

**THE STATE OF DELAWARE**  
**DEPARTMENT OF TRANSPORTATION**  
 Specification and Construction Plans

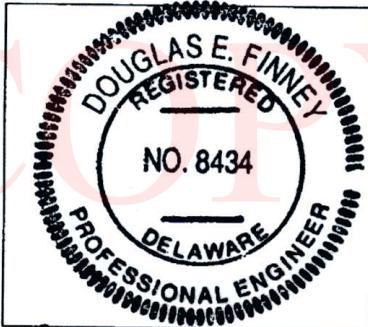
Contract No.: T201107804  
 F.A.P. No.: EBHN-K104(02)

P3E #: 10-97002

Title: Bridge 2-104A, 2-104B and 2-104C, Scour Countermeasures  
 County: Kent

INDEX OF SHEETS	
Sheet Number	Sheet Name
1	Title Sheet
2-3	General Notes
4-5	BR 2-104A Project Notes
6-7	BR 2-104A Plan and Elevation
8	BR 2-104A Construction Sequence
9-12	BR 2-104A Environmental Compliance Sheets
13-16	BR 2-104A Right-of-Way Sheet
17-18	BR 2-104B Project Notes
19-20	BR 2-104B Plan and Elevation
21	BR 2-104B Construction Sequence
22-25	BR 2-104B Environmental Compliance Sheets
26-28	BR 2-104B Right-of-Way Sheet
29-30	BR 2-104C Project Notes
31-32	BR 2-104C Plan and Elevation
33	BR 2-104C Construction Sequence
34-37	BR 2-104C Environmental Compliance Sheets
38-41	BR 2-104C Right-of-Way Sheet
42-44	Quantity Sheets
45	Location Maps

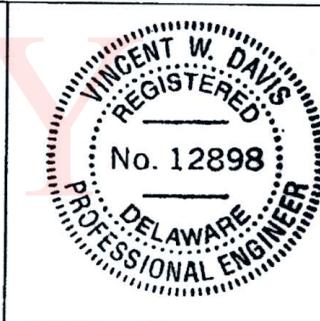
**Recommended:**



*Douglas E. Finney*  
 Bridge Management Engineer

Date: 5/4/11

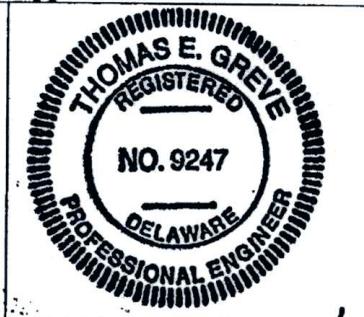
**Recommended:**



*Vincent W. Davis*  
 Stormwater Engineer

Date: 9 MAY 2011

**Approved:**



*Thomas E. Greve*  
 Central District Engineer

Date: 5/10/11

**GENERAL NOTES**

1. This project is to be constructed in accordance with 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. The contractor shall give two (2) weeks notice to the property owner when any fixture, shrub, or other object must be removed from the right of way or easement area. If the owner has not attempted to salvage this property, the contractor shall remove it without obligation. Compensation shall be incidental to the contract.
3. The ends of all curbs shall be depressed flush with the pavement at a ratio of twelve to one (12:1) unless otherwise directed by the Engineer.
4. The contractor shall provide and install PVC sleeves (4 inch inside diameter minimum, 6 inch inside diameter maximum) in proposed concrete sidewalks, islands and medians for future traffic sign posts as directed by the Engineer. The lower end of the sleeve shall sit on the top of the sub base material. The cost shall be incidental to the contract.
5. Site reviewer. An erosion control site reviewer shall be a person from the contractor’s staff assigned to Erosion and Sediment Control Implementation and Maintenance and shall be required on specific projects. The name and DNREC certification number of each site reviewer so required shall be submitted to the Department. The name of the Delaware registered professional engineer providing direction and supervision of the site reviewer, as required in Section 12.3 of the Delaware Sediment and Stormwater Regulations, shall also be submitted to the Department.

The site reviewer requirements in effect on this project shall be as marked with an (x) below:

Erosion potential for this project	Site reviewer requirement
( ) Insignificant	None
( ) Minor	Contractor certification course training only. See 1 below.
( X ) Medium	At the time of award of the contract, either the superintendent or a separate individual from the contractor’s staff shall be a certified construction reviewer (CCR). See 2 below.
( ) Major	Superintendent and individual from the contractor’s staff shall be CCR. See 3 below.

1. As defined in section 13 of the Delaware Sediment and Stormwater Regulations.
2. As defined in section 12 of the Delaware Sediment and Stormwater Regulations.
3. One individual from the contractor’s staff must be a CCR at the time of award of the contract. The superintendent must become a CCR within one year after the award of contract.

6. All dewatering operations must comply with Section 111 of the Supplemental Specifications to the Standard Specifications.
7. Staging areas - Proper erosion and sediment control measures as determined by the Engineer shall be installed in the staging areas.  
All areas used by the contractor for staging operations shall be fully restored by the contractor upon completion of the project.  
If the staging area is paved, it shall be restored to its original condition. If the staging area is unpaved, it shall be re-graded, top soiled, seeded and mulched in accordance with Delaware Standard Specifications 732 and 734, for topsoil, seed and mulch, to the satisfaction of the Engineer. The seed shall adhere to the specifications of Section 734 for Permanent Grass Seeding – Dry Ground. All costs associated with the restoration of the staging area shall be at the contractor’s expense. If the Engineer determines that a satisfactory stand of grass does not exist at the time of final inspection, all costs associated with re-establishing a satisfactory stand of grass shall be at the contractor’s expense.
8. Disturbed area: 1.63 acres
9. Electronic project files that will be made available to the contractor include: None.
10. Section 100 Project Note:

Unless otherwise noted on the plans, the Contractor shall, as part of his Project Schedule, submit to the Engineer an estimate of the monthly payments expected to be received on the contract. This will be referenced as the “Monthly Payment Chart”.

A chart in Microsoft Excel, Microsoft Word, or hand written format will be acceptable for this purpose. The chart should include, as a minimum, columns for the month, year, and estimated monthly payments. The total of all estimated monthly payments should equal the awarded contract total bid price.

The Engineer may request an updated “Monthly Payment Chart” at his discretion, depending on the accuracy of the initial estimates and according to the overall needs of the Department.

The “Monthly Payment Chart” will not be considered a binding document by either the Contractor or the Department and is considered solely informational.

On projects requiring CPM Schedules, the Contractor may, but is not required to, “Cost Load” the CPM Schedule in order to generate the monthly payment estimates.

Costs to prepare and/or update the “Monthly Payment Chart” are addressed as follows:

- a. On Contracts requiring CPM Schedules and Updates, preparation of the initial chart shall be incidental to Item 763508. Updates shall be incidental to Item 763509
- b. On contracts not requiring CPM Schedules, the cost to prepare and update the “Monthly Payment Chart” shall be included in Item 763000, Initial Expense

**Bridge 2-104A Project Notes:**

1. This project is located West of Dover, DE and involves Bridge 2-104A on Kenton Rd. (M.R.#104) over Cahoon Brook.
2. The purpose of this project is to place scour countermeasures along the structure, which is considered to be a scour critical bridge. This structure has been analyzed for the effects of scour in accordance with the procedures described in HEC 18 (FHWA Hydraulic Engineering Circular No. 18), Evaluating Scour at Bridges
3. The scour protection is designed in accordance with HEC 18 and HEC 23.
4. Hydraulic Data:

Drainage Area=	6.15 Sq. Miles
Design Storm=	Overtopping Event
Qovertopping=	1590 CFS
Voverlapping=	10.77 Ft/s
El. overtopping=	34.56 Ft
Q100=	1782 CFS
V100=	9.24 Ft/s
EL. 100=	35.10 Ft
5. Maintenance of Traffic:

Work shall be completed with daytime lane closures between the hours of 9am to 3 pm. Maintenance of traffic during shoulder closures and lane closures shall conform to cases 2 and 6 of the Delaware Manual on Uniform Traffic Control Devices, respectively. Lane closures shall only be used to construct construction entrance, etc. Payment shall be incidental to Item #763643.
6. Two message boards shall be placed two weeks prior to the start of construction so as to alert drivers to upcoming construction activity. The message shall include the date for beginning of construction and how long the construction will take place, as approved by the chief safety officer.
7. See environmental compliance sheet for further restrictions/guidance associated with this project.
8. Contractor shall excavate utility test holes in center of channel to locate the water and gas utilities. Elevations shall be taken and given to the engineer. The intent is to not disturb water and gas utilities during construction. Payment for excavation and backfill of test holes shall be as per the utility statement.

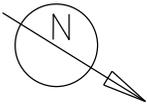
**Construction Sequence Notes:**

1. Place silt fence on the "LOC" of the site, as shown in the plans, except where it must connect to the sand bag dike.
2. Place stabilized construction entrances as shown on the plans.
3. Place stream diversion:
  - a. Place temporary sandbag dike upstream and downstream as shown in plans and according to Delaware standard details
  - b. The stream shall be pumped through the structure. The diversion shall flow into the 5' by 5' R-5 spill out area, as shown in the plans. Float intake of stream diversion.
  - c. Install sump pits, type 1 and portable sediment tanks as shown in the plans.
  - d. Dewater the work area into the portable sediment tank and discharge into the 5' by 5' spill-out R-5 area as shown in plans. Placement and removal of R-5 riprap is included in Item #265500.
  - e. All erosion and sediment control devices shall be removed when no longer needed.

- f. The dikes and pumping operation shall be paid under Item # 265500 – Stream Diversion.
  - g. All pumps used shall be “quiet” pumps.
- 
- 4. Excavate to appropriate elevations for Articulated Precast Concrete Block (APCB) mat placement and if any scour holes exist, fill with Del. #3 stone.
  - 5. Place stone bedding, APCB mat and streambed material as shown on the plans.
  - 6. Remove stream diversion.
  - 7. Remove stabilized construction entrances and replace with seeding and mulching. Seeding and mulching will consist of Permanent Seed – Dry Ground and Soil Retention Blanket Mulch, Type 3, which is incidental to Item #268000.

UNOFFICIAL  
WEBSITE  
COPY

DO NOT DISTURB TREES WITH 12" OR GREATER DIAMETER, DO NOT GRUB AND/OR GRADE AFTER TREE REMOVAL.



CL CAHOON BRANCH

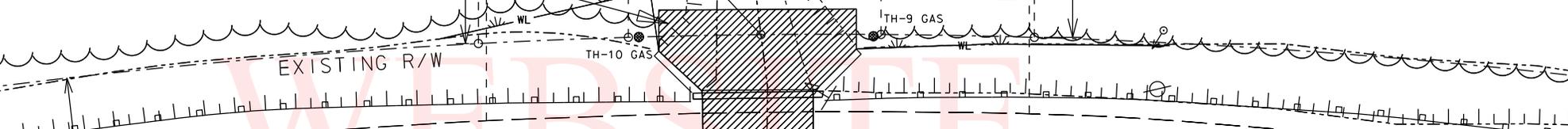
1-L

APCB MAT ON 6" DE #3 STONE (EXTEND 16' UP & DOWNSTREAM)

110'

LOC/SILT FENCE  
FOOT TRAFFIC ONLY

2-L



EXISTING R/W

CL KENTON RD.

0+00

0+50

1+00

1+50

2+00

2+50

3+00

EXISTING R/W

40.41'

35'

1-R

210'

2-R

BOTTOM OF BANK (TYP.)

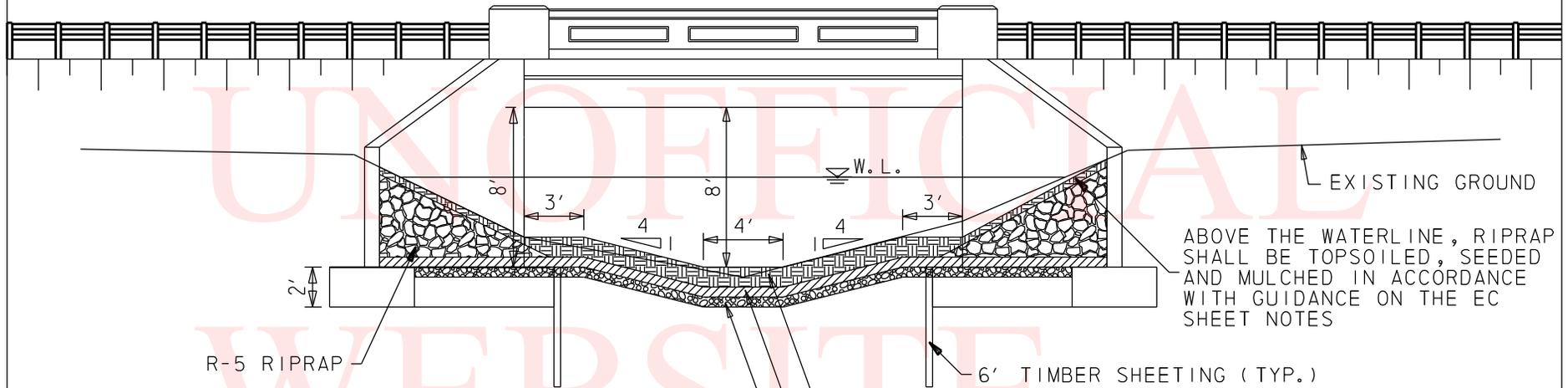
TOP OF BANK (TYP.)

PLAN

1" = 30'

T201107804	SHEET NO. 6
BR 2-104A, 2-104B & 2-104C SCOUR COUNTERMEASURES	

BR 2-104A ELEVATION



EXISTING GROUND

ABOVE THE WATERLINE, RIPRAP SHALL BE TOPSOILED, SEEDED AND MULCHED IN ACCORDANCE WITH GUIDANCE ON THE EC SHEET NOTES

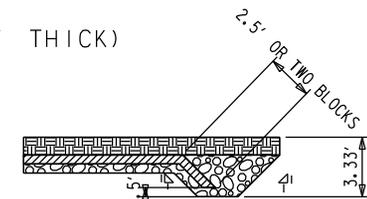
R-5 RIPRAP

6' TIMBER SHEETING (TYP.)

