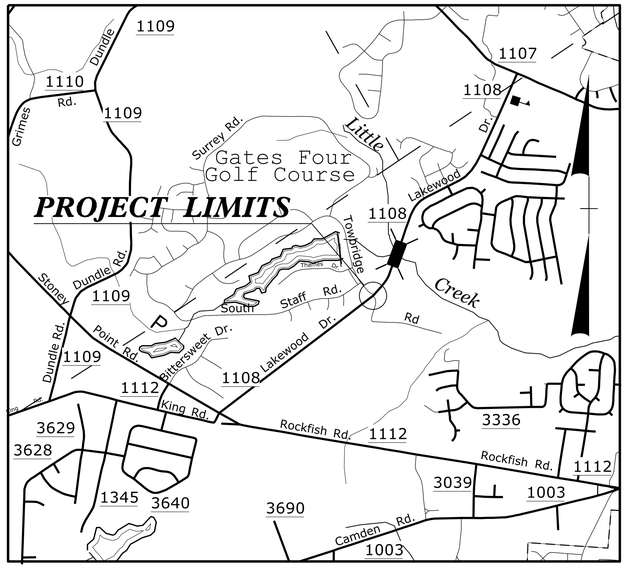
09/08/99

TIP PROJECT: 49081

CONTRACT: DF00518



VICINITY MAP
(N.T.S.)

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CUMBERLAND COUNTY

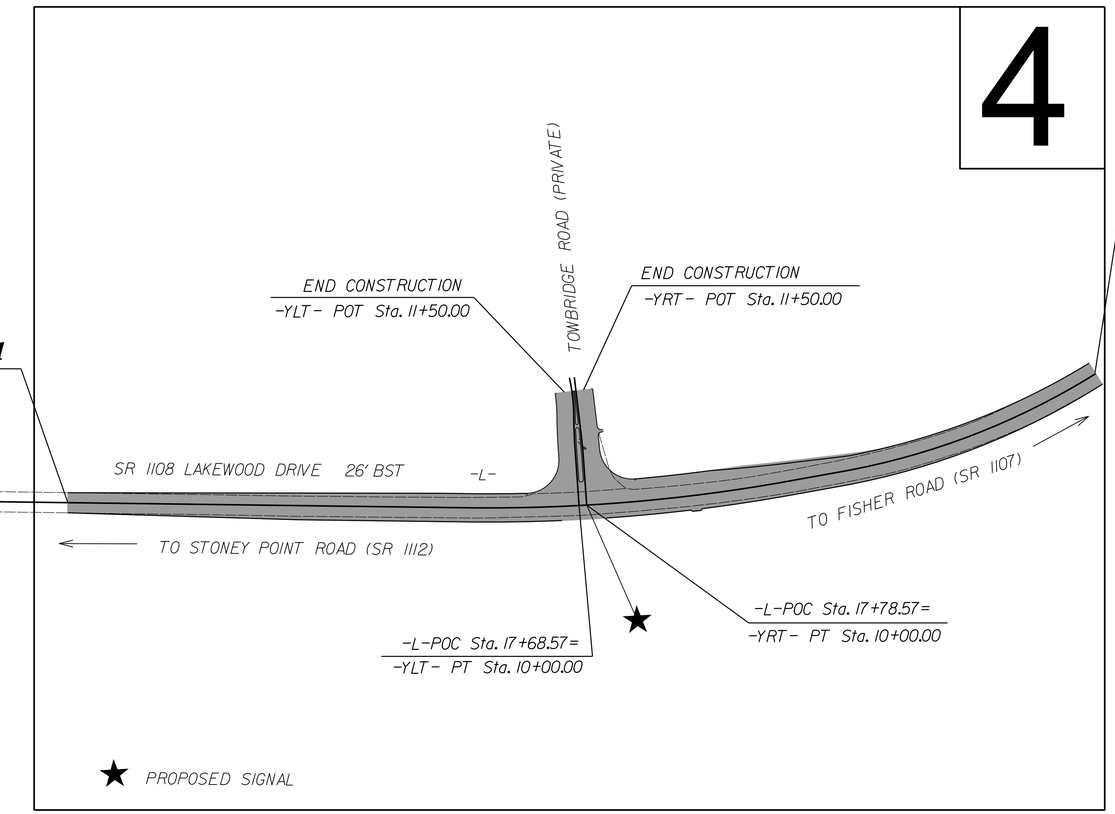
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	49081	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
49081		P.E.
49081		ROW/UTIL
49081		CONST.

LOCATION: SR 1108 (LAKEWOOD DRIVE) AT TOWBRIDGE ROAD (NON–SYSTEM)

FINAL PLANS

TYPE OF WORK: GRADING, DRAINAGE, PAVING, AND SIGNAL



END STATE PROJECT 49081
-L- PT STA STA 24+73.19

BEGIN STATE PROJECT 49081
-L- POT STA 11+00.00

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2021 = 12,731

45 MPH Posted

PROJECT LENGTH

PROJECT LENGTH = 0.260 MI

Prepared in the Office of:
DIVISION OF HIGHWAYS
431 Transportation Drive, Fayetteville, NC 28301

2024 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
AUGUST 31, 2024

LETTING DATE:
JUNE 4, 2025

JOHN GAUTHIER
PROJECT ENGINEER

ALEX HENDERSON
PROJECT DESIGN ENGINEER

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

16-APR-2025 09:26
H:\DDC_Projects\4908|Towbridge Road\Roadway\proj\4908LRdy.tsh.dgn
$$$$USERNAME$$$$

12/2/2016

PROJECT REFERENCE NO.	SHEET NO.
49081	1B

STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

Note: Not to Scale **S.U.E. = Subsurface Utility Engineering*

BOUNDARIES AND PROPERTY:

- State Line
- County Line
- Township Line
- City Line
- Reservation Line
- Property Line
- Existing Iron Pin — EIP
- Computed 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 Endangered Animal Boundary — EAB
- Existing Endangered Plant Boundary — EPB
- Existing Historic Property Boundary — HPB
- Known Contamination Area: Soil — S
- Potential Contamination Area: Soil — S
- Known Contamination Area: Water — W
- Potential Contamination Area: Water — W
- Contaminated Site: Known or Potential

BUILDINGS AND OTHER CULTURE:

- Gas Pump Vent or U/G Tank Cap
- Sign — S
- Well — W
- Small Mine
- Foundation
- Area Outline
- Cemetery
- Building
- School
- Church
- Dam

HYDROLOGY:

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

RAILROADS:

- Standard Gauge — CSX TRANSPORTATION
- RR Signal Milepost — MILEPOST 35
- Switch — SWITCH
- RR Abandoned
- RR Dismantled

RIGHT OF WAY & PROJECT CONTROL:

- Secondary Horiz and Vert Control Point
- Primary Horiz Control Point
- Primary Horiz and Vert Control Point
- Exist Permanent Easment Pin and Cap
- New Permanent Easement Pin and Cap
- Vertical Benchmark
- Existing Right of Way Marker
- Existing Right of Way Line
- New Right of Way Line — RW
- New Right of Way Line with Pin and Cap — RW
- New Right of Way Line with Concrete or Granite R/W Marker — RW
- New Control of Access Line with Concrete C/A Marker — CA
- Existing Control of Access — CA
- New Control of Access — CA
- Existing Easement Line — E
- New Temporary Construction Easement — E
- New Temporary Drainage Easement — TDE
- New Permanent Drainage Easement — PDE
- New Permanent Drainage / Utility Easement — DUE
- New Permanent Utility Easement — PUE
- New Temporary Utility Easement — TUE
- New Aerial Utility Easement — AUE

ROADS AND RELATED FEATURES:

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

VEGETATION:

- Single Tree
- Single Shrub
- Hedge
- Woods Line
- Orchard
- Vineyard — Vineyard

EXISTING STRUCTURES:

MAJOR:

- Bridge, Tunnel or Box Culvert — CONC
- Bridge Wing Wall, Head Wall and End Wall — CONC WW

MINOR:

- Head and End Wall — CONC HW
- Pipe Culvert
- Footbridge
- Drainage Box: Catch Basin, DI or JB — CB
- Paved Ditch Gutter
- Storm Sewer Manhole — S
- Storm Sewer — S

UTILITIES:

POWER:

- Existing Power Pole
- Proposed Power Pole
- Existing Joint Use Pole
- Proposed Joint Use Pole
- Power Manhole — P
- Power Line Tower
- Power Transformer
- U/G Power Cable Hand Hole
- H–Frame Pole
- U/G Power Line LOS B (S.U.E.*) — P
- U/G Power Line LOS C (S.U.E.*) — P
- U/G Power Line LOS D (S.U.E.*) — P

TELEPHONE:

- Existing Telephone Pole
- Proposed Telephone Pole
- Telephone Manhole — T
- Telephone Pedestal — T
- Telephone Cell Tower
- U/G Telephone Cable Hand Hole — HH
- U/G Telephone Cable LOS B (S.U.E.*) — T
- U/G Telephone Cable LOS C (S.U.E.*) — T
- U/G Telephone Cable LOS D (S.U.E.*) — T
- U/G Telephone Conduit LOS B (S.U.E.*) — TC
- U/G Telephone Conduit LOS C (S.U.E.*) — TC
- U/G Telephone Conduit LOS D (S.U.E.*) — TC
- U/G Fiber Optics Cable LOS B (S.U.E.*) — T FO
- U/G Fiber Optics Cable LOS C (S.U.E.*) — T FO
- U/G Fiber Optics Cable LOS D (S.U.E.*) — T FO

WATER:

- Water Manhole — W
- Water Meter
- Water Valve
- Water Hydrant
- U/G Water Line LOS B (S.U.E*) — W
- U/G Water Line LOS C (S.U.E*) — W
- U/G Water Line LOS D (S.U.E*) — W
- Above Ground Water Line — A/G Water

TV:

- TV Pedestal — C
- TV Tower
- U/G TV Cable Hand Hole — HH
- U/G TV Cable LOS B (S.U.E.*) — TV
- U/G TV Cable LOS C (S.U.E.*) — TV
- U/G TV Cable LOS D (S.U.E.*) — TV
- U/G Fiber Optic Cable LOS B (S.U.E.*) — TV FO
- U/G Fiber Optic Cable LOS C (S.U.E.*) — TV FO
- U/G Fiber Optic Cable LOS D (S.U.E.*) — TV FO

GAS:

- Gas Valve
- Gas Meter
- U/G Gas Line LOS B (S.U.E.*) — G
- U/G Gas Line LOS C (S.U.E.*) — G
- U/G Gas Line LOS D (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
- SS Forced Main Line LOS B (S.U.E.*) — FSS
- SS Forced Main Line LOS C (S.U.E.*) — FSS
- SS Forced Main Line LOS D (S.U.E.*) — FSS

MISCELLANEOUS:

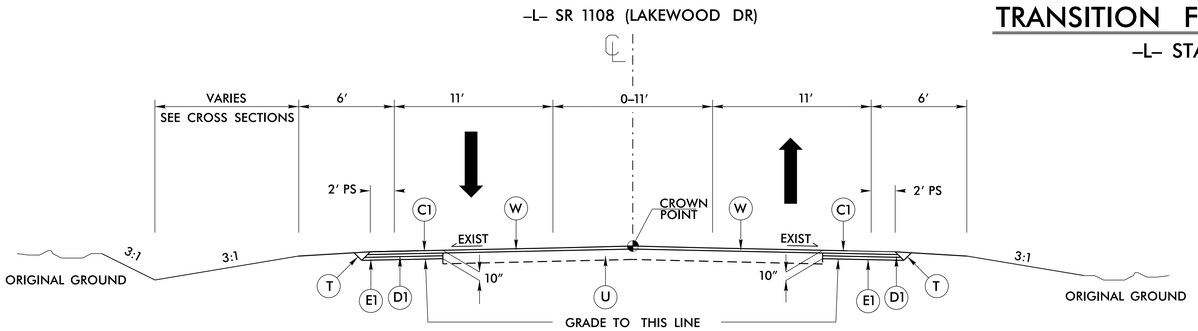
- Utility Pole
- Utility Pole with Base
- Utility Located Object
- Utility Traffic Signal Box — S
- Utility Unknown U/G Line LOS B (S.U.E.*) — ?UTL
- U/G Tank; Water, Gas, Oil
- Underground Storage Tank, Approx. Loc. — UST
- A/G Tank; Water, Gas, Oil
- Geoenvironmental Boring
- U/G Test Hole LOS A (S.U.E.*)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

PROJECT REFERENCE NO.	SHEET NO.
49081	2A-1

PAVEMENT SCHEDULE

C1	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 2" IN DEPTH.	C3	PROP. APPROX. 1-1/2" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD.
D1	PROP. APPROX. 3" ASPHALT CONCRETE INTERMEDIATE COURSE,TYPE I19.0C, AT AN AVERAGE RATE OF 342 LBS. PER SQ. YD.	D2	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE,TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	D3	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, 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.
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	E2	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5-1/2" IN DEPTH.	R1	2'-6" CONCRETE CURB & GUTTER
T	EARTH MATERIAL	U	EXISTING PAVEMENT	W	WEDGING (SEE DETAIL)

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



TYPICAL SECTION NO. 1

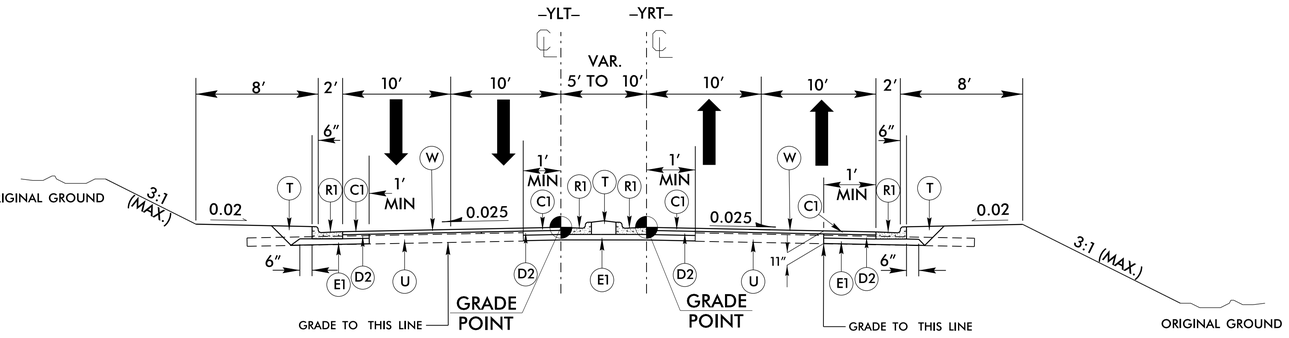
–L– STA. 14+00.00 TO 21+73.19

TRANSITION FROM EXISTING TO TS NO. 1

–L– STA. 11+00.00 TO 14+00.00

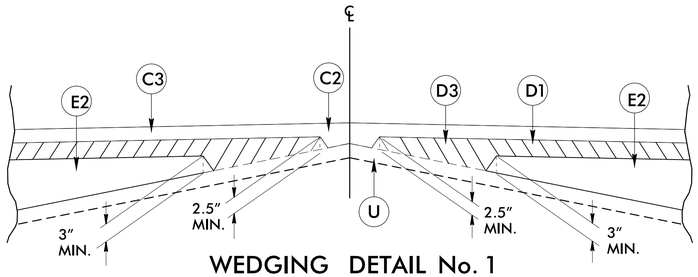
TRANSITION FROM TS NO. 1 TO EXISTING

–L– STA. 21+73.19 TO 24+73.19



TYPICAL SECTION NO.2

–YLT– /–YRT– STA. 10+16.50 TO 11+50.00



WEDGING DETAIL No. 1

CONTRACTOR SHALL COORDINATE WITH LOCAL TRAFFIC SERVICES UNIT FOR PROPOSED SIGNAL DESIGN AND PLACEMENT OF ALL PAVEMENT MARKINGS.

FOR SIGNAL WORK,CONTACT TRAFFIC SERVICES 910-364-0606,28 DAYS PRIOR TO PLACEMENT.

FOR PAVEMENT MARKING AND SIGNING,CONTACT TRAFFIC SERVICES 910-364-0606,14 DAYS PRIOR TO FINAL PLACEMENT.

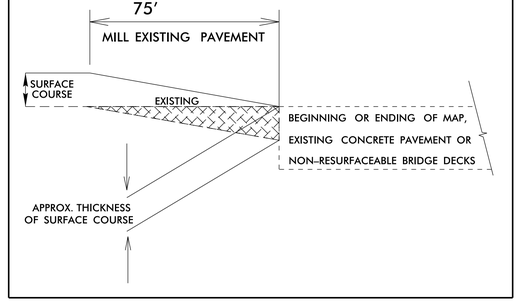
MILLING AT PAVEMENT TIE–INS

NOTES TO CONTRACTOR

For surface mixes over 1" in thickness, mill the existing pavement in acoordance with the following sketch as directed by the Engineer.

Locations shall include ties into existing concrete pavement, at bridge approaches where the bridge will not be resurfaced, and at the beginning and ending point of each resurfacing map.

Perform the work in accordance with Section 607 of the January 2018 North Carolina Department of Transportation Standard Specifications for Roads and Structures. Resurfacing will be accomplished at the same time as the milling operation.



