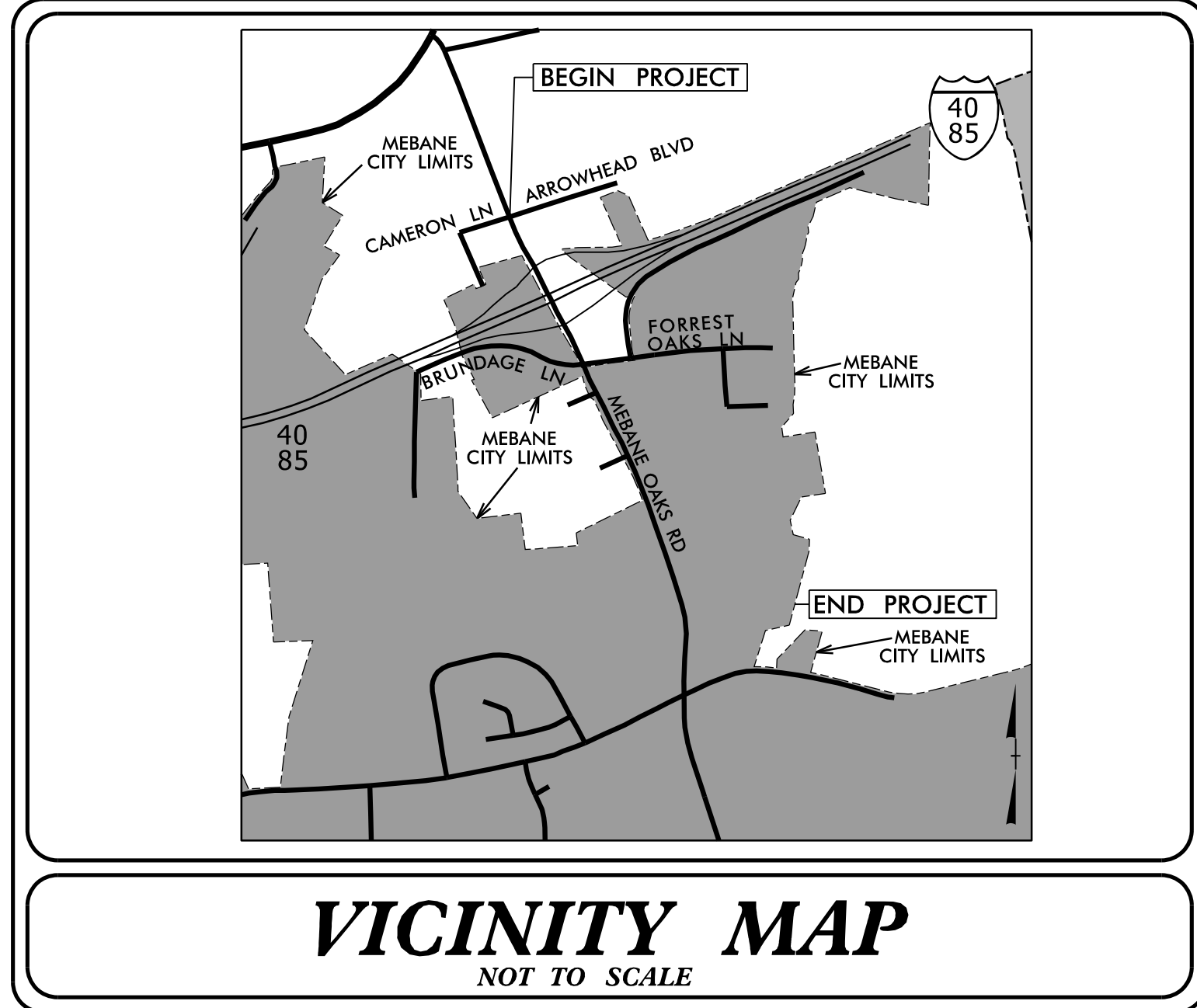


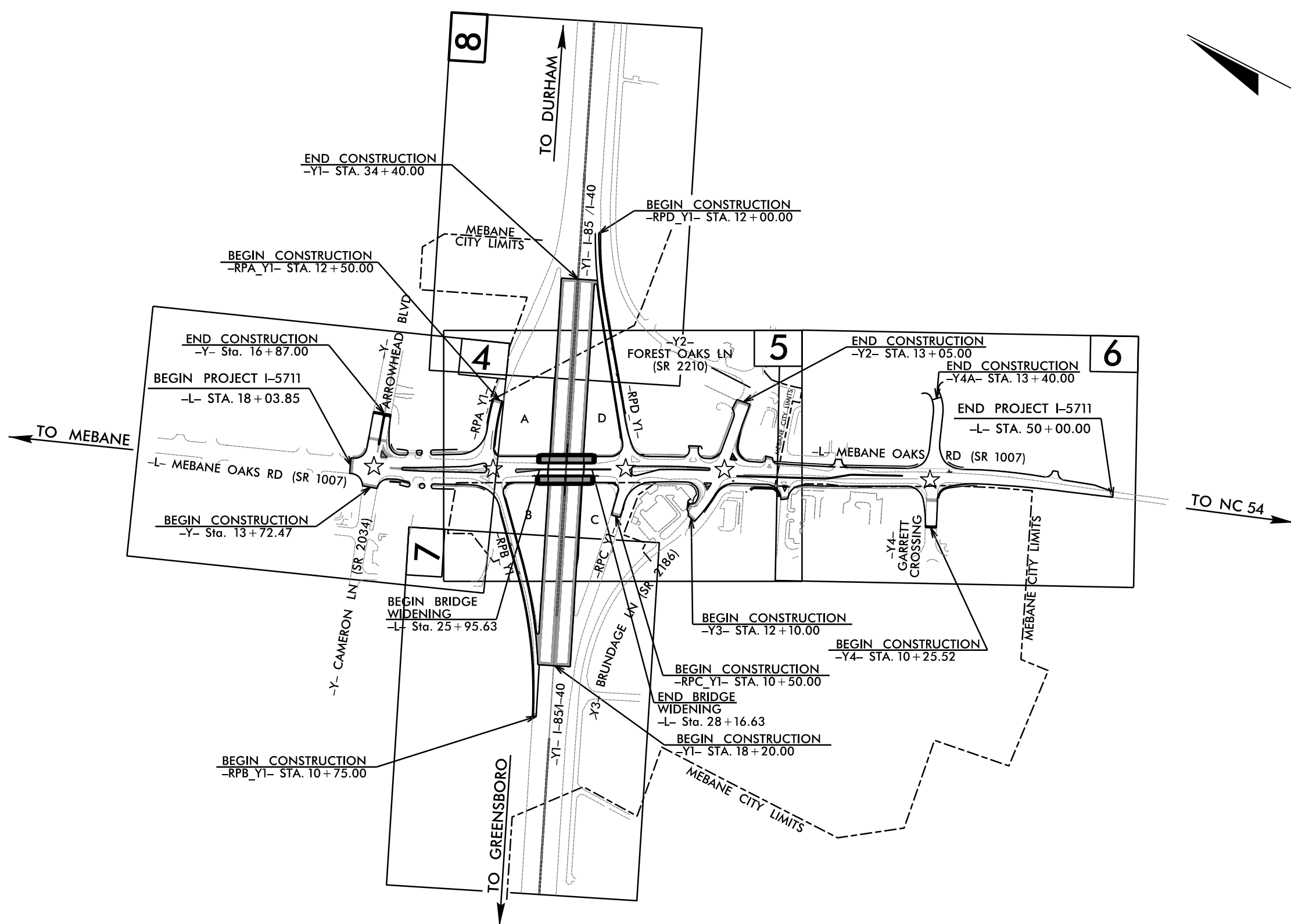
**TIP PROJECT: I-5711**



STATE OF NORTH CAROLINA  
 DIVISION OF HIGHWAYS  
 PLAN FOR PROPOSED  
 HIGHWAY EROSION CONTROL  
**ALAMANCE COUNTY**

**LOCATION: INTERCHANGE IMPROVEMENTS AT I-401-85  
 AND SR 1007 (MEBANE OAKS RD) IN MEBANE**

**TYPE OF WORK: GRADING, DRAINAGE, PAVING, STRUCTURES, SIGNALS AND PAVEMENT MARKINGS**



THIS IS A CONTROLLED ACCESS PROJECT WITH ACCESS BEING LIMITED TO INTERCHANGE

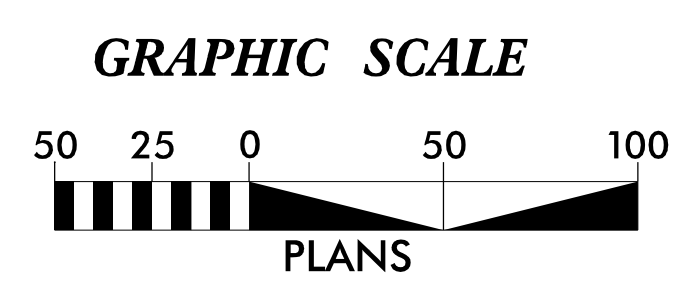
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	I-5711	EC-1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	

**EROSION AND SEDIMENT CONTROL MEASURES**

Std. #	Description	Symbol
1630.03	Temporary Silt Ditch	TD
1650.05	Temporary Diversion	TD
1605.01	Temporary Silt Fence	III III III
1606.01	Special Sediment Control Fence	△△△△△
1622.01	Temporary Berms and Slope Drains	— — — — —
1650.02	Silt Basin Type B	▨
1633.01	Temporary Rock Silt Check Type-A	▩
	Temporary Rock Silt Check Type-A with Matting and Polyacrylamide (PAM)	▩
1633.02	Temporary Rock Silt Check Type-B	▩
	Wattle/Coir Fiber Wattle	— — — — —
	Wattle/Coir Fiber Wattle with Polyacrylamide (PAM)	— — — — —
1634.01	Temporary Rock Sediment Dam Type-A	▩
1634.02	Temporary Rock Sediment Dam Type-B	▩
1655.01	Rock Pipe Inlet Sediment Trap Type-A	▩
1655.02	Rock Pipe Inlet Sediment Trap Type-B	▩
1630.04	Stilling Basin	▩
1630.06	Special Stilling Basin	▩
	Rock Inlet Sediment Trap:	
1632.01	Type A	A
1652.02	Type B	B
1652.03	Type C	C
	Skimmer Basin	▩
	Tiered Skimmer Basin	▩
	Infiltration Basin	▩

**THIS PROJECT CONTAINS  
 EROSION CONTROL PLANS  
 FOR CLEARING AND  
 GRUBBING PHASE OF  
 CONSTRUCTION.**

**THIS PROJECT HAS  
 BEEN DESIGNED TO  
 SENSITIVE WATERSHED  
 STANDARDS.**



THESE EROSION AND SEDIMENT CONTROL PLANS COMPLY WITH  
 THE APPLICABLE REGULATIONS SET FORTH BY THE NCG-010000  
 GENERAL CONSTRUCTION PERMIT EFFECTIVE APRIL 1, 2019  
 AND ISSUED BY THE NORTH CAROLINA DEPARTMENT OF  
 ENVIRONMENTAL QUALITY DIVISION OF WATER RESOURCES.

VHB Engineering NC, P.C. (C-3705)  
 940 Main Campus Drive, Suite 500  
 Raleigh, NC 27606

Prepared in the Office of:  
**VHB ENGINEERING NC, P.C.**  
 940 Main Campus Drive, Suite 500  
 Raleigh, NC 27606

Designed by:  
**COURTNEY A. CARPENTER, PE** 3811  
 NAME LEVEL III CERTIFICATION NO.

Roadway Standard Drawings

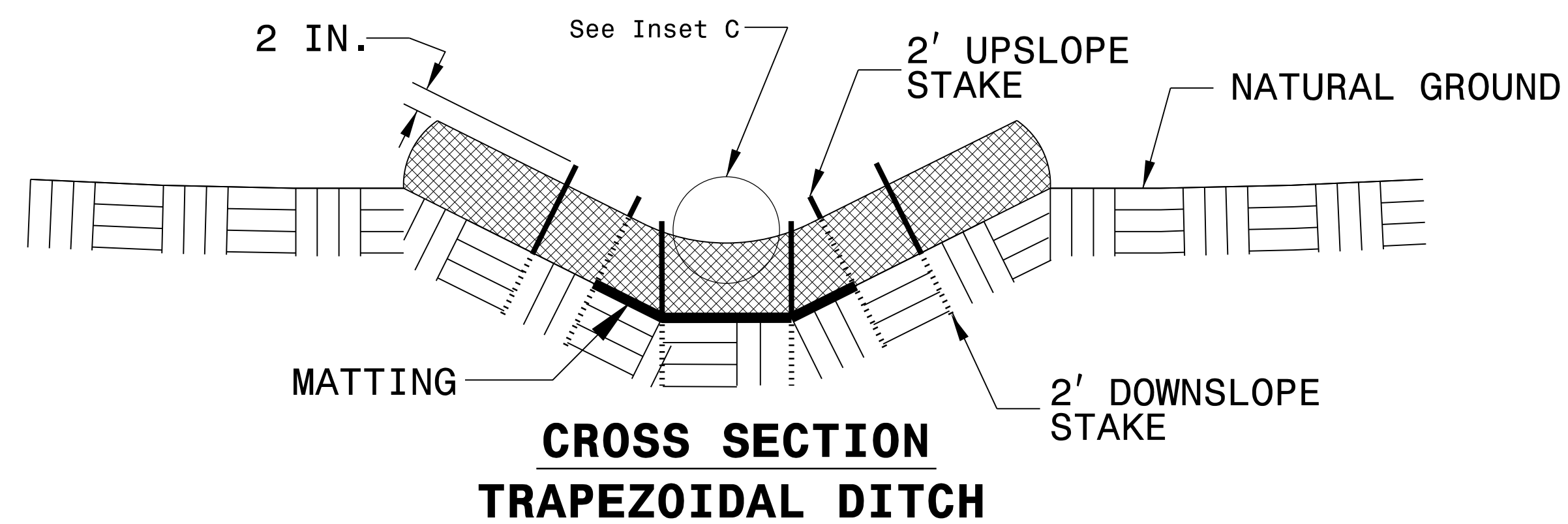
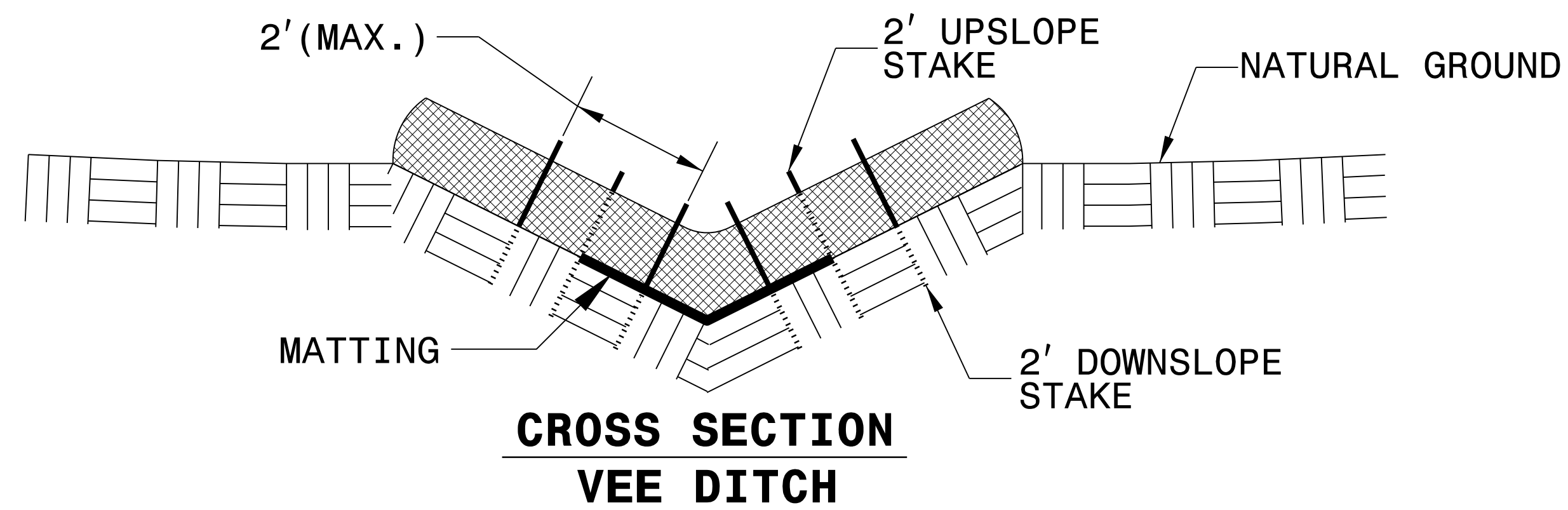
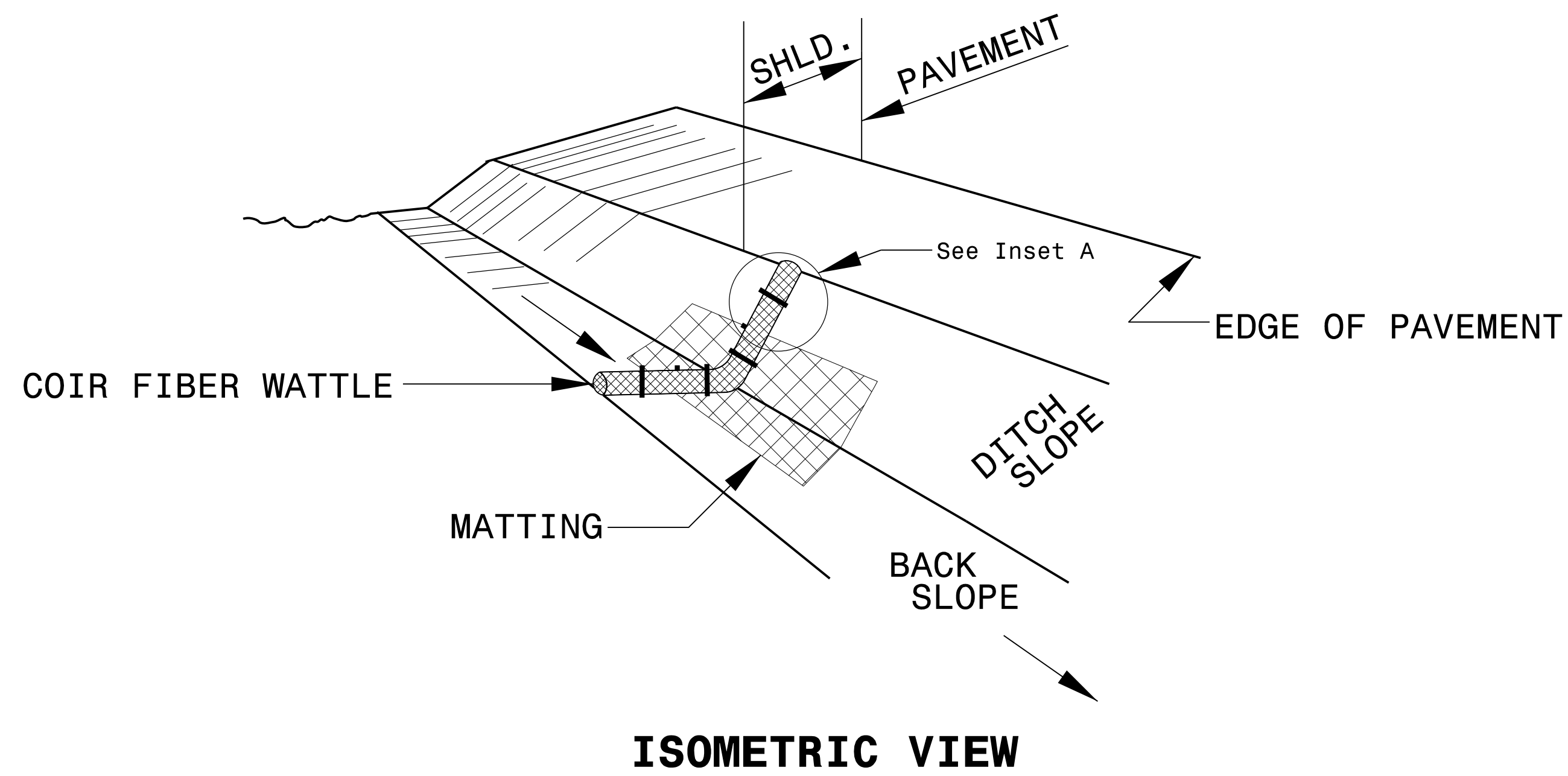
The following roadway english standards as appear in "Roadway Standard Drawings"- Roadway Design Unit - N. C. Department of Transportation - Raleigh, N. C., dated January 2018 and the latest revision thereto are applicable to this project and by reference hereby are considered a part of these plans.

