

09/08/99

See Sheet 1-A For Index of Sheets  
See Sheet 1-B For Conventional Symbology

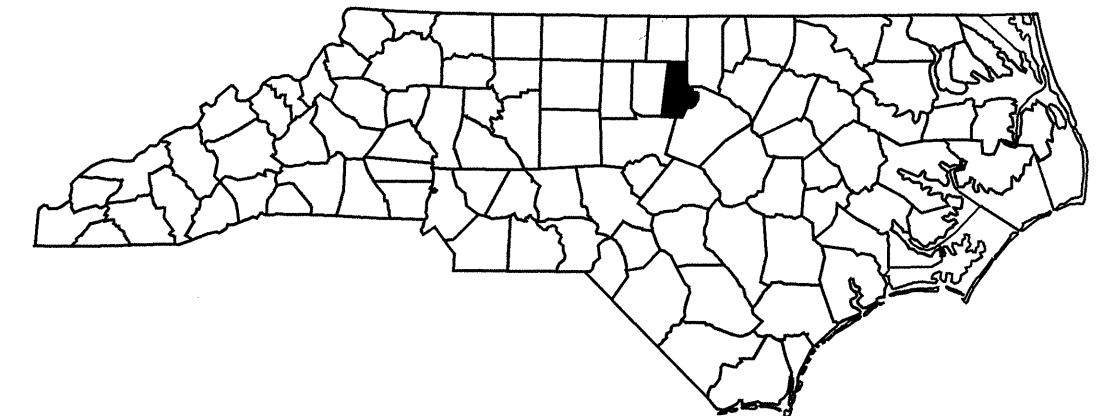
STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

**DURHAM COUNTY**

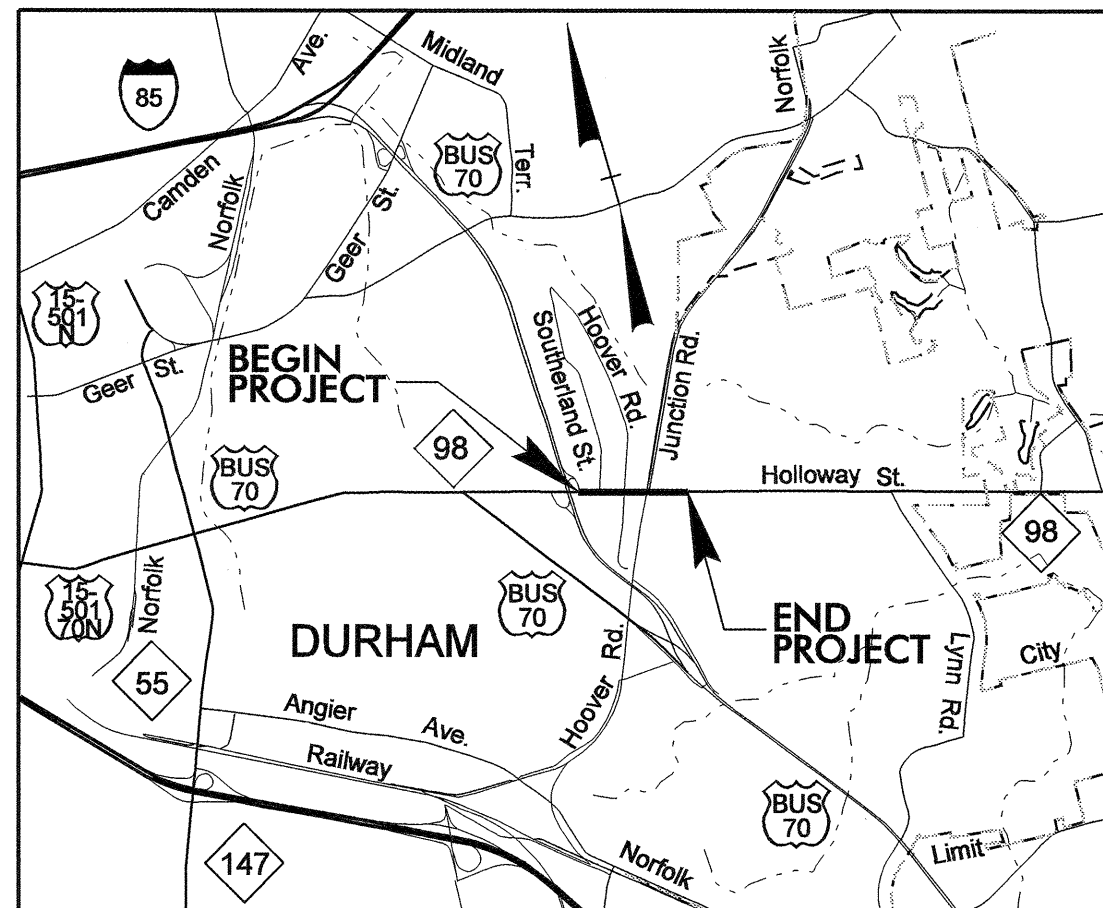
**LOCATION: DURHAM - NC 98 (HOLLOWAY ST.) FROM EAST OF US 70 BYPASS TO EAST OF JUNCTION ROAD**

**TYPE OF WORK: WIDENING, DRAINAGE, GRADING, PAVING, CURB & GUTTER AND SIGNALS**

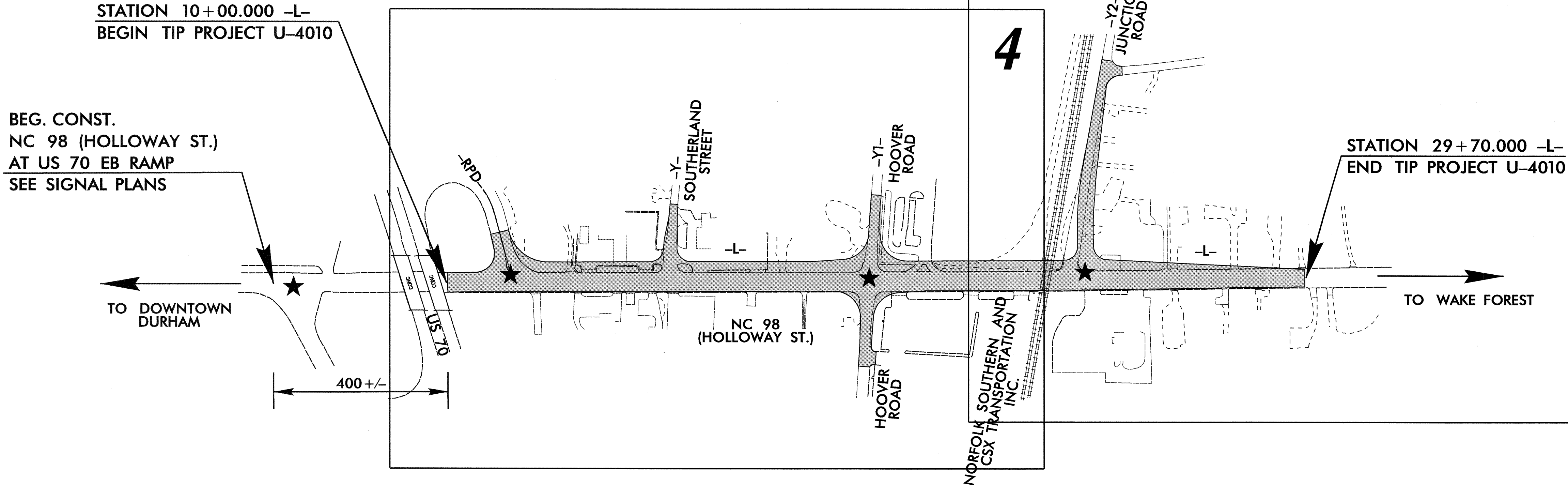
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-4010	1	
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	
35011.1.1	STP-98(5)	PE	
35011.2.2	STP-98(5)	ROW, UTIL.	
35011.3.2	STP-98(21)	CONST.	



**CONTRACT: C201439 TIP PROJECT: U-4010**



**VICINITY MAP**

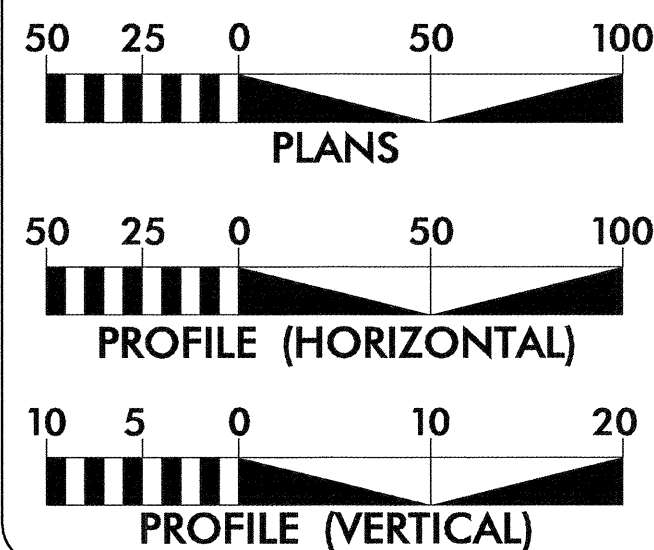


★ PROPOSED OR UPGRADED TRAFFIC SIGNALS

THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF DURHAM

CONTRACTOR WILL BE REQUIRED TO COORDINATE WITH RAILROAD ON THE INSTALLATION OF SIGNAL EQUIPMENT AND ADJUSTMENT OF RAILROAD CROSSING

**GRAPHIC SCALES**



**DESIGN DATA**

ADT 2007 = 26,419  
ADT 2030 = 34,000  
DHV = 10 %  
D = 60 %  
T = 4 % \*  
V = 40 MPH

\* (TTST 1% & DUAL 3%)

**PROJECT LENGTH**

LENGTH ROADWAY TIP PROJECT U-4010 = 0.373 MI  
TOTAL LENGTH OF TIP PROJECT U-4010 = 0.373 MI

Prepared in the Office of:  
**DIVISION OF HIGHWAYS**  
1000 Birch Ridge Dr., NC, 27610

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:  
JANUARY 23, 2003

LETTING DATE:  
APRIL 17, 2007

JASON MOORE, PE  
PROJECT ENGINEER

KEVIN E. MOORE, PE  
PROJECT DESIGN ENGINEER

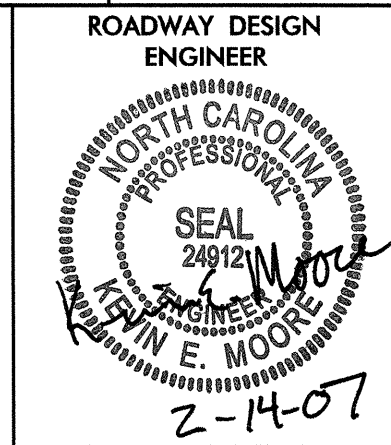
HYDRAULIC ENGINEER

*Max S. Price*  
SEAL 022893  
P.E.  
SIGNATURE: \_\_\_\_\_  
ROADWAY DESIGN ENGINEER  
SEAL 24612  
SIGNATURE: *Kevin E. Moore*

DIVISION OF HIGHWAYS  
STATE OF NORTH CAROLINA

*Aut M. Miller*  
P.E.  
STATE DESIGN ENGINEER  
DEPARTMENT OF TRANSPORTATION  
FEDERAL HIGHWAY ADMINISTRATION  
APPROVED  
DIVISION ADMINISTRATOR  
DATE \_\_\_\_\_

02-FEB-2007 15:47  
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\$FILE\$



8/17/99

GENERAL NOTES: 2006 SPECIFICATIONS  
EFFECTIVE: 07-18-06

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 11.

SUPERELEVATION:

ALL CURVES ON THIS PROJECT SHALL BE SUPERELEVATED IN ACCORDANCE WITH STD. NO. 225.04 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.

UNDERDRAINS:

UNDERDRAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 815.03 AT LOCATIONS 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 SHOWN ON 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.

TEMPORARY SHORING:

SHORING REQUIRED FOR THE MAINTENANCE OF TRAFFIC WILL BE PAID FOR AS "EXTRA WORK" IN ACCORDANCE WITH SECTION 104-7.

SUBSURFACE PLANS:

NO SUBSURFACE PLANS ARE AVAILABLE ON THIS PROJECT. THE CONTRACTOR SHOULD MAKE HIS OWN INVESTIGATION AS TO THE SUBSURFACE CONDITIONS.

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE DUKE POWER, CITY OF DURHAM, VERIZON TELEPHONE AND PSNC 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.

WHEELCHAIR RAMPS:

WHEELCHAIR RAMPS ARE SHOWN ON THE PLANS AT APPROXIMATE LOCATIONS. THE CONSTRUCTION OF ALL WHEELCHAIR RAMPS SHALL BE IN ACCORDANCE WITH STD. 848.05 and STD. 848.06.

INDEX OF SHEETS

SHEET NUMBER	SHEET
1	TITLE SHEET
1-A	INDEX OF SHEETS, GENERAL NOTES, AND LIST OF STANDARD DRAWINGS
1-B	CONVENTIONAL SYMBOLS
2	PAVEMENT SCHEDULE AND DETAILS OF WEDGING
2 AND 2-A	TYPICAL SECTIONS
2-B	PIPE HANDRAIL MOUNTED ON RETAINING WALL DETAIL
2-C	TEMPORARY 1" STEEL COVER ON DRAINAGE STRUCTURE DETAIL
2-D	CROSSWALK THRU MONOLITHIC ISLAND DETAIL
2-E	RETAINING WALL ENVELOPES
2-F	GRAVITY RETAINING WALL DETAIL
3	SUMMARY OF QUANTITIES
3-B	EARTHWORK SUMMARY, SUMMARY OF ASPHALT PAVEMENT REMOVAL, SUMMARY OF 48" CHAIN LINK FENCE, SUMMARY OF MILLING ASPHALT PAVEMENT
3-C THRU 3-E	DRAINAGE SUMMARY
3-F	PARCEL INDEX SHEET
4 AND 5	PLAN SHEETS
6 AND 7	PROFILE SHEET
TCP-1 THRU TCP-12	TRAFFIC CONTROL PLANS
PM-1 THRU PM-2	PAVEMENT MARKING PLANS
EC-1 THRU EC-6	EROSION CONTROL PLANS
SIGN-1 THRU SIGN-10	SIGNING PLANS
SIG.-1 THRU SIG.-35	SIGNAL PLANS
UC-1 THRU UC-5	UTILITY CONSTRUCTION PLANS
UO-1 THRU UO-3	UTILITIES BY OTHERS
X-1 THRU X-18	CROSS-SECTIONS

2006 ROADWAY STANDARD DRAWINGS

The following Roadway Standards as appear in "Roadway Standard Drawings" Highway Design Branch - N. C. Department of Transportation - Raleigh, N. C., Dated July 18, 2006 are applicable to this project and by reference hereby are considered a part of these plans:

STD. NO.	TITLE
DIVISION 2 - EARTHWORK	
200.02	Method of Clearing - Method II
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superelevation - Two Lane Pavement
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation - Method 'A'
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
DIVISION 6 - ASPHALT BASES AND PAVEMENTS	
654.01	Pavement Repairs
DIVISION 8 - INCIDENTALS	
806.01	Concrete Right-of-Way Marker
806.02	Granite Right-of-Way Marker
815.03	Pipe Underdrain and Blind Drain
816.04	Markers for Drainage Structure and Concrete Pad
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
840.14	Concrete Drop Inlet - 12" thru 30" Pipe
840.15	Brick Drop Inlet - 12" thru 30" Pipe
840.16	Drop Inlet Frame and Grates - for use with Std. Dwg 840.14 and 840.15
840.25	Anchorage for Frames - Brick or Concrete
840.31	Concrete Junction Box - 12" thru 66" Pipe
840.32	Brick Junction Box - 12" thru 66" Pipe
840.34	Traffic Bearing Junction Box - for Use with Pipes 42" and Under
840.45	Precast Drainage Structure
840.46	Traffic Bearing Precast Drainage Structure
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	Wheelchair Ramp - Curb Cut
852.01	Concrete Islands
852.06	Method for Placement of Drop Inlets in Concrete Islands
866.01	Chain Link Fence - 4', 5' and 6' High Fence
876.02	Guide for Rip Rap at Pipe Outlets

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

CONVENTIONAL SYMBOLS

\*S.U.E = SUBSURFACE UTILITY ENGINEER

ROADS & RELATED ITEMS

Proposed Traffic Signal	
Edge of Pavement	
Curb	
Prop. Slope Stakes Cut	
Prop. Slope Stakes Fill	
Prop. Woven Wire Fence	
Prop. Chain Link Fence	
Prop. Barbed Wire Fence	
Prop. Wheelchair Ramp	
Curb Cut for Future Wheelchair Ramp	
Exist. Guardrail	
Prop. Guardrail	
Equality Symbol	
Pavement Removal	

