

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

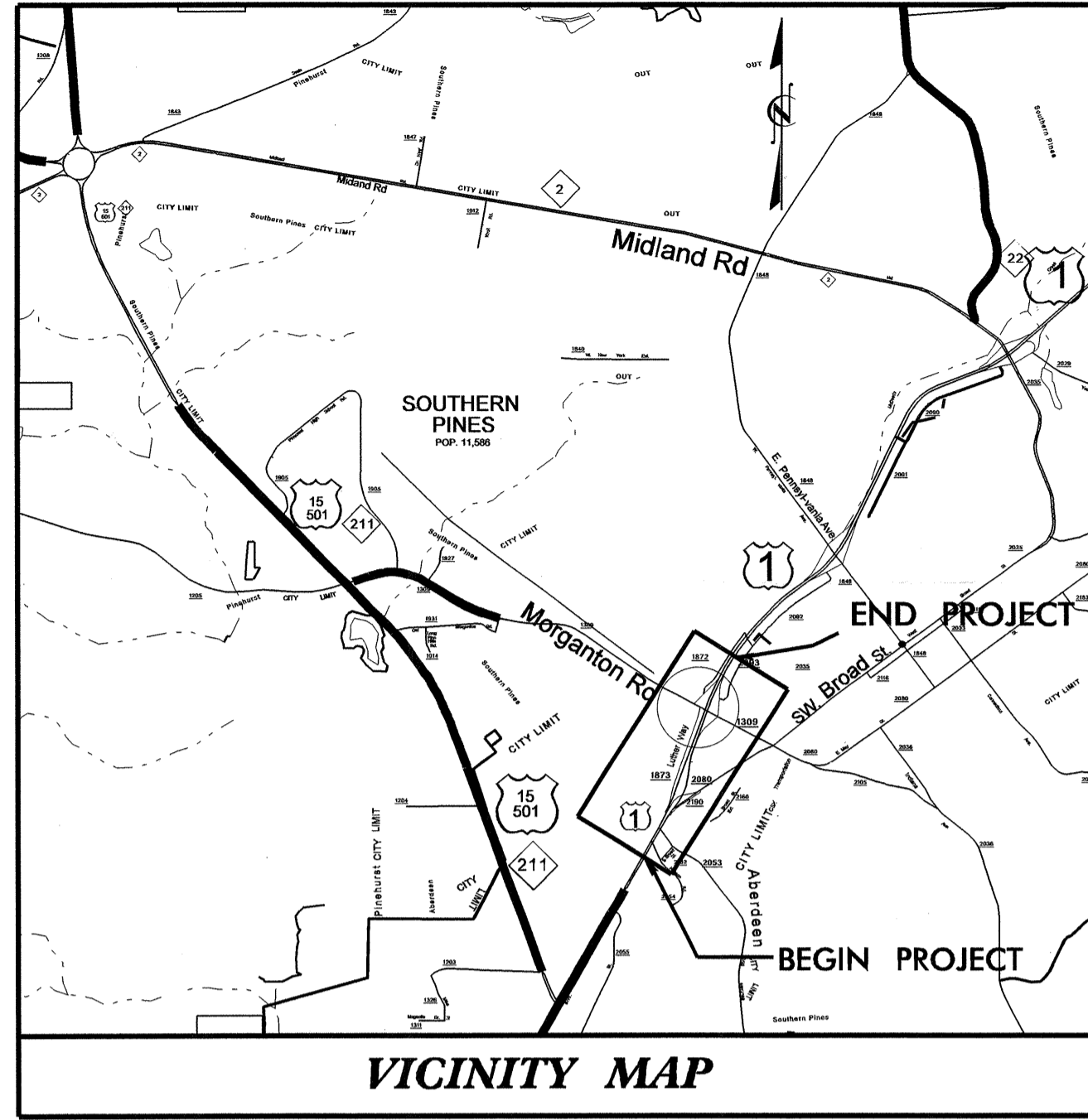
**MOORE COUNTY**

**LOCATION: ABERDEEN-SOUTHERN PINES - INTERSECTION OF  
SR 1309 (MORGANTON ROAD) AND US1 ( SANDHILLS BOULEVARD)**

**TYPE OF WORK: RESURFACING, PAVING, GRADING, DRAINAGE, RETAINING WALLS,  
STRUCTURE, GUARDRAIL, CURB & GUTTER, SIGNING AND SIGNALS**

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-3324	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
34923.1.1	STPNHF-1(10)	P.E.	
34923.2.2	STPNHF-1(10)	RW UTIL.	
34923.3.1	STPNHF-1(10)	CONSTR.	

**TIP PROJECT: U-3324**



-Y1- STA. 10+71.67 =  
BEGIN CONSTRUCTION

-SBUS1- STA. 10+00 =  
-L- STA. 14+70 OFF -16'

-L- STA. 14+67.06 =  
-Y2- STA. 10+00

-L- STA. 12+30  
BEGIN TIP PROJECT U-3324

-Y2- STA. 18+10.53  
END CONSTRUCTION

-Y4- STA. 12+00 =  
BEGIN CONSTRUCTION

-Y5- STA. 10+00 =  
BEGIN CONSTRUCTION

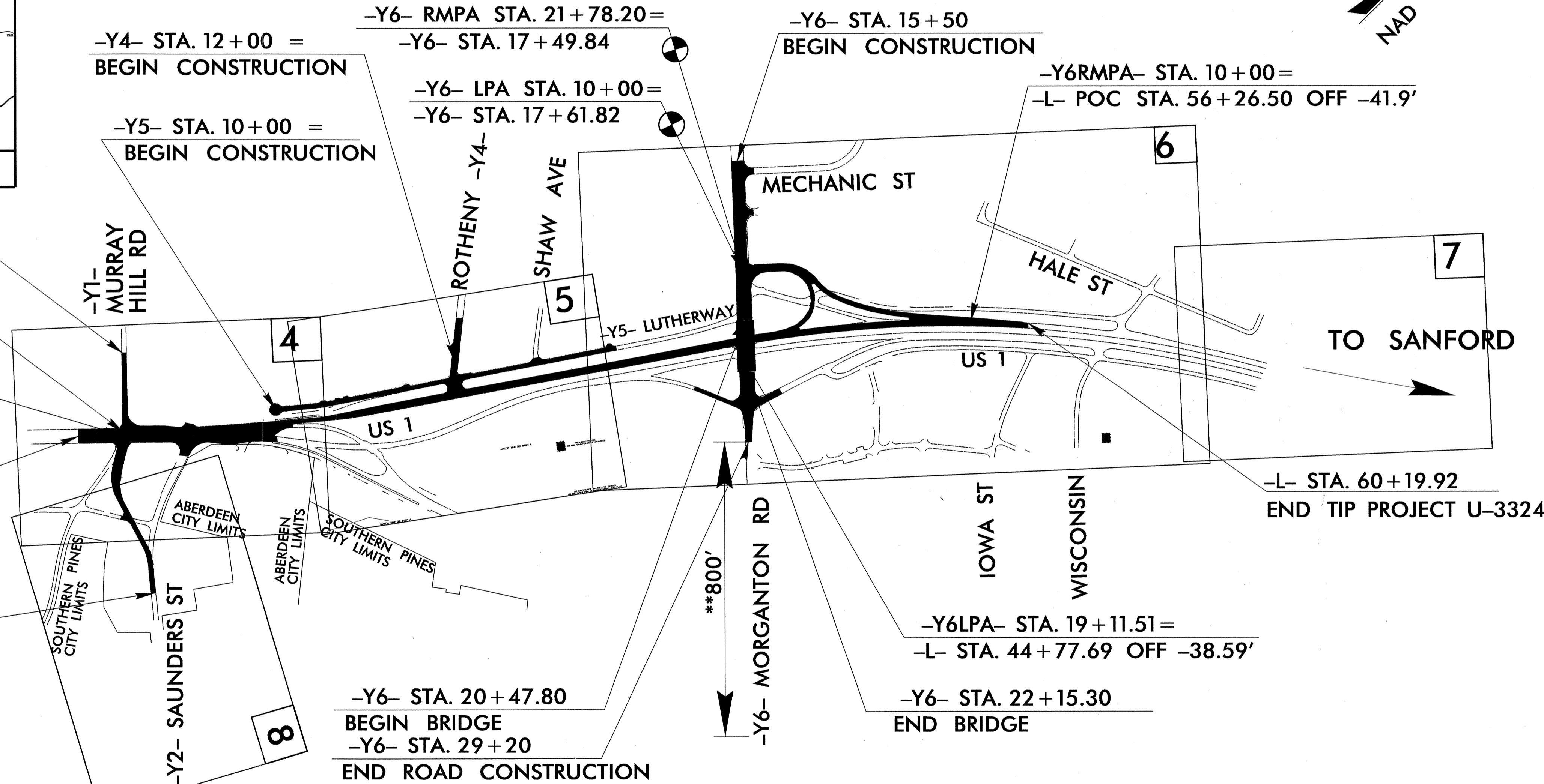
-Y6- RMPA STA. 21+78.20 =  
-Y6- STA. 17+49.84

-Y6- LPA STA. 10+00 =  
-Y6- STA. 17+61.82

-Y6- STA. 15+50  
BEGIN CONSTRUCTION

-Y6RMPA- STA. 10+00 =  
-L- POC STA. 56+26.50 OFF -41.9'

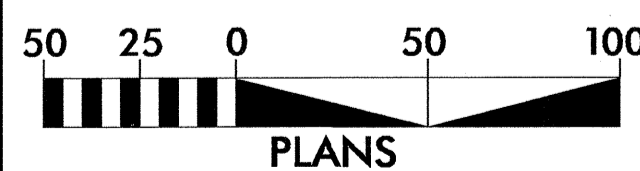
-L- STA. 60+19.92  
END TIP PROJECT U-3324



THIS IS A PARTIALLY CONTROLLED ACCESS PROJECT WITH ACCESS POINTS SHOWN ON THE PLANS

\*\*NOTE: PROJECT LIMITS EXTENDED 800' TO INCLUDE 2 EXISTING SIGNALS IN CLOSED LOOP SYSTEM

**GRAPHIC SCALES**



**DESIGN DATA**  
\*\*L- FUNCTIONAL CLASS.  
ARTERIAL FREEWAY

AADT 2008 = 34200  
AADT 2035 = 56800  
DHV = 10 %  
D = 60 %  
T = 8 % \*  
V = 60 MPH  
\* TTST 3% DUAL 5%  
STATEWIDE TIER

**PROJECT LENGTH**

LENGTH ROADWAY F.A PROJECT STPNHF-1(10) = 0.907 MI.  
TOTAL LENGTH OF STATE PROJECT 34923.1.1 = 0.907 MI.  
TOTAL LENGTH OF STRUCTURE ON -Y6- = 0.032 MI.

Prepared in the Office of:  
**DIVISION OF HIGHWAYS**

1000 Birch Ridge Dr., Raleigh NC, 27610

2012 STANDARD SPECIFICATIONS

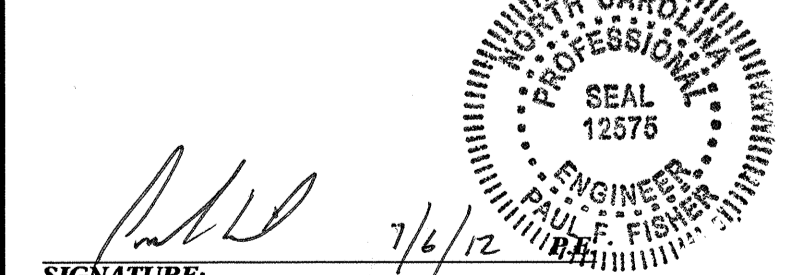
RIGHT OF WAY DATE:  
SEPT 30, 2010

LETTING DATE:  
SEPT 18, 2012

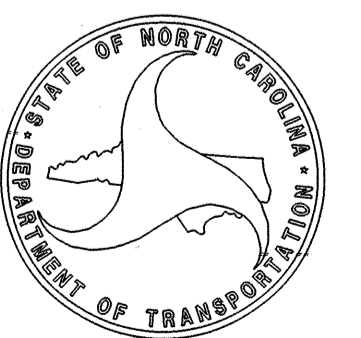
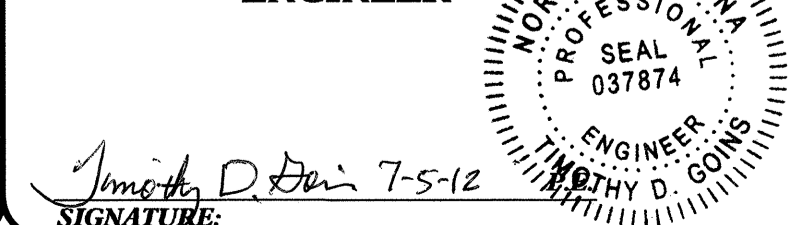
JIMMY GOODNIGHT, PE  
PROJECT ENGINEER

TIM GOINS, PE  
PROJECT DESIGN ENGINEER

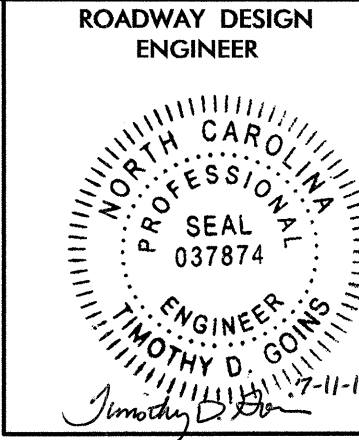
**HYDRAULICS ENGINEER**



ROADWAY DESIGN ENGINEER



**CONTRACT: C202886**



8/17/99

I:\JUL-2012\4324\H:\VOCAL\U-3324-Rdy.tsh\_1A.dgn  
\$\$\$\$\$

GENERAL NOTES: 2012 SPECIFICATIONS

EFFECTIVE: 01-17-12  
REVISED: 11/01/11

2012 ROADWAY ENGLISH STANDARD DRAWINGS

The following Roadway Standards as appear in "Roadway Standard Drawings" Highway Design Branch - N. C. Department of Transportation - Raleigh, N. C., Dated January, 2012 are applicable to this project and by reference hereby are considered a part of these plans:

SHEET NUMBER	TITLE
1	TITLE SHEET
1-A	INDEX OF SHEETS, GENERAL NOTES, AND LIST OF STANDARD DRAWINGS
1-B	CONVENTIONAL SYMBOLS
1-C THRU 1-F	SURVEY CONTROL SHEET
2-2D	PAVEMENT SCHEDULE, TYPICAL SECTIONS, AND WEDGING DETAILS
2E	DETAIL OF TEMPORARY SHORING
2-F THRU 2-H	STANDARD TEMPORARY WALL DETAIL
2-I	DETAIL OF CONCRETE JUNCTION BOX WITH 8" DIP LINE PASSING THRU
2-J	DETAIL OF CHAIN LINK FENCE ON CONCRETE BARRIER
2-K	DETAIL TO CONVERT EXIST DI OR CB TO JB
3	SUMMARY OF QUANTITIES
3A THRU 3F	SUMMARY OF DRAINAGE QUANTITIES SUMMARY OF GUARDRAIL, EARTHWORK SUMMARY, AND ASPHALT PAVEMENT REMOVAL SUMMARY
3G	PARCEL INDEX SHEET
4 THRU 8	PLAN SHEETS
9 THRU 12	PROFILE SHEETS
TMP-1 THRU TMP-27	TRAFFIC MANAGEMENT PLANS
PMP-1 THRU PMP-6	PAVEMENT MARKING PLANS
E-1 THRU E-3	ELECTRICAL PLANS
EC-1 THRU EC-14	EROSION CONTROL PLANS
SIGN-1 THRU SIGN-14	SIGNING PLANS
SIG-1 THRU SIG-39	INTELLIGENT TRANSPORTATION AND SIGNALS UNIT
UC-1 THRU UC-17	UTILITIES PLANS
UO-1 THRU UO-5	UTILITIES BY OTHERS
X-1 THRU X- 63	CROSS-SECTIONS
S-1 THRU S-44	STRUCTURE PLANS

**GRADING AND SURFACING OR RESURFACING AND WIDENING:**  
THE GRADE LINES SHOWN DENOTE THE FINISHED ELEVATION OF THE PROPOSED SURFACING AT GRADE POINTS SHOWN ON THE TYPICAL SECTIONS. WHERE NO GRADE LINES ARE SHOWN, THE PROFILES SHOWN DENOTE THE TOP ELEVATION OF THE EXISTING PAVEMENT ALONG THE CENTER LINE OF SURVEY ON WHICH THE PROPOSED RESURFACING WILL BE PLACED. GRADE LINES MAY BE ADJUSTED BY THE ENGINEER IN ORDER TO SECURE A PROPER TIE-IN.

**CLEARING:**  
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III.

**SUPERELEVATION:**  
ALL CURVES ON THIS PROJECT SHALL BE SUPERELEVATED IN ACCORDANCE WITH STD. NO. 225.04 AND NO. 225.05 USING THE RATE OF SUPERELEVATION AND RUNOFF SHOWN ON THE PLANS. SUPERELEVATION IS TO BE REVOLVED ABOUT THE GRADE POINTS SHOWN ON THE TYPICAL SECTIONS.

**SHOULDER CONSTRUCTION:**  
ASPHALT, EARTH, AND CONCRETE SHOULDER CONSTRUCTION ON THE HIGH SIDE OF SUPERELEVATED CURVES SHALL BE IN ACCORDANCE WITH STD. NO. 560.01.

**SIDE ROADS:**  
THE CONTRACTOR WILL BE REQUIRED TO DO ALL NECESSARY WORK TO PROVIDE SUITABLE CONNECTIONS WITH ALL ROADS, STREETS, AND DRIVES ENTERING THIS PROJECT. THIS WORK WILL BE PAID FOR AT THE CONTRACT UNIT PRICE FOR THE PARTICULAR ITEMS INVOLVED.

**BERM DITCHES:**  
BERM DITCHES SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 240.01 AT LOCATIONS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER.

**DRIVEWAYS:**  
DRIVEWAYS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. 848.02 USING 3' RADII OR RADII AS SHOWN ON THE PLANS. LOCATIONS OF DRIVES WILL BE AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER.

**STREET TURNOUT:**  
STREET RETURNS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 848.04 USING THE RADII NOTED ON PLANS.

**GUARDRAIL:**  
THE GUARDRAIL LOCATIONS SHOWN ON THE PLANS MAY BE ADJUSTED DURING CONSTRUCTION AS DIRECTED BY THE ENGINEER. THE CONTRACTOR SHOULD CONSULT WITH THE ENGINEER PRIOR TO ORDERING GUARDRAIL MATERIAL.

**TEMPORARY SHORING:**  
SHORING REQUIRED FOR THE MAINTENANCE OF TRAFFIC NOT SHOWN ON THE PLANS WILL BE PAID FOR AT THE CONTRACT PRICE FOR "TEMPORARY SHORING".

**END BENTS:**  
THE ENGINEER SHALL CHECK THE STRUCTURE END BENT PLANS, DETAILS, AND CROSS-SECTION PRIOR TO SETTING OF THE SLOPE STAKES FOR THE EMBANKMENT OR EXCAVATION APPROACHING A BRIDGE.

**UTILITIES:**  
UTILITY OWNERS ON THIS PROJECT ARE PROGRESS ENERGY CORP. -POWER (DISTRIBUTION) CENTURYLINK-TELEPHONE, TIME WARNER - CABLE TV  
PIEDMONT NATURAL GAS COMPANY-NATURAL GAS.  
ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS, EXCEPT AS SHOWN ON THE PLANS.

**RIGHT-OF-WAY MARKERS:**  
ALL RIGHT-OF-WAY MARKERS ON THIS PROJECT SHALL BE PLACED BY CONTRACT.

**CURB RAMPS**  
CURB RAMPS ARE SHOWN ON THE PLANS AT APPROXIMATE LOCATIONS.

STD. NO.	TITLE
<b>DIVISION 2 - EARTHWORK</b>	
200.03	Method of Clearing - Method III
225.01	Guide for Grading Subgrade - Interstate and Freeway
225.02	Guide for Grading Subgrade - Secondary and Local
225.03	Deceleration and Acceleration Lanes
225.04	Method of Obtaining Superelevation - Two Lane Pavement
225.05	Method of Obtaining Superelevation - Divided Highways
225.09	Guide for Shoulder and Ditch Transition at Grade Separations
<b>DIVISION 4 - MAJOR STRUCTURES</b>	
422.10	Reinforced Bridge Approach Fills
<b>DIVISION 5 - SUBGRADE, BASES AND SHOULDERS</b>	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
<b>DIVISION 6 - ASPHALT BASES AND PAVEMENTS</b>	
610.01	Guide for Paving Shoulders Under Bridges - Method I
610.03	Guide for Paving Shoulders Under Bridges - Method III
654.01	Pavement Repairs
665.01	Asphalt Shoulders - Milled Rumble Strips
<b>DIVISION 8 - INCIDENTALS</b>	
806.01	Concrete Right-of-Way Marker
806.02	Granite Right of Way Marker
815.03	Pipe Underdrain and Blind Drain
838.01	Concrete Endwall for Single and Double Pipe Culverts - 15" thru 48" Pipe 90 Skew
838.11	Brick Endwall for Single and Double Pipe Culverts - 15" thru 48" Pipe 90 Skew
840.00	Concrete Base Pad for Drainage Structures
840.01	Brick Catch Basin - 12" thru 54" Pipe
840.02	Concrete Catch Basin - 12" thru 54" Pipe
840.03	Frame, Grates and Hood - for Use on Standard Catch Basin
840.04	Concrete Open Throat Catch Basin - 12" thru 48" Pipe
840.05	Brick Open Throat Catch Basin - 12" thru 48" Pipe
840.16	Drop Inlet Frame and Grates - for use with Std. Dwg 840.14 and 840.15
840.18	Concrete Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.20	Frames and Wide Slot Flat Grates
840.22	Frames and Wide Slot Sag Grates
840.27	Brick Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.29	Frames and Narrow Slot Flat Grates
840.31	Concrete Junction Box - 12" thru 66" Pipe
840.32	Brick Junction Box - 12" thru 66" Pipe
840.45	Precast Drainage Structure
840.51	Brick Manhole - 12" thru 36" Pipe
840.52	Precast Manhole - 4', 5' and 6' Diameter
840.53	Precast Manhole with Masonry Base - 12" thru 42" Pipe
840.54	Manhole Frame and Cover
840.66	Drainage Structure Steps
840.71	Concrete and Brick Pipe Plug
840.72	Pipe Collar
846.01	Concrete Curb, Gutter and Curb & Gutter
848.01	Concrete Sidewalk
848.02	Driveway Turnout - Radius Type
848.04	Street Turnout
848.05	Curb Ramp - Proposed Curb & Gutter
850.01	Concrete Paved Ditches
852.01	Concrete Islands
852.02	Concrete Mountable Median - for Use with Rigid or Flexible Pavement
852.06	Method for Placement of Drop Inlets in Concrete Islands
857.01	Precast Reinforced Concrete Barrier - 41" Single Faced
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units
862.04	Anchoring End of Guardrail - B-77 and B-83 Anchor Units
866.01	Chain Link Fence - 4', 5' and 6' High Fence
876.01	Rip Rap in Channels
876.04	Drainage Ditches with Class 'B' Rip Rap

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

# CONVENTIONAL PLAN SHEET SYMBOLS

Note: Not to Scale

\*S.U.E. = Subsurface Utility Engineering

### BOUNDARIES AND PROPERTY:

State Line	-----
County Line	-----
Township Line	-----
City Line	-----
Reservation Line	-----
Property Line	-----
Existing Iron Pin	○ EIP
Property Corner	-----
Property Monument	□ ECM
Parcel/Sequence Number	⑫③
Existing Fence Line	-x-x-x-
Proposed Woven Wire Fence	○
Proposed Chain Link Fence	□
Proposed Barbed Wire Fence	◇
Existing Wetland Boundary	-WLB-
Proposed Wetland Boundary	-WLB-
Existing Endangered Animal Boundary	-EAB-
Existing Endangered Plant Boundary	-EPB-
Known Soil Contamination: Area or Site	☠ ☠
Potential Soil Contamination: Area or Site	☠ ?

### BUILDINGS AND OTHER CULTURE:

Gas Pump Vent or U/G Tank Cap	○
Sign	○
Well	○ W
Small Mine	⊗
Foundation	▭
Area Outline	▭
Cemetery	⊕
Building	▭
School	▭
Church	▭
Dam	▭

### HYDROLOGY:

Stream or Body of Water	-----
Hydro, Pool or Reservoir	▭
Jurisdictional Stream	-JS-
Buffer Zone 1	-BZ 1-
Buffer Zone 2	-BZ 2-
Flow Arrow	←
Disappearing Stream	→
Spring	○
Wetland	⊥
Proposed Lateral, Tail, Head Ditch	▭
False Sump	▭

### RAILROADS:

Standard Gauge	-----
RR Signal Milepost	○
Switch	□
RR Abandoned	-----
RR Dismantled	-----

### RIGHT OF WAY:

Baseline Control Point	◆
Existing Right of Way Marker	△
Existing Right of Way Line	-----
Proposed Right of Way Line	○
Proposed Right of Way Line with Iron Pin and Cap Marker	○
Proposed Right of Way Line with Concrete or Granite Marker	○
Existing Control of Access	⊕
Proposed Control of Access	⊕
Existing Easement Line	-E-
Proposed Temporary Construction Easement	-E-
Proposed Temporary Drainage Easement	-TDE-
Proposed Permanent Drainage Easement	-PDE-
Proposed Permanent Drainage / Utility Easement	-DUE-
Proposed Permanent Utility Easement	-PUE-
Proposed Temporary Utility Easement	-TUE-
Proposed Aerial Utility Easement	-AUE-
Proposed Permanent Easement with Iron Pin and Cap Marker	◆

### ROADS AND RELATED FEATURES:

Existing Edge of Pavement	-----
Existing Curb	-----
Proposed Slope Stakes Cut	-C-
Proposed Slope Stakes Fill	-F-
Proposed Curb Ramp	○
Existing Metal Guardrail	▭
Proposed Guardrail	▭
Existing Cable Guiderail	▭
Proposed Cable Guiderail	▭
Equality Symbol	⊕
Pavement Removal	▭

### VEGETATION:

Single Tree	○
Single Shrub	○
Hedge	▭
Woods Line	▭

Orchard	○
Vineyard	▭

### EXISTING STRUCTURES:

MAJOR: Bridge, Tunnel or Box Culvert	▭ CONC
Bridge Wing Wall, Head Wall and End Wall	▭ CONC WW
MINOR: Head and End Wall	▭ CONC HW
Pipe Culvert	▭
Footbridge	▭
Drainage Box: Catch Basin, DI or JB	▭ CB
Paved Ditch Gutter	-----
Storm Sewer Manhole	⊕
Storm Sewer	-S-

### UTILITIES:

POWER: Existing Power Pole	●
Proposed Power Pole	○
Existing Joint Use Pole	●
Proposed Joint Use Pole	○
Power Manhole	⊕
Power Line Tower	⊗
Power Transformer	⊗
U/G Power Cable Hand Hole	▭
H-Frame Pole	●
Recorded U/G Power Line	-P-
Designated U/G Power Line (S.U.E.*)	-P-

### TELEPHONE:

Existing Telephone Pole	●
Proposed Telephone Pole	○
Telephone Manhole	⊕
Telephone Booth	▭
Telephone Pedestal	▭
Telephone Cell Tower	⊗
U/G Telephone Cable Hand Hole	▭
Recorded U/G Telephone Cable	-T-
Designated U/G Telephone Cable (S.U.E.*)	-T-
Recorded U/G Telephone Conduit	-TC-
Designated U/G Telephone Conduit (S.U.E.*)	-TC-
Recorded U/G Fiber Optics Cable	-T FO-
Designated U/G Fiber Optics Cable (S.U.E.*)	-T FO-

### WATER:

Water Manhole	⊕
Water Meter	○
Water Valve	⊗
Water Hydrant	⊕
Recorded U/G Water Line	-W-
Designated U/G Water Line (S.U.E.*)	-W-
Above Ground Water Line	-A/G Water-

### TV:

TV Satellite Dish	⊕
TV Pedestal	▭
TV Tower	⊗
U/G TV Cable Hand Hole	▭
Recorded U/G TV Cable	-TV-
Designated U/G TV Cable (S.U.E.*)	-TV-
Recorded U/G Fiber Optic Cable	-TV FO-
Designated U/G Fiber Optic Cable (S.U.E.*)	-TV FO-

### GAS:

Gas Valve	◇
Gas Meter	○
Recorded U/G Gas Line	-G-
Designated U/G Gas Line (S.U.E.*)	-G-
Above Ground Gas Line	-A/G Gas-

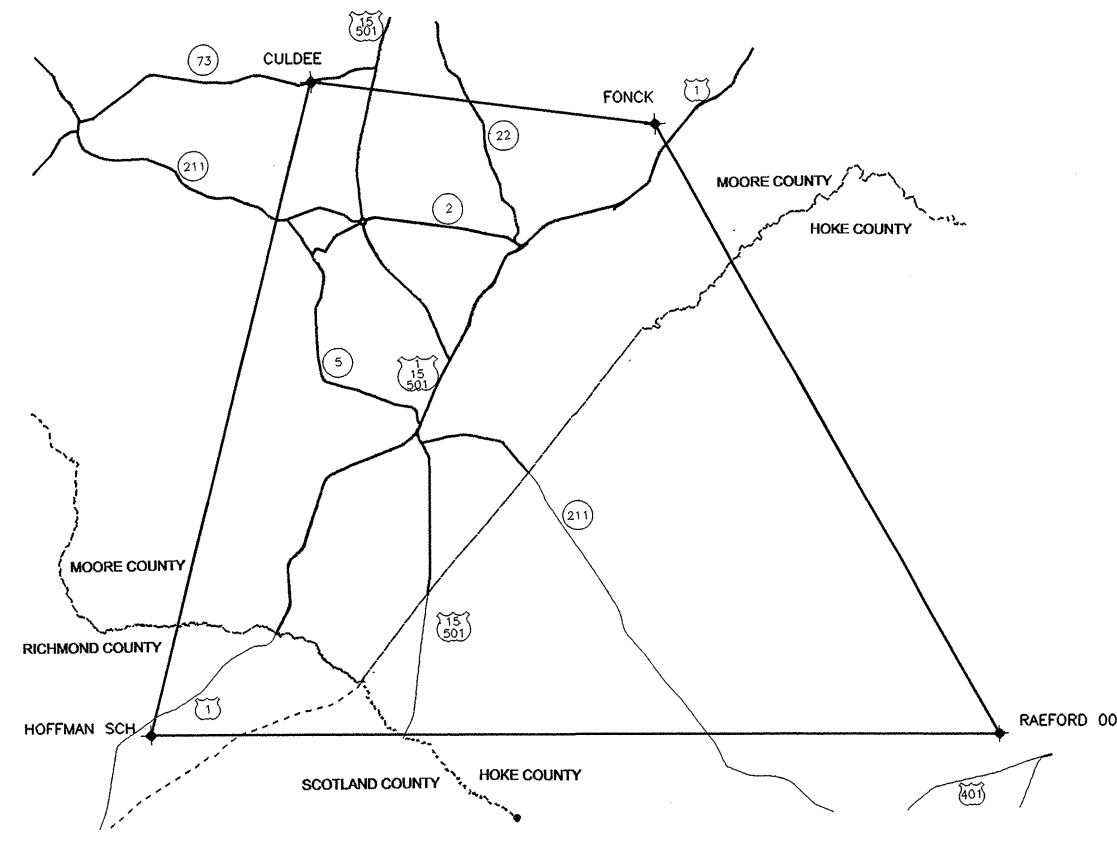
### SANITARY SEWER:

Sanitary Sewer Manhole	⊕
Sanitary Sewer Cleanout	⊕
U/G Sanitary Sewer Line	-SS-
Above Ground Sanitary Sewer	-A/G Sanitary Sewer-
Recorded SS Forced Main Line	-FSS-
Designated SS Forced Main Line (S.U.E.*)	-FSS-

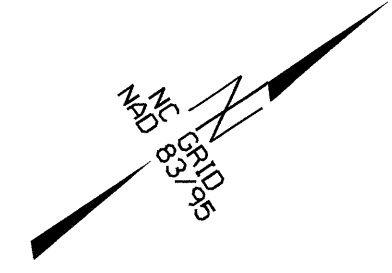
### MISCELLANEOUS:

Utility Pole	●
Utility Pole with Base	▭
Utility Located Object	○
Utility Traffic Signal Box	▭
Utility Unknown U/G Line	-?UTL-
U/G Tank; Water, Gas, Oil	▭
Underground Storage Tank, Approx. Loc.	▭
A/G Tank; Water, Gas, Oil	▭
Geoenvironmental Boring	⊕
U/G Test Hole (S.U.E.*)	○
Abandoned According to Utility Records	AATUR
End of Information	E.O.I.