1604.01 Railroad Erosion Control Detail	1632.01 Rock Inlet Sediment Trap Type A
1605.01 Temporary Silt Fence	1632.02 Rock Inlet Sediment Trap Type B
1606.01 Special Sediment Control Fence	1632.03 Rock Inlet Sediment Trap Type C
1607.01 Gravel Construction Entrance	1633.01 Temporary Rock Silt Check Type A
1622.01 Temporary Berms and Slope Drains	1633.02 Temporary Rock Silt Check Type B
1630.01 Riser Basin	1634.01 Temporary Rock Sediment Dam Type A
1630.02 Silt Basin Type B	1634.02 Temporary Rock Sediment Dam Type B
1630.03 Temporary Silt Ditch	1635.01 Rock Pipe Inlet Sediment Trap Type A
1630.04 Stilling Basin	1635.02 Rock Pipe Inlet Sediment Trap Type B
1630.05 Temporary Diversion	1640.01 Coir Fiber Baffle
1630.06 Special Stilling Basin	1645.01 Temporary Stream Crossing
1631.01 Matting Installation	

D:\66\2018\SHAN-I-5711-REU-TIP.dgn  
 USER:Rick.Pault

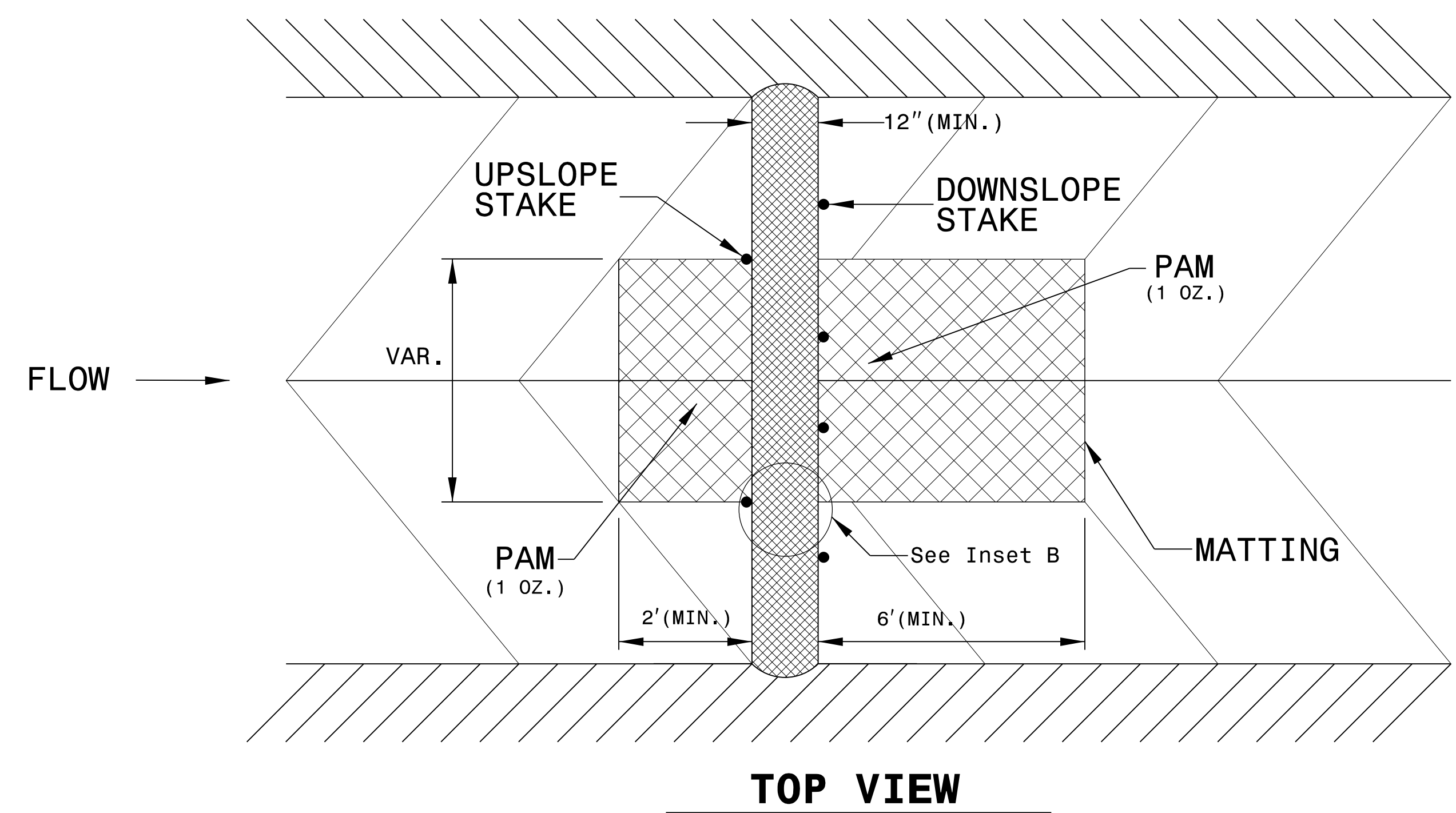
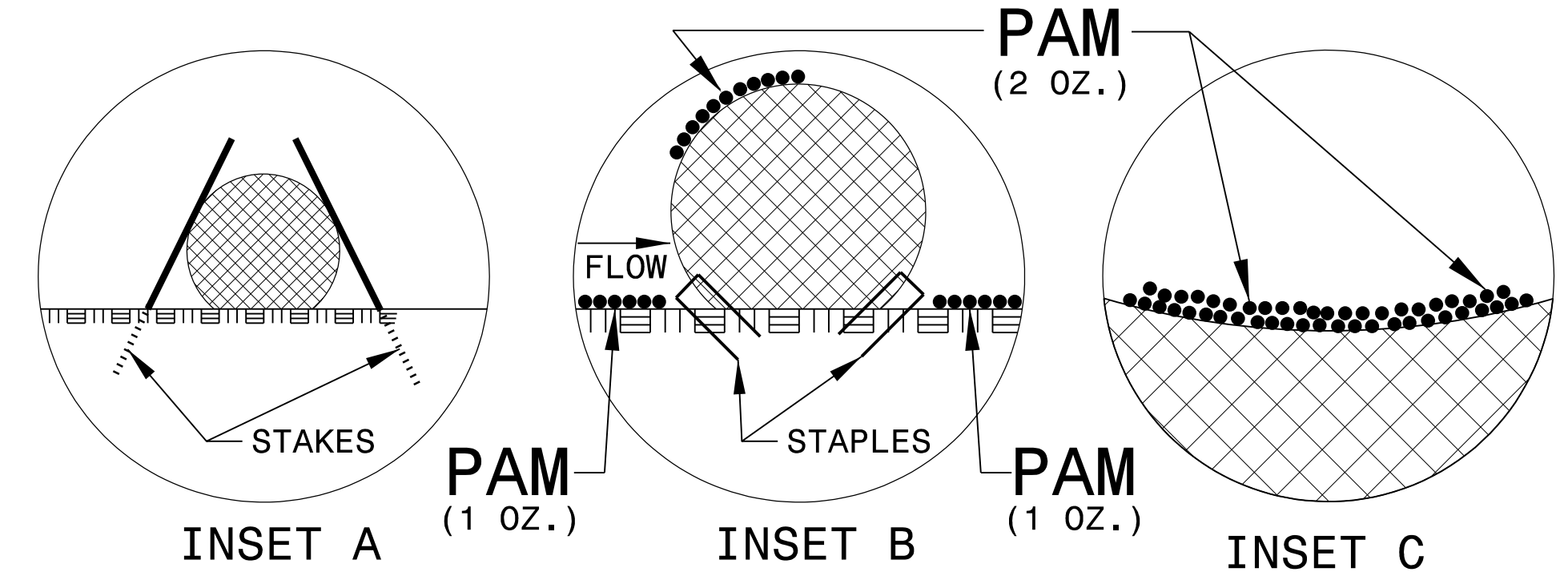
PROJECT REFERENCE NO. 1-5711	SHEET NO. EC-2
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

# COIR FIBER WATTLE WITH POLYACRYLAMIDE (PAM) DETAIL



**NOTES:**

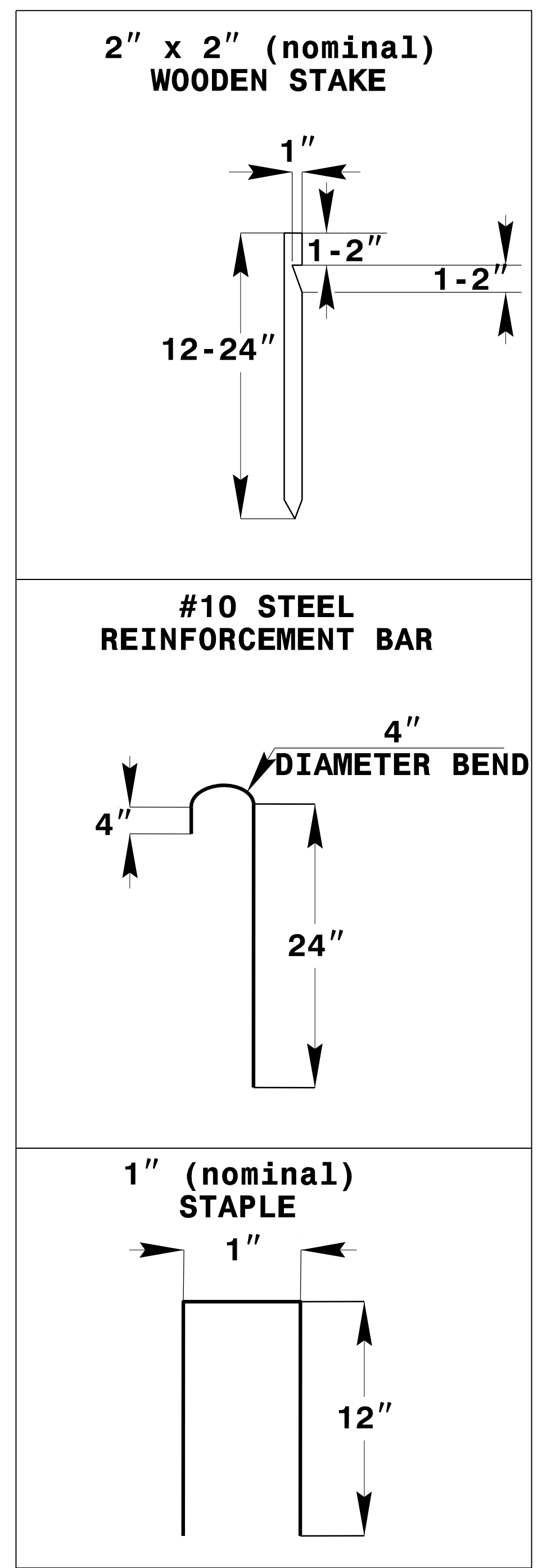
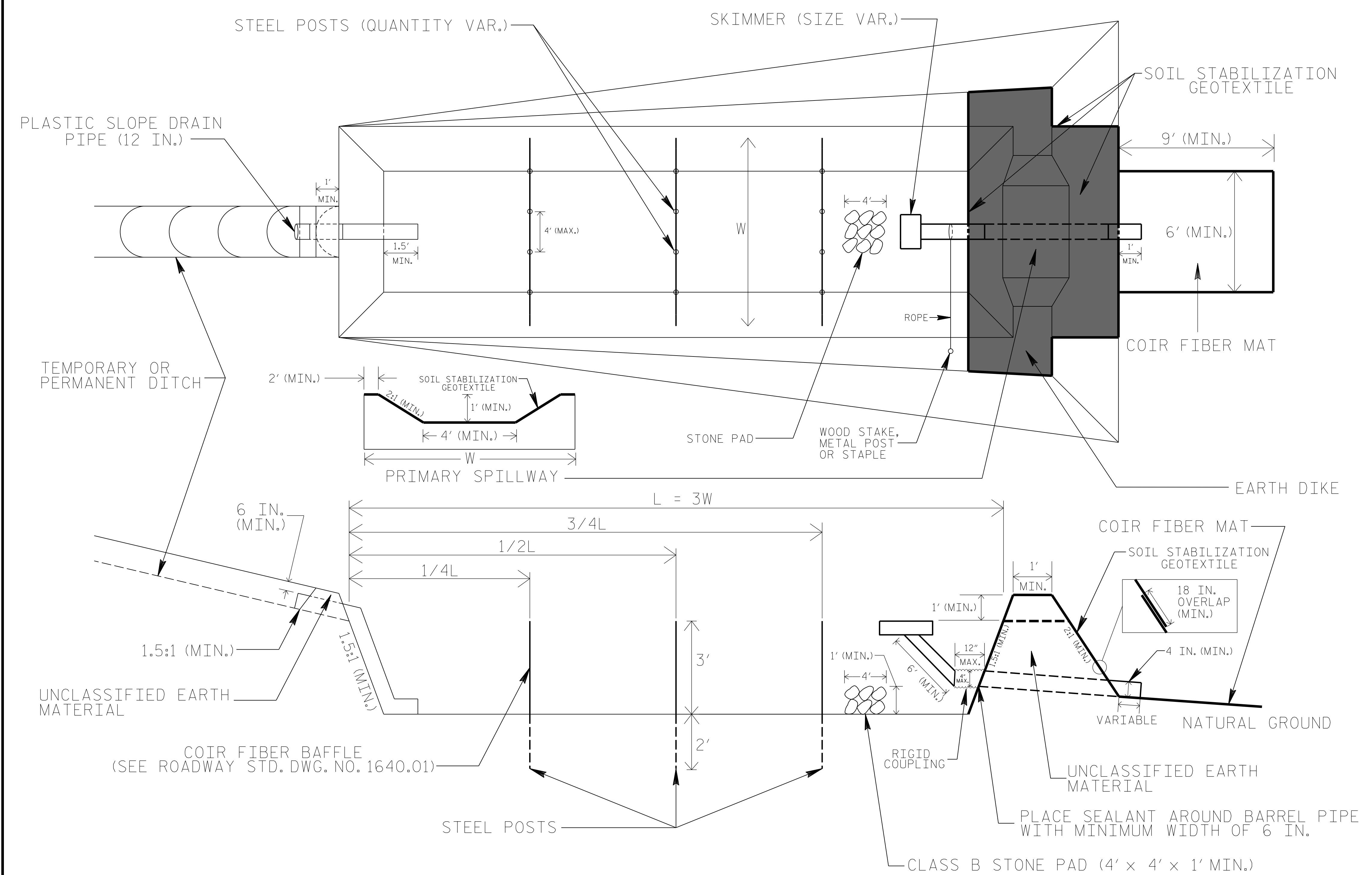
- USE MINIMUM 12 IN. DIAMETER COIR FIBER (COCONUT FIBER) WATTLE.
- USE 2 FT. WOODEN STAKES WITH A 2 IN. BY 2 IN. NOMINAL CROSS SECTION.
- ONLY INSTALL WATTLE(S) TO A HEIGHT IN DITCH SO FLOW WILL NOT WASH AROUND WATTLE AND SCOUR DITCH SLOPES AND AS DIRECTED.
- INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO BOTTOM OF DITCH.
- PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12" IN LENGTH.
- INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.
- INSTALL MATTING IN ACCORDANCE WITH SECTION 1631 OF THE STANDARD SPECIFICATIONS.
- PRIOR TO POLYACRYLAMIDE (PAM) APPLICATION, OBTAIN A SOIL SAMPLE FROM PROJECT LOCATION, AND FROM OFFSITE MATERIAL, AND ANALYZE FOR APPROPRIATE PAM FLOCCULANT TO BE APPLIED TO EACH WATTLE.
- INITIALLY APPLY 2 OUNCES OF ANIONIC OR NEUTRALLY CHARGED PAM OVER WATTLE WHERE WATER WILL FLOW AND 1 OUNCE OF PAM ON EACH SIDE OF WATTLE. REAPPLY PAM AFTER EVERY RAINFALL EVENT THAT IS EQUAL TO OR EXCEEDS 0.50 IN.





PROJECT REFERENCE NO. 1-5711	SHEET NO. EC-2B
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

# SKIMMER BASIN WITH BAFFLES DETAIL



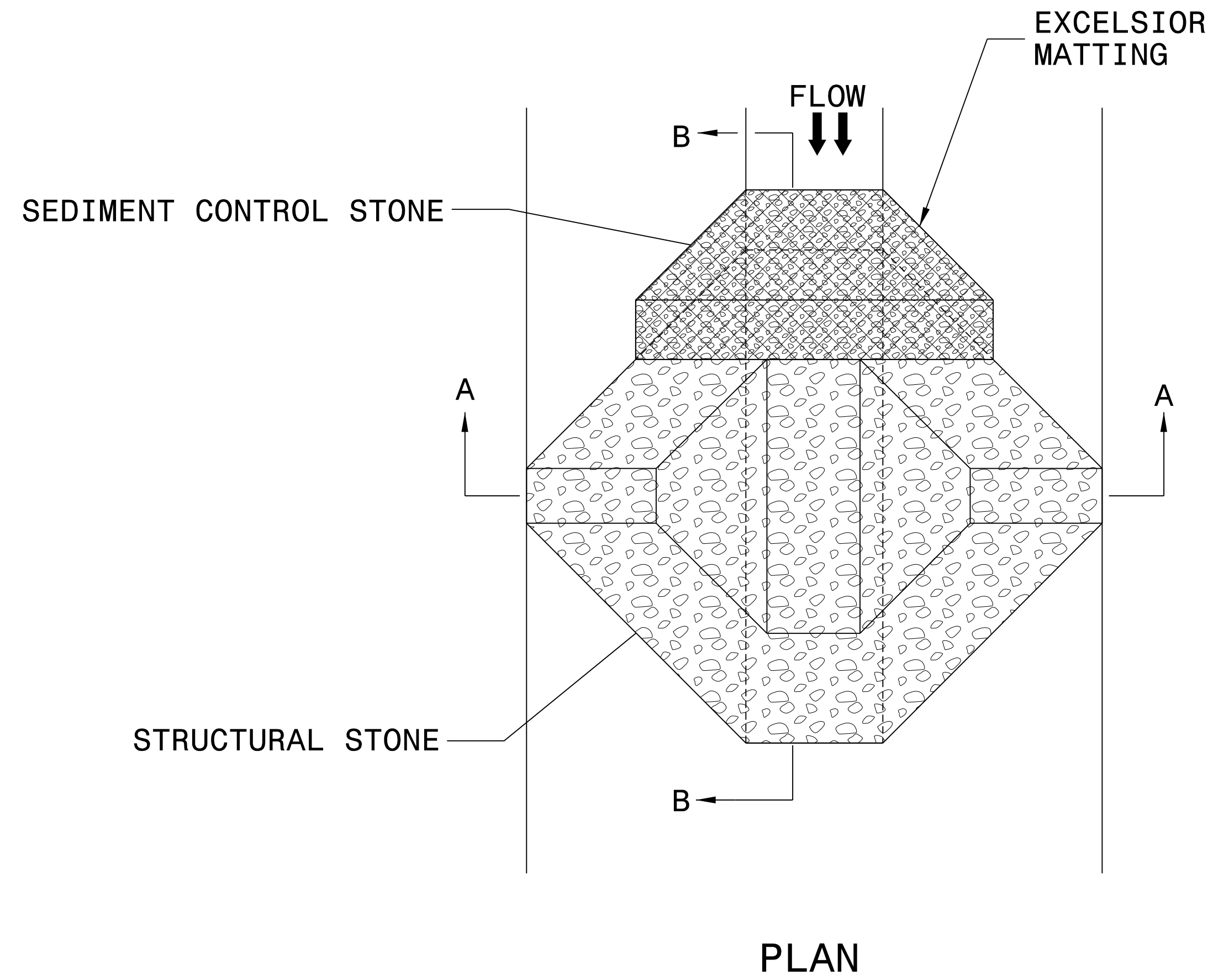
## NOTES

1. SEED AND PLACE MATTING FOR EROSION CONTROL ON INTERIOR AND EXTERIOR SIDESLOPES.
2. LIMIT EARTH DIKE HEIGHT TO 5 FT.
3. FOR BASIN DEPTH OF 3 FT., THE MINIMUM BASIN WIDTH SHALL BE 9 FT.
4. DETERMINE PRIMARY SPILLWAY WEIR LENGTH (FT.) USING  $Q/0.8$ , WHERE Q IS FLOW RATE (CFS) INTO BASIN.
5. PLASTIC SLOPE DRAIN PIPE AT INLET OF BASIN MAY BE REPLACED BY FILTRATION GEOTEXTILE OR TARP AS DIRECTED.
6. SOIL STABILIZATION GEOTEXTILE FOR PRIMARY SPILLWAY SHALL BE ONE CONTINUOUS PIECE OF MATERIAL OR OVERLAPPED 18 IN. (MIN.).