PROJECT NOTES

1. The contractor shall not work on both sides of the road simultaneously within the same area.
2. Ingress and egress shall be maintained to all businesses and dwellings on the project.
3. At the end of each workday, the contractor shall be required to backfill any area adjacent to existing travelway that has been graded, leaving no more than a 1" drop–off.
4. A minimum of two–way, two–lane traffic (plus all existing left and right turn lanes) shall be maintained during periods of construction inactivity.
5. The Contractor shall not be allowed to stop traffic for more than 5 minutes at a time in any one direction.
6. During periods of construction inactivity, the difference in elevation between lanes shall not exceed 1–1/2 inch.
7. Access to police and fire stations, fire hydrants, and hospitals shall be maintained at all times.
8. During periods of construction inactivity, place cones/drums 3′ from existing edge of pavement (travelway) as directed by the Engineer.
9. Contractor to install and maintain Erosion Control devices as directed by the Engineer.
10. The contractor shall be responsible for the permanent staking of all Proposed Right of Way, Control of Access and Drainage Easements Per NCDOT Division 6 Special Provision in the contract.
11. Contractor shall provide Driveway Turnouts at all soil or gravel drives as directed by Engineer.
12. Signing will be incidental to the project. The Contractor is responsible for relocating , removing, replacing or installing signs as directed by the Engineer. There will be no direct pay for the relocation, removal, replacement or installation of signs.

COMPUTED BY: BAH DATE: 03-14-2025
CHECKED BY: DATE:

6/21/00

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
49081	3B-1

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

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

STATION	LOCATION (LT,RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	DRAINAGE PIPE (RCP, CSP, CAAP, HDPE, or PVC) 12"	15"	18"	24"	30"	36"	42"	48"	R.C. PIPE CLASS IV 12"	15"	18"	24"	30"	36"	42"	48"	R.C. PIPE CLASS V 12"	15"	18"	24"	30"	36"	42"	48"
L 17+74.48	LT	401	402		163.90	160.66													148												
L 18+52.11	CL	403	404		161.60	160.66																						80			
PROJECT TOTALS																			148									80			

STATION	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	ENDWALLS STD. 838.01, STD. 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE) CU. YDS. 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')	LIN. *FT. 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	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME & GRATE STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. FRAME WITH GRATE STD. 840.22	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH GRATE STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	T.B.J.B. STD. 840.34	M.H. FRAME & COVER STD. 840.54	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
L 17+74.48																											134	REMOVE 134 LF 24" RCP
L 18+52.11																											53	REMOVE 53 LF 24" RCP
PROJECT TOTALS																												

ABBREVIATIONS

C.B.	CATCH BASIN
N.D.I.	NARROW DROP INLET
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
G.D.I. (N.S.)	GRATED 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

SUMMARY OF EARTHWORK

IN CUBIC YARDS

LOCATION	UNCLASSIFIED EXCAVATION	UNDERCUT	EMBT+%	BORROW	WASTE
-L- 11+00+/- TO 24+73.19+/-	992		601	601	992
-YLT- 10+16+/- TO 11+50+/-	53		20	20	53
-YRT- 10+16+/- TO 11+50+/-	45		76	76	45
MATERIAL FOR SHOULDER CONSTRUCTION			100	100	
5% TO REPLACE TOP SOIL ON BORROW PIT				40	
PROJECT TOTAL	1090			837	1090
SAY	1100			850	1100

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

CONCRETE REMOVAL SUMMARY

SURVEY LINE	STATION	STATION	LOCATION	SQ YD
-YLT-	10+28 +/-	11+50 +/-	LT	35
-YLT-	10+25 +/-	11+50 +/-	RT	37
-YRT-	10+29 +/-	11+50 +/-	RT	35
-YRT-	10+25 +/-	11+50 +/-	LT	38
			TOTAL	145
			SAY	155

ASPHALT PAVEMENT REMOVAL SUMMARY

SURVEY LINE	STATION	STATION	LOCATION	SQ YD
-YLT-	10+18 +/-	11+50 +/-	LT	129
-YRT-	10+29 +/-	11+50 +/-	RT	100
			TOTAL	229
			SAY	240

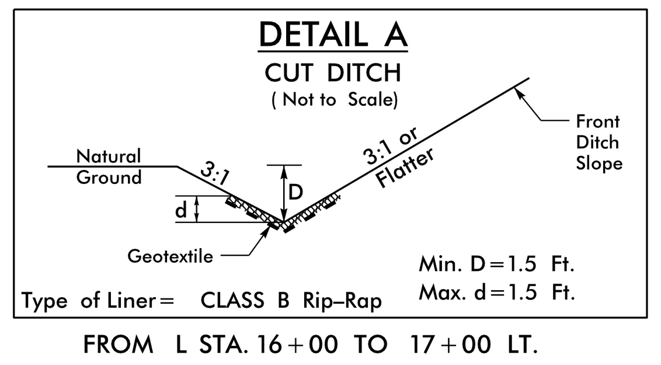
PROJECT REFERENCE NO.	SHEET NO.
49081	4

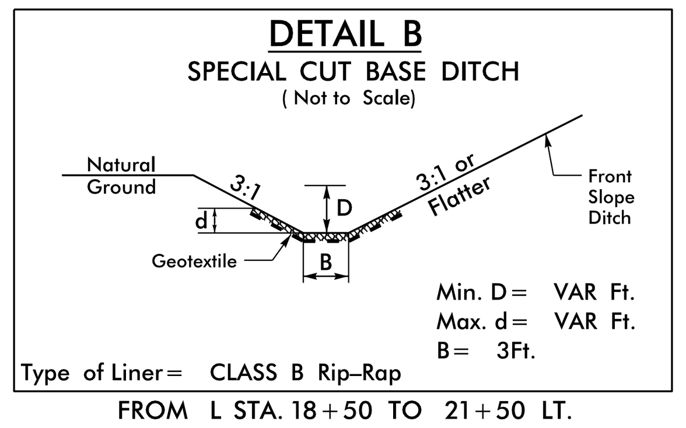
-YLT-

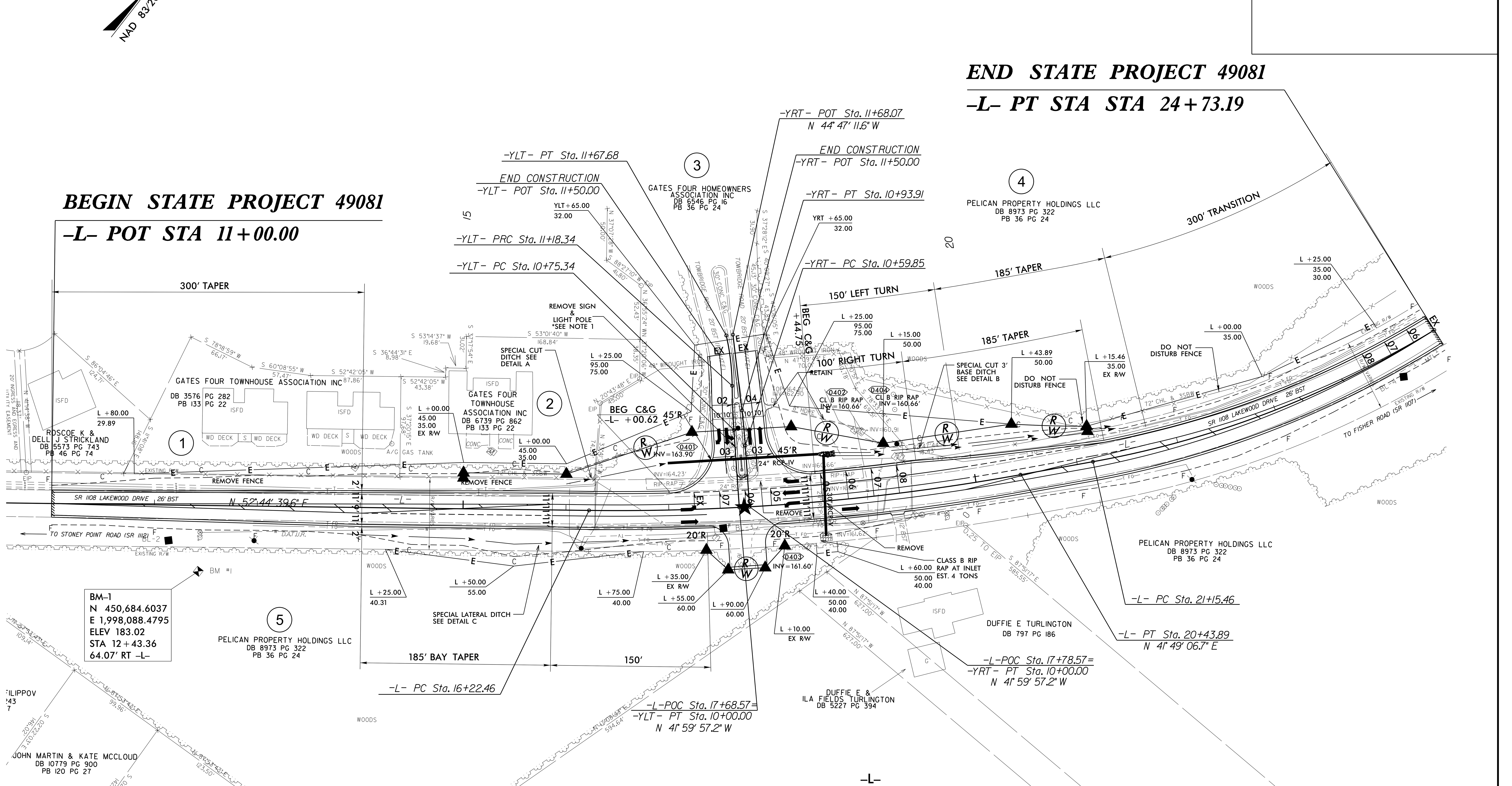
PI Sta 10+96.85	PI Sta 11+43.10
△ = 3° 31' 08.8" (RT)	△ = 12° 20' 25.6" (LT)
D = 8° 11' 06.4"	D = 25° 00' 41.4"
L = 42.99'	L = 49.34'
T = 21.50'	T = 24.77'
R = 700.00'	R = 229.08'

-YRT-

PI Sta 10+76.88
△ = 2° 47' 14.4" (LT)
D = 8° 11' 06.4"
L = 34.05'
T = 17.03'
R = 700.00'



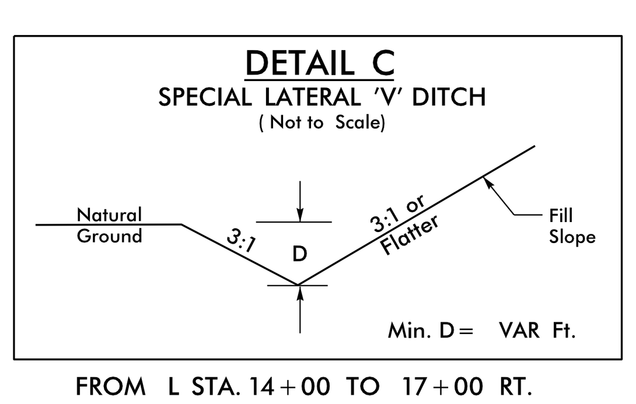




NAD 83/2011
END STATE PROJECT 49081
-L- PT STA STA 24+73.19
BEGIN STATE PROJECT 49081
-L- POT STA 11+00.00
-YRT- POT Sta. 11+68.07
N 44° 47' 11.6" W
END CONSTRUCTION
-YRT- POT Sta. 11+50.00
-YRT- PT Sta. 10+93.91
-YRT- PC Sta. 10+59.85
-YLT- PT Sta. 11+67.68
END CONSTRUCTION
-YLT- POT Sta. 11+50.00
-YLT- PRC Sta. 11+18.34
-YLT- PC Sta. 10+75.34
GATES FOUR HOMEOWNERS ASSOCIATION INC
DB 6546 PG 16
PB 36 PG 24
PELICAN PROPERTY HOLDINGS LLC
DB 8973 PG 322
PB 36 PG 24
300' TRANSITION
185' TAPER
150' LEFT TURN
185' TAPER
100' RIGHT TURN
300' TAPER
GATES FOUR TOWNHOUSE ASSOCIATION INC
DB 3576 PG 282
PB 133 PG 22
GATES FOUR TOWNHOUSE ASSOCIATION INC
DB 6739 PG 862
PB 133 PG 22
ROSCOE K & DELL J STRICKLAND
DB 5573 PG 743
PB 46 PG 74
REMOVE SIGN & LIGHT POLE *SEE NOTE 1
SPECIAL CUT DITCH SEE DETAIL A
SPECIAL CUT 3' BASE DITCH SEE DETAIL B
DO NOT DISTURB FENCE
REMOVE FENCE
BEG C&G -L- +00.62
BEG C&G +44.75
SR 1108 LAKEWOOD DRIVE 26' BST
N 52° 44' 39.6" E
TO STONEY POINT ROAD (SR 1112)
TO FISHER ROAD (SR 1107)
BM-1
N 450,684.6037
E 1,998,088.4795
ELEV 183.02
STA 12+43.36
64.07' RT -L-
PELICAN PROPERTY HOLDINGS LLC
DB 8973 PG 322
PB 36 PG 24
185' BAY TAPER
150'
-L- PC Sta. 16+22.46
-L-POC Sta. 17+68.57=
-YLT- PT Sta. 10+00.00
N 41° 59' 57.2" W
-L-POC Sta. 17+78.57=
-YRT- PT Sta. 10+00.00
N 41° 59' 57.2" W
-L- PT Sta. 20+43.89
N 41° 49' 06.7" E
-L- PC Sta. 21+15.46
SPECIAL LATERAL DITCH SEE DETAIL C
CLASS B RIP RAP AT INLET EST. 4 TONS
DUFFIE E TURLINGTON
DB 797 PG 186
DUFFIE E & ILA FIELDS TURLINGTON
DB 5227 PG 394
JOHN MARTIN & KATE MCCLOUD
DB 10779 PG 900
PB 120 PG 27
WAREES T & ASUMPTER K MUHAMMAD
DB 8852 PG 393
PB 120 PG 27
WOODS

-L-

PI Sta 18+33.82	PI Sta 22+96.51
△ = 10° 55' 32.9" (LT)	△ = 21° 48' 15.7" (LT)
D = 2° 35' 33.2"	D = 6° 05' 43.1"
L = 421.43'	L = 357.72'
T = 211.35'	T = 181.05'
R = 2,210.00'	R = 940.00'



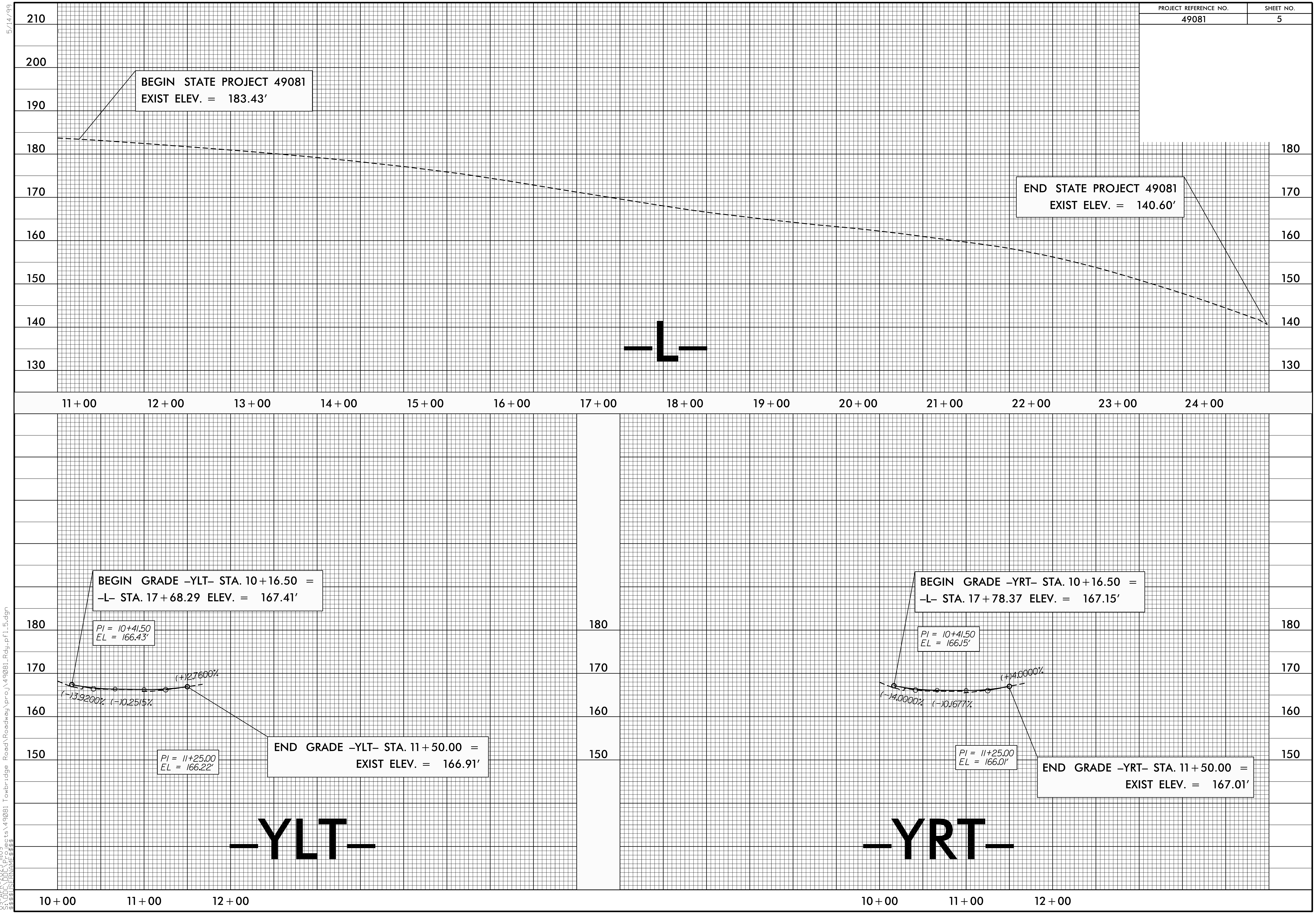
NOTE 1: NO SEPERATE PAYMENT SHALL BE MADE. REMOVAL OF SIGN AND LIGHT POLE SHALL BE INCIDENTAL TO LUMP SUM GRADING.

