

TIP PROJECT: U-4716B

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

PLAN FOR PROPOSED  
HIGHWAY EROSION CONTROL

WAKE & DURHAM COUNTIES

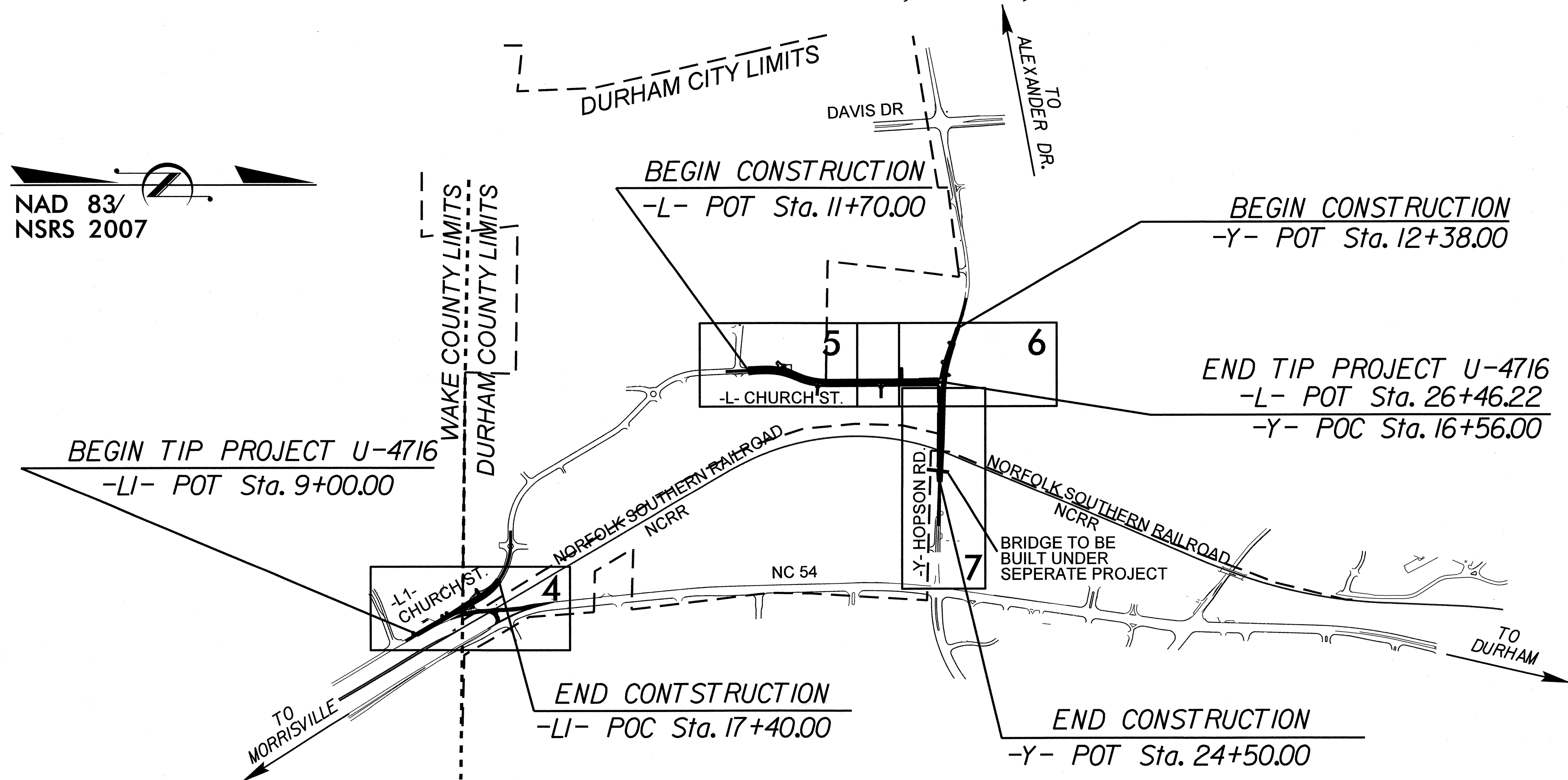
LOCATION: HOPSON RD. AND CHURCH ST. EXTENSION IN DURHAM

TYPE OF WORK: GRADING, PAVING, & DRAINAGE

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-4716B	EC-1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	

EROSION AND SEDIMENT CONTROL MEASURES

Std. #	Description	Symbol
1630.03	Temporary Silt Ditch	---TD---
1630.05	Temporary Diversion	---TD---
1605.01	Temporary Silt Fence	---III---III
1606.01	Special Sediment Control Fence	---Z---Z
1622.01	Temporary Berms and Slope Drains	---T---
1630.02	Silt Basin Type B	---B---
1633.01	Temporary Rock Silt Check Type-A	---R---A
	Temporary Rock Silt Check Type-A with Matting and Polyacrylamide (PAM)	---R---A-PAM
1633.02	Temporary Rock Silt Check Type-B	---R---B
	Wattle / Coir Fiber Wattle	---W---
	Wattle / Coir Fiber Wattle with Polyacrylamide (PAM)	---W---PAM
1634.01	Temporary Rock Sediment Dam Type-A	---RSD---A
1634.02	Temporary Rock Sediment Dam Type-B	---RSD---B
1635.01	Rock Pipe Inlet Sediment Trap Type-A	---RPIST---A
1635.02	Rock Pipe Inlet Sediment Trap Type-B	---RPIST---B
1630.04	Stilling Basin	---SB---
1630.06	Special Stilling Basin	---SSB---
	Rock Inlet Sediment Trap:	
1632.01	Type A	---RIS---A
1632.02	Type B	---RIS---B
1632.03	Type C	---RIS---C
	Skimmer Basin	---SKB---
	Tiered Skimmer Basin	---TSKB---
	Infiltration Basin	---IB---



NAD 83/  
NSRS 2007

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

THIS PROJECT HAS  
BEEN DESIGNED TO  
SENSITIVE WATERSHED  
STANDARDS.

ENVIRONMENTALLY  
SENSITIVE AREA(S) EXIST  
ON THIS PROJECT  
Refer To E. C. Special Provisions  
for Special Considerations.

**GRAPHIC SCALE**

0  
PLANS

0  
PROFILE (HORIZONTAL)

0  
PROFILE (VERTICAL)

ROADSIDE ENVIRONMENTAL UNIT  
DIVISION OF HIGHWAYS  
STATE OF NORTH CAROLINA

THESE EROSION AND SEDIMENT CONTROL PLANS COMPLY  
WITH THE REGULATIONS SET FORTH BY THE  
NCG-010000 GENERAL CONSTRUCTION PERMIT EFFECTIVE AUGUST 3, 2011  
ISSUED BY THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND  
NATURAL RESOURCES DIVISION OF WATER QUALITY.

Prepared in the Office of:  
**ROADSIDE ENVIRONMENTAL UNIT**  
1 South Wilmington St.  
Raleigh, NC 27611  
**2012 STANDARD SPECIFICATIONS**

Roadway Standard Drawings

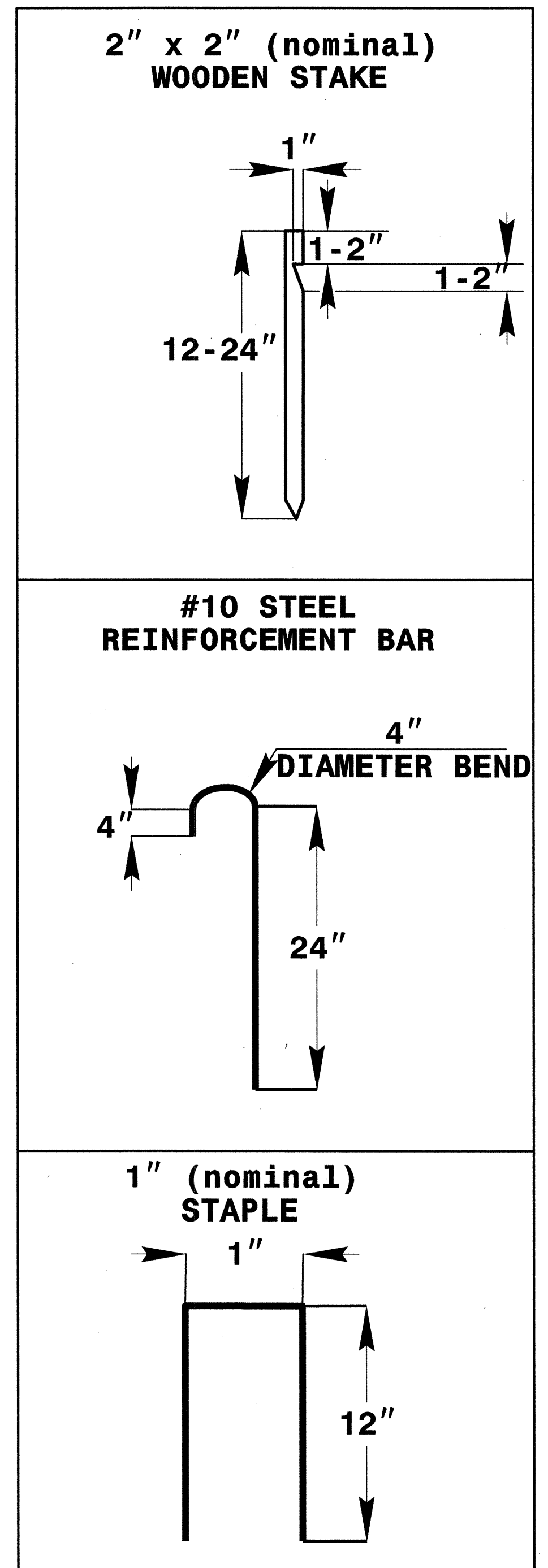
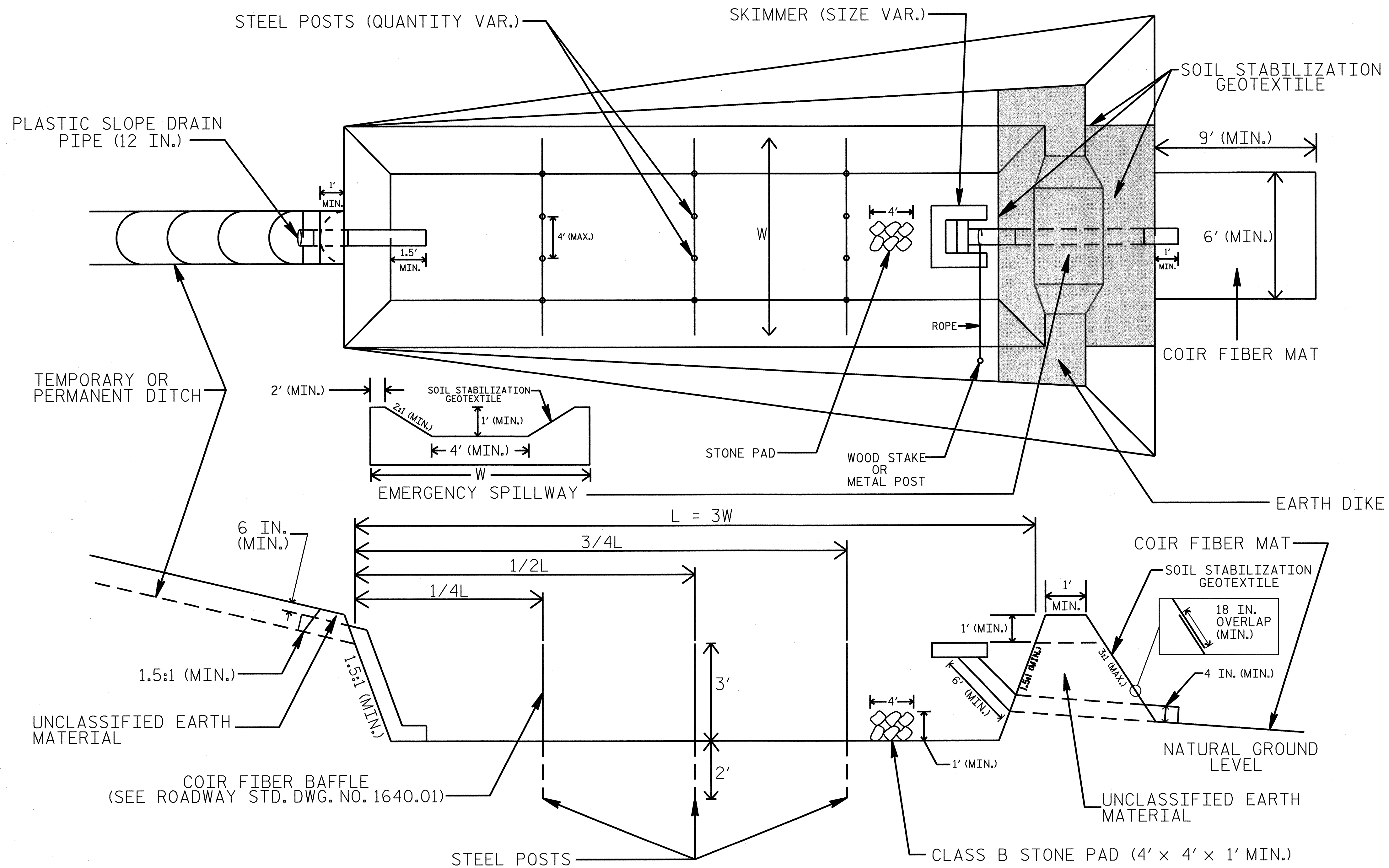
The following roadway english standards as appear in "Roadway Standard Drawings"- Roadway Design Unit - N. C. Department of Transportation - Raleigh, N. C., dated January 2012 and the latest revision thereto are applicable to this project and by reference hereby are considered a part of these plans.