EXCAVATED STREAMBED MATERIAL (1.0' THICK)  
(MATCH EXISTING STREAMBED UPSTREAM & DOWNSTREAM)

APCB MAT (ASSUME 0.5' THICK)

DEL #3 STONE BEDDING (6" THICK)



DETAIL

UPSTREAM AND DOWNSTREAM END TREATMENTS

712517-APCB MAT INSTALLATION NOTES:

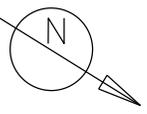
1. EXCAVATE TO THE DEPTHS SHOWN ON THIS SHEET. ALL EXCAVATED STREAM BED MATERIAL (CONSISTING OF NATURAL SEDIMENTS, GRAVEL, PEBBLES, AND SMALL STONES) SHALL BE STOCKPILED. THE STOCKPILE OF STREAM BED SEDIMENT SHALL BE KEPT SEPARATE FROM ANY OTHER EXCAVATED MATERIAL. "B" BORROW WILL BE USED TO FILL THE VOIDS IN THE APCB MAT, STREAM BED MATERIAL WILL BE PLACED IN A TWELVE INCH LIFT OVER THE PLACED APCB MAT. EXCAVATION ABOVE THE TOP OF THE APCB MAT SHALL BE PAID UNDER CHANNEL EXCAVATION ITEM # 203000. EXCAVATION BELOW THE TOP OF APCB MAT SHALL BE PAID UNDER APCB, ITEM # 712517. ANY RESHAPING OF THE STREAM BED OR FILLING OF HOLES FOR APCB SHALL BE INCIDENTAL TO ITEM # 712517.
2. THE THICKNESS OF THE APCB MAT SHALL BE DESIGNED IN ACCORDANCE WITH THE SPECIAL PROVISION, ITEM # 712517.
3. SEE EC SHEET NOTES FOR FURTHER GUIDANCE ASSOCIATED WITH STREAM RESTORATION.
4. ALL JOINTS BETWEEN APCB MAT UNITS AND BETWEEN APCB MATS AND SUBSTRUCTURE SHALL BE REINFORCED WITH CLASS A CONCRETE CLOSURE POUR. PRIOR TO CONCRETE POUR ALL CABLES SHALL BE HELD DOWN TO ENSURE THEY DO NOT PROTRUDE OVER THE CONCRETE. PAYMENT SHALL BE INCIDENTAL TO ITEM # 712517

WEST ELEVATION  
NTS

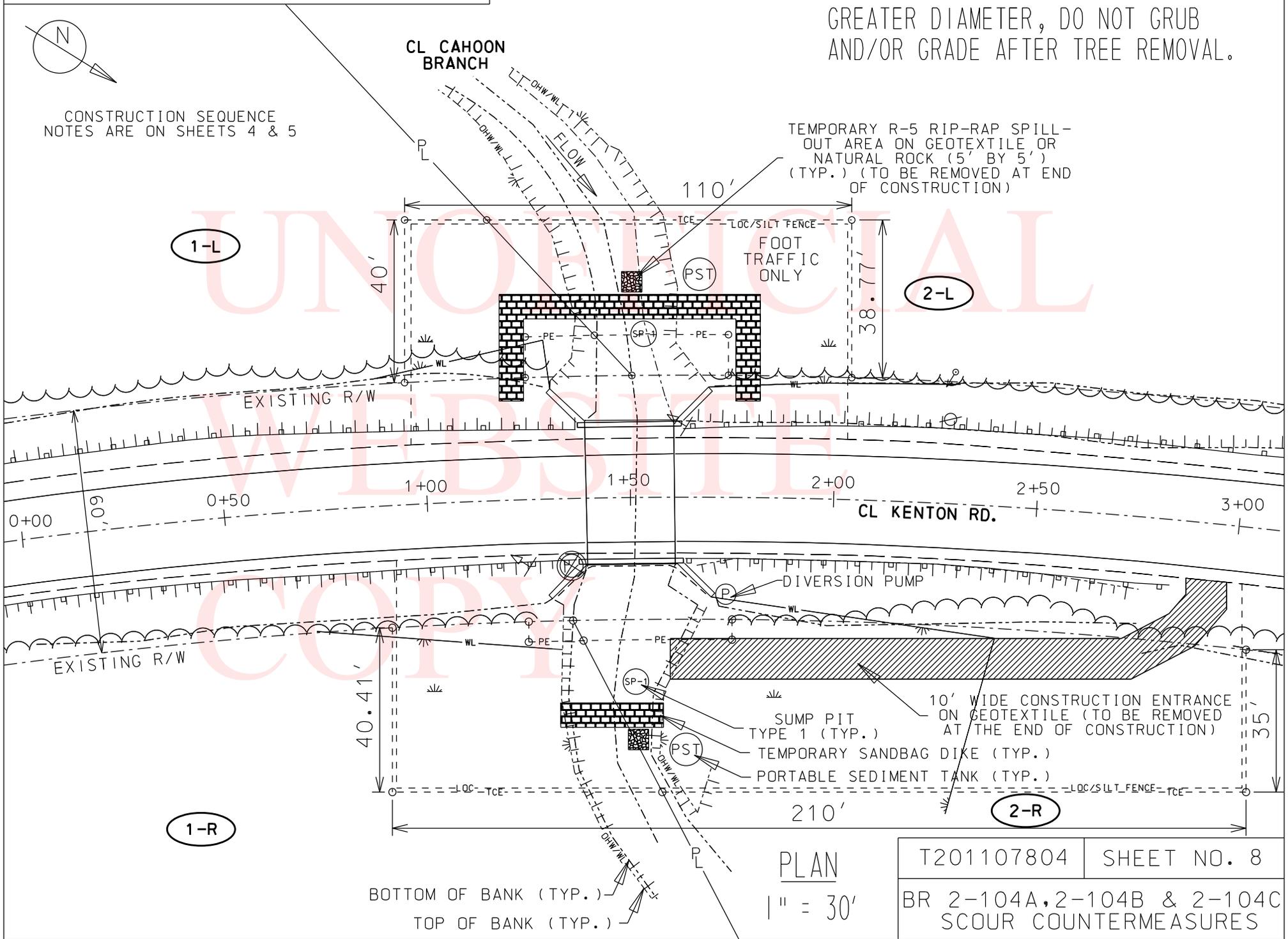
T201107804	SHEET NO. 7
BR 2-104A, 2-104B & 2-104C SCOUR COUNTERMEASURES	

BR 2-104A CONSTRUCTION SEQUENCE

DO NOT DISTURB TREES WITH 12" OR GREATER DIAMETER, DO NOT GRUB AND/OR GRADE AFTER TREE REMOVAL.



CONSTRUCTION SEQUENCE NOTES ARE ON SHEETS 4 & 5

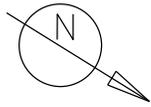


PLAN  
1" = 30'

BOTTOM OF BANK (TYP.)  
TOP OF BANK (TYP.)

T201107804	SHEET NO. 8
BR 2-104A, 2-104B & 2-104C SCOUR COUNTERMEASURES	

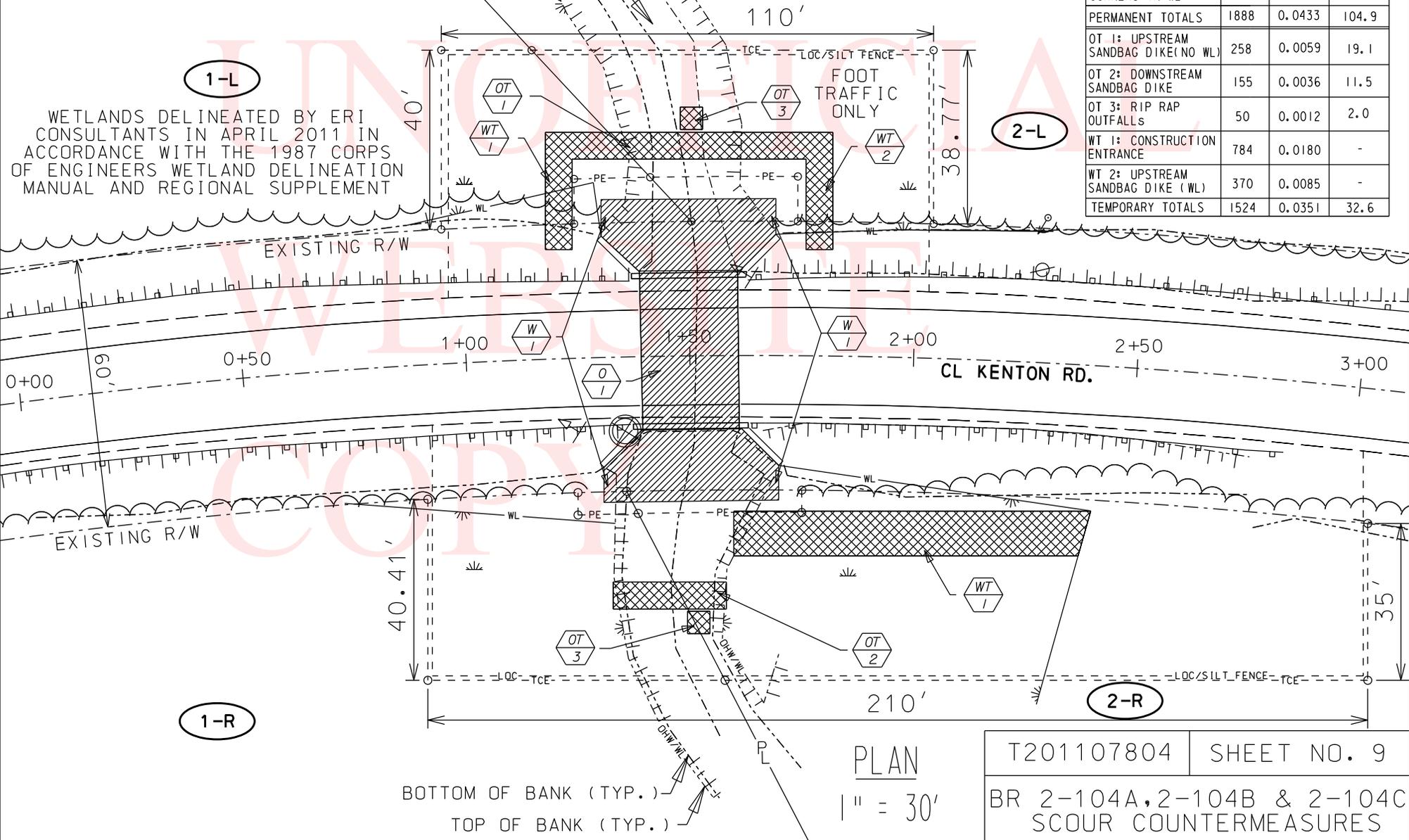
DO NOT DISTURB TREES WITH 12" OR GREATER DIAMETER, DO NOT GRUB AND/OR GRADE AFTER TREE REMOVAL.



SHEET PREPARED BY: MATT MORTENSEN  
DATE: 12/12/11

TABLE OF IMPACTS			
LOCATION	AREA (SF)	AREA (ACRES)	VOLUME (CY)
O-1: APCB MAT AND CHANNEL BED FILL	1812.7	0.0416	104.9
W-1: ALL APCB MAT CORNERS IN WL	75.3	0.0017	-
<b>PERMANENT TOTALS</b>	<b>1888</b>	<b>0.0433</b>	<b>104.9</b>
OT 1: UPSTREAM SANDBAG DIKE (NO WL)	258	0.0059	19.1
OT 2: DOWNSTREAM SANDBAG DIKE	155	0.0036	11.5
OT 3: RIP RAP OUTFALLS	50	0.0012	2.0
WT 1: CONSTRUCTION ENTRANCE	784	0.0180	-
WT 2: UPSTREAM SANDBAG DIKE (WL)	370	0.0085	-
<b>TEMPORARY TOTALS</b>	<b>1524</b>	<b>0.0351</b>	<b>32.6</b>

LEGEND	
	PERMANENT IMPACT AREA
	TEMPORARY IMPACT AREA



1-L

2-L

1-R

2-R

PLAN

1" = 30'

T201107804	SHEET NO. 9
BR 2-104A, 2-104B & 2-104C SCOUR COUNTERMEASURES	

WETLANDS DELINEATED BY ERI CONSULTANTS IN APRIL 2011 IN ACCORDANCE WITH THE 1987 CORPS OF ENGINEERS WETLAND DELINEATION MANUAL AND REGIONAL SUPPLEMENT

BOTTOM OF BANK (TYP.)  
TOP OF BANK (TYP.)

**Bridge 2-104A**

Contract T201107804; FAP: EBHN-K104(2)

**ENVIRONMENTAL COMPLIANCE NOTES**

**1. GENERAL NOTES:**

- A. THE PURPOSE OF THIS SHEET IS TO IDENTIFY THOSE ITEMS ASSOCIATED WITH ENVIRONMENTAL COMPLIANCE.
- B. IF A DEPARTURE FROM THE APPROVED PLANS (WHICH WOULD AFFECT ANY OF THE NATURAL AND/OR CULTURAL RESOURCE ISSUES) IS NECESSARY, THE ENVIRONMENTAL STUDIES SECTION SHALL BE CONTACTED AT (302) 760-2264 TO ALLOW THE DEPARTMENT TO COORDINATE WITH THE APPROPRIATE RESOURCE AGENCIES FOR 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 / APPROVAL REQUIREMENTS\*:  
CORPS OF ENGINEERS (COE) - NATIONWIDE PERMIT #3(A) AND (C) (NO PCN)  
DNREC WETLANDS & SUBAQUEOUS LANDS (WLSL) - PROJECT CONSISTENT WITH DEL.  
CODE CH. 72, SECTION 7217, (B) MAINTENANCE, AS AMENDED BY SB 186  
DNREC - WATER QUALITY CERTIFICATION (WQC) AND COASTAL ZONE CONSISTENCY  
(CZM) -- WAIVED (PROJECT NOT LOCATED IN CRITICAL RESOURCE WATER)  
\* -- THE PERMIT(S)/APPROVAL(S) LISTED ARE THOSE REQUIRED FOR THIS PROJECT.  
THE ENVIRONMENTAL STUDIES SECTION IS RESPONSIBLE FOR COORDINATING/  
OBTAINING THESE PERMITS/APPROVALS.

NOTE: THE ABSENCE OF ASTERISKS AFTER A PERMIT (COE, WLSL, WQC, CZM) INDICATES THAT COORDINATION HAS BEEN DONE WITH THAT AGENCY BUT NO WRITTEN AUTHORIZATION WAS REQUIRED. AS SUCH, NO PAPERWORK FROM THAT AGENCY SHOULD BE ANTICIPATED.

- B. CONSTRUCTION RESTRICTIONS:  
FISHERIES: NONE  
ENDANGERED SPECIES: NONE  
MIGRATORY BIRDS: NONE

- C. STREAM RESTORATION AND SLOPE RIPRAP TREATMENT:
  - i. 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 THE 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 STREAMBED 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 12" CHANNEL BED FILL. FINAL CHANNEL ELEVATIONS SHALL MATCH EXISTING ELEVATION AT THE UPSTREAM AND DOWNSTREAM PROJECT LIMITS. THROUGH THE STRUCTURE, ELEVATIONS SHALL BE NOTED ON THE PLANS. PAYMENT UNDER ITEM #712531 - CHANNEL BED FILL.

- ii. 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.
- iii. 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.
- iv. ALL RIPRAP ON THE STREAM BANK, OUTSIDE THE CHANNEL BED, SHALL BE CHOKED WITH DELAWARE #57 STONE, FILLED WITH TOPSOIL, AND SEEDED. PLACE JUST ENOUGH CHOKE MATERIAL TO PREVENT THE LOSS OF TOPSOIL THROUGH THE RIPRAP, AND THEN 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 # 734531 - STREAM BANK SEED MIX. FOLLOWING THE SEEDING OPERATION, ITEM #735533 - SOIL RETENTION BLANKET MULCH, TYPE 3, OR OTHER BLANKET AS SHOWN ON THE PLANS SHALL BE INSTALLED. ALL WORK, STARTING WITH THE INITIAL CHOKING WITH TOPSOIL THROUGH THE SEEDING AND MULCHING, SHALL BE COMPLETED PRIOR TO ANY RAIN EVENT. PAYMENT FOR RIPRAP AND DELAWARE #57 STONE SHALL BE PAID FOR UNDER THE RIPRAP ITEM. ALL OTHER ITEMS SHALL BE PAID FOR UNDER THEIR RESPECTIVE ITEMS.
- D. DUE TO VARIOUS RESOURCES (WATERS/WETLANDS/MCCLEMENTS DRAFT NATURE PRESERVE) ACCESS BEYOND THE LOC IS STRICTLY PROHIBITED. ANY CHANGES TO THE LOC MUST BE COORDINATED WITH THE DELDOT ENVIRONMENTAL STUDIES SECTION.
- E. 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 CUT FLUSH WITH THE GROUND (I.E. NO DISTURBANCE OF THE ROOT MAT).
- F. NATURALIZE PLANTING OF RED MAPLES (1½" TO 1¾" CAL., BB OR CONT.) ON 10' CENTER-SPACING (8' MIN. AND 12' MAX.) WITHIN DISTURBED AREAS (ALL WETLAND AREAS WITHIN LOC, EXCLUDING AREA WITHIN THE TOS AND RIPRAP PROTECTION. 13 RED MAPLE TREES (TOTAL) SHALL BE PLANTED IN DISTURBED WETLAND AREAS (PAYMENT UNDER ITEM #737523- PLANTING). TEMPORARY GRASS SEEDING - DRY GROUND, SHALL BE PLACED IN DISTURBED WETLAND AREAS (PAYMENT UNDER ITEM #734017- TEMPORARY GRASS SEEDING, DRY GROUND). THE CONTRACTOR SHALL BE REQUIRED TO WATER ALL MAJOR AND MINOR TREES, SHRUBS AND ALL HERBACEOUS BEDS BI-WEEKLY DURING THE PERIOD FROM JUNE 15 THROUGH OCTOBER 1. OVER THE COURSE OF THIS PERIOD, THERE ARE NINE DISTINCT WATERINGS. WATERING, ONCE INITIATED, SHALL CONTINUE WITHOUT INTERRUPTION UNTIL ALL PLANTS ON THE PROJECT HAVE BEEN WATERED. APPLY FIFTEEN (15) GALLONS OF WATER TO EACH PLANT EACH OF THE NINE WATERINGS. PAYMENT SHALL BE INCLUDED IN ITEM 737523 - PLANTING.

