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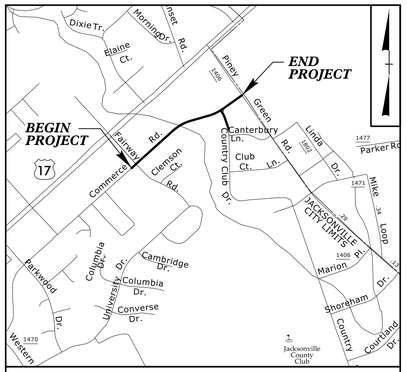
09/08/99

TIP PROJECT: U-5878

CONTRACT: DC0185

See Sheet 1A For Index of Sheets
See Sheet 1B For Conventional Symbols



VICINITY MAP

N.T.S.

100% Plans

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-5878	1	

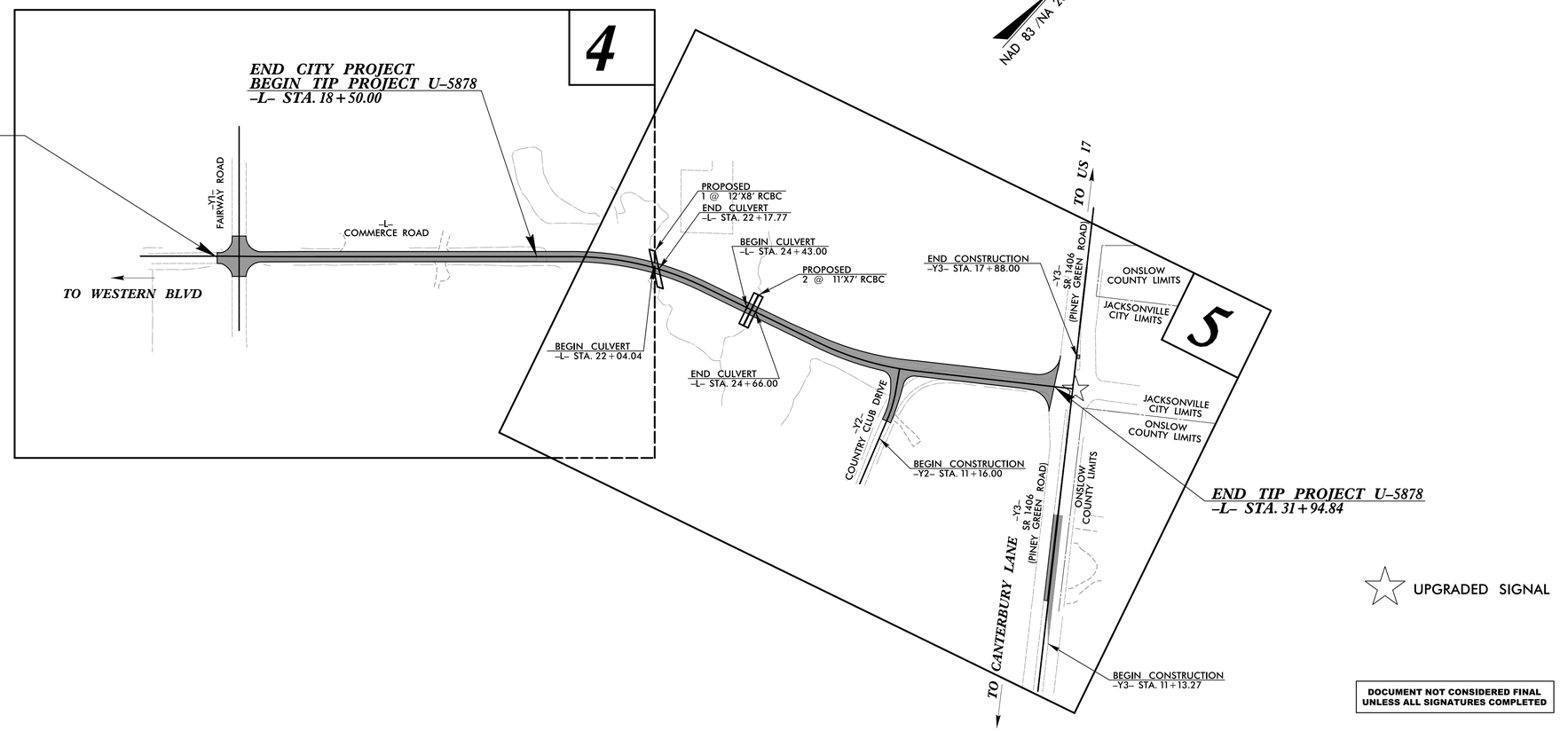
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
44694.1.1	N/A	P.E.
44694.2.1	N/A	ROW & UTIL
44694.3.1	N/A	CONST.

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

ONSLOW COUNTY

LOCATION: EXTENSION OF COMMERCE ROAD FROM FAIRWAY ROAD TO PINEY GREEN ROAD (SR 1406) AT COUNTRY CLUB DRIVE

TYPE OF WORK: GRADING, PAVING, DRAINAGE & CULVERTS



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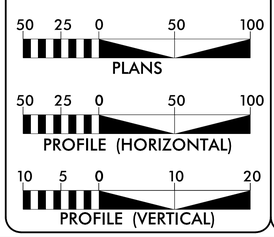
GRAPHIC SCALES



DESIGN DATA

ADT 2022 = 2,200
ADT 2042 = 8,200
K = 9
T = 4%
V = 30 MPH

* TTST = 1%, DUALS = 3%

FUNC. CLASSIFICATION: MAJOR COLLECTOR

PROJECT LENGTH

LENGTH OF CITY PROJECT = 0.127 MILES

LENGTH OF ROADWAY TIP PROJECT U-5878 = 0.248 MILES

LENGTH OF STRUCTURE TIP PROJECT U-5878 = 0.007 MILES

TOTAL LENGTH OF TIP PROJECT U-5878 = 0.255 MILES

NCDOT CONTACT: BRIAN HARDING, PE
NCDOT DIVISION 3

PLANS PREPARED FOR THE NCDOT BY:
STV ENGINEERS, INC.
1600 Perimeter Park Dr., Suite 225, Morrisville, NC 27560
NC License Number F-0991

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: AUGUST 7, 2018

LETTING DATE: JUNE 30, 2022

PATRICK A. LIVINGSTON, PE
PROJECT ENGINEER

WESTON D. MURPHY, PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

DocuSigned by: David Bocker P.E.
SIGNATURE:

NORTH CAROLINA PROFESSIONAL SEAL 029984 ENGINEER DAVID P. BOCKER 5/24/2022

ROADWAY DESIGN ENGINEER

DocuSigned by: Patrick Livingston P.E.
SIGNATURE:

NORTH CAROLINA PROFESSIONAL SEAL 045257 ENGINEER PATRICK A. LIVINGSTON 5/23/2022

STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION ·

5/23/2022
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MooreDS

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PROJECT REFERENCE NO.	SHEET NO.
U-5878	1A

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 045257 ENGINEER PATRICK A. LIVINGSTON

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STV 100 Years
STV Engineers, Inc.
1600 Perimeter Park Dr.
Suite 225
Morrisville, NC 27560
NC License Number F-0991

INDEX OF SHEETS

SHEET NUMBER	SHEET
1	TITLE SHEET
1A	INDEX OF SHEETS, GENERAL NOTES, & LIST OF STANDARD DRAWINGS
1B	CONVENTIONAL SYMBOLS
2A-1 THRU 2A-3	PAVEMENT SCHEDULE, TYPICAL SECTIONS, AND DETAILS SHEET
2C-1	PAVEMENT MARKING DETAIL
3B-1	EARTHWORK AND EXISTING ASPHALT PAVEMENT REMOVAL SUMMARIES
3D-1THRU 3D-2	DRAINAGE SUMMARY SHEETS
3G-1	GEOTECHNICAL SUMMARY SHEET
4 THRU 5	PLANS SHEETS
6	PROFILE SHEET
RW-1 THRU RW-5	SURVEY CONTROL, EXISTING CENTERLINES, RIGHT OF WAY, EASEMENTS AND PROPERTY TIES
TMP-1 THRU TMP-5	TRANSPORTATION MANAGEMENT PLANS
PMP-1 THRU PMP-3	PAVEMENT MARKING AND SIGNING PLANS
EC-1 THRU EC-7	EROSION CONTROL PLANS
SIG 1.0 THRU SIG 4.4	SIGNAL PLANS
UC-1 THRU UC-7	UTILITY CONSTRUCTION PLANS
UO-1 THRU UO-6	UTILITY BY OTHERS PLANS
X-1A	CROSS SECTION SUMMARY SHEET
X-1 THRU X-16	CROSS SECTIONS
C-1 THRU C-10	CULVERT PLANS

GENERAL NOTES

GENERAL NOTES: 2018 SPECIFICATIONS
EFFECTIVE: 01-16-2018

GRADE LINE:
GRADING AND SURFACING:

THE GRADE LINES SHOWN DENOTE THE FINISHED ELEVATION OF THE PROPOSED SURFACING AT GRADE POINTS SHOWN ON THE TYPICAL SECTIONS. GRADE LINES MAY BE ADJUSTED AT THEIR BEGINNING AND ENDING AND AT STRUCTURES AS DIRECTED BY THE ENGINEER IN ORDER TO SECURE A PROPER TIE-IN.

CLEARING:

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

SUPERELEVATION:

ALL CURVES ON THIS PROJECT SHALL BE SUPERELEVATED IN ACCORDANCE WITH STD. 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.

SIDE ROADS:

THE CONTRACTOR WILL BE REQUIRED TO DO ALL THE 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:

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

STREET TURNOUT:

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

TEMPORARY SHORING:

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

UTILITIES:

UTILITIES OWNED ON THIS PROJECT ARE
POWER - DUKE ENERGY
POWER - JONES-ONSLOW EMC
TELEPHONE - CENTURY LINK
CATV - CHARTER / SPECTRUM
FO - CROWN CASTLE

RIGHT-OF-WAY MARKERS:

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

CURB RAMPS:

CURB RAMPS ARE SHOWN ON THE PLANS AT APPROXIMATE LOCATIONS. CONSTRUCT ALL CURB RAMPS ACCORDANCE WITH STD 848.05 and/or 848.06.

STANDARD DRAWINGS

2018 ROADWAY ENGLISH STANDARD DRAWINGS EFF. 01-16-2018

The following Roadway Standards as appear in "Roadway Standard Drawings" Highway Design Branch - N. C. Department of Transportation - Raleigh, N. C., Dated January, 2018 are applicable to this project and by reference hereby are considered a part of these plans:

STD.NO.	TITLE
DIVISION 2 - EARTHWORK	
200.03	Method of Clearing - Method III
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superelevation - Two Lane Pavement
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation
310.01	Driveway Pipe Installation
DIVISION 6 - ASPHALT BASES AND PAVEMENTS	
654.01	Pavement Repairs
DIVISION 8 - INCIDENTALS	
840.00	Concrete Base Pad for Drainage Structures
840.01	Brick Catch Basin - 12" thru 54" Pipe
840.02	Concrete Catch Basin - 12" thru 54" Pipe
840.03	Frame, Grates and Hood - for Use on Standard Catch Basin
840.15	Brick Drop Inlet - 12" thru 30" Pipe
840.16	Drop Inlet Frame and Grates - for use with Std. Dwg 840.14 and 840.15
840.66	Drainage Structure Steps
846.01	Concrete Curb, Gutter and Curb & Gutter
848.01	Concrete Sidewalk
848.02	Driveway Turnout - Radius Type
848.04	Street Turnout
848.05	Curb Ramp - Proposed Curb & Gutter
848.06	Curb Ramp - Existing Curb & Gutter
852.01	Concrete Islands
852.02	Concrete Mountable Median - for Use with Rigid or Flexible Pavement
876.02	Guide for Rip Rap at Pipe Outlets
876.04	Drainage Ditches with Class 'B' Rip Rap

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Morrell

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12/2/2016

PROJECT REFERENCE NO.	SHEET NO.
U-5878	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.

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COMMERCE ROAD
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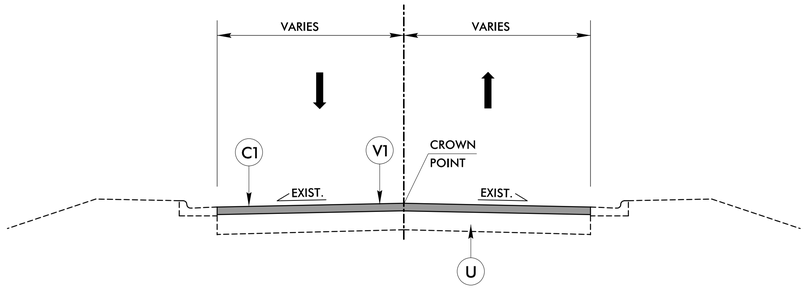
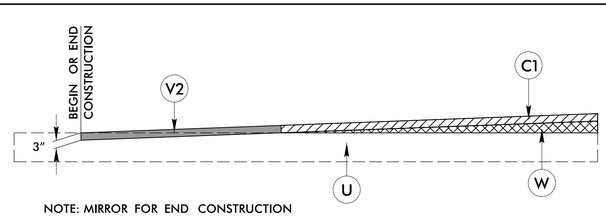


TYPICAL SECTION NO. 1

–L– STA. 11+80.00 (BEGIN CITY PROJECT) TO 12+47.76



NOTE: MIRROR FOR END CONSTRUCTION

MILLING DETAIL

LINE	FROM	TO
–L–	12+47.76	13+20.00
–L–	31+70.00	31+94.84
–Y2–	11+60.00	12+00.00

PROJECT REFERENCE NO.	SHEET NO.
U-5878	2A-1

ROADWAY DESIGN ENGINEER

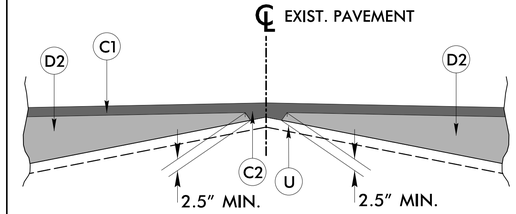
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 045257 PATRICK A. LIVINGSTON 4/20/2022

PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 022896 CLARK S. MORRISON 4/29/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STV 100 Years
STV Engineers, Inc.
1600 Perimeter Park Dr.
Suite 225
Morrisville, NC 27560
NC License Number F-0991



–L– , –Y2–

WEDGING DETAIL

COMMERCE ROAD
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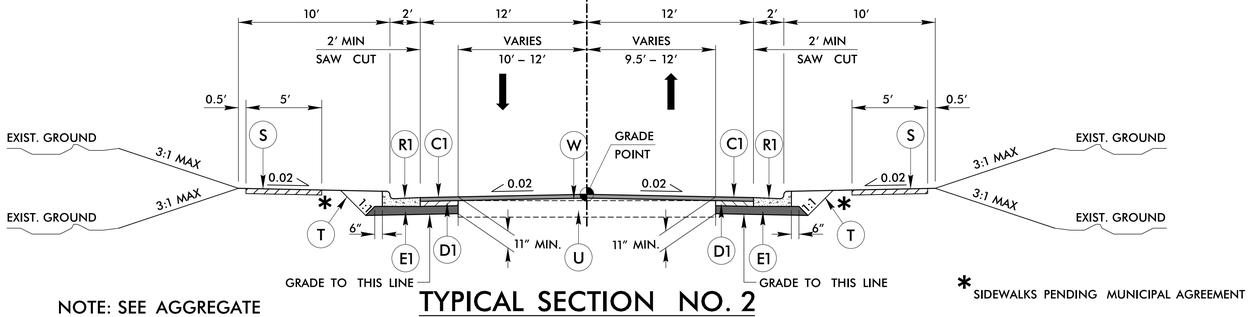
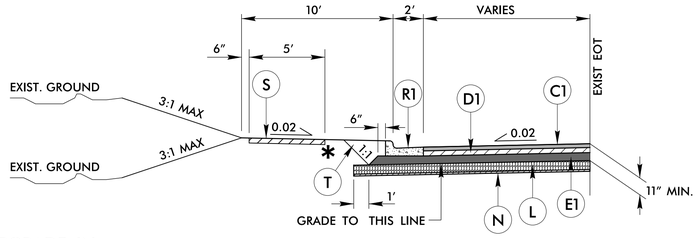


* SIDEWALKS PENDING MUNICIPAL AGREEMENT

NOTE: SEE AGGREGATE SUBGRADE DETAIL

TYPICAL SECTION NO. 2

–L– STA. 12+47.76 TO 18+50.00 (END CITY PROJECT)
–L– STA. 18+50.00 TO 19+28.00



NOTE: USE AGGREGATE SUBGRADE IN ALL AREAS OF FULL DEPTH PAVEMENT FOR THE STATION RANGES LISTED BELOW

AGGREGATE SUBGRADE DETAIL

–L– STA. 12+48.00 TO 19+28.00 (LT & RT)
–L– STA. 29+40.00 TO 31+94.00 (LT & RT)

PAVEMENT SCHEDULE FINAL PAVEMENT DESIGN DATED 07/06/2018	
C1	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ.YD.IN EACH OF TWO LAYERS.
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 1.5" IN DEPTH OR GREATER THAN 2" IN DEPTH.
D1	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
D2	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 2.5" 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.
J1	PROP. 6" AGGREGATE BASE COURSE
L	CLASS IV SUBGRADE STABILIZATION MATERIAL
N	GEOTEXTILE FOR SOIL STABILIZATION
R1	PROP. 2'-6" CURB AND GUTTER
R2	PROP. 1'-6" CURB AND GUTTER
R3	PROP. 4" CONCRETE ISLAND COVER
S	PROP. 4" CONCRETE SIDEWALK
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V1	3" MILLING
V2	VARIABLE DEPTH MILLING (0" TO 3")
W	PAVEMENT WEDGING (SEE WEDGING DETAIL)

NOTES:
ALL PAVEMENT SLOPES 1:1 UNLESS NOTED OTHERWISE
NOT TO SCALE

4/8/2022
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PROJECT REFERENCE NO.	SHEET NO.
U-5878	2A-2

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 045257 PATRICK A. LIVINGSTON 11/12/2021

PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 022896 CLARK S. MORRISON 11/12/2021

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STV 100 Years
STV Engineers, Inc.
1600 Perimeter Park Dr.
Suite 225
Morrisville, NC 27560
NC License Number F-0991

COMMERCE ROAD
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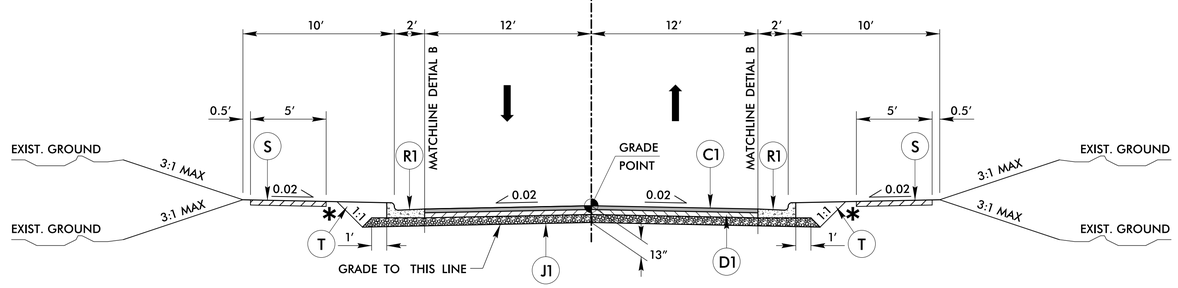
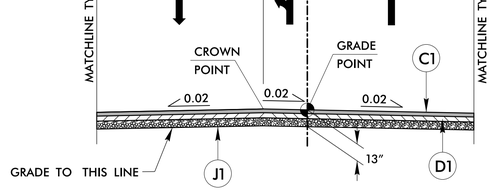


TYPICAL SECTION NO. 3

–L– STA. 19+28.00 TO 29+40.00

* SIDEWALKS PENDING MUNICIPAL AGREEMENT

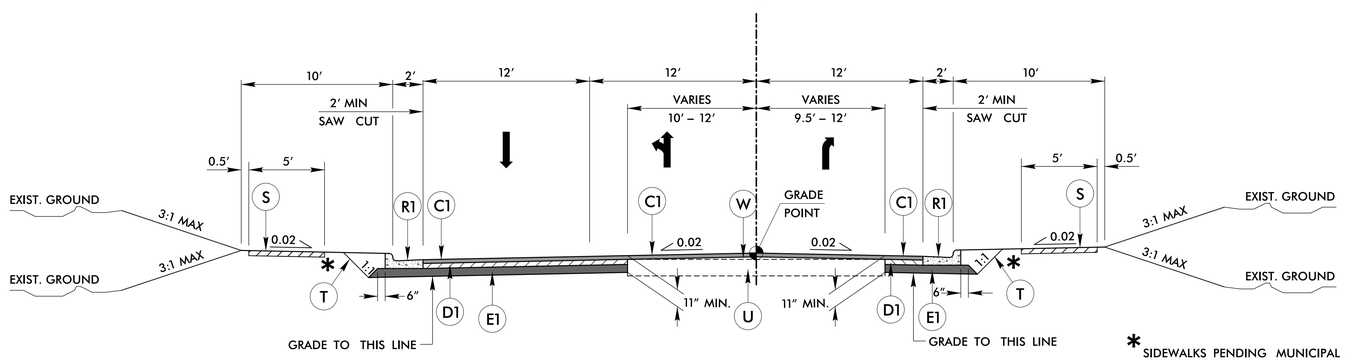
COMMERCE ROAD
℄ –L–



DETAIL A

–L– STA. 25+54.99 TO 26+30.13

COMMERCE ROAD
℄ –L–



NOTE: SEE AGGREGATE SUBGRADE DETAIL

TYPICAL SECTION NO. 4

–L– STA. 29+40.00 TO 31+94.84

* SIDEWALKS PENDING MUNICIPAL AGREEMENT

ALL PAVEMENT SLOPES 1:1 UNLESS NOTED OTHERWISE

C1	3″ S9.5B
C2	VAR. S9.5B
D1	4″ I19.0C
D2	VAR. I19.0C
E1	4″ B25.0C
J1	6″ ABC
L	AGGREGATE SUBGRADE
N	GEOTEXTILE
R1	2′-6″ C&G
R2	1′-6″ C&G
R3	4″ CONC. ISLAND COVER
S	4″ CONC. SIDEWALK
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V1	3″ MILLING
V2	0″ TO 3″ MILLING
W	WEDGING

10/7/2021
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PROJECT REFERENCE NO.	SHEET NO.
U-5878	2A-3

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 045257 ENGINEER PATRICK A. LIVINGSTON

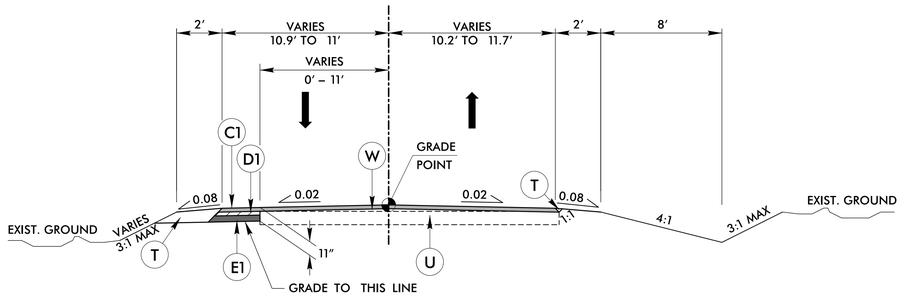
PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022896 ENGINEER CLARK S. MORRISON

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STV 100 Years
STV Engineers, Inc.
1600 Perimeter Park Dr.
Suite 225
Morrisville, NC 27560
NC License Number F-0991

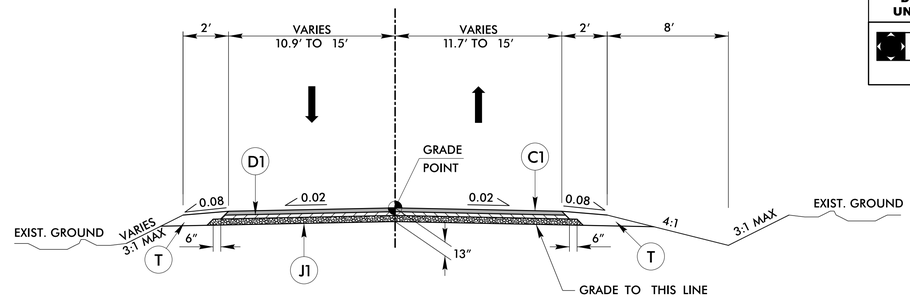
COUNTRY CLUB DRIVE
℄ –Y2–



TYPICAL SECTION NO. 5

–Y2– STA. 11+60.00 TO 12+15.00

COUNTRY CLUB DRIVE
℄ –Y2–



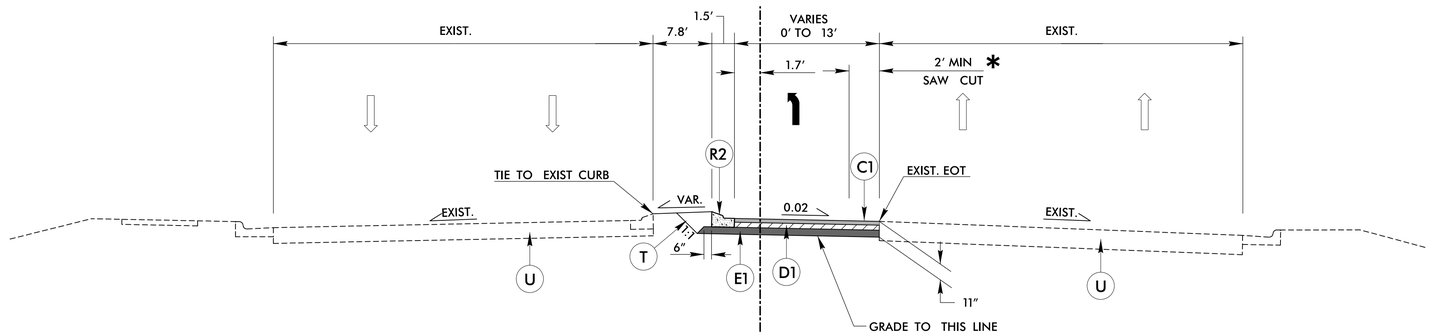
TYPICAL SECTION NO. 6

–Y2– STA. 12+15.00 TO 12+74.68

ALL PAVEMENT SLOPES 1:1 UNLESS NOTED OTHERWISE

C1	3″ S9.5B
C2	VAR. S9.5B
D1	4″ I19.0C
D2	VAR. I19.0C
E1	4″ B25.0C
J1	6″ ABC
L	AGGREGATE SUBGRADE
N	GEOTEXTILE
R1	2′-6″ C&G
R2	1′-6″ C&G
R3	4″ CONC. ISLAND COVER
S	4″ CONC. SIDEWALK
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V1	3″ MILLING
V2	0″ TO 3″ MILLING
W	WEDGING

PINEY GREEN ROAD
℄ –Y3–

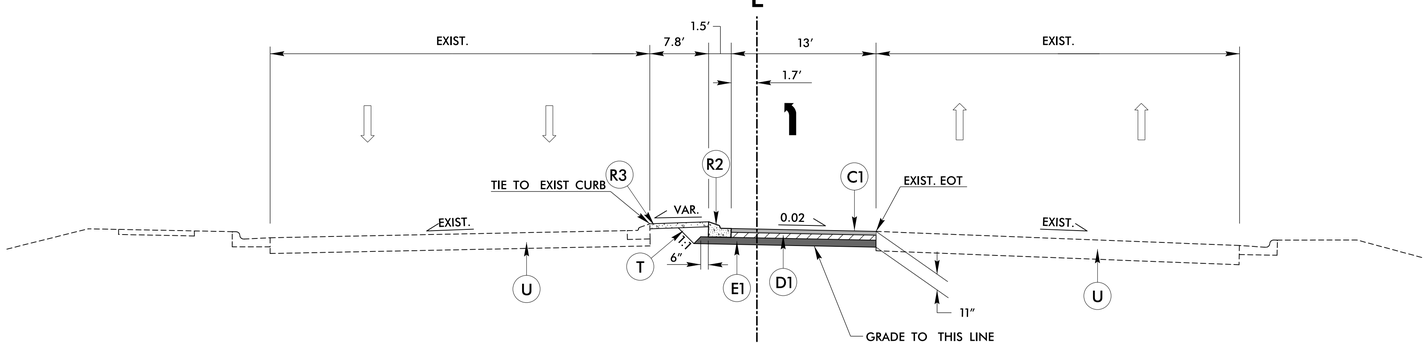


TYPICAL SECTION NO. 7

–Y3– STA. 11+13.27 TO 12+13.27

* SAWCUT IN AREAS OF LESS THAN 2′ WIDENING

PINEY GREEN ROAD
℄ –Y3–



TYPICAL SECTION NO. 8

–Y3– STA. 12+13.27 TO 14+16.06

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Mon, 06 Dec 2021 08:29:42

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5/28/99

PROJECT REFERENCE NO.	SHEET NO.
U-5878	2C-1

STV 100 Years
STV Engineers, Inc.
1600 Perimeter Park Dr.
Suite 225
Morrisville, NC 27560
NC License Number F-0991

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

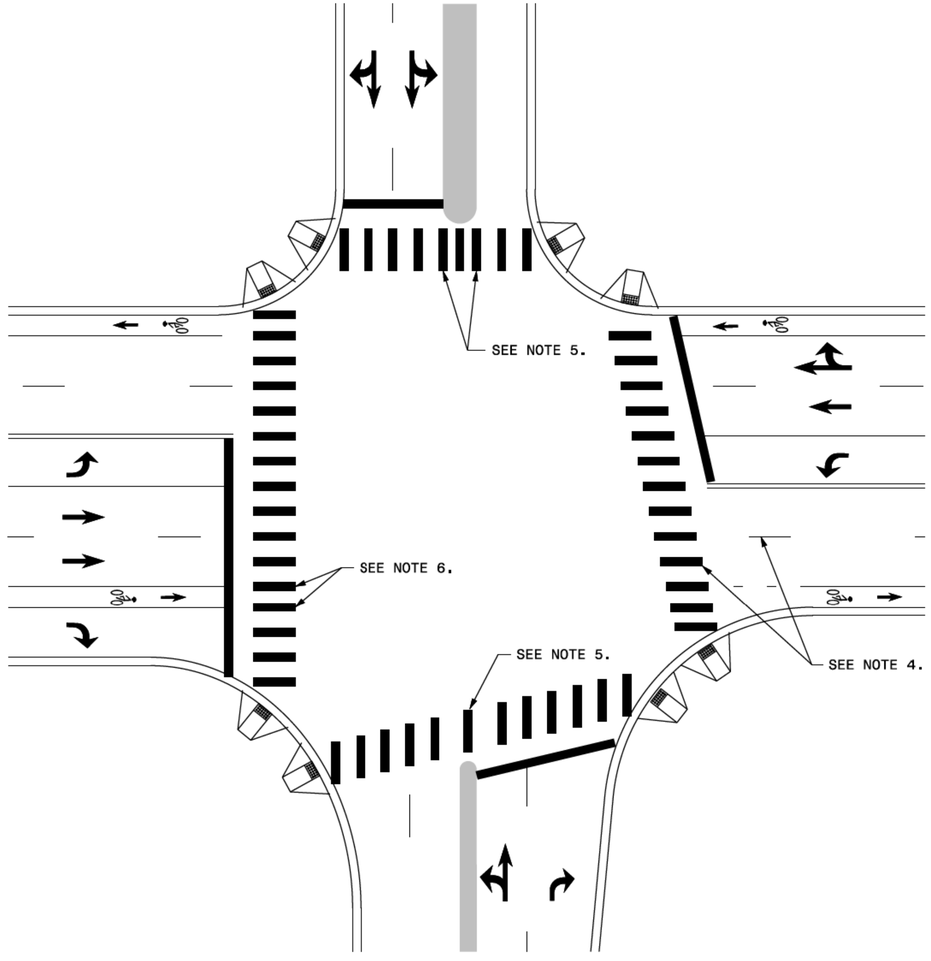
PAVEMENT MARKING DETAIL

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

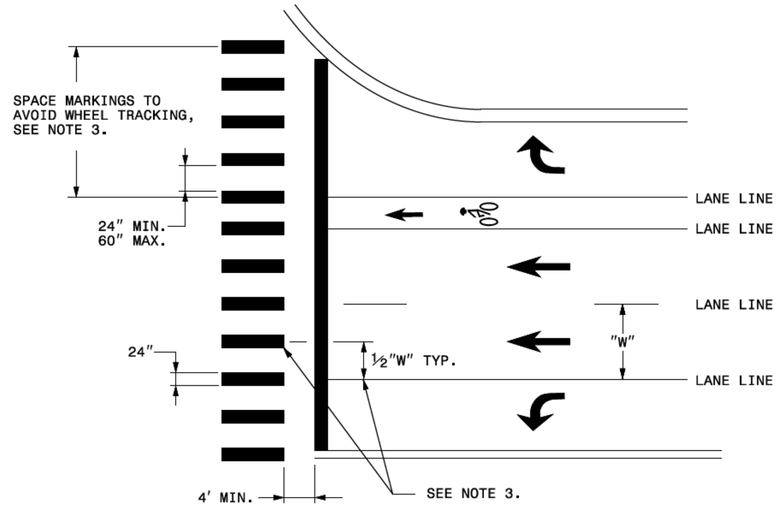
5-18

ENGLISH DETAIL DRAWING FOR
PAVEMENT MARKINGS
HI-VISIBILITY CROSSWALKS
NO-TRACK MARKING GUIDANCE

SHEET 1 OF 1



CROSSWALK INTERSECTION DETAIL



CROSSWALK MARKING DETAIL

GENERAL NOTES:

1- THE GUIDANCE IN THIS DETAIL IS TO BE USED WHEN NO-TRACK SPACING OF HI-VISIBILITY MARKINGS IS REQUESTED.

2- USE THE GUIDANCE SHOWN ON THE ABOVE DETAILS IN CONJUNCTION WITH PAVEMENT MARKING GUIDANCE SHOWN ON ROADWAY STANDARD DRAWINGS 1205.01 AND 1205.07.

3- PLACE MARKINGS TO AVOID WHEELPATH OF VEHICLES. MARKINGS TYPICALLY WILL BE LOCATED CENTERED AT THE LANE LINES AND EDGE LINES WITH ONE ADDITIONAL MARKING CENTERED IN THE MIDDLE OF THE LANE. AT WIDE LANE WIDTHS DUE TO TAPERS AND LARGE RADII, LOCATE MARKINGS AT BEST SPACING TO AVOID WHEEL TRACKING. THE SPACE BETWEEN MARKINGS SHALL NOT BE LESS THAN 24 INCHES OR GREATER THAN 60 INCHES.

4- WHERE THE CROSSWALK IS SKEWED TO THE LANE LINES, THE MARKINGS SHOULD BE PARALLEL TO THE LANE LINES.

5- PLACE MARKINGS ON BOTH EDGES OF THE NOSE OF A MEDIAN. FOR NARROW MEDIANS LESS THAN 4 FEET, A SINGLE MARKING MAY BE USED. FOR WIDE MEDIANS, INSTALL ADDITIONAL MARKINGS IN THE MEDIAN AREA. THE SPACE BETWEEN THE MARKINGS SHALL NOT TO BE LESS THAN 24 INCHES OR GREATER THAN 60 INCHES.

6- LOCATE MARKINGS CENTERED ON BICYCLE LANE LINES. MARKINGS SHALL NOT BE LOCATED IN THE CENTER OF THE BICYCLE PATH.

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

5-18

ENGLISH DETAIL DRAWING FOR
PAVEMENT MARKINGS
HI-VISIBILITY CROSSWALKS
NO-TRACK MARKING GUIDANCE

SHEET 1 OF 1

5-7-18

10/7/2021
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Mon Oct 25

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5/28/99

PROJECT REFERENCE NO.	SHEET NO.
U-5878	3B-1

STV 100 Years
STV Engineers, Inc.
1600 Perimeter Park Dr.
Suite 225
Morrisville, NC 27560
NC License Number F-0991

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF EARTHWORK

IN CUBIC YARDS

LOCATION	UNCLASSIFIED EXCAVATION	UNDERCUT	EMBT + %	BORROW	WASTE
–L– 18 + 50.00 TO 29 + 00.00	508	2,449	14,033	14,011	2,935
–Y2– 11 + 60.00 TO 12 + 74.68	12		104	92	
–Y3– 11 + 13.27 TO 14 + 16.06	190		3		188
SUBTOTAL 1	710	2,449	14,140	14,103	3,123
–L– 12 + 47.76 LT TO 18 + 50.00 LT	89	134	305	305	223
–L– 29 + 00.00 LT TO 31 + 94.84 LT	70	150	123	123	220
SUBTOTAL 2	159	284	428	428	443
–L– 12 + 47.76 RT TO 18 + 50.00 RT	85	153	341	341	238
–L– 29 + 00.00 RT TO 31 + 94.84 RT	17	55	259	259	72
SUBTOTAL 3	102	208	600	600	310
TOTAL	971	2,941	15,168	15,131	3,876
REDUCTION OF UNCLASSIFIED EXCAVATION					750
ADDITIONAL UNDERCUT		450	563	563	450
USE SUITABLE WASTE IN LIEU OF BORROW				–188	–188
SELECT GRANULAR MATERIAL IN LIEU OF BORROW				–3,450	
PROJECT TOTAL	971	3,391	15,731	12,056	4,888
ESTIMATE 5% TO REPLACE TOPSOIL ON BORROW PIT				603	
GRAND TOTAL	971	3,391	15,731	12,659	4,888
SAY	980			12,700	

ESTIMATED DDE = 450 CY
ESTIMATED SHALLOW UNDERCUT (CONTINGENCY) = 100 CY
ESTIMATED CLASS IV SUBGRADE STABILIZATION = 1,490 TONS

NOTE: Earthwork quantities are calculated by the engineer. These earthwork quantities are based in part on subsurface data provided by the Geotechnical Engineering Unit.

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

SUMMARY OF EXISTING ASPHALT PAVEMENT REMOVAL

IN CUBIC YARDS

LOCATION	YD^2
–L– 18 + 50.00 TO 29 + 00.00 RT	213
TOTAL	213
SAY	220

10/7/2021
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Model

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COMPUTED BY: CH DATE: 8/12/2021

CHECKED BY: DB DATE: 10/18/2021

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
U-5878	3D-1

Note: Invert Elevations indicated are for Bid Purposes only and shall not be used for project construction stakeout.

LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 48 INCHES & 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) SIZE 12"	15"	18"	24"	30"	36"	42"	48"	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE
								THICKNESS OR GAUGE								.064	.064	.064	.109
L 12+90	RT	0400		41.8															
		0400	0406		38.8	37.8													
L 13+00	RT	0401		42.5															
		0401	0400		39.6	38.8													
L 12+90	LT	0402		41.8															
		0402	0405		38.8	38.1													
L 13+00	LT	0403		42.5															
		0403	0402		39.6	38.8													
L 14+40	LT	0404		41.3															
		0404	0405		38.8	38.1													
L 14+40	LT	0405		41.6															
		0405	0408		38.1	37.6													
L 14+92	RT	0406		41.4															
		0406	0412		37.8	37.0													
L 14+92	RT	0407		41.5															
		0407	0406		38.5	37.8													
L 15+25	LT	0408		41.3															
		0408	0410		37.6	37.0													
L 15+25	LT	0409		41.2															
		0409	0408		38.5	37.6													
L 16+50	LT	0410		40.9															
		0410	0416		36.8	36.4													
L 16+50	LT	0411		40.3															
		0411	0410		37.9	37.0													
L 16+50	RT	0412		40.9															
		0412	0414		37.0	36.5													
L 16+50	RT	0413		41.5															
		0413	0412		37.7	37.0													
L 17+36	RT	0414		40.7															
		0414	0418		35.7	34.7													
L 17+36	RT	0415		40.5															
		0415	0414		37.3	36.5													
L 17+36	LT	0416		40.7															
		0416	0414		36.4	36.2													
L 17+36	LT	0417		40.0															
		0417	0416		37.5	36.6													
L 19+50	RT	0418		38.6															
		0418	0421		34.7	32.7													
L 19+46	RT	0419		38.8															
		0419	0418		36.2	35.4													
L 19+50	LT	0420		38.7															
		0420	0418		35.4	35.2													
L 20+90	RT	0421		36.7															
		0421	0518		29.1	29.0													
L 19+50	LT	0423		38.0															
		0423	0420		35.8	35.7													
L 22+50	RT	0500		34.8															
		0500	0519		31.8	31.2													
SHEET TOTAL																			

STATION	R.C. PIPE CLASS III 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)	*** RC PIPE CULVERTS, CONTRACTOR DESIGN	**** RC PIPE CULVERTS, CONTRACTOR DESIGN	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 838.11 OR STD. 838.80 (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')	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	CONCRETE TRANSITIONAL SECTION DROP INLET	CATCH BASIN	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME WITH TWO GRATES 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. 840.20	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	J.B. STD. 840.31 OR 840.32	ADJUSTMENT OF CATCH BASINS	T.B.D.I. STD. 840.35	TRASH RACK - 15" PIPE	TRASH RACK - 18" PIPE	DRAINAGE PIPE ELBOWS NO. & SIZE	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	CONC. COLLARS CL. "B" C.Y. STD. 840.72	PIPE REMOVAL LIN. FT.	REMARKS
L 12+90																									1			1			1																		
									200																																									
L 13+00																									1							1	1																		
L 12+90																									1			1		1																				
									148																																								
L 13+00																									1								1	1																	
									20																																								
L 14+40																									1								1	1																	
									16																																								
L 14+40																									1			1																				
									84																																								
L 14+92																									1			1																				
									156																																								
L 14+92																									1									1	1															
									16																																								
L 15+25																									1			1																				
									124																																								
L 15+25																									1									1	1															
									20																																								
L 16+50																									1			1																				
										84																																							
L 16+50																									1									1	1															
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L 16+50																									1			1																				
									84																																								
L 16+50																									1									1	1															
									16																																								
L 17+36																									1			1																				
											212																																						
L 17+36																									1										1	1														
									16																																								
L 17+36																									1			1																				
											24																																						
L 17+36																									1										1	1														
L 17+36																									1			1																				
L 17+36																									1										1	1														
L 19+50																									1			1																				
L 19+46																									1										1	1														
L 19+50																									1			1																				
L 20+90																									1	2.6		1																				
											40																																						
L 19+50																									1										1	1														
									20																																								
L 22+50																									1			1																				
									72																																								
SHEET TOTAL									1068	132	388														24	2.6		13		7	6			11	11														

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.)	(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

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COMPUTED BY: CH DATE: 8/12/2021

CHECKED BY: DB DATE: 10/18/2021

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
U-5878	3D-2

Note: Invert Elevations indicated are for Bid Purposes only and shall not be used for project construction stakeout.

LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 48 INCHES & 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) SIZE 12" | 15" | 18" | 24" | 30" | 36" | 42" | 48" | DO NOT USE RCP | DO NOT USE CSP | DO NOT USE CAAP | DO NOT USE HDPE | C.S. PIPE SIZE 12" | 15" | 18" | 24" | 30" | 36" | 42" | 48" | R.C. PIPE CLASS III SIZE 12" | 15" | 18" | 24" | 30" | 36" | 42" | 48" | R.C. PIPE CLASS IV SIZE 12" | 15" | 18" | 24" | 30" | 36" | 42" | 48" | * " R.C. PIPE (CLASS V) | ** RC PIPE CULVERTS, CONTRACTOR DESIGN | *** RC PIPE CULVERTS, CONTRACTOR DESIGN | 15" SIDE DRAIN PIPE | 18" SIDE DRAIN PIPE | ENDWALLS STD. 838.01 838.11 OR STD. 838.80 (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') | 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 | CONCRETE TRANSITIONAL SECTION DROP INLET | CATCH BASIN | D.I. STD. 840.14 OR STD. 840.15 | D.I. FRAME WITH TWO GRATES 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. 840.20 | G.D.I. FRAME WITH TWO GRATES STD. 840.22 | G.D.I. FRAME WITH GRATE STD. 840.24 | G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24 | G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.32 | J.B. STD. 840.31 OR 840.32 | ADJUSTMENT OF CATCH BASINS | T.B.D.I. STD. 840.35 | ORIFICE TRASH RACK | DRAINAGE PIPE ELBOWS NO. & SIZE | CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71 | CONC. COLLARS CL. "B" C.Y. STD. 840.72 | PIPE REMOVAL LIN. FT. | REMARKS |
|---|---|---

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COMPUTED BY: __ JKC_JBB	1/11/2018_8/25/21
CHECKED BY: ___ BDK	1/11/2018

(1-16-18)

PROJECT NO.	SHEET NO.
U-5878	3G-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF SUBSURFACE DRAINAGE

LINE	Station	Station	Location LT/RT/CL	Drain Type* UD/BD/SD	LF
CONTINGENCY				SD	1000
				TOTAL LF:	1000

*UD = Underdrain
*BD = Blind Drain
*SD = Subsurface Drain

SUMMARY OF AGGREGATE SUBGRADE/STABILIZATION

LINE	Station	Station	Aggregate Type* ASU/AST	Aggregate Thickness INCHES	Shallow Undercut CY	Class IV Subgrade Stabilization TONS	Geotextile for Soil Stabilization SY	Stabilizer Aggregate TONS	Class IV Aggregate Stabilization TONS
CONTINGENCY			AST	3					75
-L-	12+48	19+28	ASU	12	360	800	1280		
-L-	29+40	31+94	ASU	12	240	500	720		
CONTINGENCY			ASU	12	100	190	300		
			TOTAL CY/TONS/SY:		700	1490**	2300**	0	75

*ASU = Aggregate Subgrade
*AST = Aggregate Stabilization
**Total tons of "Class IV Subgrade Stabilization" and total square yards of "Geotextile for Soil Stabilization" are only the estimated quantities for ASU/AST and may only represent a portion of the subgrade stabilization and geotextile quantities shown in the Item Sheets of the Proposal.

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8/17/99

PROJECT REFERENCE NO.	SHEET NO.
U-5878	4
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 045257 — 11/12/2021 — PATRICK A. LIVINGSTON

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 029984 — 11/15/2021 — DAVID P. BOCKER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STV 100 Years — STV Engineers, Inc. 1600 Perimeter Park Dr. Suite 225 Morrisville, NC 27560 NC License Number F-0991

NOTE: CONSTRUCTION SHOWN FROM STA. 11+80.00 TO 18+50.00 PENDING MUNICIPAL AGREEMENT WITH CITY OF JACKSONVILLE.

NAD 83/2011

1 LEWISVILLE PROPERTIES, LLC
DB 4421 PG 751
MB 28 PG 22

2 DEAN DAIRY FLUID, LLC
DB 5167 PG 407

3 THE HARRY C. BROWN FAMILY LLC
DB 2728 PG 352
MB 51 PG 158

4 THE HARRY C. BROWN FAMILY LLC
DB 2413 PG 926

5 THE HARRY C. BROWN FAMILY LLC
DB 2376 PG 361
MB 43 PG 64

6 CHERIE T. BEVILL, et al
DB 2022 PG 518
MB 34 PG 99

12 NEW RIVER BAPTIST ASSOCIATION
DB 817 PG 500

13 W & B HOLDINGS, LLC
DB 5197 PG 86
PC 32 SLIDE 109

14 W & B HOLDINGS, LLC
DB 5197 PG 86
PC 32 SLIDE 109

15 RONNIE L. HENDERSON
DB 3798 PG 839
PC 32 SLIDE 109

16 JACK C. KOONCE, JR., et ux
DB 4249 PG 208

17 W & B HOLDINGS, LLC
DB 5197 PG 86

18 W & B HOLDINGS, LLC
DB 5197 PG 86

JONATHAN C. SNYDER
DB 3792 PG 800
PC 14 SLIDE 57

BEGIN CONSTRUCTION
BEGIN CITY PROJECT
-L- POT STA. 11+80.00

-Y1- POT Sta. 14+77.56

-L- POC Sta. 12+31.33 =
-Y1- POT Sta. 11+73.69

N 41° 57' 08.8" W

MILL AND OVERLAY FROM
-L- POT STA. 11+80.00 TO
-L- POT STA. 12+47.76

TIE TO EXIST CURB
-Y1- STA. 12+21.03

-L- PT Sta. 13+57.59

N 48° 03' 12.2" E
-L- PC Sta. 11+80.04

-L- POT Sta. 10+00.00

TIE TO EXIST CURB
-Y1- STA. 11+26.35

-L- PRC Sta. 12+67.78

-Y1- POT Sta. 10+00.00

END CITY PROJECT
BEGIN TIP PROJECT U-5878
-L- POT STA. 18+50.00

N 48° 02' 15.6" E

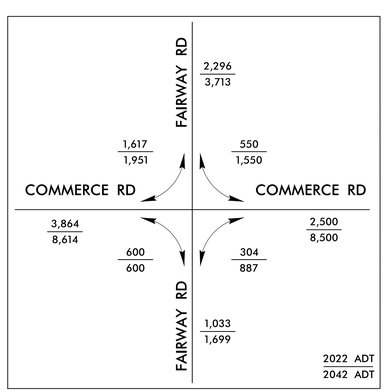
-L- PC Sta. 20+44.36

MATCHLINE -L- STA. 21+00.00 SEE SHEET 5

APPROXIMATE LOCATION OF EXISTING 20' UTILITY EASEMENT PER DEED BOOK 3279, PAGES 94-97

SEE SHEET 6 FOR -L- PROFILE

-L-		
PI Sta 12+23.91	PI Sta 13+12.69	PI Sta 21+75.99
Δ = 0° 40' 13.2" (RT)	Δ = 0° 41' 09.8" (LT)	Δ = 26° 00' 15.0" (RT)
D = 0° 45' 50.2"	D = 0° 45' 50.2"	D = 8° 11' 06.4"
L = 87.74'	L = 89.80'	L = 317.70'
T = 43.87'	T = 44.90'	T = 161.63'
R = 7,500.00'	R = 7,500.00'	R = 700.00'
e = NC	e = NC	e = 4%
Ro = N/A	Ro = N/A	Ro = 80'
DS = 50 MPH	DS = 50 MPH	DS = 40 MPH



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Morgan.Kelley

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8/17/99

PROJECT REFERENCE NO.	SHEET NO.
U-5878	5
RW SHEET NO.	

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 045257 — 11/12/2024 — PATRICK A. LIVINGSTON

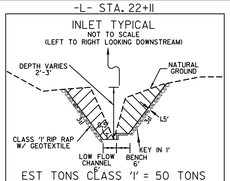
HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 029984 — 11/13/2024 — DAVID P. BOCKER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STV 100 Years — STV Engineers, Inc. 1600 Perimeter Park Dr. Suite 225 Morrisville, NC 27560 NC License Number F-0991

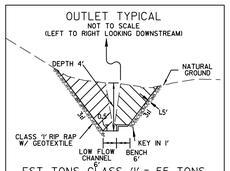
-L- STA. 22+11

INLET TYPICAL
NOT TO SCALE
(LEFT TO RIGHT LOOKING DOWNSTREAM)



EST TONS CLASS 'I' = 50 TONS
EST GEOTEXTILE = 70 SY
DDE = 30 CY

OUTLET TYPICAL
NOT TO SCALE
(LEFT TO RIGHT LOOKING DOWNSTREAM)

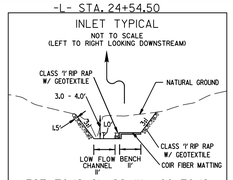


EST TONS CLASS 'I' = 55 TONS
EST GEOTEXTILE = 70 SY
DDE = 40 CY

PROP. 12'X8' RCBC
-L- STA. 22+11

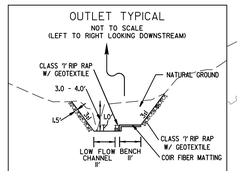
-L- STA. 24+54.50

INLET TYPICAL
NOT TO SCALE
(LEFT TO RIGHT LOOKING DOWNSTREAM)



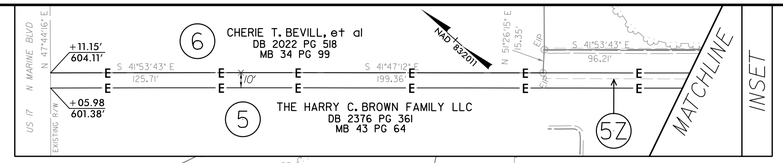
EST. TONS CLASS 'I' = 69 TONS
EST. GEOTEXTILE FABRIC = 79 SY
EST. COIR FIBER MATTING = 29 SY
DDE = 196 CY

OUTLET TYPICAL
NOT TO SCALE
(LEFT TO RIGHT LOOKING DOWNSTREAM)



EST. TONS CLASS 'I' = 61 TONS
EST. GEOTEXTILE FABRIC = 70 SY
EST. COIR FIBER MATTING = 25 SY
DDE = 131 CY

PROP. 20'11'X7' RCBC
-L- STA. 24+54.50



HARRY C. BROWN FAMILY, LLC
DB 3104 PG 238
MB 34 PG 99

UNITED PENTECOSTAL CHURCH OF JACKSONVILLE
DB 736 PG 362
DB 475 PG 060
MB 36 PG 122
SLIDE J-87

ARLINE K. COLLINS
DB 271 PG 426
DB 856 PG 283

BAILEY & FULLER PROPERTIES, LLC
DB 3466 PG 15
MB 60 PG 20

-L- POC Sta.28+30.16 = -Y2- POT Sta. 12+86.68

-L- POT Sta. 32+38.80 = -Y3- POT Sta.17+13.54

MATCHLINE EASEMENT SEE INSET THIS SHEET

BEGIN CULVERT -L- POT STA.24+43.00

END CULVERT -L- POT STA.24+66.00

END CULVERT -L- POT STA.22+17.77

BEGIN CULVERT -L- POT STA.22+04.04

-L- PC Sta. 26+30.13

-L- PT Sta. 28+68.65

-Y2- PT Sta. 12+34.56

-Y2- PC Sta. 11+63.57

-Y2- POT Sta. 10+00.00

BEGIN CONSTRUCTION -Y2- POT STA.11+16.00

END CONSTRUCTION TIP PROJECT U-5878 -L- POT STA. 31+94.84

BEGIN CONSTRUCTION -Y3- POT STA.11+13.27

-Y3- POT Sta. 10+00.00

-L- STA. 21+00.00

-L- STA. 22+00.00

-L- STA. 23+00.00

-L- STA. 24+00.00

-L- STA. 25+00.00

-L- STA. 26+00.00

-L- STA. 27+00.00

-L- STA. 28+00.00

-L- STA. 29+00.00

-L- STA. 30+00.00

-L- STA. 31+00.00

-L- STA. 32+00.00

-L- STA. 33+00.00

-L- STA. 34+00.00

-L- STA. 35+00.00

-L- STA. 36+00.00

-L- STA. 37+00.00

-L- STA. 38+00.00

-L- STA. 39+00.00

-L- STA. 40+00.00

-L- STA. 41+00.00

-L- STA. 42+00.00

-L- STA. 43+00.00

-L- STA. 44+00.00

-L- STA. 45+00.00

-L- STA. 46+00.00

-L- STA. 47+00.00

-L- STA. 48+00.00

-L- STA. 49+00.00

-L- STA. 50+00.00

-L- STA. 51+00.00

-L- STA. 52+00.00

-L- STA. 53+00.00

-L- STA. 54+00.00

-L- STA. 55+00.00

-L- STA. 56+00.00

-L- STA. 57+00.00

-L- STA. 58+00.00

-L- STA. 59+00.00

-L- STA. 60+00.00

-L- STA. 61+00.00

-L- STA. 62+00.00

-L- STA. 63+00.00

-L- STA. 64+00.00

-L- STA. 65+00.00

-L- STA. 66+00.00

-L- STA. 67+00.00

-L- STA. 68+00.00

-L- STA. 69+00.00

-L- STA. 70+00.00

-L- STA. 71+00.00

-L- STA. 72+00.00

-L- STA. 73+00.00

-L- STA. 74+00.00

-L- STA. 74+02 30.6' Ex.

-L- STA. 75+00.00

-L- STA. 76+00.00

-L- STA. 77+00.00

-L- STA. 78+00.00

-L- STA. 79+00.00

-L- STA. 80+00.00

-L- STA. 81+00.00

-L- STA. 82+00.00

-L- STA. 83+00.00

-L- STA. 84+00.00

-L- STA. 85+00.00

-L- STA. 86+00.00

-L- STA. 87+00.00

-L- STA.

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PROJECT REFERENCE NO.	SHEET NO.
U-5878	6

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 045257 PATRICK A. LIVINGSTON 11/12/2021

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 029984 DAVID P. BOCKER 11/15/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STV 100 Years
STV Engineers, Inc.
1600 Perimeter Park Dr.
Suite 225
Morrisville, NC 27560
NC License Number F-0991

5/28/99

-L-

CULVERT HYDRAULIC DATA
-L- Sta. 22+11
90 LF - 12'X8' RCBC @ 2.09%

DESIGN DISCHARGE	= 490	CFS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 30.8	FT
BASE DISCHARGE	= 600	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 32.0	FT
OVERTOPPING DISCHARGE	= 842	CFS
OVERTOPPING FREQUENCY	= >500	YRS
OVERTOPPING ELEVATION	= 35.1	FT

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

UNDERCUT EXCAVATION

-L- STA. 12+31.33 =
-Y1- STA. 11+73.69

BEGIN MILL AND OVERLAY
-L- STA. 11+80.00

END MILL AND OVERLAY BEGIN GRADE
-L- STA. 12+47.76
EL. = 42.11'

PI = 13+15.00
EL = 42.48'
VC = 120'
K = 141
DS = 55 MPH

HIGH POINT
-L- 13+32.56
EL. = 42.36'

(+)0.5503%
(−)0.3011%
EXIST.(+)0.5561%

NOTE: CONSTRUCTION SHOWN FROM STA. 11+80.00 TO 18+50.00 PENDING MUNICIPAL AGREEMENT WITH CITY OF JACKSONVILLE.