# SURVEY CONTROL SHEET U-3324



**GPS CONTROL NETWORK**  
NOT TO SCALE



-L- STA 12+50.00 BEGIN STATE PROJECT U-3324  
LOCALIZED PROJECT COORDINATES  
N = 514096.8287  
E = 1877385.7427

-L- STA 59+04.70 END STATE PROJECT U-3324  
LOCALIZED PROJECT COORDINATES  
N = 518330.4997  
E = 1879284.5420

NCDOT GPS STATION U3324-5  
LOCALIZED PROJECT COORDINATES  
N = 512946.5070  
E = 1876683.5970

NCDOT GPS STATION U3324-6  
LOCALIZED PROJECT COORDINATES  
N = 514246.3610  
E = 1877417.9150

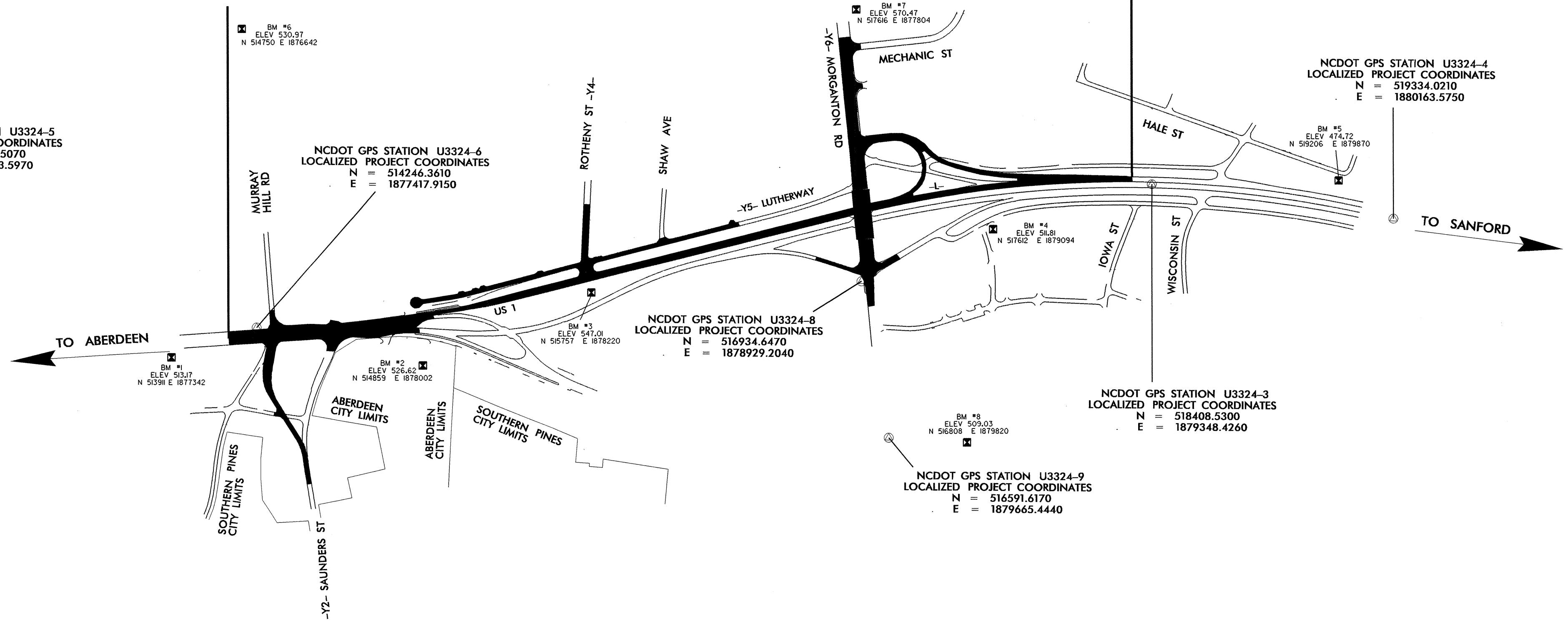
NCDOT GPS STATION U3324-7  
LOCALIZED PROJECT COORDINATES  
N = 517731.9980  
E = 1877426.3210

NCDOT GPS STATION U3324-4  
LOCALIZED PROJECT COORDINATES  
N = 519334.0210  
E = 1880163.5750

NCDOT GPS STATION U3324-8  
LOCALIZED PROJECT COORDINATES  
N = 516934.6470  
E = 1878929.2040

NCDOT GPS STATION U3324-3  
LOCALIZED PROJECT COORDINATES  
N = 518408.5300  
E = 1879348.4260

NCDOT GPS STATION U3324-9  
LOCALIZED PROJECT COORDINATES  
N = 516591.6170  
E = 1879665.4440



### DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "U3324-1"  
WITH NAD 83/95 STATE PLANE GRID COORDINATES OF  
NORTHING: 517893.9580(±ft) EASTING: 1879014.4700(±ft)  
ELEVATION: 513.874(±ft)  
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.999862850  
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "U3324-1" TO -L- STATION 12+50.00 IS  
S 23° 12' 58.5" W 4,131.700'  
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES  
VERTICAL DATUM USED IS NAVD 88

### NOTES:

1. THE SITE CALIBRATION SHOWN IS BASED UPON A NETWORK TIED TO THE HARN (HIGH ACCURACY REFERENCE NETWORK) NAD 83/95 ADJUSTMENT. THIS CALIBRATION WILL ALLOW THE END USER TO WORK WITHIN THE SAME COORDINATE SYSTEM WHEN USING RTK (REAL TIME KINEMATIC) GPS AND A LOCAL BASE STATION. IF ANOTHER SYSTEM SUCH AS VRS (VIRTUAL REFERENCE STATION) IS USED, ADDITIONAL FIELD TIES MAY BE NEEDED TO REDUCE POSSIBLE ERRORS, OR BIASES.
  2. THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:  
[HTTP://WWW.NCDOT.ORG/ODOT/PRECONSTRUCTION/HIGHWAY/LOCATION/PROJECT/](http://www.ncdot.org/odot/preconstruction/highway/location/project/)  
THE FILES TO BE FOUND ARE AS FOLLOWS:  
U3324\_1S\_GPCALIBR\_09124.TXT  
U3324\_1S\_WGS84\_09124.TXT  
U3324\_1S\_LOCAL\_09124.TXT  
U3324\_1S\_CONTROL\_09124.TXT  
THE WGS84 AND LOCAL FILES ARE COMMA DELIMITED AND CAN BE USED TO REPRODUCE THE SITE CALIBRATION FOR THE END USER'S GPS EQUIPMENT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.
- INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.  
PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM NETWORK ESTABLISHED FROM EXISTING HARD MONUMENTATION  
SEE GPS CALIBRATION SHEET FOR HORIZONTAL AND VERTICAL COORDINATE VALUES.

NOTE: DRAWING NOT TO SCALE

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# SURVEY CONTROL SHEET U-3324

GPS CALIBRATION REPORT  
PROJECT - U3324 071007

```

TIP NUMBER      U3324
USER NAME       ASMITH          DATE & TIME      8/13/08 AM
                                      9/10/2009
COORDINATE SYSTEM US STATE PLANE      ZONE      NORTH CAROLINA
HORIZONTAL DATUM  NAD 83 (AT GROUND)  1983 (AT GROUND)  3200
HORIZONTAL DATUM  NAD 83 (CONUS)
VERTICAL DATUM   NAVD89          GEOID MODEL  GEOID99 (CONUS) NC
COORDINATE UNITS US SURVEY FEET
DISTANCE UNITS  US SURVEY FEET
HEIGHT UNITS     US SURVEY FEET
    
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LOCAL SITE INFORMATION
LOCALIZED AROUND U3324-1
LATITUDE         36°10'20.39603"N
LONGITUDE        79°24'17.49427"W
SITE SCALE FACTOR 1.0001271590
HEIGHT           409.6965FT
    
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THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION USES A LOCALIZED COORDINATE SYSTEM WHICH IS VERY SIMILAR TO NORTH CAROLINA ZONE 3200 FROM WHICH IT IS DERIVED. PLEASE TAKE CARE IN UTILIZING THESE COORDINATES TO ELIMINATE CONFUSION OF THE TWO SYSTEMS. THIS FILE IS TO AID IN THE USE OF REAL TIME KINEMATIC (RTK) GPS DURING CONSTRUCTION LAYOUT.

DATUM TRANSFORMATION PARAMETERS  
 DATUM TRANSFORMATION COMPUTATION NOT REQUESTED

UPDATED DEFAULT PROJECTION (TRANSVERSE MERCATOR) DEFINITION  
 UPDATED DEFAULT PROJECTION NOT REQUESTED

HORIZONTAL ADJUSTMENT PARAMETERS

```

NORTHING COORDINATE OF ROTATION CENTER 516599.0975FT
EASTING COORDINATE OF ROTATION CENTER 1878519.2105FT
ROTATION ABOUT THE CENTER POINT 0.0000°
TRANSLATION NORTH 0.0005FT
TRANSLATION EAST 0.0015FT
SCALE FACTOR 0.99999975
    
```

VERTICAL ADJUSTMENT PARAMETERS

```

NORTHING COORDINATE OF ORIGIN POINT 512946.5075FT
EASTING COORDINATE OF ORIGIN POINT 1876683.5965FT
VERTICAL SEPARATION AT ORIGIN -0.0235FT
SLOPE NORTH -7.655PPM
SLOPE EAST 0.376PPM
    
