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ADDENDA / REVISIONS	<b>NOT TO SCALE</b>	<b>STRUCTURE MAINTENANCE, BR 1-400 ON SHALLCROSS LAKE ROAD</b>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="font-size: 8px;">CONTRACT</td> <td style="font-size: 8px;">BRIDGE NO.</td> <td style="text-align: center;"><b>1-400</b></td> </tr> <tr> <td style="font-size: 8px;">T201707402</td> <td colspan="2" style="font-size: 8px;">DESIGNED BY: DJC</td> </tr> <tr> <td style="font-size: 8px;">COUNTY</td> <td colspan="2" style="font-size: 8px;">CHECKED BY: DEF</td> </tr> <tr> <td style="font-size: 8px;">NEW CASTLE</td> <td colspan="2"></td> </tr> </table>	CONTRACT	BRIDGE NO.	<b>1-400</b>	T201707402	DESIGNED BY: DJC		COUNTY	CHECKED BY: DEF		NEW CASTLE			<b>INDEX OF SHEETS</b>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="font-size: 8px;">SECTION</td> <td style="font-size: 8px;">TY</td> </tr> <tr> <td style="font-size: 8px;">SHEET NO.</td> <td style="text-align: center;">2</td> </tr> </table>	SECTION	TY	SHEET NO.	2
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ADDENDA / REVISIONS	NOT TO SCALE	STRUCTURE MAINTENANCE, BR 1-400 ON SHALLCROSS LAKE ROAD	CONTRACT	BRIDGE NO.	SECTION
			T201707402	DESIGNED BY: DJC	TY
			COUNTY	CHECKED BY: DEF	SHEET NO.
			NEW CASTLE	3	
ADDENDA AND REVISIONS					

## EXISTING SYMBOLS

DRAINAGE	
	DITCH OR STREAM CENTERLINE
	DIRECTIONAL STREAM FLOW ARROW
	DRAINAGE INLET
	DRAINAGE JUNCTION BOX
	DRAINAGE MANHOLE
	DRAINAGE PIPE AND FLOW ARROW
	DRAINAGE PIPE HEADWALL
	RIPRAP - AREA FEATURE
	RIPRAP - LINEAR FEATURE

MANMADE ROADSIDE FEATURES	
	BOLLARD - STEEL POLE
	BOLLARD - WOOD POST
	CURB
	CURB AND GUTTER
	FENCE - CHAINLINK OR STRANDED
	FENCE - STOCKADE OR SPLIT RAIL
	FLAG POLE
	GUARDRAIL - STEEL BEAM
	GUARDRAIL - WIRE ROPE
	LAMP AND POST - RESIDENTIAL
	MAILBOX
	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
	DELINEATED WETLAND BOUNDARY LINE
	WOODS LINE BOUNDARY

RIGHT-OF-WAY SYMBOLS	
	PROPERTY MARKER - CONCRETE MON.
	PROPERTY MARKER - IRON PIPE
	HISTORIC RIGHT-OF-WAY BASELINE
	EXISTING RIGHT-OF-WAY
	EXISTING PROPERTY LINE
	EXISTING EASEMENT
	EXISTING DENIAL OF ACCESS
	EXISTING R/W & DENIAL OF ACCESS

SURVEY CONTROL & MONUMENTATION	
	SURVEY BENCHMARK LOCATION
	SURVEY TIE POINT LOCATION
	SURVEY TRAVERSE POINT
	POINT OF CURVATURE OR TANGENCY
	POINT OF INTERSECTING TANGENTS

UTILITY	
	SOIL BORING LOCATION
	UTILITY TEST HOLE LOCATION
	CABLE TV DISTRIBUTION BOX
	ELECTRIC MANHOLE
	ELECTRIC METER
	ELECTRIC TRANSFORMER
	POLE MOUNTED LUMINAIRE
	GAS MANHOLE
	GAS METER
	GAS VALVE
	GAS PUMP - SERVICE STATION
	RAILROAD TRACKS
	SANITARY SEWER MANHOLE
	SANITARY SEWER VALVE
	SANITARY SEWER CLEANOUT OR VENT
	SEPTIC DRAIN FIELD
	TELEPHONE BOOTH
	TELEPHONE MANHOLE
	TELEPHONE TEST POINT
	TRAFFIC - CONDUIT JUNCTION WELL
	TRAFFIC - LIGHT POLE AND BASE
	TRAFFIC - PEDESTRIAN POLE & BASE
	TRAFFIC - SIGNAL CABINET & BASE
	TRAFFIC - SIGNAL POLE AND BASE
	UTILITY BOX
	UTILITY POLE GUY WIRE ANCHOR
	UTILITY POLE
	WATER - FIRE HYDRANT
	WATER METER
	WATER VALVE
	WELL HEAD
	MANHOLE - UNDETERMINED OWNER

UTILITY COMPANY FACILITIES	
	ATLANTIC BROADBAND UG
	VERIZON CABLE UG

## PROPOSED SYMBOLS

CONSTRUCTION	
	CONCRETE SAFETY BARRIER - PERMANENT
	BIOFILTRATION SWALE
	BRICK PATTERNED SURFACE
	BUTT JOINT
	CLEAR ZONE
	CONSTRUCTION BASELINE
	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
	CURB OPENING
	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
	LATERAL OFFSET
	LIMIT OF CONSTRUCTION
	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
	PROPOSED DENIAL OF ACCESS
	PROPOSED PERMANENT EASEMENT
	PROPOSED RIGHT-OF-WAY
	PROPOSED R/W & DENIAL OF ACCESS
	TEMPORARY CONSTRUCTION EASEMENT
	PROPOSED RIGHT-OF-WAY BASELINE

IDENTIFIERS	
	ADJUST BY CONTRACTOR
	ADJUST BY OTHERS
	CONCRETE SAFETY BARRIER
	CURB OR CURB & GUTTER
	CONVERT TO JUNCTION BOX
	CONVERT TO DRAINAGE MANHOLE
	CURB OPENING
	CURB RAMP / TYPE
	CURB RAMP / TYPE - WITHOUT SIDEWALK SURFACE DETECTABLE WARNING SYSTEM
	CONSTRUCTION SAFETY FENCE
	DRAINAGE INLET
	DO NOT DISTURB
	ENERGY DISSIPATOR
	FENCE
	FLARED END SECTION
	FILL WITH FLOWABLE FILL
	FILTRATION STRUCTURE
	GUARDRAIL
	JUNCTION BOX
	MANHOLE
	MONUMENT - RIGHT-OF-WAY
	PIPE
	RELOCATE BY CONTRACTOR
	RELOCATE BY OTHERS
	RELOCATE BY PROPERTY OWNER
	REMOVE BY CONTRACTOR
	REMOVE BY TRAFFIC CONTRACTOR
	REMOVE BY OTHERS
	UNDERDRAIN / LENGTH
	UNDERDRAIN OUTLET PIPE

LANDSCAPING	
	LANDSCAPE PLANTINGS
	SHRUBBERY
	CONIFEROUS TREE
	DECIDUOUS TREE

TRAFFIC	
	ITMS CONDUIT
	SIGNAL CONDUIT
	CONDUIT JUNCTION WELL
	LUMINAIRE
	PAVEMENT MARKINGS
	PAVEMENT STRIPING
	TRAFFIC SIGN

PAVEMENT SECTION(S)	
	RECONSTRUCTED PAVEMENT - SEE TYPICAL SECTIONS FOR MATERIALS AND DEPTHS
	OVERLAY PAVEMENT - SEE TYPICAL SECTIONS FOR MATERIALS AND DEPTHS

ADDENDA / REVISIONS

NOT TO SCALE

STRUCTURE MAINTENANCE, BR 1-400  
ON SHALLCROSS LAKE ROAD

CONTRACT  
T201707402  
COUNTY  
NEW CASTLE

BRIDGE NO.  
**1-400**  
DESIGNED BY: DJC  
CHECKED BY: DEF

LEGEND

SECTION  
TY  
SHEET NO.  
4

GENERAL NOTES

1. THIS PROJECT IS TO BE CONSTRUCTED IN ACCORDANCE WITH THE DELAWARE DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS", DATED AUGUST 2016 AND THE DELAWARE DEPARTMENT OF TRANSPORTATION "STANDARD CONSTRUCTION DETAILS", DATED 2017, INCLUDING ALL REVISIONS UP TO THE DATE OF ADVERTISEMENT.

2. 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.

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

( X )	CROSS SECTIONS
( X )	RIGHT-OF-WAY PLANS (INCLUDED IN PLAN SET)

PROJECT NOTES

SECTION 100

1. ANY DAMAGE TO ITEMS NOTED TO BE RELOCATED OR RESET BY THE CONTRACTOR, AT THE DISCRETION OF THE ENGINEER, SHALL BE REPAIRED AND/OR REPLACED IN KIND AT THE CONTRACTOR'S EXPENSE.

SECTION 200

2. ITEMS TO BE REMOVED UNDER ITEM 211000 - REMOVAL OF STRUCTURES AND OBSTRUCTIONS SHALL INCLUDE, BUT NOT BE LIMITED TO THE FOLLOWING:

- a. EXISTING CONCRETE SLAB
- b. PARTIAL REMOVAL OF EXISTING CONCRETE RETAINING WALL
- c. EXISTING BRIDGE BARRIER
- d. PARTIAL REMOVAL OF EXISTING TIMBER RETAINING WALL
- e. CUTOFF EXISTING STEEL SHEET PILE

3. ALL EXISTING PAVEMENT FROM STA. 0+70 TO STA. 1+15 AND STA. 2+25 TO STA. 3+30.66 AS SHOWN ON THE PLANS SHALL BE EXCAVATED IN ITS ENTIRETY. PAYMENT UNDER ITEM 202000 - EXCAVATION AND EMBANKMENT.

4. SIGNING:  
TO AVOID DAMAGE, SIGNS WITHIN PROJECT LIMITS MAY BE REMOVED DURING CONSTRUCTION IF NEEDED, BUT MUST BE REPLACED TO MATCH EXISTING CONDITIONS BEFORE REOPENING THE ROADWAY. ALL WORK RELATED TO MOVING AND REINSTALLING THE SIGN SHALL BE INCIDENTAL TO ITEM \*211000 - REMOVAL OF STRUCTURES AND OBSTRUCTIONS. IF THE SIGN IS DAMAGED DURING CONSTRUCTION, THE SIGN MUST BE REPLACED AT THE CONTRACTOR'S EXPENSE.

SECTION 600

5. PORTLAND CEMENT CONCRETE:  
USE PORTLAND CEMENT CONCRETE FOR CAST-IN-PLACE ELEMENTS AS FOLLOWS:  
(f'c = 28-DAY COMPRESSIVE STRENGTH)  
CLASS A - TOP OF RETAINING WALL, SHEET PILE COPING, EXTENSION WALL, BRIDGE BARRIER RECONSTRUCTION (f'c = 4.5 ksi)  
CLASS D - CONCRETE SLAB (f'c = 4.5 ksi)  
A HIGHER CLASS CONCRETE MAY BE SUBSTITUTED FOR A LOWER CLASS CONCRETE AT NO ADDITIONAL COST TO DELDOT WITH APPROVAL OF THE BRIDGE DESIGN ENGINEER.

- CHAMFER ALL EXPOSED EDGES 3/4" UNLESS OTHERWISE NOTED.

6. BAR REINFORCEMENT:  
- REINFORCING STEEL SHALL CONFORM TO AASHTO M31 (ASTM A615), GRADE 60.  
- REINFORCING STEEL SHALL HAVE A 3" CLEAR COVER IF CAST AGAINST EARTH OR A 2" CLEAR COVER ELSEWHERE, UNLESS OTHERWISE SPECIFIED ON THE PLANS.  
- ALL REINFORCING STEEL SHALL BE PROTECTED WITH FUSION BONDED EPOXY. EPOXY COATED REINFORCING STEEL SHALL CONFORM TO ASTM A775.  
- ANY FIELD CUTTING OR FIELD BENDING MUST BE APPROVED BY THE ENGINEER. PAYMENT SHALL BE INCIDENTAL TO THE BAR REINFORCEMENT ITEM.  
- GALVANIZED REINFORCING STEEL MAY BE SUBSTITUTED FOR EPOXY-COATED REINFORCING STEEL AT NO ADDITIONAL COST TO DELDOT WITH APPROVAL OF THE BRIDGE DESIGN ENGINEER.  
- WELDING OF REINFORCEMENT DURING FABRICATION OR CONSTRUCTION IS NOT PERMITTED UNLESS SPECIFIED.

7. SHEET PILE NOTES:  
a. PZC SHAPES ARE DEPICTED IN THESE DETAILS. SCZ SHAPES ARE ALSO ACCEPTABLE FOR USE AT NO ADDITIONAL COST TO THE DEPARTMENT. IF SCZ SHAPES ARE PROPOSED IN LIEU OF PZC SHAPES, THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS SHOWING THE ALTERNATE LAYOUT, CORNER PIECES, ETC. FOR APPROVAL. THE SECTION MODULUS FOR THE ALTERNATE SHAPES SHALL BE HIGHER THAN SECTION MODULUS OF PZC13.

b. ALL STEEL SHEET PILES AND FABRICATED PIECES SHALL CONFORM TO ASTM A572 GRADE 50, GALVANIZED.

c. ALL CONNECTION UNITS SHALL BE COMPATIBLE WITH THE SHEETS BEING JOINED. FOR PAYMENT PURPOSES, THE CONNECTION UNITS SHALL BE TREATED AS THE ADJACENT UNITS OF SHEET PILING.

SECTION 800

8. MAINTENANCE OF TRAFFIC:  
MAINTENANCE OF TRAFFIC SHALL BE IN ACCORDANCE WITH THE DETOUR PLAN. THE DETOUR SHALL REMAIN IN EFFECT UNTIL THE FINAL WARM MIX OR P.C.C. PAVEMENT IS PLACED. ALL MOT ITEMS WITH THE EXCEPTION OF PORTABLE CHANGEABLE MESSAGE SIGNS AND FLAGGERS WILL BE INCLUDED IN ITEM \*801500 - MAINTENANCE OF TRAFFIC, ALL INCLUSIVE.

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

MISCELLANEOUS

10. DESIGN SPECIFICATIONS:  
(A) DELDOT BRIDGE DESIGN MANUAL, 2017 EDITION  
(B) AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 2014, 7TH EDITION, CUSTOMARY U.S. UNITS, INCLUDING 2015 AND 2016 INTERIMS.  
(C) PROVIDE MATERIALS AND PERFORM WORK IN ACCORDANCE WITH THE DELDOT STANDARD SPECIFICATIONS, AUGUST 2016.

11. EXISTING CONDITIONS:  
- ALL EXISTING DIMENSIONS AND ELEVATIONS SHOWN ARE BASED ON THE BEST AVAILABLE INFORMATION AND ARE APPROXIMATE ONLY. THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING DIMENSIONS, GEOMETRY, AND ELEVATIONS AS NECESSARY PRIOR TO ORDERING ANY MATERIALS AND COMMENCING CONSTRUCTION TO ENSURE PROPER FIT OF THE PROPOSED CONSTRUCTION. PAYMENT SHALL BE INCIDENTAL TO ITEM \*763501 - CONSTRUCTION ENGINEERING.  
- THE CONTRACTOR SHALL NOT CONSIDER ANY OF THE DATA ON THE EXISTING STRUCTURE SUPPLIED IN THE ORIGINAL DESIGN DRAWINGS OR MADE AVAILABLE BY THE DEPARTMENT OR ITS AUTHORIZED AGENTS AS POSITIVE REPRESENTATIONS OF ANY OF THE CONDITIONS THAT WILL BE ENCOUNTERED IN THE FIELD.

12. UTILITIES:  
SEE UTILITY STATEMENT AND CONSTRUCTION PLAN SHEET FOR FURTHER INFORMATION ON UTILITY COORDINATION.

13. ENVIRONMENTAL IMPACTS:  
REFER TO THE ENVIRONMENTAL COMPLIANCE PLAN FOR RESTRICTIONS AND ADDITIONAL GUIDANCE THAT MAY BE ASSOCIATED TO THIS PROJECT.

14. AS-BUILT PLANS OF THE EXISTING STRUCTURE ARE AVAILABLE AND SHALL BE OBTAINED THROUGH THE DEPARTMENT AND USED IN CONJUNCTION WITH THESE DRAWINGS WHEN DETERMINING EXISTING DIMENSIONS. ALL DIMENSIONS SHOWN ON THESE DRAWINGS WERE TAKEN FROM EXISTING PLANS AND SHOULD BE VERIFIED IN THE FIELD. THE EXISTING PLANS ARE AS FOLLOWS:

CONTRACT	DESCRIPTION
971	SHALLCROSS LAKE
82-071-02	SHALLCROSS LAKE CAUSEWAY AND ROAD REHABILITATION

15. ANY DAMAGE DONE BY THE CONTRACTOR'S OPERATIONS TO THE EXISTING FACILITIES NOT DESIGNATED FOR REPAIRS UNDER THE CONTRACT SHALL BE REPAIRED OR REPLACED AT THE CONTRACTOR'S EXPENSE.

16. THE CONTRACTOR SHALL NOTIFY DART FIRST STATE AT DOT\_DETOURS@DELAWARE.GOV AT LEAST 14 DAYS PRIOR TO THE START OF ANY DETOURS OR CONSTRUCTION, AND DOT\_DTC\_PROJECTDEVELOPMENT@DELAWARE.GOV AT SUCH TIME THE FACILITY IS COMPLETED AND OPERABLE FOR TRANSIT OPERATIONS. FOR EMERGENCY DETOUR INFORMATION ONLY, PLEASE CONTACT DTC'S CHIEF SCHEDULER AT 302-576-6019.

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ADDENDA / REVISIONS

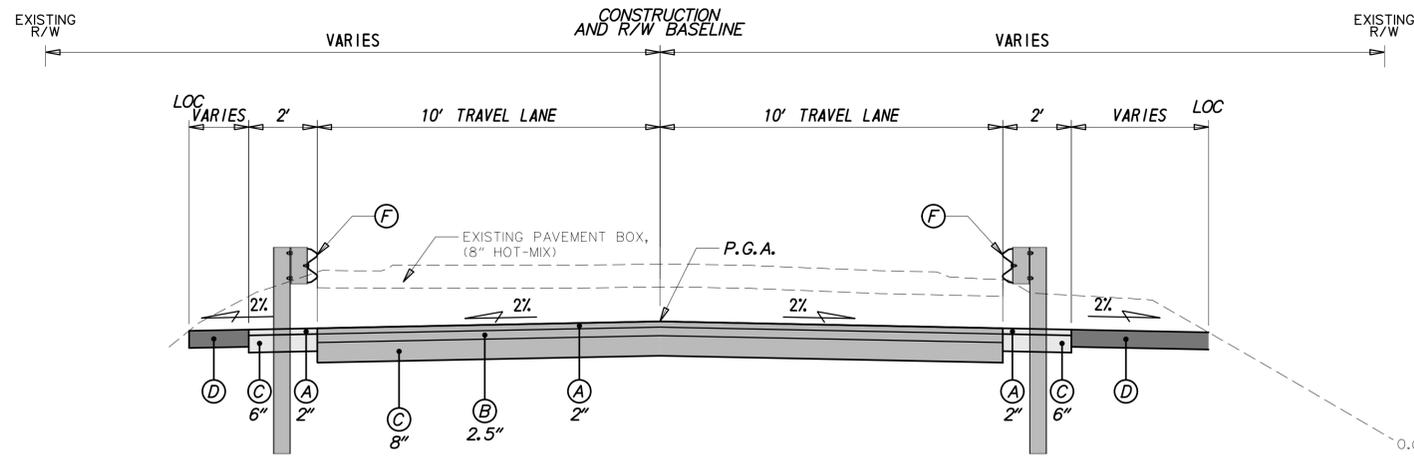
NOT TO SCALE

STRUCTURE MAINTENANCE, BR 1-400  
ON SHALLCROSS LAKE ROAD

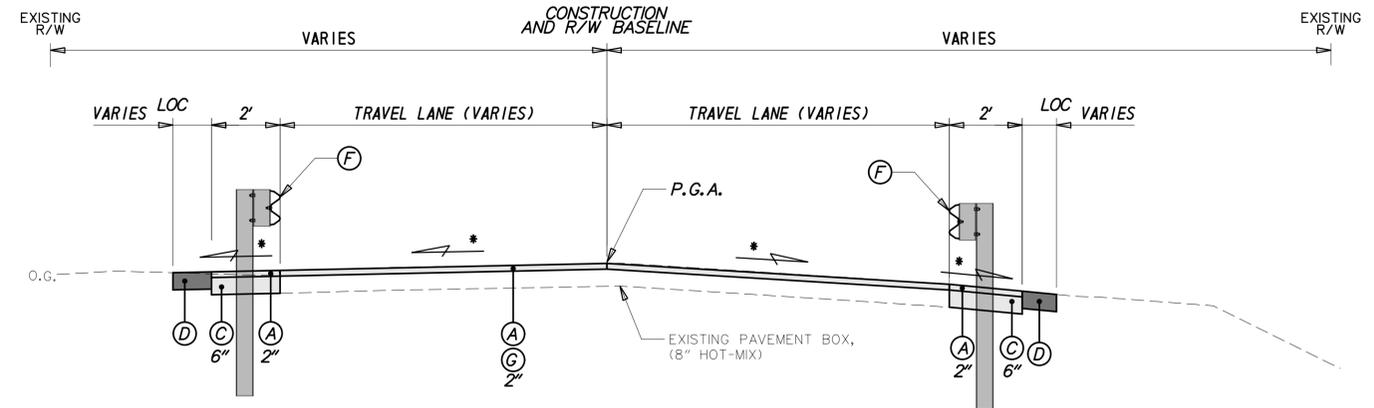
CONTRACT	BRIDGE NO.	1-400
T201707402	DESIGNED BY:	DJC
COUNTY	CHECKED BY:	DEF
NEW CASTLE		