PI = 17+80.00
EL = 41.08'
VC = 120'
K = 138
DS = 55 MPH

(−)0.3011%
(−)1.1689%

-L- STA. 18+50.00
END JACKSONVILLE MUNICIPALITY LIMIT
BEGIN TIP PROJECT

PI = 23+90.00
EL = 33.95'
VC = 180'
K = 64
DS = 40 MPH

PROPOSED GRADE

LOW POINT
-L- 23+74.55
EL. = 34.57'

(−)1.1689%

EXISTING GROUND

1 @ 12'X8' RCBC

BEGIN LATERAL BASE DITCH RT
-L- STA. 23+91
EL. = 28.58'

(+)1.6533%

(−) 6.4500%

-L-

CULVERT HYDRAULIC DATA
-L- Sta. 24+54.50
80 LF - 2 @ 11'X7' RCBC @ 0.97%

DESIGN DISCHARGE	= 230	CFS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 26.4	FT
BASE DISCHARGE	= 270	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 26.6	FT
OVERTOPPING DISCHARGE	= 1,675	CFS
OVERTOPPING FREQUENCY	= >500	YRS
OVERTOPPING ELEVATION	= 35.0	FT

-L- STA. 28+30.16 =
-Y2- STA. 12+86.68

END GRADE
-L- STA. 31+94.84 =
-Y3- STA. 17+13.47, 43.95' LT
EL. = 44.57'

PI = 26+90.00
EL = 38.91'
VC = 120'
K = 225
DS = 65 MPH

PI = 23+90.00
EL = 33.95'
VC = 180'
K = 64
DS = 40 MPH

PROPOSED GRADE

END LATERAL BASE DITCH RT
-L- STA. 25+44
EL. = 30.78'

(+)1.6533%
(+)1.1211%
EXIST.(+)2.8565%

2 @ 11'X7' RCBC
(+) 1.4000%
(±) 12.0000'
EXISTING GROUND

-L- STA. 25+00 RT
EL. = 25.50'

BEGIN LATERAL BASE DITCH RT
-L- STA. 24+65
EL. = 25.01'

END LATERAL BASE DITCH RT
-L- STA. 24+31
EL. = 26.00'

(−) 6.4500%

-Y2-

PIPE HYDRAULIC DATA
-Y2- Sta. 12+13
48 LF - 18" RCP CLASS IV @ 0.3%

DRAINAGE AREA	= 0.9	AC
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 2.9	CFS
DESIGN HW ELEVATION	= 37.4	FT
100 YEAR DISCHARGE	= 3.9	CFS
100 YEAR HW ELEVATION	= 37.5	FT
OVERTOPPING FREQUENCY	= 100+	YRS
OVERTOPPING DISCHARGE	= 15.0	CFS
OVERTOPPING ELEVATION	= 40.3	FT

PI = 11+86.00
EL = 39.92'
VC = 52'
K = 26
DS = 25 MPH

BEGIN GRADE
-Y2- STA. 11+60.00
EL. = 40.03'

PI = 12+56.00
EL = 41.02'
VC = 37'
K = 19
DS = 30 MPH

END GRADE
-Y2- STA. 12+74.68=
-L- STA. 28+30.16, 12' RT
EL. = 40.95'

PROPOSED GRADE

EXIST.(−)0.8905%
(−)0.4231%
(−)0.3747%
(+)1.5714%
EXISTING GROUND

BEGIN SPEC. CUT DITCH LT.
-Y2- STA. 12+00
EL. 37.54'

END SPEC. CUT DITCH LT.
-Y2- STA. 12+20
EL. 36.23'

PROP. 18" RCP CLASS IV
EL. = 36.30'

(−) 6.5500%

10/7/2021
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Morrisville

09/08/99

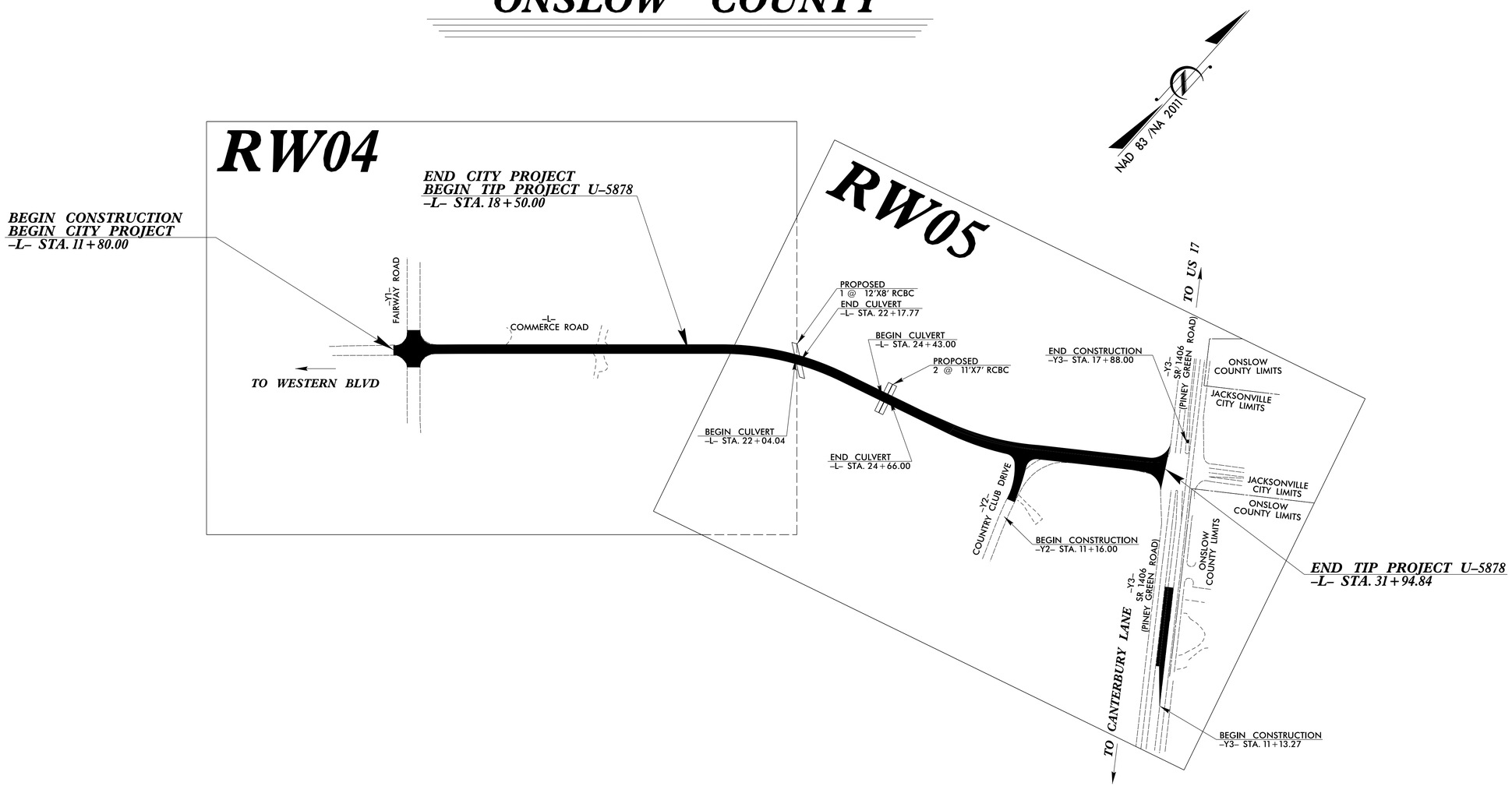
TIP PROJECT: U-5878

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-5878	RW01	07

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SURVEY CONTROL, EXISTING CENTERLINES, RIGHT OF WAY, EASEMENTS AND PROPERTY TIES

ONSLOW COUNTY



GRAPHIC SCALE

150 75 0 150 300

PLANS

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT
IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY
NCDOT FOR MONUMENT "U4007-3"
WITH NAD 83/NA 2011 STATE PLANE GRID COORDINATES OF
NORTHING: 376224.375(ft) EASTING: 2480992.509(ft)
ELEVATION: 38.81(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT
(GROUND TO GRID) IS: 0.999911272
THE N.C. LAMBERT GRID BEARING AND
LOCALIZED HORIZONTAL GROUND DISTANCE FROM
"U4007-3" TO -L- STATION 11+80.00 IS
N 53°28'00" E 5722.64(ft)
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

Prepared in the Office of:

DIVISION 2
LOCATION & SURVEYS

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:	*LETTING DATE:*
AUGUST 7, 2018	*June 30, 2022*

PROFESSIONAL LAND SURVEYOR

NORTH CAROLINA PROFESSIONAL SEAL L-5082 LAND SURVEYOR JAMES C. GREEN

DocuSigned by: Jake Green
SIGNATURE:

05/10/2022
Date:

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

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REVISIONS

SURVEY CONTROL SHEET U–5878

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

PROJECT REFERENCE NO.	SHEET NO.
U–5878	RW02C–1

Location and Surveys

DIVISION 2
LOCATION & SURVEYS

PROJECT SURVEYOR

NORTH CAROLINA PROFESSIONAL SEAL L–5082 LAND SURVEYOR JAMES C. GREEN III

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NC GRID
NAD 83 NA 2011

I, James C. Green, III, PLS, certify that the Project Control was verified under my supervision from an actual GPS survey made under my supervision and the following information was used to perform the survey:

Class of survey: ***AA***
Type of GPS field procedure: RTN
Dates of survey: June 2016
Datum/Epoch: NAD83/NA2011
Published/Fixed-control use: RTN
Localized around: U4007-3
Northing: 376224.375
Easting: 2480992.509
Combined grid factor: 0.999911272
Geoid model:_____
Units: US Survey Feet

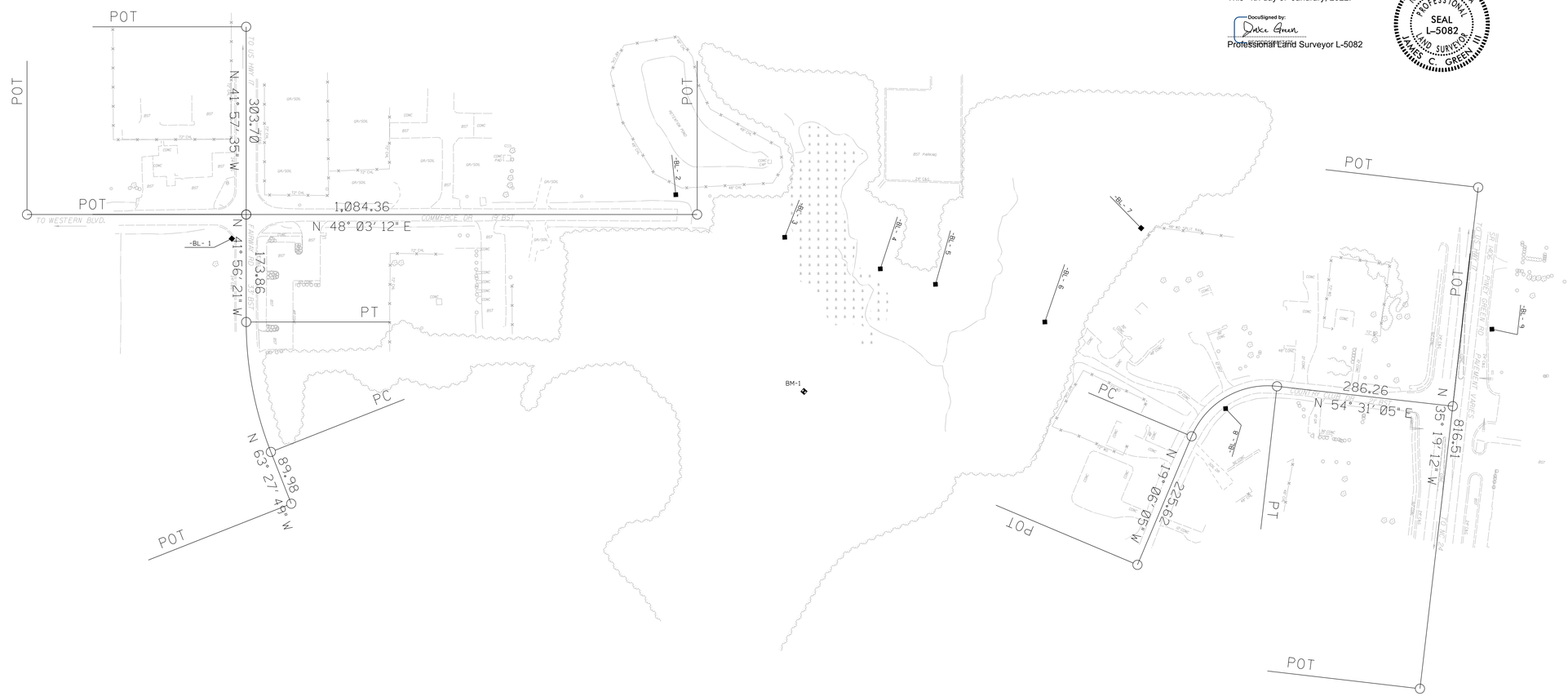
I also certify that the Baseline Control for this project was completed under my direct and responsible charge from an actual survey made under my supervision; that all horizontal closures had a minimum ratio of precision of 1:20,000 (Class AA) and Vertical accuracy to Class A. Field work was performed from June 2016, and all coordinates are based on NAD 83/2011 and all elevations are based on NAVD 88; that this survey was performed to meet the requirements of 21NCAC 56.1600 as applicable.

This 4th day of Janurary, 2022.

DocuSigned by:
Dave Green

Professional Land Surveyor L-5082

NORTH CAROLINA PROFESSIONAL SEAL L–5082 LAND SURVEYOR JAMES C. GREEN III



NOTES:

1. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.

2. THE SURVEY CONTROL DATA FOR THIS PROJECT HAS BEEN COMPILED FROM VARIOUS SOURCES. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

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6/2/99

REVISIONS

SURVEY CONTROL SHEET U–5878

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

PROJECT REFERENCE NO.	SHEET NO.
U–5878	rw02c–2

Location and Surveys

DIVISION 2
LOCATION & SURVEYS

PROJECT SURVEYOR

NORTH CAROLINA PROFESSIONAL SEAL L–5082 LAND SURVEYOR JAMES C. GREEN III

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This 4th day of Janurary, 2022.

DocuSigned by:
Dave Green
Professional Land Surveyor L-5082

NORTH CAROLINA PROFESSIONAL SEAL L–5082 LAND SURVEYOR JAMES C. GREEN III

BASELINES

BL

POINT	DESC.	NORTH	EAST	ELEVATION
1	BL-1	379622.8390	2485635.8580	42.37
2	BL-2	380155.9160	2486122.6350	38.55
3	BL-3	380222.4930	2486299.7440	30.55
4	BL-4	380287.8920	2486448.9510	28.09
5	BL-5	380328.9660	2486532.0490	32.39
6	BL-6	380401.9050	2486704.3950	31.02
7	BL-7	380618.9790	2486718.8040	38.74
8	BL-8	380493.2130	2487015.6620	39.27
9	BL-9	380876.8120	2487250.2610	44.44

BENCHMARKS

```
**************************************
BM1       ELEVATION = 36.86
N 380058      E 2486490
RR SPIKE SET IN 18" HARDWOOD
**************************************
```

EXISTING ALIGNMENTS

EL

POINT	N	E	BEARING	DIST
POT	379430.316	2485363.249		
LINE			N 48°03'12.2" E	1084.36
POT	380155.144	2486169.761		

EY

POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
POT	379368.216	2485993.992							
LINE			N 63°27'49.4" W	89.98					
PC	379408.417	2485913.488							
CURVE			N 52°42'05.0" W	213.98	21°31'28.9"(RT)	09°59'59.9"	215.25	108.91	572.96
PT	379538.085	2485743.266							
LINE			N 41°56'20.5" W	173.86					
POT	379667.414	2485627.066							

EY1

POINT	N	E	BEARING	DIST
POT	379667.414	2485627.066		
LINE			N 41°57'35.4" W	303.70
POT	379893.250	2485424.009		

EY2

POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
POT	380209.913	2487078.506							
LINE			N 19°06'04.8" W	225.62					
PC	380423.109	2487004.674							
CURVE			N 17°42'30.2" E	160.13	73°37'10.0"(RT)	42°52'35.2"	171.70	100.00	133.63
PT	380575.653	2487053.382							
LINE			N 54°31'05.2" E	286.26					
POT	380741.813	2487286.486							

EY3

POINT	N	E	BEARING	DIST
POT	380366.430	2487552.470		
LINE			N 35°19'12.1" W	816.51
POT	381032.646	2487080.412		

NOTES:

1. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.
2. THE SURVEY CONTROL DATA FOR THIS PROJECT HAS BEEN COMPILED FROM VARIOUS SOURCES. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

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6/2/99

REVISIONS

PROPOSED ALIGNMENT CONTROL SHEET U–5878

L

TYPE	STATION	NORTH	EAST
POT	10+00.00	379512.7547	2485454.9774
PC	11+80.04	379633.0993	2485588.8843
PRC	12+67.78	379691.3681	2485654.4876
PT	13+57.59	379751.0134	2485721.6221
PC	20+14.36	380190.1566	2486209.9851
PT	23+32.06	380342.6714	2486485.5798
PC	26+30.13	380424.6212	2486772.1625
PT	28+68.65	380527.6358	2486986.0196
POT	32+38.80	380742.4841	2487287.4274

Y1

TYPE	STATION	NORTH	EAST
POT	10+00.00	379538.0851	2485743.2658
POT	14+77.56	379893.2505	2485424.0089

Y2

TYPE	STATION	NORTH	EAST
POT	10+00.00	380243.3608	2487065.1427
PC	11+63.57	380398.2305	2487012.5006
PT	12+34.56	380462.1263	2486981.9521
POT	12+86.68	380506.1663	2486954.0775

Y3

TYPE	STATION	NORTH	EAST
POT	10+00.00	380160.7991	2487700.6791
POT	21+40.41	381090.4759	2487040.2005

DWY1

TYPE	STATION	NORTH	EAST
POT	10+00.00	380416.1703	2486742.6091
POT	11+23.48	380533.5114	2486704.1445

DWY2

TYPE	STATION	NORTH	EAST
POT	10+00.00	380170.7689	2486188.4244
POT	11+21.80	380080.2031	2486269.8624

NOTES:

1. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.

2. THE PROPOSED ALIGNMENT CONTROL DATA FOR THIS PROJECT HAS BEEN COMPILED FROM VARIOUS SOURCES. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

PROJECT REFERENCE NO.	SHEET NO.
U–5878	rw02d–1

Location and Surveys

DIVISION 2
LOCATION & SURVEYS

PROJECT SURVEYOR

NORTH CAROLINA PROFESSIONAL SEAL L–5082 LAND SURVEYOR JAMES C. GREEN III

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

I, James C. Green, III, PLS, certify that the data compiled came from available surveys/mapping performed by others and provided to me by NCDOT and do not certify to the accuracy or quality of the individual data sources.

This 4th day of Janurary, 2022.

DocuSigned by:
James Green
Professional Land Surveyor L-5082

NORTH CAROLINA PROFESSIONAL SEAL L–5082 LAND SURVEYOR JAMES C. GREEN III

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REVISIONS

RIGHT OF WAY CONTROL SHEET U-5878

PROJECT REFERENCE NO.	SHEET NO.
U-5878	RW03E-1

Location and Surveys

DIVISION 2
LOCATION & SURVEYS

PROJECT SURVEYOR

NORTH CAROLINA PROFESSIONAL LAND SURVEYOR SEAL L-5082 JAMES C. GREEN III

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

I , James C. Green, III , certify that the right of way and permanent easement monumentation for this project shown herein was completed under my direct and responsible charge from an actual survey made under my supervision; that all horizontal closures had a minimum ratio of precision of 1:10,000 (Class A). Field work was performed from October 2021, and all coordinates are based on NAD83/2011; That this survey was performed to meet the requirements of 21NCAC 56.1600 as applicable.

This 4th day of Janurary, 2022.

Docusigned by: James Green

Professional Land Surveyor L-5082

NORTH CAROLINA PROFESSIONAL LAND SURVEYOR SEAL L-5082 JAMES C. GREEN III

ROW MARKER IRON PIN AND CAP-E

ALIGN	STATION	OFFSET	NORTH	EAST	
L	12+89.00	-38.00	379733.8745	2485645.2640	
L	12+91.98	45.00	379673.6367	2485702.4418	SET PK NAIL
L	13+57.59	-38.00	379779.2696	2485696.2137	
L	13+57.59	-45.00	379784.4747	2485691.5332	
L	13+57.59	45.00	379717.5521	2485751.7110	
L	20+14.36	-45.00	380223.6179	2486179.8963	
L	20+14.36	45.00	380156.6953	2486240.0740	
L	20+55.00	-60.00	380263.3087	2486203.5175	
L	20+55.00	60.00	380169.5727	2486278.4413	
L	23+32.06	60.00	380284.9836	2486502.0759	
L	23+32.06	-60.00	380400.3592	2486469.0837	
L	25+53.00	60.00	380345.7288	2486714.5047	
L	25+53.00	-60.00	380461.1043	2486681.5124	
L	26+30.13	45.00	380381.3554	2486784.5346	
L	26+50.00	-68.50	380495.6548	2486770.4952	
L	26+50.00	-55.50	380483.2623	2486774.4228	SET BRIDGE SPIKE
L	27+98.57	45.00	380450.8088	2486949.3396	
L	28+68.65	-55.50	380572.8294	2486953.8048	
L	28+97.62	45.00	380507.8047	2487035.7254	
L	31+44.35	45.00	380651.0163	2487236.6350	
L	31+44.35	-55.50	380732.8533	2487178.3003	

ROW MARKER IRON PIN AND CAP-E

ALIGN	STATION	OFFSET	NORTH	EAST
Y1	12+38.28	30.03	379735.3730	2485606.3056
Y1	11+05.91	30.02	379636.9192	2485694.7958

ROW MARKER IRON PIN AND CAP-E

ALIGN	STATION	OFFSET	NORTH	EAST
Y2	11+63.57	-30.00	380388.5757	2486984.0967

ROW MARKER IRON PIN AND CAP-E

ALIGN	STATION	OFFSET	NORTH	EAST
Y3	17+96.68	-55.00	380778.4139	2487194.4346
Y3	16+49.07	-66.82	380651.2329	2487270.2957

ROW MARKER PERMANENT EASEMENT-E

ALIGN	STATION	OFFSET	NORTH	EAST	
L	21+55.00	-85.00	380346.3707	2486280.2020	
L	21+55.00	-60.00	380324.8190	2486292.8719	
L	22+05.00	80.00	380225.1912	2486402.7689	
L	22+05.00	60.00	380243.1120	2486393.8894	
L	22+10.00	-85.00	380375.5090	2486334.5458	
L	22+10.00	-60.00	380353.0294	2486345.4850	
L	22+85.00	60.00	380271.7741	2486461.1393	
L	22+85.00	80.00	380252.9576	2486467.9172	SET STAKE ONLY
L	24+00.00	60.00	380303.6637	2486567.4009	
L	24+15.00	-90.00	380452.0071	2486540.5825	
L	24+15.00	-60.00	380423.1632	2486548.8306	
L	24+15.00	95.00	380274.1365	2486591.4456	
L	24+80.00	-60.00	380441.0340	2486611.3257	NOT SET (TREE)
L	24+80.00	-90.00	380469.8779	2486603.0776	
L	24+90.00	95.00	380294.7566	2486663.5553	

ROW MARKER PERMANENT EASEMENT-E

ALIGN	STATION	OFFSET	NORTH	EAST
Y2	11+16.00	41.00	380366.3843	2487066.6294
Y2	11+41.62	30.00	380387.1009	2487047.9694
Y2	11+36.35	46.51	380387.4263	2487065.2917
Y2	11+16.00	30.00	380362.8442	2487056.2146

NOTES:

1. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.
2. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.
3. RIGHT OF WAY MONUMENTATION ESTABLISHED October 25th, 2021 TO October 28th, 2021 .

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PROJECT REFERENCE NO.	SHEET NO.
U-5878	RW04

Location and Surveys

DIVISION 2
LOCATION & SURVEYS

PROJECT SURVEYOR

NORTH CAROLINA PROFESSIONAL SEAL L-5082 LAND SURVEYOR JAMES C. GREEN III

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS

6/2/99

NAD 83/2011

1 LEWISVILLE PROPERTIES,LLC
DB 4421PG 751
MB 28 PG 22

2 DEAN DAIRY FLUID, LLC
DB 5167 PG 407

3 THE HARRY C. BROWN FAMILY LLC
DB 2728 PG 352
MB 51PG 158

4 THE HARRY C. BROWN FAMILY LLC
DB 2413 PG 926

5 THE HARRY C. BROWN FAMILY LLC
DB 2376 PG 361
MB 43 PG 64

6 CHERIE T. BEVILL, et al
DB 2022 PG 518
MB 34 PG 99

12 NEW RIVER BAPTIST ASSOCIATION
DB 817 PG 500

13 W & B HOLDINGS, LLC
DB 5197 PG 86
PC 32 SLIDE 109

14 W & B HOLDINGS, LLC
DB 5197 PG 86
PC 32 SLIDE 109

15 RONNIE L. HENDERSON
DB 3798 PG 839
PC 32 SLIDE 109

16 JACK C. KONCE, JR., et ux
DB 4249 PG 208

17 W & B HOLDINGS, LLC
DB 5197 PG 86

18 W & B HOLDINGS, LLC
DB 5197 PG 86

JONATHAN C. SNYDER
DB 3792 PG 800
PC 14 SLIDE 57

-Y1- POT Sta. 14+77.56

-L- POC Sta.12+31.33 =
-Y1- POT Sta. 11+73.69

-L- PT Sta. 13+57.59

-L- PC Sta. 11+80.04

-L- POT Sta. 10+00.00

-L- POT Sta.12+67.76

-L- PC Sta. 20+14.36

MATCHLINE -L- STA. 21+00.00 SEE SHEET 5

N 48° 03' 12.2" E

N 48° 02' 15.6" E

N 41°57'03" W 400.31'

N 41°50'25" W 400.33'

N 41°43'34" W 197.24'

S 41°57'03" E 121.95'

S 41°20'12" E 122.04'

S 41°50'25" E 124.39'

S 41°43'34" E 124.36'

S 41°43'34" E 200.00'

N 47°53'49" E 99.95'

N 48° 57' 08.1" W

S 41°58'04" E 400.20'

S 48°03'57" W 181.60'

S 47°20'19" W 73.30'

S 48°25'07" W 107.18'

S 48°08'19" W 92.82'

S 48°01'11" W 100.00'

S 47°50'38" W 100.00'

S 48°14'49" W 70.37'

S 47°28'46" W 29.63'

S 48°09'37" W 97.34'

S 48°25'07" W 26.62'

N 47°46'17" E 397.05'

S 35°35'54" E 204.34'

S 05°19'24" E 210.35'

S 42°05'20" E 199.76'

S 41°58'49" E 199.82'

S 41°58'49" E 200.18'

S 41°58'49" E 200.24'

S 41°58'49" E 199.42'

EXISTING R/W

EXIST R/W TO EIP=0.09'

EXIST R/W TO EIP=0.03'

EXIST R/W TO EIP=0.04'

EXIST R/W TO EIP=0.02'

EXIST R/W TO CONC=0.3'

EXISTING R/W

EXISTING R/W

EXISTING R/W

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PROJECT REFERENCE NO.	SHEET NO.
U-5878	RW05

Location and Surveys

DIVISION 2
LOCATION & SURVEYS

PROJECT SURVEYOR

NORTH CAROLINA PROFESSIONAL SEAL L-5082 LAND SURVEYOR JAMES C. GREEN III

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS

6/2/99

SEE SHEET 4

MATCHLINE -L- STA. 21+00.00

-L- POC Sta.28+30.16 = -Y2- POT Sta. 12+86.68

-L- POT Sta. 32+38.80 = -Y3- POT Sta.17+13.54

-L- PC Sta. 26+30.13

-L- PT Sta. 28+68.95

-L- PT Sta. 23+32.06

-Y2- PT Sta. 12+34.56

-Y2- PC Sta. 11+63.57

-Y2- POT Sta. 10+00.00

-Y3- N 35° 23' 29.3" W

N 54° 31' 05.2" E

N 74° 02' 30.6" E

S 32° 19' 52.7" W

644.50' R

760' R

745' R

640' R

CHERIE T. BEVILL, et al
DB 2022 PG 518
MB 34 PG 99

THE HARRY C. BROWN FAMILY LLC
DB 2376 PG 361
MB 43 PG 64

HARRY C. BROWN FAMILY, LLC
DB 3104 PG 238
MB 34 PG 99

UNITED PENTECOSTAL CHURCH OF JACKSONVILLE
DB 736 PG 362
DB 475 PG 060
MB 36 PG 122
SLIDE J-87

ARLINE K. COLLINS
DB 271 PG 426
DB 856 PG 283

BAILEY & FULLER PROPERTIES, LLC
DB 3466 PG 15
MB 60 PG 20

UNITED PENTECOSTAL CHURCH OF JACKSONVILLE
DB 3578 PG 586
MB 6 PG 74

JACKSONVILLE FIRST UNITED PENTECOSTAL CHURCH, INC.
DB 5401 PG 288

HELEN K. BASDEN, ET VIR
DB 1026 PG 750
MB 6 PG 74

HENRY BROOKS, et ux
DB 1619 PG 345
MB 6 PG 74

DEPT OF TRANSPORTATION
DB 5119 PG 618

BAILEY & ASSOCIATES INC.
DB 3318 PG 460

WILLIAM T. HUMPHREY, ET UX
DB 1322 PG 983

RALPH L. FOURQUET ET AL.
DB 5003 PG 350

NORMAN E. ALLEN, et ux
DB 7012 PG 472
MB 6 PG 74

DAVID ROBINSON
DB 4236 PG 734
MB 6 PG 74

MIKAYLA K. ANOJE ET AL
DB 5130 PG 612

JIMMY ROWE, et ux
DB 3812 PG 646
MB 6 PG 74

DEPARTMENT OF TRANSPORTATION
DB 3578 PG 586
MB 6 PG 74

TRAVIS MCRAE
DB 3599 PG 691
MB 6 PG 74

EDGAR S. BANKHEAD, ET UX
DB 604 PG 617
MB 6 PG 74

HELEN COLEMAN
DB 3571 PG 72
MB 6 PG 74

PHILLIP L. GURGANUS, ET UX
DB 1322 PG 812
MB 6 PG 74

TERRY L. TRENCHARD, ET UX
DB 1154 PG 565
MB 6 PG 74

JAMES E. WHITE JR.
DB 3139 PG 561
MB 6 PG 74

THOMAS G. COLLINS ET AL
DB 1340 PG 98

THOMAS GLENN COLLINS
DB 200 PG 80

CANDICE L. HARRIS, ET VIR
DB 1272 PG 126

WOODED

BST PARKING

EXISTING R/W

I, James C. Green, III , certify that the right of way and permanent easement monumentation for this project shown herein was completed under my direct and responsible charge from an actual survey made under my supervision; that all horizontal closures had a minimum ratio of precision of 1:10,000 (Class A). Field work was performed from October 2021, and all coordinates are based on NAD83/2011; That this survey was performed to meet the requirements of 21NCAC 56.1600 as applicable.

This 4th day of Janurary, 2022.

DocuSigned by: Dixie Green

Professional Land Surveyor L-5082

NORTH CAROLINA PROFESSIONAL SEAL L-5082 LAND SURVEYOR JAMES C. GREEN III

NOTES:

1. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.
2. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.
3. RIGHT OF WAY MONUMENTATION ESTABLISHED October 2021 .

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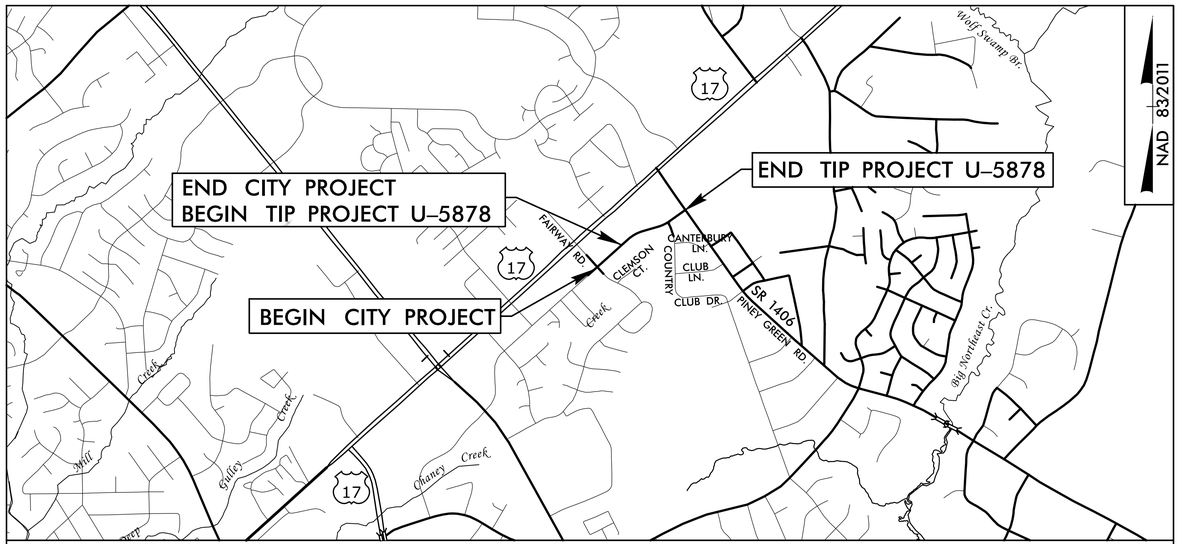
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

TRANSPORTATION MANAGEMENT PLAN

ONSLOW COUNTY



VICINITY MAP N.T.S.

LOCATION: EXTENSION OF COMMERCE ROAD FROM FAIRWAY ROAD TO PINEY GREEN ROAD (SR 1406) AT COUNTRY CLUB DRIVE

INDEX OF SHEETS

SHEET NO.	TITLE
TMP-1	TITLE SHEET, VICINITY MAP, AND INDEX OF SHEETS
TMP-1A	ROADWAY STANDARD DRAWINGS AND LEGEND
TMP-1B	TRANSPORTATION OPERATIONS PLAN
TMP-2	TEMPORARY TRAFFIC CONTROL PHASING
TMP-3	TEMPORARY TRAFFIC CONTROL PHASE I DETAIL
TMP-4	TEMPORARY TRAFFIC CONTROL PHASE II DETAIL
TMP-5	TEMPORARY TRAFFIC CONTROL PHASE III DETAIL

SHEET NO.
TMP-1

TIP PROJECT: U–5878

WORK ZONE SAFETY & MOBILITY
"from the MOUNTAINS to the COAST"

PLANS PREPARED BY:

STV 100 Years
STV Engineers, Inc.
1600 Perimeter Park Dr.
Suite 225
Morrisville, NC 27560
NC License Number F–0991

PATRICK A. LIVINGSTON, PE
PROJECT ENGINEER

WESTON D. MURPHY, PE
DESIGN ENGINEER

HIGHWAY DIVISION 3
5504 BARBADOS BLVD
CASTLE HAYNE, NC 28429
PHONE: (910) 341–2200

JESSI LEONARD, PE
DIVISION TRAFFIC ENGINEER

DIVISION OF HIGHWAYS · STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION · WORK ZONE TRAFFIC CONTROL

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

100% TRAFFIC CONTROL PLANS

SUBMITTED: 10–15–21

APPROVED: DocuSigned by: Weston Murphy 1F1CB30A3F7A488...

DATE: 1/19/2022

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 049235 ENGINEER WESTON D. MURPHY

1/18/2022
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PROJ. REFERENCE NO.	SHEET NO.
U-5878	TMP-1A

ROADWAY STANDARD DRAWINGS

THE FOLLOWING ROADWAY STANDARDS AS SHOWN IN "ROADWAY STANDARD DRAWINGS" - N.C. DEPARTMENT OF TRANSPORTATION - RALEIGH, N.C., DATED JANUARY 2018 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

STD. NO.	TITLE
1101.01	WORK ZONE ADVANCE WARNING SIGNS
1101.02	TEMPORARY LANE CLOSURES
1101.04	TEMPORARY SHOULDER CLOSURES
1101.05	WORK ZONE VEHICLE ACCESSES
1101.11	TRAFFIC CONTROL DESIGN TABLES
1110.01	STATIONARY WORK ZONE SIGNS
1110.02	PORTABLE WORK ZONE SIGNS
1115.01	FLASHING ARROW BOARDS
1130.01	DRUMS
1135.01	CONES
1145.01	BARRICADES
1150.01	FLAGGING DEVICES
1165.01	TRUCK MOUNTED ATTENUATOR
1180.01	SKINNY-DRUM

LEGEND

GENERAL

- DIRECTION OF TRAFFIC FLOW
- DIRECTION OF PEDESTRIAN TRAFFIC FLOW
- EXIST. PVMT.
- NORTH ARROW
- PROPOSED PVMT.
- TEMP. SHORING (LOCATION PURPOSES ONLY)
- WORK AREA
- REMOVAL

SIGNALS

EXISTING UPGRADED TEMP TEMPORARY

PAVEMENT MARKINGS

- EXISTING LINES
- TEMPORARY LINES

DRAINAGE

- PROPOSED PIPE CONSTRUCTION
- PREVIOUSLY CONSTRUCTED PIPE

TRAFFIC CONTROL DEVICES

- BARRICADE (TYPE III)
- WATER FILLED BARRIER
- CONE
- DRUM SKINNY DRUM TUBULAR MARKER
- TEMPORARY CRASH CUSHION
- FLASHING ARROW BOARD
- FLAGGER
- LAW ENFORCEMENT
- TRUCK MOUNTED ATTENUATOR (TMA)
- CHANGEABLE MESSAGE SIGN

TEMPORARY SIGNING

- PORTABLE SIGN
- STATIONARY SIGN
- STATIONARY OR PORTABLE SIGN

PAVEMENT MARKERS

- CRYSTAL/CRYSTAL
- CRYSTAL/RED
- YELLOW/YELLOW

PAVEMENT MARKING SYMBOLS

PAVEMENT MARKING SYMBOLS

APPROVED: Weston Murphy
DocuSigned by: 1F1C920A2F7A488...
DATE: 11/12/2021

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 049235 ENGINEER WESTON D. MURPHY

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DIVISION OF HIGHWAYS · STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION · WORK ZONE TRAFFIC CONTROL

ROADWAY STANDARD DRAWINGS & LEGEND

10/7/2021
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PROJ. REFERENCE NO.	SHEET NO.
U-5878	TMP-1B

GENERAL NOTES

CHANGES MAY BE REQUIRED WHEN PHYSICAL DIMENSIONS IN THE DETAIL DRAWINGS, STANDARD DETAILS, AND ROADWAY DETAILS ARE NOT ATTAINABLE TO MEET FIELD CONDITIONS OR RESULT IN DUPLICATE OR UNDESIRED OVERLAPPING OF DEVICES. MODIFICATION MAY INCLUDE: MOVING, SUPPLEMENTING, COVERING, OR REMOVAL OF DEVICES AS DIRECTED BY THE ENGINEER.

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.

TIME RESTRICTIONS

A) DO NOT CLOSE OR NARROW TRAVEL LANES AS FOLLOWS:

ROAD NAME	DAY AND TIME RESTRICTIONS
COUNTRY CLUB DRIVE	MONDAY THRU FRIDAY 6:00 A.M. TO 9:00 A.M. AND 4:00 P.M. TO 7:00 P.M.
PINEY GREEN ROAD (SR 1406)	MONDAY THRU FRIDAY 6:00 A.M. TO 9:00 A.M. AND 4:00 P.M. TO 7:00 P.M.

B) DO NOT CLOSE OR NARROW TRAVEL LANES DURING HOLIDAYS AND SPECIAL EVENTS AS FOLLOWS:

ROAD NAME

COUNTRY CLUB DRIVE
PINEY GREEN ROAD

1. FOR ANY UNEXPECTED OCCURRENCE THAT CREATES UNUSUALLY HIGH TRAFFIC VOLUMES, AS DIRECTED BY THE ENGINEER.
2. FOR NEW YEAR'S, BETWEEN THE HOURS OF 6:00 A.M. DECEMBER 31st TO 9:00 A.M. JANUARY 2ND. IF NEW YEAR'S DAY IS ON A FRIDAY, SATURDAY, SUNDAY, OR MONDAY THEN UNTIL 9:00 A.M. THE FOLLOWING TUESDAY.
3. FOR EASTER, BETWEEN THE HOURS OF 6:00 A.M. THURSDAY AND 9:00 A.M. MONDAY.
4. FOR MEMORIAL DAY, BETWEEN THE HOURS OF 6:00 A.M. FRIDAY TO 7:00 P.M. TUESDAY.
5. FOR INDEPENDENCE DAY, BETWEEN THE HOURS OF 6:00 A.M. THE DAY BEFORE INDEPENDENCE DAY AND 7:00 P.M. THE DAY AFTER INDEPENDENCE DAY.

   IF INDEPENDENCE DAY IS ON A FRIDAY, SATURDAY, SUNDAY OR MONDAY THEN BETWEEN THE HOURS OF 6:00 A.M. THE THURSDAY BEFORE INDEPENDENCE DAY AND 7:00 P.M. THE TUESDAY AFTER INDEPENDENCE DAY.
6. FOR LABOR DAY, BETWEEN THE HOURS OF 6:00 A.M. FRIDAY AND 9:00 A.M. TUESDAY.
7. FOR THANKSGIVING DAY, BETWEEN THE HOURS OF 7:00 P.M. TUESDAY TO 9:00 A.M. MONDAY.
8. FOR CHRISTMAS, BETWEEN THE HOURS OF 7:00 P.M. THE FRIDAY BEFORE THE WEEK OF CHRISTMAS DAY AND 9:00 A.M. THE FOLLOWING TUESDAY AFTER THE WEEK OF CHRISTMAS.

LANE AND SHOULDER CLOSURE REQUIREMENTS

C) REMOVE LANE CLOSURE DEVICES FROM THE LANE WHEN WORK IS NOT BEING PERFORMED BEHIND THE LANE CLOSURE OR WHEN A LANE CLOSURE IS NO LONGER NEEDED OR AS DIRECTED BY THE ENGINEER.

D) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING WITHIN 15 FT OF AN OPEN TRAVEL LANE, CLOSE THE NEAREST OPEN SHOULDER USING ROADWAY STANDARD DRAWING NO. 1101.04 UNLESS THE WORK AREA IS PROTECTED BY BARRIER OR GUARDRAIL OR A LANE CLOSURE IS INSTALLED.

E) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING ON THE SHOULDER ADJACENT TO AN UNDIVIDED FACILITY AND WITHIN 5 FT OF AN OPEN TRAVEL LANE, CLOSE THE NEAREST OPEN TRAVEL LANE USING ROADWAY STANDARD DRAWING NO. 1101.02 UNLESS THE WORK AREA IS PROTECTED BY BARRIER OR GUARDRAIL.

WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING ON THE SHOULDER ADJACENT TO A DIVIDED FACILITY AND WITHIN 10 FT OF AN OPEN TRAVEL LANE, CLOSE THE NEAREST OPEN TRAVEL LANE USING ROADWAY STANDARD DRAWING NO. 1101.02 UNLESS THE WORK AREA IS PROTECTED BY BARRIER OR GUARDRAIL.

F) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING WITHIN A LANE OF TRAVEL OF AN UNDIVIDED OR DIVIDED FACILITY, CLOSE THE LANE ACCORDING TO THE TRAFFIC CONTROL PLANS, ROADWAY STANDARD DRAWINGS, OR AS DIRECTED BY THE ENGINEER. CONDUCT THE WORK SO THAT ALL PERSONNEL AND/OR EQUIPMENT REMAIN WITHIN THE CLOSED TRAVEL LANE.

G) DO NOT WORK SIMULTANEOUSLY WITHIN 15 FT ON BOTH SIDES OF AN OPEN TRAVELWAY, RAMP, OR LOOP WITHIN THE SAME LOCATION UNLESS PROTECTED WITH GUARDRAIL OR BARRIER.

PAVEMENT EDGE DROP OFF REQUIREMENTS

H) BACKFILL AT A 6:1 SLOPE UP TO THE EDGE AND ELEVATION OF EXISTING PAVEMENT IN AREAS ADJACENT TO AN OPENED TRAVEL LANE THAT HAS AN EDGE OF PAVEMENT DROP-OFF AS FOLLOWS:

BACKFILL DROP-OFFS THAT EXCEED 2 INCHES ON ROADWAYS WITH POSTED SPEED LIMITS OF 45 MPH OR GREATER.

BACKFILL DROP-OFFS THAT EXCEED 3 INCHES ON ROADWAYS WITH POSTED SPEED LIMITS LESS THAN 45 MPH.

BACKFILL WITH SUITABLE COMPACTED MATERIAL, AS APPROVED BY THE ENGINEER, AT NO EXPENSE TO THE DEPARTMENT.

I) DO NOT EXCEED A DIFFERENCE OF 2 INCHES IN ELEVATION BETWEEN OPEN LANES OF TRAFFIC FOR NOMINAL LIFTS OF 1.5 INCHES. INSTALL ADVANCE WARNING "UNEVEN LANES" SIGNS (W8-11) 200 FT IN ADVANCE AND A MINIMUM OF EVERY HALF MILE THROUGHOUT THE UNEVEN AREA.

TRAFFIC PATTERN ALTERATIONS

J) NOTIFY THE ENGINEER THIRTY (30) CALENDAR DAYS PRIOR TO ANY TRAFFIC PATTERN ALTERATION.

SIGNING

K) INSTALL ADVANCE WORK ZONE WARNING SIGNS WHEN WORK IS WITHIN 40 FT FROM THE EDGE OF TRAVEL LANE AND NO MORE THAN THREE (3) DAYS PRIOR TO THE BEGINNING OF CONSTRUCTION.

L) ENSURE ALL NECESSARY SIGNING IS IN PLACE PRIOR TO ALTERING ANY TRAFFIC PATTERN.

M) INSTALL BLACK ON ORANGE "DIP" SIGNS (W8-2) AND/OR "BUMP" SIGNS (W8-1) 200 FT IN ADVANCE OF THE UNEVEN AREA, OR AS DIRECTED BY THE ENGINEER.

TRAFFIC CONTROL DEVICES

N) WHEN LANE CLOSURES ARE NOT IN EFFECT SPACE CHANNELIZING DEVICES IN WORK AREAS NO GREATER IN FEET THAN TWICE THE POSTED SPEED LIMIT (MPH) EXCEPT, 10 FT ON-CENTER IN RADII, AND 3 FT OFF THE EDGE OF AN OPEN TRAVELWAY. REFER TO STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES SECTIONS 1130 (DRUMS), 1135 (CONES) AND 1180 (SKINNY DRUMS) FOR ADDITIONAL REQUIREMENTS.

O) PLACE TYPE III BARRICADES, WITH "ROAD CLOSED" SIGN R11-2 ATTACHED, OF SUFFICIENT LENGTH TO CLOSE ENTIRE ROADWAY.

P) PLACE ADDITIONAL SETS OF THREE CHANNELIZING DEVICES DRUMS PERPENDICULAR TO THE EDGE OF TRAVELWAY ON 500 FT CENTERS WHEN UNOPENED LANES ARE CLOSED TO TRAFFIC.

PAVEMENT MARKINGS AND MARKERS

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

R) REMOVE/REPLACE ANY CONFLICTING/DAMAGED PAVEMENT MARKINGS AND MARKERS BY THE END OF EACH DAY'S OPERATION.

S) TRACE THE EXISTING AND PROPOSED MONOLITHIC ISLAND LOCATIONS WITH PROPER COLOR PAVEMENT MARKINGS PRIOR TO REMOVAL AND INSTALLATION. PLACE DRUMS TO DELINEATE ANY EXISTING AND PROPOSED MONOLITHIC ISLANDS AFTER REMOVAL AND BEFORE INSTALLATION.

MISCELLANEOUS

T) IN THE EVENT A TIE-IN CANNOT BE MADE IN ONE DAY'S TIME, BRING THE TIE-IN AREA TO AN APPROPRIATE ROADWAY ELEVATION AS DETERMINED BY THE ENGINEER. PLACE BLACK ON ORANGE "LOOSE GRAVEL" SIGNS (W8-7) AND BLACK ON ORANGE "PAVEMENT ENDS" SIGNS (W8-3) 200 FT AND 400 FT RESPECTIVELY IN ADVANCE OF THE UNEVEN AREAS. USE DRUMS TO DELINEATE THE EDGE OF ROADWAY ALONG UNPAVED AREAS.

U) ALL CURB RAMP LOCATIONS SHALL BE DERIVED FROM STATIONING SHOWN ON PAVEMENT MARKING PLANS OR AS DIRECTED BY THE ENGINEER IN COORDINATION WITH THE SIGNING AND DELINEATION UNIT.

V) CONTRACTOR SHALL MAINTAIN SIDEWALK ACCESS AT ALL TIMES AS STATED IN THE PHASING. CONTRACTOR SHALL BE RESPONSIBLE TO PROVIDE TEMPORARY SIDEWALKS (CONCRETE, ASPHALT, OR OTHER SUITABLE MATERIAL AS APPROVED BY THE ENGINEER) AT ALL LOCATIONS WHERE THE OPEN PEDESTRIAN TRAVELWAY HAS BEEN REMOVED FOR CONSTRUCTION OPERATIONS (UTILITIES, DRAINAGE, ETC.).

MANAGEMENT STRATEGIES

PHASE I - TRAFFIC WILL BE MAINTAINED ON THE EXISTING ROADWAY AS THE NEW LOCATION PORTION OF COMMERCE DRIVE IS CONSTRUCTED. LANE CLOSURES WILL BE UTILIZED TO CONSTRUCT THE EXTENTION OF THE LEFT TURN LANE ON PINEY GREEN RD.

PHASE II - TRAFFIC WILL BE SHIFTED TO THE RIGHT UTILIZING LANE CLOSURES AS THE LEFT SIDE OF THE PROPOSED COMMERCE RD IS CONSTRUCTED. COUNTRY CLUB DR. WILL BE IN A ONE-LANE/ONE-WAY PATTERN DURING CONSTRUCTION.

PHASE III - TRAFFIC WILL BE SHIFTED TO THE LEFT UTILIZING LANE CLOSURES AS THE RIGHT SIDE OF THE PROPOSED COMMERCE RD IS CONSTRUCTED. COUNTRY CLUB DR. WILL BE IN A ONE-LANE/ONE-WAY PATTERN DURING CONSTRUCTION.

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DATE: 1/27/2022

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 049235 ENGINEER WESTON D. MURPHY

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DIVISION OF HIGHWAYS · STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION · WORK ZONE TRAFFIC CONTROL

TRANSPORTATION OPERATIONS PLAN

1/27/2022
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U-5878	TMP-2

PHASING NOTES

PHASE I

NOTE: CONTRACTOR SHALL MAINTAIN ACCESS TO DRIVEWAYS FOR ALL PHASES WITHIN THE PROJECT LIMITS AND COORDINATE AS NECESSARY WITH PROPERTY OWNERS.

STEP 1

INSTALL WORK ZONE ADVANCE WARNING SIGNS IN ACCORDANCE WITH NCDOT RSD. 1101.01 SHEETS 2 AND 3 OF 3. RESIDENT ENGINEER TO DETERMINE IF DUAL MOUNTED ARE REQUIRED.

STEP 2

AWAY FROM TRAFFIC AND UTILIZING NCDOT RSD 1101.02 SHEET 1 OF 14 OR 1101.04 AS REQUIRED, PERFORM THE FOLLOWING AS SHOWN ON TMP-3:

A) CONSTRUCT PROPOSED 8″ FSS IN CONFLICT WITH CULVERT TO BE CONSTRUCTED.

B) CONSTRUCT PROPOSED -L- ROADWAY, CURB AND GUTTER, SIDEWALK, DRAINAGE, AND CULVERTS UP TO BUT NOT INCLUDING FINAL LAYER OF SURFACE COURSE FROM -L- STA. 18+50.00 TO STA. 28+75.00. PLACE BARRICADES AS SHOWN ONCE DEEMED NECESSARY BY THE ENGINEER.

C) CONSTRUCT PROPOSED -Y2- ROADWAY AND CURB AND GUTTER UP TO BUT NOT INCLUDING FINAL LAYER OF SURFACE COURSE FROM -Y2- STA. 11+60.00 TO STA. 12+74.68.

STEP 3

AWAY FROM TRAFFIC AND UTILIZING NCDOT RSD 1101.02 SHEET 3 OF 14 OR 1101.04 AS REQUIRED, PERFORM THE FOLLOWING AS SHOWN ON TMP-3:

A) CONSTRUCT PROPOSED -Y3- ROADWAY, CURB AND GUTTER, AND MEDIAN INCLUDING FINAL LAYER OF SURFACE COURSE FROM -Y3- STA. 11+13.27 TO STA. 14+16.06.

B) REMOVE EXISTING CONCRETE ISLAND AND CONSTRUCT PROPOSED CONCRETE ISLAND AND REPAIR PAVEMENT AS NECESSARY FROM -Y3- STA. 17+58+/- TO STA. 17+88.00.

C) USING NCDOT RSD 1101.02 SHEET 11 OF 14, PLACE FINAL PAVEMENT MARKINGS AND MARKERS FROM -Y3- STA. 11+13.27 TO -Y3- STA. 17+88.00, AND TIE TO EXISTING MARKINGS (SEE PAVEMENT MARKING PLAN).

PHASE II

STEP 1

AWAY FROM TRAFFIC AND UTILIZING NCDOT RSD 1101.02 SHEET 1 OF 14, PERFORM THE FOLLOWING AS SHOWN ON TMP-4:

A) CLOSE WESTBOUND LANE ON -L- (COMMERCE RD) AND USE FLAGGERS AS NECCESARY TO MAINTAIN TRAFFIC IN A TWO-WAY ONE-LANE CONFIGURATION.

B) CLOSE WESTBOUND LANE ON -L- (EXISTING COUNTRY CLUB DR) AND SHIFT TRAFFIC TO AN ONE-WAY ONE-LANE CONFIGURATION.

C) CONSTRUCT PROPOSED -L- ROADWAY, CURB AND GUTTER, AND SIDEWALK UP TO BUT NOT INCLUDING FINAL LAYER OF SURFACE COURSE FROM THE FOLLOWING STATION RANGES:

-L- STA. 11+80.00 TO STA. 18+50.00 LT
-L- STA. 28+75.00 TO STA. 31+94.84 LT

D) CONSTRUCT PROPOSED -Y2- ROADWAY UP TO BUT NOT INCLUDING FINAL LAYER OF SURFACE COURSE FROM -Y- STA. 11+60.00 LT TO 12+17.50 LT.

PHASE III

STEP 1

WORKING IN A CONTINUOUS MANNER, AWAY FROM TRAFFIC AND UTILIZING NCDOT RSD 1101.02 SHEET 1 OF 14, PERFORM THE FOLLOWING AS SHOWN ON TMP-5:

A) CLOSE EASTBOUND LANE ON -L- (COMMERCE RD) AND USE FLAGGERS AS NECCESARY TO MAINTAIN TRAFFIC IN A TWO-WAY ONE-LANE CONFIGURATION.

B) CLOSE EASTBOUND LANE ON COUNTRY CLUB DR AND SHIFT TRAFFIC TO -L-(COMMERCE RD) PREVIOUSLY CONSTRUCTED IN PHASE II, IN AN ONE-LANE ONE-WAY CONFIGURATION.

C) CONSTRUCT PROPOSED -L- ROADWAY, CURB AND GUTTER, AND SIDEWALK UP TO BUT NOT INCLUDING FINAL LAYER OF SURFACE COURSE FROM THE FOLLOWING STATION RANGES:

-L- STA. 11+80.00 TO STA. 18+50.00 RT
-L- STA. 28+75.00 TO STA. 31+94.84 RT

D) CONSTRUCT PROPOSED SIDEWALK FOR CROSSING FROM COMMERCE ROAD EXTENSION TO COUNTRY CLUB DRIVE

-Y3- STA. 16+73.39 TO STA. 16+84.63 RT
-Y3- STA. 17+49.46 TO STA. 17+50.45 RT

E) CONTINUE CONSTRUCTION OF PROPOSED -Y2- ROADWAY UP TO BUT NOT INCLUDING FINAL LAYER OF SURFACE COURSE FROM STA. 11+60.00 RT TO 12+74.68 RT.

PHASE IV

STEP 1

AWAY FROM TRAFFIC, USING NCDOT RSD 1101.02 SHEET 1 OF 14 AS REQUIRED TO PERFORM THE FOLLOWING:

A) PLACE THE FINAL LAYER OF SURFACE COURSE ON -L- (COMMERCE RD) FROM STA. 11+80.00 TO 31+94.84 AND ON -Y2- (COUNTRY CLUB RD) FROM STA. 11+60.00 TO 12+74.68.

B) TEMPORARILY CLOSE THE SOUTHBOUND THROUGH-RIGHT LANE ON -Y3- SR 1406(PINEY GREEN RD.) AS NECESSARY TO TIE IN TO INTERSECTION WITH -L- (COMMERCE RD EXTENSION).

STEP 2

USING NCDOT RSD 1101.02 SHEET 11 OF 14, PLACE FINAL PAVEMENT MARKINGS AND MARKERS FROM -L- STA 11+80.00 TO -L- STA 31+94.45, AND TIE TO EXISTING MARKINGS (SEE PAVEMENT MARKING PLAN).

STEP 3

REMOVE ALL TRAFFIC CONTROL DEVICES AND SIGNING. OPEN TO FINAL TRAFFIC PATTERN.

