK
P	PUMP
SBD	SANDBAG DIKE
SB	SANDBAG DIVERSION
	STONE CHECK DAM
SCE	STABILIZED CONSTRUCTION ENTRANCE
SF	SILT FENCE / LENGTH
—SF—	SILT FENCE
—RSF—	SILT FENCE - REINFORCED
SP	SUMP PIT
ST	SEDIMENT TRAP
ST	SEDIMENT TRAP
ST	SEDIMENT TRAP WITH INLET AS OUTLET
ST	SEDIMENT TRAP PIPE OUTLET
SW	STILLING WELL
	TEMPORARY SWALE
TSD	TEMPORARY SLOPE DRAIN
T XXX	TURBIDITY CURTAIN / LENGTH
—T—	TURBIDITY CURTAIN

LAST REVISED: 01/09/2014
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DELAWARE DEPARTMENT OF TRANSPORTATION

ADDENDUMS / REVISIONS

NOT TO SCALE

BR 1-438 ON N463 BLACKBIRD STATION ROAD OVER BLACKBIRD CREEK

CONTRACT	BRIDGE NO.	1-438
T201407104	DESIGNED BY: NED	
COUNTY	CHECKED BY: CAS	
NEW CASTLE		

LEGEND

SHEET NO.	2
TOTAL SHTS.	27

GENERAL NOTES

1. THIS PROJECT IS TO BE CONSTRUCTED IN ACCORDANCE WITH THE DELAWARE DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS", DATED AUGUST 2001 AND THE DELAWARE DEPARTMENT OF TRANSPORTATION "STANDARD CONSTRUCTION DETAILS", DATED 2001, INCLUDING ALL REVISIONS UP TO THE DATE OF ADVERTISEMENT.

2.

EROSION POTENTIAL FOR THIS PROJECT	CONTRACTOR ESC SUPERVISOR REQUIREMENT
( ) INSIGNIFICANT	NONE
( ) MINOR	CONTRACTOR TRAINING PROGRAM, AS DEFINED IN SECTION 6.2 OF THE DELAWARE SEDIMENT AND STORMWATER REGULATIONS.
( ) MEDIUM	CONTRACTOR TRAINING PROGRAM, AS DEFINED IN SECTION 6.2 OF THE DELAWARE SEDIMENT AND STORMWATER REGULATIONS.
(X) MAJOR	CERTIFIED CONSTRUCTION REVIEWER (CCR), AS DEFINED IN SECTION 6.3 OF THE DELAWARE SEDIMENT AND STORMWATER REGULATIONS.

3. ELECTRONIC PROJECT FILES THAT WILL BE MADE AVAILABLE TO THE AWARDED CONTRACTOR, INCLUDE:

( )	NONE
( )	ASCII DATA FILES WITH COORDINATES AND ELEVATIONS FOR PROPOSED POINTS AS SELECTED BY THE ENGINEER.
(X)	ALL PLAN SHEETS, IN PDF FORMAT.
( )	EXISTING DIGITAL TERRAIN MODEL, IN .DTM FILE FORMAT, COMPATIBLE WITH SOFTWARE CURRENTLY USED BY DELDOT.
( )	PROPOSED DIGITAL TERRAIN MODEL, IN .DTM FILE FORMAT, COMPATIBLE WITH SOFTWARE CURRENTLY USED BY DELDOT.
( )	DESIGN FILE, IN .DGN FILE FORMAT, CONTAINING ONLY THE PROPOSED 3D TRIANGLES OF THE PROPOSED DIGITAL TERRAIN MODEL (DTM).

NOTE: THE DOCUMENT ENTITLED "RELEASE FOR DELIVERY OF DOCUMENTS IN ELECTRONIC FORM TO A CONTRACTOR" MUST BE SIGNED BY ALL PARTIES PRIOR TO THE DELIVERY OF ANY ELECTRONIC PROJECT FILES.

4. PROJECT FILES THAT WILL BE MADE AVAILABLE TO THE CONTRACTOR, INCLUDE:

(X)	CROSS SECTIONS (WILL BE MADE AVAILABLE TO THE AWARDED CONTRACTOR)
(X)	RIGHT-OF-WAY PLANS (INCLUDED IN PLAN SET)

5. AMERICAN TRAFFIC SAFETY SERVICES ASSOCIATION (ATSSA) CERTIFIED TRAFFIC CONTROL SUPERVISOR REQUIREMENT FOR THIS PROJECT.

(X)	THE CONTRACTOR SHALL NOT BE REQUIRED TO HAVE AN ATSSA SUPERVISOR ASSIGNED TO THIS PROJECT.
( )	THE CONTRACTOR SHALL HAVE AN ATSSA SUPERVISOR ASSIGNED TO THIS PROJECT. THE CONTRACTOR'S GENERAL SUPERINTENDENT FOR THIS PROJECT OR ANOTHER ATSSA CERTIFIED MEMBER OF THE CONTRACTOR'S PROJECT STAFF MAY BE THE ATSSA SUPERVISOR. PAYMENT FOR ATSSA SUPERVISOR IS INCIDENTAL TO ITEM 743000.
( )	THE CONTRACTOR SHALL HAVE AN ATSSA SUPERVISOR ASSIGNED TO THIS PROJECT. THE ATSSA SUPERVISOR'S SOLE JOB SHALL BE SUPERVISION OF THE INSTALLATION, OPERATION AND MAINTENANCE OF TRAFFIC CONTROL DEVICES FOR THIS PROJECT. THE CONTRACTOR'S GENERAL SUPERINTENDENT FOR THIS PROJECT SHALL NOT BE THE ATSSA SUPERVISOR. PAYMENT FOR ATSSA SUPERVISOR SHALL BE PAID FOR UNDER ITEM 743031.

6. THE DISTURBED AREA FOR THIS PROJECT IS 0.9205 ACRES.

7. THE ADDITIONAL IMPERVIOUS AREA FOR THIS PROJECT IS 3,113 SQ. FEET.

8. THE EROSION AND SEDIMENT CONTROL PLANS HAVE BEEN APPROVED BY DELDOT'S STORMWATER ENGINEER UNDER DELDOT'S DELEGATED AUTHORITY. THE EROSION AND SEDIMENT CONTROL PLANS ARE VALID FOR A THREE YEAR PERIOD, BEGINNING ON THE DATE THE STORMWATER ENGINEER SIGNED THE CONSTRUCTION TITLE SHEET. IF THE FINAL ACCEPTANCE OF THE PROJECT IS ANTICIPATED TO EXTEND BEYOND THE THREE YEARS, THE CONTRACTOR SHALL INFORM THE ENGINEER THREE MONTHS PRIOR TO THE EXPIRATION OF THE EROSION AND SEDIMENT CONTROL PLAN APPROVAL. DELDOT WILL REVIEW THE CURRENT EROSION AND SEDIMENT CONTROL PLAN AND ISSUE AN EXTENSION WITH ANY APPROPRIATE MODIFICATIONS.

PROJECT NOTES

SECTION 100

1. ANY DAMAGE TO ITEMS NOTED TO BE RELOCATED OR RESET BY THE CONTRACTOR, OR MARKED "DO NOT DISTURB" (DND), AT THE DISCRETION OF THE ENGINEER, SHALL BE REPAIRED AND/OR REPLACED IN KIND AT THE CONTRACTOR'S EXPENSE.

SECTION 200

2. THE CONTRACTOR SHALL REMOVE AND RESET ALL MAILBOXES TO MAINTAIN MAIL SERVICE AS DIRECTED BY THE ENGINEER. THE CONTRACTOR SHALL RELOCATE MAILBOXES AS REQUIRED BY THE PROPOSED GEOMETRICS AND AS DIRECTED BY THE ENGINEER. WHEN RELOCATING MAILBOXES IN CURBED SECTIONS, THE FACE OF THE MAILBOX SHALL BE FLUSH WITH THE BACK EDGE OF CURB. WHEN RELOCATING MAILBOXES IN OPEN SECTIONS, THE FACE OF THE MAILBOX SHALL SET BACK 8 INCHES FROM THE EDGE OF THE PAVED SHOULDER. THE BOTTOM OF THE MAILBOX SHALL BE SET 46 INCHES ABOVE THE ROADWAY SURFACE. MAILBOXES LOCATED AT DRIVEWAY ENTRANCES SHALL BE PLACED ON THE FAR SIDE OF THE DRIVEWAY IN THE DIRECTION OF TRAVEL. POSTS BEING RESET IN CONCRETE SIDEWALK SHALL BE PLACED IN AN APPROPRIATE SIZE PVC SLEEVE. COST FOR ALL WORK AND MATERIALS SHALL BE PAID UNDER ITEM 201000 - CLEARING AND GRUBBING.

3. ITEMS TO BE REMOVED UNDER ITEM 211000 - REMOVAL OF STRUCTURES AND OBSTRUCTIONS SHALL INCLUDE, BUT NOT BE LIMITED TO THE FOLLOWING:
   - THE EXISTING BRIDGE 1-438 COMPRISED OF TWO 7'-0" HIGH x 10'-8" WIDE CORRUGATED METAL PIPE ARCHES.
   - THE EXISTING SACKED CONCRETE RIPRAP HEADWALLS UPSTREAM AND DOWNSTREAM OF THE BRIDGE.
   - THE EXISTING RIPRAP UPSTREAM AND DOWNSTREAM OF THE BRIDGE (STONE MAY BE RE-USED IF IT MEETS THE REQUIREMENTS FOR R-6 RIPRAP).
   - THE EXISTING GUARDRAIL ON THE NORTH AND SOUTH SIDES OF BLACKBIRD STATION ROAD.
   - THE EXISTING DRAINAGE PIPE LOCATED NORTHEAST OF THE BRIDGE.
   - THE EXISTING METAL FENCE NORTHWEST OF THE BRIDGE AND THE EXISTING WOODEN FENCE SOUTHWEST OF THE BRIDGE. (THE EXISTING WOODEN FENCE SOUTHWEST OF THE BRIDGE SHALL ONLY BE REMOVED FROM THE WORK ZONE AND SHALL BE RESET BY THE CONTRACTOR AT THE COMPLETION OF THE PROJECT).

SECTION 300

4. A. THE CONTRACTOR MAY ELECT TO USE ANY OF THE FOLLOWING MATERIALS TO MEET THE REQUIREMENTS OF ITEM 302007 - GRADED AGGREGATE BASE COURSE, TYPE 'B':
   a. CRUSHED STONE (PER STANDARD SPECIFICATION 821)
   b. CRUSHED CONCRETE (PER STANDARD SPECIFICATION 821)
   c. HOT-MIX MILLINGS (PER SPECIAL PROVISION 302514 MILLED HOT-MIX BASE COURSE)

   THE CONTRACTOR WILL NOT BE ALLOWED TO MIX DIFFERENT MATERIALS (OR SIMILAR MATERIALS FROM DIFFERENT SOURCES) TO MEET THE REQUIREMENTS OF ITEM 302007 - GRADED AGGREGATE BASE COURSE, TYPE 'B'.

   ALL OF THE ABOVE LISTED MATERIALS ARE PERMITTED FOR USE ON THE JOB, PROVIDED THEY ARE SEPARATED INTO APPROVED AREAS. EACH AREA OF BASE COURSE MUST BE CONSTRUCTED USING MATERIALS FROM A SINGULAR SOURCE, FULL DEPTH, IN ORDER THAT PROPER TESTING MAY BE ACCOMPLISHED. THE CONTRACTOR AND ENGINEER SHALL AGREE ON THE LIMITS OF EACH SOURCE OF MATERIAL PRIOR TO PLACEMENT.

   B. THE QUANTITY USED FOR BASE OF EACH OF THE ABOVE LISTED MATERIALS WILL BE THE CONTRACTOR'S CHOICE, WITH THE TOTAL BEING EQUAL TO THE ACTUAL QUANTITY USED UNDER ITEM 302007 - GRADED AGGREGATE BASE COURSE, TYPE 'B'.

   C. THE CONTRACTOR MAY ALSO ELECT TO RECYCLE MILLINGS FOR USE IN HOT-MIX AS PERMITTED BY THE STANDARD SPECIFICATIONS. THE CHOICE OF THE QUANTITY OF MILLINGS USED FOR THIS PURPOSE, OR FOR BASE COURSE, LIES WITH THE CONTRACTOR. ALL EXCESS MILLING MATERIAL SHALL BECOME PROPERTY OF THE CONTRACTOR.

   D. HOT-MIX MILLINGS MAY BE GENERATED FROM THE FOLLOWING SOURCES:
   a. MATERIAL MILLED ON THIS CONTRACT AT THE CONTRACTOR'S CHOICE UNDER ITEM 202000.
   b. MILLED MATERIAL FURNISHED ON THE JOB FROM THE CONTRACTOR'S YARD OR OTHER OUTSIDE SOURCE.
   ALL MILLED MATERIALS SHALL MEET THE MATERIAL REQUIREMENTS OF ITEM 302514 - MILLED HOT-MIX BASE COURSE.

   E. PAYMENT CLARIFICATION:
   a. SHOULD THE CONTRACTOR ELECT TO MILL PORTIONS OF HOT-MIX SHOWN ON THE PLANS TO BE REMOVED UNDER ITEM 202000 - EXCAVATION AND EMBANKMENT THE COST OF MILLING THIS HOT-MIX WILL BE PAID AS ITEM 202000 - EXCAVATION AND EMBANKMENT. THE MILLINGS GENERATED MAY BE RECYCLED INTO HOT-MIX, UTILIZED FOR BASE COURSE, OR DISPOSED OF TO AN APPROVED SITE. HAULING COSTS FOR DISPOSAL AND/OR RECYCLING ARE INCIDENTAL TO ITEM 202000 - EXCAVATION AND EMBANKMENT.

   b. SHOULD THE CONTRACTOR ELECT TO TEMPORARILY STOCKPILE MILLINGS ON THE JOB SITE FOR LATER USE, ALL COSTS FOR STOCKPILING AND SUBSEQUENT REHANDLING SHALL BE INCIDENTAL TO ITEM 202000 - EXCAVATION AND EMBANKMENT.

   c. MILLINGS USED FOR BASE COURSE SHALL BE PLACED IN ACCORDANCE WITH THE REQUIREMENTS OF SPECIAL PROVISION 302514 - MILLED HOT-MIX BASE COURSE. NO SEPARATE PAYMENT WILL BE MADE TO FURNISH MILLINGS FROM AN OUTSIDE SOURCE OR TRANSPORT MILLINGS WITHIN THE PROJECT LIMITS. MILLINGS USED FOR BASE COURSE WILL BE PAID FOR AT THE UNIT BID PRICE FOR ITEM 302007 - GRADED AGGREGATE BASE COURSE, TYPE 'B'.

   d. ALL COSTS TO UTILIZE MILLINGS IN RECYCLED HOT-MIX WILL BE INCIDENTAL TO THE UNIT PRICE BID FOR THE HOT-MIX ITEM USING THE RECYCLED MATERIAL.

   e. SPECIAL PROVISION 302514 - MILLED HOT-MIX BASE COURSE IS PROVIDED TO SPECIFY THE MEANS OF LAY DOWN AND COMPACTION AS WELL AS THE MATERIAL REQUIREMENTS FOR MILLINGS USED AS BASE COURSE. ALL COSTS TO BRING THE MILLINGS INTO COMPLIANCE WITH THE REQUIREMENTS OF ITEM - 302514 MILLED HOT-MIX BASE COURSE ARE INCIDENTAL TO ITEM 302007 - GRADED AGGREGATE BASE COURSE, TYPE 'B'. NO PAYMENT WILL BE MADE FOR ITEM 302514 - MILLED HOT-MIX BASE COURSE. THE QUANTITY OF MILLINGS USED FOR BASE COURSE WILL BE PAID FOR UNDER ITEM 302007 - GRADED AGGREGATE BASE COURSE.

SECTION 600

5. PORTLAND CEMENT CONCRETE
   STRUCTURAL ELEMENTS OF PORTLAND CEMENT CONCRETE SHALL BE AS NOTED: F'c = 28 DAY COMPRESSIVE STRENGTH
   ITEM 623002 - PRESTRESSED REINFORCED CONCRETE MEMBERS, BOX-BEAMS - F'c = 8.0 KSI
   ITEM 602758 - PRECAST CONCRETE ABUTMENT - F'c = 5.0 KSI
   ITEM 602738 - PRECAST CONCRETE RETAINING WALL - F'c = 5.0 KSI
   MIX REQUIREMENTS SHALL CONFORM TO SECTION 812 OF THE SPECIFICATIONS WITH THE FOLLOWING EXCEPTIONS:
   ALL EXPOSED EDGES SHALL BE CHAMFERED 3/4" UNLESS OTHERWISE NOTED. ALL NON-RIDING EXPOSED CONCRETE SURFACES SHALL BE COATED WITH SILICONE ACRYLIC CONCRETE SEALER.

6. BAR REINFORCEMENT
   REINFORCING STEEL SHALL CONFORM TO AASHTO M31 (ASTM A615), GRADE 60. ALL REINFORCING STEEL SHALL HAVE A CLEAR COVER OF 2" MINIMUM UNLESS OTHERWISE SPECIFIED ON THE PLANS. ALL REINFORCING STEEL SHALL BE PROTECTED WITH EPOXY COATED REINFORCING CONFORMING TO M284 (ASTM D3963).

SECTION 700

7. ALL PAVED AREAS TO BE RECONSTRUCTED OR WIDENED SHALL BE SAWCUT AT THE POINT WHERE THE NEW PAVEMENT IS TO TIE INTO THE EXISTING PAVEMENT. ALL HOT-MIX SAW CUTTING SHALL BE FULL DEPTH, UNLESS OTHERWISE NOTED ON THE PLANS, OR AS DIRECTED BY THE ENGINEER.

8. MAINTENANCE OF TRAFFIC SHALL BE AS PER DETOUR PLAN. THE DETOUR SHALL REMAIN IN EFFECT UNTIL ALL WORK IS COMPLETE. ALL MOT ITEMS WITH THE EXCEPTION OF CHANGEABLE MESSAGE BOARDS AND FLAGGERS WILL BE INCLUDED IN ITEM 763643 - MAINTENANCE OF TRAFFIC, ALL INCLUSIVE.

9. THE CONTRACTOR WILL INSTALL 2" HDPE CONDUIT (ITEM #745602) UNDERNEATH BLACKBIRD STATION ROAD FROM DELMARVA POWER POLE #45108-29594 TO THE DEMA ALARM POLE. ATTACH 2" HDPE CONDUIT (ITEM #745605) TO EACH POLE TO A HEIGHT OF 10 FEET ABOVE THE GROUND LEVEL. INSTALL 3 RUNS OF #4 AWG CU (1 EACH OF RED-BLACK-WHITE) (ITEM #746908) IN THE 2" HDPE CONDUIT RUNNING UNDERNEATH BLACKBIRD STATION ROAD. LEAVE 40 LF IN A COIL AT EACH END OF THE 2" HDPE CONDUIT FOR CONNECTION BY DELMARVA POWER. THE CONTRACTOR WILL NOTIFY TOM SMITH, DELMARVA POWER, AT 302-454-4138 AT LEAST 72 HOURS BEFORE PERFORMING THIS WORK.

SECTION 900

10. THIS PROJECT IS COVERED UNDER AN NPDES GENERAL PERMIT FOR CONSTRUCTION. UNDER THE GENERAL PERMIT, COMPLIANCE WITH DELDOT'S APPROVED SEDIMENT AND STORMWATER MANAGEMENT PLANS WILL CONSTITUTE COMPLIANCE WITH THE NPDES INDUSTRIAL PERMITTING REQUIREMENTS FOR THIS CONSTRUCTION PROJECT. A COPY OF THE NPDES GENERAL PERMIT AND NOI IS KEPT ON FILE IN EACH OF THE CONSTRUCTION OFFICES AND THE DEPARTMENT'S TEAM SUPPORT SECTION. A COPY OF THE GENERAL PERMIT OR THE NOI CAN BE OBTAINED UPON REQUEST FROM EITHER THE DEPARTMENT'S STORMWATER ENGINEER OR THE APPROPRIATE CONSTRUCTION ENGINEER.

MISCELLANEOUS

11. DESIGN CRITERIA
    2014 AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 7TH EDITION, U.S. CUSTOMARY UNITS.

12. LOADING
    AASHTO HL-93 FOR LIVE LOAD
    25 PSF DEAD LOAD HAS BEEN INCLUDED FOR FUTURE OVERLAY.

13. HYDRAULIC DATA
    -DRAINAGE AREA = 4.06 SQ. MILES
    -DESIGN FREQUENCY = 25-YEARS
    -DESIGN DISCHARGE = 857 CFS
    -25-YEAR FLOOD ELEVATION = 22.91 FT (UPSTREAM)

14. SCOUR ANALYSIS
    THE PROPOSED STRUCTURE HAS BEEN ANALYZED FOR THE EFFECTS OF SCOUR IN ACCORDANCE WITH HEC-18 - 'EVALUATING SCOUR AT BRIDGES'.
    -DESIGN EVENT = 100-YEAR
    -DESIGN DISCHARGE = 1,296 CFS
    -DESIGN VELOCITY = 5.66 FT/SEC
    -TAILWATER DEPTH = 7.01 FT

15. THE CONTRACTOR SHALL CONTACT WILLIAM LOTHARP, THE CHIEF OF SCHEDULING FOR DART FIRST STATE, 14 DAYS PRIOR TO THE START OF CONSTRUCTION AT 302-576-6006.

16. THE CONTRACTOR SHALL CONTACT ANTHONY TALLMAN, USGS, WITH QUESTIONS REGARDING THE USGS STREAM GAGE OR EXISTING CONCRETE WEIR LOCATED DOWNSTREAM OF BRIDGE 1-438 AT 302-734-2506 EXT. 223.

17. UTILITIES
    SEE UTILITY STATEMENT AND UTILITY RELOCATION PLAN FOR RELOCATION DETAILS.

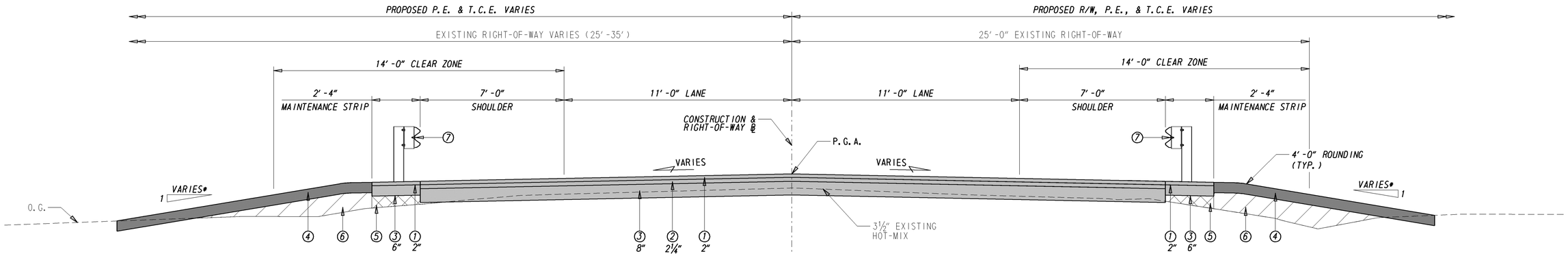
18. ENVIRONMENTAL COMPLIANCE
    REFER TO THE ENVIRONMENTAL COMPLIANCE PLAN FOR FURTHER RESTRICTIONS/GUIDANCE ASSOCIATED WITH THIS PROJECT.

19. ALL FLUSHING OF PIPES IN JURISDICTIONAL WATERS MUST INCLUDE MEASURES FOR SEDIMENT CONTAINMENT AND REMOVAL. REFER TO JURISDICTIONAL AREAS IDENTIFIED ON THE ENVIRONMENTAL COMPLIANCE SHEETS.

LOAD RATING SUMMARY

DESIGN VEHICLE	RATING FACTOR	RATING WEIGHT (TON)	CONTROLLING MEMBER	CONTROLLING POINT	LOAD EFFECT
HL-93 TRUCK (INVENTORY)	1.11	N/A	SPAN 1: EXTERIOR BEAM	106	LONG. REIN
HL-93 TANDEM (INVENTORY)	1.18	N/A	SPAN 1: EXTERIOR BEAM	105	LONG. REIN
HL-93 TRUCK TRAIN (INVENTORY)	N/A	N/A	N/A	N/A	N/A
HS-20 (INVENTORY)	1.11	39.92	SPAN 1: EXTERIOR BEAM	106	LONG. REIN
HL-93 TRUCK (OPERATING)	1.39	N/A	SPAN 1: EXTERIOR BEAM	106	LONG. REIN
HL-93 TANDEM (OPERATING)	1.49	N/A	SPAN 1: EXTERIOR BEAM	105	LONG. REIN
HL-93 TRUCK TRAIN (OPERATING)	N/A	N/A	N/A	N/A	N/A
HS-20 (OPERATING)	1.39	50.00	SPAN 1: EXTERIOR BEAM	106	LONG. REIN
DE S220 & LEGAL-LANE (LEGAL)	2.18	43.68	SPAN 1: EXTERIOR BEAM	105	CONC. STRESS
DE S335 & LEGAL-LANE (LEGAL)	1.19	41.60	SPAN 1: EXTERIOR BEAM	105	CONC. STRESS
DE S437 & LEGAL-LANE (LEGAL)	1.13	41.38	SPAN 1: EXTERIOR BEAM	105	CONC. STRESS
DE S330 & LEGAL-LANE (LEGAL)	1.99	59.63	SPAN 1: EXTERIOR BEAM	105	CONC. STRESS
DE S435 & LEGAL-LANE (LEGAL)	1.69	59.12	SPAN 1: EXTERIOR BEAM	105	CONC. STRESS
DE S540 & LEGAL-LANE (LEGAL)	1.59	63.60	SPAN 1: EXTERIOR BEAM	105	CONC. STRESS

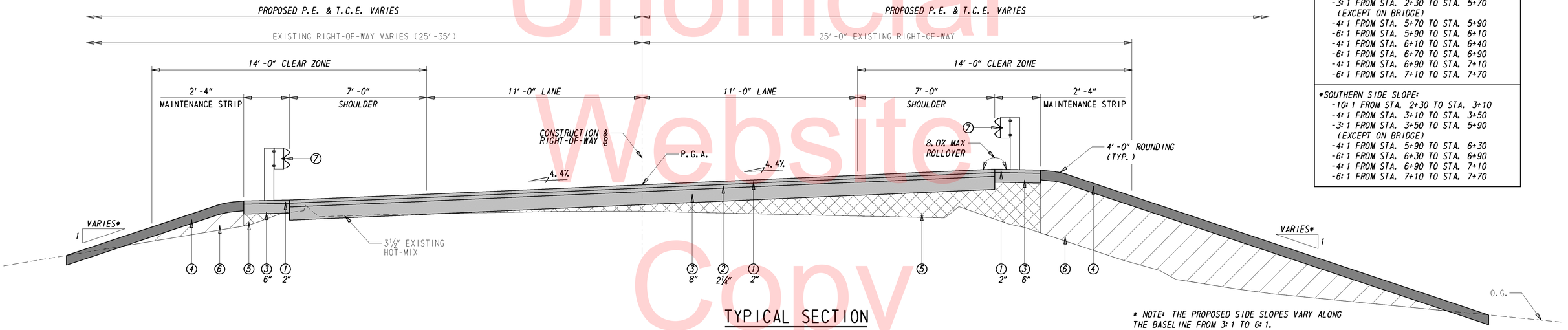
NOTE: LOAD RATING INCLUDES FUTURE WEARING SURFACE AS NOTED IN THE PLANS.



TYPICAL SECTION

TRANSITIONING CROSS SLOPES
(STA. 2+30 - STA. 4+00 & STA. 5+33 - STA. 7+70)

* NOTE:
SEE GRADES AND GEOMETRIC SHEET FOR INFORMATION ON THE ROADWAY CROSS SLOPES AND SUPERELEVATIONS.



TYPICAL SECTION

FULL SUPERELEVATION
(STA. 4+00 - STA. 5+33)

* NOTE: THE PROPOSED SIDE SLOPES VARY ALONG THE BASELINE FROM 3:1 TO 6:1.