NOTES

SECTION	
TY	
SHEET NO.	5

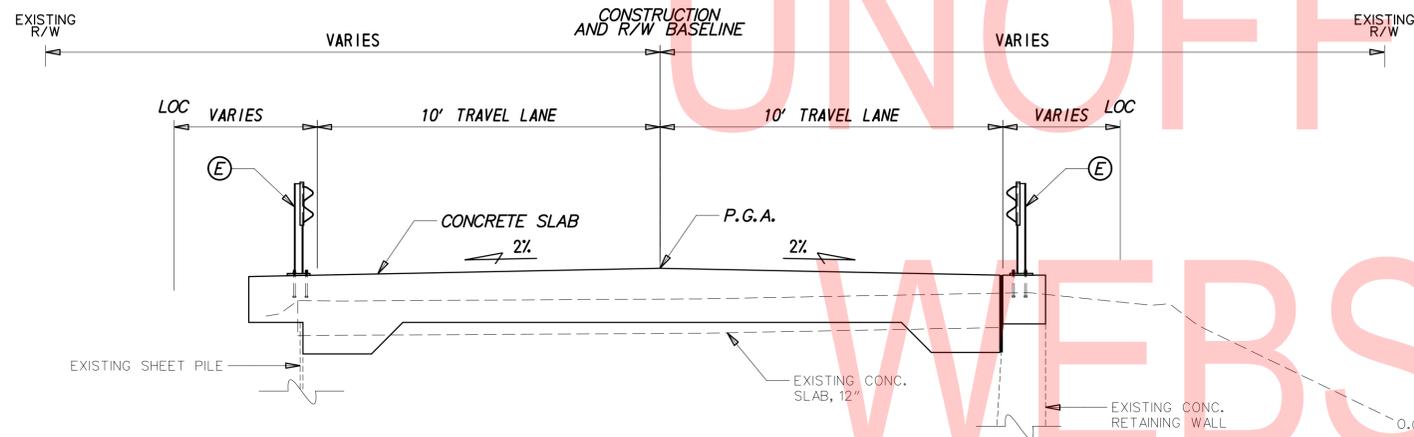


**SHALLCROSS LAKE ROAD (M.R. 428)**  
**STATION 0+70 TO STATION 1+15**  
**STATION 2+25 TO STATION 3+30.66**

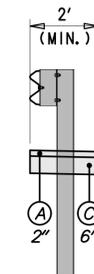


**SHALLCROSS LAKE ROAD (M.R. 428)**  
**STATION 3+30.66 TO STATION 4+50**

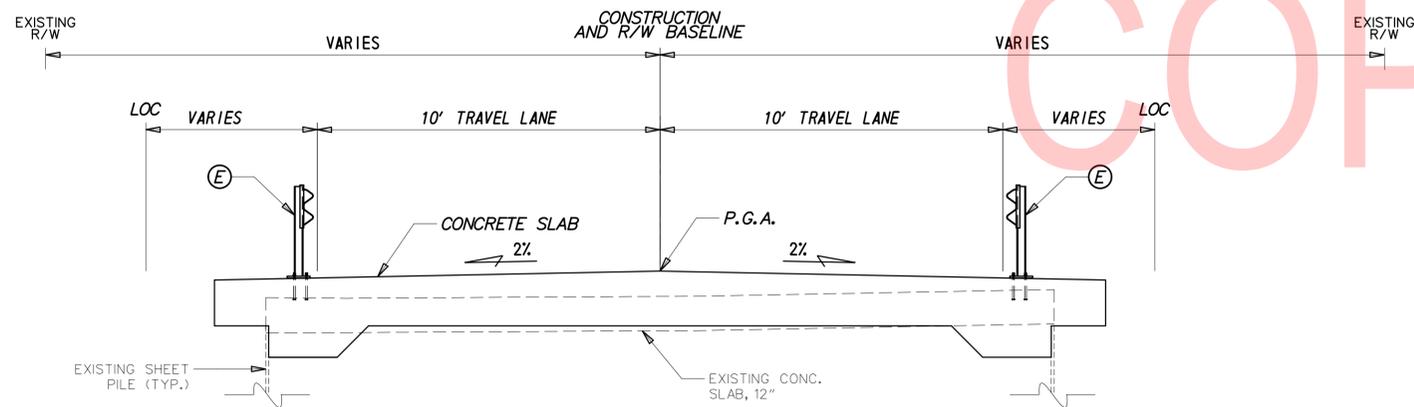
\* MATCH EXISTING CROSS SLOPE



**SHALLCROSS LAKE ROAD (M.R. 428)**  
**STATION 1+15 TO STATION 1+80**



**GUARDRAIL MAINTENANCE STRIP DETAIL**



**SHALLCROSS LAKE ROAD (M.R. 428)**  
**STATION 1+80 TO STATION 2+25**

LEGEND	
(A)	ITEM 401005 - SUPERPAVE TYPE C, PG 64-22 (CARBONATE STONE)
(B)	ITEM 401014 - SUPERPAVE TYPE B, PG 64-22
(C)	ITEM 301001 - GRADED AGGREGATE BASE COURSE, TYPE B
(D)	ITEM 908004 - TOPSOIL, 6" DEPTH ITEM 908019 - STREAM BANK SEED MIX, SEEDING
(E)	ITEM 720003 - BRIDGE GUARDRAIL
(F)	ITEM 720021 - GALVANIZED STEEL BEAM GUARDRAIL, TYPE 1-31
(G)	ITEM 760010 - PAVEMENT MILLING, BITUMINOUS CONCRETE PAVEMENT

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

**NOTES:**

- SEE SHEETS 14 AND 15 FOR CONCRETE SLAB DETAILS.
- SEE SHEET 11 FOR BRIDGE SECTION.

ADDENDA / REVISIONS

NOT TO SCALE

STRUCTURE MAINTENANCE, BR 1-400  
 ON SHALLCROSS LAKE ROAD

CONTRACT	BRIDGE NO.	<b>1-400</b>
T201707402	DESIGNED BY:	DJC
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NEW CASTLE		

TYPICAL SECTIONS

SECTION
TY
SHEET NO.
6

**CIRCULAR CURVE NO. 1**

PC (10001) 0+35.48 540509.8654 584085.9065  
 PI (11000) 0+83.79 540461.6612 584082.7949  
 CC (10002) 1+22.40 540504.7121 584165.7404  
 PT (10003) 1+22.40 540436.4613 584124.0052  
 RADIUS: 80.00  
 DELTA: 62° 14' 51.5897" LEFT  
 DEGREE OF CURVATURE(ARC): 71° 37' 11.0078"  
 LENGTH: 86.91  
 TANGENT: 48.30  
 CHORD: 82.70  
 MIDDLE ORDINATE: 11.52  
 EXTERNAL: 13.45  
 TANGENT DIRECTION: S 3° 41' 35.9203" W  
 RADIAL DIRECTION: N 86° 18' 24.0797" W  
 CHORD DIRECTION: S 27° 25' 49.8746" E  
 RADIAL DIRECTION: S 31° 26' 44.3305" W  
 TANGENT DIRECTION: S 58° 33' 15.6695" E

**CIRCULAR CURVE NO. 2**

PC (10004) 4+66.83 540256.7767 584417.8492  
 PI (11001) 4+87.16 540246.1677 584435.1984  
 CC (10005) 5+06.83 540333.5589 584464.8013  
 PCC (10006) 5+06.83 540244.0488 584455.4236  
 RADIUS: 90.00  
 DELTA: 25° 27' 53.2472" LEFT  
 DEGREE OF CURVATURE(ARC): 63° 39' 43.1181"  
 LENGTH: 40.00  
 TANGENT: 20.34  
 CHORD: 39.67  
 MIDDLE ORDINATE: 2.21  
 EXTERNAL: 2.27  
 TANGENT DIRECTION: S 58° 33' 15.6695" E  
 RADIAL DIRECTION: S 31° 26' 44.3305" W  
 CHORD DIRECTION: S 71° 17' 12.2931" E  
 RADIAL DIRECTION: S 5° 58' 51.0833" W  
 TANGENT DIRECTION: S 84° 01' 08.9167" E



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**CIRCULAR CURVE NO. 3**

PCC (10006) 5+06.83 540244.0488 584455.4236  
 PI (11002) 5+46.54 540239.9113 584494.9160  
 CC (10007) 5+73.94 540293.7766 584460.6334  
 PCC (10008) 5+73.94 540277.4407 584507.8895  
 Radius: 50.00  
 Delta: 76° 54' 39.9881" Left  
 Degree of Curvature(Arc): 114° 35' 29.6125"  
 Length: 67.12  
 Tangent: 39.71  
 Chord: 62.19  
 Middle Ordinate: 10.85  
 External: 13.85  
 Tangent Direction: S 84° 01' 08.9167" E  
 Radial Direction: S 5° 58' 51.0833" W  
 Chord Direction: N 57° 31' 31.0892" E  
 Radial Direction: S 70° 55' 48.9048" E  
 Tangent Direction: N 19° 04' 11.0952" E

**CIRCULAR CURVE NO. 4**

PCC (10008) 5+73.94 540277.4407 584507.8895  
 PI (11003) 5+94.00 540296.3953 584514.4419  
 CC (10009) 6+13.94 540349.3188 584299.9627  
 PT (10010) 6+13.94 540316.2224 584517.4590  
 Radius: 220.00  
 Delta: 10° 25' 02.6920" Left  
 Degree of Curvature(Arc): 26° 02' 36.7301"  
 Length: 40.00  
 Tangent: 20.06  
 Chord: 39.94  
 Middle Ordinate: 0.91  
 External: 0.91  
 Tangent Direction: N 19° 04' 11.0952" E  
 Radial Direction: S 70° 55' 48.9048" E  
 Chord Direction: N 13° 51' 39.7492" E  
 Radial Direction: S 81° 20' 51.5969" E  
 Tangent Direction: N 8° 39' 08.4031" E

CONSTRUCTION ALIGNMENT CONTROL				
POINT	STATION	OFFSET	NORTHING	EASTING
10000	0+74.23	0.00	540545.2761	584088.1923
10011	6+79.75	0.00	540381.2772	584527.3584
11004	5+63.94	0.00	540206.1116	584500.7034

HORIZONTAL / VERTICAL CONTROL DATA					
POINT	STATION	OFFSET	NORTHING	EASTING	ELEVATION
T. P. 7	0+70.87	15.77	540469.3834	584076.7258	11.63
T. P. 8	2+94.37	12.67	540335.9320	584264.1096	11.36
T. P. 9	3+41.34	149.13	540195.0116	584232.9959	2.50
T. P. 10	4+8.85	14.40	540274.7362	584360.8777	11.27
T. P. 11	N/A	N/A	540400.8802	584545.4246	16.36

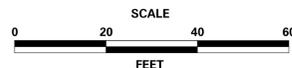
NOTE: NEGATIVE DENOTES LEFT OF BASELINE

**DATUM REFERENCE:**

HORIZONTAL - THIS PROJECT IS REFERENCED TO THE DELAWARE STATE PLANE COORDINATE SYSTEM (NAD 83/2011 EPOCH 2010.00).

VERTICAL - THIS PROJECT IS REFERENCED TO NAVD 88.

ADDENDA / REVISIONS



**STRUCTURE MAINTENANCE, BR 1-400 ON SHALLCROSS LAKE ROAD**

CONTRACT	BRIDGE NO.	<b>1-400</b>
T201707402	DESIGNED BY:	DJC
COUNTY	CHECKED BY:	DEF
NEW CASTLE		

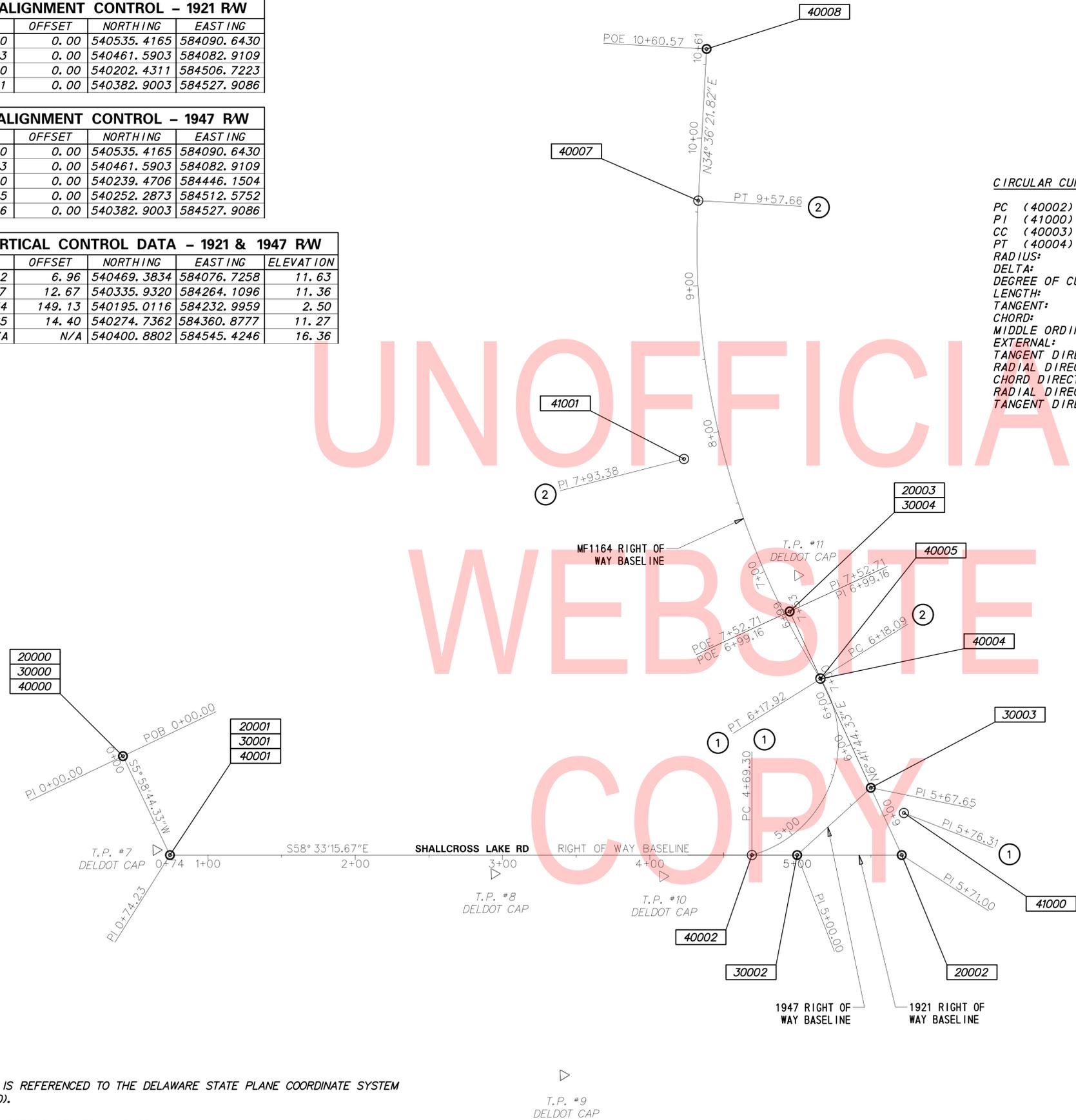
**HORIZONTAL AND VERTICAL CONTROL**

SECTION	TY
SHEET NO.	7

CONSTRUCTION ALIGNMENT CONTROL - 1921 RW				
POINT NO.	STATION	OFFSET	NORTHING	EASTING
20000	0+00.00	0.00	540535.4165	584090.6430
20001	0+74.23	0.00	540461.5903	584082.9109
20002	5+71.00	0.00	540202.4311	584506.7223
20003	7+52.71	0.00	540382.9003	584527.9086

CONSTRUCTION ALIGNMENT CONTROL - 1947 RW				
POINT NO.	STATION	OFFSET	NORTHING	EASTING
30000	0+00.00	0.00	540535.4165	584090.6430
30001	0+74.23	0.00	540461.5903	584082.9109
30002	5+00.00	0.00	540239.4706	584446.1504
30003	5+67.65	0.00	540252.2873	584512.5752
30004	6+99.16	0.00	540382.9003	584527.9086

HORIZONTAL / VERTICAL CONTROL DATA - 1921 & 1947 RW					
POINT	STATION	OFFSET	NORTHING	EASTING	ELEVATION
T. P. 7	0+67.12	6.96	540469.3834	584076.7258	11.63
T. P. 8	2+94.37	12.67	540335.9320	584264.1096	11.36
T. P. 9	3+41.34	149.13	540195.0116	584232.9959	2.50
T. P. 10	4+8.85	14.40	540274.7362	584360.8777	11.27
T. P. 11	N/A	N/A	540400.8802	584545.4246	16.36



CIRCULAR CURVE NO. 1 - MF1164

PC (40002)	4+69.30	540255.4860	584419.9598
PI (41000)	5+76.31	540226.0095	584522.8333
CC (40003)		540332.3913	584441.9957
PT (40004)	6+17.92	540333.0194	584521.9932
RADIUS:	80.00		
DELTA:	106° 26' 18.6576"	LEFT	
DEGREE OF CURVATURE(ARC):	71° 37' 11.0064"		
LENGTH:	148.6162		
TANGENT:	107.0132		
CHORD:	128.1492		
MIDDLE ORDINATE:	32.0996		
EXTERNAL:	53.6107		
TANGENT DIRECTION:	S 74° 0' 40.6764" E		
RADIAL DIRECTION:	S 15° 59' 19.3236" W		
CHORD DIRECTION:	N 52° 46' 9.9948" E		
RADIAL DIRECTION:	N 89° 33' 0.6696" E		
TANGENT DIRECTION:	N 0° 26' 59.3304" W		

CIRCULAR CURVE NO. 2 - MF1164

PC (40005)	6+18.09	540333.1894	584521.9919
PI (41001)	7+93.38	540508.4724	584520.6157
CC (40006)		540337.5465	585076.9747
PT (40007)	9+57.66	540652.7481	584620.1674
RADIUS:	555.00		
DELTA:	35° 3' 21.1536"	RIGHT	
DEGREE OF CURVATURE(ARC):	10° 19' 24.8304"		
LENGTH:	339.5715		
TANGENT:	175.2884		
CHORD:	334.2996		
MIDDLE ORDINATE:	25.7685		
EXTERNAL:	27.0232		
TANGENT DIRECTION:	N 0° 26' 59.3304" W		
RADIAL DIRECTION:	N 89° 33' 0.6696" E		
CHORD DIRECTION:	N 17° 4' 41.2464" E		
RADIAL DIRECTION:	S 55° 23' 38.1768" E		
TANGENT DIRECTION:	N 34° 36' 21.8232" E		

CONSTRUCTION ALIGNMENT CONTROL - MF1164 RW

POINT NO.	STATION	OFFSET	NORTHING	EASTING
40000	0+00.00	0.00	540535.4165	584090.6430
40001	0+74.23	0.00	540461.5903	584082.9109
40008	10+60.57	0.00	540737.4484	584678.6114

HORIZONTAL / VERTICAL CONTROL DATA - MF1164 RW

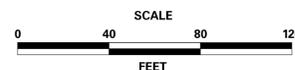
POINT	STATION	OFFSET	NORTHING	EASTING	ELEVATION
T. P. 7	0+67.12	6.96	540469.3834	584076.7258	11.63
T. P. 8	2+94.37	12.67	540335.9320	584264.1096	11.36
T. P. 9	3+41.34	149.13	540195.0116	584232.9959	2.50
T. P. 10	4+8.85	14.40	540274.7362	584360.8777	11.27
T. P. 11	6+88.26	19.69	540400.8802	584545.4246	16.36

**DATUM REFERENCE:**

HORIZONTAL - THIS PROJECT IS REFERENCED TO THE DELAWARE STATE PLANE COORDINATE SYSTEM (NAD 83/2011 EPOCH 2010.00).

VERTICAL - THIS PROJECT IS REFERENCED TO NAVD 88.

ADDENDA / REVISIONS



STRUCTURE MAINTENANCE, BR 1-400 ON SHALLCROSS LAKE ROAD

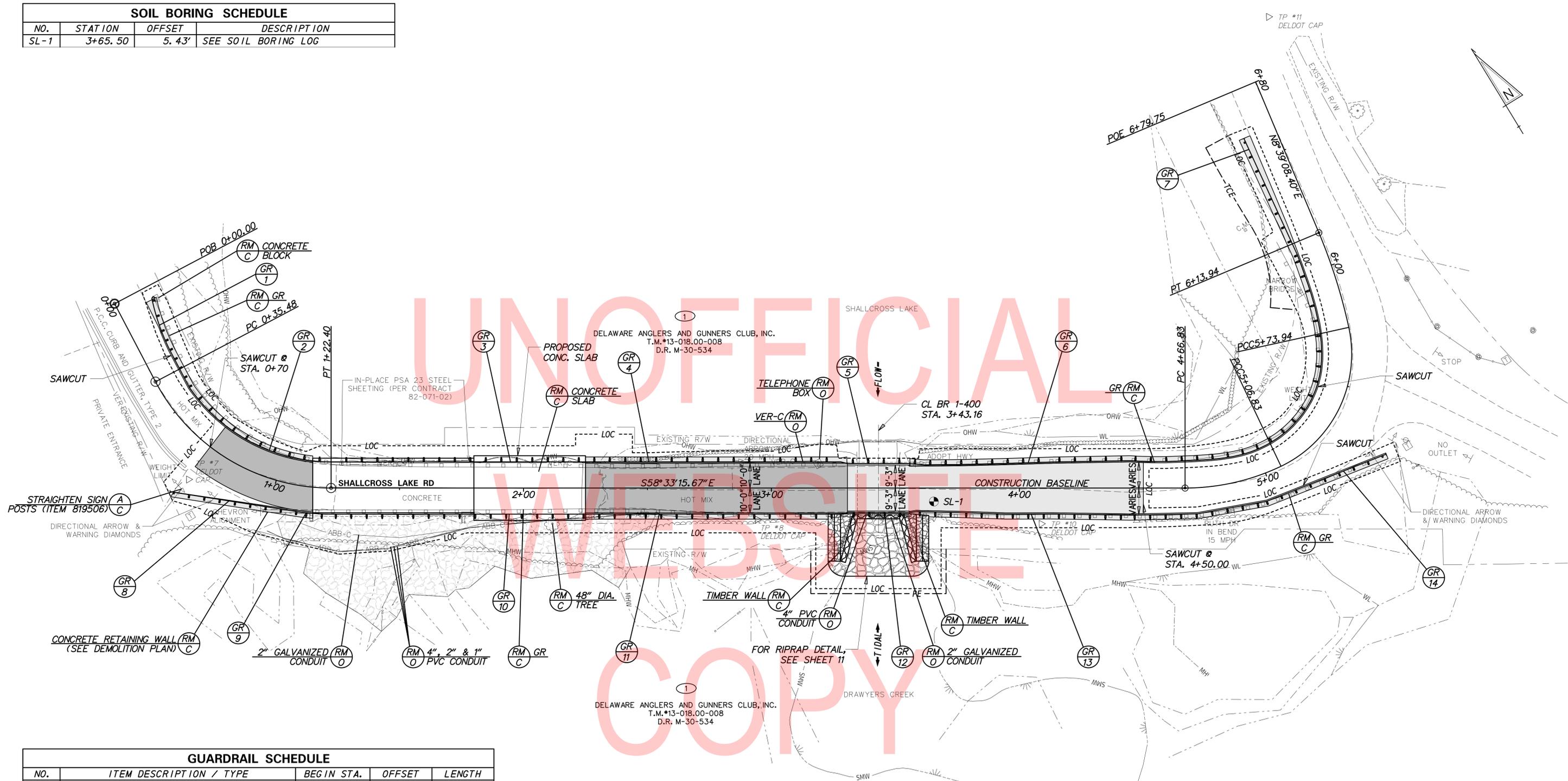
CONTRACT	BRIDGE NO.	1-400
T201707402	DESIGNED BY:	DJC
COUNTY	CHECKED BY:	DEF
NEW CASTLE		