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NORTH CAROLINA PROFESSIONAL SEAL 049235 ENGINEER WESTON D. MURPHY

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DIVISION OF HIGHWAYS · STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION · WORK ZONE TRAFFIC CONTROL

TEMPORARY TRAFFIC CONTROL PHASING

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U-5878	TMP-3

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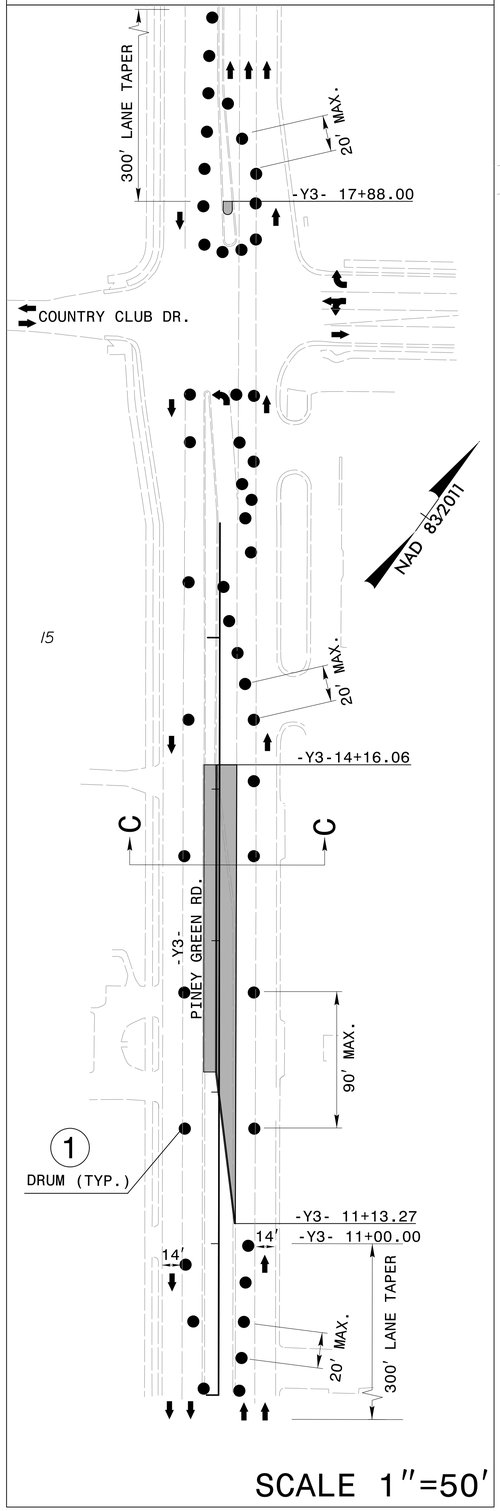

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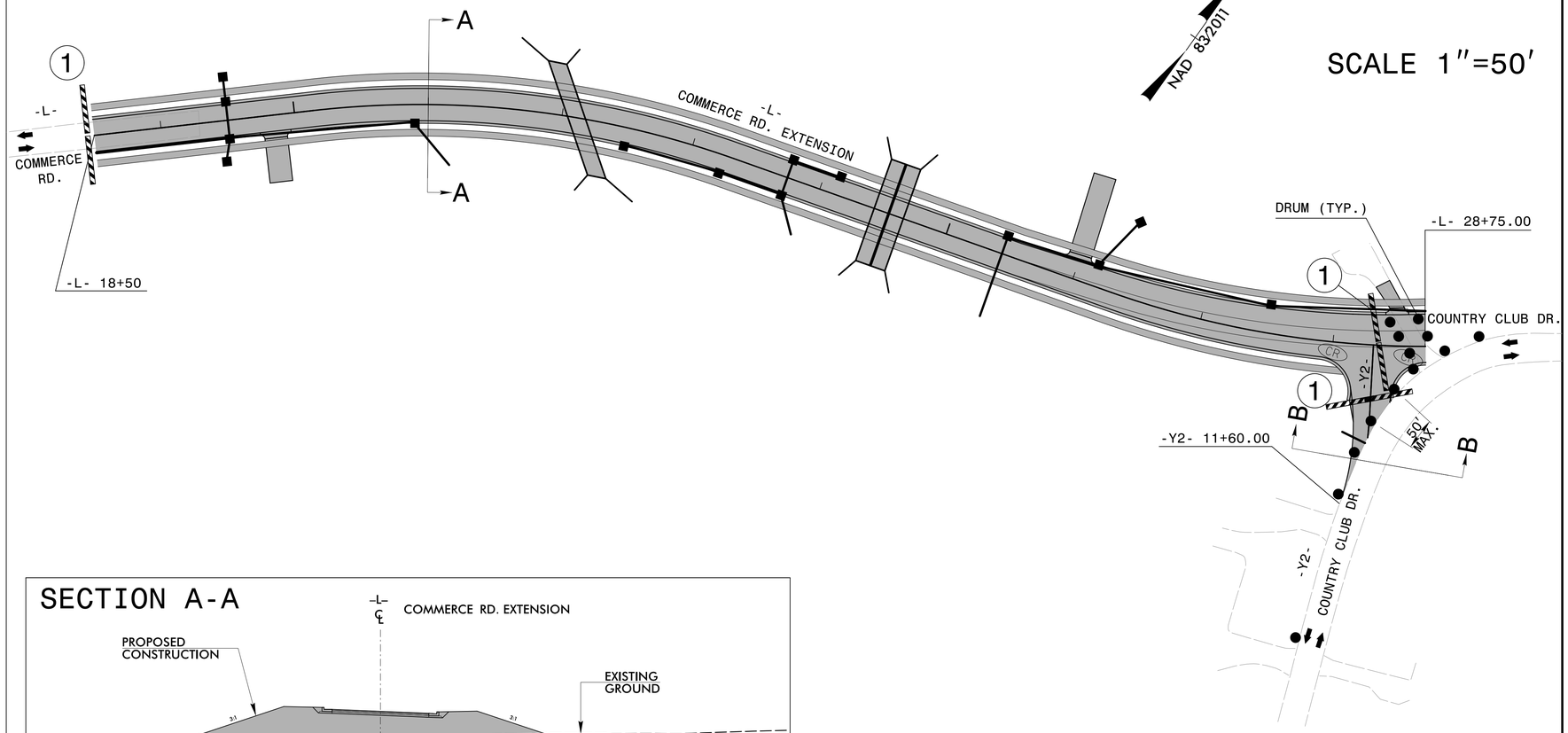

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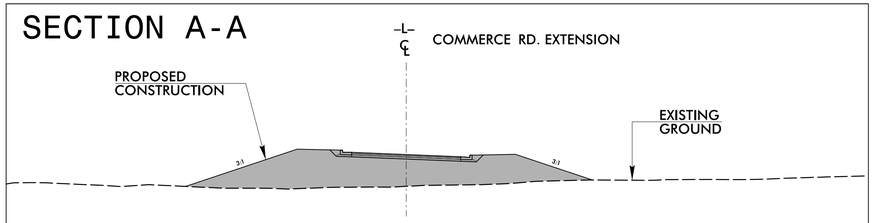

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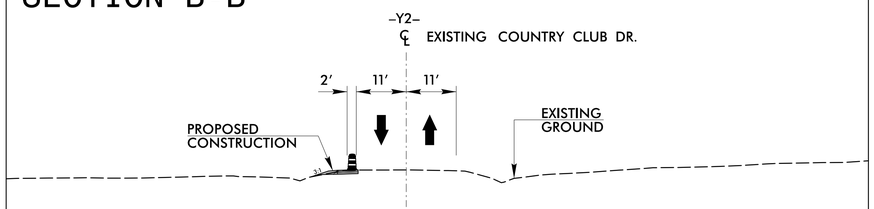

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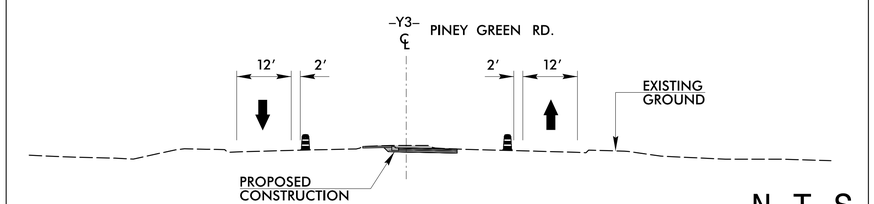

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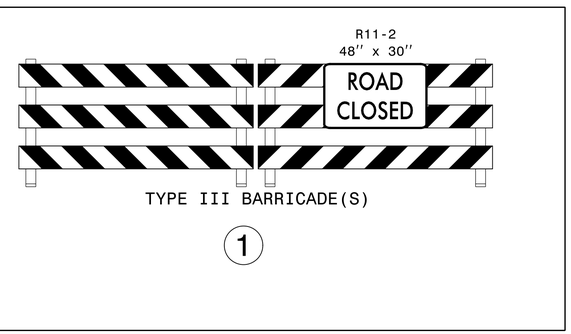

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TEMPORARY TRAFFIC CONTROL PHASE I DETAIL

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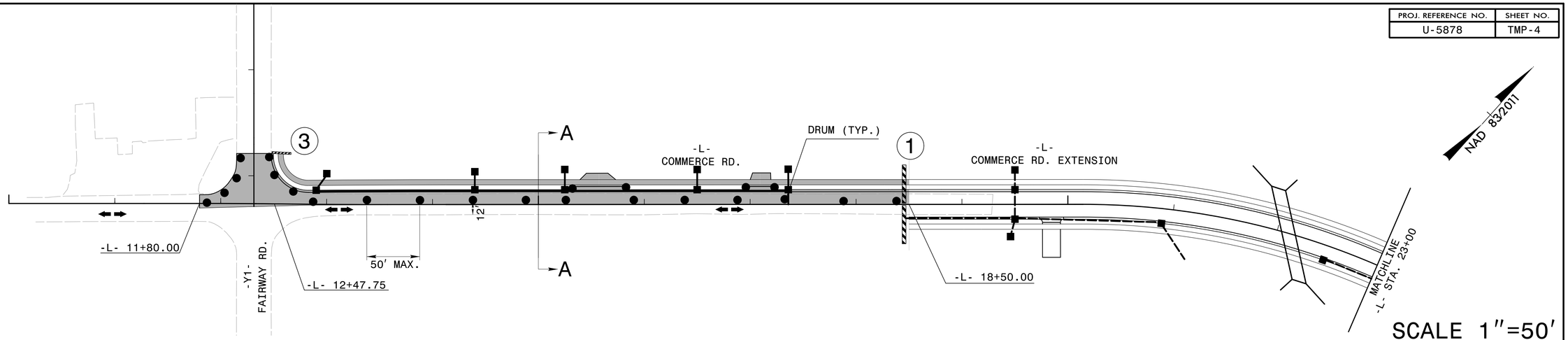

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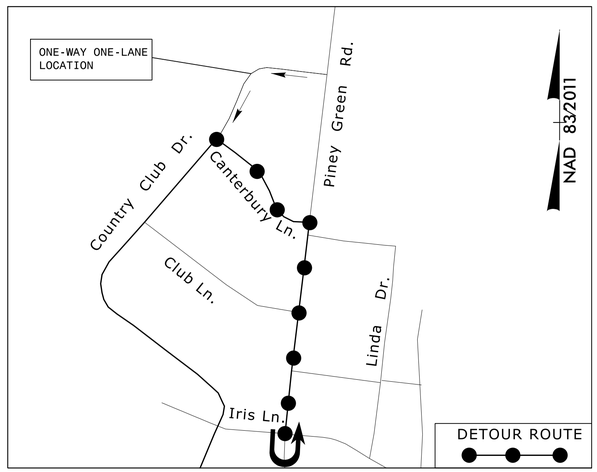

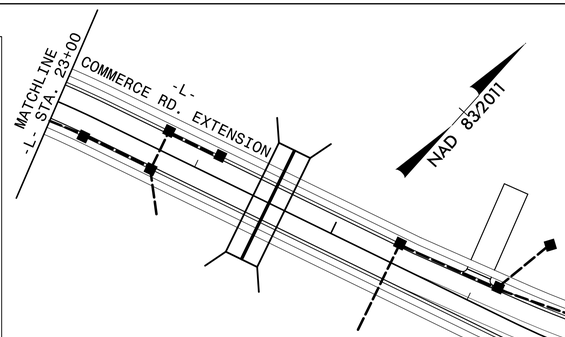

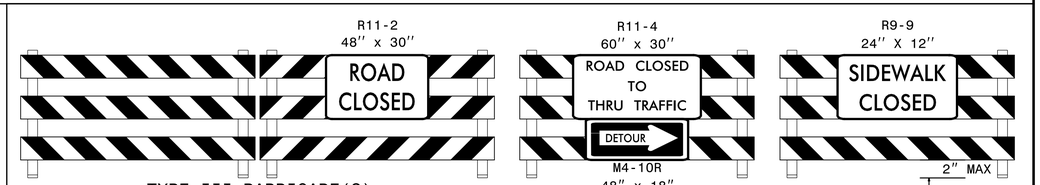

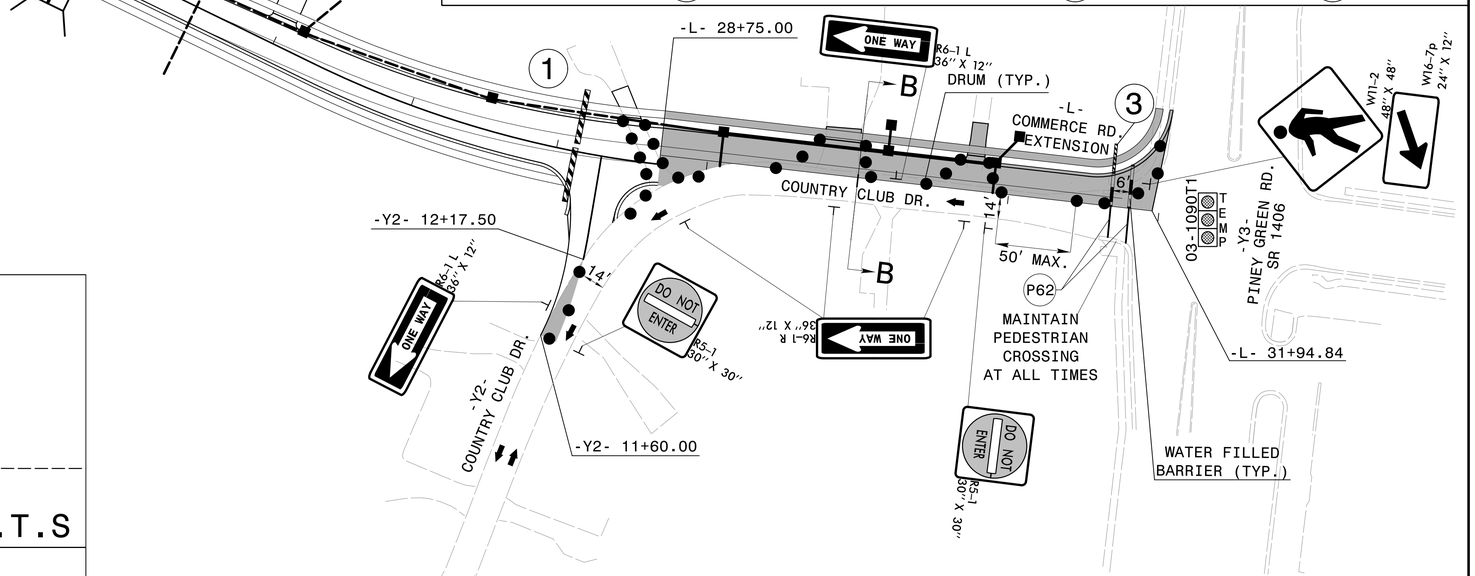

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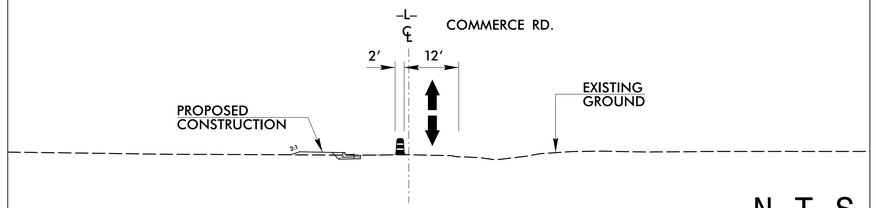

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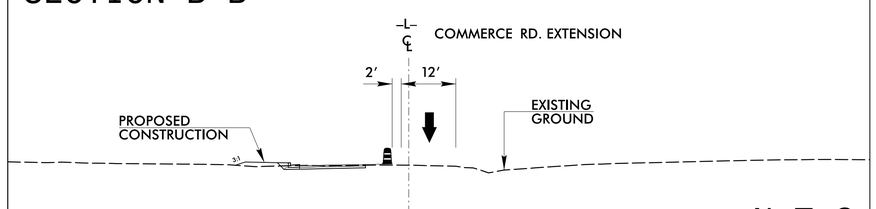

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TEMPORARY TRAFFIC CONTROL PHASE II DETAIL

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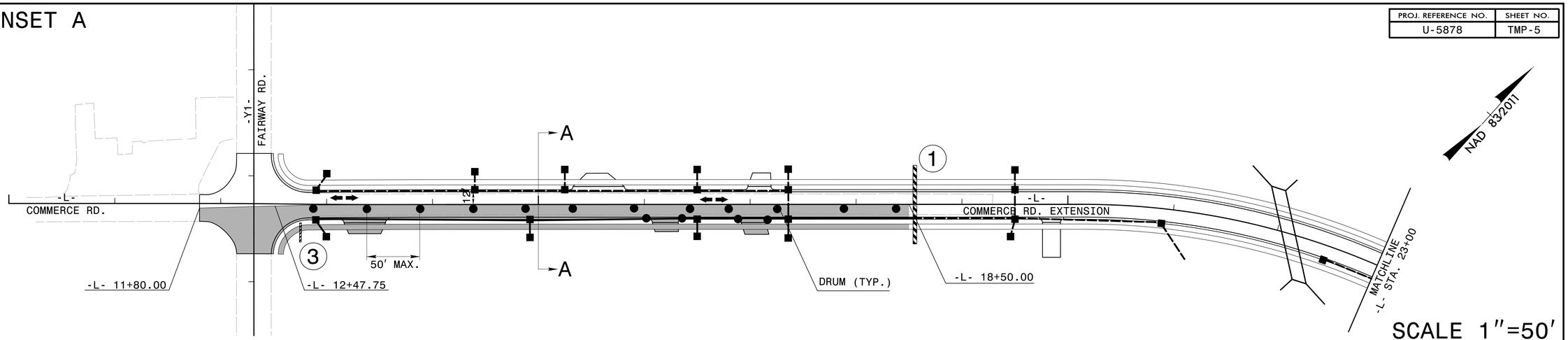

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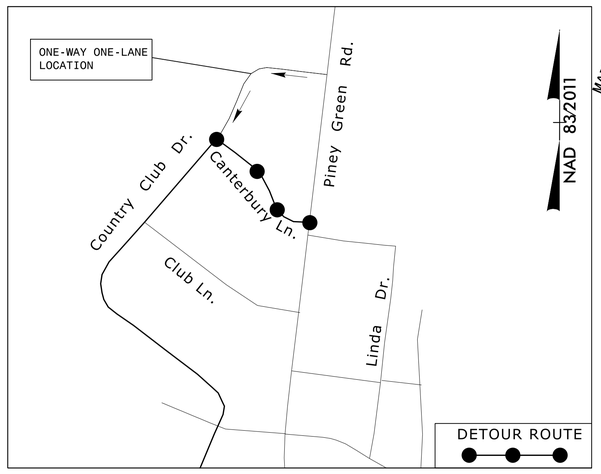

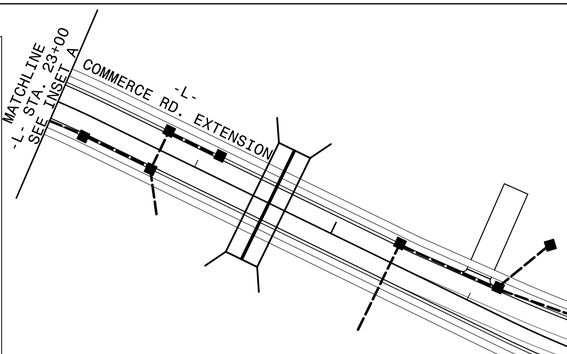

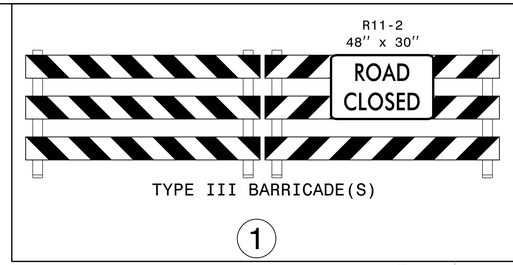

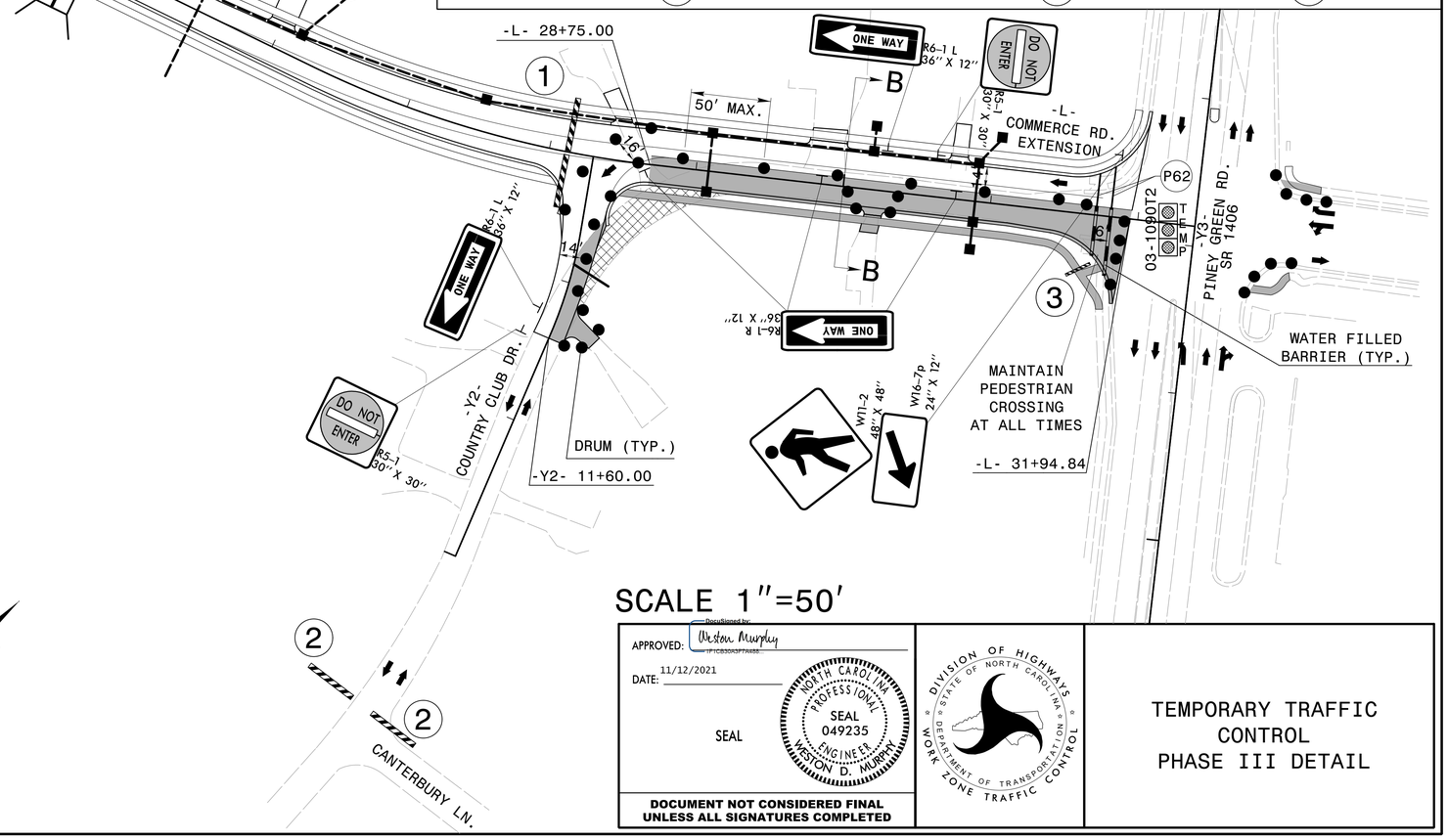

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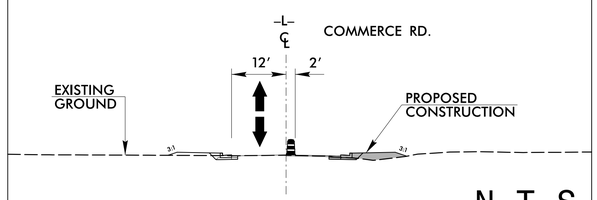

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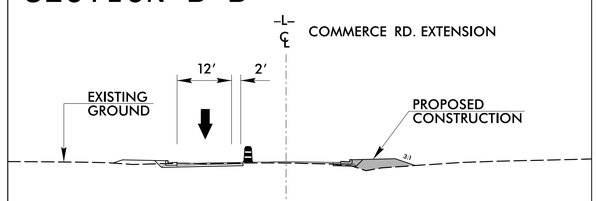

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TEMPORARY TRAFFIC CONTROL PHASE III DETAIL

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PROJECT: U-5878

CONTRACT: DC00185

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

STATE PROJECT REFERENCE NO.	SHEET NO.
U-5878	PMP-1

PAVEMENT MARKING & SIGNING PLAN

ONSLOW COUNTY

LOCATION: EXTENSION OF COMMERCE ROAD FROM FAIRWAY ROAD TO PINEY GREEN ROAD (SR 1406) AT COUNTRY CLUB DRIVE

FINAL PAVEMENT MARKING SCHEDULE

SYMBOL	DESCRIPTION
	THERMOPLASTIC (4",90 MILS)
T2	WHITE SOLID LANE LINE
T4	3FT.-9FT./SP WHITE MINISKIP
T5	2FT.-6FT./SP WHITE MINISKIP
T13	YELLOW DOUBLE CENTER
T14	2FT.-6FT./SP YELLOW MINISKIP
	THERMOPLASTIC (8",90 MILS)
T40	WHITE GORELINE
T41	WHITE DIAGONAL
T42	YELLOW DIAGONAL
	THERMOPLASTIC (24",90 MILS)
T61	WHITE STOP BAR
T62	WHITE CROSSWALK LINE
	THERMOPLASTIC (90 MILS)
T70	LEFT TURN ARROW
T71	RIGHT TURN ARROW
T73	COMBINED STRAIGHT/LEFT ARROW
	MARKERS
MA	PERMANENT MARKER (YELLOW & YELLOW)
ME	SNOWPLOWABLE MARKER (YELLOW & YELLOW)
MF	SNOWPLOWABLE MARKER (CRYSTAL & RED)

ROADWAY STANDARD DRAWINGS

THE FOLLOWING ROADWAY STANDARDS AS APPEAR IN "ROADWAY STANDARD DRAWINGS" - PROJECT SERVICES UNIT - N.C. DEPARTMENT OF TRANSPORTATION - RALEIGH, N.C., DATED JANUARY 2018 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 MULTI-LANE ROADWAYS
1205.04	PAVEMENT MARKINGS - INTERSECTIONS
1205.05	PAVEMENT MARKINGS - TURN LANES
1205.07	PAVEMNET MARKINGS - PEDESTRIAN CROSSWALKS
1205.08	PAVEMENT MARKINGS - SYMBOLS AND WORD MESSAGES
1205.09	PAVEMENT MARKINGS - PAINTED ISLANDS
1250.01	PAVEMENT MARKING SPACING
1251.01	RAISED PAVEMENT MARKERS - PERMANENT AND TEMPORARY
1253.01	SNOWPLOWABLE RAISED PAVEMENT MARKERS

SUMMARY OF QUANTITIES

ITEM NO.		ITEM DESCRIPTION	QUANTITY	UNIT
DESC. NO.	SECT. NO.			
4072000000	903	SUPPORTS, 3-LB STEEL U-CHANNEL	104	LF
4102000000	903	SIGN ERECTION, TYPE E	11	EA
4116100000	904	SIGN ERECTION, RELOCATE TYPE E (GROUND MOUNTED)	2	EA
4155000000	907	DISPOSAL OF SIGN SYSTEM, U-CHANNEL	3	EA
4238000000	907	DISPOSAL OF SIGN D, E, OR F	2	EA
4685000000	1205	THERMOPLASTIC PAVEMENT MARKING LINES (4", 90 MILS)	4134	LF
4695000000	1205	THERMOPLASTIC PAVEMENT MARKING LINES (8", 90 MILS)	158	LF
4720000000	1205	THERMOPLASTIC PAVEMENT MARKING SYMBOL	6	EA
4835000000	1205	PAINT PAVEMENT MARKING LINES (24")	93	LF
4891000000	1205	THERMOPLASTIC PAVEMENT MARKING LINES (24", 90 MILS)	617	LF
4900000000	1251	PERMANENT RAISED PAVEMENT MARKERS	30	EA
4905000000	1253	SNOWPLOWABLE PAVEMENT MARKERS	100	EA

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.

· ALL CURB RAMPS WILL BE NCDOT STANDARD DESIGNS.

PAVEMENT MARKING:

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

ROAD NAME	MARKING	MARKER
COMMERCE RD.	THERMOPLASTIC	SNOWPLOWABLE
PINEY GREEN RD.	THERMOPLASTIC	SNOWPLOWABLE & PERMANENT

· TIE PROPOSED PAVEMENT MARKING LINES TO EXISTING PAVEMENT MARKING LINES.

· REMOVE/REPLACE ANY CONFLICTING PAVEMENT MARKINGS.

· PASSING ZONE WILL BE DETERMINED IN THE FIELD AND MUST BE APPROVED BY THE ENGINEER.

· ALL EXISTING PAVEMENT MARKINGS BEYOND PROJECT LIMITS SHALL REMAIN IN PLACE. REPLACE ANY PAVEMENT MARKINGS BEYOND THE PROJECT LIMITS DAMAGED BY THE CONTRACTORS' OPERATIONS DURING CONSTRUCTION.

SIGNING:

· SIGNS FURNISHED BY STATE

· IF REMOVAL OR RELOCATION OF SIGNS ON PRIVATE STREET (NON-STATE MAINTAINED) IS REQUIRED DUE TO CONSTRUCTION, THE CONTRACTOR SHALL INFORM THE ENGINEER. THE WORK WILL BE COMPLETED BY OTHERS.

· 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.

· WHEN EXISTING SIGNS ARE REMOVED AND INSTALLED ON NEW SUPPORTS, THE RE-ERECTING SHALL IMMEDIATELY FOLLOW THE REMOVAL.

· THE BACKGROUND FOR TYPE 'E' AND 'F' SIGNS SHALL BE TYPE C REFLECTIVE SHEETING.

INDEX OF SHEETS

SHEET NO.	TITLE
PMP-1	PAVEMENT MARKING & SIGNING PLAN COVER SHEET
PMP-2 & PMP-3	PAVEMENT MARKING & SIGNING DETAIL SHEETS

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

APPROVED: DocuSigned by: Weston Murphy 7/20/2022
DATE:

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 049235 ENGINEER WESTON D. MURPHY

PLANS PREPARED BY:

STV 100 Years
STV Engineers, Inc.
1600 Perimeter Park Dr.
Suite 225
Morrisville, NC 27560
NC License Number F-0991

PATRICK A. LIVINGSTON, PE — PROJECT ENGINEER
WESTON D. MURPHY, PE — DESIGN ENGINEER

1/20/2022
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MooreDS

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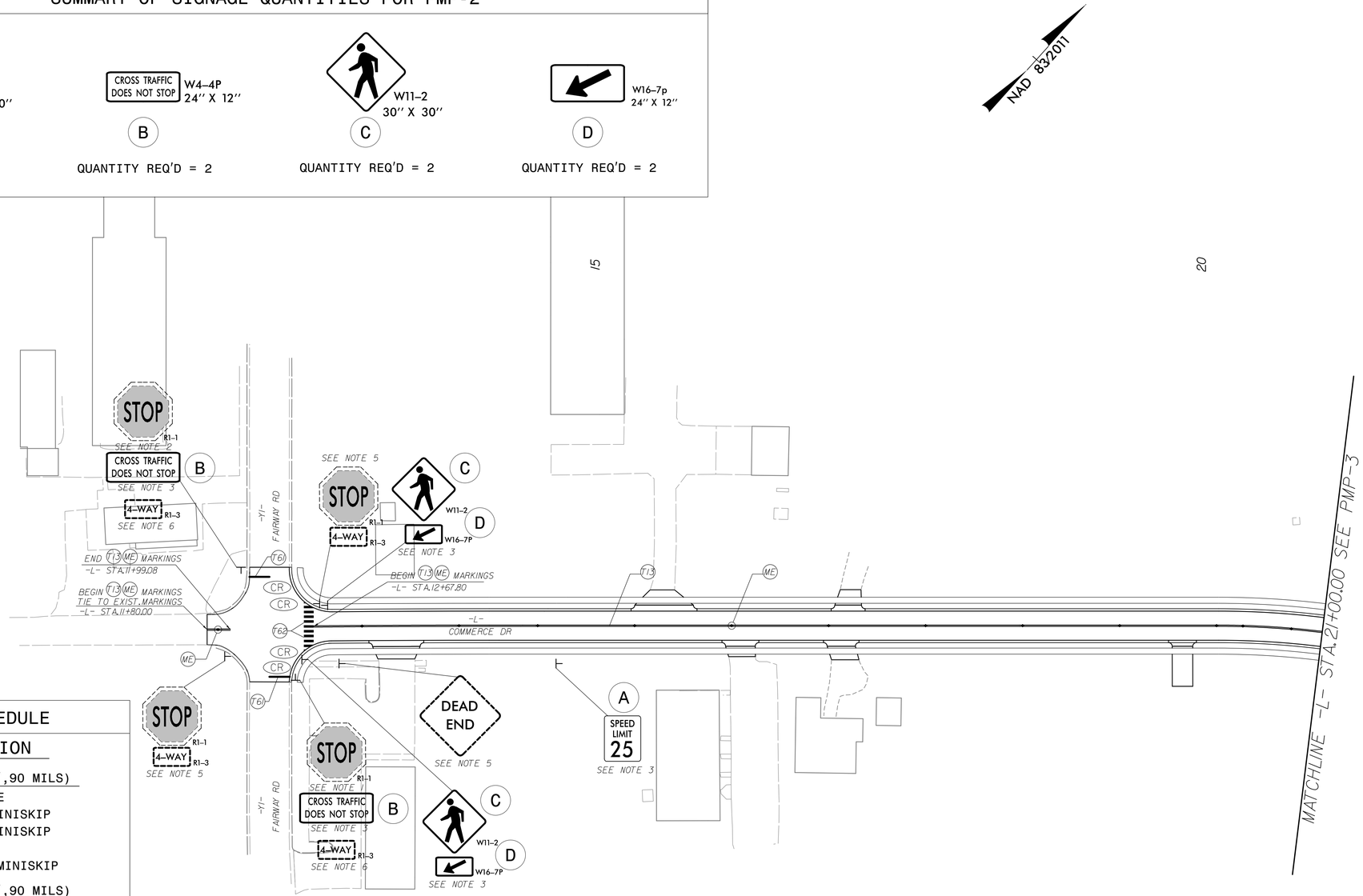
8/17/99

STV 100 Years
STV Engineers, Inc.
1600 Perimeter Park Dr.
Suite 225
Morrisville, NC 27560
NC License Number F-0991

PROJ. REFERENCE NO.	SHEET NO.
U-5878	PMP-2

SUMMARY OF SIGNAGE QUANTITIES FOR PMP-2

A	B	C	D
SPEED LIMIT 25 R2-1 24'' X 30''	CROSS TRAFFIC DOES NOT STOP W4-4P 24'' X 12''	W11-2 30'' X 30''	W16-7p 24'' X 12''
QUANTITY REQ'D = 1	QUANTITY REQ'D = 2	QUANTITY REQ'D = 2	QUANTITY REQ'D = 2



PAVEMENT MARKING SCHEDULE

SYMBOL	DESCRIPTION
	THERMOPLASTIC (4",90 MILS)
T2	WHITE SOLID LANE LINE
T4	3FT.-9FT./SP WHITE MINISKIP
T5	2FT.-6FT./SP WHITE MINISKIP
T13	YELLOW DOUBLE CENTER
T14	2FT.-6FT./SP YELLOW MINISKIP
	THERMOPLASTIC (8",90 MILS)
T40	WHITE GORELINE
T41	WHITE DIAGONAL
T42	YELLOW DIAGONAL
	THERMOPLASTIC (24",90 MILS)
T61	WHITE STOP BAR
T62	WHITE CROSSWALK LINE
	THERMOPLASTIC (90 MILS)
T70	LEFT TURN ARROW
T71	RIGHT TURN ARROW
T73	COMBINED STRAIGHT/LEFT ARROW
	MARKERS
MA	PERMANENT MARKER (YELLOW & YELLOW)
ME	SNOWPLOWABLE MARKER (YELLOW & YELLOW)
MF	SNOWPLOWABLE MARKER (CRYSTAL & RED)

NOTES:
1) RELOCATE EXIST. SIGN SYSTEM AND ERECT NEW U-CHANNEL.
2) RETAIN EXIST. SIGN SYSTEM.
3) PLACEMENT OF NEW SIGN SYSTEM.
4) PAVEMENT MARKINGS AND SYMBOLS TO BE MARKED ACCORDING TO THE ROADWAY STANDARD DRAWINGS UNLESS NOTED OTHERWISE.
5) DISPOSAL OF SIGN SYSTEM, U-CHANNEL.
6) DISPOSAL OF SIGN SYSTEM, D, E, OR F

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

APPROVED DocuSigned by: Weston Murphy 1F1CB20A3F7A488... DATE: 1/20/2022

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 049235 ENGINEER WESTON D. MURPHY

PAVEMENT MARKING & SIGNING DETAIL

SCALE:	NONE
DATE:	09/20/21
DWG. BY:	WDM
DESIGN BY:	WDM
REVIEWED BY:	PAL

DIVISION OF HIGHWAYS TRAFFIC ENGINEERING BRANCH TRAFFIC CONTROL UNIT

REVISIONS

CADD FILE

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PROJ. REFERENCE NO.	SHEET NO.
U-5878	PMP-3

STV 100 Years
STV Engineers, Inc.
1600 Perimeter Park Dr.
Suite 225
Morrisville, NC 27560
NC License Number F-0991

SUMMARY OF SIGNAGE QUANTITIES FOR PMP-3

A	E	F
SPEED LIMIT 25 R2-1 24'' X 30''	STOP R1-1 30" X 30"	RIGHT LANE MUST TURN RIGHT R3-7 R 30'' X 30''
QUANTITY REQ'D = 1	QUANTITY REQ'D = 1	QUANTITY REQ'D = 2

NAD 83 2011

MATCHLINE -L- STA.21+00.00 SEE PMP-2

BEGIN (T4)(MF) MARKINGS -L- STA.25+55.22

BEGIN (T3)(ME) MARKINGS -L- STA.28+69.12

END (T3)(ME) MARKINGS -L- STA.28+03.64

BEGIN (T5)(MF) MARKINGS -L- STA.27+91.25

SPECIAL SIGNS FOR COMMERCE RD AND COUNTRY CLUB DR ARE TO BE DESIGNED BY CITY OF JACKSONVILLE

SPEED LIMIT 25 R2-1

SEE NOTE 1

-Y2- COUNTRY CLUB DR

STOP

SEE NOTE 3

END (T4) MARKINGS

BEGIN (T2) MARKINGS -L- STA.28+69.12

END (T5)(MF) MARKINGS -L- STA.28+69.09

COMMERCE DR -L-

SPECIAL SIGNS FOR COMMERCE RD AND PINEY GREEN RD ARE TO BE DESIGNED BY CITY OF JACKSONVILLE

END (T3)(T40)(ME)(MF) MARKINGS -L- STA.31+69.28

BEGIN (T14) MARKINGS -L- STA.31+81.37

SPEED LIMIT 25

SEE NOTE 3

END (T2) MARKINGS

BEGIN (T40) MARKINGS -L- STA.31+12.77

RIGHT LANE MUST TURN RIGHT

SEE NOTE 3

-Y3- PINEY GREEN RD

BEGIN (T13)(T42) MARKINGS -Y3- STA.17+86.96

END (T13)(T42) MARKINGS -Y3- STA.17+87.73

4.5' R -Y3- STA.17+65.69

EXISTING MARKINGS

REMOVE STRIPED OUT AREA TO ALLOW FOR THROUGH MOVEMENT

END (T14) MARKINGS -L- STA.32+38.80

SEE 2C-1 FOR SPECIAL DETAIL

END (T4)(MF) MARKINGS TIE TO EXIST.MARKINGS -Y3- STA.14+16.06

BEGIN (MA) MARKERS -Y3- STA.14+16.06

BEGIN (MA) MARKERS -Y3- STA.12+13.27

BEGIN (T4)(MF) MARKINGS -Y3- STA.11+13.27

PAVEMENT MARKING SCHEDULE

SYMBOL	DESCRIPTION
	THERMOPLASTIC (4",90 MILS)
T2	WHITE SOLID LANE LINE
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T5	2FT.-6FT./SP WHITE MINISKIP
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	THERMOPLASTIC (8",90 MILS)
T40	WHITE GORELINE
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T42	YELLOW DIAGONAL
	THERMOPLASTIC (24",90 MILS)
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	MARKERS
MA	PERMANENT MARKER (YELLOW & YELLOW)
ME	SNOWPLOWABLE MARKER (YELLOW & YELLOW)
MF	SNOWPLOWABLE MARKER (CRYSTAL & RED)

NOTES:
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2) RETAIN EXIST. SIGN SYSTEM.
3) PLACEMENT OF NEW SIGN SYSTEM.
4) PAVEMENT MARKINGS AND SYMBOLS TO BE MARKED ACCORDING TO THE ROADWAY STANDARD DRAWINGS UNLESS NOTED OTHERWISE.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

APPROVED DocuSigned by: Weston Murphy 1F1FCB3D0A2F7A4BB... DATE: 1/20/2022

SEAL — NORTH CAROLINA PROFESSIONAL SEAL 049235 ENGINEER WESTON D. MURPHY

PAVEMENT MARKING & SIGNING DETAIL

SCALE:	NONE
DATE:	09/20/21
DWG. BY:	WDM
DESIGN BY:	WDM
REVIEWED BY:	PAL

DIVISION OF HIGHWAYS — TRAFFIC ENGINEERING BRANCH — TRAFFIC CONTROL UNIT

REVISIONS

CADD FILE

1/20/2022
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Moore, Jo

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TIP PROJECT: U-5878

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

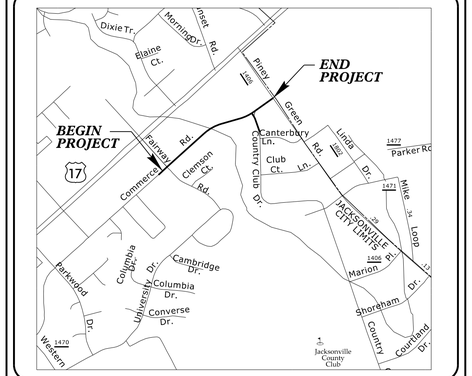
PLAN FOR PROPOSED
HIGHWAY EROSION CONTROL

ONSLOW COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-5878	EC-1	EC-12
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	
44694.1.1	N/A	P.E.	

LOCATION: *EXTENSION OF COMMERCE ROAD FROM FAIRWAY ROAD TO PINEY GREEN ROAD (SR 1406) AT COUNTRY CLUB DRIVE*

TYPE OF WORK: *GRADING, PAVING, DRAINAGE & CULVERTS*



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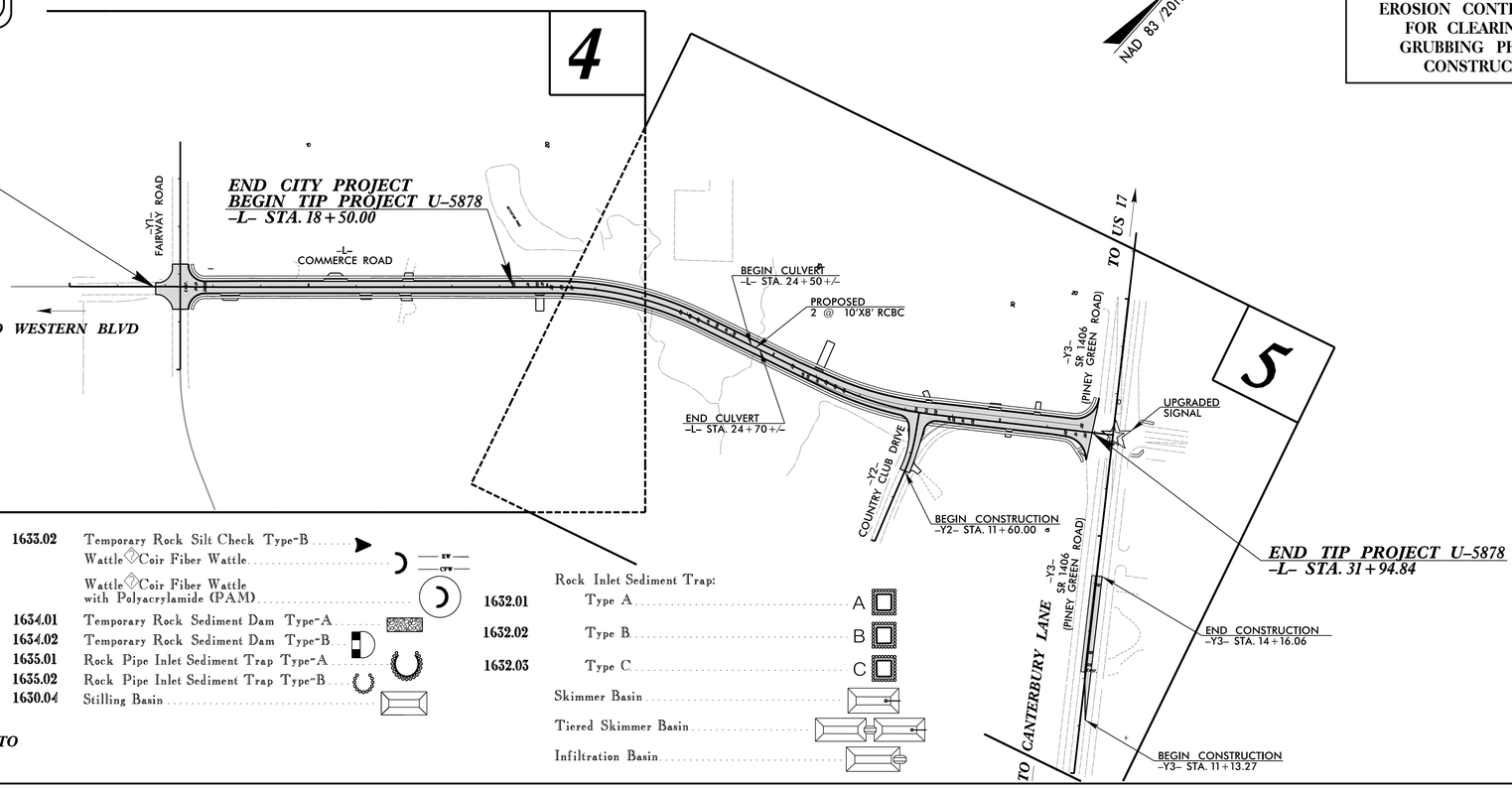
THIS PROJECT CONTAINS EROSION CONTROL PLANS FOR CLEARING AND GRUBBING PHASE OF CONSTRUCTION.

NAD 83 / 2011



EROSION AND SEDIMENT CONTROL MEASURES

Std. #	Description	Symbol
1630.03	Temporary Silt Ditch	TSD
1630.05	Temporary Diversion	TD
1605.01	Temporary Silt Fence	
1606.01	Special Sediment Control Fence	
1622.01	Temporary Berms and Slope Drains	
1630.02	Silt Basin Type B	
1633.01	Temporary Rock Silt Check Type-A	
	Temporary Rock Silt Check Type-A with Matting and Polyacrylamide (PAM)	
1633.02	Temporary Rock Silt Check Type-B	
	Wattle◇Coir Fiber Wattle	EW CFW
	Wattle◇Coir Fiber Wattle with Polyacrylamide (PAM)	
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	
1635.02	Rock Pipe Inlet Sediment Trap Type-B	
1630.04	Stilling Basin	

Rock Inlet Sediment Trap:

1632.01	Type A	A
1632.02	Type B	B
1632.03	Type C	C
	Skimmer Basin	
	Tiered Skimmer Basin	
	Infiltration Basin	

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

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, 2019 AND ISSUED BY THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL QUALITY DIVISION OF WATER RESOURCES.

NV5

NV5 ENGINEERS & CONSULTANTS, INC.
3300 REGENCY PARKWAY, SUITE 100
CARY, NC 27518
P: 919.851.1912 www.NV5.com
NC License # F-1333

Prepared in the Office of:

NV5 ENGINEERS & CONSULTANTS
3300 REGENCY PARKWAY, SUITE 100
CARY, NC 27518

Designed by:

David Bocker, P.E. ***3664***
NAME *LEVEL III CERTIFICATION NO.*

Roadway Standard Drawings

The following roadway english standards as appear in "Roadway Standard Drawings"– Roadway Design Unit – N. C. Department of Transportation – Raleigh, N. C., dated January 2018 and the latest revison thereto are applicable to this project and by reference hereby are considered a part of these plans.

1604.01	Railroad Erosion Control Detail	1632.01	Rock Inlet Sediment Trap Type A
1605.01	Temporary Silt Fence	1632.02	Rock Inlet Sediment Trap Type B
1606.01	Special Sediment Control Fence	1632.03	Rock Inlet Sediment Trap Type C
1607.01	Gravel Construction Entrance	1633.01	Temporary Rock Silt Check Type A
1622.01	Temporary Berms and Slope Drains	1633.02	Temporary Rock Silt Check Type B
1630.01	Riser Basin	1634.01	Temporary Rock Sediment Dam Type A
1630.02	Silt Basin Type B	1634.02	Temporary Rock Sediment Dam Type B
1630.03	Temporary Silt Ditch	1635.01	Rock Pipe Inlet Sediment Trap Type A
1630.04	Stilling Basin	1635.02	Rock Pipe Inlet Sediment Trap Type B
1630.05	Temporary Diversion	1640.01	Coir Fiber Baffle
1630.06	Special Stilling Basin	1645.01	Temporary Stream Crossing
1631.01	Matting Installation		

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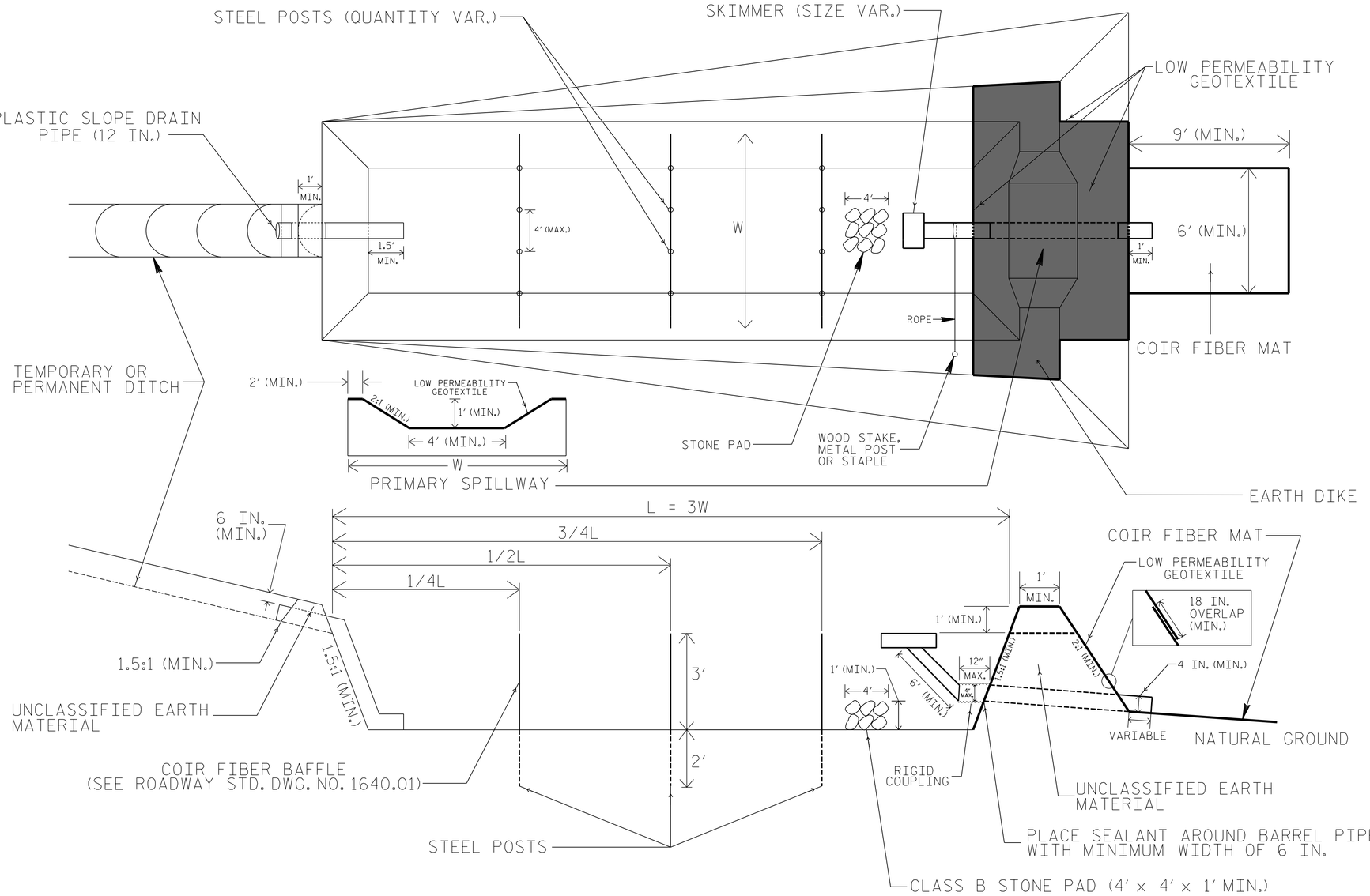
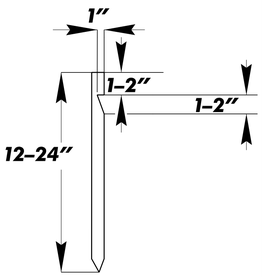
PROJECT REFERENCE NO.	SHEET NO.
U-5878	EC-02
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

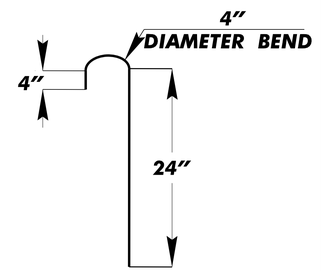
SKIMMER BASIN WITH BAFFLES DETAIL (EAST)



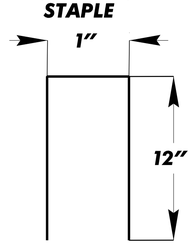
2" x 2" (nominal) WOODEN STAKE



#10 STEEL REINFORCEMENT BAR



1" (nominal) STAPLE



COIR FIBER MAT ANCHOR OPTIONS

NOTES

1. ***SEED AND PLACE MATTING FOR EROSION CONTROL ON INTERIOR AND EXTERIOR SIDESLOPES.***
2. ***LIMIT EARTH DIKE HEIGHT TO 5 FT.***
3. ***FOR BASIN DEPTH OF 3 FT., THE MINIMUM BASIN WIDTH SHALL BE 9 FT.***
4. ***DETERMINE PRIMARY SPILLWAY WEIR LENGTH (FT.) USING $Q^{0.8}$, WHERE Q IS FLOW RATE (CFS) INTO BASIN.***
5. ***PLASTIC SLOPE DRAIN PIPE AT INLET OF BASIN MAY BE REPLACED BY FILTRATION GEOTEXTILE OR TARP AS DIRECTED.***
6. ***LOW PERMEABILITY GEOTEXTILE FOR PRIMARY SPILLWAY SHALL BE ONE CONTINUOUS PIECE OF MATERIAL OR OVERLAPPED 18 IN. (MIN.).***

NOT TO SCALE

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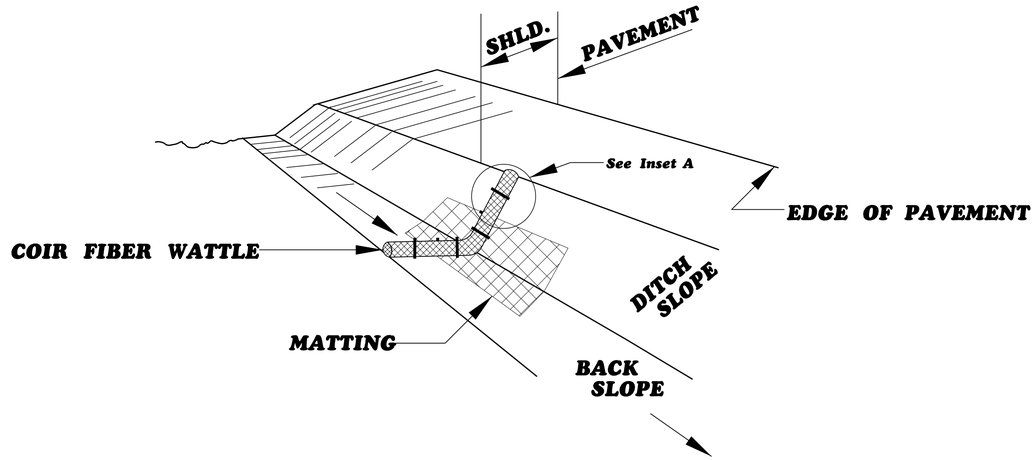
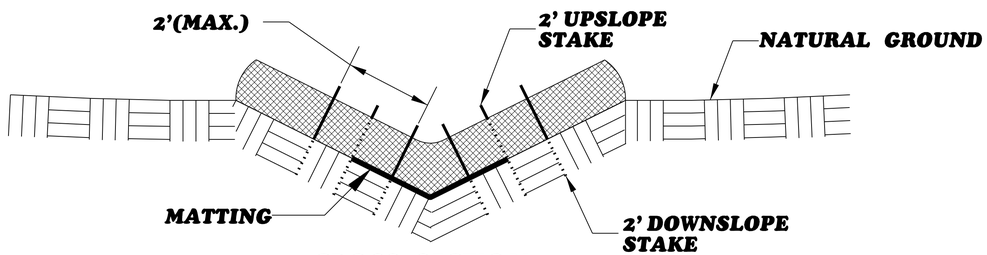
PROJECT REFERENCE NO.	SHEET NO.
U-5878	EC-02A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

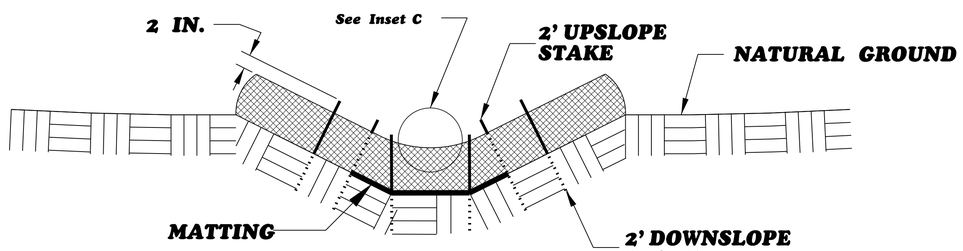
COIR FIBER WATTLE WITH POLYACRYLAMIDE (PAM) DETAIL



ISOMETRIC VIEW



CROSS SECTION
VEE DITCH



CROSS SECTION
TRAPEZOIDAL DITCH

NOTES:

USE MINIMUM 12 IN. DIAMETER COIR FIBER (COCONUT FIBER) WATTLE.

USE 2 FT. WOODEN STAKES WITH A 2 IN. BY 2 IN. NOMINAL CROSS SECTION.

ONLY INSTALL WATTLE(S) TO A HEIGHT IN DITCH SO FLOW WILL NOT WASH AROUND WATTLE AND SCOUR DITCH SLOPES AND AS DIRECTED.

INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO BOTTOM OF DITCH.

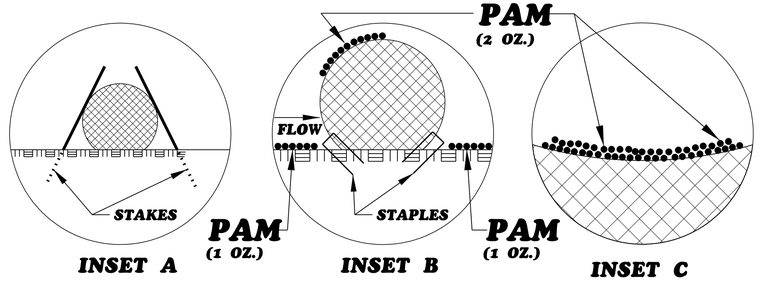
PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12" IN LENGTH.

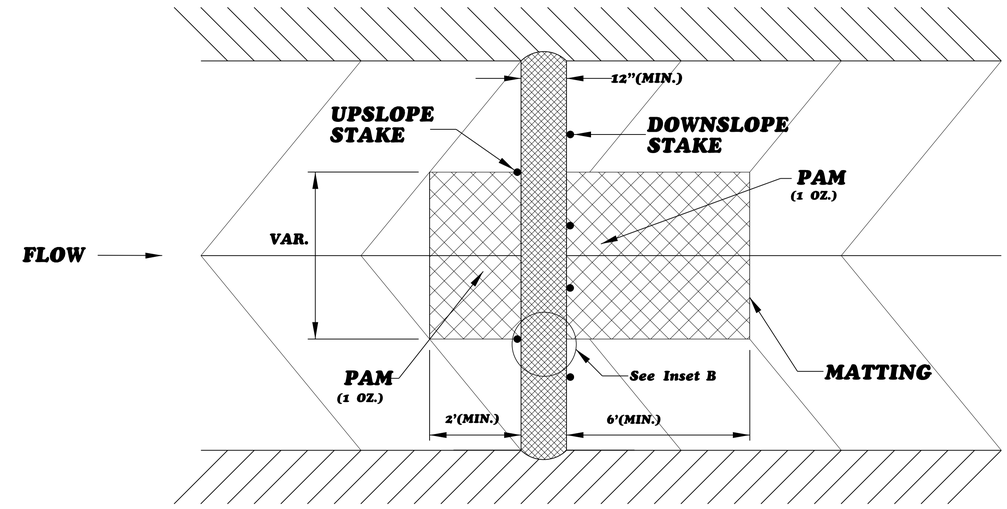
INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.

INSTALL MATTING IN ACCORDANCE WITH SECTION 1631 OF THE STANDARD SPECIFICATIONS.

PRIOR TO POLYACRYLAMIDE (PAM) APPLICATION, OBTAIN A SOIL SAMPLE FROM PROJECT LOCATION, AND FROM OFFSITE MATERIAL, AND ANALYZE FOR APPROPRIATE PAM FLOCCULANT TO BE APPLIED TO EACH WATTLE.

INITIALLY APPLY 2 OUNCES OF ANIONIC OR NEUTRALLY CHARGED PAM OVER WATTLE WHERE WATER WILL FLOW AND 1 OUNCE OF PAM ON MATTING ON EACH SIDE OF WATTLE. REAPPLY PAM AFTER EVERY RAINFALL EVENT THAT IS EQUAL TO OR EXCEEDS 0.50 IN.