*THE PROPOSED SIDE SLOPES VARY ALONG THE BASELINE AS SUCH:

*NORTHERN SIDE SLOPE:
- -3:1 FROM STA. 2+30 TO STA. 5+70 (EXCEPT ON BRIDGE)
- -4:1 FROM STA. 5+70 TO STA. 5+90
- -6:1 FROM STA. 5+90 TO STA. 6+10
- -4:1 FROM STA. 6+10 TO STA. 6+40
- -6:1 FROM STA. 6+70 TO STA. 6+90
- -4:1 FROM STA. 6+90 TO STA. 7+10
- -6:1 FROM STA. 7+10 TO STA. 7+70

*SOUTHERN SIDE SLOPE:
- -10:1 FROM STA. 2+30 TO STA. 3+10
- -4:1 FROM STA. 3+10 TO STA. 3+50
- -3:1 FROM STA. 3+50 TO STA. 5+90 (EXCEPT ON BRIDGE)
- -4:1 FROM STA. 5+90 TO STA. 6+30
- -6:1 FROM STA. 6+30 TO STA. 6+90
- -4:1 FROM STA. 6+90 TO STA. 7+10
- -6:1 FROM STA. 7+10 TO STA. 7+70

TYPICAL ROADWAY LEGEND

① ITEM 401801 - BITUMINOUS CONCRETE, SUPERPAVE, TYPE 'C', 160 GYRATIONS PG 64-22, (CARBONATE STONE)

② ITEM 401810 - BITUMINOUS CONCRETE, SUPERPAVE TYPE 'B', 160 GYRATIONS, PG 64-22

③ ITEM 302007 - GRADED AGGREGATE BASE COURSE, TYPE 'B'

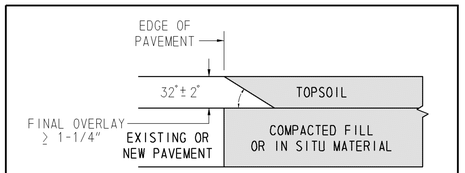
④ ITEM 908004 - TOPSOIL, 6" DEPTH
ITEM 908019 - STREAMBANK SEED MIX, SEEDING

⑤ ITEM 209001 - BORROW, TYPE 'A'

⑥ ITEM 209006 - BORROW, TYPE 'F'

⑦ ITEM 720050 - GALVANIZED STEEL BEAM GUARDRAIL, TYPE 1-31
ITEM 725003 - GUARDRAIL TO BARRIER CONNECTION, APPROACH TYPE 2-31

MATERIAL	LIFT THICKNESS	
	MINIMUM	MAXIMUM
HOT-MIX, TYPE 'C'	1.25"	2"
HOT-MIX, TYPE 'B'	2.25"	4"
BITUMINOUS CONCRETE BASE COURSE	3"	6"
GRADED AGGREGATE BASE COURSE	--	8"



SAFETY EDGE DETAIL

HOT-MIX PAVEMENTS AND OVERLAYS
NOT TO SCALE

DELAWARE DEPARTMENT OF TRANSPORTATION

ADDENDUMS / REVISIONS

SCALE 0 2.5 5.0 7.5 FEET

BR 1-438 ON N463 BLACKBIRD STATION ROAD OVER BLACKBIRD CREEK

CONTRACT	BRIDGE NO.	1-438
T201407104	DESIGNED BY: NED	
COUNTY	CHECKED BY: CAS	
NEW CASTLE		

TYPICAL SECTIONS

SHEET NO.
4
TOTAL SHTS.
27

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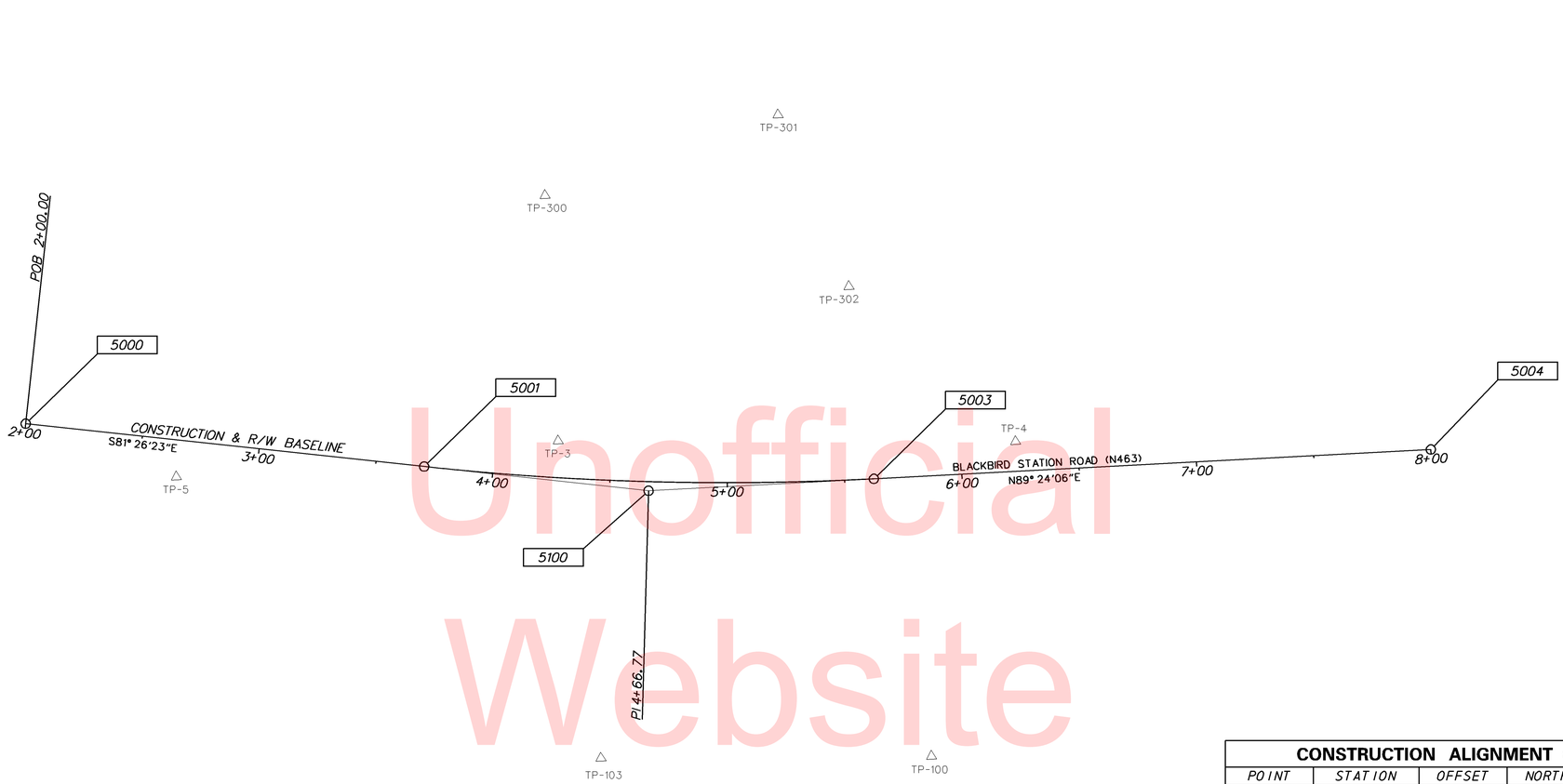

CONSTRUCTION ALIGNMENT CONTROL				
POINT	STATION	OFFSET	NORTHING	EASTING
5000	2+00.00	0.00	497696.6538	584404.3279
5004	8+00.00	0.00	497660.4297	585001.7474

HORIZONTAL / VERTICAL CONTROL DATA					
POINT	STATION	OFFSET	NORTHING	EASTING	ELEVATION
TP-3	4+27.02	-15.69	497679.7854	584630.5993	27.06
TP-4	6+23.55	-12.72	497671.3027	584825.1741	27.55
TP-5	2+66.24	15.65	497671.3232	584467.4974	33.05
TP-100	5+80.76	119.28	497538.8704	584783.7640	23.97
TP-101	4+96.86	201.38	497457.8779	584689.7304	23.16
TP-102	4+30.16	225.91	497439.0666	584609.6121	23.71
TP-103	4+51.01	118.40	497543.9631	584643.1377	23.06
TP-200	5+23.50	278.07	497380.1764	584719.1396	35.63
TP-201	3+73.29	318.36	497355.9423	584528.9912	36.06
TP-300	4+13.85	-119.67	497784.4960	584629.4454	23.20
TP-301	5+24.99	-156.50	497814.6067	584730.0102	20.73
TP-302	5+55.74	-82.39	497740.2830	584757.1024	22.88

DATUM REFERENCE:

HORIZONTAL - THIS PROJECT IS REFERENCED TO THE DELAWARE STATE PLANE COORDINATE SYSTEM (NAD 83/91).

VERTICAL - THIS PROJECT IS REFERENCED TO NAVD 88.

Element: Circular

PC (5001)	3+70.66	497671.2517	584573.0851
PI (5100)	4+66.77	497656.9456	584668.1268
CC (5002)		498857.8838	584751.7025
PT (5003)	5+62.47	497657.9493	584764.2340

Radius:	1200.00
Delta:	9°09'30.6326" Left
Degree of Curvature(Arc):	4°46'28.7339"
Length:	191.82
Tangent:	96.11
Chord:	191.61
Middle Ordinate:	3.83
External:	3.84
Tangent Direction:	S 81°26'23.4160" E
Radial Direction:	S 8°33'36.5840" W
Chord Direction:	S 86°01'08.7324" E
Radial Direction:	S 0°35'54.0487" E
Tangent Direction:	N 89°24'05.9513" E

DELAWARE DEPARTMENT OF TRANSPORTATION

ADDENDUMS / REVISIONS

SCALE 0 30 60 90 FEET

BR 1-438 ON N463 BLACKBIRD STATION ROAD OVER BLACKBIRD CREEK

CONTRACT T201407104

COUNTY NEW CASTLE

BRIDGE NO. 1-438

DESIGNED BY: NED

CHECKED BY: CAS

HORIZONTAL AND VERTICAL CONTROL

SHEET NO. 5

TOTAL SHTS. 27

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RIGHT-OF-WAY MONUMENT SCHEDULE

NO.	TYPE	STATION	OFFSET	NORTHING	EASTING
1	CAPPED REBAR	6+20.00	-29.35'	497687.8988	584821.4468
2	CAPPED REBAR	2+92.19	25.00'	497658.2100	584491.7697
3	CAPPED REBAR	6+06.74	41.48'	497616.9381	584808.9328
4	CAPPED REBAR	6+45.76	56.00'	497602.8259	584848.0969
5	CAPPED REBAR	6+77.85	53.00'	497606.1545	584880.1553
6	CAPPED REBAR	7+00.00	25.00'	497634.3869	584902.0159

*NOTE: PROPOSED UTILITIES NOT SHOWN FOR CLARITY. SEE UTILITY RELOCATION PLAN FOR DETAILS ON PROPOSED UTILITY LOCATIONS.

LANDSCAPE PLANTING SCHEDULE

NO.	PLANTING DESCRIPTION	QUANTITY
1	EASTERN RED CEDAR - JUNIPERUS VIRGINIANA (SPA. 8'-0" TO 10'-0" O.C.)	6 TREES

NOTE: THE DEPARTMENT SHALL BE IN CHARGE OF PLANTING THE PROPOSED TREES. THE PLANTINGS SHALL BE PAID FOR UNDER THE DEPARTMENT'S OPEN-END LANDSCAPING CONTRACT.

RIPRAP ENERGY DISSIPATOR SCHEDULE

NO.	T1	D	L	W1	W2	PIPE EL.	DIS. EL.
1	1'-0"	1'-6"	8'-0"	2'-0"	7'-6"	28.80	28.25

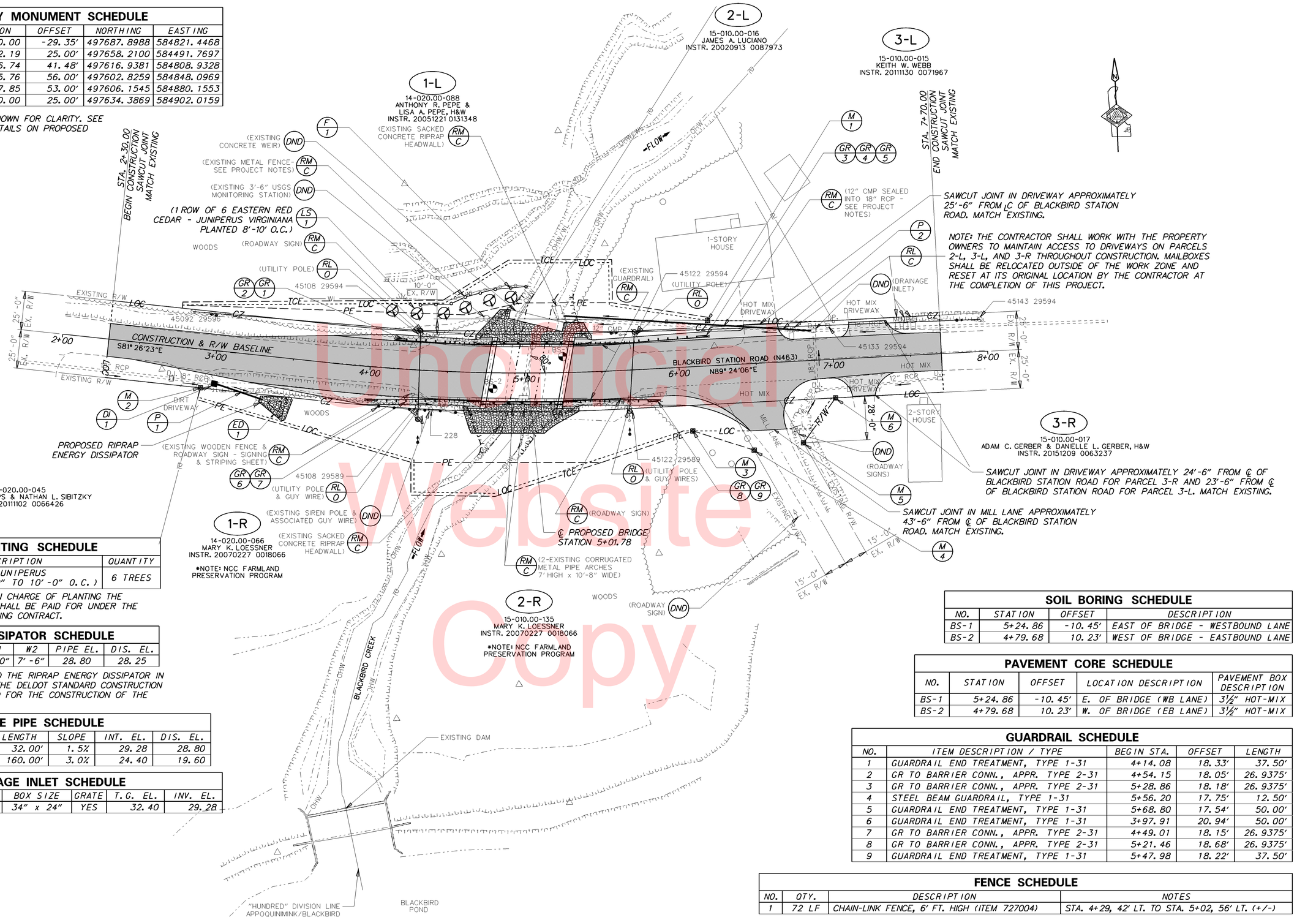
NOTE: THE CONTRACTOR SHALL BUILD THE RIPRAP ENERGY DISSIPATOR IN ACCORDANCE WITH DETAIL E-20 IN THE DELDOT STANDARD CONSTRUCTION DETAIL. R-4 RIPRAP SHALL BE USED FOR THE CONSTRUCTION OF THE ENERGY DISSIPATOR.

DRAINAGE PIPE SCHEDULE

NO.	SIZE / TYPE	CLASS	LENGTH	SLOPE	INT. EL.	DIS. EL.
1	18" R.C.P.	III	32.00'	1.5%	29.28	28.80
2	18" R.C.P.	III	160.00'	3.0%	24.40	19.60

DRAINAGE INLET SCHEDULE

NO.	STATION	OFFSET	BOX SIZE	GRATE	T.G. EL.	INV. EL.
1	3+01.00	21.18'	34" x 24"	YES	32.40	29.28



SOIL BORING SCHEDULE

NO.	STATION	OFFSET	DESCRIPTION
BS-1	5+24.86	-10.45'	EAST OF BRIDGE - WESTBOUND LANE
BS-2	4+79.68	10.23'	WEST OF BRIDGE - EASTBOUND LANE

PAVEMENT CORE SCHEDULE

NO.	STATION	OFFSET	LOCATION DESCRIPTION	PAVEMENT BOX DESCRIPTION
BS-1	5+24.86	-10.45'	E. OF BRIDGE (WB LANE)	3½" HOT-MIX
BS-2	4+79.68	10.23'	W. OF BRIDGE (EB LANE)	3½" HOT-MIX

GUARDRAIL SCHEDULE

NO.	ITEM DESCRIPTION / TYPE	BEGIN STA.	OFFSET	LENGTH
1	GUARDRAIL END TREATMENT, TYPE 1-31	4+14.08	18.33'	37.50'
2	GR TO BARRIER CONN., APPR. TYPE 2-31	4+54.15	18.05'	26.9375'
3	GR TO BARRIER CONN., APPR. TYPE 2-31	5+28.86	18.18'	26.9375'
4	STEEL BEAM GUARDRAIL, TYPE 1-31	5+56.20	17.75'	12.50'
5	GUARDRAIL END TREATMENT, TYPE 1-31	5+68.80	17.54'	50.00'
6	GUARDRAIL END TREATMENT, TYPE 1-31	3+97.91	20.94'	50.00'
7	GR TO BARRIER CONN., APPR. TYPE 2-31	4+49.01	18.15'	26.9375'
8	GR TO BARRIER CONN., APPR. TYPE 2-31	5+21.46	18.68'	26.9375'
9	GUARDRAIL END TREATMENT, TYPE 1-31	5+47.98	18.22'	37.50'

FENCE SCHEDULE

NO.	QTY.	DESCRIPTION	NOTES
1	72 LF	CHAIN-LINK FENCE, 6' FT. HIGH (ITEM 727004)	STA. 4+29, 42' LT. TO STA. 5+02, 56' LT. (+/-)

DELAWARE
DEPARTMENT OF TRANSPORTATION

ADDENDUMS / REVISIONS

SCALE 0 30 60 90 FEET

BR 1-438 ON N463 BLACKBIRD STATION ROAD OVER BLACKBIRD CREEK

CONTRACT	BRIDGE NO.	1-438
T201407104	DESIGNED BY: NED	
COUNTY	CHECKED BY: CAS	
NEW CASTLE		

CONSTRUCTION PLAN

SHEET NO. 6
TOTAL SHTS. 27

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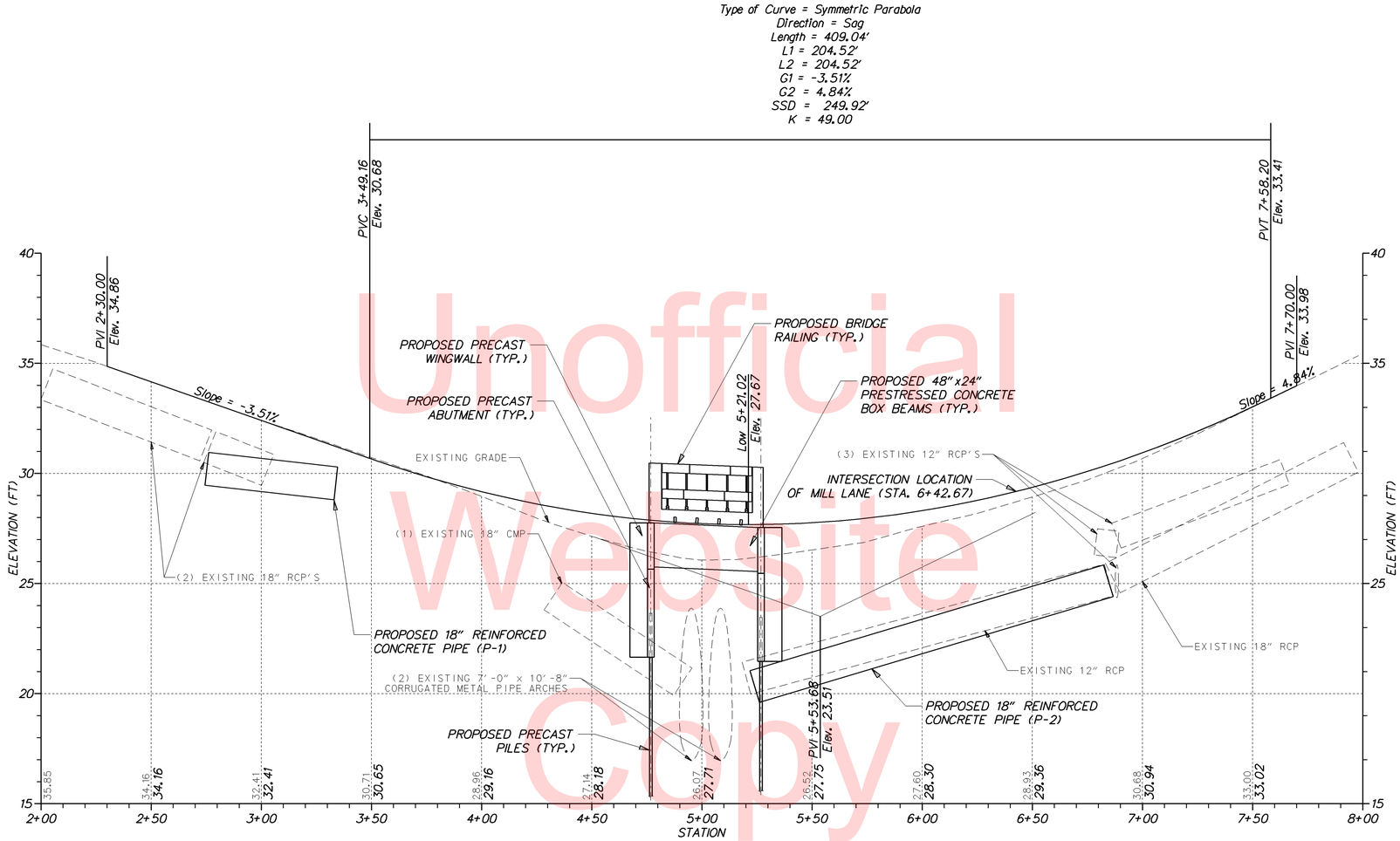

N463 – BLACKBIRD STATION ROAD

VERTICAL SCALE FEET 0 3 6 9

DELAWARE DEPARTMENT OF TRANSPORTATION	ADDENDUMS / REVISIONS	SCALE 0 30 60 90 FEET	BR 1-438 ON N463 BLACKBIRD STATION ROAD OVER BLACKBIRD CREEK	CONTRACT T201407104	BRIDGE NO. 1-438	PROFILE
				COUNTY NEW CASTLE	DESIGNED BY: NED	SHEET NO. 7
					CHECKED BY: CAS	TOTAL SHTS. 27

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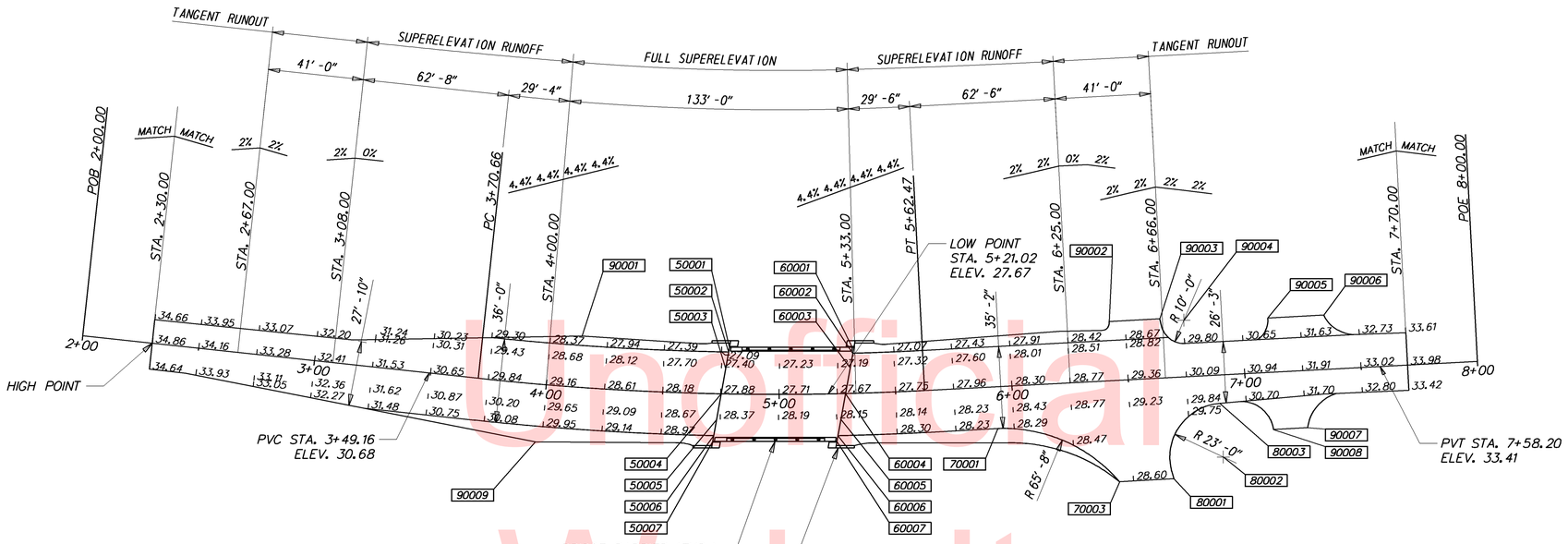

COORDINATE LIST

POINT NO.	STATION	OFFSET	NORTHING	EASTING	ELEVATION
50001	4+78.37	-20.04'	497680.0235	584681.3716	26.97
50002	4+78.04	-18.00'	497678.0050	584680.9228	27.06
50003	4+76.91	-11.00'	497671.0835	584679.3820	27.38
50004	4+75.15	0.00'	497660.2136	584676.9629	27.88
50005	4+73.43	11.00'	497649.3451	584674.5441	28.38
50006	4+72.35	18.00'	497642.4289	584673.0050	28.70
50007	4+71.98	20.47'	497639.9885	584672.4619	28.81
60001	5+31.93	-19.79'	497677.8034	584733.9915	26.81
60002	5+32.07	-17.21'	497675.2285	584734.0903	26.92
60003	5+30.77	-11.00'	497669.0328	584732.7119	27.19
60004	5+28.51	0.00'	497658.0752	584730.2733	27.67
60005	5+26.29	11.00'	497647.1189	584727.8350	28.16
60006	5+24.90	18.00'	497640.1517	584726.2845	28.46
60007	5+24.42	20.42'	497637.7403	584725.7478	28.57
70001	5+92.89	17.93'	497640.3349	584794.8336	28.26
70002	5+92.05	83.54'	497574.7248	584794.6761	N/A
70003	6+43.96	43.44'	497615.3672	584846.1665	28.48
80001	6+67.34	43.44'	497615.6114	584869.5461	28.96
80002	6+89.00	35.20'	497624.0702	584891.1181	N/A
80003	6+88.70	12.20'	497647.0639	584890.5777	30.29
90001	4+13.81	-22.07'	497687.5260	584618.3635	28.11
90002	6+43.04	-25.42'	497684.2095	584844.5300	28.32
90003	6+64.86	-25.41'	497684.4288	584866.3447	28.80
90004	6+75.17	-24.26'	497683.3828	584876.6720	N/A
90005	7+11.08	-23.33'	497682.8309	584912.5856	30.05
90006	7+35.17	-23.31'	497683.0596	584936.6796	30.03
90007	7+25.80	24.53'	497635.1305	584927.8057	32.00
90008	7+11.06	24.55'	497634.9506	584913.0665	31.12
90009	3+97.42	24.75'	497643.0099	584596.4581	29.46

DELAWARE
DEPARTMENT OF TRANSPORTATION

ADDENDUMS / REVISIONS

SCALE
0 30 60 90
FEET

BR 1-438 ON N463 BLACKBIRD STATION ROAD OVER BLACKBIRD CREEK

CONTRACT	BRIDGE NO.	1-438
T201407104	DESIGNED BY: NED	
COUNTY	CHECKED BY: CAS	
NEW CASTLE		

GRADES AND GEOMETRICS

SHEET NO.
8
TOTAL SHTS.
27

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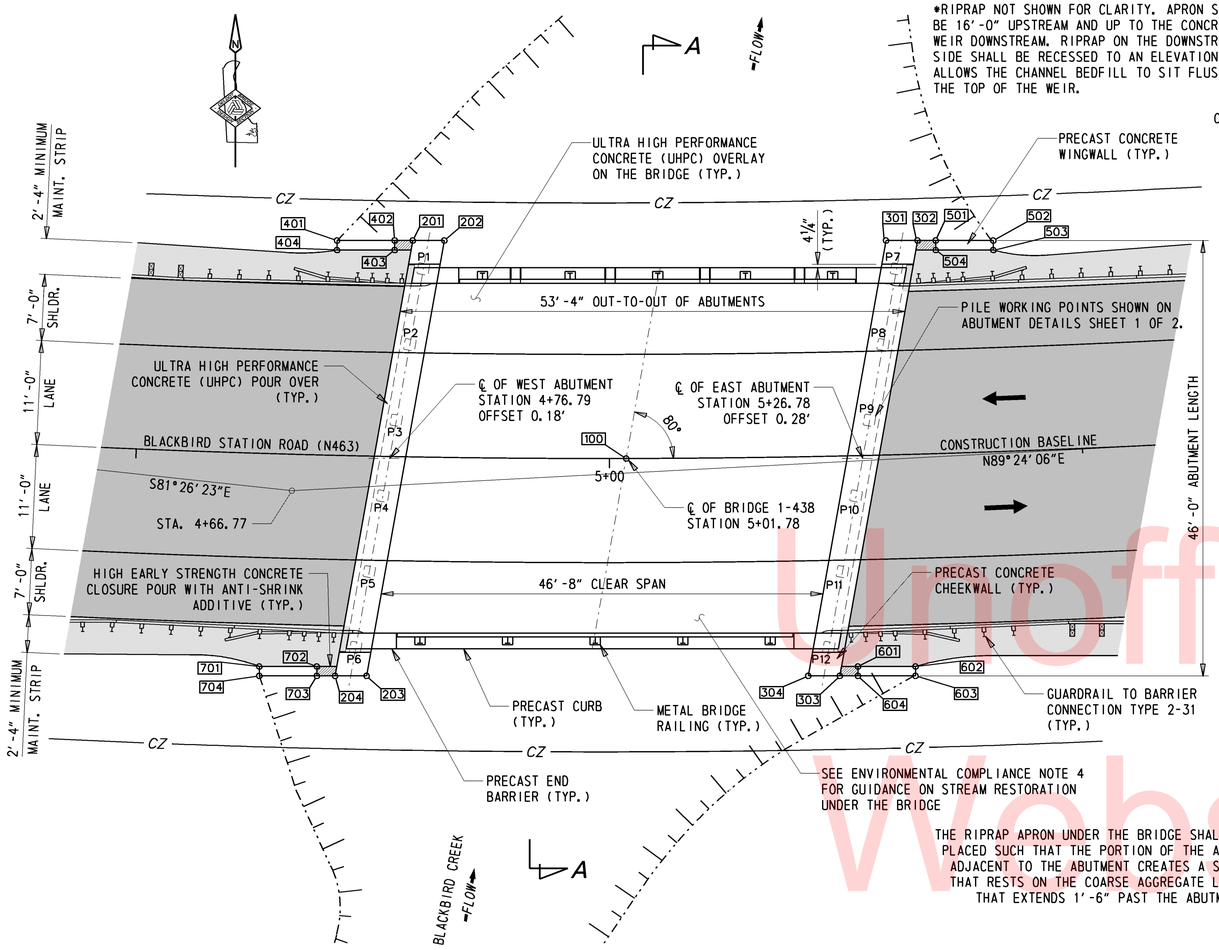
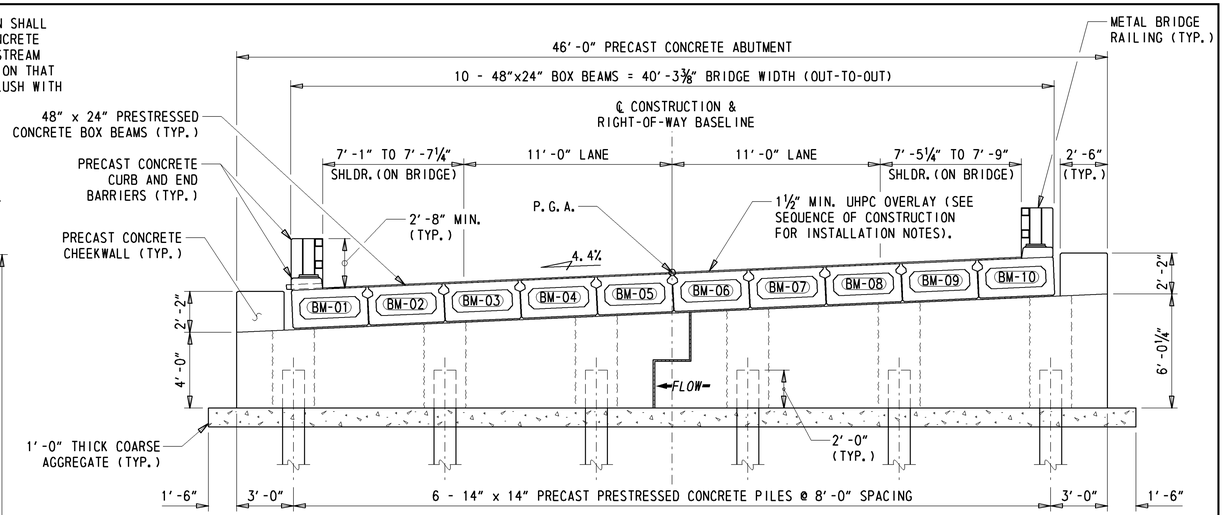


PLAN

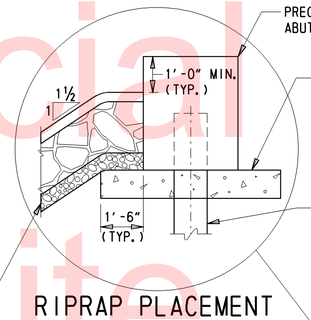
1/8" = 1'-0"



BRIDGE SECTION

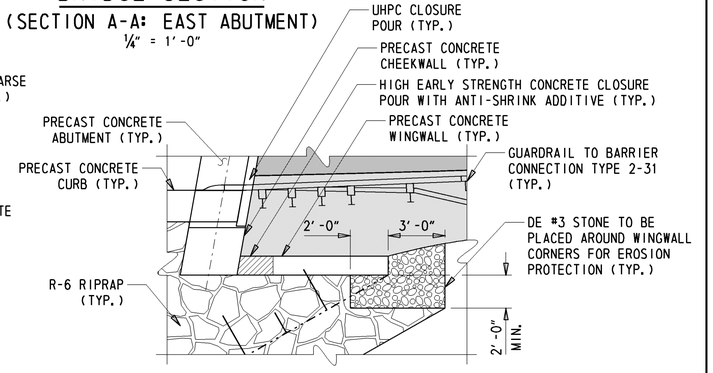
(SECTION A-A: EAST ABUTMENT)

¼" = 1'-0"



RIPRAP PLACEMENT UNDER BRIDGE

⅜" = 1'-0"