HORIZONTAL AND VERTICAL CONTROL

SECTION	TY
	SHEET NO.
	8

9/24/2019 T:\Dover\Projects\425025\05\600\_CADD\05\_Official\Plans\HV02\_BR1-400.dgn

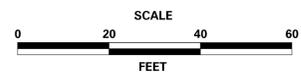
SOIL BORING SCHEDULE			
NO.	STATION	OFFSET	DESCRIPTION
SL-1	3+65.50	5.43'	SEE SOIL BORING LOG



**GUARDRAIL SCHEDULE**

NO.	ITEM DESCRIPTION / TYPE	BEGIN STA.	OFFSET	LENGTH
1	GUARDRAIL END TREATMENT, TYPE 2-31	0+5.24	-14.25'	50.00
2	GUARDRAIL, TYPE 1-31	0+44.25	-10.50'	62.50
3	GUARDRAIL, BRIDGE	1+17.00	-10.50'	106.25
4	GUARDRAIL, TYPE 1-31	2+23.25	-10.50'	106.25
5	GUARDRAIL, BRIDGE	3+29.50	-9.83'	25.00
6	GUARDRAIL, TYPE 1-31	3+54.50	-10.50'	231.25
7	GUARDRAIL END TREATMENT, TYPE 1-31	6+08.66	-13.20'	50.00
8	GUARDRAIL END TREATMENT, TYPE 1-31	0+68.16	23.74'	50.00
9	GUARDRAIL, TYPE 1-31	1+10.75	10.50'	6.25
10	GUARDRAIL, BRIDGE	1+17.00	10.50'	106.25
11	GUARDRAIL, TYPE 1-31	2+23.25	10.50'	106.25
12	GUARDRAIL, BRIDGE	3+29.50	9.83'	25.00
13	GUARDRAIL, TYPE 1-31	3+54.50	10.50'	150.00
14	GUARDRAIL END TREATMENT, TYPE 1-31	4+96.74	25.05'	50.00

ADDENDA / REVISIONS



**STRUCTURE MAINTENANCE, BR 1-400  
ON SHALLCROSS LAKE ROAD**

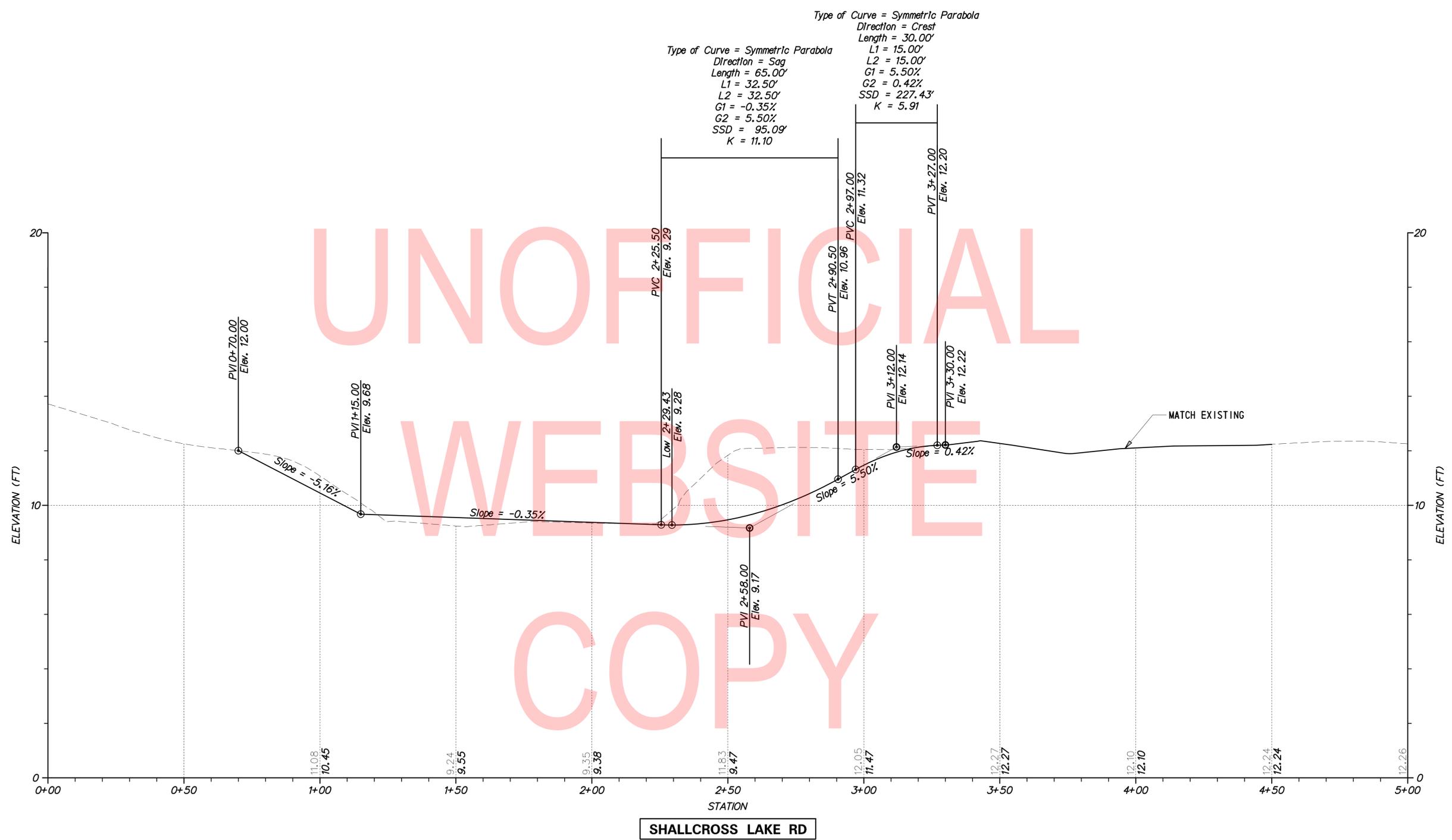
CONTRACT  
T201707402  
COUNTY  
NEW CASTLE

BRIDGE NO. **1-400**  
DESIGNED BY: DJC  
CHECKED BY: DEF

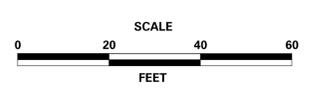
**CONSTRUCTION PLAN**

SECTION  
TY  
SHEET NO.  
9

9/24/2019 T:\Dover\Projects\425025\05\600\_CADD\05\_Official\Plans\PF01\_BR1-400.dgn



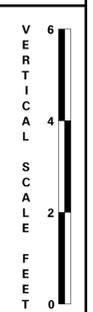
SHALLCROSS LAKE RD



STRUCTURE MAINTENANCE, BR 1-400  
ON SHALLCROSS LAKE ROAD

CONTRACT	BRIDGE NO.	1-400
T201707402	DESIGNED BY:	DJC
COUNTY	CHECKED BY:	DEF
NEW CASTLE		

SECTION	TY
PROFILE	
SHEET NO.	10



ADDENDA / REVISIONS

CONSTRUCTION & R/W BASELINE

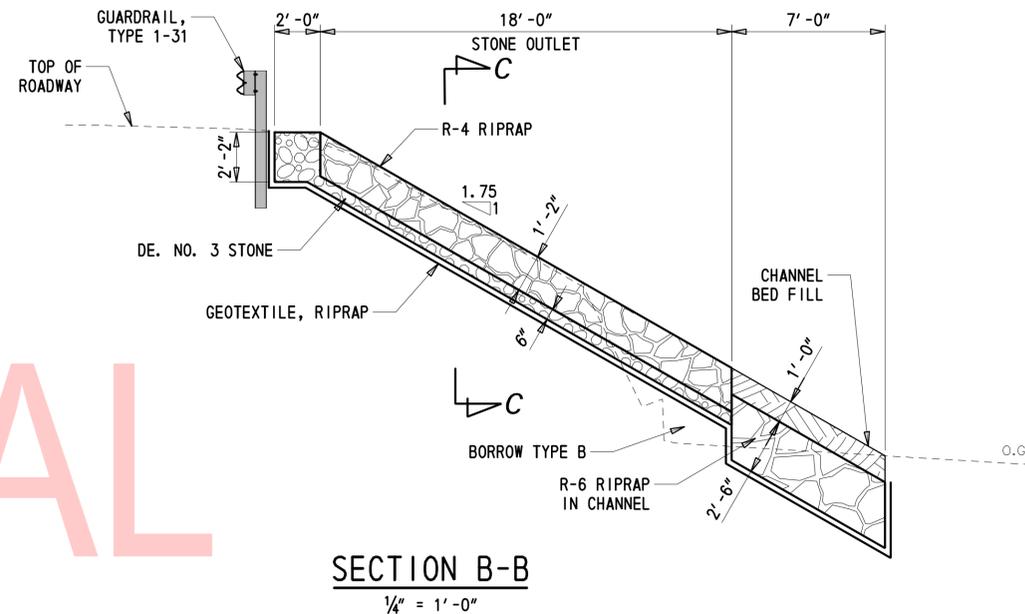
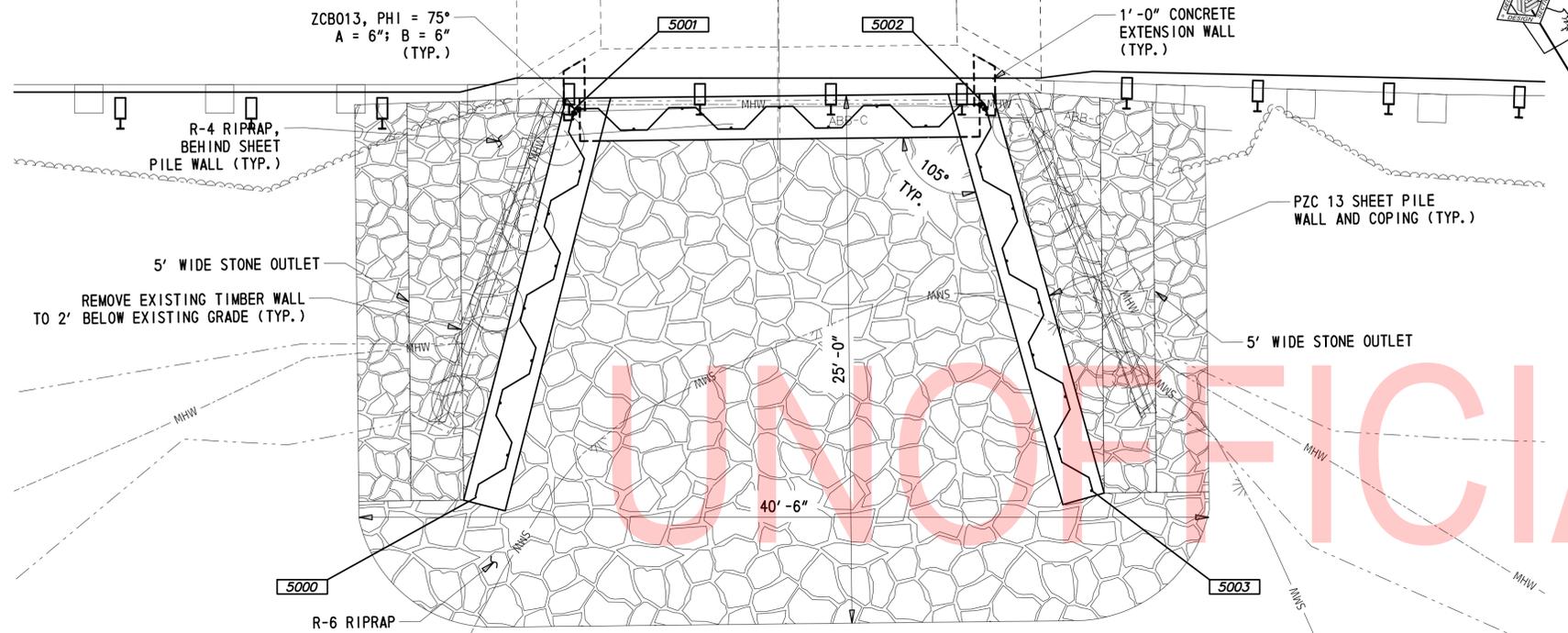
SHALLCROSS LAKE RD

CL BR 1-400

S58°33'15.67"E

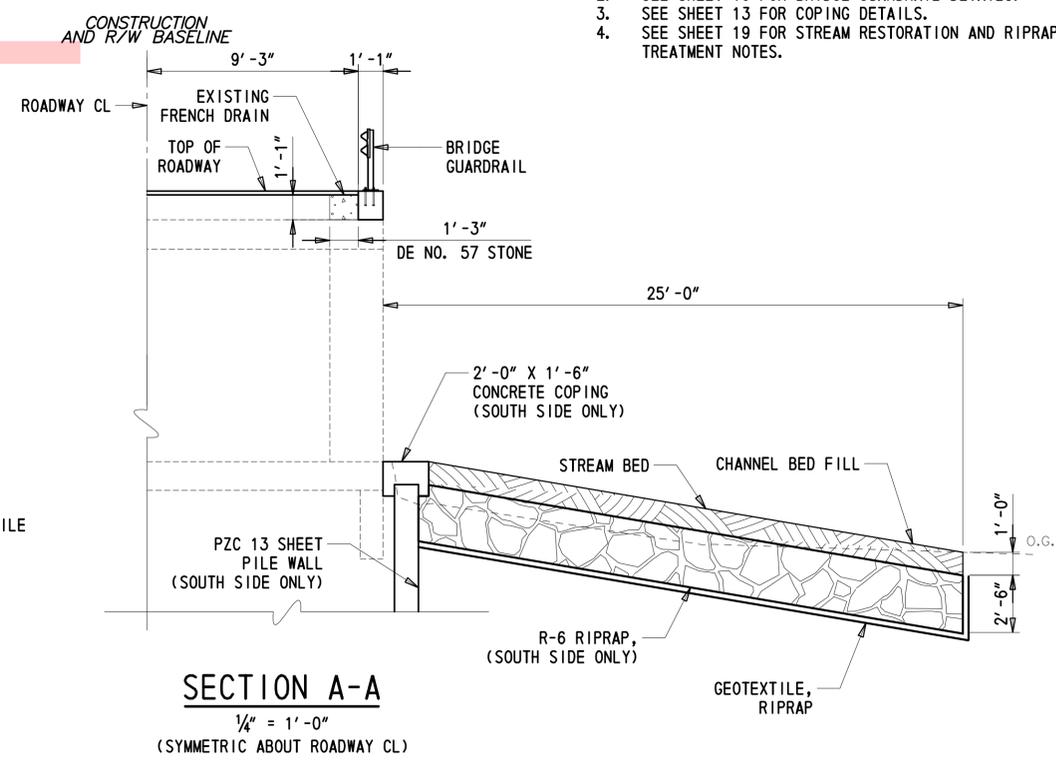
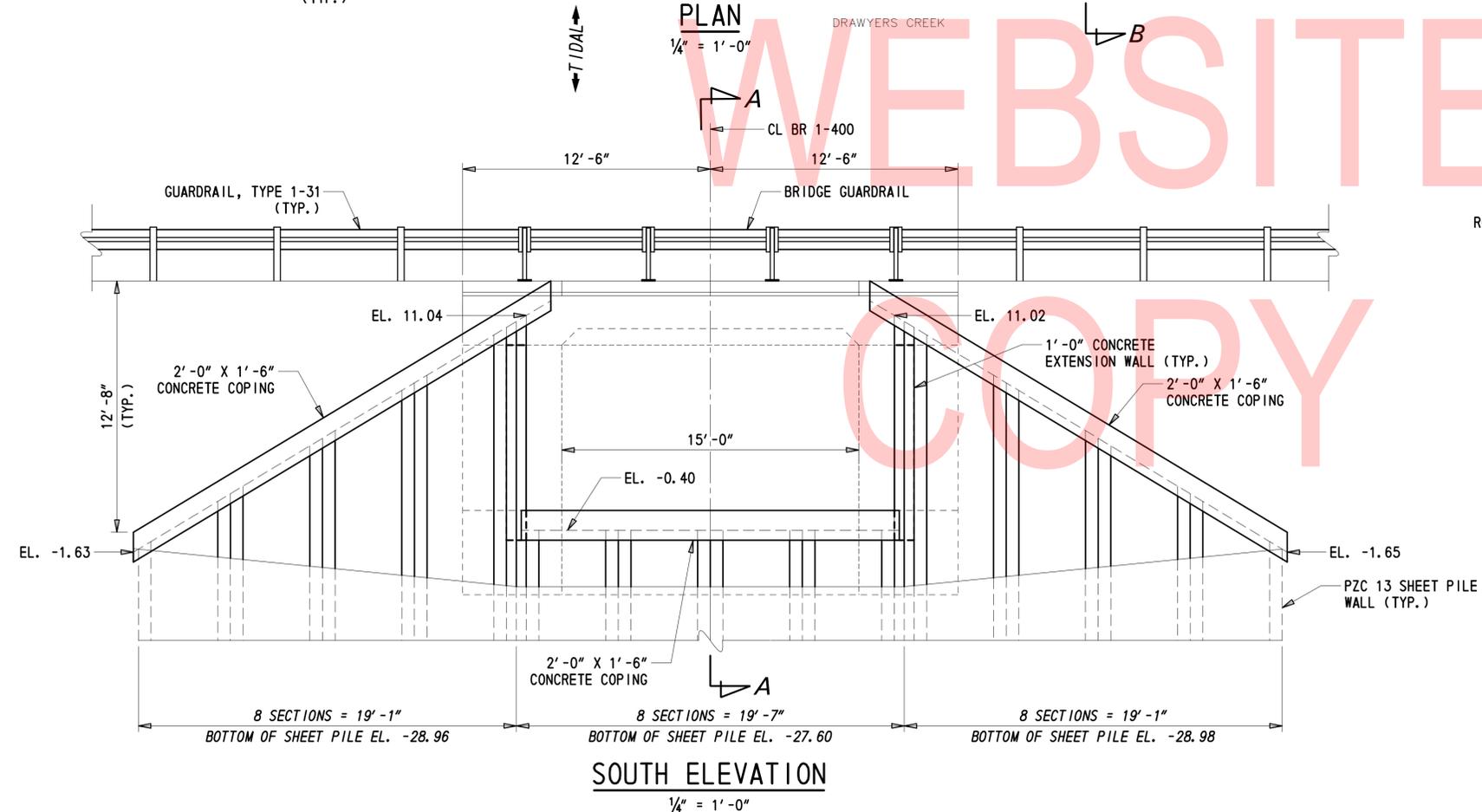
3+50  
STA. 3+43.16

COORDINATE LIST				
POINT NO.	STATION	OFFSET	NORTHING	EASTING
5000	3+28.47	29.28'	540303.9752	584284.5378
5001	3+33.37	10.83'	540317.1569	584298.3416
5002	3+52.96	10.83'	540306.9388	584315.0516
5003	3+57.86	29.28'	540288.6448	584309.6081



**UNOFFICIAL WEBSITE COPY**

- NOTES:
- SEE SHEET 12 FOR BARRIER DEMOLITION DETAILS.
  - SEE SHEET 16 FOR BRIDGE GUARDRAIL DETAILS.
  - SEE SHEET 13 FOR COPING DETAILS.
  - SEE SHEET 19 FOR STREAM RESTORATION AND RIPRAP TREATMENT NOTES.