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 Temporary Rock Silt Check Type A	1633.01 Temporary Rock Silt Check Type A
1630.02 Temporary Rock Silt Check Type B	1634.01 Temporary Rock Sediment Dam Type A
1630.03 Temporary Rock Silt Check Type C	1634.02 Temporary Rock Sediment Dam Type B
1630.04 Stilling Basin	1635.01 Rock Pipe Inlet Sediment Trap Type A
1630.05 Temporary Diversion	1635.02 Rock Pipe Inlet Sediment Trap Type B
1630.06 Special Stilling Basin	1640.01 Coir Fiber Baffle
1631.01 Matting Installation	1645.01 Temporary Stream Crossing

0371DEL\_P17-18

PROJECT REFERENCE NO. U-4716B	SHEET NO. EC-2
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

# SKIMMER BASIN WITH BAFFLES DETAIL



## COIR FIBER MAT ANCHOR OPTIONS

### NOTES

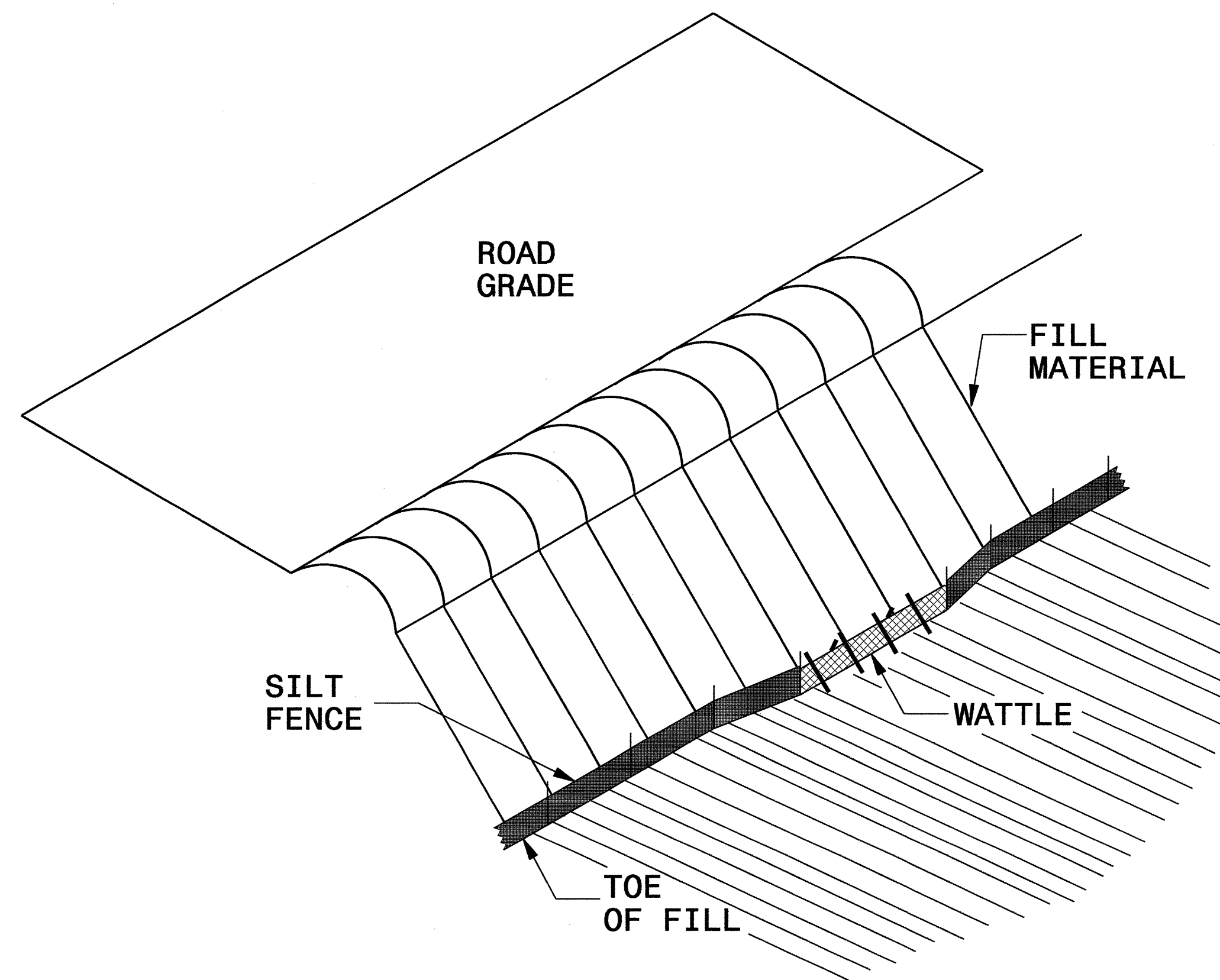
1. SEED AND PLACE MATTING FOR EROSION CONTROL ON INTERIOR AND EXTERIOR SIDESLOPES.
2. LIMIT EARTH DIKE HEIGHT TO 5 FT.
3. FOR BASIN DEPTH OF 3 FT., THE MINIMUM BASIN WIDTH SHALL BE 9 FT.
4. DETERMINE EMERGENCY SPILLWAY LENGTH (FT.) USING  $Q/0.8$ , WHERE Q IS FLOW RATE (CFS) INTO BASIN.
5. PLASTIC SLOPE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

NOT TO SCALE

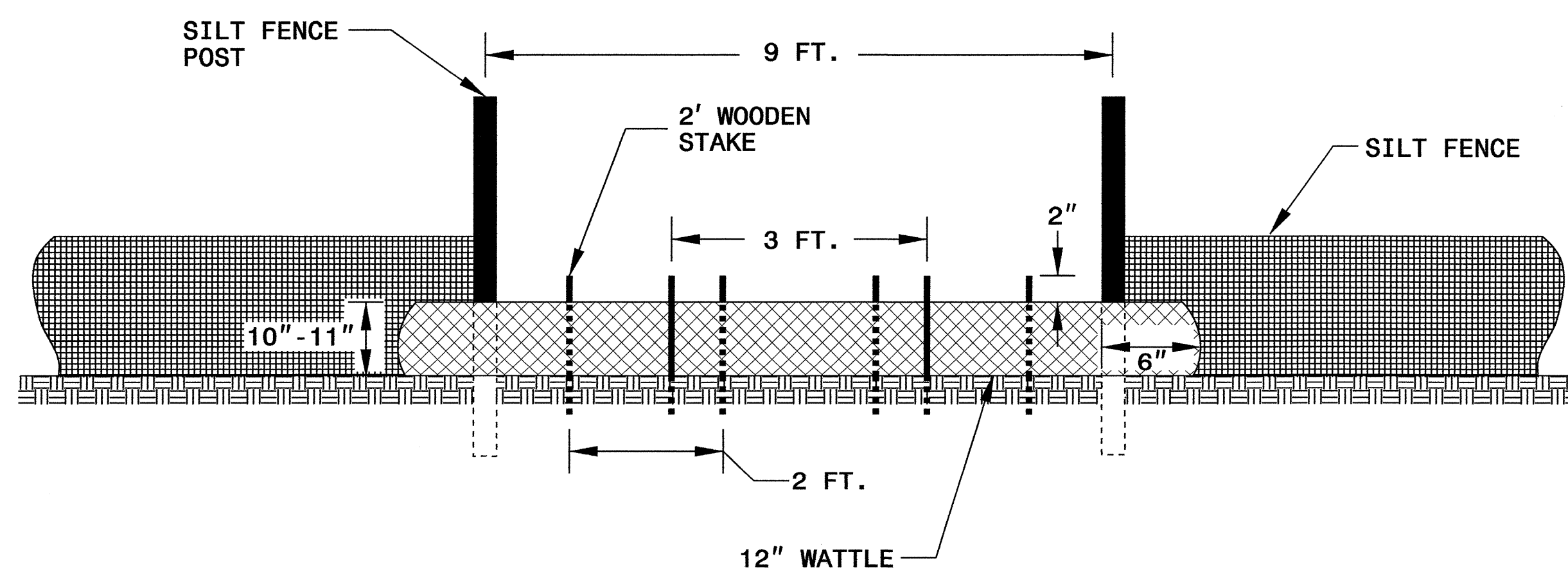


# SILT FENCE COIR FIBER WATTLE BREAK DETAIL

PROJECT REFERENCE NO. U-4716B		SHEET NO. EC-2A	
R/W SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	