```

DEOID MODEL DEFINITION  
 GEOID99 (CONUS) NC SUB GRID

RESIDUAL DIFFERENCES BETWEEN GPS (WGS84) AND LOCAL COORDINATES

SUMMARY			
	MAXIMUM ERROR	ROOT MEAN SQUARE ERROR	POINT
HORIZONTAL	0.0035FT	0.001	U3324-7 GPS
VERTICAL	0.0015FT	0.000	U3324-4 GPS
THREE-DIMENSIONAL	0.0035FT	0.001	U3324-7 GPS

POINT RESIDUALS					
WGS84 COORDINATES		CALCULATED POINT FOR DISPLAY ONLY		LOCAL COORDINATES	
POINT	U3324-5 GPS	NORTHING	512946.5075FT	POINT	U3324-5
LATITUDE	36°09'31.36965"N	EASTING	1876683.5965FT	NORTHING	512946.5075FT
LONGITUDE	79°24'45.32517"W	ELEVATION	478.7685FT	EASTING	1876683.5965FT
HEIGHT	366.7685FT	HORIZ ERROR	0.0015FT	ELEVATION	478.7945FT
		VERT ERROR	0.0005FT	UTILIZED HORIZ AND VERT	
		3D ERROR	0.0015FT	QUALITY ADJUSTED QUALITY	
POINT	U3324-3 GPS	NORTHING	518486.5295FT	POINT	U3324-3
LATITUDE	35°10'25.49872"N	EASTING	1879348.4275FT	NORTHING	518486.5295FT
LONGITUDE	79°24'13.49696"W	ELEVATION	502.0225FT	EASTING	1879348.4265FT
HEIGHT	398.1165FT	HORIZ ERROR	0.0005FT	ELEVATION	502.0225FT
		VERT ERROR	0.0005FT	UTILIZED HORIZ AND VERT	
		3D ERROR	0.0005FT	QUALITY ADJUSTED QUALITY	
POINT	U3324-4 GPS	NORTHING	519334.0215FT	POINT	U3324-4
LATITUDE	35°10'34.68473"N	EASTING	1880163.5765FT	NORTHING	519334.0215FT
LONGITUDE	79°24'03.72329"W	ELEVATION	456.6585FT	EASTING	1880163.5765FT
HEIGHT	352.7595FT	HORIZ ERROR	0.0015FT	ELEVATION	456.6515FT
		VERT ERROR	0.0015FT	UTILIZED HORIZ AND VERT	
		3D ERROR	0.0015FT	QUALITY ADJUSTED QUALITY	
POINT	U3324-6 GPS	NORTHING	514246.3615FT	POINT	U3324-6
LATITUDE	35°09'44.28854"N	EASTING	1877417.9155FT	NORTHING	514246.3615FT
LONGITUDE	79°24'26.64338"W	ELEVATION	522.3165FT	EASTING	1877417.9155FT
HEIGHT	418.3875FT	HORIZ ERROR	0.0005FT	ELEVATION	522.3175FT
		VERT ERROR	0.0005FT	UTILIZED HORIZ AND VERT	
		3D ERROR	0.0005FT	QUALITY ADJUSTED QUALITY	
POINT	U3324-7 GPS	NORTHING	517731.9955FT	POINT	U3324-7
LATITUDE	35°10'18.72970"N	EASTING	1877426.3285FT	NORTHING	517731.9955FT
LONGITUDE	79°24'36.61859"W	ELEVATION	578.6235FT	EASTING	1877426.3215FT
HEIGHT	474.7395FT	HORIZ ERROR	0.0035FT	ELEVATION	578.6235FT
		VERT ERROR	0.0005FT	UTILIZED HORIZ AND VERT	
		3D ERROR	0.0035FT	QUALITY ADJUSTED QUALITY	
POINT	U3324-8 GPS	NORTHING	516934.6475FT	POINT	U3324-8
LATITUDE	35°10'18.98475"N	EASTING	1878929.2045FT	NORTHING	516934.6475FT
LONGITUDE	79°24'18.47417"W	ELEVATION	534.2835FT	EASTING	1878929.2045FT
HEIGHT	438.5295FT	HORIZ ERROR	0.0005FT	ELEVATION	534.2835FT
		VERT ERROR	0.0005FT	UTILIZED HORIZ AND VERT	
		3D ERROR	0.0005FT	QUALITY ADJUSTED QUALITY	
POINT	U3324-9 GPS	NORTHING	516591.6195FT	POINT	U3324-9
LATITUDE	35°10'07.84174"N	EASTING	1878668.4465FT	NORTHING	516591.6175FT
LONGITUDE	79°24'09.59662"W	ELEVATION	595.6665FT	EASTING	1878668.4445FT
HEIGHT	405.5665FT	HORIZ ERROR	0.0035FT	ELEVATION	595.6665FT
		VERT ERROR	0.0005FT	UTILIZED HORIZ AND VERT	
		3D ERROR	0.0035FT	QUALITY ADJUSTED QUALITY	

**DATUM DESCRIPTION**

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "U3324-1"

WITH NAD 83/95 STATE PLANE GRID COORDINATES OF  
 NORTHING: 517893.9580(±) EASTING: 1879014.4700(±)  
 ELEVATION: 513.874(±)

THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.999862850

THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "U3324-1" TO -L- STATION 12+50.00 IS  
 S 23° 12' 58.5" W 4,131.700'

ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES  
 VERTICAL DATUM USED IS NAVD 88

**NOTES:**

- THE SITE CALIBRATION SHOWN IS BASED UPON A NETWORK TIED TO THE HARN (HIGH ACCURACY REFERENCE NETWORK) NAD 83/95 ADJUSTMENT. THIS CALIBRATION WILL ALLOW THE END USER TO WORK WITHIN THE SAME COORDINATE SYSTEM WHEN USING RTK (REAL TIME KINEMATIC) GPS AND A LOCAL BASE STATION IF ANOTHER SYSTEM SUCH AS VRS (VIRTUAL REFERENCE STATION) IS USED. ADDITIONAL FIELD TIES MAY BE NEEDED TO REDUCE POSSIBLE ERRORS OR BIASES.
- THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:  
[HTTP://WWW.NCDOT.ORG/DOH/PRECONSTRUCTION/HIGHWAY/LOCATION/PROJECT/](http://www.ncdot.org/doh/preconstruction/highway/location/project/)

THE FILES TO BE FOUND ARE AS FOLLOWS:  
 U3324.IS.GPSCALIB.081014.HTML  
 U3324.IS.WGS84.091024.TXT  
 U3324.IS.LOCAL.081014.TXT  
 U3324.IS.CONTROL.081014.TXT

THE WGS84 AND LOCAL FILES ARE COMMA DELIMITED AND CAN BE USED TO REPRODUCE THE SITE CALIBRATION FOR THE END USER'S GPS EQUIPMENT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

● INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.

PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM. NETWORK ESTABLISHED FROM EXISTING HARN MONUMENTATION. SEE GPS CALIBRATION SHEET FOR HORIZONTAL AND VERTICAL COORDINATE VALUES.

6/2/09  
 06 JUN 2012 10:27  
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 U3324\_1s\_1d\_091124.dgn



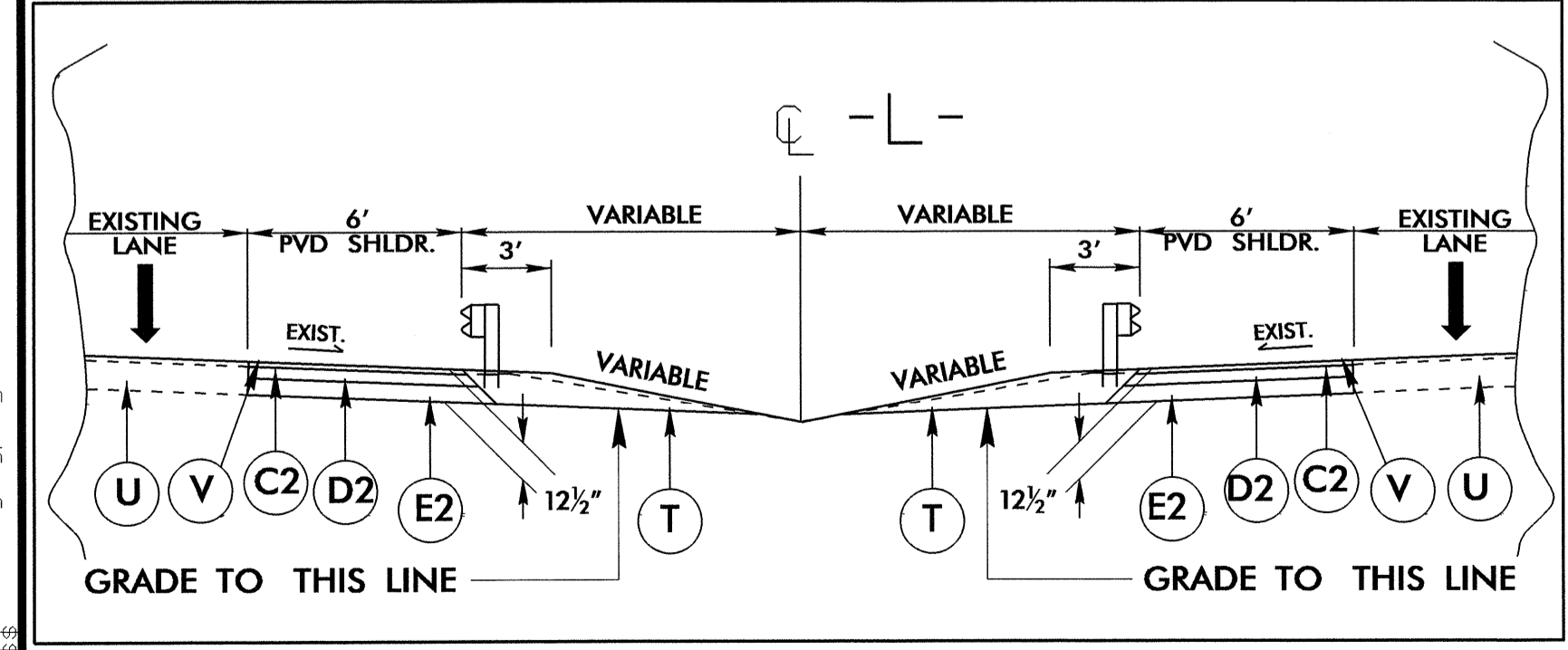


6/2/09

# PAVEMENT SCHEDULE

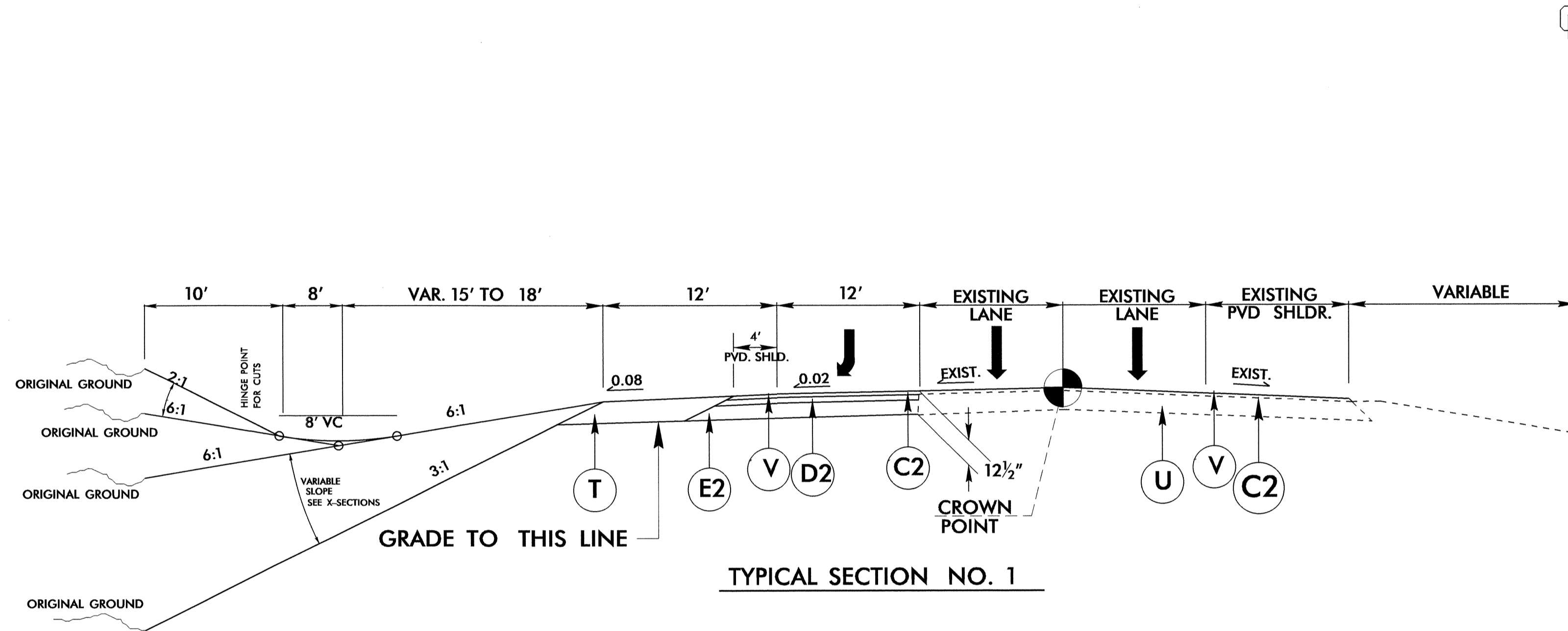
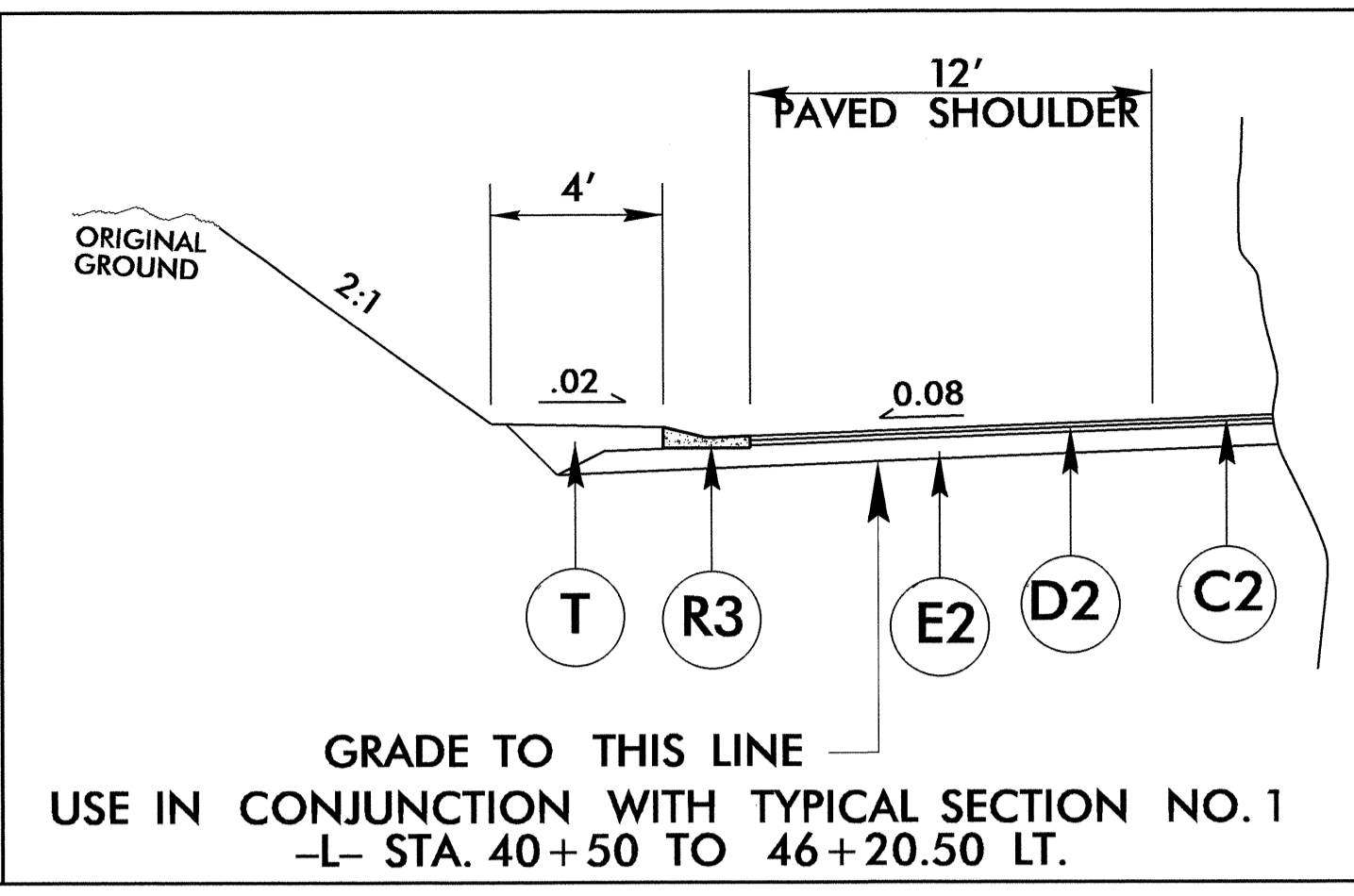
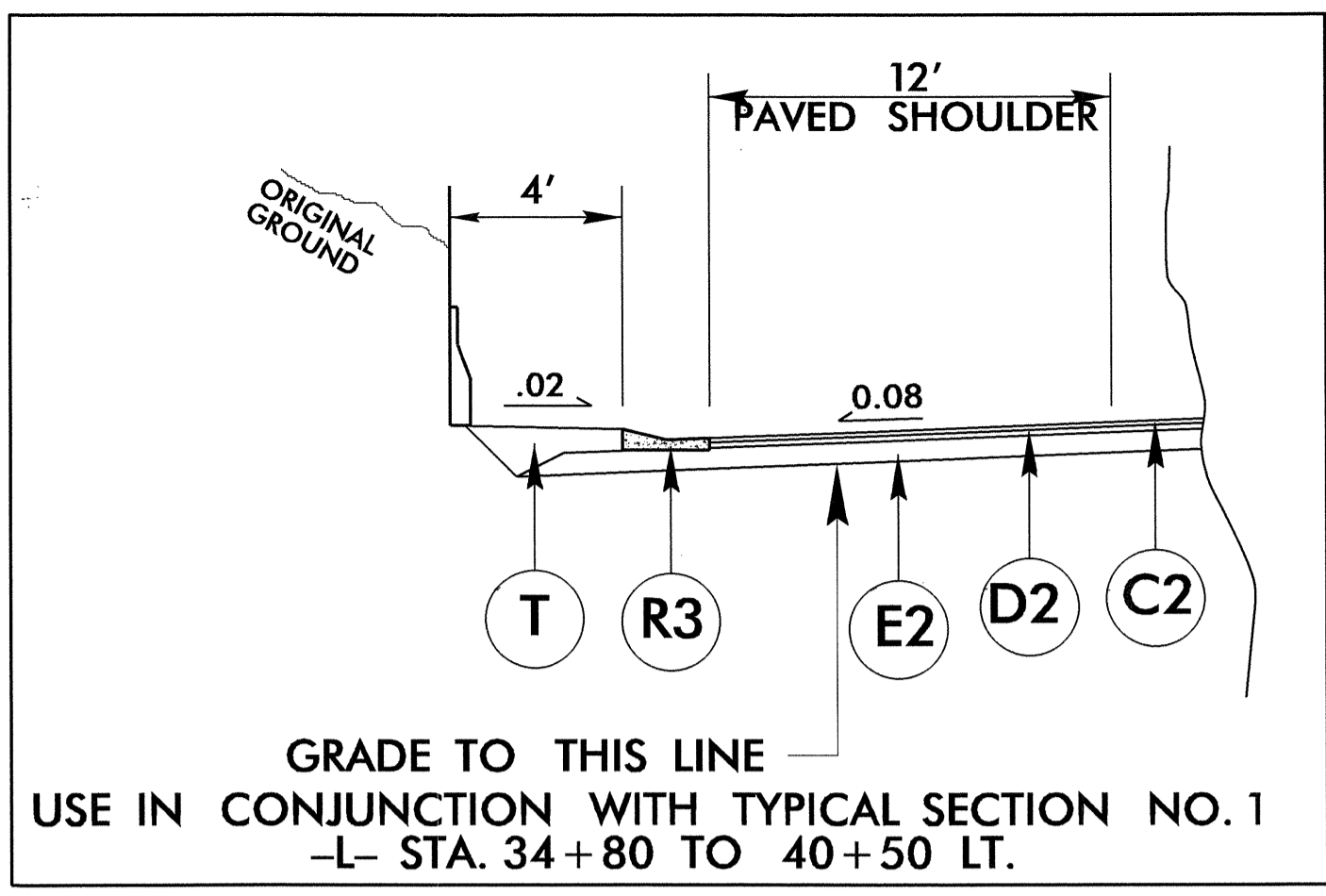
C	PROP. APPROX. 1.5" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
C1	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C2	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 2" IN DEPTH.
C4	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 2" IN DEPTH.
D1	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
D2	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
D3	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE TYPE I19.0B AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 2 1/2" IN DEPTH OR GREATER THAN 4" IN DEPTH.
D4	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 2 1/2" IN DEPTH OR GREATER THAN 4" IN DEPTH.
E	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
E1	PROP. APPROX. 5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 570 LBS. PER SQ. YD.
E2	PROP. APPROX. 5.5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 627 LBS. PER SQ. YD.
E3	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 4" IN DEPTH OR GREATER THAN 5 1/2" IN DEPTH.
E4	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 4" IN DEPTH OR GREATER THAN 5 1/2" IN DEPTH.
R	2'-6" CONCRETE CURB AND GUTTER.
R1	2'-6" CONCRETE CURB AND GUTTER TO BE REMOVED
R2	2'-6" CONCRETE CURB AND GUTTER TO BE RETAINED
R3	CONCRETE EXPRESSWAY GUTTER
R4	SHOULDER BERM GUTTER
R5	5" MONOLITHIC ISLAND
S	4" CONCRETE SIDEWALK.
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