REVISIONS

8/17/99

28-MAY-2025 15:57
$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
49081	5



09-APR-2025 11:09
S:\DDC\DDC\Projects\49081 Towbridge Road\Roadway\proj\49081_Rdy_pfl_5.dgn
$$$$USERNAME$$$$

5/26/20

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

PAVEMENT MARKING & SIGNING PLAN
CUMBERLAND COUNTY

LOCATION: LAKEWOOD DRIVE AT TOWBRIDGE RD.

ROADWAY STANDARD DRAWING

THE FOLLOWING ROADWAY STANDARDS AS APPEAR IN "ROADWAY STANDARD DRAWINGS" - PROJECT SERVICES UNIT - N.C. DEPARTMENT OF TRANSPORTATION - RALEIGH, N.C., DATED JANUARY 2024 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

STD. NO.	TITLE
904.10	ORIENTATION OF GROUND MOUNTED SIGNS
904.50	MOUNTING OF TYPE 'D', 'E' AND 'F' SIGNS ON 'U' CHANNEL POSTS
1205.01	PAVEMENT MARKINGS - LINE TYPES AND OFFSETS
1205.02	PAVEMENT MARKINGS - TWO-LANE AND MULTILANE ROADWAYS
1205.04	PAVEMENT MARKINGS - INTERSECTIONS
1205.05	PAVEMENT MARKINGS - TURN LANES
1205.08	PAVEMENT MARKINGS - SYMBOLS AND WORD MESSAGES
1205.09	PAVEMENT MARKINGS - PAINTED ISLANDS
1250.01	RAISED PAVEMENT MARKERS - INSTALLATION SPACING (SHEETS 1 AND 3)
1251.01	RAISED PAVEMENT MARKERS - PERMANENT AND TEMPORARY

SUMMARY OF QUANTITIES

ITEM NO.		ITEM DESCRIPTION	QUANTITY	UNIT
DESC. NO.	SECT. NO.			
4025000000	901	CONTRACTOR FURNISHED, TYPE E SIGN	12.5	S.F.
4072000000	903	SUPPORTS, 3 LB STEEL U-CHANNEL	28	L.F.
4102000000	904	SIGN ERECTION, TYPE E	2	EA.
4155000000	907	DISPOSAL OF SIGN SYSTEM, U-CHANNEL	1	EA.
4685000000	1205	THERMOPLASTIC PAVEMENT MARKING LINES (4", 90 MILS)	6193	L.F.
4700000000	1205	THERMOPLASTIC PAVEMENT MARKING LINES (12", 90 MILS)	125	L.F.
4891000000	1205	THERMOPLASTIC PAVEMENT MARKING LINES (24", 90 MILS)	84	L.F.
4725000000	1205	THERMOPLASTIC PAVEMENT MARKING SYMBOLS (90 MILS)	6	EA.
4900000000	1251	RAISED PAVEMENT MARKERS	74	EA.

PLAN PREPARED BY: N.C.D.O.T. SIGNING AND DELINEATION UNIT

D. M. EATON, P.E. — SIGNING & DELINEATION REGIONAL ENGINEER

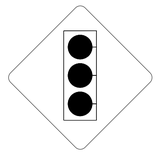
S. W. JOHNS — SIGNING & DELINEATION PROJECT DESIGN ENGINEER

PAVEMENT MARKING SCHEDULE

SYMBOL	DESCRIPTION
THERMOPLASTIC (4", 90 MILS)	
T1	WHITE EDGELINE
T2	WHITE SOLID LANE LINE
T4	3FT.-9FT./SP WHITE MINISKIP
T10	YELLOW EDGELINE
T13	YELLOW DOUBLE CENTER
THERMOPLASTIC (12", 90 MIL)	
T52	YELLOW DIAGONAL
THERMOPLASTIC (24", 90 MIL)	
T61	WHITE STOPBAR
THERMOPLASTIC PAVEMENT MARKING SYMBOLS (90 MIL)	
T70	LEFT TURN ARROW
T71	RIGHT TURN ARROW
PERMANENT RAISED MARKERS	
MA	YELLOW & YELLOW
MB	CRYSTAL & RED

E SIGNS

401 QUANTITY REQ'D 2



30" X 30"
W3-3

ONE "U" POST PER SIGN

SIGNING GENERAL NOTES

. SIGNS FURNISHED BY THE CONTRACTOR

. CONFIRM IN WRITING AT LEAST 4 MONTHS IN ADVANCE, THE ACTUAL DATE THE DEPARTMENT FURNISHED SIGNS WILL BE REQUIRED.

. WHEN NOT STATIONED OR DIMENSIONED ON PLANS, ALL 'E' AND 'F' SIGNS SHALL BE FIELD LOCATED BY THE ENGINEER

. ALL EXISTING SIGNS ON "U" CHANNEL POST WITHIN THE PROJECT LIMITS SHALL BE REMOVED AND DISPOSED OF UNLESS OTHERWISE NOTED ON PLANS.

. THE BACKGROUND FOR TYPE E & F SIGNS SHALL BE TYPE C REFLECTIVE SHEETING.

PAVEMENT MARKING GENERAL NOTES

THE FOLLOWING GENERAL NOTES APPLY AT ALL TIMES FOR THE DURATION OF THE CONSTRUCTION PROJECT, EXCEPT WHEN OTHERWISE NOTED IN THE PLAN, OR DIRECTED BY THE ENGINEER.

A) INSTALL PAVEMENT MARKINGS AND PAVEMENT MARKERS ON THE FINAL SURFACE AS FOLLOWS:

ROAD NAME	MARKING	MARKER
LAKEWOOD DR	THERMOPLASTIC	PERMANENT RAISED

B) TIE PROPOSED PAVEMENT MARKING LINES TO EXISTING PAVEMENT MARKING LINES.

C) REMOVE/REPLACE ANY CONFLICTING/DAMAGED PAVEMENT MARKINGS AND MARKERS.

D) PASSING ZONES WILL BE DETERMINED IN THE FIELD AND MUST BE APPROVED BY THE ENGINEER.

E) UNLESS OTHERWISE SPECIFIED, HEATED-IN-PLACE THERMOPLASTIC MAY BE USED IN LIEU OF COLD APPLIED PLASTIC FOR STOP BARS, SYMBOLS, CHARACTERS AND DIAGONALS ON ASPHALT OR CONCRETE ROADWAYS. IF HEATED-IN-PLACE IS USED, IT SHALL BE PAID FOR USING THE COLD APPLIED PAY ITEM.

INDEX

49081
PMP 001

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

APPROVED: DocuSigned by: David M. Eaton DDA1C5F24764F7...

DATE: 05/05/2025

SEAL:

NORTH CAROLINA PROFESSIONAL SEAL 043780 ENGINEER DAVID M. EATON

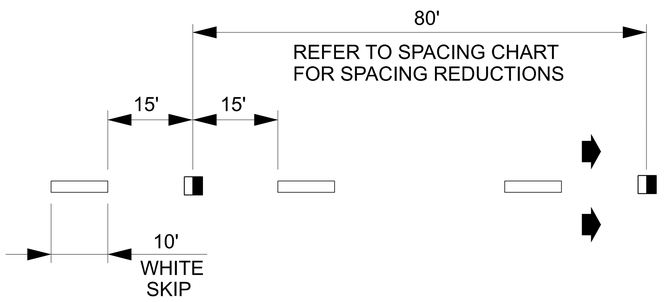
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

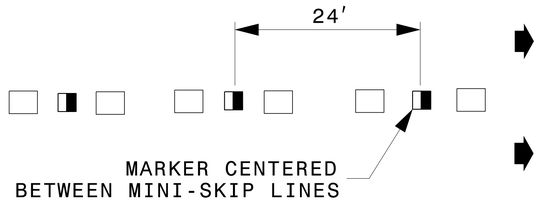
WBS# 49081

5/26/20

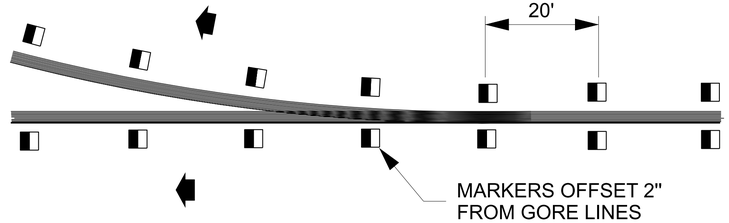
10'-30'/SP SKIP LINE



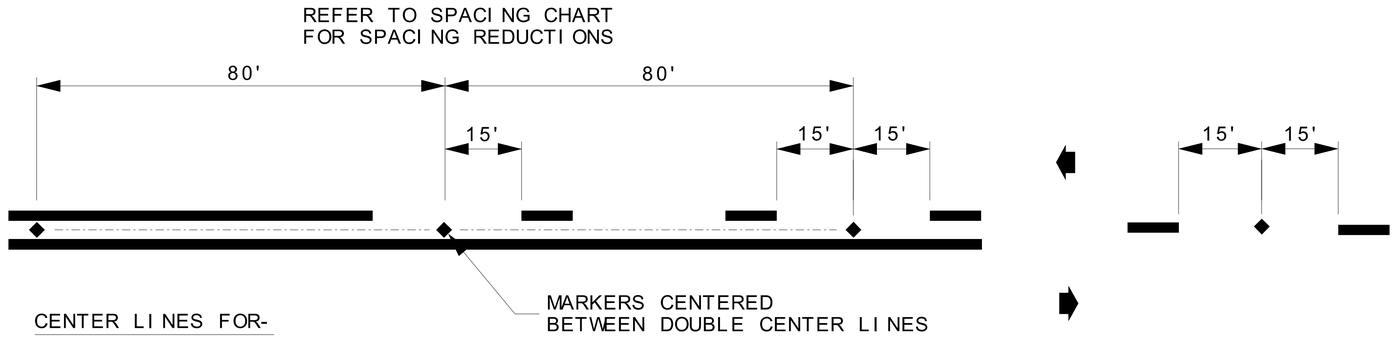
3'-9'/SP MINI-SKIP LINE



GORE LINES



YELLOW CENTER LINES

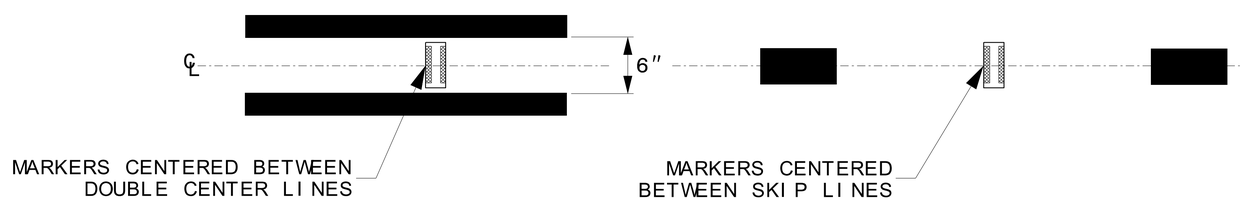


CENTER LI NES FOR-

TWO-LANE, TWO-WAY ROADWAYS
UNDI VI DED ROADWAYS
TWO-WAY LEFT TURN LANES

DETAIL OF PAVEMENT MARKER PLACEMENT

RAI SED REFLECTI VE PAVEMENT MARKERS



LEGEND

- CRYSTAL/RED PAVEMENT MARKER
- YELLOW/YELLOW PAVEMENT MARKER
- DIRECTION OF TRAFFIC FLOW

49081

PMP | 01A

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

APPROVED: DocuSigned by: Matthew V. Springer BC60F0EB8584403...

DATE: 05/05/2025

SEAL:

NORTH CAROLINA PROFESSIONAL SEAL 042546 ENGINEER MATTHEW V. SPRINGER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION

1250D01
SHEET 2 OF 3

ROADWAY DETAIL DRAWING FOR
RASISED PAVEMENT MARKINGS
INSTALLATION SPACING

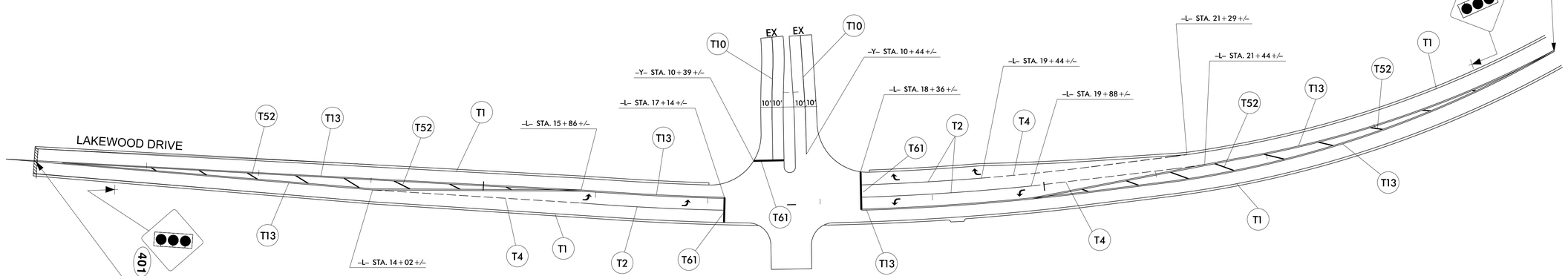
5/26/20

15

20

NAD 83/2011

END PAVEMENT MARKING PROJECT 49081
-L- STA. 24+73.19 +/- TIE TO EXISTING



BEGIN PAVEMENT MARKING PROJECT 49081
-L- STA. 11+00.00 +/- TIE TO EXISTING

49081

PMP | 002

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

APPROVED: DocuSigned by: David M. Eaton DDA1C5F247484F7...

DATE: 05/05/2025

SEAL:

NORTH CAROLINA PROFESSIONAL SEAL 043780 ENGINEER DAVID M. EATON

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

TIP PROJECT: 49081

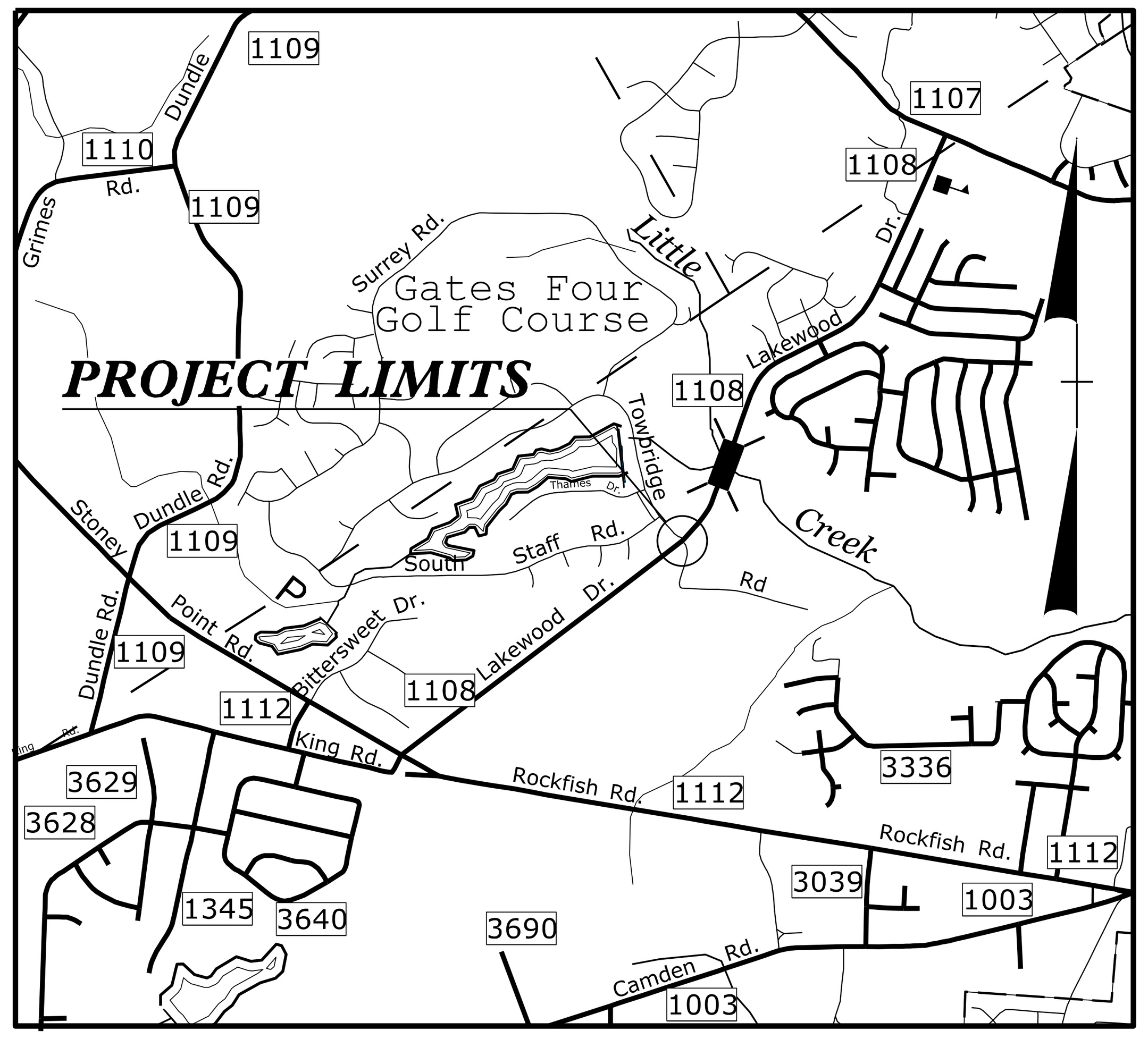
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	49081	EC-1	
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