**3. CULTURAL RESOURCES ISSUES:**

THERE ARE NO ELIGIBLE OR POTENTIALLY ELIGIBLE STANDING STRUCTURES OVER FIFTY YEARS AND OLDER NOR ARE THERE ARCHAEOLOGICAL SITES PRESENT WITHIN THE PROJECT AREA. THE SHPO HAS AGREED THAT THE WORK IS CONSISTENT WITH A FINDING OF "NO HISTORIC PROPERTIES AFFECTED."

UNOFFICIAL  
WEBSITE  
COPY

DO NOT DISTURB TREES WITH 12" OR GREATER DIAMETER, DO NOT GRUBB AFTER TREE REMOVAL. NO GRADING OUTSIDE RESTORATION AREA

PARCEL #2-00-06600-02-2400-000  
 FOSE, LINDA K  
 DEED D-0685-0193  
 PROPERTY AREA = 4.69 ACRES  
 AREA OF TCE = 0.0294 ACRES  
 AREA OF PE = 0.0050 ACRES

PARCEL #2-00-06600-02-1900-000  
 ROBERT L EDGELL AND LYNN P EDGELL  
 DEED Y-0054-0235  
 PROPERTY AREA = 12.11 ACRES  
 AREA OF TCE = 0.0568 ACRES  
 AREA OF PE = 0.0065 ACRES

**RECOMMENDED**

*Anna Gravett/Shehna Chaudhry* 5/13/2011  
 TEAM SUPPORT SQUAD MANAGER DATE

*John Smith* 5/13/2011  
 TEAM SUPPORT ENGINEER DATE

*Robert Wiley* 5/13/2011  
 ASSISTANT DIRECTOR, DESIGN DATE

**"AS-ACQUIRED" PLANS**

I Certify that all proposed Right-of-Way has been acquired in the name of THE STATE OF DELAWARE and that these plans accurately depict the nature and extent of THE REAL ESTATE SECTION acquisition under this project.

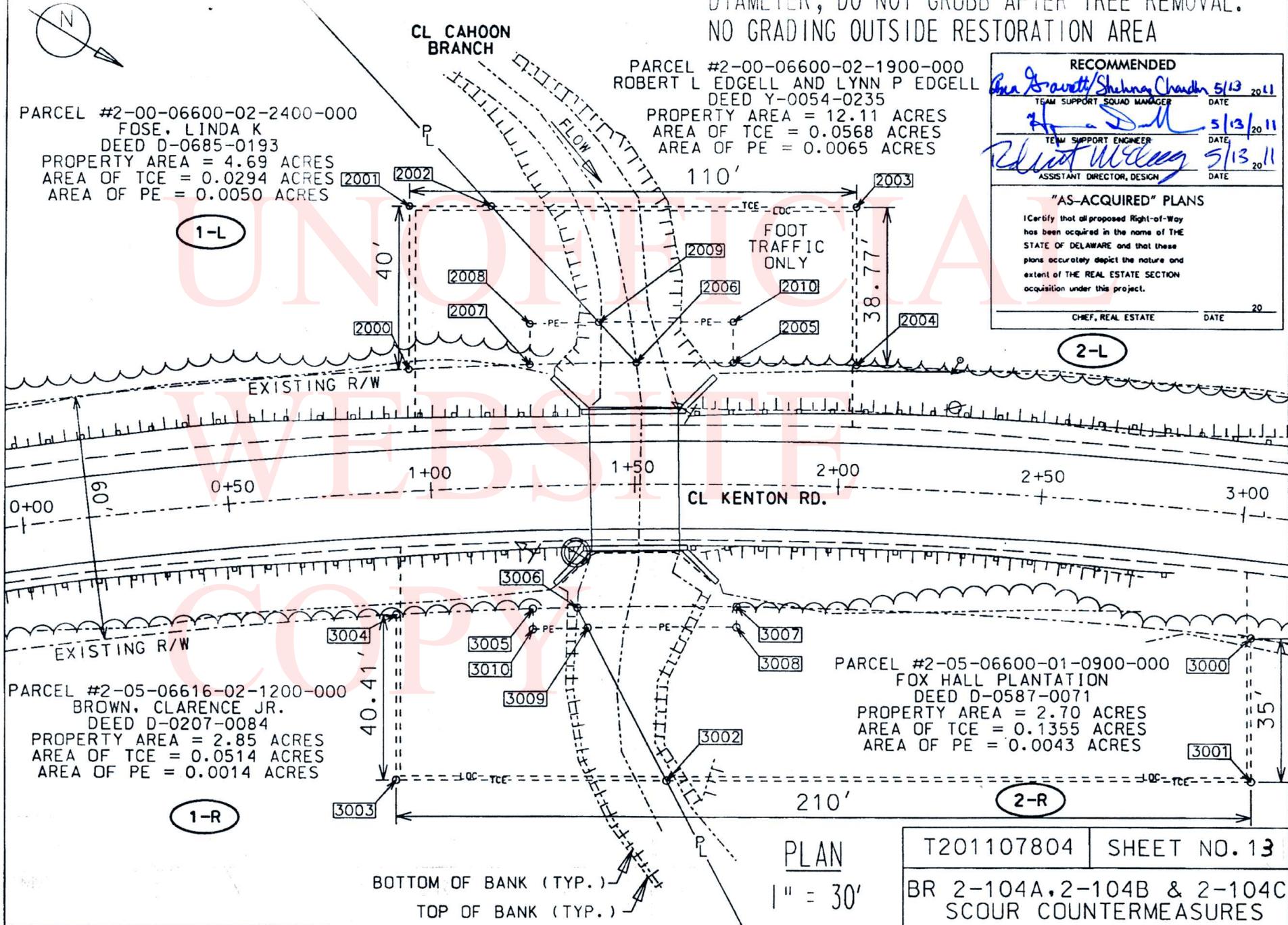
\_\_\_\_\_  
 CHEF, REAL ESTATE DATE

1-L

2-L

1-R

2-R



PLAN  
 1" = 30'

T201107804 | SHEET NO. 13  
 BR 2-104A, 2-104B & 2-104C  
 SCOUR COUNTERMEASURES

**Right of Way Data Sheet for BR. 2-104A**

Sheet 2 of 11

METES AND BOUNDS								
Assessment Number	Ownership of Record				Type of Acquisition		Parcel area (acres)	
20006600022400000	Fose, Linda K 104A-1-L D 685 193				TCE		4.69	
Alignment Number		Line Data			Curve Data			
PT. NO	Station	Offset	Bearing	Distance (ft)	Chord Bearing	Chord Length (ft)	Radius (ft)	Arc Length (ft)
2000	0+96	-30.00	S 58°10'42" W	40.00				
2001	0+98.01	-69.95	N 31°49'18" W	20.19				
2002	1+17.15	-69.06	N 15°07'49" E	38.80				
2009	1+41.82	-40.00			S 33°12'27" E	17.01	1328.43	17.010
2008	1+25.32	-40.00	N 58°10'42" E	10.00				
2007	1+25	-30.00			S 34°12'13" E	29.70	1318.43	29.701
2000	0+96	-30.00						
Area = 1279 sq. feet		0.0294 acres						

METES AND BOUNDS								
Assessment Number	Ownership of Record				Type of Acquisition		Parcel area (acres)	
20006600022400000	Fose, Linda K 104A-1-L D 685 193				PE		4.69	
Alignment Number		Line Data			Curve Data			
PT. NO	Station	Offset	Bearing	Distance (ft)	Chord Bearing	Chord Length (ft)	Radius (ft)	Arc Length (ft)
2007	1+25	-30.00	S 58°10'42" W	10.00				
2008	1+25.32	-40.00			N 33°12'27" W	17.01	1328.43	17.010
2009	1+41.82	-40.00	N 15°07'49" E	13.51				
2006	1+50.66	-30.00			S 32°59'54" E	26.23	1318.43	26.230
2007	1+25	-30.00						
Area = 217 sq. feet		0.0050 acres						

METES AND BOUNDS								
Assessment Number	Ownership of Record				Type of Acquisition		Parcel area (acres)	
20006600021900000	Edgell, Robert L & Lynn P 104A-2-L Y 54 235				TCE		12.11	
Alignment Number		Line Data			Curve Data			
PT. NO	Station	Offset	Bearing	Distance (ft)	Chord Bearing	Chord Length (ft)	Radius (ft)	Arc Length (ft)
2005	1+73.89	-30.00	S 58°10'42" W	10.00				
2010	1+73.82	-40.00			S 32°05'03" E	33.00	1328.43	33.001
2009	1+41.82	-40.00	S 15°07'49" W	38.80				
2002	1+17.15	-69.06	N 31°49'18" W	89.81				
2003	2+02.97	-68.80	N 58°10'42" E	38.77				
2004	2+04.11	-30.00			S 30°45'03" E	30.33	1318.43	30.331
2005	1+73.89	-30.00						
Area = 2476 sq. feet		0.0568 acres						

**Right of Way Data Sheet for BR. 2-104A**

**Sheet 3 of 11**

METES AND BOUNDS								
Assessment Number		Ownership of Record			Type of Acquisition		Parcel area (acres)	
20006600021900000		Edgell, Robert L & Lynn P 104A-2-L Y 54 235			PE		12.11	
Alignment Number		Line Data			Curve Data			
PT. NO	Station	Offset	Bearing	Distance (ft)	Chord Bearing	Chord Length (ft)	Radius (ft)	Arc Length (ft)
2006	1+50.66	-30.00	S 15°07'49" W	13.51				
2009	1+41.82	-40.00			N 32°05'03" W	33.00	1328.43	33.001
2010	1+73.82	-40.00	N 58°10'42" E	10.00				
2005	1+73.89	-30.00			S 31°52'47" E	23.78	1318.43	23.780
2006	1+50.66	-30.00						
Area = 282 sq. feet		0.0065 acres						

METES AND BOUNDS								
Assessment Number		Ownership of Record			Type of Acquisition		Parcel area (acres)	
20506616021200000		Brown, Clarence JR. 104A-1-R D 207 84			TCE		2.85	
Alignment Number		Line Data			Curve Data			
PT. NO	Station	Offset	Bearing	Distance (ft)	Chord Bearing	Chord Length (ft)	Radius (ft)	Arc Length (ft)
3005	1+24.06	30.00	N 58°10'42" E	5.00				
3010	1+23.90	35.00			N 33°15'35" W	13.47	1253.43	13.470
3009	1+37.74	35.00	N 30°41'46" E	41.98				
3002	1+57.46	72.49	S 31°49'18" E	66.39				
3003	0+87.20	70.34	S 58°10'42" W	40.41				
3004	0+89.67	30.00			N 34°22'20" W	33.59	1258.43	33.591
3005	1+24.06	30.00						
Area = 2241 sq. feet		0.0514 acres						

METES AND BOUNDS								
Assessment Number		Ownership of Record			Type of Acquisition		Parcel area (acres)	
20506616021200000		Brown, Clarence JR. 104A-1-R D 207 84			PE		2.85	
Alignment Number		Line Data			Curve Data			
PT. NO	Station	Offset	Bearing	Distance (ft)	Chord Bearing	Chord Length (ft)	Radius (ft)	Arc Length (ft)
3006	1+35.21	30.00	N 30°41'46" E	5.58				
3009	1+37.74	35.00			S 33°15'35" E	13.47	1253.43	13.470
3010	1+23.90	35.00	S 58°10'42" W	5.00				
3005	1+24.06	30.00			N 33°20'18" W	10.89	1258.43	10.890
3006	1+35.21	30.00						
Area = 61 sq. feet		0.0014 acres						

**Right of Way Data Sheet for BR. 2-104A**

Sheet 4 of 11

METES AND BOUNDS								
Assessment Number	Ownership of Record				Type of Acquisition		Parcel area (acres)	
20506600010900000	Fox Hall Plantation 104A-2-R D 587 71				TCE		2.70	
Alignment Number		Line Data			Curve Data			
PT. NO	Station	Offset	Bearing	Distance (ft)	Chord Bearing	Chord Length (ft)	Radius (ft)	Arc Length (ft)
3000	3+05	30.00	N 58°10'42" E	35.00				
3001	3+09.02	64.79	S 31°49'18" E	143.61				
3002	1+57.46	72.49	S 30°41'46" W	41.98				
3009	1+37.74	35.00			N 32°12'04" W	36.53	1253.43	36.531
3008	1+75.30	35.00	S 58°10'42" W	5.00				
3007	1+75.26	30.00			N 28°26'36" W	126.67	1258.43	126.724
3000	3+05	30.00						
Area = 5904 sq. feet		0.1355 acres						

METES AND BOUNDS								
Assessment Number	Ownership of Record				Type of Acquisition		Parcel area (acres)	
20506600010900000	Fox Hall Plantation 104A-2-R D 587 71				PE		2.70	
Alignment Number		Line Data			Curve Data			
PT. NO	Station	Offset	Bearing	Distance (ft)	Chord Bearing	Chord Length (ft)	Radius (ft)	Arc Length (ft)
3007	1+75.26	30.00	N 58°10'42" E	5.00				
3008	1+75.30	35.00			S 32°12'04" E	36.53	1253.43	36.531
3009	1+37.74	35.00	S 30°41'46" W	5.58				
3006	1+35.21	30.00			N 32°14'56" W	39.11	1258.43	39.112
3007	1+75.26	30.00						
Area = 188 sq. feet		0.0043 acres						

**Bridge 2-104B Project Notes:**

1. This project is located Northwest of Dover, DE and involves Bridge 2-104B on Kenton Rd. (M.R.#104) over Mudstone Branch.
2. The purpose of this project is to place scour countermeasures along the structure, which is considered to be a scour critical bridge. This structure has been analyzed for the effects of scour in accordance with the procedures described in HEC 18 (FHWA Hydraulic Engineering Circular No. 18), Evaluating Scour at Bridges
3. The scour protection is designed in accordance with HEC 18 and HEC 23.
4. Hydraulic Data:

Drainage Area=	8.62 Sq. Miles
Design Storm=	Overtopping Event
Qovertopping=	1370 CFS
Vovertopping=	12.13 Ft/s
El. overtopping=	36.51 Ft
Q100=	2295 CFS
V100=	5.49 Ft/s
EL. 100=	38.08 Ft
5. Maintenance of Traffic:

Work shall be completed with daytime lane closures between the hours of 9am to 3 pm. Maintenance of traffic during shoulder closures and lane closures shall conform to cases 2 and 6 of the Delaware Manual on Uniform Traffic Control Devices, respectively. Lane closures shall only be used to construct construction entrance, etc. Payment shall be incidental to Item #763643.
6. Two message boards shall be placed two weeks prior to the start of construction so as to alert drivers to upcoming construction activity. The message shall include the date for beginning of construction and how long the construction will take place, as approved by the chief safety officer.
7. See environmental compliance sheet for further restrictions/guidance associated with this project.
8. Contractor shall excavate a utility test hole in center of channel to locate the water utility. Elevation shall be taken and given to the engineer. The intent is to not disturb the water utility during construction. Payment for excavation and backfill of test hole shall be as per the utility statement.

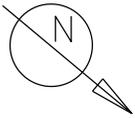
**Construction Sequence Notes:**

1. Place silt fence on the "LOC" of the site, as shown in the plans, except where it must connect to the sand bag dike. Only at the location shown on the plans, orange construction safety fence will be used instead of silt fence.
2. Place stabilized construction entrances as shown on the plans.
3. Place stream diversion:
  - a. Place temporary sandbag dike upstream and downstream as shown in plans and according to Delaware standard details
  - b. The stream shall be pumped through the structure. The diversion shall flow into the 5' by 5' R-5 spill out area, as shown in the plans. Float intake of stream diversion.
  - c. Install sump pits, type 1 and portable sediment tanks as shown in the plans.

- d. Dewater the work area into the portable sediment tank and discharge into the 5' by 5' spill-out R-5 area as shown in plans. Placement and removal of R-5 riprap is included in Item #265500.
  - e. All erosion and sediment control devices shall be removed when no longer needed.
  - f. The dikes and pumping operation shall be paid under Item # 265500 – Stream Diversion.
  - g. All pumps used shall be “quiet” pumps.
4. Excavate to appropriate elevations for Articulated Precast Concrete Block (APCB) mat placement and if any scour holes exist, fill with Del. #3 stone.
  5. Place stone bedding, APCB mat and streambed material as shown on the plans.
  6. Remove stream diversion.
  7. Remove stabilized construction entrances and replace with seeding and mulching. Seeding and mulching will consist of Permanent Seed – Dry Ground and Soil Retention Blanket Mulch, Type 3, which is incidental to Item #268000.
  8. Repair driveway at end of construction entrance from road to right of way line with 2” Hot Mix, Type C on 4” GABC Type B. Any required excavation is incidental to Item #401665.

