

09/28/09

See Sheet 1-A For Index of Sheets
See Sheet 1-A For Index of Sheets

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

FORSYTH COUNTY

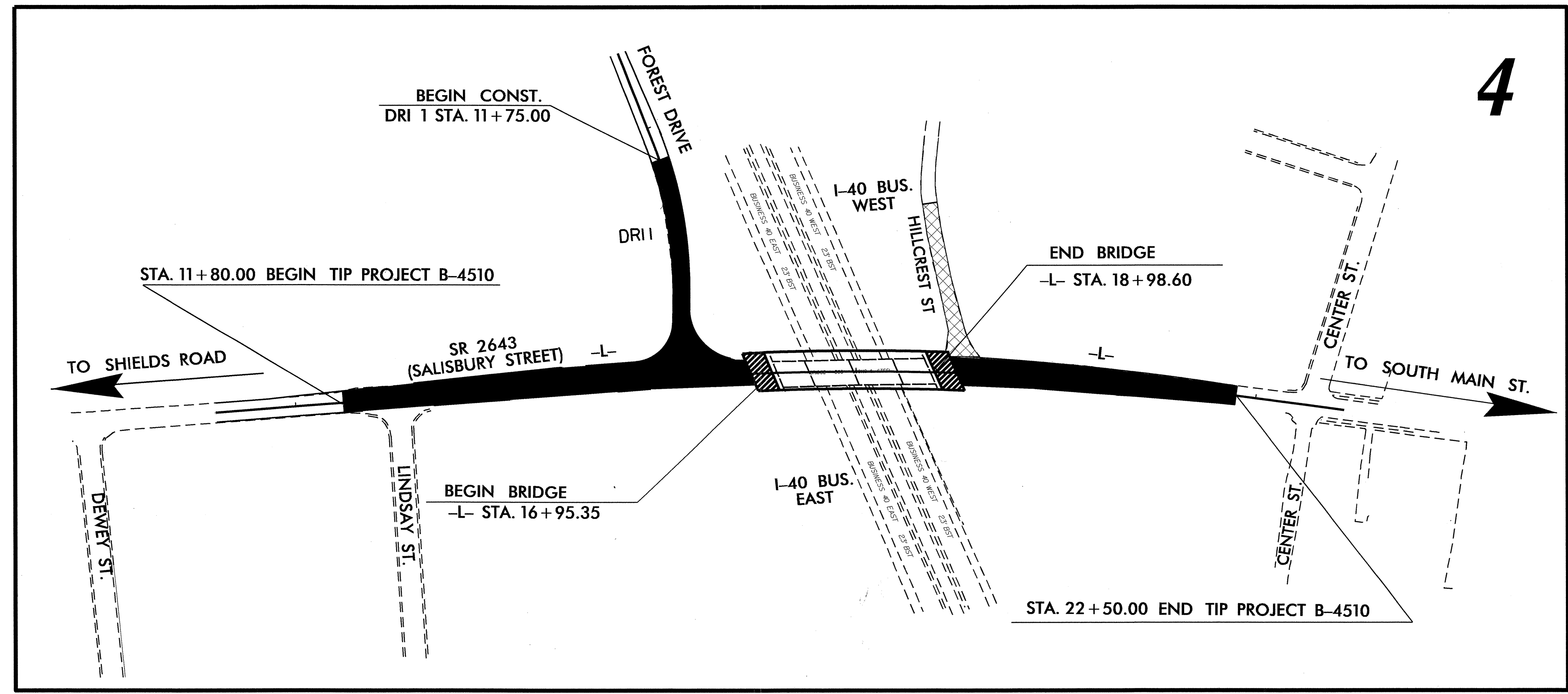
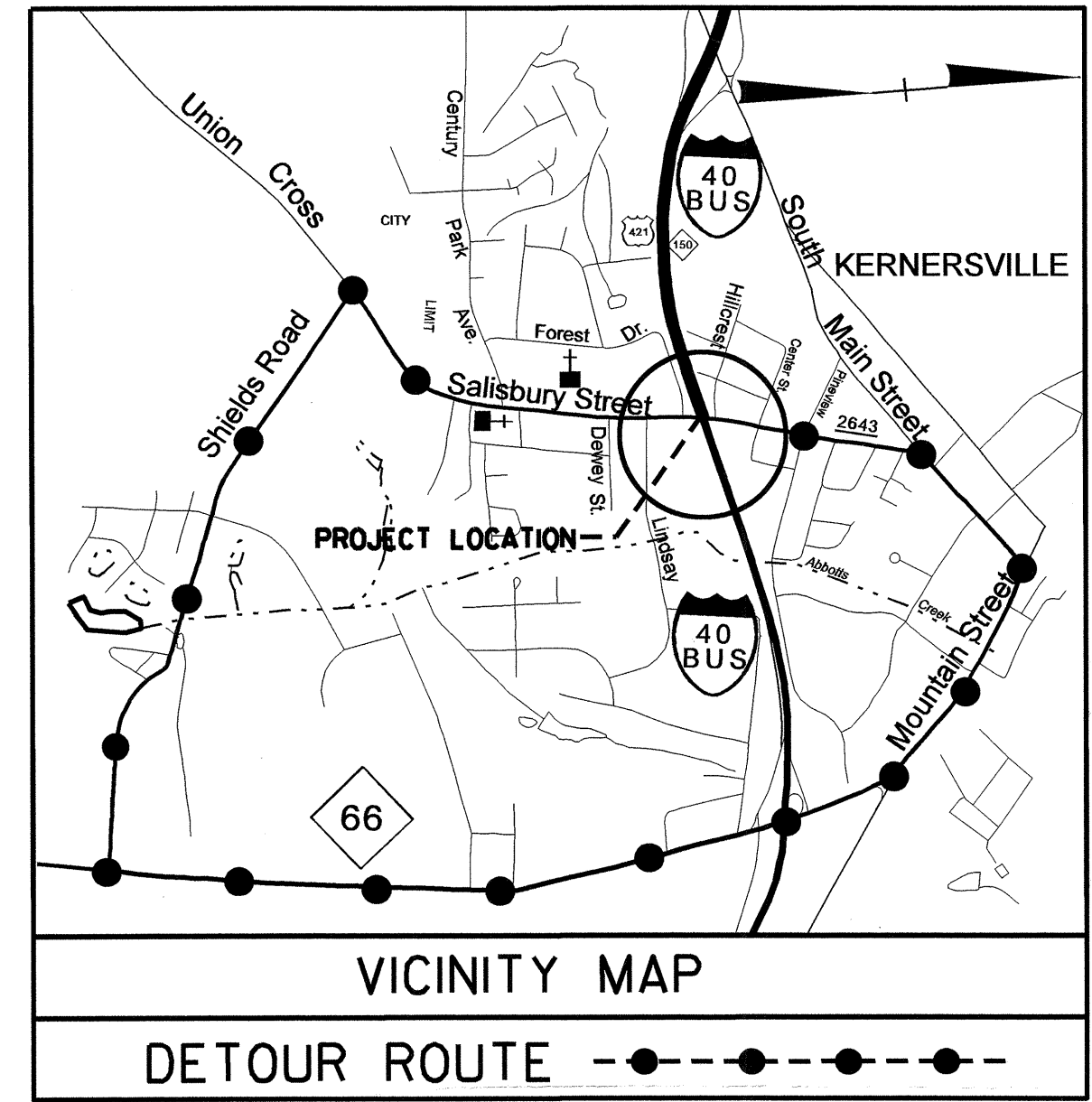
LOCATION: BRIDGE No. 368 OVER I40 BUSINESS ON SR 2643

TYPE OF WORK: GRADING, DRAINAGE, STRUCTURE, PAVING, WALLS

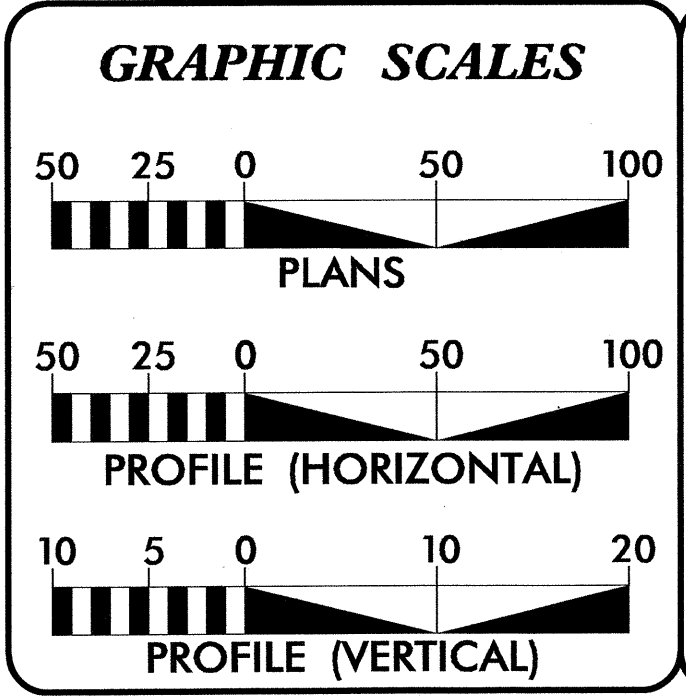
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4510	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
33737.1.1	BRSTP-2643(1)	PE	
33737.2.1	BRSTP-2643(1)	RW & UTILITY	
33737.3.1	BRSTP-2643(4)	CONSTR.	

TIP PROJECT: B-4510

CONTRACT: C202601



4



DESIGN DATA

ADT 2010	=	11,568
ADT 2035	=	16,300
DHV	=	10 %
D	=	60 %
T	=	3 % *
V	=	40 MPH
* TTST	=	1% DUAL 2%
FUNC CLASS	=	URBAN COLLECTOR
STATEWIDE TIER	=	

PROJECT LENGTH

LENGHT OF ROADWAY TIP PROJECT B-4510	=	0.165 MILES.
LENGHT OF STRUCTURE TIP PROJECT B-4510	=	0.038 MILES.
TOTAL LENGHT OF TIP PROJECT B-4510	=	0.203 MILES.

THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF THE TOWN OF KERNERSVILLE.

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

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: MAY 14, 2009

LETTING DATE: SEPTEMBER 20, 2011

JIMMY GOODNIGHT, PE
PROJECT ENGINEER

STEVE KENDALL, PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

Signature: *Steve Kendall*

ROADWAY DESIGN

Signature: *Jimmy Goodnight*

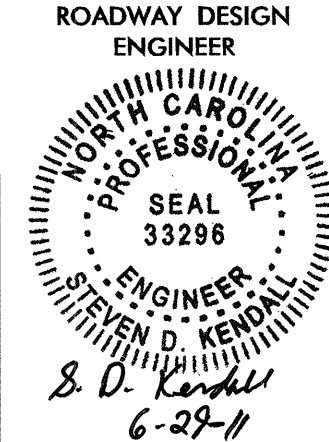
DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

Art McMiller
STATE HIGHWAY DESIGN ENGINEER P.E.

20-JUN-2011 09:45
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\$\$\$\$\$USERNAME\$\$\$\$\$

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO. B-4510 SHEET NO. 1-A



**2006 ROADWAY ENGLISH
STANDARD DRAWINGS**

GENERAL NOTES

INDEX OF SHEETS

EFF. 07-18-06
REV. 01-02-07

2006 SPECIFICATIONS
EFFECTIVE: 07-18-06
REVISED: 07-18-06

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

GRADE LINE:

GRADING AND SURFACING:

THE GRADE LINES SHOWN DENOTE THE FINISH ELEVATION OF THE PROPOSED SURFACING AT GRADE POINTS SHOWN ON THE TYPICAL SECTIONS. GRADE LINES MAY BE ADJUSTED AT THEIR BEGINNING AND ENDING AND AT STRUCTURES AS DIRECTED 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. 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 ITEM INVOLVED.

UNDERDRAINS:

UNDERDRAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. 815.03 AT LOCATIONS DIRECTED BY THE ENGINEER.

DRIVEWAYS:

DRIVEWAYS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. 848.02 USING 3' RADIUS 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".

SUBSURFACE PLANS:

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

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: A.T.&T., DUKE ENERGY, PIEDMONT NATURAL GAS, CITY/COUNTY UTILITY COMMISSION OF WINSTON-SALEM & FORSYTH COUNTY, TOWN OF KERNERSVILLE

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 THE DETAILS SHOWN IN THE PLANS.

SHEET No.	SHEET
1	TITLE SHEET
1-A	INDEX OF SHEETS, GENERAL NOTES AND LIST OF STANDARD DRAWINGS
1-B	CONVENTIONAL SYMBOLS
1-C THRU 1-D	SURVEY CONTROL SHEET
2 THRU 2-A	TYPICAL SECTIONS, PAVEMENT SCHEDULE, AND WEDGING DETAILS
2-B	STANDARD TEMPORARY SHORING
2-C & 2-D	METHOD OF PIPE INSTALLATION
2-E	GRAVITY RETAINING WALL
2-F	STANDARD GRAVITY RETAINING WALL
2-G	CHAIN LINK FENCE ON RETAINING WALL
2-H THRU 2-J	CURB RAMP, CURB RAMP NOTES & CURB RAMP SPECIAL DETAILS.
2-K	ANCHORAGE FOR FRAMES
3	SUMMARY OF QUANTITIES
3A	DRAINAGE SUMMARY SHEET STATEWIDE (48" & UNDER)
3B	GUARDRAIL SUMMARY EARTHWORK SUMMARY
	REMOVAL OF EXIST. ASPHALT PAVEMENT
	REMOVAL OF EXIST. CONCRETE PAVEMENT
	BREAKING OF EXIST. ASPHALT PAVEMENT
	PROPOSED CHAIN LINK FENCE
4	PLAN SHEET
5	PROFILE SHEET
TMP-1 THRU TMP-11	TRANSPORTATION MANAGEMENT PLANS
PMP-1 THRU PMP-2	PAVEMENT MARKING PLANS
SIGN-1 THRU SIGN-3	SIGNING PLANS
SD-1	SPECIAL SIGN DESIGN
EC-1 THRU EC-4	EROSION CONTROL PLANS
UC-1 THRU UC-5	UTILITIES CONSTRUCTION PLANS
UO-1 THRU UO-2	UTILITIES BY OTHERS PLANS
X-1	CROSS-SECTION SUMMARY
X-2 THRU X-13	CROSS-SECTIONS
S-1 THRU S-35	STRUCTURE PLANS

STD.NO.	TITLE
DIVISION 2 – EARTHWORK	
200.03	Method of Clearing – Method III
225.02	Guide for Grading Subgrade – Secondary and Local
225.04	Method of Obtaining Superelevation – Two Lane Pavement
225.06	Method of Grading Sight Distance at Intersection.
DIVISION 4 – MAJOR STRUCTURES	
422.10	Reinforced Bridge Approach Fills
DIVISION 5 – SUBGRADE, BASES AND PAVEMENTS	
560.01	Method of Shoulder Construction – High Side of Superelevated Curve – Method I
DIVISION 6 – ASPHALT, BASES, AND PAVEMENTS	
610.03	Guide for Paving Shoulders Under Bridges – Method III
654.01	Pavement Repairs
DIVISION 8 – INCIDENTALS	
806.01	Concrete Right of Way Markers
806.02	Granite Right of Way Markers
815.03	Pipe Underdrain and Blind Drain
840.00	Concrete Base Pad for Drainage Structure
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"
840.15	Brick Drop Inlet – 12" thru 30"
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
840.24	Frames and Narrow Slot Sag Grates
840.27	Brick Grated Drop Inlet Type B – 12" thru 36" Pipe
840.45	Precast Drainage Structure
840.51	Brick Manhole – 12" thru 42" 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
846.01	Concrete Curb, Gutter and Curb & Gutter
848.01	Concrete Sidewalk
848.02	Driveway Turnout Radius
848.04	Street Turnout
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Unit
866.01	Chain Link Fence – 4', 5', and 6' High Fence
876.02	Guide for Rip Rap at Pipe Outlets

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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	○ EP
Property Corner	-----
Property Monument	□ ECM
Parcel/Sequence Number	(23)
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: Boundary or Site	☠ ☠
Potential Soil Contamination: Boundary or Site	☠ ☠

BUILDINGS AND OTHER CULTURE:

Gas Pump Vent or U/G Tank Cap	○
Sign	○ S
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	→ FLOW
False Sump	▭

RAILROADS:

Standard Gauge	-----
RR Signal Milepost	○ CSX TRANSPORTATION MILEPOST 35
Switch	□ 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	○ CR
Curb Cut Future Ramp	○ CCFR
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	▭ 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	○ S
Storm Sewer	-S-

UTILITIES:

POWER:	
Existing Power Pole	●
Proposed Power Pole	○
Existing Joint Use Pole	●
Proposed Joint Use Pole	○
Power Manhole	○ P
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	○ T
Telephone Booth	□ T
Telephone Pedestal	□ T
Telephone Cell Tower	⊗
U/G Telephone Cable Hand Hole	○ T
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	○ W
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	○ TV
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.	▭ UST
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.

DATUM DESCRIPTION

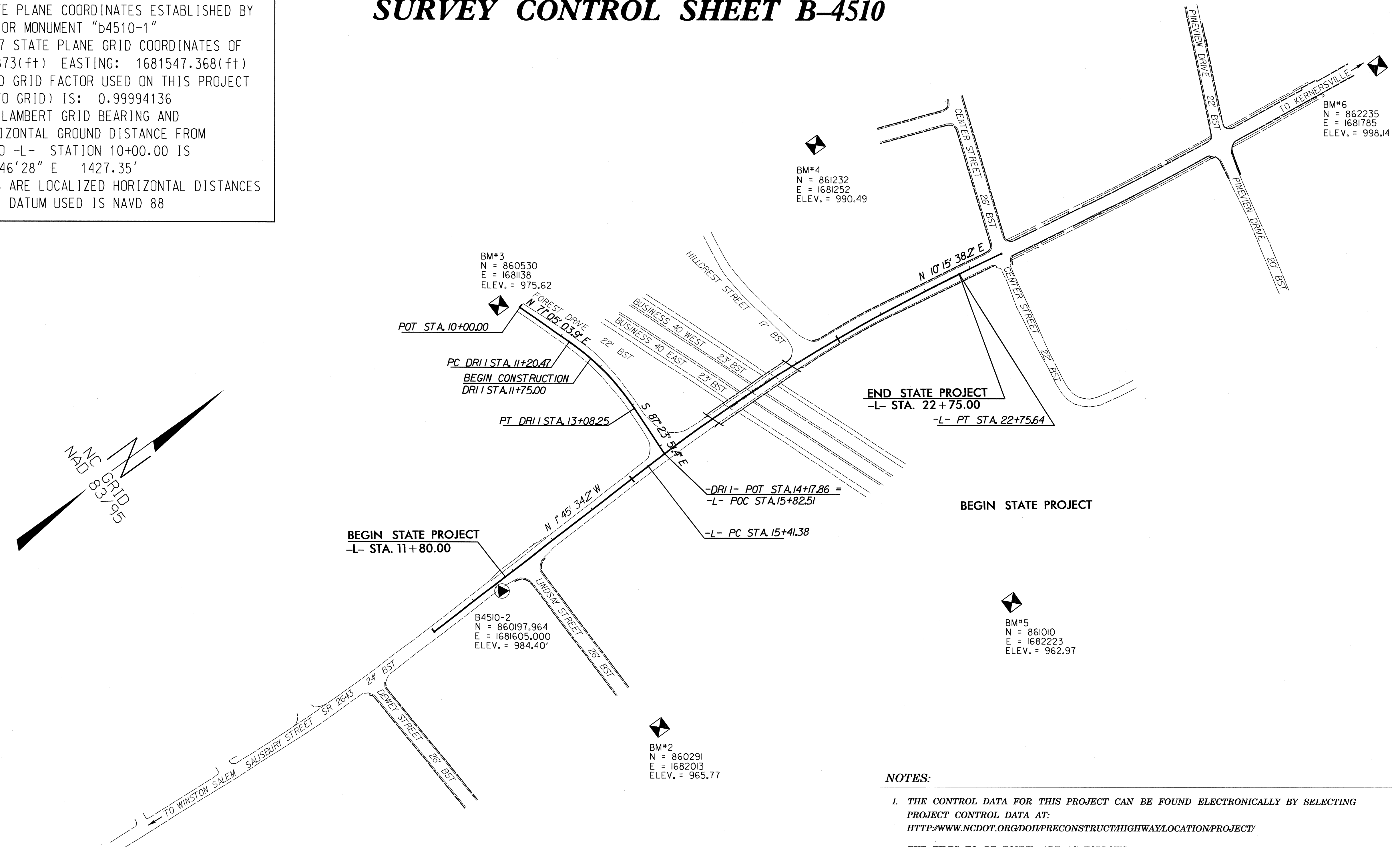
THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "b4510-1"

WITH NAD 83/95 2007 STATE PLANE GRID COORDINATES OF
 NORTHING: 858613.873(ft) EASTING: 1681547.368(ft)
 THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99994136

THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B4510-1" TO -L- STATION 10+00.00 IS
 N 1°46'28" E 1427.35'

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

STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS SURVEY CONTROL SHEET B-4510



NOTE: DRAWING NOT TO SCALE

NOTES:

- THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:
[HTTP://WWW.NCDOT.ORG/DOH/PRECONSTRUCT/HIGHWAYLOCATION/PROJECT/](http://www.ncdot.org/DOH/PRECONSTRUCT/HIGHWAYLOCATION/PROJECT/)
 THE FILES TO BE FOUND ARE AS FOLLOWS:
 B4510_LS_CONTROL_DATE.HTML
- SITE CALIBRATION INFORMATION HAS NOT BEEN PROVIDED FOR THIS PROJECT. 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 NGS ONLINE POSITIONING SERVICE (OPUS)
 SEE GPS CALIBRATION SHEET FOR HORIZONTAL AND VERTICAL COORDINATE VALUES.

B4510-1
 N = 858613.873
 E = 1681547.368
 ELEV. = 981.95'

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STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SURVEY CONTROL SHEET B-4510

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "b4510-1"

WITH NAD 83/95 2007 STATE PLANE GRID COORDINATES OF NORTHING: 858613.873(ft) EASTING: 1681547.368(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99994136
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B4510-1" TO -L- STATION 10+00.00 IS
N 1°46'28" E 1427.35'

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

BM1 ELEVATION = 975.51
N 859243 E 1681631
L STATION 10+00
S 2° 49' 49.6" E DIST 798.51
CHISLED SQUARE IN SIDEWALK OF BUILDING
1021 OF THE CARDINAL TOWNHOUSE
APARTMENTS. SQUARE IS ON END OF
SIDEWALK +/- 10' SW OF APT. F

BM2 ELEVATION = 965.77
N 860292 E 1682012
L STATION 12+38 428 RIGHT
CHISLED SQUARE IN BACK OF CONCRETE CURB
AND GUTTER LOCATED ON LINDSEY ST. NORTH
OF ENTRANCE TO SMALL MOBILE HOME PARK 8'
WEST OF FIRE HYDRANT IN SE CORNER 415B
LINDSEY ST.