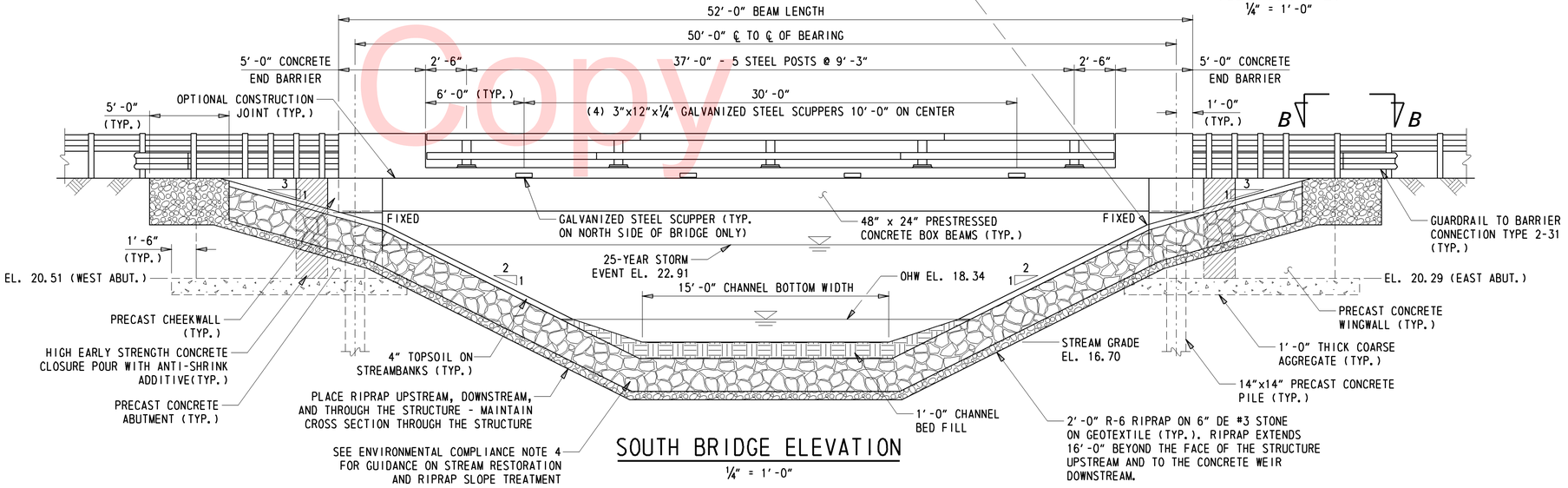


EROSION PROTECTION DETAIL

(SECTION B-B)

¼" = 1'-0"

WORKING POINTS					
	PT.	STATION	OFFSET	NORTHING	EASTING
	100	5+01.78	0.00	497658.8502	584703.5527
WEST ABUTMENT	201	4+78.84	-22.86	497682.8123	584681.9923
	202	4+82.23	-22.91	497682.6718	584685.3226
	203	4+74.81	23.22	497637.0592	584675.1716
	204	4+71.55	23.29	497637.1997	584671.8413
EAST ABUTMENT	301	5+29.81	-22.66	497680.7046	584731.9478
	302	5+33.20	-22.57	497680.5641	584735.2782
	303	5+23.87	23.22	497634.9515	584725.1272
	304	5+20.60	23.16	497635.0920	584721.7968
NORTHWEST WINGWALL	401	4+70.68	-22.70	497683.1495	584673.9994
	402	4+76.88	-22.83	497682.8931	584680.0773
	403	4+76.90	-21.83	497681.8940	584680.0352
	404	4+70.71	-21.70	497682.1504	584673.9572
NORTHEAST WINGWALL	501	3+35.16	-22.51	497680.4833	584737.1932
	502	5+41.35	-22.31	497680.2269	584743.2711
	503	5+41.32	-21.31	497679.2277	584743.2289
	504	5+35.12	-21.51	497679.4842	584737.1510
SOUTHEAST WINGWALL	601	5+25.77	22.26	497635.8698	584727.0843
	602	5+31.74	22.41	497635.6133	584733.1622
	603	5+31.71	23.41	497634.6142	584733.1201
	604	5+25.75	23.26	497634.8707	584727.0421
SOUTHWEST WINGWALL	701	4+63.67	22.51	497638.5360	584663.8905
	702	4+69.64	22.34	497638.2796	584669.9684
	703	4+69.67	23.34	497637.2805	584669.9263
	704	4+63.70	23.51	497637.5369	584663.8484



SOUTH BRIDGE ELEVATION

¼" = 1'-0"

DELAWARE DEPARTMENT OF TRANSPORTATION	ADDENDUMS / REVISIONS	SCALE AS NOTED	BR 1-438 ON N463 BLACKBIRD STATION ROAD OVER BLACKBIRD CREEK	CONTRACT T201407104	BRIDGE NO. 1-438	BRIDGE PLAN, SECTION AND ELEVATION	SHEET NO. 9
				COUNTY NEW CASTLE	DESIGNED BY: NED		TOTAL SHTS. 27
					CHECKED BY: CAS		

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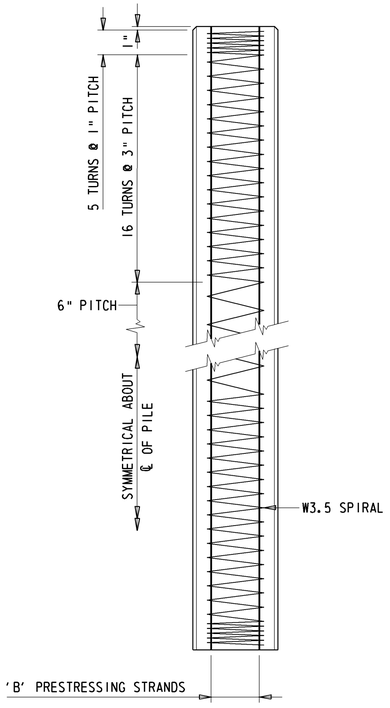
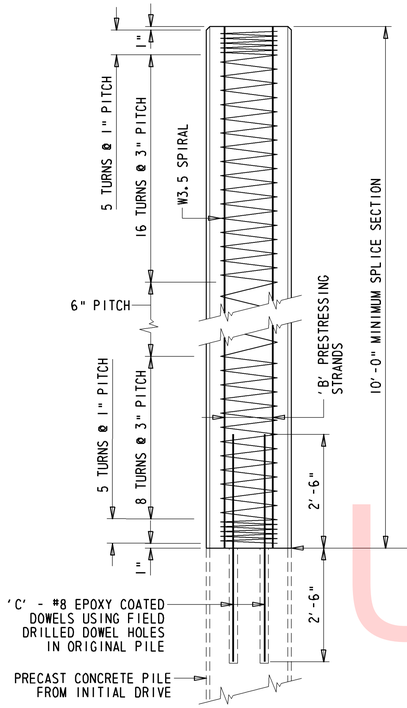
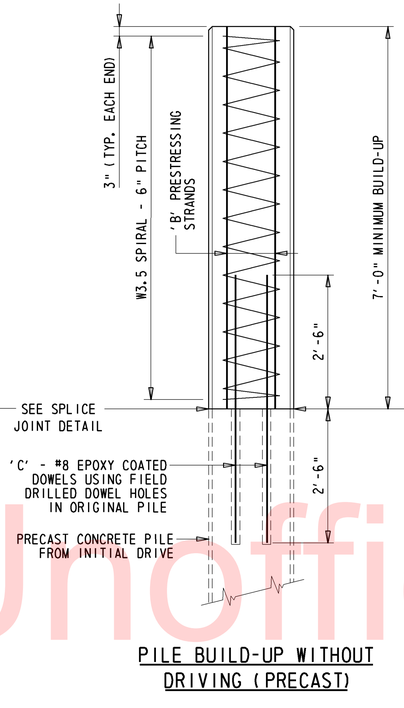


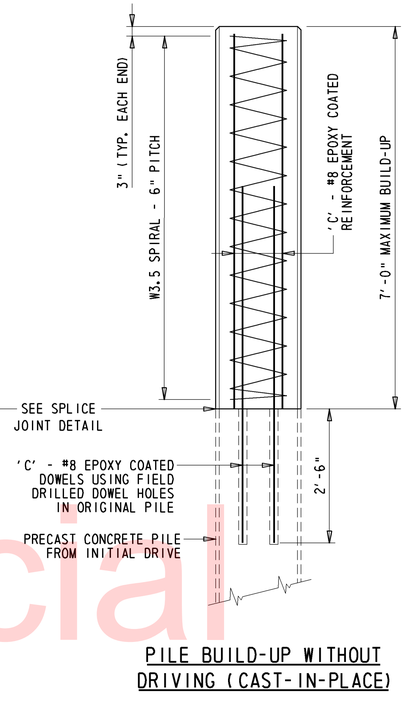
PILE ELEVATION



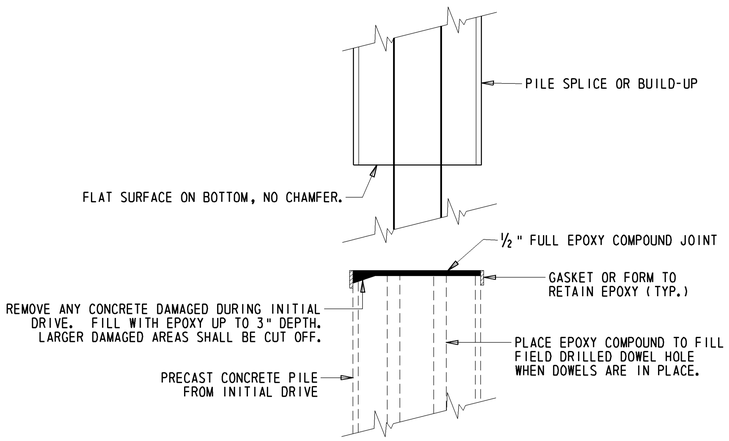
PILE BUILD-UP FOR DRIVING (PRECAST)



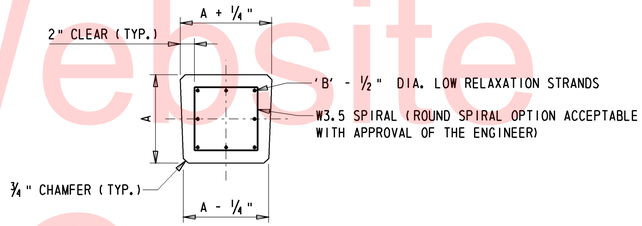
PILE BUILD-UP WITHOUT DRIVING (PRECAST)



PILE BUILD-UP WITHOUT DRIVING (CAST-IN-PLACE)



SPLICE JOINT DETAIL



TYPICAL PRECAST PILE SECTION

PRECAST PRESTRESSED CONCRETE PILE SIZES		
PILE SIZE 'A'	STRANDS 'B'	DOWELS 'C'
12"	6	N/A
14"	8	N/A
16"	10	N/A
18"	12	N/A
20"	16	N/A
24"	24	N/A

PILE INSTALLATION DATA

	SUBSTRUCTURE UNIT	DESIGN DATA		ACTUAL FIELD DATA		
		MINIMUM TIP ELEVATION	ESTIMATED PILE TIP ELEVATION	ACTUAL MINIMUM TIP ELEVATION	ACTUAL AVERAGE TIP ELEVATION	ACTUAL MAXIMUM TIP ELEVATION
WEST ABUTMENT	P1	-18.00	-22.49			
	P2	-18.00	-22.49			
	P3	-18.00	-22.49			
	P4	-18.00	-22.49			
	P5	-18.00	-22.49			
	P6	-18.00	-22.49			
EAST ABUTMENT	P7	-18.00	-22.71			
	P8	-18.00	-22.71			
	P9	-18.00	-22.71			
	P10	-18.00	-22.71			
	P11	-18.00	-22.71			
	P12	-18.00	-22.71			

PROJECT SPECIFIC PILE NOTES

1. PILE TYPE
   THIS PROJECT SHALL UTILIZE 14" x 14" PRESTRESSED-PRECAST CONCRETE PILE.
2. ESTIMATED PRODUCTION PILE LENGTH IS 45'-0".
3. REQUIRED TEST PILE LENGTH IS 5'-0" LONGER THAN THE ESTIMATED PRODUCTION PILE LENGTH.
4. PILES SHALL BE DRIVEN TO A BEARING RESISTANCE OF 320 KIPS USING A RESISTANCE FACTOR OF 0.65.
5. REFER TO THE PILE INSTALLATION DATA TABLE FOR MINIMUM TIP ELEVATION.
6. THE MAXIMUM ALLOWABLE VARIATION AT THE TOP OF THE PILE SHALL BE 2" IN ANY DIRECTION FROM THE LOCATION SHOWN ON THE PLANS.

GENERAL PILE NOTES

1. FOR MORE INFORMATION REGARDING PILE MATERIALS AND FABRICATION, REFER TO SECTION 618 (PILE MATERIALS) OF THE STANDARD SPECIFICATIONS. FOR MORE INFORMATION REGARDING PILE DRIVING AND INSTALLATION, REFER TO SECTION 619 (INSTALLATION OF PILES) OF THE STANDARD SPECIFICATIONS.
2. EACH TEST PILE SHALL BE DYNAMICALLY TESTED BY THE CONTRACTOR IN ACCORDANCE WITH ITEM #619519 - DYNAMIC PILE TESTING BY CONTRACTOR. THE QUANTITY FOR DYNAMIC PILE TESTING SHALL INCLUDE ONE FOR THE INITIAL DRIVE AND ONE FOR THE RE-STRIKE OF EACH TEST PILE. THE NEED TO RESTRIKE EITHER A TEST PILE OR A PRODUCTION PILE SHALL BE THE SOLE DECISION OF THE ENGINEER.
3. WAVE EQUATION ANALYSIS SHALL BE SUBMITTED BY THE CONTRACTOR FOR REVIEW BY THE ENGINEER (ELECTRONIC PREFERRED, OTHERWISE 8 COPIES MINIMUM).
4. ALL PILES SHALL BE ORDERED PER PLAN LENGTH. TEST PILES, AS NOTED, SHALL BE DRIVEN FIRST TO ESTABLISH DRIVING CRITERIA FOR THE OTHER PILES IN EACH SUBSTRUCTURE ELEMENT.

PRESTRESSED-PRECAST CONCRETE PILE NOTES

1. IF PILE BUILD-UP IS REQUIRED PER PILE DRIVING CONDITIONS, THE CONTRACTOR SHALL SUBMIT FOR DEPARTMENT'S APPROVAL A WORKING DRAWING SHOWING THE PROPOSED PLACEMENT AND DEPTH FOR A TOTAL OF 4 FIELD DRILLED DOWEL HOLES.
2. (ONLY IF PILE BUILD-UP IS REQUIRED PER PILE DRIVING CONDITIONS) DOWEL HOLES FIELD DRILLED IN THE TOP OF THE PILES SHALL BE CLEANED BY INSERTING A HIGH PRESSURE AIR HOSE TO THE BOTTOM AND BLOWING THE HOLE CLEAN FROM THE BOTTOM UPWARD PRIOR TO SETTING AND GROUTING THE DOWEL BARS. DOWELS SHALL BE SET WITH AN APPROVED NON-SHRINK EPOXY GROUT.
3. (ONLY IF PILE BUILD-UP IS REQUIRED PER PILE DRIVING CONDITIONS) EPOXY GROUT FOR GROUTING THE DOWEL BARS IN THE TOP OF THE PRESTRESSED-PRECAST CONCRETE PILE SHALL BE AN APPROVED NON-SHRINK EPOXY GROUT SPECIFICALLY DESIGNED AS A FAST SETTING COMPOUND THAT POURS EASILY TO FILL THE VOIDS. THE COST OF GROUTING THE DOWEL BARS SHALL BE INCIDENTAL TO THE UNIT BID ITEM FOR THAT RESPECTIVE PILE.
4. THE WORKING DRAWINGS SHALL ALSO INCLUDE DESIGN AND DETAILS OF THE PROPOSED PICK-UP AND SUPPORT POINTS, AND LIFTING LOOPS FOR THE DEPARTMENT'S APPROVAL.
5. THE CONTRACTOR MAY CONSIDER USING ALTERNATIVE PILE BUILD-UP DETAILS FOR BOTH DRIVING AND WITHOUT DRIVING. ALL ALTERNATIVE DETAILS FOR PILE BUILD-UPS SHALL BE SUBMITTED TO THE DEPARTMENT FOR APPROVAL.
7. THE CONTRACTOR MAY CONSIDER USING ALTERNATIVE SPLICE JOINT DETAIL. ALL ALTERNATIVE DETAILS FOR SPLICE JOINT SHALL BE SUBMITTED TO THE DEPARTMENT FOR APPROVAL.

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DELAWARE DEPARTMENT OF TRANSPORTATION

ADDENDUMS / REVISIONS

NOT TO SCALE

BR 1-438 ON N463 BLACKBIRD STATION ROAD OVER BLACKBIRD CREEK

CONTRACT T201407104

COUNTY NEW CASTLE

BRIDGE NO. 1-438

DESIGNED BY: NED

CHECKED BY: CAS

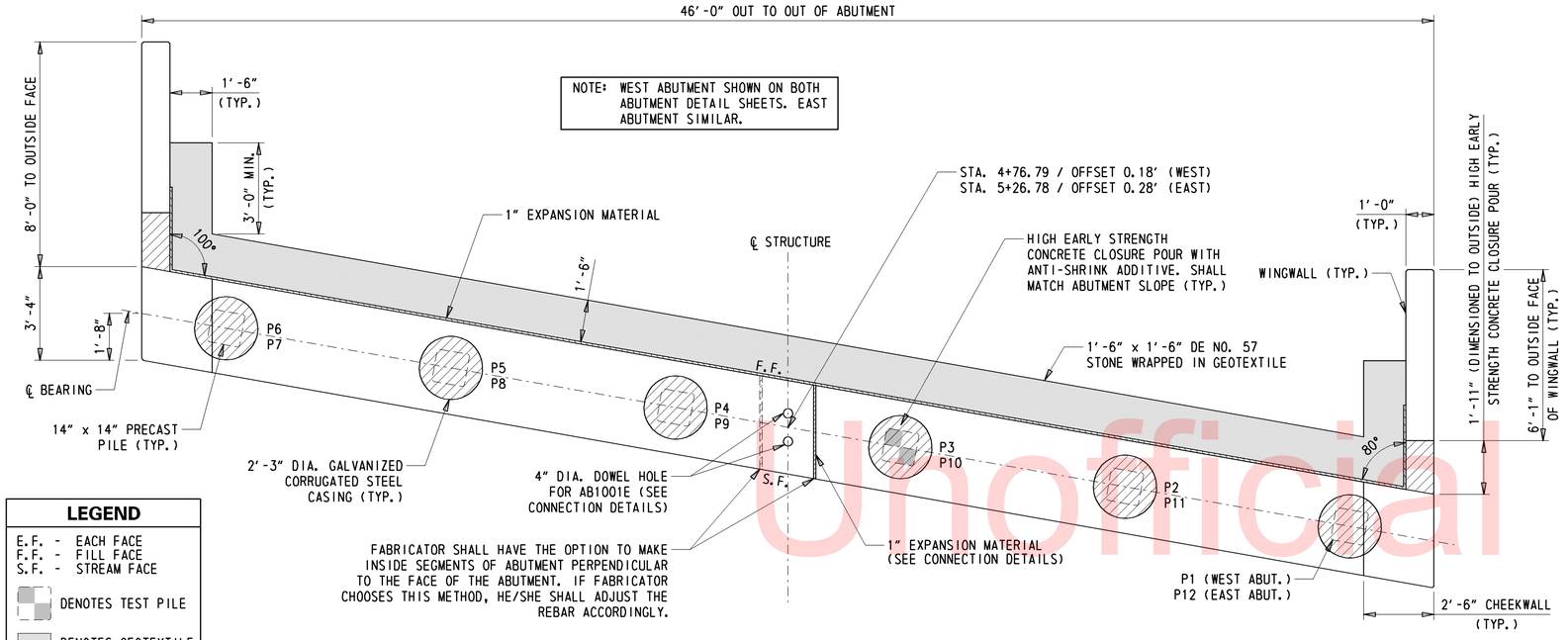
PRECAST PRESTRESSED CONCRETE PILE DETAILS

SHEET NO. 10

TOTAL SHTS. 27

PILE COORDINATES (WEST ABUTMENT)				
NO.	STATION	OFFSET	NORTHING	EASTING
P1	4+80.04	-19.88'	497679.7673	584682.9954
P2	4+78.72	-11.86'	497671.8347	584681.2300
P3	4+77.43	-3.83'	497663.9021	584679.4646
P4	4+76.15	4.19'	497655.9694	584677.6993
P5	4+74.89	12.22'	497648.0368	584675.9339
P6	4+73.64	20.25'	497640.1042	584674.1685

PILE COORDINATES (EAST ABUTMENT)				
NO.	STATION	OFFSET	NORTHING	EASTING
P7	5+30.88	-19.63'	497677.6596	584732.9510
P8	5+29.22	-11.67'	497669.7270	584731.1856
P9	5+27.59	-3.70'	497661.7943	584729.4202
P10	5+25.98	4.26'	497653.8617	584727.6548
P11	5+24.39	12.23'	497645.9291	584725.8894
P12	5+22.82	20.20'	497637.9964	584724.1240



WEST ABUTMENT PLAN

⅜" = 1'-0"

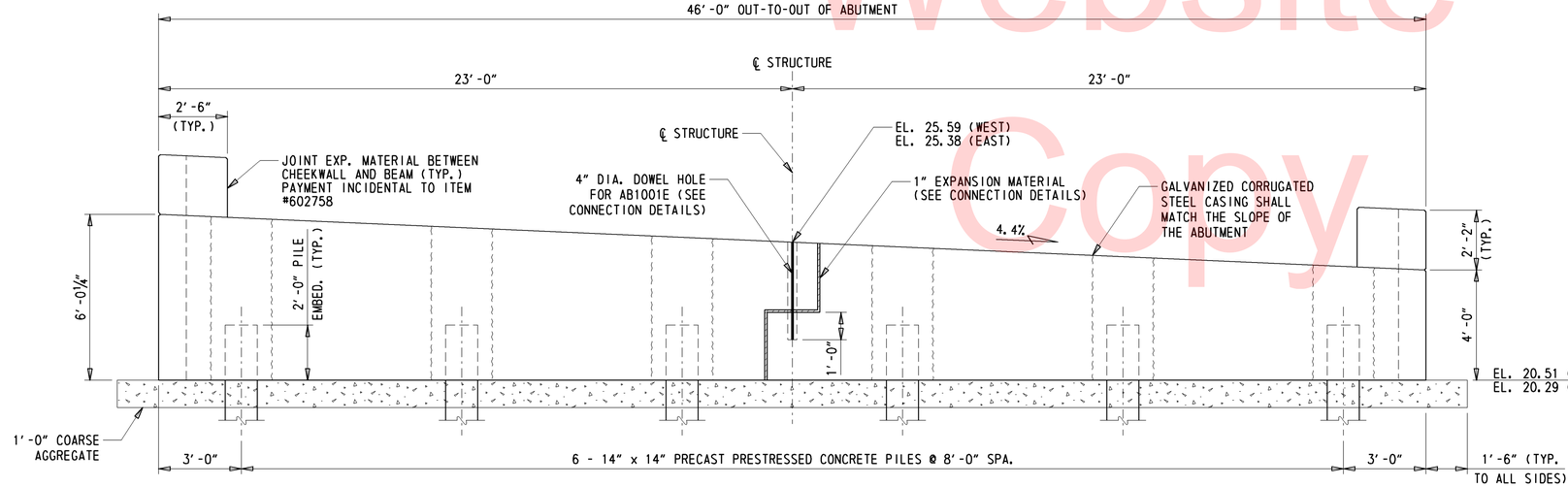
LEGEND

E.F. - EACH FACE
F.F. - FILL FACE
S.F. - STREAM FACE

DENOTES TEST PILE

DENOTES GEOTEXTILE STONE WRAP PLUG

DENOTES HIGH EARLY STRENGTH CONCRETE CLOSURE POUR

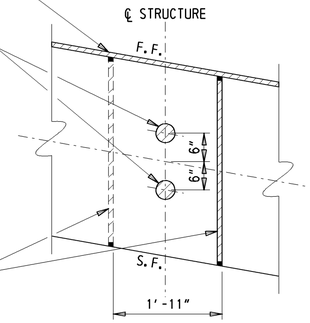


WEST ABUTMENT ELEVATION

⅜" = 1'-0"

APPLY 2'-0" WIDE WATERPROOFING MEMBRANE AND EXPANSION JOINT MATERIAL HORIZONTALLY AND VERTICALLY ALONG ABUTMENT JOINTS. THE WATERPROOFING MEMBRANE SHALL BE CENTERED ALONG THE ABUTMENT JOINTS.

4" DIA. DOWEL HOLE FOR AB1001E. DOWEL HOLE SHALL BE GROUTED AFTER ABUTMENT SECTIONS ARE IN PLACE AND REINFORCING DOWEL IS SET. GROUT SHALL MATCH THE PROPOSED GRADE OF THE ABUTMENTS.

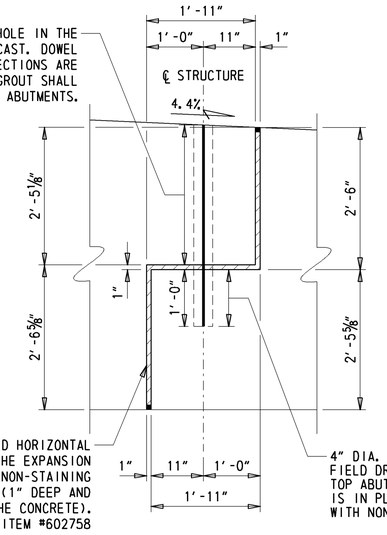


1" EXPANSION MATERIAL. ALL EXPOSED HORIZONTAL AND VERTICAL SURFACES OF THE EXPANSION MATERIAL SHALL BE SEALED WITH NON-STAINING GRAY NON-BITUMINOUS JOINT SEALER (1" DEEP AND HOLD ⅛" BELOW THE SURFACE OF THE CONCRETE). PAYMENT INCIDENTAL TO ITEM #602758

ABUTMENT CONNECTION PLAN

¾" = 1'-0"

4" DIA. DOWEL HOLE FOR AB1001E. DOWEL HOLE IN THE TOP SECTION OF ABUTMENT SHALL BE PRECAST. DOWEL HOLE SHALL BE GROUTED AFTER ABUTMENT SECTIONS ARE IN PLACE AND REINFORCING DOWEL IS SET. GROUT SHALL MATCH THE PROPOSED GRADE OF THE ABUTMENTS.



1" EXPANSION MATERIAL. ALL EXPOSED HORIZONTAL AND VERTICAL SURFACES OF THE EXPANSION MATERIAL SHALL BE SEALED WITH NON-STAINING GRAY NON-BITUMINOUS JOINT SEALER (1" DEEP AND HOLD ⅛" BELOW THE SURFACE OF THE CONCRETE). PAYMENT INCIDENTAL TO ITEM #602758

4" DIA. HOLE TO BE FIELD DRILLED AFTER TOP ABUTMENT SECTION IS IN PLACE. FILL WITH NON-SHRINK GROUT.

ABUTMENT CONNECTION ELEVATION

¾" = 1'-0"

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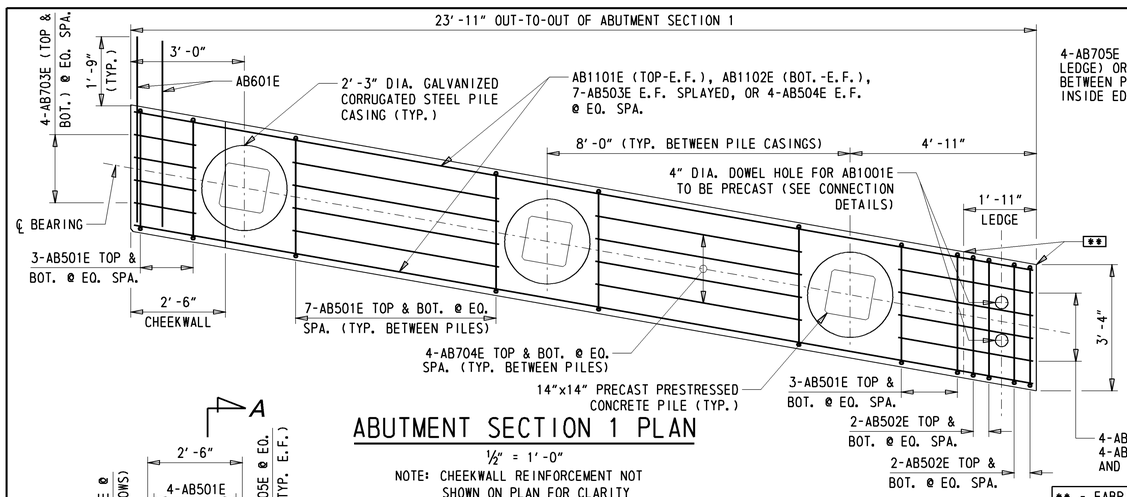
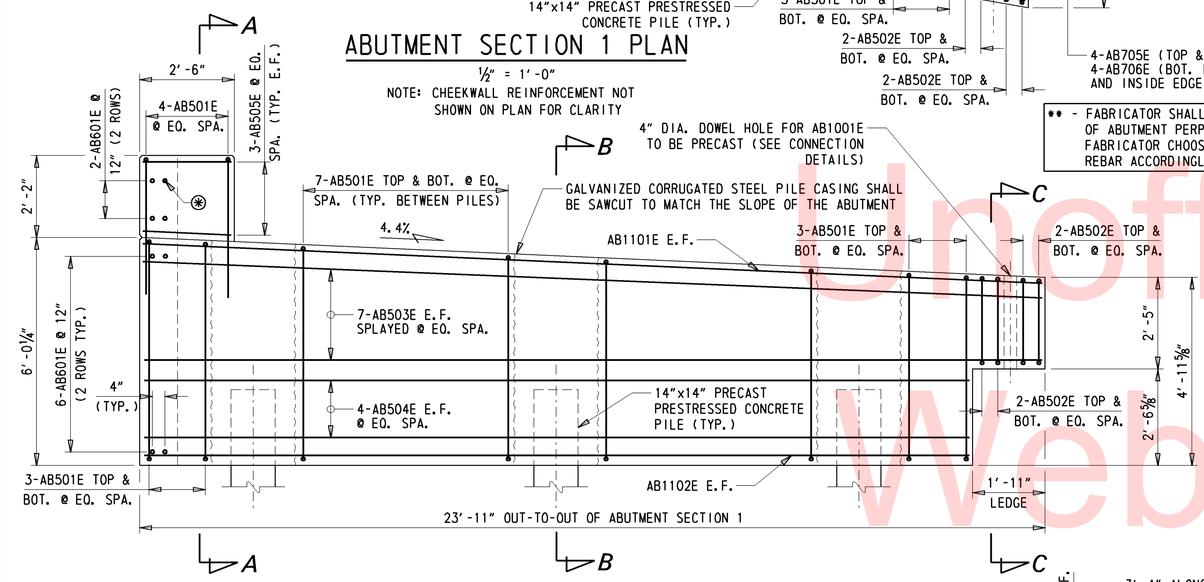
DELAWARE DEPARTMENT OF TRANSPORTATION	ADDENDUMS / REVISIONS	SCALE AS NOTED	BR 1-438 ON N463 BLACKBIRD STATION ROAD OVER BLACKBIRD CREEK	CONTRACT T201407104	BRIDGE NO. 1-438	ABUTMENT DETAILS SHEET 1 OF 2	SHEET NO. 11
				COUNTY NEW CASTLE	DESIGNED BY: NED		TOTAL SHTS. 27
					CHECKED BY: CAS		



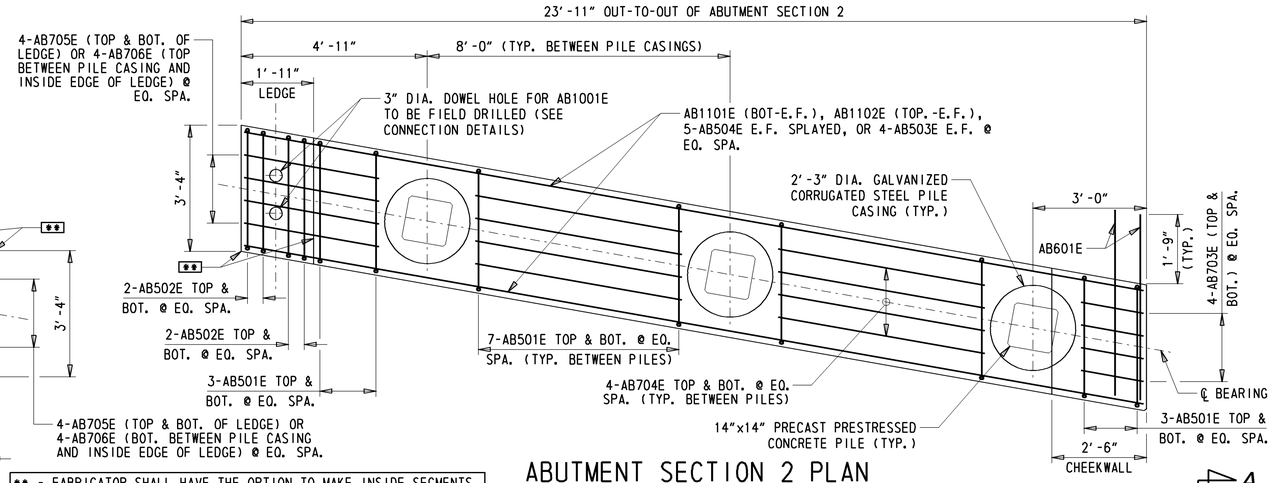
ABUTMENT SECTION 1 PLAN

½" = 1'-0"

NOTE: CHEEKWALL REINFORCEMENT NOT SHOWN ON PLAN FOR CLARITY



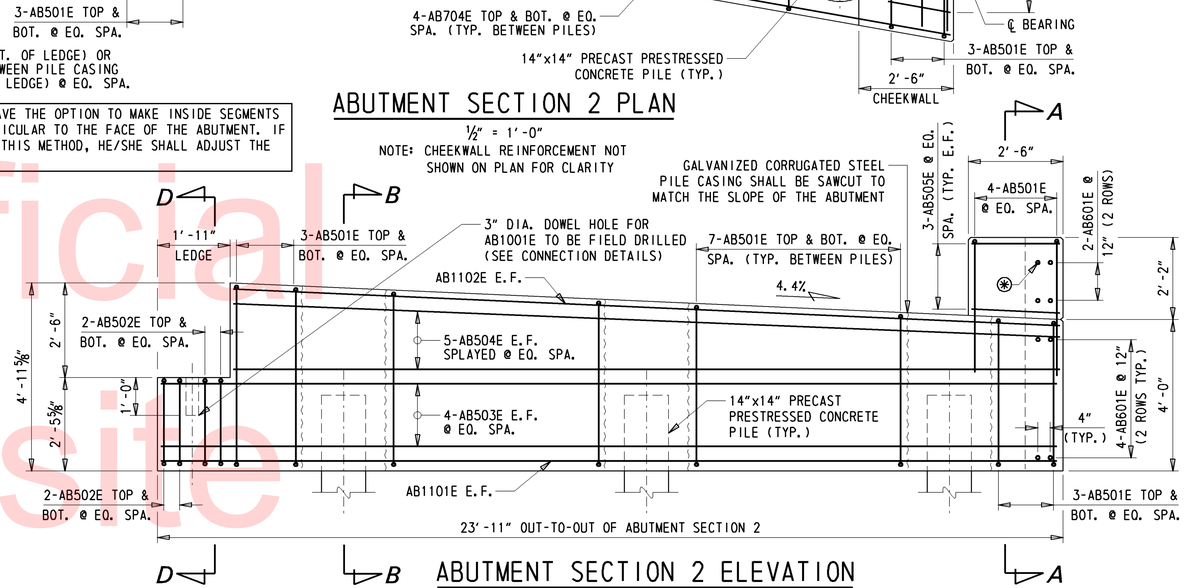
** - FABRICATOR SHALL HAVE THE OPTION TO MAKE INSIDE SEGMENTS OF ABUTMENT PERPENDICULAR TO THE FACE OF THE ABUTMENT. IF FABRICATOR CHOOSES THIS METHOD, HE/SHE SHALL ADJUST THE REBAR ACCORDINGLY.