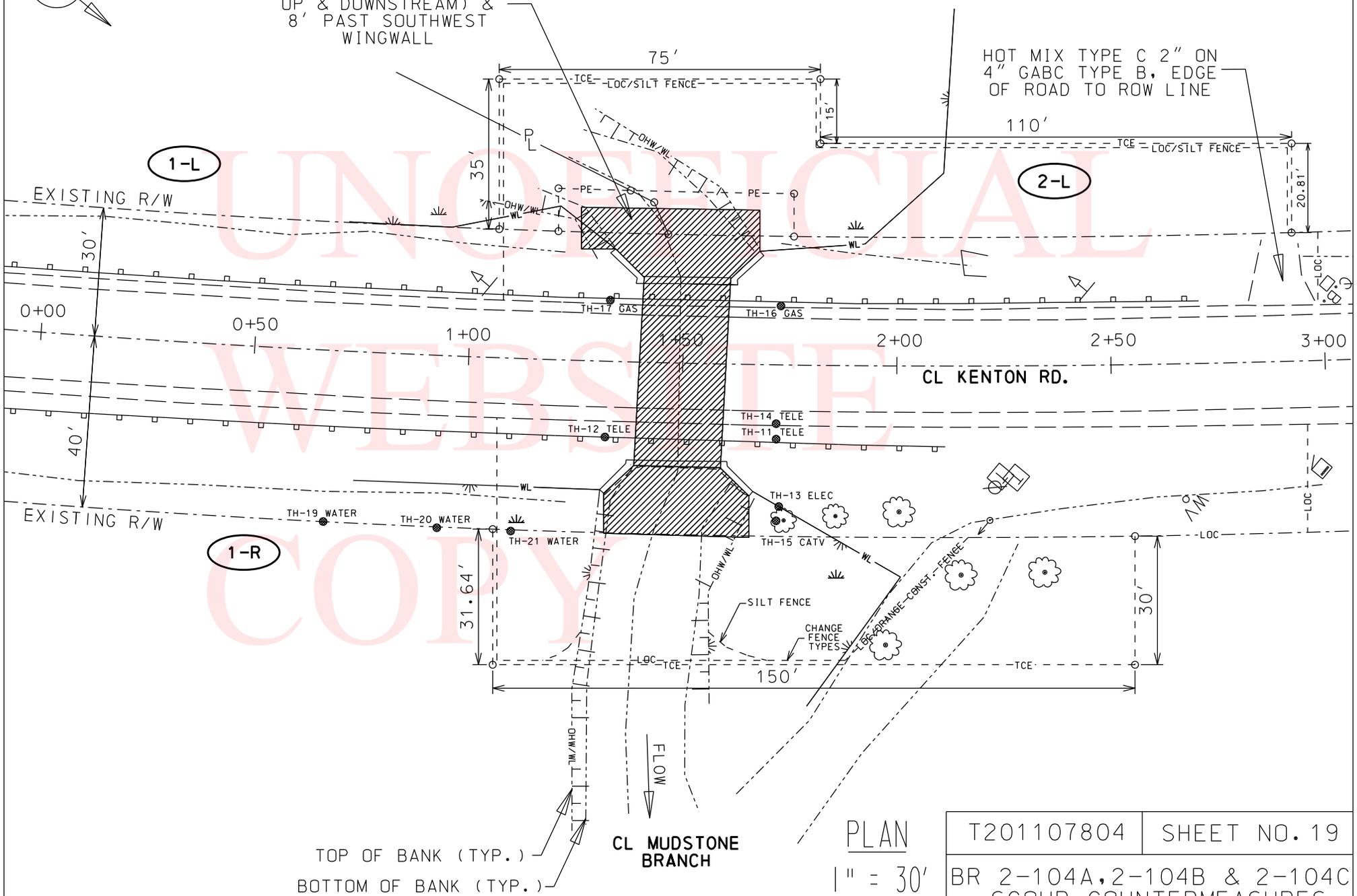
UNOFFICIAL  
WEBSITE  
COPY

DO NOT DISTURB TREES WITH 12" OR GREATER DIAMETER, DO NOT GRUB AND/OR GRADE AFTER TREE REMOVAL.



APCB MAT ON 6" DE #3 STONE (EXTEND 16' UP & DOWNSTREAM) & 8' PAST SOUTHWEST WINGWALL

HOT MIX TYPE C 2" ON 4" GABC TYPE B, EDGE OF ROAD TO ROW LINE



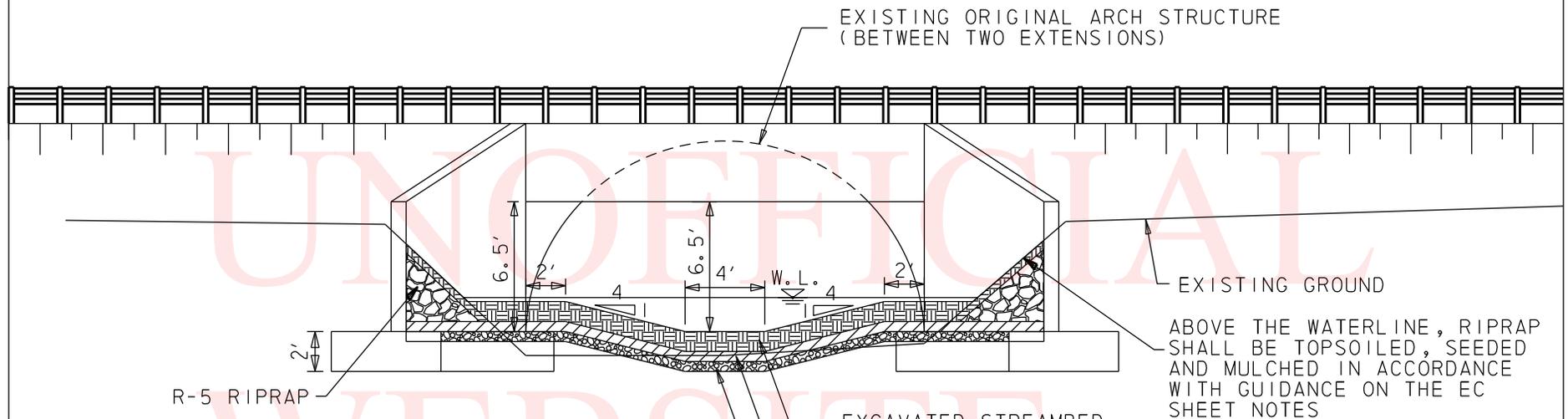
TOP OF BANK (TYP.)  
BOTTOM OF BANK (TYP.)

CL MUDSTONE BRANCH

PLAN  
1" = 30'

T201107804	SHEET NO. 19
BR 2-104A, 2-104B & 2-104C SCOUR COUNTERMEASURES	

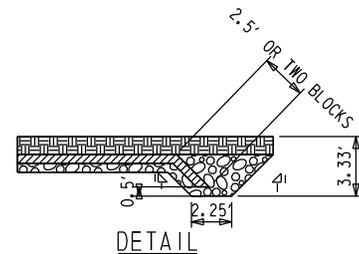
BR 2-104B ELEVATION



712517-APCB MAT INSTALLATION NOTES:

1. EXCAVATE TO THE DEPTHS SHOWN ON THIS SHEET. ALL EXCAVATED STREAM BED MATERIAL (CONSISTING OF NATURAL SEDIMENTS, GRAVEL, PEBBLES, AND SMALL STONES) SHALL BE STOCKPILED. THE STOCKPILE OF STREAM BED SEDIMENT SHALL BE KEPT SEPARATE FROM ANY OTHER EXCAVATED MATERIAL. "B" BORROW WILL BE USED TO FILL THE VOIDS IN THE APCB MAT, STREAM BED MATERIAL WILL BE PLACED IN A TWELVE INCH LIFT OVER THE PLACED APCB MAT. EXCAVATION ABOVE THE TOP OF THE APCB MAT SHALL BE PAID UNDER CHANNEL EXCAVATION ITEM # 203000. EXCAVATION BELOW THE TOP OF APCB MAT SHALL BE PAID UNDER APCB, ITEM # 712517. ANY RESHAPING OF THE STREAM BED OR FILLING OF HOLES FOR APCB SHALL BE INCIDENTAL TO ITEM # 712517.
2. THE THICKNESS OF THE APCB MAT SHALL BE DESIGNED IN ACCORDANCE WITH THE SPECIAL PROVISION, ITEM # 712517.
3. SEE EC SHEET NOTES FOR FURTHER GUIDANCE ASSOCIATED WITH STREAM RESTORATION.
4. ALL JOINTS BETWEEN APCB MAT UNITS AND BETWEEN APCB MATS AND SUBSTRUCTURE SHALL BE REINFORCED WITH CLASS A CONCRETE CLOSURE POUR. PRIOR TO CONCRETE POUR ALL CABLES SHALL BE HELD DOWN TO ENSURE THEY DO NOT PROTRUDE OVER THE CONCRETE. PAYMENT SHALL BE INCIDENTAL TO ITEM # 712517

WEST ELEVATION  
NTS



UPSTREAM AND DOWNSTREAM  
END TREATMENTS

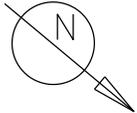
T201107804

SHEET NO.20

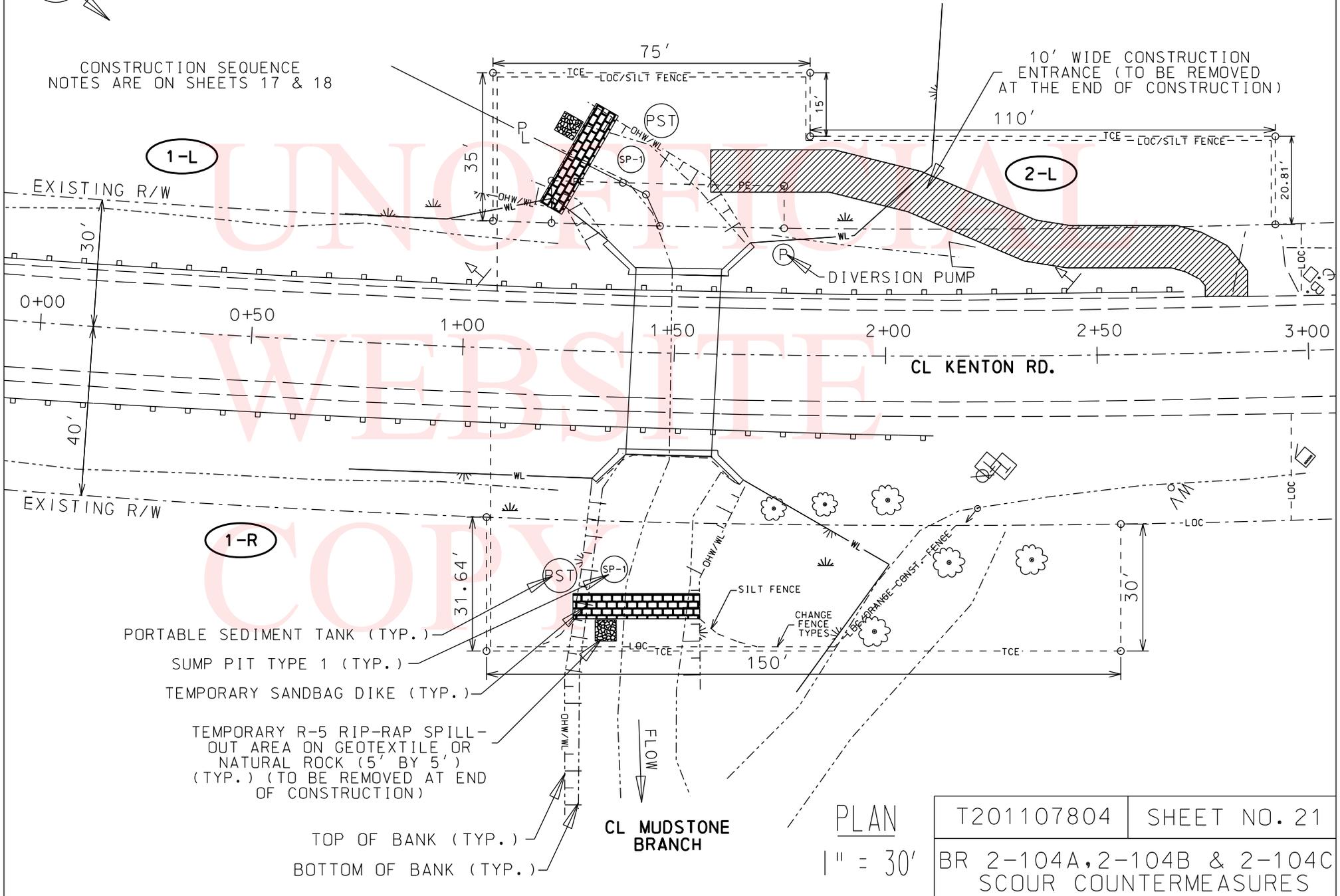
BR 2-104A, 2-104B & 2-104C  
SCOUR COUNTERMEASURES

BR 2-104B CONSTRUCTION SEQUENCE

DO NOT DISTURB TREES WITH 12" OR GREATER DIAMETER, DO NOT GRUB AND/OR GRADE AFTER TREE REMOVAL.



CONSTRUCTION SEQUENCE NOTES ARE ON SHEETS 17 & 18



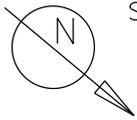
- 1-L
- 1-R
- PORTABLE SEDIMENT TANK (TYP.)
- SUMP PIT TYPE 1 (TYP.)
- TEMPORARY SANDBAG DIKE (TYP.)
- TEMPORARY R-5 RIP-RAP SPILL-OUT AREA ON GEOTEXTILE OR NATURAL ROCK (5' BY 5') (TYP.) (TO BE REMOVED AT END OF CONSTRUCTION)
- TOP OF BANK (TYP.)
- BOTTOM OF BANK (TYP.)

PLAN  
1" = 30'

T201107804	SHEET NO. 21
BR 2-104A, 2-104B & 2-104C SCOUR COUNTERMEASURES	

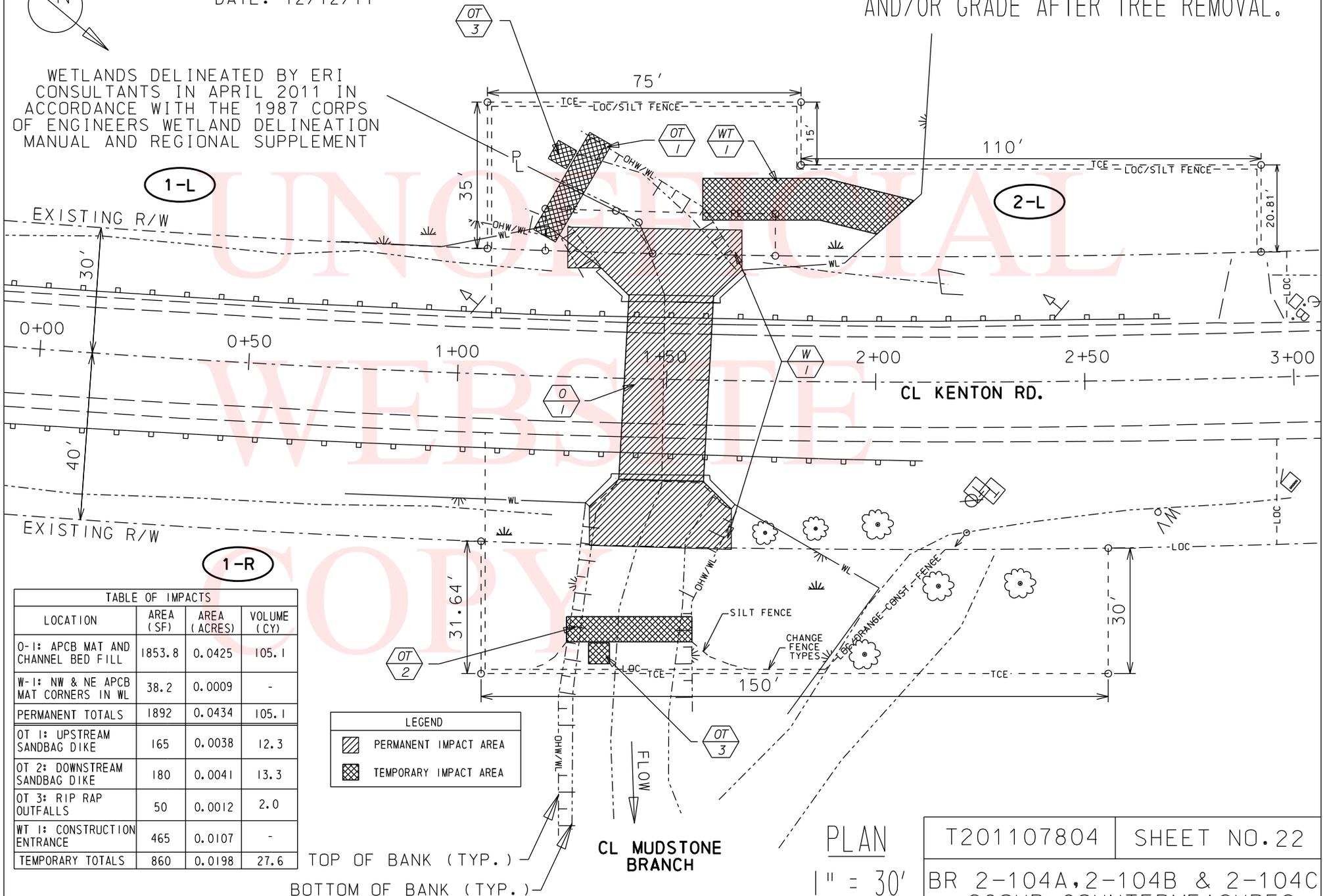
BR 2-104B ENVIRONMENTAL COMPLIANCE SHEET

DO NOT DISTURB TREES WITH 12" OR GREATER DIAMETER, DO NOT GRUB AND/OR GRADE AFTER TREE REMOVAL.