V	MILLED RUMBLE STRIPS
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL SHEET No. 2-B)

NOTE: PAVEMENT EDGES ARE 1:1 UNLESS OTHERWISE NOTED

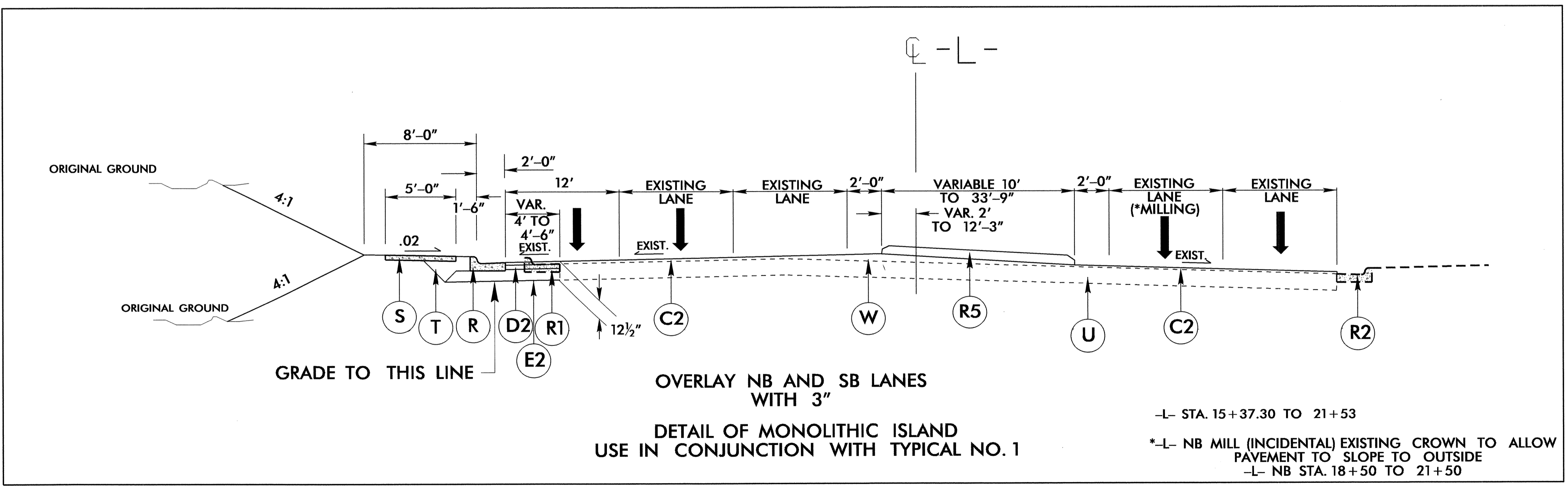


## DETAIL OF MEDIAN GUARDRAIL

- L- RT. STA. 27+65 TO 44+67.75
- L- RT. STA. 45+67.75 TO 60+20
- L- LT. STA. 27+50 TO 44+67.75
- L- LT. STA. 45+67.75 TO 60+20



USE TYPICAL SECTION NO. 1  
-L- STA. 24+46 TO 46+45.87 LT  
\*OVERLAY EXISTING LANES & SHOULDERS  
-L- LT STA. 12+30 TO 59+04.70 (US1SB)  
-L- RT STA. 12+30 TO 23+08.72 (US1NB)



-L- STA. 15+37.30 TO 21+53  
\*-L- NB MILL (INCIDENTAL) EXISTING CROWN TO ALLOW PAVEMENT TO SLOPE TO OUTSIDE  
-L- NB STA. 18+50 TO 21+50

PROJECT REFERENCE NO. U-3324	SHEET NO. 2
ROADWAY DESIGN ENGINEER MORTY D. GOINS 7-17-12	PAVEMENT DESIGN ENGINEER LAWMIR G. WITCIEK 02/20/12

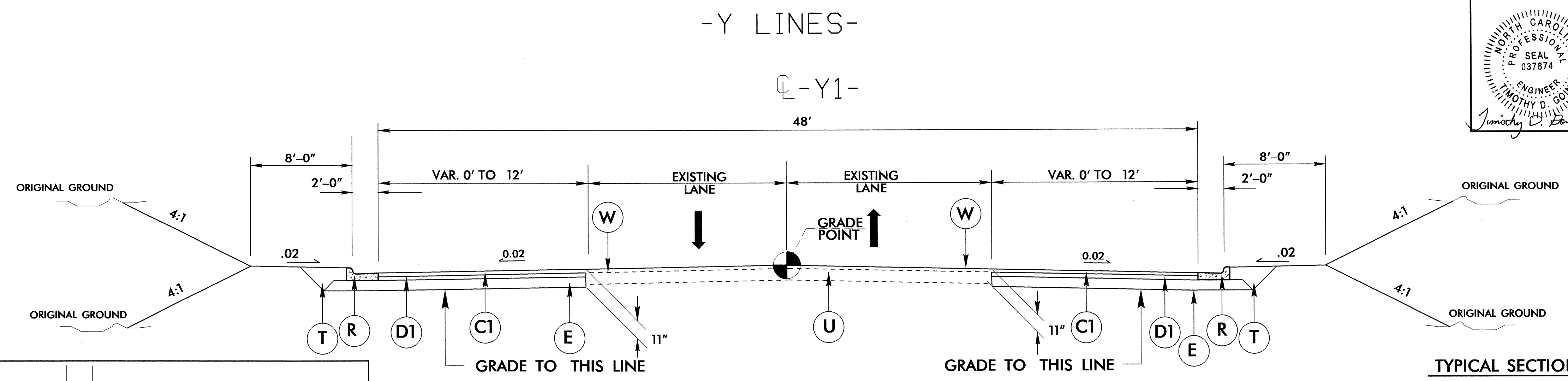
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6/2/09

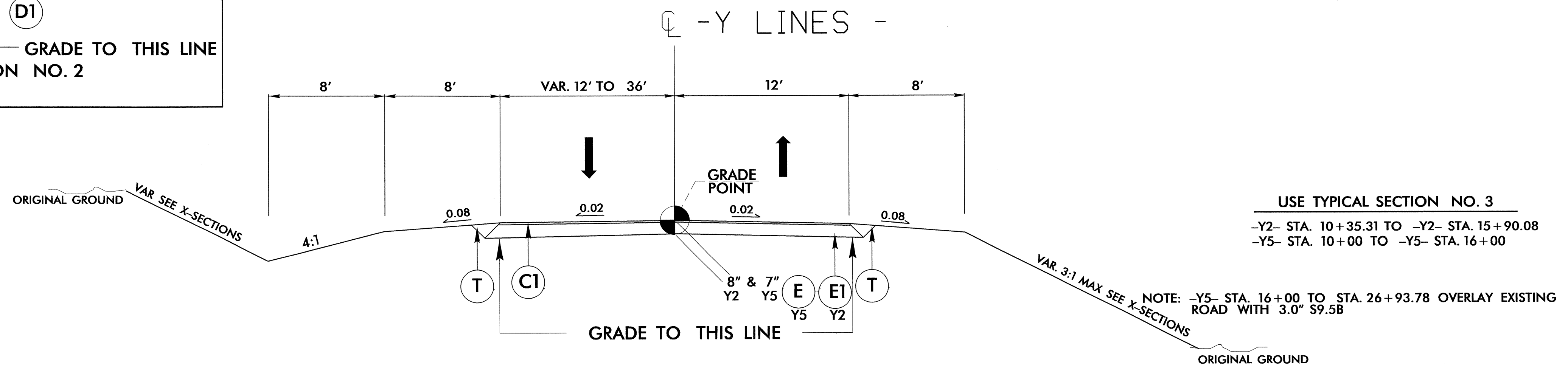
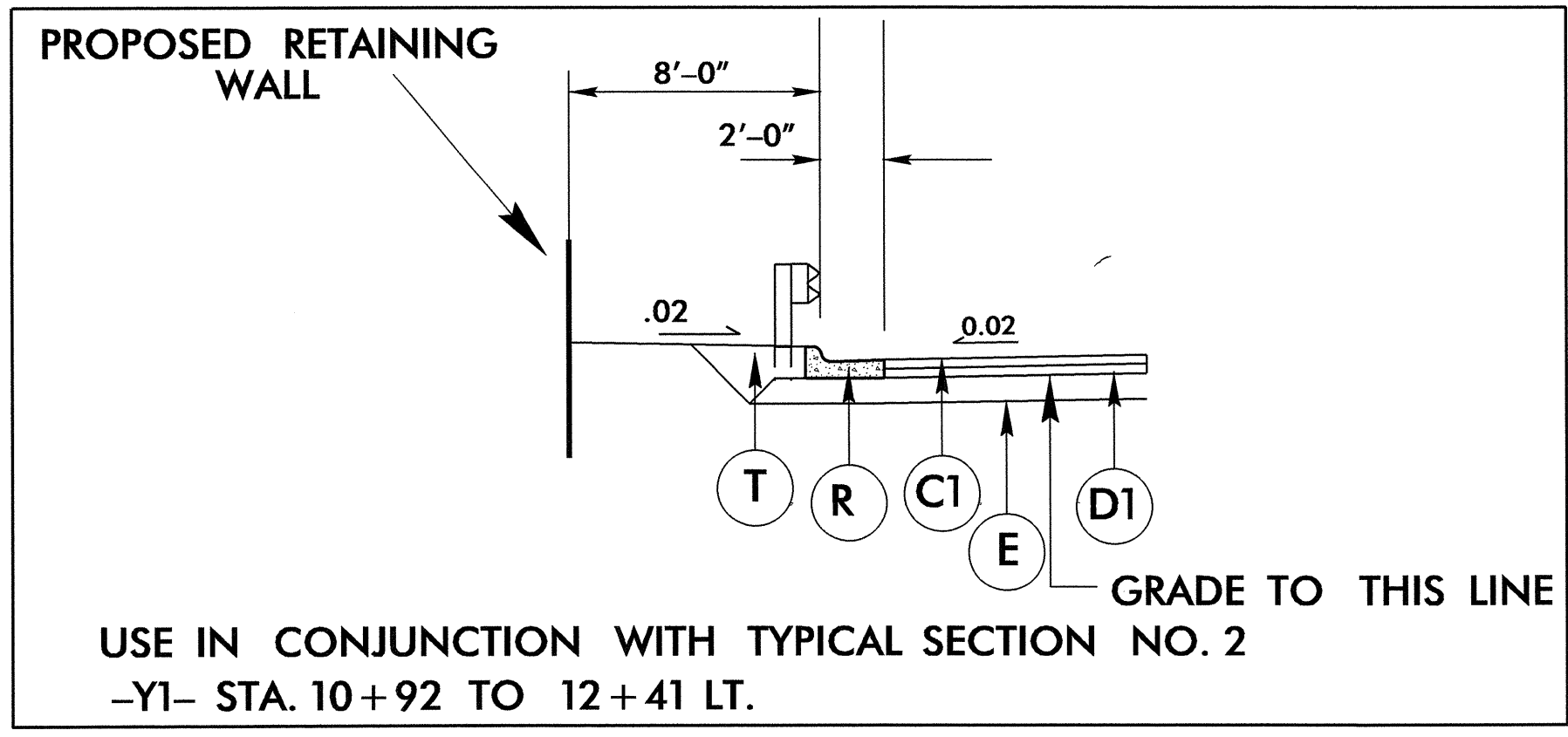
PROJECT REFERENCE NO. U-3324	SHEET NO. 2-A
ROADWAY DESIGN ENGINEER JIMMY D. GOINS 7-5-12	PAVEMENT DESIGN ENGINEER Vladimir Vladimirov 9/5/12

PAVEMENT SCHEDULE	
C1	3" S9.5B
E	4" B25.0B
E1	5" B25.0B
T	EARTH MATERIAL.
R	2'-6" C&G
U	EXISTING PAVEMENT.
W	WEDGING



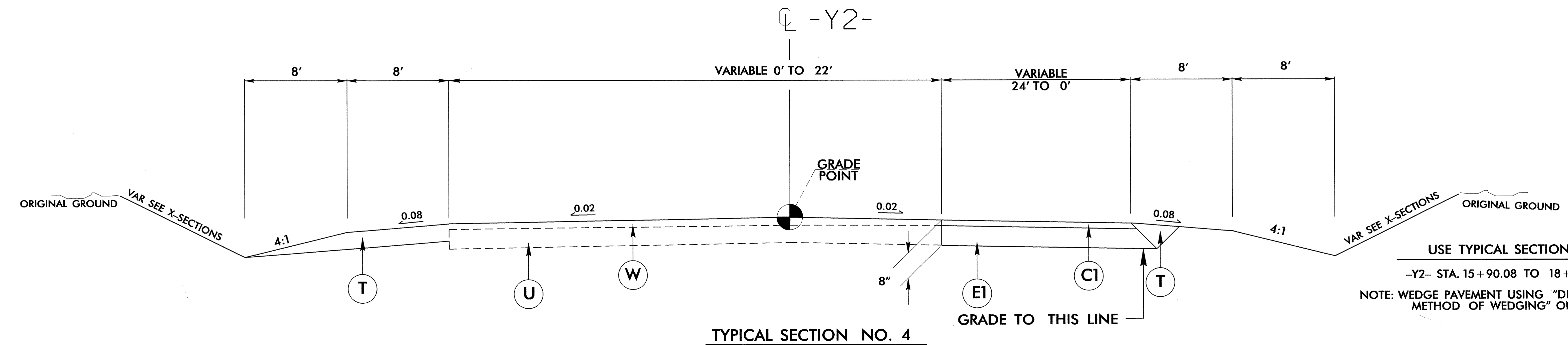
TYPICAL SECTION NO. 2

-Y1- STA. 10+71.67 TO -Y1- STA. 14+41.45  
 NOTE: WEDGE PAVEMENT USING "DETAIL SHOWING METHOD OF WEDGING" ON SHEET 2-B



TYPICAL SECTION NO. 3

USE TYPICAL SECTION NO. 3  
 -Y2- STA. 10+35.31 TO -Y2- STA. 15+90.08  
 -Y5- STA. 10+00 TO -Y5- STA. 16+00  
 NOTE: -Y5- STA. 16+00 TO STA. 26+93.78 OVERLAY EXISTING ROAD WITH 3.0" S9.5B



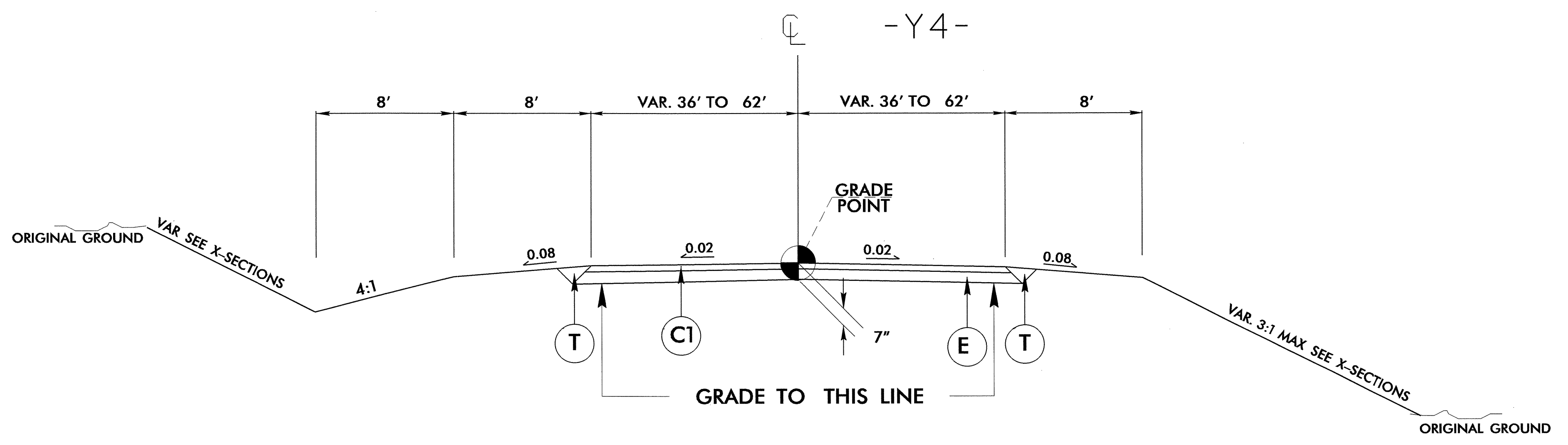
TYPICAL SECTION NO. 4

USE TYPICAL SECTION NO. 4  
 -Y2- STA. 15+90.08 TO 18+10.53  
 NOTE: WEDGE PAVEMENT USING "DETAIL SHOWING METHOD OF WEDGING" ON SHEET 2-B

05 JUL 2012 08:51 u3324\_rdy\_tup.dgn

6/22/09

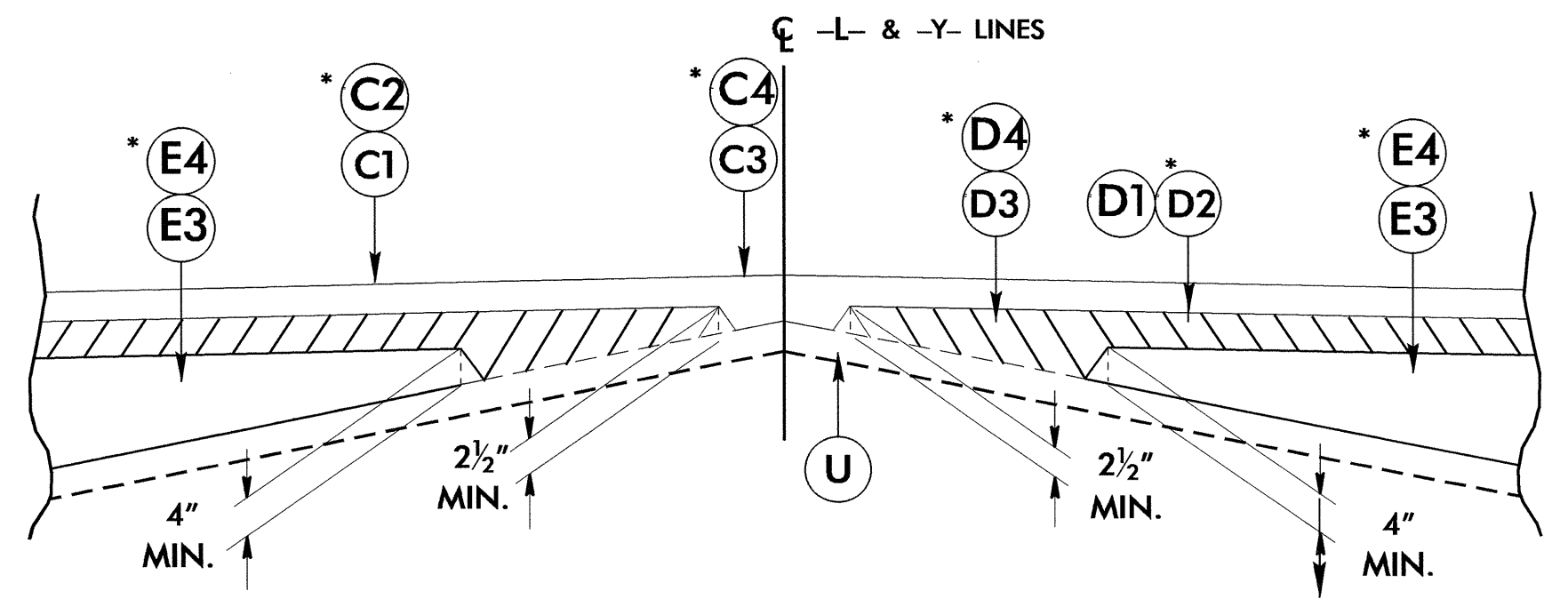
PAVEMENT SCHEDULE	
C1	3" S9.5B
D1	4" I19.0B
E	4" B25.0B
R	2'-6" C&G
R1	2'-6" C&G TO BE REMOVED
R2	2'-6" C&G TO BE RETAINED
S	4" CONCRETE SIDEWALK.
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
W	WEDGING



TYPICAL SECTION NO. 5

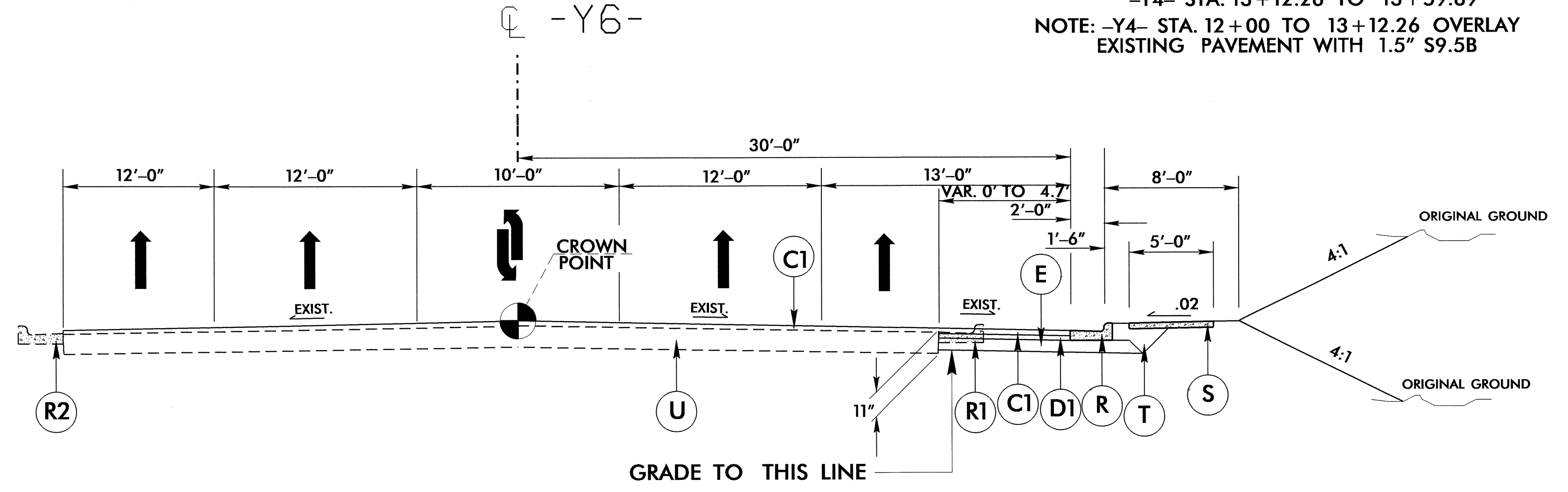
USE TYPICAL SECTION NO. 5

-Y4- STA. 13+12.26 TO 13+59.89  
NOTE: -Y4- STA. 12+00 TO 13+12.26 OVERLAY EXISTING PAVEMENT WITH 1.5" S9.5B



Detail Showing Method of Wedging

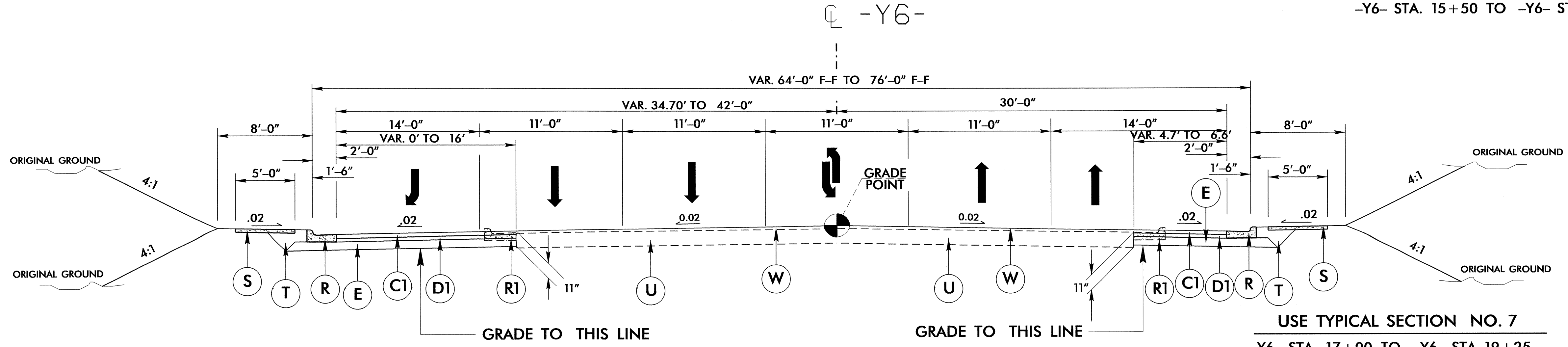
\* DENOTES -L- PAVEMENT DESIGN



TYPICAL SECTION NO. 6

USE TYPICAL SECTION NO. 6

-Y6- STA. 15+50 TO -Y6- STA. 17+00



TYPICAL SECTION NO. 7

USE TYPICAL SECTION NO. 7

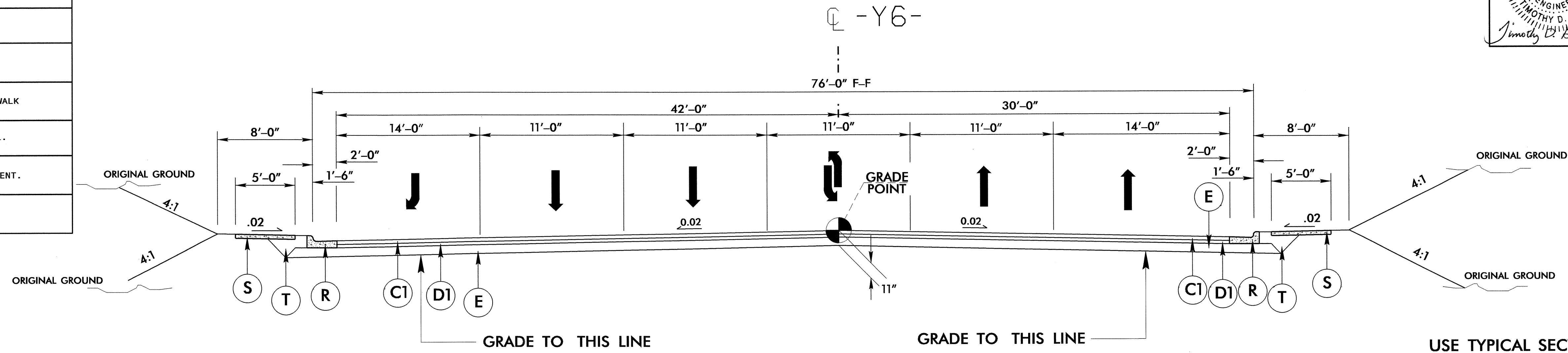
-Y6- STA. 17+00 TO -Y6- STA. 19+25

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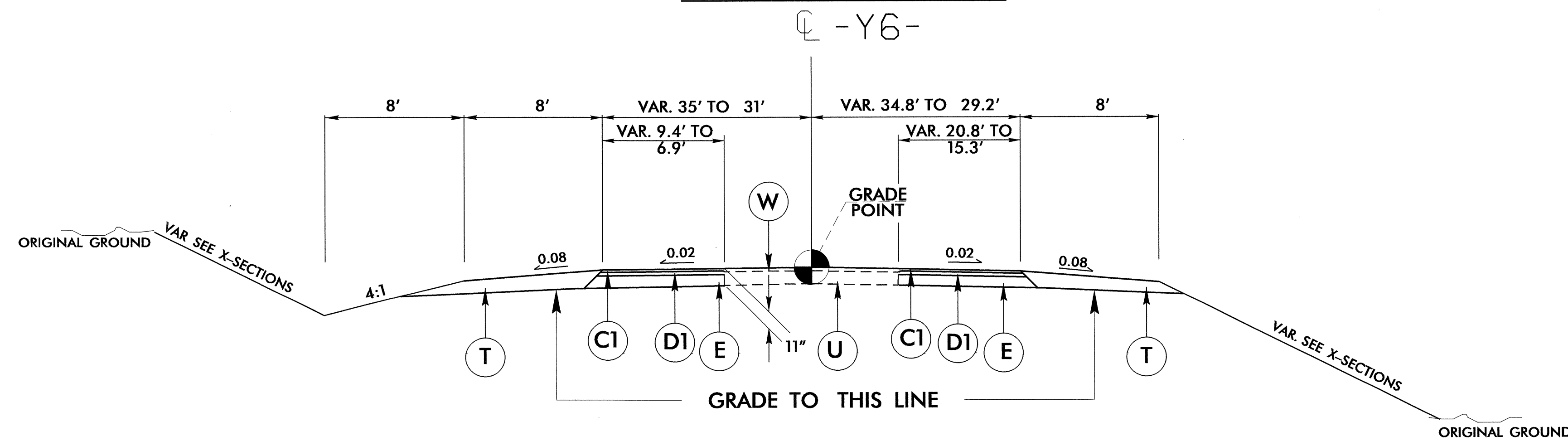
PAVEMENT SCHEDULE	
C1	3" S9.5B
D1	4" I19.0B
E	4" B25.0B
R	2'-6" C&G
S	4" CONC. SIDEWALK
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
W	WEDGING

PROJECT REFERENCE NO. U-3324	SHEET NO. 2-C
ROADWAY DESIGN ENGINEER TIMOTHY D. GOINS	PAVEMENT DESIGN ENGINEER Vladimir Kuznetsov



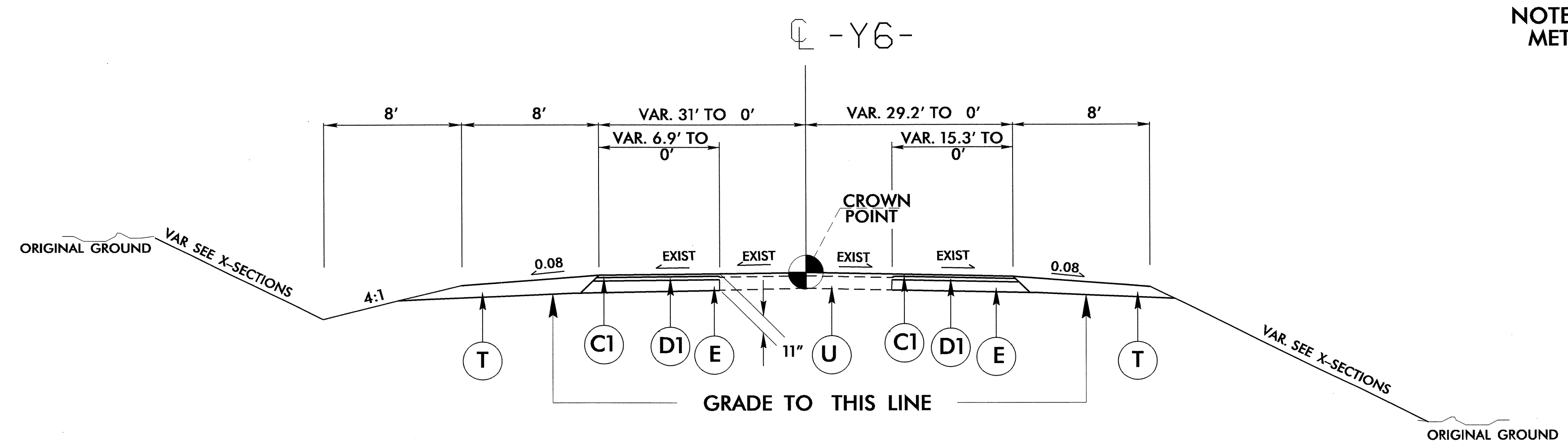
TYPICAL SECTION NO. 8

USE TYPICAL SECTION NO. 8  
 -Y6- STA. 19+25 TO -Y6- STA. 20+47.80 (BEGIN BRIDGE)  
 -Y6- STA. 22+15.30 (END BRIDGE) TO -Y6- STA. 24+00



TYPICAL SECTION NO. 9

USE TYPICAL SECTION NO. 9  
 -Y6- STA. 24+00 TO 26+00  
 NOTE: WEDGE PAVEMENT USING "DETAIL SHOWING METHOD OF WEDGING" ON SHEET 2-B



TYPICAL SECTION NO. 10

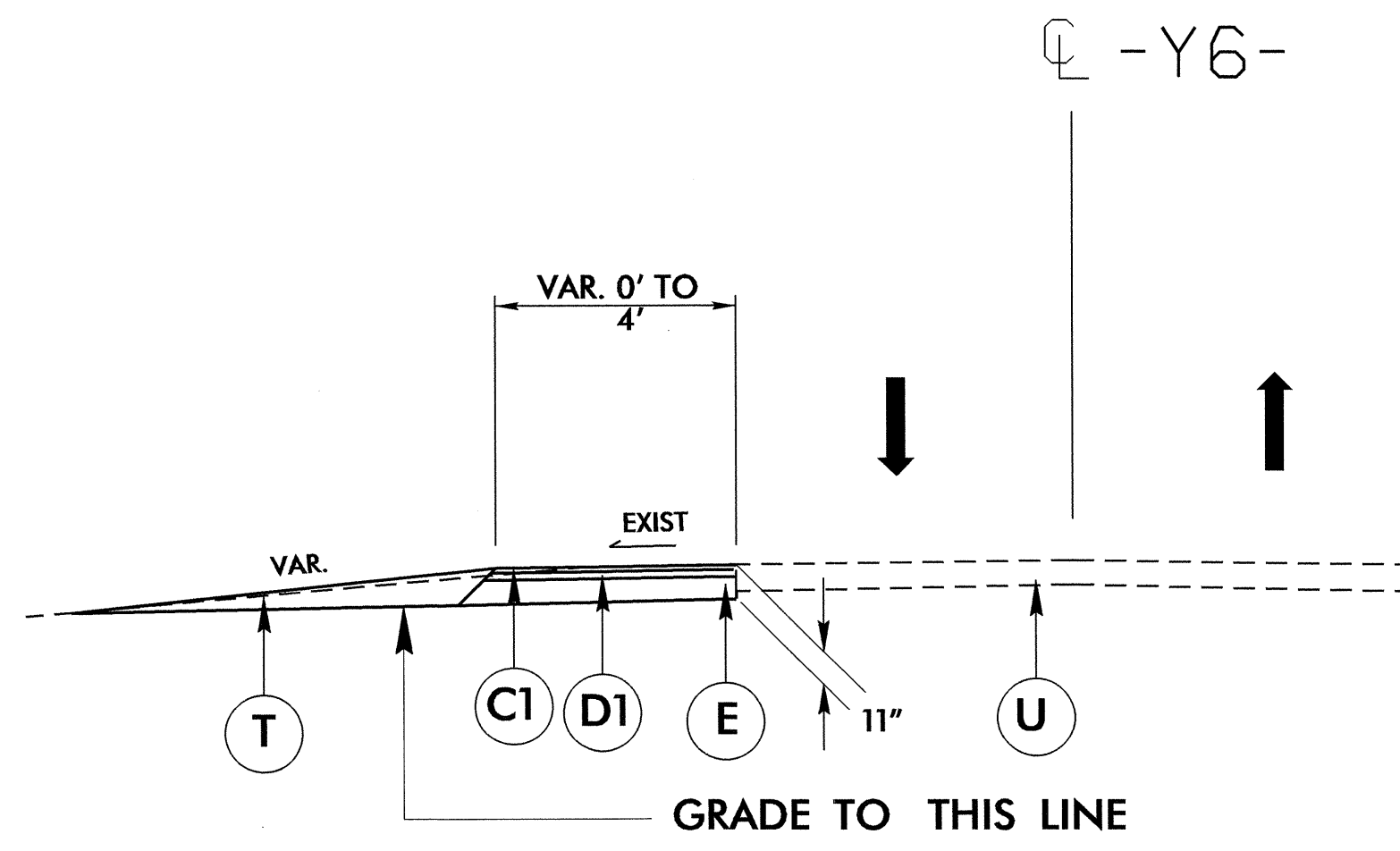
USE TYPICAL SECTION NO. 10  
 -Y6- STA. 26+00 TO 29+20

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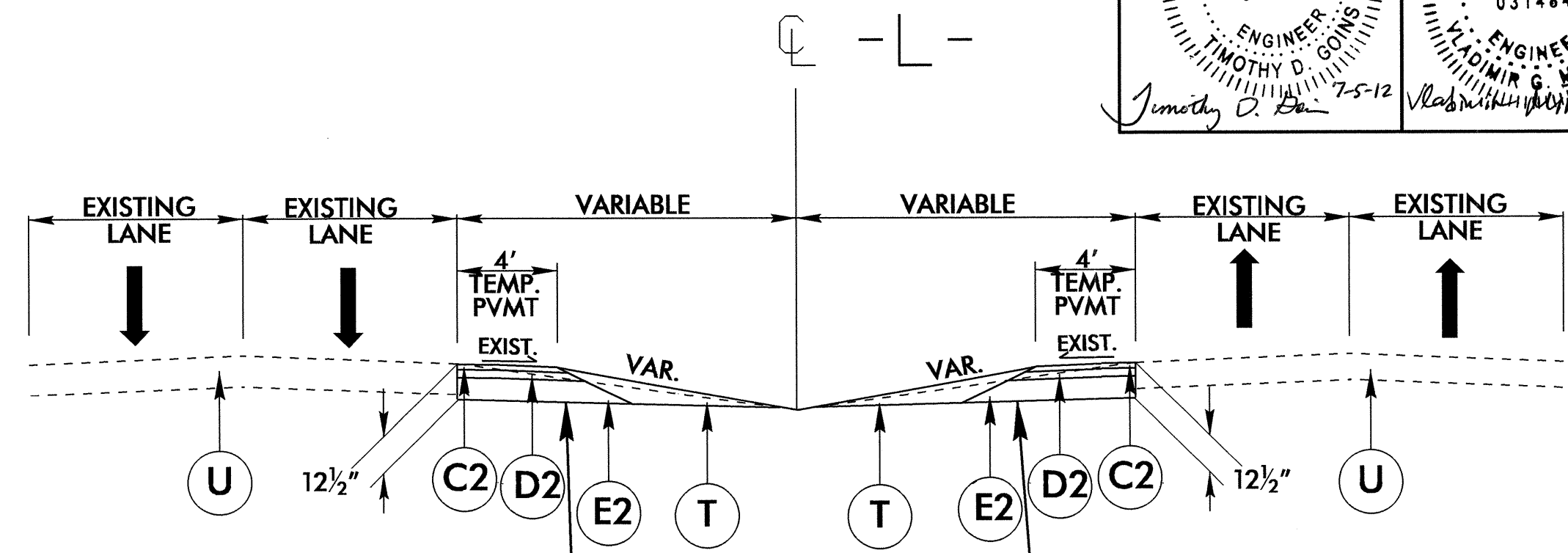
6/2/99

PAVEMENT SCHEDULE	
C1	3" S9.5B
C3	VAR. DEPTH S9.5B
D1	4" I19.0B
D2	4" I19.0C
D3	VAR. DEPTH I19.0B
E	4" B25.0B
E1	5" B25.0B
E2	5.5" B25.0C
E3	VAR. DEPTH B25.0B
R	2'-6" C&G
T	EARTH MATERIAL.
U	EXISTING PAVEMENT

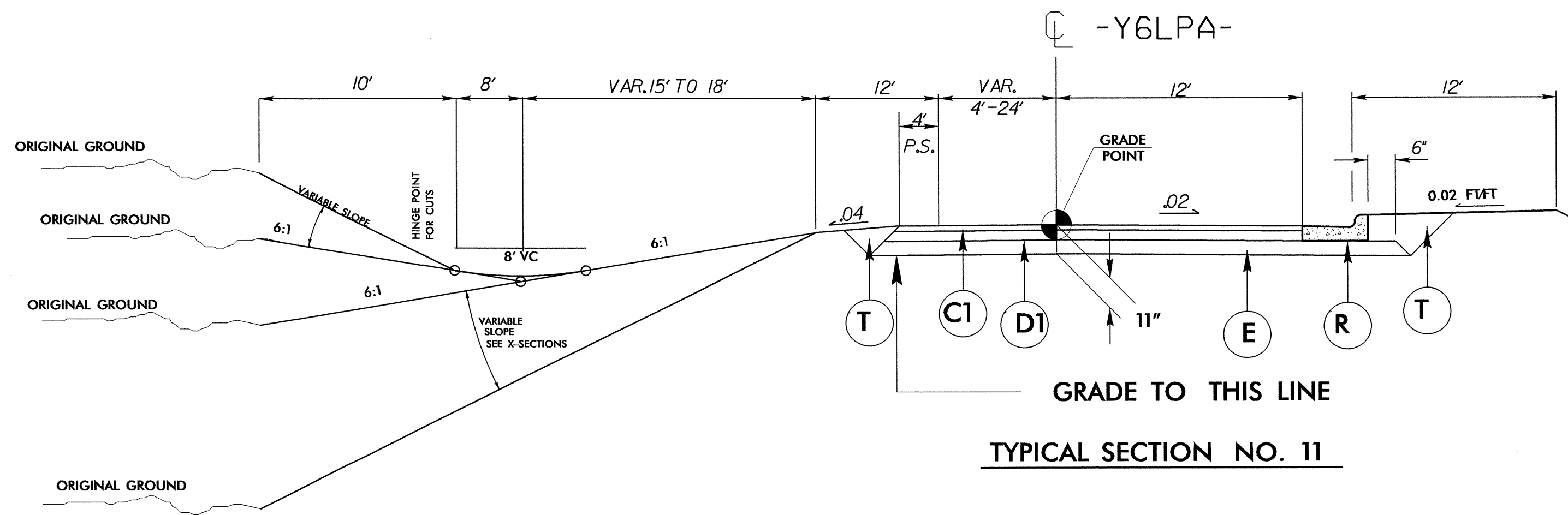
PROJECT REFERENCE NO. U-3324	SHEET NO. 2-D
ROADWAY DESIGN ENGINEER TIMOTHY D. GOINS 7-5-12	PAVEMENT DESIGN ENGINEER VLADIMIR G. MITCHELL 7/5/12



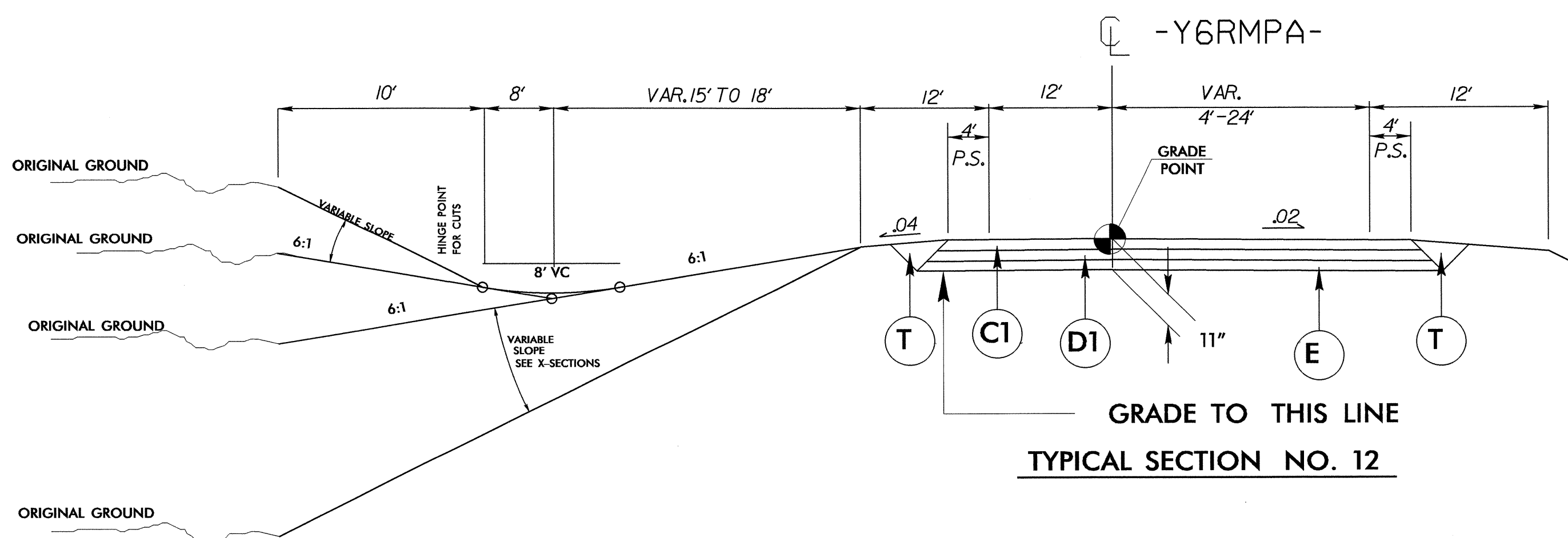
**TEMPORARY PAVEMENT DETAIL**  
 -Y6- STA. 19+84.37 TO 20+41.6  
 -Y6- STA. 22+24.80 TO 23+49.30



**TEMPORARY PAVEMENT DETAIL**  
 -L- STA. 40+22.60 TO 44+60 (RT. SIDE)  
 -L- STA. 45+80.6 TO 47+78.8 (RT. SIDE)  
 -L- STA. 44+00 TO 44+67 (LT. SIDE)  
 -L- STA. 45+80 TO 49+75 (LT. SIDE)




**USE TYPICAL SECTION NO. 11**  
 -Y6LPA- STA. 10+35.22 TO -Y6LPA- STA. 17+42.20  
 VAR. SEE X-SECTIONS



**USE TYPICAL SECTION NO. 12**  
 -Y6RMPA- STA. 10+00 TO -Y6RMPA- STA. 21+43.07  
 VAR. SEE X-SECTIONS

03-JUL-2012 12:32  
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GEOTECHNICAL ENGINEER  
 ENGINEER  
  
 Scott A. Shidden 11/18/11  
 SIGNATURE DATE

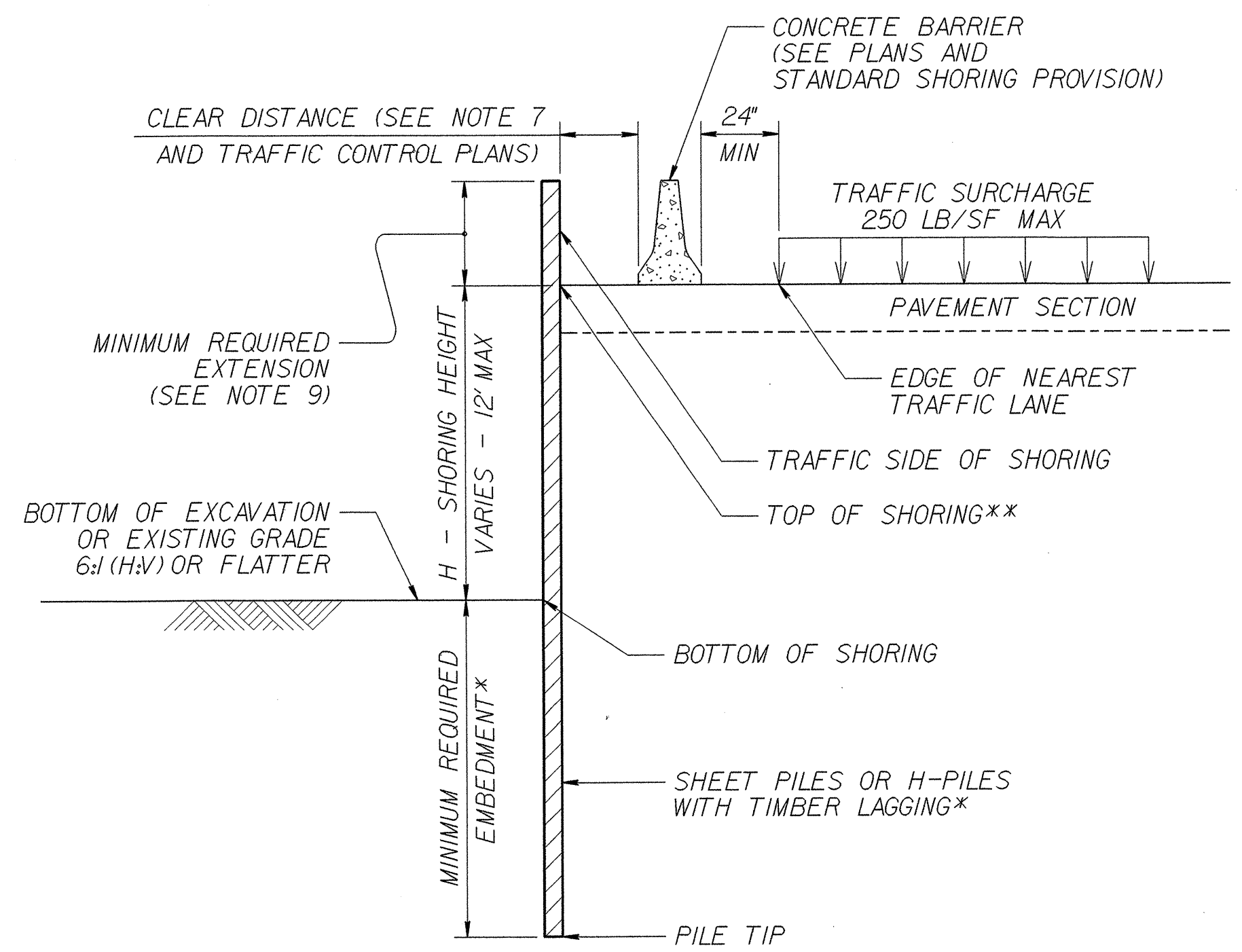
GROUNDWATER CONDITION (SEE NOTE 6)	H SHORING HEIGHT (FT)	SLOPE OR SURCHARGE CASE WITH NO TRAFFIC IMPACT					SURCHARGE CASE WITH TRAFFIC IMPACT				
		SHEET PILES		H-PILES WITH TIMBER LAGGING			SHEET PILES		H-PILES WITH TIMBER LAGGING		
		MINIMUM REQUIRED EMBEDMENT (FT)	MINIMUM REQUIRED SECTION MODULUS (IN <sup>3</sup> /FT)	MINIMUM REQUIRED EMBEDMENT* (FT) (SEE NOTE 10)			MINIMUM REQUIRED EMBEDMENT (FT)	MINIMUM REQUIRED SECTION MODULUS (IN <sup>3</sup> /FT)	MINIMUM REQUIRED EMBEDMENT* (FT) (SEE NOTE 10)		
			HP 10x42	HP 12x53	HP 14x73			HP 10x42	HP 12x53	HP 14x73	
GROUNDWATER ELEVATION BETWEEN BOTTOM OF SHORING AND PILE TIP	< 6	11.5	4.5	11.5	11.5	11.5	16.0	12.0	13.0	13.0	13.0
	7	13.0	7.0	13.0	13.0	13.0	17.0	14.5	14.5	14.5	14.5
	8	15.0	10.0	--	15.0	15.0	18.0	17.0	--	15.5	15.5
	9	17.0	14.0	--	17.0	17.0	19.0	20.0	--	17.0	17.0
	10	18.5	19.5	--	--	18.5	20.0	23.5	--	--	18.5
	11	20.5	26.0	--	--	--	21.0	28.0	--	--	20.0
GROUNDWATER ELEVATION BELOW PILE TIP	< 6	7.5	3.0	8.0	8.0	8.0	11.0	10.0	9.5	9.5	9.5
	7	8.5	4.5	9.5	9.5	9.5	12.0	12.0	10.5	10.5	10.5
	8	10.0	6.5	10.5	10.5	10.5	12.5	14.0	11.5	11.5	11.5
	9	11.0	9.5	--	12.0	12.0	13.5	16.5	--	12.5	12.5
	10	12.5	13.0	--	--	13.5	14.0	19.5	--	13.5	13.5
	11	13.5	17.0	--	--	14.5	15.0	22.5	--	--	14.5
12	15.0	21.5	--	--	16.0	16.0	25.5	--	--	15.5	

NOTES:

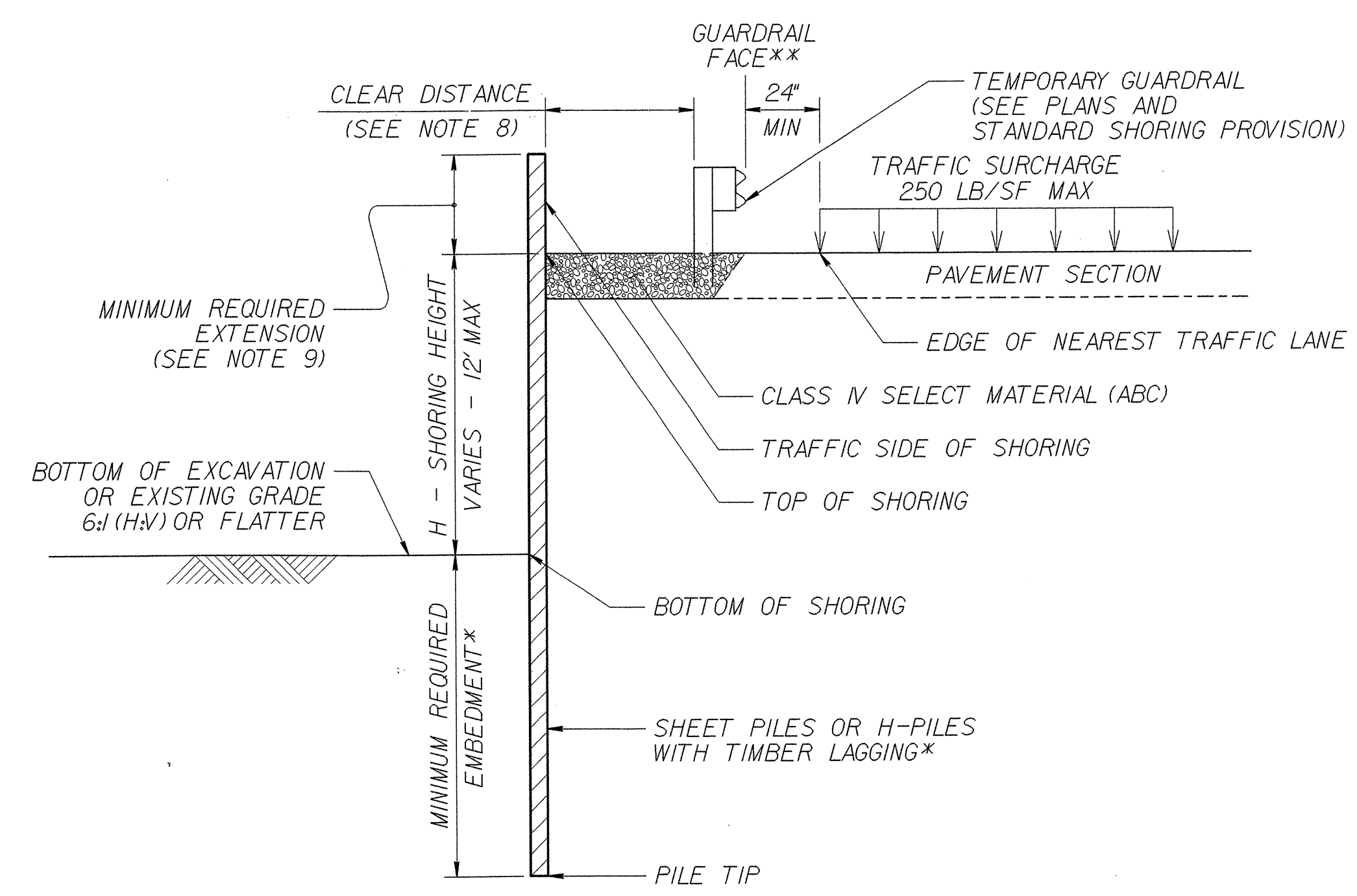
1. AT THE CONTRACTOR'S OPTION, USE STANDARD TEMPORARY SHORING AS NOTED IN THE PLANS.