NOT TO SCALE

PROJECT REFERENCE NO. 1-5711	SHEET NO. EC-2A
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

# TEMPORARY ROCK SILT CHECK TYPE 'A' WITH EXCELSIOR MATTING AND POLYACRYLAMIDE (PAM)



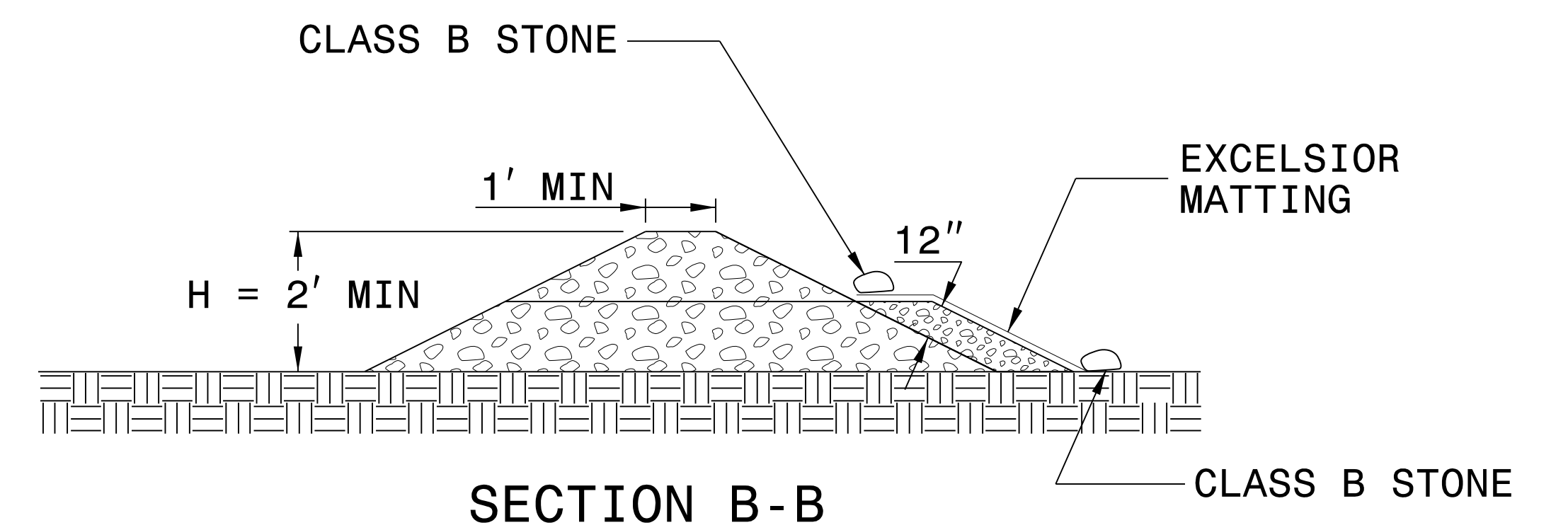
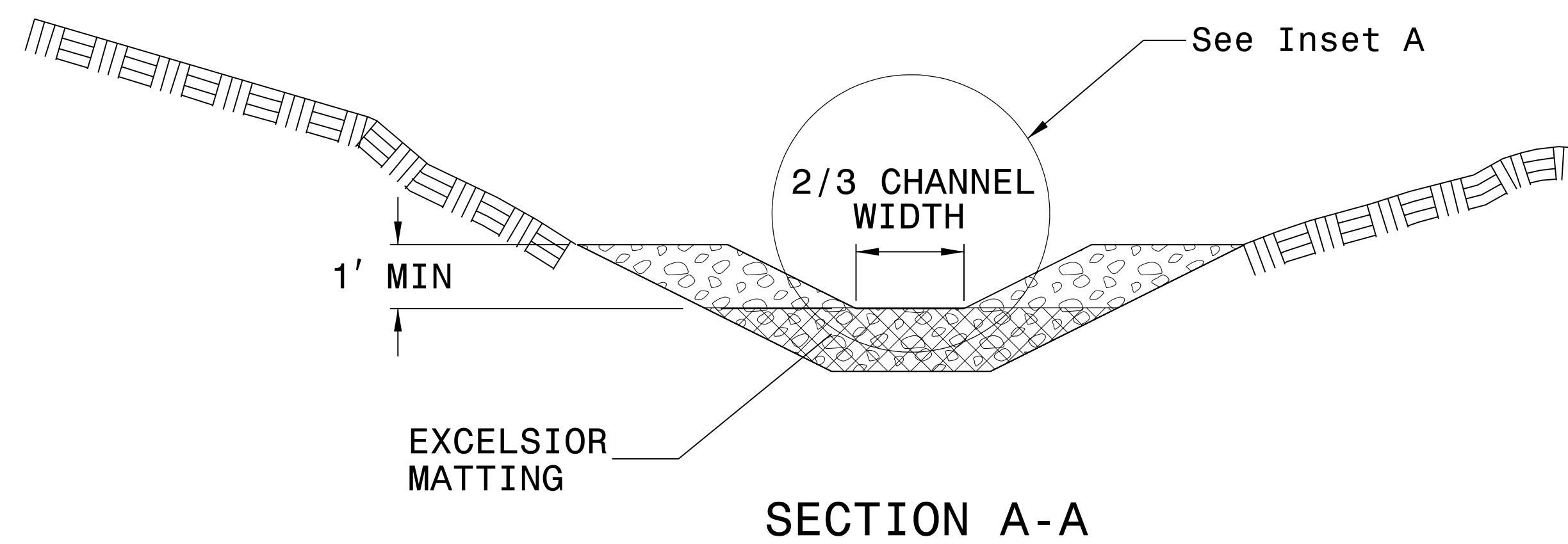
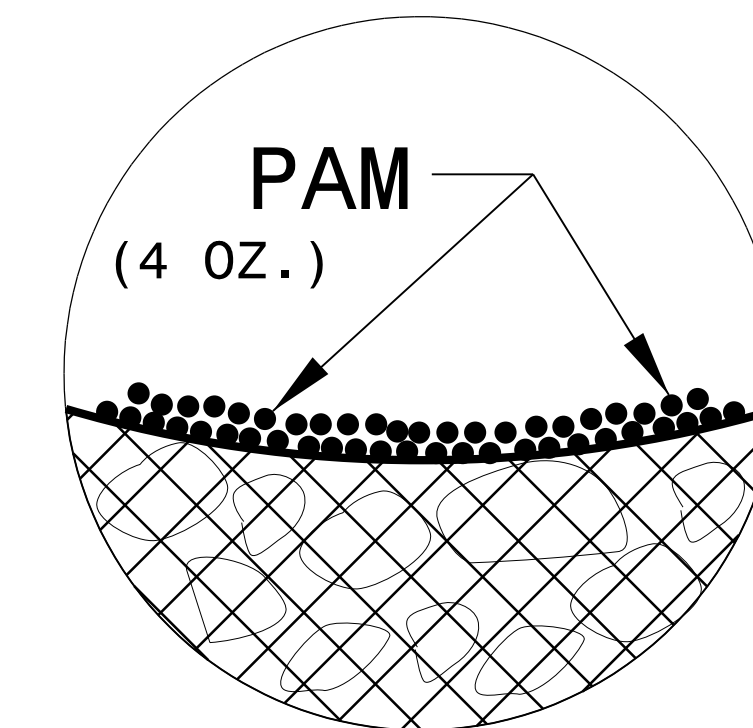
## NOTES:

INSTALL TEMPORARY ROCK SILT CHECK TYPE A IN ACCORDANCE WITH ROADWAY STANDARD DRAWING NO. 1633.01.

USE EXCELSIOR FOR MATTING MATERIAL AND ANCHOR MATTING SECTION AT TOP AND BOTTOM WITH CLASS B STONE.

PRIOR TO POLYACRYLAMIDE (PAM) APPLICATION, OBTAIN A SOIL SAMPLE FROM PROJECT LOCATION, AND FROM OFFSITE MATERIAL, AND ANALYZE FOR APPROPRIATE PAM FLOCCULANT TO BE APPLIED TO EACH ROCK SILT CHECK.

INITIALLY APPLY 4 OUNCES OF POLYACRYLAMIDE (PAM) TO TOP OF MATTING SECTION AND AFTER EVERY RAINFALL EVENT THAT EQUALS OR EXCEEDS 0.50 INCHES.



NOT TO SCALE

DIVISION OF HIGHWAYS  
STATE OF NORTH CAROLINA

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PROJECT REFERENCE NO. <i>1-5711</i>	SHEET NO. <i>EC-3A</i>
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

# ***SOIL STABILIZATION TIMEFRAMES***

<i>SITE DESCRIPTION</i>	<i>STABILIZATION TIME</i>	<i>TIMEFRAME EXCEPTIONS</i>
PERIMETER DIKES, SWALES, DITCHES AND SLOPES	7 DAYS	NONE
HIGH QUALITY WATER (HQW) ZONES	7 DAYS	NONE
SLOPES STEEPER THAN 3:1	7 DAYS	IF SLOPES ARE 10' OR LESS IN LENGTH AND ARE NOT STEEPER THAN 2:1, 14 DAYS ARE ALLOWED.
SLOPES 3:1 OR FLATTER	14 DAYS	7 DAYS FOR SLOPES GREATER THAN 50' IN LENGTH.
ALL OTHER AREAS WITH SLOPES FLATTER THAN 4:1	14 DAYS	NONE, EXCEPT FOR PERIMETERS AND HQW ZONES.

CLEARING AND GRUBBING  
EROSION CONTROL FOR  
CONSTRUCTION SHEET 4

NOTE:  
PLACE TEMPORARY ROCK SEDIMENT DAMS TYPE - B  
AND TEMPORARY ROCK SILT CHECKS TYPE - A AT  
DRAINAGE OUTLETS.

NOTE:  
UTILIZE FABRIC INSERT INLET PROTECTION  
DEVICES IN LIEU OF ROCK INLET SEDIMENT  
TRAPS, TYPE C TO AVOID IMPOUNDMENT  
OF WATER IN ROADWAY OPEN TO TRAFFIC

-L-  
PI Sta 19+55.91  
 $\Delta = 5' 55' 08.8''$  (LT)  
 $D = 1' 29' 59.6''$   
 $L = 394.64'$   
 $T = 197.49'$   
 $R = 3,820.00'$   
 $e = 3\%$  (Exist)  
 $R.O. = 265' (53' Inc)$

# LOCHNER

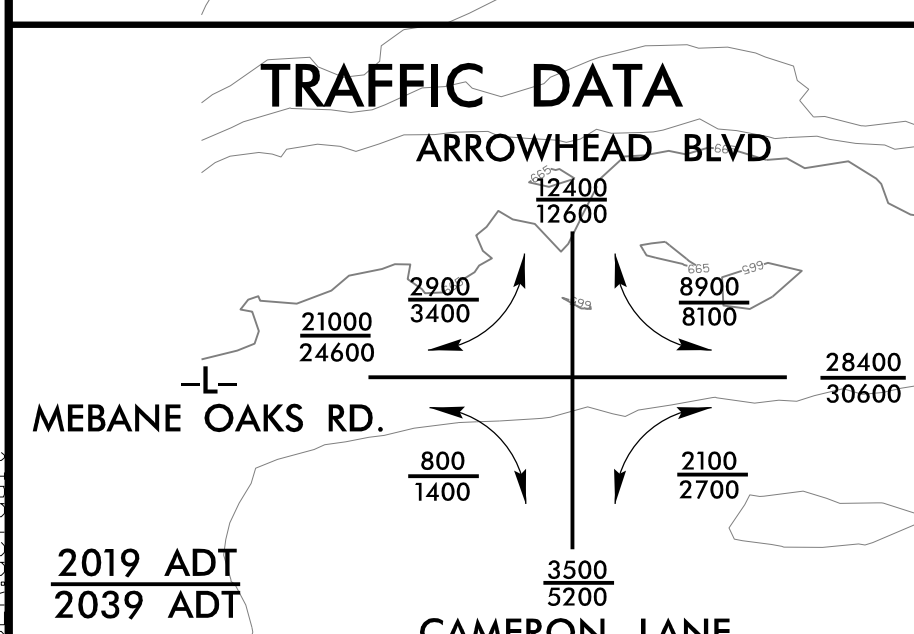
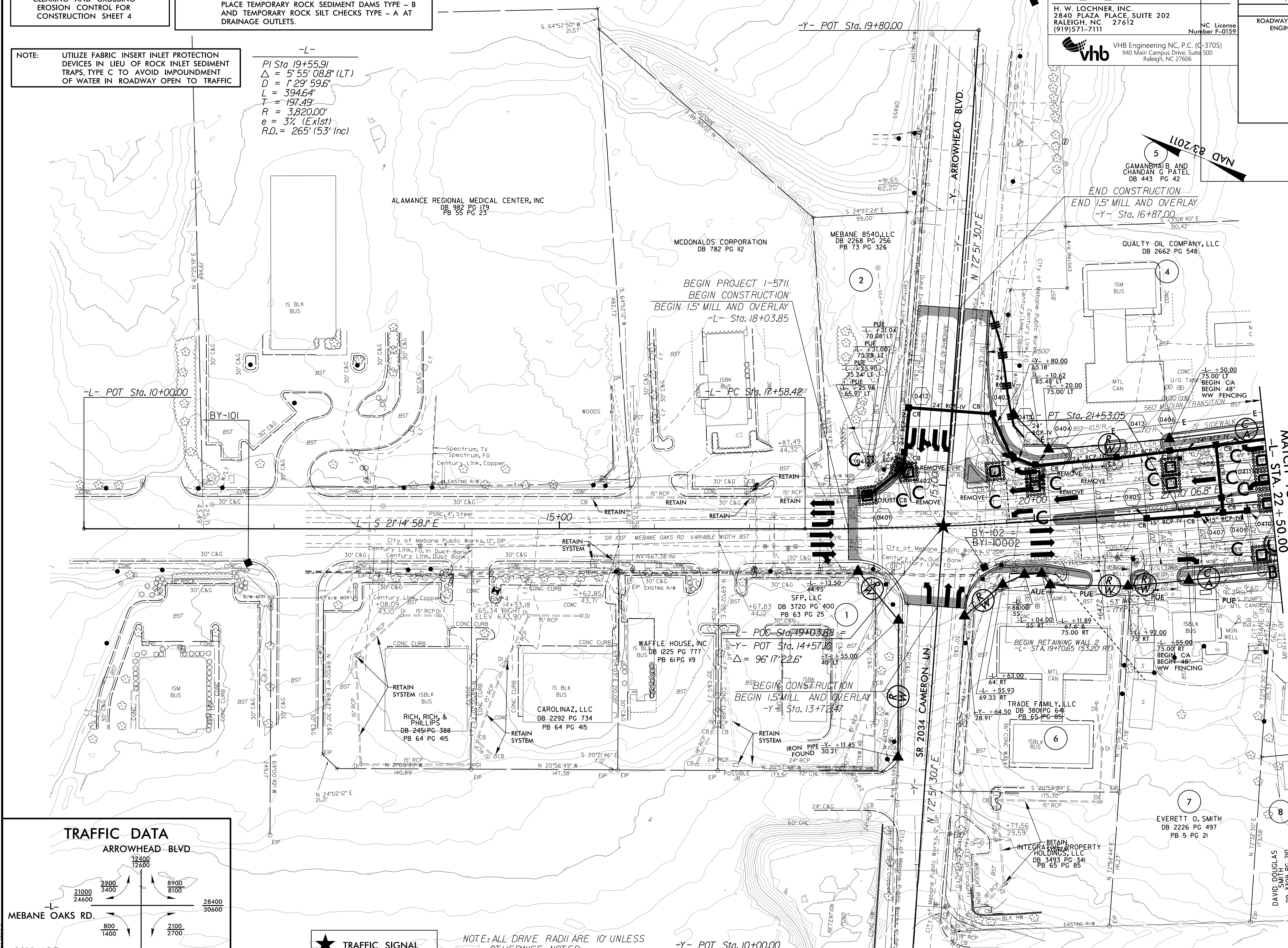
H. W. LOCHNER, INC.  
2840 PLAZA PLACE, SUITE 202  
RALEIGH, NC 27612  
(919) 571-7111

NC License  
Number E-0159



VHB Engineering NC, P.C. (C-3705)  
940 Main Campus Drive, Suite 500  
Raleigh, NC 27606

PROJECT REFERENCE NO. I-5711	SHEET NO. EC-04/CONST.04
R/W SHEET NO.	HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER	



NOTE: ALL DRIVE RADII ARE 10' UNLESS OTHERWISE NOTED.

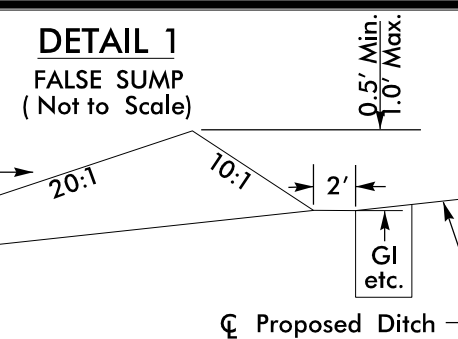
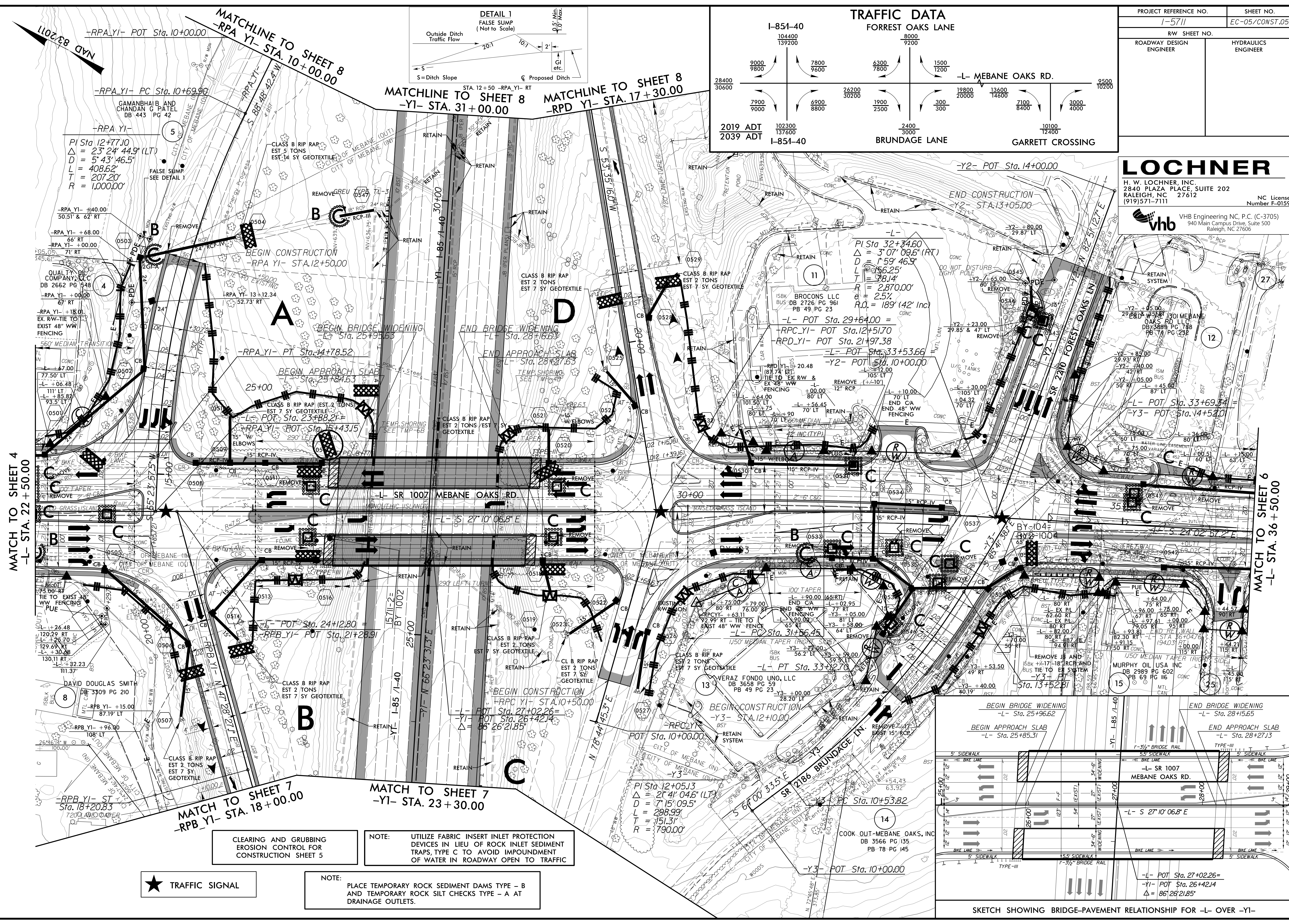
MATCH TO SHEET 5  
-L- STA 22 + 50.00

5  
CAMANATHAB AND  
CHANDAN G PATEL  
DB 443 PG 42  
END CONSTRUCTION  
END 1.5" MILL AND OVERLAY  
-Y- Sta. 16+87.00

BEGIN PROJECT I-5711  
BEGIN CONSTRUCTION  
BEGIN 1.5" MILL AND OVERLAY  
-L- Sta. 18+03.85

POS Sta. 19+03.88  
-Y- POT Sta. 14+57.18  
 $\Delta = 96' 17' 22.6''$   
-Y- Sta. 13+72.77  
BEGIN CONSTRUCTION  
BEGIN 1.5" MILL AND OVERLAY

-Y- POT Sta. 10+00.00



**TRAFFIC DATA**  
**FORREST OAKS LANE**

I-851-40		8000 9200		-L- MEBANE OAKS RD.		9500 10200	
9000 9800	7800 9600	6300 7800	1500 1200	19800 20000	13600 14600	7100 8400	3000 4000
28400 30600	102300 137600	26200 30200	2400 3000	2400 3000	10100 12400		
2019 ADT		I-851-40		BRUNDAGE LANE		GARRETT CROSSING	
2039 ADT							

PROJECT REFERENCE NO. I-5711		SHEET NO. EC-05/CONST.05	
RW SHEET NO.		HYDRAULICS ENGINEER	
ROADWAY DESIGN ENGINEER			

**LOCHNER**  
 H. W. LOCHNER, INC.  
 2840 PLAZA PLACE, SUITE 202  
 RALEIGH, NC 27612  
 (919) 571-7111  
 NC License Number F-0159

**vhb** VHB Engineering NC, P.C. (C-3705)  
 940 Main Campus Drive, Suite 500  
 Raleigh, NC 27606

MATCH TO SHEET 4  
-L- STA. 22 + 50.00

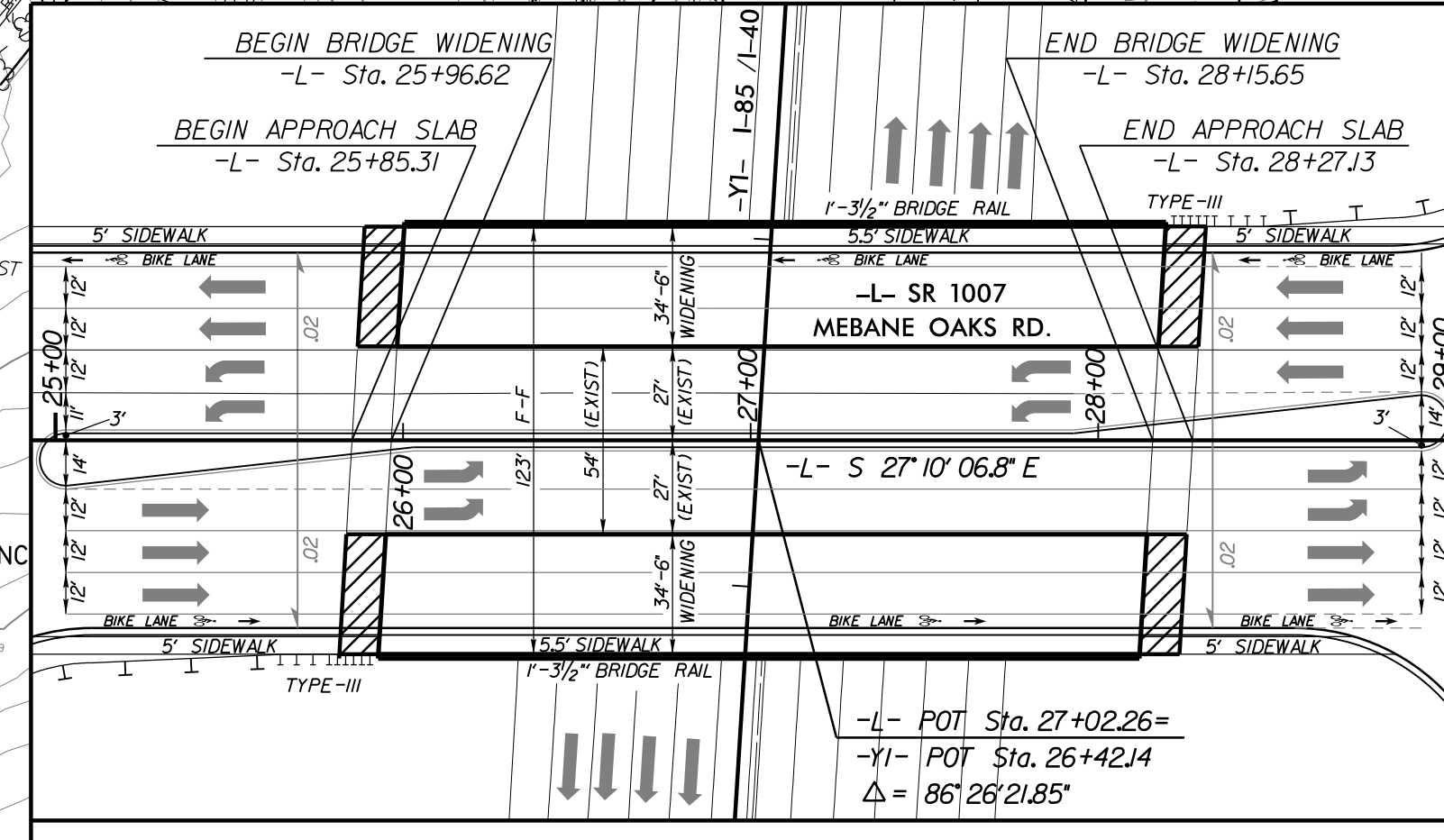
MATCH TO SHEET 6  
-L- STA. 36 + 50.00

CLEARING AND GRUBBING EROSION CONTROL FOR CONSTRUCTION SHEET 5

NOTE: UTILIZE FABRIC INSERT INLET PROTECTION DEVICES IN LIEU OF ROCK INLET SEDIMENT TRAPS, TYPE C TO AVOID IMPOUNDMENT OF WATER IN ROADWAY OPEN TO TRAFFIC

★ TRAFFIC SIGNAL

NOTE: PLACE TEMPORARY ROCK SEDIMENT DAMS TYPE - B AND TEMPORARY ROCK SILT CHECKS TYPE - A AT DRAINAGE OUTLETS.