**ISOMETRIC VIEW**

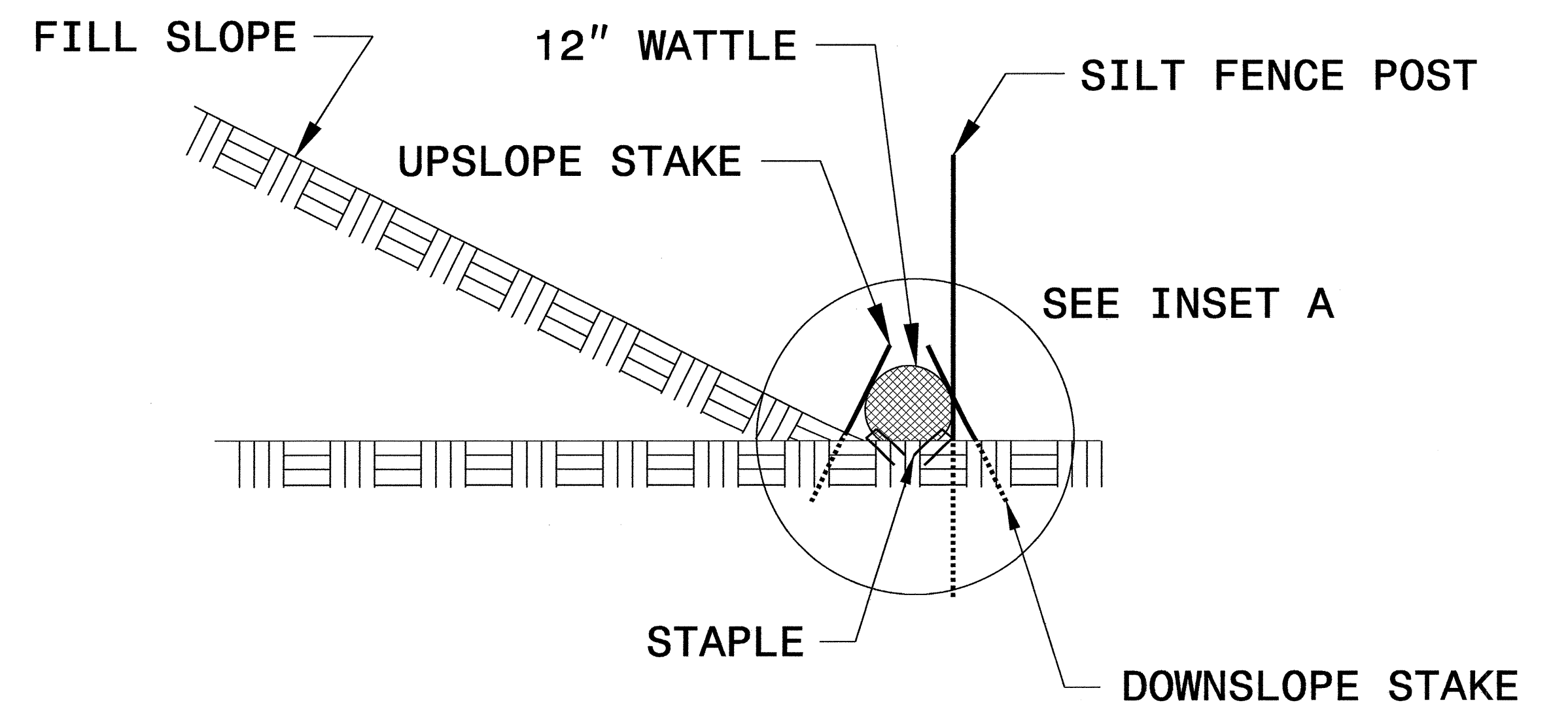
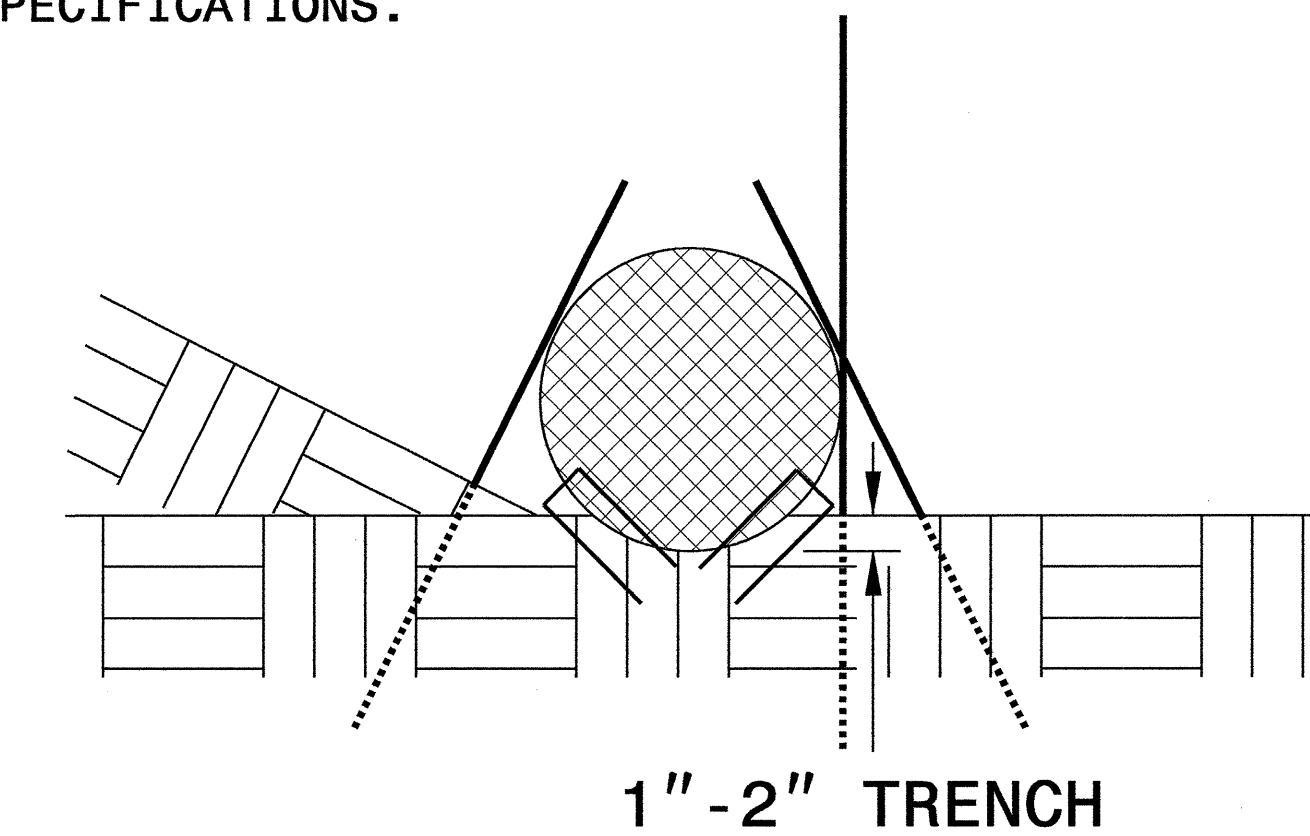


**VIEW FROM SLOPE**

**NOTES:**

- USE MINIMUM 12 IN. DIAMETER COIR FIBER (COCONUT FIBER) WATTLE AND LENGTH OF 10 FT.
- EXCAVATE A 1 TO 2 INCH TRENCH FOR WATTLE TO BE PLACED.
- DO NOT PLACE WATTLE ON TOE OF SLOPE.
- USE 2 FT. WOODEN STAKES WITH A 2 IN. BY 2 IN. NOMINAL CROSS SECTION.
- INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO GROUND.
- 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.
- WATTLE INSTALLATION CAN BE ON OUTSIDE OF THE SILT FENCE AS DIRECTED.
- INSTALL TEMPORARY SILT FENCE IN ACCORDANCE WITH SECTION 1605 OF THE STANDARD SPECIFICATIONS.

**INSET A**

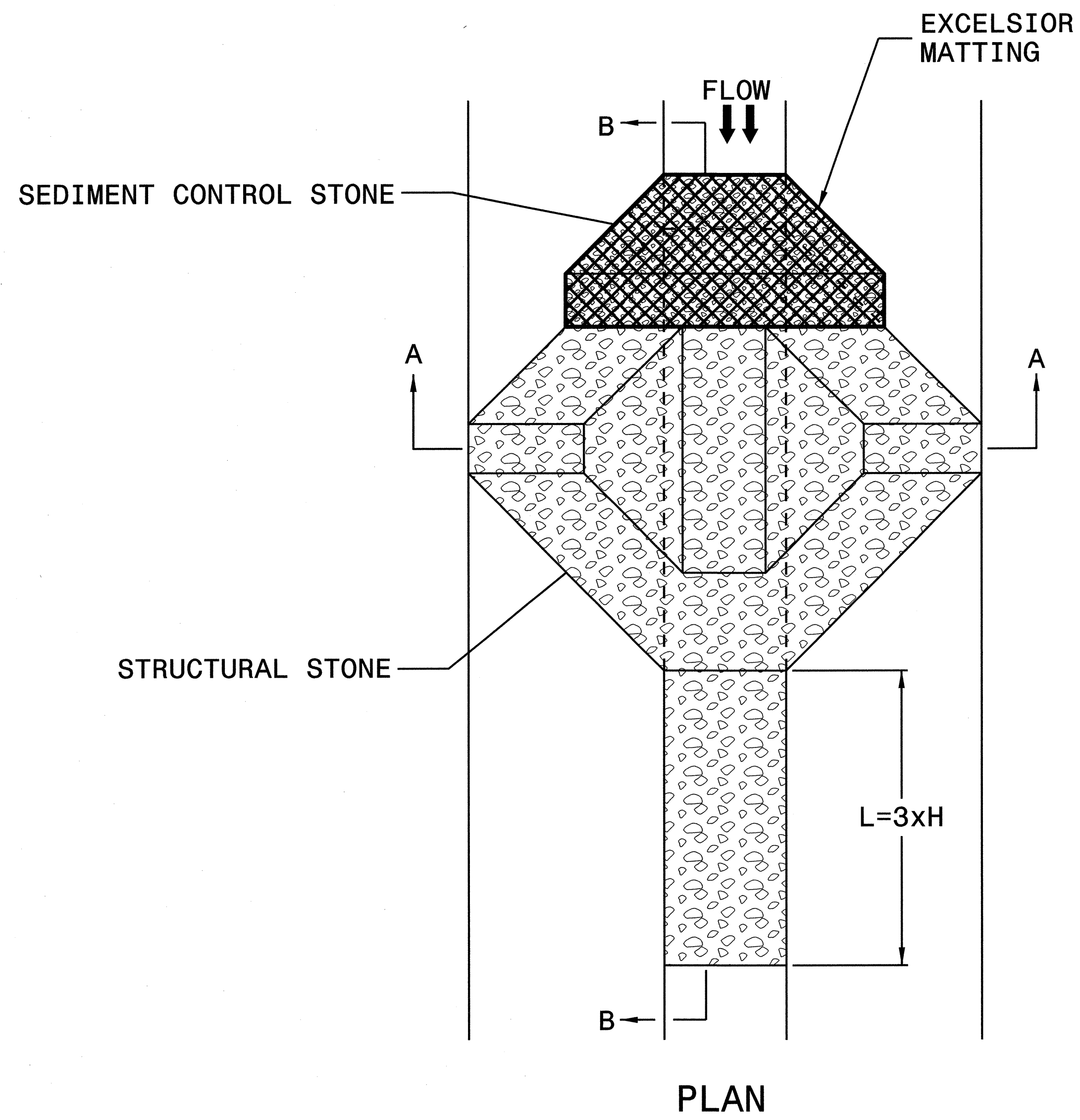


**SIDE VIEW**

0371DEL\_P17-18

PROJECT REFERENCE NO. U-4716B	SHEET NO. EC-2B
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