ADDENDA / REVISIONS

SCALE AS NOTED

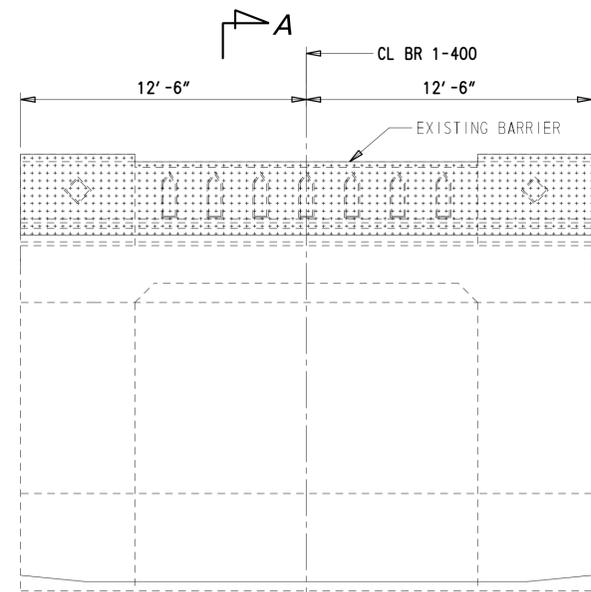
STRUCTURE MAINTENANCE, BR 1-400 ON SHALLCROSS LAKE ROAD

CONTRACT	BRIDGE NO.	<b>1-400</b>
T201707402	DESIGNED BY:	RMB
COUNTY	CHECKED BY:	DEF
NEW CASTLE		

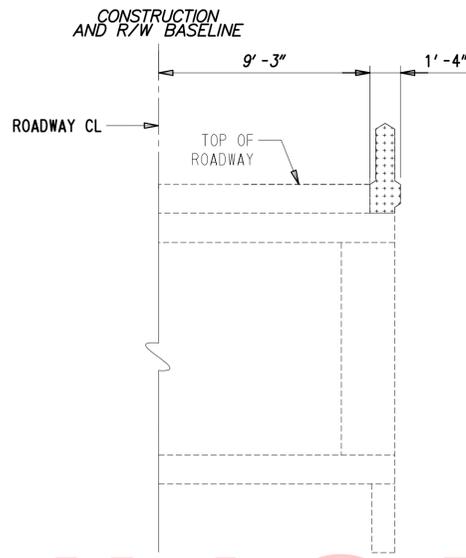
BRIDGE PLAN, ELEVATION AND SECTION

SECTION	TY
SHEET NO.	11

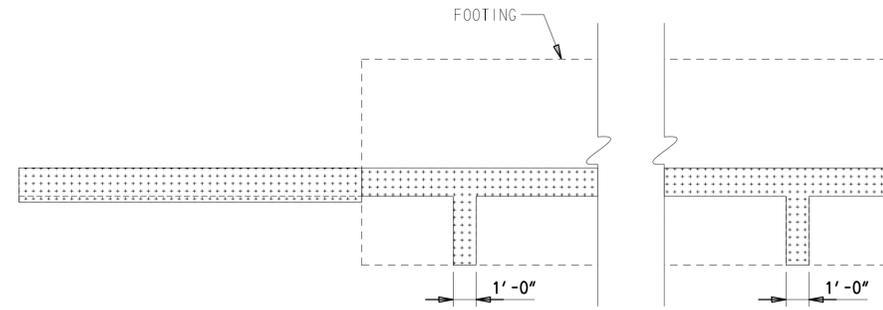
9/24/2019 T:\Dover\Projects\425025\05\600\_CADD\05\_Official\Plans\PE01\_BR1-400.dgn



**BRIDGE ELEVATION**  
1/4" = 1'-0"



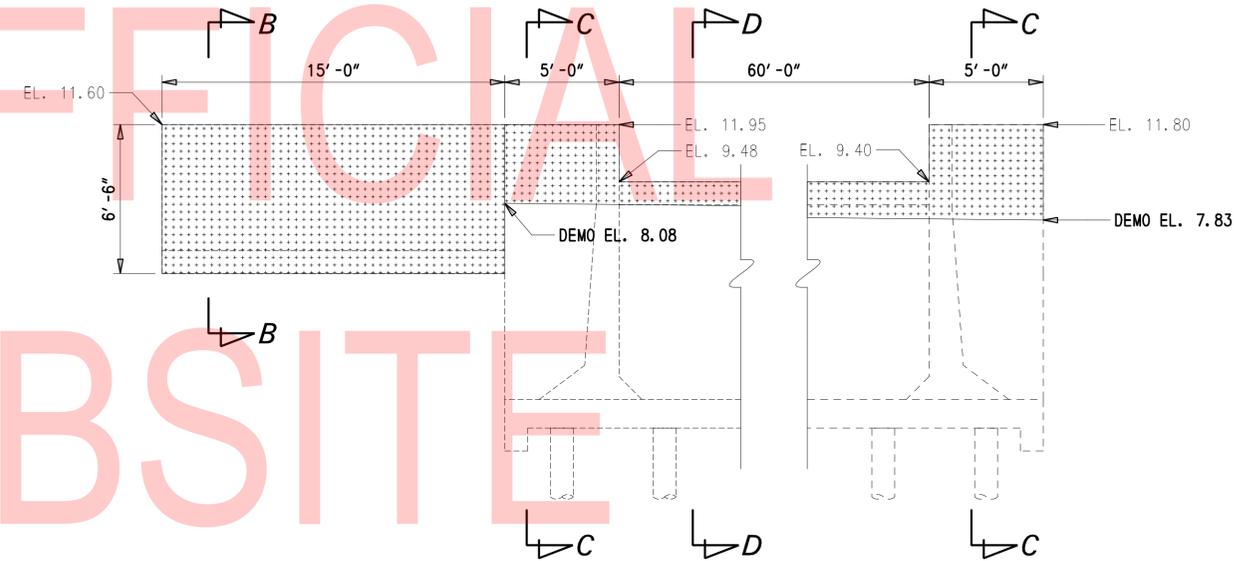
**SECTION A-A**  
1/4" = 1'-0"  
(SYMMETRIC ABOUT ROADWAY CL)



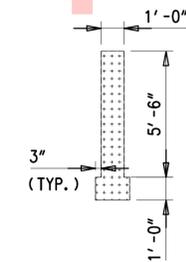
**CONCRETE RETAINING WALL PLAN**  
1/4" = 1'-0"

LEGEND	
	INDICATES EXTENT OF DEMOLITION

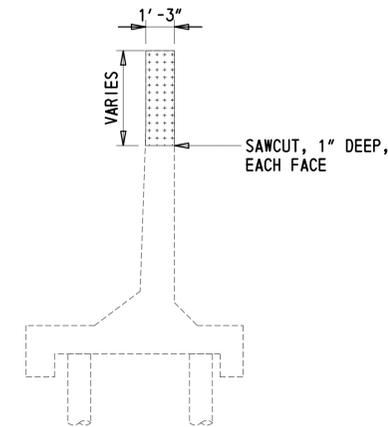
UNOFFICIAL WEBSITE COPY



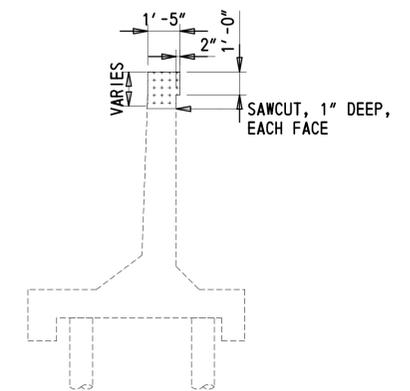
**CONCRETE RETAINING WALL ELEVATION**  
1/4" = 1'-0"



**SECTION B-B**  
1/4" = 1'-0"



**SECTION C-C**  
1/4" = 1'-0"



**SECTION D-D**  
1/4" = 1'-0"

**NOTES:**

1. AFTER SAWCUT, INTENTIONALLY ROUGHEN SURFACE AND REMOVE ALL LOOSE CONCRETE TO PROVIDE A SOUND BOND BETWEEN EXISTING AND NEW CONCRETE. PAYMENT FOR SAWCUT AND ROUGHENING SURFACE INCIDENTAL TO ITEM 211000.
2. APPLY AN EPOXY BONDING COMPOUND BETWEEN EXISTING AND NEW CONCRETE. PAYMENT INCIDENTAL TO ITEM 610000.
3. DO NOT DAMAGE EXISTING VERTICAL REINFORCEMENT TO REMAIN. SEE SHEETS 15 AND 16 FOR DETAILS.
4. CLEAN ANY EXPOSED REINFORCEMENT USING MECHANICAL MEANS. PAYMENT INCIDENTAL TO ITEM 610000.

ADDENDA / REVISIONS

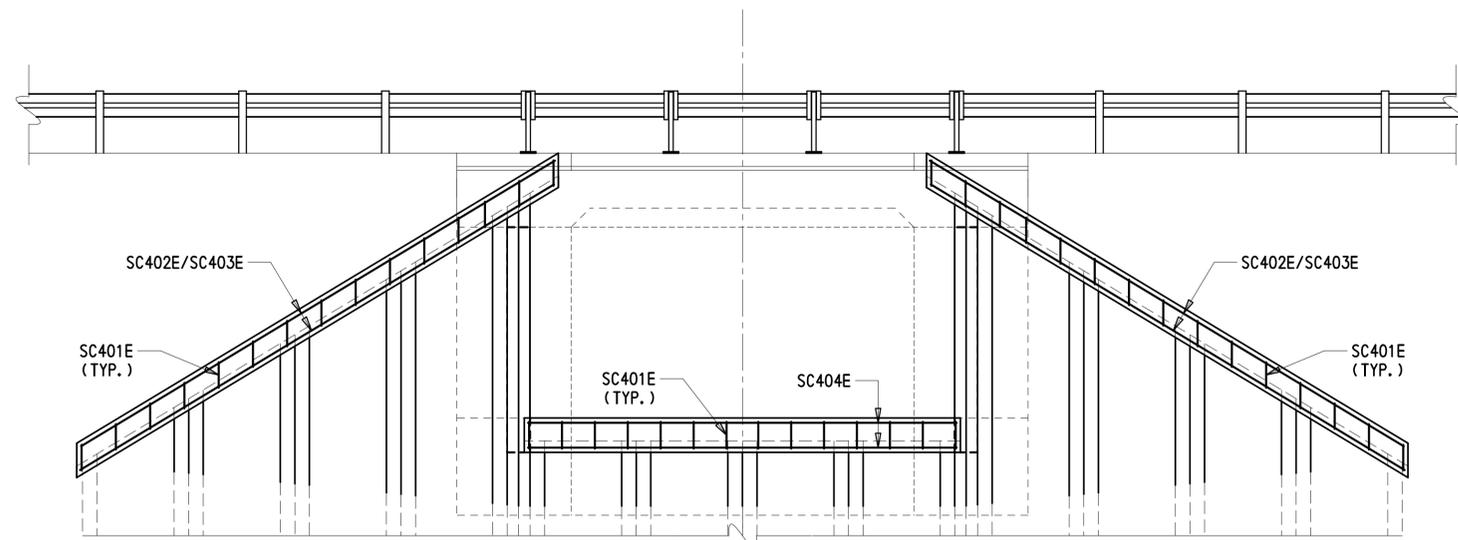
SCALE AS NOTED

**STRUCTURE MAINTENANCE, BR 1-400  
ON SHALLCROSS LAKE ROAD**

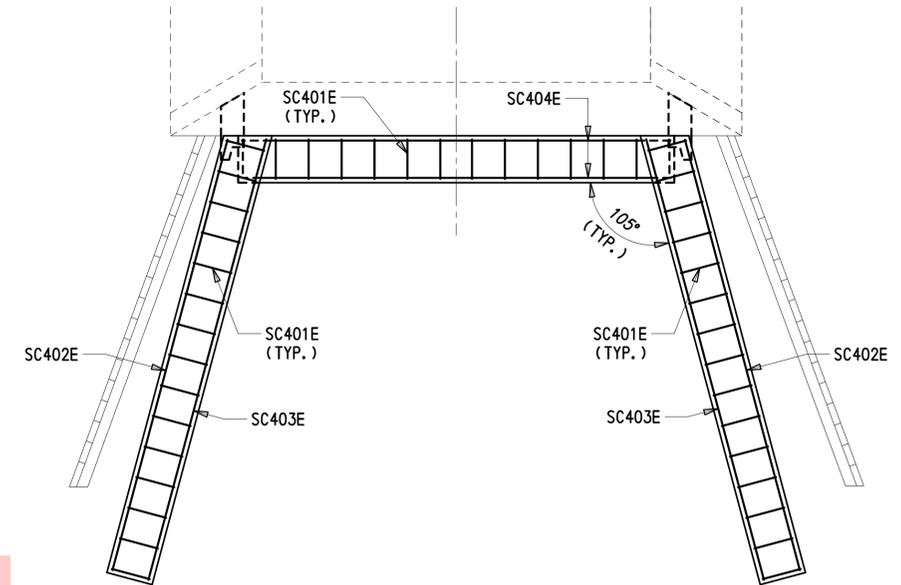
CONTRACT	BRIDGE NO.	<b>1-400</b>
T201707402	DESIGNED BY:	RMB
COUNTY	CHECKED BY:	DEF
NEW CASTLE		

**DEMOLITION DETAILS**

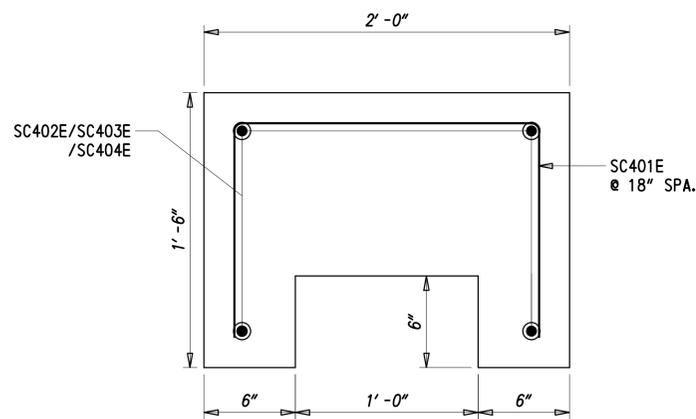
SECTION
TY
SHEET NO.
12



**ELEVATION**  
 NOT TO SCALE  
 (EXTENSION WALL REINFORCING  
 NOT SHOWN FOR CLARITY)

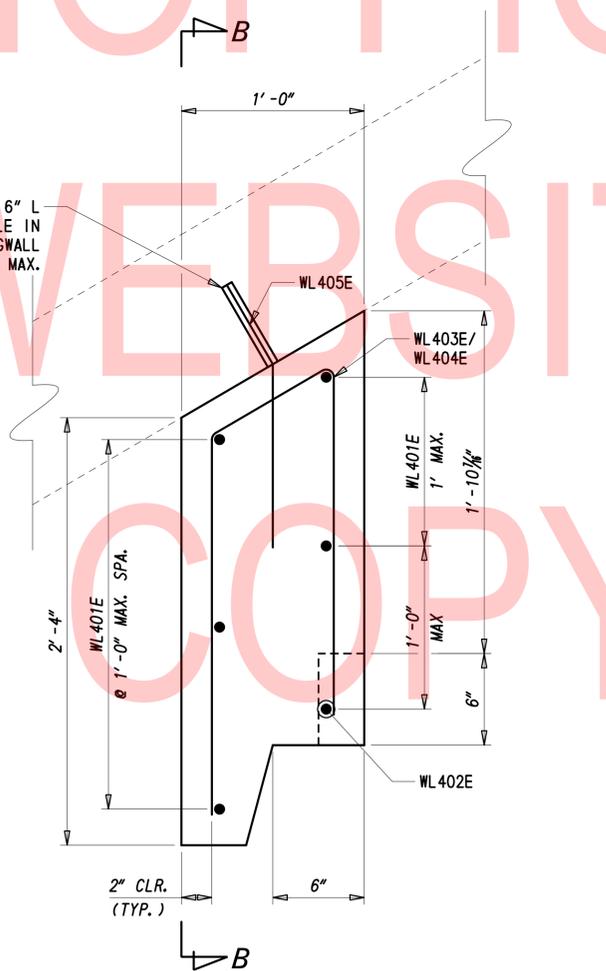


**PLAN**  
 $\frac{1}{4}'' = 1' - 0''$   
 (EXTENSION WALL REINFORCING  
 NOT SHOWN FOR CLARITY)

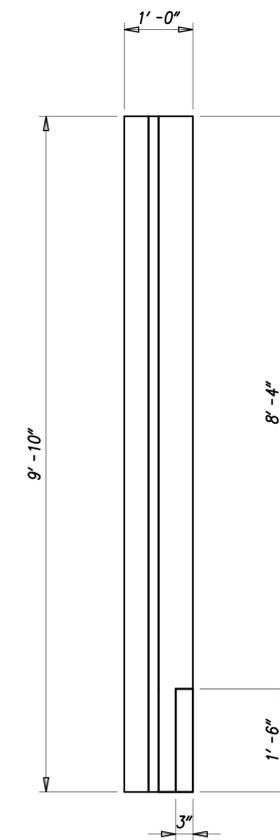


**COPING DETAIL**  
 NOT TO SCALE

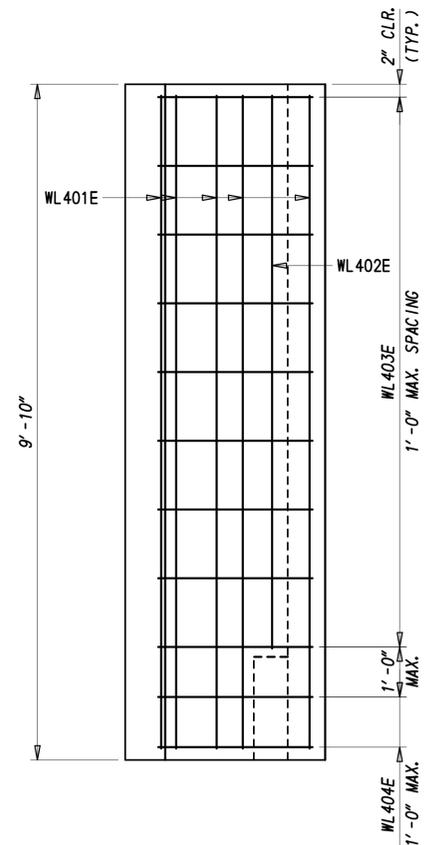
3/4" DIA. X 6" L  
 DRILLED HOLE IN  
 EXISTING WINGWALL  
 SPACED @ 1'-0" MAX.



**TYPICAL EXTENSION WALL SECTION**  
 NOT TO SCALE



**TYPICAL EXTENSION WALL ELEVATION**  
 $\frac{3}{4}'' = 1' - 0''$



**SECTION B-B**  
 $\frac{3}{4}'' = 1' - 0''$

ADDENDA / REVISIONS

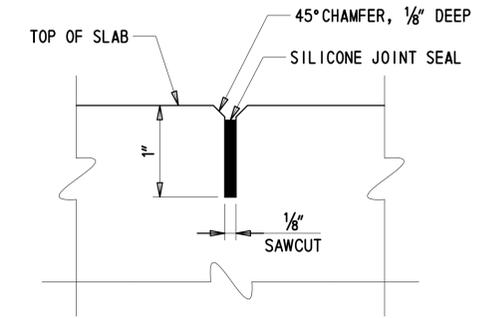
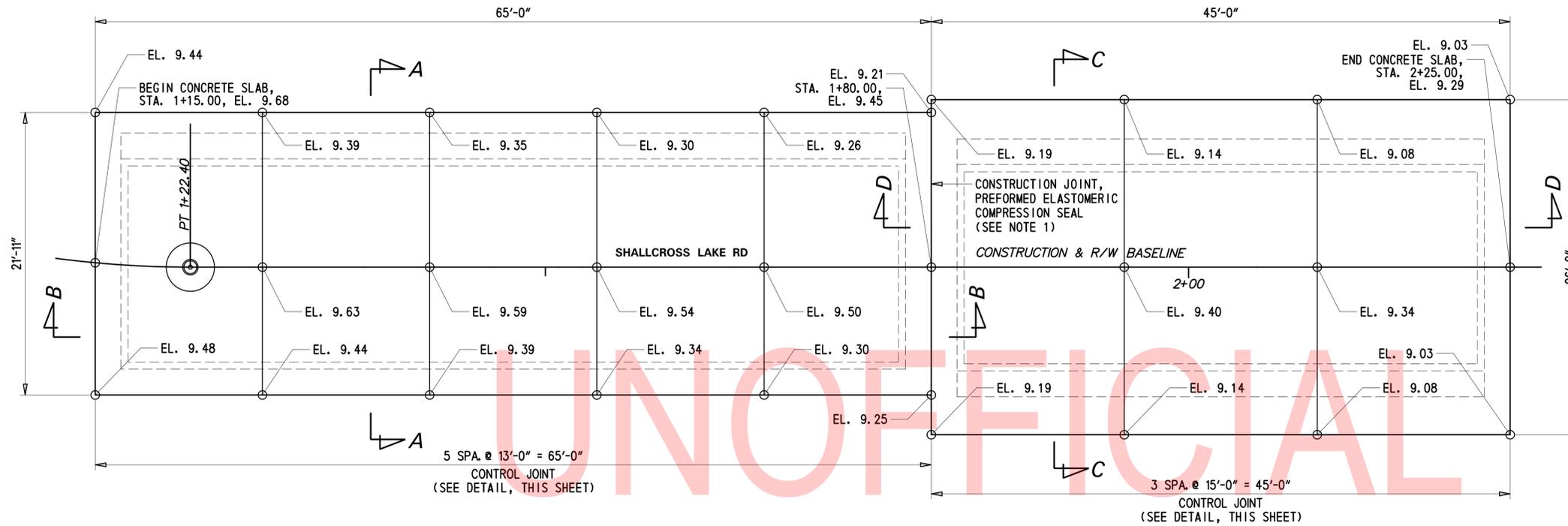
SCALE AS NOTED

STRUCTURE MAINTENANCE, BR 1-400  
 ON SHALLCROSS LAKE ROAD

CONTRACT	BRIDGE NO.	<b>1-400</b>
T201707402	DESIGNED BY:	DJC
COUNTY	CHECKED BY:	DEF
NEW CASTLE		

EXTENSION WALL &  
 COPING DETAILS

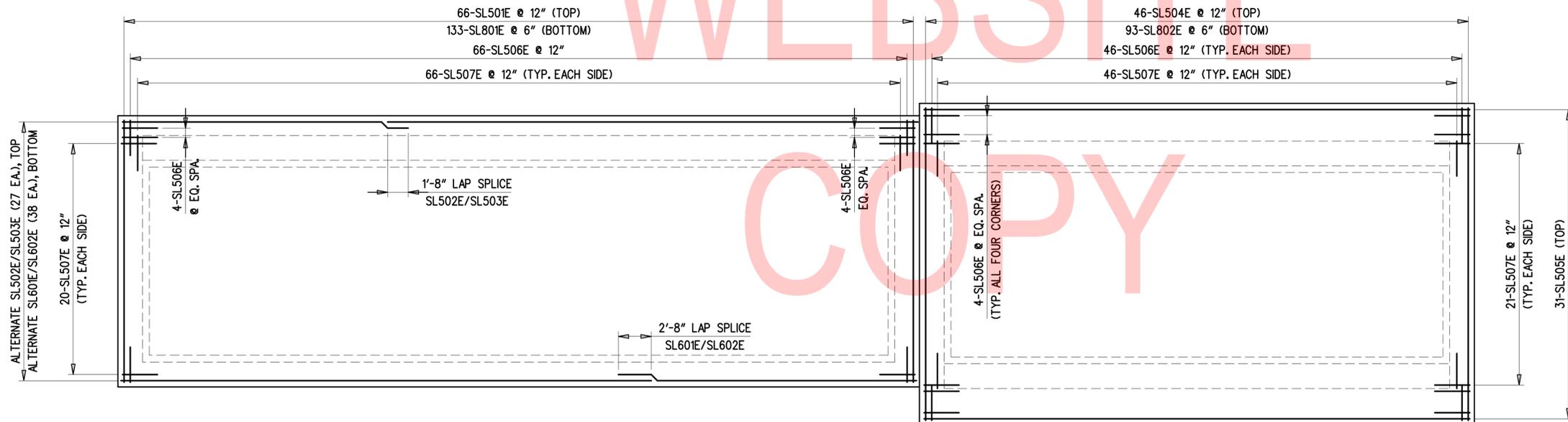
SECTION	TY
SHEET NO.	13



**CONTROL JOINT DETAIL**  
NOT TO SCALE

**PLAN**

3/8" = 1'-0"  
(BRIDGE MOUNTED GUARDRAIL NOT SHOWN FOR CLARITY)



**PLAN - REINFORCING**

3/8" = 1'-0"  
(BRIDGE MOUNTED GUARDRAIL NOT SHOWN FOR CLARITY)

- NOTE:
1. PAYMENT FOR CONCRETE SLAB CONCRETE SHALL BE UNDER ITEM 610018.
  2. FOR PREFORMED ELASTOMERIC COMPRESSION SEAL DETAIL, SEE DELDOT STANDARD CONSTRUCTION DETAILS, DETAIL P-1, SEALANT DETAIL - TRANSVERSE JOINT. PAYMENT SHALL BE INCIDENTAL TO ITEM 610018.
  3. PAYMENT FOR THE CONTROL JOINT SHALL BE INCIDENTAL TO ITEM 610018.
  4. SEE SHEET 15 FOR CONCRETE SLAB SECTION VIEWS.
  5. SEE SHEET 16 FOR BRIDGE GUARDRAIL DETAILS.