BM3 ELEVATION = 975.62
N 860530 E 1681138
L STATION 15+03 438 LEFT
R/R SPIKE SET IN WEST ROOT OF A 4" MAPLE
+/- 11 FROM EDGE OF PAVEMENT AND +/- 19
FROM FENCE CORNER AT DAYCARE CENTER

BM4 ELEVATION = 990.49
N 861232 E 1681251
L STATION 21+43 361 LEFT
CHISLED SQUARE IN WESTERN CURB AND
GUTTER OF CENTER ST. BETWEEN HOUSE 712
AND 708

BM5 ELEVATION = 962.97
N 861010 E 1682223
L STATION 20+41 632 RIGHT
R/R SPIKE SET IN WEST ROOT OF A 14" GUM
14' SOUTH OF I-40 EAST BOUND LANE

BM6 ELEVATION = 998.14
N 862235 E 1681784
L STATION 23+69
N 9° 26' 26.2" E DIST 842.20
CHISLED SQUARE IN NORTH EAST CONCRETE
PAD OF SIDEWALK 7.9' EAST OF SALISBURY
ST. EDGE OF PAVEMENT. 5.2' EAST OF POWER
POLE A3A

BL POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
3	BL-3	859569.0140	1681603.6570	980.34	OUTSIDE PROJECT LIMITS	
2	B4510-2	860197.9640	1681605.0003	984.40	11+56.94	18.26 RT
4	BL-4	860745.4580	1681590.2720	988.71	17+05.46	16.52 RT
5	BL-5	861391.0620	1681613.9990	991.42	23+50.16	29.01 LT
6	BL-6	861881.2510	1681700.1880	995.47	OUTSIDE PROJECT LIMITS	
7	BL-7	862184.2800	1681773.8750	997.70	OUTSIDE PROJECT LIMITS	

BY1 POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
2	B4510-2	860197.9640	1681605.0003	984.40	11+56.94	18.26 RT
8	BY1-8	859904.4990	1681625.8770	983.96	OUTSIDE PROJECT LIMITS	
9	BY1-9	859879.5510	1682015.5120	976.76	OUTSIDE PROJECT LIMITS	

BY2 POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
2	B4510-2	860197.9640	1681605.0003	984.40	11+56.94	18.26 RT
10	BY2-10	860297.0480	1681902.8460	971.10	12+46.83	319.01 RT

BY4 POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
13	BY4-13	860636.3760	1681054.4160	970.35	16+02.92	519.23 LT
4	BL-4	860745.4580	1681590.2720	988.71	17+05.46	16.52 RT
14	BY4-14	860866.4990	1681664.8520	966.31	18+30.83	86.94 RT
15	BY4-15	861068.3690	1682203.5740	965.14	21+08.73	605.33 RT

BY6 POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
18	BY6-18	861518.3370	1681374.8200	994.80	OUTSIDE PROJECT LIMITS	
25	BL-5	861391.0620	1681613.9990	991.42	23+50.16	29.01 LT
19	BY6-19	861349.0960	1681993.6580	990.65	OUTSIDE PROJECT LIMITS	

BY7 POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
20	BY7-20	862070.4370	1681361.4630	992.45	OUTSIDE PROJECT LIMITS	
26	BL-6	861881.2510	1681700.1880	995.47	OUTSIDE PROJECT LIMITS	
21	BY7-21	861832.0840	1682039.6760	989.58	OUTSIDE PROJECT LIMITS	

BY3 POINT	DESC.	NORTH	EAST	ELEVATION	DR11 STATION	OFFSET
11	BY3-11	860552.5370	1681090.8830	973.51	OUTSIDE PROJECT LIMITS	
12	BY3-12	860611.9890	1681468.1410	984.32	13+12.68	15.59 RT
4	BL-4	860745.4580	1681590.2720	988.71	OUTSIDE PROJECT LIMITS	

BY5 POINT	DESC.	NORTH	EAST	ELEVATION	DR12 STATION	OFFSET
16	BY5-16	860936.6110	1681268.9130	987.02	OUTSIDE PROJECT LIMITS	
31	(NOT SET)	860973.5658	1681598.6553	UNKNOWN	OUTSIDE PROJECT LIMITS	
17	BY5-17	860973.9460	1681602.0480	988.07	OUTSIDE PROJECT LIMITS	

NOTES:

1. THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:
[HTTP://WWW.NCDOT.ORG/DOH/RECONSTRUCT/HIGHWAY/LOCATION/PROJECT/](http://www.ncdot.org/DOH/RECONSTRUCT/HIGHWAY/LOCATION/PROJECT/)

THE FILES TO BE FOUND ARE AS FOLLOWS:
B4510_LS_CONTROL_DATE.HTML

SITE CALIBRATION INFORMATION HAS NOT BEEN PROVIDED FOR THIS PROJECT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.



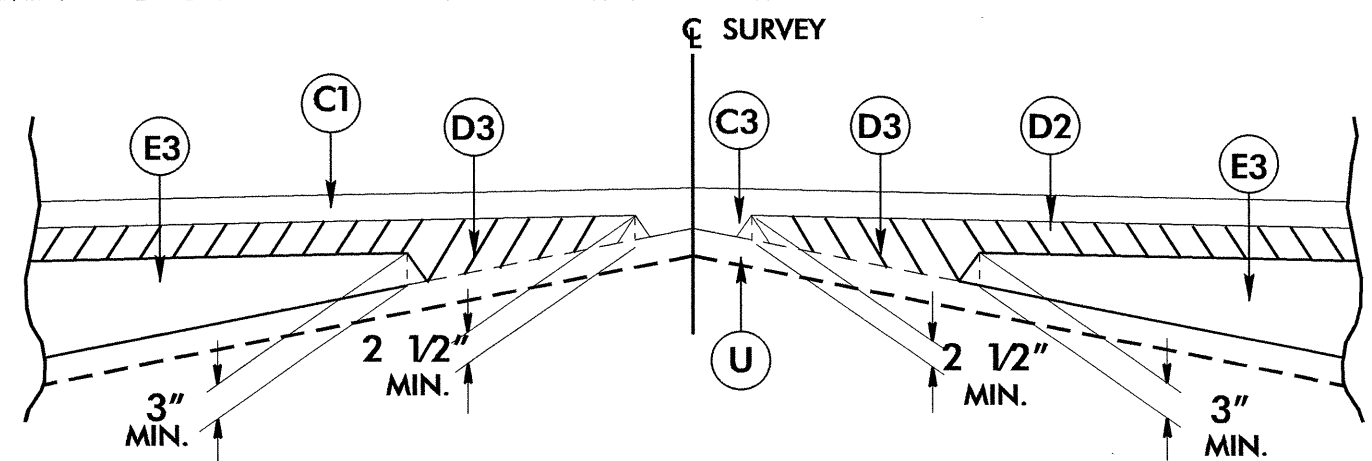
INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.

PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM.
NETWORK ESTABLISHED FROM NGS ONLINE POSITIONING SERVICE (OPUS)
SEE GPS CALIBRATION SHEET FOR HORIZONTAL AND VERTICAL COORDINATE VALUES.

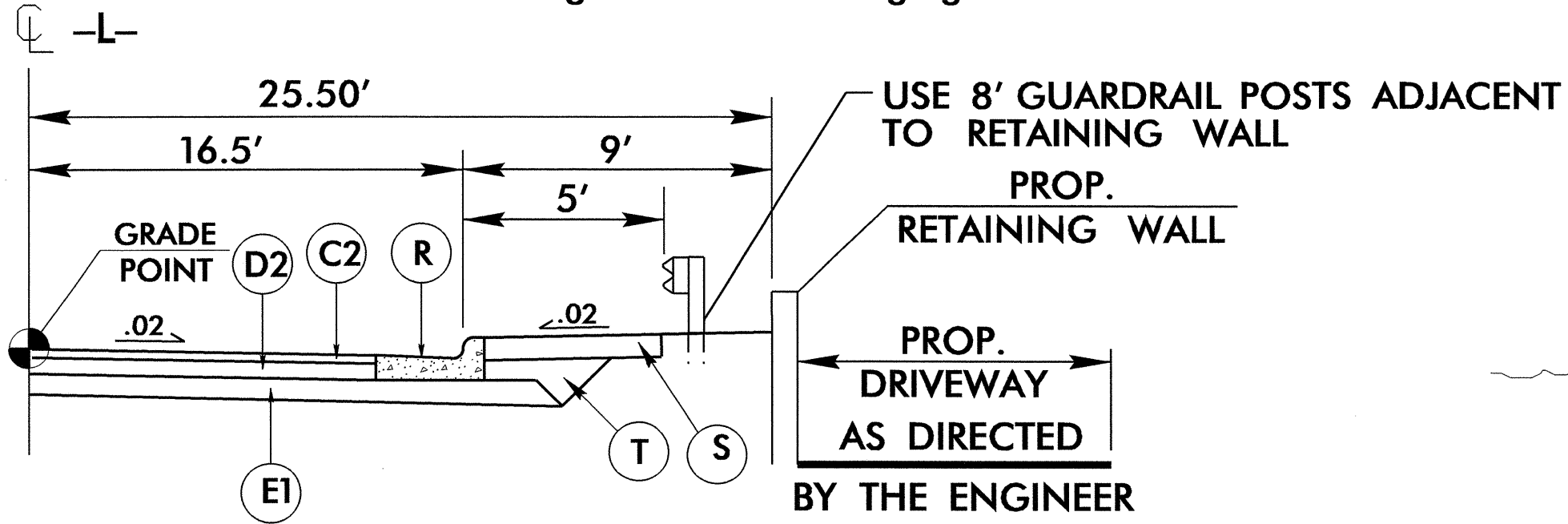
6/2/99

PAVEMENT SCHEDULE <small>(FINAL PAVEMENT DESIGN)</small>	
B	PROP. APPROX. 5/8" OPEN-GRADED ASPHALT FRICTION COURSE, TYPE FC1 MOD AT AN AVERAGE RATE OF 70 LBS. PER SQ. YD.
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 2" IN DEPTH.
D1	PROP. APPROX. 2 1/2" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.
D2	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, 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.
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
E2	PROP. APPROX. 5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 570 LBS. PER SQ. YD.
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0, 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.
M	MILLING EXISTING PAVEMENT, 5/8" DEPTH
R	2'-6" CONCRETE CURB AND GUTTER.
S	4" CONC. SIDEWALK
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE WEDGING DETAIL)

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



Detail Showing Method of Wedging

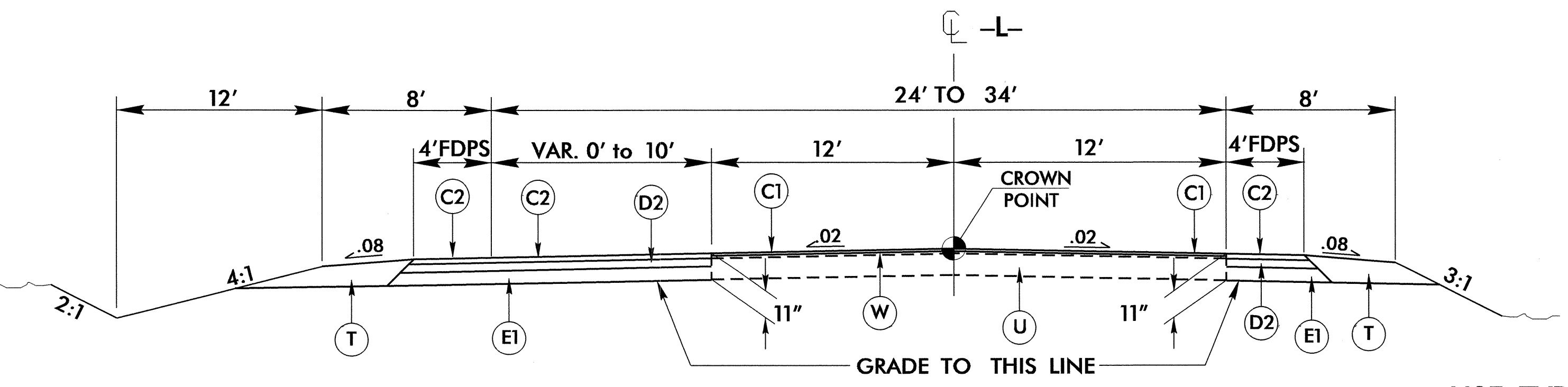


WALL TYPICAL SECTION

TO BE USED IN CONJUNCTION WITH TYPICAL SECTION No. 2.
-L- Sta. 14+72.17 to Sta. 15+52.00 RT.

SEE SHEETS 2-E AND 2-F FOR RETAINING WALL PLANS

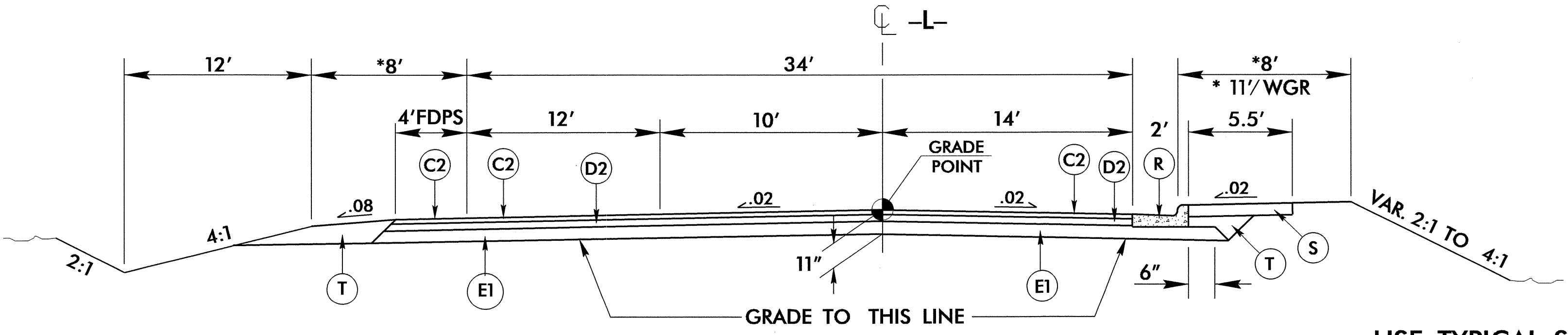
PROJECT REFERENCE NO. B-4510	SHEET NO. 2
ROADWAY DESIGN ENGINEER SEAL 33296 S. D. KIMBLE 7/12/11	PAVEMENT DESIGN ENGINEER SEAL 22896 CLARK S. MORRISON 7/12/11



TYPICAL SECTION NO. 1

USE TYPICAL SECTION NO. 1

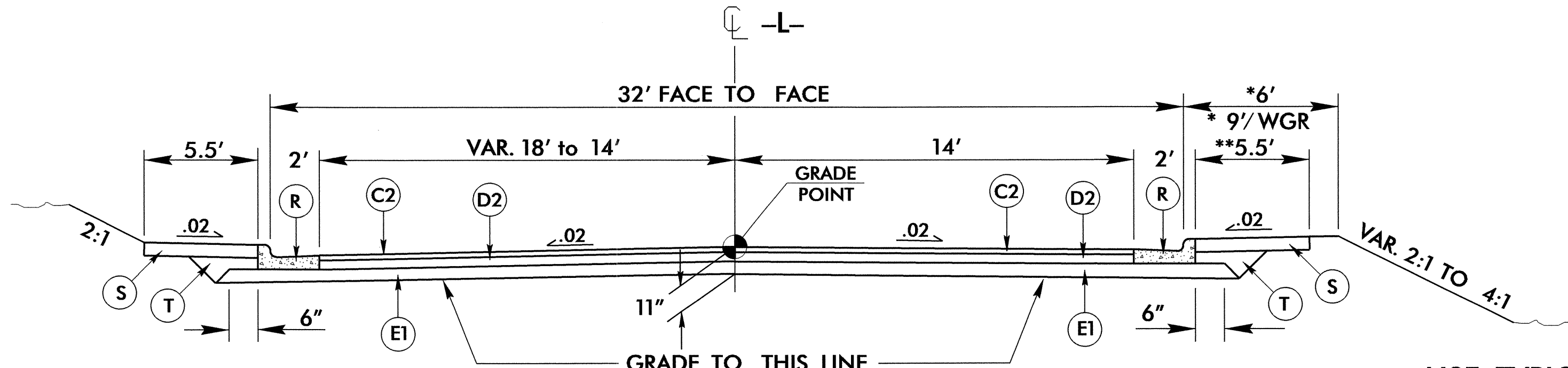
-L- Sta. 11+80.00 to Sta. 14+67.27



TYPICAL SECTION NO. 2

USE TYPICAL SECTION NO. 2

-L- Sta. 14+67.27 to Sta. 16+95.35 (BEGIN BRIDGE)

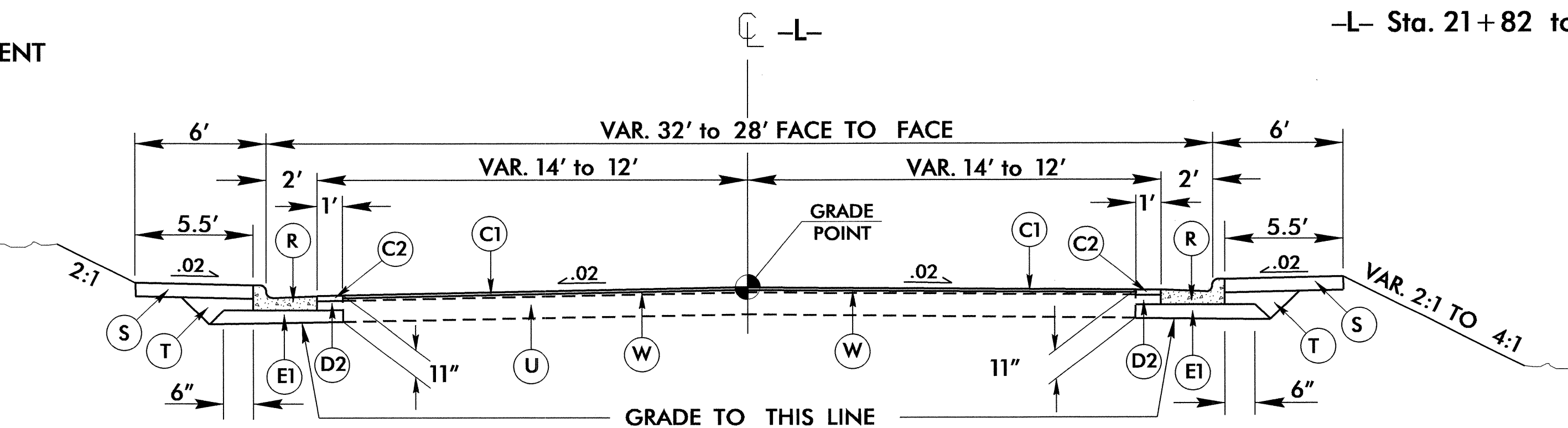


TYPICAL SECTION NO. 3

USE TYPICAL SECTION NO. 3

-L- Sta. 18+98.60 (END BRIDGE) to Sta. 21+85.00

** NOTE: TRANSITION SIDEWALK FROM 5.5' TO EXIST.
-L- Sta. 21+82 to Sta. 22+50 (RT.)



TYPICAL SECTION NO. 4

USE TYPICAL SECTION NO. 4

-L- Sta. 21+85.00 to Sta. 22+50.00

NOTE: TRANSITION TO EXIST -L- Sta. 22+50 to Sta. 22+82

12-JUL-2011 11:42 AM Roadway\Projects\B-4510-r.dwg:typ.dgn

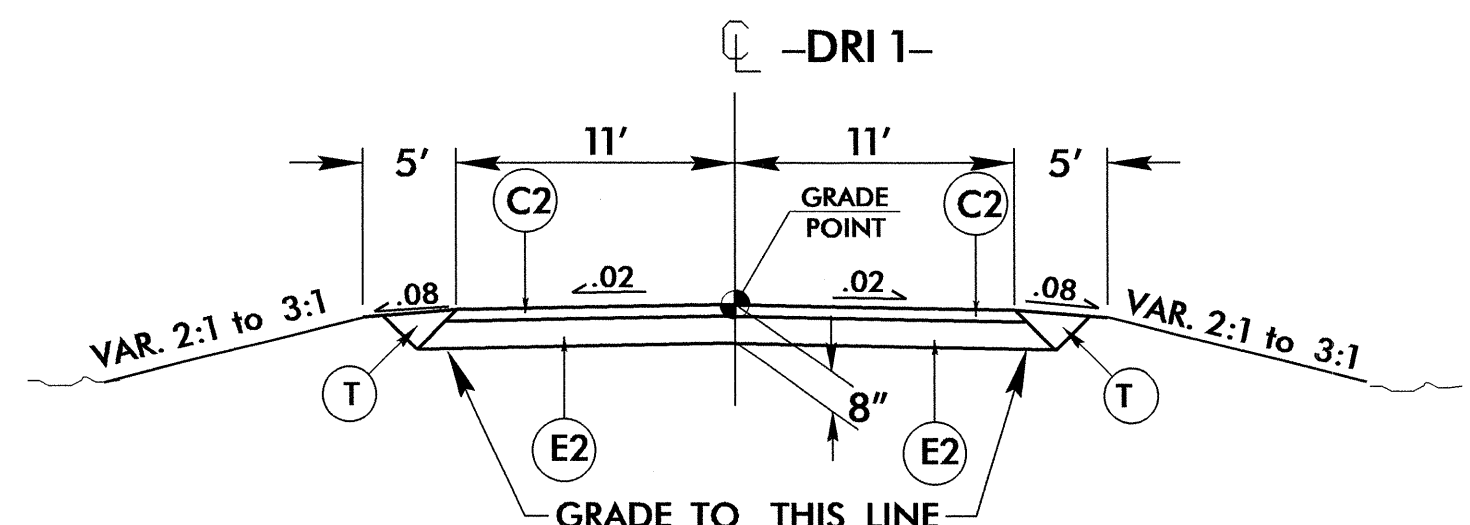
6/2/99

PROJECT REFERENCE NO. B-4510	SHEET NO. 2A
ROADWAY DESIGN ENGINEER SEAL 33296 STEVEN D. KENDALL	PAVEMENT DESIGN ENGINEER SEAL 22898 CLARK S. WARRIS

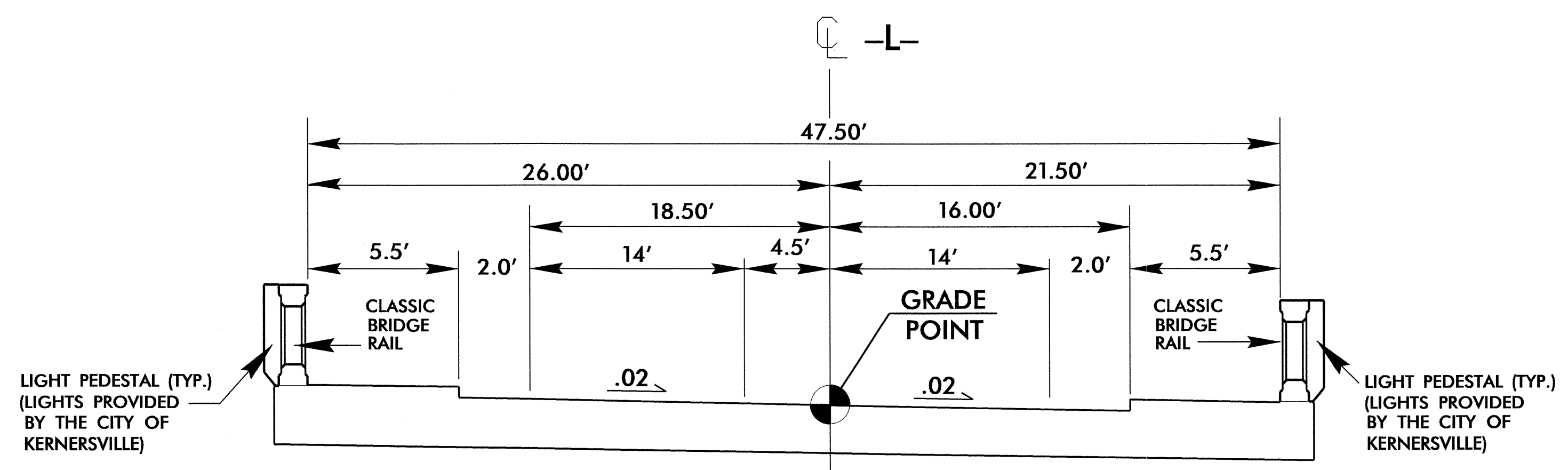
8. D. Kendall
7-12-11

USE TYPICAL SECTION NO. 5

TRANSITION -DRI 1- FROM Sta. 11+75 to Sta. 12+25
-DRI 1- Sta. 12+25.00 to Sta. 13+93.81