RIGHT OF WAY

Baseline Control Point	
Existing Right of Way Marker	
Exist. Right of Way Line w/Marker	
Prop. Right of Way Line with Proposed	
RW Marker (Iron Pin & Cap)	
Prop. Right of Way Line with Proposed (Concrete or Granite) RW Marker	
Exist. Control of Access Line	
Prop. Control of Access Line	
Exist. Easement Line	
Prop. Temp. Construction Easement Line	
Prop. Temp. Drainage Easement Line	
Prop. Perm. Drainage Easement Line	

HYDROLOGY

Stream or Body of Water	
River Basin Buffer	
Flow Arrow	
Disappearing Stream	
Spring	
Swamp Marsh	
Shoreline	
Falls, Rapids	
Prop Lateral, Tail, Head Ditches	

STRUCTURES

MAJOR Bridge, Tunnel, or Box Culvert	
Bridge Wing Wall, Head Wall and End Wall	

MINOR

Head & End Wall	
Pipe Culvert	
Footbridge	
Drainage Boxes	
Paved Ditch Gutter	

UTILITIES

Exist. Pole	
Exist. Power Pole	
Prop. Power Pole	
Exist. Telephone Pole	
Prop. Telephone Pole	
Exist. Joint Use Pole	
Prop. Joint Use Pole	
Telephone Pedestal	
U/G Telephone Cable Hand Hold	
Cable TV Pedestal	
U/G TV Cable Hand Hold	
U/G Power Cable Hand Hold	
Hydrant	
Satellite Dish	
Exist. Water Valve	
Sewer Clean Out	
Power Manhole	
Telephone Booth	
Cellular Telephone Tower	
Water Manhole	
Light Pole	
H-Frame Pole	
Power Line Tower	
Pole with Base	
Gas Valve	
Gas Meter	
Telephone Manhole	
Power Transformer	
Sanitary Sewer Manhole	
Storm Sewer Manhole	
Tank; Water, Gas, Oil	
Water Tank With Legs	
Traffic Signal Junction Box	
Fiber Optic Splice Box	
Television or Radio Tower	
Utility Power Line Connects to Traffic Signal Lines Cut Into the Pavement	

Recorded Water Line	
Designated Water Line (S.U.E.*)	
Sanitary Sewer	
Recorded Sanitary Sewer Force Main	
Designated Sanitary Sewer Force Main(S.U.E.*)	
Recorded Gas Line	
Designated Gas Line (S.U.E.*)	
Storm Sewer	
Recorded Power Line	
Designated Power Line (S.U.E.*)	
Recorded Telephone Cable	
Designated Telephone Cable (S.U.E.*)	
Recorded U/G Telephone Conduit	
Designated U/G Telephone Conduit (S.U.E.*)	
Unknown Utility (S.U.E.*)	
Recorded Television Cable	
Designated Television Cable (S.U.E.*)	
Recorded Fiber Optics Cable	
Designated Fiber Optics Cable (S.U.E.*)	
Exist. Water Meter	
U/G Test Hole (S.U.E.*)	
Abandoned According to U/G Record	
End of Information	

BOUNDARIES & PROPERTIES

State Line	
County Line	
Township Line	
City Line	
Reservation Line	
Property Line	
Property Line Symbol	
Exist. Iron Pin	
Property Corner	
Property Monument	
Property Number	
Parcel Number	
Fence Line	
Existing Wetland Boundaries	
High Quality Wetland Boundary	
Medium Quality Wetland Boundaries	
Low Quality Wetland Boundaries	
Proposed Wetland Boundaries	
Existing Endangered Animal Boundaries	
Existing Endangered Plant Boundaries	

BUILDINGS & OTHER CULTURE

Buildings	
Foundations	
Area Outline	
Gate	
Gas Pump Vent or U/G Tank Cap	
Church	
School	
Park	
Cemetery	
Dam	
Sign	
Well	
Small Mine	
Swimming Pool	

TOPOGRAPHY

Loose Surface	
Hard Surface	
Change in Road Surface	
Curb	
Right of Way Symbol	
Guard Post	
Paved Walk	
Bridge	
Box Culvert or Tunnel	
Ferry	
Culvert	
Footbridge	
Trail, Footpath	
Light House	

VEGETATION

Single Tree	
Single Shrub	
Hedge	
Woods Line	
Orchard	
Vineyard	

RAILROADS

Standard Gauge	
RR Signal Milepost	
Switch	

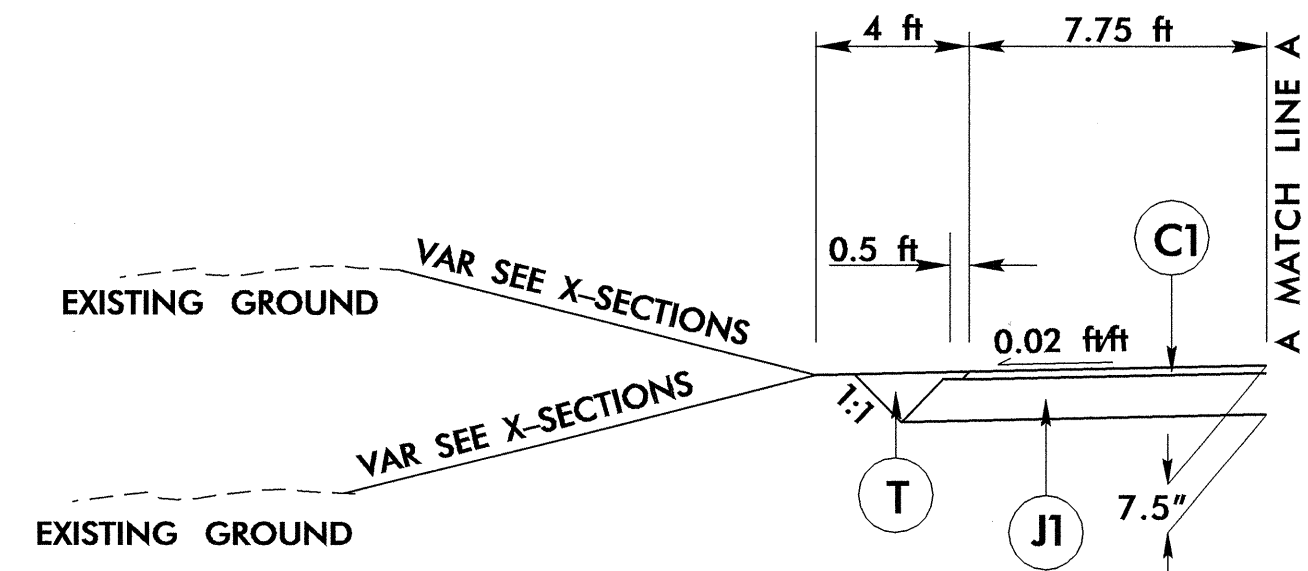
5/28/99

08-APR-2004 11:58 AM d:\010.tsh  
trmeadows AT 11:59:25

PAVEMENT SCHEDULE	
C1	PROP. APPROX. 1.5" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
C2	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.
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 1 1/2" 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. 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.
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
E2	PROP. APPROX. 4 1/2" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 513 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 3" IN DEPTH OR GREATER THAN 5 1/2" IN DEPTH.
J1	PROP. 6" AGGREGATE BASE COURSE
R1	2'-6" CONCRETE CURB & GUTTER
R2	5" MONOLITHIC CONCRETE ISLAND (KEYED IN).
S	4" CONCRETE SIDEWALK.

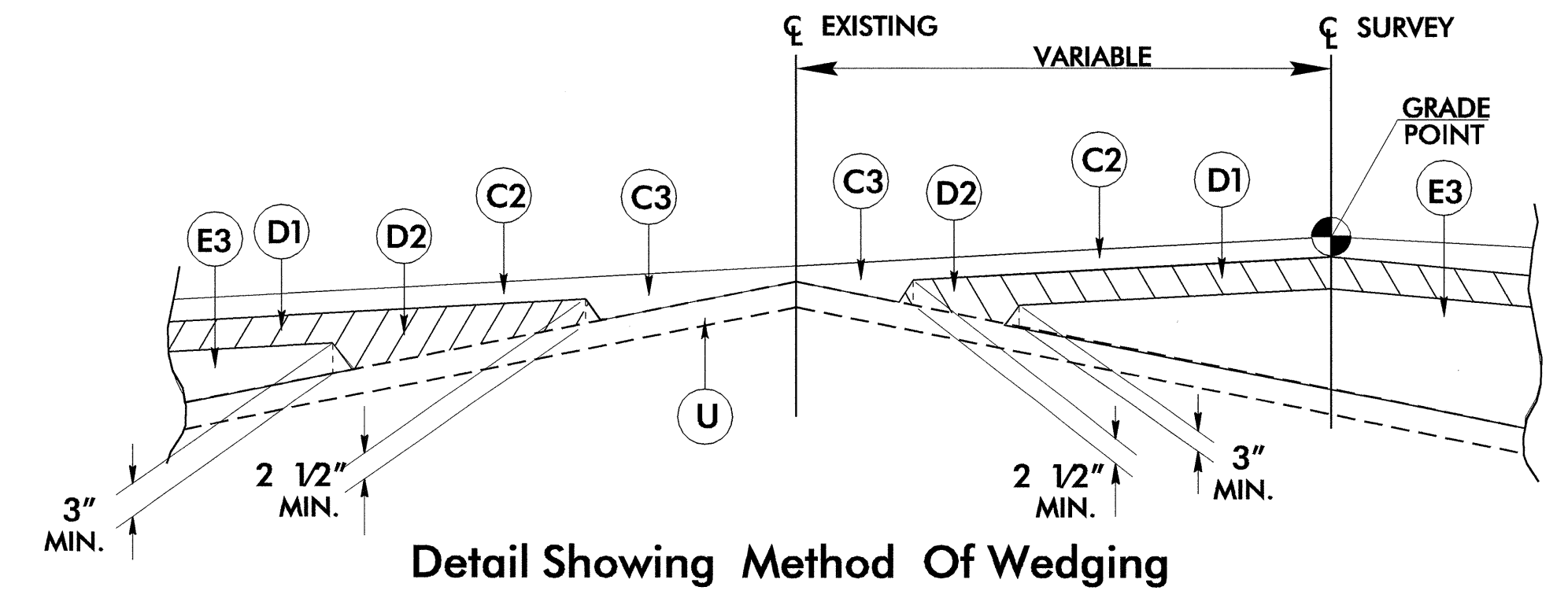
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
V	MILLING SEE SHEET 3-B FOR LOCATIONS OF MILLING OF THE EXISTING PAVEMENT
W	WEDGING

NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.

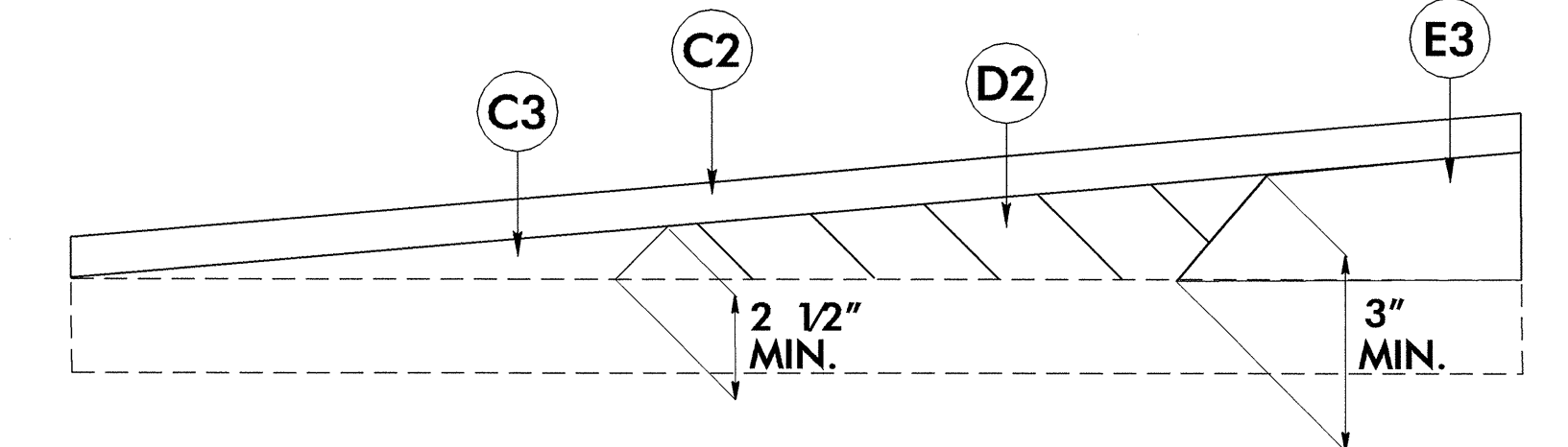


**TYPICAL SECTION NO. 1A**

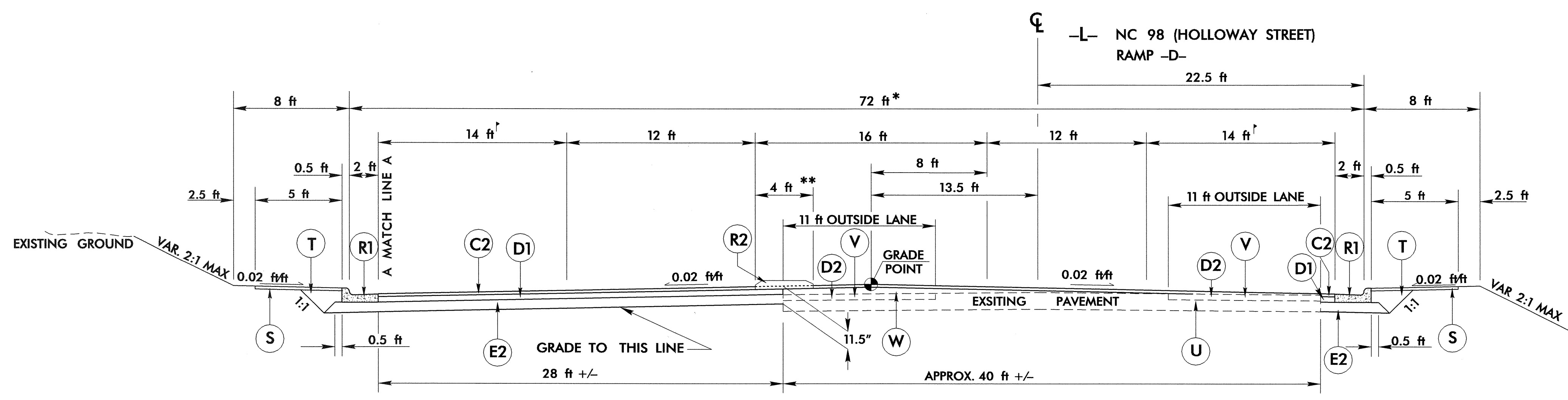
USE TYPICAL NO. 1A AS FOLLOWS:  
 -L- STA. 21+50.00 TO STA. 24+36.86  
 -L- STA. 24+95.11 TO STA. 27+00.00  
 SEE TRAFFIC CONTROL PLANS