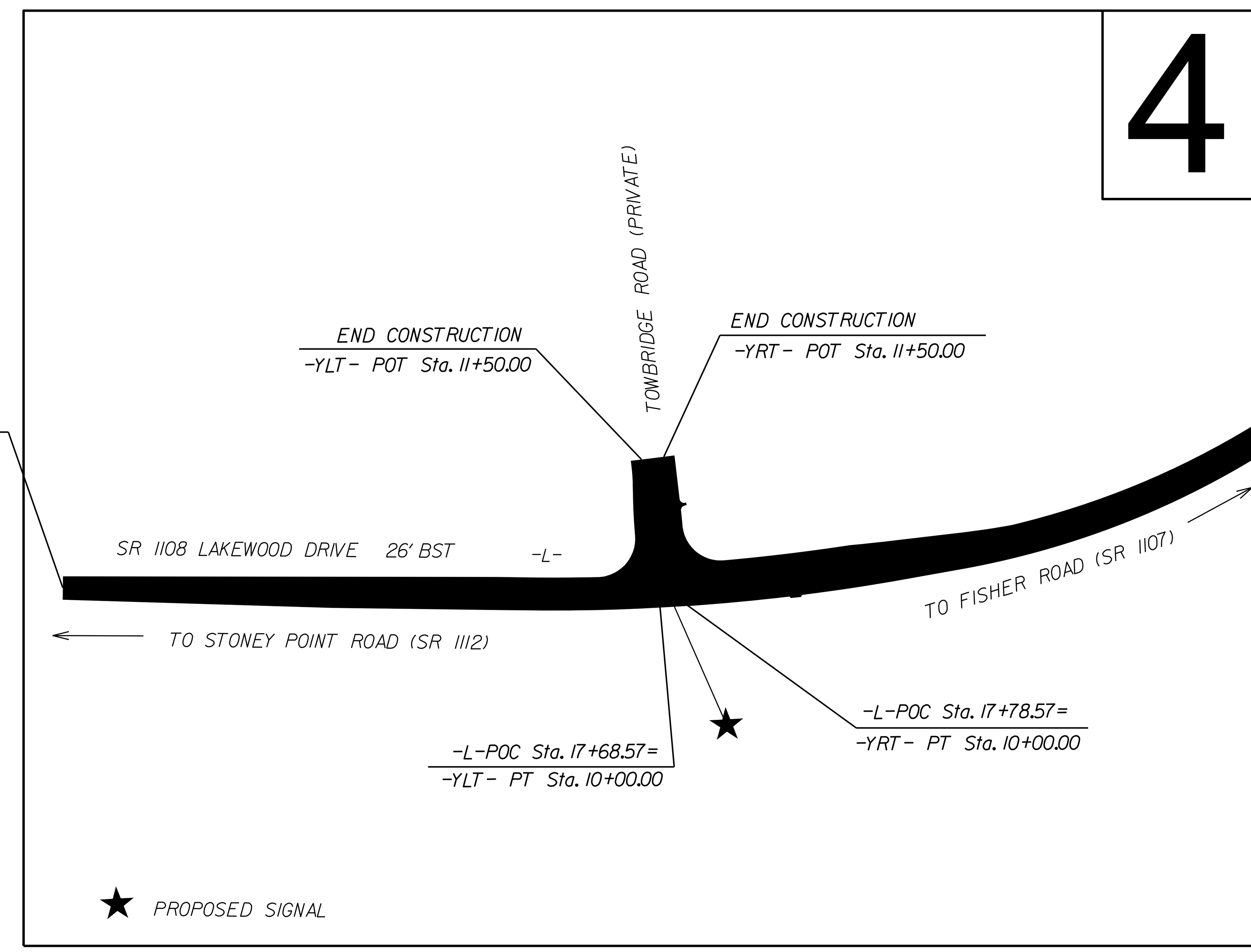
PLAN FOR PROPOSED
HIGHWAY EROSION CONTROL

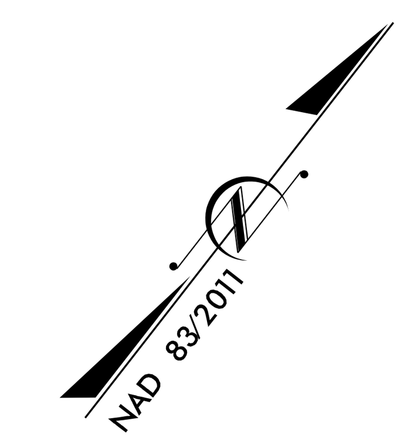
CUMBERLAND COUNTY

LOCATION: SR 1108 (LAKEWOOD DRIVE) AT TOWBRIDGE ROAD (NON–SYSTEM)
TYPE OF WORK: GRADING, DRAINAGE, PAVING, AND SIGNAL



VICINITY MAP
(N.T.S.)





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

NOTE:
CLEARING ON THIS PROJECT WILL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD II.

THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES.

GRAPHIC SCALE

50 25 0 50 100

PLANS

THESE EROSION AND SEDIMENT CONTROL PLANS COMPLY WITH THE APPLICABLE REGULATIONS SET FORTH BY THE NCG–010000 GENERAL CONSTRUCTION PERMIT EFFECTIVE APRIL 1, 2024 AND ISSUED BY THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL QUALITY DIVISION OF WATER RESOURCES.

ms consultants, inc.
5444 Wade Park Blvd.
Suite 160
Raleigh, NC 27607
NC License Number : C-3239

Prepared In the Office of:

ms consultants, inc.
5444 Wade Park Blvd.
Suite 160
Raleigh, NC 27607

Designed by:

Andrew Hollen — 3490
NAME — LEVEL III CERTIFICATION NO.

Roadway Standard Drawings

The "Roadway Standard Drawings"- Roadway Design Unit - N. C. Department of Transportation - Raleigh, N. C., dated January 2024 and the latest revision thereto are applicable to this project and by reference hereby are considered a part of these plans.

PROJECT REFERENCE NO.	SHEET NO.
49081	EC-02
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

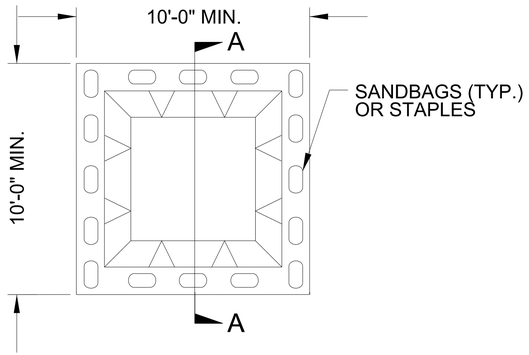
EROSION & SEDIMENT CONTROL LEGEND

Std. #	Description	Symbol
1605.01	Temporary Silt Fence	
1606.01	Special Sediment Control Fence	
1622.01	Temporary Berms and Slope Drains	
1630.02	Silt Basin Type B	
1630.03	Temporary Silt Ditch	TSD
1630.04	Stilling Basin	
1630.05	Temporary Diversion	TD
1630.06	Special Stilling Basin	
1630.07	Skimmer Basin	
1630.08	Tiered Skimmer Basin	
1630.09	Earthen Dam with Skimmer	
	Infiltration Basin	
	Rock Inlet Sediment Trap:	
1632.01	Type A	A
1632.02	Type B	B
1632.03	Type C	C

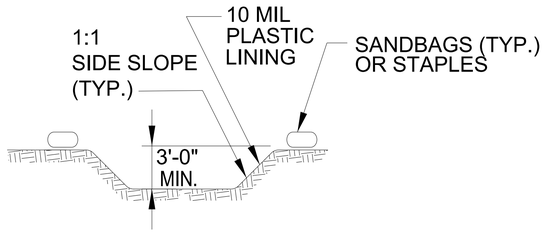
Std. #	Description	Symbol
1633.01	Temporary Rock Silt Check Type A	
1633.02	Temporary Rock Silt Check Type B	
1633.03	Temporary Rock Silt Check Type A with Excelsior Matting and Flocculant	
1634.01	Temporary Rock Sediment Dam Type A	
1634.02	Temporary Rock Sediment Dam Type B	
1635.01	Rock Pipe Inlet Sediment Trap Type A	A
1635.02	Rock Pipe Inlet Sediment Trap Type B	B
1636.01	Excelsior Wattle Check	
1636.01	Excelsior Wattle Check with Flocculant	
1636.01	Coir Fiber Wattle Check	
1636.01	Coir Fiber Wattle Check with Flocculant	
1636.02	Silt Fence Excelsior Wattle Break	EW
	Silt Fence Coir Fiber Wattle Break	CFW
1636.03	Excelsior Wattle Barrier	—EW—EW—EW—
1636.03	Coir Fiber Wattle Barrier	—CFW—CFW—CFW—

PROJECT REFERENCE NO.	SHEET NO.
49081	EC-02A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

ONSITE CONCRETE WASHOUT STRUCTURE WITH LINER



PLAN



SECTION A-A

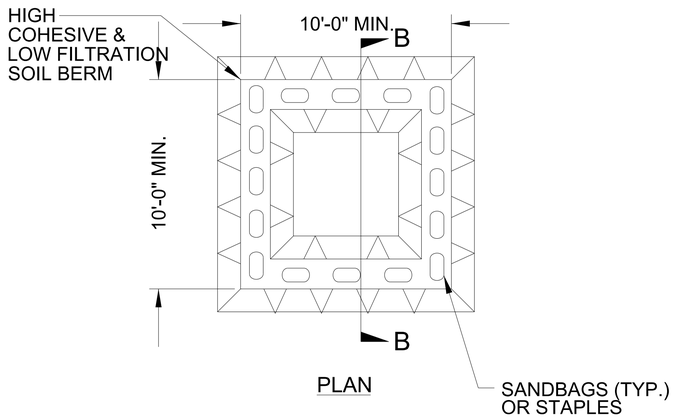
NOTES:
1. ACTUAL LOCATION DETERMINED IN FIELD

2. THE CONCRETE WASHOUT STRUCTURES SHALL BE MAINTAINED WHEN THE LIQUID AND/OR SOLID REACHES 75% OF THE STRUCTURES CAPACITY TO PROVIDE ADEQUATE HOLDING CAPACITY WITH A MINIMUM 12 INCHES OF FREEBOARD.

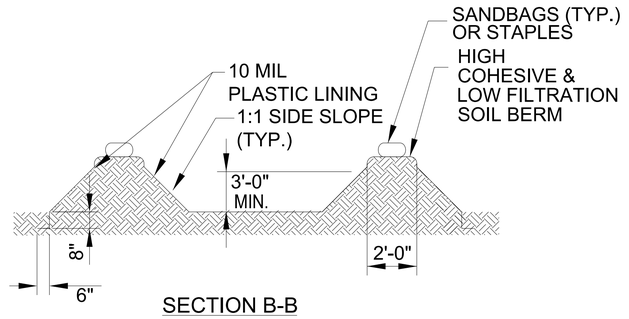
3.CONCRETE WASHOUT STRUCTURE NEEDS TO BE CLEARLY MARKED WITH SIGNAGE NOTING DEVICE.

BELOW GRADE WASHOUT STRUCTURE

NOT TO SCALE



PLAN



SECTION B-B

NOTES:
1. ACTUAL LOCATION DETERMINED IN FIELD

2. THE CONCRETE WASHOUT STRUCTURES SHALL BE MAINTAINED WHEN THE LIQUID AND/OR SOLID REACHES 75% OF THE STRUCTURES CAPACITY TO PROVIDE ADEQUATE HOLDING CAPACITY WITH A MINIMUM 12 INCHES OF FREEBOARD.

3.CONCRETE WASHOUT STRUCTURE NEEDS TO BE CLEARLY MARKED WITH SIGNAGE NOTING DEVICE.

ABOVE GRADE WASHOUT STRUCTURE

NOT TO SCALE

PROJECT REFERENCE NO.	SHEET NO.
49081	EC-3
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SOIL STABILIZATION SUMMARY SHEET

MATTING FOR EROSION CONTROL

CONST SHEET NO.	LINE	FROM STATION	TO STATION	SIDE	ESTIMATE (SY)
4	-L-	14+50	17+00	RT	195
				SUBTOTAL	195
MISCELLANEOUS MATTING TO BE INSTALLED AS DIRECTED BY THE ENGINEER					2200
				TOTAL	2395
				SAY	2400

MATTING FOR EROSION CONTROL

CONST SHEET NO.	LINE	FROM STATION	TO STATION	SIDE	ESTIMATE (SY)

PROJECT REFERENCE NO.	SHEET NO.
49081	EC-3A
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

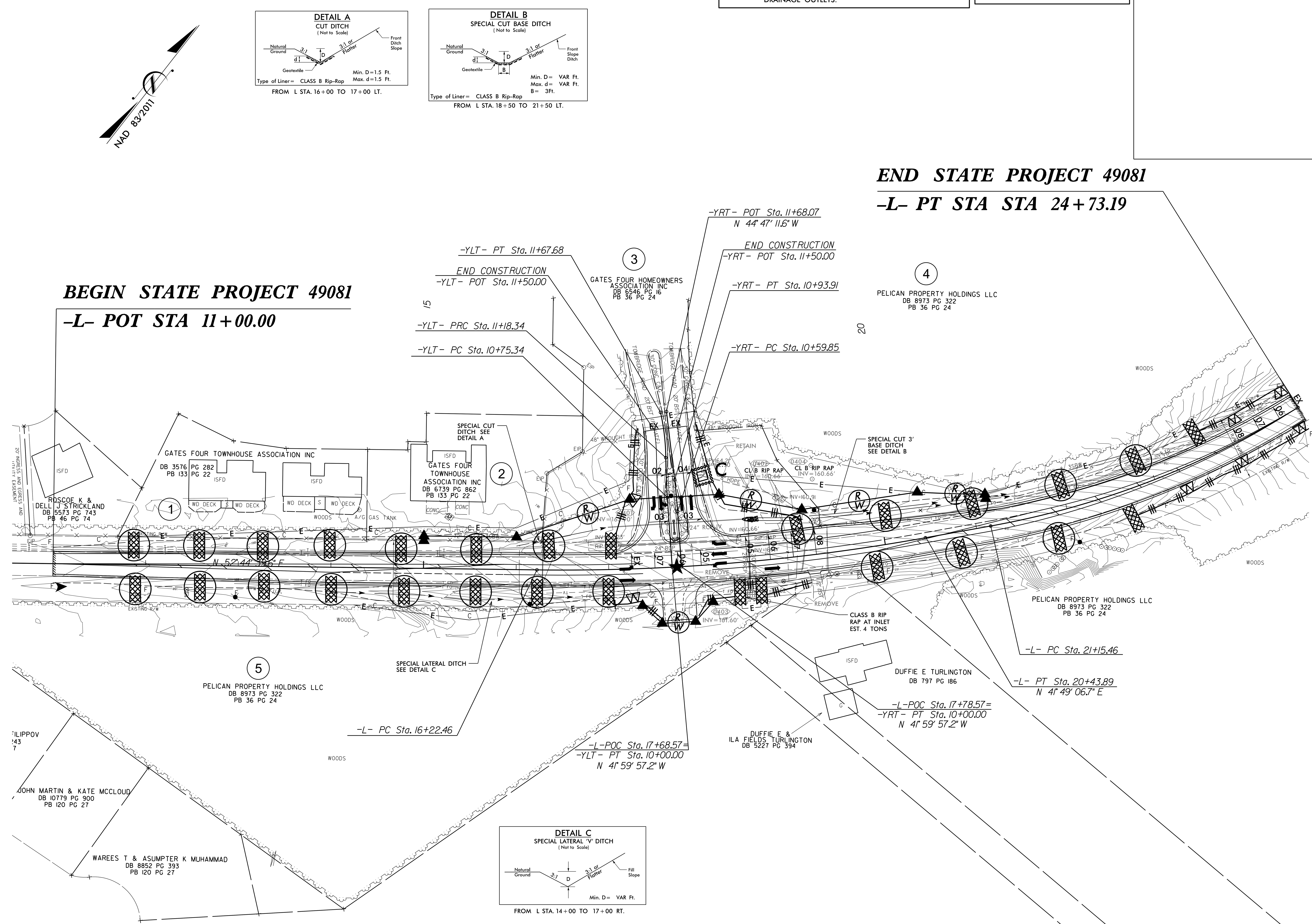
SOIL STABILIZATION TIMEFRAMES

SITE DESCRIPTION	STABILIZATION TIME	TIMEFRAME EXCEPTIONS
PERIMETER DIKES, SWALES, DITCHES AND SLOPES	7 DAYS	NONE
HIGH QUALITY WATER (HQW) ZONES	7 DAYS	NONE
SLOPES STEEPER THAN 3:1	7 DAYS	IF SLOPES ARE 10' OR LESS IN LENGTH AND ARE NOT STEEPER THAN 2:1, 14 DAYS ARE ALLOWED.
SLOPES 3:1 TO 4:1	14 DAYS	7 DAYS FOR SLOPES GREATER THAN 50' IN LENGTH WITH SLOPES STEEPER THAN 4:1. 7 DAYS FOR PERIMETER DIKES, SWALES, DITCHES PERIMETER SLOPES, AND HQW ZONES
ALL OTHER AREAS WITH SLOPES FLATTER THAN 4:1	14 DAYS	7 DAYS FOR PERIMETER DIKES, SWALES, DITCHES PERIMETER SLOPES, AND HQW ZONES