ADDENDA / REVISIONS

SCALE AS NOTED

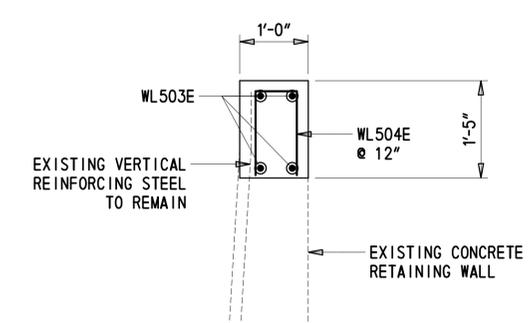
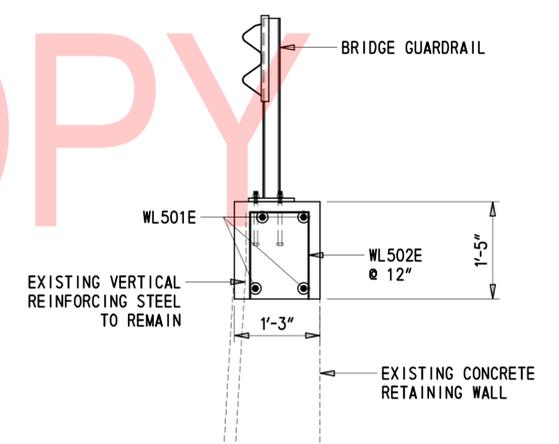
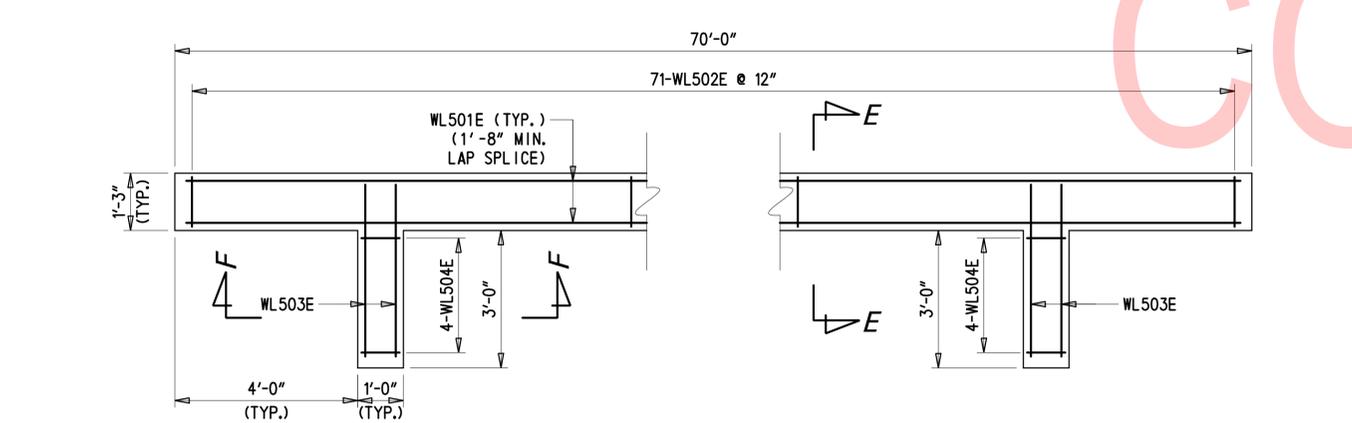
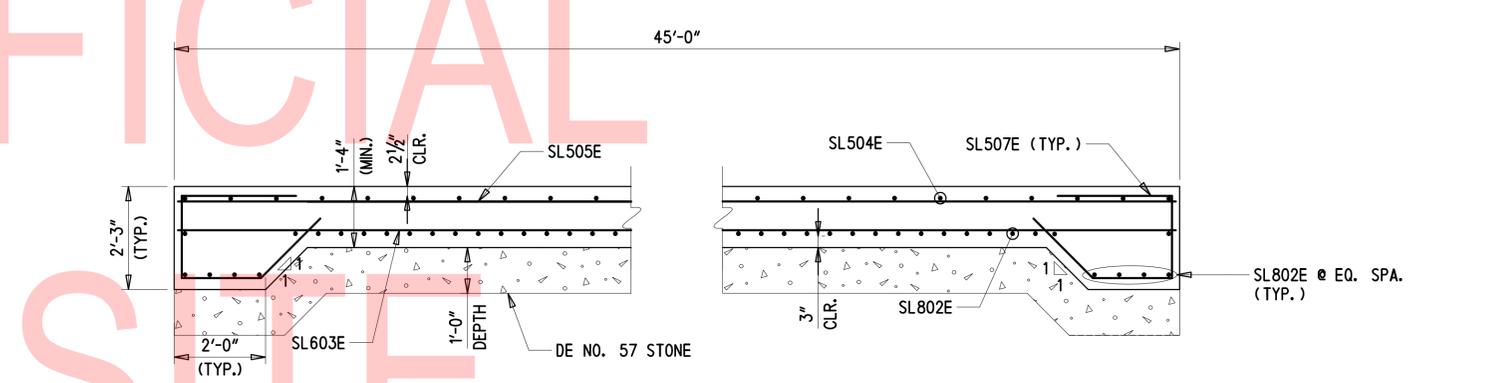
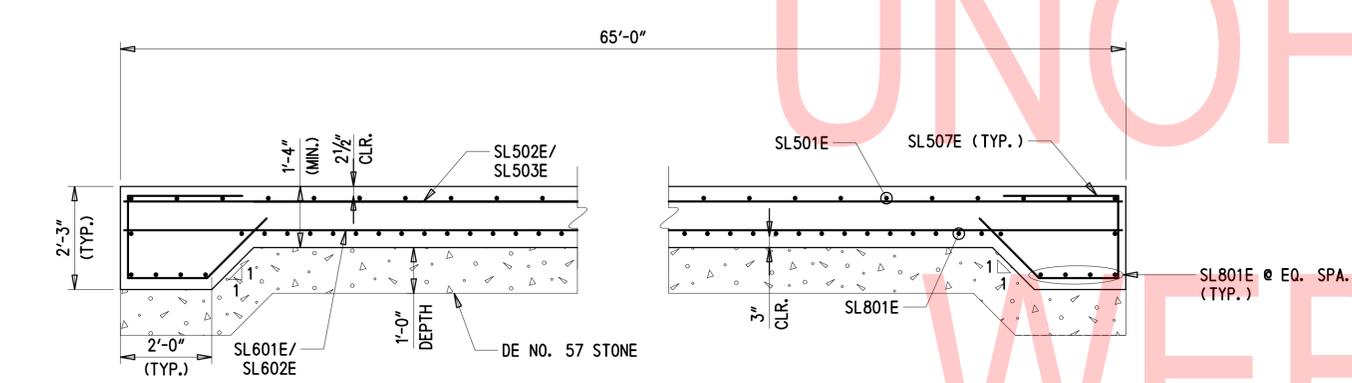
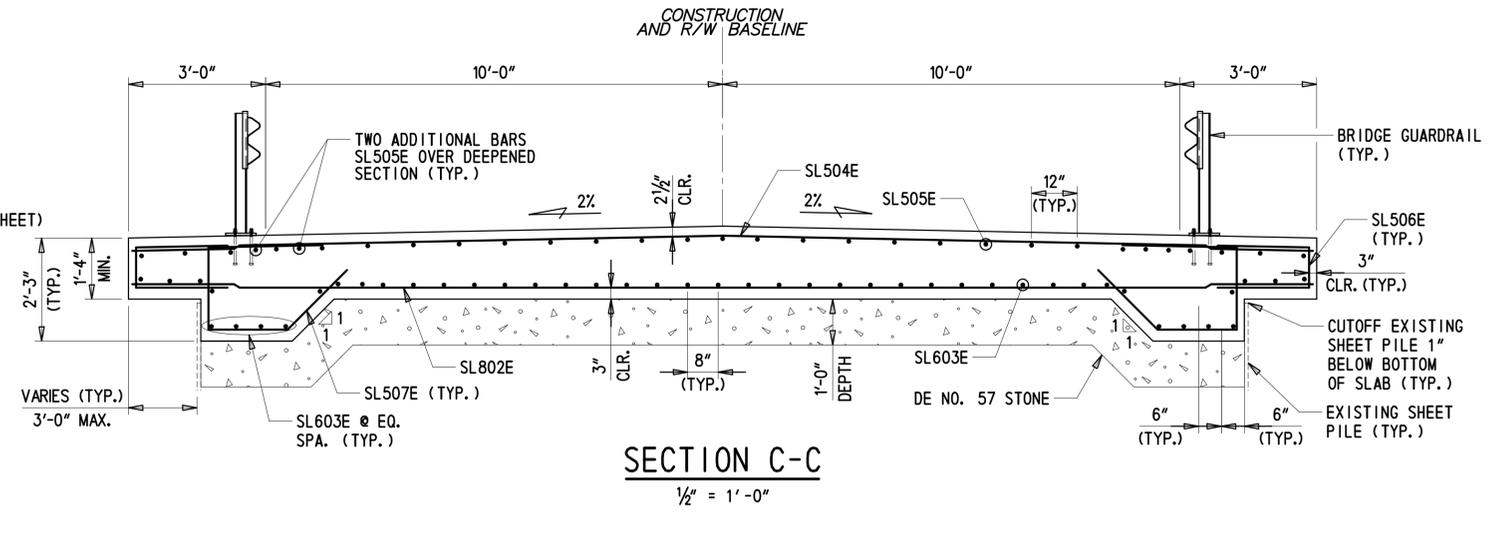
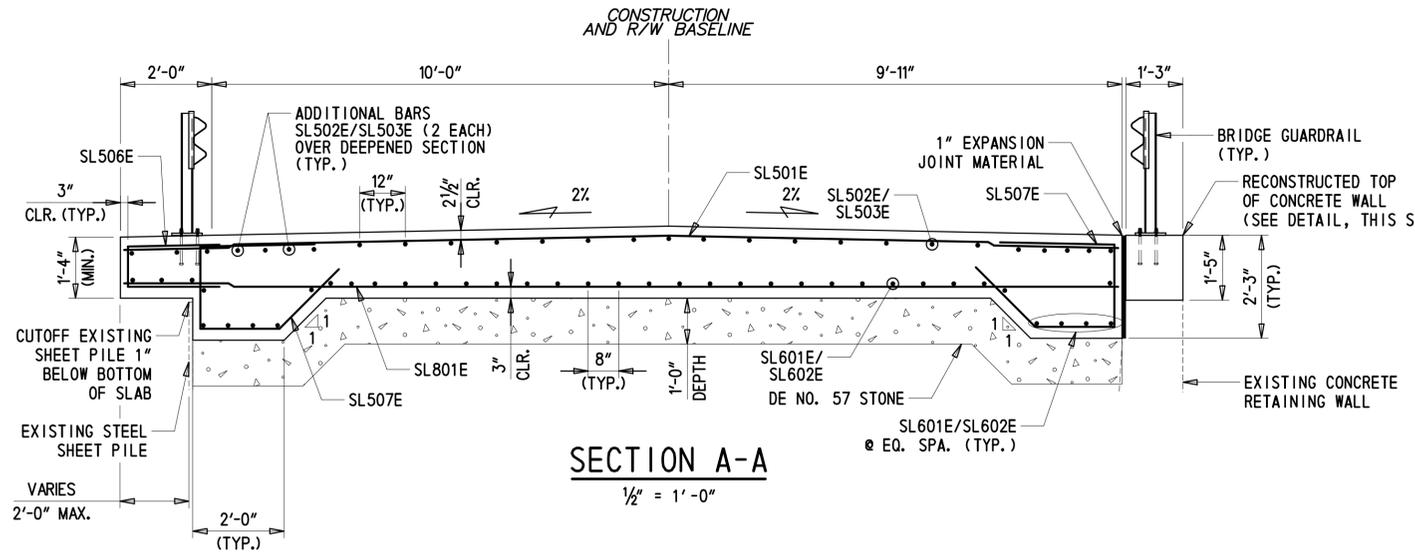
STRUCTURE MAINTENANCE, BR 1-400  
ON SHALLCROSS LAKE ROAD

CONTRACT  
T201707402  
COUNTY  
NEW CASTLE

BRIDGE NO.  
1-400  
DESIGNED BY: RMB  
CHECKED BY: DEF

CONCRETE SLAB  
DETAILS - 1

SECTION  
TY  
SHEET NO.  
14

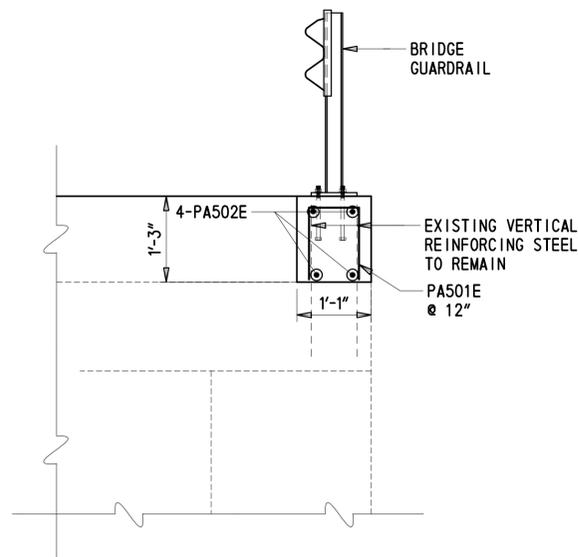


- NOTE:
- PAYMENT FOR CUTTING OFF STEEL SHEET PILE AT THE BOTTOM OF THE PROPOSED CONCRETE SLAB SHALL BE INCIDENTAL TO ITEM 211000.
  - PAYMENT FOR EXPANSION JOINT MATERIAL SHALL BE INCIDENTAL TO ITEM 610018.
  - SEE SHEET 16 FOR BRIDGE GUARDRAIL DETAILS.
  - SEE SHEET 14 FOR CONCRETE SLAB PLAN VIEWS AND GRADES.

UNOFFICIAL  
WEBSITE  
COPY

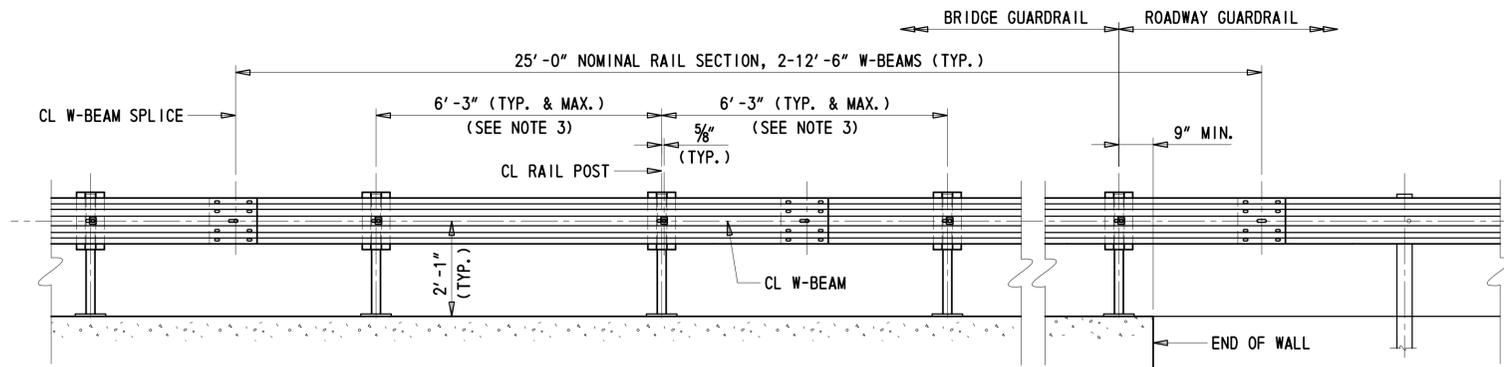
9/24/2019 T:\Dover\Projects\425025\05\600\_CADD\05\_Official\Plans\DT03\_BR1-400.dgn

ADDENDA / REVISIONS	SCALE AS NOTED	STRUCTURE MAINTENANCE, BR 1-400 ON SHALLCROSS LAKE ROAD	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="font-size: 8px;">CONTRACT</td> <td style="font-size: 8px;">BRIDGE NO.</td> <td style="text-align: center;">1-400</td> </tr> <tr> <td style="font-size: 8px;">T201707402</td> <td style="font-size: 8px;">DESIGNED BY:</td> <td style="font-size: 8px;">RMB</td> </tr> <tr> <td style="font-size: 8px;">COUNTY</td> <td style="font-size: 8px;">CHECKED BY:</td> <td style="font-size: 8px;">DEF</td> </tr> <tr> <td style="font-size: 8px;">NEW CASTLE</td> <td></td> <td></td> </tr> </table>	CONTRACT	BRIDGE NO.	1-400	T201707402	DESIGNED BY:	RMB	COUNTY	CHECKED BY:	DEF	NEW CASTLE			CONCRETE SLAB DETAILS - 2	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="font-size: 8px;">SECTION</td> <td style="text-align: center;">TY</td> </tr> <tr> <td style="font-size: 8px;">SHEET NO.</td> <td style="text-align: center;">15</td> </tr> </table>	SECTION	TY	SHEET NO.	15
CONTRACT	BRIDGE NO.	1-400																			
T201707402	DESIGNED BY:	RMB																			
COUNTY	CHECKED BY:	DEF																			
NEW CASTLE																					
SECTION	TY																				
SHEET NO.	15																				



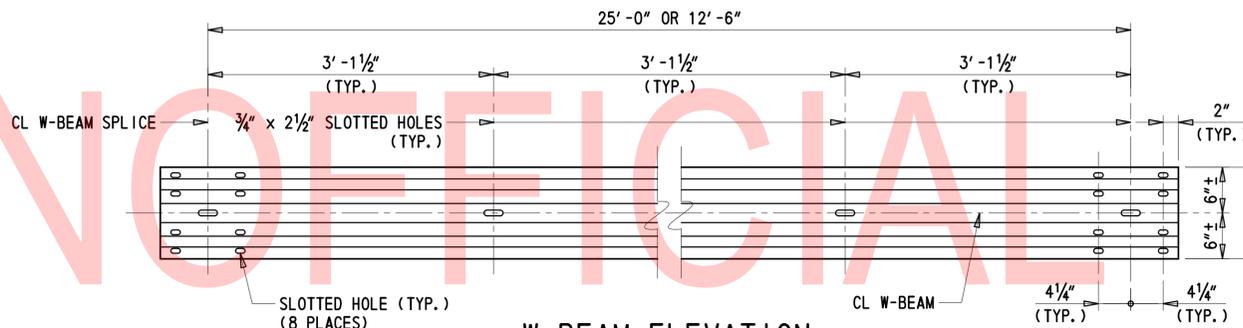
**BRIDGE BARRIER RECONSTRUCTION DETAIL**

$\frac{3}{4}'' = 1'-0''$   
(OTHER SIDE SIMILAR)