TYPICAL SECTION NO. 5



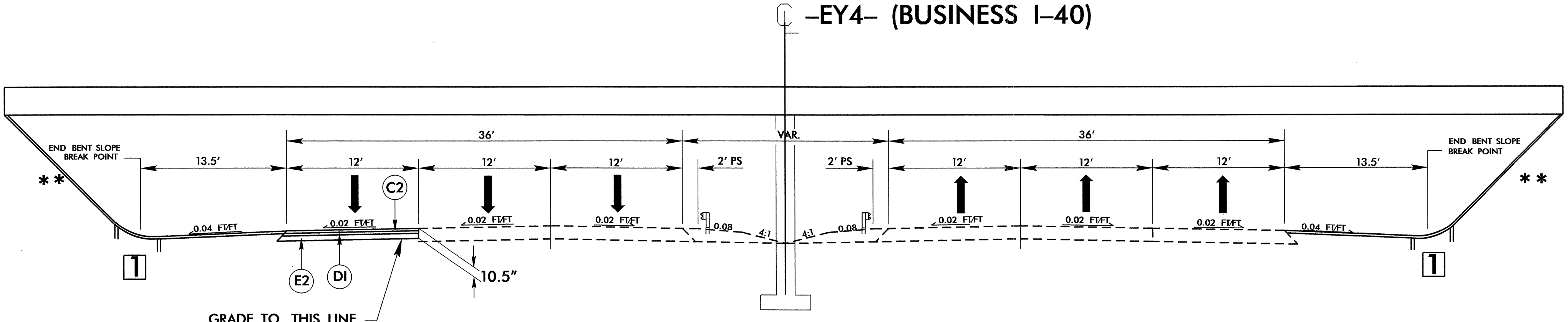
TYPICAL SECTION ON BRIDGE

PAVEMENT SCHEDULE

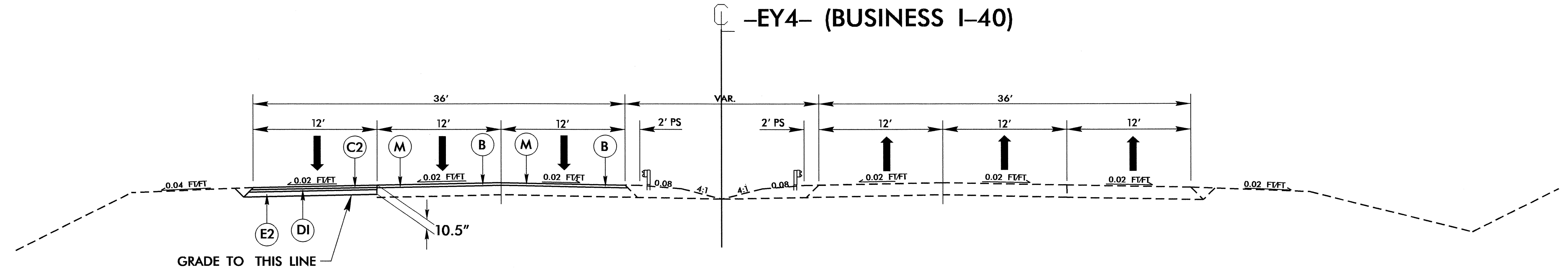
B	5/8" FC1 MOD
C2	3" S9.5B
D1	2.5" I19.0B
E2	5" B25.0B
M	5/8" MILLING
T	EARTH MATERIAL

DESIGN DATA -L-

ADT 2010	=	11,568
ADT 2035	=	16,300
DHV	=	10%
D	=	60%
T	=	3%
V	=	40 MPH
TTST	=	1%
DUAL	=	2%
FUNC. CLASS.	=	URBAN COLLECTOR
MINIMUM VERTICAL CLEARANCE	=	16.5
** SLOPES DETERMINED BY SOILS AND FOUNDATION UNIT		
1	SEE STANDARD	610.03



DETAIL OF TYPICAL SECTION UNDER STRUCTURE

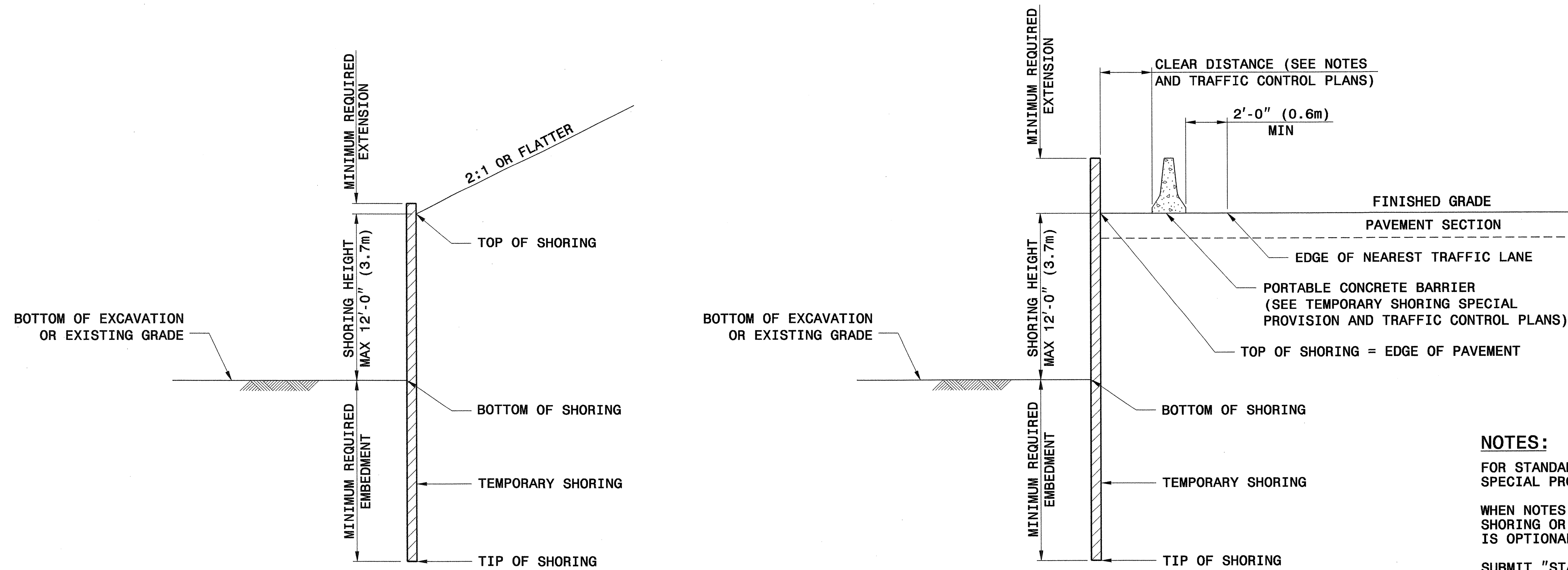


-EY4- Sta. 7+00 +/- to Sta. 19+50 +/-
SEE (TMP) TRANSPORTATION MANAGEMENT PLANS

I:\JUL-2011\PC00
 R:\Roadway\PC00\B-4510_rdy_tjw.dgn
 \$\$\$\$REFERENCE\$\$\$\$



Scott A. Hadden 3/29/07
SIGNATURE DATE



SLOPE CASE

SURCHARGE CASE

NOTES:

FOR STANDARD TEMPORARY SHORING, SEE TEMPORARY SHORING SPECIAL PROVISION.

WHEN NOTES ON PLANS DO NOT PROHIBIT STANDARD TEMPORARY SHORING OR STANDARD SHORING, STANDARD TEMPORARY SHORING IS OPTIONAL.

SUBMIT "STANDARD TEMPORARY SHORING SELECTION FORM" AT LEAST 14 DAYS BEFORE BEGINNING SHORING CONSTRUCTION. UP TO THREE LOCATIONS MAY BE INCLUDED ON EACH SELECTION FORM.

STANDARD TEMPORARY SHORING IS BASED ON THE FOLLOWING CONDITIONS:

- 1) MAXIMUM SHORING HEIGHT IS 12'-0" (3.7m).
- 2) TRAFFIC SURCHARGE IS 240 PSF (11.5 KPA) MAXIMUM OR BACKSLOPE IS 2:1 (H:V) OR FLATTER.
- 3) BOTTOM OF EXCAVATION OR EXISTING GRADE IN FRONT OF SHORING IS 6:1 (H:V) SLOPE OR FLATTER.
- 4) H PILE SPACING IS 6'-0" (1.8m).
- 5) H PILE EMBEDMENT DEPTHS ARE FOR DRIVEN PILES.
- 6) TIMBER LAGGING IS A MINIMUM OF 3" (75mm) THICK.

STANDARD TEMPORARY SHORING IS BASED ON THE FOLLOWING IN-SITU ASSUMED SOIL PARAMETERS:
TOTAL UNIT WEIGHT = 120 PCF (18.8 KN/M³)
FRICTION ANGLE = 30 DEGREES
COHESION = 0 PSF (0 KPA)
GROUNDWATER IS ASSUMED TO BE BELOW BOTTOM OF SHORING.

DO NOT USE STANDARD TEMPORARY SHORING WHEN THE ASSUMED SOIL PARAMETERS ARE NOT APPLICABLE OR GROUNDWATER IS ABOVE THE BOTTOM OF SHORING.

DO NOT USE STANDARD TEMPORARY SHORING WHEN VERY LOOSE OR SOFT SOIL OR MUCK IS PRESENT WITHIN THE EMBEDMENT DEPTH.

VERIFY GROUNDWATER ELEVATION BEFORE BEGINNING SHORING CONSTRUCTION.

IF THE CLEAR DISTANCE AVAILABLE IS LESS THAN THE MINIMUM REQUIRED IN ACCORDANCE WITH THE TRAFFIC CONTROL PLANS, SET THE BARRIER AGAINST THE TRAFFIC SIDE OF THE SHORING AND USE THE "SURCHARGE CASE WITH TRAFFIC IMPACT".

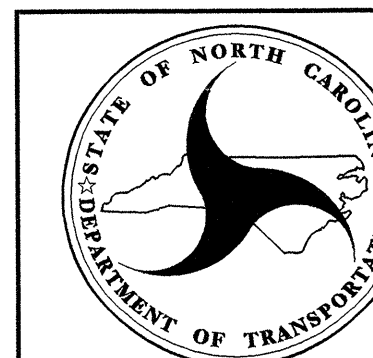
AT THE CONTRACTOR'S OPTION, H PILE EMBEDMENT DEPTHS FOR PILES SET IN DRILLED HOLES MAY BE REDUCED BY 25%. FOR PILE EXCAVATION, SEE TEMPORARY SHORING SPECIAL PROVISION.

CONTROL DRAINAGE DURING CONSTRUCTION IN THE VICINITY OF THE SHORING. COLLECT AND DIRECT RUNOFF AWAY FROM SHORING.

CONTACT THE ENGINEER IF MINIMUM REQUIRED EMBEDMENT IS NOT ACHIEVED.

GROUNDWATER CONDITION	SHORING HEIGHT FT (m)	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 (m)	MINIMUM REQUIRED SECTION MODULUS IN ³ /FT (cm ³ /m)	MINIMUM REQUIRED EMBEDMENT FT (m)			MINIMUM REQUIRED EMBEDMENT FT (m)	MINIMUM REQUIRED SECTION MODULUS IN ³ /FT (cm ³ /m)	MINIMUM REQUIRED EMBEDMENT FT (m)		
			HP 10x42 (HP 250x62)	HP 12x53 (HP 310x79)	HP 14x73 (HP 360x108)			HP 10x42 (HP 250x62)	HP 12x53 (HP 310x79)	HP 14x73 (HP 360x108)	
GROUNDWATER ELEVATION BELOW TIP OF SHORING	< 6 (1.8)	7.5 (2.3)	3.0 (161)	8.0 (2.4)	8.0 (2.4)	8.0 (2.4)	11.0 (3.4)	10.0 (538)	9.5 (2.9)	9.5 (2.9)	9.5 (2.9)
	7 (2.1)	8.5 (2.6)	4.5 (242)	9.5 (2.9)	9.5 (2.9)	9.5 (2.9)	12.0 (3.7)	12.0 (645)	10.5 (3.2)	10.5 (3.2)	10.5 (3.2)
	8 (2.4)	10.0 (3.0)	6.5 (349)	10.5 (3.2)	10.5 (3.2)	10.5 (3.2)	12.5 (3.8)	14.0 (753)	11.5 (3.5)	11.5 (3.5)	11.5 (3.5)
	9 (2.7)	11.0 (3.4)	9.5 (511)	--	12.0 (3.7)	12.0 (3.7)	13.5 (4.1)	16.5 (887)	--	12.5 (3.8)	12.5 (3.8)
	10 (3.0)	12.5 (3.8)	13.0 (699)	--	--	13.5 (4.1)	14.0 (4.3)	19.5 (1048)	--	13.5 (4.1)	13.5 (4.1)
	11 (3.4)	13.5 (4.1)	17.0 (914)	--	--	14.5 (4.4)	15.0 (4.6)	22.5 (1210)	--	--	14.5 (4.4)
	12 (3.7)	15.0 (4.6)	21.5 (1156)	--	--	16.0 (4.9)	16.0 (4.9)	25.5 (1371)	--	--	15.5 (4.7)
GROUNDWATER ELEVATION BETWEEN BOTTOM OF SHORING AND TIP OF SHORING	< 6 (1.8)	11.5 (3.5)	4.5 (242)	11.5 (3.5)	11.5 (3.5)	11.5 (3.5)	16.0 (4.9)	12.0 (645)	13.0 (4.0)	13.0 (4.0)	13.0 (4.0)
	7 (2.1)	13.0 (4.0)	7.0 (376)	13.0 (4.0)	13.0 (4.0)	13.0 (4.0)	17.0 (5.2)	14.5 (780)	14.5 (4.4)	14.5 (4.4)	14.5 (4.4)
	8 (2.4)	15.0 (4.6)	10.0 (538)	--	15.0 (4.6)	15.0 (4.6)	18.0 (5.5)	17.0 (914)	--	15.5 (4.7)	15.5 (4.7)
	9 (2.7)	17.0 (5.2)	14.0 (753)	--	17.0 (5.2)	17.0 (5.2)	19.0 (5.8)	20.0 (1075)	--	17.0 (5.2)	17.0 (5.2)
	10 (3.0)	18.5 (5.6)	19.5 (1048)	--	--	18.5 (5.6)	20.0 (6.1)	23.5 (1263)	--	--	18.5 (5.6)
	11 (3.4)	20.5 (6.3)	26.0 (1398)	--	--	--	21.0 (6.4)	28.0 (1505)	--	--	20.0 (6.1)
	12 (3.7)	22.5 (6.9)	33.0 (1774)	--	--	--	22.0 (6.7)	33.0 (1774)	--	--	21.5 (6.6)

NOTE: MINIMUM REQUIRED EXTENSION IS 6" (150mm) FOR "SLOPE OR SURCHARGE CASE WITH NO TRAFFIC IMPACT" AND 32" (800 mm) FOR "SURCHARGE CASE WITH TRAFFIC IMPACT".



GEOTECHNICAL ENGINEERING UNIT
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD DRAWING NO. 1801.01

STANDARD TEMPORARY SHORING

DATE: 2-20-07

30-JUL-2009 08:49
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 jlowerton AT PS237501

5/14/99

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

ENGLISH DETAIL DRAWING FOR
METHOD OF PIPE INSTALLATION
 FILL HEIGHT TABLES

SHEET 3 OF 3
300D01

FLEXIBLE PIPE

Round Corrugated Steel Pipe
 2 2/3 x 1/2 corrugation **

Diameter (inches)	Minimum cover (inches)	Maximum Height of Cover (feet)				
		16 (Ga)	14	12	10	8
12	12	204	256			
15	12	162	204			
18	12	135	169	239		
21	12	115	145	204		
24	12	100	126	178		
30	12	79	100	142		
36	12	65	83	117	152	
42	12	55	70	100	130	160
48	12	48	61	87	113	139
54	12		54	77	100	123
60	12			69	90	111
66	12				81	100
72	12				74	91
78	12					81
84	12					69

Round Corrugated Aluminum Pipe
 2 2/3 x 1/2 corrugation **

Diameter (inches)	Minimum cover (inches)	Maximum Height of Cover (feet)				
		16 (Ga)	14	12	10	8
12	12	123	155	218	281	344
15	12	98	123	174	224	275
18	12	81	102	144	187	228
21	12	69	87	123	160	195
24	12	60	78	108	139	171
27	12		67	95	123	151
30	12		60	85	111	136
36	12		50	71	92	113
42	12			60	78	96
48	12			52	68	84
54	12			46	50	74
60	12				50	62
66	12					51
72	12					41

** FOR DIFFERENT CORRUGATIONS AND ARCH PIPES REFER TO ROADWAY DESIGN MANUAL OR MANUFACTURERS SPECIFICATION.

REFER TO THE FOLLOWING FOR PIPE SPECIFICATIONS

- CSP - AASHTO M36
- CAAP - AASHTO M196
- HDPE - AASHTO M294
- PVC - ASTM F949 or AASHTO M304

NOTES: FILL HEIGHTS SHOWN WERE CALCULATED USING AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS

1' MINIMUM COVER FOR ALL SIDE DRAIN PIPE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS

RIGID PIPE

- RCP - * (Minimum fill) 1' for Class IV & CLASS V
 2' for Class III & Class II
- * (Maximum fill) 10' - Class II pipe
 20' - Class III pipe
 30' - Class IV pipe
 40' - Class V pipe

(For fills > 40' & < 80' use LRFD Direct Design Method)

* FILL HEIGHT IS MEASURED FROM THE TOP OF THE PIPE TO THE BOTTOM OF THE PAVEMENT STRUCTURE

REFER TO THE FOLLOWING FOR PIPE SPECIFICATIONS

- RCP - AASHTO M170

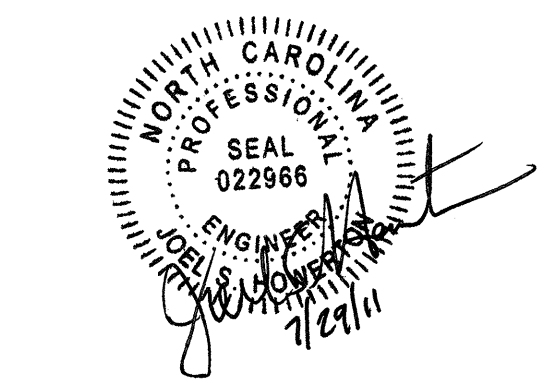
NOTES: FILL HEIGHTS SHOWN WERE CALCULATED USING AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS

1' MINIMUM COVER FOR ALL SIDE DRAIN PIPE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS

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

ENGLISH DETAIL DRAWING FOR
METHOD OF PIPE INSTALLATION
 FILL HEIGHT TABLES


SHEET 3 OF 3
300D01

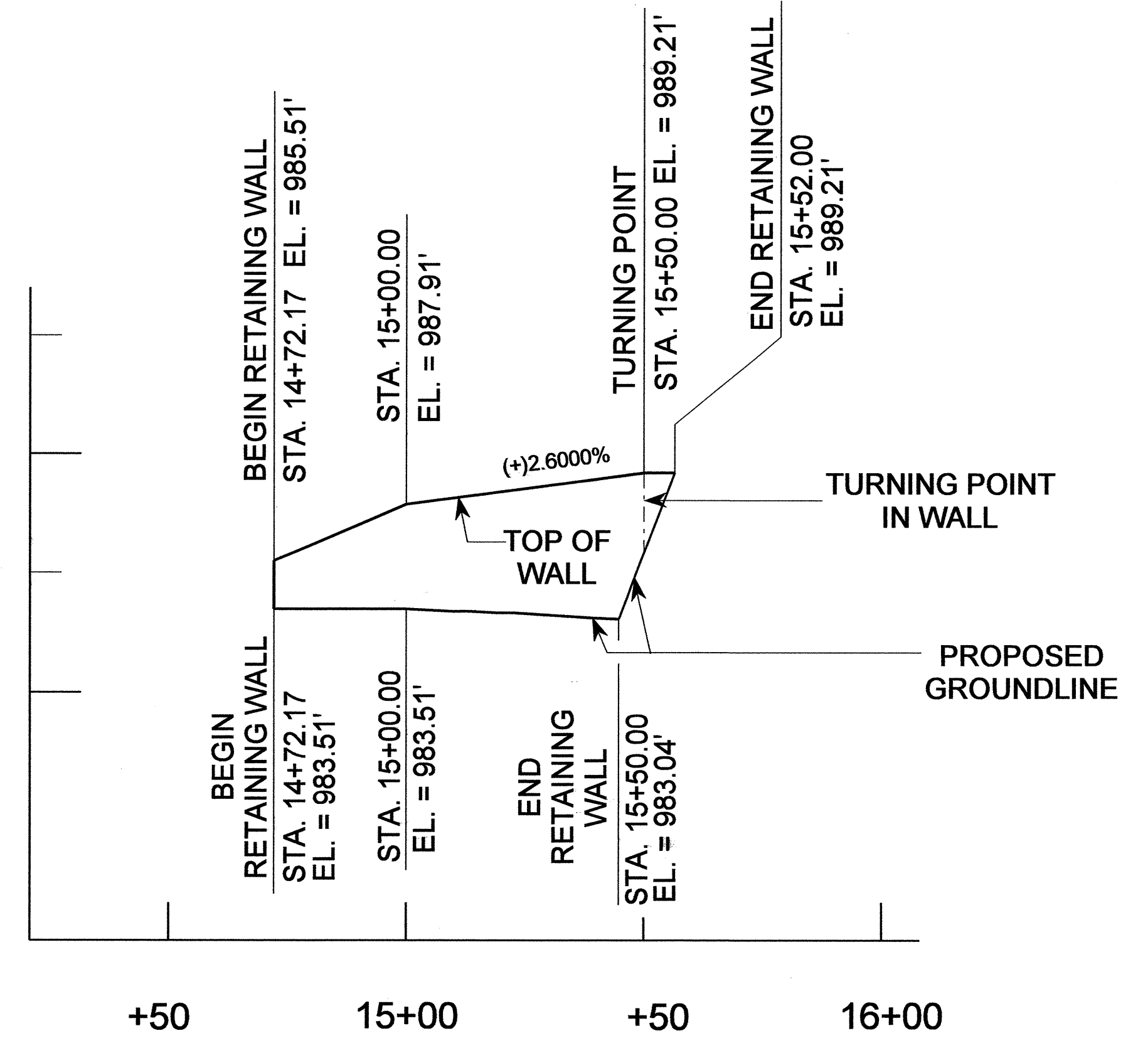
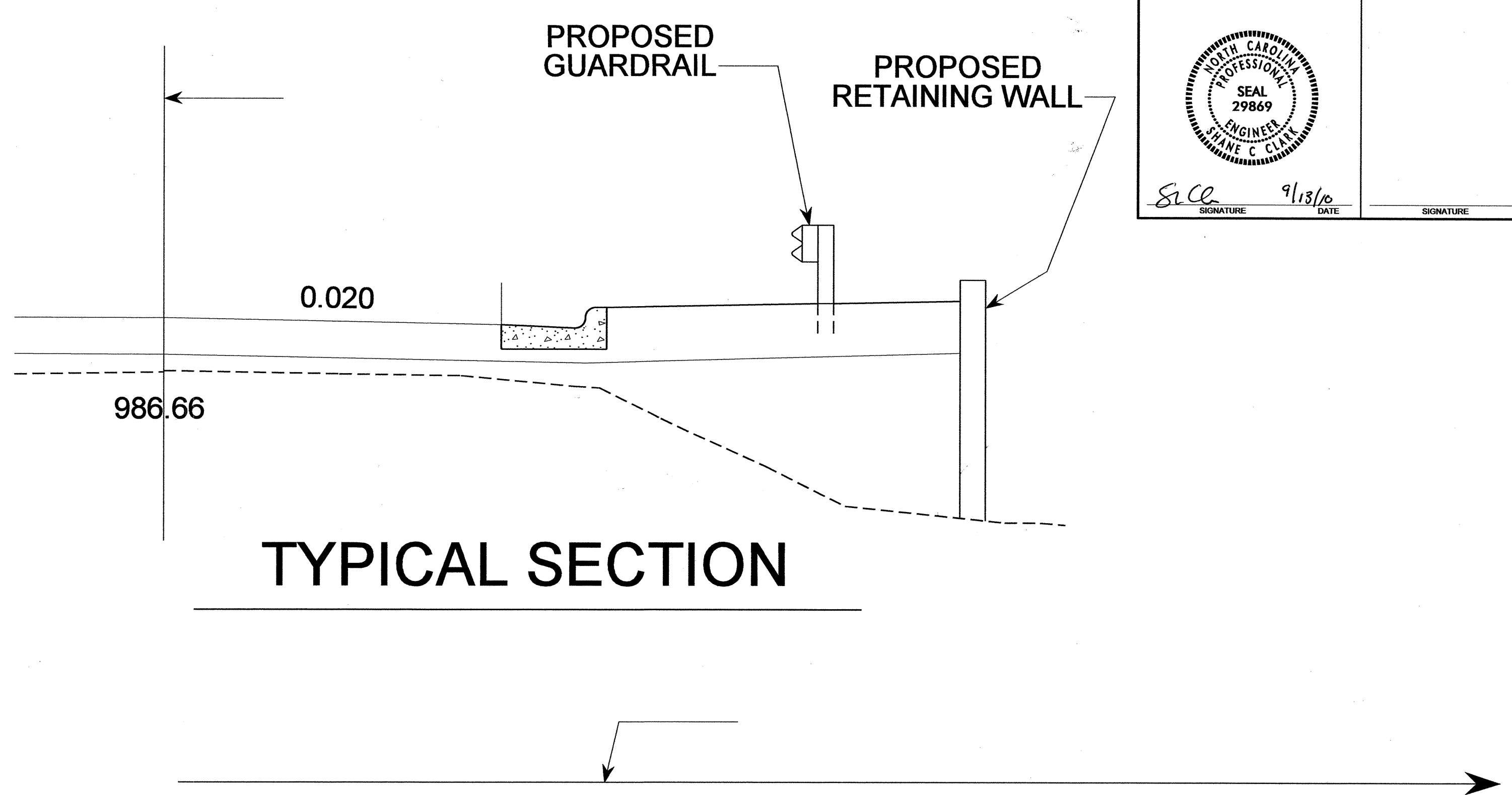
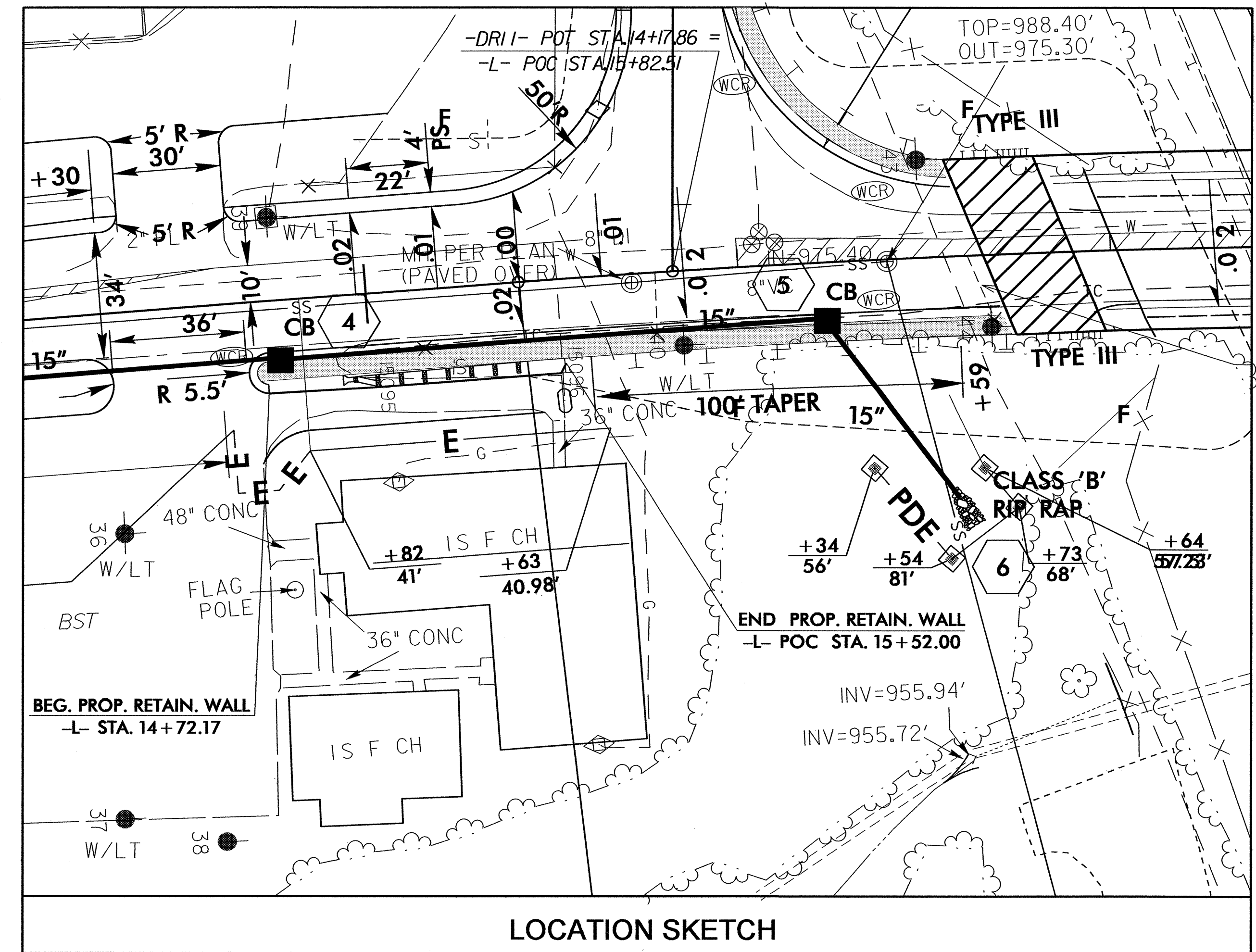