TOP VIEW

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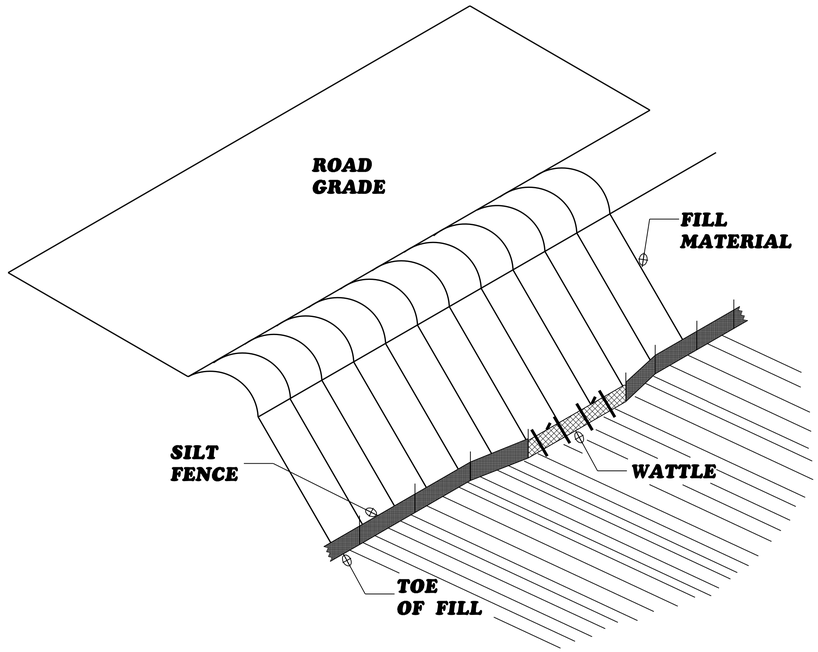
PROJECT REFERENCE NO.	SHEET NO.
U-5878	EC-02B
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

SILT FENCE COIR FIBER WATTLE BREAK DETAIL



ISOMETRIC VIEW

NOTES:

USE MINIMUM 12 IN. DIAMETER COIR FIBER (COCONUT FIBER) WATTLE AND LENGTH OF 10 FT.

EXCAVATE A 1 TO 2 INCH TRENCH FOR WATTLE TO BE PLACED.

DO NOT PLACE WATTLE ON TOE OF SLOPE.

USE 2 FT. WOODEN STAKES WITH A 2 IN. BY 2 IN. NOMINAL CROSS SECTION.

INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO GROUND.

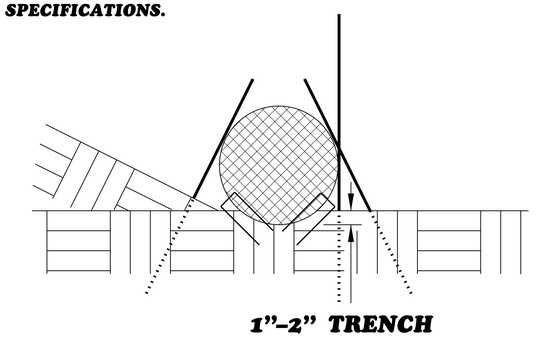
PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12" IN LENGTH.

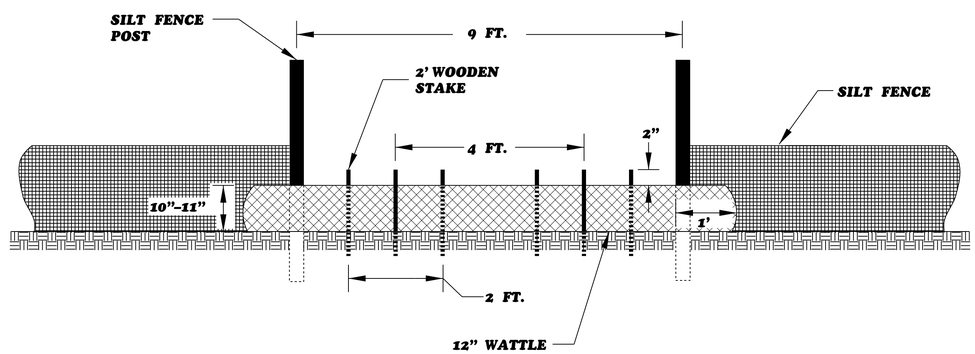
INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.

WATTLE INSTALLATION CAN BE ON OUTSIDE OF THE SILT FENCE AS DIRECTED.

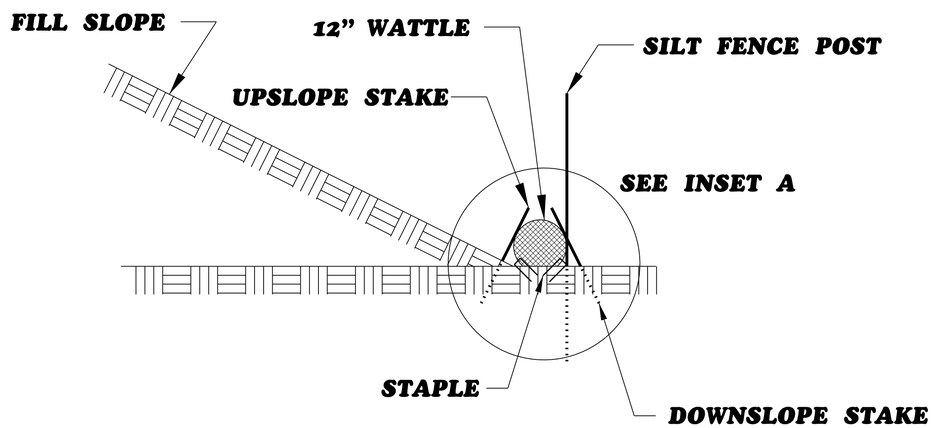
INSTALL TEMPORARY SILT FENCE IN ACCORDANCE WITH SECTION 1605 OF THE STANDARD SPECIFICATIONS.

INSET A





VIEW FROM SLOPE



SIDE VIEW

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PROJECT REFERENCE NO.	SHEET NO.
U-5878	EC-03
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SOIL STABILIZATION SUMMARY SHEET

PERMANENT SOIL REINFORCEMNT MAT

CONST SHEET NO.	LINE	FROM STATION	TO STATION	SIDE	ESTIMATE (SY)
5	-L-	23+91	24+31	RT	55
5	-Y2-	12+00	12+20	LT	15
			SUBTOTAL		70
	ADDITIONAL	PSRM TO	BE INSTALLED		0
				TOTAL	70
				SAY	70

PERMANENT SOIL REINFORCEMENT MAT

CONST SHEET NO.	LINE	FROM STATION	TO STATION	SIDE	ESTIMATE (SY)
			SUBTOTAL		
		ADDITIONAL	PSRM TO BE INSTALLED		
				TOTAL	
				SAY	

DocuSign Envelope ID: 96F5E234-EA90-4791-BE14-55EFA86FE173

PROJECT REFERENCE NO.	SHEET NO.
U-5878	EC-03A
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 OR FLATTER	14 DAYS	7 DAYS FOR SLOPES GREATER THAN 50' IN LENGTH.
ALL OTHER AREAS WITH SLOPES FLATTER THAN 4:1	14 DAYS	NONE, EXCEPT FOR PERIMETERS AND HQW ZONES.

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PROJECT REFERENCE NO.	SHEET NO.
U-5878	EC-04/CONST.04
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

STV 100 Years
STV Engineers, Inc.
1500 Perimeter Park Dr.
Suite 120
Morrisville, NC 27560
NC License Number F-0991

8/17/99

NOTE: CONSTRUCTION SHOWN FROM STA.11+80.00 TO 18+50.00 PENDING MUNICIPAL AGREEMENT WITH CITY OF JACKSONVILLE.

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

CLEARING AND GRUBBING EROSION CONTROL FOR CONSTRUCTION SHEET 04

NAD 83/2011

BEGIN CONSTRUCTION
BEGIN CITY PROJECT
–L– POT STA. 11+80.00

END CITY PROJECT
BEGIN TIP PROJECT U-5878
–L– POT STA. 18+50.00

LEWISVILLE PROPERTIES,LLC
DB 4421 PG 751
MB 28 PG 22

THE HARRY C. BROWN FAMILY LLC
DB 2728 PG 352
MB 51 PG 158

LAND O SUN II, LLC
DB 1602 PG 636

THE HARRY C. BROWN FAMILY LLC
DB 2413 PG 926

THE HARRY C. BROWN FAMILY, LLC
DB 2376 PG 361
MB 43 PG 64

NEW RIVER BAPTIST ASSOCIATION
DB 817 PG 500

BODENHAMER NC PROPERTIES, LLC
DB 3323 PG 473
PC 32 SLIDE 109

BODENHAMER NC PROPERTIES, LLC
DB 3798 PG 839
PC 32 SLIDE 109

RONNIE L. HENDERSON
DB 3798 PG 839
PC 32 SLIDE 109

JACK G. KOONCE, JR., et ux
DB 4249 PG 208

CHERIE T. BEVILL, et al
DB 2022 PG 518
MB 34 PG 99

JONATHAN C. SNYDER
DB 3792 PG 800
PC 14 SLIDE 57

-Y1- POT Sta. 14+77.56

-L- POC Sta.12+31.33 =
-Y1- POT Sta. 11+73.69

N 47° 57' 08.1" W

MILL AND OVERLAY FROM
-L- POT STA.11+80.00 TO
-L- POT STA.12+42.75

TIE TO EXIST CURB
-Y1- STA.12+21.03
Y1= +38.28 EX. R/W
-L- +89.00

-L- PT Sta. 13+57.59

N 48° 03' 12.2" E
-L- PC Sta. 11+80.04

-L- POT Sta. 10+00.00

-L- PRC Sta. 12+67.78

-Y1- POT Sta. 10+00.00

BL-1
-L-
12+08.26
38.98' RT

TIE TO EXIST CURB
-Y1- STA.11+26.35
Y1= +05.91 EX. R/W

N 48° 02' 15.6" E
-L- PC Sta. 20+14.36

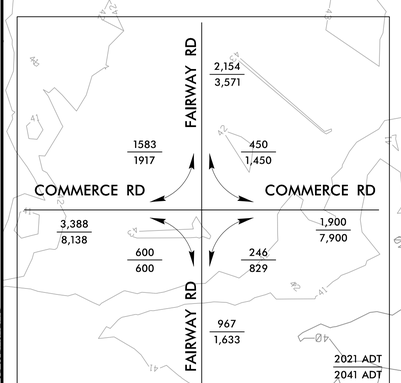
MATCHLINE -L- STA 21+00
SEE SHEET 5

BL-2
19+26.51
32.95' LT

APPROXIMATE LOCATION OF EXISTING 20' UTILITY EASEMENT PER DEED BOOK 3279, PAGES 94-97

84 x 42 x 3
2 inch Skimmer
with 1.75 inch
Orifice Diameter
13 ft. weir
ID 0401

-L-		
PI Sta 12+23.91	PI Sta 13+12.69	PI Sta 21+75.99
Δ = 0° 40' 13.2" (RT)	Δ = 0° 41' 09.8" (LT)	Δ = 26° 00' 15.0" (RT)
D = 0° 45' 50.2"	D = 0° 45' 50.2"	D = 8° 11' 06.4"
L = 87.74'	L = 89.80'	L = 317.70'
T = 43.87'	T = 44.90'	T = 161.63'
R = 7,500.00'	R = 7,500.00'	R = 700.00'
e = NC	e = NC	e = 4%
Ro = N/A	Ro = N/A	Ro = 80'
DS = 50 MPH	DS = 50 MPH	DS = 40 MPH



SEE SHEET 6 -L- PROFILE

10/12/2021
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chrisjohnson

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PROJECT REFERENCE NO.	SHEET NO.
U-5878	EC-05/CONST.05
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

STV 100 Years
STV Engineers, Inc.
1600 Perimeter Park Dr.
Suite 225
Morrisville, NC 27560
NC License Number F-0991

END CONSTRUCTION
TIP PROJECT U-5878
-L- POT STA. 31+94.84

REVISIONS
8/17/99
ROW REVISION 16/10/2021 DSM - SECOND TAKING - ADDED TCE TO PARCEL 5 AND LABELED AS "5Z".

SHEET 4 OF 6

84 x 42 x 3
2 inch Skimmer
with 1.75 inch
Orifice Diameter
13 ft. weir
ID 0401

52 x 26 x 3
1.5 inch Skimmer
with 1 inch
Orifice Diameter
5 ft. weir
ID 0501

88 x 44 x 3
2 inch Skimmer
with 1.625 inch
Orifice Diameter
14 ft. weir
ID 0502

MATCHLINE SEE INSET

MATCHLINE INSET

NAD 83/2011

BEGIN CULVERT
-L- POT STA.24+43.00

END CULVERT
-L- POT STA.24+66.00

-L- POC Sta. 23+32.06
-Y2- POT Sta. 10+00.00

-L- PC Sta. 26+30.13

-L- PT Sta. 28+68.65

-L- STA.21+00.00

-L- PT Sta. 23+32.06

-L- PI Sta. 27+50.56
Δ = 19° 31' 25.4" (LT)
D = 8° 11' 06.4"
L = 238.53'
T = 120.43'
R = 700.00'
e = 4%
Ro = 80'
DS = 40 MPH

-L- PI Sta. 21+75.99
Δ = 26° 00' 15.0" (RT)
D = 8° 11' 06.4"
L = 317.70'
T = 161.63'
R = 700.00'
e = 4%
Ro = 80'
DS = 40 MPH

-Y2- PI Sta. 11+99.23
Δ = 13° 33' 28.1" (LT)
D = 19° 05' 54.9"
L = 70.99'
T = 35.66'
R = 300.00'
e = 3%
Ro = 42'
DS = 20 MPH

-Y2- PC Sta. 11+63.57

-Y2- PT Sta. 12+34.56

-Y2- POT Sta. 10+00.00

-Y3- POT Sta. 10+00.00

-L- POT Sta. 32+38.80 = -Y3- POT Sta.17+13.54

BEGIN CONSTRUCTION
-Y2- POT STA.11+16.00

BEGIN CONSTRUCTION
-Y3- POT STA.11+13.27

END CONSTRUCTION
TIE TO EXIST CURB
-Y3- STA.17+87.06

TIE TO EXIST SIDEWALK
-Y3- STA.17+87.03

TIE TO EXIST CONC. MONOLITHIC ISLAND
-Y3- STA.17+88.00

BEGIN SIDEWALK
-Y3- STA.17+50.45

TIE TO EXIST SIDEWALK
-Y3- STA.17+49.46

TIE TO EXIST SIDEWALK
-Y3- STA.16+84.63

BEGIN SIDEWALK
-Y3- STA.16+73.39

TIE TO EXIST SIDEWALK
-Y3- STA.16+50.19

TIE TO EXIST CURB
-Y3- STA.16+55.16

TIE TO EXIST MONOLITHIC ISLAND
-Y3- POT STA.14+16.06

TIE TO EXIST CURB
-Y3- STA.11+13.27

RETAIN EXISTING 1'-6" C&G

PROP 1'-6" C&G

RETAIN EXISTING 2'-6" C&G

END 2'-6" C&G
-Y2- 44.80

END 2'-6" C&G
-Y2- 42.54

BL-1 -L- 26+33.13 201.53' LT

BL-2 -L- 22+10.79

BL-3 -L- 21+06.96 301.2' RT

BL-4 -L- 22+10.79 22.0' RT

BL-5 -L- 23+72.97 25.95' RT

BL-6 -L- 28+58.72 28.0' RT

BL-7 -L- 26+33.13 201.53' LT

BL-8 -L- 28+72.82 45.24' RT

BL-9 -Y3- 18+44.57 47.50' LT

BM-1 -L- 22+10.79 301.05' RT
BM1 N 380058 E 2486490 ELEVATION 36.86
BL STATION 15+19.00 22' RIGHT
RR SPIKE SET IN 18" HARDWOOD

NOTE:
UTILIZE COIR FIBER MATTING ADJACENT TO WETLANDS/JURISDICTIONAL AREAS, AND AS DIRECTED

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

CLEARING AND GRUBBING
EROSION CONTROL FOR CONSTRUCTION SHEET 05

SEE SHEET 6 FOR -L- & -Y2- PROFILES

COMMERCE RD	PINEY GREEN RD	SHOPPING CENTER ENTRANCE
726 / 2,476	20,300 / 31,300	N/A / 3,500*
2,200 / 7,900	1,300 / 5,300	N/A / 7,600*
	20,925 / 34,342	N/A / 3,700*

2021 ADT
2041 ADT
* 2040 ADT

ARLINE K. COLLINS DB 271 PG 426 DB 856 PG 283
JACKSONVILLE CITY LIMITS
BAILEY & FULLER PROPERTIES, LLC DB 3466 PG 15 MB 60 PG 20
BAILEY & ASSOCIATES INC. DB 3318 PG 460
WILLIAM T. HUMPHREY, ET UX DB 1322 PG 983
DEPARTMENT OF TRANSPORTATION DB 3578 PG 586 MB 6 PG 74
HELEN K. BASDEN, ET UX DB 1026 PG 750 MB 6 PG 74
RICHARD J. SCOPPE DB 33546 PG 972 MB 6 PG 74
HENRY BROOKS, et ux DB 1619 PG 345 MB 6 PG 74
CHERIE T. BEVILL, et al DB 2022 PG 518 MB 34 PG 99
ABBY MORTON DB 735 PG 818 MB 6 PG 74
TOMMY GULLEDGE, et ux DB 4284 PG 386 MB 6 PG 74
DAVID ROBINSON DB 4236 PG 734 MB 6 PG 74
NORMAN E. ALLEN, et ux DB 7019 PG 472 MB 6 PG 74
HANS MILLER, et ux DB 785 PG 812 MB 6 PG 74
JIMMY ROWE, et ux DB 381 PG 646 MB 6 PG 74
TRAVIS MCRAE DB 3599 PG 691 MB 6 PG 74
EDGAR S. BANKHEAD, ET UX DB 604 PG 617 MB 6 PG 74
PHILLIP L. GURGANUS, ET UX DB 1322 PG 812 MB 6 PG 74
TERRY L. TRENCHARD, ET UX DB 1154 PG 565 MB 6 PG 74
JAMES E. WHITE JR. DB 3139 PG 581 MB 6 PG 74
THOMAS G. COLLINS ET AL DB 1340 PG 98
THOMAS GLENN COLLINS DB 200 PG 80
CANDICE L. HARRIS, ET VIR DB 1272 PG 126
COLEMAN 71 PG 72 PG 74
COSTAL SONVILLE DB 736 PG 362 DB 475 PG 060 MB 36 PG 122 SLIDE J-87

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christopherhurd

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8/17/99

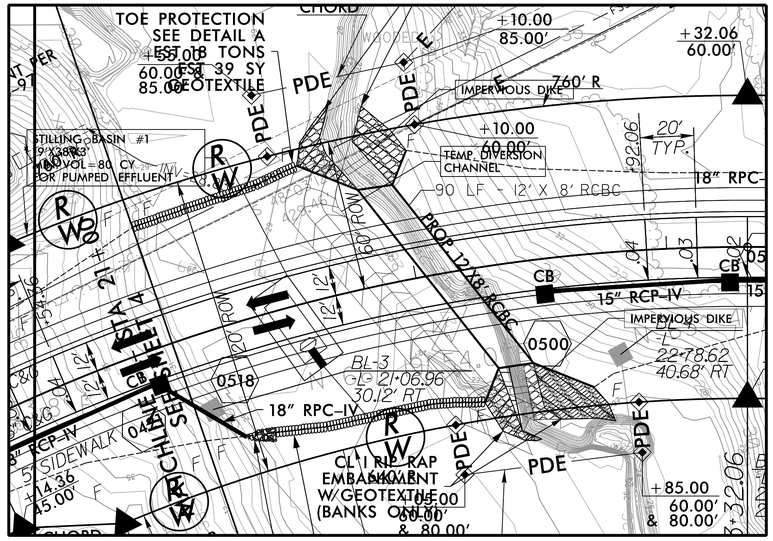
CULVERT CONSTRUCTION SEQUENCE STA. 22+11 –L–

PROJECT REFERENCE NO.	
U-5878	EC-05A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

STV 100 Years
STV Engineers, Inc.
1500 Perimeter Park Dr.
Suite 120
Morrisville, NC 27560
NC License Number F-0991

PHASE 1

NAD 83/2011



1. INSTALL STILLING BASIN (80 CY).

2. INSTALL TEMPORARY DIVERSION CHANNEL (1.5:1 SIDE SLOPES, BASE WIDTH 6', 3.5' DEEP) LINED WITH NON–EROSIVE LINER.

3. INSTALL IMPERVIOUS DIKES AND DIVERT WATER TO TEMPORARY DIVERSION DITCH.

4. INSTALL 90 LF OF 12' X 8' RCBC, WHILE PUMPING EFFLUENT INTO SPECIAL STILLING BASIN.

5. REMOVE IMPERVIOUS DIKES AND DIVERT WATER TO NEW CULVERT.

6. REMOVE TEMPORARY DIVERSION DITCH.

7. INSTALL WING WALLS AND CHANNEL IMPROVEMENTS.

8. REMOVE STILLING BASIN.

9. CONSTRUCT ROADWAY OVER NEWLY CONSTRUCTED CULVERT.

10/12/2021
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christian.hurd

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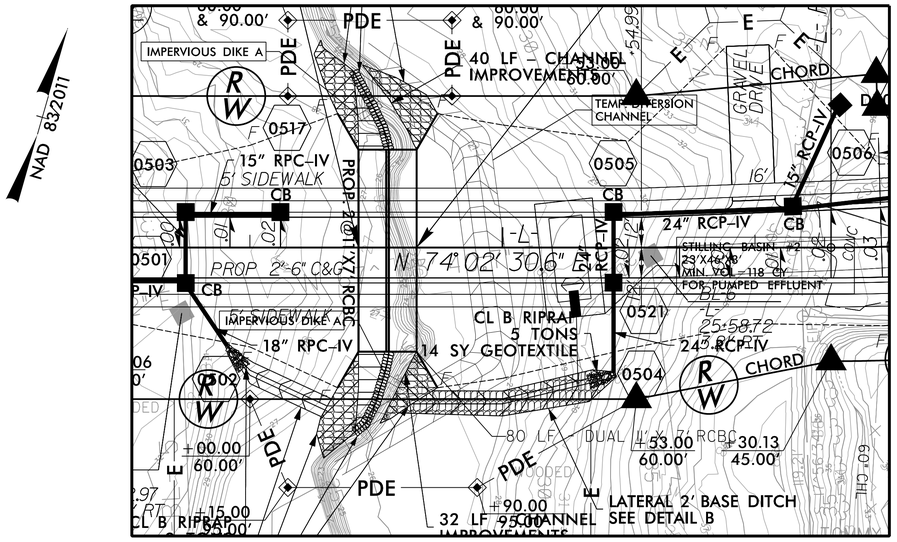
8/17/99

CULVERT CONSTRUCTION SEQUENCE STA. 24+54 –L–

PROJECT REFERENCE NO.	SHEET NO.
U-5878	EC-05B
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

STV 100 Years
STV Engineers, Inc.
1500 Perimeter Park Dr.
Suite 120
Morrisville, NC 27560
NC License Number F-0991

PHASE I



1. INSTALL STILLING BASIN (118 CY).

2. INSTALL TEMPORARY DIVERSION CHANNEL (1.5:1 SIDE SLOPES, BASE WIDTH 5.5', 3' DEEP) LINED WITH NON–EROSIVE LINER.

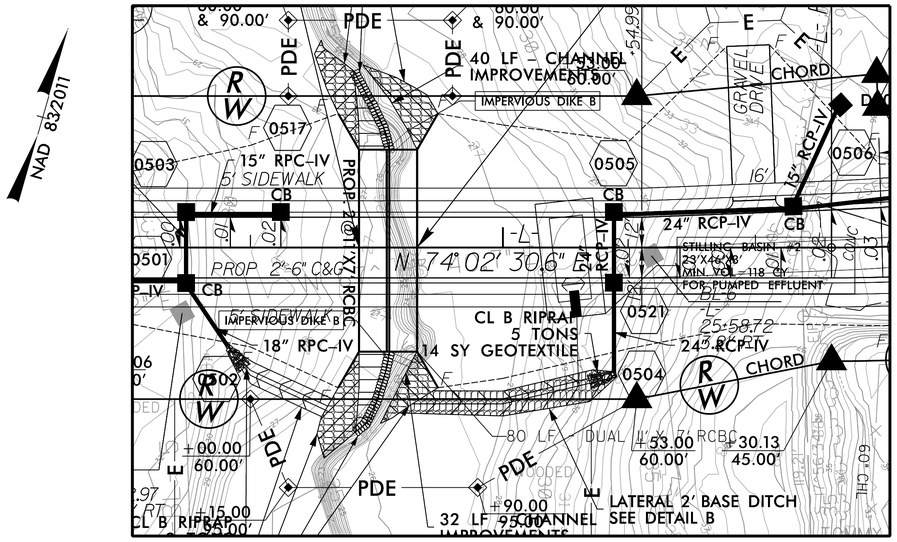
3. INSTALL IMPERVIOUS DIKES A AND DIVERT WATER TO TEMPORARY DIVERSION CHANNEL.

4. INSTALL 80 LF OF DUAL 11' X 7' RCBC, WHILE PUMPING EFFLUENT INTO SPECIAL STILLING BASIN.

5. CONSTRUCT WESTERN BARREL WING WALLS AND CHANNEL IMPROVEMENTS.

6. REMOVE IMPERVIOUS DIKES A AND TEMPORARY DIVERSION CHANNEL.

PHASE II



7. INSTALL IMPERVIOUS DIKES B, DIVERTING FLOW THROUGH THE WESTERN BARREL ONLY, KEEPING THE EASTERN BARREL DRY.

8. CONSTRUCT EASTERN BARREL WING WALLS AND CHANNEL IMPROVEMENTS.

9. REMOVE IMPERVIOUS DIKES B, ALLOWING NORMAL FLOW THROUGH THE CULVERT.

10. REMOVE STILLING BASIN.

11. CONSTRUCT ROADWAY OVER NEWLY CONSTRUCTED CULVERT.

10/12/2021
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christianhind

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8/17/99

PROJECT REFERENCE NO.	SHEET NO.
U-5878	EC-06/CONST.04
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

STV 100 Years
STV Engineers, Inc.
1500 Perimeter Park Dr.
Suite 120
Morrisville, NC 27560
NC License Number F-0991

NOTE: CONSTRUCTION SHOWN FROM STA. 11+80.00 TO 18+50.00 PENDING MUNICIPAL AGREEMENT WITH CITY OF JACKSONVILLE.

NAD 83/2011

BEGIN CONSTRUCTION
BEGIN CITY PROJECT
-L- POT STA. 11+80.00

END CITY PROJECT
BEGIN TIP PROJECT U-5878
-L- POT STA. 18+50.00

MILL AND OVERLAY AS SHOWN FROM
-L- POT STA. 11+80.00 TO
-L- POT STA. 12+42.75

-L- POC Sta. 12+31.33
-Y1- POT Sta. 11+73.69
-Y1- POT Sta. 14+77.56
-L- PRC Sta. 12+67.78
-L- POT Sta. 10+00.00
-L- PC Sta. 11+80.04
-L- POT Sta. 10+00.00
-L- PT Sta. 13+57.59
-L- PC Sta. 20+14.36
-L- POT Sta. 21+00
MATCHLINE -L- STA 21+00 SEE SHEET 5

TIE TO EXIST CURB
-Y1- STA. 12+21.03
TIE TO EXIST CURB
-Y1- STA. 11+26.35

N 48° 03' 12.2" E
N 48° 02' 15.6" E
N 47° 57' 08.1" W

BL-1
-L-
12+08.26
38.98' RT

BL-2
-L-
19+26.51
32.95' LT

LEWISVILLE PROPERTIES, LLC
DB 4421 PG 751
MB 28 PG 22

LAND O SUN II, LLC
DB 1602 PG 636

THE HARRY C. BROWN FAMILY LLC
DB 2728 PG 352
MB 51 PG 158

THE HARRY C. BROWN FAMILY LLC
DB 2413 PG 926

THE HARRY C. BROWN FAMILY LLC
DB 2376 PG 361
MB 43 PG 64

NEW RIVER BAPTIST ASSOCIATION
DB 817 PG 500

BODENHAMER NC PROPERTIES, LLC
DB 3323 PG 473
PC 32 SLIDE 109

RONNIE L. HENDERSON
DB 3798 PG 839
PC 32 SLIDE 109

JACK C. KOONCE, JR., et ux
DB 4249 PG 208

CHERIE T. BEVILL, et al
DB 2022 PG 518
MB 34 PG 99

JONATHAN C. SNYDER
DB 3792 PG 800
PC 14 SLIDE 57

APPROXIMATE LOCATION OF EXISTING 20' UTILITY EASEMENT PER DEED BOOK 3279, PAGES 94-97

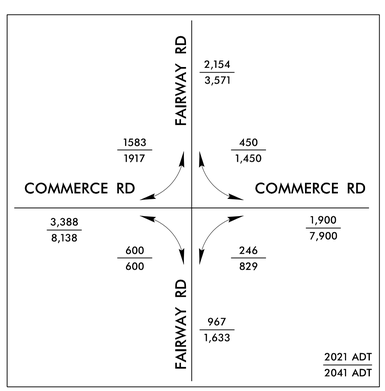
84 x 42 x 3
2 inch Skimmer
with 1.75 inch
Orifice Diameter
13 ft. weir
ID 0401

RETENTION POND

ASPHALT DRIVE

REMOVE

-L-		
PI Sta 12+23.91	PI Sta 13+12.69	PI Sta 21+75.99
Δ = 0° 40' 13.2" (RT)	Δ = 0° 41' 09.8" (LT)	Δ = 26° 00' 15.0" (RT)
D = 0° 45' 50.2"	D = 0° 45' 50.2"	D = 8° 11' 06.4"
L = 87.74'	L = 89.80'	L = 317.70'
T = 43.87'	T = 44.90'	T = 161.63'
R = 7,500.00'	R = 7,500.00'	R = 700.00'
e = NC	e = NC	e = 4%
Ro = N/A	Ro = N/A	Ro = 80'
DS = 50 MPH	DS = 50 MPH	DS = 40 MPH



SEE SHEET 6 FOR -L- PROFILE

10/12/2021
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christianburd

DocuSign Envelope ID: 96F5E234-EA90-4791-BE14-55EFA86FE173

PROJECT REFERENCE NO.	SHEET NO.
U-5878	EC-07/CONST.05
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

STV 100 Years
STV Engineers, Inc.
1600 Perimeter Park Dr.
Suite 225
Morrisville, NC 27560
NC License Number F-0991

END CONSTRUCTION TIP PROJECT U-5878 -L- POT STA. 31+94.84

Place Matting for Erosion Control on Slope as Work Allows.
Sta. 21+00 to Sta. 22+50 LT
Sta. 21+00 to Sta. 23+00 RT
Sta. 24+00 to Sta. 25+50 RT
Sta. 24+00 to Sta. 26+00 LT
Sta. 26+00 to Sta. 27+00 RT

84 x 42 x 3
2 inch Skimmer with 1.75 inch Orifice Diameter
13 ft. weir
ID 0401

52 x 26 x 3
1.5 inch Skimmer with 1 inch Orifice Diameter
14 ft. weir
ID 0501

88 x 44 x 3
2 inch Skimmer with 1.625 inch Orifice Diameter
14 ft. weir
ID 0502

-L- POC Sta. 28+56.46
-Y2- POT Sta. 10+80.00

-L- PC Sta. 26+30.13

BEGIN CULVERT
-L- POT STA. 24+43.00

END CULVERT
-L- POT STA. 24+66.00

MATCHLINE -L- STA. 21+00.00
SEE SHEET 4

MATCHLINE -L- STA. 23+32.06
SEE SHEET 5

BEGIN CONSTRUCTION
-Y2- POT STA. 11+16.00

-Y2- PC Sta. 11+63.57

-Y2- PT Sta. 12+34.56

-Y2- POT Sta. 10+00.00

-Y3- POT Sta. 10+00.00

BEGIN CONSTRUCTION
-Y3- POT STA. 11+13.27

-L- POT Sta. 32+38.80 = -Y3- POT Sta. 17+13.54

END CONSTRUCTION
TIE TO EXIST CURB
-Y3- STA. 17+87.06

BEGIN SIDEWALK
-Y3- STA. 17+50.45
TIE TO EXIST SIDEWALK
-Y3- STA. 17+49.46

TIE TO EXIST SIDEWALK
-Y3- STA. 16+84.63

BEGIN SIDEWALK
-Y3- STA. 16+73.39

TIE TO EXIST SIDEWALK
-Y3- STA. 16+50.9

TIE TO EXIST CURB
-Y3- STA. 16+55.6

TIE TO EXIST SIDEWALK
-Y3- STA. 11+13.27

TIE TO EXIST MONOLITHIC ISLAND
-Y3- POT STA. 14+16.06

TIE TO EXIST CONC. MONOLITHIC ISLAND
-Y3- STA. 17+88.00

TIE TO EXIST SIDEWALK
-Y3- STA. 17+87.03

BL-9 -Y3- 18+44.57 47.50' LT

BL-8 -L- 28+72.82 45.24' RT

BL-7 -L- 26+33.13 201.53' LT

BL-6 -L- 25+58.72 98.5' RT

BL-5 -L- 23+72.97 25.95' RT

BM-1 -L- 22+10.79
N 380058 E 2486490
ELEVATION 36.86
BL STATION 15+19.00 22' RIGHT
RR SPIKE SET IN 18" HARDWOOD

NOTE:
UTILIZE COIR FIBER MATTING ADJACENT TO WETLANDS/JURISDICTIONAL AREAS, AND AS DIRECTED

* SURVEY OF SIDEWALKS ON NEW SECTION OF COUNTRY CLUB ROAD NOT UP TO DATE. CONTRACTOR TO TIE IN AS THEY SEE FIT

PAVEMENT REMOVAL

SEE SHEET 6 FOR -L- & -Y2- PROFILES

-L-	
PI Sta. 21+75.99	PI Sta. 27+50.56
△ = 26° 00' 15.0" (RT)	△ = 19° 31' 25.4" (LT)
D = 8° 11' 06.4"	D = 8° 11' 06.4"
L = 317.70'	L = 238.53'
T = 161.63'	T = 120.43'
R = 700.00'	R = 700.00'
e = 4%	e = 4%
Ro = 80'	Ro = 80'
DS = 40 MPH	DS = 40 MPH

-Y2-
PI Sta. 11+99.23
△ = 13° 33' 28.1" (LT)
D = 19° 05' 54.9"
L = 70.99'
T = 35.66'
R = 300.00'
e = 3%
Ro = 42'
DS = 20 MPH

COMMERCE RD	726 / 2,476	PINEY GREEN RD	20,300 / 31,300
	2,200 / 7,900		N/A / 3,500*
PINEY GREEN RD	1,300 / 5,300	SHOPPING CENTER ENTRANCE	N/A / 3,700*
			20,925 / 34,342

* 2040 ADT

TEMPORARY EARTH BERM
(Not to Scale)
B
H
H
D
Natural Ground
D = 2 Ft.
B = 1Ft.
•STABILIZE EARTH BERM•

REVISIONS
8/17/99 ROW REVISION (6/10/2021) DSM - SECOND TAKING - ADDED TCE TO PARCEL 5 AND LABELED AS "5Z".

10/12/2021
R:\Environmental\Design\U5878_HYD_EC_psh07.dgn
christopherhurd

ARLINE K. COLLINS DB 271 PG 426 DB 856 PG 283
BAILEY & FULLER PROPERTIES, LLC DB 3466 PG 15 MB 60 PG 20
DEPARTMENT OF TRANSPORTATION DB 3578 PG 586 MB 6 PG 74
HELEN K. BASDEN, ET UX DB 1026 PG 750 MB 6 PG 74
RICHARD J. SCOPPE DB 33546 PG 972 MB 6 PG 74
HENRY BROOKS, et ux DB 1619 PG 345 MB 6 PG 74
CHERIE T. BEVILL, et al DB 2022 PG 518 MB 34 PG 99
ABBY MORTON DB 735 PG 818 MB 6 PG 74
TOMMY GULLEDGE, et ux DB 4284 PG 386 MB 6 PG 74
DAVID ROBINSON DB 4236 PG 734 MB 6 PG 74
NORMAN E. ALLEN, et ux DB 701 PG 472 MB 6 PG 74
HANS MILLER, et ux DB 785 PG 812 MB 6 PG 74
JIMMY ROWE, et ux DB 381 PG 646 MB 6 PG 74
TRAVIS MCRAE DB 3599 PG 691 MB 6 PG 74
EDGAR S. BANKHEAD, ET UX DB 604 PG 617 MB 6 PG 74
PHILLIP L. GURGANUS, ET UX DB 1322 PG 812 MB 6 PG 74
TERRY L. TRENCHARD, ET UX DB 1154 PG 565 MB 6 PG 74
JAMES E. WHITE JR. DB 3139 PG 581 MB 6 PG 74
BAILEY & ASSOCIATES INC. DB 3318 PG 460
WILLIAM T. HUMPHREY, ET UX DB 1322 PG 983
THOMAS G. COLLINS ET AL DB 1340 PG 98
THOMAS GLENN COLLINS DB 200 PG 80
CANDICE L. HARRIS, ET VIR DB 1272 PG 126
JACKSONVILLE CITY LIMITS

DocuSign Envelope ID: 96F5E234-EA90-4791-BE14-55EFA86FE173

TIP Project: U-5878

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

ONSLOW COUNTY

Project No.	Sheet No.
U-5878	Sig. 1.0

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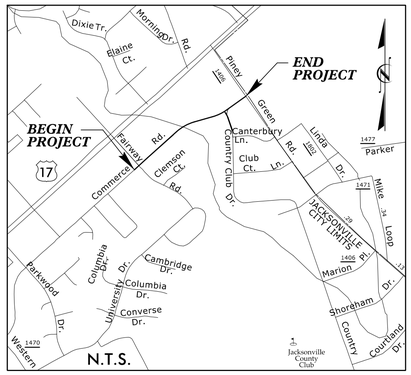
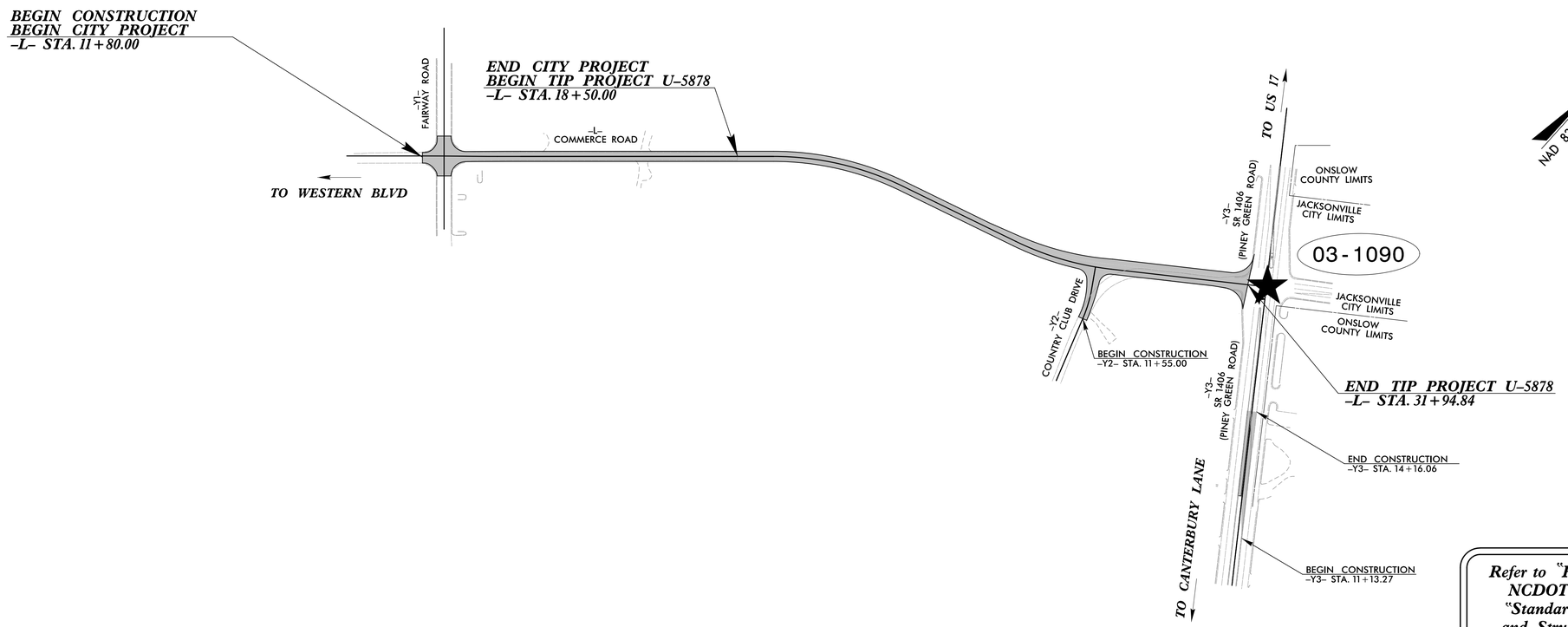
Vicinity Map



LOCATION: EXTENSION OF COMMERCE ROAD FROM FAIRWAY ROAD TO PINEY GREEN ROAD (SR 1406) AT COUNTRY CLUB DRIVE

TYPE OF WORK: SIGNALS

★ PROPOSED SIGNAL
XX-XXXX SIGNAL ID NUMBER



Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.

Index of Plans

Sheet #	Reference #	Location/Description
Sig. 1.0	-------	Title Sheet
Sig. 2.0–4.4	03–1090	SR 1406 (Piney Green Road) at Commerce Road/Commerce Road Extension

INTELLIGENT TRANSPORTATION AND SIGNALS UNIT

Contacts:

Zachary Little, P.E. – Eastern Region Signals Engineer
D. Todd Joyce, P.E. – Signal Equipment Design Engineer
Meghan LeBlanc, P.E. – Eastern Region Signal Project Engineer
I. Neil Avery – Signal Communications Project Engineer

DIVISION OF HIGHWAYS
TRANSPORTATION MOBILITY AND SAFETY DIVISION
Transportation Systems Management & Operations Unit

750 N. Greenfield Parkway, Garner, NC 27529

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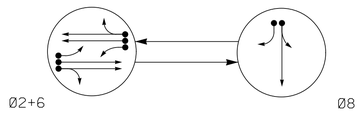
PROJECT REFERENCE NO.	SHEET NO.
U-5878	Sig. 2.0

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

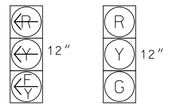
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE Ø2+6	PHASE Ø8	PHASE FLASH
21	~~F Y~~	~~R~~	~~Y~~
22,23	G	R	Y
41,42	DISCONNECTED		
61	~~F Y~~	~~R~~	~~Y~~
62,63	G	R	Y
81,82	R	G	R

SIGNAL FACE I.D.

All Heads L.E.D.



21
61

22,23
41,42*
62,63
81,82

* 41 AND 42 BAGGED AND DISCONNECTED DURING THIS CONSTRUCTION PHASE

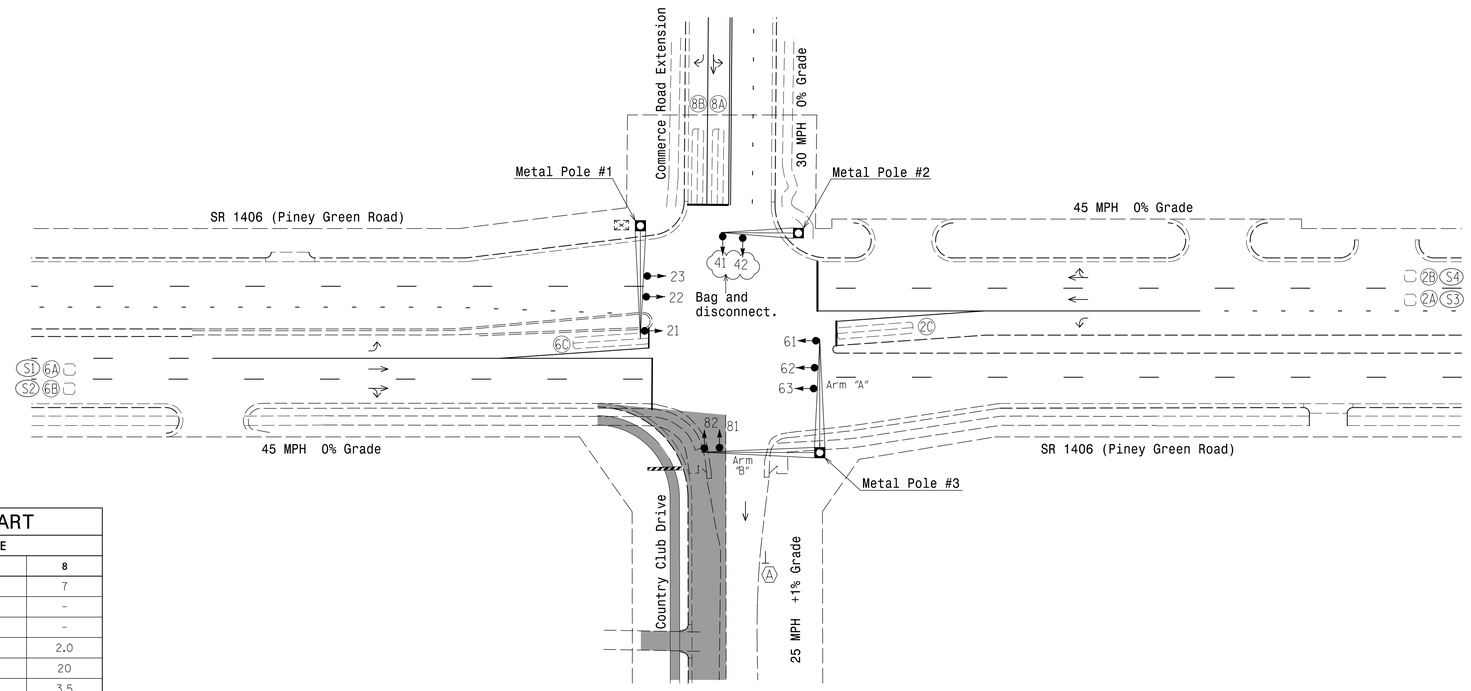
ASC/3 DETECTOR INSTALLATION CHART

DETECTOR					PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
2A/S3	6X6	300	5	-	2	Yes	-	-	X	N	X	-
2B/S4	6X6	300	5	-	2	Yes	-	-	X	N	X	-
2C	6X40	0	2-4-2	-	2	Yes	-	3	-	N	-	-
4A	6X40	0	2-4-2	-	DISCONNECTED							
6A/S1	6X6	300	5	-	6	Yes	-	-	X	N	X	-
6B/S2	6X6	300	5	-	6	Yes	-	-	X	N	X	-
6C	6X40	0	2-4-2	-	6	Yes	-	3	-	N	-	-
8A	6X40	0	2-4-2	-	8	Yes	-	-	-	N	-	-
8B	6X40	0	2-4-2	-	8	Yes	-	15	-	N	-	-

2 Phase
Fully Actuated
Jacksonville Signal System

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Set all detector units to presence mode.
4. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
5. Bag and disconnect signal heads 41 and 42.



LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
▭	Inductive Loop Detector	▭
⊠	Controller & Cabinet	⊠
□	Junction Box	■
------	2-in Underground Conduit	------
N/A	Right of Way	- - - - -
→	Directional Arrow	→
○	Metal Pole with Mastarm	■
Ⓐ	"DO NOT ENTER" Sign (R5-1)	Ⓐ
▬	Construction Zone	N/A

ASC/3 TIMING CHART

FEATURE	PHASE 2	PHASE 6	PHASE 8
Min Green *	12	12	7
Walk *	-	-	-
Ped Clear	-	-	-
Veh. Extension *	6.0	6.0	2.0
Max 1 *	90	90	20
Yellow	4.5	4.5	3.5
Red Clear	1.1	1.1	2.4
Actuations B4 Add *	0	0	-
Seconds /Actuation *	1.5	1.5	-
Max Initial *	34	34	-
Time Before Reduction *	15	15	-
Time To Reduce *	45	45	-
Minimum Gap	3.0	3.0	-
Locking Detector	X	X	-
Recall Position	VEH. RECALL	VEH. RECALL	-
Dual Entry	-	-	-
Simultaneous Gap	X	X	X

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

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Signal Upgrade
Temporary Design 1 (TMP Phase II)

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared for: Transportation Mobility and Safety Division, Department of Transportation, State of North Carolina, Signal Design Section

750 N.Greenfield Pkwy,Garner,NC 27529

SCALE 0 40 1"=40'

SR 1406 (Piney Green Road) at Country Club Drive / Commerce Road Extension

Division 3 Onslow County Jacksonville

PLAN DATE:	August 2018	REVIEWED BY:	D. Darity
PREPARED BY:	A. Wiseman	REVIEWED BY:	J. Carroll

REVISIONS	INIT.	DATE

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 030005 ENGINEER JUSTIN T. CARROLL

DocuSigned by: Justin T. Carroll 634DAC5D4E18486...

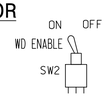
10/26/2021
DATE

SIG. INVENTORY NO. 03-1090TI

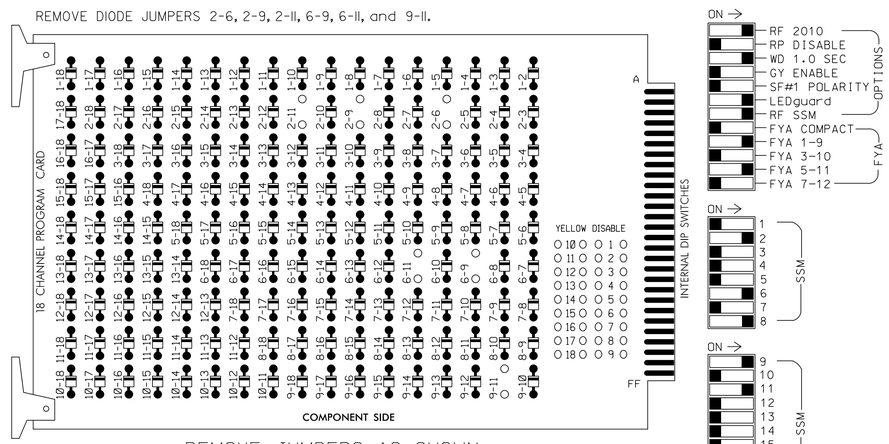
DocuSign Envelope ID: 96F5E234-EA90-4791-BE14-55EFA86FE173

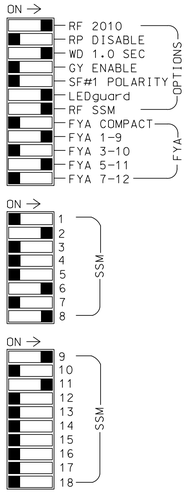
EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE DIODE JUMPERS 2-6, 2-9, 2-11, 6-9, 6-11, and 9-11.





REMOVE JUMPERS AS SHOWN

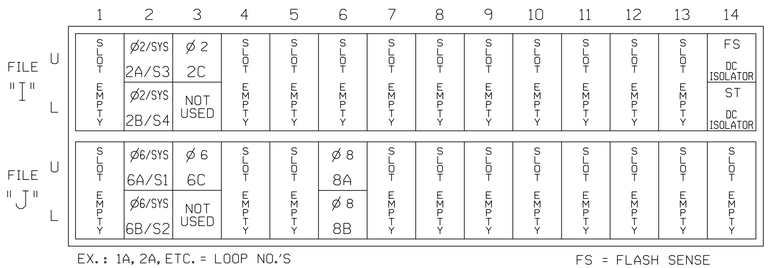
NOTES:

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 Red Enable is active at all times during normal operation.
4. Integrate monitor with Ethernet network in cabinet.

■ = DENOTES POSITION OF SWITCH

INPUT FILE POSITION LAYOUT

(front view)



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.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
2A/S3	TB2-5,6	I2U	39	2	2/SYS	YES			X	N
2B/S4	TB2-7,8	I2L	43	12	2/SYS	YES			X	N
2C	TB2-9,10	I3U	63	32	2	YES		3		N
6A/S1	TB3-5,6	J2U	40	6	6/SYS	YES			X	N
6B/S2	TB3-7,8	J2L	44	16	6/SYS	YES			X	N
6C	TB3-9,10	J3U	64	36	6	YES		3		N
8A	TB5-9,10	J6U	42	8	8	YES				N
8B	TB5-11,12	J6L	46	18	8	YES		15		N

INPUT FILE POSITION LEGEND: J2L

FILE J
SLOT 2
LOWER

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 Plans.
2. Program controller to start up in phase 2 Green and 6 Green.
3. The cabinet and controller are part of the Jacksonville Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070E
CABINET.....332 W/AUX
SOFTWARE.....ECONOLITE ASC/3-2070
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S2,S8,S11,AUX S1,AUX S4
PHASES USED.....2,6,8
OVERLAP "A".....*
OVERLAP "B".....NOT USED
OVERLAP "C".....*
OVERLAP "D".....NOT USED

* See overlap programming detail this sheet

PROJECT REFERENCE NO.	SHEET NO.
U-5878	Sig. 2.1

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	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	22,23	NU	NU	NU	NU	NU	62,63	NU	NU	81,82	NU	61 ★	NU	NU	21 ★	NU	NU
RED		128						134			107							
YELLOW		129						135			108							
GREEN		130						136			109							
RED ARROW													A121			A114		
YELLOW ARROW													A122			A115		
FLASHING YELLOW ARROW													A123			A116		
GREEN ARROW																		

NU = Not Used

★ See pictorial of head wiring in detail below.

ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL

(program controller as shown)

1. From Main Menu select [2. CONTROLLER]
2. From CONTROLLER Submenu select [2. VEHICLE OVERLAPS]

OVERLAP A

Select TMG VEH OVLP [A] and 'OTHER/ECONOLITE'

```
TMG VEH OVLP...[A] TYPE:[OTHER/ECONOLITE]
  PHASES 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
INCLUDED . X . . . . . . . . . . . . . .
PROTECT  . . . . . . . . . . . . . . . .
PED PRTC . . . . . . . . . . . . . . . .
NOT OVLP . . . . . . . . . . . . . . . .
FLSH GRN . 1 . . . . . . . . . . . . . .
LAG X PH . . . . . . . . . . . . . . . .
LAG 2 PH . . . . . . . . . . . . . . . .

LAG GRN 0.0 YEL 0.0 RED 0.0 ADV GRN 0.0
```

Toggle Twice

OVERLAP C

Select TMG VEH OVLP [C] and 'OTHER/ECONOLITE'

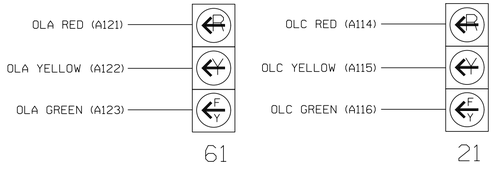
```
TMG VEH OVLP...[C] TYPE:[OTHER/ECONOLITE]
  PHASES 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
INCLUDED . . . . . X . . . . . . . . . .
PROTECT  . . . . . . . . . . . . . . . .
PED PRTC . . . . . . . . . . . . . . . .
NOT OVLP . . . . . . . . . . . . . . . .
FLSH GRN . . . . . 1 . . . . . . . . . .
LAG X PH . . . . . . . . . . . . . . . .
LAG 2 PH . . . . . . . . . . . . . . . .

LAG GRN 0.0 YEL 0.0 RED 0.0 ADV GRN 0.0
```

END PROGRAMMING

FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: Ø3-1Ø9ØT1
DESIGNED: AUG 2Ø18
SEALED: 10/26/2021
REVISED: N/A

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STV Engineers, Inc.
900 West Trade St., Suite 715
Charlotte, NC 28202
(704) 372-1885
NC License Number F-0991

Electrical Detail
Temporary Signal Design 1 - TMP Phase II

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

NC Department of Transportation Mobility and Safety Division Traffic Engineering Branch Signals Management Section

750 N.Greenfield Pkwy,Garner,NC 27529

SR 1406 (Piney Green Road)
at
Country Club Drive / Commerce Road Extension

Division 3 | Onslow County | Jacksonville

PLAN DATE:	August 2018	REVIEWED BY:	J. Trueblood
PREPARED BY:	A. Wiseman	REVIEWED BY:	J. Carroll

REVISIONS	INIT.	DATE

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 030005 ENGINEER JUSTIN T. CARROLL

DocuSigned by: Justin T. Carroll 634DAC5D4E184A6...

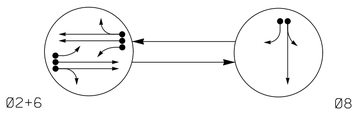
10/26/2021
DATE

SIG. INVENTORY NO. 03-1090T1

DocuSign Envelope ID: 96F5E234-EA90-4791-BE14-55EFA86FE173

PROJECT REFERENCE NO.	SHEET NO.
U-5878	Sig. 3.0

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

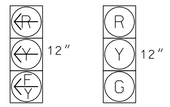
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE Ø2+6	PHASE Ø8	PHASE FLASH
21	~~G~~ Y	~~R~~	~~Y~~
22,23	G	R	Y
41,42	DISCONNECTED		
61	~~G~~ Y	~~R~~	~~Y~~
62,63	G	R	Y
81,82	R	G	R

SIGNAL FACE I.D.

All Heads L.E.D.



21
61

22,23
41,42*
62,63
81,82

* 41 AND 42 BAGGED AND DISCONNECTED DURING THIS CONSTRUCTION PHASE

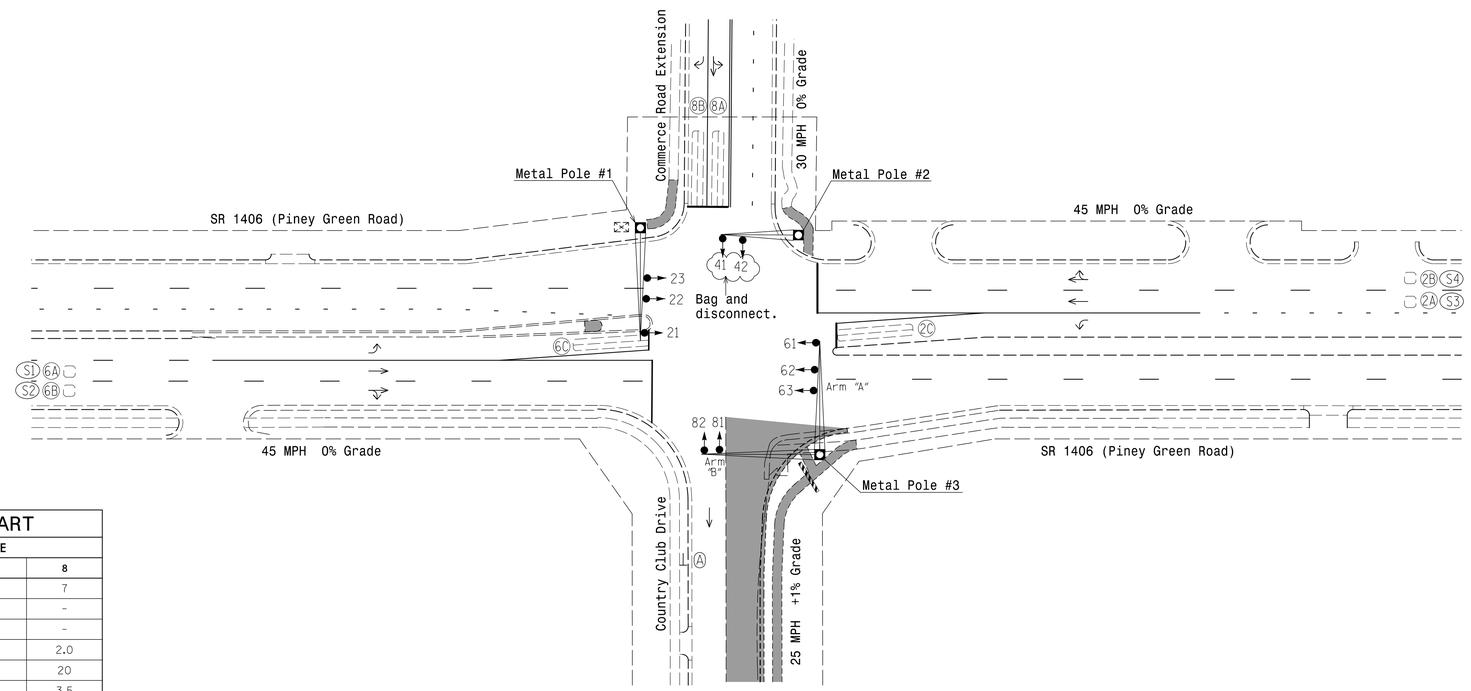
ASC/3 DETECTOR INSTALLATION CHART

DETECTOR					PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
2A/S3	6X6	300	5	-	2	Yes	-	-	X	N	X	-
2B/S4	6X6	300	5	-	2	Yes	-	-	X	N	X	-
2C	6X40	0	2-4-2	-	2	Yes	-	3	-	N	-	-
4A	6X40	0	2-4-2	-	DISCONNECTED							
6A/S1	6X6	300	5	-	6	Yes	-	-	X	N	X	-
6B/S2	6X6	300	5	-	6	Yes	-	-	X	N	X	-
6C	6X40	0	2-4-2	-	6	Yes	-	3	-	N	-	-
8A	6X40	0	2-4-2	-	8	Yes	-	-	-	N	-	-
8B	6X40	0	2-4-2	-	8	Yes	-	15	-	N	-	-

2 Phase
Fully Actuated
Jacksonville Signal System

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Set all detector units to presence mode.
4. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
5. Bag and disconnect signal heads 41 and 42.
6. Relocate existing Sign A (see TMP Plans).



LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
▭	Inductive Loop Detector	▭
⊠	Controller & Cabinet	⊠
□	Junction Box	■
----------	2-in Underground Conduit	----------
N/A	Right of Way	----------
→	Directional Arrow	→
○→	Metal Pole with Mastarm	■→
Ⓐ	"DO NOT ENTER" Sign (R5-1)	Ⓐ
▓	Construction Zone	N/A

ASC/3 TIMING CHART

FEATURE	PHASE 2	PHASE 6	PHASE 8
Min Green *	12	12	7
Walk *	-	-	-
Ped Clear	-	-	-
Veh. Extension *	6.0	6.0	2.0
Max 1 *	90	90	20
Yellow	4.5	4.5	3.5
Red Clear	1.1	1.1	2.4
Actuations B4 Add *	0	0	-
Seconds /Actuation *	1.5	1.5	-
Max Initial *	34	34	-
Time Before Reduction *	15	15	-
Time To Reduce *	45	45	-
Minimum Gap	3.0	3.0	-
Locking Detector	X	X	-
Recall Position	VEH. RECALL	VEH. RECALL	-
Dual Entry	-	-	-
Simultaneous Gap	X	X	X

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

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Signal Upgrade
Temporary Design 2 (TMP Phase III)

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

SR 1406 (Piney Green Road) at Country Club Drive / Commerce Road Extension

Division 3 Onslow County Jacksonville

PLAN DATE: August 2018 REVIEWED BY: D. Darity
PREPARED BY: A. Wiseman REVIEWED BY: J. Carroll

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

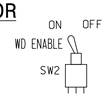
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 030005 ENGINEER JUSTIN T. CARROLL
DocuSigned by: Justin T. Carroll 634DAC5D4E1E486...
10/26/2021
DATE

SIG. INVENTORY NO. 03-109012

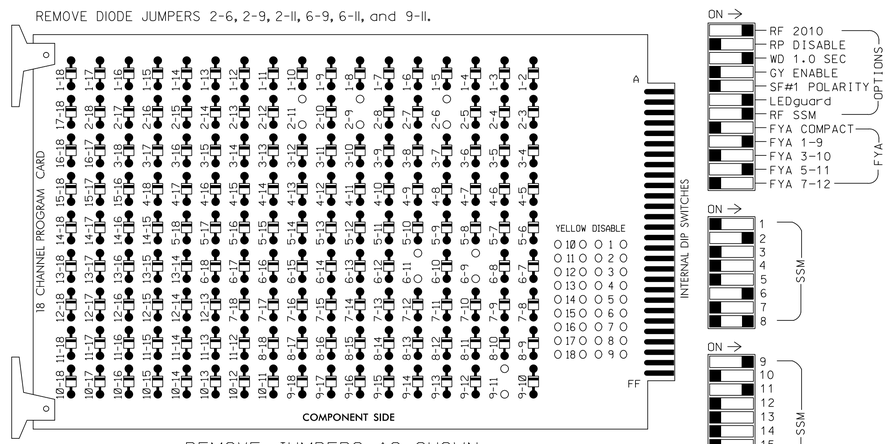
DocuSign Envelope ID: 96F5E234-EA90-4791-BE14-55EFA86FE173

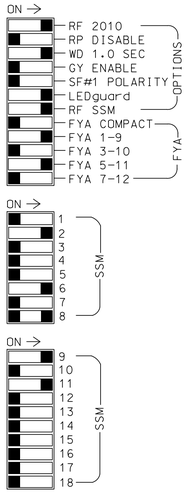
EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE DIODE JUMPERS 2-6, 2-9, 2-11, 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 Red Enable is active at all times during normal operation.
4. Integrate monitor with Ethernet network in cabinet.

■ = DENOTES POSITION OF SWITCH

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	SLOT EMPTY	Ø2/SYS 2A/S3	Ø 2 2C	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
	L		Ø2/SYS 2B/S4	NOT USED											ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	Ø6/SYS 6A/S1	Ø 6 6C	SLOT EMPTY	SLOT EMPTY	Ø 8 8A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L		Ø6/SYS 6B/S2	NOT USED			Ø 8 8B								

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.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
2A/S3	TB2-5,6	I2U	39	2	2/SYS	YES			X	N
2B/S4	TB2-7,8	I2L	43	12	2/SYS	YES			X	N
2C	TB2-9,10	I3U	63	32	2	YES		3		N
6A/S1	TB3-5,6	J2U	40	6	6/SYS	YES			X	N
6B/S2	TB3-7,8	J2L	44	16	6/SYS	YES			X	N
6C	TB3-9,10	J3U	64	36	6	YES		3		N
8A	TB5-9,10	J6U	42	8	8	YES				N
8B	TB5-11,12	J6L	46	18	8	YES		15		N

INPUT FILE POSITION LEGEND: J2L

FILE J
SLOT 2
LOWER

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 Plans.
2. Program controller to start up in phase 2 Green and 6 Green.
3. The cabinet and controller are part of the Jacksonville Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070E
CABINET.....332 W/AUX
SOFTWARE.....ECONOLITE ASC/3-2070
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S2,S8,S11,AUX S1,AUX S4
PHASES USED.....2,6,8
OVERLAP "A".....*
OVERLAP "B".....NOT USED
OVERLAP "C".....*
OVERLAP "D".....NOT USED

* See overlap programming detail this sheet

PROJECT REFERENCE NO.	SHEET NO.
U-5878	Sig. 3.1

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	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	22,23	NU	NU	NU	NU	NU	62,63	NU	NU	81,82	NU	61★	NU	NU	21★	NU	NU
RED		128						134			107							
YELLOW		129						135			108							
GREEN		130						136			109							
RED ARROW													A121			A114		
YELLOW ARROW													A122			A115		
FLASHING YELLOW ARROW													A123			A116		
GREEN ARROW																		

NU = Not Used

★ See pictorial of head wiring in detail below.

ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL

(program controller as shown)

1. From Main Menu select [2. CONTROLLER]
2. From CONTROLLER Submenu select [2. VEHICLE OVERLAPS]

OVERLAP A

Select TMG VEH OVLP [A] and 'OTHER/ECONOLITE'

```
TMG VEH OVLP...[A] TYPE:[OTHER/ECONOLITE]
  PHASES 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
INCLUDED . X . . . . . . . . . . . . . .
PROTECT  . . . . . . . . . . . . . . . .
PED PRTC . . . . . . . . . . . . . . . .
NOT OVLP . . . . . . . . . . . . . . . .
FLSH GRN . 1 . . . . . . . . . . . . . .
LAG X PH . . . . . . . . . . . . . . . .
LAG 2 PH . . . . . . . . . . . . . . . .

LAG GRN 0.0 YEL 0.0 RED 0.0 ADV GRN 0.0
```

Toggle Twice

OVERLAP C

Select TMG VEH OVLP [C] and 'OTHER/ECONOLITE'

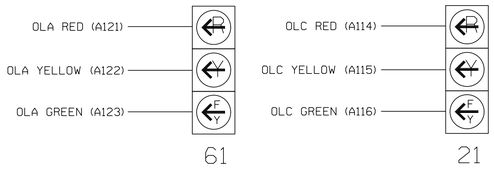
```
TMG VEH OVLP...[C] TYPE:[OTHER/ECONOLITE]
  PHASES 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
INCLUDED . . . . . X . . . . . . . . . .
PROTECT  . . . . . . . . . . . . . . . .
PED PRTC . . . . . . . . . . . . . . . .
NOT OVLP . . . . . . . . . . . . . . . .
FLSH GRN . . . . . 1 . . . . . . . . . .
LAG X PH . . . . . . . . . . . . . . . .
LAG 2 PH . . . . . . . . . . . . . . . .

LAG GRN 0.0 YEL 0.0 RED 0.0 ADV GRN 0.0
```

END PROGRAMMING

FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: Ø3-1Ø9ØT2
DESIGNED: AUG 2Ø18
SEALED: 10/26/2021
REVISED: N/A

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STV Engineers, Inc.
900 West Trade St., Suite 715
Charlotte, NC 28202
(704) 372-1885
NC License Number F-0991

Electrical Detail
Temporary Signal Design 2 - TMP Phase III

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

NC Department of Transportation Mobility and Safety Division Traffic Engineering Branch Signals Management Section
750 N.Greenfield Pkwy,Garner,NC 27529

SR 1406 (Piney Green Road)
at
Country Club Drive / Commerce Road Extension

Division 3 | Onslow County | Jacksonville

PLAN DATE:	August 2018	REVIEWED BY:	J. Trueblood
PREPARED BY:	A. Wiseman	REVIEWED BY:	J. Carroll

REVISIONS	INIT.	DATE

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 030005 ENGINEER JUSTIN T. CARROLL

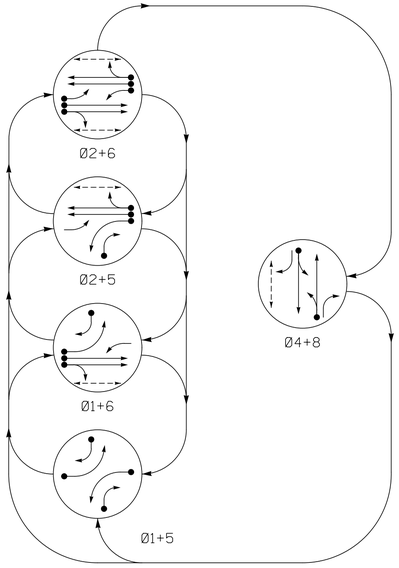
DocuSigned by: Justin T. Carroll 63ADAC5D4E18486...
10/26/2021
DATE

SIG. INVENTORY NO. 03-1090T2

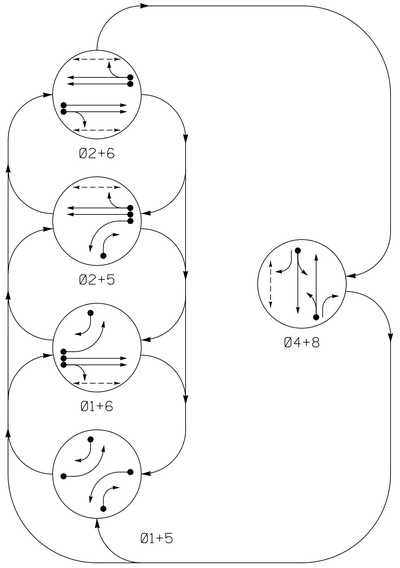
DocuSign Envelope ID: 96F5E234-EA90-4791-BE14-55EFA86FE173

PROJECT REFERENCE NO.	SHEET NO.
U-5878	Sig. 4.0

DEFAULT PHASING DIAGRAM



ALTERNATE PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

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

DEFAULT PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE 01+5	01+6	02+5	02+6	04+8	FLASH
11	←●	←	F Y	F Y	~~R~~	~~Y~~
21,22	R	R	G	G	R	Y
41,42	R	R	R	R	G	R
43	F Y	R	F Y	R	F Y	R
51	←●	F Y	←	F Y	~~R~~	~~Y~~
61,62	R	G	R	G	R	Y
81,82	R	R	R	R	G	R
83	F Y	F Y	R	R	F Y	R
P21,P22	DW	DW	W	W	DW	DRK
P61,P62	DW	W	DW	W	DW	DRK
P81,P82	DW	DW	DW	DW	W	DRK

ALTERNATE PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE 01+5	01+6	02+5	02+6	04+8	FLASH
11	←●	←	~~R~~	~~R~~	~~R~~	~~Y~~
21,22	R	R	G	G	R	Y
41,42	R	R	R	R	G	R
43	F Y	R	F Y	R	F Y	R
51	←●	~~R~~	←	~~R~~	~~R~~	~~Y~~
61,62	R	G	R	G	R	Y
81,82	R	R	R	R	G	R
83	F Y	F Y	R	R	F Y	R
P21,P22	DW	DW	W	W	DW	DRK
P61,P62	DW	W	DW	W	DW	DRK
P81,P82	DW	DW	DW	DW	W	DRK

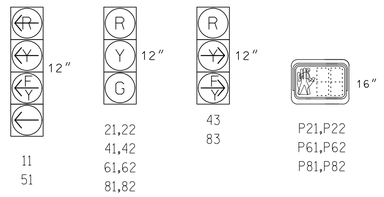
ASC/3 DETECTOR INSTALLATION CHART

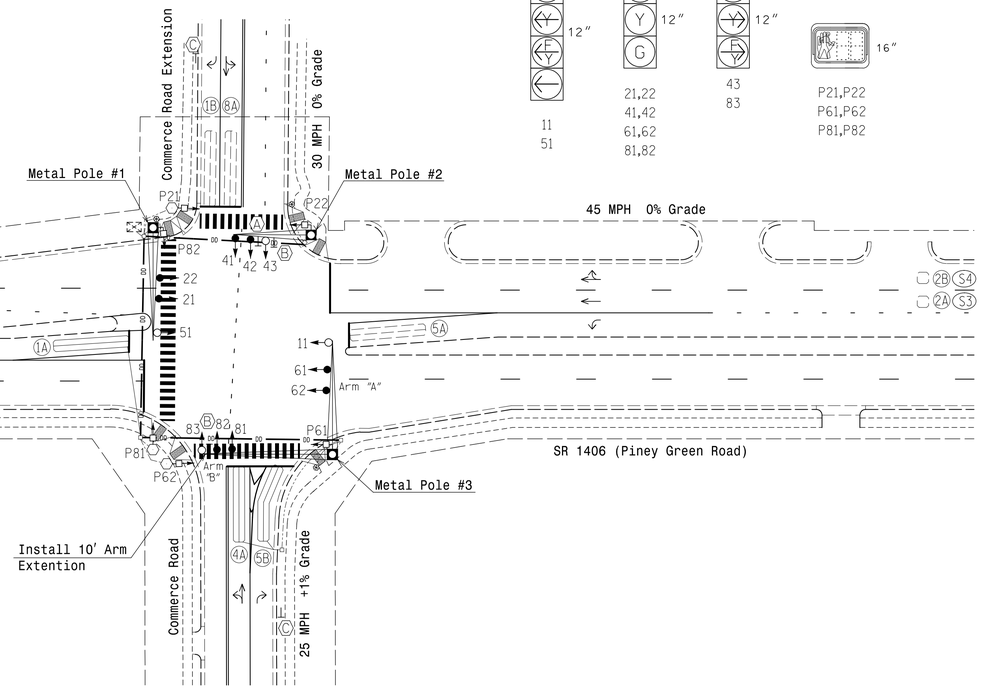
DETECTOR					PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
1A	6X40	0	2-4-2	Y	1	Yes	-	15∗	-	N	-	Y
					6∗∗	Yes	-	3	-	G	-	Y
1B	6X40	0	2-4-2	-	1	Yes	-	15	-	N	-	-
2A/S3	6X6	300	5	-	2	Yes	-	-	X	N	X	-
2B/S4	6X6	300	5	-	2	Yes	-	-	X	N	X	-
4A	6X40	0	2-4-2	Y	4	Yes	-	-	-	N	-	-
5A	6X40	0	2-4-2	-	5	Yes	-	15∗	-	N	-	Y
					2∗∗	Yes	-	3	-	G	-	Y
5B	6X40	0	2-4-2	Y	5	Yes	-	15	-	N	-	Y
6A/S1	6X6	295	5	-	6	Yes	-	-	X	N	X	-
6B/S2	6X6	295	5	-	6	Yes	-	-	X	N	X	-
8A	6X40	0	2-4-2	-	8	Yes	-	-	-	N	-	-

∗ Disable Delay During Alternate Phasing Operation.
∗∗ Disable Phase 2 and 6 Call For Loops 1A and 5A During Alternate Phasing Operation.

SIGNAL FACE I.D.

All Heads L.E.D.





ASC/3 TIMING CHART

FEATURE	PHASE 1	2	4	5	6	8
Min Green *	7	12	7	7	12	7
Walk *	-	7	-	-	7	7
Ped Clear	-	10	-	-	15	26
Veh. Extension *	2.0	6.0	2.0	2.0	6.0	2.0
Max 1 *	20	90	30	20	90	30
Yellow	3.0	4.5	3.5	3.0	4.5	3.5
Red Clear	3.1	1.6	3.3	3.1	1.6	3.3
Actuations B4 Add *	-	0	-	-	0	-
Seconds /Actuation *	-	1.5	-	-	1.5	-
Max Initial *	-	34	-	-	34	-
Time Before Reduction *	-	15	-	-	15	-
Time To Reduce *	-	45	-	-	45	-
Minimum Gap	-	3.0	-	-	3.0	-
Locking Detector	-	X	-	-	X	-
Recall Position	-	VEH. RECALL	-	-	VEH. RECALL	-
Dual Entry	-	-	X	-	-	X
Simultaneous Gap	X	X	X	X	X	X

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

5 Phase
Fully Actuated
Jacksonville Signal System

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 and/or phase 5 may be lagged.
4. Reposition existing signal heads numbered 41, 42, 81, and 82.
5. Renumber existing signal heads 22, 23, 62, and 63 to 21, 22, 61, and 62.
6. Renumber existing loops 2C and 8B to 5A and 1B.
7. Replace existing signal heads numbered 21 and 61 with 51 and 11.
8. Set all detector units to presence mode.
9. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
10. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
11. The Division Traffic Engineer will determine the hours of use for each phasing plan.
12. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
13. Pedestrian pedestal and pushbutton posts shall be BLACK per special provisions.
14. Remove bags and reconnect signal heads 41 and 42.

LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
▭↓	Pedestrian Signal Head With Push Button & Sign	■↓
▭	Inductive Loop Detector	▭
⊠	Controller & Cabinet	⊠
□	Junction Box	■
----------	2-in Underground Conduit	----------
N/A	Right of Way	----------
→	Directional Arrow	→
⊂▭	Metal Pole with Mastarm	■
⊛	Type I Pushbutton Post	⊛
⬡	Type II Signal Pedestal	⬢
Ⓐ	Right Arrow "ONLY" Sign (R3-5R)	Ⓐ
Ⓑ	"RIGHT TURN MUST YIELD TO U-TURN" Sign	Ⓑ
Ⓒ	"RIGHT LANE MUST TURN RIGHT" Sign (R3-7)	Ⓒ

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STV Engineers, Inc.
900 West Trade St., Suite 715
Charlotte, NC 28202
(704) 372-1885
NC License Number F-0991

Signal Upgrade - Final Design

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared for: Transportation Mobility and Safety Division, North Carolina Department of Transportation, Traffic Signal Design Section
750 N.Greenfield Pkwy,Garner,NC 27529

SR 1406 (Piney Green Road) at Commerce Road / Commerce Road Extension

Division 3 Onslow County Jacksonville

PLAN DATE: August 2018 REVIEWED BY: A. Wiseman

PREPARED BY: J. Trueblood REVIEWED BY: J. Carroll

REVISIONS	INIT.	DATE

SCALE 0 40 1"=40'

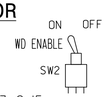
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 030005 ENGINEER JUSTIN T. CARROLL
DocuSigned by: Justin T. Carroll 634DAC5D4E16486...
10/26/2021 DATE

SIG. INVENTORY NO. 03-1090

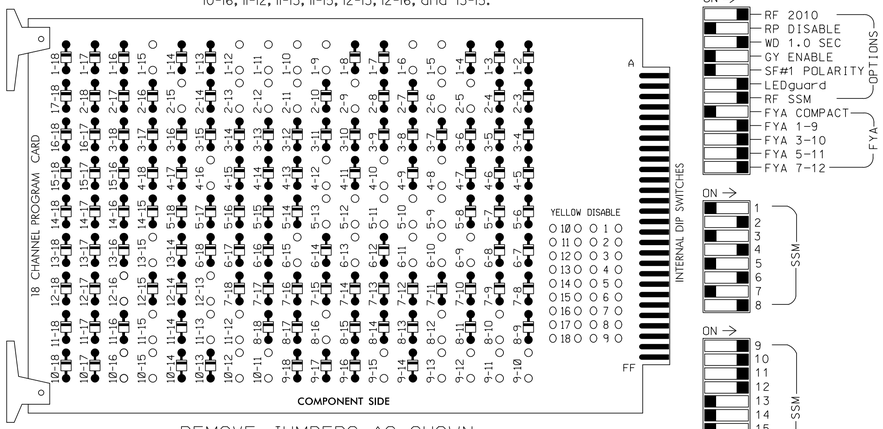
DocuSign Envelope ID: 96F5E234-EA90-4791-BE14-55EFA86FE173

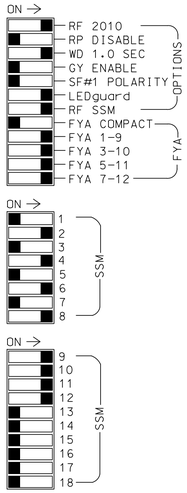
EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE DIODE JUMPERS I-5, I-6, I-9, I-10, I-11, I-12, I-15, 2-5, 2-6, 2-9, 2-11, 2-12, 2-13, 2-15, 4-8, 4-10, 4-12, 4-16, 5-9, 5-10, 5-11, 5-12, 5-13, 6-9, 6-10, 6-11, 6-13, 6-15, 8-10, 8-12, 8-16, 9-10, 9-11, 9-12, 9-13, 9-15, 10-11, 10-12, 10-15, 10-16, 11-12, 11-13, 11-15, 12-13, 12-16, and 13-15.





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 Red Enable is active at all times during normal operation.
4. Integrate monitor with Ethernet network in cabinet.

■ = DENOTES POSITION OF SWITCH

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 Plans.
2. Program phases 4 and 8 for Dual Entry.
3. Program controller to start up in phase 2 Walk and 6 Walk.
4. The cabinet and controller are part of the Jacksonville Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070E
CABINET.....332 W/AUX
SOFTWARE.....ECONOLITE ASC/3-2070
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S1,S2,S3,S5,S7,S8,S9,S11,S12, AUX S1,AUX S2,AUX S4,AUX S5
PHASES USED.....1,2,2 PED,4,5,6,6 PED,8,8 PED
OVERLAP "A".....*
OVERLAP "B".....*
OVERLAP "C".....*
OVERLAP "D".....*

* See overlap programming detail on sheet 2

PROJECT REFERENCE NO.	SHEET NO.
U-5878	Sig. 4.1

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	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11 ★	21,22	P21, P22	NU	41,42	NU	51 ★	61,62	P61, P62	NU	81,82	P81, P82	11 ★	83 ★	NU	51 ★	43 ★	NU
RED		128			101			134			107			A124			A101	
YELLOW	*	129			102		*	135			108							
GREEN		130			103			136			109							
RED ARROW													A121			A114		
YELLOW ARROW													A122	A125		A115	A102	
FLASHING YELLOW ARROW													A123	A126		A116	A103	
GREEN ARROW	127						133											
			113						119			110						
			115						121			112						

NU = Not Used

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

★ See pictorial of head wiring in detail below.

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	Ø 1	Ø 1	Ø2/SYS	WIRED INPUT ⊗	SLOT EMPTY	Ø 4	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø2 PED DC ISOLATOR	Ø6 PED DC ISOLATOR	FS DC ISOLATOR
		1A	1B	2A/S3			4A								
	L	NOT USED	NOT USED	Ø2/SYS 2B/S4			NOT USED						NOT USED	Ø8 PED DC ISOLATOR	ST DC ISOLATOR
FILE "J"	U	Ø 5	Ø 5	Ø6/SYS	WIRED INPUT ⊗	SLOT EMPTY	Ø 8	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
		5A	5B	6A/S1			8A								
	L	NOT USED	NOT USED	Ø6/SYS 6B/S2			NOT USED								

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

FS = FLASH SENSE
ST = STOP TIME

⊗ Wired Input - Do not populate slot with detector card

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
1A [1]	TB2-1,2	I1U	56	1 ★	1	YES		15		N
	-	J4U	48	26★	6	YES		3		G
1B	TB2-5,6	I2U	39	2	1	YES		15		N
2A/S3	TB2-9,10	I3U	63	32	2/SYS	YES			X	N
2B/S4	TB2-11,12	I3L	76	42	2/SYS	YES			X	N
4A	TB4-9,10	I6U	41	4	4	YES				N
5A [2]	TB3-1,2	J1U	55	5 ★	5	YES		15		N
	-	I4U	47	22★	2	YES		3		G
5B	TB3-5,6	J2U	40	6	5	YES		15		N
6A/S1	TB3-9,10	J3U	64	36	6/SYS	YES			X	N
6B/S2	TB3-11,12	J3L	77	46	6/SYS	YES			X	N
8A	TB5-9,10	J6U	42	8	8	YES				N
PED PUSH BUTTONS										
P21,P22	TB8-4,6	I12U	67	PED 2	2 PED					
P61,P62	TB8-7,9	I13U	68	PED 6	6 PED					
P81,P82	TB8-8,9	I13L	70	PED 8	8 PED					

NOTE:
INSTALL DC ISOLATORS IN INPUT FILE SLOTS I12 AND I13.

[1] Add jumper from I1-W to J4-W, on rear of input file.

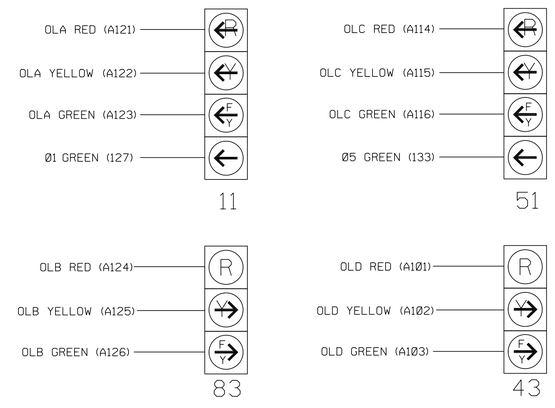
[2] Add jumper from J1-W to I4-W, on rear of input file.

★ For the detectors to work as shown on the signal design plan, see the Vehicle Detector Setup Programming Detail for Alternate Phasing on sheet 3.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

FYA SIGNAL WIRING DETAIL

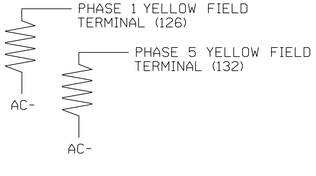
(wire signal heads as shown)



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: 03-1090
DESIGNED: AUG 2018
SEALED: 10/26/2021
REVISED: N/A

STV 100 Years
STV Engineers, Inc.
900 West Trade St., Suite 715
Charlotte, NC 28202
(704) 372-1885
NC License Number F-0991

Electrical Detail - Sheet 1 of 4
Final Design
Signal Upgrade

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

NC Department of Transportation Traffic Engineering Branch Traffic Signals Management Section
750 N.Greenfield Pkwy,Garner,NC 27529

SR 1406 (Piney Green Road) at Commerce Road / Commerce Road Extension

Division 3 | Onslow County | Jacksonville

PLAN DATE: August 2018	REVIEWED BY: A. Wiseman
PREPARED BY: J. Trueblood	REVIEWED BY: J. Carroll

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 030005 ENGINEER JUSTIN T. CARROLL
DocuSigned by: Justin T. Carroll 6340ACSD4E18486...
10/26/2021 DATE

SIG. INVENTORY NO. 03-1090

DocuSign Envelope ID: 96F5E234-EA90-4791-BE14-55EFA86FE173

ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL

(program controller as shown)

1. From Main Menu select [2. CONTROLLER]
2. From CONTROLLER Submenu select [2. VEHICLE OVERLAPS]

OVERLAP A

Select TMG VEH OVLP [A] and 'PPLT FYA'

```
TMG VEH OVLP...[A] TYPE: .....PPLT FYA

PROTECTED LEFT TURN....   PHASE    1
OPPOSING THROUGH.......   PHASE    2

FLASHING ARROW OUTPUT.....CH9   ISOLATE

DELAY START OF: FYA..0.0 CLEARANCE..0.0
ACTION PLAN SF BIT DISABLE.......... 1
```

← NOTICE ACTION PLAN SF BIT "1"

Toggle Once

↓

OVERLAP B

Select TMG VEH OVLP [B] and 'OTHER/ECONOLITE'

```
TMG VEH OVLP...[B] TYPE:OTHER/ECONOLITE
  PHASES 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
INCLUDED X . . . . . X . . . . . .
PROTECT  . . . . . .
PED PRTC . . . . . .
NOT OVLP . . . . . .
FLSH GRN 1 . . . . . 1 . . . . . .
LAG X PH . . . . . .
LAG 2 PH . . . . . .

LAG GRN 0.0 YEL 0.0 RED 0.0 ADV GRN 0.0
```

Toggle Once

↓

OVERLAP C

Select TMG VEH OVLP [C] and 'PPLT FYA'

```
TMG VEH OVLP...[C] TYPE: .....PPLT FYA

PROTECTED LEFT TURN....   PHASE    5
OPPOSING THROUGH.......   PHASE    6

FLASHING ARROW OUTPUT.....CH11 ISOLATE

DELAY START OF: FYA..0.0 CLEARANCE..0.0
ACTION PLAN SF BIT DISABLE.......... 5
```

← NOTICE ACTION PLAN SF BIT "5"

Toggle Once

↓

OVERLAP D

Select TMG VEH OVLP [D] and 'OTHER/ECONOLITE'

```
TMG VEH OVLP...[D] TYPE:OTHER/ECONOLITE
  PHASES 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
INCLUDED . . . X X . . . . . .
PROTECT  . . . . . .
PED PRTC . . . . . .
NOT OVLP . . . . . .
FLSH GRN . . . 1 1 . . . . . .
LAG X PH . . . . . .
LAG 2 PH . . . . . .

LAG GRN 0.0 YEL 0.0 RED 0.0 ADV GRN 0.0
```

END PROGRAMMING

PROJECT REFERENCE NO.	SHEET NO.
U-5878	Sig. 4.2

FLASHER CIRCUIT MODIFICATION DETAIL

IN ORDER TO ENSURE THAT SIGNALS FLASH CONCURRENTLY ON THE SAME APPROACH, MAKE THE FOLLOWING FLASHER CIRCUIT CHANGES:

1. ON REAR OF PDA - REMOVE WIRE FROM TERM. T2-4 AND TERMINATE ON T2-2.
2. ON REAR OF PDA - REMOVE WIRE FROM TERM. T2-5 AND TERMINATE ON T2-3.
3. REMOVE FLASHER UNIT 2.

THE CHANGES LISTED ABOVE TIES ALL PHASES AND OVERLAPS TO FLASHER UNIT 1.

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

Countdown Ped Signals are required to display timing only during Ped Clearance Interval. Consult Ped Signal Module user's manual for instructions on selecting this feature.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-1090
DESIGNED: AUG 2018
SEALED: 10/26/2021
REVISED: N/A

Electrical Detail - Sheet 2 of 4
Final Design
Signal Upgrade

STV 100 Years
STV Engineers, Inc.
900 West Trade St., Suite 715
Charlotte, NC 28202
(704) 372-1885
NC License Number F-0991

ELECTRICAL AND PROGRAMMING DETAILS FOR:

NC Transportation Mobility and Safety Division
Traffic Engineering Branch
Department of Transportation
Signals Management Section
750 N.Greenfield Pkwy,Garner,NC 27529

SR 1406 (Piney Green Road)
at
Commerce Road /
Commerce Road Extension

Division 3 | Onslow County | Jacksonville

PLAN DATE: August 2018	REVIEWED BY: A. Wiseman		
PREPARED BY: J. Trueblood	REVIEWED BY: J. Carroll		

REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 030005 ENGINEER JUSTIN T. CARROLL

DocuSigned by: Justin T. Carroll 6M4AC5D4E18486...
10/26/2021
DATE

SIG. INVENTORY NO. 03-1090

DocuSign Envelope ID: 96F5E234-EA90-4791-BE14-55EFA86FE173

PROJECT REFERENCE NO.	SHEET NO.
U-5878	Sig. 4.3

ECONOLITE ASC/3-2070 VEHICLE DETECTOR SETUP PROGRAMMING DETAIL FOR ALTERNATE PHASING LOOPS 1A, 5A

(program controller as shown)

IMPORTANT!

Program detectors per the input file connection and programming chart shown on sheet 1 before proceeding.

1. From Main Menu select [8. UTILITIES]
2. From UTILITIES Submenu select [1. COPY/CLEAR]
3. Copy from DETECTOR PLAN "1" to DETECTOR PLAN "2".

```
COPY / CLEAR UTILITY
      FROM                TO
PHASE TIMING.... . > PHASE TIMING.... .
TIMING PLAN..... . > TIMING PLAN..... .
PH DET OPT PLAN. . > PH DET OPT PLAN. .
DETECTOR PLAN... 1 > DETECTOR PLAN... 2
  TOGGLE TO SELECT A "FROM" AND A "TO"
          THEN PRESS ENTER
```

4. From Main Menu select [6. DETECTORS]
5. From DETECTOR Submenu select [2. VEHICLE DETECTOR SETUP]
6. Place cursor in VEH DET PLAN [ ] position and enter "2".

- Place cursor in VEH DETECTOR [ ] position and enter "1".
- Set delay time to "0".

```
VEH DETECTOR [ 1]   VEH DET PLAN [ 2]
TYPE: N-NTCIP
TS2 DETECTOR..... . ECPI LOG.......   NO
DET PH - 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
 1  1    . . . . . .
EXTEND TIME...  0.0 DELAY TIME...    0.0
USE ADDED INITIAL . CROSS SWITCH PH..  0
LOCK IN..... NONE NTCIP VOL . OR OCC .
PMT QUEUE DELAY. NO
```

← NOTICE VEH DET PLAN 2

← ENSURE DELAY IS SET TO '0'

- Place cursor in VEH DETECTOR [ ] position and enter "26".
- Set assigned phase to "0".

ENSURE PHASE IS SET TO "0" →

```
VEH DETECTOR [26]   VEH DET PLAN [ 2]
TYPE: G-GREEN EXTENSION/DELAY
TS2 DETECTOR..... . ECPI LOG.......   NO
DET PH - 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
 26 0    . . . . . .
EXTEND TIME...  0.0 DELAY TIME...    3.0
USE ADDED INITIAL . CROSS SWITCH PH..  0
LOCK IN..... NONE NTCIP VOL . OR OCC .
PMT QUEUE DELAY. NO
```

← NOTICE VEH DET PLAN 2

- Place cursor in VEH DETECTOR [ ] position and enter "5".
- Set delay time to "0".

```
VEH DETECTOR [ 5]   VEH DET PLAN [ 2]
TYPE: N-NTCIP
TS2 DETECTOR..... . ECPI LOG.......   NO
DET PH - 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
 5  5    . . . . . .
EXTEND TIME...  0.0 DELAY TIME...    0.0
USE ADDED INITIAL . CROSS SWITCH PH..  0
LOCK IN..... NONE NTCIP VOL . OR OCC .
PMT QUEUE DELAY. NO
```

← NOTICE VEH DET PLAN 2

← ENSURE DELAY IS SET TO '0'

- Place cursor in VEH DETECTOR [ ] position and enter "22".
- Set assigned phase to "0".

ENSURE PHASE IS SET TO "0" →

```
VEH DETECTOR [22]   VEH DET PLAN [ 2]
TYPE: G-GREEN EXTENSION/DELAY
TS2 DETECTOR..... . ECPI LOG.......   NO
DET PH - 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
 22 0    . . . . . .
EXTEND TIME...  0.0 DELAY TIME...    3.0
USE ADDED INITIAL . CROSS SWITCH PH..  0
LOCK IN..... NONE NTCIP VOL . OR OCC .
PMT QUEUE DELAY. NO
```

← NOTICE VEH DET PLAN 2

END PROGRAMMING

```
THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-1090
DESIGNED: AUG 2018
SEALED: 10/26/2021
REVISED: N/A
```

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Electrical Detail - Sheet 3 of 4
Final Design
Signal Upgrade

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

NC Department of Transportation Transmission Mobility and Safety Division Traffic Engineering Branch Signals Management Section

750 N.Greenfield Pkwy,Garner,NC 27529

SR 1406 (Piney Green Road)
at
Commerce Road /
Commerce Road Extension

Division 3 | Onslow County | Jacksonville

PLAN DATE: August 2018	REVIEWED BY:	A. Wiseman	
PREPARED BY: J. Trueblood	REVIEWED BY:	J. Carroll	

REVISIONS	INIT.	DATE

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 030005 ENGINEER JUSTIN T. CARROLL

Docusigned by: Justin T. Carroll 10/26/2021
634DAC5D4E18486...
DATE

SIG. INVENTORY NO. 03-1090

DocuSign Envelope ID: 96F5E234-EA90-4791-BE14-55EFA86FE173

PROJECT REFERENCE NO.	SHEET NO.
U-5878	Sig. 4.4

ALTERNATE PHASING ACTIVATION DETAIL

TO RUN ALT. PHASING DURING FREE RUN – PROGRAM CHANGES (SHOWN BELOW) IN A TIME BASED ACTION PLAN. SCHEDULE A DAY PLAN THAT INCLUDES THE ACTION PLAN PROGRAMMED TO SELECT VEH DET PLAN 2 AND ENABLE SF BITS 1 and 5.

TO RUN ALT. PHASING DURING COORDINATION – SELECT THE TIME BASED ACTION PLAN THAT IS PROGRAMMED TO SELECT VEH DET PLAN 2 AND ENABLE SF BITS 1 and 5.

PHASING	VEH DET PLAN	SF BITS ENABLED
ACTIONS REQUIRED TO RUN DEFAULT PHASING	1	NONE
ACTIONS REQUIRED TO RUN ALTERNATE PHASING	2	1, 5

IMPORTANT: IF ALT. PHASING IS USED DURING FREE RUN AND COORDINATION, DO NOT OPERATE TIME OF DAY EVENTS CONCURRENTLY WITH COORDINATION PLAN EVENTS IN THE EVENT SCHEDULER. (EX. FREE RUN EVENT SHOULD END BEFORE COORDINATION PLAN EVENT STARTS AND VICE-VERSA).

ALTERNATE PHASING CHANGE SUMMARY

THE FOLLOWING IS A SUMMARY OF WHAT TAKES PLACE WHEN SF BITS 1 AND 5 AND VEH DET PLAN 2 ACTIVATE TO CALL THE "ALTERNATE PHASING":

SF BITS 1,5: Modifies overlap parent phases for heads 11 and 51 to run protected turns only.

VEH DET PLAN 2: Disables phase 6 call on loop 1A and reduces delay time for phase 1 call on loop 1A to 0 seconds.

Disables phase 2 call on loop 5A and reduces delay time for phase 5 call on loop 5A to 0 seconds.

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ECONOLITE ASC/3-2070 ACTION PLAN PROGRAMMING DETAIL

1. From Main Menu select [5. TIME BASE]
2. From TIME BASE Submenu select [2. ACTION PLAN]

```
ACTION PLAN...[  1]
PATTERN.....AUTO   SYS OVERRIDE.... NO
TIMING PLAN..... 0   SEQUENCE.....  0
VEH DETECTOR PLAN.. 2   DET LOG........NONE
FLASH.........   --   RED REST..... NO
VEH DET DIAG PLN... 0   PED DET DIAG PLN..0
DIMMING ENABLE..   NO   PRIORITY RETURN. NO
PED PR RETURN..    NO   QUEUE DELAY..... NO
PMT COND DELAY     NO
  PHASE   1  2  3  4  5  6  7  8  9  0  1  2  3  4  5  6
PED RCL   .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
WALK 2    .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
VEX 2     .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
VEH RCL   .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
MAX RCL   .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
MAX 2     .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
  PHASE   1  2  3  4  5  6  7  8  9  0  1  2  3  4  5  6
MAX 3     .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
CS INH    .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
OMIT      .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
SPC FCT   X  .  .  .  X  .  .  .  (1-8)
AUX FCT   .  .  .  (1-3)
          1  2  3  4  5  6  7  8  9  0  1  2  3  4  5
LP 1-15   .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
LP 16-30  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
LP 31-45  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
LP 46-60  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
LP 61-75  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
LP 76-90  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
LP 91-100 .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
```

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-1090
DESIGNED: AUG 2018
SEALED: 10/26/2021
REVISED: N/A

Electrical Detail - Sheet 4 of 4
Final Design
Signal Upgrade

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

SR 1406 (Piney Green Road)
at
Commerce Road /
Commerce Road Extension

Division 3 | Onslow County | Jacksonville

PLAN DATE:	August 2018	REVIEWED BY:	A. Wiseman
PREPARED BY:	J. Trueblood	REVIEWED BY:	J. Carroll

REVISIONS	INIT.	DATE

NC DOT Transportation Mobility and Safety Division Traffic Engineering Branch Signal Management Section
750 N.Greenfield Pkwy,Garner,NC 27529

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 030005 ENGINEER JUSTIN T. CARROLL

DocuSigned by: Justin T. Carroll 634DAC5D4E18486...
10/26/2021 DATE

SIG. INVENTORY NO. 03-1090

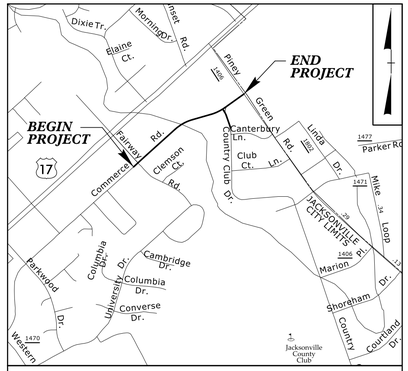
DocuSign Envelope ID: 96F5E234-EA90-4791-BE14-55EFA86FE173

09/08/99

TIP PROJECT: U-5878

CONTRACT: DC00185

See Sheet UC-1 For Index of Sheets
See Sheet UC-2 For Conventional Symbols



VICINITY MAP

N.T.S.

100% PLANS

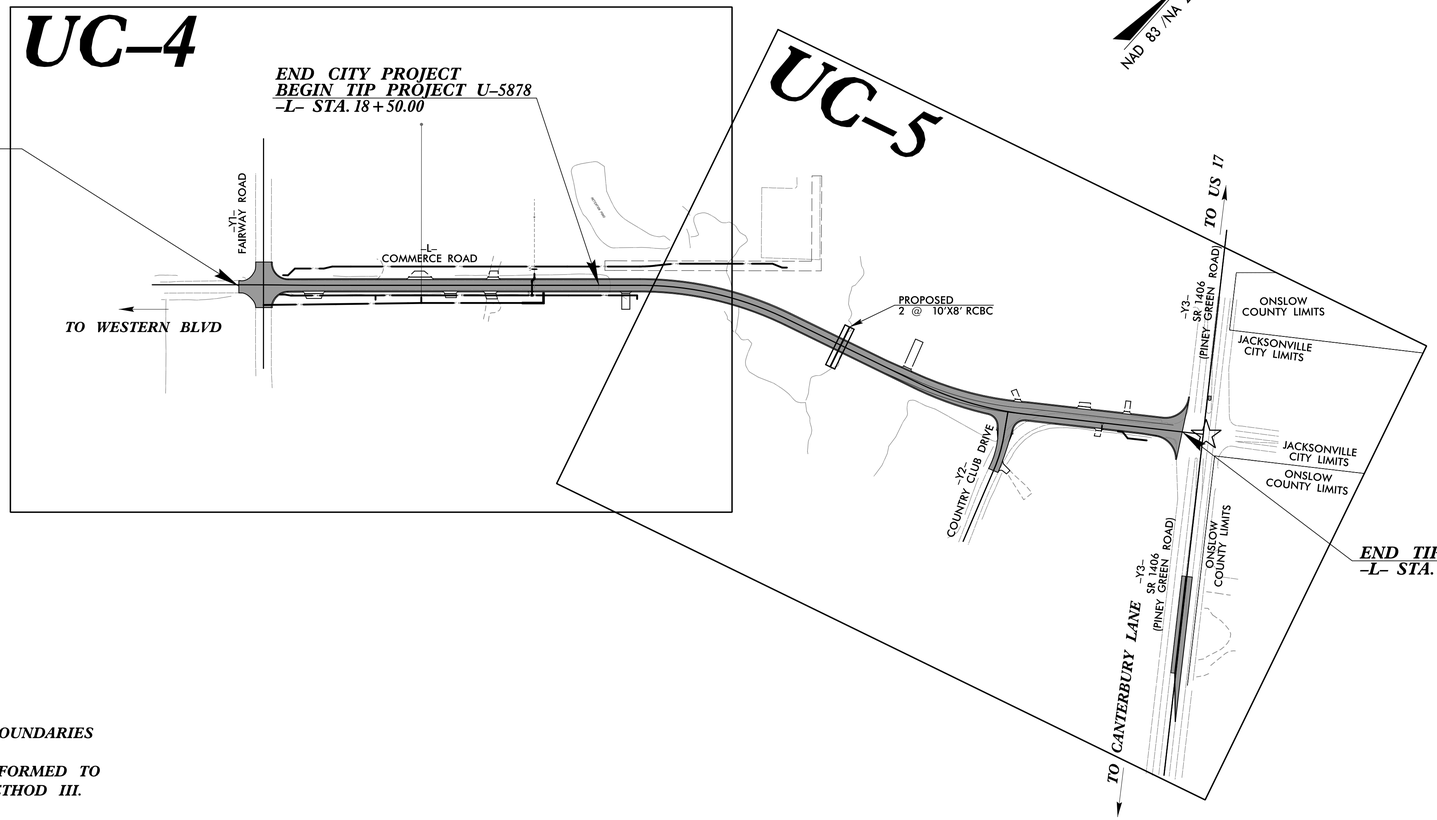
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

T.I.P. NO.	SHEET NO.
U-5878	UC-1

UTILITY CONSTRUCTION PLANS
ONSLOW COUNTY

LOCATION: EXTENSION OF COMMERCE ROAD FROM FAIRWAY ROAD TO PINEY GREEN ROAD (SR 1406) AT COUNTRY CLUB DRIVE

TYPE OF WORK: WATER LINE AND SANITARY SEWER RELOCATIONS



THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF THE CITY OF JACKSONVILLE.
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY MODIFIED METHOD III.

DOCUMENT NOT CONSIDERED FINAL UNTIL ALL SIGNATURES ARE COMPLETED

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

INDEX OF SHEETS

SHEET NO.:	DESCRIPTION:
UC-1	TITLE SHEET
UC-2	UTILITY SYMBOLOGY
UC-3	NOTES
UC-3A	DETAILS
UC-4 THRU UC-5	UTILITY CONSTRUCTION SHEETS
UC-6 THRU UC-7	PROFILE SHEETS

WATER AND SEWER OWNERS ON PROJECT

(A) WATER – CITY OF JACKSONVILLE
(B) WATER – ONSLOW WATER & SEWER AUTHORITY
(C) SANITARY SEWER – CITY OF JACKSONVILLE

PREPARED IN THE OFFICE OF

STV 100 Years
STV Engineers, Inc.
900 West Trade St., Suite 715
Charlotte, NC 28202
NC License Number F-0991
(704) 372-1885 FAX: (704) 372-3393

PATRICK A. LIVINGSTON, PE	CONSULTANT CONTACT #1
ANDREW T. PARKER, PE	CONSULTANT CONTACT #2
WESTON D. MURPHY, PE	CONSULTANT CONTACT #3

SEAL

DocuSigned by: Andrew T. Parker
NORTH CAROLINA PROFESSIONAL SEAL 040784 ENGINEER ANDREW T PARKER
11/12/2021

DIVISION OF HIGHWAYS
UTILITIES UNIT
1555 MAIL SERVICES CENTER
RALEIGH NC 27699-1555
PHONE (919) 707-6690
FAX (919) 250-4151

BO HEMPHILL, PE	EASTERN UTILITIES MANAGER
NABIL HAMDAN	UTILITIES REGIONAL ENGINEER
LONNY A. SLEEPER	UTILITIES ENGINEER
ROY SUTTON	UTILITIES COORDINATOR

11/11/2021
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5/14/99

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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PROJECT REFERENCE NO.	SHEET NO.
U-5878	UC-2

UTILITIES PLAN SHEET SYMBOLS

PROPOSED WATER SYMBOLS

- Water Line (Sized as Shown) — 12" WL
- 11¼ Degree Bend
- 22½ Degree Bend
- 45 Degree Bend
- 90 Degree Bend
- Plug
- Tee
- Cross
- Reducer
- Gate Valve — GV
- Butterfly Valve — BV
- Tapping Valve — TGV
- Line Stop — LS
- Line Stop with Bypass — LS/BP
- Blow Off — BO
- Fire Hydrant — PFH
- Relocate Fire Hydrant — RFH
- Remove Fire Hydrant — REM FH
- Water Meter — PWM
- Relocate Water Meter — RWM
- Remove Water Meter — REM WM
- Water Pump Station — PS(W)
- RPZ Backflow Preventer — PRPZ
- DCV Backflow Preventer — PBFP
- Relocate RPZ Backflow Preventer — RRPZ
- Relocate DCV Backflow Preventer — RBFP

PROPOSED SEWER SYMBOLS

- Gravity Sewer Line (Sized as Shown) — 12" SS
- Force Main Sewer Line (Sized as Shown) — 12" FSS
- Manhole (Sized per Note)
- Sewer Pump Station — PS(SS)

PROPOSED MISCELLANEOUS UTILITIES SYMBOLS

- Power Pole
- Telephone Pole
- Joint Use Pole
- Telephone Pedestal — TEL PED
- Utility Line by Others (Type as Shown) — PROP O/H POW LINES
- Trenchless Installation — 12" TL INSTALL
- Encasement by Open Cut — 24" ENCAS BY OC
- Encasement — 24" ENCASEMENT
- Thrust Block
- Air Release Valve — AR
- Utility Vault — UV
- Concrete Pier — CP
- Steel Pier — SP
- Plan Note — NOTE
- Pay Item Note — PAY ITEM

EXISTING UTILITIES SYMBOLS

- Power Pole
- Telephone Pole
- Joint Use Pole
- Utility Pole
- Utility Pole with Base
- H-Frame Pole
- Power Transmission Line Tower
- Water Manhole
- Power Manhole
- Telephone Manhole
- Sanitary Sewer Manhole
- Hand Hole for Cable
- Power Transformer
- Telephone Pedestal
- CATV Pedestal
- Gas Valve
- Gas Meter
- Located Miscellaneous Utility Object
- Abandoned According to Utility Records — AATUR
- End of Information — E.O.I.
- *Underground Power Line
- *Underground Telephone Cable
- *Underground Telephone Conduit
- *Underground Fiber Optics Telephone Cable
- *Underground TV Cable
- *Underground Fiber Optics TV Cable
- *Underground Gas Pipeline
- Aboveground Gas Pipeline — A/G Gas
- *Underground Water Line
- Aboveground Water Line — A/G Water
- *Underground Gravity Sanitary Sewer Line
- Aboveground Gravity Sanitary Sewer Line — A/G Sanitary Sewer
- *Underground SS Forced Main Line
- Underground Unknown Utility Line
- SUE Test Hole
- Water Meter
- Water Valve
- Fire Hydrant
- Sanitary Sewer Cleanout

*For Existing Utilities

- Utility Line Drawn from Record (Type as Shown)
- Designated Utility Line (Type as Shown)

REV: 2/1/2012

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UTILITY CONSTRUCTION

STV 100 Years
STV Engineers, Inc.
900 West Trade St., Suite 715
Charlotte, NC 28202
NC License Number F-0991

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REVISED:	
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UTILITIES ENGINEERING SEC. PHONE:(919)707-6690 FAX:(919)250-4151	UTILITY CONSTRUCTION PLANS ONLY

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 040784 ANDREW T. PARKER 11/19/2021

UTILITY CONSTRUCTION

GENERAL NOTES:

1. THE PROPOSED UTILITY CONSTRUCTION SHALL MEET THE APPLICABLE REQUIREMENTS OF THE NC DEPARTMENT OF TRANSPORTATION'S "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" DATED JANUARY 2018.

2. THE EXISTING UTILITIES BELONG TO THE CITY OF JACKSONVILLE AND ONSLOW WATER AND SEWER AUTHORITY.

3. ALL WATER LINES TO BE INSTALLED WITHIN COMPLIANCE OF THE RULES AND REGULATIONS OF THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL QUALITY, DIVISION OF WATER RESOURCES, PUBLIC WATER SUPPLY SECTION. ALL SEWER LINES TO BE INSTALLED WITHIN COMPLIANCE OF THE RULES AND REGULATIONS OF THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENT QUALITY, DIVISION OF WATER RESOURCES, WATER QUALITY SECTION. PERFORM ALL WORK IN ACCORDANCE WITH THE APPLICABLE PLUMBING CODES.

4. THE UTILITY OWNER OWNS THE EXISTING UTILITY FACILITIES AND WILL OWN THE NEW UTILITY FACILITIES AFTER ACCEPTANCE BY THE DEPARTMENT. THE DEPARTMENT OWNS THE CONSTRUCTION CONTRACT AND HAS ADMINISTRATIVE AUTHORITY. COMMUNICATIONS AND DECISIONS BETWEEN THE CONTRACTOR AND UTILITY OWNER ARE NOT BINDING UPON THE DEPARTMENT OR THIS CONTRACT UNLESS AUTHORIZED BY THE ENGINEER. AGREEMENTS BETWEEN THE UTILITY OWNER AND CONTRACTOR FOR THE WORK THAT IS NOT PART OF THIS CONTRACT OR IS SECONDARY TO THIS CONTRACT ARE ALLOWED, BUT ARE NOT BINDING UPON THE DEPARTMENT.

5. PROVIDE ACCESS FOR THE DEPARTMENT PERSONNEL AND THE OWNER'S REPRESENTATIVES TO ALL PHASES OF CONSTRUCTION. NOTIFY DEPARTMENT PERSONNEL AND THE UTILITY OWNER TWO WEEKS PRIOR TO COMMENCEMENT OF ANY WORK AND ONE WEEK PRIOR TO SERVICE INTERRUPTION. KEEP UTILITY OWNERS' REPRESENTATIVES INFORMED OF WORK PROGRESS AND PROVIDE OPPORTUNITY FOR INSPECTION OF CONSTRUCTION AND TESTING.

6. THE PLANS DEPICT THE BEST AVAILABLE INFORMATION FOR THE LOCATION, SIZE, AND TYPE OF MATERIAL FOR ALL EXISTING UTILITIES. MAKE INVESTIGATIONS FOR DETERMINING THE EXACT LOCATION, SIZE, AND TYPE MATERIAL OF THE EXISTING FACILITIES AS NECESSARY FOR THE CONSTRUCTION OF THE PROPOSED UTILITIES AND FOR AVOIDING DAMAGE TO EXISTING FACILITIES. REPAIR ANY DAMAGE INCURRED TO EXISTING FACILITIES TO THE ORIGINAL OR BETTER CONDITION AT NO ADDITIONAL COST TO THE DEPARTMENT.

7. MAKE FINAL CONNECTIONS OF THE NEW WORK TO THE EXISTING SYSTEM WHERE INDICATED ON THE PLANS, AS REQUIRED TO FIT THE ACTUAL CONDITIONS, OR AS DIRECTED.

8. MAKE CONNECTIONS BETWEEN EXISTING AND PROPOSED UTILITIES AT TIMES MOST CONVENIENT TO THE PUBLIC, WITHOUT ENDANGERING THE UTILITY SERVICE, AND IN ACCORDANCE WITH THE UTILITY OWNER'S REQUIREMENTS. MAKE CONNECTIONS ON WEEKENDS AND AT NIGHT IF NECESSARY.

9. ALL UTILITY MATERIALS SHALL BE APPROVED PRIOR TO DELIVERY TO THE PROJECT. SEE 1500-7, " SUBMITTALS AND RECORDS" IN SECTION 1500 OF THE STANDARD SPECIFICATIONS.

PROJECT SPECIFIC NOTES:

1. WORK PERFORMED ON THE ONWASA SYSTEM SHALL MEET THE ADDITIONAL REQUIREMENTS OF THE ONWASA *MANUAL OF STANDARDS, SPECIFICATIONS AND DETAILS,* LATEST EDITION (MAY 2016), WHICH ARE PROVIDED IN THE FOLLOWING NOTES AND SPECIAL PROVISIONS.

2. WORK PERFORMED ON THE CITY OF JACKSONVILLE'S SYSTEM SHALL MEET THE ADDITIONAL REQUIREMENTS OF THE CITY OF JACKSONVILLE'S *MANUAL OF SPECIFICATIONS STANDARDS AND DESIGN,* LATEST EDITION (JUNE 2006), WHICH ARE PROVIDED IN THE FOLLOWING NOTES AND SPECIAL PROVISIONS.

3. PROPOSED WATER LINE FROM -WL1- LINE STATION 10+00.00 TO -WL1- LINE STATION 17+37.34 AND -WL2- LINE STATION 10+00.00 TO -WL2- LINE STATION 10+66.38 SHALL BE PC350 D.I. PIPE WITH DUCTILE IRON FITTINGS.

4. PROPOSED FORCE MAIN FROM -FSS1- LINE STATION 10+00.00 TO -FSS1- LINE STATION 18+31.79 AND FROM -FSS1- LINE STATION 20+21.22 TO -FSS1- LINE STATION 20+55.20 SHALL BE AWWA C900, DR18 PVC PIPE.

5. PROPOSED FORCE MAIN FROM -FSS1- LINE STATION 18+31.79 TO -FSS1- LINE STATION 20+21.22 SHALL BE AWWA C900, DR18 FPVC PIPE.

6. PROPOSED SANITARY GRAVITY SEWER FROM -SS1- LINE STATION 0+00.00 TO -SS1- LINE STATION 5+40.00 SHALL BE PC350 D.I. PIPE WITH DUCTILE IRON FITTINGS.

7. IN ADVANCE OF BEGINNING UTILITY WORK, SOFT DIGS SHALL BE PERFORMED BY CONTRACTOR TO VERIFY ACTUAL WATER LINE AND FORCE MAIN DEPTHS AND LOCATIONS AT PROPOSED TIE-IN LOCATIONS.

8. JOINTS OF FPVC PIPE SEGMENTS SHALL BE BUTT-WELDED FLUSH TO THE OUTSIDE DIAMETER OF THE PIPE.

9. THE CONTRACTOR SHALL INSTALL THE FPVC PIPE BY THE HORIZONTALLY-DRILLED, DIRECTIONALLY-CONTROLLED METHOD OF CONSTRUCTION. PIPE SHALL BE FILLED WITH POTABLE WATER AND NOT BE CONNECTED TO ANY OTHER PIPE OR FITTINGS FOR ONE WEEK FROM TIME OF INSTALLATION.