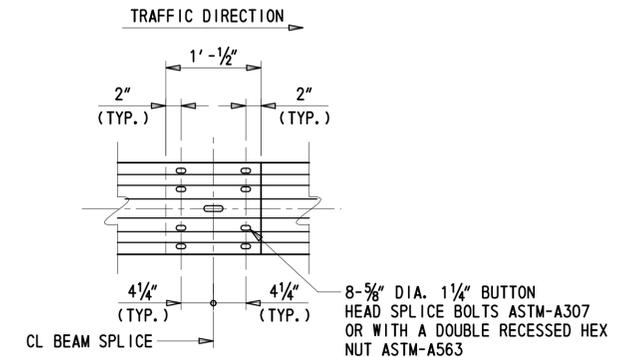
**BRIDGE GUARDRAIL ELEVATION**

$1'' = 1'-0''$



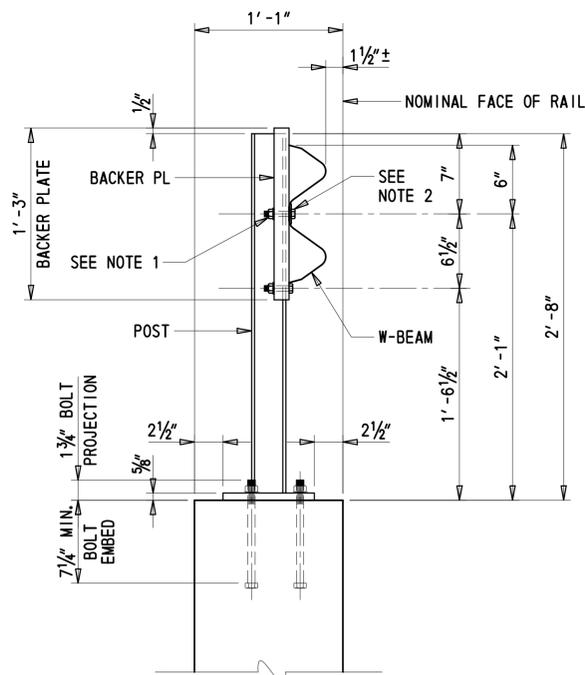
**W-BEAM ELEVATION**

$1'' = 1'-0''$



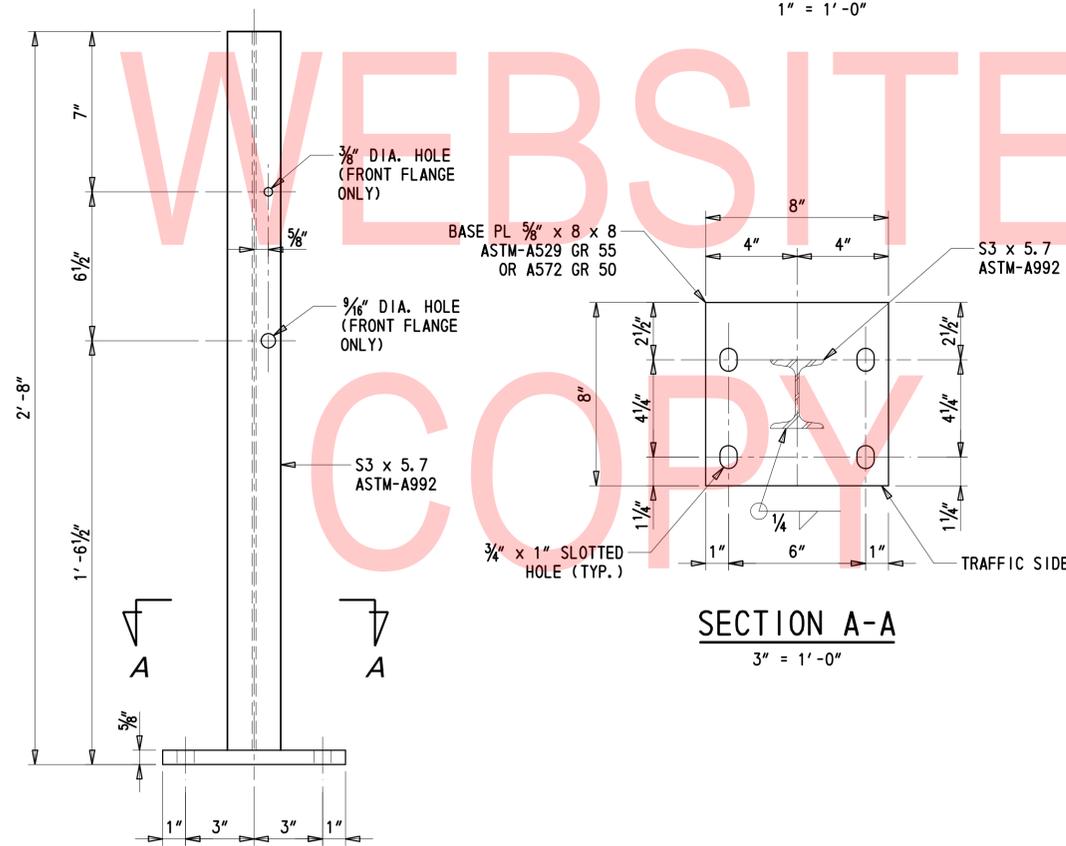
**W-BEAM SPLICE ELEVATION**

$1'' = 1'-0''$



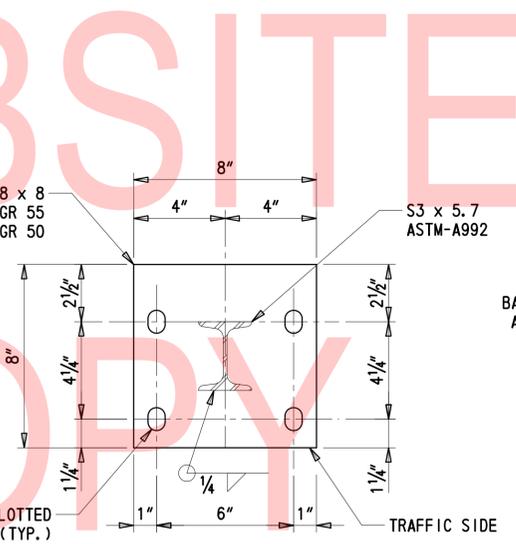
**RAIL SECTION**

$1\frac{1}{2}'' = 1'-0''$



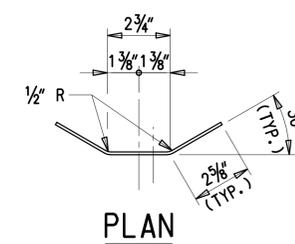
**POST ELEVATION**

$3'' = 1'-0''$



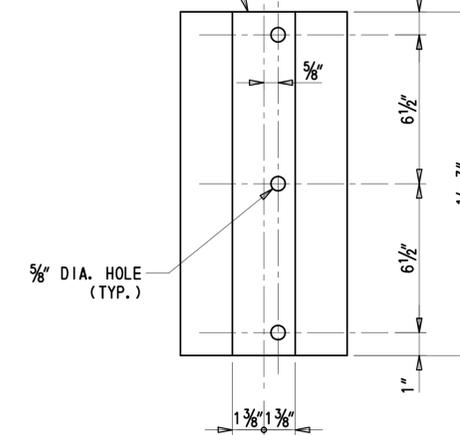
**SECTION A-A**

$3'' = 1'-0''$



**PLAN**

BACKER PL 1/8" x 8" x 1'-3"  
ASTM-A1011 CS OR SS GR 33,  
OR A1008 CS OR SS GR 33  
(11 GAGE ACCEPTABLE)



**BACKER PLATE ELEVATION**

$3'' = 1'-0''$

**NOTES:**

1. TIGHTEN THE FIRST HEX NUT BY HAND UNTIL THE TOP AND BOTTOM EDGES OF THE W-BEAM ENGAGE THE BACKER PLATE (BACKER PLATE SHOULD BE SNUG AGAINST THE POST). THEN TIGHTEN HEX NUT ONE FULL TURN WITH WRENCH AND SECURE THE SECOND HEX NUT.
2. PL ASTM 1/8" x 1 3/4" x 1 3/4" WITH 3/8" DIA. HOLE CENTERED IN PLATE, ASTM-A36. SQUARE GUARDRAIL WASHER.
3. MAINTAIN 6'-3" POST SPACING WHEREVER POSSIBLE FOR USE WITH 12'-6" W-BEAM SECTIONS. SYMMETRY OF POST SPACING ON BOTH SIDES AND ALONG STRUCTURE IS NOT NECESSARY.

**MATERIAL NOTES:**

1. GALVANIZE ALL STEEL COMPONENTS.
2. ANCHOR BOLTS FOR BASE PLATE SHALL BE 5/8" DIA. ASTM-A325 OR A449 BOLTS WITH ONE HARDENED WASHER AND ONE REGULAR LOCK WASHER PLACED UNDER EACH HEAVY HEX NUT. NUTS SHALL CONFORM TO A563 REQUIREMENTS
3. W-BEAM SHALL MEET THE REQUIREMENTS OF SECTION 720 OF THE STANDARD SPECIFICATIONS.

ADDENDA / REVISIONS

SCALE AS NOTED

STRUCTURE MAINTENANCE, BR 1-400  
ON SHALLCROSS LAKE ROAD

CONTRACT  
T201707402  
COUNTY  
NEW CASTLE

BRIDGE NO. **1-400**  
DESIGNED BY: RMB  
CHECKED BY: DEF

BRIDGE GUARDRAIL  
DETAILS

SECTION  
TY  
SHEET NO.  
16

① ANY MARK NUMBER WITH SUFFIX 'E' DENOTES EPOXY COATED REINFORCING STEEL.

② ALL MARK 'LOCATION PREFIXES' SHALL CONSIST OF TWO LETTERS AND ARE AS FOLLOWS: AB = ABUTMENT, AS = APPROACH SLAB, BC = BOX CULVERT, BW = BACKWALL, CL = COLUMN, DK = DECK, DL = DOWEL, FT = FOOTING, HW = HEADWALL, MS = MISC. BARS, PA = PARAPET, PR = PIER, SC = SHEETPILE CAP, SL = SLAB, TW = TOEWALL, WL = WALL (UNIQUE LOCATION), WW = WINGWALL

SPECIFICATIONS					BENDING DIMENSIONS (FEET-INCHES /QUARTER INCH)											
QTY.	SIZE	LENGTH	MARK	TYPE	A	B	C	D	E	F/R	G	H	J	K	O	
52	5	2-70	PA501E	17		110		90	110							
8	5	24-80	PA502E	STR		24-80										
44	4	4-00	SC401E	17			1-20	1-80	1-20							
4	4	23-60	SC402E	STR		23-60										
4	4	22-100	SC403E	STR		22-10										
4	4	18-90	SC404E	STR		18-90										
66	5	21-50	SL501E	STR												
27	5	43-00	SL502E	STR												
27	5	23-20	SL503E	STR												
46	5	25-60	SL504E	STR												
31	5	44-60	SL505E	STR												
182	5	4-102	SL506E	17		2-00	0-102	2-00								
306	5	7-101	SL507E	16	2-60	1-92	1-83	1-100				1-32		1-32	3-01	
38	6	43-00	SL601E	STR												
38	6	24-20	SL602E	STR												
45	6	44-60	SL603E	STR												
133	8	21-50	SL801E	STR												
93	8	25-60	SL802E	STR												
10	4	9-60	WL401E	STR		9-50										
2	4	8-00	WL402E	STR		8-00										
18	4	4-91	WL403E	SP1		2-00	0-91	2-00				0-80		0-43		
4	4	4-31	WL404E	SP1		2-00	0-91	1-60				0-80		0-43		
22	4	1-60	WL405E	16			1-00	0-60				0-30		0-51	1-51	
8	5	35-70	WL501E	STR		35-70										
71	5	3-50	WL502E	17		1-30	0-110	1-30								
8	5	3-90	WL503E	STR		3-90										
8	5	3-20	WL504E	17		1-30	0-80	1-30								

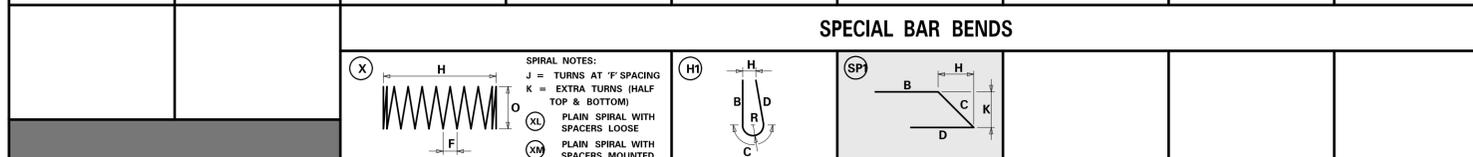
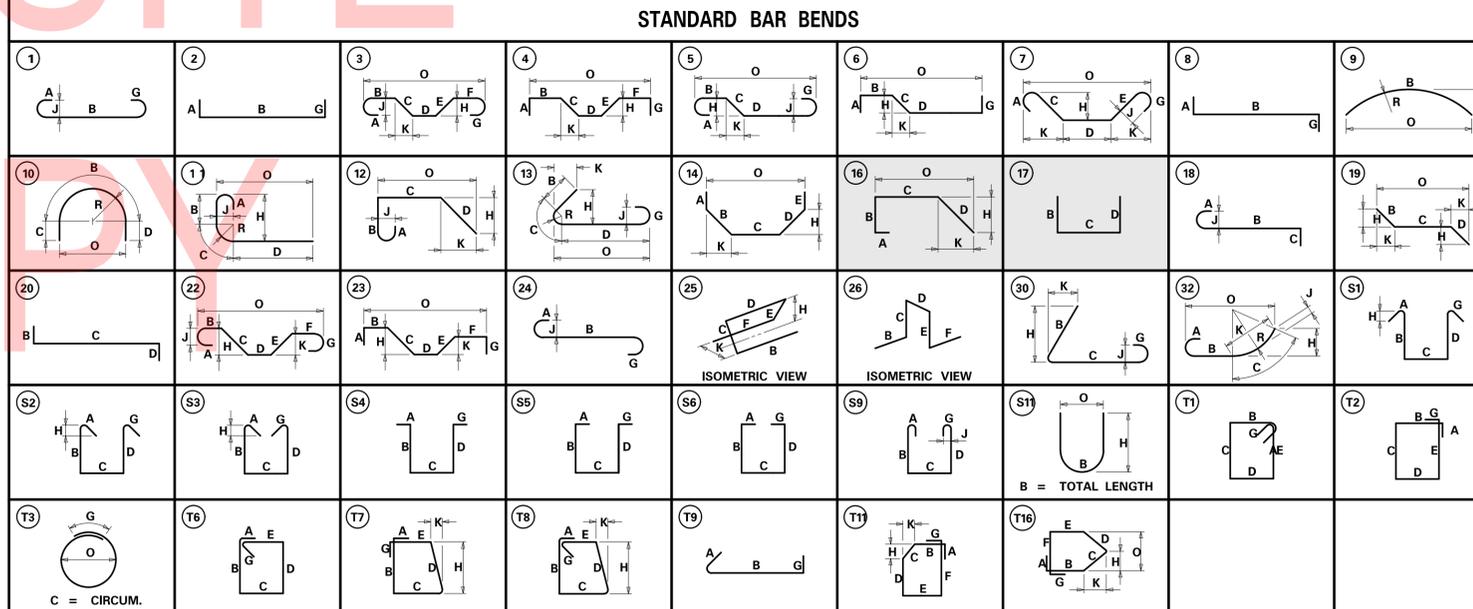
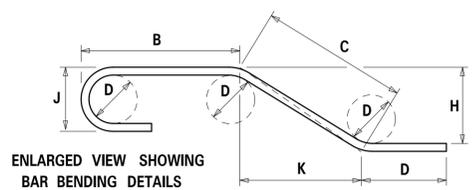
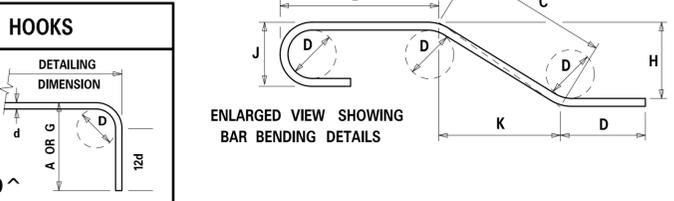
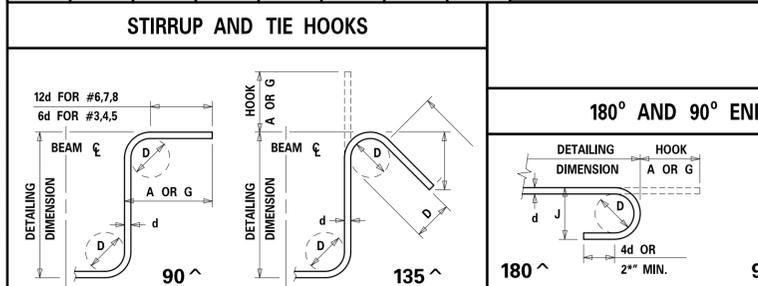
SPECIFICATIONS					BENDING DIMENSIONS (FEET-INCHES /QUARTER INCH)										
QTY.	SIZE	LENGTH	MARK	TYPE	A	B	C	D	E	F/R	G	H	J	K	O

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

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ASTM STANDARD ENGLISH REINFORCING BARS				RECOMMENDED END HOOKS, APPLICABLE TO ALL GRADES				STIRRUP AND TIE HOOKS, APPLICABLE TO ALL GRADES			
BAR SIZE	NOMINAL DIMENSIONS			180° HOOKS		90° HOOKS		90° HOOK		135° HOOK	
	DIAMETER (INCHES)	AREA (INCHES <sup>2</sup> )	WEIGHT (LBS./FT.)	D	A OR G	J	A OR G	D	A OR G	A OR G	A OR G
3	0.375	0.110	0.376	2 1/4"	5"	3"	6"	1 1/2"	4"	4"	2 1/2"
4	0.500	0.200	0.668	3"	6"	4"	8"	2"	4 1/2"	4 1/2"	3"
5	0.625	0.310	1.043	3 3/4"	7"	5"	10"	2 1/2"	6"	5 1/2"	3 3/4"
6	0.750	0.440	1.502	4 1/2"	8"	6"	1-0"	4 1/2"	1-0"	8"	4 1/2"
7	0.875	0.600	2.044	5 1/4"	10"	7"	1-2"	5 1/4"	1-2"	9"	5 1/4"
8	1.000	0.790	2.670	6"	11"	8"	1-4"	6"	1-4"	10 1/2"	6"
9	1.128	1.000	3.400	9 1/2"	1-3"	11 3/4"	1-7"				
10	1.270	1.270	4.303	10 3/4"	1-5"	1-1 1/4"	1-10"				
11	1.410	1.560	5.313	1-0"	1-7"	1-2 3/4"	2-0"				
14	1.693	2.250	7.650	1-6 1/4"	2-3"	1-9 3/4"	2-7"				
18	2.257	4.000	13.600	2-0"	3-0"	2-4 1/2"	3-5"				

- NOTES:
- FIGURES SHOWN IN CIRCLES REPRESENT BAR BEND TYPES.
  - STANDARD BAR BENDS INCLUDE ONLY THOSE TYPES BELOW, INDICATED AS SUCH.
  - ALL DIMENSIONS OUT-TO-OUT, EXCEPT "A" AND "C" ON STD. 180° AND 135° HOOKS.
  - "J" DIMENSIONS ON 180° HOOKS TO BE SHOWN ONLY WHERE NECESSARY TO RESTRICT HOOK SIZE, OTHERWISE STANDARD 'ACI' HOOKS ARE TO BE USED.
  - WHERE "J" IS NOT SHOWN, "J" WILL BE KEPT EQUAL TO OR LESS THAN "H" ON TYPES 3, 5 AND 22. WHERE "J" CAN EXCEED "H", IT SHALL BE SHOWN.
  - "H" DIMENSIONS OF STIRRUPS TO BE SHOWN AS NEEDED TO FIT WITHIN THE CONCRETE.
  - UNLESS OTHERWISE NOTED, DIAMETER "D" IS THE SAME FOR ALL BENDS AND HOOKS ON A BAR (EXCEPT FOR BEND TYPES 11 AND 13).
  - WHERE SLOPE DIFFERS FROM 45° OFFSET, "H" AND "K" MUST BE SHOWN.
  - WHERE BARS ARE TO BE BENT MORE ACCURATELY THAN STANDARD BENDING TOLERANCES, BENDING DIMENSIONS REQUIRING CLOSER FABRICATION SHOULD HAVE LIMITS INDICATED.
  - FOR RECOMMENDED DIAMETER "D", OF BENDS, HOOKS, ETC., REFER TO TABLE ABOVE, 'CRS1' OR 'ACI' TABLES WHERE APPLICABLE AND REQUIRED.
  - TYPE S1-S6, S11, T1-T3 AND T6-T9 APPLICABLE TO BAR SIZES #3 THROUGH #8.



ADDENDA / REVISIONS	

CONTRACT		BRIDGE NO.		SECTION	
T201707402	NEW CASTLE	1-400		TY	
DESIGNED BY: RMB		CHECKED BY: DEF		SHEET NO.	
				17	

STRUCTURE MAINTENANCE, BR 1-400 ON SHALLCROSS LAKE ROAD				REINFORCEMENT BAR LIST	
CONTRACT		BRIDGE NO.		SECTION	
T201707402	NEW CASTLE	1-400		TY	
DESIGNED BY: RMB		CHECKED BY: DEF		SHEET NO.	
				17	

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BORING: SL-1		DATE DRILLED: 2/13/18			
STATION: 3+65.50		OFFSET: 5.43'			
ELEVATION: 11.60		NORTHING: 540305.001			
EASTING: 584328.577		COMMENTS: N/A			
SAMPLE INFORMATION					
NO.	DEPTH	BLOWS /6"	DESCRIPTION	CLASS /G.I.	REMARKS
1	0.0 1.5		MOIST GRAY FINE GRAVEL AND COARSE SAND W/SOME FINE SAND AND ORGANIC MATTER, TRACE OF SILT.	A-1-B	HOT-MIX 10" STONE 6"
2	2.0	12 14 26	MOIST DENSE GRAY ORGANIC COARSE SANDY FINE GRAVEL W/TRACE FINE SAND AND SILT.	A-1-A	
3	4.0 4.0	8 4 6	MOIST LOOSE BROWN FINE GRAVELLY COARSE SAND W/SOME FINE SAND AND SILT.	A-1-B	
4	6.0	7 9 11	MOIST MEDIUM DENSE BROWN COARSE SAND AND FINE GRAVEL W/SOME FINE SAND, TRACE OF SILT.	A-1-B	
5	8.0	4 6 4	MOIST LOOSE BROWN COARSE TO FINE SANDY FINE GRAVEL W/TRACE SILT.	A-1-B	
6	10.0	13 41 40	WET VERY DENSE BROWN FINE TO COARSE SAND AND FINE GRAVEL W/SOME SILT.	A-1-B	
7	12.0	7 3 2	WET LOOSE BROWN COARSE TO FINE SAND W/SOME FINE GRAVEL AND SILT.	A-1-B	
8	14.0	2 2 2	SATURATED SOFT GRAY CLAYEY SILT W/TRACE FINE TO COARSE SAND AND FINE GRAVEL.	A-4(B)	
9	16.0	3 4 7	SATURATED MEDIUM DENSE GRAY FINE GRAVELLY COARSE SAND W/TRACE FINE SAND AND SILT.	A-1-B	
10	18.0	6 10 11	SATURATED MEDIUM DENSE GRAY COARSE TO FINE SAND W/SOME SILT, TRACE OF FINE GRAVEL.	A-1-B	
11	23.0	4 5 6 7	NO SAMPLE		
12	28.0	23 37 41	SATURATED VERY DENSE GRAY SILTY FINE TO COARSE SAND W/SOME FINE GRAVEL.	A-2-4(0)	
13	33.0	39	SATURATED VERY DENSE GRAY ORGANIC SILTY FINE SAND W/SOME COARSE SAND AND FINE GRAVEL.	A-2-4(0)	
14	38.0	50/3 8 32 31	SATURATED MEDIUM DENSE GRAY CLAYEY FINE TO COARSE SAND W/SOME SILT, TRACE OF FINE GRAVEL.	A-2-4(0)	
15	43.0	38	SATURATED VERY DENSE GRAY SILTY FINE TO COARSE SAND W/TRACE FINE GRAVEL.	A-2-4(0)	
16	48.0	23 34 27	SATURATED VERY DENSE GRAY SILTY FINE TO COARSE SAND W/TRACE FINE GRAVEL.	A-2-4(0)	
	50.0	50/4	SATURATED VERY DENSE GRAY SILTY FINE TO COARSE SAND W/TRACE FINE GRAVEL AND ORGANIC MATTER.	A-2-4(0)	
	50.0		END BORING		

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ADDENDA / REVISIONS

NOT TO SCALE

STRUCTURE MAINTENANCE, BR 1-400  
ON SHALLCROSS LAKE ROAD

CONTRACT  
T201707402  
COUNTY  
NEW CASTLE

BRIDGE NO. **1-400**  
DESIGNED BY: RMB  
CHECKED BY: DEF

SOIL BORING LOG

SECTION  
TY  
SHEET NO.  
18

ORIGINAL SHEET PREPARED BY:  
CENTURY ENGINEERING, INC.  
4134 NORTH DUPONT HIGHWAY  
DOVER, DE 19901  
11-29-2018  
SHEET LAST UPDATED:  
01-08-2019.

WETLANDS DELINEATED BY:  
CENTURY ENGINEERING, INC.  
4134 NORTH DUPONT HIGHWAY  
DOVER, DE 19901  
01-03-2018  
IN ACCORDANCE WITH THE  
US ARMY CORPS OF ENGINEERS  
"CORPS OF ENGINEERS WETLAND  
DELINEATION MANUAL (1987)"  
AND REGIONAL SUPPLEMENTS.