PROJECT SERVICES UNIT
 STANDARDS AND SPECIAL DESIGN
 Office 919-250-4128 FAX 919-250-4119

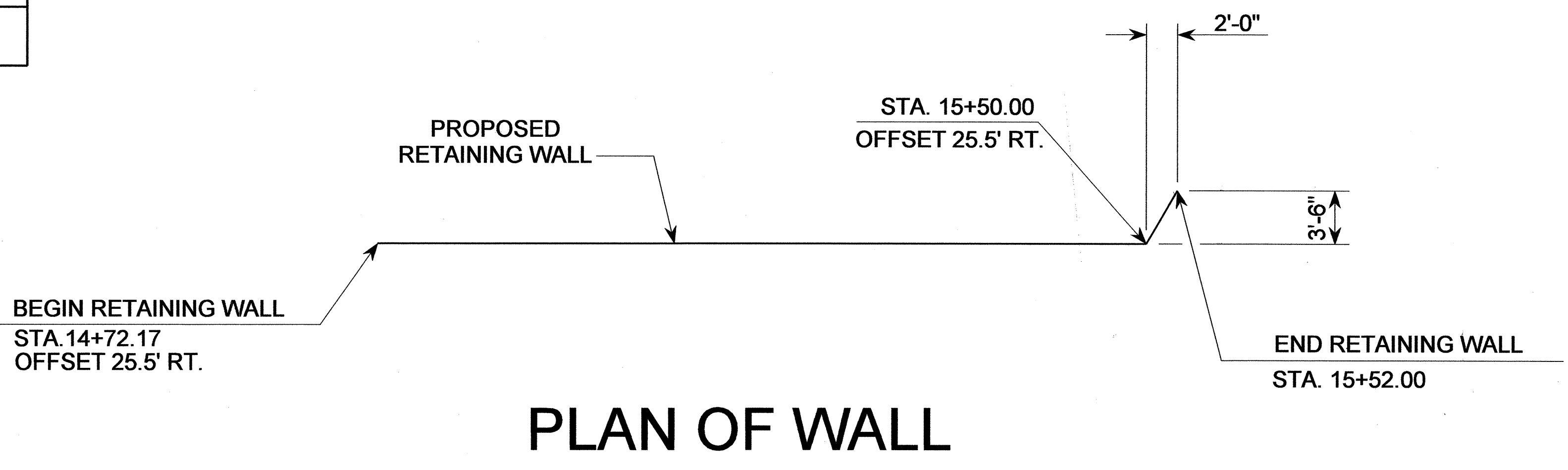
SEE PLATE FOR TITLE

ORIGINAL BY: KKempf DATE: 5-15-09
 MODIFIED BY: *Eric Ward* DATE: 7/20/09
 CHECKED BY: *Eric Ward* DATE: 7/20/09
 FILE SPEC: ericward/stds/stdsdetails/30001/0300d01.dgn


 S.C. CLARK 9/13/10
 SIGNATURE DATE



WALL ENVELOPE
SEE PLAN VIEW FOR OFFSET DETAILS

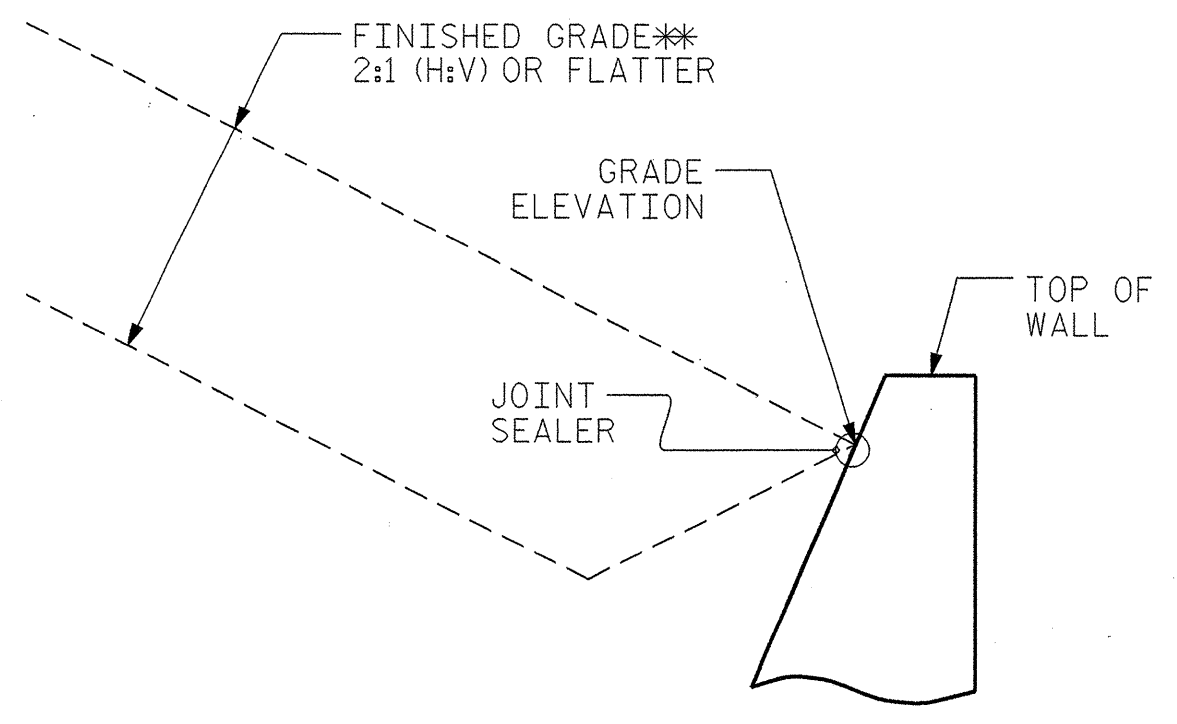


GRAVITY RETAINING WALL	
FROM STA. 14+72.17 TO 15+52.00 -L-	340 SQ. FT.

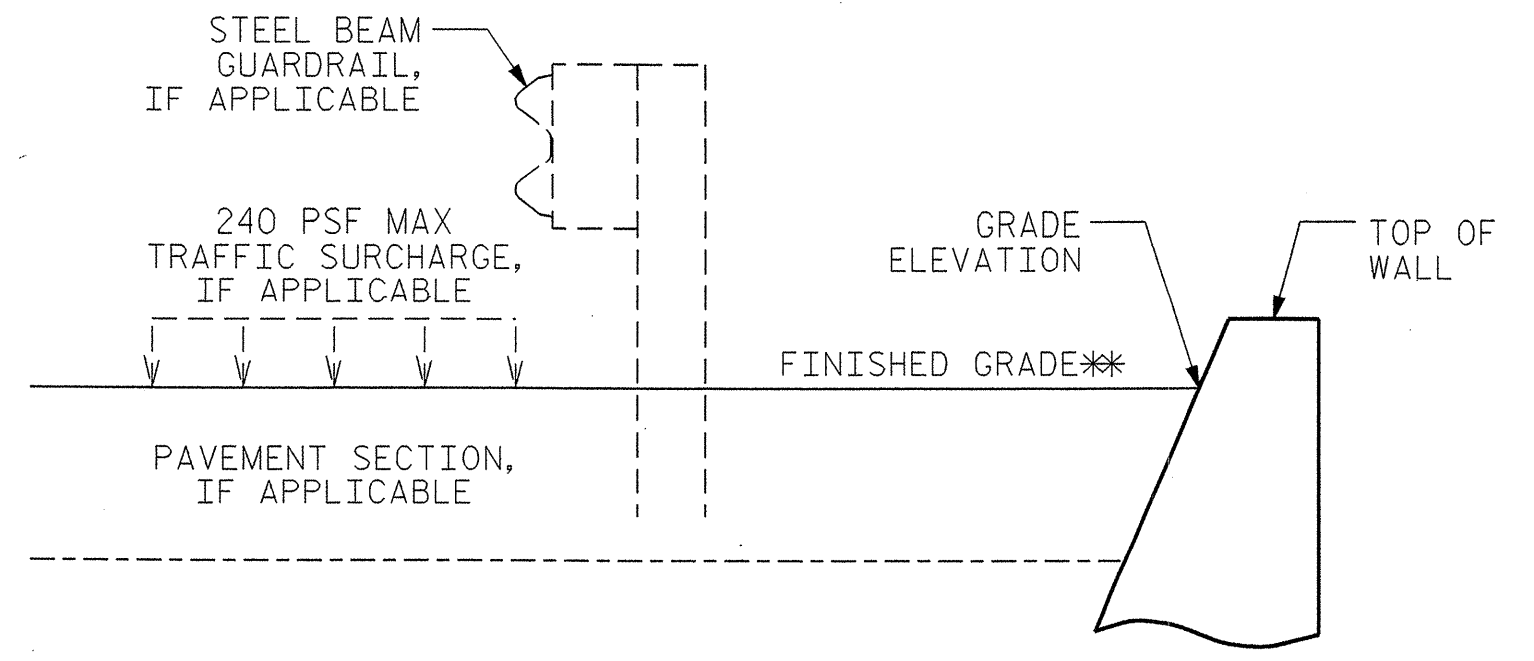
PROJECT NO.: B-4510
FORSYTH COUNTY
STATION: 14+72.17 -L- TO 15+52.00 -L-
 SHEET 1 OF 2

GEOTECHNICAL ENGINEERING UNIT
 EASTERN REGIONAL OFFICE
 WESTERN REGIONAL OFFICE
 CONTRACT OFFICE
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

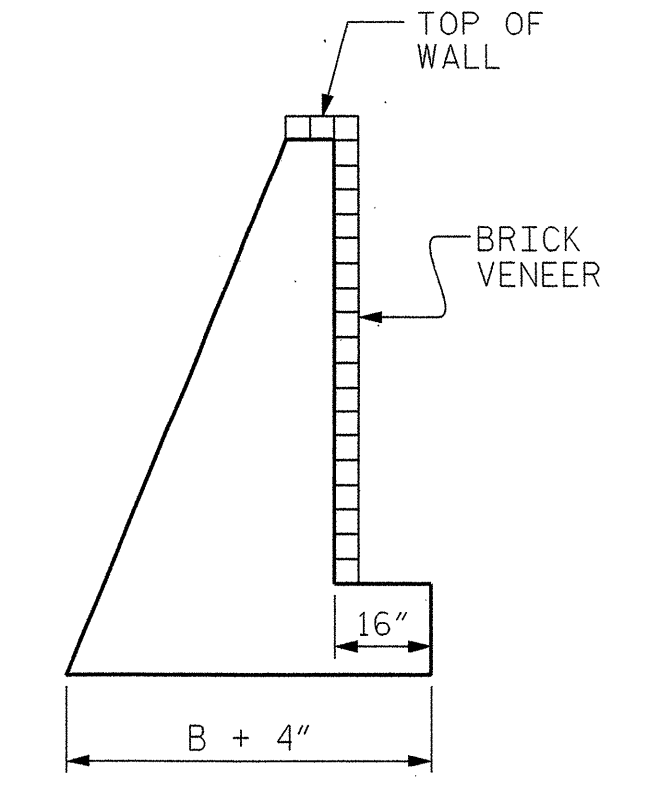
STANDARD DRAWING NO. 453.01					
GRAVITY RETAINING WALL					
REVISIONS					
NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		
					SHEET NO.
					TOTAL SHEETS



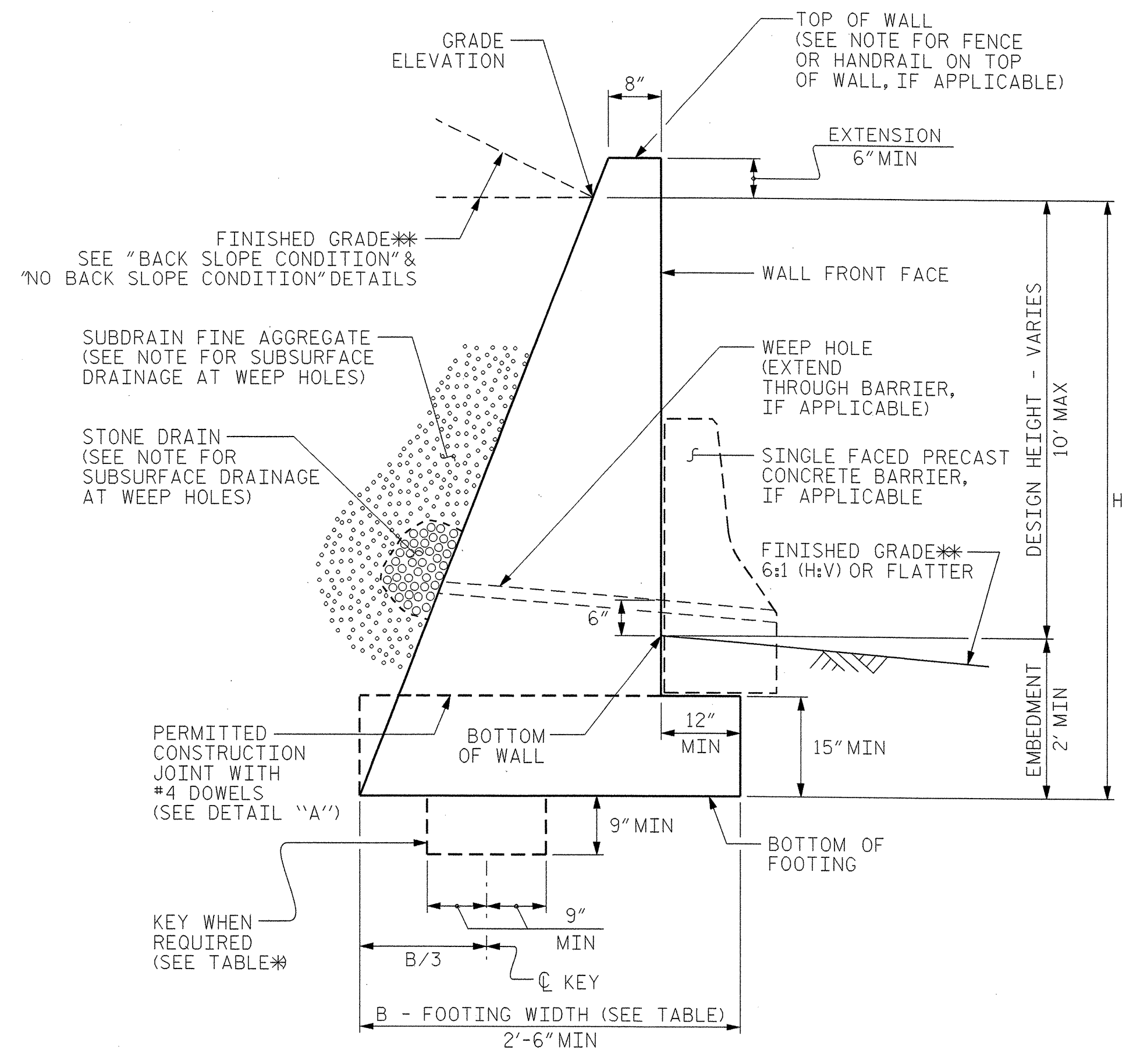
BACK SLOPE CONDITION
 **SEE ROADWAY PLANS FOR FINISHED GRADE AND DITCH DETAILS.



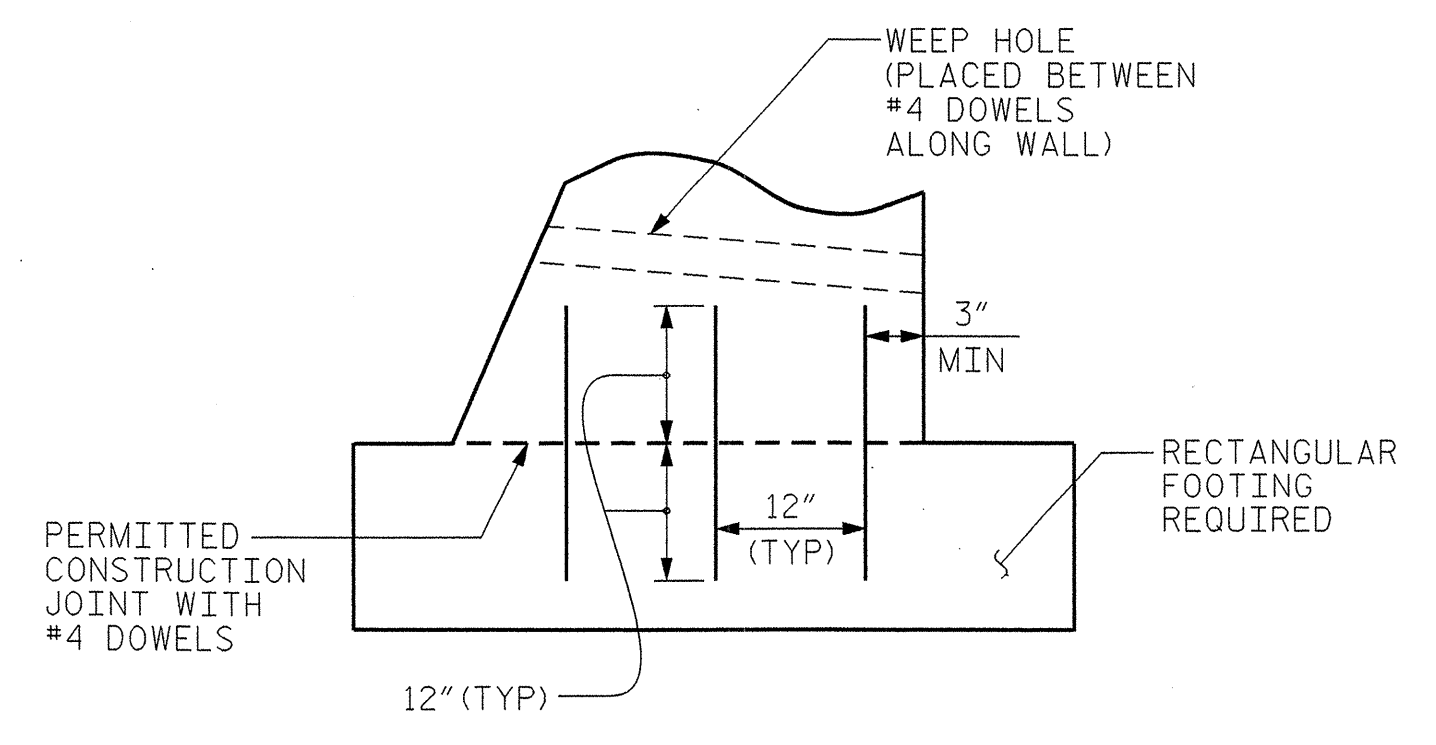
NO BACK SLOPE CONDITION
 **SEE ROADWAY PLANS FOR FINISHED GRADE DETAILS.



BRICK VENEER DETAIL
 (WHEN APPLICABLE)



STANDARD CIP GRAVITY WALL
 **SEE ROADWAY PLANS FOR FINISHED GRADE AND DITCH DETAILS.