2. FOR STANDARD TEMPORARY SHORING, SEE STANDARD SHORING PROVISION.
3. STANDARD TEMPORARY SHORING IS BASED ON THE FOLLOWING IN-SITU ASSUMED SOIL PARAMETERS:  
 UNIT WEIGHT,  $\gamma = 120 \text{ LB/CF}$   
 FRICTION ANGLE,  $\phi = 30 \text{ DEGREES}$   
 COHESION,  $c = 0 \text{ LB/SF}$
4. DO NOT USE STANDARD TEMPORARY SHORING IF ASSUMED SOIL PARAMETERS ARE NOT APPLICABLE.
5. DO NOT USE STANDARD TEMPORARY SHORING WHEN VERY LOOSE OR SOFT SOIL OR MUCK IS WITHIN THE EMBEDMENT DEPTH.
6. USE GROUNDWATER ELEVATION NOTED IN THE PLANS. IF NO GROUNDWATER ELEVATION IS SHOWN IN THE PLANS, USE "GROUNDWATER ELEVATION BETWEEN BOTTOM OF SHORING AND PILE TIP" FOR GROUNDWATER CONDITION. DO NOT USE STANDARD TEMPORARY SHORING IF GROUNDWATER IS ABOVE BOTTOM OF SHORING.
7. AT THE CONTRACTOR'S OPTION OR IF AVAILABLE CLEAR DISTANCE IS LESS THAN THE MINIMUM REQUIRED FOR CONCRETE BARRIER, SET BARRIER NEXT TO AND UP AGAINST TRAFFIC SIDE OF PILES AND USE "SURCHARGE CASE WITH TRAFFIC IMPACT".
8. AT THE CONTRACTOR'S OPTION OR IF AVAILABLE CLEAR DISTANCE IS LESS THAN 4' FOR TEMPORARY GUARDRAIL, ATTACH GUARDRAIL TO TRAFFIC SIDE OF PILES AS SHOWN IN THE PLANS AND USE "SURCHARGE CASE WITH TRAFFIC IMPACT".
9. MINIMUM REQUIRED EXTENSION IS 6' FOR "SLOPE OR SURCHARGE CASE WITH NO TRAFFIC IMPACT" AND 32' FOR "SURCHARGE CASE WITH TRAFFIC IMPACT".
10. MINIMUM REQUIRED EMBEDMENT FOR H-PILES WITH TIMBER LAGGING IS BASED ON DRIVEN H-PILES AT MAXIMUM 6' SPACING. AT THE CONTRACTOR'S OPTION, EMBEDMENT DEPTHS MAY BE REDUCED BY 25% FOR DRILLED-IN H-PILES.
11. SUBMIT A "STANDARD TEMPORARY SHORING SELECTION FORM" AT LEAST 7 DAYS BEFORE STARTING TEMPORARY SHORING CONSTRUCTION. UP TO 3 SHORING LOCATIONS MAY BE INCLUDED ON EACH FORM.
12. CONTACT THE ENGINEER IF PILES DO NOT ATTAIN THE MINIMUM REQUIRED EMBEDMENT.

MINIMUM REQUIRED EMBEDMENT AND SECTION MODULUS

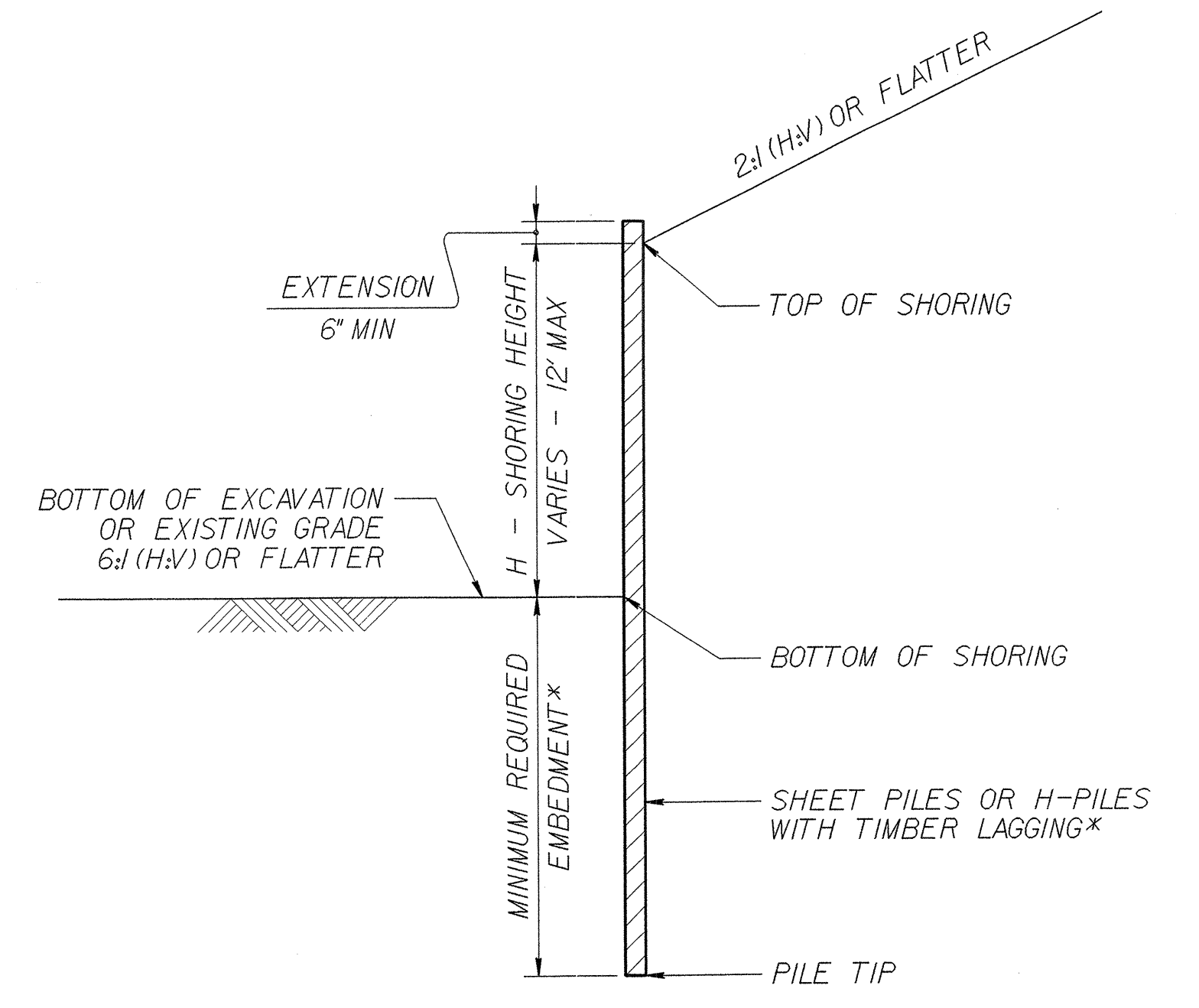
**\*DO NOT USE H-PILES WITH TIMBER LAGGING FOR GROUNDWATER CONDITION, SHORING HEIGHT AND H-PILE SIZE SHOWN IF MINIMUM REQUIRED EMBEDMENT IS "--".**



**CONCRETE BARRIER**  
**\*\*TOP OF SHORING = EDGE OF PAVEMENT**

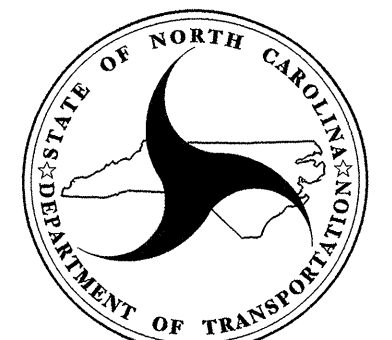


**TEMPORARY GUARDRAIL**  
**\*\*GUARDRAIL FACE = EDGE OF PAVEMENT**

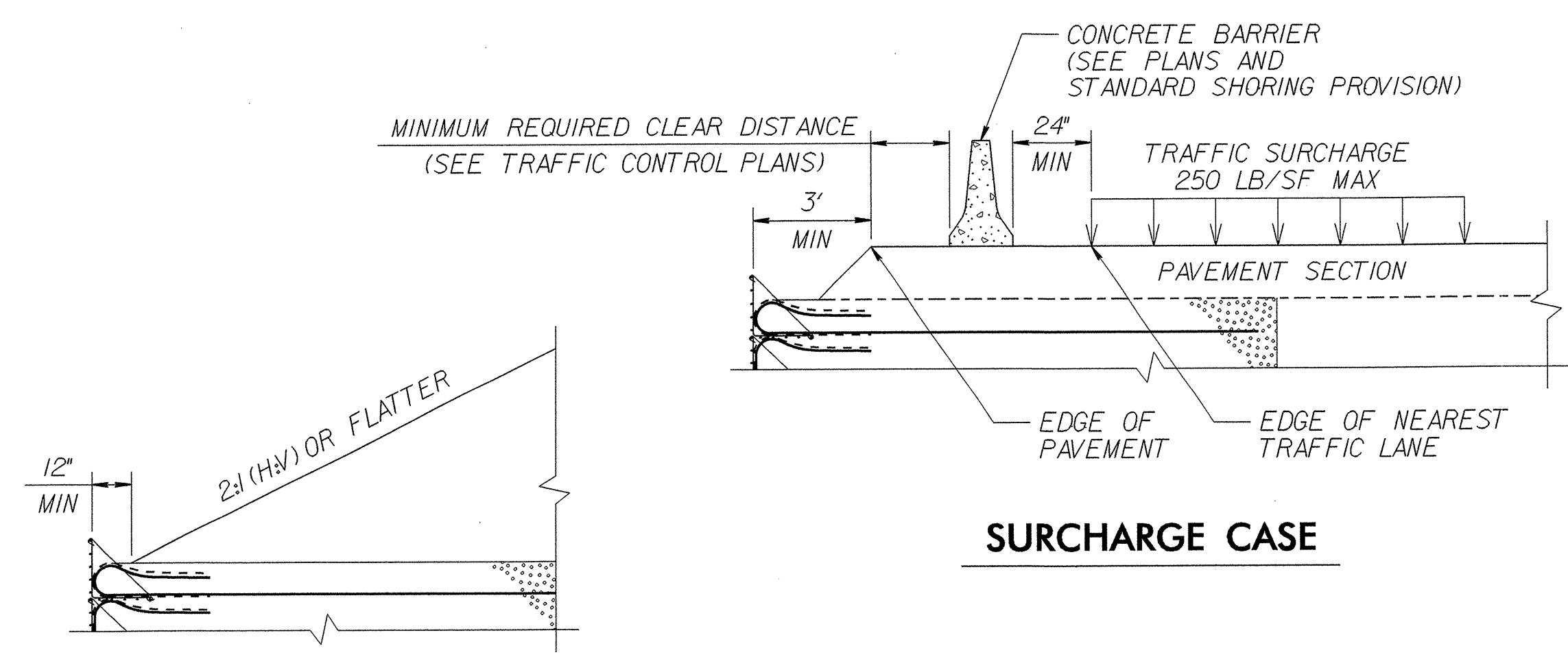


**STANDARD TEMPORARY SHORING (SLOPE CASE)**  
**\*SEE TABLE ABOVE.**

**STANDARD TEMPORARY SHORING (SURCHARGE CASE)**  
**\*SEE TABLE ABOVE.**

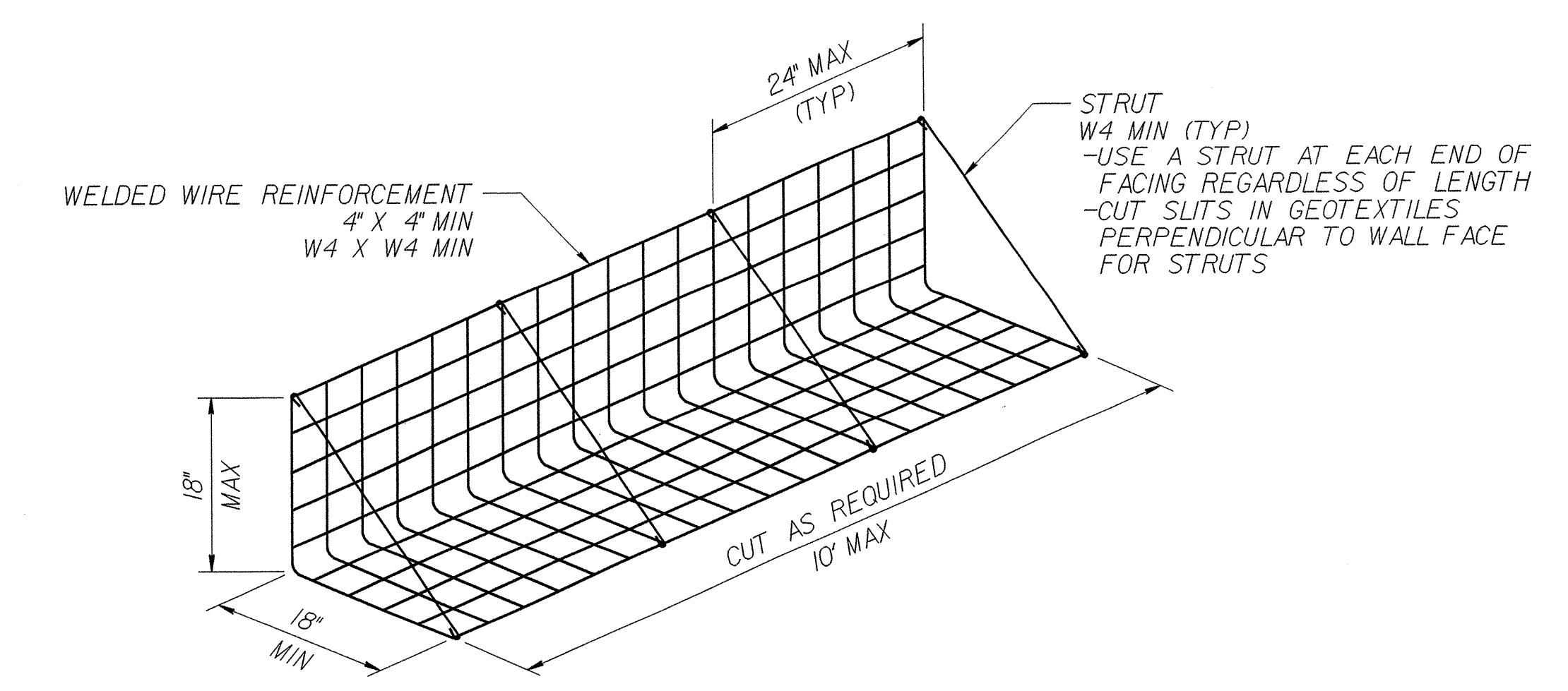

**GEOTECHNICAL ENGINEERING UNIT**  
 STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

STANDARD DRAWING NO. 1801.01  
**STANDARD TEMPORARY SHORING**  
 DATE: 1-17-12

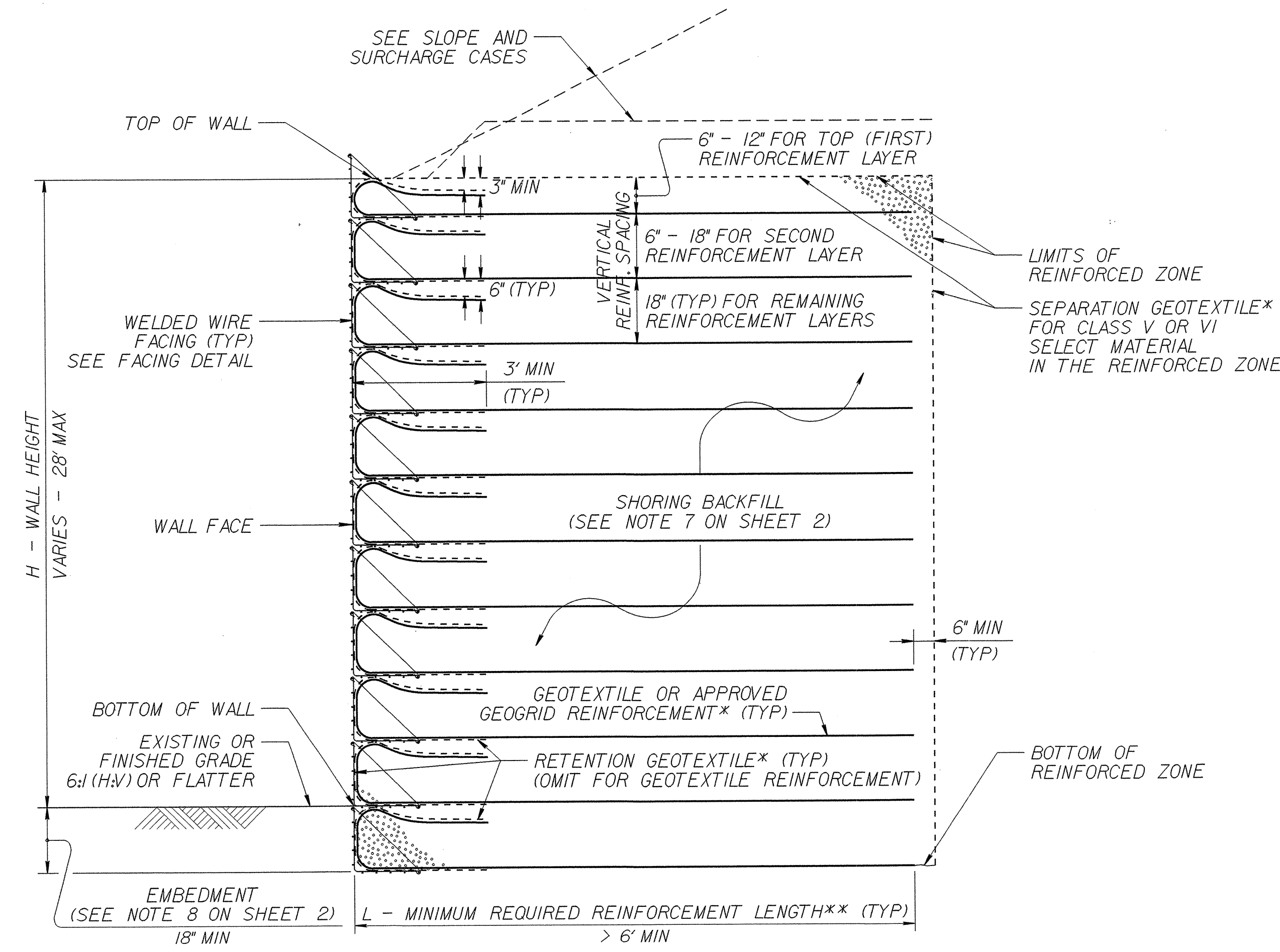


**SLOPE CASE**

**SURCHARGE CASE**

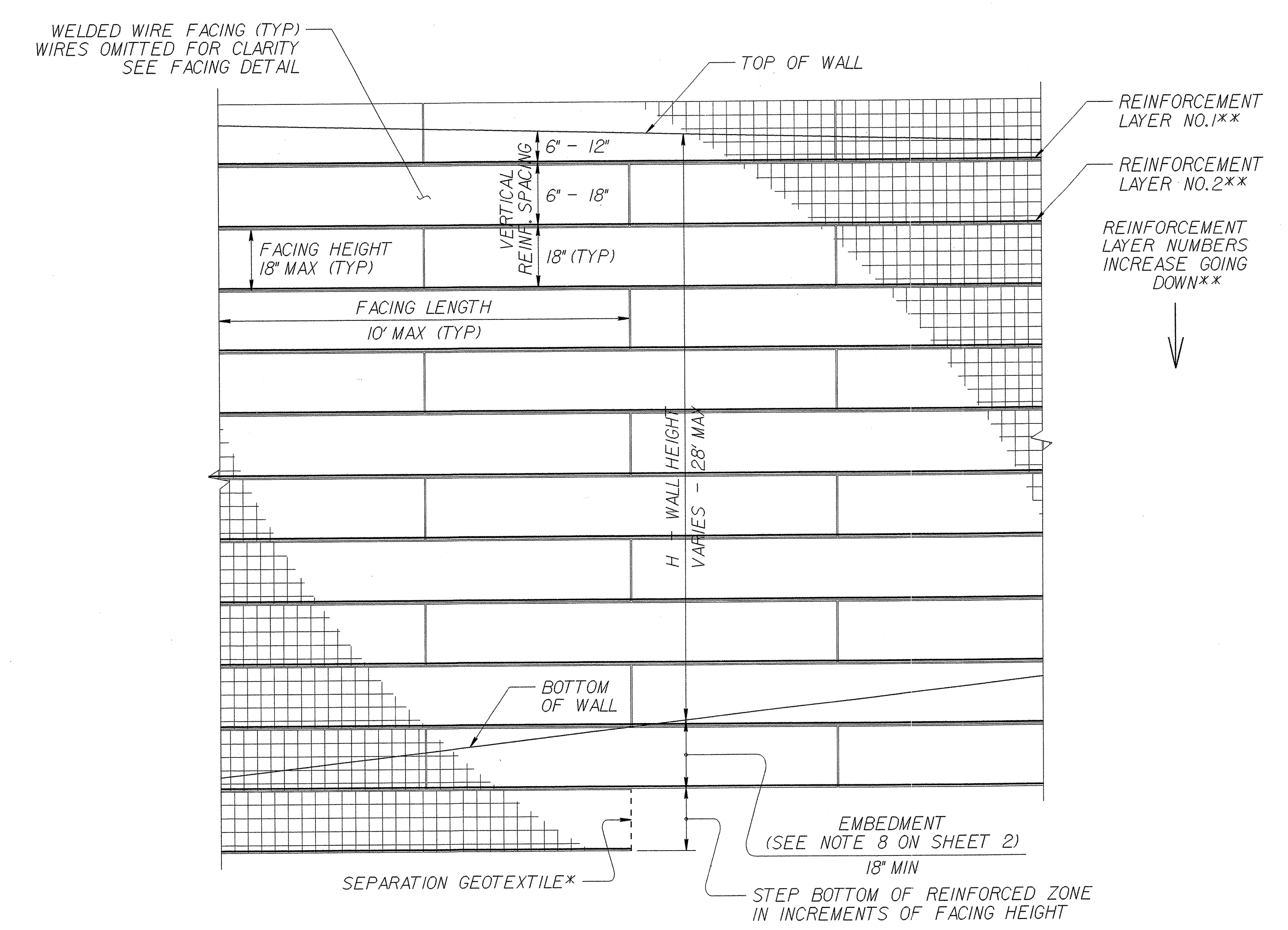


**FACING DETAIL**



**STANDARD TEMPORARY WALL**

(FOR STANDARD TEMPORARY WALLS ON STRUCTURES, SEE TEMPORARY WALL ON STRUCTURE DETAIL ON SHEET 2.)  
 \*SEE GEOSYNTHETIC PLACEMENT DETAILS ON SHEET 2.  
 \*\*SEE REINFORCEMENT TABLES ON SHEET 3.

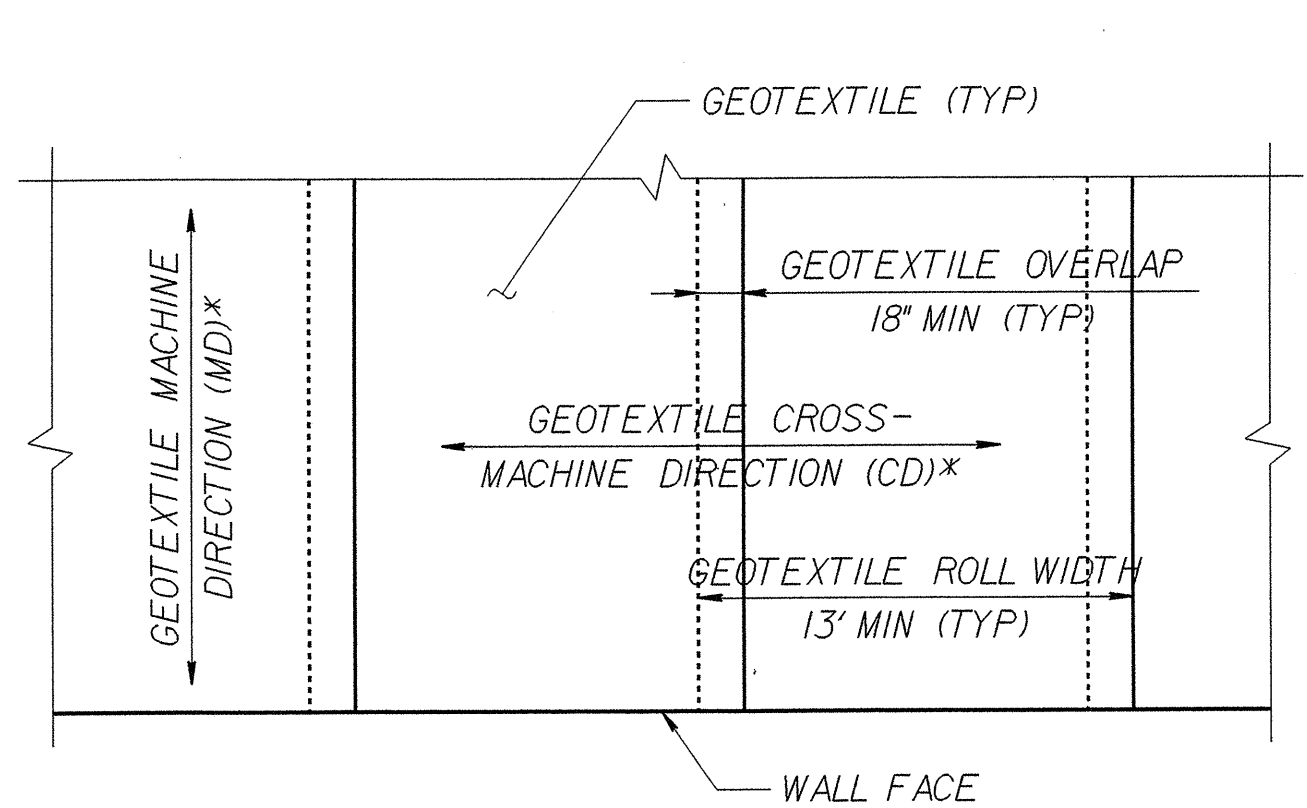


**STANDARD TEMPORARY WALL - PARTIAL ELEVATION**

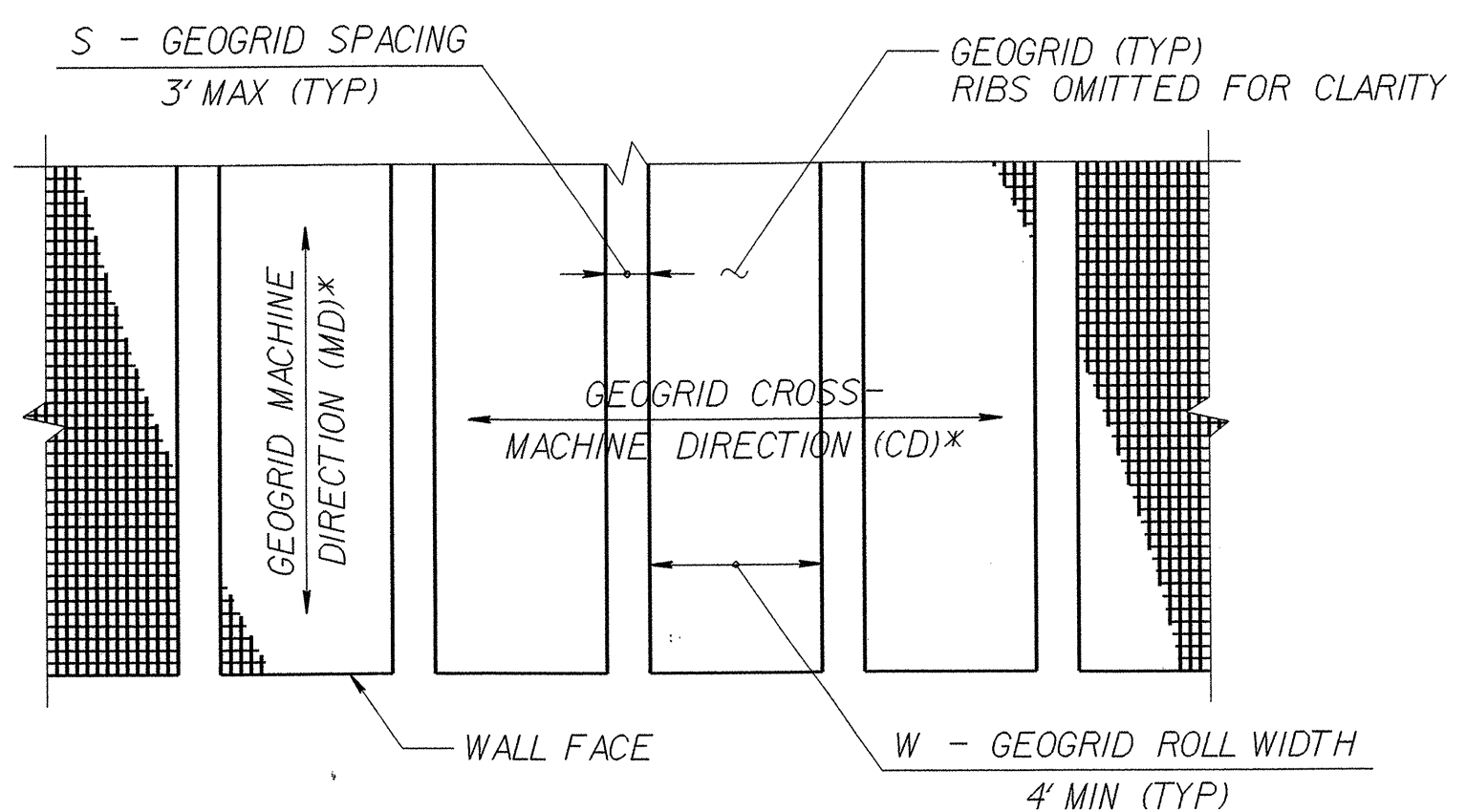
\*SEE GEOSYNTHETIC PLACEMENT DETAILS ON SHEET 2.  
 \*\*SEE REINFORCEMENT TABLES ON SHEET 3.



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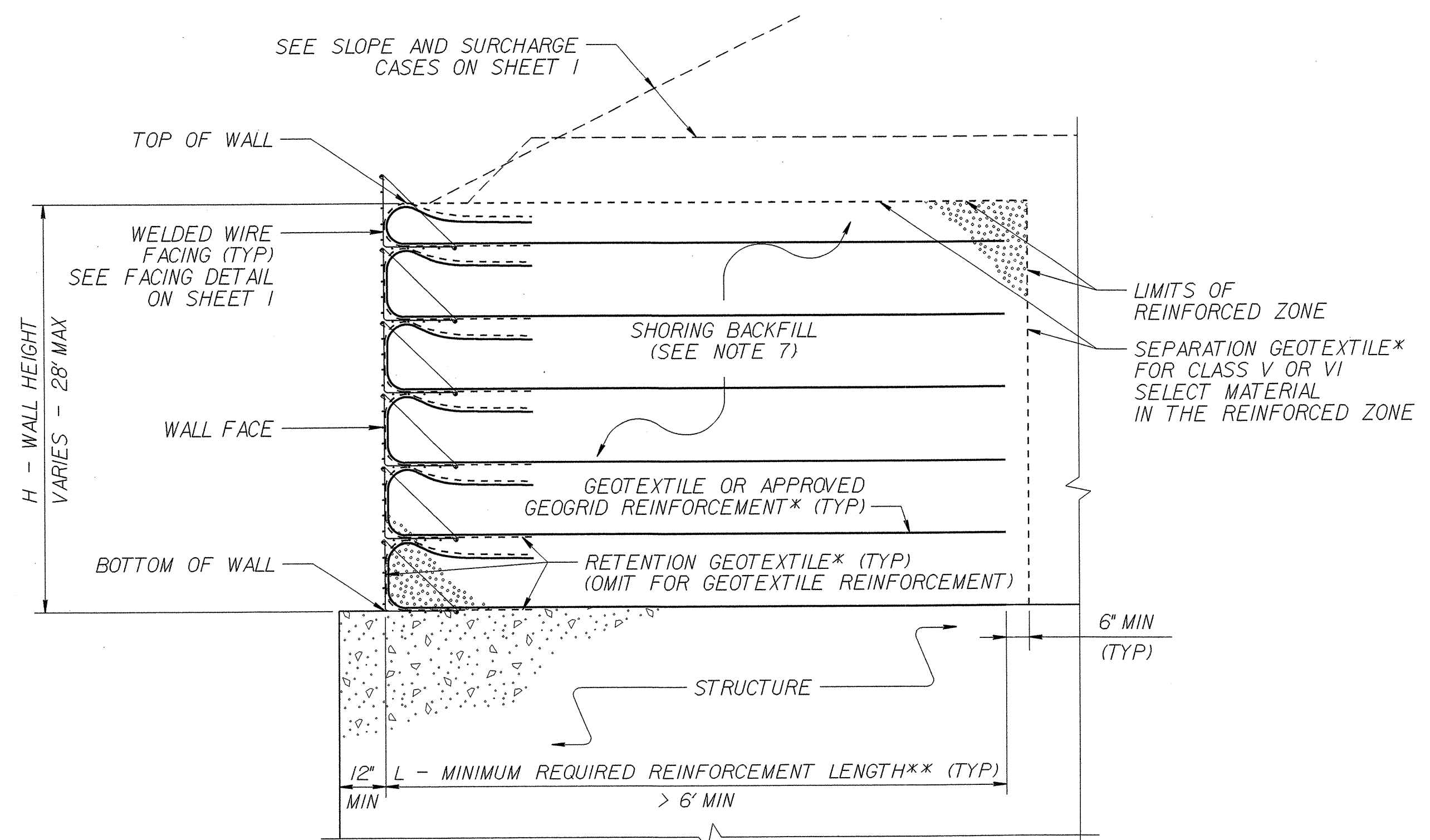


**GEOTEXTILE PLACEMENT**  
(100% COVERAGE MIN FOR GEOTEXTILE REINFORCEMENT)



**GEOGRID PLACEMENT**  
(80% COVERAGE MIN FOR GEOGRID REINFORCEMENT -  $\frac{W}{W+S} \times 100 \geq 80\%$ , SEE NOTE 11)

**GEOSYNTHETIC PLACEMENT DETAILS**  
(PLAN VIEW)  
\*SEE NOTE 12.



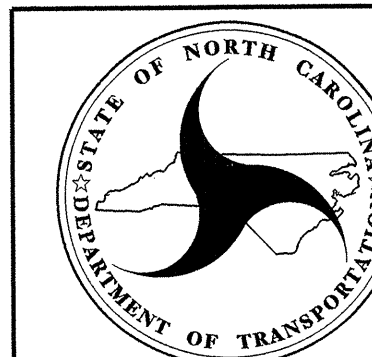
**TEMPORARY WALL ON STRUCTURE DETAIL**  
\*SEE GEOSYNTHETIC PLACEMENT DETAILS.  
\*\*SEE REINFORCEMENT TABLES ON SHEET 3.

**NOTES:**

1. AT THE CONTRACTOR'S OPTION, USE STANDARD TEMPORARY WALLS AS NOTED IN THE PLANS.
2. FOR STANDARD TEMPORARY WALLS, SEE STANDARD SHORING PROVISION.
3. STANDARD TEMPORARY WALLS ARE BASED ON THE FOLLOWING IN-SITU ASSUMED SOIL PARAMETERS:  
UNIT WEIGHT,  $\gamma = 120$  LB/CF  
FRICTION ANGLE,  $\phi = 30$  DEGREES  
COHESION,  $c = 0$  LB/SF
4. DO NOT USE STANDARD TEMPORARY WALLS IF ASSUMED SOIL PARAMETERS ARE NOT APPLICABLE.
5. DO NOT USE STANDARD TEMPORARY WALLS WHEN VERY LOOSE OR SOFT SOIL OR MUCK IS BELOW TEMPORARY WALLS.
6. USE GROUNDWATER ELEVATION NOTED IN THE PLANS. IF NO GROUNDWATER ELEVATION IS SHOWN IN THE PLANS, ASSUME GROUNDWATER DEPTH IS LESS THAN 7' BELOW BOTTOM OF REINFORCED ZONE. DO NOT USE STANDARD TEMPORARY WALLS IF GROUNDWATER IS ABOVE BOTTOM OF REINFORCED ZONE.
7. DO NOT USE A-2-4 SOIL FOR STANDARD TEMPORARY WALLS AROUND CULVERTS OR IN THE REINFORCED ZONE OF STANDARD TEMPORARY WALLS FOR SLOPE CASES. DO NOT USE CLASS VI SELECT MATERIAL IN THE REINFORCED ZONE OF STANDARD TEMPORARY WALLS WITH GEOTEXTILE REINFORCEMENT.
8. EMBEDMENT IS NOT REQUIRED FOR STANDARD TEMPORARY WALLS ON STRUCTURES OR ROCK AS DETERMINED BY THE ENGINEER.
9. DO NOT USE MORE THAN 4 DIFFERENT REINFORCEMENT STRENGTHS FOR EACH STANDARD TEMPORARY WALL.
10. GEOGRIDS ARE APPROVED FOR SHORT-TERM DESIGN STRENGTHS FOR A 3-YEAR DESIGN LIFE IN THE MACHINE DIRECTION (MD) AND CROSS-MACHINE DIRECTION (CD) BASED ON MATERIAL TYPE. FOR DETAILS OF APPROVED GEOGRIDS AND SHORT-TERM DESIGN STRENGTHS, SEE [www.ncdot.org/doh/operations/materials/soils/gep.htm](http://www.ncdot.org/doh/operations/materials/soils/gep.htm) DEFINE MATERIAL TYPE FROM THE WEBSITE ABOVE FOR SHORING BACKFILL AS FOLLOWS:

MATERIAL TYPE	SHORING BACKFILL
BORROW	A-2-4 SOIL
FINE AGGREGATE	CLASS II, TYPE I OR CLASS III SELECT MATERIAL
COARSE AGGREGATE	CLASS V OR VI SELECT MATERIAL

11. FOR GEOGRID REINFORCEMENT WITH LESS THAN 100% COVERAGE, STAGGER REINFORCEMENT SO GEOGRIDS ARE CENTERED OVER GAPS IN THE REINFORCEMENT LAYER BELOW.
12. AT THE CONTRACTOR'S OPTION, REINFORCEMENT MAY BE INSTALLED WITH THE MD PARALLEL TO THE WALL FACE IF BOTH THE FOLLOWING CONDITIONS OCCUR:  
- W (REINFORCEMENT ROLL WIDTH)  $\geq$  L (MINIMUM REQUIRED REINFORCEMENT LENGTH) + 4.5' AND  
- REINFORCEMENT STRENGTH IN CD  $\geq$  MINIMUM REQUIRED REINFORCEMENT STRENGTH IN MD.
13. SUBMIT A "STANDARD TEMPORARY WALL SELECTION FORM" AT LEAST 7 DAYS BEFORE STARTING TEMPORARY WALL CONSTRUCTION.
