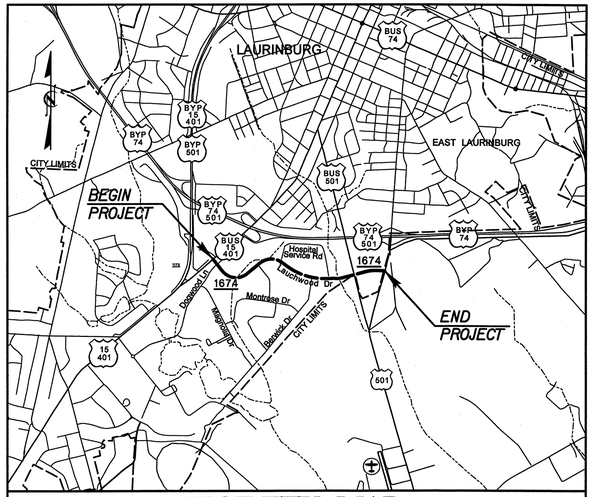
7/2/99

TIP PROJECT: U-5027

CONTRACT: C202074

See Sheet 1-A For Index of Sheets



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

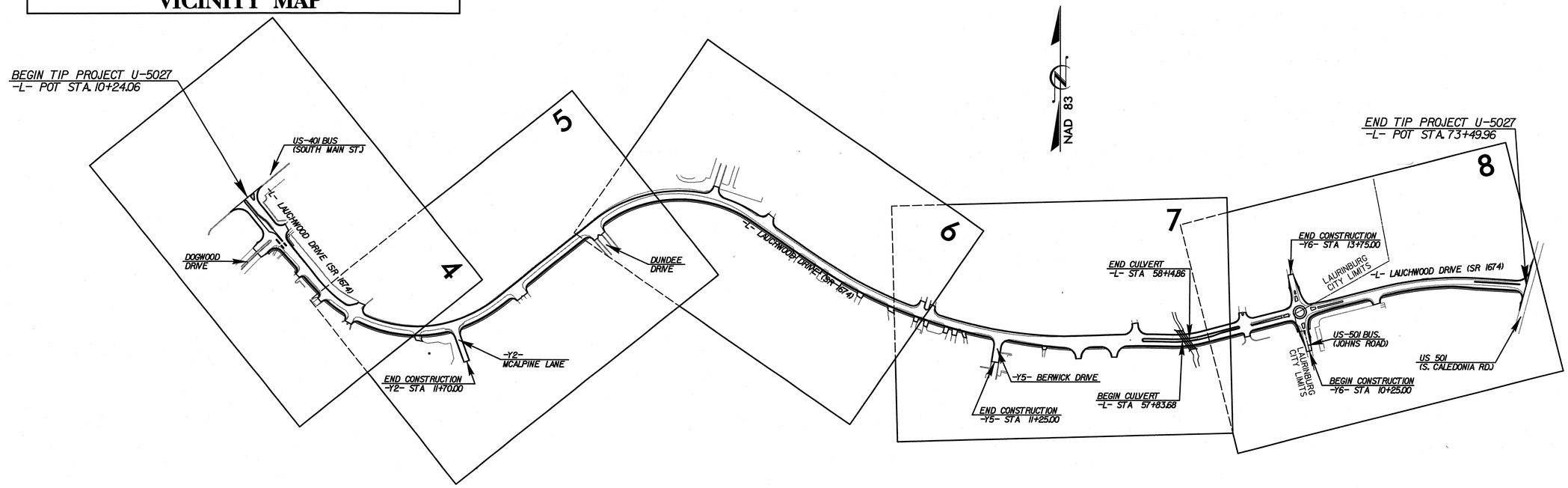
SCOTLAND COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-5027	1	118

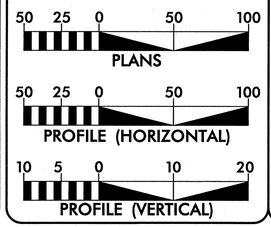
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
41900.1.1	–	P.E.
41900.2.1	–	R.O.W./Utilities
41900.3.ST1	–	Construction

LOCATION: *Lauchwood Dr. from US-15/401 Bus. (South Main St.) To US-501 (South Caledonia Rd.)*

TYPE OF WORK: *Grading, Drainage, Paving, Signals, & Culvert*



GRAPHIC SCALES



DESIGN DATA

ADT 2004	=	4,900
ADT 2025	=	7,350
DHV	=	10 %
D	=	50 %
T	=	6 % *
V	=	40 MPH

* TTST 2% DUAL 4%

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT U-5027	1.19 mi.
LENGTH OF STRUCTURE TIP PROJECT U-5027	0.01 mi.
TOTAL LENGTH TIP PROJECT U-5027	1.20 mi.

Prepared In the Office of:

HNTB

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
AUGUST 8, 2004

LETTING DATE:
March 17, 2009

ENRICO A. ROQUE, P.E.
PROJECT ENGINEER

PHILLIP E. ROGERS, EI
PROJECT DESIGNER

ALISON WHITESELL, P.E.
NCDOT CONTACT

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 18203 ENGINEER SCOTT T. YARLEY

SIGNATURE: P.E. 11/24/08

ROADWAY DESIGN ENGINEER

11/24/08

NORTH CAROLINA PROFESSIONAL SEAL 19824 ENGINEER ENRICO A. ROQUE

SIGNATURE: P.E.

DGN
$DATE$
$TIME$

INDEX OF SHEETS

SHEET NUMBER	SHEET
1	TITLE SHEET
1-A	INDEX OF SHEETS, GENERAL NOTES & LIST OF STANDARDS
1-B	SYMBOLOGY SHEET
2 THRU 2-E	TYPICAL SECTION SHEETS
2-F	ISLAND DETAIL SHEET
2-G	ROUNDABOUT DETAIL SHEET
2-H	ANCHORAGE FOR FRAMES DETAIL SHEET
2-I THRU 2-T	TEMPORARY SHORING DETAILS
3	SUMMARY OF QUANTITIES
3-A	SUMMARY OF EARTHWORK, REMOVAL OF EXISTING ASPHALT PAVEMENT, ROW DATA SHEET & PARCEL INDEX SHEET
3-B THRU 3-D	DRAINAGE SUMMARY SHEETS
4 THRU 8	PLAN SHEETS
9 THRU 11	PROFILE SHEETS
TCP-1	TRAFFIC CONTROL & PAVEMENT MARKING TITLE SHEET
TCP-2	PROJECT NOTES SHEET
TCP-2A	PHASING SHEET
TCP-3 THRU TCP-5	TRAFFIC CONTROL PLANS - PHASE I OVERVIEW SHEETS
TCP-6 THRU TCP-8	TRAFFIC CONTROL PLANS - PHASE II OVERVIEW SHEETS
TCP-8A	ROUNDABOUT CONSTRUCTION SEQUENCE
TCP-8B	ISLAND CONSTRUCTION AT S. MAIN ST.
TCP-9	OFFSITE DETOUR (-Y6-)
TCP-10	TRUCK DETOUR ROUTES
TCP-11	WORK ZONE WARNING SIGNS SHEET
PM-1 THRU PM-5	PAVEMENT MARKING PLAN SHEETS
EC-1	EROSION CONTROL TITLE SHEET
EC-2 THRU EC-2D	EROSION CONTROL NOTES & DETAILS SHEETS
EC-2E	CULVERT CONSTRUCTION SEQUENCE
EC-3 THRU EC-7	EROSION CONTROL PLAN SHEETS
SIG-1 THRU SIG-9	SIGNAL PLAN SHEETS
UO-1 THRU UO-6	UTILITY BY OTHERS PLAN SHEETS
X-0	CROSS SECTION SUMMARY
X-1 THRU X-21	-L- CROSS SECTION SHEETS
X-22	-Y2- CROSS SECTION SHEET
X-23	-Y5- CROSS SECTION SHEET
X-24 THRU X-25	-Y6- CROSS SECTION SHEETS
S-0	CULVERT TITLE SHEET
S-1 THRU S-6	CULVERT DESIGN SHEETS
SN	STANDARD STRUCTURE NOTES

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
225.05	Method of Obtaining Superelevation - Divided Highways
225.06	Method of Grading Sight Distance at Intersections
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation - Method 'A'
310.02	Parallel Pipe End Section - Precast Concrete Section for 15" to 24" Pipe
310.03	Cross Pipe End Section - Precast Concrete Section for 18" to 30" Pipe
310.04	Parallel Pipe End Section - Prefabricated Steel Section for 15" to 24" Pipe
310.05	Cross Pipe End Section - Prefabricated Steel Section for 18" to 30" Pipe
310.10	Driveway Pipe Construction
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
838.01	Concrete Endwall for Single and Double Pipe Culverts - 15" thru 48" Pipe 90 Skew
838.11	Brick Endwall for Single and Double Pipe Culverts - 15" thru 48" Pipe 90 Skew
838.80	Precast Endwalls - 12" thru 72" Pipe 90 Skew

STANDARD DRAWINGS (CONT.)

STD.NO.	TITLE
DIVISION 8 - INCIDENTALS (cont.)	
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
840.45	Precast Drainage Structure
840.54	Manhole Frame and Cover
840.66	Drainage Structure Steps
840.72	Pipe Collar
846.01	Concrete Curb, Gutter and Curb & Gutter
848.03	Driveway Turnout - Drop Curb Type
848.04	Street Turnout
848.05	Wheelchair Ramp - Curb Cut
852.01	Concrete Islands
852.05	Median Curb for Catch Basin - for Use with 1'-6" Curb and Gutter
852.10	Median Construction - with Curb and Gutter
876.02	Guide for Rip Rap at Pipe Outlets

GENERAL NOTES:

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 ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD II.

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

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.

DRIVEWAYS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. 848.03 AT LOCATIONS SHOWN ON PLANS OR AS DIRECTED BY THE ENGINEER.

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

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

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

UTILITY OWNERS ON THIS PROJECT ARE: ADELPHIA, AT&T, PIEDMONT NATURAL GAS, TIME WARNER CABLE, CITY OF LAURINBURG WATER & SEWER, AND PUBLIC WORKS - ELECTRIC.

ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS.

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

WHEELCHAIR RAMPS ARE SHOWN ON THE PLANS AT APPROXIMATE LOCATIONS. THE CONSTRUCTION OF ALL WHEELCHAIR RAMPS SHALL BE IN ACCORDANCE WITH STD. NO. 848.05

7/2/99

Note: Not to Scale

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

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

HNTB NORTH CAROLINA, P.C.
343 E. SIX FORKS ROAD, SUITE 200
Raleigh, North Carolina 27609

PROJECT REFERENCE NO.	SHEET NO.
U-5027	1-B

CONVENTIONAL PLAN SHEET SYMBOLS

BOUNDARIES AND PROPERTY:

- State Line
- County Line
- Township Line
- City Line
- Reservation Line
- Property Line
- Existing Iron Pin — EIP
- Property Corner
- Property Monument — ECM
- Parcel/Sequence Number — 123
- Existing Fence Line
- Proposed Woven Wire Fence
- Proposed Chain Link Fence
- Proposed Barbed Wire Fence
- Existing Wetland Boundary — WLB
- Proposed Wetland Boundary — WLB
- Existing High Quality Wetland Boundary — HQ WLB
- Existing Endangered Animal Boundary — EAB
- Existing Endangered Plant Boundary — EPB

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
- River Basin Buffer — RBB
- Flow Arrow
- Disappearing Stream
- Spring
- Swamp Marsh
- Proposed Lateral, Tail, Head Ditch — FLOW
- False Sump

RAILROADS:

- Standard Guage — CSX TRANSPORTATION
- RR Signal Milepost — 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 Utility Easement — PUE

ROADS AND RELATED FEATURES:

- Existing Edge of Pavement
- Existing Curb
- Proposed Slope Stakes Cut — C
- Proposed Slope Stakes Fill — F
- Proposed Wheel Chair Ramp — WCR
- Existing Metal Guardrail
- Proposed Guardrail
- Existing Cable Guiderail
- Proposed Cable Guiderail
- Equaility 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 — HH
- 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
- Telephone Pedestal — T
- Telephone Cell Tower
- U/G Telephone Cable Hand Hole — HH
- 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 — C
- TV Tower
- U/G TV Cable Hand Hole — HH
- 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 — S
- Utility Unknown U/G Line — ?UTL
- U/G Tank; Water, Gas, Oil
- A/G Tank; Water, Gas, Oil
- U/G Test Hole (S.U.E.*)
- Abandoned According to Utility Records — AATUR
- End of Information — E.O.I.

DGN
$DATE$
$TIME$

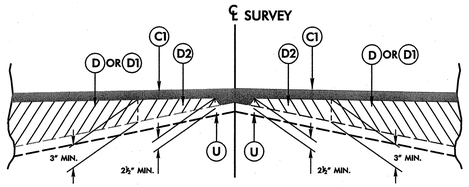
HNTB NORTH CAROLINA, P.C.
343 E. SIX FORKS ROAD, SUITE 200
Raleigh, North Carolina 27609

N.T.S.

PROJECT REFERENCE NO.	SHEET NO.
U-5027	2
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER — SEAL 19824 — ENGINEER — 11/3/08

PAVEMENT DESIGN ENGINEER — SEAL 16741 — ENGINEER — XAVIER C. BARRETT — 11/3/08



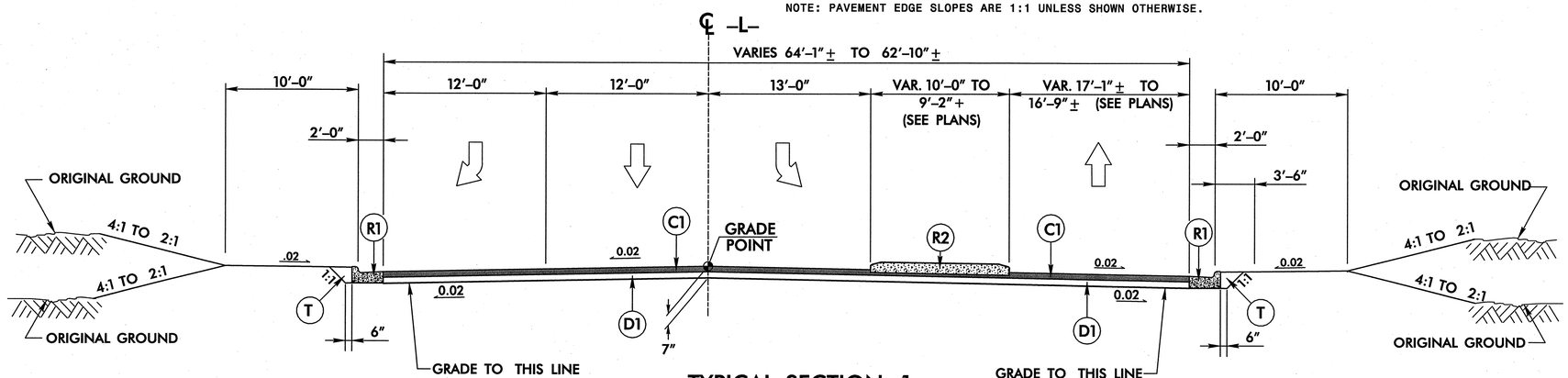
DETAIL SHOWING METHOD OF WEDGING
SEE TYPICAL SECTIONS

PAVEMENT SCHEDULE

C1	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	R3	PROP. 1'-6" CONCRETE CURB AND GUTTER.
D	PROP. APPROX. 2½" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.	R4	9" CONCRETE CURB
D1	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE,TYPE I19.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	R5	8'-6" CONCRETE APRON
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 2½" IN DEPTH OR GREATER THAN 4" IN DEPTH.	S	4" CONCRETE SIDEWALK
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	T	EARTH MATERIAL.
E2	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 5½" IN DEPTH.	U	EXISTING PAVEMENT.
R1	PROP. 2'-6" CONCRETE CURB AND GUTTER.	V	MILLING BITUMINOUS PAVEMENT, VAR. DEPTH 0 - 3"
R2	PROP. 5" MONOLITHIC CONCRETE ISLAND (KEYED IN).	W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE WEDGING DETAIL)

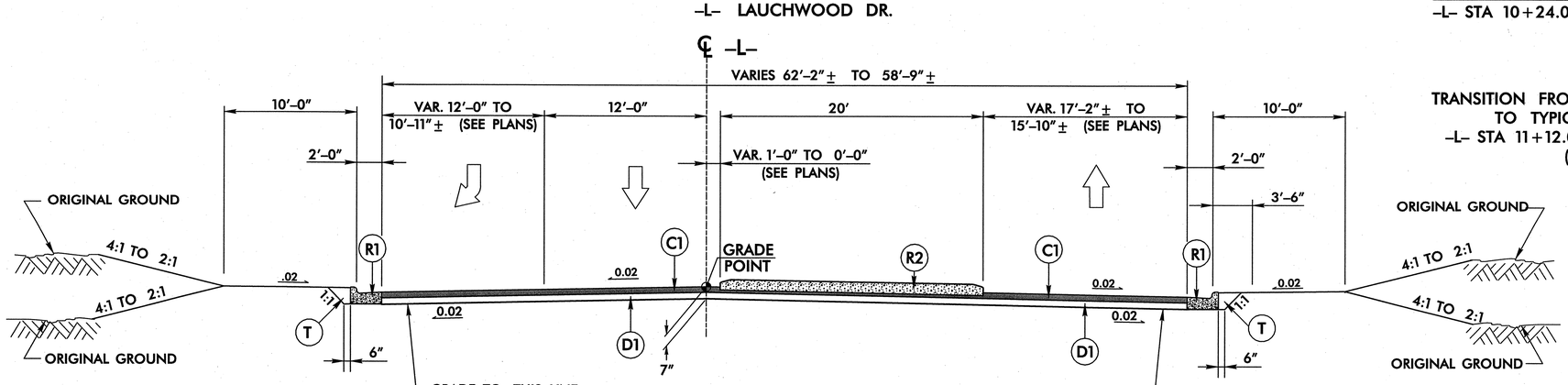
NOTE: THE CONTRACTOR MAY STABILIZE C&G WITH SAND-CLAY MATERIAL WHERE ADDITIONAL STABILITY IS NEEDED. (SEE PROJECT SPECIAL PROVISIONS)

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



TYPICAL SECTION 1
-L- LAUCHWOOD DR.

USE TYPICAL SECTION NO. 1 :
-L- STA 10+24.06 TO -L- STA 11+12.00



TYPICAL SECTION 2
-L- LAUCHWOOD DR.

TRANSITION FROM TYPICAL SECTION NO. 1 TO TYPICAL SECTION NO. 2
-L- STA 11+12.00 TO -L- STA 11+60.00
(SEE PLANS)

USE TYPICAL SECTION NO. 2 :
-L- STA 11+60.00 TO -L- STA 12+03.98

NOTE:
SEE PLANS FOR TURNOUTS, TAPERS, ISLANDS & TURN LANE LOCATIONS.

DGN
$DATE$
$TIME$

C1	3" ACSC TYPE S9.5B	R1	2'-6" CURB AND GUTTER.	T	EARTH MATERIAL
D	2-1/2" ACIC TYPE I19.0B	R2	5" MONOLITHIC CONCRETE ISLAND (KEYED IN).	U	EXISTING PAVEMENT
D1	4" ACIC TYPE I19.0B	R3	1'-6" CURB AND GUTTER.	V	VAR. MILLING
D2	VAR. DEPTH ACIC TYPE I19.0B	R4	9" CONCRETE CURB	W	WEDGING
E1	4" ACBC TYPE B25.0B	R5	7'-9" CONCRETE PAD		
E2	VAR. DEPTH ACBC TYPE B25.0B	S	4" CONCRETE SIDEWALK		

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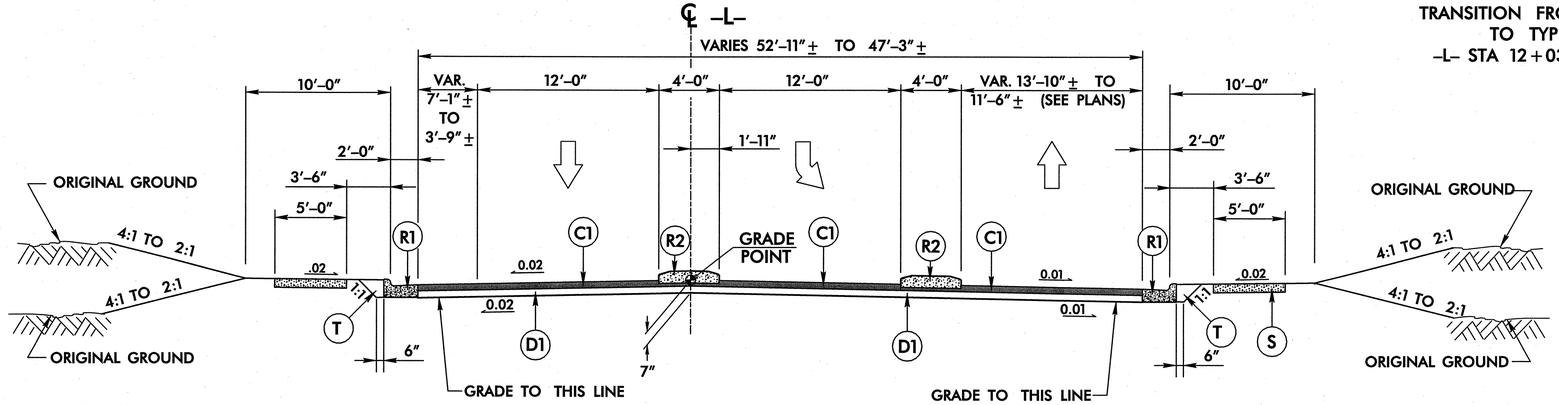
N.T.S.

PROJECT REFERENCE NO.	SHEET NO.
U-5027	2-A
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 19824 ENGINEER — 11/3/08

PAVEMENT DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 15741 ENGINEER XAVIER C. BARRETT — 11/3/08

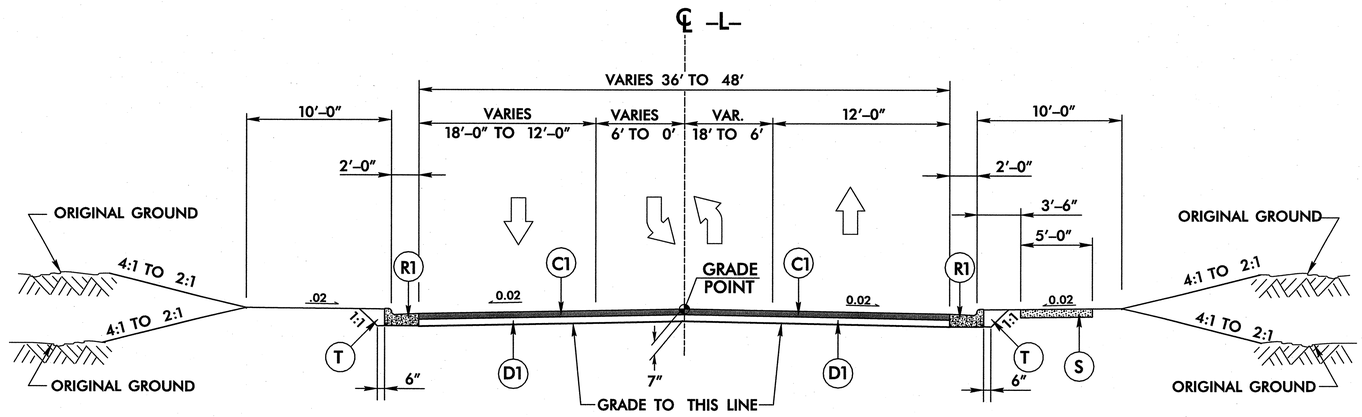


TRANSITION FROM TYPICAL SECTION NO. 2
TO TYPICAL SECTION NO. 3
–L– STA 12+03.98 TO –L– STA 12+50.13
(SEE PLANS)

TYPICAL SECTION 3

–L– LAUCHWOOD DR.

USE TYPICAL SECTION NO. 2 :
–L– STA 12+50.13 TO –L– STA 13+01.97



TYPICAL SECTION 4

–L– LAUCHWOOD DR.

USE TYPICAL SECTION NO. 4 :
–L– STA 13+01.97 TO –L– STA 15+37.50

NOTE:
SEE PLANS FOR TAPERS, ISLANDS & TURN LANE LOCATIONS.

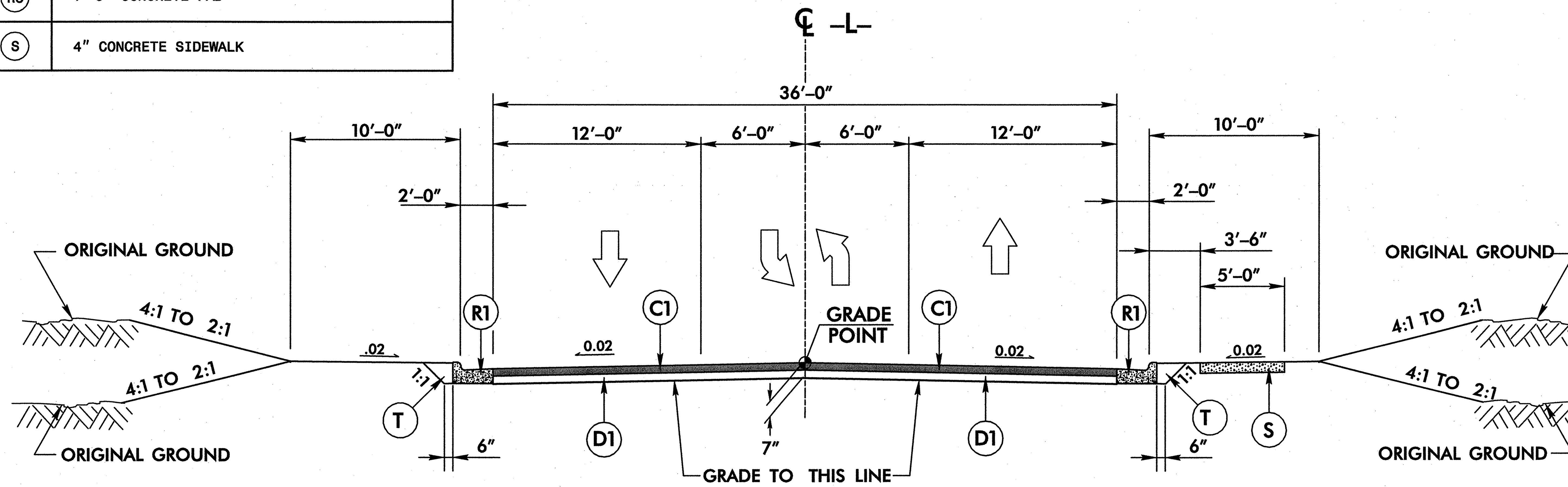
DGN
$DATE$
$TIME$

HNTB NORTH CAROLINA, P.C.
343 E. SIX FORKS ROAD, SUITE 200
Raleigh, North Carolina 27609

N.T.S.

PROJECT REFERENCE NO.	SHEET NO.
U-5027	2-B
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

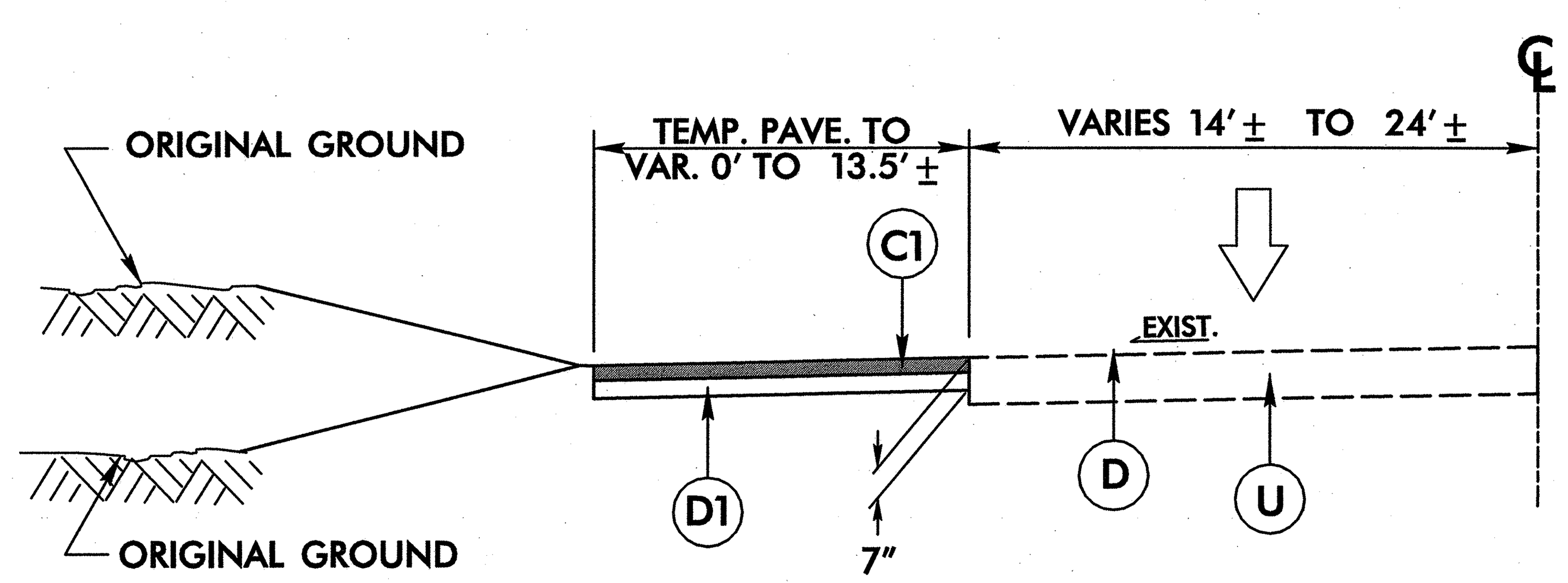
(C1)	3" ACSC TYPE S9.5B	(R1)	2'-6" CURB AND GUTTER.	(T)	EARTH MATERIAL
(D)	2-1/2" ACIC TYPE I19.0B	(R2)	5" MONOLITHIC CONCRETE ISLAND (KEYED IN).	(U)	EXISTING PAVEMENT
(D1)	4" ACIC TYPE I19.0B	(R3)	1'-6" CURB AND GUTTER.	(V)	VAR. MILLING
(D2)	VAR. DEPTH ACIC TYPE I19.0B	(R4)	9" CONCRETE CURB	(W)	WEDGING
(E1)	4" ACBC TYPE B25.0B	(R5)	7'-9" CONCRETE PAD		
(E2)	VAR. DEPTH ACBC TYPE B25.0B	(S)	4" CONCRETE SIDEWALK		



TYPICAL SECTION 5

-L- LAUCHWOOD DR.