DETAIL "A"

H (FT)	3 - < 6	6 - 9	> 9 - 12
BACK SLOPE CONDITION	.66	.70*	.75*
NO BACK SLOPE CONDITION WITH TRAFFIC SURCHARGE	.80	.75*	.70*
NO BACK SLOPE CONDITION WITHOUT TRAFFIC SURCHARGE	.60	.60	.60

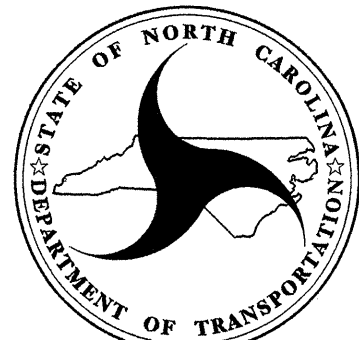
B/H RATIO
 (B = 2'-6" MIN)

*KEY IS REQUIRED FOR "BACK SLOPE CONDITION" OR "NO BACK SLOPE CONDITION WITH TRAFFIC SURCHARGE" WHEN H IS 6' OR GREATER.

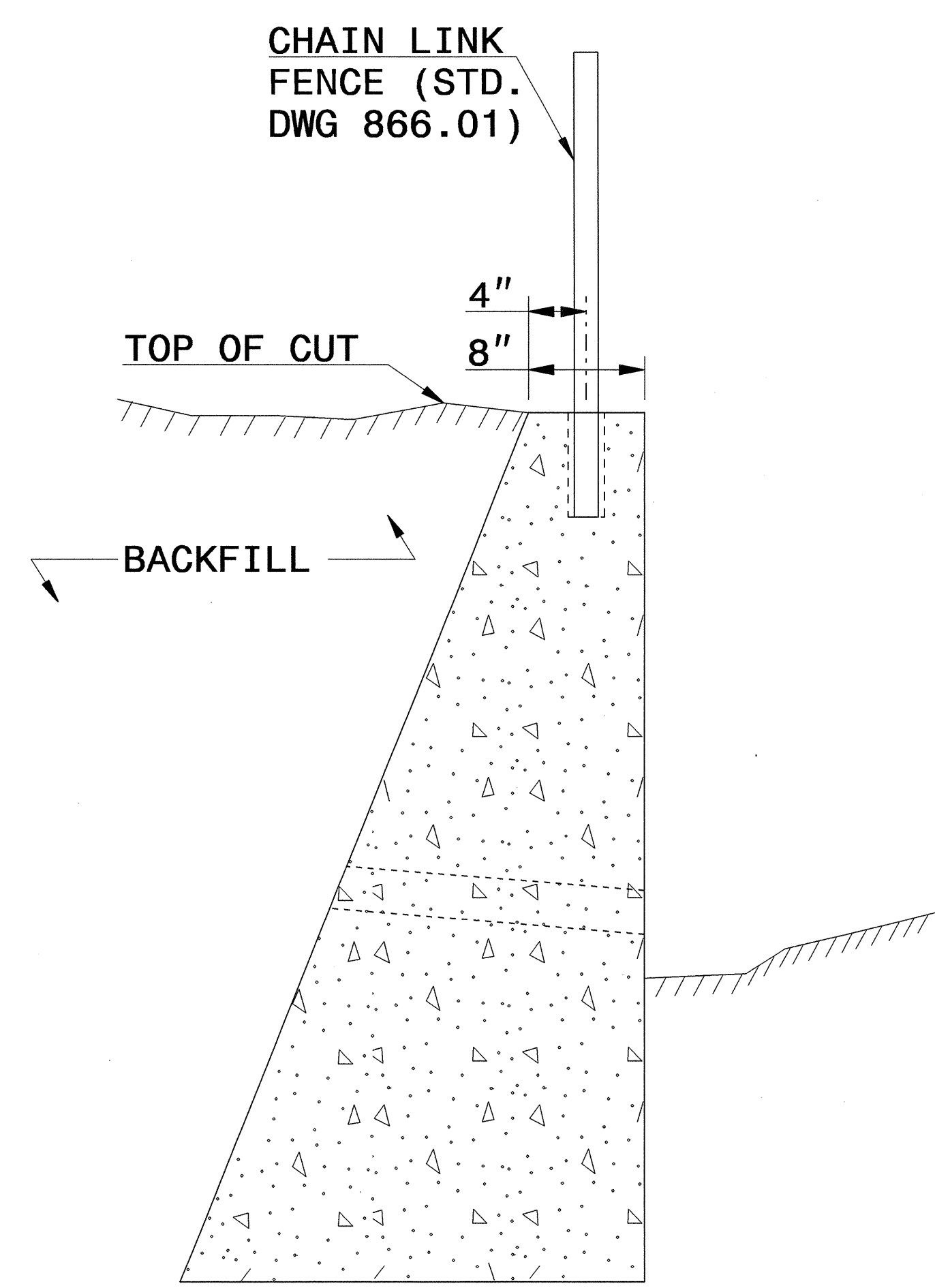
NOTES:

- FOR STANDARD CIP GRAVITY RETAINING WALLS, SEE CAST-IN-PLACE GRAVITY RETAINING WALLS PROVISION.
- FOR STEEL BEAM GUARDRAIL, SEE ROADWAY PLANS AND SECTION 862 OF THE STANDARD SPECIFICATIONS.
- FOR SINGLE FACED PRECAST CONCRETE BARRIER, SEE ROADWAY PLANS AND SECTION 857 OF THE STANDARD SPECIFICATIONS.
- FOR FENCES OR HANDRAILS ON TOP OF WALLS, SEE ROADWAY PLANS FOR FENCE OR HANDRAIL ATTACHMENT DETAILS.
- FOR SUBSURFACE DRAINAGE AT WEEP HOLES, SEE ARTICLE 410-9 OF THE STANDARD SPECIFICATIONS.
- STANDARD CIP GRAVITY WALLS ARE BASED ON THE FOLLOWING IN-SITU ASSUMED SOIL PARAMETERS:
 UNIT WEIGHT, $\gamma = 120$ PCF
 FRICTION ANGLE, $\phi = 35$ DEGREES (GROUNDWATER WITHIN 5' OF BOTTOM OF FOOTING)
 FRICTION ANGLE, $\phi = 30$ DEGREES (GROUNDWATER MORE THAN 5' BELOW BOTTOM OF FOOTING)
 COHESION, $c = 0$ PSF
- DO NOT USE STANDARD CIP GRAVITY WALLS IF THE ASSUMED SOIL PARAMETERS ARE NOT APPLICABLE OR GROUNDWATER IS ABOVE THE BOTTOM OF FOOTING.
- DO NOT USE STANDARD CIP GRAVITY WALLS WHEN VERY LOOSE OR SOFT SOIL OR MUCK IS PRESENT BELOW WALLS.
- BEFORE BEGINNING STANDARD CIP GRAVITY WALL CONSTRUCTION, SURVEY WALL LOCATIONS AND SUBMIT WALL PROFILE VIEWS (WALL ENVELOPES) FOR REVIEW. FOR WALL ENVELOPES, INCLUDE BOTTOM OF WALL, EXISTING GROUND AND GRADE ELEVATIONS AND OTHER ELEVATIONS AS NEEDED AT INTERVALS OF 25' OR LESS ALONG WALLS. DO NOT START WALL CONSTRUCTION UNTIL WALL ENVELOPES ARE ACCEPTED.
- FOR BRICK VENEERS, SUBMIT BRICK SAMPLES FOR APPROVAL BEFORE BEGINNING STANDARD CIP GRAVITY WALL CONSTRUCTION.
- DO NOT PLACE CONCRETE UNTIL EXCAVATION DIMENSIONS AND FOUNDATION MATERIAL ARE APPROVED.
- WHEN CONSTRUCTING STANDARD CIP GRAVITY WALLS WITH A CONSTRUCTION JOINT AS SHOWN IN DETAIL "A", PROVIDE A MINIMUM OF 3 EQUALLY SPACED #4 DOWELS AT INTERVALS OF 1'-6" ALONG WALLS.

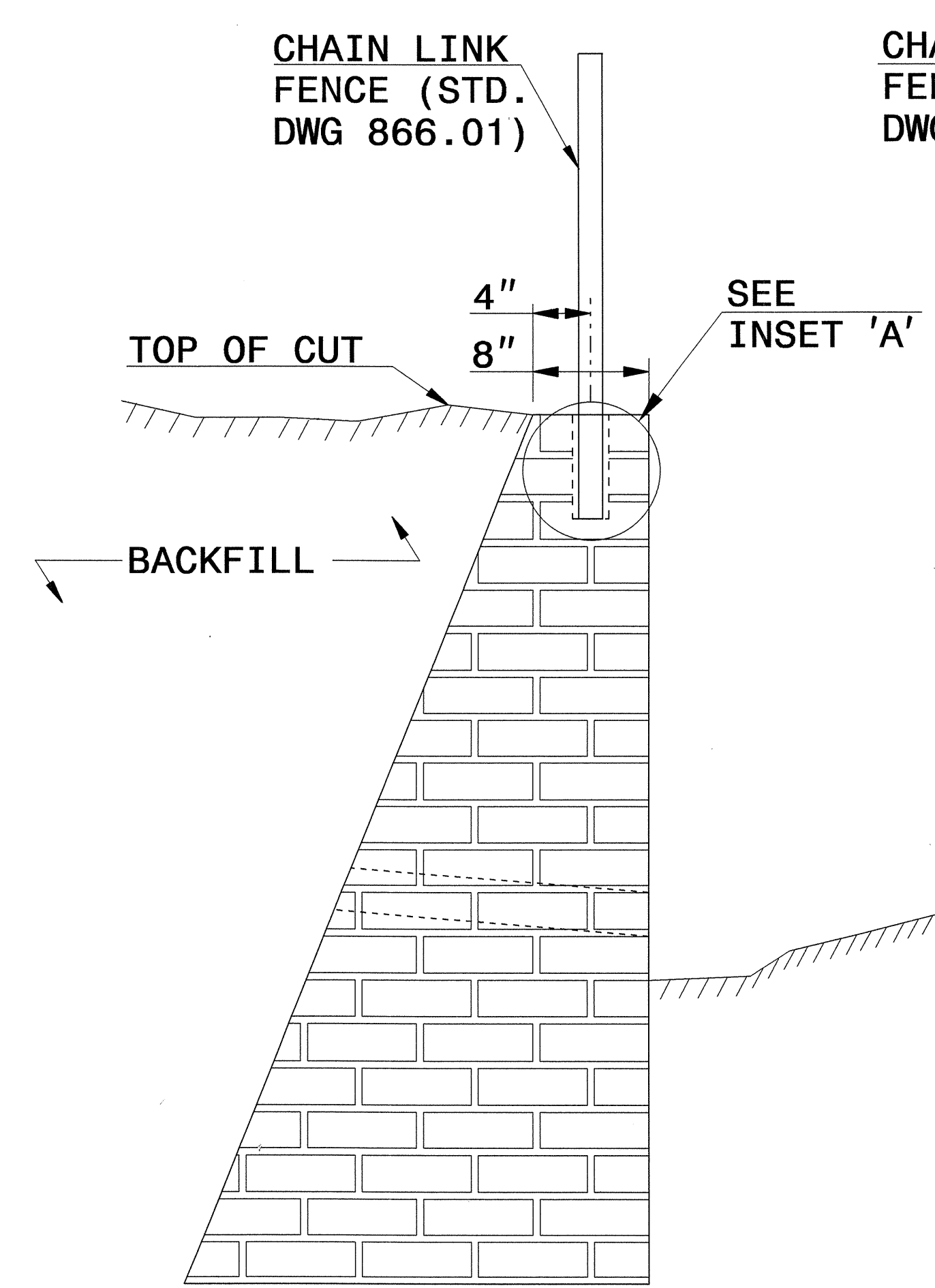
PROJECT NO.: B-4510
COUNTY: FORSYTH
STATION: 14+72.17 -L- TO 15+52.00 -L-
 SHEET OF


GEOTECHNICAL ENGINEERING UNIT
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

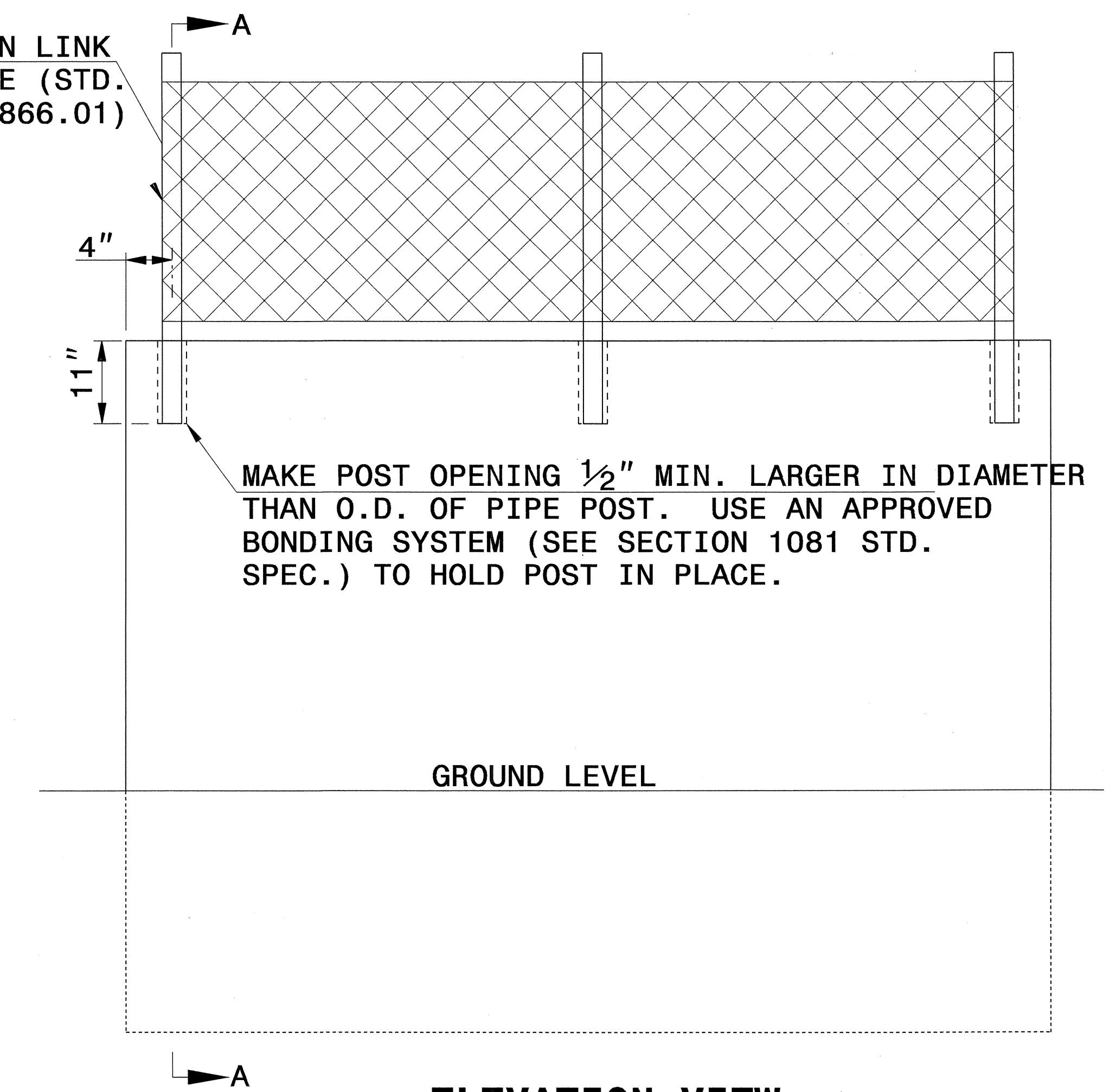
STANDARD DRAWING NO. 453.01
STANDARD CAST-IN-PLACE (CIP) GRAVITY RETAINING WALL
 DATE: 6/21/11
 SHEET NO. TOTAL SHEETS



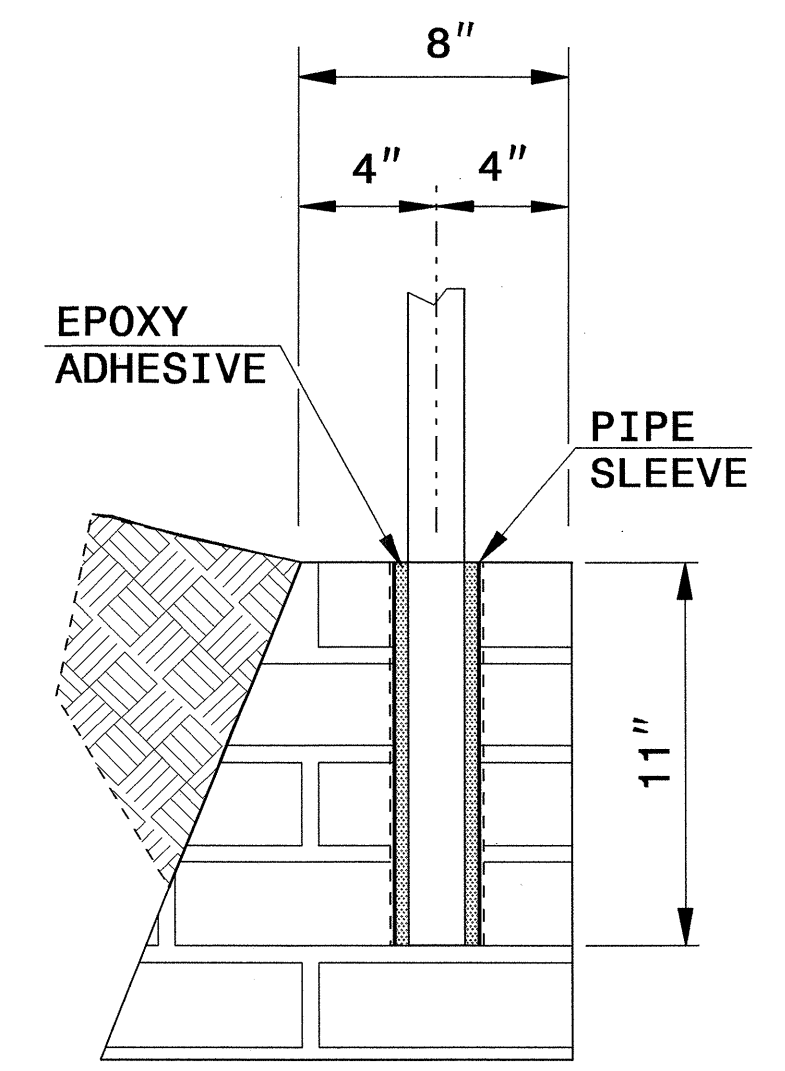
**SECTION A-A
CONCRETE RETAINING WALL**



**SECTION A-A
BRICK MASONRY RETAINING WALL**



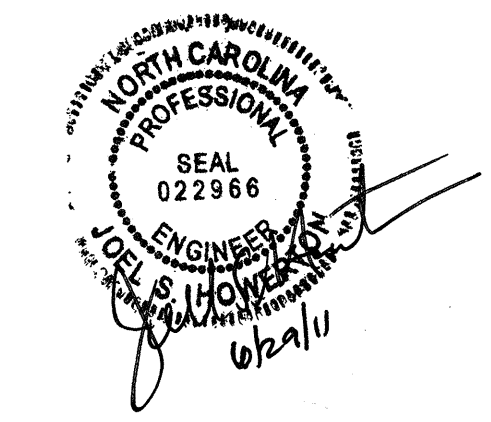
**ELEVATION VIEW
OF RETAINING WALL**



INSET 'A'

GENERAL NOTES:

EMBED CHAIN LINK FENCE 11" INTO PROPOSED WALL WITH EPOXY OR CONCRETE GROUT ANCHORING SYSTEM AS DIRECTED BY THE ENGINEER. PRE-MEASURE AND CENTER THE PROPOSED RAILING CENTERED ON TOP OF WALL FOR POST SPACINGS. USE A ROTARY DRILL TO DRILL FOR HOLES IN THE CONCRETE . NO IMPACT DRILLS WILL BE ALLOWED, TO ELIMINATE ANY POSSIBLTY OF STRUCTURAL DAMAGES TO THE PROPOSED WALL.
INSTALL PIPE SLEEVES IN THE BRICK RETAINING WALL (SEE INSET 'A') AND REFER TO STD. SPECIFICATION 1081 FOR PROPER ANCHOR SYSTEM.



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**CHAIN LINK FENCE
ON RETAINING WALL**

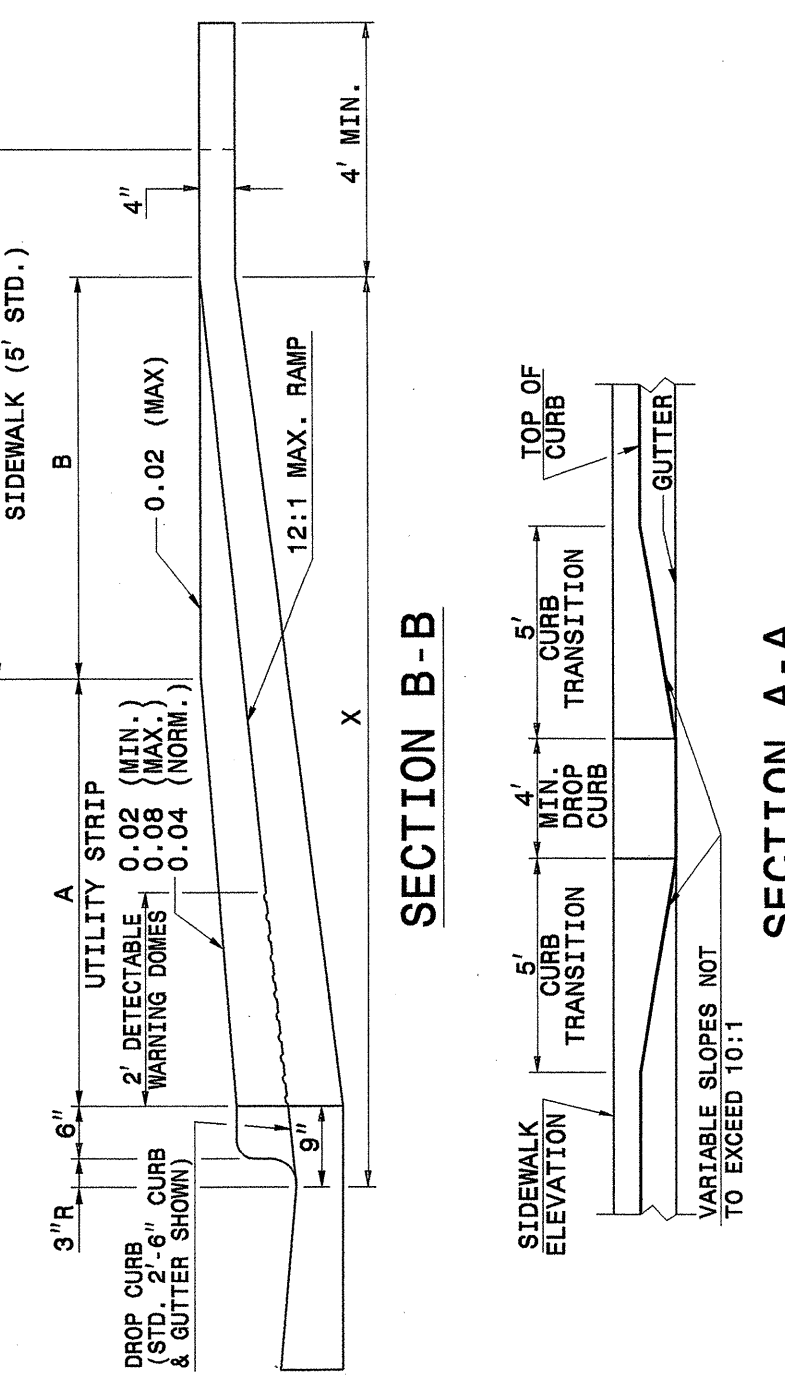
ORIGINAL BY: L. Robinson DATE: Nov. 1996
 MODIFIED BY: E.E. Ward DATE: Nov. 2001
 CHECKED BY: *[Signature]* DATE: 5/24/11
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 PLOT SHEET: 2-6
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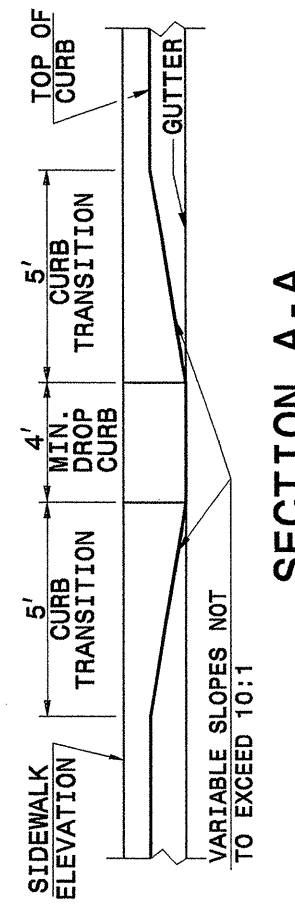
STATE OF NORTH CAROLINA
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ENGLISH DETAIL DRAWING FOR
CURB RAMP
PROPOSED CURB AND GUTTER