14. DO NOT PLACE SHORING BACKFILL OR REINFORCEMENT UNTIL EXCAVATION DIMENSIONS AND FOUNDATION MATERIAL ARE APPROVED.
15. FOR STANDARD TEMPORARY WALLS WITH PILE FOUNDATIONS IN THE REINFORCED ZONE, DRIVE PILES THROUGH REINFORCEMENT AFTER CONSTRUCTING TEMPORARY WALLS.
16. DO NOT SPLICE OR OVERLAP REINFORCEMENT SO SEAMS ARE PARALLEL TO THE WALL FACE.
17. CONTACT THE ENGINEER WHEN EXISTING OR FUTURE OBSTRUCTIONS SUCH AS FOUNDATIONS, PAVEMENTS, PIPES, INLETS OR UTILITIES WILL INTERFERE WITH REINFORCEMENT.
18. FOR STANDARD TEMPORARY WALLS WITH INTERIOR ANGLES LESS THAN 90 DEGREES, WRAP GEOSYNTHETICS AT ACUTE CORNERS AS DIRECTED BY THE ENGINEER.
19. FOR STANDARD TEMPORARY WALLS WITH TOP OF WALL WITHIN 5' OF FINISHED GRADE, REMOVE TOP FACING AND INCORPORATE TOP REINFORCEMENT LAYER INTO FILL WHEN PLACING FILL IN FRONT OF WALL.



**GEOTECHNICAL ENGINEERING UNIT**  
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

STANDARD DRAWING NO. 1801.02

STANDARD TEMPORARY WALL  
Sheet 2 of 3

DATE: 1-17-12

GEOTECHNICAL ENGINEER

ENGINEER



Scott A. Shidden 11/18/11  
SIGNATURE DATE

SIGNATURE DATE

SLOPE OR SURCHARGE CASE	GROUNDWATER DEPTH BELOW BOTTOM OF REINFORCED ZONE (SEE NOTE 6 ON SHEET 2) (FT)	SHORING BACKFILL TYPE IN THE REINFORCED ZONE (SEE NOTE 7 ON SHEET 2)	H - WALL HEIGHT (FT)																									
			< 4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	
SLOPE CASE	> 0	CLASS II, TYPE I, CLASS III, CLASS V OR CLASS VI SELECT MATERIAL	6	6	7	8	9	11	12	13	13	14	15	16	17	18	19	20	21	22	23	24	24	25	26	27	27	
SURCHARGE CASE	> 0 TO 7 FOR H < 20' > 0 TO 10 FOR H ≥ 20'	ALL SHORING BACKFILL TYPES	6	7	7	8	8	9	9	10	11	11	12	12	13	14	14	15	16	16	17	18	18	19	20	20	21	
		A-2-4 SOIL	6	6	7	8	8	9	9	10	11	11	12	12	13	14	14	15	15	16	16	17	17	18	19	19	20	
		CLASS II, TYPE I OR CLASS III SELECT MATERIAL	6	6	7	7	8	8	9	10	10	11	11	12	12	13	13	14	14	15	15	16	16	17	17	18	19	
	> 7 FOR H < 20' > 10 FOR H ≥ 20'	CLASS V OR CLASS VI SELECT MATERIAL	6	6	7	7	7	8	8	9	9	10	10	11	11	12	12	13	13	14	14	15	16	16	17	18	18	

**L - MINIMUM REQUIRED REINFORCEMENT LENGTH (FT)**  
(FOR ALL REINFORCEMENT TYPES)

WALL HEIGHT (H) + EMBEDMENT (FT)	NUMBER OF REINFORCEMENT LAYERS*
2.5 - 4	3
4 - 5.5	4
5.5 - 7	5
7 - 8.5	6
8.5 - 10	7
10 - 11.5	8
11.5 - 13	9
13 - 14.5	10
14.5 - 16	11
16 - 17.5	12
17.5 - 19	13
19 - 20.5	14
20.5 - 22	15
22 - 23.5	16
23.5 - 25	17
25 - 26.5	18
26.5 - 28	19
28 - 29.5	20

\*BASED ON VERTICAL REINFORCEMENT SPACING SHOWN ON SHEET 1.

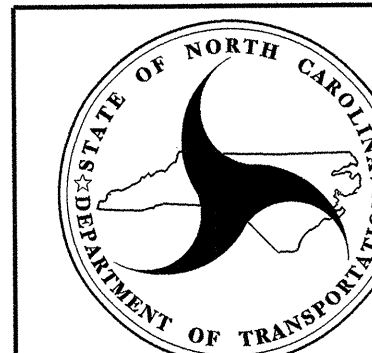
REINFORCEMENT LAYER NUMBER*	SHORING BACKFILL TYPE IN THE REINFORCED ZONE (SEE NOTE 7 ON SHEET 2)				
	SLOPE CASE		SURCHARGE CASE		
	CLASS II, TYPE I OR CLASS III SELECT MATERIAL	CLASS V SELECT MATERIAL	A-2-4 SOIL	CLASS II, TYPE I OR CLASS III SELECT MATERIAL	CLASS V SELECT MATERIAL
1	2400	2400	2400	2400	2400
2	2400	2400	2400	2400	2400
3	2400	2400	2400	2400	2400
4	2400	2400	2500	2400	2400
5	2500	2400	3000	2400	2400
6	3000	2400	3500	2800	2400
7	3500	2700	4000	3200	2600
8	4000	3100	4500	3600	2900
9	4500	3500	5000	4000	3200
10	5000	3900	5500	4400	3500
11	5500	4300	6000	4800	3800
12	6000	4700	6500	5200	4100
13	6500	5100	7000	5600	4400
14	7000	5400	7500	6000	4700
15	7500	5800	8000	6400	5000
16	8000	6200	8500	6800	5300
17	8500	6600	9000	7200	5600
18	9000	7000	9500	7600	5900
19	9500	7400	10000	8000	6200
20	10000	7800	10500	8400	6500

**GEOTEXTILE REINFORCEMENT ULTIMATE TENSILE STRENGTH (LB/FT)**

REINFORCEMENT LAYER NUMBER*	SHORING BACKFILL TYPE IN THE REINFORCED ZONE (SEE NOTE 7 ON SHEET 2)				
	SLOPE CASE		SURCHARGE CASE		
	CLASS II, TYPE I OR CLASS III SELECT MATERIAL	CLASS V OR CLASS VI SELECT MATERIAL	A-2-4 SOIL	CLASS II, TYPE I OR CLASS III SELECT MATERIAL	CLASS V OR CLASS VI SELECT MATERIAL
1	240	200	340	290	240
2	380	310	520	430	350
3	530	420	700	570	460
4	690	550	870	720	570
5	860	690	1050	860	680
6	1030	830	1220	1000	790
7	1200	970	1400	1150	900
8	1370	1110	1580	1290	1010
9	1550	1240	1750	1430	1120
10	1720	1380	1930	1580	1230
11	1890	1520	2100	1720	1340
12	2060	1660	2280	1860	1450
13	2240	1800	2450	2010	1560
14	2410	1940	2630	2150	1670
15	2580	2080	2800	2290	1780
16	2750	2220	2980	2440	1890
17	2930	2360	3160	2580	2000
18	3100	2500	3330	2720	2110
19	3270	2640	3510	2860	2220
20	3440	2780	3690	3000	2330

**GEOGRID REINFORCEMENT SHORT-TERM DESIGN STRENGTH (LB/FT)**  
(SEE NOTE 10 ON SHEET 2.)

**MINIMUM REQUIRED REINFORCEMENT STRENGTH IN MD**  
(SEE NOTE 9 ON SHEET 2.)  
\*SEE PARTIAL ELEVATION ON SHEET 1 FOR REINFORCEMENT LAYER NUMBERING.



**GEOTECHNICAL ENGINEERING UNIT**  
STATE OF NORTH CAROLINA  
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RALEIGH

STANDARD DRAWING NO. 1801.02

STANDARD TEMPORARY WALL  
Sheet 3 of 3

DATE: 1-17-12



STATE OF NORTH CAROLINA  
DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
RALEIGH, N.C.

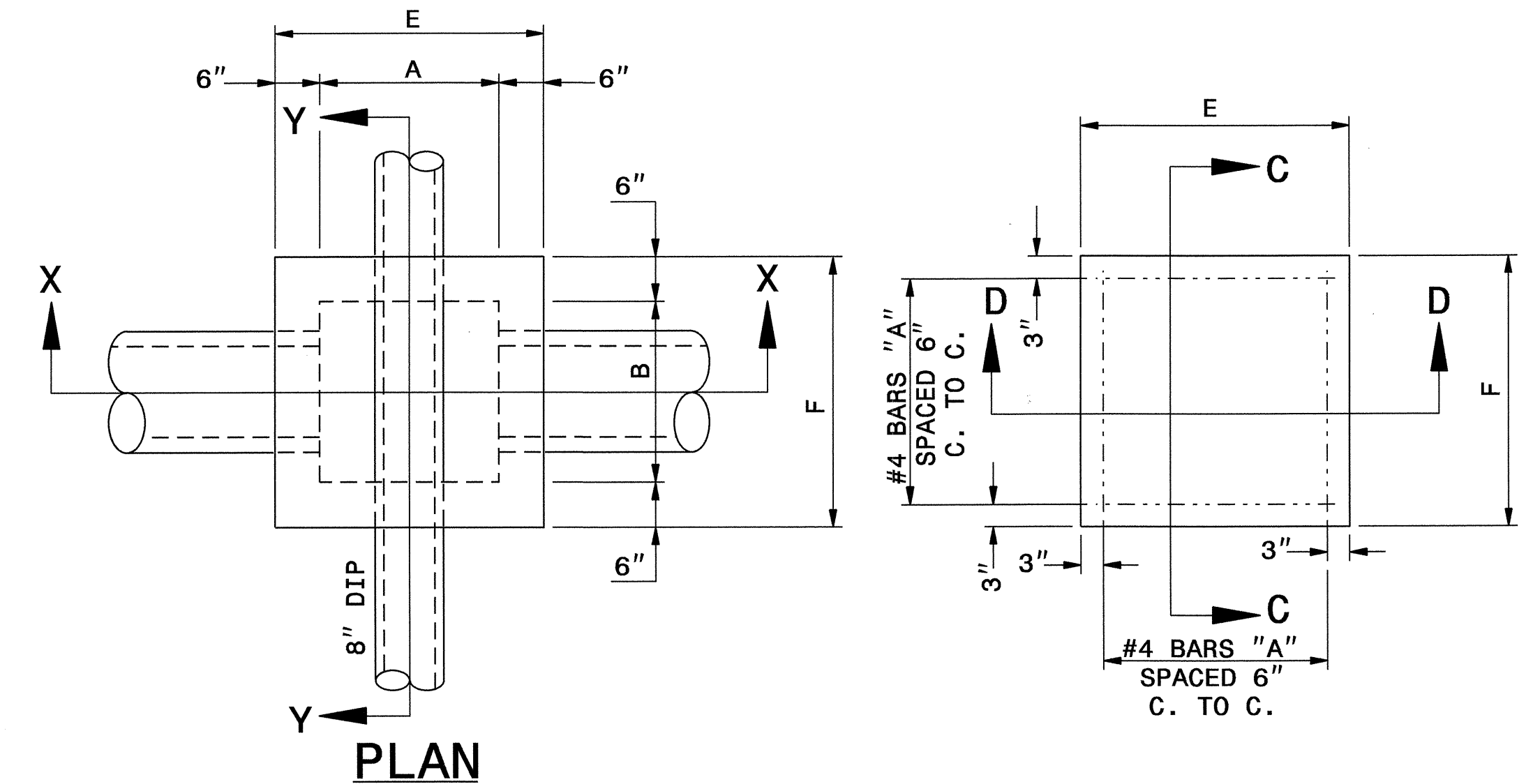
ENGLISH DETAIL DRAWING FOR  
CONCRETE JUNCTION BOX WITH  
8" DIP LINE PASSING THRU  
12" THRU 48" PIPE

SHEET 1 OF 1  
**840D31**

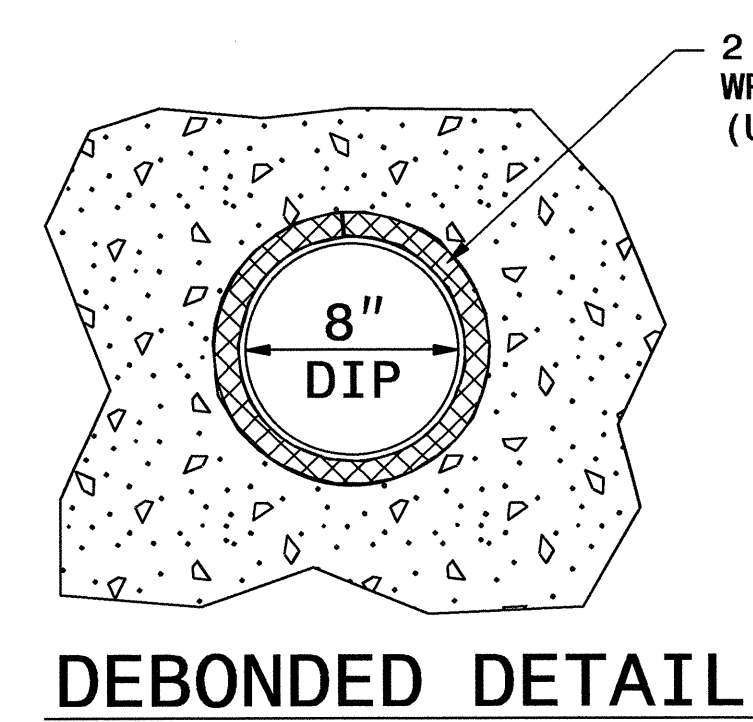
STATE OF NORTH CAROLINA  
DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR  
CONCRETE JUNCTION BOX WITH  
8" DIP LINE PASSING THRU  
12" THRU 48" PIPE

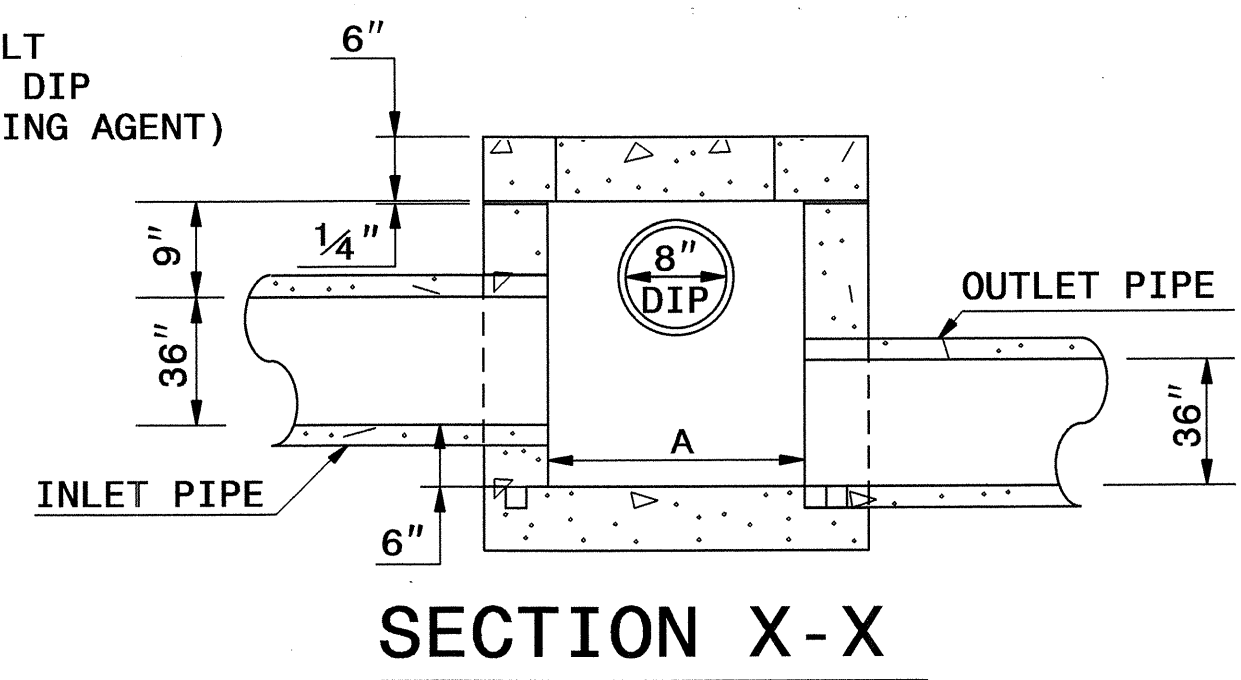
SHEET 1 OF 1  
**840D31**



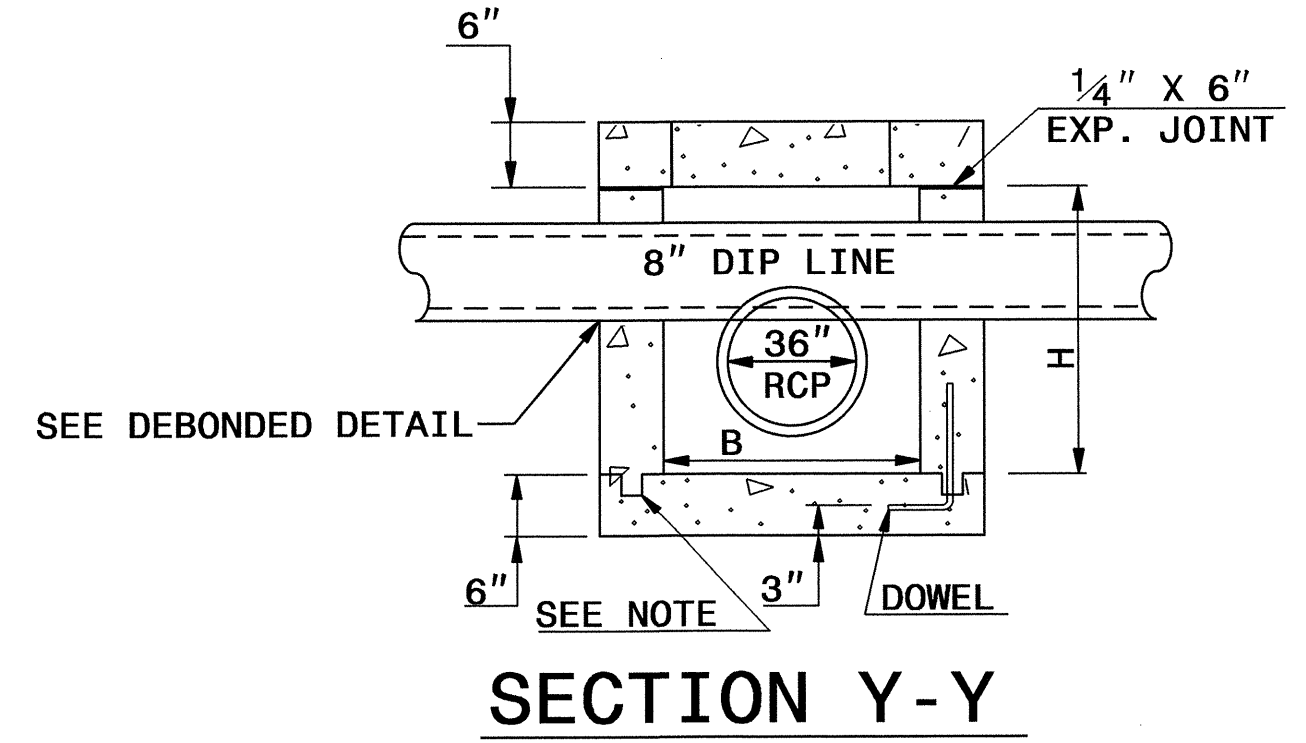
GENERAL NOTES:  
CLASS "B" CONCRETE TO BE USED THROUGHOUT.  
OPTIONAL CONSTRUCTION - MONOLITHIC POUR, 2" KEYWAY, OR #4 BAR DOWELS AT 12" CENTERS AS DIRECTED BY THE ENGINEER.  
FORMS ARE TO BE USED FOR THE CONSTRUCTION OF THE BOTTOM SLAB.  
IF REINFORCED CONCRETE PIPE IS SET IN BASE SLAB OF BOX, ADD TO BASE AS SHOWN ON STANDARD NO. 840.00.  
SEE UTILITIES PLANS FOR THE INVERT ELEVATIONS OF THE DUCTILE IRON SEWER PIPE AND THE REINFORCED CONCRETE STORM DRAINAGE PIPE.  
SEE RDWY. STD. DWG. NO. 840.54 IF MANHOLE RING AND COVER IS REQUIRED.



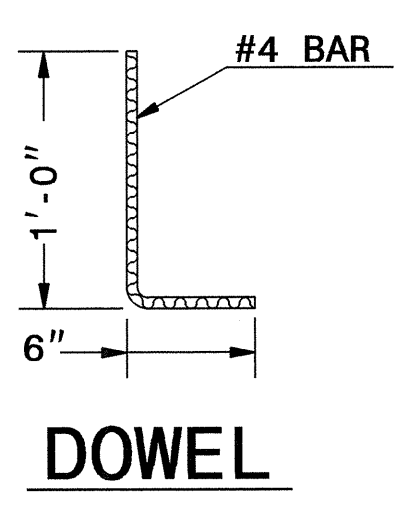
2 PIECES 30 lb FELT WRAPPED AROUND 8" DIP (USED AS A DEBONDING AGENT)



SECTION X-X



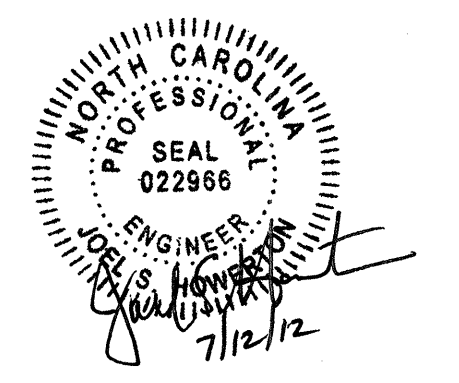
SECTION Y-Y



DOWEL

DIMENSIONS AND QUANTITIES FOR CONCRETE JUNCTION BOXES														
DIMENSIONS OF BOX AND PIPE				REINFORCEMENT BARS "A"		COVER DIMENSIONS		CUBIC YARDS IN BOX			TOTAL QUANTITIES BOX AND COVER		DEDUCTIONS FOR ONE PIPE CU.YDS.	