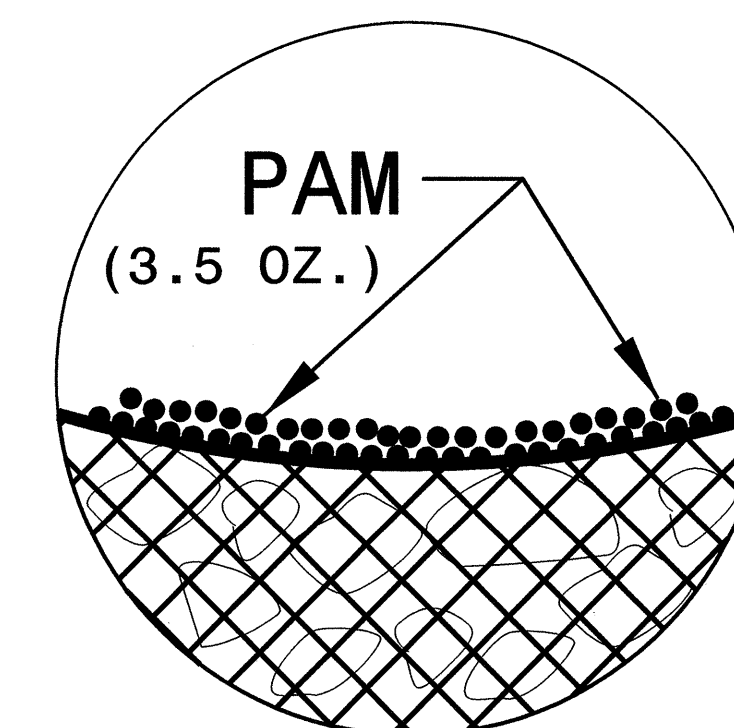


## NOTES

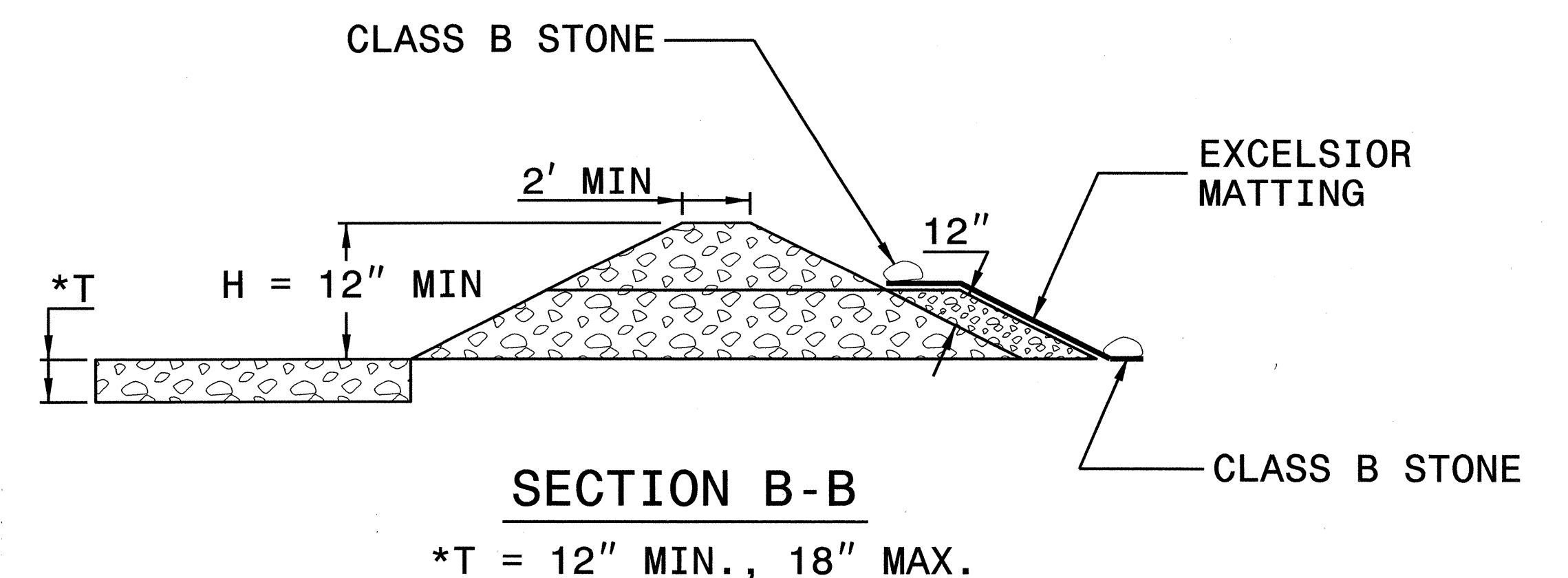
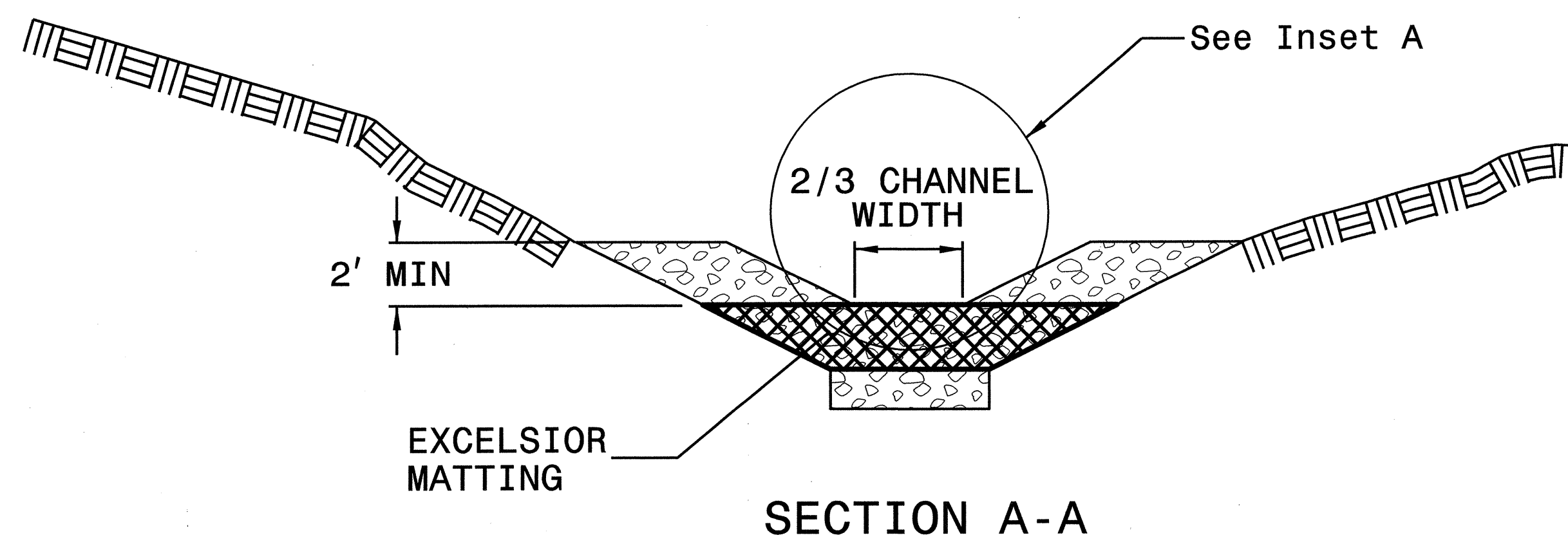
USE EXCELSIOR FOR MATTING MATERIAL AND ANCHOR MATTING SECTION AT TOP AND BOTTOM WITH CLASS B STONE.

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



INSET A



NOT TO SCALE





0371DEL\_P17-18

DIVISION OF HIGHWAYS  
STATE OF NORTH CAROLINA

PROJECT REFERENCE NO. <i>U-4716B</i>	SHEET NO. <i>EC-3A</i>
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

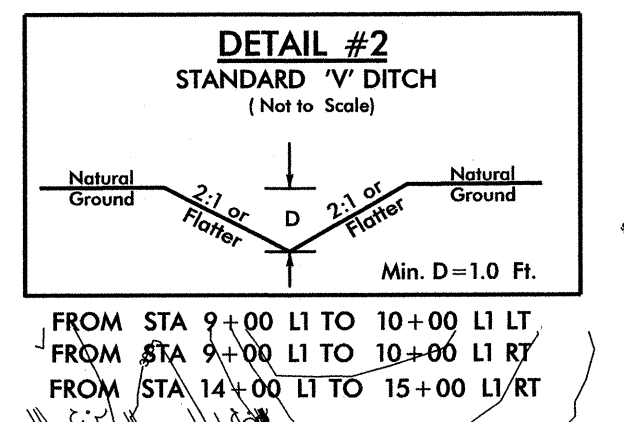
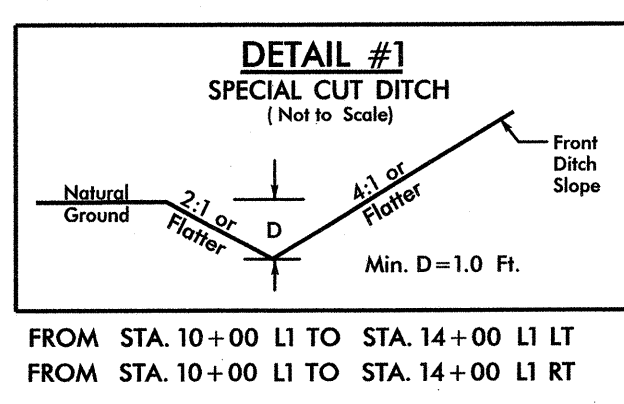
***SOIL STABILIZATION TIMEFRAMES***

<i>SITE DESCRIPTION</i>	<i>STABILIZATION TIME</i>	<i>TIMEFRAME EXCEPTIONS</i>
PERIMETER DIKES, SWALES, DITCHES AND SLOPES	7 DAYS	NONE
HIGH QUALITY WATER (HOW) 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 HOW ZONES.



0371DEL\_P17-18

I:\SPDAT\SS 3-11-2012 08:45  
 C:\Documents and Settings\mchen\My Documents\drive\Ren\Consultant\U-4716\Environmental\Design\U4716\_EC\_psh04.dgn  
 AT: REN\256946

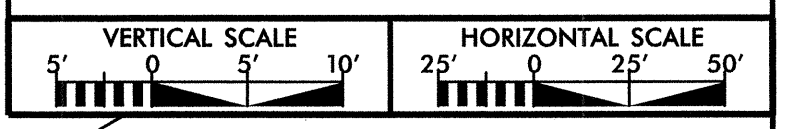


CLEARING AND GRUBBING  
EROSION CONTROL FOR  
CONSTRUCTION SHEET 4

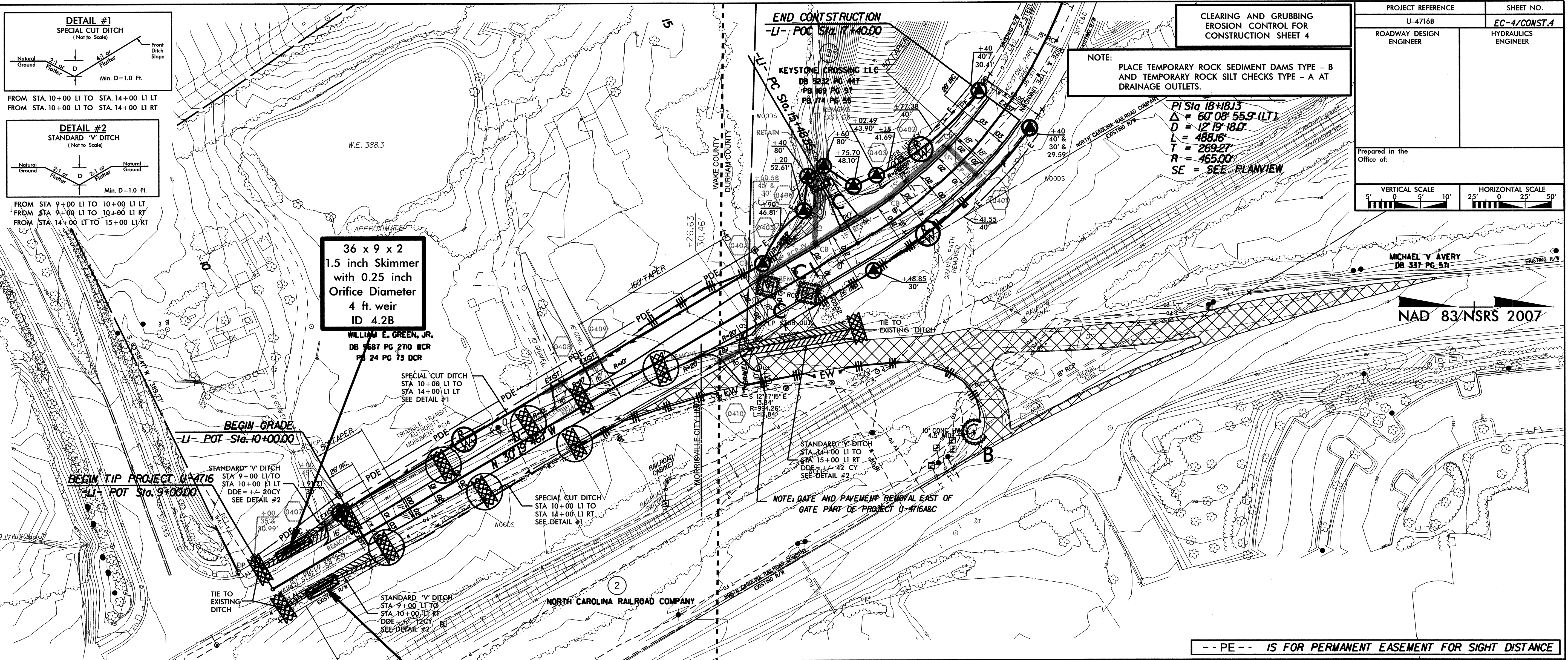
PROJECT REFERENCE U-4716B	SHEET NO. EC-4/CONST. A
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
Prepared in the Office of:	

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

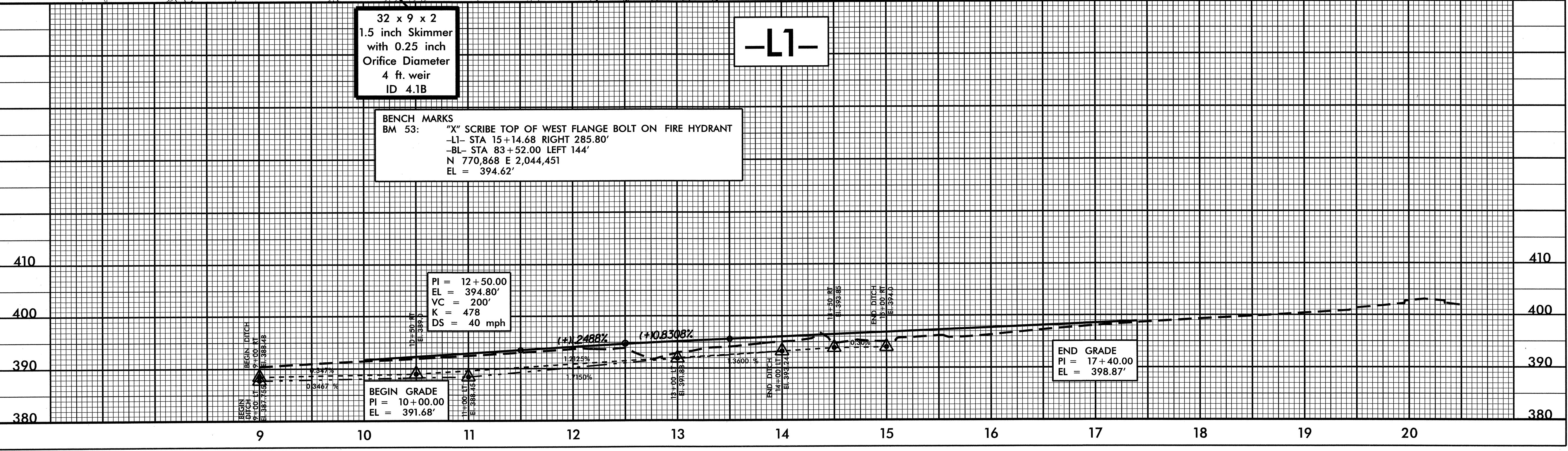
PI Sta 18+18.13  
Δ = 60' 08" 55.9' (LT)  
D = 12' 19" 18.0"  
L = 488.16'  
T = 269.27'  
R = 465.00'  
SE = SEE PLANVIEW