10. THE CONTRACTOR SHALL EMPLOY EXPERIENCED PERSONNEL TO OPERATE THE DIRECTIONAL DRILLING EQUIPMENT AND THE POSITION MONITORING AND STEERING EQUIPMENT. THE CONTRACTOR SHALL USE CERTIFIED FUSING PERSONNEL APPROVED BY THE PIPE MANUFACTURER.

11. THE CONTRACTOR SHALL AT ALL TIMES, PROVIDE AND MAINTAIN INSTRUMENTATION THAT WILL ACCURATELY LOCATE THE PILOT HOLE POSITION IN THE X, Y, AND Z AXES RELATIVE TO THE GROUND SURFACE. DRILL FLUID FLOW RATE AND PRESSURE SHALL ALSO BE MONITORED. THE CONTRACTOR SHALL MAINTAIN AND PROVIDE TO THE ENGINEER ACCESS TO THE DATA GENERATED BY THE DOWNHOLE SURVEY TOOLS.

12. PIPE INSTALLED BY HORIZONTAL DIRECTIONAL DRILLING SHALL BE LOCATED AS SHOWN ON THE DRAWINGS. THE CONTRACTOR SHALL PLOT THE ACTUAL HORIZONTAL AND VERTICAL ALIGNMENT OF THE PILOT BORE AT INTERVALS NOT EXCEEDING 30 FEET. THIS "AS-BUILT" PLAN AND PROFILE SHALL BE UPDATED AS THE PILOT BORE IS ADVANCED. AT THE COMPLETION OF THE PILOT HOLE, THE CONTRACTOR SHALL PROVIDE THE COORDINATES OF THE PILOT HOLE AS SPECIFIED.

13. THE CONTRACTOR SHALL HAVE ACCURATE WORKING GAUGES THAT REGISTER TENSILE FORCE BEING USED TO PULL THE PIPELINE BACK THROUGH THE REAMED BOREHOLE.

14. DEVIATIONS FROM, AND CORRECTIONS TO, THE DESIGN CENTERLINE SHALL NOT EXCEED 2% OF THE DEPTH PER 100 FEET AND 2% HORIZONTALLY PER 100 FEET. CONTRACTOR TO ENSURE NEWLY CONSTRUCTED UTILITIES ARE ENTIRELY WITHIN RIGHT-OF-WAY OR UTILITY EASEMENT.

15. THE HORIZONTAL DIRECTIONAL DRILLING OPERATION SHALL BE CONDUCTED IN A MANNER TO ELIMINATE THE DISCHARGE OF WATER, DRILLING MUD, AND CUTTINGS TO AREAS NOT INVOLVED IN THE CONSTRUCTION PROCESS. THE CONTRACTOR SHALL IMMEDIATELY CONTAIN AND CLEAN UP ANY INADVERTENT RETURNS. THE CONTRACTOR SHALL ALSO PROVIDE EQUIPMENT AND PROCEDURES TO MAXIMIZE THE RECIRCULATION OR REUSE OF DRILLING MUD TO MINIMIZE WASTE DISPOSAL.

16. AFTER INSTALLING DIRECTIONAL DRILL, CONTRACTOR TO DIG DOWN, CUT PIPE AND INSTALL FITTINGS REQUIRED TO COMPLETE CONNECTION.

17. MIKE MOORE, CONSTRUCTION SPECIALIST WITH THE CITY OF JACKSONVILLE, WILL SERVE AS THE UTILITY OWNER CONTACT FOR THE CITY OF JACKSONVILLE'S FACILITIES ON THIS PROJECT. CONTRACTOR, AS REQUIRED BY STANDARD SPECIFICATION SECTION 1500-2, SHALL CONTACT HIM AT (910) 938-5332.

18. REMY HUMPHREY OF ONSLOW WATER AND SEWER AUTHORITY, WILL SERVE AS THE UTILITY OWNER CONTACT FOR ONWASA'S FACILITIES ON THIS PROJECT. CONTRACTOR, AS REQUIRED BY STANDARD SPECIFICATION SECTION 1500-2, SHALL CONTACT HIM AT (910) 937-7509.

19. NO INTERRUPTION TO EXISTING SERVICE SHALL TAKE PLACE UNTIL ALL CITY OF JACKSONVILLE CUSTOMERS HAVE BEEN NOTIFIED A MINIMUM OF 48 HOURS IN ADVANCE. NOTICE OF INTERRUPTION SHALL BE PREPARED BY THE PUBLIC WORKS OFFICE ON OFFICIAL LETTERHEAD. DISTRIBUTION TO EACH CUSTOMER SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR UNDER THE DIRECTION OF THE OWNER'S AUTHORITY.

20. NO INTERRUPTION TO EXISTING SERVICE SHALL TAKE PLACE UNTIL CONTRACTOR RECEIVES VERIFICATION THAT ONWASA HAS NOTIFIED ALL CUSTOMERS. THE CONTRACTOR SHALL NOTIFY ONWASA A MINIMUM OF SEVEN (7) DAYS IN ADVANCE OF A PLANNED SERVICE INTERRUPTION. TO SCHEDULE SERVICE INTERRUPTIONS, CONTRACTOR SHALL CONTACT MATTHEW PADGETT, ONWASA DISTRIBUTION SUPERINTENDENT, AT (910) 937-7559.

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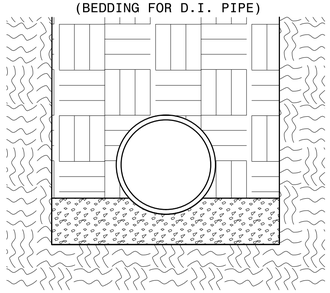
UTILITY CONSTRUCTION

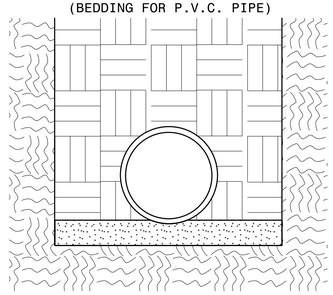
PROJECT TYPICAL DETAILS

TYPE "4"
(BEDDING FOR D.I. PIPE)



PIPE BEDDED IN SAND, GRAVEL OR CRUSHED STONE TO A DEPTH OF ⅛ PIPE DIAMETER, 4" MINIMUM UNDER PIPE. TRENCH BACKFILLED IN LOOSE 6" LAYERS COMPACTED TO TOP OF TRENCH USING LOCAL EXCAVATED MATERIAL, IF APPROVED BY THE ENGINEER, OR SELECT MATERIAL. ALL MATERIAL SHALL BE FREE OF ROCKS, FOREIGN MATERIAL, AND FROZEN EARTH. COMPACTION SHALL BE TO APPROX. 95% DENSITY IN ACCORDANCE WITH AASHTO T-99 AS MODIFIED BY THE DEPARTMENT OF TRANSPORTATION.

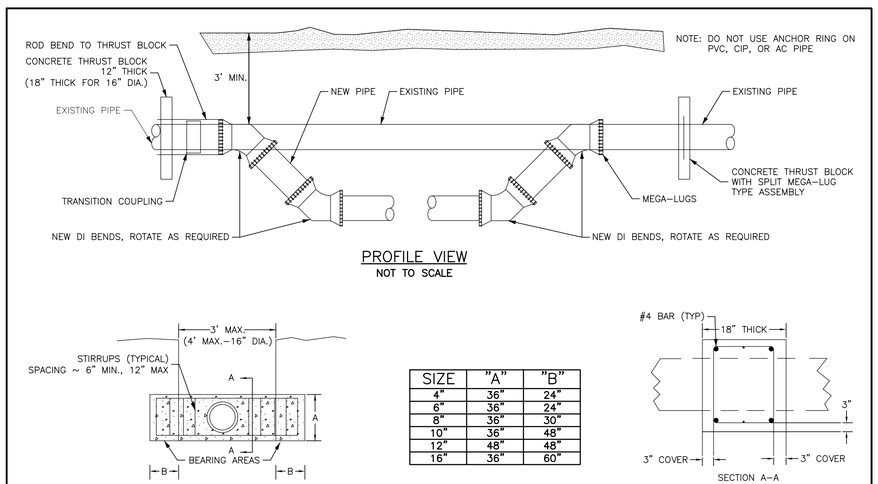
CLASS "C"
(BEDDING FOR P.V.C. PIPE)



PIPE BEDDED IN LOOSE MATERIAL, LIGHTLY TAMPED WITH A MINIMUM OF 6" UNDER PIPE. TRENCH BACKFILLED IN LOOSE 6" LAYERS COMPACTED TO TOP OF TRENCH USING LOCAL EXCAVATED MATERIAL, IF APPROVED BY THE ENGINEER, OR SELECT MATERIAL. ALL MATERIAL SHALL BE FREE OF ROCKS, FOREIGN MATERIAL, AND FROZEN EARTH. COMPACTION SHALL BE TO APPROX. 95% DENSITY IN ACCORDANCE WITH AASHTO T-99 AS MODIFIED BY THE DEPARTMENT OF TRANSPORTATION.

MAXIMUM TRENCH WIDTH
AT TOP OF PIPE

NOMINAL PIPE SIZE (INCHES)	TRENCH WIDTH (INCHES)	NOMINAL PIPE SIZE (INCHES)	TRENCH WIDTH (INCHES)
4	28	20	44
6	30	24	48
8	32	30	54
10	34	36	60
12	36	42	66
14	38	48	72
16	40	54	78
18	42		



SIZE	"A"	"B"
4"	36"	24"
6"	36"	24"
8"	36"	30"
10"	36"	48"
12"	48"	48"
16"	36"	60"

DETAIL TO BE USED FOR ONWASA RELOCATIONS. FOR CITY OF JACKSONVILLE RELOCATIONS, REFERENCE THE CITY DETAIL 512.04

LIST OF CITY OF JACKSONVILLE STANDARD DETAILS

511.01	WATER MAIN EMBEDMENT DETAILS
512.01	BLOCKING DETAIL FOR HORIZONTAL BENDS AND TEE
512.02	THRUST COLLAR & BLOCKING WITH RESTRAINT FLANGE SYSTEM
512.03	STANDARD VERTICAL BEND DETAIL
512.04	WATER BYPASS FOR DEEPLY BURIED WATER LINES
512.05	STANDARD ANCHOR BLOCKING DETAIL
512.07	TIE ROD ANCHORS DATUM CHART
513.01	STANDARD SLIP TYPE VALVE BOX DETAIL
513.03	STANDARD 1" WATER TAPPING DETAIL
514.05	STANDARD PERMANENT BLOW-OFF ASSEMBLY
515.01	STANDARD 3/4" DOMESTIC WATER METER INSTALLATION
515.02	STANDARD 1-1/2" WATER METER INSTALLATION DETAIL
519.01	2-1/2" TO 10" DCV, DDCV, RPZ ASSEMBLY (ABOVE GROUND)
531.01	SANITARY SEWER LINE TRENCH DETAIL
532.01	STANDARD ECCENTRIC TOP PRECAST MANHOLE
532.03	STANDARD SHALLOW PRECAST MANHOLE
532.04	PRECAST CONCRETE DOGHOUSE MANHOLE
532.05	STANDARD SEWER INVERT PLANS FOR MANHOLES
533.01	TYPICAL LATERAL SADDLE DETAIL
533.03	TYPICAL PVC SEWER LATERAL CLEANOUT WITH IN-LINE WYE
534.03	COMBINATION AIR VALVE AIR RELEASE MANHOLE
C01.01	TYPICAL TRENCH BACKFILL AND SURFACE REPAIR DETAILS
C06.01	STANDARD MANHOLE RING & COVER US FOUNDRY 700KL STANDARD MANHOLE RING & COVER CAST-IN PRECAST FLAT TOP
C06.04	STANDARD MANHOLE RING & COVER GRADE ADJUSTMENT - PRECAST STANDARD MANHOLE RING & COVER GRADE ADJUSTMENT - BRICK
C06.05	STANDARD POLYPROPYLENE PLASTIC STEP
C07.02	TYPICAL RESIDENTIAL WATER & SEWER SERVICE SCHEMATIC
C09.01	ILLUSTRATIVE UTILITY TRIANGULATION FOR AS-BUILT DRAWINGS

HTTPS://WWW.JACKSONVILLENC.GOV/858/MSSD

LIST OF ONWASA STANDARD DETAILS

WS_VB	VALVE BOX INSTALLATION
WS_ILV	INLINE VALVE
WS_TB1-TB4	THRUST BLOCKING
WS_ED	WATER MAIN EMBEDMENT DETAIL
WS_FHD	FIRE HYDRANT ASSEMBLY CURB AND GUTTER SECTION
WS_SCM	¾ TO 1 SERVICE CONNECTION AND METER
WS_MI	¾ TO 1 METER INSTALLATION
WS_WMARK	WATER MAIN UTILITY MARKER

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CITY OF JACKSONVILLE STANDARD DETAILS

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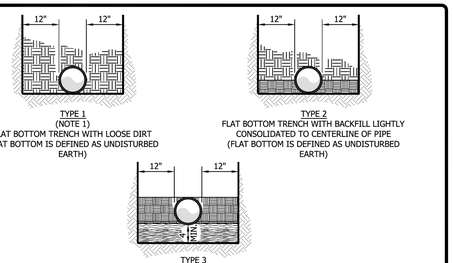
NORTH CAROLINA — ANDREW T. PARKER — SEAL 040784 — ENGINEER — 11/17/2021

UTILITY CONSTRUCTION



NOTES:

1. FOR NORMAL PIPE SIZES 14 INCH AND LARGER, CONSIDERATION SHOULD BE GIVEN TO THE USE OF LAYING CONDITIONS OTHER THAN TYPE.
2. CONSIDERATION OF THE PIPE-ZONE EMBEDMENT CONDITIONS INCLUDED IN THIS FIGURE MAY BE INFLUENCED BY FACTORS OTHER THAN PIPE STRENGTH. FOR ADDITIONAL INFORMATION ON PIPE BEDDING AND BACKFILL, SEE ANSI/AWWA C600.

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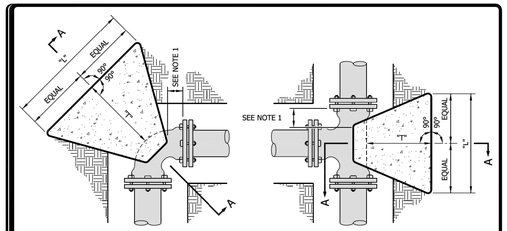
WATER MAIN EMBEDMENT DETAILS

SCALE: Not To Scale | DETAIL # 511.01 | REVISION DATE: Jan, 2016 | SHEET #: 1 of 3



NOTES:

1. CONCRETE BLOCKING IS TO BE FORMED TO ENSURE ACCESSIBILITY TO FITTINGS AND POURED AGAINST UNDISTURBED EARTH.
2. FITTINGS ARE TO BE COMPLETELY WRAPPED WITH PLASTIC, PRIOR TO POURING CONCRETE.
3. CONCRETE TO BE MINIMUM 3,000 PSI. @ 28 DAYS.
4. WHEN SACKRETE IS TO BE USED, IT SHALL BE PROPERLY MIXED PER MANUFACTURER SPECIFICATIONS.

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BLOCKING DETAIL for HORIZONTAL BENDS AND TEE

SCALE: Not To Scale | DETAIL # 512.01 | REVISION DATE: Jan, 2016 | SHEET #: 1 of 2

TEST PRESSURE = 150 P.S.I.

PIPE SIZE	TYPE FITTING	DIMENSIONS (Ft.) "L"	"H"	"T"	VOLUME. CONCRETE CU. YD.
<4 INCHES	11 1/4°	---	---	---	---
	22 1/2°	1.00	1.00	1.50	0.06
	45°	1.00	1.00	1.50	0.06
	90°	1.00	1.00	2.50	0.09
	TEE	1.00	1.00	2.00	0.07
4 INCHES	11 1/4°	1.00	1.00	2.50	0.09
	22 1/2°	1.00	1.00	2.50	0.09
	45°	1.00	1.00	2.50	0.09
	90°	1.50	1.50	2.50	0.15
	TEE	1.50	1.50	2.00	0.12
6 INCHES	11 1/4°	1.50	1.50	2.50	0.15
	22 1/2°	1.50	1.50	2.50	0.15
	45°	1.50	1.50	2.50	0.15
	90°	2.00	2.00	3.00	0.28
	TEE	2.00	2.00	2.50	0.23
8 INCHES	11 1/4°	2.00	2.00	2.50	0.23
	22 1/2°	2.00	2.00	2.50	0.23
	45°	2.00	2.00	2.75	0.25
	90°	3.00	2.00	3.00	0.39
	TEE	3.00	2.00	2.50	0.32
12 INCHES	11 1/4°	2.00	2.00	3.00	0.28
	22 1/2°	2.00	2.00	3.00	0.28
	45°	3.00	2.50	3.00	0.47
	90°	4.50	3.00	3.50	0.94
	TEE	4.50	3.00	3.00	0.81
16 INCHES	11 1/4°	2.00	2.00	3.00	0.28
	22 1/2°	3.00	2.00	3.00	0.39
	45°	4.00	3.00	3.50	0.84
	90°	6.50	3.50	3.50	1.54
	TEE	6.50	3.50	3.00	1.32

TEST PRESSURE = 200 P.S.I.

PIPE SIZE	TYPE FITTING	DIMENSIONS (Ft.) "L"	"H"	"T"	VOLUME. CONCRETE CU. YD.
<4 INCHES	11 1/4°	1.00	1.00	1.00	0.04
	22 1/2°	1.00	1.00	1.50	0.06
	45°	1.00	1.00	1.50	0.06
	90°	1.50	1.50	2.50	0.15
	TEE	1.50	1.50	2.00	0.12
4 INCHES	11 1/4°	1.00	1.00	2.50	0.09
	22 1/2°	1.00	1.00	2.50	0.09
	45°	1.50	1.50	2.50	0.15
	90°	1.50	1.50	2.50	0.15
	TEE	1.50	1.50	2.00	0.12
6 INCHES	11 1/4°	1.50	1.50	2.50	0.15
	22 1/2°	1.50	1.50	2.50	0.15
	45°	1.50	1.50	2.50	0.15
	90°	2.50	2.00	3.00	0.33
	TEE	2.50	2.00	2.50	0.28
8 INCHES	11 1/4°	2.00	2.00	2.50	0.23
	22 1/2°	2.00	2.00	2.50	0.23
	45°	2.00	2.00	2.50	0.23
	90°	4.00	2.00	3.00	0.50
	TEE	4.00	2.00	2.50	0.42
12 INCHES	11 1/4°	2.00	2.00	3.00	0.28
	22 1/2°	3.00	2.00	3.00	0.39
	45°	4.00	2.50	3.00	0.61
	90°	5.50	3.00	3.50	1.13
	TEE	5.50	3.00	3.00	0.97
16 INCHES	11 1/4°	2.00	2.00	3.00	0.28
	22 1/2°	4.00	2.00	3.00	0.50
	45°	5.50	3.00	3.50	1.13
	90°	7.50	4.00	3.50	2.01
	TEE	7.50	4.00	3.00	1.72

CHART NOTES:

1. IF BLOCKING EXCAVATION IS IN LIGHTLY COMPACTED FILL AREAS, OR IN AREAS WHERE BOULDERS OR STUMPS HAVE BEEN REMOVED, BLOCKING SIZE MUST BE RE-SIZED FOR THE SPECIFIC LOCATION/CIRCUMSTANCE BY A NC LICENSED PROFESSIONAL ENGINEER.
2. BLOCKING SIZES SHOWN IN THESE TABLES ASSUME THE FOLLOWING:
   A. BLOCKING IS CONSTRUCTED IN RESIDUAL SOILS AS SHOWN IN DETAIL
   B. SOIL BEARING PRESSURE = 2000 PSF
   C. VELOCITY OF FLOW = 15 FPS
3. THIS DETAIL NOT APPLICABLE TO REDUCING BENDS.
4. NEITHER THE WEIGHT OF THE CONCRETE BLOCKING NOR FRICTION BETWEEN CONCRETE BLOCKING AND SOIL WAS ADDED INTO BLOCKING SIZES COMPUTATION. THEREFORE, BLOCKING SIZE IS CONSERVATIVE.

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BLOCKING DETAIL for HORIZONTAL BENDS AND TEE

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TABLE 10.7 - DESCRIPTION OF MATERIAL CLASSIFICATION (AS DEFINED IN ASTM 2321)

CLASS	TYPE	SOIL SYMBOL GROUP	DESCRIPTION ASTM D 2487	PERCENTAGE PASSING SIEVE SIZES 1.5 IN (40 MM)	NO. 4 (4.75 MM)	NO. 200 (0.075 MM)	ATTERBREG LIMITS LL	PL	COEFFICIENTS UNIFORMITY CU	CURVATURE CC
IA	MANUFACTURED AGGREGATES: OPEN GRADED, CLEAN	NONE	ANGULAR, CRUSHED STONE OR ROCK, CRUSHED GRAVEL, BROKEN CORAL, CRUSHED SLAG, CINDERS OR SHELLS: LARGE VOID CONTENT, CONTAIN LITTLE OR NO FINES	100	≤10%	<5	NON PLASTIC			
IB	MANUFACTURED, PROCESSED AGGREGATES: DENSE GRADED, CLEAN	NONE	ANGULAR, CRUSHED STONE (OR OTHER CLASS IA MATERIALS) AND STONE/SAND MIXTURES WITH GRADATIONS SELECTED TO MINIMIZE MIGRATION OF ADJACENT SOILS: CONTAIN LITTLE OR NO FINES	100	≤50%	<5	NON PLASTIC			
II	COARSE-GRAINED SOILS, CLEAN	GW	WELL-GRADED GRAVELS AND GRAVEL-SAND MIXTURES; LITTLE OR NO FINES	100	<50% OF COARSE FRACTION	<5	NON PLASTIC		>4	1 TO 3
		GP	POORLY-GRADED GRAVELS AND GRAVEL-SAND MIXTURES; LITTLE OR NO FINES						<4	<1 OR >3
		SW	WELL-GRADED SANDS AND GRAVELLY SANDS; LITTLE OR NO FINES		>50% OF COARSE FRACTION				>6	1 TO 3
		SP	POORLY-GRADED SANDS AND GRAVELLY SANDS; LITTLE OR NO FINES						<6	<1 OR >3
	COARSE-GRAINED SOILS, BORDERLINE CLEAN TO W/FINES	E.G. GW-GC, SP-SM	SANDS AND GRAVELS WHICH ARE BORDERLINE BETWEEN CLEAN AND WITH FINES	100	VARIES	5% TO 12%	NON PLASTIC		SAME AS FOR GW, GP, SW AND SP	
III	COARSE-GRAINED SOILS WITH FINES	GM	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES	100	>50% OF COARSE FRACTION	>12% TO <50%		<4 OR <"A" LINE		
		GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES					<7 OR >"A" LINE		
		SM	SILTY SANDS, SAND-SILT MIXTURES		>50% OF COARSE FRACTION			>4 OR <"A" LINE		
		SC	CLAYEY SANDS, SAND-SILT MIXTURES					>7 OR >"A" LINE		
IV	FINE-GRAINED SOILS (INORGANIC)	ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS, SILTS WITH SLIGHT PLASTICITY	100	100	>50	<50	<4 OR <"A" LINE		
		CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS					>7 OR >"A" LINE		
IVB	FINE-GRAINED SOILS (INORGANIC)	MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SANDY OR SILTY SOILS, ELASTIC SILTS	100	100	>50	>50	<"A" LINE		
		CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS					>"A" LINE		
V	ORGANIC SOILS	OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY	100	100	>50	<50	<4 OR <"A" LINE		
		OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS				>50	<"A" LINE		
	HIGHLY ORGANIC	PT	PEAT AND OTHER HIGH ORGANIC SOILS							

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WATER MAIN EMBEDMENT DETAILS

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TABLE 10.8
RECOMMENDATIONS FOR INSTALLATION AND USE OF SOILS AND AGGREGATES FOR FOUNDATION, EMBEDMENT AND BACKFILL

	SOIL CLASS (SEE TABLE 10.7) CLASS IA	CLASS IB	CLASS II	CLASS III	CLASS IV-A
GENERAL RECOMMENDATIONS AND RESTRICTIONS	DO NOT USE WHERE CONDITIONS MAY CAUSE MIGRATION OF FINES FROM ADJACENT SOIL AND LOSS OF PIPE SUPPORT. SUITABLE FOR USE AS A DRAINAGE BLANKET AND UNDERDRAIN IN ROCK CUTS WHERE ADJACENT MATERIAL IS SUITABLY GRADED.	PROCESS MATERIALS AS REQUIRED TO OBTAIN GRADATION WHICH WILL MINIMIZE MIGRATION OF ADJACENT MATERIALS. SUITABLE FOR USE AS DRAINAGE BLANKET AND UNDERDRAIN.	WHERE HYDRAULIC GRADIENT EXISTS CHECK GRADATION TO MINIMIZE MIGRATION. "CLEAN" GROUPS SUITABLE FOR USE AS DRAINAGE BLANKET AND UNDERDRAIN.	DO NOT USE WHERE WATER CONDITIONS IN TRENCH MAY CAUSE INSTABILITY.	OBTAIN GEOTECHNICAL EVALUATION OF PROPOSED MATERIAL. MAY NOT BE SUITABLE UNDER HIGH EARTH FILLS, SURFACE APPLIED WHEEL LOADS AND UNDER HEAVY VIBRATORY COMPACTORS AND TAMPERS. DO NOT USE WHERE WATER CONDITIONS IN TRENCH MAY CAUSE INSTABILITY.
FOUNDATION	SUITABLE AS FOUNDATION AND FOR REPLACING OVER-EXCAVATED AND UNSTABLE TRENCH BOTTOM AS RESTRICTED ABOVE. INSTALL AND COMPACT IN 6-IN. MAXIMUM LAYERS.	SUITABLE AS FOUNDATION AND FOR REPLACING OVER-EXCAVATED AND UNSTABLE TRENCH BOTTOM. INSTALL AND COMPACT IN 6-IN. MAXIMUM LAYERS.	SUITABLE AS FOUNDATION AND FOR REPLACING OVER-EXCAVATED AND UNSTABLE TRENCH BOTTOM AS RESTRICTED ABOVE. INSTALL AND COMPACT IN 6-IN. MAXIMUM LAYERS.	SUITABLE AS FOUNDATION AND FOR REPLACING OVER-EXCAVATED AND UNSTABLE TRENCH BOTTOM AS RESTRICTED ABOVE. DO NOT USE IN THICKNESS GREATER THAN 12 IN. TOTAL. INSTALL AND COMPACT IN 6-IN. MAXIMUM LAYERS.	SUITABLE ONLY IN UNDISTURBED CONDITION AND WHERE TRENCH IS DRY. REMOVE ALL LOOSE MATERIAL AND PROVIDE FIRM, UNIFORM TRENCH BOTTOM BEFORE BEDDING IS PLACED.
BEDDING	SUITABLE AS RESTRICTED ABOVE. INSTALL IN 6-IN. MAXIMUM LAYERS. LEVEL FINAL GRADE BY HAND. MINIMUM DEPTH 4 IN. (6 IN. IN ROCK CUTS).	INSTALL AND COMPACT IN 6-IN. MAXIMUM LAYERS. LEVEL FINAL GRADE BY HAND. MINIMUM DEPTH 4 IN. (6 IN. IN ROCK CUTS).	SUITABLE AS RESTRICTED ABOVE. INSTALL AND COMPACT IN 6-IN. MAXIMUM LAYERS. LEVEL FINAL GRADE BY HAND. MINIMUM DEPTH 4 IN. (6 IN. IN ROCK CUTS).	SUITABLE ONLY IN DRY TRENCH CONDITIONS. INSTALL AND COMPACT IN 6-IN. MAXIMUM LAYERS. LEVEL FINAL GRADE BY HAND. MINIMUM DEPTH 4 IN. (6 IN. IN ROCK CUTS).	SUITABLE ONLY IN DRY TRENCH CONDITIONS AND WHEN OPTIMUM PLACEMENT AND COMPACTION CONTROL IS MAINTAINED. INSTALL AND COMPACT IN 6-IN. MAXIMUM LAYERS. LEVEL FINAL GRADE BY HAND. MINIMUM DEPTH 4 IN. (6 IN. IN ROCK CUTS).
HAUCHING	SUITABLE AS RESTRICTED ABOVE. INSTALL IN 6-IN. MAXIMUM LAYERS. WORK IN AROUND PIPE BY HAND TO PROVIDE UNIFORM SUPPORT.	INSTALL AND COMPACT IN 6-IN. MAXIMUM LAYERS. WORK IN AROUND PIPE BY HAND TO PROVIDE UNIFORM SUPPORT.	SUITABLE AS RESTRICTED ABOVE. INSTALL AND COMPACT IN 6-IN. MAXIMUM LAYERS. WORK IN AROUND PIPE BY HAND TO PROVIDE UNIFORM SUPPORT.	SUITABLE AS RESTRICTED ABOVE. INSTALL AND COMPACT 6-IN. MAXIMUM LAYERS. WORK IN AROUND PIPE BY HAND TO PROVIDE UNIFORM SUPPORT.	SUITABLE ONLY IN DRY TRENCH CONDITIONS AND WHEN OPTIMUM PLACEMENT AND COMPACTION CONTROL IS MAINTAINED. INSTALL AND COMPACT IN 6-IN. MAXIMUM LAYERS. WORK IN AROUND PIPE BY HAND TO PROVIDE UNIFORM SUPPORT.
INITIAL BACKFILL	SUITABLE AS RESTRICTED ABOVE. INSTALL TO A MINIMUM OF 6 IN. ABOVE PIPE CROWN.	INSTALL AND COMPACT TO A MINIMUM OF 6 IN. ABOVE PIPE CROWN.	SUITABLE AS RESTRICTED ABOVE. INSTALL AND COMPACT TO A MINIMUM OF 6 IN. ABOVE PIPE CROWN.	SUITABLE AS RESTRICTED ABOVE. INSTALL AND COMPACT TO A MINIMUM OF 6 IN. ABOVE PIPE CROWN.	SUITABLE AS RESTRICTED ABOVE. INSTALL AND COMPACT TO A MINIMUM OF 6 IN. ABOVE PIPE CROWN.
FINAL BACKFILL	COMPACT AS REQUIRED BY THE ENGINEER.	COMPACT AS REQUIRED BY THE ENGINEER.	COMPACT AS REQUIRED BY THE ENGINEER.	COMPACT AS REQUIRED BY THE ENGINEER.	SUITABLE AS RESTRICTED ABOVE. COMPACT AS REQUIRED BY THE ENGINEER.

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STV 100 Years
STV Engineers, Inc.
900 West Trade St., Suite 715
Charlotte, NC 28202
NC License Number F-0991

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U-5878	UC-3C
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CHECKED BY: ATP	
APPROVED BY:	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 040784 ENGINEER ANDREW T. PARKER 11/12/2021

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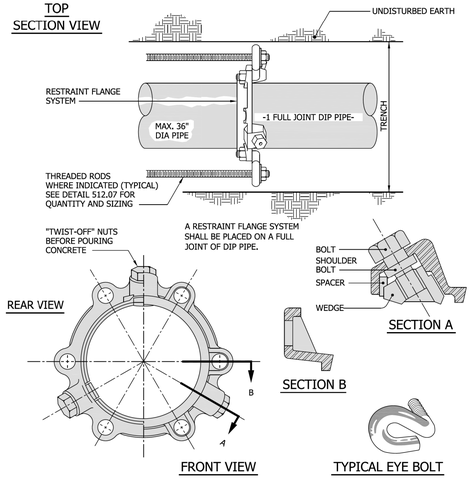

NOTES:

1. BACKFILL AND COMPACT IN 6" LAYERS.
2. PLACE RESTRAINT FLANGE ON ONE FULL JOINT OF PIPE.

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BLOCKING with RESTRAINT FLANGE SYSTEM

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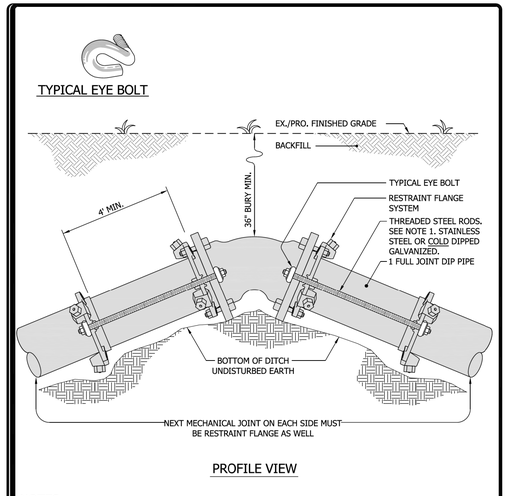

PROFILE VIEW

NOTES:

1. SEE DETAIL 512.07 FOR TIE ROD DIAMETERS AND NUMBERS PF RODS.
2. USE OF GRIP RINGS IN LIEU OF RESTRAINT FLANGE SYSTEM SHALL BE PERMITTED ON A CASE BY CASE BASIS BY THE PUBLIC SERVICES DIRECTOR.

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STANDARD VERTICAL BEND DETAIL

SCALE:	DETAIL #
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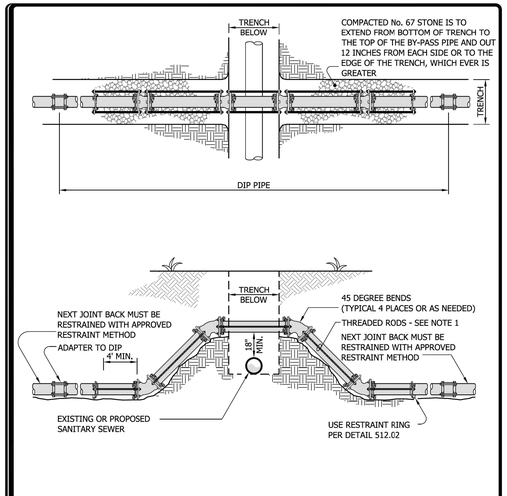

NOTES:

1. SEE DETAIL 512.07 FOR TIE ROD DIAMETERS AND NUMBERS OF RODS.
2. THE BYPASS IS TO BE ASSEMBLED ABOVE GROUND FIRST.
3. RECORD ALL AS-BUILT LENGTHS USING THE CENTER LINES OF THE PIPES OR BENDS AS REFERENCE POINTS.
4. ADAPTERS VARY IN TYPE ACCORDING TO THE MATERIAL OF THE EXISTING WATER MAIN.
5. USE OF GRIP RINGS IN LIEU OF RESTRAINT FLANGE SYSTEM SHALL BE PERMITTED ON A CASE BY CASE BASIS BY THE PUBLIC SERVICES DIRECTOR.

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WATER BYPASS for DEEPLY BURIED WATER LINES

SCALE:	DETAIL #
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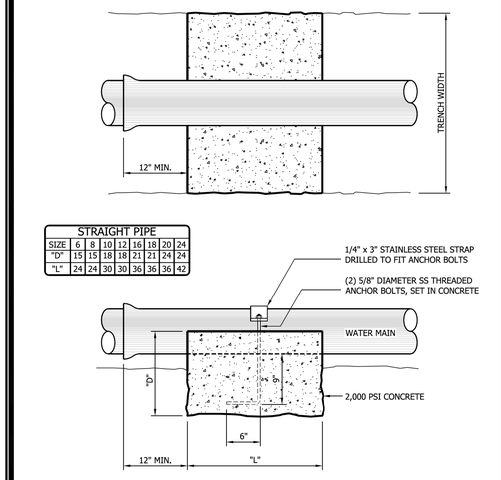

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STANDARD ANCHOR BLOCK DETAIL

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TIE ROD ANCHORS DATUM		
PIPE SIZE (INCHES)	ROD DIAMETER	NUMBER OF RODS REQUIRED
TEST PRESSURE = 150 PSI		
6	3/4"	2
8	3/4"	2
10	3/4"	2
12	3/4"	4
16	3/4"	6
20	3/4"	8
24	3/4"	8
30	1"	10
TEST PRESSURE = 200 PSI		
6	3/4"	2
8	3/4"	2
10	3/4"	4
12	3/4"	6
16	3/4"	8
20	3/4"	12
24	3/4"	10
30	1"	14

TIE RODS SHALL BE ASTM A276, TYPE 304 STAINLESS STEEL OR ASTM A307, GRADE A THAT IS BITUMASTIC COATED, OR GALVANIZED IN ACCORDANCE WITH ASTM F2329.

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TIE RODS ANCHORS DATUM CHART

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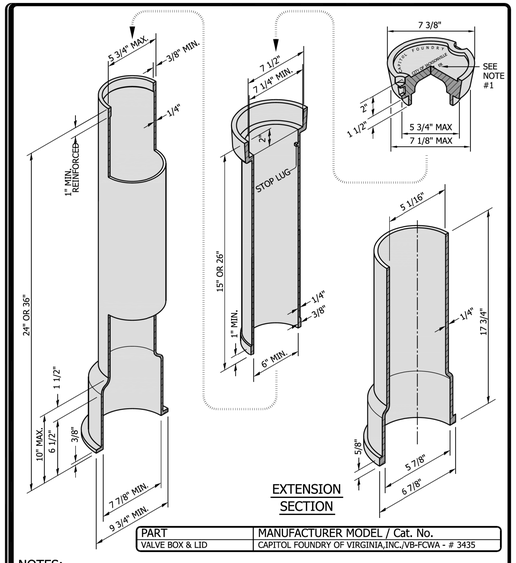

PART	MANUFACTURER MODEL / Cat. No.
VALVE BOX & LID	CAPITOL FOUNDRY OF VIRGINIA,INC.,VB-FCWA - # 3435

NOTES:

1. USE HEAVY DUTY TRAFFIC LID MARKED "WATER" (OR "SEWER" IF APPLICABLE).
2. VALVE BOX FINISH: ASPHALT COATED

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STANDARD SLIP TYPE VALVE BOX DETAIL

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STV Engineers, Inc.
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Charlotte, NC 28202
NC License Number F-0991

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APPROVED BY:	
REVISED:	
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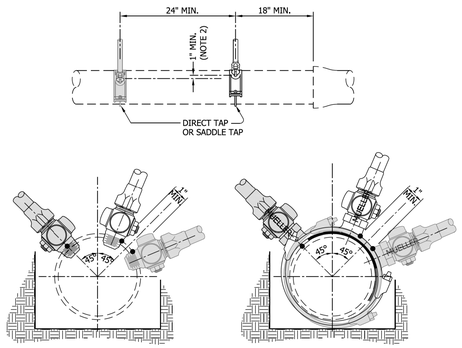
UTILITIES ENGINEERING SEC. PHONE:(919)707-6690 FAX:(919)250-4151	UTILITY CONSTRUCTION PLANS ONLY

NORTH CAROLINA — Andrew Parker — SEAL 040784 — ENGINEER — ANDREW PARKER — 11/15/2021

UTILITY CONSTRUCTION

PART	MANUFACTURER MODEL / Cat. No.
SADDLE	FORD / 1018 SERIES FORD / S-90 SERIES (C900 PVC ONLY) MUELLER / BR1B SERIES MUELLER / H1300 SERIES (C900 PVC ONLY)
CORP. STOP	FORD / F600 SERIES MUELLER / H-15000 SERIES



DIRECT TAP
PVC, C900, AND DIP

SADDLE TAP
ACP, PVC, C900, AND DIP
SEE NOTE 1

NOTES:

1. ALL BRONZE SADDLES TO BE SINGLE STRAP FOR 1".
2. IF 2 TAPS ARE MADE ON EACH SIDE OF THE MAIN THERE SHALL BE A MINIMUM OF 24" HORIZONTAL SEPARATION. MULTIPLE TAPS ON THE SAME SIDE SHALL HAVE A MINIMUM 24" HORIZONTAL SEPARATION AND BE STAGGERED A MINIMUM OF 1" VERTICALLY TO PREVENT DAMAGE TO THE MAIN.
3. SPECIFIC PRODUCTS CITED BY THIS DETAIL ARE USED TO DENOTE THE QUALITY STANDARD OF PRODUCT DESIRED

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STANDARD 1" WATER TAPPING DETAIL

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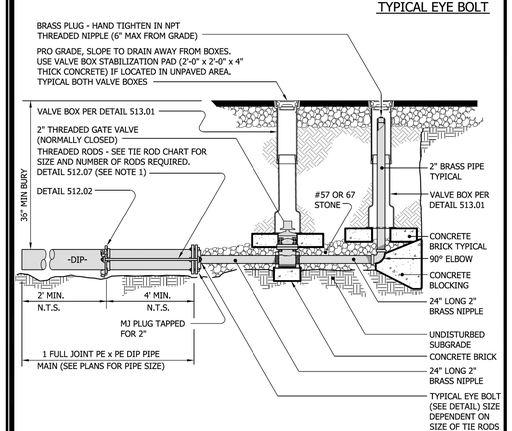
TYPICAL EYE BOLT



NOTES:

1. IN LIEU OF RODDED FITTINGS, CONTRACTOR MAY USE WEDGE ACTION RESTRAINT GLAND JOINT RESTRAINT ON FITTINGS.
2. NO DISCHARGE FROM BLOW-OFF SHOULD GO DIRECTLY INTO A CREEK.
3. PROVIDE EROSION AND SEDIMENTATION CONTROL FOR DISCHARGE.
4. NO PLASTIC OR GALVANIZED SCREW FITTINGS BEFORE VALVE. FOR MAINS LARGER THAN 12", USE 6" DIP BLOW-OFF-ASSEMBLY. NO PLASTIC SCREW FITTINGS PERMITTED IN ASSEMBLY.

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STANDARD PERMANENT BLOW-OFF ASSEMBLY

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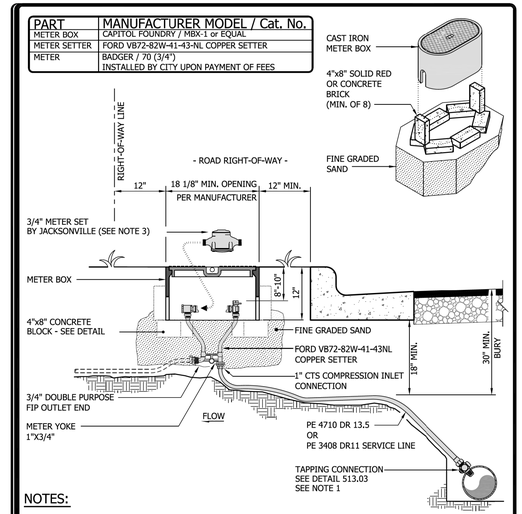
PART	MANUFACTURER MODEL / Cat. No.
METER BOX	CAPITOL FOUNDRY / MBX-1 or EQUAL
METER SETTER	FORD VB72-82W-41-43-NL COPPER SETTER
METER	BADGER / 70 (3/4") INSTALLED BY CITY UPON PAYMENT OF FEES



NOTES:

1. IF INSTALLATION IS FOR STUB-OUT METER, METER SHOULD BE PURCHASED FROM CITY OF JACKSONVILLE (AT APPLICANTS EXPENSE).
2. METER MUST BE LEVEL, STRAIGHT, & CENTERED IN BOX ACROSS METER CONNECTIONS.
3. SUBSTITUTION REQUIRES APPROVAL BY CITY OF JACKSONVILLE PUBLIC SERVICES DIRECTOR.
4. METER SHOULD NOT BE LOCATED IN A DRIVEWAY. IF METER MUST BE LOCATED IN DRIVEWAY, A TRAFFIC RATED BOX AND COVER SHALL BE USED EQUAL TO OR EXCEEDING THE MID-STATES PLASTICS, INC. "BCP" SERIES RECTANGULAR METER BOX PART NO. MSBCF1118-12

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STANDARD 3/4" DOMESTIC WATER METER INSTALLATION

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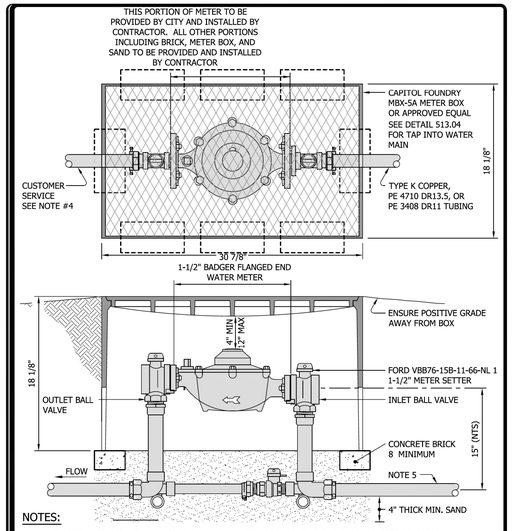

NOTES:

1. IN TRAFFIC LOAD SITUATIONS, COVER & BOX SHALL BE APPROVED BY CITY PUBLIC SERVICES DIRECTOR.
2. METER BOX TO BE LOCATED ON THE RIGHT-OF-WAY SIDE OF PROPERTY LINE .
3. WHEN METER BOX IS SET IN SIDEWALK, PIGTAIL TO EXTEND 2 FEET BEYOND EDGE OF SIDEWALK.
4. FITTING TO BE USED WHEN CONNECTING TO EXISTING SERVICE, OTHERWISE PLUG OR CRIMP END OF SERVICE LINE.
5. PROVIDE A REDUCER THIS VICINITY IF SERVICE LINE FROM MAIN IS LARGER THAN 1 1/2".

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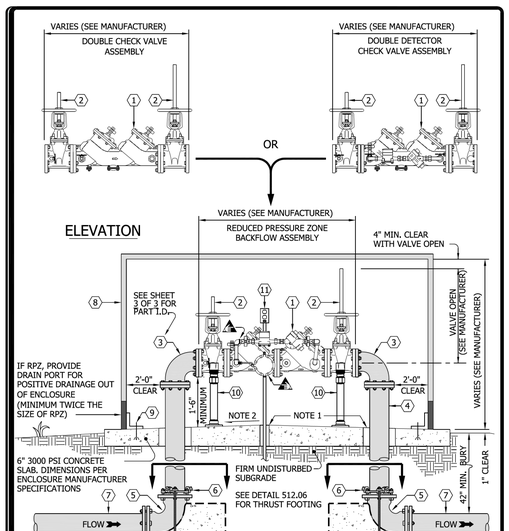
STANDARD 1 1/2" WATER METER INSTALLATION DETAIL

SCALE: Not To Scale	DETAIL # 515.02
REVISION DATE: Jan, 2016	SHEET #: 1 of 1



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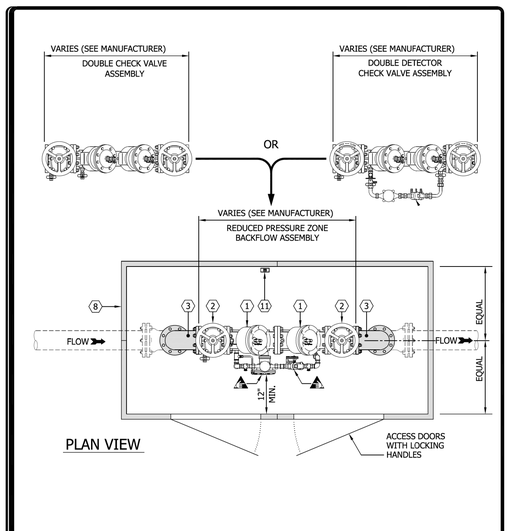
2 1/2" to 10" DCV, DDCV, RPZ ASSEMBLY (ABOVE GROUND)

SCALE: Not To Scale	DETAIL # 519.01
REVISION DATE: Jan, 2016	SHEET #: 1 of 3



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2 1/2" to 10" DCV, DDCV, RPZ ASSEMBLY (ABOVE GROUND)

SCALE: Not To Scale	DETAIL # 519.01
REVISION DATE: Jan, 2016	SHEET #: 2 of 3

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8/11/2021
Norman

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CITY OF JACKSONVILLE STANDARD DETAILS

STV 100 Years
STV Engineers, Inc.
900 West Trade St., Suite 715
Charlotte, NC 28202
NC License Number F-0991

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PROJECT REFERENCE NO.	SHEET NO.
U-5878	UC-3E
DESIGNED BY: ATP	
DRAWN BY: ABN	
CHECKED BY: ATP	
APPROVED BY:	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE:(919)707-6690 FAX:(919)250-4151	UTILITY CONSTRUCTION PLANS ONLY

NORTH CAROLINA — Professional Engineer — SEAL 040784 — 11/12/2021 — ENGINEER — MOREYT PARKER

UTILITY CONSTRUCTION

#	PART	MANUFACTURER MODEL / Cat. No.
1	BACKFLOW ASSEMBLY	USC APPROVED
2	OS&Y GATE VALVE WITH RESILIENT SEATS	JACKSONVILLE CITY OFFICIAL APPROVED
3	90° DIP FLANGE x FLANGE ELBOW	AMERICAN CAST IRON PIPE, GRIFFIN PIPE CO., UNION-TYLER PIPE CO., or U.S. PIPE & FOUNDRY
4	DIP FLANGE x PE PIPE (VERIFY LENGTH)	AMERICAN CAST IRON PIPE, GRIFFIN PIPE CO., U.S. PIPE & FOUNDRY
5	90° DIP MJ x MJ ELBOW	AMERICAN CAST IRON PIPE, GRIFFIN PIPE CO., UNION-TYLER PIPE CO., or U.S. PIPE & FOUNDRY
6	WEDGE ACTION RESTRAINT GLAND JOINT RESTRAINT	EBBA IRON SALES, INC. / STAR PIPE PRODUCTS
7	3" THRU 10" DIP	AMERICAN CAST IRON PIPE, GRIFFIN PIPE CO., UNION-TYLER PIPE CO., or U.S. PIPE & FOUNDRY
8	ASSE STANDARD 1060 INSULATED ENCLOSURE WITH LOCKING ACCESS DOORS AND HEATER (120 V, 1 PHASE, 60 HZ) VERIFY FITTINGS WILL FIT INSIDE BOX BEFORE ORDERING	HOTBOX / HB4E - HB10E (OR APPROVED EQUIVALENT)
9	STAINLESS STEEL EXPANSION ANCHOR BOLTS PER BOX MANUFACTURER RECOMMENDED SIZE & SPACING	
10	ADJUSTABLE PIPE SUPPORTS HOT DIP GALVANIZED	SHOP FABRICATED AND HOT DIP GALVANIZED OR "STANDON" MODEL S92 SADDLE SUPPORT
11	PROVIDE 120V RECEPTACLE ON GFCI NEAR PIPE RISER, SET MINIMUM 12" ABOVE DISCHARGE POINT OF RPZ. (AS APPLICABLE)	UL STD. 943-NEMA 3R.

NOTES:

1. PROVIDE MINIMUM 3" ANNULAR CLEARANCE AROUND ALL DIP RISERS AND 1" AROUND ELECTRICAL CONDUIT.
2. SLOPE FLOOR TO DRAIN TO PORTS AT BOTH ENDS. ENSURE POSITIVE SURFACE GRADE AWAY FROM ENCLOSURE.
3. SPECIFIC PRODUCTS CITED BY THIS DETAIL ARE USED TO DENOTE THE QUALITY STANDARD OF PRODUCT DESIRED

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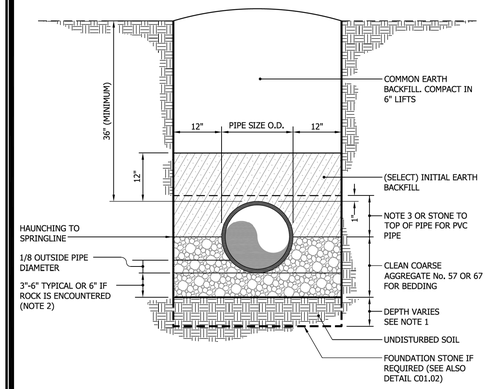
2 1/2" to 10" DCV, DDCV, RPZ ASSEMBLY (ABOVE GROUND)

SCALE: Not To Scale | DETAIL # 519.01 | REVISION DATE: Jan, 2016 | SHEET #: 3 of 3



NOTES:

1. FOUNDATION STONE SHALL BE REQUIRED WHEN SOIL CONDITIONS ARE UNSUITABLE.
2. AN ADDITIONAL 1 INCH DEPTH OF BEDDING MATERIAL WILL BE REQUIRED FOR EACH ADDITIONAL 2 FEET OF TRENCH DEPTH IN EXCESS OF 16 FEET UP TO A MAXIMUM OF 12 INCHES.
3. HAUNCHING FOR DEPTH FLEXIBLE WALL PIPE (C900 PVC, AND SDR35) SHALL BE OUTSIDE PIPE DIAMETER + 1 INCH. HAUNCHING SHALL BE THOROUGHLY COMPACTED NO. 57 OR 67 STONE.

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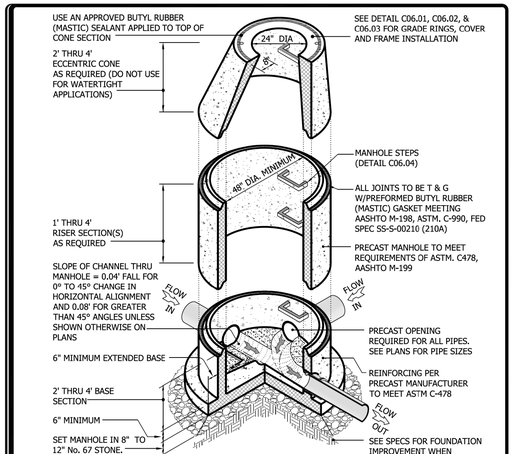
SANITARY SEWER LINE TRENCH DETAIL

SCALE: Not To Scale | DETAIL # 531.01 | REVISION DATE: Jan, 2016 | SHEET #: 1 of 1



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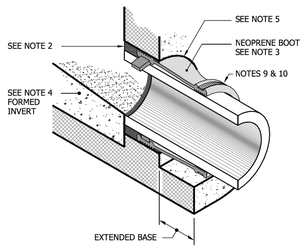
STANDARD ECCENTRIC TOP PRECAST MANHOLE DETAIL

SCALE: Not To Scale | DETAIL # 532.01 | REVISION DATE: Jan, 2016 | SHEET #: 1 of 2



NOTES:

1. CONCRETE STRENGTH TO BE 4,000 PSI MINIMUM.
2. PIPES WILL BE GROUTED INSIDE AND OUT.
3. FLEXIBLE SLEEVE BOOTS CAST IN PLACE OR INSTALLED WITH STAINLESS STEEL EXPANDER RINGS. BOOTS TO MEET ASTM C-923 STANDARDS.
4. SEE DETAIL 532.05 FOR TYPICAL INVERT SHAPING.
5. SERVICE LATERALS INTO EXISTING MANHOLES TO BE CORE DRILLED AND BOOTED.
6. MAXIMUM DEPTH 4' DIAMETER MANHOLE = 15' (SEE SEWER DESIGN SECTION FOR OTHER REQUIREMENTS / LIMITATIONS).
7. WHEN DIRECTED BY THE PUBLIC SERVICES DIRECTOR, PLACE MANHOLE INSERT SUCH AS "NO-FLOW/INFLOW" INSERT OR "RAINSTOPPER" INSERT AS MANUFACTURED BY "SOUTHWESTERN PACKING & SEALS" OR APPROVED EQUAL.
8. FOR WATERTIGHT APPLICATIONS, PLACE BUTYL RUBBER BETWEEN FRAME AND CONE.
9. ALL BANDED CONNECTIONS SHALL BE DOUBLE BANDED. FOR PIPE CONNECTIONS 12" AND LARGER, 2 SETS OF BANDS SHALL BE REQUIRED.
10. LUBRICATE THE FOLLOWING: PIPE EXTERIOR, BOOT INTERIOR, BOOT EXTERIOR, S.S. BANDS (TOP & BOTTOM).
11. PLACE MANHOLE OPENING OVER THE EFFLUENT LINE.

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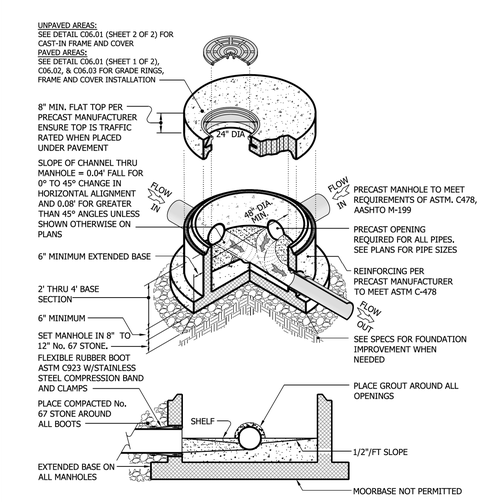
STANDARD ECCENTRIC TOP PRECAST MANHOLE DETAIL

SCALE: Not To Scale | DETAIL # 532.01 | REVISION DATE: Jan, 2016 | SHEET #: 2 of 2



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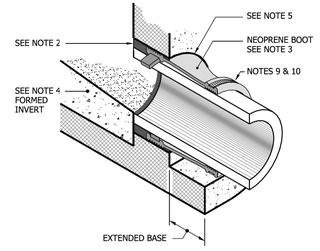
STANDARD SHALLOW PRECAST MANHOLE DETAIL

SCALE: Not To Scale | DETAIL # 532.03 | REVISION DATE: Jan, 2016 | SHEET #: 1 of 2



NOTES:

1. CONCRETE STRENGTH TO BE 4,000 PSI MINIMUM.
2. PIPES WILL BE GROUTED INSIDE AND OUT.
3. FLEXIBLE SLEEVE BOOTS CAST IN PLACE OR INSTALLED WITH STAINLESS STEEL EXPANDER RINGS. BOOTS TO MEET ASTM C-923 STANDARDS.
4. SEE DETAIL 532.05 FOR TYPICAL INVERT SHAPING.
5. SERVICE LATERALS INTO EXISTING MANHOLES TO BE CORE DRILLED AND BOOTED.
6. MAXIMUM DEPTH 4' DIAMETER MANHOLE = 15' (SEE SEWER DESIGN SECTION FOR OTHER REQUIREMENTS / LIMITATIONS).
7. WHEN DIRECTED BY THE PUBLIC SERVICES DIRECTOR, PLACE MANHOLE INSERT SUCH AS "NO-FLOW/INFLOW" INSERT OR "RAINSTOPPER" INSERT AS MANUFACTURED BY "SOUTHWESTERN PACKING & SEALS" OR APPROVED EQUAL.
8. FOR WATERTIGHT APPLICATIONS, PLACE BUTYL RUBBER BETWEEN FRAME AND CONE.
9. ALL BANDED CONNECTIONS SHALL BE DOUBLE BANDED. FOR PIPE CONNECTIONS 12" AND LARGER, 2 SETS OF BANDS SHALL BE REQUIRED.
10. LUBRICATE THE FOLLOWING: PIPE EXTERIOR, BOOT INTERIOR, BOOT EXTERIOR, S.S. BANDS (TOP & BOTTOM).
11. PLACE MANHOLE OPENING OVER THE EFFLUENT LINE.