8/17/99

CLEARING AND GRUBBING  
EROSION CONTROL FOR  
CONSTRUCTION SHEET 6

NOTE:  
PLACE TEMPORARY ROCK SEDIMENT DAMS TYPE - B  
AND TEMPORARY ROCK SILT CHECKS TYPE - A AT  
DRAINAGE OUTLETS.

NOTE:  
UTILIZE FABRIC INSERT INLET PROTECTION  
DEVICES IN LIEU OF ROCK INLET SEDIMENT  
TRAPS, TYPE C TO AVOID IMPOUNDMENT  
OF WATER IN ROADWAY OPEN TO TRAFFIC

$P\ Sta\ 38+23.80$   
 $\Delta = 2^{\circ}03'23.8'' (LT)$   
 $D = 2^{\circ}59'59.2''$   
 $L = 68.56'$   
 $T = 34.28'$   
 $R = 190.00'$   
 $e = NC (Exist)$

$P\ Sta\ 45+57.27$   
 $\Delta = 6^{\circ}42'41.3'' (RT)$   
 $D = 2^{\circ}29'28.0''$   
 $L = 269.42'$   
 $T = 134.86'$   
 $R = 2,300.00'$   
 $e = 6\% (Exist)$

$-Y4A-$   
 $P\ Sta\ 13+24.59$   
 $\Delta = 35^{\circ}09'38.4'' (LT)$   
 $D = 38^{\circ}11'49.9''$   
 $L = 92.05'$   
 $T = 47.53'$   
 $R = 150.00'$

# LOCHNER

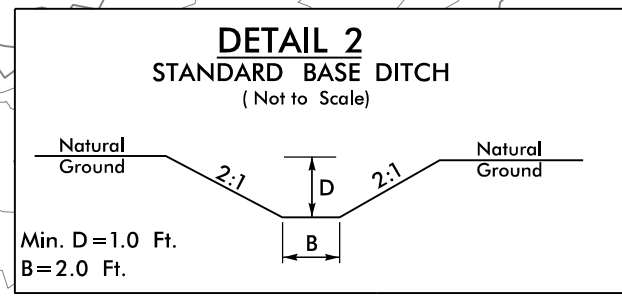
H. W. LOCHNER, INC.  
2840 PLAZA PLACE, SUITE 202  
RALEIGH, NC 27612  
(919) 571-7111

NC License  
Number E-0159



VHB Engineering NC, P.C. (C-3705)  
940 Main Campus Drive, Suite 500  
Raleigh, NC 27606

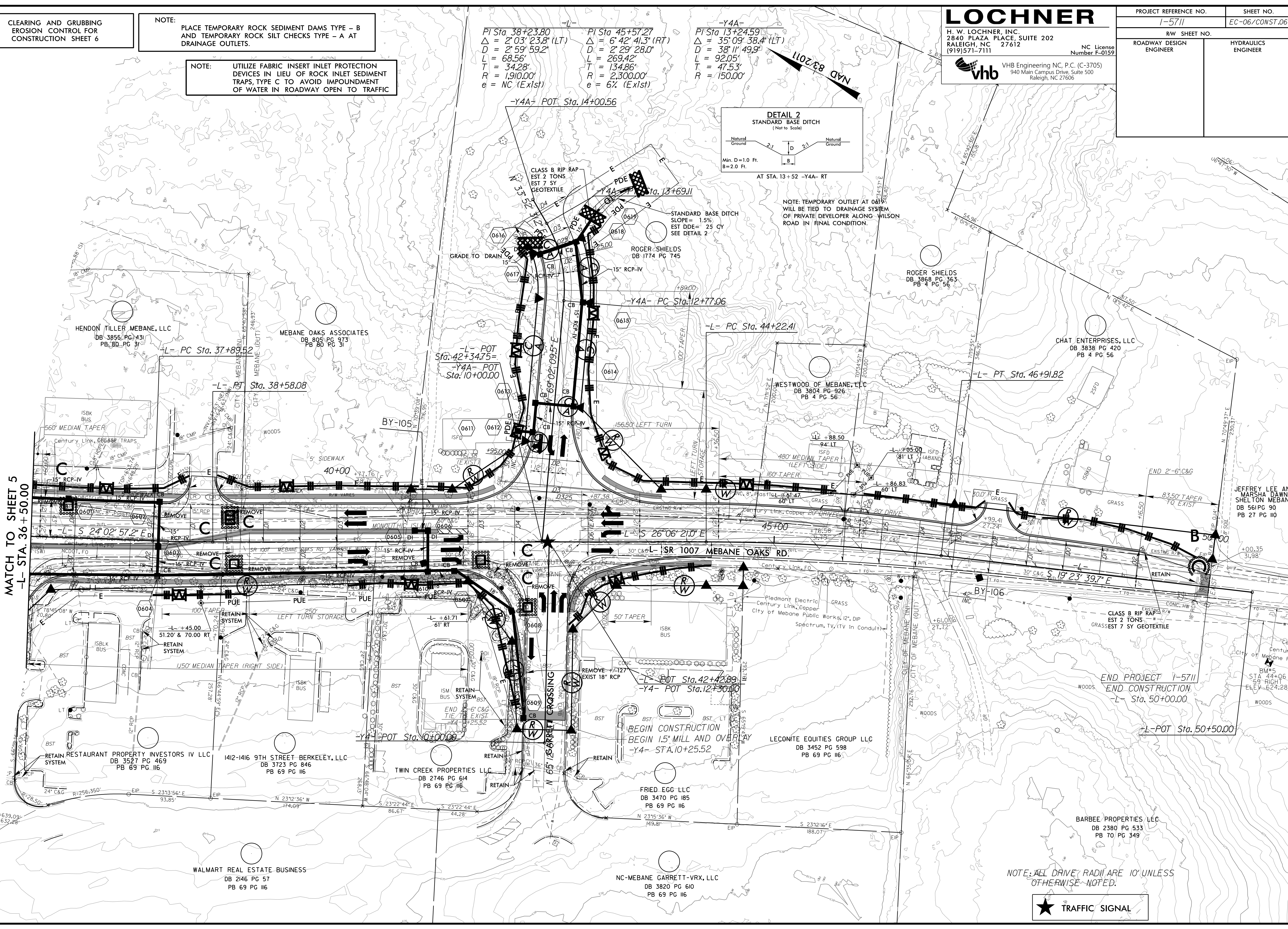
PROJECT REFERENCE NO. I-5711	SHEET NO. EC-06/CONST.06
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER



NOTE: TEMPORARY OUTLET AT 0615  
WILL BE TIED TO DRAINAGE SYSTEM  
OF PRIVATE DEVELOPER ALONG WILSON  
ROAD IN FINAL CONDITION.

MATCH TO SHEET 5  
-L- STA. 36+50.00

12/16/2020  
T:\Projects\I-5711\REV. CG.PSH06.dgn  
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NOTE: ALL DRIVE RADII ARE 10' UNLESS  
OTHERWISE NOTED.



TRAFFIC SIGNAL

8/17/99

CLEARING AND GRUBBING  
EROSION CONTROL FOR  
CONSTRUCTION SHEET 7

NOTE:  
PLACE TEMPORARY ROCK SEDIMENT DAMS TYPE - B  
AND TEMPORARY ROCK SILT CHECKS TYPE - A AT  
DRAINAGE OUTLETS.

NOTE:  
UTILIZE FABRIC INSERT INLET PROTECTION  
DEVICES IN LIEU OF ROCK INLET SEDIMENT  
TRAPS, TYPE C TO AVOID IMPOUNDMENT  
OF WATER IN ROADWAY OPEN TO TRAFFIC

# LOCHNER

H. W. LOCHNER, INC.  
2840 PLAZA PLACE, SUITE 202  
RALEIGH, NC 27612  
(919)571-7111

NC License  
Number E-0159



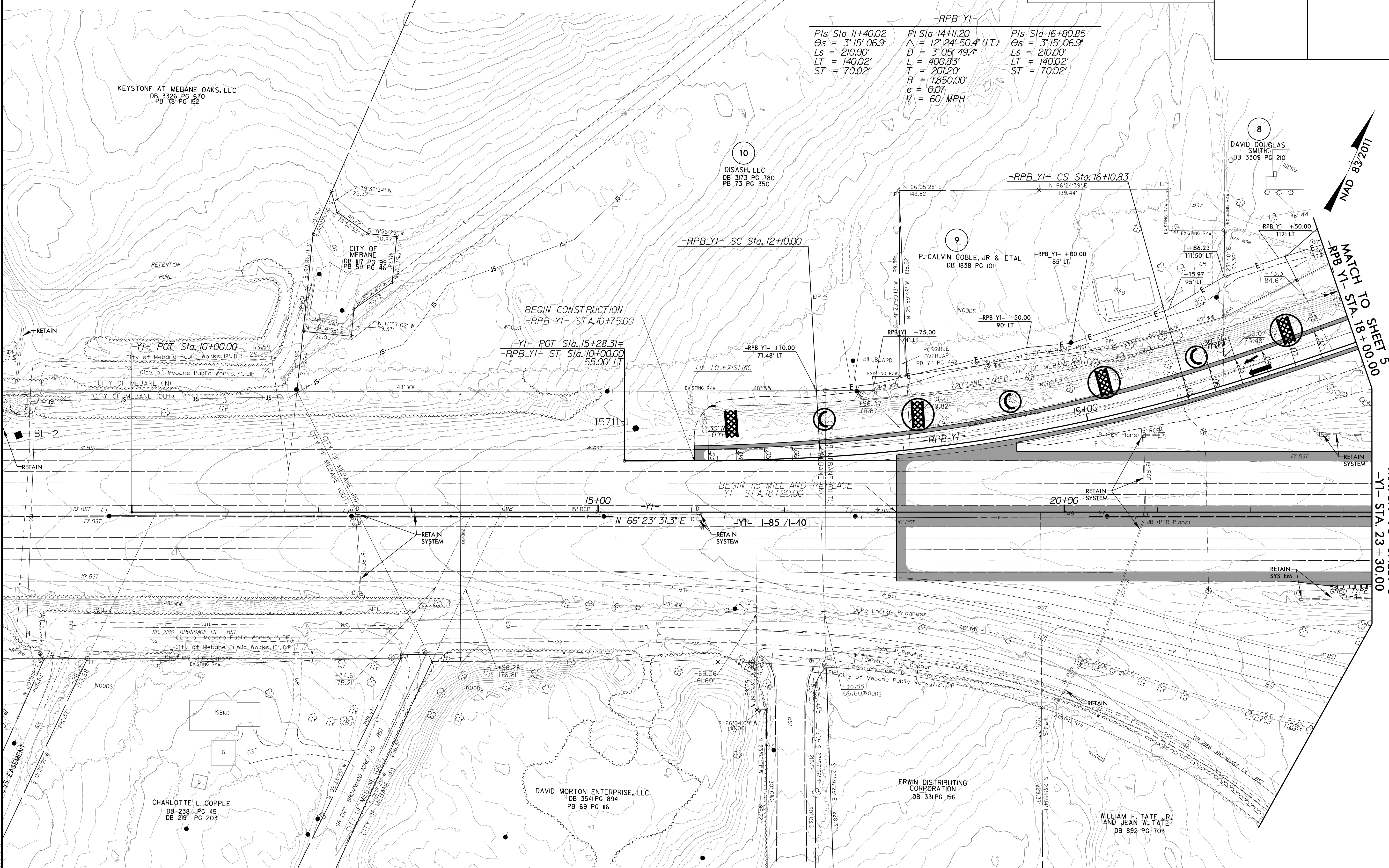
VHB Engineering NC, P.C. (C-3705)  
940 Main Campus Drive, Suite 500  
Raleigh, NC 27606

PROJECT REFERENCE NO. I-5711	SHEET NO. EC-07/CONST.07
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

-RPB YI-  
 PIs Sta 11+40.02  
 $\Delta s = 3'15'06.9"$   
 $L_s = 210.00'$   
 $LT = 140.02'$   
 $ST = 70.02'$

Pi Sta 14+11.20  
 $\Delta = 12'24'50.4" (LT)$   
 $D = 3'05'49.4"$   
 $L = 400.83'$   
 $T = 201.20'$   
 $R = 1,850.00'$   
 $e = 0.07'$   
 $V = 60 MPH$

Pi Sta 16+80.85  
 $\Delta s = 3'15'06.9"$   
 $L_s = 210.00'$   
 $LT = 140.02'$   
 $ST = 70.02'$



NOTE: ALL DRIVE RADII ARE 10' UNLESS OTHERWISE NOTED.

12/16/2020  
I:\5711\I-5711.REU.CG.PSH07.dgn  
HSE

NOTE: UTILIZE FABRIC INSERT INLET PROTECTION DEVICES IN LIEU OF ROCK INLET SEDIMENT TRAPS, TYPE C TO AVOID IMPOUNDMENT OF WATER IN ROADWAY OPEN TO TRAFFIC

CLEARING AND GRUBBING EROSION CONTROL FOR CONSTRUCTION SHEET 8

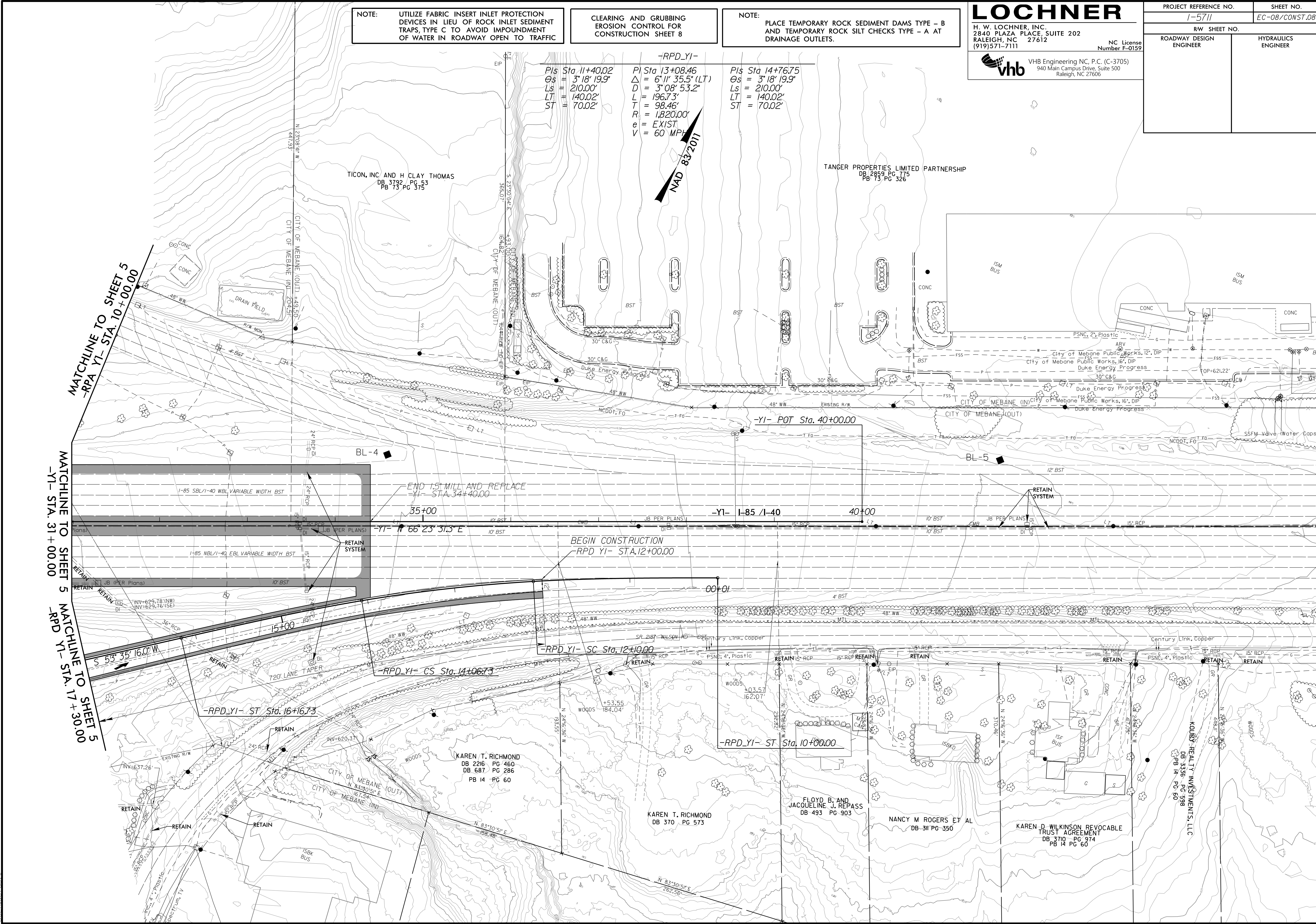
NOTE: PLACE TEMPORARY ROCK SEDIMENT DAMS TYPE - B AND TEMPORARY ROCK SILT CHECKS TYPE - A AT DRAINAGE OUTLETS.