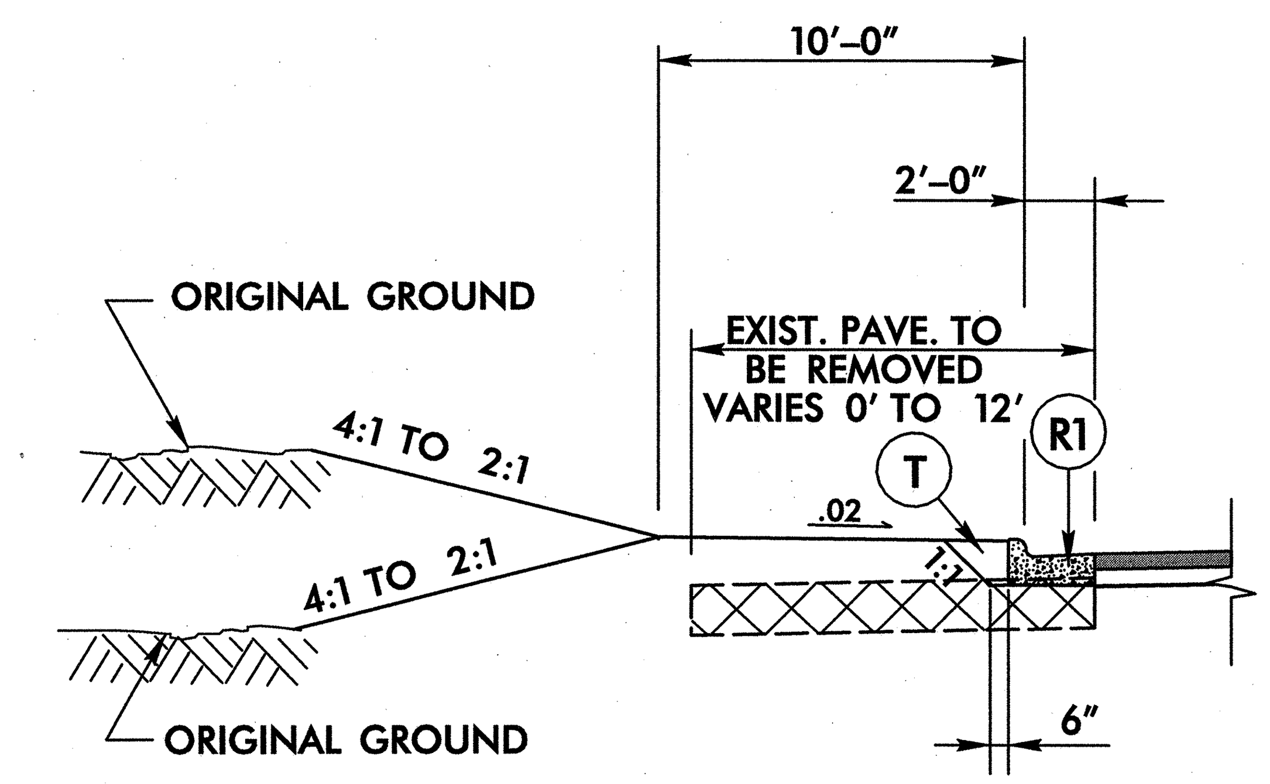
USE TYPICAL SECTION NO. 5 :
-L- STA 15+37.50 TO -L- STA 17+80.00



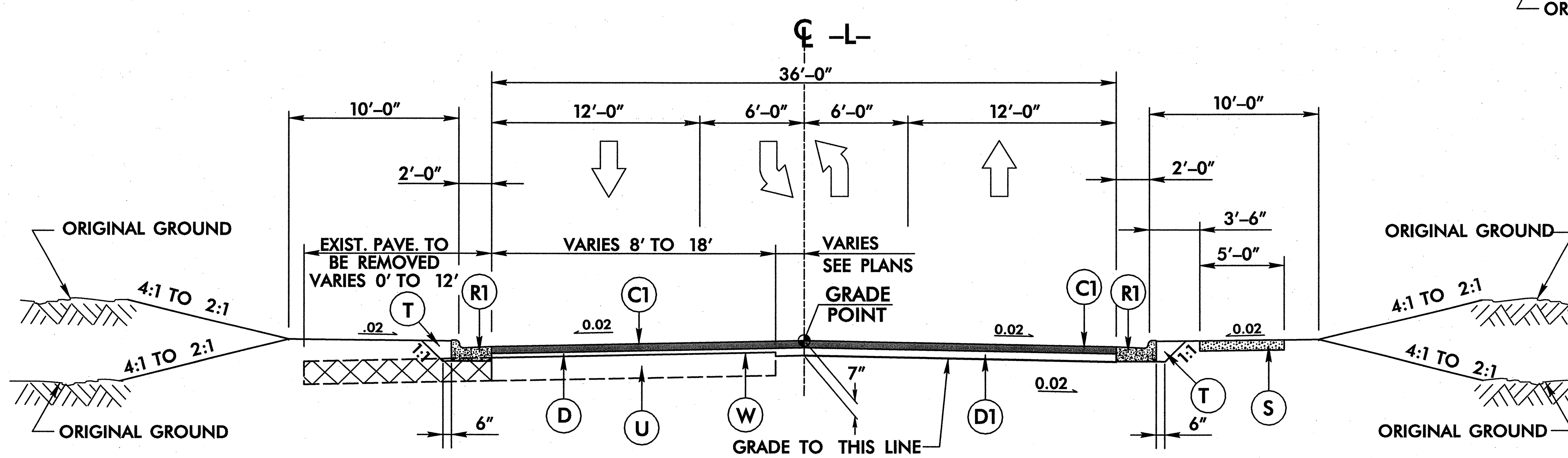
TYPICAL SECTION 5A

-L- LAUCHWOOD DR.

USE TYPICAL SECTION NO. 5A :
-L- STA 10+57 ± TO -L- STA 20+00 ± LT.
-L- STA 55+38 ± TO -L- STA 60+56 ± RT.



USE TYPICAL SECTION NO. 5B :
-L- STA 14+90 ± TO -L- STA 17+80 ±



TYPICAL SECTION 6

-L- LAUCHWOOD DR.

USE TYPICAL SECTION NO. 6 :
-L- STA 17+80 ± TO -L- STA 36+38 ±

NOTE:
SEE PLANS FOR CURB & GUTTER PLACEMENT AND PAVEMENT REMOVAL.

DGN
$DATE$
$TIME$

C1	3" ACSC TYPE S9.5B	R1	2'-6" CURB AND GUTTER.	T	EARTH MATERIAL
D	2-1/2" ACIC TYPE I19.0B	R2	5" MONOLITHIC CONCRETE ISLAND (KEYED IN).	U	EXISTING PAVEMENT
D1	4" ACIC TYPE I19.0B	R3	1'-6" CURB AND GUTTER.	V	VAR. MILLING
D2	VAR. DEPTH ACIC TYPE I19.0B	R4	9" CONCRETE CURB	W	WEDGING
E1	4" ACBC TYPE B25.0B	R5	7'-9" CONCRETE PAD		
E2	VAR. DEPTH ACBC TYPE B25.0B	S	4" CONCRETE SIDEWALK		

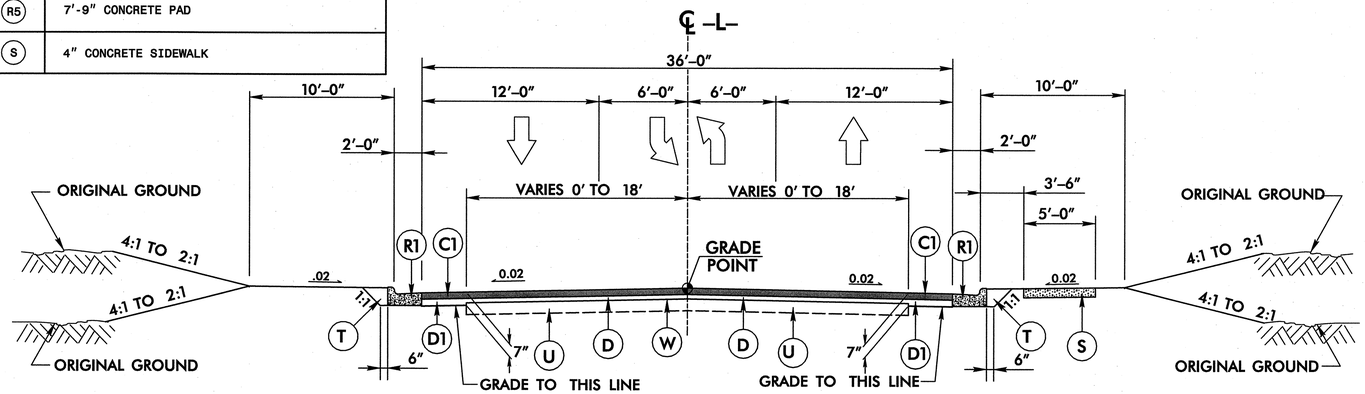
HNTB NORTH CAROLINA, P.C.
343 E. SIX FORKS ROAD, SUITE 200
Raleigh, North Carolina 27609

N.T.S.

PROJECT REFERENCE NO.	SHEET NO.
U-5027	2-C
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 19844 ENGINEER — 11/5/09

PAVEMENT DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 15741 ENGINEER — XAVIER C. BARRETT — 10/5/09

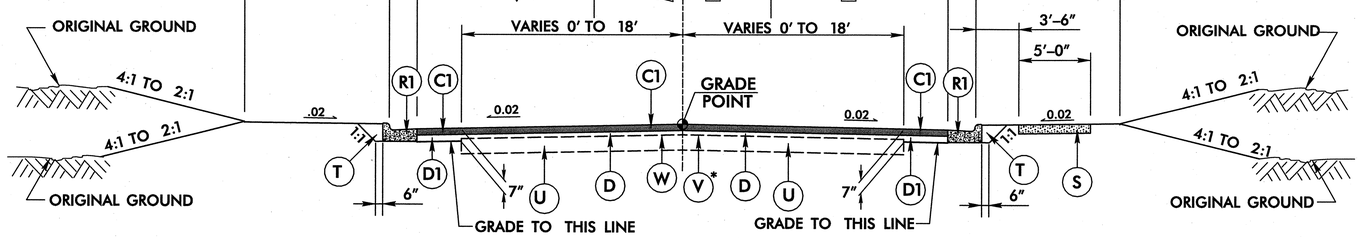


TYPICAL SECTION 7

–L– LAUCHWOOD DR.

USE TYPICAL SECTION NO. 7 :
–L– STA 36+38± TO –L– STA 50+11.65

TRANSITION FROM TYPICAL SECTION NO. 7 TO TYPICAL SECTION NO. 8
–L– STA 50+11.65 TO –L– STA 52+51.65
(SEE PLANS)

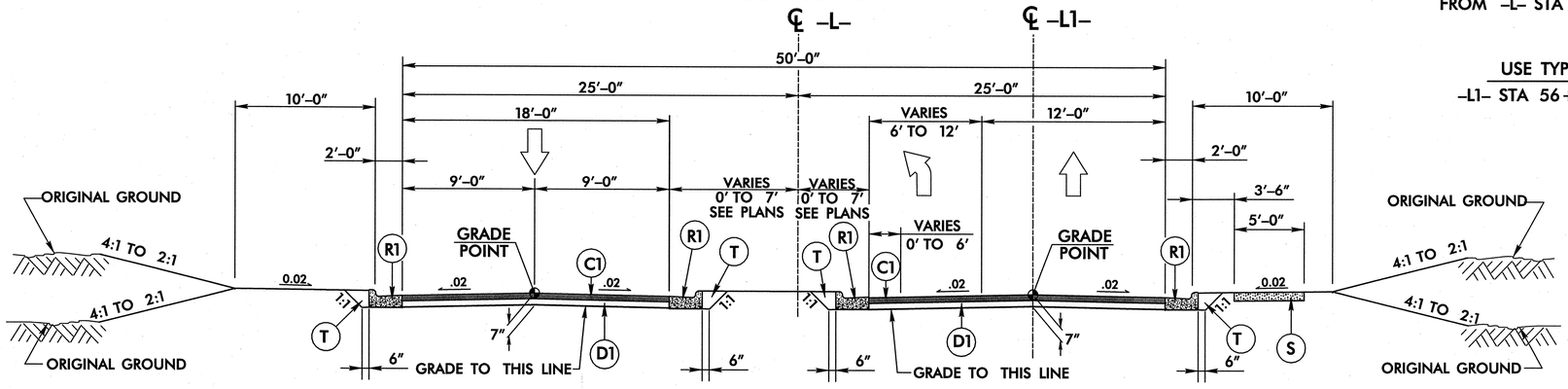


TYPICAL SECTION 8

–L– LAUCHWOOD DR.

USE TYPICAL SECTION NO. 8 :
–L– STA 50+11.65 TO –L– STA 56+10.00
(* VARIABLE WEDGING, 0" – 3",
FROM –L– STA 54+50.00 TO –L– STA 56+10.00)

USE TYPICAL SECTION NO. 9 :
–L1– STA 56+10.00 TO –L1– STA 62+72.58



TYPICAL SECTION 9

–L1– LAUCHWOOD DR.

NOTE:
SEE PLANS FOR TAPERS, ISLANDS & TURN LANE LOCATIONS.

DGN
$DATE$
$TIME$

C1	3" ACSC TYPE S9.5B	R1	2'-6" CURB AND GUTTER.	T	EARTH MATERIAL
D	2-1/2" ACIC TYPE I19.0B	R2	5" MONOLITHIC CONCRETE ISLAND (KEYED IN).	U	EXISTING PAVEMENT
D1	4" ACIC TYPE I19.0B	R3	1'-6" CURB AND GUTTER.	V	VAR. MILLING
D2	VAR. DEPTH ACIC TYPE I19.0B	R4	9" CONCRETE CURB	W	WEDGING
E1	4" ACBC TYPE B25.0B	R5	7'-9" CONCRETE PAD		
E2	VAR. DEPTH ACBC TYPE B25.0B	S	4" CONCRETE SIDEWALK		

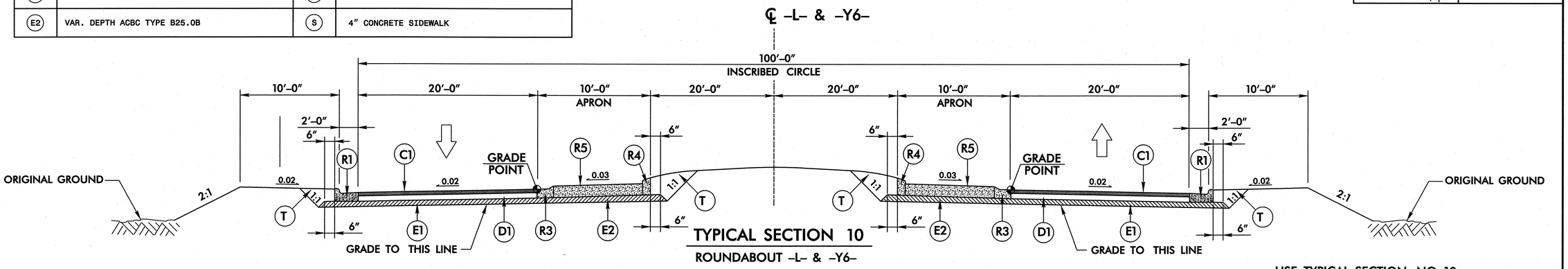
HNTB NORTH CAROLINA, P.C.
343 E. SIX FORKS ROAD, SUITE 200
Raleigh, North Carolina 27609

N.T.S.

PROJECT REFERENCE NO.	SHEET NO.
U-5027	2-D
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER — SEAL 20824 — ENGINEER — 11/3/08

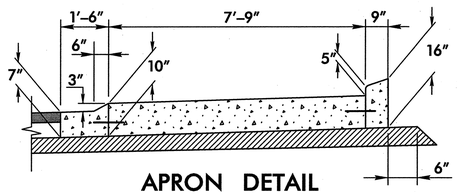
PAVEMENT DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 15741 ENGINEER XAVIER C. BARRETT — 11/3/08



TYPICAL SECTION 10

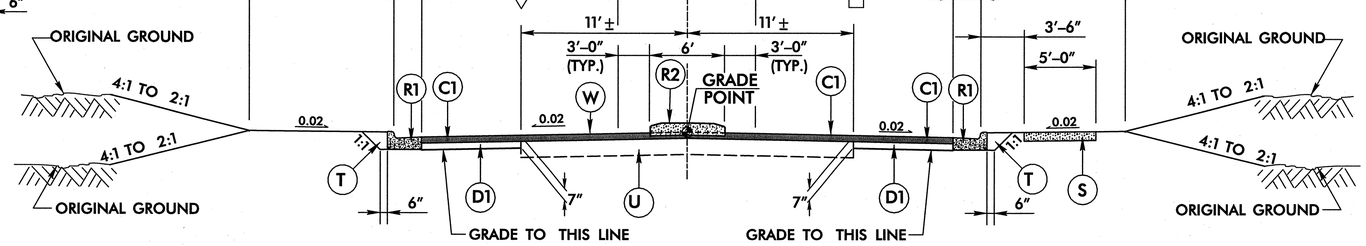
ROUNDABOUT –L– & –Y6–

USE TYPICAL SECTION NO. 10 :
–L– STA 62+72.58 TO –L– STA 63+72.58
–Y6– STA 11+52.74 TO –Y6– STA 12+52.74



APRON DETAIL

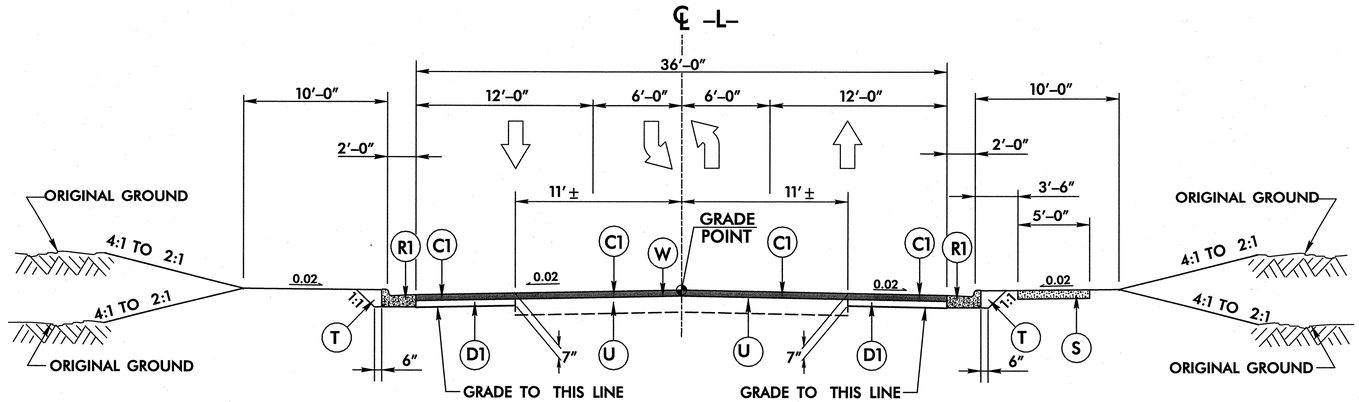
NOTE:
1. PLACE 18" LONG #8 BARS AT 12" CENTERS BEGINNING 6" FROM LONGITUDINAL JOINT.
2. PLACE 14" LONG #4 "J" BARS AT 36" CENTERS AT ALL LONGITUDINAL SLAB/CURB JOINTS.



TYPICAL SECTION 11

–L– LAUCHWOOD DR.

USE TYPICAL SECTION NO. 11 :
–L– STA 63+72.58 TO –L– STA 65+21.46



TYPICAL SECTION 12

–L– LAUCHWOOD DR.

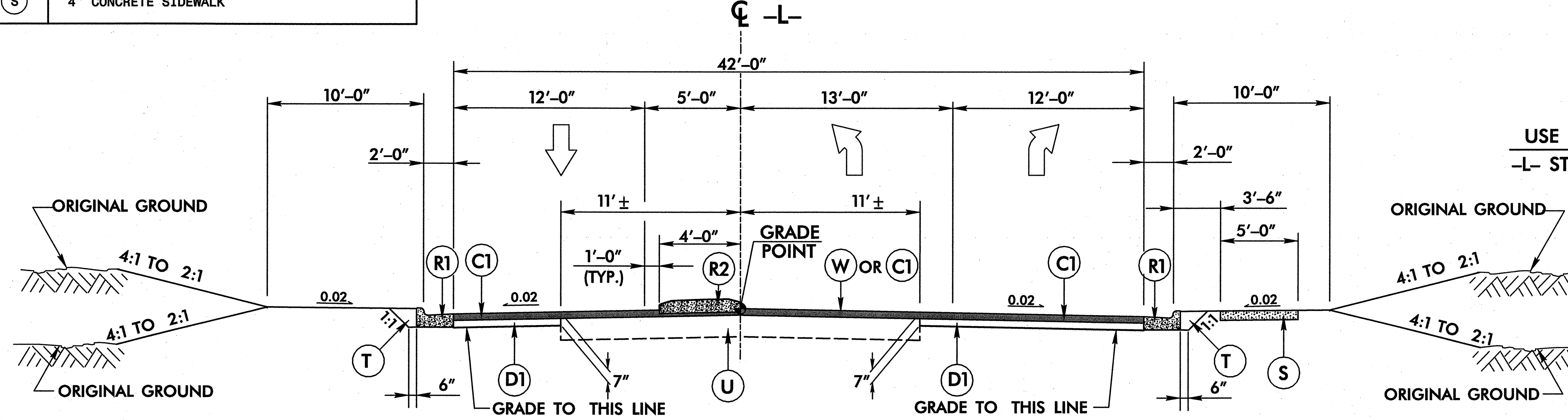
USE TYPICAL SECTION NO. 12 :
–L– STA 66+21.46 TO –L– STA 70+20.00

TRANSITION FROM TYPICAL SECTION NO. 12 TO TYPICAL SECTION NO. 13
–L– STA 70+20.00 TO –L– STA 71+20.00
(SEE PLANS)

NOTE:
SEE PLANS FOR TAPERS, ISLANDS & TURN LANE LOCATIONS.

DGN
$DATE$
$TIME$

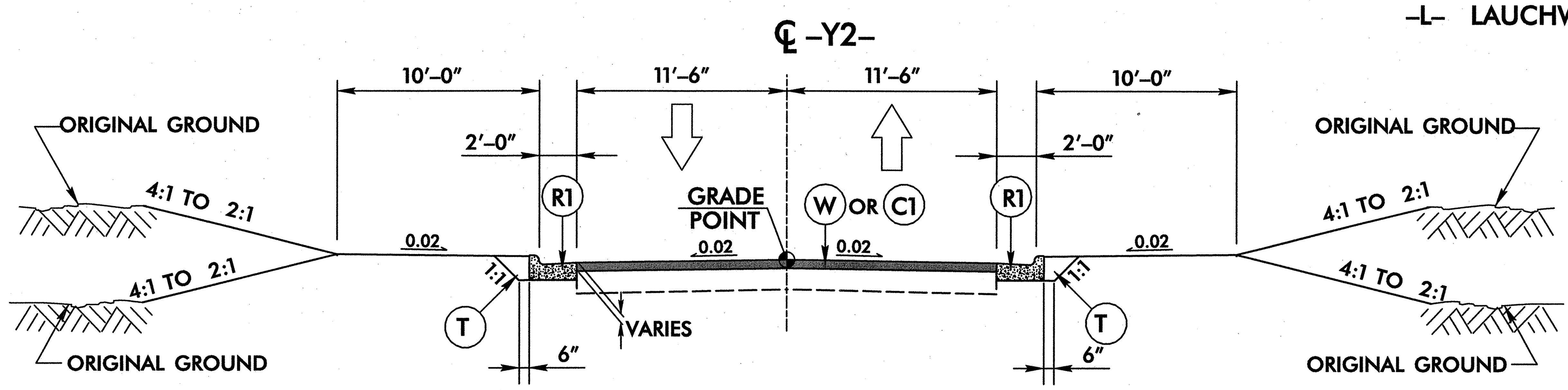
(C1)	3" ACSC TYPE S9.5B	(R1)	2'-6" CURB AND GUTTER.	(T)	EARTH MATERIAL
(D)	2-1/2" ACIC TYPE I19.0B	(R2)	5" MONOLITHIC CONCRETE ISLAND (KEYED IN).	(U)	EXISTING PAVEMENT
(D1)	4" ACIC TYPE I19.0B	(R3)	1'-6" CURB AND GUTTER.	(V)	VAR. MILLING
(D2)	VAR. DEPTH ACIC TYPE I19.0B	(R4)	9" CONCRETE CURB	(W)	WEDGING
(E1)	4" ACBC TYPE B25.0B	(R5)	7'-9" CONCRETE PAD		
(E2)	VAR. DEPTH ACBC TYPE B25.0B	(S)	4" CONCRETE SIDEWALK		



TYPICAL SECTION 13

-L- LAUCHWOOD DR.