NAD 83/NSRS 2007



-- PE -- IS FOR PERMANENT EASEMENT FOR SIGHT DISTANCE





PROJECT REFERENCE	SHEET NO.
U-4716B	EC-5/CONST.5
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
HATCH MOTT MACDONALD I & E, LLC LICENSE NO. F-0669	
Prepared in the Office of: <b>Hatch Mott MacDonald</b>	
VERTICAL SCALE 5' 0 5' 10'	HORIZONTAL SCALE 25' 0 25' 50'

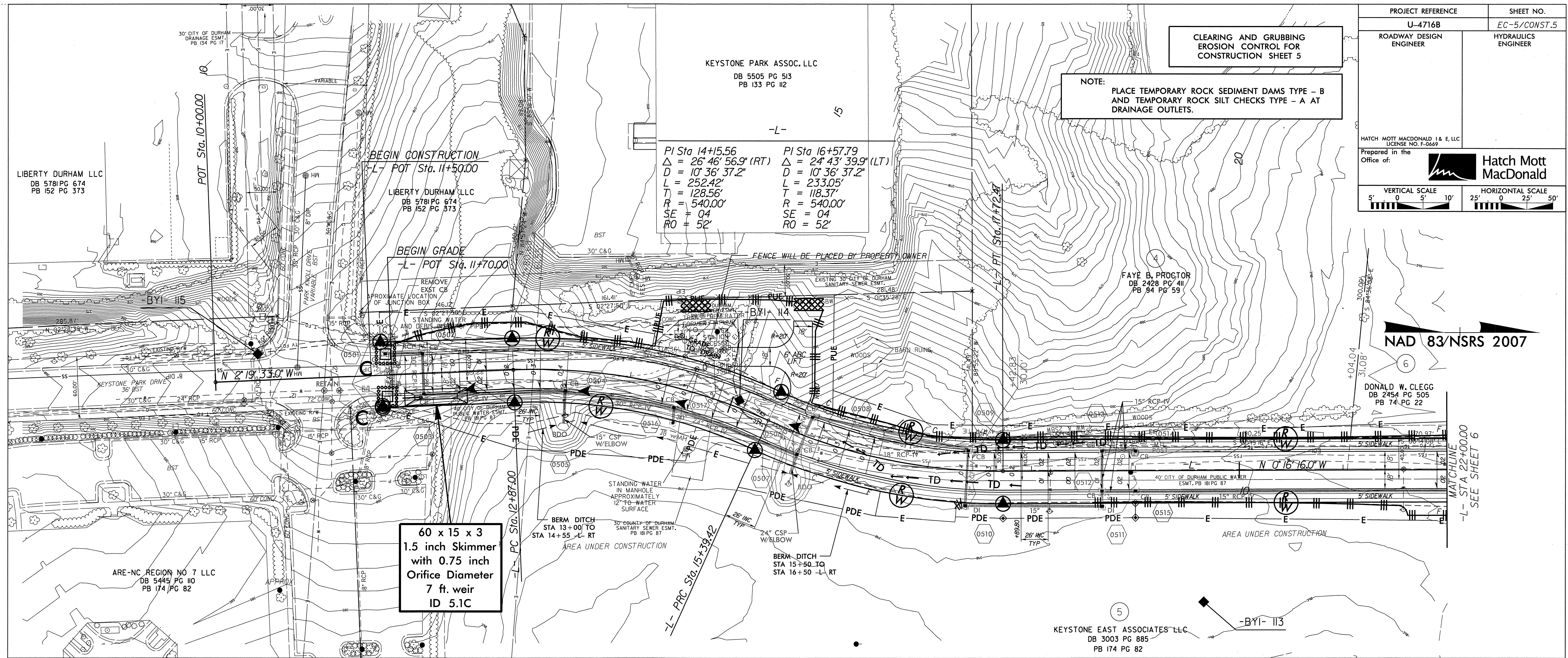
CLEARING AND GRUBBING  
EROSION CONTROL FOR  
CONSTRUCTION SHEET 5

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

KEYSTONE PARK ASSOC. LLC  
DB 5505 PG 513  
PB 133 PG 112

-L-

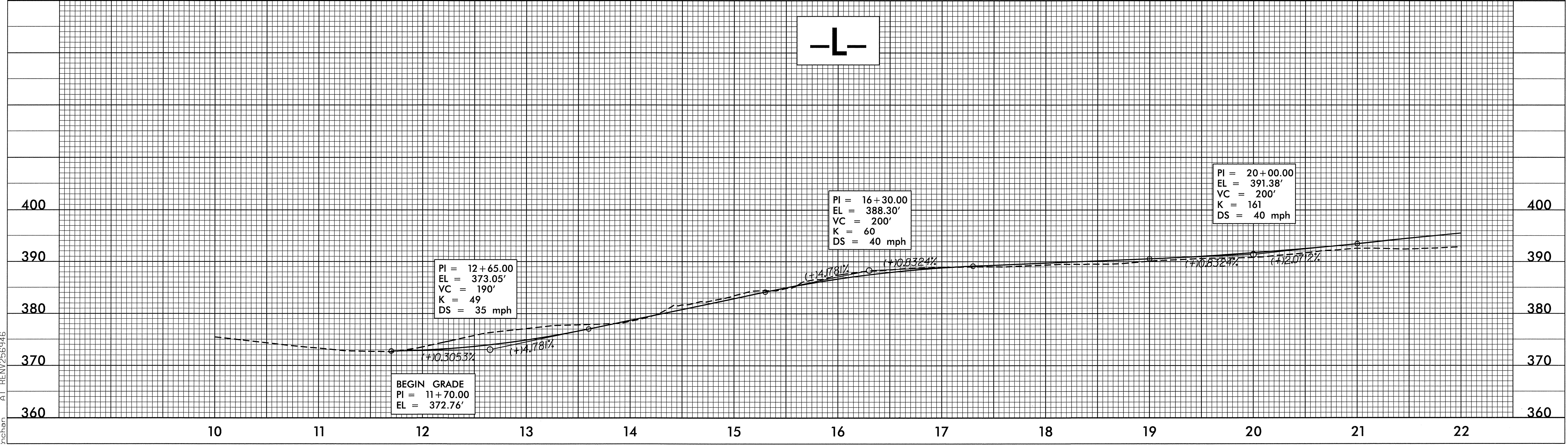
PI Sta 14+15.56 Δ = 26° 46' 56.9" (RT) D = 10' 36' 37.2" L = 252.42' T = 128.56' R = 540.00' SE = 04' RO = 52'	PI Sta 16+57.79 Δ = 24° 43' 39.9" (LT) D = 10' 36' 37.2" L = 233.05' T = 118.37' R = 540.00' SE = 04' RO = 52'
---	---



60 x 15 x 3  
1.5 inch Skimmer  
with 0.75 inch  
Orifice Diameter  
7 ft. weir  
ID 5.1C

NAD 83/NSRS 2007

MATCHLINE  
-L- STA 22+00.00  
SEE SHEET 6



0371DEL\_P17-18  
 27-SEP-2012 14:51  
 C:\Documents and Settings\nchan\My Documents\Ren\Rail\U-4716B\Updated files from mike pekarek 9-25-2012\U4716\_rdu\_psh05.dgn  
 nchan AT REN\256946



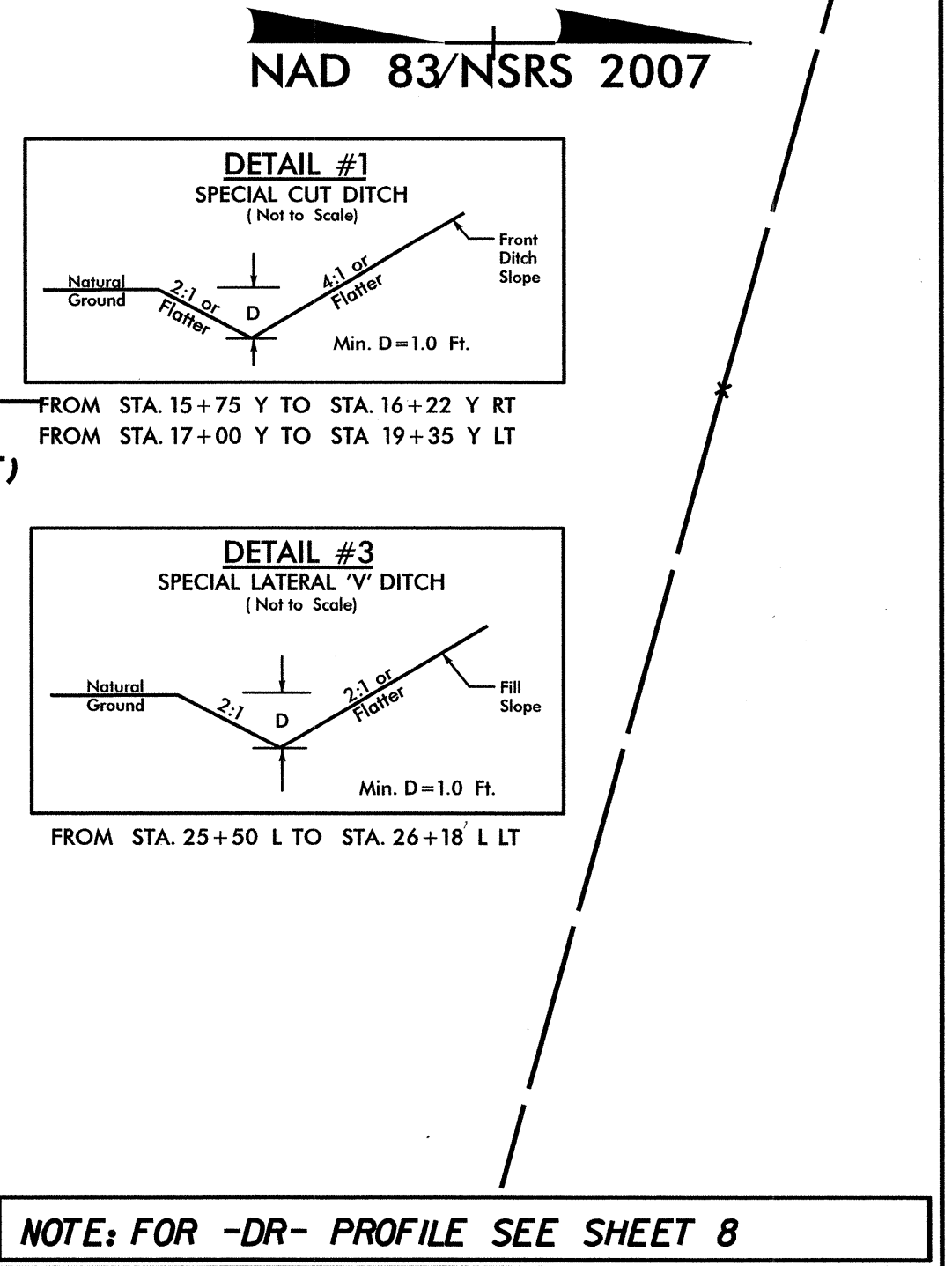
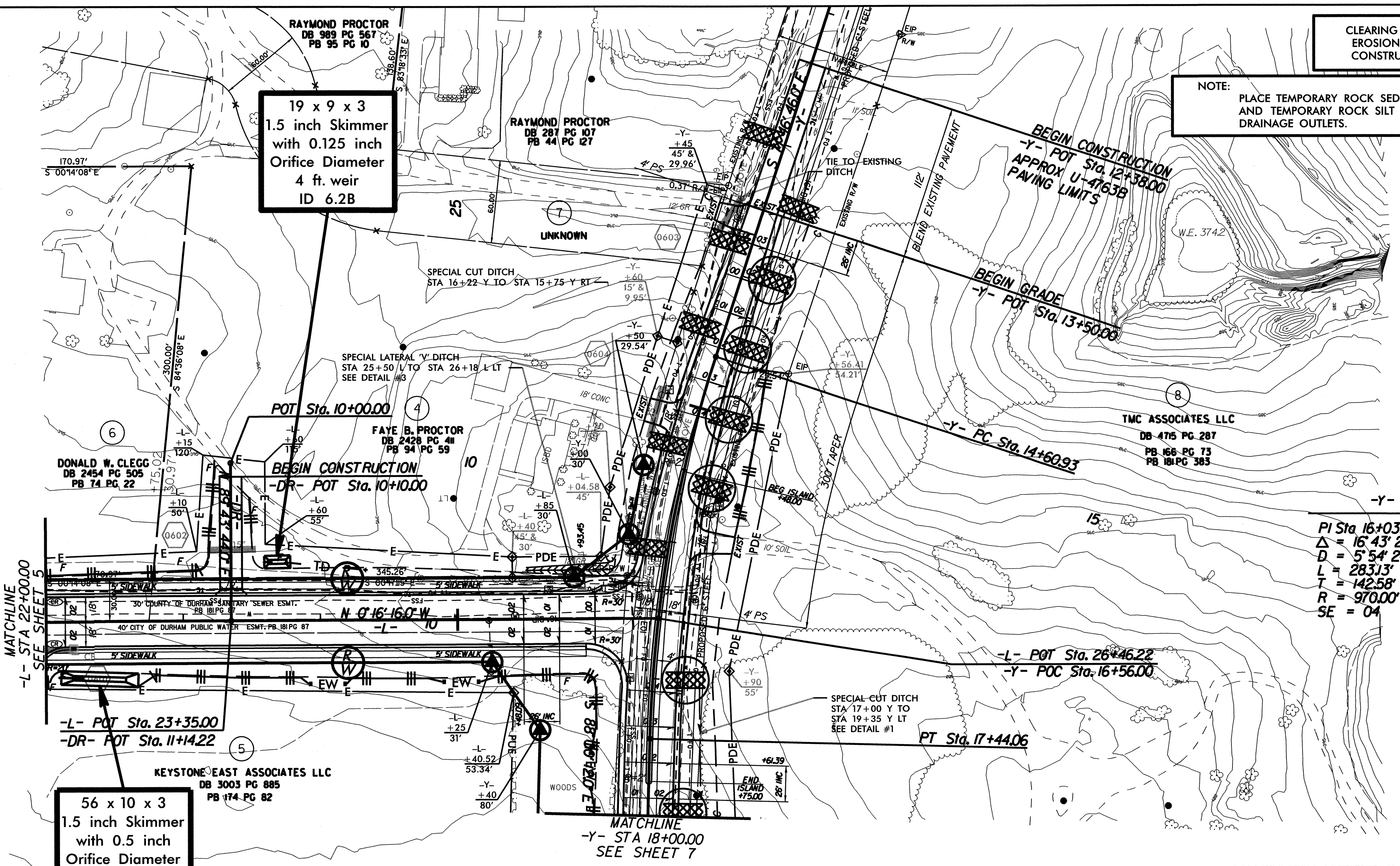
0371DEL\_P17-18