**LOCHNER**  
 H. W. LOCHNER, INC.  
 2840 PLAZA PLACE, SUITE 202  
 RALEIGH, NC 27612  
 (919) 571-7111

NC License  
 Number F-0159

**vhb**  
 VHB Engineering NC, P.C. (C-3705)  
 940 Main Campus Drive, Suite 500  
 Raleigh, NC 27606

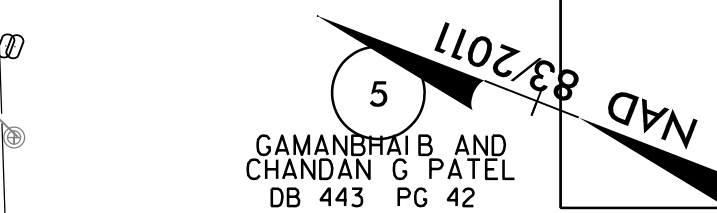
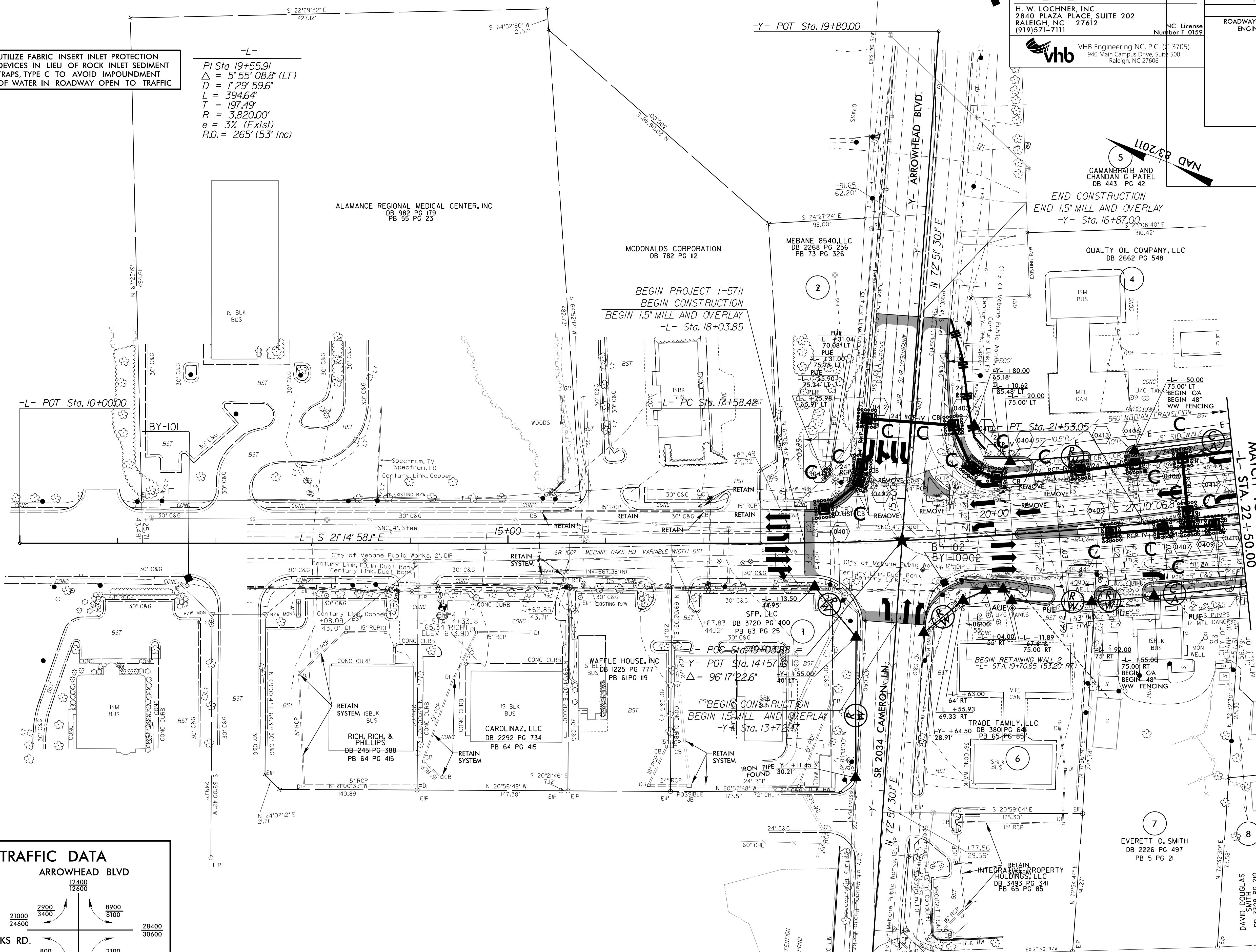
PROJECT REFERENCE NO. 1-5711	SHEET NO. EC-08/CONST.08
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER



PROJECT REFERENCE NO. I-5711		SHEET NO. EC-09/CONST.04	
RW SHEET NO.		HYDRAULICS ENGINEER	
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	

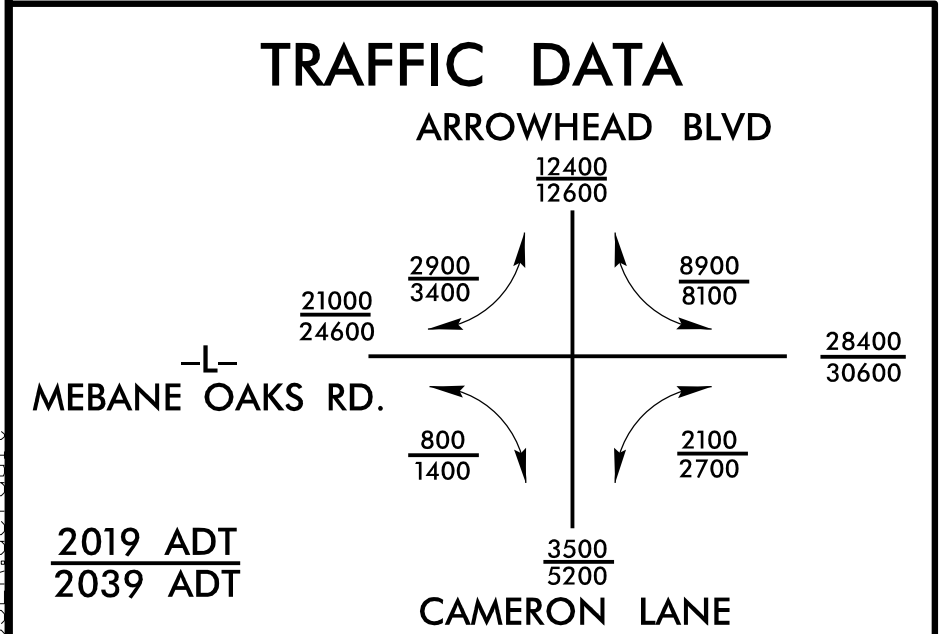
NOTE: UTILIZE FABRIC INSERT INLET PROTECTION DEVICES IN LIEU OF ROCK INLET SEDIMENT TRAPS, TYPE C TO AVOID IMPOUNDMENT OF WATER IN ROADWAY OPEN TO TRAFFIC

-L-  
PI Sta 19+55.91  
 $\Delta = 5' 55'' 08.8'' (LT)$   
 $D = 1' 29'' 59.6''$   
 $L = 394.64'$   
 $T = 197.49'$   
 $R = 3,820.00'$   
 $e = 3\% (Exist)$   
 $R.O. = 265' (53' Inc)$



END CONSTRUCTION  
END 1.5" MILL AND OVERLAY  
-Y- Sta. 16+87.00

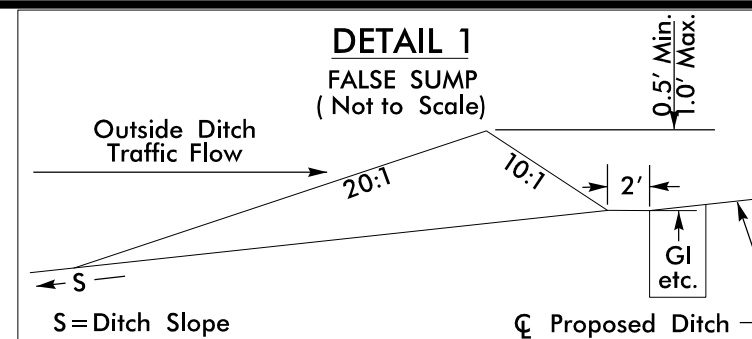
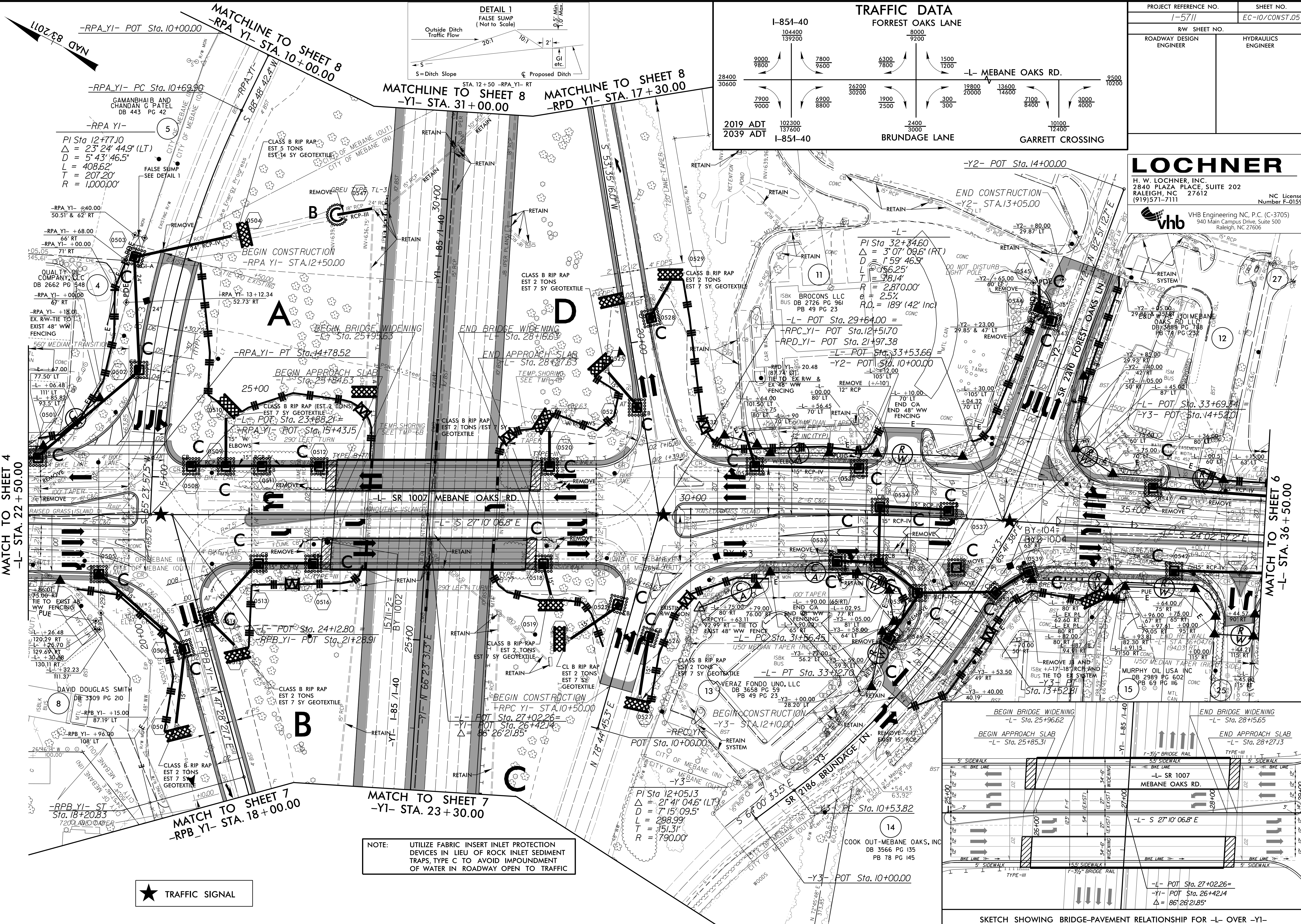
MATCH TO SHEET 5  
-L- STA. 22 + 50.00



★ TRAFFIC SIGNAL

NOTE: ALL DRIVE RADII ARE 10' UNLESS OTHERWISE NOTED.

-Y- POT Sta. 10+00.00



TRAFFIC DATA			
FORREST OAKS LANE			
I-851-40	104400	139200	
	9000	7800	6300
	9800	9600	7800
	28400	30600	
2019 ADT	102300	137600	
2039 ADT	1851-40		
BRUNDAGE LANE		GARRETT CROSSING	
	26200	30200	1900
	2600	3000	2400
	19800	20000	13600
	1500	1200	1500
	300	300	7100
			8400
			10100
			12400
			9500
			10200

PROJECT REFERENCE NO.	SHEET NO.
I-5711	EC-10/CONST.05
RW SHEET NO.	HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER	

**LOCHNER**  
 H. W. LOCHNER, INC.  
 2840 PLAZA PLACE, SUITE 202  
 RALEIGH, NC 27612  
 (919) 571-7111  
 NC License Number F-0159

**vhb** VHB Engineering NC, P.C. (C-3705)  
 940 Main Campus Drive, Suite 500  
 Raleigh, NC 27606

MATCH TO SHEET 4  
-L- STA. 22 + 50.00

MATCH TO SHEET 6  
-L- STA. 36 + 50.00

-RPA Y1- POT Sta. 10+00.00  
 -RPA Y1- PC Sta. 10+69.90  
 GAMANBHAI B AND CHANDAN G PATEL DB 443 PG 42  
 -RPA Y1-  
 $PI Sta 12+77.00$   
 $\Delta = 23' 24' 44.9"$  (LT)  
 $D = 5' 43' 46.5"$   
 $L = 408.62'$   
 $T = 207.20'$   
 $R = 1,000.00'$

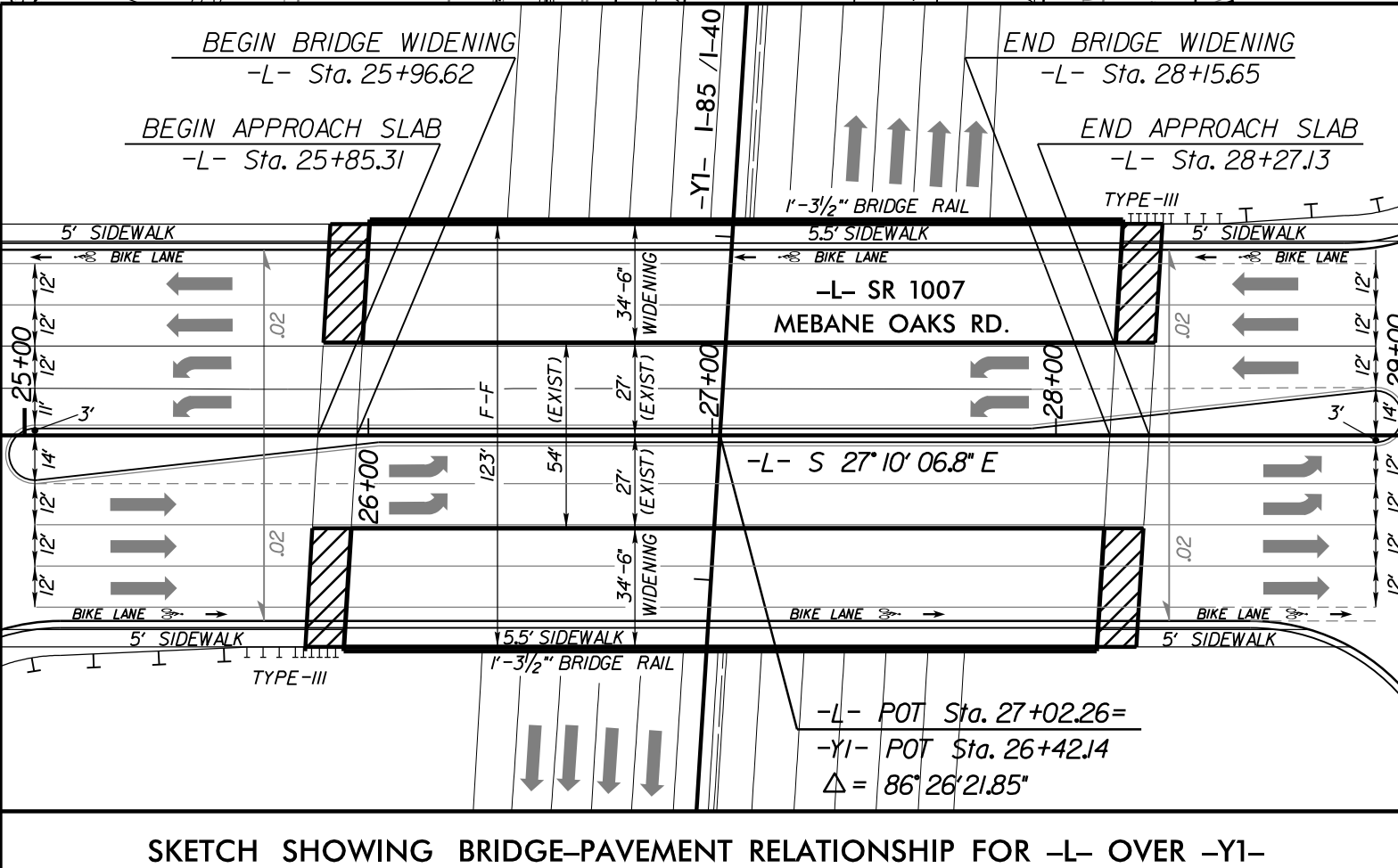
MATCHLINE TO SHEET 8  
-Y1- STA. 31 + 00.00

MATCHLINE TO SHEET 8  
-RPD Y1- STA. 17 + 30.00

MATCH TO SHEET 7  
-RPB Y1- STA. 18 + 00.00

MATCH TO SHEET 7  
-Y1- STA. 23 + 30.00

NOTE: UTILIZE FABRIC INSERT INLET PROTECTION DEVICES IN LIEU OF ROCK INLET SEDIMENT TRAPS, TYPE C TO AVOID IMPOUNDMENT OF WATER IN ROADWAY OPEN TO TRAFFIC



8/17/99

# LOCHNER

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2840 PLAZA PLACE, SUITE 202  
RALEIGH, NC 27612  
(919) 571-7111

NC License  
Number E-0159

**vhb** VHB Engineering NC, P.C. (C-3705)  
940 Main Campus Drive, Suite 500  
Raleigh, NC 27606

PROJECT REFERENCE NO. I-5711	SHEET NO. EC-II/CONST.06
R/W SHEET NO.	HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER	

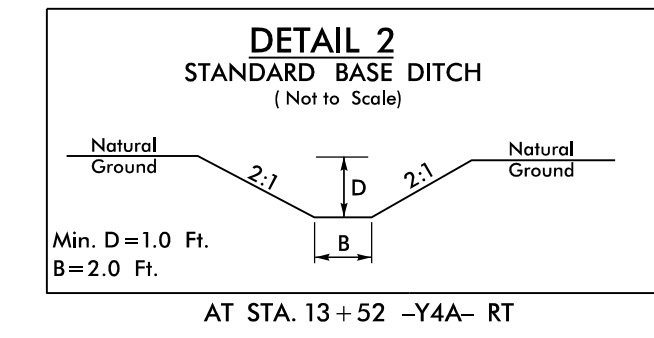
**NOTE:** UTILIZE FABRIC INSERT INLET PROTECTION DEVICES IN LIEU OF ROCK INLET SEDIMENT TRAPS, TYPE C TO AVOID IMPOUNDMENT OF WATER IN ROADWAY OPEN TO TRAFFIC

**-L-**  
 PI Sta 38+23.80  
 $\Delta = 2^{\circ}03'23.8"$  (LT)  
 $D = 2^{\circ}59'59.2"$   
 $L = 68.56'$   
 $T = 34.28'$   
 $R = 190.00'$   
 $e = NC$  (Exist)

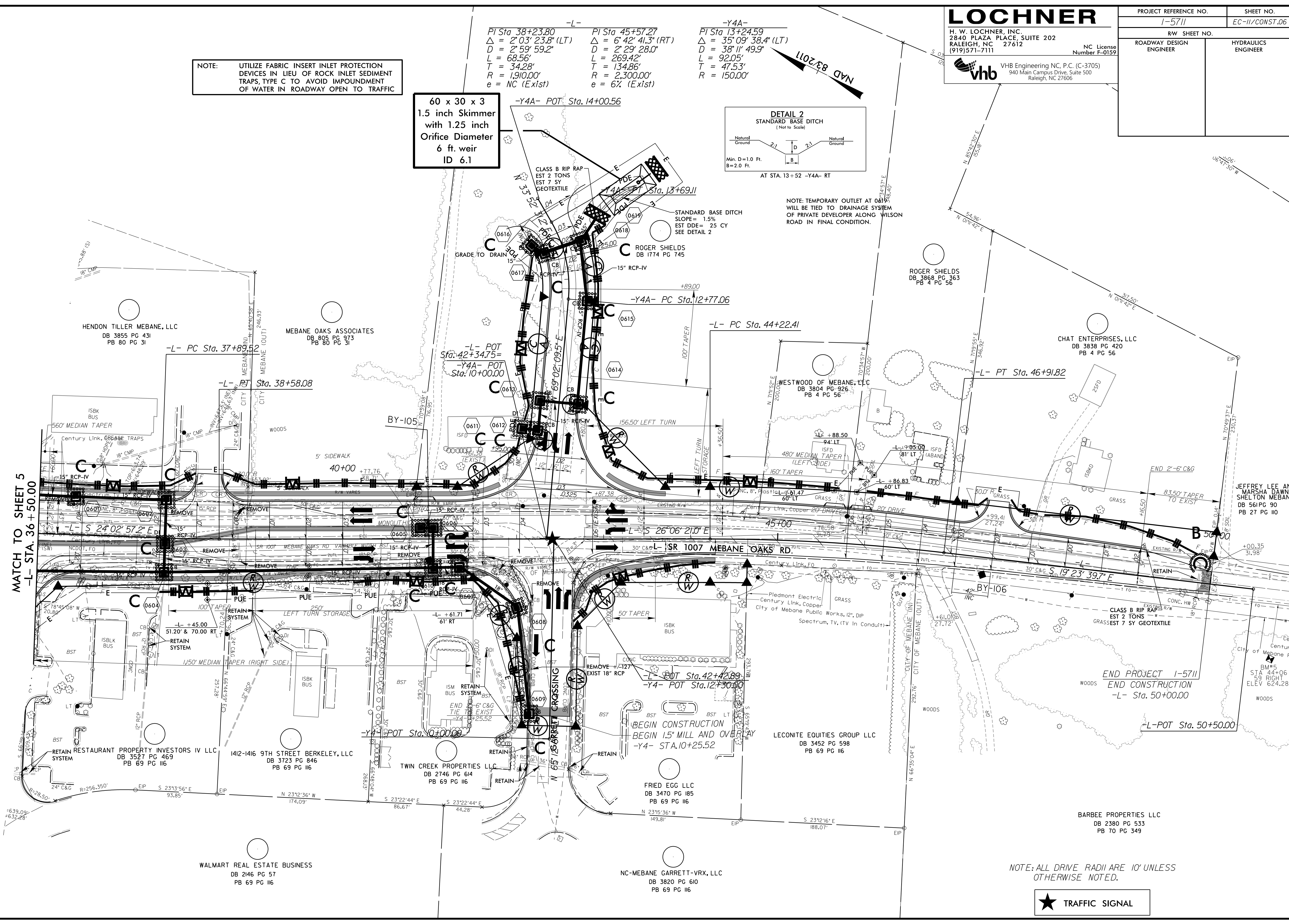
**-L-**  
 PI Sta 45+57.27  
 $\Delta = 6^{\circ}42'41.3"$  (RT)  
 $D = 2^{\circ}29'28.0"$   
 $L = 269.42'$   
 $T = 134.86'$   
 $R = 2,300.00'$   
 $e = 6\%$  (Exist)

**-Y4A-**  
 PI Sta 13+24.59  
 $\Delta = 35^{\circ}09'38.4"$  (LT)  
 $D = 38^{\circ}11'49.9"$   
 $L = 92.05'$   
 $T = 47.53'$   
 $R = 150.00'$

**60 x 30 x 3**  
**1.5 inch Skimmer**  
**with 1.25 inch**  
**Orifice Diameter**  
**6 ft. weir**  
**ID 6.1**



**NOTE:** TEMPORARY OUTLET AT 0615 WILL BE TIED TO DRAINAGE SYSTEM OF PRIVATE DEVELOPER ALONG WILSON ROAD IN FINAL CONDITION.