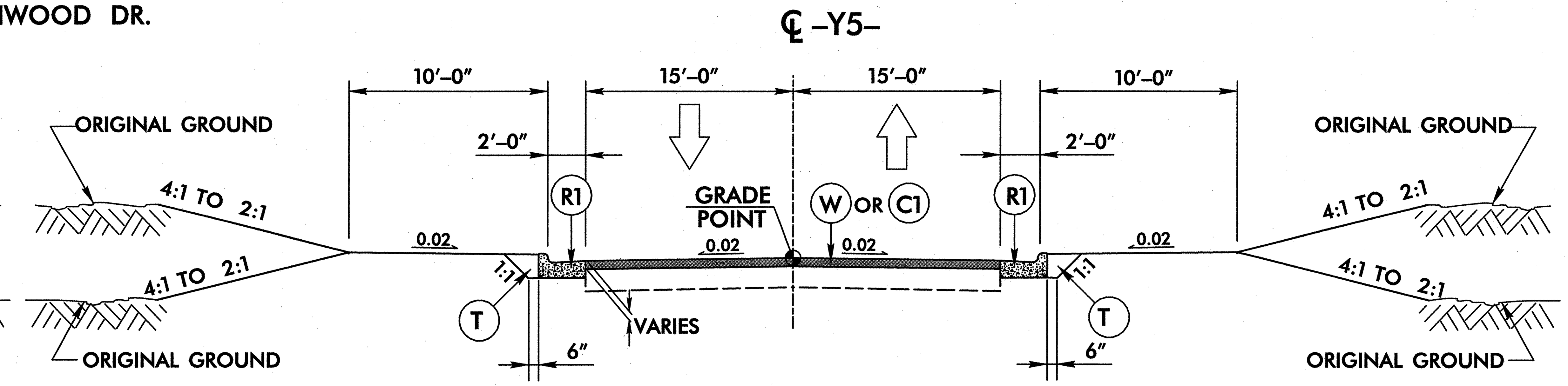
USE TYPICAL SECTION NO. 13 :
-L- STA 71+20.00 TO -L- STA 73+49.96



TYPICAL SECTION 14

-Y2- MCALPINE LANE

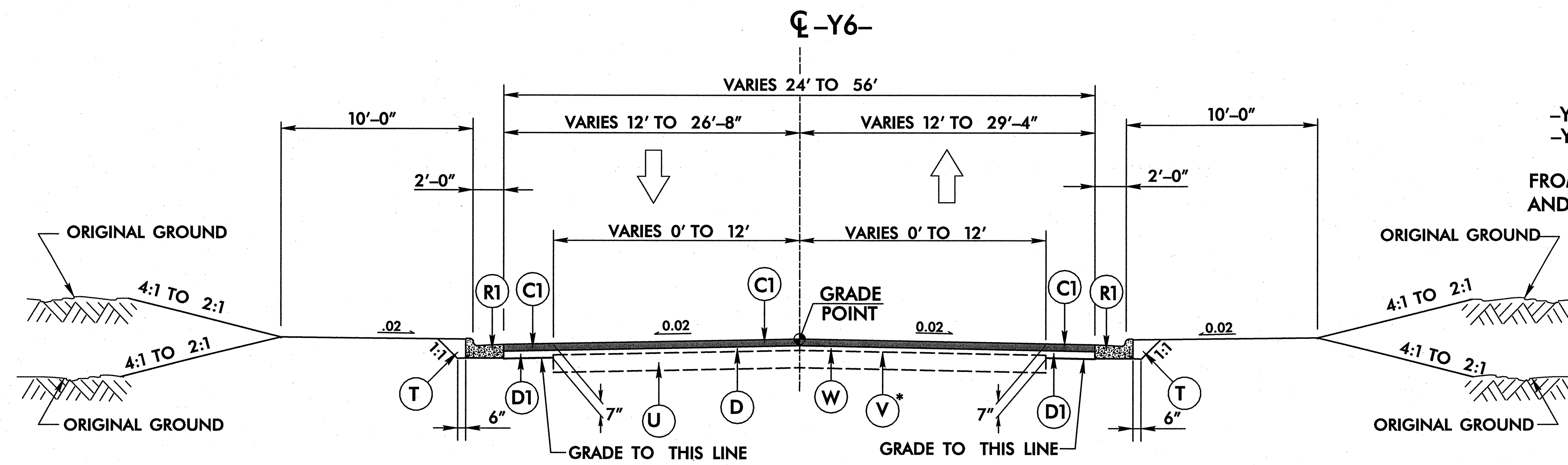
USE TYPICAL SECTION NO. 14 :
-Y2- STA 10+18.00 TO -Y2- STA 11+70.00



TYPICAL SECTION 15

-Y5- BERWICK DRIVE

USE TYPICAL SECTION NO. 15 :
-Y5- STA 10+18.00 TO -Y5- STA 11+25.00



USE TYPICAL SECTION NO. 16 :
-Y6- STA 10+25.00 TO -Y6- STA 11+52.74
-Y6- STA 12+52.74 TO -Y6- STA 13+75.00
(* VARIABLE WEDGING, 0" - 3",
FROM -Y6- STA 11+18.00 TO -Y6- STA 11+52.00
AND -Y6- STA 12+84.00 TO -Y6- STA 13+07.00)

TYPICAL SECTION 16

-Y6- JOHNS ROAD

DGN
$DATE$
$TIME$

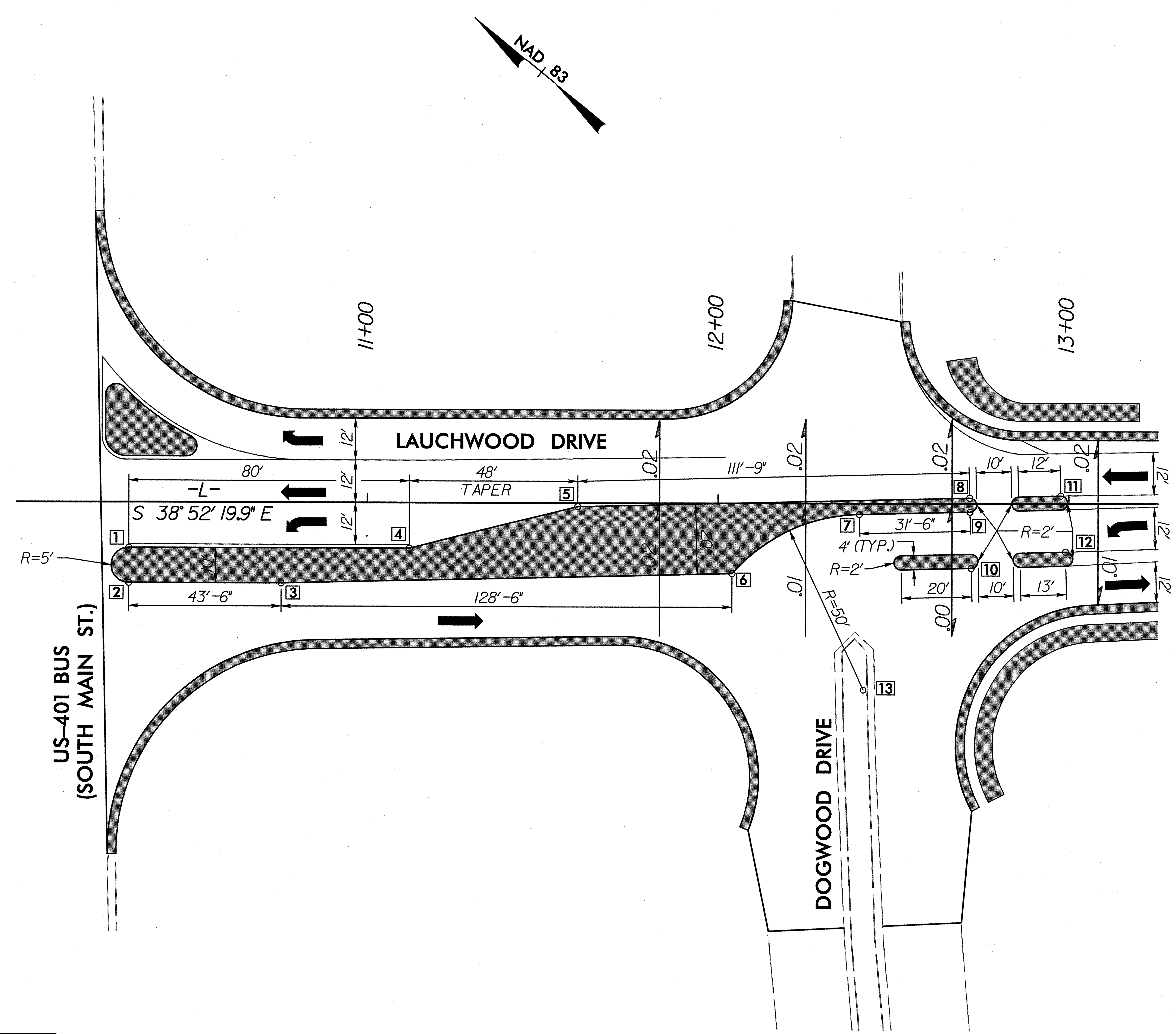
HNTB NORTH CAROLINA, P.C.
343 E. SIX FORKS ROAD, SUITE 200
Raleigh, North Carolina 27609

GRAPHIC SCALE
20 10 0 20
PLANS

PROJECT REFERENCE NO.	SHEET NO.
U-5027	2-F

RW SHEET NO.

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER



POINT	STATION	OFFSET	LT /RT
1	10+32.00	13.00	RT
2	10+32.00	23.00	RT
3	10+75.49	23.00	RT
4	11+12.00	13.00	RT
5	11+60.00	1.00	RT
6	12+03.98	19.97	RT
7	12+40.25	3.11	RT
8	12+71.70	1.64	LT
9	12+71.79	2.36	RT
10	12+72.17	18.36	RT
11	12+97.69	2.25	LT
12	12+99.07	13.72	RT
13	12+41.43	53.09	RT

LAUCHWOOD DRIVE & DOGWOOD DRIVE
ISLAND DETAIL

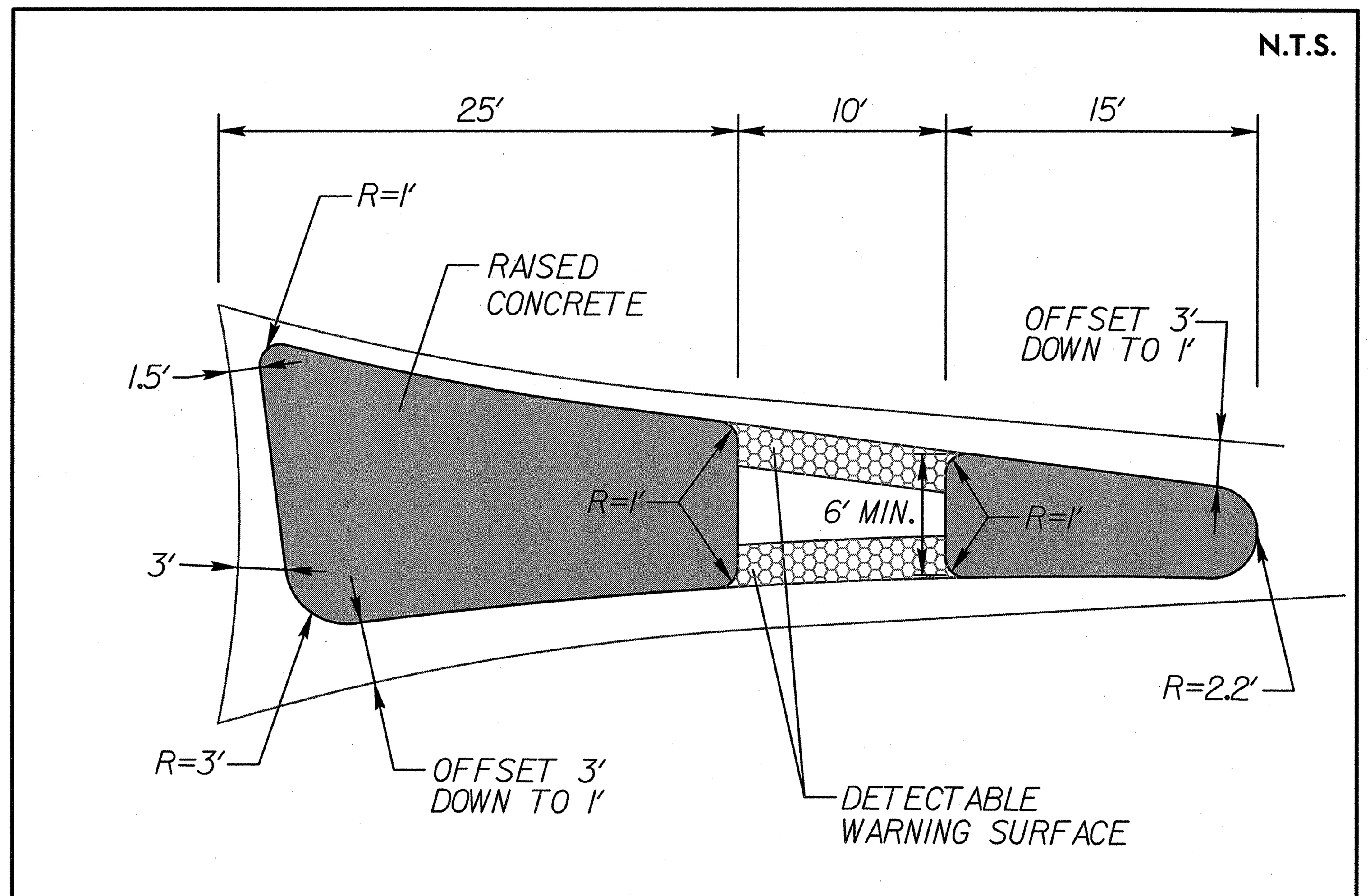
NOTE:
SEE SHEET 2 & 2-A FOR ISLAND TYPICAL SECTIONS.

DGN
$DATE$
$TIME$

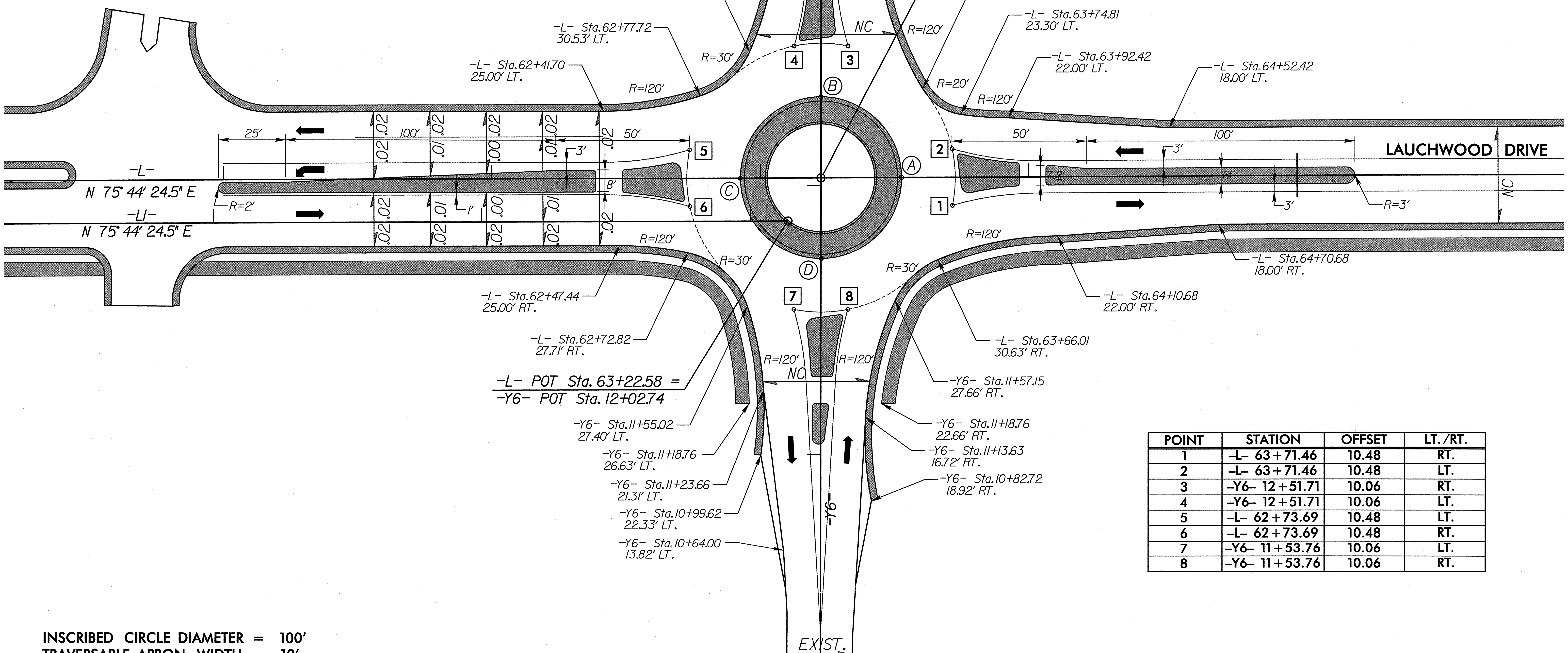
HNTB NORTH CAROLINA, P.C.
343 E. SIX FORKS ROAD, SUITE 200
Raleigh, North Carolina 27609

GRAPHIC SCALE
20 10 0 20
PLANS

PROJECT REFERENCE NO.	SHEET NO.
U-5027	2-G
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER



CONCRETE SPLITTER ISLAND DETAIL



POINT	STATION	OFFSET	LT./RT.
1	-L- 63+71.46	10.48	RT.
2	-L- 63+71.46	10.48	LT.
3	-Y6- 12+51.71	10.06	RT.
4	-Y6- 12+51.71	10.06	LT.
5	-L- 62+73.69	10.48	LT.
6	-L- 62+73.69	10.48	RT.
7	-Y6- 11+53.76	10.06	LT.
8	-Y6- 11+53.76	10.06	RT.

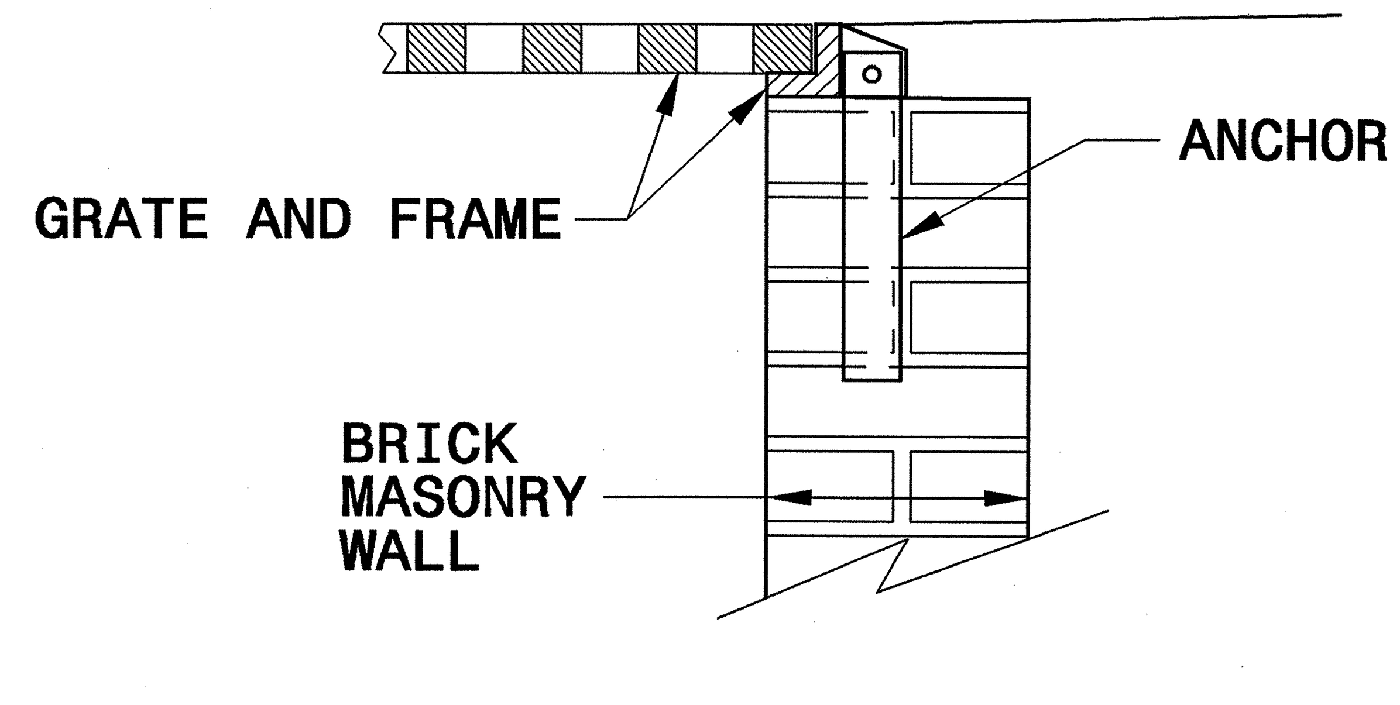
INSCRIBED CIRCLE DIAMETER = 100'
TRAVERSABLE APRON WIDTH = 10'
CENTRAL ISLAND DIAMETER = 40'
CIRCULAR ROADWAY WIDTH = 20'

JOHNS ROAD & LAUCHWOOD DRIVE INTERSECTION DETAIL

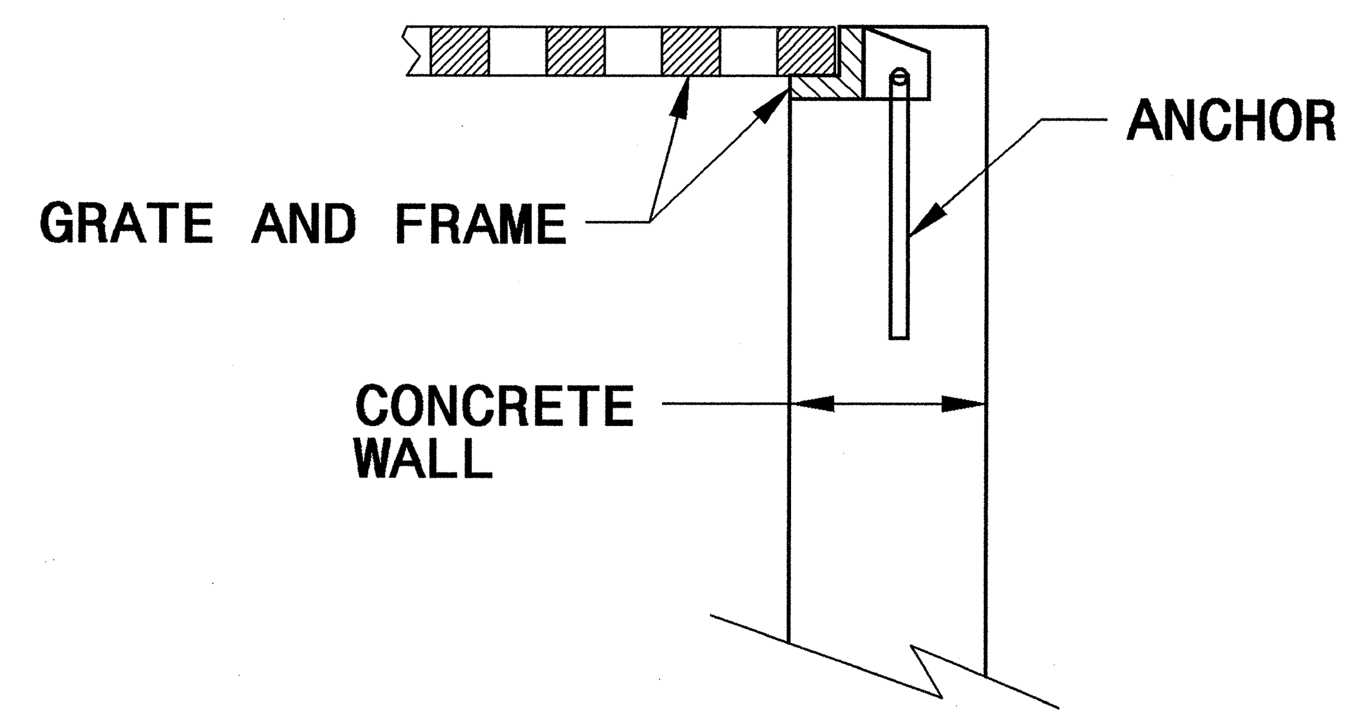
NOTE:
SEE SHEET 2-D FOR ROUNDABOUT TYPICAL SECTION.
SEE SHEET 11 FOR CENTRAL ISLAND PROFILE THROUGH POINTS A,B,C & D.

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

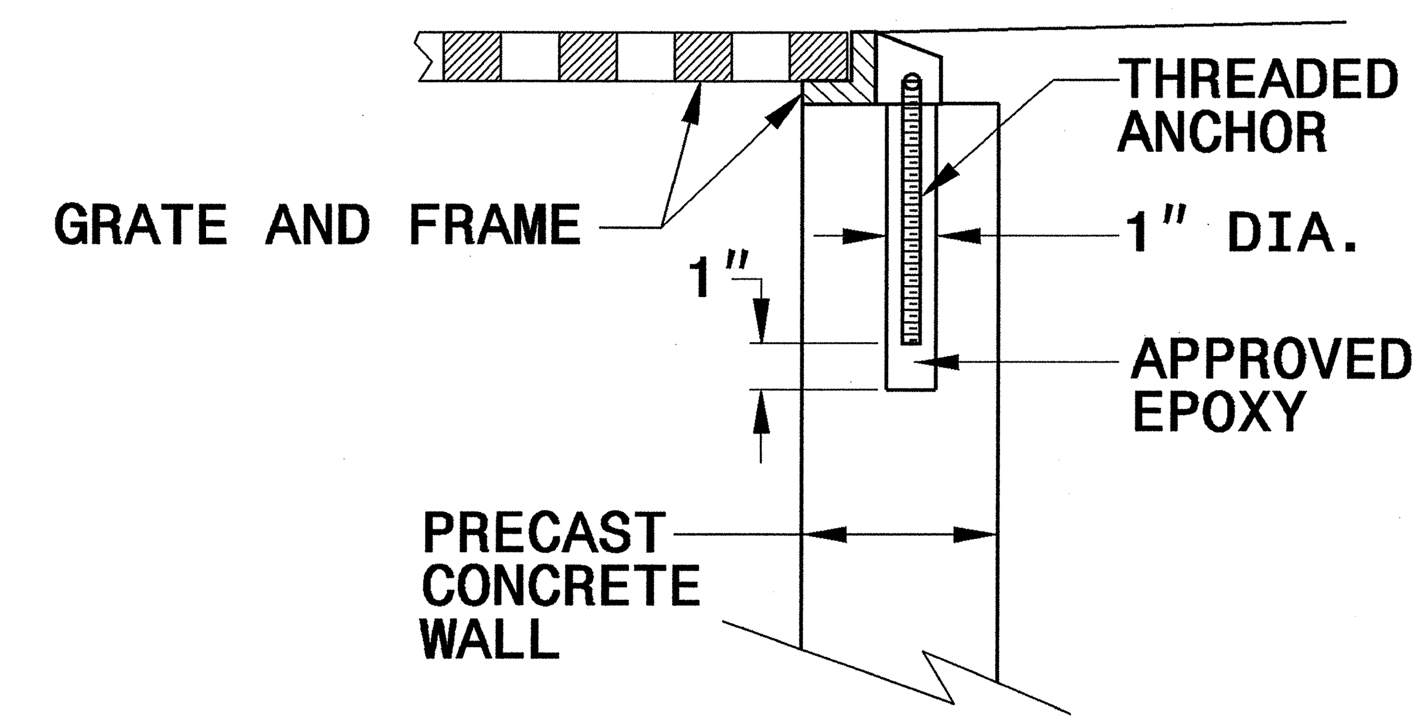
ENGLISH DETAIL DRAWING FOR
ANCHORAGE FOR FRAMES
BRICK/CONCRETE/PRECAST CONCRETE



BRICK MASONRY CONSTRUCTION



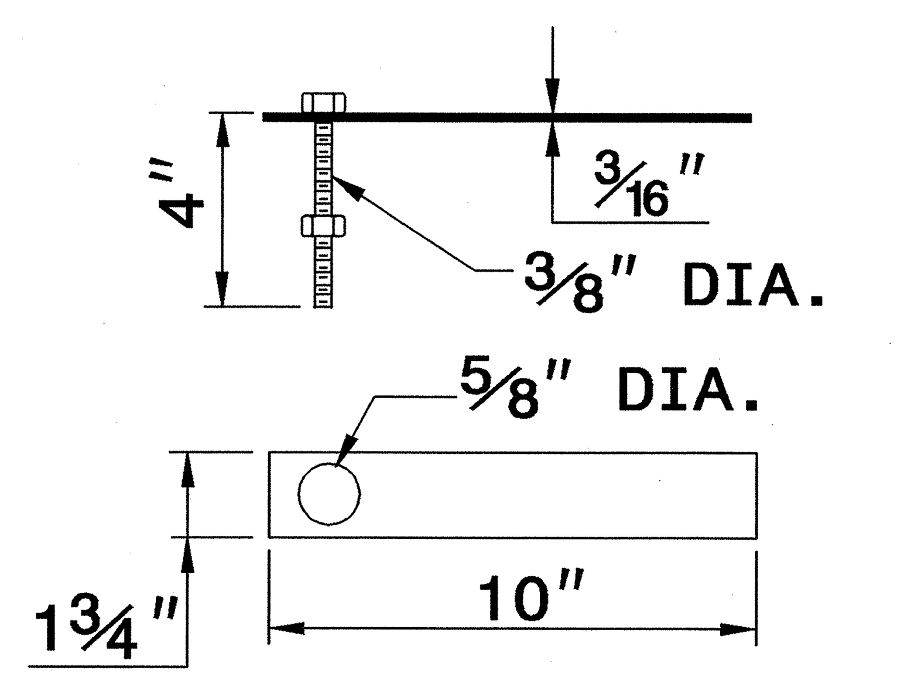
CONCRETE CONSTRUCTION



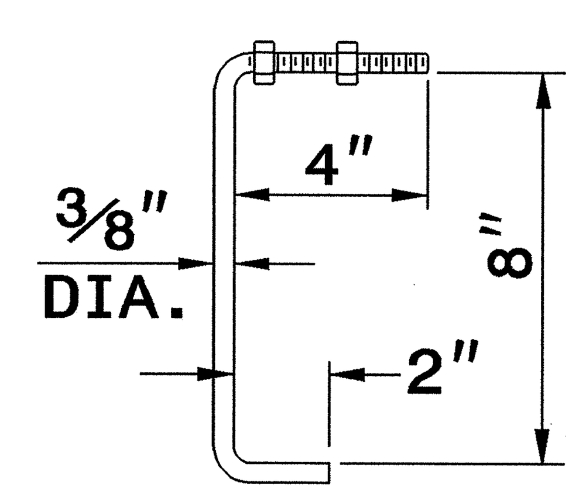
PRECAST CONCRETE CONSTRUCTION

DETAIL SHOWING ANCHORAGE OF FRAME FOR GRATED DROP INLET

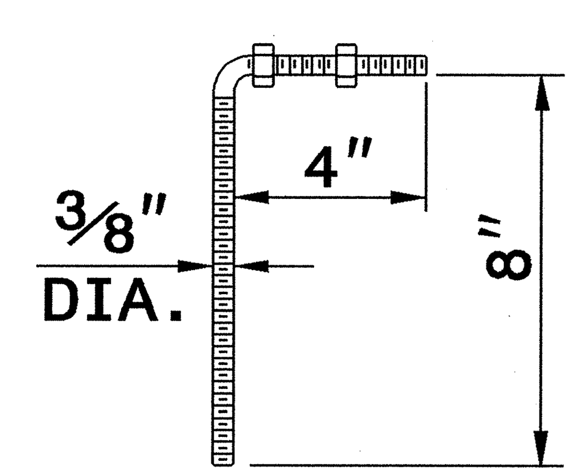
NOTE:
CONSTRUCT GRATED DROP INLET TO COINCIDE WITH NORMAL OR SUPERELEVATED SHOULDER OR PAVEMENT SLOPE.