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STANDARD SHALLOW PRECAST MANHOLE DETAIL

SCALE: Not To Scale | DETAIL # 532.03 | REVISION DATE: Jan, 2016 | SHEET #: 2 of 2

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APPROVED BY:	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
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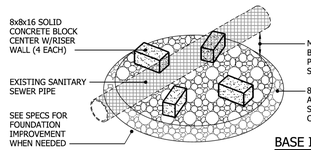
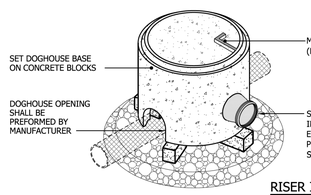
NORTH CAROLINA — Richard Norbert Parker — SEAL 040784 — ENGINEER — RICHARD NORBERT PARKER — 11/19/2021

UTILITY CONSTRUCTION

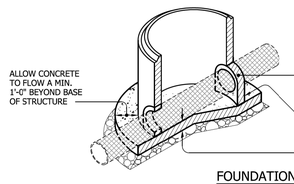
CITY OF JACKSONVILLE STANDARD DETAILS



BASE ISOMETRIC VIEW



RISER ISOMETRIC VIEW



FOUNDATION SECTION VIEW

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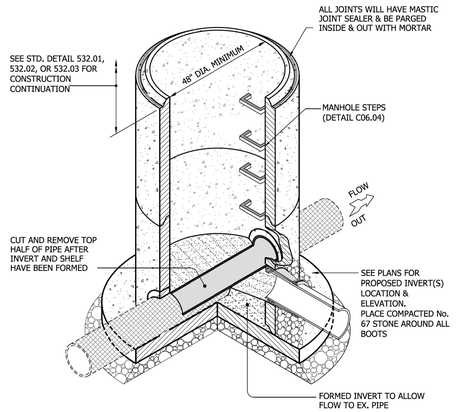
PRECAST CONCRETE DOGHOUSE MANHOLE	SCALE: Not To Scale	DETAIL # 532.04
	REVISION DATE: Jan, 2016	SHEET #: 1 of 2



INVERT SECTION VIEW

NOTES:

1. ALL SERVICE LATERALS INTO MANHOLE TO BE CORE DRILLED AND BOOTED.

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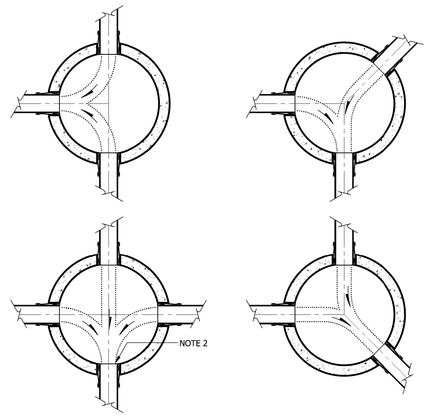
PRECAST CONCRETE DOGHOUSE MANHOLE	SCALE: Not To Scale	DETAIL # 532.04
	REVISION DATE: Jan, 2016	SHEET #: 2 of 2



PLAN VIEWS

SEE DETAIL 532.01 FOR ISOMETRIC AND ELEVATION VIEWS

NOTES:

1. CONCRETE SHELF SHOULD BE NO LOWER THAN THE PIPE SPRING LINE ELEVATION AT MANHOLE WALL.
2. SERVICE LINE ENTRIES TO HAVE CAST IN PLACE TROUGHS.
3. RADIUS OF INVERT MUST HAVE ENOUGH ROOM TO BE ABLE TO INSERT AIR PLUGS AND TV EQUIPMENT.
4. CONCRETE STRENGTH TO BE 4,000 PSI MINIMUM.
5. CONCRETE FORMED INVERT SHALL BE PRECAST WHEREVER POSSIBLE. MOORBASE NOT PERMITTED.

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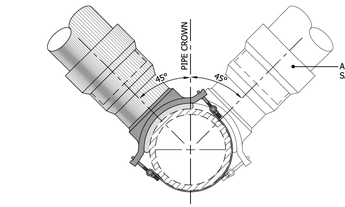
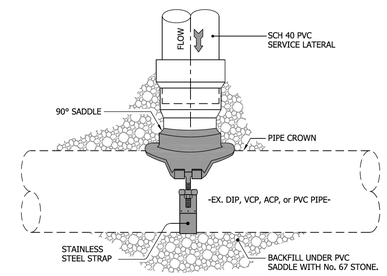
STANDARD SEWER INVERT PLANS FOR MANHOLES	SCALE: Not To Scale	DETAIL # 532.05
	REVISION DATE: Jan, 2016	SHEET #: 1 of 1



SADDLE INSTALLATION FOR DIP, VCP, AND PVC PIPE



NOTES:

1. EXISTING MAINS ONLY - NEW CONSTRUCTION MUST USE IN-LINE WYE.
2. UNIVERSAL SADDLES ARE NOT PERMITTED.

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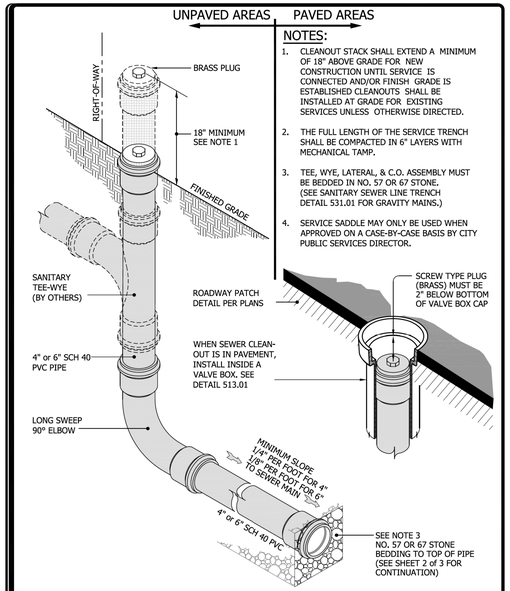
TYPICAL LATERAL SADDLE DETAIL	SCALE: Not To Scale	DETAIL # 533.01
	REVISION DATE: Jan, 2016	SHEET #: 1 of 1



NOTES:

1. CLEANOUT STACK SHALL EXTEND A MINIMUM OF 18" ABOVE GRADE FOR NEW CONSTRUCTION UNTIL SERVICE IS CONNECTED AND/OR FINISH GRADE IS ESTABLISHED CLEANOUTS SHALL BE INSTALLED AT GRADE FOR EXISTING SERVICES UNLESS OTHERWISE DIRECTED.
2. THE FULL LENGTH OF THE SERVICE TRENCH SHALL BE COMPACTED IN 6" LAYERS WITH MECHANICAL TAMP.
3. TEE, WYE, LATERAL, & C.O. ASSEMBLY MUST BE BEDDED IN NO. 57 OR 67 STONE. (SEE SANITARY SEWER LINE TRENCH DETAIL 531.01 FOR GRAVITY MAINS.)
4. SERVICE SADDLE MAY ONLY BE USED WHEN APPROVED ON A CASE-BY-CASE BASIS BY CITY PUBLIC SERVICES DIRECTOR.

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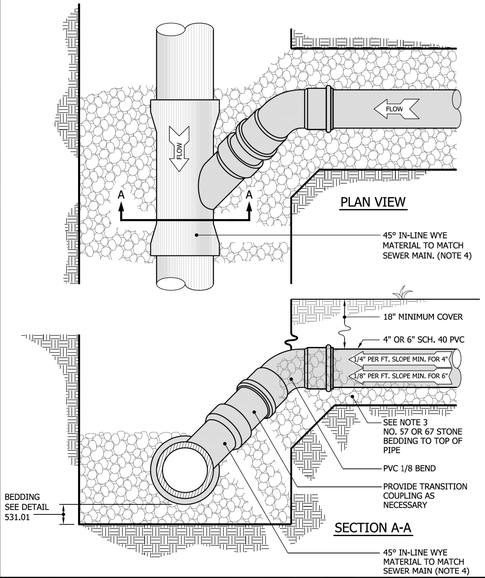
TYPICAL PVC SEWER LATERAL CLEANOUT WITH IN-LINE WYE	SCALE: Not To Scale	DETAIL # 533.03
	REVISION DATE: Jan, 2016	SHEET #: 1 of 3



PLAN VIEW

SECTION A-A

Public Services Department P.O. Box 128 Jacksonville, N.C. 28541	CITY of JACKSONVILLE (USE WITH THE JACKSONVILLE STANDARD SPECIFICATIONS ONLY)	http://www.jacksonvillenc.gov
TYPICAL PVC SEWER LATERAL CLEANOUT WITH IN-LINE WYE	SCALE: Not To Scale	DETAIL # 533.03
	REVISION DATE: Jan, 2016	SHEET #: 2 of 3

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CITY OF JACKSONVILLE STANDARD DETAILS

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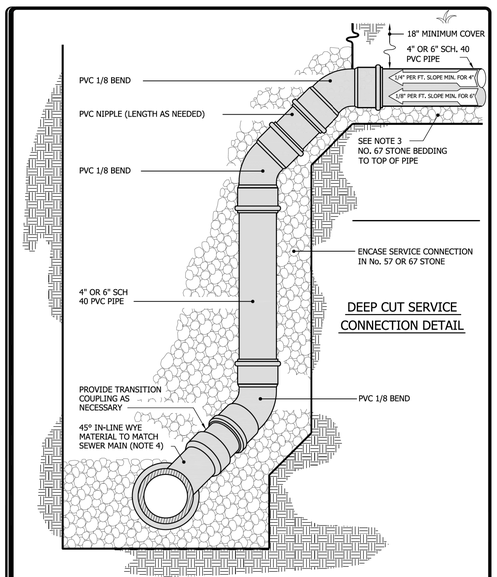
NORTH CAROLINA — Professional Engineer — SEAL 040784 — ENGINEER — MOREVET PARKER — 11/22/2021

UTILITY CONSTRUCTION



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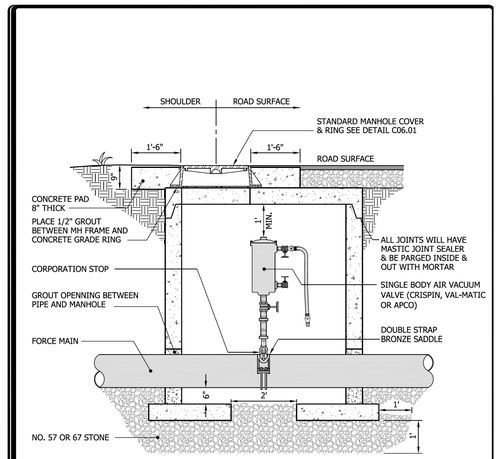
TYPICAL PVC SEWER LATERAL CLEANOUT WITH IN-LINE WYE

SCALE: Not To Scale	DETAIL # 533.03
REVISION DATE: Jan, 2016	SHEET #: 3 of 3



NOTES:
1. FORCE MAINS 4" DIA. AND SMALLER TO BE ONE FULL JOINT OF D.I.P. THRU AIR RELEASE MANHOLES.
2. PRECAST MANHOLE SHALL BE 5'-0" I.D. MINIMUM.
3. TYPE AND SIZE OF VALVES TO BE DETERMINED BY THE CITY PUBLIC SERVICES DIRECTOR.
4. MANHOLE HEIGHT AND VERTICAL PLACEMENT OF FORCEMAIN SHALL BE SUFFICIENT FOR INSTALLATION OF AIR VALVE WHILE ALLOWING FOR 1 FT. CLEARANCE BETWEEN TOP OF VALVE AND UNDERSIDE OF TOP SLAB - 4'-0" MIN.

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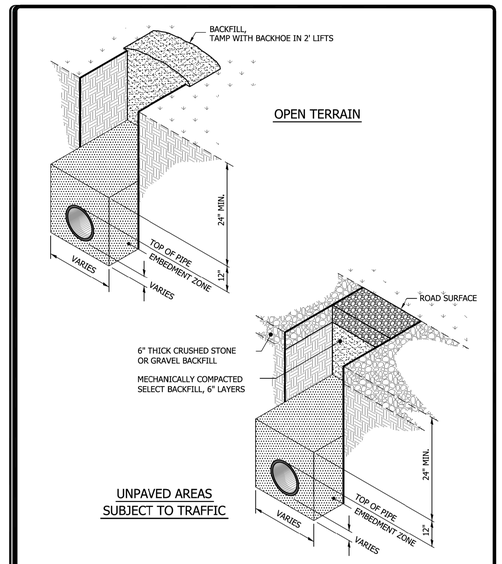
COMBINATION AIR VALVE AIR RELEASE MANHOLE

SCALE: Not To Scale	DETAIL # 534.03
REVISION DATE: Jan, 2016	SHEET #: 1 of 1



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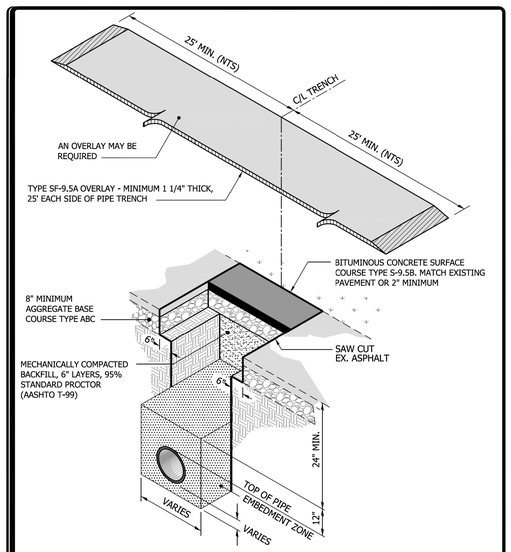
TYPICAL TRENCH BACKFILL AND SURFACE REPAIR DETAILS

SCALE: Not To Scale	DETAIL # C01.01
REVISION DATE: Jan, 2016	SHEET #: 1 of 2



PAVED AREAS

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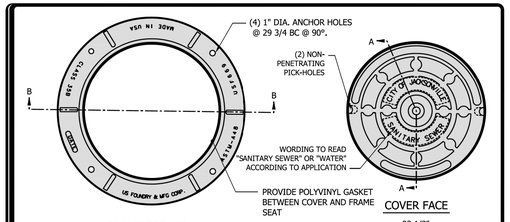
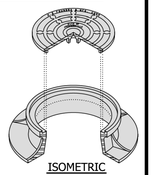
TYPICAL TRENCH BACKFILL AND SURFACE REPAIR DETAILS

SCALE: Not To Scale	DETAIL # C01.01
REVISION DATE: Jan, 2016	SHEET #: 2 of 2



	US FOUNDRY & MFG. CORP	EJ (EAST JORDAN IRONWORK)
APPROVED MODELS	669 RING & KL COVER (8015299)	V1384 (41384151A01)
COVER WEIGHT	125 Lbs.	123 Lbs.
FRAME WEIGHT	190 Lbs.	153 Lbs.
LOAD RATING	HEAVY DUTY	HEAVY DUTY
MATERIAL	ASTM A 48 CLASS 35B	ASTM A 48 CLASS 35B
FINISH	UNCOATED	UNCOATED

NOTE:
THE CITED EXAMPLES ARE USED TO DENOTE THE QUALITY STANDARD OF PRODUCT DESIRED.



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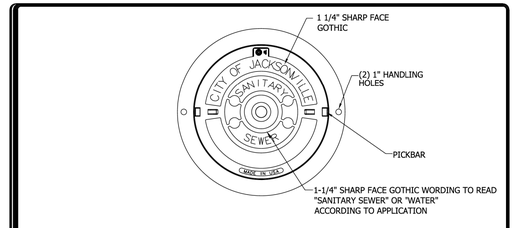
STANDARD MANHOLE COVER & RING

SCALE: Not To Scale	DETAIL # C06.01
REVISION DATE: Jan, 2016	SHEET #: 1 of 2



	EAST JORDAN IRON WORKS
APPROVED MODEL	V-1384 (41384151A03)
COVER WEIGHT	123 Lbs.
FRAME WEIGHT	153 Lbs.
LOAD RATING	HEAVY DUTY
MATERIAL	ASTM A 48 CLASS 35B
FINISH	UNCOATED

NOTE:
THE CITED EXAMPLE IS USED TO DENOTE THE QUALITY STANDARD OF PRODUCT DESIRED.

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STANDARD CAST-IN MANHOLE FRAME & COVER

SCALE: Not To Scale	DETAIL # C06.01
REVISION DATE: Jan, 2016	SHEET #: 2 of 2

11/17/2021
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PROJECT REFERENCE NO.	SHEET NO.
U-5878	UC-3H
DESIGNED BY: ATP	
DRAWN BY: ABN	
CHECKED BY: ATP	
APPROVED BY:	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
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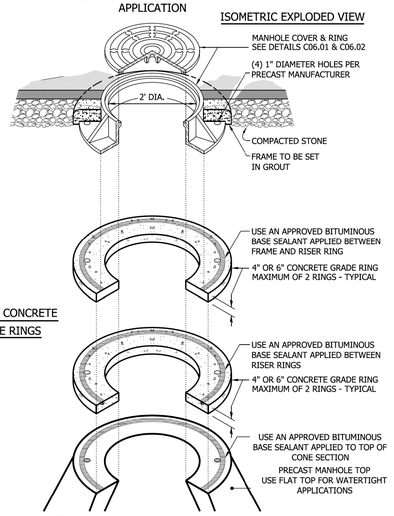
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 040784 ENGINEER ANDREW F. PARKER 11/12/2021

UTILITY CONSTRUCTION

PAVEMENT APPLICATION

SEE FLAT TOP FOR NON-PAVED APPLICATION

ISOMETRIC EXPLODED VIEW



NOTE:

1. PLACE 1/2" PARGE COAT ON INTERIOR OF MANHOLE FROM HALF DEPTH OF IRON CASTING TO A DEPTH OF 2" BELOW THE TOP OF CONE SECTION

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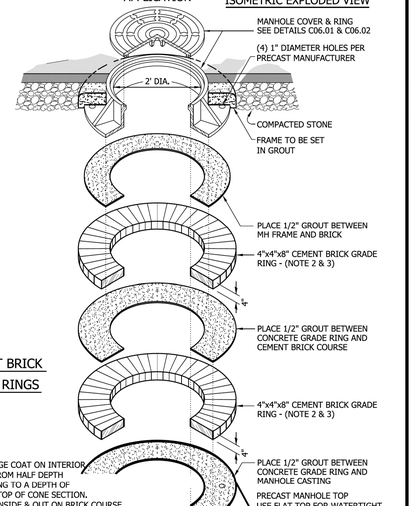
STANDARD MANHOLE RING AND COVER GRADE ADJUSTMENT

SCALE: Not To Scale | DETAIL # C06.04 | REVISION DATE: Jan, 2016 | SHEET #: 1 of 2

PAVEMENT APPLICATION

SEE FLAT TOP FOR NON-PAVED APPLICATION

ISOMETRIC EXPLODED VIEW



NOTE:

1. PLACE 1/2" PARGE COAT ON INTERIOR OF MANHOLE FROM HALF DEPTH OF IRON CASTING TO A DEPTH OF 2" BELOW THE TOP OF CONE SECTION.
2. MORTAR SEAL INSIDE & OUT ON BRICK COURSE.
3. A MAXIMUM OF 12" RAISING IS ALLOWED USING BRICK RINGS.
4. ADJUSTMENT USING BRICK IS AT THE DISCRETION OF THE PUBLIC SERVICES DIRECTOR.

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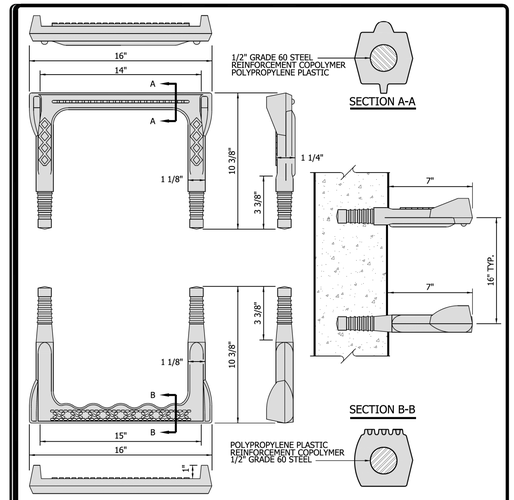
STANDARD MANHOLE RING AND COVER GRADE ADJUSTMENT

SCALE: Not To Scale | DETAIL # C06.04 | REVISION DATE: Jan, 2016 | SHEET #: 2 of 2



NOTES:

1. STEP DESIGN, INSTALLATION, AND MATERIAL SHALL MEET THE REQUIREMENTS OF ASTM C478 AND NCDOT.
2. PLASTIC MATERIAL CONSISTS OF SUPER HIGH IMPACT RESISTANT COPOLYMER POLYPROPYLENE AND CONFORM TO SPECIFIC REQUIREMENTS AS DETAILED IN ASTM D4101.
3. REINFORCING STEEL SHALL BE 1/2" REBAR, GRADE 60 AND MEET THE REQUIREMENTS OF ASTM A615.
4. STEP WIDTH AND SPACING TO BE CONSISTANT WITH THE LATEST REQUIREMENTS OF OSHA.

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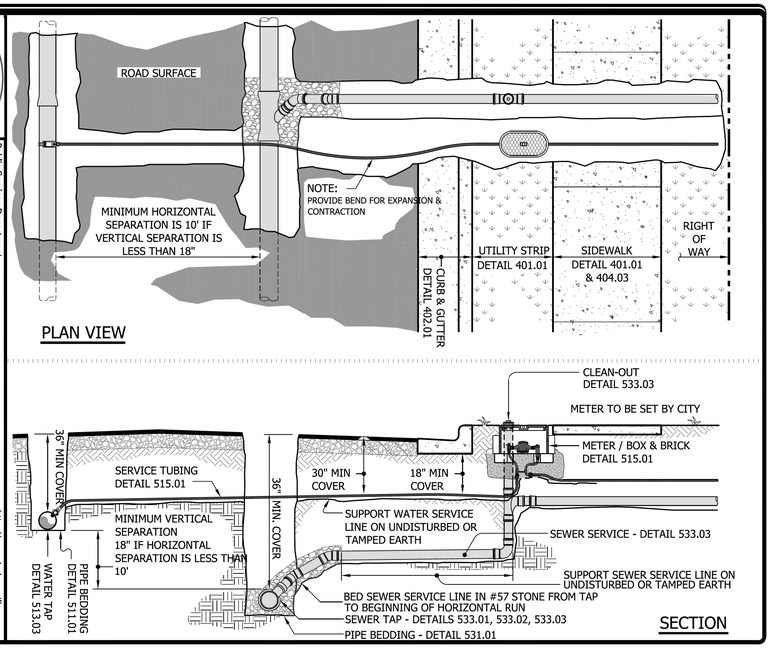
STANDARD POLYPROPYLENE PLASTIC STEP DETAIL

SCALE: Not To Scale | DETAIL # C06.05 | REVISION DATE: Jan, 2016 | SHEET #: 1 of 1

TYPICAL RESIDENTIAL WATER & SEWER SERVICE SCHEMATIC



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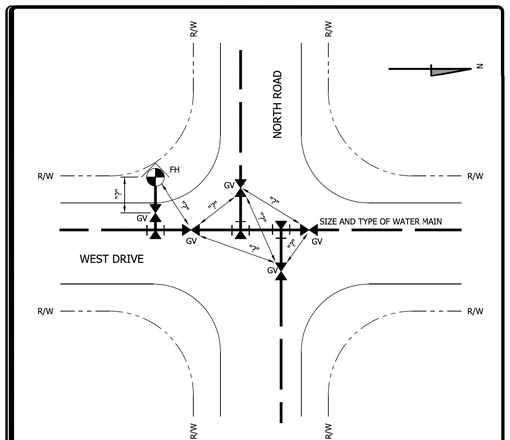

NOTES:

1. THE SKETCH SHALL INDICATE WHETHER THE VARIOUS MAINS ARE ACP, PVC, DIP, ETC.
2. THERE SHALL BE AT LEAST TWO MEASUREMENTS TO EACH VALVE EXCEPT FIRE HYDRANT LATERAL GUARD VALVE WHICH MAY BE MEASURED FROM THE HYDRANT OPENING NUT.
3. MEASUREMENTS SHALL BE MADE TO THE NEAREST 0.1 FOOT.
4. MEASUREMENTS MAY BE MADE TO:
   - A. THE CENTER OF OTHER VALVE BOXES.
   - B. THE CENTER OF MANHOLE COVERS.
   - C. THE OPERATING NUT OF HYDRANTS.
   - D. CORNER OF STORM SEWER CURB INLETS.
   - E. PERPENDICULAR TO FACE OF CURB.
   - F. OTHER OBSERVABLE, FIXED, PERMANENT OBJECTS.
   - G. DO NOT USE POWER/TELEPHONE POLES, CABLE OR TELEPHONE ABOVE GROUND BOXES.

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ILLUSTRATIVE UTILITY TRIANGULATION FOR AS-BUILT DRAWINGS

SCALE: Not To Scale | DETAIL # C09.01 | REVISION DATE: Jan, 2016 | SHEET #: 1 of 1

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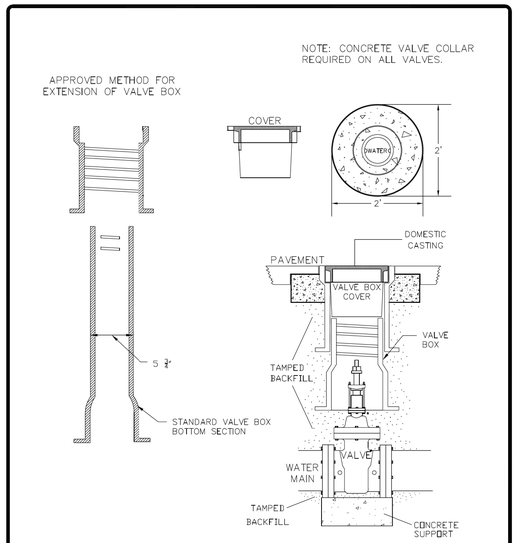
NORTH CAROLINA — Andrew T. Parker — SEAL 040784 — ENGINEER — ANDREW T. PARKER — 11/19/2021

UTILITY CONSTRUCTION



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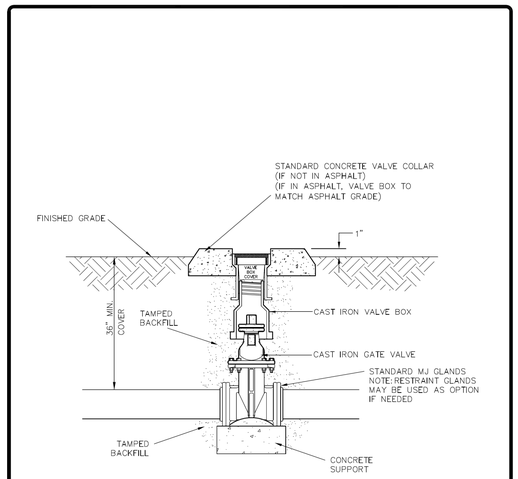
VALVE BOX INSTALLATION

SCALE: Not To Scale	DETAIL # WS_VB
REVISION DATE: May, 2016	SHEET # 1 of 1



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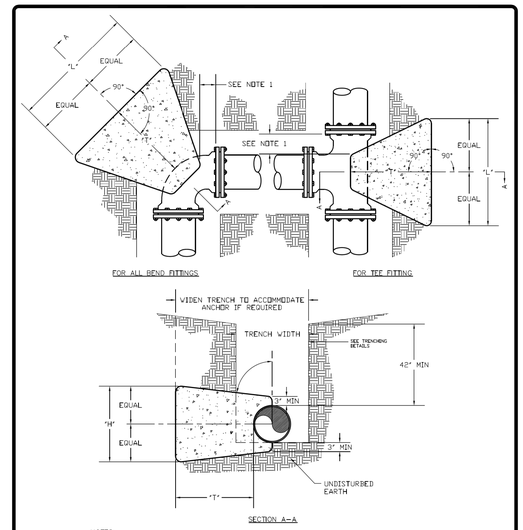
INLINE VALVE DETAIL

SCALE: Not To Scale	DETAIL # WS_ILV
REVISION DATE: May, 2016	SHEET # 1 of 1



NOTES:
1. CONCRETE BLOCKING IS TO BE FORMED TO ENSURE ACCESSIBILITY TO FITTINGS AND POURED AGAINST UNDISTURBED EARTH.
2. ALL FITTINGS SHALL BE WRAPPED IN POLYETHYLENE TO PREVENT CONCRETE FROM CONTACTING FITTINGS, BOLTS, OR ENDS OF MECHANICAL JOINT BENDS.
3. CONCRETE TO BE MINIMUM 3,000 PSI @ 28 DAYS.
4. WHEN SACKRETE IS TO BE USED, IT SHALL BE PROPERLY MIXED PER MANUFACTURER SPECIFICATIONS.
5. FOR REQUIRED DIMENSIONS, SEE WS_TB2

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THRUST BLOCKING

SCALE: Not To Scale	DETAIL # WS_TB1
REVISION DATE: May, 2016	SHEET # 1 of 4

TEST PRESSURE = 150 PSI

PIPE SIZE	TYPE FITTING	DIMENSIONS (FT) "L"	"H"	"T"	VOLUME CONCRETE CU. YD.
	11 1/4°	-----	-----	-----	-----
4 INCHES	22 1/2°	1.00	1.00	1.50	0.06
	45°	1.00	1.00	1.50	0.06
	90°	1.00	1.00	2.50	0.09
	TEE	1.00	1.00	2.00	0.07
	11 1/4°	1.00	1.00	2.50	0.09
4 INCHES	22 1/2°	1.00	1.00	2.50	0.09
	45°	1.00	1.00	2.50	0.09
	90°	1.50	1.50	2.50	0.15
	TEE	1.50	1.50	2.00	0.12
	11 1/4°	1.50	1.50	2.50	0.15
6 INCHES	22 1/2°	1.50	1.50	2.50	0.15
	45°	1.50	1.50	2.50	0.15
	90°	2.00	2.00	3.00	0.28
	TEE	2.00	2.00	2.50	0.23
	11 1/4°	2.00	2.00	2.50	0.23
8 INCHES	22 1/2°	2.00	2.00	2.50	0.23
	45°	2.00	2.00	2.75	0.25
	90°	3.00	2.00	3.00	0.39
	TEE	3.00	2.00	2.50	0.32
	11 1/4°	2.00	2.00	3.00	0.28
12 INCHES	22 1/2°	2.00	2.00	3.00	0.28
	45°	3.00	2.00	3.00	0.47
	90°	4.50	3.00	3.50	0.94
	TEE	4.50	3.00	3.00	0.81
	11 1/4°	2.00	2.00	3.00	0.28
16 INCHES	22 1/2°	3.00	2.00	3.00	0.39
	45°	4.00	3.00	3.50	0.84
	90°	6.50	3.50	3.50	1.54
	TEE	6.50	3.00	3.00	1.32

TEST PRESSURE = 200 PSI

PIPE SIZE	TYPE FITTING	DIMENSIONS (FT) "L"	"H"	"T"	VOLUME CONCRETE CU. YD.
	11 1/4°	1.00	1.00	1.00	0.04
4 INCHES	22 1/2°	1.00	1.00	1.50	0.06
	45°	1.00	1.00	1.50	0.06
	90°	1.50	1.50	2.50	0.15
	TEE	1.50	1.50	2.00	0.12
	11 1/4°	1.00	1.00	2.50	0.09
4 INCHES	22 1/2°	1.00	1.00	2.50	0.09
	45°	1.50	1.50	2.50	0.15
	90°	1.50	1.50	2.50	0.15
	TEE	1.50	1.50	2.00	0.12
	11 1/4°	1.50	1.50	2.50	0.15
6 INCHES	22 1/2°	1.50	1.50	2.50	0.15
	45°	1.50	1.50	2.50	0.15
	90°	2.50	2.00	3.00	0.33
	TEE	2.50	2.00	2.50	0.28
	11 1/4°	2.00	2.00	2.50	0.23
8 INCHES	22 1/2°	2.00	2.00	2.50	0.23
	45°	2.00	2.00	2.75	0.23
	90°	4.00	2.00	3.00	0.50
	TEE	4.00	2.00	2.50	0.42
	11 1/4°	2.00	2.00	3.00	0.28
12 INCHES	22 1/2°	3.00	2.00	3.00	0.39
	45°	4.00	2.50	3.00	0.61
	90°	5.50	3.00	3.50	1.13
	TEE	5.50	3.00	3.00	0.97
	11 1/4°	2.00	2.00	3.00	0.28
16 INCHES	22 1/2°	4.00	2.00	3.00	0.50
	45°	5.50	3.00	3.50	1.13
	90°	7.50	4.00	3.50	2.01
	TEE	7.50	4.00	3.00	1.72

CHART NOTES:
1. IF BLOCKING EXCAVATION IS IN LIGHTLY COMPACTED FILL AREAS, OR IN AREAS WHERE BOULDERS OR STUMPS HAVE BEEN REMOVED, BLOCKING SIZE MUST BE RE-SIZED FOR THE SPECIFIC LOCATION/CIRCUMSTANCE BY A NC LICENSED PROFESSIONAL ENGINEER.
2. BLOCKING SIZES SHOWN IN THESE TABLES ASSUME THE FOLLOWING:
   a. BLOCKING IS CONSTRUCTED IN RESIDUAL SOILS AS SHOWN IN DETAIL
   b. SOIL BEARING PRESSURE = 2000 PSF
   c. VELOCITY OF FLOW = 15 FPS
3. THIS DETAIL NOT APPLICABLE TO REDUCING BENDS.
4. NEITHER THE WEIGHT OF THE CONCRETE BLOCKING NOR FRICTION BETWEEN CONCRETE BLOCKING AND SOIL WAS ADDED INTO BLOCKING SIZES COMPUTATION. THEREFORE, BLOCKING SIZE IS CONSERVATIVE.

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THRUST BLOCKING

SCALE: Not To Scale	DETAIL # WS_TB2
REVISION DATE: May, 2016	SHEET # 2 of 4

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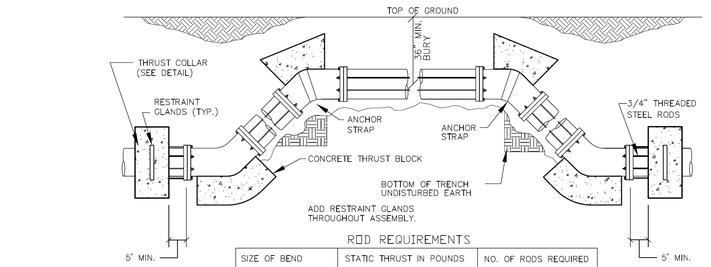
THRUST BLOCKING

SCALE: Not To Scale	DETAIL # WS_TB3
REVISION DATE: May, 2016	SHEET # 3 of 4



BLOCKING CROSS SECTION
NO SCALE

ROD REQUIREMENTS

SIZE OF BEND	STATIC THRUST IN POUNDS	NO. OF RODS REQUIRED
6"	4,328	4
8"	7,694	4
12"	17,312	4
16"	30,779	8
24"	69,252	8

GENERAL NOTES:
1. ALL FITTINGS SHALL BE WRAPPED IN POLYETHYLENE TO PREVENT CONCRETE FROM CONTACTING FITTINGS, BOLTS, OR ENDS OF MECHANICAL JOINT BENDS.
2. EACH FITTING SHALL BE SECURED BY TWO FORMS OF RESTRAINT. RESTRAINING GLANDS AND CONCRETE THRUST BLOCKING ARE PREFERRED. WEDGE-ACTION RESTRAINT GLANDS (I.E. MEGALUGS) ARE APPROVED ONLY FOR USE ON DUCTILE IRON PIPE. FULL-CIRCUMFERENTIAL PIPE RESTRAINT GLANDS (I.E. GRIP RINGS) MAY BE USED ON PVC OR DUCTILE IRON PIPE. ALL RESTRAINT GLANDS SHALL BE SPECIFICALLY DESIGNED FOR USE ON THE TYPE OF PIPE FOR WHICH THEY ARE BEING INSTALLED. OTHER FORMS OF RESTRAINT SUCH AS THREADED ROD, BELL RESTRAINT HARNESSES, ETC. MAY BE APPROVED BY ONWASA ON A CASE-BY-CASE BASIS.
3. IF APPROVED FOR USE BY ONWASA, STEEL RODS AND BOLTS SHALL BE 3/4" HOT DIPPED GALVANIZED.
4. MUST USE DUCTILE IRON EYE BOLTS WHERE NECESSARY.

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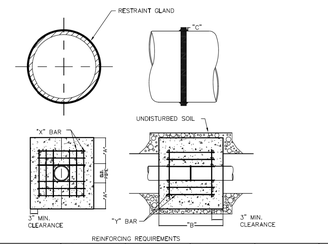
THRUST BLOCKING

SCALE: Not To Scale	DETAIL # WS_TB4
REVISION DATE: May, 2016	SHEET # 4 of 4



REINFORCING REQUIREMENTS

I.D. PIPE	REBAR SIZE	"X" BAR LENGTH	"X" BAR WEIGHT	"Y" BAR LENGTH	"Y" BAR WEIGHT	NO. REQUIRED
6" - 36"	#5	2'-2"± O.D. PIPE	1.043 LBS/FT	1'-1"	1.1 LBS. EACH	X=24, Y=12
48" & greater	#6	3'-0"± O.D. PIPE	1.502 LBS/FT	1'-3"	1.9 LBS. EACH	X=24, Y=12

THRUST COLLAR, AND THRUST SCHEDULE

I.D. PIPE	"A"	"B"	"C"-6"-16", 20"-24", 30"-36", 48"
6" - 36"	1'-4"	1'-7"	2" 3" 4"
48" & greater	1'-8"	1'-9"	6"

NOTES:
1. CONCRETE SHALL BE 3000 PSI AND TRANSIT MIXED.
2. REINFORCING BARS SHALL BE DEFORMED AND TIED TOGETHER.
3. TRENCH BOTTOM WIDTH IN VICINITY OF THRUST BLOCK INSTALLATION SHALL BE THE MINIMUM WIDTH AS SHOWN ON STANDARD EMBEDMENT DETAIL.
4. BACKFILL TAMPED IN 6" LIFTS PER STANDARD EMBEDMENT DETAIL.

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THRUST BLOCKING

SCALE: Not To Scale	DETAIL # WS_TB4
REVISION DATE: May, 2016	SHEET # 4 of 4

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ONWASA STANDARD DETAILS

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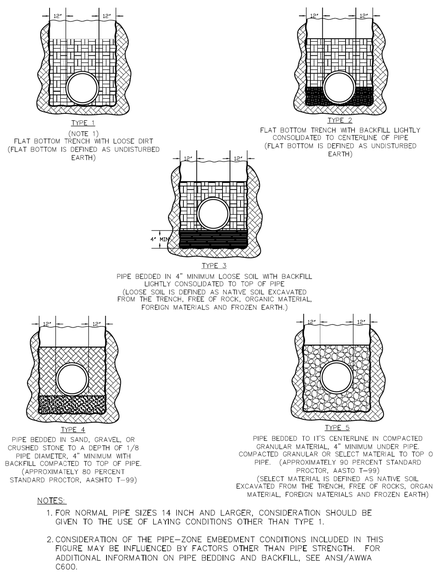
UTILITIES ENGINEERING SEC. PHONE:(919)707-6690 FAX:(919)250-4151	UTILITY CONSTRUCTION PLANS ONLY

NORTH CAROLINA ENGINEER SEAL 040784 NORWYT PARKER 11/15/2021

UTILITY CONSTRUCTION



NOTES:

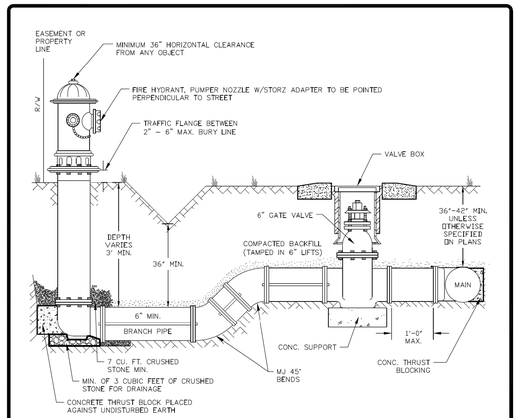
1. FOR NORMAL PIPE SIZES 14 INCH AND LARGER, CONSIDERATION SHOULD BE GIVEN TO THE USE OF LAYING CONDITIONS OTHER THAN TYPE 1.
2. CONSIDERATION OF THE PIPE-ZONE EMBEDMENT CONDITIONS INCLUDED IN THIS FIGURE MAY BE INFLUENCED BY FACTORS OTHER THAN PIPE STRENGTH. FOR ADDITIONAL INFORMATION ON PIPE BEDDING AND BACKFILL, SEE ANSI/AWWA C600.

ONWASA

Onslow Water & Sewer Authority
USE WITH "ONWASA MANUAL OF SPECIFICATIONS, STANDARDS and DETAILS, latest revision"

WATER MAIN EMBEDMENT DETAILS

SCALE: Not To Scale | DETAIL #: WS_ED
REVISION DATE: May, 2016 | SHEET #: 1 of 1



NOTES:

1. FIRE HYDRANT MANUFACTURER SHALL BE AS REQUIRED BY PROJECT SPECIFICATIONS.
2. FIRE HYDRANT SHALL BE INSTALLED USING HYDRANT TEE.
3. BRANCH PIPE SHALL BE DUCTILE IRON.
4. FIRE HYDRANTS WILL BE INSTALLED IN TRUE VERTICAL POSITION.
5. ALL JOINTS ON FIRE HYDRANT ASSEMBLIES SHALL BE RESTRAINED.
6. ALL FIRE HYDRANTS SHALL BE LOCATED WITHIN DEDICATED STREET RIGHT-OF-WAY OR A 20-FOOT PUBLICLY DEDICATED PERMANENT UTILITY EASEMENT TO ONWASA.
7. INSTALL BOLLARD GUARD POST AS PER DRAWINGS OR CONDITIONS MANDATE.
8. HYDRANT SHALL NOT BE INSTALLED SO THAT THE FINISHED ELEVATION OF SURROUNDING AREA (INCLUDING LANDSCAPING, MULCH, GRAVEL, ETC.) IS ABOVE THE MAXIMUM BURY LINE OF THE HYDRANT.
9. MAXIMUM PERMISSIBLE EXTENSION LENGTH IS 2-FEET.
10. IF HYDRANT LEG IS LESS THAN 10-FEET LONG, THE HYDRANT SHALL BE RODDED BACK TO THE VALVE.

ANYTIME SITE WORK, CONSTRUCTION, ROAD WORK, OR ANY OTHER WORK CHANGES THE GRADE OF THE FIRE HYDRANT, THE CONTRACTOR IS RESPONSIBLE FOR ADJUSTING THE FIRE HYDRANT TO STAY WITHIN COMPLIANCE.

ONWASA

Onslow Water & Sewer Authority
USE WITH "ONWASA MANUAL OF SPECIFICATIONS, STANDARDS and DETAILS, latest revision"

FIRE HYDRANT ASSEMBLY SHOULDER / DITCH SECTION

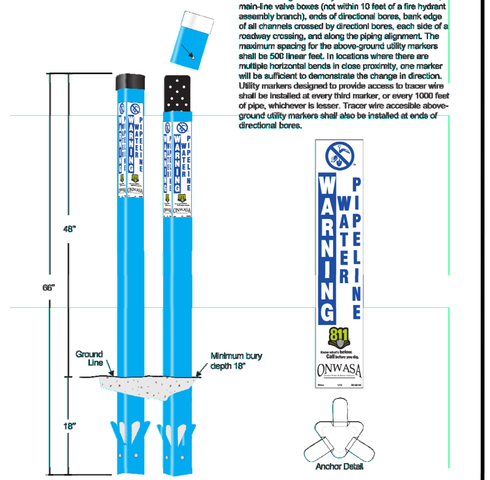
SCALE: Not To Scale | DETAIL #: WS_FHD
REVISION DATE: May, 2016 | SHEET #: 1 of 1

Parts List
1 - Rhino # TVF66UB - Rhino TriView Flex™, 66" Blue with Black Cap OR
1 - Rhino # TVT66UW2 - Rhino TriView™ Test Station, 66", 2 Inside Terminals, Blue with White Cap
1 - Cap Lock - TS-LOCK for Test Stations
3 - Decal # SD-8516K Custom Decals

NOTES:
The TriGrip Anchor Flaps™ shall be extended priority to burial of the post. Soil shall be compacted during placement of marker post.

All materials shall be provided by Rhino Marking & Protection Sytems, Inc.

Install above-ground utility markers at horizontal bends, main-line valve boxes (not within 10 feet of a fire hydrant assembly branch), ends of directional bores, bank edge of all channels crossed by directional bores, each side of a roadway crossing, and along the piping alignment. The maximum spacing for the above-ground utility markers shall be 500 linear feet. In locations where there are multiple horizontal bends in close proximity, one marker will be sufficient to demonstrate the change in direction. Utility markers designed to provide access to tracer wire shall be installed at every third marker, or every 1000 feet of pipe, whichever is lesser. Tracer wire accessible above-ground utility markers shall also be installed at ends of directional bores.

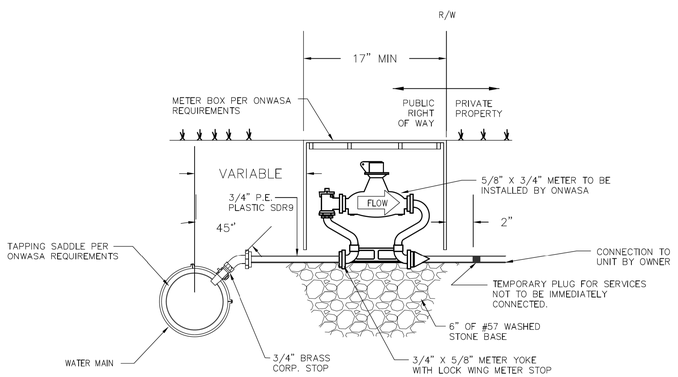


ONWASA

Onslow Water & Sewer Authority
USE WITH "ONWASA MANUAL OF SPECIFICATIONS, STANDARDS and DETAILS, latest revision"

STANDARD UTILITY MARKER FOR WATER MAIN

SCALE: Not To Scale | DETAIL #: WS_WMRK
REVISION DATE: May, 2016 | SHEET #: 1 of 1



NOTE: METER BOX TO BE SUPPORTED ON BRICK OR BLOCK

ONWASA

Onslow Water & Sewer Authority
USE WITH "ONWASA MANUAL OF SPECIFICATIONS, STANDARDS and DETAILS, latest revision"

3/4" TO 1" SERVICE CONNECTION AND METER

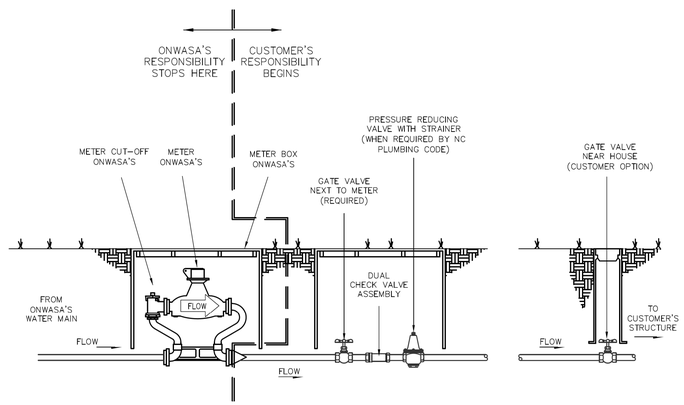
SCALE: Not To Scale | DETAIL #: WS_SCM
REVISION DATE: May, 2016 | SHEET #: 1 of 1

ONWASA

Onslow Water & Sewer Authority
USE WITH "ONWASA MANUAL OF SPECIFICATIONS, STANDARDS and DETAILS, latest revision"

3/4" TO 1" METER INSTALLATION

SCALE: Not To Scale | DETAIL #: WS_MI
REVISION DATE: May, 2016 | SHEET #: 1 of 1



North Carolina Plumbing Code Section 608 requires a gate valve, backflow prevention and a pressure reducing valve on all connections with the Public Water Supply.

1. A gate valve and a pressure reducing valve MUST be installed directly behind the meter (see diagram above).
2. An additional gate valve located near the house is recommended, but not required.
3. All materials shall be pressure rated to one hundred-fifty (150 psi).
4. The water meter will be locked upon installation. Please contact the Onslow Water and Sewer Authority (ONWASA) twenty-four (24) hours in advance to schedule the inspection of the valves.
5. All valves MUST be installed prior to unlocking the meter.

Meter Placement Note:

Place the blue flag approximately thirty (30) feet from the center of the road Utility Right of Way for proper placement of ONWASA's water meter. All efforts will be made to install the meter where it is marked; however, ONWASA reserves the right to place the meter in the most feasible location to all parties involved. If the blue flag is not placed in a feasible location, it may result in a delay of installation.

11/4/2021
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Norman

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5/14/99

NOTE:
1. ALL WATER AND SEWER UTILITIES ARE OWNED AND OPERATED BY THE CITY OF JACKSONVILLE UNLESS INDICATED AS OWNED BY ONWASA.
2. PER RECORD DRAWING FROM THE CITY OF JACKSONVILLE, JOB NUMBER SO70117-4281, SANITARY GRAVITY SEWER LINE EXISTS FROM PROPERTY 3 TO MANHOLE NEAR -L- STATION 15+59.30 AND WAS NOT CAPTURED BY SURVEY. TIE-IN ALIGNMENT INTO PROPOSED SSMH-2 IS APPROXIMATE AND SHOULD BE VERIFIED BY CONTRACTOR PRIOR TO INSTALLATION.
3. PRIOR TO COMMENCING ANY WORK ON THIS TRENCHLESS INSTALLATION ON THIS PROJECT, PROVIDE A DESIGN FOR THE TRENCHLESS INSTALLATION CERTIFIED BY AN ENGINEER LICENSED BY THE STATE OF NORTH CAROLINA, AS REQUIRED BY SUBARTICLE 1550-3(B) OF THE STANDARD SPECIFICATIONS.

PENDING MUNICIPAL AGREEMENT WITH CITY OF JACKSONVILLE.

STV 100 Years
STV Engineers, Inc.
1600 Perimeter Park Dr.
Suite 225
Morrisville, NC 27560
NC License Number F-0991

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT REFERENCE NO.	SHEET NO.
U-5878	UC-4
DESIGNED BY: ATP	
DRAWN BY: ABN	
CHECKED BY: ATP	
APPROVED BY:	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE:(919)707-6690 FAX:(919)250-4151	UTILITY CONSTRUCTION PLANS ONLY

NORTH CAROLINA — Licensed Engineer — SEAL 040784 — ENGINEER — ANDREW T. PARKER — 11/18/2021

NAD 83/2011

UTILITY CONSTRUCTION

LEWISVILLE PROPERTIES,LLC
DB 4421PG 751
MB 28 PG 22

THE HARRY C. BROWN FAMILY LLC
DB 2728 PG 352
MB 51PG 158

DEAN DAIRY FLUID, LLC
DB 5167 PG 407

THE HARRY C. BROWN FAMILY LLC
DB 2413 PG 926

NEW RIVER BAPTIST ASSOCIATION
DB 817 PG 500

BEGIN CONSTRUCTION
BEGIN CITY PROJECT
–L– POT STA. 11+80.00

END CITY PROJECT
BEGIN EIP PROJECT U-5878
–L– POT STA. 18+50.00

MILL AND OVERLAY FROM
–L– POT STA.11+80.00 TO
–L– POT STA.12+47.76

–Y1– POT Sta.14+77.56
TIE TO EXISTING 8″ FORCE SEWER MAIN W/ HDPE TRANSITION ADAPTER, LONG PATTERN SLEEVE & CONCRETE THRUST COLLAR
-FSS1- STA. 10+00.00
-L- STA. 12+72.00 (20.42′ LT.)

–L– POC Sta.12+31.33 =
–Y1– POT Sta.11+73.69

–L– POT Sta.13+57.59

–Y1– POT Sta.10+00.00

–L– POT Sta.10+00.00

TIE TO EXIST. CURB
STA.12+20.3

TIE TO EXIST. CURB
–Y1– STA.11+26.35

2 - 45° BENDS (HORZ.)
-FSS1- STA. 10+10.00
-FSS1- STA. 10+30.05

2 - 11.25° BENDS (HORZ.)
-WL1- STA. 10+10.00
-WL1- STA. 10+22.73

TIE TO EXISTING 6″ WATER LINE W/ LONG PATTERN SLEEVE & CONCRETE THRUST COLLAR
-WL1- STA. 10+00.00
-L- STA. 12+66.07 (19.93′ RT.)

1″ AIR RELEASE VALVE
-FSS1- STA. 10+58.14

2 - 11.25° BENDS (HORZ.)
-FSS1- STA. 10+90.30
-FSS1- STA. 11+08.25

EXISTING SEWER MANHOLE LOCATION APPROXIMATE, PER CITY OF JACKSONVILLE RECORD DRAWINGS

6″ LINE STOP

ABANDON 844.0 LF 8″ UTILITY PIPE

832.0 LF 8″ FORCE SEWER MAIN
-FSS1- PVC, C900 DR18

ABANDON 715.0 LF 6″ UTILITY PIPE

RECONNECT WATER METER

738.0 LF 6″ WATER LINE
-WL1- RJ DIP

APPROXIMATE LOCATION OF EXISTING 20′ UTILITY EASEMENT PER DEED BOOK 3279, PAGES 94-97

CONCRETE THRUST COLLAR

9.0 LF DIRECTIONAL DRILLING OF 8″ FORCE SEWER MAIN

9.0 LF 8″ FORCE SEWER MAIN
-FSS1- FPVC, C900 DR18

11.25° BEND (VERT.)
-FSS1- STA. 18+31.79
BEGIN DIRECTIONAL DRILL

BEND RADIUS: 283.5′
BEGIN STA.: 18+00.05
END STA.: 18+31.79

BEND RADIUS: 283.5′
BEGIN STA.: 17+48.31
END STA.: 17+80.05

ABANDON 37.0 LF 6″ UTILITY PIPE

48.0 LF 6″ WATER LINE
6″ GATE VALVE
RJ DIP
2 - 45° BENDS

6″X6″X6″ TEE
-WL1- STA. 15+23.93

CONNECT TO EXISTING FORCE MAIN PIPES

TH#1 TH#2 TH#4 TH#6 TH#7 TH#8 TH#8.1

4′ DIA. UTILITY MANHOLE
1.0 LF UTILITY MANHOLE
WALL 4′ DIA.
SSMH-1, -SS1- STA. 0+00.00

4 - RECONNECT WATER METERS

4 - RELOCATE 1″ RPZ BACKFLOW PREVENTION ASSEMBLIES
50.0 LF WATER SERVICE LINE

ABANDON 328.0 LF 8″ UTILITY PIPE

328.0 LF 8″ SANITARY GRAVITY SEWER
-SS1- DIP

9.0 LF FIRE HYDRANT LEG

REMOVE UTILITY MANHOLE

12.0 LF 8″ SANITARY GRAVITY SEWER
DIP; APPROXIMATE SLOPE: 0.40%, EXTEND EXISTING SEWER PIPE THROUGH REMOVED MANHOLE, CONTRACTOR TO MAINTAIN ALIGNMENT AND SLOPE (SEE NOTE 2)

4′ DIA. UTILITY MANHOLE
SSMH-2, -SS1- STA. 3+27.75

RECONNECT WATER METER

210.0 LF 8″ SANITARY GRAVITY SEWER
-SS1- DIP

ABANDON 206.0 LF 8″ UTILITY PIPE

RECONNECT WATER METER

REMOVE 2″ BLOWOFF
(PER CITY OF JACKSONVILLE RECORD DRAWING, JOB NO. 5070117-4281)

64.0 LF 2″ FORCE SEWER MAIN
65.0 LF 2″ FORCE SEWER MAIN
66.0 LF 2″ FORCE SEWER MAIN
67.0 LF 2″ FORCE SEWER MAIN
PVC; CONNECT TO EXISTING 2″ FORCE MAIN PIPES. EXISTING PIPES WERE NOT INCLUDED IN SURVEY, THUS CONNECTION LOCATION IS APPROXIMATE; REFERENCE CITY OF JACKSONVILLE RECORD DRAWING, JOB NO. 5070117-4281

4′ DIA. UTILITY MANHOLE
SSMH-3, -SS1- STA. 5+37.75

ABANDON UTILITY MANHOLE

RECONNECT WATER METER

END WATER LINE CONSTRUCTION
6″ RESTRAINED CAP
-WL1- STA. 17+37.34
-L- STA. 20+02.96 (21.00′ RT.)

2″ BLOW OFF
13.0 LF 2″ WATER SERVICE LINE

MATCHLINE –L– STA.21+00.00 SEE SHEET UC-5

THE ESTIMATED QUANTITY OF DUCTILE IRON WATER FITTINGS ON THIS PLAN SHEET IS 515 POUNDS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.

THE ESTIMATED QUANTITY OF DUCTILE IRON SEWER FITTINGS ON THIS PLAN SHEET IS 635 POUNDS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.

SEE SHEET UC-6 FOR -FSS1- PROFILE
SEE SHEET UC-6 FOR -SS1- PROFILE
SEE SHEET UC-7 FOR -WL1- PROFILE

11/1/2021
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Nathan

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5/14/99

NOTE:
1. ALL WATER AND SEWER UTILITIES ARE OWNED AND OPERATED BY THE CITY OF JACKSONVILLE UNLESS INDICATED AS OWNED BY ONWASA.
2. PRIOR TO COMMENCING ANY WORK ON THIS TRENCHLESS INSTALLATION ON THIS PROJECT, PROVIDE A DESIGN FOR THE TRENCHLESS INSTALLATION CERTIFIED BY AN ENGINEER LICENSED BY THE STATE OF NORTH CAROLINA, AS REQUIRED BY SUBARTICLE 1550-3(B) OF THE STANDARD SPECIFICATIONS.

182.0 LF DIRECTIONAL DRILLING OF 8" FORCE SEWER MAIN

182.0 LF 8" FORCE SEWER MAIN
-FSS1- FPVC, C900 DR18

CONCRETE THRUST COLLAR

11.25° BEND (VERT.)
-FSS1- STA. 20+21.22
END DIRECTIONAL DRILL

2 - 22.5° BENDS (HORZ.)
-FSS1- STA. 20+23.72
-FSS1- STA. 20+45.20

TIE TO EXISTING 8" FORCE SEWER MAIN
W/ LONG PATTERN SLEEVE &
CONCRETE THRUST COLLAR
-FSS1- STA. 20+55.20
-L- STA. 22+89.16 (97.31' LT.)

APPROXIMATE LOCATION OF EXISTING 20' UTILITY EASEMENT PER DEED BOOK 3279, PAGES 94-97

34.0 LF 8" FORCE SEWER MAIN
-FSS1- PVC, C900 DR18

TH#9.1

TIE TO EXISTING 6" WATER LINE
W/ LONG PATTERN SLEEVE &
CONCRETE THRUST COLLAR
SEE DETAILS WS_TB1-TB4
-WL2- STA. 10+66.38
-L- STA. 31+23.28 (25.99' RT.)

ABANDON 83.0 LF 6" UTILITY PIPE
ONWASA

RECONNECT WATER METER
ONWASA
SEE DETAIL WS_SCM

6" LINE STOP
ONWASA
SEE DETAILS
WS_VB, WS_ILV

TIE TO EXISTING 6" WATER LINE
W/ CONCRETE THRUST COLLAR
SEE DETAILS WS_TB1-TB4
-WL2- STA. 10+00.00
-L- STA. 30+61.82 (14.18' RT.)

TH#10

2 - 45° BENDS (ROTATED)
-WL2- STA. 10+10.00
-WL2- STA. 10+21.75

67.0 LF 6" WATER LINE
-WL2- ONWASA, RJ DIP

2 - 11.25° BENDS (VERT.)
-WL2- STA. 10+38.79
-WL2- STA. 10+48.79

RELOCATE FIRE HYDRANT
8.0 LF FIRE HYDRANT LEG
6" VALVE
ONWASA
SEE DETAIL WS_FHD

ABANDON 10.0 LF
6" UTILITY PIPE
ONWASA

END CONSTRUCTION
TIP PROJECT U-5878
-L- POT STA. 31+94.84

RELOCATE WATER METER
5.0 LF WATER SERVICE LINE
ONWASA
SEE DETAILS WS_SCM, WS_MI

ABANDON 215.0 LF 8" UTILITY PIPE

REMOVE WATER METER
ONWASA

RELOCATE WATER METER
88.0 LF WATER SERVICE LINE
ONWASA
SEE DETAILS WS_SCM, WS_MI

NEW JONES-ONSLOW EMC
BORE- SECONDARY POWER
NORMAN E. ALLEN, et ux
DB 701PG 472
MB 6 PG 74

NEW DUKE ENERGY JOINT USE POLES, REROUTE BURIED SERVICES AS NEEDED

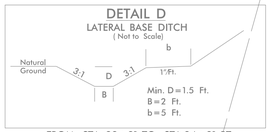
NEW JOINT USE CENTURY LINK POLE & ANCHORS, REROUTE BURIED SERVICES TO NEW POLE

THE ESTIMATED QUANTITY OF DUCTILE IRON SEWER FITTINGS ON THIS PLAN SHEET IS 415 POUNDS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.