DATE: 31-JUL-2012 08:45  
C:\Documents and Settings\nehan\My Documents\From D drive\Ren\Consultant\U-4716\Environmental\Design\4716\_EC\_psh06.dgn  
nehan AT REN\256546

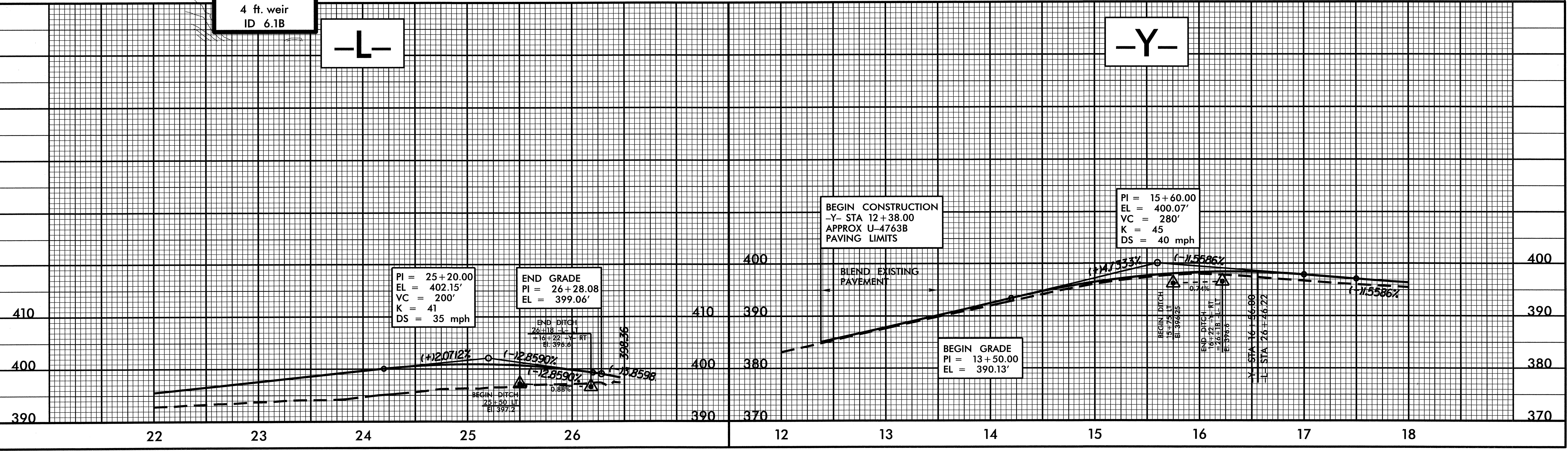
CLEARING AND GRUBBING  
EROSION CONTROL FOR  
CONSTRUCTION SHEET 6

PROJECT REFERENCE U-4716B	SHEET NO. EC-6/CONST.6
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
Prepared in the Office of:	
VERTICAL SCALE 5' 0 5' 10'	HORIZONTAL SCALE 25' 0 25' 50'

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



NOTE: FOR -DR- PROFILE SEE SHEET 8





0371DEL\_P17-18

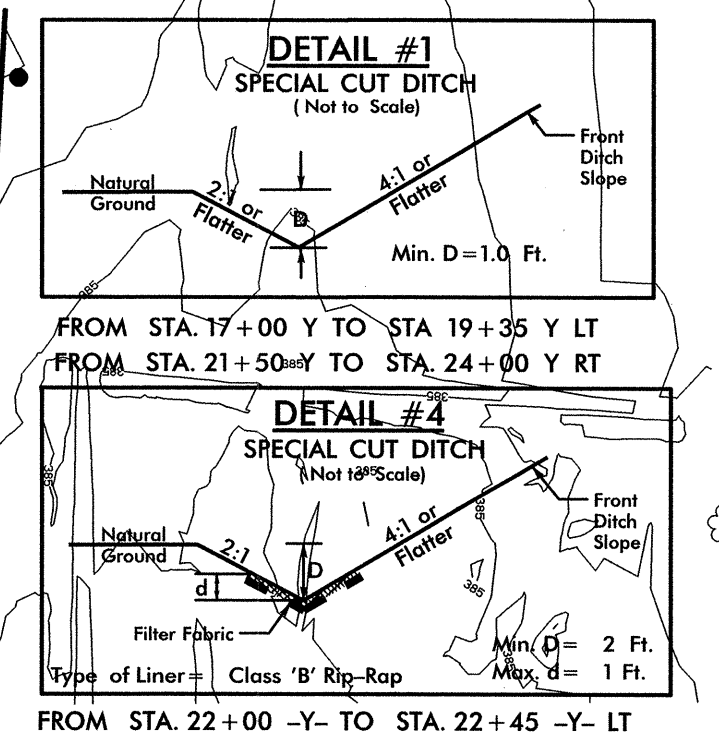
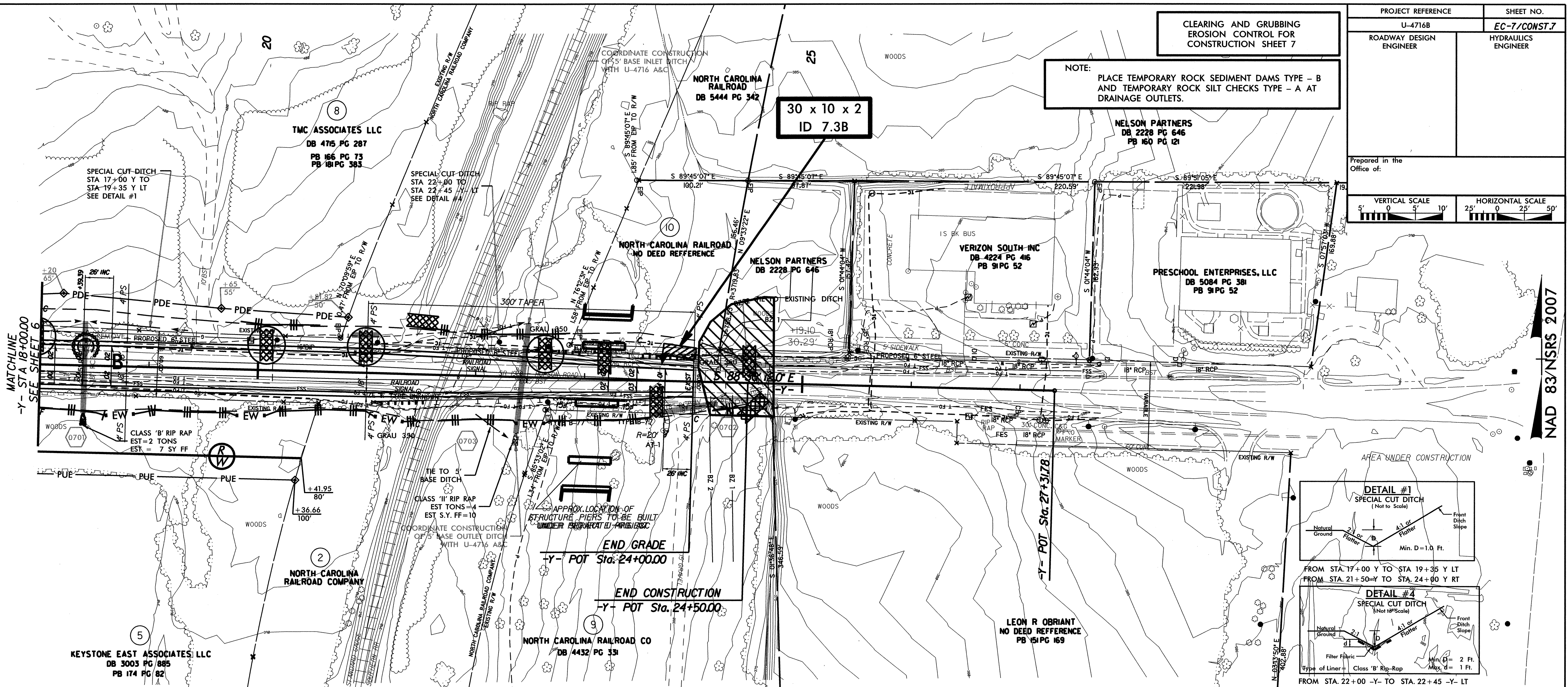
\\\$DATE\$\$ 31-JUL-2012 08:45 C:\Documents and Settings\nehan\My Documents\From D drive\Reu\Consultant\U-4716\Environmental\Design\U4716-EC\_psh07.dgn nehan AT RENV256546

PROJECT REFERENCE		SHEET NO.	
U-4716B		EC-7/CONST.7	
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	

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

Prepared in the Office of:

VERTICAL SCALE	HORIZONTAL SCALE
1" = 5'	1" = 25'



**-Y-**

BENCH MARKS  
 BM 52: R/R SPIKE SET IN 20" PINE  
 -Y- STA 24+70.86 LEFT 41.25'  
 -BY- STA 8+71 LEFT 28'  
 N 774,167 E 2,043,394  
 EL = 379.87'