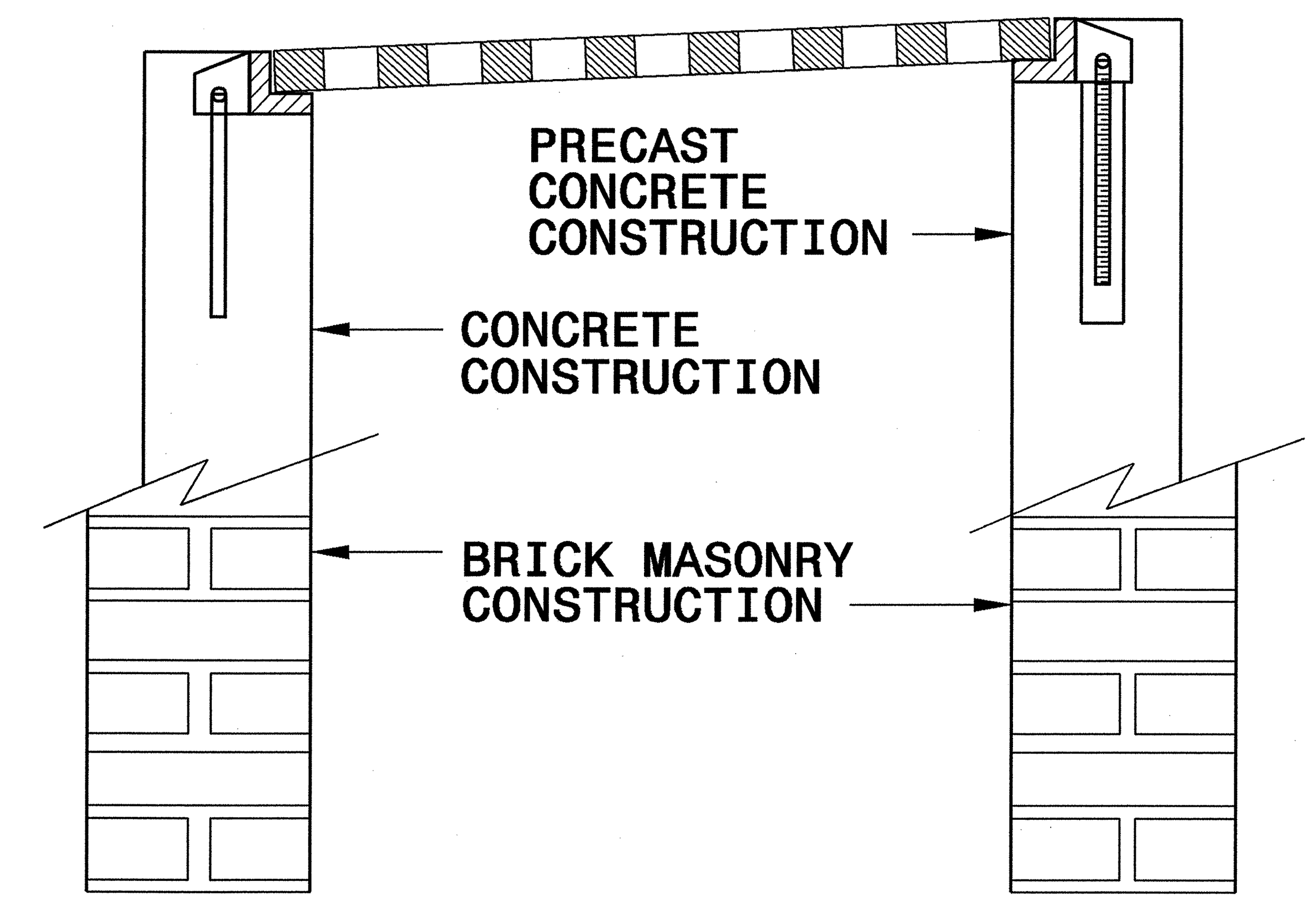
MASONRY ANCHOR
3⁄8″ DIA. BOLT WITH PLATE



CONCRETE ANCHOR
3⁄8″ DIA. BENT BAR



PRECAST CONCRETE ANCHOR
3⁄8″ DIA. BENT BAR



FRAME AND GRATE INSTALLATION FOR NORMAL CROWN AND SUPERELEVATED SECTIONS

SHEET 1 OF 1
840D25

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

ENGLISH DETAIL DRAWING FOR
ANCHORAGE FOR FRAMES
BRICK/CONCRETE/PRECAST CONCRETE

SHEET 1 OF 1
840D25

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER JOEL S. HOWERTON 11/20/06

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

SEE PLATE FOR TITLE

ORIGINAL BY: 2006 STD 840.25 DATE: 07/18/06
MODIFIED BY: E.E. WARD DATE: 9/25/06
CHECKED BY: DATE:
FILE SPEC.:

27-SEP-2006 08:59
S:\Contracts\Contracts\Special Details\ericward\stds\06 Stds to Special Details\84025 Anchorage for Frames\0840d25.dgn
ericward AT PS222293

PROJECT REFERENCE NO.	SHEET
U-5027	2-I

GEOTECHNICAL ENGINEER

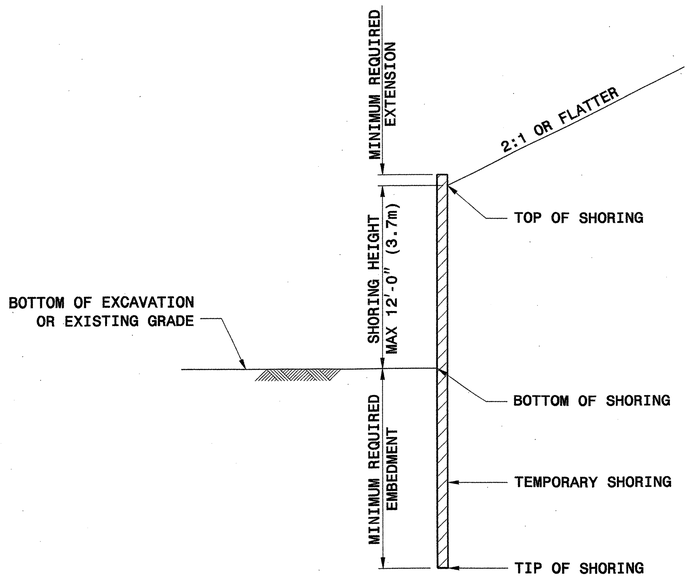
NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

Scott A. Hidden 3/29/07

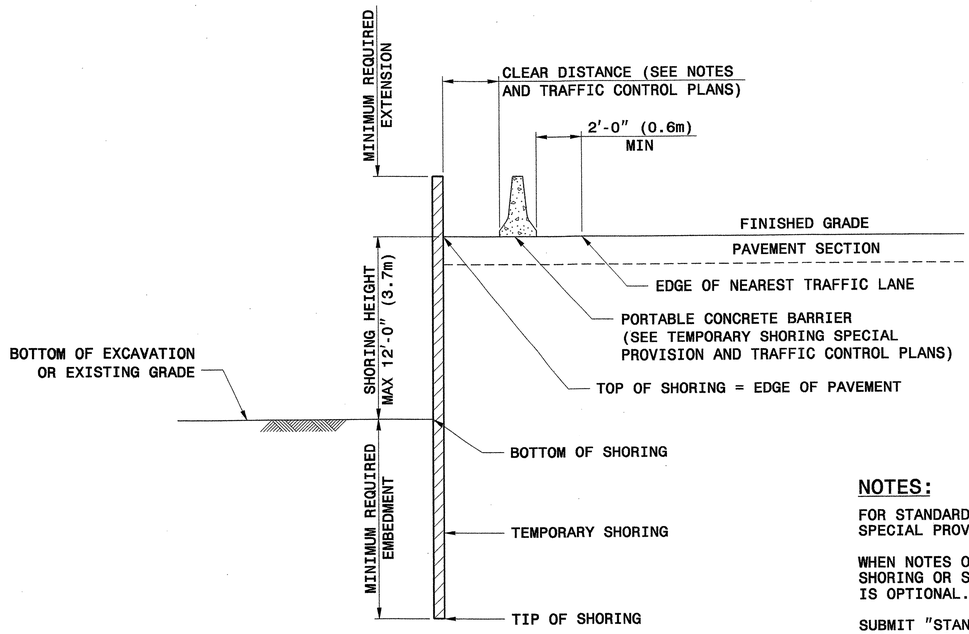
SIGNATURE DATE

ENGINEER

SIGNATURE DATE



SLOPE CASE



SURCHARGE CASE

		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		
GROUNDWATER CONDITION	SHORING HEIGHT FT (m)	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 BEWTEEN 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 TRAFFFIC IMPACT".

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/M^3)
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.

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

GEOTECHNICAL ENGINEERING UNIT

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD DRAWING NO. 1801.01

STANDARD TEMPORARY SHORING

DATE: 2-20-07

PROJECT REFERENCE NO.	SHEET
U-5027	2-J

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

Scott A. Hidden 3/29/07
SIGNATURE DATE

ENGINEER

SIGNATURE DATE

STANDARD TEMPORARY MSE WALL OPTIONS

TEMPORARY MSE WALL OPTION	VENDOR	CONTACT INFORMATION	REINFORCEMENT TYPE	SHEETS
TEMPORARY FABRIC WALL	N/A	N/A	POLYESTER OR POLYPROPYLENE FABRIC	3
HILFIKER TEMPORARY WALL	HILFIKER RETAINING WALLS	1902 HILFIKER LANE, EUREKA, CA 95503-5711 707-443-5093 WWW.HILFIKER.COM	WELDED WIRE MAT	4
SIERRASCAPE TEMPORARY WALL	TENSAR EARTH TECHNOLOGIES, INC	5883 GLENRIDGE DRIVE, SUITE 200 ATLANTA, GA 30328-5363 404-250-1290 WWW.TENSARCORP.COM	GEOGRID	5
RETAINED EARTH TEMPORARY WALL	THE REINFORCED EARTH COMPANY	8614 WESTWOOD CENTER DRIVE, SUITE 1100 VIENNA, VA 22182-2233 703-749-4325 WWW.REINFORCEDEARTH.COM	WELDED WIRE MESH	6-8
TERRATREL TEMPORARY WALL	THE REINFORCED EARTH COMPANY	8614 WESTWOOD CENTER DRIVE, SUITE 1100 VIENNA, VA 22182-2233 703-749-4325 WWW.REINFORCEDEARTH.COM	RIBBED STEEL STRIPS	9-11

FOR STANDARD TEMPORARY MSE WALLS, SEE TEMPORARY SHORING SPECIAL PROVISION.

WHEN NOTES ON PLANS DO NOT PROHIBIT TEMPORARY MSE WALLS OR STANDARD SHORING, STANDARD TEMPORARY MSE WALLS ARE OPTIONAL.

WHEN NOTES ON PLANS REQUIRE TEMPORARY MSE WALLS, USE STANDARD TEMPORARY MSE WALLS OR CONTRACTOR DESIGNED TEMPORARY MSE WALLS.

WHEN THE ALIGNMENT OF STANDARD TEMPORARY MSE WALLS RESULTS IN AN INTERIOR ANGLE LESS THAN 90 DEGREES, SUBMIT AN ACUTE CORNER DETAIL FOR THE SPECIFIC SITUATION IN ACCORDANCE WITH THE WALL VENDOR RECOMMENDATIONS. ALSO, SUBMIT A "STANDARD TEMPORARY MSE WALL SELECTION FORM" FOR EACH TEMPORARY MSE WALL LOCATION. SUBMIT THESE ITEMS AT LEAST 14 DAYS BEFORE BEGINNING WALL CONSTRUCTION.

STANDARD TEMPORARY MSE WALLS ARE BASED ON THE FOLLOWING CONDITIONS:
1) MAXIMUM WALL HEIGHT IS 28'-0" (8.5m).
2) TRAFFIC SURCHARGE IS 240 PSF (11.5 KPA) MAXIMUM OR BACKSLOPE IS 2:1 (H:V) OR FLATTER.
3) EXISTING OR FINISHED GRADE IN FRONT OF WALL IS 6:1 (H:V) SLOPE OR FLATTER.
4) THE GRADE OF THE TOP OF WALL IS LESS THAN 4% FOR RETAINED EARTH AND TERRATREL TEMPORARY WALLS.
5) DESIGN SERVICE LIFE IS 3 YEARS.
6) MATERIAL IN REINFORCED ZONE IS SHORING BACKFILL.
7) MAXIMUM APPLIED BEARING PRESSURE IS 1 TSF (100 KPA) FOR WALL HEIGHTS UP TO 8'-0" (2.4m), 2 TSF (195 KPA) FOR WALL HEIGHTS BETWEEN 8'-0" AND 18'-0" (2.4m AND 5.5m) AND 3 TSF (290 KPA) FOR WALL HEIGHTS OVER 18'-0" (5.5m).

STANDARD TEMPORARY MSE WALLS ARE BASED ON THE FOLLOWING IN-SITU ASSUMMED SOIL PARAMETERS:
TOTAL UNIT WEIGHT = 120 PCF (18.8 KN/M^3)
FRICTION ANGLE = 30 DEGREES
COHESION = 0 PSF (0 KPA)
GROUNDWATER IS ASSUMED TO BE BELOW BOTTOM OF REINFORCED ZONE.

DO NOT USE STANDARD TEMPORARY MSE WALLS WHEN THE ASSUMED SOIL PARAMETERS ARE NOT APPLICABLE OR VERY LOOSE OR SOFT SOIL OR MUCK IS PRESENT BELOW THE BOTTOM OF REINFORCED ZONE.

CONTROL DRAINAGE DURING CONSTRUCTION IN THE VICINITY OF STANDARD TEMPORARY MSE WALLS. COLLECT AND DIRECT RUNOFF AWAY FROM WALLS AND SHORING BACKFILL.

EXCAVATE AS NECESSARY FOR STANDARD TEMPORARY MSE WALLS IN ACCORDANCE WITH THE FOLLOWING FOR THE WALL OPTION CHOSEN:
1) MINIMUM EMBEDMENT OF 18" (450mm) UNLESS WALL BEARS ON ROCK, CONCRETE OR PAVEMENT AS DETERMINED BY THE ENGINEER
2) VERTICAL STEPS IN INCREMENTS EQUAL TO THE VERTICAL REINFORCEMENT SPACING
3) WITH THE EXCEPTION OF EITHER THE FIRST OR LAST SECTION OF WALL, HORIZONTAL SECTION LENGTHS IN INCREMENTS EQUAL TO THE FOLLOWING:

STANDARD TEMPORARY MSE WALL OPTION	INCREMENT
TEMPORARY FABRIC WALL	9'-0" (2.7m) MIN (VARIES)
HILFIKER TEMPORARY WALL	10'-0" (3.0m) MIN (VARIES)
SIERRASCAPE TEMPORARY WALL	18'-7¼" (5.7m)
RETAINED EARTH TEMPORARY WALL	24'-0" (7.3m)
TERRATREL TEMPORARY WALL	19'-8" (6.0m)

DO NOT PLACE SHORING BACKFILL OR FIRST REINFORCEMENT LAYER UNTIL OBTAINING APPROVAL OF THE EXCAVATION DEPTH AND FOUNDATION MATERIAL.

IF APPLICABLE, INSTALL FOUNDATIONS LOCATED WITHIN THE REINFORCED ZONE BEFORE BEGINNING WALL CONSTRUCTION UNLESS DIRECTED OTHERWISE BY THE ENGINEER.

ERECT AND MAINTAIN FACINGS AND FORMS AS SHOWN ON THE STANDARD TEMPORARY MSE WALL DETAILS. STAGGER VERTICAL JOINTS OF FACINGS AND FORMS TO CREATE A RUNNING BOND WHEN POSSIBLE UNLESS SHOWN OTHERWISE ON THESE DETAILS.

PLACE FACINGS AND FORMS AS NEAR TO VERTICAL AS POSSIBLE WITH NO NEGATIVE BATTER. CONSTRUCT STANDARD TEMPORARY MSE WALLS WITH A VERTICAL AND HORIZONTAL TOLERANCE OF 3" (75mm) WHEN MEASURED WITH A 10'-0" (3m) STRAIGHT EDGE AND AN OVERALL VERTICAL PLUMBNESS (BATTER) AND HORIZONTAL ALIGNMENT OF LESS THAN 6" (150mm).

PLACE REINFORCEMENT AT LOCATIONS AND ELEVATIONS SHOWN ON THE STANDARD TEMPORARY MSE WALL DETAILS AND IN SLIGHT TENSION FREE OF KINKS, FOLDS, WRINKLES OR CREASES.

DO NOT SPLICE REINFORCEMENT IN THE REINFORCEMENT DIRECTION (RD), i.e., PARALLEL TO THE WALL FACE. SEAMS ARE ALLOWED IN THE CROSS-REINFORCEMENT DIRECTION (CRD).

CONTACT THE ENGINEER WHEN EXISTING OR FUTURE STRUCTURES SUCH AS FOUNDATIONS, PAVEMENTS, PIPES, INLETS OR UTILITIES WILL INTERFERE WITH REINFORCEMENT. TO AVOID STRUCTURES, DELFECT, SKEW AND MODIFY REINFORCEMENT.

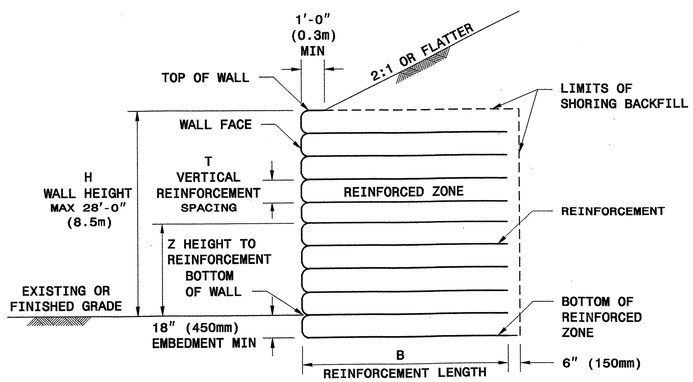
PLACE SHORING BACKFILL IN 8" TO 10" (200mm to 250mm) THICK LIFTS AND COMPACT IN ACCORDANCE WITH SUBARTICLE 235-4(C) OF THE STANDARD SPECIFICATIONS. USE ONLY HAND OPERATED COMPACTION EQUIPMENT WITHIN 3'-0" (1m) OF THE WALL FACE.

DO NOT DAMAGE REINFORCEMENT WHEN PLACING AND COMPACTING SHORING BACKFILL. DO NOT OPERATE HEAVY EQUIPMENT ON REINFORCEMENT UNTIL IT IS COVERED WITH AT LEAST 10" (250mm) OF SHORING BACKFILL. DO NOT USE SHEEPSFOOT, GRID ROLLERS OR OTHER TYPES OF COMPACTION EQUIPMENT WITH FEET.

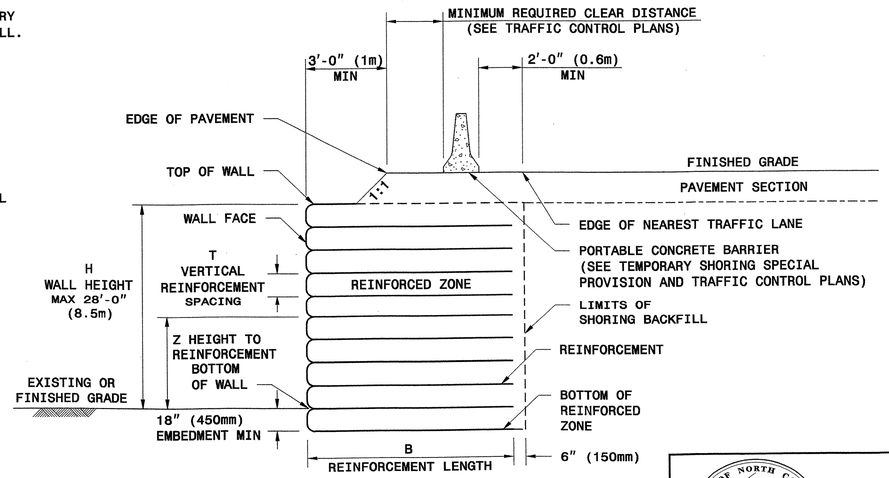
COVER REINFORCING AND RETENTION FABRIC WITH AT LEAST 3" (75mm) OF SHORING BACKFILL. PLACE TOP REINFORCEMENT LAYER BETWEEN 4" AND 24" (100mm and 600mm) BELOW TOP OF WALL DEPENDING ON WALL OPTION.

BENCH STANDARD TEMPORARY MSE WALLS INTO THE SIDES OF EXCAVATIONS WHERE APPLICABLE.

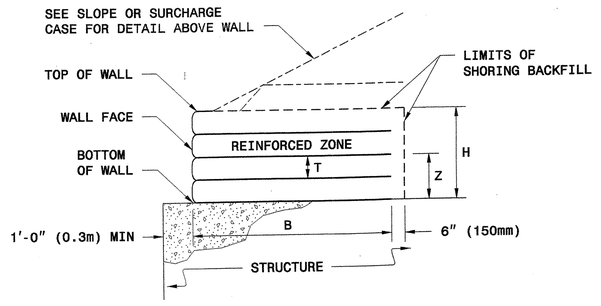
IF THE TOP OF WALL IS WITHIN 5'-0" (1.5m) OF FINISHED GRADE, REMOVE TOP FORM OR FACING AND INCORPORATE THE TOP REINFORCEMENT LAYER INTO THE FILL WHEN PLACING FILL IN FRONT OF THE WALL. STANDARD TEMPORARY MSE WALLS REMAIN IN PLACE PERMANENTLY UNLESS REQUIRED OTHERWISE.



SLOPE CASE



SURCHARGE CASE



TEMPORARY MSE WALL ON STRUCTURE

GEOTECHNICAL ENGINEERING UNIT

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH

STANDARD DRAWING NO. 1801.02

STANDARD TEMPORARY MECHANICALLY STABILIZED EARTH (MSE) WALLS

SHEET 1 OF 11 DATE: 2-20-07

PROJECT REFERENCE NO.	SHEET
U-5027	2-K

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

scott a. hidden 3/29/07

SIGNATURE DATE

ENGINEER

SIGNATURE DATE

HOW TO USE THIS SHEET:

- FOR ALL WALL OPTIONS, DETERMINE MINIMUM REQUIRED REINFORCEMENT LENGTH (B) FROM TABLE AT RIGHT BASED ON WALL HEIGHT (H) AND SLOPE OR SURCHARGE CASE
- FOR STANDARD TEMPORARY FABRIC WALL, SEE SHEET 3 FOR FABRIC STRENGTH REQUIREMENTS BASED ON WALL HEIGHT (H)
- FOR ALL OTHER WALL OPTIONS, DETERMINE REINFORCEMENT TYPE FROM TABLES BELOW FOR EACH HEIGHT TO REINFORCEMENT (Z) BASED ON WALL HEIGHT (H) AND SLOPE OR SURCHARGE CASE

MINIMUM REQUIRED REINFORCEMENT LENGTH B (FT)

(FOR ALL WALL OPTIONS)

WALL HEIGHT H (FT)	<8	8 TO 10	10 TO 12	12 TO 14	14 TO 16	16 TO 18	18 TO 20	20 TO 22	22 TO 24	24 TO 26	26 TO 28
SLOPE CASE	8	11	13	14	16	18	20	22	24	25	27
SURCHARGE CASE	8	9	11	12	14	15	16	18	19	21	22

TERRATREL TEMPORARY WALL (STRIPS PER LEVEL PER PANEL)

H (FT) <4	4 TO 6	6 TO 8	8 TO 10	10 TO 12	12 TO 14	14 TO 16	16 TO 18	18 TO 20	20 TO 22	22 TO 24	24 TO 26	26 TO 28	Z (FT-INCHES)
												3	27 - 8
											3	3	26 -10
											3	3	25 - 2
										3	3	3	23 - 6
									3	3	3	3	21 -10
								3	3	3	3	3	20 - 2
							3	3	3	3	3	3	18 - 6
						3	3	3	3	3	3	3	16 -10
						3	3	3	3	3	3	3	15 - 2
					4	3	3	3	3	3	3	3	13 - 6
				4	4	3	3	3	3	3	3	3	11 -10
			5	4	4	3	3	3	3	3	3	3	10 - 2
		5	5	4	4	3	3	3	3	3	3	3	8 - 6
	5	5	5	4	4	3	3	3	3	3	3	3	6 -10
	5	5	5	4	4	3	3	3	3	3	3	3	5 - 2
5	5	5	5	4	4	3	3	3	3	3	3	3	3 - 6
5	5	5	5	4	4	3	3	3	3	3	3	3	1 -10
5	5	5	5	4	4	3	3	3	3	3	3	3	0 - 2
5	5	5	5	4	4	3	3	3	3	3	3	3	-0 - 8

SLOPE AND SURCHARGE CASES

SIERRASCAPE TEMPORARY WALL (GEOGRID TYPE)

11 = UX1100MSE 16 = UX1600MSE
14 = UX1400MSE 17 = UX1700MSE
15 = UX1500MSE

H (FT) <4	4 TO 6	6 TO 8	8 TO 10	10 TO 12	12 TO 14	14 TO 16	16 TO 18	18 TO 20	20 TO 22	22 TO 24	24 TO 26	26 TO 28	Z (FT)
												11	26.5
											11	11	25.5
											11	11	24
										11	11	11	22.5
									11	11	11	15	21
								11	11	11	14	15	19.5
							11	11	11	14	15	15	18
						11	11	11	11	14	15	15	16.5
						11	11	11	11	15	15	15	15
					11	11	11	11	15	15	15	15	13.5
					11	11	11	15	15	15	15	15	12
				11	11	11	11	15	15	15	15	16	10.5
			11	11	11	11	15	15	15	15	15	16	9
		11	11	11	11	14	15	15	15	15	16	16	7.5
		11	11	11	11	14	15	15	15	16	16	16	6
	11	11	11	11	15	15	15	15	15	16	16	17	4.5
11	11	11	11	14	15	15	15	15	16	16	16	17	3
11	11	11	11	14	15	15	15	16	16	16	17	17	1.5
11	11	11	14	15	15	15	15	16	16	17	17	17	0
11	11	11	14	15	15	15	15	16	16	17	17	17	-1.5

SLOPE CASE

H (FT) <4	4 TO 6	6 TO 8	8 TO 10	10 TO 12	12 TO 14	14 TO 16	16 TO 18	18 TO 20	20 TO 22	22 TO 24	24 TO 26	26 TO 28	Z (FT)
												11	26.5
												11	25.5
											11	11	24
											11	11	22.5
										11	11	11	21
									11	11	11	11	19.5
								11	11	11	11	15	18
							11	11	11	11	15	15	16.5
						11	11	11	11	11	15	15	15
						11	11	11	11	15	15	15	13.5
					11	11	11	11	15	15	15	15	12
					11	11	11	15	15	15	15	15	10.5
				11	11	11	11	15	15	15	15	15	9
			11	11	11	11	15	15	15	15	15	16	7.5
		11	11	11	11	15	15	15	15	15	16	16	6
	11	11	11	11	15	15	15	15	15	16	16	16	4.5
11	11	11	11	14	15	15	15	15	16	16	16	16	3
11	11	11	11	15	15	15	15	15	15	16	16	17	1.5
11	11	11	14	15	15	15	15	15	15	16	16	17	0
11	11	11	14	15	15	15	15	15	15	16	16	17	-1.5

SURCHARGE CASE

HILFIKER TEMPORARY WALL (WELDED WIRE MAT TYPE)

4.5 = W4.5 x W3.5
7.0 = W7.0 x W3.5
9.5 = W9.5 x W4.0

H (FT) <4	4 TO 6	6 TO 8	8 TO 10	10 TO 12	12 TO 14	14 TO 16	16 TO 18	18 TO 20	20 TO 22	22 TO 24	24 TO 26	26 TO 28	Z (FT)
												4.5	26
											4.5	7.0	24
										4.5	7.0	7.0	22
									4.5	7.0	7.0	7.0	20
								4.5	7.0	7.0	7.0	7.0	18
							4.5	7.0	7.0	7.0	7.0	7.0	16
						4.5	7.0	7.0	7.0	7.0	7.0	9.5	14
					4.5	7.0	7.0	7.0	7.0	7.0	9.5	9.5	12
				4.5	7.0	7.0	7.0	7.0	7.0	9.5	9.5	9.5	10
			4.5	7.0	7.0	7.0	7.0	7.0	9.5	9.5	9.5	9.5	8
		4.5	7.0	7.0	7.0	7.0	7.0	9.5	9.5	9.5	9.5	9.5	6
	4.5	7.0	7.0	7.0	7.0	7.0	9.5	9.5	9.5	9.5	9.5	9.5	4
	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	7.0	3
4.5	7.0	7.0	7.0	7.0	7.0	9.5	9.5	9.5	9.5	9.5	9.5	7.0	2
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	7.0	7.0	1
7.0	7.0	7.0	7.0	7.0	9.5	9.5	9.5	9.5	9.5	9.5	7.0	7.0	0
7.0	7.0	7.0	7.0	7.0	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	-1.5

SLOPE CASE

H (FT) <4	4 TO 6	6 TO 8	8 TO 10	10 TO 12	12 TO 14	14 TO 16	16 TO 18	18 TO 20	20 TO 22	22 TO 24	24 TO 26	26 TO 28	Z (FT)
												4.5	26
											4.5	7.0	24
										4.5	7.0	7.0	22
									4.5	7.0	7.0	7.0	20
								4.5	7.0	7.0	7.0	7.0	18
							4.5	7.0	7.0	7.0	7.0	7.0	16
						4.5	7.0	7.0	7.0	7.0	7.0	9.5	14
					4.5	7.0	7.0	7.0	7.0	7.0	9.5	9.5	12
				4.5	7.0	7.0	7.0	7.0	7.0	9.5	9.5	9.5	10
			4.5	7.0	7.0	7.0	7.0	7.0	9.5	9.5	9.5	9.5	8
		4.5	7.0	7.0	7.0	7.0	7.0	9.5	9.5	9.5	9.5	9.5	6
	4.5	7.0	7.0	7.0	7.0	7.0	9.5	9.5	9.5	9.5	9.5	9.5	4
4.5	7.0	7.0	7.0	7.0	7.0	7.0	9.5	9.5	9.5	9.5	9.5	9.5	2
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	7.0	1
7.0	7.0	7.0	7.0	7.0	7.0	9.5	9.5	9.5	9.5	9.5	9.5	9.5	-1.5

SURCHARGE CASE

RETAINED EARTH TEMPORARY WALL (WELDED WIRE MESH TYPE)

3X1 = 3W8 x W8 x 1.0′
3X2 = 3W8 x W8 x 2.0′

H (FT) <4	4 TO 6	6 TO 8	8 TO 10	10 TO 12	12 TO 14	14 TO 16	16 TO 18	18 TO 20	20 TO 22	22 TO 24	24 TO 26	26 TO 28	Z (FT-INCHES)
												3X1	27 - 6
												3X1	26 -10
											3X1	3X2	25 - 2
										3X1	3X1	3X2	23 - 6
									3X1	3X1	3X2	3X2	21 -10
								3X1	3X1	3X2	3X2	3X2	20 - 2
							3X1	3X2	3X2	3X2	3X2	3X2	18 - 6
						3X1	3X2	3X2	3X2	3X2	3X2	3X2	16 -10
						3X1	3X2	3X2	3X2	3X2	3X2	3X2	15 - 2
					3X1	3X2	3X2	3X2	3X2	3X2	3X2	3X2	13 - 6
				3X1	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	11 -10
			3X1	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	10 - 2
		3X1	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	8 - 6
		3X1	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	6 -10
	3X1	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	5 - 2
3X1	3X1	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3 - 6
3X1	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	1 -10
3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	0 - 2
3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	-1 - 6

SLOPE AND SURCHARGE CASES

NOTES FOR HILFIKER TEMPORARY WALL

1) CAP MAT AT TOP OF WALL IS NOT INCLUDED IN TABLES.
2) REINFORCEMENT IS NOT REQUIRED AT 1′ LEVEL FOR SLOPE CASE UNTIL WALL HEIGHT (H) IS GREATER THAN 24′.
3) REINFORCEMENT IS NOT REQUIRED AT 3′ LEVEL FOR SLOPE CASE UNTIL WALL HEIGHT (H) IS GREATER THAN 26′.
4) REINFORCEMENT IS NOT REQUIRED AT 1′ LEVEL FOR SURCHARGE CASE UNTIL WALL HEIGHT (H) IS GREATER THAN 26′.