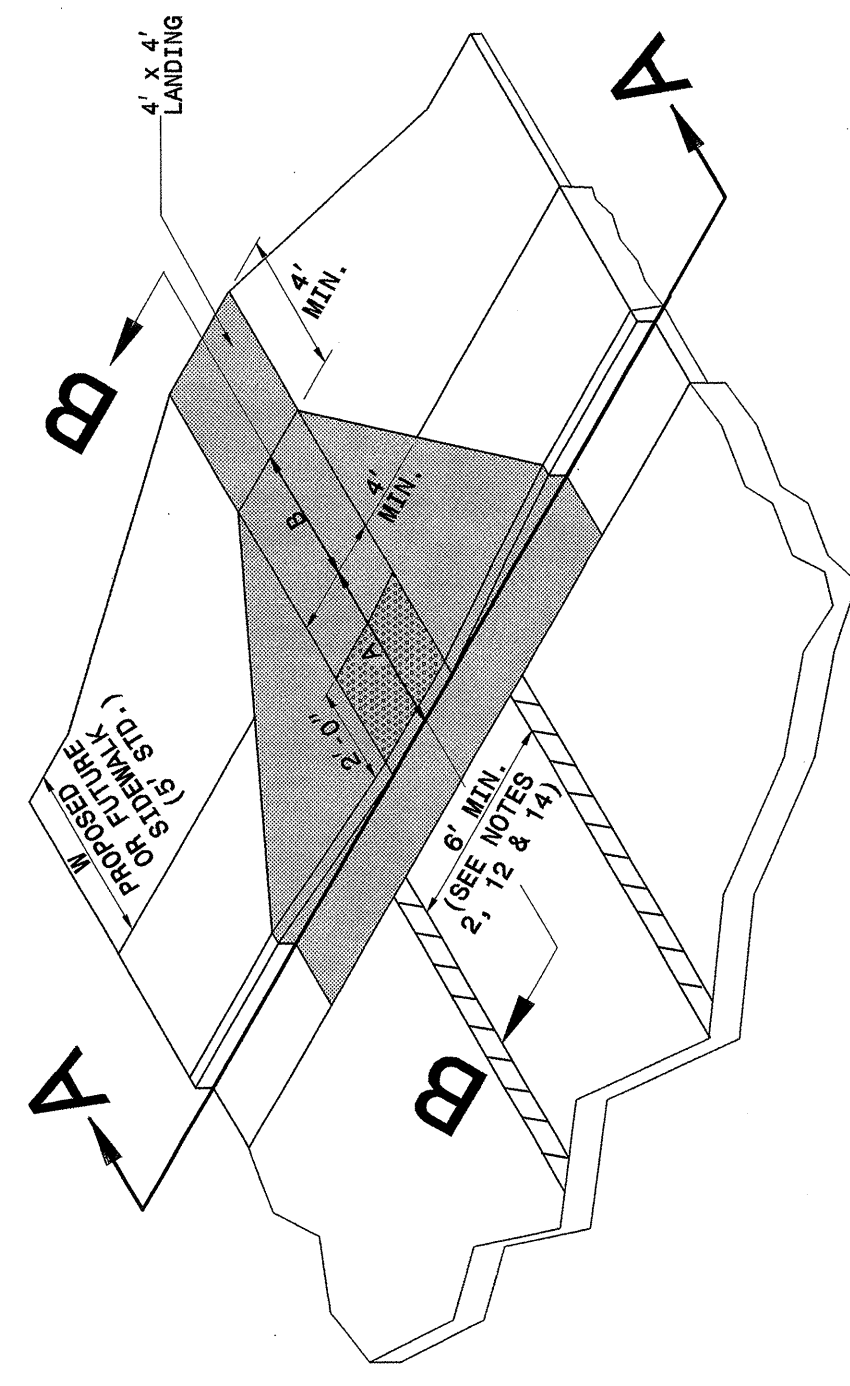
SHEET 1 OF 3
848D05



SECTION B-B



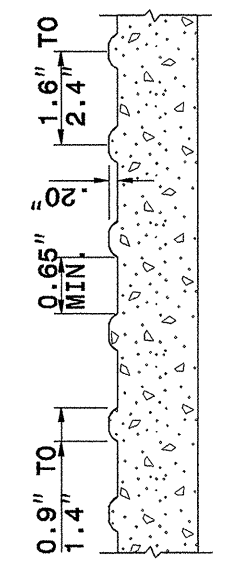
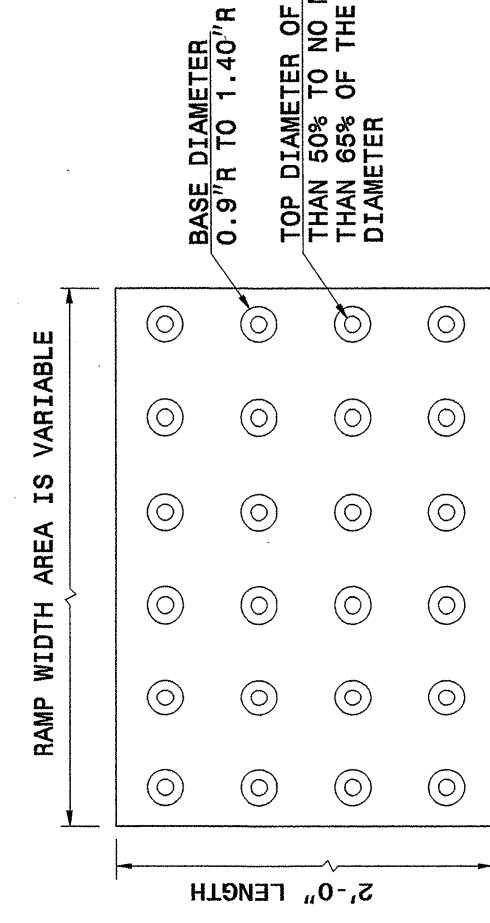
SECTION A-A



ISOMETRIC VIEW

PAY LIMITS FOR CURB RAMP

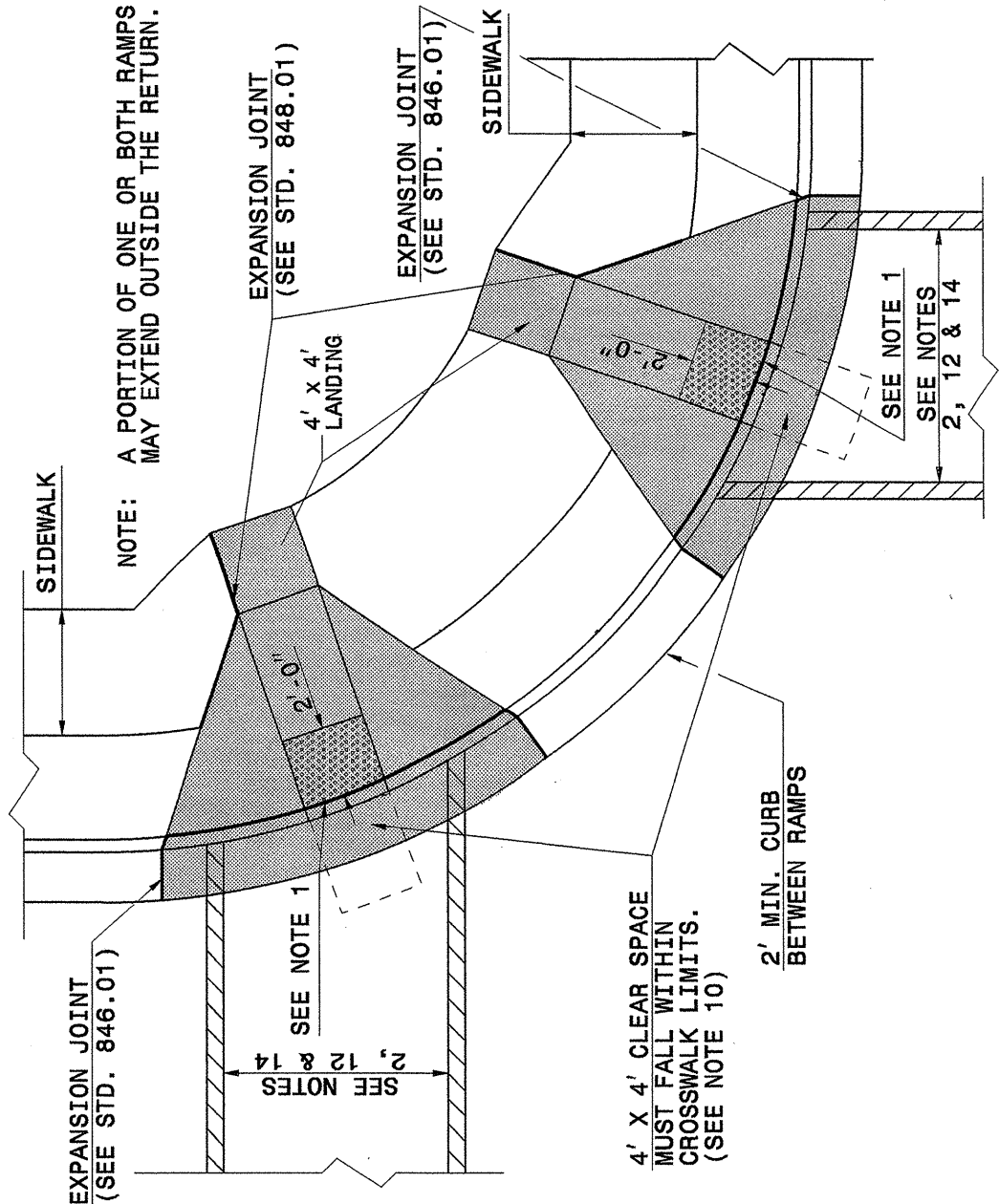
NOTES:
1. DETECTABLE WARNING DOMES WILL COVER 2'-0" LENGTH AND FULL WIDTH OF THE RAMP FLOOR AS SHOWN ON THE DETAILS.
2. DETECTABLE WARNING DOMES WILL CONTRAST VISIBILITY WITH ADJOINING SURFACE, EITHER LIGHT-ON-DARK, OR DARK-ON-LIGHT SEQUENCE COVERING THE ENTIRE RAMP.



DETECTABLE WARNING DOMES

W	A	W+A+9"	X	B
5'	0.0'	5.8'	5.8'	5.0"
6'	0.0'	6.8'	6.8'	6.0"
7'	0.0'	7.8'	7.3'	6.5"
8'	0.0'	8.8'	7.3'	6.5"
5'	2.0'	7.8'	7.8'	5.0'
5'	2.5'	8.3'	8.1'	4.8'
5'	3.0'	8.8'	8.3'	4.4'
5'	4.0'	9.8'	8.4'	4.1'
5'	4.5'	10.3'	8.7'	3.8'
5'	5.0'	10.8'	8.9'	3.1'

B = X - (A+9")
B = DISTANCE FROM FRONT EDGE OF SIDEWALK TO BACK POINT OF 12:1 (8.33%) SLOPE.
* BASEWALK SLOPES REQUIRED FOR ALL SIDEWALK SURFACES
** BACK OF SIDEWALK DROP REQUIRED FOR SIDEWALK SLOPES 0.04.



PLAN VIEW

DUAL RAMPS ANY RADIUS (4' MIN. FLOOR WIDTH)

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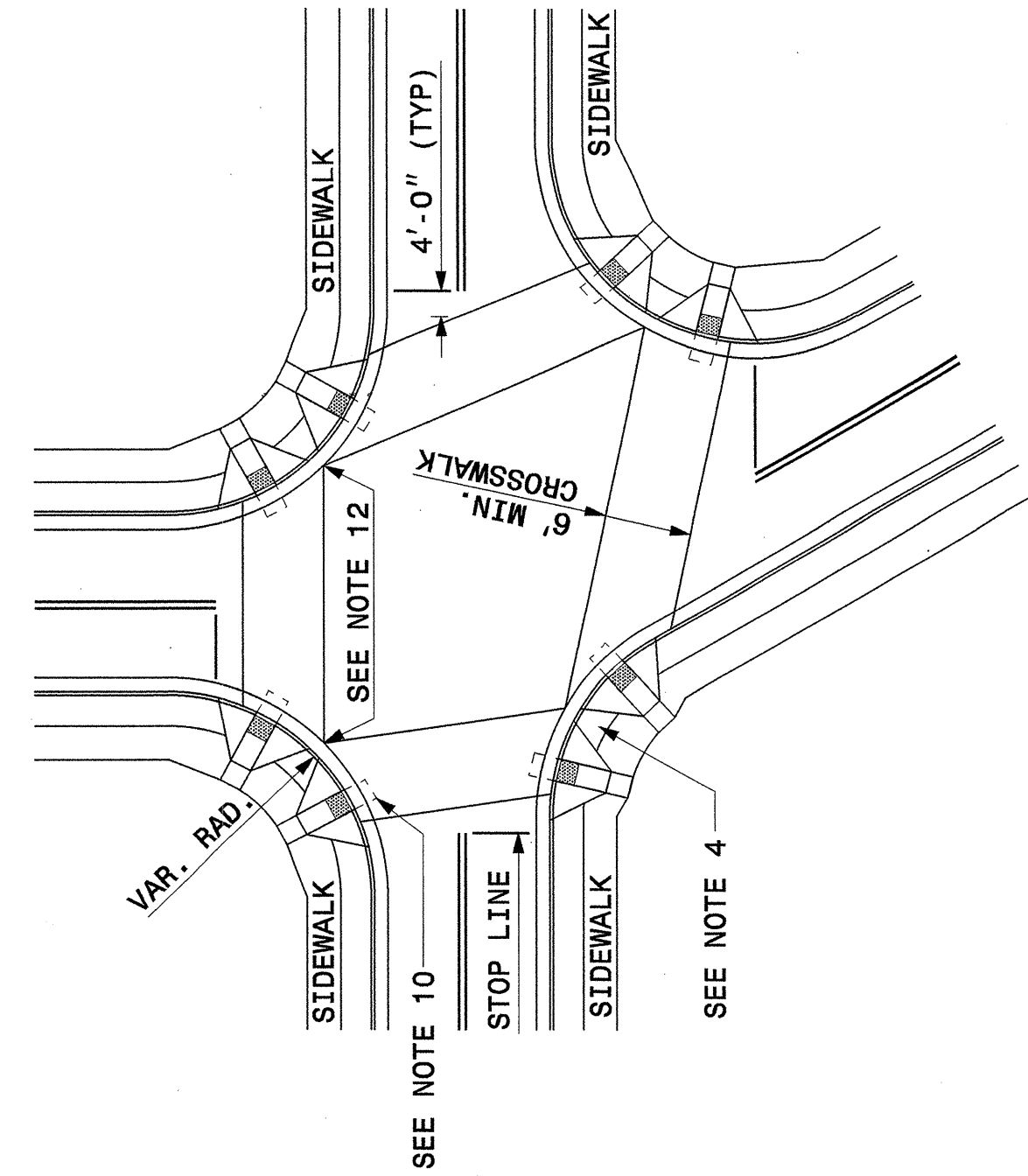
ENGLISH DETAIL DRAWING FOR
CURB RAMP
PROPOSED CURB AND GUTTER

SHEET 1 OF 3
848D05

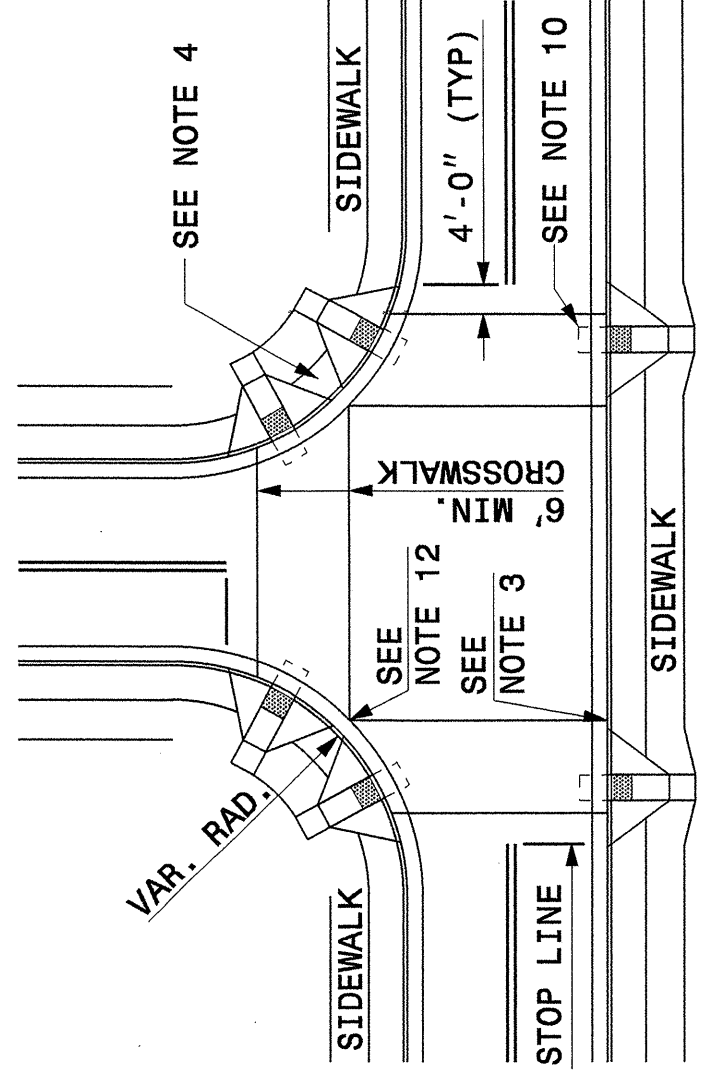
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ENGLISH DETAIL DRAWING FOR
CURB RAMP
PROPOSED CURB AND GUTTER

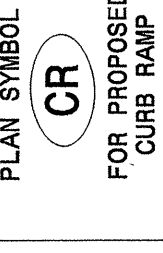
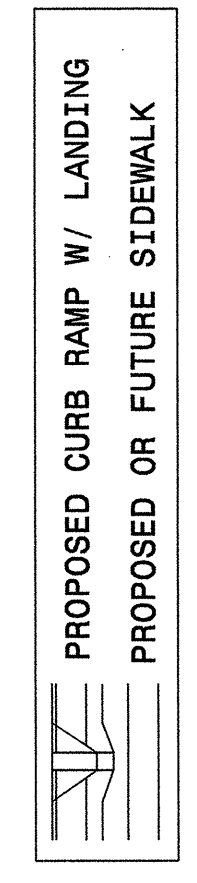
SHEET 2 OF 3
848D05



DETAIL SHOWING TYPICAL LOCATION OF CURB RAMPS, PEDESTRIAN CROSSWALKS AND STOP LINES



DETAIL SHOWING TYPICAL LOCATION OF CURB RAMPS, PEDESTRIAN CROSSWALKS AND STOP LINES FOR TEE INTERSECTIONS



ALLOWABLE LOCATIONS
DUAL RAMP RADII.....ANY

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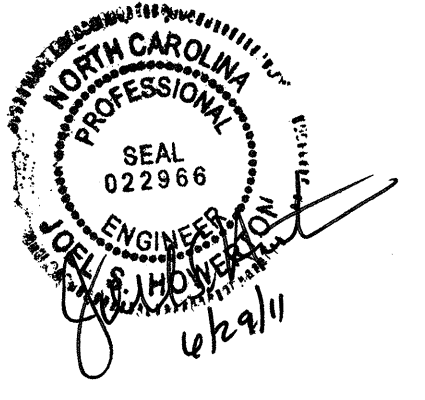
ENGLISH DETAIL DRAWING FOR
CURB RAMP
PROPOSED CURB AND GUTTER

SHEET 2 OF 3
848D05

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SEE PLATE FOR TITLE

ORIGINAL BY: STD.NO.848.05 DATE: 4-22-10
MODIFIED BY: DATE:
CHECKED BY: DATE: 5/3/11
FILE SPEC.: SpecialDetails/EricWard/STDS/848D05.dgn



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ENGLISH DETAIL DRAWING FOR
CURB RAMPS
NOTES

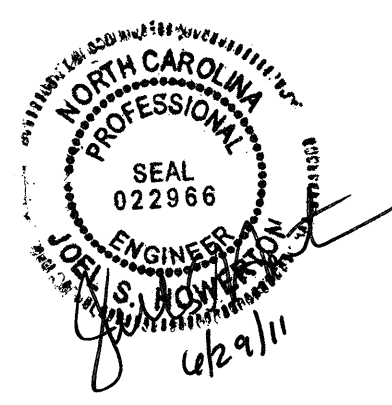
SHEET 3 OF 3
848D05

- NOTES:
1. CONSTRUCT THE RAMP SURFACE TO BE STABLE, FIRM, AND SLIP RESISTANT. CONSTRUCT THE CURB RAMP TYPE AS SHOWN IN THE PAVEMENT MARKING PLANS OR AS DIRECTED BY THE ENGINEER.
 2. LOCATE CURB RAMPS AND PLACE PEDESTRIAN CROSSWALK MARKINGS AS SHOWN IN THE PAVEMENT MARKING PLANS. WHEN FIELD ADJUSTMENTS REQUIRE MOVING CURB RAMPS OR MARKINGS AS SHOWN, CONTACT THE SIGNING AND DELINEATION UNIT OR LOCATE AS DIRECTED BY THE ENGINEER.
 3. COORDINATE THE CURB RAMP AND THE PEDESTRIAN CROSSWALK MARKINGS SO A 4'x4' CLEAR SPACE AT THE BASE OF THE CURB RAMP WILL FALL WITHIN THE PEDESTRIAN CROSSWALK LINES.
 4. SET BACK DISTANCE FROM INSIDE CROSSWALK MARKING TO NEAREST EDGE OF TRAVEL LANE IS 4' MINIMUM.
 5. REFER TO THE PAVEMENT MARKING PLANS FOR STOP BAR LOCATIONS AT SIGNALIZED INTERSECTIONS. IF A PAVEMENT MARKING PLAN IS NOT PROVIDED, CONTACT THE SIGNAL DESIGN SECTION FOR THE STOP BAR LOCATIONS OR LOCATE AS DIRECTED BY THE ENGINEER.
 6. TERMINATE PARKING A MINIMUM OF 20' BACK OF A PEDESTRIAN CROSSWALK.
 7. CONSTRUCT CURB RAMPS A MINIMUM OF 4' WIDE.
 8. CONSTRUCT THE RUNNING SLOPE OF THE RAMP 8.33% MAXIMUM.
 9. ALLOWABLE CROSS SLOPE ON SIDEWALKS AND CURB RAMPS WILL BE 2% MAXIMUM.
 10. CONSTRUCT THE SIDE FLARE SLOPE A MAXIMUM OF 10% MEASURED ALONG THE CURB LINE.
 11. CONSTRUCT THE COUNTER SLOPE OF THE GUTTER OR STREET AT THE BASE OF THE CURB RAMP A MAXIMUM OF 5% AND MAINTAIN A SMOOTH TRANSITION.
 12. CONSTRUCT LANDINGS FOR SIDEWALK A MINIMUM OF 4'x4' WITH A MAXIMUM SLOPE OF 2% IN ANY DIRECTION. CONSTRUCT LANDINGS FOR MEDIAN ISLANDS A MINIMUM OF 5'x5' WITH A MAXIMUM SLOPE OF 2% IN ANY DIRECTION.
 13. TO USE A MEDIAN ISLAND AS A PEDESTRIAN REFUGE AREA, MEDIAN ISLANDS WILL BE A MINIMUM OF 6' WIDE. CONSTRUCT MEDIAN ISLANDS TO PROVIDE PASSAGE OVER OR THROUGH THE ISLAND.
 14. SMALL CHANNELIZATION ISLANDS THAT CAN NOT PROVIDE A 5'x5' LANDING AT THE TOP OF A RAMPS, WILL BE CUT THROUGH LEVEL WITH THE SURFACE STREET.
 15. CURB RAMPS WITH RETURNED CURBS MAY BE USED ONLY WHERE PEDESTRIANS WOULD NOT NORMALLY WALK ACROSS THE RAMP. THE ADJACENT SURFACE IS PLANTING OR OTHER NON-WALKING SURFACE OR THE SIDE APPROACH IS SUBSTANTIALLY OBSTRUCTED.
 16. PLACE A 1/2" EXPANSION JOINT WHERE THE CONCRETE CURB RAMP JOINS THE CURB AS SHOWN IN ROADWAY STANDARD DRAWING 848.01
 17. PLACE ALL PEDESTRIAN PUSH BUTTON ACTUATORS AND CROSSING SIGNALS AS SHOWN IN THE PLANS OR AS SHOWN IN THE MUTCD.
 18. CURB RAMPS THROUGH MEDIAN ISLANDS, SINGLE RAMPS AT DUAL CROSSWALKS OR LIMITED R/W SITUATIONS, WILL BE HANDLED BY SPECIAL DETAILS. CONTACT THE CONTRACT STANDARDS AND DEVELOPMENT UNIT FOR THE DETAILS OR FOR A SPECIAL DESIGN.