SHEET PREPARED BY: MATT MORTENSEN  
DATE: 12/12/11

WETLANDS DELINEATED BY ERI CONSULTANTS IN APRIL 2011 IN ACCORDANCE WITH THE 1987 CORPS OF ENGINEERS WETLAND DELINEATION MANUAL AND REGIONAL SUPPLEMENT



1-L

2-L

1-R

TABLE OF IMPACTS			
LOCATION	AREA (SF)	AREA (ACRES)	VOLUME (CY)
0-1: APCB MAT AND CHANNEL BED FILL	1853.8	0.0425	105.1
W-1: NW & NE APCB MAT CORNERS IN WL	38.2	0.0009	-
<b>PERMANENT TOTALS</b>	<b>1892</b>	<b>0.0434</b>	<b>105.1</b>
OT 1: UPSTREAM SANDBAG DIKE	165	0.0038	12.3
OT 2: DOWNSTREAM SANDBAG DIKE	180	0.0041	13.3
OT 3: RIP RAP OUTFALLS	50	0.0012	2.0
WT 1: CONSTRUCTION ENTRANCE	465	0.0107	-
<b>TEMPORARY TOTALS</b>	<b>860</b>	<b>0.0198</b>	<b>27.6</b>

LEGEND	
	PERMANENT IMPACT AREA
	TEMPORARY IMPACT AREA

TOP OF BANK (TYP.)  
BOTTOM OF BANK (TYP.)

PLAN  
1" = 30'

T201107804	SHEET NO. 22
BR 2-104A, 2-104B & 2-104C SCOUR COUNTERMEASURES	

**Bridge 2-104B**

Contract T201107804; FAP: EBHN-K104(2)

**ENVIRONMENTAL COMPLIANCE NOTES**

**1. GENERAL NOTES:**

- A. THE PURPOSE OF THIS SHEET IS TO IDENTIFY THOSE ITEMS ASSOCIATED WITH ENVIRONMENTAL COMPLIANCE.
- B. IF A DEPARTURE FROM THE APPROVED PLANS (WHICH WOULD AFFECT ANY OF THE NATURAL AND/OR CULTURAL RESOURCE ISSUES) IS NECESSARY, THE ENVIRONMENTAL STUDIES SECTION SHALL BE CONTACTED AT (302) 760-2264 TO ALLOW THE DEPARTMENT TO COORDINATE WITH THE APPROPRIATE RESOURCE AGENCIES FOR 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 / APPROVAL REQUIREMENTS\*:  
CORPS OF ENGINEERS (COE) - NATIONWIDE PERMIT #3(A) AND (C) (NO PCN)  
DNREC WETLANDS & SUBAQUEOUS LANDS (WLSL) - PROJECT CONSISTENT WITH DEL.  
CODE CH. 72, SECTION 7217, (B) MAINTENANCE, AS AMENDED BY SB 186  
DNREC - WATER QUALITY CERTIFICATION (WQC) AND COASTAL ZONE CONSISTENCY  
(CZM) -- WAIVED (PROJECT NOT LOCATED IN CRITICAL RESOURCE WATER)  
\* -- THE PERMIT(S)/APPROVAL(S) LISTED ARE THOSE REQUIRED FOR THIS PROJECT.  
THE ENVIRONMENTAL STUDIES SECTION IS RESPONSIBLE FOR COORDINATING/  
OBTAINING THESE PERMITS/APPROVALS.

NOTE: THE ABSENCE OF ASTERISKS AFTER A PERMIT (COE, WLSL, WQC, CZM) INDICATES THAT COORDINATION HAS BEEN DONE WITH THAT AGENCY BUT NO WRITTEN AUTHORIZATION WAS REQUIRED. AS SUCH, NO PAPERWORK FROM THAT AGENCY SHOULD BE ANTICIPATED.

- B. CONSTRUCTION RESTRICTIONS:  
FISHERIES: NONE  
ENDANGERED SPECIES: NONE  
MIGRATORY BIRDS: NONE
- C. STREAM RESTORATION AND SLOPE RIPRAP TREATMENT:
  - i. 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 THE 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 STREAMBED 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 12" CHANNEL BED FILL. FINAL CHANNEL ELEVATIONS SHALL MATCH EXISTING ELEVATION AT THE UPSTREAM AND DOWNSTREAM PROJECT LIMITS. THROUGH THE STRUCTURE, ELEVATIONS SHALL BE NOTED ON THE PLANS. PAYMENT UNDER ITEM #712531 - CHANNEL BED FILL.

ii. 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.

iii. 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.

iv. ALL RIPRAP ON THE STREAM BANK, OUTSIDE THE CHANNEL BED, SHALL BE CHOKED WITH DELAWARE #57 STONE, FILLED WITH TOPSOIL, AND SEEDED. PLACE JUST ENOUGH CHOKE MATERIAL TO PREVENT THE LOSS OF TOPSOIL THROUGH THE RIPRAP, AND THEN 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 # 734531 - STREAM BANK SEED MIX. FOLLOWING THE SEEDING OPERATION, ITEM #735533 - SOIL RETENTION BLANKET MULCH, TYPE 3, OR OTHER BLANKET AS SHOWN ON THE PLANS SHALL BE INSTALLED. ALL WORK, STARTING WITH THE INITIAL CHOKING WITH TOPSOIL THROUGH THE SEEDING AND MULCHING, SHALL BE COMPLETED PRIOR TO ANY RAIN EVENT. PAYMENT FOR RIPRAP AND DELAWARE #57 STONE SHALL BE PAID FOR UNDER THE RIPRAP ITEM. ALL OTHER ITEMS SHALL BE PAID FOR UNDER THEIR RESPECTIVE ITEMS.

D. DUE TO VARIOUS RESOURCES (WATERS/WETLANDS/MCCLEMENTS DRAFT NATURE PRESERVE/STATE NATURAL AREA) ACCESS BEYOND THE LOC IS STRICTLY PROHIBITED. ANY CHANGES TO THE LOC MUST BE COORDINATED WITH THE DELDOT ENVIRONMENTAL STUDIES SECTION.

- E. 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 CUT FLUSH WITH THE GROUND (I.E. NO DISTURBANCE OF THE ROOT MAT).
- F. NATURALIZE PLANTING OF RED MAPLES (1½" TO 1¾" CAL., BB OR CONT.) ON 10' CENTER-SPACING (8' MIN. AND 12' MAX.) WITHIN DISTURBED AREAS (ALL WETLAND AREAS WITHIN LOC, EXCLUDING AREA WITHIN THE TOS AND RIPRAP PROTECTION. 6 RED MAPLE TREES (TOTAL) SHALL BE PLANTED IN DISTURBED WETLAND AREAS (PAYMENT UNDER ITEM #737523- PLANTING). TEMPORARY GRASS SEEDING - DRY GROUND, SHALL BE PLACED IN DISTURBED WETLAND AREAS (PAYMENT UNDER ITEM #734017- TEMPORARY GRASS SEEDING, DRY GROUND). THE CONTRACTOR SHALL BE REQUIRED TO WATER ALL MAJOR AND MINOR TREES, SHRUBS AND ALL HERBACEOUS BEDS BI-WEEKLY DURING THE PERIOD FROM JUNE 15 THROUGH OCTOBER 1. OVER THE COURSE OF THIS PERIOD, THERE ARE NINE DISTINCT WATERINGS. WATERING, ONCE INITIATED, SHALL CONTINUE WITHOUT INTERRUPTION UNTIL ALL PLANTS ON THE PROJECT HAVE BEEN WATERED. APPLY FIFTEEN (15) GALLONS OF WATER TO EACH PLANT EACH OF THE NINE WATERINGS. PAYMENT SHALL BE INCLUDED IN ITEM 737523 - PLANTING.

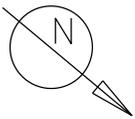
G. CONTACT EILEEN BUTLER, DNREC PARKS AT 302-739-9239 TO ARRANGE AN ON-SITE MEETING WITH THE DELDOT ENGINEER AND THE CONTRACTOR PRIOR TO CONSTRUCTION COMMENCEMENT

**3. CULTURAL RESOURCES ISSUES:**

THERE ARE NO ELIGIBLE OR POTENTIALLY ELIGIBLE STANDING STRUCTURES OVER FIFTY YEARS AND OLDER NOR ARE THERE ARCHAEOLOGICAL SITES PRESENT WITHIN THE PROJECT AREA. THE SHPO HAS AGREED THAT THE WORK IS CONSISTENT WITH A FINDING OF "NO HISTORIC PROPERTIES AFFECTED."

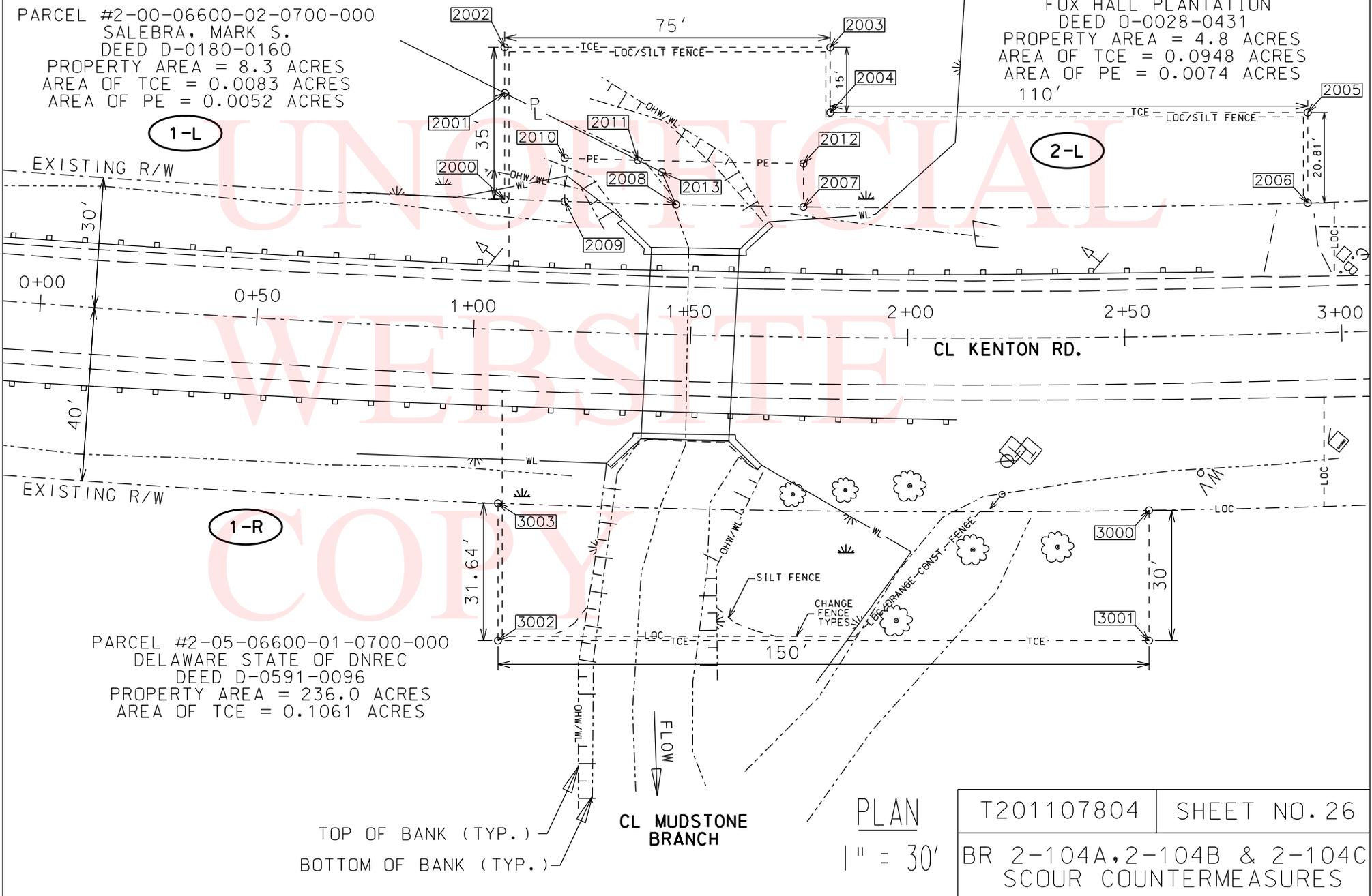
UNOFFICIAL  
WEBSITE  
COPY

DO NOT DISTURB TREES WITH 12" OR GREATER DIAMETER, DO NOT GRUB AND/OR GRADE AFTER TREE REMOVAL.