ABUTMENT SECTION 2 PLAN

½" = 1'-0"

NOTE: CHEEKWALL REINFORCEMENT NOT SHOWN ON PLAN FOR CLARITY



NOTE TO PRECASTER:
THE PRECASTER SHALL INCLUDE DETAILS OF THE LIFTING STRANDS IN THEIR SUBMITTED SHOP DRAWINGS.

ABUTMENT SECTION 1 ELEVATION

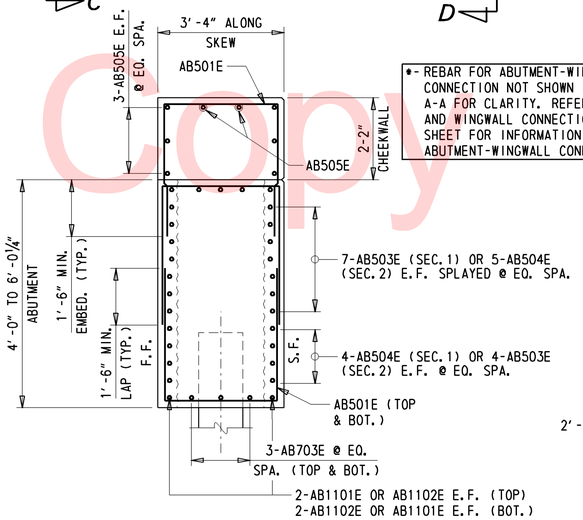
½" = 1'-0"

ABUTMENT SECTION 2 ELEVATION

½" = 1'-0"

SECTION A-A

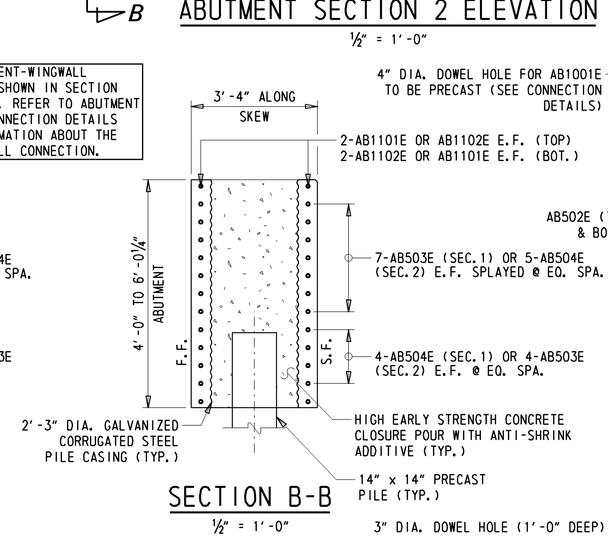
½" = 1'-0"



* - REBAR FOR ABUTMENT-WINGWALL CONNECTION NOT SHOWN IN SECTION A-A FOR CLARITY. REFER TO ABUTMENT AND WINGWALL CONNECTION DETAILS SHEET FOR INFORMATION ABOUT THE ABUTMENT-WINGWALL CONNECTION.

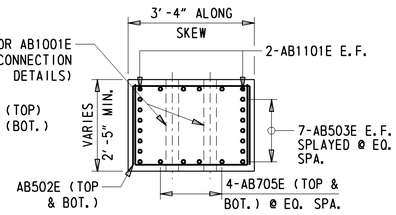
SECTION B-B

½" = 1'-0"



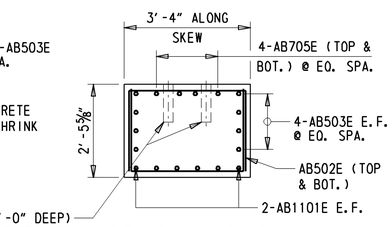
SECTION C-C

½" = 1'-0"



SECTION D-D

½" = 1'-0"



PRECAST ABUTMENT NOTES

DESIGN PLANS - WORKING DRAWINGS

INFORMATION PERTAINING TO THE PRECAST REINFORCED CONCRETE ABUTMENTS IS INTENDED TO SERVE AS AN INDICATION OF THE TYPE OF CONSTRUCTION ACCEPTABLE FOR USE. THE CONTRACTOR WILL BE REQUIRED TO PREPARE AND SUBMIT, FOR APPROVAL, A COMPLETE SET OF DETAILED SHOP DRAWINGS FOR THE PRECAST CONCRETE UNITS THEY PROPOSE TO FURNISH.

HANDLING

PRECAST ABUTMENTS SHALL BE HANDLED ONLY BY LIFTING STRANDS PROVIDED ESPECIALLY FOR THIS PURPOSE. THE APPROXIMATE DEAD WEIGHT OF THE SECTION 1 ABUTMENT UNIT AND SECTION 2 ABUTMENT UNIT IS 28.12 TONS AND 23.14 TONS RESPECTIVELY.

CONCRETE STRESSES

THE MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS EQUALS 5000 PSI.

BAR REINFORCEMENT

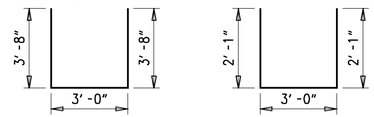
MATERIALS REQUIREMENT: AASHTO M31 - GRADE 60 ALL BAR REINFORCEMENT TO HAVE 2" MINIMUM COVER EXCEPT AS NOTED OR DETAILED. ABUTMENT REINFORCEMENT SHALL BE PLACED SUCH THAT IT DOES NOT INTERFERE WITH THE DRILLING LOCATIONS FOR BEAM DOWELS AS SHOWN IN THE TYPICAL ABUTMENT SECTION DETAIL ON THE ABUTMENT AND WINGWALL DETAILS SHEET. ALL BAR REINFORCEMENT AND CHAIR SUPPORTS SHALL BE PROTECTED WITH FUSION BONDED EPOXY CONFORMING TO AASHTO M284. PAYMENT FOR REINFORCING BARS IS INCIDENTAL TO ITEM #602758 - PRECAST CONCRETE ABUTMENT.

CONCRETE FINISH

ALL SIDES OF ABUTMENTS SHALL BE PROTECTED WITH A WATER MISCIBLE, PENETRATING ALKYL ALKOXY SILANE SEALER. PAYMENT INCIDENTAL TO ITEM #602758 - PRECAST CONCRETE ABUTMENT.

BENDING DIAGRAMS

ALL DIMENSIONS ARE FROM OUT TO OUT.



DIAGRAMS ARE NOT TO SCALE.

REINFORCING BAR LIST

STRAIGHT BARS				BENT BARS			
MARK	SIZE	QTY.	LENGTH	MARK	SIZE	QTY.	LENGTH
AB503E	5	22	23'-7"	AB501E	5	88	10'-4"
AB504E	5	18	21'-8"	AB502E	5	16	7'-2"
AB505E	5	16	2'-2"				
AB601E	6	28	4'-11"				
AB703E	7	16	1'-7"				
AB704E	7	32	5'-7"				
AB705E	7	16	3'-6"				
AB706E	7	8	1'-7"				
AB1001E	10	4	3'-6"				
AB1101E	11	4	23'-7"				
AB1102E	11	4	21'-8"				

NOTE:
1. ALL REBAR QUANTITIES ARE THE TOTAL OF ABUTMENT SECTION 1 & ABUTMENT SECTION 2 FOR EACH ABUTMENT.
2. AB1001E SHALL BE INCIDENTAL TO ITEM #623758

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DELAWARE DEPARTMENT OF TRANSPORTATION

ADDENDUMS / REVISIONS

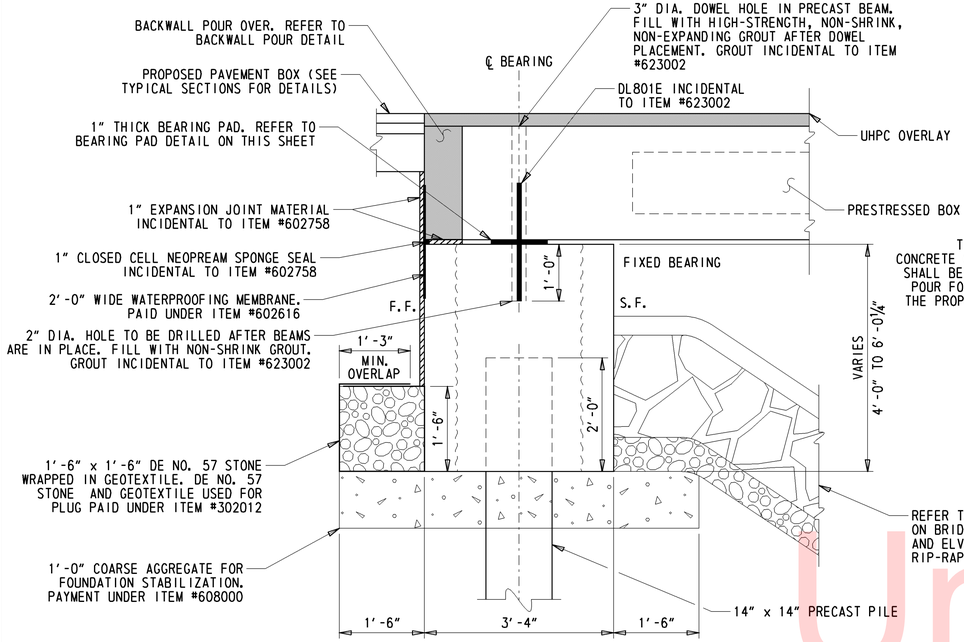
SCALE AS NOTED

BR 1-438 ON N463 BLACKBIRD STATION ROAD OVER BLACKBIRD CREEK

CONTRACT	BRIDGE NO.	1-438
T201407104	DESIGNED BY: NED	
COUNTY	CHECKED BY: CAS	
NEW CASTLE		

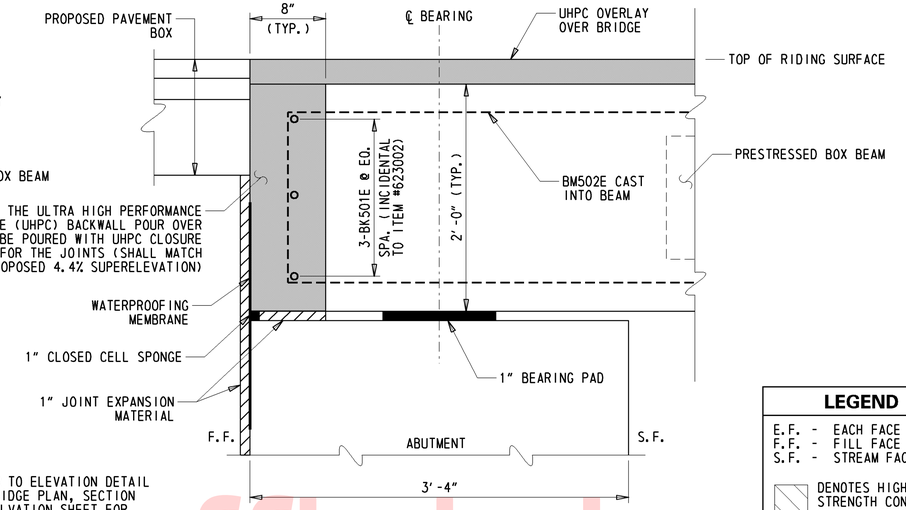
ABUTMENT DETAILS SHEET 2 OF 2

SHEET NO.
12
TOTAL SHTS.
27



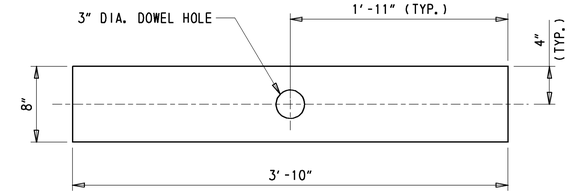
TYPICAL ABUTMENT SECTION

¾" = 1'-0"



BACKWALL POUR DETAIL

1½" = 1'-0"



1" THICK BEARING PAD DETAIL

1½" = 1'-0"

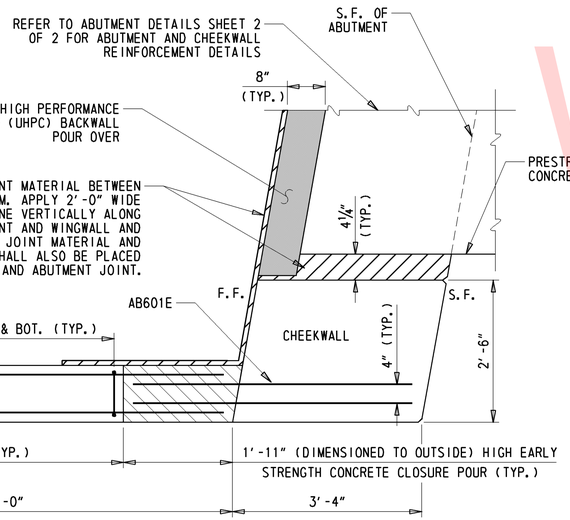
ELASTOMERIC BEARING NOTES:

1. 20 TOTAL ELASTOMERIC BEARINGS REQUIRED.
2. ALL BEARING PADS SHALL BE 50 MIN. DUROMETER ELASTOMERIC.
3. ELASTOMERIC BEARINGS SHALL BE ATTACHED TO THE TOP OF ABUTMENT SEAT WITH AN APPROVED EPOXY ADHESIVE IN SUCH A WAY THAT VISIBLE CONCRETE SURFACES WILL NOT BE STAINED. ENSURE THE EPOXY ADHESIVE HAS SET PRIOR TO PLACEMENT OF BEAMS.
4. PAYMENT FOR FABRICATION AND INSTALLATION OF ELASTOMERIC BEARINGS SHALL BE INCIDENTALL TO ITEM #623002 - PRESTRESSED REINFORCED CONCRETE MEMEBERS, BOX BEAMS.

LEGEND

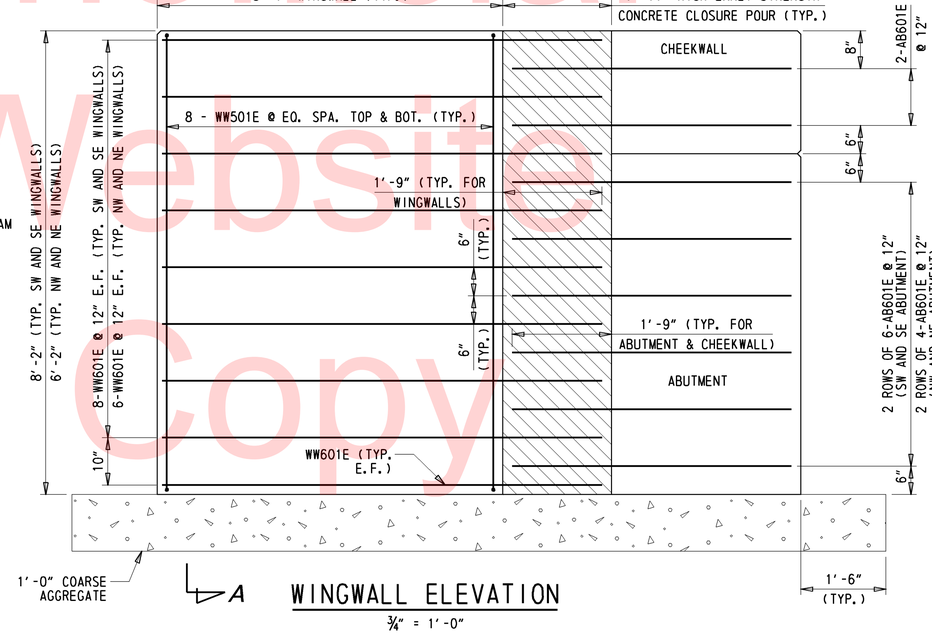
E.F. - EACH FACE
F.F. - FILL FACE
S.F. - STREAM FACE

DENOTES HIGH EARLY STRENGTH CONCRETE CLOSURE POUR



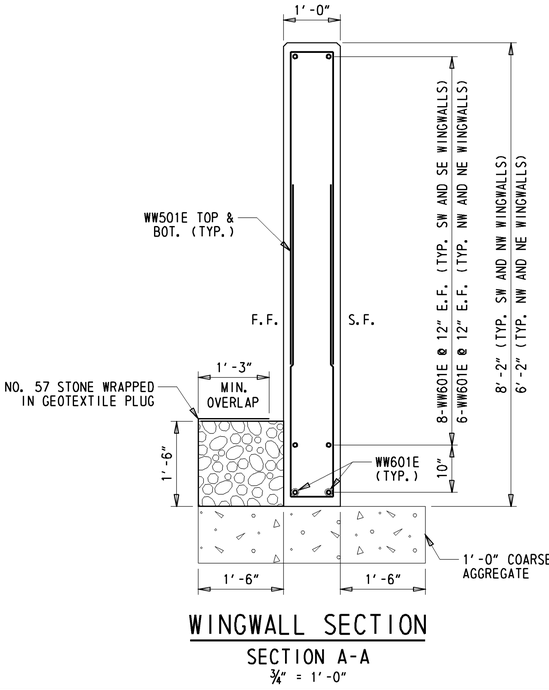
WINGWALL PLAN

¾" = 1'-0"



WINGWALL ELEVATION

¾" = 1'-0"



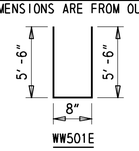
WINGWALL SECTION

SECTION A-A

¾" = 1'-0"

BENDING DIAGRAMS

ALL DIMENSIONS ARE FROM OUT TO OUT.



DIAGRAMS ARE NOT TO SCALE.

REINFORCING BAR LIST (EACH WINGWALL)

STRAIGHT BARS				BENT BARS			
MARK	SIZE	QTY.	LENGTH	MARK	SIZE	QTY.	LENGTH
WW601E (NW & NE)	6	14	7'-8"	WW501E	5	16	11'-8"
WW601E (SW & SE)	6	18	7'-8"				
BK501E	5	6 (3 PER BACKWALL)	41'-2"				
DL801E	8	20 (2 PER BEAM)	2'-1"				

PRECAST WINGWALL NOTES

DESIGN PLANS - WORKING DRAWINGS

INFORMATION PERTAINING TO THE PRECAST REINFORCED CONCRETE WINGWALLS IS INTENDED TO SERVE AS AN INDICATION OF THE TYPE OF CONSTRUCTION ACCEPTABLE FOR USE. THE CONTRACTOR WILL BE REQUIRED TO PREPARE AND SUBMIT, FOR APPROVAL, A COMPLETE SET OF DETAILED SHOP DRAWINGS FOR THE PRESTRESSED PRECAST CONCRETE UNITS THEY PROPOSE TO FURNISH.

CONCRETE STRESSES

THE MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS EQUALS 5000 PSI.

CONCRETE FINISH

ALL SIDES OF WINGWALLS SHALL BE PROTECTED WITH A WATER MISCIBLE, PENETRATING ALKYL ALKOXY SILANE SEALER. PAYMENT INCIDENTAL TO ITEM #602738 - PRECAST CONCRETE RETAINING WALL.

HANDLING

PRECAST WINGWALLS SHALL BE HANDLED ONLY BY LIFTING DEVICE PROVIDED ESPECIALLY FOR THIS PURPOSE. THE APPROXIMATE DEAD WEIGHT FOR EACH OF THE SE/SW UNITS IS 3.73 TONS. THE APPROXIMATE DEAD WEIGHT FOR EACH OF THE NE/NW UNITS IS 2.82 TONS.

BAR REINFORCEMENT

MATERIALS REQUIREMENT: AASHTO M31 - GRADE 60 ALL BAR REINFORCEMENT TO HAVE 2" MINIMUM COVER EXCEPT AS NOTED OR DETAILED. ALL BAR REINFORCEMENT AND CHAIR SUPPORTS SHALL BE PROTECTED WITH FUSION BONDED EPOXY CONFORMING TO AASHTO M284. PAYMENT FOR REINFORCING BARS IS INCIDENTAL TO ITEM #602738 - PRECAST CONCRETE RETAINING WALL.

MISCELLANEOUS NOTES

CHEEKWALL AND ABUTMENT REINFORCEMENT ACCOUNTED FOR IN "REINFORCING BAR LIST" ON ABUTMENT DETAILS

DELAWARE
DEPARTMENT OF TRANSPORTATION

ADDENDUMS / REVISIONS

SCALE AS NOTED

BR 1-438 ON N463 BLACKBIRD STATION ROAD OVER BLACKBIRD CREEK

CONTRACT	BRIDGE NO.	1-438
T201407104	DESIGNED BY: NED	
COUNTY	CHECKED BY: CAS	
NEW CASTLE		

ABUTMENT & WINGWALL CONNECTION DETAILS

SHEET NO.
13
TOTAL SHTS.
27

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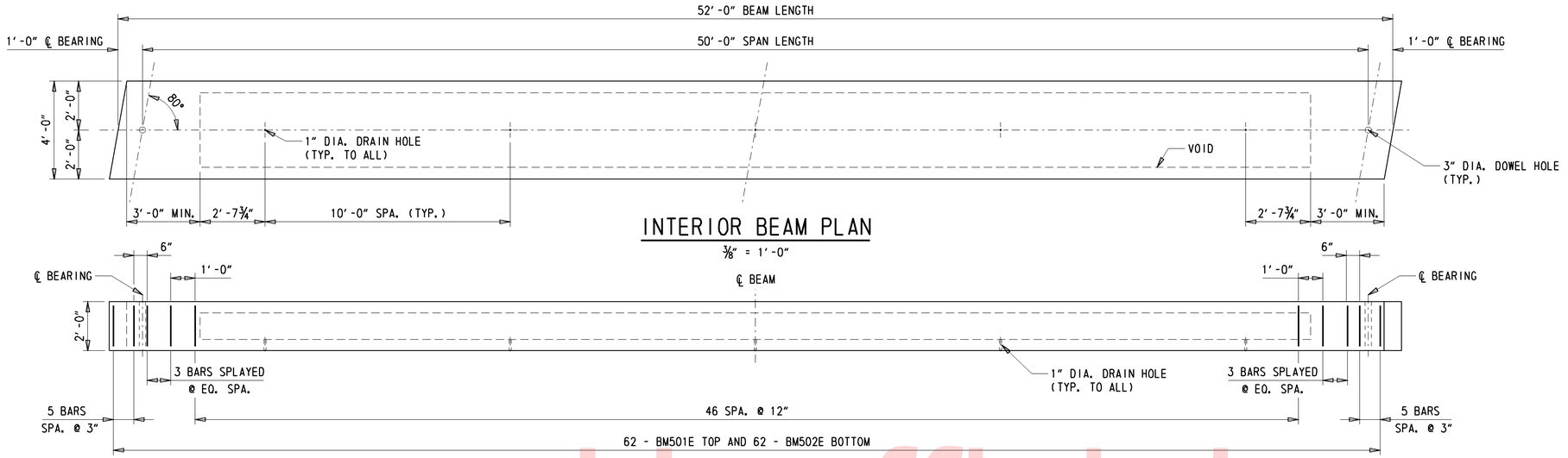
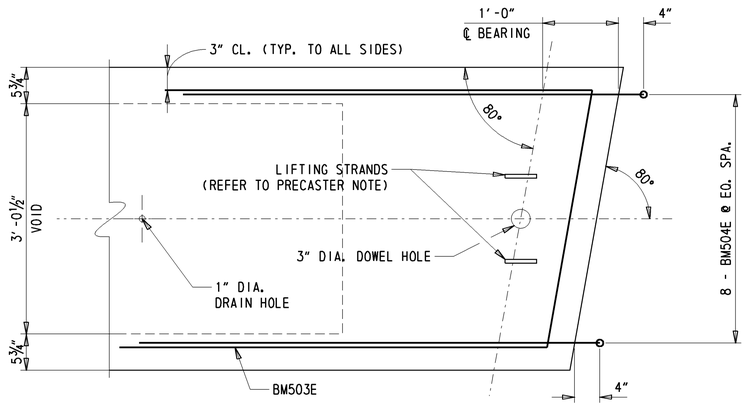


INTERIOR BEAM PLAN

⅜" = 1'-0"

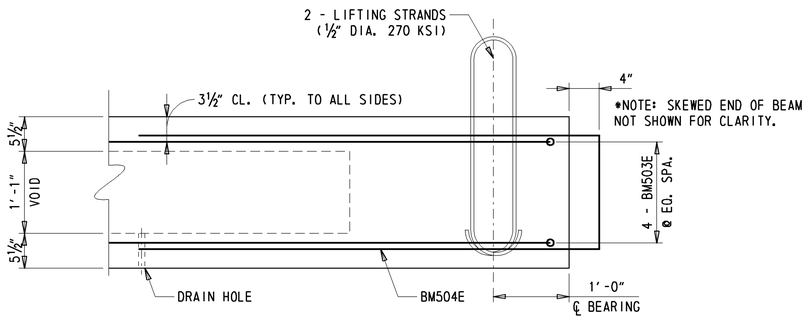
INTERIOR BEAM ELEVATION

⅜" = 1'-0"



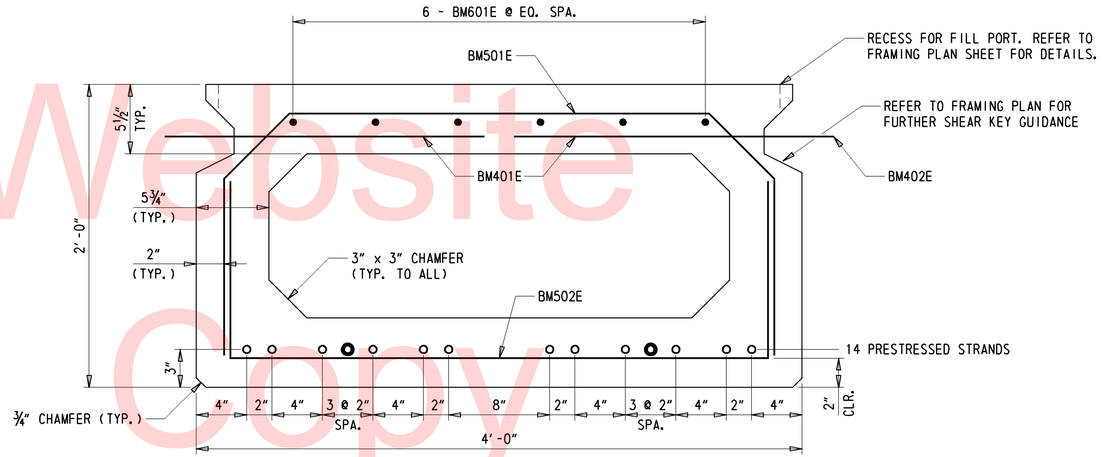
TYPICAL INTERIOR BEAM END PLAN

1" = 1'-0"



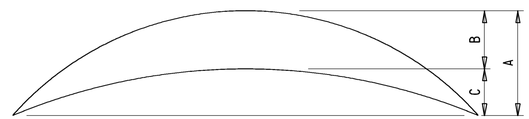
TYPICAL BEAM END ELEVATION FOR INTERIOR BEAM

1" = 1'-0"



TYPICAL INTERIOR BEAM SECTION

2" = 1'-0"



CAMBER DIAGRAM

A = ESTIMATED PRESTRESS CAMBER LESS DEFLECTION DUE TO DEAD LOAD OF BEAM TIMES CREEP = 1.005"
B = DEFLECTION DUE TO DEAD LOAD OF OVERLAY = -0.0534"
C = A - B = NET CAMBER = 0.952"

- ○ 0.6" DIA., 270 KSI LOW RELAXATION PRESTRESSING STRAND (12 STRANDS TOTAL)
- ◉ 0.6" DIA., 270 KSI LOW RELAXATION PRESTRESSING STRAND TO BE DEBONDED FOR 5'-0" @ EACH END (2 STRANDS TOTAL)

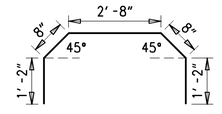
NOTE TO PRECASTER:
LIFTING STRANDS SHALL BE SPACED SO THAT THEY DO NOT INTERFERE WITH STRAND SPACING. THE PRECASTER SHALL INCLUDE DETAILS OF THE PLACEMENT OF THESE ITEMS IN THEIR SUBMITTED SHOP DRAWINGS.

REINFORCING BAR LIST

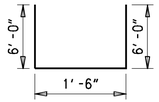
STRAIGHT BARS				BENT BARS			
MARK	SIZE	QTY.	LENGTH	MARK	SIZE	QTY.	LENGTH
BM401E	4	154	1'-6"	BM501E	5	62	6'-4"
BM402E	4	154	5½"	BM502E	5	62	6'-0"
BM601E	6	6	51'-8"	BM503E	5	8	15'-6"
				BM504E	5	16	13'-6"

BENDING DIAGRAMS

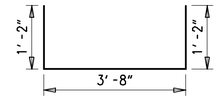
ALL DIMENSIONS ARE FROM OUT TO OUT.