**Detail Showing Method Of Wedging**



**Wedging Detail For Resurfacing**

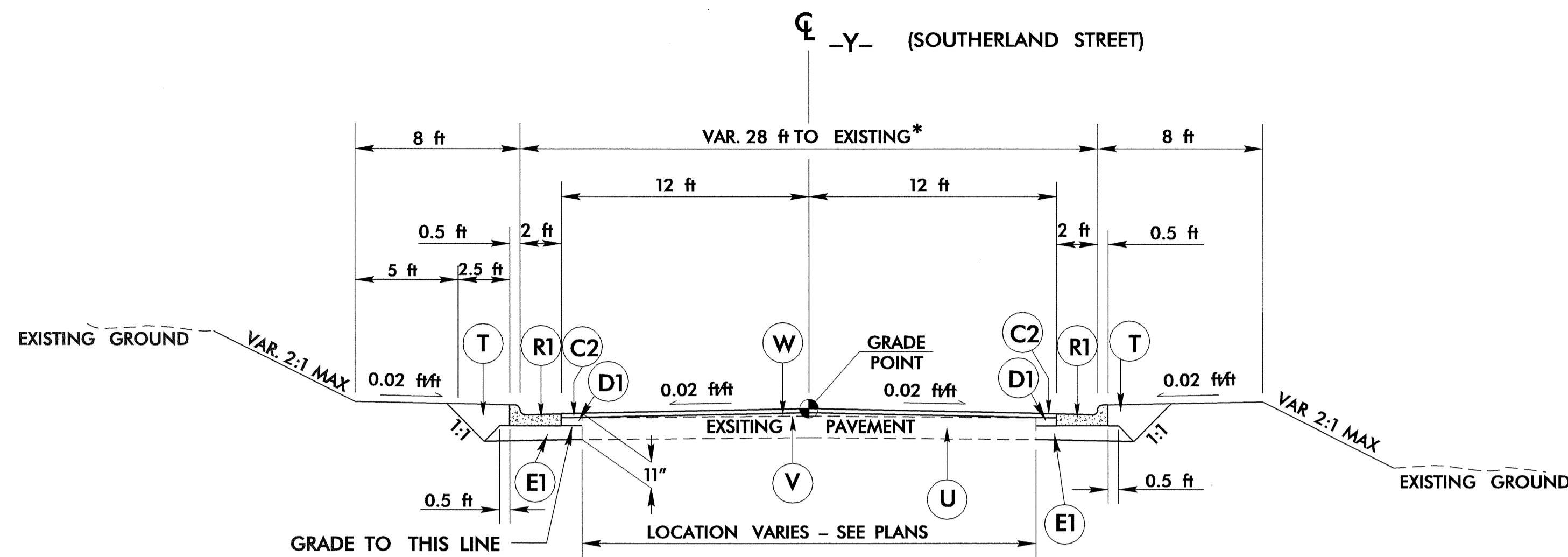


**TYPICAL SECTION NO. 1**

USE TYPICAL NO. 1 AS FOLLOWS:  
 -L- STA. 14+50.00 TO STA. 22+50.00  
 -RPD- STA. 10+08.00 TO STA. 11+00.17  
 \*NOTE: TRANSITION FROM EXISTING TO T.S. NO. 1 FROM -L- STA. 10+50 TO 14+50  
 \*NOTE: TRANSITION FROM T.S. NO. 1 TO EXISTING FROM -L- STA. 22+50 TO 29+20  
 NOTE: MILL AND RESURFACE EXISTING FROM -L- STA. 10+00 TO 10+50 AND -L- STA. 29+20 TO 29+70

NOTES:  
 \* SEE PLANS FOR PAVEMENT TRANSITIONS  
 \*\* 4 ft CONC. ISLAND LOCATION VARIES SEE PLANS  
 † SHARED BICYCLE - VEHICLE LANE

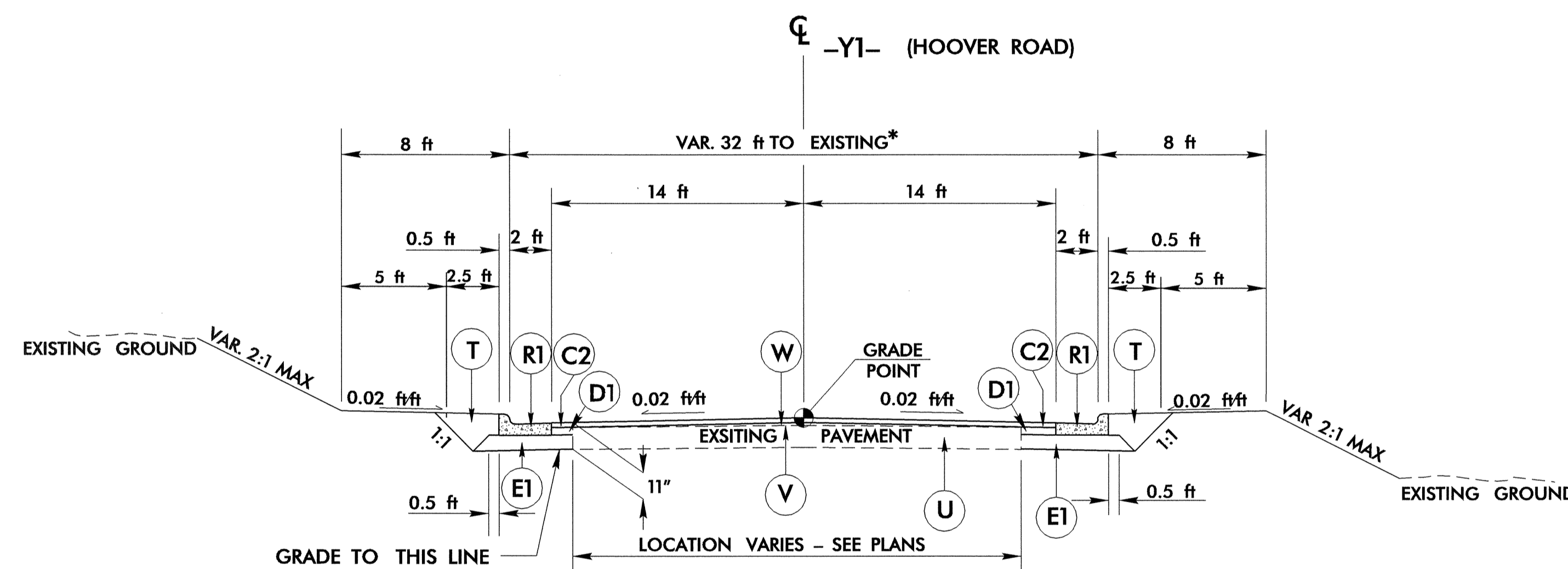
PROJECT REFERENCE NO. U-4010	SHEET NO. 2-A
RW SHEET NO.	
ROADWAY DESIGN ENGINEER NORTH CAROLINA PROFESSIONAL SEAL 29812 KEVIN E. MOORE 1-9-07	PAVEMENT DESIGN ENGINEER NORTH CAROLINA PROFESSIONAL SEAL 22896 CLAYTON S. MORRISON 1-9-07



**TYPICAL SECTION NO. 2**

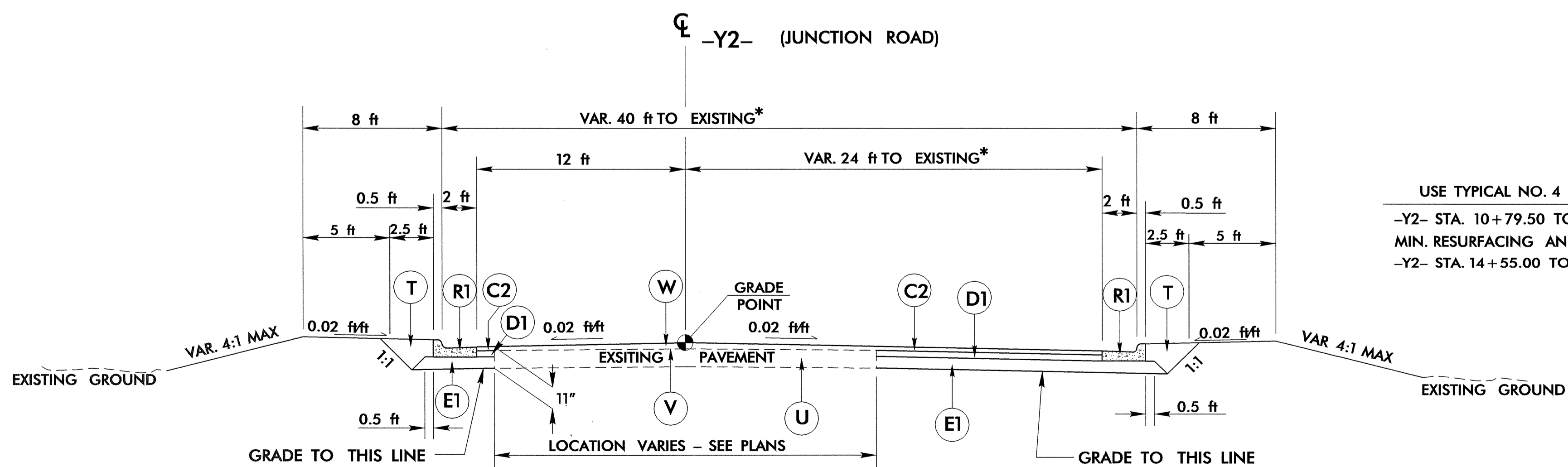
USE TYPICAL NO. 2 AS FOLLOWS:  
 -Y- STA. 10+83.84 TO STA. 11+48.00  
 MIN. RESURFACING FROM  
 -Y- STA. 11+48.00 TO 11+80.00

C2	3", TYPE S9.5B
D1	4", TYPE I19.0B
E1	4", TYPE B25.0B
E2	4 1/2", TYPE B25.0B
R1	2'-6" CONC. C & G
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V	MILLING SEE SHEET 3-B
W	WEDGING



**TYPICAL SECTION NO. 3**

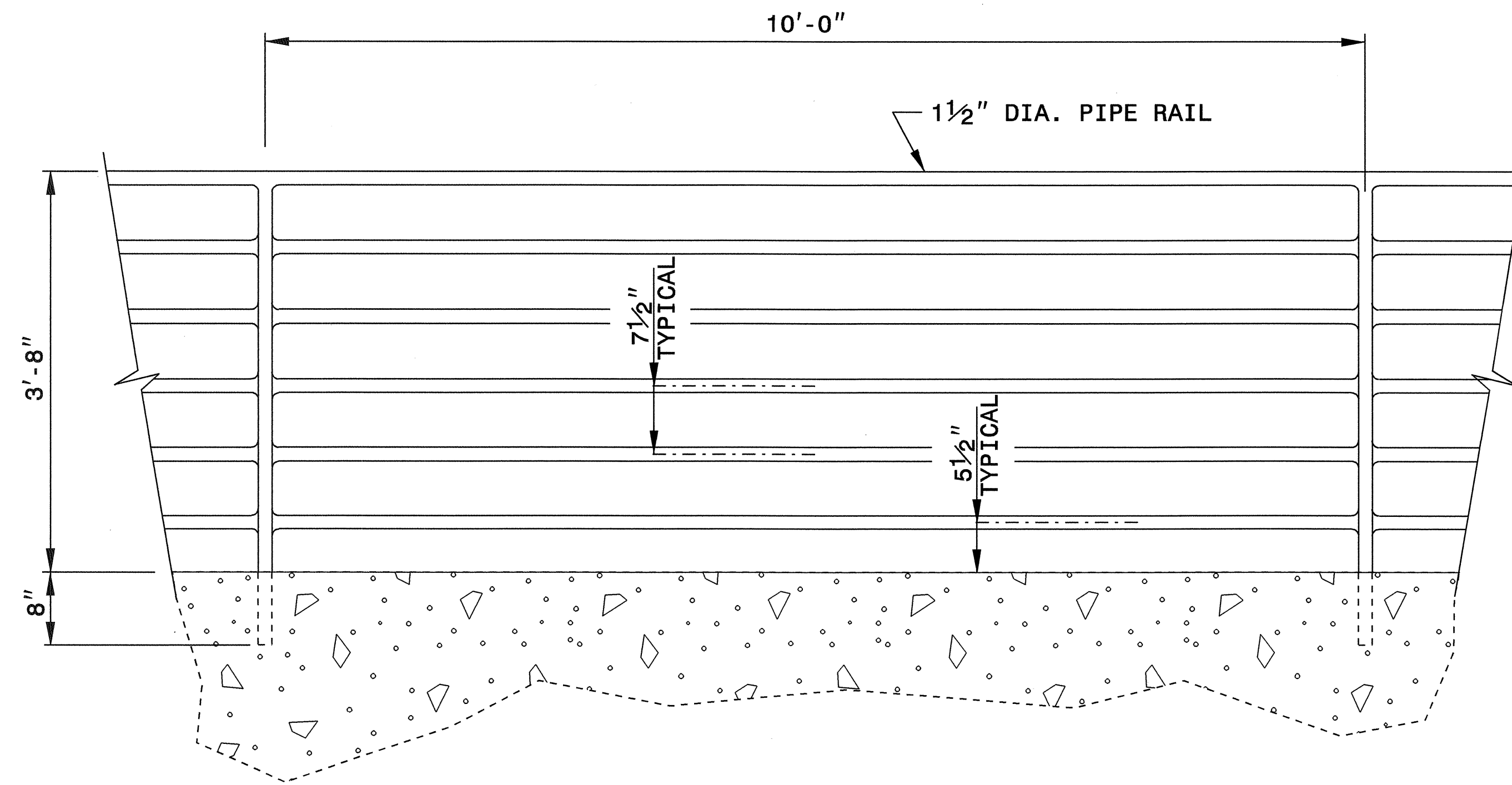
USE TYPICAL NO. 3 AS FOLLOWS:  
 -Y1- STA. 10+10.00 TO STA. 11+78.07  
 -Y1- STA. 13+37.71 TO STA. 14+53.70  
 MIN. RESURFACING AND WIDENING FROM  
 -Y1- STA. 14+53.70 TO 14+60.00



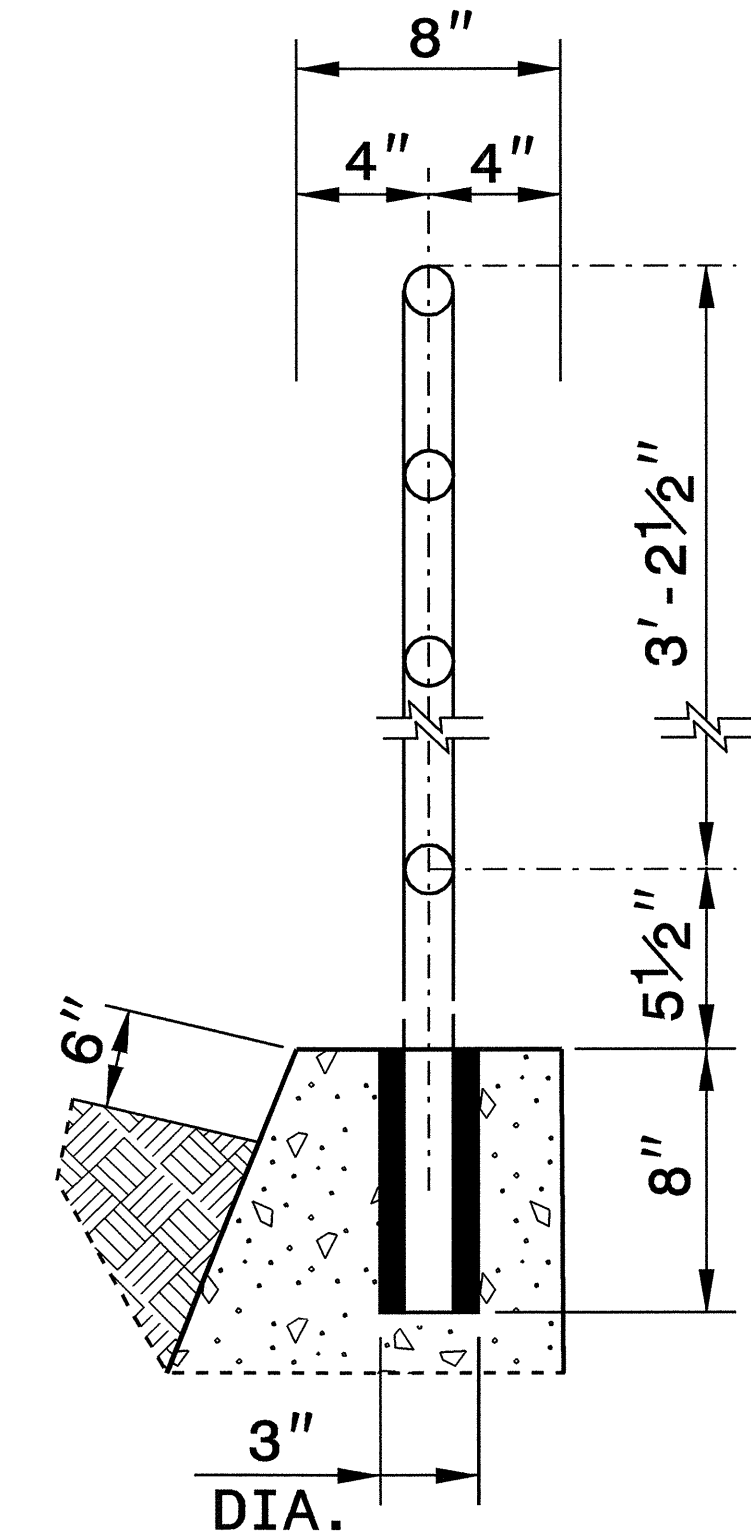
**TYPICAL SECTION NO. 4**

USE TYPICAL NO. 4 AS FOLLOWS:  
 -Y2- STA. 10+79.50 TO STA. 14+55.00  
 MIN. RESURFACING AND WIDENING FROM  
 -Y2- STA. 14+55.00 TO 15+10.00

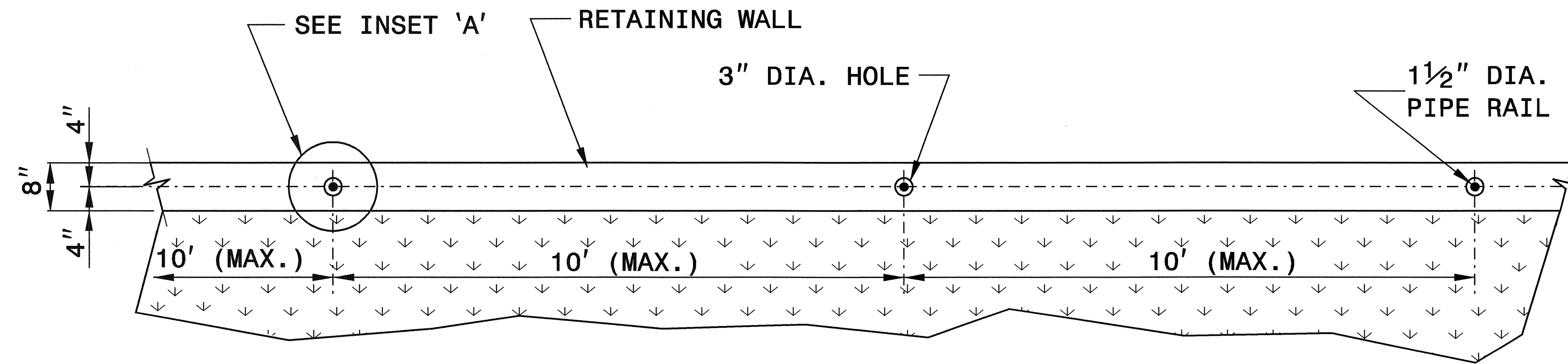
NOTES:  
 \* SEE PLANS FOR PAVEMENT TRANSITIONS



**ELEVATION OF HANDRAIL**



**INSET 'A'**



**PLAN VIEW**

**NOTES:**

PROPOSED STEEL PIPE RAIL SHALL BE CONSTRUCTED OF 1 1/2" DIAMETER SCHEDULE 40 PLAIN END GALVANIZED STEEL PIPE MEETING THE REQUIREMENTS OF ASTM A53.