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ENGLISH DETAILS DRAWING FOR
CURB RAMPS
NOTES

SHEET 3 OF 3
848D05

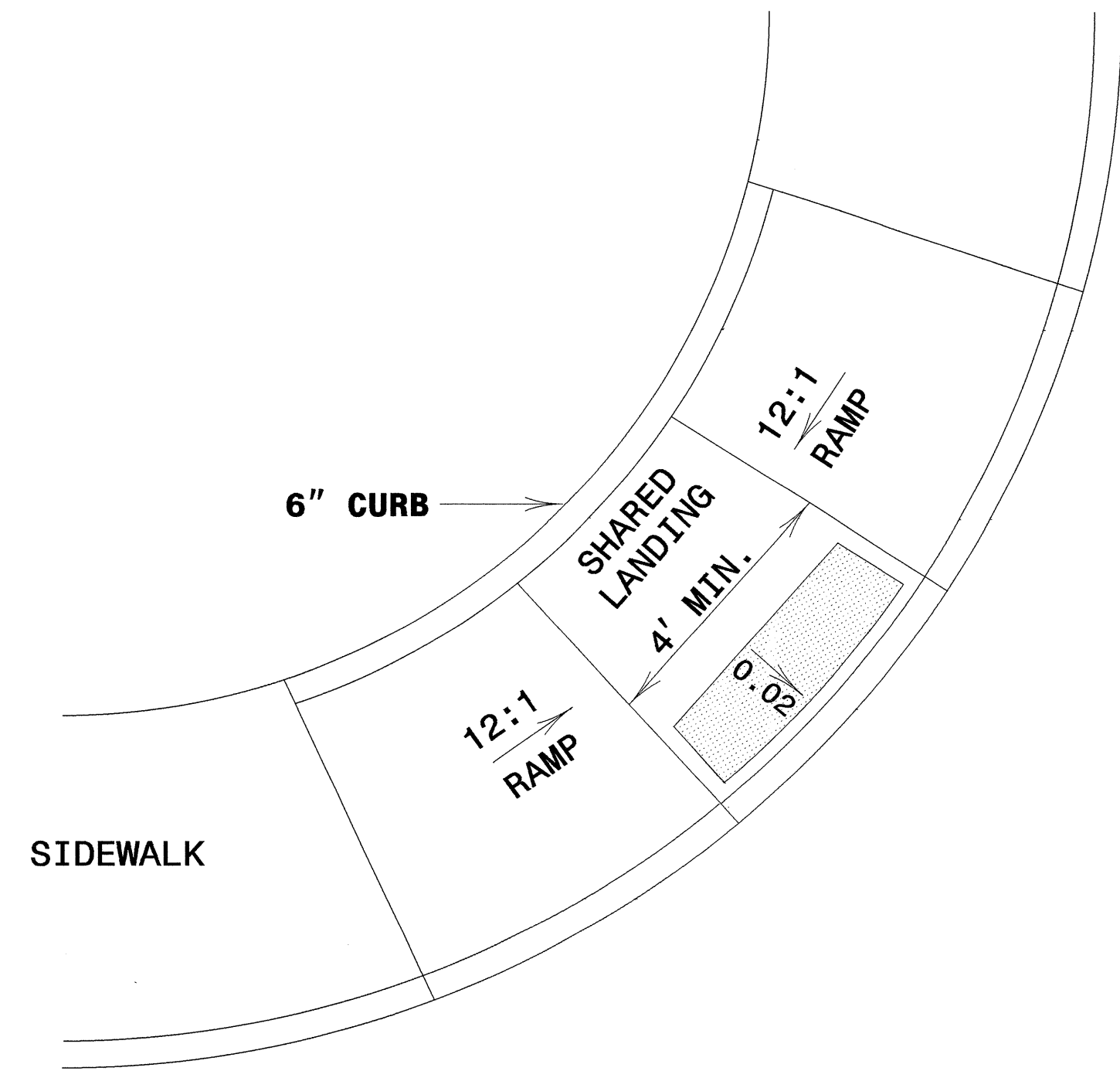


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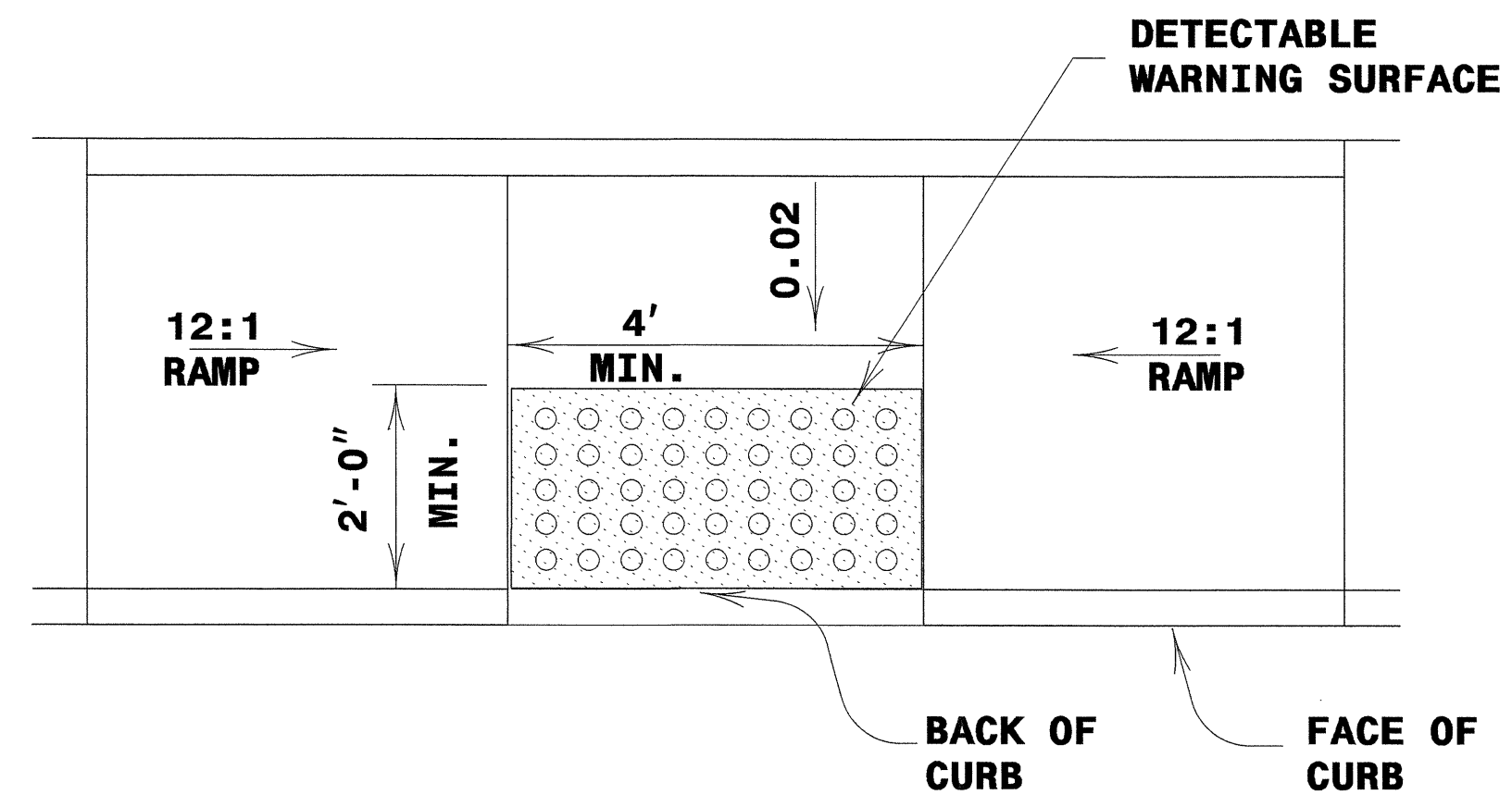
SEE PLATE FOR TITLE

ORIGINAL BY: STD.NO.848.05 DATE: 4-22-11
 MODIFIED BY: *Eric Ward* DATE: *5/21/11*
 CHECKED BY: *Eric Ward* DATE: *5/21/11*
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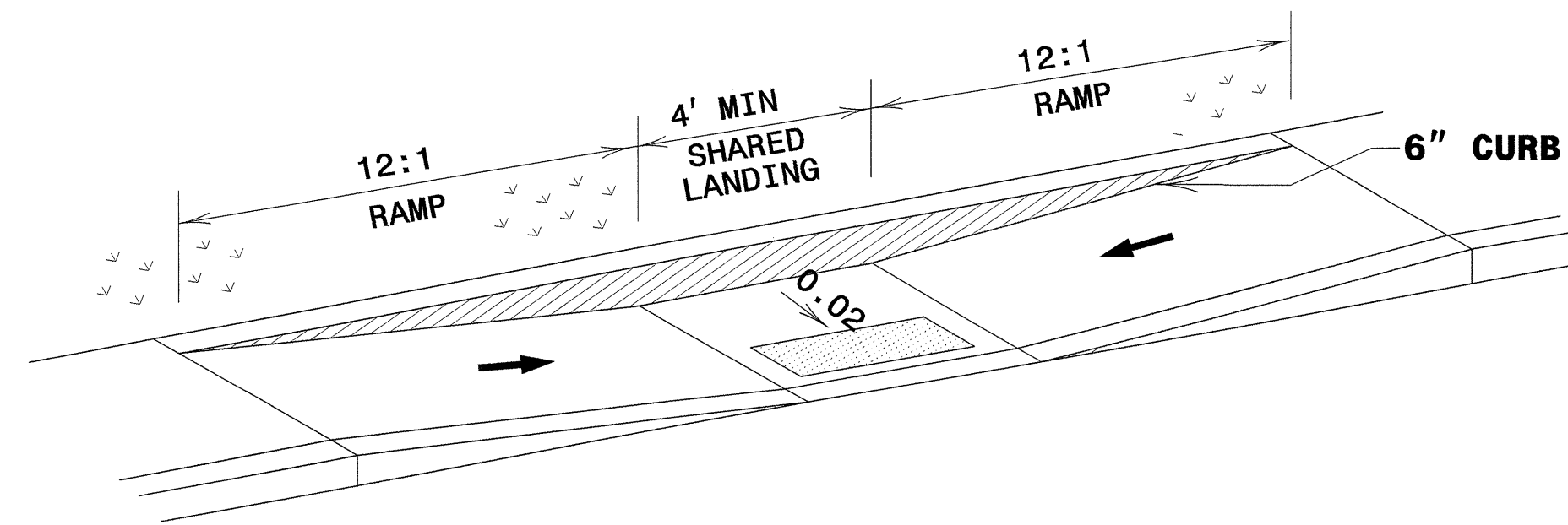
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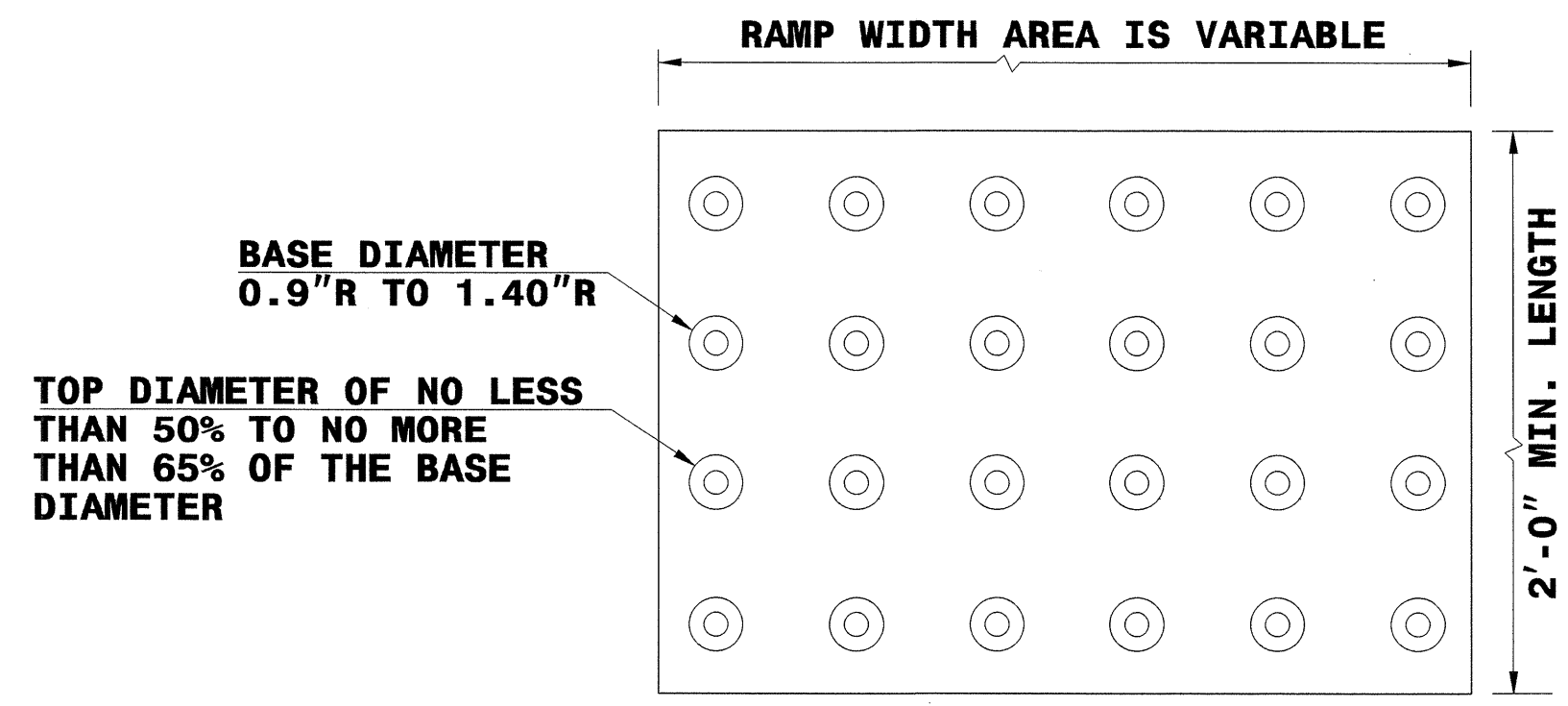
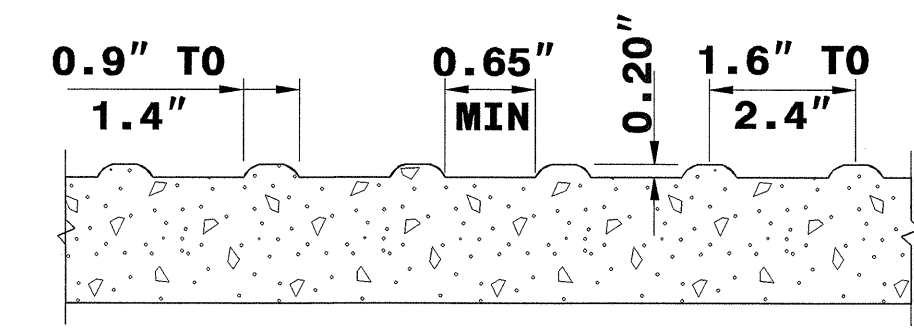
PARALLEL CURB RAMP
PLAN VIEW



PARALLEL CURB RAMP
PLAN VIEW



PARALLEL CURB RAMP
ISOMETRIC VIEW



DETECTABLE WARNINGS

SEE SHEET 2-I FOR CURB RAMP GENERAL NOTES



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**CURB RAMP
SPECIAL DETAILS**

ORIGINAL BY: STD.NO.848.05 DATE: 4-22-10
 MODIFIED BY: *Eric Ward* DATE: *4/21/10*
 CHECKED BY: *Eric Ward* DATE: *4/21/10*
 FILE SPEC.: SpecialDetails/EricWard/STD84805.dgn

STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS

ROADWAY DESIGN
ENGINEER

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
ROADWAY SUMMARY OF QUANTITIES FOR CONTRACT - C202601

ItemNumber	Sec #	Quantity	Unit	Description	ItemNumber	Sec #	Quantity	Unit	Description	ItemNumber	Sec #	Quantity	Unit	Description
0000100000-N	800	Lump Sum		MOBILIZATION	3045000000-E	862	87.5	LF	STEEL BM GUARDRAIL, SHOP CURVED	5325800000-E	1510	93	LF	8" WATER LINE
0029000000-N	SP	Lump Sum		REINFORCED BRIDGE APPROACH FILL, STATION ***** (17+96.98)	3105000000-N	862	2	EA	STEEL BM GUARDRAIL TERMINAL SECTIONS	5540000000-E	1515	1	EA	6" VALVE
0038000000-E	SP	1,000	CY	SHALLOW UNDERCUT	3150000000-N	862	5	EA	ADDITIONAL GUARDRAIL POSTS	5546000000-E	1515	1	EA	8" VALVE
0043000000-N	226	Lump Sum		GRADING	3215000000-N	862	4	EA	GUARDRAIL ANCHOR UNITS, TYPE III	5571600000-E	1515	3	EA	6" TAPPING VALVE
0050000000-E	226	1	ACR	SUPPLEMENTARY CLEARING & GRUB-BING	3270000000-N	SP	4	EA	GUARDRAIL ANCHOR UNITS, TYPE 350	5571800000-E	1515	1	EA	8" TAPPING VALVE
0057000000-E	226	500	CY	UNDERCUT EXCAVATION	3360000000-E	863	1,075	LF	REMOVE EXISTING GUARDRAIL	5643100000-E	1515	11	EA	3/4" WATER METER
0080000000-E	SP	2,000	TON	CLASS IV SUBGRADE STABILIZATION	3389100000-N	SP	1	EA	GUARDRAIL ANCHOR UNITS, TYPE 350 TEMPORARY	5666000000-E	1515	2	EA	FIRE HYDRANT
0196000000-E	270	3,000	SY	FABRIC FOR SOIL STABILIZATION	3435000000-N	SP	14	EA	GENERIC GUARDRAIL ITEM EXTRA LENGTH GUARDRAIL POST (8" STEEL)	5691300000-E	1520	20	LF	8" SANITARY GRAVITY SEWER
0199000000-E	SP	840	SF	TEMPORARY SHORING	3435000000-N	SP	14	EA	GENERIC GUARDRAIL ITEM EXTRA LENGTH GUARDRAIL POST (8" STEEL)	5768000000-N	1520	5	EA	SANITARY SEWER CLEAN-OUT
0318000000-E	SP	100	TON	FOUNDATION CONDITIONING MATERIAL, MINOR STRS	3536000000-E	866	80	LF	CHAIN LINK FENCE, 48" FABRIC	5775000000-E	1525	1	EA	4' DIA UTILITY MANHOLE
0320000000-E	SP	310	SY	FOUNDATION CONDITIONING FABRIC	3542000000-E	866	7	EA	METAL LINE POSTS FOR 48" CHAIN LINK FENCE	5781000000-E	1525	11	LF	UTILITY MANHOLE WALL, 4' DIA
0366000000-E	SP	164	LF	15" RC PIPE CULVERTS, CLASS III	3548000000-E	866	2	EA	METAL TERMINAL POSTS FOR 48" CHAIN LINK FENCE	5801000000-E	1530	66	LF	ABANDON 8" UTILITY PIPE
0448200000-E	SP	456	LF	15" RC PIPE CULVERTS, CLASS IV	3649000000-E	876	1	TON	RIP RAP, CLASS B	5815000000-N	1530	11	EA	REMOVE WATER METER
0448400000-E	SP	108	LF	24" RC PIPE CULVERTS, CLASS IV	3656000000-E	876	455	SY	FILTER FABRIC FOR DRAINAGE	5815000000-N	1530	2	EA	REMOVE FIRE HYDRANT
0448500000-E	SP	180	LF	30" RC PIPE CULVERTS, CLASS IV	4072000000-E	903	106	LF	SUPPORTS, 3-LB STEEL U-CHANNEL	5828000000-N	1530	1	EA	REMOVE UTILITY MANHOLE
0995000000-E	340	400	LF	PIPE REMOVAL	4102000000-N	904	9	EA	SIGN ERECTION, TYPE E	5882000000-N	SP	1	EA	GENERIC UTILITY ITEM REMOVE WATER VALVE
1000000000-E	462	155	SY	6" SLOPE PROTECTION	4155000000-N	907	13	EA	DISPOSAL OF SIGN SYSTEM, U-CHANNEL	6000000000-E	1605	1,850	LF	TEMPORARY SILT FENCE
1220000000-E	545	1,000	TON	INCIDENTAL STONE BASE	4400000000-E	1110	550	SF	WORK ZONE SIGNS (STATIONARY)	6006000000-E	1610	230	TON	STONE FOR EROSION CONTROL, CLASS A
1297000000-E	607	3,200	SY	MILLING ASPHALT PAVEMENT, **** DEPTH 5/8"	4405000000-E	1110	330	SF	WORK ZONE SIGNS (PORTABLE)	6009000000-E	1610	330	TON	STONE FOR EROSION CONTROL, CLASS B
1308000000-E	607	311	SY	MILLING ASPHALT PAVEMENT, **** TO ***** DEPTH (0" TO 1-1/2")	4410000000-E	1110	215	SF	WORK ZONE SIGNS (BARRICADE MOUNTED)	6012000000-E	1610	290	TON	SEDIMENT CONTROL STONE
1489000000-E	610	1,500	TON	ASPHALT CONC BASE COURSE, TYPE B25.0B	4415000000-N	1115	2	EA	FLASHING ARROW PANELS, TYPE C	6015000000-E	1615	3	ACR	TEMPORARY MULCHING
1498000000-E	610	800	TON	ASPHALT CONC INTERMEDIATE COURSE, TYPE I19.0B	4420000000-N	1120	4	EA	CHANGEABLE MESSAGE SIGN	6018000000-E	1620	100	LB	SEED FOR TEMPORARY SEEDING
1519000000-E	610	1,000	TON	ASPHALT CONC SURFACE COURSE, TYPE S9.5B	4430000000-N	1130	100	EA	DRUMS	6021000000-E	1620	0.5	TON	FERTILIZER FOR TEMPORARY SEEDING
1575000000-E	SP	165	TON	ASPHALT BINDER FOR PLANT MIX	4435000000-N	1135	80	EA	CONES	6024000000-E	1622	260	LF	TEMPORARY SLOPE DRAINS
1577000000-E	SP	5	TON	POLYMER MODIFIED ASPHALT BINDER FOR PLANT MIX	4445000000-E	1150	1,920	HR	FLAGGER	6027000000-N	1622	6	EA	INLET PROTECTION AT TEMPORARY SLOPE DRAINS
1662000000-E	650	75	TON	OPEN-GRADED ASPHALT FRICTION COURSE, TYPE FC-1 MODIFIED	4450000000-N	1160	2	EA	TEMPORARY CRASH CUSHIONS	6030000000-E	1630	450	CY	SILT EXCAVATION
1693000000-E	654	26	TON	ASPHALT PLANT MIX, PAVEMENT REPAIR	4470000000-N	1160	1	EA	RESET TEMPORARY CRASH CUSHIONS	6036000000-E	1631	7,500	SY	MATting FOR EROSION CONTROL
2000000000-N	806	18	EA	RIGHT OF WAY MARKERS	4480000000-N	1165	4	EA	TMIA	6042000000-E	1632	900	LF	1/4" HARDWARE CLOTH
2022000000-E	SP	112	CY	SUBDRAIN EXCAVATION	4485000000-E	1170	1,060	LF	PORTABLE CONCRETE BARRIER	6071030000-E	SP	300	LF	COIR FIBER BAFFLE
2033000000-E	SP	84	CY	SUBDRAIN FINE AGGREGATE	4500000000-E	1170	1,400	LF	RESET PORTABLE CONCRETE BARRIER	6084000000-E	1660	3	ACR	SEEDING & MULCHING
2044000000-E	SP	500	LF	6" PERFORATED SUBDRAIN PIPE	4510000000-N	SP	24	HR	LAW ENFORCEMENT	6087000000-E	1660	3	ACR	MOWING
2070000000-N	SP	1	EA	SUBDRAIN PIPE OUTLETS	4650000000-N	1251	60	EA	TEMPORARY RAISED PAVEMENT MARKERS	6090000000-E	1661	50	LB	SEED FOR REPAIR SEEDING
2077000000-E	SP	6	LF	6" OUTLET PIPE (SUBDRAINS)	4685000000-E	1205	861	LF	THERMOPLASTIC PAVEMENT MARKING LINES (4", 90 MILS)	6093000000-E	1661	0.25	TON	FERTILIZER FOR REPAIR SEEDING
2264000000-E	840	1	CY	PIPE PLUGS	4686000000-E	1205	3,078	LF	THERMOPLASTIC PAVEMENT MARKING LINES (4", 120 MILS)	6096000000-E	1662	100	LB	SEED FOR SUPPLEMENTAL SEEDING
2286000000-N	840	19	EA	MASONRY DRAINAGE STRUCTURES	4695000000-E	1205	66	LF	THERMOPLASTIC PAVEMENT MARKING LINES (8", 90 MILS)	6108000000-E	1665	2.5	TON	FERTILIZER TOPDRESSING
2308000000-E	840	24.2	LF	MASONRY DRAINAGE STRUCTURES	4710000000-E	1205	44	LF	THERMOPLASTIC PAVEMENT MARKING LINES (24", 120 MILS)	6114500000-N	SP	20	MHR	SPECIALIZED HAND MOWING
2364000000-N	840	3	EA	FRAME WITH TWO GRATES, STD 840.16	4725000000-E	1205	2	EA	THERMOPLASTIC PAVEMENT MARKING SYMBOL (90 MILS)	6117000000-N	SP	25	EA	RESPONSE FOR EROSION CONTROL
2366000000-N	840	2	EA	FRAME WITH TWO GRATES, STD 840.24	4770000000-E	1205	1,290	LF	COLD APPLIED PLASTIC PAVEMENT MARKING LINES, TYPE ** (4") (II)	8436000000-E	453	340	SF	GRAVITY RETAINING WALLS
2374000000-N	840	2	EA	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (E)	4775000000-E	1205	1,250	LF	COLD APPLIED PLASTIC PAVEMENT MARKING LINES, TYPE ** (6") (IV)					
2374000000-N	840	4	EA	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (F)	4780000000-E	1205	46	LF	COLD APPLIED PLASTIC PAVEMENT MARKING LINES, TYPE ** (8") (II)					
2374000000-N	840	6	EA	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (G)	4810000000-E	1205	21,600	LF	PAINT PAVEMENT MARKING LINES (4")					
2396000000-N	840	2	EA	FRAME WITH COVER, STD 840.54	4815000000-E	1205	6,600	LF	PAINT PAVEMENT MARKING LINES (6")					
2549000000-E	846	1,000	LF	2'-6" CONCRETE CURB & GUTTER	4820000000-E	1205	100	LF	PAINT PAVEMENT MARKING LINES (8")					
2591000000-E	848	600	SY	4" CONCRETE SIDEWALK	4835000000-E	1205	15	LF	PAINT PAVEMENT MARKING LINES (24")					
2612000000-E	848	70	SY	6" CONCRETE DRIVEWAY	4845000000-N	1205	1	EA	PAINT PAVEMENT MARKING SYMBOL					
2759000000-N	SP	6	EA	GENERIC PAVING ITEM CONCRETE CURB RAMPS	4955000000-N	1264	3	EA	OBJECT MARKERS (END OF ROAD)					
2830000000-N	858	2	EA	ADJUSTMENT OF MANHOLES	5325600000-E	1510	1,213	LF	6" WATER LINE					
3030000000-E	862	2,000	LF	STEEL BM GUARDRAIL										