**MATCH TO SHEET 5**  
**-L- STA. 36+50.00**

**END PROJECT I-5711**  
**END CONSTRUCTION**  
**-L- Sta. 50+00.00**

**-L-POT Sta. 50+50.00**

**NOTE:** ALL DRIVE RADII ARE 10' UNLESS OTHERWISE NOTED.



12/16/2020  
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 PSH

8/17/99

NOTE: UTILIZE FABRIC INSERT INLET PROTECTION DEVICES IN LIEU OF ROCK INLET SEDIMENT TRAPS, TYPE C TO AVOID IMPOUNDMENT OF WATER IN ROADWAY OPEN TO TRAFFIC

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 H. W. LOCHNER, INC.  
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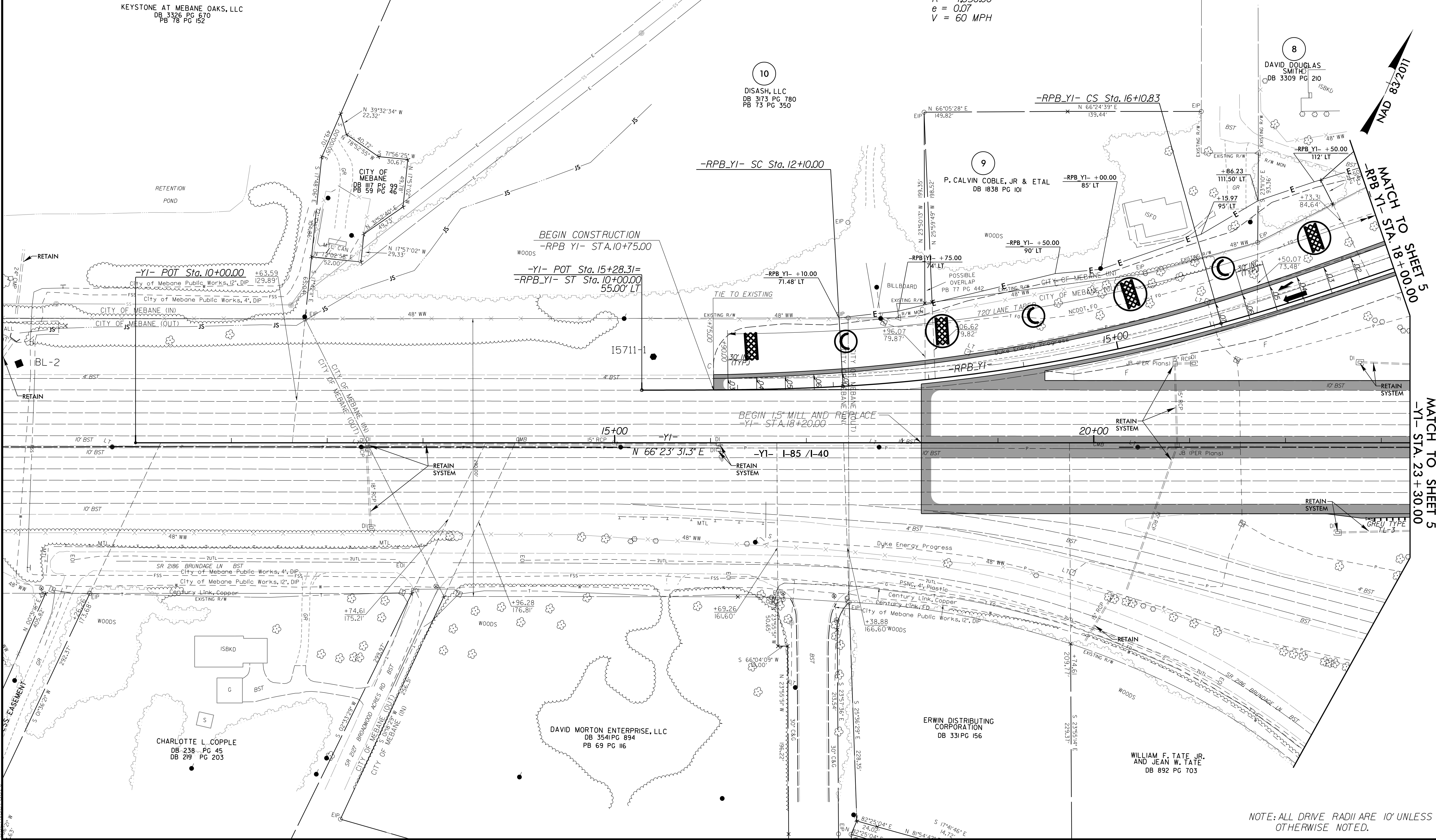
NC License Number F-0159

**vhb**  
 VHB Engineering NC, P.C. (C-3705)  
 940 Main Campus Drive, Suite 500  
 Raleigh, NC 27606

PROJECT REFERENCE NO. I-5711	SHEET NO. EC-12/CONST.07
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

-RPB YI-

Pls Sta 11+40.02 Θs = 3°15'06.9" Ls = 210.00' LT = 140.02' ST = 70.02'	Pl Sta 14+11.20 Δ = 12°24'50.4" (LT) D = 3°05'49.4" L = 400.83' T = 201.20' R = 1,850.00' e = 0.07 V = 60 MPH	Pls Sta 16+80.85 Θs = 3°15'06.9" Ls = 210.00' LT = 140.02' ST = 70.02'
--	--	--



12/16/2020  
I:\5711\REV.FINAL\_PSH07.dgn  
PSH07.dgn

MATCH TO SHEET 5  
 -YI- STA. 18+00.00  
 MATCH TO SHEET 5  
 -YI- STA. 23+30.00

NOTE: ALL DRIVE RADII ARE 10' UNLESS OTHERWISE NOTED.

NOTE: UTILIZE FABRIC INSERT INLET PROTECTION DEVICES IN LIEU OF ROCK INLET SEDIMENT TRAPS, TYPE C TO AVOID IMPOUNDMENT OF WATER IN ROADWAY OPEN TO TRAFFIC

# LOCHNER

H. W. LOCHNER, INC.  
2840 PLAZA PLACE, SUITE 202  
RALEIGH, NC 27612  
(919) 571-7111

NC License  
Number F-0159



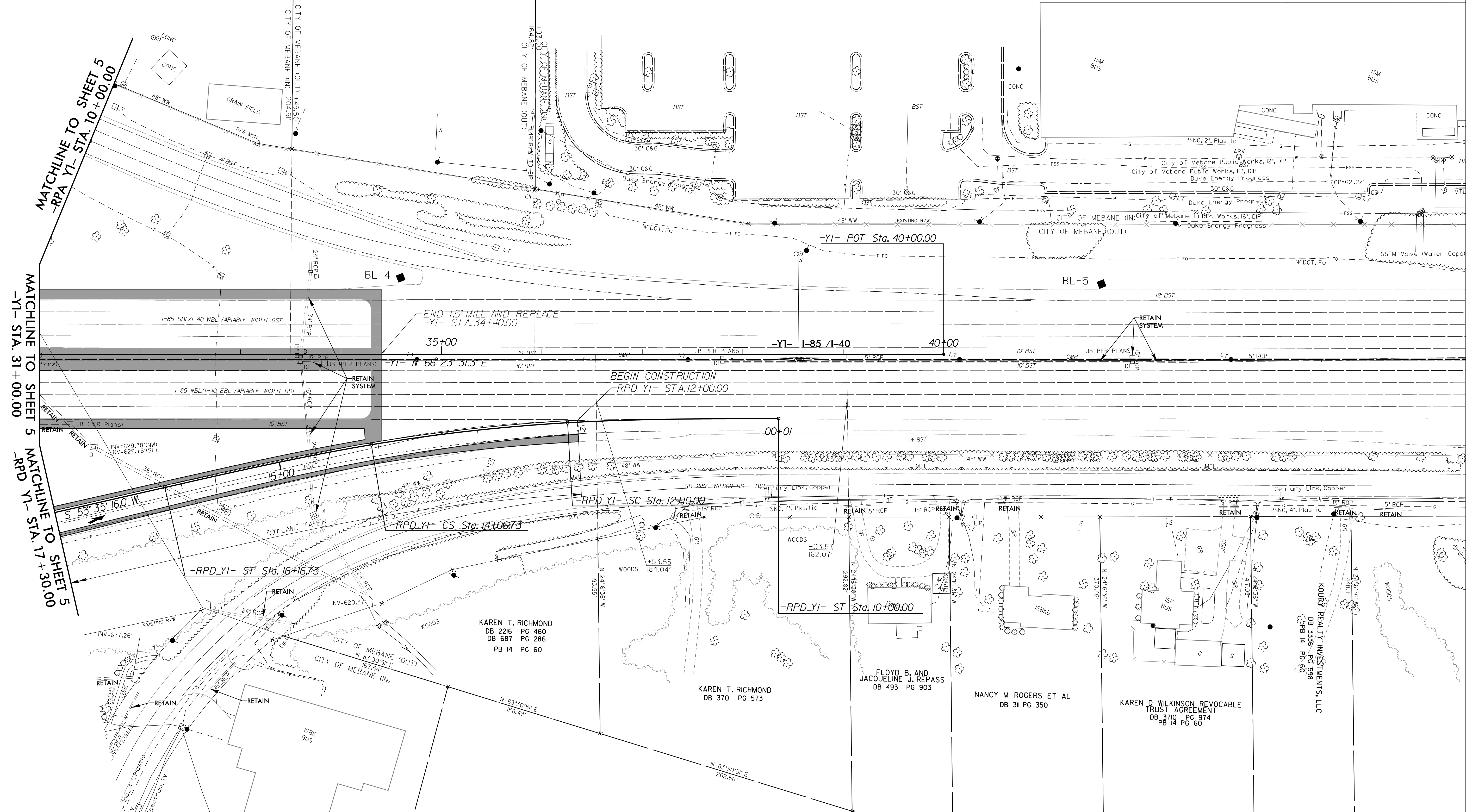
VHB Engineering, P.C. (C-3705)  
940 Main Campus Drive, Suite 500  
Raleigh, NC 27606

PROJECT REFERENCE NO. 1-5711	SHEET NO. EC-13/CONST.08
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

-RPD\_YI-

Pls Sta 11+40.02 Θs = 3° 18' 19.9" Ls = 210.00' LT = 140.02' ST = 70.02'	Pls Sta 13+08.46 Δ = 6° 11' 35.5" (LT) D = 3° 08' 53.2" L = 196.73' T = 98.46' R = 1,820.00' e = EXIST V = 60 MPH	Pls Sta 14+76.75 Θs = 3° 18' 19.9" Ls = 210.00' LT = 140.02' ST = 70.02'
--	--	--

NAD 83 201



MATCHLINE TO SHEET 5  
-RPA YI- STA. 10+00.00

MATCHLINE TO SHEET 5  
-YI- STA. 31+00.00

MATCHLINE TO SHEET 5  
-RPD YI- STA. 17+30.00

TICON, INC AND H CLAY THOMAS  
DB 3792 PG 53  
PB 73 PG 375

TANGER PROPERTIES LIMITED PARTNERSHIP  
DB 2859 PG 775  
PB 73 PG 326

END 15\"/>

BEGIN CONSTRUCTION  
-RPD YI- STA. 12+00.00

-RPD\_YI- SC Sta. 12+10.00

-RPD\_YI- ST Sta. 16+16.73

-RPD\_YI- ST Sta. 10+00.00

KAREN T. RICHMOND  
DB 2216 PG 460  
DB 687 PG 286  
PB 14 PG 60

KAREN T. RICHMOND  
DB 370 PG 573

FLOYD B. AND  
JACQUELINE J. REPASS  
DB 493 PG 903

NANCY M ROGERS ET AL  
DB 311 PG 350

KAREN D. WILKINSON REVOCABLE  
TRUST AGREEMENT  
DB 3710 PG 974  
PB 14 PG 60

KOURI REALTY INVESTMENTS, LLC  
DB 3336 PG 598  
PB 14 PG 60



**2018 English Standards & Quantity Estimates**

Name: VHB  
 Project Engineer: Courtney Carpenter, PE

Date: 12/16/20

CONTRACT # 50401.2.1FS1  
 TIP # I-5711

COUNTY Alamance DIV. 7  
 LETTING 12/21/2021

RDY, PS or DDC? RDY  
 MILEAGE 0.563 miles

**STANDARDS NEEDED:**

- 1605.01 (TSF)
- 1606.01 (SSCF)
- 1607.01 (GCE)
- 1622.01 (TSDN)
- 1632.03 (RIST-C)
- 1633.01 (SC-A)
- 1633.02 (SC-B)
- 1630.05 (T.DIV)
- 1635.02 (PIST-B)
- 1640.01 (BAFFLE)
- 1631.01 (MATT)

**DETAILS NEEDED:**

- Skimmer Basin
- Coir Fiber Wattle with PAM
- TRSC-A with Matting & PAM

**SUMMARY SHEETS NEEDED:**

- Matting Summary Sheet
- Stabilization Guidelines

**REFORESTATION SHEETS:**

**# OF YEARS FOR PROJECT CONSTRUCTION**

MAINTENANCE FACTOR 1.5 1 YRS

**CONSTRUCTION ENTRANCES**

# OF ENTRANCES: 12  
 FILTRATION GEOTEXTILE REQUIRED 900 SY  
 CLASS A STONE REQUIRED 300 TONS

**SPECIAL STILLING BASINS**

NO. OF DRILLED PIERS 0  
 # OF SPECIAL STILLING BASINS 0 EA  
 FILTRATION GEOTEXTILE REQUIRED 0 SY  
 SEDIMENT CONTROL STONE 0 TON

**# OF SILT CHECKS TYPE A with MATTING & PAM**

MATTING FOR EROSION CONTROL REQUIRED 35 SY  
 POLYACRYLAMIDE (PAM) REQUIRED 32 LB

# OF WATTLES WITHOUT PAM 0

# OF COIR FIBER WATTLES WITHOUT PAM 0

**# OF TEMPORARY STREAM CROSSINGS**

FILTRATION GEOTEXTILE REQUIRED 0 SY  
 TEMPORARY PIPE FOR STREAM CROSSING 0 LF  
 SEDIMENT CONTROL STONE 0 TON  
 EROSION CONTROL STONE, CLASS B 0 TON

**# OF CSX RAILROAD BRIDGE CROSSINGS**

TEMPORARY SILT FENCE REQUIRED 0 LF  
 FILTRATION GEOTEXTILE REQUIRED 0 SY

**ADDITIONAL PROJECT INFORMATION**

RIPARIAN BUFFERS (50 FT.) ON PROJECT NO

HIGH QUALITY WATER (HQW) ON PROJECT NO

DESIGN STANDARDS IN SENSITIVE WATERSHEDS (DSSW) NO

303(d) STREAM FOR CONSTRUCTION-RELATED TURBIDITY NO

BORROW EXCAVATION QUANTITY 0 CY

PROJECT IN FALLS LAKE WATERSHED NO

PROJECT IN JORDAN LAKE WATERSHED YES

WATTLES IN DITCHLINE WITHOUT PAM YES

WATTLES USED AS SILT FENCE BREAKS NO

CRIMPING SP NEEDED ON PROJECT: NO

CCPCUA PERMIT AND SP REQUIRED : NO

**SPECIAL PROVISIONS NEEDED:**

- 1. SEEDMIX TYPE: East
- 3. NUTRIENT MANAGEMENT TRAINING (add above Temp. Seeding)
- 6. LAWNFINISH
- 12. RESPONSE
- 16. MINIMIZE
- 17. STOCKPILE/HAUL ROAD
- 18. MATERIALS MANAGEMENT
- 19. WASTE/BORROW
- 20. TEMP. DIVERSION
- 23. SAFETY FENCE
- 25. SKIMMER BASIN
- 32. COIR FIBER WATTLES WITH PAM
- 36. TRSC-A W/ MAT & PAM
- 41. COIR FIBER MAT
- 52. CONC. WASHOUT STR.

**Project Quantities**

ITEM NUMBER	SECTION	TRNS-PORT ITEM DESCRIPTION	QUANTITY	UNIT
019600000-E	270	GEOTEXTILE FOR SOIL STABILIZATION	100	SY
107700000-E	1005	#57 STONE	0	TON
362800000-E	876	RIP RAP, CLASS I	0	TON
363500000-E	876	RIP RAP, CLASS II	0	TON
364200000-E	876	RIP RAP, CLASS A	0	TON
364900000-E	876	RIP RAP, CLASS B	0	TON
365100000-E	SP	BOULDERS	0	TON
365600000-E	876	GEOTEXTILE FOR DRAINAGE	1350	SY
600000000-E	1605	TEMPORARY SILT FENCE	7880	LF
600600000-E	1610	EROSION CONTROL STONE, CLASS A	525	TON
600900000-E	1610	EROSION CONTROL STONE, CLASS B	4500	TON
601200000-E	1610	SEDIMENT CONTROL STONE	4360	TON
601500000-E	1615	TEMPORARY MULCHING	36.50	ACR
601800000-E	1620	SEED FOR TEMPORARY SEEDING	500.00	LB
602100000-E	1620	FERTILIZER FOR TEMPORARY SEEDING	3.50	TON
602400000-E	1622	TEMPORARY SLOPE DRAINS	200	LF
602900000-E	SP	SAFETY FENCE	600	LF
603000000-E	1630	SILT EXCAVATION	900	CY
603600000-E	1631	MATTING FOR EROSION CONTROL:	8800	SY+DITCH
603700000-E	SP	COIR FIBER MAT	160	SY
603800000-E	SP	PERMANENT SOIL REINFORCEMENT MAT	0 SY	+
604200000-E	1632	1/4" HARDWARE CLOTH	0 SY	+
604300000-E	SP	LOW PERMEABILITY GEOTEXTILE	0	SY
604500000-E	SP	*** TEMPORARY PIPE - (15")	0	LF
604500000-E	SP	*** TEMPORARY PIPE - (18")	0	LF
604500000-E	SP	*** TEMPORARY PIPE - (24")	0	LF
604500000-E	SP	*** TEMPORARY PIPE - (36")	0	LF
604600000-E	1636	TEMPORARY PIPE FOR STREAM CROSSING	0	LF
604800000-E	SP	FLOATING TURBIDITY CURTAIN	9803	SY
606900000-E	1638	STILLING BASINS	0	CY
607000000-N	1639	SPECIAL STILLING BASINS	0	EA
607101000-E	SP	WATTLE	0	LF
607101200-E	SP	COIR FIBER WATTLE	90	LF
607101300-E	SP	WATTLE BARRIER	0	LF
607101400-E	SP	COIR FIBER WATTLE BARRIER	0	LF
607102000-E	SP	POLYACRYLAMIDE (PAM)	60	LB
607103000-E	1640	COIR FIBER BAFFLE	222	LF
607105000-E	SP	*** SKIMMER - (1-1/2")	1	EA
607105000-E	SP	*** SKIMMER - (2")	0	EA
607105000-E	SP	*** SKIMMER - (2-1/2")	0	EA
607105000-E	SP	*** SKIMMER - (3")	0	EA
607105000-E	SP	*** SKIMMER - (4")	0	EA
607105000-E	SP	*** SKIMMER - (5")	0	EA
608400000-E	1660	SEEDING AND MULCHING	36.50	ACR
608700000-E	1660	MOWING	18.25	ACR
609000000-E	1661	SEED FOR REPAIR SEEDING	100.00	LB
609300000-E	1661	FERTILIZER FOR REPAIR SEEDING	0.25	TON
609600000-E	1662	SEED FOR SUPPLEMENTAL SEEDING	150.00	LB
610500000-E	1663	WATER	0.0	M/G
610800000-E	1665	FERTILIZER TOPDRESSING	4.50	TON
611100000-E	SP	IMPERVIOUS DIKE	0	LF
611450000-N	1667	SPECIALIZED HAND MOWING	10	MHR
611700000-N	1675	RESPONSE FOR EROSION CONTROL	25	EA
611800000-N	SP	ROOTWADS	0	EA
612000000-E	SP	CULVERT DIVERSION CHANNEL	0	CY
612300000-E	1670	REFORESTATION	0.00	ACR
612600000-E	SP	STREAMBANK REFORESTATION	0.00	ACR
612900000-E	SP	WETLAND REFORESTATION	0	ACR
611750000-N	SP	CONCRETE WASHOUT STRUCTURE	4	EA
613500000-E	SP	GENERIC EROSION CONTROL ITEM - DISKING	0	ACR
613500000-E	SP	GENERIC EROSION CONTROL ITEM - RIPPING	0	ACR
613500000-E	SP	GENERIC EROSION CONTROL ITEM - WETLAND GRASS PLANTING	0	ACR
613500000-E	SP	GENERIC EROSION CONTROL ITEM - COMPOST BLANKET	0	ACR

**Project Checklist**

TIP

DATE

CHECKED BY

ROADWAY/PS/DDI

- SKIMMER/TIERED SKIMMER BASIN DETAIL(S) INCLUDED
- EARTHEN DAM WITH SKIMMER DETAIL INCLUDED
- INFILTRATION BASIN DETAIL INCLUDED
- BORROW PIT DEWATERING BASIN DETAIL INCLUDED
- WATTLE/COIR FIBER WATTLE DETAIL(S) INCLUDED
- SILT CHECK TYPE A WITH MATTING AND PAM DETAIL INCLUDED
- MATTING SUMMARY SHEET(S) AND STABILIZATION GUIDELINES INCLUDED
- ENV. SENS. AREAS SHOWN ON PLAN SHEETS (TROUT/HQW/CA/303(d)/DSSW/STREAM RELOCATION)
- NEUSE/TAR-PAM/JORDAN LAKE/RANDLEMAN/CATAWBA RIVER BASIN (ESA)
- TREE REFORESTATION SHEET INCLUDED (APPROPRIATE WORDING IN SP)
- STREAMBANK/WETLAND/BUFFER REFORESTATION SHEETS INCLUDED
- STREAMBANK REFORESTATION SHOWN ON PLANS (MATTING ON SLOPE NOTE)
- STILLING BASIN NOTE (BRIDGES OVER WATER)
- EARTH BERMS/CLEAN WATER DIVERSION WITH DETAIL ON PLANS
- CULVERT PHASING ON PLANS/QUANTITIES INCLUDED
- TEMPORARY PIPE(S) QUANTITY (CULVERTS & STREAM CROSSING)
- SKIMMER BASIN QUANTITIES INCLUDED
- RISER BASIN QUANTITIES INCLUDED
- GRAVEL CONST. ENT. QUANTITIES INCLUDED
- STREAM RELOCATION QUANTITIES & SP'S INCLUDED
- SAFETY FENCE QUANTITY INCLUDED
- PLAN DESIGNED TO HQW/SENSITIVE WATERSHED STANDARDS
- QUANTITIES MATCH
- SPECIAL PROVISIONS MATCH

<b>TITLE SHEET</b>	
CORRECT TIP PROJECT NUMBER	<input type="checkbox"/>
NOTES (HQW/ESA/303(d)/SENS WATER STD/C & G)	<input type="checkbox"/>
CORRECT STANDARDS	<input type="checkbox"/>
BEGIN & ENDING PROJ. TIP NUMBER	<input type="checkbox"/>

SPECIAL PROVISIONS (PDF) PUT IN CONTRACTS FOLDER	<input type="checkbox"/>
LATE - EMAILED TO: _____	
DATE: _____	
BY: _____	

COMMENTS & NOTES: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Project Special Provisions  
Erosion Control**

**STABILIZATION REQUIREMENTS:**

(4-30-2019)

Stabilization for this project shall comply with the time frame guidelines as specified by the NCG-010000 general construction permit effective April 1, 2019 issued by the North Carolina Department of Environmental Quality Division of Water Resources. Temporary or permanent ground cover stabilization shall occur within 7 calendar days from the last land-disturbing activity, with the following exceptions in which temporary or permanent ground cover shall be provided in 14 calendar days from the last land-disturbing activity:

- Slopes between 2:1 and 3:1, with a slope length of 10 ft. or less
- Slopes 3:1 or flatter, with a slope of length of 50 ft. or less
- Slopes 4:1 or flatter

The stabilization timeframe for High Quality Water (HQW) Zones shall be 7 calendar days with no exceptions for slope grades or lengths. High Quality Water Zones (HQW) Zones are defined by North Carolina Administrative Code 15A NCAC 04A.0105 (25). Temporary and permanent ground cover stabilization shall be achieved in accordance with the provisions in this contract and as directed.