PIPE RAIL SHALL BE EMBEDDED 8" INTO PROPOSED WALL WITH CHEMICAL OR CONCRETE GROUT ANCHORING SYSTEM AS DIRECTED BY THE ENGINEER.

REPAIR OF GALVANIZING SHALL BE IN ACCORDANCE WITH SECTION 1076 OF THE NCDOT STANDARD SPECIFICATIONS.

PAINTING, IF REQUIRED BY THE ENGINEER, SHALL BE IN ACCORDANCE WITH SECTION 1080 OF THE STANDARD SPECIFICATIONS.

THE PROPOSED RAILING SHALL BE CENTERED ON TOP OF THE WALL WITH POST SPACING SYMMETRICAL ABOUT THE CENTER-LINE OF THE WALL.

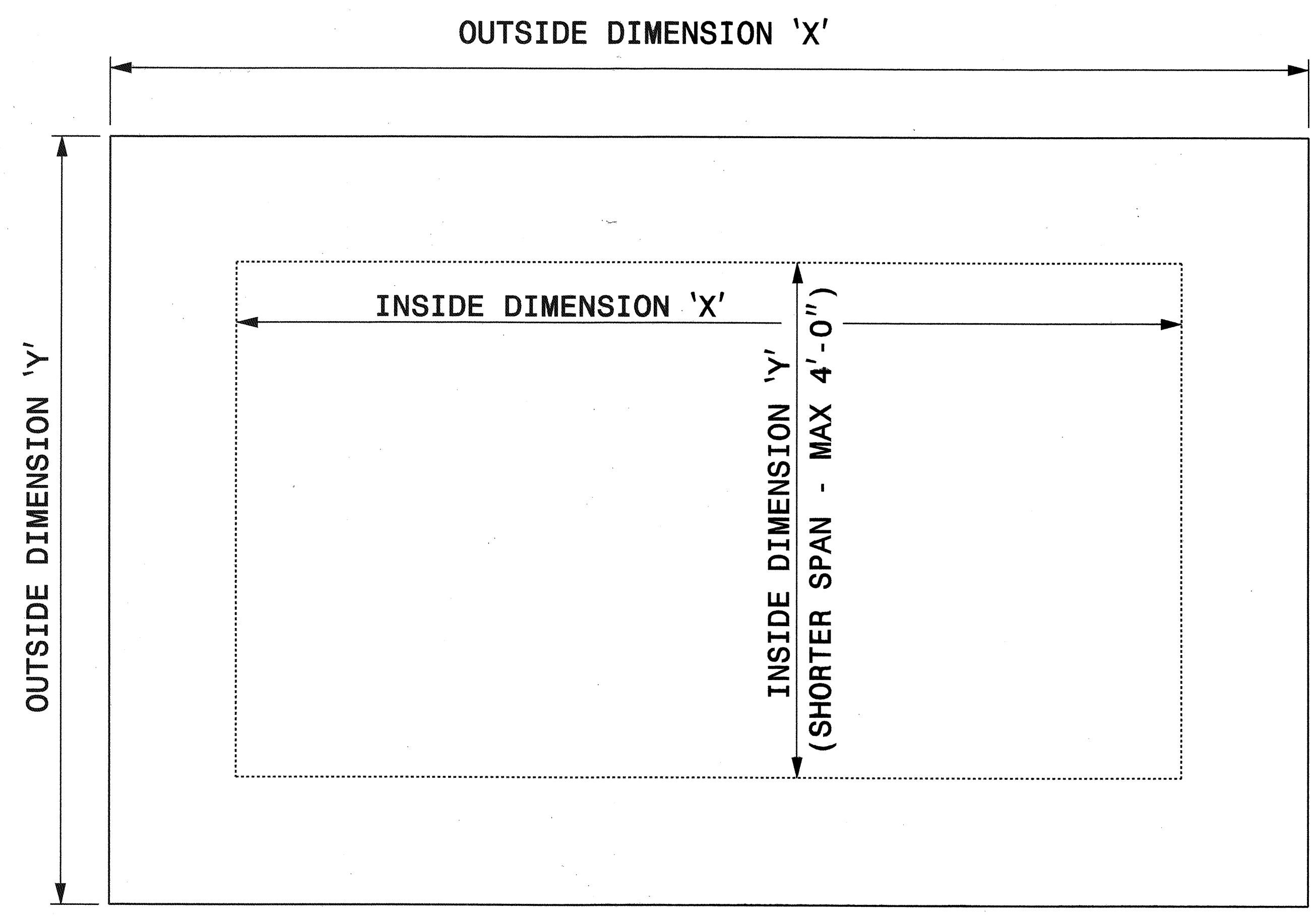
HOLES FOR EMBEDMENT OF RAIL IN WALL SHALL BE MADE WITH A ROTARY DRILL ONLY (NO ROTARY-IMPACT DRILLS).

WELDING SHALL BE DONE IN ACCORDANCE WITH ARTICLE 1072-20 OF THE STANDARD SPECIFICATIONS.

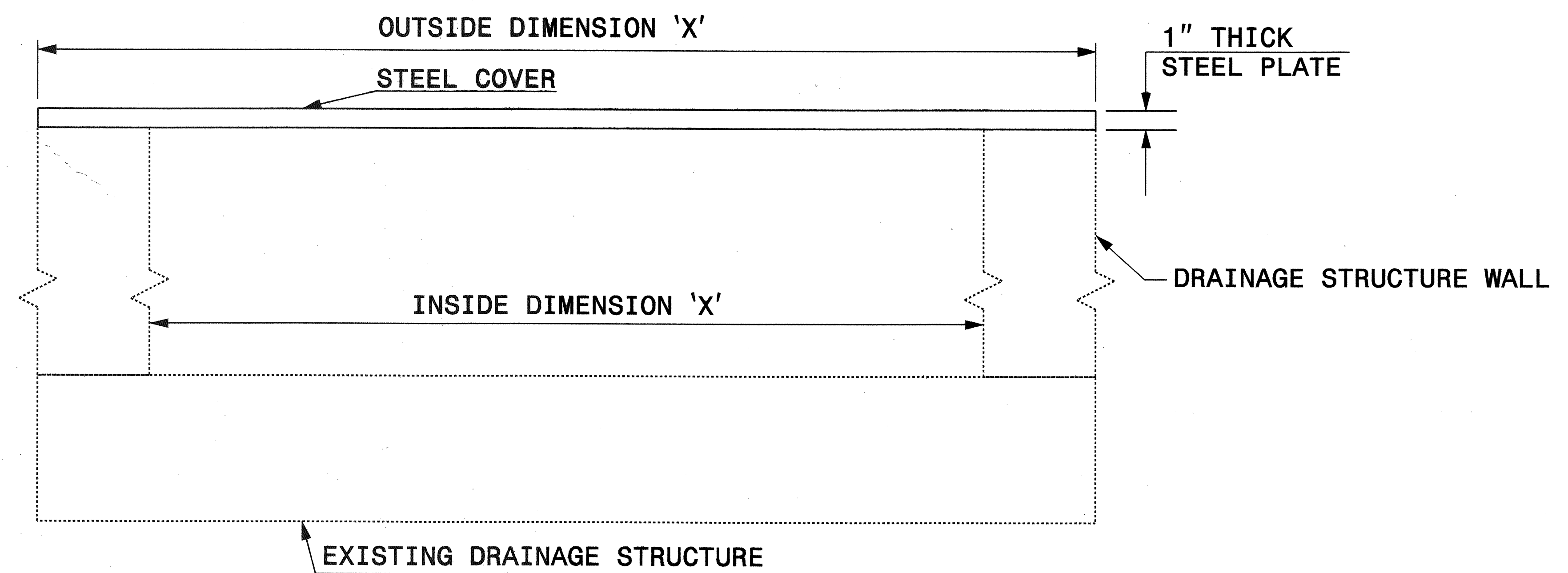
SEE DETAIL SHEET 2-E THRU 2-F FOR RETAINING WALLS



<b>PROJECT SERVICES UNIT</b>	
<b>STANDARDS AND SPECIAL DESIGN</b>	
Office 919-250-4128 FAX 919-250-4119	
<b>SPECIAL DETAIL OF</b>	
<b>PIPE HANDRAIL MOUNTED</b>	
<b>ON RETAINING WALL</b>	
ORIGINAL BY: E.E. WARD	DATE: 3-04
MODIFIED BY: T.S. Spell	DATE: 1-07
CHECKED BY: <i>T.S. Spell</i>	DATE: 1/3/07
FILE SPEC.: \\s7\details\stand\084203e&m.dgn	



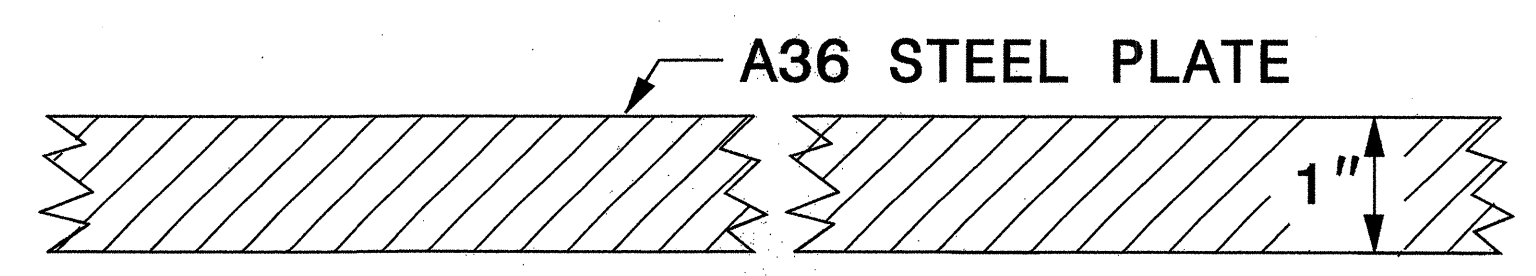
**PLAN VIEWS**



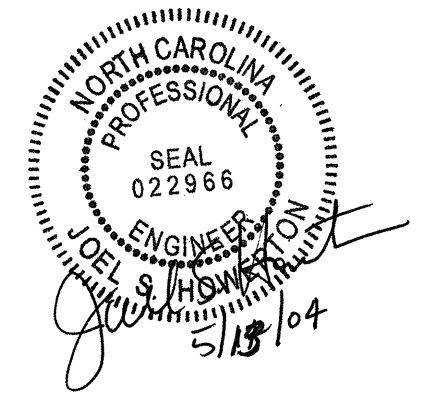
**ELEVATION VIEWS**

**GENERAL NOTES:**

- USE GRADE A36 STEEL
- STEEL COVERS ARE FOR TEMPORARY USE FOR DURING PHASE CONSTRUCTION.
- FILL SHALL BE PLACED DIRECTLY OVER THE STEEL PLATES.
- SEE ROADWAY PLANS AND PROVISIONS FOR LOCATIONS
- QUANTITIES TO BE PAID FOR AT THE UNIT PRICE BID PER EACH.



**SECTION VIEW OF STEEL TOP PLATE**

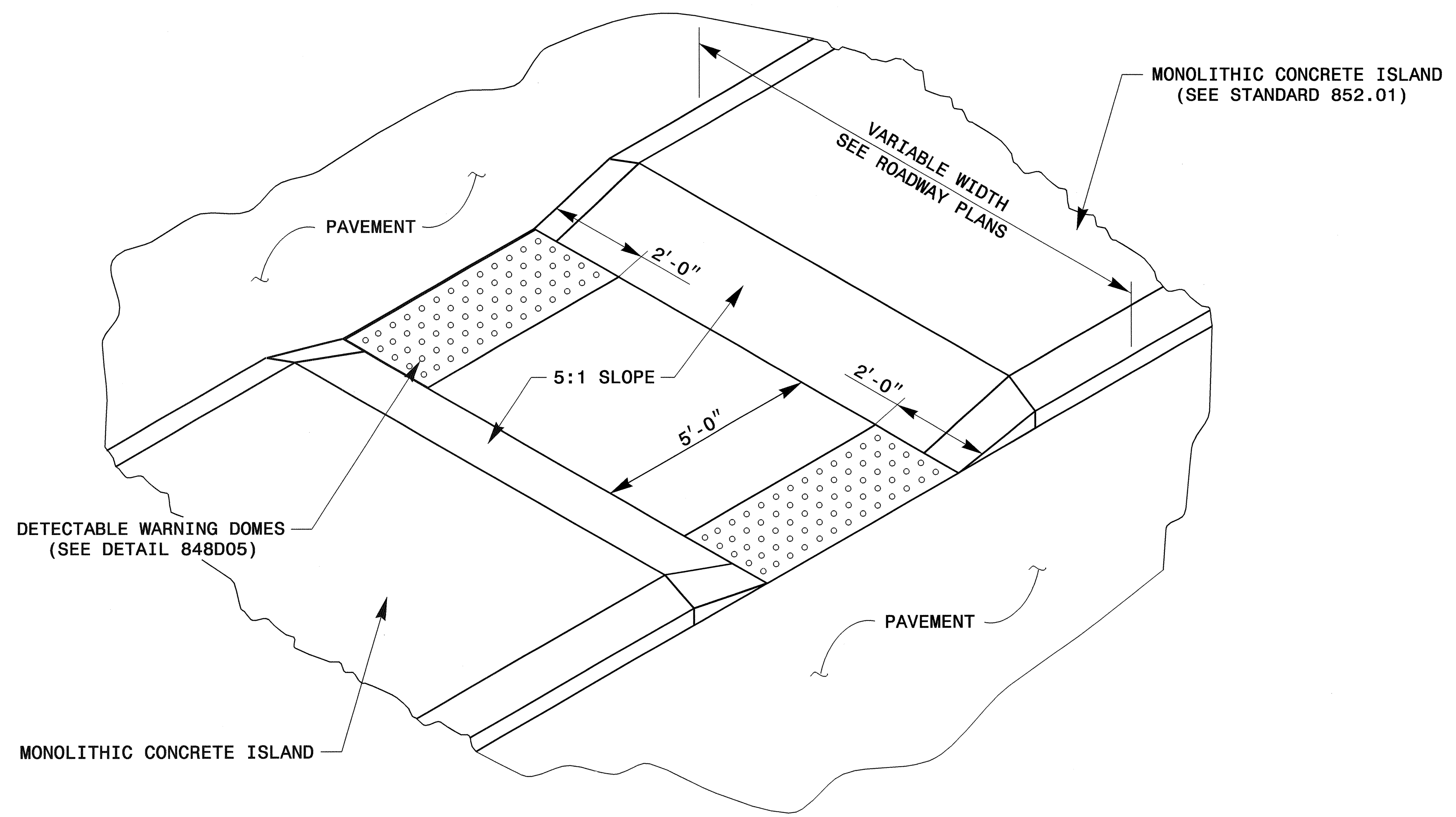


**DESIGN SERVICES UNIT  
STANDARDS AND SPECIAL DESIGN**  
Office 919-250-4128 FAX 919-250-4119

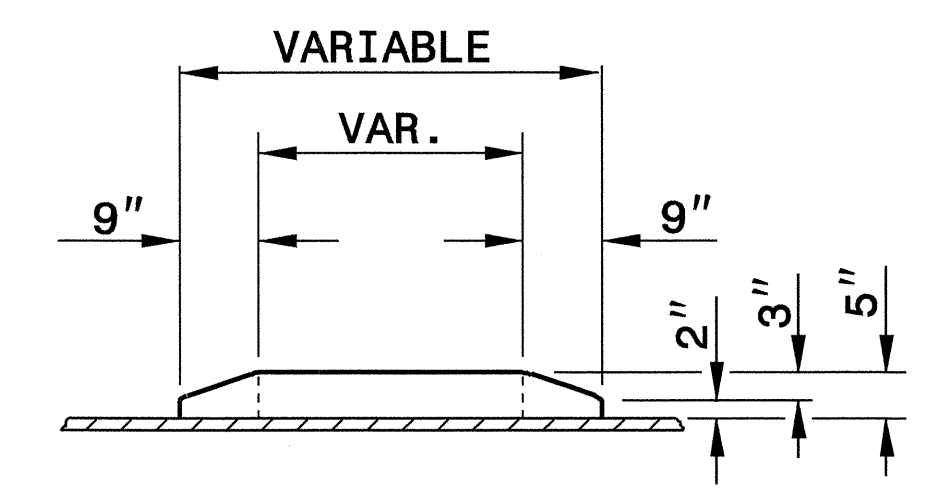
**DETAIL OF TEMPORARY  
1" STEEL COVER  
OVER DRAINAGE STRUCTURE**

ORIGINAL BY: E.E. WARD DATE: 2-2-98  
 MODIFIED BY: [Signature] DATE: [Blank]  
 CHECKED BY: [Signature] DATE: 11-01  
 FILE SPEC.: eric/usr/details/metric/stand/stlcvr2.dgn