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###DOSEFRAME###

STATE OF NORTH CAROLINA
 DIVISION OF HIGHWAYS

REMOVAL OF EXISTING CONCRETE PAVEMENT

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	YD ²
-L-	20+15	20+15	LT.	258
TOTAL:				258
SAY:				270

REMOVAL OF EXISTING ASPHALT PAVEMENT

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	YD ²
DRI	19+23	19+23	LT	66
HILLCREST ST.			LT & RT	576
I-40	7+00	19+50.00	LT.	1388.89
-L-	13+97	14+33	LT.	75.26
-L-	14+65	15+09	LT.	79.89
-L-	13+68	14+30	RT.	133.67
TOTAL:				2319.70
SAY:				2350.00

EARTHWORK SUMMARY

STATION	STATION	UNDERCUT	UNCL. EXCAV. +/- %	EMBANK. +/- %	BORROW
SUMMARY No. 1					
-L- 11+80.00	16+95.35		470	1,232	762
DRI 11+75.00	13+90.00		7	607	600
SUMMARY No. 1 TOTAL			477	1,839	1,362
SUMMARY No. 2					
-L- 18+98.60	22+50.00		6	1,813	1,807
SUMMARY No. 2 TOTAL			6	1,813	1,807
SUMMARY TOTAL			483	3,652	3,169
SHOULDER MATERIAL				120	144
LOSS DUE TO CLEARING & GRUBBING			-100		-100
CONTINGENCY UNDERCUT			500	600	600
PROJECT TOTALS:			500	383	4,396
EST. 5% REPLACE TOP SOIL ON BORROW PIT					191
GRAND TOTALS:			500	383	4,004
SAY:			500	400	4,315
EST. SHALLOW UNDERCUT			1,000 CY		
CLASS IV SUBGRADE STABILIZATION			2,000 Tons		

PROPOSED CHAIN LINK FENCE

STATION TO STATION	FABRIC LENGTH	LINE POSTS	TERMINAL POSTS	REMARKS
-L- 14+72.17 to 15+52.00 RT.	79.83	6.32	2	SEE SHT. 2-G FOR FENCE TO WALL ATTACHMENT
TOTAL:	79.83	6.32	2	
SAY:	80.00	7.00	2.00	

BREAKING OF EXISTING ASPHALT PAVEMENT

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	YD ²
L	14+00	17+01	CL	956
L	18+93	22+05	CL	962
DRI	12+50	13+94	CL	396
TOTAL:				2314
SAY:				2320

GUARDRAIL SUMMARY

"N" = DISTANCE FROM EDGE OF LANE TO FACE OF GUARDRAIL.
 TOTAL SHOULDER WIDTH = DISTANCE FROM EDGE OF TRAVEL LANE TO SHOULDER BREAK POINT.
 FLARE LENGTH = DISTANCE FROM LAST SECTION OF PARALLEL GUARDRAIL TO END OF GUARDRAIL.
 W = TOTAL WIDTH OF FLARE FROM BEGINNING OF TAPER TO END OF GUARDRAIL.
 G = GATING IMPACT ATTENUATOR TYPE 350
 NG = NON-GATING IMPACT ATTENUATOR TYPE 350

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH			WARRANT POINT		"N" DIST. FROM E.O.L.	TOTAL SHOUL. WIDTH	FLARE LENGTH		W		ANCHORS				IMPACT ATTENUATOR TYPE 350			SINGLE FACED GUARDRAIL	REMOVE EXISTING GUARDRAIL	REMARKS							
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	GRAU 350	TES	TYPE III	TEMP. GRAU 350	EA	G	NG										
-L-	14+20.35	16+95.35	RT.	275.00'			16+95.35		8'	11'	50'		1'												USE 8' GUARDRAIL POSTS ALONG RETAINING WALL						
-L-	18+98.60	20+63.60	RT.	125.00'			18+98.60		8'	11'		50'		1'																	
-DRI-	12+54.05	-L- 16+95.35	LT.	87.50'	87.50'			16+95.35	8'	11'	50'		1'																		
-L-	18+98.60	20+23.60	LT.	125.00'				18+98.60	8'	11'		50'		1'																	
I-40 EB	10+50.00	15+87.50	RT. MD.	537.50'																				537.50'	REMOVE DURING CONSTRUCTION AS NEEDED						
I-40 WB	10+50.00	15+87.50	LT. MD.	537.50'																				537.50'							
HILLCREST STREET				25.00'																											
SUBTOTAL				2,250'	87.50'																				1,075	TOTAL					
LESS DEDUCTIONS ANCHORS				-275'																											
PROJECT TOTAL				1,975'	87.50'																										
SAY				2,000'	87.50'																										
																LESS DEDUCTIONS ANCHORS															
																4 - GRAU-350 @ 50' = 200'															
																4 - TYPE III @ 18.75' = 75'															
																TOTAL		-275'													

5 ADDITIONAL GUARDRAIL POSTS

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.

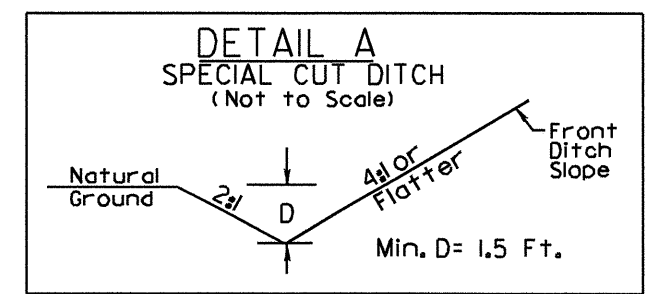
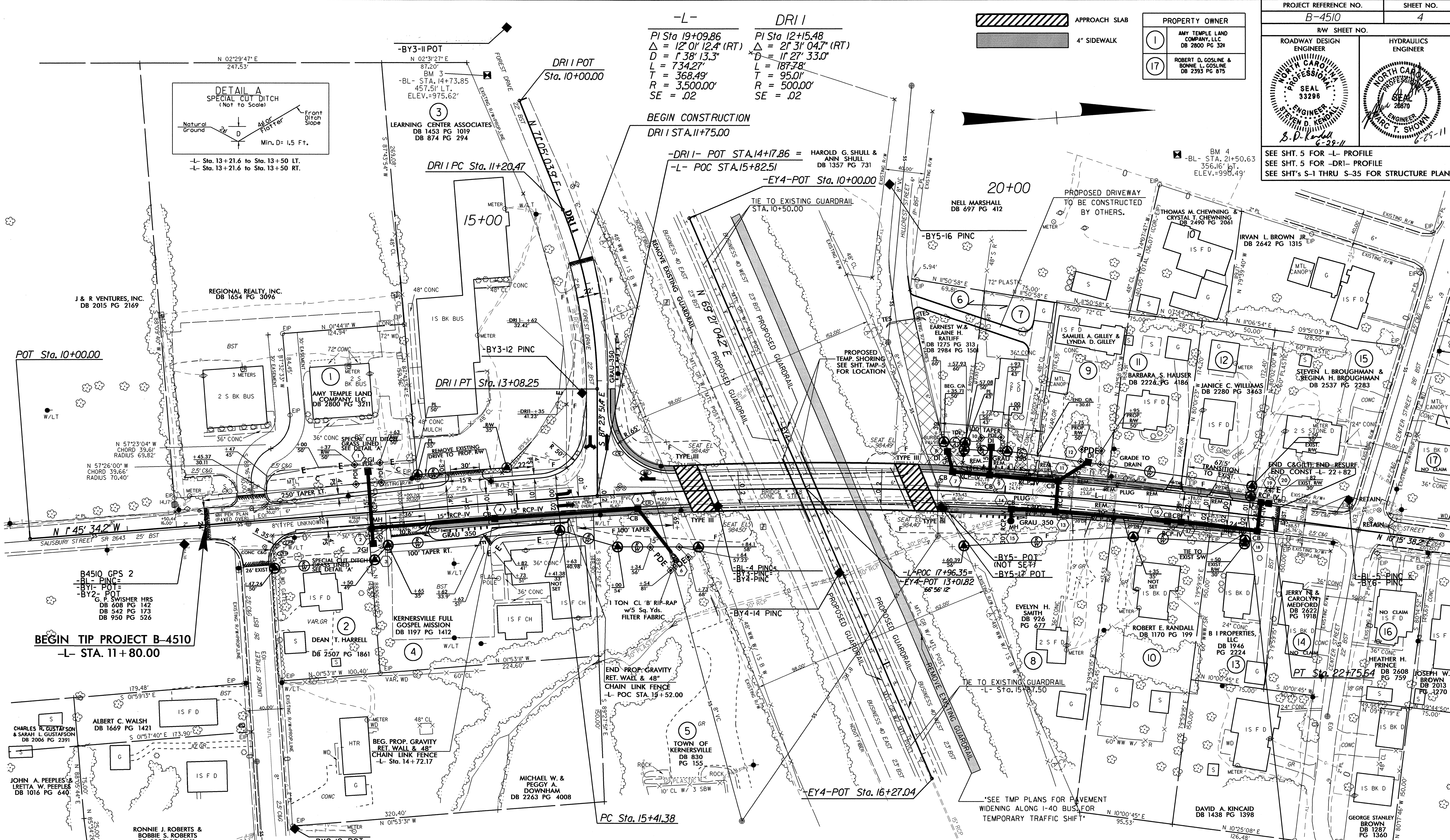
Approximate quantities only. Unclassified Excavation, Borrow Excavation, Fine Grading, Clearing & Grubbing, Breaking of Existing Pavement and Removal of Existing Pavement will be paid for at the lump sum price for "Grading".

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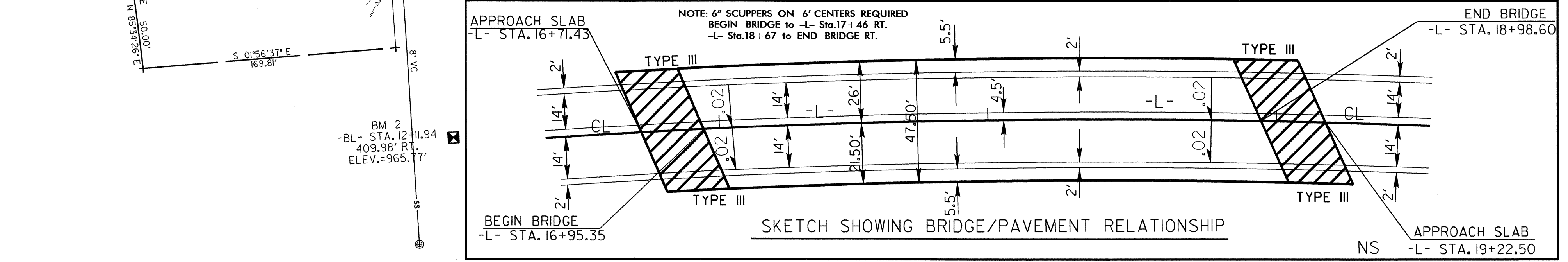
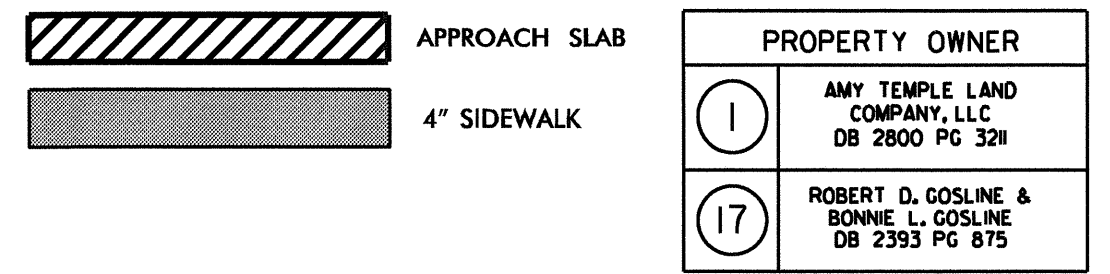
PROJECT REFERENCE NO.	SHEET NO.
B-4510	4
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
SEE SHT. 5 FOR -L- PROFILE SEE SHT. 5 FOR -DRI- PROFILE SEE SHT'S S-1 THRU S-35 FOR STRUCTURE PLANS	



-L- **DRI I**

PI Sta 19+09.86 $\Delta = 12^{\circ}01'12.4''$ (RT)
 $D = 138'13.3''$
 $L = 734.27'$
 $T = 368.49'$
 $R = 3,500.00'$
 $SE = .02$

PI Sta 12+15.48 $\Delta = 21^{\circ}31'04.7''$ (RT)
 $D = 1127'33.0''$
 $L = 187.78'$
 $T = 95.0'$
 $R = 500.00'$
 $SE = .02$



END TIP PROJECT B-4510
-L- PT STA. 22 + 50.00 (END GRADE)

TRAFFIC DIAGRAM	400	FOREST DRIVE	500
2007	500		700
2035			
	200	11000	200
	300	16300	300
11200	1000		<100
16700	1700		100
	2200		100
	3100		200
		50500	
		58000	
			11200
			16400

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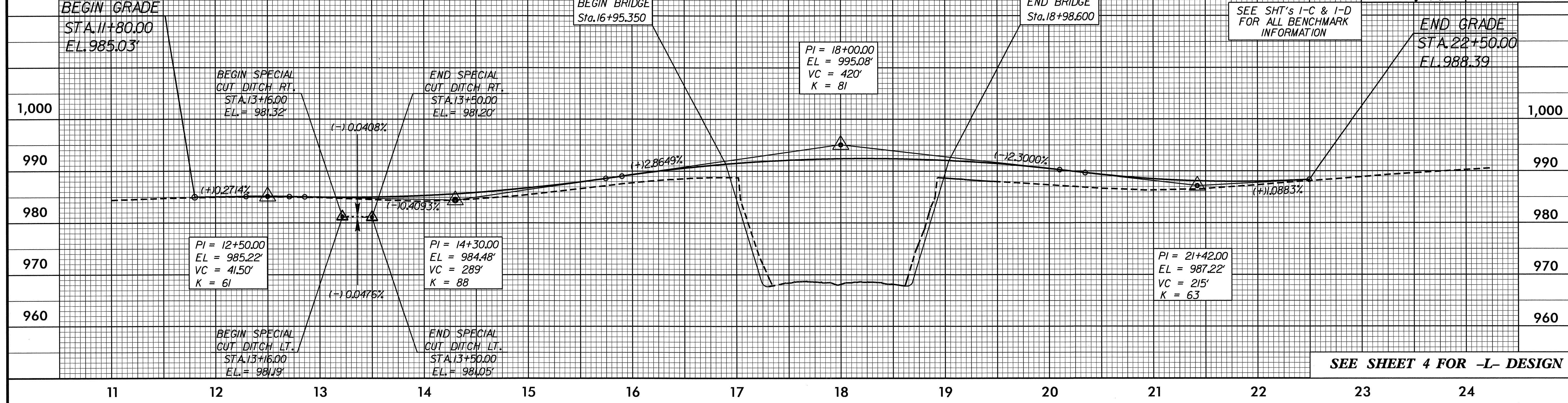
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PROJECT REFERENCE NO. B-4510	SHEET NO. 5
ROADWAY DESIGN ENGINEER SEAL 33296 STEVEN D. KENDALL 6-23-11	HYDRAULICS ENGINEER SEAL 20870 MARC T. SHOWN 6-22-11

-L-

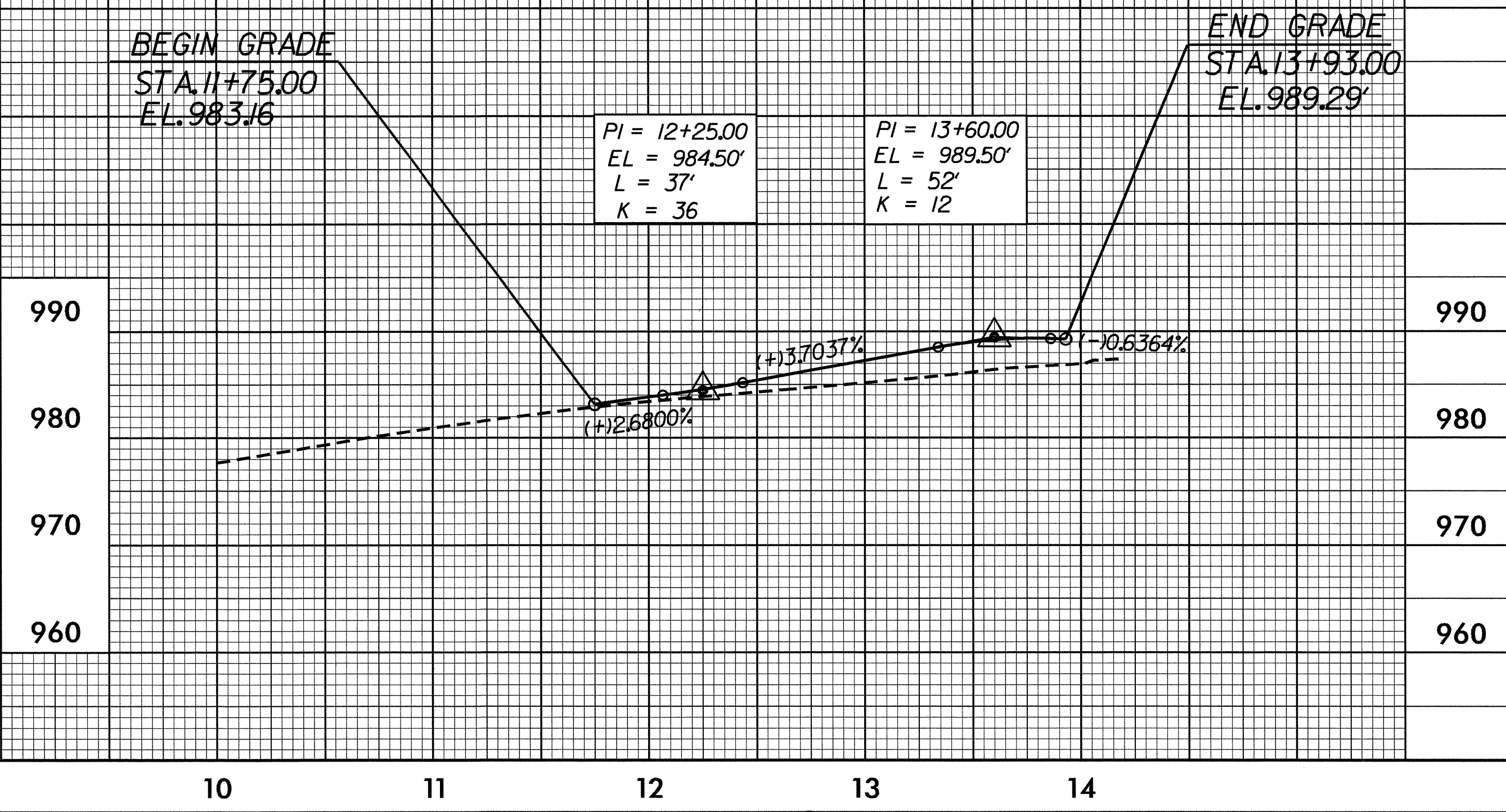
DITCH LEGEND
 LEFT DITCH - - - - -
 RIGHT DITCH - - - - -

NOTE: SEE SHEETS S-1 THRU S-35 FOR STRUCTURE PLANS.



SEE SHEET 4 FOR -DRI 1- DESIGN

-DRI 1-



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