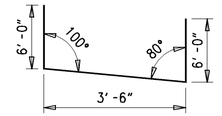
BM501E



BM504E



BM502E



BM503E

DIAGRAMS ARE NOT TO SCALE.

PRESTRESSED BEAM NOTES (48" x 24")

DESIGN PLANS - WORKING DRAWINGS

INFORMATION PERTAINING TO THE PRESTRESSED PRECAST REINFORCED CONCRETE BOX BEAMS IS INTENDED TO SERVE AS AN INDICATION OF THE TYPE OF CONSTRUCTION ACCEPTABLE FOR USE. THE CONTRACTOR WILL BE REQUIRED TO PREPARE AND SUBMIT, FOR APPROVAL, A COMPLETE SET OF DETAILED SHOP DRAWINGS FOR THE PRESTRESSED PRECAST CONCRETE UNITS THEY PROPOSE TO FURNISH.

HANDLING

PRESTRESSED BEAMS SHALL BE HANDLED ONLY BY LIFTING STRANDS PROVIDED ESPECIALLY FOR THIS PURPOSE. THE APPROXIMATE DEAD WEIGHT OF EACH UNIT IS 19.97 TONS.

CONCRETE STRESSES

THE MINIMUM COMPRESSIVE STRENGTH AT TIME OF INITIAL PRESTRESS EQUALS 6400 PSI.
THE MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS EQUALS 8000 PSI.

BAR REINFORCEMENT

MATERIALS REQUIREMENT: AASHTO M31 - GRADE 60
ALL BAR REINFORCEMENT TO HAVE 2" MINIMUM COVER EXCEPT AS NOTED OR DETAILED.
ALL BAR REINFORCEMENT AND CHAIR SUPPORTS SHALL BE PROTECTED WITH FUSION BONDED EPOXY CONFORMING TO AASHTO M284.
PAYMENT FOR REINFORCING BARS IS INCIDENTAL TO ITEM #623002 - PRESTRESSED REINFORCED CONCRETE MEMBERS, BOX BEAMS.

STRAND

INITIAL PRESTRESS ON EACH 0.6" DIA. 270 KSI LOW RELAXATION STRAND EQUALS 43942 LBS. MINIMUM ULTIMATE STRENGTH EQUALS 58590 LBS PER STRAND.

CONCRETE FINISH

THE TOPS OF THE PRECAST ADJACENT CONCRETE BOX BEAMS SHALL HAVE A SMOOTH FINISH. THE BOTTOM, SIDES, AND ENDS OF THE BEAMS SHALL BE PROTECTED WITH A WATER MISCIBLE, PENETRATING ALKYL ALKOXY SILANE SEALER. TO CREATE AN EXPOSED COARSE AGGREGATE SURFACE, AN IN-FORM RETARDER SHALL BE APPLIED TO THE ENTIRE SURFACE AREA OF THE SHEAR KEYS. PAYMENT INCIDENTAL TO ITEM #623002 - PRESTRESSED REINFORCED CONCRETE MEMBERS, BOX BEAMS.

NOTE: 10 TOTAL BEAMS REQUIRED
8 INTERIOR BEAMS AND 2 FASCIA BEAMS

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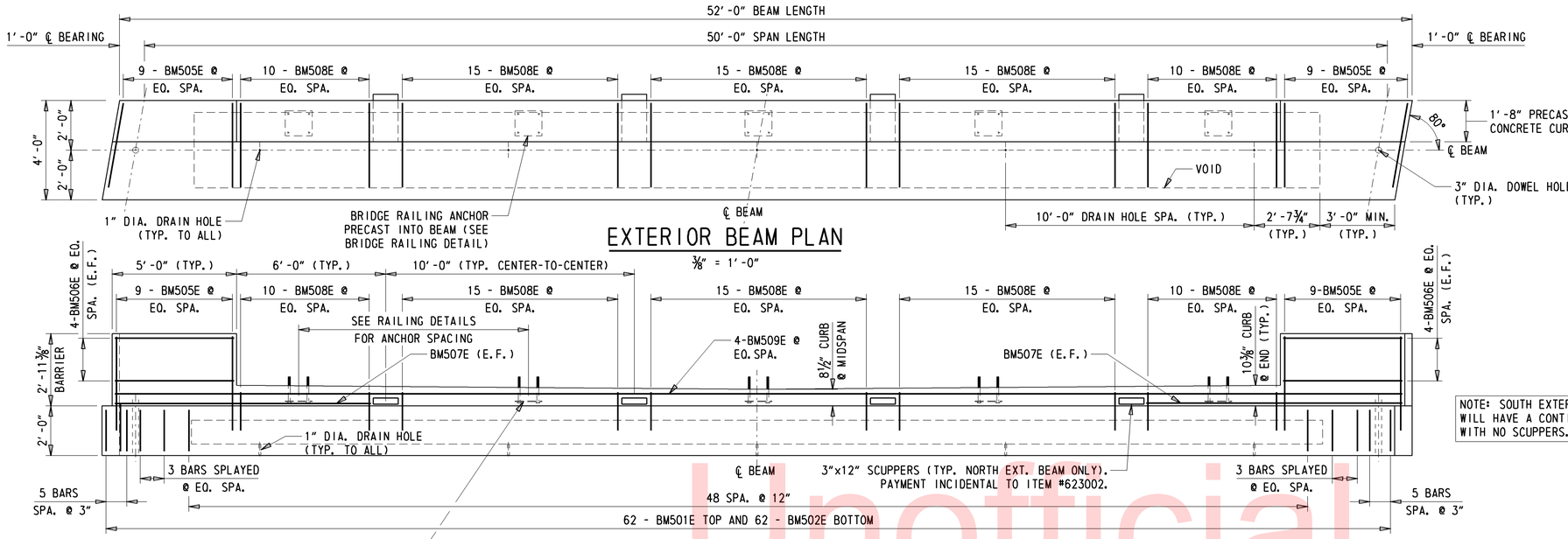
DELAWARE DEPARTMENT OF TRANSPORTATION	ADDENDUMS / REVISIONS	SCALE AS NOTED	BR 1-438 ON N463 BLACKBIRD STATION ROAD OVER BLACKBIRD CREEK	CONTRACT T201407104	BRIDGE NO. 1-438	INTERIOR BEAM DETAILS	SHEET NO. 14
				COUNTY NEW CASTLE	DESIGNED BY: NED		TOTAL SHTS. 27
					CHECKED BY: CAS		



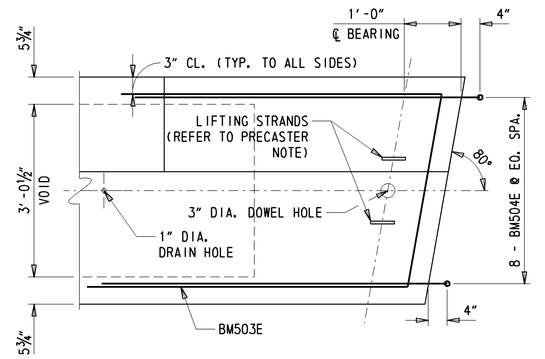
EXTERIOR BEAM PLAN

⅜" = 1'-0"

EXTERIOR BEAM ELEVATION

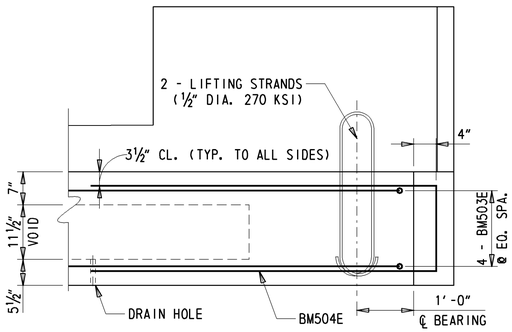
⅜" = 1'-0"

NOTE: SOUTH EXTERIOR BEAM WILL HAVE A CONTINUOUS CURB WITH NO SCUPPERS.



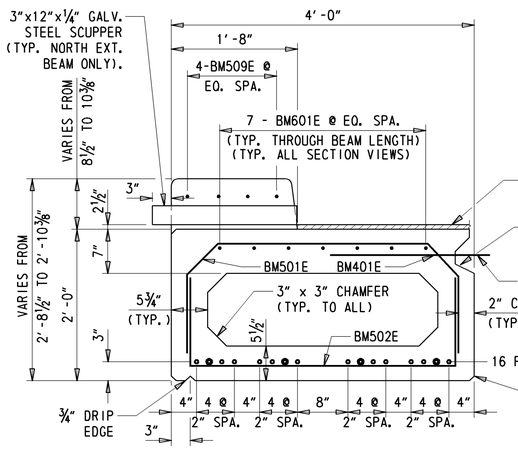
TYPICAL EXTERIOR BEAM END PLAN

¾" = 1'-0"



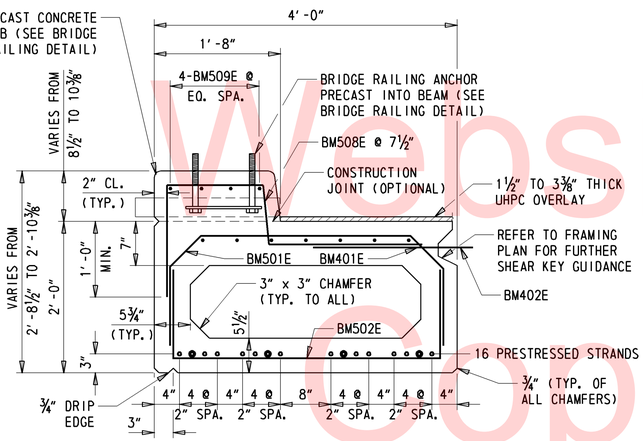
TYPICAL BEAM END ELEVATION FOR EXTERIOR BEAM

¾" = 1'-0"



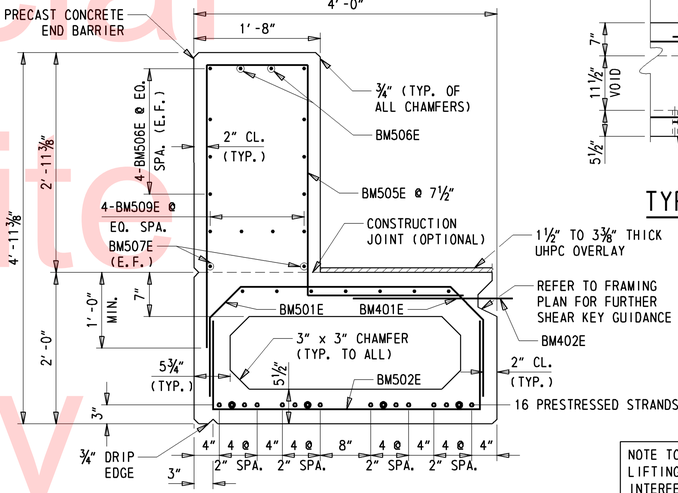
TYPICAL EXTERIOR BEAM SECTION (AT CONCRETE CURB & SCUPPER)

1" = 1'-0"



TYPICAL EXTERIOR BEAM SECTION (AT CONCRETE CURB & METAL POST)

1" = 1'-0"



TYPICAL EXTERIOR BEAM SECTION (AT CONCRETE END BARRIER)

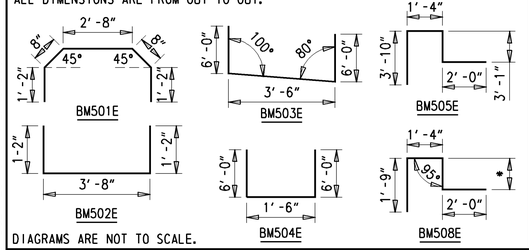
1" = 1'-0"

- ○ 0.6" DIA., 270 KSI LOW RELAXATION PRESTRESSING STRAND (12 STRANDS TOTAL)
- ◘ 0.6" DIA., 270 KSI LOW RELAXATION PRESTRESSING STRAND TO BE DEBONDED FOR 5'-0" @ EACH END (4 STRANDS TOTAL)

NOTE TO PRECASTER:
LIFTING STRANDS SHALL BE SPACED SO THAT THEY DO NOT INTERFERE WITH STRAND SPACING. PRECASTER SHALL ENSURE PROPER PLACEMENT OF THE LIFTING STRANDS TO AVOID CONFLICT WITH THE PRECAST CONCRETE BARRIER. THE PRECASTER SHALL INCLUDE DETAILS OF THE PLACEMENT OF THESE ITEMS IN THEIR SUBMITTED SHOP DRAWINGS. PRECASTER SHALL REFER TO BRIDGE RAILING DETAILS FOR ADDITIONAL INFORMATION ON PRECAST CURB AND END BARRIERS.

BENDING DIAGRAMS

ALL DIMENSIONS ARE FROM OUT TO OUT.



DIAGRAMS ARE NOT TO SCALE.

REINFORCING BAR LIST

STRAIGHT BARS				BENT BARS			
MARK	SIZE	QTY.	LENGTH	MARK	SIZE	QTY.	LENGTH
BM401E	4	154	1'-6"	BM501E	4	62	6'-4"
BM402E	4	154	5½"	BM502E	4	62	6'-0"
BM601E	6	7	51'-8"	BM503E	5	8	15'-6"
BM506E	5	20	4'-8"	BM504E	5	16	13'-6"
BM507E	5	4	10'-2"	BM505E	5	18	10'-3"
BM509E	5	4	51'-8"	BM508E	5	65	5'-10" TO 5'-11½"

* - LEG OF BM506E SHALL VARY FROM 9" TO 10½" AS NEEDED TO ACCOMODATE VARIABLE CURB HEIGHT

PRESTRESSED BEAM NOTES (48" x 24")

DESIGN PLANS - WORKING DRAWINGS

INFORMATION PERTAINING TO THE PRESTRESSED PRECAST REINFORCED CONCRETE BOX BEAMS IS INTENDED TO SERVE AS AN INDICATION OF THE TYPE OF CONSTRUCTION ACCEPTABLE FOR USE. THE CONTRACTOR WILL BE REQUIRED TO PREPARE AND SUBMIT, FOR APPROVAL, A COMPLETE SET OF DETAILED SHOP DRAWINGS FOR THE PRESTRESSED PRECAST CONCRETE UNITS THEY PROPOSE TO FURNISH.

HANDLING

PRESTRESSED BEAMS SHALL BE HANDLED ONLY BY LIFTING STRANDS PROVIDED ESPECIALLY FOR THIS PURPOSE. THE APPROXIMATE DEAD WEIGHT OF EACH UNIT IS 28.43 TONS.

CONCRETE STRESSES

THE MINIMUM COMPRESSIVE STRENGTH AT TIME OF INITIAL PRESTRESS EQUALS 6400 PSI.
THE MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS EQUALS 8000 PSI.

BAR REINFORCEMENT

MATERIALS REQUIREMENT: AASHTO M31 - GRADE 60
ALL BAR REINFORCEMENT TO HAVE 2" MINIMUM COVER EXCEPT AS NOTED OR DETAILED.
ALL BAR REINFORCEMENT AND CHAIR SUPPORTS SHALL BE PROTECTED WITH FUSION BONDED EPOXY CONFORMING TO AASHTO M284.
PAYMENT FOR REINFORCING BARS IS INCIDENTAL TO ITEM #623002 - PRESTRESSED REINFORCED CONCRETE MEMBERS, BOX BEAMS.

STRAND

INITIAL PRESTRESS ON EACH 0.6" DIA. 270 KSI LOW RELAXATION STRAND EQUALS 43942 LBS MINIMUM
ULTIMATE STRENGTH EQUALS 58590 LBS PER STRAND.

CONCRETE FINISH

THE TOPS OF THE PRECAST ADJACENT CONCRETE BOX BEAMS SHALL HAVE A SMOOTH FINISH. THE BOTTOM, SIDES, AND ENDS OF THE BEAMS SHALL BE PROTECTED WITH A WATER MISCIBLE, PENETRATING ALKYL ALKOXY SILANE SEALER. TO CREATE AN EXPOSED COARSE AGGREGATE SURFACE, AN IN-FORM RETARDER SHALL BE APPLIED TO THE ENTIRE SURFACE AREA OF THE SHEAR KEYS. PAYMENT INCIDENTAL TO ITEM #623002 - PRESTRESSED REINFORCED CONCRETE MEMBERS, BOX BEAMS.

CAMBER DIAGRAM

A = ESTIMATED PRESTRESS CAMBER LESS DEFLECTION DUE TO DEAD LOAD OF BEAM TIMES CREEP = 1.060"
B = DEFLECTION DUE TO DEAD LOAD OF OVERLAY AND PARAPET = -0.05" (BARRIER PRECAST INTO BEAM)
C = A - B = NET CAMBER AT TIME OF CONSTRUCTION = 1.010"

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DELAWARE DEPARTMENT OF TRANSPORTATION

ADDENDUMS / REVISIONS

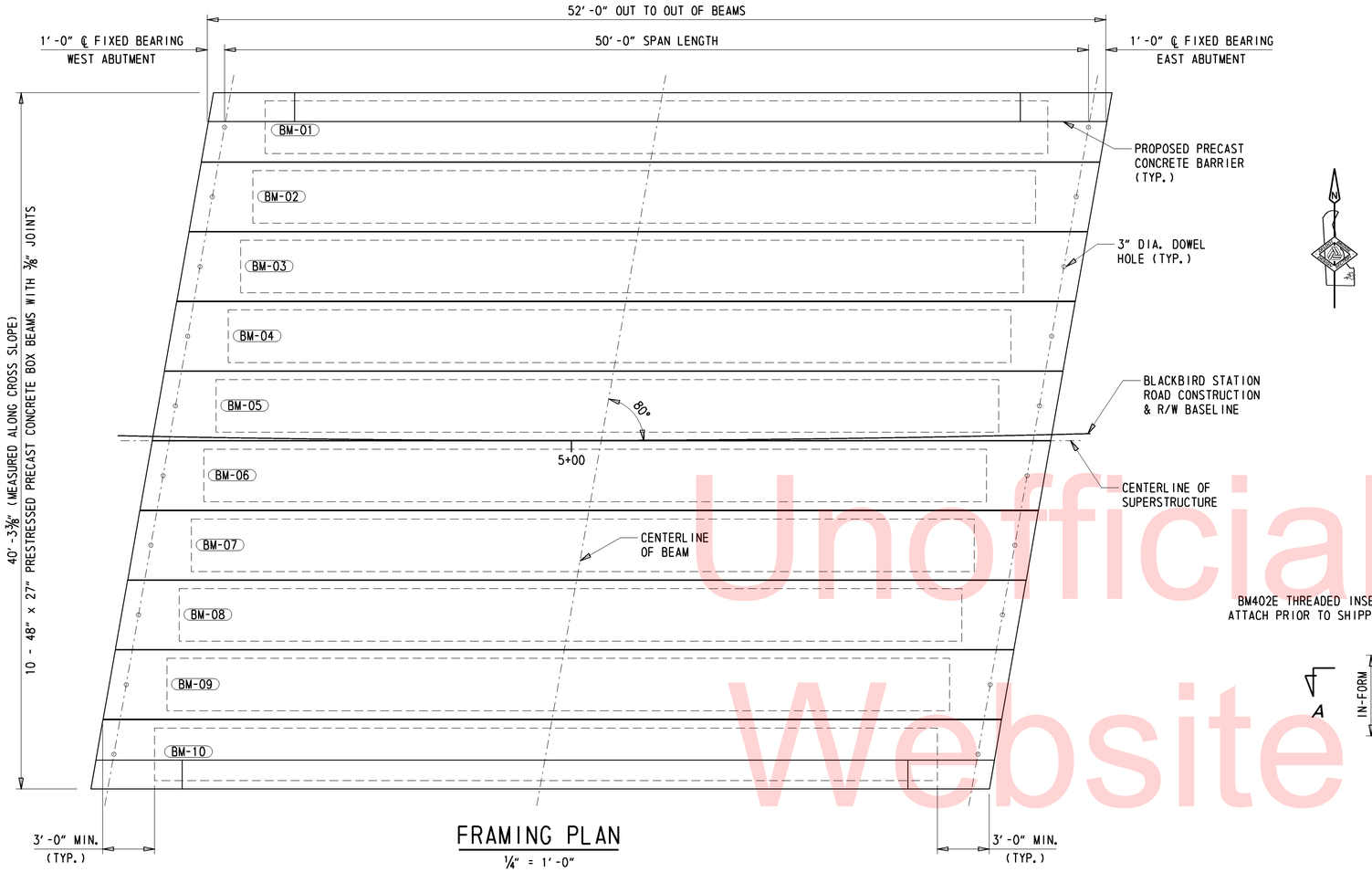
SCALE AS NOTED

BR 1-438 ON N463 BLACKBIRD STATION ROAD OVER BLACKBIRD CREEK

CONTRACT	BRIDGE NO.	1-438
T201407104	DESIGNED BY: NED	
COUNTY	CHECKED BY: CAS	
NEW CASTLE		

EXTERIOR BEAM DETAILS

SHEET NO.	
15	
TOTAL SHTS.	
27	



FRAMING PLAN

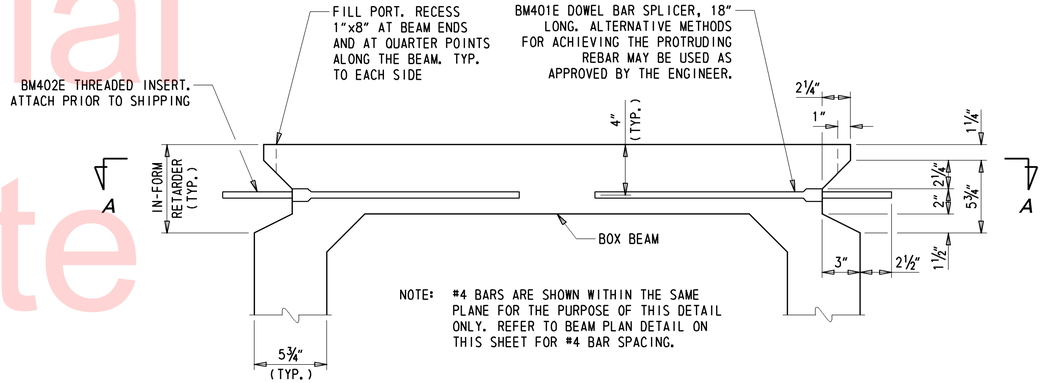
1/4" = 1'-0"

FRAMING PLAN NOTES:

1. FILL BEARING DOWEL HOLES WITH APPROVED HIGH STRENGTH, NON-SHRINK, NON-EXPANDING, NON-STAIN GROUT. PAYMENT INCLUDED UNDER ITEM #623002 - PRESTRESSED REINFORCED CONCRETE MEMBERS, BOX BEAMS.
2. FILL ALL SHEAR KEYWAYS AND CAVITIES WITH APPROVED ULTRA HIGH PERFORMANCE CONCRETE (UHPC). PAYMENT INCLUDED UNDER ITEM #618516 - ULTRA HIGH PERFORMANCE CONCRETE.
3. DO NOT MIX OR POUR UHPC WITHOUT A MANUFACTURING REPRESENATIVE ONSITE.
4. THE ENTIRE SURFACE AREA OF THE SHEAR KEYS SHALL BE PREPARED IN ACCORDANCE WITH SPECIAL PROVISION #618516. FOR GUIDANCE ON PREPARING THE AREA TO RECEIVE UHPC OVERLAY, SEE CONSTRUCTION SEQUENCE & EROSION CONTOL PLAN.
5. PLACING UHPC BETWEEN BEAM SECTIONS SHALL BE DONE WHEN AIR TEMPERATURE IS ABOVE 40°F OR AS PER THE MANUFACTURER'S RECOMMENDATION, WHICHEVER IS HIGHER. NO TRAFFIC OR EQUIPMENT SHALL BE PERMITTED ON THE BRIDGE UNTIL THE UHPC HAS A MINIMUM COMPRESSIVE STRENGTH OF 15 KSI OR UNLESS OTHERWISE NOTED BY THE ENGINEER.

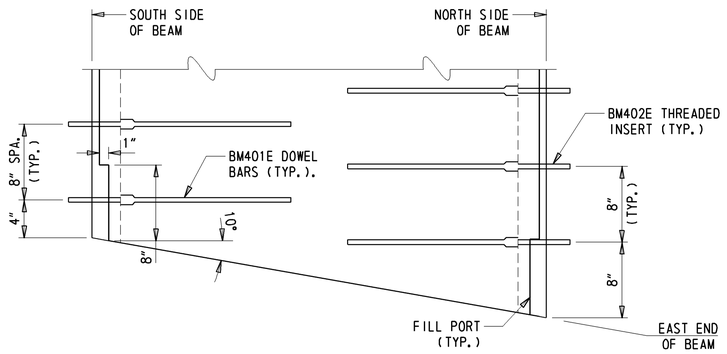
PRECAST SHEAR KEY NOTES:

1. TO CREATE AN EXPOSED COARSE AGGREGATE SURFACE, AN IN-FORM RETARDER SHALL BE APPLIED FROM THE TOP OF BEAM TO BOTTOM OF THE SHEAR KEY ALONG THE FULL LENGTH OF BEAM ON BOTH SIDES. NO STAINS FROM OIL, GREASE OR OTHER CONTAMINATES SHALL BE PRESENT WITHIN THE SHEAR KEY. OMIT THE SHEAR KEY DETAIL AND BM401E AND BM402E BARS ON THE STREAM FACE OF THE FASCIA BEAMS.
2. BM402E BARS SHALL BE INSTALLED PRIOR TO DELIVERING BEAMS TO THE CONSTRUCTION SITE. AN ALTERNATIVE METHOD TO THREADED BM402E BARS PROTRUDING INTO THE SHEAR KEY SPACE MAY BE SUBMITTED FOR APPROVAL BY THE ENGINEER.
3. BARS SHALL BE STAGGERED ACCORDING TO THE DETAILS PROVIDED ON THIS SHEET TO FORM A NON CONTACT LAP SPLICE.
4. RECESS TOP OF SHEAR KEY 1"x8" FOR A FILL PORT, AT BEAM ENDS AND AT QUARTER POINTS ALONG THE BEAM.
5. VALUE ENGINEERING PROPOSALS ELIMINATING THE USE OF UHPC WILL NOT BE CONSIDERED.



SHEAR KEY SECTION

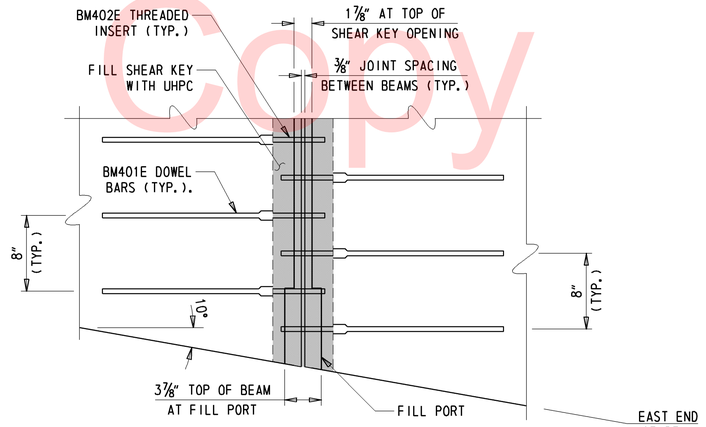
2" = 1'-0"



BEAM PLAN

(SECTION A-A)

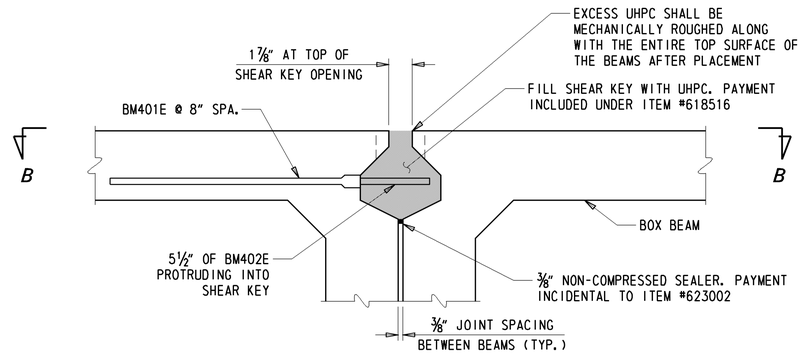
1½" = 1'-0"



NON CONTACT LAP SPLICE PLAN

(SECTION B-B)

1½" = 1'-0"



SHEAR KEY DETAIL

2" = 1'-0"

DELAWARE DEPARTMENT OF TRANSPORTATION	ADDENDUMS / REVISIONS	SCALE AS NOTED	BR 1-438 ON N463 BLACKBIRD STATION ROAD OVER BLACKBIRD CREEK	CONTRACT T201407104 / COUNTY NEW CASTLE	BRIDGE NO. 1-438 / DESIGNED BY: NED / CHECKED BY: CAS	FRAMING PLAN	SHEET NO. 16 / TOTAL SHTS. 27

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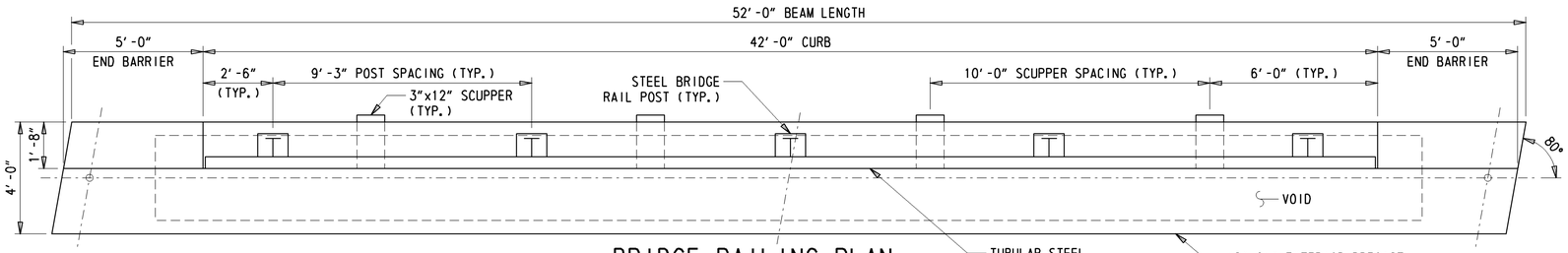
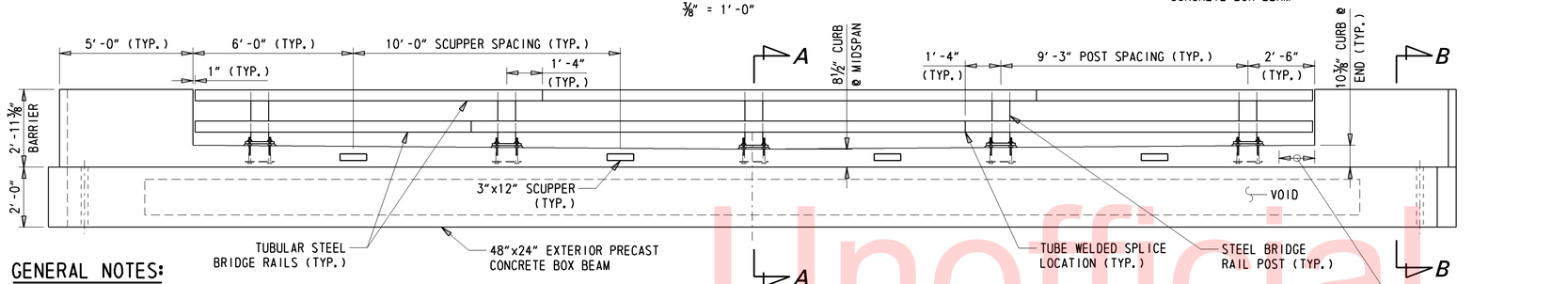


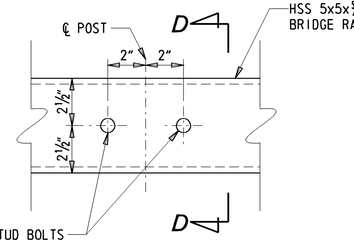
BRIDGE RAILING PLAN

3/8" = 1'-0"



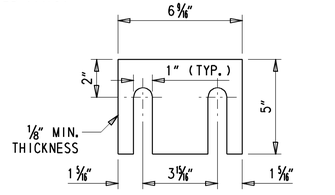
BRIDGE RAILING ELEVATION

3/8" = 1'-0"



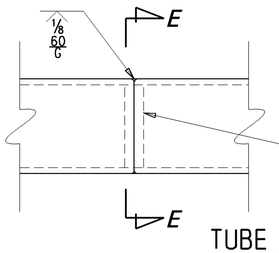
STUD BOLT LOCATION DETAIL

3" = 1'-0"



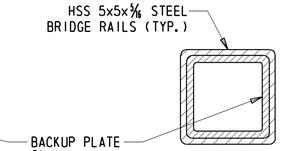
RAILING SHIM DETAIL

3" = 1'-0"



TUBE WELDED SPLICE

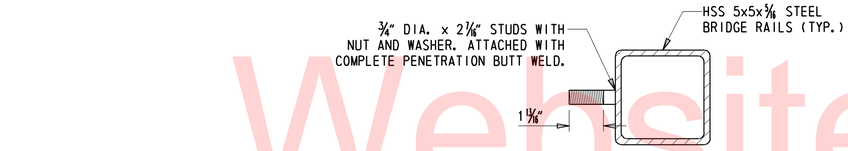
3" = 1'-0"



SECTION E-E

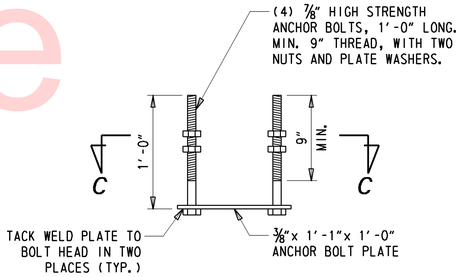
GENERAL NOTES:

1. CURB AND END BARRIERS SHALL BE PRECAST WITH THE EXTERIOR BEAMS.
2. THE MINIMUM HEIGHT OF BARRIER MUST BE 2'-8" AFTER THE UHPC OVERLAY HAS BEEN PLACED.
3. REBAR CONFIGURATION FOR THE BARRIER SYSTEM NOT SHOWN IN THE BRIDGE RAILING PLAN AND BRIDGE RAILING ELEVATION FOR CLARITY. SEE BRIDGE RAILING SECTIONS BELOW AND EXTERIOR BEAM DETAILS FOR INFORMATION ON REBAR CONFIGURATION FOR THE BARRIER SYSTEM.
4. REINFORCEMENT FOR THE EXTERIOR BEAM IS NOT SHOWN IN THE BRIDGE RAILING SECTIONS FOR CLARITY. SEE EXTERIOR BEAM DETAIL FOR EXTERIOR BEAM REINFORCEMENT. ALL REBAR DIMENSIONS AND QUANTITIES FOR THE EXTERIOR BEAM AND BARRIER SYSTEM CAN BE FOUND ON THE EXTERIOR BEAM DETAILS SHEET.
5. LENGTHS OF ALL TUBULAR STEEL BRIDGE RAIL SHALL BE SUBMITTED BY THE FABRICATOR ALONG WITH SHOP DRAWINGS FOR REVIEW BY THE ENGINEER.
6. ALL STRUCTURAL STEEL SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 AND ASTM A153.
7. POSTS SHALL BE NORMAL TO BRIDGE RAILING.
8. ALL EXPOSED CORNERS SHALL BE GROUND SMOOTH.