GEOTECHNICAL ENGINEERING UNIT

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH

STANDARD DRAWING NO. 1801.02

STANDARD TEMPORARY MSE WALL REINFORCEMENT TABLES - ENGLISH UNITS

SHEET 2 OF 11 DATE: 2-20-07

PROJECT REFERENCE NO.	SHEET
U-5027	2-L

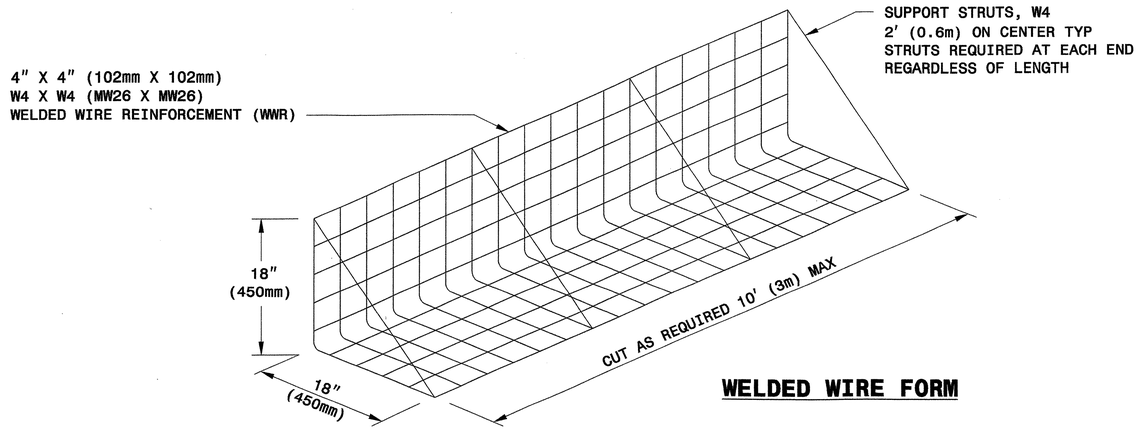
GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

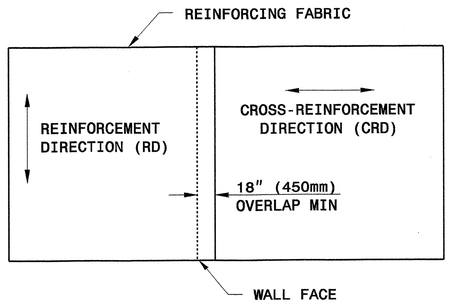
Scott A. Hidden 3/29/07
SIGNATURE DATE

ENGINEER

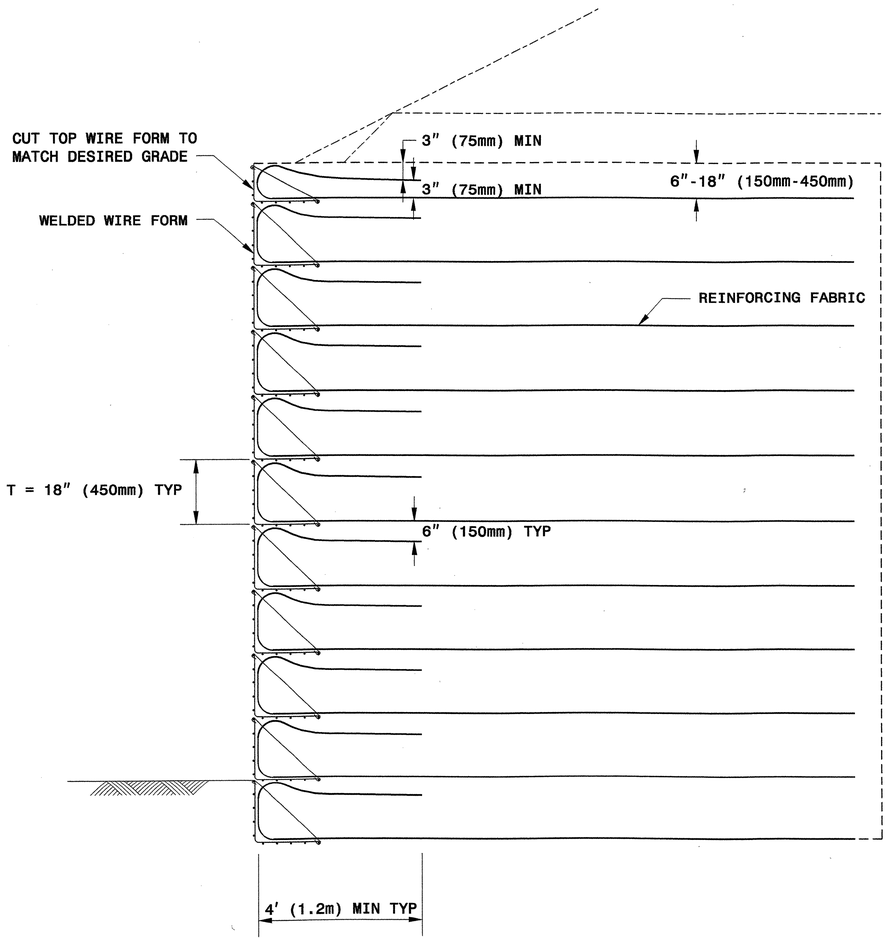
SIGNATURE DATE



WELDED WIRE FORM



PLAN VIEW OF FABRIC OVERLAP



TYPICAL SECTION

MINIMUM REQUIRED REINFORCING FABRIC STRENGTH FOR RD*
(SLOPE AND SURCHARGE CASES)

WALL HEIGHT H FEET (M)	POLYESTER WIDE WIDTH TENSILE STRENGTH @ ULTIMATE LB/INCH (KN/M)	POLYPROPYLENE WIDE WIDTH TENSILE STRENGTH @ ULTIMATE LB/INCH (KN/M)
4 (1.2)	200 (35)	200 (35)
6 (1.8)	200 (35)	200 (35)
8 (2.4)	200 (35)	200 (35)
10 (3.0)	200 (35)	230 (40)
12 (3.7)	220 (39)	264 (46)
14 (4.3)	248 (43)	297 (52)
16 (4.9)	276 (48)	330 (58)
18 (5.5)	304 (53)	364 (64)
20 (6.1)	332 (58)	397 (70)
22 (6.7)	359 (63)	431 (76)
24 (7.3)	387 (68)	464 (81)
26 (7.9)	415 (73)	497 (87)
28 (8.5)	443 (78)	531 (93)

*RD = REINFORCEMENT DIRECTION

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

GEOTECHNICAL ENGINEERING UNIT

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD DRAWING NO. 1801.02

TEMPORARY
FABRIC WALL

SHEET 3 OF 11 DATE: 12-19-06

PROJECT REFERENCE NO.	SHEET
U-5027	2-M

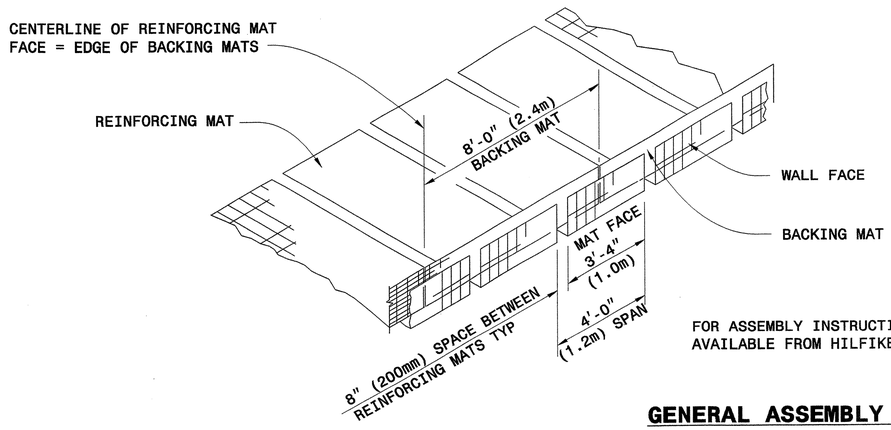
GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

Scott A. Hidden 3/29/07
SIGNATURE DATE

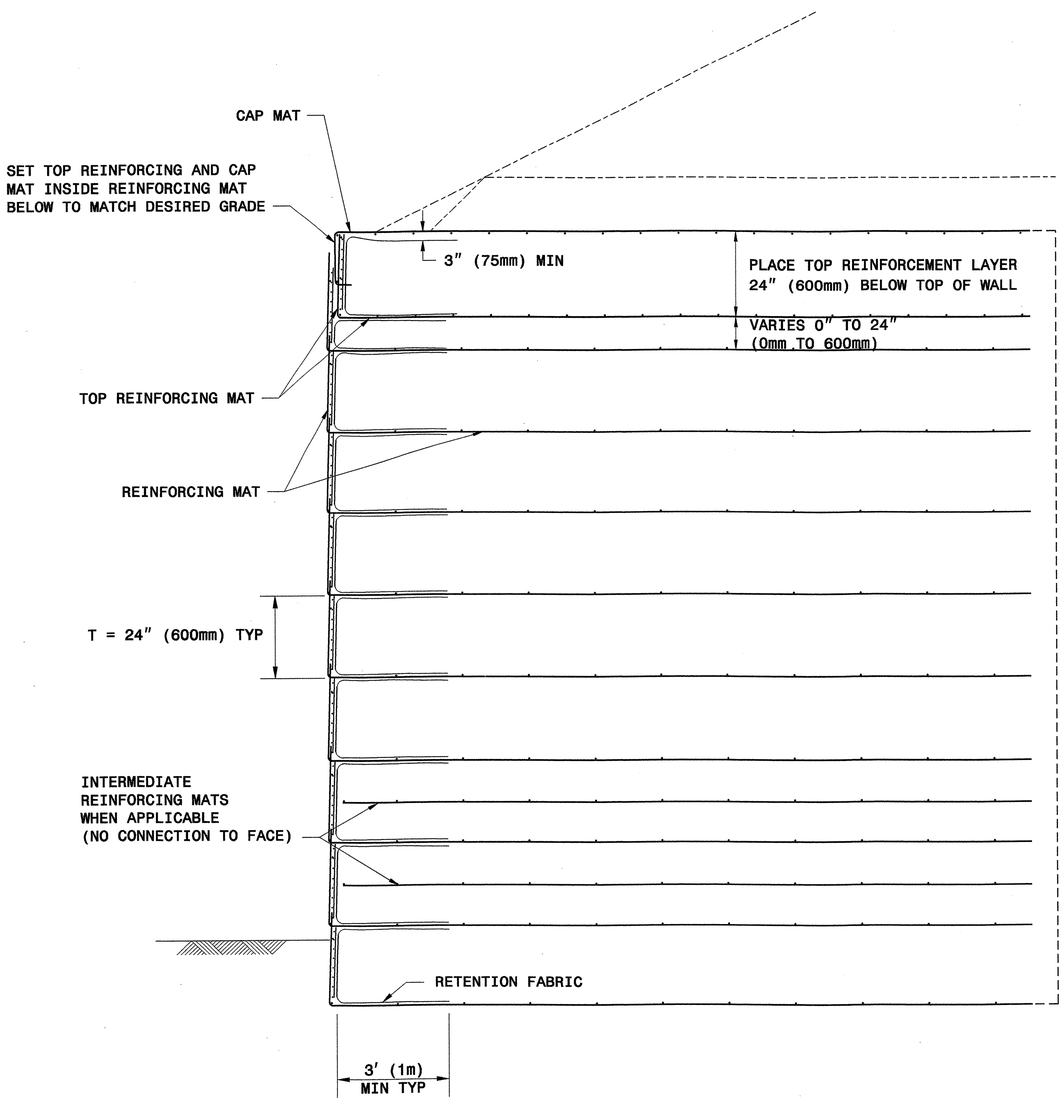
ENGINEER

SIGNATURE DATE

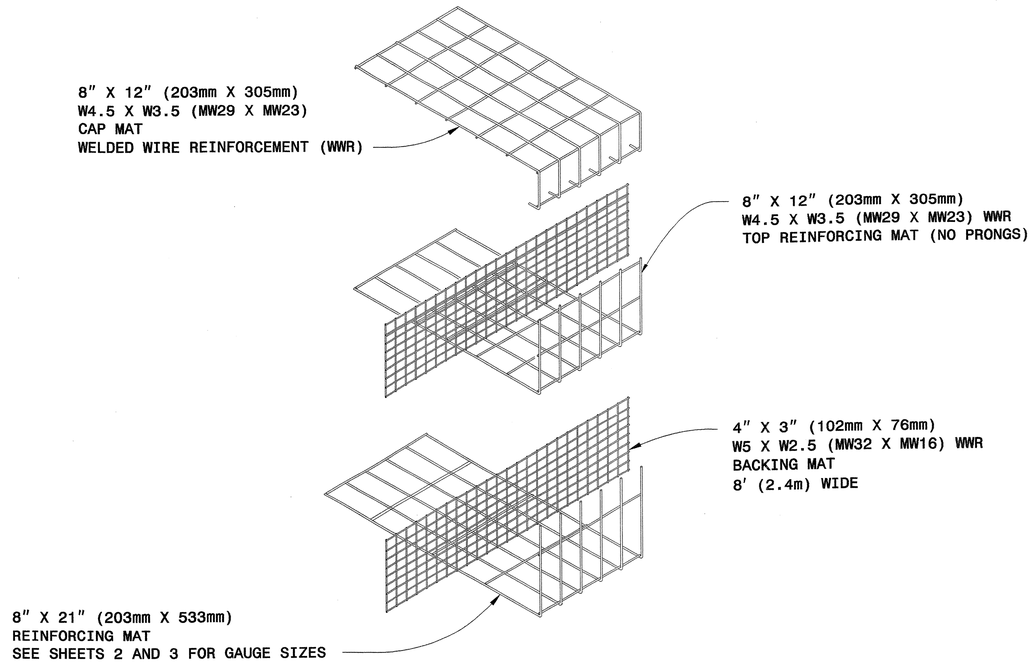


FOR ASSEMBLY INSTRUCTIONS, SEE WELDED WIRE WALL CONSTRUCTION GUIDE AVAILABLE FROM HILFIKER WEBSITE AT WWW.HILFIKER.COM/WWW

GENERAL ASSEMBLY DETAIL



TYPICAL SECTION



WALL COMPONENTS

HILFIKER RETAINING WALLS

GEOTECHNICAL ENGINEERING UNIT

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD DRAWING NO. 1801.02

HILFIKER TEMPORARY WALL

SHEET 4 OF 11 DATE: 12-19-06

C221427 3/29/2007 std no 1801 shidden GE-Oce34bond

PROJECT REFERENCE NO.	SHEET
U-5027	2-N

GEOTECHNICAL ENGINEER

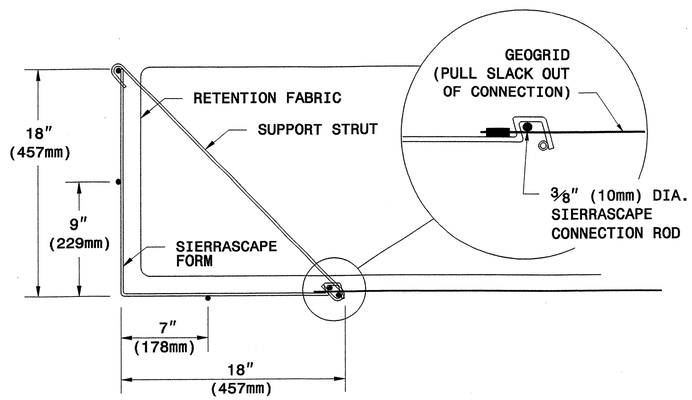
NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

Scott A. Hidden 3/29/07

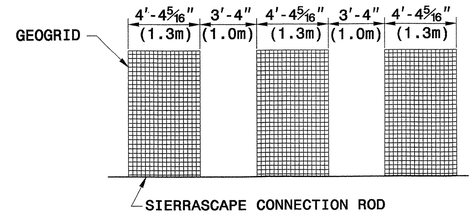
SIGNATURE DATE

ENGINEER

SIGNATURE DATE

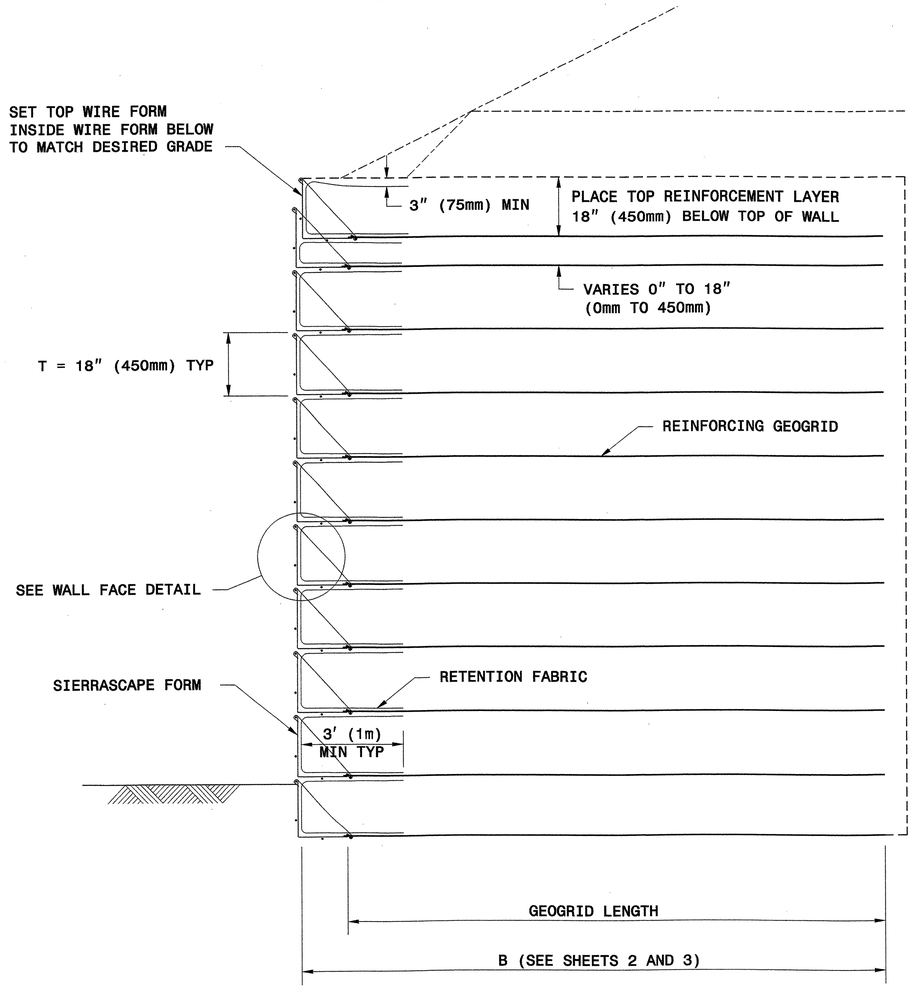


WALL FACE DETAIL

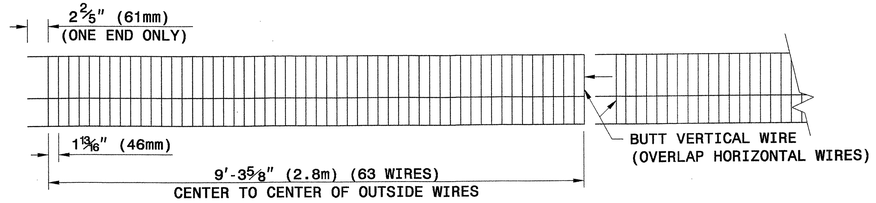


PLACE ALTERNATE LAYERS OF GEOGRID IN STAGGERED PATTERN SUCH THAT THE LAYER ABOVE IS CENTERED OVER SPACE BELOW

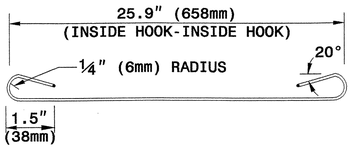
TYPICAL GEOGRID COVERAGE



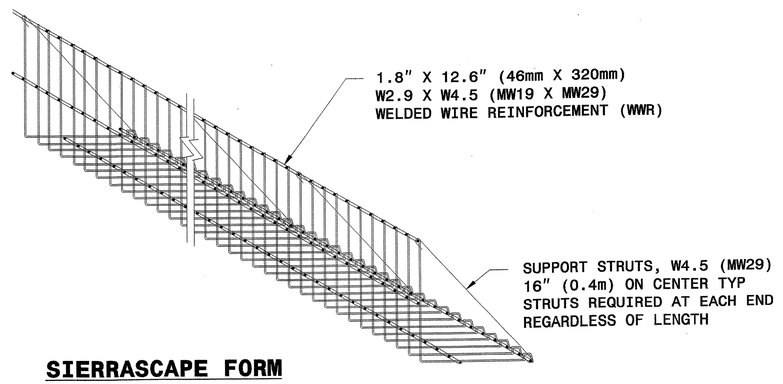
TYPICAL SECTION



ELEVATION VIEW



SUPPORT STRUT



SIERRASCAPE FORM

WALL COMPONENTS

TENSAR®
TENSAR EARTH TECHNOLOGIES, INC.

GEOTECHNICAL ENGINEERING UNIT

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH

STANDARD DRAWING NO. 1801.02

SIERRASCAPE TEMPORARY WALL

SHEET 5 OF 11 DATE: 12-19-06

PROJECT REFERENCE NO.	SHEET
U-5027	2-0

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

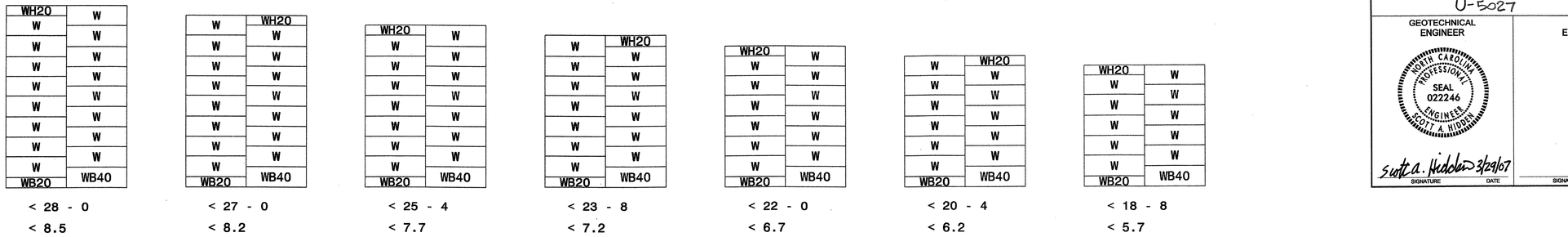
Scott A. Hidden 3/29/07

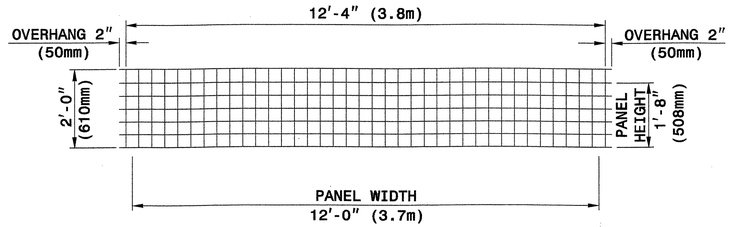
SIGNATURE DATE

ENGINEER

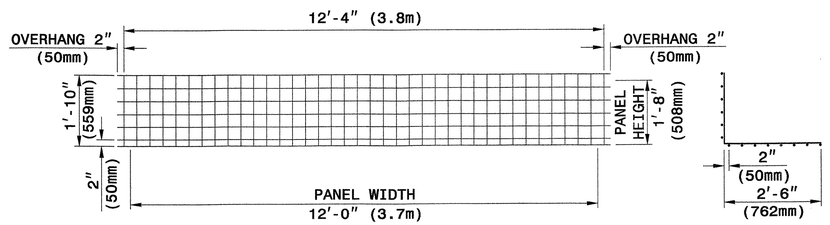
SIGNATURE DATE

PANEL LAYOUTS

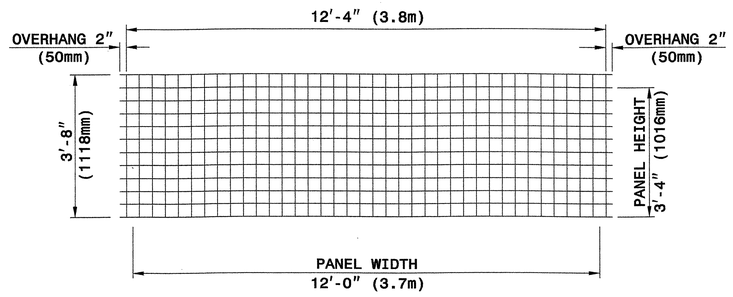




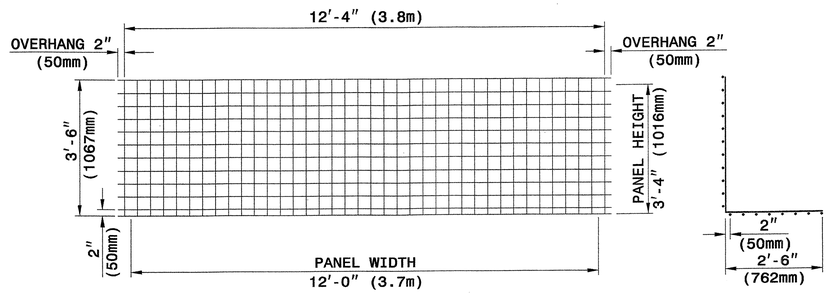
TYPE WH20



TYPE WB20 **SECTION**



TYPE W



TYPE WB40 **SECTION**

WELDED WIRE FACINGS **WELDED WIRE FORMS**

PANEL TYPES (WELDED WIRE FACINGS AND FORMS)

4″ X 4″ (100mm X 100mm), W8 X W8 (MW52 X MW52) WELDED WIRE REINFORCEMENT (WWR)

The Reinforced Earth Company

GEOTECHNICAL ENGINEERING UNIT

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH

STANDARD DRAWING NO. 1801.02

RETAINED EARTH TEMPORARY WALL

SHEET 6 OF 11 DATE: 12-19-06

PROJECT REFERENCE NO.	SHEET
U-5027	2-P

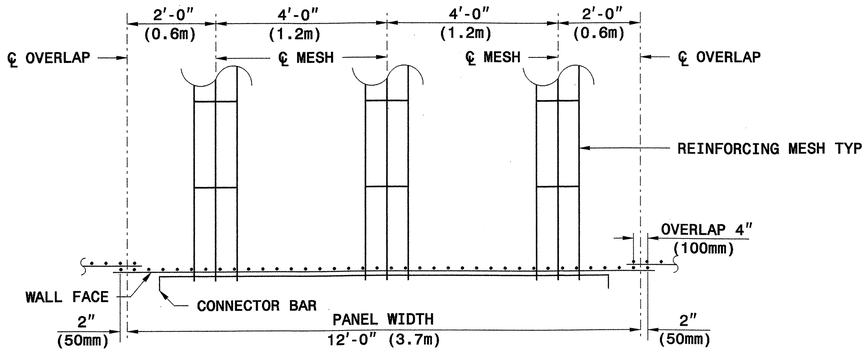
GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

Scott A. Hidden 3/29/07
SIGNATURE DATE

ENGINEER

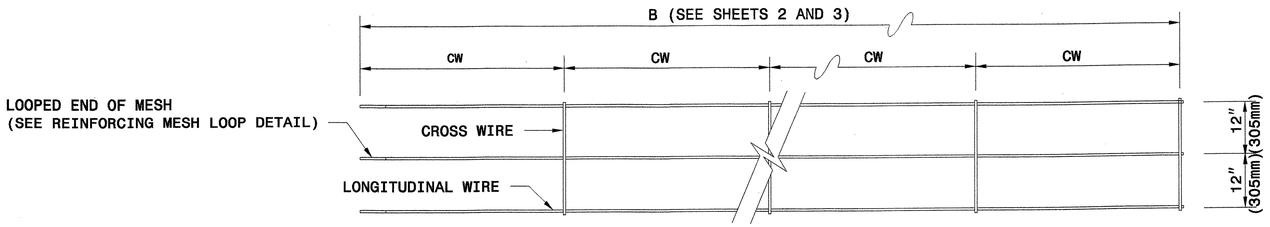
SIGNATURE DATE



REINFORCING MESH PLACEMENT DETAIL (PLAN VIEW)