**SEEDING AND MULCHING:**

**(East)**

The kinds of seed and fertilizer, and the rates of application of seed, fertilizer, and limestone, shall be as stated below. During periods of overlapping dates, the kind of seed to be used shall be determined. All rates are in pounds per acre.

All Roadway Areas

<b>March 1 - August 31</b>		<b>September 1 - February 28</b>	
50#	Tall Fescue	50#	Tall Fescue
10#	Centipede	10#	Centipede
25#	Bermudagrass (hulled)	35#	Bermudagrass (unhulled)
500#	Fertilizer	500#	Fertilizer
4000#	Limestone	4000#	Limestone

Waste and Borrow Locations

<b>March 1 – August 31</b>		<b>September 1 - February 28</b>	
75#	Tall Fescue	75#	Tall Fescue
25#	Bermudagrass (hulled)	35#	Bermudagrass (unhulled)
500#	Fertilizer	500#	Fertilizer
4000#	Limestone	4000#	Limestone

Note: 50# of Bahiagrass may be substituted for either Centipede or Bermudagrass only upon Engineer's request.

Approved Tall Fescue Cultivars

06 Dust	Escalade	Justice	Serengeti
2 <sup>nd</sup> Millennium	Essential	Kalahari	Shelby
3 <sup>rd</sup> Millennium	Evergreen 2	Kitty Hawk 2000	Sheridan
Apache III	Falcon IV	Legitimate	Signia
Avenger	Falcon NG	Lexington	Silver Hawk
Barlexas	Falcon V	LSD	Sliverstar
Barlexas II	Faith	Magellan	Shenandoah Elite
Bar Fa	Fat Cat	Matador	Sidewinder
Barrera	Festnova	Millennium SRP	Skyline
Barrington	Fidelity	Monet	Solara
Barrobusto	Finelawn Elite	Mustang 4	Southern Choice II
Barvado	Finelawn Xpress	Ninja 2	Speedway
Biltmore	Finesse II	Ol' Glory	Spyder LS
Bingo	Firebird	Olympic Gold	Sunset Gold
Bizem	Firecracker LS	Padre	Taccoa
Blackwatch	Firenza	Patagonia	Tanzania
Blade Runner II	Five Point	Pedigree	Trio
Bonsai	Focus	Picasso	Tahoe II
Braveheart	Forte	Piedmont	Talladega
Bravo	Garrison	Plantation	Tarheel
Bullseye	Gazelle II	Proseeds 5301	Terrano
Cannavaro	Gold Medallion	Prospect	Titan ltd
Catalyst	Grande 3	Pure Gold	Titanium LS
Cayenne	Greenbrooks	Quest	Tracer
Cessane Rz	Greenkeeper	Raptor II	Traverse SRP
Chipper	Gremlin	Rebel Exeda	Tulsa Time
Cochise IV	Greystone	Rebel Sentry	Turbo
Constitution	Guardian 21	Rebel IV	Turbo RZ
Corgi	Guardian 41	Regiment II	Tuxedo RZ
Corona	Hemi	Regenerate	Ultimate
Coyote	Honky Tonk	Rendition	Venture
Darlington	Hot Rod	Rhambler 2 SRP	Umbrella
Davinci	Hunter	Rembrandt	Van Gogh
Desire	Inferno	Reunion	Watchdog
Dominion	Innovator	Riverside	Wolfpack II
Dynamic	Integrity	RNP	Xtremegreen
Dynasty	Jaguar 3	Rocket	
Endeavor	Jamboree	Scorpion	

On cut and fill slopes 2:1 or steeper Centipede shall be applied at the rate of 5 pounds per acre and add 20# of Sericea Lespedeza from January 1 - December 31.

Fertilizer shall be 10-20-20 analysis. A different analysis of fertilizer may be used provided the 1-2-2 ratio is maintained and the rate of application adjusted to provide the same amount of plant food as a 10-20-20 analysis and as directed.

#### **NUTRIENT MANAGEMENT TRAINING REQUIREMENTS:**

The person(s) responsible for applying fertilizer or person(s) conducting the application of fertilizer on this project within the Jordan Lake or Falls Lake Watershed shall complete the following web-based training prior to performing this work:

<http://www.jordanlake.org/web/jordanlake/fertilizer-management>

A certificate of completion must be presented by the person(s) responsible for fertilizer application or person(s) conducting the application of fertilizer prior to performing fertilizer application on the project within the limits of the Jordan Lake or Fall Lake Watershed.

#### **TEMPORARY SEEDING:**

Fertilizer shall be the same analysis as specified for *Seeding and Mulching* and applied at the rate of 400 pounds and seeded at the rate of 50 pounds per acre. Sweet Sudan Grass, German Millet or Browntop Millet shall be used in summer months and Rye Grain during the remainder of the year. The Engineer will determine the exact dates for using each kind of seed.

#### **FERTILIZER TOPDRESSING:**

Fertilizer used for topdressing on all roadway areas except slopes 2:1 and steeper shall be 10-20-20 grade and shall be applied at the rate of 500 pounds per acre. A different analysis of fertilizer may be used provided the 1-2-2 ratio is maintained and the rate of application adjusted to provide the same amount of plant food as 10-20-20 analysis and as directed.

Fertilizer used for topdressing on slopes 2:1 and steeper and waste and borrow areas shall be 16-8-8 grade and shall be applied at the rate of 500 pounds per acre. A different analysis of fertilizer may be used provided the 2-1-1 ratio is maintained and the rate of application adjusted to provide the same amount of plant food as 16-8-8 analysis and as directed.

#### **SUPPLEMENTAL SEEDING:**

The kinds of seed and proportions shall be the same as specified for *Seeding and Mulching*, with the exception that no centipede seed will be used in the seed mix for supplemental seeding. The rate of application for supplemental seeding may vary from 25# to 75# per acre. The actual rate per acre will be determined prior to the time of topdressing and the Contractor will be notified in writing of the rate per acre, total quantity needed, and areas on which to apply the supplemental seed. Minimum tillage equipment, consisting of a sod seeder shall be used for incorporating seed

into the soil as to prevent disturbance of existing vegetation. A clodbuster (ball and chain) may be used where degree of slope prevents the use of a sod seeder.

**MOWING:**

The minimum mowing height on this project shall be 4 inches.

**LAWN TYPE APPEARANCE:**

All areas adjacent to lawns must be hand finished as directed to give a lawn type appearance. Remove all trash, debris, and stones  $\frac{3}{4}$ " and larger in diameter or other obstructions that could interfere with providing a smooth lawn type appearance. These areas shall be reseeded to match their original vegetative conditions, unless directed otherwise by the Field Operations Engineer.

**RESPONSE FOR EROSION CONTROL:**

**Description**

Furnish the labor, materials, tools and equipment necessary to move personnel, equipment, and supplies to the project necessary for the pursuit of any or all of the following work as shown herein, by an approved subcontractor.

<b>Section</b>	<b>Erosion Control Item</b>	<b>Unit</b>
1605	Temporary Silt Fence	LF
1606	Special Sediment Control Fence	LF/TON
1615	Temporary Mulching	ACR
1620	Seed - Temporary Seeding	LB
1620	Fertilizer - Temporary Seeding	TN
1631	Matting for Erosion Control	SY
SP	Coir Fiber Mat	SY
1640	Coir Fiber Baffles	LF
SP	Permanent Soil Reinforcement Mat	SY
1660	Seeding and Mulching	ACR
1661	Seed - Repair Seeding	LB
1661	Fertilizer - Repair Seeding	TON
1662	Seed - Supplemental Seeding	LB
1665	Fertilizer Topdressing	TON
SP	Safety/Highly Visible Fencing	LF
SP	Response for Erosion Control	EA

### **Construction Methods**

Provide an approved subcontractor who performs an erosion control action as described in the NPDES Inspection Form SPPP30. Each erosion control action may include one or more of the above work items.

### **Measurement and Payment**

*Response for Erosion Control* will be measured and paid for by counting the actual number of times the subcontractor moves onto the project, including borrow and waste sites, and satisfactorily completes an erosion control action described in Form 1675. The provisions of Article 104-5 of the *Standard Specifications* will not apply to this item of work.

Payment will be made under:

<b>Pay Item</b>	<b>Pay Unit</b>
Response for Erosion Control	Each

### **MINIMIZE REMOVAL OF VEGETATION:**

The Contractor shall minimize removal of vegetation within project limits to the maximum extent practicable. Vegetation along stream banks and adjacent to other jurisdictional resources outside the construction limits shall only be removed upon approval of Engineer. No additional payment will be made for this minimization work.

### **STOCKPILE AREAS:**

The Contractor shall install and maintain erosion control devices sufficient to contain sediment around any erodible material stockpile areas as directed.

### **ACCESS AND HAUL ROADS:**

At the end of each working day, the Contractor shall install or re-establish temporary diversions or earth berms across access/haul roads to direct runoff into sediment devices. Silt fence sections that are temporarily removed shall be reinstalled across access/haul roads at the end of each working day.

### **CONSTRUCTION MATERIALS MANAGEMENT**

(3-19-19) (rev. 04-27-19)

#### **Description**

The requirements set forth shall be adhered to in order to meet the applicable materials handling requirements of the NCG010000 permit. Structural controls installed to manage construction materials stored or used on site shall be shown on the E&SC Plan. Requirements for handling materials on construction sites shall be as follows:



**Polyacrylamides (PAMS) and Flocculants**

Polyacrylamides (PAMS) and flocculants shall be stored in leak-proof containers that are kept under storm-resistant cover or surrounded by secondary containment structures designed to protect adjacent surface waters. PAMS or other flocculants used shall be selected from the NC DWR List of Approved PAMS/Flocculants. The concentration of PAMS and other flocculants used shall not exceed those specified in the NC DWR List of Approved PAMS/Flocculants and in accordance with the manufacturer's instructions. The NC DWR List of Approved PAMS/Flocculants is available at:

[https://files.nc.gov/ncdeq/Water%20Quality/Environmental%20Sciences/ATU/ApprovedPAMS4\\_1\\_2017.pdf](https://files.nc.gov/ncdeq/Water%20Quality/Environmental%20Sciences/ATU/ApprovedPAMS4_1_2017.pdf)

**Equipment Fluids**

Fuels, lubricants, coolants, and hydraulic fluids, and other petroleum products shall be handled and disposed of in a manner so as not to enter surface or ground waters and in accordance with applicable state and federal regulations. Equipment used on the site must be operated and maintained properly to prevent discharge of fluids. Equipment, vehicle, and other wash waters shall not be discharged into E&SC basins or other E&SC devices. Alternative controls should be provided such that there is no discharge of soaps, solvents, or detergents.

**Waste Materials**

Construction materials and land clearing waste shall be disposed of in accordance with North Carolina General Statutes, Chapter 130A, Article 9 - Solid Waste Management, and rules governing the disposal of solid waste (15A NCAC 13B). Areas dedicated for managing construction material and land clearing waste shall be at least 50 feet away from storm drain inlets and surface waters unless it can be shown that no other alternatives are reasonably available. Paint and other liquid construction material waste shall not be dumped into storm drains. Paint and other liquid construction waste washouts should be located at least 50 feet away from storm drain inlets unless there is no alternative. Other options are to install lined washouts or use portable, removable bags or bins. Hazardous or toxic waste shall be managed in accordance with the federal Resource Conservation and Recovery Act (RCRA) and NC Hazardous Waste Rules at 15A NCAC, Subchapter 13A. Litter and sanitary waste shall be managed in a manner to prevent it from entering jurisdictional waters and shall be disposed of offsite.

**Herbicide, Pesticide, and Rodenticides**

Herbicide, pesticide, and rodenticides shall be stored and applied in accordance with the Federal Insecticide, Fungicide, and Rodenticide Act, North Carolina Pesticide Law of 1971 and labeling restrictions.

**Concrete Materials**

Concrete materials onsite, including excess concrete, must be controlled and managed to avoid contact with surface waters, wetlands or buffers. No concrete or cement slurry shall be discharged from the site. (Note that discharges from onsite concrete plants require coverage under a separate NPDES permit – NCG140000.) Concrete wash water shall be managed in accordance with the *Concrete Washout Structure* provision. Concrete slurry shall be managed and disposed of in accordance with *NCDOT DGS and HOS DCAR Distribution of Class A Residuals Statewide* (Permit No. WQ0035749). Any hardened concrete residue will be disposed of, or recycled on site, in accordance with state solid waste regulations.

**Earthen Material Stock Piles**

Earthen material stock piles shall be located at least 50 feet away from storm drain inlets and surface waters unless it can be shown that no other alternatives are reasonably available.

**Measurement and Payment**

Conditions set within the *Construction Materials Management* provision are incidental to the project for which no direct compensation will be made.

**WASTE AND BORROW SOURCES:**

Payment for temporary erosion control measures, except those made necessary by the Contractor's own negligence or for his own convenience, will be paid for at the appropriate contract unit price for the devices or measures utilized in borrow sources and waste areas.

No additional payment will be made for erosion control devices or permanent seeding and mulching in any commercial borrow or waste pit. All erosion and sediment control practices that may be required on a commercial borrow or waste site will be done at the Contractor's expense.

All offsite Staging Areas, Borrow and Waste sites shall be in accordance with "Borrow and Waste Site Reclamation Procedures for Contracted Projects" located at:

<https://connect.ncdot.gov/resources/roadside/FieldOperationsDocuments/ContractedReclamationProcedures.pdf>

All forms and documents referenced in the "Borrow and Waste Site Reclamation Procedures for Contracted Projects" shall be included with the reclamation plans for offsite staging areas, and borrow and waste sites.

**TEMPORARY DIVERSION:**

This work consists of installation, maintenance, and cleanout of *Temporary Diversions* in accordance with Section 1630 of the *Standard Specifications*. The quantity of excavation for

installation and cleanout will be measured and paid for as *Silt Excavation* in accordance with Article 1630-3 of the *Standard Specifications*.

### **SAFETY FENCE AND JURISDICTIONAL FLAGGING:**

#### **Description**

*Safety Fence* shall consist of furnishing materials, installing and maintaining polyethylene or polypropylene fence along the outside riparian buffer, wetland, or water boundary, or other boundaries located within the construction corridor to mark the areas that have been approved to infringe within the buffer, wetland, endangered vegetation, culturally sensitive areas or water. The fence shall be installed prior to any land disturbing activities.

Interior boundaries for jurisdictional areas noted above shall be delineated by stakes and highly visible flagging.

Jurisdictional boundaries at staging areas, waste sites, or borrow pits, whether considered outside or interior boundaries shall be delineated by stakes and highly visible flagging.

#### **Materials**

##### **(A) Safety Fencing**

Polyethylene or polypropylene fence shall be a highly visible preconstructed safety fence approved by the Engineer. The fence material shall have an ultraviolet coating.

Either wood posts or steel posts may be used. Wood posts shall be hardwood with a wedge or pencil tip at one end, and shall be at least 5 ft. in length with a minimum nominal 2" x 2" cross section. Steel posts shall be at least 5 ft. in length, and have a minimum weight of 0.85 lb/ft of length.

##### **(B) Boundary Flagging**

Wooden stakes shall be 4 feet in length with a minimum nominal 3/4" x 1-3/4" cross section. The flagging shall be at least 1" in width. The flagging material shall be vinyl and shall be orange in color and highly visible.

#### **Construction Methods**

No additional clearing and grubbing is anticipated for the installation of this fence. The fence shall be erected to conform to the general contour of the ground.

##### **(A) Safety Fencing**

Posts shall be set at a maximum spacing of 10 ft., maintained in a vertical position and hand set or set with a post driver. Posts shall be installed a minimum of 2 ft. into the ground. If hand set, all

backfill material shall be thoroughly tamped. Wood posts may be sharpened to a dull point if power driven. Posts damaged by power driving shall be removed and replaced prior to final acceptance. The tops of all wood posts shall be cut at a 30-degree angle. The wood posts may, at the option of the Contractor, be cut at this angle either before or after the posts are erected.

The fence geotextile shall be attached to the wood posts with one 2" galvanized wire staple across each cable or to the steel posts with wire or other acceptable means.

Place construction stakes to establish the location of the safety fence in accordance with Article 105-9 or Article 801-1 of the *Standard Specifications*. No direct pay will be made for the staking of the safety fence. All stakeouts for safety fence shall be considered incidental to the work being paid for as "Construction Surveying", except that where there is no pay item for construction surveying, all safety fence stakeout will be performed by state forces.

The Contractor shall be required to maintain the safety fence in a satisfactory condition for the duration of the project as determined by the Engineer.

(B) Boundary Flagging

Boundary flagging delineation of interior boundaries shall consist of wooden stakes on 25 feet maximum intervals with highly visible orange flagging attached. Stakes shall be installed a minimum of 6" into the ground. Interior boundaries may be staked on a tangent that runs parallel to buffer but must not encroach on the buffer at any location. Interior boundaries of hand clearing shall be identified with a different colored flagging to distinguish it from mechanized clearing.

Boundary flagging delineation of interior boundaries will be placed in accordance with Article 105-9 or Article 801-1 of the *Standard Specifications*. No direct pay will be made for delineation of the interior boundaries. This delineation will be considered incidental to the work being paid for as *Construction Surveying*, except that where there is no pay item or construction surveying the cost of boundary flagging delineation shall be included in the unit prices bid for the various items in the contract. Installation for delineation of all jurisdictional boundaries at staging areas, waste sites, or borrow pits shall consist of wooden stakes on 25 feet maximum intervals with highly visible orange flagging attached. Stakes shall be installed a minimum of 6" into the ground. Additional flagging may be placed on overhanging vegetation to enhance visibility but does not substitute for installation of stakes.

Installation of boundary flagging for delineation of all jurisdictional boundaries at staging areas, waste sites, or borrow pits shall be performed in accordance with Subarticle 230-4(B)(5) or Subarticle 802-2(F) of the *Standard Specifications*. No direct pay will be made for this delineation, as the cost of same shall be included in the unit prices bid for the various items in the contract.

The Contractor shall be required to maintain alternative stakes and highly visible flagging in a satisfactory condition for the duration of the project as determined by the Engineer.

## Measurement and Payment

*Safety Fence* will be measured and paid as the actual number of linear feet of polyethylene or polypropylene fence installed in place and accepted. Such payment will be full compensation including but not limited to furnishing and installing fence geotextile with necessary posts and post bracing, staples, tie wires, tools, equipment and incidentals necessary to complete this work.

Payment will be made under:

<b>Pay Item</b>	<b>Pay Unit</b>
Safety Fence	Linear Foot

## **SKIMMER BASIN WITH BAFFLES:**

### Description

Provide a skimmer basin to remove sediment from construction site runoff at locations shown in the erosion control plans. See the Skimmer Basin with Baffles Detail sheet provided in the erosion control plans. Work includes constructing sediment basin, installation of temporary slope drain pipe and coir fiber baffles, furnishing, installation and cleanout of skimmer, providing and placing stone pad on bottom of basin underneath skimmer device, providing and placing a geotextile spillway liner, providing coir fiber mat stabilization for the skimmer outlet, disposing of excess materials, removing temporary slope drain, coir fiber baffles, geotextile liner and skimmer device, backfilling basin area with suitable material and providing proper drainage when basin area is abandoned.