PROJECT REFERENCE NO.	SHEET NO.
49081	EC-04/CONST.04

CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 04

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

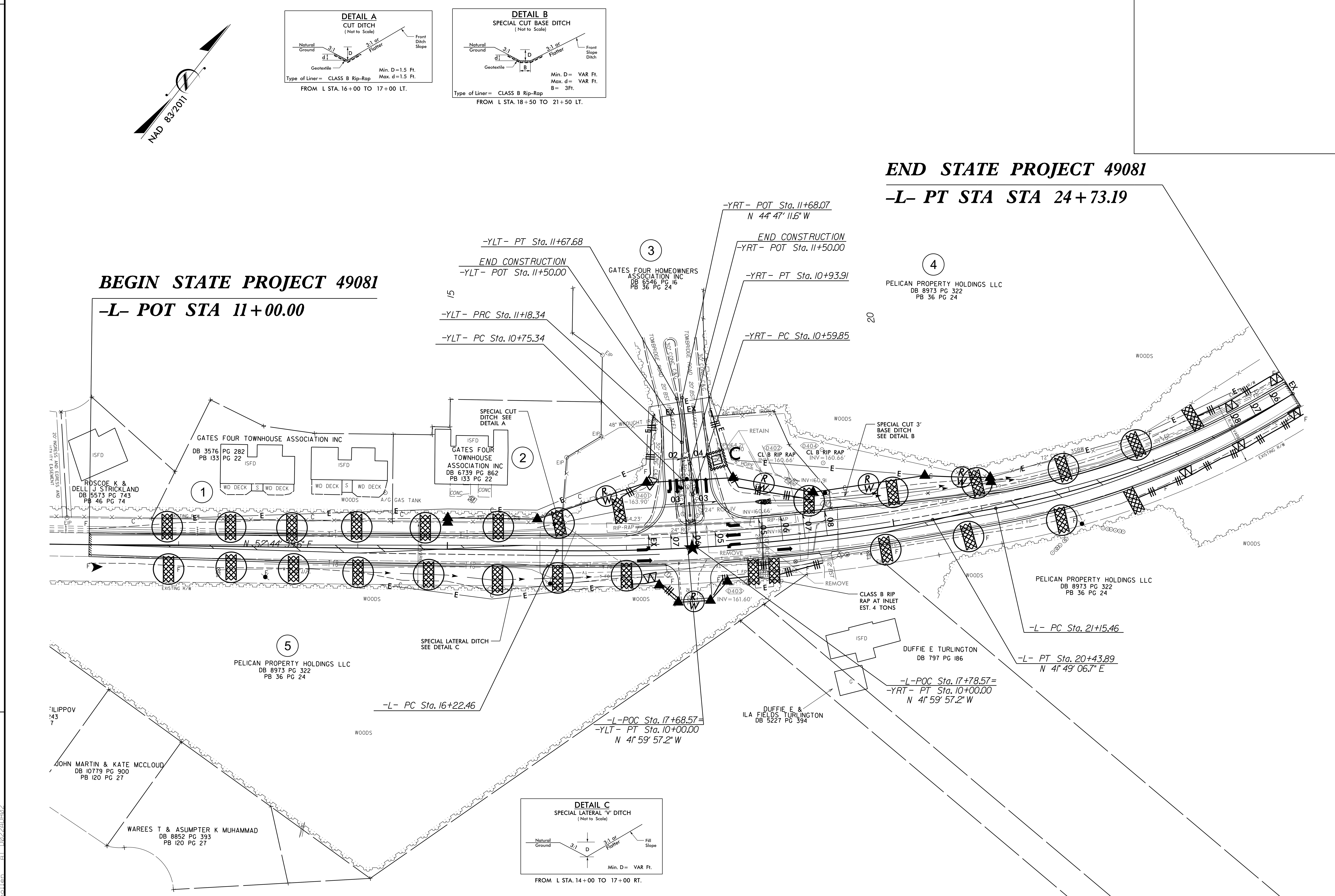


REVISIONS

8/17/99

29-APR-2025 10:46
Lakewood Dr. at Towbridge Erosion Control\Roadside Environmental\Erosion Control\Design\49081_EC_psh_4.dgn

PROJECT REFERENCE NO.	SHEET NO.
49081	EC-05/CONST.04



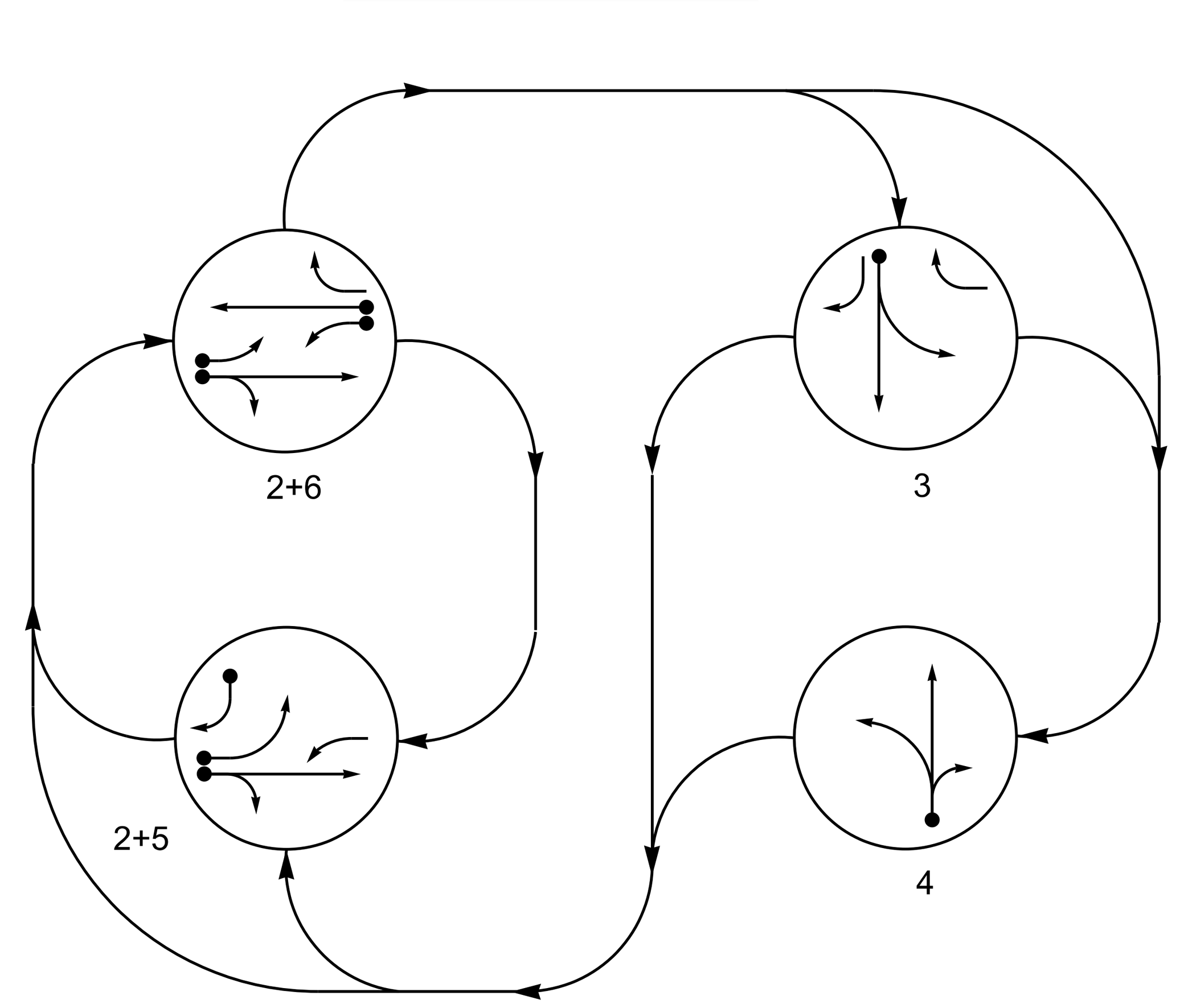
DETAIL A
CUT DITCH
(Not to Scale)
Natural Ground
Front Ditch Slope
3:1 or Flatter
Geotextile
Min. D=1.5 Ft.
Max. d=1.5 Ft.
Type of Liner= CLASS B Rip-Rap
FROM L STA. 16+00 TO 17+00 LT.
DETAIL B
SPECIAL CUT BASE DITCH
(Not to Scale)
Min. D= VAR Ft.
Max. d= VAR Ft.
B= 3Ft.
Type of Liner= CLASS B Rip-Rap
FROM L STA. 18+50 TO 21+50 LT.
NAD 83/2011
BEGIN STATE PROJECT 49081
-L- POT STA 11+00.00
END STATE PROJECT 49081
-L- PT STA STA 24+73.19
-YLT- PT Sta. 11+67.68
END CONSTRUCTION
-YLT- POT Sta. 11+50.00
-YLT- PRC Sta. 11+18.34
-YLT- PC Sta. 10+75.34
-YRT- POT Sta. 11+68.07
N 44° 47' 11.6" W
END CONSTRUCTION
-YRT- POT Sta. 11+50.00
-YRT- PT Sta. 10+93.91
-YRT- PC Sta. 10+59.85
GATES FOUR HOMEOWNERS ASSOCIATION INC
DB 6546 PG 16
PB 36 PG 24
PELICAN PROPERTY HOLDINGS LLC
DB 8973 PG 322
PB 36 PG 24
GATES FOUR TOWNHOUSE ASSOCIATION INC
DB 3576 PG 282
PB 133 PG 22
GATES FOUR TOWNHOUSE ASSOCIATION INC
DB 6739 PG 862
PB 133 PG 22
ROSCOE K & DELL J STRICKLAND
DB 5573 PG 743
PB 46 PG 74
SPECIAL CUT DITCH SEE DETAIL A
SPECIAL CUT 3' BASE DITCH SEE DETAIL B
SPECIAL LATERAL DITCH SEE DETAIL C
CLASS B RIP RAP AT INLET EST. 4 TONS
-L- PC Sta. 21+15.46
-L- PT Sta. 20+43.89
N 41° 49' 06.7" E
-L-POC Sta. 17+78.57=
-YRT- PT Sta. 10+00.00
N 41° 59' 57.2" W
-L-POC Sta. 17+68.57=
-YLT- PT Sta. 10+00.00
N 41° 59' 57.2" W
-L- PC Sta. 16+22.46
DUFFIE E TURLINGTON
DB 797 PG 186
DUFFIE E & ILA FIELDS TURLINGTON
DB 5227 PG 394
JOHN MARTIN & KATE MCCLOUD
DB 10779 PG 900
PB 120 PG 27
WAREES T & ASUMPTER K MUHAMMAD
DB 8852 PG 393
PB 120 PG 27
WOODS
DETAIL C
SPECIAL LATERAL 'V' DITCH
(Not to Scale)
Fill Slope
Min. D= VAR Ft.
FROM L STA. 14+00 TO 17+00 RT.

REVISIONS

8/17/99

29-APR-2025 10:46 N:\00.60\1074.7-00 NCDOT DIV 6 TRAFFIC GESC\01 - Lakewood Dr. at Towbridge Erosion Control\Roadside Environmental\Erosion Control\Design\49081_EC_psh_5.dgn

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

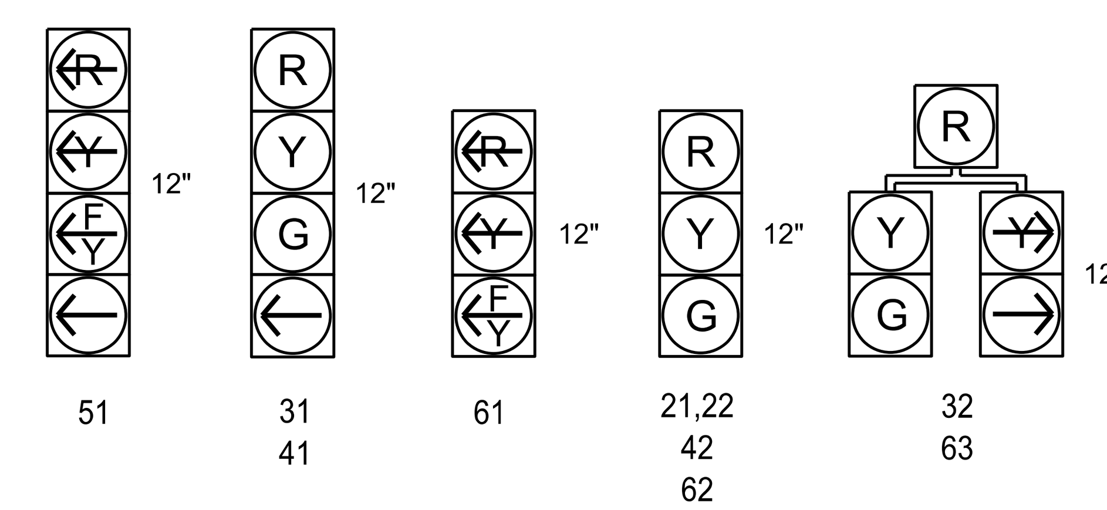
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE 2+5	PHASE 2+6	PHASE 3	PHASE 4	FLASH
21,22	G	G	R	R	R
31	R	R	G ←	R	R
32	R / →	R	G	R	R
41	R	R	R	G ←	R
42	R	R	R	G	R
51	←	F Y ←	←R	←R	←R
61	F Y ←	F Y ←	←R	←R	←R
62	R	G	R	R	R
63	R	G	R / →	R	R

SIGNAL FACE I.D.

All Heads L.E.D.



MAXTIME DETECTOR INSTALLATION CHART

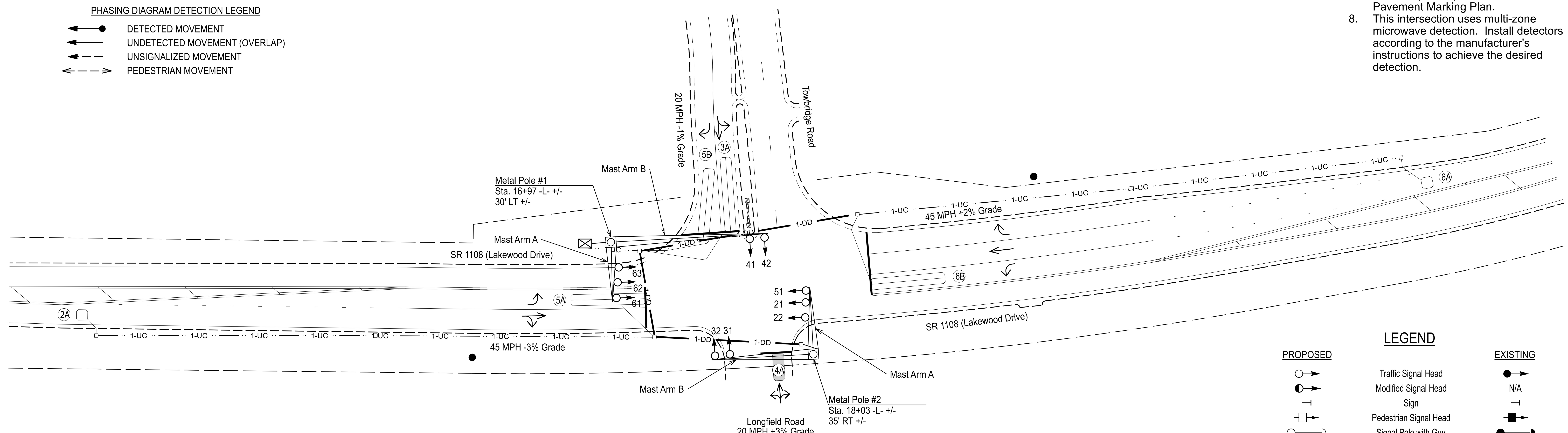
DETECTOR					PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOP LINE (FT)	TURNS	NEW LOOP	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN	NEW CARD
2A	6X6	300	5	X	2	-	-	X	X	X	-	X
3A	6X40	0	2-4-2	X	3	-	-	X	-	X	-	X
4A	*	0	*	-	4	5.0	-	X	-	X	-	-
5A	6X40	0	2-4-2	X	5	15.0	-	X	-	X	-	X
					2	3.0	-	X		X	X	X
5B	6X40	+5	2-4-2	X	5	15.0	-	X	-	X	-	X
6A	6X6	300	5	X	6	-	-	X	X	X	-	X
6B	6X40	0	2-4-2	X	6	3.0	-	X	-	X	X	X

* Multi-zone Microwave Detection

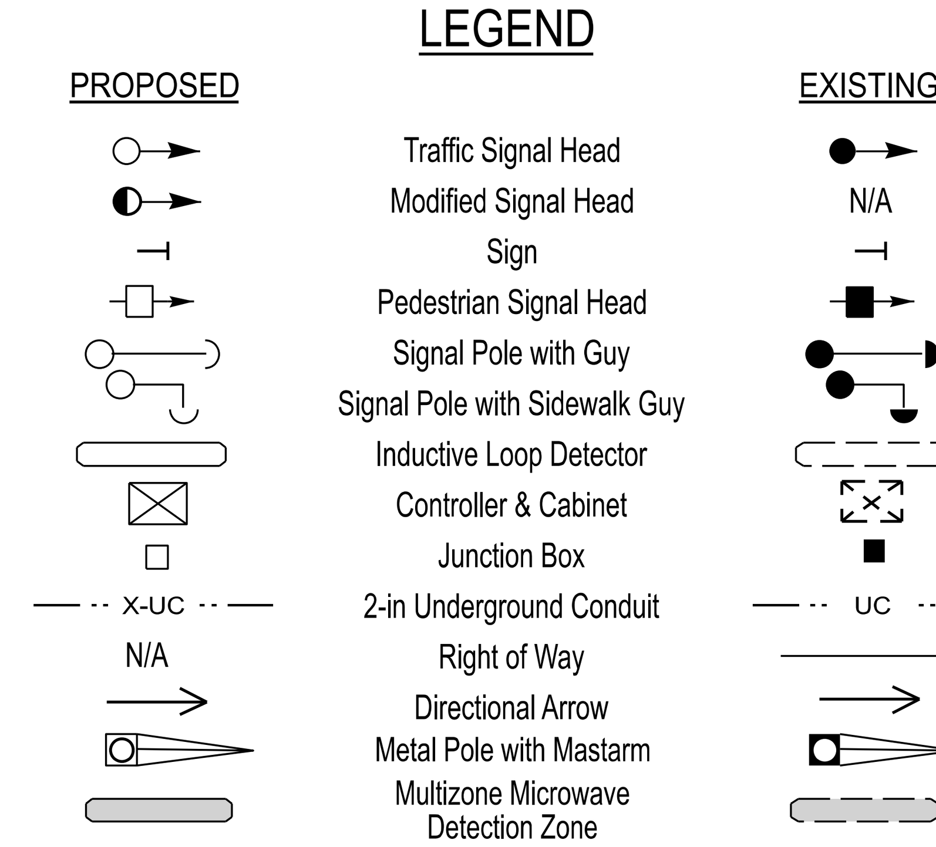
4 Phase
Fully Actuated
Isolated

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 5 may be lagged.
4. The order of phase 3 and phase 4 may be reversed.
5. Set all detector units to presence mode.
6. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
7. Install stop lines per the Pavement Marking Plan.
8. This intersection uses multi-zone microwave detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.