PARCEL #2-00-06600-02-0700-000  
 SALEBRA, MARK S.  
 DEED D-0180-0160  
 PROPERTY AREA = 8.3 ACRES  
 AREA OF TCE = 0.0083 ACRES  
 AREA OF PE = 0.0052 ACRES

PARCEL #2-00-06600-02-0600-000  
 FOX HALL PLANTATION  
 DEED 0-0028-0431  
 PROPERTY AREA = 4.8 ACRES  
 AREA OF TCE = 0.0948 ACRES  
 AREA OF PE = 0.0074 ACRES  
 110'



PARCEL #2-05-06600-01-0700-000  
 DELAWARE STATE OF DNREC  
 DEED D-0591-0096  
 PROPERTY AREA = 236.0 ACRES  
 AREA OF TCE = 0.1061 ACRES

PLAN  
 1" = 30'

T201107804	SHEET NO. 26
BR 2-104A, 2-104B & 2-104C SCOUR COUNTERMEASURES	

**Right of Way Data Sheet for BR. 2-104B**

Sheet 6 of 11

METES AND BOUNDS								
Assessment Number		Ownership of Record			Type of Acquisition		Parcel area (acres)	
20006600020700000		Salebra, Mark S. 104B-1-L D 180 160			TCE		8.30	
Alignment Number		Line Data			Curve Data			
PT. NO	Station	Offset	Bearing	Distance (ft)	Chord Bearing	Chord Length (ft)	Radius (ft)	Arc Length (ft)
2000	1+06	-30.00	S 50°10'31" W	24.48				
2001	1+05.07	-54.47	N 13°06'00" W	34.38				
2011	1+36.78	-40.00			S 38°06'41" E	16.88	2794.79	16.880
2010	1+19.67	-40.00	N 50°10'31" E	10.01				
2009	1+20	-30.00			S 37°48'44" E	13.84	2804.79	13.840
2000	1+06	-30.00						
Area = 361 sq. feet		0.0083 acres						

METES AND BOUNDS								
Assessment Number		Ownership of Record			Type of Acquisition		Parcel area (acres)	
20006600020700000		Salebra, Mark S. 104B-1-L D 180 160			PE		8.30	
Alignment Number		Line Data			Curve Data			
PT. NO	Station	Offset	Bearing	Distance (ft)	Chord Bearing	Chord Length (ft)	Radius (ft)	Arc Length (ft)
2009	1+20	-30.00	S 50°10'31" W	10.01				
2010	1+19.67	-40.00			N 38°06'41" W	16.88	2794.79	16.880
2011	1+36.78	-40.00	N 13°06'00" W	6.15				
2013	1+42.42	-37.37	N 26°24'55" E	8.15				
2008	1+45.92	-30.00			S 38°13'04" E	25.66	2804.79	25.660
2009	1+20	-30.00						
Area = 228 sq. feet		0.0052 acres						

METES AND BOUNDS								
Assessment Number		Ownership of Record			Type of Acquisition		Parcel area (acres)	
20006600020600000		Fox Hall Plantation 104B-2-L O 28 431			TCE		4.80	
Alignment Number		Line Data			Curve Data			
PT. NO	Station	Offset	Bearing	Distance (ft)	Chord Bearing	Chord Length (ft)	Radius (ft)	Arc Length (ft)
2007	1+75.60	-30.00	S 50°10'31" W	10.00				
2012	1+75.47	-40.00			S 38°41'25" E	38.13	2794.79	38.130
2011	1+36.78	-40.00	S 13°06'00" E	34.38				
2001	1+05.07	-54.47	S 50°10'31" W	10.52				
2002	1+04.66	-64.98	N 39°49'29" W	75.00				
2003	1+81.42	-66.80	N 50°10'31" E	15.00				
2004	1+81.59	-51.80	N 39°49'29" W	110.00				
2005	2+93.62	-50.81	N 50°10'31" E	20.81				
2006	2+93.01	-30.00			S 40°16'53" E	116.17	2804.79	116.178
2007	1+75.60	-30.00						
Area = 4129 sq. feet		0.0948 acres						

**Right of Way Data Sheet for BR. 2-104B**

Sheet 7 of 11

METES AND BOUNDS								
Assessment Number		Ownership of Record			Type of Acquisition		Parcel area (acres)	
20006600020600000		Fox Hall Plantation 104B-2-L O 28 431			PE		4.80	
Alignment Number		Line Data			Curve Data			
PT. NO	Station	Offset	Bearing	Distance (ft)	Chord Bearing	Chord Length (ft)	Radius (ft)	Arc Length (ft)
2008	1+45.92	-30.00	S 26°24'55" W	8.15				
2013	1+42.42	-37.37	S 13°06'00" E	6.15				
2011	1+36.78	-40.00			N 38°41'25" W	38.13	2794.79	38.130
2012	1+75.47	-40.00	N 50°10'31" E	10.00				
2007	1+75.60	-30.00			S 38°47'24" E	29.35	2804.79	29.350
2008	1+45.92	-30.00						
Area = 322 sq. feet		0.0074 acres						

METES AND BOUNDS								
Assessment Number		Ownership of Record			Type of Acquisition		Parcel area (acres)	
20506600010700000		Delaware State of DNREC D 591 96			TCE		236.00	
Alignment Number		Line Data			Curve Data			
PT. NO	Station	Offset	Bearing	Distance (ft)	Chord Bearing	Chord Length (ft)	Radius (ft)	Arc Length (ft)
3000	2+55	30.00	N 50°10'31" E	30.00				
3001	2+54.56	70.00	S 39°49'29" E	150.00				
3002	1+08.20	71.62	S 50°10'31" W	31.64				
3003	1+07.06	40.00			N 39°11'54" W	150.01	2874.79	150.027
3000	2+55	40.00						
Area = 4623 sq. feet		0.1061 acres						

**Bridge 2-104C Project Notes:**

1. This project is located South of Cheswold, DE and involves Bridge 2-104C on Kenton Rd./SR 15 (M.R.#104) over Fork Branch.
2. The purpose of this project is to place scour countermeasures along the structure, which is considered to be a scour critical bridge. This structure has been analyzed for the effects of scour in accordance with the procedures described in HEC 18 (FHWA Hydraulic Engineering Circular No. 18), Evaluating Scour at Bridges
3. The scour protection is designed in accordance with HEC 18 and HEC 23.
4. Hydraulic Data:

Drainage Area=	5.72 Sq. Miles
Design Storm=	Overtopping Event
Qovertopping=	1045 CFS
Vovertopping=	7.49Ft/s
El. overtopping=	38.22 Ft
Q100=	1620 CFS
V100=	5.64 Ft/s
EL. 100=	39.94 Ft
5. Maintenance of Traffic:

Work shall be completed with daytime lane closures between the hours of 9am to 3 pm. Maintenance of traffic during shoulder closures and lane closures shall conform to cases 2 and 6 of the Delaware Manual on Uniform Traffic Control Devices, respectively. Lane closures shall only be used to construct construction entrance, etc. Payment shall be incidental to Item #763643.
6. Two message boards shall be placed two weeks prior to the start of construction so as to alert drivers to upcoming construction activity. The message shall include the date for beginning of construction and how long the construction will take place, as approved by the chief safety officer.
7. See environmental compliance sheet for further restrictions/guidance associated with this project.

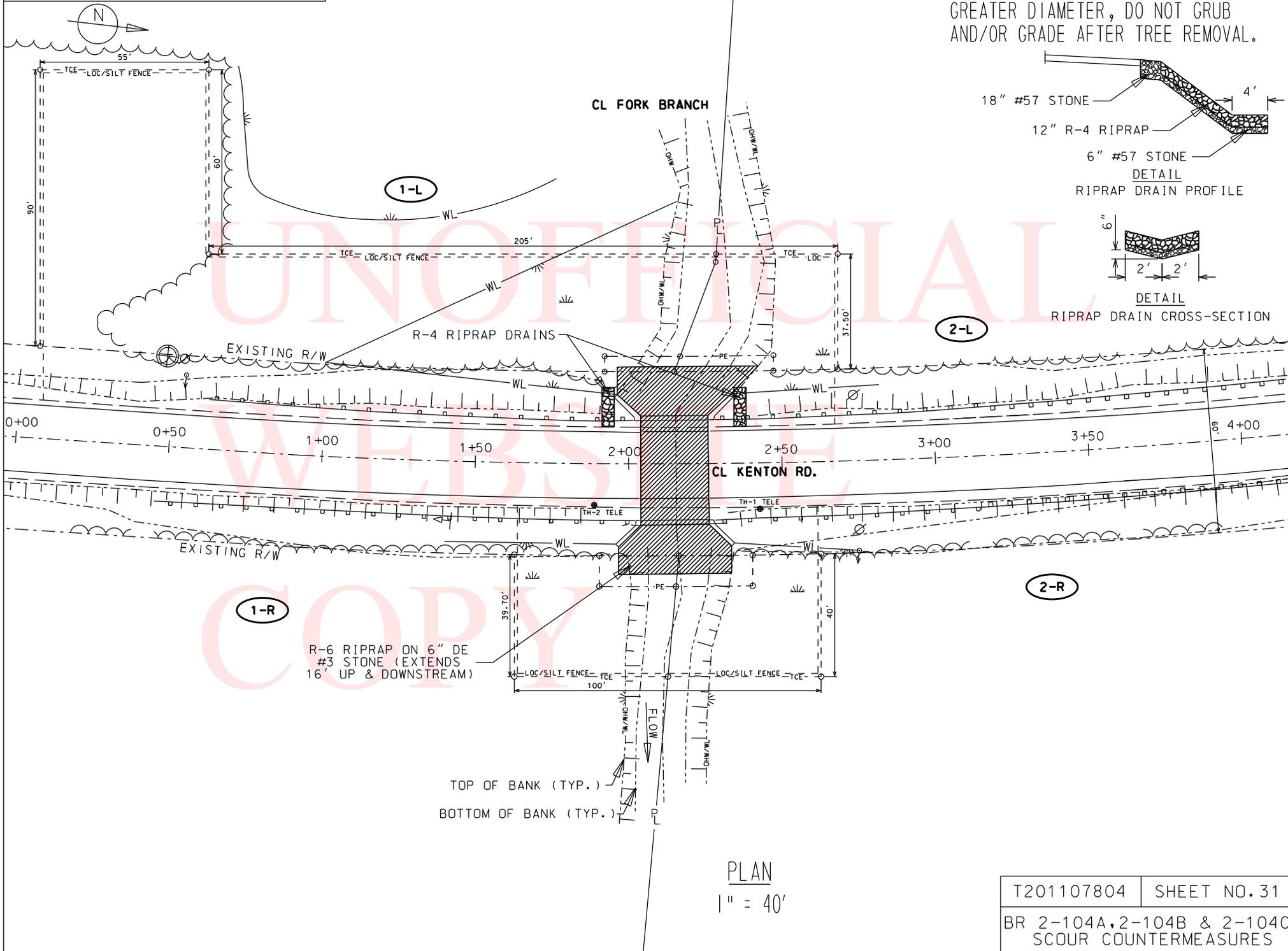
**Construction Sequence Notes:**

1. Place silt fence on the "LOC" of the site, as shown in the plans, except where it must connect to the sand bag dike.
2. Place stabilized construction entrances as shown on the plans.
3. Place stream diversion:
  - a. Place temporary sandbag dike upstream and downstream as shown in plans and according to Delaware standard details
  - b. The stream shall be pumped through the structure. The diversion shall flow into the 5' by 5' R-5 spill out area, as shown in the plans. Float intake of stream diversion.
  - c. Install sump pits, type 1 and portable sediment tanks as shown in the plans.
  - d. Dewater the work area into the portable sediment tank and discharge into the 5' by 5' spill-out R-5 area as shown in plans. Placement and removal of R-5 riprap is included in Item #265500.
  - e. All erosion and sediment control devices shall be removed when no longer needed.
  - f. The dikes and pumping operation shall be paid under Item # 265500 – Stream Diversion.
  - g. All pumps used shall be "quiet" pumps.
4. Excavate to appropriate elevations for R-6 riprap placement and if any scour holes exist, fill with Del. #3 stone.

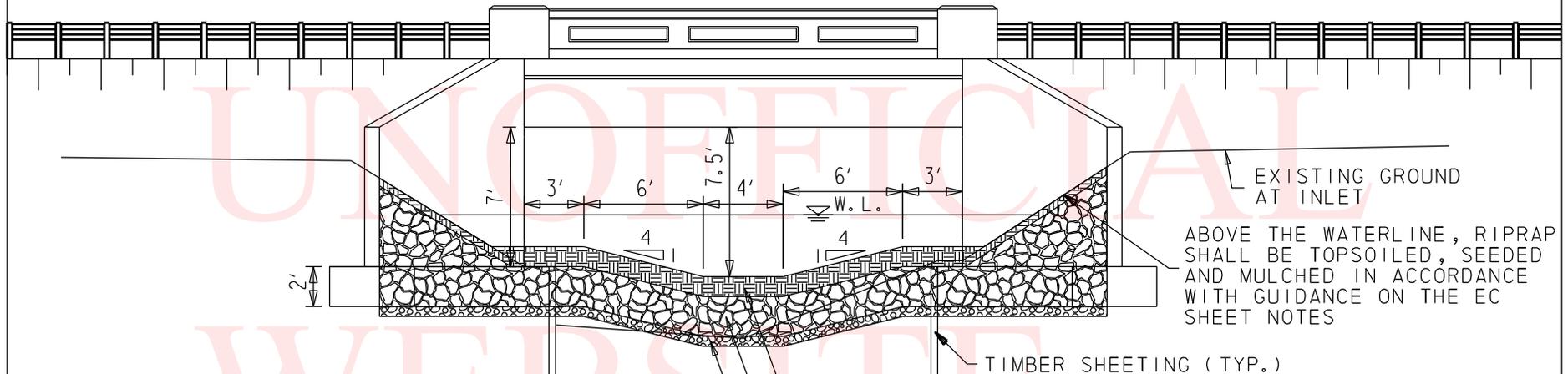
5. Place stone bedding, R-6 riprap and streambed material as shown on the plans.
6. Place R-4 riprap drains over #57 stone, as shown on the plan sheet, for roadway runoff on the west shoulder.
7. Remove stream diversion.
8. Remove stabilized construction entrances and replace with seeding and mulching. Seeding and mulching will consist of Permanent Seed – Dry Ground and Soil Retention Blanket Mulch, Type 3, which is incidental to Item #268000.

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BR 2-104C ELEVATION



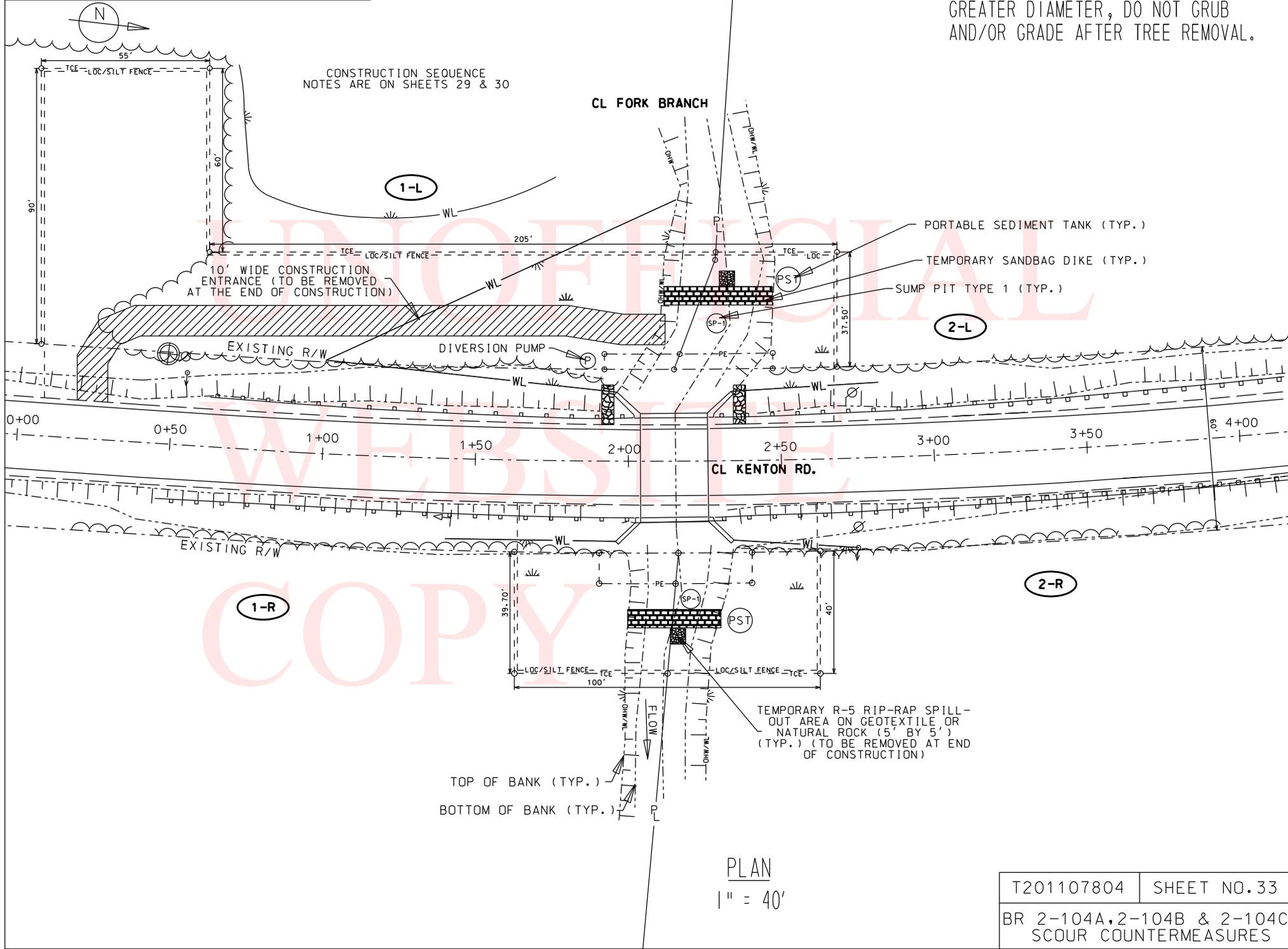
712007-R-6 RIPRAP INSTALLATION NOTES:

- EXCAVATE TO THE DEPTHS SHOWN ON THIS SHEET. ALL EXCAVATED STREAM BED MATERIAL (CONSISTING OF NATURAL SEDIMENTS, GRAVEL, PEBBLES, AND SMALL STONES) SHALL BE STOCKPILED. THE STOCKPILE OF STREAM BED SEDIMENT SHALL BE KEPT SEPARATE FROM ANY OTHER EXCAVATED MATERIAL. "B" BORROW WILL BE USED TO FILL THE VOIDS IN THE RIPRAP, STREAM BED MATERIAL WILL BE PLACED IN A TWELVE INCH LIFT OVER THE PLACED R-6 RIPRAP. EXCAVATION ABOVE THE TOP OF THE R-6 RIPRAP SHALL BE PAID UNDER CHANNEL EXCAVATION ITEM # 203000. EXCAVATION BELOW THE TOP OF R-6 RIPRAP SHALL BE INCLUDED IN RIPRAP, ITEM # 712007. ANY RESHAPING OF THE STREAM BED OR FILLING OF HOLES FOR RIPRAP SHALL BE INCIDENTAL TO ITEM # 712007.
- SEE EC SHEET NOTES FOR FURTHER GUIDANCE ASSOCIATED WITH STREAM RESTORATION.