PIPE	SPAN	WIDTH	HEIGHT	NO.	LENGTH	E	F	COVER	FLOOR	WALL/ FT. OF HT.	LBS. REINF	CU. YDS. MIN. "H"	C.S.	R.C.
12"	2'-0"	2'-0"	2'-3"	12	2'-9"	3'-0"	3'-0"	0.167	0.167	0.185	22	0.750	0.015	0.024
15"	2'-3"	2'-3"	2'-6"	12	3'-0"	3'-3"	3'-3"	0.196	0.196	0.204	24	0.902	0.023	0.036
18"	2'-6"	2'-6"	2'-9"	14	3'-3"	3'-6"	3'-6"	0.227	0.227	0.222	30	1.065	0.033	0.049
24"	3'-0"	3'-0"	3'-3"	16	3'-9"	4'-0"	4'-0"	0.296	0.296	0.259	40	1.434	0.059	0.085
30"	3'-6"	3'-6"	3'-9"	18	4'-3"	4'-6"	4'-6"	0.375	0.375	0.296	51	1.860	0.092	0.127
36"	4'-0"	4'-0"	4'-3"	20	4'-9"	5'-0"	5'-0"	0.463	0.463	0.333	64	2.341	0.132	0.178
42"	4'-6"	4'-6"	4'-9"	22	5'-3"	5'-6"	5'-6"	0.560	0.560	0.370	77	2.878	0.180	0.243
48"	5'-0"	5'-0"	5'-3"	24	5'-9"	6'-0"	6'-0"	0.667	0.667	0.407	92	3.471	0.235	0.317

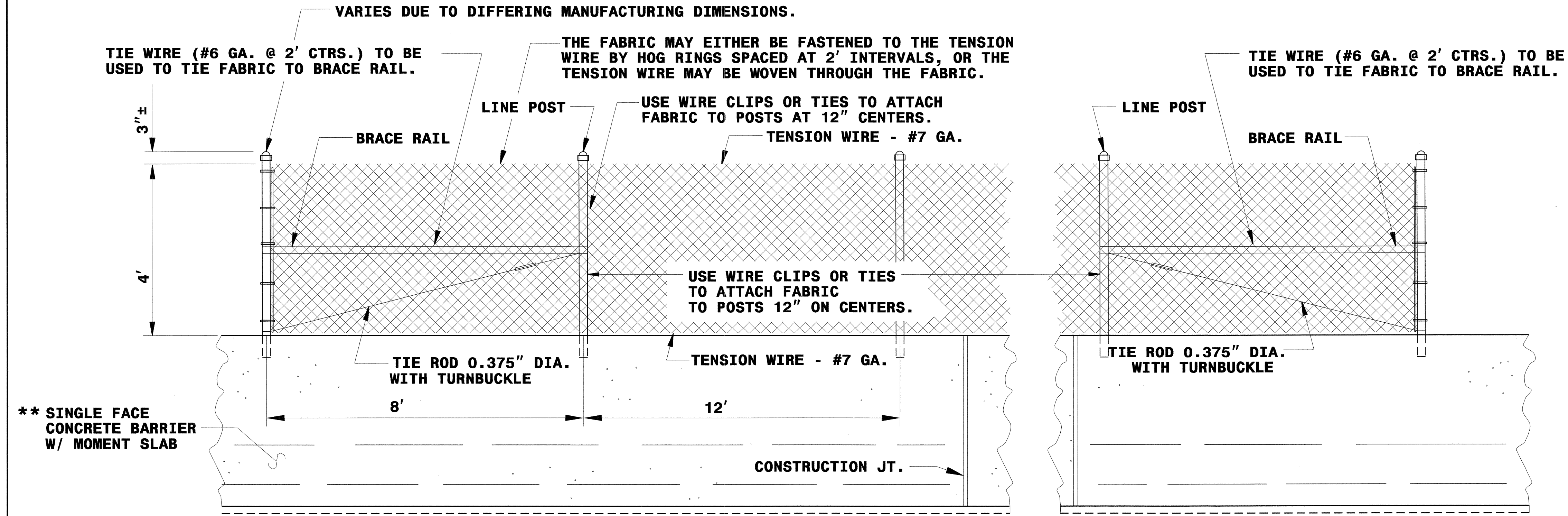
28 FEB 2012 11:44 \\contracts\special\details\metric\conflict\_box.dgn



**CONTRACT STANDARDS AND DEVELOPMENT UNIT**  
Office 919-707-6950 FAX 919-250-4119

**SEE PLATE FOR TITLE**

ORIGINAL BY: E.E. WARD DATE: 3-12-98  
 MODIFIED BY: [Signature] DATE: [Blank]  
 CHECKED BY: [Signature] DATE: 2/20/12  
 FILE SPEC.: \\usr\details\stand\conflict\_box.dgn



### MOUNTED CHAIN LINK FENCE

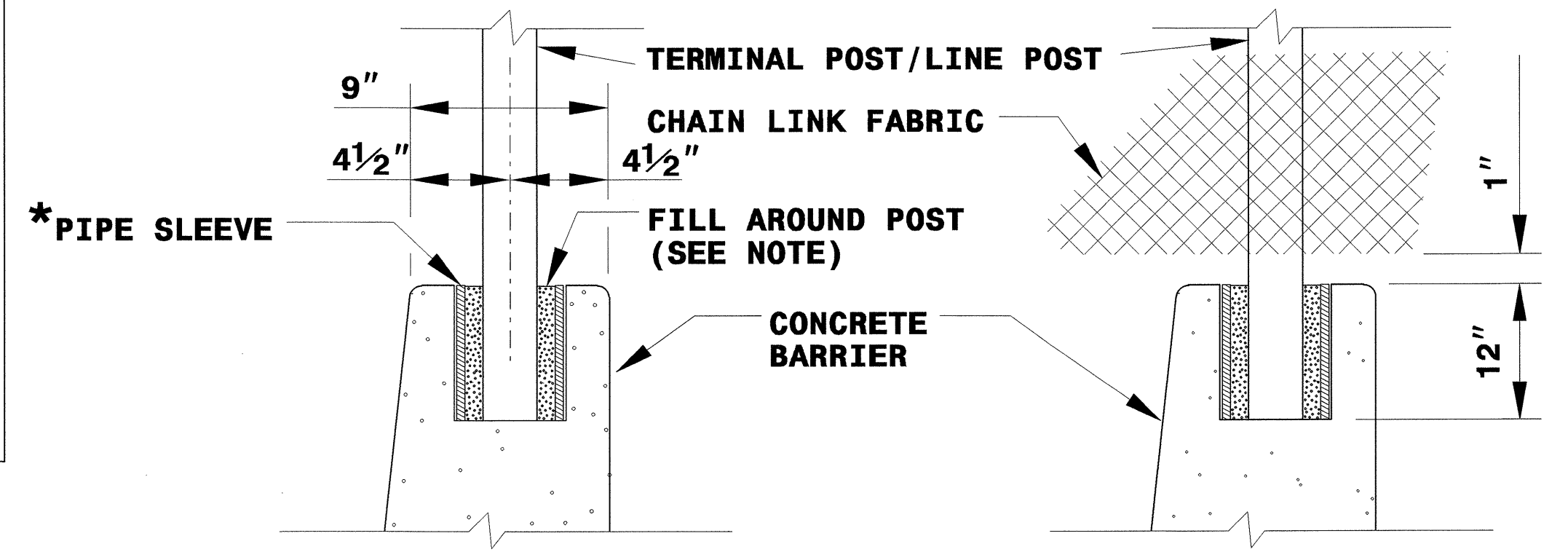
\*\* SINGLE FACE CONCRETE BARRIER W/ MOMENT SLAB

\* INSTALL PIPE SLEEVES IN THE CONCRETE BARRIER WALL WITH COMPONENTS OF GALVANIZED STEEL POST OR ALUMINUM ALLOY POST AS INDICATED ...

GALVANIZED OR ALUMINUM LINE POST (1.90" O.D.): 2.5" Ø x 12" SLEEVE  
GALVANIZED OR ALUMINUM TERMINAL POST (2.375" O.D.): 3" Ø x 12" SLEEVE

NOTE:  
PLACE PIPE SLEEVES TO CORRESPOND WITH LINE POST AND TERMINAL POST AS SHOWN.  
THE MIN. LENGTH OF LINE POST OR TERMINAL POST = 12" (PIPE SLEEVE) + 1" (CL.) + HEIGHT OF FENCE + CAP FOR PIPE POST.  
FILL SPACE BETWEEN POST AND PIPE WITH MATERIAL APPROVED BY ENGINEER.

\*\* SEE STRUCTURE DESIGN PLANS FOR CONCRETE BARRIER DESIGN DIMENSIONS.



### POST EMBEDMENT IN CONCRETE BARRIER

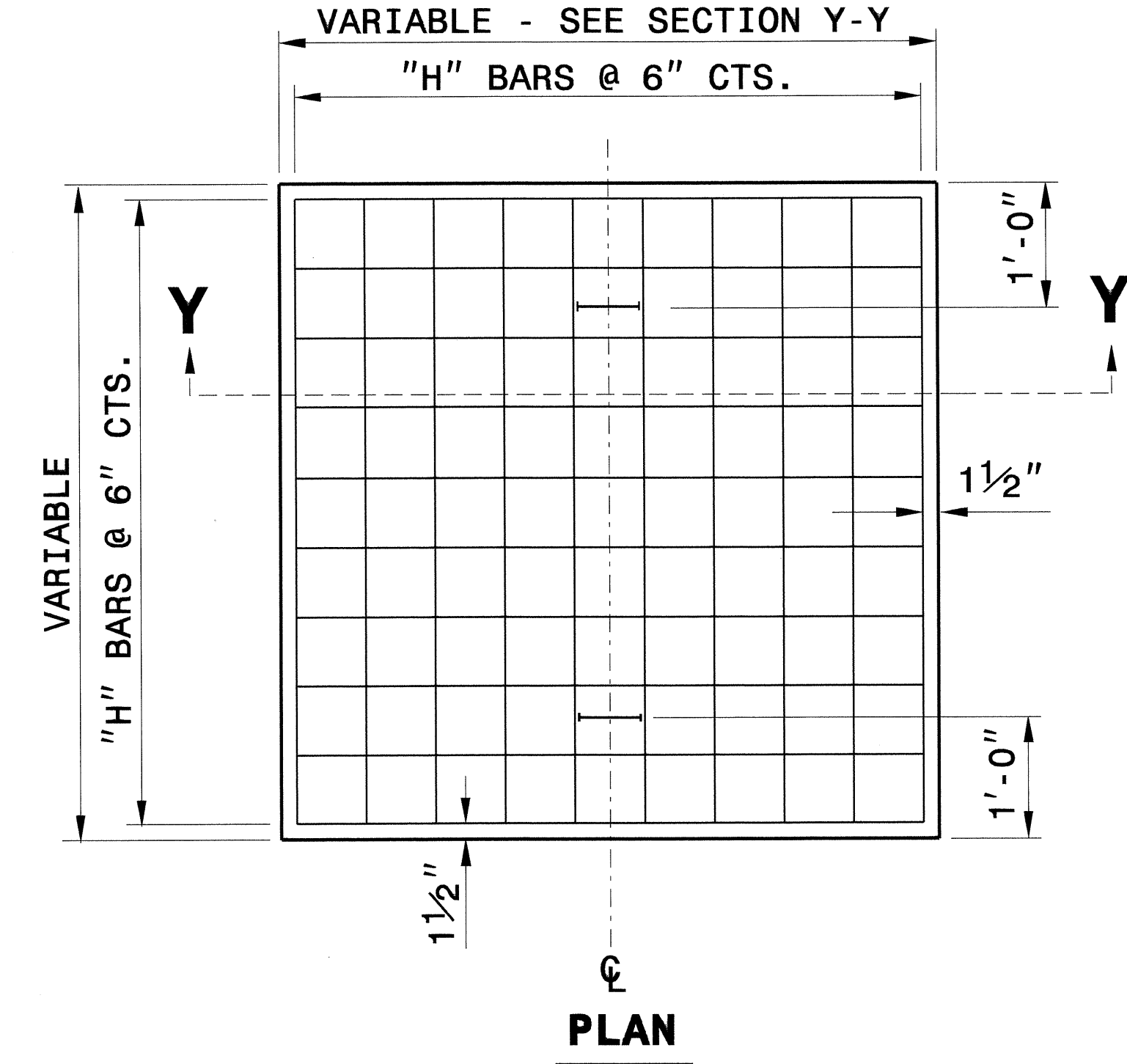
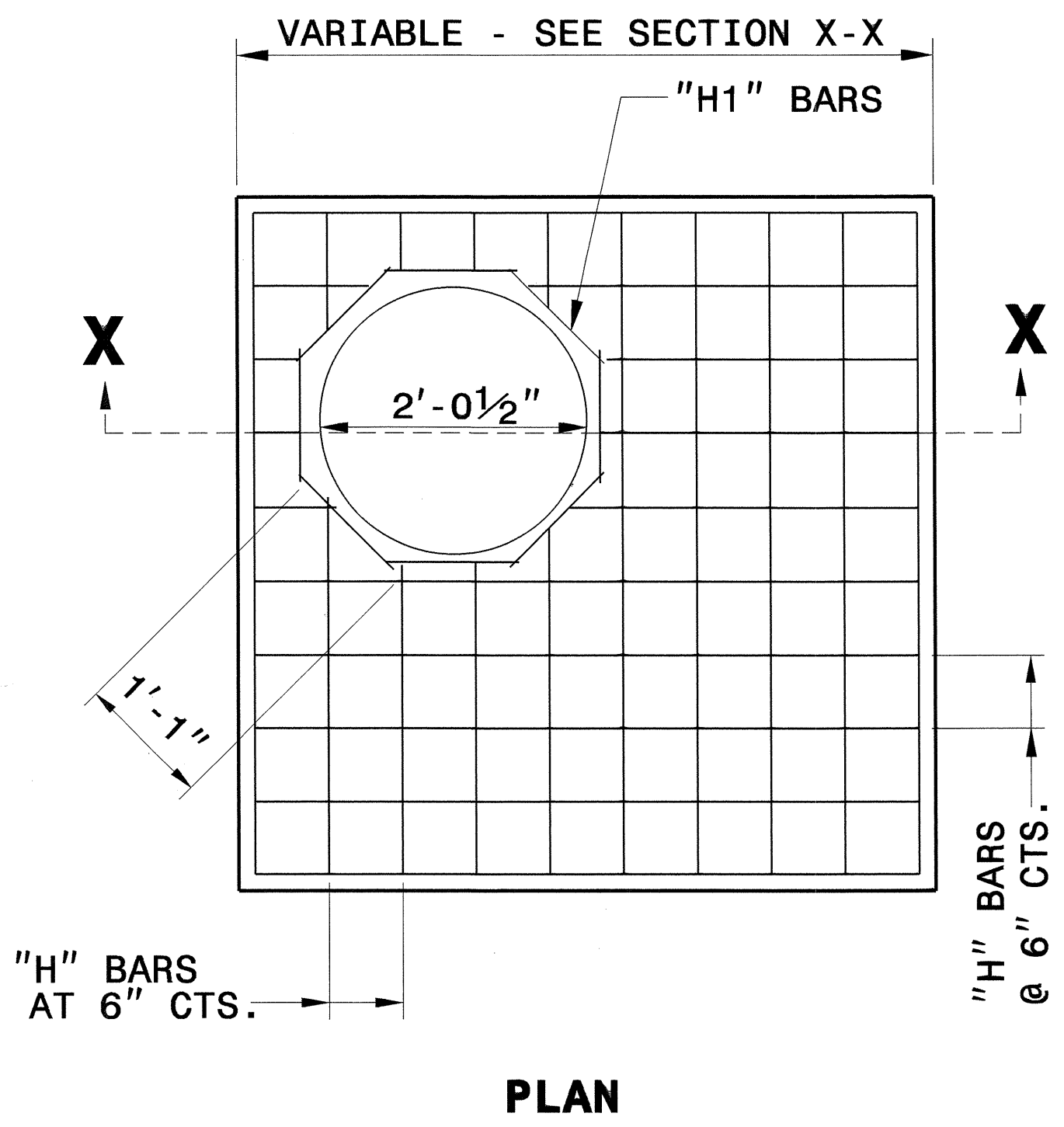
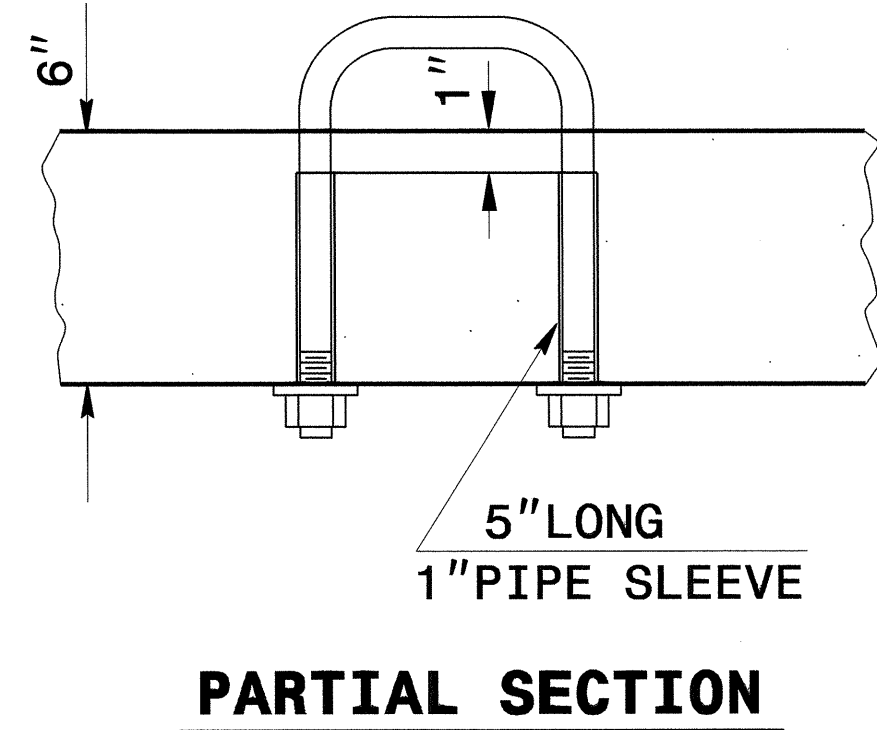
Professional Engineer Seal for North Carolina, No. 022966, signed by J. Howerton on 7/2/12.

CONTRACT STANDARDS & DEVELOPMENT UNIT  
STANDARDS AND SPECIAL DESIGN  
Office 919-707-6950 FAX 919-250-4119

**CHAIN LINK FENCE  
ON CONCRETE BARRIER**

ORIGINAL BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
MODIFIED BY: rnbritt DATE: 06-13-12  
CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
FILE SPEC.: jhowerton/Chain Link Fence on Single Face Barrier.dgn

\$\$\$\$\$\$ PERMANENT \$\$\$\$\$\$  
 \$\$\$\$\$\$ DIMENSIONS \$\$\$\$\$\$  
 \$\$\$\$\$\$ TOLERANCES \$\$\$\$\$\$  
 \$\$\$\$\$\$ UNLESS OTHERWISE NOTED \$\$\$\$\$\$

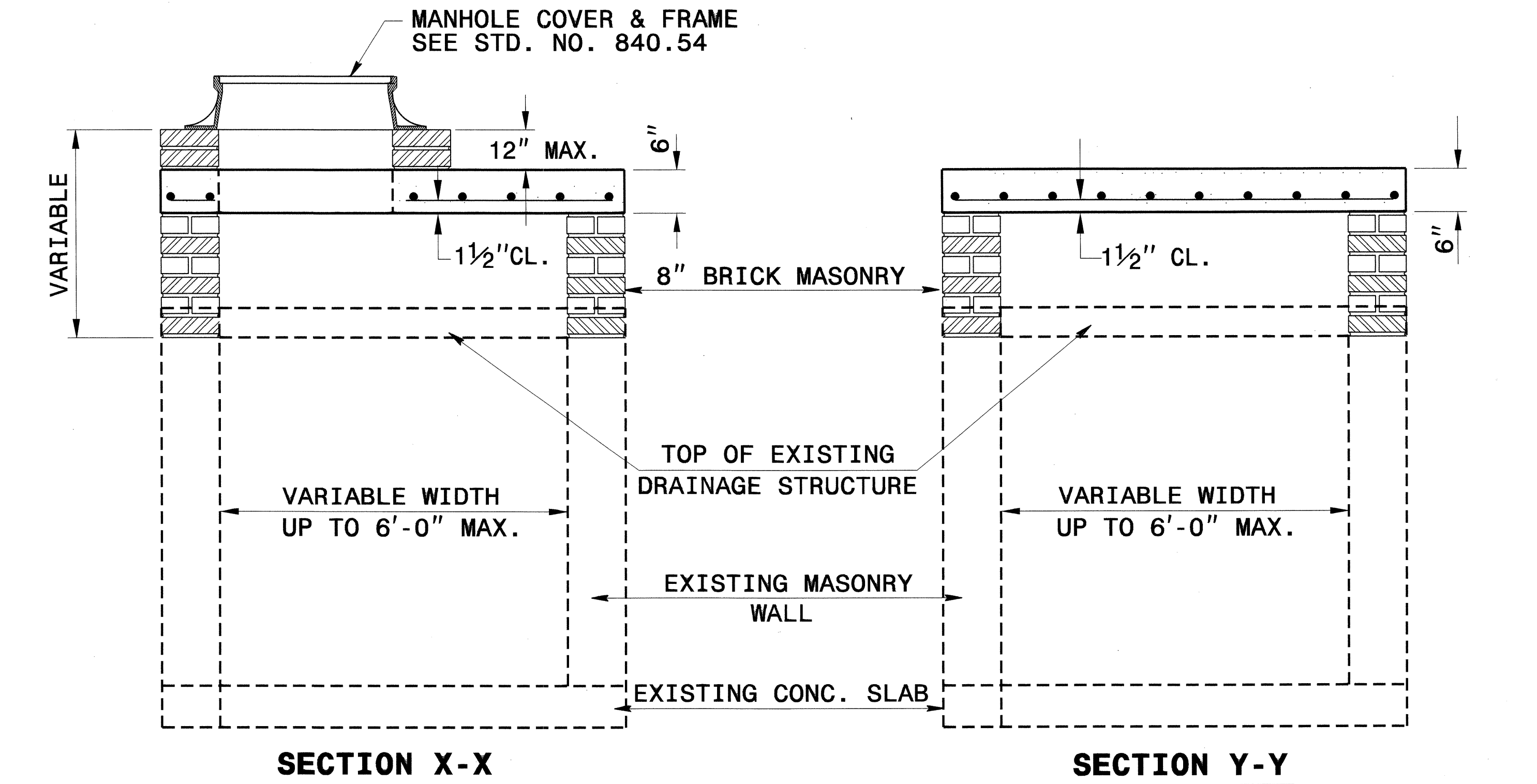
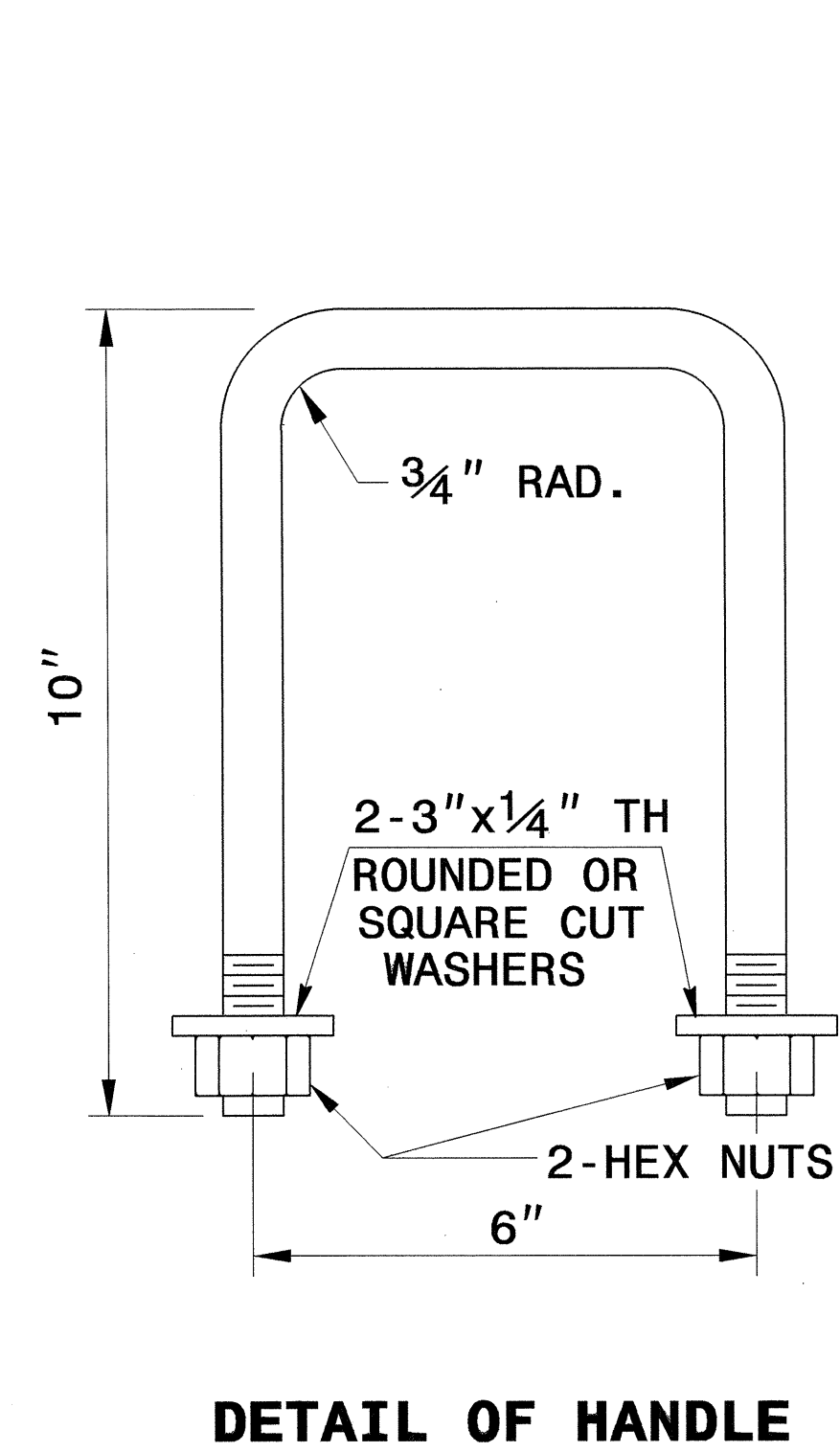


**GENERAL NOTES:**

CONSTRUCT IN ACCORDANCE WITH SECTION 859 OF THE STANDARD SPECIFICATIONS.

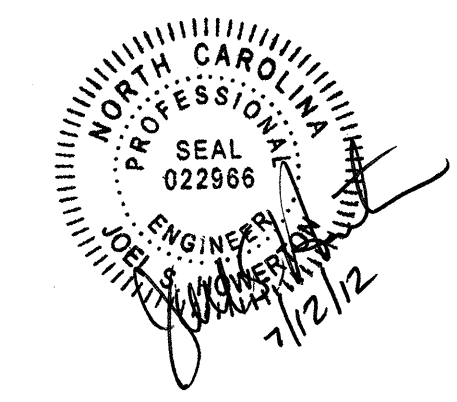
THE DIMENSIONS FOR THE EXISTING BOXES ARE APPROXIMATE AND MAY VARY SLIGHTLY.

DETAIL INTENDED FOR NON-TRAFFIC BEARING DRAINAGE STRUCTURES.



BILL OF MATERIALS				
REINFORCING STEEL				
CODE	SIZE	QTY.	LENGTH	REINF. STEEL LBS.
H	#4	20	4'-6"	60.12
H1	#4	8	1'-1"	5.79
TOTAL				65.91 *
MASONRY				CU YDS
TOP SLAB CONCRETE CLASS "B"				0.43 *
BRICK MASONRY PER FT HT (MIN)				0.41

**\* NOTE:**  
 QUANTITIES BASED ON 3'-6" X 3'-6" DRAINAGE STRUCTURE. ADJUST QUANTITIES FOR LARGER STRUCTURES AND MANHOLE CONSTRUCTION.



**CONTRACT STANDARDS & DEVELOPMENT UNIT**  
 STANDARDS AND SPECIAL DESIGN  
 Office 919-250-4128 FAX 919-250-4119

**DETAIL TO CONVERT EXISTING DROP INLET OR CATCH BASIN TO JUNCTION BOX (MANHOLE OPTIONAL)**

ORIGINAL BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
 MODIFIED BY: rnbritt DATE: 05/10/06  
 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
 FILE SPEC.: details/nbritt/english/hydro/boxconversion

5/14/99  
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 \$\$\$USERNAME\$\$\$









RD248617

COMPUTED BY: EM DATE:
CHECKED BY: DDL DATE:

PROJECT NO. SHEET NO.
U-3324 3-C

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

Note: Invert Elevations indicated are for Bid Purposes only and shall not be used for project construction stakeout. See "Standard Specifications For Roads and Structures, Section 300-5".

LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 48 INCHES & UNDER)

Table with columns for Station, Structure No., Top Elevation, Invert Elevation, Slope Critical, Drainage Pipe, C.S. Pipe, R.C. Pipe Class III, R.C. Pipe Class IV, Endwalls, Quantities for Drainage Structures, Frame, Grates, and Hood Standard, Concrete Transitional Section, and Abbreviations. Includes a SHEET TOTALS row at the bottom.



RD248617

COMPUTED BY: EM DATE: 6/6/2012  
CHECKED BY: DL DATE: 6/7/2012

PROJECT NO. U-3324 SHEET NO. 3-D

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS

Note: Invert Elevations indicated are for Bid Purposes only and shall not be used for project construction stakeout.  
See "Standard Specifications For Roads and Structures, Section 300-5".

LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 48 INCHES & UNDER)

Table with columns for Station, Structure No., Top Elevation, Invert Elevation, Slope Critical, Drainage Pipe (RCP, CSP, CAAP, HDPE, or PVC), C.S. Pipe, R.C. Pipe Class III, R.C. Pipe Class IV, Endwalls, Quantities for Drainage Structures, Frame, Grates, and Hood Standard, Concrete Transitional Section, Conc. Collars, Pipe Removal, and Abbreviations. Includes SHEET TOTALS and PROJECT TOTALS rows.



**SUMMARY OF EARTHWORK**  
 IN CUBIC YARDS

LOCATION	UNCLASSIFIED EXCAVATION	UNDERCUT	EMBT + %	BORROW	WASTE
-L- 12+30LT to -L- 42+00LT	7781		1052		6729
-Y1- 10+79.49 to -Y1- 14+41.95	573		145		428
-Y2- 10+35.31 to -Y2- 18+10.53	2734		1444		1290
-Y4- 13+00 to -Y4- 14+00	40		300	260	0
<b>WASTE IN LIEU OF BORROW</b>				-260	
Subtotal	11128		2941	0	8187
-Y6- 15+50 to -Y6- 20+47.80	338		2106	1768	
-Y6- 22+15.30 to -Y6- 29+20	200		5093	4893	
<b>WASTE IN LIEU OF BORROW</b>					
Subtotal	538		7199	6661	0
-Y6- LPA 14+00 to -Y6- LPA 16+00	1020		256		764
-Y6RMPA- 14+00 to -Y6RMPA- 21+43.07			33852	33852	
L 42+00 LT to L 59+50 LT	7219		1282		5937
<b>WASTE IN LIEU OF BORROW</b>				-6702	-6702
Subtotal	8239		35389	27150	0