LEGEND



MAXTIME TIMING CHART

FEATURE	PHASE 2	PHASE 3	PHASE 4	PHASE 5	PHASE 6
Walk *	-	-	-	-	-
Ped Clear	-	-	-	-	-
Min Green *	12	7	7	7	12
Passage *	6.0	2.0	2.0	2.0	6.0
Max 1 *	90	25	20	20	90
Yellow Change	4.8	3.0	3.0	3.0	4.8
Red Clear	1.6	1.9	2.3	2.6	1.6
Added Initial *	2.5	-	-	-	2.5
Maximum Initial *	34	-	-	-	34
Time Before Reduction *	15	-	-	-	15
Time To Reduce *	30	-	-	-	30
Minimum Gap	3.0	-	-	-	3.0
Advance Walk	-	-	-	-	-
Non Lock Detector	-	X	X	X	-
Vehicle Recall	MIN RECALL	-	-	-	MIN RECALL
Dual Entry	-	-	-	-	-

* These values may be field adjusted. Do not adjust Min Green and Passage times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

This plan supersedes the plan signed and sealed on 11/16/22.

New Installation

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared in the Offices of: Transportation Mobility and Safety Division, State of North Carolina Department of Transportation, Signal Design Section
750 N. Greenfield Pkwy, Garner, NC 27529

SR 1108 (Lakewood Drive) at Towbridge Road / Longfield Road

Division 6 Cumberland County Fayetteville

PLAN DATE:	January 2025	REVIEWED BY:	BMH
PREPARED BY:	KGP, Jr.	REVIEWED BY:	

REVISIONS	INIT.	DATE

SCALE 0 30 1"=30'

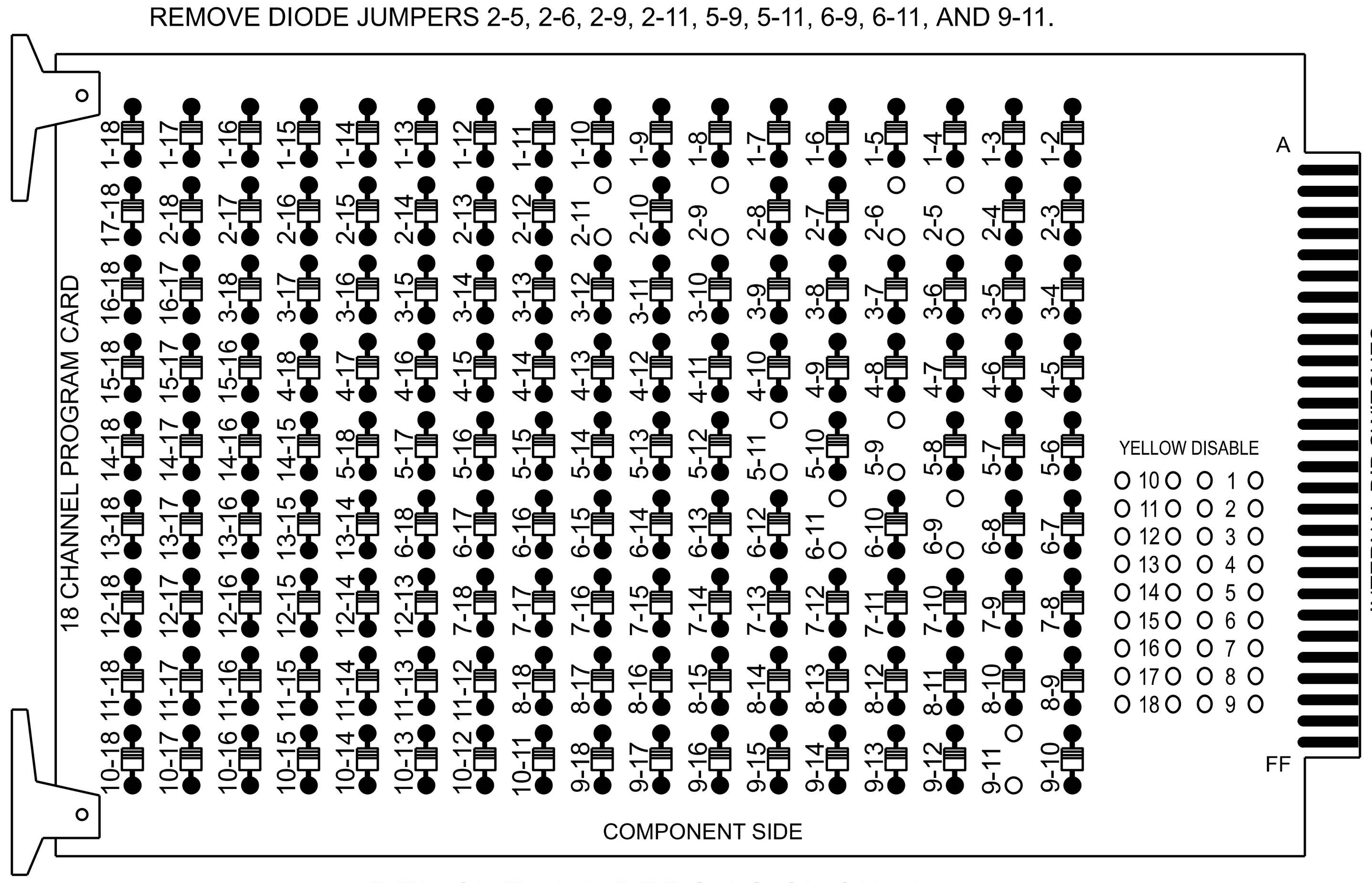
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 047646 ENGINEER BAILEY M. HARDEN
DocuSigned by: Bailey Harden 04/04/2025
DCEF3411623A425...
DATE

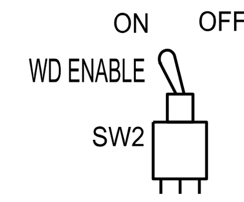
SIG. INVENTORY NO. 06-1395

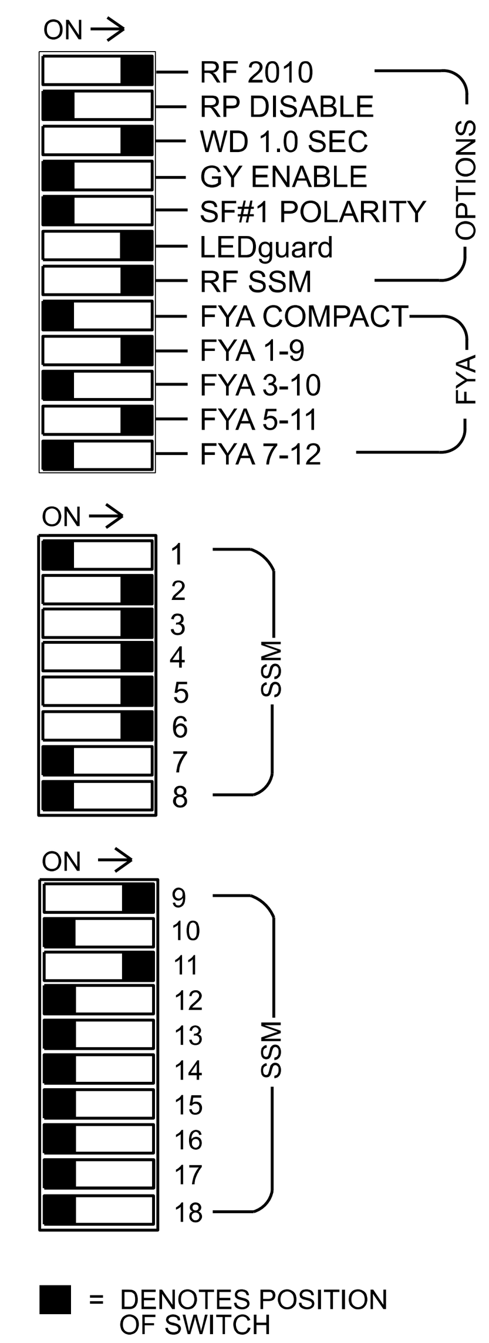
18 CHANNEL IP CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS 2-5, 2-6, 2-9, 2-11, 5-9, 5-11, 6-9, 6-11, AND 9-11.







REMOVE JUMPERS AS SHOWN

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that the Red Enable is active at all times during normal operation.
4. Integrate monitor with Ethernet network in cabinet.

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the signal plan.
2. Program controller to start up in phase 2 Green No Walk and 6 Green No Walk.
3. If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.

EQUIPMENT INFORMATION

Controller..2070LX
Cabinet...332 w/ Aux
Software...Q-Free MAXTIME
Cabinet Mount....................................Base
Output File Positions..........................18 With Aux. Output File
Load Switches Used...........................S2, S4, S5, S7, S8, AUX S1, AUX S4
Phases Used.......................................2, 3, 4, 5, 6
Overlap "1"..*
Overlap "2"..Not Used
Overlap "3"..*
Overlap "4"..Not Used

*See overlap programming detail on sheet 2

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4			S5		S6	S7		S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3			4		14	5		6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3			4		4 PED	5		6	6 PED	7	8	8 PED	OL1	OL2	SPARE	OL3	OL4	SPARE
SIGNAL HEAD NO.	NU	21,22	NU	31	32	63	41	42	NU	51★	32	62,63	NU	NU	NU	NU	61★	NU	NU	51★	NU	NU
RED		128		116	116		101	101		*		134										
YELLOW		129		117	117		102	102				135										
GREEN		130		118	118		103	103				136										
RED ARROW																	A121			A114		
YELLOW ARROW						117					132						A122			A115		
FLASHING YELLOW ARROW																	A123			A116		
GREEN ARROW				118		118	103			133	133											

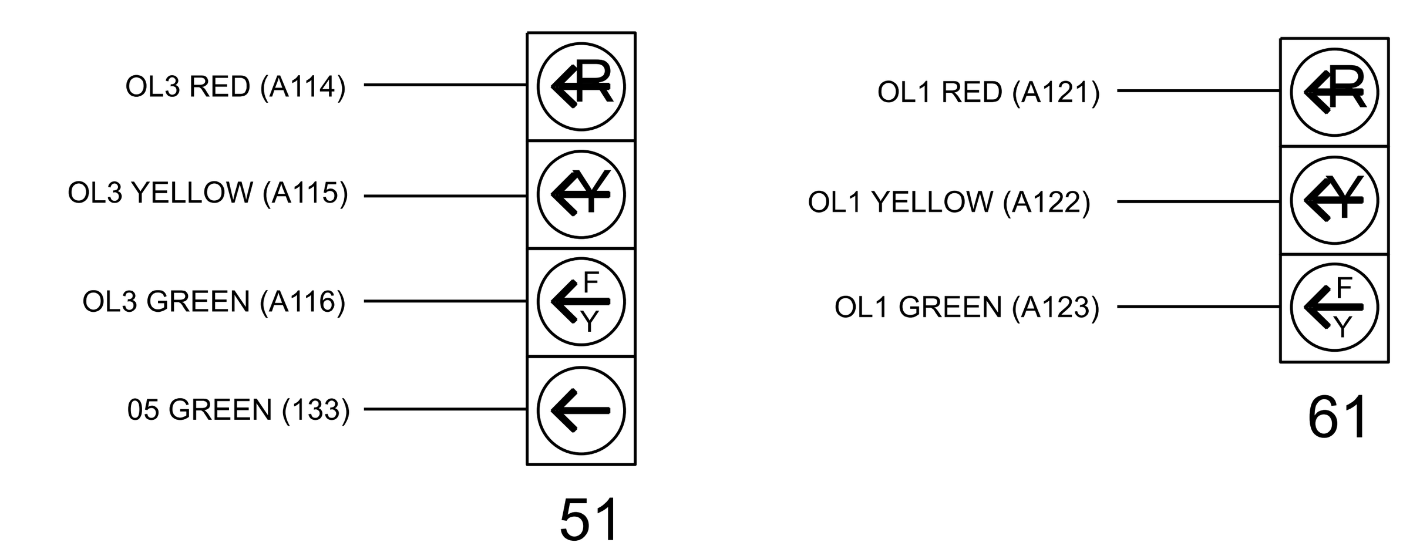
NU = Not Used

* Denotes install load resistor. See load resistor installation detail this sheet.

★See pictorial of head wiring in detail this sheet.

FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



INPUT FILE POSITION LAYOUT

(front view)

FILE		1	2	3	4	5	6	7	8	9	1O	11	12	13	14
"I"	U	SLOT EMPTY	Ø 2 2A	SLOT EMPTY	SLOT EMPTY	Ø 3 3A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
	L		NOT USED			NOT USED									ST DC ISOLATOR
"J"	U	Ø 5 5A	Ø 6 6A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø 5 5B	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L	NOT USED	Ø 6 6B							NOT USED					

EX. : 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT POINT	DETECTOR NO.	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN
2A	TB2-5,6	I2U	39	1	2	2			X	X	X	
3A	TB4-5,6	I5U	58	20	7	3			X		X	
5A	TB3-1,2	J1U	55	17	15	5	15.0		X		X	
				-	31	2	3.0		X		X	X
5B	TB7-9,10	J9U	59	19	27	5	15.0		X		X	
6A	TB3-5,6	J2U	40	2	16	6			X	X	X	
6B	TB3-7,8	J2L	44	6	17	6	3.0		X		X	X

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

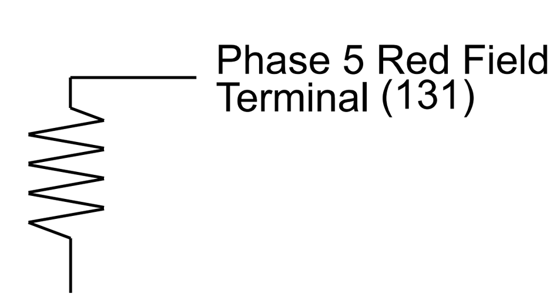
SPECIAL DETECTOR NOTE

Install a multizone microwave detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer -approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown)

ACCEPTABLE VALUES	
Value (ohms)	Wattage
1.5K - 1.9K	25W (min)
2.0K - 3.0K	10W (min)



THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 06-1395
DESIGNED: January 2025
SEALED: 4/4/2025
REVISED: N/A

This plan supersedes the plan signed and sealed 11/16/22.

Electrical Detail - Sheet 1 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Electrical and Programming Details For:

SR 1108 (Lakewood Drive) at Towbridge Road / Longfield Road

Division 6 | Cumberland County | Fayetteville

PLAN DATE: April 2025 | REVIEWED BY:
PREPARED BY: Cameron Barlow | REVIEWED BY:

REVISIONS	INIT.	DATE

Prepared in the Offices of:
Transportation Mobility and Safety Division
ITS & Signals Management Section
750 N. Greenfield Pkwy, Garner, NC 27529

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 059834 ENGINEER SARAH G. KIRKPATRICK
DocuSigned by: Sarah G Kirkpatrick 7ACCC8DB119E46C...
04/07/2025
DATE

SIG. INVENTORY NO. 06-1395

PROJECT REFERENCE NO.	SHEET NO.
49081	Sig. 1.2

OVERLAP PROGRAMMING

Front Panel
Main Menu >Controller >Overlap >Overlap Parameters/Overlap Timings

Web Interface
Home >Controller >Overlap Configuration >Overlaps

Overlap Plan 1

Overlap	1	3
Type	FYA 4 - Section	FYA 4 - Section
Included Phases	2	6
Modifier Phases	-	5
Modifier Overlaps	-	-
Trail Green	0	0
Trail Yellow	0.0	0.0
Trail Red	0.0	0.0

MAXTIME STARTUP AND SOFTWARE FLASH PROGRAMMING DETAIL

Front Panel
Main Menu >Controller >Unit

Web Interface
Home >Controller >Unit

Modify parameters as shown below and save changes.