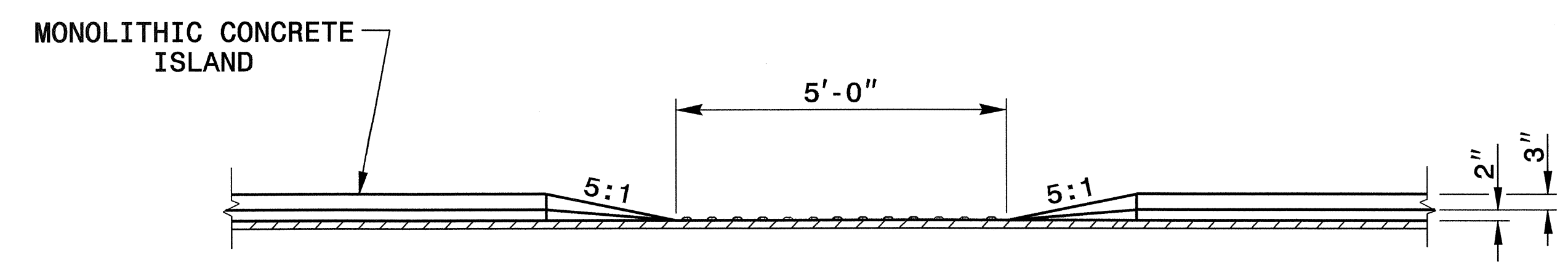
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 31-OCT-2001 16:22  
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 encward



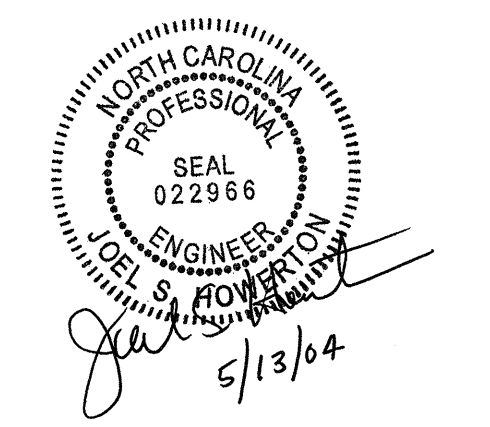
**ISOMETRIC VIEW**



**MONOLITHIC CONCRETE ISLAND  
REFER TO STD.852.01**



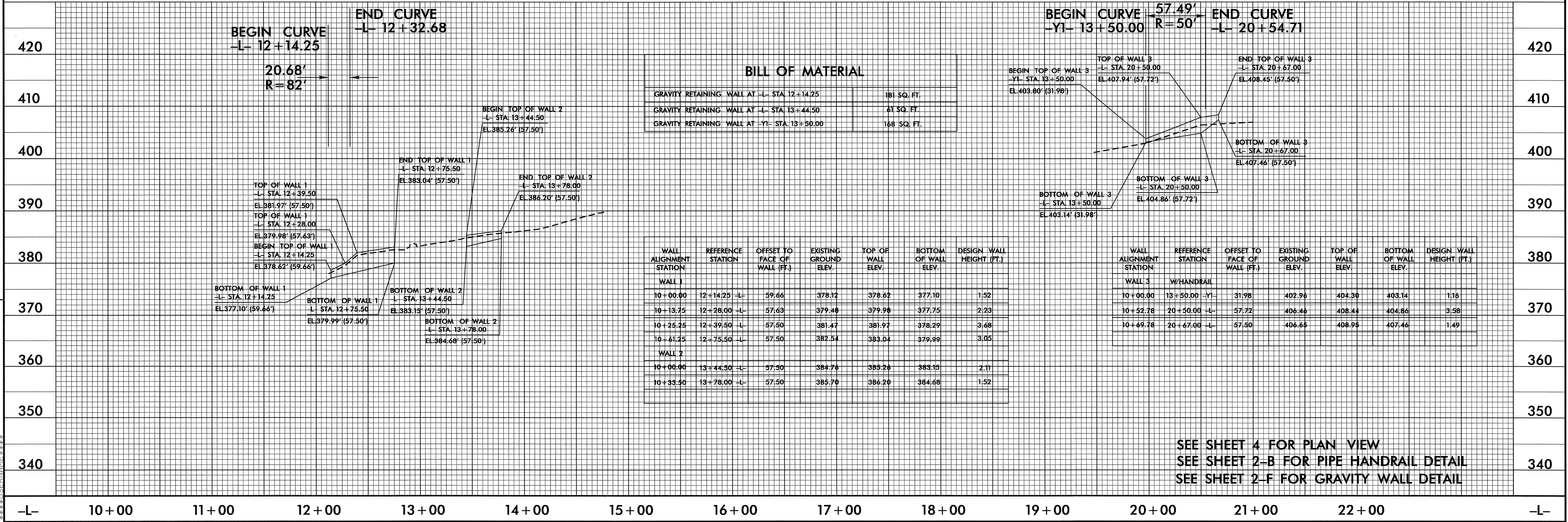
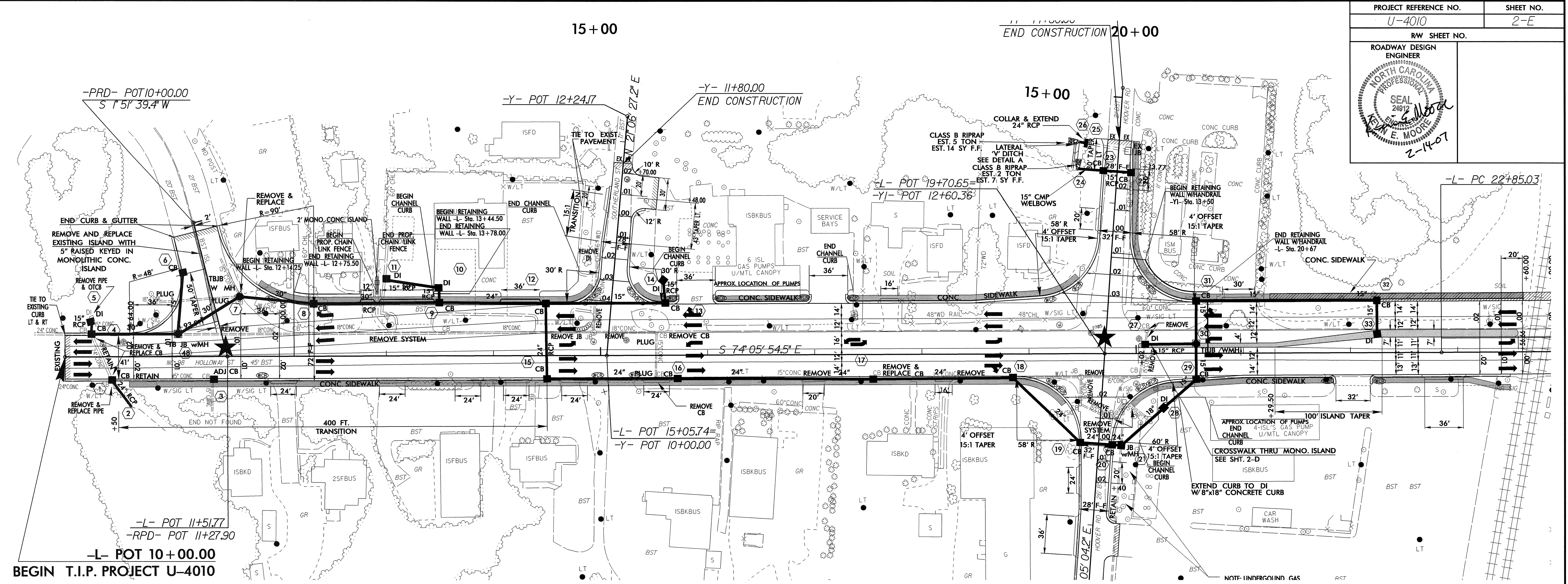
**ELEVATION**



<b>DESIGN SERVICES UNIT STANDARDS AND SPECIAL DESIGN</b>	
Office 919-250-4128	FAX 919-250-4119
<b>CROSSWALK THRU MONOLITHIC ISLAND</b>	
ORIGINAL BY: T. Spell	DATE: 2-5-02
MODIFIED BY: C. B. [Signature]	DATE: 4-12-04
FILE SPEC.: w:\details\stand\island.eng.dgn	

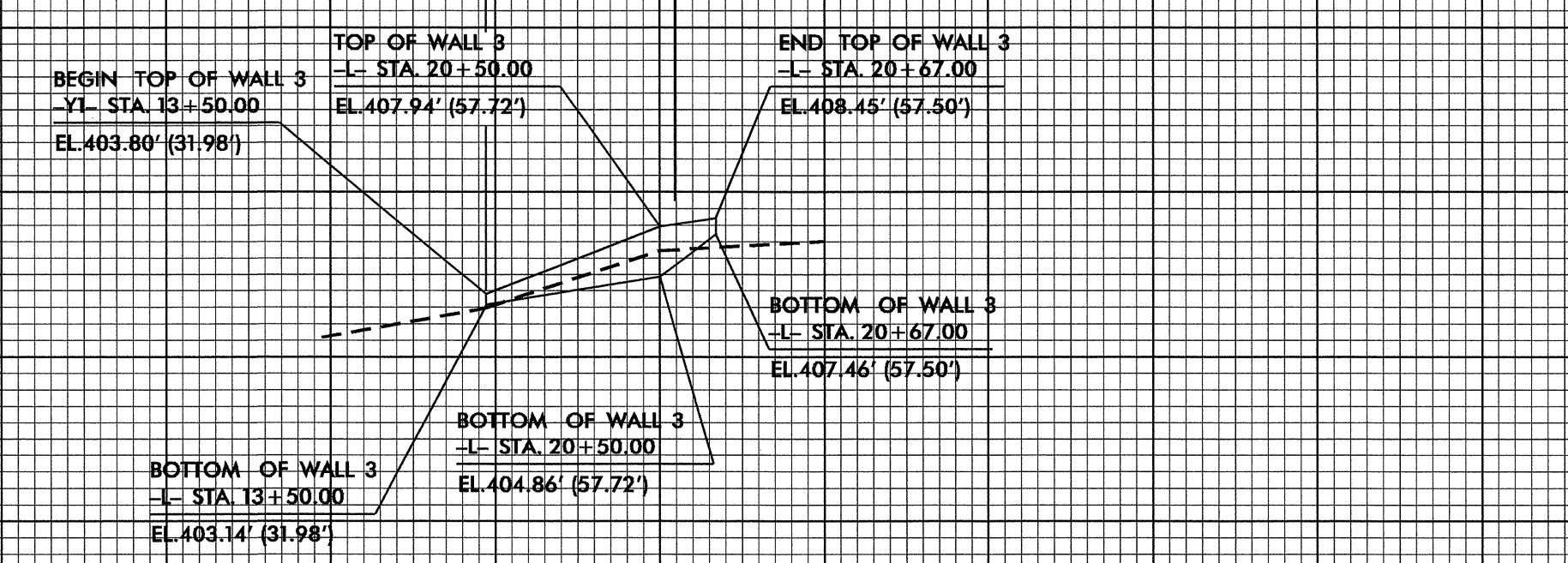
08-APR-2004 11:05  
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 spell - R1 05200555





**BILL OF MATERIAL**

GRAVITY RETAINING WALL AT -L- STA 12+14.25	181 SQ. FT.
GRAVITY RETAINING WALL AT -L- STA 13+44.50	61 SQ. FT.
GRAVITY RETAINING WALL AT -YI- STA 13+50.00	168 SQ. FT.



WALL ALIGNMENT STATION	REFERENCE STATION	OFFSET TO FACE OF WALL (FT.)	EXISTING GROUND ELEV.	TOP OF WALL ELEV.	BOTTOM OF WALL ELEV.	DESIGN WALL HEIGHT (FT.)
<b>WALL 1</b>						
10+00.00	12+14.25	-L-	378.12	378.62	377.10	1.52
10+13.75	12+28.00	+L-	379.48	379.98	377.75	2.23
10+26.25	12+39.50	-L-	381.47	381.97	378.29	3.68
10+61.25	12+75.50	-L-	382.54	383.04	379.99	3.05
<b>WALL 2</b>						
10+00.00	13+44.50	-L-	384.78	385.28	383.15	2.11
10+33.50	13+78.00	-L-	385.70	386.20	384.68	1.52

WALL ALIGNMENT STATION	REFERENCE STATION	OFFSET TO FACE OF WALL (FT.)	EXISTING GROUND ELEV.	TOP OF WALL ELEV.	BOTTOM OF WALL ELEV.	DESIGN WALL HEIGHT (FT.)
<b>WALL 3</b>						
10+00.00	13+50.00	-YI-	31.98	402.96	404.30	1.16
10+52.78	20+30.00	-L-	57.72	406.46	408.44	3.58
10+69.78	20+67.00	-L-	57.90	406.65	408.95	1.49

SEE SHEET 4 FOR PLAN VIEW  
 SEE SHEET 2-B FOR PIPE HANDRAIL DETAIL  
 SEE SHEET 2-F FOR GRAVITY WALL DETAIL

REVISIONS

8/17/99  
 12-FEB-2007 10:16  
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 \$\$\$USERNAME\$\$\$

NOTES

FOR GRAVITY RETAINING WALLS, SEE SECTION 453 OF THE STANDARD SPECIFICATIONS.

THE GRAVITY RETAINING WALL IS BASED ON THE FOLLOWING IN-SITU ASSUMED SOIL PARAMETERS:  
 TOTAL UNIT WEIGHT = 120 PCF (18.8 kN/m<sup>3</sup>)  
 COHESION = 0 PSF (0 kPa)  
 FRICTION ANGLE = 35 DEGREES (GROUNDWATER WITHIN 5'-0" (1.5m) OF BOTTOM OF FOOTING)  
 FRICTION ANGLE = 30 DEGREES (GROUNDWATER MORE THAN 5'-0" (1.5m) BELOW BOTTOM OF FOOTING)

DO NOT USE A GRAVITY RETAINING WALL IF THE ASSUMED SOIL PARAMETERS ARE NOT APPLICABLE OR GROUNDWATER IS ABOVE THE BOTTOM OF FOOTING.

DO NOT USE A GRAVITY RETAINING WALL WHEN VERY LOOSE OR SOFT SOIL OR MUCK IS PRESENT BELOW THE WALL.

DO NOT PLACE CONCRETE UNTIL OBTAINING APPROVAL OF THE EXCAVATION DEPTH AND CHECKING FOUNDATION MATERIAL FOR IN-SITU ASSUMED SOIL PARAMETERS.

USE CLASS "A" CONCRETE AND PROVIDE CLASS I SURFACE FINISH FOR ALL EXPOSED SURFACES.