LEGEND	
	PERMANENT IMPACT AREA
	TEMPORARY IMPACT AREA
---OHW---	ORDINARY HIGH WATER
---WL---	WETLAND BOUNDARY
---MHW---	MEAN HIGH WATER
---SMW---	STATE MAPPED WETLAND
	IMPACT AREA TYPE ID. (SEE BELOW) IMPACT AREA ID. AND/OR NUMBER
O =	OPEN WATER IMPACT
T =	TEMPORARY IMPACT
C =	CREATION AREA
W =	WETLAND IMPACT

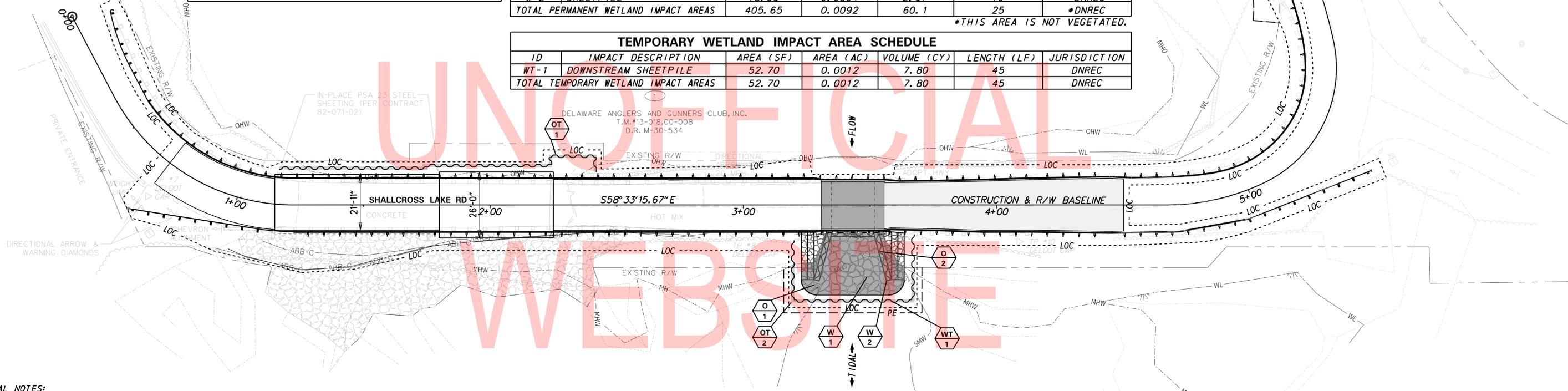
PERMANENT OPEN WATER IMPACT AREA SCHEDULE						
ID	IMPACT DESCRIPTION	AREA (SF)	AREA (AC)	VOLUME (CY)	LENGTH (LF)	JURISDICTION
O-1	DOWNSTREAM RIPRAP	822.07	0.0188	121.78	25	USACE
O-1	DOWNSTREAM RIPRAP	434.42	0.0099	64.35	10	DNREC
O-2	SHEETPILE	99.95	0.0022	14.80	57	USACE
O-2	SHEETPILE	81.95	0.0018	13.47	9	DNREC
TOTAL PERMANENT OPEN WATER IMPACTS		922.02	0.0210	136.58	82	USACE
		516.37	0.0117	77.82	19	DNREC

TEMPORARY OPEN WATER IMPACT AREA SCHEDULE						
ID	IMPACT DESCRIPTION	AREA (SF)	AREA (AC)	VOLUME (CY)	LENGTH (LF)	JURISDICTION
OT-1	UPSTREAM SHEETPILE	163.69	0.0037	24.25	136	USACE/DNREC
OT-2	DOWNSTREAM SHEETPILE	87.34	0.0020	13.58	73	USACE
OT-2	DOWNSTREAM SHEETPILE	34.67	0.0008	5.78	28	DNREC
TOTAL TEMPORARY OPEN WATER IMPACTS		251.03	0.0057	37.18	209	USACE
		198.36	0.0045	30.03	164	DNREC

PERMANENT WETLAND IMPACT AREA SCHEDULE						
ID	IMPACT DESCRIPTION	AREA (SF)	AREA (AC)	VOLUME (CY)	LENGTH (LF)	JURISDICTION
W-1	DOWNSTREAM RIPRAP	387.65	0.0088	57.43	15	*DNREC
W-2	SHEETPILE	18.00	0.0004	2.67	10	*DNREC
TOTAL PERMANENT WETLAND IMPACT AREAS		405.65	0.0092	60.1	25	*DNREC

\*THIS AREA IS NOT VEGETATED.

TEMPORARY WETLAND IMPACT AREA SCHEDULE						
ID	IMPACT DESCRIPTION	AREA (SF)	AREA (AC)	VOLUME (CY)	LENGTH (LF)	JURISDICTION
WT-1	DOWNSTREAM SHEETPILE	52.70	0.0012	7.80	45	DNREC
TOTAL TEMPORARY WETLAND IMPACT AREAS		52.70	0.0012	7.80	45	DNREC



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, CONTACT THE ENVIRONMENTAL STUDIES SECTION AT (302)760-2264 TO ALLOW FOR COORDINATION WITH THE APPROPRIATE RESOURCE AGENCIES AND APPROVAL.
- C. USE OF THESE SHEETS 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): NATIONWIDE PERMIT (NWP) #14
  - DNREC - WETLANDS & SUBAQUEOUS LANDS (WLSL): SUBAQUEOUS LANDS PERMIT
  - DNREC - COASTAL ZONE MANAGEMENT (CZM): N/A
  - NEW CASTLE COUNTY - FLOOD PLAIN PERMIT: N/A
  - DNREC - WATER QUALITY (WQC): N/A

\* THE PERMITS/ APPROVALS LISTED ARE THOSE REQUIRED FOR THIS PROJECT. THE ENVIRONMENTAL STUDIES SECTION IS RESPONSIBLE FOR COORDINATING AND/OR OBTAINING THESE APPROVALS.  
\*\* THE CONTRACTOR MUST ENSURE THAT THESE PERMITS/APPROVALS ARE IN THEIR POSSESSION PRIOR TO BEGINNING CONSTRUCTION IN THE PERMITTED AREA(S) AND ENSURE THEY ARE DISPLAYED ON-SITE DURING THE ENTIRE CONSTRUCTION PERIOD.
- B. CONSTRUCTION RESTRICTIONS:
  - FISHERIES - MARCH 1 TO JUNE 30- NO IN WATER WORK
  - MIGRATORY BIRDS - N/A
  - ENDANGERED SPECIES - N/A

3. CULTURAL RESOURCES:

- A. AS A RESULT OF THE CURRENT PROJECT COORDINATION, THE BRIDGE 1-400 PROJECT IS CONSISTENT WITH STIPULATION 11.B.2 OR 11.B.3.a.1 OF THE 2013 PROGRAMMATIC AGREEMENT FOR THE FEDERAL AID HIGHWAY PROGRAM IN DELAWARE. DELDOT QUALIFIED STAFF HAVE REVIEWED THE PROJECT AND DETERMINED THAT NO HISTORIC PROPERTIES WILL BE AFFECTED.

4. STREAM RESTORATION AND RIP RAP TREATMENT:

- A. FOLLOW THE SPECIAL PROVISION FOR ITEM 707500- CHANNEL BED FILL IN REGARDS TO THE SALVAGING OF ON-SITE NATURAL STREAM BOTTOM MATERIAL OR THE FURNISHINGS OF OFF-SITE MATERIAL. IF SUFFICIENT SOURCES FOR CHANNEL BED FILL DO NOT EXIST ON-SITE, ANY NEW MATERIAL MUST CONFORM TO THE REQUIREMENTS OF ITEM 707500- CHANNEL BED FILL. RECESS ALL RIP RAP IN THE CHANNEL BOTTOM (I.E. BELOW THE WATER LINE) ONE FOOT BELOW STREAM BED ELEVATION AND CHOKO WITH BORROW TYPE "B" SO THAT ALL OF THE VOIDS IN THE RIP RAP ARE FILLED WITH SPECIFIED MATERIAL. PAYMENT UNDER ITEM 209002- BORROW, TYPE B. COVER THE RIP RAP WITH A MINIMUM OF 12" CHANNEL BED FILL. MATCH THE FINAL CHANNEL ELEVATION WITH EXISTING ELEVATIONS AT THE UPSTREAM AND DOWNSTREAM PROJECT LIMITS. THROUGH THE STRUCTURE, ELEVATIONS WILL BE AS NOTED ON THE PLANS. PAYMENT UNDER ITEM 707500- CHANNEL BED FILL.
- B. RESTORE 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) TO EXISTING CONDITIONS. FILL ANY CAVITIES OR SCOUR HOLES RESULTING FROM CONSTRUCTION ACTIVITIES WITH CHANNEL BED FILL. PAYMENT UNDER ITEM 707500- CHANNEL BED FILL.
- C. WHEN ALL EROSION AND SEDIMENT CONTROL MEASURE ARE REMOVED AND THE STREAM RETURNS TO ITS NATURAL FLOW CONDITIONS, THE FLOW MUST REMAIN ABOVE GROUND AND ABOVE THE RIP RAP (I.E. THE FLOW CANNOT BE "LOST" IN THE RIP RAP BENEATH THE STRUCTURE). IF THIS IS NOT ACHIEVED, THE CONTRACTOR WILL BE REQUIRED TO TAKE CORRECTIVE ACTION AT THE CONTRACTOR'S EXPENSE.

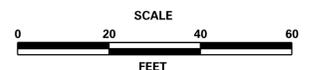
- D. CHOKO ALL RIP RAP ON THE STREAM BANK, OUTSIDE THE CHANNEL BED, WITH DELAWARE #57 STONE. PLACE JUST ENOUGH CHOKO MATERIAL TO PREVENT THE LOSS OF TOPSOIL THROUGH THE RIP RAP, AND THEN FINISH FILLING THE VOIDS WITH TOPSOIL SO THAT THE RIP RAP PEAKS ARE BARELY VISIBLE. PLACE AN ADDITIONAL 4-INCH TOPSOIL LAYER ON TOP OF THE RIP RAP. SLOPE SEEDING WILL BE DONE WITH ITEM 908019- STREAM BANK SEED MIX, SEEDING. FOLLOWING THE SEEDING OPERATION, INSTALL ITEM 908020- EROSION CONTROL BLANKET (ECB) MULCH, OR OTHER BLANKET AS SHOWN ON THE PLANS. ECB AT TOE OF SLOPE CAN BE EITHER TRENCHED IN OR STAPLED AT 6" ON CENTER. COMPLETE ALL WORK, STARTING WITH THE INITIAL CHOKING WITH TOPSOIL THROUGH THE SEEDING AND MULCHING PRIOR TO ANY RAIN EVENT. DELAWARE #57 STONE IS INCIDENTAL TO THE RIP RAP ITEM. ALL OTHER ITEMS WILL BE PAID FOR UNDER THEIR RESPECTIVE ITEM.
- E. THE TOPSOIL/SEED/MULCH CAN BE PLACED BEFORE OR AFTER THE REMOVAL OF THE STREAM DIVERSION. IF THE PLACEMENT OCCURS AFTER STREAM DIVERSION REMOVAL, USE A TURBIDITY CURTAIN TO MINIMIZE IN-STREAM SEDIMENTATION. PAYMENT WILL BE INCIDENTAL TO ITEM 909005- STREAM DIVERSION.

5. PROTECTION OF RESOURCES:

- A. KEEP CLEARING IN WETLAND AREAS TO A MINIMUM ABSOLUTELY NECESSARY FOR CONSTRUCTION ACCESS. SUPPORT ALL EQUIPMENT TRAVERSING WETLANDS AND SUBAQUEOUS LAND ON MATS. PAYMENT FOR MATS WILL BE MADE UNDER ITEM 621500- TEMPORARY TIMBER MAT. IN WETLAND AREAS THAT ARE CLEARED, NO GRUBBING EXCEPT WHERE NECESSARY TO CONSTRUCT PROJECT COMPONENTS SUCH AS FOUNDATIONS AND RIP RAP PROTECTION IS PERMITTED. CUT VEGETATION FLUSH WITH THE GROUND (I.E. NO DISTURBANCE OF THE ROOT MAT). RESTORE TEMPORARILY DISTURBED WETLAND AREAS TO GRADE AND SEED WITH ITEM 908017- TEMPORARY GRASS SEEDING (ANNUAL RYEGRASS).

- B. USE SILT FENCE OR CONSTRUCTION SAFETY FENCE ALONG THE LIMITS OF CONSTRUCTION IN ALL AREAS WHERE WATER AND WETLANDS ARE BEING IMPACTED (AS SHOWN ON ENVIRONMENTAL COMPLIANCE SHEETS), AND ALSO IN ANY AREA WHERE WATER/WETLANDS EXIST WITHIN 20 FEET OF THE LIMIT OF CONSTRUCTION (AS SHOWN ON CONSTRUCTION PLAN SHEETS). ANY CONTRACTOR ACCESS BEYOND THE LIMIT OF CONSTRUCTION IS STRICTLY PROHIBITED.
- C. USE SANDBAGS TO SECURE SILT FENCE AT AREAS ADJACENT TO WOODED UPLANDS/ ALL WETLANDS IN LIEU OF TRENCHING UNLESS PROPER EROSION & SEDIMENT CONTROL CANNOT BE MAINTAINED. SANDBAGS USED TO SECURE SILT FENCE IS 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. CLEARLY MARK ALL TREES TO BE REMOVED WITH PAINT PRIOR TO THE EROSION AND SEDIMENT CONTROL MEETING.

ADDENDA / REVISIONS



STRUCTURE MAINTENANCE, BR 1-400  
ON SHALLCROSS LAKE ROAD

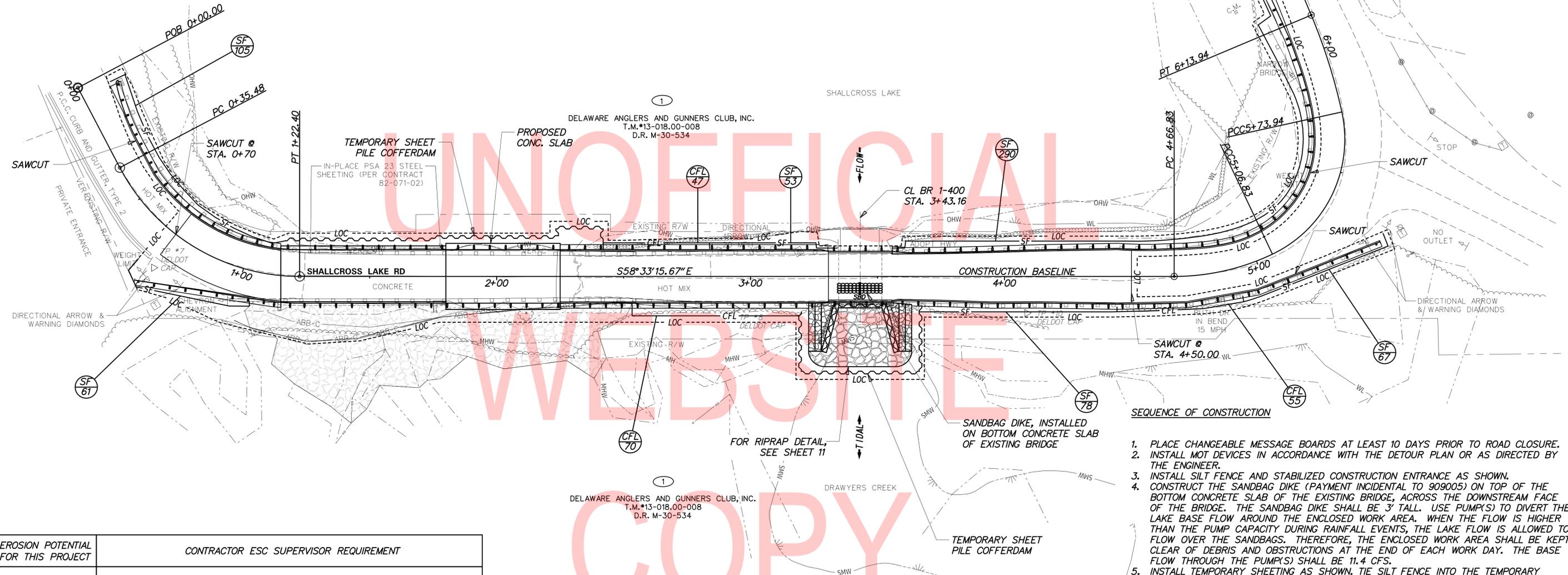
CONTRACT	BRIDGE NO.	1-400
T201707402	DESIGNED BY:	KMC /TJA
COUNTY	CHECKED BY:	AKM
NEW CASTLE		

SECTION	CEI
SHEET NO.	19
ENVIRONMENTAL COMPLIANCE	

1. 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 801000.

EROSION & SEDIMENT CONTROL	
	COMPOST FILTER LOG / LENGTH
	COMPOST FILTER LOG
	SANDBAG DIKE
	SILT FENCE / LENGTH
	SILT FENCE



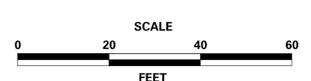
1. PLACE CHANGEABLE MESSAGE BOARDS AT LEAST 10 DAYS PRIOR TO ROAD CLOSURE.
2. INSTALL MOT DEVICES IN ACCORDANCE WITH THE DETOUR PLAN OR AS DIRECTED BY THE ENGINEER.
3. INSTALL SILT FENCE AND STABILIZED CONSTRUCTION ENTRANCE AS SHOWN.
4. CONSTRUCT THE SANDBAG DIKE (PAYMENT INCIDENTAL TO 909005) ON TOP OF THE BOTTOM CONCRETE SLAB OF THE EXISTING BRIDGE, ACROSS THE DOWNSTREAM FACE OF THE BRIDGE. THE SANDBAG DIKE SHALL BE 3' TALL. USE PUMP(S) TO DIVERT THE LAKE BASE FLOW AROUND THE ENCLOSED WORK AREA. WHEN THE FLOW IS HIGHER THAN THE PUMP CAPACITY DURING RAINFALL EVENTS, THE LAKE FLOW IS ALLOWED TO FLOW OVER THE SANDBAGS. THEREFORE, THE ENCLOSED WORK AREA SHALL BE KEPT CLEAR OF DEBRIS AND OBSTRUCTIONS AT THE END OF EACH WORK DAY. THE BASE FLOW THROUGH THE PUMP(S) SHALL BE 11.4 CFS.
5. INSTALL TEMPORARY SHEETING AS SHOWN. TIE SILT FENCE INTO THE TEMPORARY SHEETING.
6. INSTALL PERMANENT SHEET PILES AS SHOWN.
7. DRILL DOWEL HOLES FOR CONCRETE EXTENSION WALL DOWELS INTO THE EXISTING WINGWALL AND INSTALL DOWEL BARS AS SHOWN.
8. CONSTRUCT CONCRETE EXTENSION WALL AND SHEET PILE COPING AS SHOWN.
9. EXCAVATE BEHIND EXISTING TIMBER WINGWALLS AND REMOVE TIMBER WINGWALLS TO 2' BELOW EXISTING GRADE.
10. BACKFILL THE SHEET PILE WALL. DO NOT USE VIBRATORY COMPACTION EQUIPMENT.
11. INSTALL R-6 RIPRAP IN THE CHANNEL TO THE LIMITS SHOWN.
12. INSTALL STONE OUTLETS BEHIND THE WINGWALLS IN ACCORDANCE WITH DELDOT STANDARD CONSTRUCTION DETAIL E-21.
13. REMOVE SANDBAG DIKE AND TEMPORARY SHEETING.
14. REMOVE EXISTING CONCRETE ROADWAY OVER THE OVERFLOW SPILLWAY AND INSTALL NEW SLAB AS SHOWN.
15. CONSTRUCT FULL DEPTH PAVEMENT SECTIONS.
16. CONSTRUCT MILL AND OVERLAY PAVEMENT SECTIONS.
17. INSTALL GUARDRAIL.
18. PLACE TOPSOIL, SEED AND MULCH.
19. REMOVE TEMPORARY EROSION AND SEDIMENT CONTROL DEVICES AFTER VEGETATION HAS STABILIZED ALL DISTURBED AREAS IN ACCORDANCE WITH THESE PLANS AND AS DIRECTED BY THE ENGINEER.
20. REMOVE ALL MOT DEVICES AND REOPEN THE ROADWAY. REMOVAL OF MOT DEVICES MAY OCCUR PRIOR TO REMOVAL OF TEMPORARY EROSION AND SEDIMENT CONTROL DEVICES.

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.
( X ) MAJOR	CERTIFIED CONSTRUCTION REVIEWER (CCR), AS DEFINED IN SECTION 6.3 OF THE DELAWARE SEDIMENT AND STORMWATER REGULATIONS.

3. THE SEDIMENT AND STORMWATER MANAGEMENT PLANS HAVE BEEN APPROVED BY DELDOT'S STORMWATER ENGINEER UNDER DELDOT'S DELEGATED AUTHORITY. THE SEDIMENT AND STORMWATER MANAGEMENT PLANS ARE VALID FOR A FIVE YEAR PERIOD, BEGINNING ON THE DATE THE STORMWATER ENGINEER SIGNED THIS SHEET. IF THE FINAL ACCEPTANCE OF THE PROJECT IS ANTICIPATED TO EXTEND BEYOND THE FIVE YEARS, THE CONTRACTOR WILL INFORM THE ENGINEER THREE MONTHS PRIOR TO THE EXPIRATION OF THE APPROVED SEDIMENT AND STORMWATER MANAGEMENT PLANS. THE STORMWATER ENGINEER WILL REVIEW THE CURRENT SEDIMENT AND STORMWATER MANAGEMENT PLAN AND ISSUE AN EXTENSION WITH ANY APPROPRIATE MODIFICATIONS.
4. THE DISTURBED AREA FOR THIS PROJECT IS 0.24 ACRES.
5. THE ADDITIONAL IMPERVIOUS AREA FOR THIS PROJECT IS 0.00 SQUARE FEET.

*Vincent W. Davis* 09/27/2019  
 DELDOT STORMWATER ENGINEER DATE  
 "I CERTIFY TO THE BEST OF MY KNOWLEDGE AND BELIEF THAT THESE PLANS MEET THE REQUIREMENTS OF THE DELAWARE SEDIMENT AND STORMWATER REGULATIONS AND THAT ALL CLEARING, GRADING, AND CONSTRUCTION WILL BE ACCOMPLISHED PURSUANT TO THE PLAN."