Start Up Parameters

StartUp Clearance Hold
6

Unit Flash Parameters

All Red Flash Exit Time
6

OUTPUT CHANNEL CONFIGURATION

Front Panel
Main Menu >Controller >More>Channels>Channels Config

Web Interface
Home >Controller >Advanced IO>Channels>Channel Configuration

Channel Configuration

Channel	Control Type	Control Source	Flash Yellow	Flash Red	Flash Alt	MMU Channel
1	Phase Vehicle	1		X	X	1
2	Phase Vehicle	2		X		2
3	Phase Vehicle	3		X	X	3
4	Phase Vehicle	4		X		4
5	Phase Vehicle	5		X		5
6	Phase Vehicle	6		X	X	6
7	Phase Vehicle	7		X		7
8	Phase Vehicle	8		X	X	8
9	Overlap	1		X	X	9
10	Overlap	2		X	X	10
11	Overlap	3		X		11
12	Overlap	4		X		12
13	Phase Ped	2				13
14	Phase Ped	4				14
15	Phase Ped	6				15
16	Phase Ped	8				16
17	Overlap	5		X	X	17
18	Overlap	6		X		18

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 06-1395
DESIGNED: January 2025
SEALED: 4/4/2025
REVISED: N/A

This plan supersedes the plan signed and sealed 11/16/22.

Electrical Detail - Sheet 2 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Electrical and Programming Details For:

Prepared in the Offices of:

Transportation Mobility and Safety Division
NCDEPARTMENT OF TRANSPORTATION
ITS & Signals Management Section

750 N. Greenfield Pkwy, Garner, NC 27529

SR 1108 (Lakewood Drive)
at
Towbridge Road /
Longfield Road

Division 6 | Cumberland County | Fayetteville

PLAN DATE: April 2025 | REVIEWED BY:

PREPARED BY: Cameron Barlow | REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL

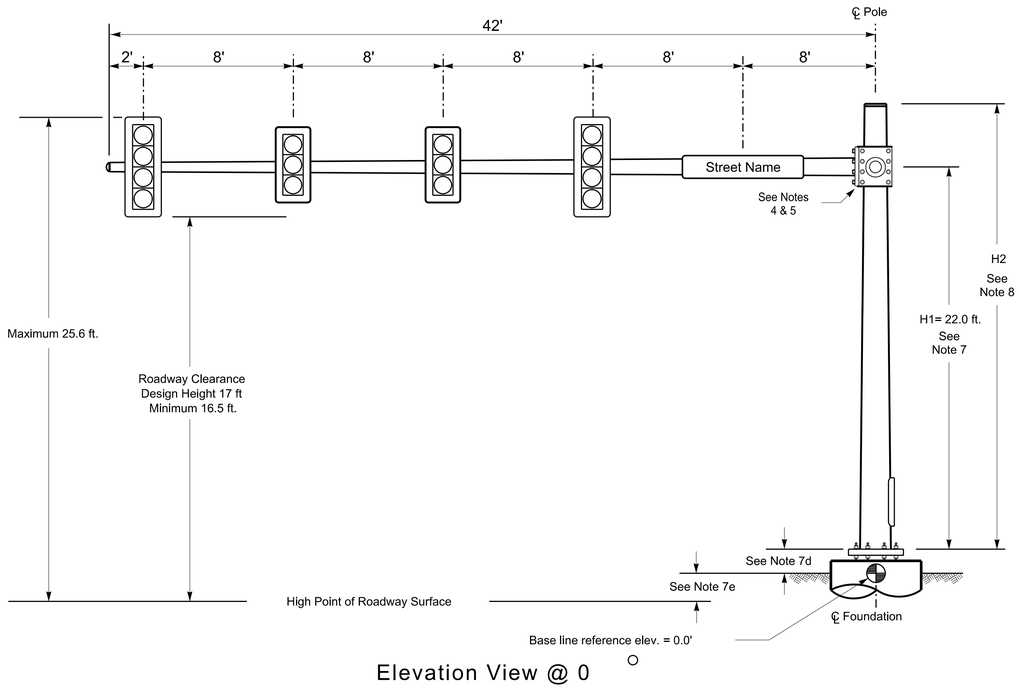
NORTH CAROLINA PROFESSIONAL SEAL 059834 ENGINEER SARAH G. KIRKPATRICK

Sarah G. Kirkpatrick 04/07/2025
DATE

SIG. INVENTORY NO. 06-1395

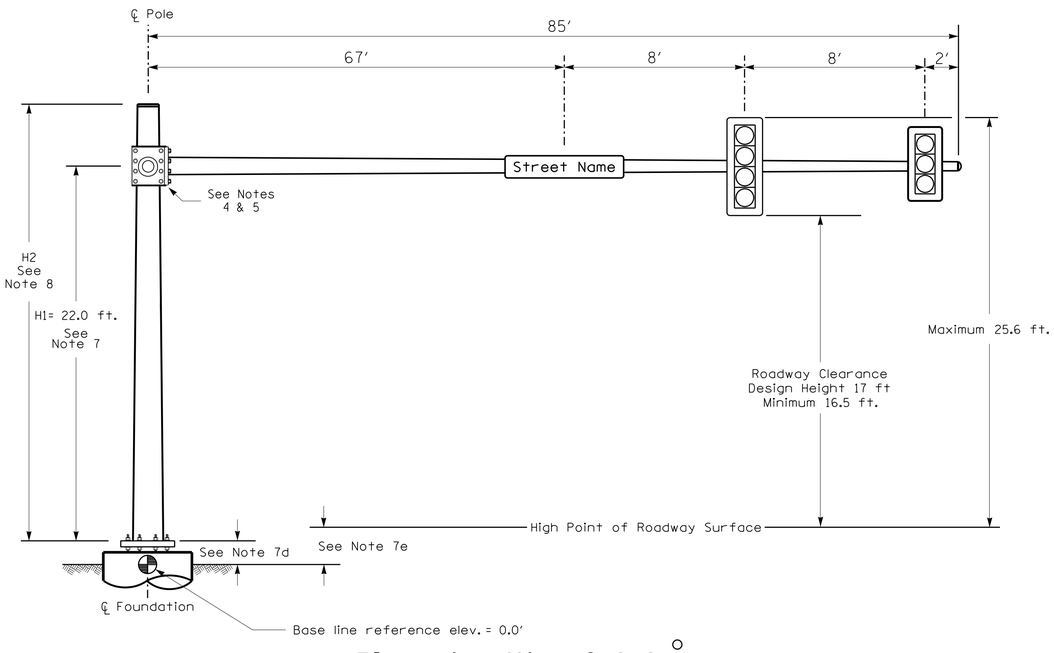
7-APR-2025 09:28
S:\ATS_GS41\IS Signals\Workgroups\Sig Mgmt\Training Associates\Cameron\Projects\06-1395\06-1395_smu_ele_2025mmdi.dgn
crbarlow

Design Loading for METAL POLE NO. 1, MAST ARM A



Elevation View @ 0°

Design Loading for METAL POLE NO. 1, MAST ARM B



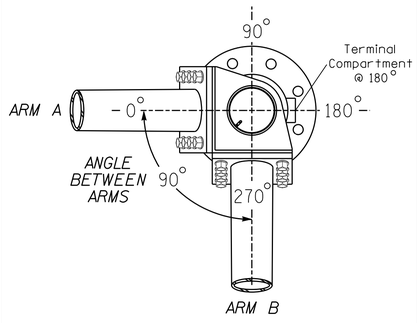
Elevation View @ 270°

SPECIAL NOTE

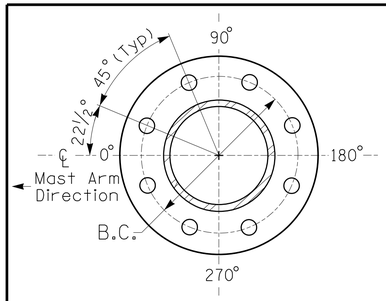
The contractor is responsible for verifying that the mast arm attachment height (H1) will provide the "Design Height" clearance from the roadway before submitting final shop drawings for approval. Verify elevation data below which was obtained by field measurement or from available project survey data.

Elevation Data for Mast Arm Attachment (H1)

Elevation Differences for:	Arm A	Arm B
Baseline reference point at ℄ Foundation @ ground level	0.0 ft.	0.0 ft.
Elevation difference at High point of roadway surface	+2.7 ft.	-1.4 ft.
Elevation difference at Edge of travelway or face of curb	+0.6 ft.	-0.5 ft.

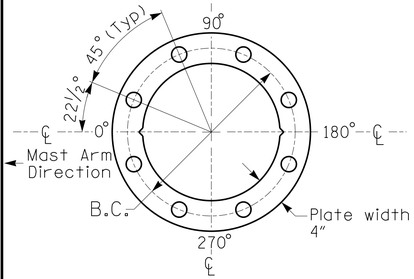


POLE RADIAL ORIENTATION



8 BOLT BASE PLATE DETAIL

See Note 6



BASE PLATE TEMPLATE & ANCHOR BOLT LOCK PLATE DETAIL

For 8 Bolt Base Plate

METAL POLE No. 1

PROJECT REFERENCE NO.	SHEET NO.
49081	Sig.1.3

MAST ARM LOADING SCHEDULE

LOADING SYMBOL	DESCRIPTION	AREA	SIZE	WEIGHT
	RIGID MOUNTED SIGNAL HEAD 12"-3 SECTION-WITH BACKPLATE	9.3 S.F.	25.5"W X 52.5"L	60 LBS
	RIGID MOUNTED SIGNAL HEAD 12"-5 SECTION-WITH BACKPLATE	16.3 S.F.	42.0"W X 56.0"L	103 LBS
	RIGID MOUNTED SIGNAL HEAD 12"-4 SECTION-WITH BACKPLATE	11.5 S.F.	25.5"W X 66.0"L	74 LBS
Street Name	STREET NAME SIGN RIGID MOUNTED	16.0 S.F.	24.0"W X 96.0"L	36 LBS

NOTES

DESIGN REFERENCE MATERIAL

1. Design the traffic signal structure and foundation in accordance with:
   - The 1st Edition 2015 AASHTO LRFD "Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, including all of the latest interim revisions.
   - The 2024 NCDOT "Standard Specifications for Roads and Structures." The latest addenda to the specifications can be found in the traffic signal project special provisions.
   - The 2024 NCDOT Roadway Standard Drawings.
   - The traffic signal project plans and special provisions.
   - The NCDOT "Metal Pole Standards" located at the following NCDOT website: https://connect.ncdot.gov/resources/safety/Pages/TSMO-Design-Resources.aspx

DESIGN REQUIREMENTS

2. Design the traffic signal structure using the loading conditions shown in the elevation views. These are anticipated worst case "design loads" and may not represent the actual loads that will be applied at the time of the installation. The contractor should refer to the traffic signal plans for the actual loads that will be applied at the time of the installation.
3. Design all signal supports using force ratios that do not exceed 0.9.
4. The camber design for the mast arm deflection should provide an appearance of a low pitched arch where the tip or the free end of the mast arm does not deflect below horizontal when fully loaded.
5. A clamp-type bolted mast arm-to-pole connection may be used instead of the welded ring stiffened box connection shown as long as the connection meets all of the design requirements.
6. Design base plate with 8 anchor bolt holes. Provide 2 inch x 60 inch anchor bolts.
7. The mast arm attachment height (H1) shown is based on the following design assumptions:
   a. Mast arm slope and deflection are not considered in determining the arm attachment height as they are assumed to offset each other.
   b. Signal heads are rigidly mounted and vertically centered on the mast arm.
   c. The roadway clearance height for design is as shown in the elevation views.
   d. The top of the pole base plate is 0.75 feet above the ground elevation.
   e. Refer to the Elevation Data Chart for the elevation differences between the proposed foundation ground level and the high point of the roadway.
8. The pole manufacturer will determine the total height (H2) of each pole using the greater of the following:
   - Mast arm attachment height (H1) plus 2 feet, or
   - H1 plus 1/2 of the total height of the mast arm attachment assembly plus 1 foot.
9. If pole location adjustments are required, the contractor must gain approval from the Engineer as this may affect the mast arm lengths and arm attachment heights. The contractor may contact the Signal Design Section Senior Structural Engineer for assistance at (919) 814-5000.
10. The contractor is responsible for verifying that the mast arm length shown will allow proper positioning of the signal heads over the roadway.
11. The contractor is responsible for providing soil penetration testing data (SPT) to the pole manufacturer so site specific foundations can be designed.

NCDOT Wind Zone 3 (130 mph)

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared In the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy,Garner,NC 27529

SR 1108 (Lakewood Drive) at Towbridge Road / Longfield Road

Division 6 Cumberland County Fayetteville

PLAN DATE:	July 2024	REVIEWED BY:	BMH
PREPARED BY:	KGP, Jr.	REVIEWED BY:	ZML

SCALE 0 N/A N/A

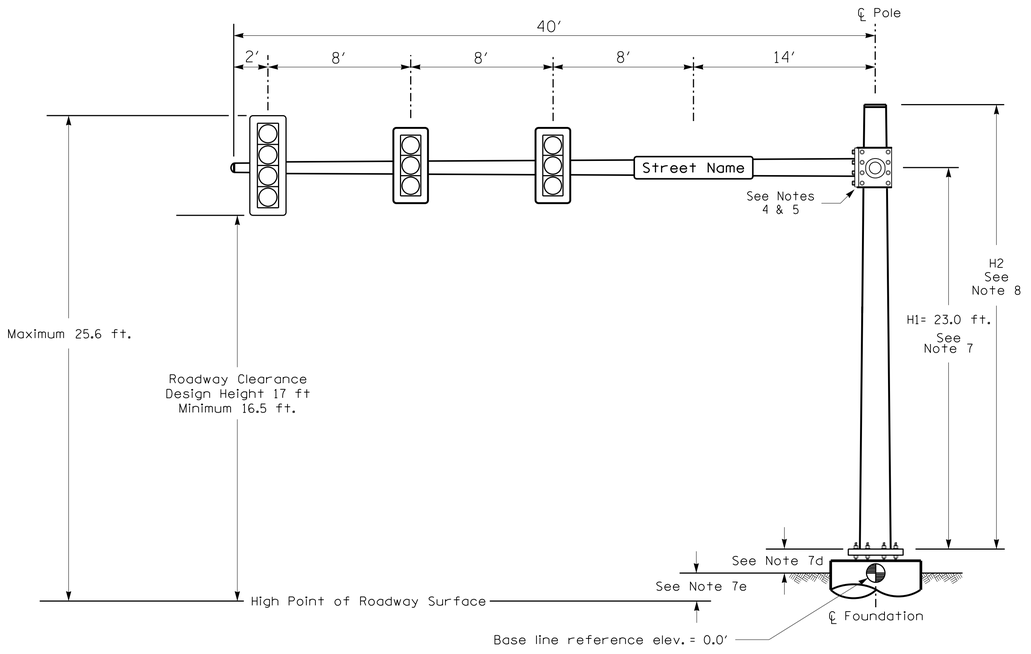
REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 047646 ENGINEER BAILEY M. HARDEN
DocuSigned by: Bailey Harden 04/08/2025
DCEF3411823A429...
DATE

SIG. INVENTORY NO. 06-1395

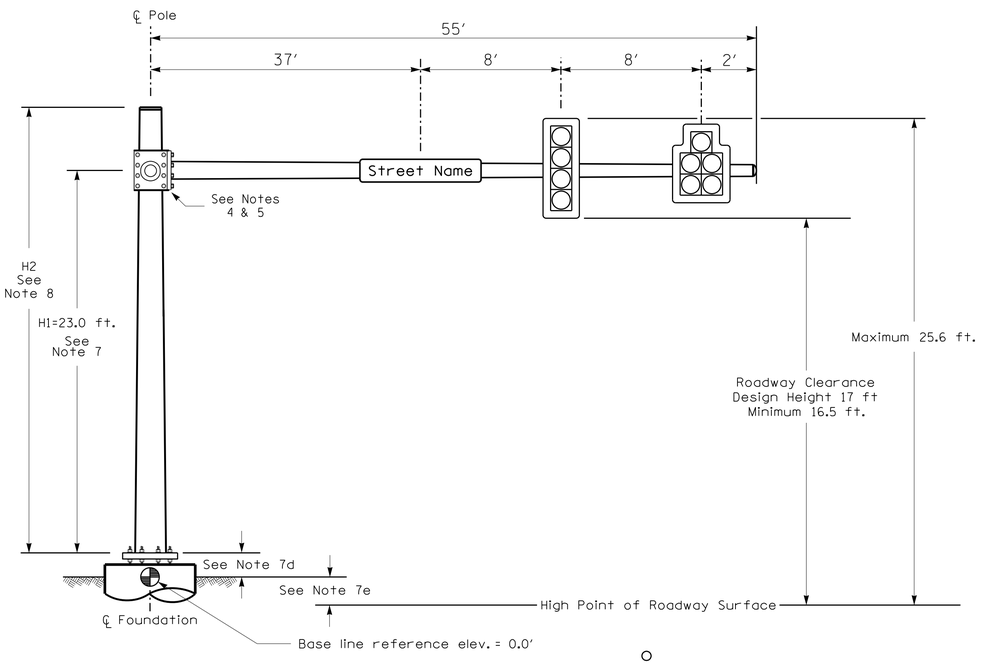
8-APR-2025 11:33
pw://ncdot-pw.bentley.com:ncdot-pw-01/Documents/NCDOT TSMO/Signal Design Section/Division_06/06-1395/Signal Design/2025-01/061395_sig_m1_2025mods.dgn
kgpeedin

Design Loading for METAL POLE NO. 2, MAST ARM A



Elevation View @ 0°

Design Loading for METAL POLE NO. 2, MAST ARM B



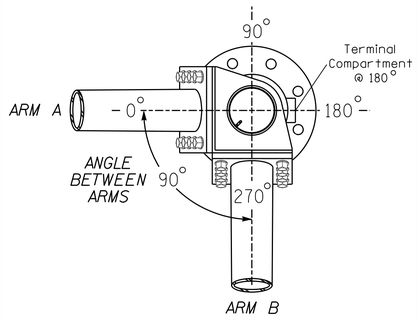
Elevation View @ 270°

SPECIAL NOTE

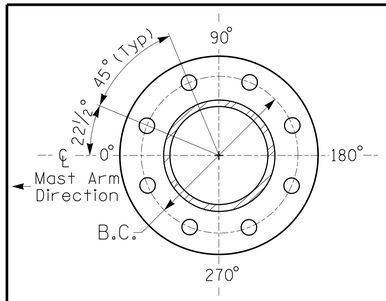
The contractor is responsible for verifying that the mast arm attachment height (H1) will provide the "Design Height" clearance from the roadway before submitting final shop drawings for approval. Verify elevation data below which was obtained by field measurement or from available project survey data.