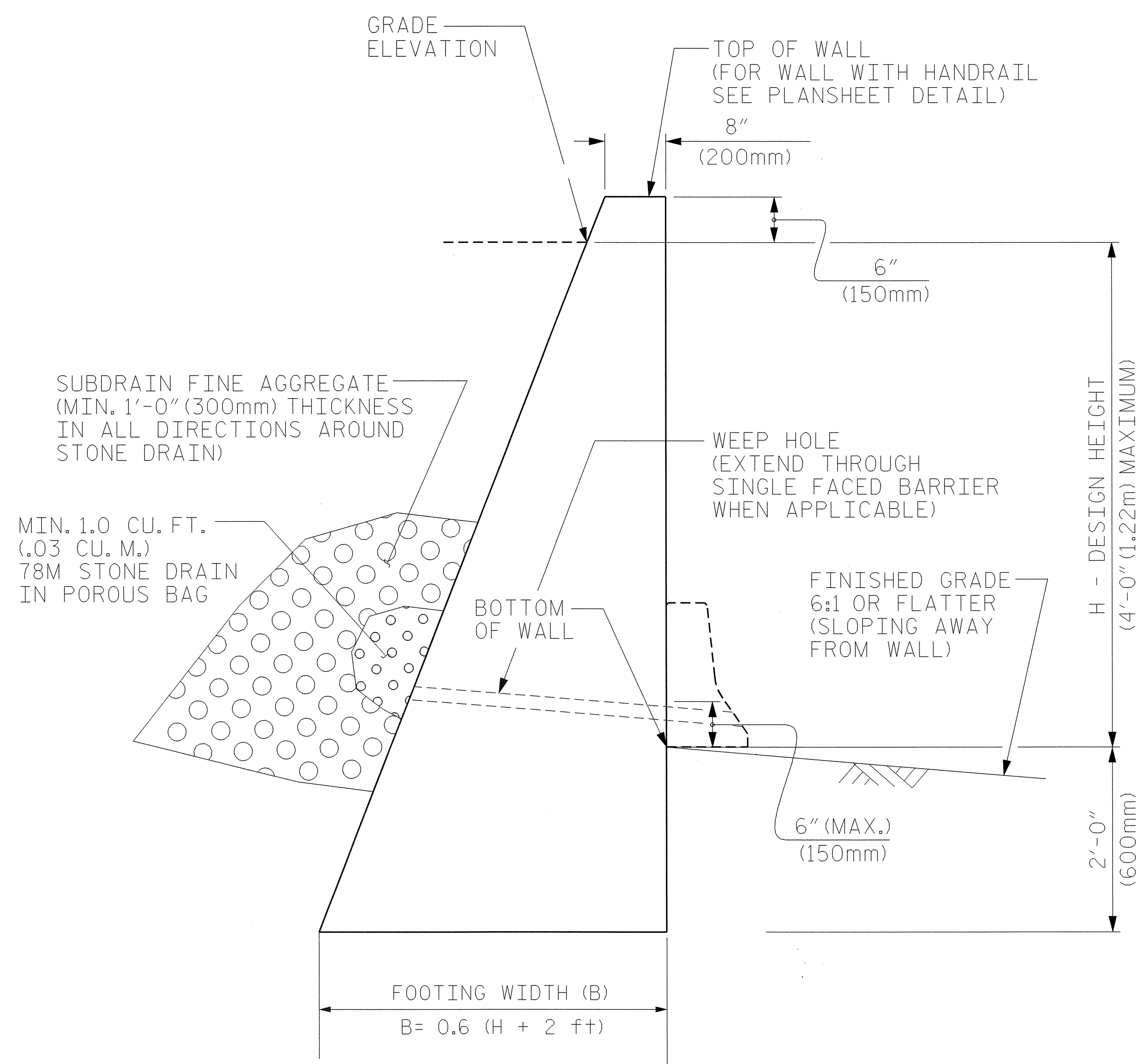
PROVIDE 3" (75mm) DIAMETER WEEP HOLES ON 10'-0" (3m) CENTERS ALONG WALL. SLOPE WEEP HOLES ON A 1" (25mm) PER FOOT (300mm) SLOPE THROUGH THE WALL SO THAT WATER DRAINS OUT OF THE FRONT OF THE WALL.

CONSTRUCT A HORIZONTAL DRAIN IN SUBDRAIN FINE AGGREGATE AT LEAST 1'-0" (300mm) TALL AND 1'-0" (300mm) WIDE TO CONNECT ALL STONE DRAINS.

PROVIDE GROOVED CONTRACTION JOINTS EVERY 10'-0" (3m) AND EXPANSION JOINTS EVERY 30'-0" (9m) ALONG THE WALL.

DO NOT BACKFILL BEHIND WALL UNTIL CONCRETE DEVELOPS A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI (20.7 MPa). COMPACT BACKFILL IN ACCORDANCE WITH SUBARTICLE 235-4(C) OF THE STANDARD SPECIFICATIONS. PLACE BACKFILL WITHIN 3'-0" (1m) OF THE BACK OF THE WALL WITH HAND OPERATED EQUIPMENT. DO NOT OPERATE HEAVY EARTH MOVING EQUIPMENT WITHIN 10'-0" (3m) OF THE BACK OF WALL.

SEE PREVIOUS SHEET(S) FOR PLAN AND PROFILE VIEW (WALL ENVELOPE) AND PROPOSED ELEVATIONS FOR GRAVITY RETAINING WALL(S).



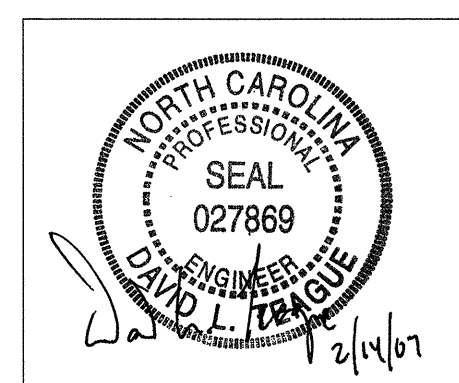
TYPICAL SECTION

PROJECT NO. U-4010  
DURHAM COUNTY  
 STATION: SEE SHEET 2-E

SHEET OF

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

GRAVITY  
 RETAINING  
 WALL



ASSEMBLED BY :	DATE :
CHECKED BY :	DATE :
DRAWN BY : NTR 2/07	REV.
CHECKED BY : DLT 2/07	

REVISIONS						TOTAL SHEETS
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			



STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

## SUMMARY OF PAVEMENT REMOVAL

IN SQUARE YARDS

SURVEY LINE	LOCATION	QUANTITY
-Y2- STA. 10+22.88 TO STA. 13+19.24	LT.	474.3 SY
-L- STA. 21+25.00 TO STA. 24+36.86 *	LT.	262.5 SY
-L- STA. 24+95.11 TO STA. 27+00.00 *	LT.	171.1 SY
PER GEO TECH. RECOMMENDATION	(CONTINGENCY)	500.0 SY
PROJECT TOTAL		1407.9 SY
SAY:		1410.0 SY

\* TEMPORARY PAVEMENT (SEE TCP PLANS)

## SUMMARY OF EARTHWORK

IN CUBIC YARDS

LOCATION	UNCLASSIFIED EXCAVATION	EMBT+%	BORROW	WASTE
-L- LT. 10+00.00 TO 15+00.00	1011	7	0	1004
-L- LT. 15+50.00 TO 20+00.00	540	101	0	439
-L- LT. 20+00.00 TO 24+00.00	190	325	135	0
-L- RT. 10+00.00 TO 19+50.00	303	298	0	5
-L- RT. 20+50.00 TO 23+50.00	68	29	0	39
-RPD- 10+00.00 TO 10+80.00	98	31	0	67
-Y- 10+50.00 TO 11+80.00	109	25	0	84
-Y1- 10+00.00 TO 12+00.00	91	50	0	41
-Y1- 13+50.00 TO 15+00.00	50	182	132	0
<b>SUBTOTAL NO. 1</b>	<b>2460</b>	<b>1048</b>	<b>267</b>	<b>1679</b>
-L- LT. 24+00.00 TO 30+00.00	157	224	67	0
-L- RT. 23+50.00 TO 30+00.00	124	174	50	0
-Y2- 10+50.00 TO 15+20.00	97	752	655	0
<b>SUBTOTAL NO. 2</b>	<b>378</b>	<b>1150</b>	<b>772</b>	<b>0</b>
<b>PROJECT SUBTOTALS</b>	<b>2838</b>	<b>2198</b>	<b>1039</b>	<b>1679</b>
LOSS DUE TO CLEAR. & GRUBBING	-150			-150
ADDITIONAL UNDERCUT EXCAV.	0	0	0	0
WASTE IN LIEU OF BORROW			-1039	-1039
<b>PROJECT TOTALS</b>	<b>2688</b>	<b>2198</b>	<b>0</b>	<b>490</b>
REPLACE TOP SOIL BORROW PITS	0			
<b>GRAND TOTALS</b>	<b>2688</b>	<b>2198</b>	<b>0</b>	<b>490</b>
SAY	2700		0	

UNDERCUT EXCAVATION = 1500 CUBIC YARDS (CONTINGENCY ITEM)  
DRAINAGE DITCH EXCAVATION = 2 CUBIC YARDS

APPROXIMATE QUANTITIES ONLY. UNCLASSIFIED EXCAVATION, BORROW EXCAVATION, SHOULDER BORROW, FINE GRADING, CLEARING AND GRUBBING, BREAKING OF EXISTING PAVEMENT AND REMOVAL OF EXISTING PAVEMENT WILL BE PAID FOR AT THE LUMP SUM PRICE FOR "GRADING".

NOTE: 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.

## SUMMARY OF CHAIN LINK FENCE

SURVEY LINE	LOCATION	FABRIC (FEET)	LINE POST	TERMINAL POST
-L- STA 12+91.55	LT.	19.26	2	2
<b>PROJECT TOTAL</b>		<b>19.26</b>	<b>2</b>	<b>2</b>
SAY:		25.0 FT.	2 EACH	2 EACH

## SUMMARY OF MILLING ASPHALT PAVEMENT

LINE	STA. TO STA.	LOCATION	VARIABLE 2.5" TO 3" SQ. YARDS	INCIDENTAL SQ. YARDS
-L-	10+00.00 TO 23+58.49	LT.	1696.51	
-L-	23+93.17 TO 29+70.00	LT.	706.21	
-L-	10+00.00 TO 23+50.28	RT.	1662.15	
-L-	23+84.82 TO 29+70.00	RT.	714.03	
-Y1-	10+67.00 TO 12+39.81	CL.	534.94	
-L-	10+00.00 TO 11+00.00	CL.		158.24
-L-	12+00.00 TO 13+50.00	CL.		192.30
-L-	15+50.00 TO 23+53.00	CL.		925.41
-L-	25+50.00 TO 27+00.00	CL.		123.23
-L-	28+50.00 TO 29+70.00	CL.		202.27
-RPD-	10+70.00 TO 10+80.00	LT.		5.78
-RPD-	10+70.00 TO 10+80.00	RT.		6.74
-Y-	10+50.00 TO 11+80.00	CL.		252.09
-Y1-	10+50.00	CL.		49.70
-Y1-	13+50.00 TO 14+60.00	CL./RT.		173.58
-Y2-	13+50.00 TO 15+10.00	LT./CL.		226.82
<b>TOTAL</b>			<b>5313.85</b>	<b>2316.16</b>
SAY			5320	2320



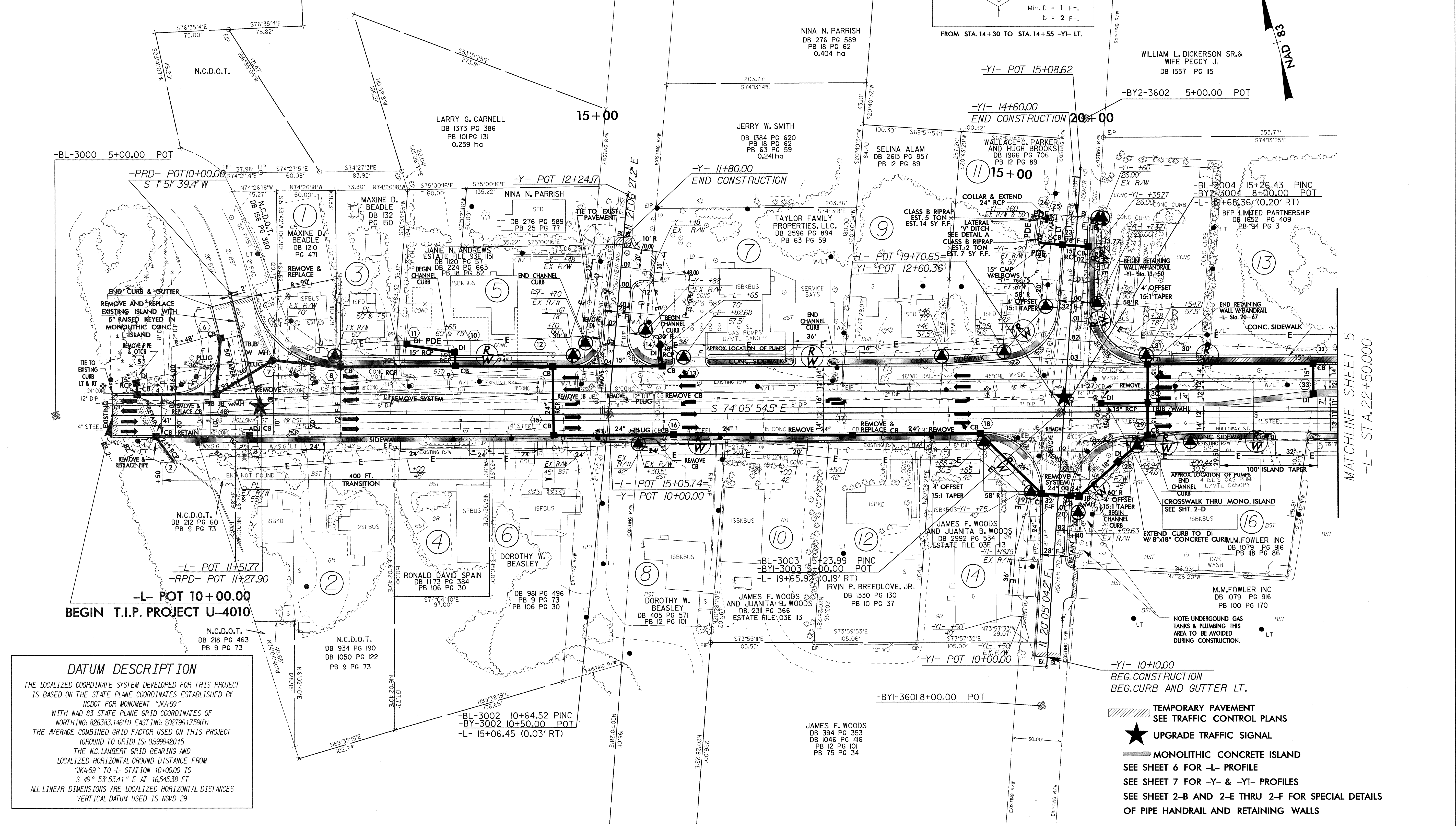
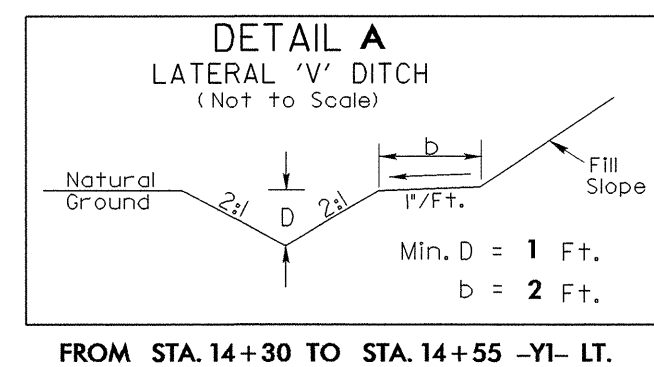
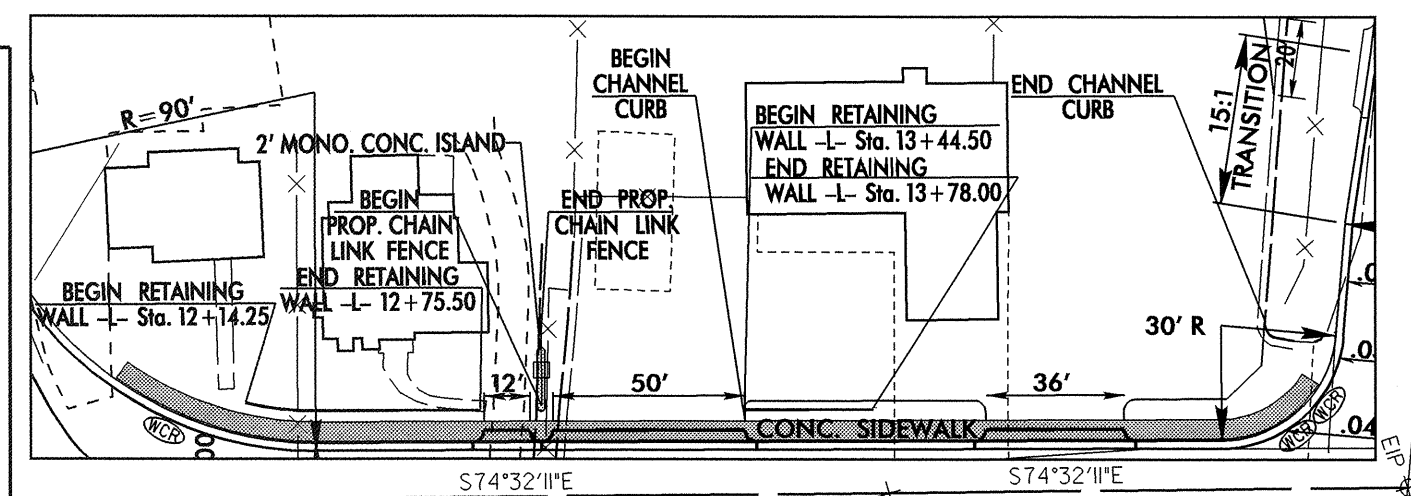
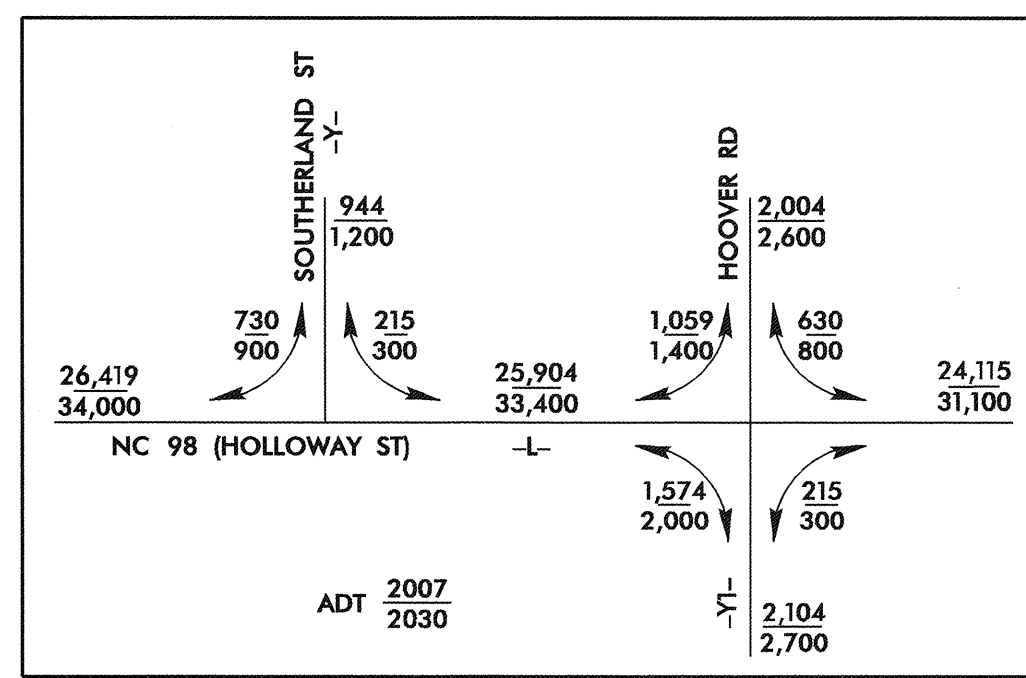