PIPE HYDRAULIC DATA  
 DRAINAGE STRUCTURE NO. 0703

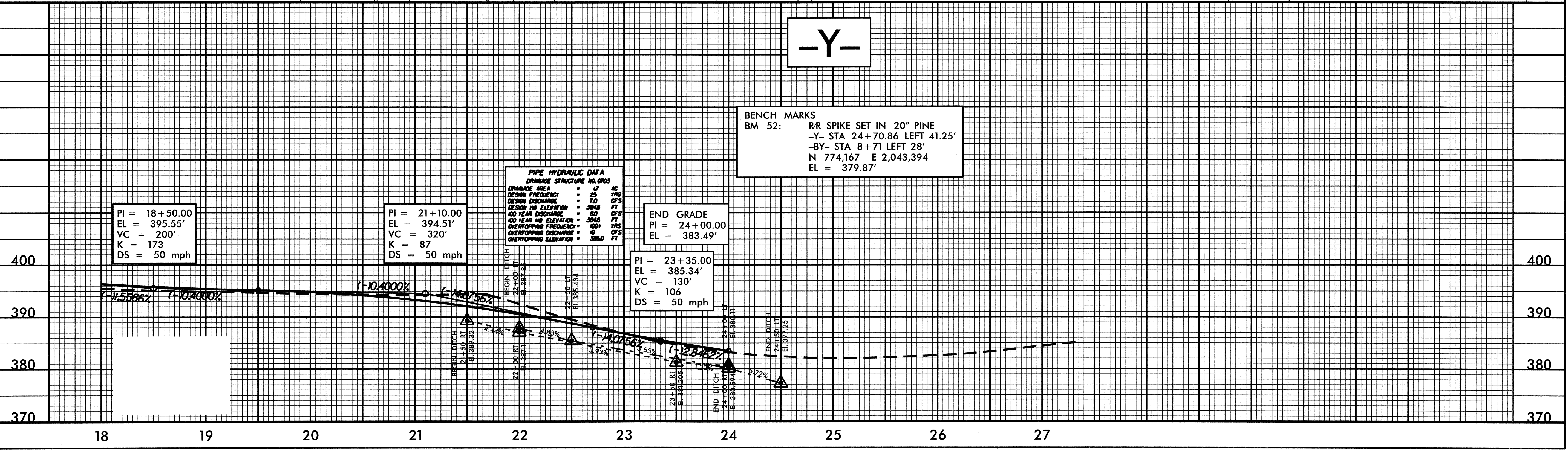
DRAINAGE AREA	17	AC
DESIGN FREQUENCY	25	YRS
DESIGN DISCHARGE	17.0	CFS
DESIGN HW ELEVATION	394.6	FT
100 YEAR DISCHARGE	80	CFS
100 YEAR HW ELEVATION	394.6	FT
OVERTOPPING FREQUENCY	100	YRS
OVERTOPPING DISCHARGE	10	CFS
OVERTOPPING ELEVATION	386.0	FT

PI = 18+50.00  
 EL = 395.55'  
 VC = 200'  
 K = 173  
 DS = 50 mph

PI = 21+10.00  
 EL = 394.51'  
 VC = 320'  
 K = 87  
 DS = 50 mph

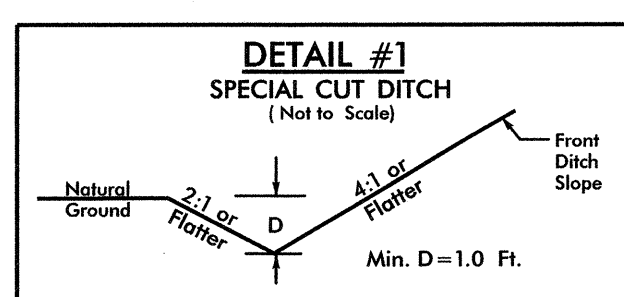
END GRADE  
 PI = 24+00.00  
 EL = 383.49'

PI = 23+35.00  
 EL = 385.34'  
 VC = 130'  
 K = 106  
 DS = 50 mph

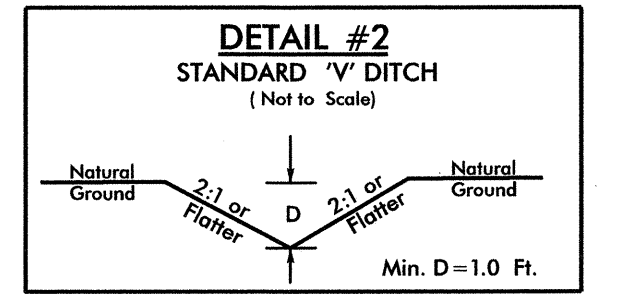




0371DEL\_P17-18



FROM STA. 10+00 LI TO STA. 14+00 LI LT  
FROM STA. 10+00 LI TO STA. 14+00 LI RT



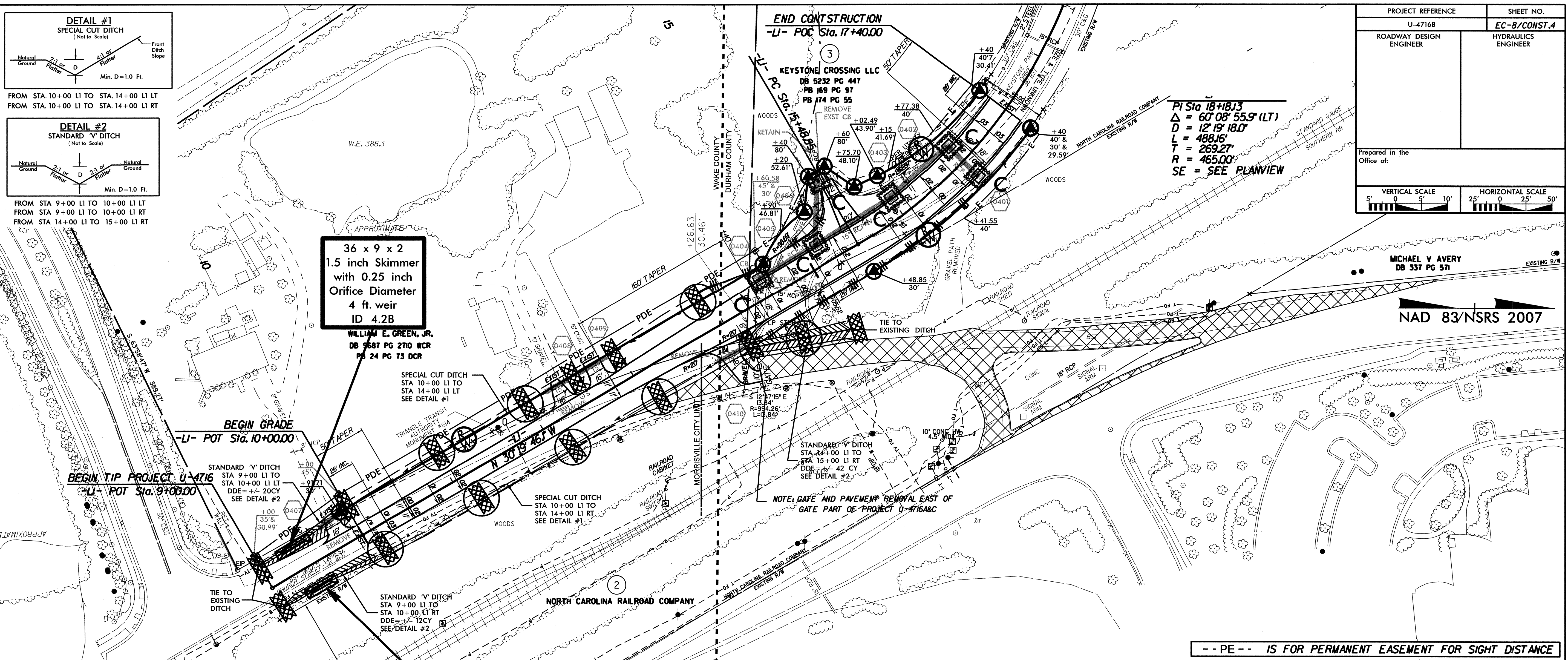
FROM STA 9+00 LI TO 10+00 LI LT  
FROM STA 9+00 LI TO 10+00 LI RT  
FROM STA 14+00 LI TO 15+00 LI RT

\S\DATES\$ 3-JUL-2012 08:45  
 C:\Documents and Settings\mchan\My Documents\From D drive\Reu\Consultant\U-4716\Environmental\Design\U4716\_EC\_psh04.dgn  
 mchan AT RENW256546

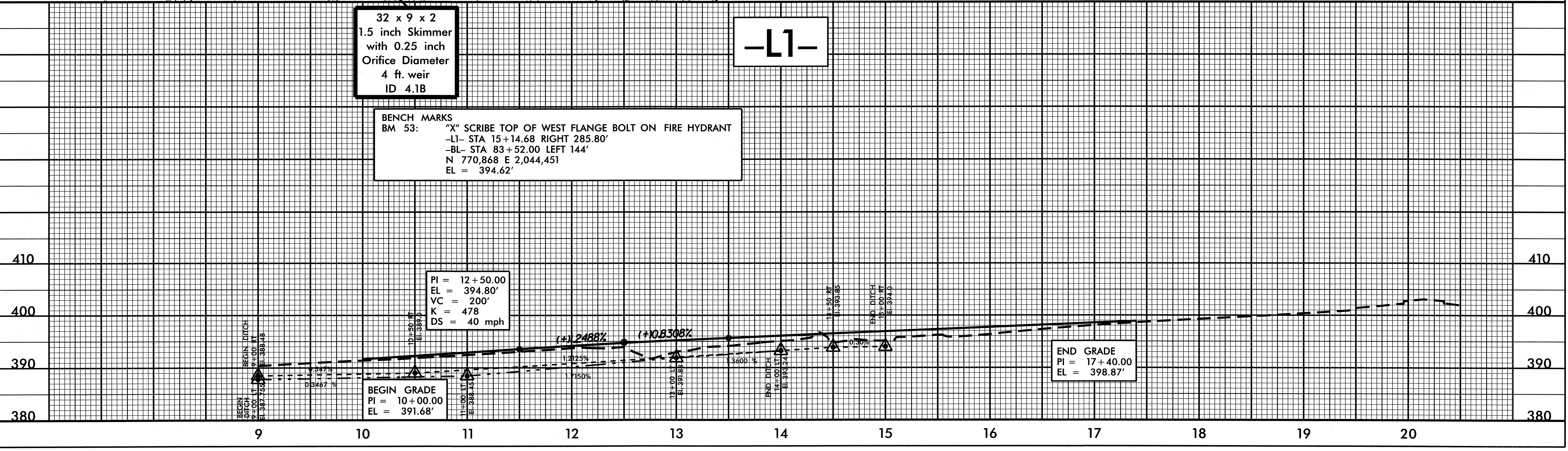
PROJECT REFERENCE	SHEET NO.
U-4716B	EC-8/CONST.4
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
Prepared in the Office of:	
VERTICAL SCALE	HORIZONTAL SCALE
5' 0" 5' 10'	25' 0" 25' 50'

PI Sta 18+18.13  
 $\Delta = 60' 08" 55.9" (LT)$   
 $D = 12' 19" 18.0"$   
 $L = 488.16'$   
 $T = 269.27'$   
 $R = 465.00'$   
 SE = SEE PLANVIEW

NAD 83/NSRS 2007



-- PE -- IS FOR PERMANENT EASEMENT FOR SIGHT DISTANCE



**32 x 9 x 2**  
 1.5 inch Skimmer  
 with 0.25 inch  
 Orifice Diameter  
 4 ft. weir  
 ID 4.1B

**BENCH MARKS**  
 BM 53: "X" SCRIBE TOP OF WEST FLANGE BOLT ON FIRE HYDRANT  
 -LI- STA 15+14.68 RIGHT 285.80'  
 -BL- STA 83+52.00 LEFT 144'  
 N 770,868 E 2,044,451  
 EL = 394.62'

PI = 12+50.00  
 EL = 394.80'  
 VC = 200'  
 K = 478  
 DS = 40 mph

**BEGIN GRADE**  
 PI = 10+00.00  
 EL = 391.68'

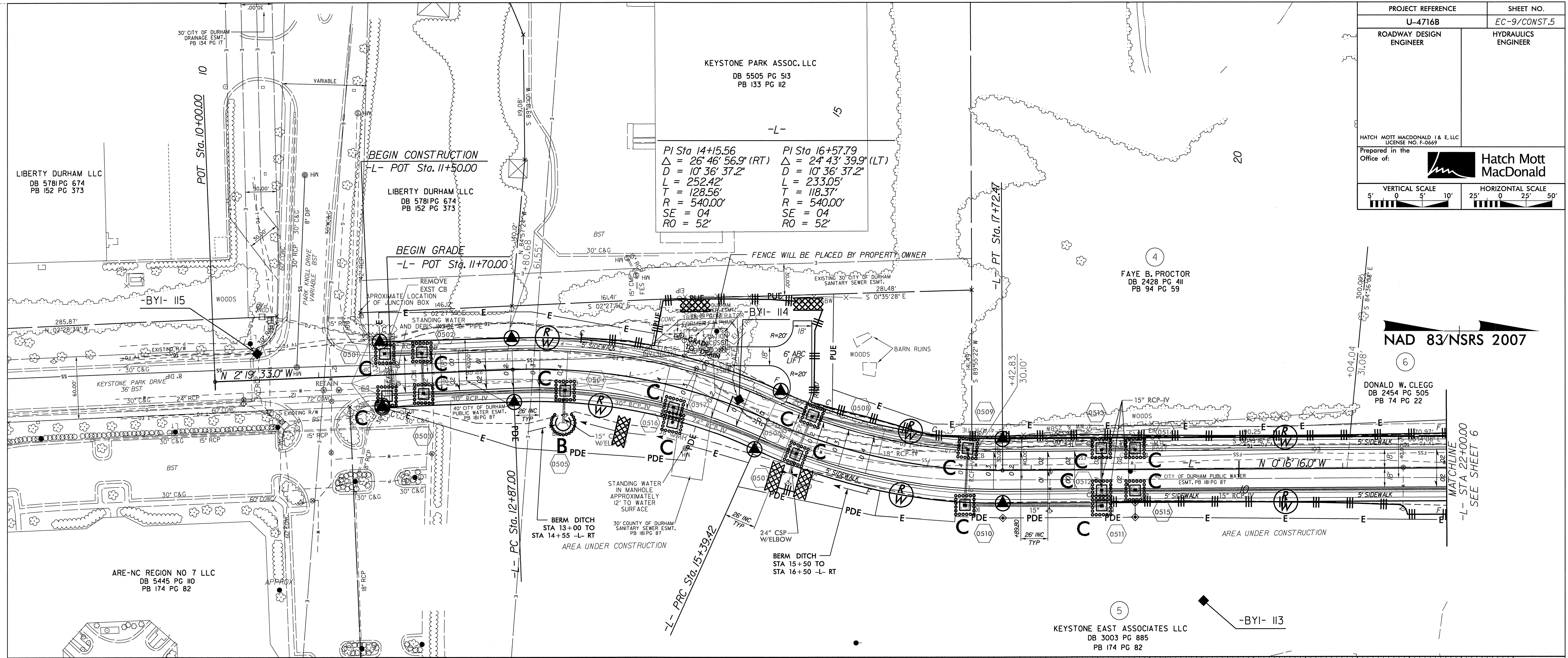
**END GRADE**  
 PI = 17+40.00  
 EL = 398.87'