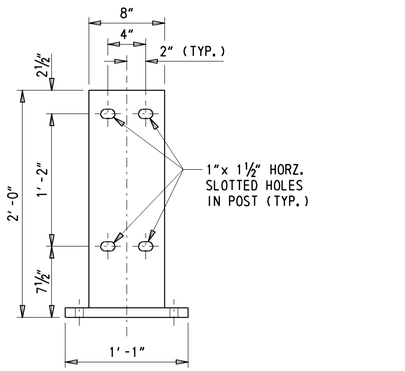
STUD BOLT (SECTION D-D)

3" = 1'-0"



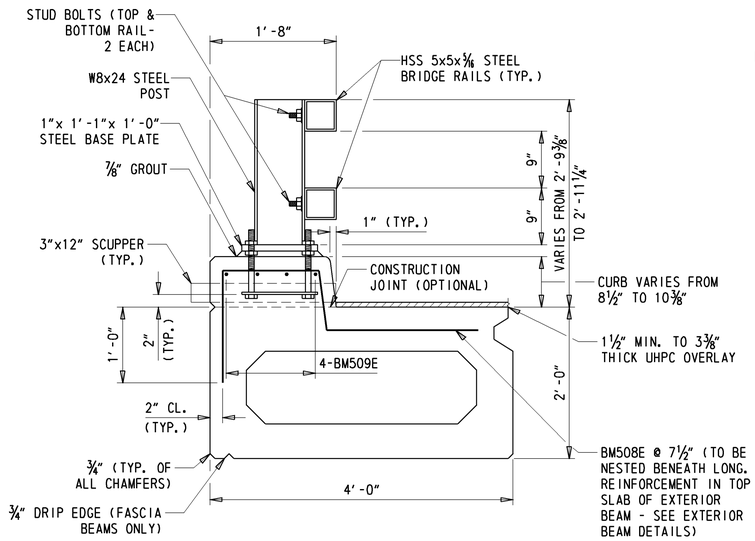
POST ANCHOR BOLT DETAIL

1½" = 1'-0"



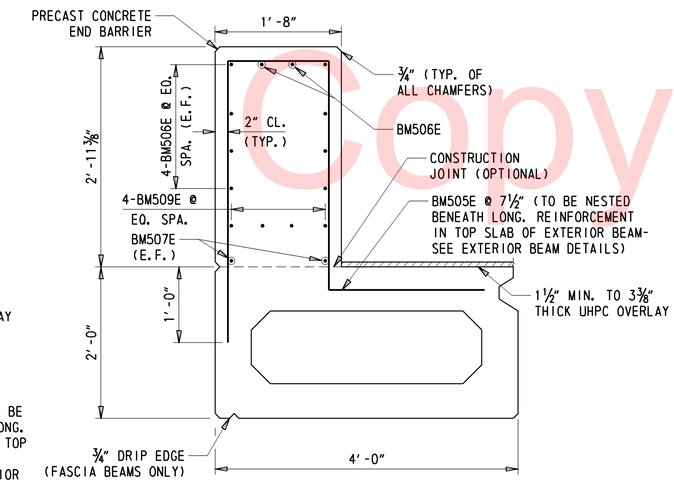
BRIDGE POST ELEVATION

1½" = 1'-0"



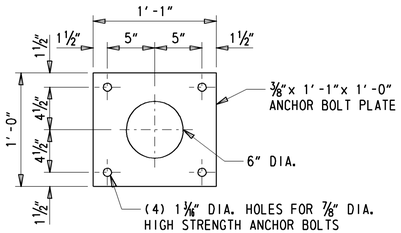
TYPICAL BRIDGE RAILING SECTION (SECTION A-A: CURB AND RAIL POST)

1" = 1'-0"



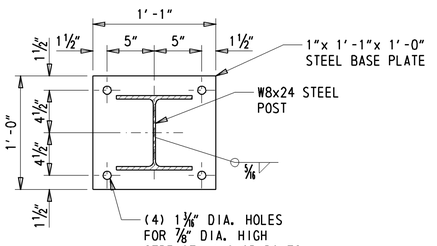
TYPICAL BRIDGE RAILING SECTION (SECTION B-B: CONCRETE END BARRIER)

1" = 1'-0"



POST ANCHOR BOLT PLATE (SECTION C-C)

1½" = 1'-0"



POST BASE PLATE PLAN

1½" = 1'-0"

DELAWARE DEPARTMENT OF TRANSPORTATION	ADDENDUMS / REVISIONS	SCALE AS NOTED	BR 1-438 ON N463 BLACKBIRD STATION ROAD OVER BLACKBIRD CREEK	CONTRACT T201407104	BRIDGE NO. 1-438	BRIDGE RAILING DETAILS	SHEET NO. 17
				COUNTY NEW CASTLE	DESIGNED BY: NED		TOTAL SHTS. 27
					CHECKED BY: CAS		

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BORING: BS-1 | **DATE DRILLED:** 6/24/14
STATION: 5+24.86 | **OFFSET:** -10.45' | **ELEVATION:** 26.01 | **NORTHING:** 497653.014 | **EASTING:** 584722.381
COMMENTS: N/A

NO.	DEPTH	BLOWS /6"	DESCRIPTION	CLASS /G.I.	REMARKS
1	0.5 2.0	13 12 10	MOIST MEDIUM DENSE GRAY COARSE SANDY FINE GRAVEL W/SOME FINE SAND AND SILT.	A-1-B	
2	2.0 4.0	8 8 8 5	MOIST MEDIUM DENSE BROWN CLAYEY FINE SAND W/SOME COARSE SAND, FINE GRAVEL AND SILT.	A-2-4(0)	
3	4.0 6.0	9 6 4 3	NO RECOVERY		BOTTOM OF E. ABUTMENT EL. 20.29
4	6.0 8.0	4 6 4 3	NO SIEVE ANALYSIS - INDICATION OF MOIST LOOSE BROWN SILTY SAND W/SOME FINE GRAVEL.		▽ WATER LEVEL (EL. 18.01)
5	8.0 10.0	6 6 3 3	WET LOOSE GRAY CLAYEY FINE GRAVEL W/SOME COARSE TO FINE SAND W/SOME SILT.	A-2-4(0)	
6	10.0 12.0	3 3 4 6	SATURATED FIRM GRAY SILTY CLAY W/SOME COARSE SAND, TRACE OF FINE SAND.	A-7-5(17)	
7	12.0 14.0	WR 1 1 2	SATURATED SOFT GRAY SILTY CLAY W/SOME COARSE SAND, TRACE OF FINE SAND.	A-7-5(20)	
8	14.0 16.0	2 1 1 2	SATURATED SOFT GRAY SILTY CLAY W/SOME FINE TO COARSE SAND, TRACE OF FINE GRAVEL.	A-7-5(18)	
9	16.0 18.0	2 2 2 2	SATURATED SOFT GRAY COARSE SANDY CLAY W/SOME SILT AND FINE SAND.	A-7-5(13)	
U-1	18.0 24.0		SAMPLE UNSUITABLE FOR CONSOLIDATION. GRAVEL + 2" REMOVED FROM SHELBY TUBE.		
10	24.0 29.0	1 2 1 2	SATURATED LOOSE GRAY ORGANIC FINE SANDY CLAY W/SOME COARSE SAND AND SILT.	A-7-5(9)	
11	29.0 34.0	5 7 9 13	SATURATED VERY STIFF GRAY ORGANIC FINE SANDY CLAY W/SOME COARSE SAND AND SILT.	A-7-5(8)	
12	34.0 39.0	7 11 16 22	SATURATED VERY STIFF GRAY ORGANIC FINE SANDY CLAY W/SOME COARSE SAND AND SILT.	A-7-5(6)	
13	39.0 44.0	10 14 13 18	SATURATED VERY STIFF GRAY ORGANIC CLAYEY FINE TO COARSE SANDY SILT	A-5(2)	
14	44.0 49.0	44 50	SATURATED VERY DENSE GRAY COARSE TO FINE SAND W/SOME SILT, TRACE OF FINE GRAVEL.	A-1-B	E. ABUTMENT PILE ELEV. -22.71
15	49.0 54.0	50	SATURATED VERY DENSE GRAY COARSE TO FINE SAND W/TRACE FINE GRAVEL AND SILT.	A-1-B	
16	54.0 59.0	50	SATURATED VERY DENSE GRAY COARSE TO FINE SAND W/TRACE SILT AND FINE GRAVEL.	A-1-B	
17	59.0 61.0	50	SATURATED VERY DENSE GRAY COARSE TO FINE SAND W/TRACE FINE GRAVEL AND SILT.	A-1-B	
			END BORING		

BORING: BS-2 | **DATE DRILLED:** 6/24/14
STATION: 4+79.68 | **OFFSET:** 10.23' | **ELEVATION:** 26.13 | **NORTHING:** 497656.229 | **EASTING:** 584673.998
COMMENTS: N/A

NO.	DEPTH	BLOWS /6"	DESCRIPTION	CLASS /G.I.	REMARKS
1	2.0 4.0	8 12 11 9	MOIST MEDIUM DENSE BROWN SILTY FINE SAND W/SOME COARSE SAND AND FINE.	A-2-4(0)	HOT-MIX 3.5"
2	4.0 6.0	2 3 3 5	MOIST FIRM BROWN FINE SANDY SILT W/SOME COARSE SAND AND FINE GRAVEL.	A-4(0)	BOTTOM OF W. ABUTMENT EL. 20.51 ▽ WATER LEVEL (EL. 20.73)
3	6.0 8.0	2 6 9 12	MOIST MEDIUM DENSE BROWN CLAYEY FINE GRAVEL W/SOME FINE TO COARSE SAND AND SILT.	A-1-B	
4	8.0 10.0	1 2 3 3	SATURATED FIRM GRAY COARSE TO FINE SANDY CLAY W/SOME SILT, TRACE OF FINE GRAVEL.	A-7-6(4)	
5	10.0 12.0	1 1 1 1	NO SIEVE ANALYSIS - INDICATION OF SATURATED SOFT GRAY SANDY CLAY W/SOME SILT.		
6	12.0 14.0	2 3 5 7	SATURATED LOOSE GRAY SILTY COARSE TO FINE SAND.	A-2-4(0)	
7	14.0 16.0	2 3 5 7	SATURATED FIRM GRAY COARSE TO FINE SANDY CLAY W/SOME SILT.	A-7-5(6)	
8	16.0 18.0	4 6 7 6	SATURATED STIFF GRAY COARSE TO FINE SANDY CLAY W/SOME SILT.	A-7-5(5)	
9	18.0 24.0	4 5 6 5	SATURATED STIFF GRAY ORGANIC SILT W/ TRACE COARSE TO FINE SAND.	A-5(7)	
10	24.0 29.0	2 1 1 3	SATURATED SOFT GRAY SILT W/TRACE FINE TO COARSE SAND.	A-5(6)	
U-1	29.0 31.0		SAMPLE UNSUITABLE FOR CONSOLIDATION.		
11	31.0 34.0	3 2 3 3	SATURATED FIRM GRAY ORGANIC SILT W/TRACE FINE SAND.	A-5(11)	
12	34.0 39.0	7 8 14 19	SATURATED VERY STIFF GRAY ORGANIC CLAYEY SILT W/ SOME COARSE SAND, TRACE OF FINE SAND.	A-5(13)	
13	39.0 44.0	10 12 16 22	SATURATED VERY STIFF GRAY CLAYEY SILT W/ SOME FINE SAND, TRACE OF COARSE SAND.	A-5(11)	
14	44.0 49.0	50	SATURATED VERY DENSE GRAY COARSE TO FINE SAND W/ SOME FINE GRAVEL AND SILT.	A-1-B	W. ABUTMENT PILE ELEV. -22.49
15	49.0 54.0	50	SATURATED VERY DENSE GRAY COARSE TO FINE SAND W/ TRACE FINE GRAVEL AND SILT.	A-1-B	
16	54.0 59.0	50	SATURATED VERY DENSE GRAY FINE TO COARSE SAND W/SOME SILT, TRACE OF FINE GRAVEL.	A-2-4(0)	
17	59.0 61.0	50	SATURATED VERY DENSE GRAY FINE TO COARSE SAND W/SOME SILT.	A-2-4(0)	
			END BORING		

NOTES:
1. BORING LOGS CREATED BY THE DELAWARE DEPARTMENT OF TRANSPORTATION. SUBSURFACE EXPLORATION COMPLETED BY WALTON CORPORATION.
2. REFER TO CONSTRUCTION PLAN SHEET FOR BORING LOCATIONS. BORING LOGS ARE LABELED AS B-1 AND B-2.
3. SOIL SAMPLING: 2 IN. OUTSIDE DIA. SPLIT BARREL SAMPLER, DRIVEN WITH A 140 LB. HAMMER FALLING 30 IN.
4. ALL DEPTHS GIVEN ARE GIVEN IN FEET.

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DELAWARE
DEPARTMENT OF TRANSPORTATION

ADDENDUMS / REVISIONS

BR 1-438 ON N463 BLACKBIRD STATION ROAD OVER BLACKBIRD CREEK

CONTRACT: T201407104
COUNTY: NEW CASTLE
BRIDGE NO.: 1-438
DESIGNED BY: NED
CHECKED BY: CAS

SOIL BORING LOGS

SHEET NO.: 18
TOTAL SHTS.: 27

ENVIRONMENTAL COMPLIANCE NOTES

1. GENERAL NOTES:

A. THE PURPOSE OF THIS SHEET IS TO IDENTIFY THOSE ITEMS ASSOCIATED WITH ENVIRONMENTAL COMPLIANCE. IMPACT CALCULATIONS ARE FOR THE AGENCY PERMIT REPORTING PURPOSES ONLY AND ARE NOT TO BE USED FOR BIDDING PURPOSES.

B. IF A DEPARTURE FROM THE APPROVED PLANS (WHICH WOULD AFFECT ANY NATURAL AND/OR CULTURAL RESOURCES) IS NECESSARY, THE ENVIRONMENTAL STUDIES SECTION SHALL BE CONTACTED AT (302)760-2264 TO ALLOW FOR COORDINATION WITH THE APPROPRIATE RESOURCE AGENCIES AND APPROVAL.

C. USE OF THIS SHEET DOES NOT ALLEVIATE THE CONTRACTOR'S RESPONSIBILITY TO COMPLY WITH ALL CONDITIONS SET FORTH IN THE ENVIRONMENTAL STATEMENT AND PERMITS.

2. NATURAL RESOURCE ISSUES:

A. PERMIT REQUIREMENTS/APPROVALS*:
U.S. ARMY CORPS OF ENGINEERS (COE): NWP #3(a) AND (c) (NO PCN)
DNREC - WETLANDS & SUBAQUEOUS LANDS (WLSL): PROJECT CONSISTENT WITH DEL. CODE CH. 72, SECTION 7207, SPECIAL EXEMPTION (b)
DNREC - WATER QUALITY (WQC) & COASTAL ZONE CONSISTENCY (CZM): ISSUED (PROJECT IS NOT LOCATED IN CRW)
NCC DEPT. OF LAND USE - FLOODPLAIN APPROVAL**

* THE PERMITS/APPROVALS LISTED ARE THOSE REQUIRED FOR THIS PROJECT. THE ENVIRONMENTAL STUDIES SECTION IS RESPONSIBLE FOR COORDINATING AND/OR OBTAINING THIS APPROVAL.
** THE CONTRACTOR MUST ENSURE THAT THESE PERMITS/APPROVALS ARE IN THEIR POSSESSION PRIOR TO BEGINNING CONSTRUCTION IN THE PERMITTED AREA(S) AND ENSURE IT IS DISPLAYED ON-SITE DURING THE ENTIRE CONSTRUCTION PERIOD.

B. CONSTRUCTION RESTRICTIONS:
FISHERIES - NO IN-WATER WORK SHALL OCCUR BETWEEN MARCH 15 - JUNE 30.
ENDANGERED SPECIES - NONE
MIGRATORY BIRDS - NONE (CURRENTLY PIPES)

3. CULTURAL RESOURCE ISSUES:

A. ANY STAGING AND STOCKPILE AREA(S) OUTSIDE OF THE PROJECT'S LOC THAT INDIVIDUALLY OR CUMULATIVELY ARE LARGER THAN 10,000 SQUARE FEET MUST BE APPROVED BY DELDOT'S ARCHAEOLOGIST. CONTACT THE AREA ENGINEER WHO WILL COORDINATE WITH DELDOT'S ARCHAEOLOGIST. WITHIN 30 DAYS, DELDOT WILL (1) APPROVE THE USE OF THE PROPOSED STAGING AND STOCKPILE AREA(S), (2) REJECT THE REQUEST, OR (3) PERFORM AN ARCHAEOLOGICAL SURVEY TO DETERMINE WHETHER TO APPROVE OR REJECT THE REQUEST, WHICH MAY TAKE UP TO 3 MONTHS. IF AN ARCHAEOLOGICAL SURVEY IS NECESSARY, DELDOT OR A CONSULTANT ON ITS BEHALF WILL UNDERTAKE THE SURVEY.

4. STREAM RESTORATION AND SLOPE RIPRAP TREATMENT

A. THE CONTRACTOR SHALL FOLLOW THE SPECIAL PROVISIONS OF ITEM #712531 - CHANNEL BED FILL IN REGARDS TO THE SALVAGING OF ON-SITE NATURAL STREAM BOTTOM MATERIAL OR THE FURNISHING OF OFF-SITE MATERIAL. IF SUFFICIENT SOURCES FOR CHANNEL BED FILL DO NOT EXIST ON-SITE, ANY NEW MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF ITEM #712531 - CHANNEL BED FILL. ALL RIPRAP IN THE CHANNEL BOTTOM (I.E. BELOW THE WATER LINE) SHALL BE RECESSED ONE FOOT BELOW STREAM BED ELEVATION AND CHOKED WITH BORROW TYPE 'B' SO THAT ALL OF THE VOIDS IN THE RIPRAP ARE FILLED WITH MATERIAL. PAYMENT UNDER ITEM #209002 - BORROW TYPE 'B'. THE RIPRAP SHALL THEN BE COVERED WITH A MINIMUM OF 12" CHANNEL BED FILL. FINAL CHANNEL ELEVATIONS SHALL SHALL MATCH EXISTING ELEVATIONS AT THE UPSTREAM AND DOWNSTREAM PROJECT LIMITS. THROUGH THE STRUCTURE, ELEVATIONS SHALL BE AS NOTED ON THE PLANS. PAYMENT UNDER ITEM #712531 - CHANNEL BED FILL.

B. OTHER AREAS OF THE CHANNEL BOTTOM AFFECTED BY CONSTRUCTION (INCLUDING, BUT NOT LIMITED TO, THE LOCATION OF SUMP PITS, STABILIZED OUTFALLS, TEMPORARY PIPES AND/OR SANDBAG DIKES AND DIVERSIONS) SHALL BE RESTORED TO EXISTING CONDITIONS. ANY CAVITIES OR SCOUR HOLES RESULTING FROM CONSTRUCTION ACTIVITIES SHALL BE FILLED WITH CHANNEL BED FILL. PAYMENT UNDER ITEM #712531 - CHANNEL BED FILL.

C. WHEN ALL EROSION AND SEDIMENT CONTROL MEASURES ARE REMOVED AND THE STREAM RETURNS TO ITS NATURAL FLOW CONDITIONS, THE FLOW MUST REMAIN ABOVE GROUND AND ABOVE THE RIPRAP (I.E. THE FLOW CANNOT BE "LOST" IN THE RIPRAP OR BENEATH THE STRUCTURE). IF THIS IS NOT ACHIEVED, THE CONTRACTOR WILL BE REQUIRED TO TAKE CORRECTIVE ACTION AT THE CONTRACTOR'S EXPENSE.

D. ALL RIPRAP ON THE STREAM BANK, OUTSIDE THE CHANNEL BED, SHALL BE CHOKED WITH DELAWARE #57 STONE. PLACE JUST ENOUGH CHOKE MATERIAL TO PREVENT THE LOSS OF CHANNEL BED FILL OR TOPSOIL (DEPENDING ON LOCATION AS INDICATED BELOW) THROUGH THE RIPRAP.
- BENEATH THE BRIDGE: AFTER PLACING THE DE #57 STONE, DO A FINAL CHOKE OF CHANNEL BED FILL SO THAT THE RIRPAP PEAKS ARE BARELY VISIBLE. PAYMENT UNDER ITEM #712531 - CHANNEL BED FILL. DELAWARE #57 STONE SHALL BE INCIDENTAL TO THE RIPRAP ITEM.
- ALL OTHER LOCATIONS: FINISH FILLING THE VOIDS WITH TOPSOIL SO THAT THE RIPRAP PEAKS ARE BARELY VISIBLE. AN ADDITIONAL 4-INCH TOPSOIL LAYER SHALL BE PLACED ON TOP OF THE RIPRAP. SLOPE SEEDING SHALL BE WITH ITEM #908019 - STREAMBANK SEED MIX, SEEDING. FOLLOWING THE SEEDING OPERATION, ITEM #908020 - EROSION CONTROL BLANKET MULCH, OR OTHER BLANKET AS SHOWN ON THE PLANS SHALL BE INSTALLED. ALL WORK, STARTING WITH THE INITIAL CHOKING WITH TOPSOIL, THROUGH THE SEEDING, SHALL BE COMPLETED PRIOR TO ANY RAIN EVENT. DELAWARE #57 STONE SHALL BE INCIDENTAL TO THE RIPRAP ITEM. ALL OTHER ITEMS SHALL BE PAID FOR UNDER THEIR RESPECTIVE ITEMS.

E. THE TOPSOIL/SEED MULCH CAN BE PLACED BEFORE OR AFTER THE REMOVAL OF THE STREAM DIVERSION. IF IT OCCURS AFTER STREAM DIVERSION REMOVAL, A TURBIDITY SHALL BE USED TO MINIMIZE IN-STREAM SEDIMENTATION. PAYMENT SHALL BE INCIDENTAL TO ITEM #909005 - STREAM DIVERSION.

5. PROTECTION OF RESOURCES

A. CLEARING IN WETLAND AREAS SHALL BE KEPT TO A MINIMUM ABSOLUTELY NECESSARY FOR CONSTRUCTION ACCESS. IN WETLAND AREAS THAT ARE CLEARED, THERE SHALL BE NO GRUBBING EXCEPT WHERE NECESSARY TO CONSTRUCT PROJECT COMPONENTS SUCH AS FOUNDATIONS AND RIPRAP PROTECTION. VEGETATION SHALL BE BE CUT FLUSH WITH THE GROUND (I.E. NO DISTURBANCE OF THE ROOT MAT). TEMPORARILY DISTURBED WETLAND AREAS SHALL BE RESTORED TO GRADE AND SEEDED WITH TEMPORARY GRASS SEEDING - DRY GROUND, (PAYMENT UNDER ITEM #908017).

B. SILT FENCE OR CONSTRUCTION SAFETY FENCE SHALL BE USED ALONG THE LIMITS OF CONSTRUCTION IN ALL AREAS WHERE WATER/WETLANDS ARE BEING IMPACTED (AS SHOWN ON THE EC SHEET), AND ALSO IN ANY AREA WHERE WATER/WETLANDS EXIST WITHIN 20 FEET OF THE LOC (AS SHOWN ON THE CONSTRUCTION PLANS). CONTRACTOR ACCESS BEYOND THE LOC IS STRICTLY PROHIBITED.

C. SILT FENCE INSTALLATION ADJACENT TO WOODED UPLANDS/WETLANDS: SANDBAGS SHALL BE USED TO SECURE SILT FENCE IN LIEU OF TRENCHING PROVIDED PROPER EROSION & SEDIMENT CONTROL CAN BE MAINTAINED. SANDBAGS USED TO SECURE SILT FENCE SHALL BE INCIDENTAL TO ITEM #905001 - SILT FENCE. THE ENVIRONMENTAL STUDIES SECTION (CAROL SULLIVAN, 302-760-2129) CAN PROVIDE FURTHER GUIDANCE REGARDING THIS METHOD OF INSTALLATION.

D. ALL TREES TO BE REMOVED SHALL BE CLEARLY MARKED WITH PAINT PRIOR TO THE EROSION & SEDIMENT CONTROL MEETING.

6. PLANTING GUIDANCE, WORK DONE BY DELDOT:

PLANTING GUIDANCE (INFORMATIONAL ONLY, WORK TO BE DONE BY OTHERS. THERE SHALL BE NO PAYMENT FOR PLANTING ON THIS CONTRACT.): UPON FINAL ACCEPTANCE OF THE CONTRACT, APPROPRIATE TREES AND/OR SHRUBS SHALL BE PLANTED IN A NATURALIZED PATTERN (MINIMUM 8', MAXIMUM 12' CENTERS) IN TEMPORARILY DISTURBED WOODED WETLAND AREAS WITHIN THE LOC. FINAL PLANT COUNTS WILL BE BASED ON FIELD CONDITIONS AND DETERMINED BY THE ROADSIDE ENVIRONMENTAL ADMINISTRATOR OR HIS/HER DESIGNEE. SPECIFIC PLANT SELECTION IS ALSO AT HIS/HER DISCRETION, BUT SHALL BE A NATIVE SPECIES APPROVED BY THE DELAWARE DEPARTMENT OF NATURAL RESOURCES.

E.C. SHEET 1 OF 2

DELAWARE DEPARTMENT OF TRANSPORTATION	ADDENDUMS / REVISIONS	NOT TO SCALE	BR 1-438 ON N463 BLACKBIRD STATION ROAD OVER BLACKBIRD CREEK	CONTRACT T201407104	BRIDGE NO. 1-438	ENVIRONMENTAL COMPLIANCE NOTES	SHEET NO. 19
				COUNTY NEW CASTLE	DESIGNED BY: NED		TOTAL SHTS. 27
					CHECKED BY: CAS		

LAST REVISED: 02/18/2015
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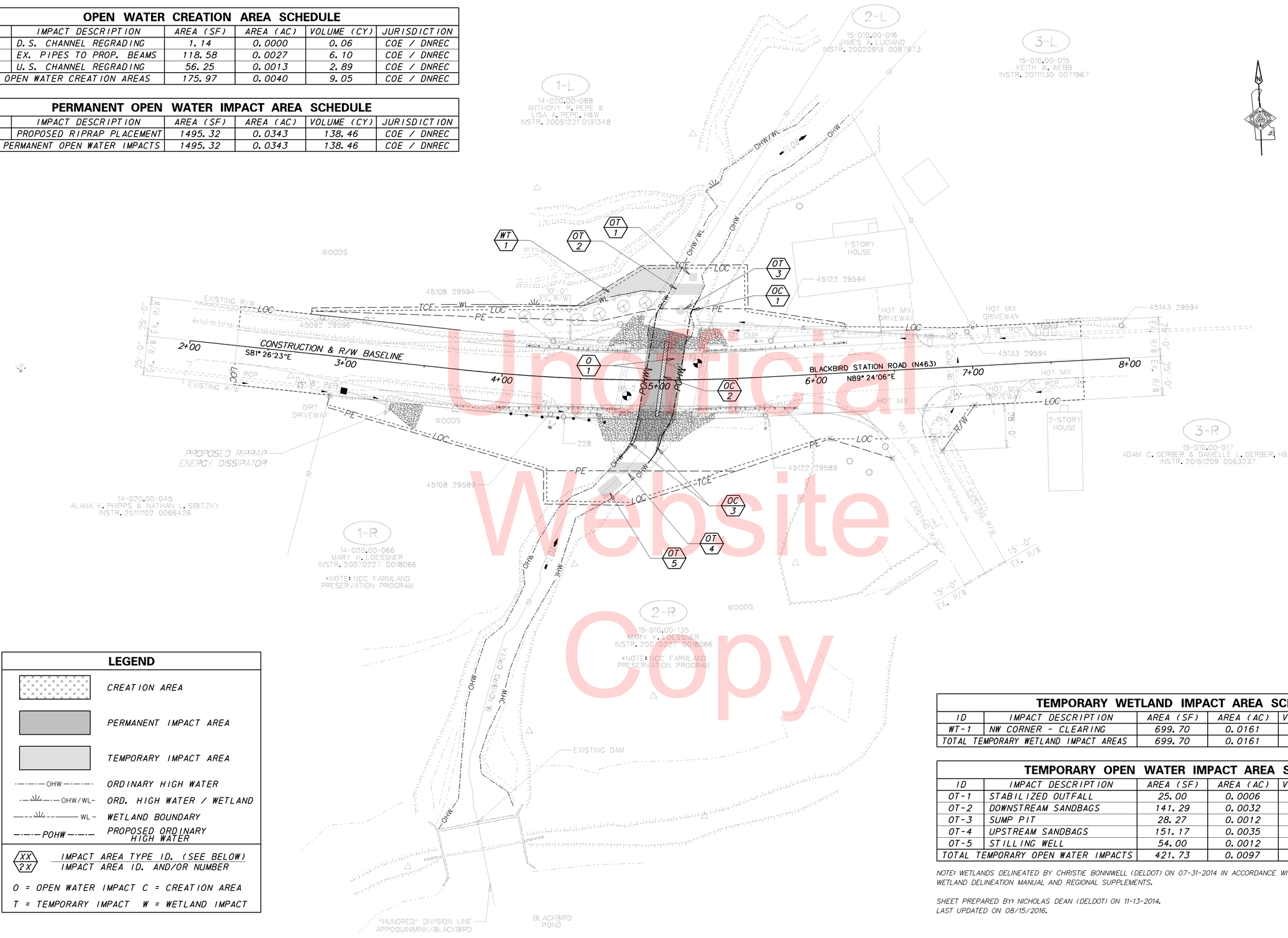
OPEN WATER CREATION AREA SCHEDULE					
ID	IMPACT DESCRIPTION	AREA (SF)	AREA (AC)	VOLUME (CY)	JURISDICTION
OC-1	D.S. CHANNEL REGRADING	1.14	0.0000	0.06	COE / DNREC
OC-2	EX. PIPES TO PROP. BEAMS	118.58	0.0027	6.10	COE / DNREC
OC-3	U.S. CHANNEL REGRADING	56.25	0.0013	2.89	COE / DNREC
TOTAL OPEN WATER CREATION AREAS		175.97	0.0040	9.05	COE / DNREC

PERMANENT OPEN WATER IMPACT AREA SCHEDULE					
ID	IMPACT DESCRIPTION	AREA (SF)	AREA (AC)	VOLUME (CY)	JURISDICTION
O-1	PROPOSED RIPRAP PLACEMENT	1495.32	0.0343	138.46	COE / DNREC
TOTAL PERMANENT OPEN WATER IMPACTS		1495.32	0.0343	138.46	COE / DNREC



LEGEND

- CREATION AREA
- PERMANENT IMPACT AREA
- TEMPORARY IMPACT AREA
- OHW — ORDINARY HIGH WATER
- OHW/WL — ORD. HIGH WATER / WETLAND
- WL — WETLAND BOUNDARY
- POHW — PROPOSED ORDINARY HIGH WATER
- XX / ?X — IMPACT AREA TYPE ID. (SEE BELOW) / IMPACT AREA ID. AND/OR NUMBER

O = OPEN WATER IMPACT C = CREATION AREA

T = TEMPORARY IMPACT W = WETLAND IMPACT

TEMPORARY WETLAND IMPACT AREA SCHEDULE					
ID	IMPACT DESCRIPTION	AREA (SF)	AREA (AC)	VOLUME (CY)	JURISDICTION
WT-1	NW CORNER - CLEARING	699.70	0.0161	N/A	COE
TOTAL TEMPORARY WETLAND IMPACT AREAS		699.70	0.0161	N/A	COE

TEMPORARY OPEN WATER IMPACT AREA SCHEDULE					
ID	IMPACT DESCRIPTION	AREA (SF)	AREA (AC)	VOLUME (CY)	JURISDICTION
OT-1	STABILIZED OUTFALL	25.00	0.0006	1.85	COE / DNREC
OT-2	DOWNSTREAM SANDBAGS	141.29	0.0032	9.16	COE / DNREC
OT-3	SUMP PIT	28.27	0.0012	5.24	COE / DNREC
OT-4	UPSTREAM SANDBAGS	151.17	0.0035	9.80	COE / DNREC
OT-5	STILLING WELL	54.00	0.0012	4.00	COE / DNREC
TOTAL TEMPORARY OPEN WATER IMPACTS		421.73	0.0097	30.05	COE / DNREC

NOTE: WETLANDS DELINEATED BY CHRISTIE BONNIWELL (DELDOT) ON 07-31-2014 IN ACCORDANCE WITH THE 1987 CORPS OF ENGINEERS WETLAND DELINEATION MANUAL AND REGIONAL SUPPLEMENTS.