½" (13mm) DIA. BAR

CONNECTOR BAR



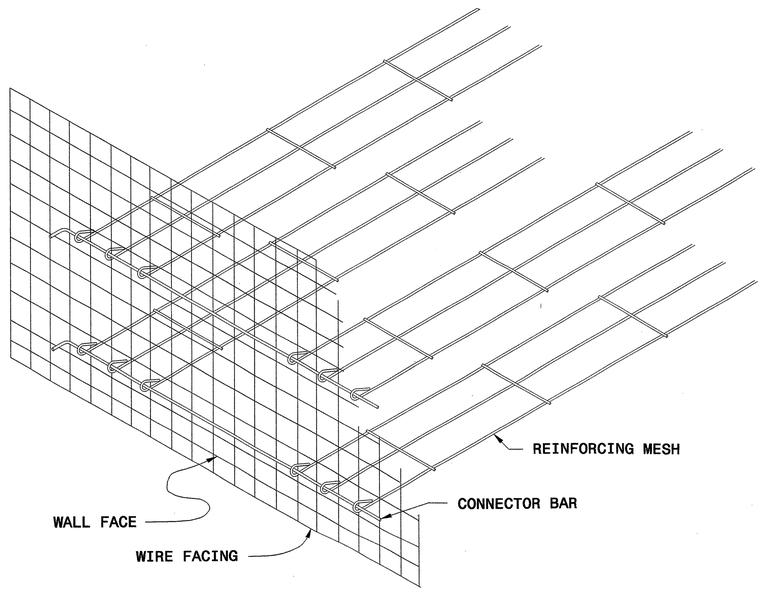
IF REINFORCEMENT LENGTH IS NOT AN INCREMENT OF 2'-0" (610mm) MAKE CW EQUAL TO 12" (305mm) AT THE END OF THE REINFORCING MESH OPPOSITE THE LOOPED END

3W8 X W8 x 2.0' (3MW52 X MW52 X 610mm)

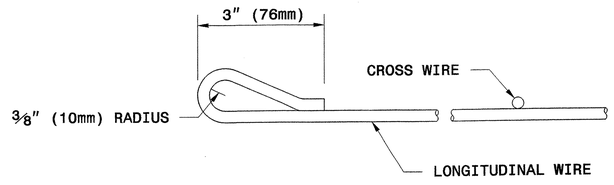
- NO. OF LONGITUDINAL WIRES
- GAUGE OF LONGITUDINAL WIRES
- GAUGE OF CROSS WIRES
- SPACING OF CROSS WIRES IN FT (mm), CW

REINFORCING MESH DESIGNATION

REINFORCING MESH



GENERAL ASSEMBLY DETAIL



REINFORCING MESH LOOP DETAIL

The Reinforced Earth Company

GEOTECHNICAL ENGINEERING UNIT

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD DRAWING NO. 1801.02

RETAINED EARTH TEMPORARY WALL

SHEET 7 OF 11 DATE: 12-19-06

PROJECT REFERENCE NO.	SHEET
U-5027	2-Q

GEOTECHNICAL ENGINEER

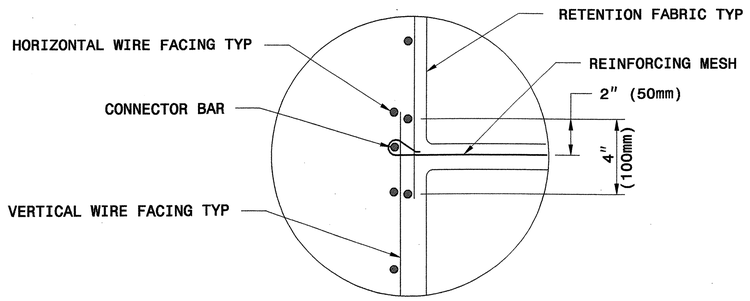
NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A HIDDEN

Scott A. Hidden 3/29/07

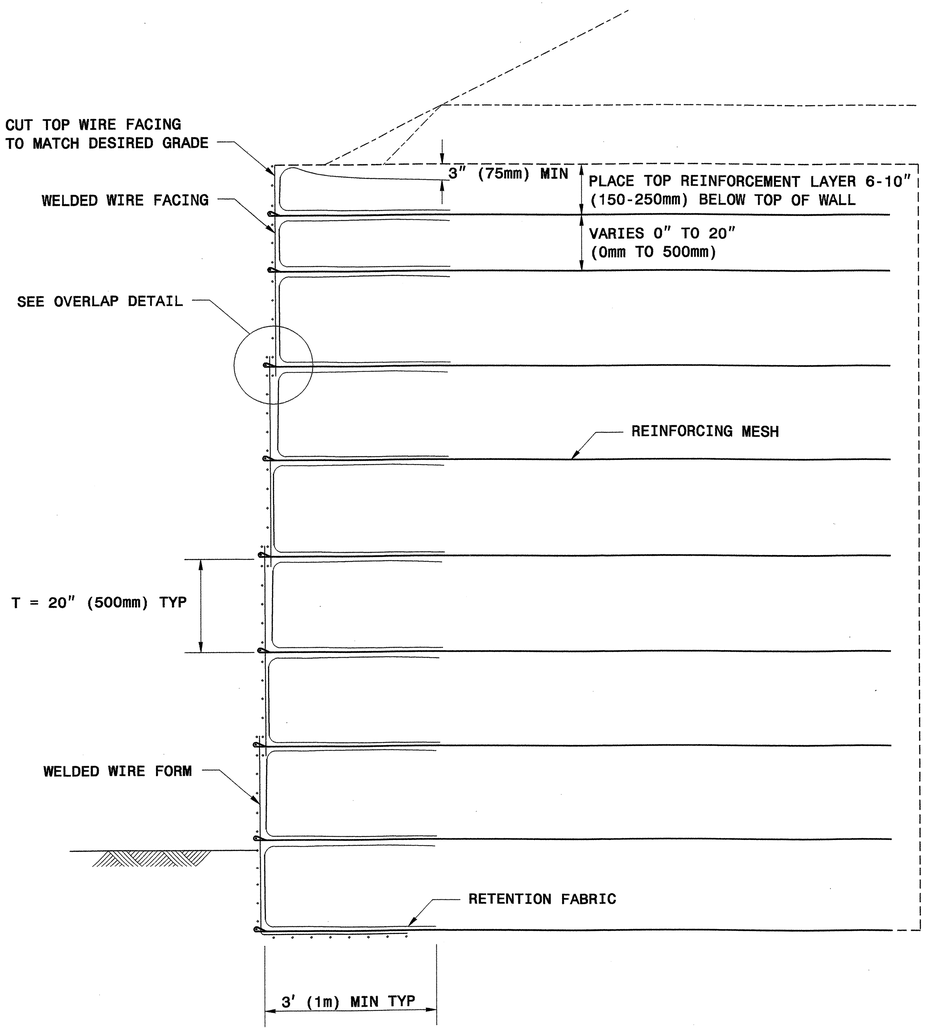
SIGNATURE DATE

ENGINEER

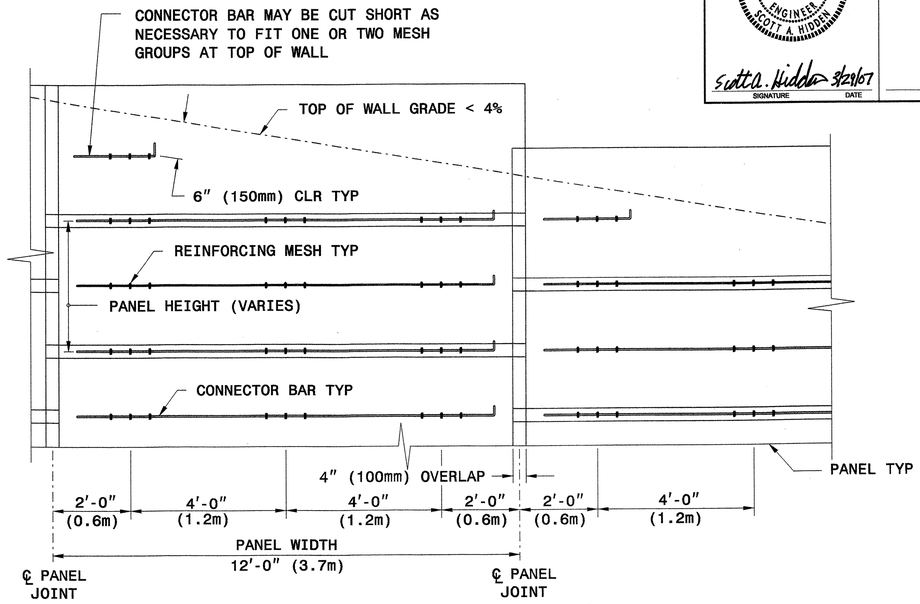
SIGNATURE DATE



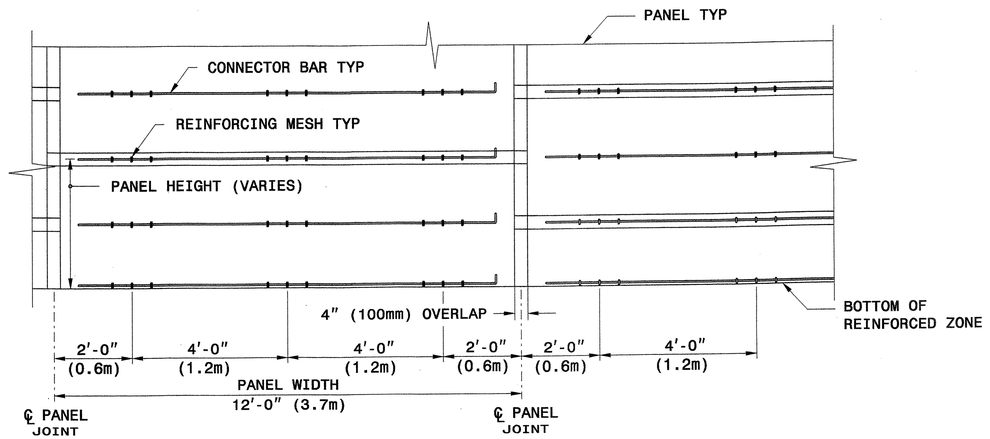
OVERLAP DETAIL



TYPICAL SECTION



TYPICAL ELEVATION @ TOP OF WALL
(WIRES NOT SHOWN FOR CLARITY)



TYPICAL ELEVATION @ BOTTOM OF WALL
(WIRES NOT SHOWN FOR CLARITY)

The Reinforced Earth Company

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

GEOTECHNICAL ENGINEERING UNIT

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH

STANDARD DRAWING NO. 1801.02

RETAINED EARTH TEMPORARY WALL

SHEET 8 OF 11 DATE: 12-19-06

C221427 3/29/2007 std no 1801 shidden GE-Oce34bond

PROJECT REFERENCE NO.	SHEET
U-5027	2-R

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

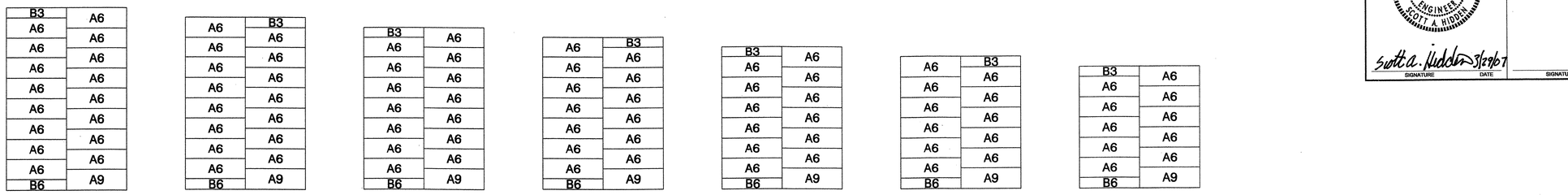
Scott A. Hidden 3/29/07

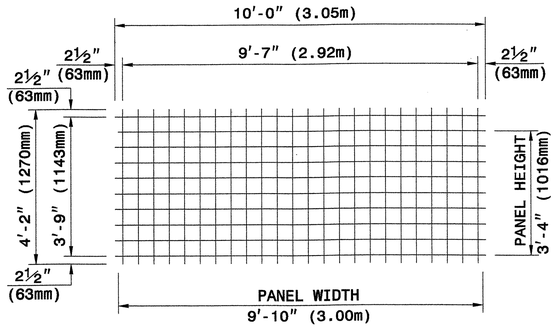
SIGNATURE DATE

ENGINEER

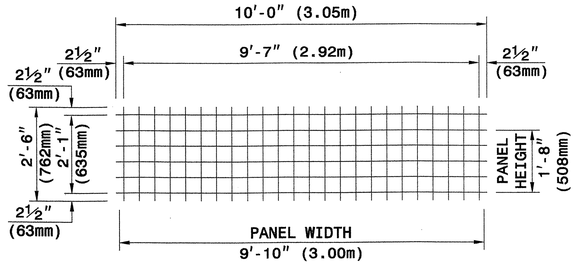
SIGNATURE DATE

PANEL LAYOUTS

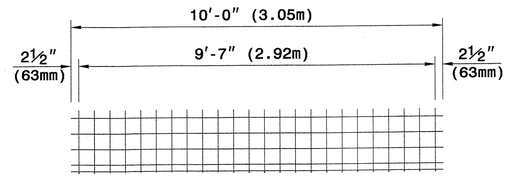




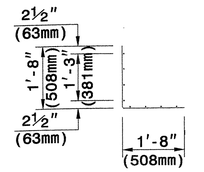
TYPE A



TYPE B



WELDED WIRE FORM



SECTION

WELDED WIRE FACINGS

PANEL TYPES (WELDED WIRE FACINGS AND FORM

5" X 5" (125mm X 125mm), W5 X W5 (MW32 X MW32) WELDED WIRE REINFORCEMENT (WWR)

The Reinforced Earth Company

GEOTECHNICAL ENGINEERING UNIT

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH

STANDARD DRAWING NO. 1801.02

TERRATREL TEMPORARY WALL

SHEET 9 OF 11 DATE: 12-19-06

PROJECT REFERENCE NO.	SHEET
U-5027	2-S

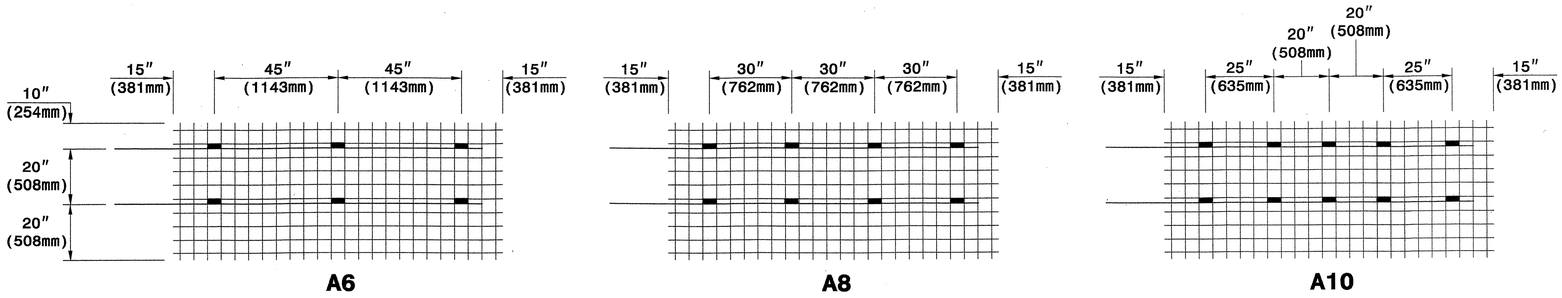
GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

Scott A. Hidden 3/2/07
SIGNATURE DATE

ENGINEER

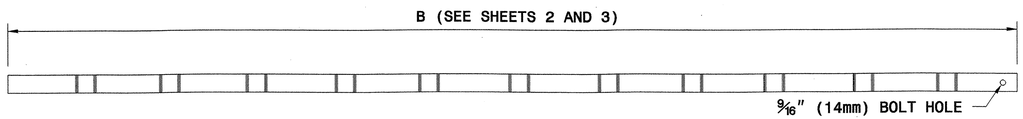
SIGNATURE DATE



KEY: A8

- A8 — NUMBER OF REINFORCING STRIPS
- A8 — PANEL TYPE

CONNECTOR ROD AND REINFORCING STRIP PLACEMENT DIAGRAMS



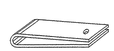
REINFORCING STRIP - 2" X 5/32" (50mm X 4mm)

½" (13mm) DIA. ROD

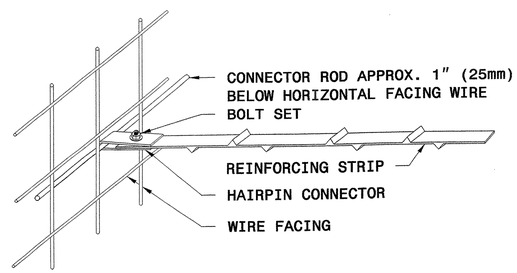
CONNECTOR ROD

½" (13mm) BOLT WITH NUT AND WASHER

BOLT SET



HAIRPIN CONNECTOR



STRIP TO FACING CONNECTION

WALL COMPONENTS

The Reinforced Earth Company

GEOTECHNICAL ENGINEERING UNIT

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD DRAWING NO. 1801.02

TERRATREL
TEMPORARY WALL

SHEET 10 OF 11 DATE: 12-19-06

C221427 3/29/2007 std no 1801 shidden GE-Oce34bond

PROJECT REFERENCE NO.	SHEET
U-5027	2-T

GEOTECHNICAL ENGINEER

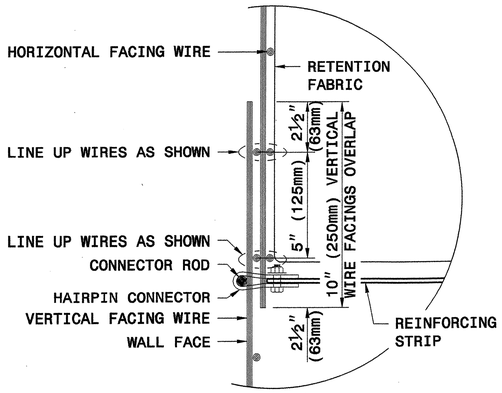
NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

Scott A. Hidden 3/21/07

SIGNATURE DATE

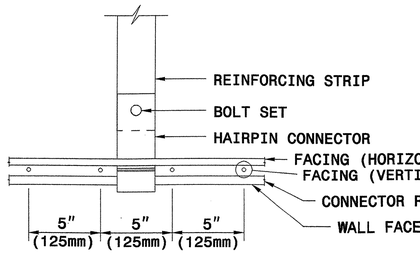
ENGINEER

SIGNATURE DATE

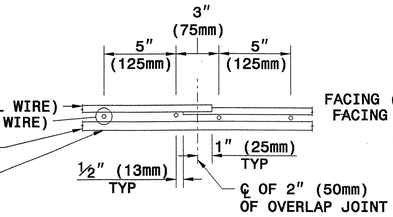


OVERLAP FACINGS VERTICALLY ONE FULL 5" (125mm) WIRE SQUARE DISREGARDING HALF SQUARES AT EDGES

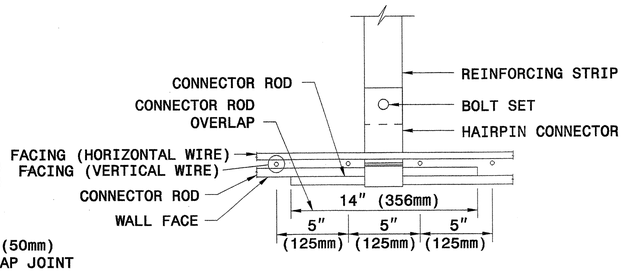
VERTICAL OVERLAP DETAIL



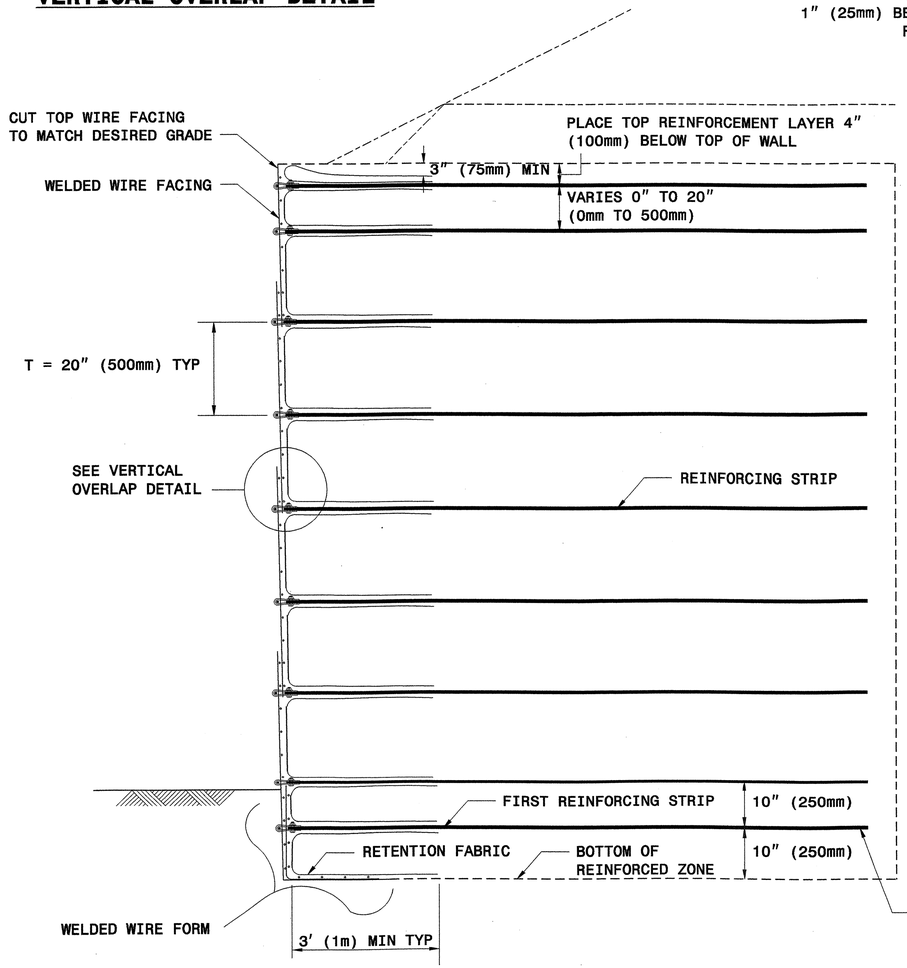
PLAN DETAIL 'A'
STRIP CONNECTION



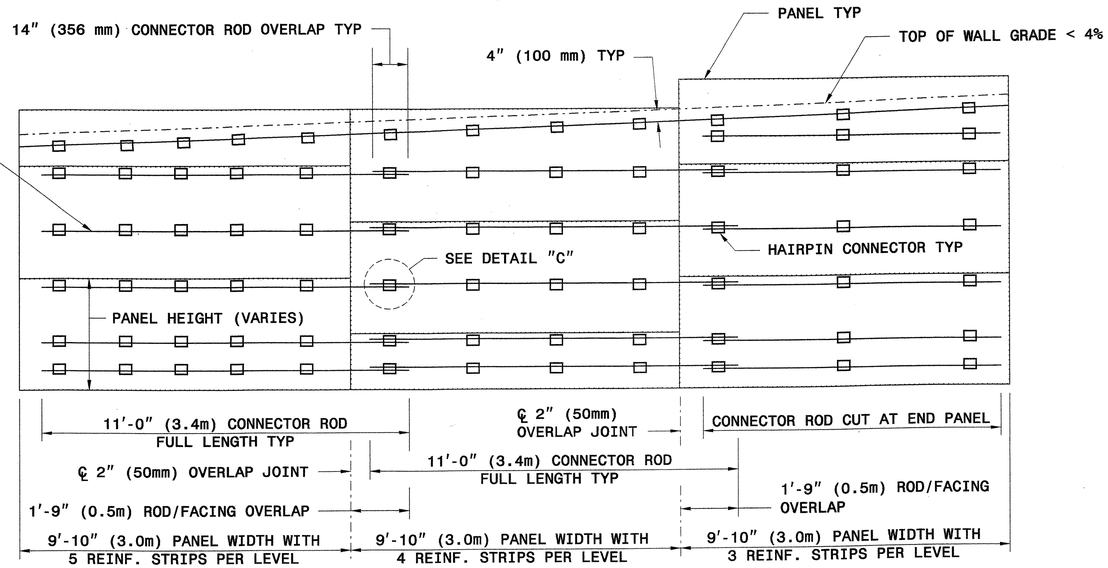
PLAN DETAIL 'B'
HORIZONTAL OVERLAP DETAIL



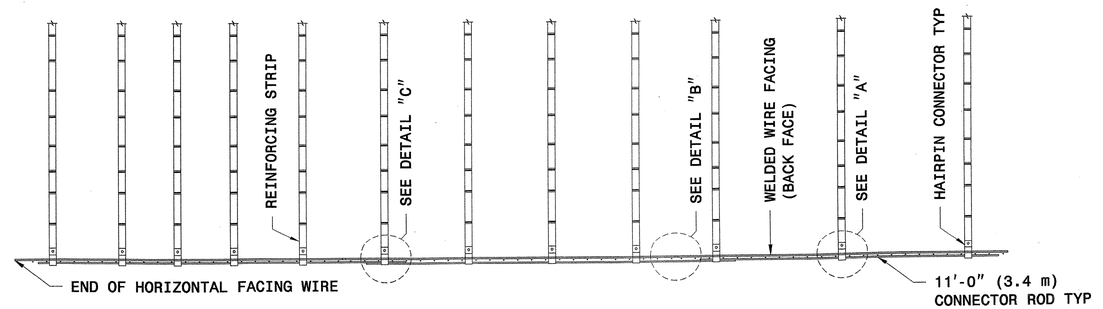
PLAN DETAIL 'C'
STRIP CONNECTION WITH HORIZONTAL OVERLAP DETAIL



TYPICAL SECTION



TYPICAL ELEVATION
(WIRES NOT SHOWN FOR CLARITY)



TYPICAL PLAN

The Reinforced Earth Company

GEOTECHNICAL ENGINEERING UNIT

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD DRAWING NO. 1801.02

TERRATREL
TEMPORARY WALL

SHEET 11 OF 11 DATE: 12-19-06

C221427 3/29/2007 std no 1801 shidden GE-Oce34bond

7/2/99

COMPUTED BY: JRH DATE: 4-04
CHECKED BY: EAR DATE: 4-04

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

HNTB NORTH CAROLINA, P.C.
343 E. SIX FORKS ROAD, SUITE 200
Raleigh, North Carolina 27609