PROJECT REFERENCE NO. U-4010	SHEET NO. 4
ROADWAY DESIGN ENGINEER NORTH CAROLINA PROFESSIONAL SEAL VIN E. MOORE 2-14-07	HYDRAULICS ENGINEER NORTH CAROLINA PROFESSIONAL SEAL MAX S. PRICE 2/14/07



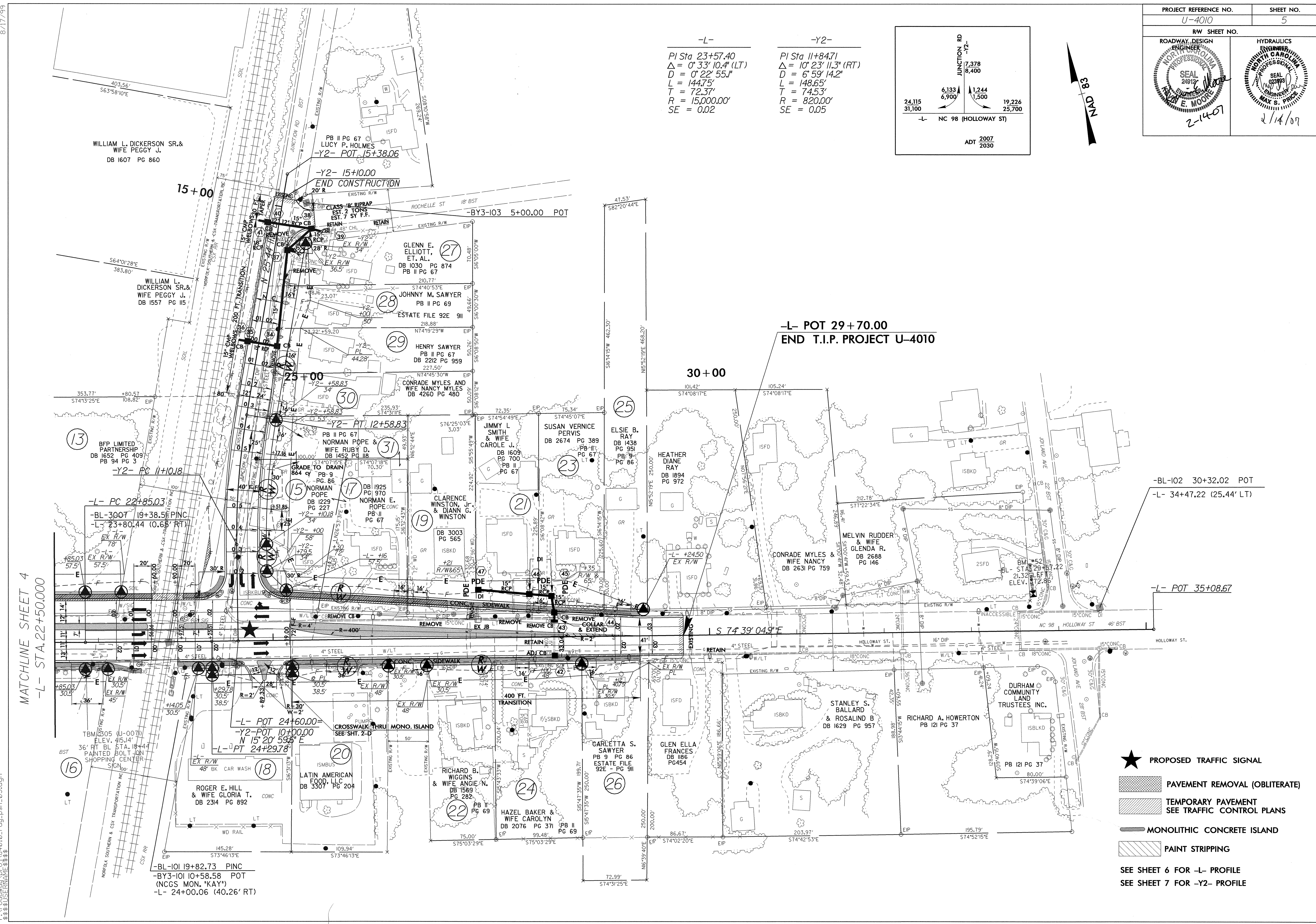
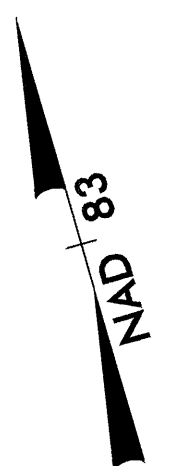
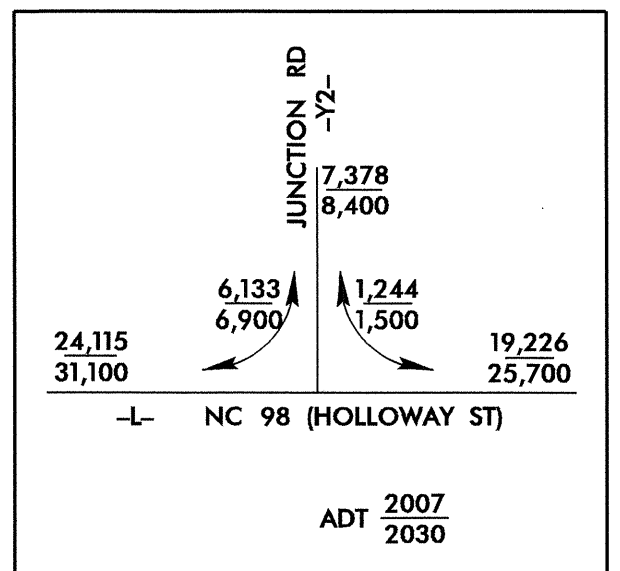
**DATUM DESCRIPTION**  
 THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "JKA-59"  
 WITH NAD 83 STATE PLANE GRID COORDINATES OF  
 NORTHING: 826383.146(11) EASTING: 202796.175(11)  
 THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.999942015  
 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "JKA-59" TO L- STATION 10+00.00 IS  
 S 49° 53' 53.41" E AT 16545.38 FT  
 ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES  
 VERTICAL DATUM USED IS NGVD 29

- TEMPORARY PAVEMENT  
SEE TRAFFIC CONTROL PLANS
- ★ UPGRADE TRAFFIC SIGNAL
- MONOLITHIC CONCRETE ISLAND  
SEE SHEET 6 FOR -L- PROFILE  
SEE SHEET 7 FOR -Y- & -YI- PROFILES  
SEE SHEET 2-B AND 2-E THRU 2-F FOR SPECIAL DETAILS  
OF PIPE HANDRAIL AND RETAINING WALLS

PROJECT REFERENCE NO.	SHEET NO.
U-4010	5
RW SHEET NO.	
ROADWAY DESIGN ENGINEER NORTH CAROLINA PROFESSIONAL SEAL 24912 E. MOORE 2-14-07	HYDRAULICS ENGINEER NORTH CAROLINA PROFESSIONAL SEAL 02893 WAYNE S. PRICE 2/14/07

-L-  
 PI Sta 23+57.40  
 $\Delta = 0^\circ 33' 10.4" (LT)$   
 $D = 0^\circ 22' 55.1"$   
 $L = 144.75'$   
 $T = 72.37'$   
 $R = 15,000.00'$   
 $SE = 0.02$

-Y2-  
 PI Sta 11+84.71  
 $\Delta = 10^\circ 23' 11.3" (RT)$   
 $D = 6^\circ 59' 14.2"$   
 $L = 148.65'$   
 $T = 74.53'$   
 $R = 820.00'$   
 $SE = 0.05$



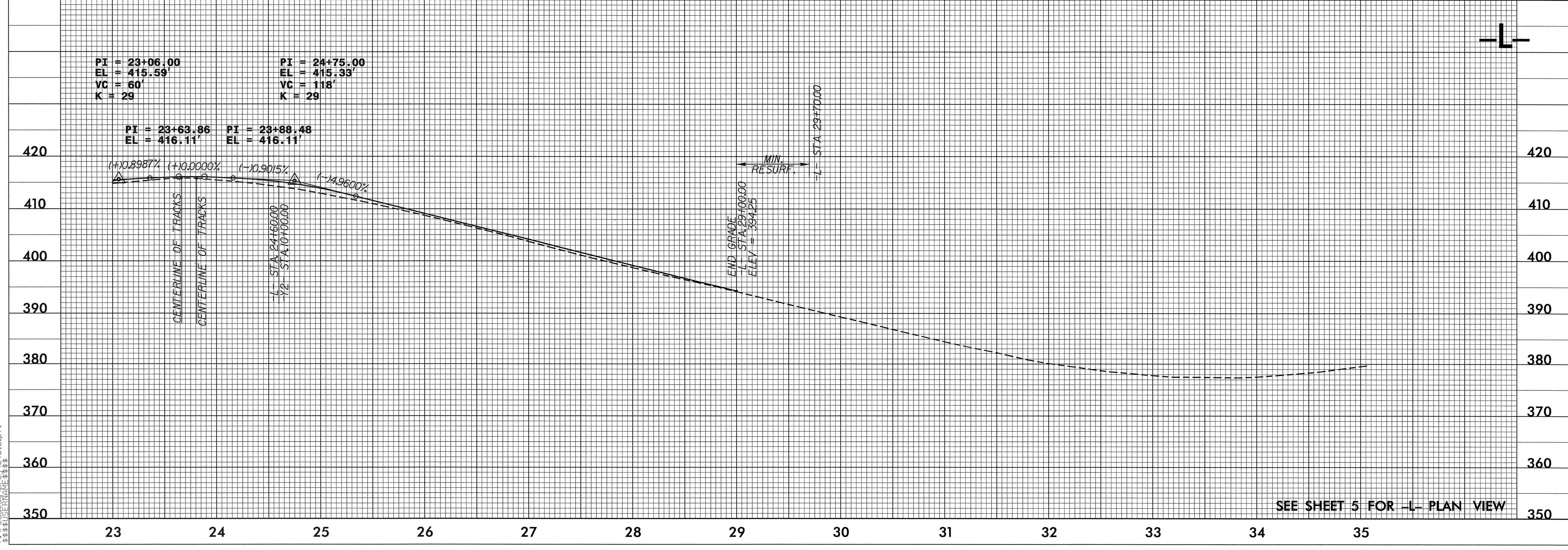
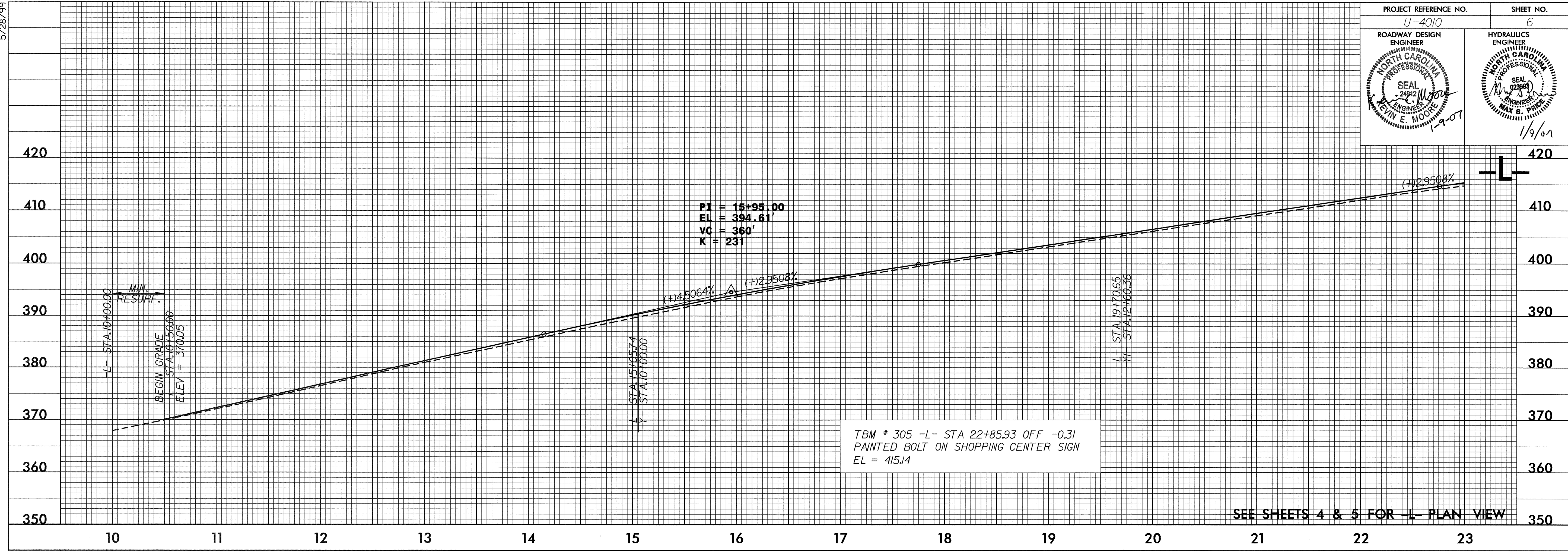
MATCHLINE SHEET 4  
 -L- STA. 22+50.00