SHEET PREPARED BY: NICHOLAS DEAN (DELDOT) ON 11-13-2014.
LAST UPDATED ON 08/15/2016.

E.C. SHEET 2 OF 2

DELAWARE
DEPARTMENT OF TRANSPORTATION

ADDENDUMS / REVISIONS

SCALE 0 30 60 90 FEET

BR 1-438 ON N463 BLACKBIRD STATION ROAD OVER BLACKBIRD CREEK

CONTRACT	T201407104
COUNTY	NEW CASTLE
BRIDGE NO.	1-438
DESIGNED BY:	NED
CHECKED BY:	CAS

ENVIRONMENTAL COMPLIANCE PLAN

SHEET NO.	20
TOTAL SHTS.	27

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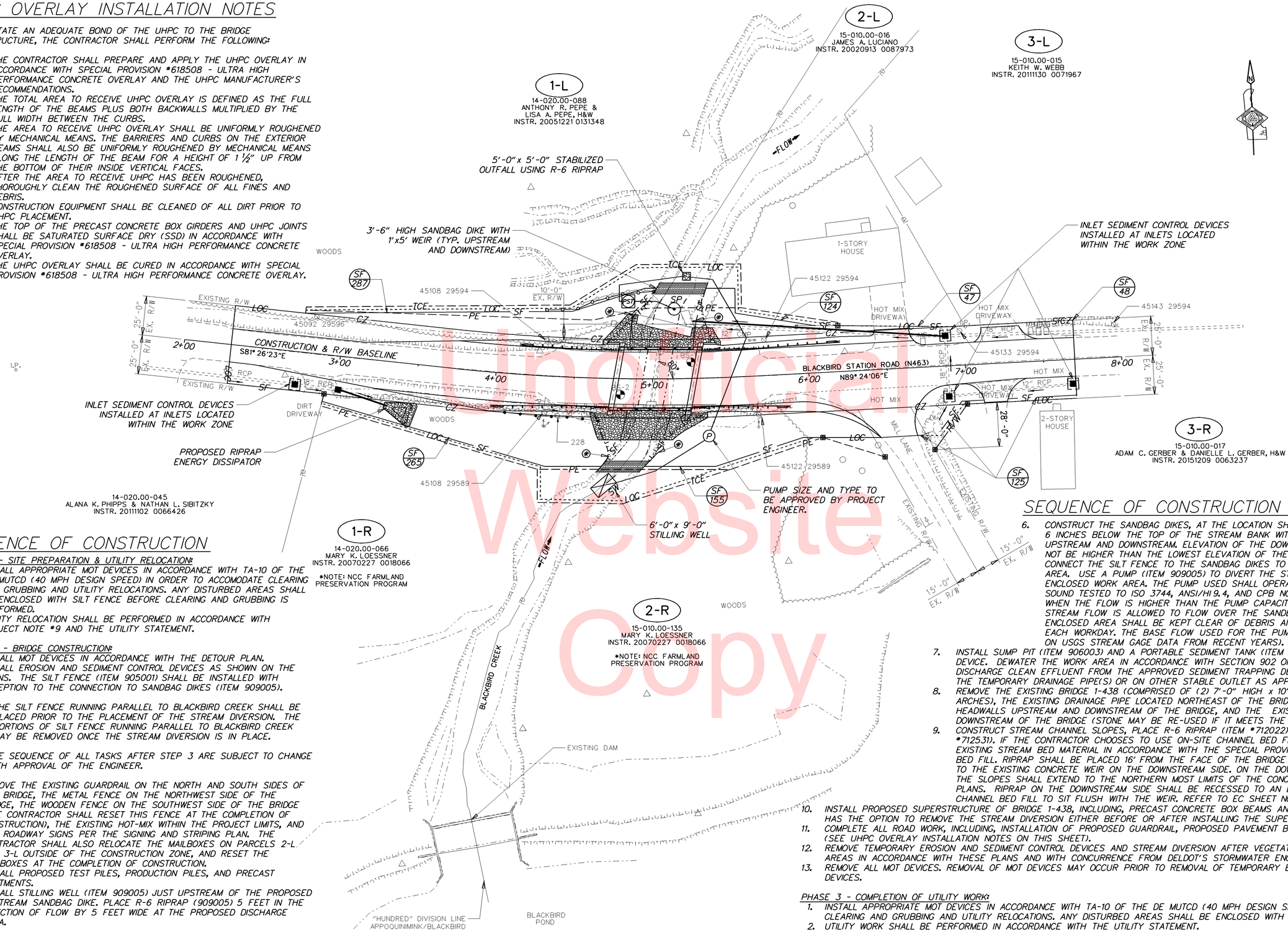
UHPC OVERLAY INSTALLATION NOTES

TO FACILITATE AN ADEQUATE BOND OF THE UHPC TO THE BRIDGE SUPERSTRUCTURE, THE CONTRACTOR SHALL PERFORM THE FOLLOWING:

1. THE CONTRACTOR SHALL PREPARE AND APPLY THE UHPC OVERLAY IN ACCORDANCE WITH SPECIAL PROVISION *618508 - ULTRA HIGH PERFORMANCE CONCRETE OVERLAY AND THE UHPC MANUFACTURER'S RECOMMENDATIONS.
2. THE TOTAL AREA TO RECEIVE UHPC OVERLAY IS DEFINED AS THE FULL LENGTH OF THE BEAMS PLUS BOTH BACKWALLS MULTIPLIED BY THE FULL WIDTH BETWEEN THE CURBS.
3. THE AREA TO RECEIVE UHPC OVERLAY SHALL BE UNIFORMLY ROUGHENED BY MECHANICAL MEANS. THE BARRIERS AND CURBS ON THE EXTERIOR BEAMS SHALL ALSO BE UNIFORMLY ROUGHENED BY MECHANICAL MEANS ALONG THE LENGTH OF THE BEAM FOR A HEIGHT OF 1 ½" UP FROM THE BOTTOM OF THEIR INSIDE VERTICAL FACES.
4. AFTER THE AREA TO RECEIVE UHPC HAS BEEN ROUGHENED, THOROUGHLY CLEAN THE ROUGHENED SURFACE OF ALL FINES AND DEBRIS.
5. CONSTRUCTION EQUIPMENT SHALL BE CLEANED OF ALL DIRT PRIOR TO UHPC PLACEMENT.
6. THE TOP OF THE PRECAST CONCRETE BOX GIRDERS AND UHPC JOINTS SHALL BE SATURATED SURFACE DRY (SSD) IN ACCORDANCE WITH SPECIAL PROVISION *618508 - ULTRA HIGH PERFORMANCE CONCRETE OVERLAY.
7. THE UHPC OVERLAY SHALL BE CURED IN ACCORDANCE WITH SPECIAL PROVISION *618508 - ULTRA HIGH PERFORMANCE CONCRETE OVERLAY.



SEQUENCE OF CONSTRUCTION

PHASE 1 - SITE PREPARATION & UTILITY RELOCATION:

1. INSTALL APPROPRIATE MOT DEVICES IN ACCORDANCE WITH TA-10 OF THE DE MUTCD (40 MPH DESIGN SPEED) IN ORDER TO ACCOMODATE CLEARING AND GRUBBING AND UTILITY RELOCATIONS. ANY DISTURBED AREAS SHALL BE ENCLOSED WITH SILT FENCE BEFORE CLEARING AND GRUBBING IS PERFORMED.
2. UTILITY RELOCATION SHALL BE PERFORMED IN ACCORDANCE WITH PROJECT NOTE *9 AND THE UTILITY STATEMENT.

PHASE 2 - BRIDGE CONSTRUCTION:

1. INSTALL MOT DEVICES IN ACCORDANCE WITH THE DETOUR PLAN.
2. INSTALL EROSION AND SEDIMENT CONTROL DEVICES AS SHOWN ON THE PLANS. THE SILT FENCE (ITEM 905001) SHALL BE INSTALLED WITH EXCEPTION TO THE CONNECTION TO SANDBAG DIKES (ITEM 909005).

   * THE SILT FENCE RUNNING PARALLEL TO BLACKBIRD CREEK SHALL BE PLACED PRIOR TO THE PLACEMENT OF THE STREAM DIVERSION. THE PORTIONS OF SILT FENCE RUNNING PARALLEL TO BLACKBIRD CREEK MAY BE REMOVED ONCE THE STREAM DIVERSION IS IN PLACE.

*** THE SEQUENCE OF ALL TASKS AFTER STEP 3 ARE SUBJECT TO CHANGE WITH APPROVAL OF THE ENGINEER.

3. REMOVE THE EXISTING GUARDRAIL ON THE NORTH AND SOUTH SIDES OF THE BRIDGE, THE METAL FENCE ON THE NORTHWEST SIDE OF THE BRIDGE, THE WOODEN FENCE ON THE SOUTHWEST SIDE OF THE BRIDGE (THE CONTRACTOR SHALL RESET THIS FENCE AT THE COMPLETION OF CONSTRUCTION), THE EXISTING HOT-MIX WITHIN THE PROJECT LIMITS, AND THE ROADWAY SIGNS PER THE SIGNING AND STRIPING PLAN. THE CONTRACTOR SHALL ALSO RELOCATE THE MAILBOXES ON PARCELS 2-L AND 3-L OUTSIDE OF THE CONSTRUCTION ZONE, AND RESET THE MAILBOXES AT THE COMPLETION OF CONSTRUCTION.
4. INSTALL PROPOSED TEST PILES, PRODUCTION PILES, AND PRECAST ABUTMENTS.
5. INSTALL STILLING WELL (ITEM 909005) JUST UPSTREAM OF THE PROPOSED UPSTREAM SANDBAG DIKE. PLACE R-6 RIPRAP (909005) 5 FEET IN THE DIRECTION OF FLOW BY 5 FEET WIDE AT THE PROPOSED DISCHARGE AREA.

SEQUENCE OF CONSTRUCTION (CONTINUED)

6. CONSTRUCT THE SANDBAG DIKES, AT THE LOCATION SHOWN, WITH THE TOP ELEVATION 6 INCHES BELOW THE TOP OF THE STREAM BANK WITH A 1'x5' WEIR OPENING UPSTREAM AND DOWNSTREAM. ELEVATION OF THE DOWNSTREAM SANDBAG DIKE SHALL NOT BE HIGHER THAN THE LOWEST ELEVATION OF THE UPSTREAM SANDBAG DIKE. CONNECT THE SILT FENCE TO THE SANDBAG DIKES TO COMPLETELY ENCLOSE THE WORK AREA. USE A PUMP (ITEM 909005) TO DIVERT THE STREAM BASE FLOW AROUND THE ENCLOSED WORK AREA. THE PUMP USED SHALL OPERATE AT OR BELOW 70 dBA AND BE SOUND TESTED TO ISO 3744, ANSI/HI 9.4, AND CPB NOISE LEVEL TESTING STANDARDS. WHEN THE FLOW IS HIGHER THAN THE PUMP CAPACITY DURING RAINFALL EVENTS, THE STREAM FLOW IS ALLOWED TO FLOW OVER THE SANDBAG DIKE. THEREFORE, THE ENCLOSED AREA SHALL BE KEPT CLEAR OF DEBRIS AND OBSTRUCTIONS AT THE END OF EACH WORKDAY. THE BASE FLOW USED FOR THE PUMPS SHALL BE 10.0 CFS (BASED ON USGS STREAM GAGE DATA FROM RECENT YEARS).
7. INSTALL SUMP PIT (ITEM 906003) AND A PORTABLE SEDIMENT TANK (ITEM 906001) AS A SEDIMENT TRAPPING DEVICE. DEWATER THE WORK AREA IN ACCORDANCE WITH SECTION 902 OF DELDOT STANDARD SPECIFICATIONS. DISCHARGE CLEAN EFFLUENT FROM THE APPROVED SEDIMENT TRAPPING DEVICE AT THE STABILIZED OUTLET OF THE TEMPORARY DRAINAGE PIPE(S) OR ON OTHER STABLE OUTLET AS APPROVED BY THE ENGINEER.
8. REMOVE THE EXISTING BRIDGE 1-438 (COMPRISED OF (2) 7'-0" HIGH x 10'-8" WIDE CORRUGATED METAL PIPE ARCHES), THE EXISTING DRAINAGE PIPE LOCATED NORTHEAST OF THE BRIDGE, THE EXISTING SACKED CONCRETE HEADWALLS UPSTREAM AND DOWNSTREAM OF THE BRIDGE, AND THE EXISTING RIPRAP UPSTREAM AND DOWNSTREAM OF THE BRIDGE (STONE MAY BE RE-USED IF IT MEETS THE REQUIREMENTS FOR R-6 RIPRAP).
9. CONSTRUCT STREAM CHANNEL SLOPES, PLACE R-6 RIPRAP (ITEM *712022), AND CHANNEL BED FILL (ITEM *712531). IF THE CONTRACTOR CHOOSES TO USE ON-SITE CHANNEL BED FILL, EXCAVATE AND STOCKPILE THE EXISTING STREAM BED MATERIAL IN ACCORDANCE WITH THE SPECIAL PROVISIONS OF ITEM *712531 - CHANNEL BED FILL. RIPRAP SHALL BE PLACED 16' FROM THE FACE OF THE BRIDGE ON THE UPSTREAM SIDE AND UP TO THE EXISTING CONCRETE WEIR ON THE DOWNSTREAM SIDE. ON THE DOWNSTREAM SIDE, THE RIPRAP ON THE SLOPES SHALL EXTEND TO THE NORTHERN MOST LIMITS OF THE CONCRETE WEIR AS SHOWN ON THE PLANS. RIPRAP ON THE DOWNSTREAM SIDE SHALL BE RECESSED TO AN ELEVATION THAT ALLOWS FOR THE CHANNEL BED FILL TO SIT FLUSH WITH THE WEIR. REFER TO EC SHEET NOTE 4 FOR FURTHER GUIDANCE.
10. INSTALL PROPOSED SUPERSTRUCTURE OF BRIDGE 1-438, INCLUDING, PRECAST CONCRETE BOX BEAMS AND BRIDGE RAILING. THE CONTRACTOR HAS THE OPTION TO REMOVE THE STREAM DIVERSION EITHER BEFORE OR AFTER INSTALLING THE SUPERSTRUCTURE OF BRIDGE 1-438.
11. COMPLETE ALL ROAD WORK, INCLUDING, INSTALLATION OF PROPOSED GUARDRAIL, PROPOSED PAVEMENT BOX, AND UHPC RIDING SURFACE (SEE UHPC OVERLAY INSTALLATION NOTES ON THIS SHEET).
12. REMOVE TEMPORARY EROSION AND SEDIMENT CONTROL DEVICES AND STREAM DIVERSION AFTER VEGETATION HAS STABILIZED ALL DISTURBED AREAS IN ACCORDANCE WITH THESE PLANS AND WITH CONCURRENCE FROM DELDOT'S STORMWATER ENGINEER.
13. REMOVE ALL MOT DEVICES. REMOVAL OF MOT DEVICES MAY OCCUR PRIOR TO REMOVAL OF TEMPORARY EROSION AND SEDIMENT CONTROL DEVICES.

PHASE 3 - COMPLETION OF UTILITY WORK:

1. INSTALL APPROPRIATE MOT DEVICES IN ACCORDANCE WITH TA-10 OF THE DE MUTCD (40 MPH DESIGN SPEED) IN ORDER TO ACCOMODATE CLEARING AND GRUBBING AND UTILITY RELOCATIONS. ANY DISTURBED AREAS SHALL BE ENCLOSED WITH SILT FENCE.
2. UTILITY WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE UTILITY STATEMENT.
3. REMOVE ALL MOT DEVICES.

DELAWARE
DEPARTMENT OF TRANSPORTATION

ADDENDUMS / REVISIONS

SCALE
0 30 60 90
FEET

BR 1-438 ON N463 BLACKBIRD STATION ROAD OVER BLACKBIRD CREEK

CONTRACT	BRIDGE NO. 1-438	CONSTRUCTION SEQUENCE & EROSION CONTROL PLAN	SHEET NO.
T201407104	DESIGNED BY: NED		21
COUNTY			TOTAL SHTS.
NEW CASTLE	CHECKED BY: CAS		27

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PORTABLE CHANGEABLE MESSAGE SIGNS

PRIOR TO DETOUR
(10 DAYS PRIOR TO BEGINNING OF DETOUR)

PCMS-1

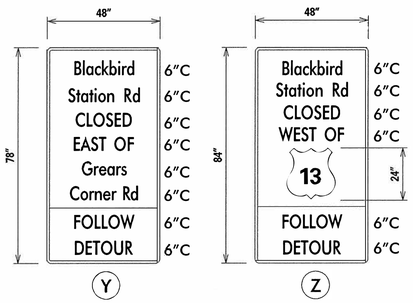
BLACK- BIRD STA ROAD	TO CLOSE STARTING XX/XX/XX

DURING DETOUR
(DISPLAY FOR 5 DAYS AFTER IMPLEMENTATION OF DETOUR)

PCMS-2

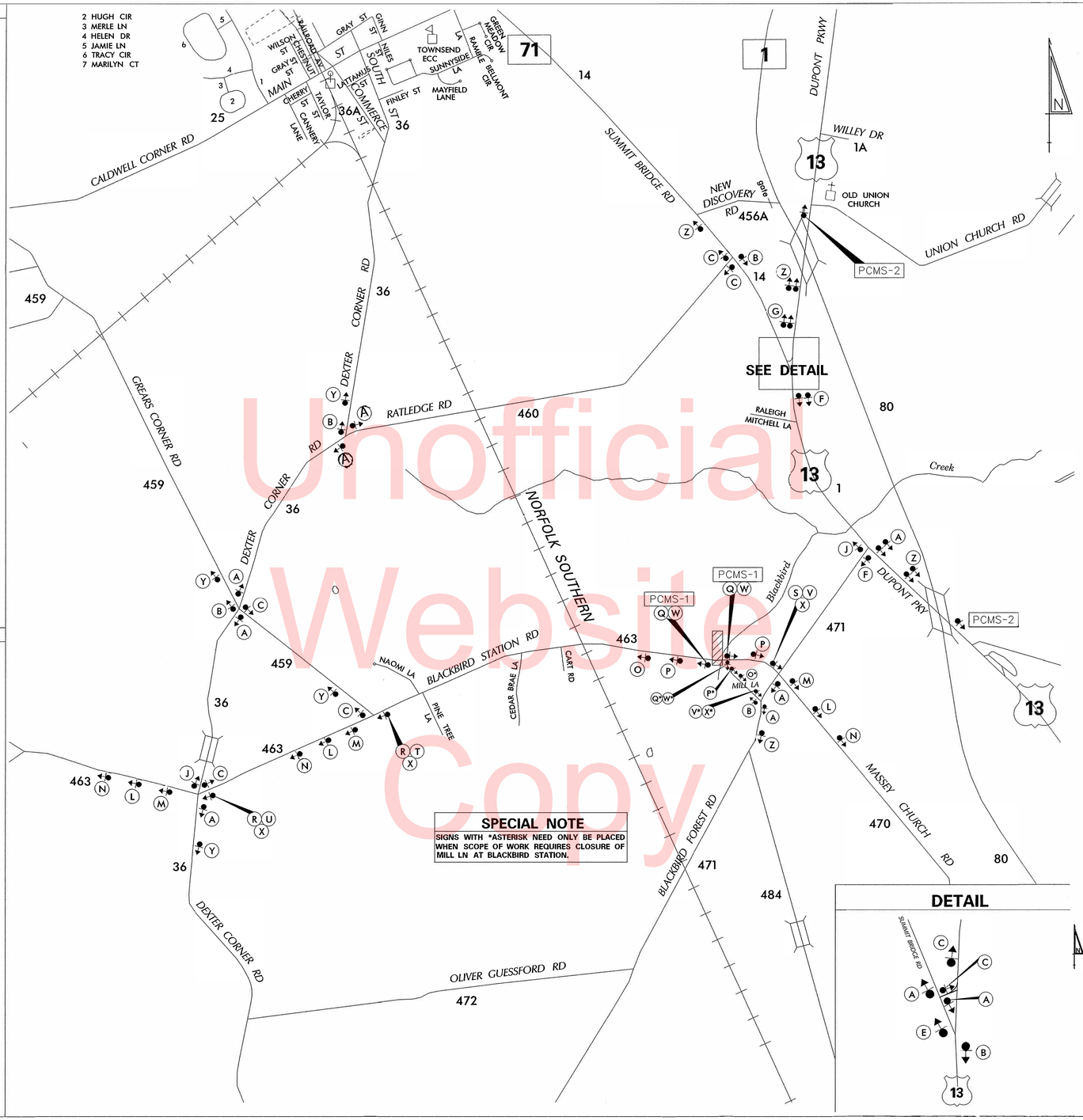
BLACK- BIRD STA ROAD	CLOSED FOLLOW DETOUR

SPECIAL SIGNS



*D/G RETROREFLECTIVE FLUORESCENT ORANGE BACKGROUND; BLACK LEGEND

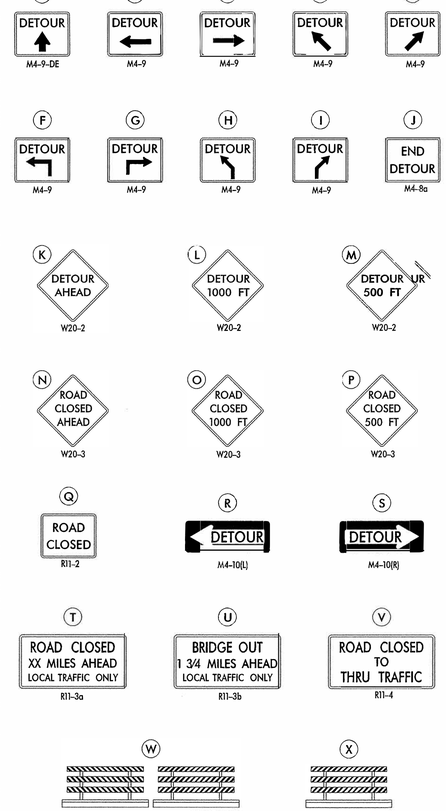
13 WHITE BACKGROUND; BLACK LEGEND



SPECIAL NOTE
SIGNS WITH *ASTERISK NEED ONLY BE PLACED WHEN SCOPE OF WORK REQUIRES CLOSURE OF MILL LN AT BLACKBIRD STATION.

DETAIL

LEGEND



GENERAL NOTES

1. ALL DETOUR SIGNING, INCLUDING TRAILBLAZERS, ARE TO BE SUPPLIED AND MAINTAINED BY THE GENERAL CONTRACTOR IN COMPLIANCE WITH "THE DELAWARE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (DE MUTCD.)
2. THE CONTRACTOR SHALL COMPLY WITH GUIDELINES IN "THE DELAWARE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (DE MUTCD PART 6) FOR BARRICADES AND SIGNS (AS PER LATEST REVISION.)
3. DESIGN OF ALL SIGNS SHALL BE IN ACCORDANCE WITH THE FHWA STANDARD HIGHWAY SIGNS BOOK.
4. SIZES OF ALL SIGNS SHALL BE IN ACCORDANCE WITH "THE DELAWARE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (DE MUTCD.) SIZE OF SIGN SHALL BE BASED ON TYPE OF ROADWAY ON WHICH THE SIGN IS INSTALLED.
5. SIGNS NO LONGER IN USE SHALL BE COMPLETELY COVERED WITH NO RETROREFLECTIVE MATERIAL SHOWING, OR SHALL BE REMOVED, AS DIRECTED BY THE ENGINEER.
6. FIELD CONDITIONS MAY DICTATE CHANGES AT SOME TIME DURING THE LIFE OF THE CONTRACT. IN THE EVENT OF OMISSIONS OR CORRECTIONS, THE SIGNING PROVISIONS OF "THE DELAWARE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (DE MUTCD) WILL PREVAIL.
7. SIGNS "N" THROUGH "Q" AND "T" AND "V", THE WORD "ROAD" SHOULD BE CHANGED TO "RAMP", "RR XING", OR "BRIDGE" WHERE APPLICABLE.
8. WARNING SIGNS AND DETOUR TRAILBLAZERS SHALL BE MOUNTED ON BREAKAWAY POSTS AND HAVE RETROREFLECTIVE FLUORESCENT ORANGE SHEETING.
9. "W" BARRICADES SHALL COMPLETELY RUN THE FULL WIDTH OF THE ROADWAY.
10. BARRICADES SHALL BE A MINIMUM OF 6 FEET WIDE UNLESS DIRECTED BY THE ENGINEER.

RECOMMENDED _____ DATE: 2/27/15
RECOMMENDED _____ DATE: _____
RECOMMENDED _____ DATE: 3/13/15
RECOMMENDED CHIEF SAFETY OFFICER _____ DATE: 3/13/2015
APPROVED TRAFFIC ENGINEER _____ DATE: 3/13/2015

DELAWARE DEPARTMENT OF TRANSPORTATION

ADDENDUM / REVISIONS

NOT TO SCALE

BRIDGE REPLACEMENT BLACKBIRD STATION RD (BR 1-438) OVER BLACKBIRD CREEK

CONTRACT T201407104	ROAD NO.	N463	SHEET NO. 22
COUNTY NEW CASTLE	DESIGNED BY: MFR		TOTAL SHTS. 27
	CHECKED BY: ASW		

VEHICULAR DETOUR PLAN
BLACKBIRD STATION RD (N463)
BR 1-438 OVER BLACKBIRD CREEK

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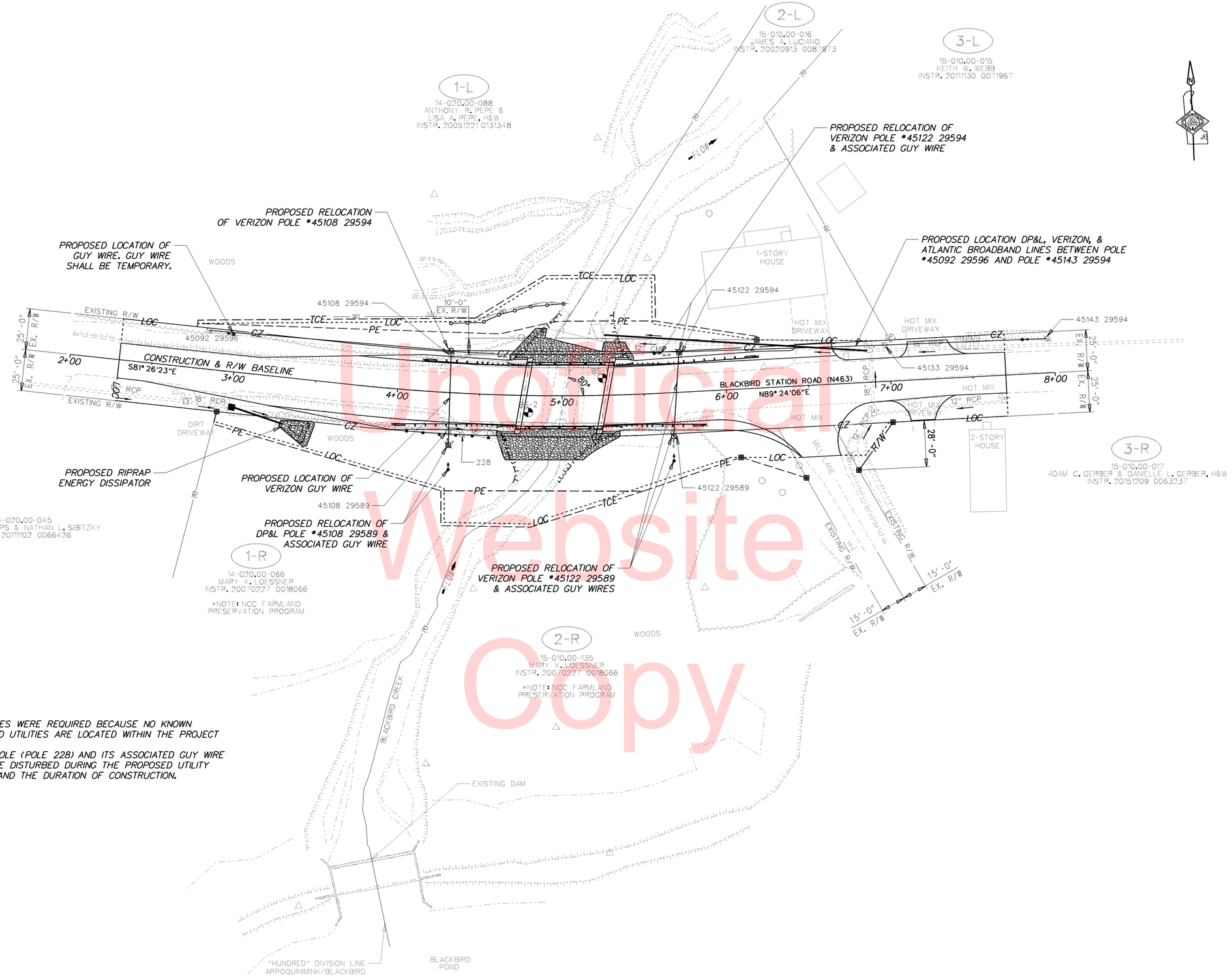

NOTES:

1. NO TEST HOLES WERE REQUIRED BECAUSE NO KNOWN UNDERGROUND UTILITIES ARE LOCATED WITHIN THE PROJECT LIMITS.
2. THE SIREN POLE (POLE 228) AND ITS ASSOCIATED GUY WIRE SHALL NOT BE DISTURBED DURING THE PROPOSED UTILITY RELOCATION AND THE DURATION OF CONSTRUCTION.