PROJECT REFERENCE NO.	SHEET NO.
U-5027	3

SUMMARY OF QUANTITIES

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
ROADWAY SUMMARY OF QUANTITIES FOR CONTRACT - C202074

ItemNumber	Sec #	Quantity	Unit	Description
0000100000-N	800	Lump Sum		MOBILIZATION
0001000000-E	200	Lump Sum		CLEARING & GRUBBING .. ACRE(S)
0008000000-E	200	1	ACR	SUPPLEMENTARY CLEARING & GRUBBING
0022000000-E	225	3,200	CY	UNCLASSIFIED EXCAVATION
0036000000-E	225	100	CY	UNDERCUT EXCAVATION
0106000000-E	230	6,250	CY	BORROW EXCAVATION
0156000000-E	250	9,500	SY	REMOVAL OF EXISTING ASPHALT PAVEMENT
0199000000-E	SP	420	SF	TEMPORARY SHORING
0318000000-E	300	565	TON	FOUNDATION CONDITIONING MATERIAL, MINOR STRS
0343000000-E	310	32	LF	15" SIDE DRAIN PIPE
0366000000-E	310	3,206	LF	15" RC PIPE CULVERTS, CLASS III
0372000000-E	310	1,046	LF	18" RC PIPE CULVERTS, CLASS III
0378000000-E	310	1,032	LF	24" RC PIPE CULVERTS, CLASS III
0453000000-E	310	4	EA	**" PIPE END SECTION (15")
0453000000-E	310	2	EA	**" PIPE END SECTION (18")
0453000000-E	310	3	EA	**" PIPE END SECTION (24")
0995000000-E	340	767	LF	PIPE REMOVAL
0996000000-N	350	6	EA	PIPE CLEAN-OUT
1011000000-N	500	Lump Sum		FINE GRADING
1077000000-E	SP	245	TON	#57 STONE
1308000000-E	607	600	SY	MILLING ASPHALT PAVEMENT, ***" TO ******* DEPTH (0" TO 3")
1330000000-E	607	400	SY	INCIDENTAL MILLING
1489000000-E	610	220	TON	ASPHALT CONC BASE COURSE, TYPE B25.0B
1498000000-E	610	7,925	TON	ASPHALT CONC INTERMEDIATE COURSE, TYPE I19.0B
1519000000-E	610	5,775	TON	ASPHALT CONC SURFACE COURSE, TYPE S9.5B
1560000000-E	620	810	TON	ASPHALT BINDER FOR PLANT MIX, GRADE PG 64-22
1693000000-E	654	220	TON	ASPHALT PLANT MIX, PAVEMENT REPAIR
1869000000-E	710	135	SY	***** PORT CEM CONC PAVEMENT, MISCELLANEOUS (WITHOUT DOWELS) (10")
2000000000-N	806	51	EA	RIGHT OF WAY MARKERS
2209000000-E	838	2.196	CY	ENDWALLS
2253000000-E	840	1.691	CY	PIPE COLLARS
2286000000-N	840	53	EA	MASONRY DRAINAGE STRUCTURES
2308000000-E	840	5.18	LF	MASONRY DRAINAGE STRUCTURES
2364000000-N	840	11	EA	FRAME WITH TWO GRATES, STD 840.16
2374000000-N	840	9	EA	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (E)
2374000000-N	840	10	EA	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (F)
2374000000-N	840	23	EA	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (G)
2440000000-N	852	3	EA	CONCRETE TRANSITIONAL SECTION FOR CATCH BASIN
2535000000-E	846	132	LF	**"X **" CONCRETE CURB (9"X16")
2542000000-E	846	190	LF	1'-6" CONCRETE CURB & GUTTER
2549000000-E	846	14,100	LF	2'-6" CONCRETE CURB & GUTTER
2591000000-E	848	2,900	SY	4" CONCRETE SIDEWALK
2605000000-N	848	63	EA	CONCRETE WHEELCHAIR RAMPS
2612000000-E	848	245	SY	6" CONCRETE DRIVEWAY
2655000000-E	852	765	SY	5" MONOLITHIC CONCRETE ISLANDS (KEYED IN)
2830000000-N	858	6	EA	ADJUSTMENT OF MANHOLES
2845000000-N	858	6	EA	ADJUSTMENT OF METER BOXES OR VALVE BOXES
3642000000-E	876	5	TON	RIP RAP, CLASS A
3649000000-E	876	25	TON	RIP RAP, CLASS B
3656000000-E	876	145	SY	FILTER FABRIC FOR DRAINAGE
4400000000-E	1110	418	SF	WORK ZONE SIGNS (STATIONARY)
4405000000-E	1110	96	SF	WORK ZONE SIGNS (PORTABLE)
4410000000-E	1110	106	SF	WORK ZONE SIGNS (BARRICADE MOUNTED)
4430000000-N	1130	340	EA	DRUMS
4445000000-E	1145	238	LF	BARRICADES (TYPE III)
4455000000-N	1150	180	MD	FLAGGER
4465000000-N	1160	4	EA	TEMPORARY CRASH CUSHIONS
4470000000-N	1160	2	EA	RESET TEMPORARY CRASH CUSHIONS
4485000000-E	1170	698	LF	PORTABLE CONCRETE BARRIER
4500000000-E	1170	351	LF	RESET PORTABLE CONCRETE BARRIER
4507000000-E	SP	120	LF	WATER FILLED BARRIER
4685000000-E	1205	388	LF	THERMOPLASTIC PAVEMENT MARKING LINES (4", 90 MILS)
4686000000-E	1205	15,279	LF	THERMOPLASTIC PAVEMENT MARKING LINES (4", 120 MILS)
4695000000-E	1205	161	LF	THERMOPLASTIC PAVEMENT MARKING LINES (8", 90 MILS)
4697000000-E	1205	674	LF	THERMOPLASTIC PAVEMENT MARKING LINES (8", 120 MILS)
4710000000-E	1205	382	LF	THERMOPLASTIC PAVEMENT MARKING LINES (24", 120 MILS)
4725000000-E	1205	40	EA	THERMOPLASTIC PAVEMENT MARKING SYMBOL (90 MILS)
4810000000-E	1205	53,831	LF	PAINT PAVEMENT MARKING LINES (4")
4820000000-E	1205	24	LF	PAINT PAVEMENT MARKING LINES (8")
4835000000-E	1205	395	LF	PAINT PAVEMENT MARKING LINES (24")
4845000000-N	1205	2	EA	PAINT PAVEMENT MARKING SYMBOL
4850000000-E	1205	29,524	LF	REMOVAL OF PAVEMENT MARKING LINES (4")
4860000000-E	1205	50	LF	REMOVAL OF PAVEMENT MARKING LINES (8")
4870000000-E	1205	127	LF	REMOVAL OF PAVEMENT MARKING LINES (24")
4900000000-N	1251	329	EA	PERMANENT RAISED PAVEMENT MARKERS
5325600000-E	1510	100	LF	6" WATER LINE
6000000000-E	1605	6,600	LF	TEMPORARY SILT FENCE
6009000000-E	1610	215	TON	STONE FOR EROSION CONTROL, CLASS B
6015000000-E	1615	0.5	ACR	TEMPORARY MULCHING
6018000000-E	1620	50	LB	SEED FOR TEMPORARY SEEDING
6021000000-E	1620	0.03	TON	FERTILIZER FOR TEMPORARY SEEDING
6029000000-E	SP	460	LF	SAFETY FENCE
6042000000-E	1632	1,800	LF	1/4" HARDWARE CLOTH
6070000000-N	SP	1	EA	SPECIAL STILLING BASINS
6084000000-E	1660	10	ACR	SEEDING & MULCHING
6087000000-E	1660	6.1	ACR	MOWING
6093000000-E	1661	0.25	TON	FERTILIZER FOR REPAIR SEEDING
6096000000-E	1662	245	LB	SEED FOR SUPPLEMENTAL SEEDING
6108000000-E	1665	2	TON	FERTILIZER TOPDRESSING
6111000000-E	SP	230	LF	IMPERVIOUS DIKE
7060000000-E	1705	50	LF	SIGNAL CABLE
7300000000-E	1715	95	LF	UNPAVED TRENCHING (**********) (1, 2")
7324000000-N	1716	1	EA	JUNCTION BOX (STANDARD SIZE)
7444000000-E	1725	1,460	LF	INDUCTIVE LOOP SAWCUT
7456000000-E	1726	865	LF	LEAD-IN CABLE (**********) (14-2)
7636000000-N	1745	6	EA	SIGN FOR SIGNALS
8126000000-N	414	Lump Sum		CULVERT EXCAVATION, STA ****** (57+99.41 -L-)
8133000000-E	414	186	TON	FOUNDATION CONDITIONING MATERIAL, BOX CULVERT
8196000000-E	420	226	CY	CLASS A CONCRETE (CULVERT)
8245000000-E	425	52,876	LB	REINFORCING STEEL (CULVERT)

DON
DTE
TME

7/2/99

COMPUTED BY: JRH DATE: 4-04
CHECKED BY: EAR DATE: 4-04

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

HNTB NORTH CAROLINA, P.C.
343 E. SIX FORKS ROAD, SUITE 200
Raleigh, North Carolina 27609

PROJECT REFERENCE NO. U-5027 | SHEET NO. 3-A

SUMMARY OF EARTHWORK

IN CUBIC YARDS

LOCATION	UNCLASSIFIED EXCAVATION	UNDERCUT	EMBT+%	BORROW	WASTE
-L- STA 10+24.06 TO -L- STA 42+00.00	2,122	-	4,494	2,372	-
-L- STA 42+00.00 TO -L- STA 73+49.96	1,213	-	3,478	2,961	-
-Y2- STA 10+18 TO -Y2- STA 11+70	9	-	28	19	-
-Y5- STA 10+18 TO -Y2- STA 11+25	14		12		2
-Y6- STA 10+25 TO -Y2- STA 13+75			379	379	
TOTAL:	3,358	-	9,121	5,731	2
5% LOSS DUE TO CLEARING AND GRUBBING:	-170			170	
REPLACE TOPSOIL ON BORROW PITS				295	
EARTH WASTE TO REPLACE BORROW				-2	-2
GRAND TOTALS:	3,188			6,194	
SAY:	3,200			6,250	

REMOVAL OF EXISTING "ASPHALT" PAVEMENT

LOCATION	LOCATION	SQ. YDS.
-L- STA 10+24.06 TO -L- STA 17+80	LT. & RT.	4170.56
-L- STA 17+80 TO -L- STA 36+38	LT.	1282.00
-L1- STA 56+10 TO -L1- STA 63+72.58	LT. & RT.	3889.90
GRAND TOTALS:		9342.46
SAY		9500.00

RIGHT OF WAY AREA DATA SHEET

PARCEL NO.	PROPERTY OWNERS NAME	TOTAL ACREAGE	AREA TAKEN	AREA REMAINING RIGHT	AREA REMAINING LEFT	CONSTR. EASEMENT	PERMANENT DRAINAGE EASEMENT	TEMPORARY DRAINAGE EASEMENT	PERMANENT UTILITY EASEMENT
1	SCOTLAND ASSOCIATES DB 7M PG 211	10.48 AC	1,641 sf		10.44 AC	10,509 sf	2,412 sf		
2	SCOTLAND HEALTH DB 15C PG 115	11.29 AC			11.29 AC	1,743 sf	86 sf		15,977 sf
3	ST.ANDREWS PRESBYTERIAN COLLEGE DB 3N PG 235	833.53 AC		833.53 AC		3,606 sf			
4	J.BOWLING & BEVERLY BOWLING DB 424 PG 74 MB 9 PG 248	35,719 sf	494 sf	35,225 sf		183 sf			
4Z	J.BOWLING & BEVERLY BOWLING DB 424 PG 74 MB 9 PG 248	35,719 sf		35,225 sf		358 sf			
5	SHERBROOKE HOMEOWNERS INC. DB 90 PG 722, DB 15M PG 77, MB 8 PG 349, MB 8 PG 378, MB 8 PG 464	6.80 AC	NO CLAIM						
5A	SCOTLAND MEMORIAL HOSPITAL DB 11F PG 84, MB 8 PG 474	1.16 AC		1.16 AC					3,368 sf
6	SCOTLAND ORTHOPEDIC DB 407 PG 293 MB 8 PG 474	1.08 AC			1.08 AC				5,173 sf
7	SCOTLAND MEMORIAL HOSPITAL DB 11F PG 84 MB 8 PG 237	39.56 AC	19,784 sf		39.11 AC			244 sf	29,577 sf
8	LAUCHWOOD MEDICAL DB 9M PG 173, DB 363 PG 178 MB 8 PG 307	1.35 AC	5,020 sf	1.23 AC					
9	CITY OF LAURINBURG DB 7M PG 407	5.69 AC	9,586 sf	5.47 AC		2,138 sf		795 sf	8,644 sf
10	SCOTLAND COUNTY DB 627 PG 275	6.01 AC	965 sf		5.99 AC	889 sf		807 sf	10,712 sf
11	ANDREW O.INGRAM DB 76F PG 26	3.06 AC	1,995 sf	3.01 AC		753 sf		833 sf	5,123 sf
12	CHARLES M.GRACE IV DB 800 PG 294 MB 4 PG 493, MB 10 PG 151	1.48 AC	438 sf	1.47 AC		2,468 sf			
13	PROFESSIONAL PROVIDERS HOMECARE AGENCY INC. DB 498 PG 207 MB 4 PG 493, MB 10 PG 151	1.47 AC		1.47 AC		911 sf			
14	PROFESSIONAL PROVIDERS HOMECARE AGENCY INC. DB 498 PG 207 MB 4 PG 493	26.16 AC				852 sf			

PARCEL INDEX SHEET

PARCEL NO.	SHEET NO.	PROPERTY OWNERS NAME
1	4	SCOTLAND ASSOCIATES
2	4,5,6	SCOTLAND HEALTH
3	4	ST.ANDREWS PRESBYTERIAN COLLEGE
4	5	J.BOWLING & BEVERLY BOWLING
5	5	SHERBROOKE HOMEOWNERS INC.
5A	6	SCOTLAND MEMORIAL HOSPITAL
6	6	SCOTLAND ORTHOPEDIC
7	6,7	SCOTLAND MEMORIAL HOSPITAL
8	7	LAUCHWOOD MEDICAL
9	7	CITY OF LAURINBURG
10	7,8	SCOTLAND COUNTY
11	7,8	ANDREW O.INGRAM
12	8	CHARLES M.GRACE IV
13	8	PROFESSIONAL PROVIDERS HOMECARE AGENCY INC.
14	8	PROFESSIONAL PROVIDERS HOMECARE AGENCY INC.

DGN
$DATE$
$TIME$

COMPUTED BY: KRJ & PR DATE: May-06
CHECKED BY: ER DATE: Jul-06

RALD343-088

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

HNTB NORTH CAROLINA, P.C.
343 E. SIX FORKS ROAD, SUITE 200
Raleigh, North Carolina 27609

PROJECT NO.	SHEET NO.
U-5027	3-B

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

STATION	LOCATION (LT, RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	CLASS III R.C. PIPE (UNLESS NOTED OTHERWISE) 12"	15"	18"	24"	30"	36"	42"	48"	BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE) 12" .064	15" .064	18" .064	24" .064	24"	30" .079	30"	36" .079	36"	42" .109	42"	48" .109	48"	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CU. YARDS R.C.P.	C.S.P.	QUANITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0')	*TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') "" A 5.0' THRU 10.0'	B 10.0' AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	CONCRETE TRANSITIONAL SECTION CATCH BASIN	DROP INLET	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME WITH TWO GRATES STD. 840.16	J.B. STD. 840.31 OR 840.32	MANHOLE STD. 840.51	M.H. STD. 840.51 OR 840.53	M.H. FRAME AND COVER STD. 840.54		15" PIPE END SECT. STD. 310.02	18" PIPE END SECT. STD. 310.03	24" PIPE END SECT. STD. 310.03																							CORR. STEEL ELBOWS NO. & SIZE	CONC. COLLARS CL. "B" C.Y. STD. 840.72	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	PIPE REMOVAL LIN. FT.	REMARKS
SHEET 4																																																																																	
14+65	LT	1		208.60																														1			1			1																																				
14+65 TO 16+70	LT	1	1A		205.60	204.75			200																																																																						
16+70	LT	1A		207.55																														1			1			1																																				
16+70 TO 16+70	LT	1A	2		204.55	203.20			16																																																																					
16+70	LT	2		206.00																														1									1	1																																	
16+70 TO 17+58	LT	2	2A		203.00	202.73			88																																																																				57	REMOVE EXIST. 15" RCP
17+58	LT	2A		206.60																														1			1			1																																				
17+58 TO 17+92.5	LT	2A	OUT		203.73	202.64			28																																									1																											
17+92.5	LT	3A		206.57																														1			1			1																																				
17+92.5 TO 20+38	LT	3A	3		203.57	200.77			236																																																																					
SHEET 5																																																																																
20+38	LT	3		204.79																														1			1			1																																				
20+51 TO 20+38	LT	IN	3		202.53	200.02					20																																								1																									
20+38 TO 20+07	CL	3	OUT		200.02	199.81					68																																								1																								81	REMOVE EXIST. 15" RCP
20+97	LT	3C		204.67																														1			1	1																																						
20+97 TO 20+38	LT	3C	3		200.71	200.52				56																																																																				
21+04	LT	4		204.68																														1			1	1																																						
21+04 TO 20+97	LT	4	3C		200.82	200.81				4																																																																				
22+70	LT	4A		204.93																														1			1		1																																					
22+70 TO 20+98	LT	4A	4		201.40	200.92				160																																																																	93	REMOVE EXIST. 18" RCP
24+38	LT	4B		205.53																														1			1		1																																					
24+38 TO 22+70	LT	4B	4A		202.13	201.65				160																																																																				
25+83	LT	5		206.10																														1			1		1																																					
25+83 TO 24+38	LT	5	4B		202.77	202.33			144																																																																					
25+83	RT	6		206.10																														1			1			1																																				
25+83 TO 25+83	CL	6	5		203.10	202.97			44																																																																					
Y2 10+54	RT	7		205.51																														1			1			1																																				
Y2 10+54	LT	8		205.51																														1			1		1																																					
Y2 10+54 TO 10+54	LT	IN	8		203.00	202.50			12																																									1																											
Y2 10+54 TO 10+54	CL	8	7		202.50	202.38			24																																																																					
Y2 10+54 TO L 20+1	RT	7	OUT		202.38	201.41			184																																									1																										53	REMOVE EXIST. 18" RCP
30+23	RT	9		210.53																														1			1			1																																				
30+23 TO 30+51	RT	9	OUT		207.53	207.45			32																							0.732																																														HEADWALL
30+30	RT	9A		210.56																														1			1			1																																				
30+30 TO 30+23	RT	9A	9		207.56	207.53			4																																																																					
SHEET 6																																																																															
32+10	RT	10		210.82																														1			1			1																																				
32+10 TO 32+10	RT	10	OUT		206.32	206.22					20																																								1																								34	REMOVE EXIST. 18" RCP
34+10	RT	11		211.96																														1			1			1																																				
34+10 TO 32+10	RT	11	10		208.03	207.07			192																																																																				
36+10	RT	11A		213.59																														1			1			1																																				
36+10 TO 34+10	RT	11A	11		209.19	208.32			192																																																																					
38+47	RT	12		215.04																														1			1			1																																				
38+47 TO 36+10	RT	12	11A		210.55	209.39			232																																																																					
38+47	LT	13		215.10																														1			1		1																																					
38+47 TO 38+47	CL	13	12		210.97	210.75			44																																																																					
38+47	LT	14		214.00																														1									1	1																																	
38+47 TO 38+47	LT	14	13		211.25	211.17			16																																																																					
39+99 TO 39+67	RT	14A			214.87	214.54																									32																																																				
SHEET 6 (CONT.)																																																																																	
SHEET TOTALS								0	1688	380	108	0	0	0	0														32	0	0	0.732		22	0		20	2	5	13	0	0	2	2	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				318	

ABBREVIATIONS	
C.B.	CATCH BASIN
N.D.I.	NARROW DROP INLET
D.I.	DROP INLET
M.D.I.	MEDIAN DROP INLET
M.D.I.(N.S.)	MEDIAN DROP INLET (NARROW SLOT)
J.B.	JUNCTION BOX
M.H.	MANHOLE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX

COMPUTED BY: KRJ & PR DATE: May-06

CHECKED BY: ER DATE: Jul-06

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

HNTB NORTH CAROLINA, P.C.
343 E. SIX FORKS ROAD, SUITE 200
Raleigh, North Carolina 27609

PROJECT NO.	SHEET NO.
U-5027	3-C

RALD343-088

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

STATION	LOCATION (LT, RT, OR CL)'	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	CLASS III R.C. PIPE (UNLESS NOTED OTHERWISE) 12"	15"	18"	24"	30"	36"	42"	48"	BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE) 12"	15"	18"	24"	30"	36"	42"	48"	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CU. YARDS R.C.P.	CU. YARDS C.S.P.	QUANTITIES FOR DRAINAGE STRUCTURES "TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL. 'B') PER EACH (0' THRU 5.0')	... A 5.0' THRU 10.0'	... B 10.0' AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	CONCRETE TRANSITIONAL SECTION CATCH BASIN	DROP INLET	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME WITH TWO GRATES STD. 840.16	J.B. STD. 840.31 OR 840.32	MANHOLE STD. 840.51	M.H. STD. 840.51 OR 840.53	M.H. FRAME AND COVER STD. 840.54	15" PIPE END SECT. STD. 310.02	18" PIPE END SECT. STD. 310.03	24" PIPE END SECT. STD. 310.03	CORR. STEEL ELBOWS NO. & SIZE	CONC. COLLARS CL. "B" C.Y. STD. 840.72	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	PIPE REMOVAL LIN. FT.	REMARKS
SHEET 6 (CONT.)																																																	
42+90	RT	15		214.50																									1	0.04						1	1											
42+90 TO 44+46.5	RT	15	16		209.46	208.98				160																																							
44+46.5	RT	16		214.50																									1	0.7						1	1											
45+38.5	LT	25		214.94																									1			1			1													
SHEET 7																																																	
44+46.5 TO 45+65	RT	16	17		208.80	208.54					120																																						
45+65	RT	17		213.50																									1							1	1											
45+65 TO 46+96.5	RT	17	18		208.54	208.19					132																																						
46+96.5	RT	18		212.50																									1							1	1											
46+96.5 TO 49.05	RT	18	19		207.69	207.05						212																																					
49+05	RT	19		212.00																									1							1	1											
Y5 10+90	RT	20		212.84																									1			1			1													
Y5 10+90 TO 10+90	CL	20	21		209.84	209.66				36																																							
Y5 10+90	LT	21		212.84																									1			1			1													
Y5 10+90 TO 50+20	RT	21	22		209.64	207.45				68																																							
50+20	RT	22		211.70																									1							1	1											
49+05 TO 50+20	RT	19	22		207.05	206.70						116																																					
50+20 TO 51+46.5	RT	22	23		206.70	206.32						128																																					
51+46.5	RT	23		211.00																									1							1	1											
51+46.5 TO 52+54	RT	23	24		206.32	205.98						112																																					
52+54	RT	24		211.00																									1	0.02						1	1											REMOVE EXIST. C.B.
45+38.5 TO 49+00	LT	25	26		211.86	210.08				356																																						
49+00	LT	26		212.88																									1			1			1													
49+00 TO 52+54	LT	26	27		209.88	206.28					350																																					
52+54	LT	27		211.32																									1	0.54		1			1												REMOVE EXIST. C.B.
52+54 TO 52+54	CL	24	27		205.98	205.78						68																																				54	REMOVE EXIST. 15" RCP
52+54 TO 53+99	LT	27	27A		205.78	205.06						144																																				144	REMOVE EXIST. 15" RCP
53+99	LT	27A		211.41																									1	1.55		1			1												REMOVE EXIST. C.B.
53+99	CL	30	27A		208.59	206.26				72																																						54	REMOVE EXIST. 15" RCP
53+99	RT	30		212.00																									1							1	1											REMOVE EXIST. C.B.
53+99 TO 55+26	LT	27A	27B		204.86	204.26						120																																				129	REMOVE EXIST. 18" RCP
55+26	LT	27B		211.39																									1	2.33		1			1												REMOVE EXIST. C.B.
55+26 TO 55+41	LT	27B	EX.MH		204.06	203.99						24																																				15	REMOVE EXIST. 18" RCP
55+40 TO 55+41	CL	31	EX.MH		207.04	204.74				48																																						53	REMOVE EXIST. 15" RCP
55+40	RT	31		211.39																									1			1			1												REMOVE EXIST. D.I. (2)
58+40	LT	31A		206.70																									1			1			1													
58+40 TO 59+02	LT	31A	31B		203.70	203.10				60																																						
59+02	LT	31B		206.92																									1			1	1		1												REPLACE EXIST. CB
59+02	RT	31C		206.92																									1			1	1		1												REPLACE EXIST. CB
59+02	RT	31D		206.92																									1			1	1													REPLACE EXIST. CB
59+02	LT	31E		206.92																									1			1	1													REPLACE EXIST. CB
SHEET 8																																																	
63+90	LT	34		212.17																									1			1			1													
63+62	LT	34A		212.45																									1			1	1													
63+62 TO 63+90	LT	34A	34		209.53	209.42				24																																						
63+90	RT	35		212.13																									1			1			1													
SHEET 8 (CONT.)																																																	
SHEET TOTALS								0	824	602	924	0	0	0	0					0	0	0		25	5.18		16	5	4	7	3	0	9	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	449	

ABBREVIATIONS

C.B.	CATCH BASIN
N.D.I.	NARROW DROP INLET
D.I.	DROP INLET
M.D.I.	MEDIAN DROP INLET
M.D.I.(N.S.)	MEDIAN DROP INLET (NARROW SLOT)
J.B.	JUNCTION BOX
M.H.	MANHOLE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX

RALD343-088

COMPUTED BY: KRJ & PR DATE: May-06

CHECKED BY: ER DATE: Jul-06

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

HNTB NORTH CAROLINA, P.C.
343 E. SIX FORKS ROAD, SUITE 200
Raleigh, North Carolina 27609

PROJECT NO.	SHEET NO.
U-5027	3-D

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

STATION	LOCATION (LT. RT. OR CL)'	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	CLASS III R.C. PIPE (UNLESS NOTED OTHERWISE) 12"	15"	18"	24"	30"	36"	42"	48"	BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE) 12"	15"	18"	24"	30"	36"	42"	48"	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CU. YARDS R.C.P.	C.S.P.	QUANTITIES FOR DRAINAGE STRUCTURES *TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL. 'B') PER EACH (0' THRU 5.0')	A 5.0' THRU 10.0'	B 10.0' AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	CONCRETE TRANSITIONAL SECTION CATCH BASIN	DROP INLET	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME WITH TWO GRATES STD. 840.16	J.B. STD. 840.31 OR 840.32	MANHOLE STD. 840.51	M.H. STD. 840.51 OR 840.53	M.H. FRAME AND COVER STD. 840.54	15" PIPE END SECT. STD. 310.02	18" PIPE END SECT. STD. 310.03	24" PIPE END SECT. STD. 310.03	CORR. STEEL ELBOWS NO. & SIZE	CONC. COLLARS CL. "B" C.Y. STD. 840.72	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	PIPE REMOVAL LIN. FT.	REMARKS
SHEET 8																																																			
63+90	CL	34	35		209.22	209.07			48																																											
63+90	RT	35	OUT		209.07	209.01			20																																										
Y6 10+41 TO 10+68	RT	35A			209.53	OUT			28																				0.732																								
63+50	RT	35B		212.22																										1			1	1																		
63+50	RT	EX	35B		209.53	209.47			8																																										
63+50	RT	35B	OUT		209.27	209.17			20																																										
65+69	RT	36		213.57																										1			1			1																
65+69 TO 63+90	RT	36	35		211.41	209.07			180																																										
67+14	RT	37		215.35																										1			1			1																
67+14 TO 65+69	RT	37	36		212.35	211.61			144																																										
71+23	RT	38		214.19																										1			1			1																
71+23 TO 72+40.5	RT	38	40		211.19	210.77			166																																										
72+40.5	LT	39		213.92																										1			1			1																
72+40.5	RT	40		213.84																										1			1	1																		
72+40.5	CL	39	40		210.94	210.76			48																																										
72+40.5 TO	RT	40	OUT		210.77	210.73			16																				0.732																								
73+40	LT	41			IN	211.71				32																																										
73+23	RT		42		211.73	OUT				32																																										
Y6 12+66	LT	IN	35C		IN	209.58			16																																										
SHEET TOTALS								0	694	64	0	0	0	0	0												0	0	0	1.464		6	0		6	2	1	3	0	0	0	0	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.691		0	
GRAND TOTALS								0	3206	1046	1032	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	32	0	0	2.196		53	5.18		42	9	10	23	3	0	11	11	0	0	0	0	0	4	2	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.691		767	

ABBREVIATIONS

C.B.	CATCH BASIN
N.D.I.	NARROW DROP INLET
D.I.	DROP INLET
M.D.I.	MEDIAN DROP INLET
M.D.I.(N.S.)	MEDIAN DROP INLET (NARROW SLOT)
J.B.	JUNCTION BOX
M.H.	MANHOLE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX

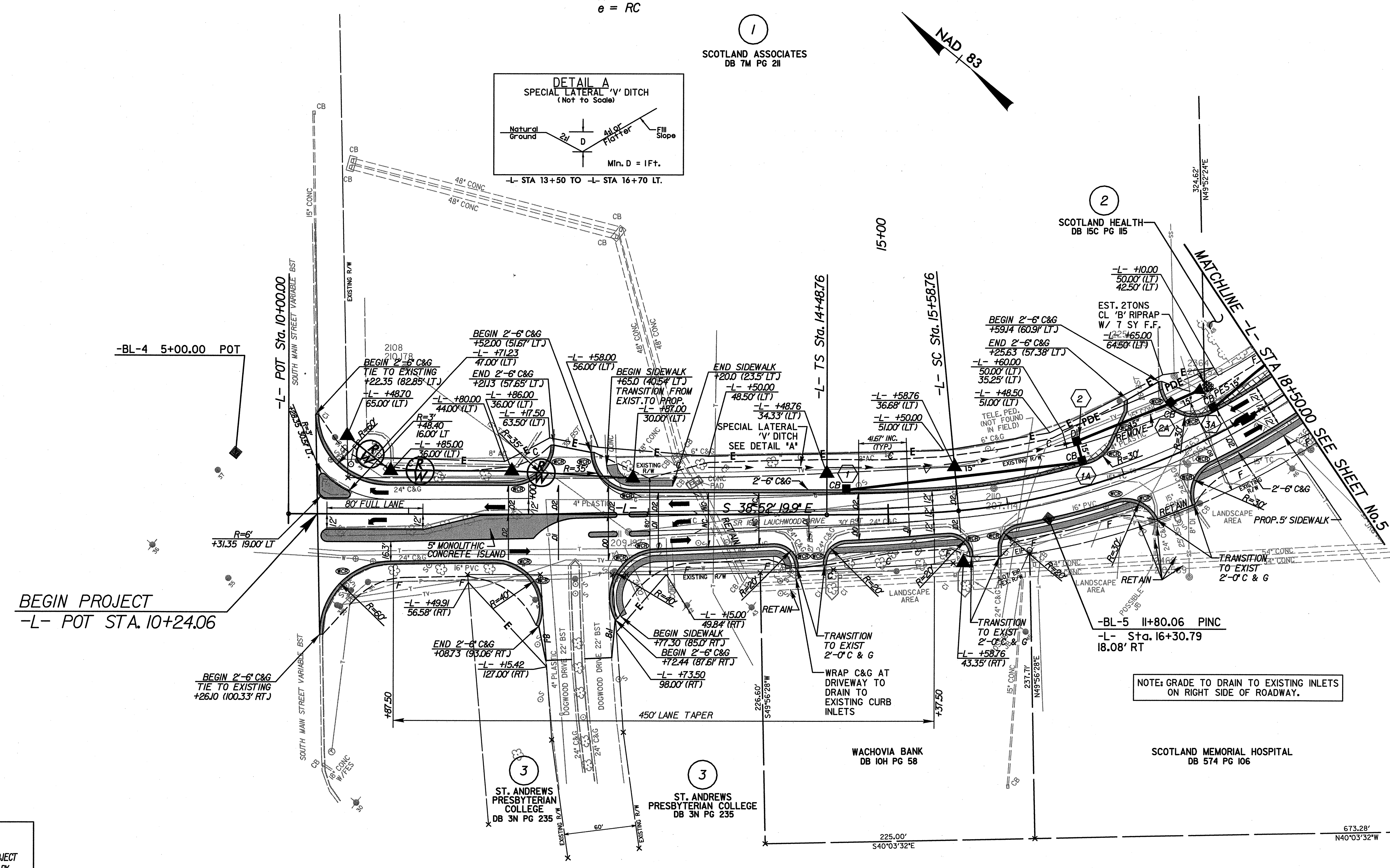
HNTB NORTH CAROLINA, P.C.
343 E. SIX FORKS ROAD, SUITE 200
Raleigh, North Carolina 27609

GRAPHIC SCALE
50 25 0 50 100
PLANS

PROJECT REFERENCE NO.	SHEET NO.
U-5027	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 19824 10/1/08	NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 18203 SCOTT A. YATES 10/8/08

-L-

PIs Sta 15+22.13	PI Sta 20+40.68
Θs = 5° 23' 12.4"	Δ = 78° 57' 46.3" (LT)
Ls = 110.00'	D = 9° 47' 38.9"
LT = 73.37'	L = 806.22
ST = 36.70'	T = 481.92'
	R = 585.00'
	e = RC



DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCGS FOR MONUMENT "EXIT" WITH NAD 83 STATE PLANE GRID COORDINATES OF NORTHING: 365873.9927(ft) EASTING: 1861953.0346(ft) THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.9999046 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "EXIT" TO -L- STATION 10+00.00 IS S 83°56'37.81"W @ 5,965.12' ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES VERTICAL DATUM USED IS NAVD 88