### Materials

<b>Item</b>	<b>Section</b>
Stone for Erosion Control, Class B	1042
Geotextile for Soil Stabilization, Type 4	1056
Fertilizer for Temporary Seeding	1060-2
Seed for Temporary Seeding	1060-4
Seeding and Mulching	1060-4
Matting for Erosion Control	1060-8
Staples	1060-8
Coir Fiber Mat	1060-14
Temporary Slope Drain	1622-2
Coir Fiber Baffle	1640

Provide appropriately sized and approved skimmer device.

Provide Schedule 40 PVC pipe with a length of 6 ft. to attach to the skimmer and the coupling connection to serve as the arm pipe. For skimmer sizes of 2.5 in. and smaller, the arm pipe diameter shall be 1.5 inches. For skimmer sizes of 3 in. and larger, refer to manufacturer recommendation.

Provide 4" diameter Schedule 40 PVC pipe to attach to coupling connection of skimmer to serve as the barrel pipe through the earthen dam.

Anchors: Staples, stakes, or reinforcement bars shall be used as anchors.

#### Wooden Stakes:

Provide hardwood stakes 12"- 24" long with a 2" x 2" nominal square cross section. One end of the stake must be sharpened or beveled to facilitate driving through the coir fiber mat and down into the underlying soil. The other end of the stake needs to have a 1"- 2" long head at the top with a 1"- 2" notch following to catch and secure the coir fiber mat.

#### Steel Reinforcement Bars:

Provide uncoated #10 steel reinforcement bars 24" nominal length. The bars shall have a 4" diameter bend at one end with a 4" straight section at the tip to catch and secure the coir fiber mat.

#### Staples:

Provide staples made of 0.125" diameter new steel wire formed into a *u* shape not less than 12" in length with a throat of 1" in width.

### **Construction Methods**

Excavate basin according to the erosion control plans with basin surface free of obstructions, debris, and pockets of low-density material. Install temporary slope drain pipe and construct the primary spillway according to the Skimmer Basin with Baffles Detail sheet in the erosion control plans. Temporary slope drain pipe at inlet of basin may be replaced by geotextile as directed. Construct the coir fiber baffles according to *Roadway Standard Drawings* No. 1640.01 and Section 1640 of the *Standard Specifications*.

Install skimmer device according to manufacturer recommendations. Install 4" Schedule 40 PVC pipe into dam on the lower side of basin 1 ft. from the bottom of the basin and according to the detail, and extend the pipe so the basin will drain. Attach a 6 ft. arm pipe to the coupling connection and skimmer according to manufacturer recommendations. The coupling shall be rigid and non-buoyant and not exceed a diameter of 4" and 12" in length. Attach the rope included with the skimmer to the tee between the vent socket and the tube inlet, and the other end to a wooden stake or metal post. Clean out skimmer device when it becomes clogged with sediment and/or debris and is unable to float at the top of water in skimmer basin. Take appropriate measures to avoid ice accumulation in the skimmer device. Construct a stone pad of Class B stone directly underneath the skimmer device at bottom of basin. The pad shall be a minimum of 12" in height, and shall have a minimum cross sectional area of 4 ft. by 4 ft.

Line primary spillway with geotextile unrolled in the direction of flow and lay smoothly but loosely on soil surface without creases. Bury edges of geotextile in a trench at least 5" deep and

tamp firmly. If geotextile for the primary spillway is not one continuous piece of material, make horizontal overlaps a minimum of 18" with upstream geotextile overlapping the downstream geotextile. Secure geotextile with eleven gauge wire staples shaped into a *u* shape with a length of not less than 12" and a throat not less than 1" in width. Place staples along outer edges and throughout the geotextile a maximum of 3 ft. horizontally and vertically. Geotextile shall be placed to the bottom and across the entire width of the basin according to the Skimmer Basin with Baffles detail. Place sealant inside basin around barrel pipe on top of geotextile with a minimum width of 6 in.

At the skimmer outlet, provide a smooth soil surface free from stones, clods, or debris that will prevent contact of the coir fiber matting with the soil. Unroll the matting and apply without stretching such that it will lie smoothly but loosely on the soil surface. Wooden stakes, reinforcement bars, or staples may be used as anchors in accordance with the details in the plans and as directed. Place anchors across the matting at the ends approximately 1 ft. apart. Place anchors along the outer edges and down the center of the matting 3 ft. apart.

All bare side slope sections of the skimmer basin shall be seeded with a temporary or permanent seed mix as directed and in accordance with Articles 1620-3, 1620-4, 1620-5, 1660-4, 1660-5 and 1660-7 of the *Standard Specifications*. Straw or excelsior matting shall be installed on all bare side slope sections immediately upon the completion of seeding and in accordance with Article 1631-3 of the *Standard Specifications*.

### **Measurement and Payment**

*Silt Excavation* will be measured and paid for in accordance with Article 1630-4 of the *Standard Specifications*, as calculated from the typical section throughout the length of the basin as shown on the final approved plans.

*Geotextile for Soil Stabilization* will be measured and paid for in accordance with Article 270-4 of the *Standard Specifications*.

*Coir Fiber Baffles* will be measured and paid for in accordance with Article 1640-4 of the *Standard Specifications*.

\_\_\_" *Skimmer* will be measured in units of each. \_\_\_" *Skimmer* will be measured and paid for as the maximum number of each size skimmer acceptably installed and in use at any one time during the life of the project. Barrel and arm pipe, cleanout, relocation and reinstallation of \_\_\_" *Skimmer* is considered incidental to the measurement of the quantity of \_\_\_" *Skimmer* and no separate payment will be made. No separate payment shall be made if \_\_\_" *Skimmer*, barrel and/or arm pipe(s) are damaged by ice accumulation.

*Coir Fiber Mat* will be measured and paid for as the actual number of square yards measured along the surface of the ground over which coir fiber mat is installed and accepted.

*Temporary Slope Drain* will be measured and paid for in accordance with Article 1622-4 of the *Standard Specifications*.

*Stone for Erosion Control, Class \_\_* will be measured and paid for in accordance with Article 1610-4 of the *Standard Specifications*.

*Seeding and Mulching* will be measured and paid for in accordance with Article 1660-8 of the *Standard Specifications*.

*Seed for Temporary Seeding* will be measured and paid for in accordance with Article 1620-6 of the *Standard Specifications*.

*Fertilizer for Temporary Seeding* will be measured and paid for in accordance with Article 1620-6 of the *Standard Specifications*.

*Matting for Erosion Control* will be measured and paid for in accordance with Article 1631-4 of the *Standard Specifications*.

No measurement will be made for other items or for over excavation or stockpiling.

Payment will be made under:

**Pay Item**

\_\_" Skimmer  
Coir Fiber Mat

**Pay Unit**

Each  
Square Yard

**COIR FIBER WATTLES WITH POLYACRYLAMIDE (PAM):**

**Description**

Coir Fiber Wattles are tubular products consisting of coir fibers (coconut fibers) encased in coir fiber netting. Coir Fiber Wattles are used on slopes or channels to intercept runoff and act as a velocity break. Coir Fiber Wattles are to be placed at locations shown on the plans or as directed. Installation shall follow the detail provided in the plans and as directed. Work includes furnishing materials, installation of coir fiber wattles, matting installation, PAM application, and removing wattles.

**Materials**

Coir Fiber Wattle shall meet the following specifications:

100% Coir (Coconut) Fibers	
Minimum Diameter	12 in.
Minimum Density	3.5 lb/ft <sup>3</sup> +/- 10%
Net Material	Coir Fiber
Net Openings	2 in. x 2 in.
Net Strength	90 lbs.
Minimum Weight	2.6 lbs./ft. +/- 10%



Anchors: Stakes shall be used as anchors.

Wooden Stakes:

Provide hardwood stakes a minimum of 2-ft. long with a 2 in. x 2 in. nominal square cross section. One end of the stake must be sharpened or beveled to facilitate driving down into the underlying soil.

Matting shall meet the requirements of Article 1060-8 of the *Standard Specifications*, or shall meet specifications provided elsewhere in this contract.

Provide staples made of 0.125" diameter new steel wire formed into a *u* shape not less than 12" in length with a throat of 1" in width.

Polyacrylamide (PAM) shall be applied in powder form and shall be anionic or neutrally charged. Soil samples shall be obtained in areas where the wattles will be placed, and from offsite material used to construct the roadway, and analyzed for the appropriate PAM flocculant to be utilized with each wattle. The PAM product used shall be listed on the North Carolina Department of Environmental Quality Division of Water Resources web site as an approved PAM product for use in North Carolina.

### **Construction Methods**

Coir Fiber Wattles shall be secured to the soil by wire staples approximately every 1 linear foot and at the end of each section of wattle. A minimum of 4 stakes shall be installed on the downstream side of the wattle with a maximum spacing of 2 linear feet along the wattle, and according to the detail. Install a minimum of 2 stakes on the upstream side of the wattle according to the detail provided in the plans. Stakes shall be driven into the ground a minimum of 10 in. with no more than 2 in. projecting from the top of the wattle. Drive stakes at an angle according to the detail provided in the plans.

Only install coir fiber wattle(s) to a height in ditch so flow will not wash around wattle and scour ditch slopes and according to the detail provided in the plans and as directed. Overlap adjoining sections of wattles a minimum of 6 in.

Installation of matting shall be in accordance with the detail provided in the plans, and in accordance with Article 1631-3 of the *Standard Specifications*, or in accordance with specifications provided elsewhere in this contract.

Apply PAM over the lower center portion of the coir fiber wattle where the water is going to flow over at a rate of 2 ounces per wattle, and 1 ounce of PAM on matting on each side of the wattle. PAM applications shall be done during construction activities after every rainfall event that is equal to or exceeds 0.50 in.

The Contractor shall maintain the coir fiber wattles until the project is accepted or until the wattles are removed, and shall remove and dispose of silt accumulations at the wattles when so directed in accordance with the requirements of Section 1630 of the *Standard Specifications*.

### Measurement and Payment

*Coir Fiber Wattles* will be measured and paid for by the actual number of linear feet of wattles which are installed and accepted. Such price and payment will be full compensation for all work covered by this section, including, but not limited to, furnishing all materials, labor, equipment and incidentals necessary to install the *Coir Fiber Wattles*.

Matting will be measured and paid for in accordance with Article 1631-4 of the *Standard Specifications*, or in accordance with specifications provided elsewhere in this contract.

*Polyacrylamide(PAM)* will be measured and paid for by the actual weight in pounds of PAM applied to the coir fiber wattles. Such price and payment will be full compensation for all work covered by this section, including, but not limited to, furnishing all materials, labor, equipment and incidentals necessary to apply the *Polyacrylamide(PAM)*.

Payment will be made under:

<b>Pay Item</b>	<b>Pay Unit</b>
Polyacrylamide(PAM)	Pound
Coir Fiber Wattle	Linear Foot

### **TEMPORARY ROCK SILT CHECK TYPE A WITH EXCELSIOR MATTING AND POLYACRYLAMIDE (PAM):**

#### **Description**

Temporary Rock Silt Checks Type A with Excelsior Matting and Polyacrylamide (PAM) are devices utilized in temporary and permanent ditches to reduce runoff velocity and incorporate PAM into the construction runoff to increase settling of sediment particles and reduce turbidity of runoff. Temporary Rock Silt Checks Type A with Excelsior Matting and PAM are to be placed at locations shown on the plans or as directed. Installation shall follow the detail provided in the plans and as directed. Work includes furnishing materials, installation of Temporary Rock Silt Checks Type A, matting installation, PAM application, and removing Temporary Rock Silt Checks Type A with Excelsior Matting and PAM.

#### **Materials**

Structural stone shall be class B stone that meets the requirements of Section 1042 of the *Standard Specifications* for Stone for Erosion Control, Class B.

Sediment control stone shall be #5 or #57 stone, which meets the requirements of Section 1005 of the *Standard Specifications* for these stone sizes.

Matting shall meet the requirements of Excelsior Matting in Subarticle 1060-8(B) of the *Standard Specifications*, or shall meet specifications provided elsewhere in this contract.

Polyacrylamide (PAM) shall be applied in powder form and shall be anionic or neutrally charged. Soil samples shall be obtained in areas where the Temporary Rock Silt Checks Type A with Excelsior Matting and PAM will be placed, and from offsite material used to construct the roadway, and analyzed for the appropriate PAM flocculant to be utilized with each Temporary Rock Silt Check Type A. The PAM product used shall be listed on the North Carolina Department of Environmental Quality Division of Water Resources web site as an approved PAM product for use in North Carolina.

### **Construction Methods**

Temporary Rock Silt Checks Type A shall be installed in accordance with Subarticle 1633-3(A) of the *Standard Specifications*, Roadway Standard Drawing No. 1633.01 and the detail provided in the plans.

Installation of matting shall be in accordance with the detail provided in the plans, and anchored by placing Class B stone on top of the matting at the upper and lower ends.

Apply PAM at a rate of 4 ounces over the center portion of the Temporary Rock Silt Checks Type A and matting where the water is going to flow over. PAM applications shall be done during construction activities and after every rainfall event that is equal to or exceeds 0.50 in.

The Contractor shall maintain the Temporary Rock Silt Checks Type A with Excelsior Matting and PAM until the project is accepted or until the Temporary Rock Silt Checks Type A with Excelsior Matting and PAM are removed, and shall remove and dispose of silt accumulations at the Temporary Rock Silt Checks Type A with Excelsior Matting and PAM when so directed in accordance with the requirements of Section 1630 of the *Standard Specifications*.

### **Measurement and Payment**

*Temporary Rock Silt Checks Type A* will be measured and paid for in accordance with Article 1633-5 of the *Standard Specifications*, or in accordance with specifications provided elsewhere in this contract.

Matting will be measured and paid for in accordance with Article 1631-4 of the *Standard Specifications*, or in accordance with specifications provided elsewhere in this contract.

*Polyacrylamide(PAM)* will be measured and paid for by the actual weight in pounds of PAM applied to the Temporary Rock Silt Checks Type A. Such price and payment will be full compensation for all work covered by this section, including, but not limited to, furnishing all materials, labor, equipment and incidentals necessary to apply the *Polyacrylamide(PAM)*.

Payment will be made under:

<b>Pay Item</b>	<b>Pay Unit</b>
Polyacrylamide(PAM)	Pound

### **COIR FIBER MAT:**

#### **Description**

Furnish material, install and maintain coir fiber mat in locations shown on the plans or in locations as directed. Work includes providing all materials, excavating and backfilling, and placing and securing coir fiber mat with stakes, steel reinforcement bars or staples as directed.

#### **Materials**

<b>Item</b>	<b>Section</b>
Coir Fiber Mat	1060-14

Anchors: Stakes, reinforcement bars, or staples shall be used as anchors.

#### Wooden Stakes:

Provide hardwood stakes 12"- 24" long with a 2" x 2" nominal square cross section. One end of the stake must be sharpened or beveled to facilitate driving through the coir fiber mat and down into the underlying soil. The other end of the stake needs to have a 1"- 2" long head at the top with a 1"- 2" notch following to catch and secure the coir fiber mat.

#### Steel Reinforcement Bars:

Provide uncoated #10 steel reinforcement bars 24" nominal length. The bars shall have a 4" diameter bend at one end with a 4" straight section at the tip to catch and secure the coir fiber mat.

#### Staples:

Provide staples made of 0.125" diameter new steel wire formed into a *u* shape not less than 12" in length with a throat of 1" in width.

#### **Construction Methods**

Place the coir fiber mat immediately upon final grading. Provide a smooth soil surface free from stones, clods, or debris that will prevent the contact of the mat with the soil. Unroll the mat and apply without stretching such that it will lie smoothly but loosely on the soil surface.

For stream relocation applications, take care to preserve the required line, grade, and cross section of the area covered. Bury the top slope end of each piece of mat in a narrow trench at least 6 in.

deep and tamp firmly. Where one roll of matting ends and a second roll begins, overlap the end of the upper roll over the buried end of the second roll so there is a 6 in. overlap. Construct check trenches at least 12 in. deep every 50 ft. longitudinally along the edges of the mat or as directed. Fold over and bury mat to the full depth of the trench, close and tamp firmly. Overlap mat at least 6 in. where 2 or more widths of mat are installed side by side.

Place anchors across the mat at the ends approximately 1 ft. apart. Place anchors along the outer edges and down the center of the mat 3 ft. apart.

Adjustments in the trenching or anchoring requirements to fit individual site conditions may be required.

### **Measurement and Payment**

*Coir Fiber Mat* will be measured and paid for as the actual number of square yards measured along the surface of the ground over which coir fiber mat is installed and accepted.

No measurement will be made for anchor items.

Payment will be made under:

#### **Pay Item**

Coir Fiber Mat

#### **Pay Unit**

Square Yard

### **CONCRETE WASHOUT STRUCTURE:**

(12-10-20)

#### **Description**

Concrete washout structures are enclosures above or below grade to contain concrete waste water and associated concrete mix from washing out ready-mix trucks, drums, pumps, or other equipment. Concrete washouts must collect and retain all the concrete washout water and solids, so that this material does not migrate to surface waters or into the ground water. These enclosures are not intended for concrete waste not associated with wash out operations.

The concrete washout structure may include constructed devices above or below ground and or commercially available devices designed specifically to capture concrete wash water.

#### **Materials**

##### **Item**

Temporary Silt Fence

##### **Section**

1605

*Safety Fence* shall meet the specifications as provided elsewhere in this contract.

Geomembrane basin liner shall meet the following minimum physical properties for low permeability; it shall consist of a polypropylene or polyethylene 10 mil thick geomembrane. If the minimum setback dimensions can be achieved the liner is not required. (5 feet above groundwater, 50 feet from top of bank of perennial stream, other surface water body, or wetland.)

### **Construction Methods**

Build an enclosed earthen berm or excavate to form an enclosure in accordance with the details and as directed.

Install temporary silt fence around the perimeter of the enclosure in accordance with the details and as directed if structure is not located in an area where existing erosion and sedimentation control devices are capable to containing any loss of sediment.

Post a sign with the words “Concrete Washout” in close proximity of the concrete washout area, so it is clearly visible to site personnel. Install safety fence as directed for visibility to construction traffic.

The construction details for the above grade and below grade concrete washout structures can be found on the following web page link:

<https://connect.ncdot.gov/resources/roadside/SoilWaterDocuments/ConcreteWashoutStructureDetail.pdf>

Alternate details for accommodating concrete washout may be submitted for review and approval.

The alternate details shall include the method used to retain and dispose of the concrete waste water within the project limits and in accordance with the minimum setback requirements. (5 feet above groundwater, 50 feet from top of bank of perennial stream, other surface water body, or wetland.)

### **Maintenance and Removal**

Maintain the concrete washout structure(s) to provide adequate holding capacity plus a minimum freeboard of 12 inches. Remove and dispose of hardened concrete and return the structure to a functional condition after reaching 75% capacity.

Inspect concrete washout structures for damage and maintain for effectiveness.

Remove the concrete washout structures and sign upon project completion. Grade the earth material to match the existing contours and permanently seed and mulch area.

**Measurement and Payment**

*Concrete Washout Structure* will be paid for per each enclosure installed in accordance with the details. If alternate details or commercially available devices are approved, then those devices will also be paid for per each approved and installed device.

*Temporary Silt Fence* will be measured and paid for in accordance with Article 1605-5 of the *Standard Specifications*.

*Safety Fence* shall be measured and paid for as provided elsewhere in this contract.

No measurement will be made for other items or for over excavation or stockpiling.

Payment will be made under:

<b>Pay Item</b>	<b>Pay Unit</b>
Concrete Washout Structure	Each

**FABRIC INSERT INLET PROTECTION DEVICE (HIGH FLOW)**

(6-29-17)

**Description**

This work shall consist of installing, maintaining, and removing *Fabric Insert Inlet Protection Device*, of the type specified, in inlet structures (catch basins, drop inlets, etc) in areas where asphalt or concrete may prevent the proper installation of a Rock Inlet Sediment Traps Type C, or as directed.

**Materials**

The product shall be a fabric inlet protection device composed of a fitted woven polypropylene geotextile double sewn with nylon thread suspended sack. The *Fabric Insert Inlet Protection Device* shall be manufactured to fit the opening of the catch basin or drop inlet or shall have a deflector to direct runoff from the curb opening into the fabric sack. The *Fabric Insert Inlet Protection Device* shall have a rigid frame or support system to support the loaded weight of the product. The product shall have lifting loops for removing the device from the basin and will have dump straps attached at the bottom to facilitate the emptying of the device. The *Fabric Insert Inlet Protection Device* shall have an overflow system to allow stormwater to enter the inlet structure and avoid ponding on the roadway when the device reaches capacity.

The stitching shall meet the following physical properties:

<b>Physical</b>	<b>Test Method</b>	<b>English</b>
Average Wide Width Strength	ASTM D-4884	165 lb/in

The fitted filter assembly shall have the following physical properties:

<b>Physical</b>	<b>Test Method</b>	<b>English</b>
Grab Tensile	ASTM D-4632	255 x 275 lbs
Minimum Puncture Strength	ASTM D-4833	125 lbs
Mullen Burst	ASTM D-3786	420 PSI
Minimum UV Resistance	ASTM D-4355	70 %.
Flow Rate	ASTM D-4491	200 gal/min/ft <sup>2</sup>
Apparent Opening	ASTM D-4751	20 US Sieve
Permittivity	ASTM D-4491	1.5 sec <sup>-1</sup>

### Construction Methods

Strictly comply with manufacturer's installation instructions and recommendations. Maintenance shall include regular daily inspections and after each qualifying rain event. The *Fabric Insert Inlet Protection Device* shall be emptied, cleaned and placed back into the basin when it reaches 50% capacity or as directed.

### Measurement and Payment

This work will be paid for at the contract unit price per *Fabric Insert Inlet Protection Device* of the type specified, complete in place and accepted. Such payment shall be full compensation for furnishing and installing the *Fabric Insert Inlet Protection Device* in accordance with this specification and for all required maintenance.

Maintenance of the device, cleanout and disposal of accumulated sediments shall be paid for by *Fabric Insert Inlet Protection Device Cleanout*.

Payment will be made under:

<b>Pay Item</b>	<b>Pay Unit</b>
Fabric Insert Inlet Protection Device	Each
Fabric Insert Inlet Protection Device Cleanout	Each