- ★ PROPOSED TRAFFIC SIGNAL
  - [Hatched Box] PAVEMENT REMOVAL (OBLITERATE)
  - [Dotted Box] TEMPORARY PAVEMENT  
SEE TRAFFIC CONTROL PLANS
  - [Solid Grey Box] MONOLITHIC CONCRETE ISLAND
  - [Diagonal Lines Box] PAINT STRIPPING
- SEE SHEET 6 FOR -L- PROFILE  
 SEE SHEET 7 FOR -Y2- PROFILE

5/28/99

PROJECT REFERENCE NO. U-4010	SHEET NO. 6
ROADWAY DESIGN ENGINEER NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 28912 KEVIN E. MOORE 1-9-07	HYDRAULICS ENGINEER NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 02384 MAX S. PERRY 1/9/07

DESIGN REVISION-REVISED GRADE ON -L- STATIONS 15+95.00 TO 29+00.00 FROM 10/25/06

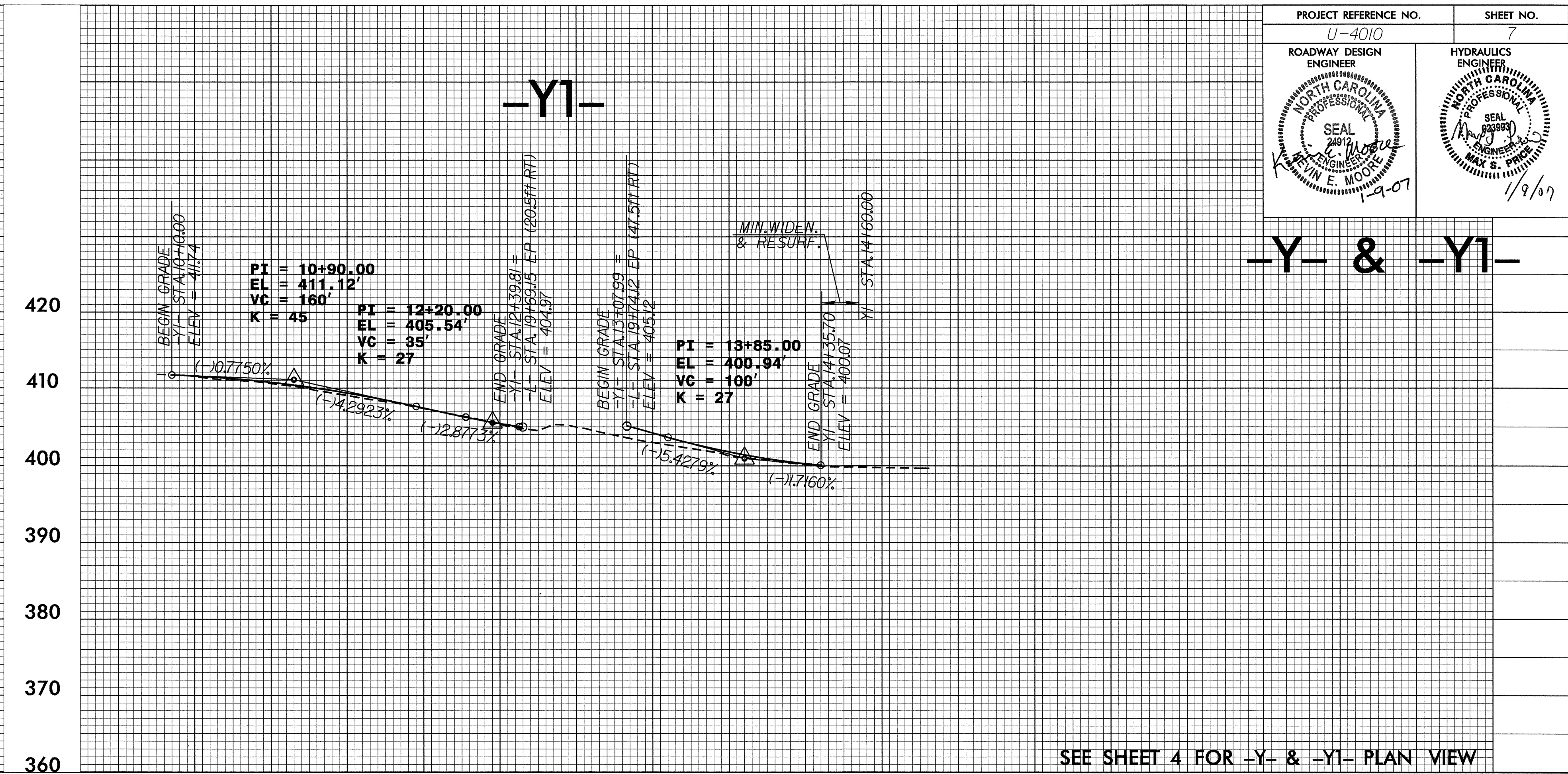
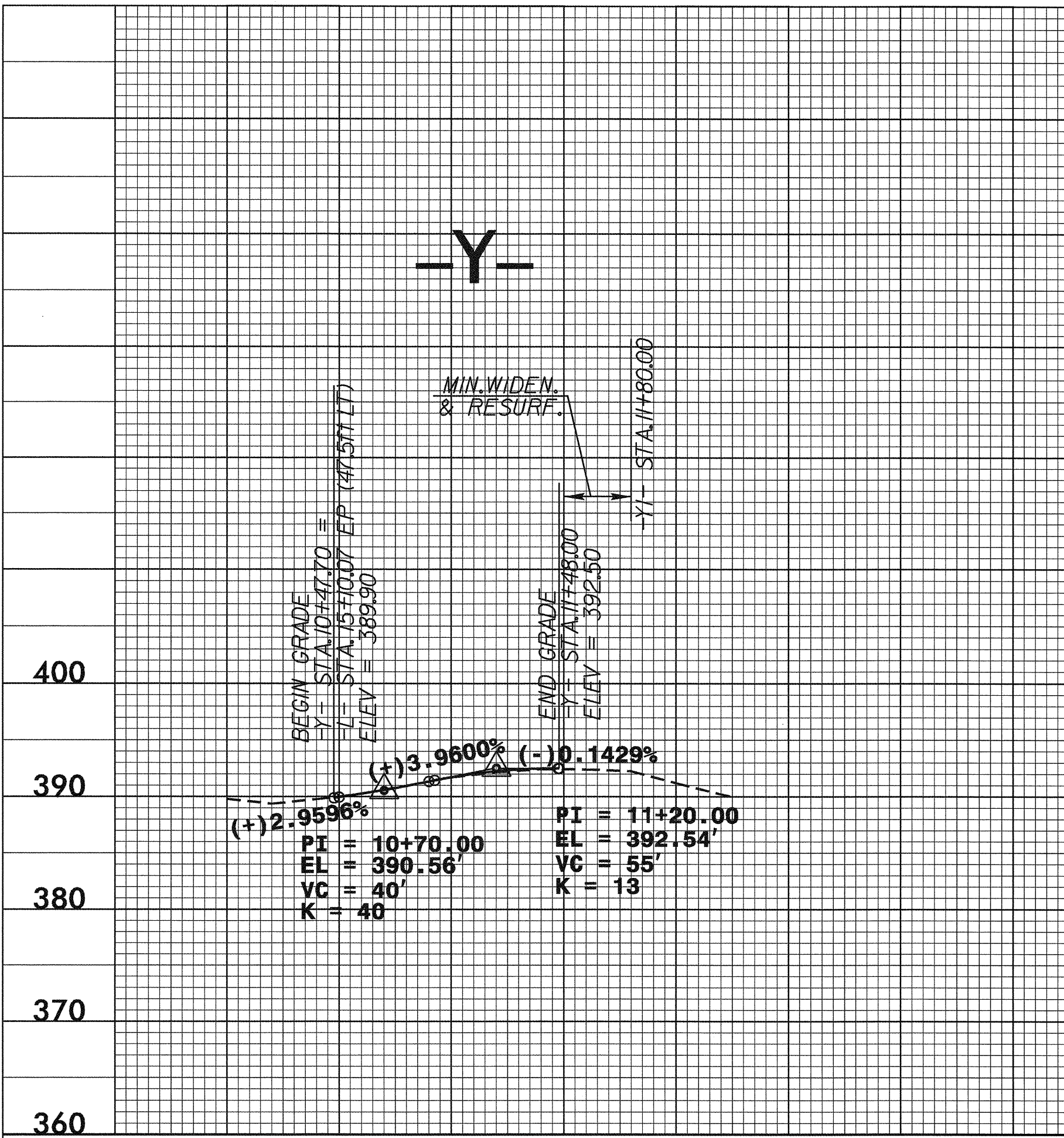


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5/28/99

DESIGN REVISION: REVISED GRADE ON -Y2- frm 10/25/06

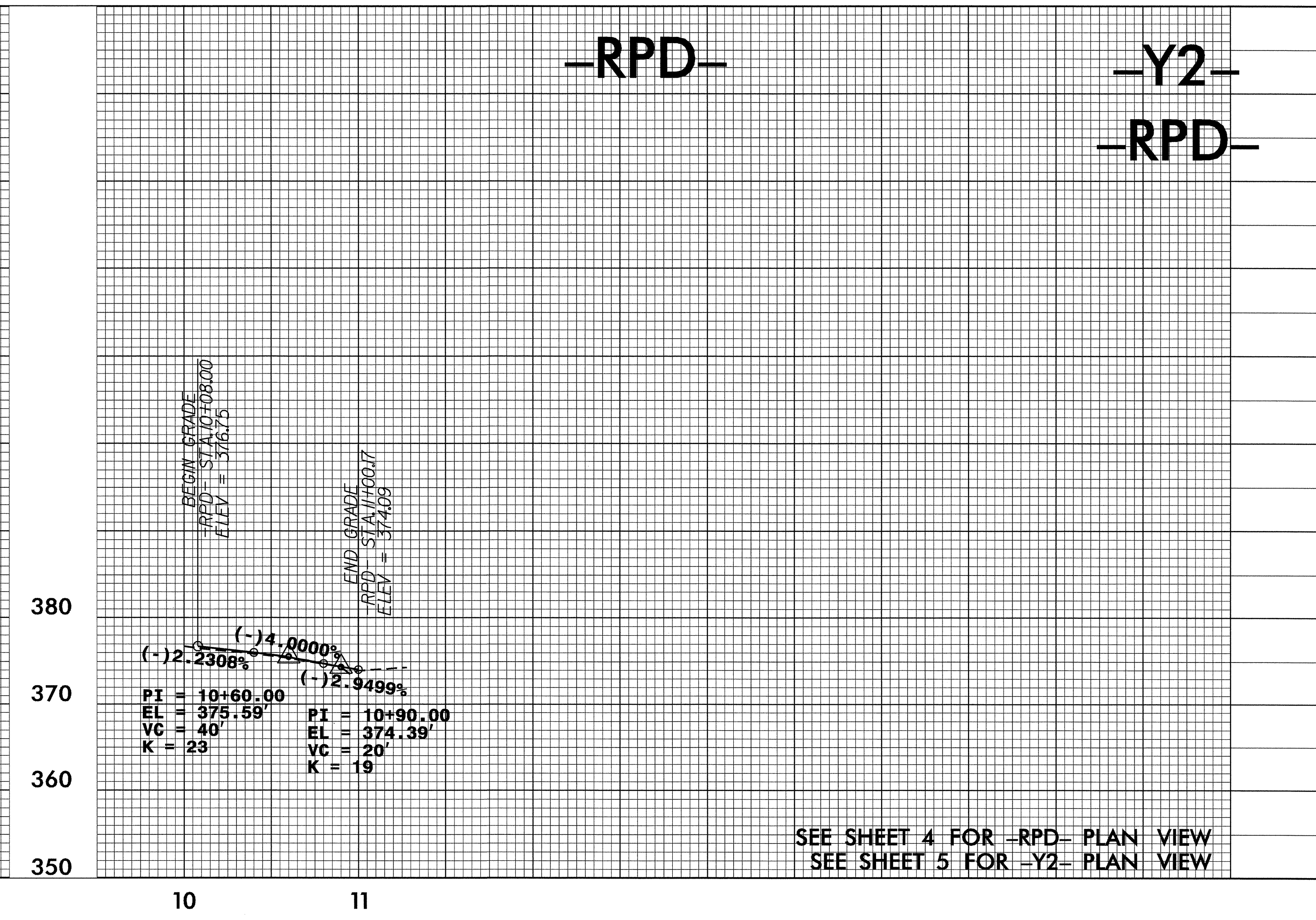
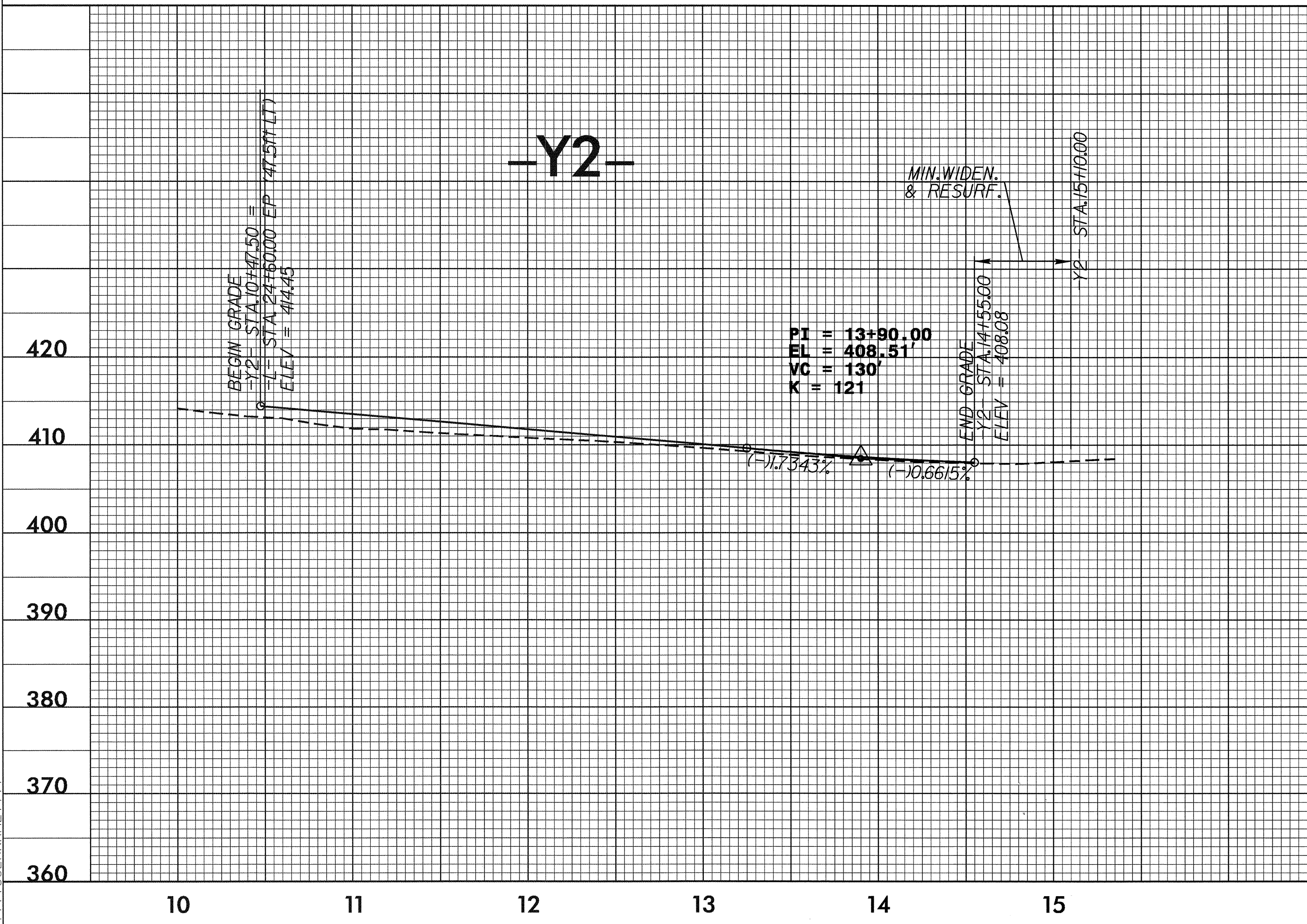
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PROJECT REFERENCE NO. U-4010	SHEET NO. 7
ROADWAY DESIGN ENGINEER NORTH CAROLINA PROFESSIONAL SEAL VIN E. MOOR 1-9-07	HYDRAULICS ENGINEER NORTH CAROLINA PROFESSIONAL SEAL MAX S. PRIGG 1/9/07

**-Y- & -Y1-**

SEE SHEET 4 FOR -Y- & -Y1- PLAN VIEW



SEE SHEET 4 FOR -RPD- PLAN VIEW  
SEE SHEET 5 FOR -Y2- PLAN VIEW