WEST ELEVATION  
NTS

T201107804	SHEET NO. 32
BR 2-104A, 2-104B & 2-104C SCOUR COUNTERMEASURES	

DO NOT DISTURB TREES WITH 12" OR GREATER DIAMETER, DO NOT GRUB AND/OR GRADE AFTER TREE REMOVAL.



COPY

PLAN  
1" = 40'

T201107804	SHEET NO.33
BR 2-104A, 2-104B & 2-104C SCOUR COUNTERMEASURES	

SHEET PREPARED BY: MATT MORTENSEN  
DATE: 12/12/11

DO NOT DISTURB TREES WITH 12" OR GREATER DIAMETER, DO NOT GRUB AND/OR GRADE AFTER TREE REMOVAL.

WETLANDS DELINEATED BY ERI CONSULTANTS IN APRIL 2011 IN ACCORDANCE WITH THE 1987 CORPS OF ENGINEERS WETLAND DELINEATION MANUAL AND REGIONAL SUPPLEMENT

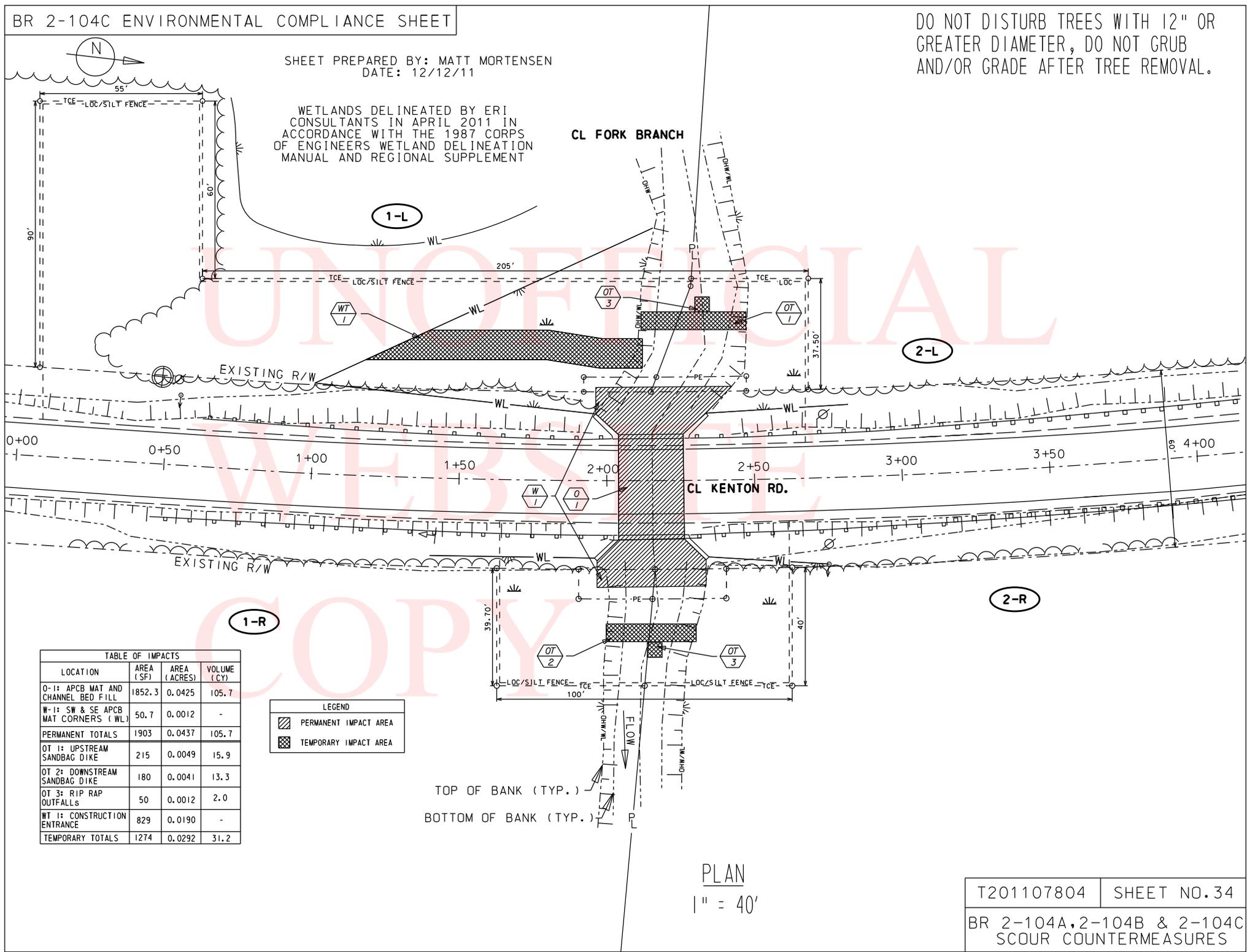


TABLE OF IMPACTS

LOCATION	AREA (SF)	AREA (ACRES)	VOLUME (CY)
0-1: APCB MAT AND CHANNEL BED FILL	1852.3	0.0425	105.7
W-1: SW & SE APCB MAT CORNERS (WL)	50.7	0.0012	-
<b>PERMANENT TOTALS</b>	<b>1903</b>	<b>0.0437</b>	<b>105.7</b>
OT 1: UPSTREAM SANDBAG DIKE	215	0.0049	15.9
OT 2: DOWNSTREAM SANDBAG DIKE	180	0.0041	13.3
OT 3: RIP RAP OUTFALLS	50	0.0012	2.0
WT 1: CONSTRUCTION ENTRANCE	829	0.0190	-
<b>TEMPORARY TOTALS</b>	<b>1274</b>	<b>0.0292</b>	<b>31.2</b>

LEGEND

	PERMANENT IMPACT AREA
	TEMPORARY IMPACT AREA

TOP OF BANK (TYP.)  
BOTTOM OF BANK (TYP.)

PLAN  
1" = 40'

**Bridge 2-104C**

Contract T201107804; FAP: EBHN-K104(2)

**ENVIRONMENTAL COMPLIANCE NOTES**

**1. GENERAL NOTES:**

- A. THE PURPOSE OF THIS SHEET IS TO IDENTIFY THOSE ITEMS ASSOCIATED WITH ENVIRONMENTAL COMPLIANCE.
- B. IF A DEPARTURE FROM THE APPROVED PLANS (WHICH WOULD AFFECT ANY OF THE NATURAL AND/OR CULTURAL RESOURCE ISSUES) IS NECESSARY, THE ENVIRONMENTAL STUDIES SECTION SHALL BE CONTACTED AT (302) 760-2264 TO ALLOW THE DEPARTMENT TO COORDINATE WITH THE APPROPRIATE RESOURCE AGENCIES FOR 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 / APPROVAL REQUIREMENTS\*:  
CORPS OF ENGINEERS (COE) - NATIONWIDE PERMIT #3(A) AND (C) (NO PCN)  
DNREC WETLANDS & SUBAQUEOUS LANDS (WLSL) - PROJECT CONSISTENT WITH DEL.  
CODE CH. 72, SECTION 7217, (B) MAINTENANCE, AS AMENDED BY SB 186  
DNREC - WATER QUALITY CERTIFICATION (WQC) AND COASTAL ZONE CONSISTENCY  
(CZM) -- WAIVED (PROJECT NOT LOCATED IN CRITICAL RESOURCE WATER)  
\* -- THE PERMIT(S)/APPROVAL(S) LISTED ARE THOSE REQUIRED FOR THIS PROJECT.  
THE ENVIRONMENTAL STUDIES SECTION IS RESPONSIBLE FOR COORDINATING/  
OBTAINING THESE PERMITS/APPROVALS.

NOTE: THE ABSENCE OF ASTERISKS AFTER A PERMIT (COE, WLSL, WQC, CZM) INDICATES THAT COORDINATION HAS BEEN DONE WITH THAT AGENCY BUT NO WRITTEN AUTHORIZATION WAS REQUIRED. AS SUCH, NO PAPERWORK FROM THAT AGENCY SHOULD BE ANTICIPATED.

- B. CONSTRUCTION RESTRICTIONS:  
FISHERIES: NONE  
ENDANGERED SPECIES: NONE  
MIGRATORY BIRDS: NONE
- C. STREAM RESTORATION AND SLOPE RIPRAP TREATMENT:
  - i. 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 THE 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 STREAMBED 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 12" CHANNEL BED FILL. FINAL CHANNEL ELEVATIONS SHALL MATCH EXISTING ELEVATION AT THE UPSTREAM AND DOWNSTREAM PROJECT LIMITS. THROUGH THE STRUCTURE, ELEVATIONS SHALL BE NOTED ON THE PLANS. PAYMENT UNDER ITEM #712531 - CHANNEL BED FILL.

ii. 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.

iii. 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.

iv. ALL RIPRAP ON THE STREAM BANK, OUTSIDE THE CHANNEL BED, SHALL BE CHOKED WITH DELAWARE #57 STONE, FILLED WITH TOPSOIL, AND SEEDED. PLACE JUST ENOUGH CHOKE MATERIAL TO PREVENT THE LOSS OF TOPSOIL THROUGH THE RIPRAP, AND THEN 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 # 734531 - STREAM BANK SEED MIX. FOLLOWING THE SEEDING OPERATION, ITEM #735533 - SOIL RETENTION BLANKET MULCH, TYPE 3, OR OTHER BLANKET AS SHOWN ON THE PLANS SHALL BE INSTALLED. ALL WORK, STARTING WITH THE INITIAL CHOKING WITH TOPSOIL THROUGH THE SEEDING AND MULCHING, SHALL BE COMPLETED PRIOR TO ANY RAIN EVENT. PAYMENT FOR RIPRAP AND DELAWARE #57 STONE SHALL BE PAID FOR UNDER THE RIPRAP ITEM. ALL OTHER ITEMS SHALL BE PAID FOR UNDER THEIR RESPECTIVE ITEMS.

D. DUE TO VARIOUS RESOURCES (WATERS/WETLANDS/STATE NATURAL AREA) ACCESS BEYOND THE LOC IS STRICTLY PROHIBITED. ANY CHANGES TO THE LOC MUST BE COORDINATED WITH THE DELDOT ENVIRONMENTAL STUDIES SECTION.

E. 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 CUT FLUSH WITH THE GROUND (I.E. NO DISTURBANCE OF THE ROOT MAT).

F. NATURALIZE PLANTING OF RED MAPLES (1½" TO 1¾" CAL., BB OR CONT.) ON 10' CENTER-SPACING (8' MIN. AND 12' MAX.) WITHIN DISTURBED AREAS (ALL WETLAND AREAS WITHIN LOC, EXCLUDING AREA WITHIN THE TOS AND RIPRAP PROTECTION. 9 RED MAPLE TREES (TOTAL) SHALL BE PLANTED IN DISTURBED WETLAND AREAS (PAYMENT UNDER ITEM #737523- PLANTING). TEMPORARY GRASS SEEDING - DRY GROUND, SHALL BE PLACED IN DISTURBED WETLAND AREAS (PAYMENT UNDER ITEM #734017- TEMPORARY GRASS SEEDING, DRY GROUND).

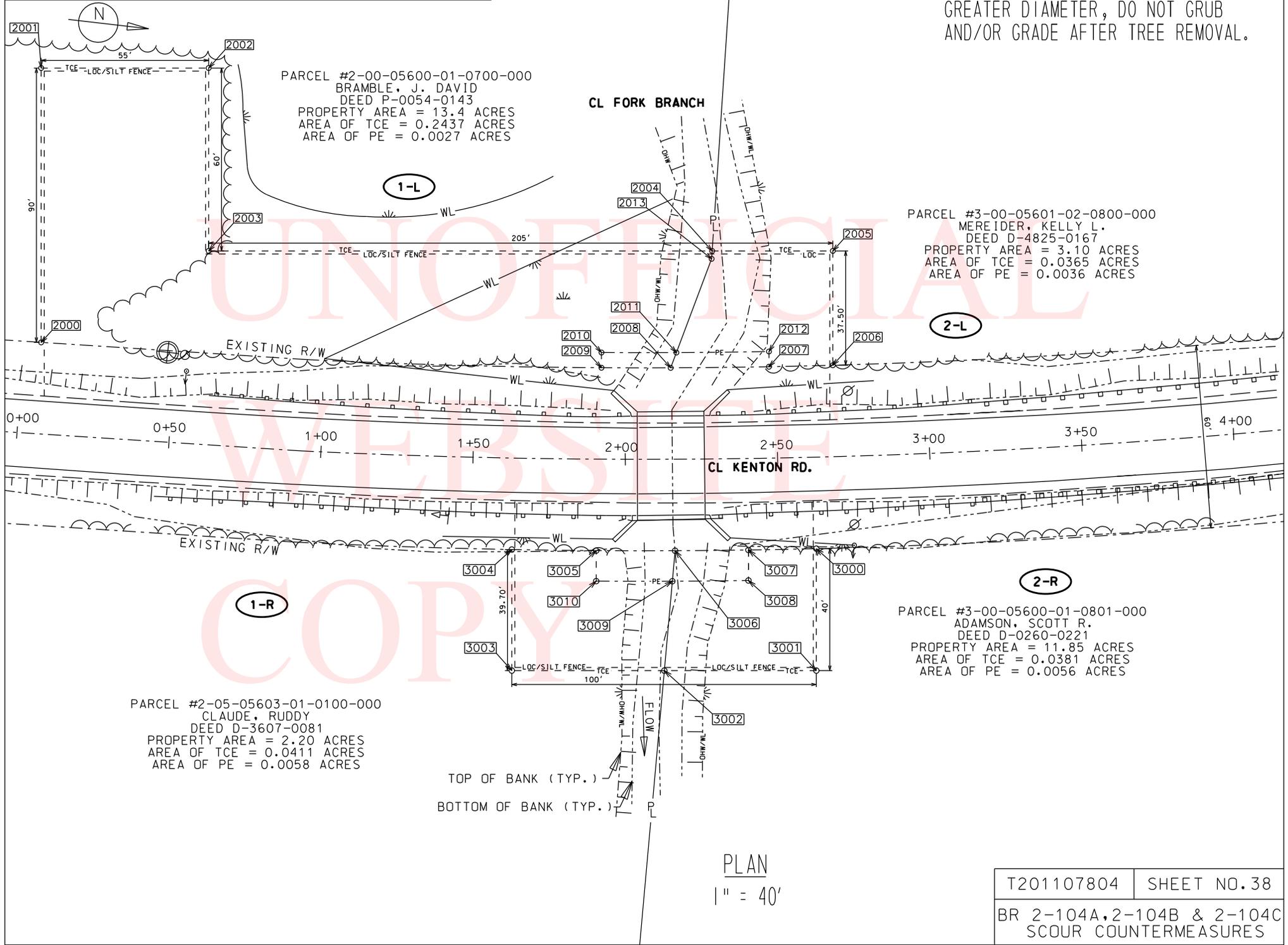
THE CONTRACTOR SHALL BE REQUIRED TO WATER ALL MAJOR AND MINOR TREES, SHRUBS AND ALL HERBACEOUS BEDS BI-WEEKLY DURING THE PERIOD FROM JUNE 15 THROUGH OCTOBER 1. OVER THE COURSE OF THIS PERIOD, THERE ARE NINE DISTINCT WATERINGS. WATERING, ONCE INITIATED, SHALL CONTINUE WITHOUT INTERRUPTION UNTIL ALL PLANTS ON THE PROJECT HAVE BEEN WATERED. APPLY FIFTEEN (15) GALLONS OF WATER TO EACH PLANT EACH OF THE NINE WATERINGS. PAYMENT SHALL BE INCLUDED IN ITEM 737523 - PLANTING.