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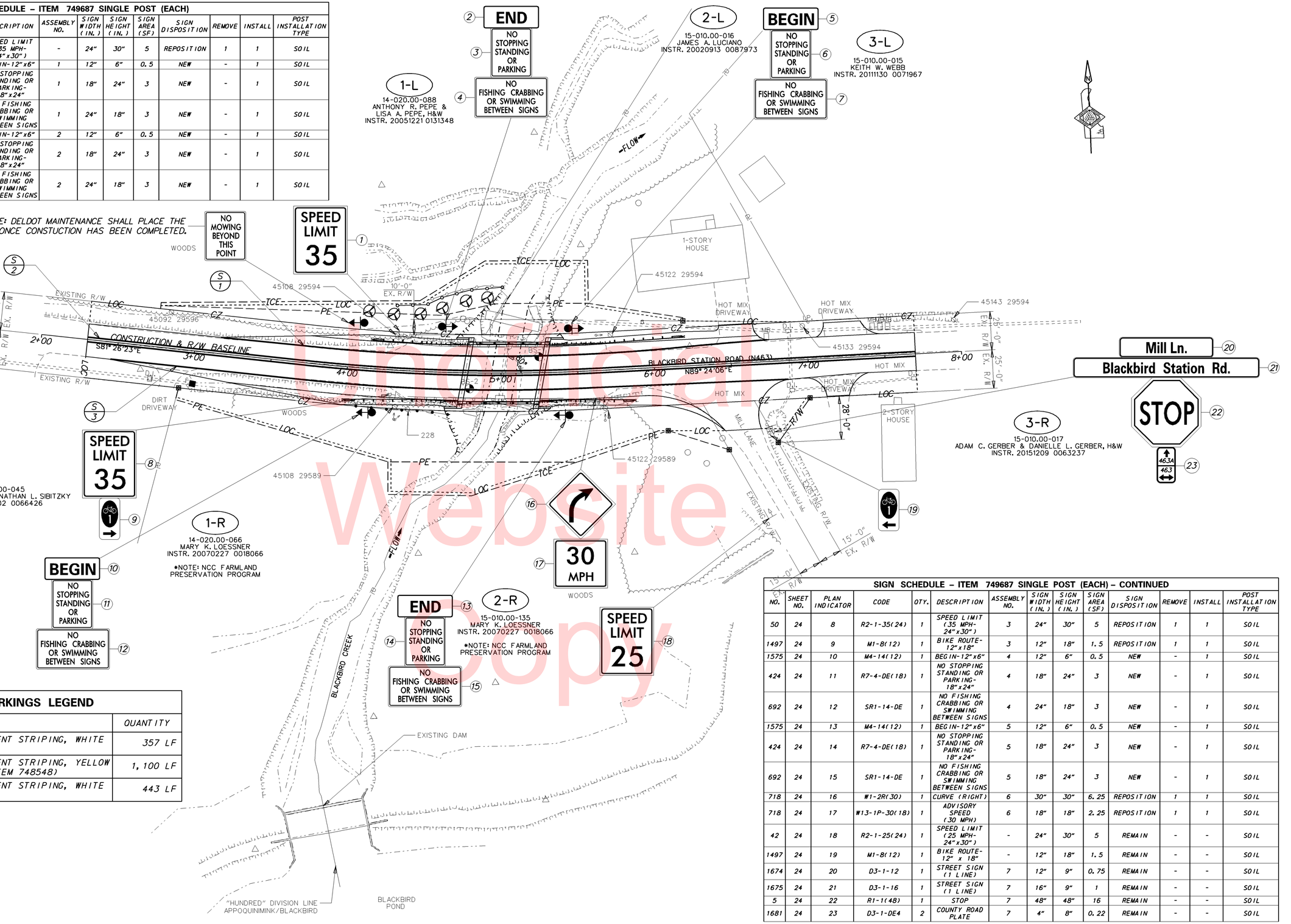
DELAWARE DEPARTMENT OF TRANSPORTATION	ADDENDUMS / REVISIONS	SCALE 0 30 60 90 FEET	BR 1-438 ON N463 BLACKBIRD STATION ROAD OVER BLACKBIRD CREEK	CONTRACT T201407104	BRIDGE NO. 1-438	UTILITY RELOCATION PLAN	SHEET NO. 23
				COUNTY NEW CASTLE	DESIGNED BY: NED		TOTAL SHTS. 27
					CHECKED BY: CAS		

SIGN SCHEDULE – ITEM 749687 SINGLE POST (EACH)

NO.	SHEET NO.	PLAN INDICATOR	CODE	QTY.	DESCRIPTION	ASSEMBLY NO.	SIGN WIDTH (IN.)	SIGN HEIGHT (IN.)	SIGN AREA (SF)	SIGN DISPOSITION	REMOVE	INSTALL	POST INSTALLATION TYPE
50	24	1	R2-1-35(24)	1	SPEED LIMIT (35 MPH-24"x30")	-	24"	30"	5	REPOSITION	1	1	SOIL
1575	24	2	M4-14(12)	1	BEGIN-12"x6"	1	12"	6"	0.5	NEW	-	1	SOIL
424	24	3	R7-4-DE(18)	1	NO STOPPING STANDING OR PARKING-18"x24"	1	18"	24"	3	NEW	-	1	SOIL
692	24	4	SR1-14-DE	1	NO FISHING CRABBING OR SWIMMING BETWEEN SIGNS	1	24"	18"	3	NEW	-	1	SOIL
1575	24	5	M4-14(12)	1	BEGIN-12"x6"	2	12"	6"	0.5	NEW	-	1	SOIL
424	24	6	R7-4-DE(18)	1	NO STOPPING STANDING OR PARKING-18"x24"	2	18"	24"	3	NEW	-	1	SOIL
692	24	7	SR1-14-DE	1	NO FISHING CRABBING OR SWIMMING BETWEEN SIGNS	2	24"	18"	3	NEW	-	1	SOIL

NOTE: DELDOT MAINTENANCE SHALL PLACE THE SIGN ONCE CONSTUCTION HAS BEEN COMPLETED.



PAVEMENT MARKINGS LEGEND

SYMBOL	ITEM	QUANTITY
1	EPOXY RESIN PAINT PAVEMENT STRIPING, WHITE 5" SOLID (ITEM 748548)	357 LF
2	EPOXY RESIN PAINT PAVEMENT STRIPING, YELLOW 5" SOLID DOUBLE LINE (ITEM 748548)	1,100 LF
3	EPOXY RESIN PAINT PAVEMENT STRIPING, WHITE 5" SOLID (ITEM 748548)	443 LF

SIGN SCHEDULE – ITEM 749687 SINGLE POST (EACH) – CONTINUED

NO.	SHEET NO.	PLAN INDICATOR	CODE	QTY.	DESCRIPTION	ASSEMBLY NO.	SIGN WIDTH (IN.)	SIGN HEIGHT (IN.)	SIGN AREA (SF)	SIGN DISPOSITION	REMOVE	INSTALL	POST INSTALLATION TYPE
50	24	8	R2-1-35(24)	1	SPEED LIMIT (35 MPH-24"x30")	3	24"	30"	5	REPOSITION	1	1	SOIL
1497	24	9	M1-8(12)	1	BIKE ROUTE-12"x18"	3	12"	18"	1.5	REPOSITION	1	1	SOIL
1575	24	10	M4-14(12)	1	BEGIN-12"x6"	4	12"	6"	0.5	NEW	-	1	SOIL
424	24	11	R7-4-DE(18)	1	NO STOPPING STANDING OR PARKING-18"x24"	4	18"	24"	3	NEW	-	1	SOIL
692	24	12	SR1-14-DE	1	NO FISHING CRABBING OR SWIMMING BETWEEN SIGNS	4	24"	18"	3	NEW	-	1	SOIL
1575	24	13	M4-14(12)	1	BEGIN-12"x6"	5	12"	6"	0.5	NEW	-	1	SOIL
424	24	14	R7-4-DE(18)	1	NO STOPPING STANDING OR PARKING-18"x24"	5	18"	24"	3	NEW	-	1	SOIL
692	24	15	SR1-14-DE	1	NO FISHING CRABBING OR SWIMMING BETWEEN SIGNS	5	18"	24"	3	NEW	-	1	SOIL
718	24	16	W1-2R(30)	1	CURVE (RIGHT)	6	30"	30"	6.25	REPOSITION	1	1	SOIL
718	24	17	W13-1P-30(18)	1	ADVISORY SPEED (30 MPH)	6	18"	18"	2.25	REPOSITION	1	1	SOIL
42	24	18	R2-1-25(24)	1	SPEED LIMIT (25 MPH-24"x30")	-	24"	30"	5	REMAIN	-	-	SOIL
1497	24	19	M1-8(12)	1	BIKE ROUTE-12" x 18"	-	12"	18"	1.5	REMAIN	-	-	SOIL
1674	24	20	D3-1-12	1	STREET SIGN (1 LINE)	7	12"	9"	0.75	REMAIN	-	-	SOIL
1675	24	21	D3-1-16	1	STREET SIGN (1 LINE)	7	16"	9"	1	REMAIN	-	-	SOIL
5	24	22	R1-1(48)	1	STOP	7	48"	48"	16	REMAIN	-	-	SOIL
1681	24	23	D3-1-DE4	2	COUNTY ROAD PLATE	7	4"	8"	0.22	REMAIN	-	-	SOIL

DELAWARE DEPARTMENT OF TRANSPORTATION

ADDENDUMS / REVISIONS

SCALE 0 30 60 90 FEET

BR 1-438 ON N463 BLACKBIRD STATION ROAD OVER BLACKBIRD CREEK

CONTRACT	BRIDGE NO. 1-438
T201407104	DESIGNED BY: NED
COUNTY: NEW CASTLE	CHECKED BY: CAS

SIGNING AND STRIPING PLAN

SHEET NO. 24 TOTAL SHTS. 27

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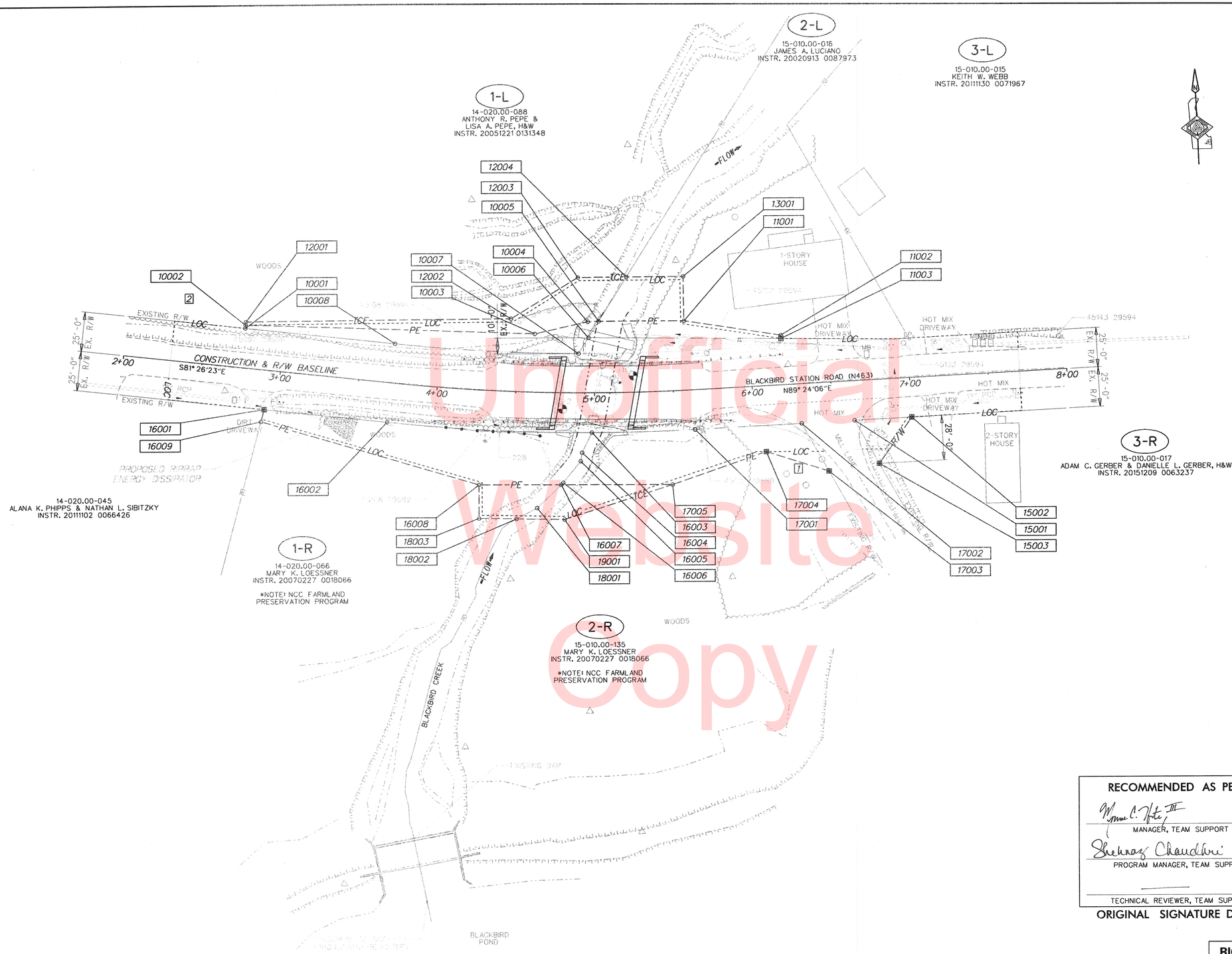

RECOMMENDED AS PER REVISION 2

MANAGER, TEAM SUPPORT	DATE 7/22/16
PROGRAM MANAGER, TEAM SUPPORT	DATE 7/22/16
TECHNICAL REVIEWER, TEAM SUPPORT	DATE

ORIGINAL SIGNATURE DATE: 12-08-2015

RIGHT-OF-WAY SHEET 1 OF 3

DELAWARE
DEPARTMENT OF TRANSPORTATION

ADDENDUMS / REVISIONS
1 - DELETED FEE ON PARCEL 2-R AND CHANGED IT TO PE - NED 02/18/2016
2 - REMOVED 15'-0" UTILITY EASEMENT ON PARCEL 1-L - NED 07/11/2016

SCALE
0 30 60 90
FEET

BR 1-438 ON N463 BLACKBIRD STATION ROAD OVER BLACKBIRD CREEK

CONTRACT	T201407104
COUNTY	NEW CASTLE
BRIDGE NO.	1-438
DESIGNED BY:	NED
CHECKED BY:	CAS

RIGHT-OF-WAY PLAN

SHEET NO.	25
TOTAL SHTS.	27

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ASSESSMENT NUMBER	OWNERSHIP OF RECORD	TYPE OF ACQUISITION	TITLE SOURCE	PARCEL AREA (ACRES)
14-020.00-088	(1-L) ANTHONY R. PEPE & LISA A. PEPEM H&W	P/E	INSTR. 200512210131348	6.900

ALIGNMENT NUMBER & DESCRIPTION: 5000 - CONSTRUCTION BASELINE

PT. NO.	ALIGN. NO.	STATION	OFFSET *	NORTH	EAST	BEARING	DISTANCE	CHORD BEARING	CHORD LENGTH	ARC LENGTH	RADIUS **
10001	5000	2+75.00	-25.00	497710.2124	584482.2095	N 8°40'50.70" E	2.00				
10002	5000	2+75.00	-27.00	497712.1936	584482.5120	S 85°35'23.96" E	183.61				
10003	5000	4+61.00	-37.00	497698.0749	584665.5833	N 79°51'20.43" E	34.46				
10004	5000	4+95.69	-45.08	497704.1438	584699.5019	N 89°59'59.53" E	6.98				
10005	5000	5+02.93	-45.37	497704.1438	584706.4782	S 34°44'02.39" W	12.24				
10006	5000	4+96.15	-35.03	497694.0816	584699.5019	S 34°44'02.39" W	11.83				
10007	5000	4+89.72	-25.00	497684.3630	584692.7639			N 84°16'56.36" W	116.54	116.59	1175.00
10008	5000	3+70.66	-25.00	497695.9732	584576.8063	N 81°26'23.42" W	95.66				
10001	5000	2+75.00	-25.00	497710.2124	584482.2095						

FIGURE 10001 AREA = 2048.5218 SQ. FT. (0.0470 ACRES)

ASSESSMENT NUMBER	OWNERSHIP OF RECORD	TYPE OF ACQUISITION	TITLE SOURCE	PARCEL AREA (ACRES)
14-020.00-088	(1-L) ANTHONY R. PEPE & LISA A. PEPEM H&W	TCE	INSTR. 200512210131348	6.900

ALIGNMENT NUMBER & DESCRIPTION: 5000 - CONSTRUCTION BASELINE

PT. NO.	ALIGN. NO.	STATION	OFFSET *	NORTH	EAST	BEARING	DISTANCE	CHORD BEARING	CHORD LENGTH	ARC LENGTH	RADIUS **
10002	5000	2+75.00	-27.00	497712.1936	584482.5120	N 8°40'50.70" E	1.99				
12001	5000	2+75.00	-29.00	497714.1649	584482.8130	S 88°00'02.95" E	168.20				
12002	5000	4+45.00	-46.00	497708.2972	584650.9089	N 61°07'18.10" E	49.78				
12003	5000	4+89.00	-73.00	497732.3368	584694.4954	S 87°55'31.58" E	30.78				
12004	5000	5+21.78	-73.03	497731.2226	584725.2522	S 34°44'02.39" W	32.95				
10005	5000	5+02.93	-45.37	497704.1438	584706.4782	S 89°59'59.53" W	6.98				
10004	5000	4+95.69	-45.08	497704.1438	584699.5019	S 79°51'20.43" W	34.46				
10003	5000	4+61.00	-37.00	497698.0749	584665.5833	N 85°35'23.96" W	183.61				
10002	5000	2+75.00	-27.00	497712.1936	584482.5120						

FIGURE 12001 AREA = 2416.3903 SQ. FT. (0.0555 ACRES)

ASSESSMENT NUMBER	OWNERSHIP OF RECORD	TYPE OF ACQUISITION	TITLE SOURCE	PARCEL AREA (ACRES)
15-010.00-016	(2-L) JAMES A. LUCIANO	P/E	INSTR. 200209130087973	0.580

ALIGNMENT NUMBER & DESCRIPTION: 5000 - CONSTRUCTION BASELINE

PT. NO.	ALIGN. NO.	STATION	OFFSET *	NORTH	EAST	BEARING	DISTANCE	CHORD BEARING	CHORD LENGTH	ARC LENGTH	RADIUS **
10006	5000	4+96.15	-35.03	497694.0816	584699.5019	N 34°44'02.39" E	12.24				
10005	5000	5+02.93	-45.37	497704.1438	584706.4782	S 87°38'21.26" E	54.00				
11001	5000	5+59.00	-44.00	497701.9197	584760.4275	S 78°59'05.34" E	62.15				
11002	5000	6+20.00	-31.50	497690.0457	584821.4277	S 0°30'30.09" E	2.15				
11003	5000	6+20.00	-29.35	497687.8988	584821.4468	N 87°05'51.15" W	122.10				
10006	5000	4+96.15	-35.03	497694.0816	584699.5019						

FIGURE 11001 AREA = 1010.8013 SQ. FT. (0.0232 ACRES)

ASSESSMENT NUMBER	OWNERSHIP OF RECORD	TYPE OF ACQUISITION	TITLE SOURCE	PARCEL AREA (ACRES)
15-010.00-016	(2-L) JAMES A. LUCIANO	TCE	INSTR. 200209130087973	0.580

ALIGNMENT NUMBER & DESCRIPTION: 5000 - CONSTRUCTION BASELINE

PT. NO.	ALIGN. NO.	STATION	OFFSET *	NORTH	EAST	BEARING	DISTANCE	CHORD BEARING	CHORD LENGTH	ARC LENGTH	RADIUS **
10005	5000	5+02.93	-45.37	497704.1438	584706.4782	N 34°44'02.39" E	32.95				
12004	5000	5+21.78	-73.03	497731.2226	584725.2522	S 87°55'31.58" E	35.93				
13001	5000	5+60.00	-72.00	497729.9220	584761.1576	S 1°29'36.80" W	28.01				
11001	5000	5+59.00	-44.00	497701.9197	584760.4275	N 87°38'21.26" W	54.00				
10005	5000	5+02.93	-45.37	497704.1438	584706.4782						

FIGURE 13001 AREA = 1254.5117 SQ. FT. (0.0288 ACRES)

ASSESSMENT NUMBER	OWNERSHIP OF RECORD	TYPE OF ACQUISITION	TITLE SOURCE	PARCEL AREA (ACRES)
14-020.00-066	(1-R) MARY K. LOESSNER	P/E	INSTR. 200702270018066	7.784

ALIGNMENT NUMBER & DESCRIPTION: 5000 - CONSTRUCTION BASELINE

PT. NO.	ALIGN. NO.	STATION	OFFSET *	NORTH	EAST	BEARING	DISTANCE	CHORD BEARING	CHORD LENGTH	ARC LENGTH	RADIUS **
16001	5000	2+92.19	25.00	497658.2100	584491.7697	S 81°26'23.42" E	78.47				
16002	5000	3+70.66	25.00	497646.5302	584569.3639			S 84°29'12.07" E	130.22	130.28	-1225.00
16003	5000	4+98.28	25.00	497634.0187	584698.9851	S 28°48'11.44" W	14.12				
16004	5000	4+92.21	37.67	497621.6433	584692.1807	S 12°06'11.47" W	5.45				
16005	5000	4+91.36	43.05	497616.3190	584691.0390	S 41°36'54.94" W	17.52				
16006	5000	4+80.87	56.75	497603.2187	584679.4017	S 48°54'02.86" W	1.80				
16007	5000	4+79.64	58.01	497602.0346	584678.0444	N 87°26'45.00" W	52.26				
16008	5000	4+29.85	59.82	497604.3635	584625.8377	N 71°16'09.64" W	144.05				
16009	5000	2+91.00	32.86	497650.6198	584489.4198	N 17°12'07.77" E	7.95				
16001	5000	2+92.19	25.00	497658.2100	584491.7697						

FIGURE 16001 AREA = 5015.9020 SQ. FT. (0.1151 ACRES)

ASSESSMENT NUMBER	OWNERSHIP OF RECORD	TYPE OF ACQUISITION	TITLE SOURCE	PARCEL AREA (ACRES)
14-020.00-066	(1-R) MARY K. LOESSNER	TCE	INSTR. 200702270018066	7.784

ALIGNMENT NUMBER & DESCRIPTION: 5000 - CONSTRUCTION BASELINE

PT. NO.	ALIGN. NO.	STATION	OFFSET *	NORTH	EAST	BEARING	DISTANCE	CHORD BEARING	CHORD LENGTH	ARC LENGTH	RADIUS **
16008	5000	4+29.85	59.82	497604.3635	584625.8377	S 87°26'45.00" E	52.26				
16007	5000	4+79.64	58.01	497602.0346	584678.0444	S 48°54'02.86" W	21.25				
18001	5000	4+65.34	72.98	497588.0653	584662.0306	S 64°45'56.80" W	14.80				
18002	5000	4+53.24	80.28	497581.7578	584648.6473	N 86°35'35.76" W	23.75				
18003	5000	4+31.00	81.00	497583.1689	584624.9434	N 2°24'57.50" E	21.21				
16008	5000	4+29.85	59.82	497604.3635	584625.8377						

FIGURE 18001 AREA = 858.3273 SQ. FT. (0.0197 ACRES)

7

ASSESSMENT NUMBER	OWNERSHIP OF RECORD	TYPE OF ACQUISITION	TITLE SOURCE	PARCEL AREA (ACRES)
15-010.00-135	(2-R) MARY K. LOESSNER	P/E	INSTR. 200702270018066	11.176

ALIGNMENT NUMBER & DESCRIPTION: 5000 - CONSTRUCTION BASELINE

PT. NO.	ALIGN. NO.	STATION	OFFSET *	NORTH	EAST	BEARING	DISTANCE	CHORD BEARING	CHORD LENGTH	ARC LENGTH	RADIUS **
16003	5000	4+98.28	25.00	497634.0187	584698.9851			S 89°03'57.39" E	65.52	65.53	-1225.00
17001	5000	5+62.47	25.00	497632.9506	584764.4951	N 89°24'05.95" E	67.64				
17002	5000	6+30.12	25.00	497633.6570	584832.1345	S 27°22'20.22" E	34.72				
17003	5000	6+45.76	56.00	497602.8259	584848.0969	N 70°11'02.75" W	41.63				
17004	5000	6+06.74	41.48	497616.9381	584808.9328	S 73°20'21.89" W	62.96				
17005	5000	5+47.00	59.00	497598.8867	584748.6134	N 87°26'45.00" W	70.64				
16007	5000	4+79.64	58.01	497602.0346	584678.0444	N 48°54'02.86" E	1.80				
16006	5000	4+80.87	56.75	497603.2187	584679.4017	N 41°36'54.94" E	17.52				
16005	5000	4+91.36	43.05	497616.3190	584691.0390	N 12°06'11.47" E	5.45				
16004	5000	4+92.21	37.67	497621.6433	584692.1807	N 28°48'11.44" E	14.12				
16003	5000	4+98.28	25.00	497634.0187	584698.9851						

FIGURE 17001 AREA = 4149.7642 SQ. FT. (0.0953 ACRES)

ASSESSMENT NUMBER	OWNERSHIP OF RECORD	TYPE OF ACQUISITION	TITLE SOURCE	PARCEL AREA (ACRES)
15-010.00-135	(2-R) MARY K. LOESSNER	TCE	INSTR. 200702270018066	11.176

ALIGNMENT NUMBER & DESCRIPTION: 5000 - CONSTRUCTION BASELINE

PT. NO.	ALIGN. NO.	STATION	OFFSET *	NORTH	EAST	BEARING	DISTANCE	CHORD BEARING	CHORD LENGTH	ARC LENGTH	RADIUS **
16007	5000	4+79.64	58.01	497602.0346	584678.0444	S 87°26'45.00" E	70.64				
17005	5000	5+47.00	59.00	497598.8867	584748.6134	S 74°42'48.20" W	71.88				
19001	5000	4+82.00	80.00	497579.9347	584679.2730	N 86°35'35.76" W	30.68				
18002	5000	4+53.24	80.28	497581.7578	584648.6473	N 64°45'56.80" E	14.80				
18001	5000	4+65.34	72.98	497588.0653	584662.0306	N 48°54'02.86" E	21.25				
16007	5000	4+79.64	58.01	497602.0346	584678.0444						

FIGURE 19001 AREA = 1072.1698 SQ. FT. (0.0246 ACRES)

ASSESSMENT NUMBER	OWNERSHIP OF RECORD	TYPE OF ACQUISITION	TITLE SOURCE	PARCEL AREA (ACRES)
15-010.00-017	(3-R) CHARLES RACE & BONNIE L. RACE	FEE	INSTR. 20150722 0036352	1.550

ALIGNMENT NUMBER & DESCRIPTION: 5000 - CONSTRUCTION BASELINE

PT. NO.	ALIGN. NO.	STATION	OFFSET *	NORTH	EAST	BEARING	DISTANCE	CHORD BEARING	CHORD LENGTH	ARC LENGTH	RADIUS **
15001	5000	6+63.72	25.00	497634.0079	584865.7352	N 89°24'05.95" E	36.28				
15002	5000	7+00.00	25.00	497634.3868	584902.0165	S 37°45'03.65" W	35.71				
15003	5000	6+77.85	53.00	497606.1545	584880.1559	N 27°22'20.22" W	31.37				
15001	5000	6+63.72	25.00	497634.0079	584865.7352						

FIGURE 15001 AREA = 508.0122 SQ. FT. (0.0117 ACRES)

LEGEND

FEE	AREA OF ACQUISITION
R/W	AREA OCCUPIED BY EXISTING R/W
P/E	PERMANENT EASEMENT
TCE	TEMPORARY CONSTRUCTION EASEMENT
*	'-' OFFSET IS LEFT OF BASELINE
**	'-' CURVE TURNS TO THE LEFT

RIGHT-OF-WAY SHEET 2 OF 3

DELAWARE DEPARTMENT OF TRANSPORTATION

ADDENDUMS / REVISIONS

7 - DELETED FEE ON PARCEL 2-R AND CHANGED IT TO PE - NED 02/18/2016

BR 1-438 ON N463 BLACKBIRD STATION ROAD OVER BLACKBIRD CREEK

CONTRACT	T201407104
COUNTY	NEW CASTLE
BRIDGE NO.	1-438
DESIGNED BY: NED	
CHECKED BY: CAS	

RIGHT-OF-WAY DATA SHEET

SHEET NO.	26
TOTAL SHTS.	27

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COUNTY ASSESSMENT PARCEL NUMBER	PLAN SHEET NUMBER	OWNERSHIP OF RECORD	TITLE SOURCE	PROPERTY AREA BEFORE ACQUISITION (ACRE) D=DEED C=CALCULATED A=ASSESMENT	ACQUISITION CODE FEE, R/W, P/E, TCE	AREA TO BE ACQUIRED				PROPERTY AREA REMAINING (SQ. FEET /ACRES)	DEED RECORD OF ACQUISITION	REMARKS
						ACQUISITION (SQ. FEET /ACRES)	AREA OCCUPIED BY EXISTING RIGHT OF WAY (SQ. FEET /ACRES)	EASEMENT PERMANENT (SQ. FEET /ACRES)	EASEMENT TEMPORARY (SQ. FEET /ACRES)			
14-020.00-088	6	(1-L) ANTHONY R. PEPE & LISA A. PEPE H&W	INSTR. 20051221013134 8	D - 6.90	P/E			2048.5218 / 0.05				2
					TCE				2416.3903 / 0.06	300564.00 / 6.90		
15-010.00-016	6	(2-L) JAMES A. LUCIANO	INSTR. 20020913008797 3	D - 0.58	P/E			1010.8013 / 0.02				
					TCE				1254.5117 / 0.03	25264.80 / 0.58		
14-020.00-066	6	(1-R) MARY K. LOESSNER	INSTR. 20070227001806 6	D - 7.78	P/E			5015.902 / 0.12				
					TCE				858.3273 / 0.02	339069.44 / 7.78		
15-010.00-135	6	(2-R) MARY K. LOESSNER	INSTR. 20070227001806 6	D - 11.18	1 P/E			4149.7642 / 0.10				
					TCE				1072.1698 / 0.02	486809.127 / 11.18		
15-010.00-017	6	(3-R) CHARLES RACE & BONNIE L. RACE	INSTR. 20150722 0036352	D - 1.55	FEE	508.0122 / 0.01				67009.9878 / 1.54		

RIGHT-OF-WAY SHEET 3 OF 3

ACQUISITION CODES
FEE - ACQUISITION
P/E - PERMANENT EASEMENT
R/W - AREA OCCUPIED BY EXISTING R/W
TCE - TEMPORARY EASEMENT

DELAWARE
DEPARTMENT OF TRANSPORTATION

ADDENDUMS / REVISIONS
1 - DELETED FEE ON PARCEL 2-R AND CHANGED IT TO PE - NED 02/18/2016
2 - REMOVED 15'-0" UTILITY EASEMENT ON PARCEL 1-L - NED 07/11/2016

BR 1-438 ON N463 BLACKBIRD STATION ROAD OVER BLACKBIRD CREEK

CONTRACT T201407104
COUNTY NEW CASTLE
BRIDGE NO. 1-438
DESIGNED BY: NED
CHECKED BY: CAS

RIGHT-OF-WAY TABULATION SHEET

SHEET NO. 27
TOTAL SHTS. 27

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