Elevation Data for Mast Arm Attachment (H1)

Elevation Differences for:	Arm A	Arm B
Baseline reference point at ⊕ ℄ Foundation @ ground level	0.0 ft.	0.0 ft.
Elevation difference at High point of roadway surface	3.1 ft.	0.0 ft.
Elevation difference at Edge of travelway or face of curb	+3.0 ft.	0.0 ft.

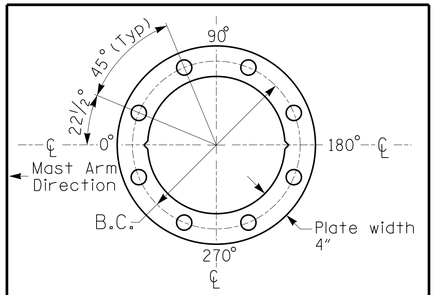


POLE RADIAL ORIENTATION



8 BOLT BASE PLATE DETAIL

See Note 6



BASE PLATE TEMPLATE & ANCHOR BOLT LOCK PLATE DETAIL

For 8 Bolt Base Plate

METAL POLE No. 2

PROJECT REFERENCE NO.	SHEET NO.
49081	Sig. 1.4

MAST ARM LOADING SCHEDULE

LOADING SYMBOL	DESCRIPTION	AREA	SIZE	WEIGHT
	RIGID MOUNTED SIGNAL HEAD 12″-3 SECTION-WITH BACKPLATE	9.3 S.F.	25.5″W X 52.5″L	60 LBS
	RIGID MOUNTED SIGNAL HEAD 12″-5 SECTION-WITH BACKPLATE	16.3 S.F.	42.0″W X 56.0″L	103 LBS
	RIGID MOUNTED SIGNAL HEAD 12″-4 SECTION-WITH BACKPLATE	11.5 S.F.	25.5″W X 66.0″L	74 LBS
Street Name	STREET NAME SIGN RIGID MOUNTED	16.0 S.F.	24.0″W X 96.0″L	36 LBS

NOTES

DESIGN REFERENCE MATERIAL

1. Design the traffic signal structure and foundation in accordance with:
   - The 1st Edition 2015 AASHTO LRFD "Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, including all of the latest interim revisions.
   - The 2024 NCDOT "Standard Specifications for Roads and Structures." The latest addenda to the specifications can be found in the traffic signal project special provisions.
   - The 2024 NCDOT Roadway Standard Drawings.
   - The traffic signal project plans and special provisions.
   - The NCDOT "Metal Pole Standards" located at the following NCDOT website: https://connect.ncdot.gov/resources/safety/Pages/TSMO-Design-Resources.aspx

DESIGN REQUIREMENTS

2. Design the traffic signal structure using the loading conditions shown in the elevation views. These are anticipated worst case "design loads" and may not represent the actual loads that will be applied at the time of the installation. The contractor should refer to the traffic signal plans for the actual loads that will be applied at the time of the installation.
3. Design all signal supports using force ratios that do not exceed 0.9.
4. The camber design for the mast arm deflection should provide an appearance of a low pitched arch where the tip or the free end of the mast arm does not deflect below horizontal when fully loaded.
5. A clamp-type bolted mast arm-to-pole connection may be used instead of the welded ring stiffened box connection shown as long as the connection meets all of the design requirements.
6. Design base plate with 8 anchor bolt holes. Provide 2 inch x 60 inch anchor bolts.
7. The mast arm attachment height (H1) shown is based on the following design assumptions:
   a. Mast arm slope and deflection are not considered in determining the arm attachment height as they are assumed to offset each other.
   b. Signal heads are rigidly mounted and vertically centered on the mast arm.
   c. The roadway clearance height for design is as shown in the elevation views.
   d. The top of the pole base plate is 0.75 feet above the ground elevation.
   e. Refer to the Elevation Data Chart for the elevation differences between the proposed foundation ground level and the high point of the roadway.
8. The pole manufacturer will determine the total height (H2) of each pole using the greater of the following:
   - Mast arm attachment height (H1) plus 2 feet, or
   - H1 plus 1/2 of the total height of the mast arm attachment assembly plus 1 foot.
9. If pole location adjustments are required, the contractor must gain approval from the Engineer as this may affect the mast arm lengths and arm attachment heights. The contractor may contact the Signal Design Section Senior Structural Engineer for assistance at (919) 814-5000.
10. The contractor is responsible for verifying that the mast arm length shown will allow proper positioning of the signal heads over the roadway.
11. The contractor is responsible for providing soil penetration testing data (SPT) to the pole manufacturer so site specific foundations can be designed.

NCDOT Wind Zone 3 (130 mph)

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared in the Offices of:
Transportation Mobility and Safety Division
Signal Design Section
750 N.Greenfield Pkwy.Garner,NC 27529

SR 1108 (Lakewood Drive) at Towbirdge Road /

Division 6 Cumberland County Fayettville

PLAN DATE:	January 2024	REVIEWED BY:	BMH
PREPARED BY:	KGP, Jr.	REVIEWED BY:	ZMH

SCALE 0 N/A N/A

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 047646 ENGINEER BAILEY M. HARDEN

DocuSigned by: Bailey Harden 04/08/2025
DCEF3411623A425...

SIG. INVENTORY NO. 06-1395

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	49081	X-1

6/23/16

09-JUL-2024 13:09
S:\DDC\DDC\Projects\49081 Towbridge Road\Roadway\cm\NEW\49081_Rdy_xpl_L.dgn
$$$$USERNAME$$$$

6/23/16

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	49081	X-2

75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

180 175 170 185

3:1 3:1 0.076 176.68 0.028 3:1 3:1

173.70 174.97

176.49
15+00.00

3:1 3:1 0.063 177.84 0.011 3:1 3:1

175.11 175.83

177.66
14+50.00

S.S.177.96

3:1 3:1 0.048 178.87 0.006 3:1

176.43

178.72
14+00.00

S.S.178.47

3:1 3:1 0.044 179.83 0.016 3:1

177.48

179.67
13+50.00

S.S.179.16

3:1 3:1 0.047 180.69 0.019 3:1

178.32

180.54
13+00.00

6/23/16

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	49081	X-3

75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

175 170 165 160

Entrance to Gates Four

0.070 169.03 0.047

3:1

S.S. 169.75

168.82

17+50.00

NON STANDARD SHOULDER WIDTH 14.56'

0.074 170.63 0.032

3:1 3:1 3:1 3:1

163.90 169.24

170.41

17+00.00

NON STANDARD SHOULDER WIDTH 9.46'

0.070 172.22 0.030

3:1 3:1 3:1 3:1

167.47 170.36

172.02

16+50.00

175 170 165 180

0.079 173.80 0.036

3:1 3:1 3:1 3:1

170.69 171.33

173.66

16+00.00

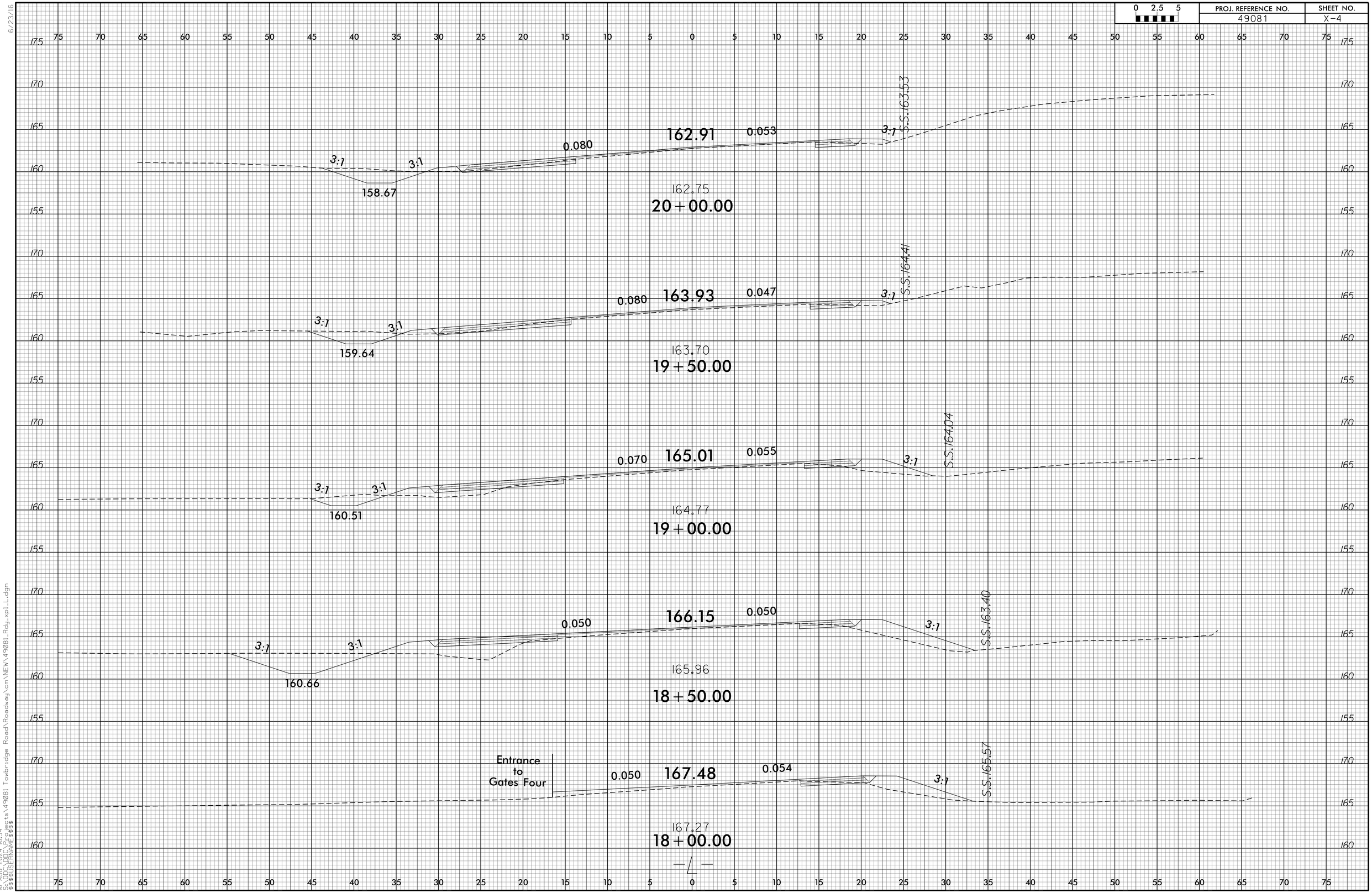
0.083 175.37 0.036

3:1 3:1 3:1 3:1

172.21 172.23

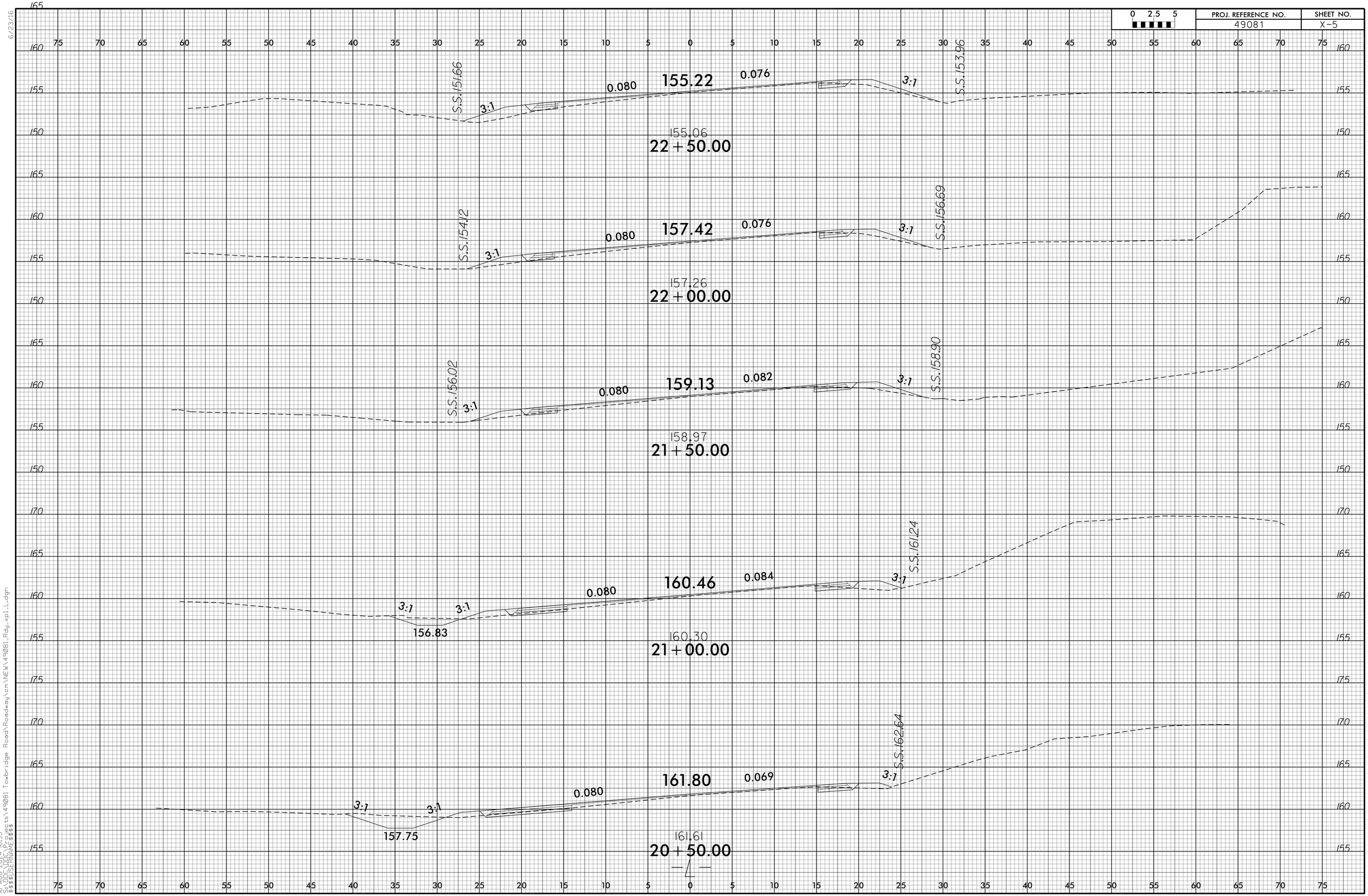
175.19

15+50.00



6/23/16

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	49081	X-5



16-AUG-2024 16:33
C:\Projects\49081 Towbridge Road\Roadway\cm\NEW\49081_Rdy_xpl_L.dgn
$$$$USERNAME$$$$

PROJ. REFERENCE NO.	SHEET NO.
49081	X-6

6/23/16

09-JUL-2024 13:18
S:\DDC\DDC\Projects\49081 Towbridge Road\Roadway\cm\NEW\49081_Rdy_xpl_L.dgn
$$$$USERNAME$$$$

6/23/16

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	49081	X-7

75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

170
165
160
175

EXIST

166.91
11+50.00

S.S.167.04
3:1
0.020
166.28
–YRT–

165.84
11+00.00

S.S.167.83
0.030
166.51
–YRT–

166.35
10+50.00
–YLT–

31-AUG-2021459
D:\Projects\49081 Towbridge Road\Roadway\cm\NEW\49081_Rdy_xpl_Y.dgn
$$$$USERNAME$$$$

6/23/16

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	49081	X-8

75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

170 165 160 170 175 170 165 160

EXIST

167.01
11+50.00

–YLT–
166.05
0.040
3:1
S.S.164.30

165.55
11+00.00

–YLT–
166.24
0.030
3:1
S.S.163.31

165.96
10+50.00

–YRT–

31-AUG-2021 14:59
C:\Projects\49081 Towbridge Road\Roadway\cm\NEW\49081_Rdy_xpl_Y.dgn
$$$$USERNAME$$$$