**3. CULTURAL RESOURCES ISSUES:**

THERE ARE NO ELIGIBLE OR POTENTIALLY ELIGIBLE STANDING STRUCTURES OVER FIFTY YEARS AND OLDER NOR ARE THERE ARCHAEOLOGICAL SITES PRESENT WITHIN THE PROJECT AREA. THE SHPO HAS AGREED THAT THE WORK IS CONSISTENT WITH A FINDING OF "NO HISTORIC PROPERTIES AFFECTED."

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DO NOT DISTURB TREES WITH 12" OR GREATER DIAMETER, DO NOT GRUB AND/OR GRADE AFTER TREE REMOVAL.



PARCEL #2-00-05600-01-0700-000  
 BRAMBLE, J. DAVID  
 DEED P-0054-0143  
 PROPERTY AREA = 13.4 ACRES  
 AREA OF TCE = 0.2437 ACRES  
 AREA OF PE = 0.0027 ACRES

PARCEL #3-00-05601-02-0800-000  
 MERIDER, KELLY L.  
 DEED D-4825-0167  
 PROPERTY AREA = 3.10 ACRES  
 AREA OF TCE = 0.0365 ACRES  
 AREA OF PE = 0.0036 ACRES

PARCEL #2-05-05603-01-0100-000  
 CLAUDE, RUDDY  
 DEED D-3607-0081  
 PROPERTY AREA = 2.20 ACRES  
 AREA OF TCE = 0.0411 ACRES  
 AREA OF PE = 0.0058 ACRES

PARCEL #3-00-05600-01-0801-000  
 ADAMSON, SCOTT R.  
 DEED D-0260-0221  
 PROPERTY AREA = 11.85 ACRES  
 AREA OF TCE = 0.0381 ACRES  
 AREA OF PE = 0.0056 ACRES

TOP OF BANK (TYP.)  
 BOTTOM OF BANK (TYP.)

PLAN  
 1" = 40'

T201107804	SHEET NO.38
BR 2-104A, 2-104B & 2-104C SCOUR COUNTERMEASURES	

**Right of Way Data Sheet for BR. 2-104C**

Sheet 9 of 11

METES AND BOUNDS								
Assessment Number		Ownership of Record			Type of Acquisition		Parcel area (acres)	
20005600010700000		Bramble, J. David 104C-1-L P 54 143			TCE		13.40	
Alignment Number		Line Data			Curve Data			
PT. NO	Station	Offset	Bearing	Distance (ft)	Chord Bearing	Chord Length (ft)	Radius (ft)	Arc Length (ft)
2000	0+06	-30.00	S 83°21'57" W	90.00				
2001	0+00.18	-119.81	N 06°38'03" W	55.00				
2002	0+55.07	-123.37	N 83°21'57" E	60.00				
2003	0+58.95	-63.49	N 06°38'03" W	165.36				
2004	2+29.23	-68.25	N 87°10'35" E	2.59				
2013	2+29.03	-65.67	S 76°00'44" E	32.86				
2011	2+16.96	-35.00			S 06°35'27" E	24.60	2240.24	24.600
2010	1+91.97	-35.00	N 83°21'57" E	5.00				
2009	1+92.00	-30.00			S 04°02'43" E	184.20	2245.24	184.252
2000	0+06	-30.00						
Area = 10614 sq. feet		0.2437 acres						

METES AND BOUNDS								
Assessment Number		Ownership of Record			Type of Acquisition		Parcel area (acres)	
20005600010700000		Bramble, J. David 104C-1-L P 54 143			PE		13.40	
Alignment Number		Line Data			Curve Data			
PT. NO	Station	Offset	Bearing	Distance (ft)	Chord Bearing	Chord Length (ft)	Radius (ft)	Arc Length (ft)
2009	1+92.00	-30.00	S 83°21'57" W	5.00				
2010	1+91.97	-35.00			N 06°35'27" W	24.60	2240.24	24.600
2011	2+16.96	-35.00	S 76°00'44" E	5.37				
2008	2+15.02	-30.00			S 06°31'19" E	22.71	2245.24	22.710
2009	1+92.00	-30.00						
Area = 119 sq. feet		0.0027 acres						

METES AND BOUNDS								
Assessment Number		Ownership of Record			Type of Acquisition		Parcel area (acres)	
30005601020800000		Mereider, Kelly L 104C-2-L D 4825 167			TCE		3.10	
Alignment Number		Line Data			Curve Data			
PT. NO	Station	Offset	Bearing	Distance (ft)	Chord Bearing	Chord Length (ft)	Radius (ft)	Arc Length (ft)
2007	2+47.74	-30.00	S 83°21'57" W	5.00				
2012	2+47.83	-35.00			S 07°18'37" E	30.40	2240.24	30.400
2011	2+16.96	-35.00	N 76°00'44" W	32.86				
2013	2+29.03	-65.67	S 87°10'35" W	2.59				
2004	2+29.23	-68.25	N 06°38'03" W	39.64				
2005	2+70.08	-67.49	N 83°21'57" E	37.50				
2006	2+69.01	-30.00			S 07°56'40" E	20.99	2245.24	20.990
2007	2+47.74	-30.00						
Area = 1592 sq. feet		0.0365 acres						

**Right of Way Data Sheet for BR. 2-104C**

Sheet 10 of 11

METES AND BOUNDS								
Assessment Number	Ownership of Record				Type of Acquisition		Parcel area (acres)	
30005601020800000	Mereider, Kelly L 104C-2-L D 4825 167				PE		3.10	
Alignment Number		Line Data			Curve Data			
PT. NO	Station	Offset	Bearing	Distance (ft)	Chord Bearing	Chord Length (ft)	Radius (ft)	Arc Length (ft)
2008	2+15.02	-30.00	N 76°00'44" W	5.37				
2011	2+16.96	-35.00			N 07°18'37" W	30.40	2240.24	30.400
2012	2+47.83	-35.00	N 83°21'57" E	5.00				
2007	2+47.74	-30.00			S 07°19'00" E	32.29	2245.24	32.290
2008	2+15.02	-30.00						
Area = 157 sq. feet		0.0036 acres						

METES AND BOUNDS								
Assessment Number	Ownership of Record				Type of Acquisition		Parcel area (acres)	
20505603010100000	Claude, Ruddy 104C-1-R D 3607 81				TCE		2.20	
Alignment Number		Line Data			Curve Data			
PT. NO	Station	Offset	Bearing	Distance (ft)	Chord Bearing	Chord Length (ft)	Radius (ft)	Arc Length (ft)
3005	1+90.65	30.00	N 83°21'57" E	10.00				
3010	1+90.72	40.00			N 06°34'03" W	25.00	2315.24	25.000
3009	2+15.29	40.00	N 88°30'05" E	29.44				
3002	2+12.61	69.31	S 06°38'03" E	50.08				
3003	1+64.01	69.70	S 83°21'57" W	39.70				
3004	1+63.29	30.00			N 05°54'45" W	27.72	2305.24	27.720
3005	1+90.65	30.00						
Area = 1790 sq. feet		0.0411 acres						

METES AND BOUNDS								
Assessment Number	Ownership of Record				Type of Acquisition		Parcel area (acres)	
20505603010100000	Claude, Ruddy 104C-1-R D 3607 81				PE		2.20	
Alignment Number		Line Data			Curve Data			
PT. NO	Station	Offset	Bearing	Distance (ft)	Chord Bearing	Chord Length (ft)	Radius (ft)	Arc Length (ft)
3006	2+16.21	30.00	N 88°30'05" E	10.04				
3009	2+15.31	39.76			S 06°34'03" E	25.00	2315.24	25.000
3010	1+90.71	39.79	S 83°21'57" W	10.00				
3005	1+90.65	30.00			N 06°34'09" W	25.90	2305.24	25.900
3006	2+16.21	30.00						
Area = 255 sq. feet		0.0058 acres						

**Right of Way Data Sheet for BR. 2-104C**

Sheet 11 of 11

METES AND BOUNDS								
Assessment Number	Ownership of Record				Type of Acquisition		Parcel area (acres)	
30005600010801000	Adamson, Scott R. 104C-2-R D 260 221				TCE		11.85	
Alignment Number		Line Data			Curve Data			
PT. NO	Station	Offset	Bearing	Distance (ft)	Chord Bearing	Chord Length (ft)	Radius (ft)	Arc Length (ft)
3000	2+62	30.00	N 83°21'57" E	40.00				
3001	2+61.04	69.99	S 06°38'03" E	49.92				
3002	2+12.61	69.31	S 88°30'05" W	29.44				
3009	2+15.29	40.00			N 07°10'55" W	25.00	2315.24	25.000
3008	2+39.85	40.00	S 83°21'57" W	10.00				
3007	2+40	30.00			N 07°45'47" W	22.29	2305.24	22.290
3000	2+62	30.00						
Area = 1661 sq. feet		0.0381 acres						

METES AND BOUNDS								
Assessment Number	Ownership of Record				Type of Acquisition		Parcel area (acres)	
30005600010801000	Adamson, Scott R. 104C-2-R D 260 221				PE		11.85	
Alignment Number		Line Data			Curve Data			
PT. NO	Station	Offset	Bearing	Distance (ft)	Chord Bearing	Chord Length (ft)	Radius (ft)	Arc Length (ft)
3007	2+40	30.00	N 83°21'57" E	10.00				
3008	2+39.85	40.00			S 07°10'55" E	25.00	2315.24	25.000
3009	2+15.29	40.00	S 88°30'05" W	10.04				
3006	2+16.21	30.00			N 07°12'11" W	24.10	2305.24	24.100
3007	2+40	30.00						
Area = 245 sq. feet		0.0056 acres						

<b>QUANTITY SUMMARY BR 2-104A</b>			
<b>Item</b>	<b>Item Title</b>	<b>Unit</b>	<b>Quantity</b>
201000	Clearing and Grubbing	L.S.	L.S.
203000	Channel Excavation	C.Y.	140
209002	Borrow, Type B	C.Y.	10
251000	Silt Fence	L.F.	540
263000	Sump Pit, Type 1	EACH	2
265500	Stream Diversion	L.S.	L.S.
268000	Stabilized Construction Entrance	TON	110
270000	Portable Sediment Tank	EACH	2
302011	Delaware No. 3 Stone	TON	71
712006	Riprap, R-5	S.Y.	51
712517	Articulated Pre-Cast Concrete Blocks	S.F.	1882
712531	Channel Bed Fill	C.Y.	70
732000	Topsoil, 4" Depth	S.Y.	75
734013	Permanent Grass Seeding, Dry Ground	S.Y.	400
734017	Temporary Grass Seeding, Dry Ground	S.Y.	800
734531	Stream Bank Seed Mix	S.Y.	75
735533	Soil Retention Blanket Mulch, Type 3	S.Y.	75
737523	Planting	L.S.	L.S.
743004	Furnish and Maintain Portable Changeable Message Sign	EA-D.Y.	28
743051	Flagger, Kent County, State **	HR	100
763501	Construction Engineering	L.S.	L.S.
763643	Maintenance of Traffic, All Inclusive	L.S.	L.S.

\*\* Fixed Price Item

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<b>QUANTITY SUMMARY BR 2-104B</b>			
<b>Item</b>	<b>Item Title</b>	<b>Unit</b>	<b>Quantity</b>
201000	Clearing and Grubbing	L.S.	L.S.
203000	Channel Excavation	C.Y.	25
209002	Borrow, Type B	C.Y.	10
251000	Silt Fence	L.F.	580
263000	Sump Pit, Type 1	EACH	2
265500	Stream Diversion	L.S.	L.S.
268000	Stabilized Construction Entrance	TON	99
270000	Portable Sediment Tank	EACH	2
302007	GABC, Type B	C.Y.	2.5
302011	Delaware No. 3 Stone	TON	74
401665	Superpave, Type C Hot-Mix, 160 Gyration, PG 64-22, Patching	TON	2.5
712006	Riprap, R-5	S.Y.	48
712517	Articulated Pre-Cast Concrete Blocks	S.F.	1966
712531	Channel Bed Fill	C.Y.	75
727014	Construction Safety Fence	L.F.	150
732000	Topsoil, 4" Depth	S.Y.	75
734013	Permanent Grass Seeding, Dry Ground	S.Y.	300
734017	Temporary Grass Seeding, Dry Ground	S.Y.	345
734531	Stream Bank Seed Mix	S.Y.	75
735533	Soil Retention Blanket Mulch, Type 3	S.Y.	75
737523	Planting	L.S.	L.S.
743004	Furnish and Maintain Portable Changeable Message Sign	EA-D.Y.	28
743051	Flagger, Kent County, State **	HR	100
763501	Construction Engineering	L.S.	L.S.
763643	Maintenance of Traffic, All Inclusive	L.S.	L.S.

\*\* Fixed Price Item

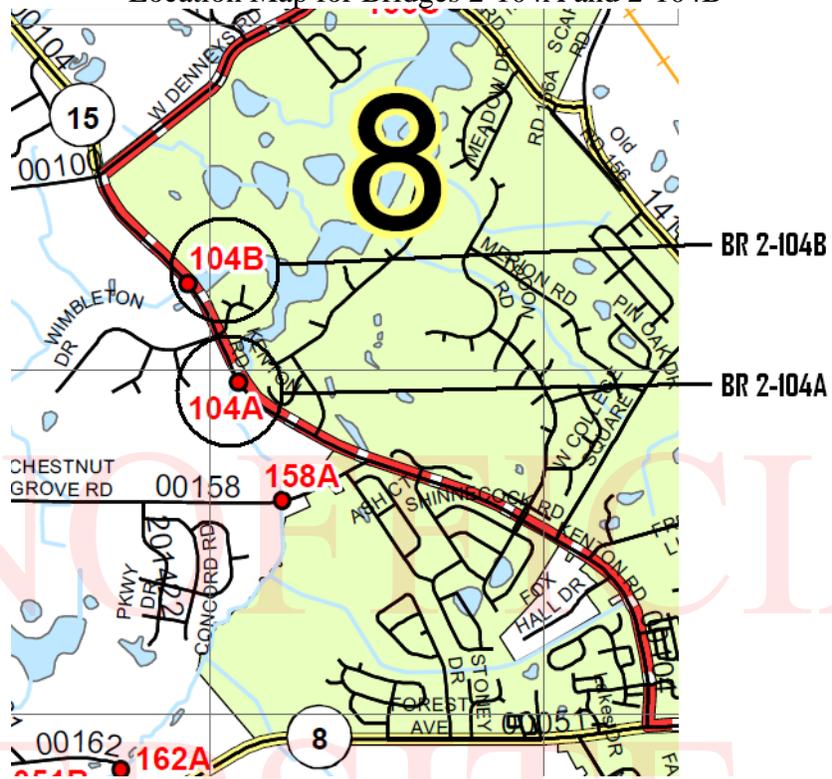
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<b>QUANTITY SUMMARY BR 2-104C</b>			
<b>Item</b>	<b>Item Title</b>	<b>Unit</b>	<b>Quantity</b>
201000	Clearing and Grubbing	L.S.	L.S.
203000	Channel Excavation	C.Y.	26
209002	Borrow, Type B	C.Y.	20
251000	Silt Fence	L.F.	690
263000	Sump Pit, Type 1	EACH	2
265500	Stream Diversion	L.S.	L.S.
268000	Stabilized Construction Entrance	TON	156
270000	Portable Sediment Tank	EACH	2
302011	Delaware No. 3 Stone	TON	71
302012	Delaware No. 57 Stone	TON	4
712005	Riprap, R-4	S.Y.	14
712007	Riprap, R-6	S.Y.	210
712531	Channel Bed Fill	C.Y.	70
713003	Geotextiles, Riprap	S.Y.	224
732000	Topsoil, 4" Depth	S.Y.	75
734013	Permanent Grass Seeding, Dry Ground	S.Y.	300
734017	Temporary Grass Seeding, Dry Ground	S.Y.	765
734531	Stream Bank Seed Mix	S.Y.	75
735533	Soil Retention Blanket Mulch, Type 3	S.Y.	75
737523	Planting	L.S.	L.S.
743004	Furnish and Maintain Portable Changeable Message Sign	EA-D.Y.	28
743051	Flagger, Kent County, State **	HR	100
763501	Construction Engineering	L.S.	L.S.
763643	Maintenance of Traffic, All Inclusive	L.S.	L.S.

\*\* Fixed Price Item

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Location Map for Bridges 2-104A and 2-104B



Location Map for Bridge 2-104C