ADDENDA / REVISIONS



STRUCTURE MAINTENANCE, BR 1-400 ON SHALLCROSS LAKE ROAD

CONTRACT	BRIDGE NO.	1-400
T201707402	DESIGNED BY:	SM
COUNTY	CHECKED BY:	DEF
NEW CASTLE		

CONSTRUCTION PHASING, M.O.T., AND EROSION CONTROL PLAN

SECTION	TY
SHEET NO.	20

9/24/2019 T:\Dover\Projects\425025\05\600\_CADD\05\_Official\Plans\CS01\_BR1-400.dgn

**PORTABLE CHANGEABLE MESSAGE SIGNS**

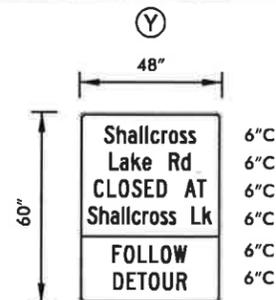
PRIOR TO DETOUR  
(10 DAYS PRIOR TO BEGINNING OF DETOUR)

PCMS-1

SHLCROSS  
LAKE RD  
TO CLOSE

STARTING  
XX/XX/XX

**SPECIAL SIGNS**



Black Legend;  
Retroreflective Fluorescent  
Orange Background

PREPARED BY  
T.Y. LIN INTERNATIONAL



7/2/2019  
DATE

SEAL

ADDENDA / REVISIONS

NOT TO SCALE

STRUCTURE MAINTENANCE, BR 1-400  
ON SHALLCROSS LAKE ROAD

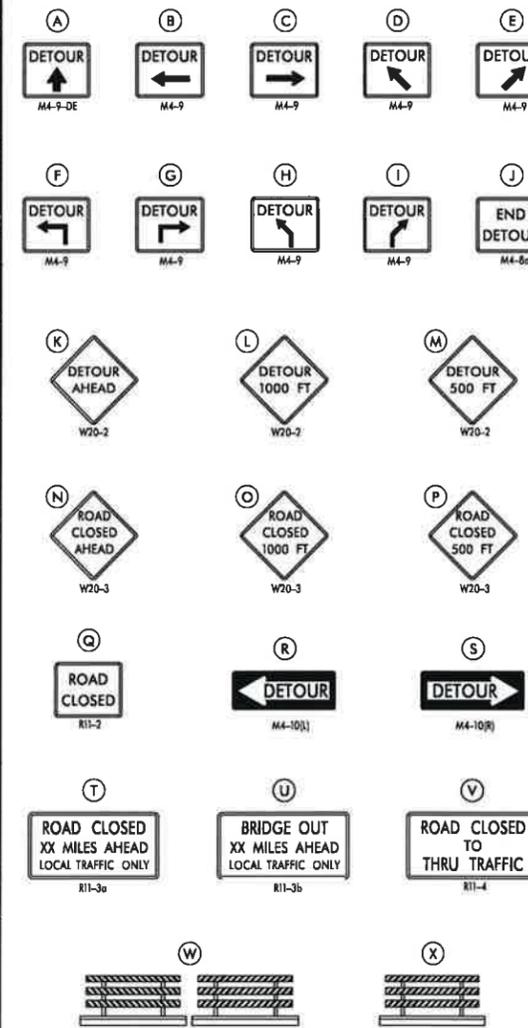
CONTRACT  
T201707402  
COUNTY  
NEW CASTLE

PERMIT NO.  
DESIGNED BY: SM  
CHECKED BY: DEF

VEHICULAR DETOUR PLAN  
SHALLCROSS LAKE RD  
AT SHALLCROSS LAKE

SECTION  
TY  
SHEET NO.  
21

**LEGEND**



**GENERAL NOTES**

- ALL TEMPORARY TRAFFIC CONTROL DEVICES ARE TO BE SUPPLIED AND MAINTAINED BY THE GENERAL CONTRACTOR AND SHALL BE IN COMPLIANCE WITH THIS PLAN AND THE DELAWARE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (DE MUTCD) LATEST EDITION.
- SIGNS "N" THROUGH "Q" AND "T" AND "V", THE WORD "ROAD" SHALL BE CHANGED TO "RAMP", "RR XING" OR "BRIDGE" WHERE APPLICABLE.
- "W" TYPE 3 BARRICADES AT A ROAD CLOSURE SHALL BE PLACED COMPLETELY ACROSS THE ROADWAY, FROM CURB TO CURB, OR FROM EDGE OF ROAD TO EDGE OF ROAD, WITH THE STRIPES POSITIONED DOWNWARD TOWARD THE CENTER OF THE ROADWAY.
- BARRICADES SHALL BE A MINIMUM OF 6 FEET WIDE UNLESS DIRECTED BY THE ENGINEER.

CONCURRENCE FOR IMPLEMENTATION

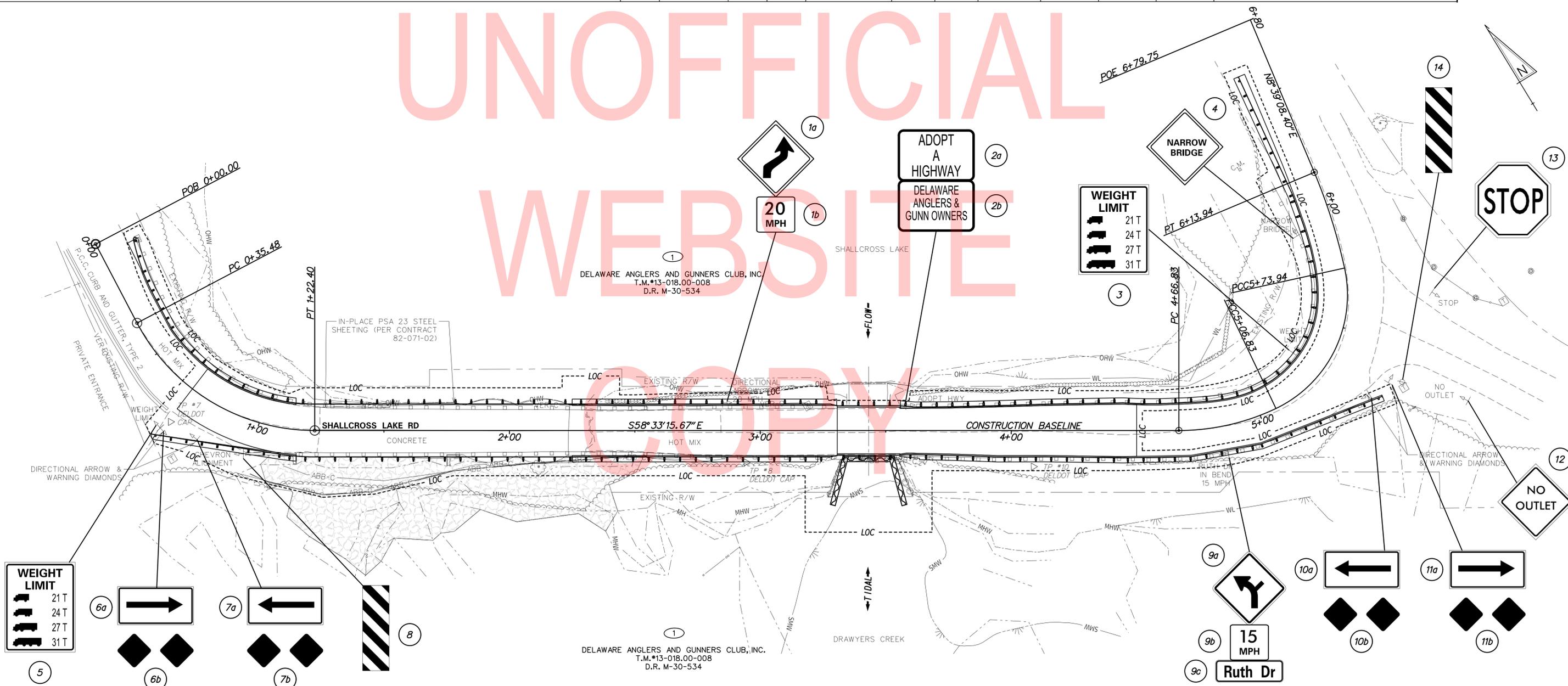
*[Signature]* 7-8-19  
TRAFFIC SAFETY DATE

LAST REVISED: 9/11/2018  
7/2/2019  
8:55:24 AM  
8FILES

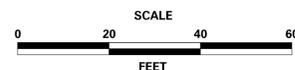
PERMANENT SIGN SCHEDULE

#	SHEET NO.	PLAN IDENTIFIER	SIGN DESIGNATION	QTY.	DESCRIPTION	SIGN WIDTH (IN)	SIGN HEIGHT (IN)	SIGN AREA (SF)	ITEM 819018 SINGLE POST (EACH)			ITEM 819019 INSTALLATION OR REMOVAL OF TRAFFIC SIGN(S) ON MULTIPLE SIGN POSTS (SF)			POST INSTALLATION TYPE	Code X11 12' Post (W/ Basepost)	ITEM 819016 4" HOLE, 0-6" (EACH)	ITEM 819017 4" HOLE, >6" (EACH)	REMARKS
									SIGN DISPOSITION	REMOVE	INSTALL	SIGN DISPOSITION	REMOVE	INSTALL					
742	21	1a	W1-4_R(30)	1	REVERSE CURVE (Right) - 30x30	30"	30"	6.25	REMAIN					SOIL					
1282	21	1b	W13-1P-20(18)	1	ADVISORY SPEED (20 MPH) 18x18	18"	18"	2.25	REMAIN					SOIL					
1872	21	2a	D14-3-DE	1	ADOPT A HIGHWAY	24"			REMAIN					SOIL					
	21	2b	D14-2-DE	1	ACKNOWLEDGEMENT	24"			REMAIN					SOIL					
628	21	3	R12-5-DE(30)	1	WEIGHT LIMIT (4 LINE SYMBOL) - 30xVaries	30"			REMAIN					SOIL					
950	21	4	W5-2(36)	1	NARROW BRIDGE - 36x36	36"	36"	9	REMAIN					SOIL					
628	21	5	R12-5-DE(30)	1	WEIGHT LIMIT (4 LINE SYMBOL) - 30xVaries	30"			REMAIN					SOIL					
774	21	6a	W1-6_R(48)	1	ONE DIRECTIONAL LARGE ARROW (Right) - 48x24	48"	24"	8	REMAIN					SOIL					
1964	21	6b	OM4-3	2	END OF ROAD OBJECT MARKER	18"	18"	2.25	REMAIN					SOIL					STRAIGHTEN SIGN POSTS UNDER ITEM 819506
770	21	7a	W1-6_L(48)	1	ONE DIRECTIONAL LARGE ARROW (Left) - 48x24	48"	24"	8	REMAIN					SOIL					
1964	21	7b	OM4-3	2	END OF ROAD OBJECT MARKER	18"	18"	2.25	REMAIN					SOIL					
1963	21	8	OM3-R	1	TYPE 3 OBJECT MARKER	12"	36"	3	REMAIN					SOIL					
783	21	9a	W1-10_R(36)	1	COMBINATION HORIZONTAL ALIGNMENT/INTERSECTION (Right) - 36x36	36"	36"	9	REMAIN					SOIL					
1279	21	9b	W13-1P-15(18)	1	ADVISORY SPEED (15 MPH) 18x18	18"	18"	2.25	REMAIN					SOIL					
	21	9c		1	ADVANCE STREET NAME	VARIABLES	9"		REMAIN					SOIL					
774	21	10a	W1-6_L(48)	1	ONE DIRECTIONAL LARGE ARROW (Left) - 48x24	48"	24"	8	REMAIN					SOIL					
1964	21	10b	OM4-3	2	END OF ROAD OBJECT MARKER	18"	18"	2.25	REMAIN					SOIL					
770	21	11a	W1-6_R(48)	1	ONE DIRECTIONAL LARGE ARROW (Right) - 48x24	48"	24"	8	REMAIN					SOIL					
1964	21	11b	OM4-3	2	END OF ROAD OBJECT MARKER	18"	18"	2.25	REMAIN					SOIL					
1320	21	12	W14-2(30)	1	NO OUTLET - 30x30	30"	30"	6.25	REMAIN					SOIL					
1	21	13	R1-1(18)	1	STOP	18"	18"	2.25	REMAIN					SOIL					
1956	21	14	OM2-2V	1	TYPE 2 OBJECT MARKER	6"	12"	0.5	REMAIN					SOIL					
PAGE TOTALS										0	0		0	0		0	0		

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ADDENDA / REVISIONS



STRUCTURE MAINTENANCE, BR 1-400  
ON SHALLCROSS LAKE ROAD

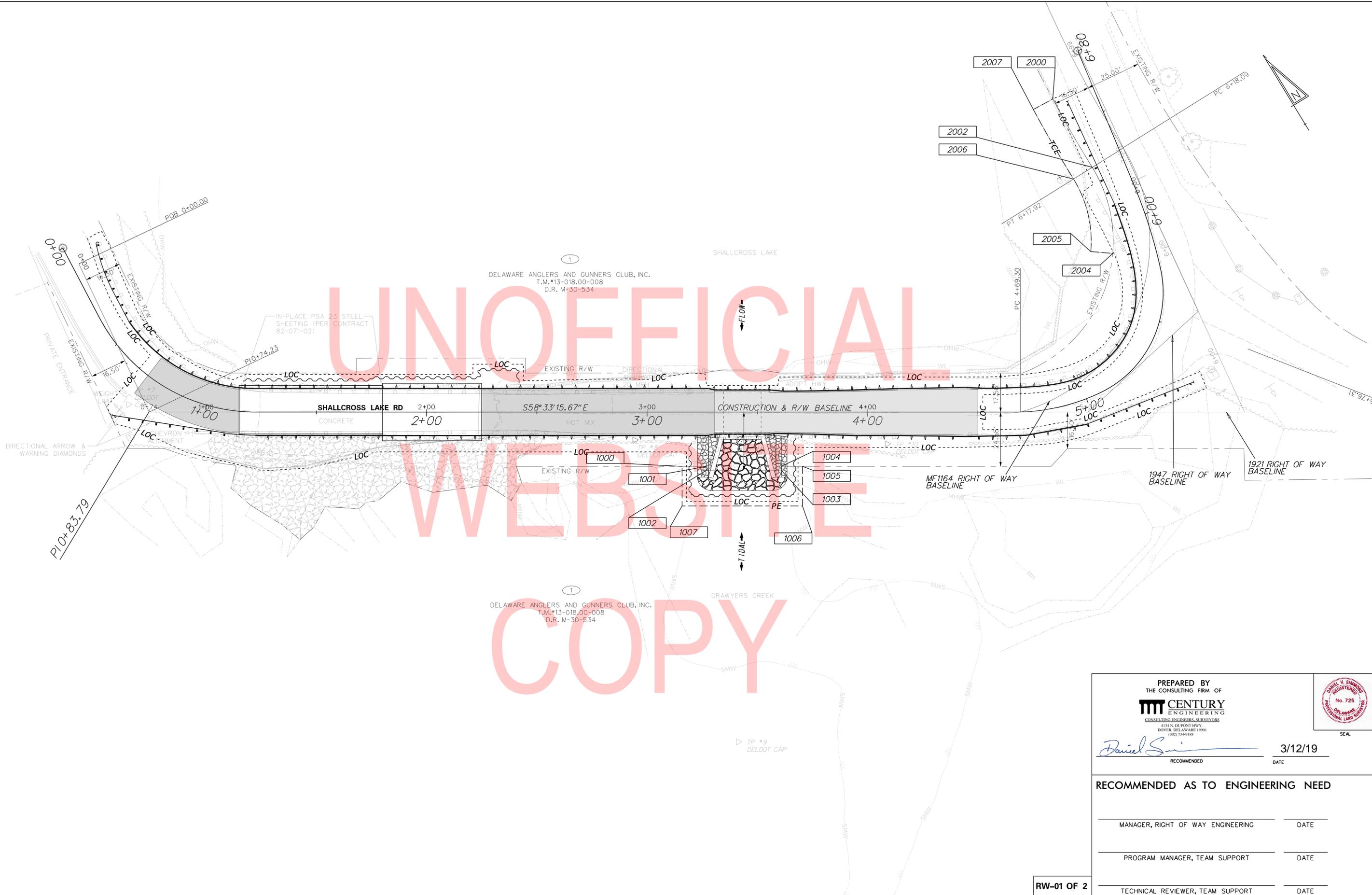
CONTRACT	T201707402	BRIDGE NO.	1-400
COUNTY	NEW CASTLE	DESIGNED BY:	SM
		CHECKED BY:	DEF

SIGNING AND STRIPING PLAN

SECTION	TY
SHEET NO.	22

9/24/2019 T:\Dover\Projects\425025\05\600\_CADD\05\_Official\Plans\SS01\_BR1-400.dgn

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WEBSITE  
COPY



1  
DELAWARE ANGLERS AND GUNNERS CLUB, INC.  
T.M.\*13-018.00-008  
D.R. M-30-534

1  
DELAWARE ANGLERS AND GUNNERS CLUB, INC.  
T.M.\*13-018.00-008  
D.R. M-30-534

PREPARED BY  
THE CONSULTING FIRM OF  
**CENTURY ENGINEERING**  
CONSULTING ENGINEERS SURVEYORS  
4134 N. DU PONT HWY.  
DOVER, DELAWARE 19901  
(302) 734-9188

*Daniel V. Sumner* 3/12/19  
RECOMMENDED DATE

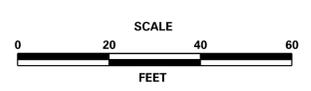
RECOMMENDED AS TO ENGINEERING NEED

MANAGER, RIGHT OF WAY ENGINEERING	DATE
PROGRAM MANAGER, TEAM SUPPORT	DATE
TECHNICAL REVIEWER, TEAM SUPPORT	DATE

RW-01 OF 2



ADDENDA / REVISIONS	



**STRUCTURE MAINTENANCE, BR 1-400  
ON SHALLCROSS LAKE ROAD**

CONTRACT T201707402	BRIDGE NO. <b>1-400</b>
COUNTY NEW CASTLE	DESIGNED BY: WC CHECKED BY: KC

<b>RIGHT OF WAY PLAN</b>
SECTION CE1 SHEET NO. 23

DATES \$ FILENAMES

COUNTY ASSESSMENT PARCEL NUMBER	PLAN SHEET NUMBER	OWNERSHIP OF RECORD	TITLE SOURCE	PROPERTY AREA BEFORE ACQUISITION (ACRE)  D=DEED C=CALCULATED A=ASSESSMENT	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)	EASEMENT					
							AREA OCCUPIED BY EXISTING RIGHT OF WAY (SQ. FEET /ACRES)	PERMANENT (SQ. FEET /ACRES)				TEMPORARY (SQ. FEET /ACRES)
13-018.00-008	-	(1) DELAWARE ANGLERS AND GUNNERS CLUB, INC.	M-30-534	D - 48.13	P/E TCE			916.9983 / 0.02		735.5041 / 0.02	2096542.80 / 48.13	

ASSESSMENT NUMBER	OWNERSHIP OF RECORD	TYPE OF ACQUISITION	TITLE SOURCE	PARCEL AREA (ACRES)							
13-018.00-008	(1) DELAWARE ANGLERS AND GUNNERS CLUB, INC.	P/E	M-30-534	48.130							
ALIGNMENT NUMBER & DESCRIPTION: 20 - MF1164											
PT. NO.	ALIGN. NO.	STATION	OFFSET *	NORTH	EAST	BEARING	DISTANCE	CHORD BEARING	CHORD LENGTH	ARC LENGTH	RADIUS **
1000	20	3+15.88	24.58	540314.5540	584276.2480	S 58°33'15.67" E	11.08				
1001	20	3+26.96	24.58	540308.7737	584285.7007	S 31°26'44.33" W	1.73				
1002	20	3+26.96	26.31	540307.2977	584284.7982	S 58°33'15.67" E	33.85				
1003	20	3+60.81	26.31	540289.6386	584313.6769	N 31°26'44.33" E	1.73				
1004	20	3+60.81	24.58	540291.1145	584314.5794	S 58°33'15.67" E	9.64				
1005	20	3+70.45	24.58	540286.0854	584322.8036	S 31°26'44.33" W	17.88				
1006	20	3+70.45	42.46	540270.8337	584313.4773	N 58°33'15.67" W	54.57				
1007	20	3+15.88	42.46	540299.3023	584266.9217	N 31°26'44.33" E	17.88				
1000	20	3+15.88	24.58	540314.5540	584276.2480						
FIGURE 100 AREA = 916.9983 SQ. FT. (0.0211 ACRES)											

ASSESSMENT NUMBER	OWNERSHIP OF RECORD	TYPE OF ACQUISITION	TITLE SOURCE	PARCEL AREA (ACRES)							
13-018.00-008	(1) DELAWARE ANGLERS AND GUNNERS CLUB, INC.	TCE	M-30-534	48.130							
ALIGNMENT NUMBER & DESCRIPTION: 20 - MF1164											
PT. NO.	ALIGN. NO.	STATION	OFFSET *	NORTH	EAST	BEARING	DISTANCE	CHORD BEARING	CHORD LENGTH	ARC LENGTH	RADIUS **
2000	20	6+52.63	-16.49	540368.6114	584506.3303			S 1°20'32.05" W	35.71	35.71	-571.50
2002	20	6+17.95	-16.50	540332.9144	584505.4939			S 18°01'52.44" W	40.05	40.74	63.62
2004	20	5+66.59	-16.58	540294.8349	584493.0981	N 53°37'23.27" W	10.00				
2005	20	5+66.60	-26.58	540300.7658	584485.0468			N 18°02'37.27" E	33.73	34.31	-53.62
2006	20	6+17.95	-26.50	540332.8363	584495.4941			N 1°20'32.05" E	36.33	36.34	581.50
2007	20	6+52.63	-26.49	540369.1578	584496.3452	S 86°52'05.28" E	10.00				
2000	20	6+52.63	-16.49	540368.6114	584506.3303						
FIGURE 200 AREA = 735.5041 SQ. FT. (0.0169 ACRES)											

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LEGEND	
FEE	AREA OF ACQUISITION
RW	AREA OCCUPIED BY EXISTING RW
PE	PERMANENT EASEMENT
TCE	TEMPORARY CONSTRUCTION EASEMENT
*	OFFSET IS LEFT OF BASELINE
**	CURVE TURNS TO THE LEFT

ACQUISITION CODES	
RW-02 OF 2	FEE - ACQUISITION R/W - AREA OCCUPIED BY EXISTING R/W
	P/E - PERMANENT EASEMENT TCE - TEMPORARY EASEMENT

ADDENDA / REVISIONS

NOT TO SCALE

**STRUCTURE MAINTENANCE, BR 1-400  
ON SHALLCROSS LAKE ROAD**

CONTRACT	BRIDGE NO.	<b>1-400</b>
T201707402	DESIGNED BY:	WC
COUNTY	CHECKED BY:	KC
NEW CASTLE		

RIGHT OF WAY DATA & TABULATION SHEET	
SECTION	CE1
SHEET NO.	24

\$DATE\$  
\$FILENAME\$