**-LI-**

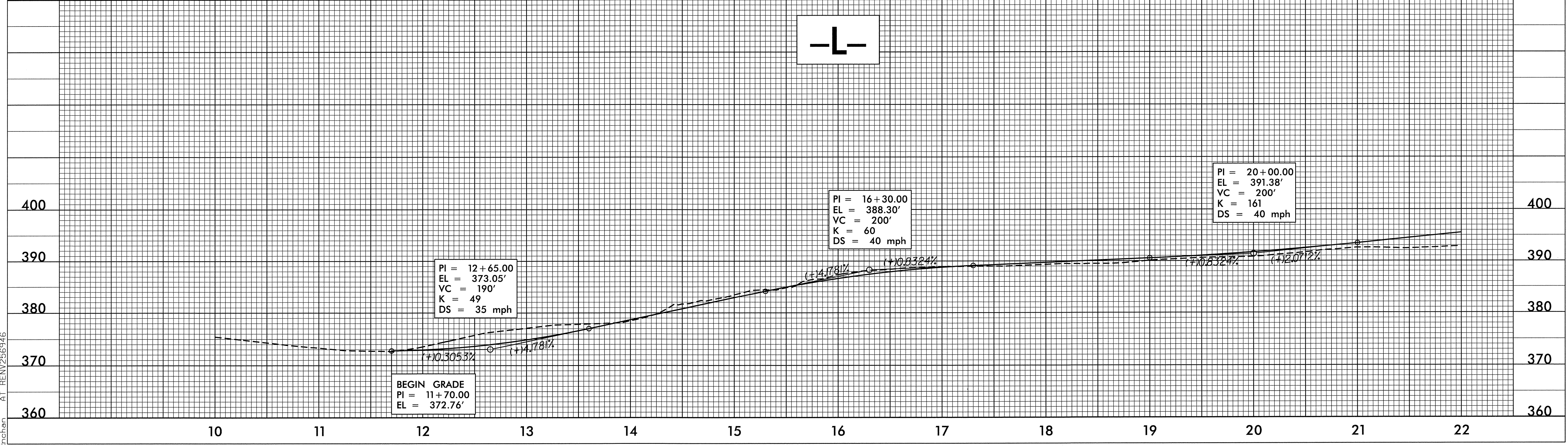


PROJECT REFERENCE		SHEET NO.
U-4716B		EC-9/CONST.5
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	
HATCH MOTT MACDONALD I & E, LLC LICENSE NO. F-0669		
Prepared in the Office of:		
Hatch Mott MacDonald		
VERTICAL SCALE 5' 0 5 10'		HORIZONTAL SCALE 25' 0 25' 50'

0371DEL\_P17-18



sspDATE\$ 27-SEP-2012 14:53  
 C:\Documents and Settings\nchan\Mj Documents\Reu\Fail\U-4716B\updated files from mike pekarek 9-25-2012\U4716\_r.dwg\_psh05.dgn  
 nchan AT RENV256946



NAD 83/NSRS 2007

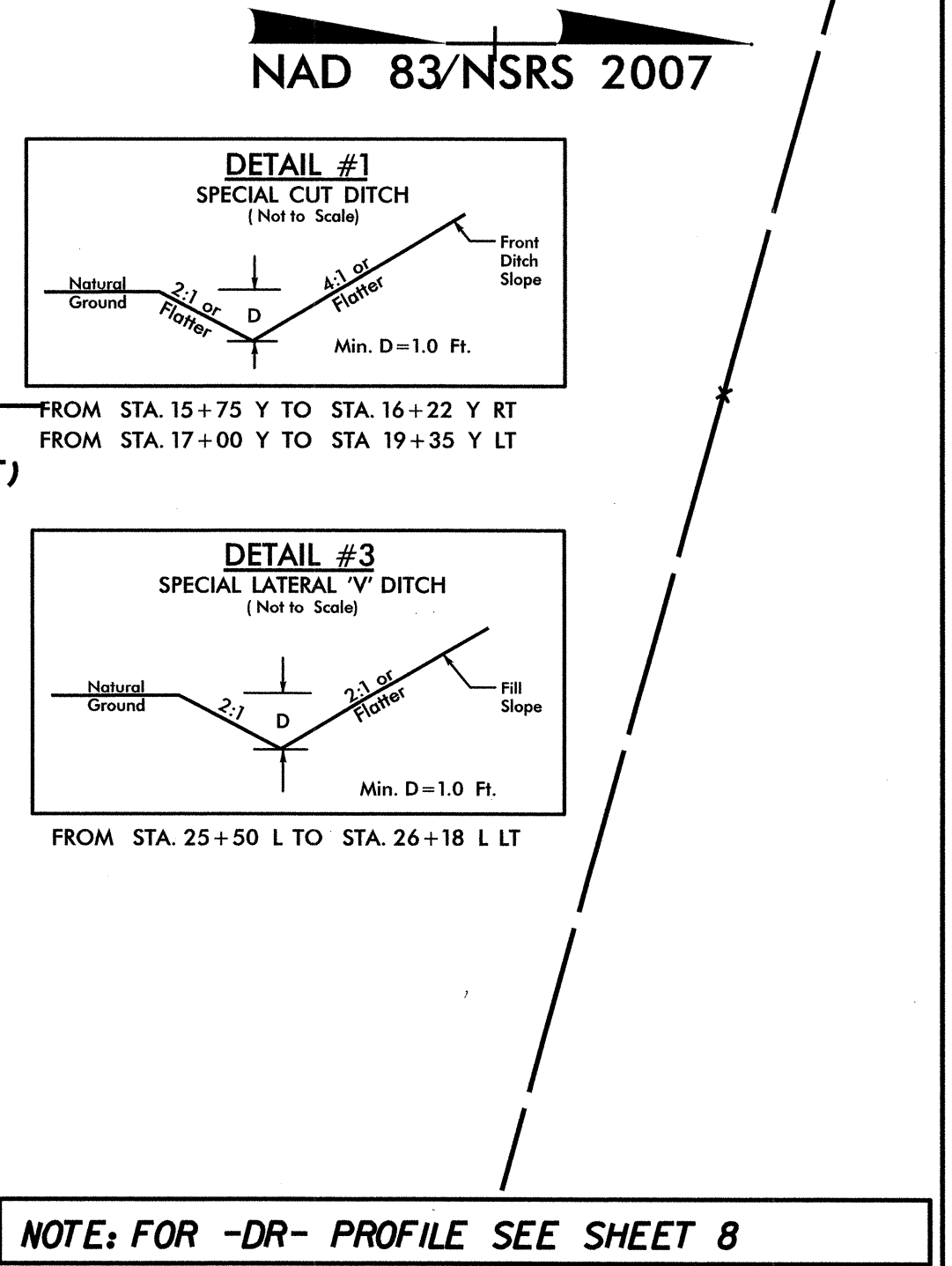
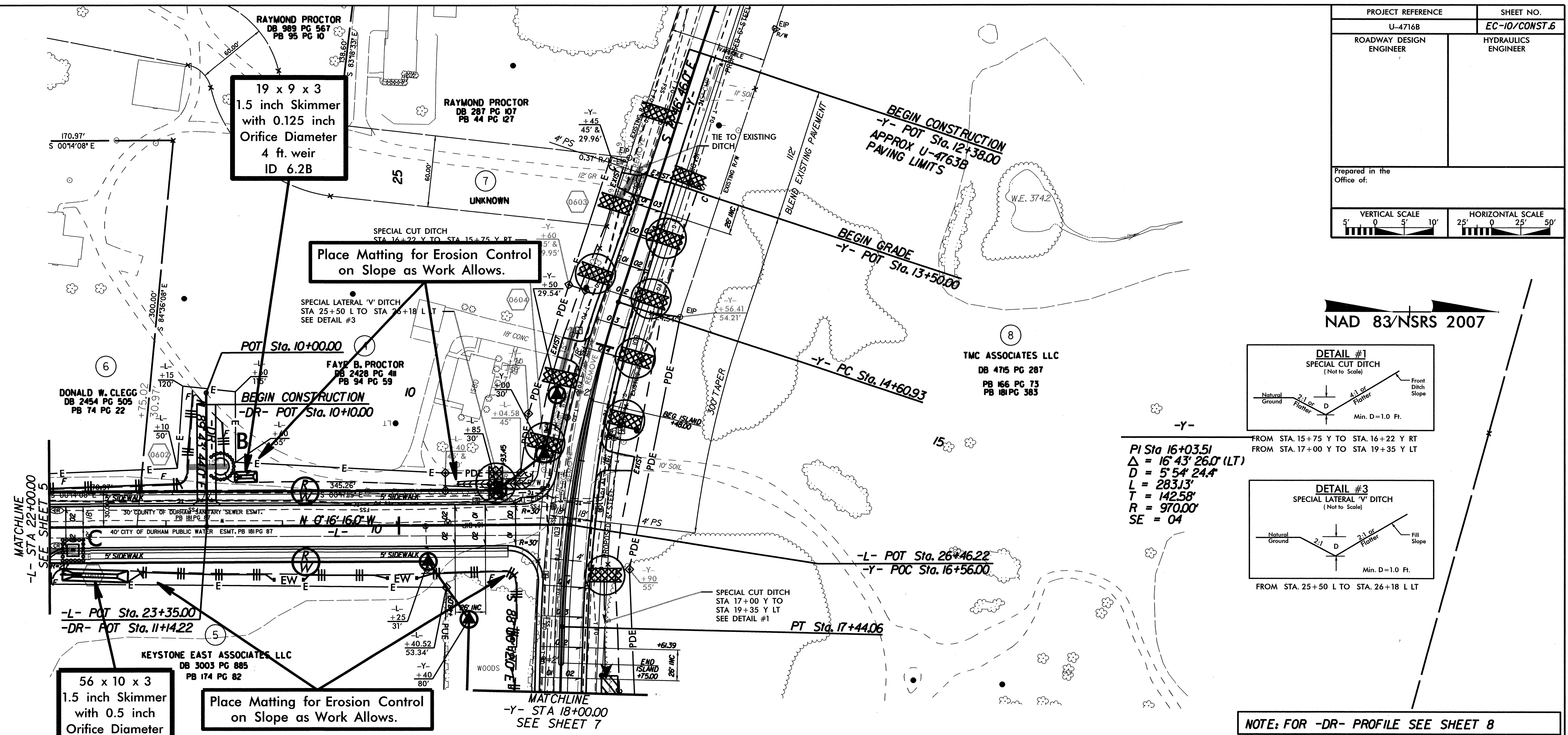
MATCHLINE  
 -L- STA 22+00.00  
 SEE SHEET 6



0371DEL\_P17-18

DATE: 31-JUL-2012 08:45  
C:\Documents and Settings\nehan\My Documents\From D drive\Rev\Consultant\U-4716\Environmental\Design\U4716-EC\_psh06.dgn  
nehan AT RENV256946

PROJECT REFERENCE U-4716B	SHEET NO. EC-10/CONST.6
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
Prepared in the Office of:	
VERTICAL SCALE 5' 0 5' 10'	HORIZONTAL SCALE 25' 0 25' 50'



NOTE: FOR -DR- PROFILE SEE SHEET 8