DENOTES PAVEMENT REMOVAL

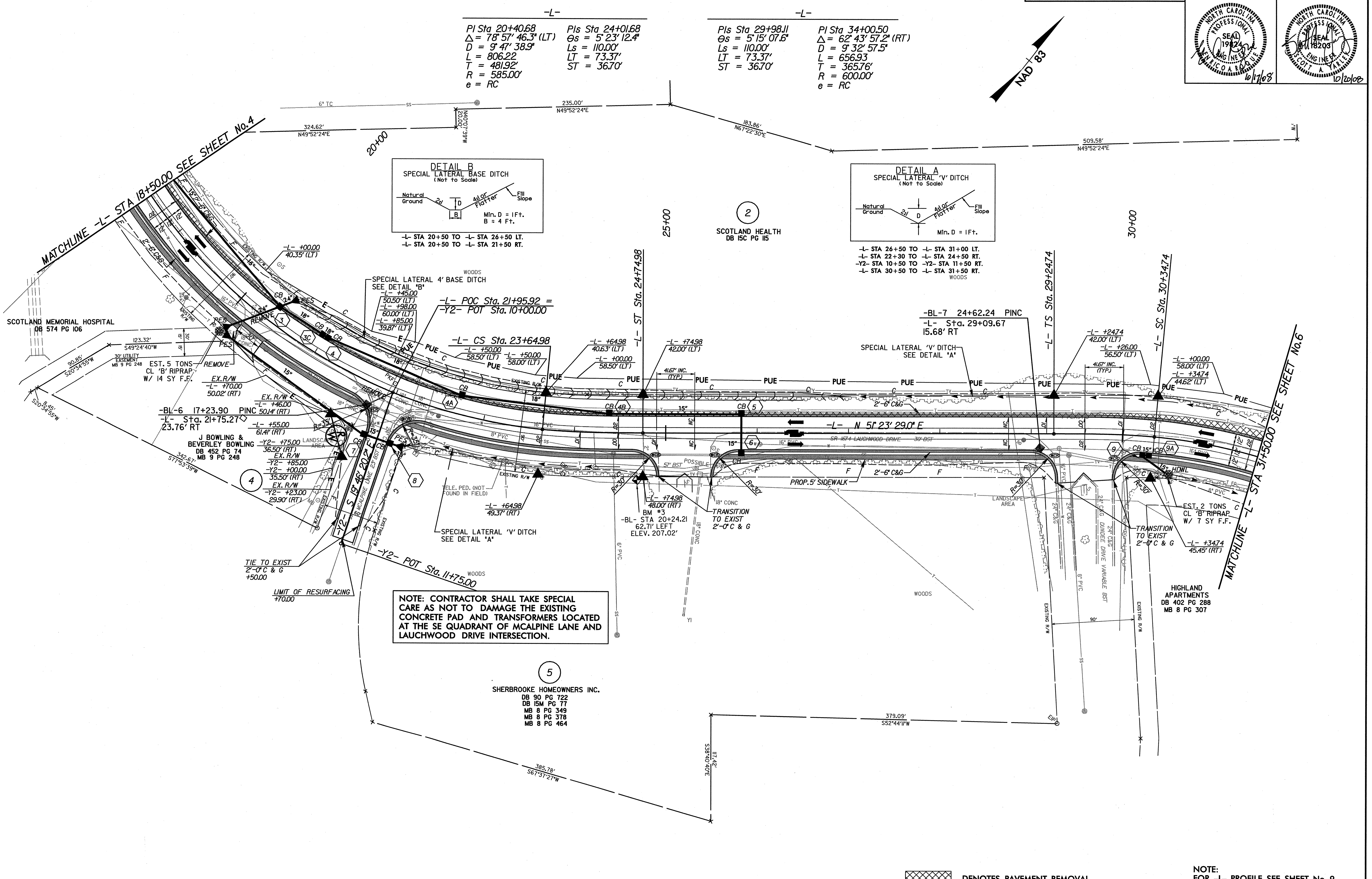
NOTE:
FOR -L- PROFILE SEE SHEET No. 9.
FOR ISLAND DETAIL SEE SHEET No. 2-F

DGN
$DATE$
$TIME$

HNTB NORTH CAROLINA, P.C.
343 E. SIX FORKS ROAD, SUITE 200
Raleigh, North Carolina 27609

GRAPHIC SCALE
50 25 0 50 100
PLANS

PROJECT REFERENCE NO.	SHEET NO.
U-5027	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER



-L-
PI Sta 20+40.68
Δ = 78° 57' 46.3" (LT)
D = 9° 47' 38.9"
L = 806.22
T = 481.92'
R = 585.00'
e = RC
PIs Sta 24+01.68
θs = 5° 23' 12.4"
Ls = 110.00'
LT = 73.37'
ST = 36.70'
-L-
PIs Sta 29+98.11
θs = 5° 15' 07.6"
Ls = 110.00'
LT = 73.37'
ST = 36.70'
PI Sta 34+00.50
Δ = 62° 43' 57.2" (RT)
D = 9° 32' 57.5"
L = 656.93
T = 365.76'
R = 600.00'
e = RC
NAD 83
MATCHLINE -L- STA 18+50.00 SEE SHEET No. 4
MATCHLINE -L- STA 31+50.00 SEE SHEET No. 6
DETAIL B
SPECIAL LATERAL BASE DITCH
(Not to Scale)
Min. D = 1 Ft.
B = 4 Ft.
-L- STA 20+50 TO -L- STA 26+50 LT.
-L- STA 20+50 TO -L- STA 21+50 RT.
DETAIL A
SPECIAL LATERAL 'V' DITCH
(Not to Scale)
Min. D = 1 Ft.
-L- STA 26+50 TO -L- STA 31+00 LT.
-L- STA 22+30 TO -L- STA 24+50 RT.
-Y2- STA 10+50 TO -Y2- STA 11+50 RT.
-L- STA 30+50 TO -L- STA 31+50 RT.
SCOTLAND MEMORIAL HOSPITAL
DB 574 PG 106
SCOTLAND HEALTH
DB 15C PG 115
J BOWLING &
BEVERLEY BOWLING
DB 452 PG 74
MB 9 PG 248
SHERBROOKE HOMEOWNERS INC.
DB 90 PG 722
DB 15M PG 77
MB 8 PG 349
MB 8 PG 378
MB 8 PG 464
HIGHLAND
APARTMENTS
DB 402 PG 288
MB 8 PG 307
-L- POC Sta. 21+95.92 =
-Y2- POT Sta. 10+00.00
-L- CS Sta. 23+64.98
-L- ST Sta. 24+74.98
-L- TS Sta. 29+24.74
-L- SC Sta. 30+34.74
-BL-6 17+23.90 PINC
-L- Sta. 21+75.27
23.76' RT
-BL-7 24+62.24 PINC
-L- Sta. 29+09.67
15.68' RT
-L- N 51° 23' 29.0" E
-Y2- S 19° 46' 20.2" E
-Y2- POT Sta. 11+75.00
SPECIAL LATERAL 4' BASE DITCH
SEE DETAIL 'B'
SPECIAL LATERAL 'V' DITCH
SEE DETAIL 'A'
EST. 5 TONS
CL 'B' RIPRAP
W/ 14 SY F.F.
EST. 2 TONS
CL 'B' RIPRAP
W/ 7 SY F.F.
BM #3
-BL- STA 20+24.21
62.71' LEFT
ELEV. 207.02'
TRANSITION
TO EXIST
2'-0" C & G
TIE TO EXIST
2'-0" C & G
LIMIT OF RESURFACING
PROP. 5' SIDEWALK
TELE. PED. (NOT FOUND IN FIELD)
WOODS

NOTE: CONTRACTOR SHALL TAKE SPECIAL CARE AS NOT TO DAMAGE THE EXISTING CONCRETE PAD AND TRANSFORMERS LOCATED AT THE SE QUADRANT OF MCALPINE LANE AND LAUCHWOOD DRIVE INTERSECTION.

DENOTES PAVEMENT REMOVAL

NOTE:
FOR -L- PROFILE SEE SHEET No. 9
FOR -Y2- PROFILE SEE SHEET No. 11.

DGN
$DATE$
$TIME$

HNTB NORTH CAROLINA, P.C.
343 E. SIX FORKS ROAD, SUITE 200
Raleigh, North Carolina 27609

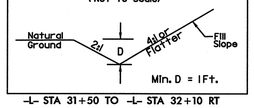
GRAPHIC SCALE
50 25 0 50 100
PLANS

PROJECT REFERENCE NO.	SHEET NO.
U-5027	6
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER — SEAL 19824 — 10/11/08
HYDRAULICS ENGINEER — SEAL 18203 — 10/8/08

NAD 83

DETAIL A
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



-L- STA 31+50 TO -L- STA 32+10 RT
-L- STA 32+10 TO -L- STA 40+50 RT.
-L- STA 35+75 TO -L- STA 37+70 LT.
-L- STA 37+50 TO -L- STA 41+50 LT.
-L- STA 42+50 TO -L- STA 43+00 RT.
-L- STA 43+50 TO -L- STA 44+50 RT.
-L- STA 44+95 TO -L- STA 45+50 RT.

-L-
PI Sta 34+00.50
Δ = 62° 43' 57.2" (RT)
D = 9° 32' 57.5"
L = 656.93
T = 365.76'
R = 600.00'
e = RC

PIs Sta 37+28.37
Θs = 5° 15' 07.6"
Ls = 110.00'
LT = 73.37'
ST = 36.70'

-L-
PIs Sta 40+64.10
Θs = 1° 30' 02.2"
Ls = 110.00'
LT = 73.34'
ST = 36.67'

PI Sta 41+26.88
Δ = 33° 12' 12.5" (LT)
D = 2° 43' 42.1"
L = 1,216.97
T = 626.11'
R = 2,100.00'
e = 3.0%

-BL-8 29+49.37 PINC
-L- Sta. 33+88.63
51.86' LT

-BL-9 39+23.83 PINC
-L- Sta. 43+49.82
32.79' RT

MATCHLINE -L- STA 31+50.00 SEE SHEET No.5

MATCHLINE -L- STA 45+50.00 SEE SHEET No.7

-L- S 55° 22' 18.6" E

-L- TS Sta. 39+90.77

-L- SC Sta. 41+00.77

-L- CS Sta. 36+91.68

-L- ST Sta. 38+01.68

35+00

40+00

45+00

5A SCOTLAND MEMORIAL HOSPITAL
DB 11F PG 84
MB 8 PG 474

6 SCOTLAND ORTHOPEDIC
DB 407 PG 283
MB 8 PG 474

7 SCOTLAND MEMORIAL HOSPITAL
DB 11F PG 84
MB 8 PG 237

2 SCOTLAND HEALTH
DB 15C PG 115

HIGHLAND APARTMENTS
DB 402 PG 288
MB 8 PG 307

GEORGE WASHIGTON & MARCY COLKITT
DB 14Y PG 117
MB 8 PG 307

WILLIAM GOODWIN & CARNEVALE REYNOLDS
DB 9K PG 715
MB 8 PG 307

CHARLES M GRACE IV
DB 11P PG 334
MB 8 PG 307

FRANK ROOFE
DB 440 PG 243
MB 8 PG 307

H HUGHES & K HARRELL
DB 12F PG 147
MB 8 PG 307

JAMES CURRIN
DB 636 PG 265
MB 8 PG 307

HAL FOGLEMAN
DB 9H PG 285
MB 8 PG 307

SPECIAL LATERAL 'V' DITCH SEE DETAIL "A"

EST. 5 TONS CL 'B' RIPRAP W/ 14 SY F.F.

EXIST. DITCH

PROP. 5' SIDEWALK

NOTE: 15" RCP CONFLICTS W/ S.S. MANHOLE

TRANSITION TO EXIST 2'-0"C & G

END 2'-6" C&G +80.40 (49.27" LT)

BEGIN 2'-6" C&G +09.25 (46.85" LT)

2'-6" C&G

SR 1674 LAUCHWOOD DRIVE

EXISTING R/W

PROP. R/W

PUE

WOODS

LANDSCAPE AREA

DENOTES PAVEMENT REMOVAL

NOTE:
FOR -L- PROFILE SEE SHEET No. 9 & 10.

DGN
$DATE$
$TIME$

HNTB
HNTB NORTH CAROLINA, P.C.
343 E. SIX FORKS ROAD, SUITE 200
Raleigh, North Carolina 27609

GRAPHIC SCALE
50 25 0 50 100
PLANS

PROJECT REFERENCE NO.	SHEET NO.
U-5027	7
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
SEAL 19824 ENRICO A. ROQUE 10/11/08	SEAL 18203 SCOTT A. YARLEY 10/8/08

-L-

PI Sta 47+26.88
Δ = 33° 12′ 12.5″ (LT)
D = 2° 43′ 42.1″
L = 1,216.97
T = 626.11′
R = 2,100.00′
e = 3.0%

PIs Sta 53+54.41
θs = 1° 30′ 02.2″
Ls = 110.00′
LT = 73.34′
ST = 36.67′

-L-

PI Sta 55+93.42
Δ = 2° 59′ 39.7″ (RT)
D = 1° 08′ 45.3″
L = 261.31′
T = 130.68′
R = 5,000.00′
e = EXIST.

-L-

PI Sta 58+06.97
Δ = 15° 40′ 39.8″ (LT)
D = 11° 14′ 04.1″
L = 139.55′
T = 70.21′
R = 510.00′
e = EXIST.

-L1-

PI Sta 56+36.75
Δ = 1° 59′ 40.0″ (RT)
D = 1° 08′ 58.5″
L = 173.49′
T = 86.75′
R = 4,984.00′
e = EXIST.

PI Sta 58+08.62
Δ = 15° 40′ 39.8″ (LT)
D = 10° 53′ 33.8″
L = 143.93′
T = 72.42′
R = 526.00′
e = EXIST.

DETAIL A
SPECIAL LATERAL 'V' DITCH
(Not to Scale)

Natural Ground
2:1
D
4:1 or Flatter
Fill Slope
Min. D = 1Ft.

-L- STA 45+50 TO -L- STA 45+60 RT.
-L- STA 46+50 TO -L- STA 47+00 RT.
-L- STA 48+39 TO -L- STA 49+00 RT.
-Y5- STA 10+35 TO -Y5- STA 11+25 RT.
-Y5- STA 10+35 TO -Y5- STA 11+25 LT.
-L- STA 50+00 TO -L- STA 52+50 RT.
-L- STA 53+50 TO -L- STA 54+50 RT.

TEMPORARY SHORING #1

TEMPORARY SHORING FOR CULVERT CONSTRUCTION & MAINTENANCE OF TRAFFIC (SEE TRAFFIC CONTROL PLAN, SHEET TCP-4)

NOTE:
FOR -L- PROFILE SEE SHEET No. 10.
FOR -L1- PROFILE SEE SHEET No. 10.
FOR -Y5- PROFILE SEE SHEET No. 11.

DGN
$DATE$
$TIME$

HNTB HNTB NORTH CAROLINA, P.C.
343 E. SIX FORKS ROAD, SUITE 200
Raleigh, North Carolina 27609

GRAPHIC SCALE
50 25 0 50 100
PLANS

PROJECT REFERENCE NO.	SHEET NO.
U-5027	8
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
SEAL 19824 10/11/08	SEAL 18203 SCOTT A. YARLEY 10/8/08

-L-

PIs Sta 67+21.51	PI Sta 69+18.28	PIs Sta 71+13.69
Θs = 2° 15′ 03.3″	Δ = 13° 02′ 56.1″ (RT)	Θs = 2° 15′ 03.3″
Ls = 110.00′	D = 4° 05′ 33.2″	Ls = 110.00′
LT = 73.34′	L = 318.85	LT = 73.34′
ST = 36.67′	T = 160.12′	ST = 36.67′
	R = 1,400.00′	
	e = 3.0%	

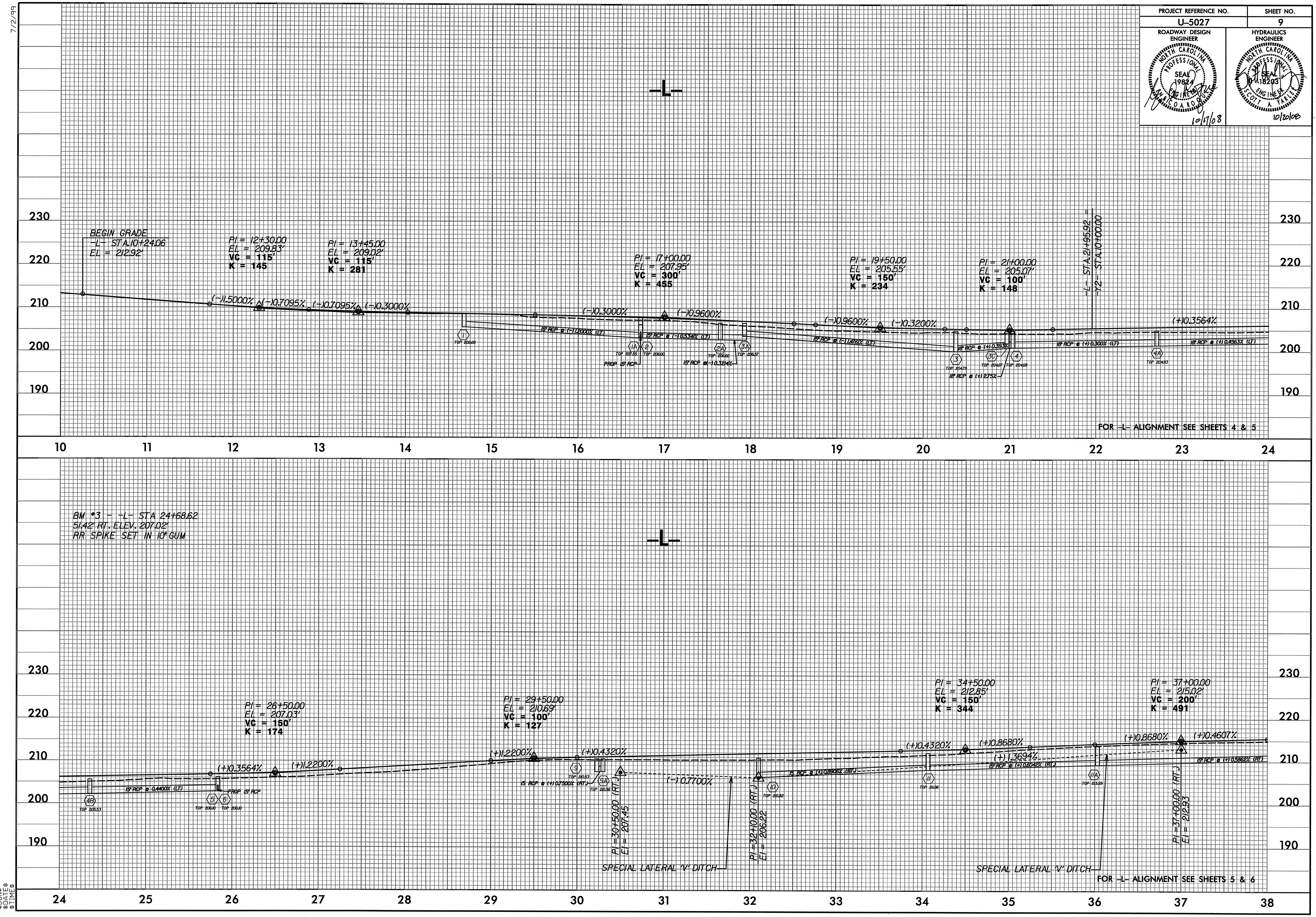
END PROJECT
-L- POT STA. 73+49.96

DETAIL A
SPECIAL LATERAL ′V′ DITCH
(Not to Scale)

-L- STA 72+50 TO -L- STA 73+15 RT.

NOTE:
FOR -L- PROFILE SEE SHEET No. 10 & 11
FOR ROUNDABOUT DETAIL SEE SHEET No. 2-G

DGN
$DATE$
$TIME$


PROJECT REFERENCE NO.
U-5027
SHEET NO.
9
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 19824 ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 18203 ENGINEER SCOTT A. YARECK
10/17/08
10/20/08
7/2/99
-L-
BEGIN GRADE
-L- STA.10+24.06
EL = 212.92'
PI = 12+30.00
EL = 209.83'
VC = 115'
K = 145
PI = 13+45.00
EL = 209.02'
VC = 115'
K = 281
PI = 17+00.00
EL = 207.95'
VC = 300'
K = 455
PI = 19+50.00
EL = 205.55'
VC = 150'
K = 234
PI = 21+00.00
EL = 205.07'
VC = 100'
K = 148
-L- STA.21+95.92 =
-Y2- STA.10+00.00
(-)1.5000%
(-)0.7095%
(-)0.7095%
(-)0.3000%
(-)0.3000%
(-)0.9600%
(-)0.9600%
(-)0.3200%
(+)0.3564%
PROP 15" RCP
FOR -L- ALIGNMENT SEE SHEETS 4 & 5
230
220
210
200
190
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
BM #3 - -L- STA 24+68.62
51.42' RT. ELEV. 207.02'
RR SPIKE SET IN 10" GUM
-L-
PI = 26+50.00
EL = 207.03'
VC = 150'
K = 174
PI = 29+50.00
EL = 210.69'
VC = 100'
K = 127
PI = 34+50.00
EL = 212.85'
VC = 150'
K = 344
PI = 37+00.00
EL = 215.02'
VC = 200'
K = 491
(+)0.3564%
(+)1.2200%
(+)1.2200%
(+)0.4320%
(-)0.7700%
(+)0.4320%
(+)0.8680%
(+)1.3694%
(+)0.8680%
(+)0.4607%
PROP 15" RCP
PI =30+50.00 (RT.)
EI = 207.45
PI =32+10.00 (RT.)
EI = 206.22
PI =37+00.00 (RT.)
EI = 212.93
SPECIAL LATERAL 'V' DITCH
SPECIAL LATERAL 'V' DITCH
FOR -L- ALIGNMENT SEE SHEETS 5 & 6
230
220
210
200
190
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
DGN
$DATE$
$TIME$

7/2/99

PROJECT REFERENCE NO.	SHEET NO.
U-5027	10

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 19824 ENGINEER AMERICO RORIZ — 10/14/08

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 28203 ENGINEER SCOTT A YATES — 10/8/08

BM #2 = -L- STA 47+97.01
77.79' LT. ELEV. 215.80
RR SPIKE SET IN 10" PINE

-L-

PI = 41+45.00
EL = 217.07'
VC = 150'
K = 190

(+)0.4607%

(-)0.3292%

PI = 46+25.00
EL = 215.49'
VC = 100'
K = 262

(-)0.3292%

(-)0.7108%

PI = 49+50.00
EL = 213.18'
VC = 500'
K = 1392

(-)0.7108%

-L- STA 49+62.17 =
-Y5- STA 10+00.00

(-)0.3517%

(-)0.3034%

PI = 54+50.00 (RT.)
EL = 211.73

PI = 50+00.00 (RT.)
EL = 212.17

(12) TOP 21524
(13) TOP 21550
(14) TOP 21400
PROP 15" RCP
15" RCP @ (-)0.4682% (RT.)
(15) TOP 21430
18" RCP @ (-)0.2667% (RT.)
(16) TOP 21450
(25) TOP 21404
18" RCP @ (-)0.6439% (RT.)
(17) TOP 21350
(18) TOP 21230
18" RCP @ (-)0.5568% (LT.)
24" RCP @ (-)0.3016% (RT.)
(26) TOP 21268
18" RCP @ (-)1.1388% (LT.)
(19) TOP 21100
24" RCP @ (-)0.3016% (RT.)
(22) TOP 21170
24" RCP @ (-)0.2588% (RT.)
(23) TOP 21100
24" RCP @

SPECIAL LATERAL 'V' DITCH
FOR -L- ALIGNMENT SEE SHEETS 6 & 7

HYDRAULIC DATA

DRAINAGE AREA	2.0 SQ.MI.
DESIGN DISCHARGE	753 FT³/S
DESIGN FREQUENCY	25 YR.
DESIGN HIGH WATER EL.	206.5
BASE DISCHARGE	993 FT³/S
BASE HIGH WATER EL.	207.7
OVERTOPPING FLOOD	40± YR.
OVERTOPPING DISCHARGE	825± FT³/S
OVERTOPPING ELEV.	207.1

BEGIN SPLINE GRADE
-L- STA. 55+50.00
-U- STA. 55+50.00
EL = 211.07'

PI = 54+00.00 (RT.)
EL = 210.88

PI = 54+50.00 (RT.)
EL = 211.03

(-)0.3517%

(-)0.340%

PI = 56+00.00
EL = 210.96

PI = 56+50.00
EL = 209.97

PI = 57+00.00
EL = 209.16

PI = 57+50.00
EL = 208.32

PI = 58+00.00
EL = 207.50

PI = 58+50.00
EL = 207.40

PI = 59+00.00
EL = 207.22

PI = 59+50.00
EL = 207.45

(-)1.8600%

(-)1.6200%

(-)1.6800%

(-)1.0400%

(-)0.800%

(-)0.360%

(+)0.460%

(+)0.6800%

PI = 60+50.00
EL = 208.13'

PI = 61+00.00
EL = 208.64'

(+)1.0200%

(+)1.6300%

PI = 62+00.00
EL = 210.27'

(+)2.1369%

PI = 62+92.41
EL = 212.22'

(+)2.0000%

INSCRIBED CIRCLE
CENTRAL ISLAND

PI = 63+52.41
EL = 213.00'

(+)2.0000%

PI = 63+72.41
EL = 212.60'

(+)0.7373%

℄ JOHNS RD.
(RECENTLY REPAVED)

END SPLINE GRADE
-L- STA. 63+72.41
EL = 211.82'

(+)0.30%

(-)0.3036% (RT.)

(27) TOP 21.32
(24) TOP 21.00
PROP 15" RCP
24" RCP @ 0.5000% LT.
PROP 15" RCP
(28) TOP 21.18
(30) TOP 21.20
24" RCP @ 0.6667% LT.
(29) TOP 21.39
24" RCP
(31) TOP 21.39
PROP 15" RCP
EXIST. 3 - 54" RCP's TO BE REMOVED
PROPOSED 3 - 8 FT. X 5 FT. RCBC
(32) TOP 20.70
18" RCP @ (-) 2.8833% (RT.)
EXIST 15" RCP
(33) TOP 20.80
(35) TOP 21.22
(34) TOP 21.22
15" RCP @ (+)1.5000% (RT.)
(36) TOP 21.44

FOR -L- ALIGNMENT SEE SHEETS 2-D, 7 & 8

DON
$DATE$
$TIME$

7/2/99

PROJECT REFERENCE NO.	SHEET NO.
U-5027	11

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 19874 ENGINEER SCOTT A. ROBERTS
10/17/08

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 048203 ENGINEER SCOTT A. VIERLEY
10/20/08

-L-

END PROPOSED GRADE
-L- STA. 73+49.96
EL = 214.87'

PI = 66+45.00
EL = 214.61'
VC = 150'
K = 340

PI = 69+45.00
EL = 215.50'
VC = 450'
K = 658

PI = 72+70.00
EL = 214.24'
VC = 150'
K = 128

(+)0.2967%
(+)0.2967%
(-)0.3877%
(-)0.3877%
(+)0.7879%

15" RCP @ (+)0.8528% (RT)
15" RCP @ (-)0.3846% (RT)
PROP. 15" RCP

37 TOP 215.55
38 TOP 214.9
40 TOP 213.84
39 TOP 213.92

FOR -L- ALIGNMENT SEE SHEET 8

-Y2- MCALPINE LN.

FOR -Y2- ALIGNMENT SEE SHEET 5

BEGIN PROP. GRADE
-Y2- STA. 10+18.00
EL = 205.77'

END PROP. GRADE
-Y2- STA. 11+70.00
EL = 206.22'

PI = 10+85.00
EL = 205.55'
VC = 100'
K = 89

205.41

(-)0.3306%
(+)0.7900%
(+)2.0%

7 TOP 205.21
8 TOP 205.21

-Y5- BERWICK DR.

FOR -Y5- ALIGNMENT SEE SHEET 7

BEGIN PROP. GRADE
-Y5- STA. 10+18.00
EL = 213.88'

END PROP. GRADE
-Y5- STA. 11+25.00
EL = 213.30'

PI = 10+70.00
EL = 213.01'
VC = 100'
K = 45

213.34

(-)1.6760% (+)0.5300%
(+)3.0%
1.64% (RT)
1.01% (LT)

PI=10+35.00 (LT)
EL=212.32
PI=10+35.00 (RT)
EL=211.77

PI=11+25.00 (RT & LT)
EL=213.08 LT. & 213.00 RT.

2 - SPECIAL LATERAL 'V' DITCHES (LT & RT)

-Y6- JOHNS RD.

FOR -Y6- ALIGNMENT SEE SHEETS 2-D & 8

-L- ℄

BEGIN PROP. GRADE
-Y6- STA. 10+25.00
EL = 212.06'

END PROP. GRADE
-Y6- STA. 13+75.00
EL = 213.39'

INSCRIBED CIRCLE
CENTRAL ISLAND

PI = 11+00.00
EL = 212.44'
VC = 80'
K = 85

PI = 11+47.74
EL = 212.21'

PI = 12+32.74
EL = 212.61'

PI = 12+52.74
EL = 212.21'

PI = 13+30.00
EL = 213.52'
VC = 80'
K = 40

(+)0.5114%
(-)0.4337%
(+)2.0000%
(-)2.0000%
(+)1.6990%
(-)0.3000%

Ⓓ Ⓑ

CENTRAL ISLAND

FOR -CI- ALIGNMENT SEE SHEET 2-D & 8

PI = 0+94.25
EL = 212.00'
VC = 70'

PI = 1+88.50
EL = 213.25'
VC = 70'

Ⓒ 213.00
Ⓓ 212.62
Ⓒ 212.23
Ⓓ 212.62
Ⓒ 213.00

(-)1.3050%
(+)1.3050%

DGN
$FILE$
$TIME$