MEDIAN GUARDRAIL -L- 27+50 - 60+20			726	726	
Total	19905		46255	34537	8187
Loss due to Clearing & Grubbing	-850			850	
SHOULDER MATERIAL			2118		
<b>Project Total</b>	19055		48373	37505	8187
Est. 5% to Replace Top Soil on Borrow Pit				1875	
<b>Grand Total</b>	19015			39380	
<b>Say</b>	19500			39500	
Shallow Undercut		1000			
Estimated Undercut		2500			

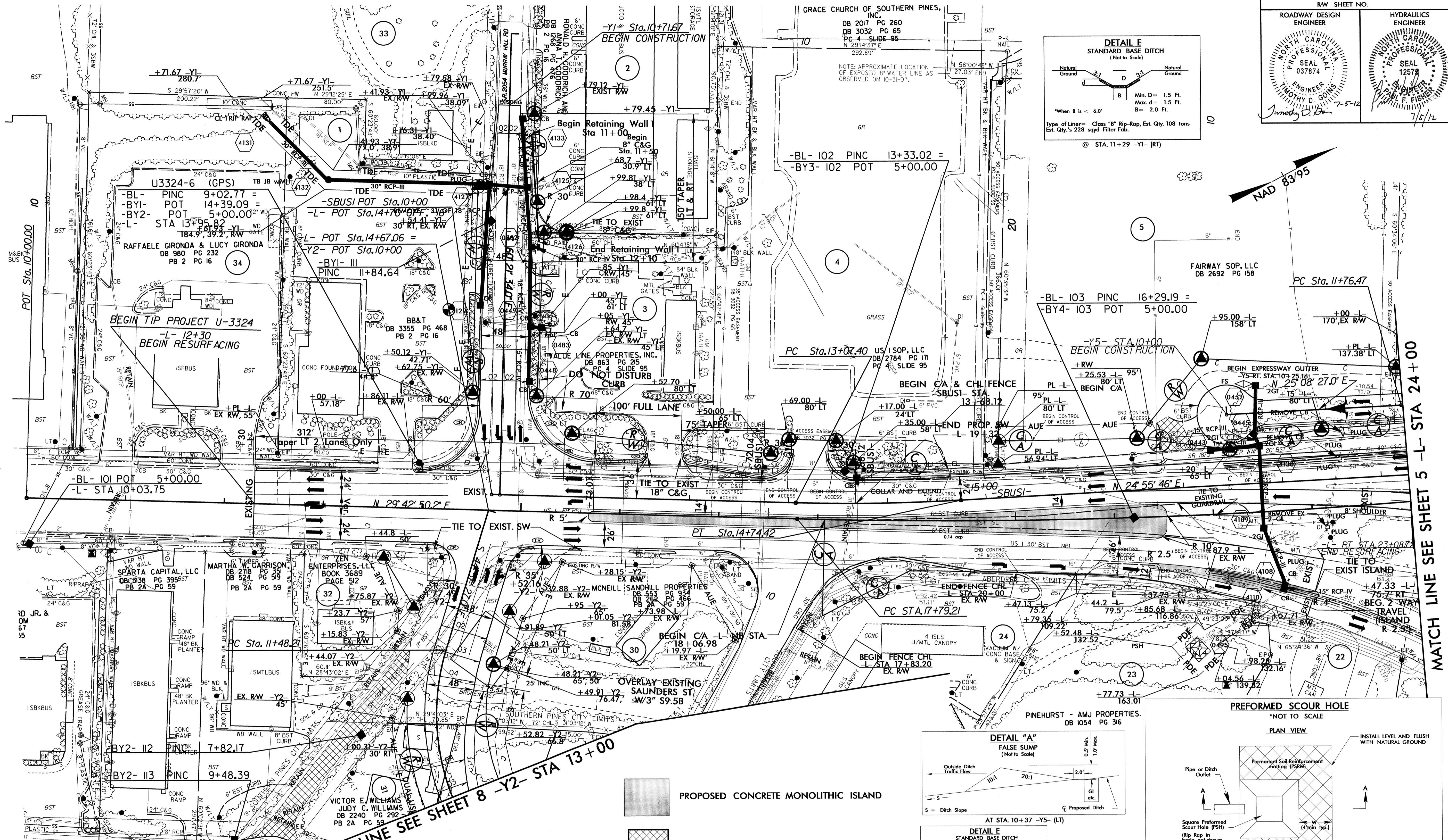
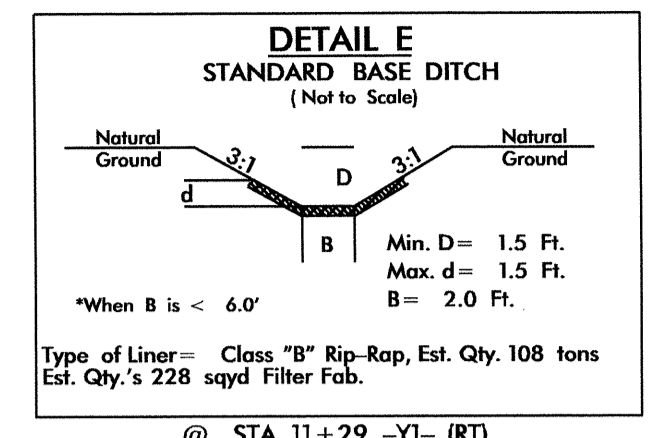
**PAVEMENT REMOVAL SUMMARY**

SURVEY LINE	STATION	STATION	LOCATION LV/RVCL	YD <sup>2</sup>
-Y2-	11+46	12+96	RT	469.00
-Y2-	14+62	15+04	LT	98.33
-Y5-	26+94	32+99	CL	519.39
-Y6-	18+25	18+99	LT	694.10
-L-	21+50	21+89	LT	102.77
-L-	48+50	51+11	RT	634.46
-L-	49+18	51+18	LT	292.25
-L-	51+15	51+41	LT	136.05
-L-	52+93	53+25	LT	134.42
-L-	55+18	55+67	LT	31.29
-L- (Temp)	40+22	44+60	RT	194.66
-L- (Temp)	45+80	47+80	RT	88.88
-L- (Temp)	44+00	44+68	LT	30.22
-L- (Temp)	45+81	49+75	LT	175.11
TOTAL:				3599.74
SAY:				3600

Earthwork quantities are calculated by the Roadway Design Unit. These earthwork quantities are based in part on subsurface data provided by the Geotechnical Engineering Unit.

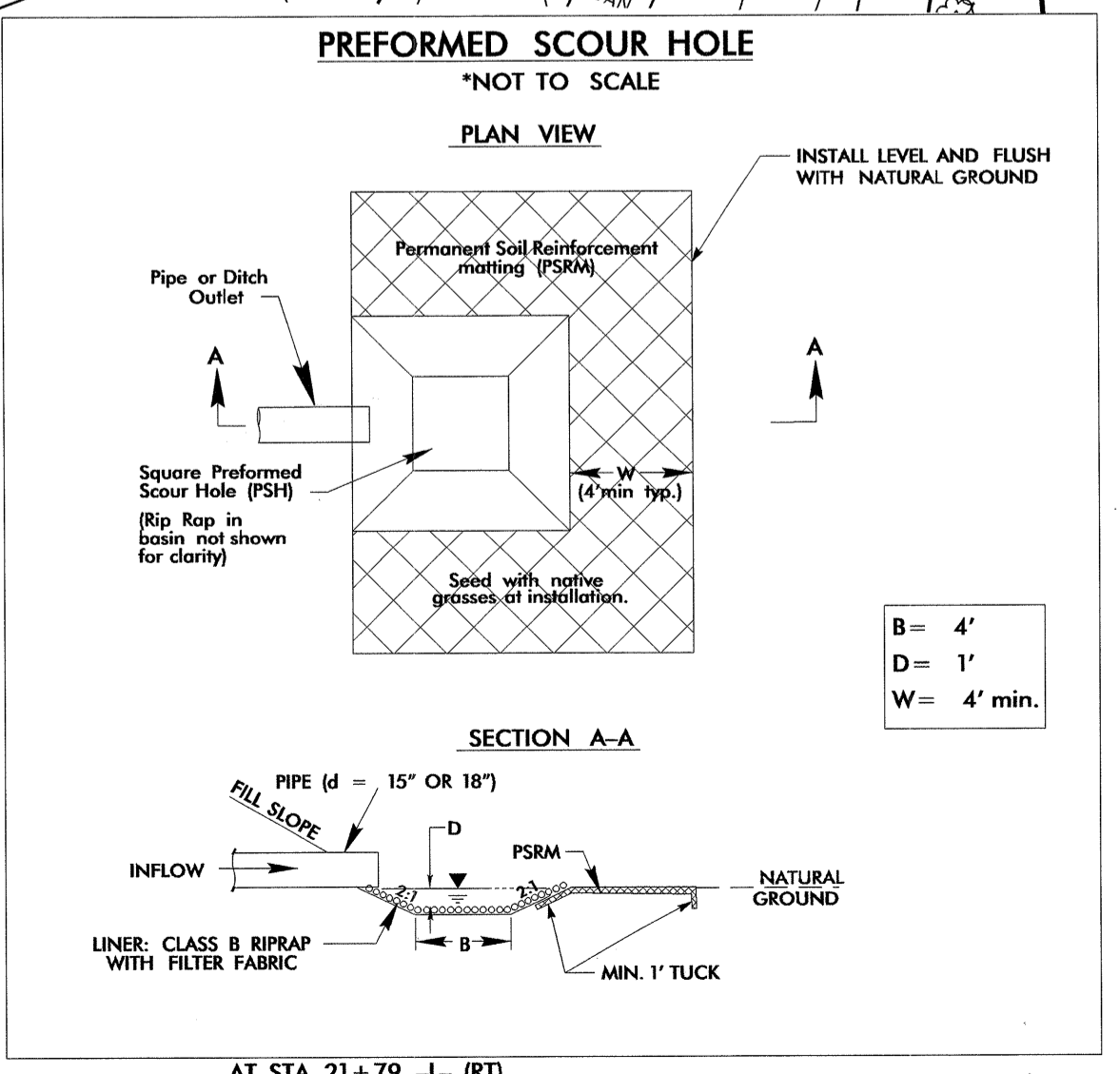
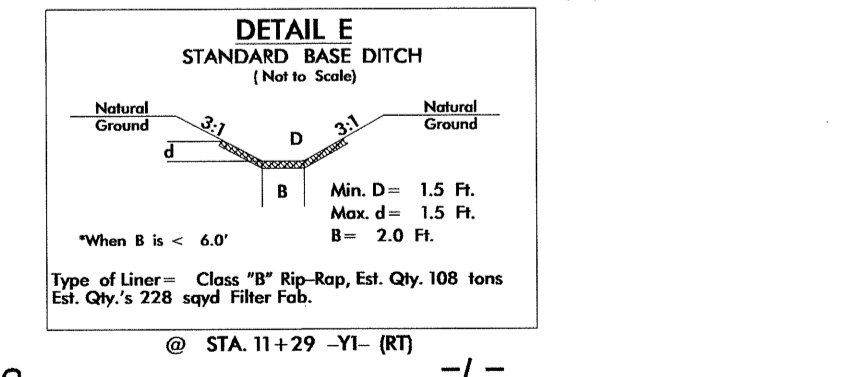
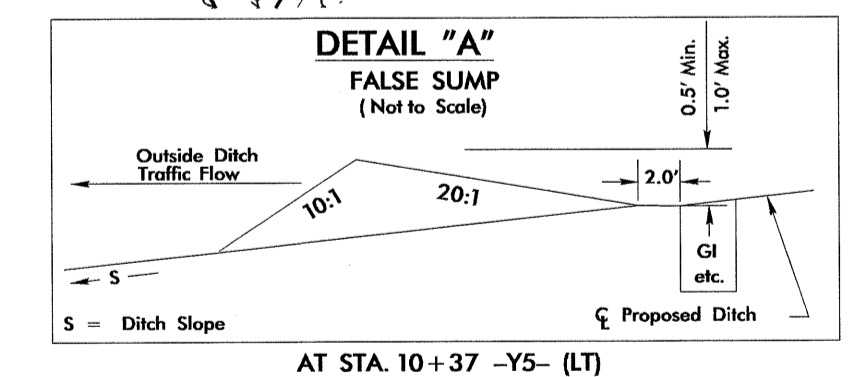
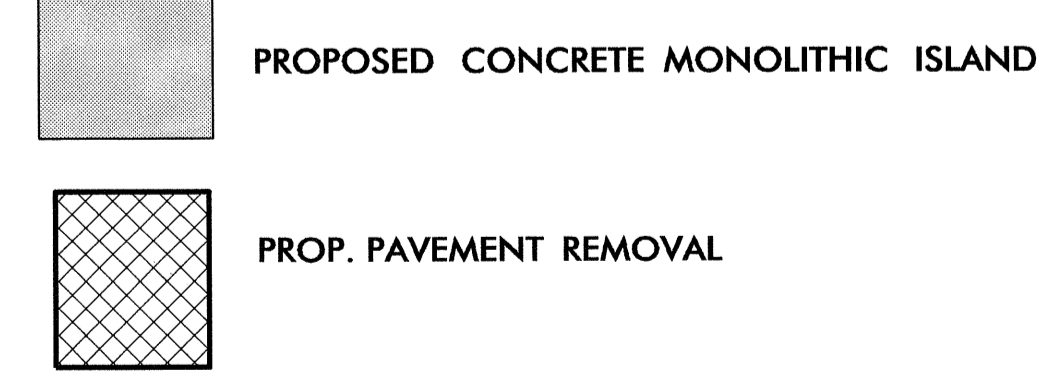
Approximate quantities only. Unclassified excavation, fine grading, clearing and grubbing, and removal of existing pavement will be paid for at the lump sum price for "Grading".





REVISIONS

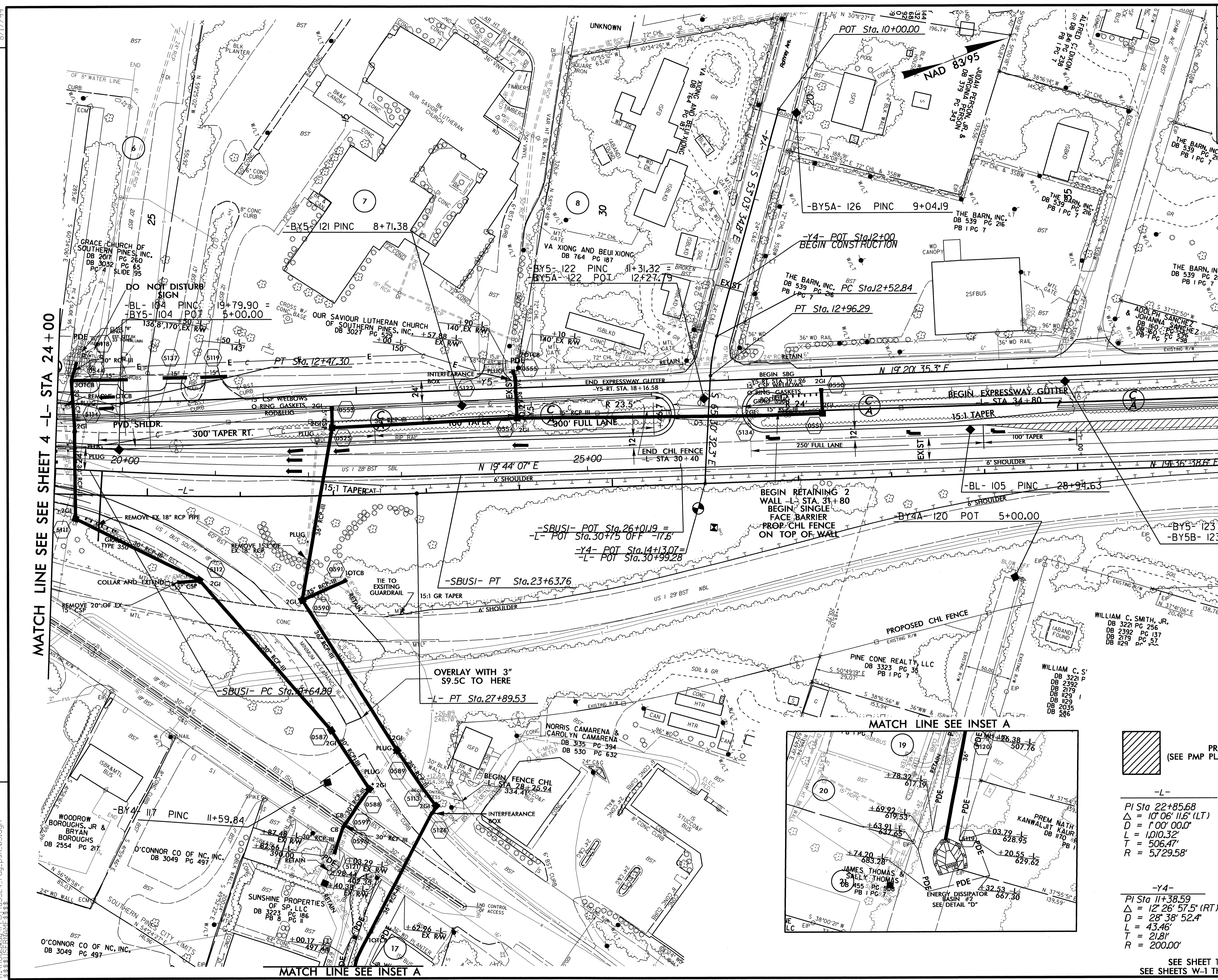
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 03 JUL 2002 15:42 u3324-rdy.psh\_04.dgn  
 03 JUL 2002 15:42 u3324-rdy.psh\_04.dgn



MURRAY HILL RD			
4000		7000	
US 1	800	3200	US 1
	1400	5600	
	27600	2900	30400
	48900	4700	5400
		6200	10300
		SAUNDERS ST. (RELOCATED)	
		2030 ADT	

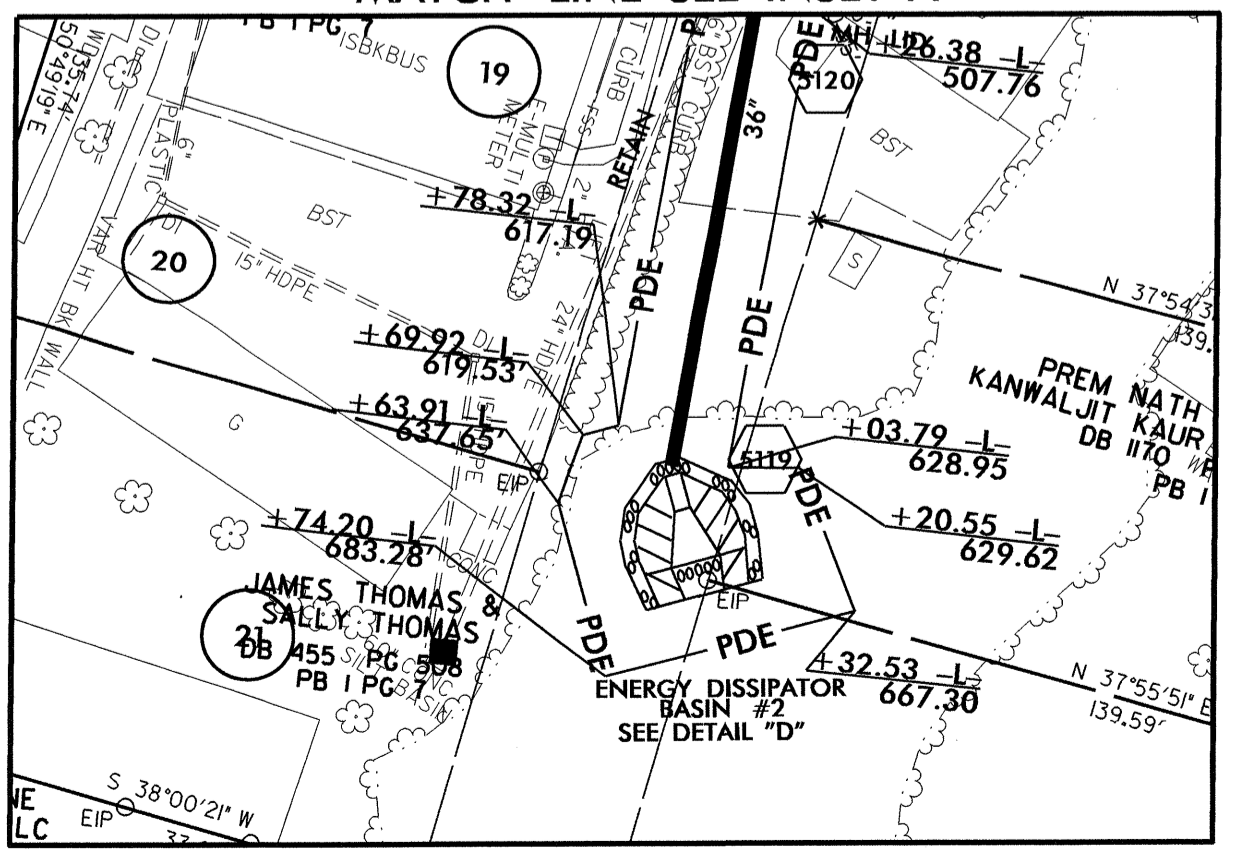
-Y5-	-Y2-	-L-
PI Sta 12+11.92	PI Sta 12+37.15	PI Sta 22+85.68
$\Delta = 5' 47'' 51.7''$ (LT)	$\Delta = 43' 08'' 06.0''$ (LT)	$\Delta = 10' 06'' 11.6''$ (LT)
D = 8' 11' 06.4"	D = 25' 27' 53.2"	D = 1' 00' 00.0"
L = 70.83'	L = 169.39'	L = 1,010.32'
T = 35.45'	T = 88.94'	T = 506.47'
R = 700.00'	R = 225.00'	R = 5,729.58'
SE = SEE PLANS	SE = SEE PLANS	SE = EXIST

AT STA. 21+79 -L- (RT)  
 SEE SHEETS 9 & 10 FOR -Y2- AND -Y5- PROFILES  
 SEE SHEET W-1 THRU W-9 FOR RETAINING WALL PLANS



MATCH LINE SEE SHEET 4 -L- STA 24+00

MATCH LINE SEE SHEET 6 -L- STA 38+00

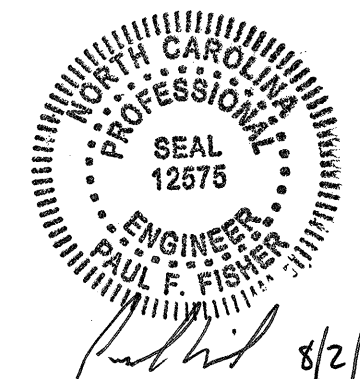
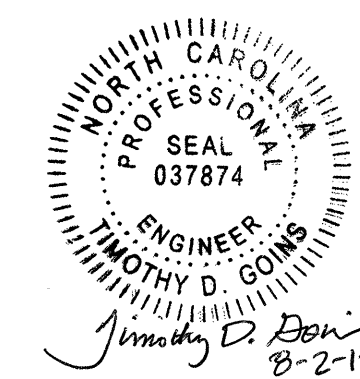


PROP. PAINT STRIPING  
(SEE PMP PLANS FOR EXACT LOCATIONS)

-L-	-Y4-	-Y5-
$PI\ Sta\ 22+85.68$ $\Delta = 10'06"11.6" (LT)$ $D = 1'00'00.0"$ $L = 1,010.32'$ $T = 506.47'$ $R = 5,729.58'$	$PI\ Sta\ 11+38.59$ $\Delta = 12'26'57.5" (RT)$ $D = 28'38'52.4"$ $L = 43.46'$ $T = 21.81'$ $R = 200.00'$	$PI\ Sta\ 12+11.92$ $\Delta = 5'47'51.7" (LT)$ $D = 8'11'06.4"$ $L = 70.83'$ $T = 35.45'$ $R = 700.00'$

SEE SHEET 10 FOR -Y4- AND -Y5- PROFILES  
SEE SHEETS W-1 THRU W-9 FOR RETAINING WALL PLANS

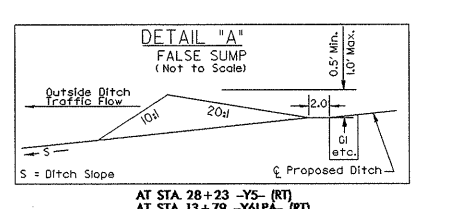
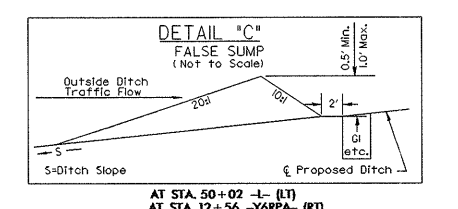
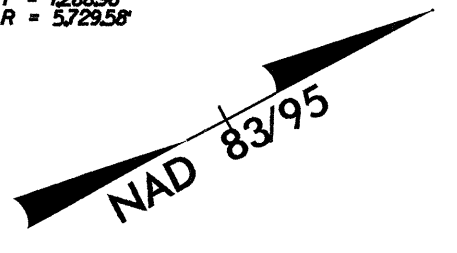
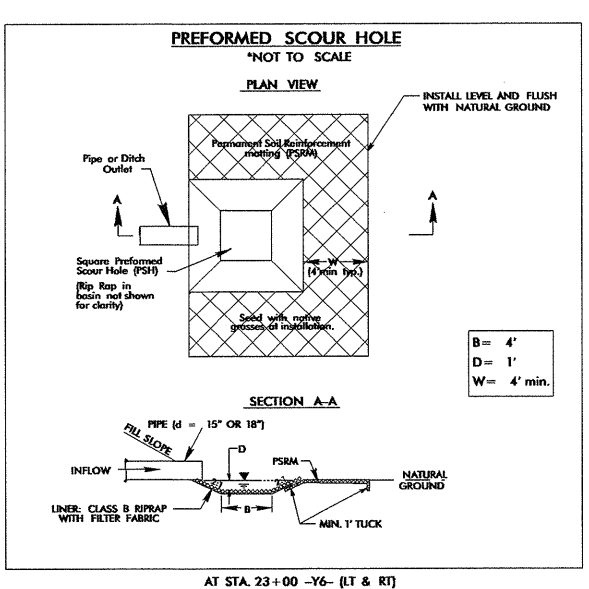
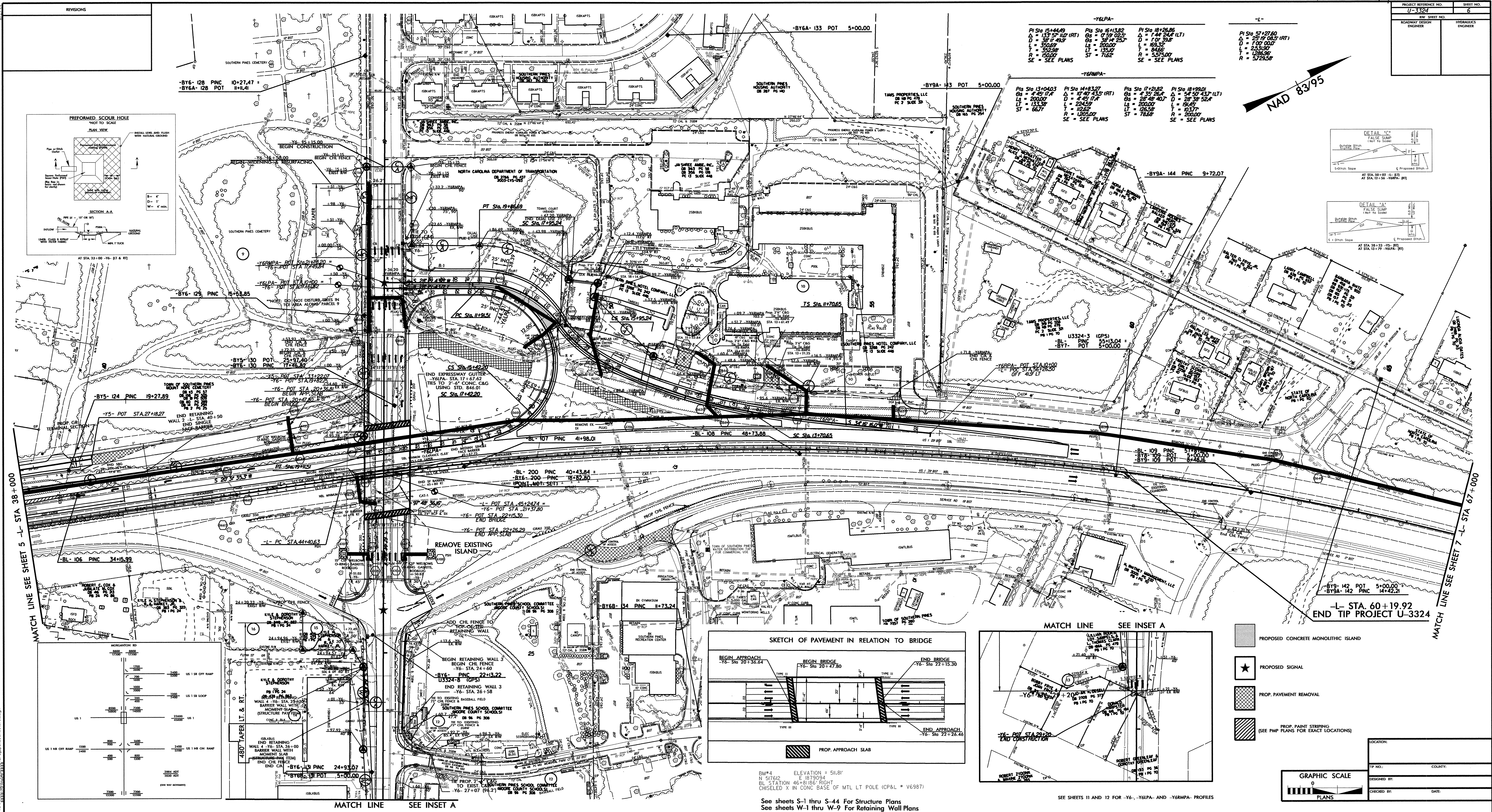
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8/17/99



8-2-12

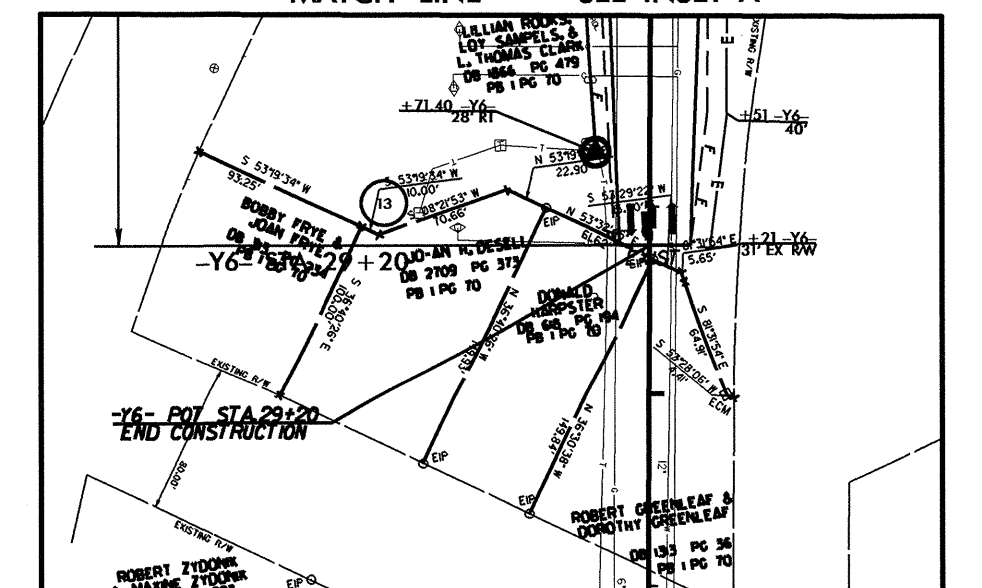
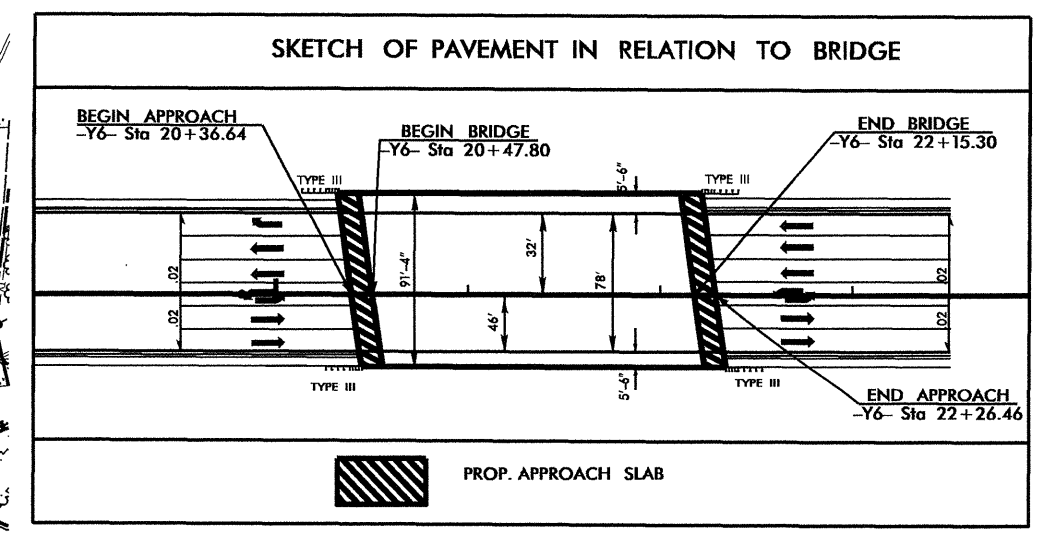
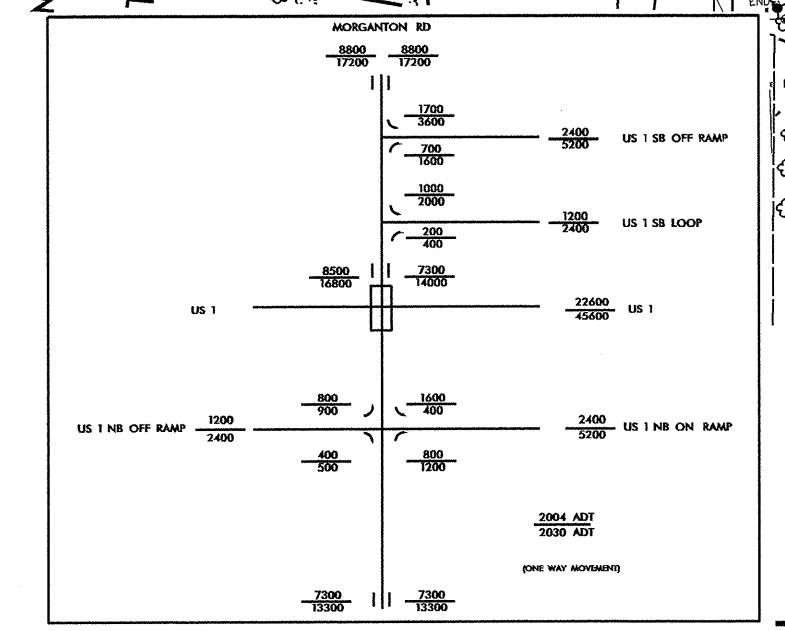
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PROJECT REFERENCE NO.	SHEET NO.
U-3324	6
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

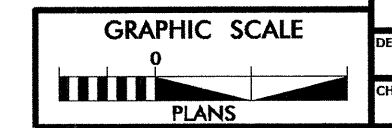


MATCH LINE SEE SHEET 5 -L- STA 38+00

MATCH LINE SEE SHEET 7 -L- STA 67+00



- PROPOSED CONCRETE MONOLITHIC ISLAND
- PROPOSED SIGNAL
- PROP. PAVEMENT REMOVAL
- PROP. PAINT STRIPINGS (SEE PWP PLANS FOR EXACT LOCATIONS)

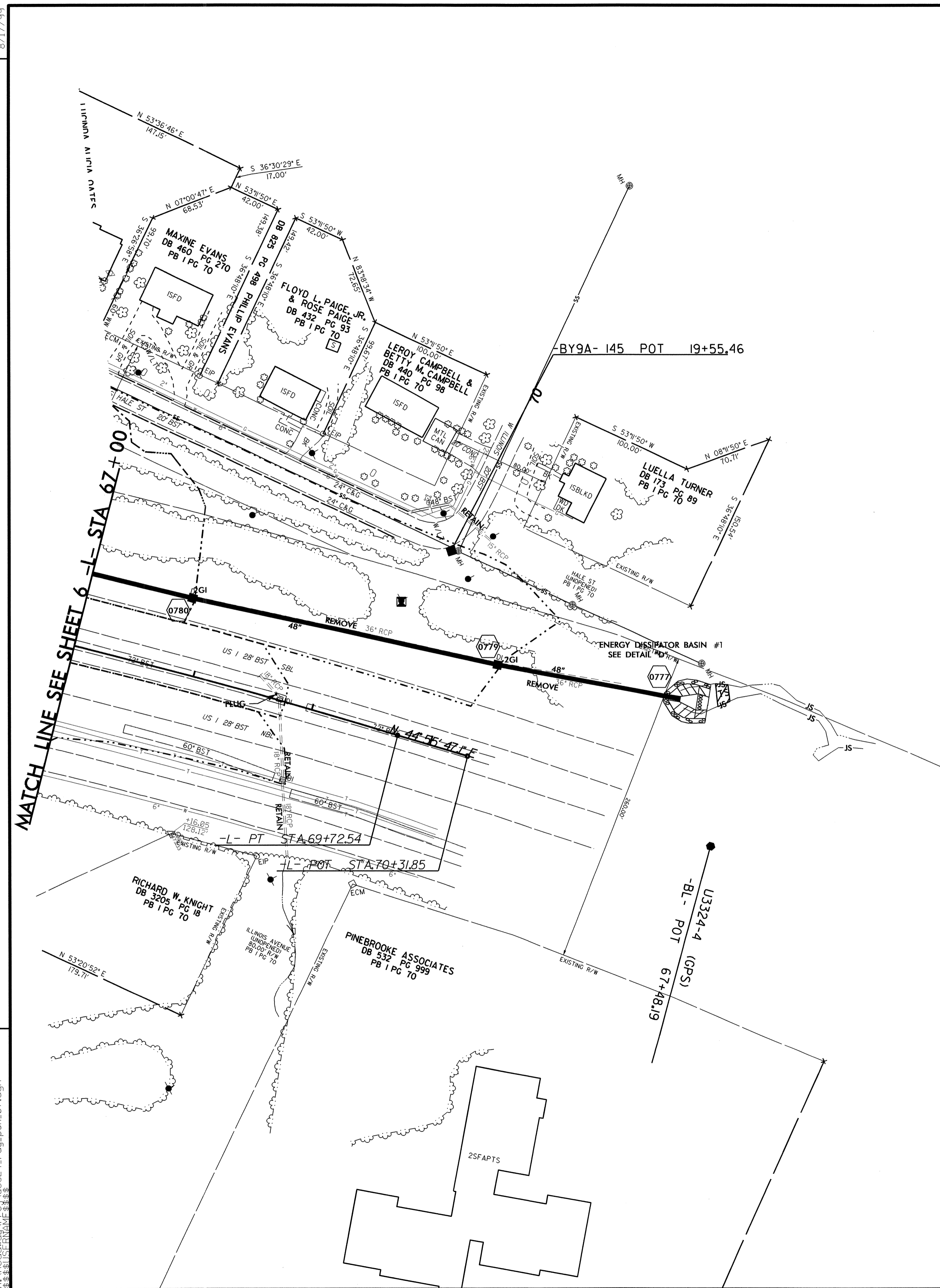
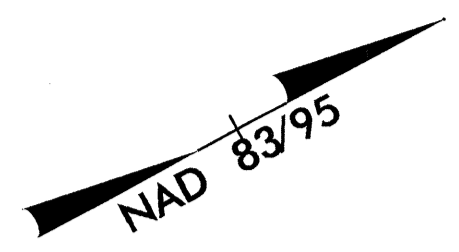


LOCATION:	
TIP NO.:	COUNTY:
DESIGNED BY:	
CHECKED BY:	DATE:

BM#4 ELEVATION = 51.87'  
 N 51762 E 187804  
 BL STATION 46+81.86 RIGHT  
 CHECKED IN CONC. BASE OF MTL LT POLE (CP&L = V6987)  
 -Y6- 27+07 (R-21) ON PG 308 (S&L 14.0)

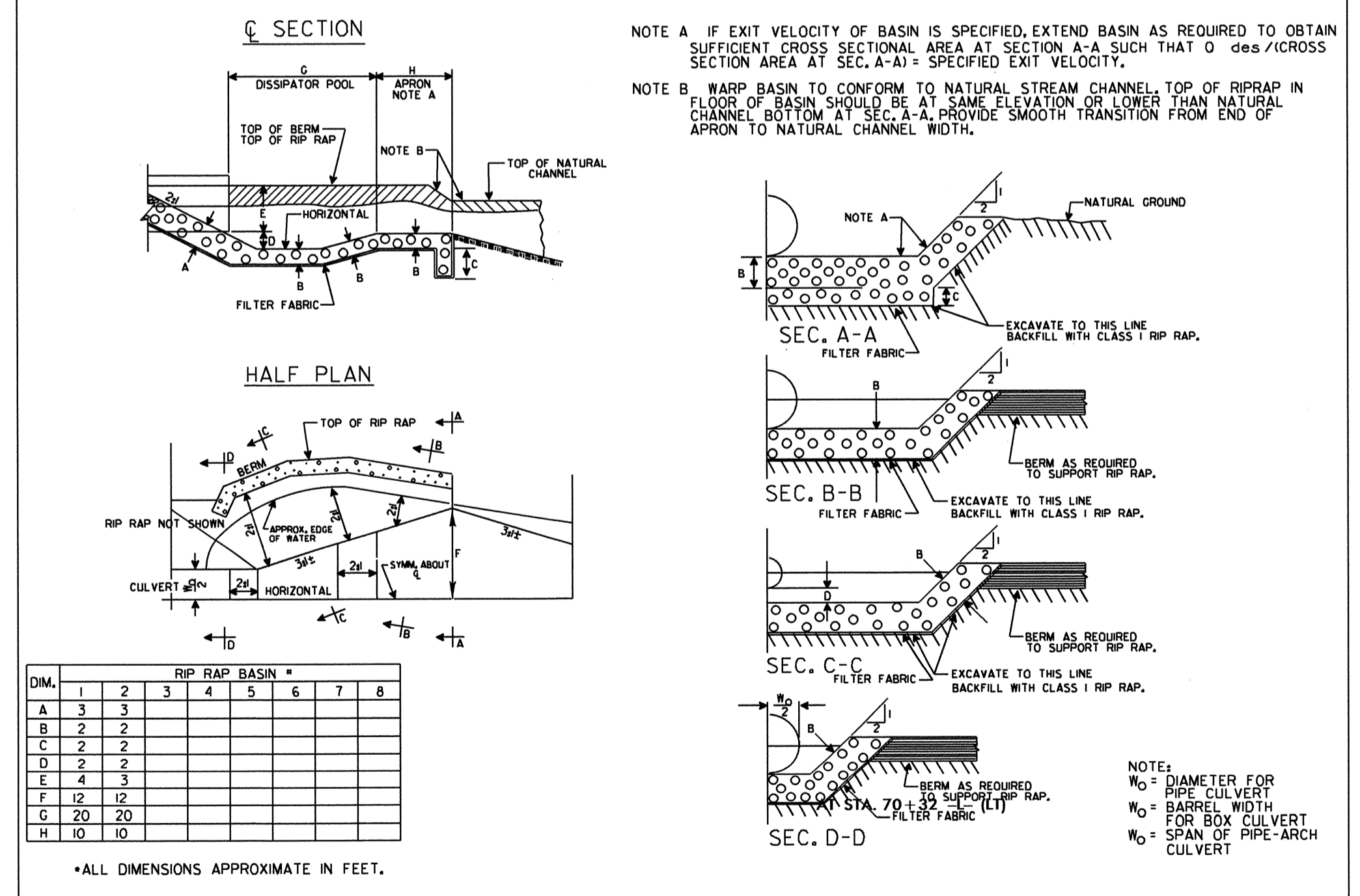
See sheets S-1 thru S-44 For Structure Plans  
 See sheets W-1 thru W-9 For Retaining Wall Plans

SEE SHEETS 11 AND 12 FOR -Y6-, -Y6LPA- AND -Y6RMPA- PROFILES

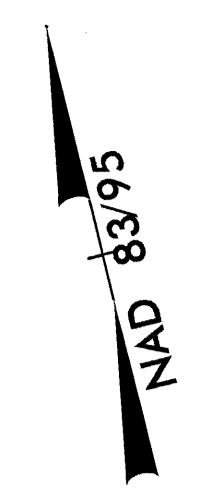


REVISIONS

**DETAIL "D"**  
RIP-RAPPED ENERGY DISSIPATOR BASIN

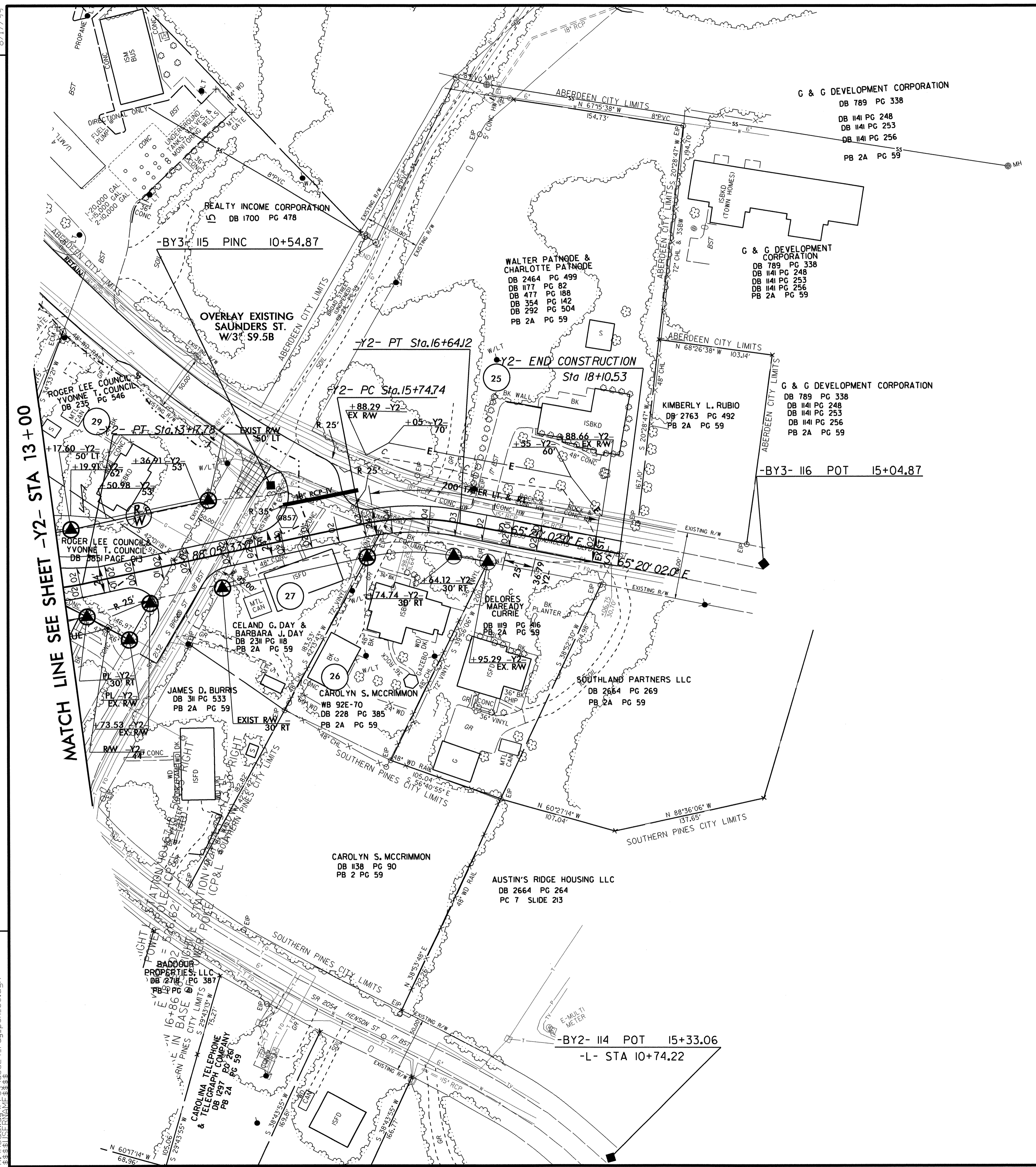






-Y2-

PI Sta 12+37.15 Δ = 43' 08" 06.0" (LT) D = 25' 27" 53.2" L = 169.39' T = 88.94' R = 225.00' SE = SEE PLANS	PI Sta 16+20.03 Δ = 22' 45" 31.0" (RT) D = 25' 27" 53.2" L = 89.37' T = 45.28' R = 225.00' SE = SEE PLANS
--	---



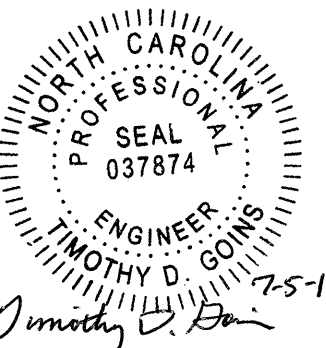
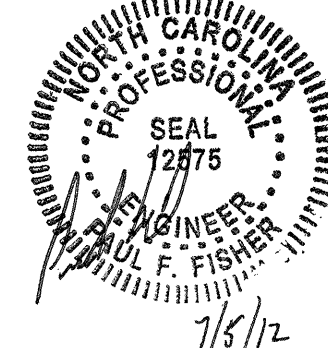
MATCH LINE SEE SHEET -Y2- STA 13+00

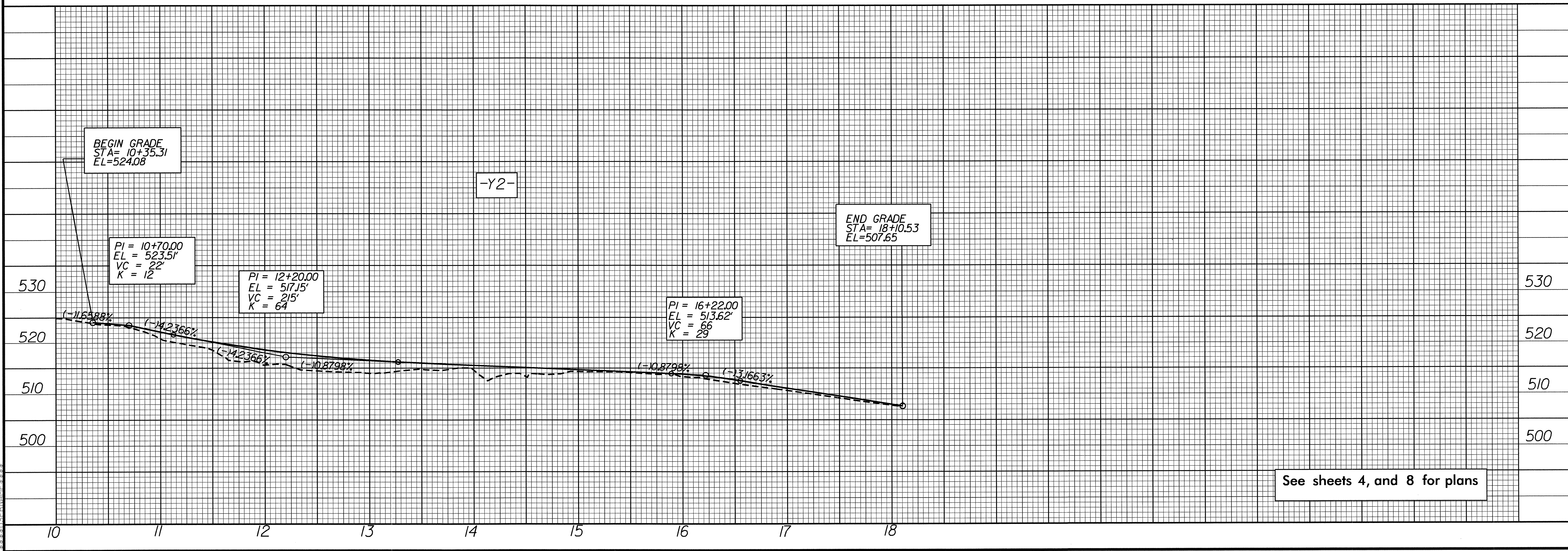
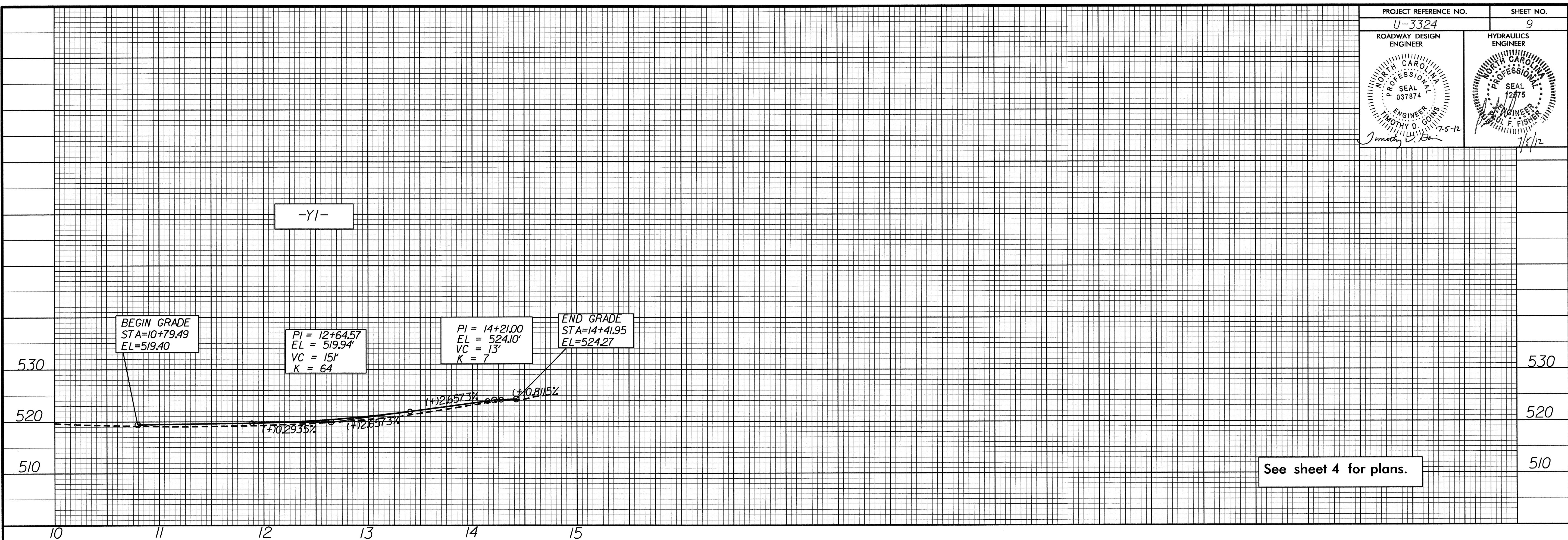
REVISIONS

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8/17/99  
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SEE SHEET 9 FOR -Y2- PROFILE

5/28/99

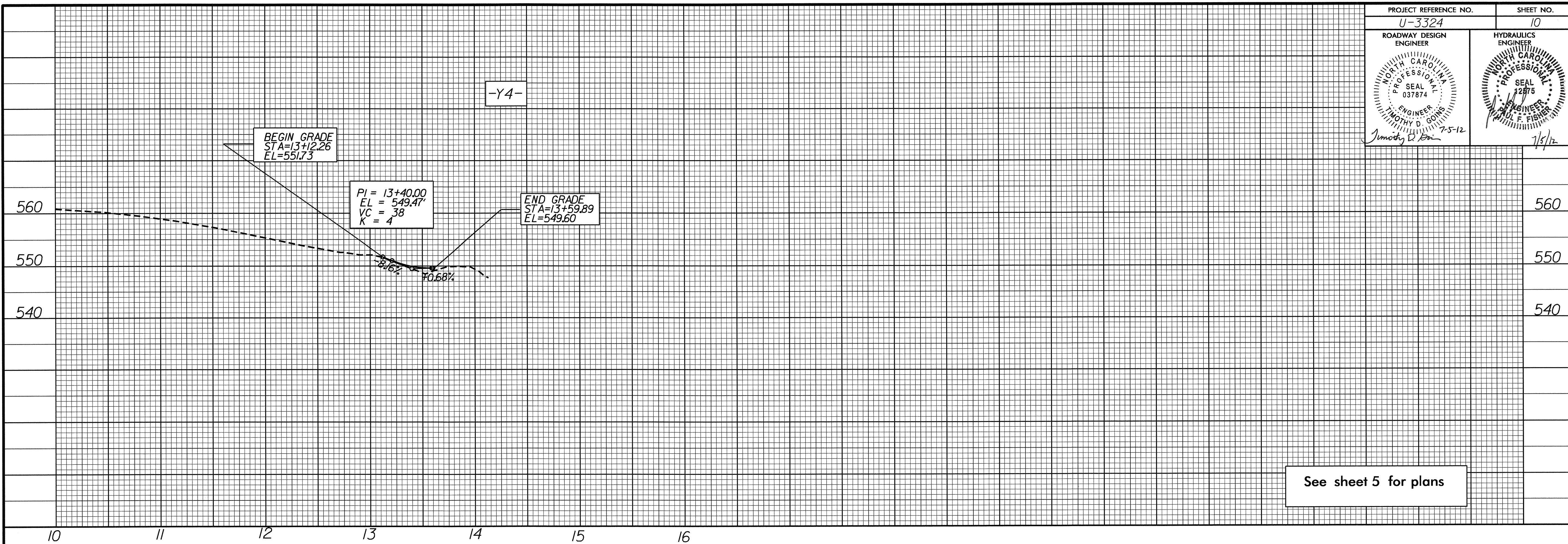
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ROADWAY DESIGN ENGINEER MOTHEY D. GOING	HYDRAULICS ENGINEER L. FISHER
	



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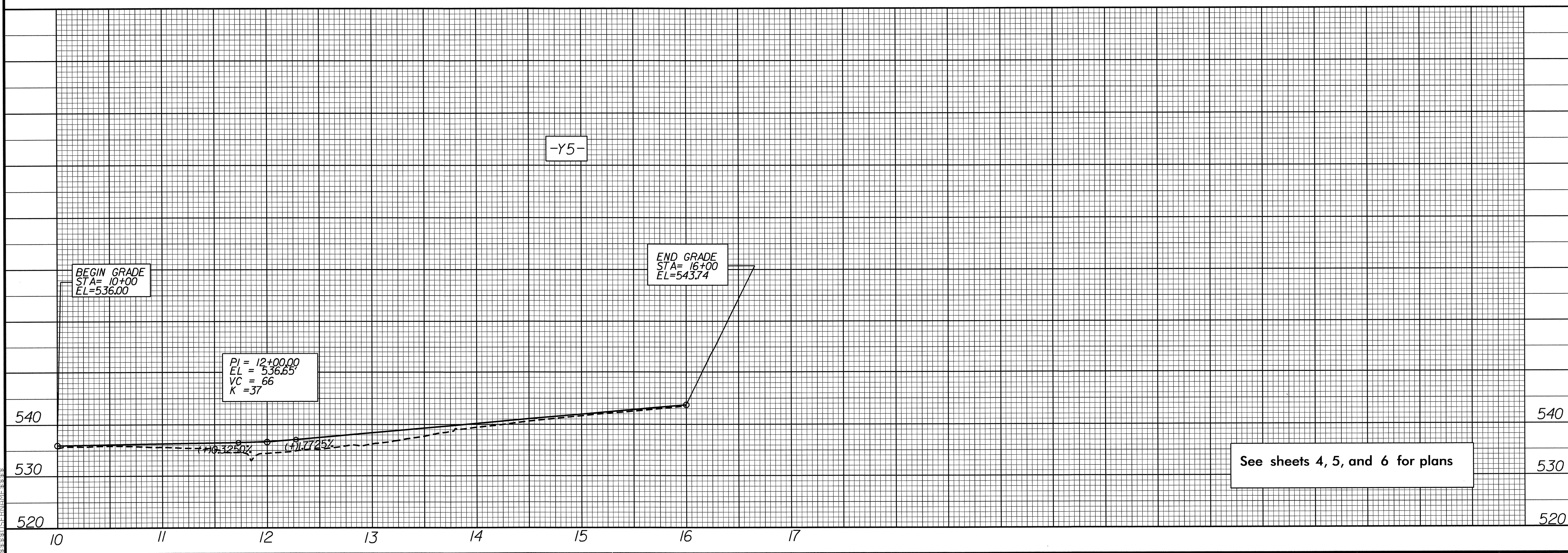
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PROJECT REFERENCE NO. U-3324	SHEET NO. 10
ROADWAY DESIGN ENGINEER SEAL 037874 TIMOTHY D. GONS 7-5-12	HYDRAULICS ENGINEER SEAL 12876 PAUL F. FISHER 7/3/12



See sheet 5 for plans

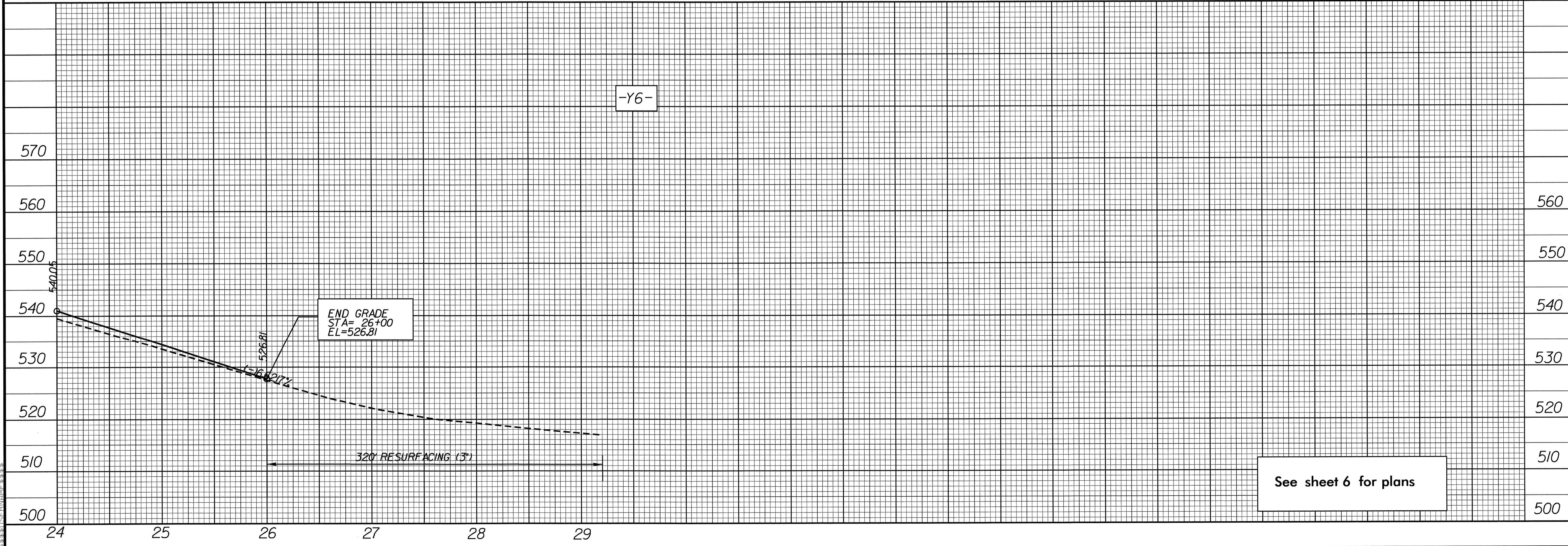
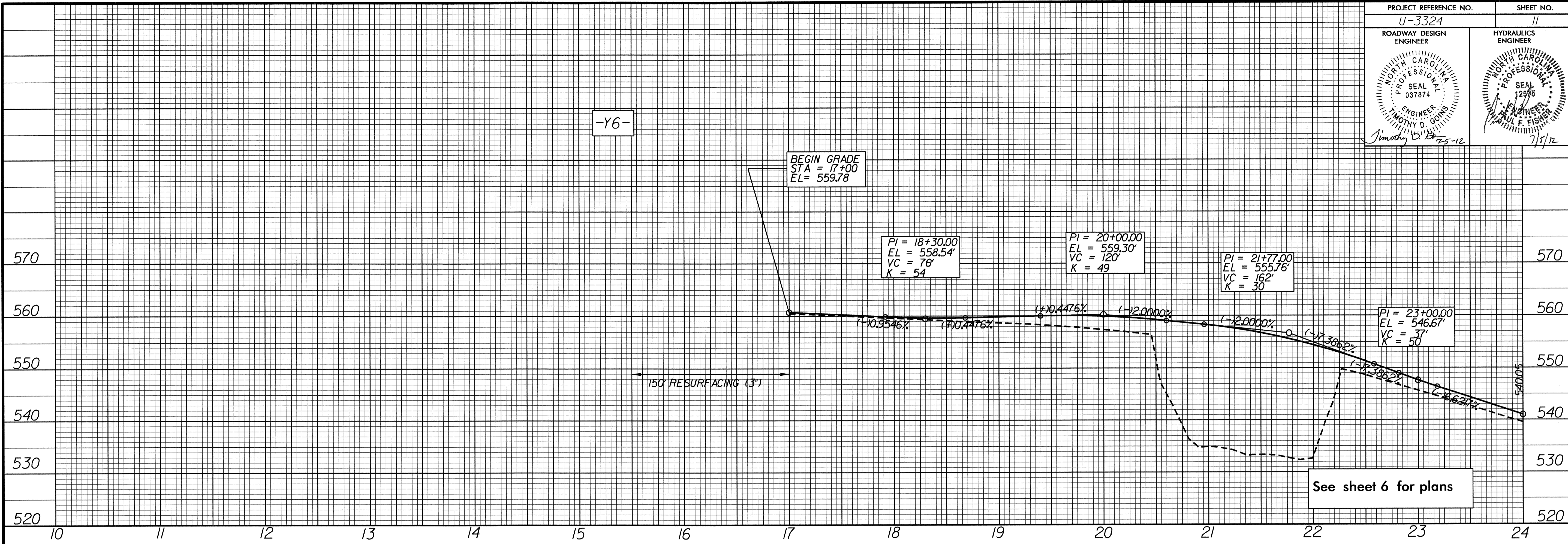
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See sheets 4, 5, and 6 for plans

5/28/99

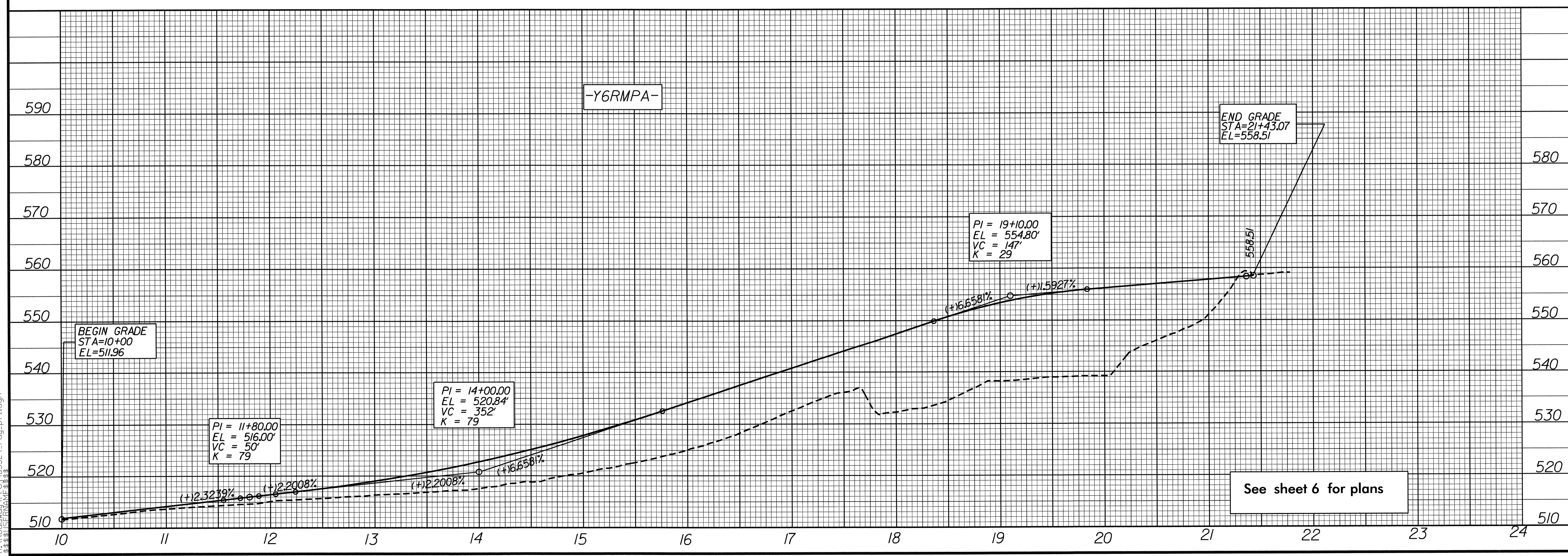
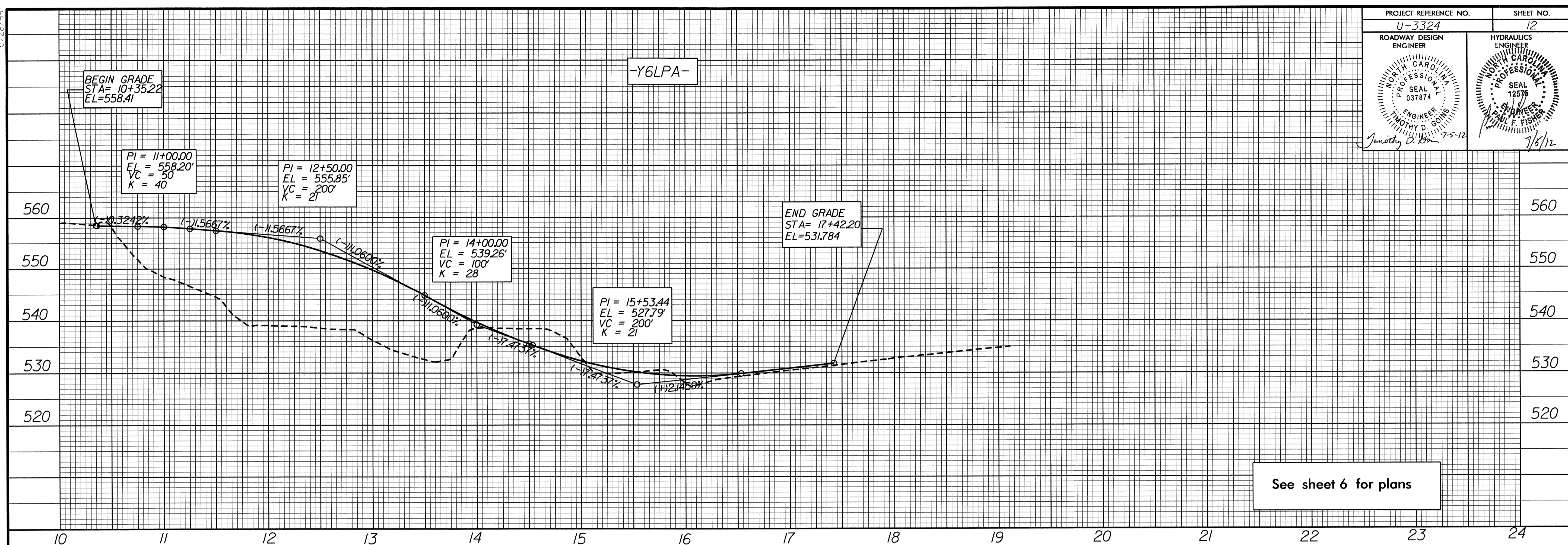
PROJECT REFERENCE NO. U-3324	SHEET NO. 11
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
Timothy D. Goums 5/25-12	Paul F. Fisher 7/5/12



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\$\$\$\$\$ ICFR\NAME\$\$\$\$\$

5/28/99

PROJECT REFERENCE NO. U-3324	SHEET NO. 12
ROADWAY DESIGN ENGINEER TIMOTHY D. GOINS 7-5-12	HYDRAULICS ENGINEER TIMOTHY D. GOINS 7/5/12



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