THE ESTIMATED QUANTITY OF DUCTILE IRON WATER FITTINGS ON THIS PLAN SHEET IS 425 POUNDS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.

SEE SHEET UC-6 FOR -FSS1- PROFILE
SEE SHEET UC-7 FOR -WL2- PROFILE

DETAIL D
LATERAL BASE DITCH
(Not to Scale)



FROM STA. 23+91 TO STA.24+31 RT
DDE=16 CY

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STV Engineers, Inc.
1600 Perimeter Park Dr.
Suite 225
Morrisville, NC 27560
NC License Number F-0991

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PROJECT REFERENCE NO.	SHEET NO.
U-5878	UC-5
DESIGNED BY: ATP	
DRAWN BY: ABN	
CHECKED BY: ATP	
APPROVED BY:	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE:(919)707-6690 FAX:(919)250-4151	UTILITY CONSTRUCTION PLANS ONLY

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 040784 ENGINEER NORVETT PARKER 11/12/2021

UTILITY CONSTRUCTION

NAD 83/2011

SEE SHEET UC-4

MATCHLINE -L- STA.21+00.00

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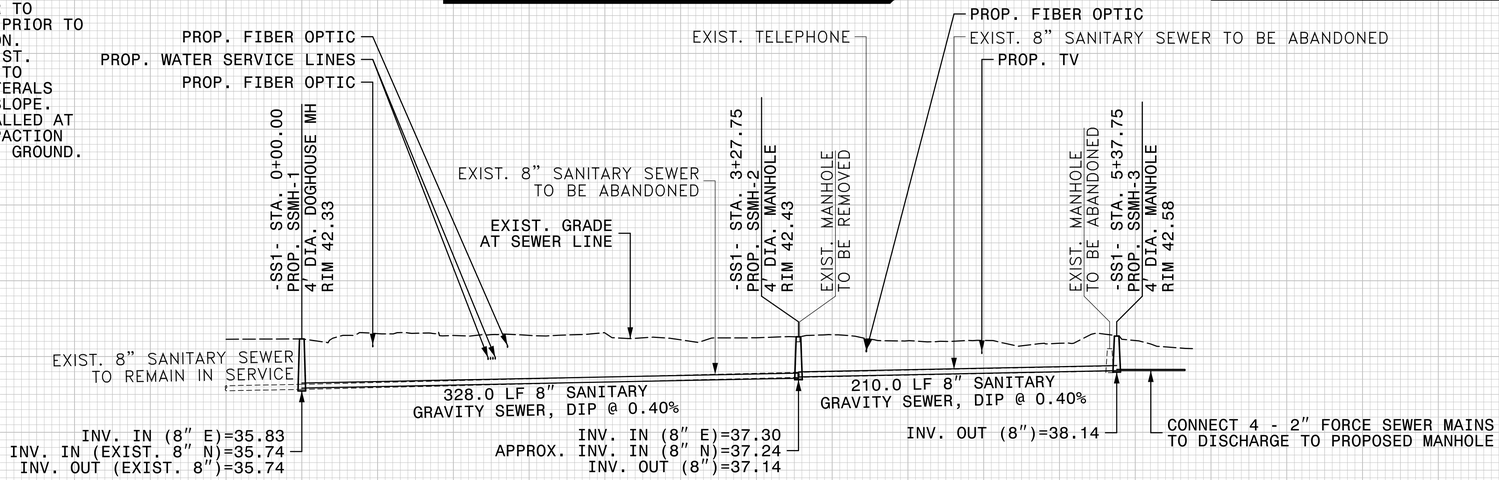
5/28/99

SCALE: 1" = 50' HORIZONTAL
1" = 10' VERTICAL

NOTES:
1. LOCATION AND DEPTHS OF EXIST. AND PROP. UTILITIES SHOWN ON PROFILE ARE APPROXIMATE UNLESS OTHERWISE NOTED. CONTRACTOR TO FIELD VERIFY LOCATIONS AND DEPTHS PRIOR TO GRAVITY SANITARY SEWER CONSTRUCTION.
2. CONTRACTOR TO FIELD LOCATE ALL EXIST. CLEANOUTS AND LATERALS AND TIE-IN TO PROPOSED SANITARY SEWER. SEWER LATERALS SHALL BE INSTALLED AT MINIMUM 1% SLOPE.
3. GRAVITY SANITARY SEWER TO BE INSTALLED AT MINIMUM REQUIRED SLOPE 0.40%. COMPACTION AND FILL SHALL RE-ESTABLISH EXIST. GROUND.

PROP. 8" SANITARY SEWER -SS1- CITY OF JACKSONVILLE COMMERCE ROAD



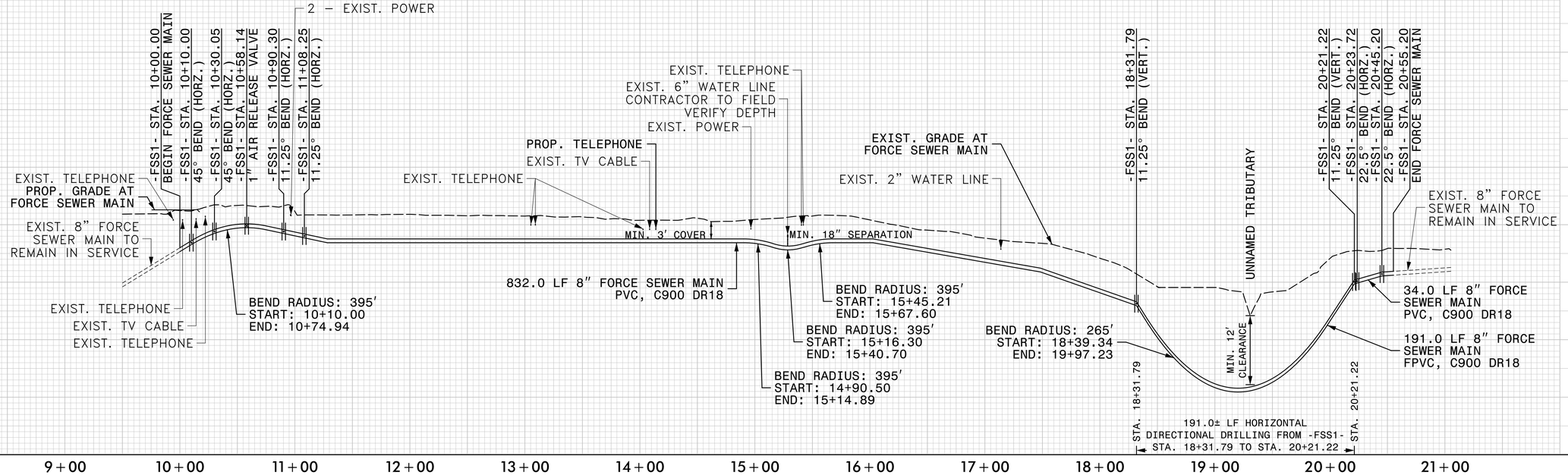
SEE SHEET UC-4 FOR -SS1- PLAN

SCALE: 1" = 50' HORIZONTAL
1" = 10' VERTICAL

NOTES:
1. LOCATION AND DEPTHS OF EXIST. AND PROP. UTILITIES SHOWN ON PROFILE ARE APPROXIMATE UNLESS OTHERWISE NOTED. CONTRACTOR TO FIELD VERIFY LOCATIONS AND DEPTHS PRIOR TO FORCE MAIN SEWER CONSTRUCTION.

PROP. 8" FORCE SEWER MAIN -FSS1- CITY OF JACKSONVILLE COMMERCE ROAD

SEE SHEET UC-4 & UC-5 FOR -FSS1- PLAN



STV 100 Years
STV Engineers, Inc.
900 West Trade St., Suite 715
Charlotte, NC 28202
NC License Number F-0991

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PROJECT REFERENCE NO.	SHEET NO.
U-5878	UC-6
DESIGNED BY: ATP	
DRAWN BY: ABN	
CHECKED BY: ATP	
APPROVED BY:	
REVISED:	

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
UTILITIES ENGINEERING SEC.
PHONE:(919)707-6690
FAX:(919)250-4151

NORTH CAROLINA — Michael Norbert Parker — SEAL 040784 — ENGINEER — 11/15/2021

UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION

11/4/2021
R:\Utilities\Water and Sewer\SHT\U5878_ut_UC06_psh.dgn
NorbertA

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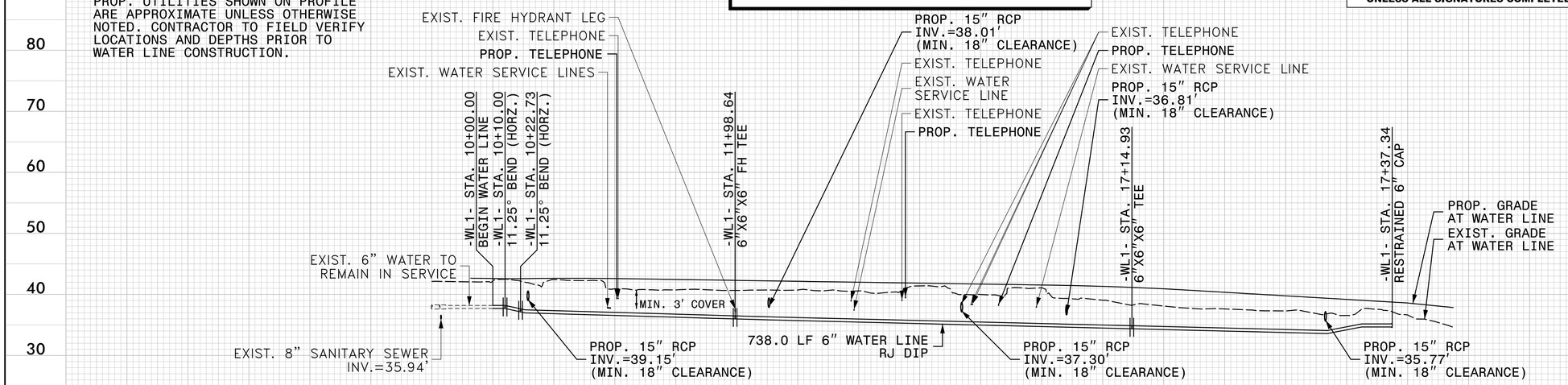
5/28/99

SCALE: 1" = 50' HORIZONTAL
1" = 10' VERTICAL

NOTES:
1. LOCATION AND DEPTHS OF EXIST. AND PROP. UTILITIES SHOWN ON PROFILE ARE APPROXIMATE UNLESS OTHERWISE NOTED. CONTRACTOR TO FIELD VERIFY LOCATIONS AND DEPTHS PRIOR TO WATER LINE CONSTRUCTION.

PROP. 6" WATER LINE -WL1- CITY OF JACKSONVILLE COMMERCE ROAD

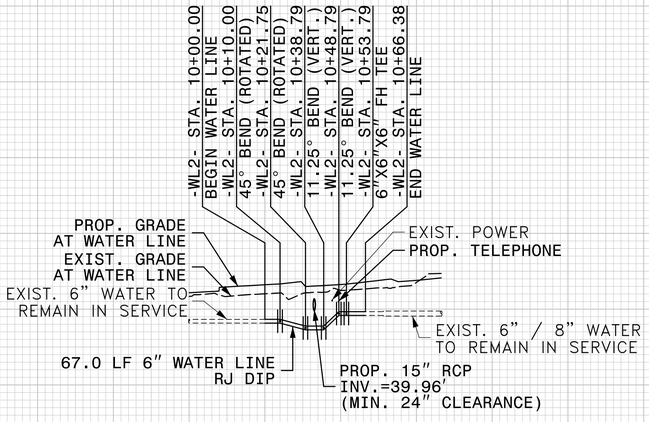


SEE SHEET UC-4 FOR -WL1- PLAN

SCALE: 1" = 50' HORIZONTAL
1" = 10' VERTICAL

NOTES:
1. LOCATION AND DEPTHS OF EXIST. AND PROP. UTILITIES SHOWN ON PROFILE ARE APPROXIMATE UNLESS OTHERWISE NOTED. CONTRACTOR TO FIELD VERIFY LOCATIONS AND DEPTHS PRIOR TO WATER LINE CONSTRUCTION.
2. PER ONWASA STANDARDS, REQUIREMENT FOR VERTICAL CLEARANCE UNDER STORMWATER PIPE IS MINIMUM 24".

PROP. 6" WATER LINE -WL2- ONWASA COUNTRY CLUB DRIVE



SEE SHEET UC-5 FOR -WL2- PLAN

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STV Engineers, Inc.
900 West Trade St., Suite 715
Charlotte, NC 28202
NC License Number F-0991

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PROJECT REFERENCE NO.	SHEET NO.
U-5878	UC-7
DESIGNED BY: ATP	
DRAWN BY: ABN	
CHECKED BY: ATP	
APPROVED BY:	
REVISED:	

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
UTILITIES ENGINEERING SEC.
PHONE:(919)707-6690
FAX:(919)250-4151

NORTH CAROLINA — SEAL 040784 — ENGINEER — NORENT PARKER — 11/12/2021

UTILITY CONSTRUCTION PLANS ONLY

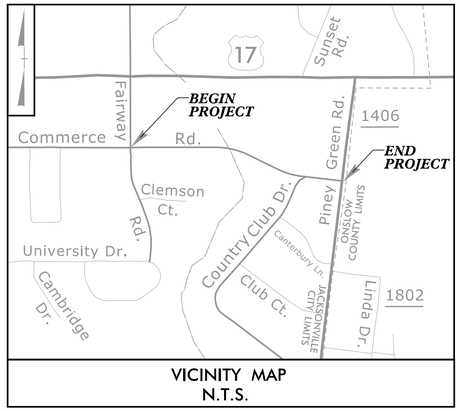
UTILITY CONSTRUCTION

11/11/2021
R:\Utilities\Water and Sewer\SHT\U5878_ut_UC07_psh.dgn
Norena

ADDED STORM DRAINAGE PLANS 7/10/17
ADDED ALL UTILITY RELOCATION PLANS 7/5/18

TIP PROJECT: U-5878

CONTRACT: DC0185



VICINITY MAP
N.T.S.

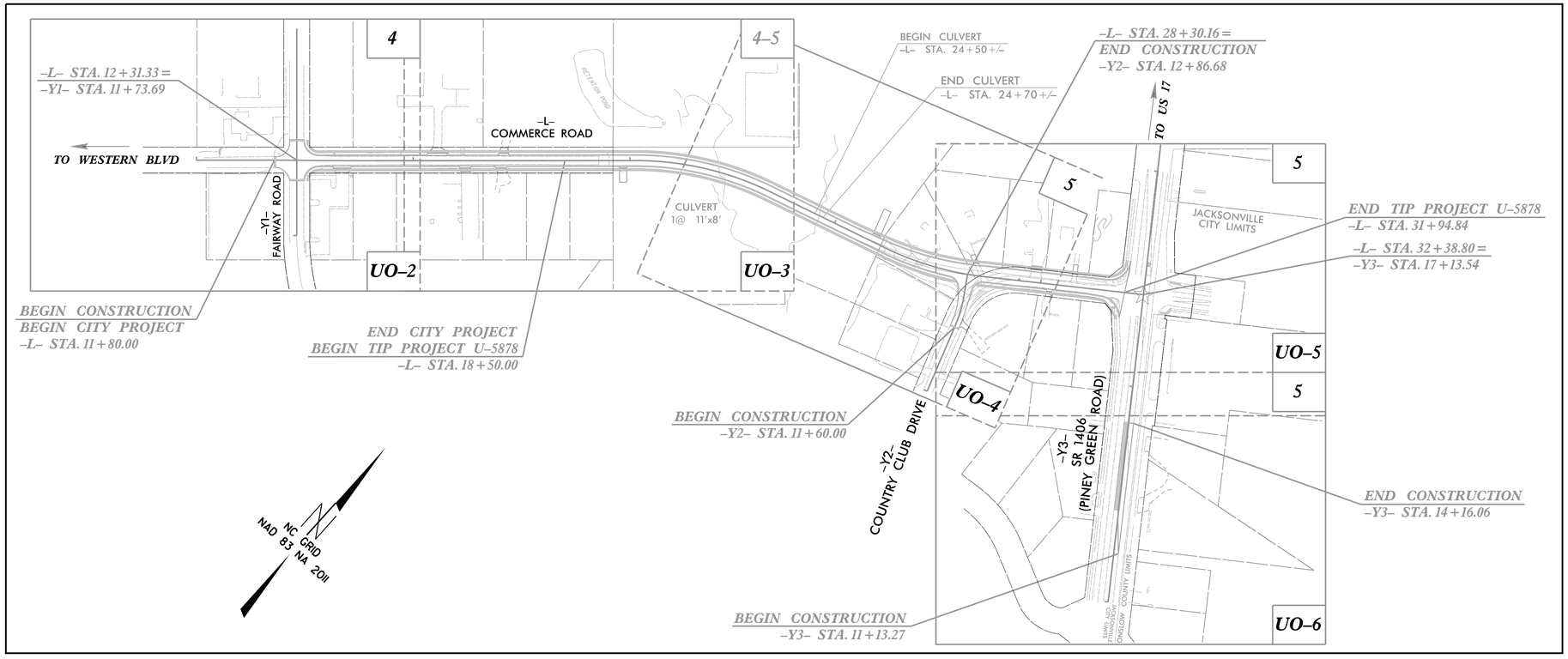
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

UTILITIES BY OTHERS PLANS
ONSLOW COUNTY

T.I.P. NO.	SHEET NO.
U-5878	UO-1

NOTE:
ALL UTILITY WORK SHOWN ON THIS SHEET IS DONE BY OTHERS.
NO PAYMENT WILL BE MADE TO THE CONTRACTOR FOR UTILITY WORK SHOWN ON THIS SHEET.

LOCATION: EXTENSION OF COMMERCE ROAD FROM FAIRWAY ROAD TO PINEY GREEN ROAD (SR 1406) AT COUNTRY CLUB ROAD
TYPE OF WORK: AERIAL AND BURIED POWER, TELEPHONE AND CATV



GRAPHIC SCALES

30 15 0 30 60
PLANS

INDEX OF SHEETS

SHEET NO.:	*DESCRIPTION:*
UO-1	***TITLE SHEET***
UO-2 THRU UO-6	*UBO PLAN SHEETS*

UTILITY OWNERS WITH CONFLICTS

(A) POWER - DUKE ENERGY
(B) POWER - JONES-ONSLOW EMC
(C) TELEPHONE - CENTURY LINK
(D) CATV - CHARTER/SPECTRUM
(E) FO - CROWN CASTLE

PREPARED IN THE OFFICE OF:
V&M
Vaughn & Melton
Consulting Engineers
1318-F Patton Avenue
Asheville, NC 28806
(828) 253-2796

Lynn Kieselhorst, P.G. — *UTILITY PROJECT MANAGER*
Lynn Kieselhorst, P.G. — *PROJECT UTILITY COORDINATOR*

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS
DIVISION 3
5501 BARBADOS BLVD.
CASTLE HAYNE, NC 28429

Brian Harding, P.E. — *DDC ENGINEER*
Lonny Sleeper — *DIVISION UTILITY ENGINEER*
J. "Steve" Davis — *DIV. UTILITY COORDINATOR*

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ADDED STORM DRAINAGE 7/5/18
ADDED CHARTER, CENTURY LINK PLANS 2/15/18
7/17/17

STORM DRAINAGE

	STR. NO.	TOP	INVERT	PIPE SIZE	LENGTH
	DI 0403	42.50	39.64	15″	17′
	CB 0402	41.78	38.78	15″	24′
	CB 0400	41.75	38.66	15″	199′
	CB 0406	41.42	37.67	15″	155′
UO-3	CB 0412	40.94	36.89		

STR. NO.	TOP	INVERT	PIPE SIZE	LENGTH
DI 0401	42.50	39.52	15″	17′
CB 0400	41.75	38.66		
DI 0407	41.50	38.36	15″	14′
CB 0406	41.42	37.67		

	STR. NO.	TOP	INVERT	PIPE SIZE	LENGTH
	DI 0404	41.30	39.05	15″	15′
	CB 0405	41.57	38.57	15″	82′
UO-3	CB 0408	41.32	38.16		

CENTURY LINK WILL ABANDON BURIED DISTRIBUTION LINES, WITHIN CONSTRUCTION LIMITS, AND WILL ATTACH TO DUKE ENERGY POLES, BURIED SERVICE CONNECTIONS WILL BE REROUTED AS NEEDED ON SHEETS UO-2 AND UO-3

CHARTER/SPECTRUM WILL ABANDON EX. BURIED LINES, EXCEPT AS NOTED, AND RELOCATE ALONG SOUTHERN EDGE OF PROP. ROW ON SHEETS UO-2 AND UO-3

PROJECT REFERENCE NO.	SHEET NO.
U-5878	UO-2

UTILITIES BY OTHERS

NOTE:
ALL PROPOSED UTILITY WORK SHOWN ON THIS SHEET WILL BE DONE BY OTHERS. NO PAYMENT WILL BE MADE TO THE CONTRACTOR FOR PROPOSED UTILITY WORK SHOWN ON THIS SHEET.

NC GRID NAD 83 NA 2011

EXISTING POWER TO REMAIN
ABANDON U/G CATV CABLES
EXISTING POWER TO REMAIN
EXISTING OVERHEAD F/O CABLE TO REMAIN
ABANDON U/G TELEPHONE
EXISTING OVERHEAD F/O CABLE TO REMAIN
EXISTING POWER TO REMAIN
PROPOSED U/G FIBER OPTIC CATV CABLES
EXISTING U/G CATV TO REMAIN
U/G CATV CABLES TO REMAIN
EXISTING U/G TELEPHONE TO REMAIN
EXISTING U/G TELEPHONE TO REMAIN
PROPOSED U/G CATV CABLES
ABANDON U/G CATV CABLES

BEGIN CONSTRUCTION
BEGIN CITY PROJECT
–L– STA. 11+80.00

MATCHLINE –L– STA. 15+00.00
SEE SHEET UO-3

60 SCALE 11X17

30 15 0 30 60

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Consulting Engineers
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Tri-Cities, Tennessee 423-467-8400
Knoxville, Tennessee 865-546-5800
Middlesboro, Kentucky 606-248-6600
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NC\UTILITIES\31614-03_U-5878\UTIL\UO-2.DGN

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ADDED STORM DRAINAGE 7/17/17
ADDED CHARTER, CENTURY LINK PLANS 2/15/18 7/5/18

PROJECT REFERENCE NO.	SHEET NO.
U-5878	UO-3

UTILITIES BY OTHERS

NOTE:
ALL PROPOSED UTILITY WORK SHOWN ON THIS SHEET WILL BE DONE BY OTHERS. NO PAYMENT WILL BE MADE TO THE CONTRACTOR FOR PROPOSED UTILITY WORK SHOWN ON THIS SHEET.

STORM DRAINAGE

UO-2

STR. NO.	TOP	INVERT	PIPE SIZE	LENGTH
CB 0405	41.57	38.57	15″	82′
CB 0408	41.32	38.16	15″	122′
CB 0410	40.94	37.55	15″	24′
CB 0412	40.94	36.89	15″	83′
CB 0414	40.67	IN 36.48 OUT 36.23	18″	229′
CB 0418	38.35	35.08	18″	118′
CB 0421	36.69	33.43	18″	25′
PIPE OUTLET 0422		32.50	18″	

STR. NO.	TOP	INVERT	PIPE SIZE	LENGTH
DI 0409	41.20	38.95	15″	17′
CB 0408	41.32	38.16		
DI 0411	40.30	38.05	15″	17′
CB 0410	40.94	37.55		
DI 0417	40.00	37.75	15″	18′
CB 0416	40.67	37.66		
CB 0414	40.67	36.48	15″	24′
DI 0420	38.55	35.55	15″	24′
CB 0418	38.35	35.33		
UO-2 CB 0406	41.42	37.67	15″	155′
CB 0412	40.94	36.89		
DI 0413	41.50	37.60	15″	14′
CB 0412	40.94	36.89		
DI 0415	40.50	37.26	15″	16′
CB 0414	40.67	36.48		
DI 0419	38.75	36.50	15″	26′
CB 0418	38.35	35.33		

THE HARRY C. BROWN FAMILY LLC
DB 2376 PG 361
MB 43 PG 64

U/G FIBER OPTIC CABLES TO REMAIN
PROPOSED U/G CATV FIBER OPTIC CABLE
EXISTING U/G POWER TO REMAIN
ABANDON U/G CATV CABLE
U/G FIBER OPTIC CABLES TO REMAIN
NEW BORE FOR U/G CATV
NEW BORE FOR CENTURYLINK U/G CABLE
PROPOSED U/G CATV FIBER OPTIC CABLE
PROPOSED U/G TELEPHONE LINE
EXISTING OVERHEAD POWERLINES TO REMAIN
APPROXIMATE LOCATION OF EXISTING 20′ UTILITY EASEMENT PER DEED BOOK 3279, PAGES 94–97

END CITY PROJECT
BEGIN TIP PROJECT U-5878
–L– STA. 18+50.00

MATCHLINE –L– STA. 15+00.00 SEE SHEET UO-2
MATCHLINE –L– STA. 23+00.00 SEE SHEET UO-4

11x17– 60 SCALE

V&M Vaughn & Melton Consulting Engineers
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Charlotte, North Carolina 704-357-0488
Tri-Cities, Tennessee 423-467-8400
Knoxville, Tennessee 865-546-5800
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ADDED CHARTER, CENTURY LINK & JONES-ONSLOW EMC PLANS 7/5/18
ADDED STORM DRAINAGE 2/15/18
7/17/17

PROJECT REFERENCE NO.	SHEET NO.
U-5878	UO-4

UTILITIES BY OTHERS

NOTE:
ALL PROPOSED UTILITY WORK SHOWN ON THIS SHEET WILL BE DONE BY OTHERS. NO PAYMENT WILL BE MADE TO THE CONTRACTOR FOR PROPOSED UTILITY WORK SHOWN ON THIS SHEET.

STORM DRAINAGE

UO-3

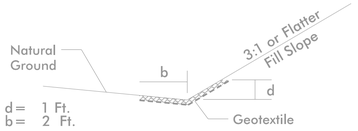
STR. NO.	TOP	INVERT	PIPE SIZE	LENGTH
CB 0500	34.82	31.82	15″	120′
CB 0501	34.00	30.99		
CB 0503	34.26	31.26	15″	24′
CB 0501	34.00	30.99		
PIPE OUTLET 0502		30.55	15″	30′

STR. NO.	TOP	INVERT	PIPE SIZE	LENGTH
CB 0510	41.07	38.07	15″	36′
CB 0509	40.59	IN 37.58 OUT 37.33	18″	152′
CB 0508	38.51	35.25	18″	129′
CB 0506	37.09	IN 32.58 OUT 32.08	24″	68′
CB 0505	35.97	31.61	24″	55′
PIPE OUTLET 0504		31.00		

UO-5

STR. NO.	TOP	INVERT	PIPE SIZE	LENGTH
DI 0507	35.30	33.05	15″	43′
CB 0506	37.09	32.83		
CB 0511	41.82	38.81	15″	107′
CB 0509	40.59	37.58		

DETAIL A
TOE PROTECTION

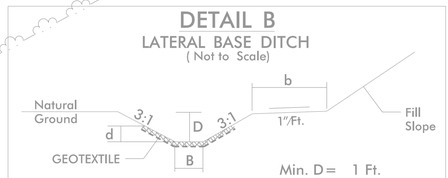


d = 1 Ft.
b = 2 Ft.

Type of Liner = CL. B Rip–Rap

FROM –L– STA. 21+00+/– TO STA. 21+70+/– LT
FROM –L– STA. 21+20+/– TO STA. 22+20+/– RT

DETAIL B
LATERAL BASE DITCH
(Not to Scale)



Min. D = 1 Ft.
Max. d = 1 Ft.
B = 2 Ft.
b = 5 Ft.

*When B is < 6.0′

Type of Liner = Class I Rip–Rap

FROM STA. 24+65+/– TO STA. 25+44+/– RT
34 TON CL I RIP–RAP
76 SY GEOTEXTILE
DDE = 32 CY

MATCHLINE –L– STA. 23+00.00
SEE SHEET UO-3

MATCHLINE –L– STA. 29+50.00
SEE SHEET UO-5

BEGIN CULVERT
–L– STA. 24+50+/–

END CULVERT
–L– STA. 24+70+/–

–L– STA. 28+30.16 =
–Y2– STA. 12+86.68

BEGIN CONSTRUCTION
–Y2– STA. 11+60.00

NC GRID
NAD 83 NA 2011

6 CHERIE T. BEVILL, et al
DB 2022 PG 518
MB 34 PG 99

7 ABBY MORTON
DB 735 PG 818
MB 6 PG 74

8 HENRY BROOKS, et ux
DB 1619 PG 345
MB 6 PG 74

9 RICHARD J. S
DB 33546
MB 6 PG

19 TOMMY GULLEDGE, et ux
DB 4284 PG 386
MB 6 PG 74

22 DAVID ROBINSON
DB 4236 PG 734
MB 6 PG 74

NORMAN E. ALLEN, et ux
DB 701PG 472
MB 6 PG 74

HANS MILLE
DB 785 P
MB 6 PG

TRAVIS M
DB 3599 P
MB 6 PG

LATERAL 2′ BASE DITCH
SEE DETAIL B

LATERAL 2′ BASE DITCH
SEE DETAIL D

SPECIAL CUT DITCH
SEE DETAIL C

NEW JOINT USE CENTURY LINK POLE & ANCHORS, REROUTE BURIED SERVICES TO NEW POLE

REMOVE JOEMC POLES

TELEPHONE TO REMAIN

REMOVE POWER

CATV REMAIN

TOP=41.10′
INV=33.05′

TOP=40.21′
INV=32.76′

TOP=39.72′
INV=32.37′

RETAIN

REMAIN ADJUST ANCHORING

NEW JONES-ONSLOW EMC BORE-SECONDARY POWER

REMAIN

EXISTING POWER TO REMAIN

CATV REMAIN

TELEPHONE TO REMAIN

ABANDON UG TV

REMOVE UG

PROP UG POWER CONDUIT

PROP 2@1"Ø SCH 40 PVC

11x17– 60 SCALE

30 15 0 30 60

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ADDED STORM DRAINAGE 7/6/17
ADDED DUKE PLANS 2/15/18
ADDED CHARTER & CENTURY LINK PLANS 5/23/18
7/5/18

PROJECT REFERENCE NO.	SHEET NO.
U-5878	UO-5

UTILITIES BY OTHERS

NOTE:
ALL PROPOSED UTILITY WORK SHOWN ON THIS SHEET WILL BE DONE BY OTHERS. NO PAYMENT WILL BE MADE TO THE CONTRACTOR FOR PROPOSED UTILITY WORK SHOWN ON THIS SHEET.

NAD 83 NC GRID NA 2011

NEW DUKE ENERGY JOINT USE POLES, REROUTE BURIED SERVICES AS NEEDED

-Y3- 20+00

TOP=43.07'
INV=35.17'

TOP=44.99'
INV=35.17'

-L- STA. 32+38.80 =
-Y3- STA. 17+13.54

MATCHLINE -L- STA. 29+50.00
SEE SHEET UO-4

MATCHLINE -Y3- STA. 15+00.00
SEE SHEET UO-6

END TIP PROJECT U-5878
-L- STA. 31+94.84

REMOVE

REMAIN

OVERHEAD POWER TO REMAIN

NEW CENTURY LINK BORE

EXISTING CATV TO REMAIN

EXISTING TELEPHONE TO REMAIN

Abandoned Raw Water Line

Abandoned Air Release Valve

DUKE 1F6L85
DUKE 1F4F63
DUKE 1F4F64
DUKE JHF96
DUKE JHF94
DUKE JHF95
DUKE JHK00

PROP O/H POW TEL & CATV
EXISTING R/W
POW TEL & CATV LINES
CATV CONN. UNDERGROUND
SIGNAL BOX

HELEN K. BASDEN, ET VIR
DB 1026 PG 750
MB 6 PG 74

COPPE, JR.
PG 972
74

UNITED PENTECOSTAL CHURCH OF JACKSONVILLE
DB 3578 PG 586
MB 6 PG 74

ARLINE K. COLLINS
DB 271 PG 426
DB 856 PG 283

BAILEY & FULLER PROPERTIES, LLC
DB 3466 PG 15
MB 60 PG 20

BAILEY & ASSOCIATES INC.
DB 3318 PG 460

JACKSONVILLE CITY LIMITS

JIMMY ROWE, et ux
DB 381 PG 646
MB 6 PG 74

DEPARTMENT OF TRANSPORTATION
DB 3578 PG 586
MB 6 PG 74

WILLIAM T. HUMPHREY, ET UX
DB 1322 PG 983

AREA UNDER CONSTRUCTION PER U-3810

NCDOT GREEN RD PAVEMENT VARIES

NCDOT PDE

STORM DRAINAGE

STR. NO.	TOP	INVERT	PIPE SIZE	LENGTH
DI 0516	42.25	40.00	15"	17'
CB 0515	42.86	39.86	15"	36'
CB 0513	42.62	39.62	15"	69'
CB 0511	41.82	38.81	15"	107'
CB 0509	40.59	37.58		

STR. NO.	TOP	INVERT	PIPE SIZE	LENGTH
DI 0512	41.20	38.95	15"	15'
CB 0511	41.82	38.81		
DI 0514	42.00	39.75	15"	22'
CB 0513	42.62	39.62		

30 15 0 30 60

11x17- 60 SCALE

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Consulting Engineers
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PROJECT REFERENCE NO.	SHEET NO.
U-5878	UO-6

UTILITIES BY OTHERS

NOTE:
ALL PROPOSED UTILITY WORK SHOWN ON THIS SHEET WILL BE DONE BY OTHERS. NO PAYMENT WILL BE MADE TO THE CONTRACTOR FOR PROPOSED UTILITY WORK SHOWN ON THIS SHEET.

NO UTILITIES BY OTHERS WORK ON THIS SHEET

MATCHLINE -Y3- STA. 15+00.00
SEE SHEET UO-5

END CONSTRUCTION
-Y3- 14+16.06

BEGIN CONSTRUCTION
-Y3- POT 11+13.27

EXISTING TELEPHONE TO REMAIN

EXISTING CATV TO REMAIN

EXISTING POWER TO REMAIN

TOP=45.12'
INV=39.12'

TOP=45.77'
INV=38.37'

TOP=45.36'
INV=37.66'

-Y3- 12+00

-Y3- 10+00

-Y3-

NC GRID
NAD 83 NA 2011

TRAVIS MCRAE
DB 3599 PG 691
MB 6 PG 74

EDGAR S. BANK-HEAD, ET UX
DB 604 PG 617
MB 6 PG 74

HELEN COLEMAN
DB 3571 PG 72
MB 6 PG 74

PHILLIP L. GURGANUS, ET UX
DB 1322 PG 812
MB 6 PG 74

TERRY L. TRENCHARD, ET UX
DB 1154 PG 565
MB 6 PG 74

JAMES E. WHITE JR.
DB 3139 PG 561
MB 6 PG 74

THOMAS G. COLLINS ET AL
DB 1340 PG 98

THOMAS GLENN COLLINS
DB 200 PG 80

CANDICE L. VAR HARRIS, ET VIR
DB 1272 PG 126

THEODORE SMITH
DB 4270 PG 625

JACKSONVILLE CITY LIMITS

SR 1406 PINEY GREEN RD

30 15 0 30 60

11x17- 60 SCALE

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Charlotte, North Carolina 704-357-0488
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PROJ. REFERENCE NO.	SHEET NO.
U-5878	X-1A

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CROSS-SECTION SUMMARY

NOTE: EMBANKMENT COLUMN INCLUDES BACKFILL FOR UNDERCUT

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

Station	Uncl. Exc.	Embt	Undercut
L	(cu. yd.)	(cu. yd.)	(cu. yd.)
18+50.00	0	0	0
18+75.00	4	40	12
19+00.00	4	40	12
19+50.00	4	89	12
20+00.00	7	83	0
20+50.00	7	192	0
21+00.00	0	594	0
21+50.00	0	1415	435
22+00.00	0	1815	642
22+50.00	0	1162	207
23+00.00	0	424	0
23+50.00	0	140	0
24+00.00	0	306	0
24+50.00	0	818	0
25+00.00	0	1143	0
25+50.00	0	964	0
26+00.00	0	550	46
26+25.00	4	166	60
26+50.00	11	148	86
27+00.00	76	260	206
27+50.00	113	251	220
28+00.00	123	213	183
28+50.00	110	189	156
29+00.00	45	224	172

Station	Uncl. Exc.	Embt	Undercut
Y2	(cu. yd.)	(cu. yd.)	(cu. yd.)
11+60.00	0	0	0
12+00.00	4	7	0
12+50.00	6	41	0
12+74.68	2	35	0

Station	Uncl. Exc.	Embt	Undercut
Y3	(cu. yd.)	(cu. yd.)	(cu. yd.)
11+13.27	0	0	0
11+50.00	7	0	0
12+00.00	24	1	0
12+50.00	33	1	0
13+00.00	38	0	0
13+50.00	40	0	0
14+00.00	37	0	0
14+16.06	11	0	0

Station	Uncl. Exc.	Embt	Undercut
L (LT)	(cu. yd.)	(cu. yd.)	(cu. yd.)
12+47.75	0	0	0
12+50.00	0	0	0
13+00.00	11	9	11
13+50.00	9	11	11
14+00.00	6	19	11
14+50.00	6	24	11
15+00.00	7	17	11
15+50.00	9	9	11
16+00.00	9	9	11
16+50.00	7	24	11
17+00.00	7	26	11
17+50.00	7	25	12
18+00.00	6	36	12
18+50.00	5	35	11

Station	Uncl. Exc.	Embt	Undercut
L (LT)	(cu. yd.)	(cu. yd.)	(cu. yd.)
29+00.00	0	0	0
29+50.00	23	12	18
30+00.00	30	6	35
30+50.00	12	18	30
31+00.00	2	25	27
31+50.00	2	26	28
31+94.84	1	11	12

Station	Uncl. Exc.	Embt	Undercut
L (RT)	(cu. yd.)	(cu. yd.)	(cu. yd.)
12+47.75	0	0	0
12+50.00	0	0	0
13+00.00	11	11	11
13+50.00	11	9	12
14+00.00	8	15	13
14+50.00	6	24	13
15+00.00	6	24	13
15+50.00	6	23	13
16+00.00	6	24	12
16+50.00	7	27	12
17+00.00	8	18	13
17+50.00	7	19	14
18+00.00	5	36	14
18+50.00	4	43	13

Station	Uncl. Exc.	Embt	Undercut
L (RT)	(cu. yd.)	(cu. yd.)	(cu. yd.)
29+00.00	0	0	0
29+50.00	2	42	6
30+00.00	2	40	11
30+50.00	3	44	11
31+00.00	3	40	11
31+50.00	4	28	11
31+94.84	3	13	5

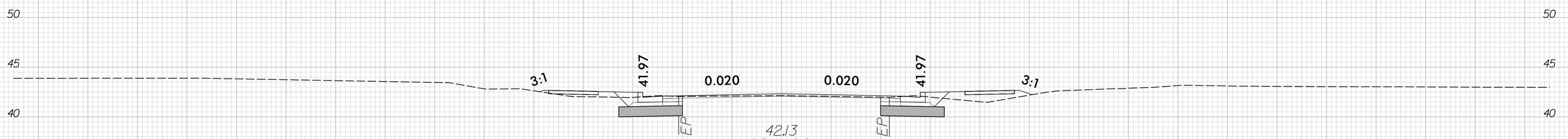
DocuSign Envelope ID: 96F5E234-EA90-4791-BE14-55EFA86FE173

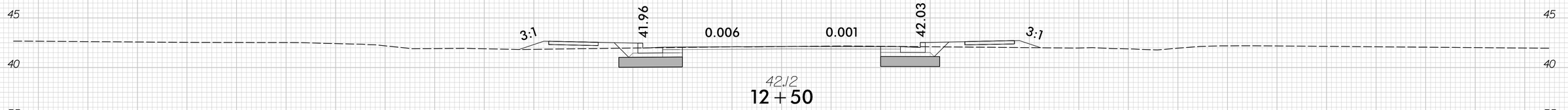
6/23/16

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	U-5878	X-1

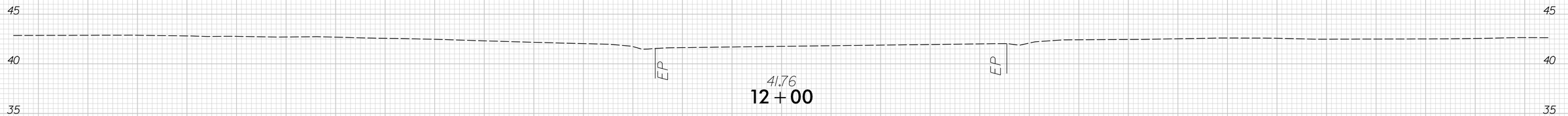
Note: "Quantities are approximate only. The Resident Engineer will re–cross–section the work accurately when the project is staked out. These cross–section notes will be used in computing the final quantities for which the contractor will be paid."

SHALLOW UNDERCUT EXCAVATION

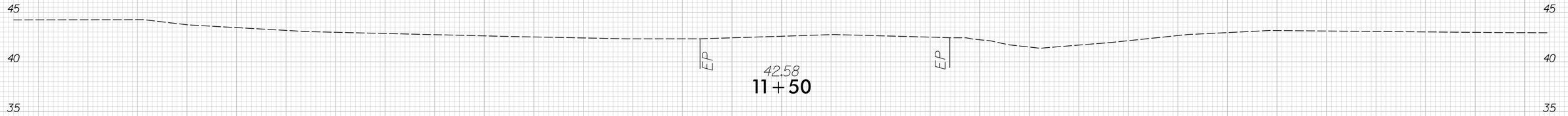




BEGIN SHALLOW UNDERCUT –L– STA. 12+48.00



BEGIN CITY PROJECT –L– STA. 11+80.00



–L–

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Mcredmond

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

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6/23/16

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	U-5878	X-2

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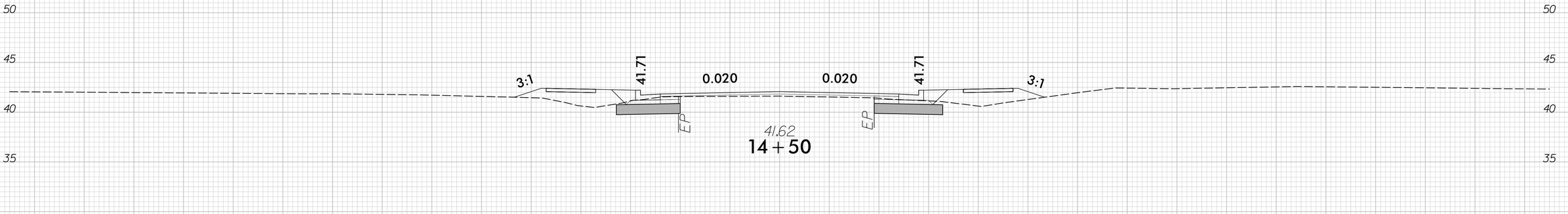
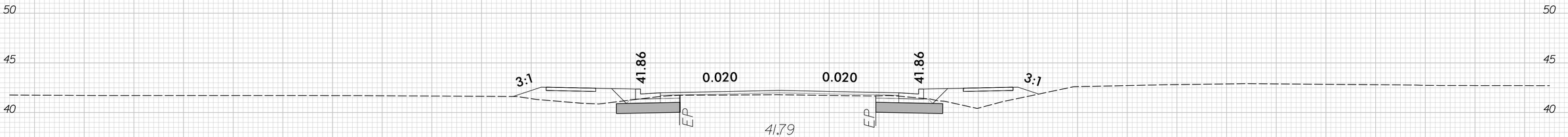
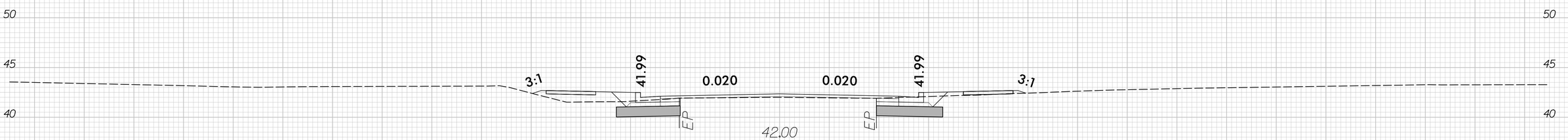
SHALLOW UNDERCUT EXCAVATION







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MicroStation

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6/23/16

0 2.5 5

PROJ. REFERENCE NO.	SHEET NO.
U-5878	X-3

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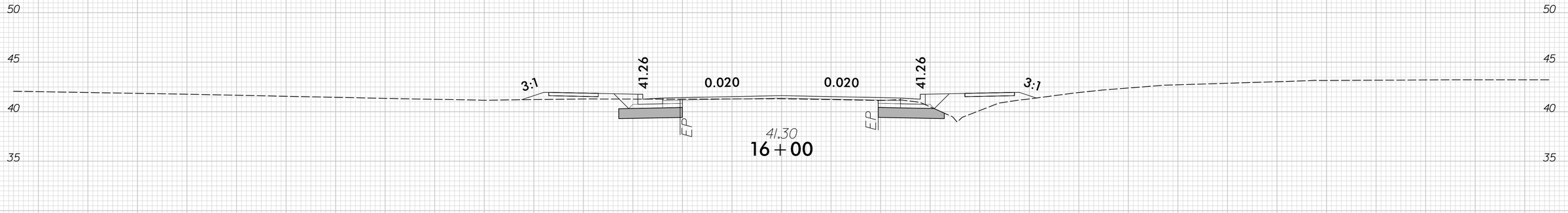
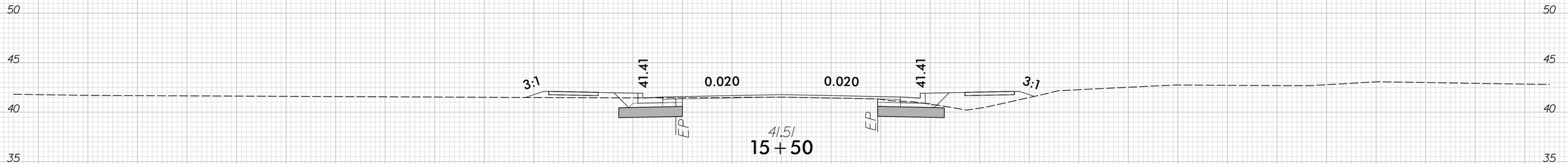
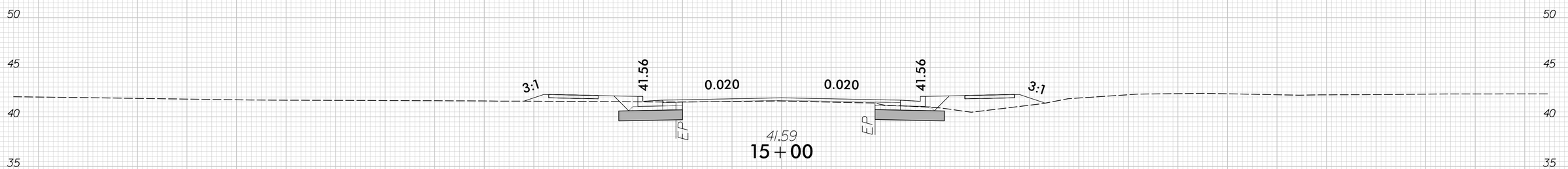
SHALLOW UNDERCUT EXCAVATION







—L—

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Morelli

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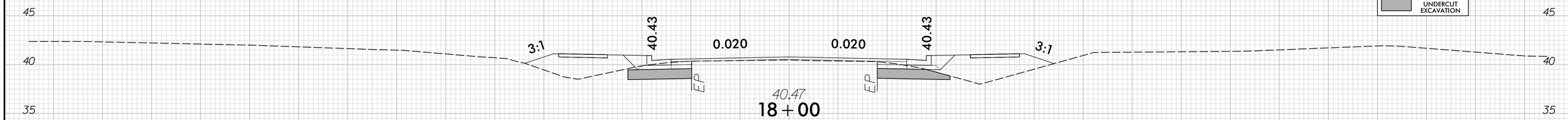
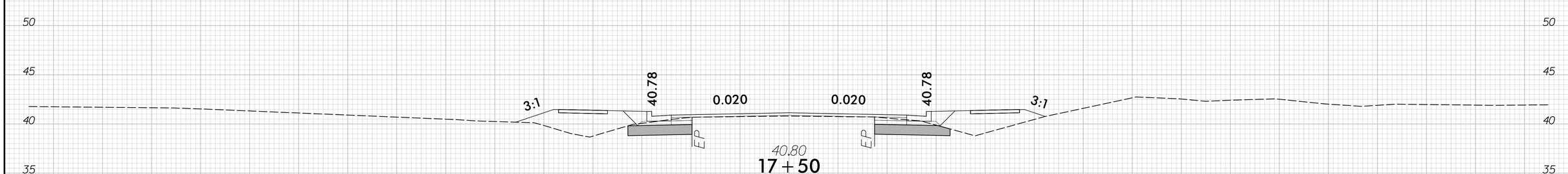
6/23/16

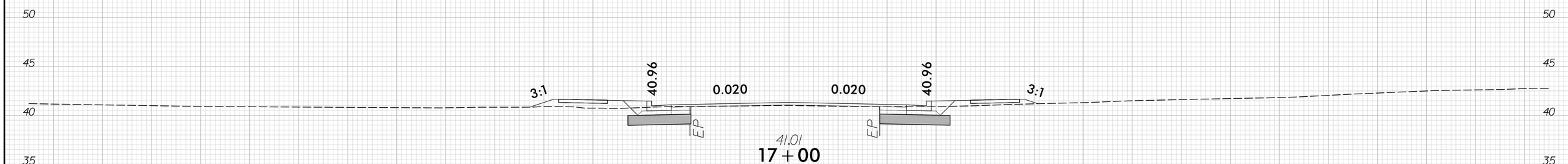
PROJ. REFERENCE NO.	SHEET NO.
U-5878	X-4

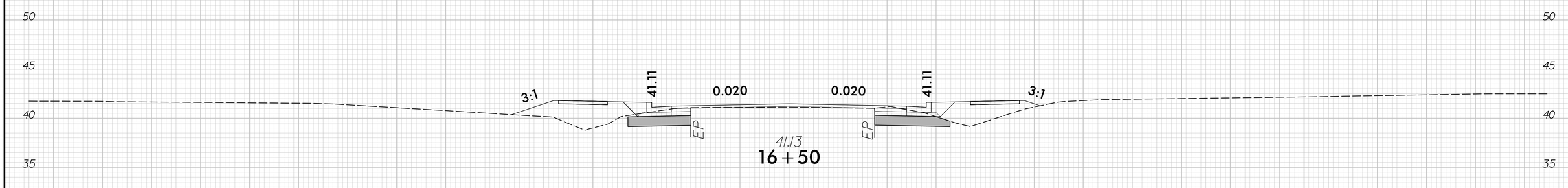
0 2.5 5

SHALLOW UNDERCUT EXCAVATION









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6/23/16

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	U-5878	X-5

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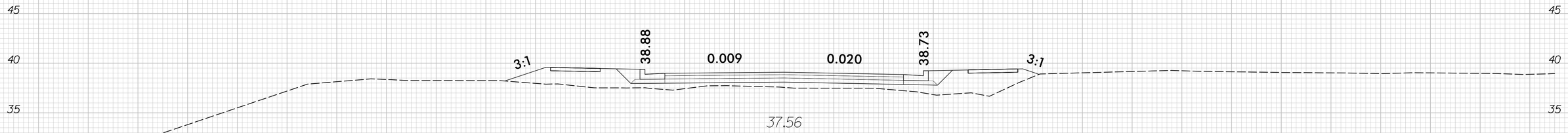
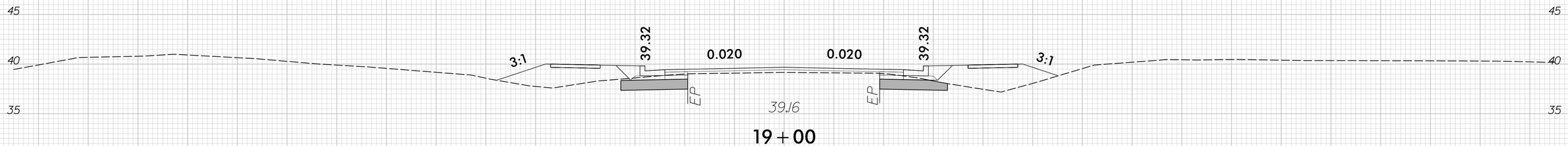
SHALLOW UNDERCUT EXCAVATION

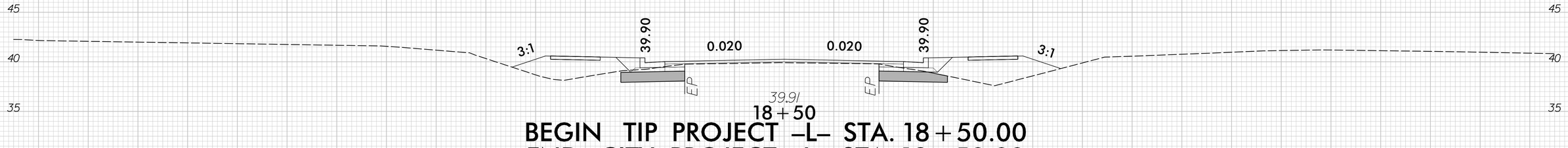


19 + 50

END SHALLOW UNDERCUT –L– 19 + 28.00



19 + 00



18 + 50

BEGIN TIP PROJECT –L– STA. 18 + 50.00
END CITY PROJECT –L– STA. 18 + 50.00

–L–

10/7/2021
R. Rackley
Moore

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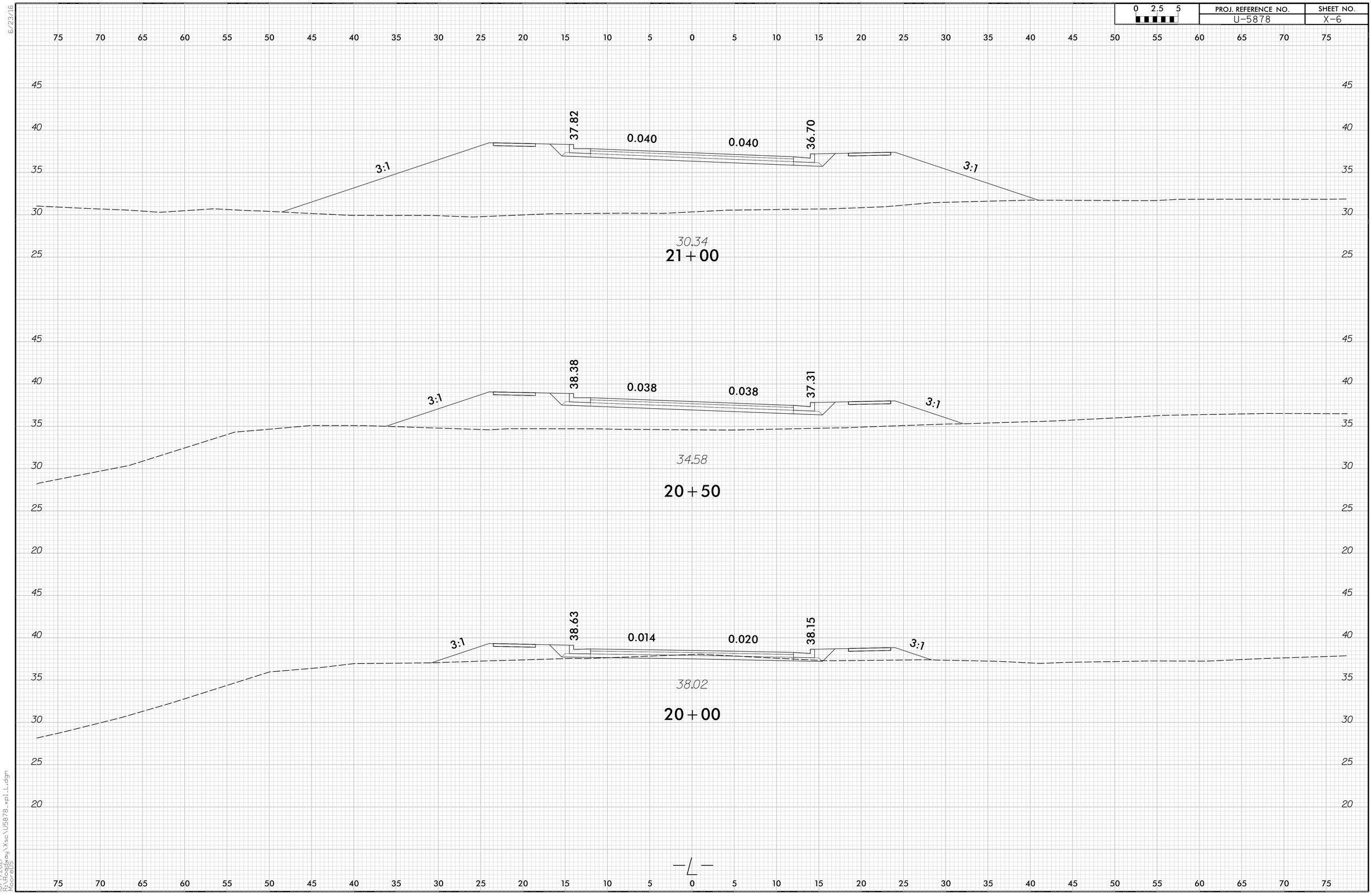
6/23/16

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	U-5878	X-6



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6/23/16

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	U-5878	X-7

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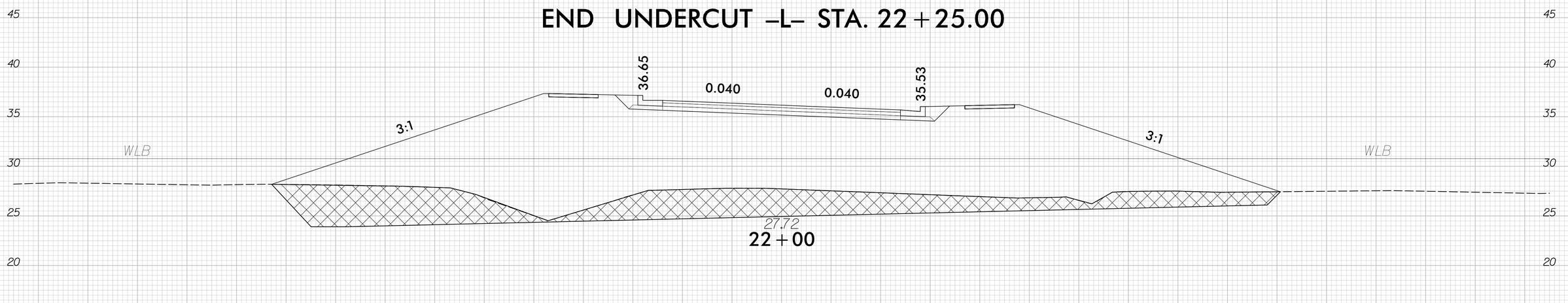
UNDERCUT EXCAVATION

END UNDERCUT –L– STA. 22+25.00



22+00

21+50

BEGIN UNDERCUT –L– STA. 21+01.00

–L–

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

11/1/2021
Plan View \Xsc \U5878_xp1_L.dgn
MicroStation

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6/23/16

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	U-5878	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

40 35 30 25

3:1 34.69 0.011 0.020 34.25 3:1

33.40

23+50

40 35 30 25

3:1 35.43 0.036 0.036 34.42 3:1

33.22

23+00

45 40 35 30 25 20

3:1 36.07 0.040 0.040 34.95 3:1 WLB

30.41

22+50

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

10/7/2021
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Moore, Ed

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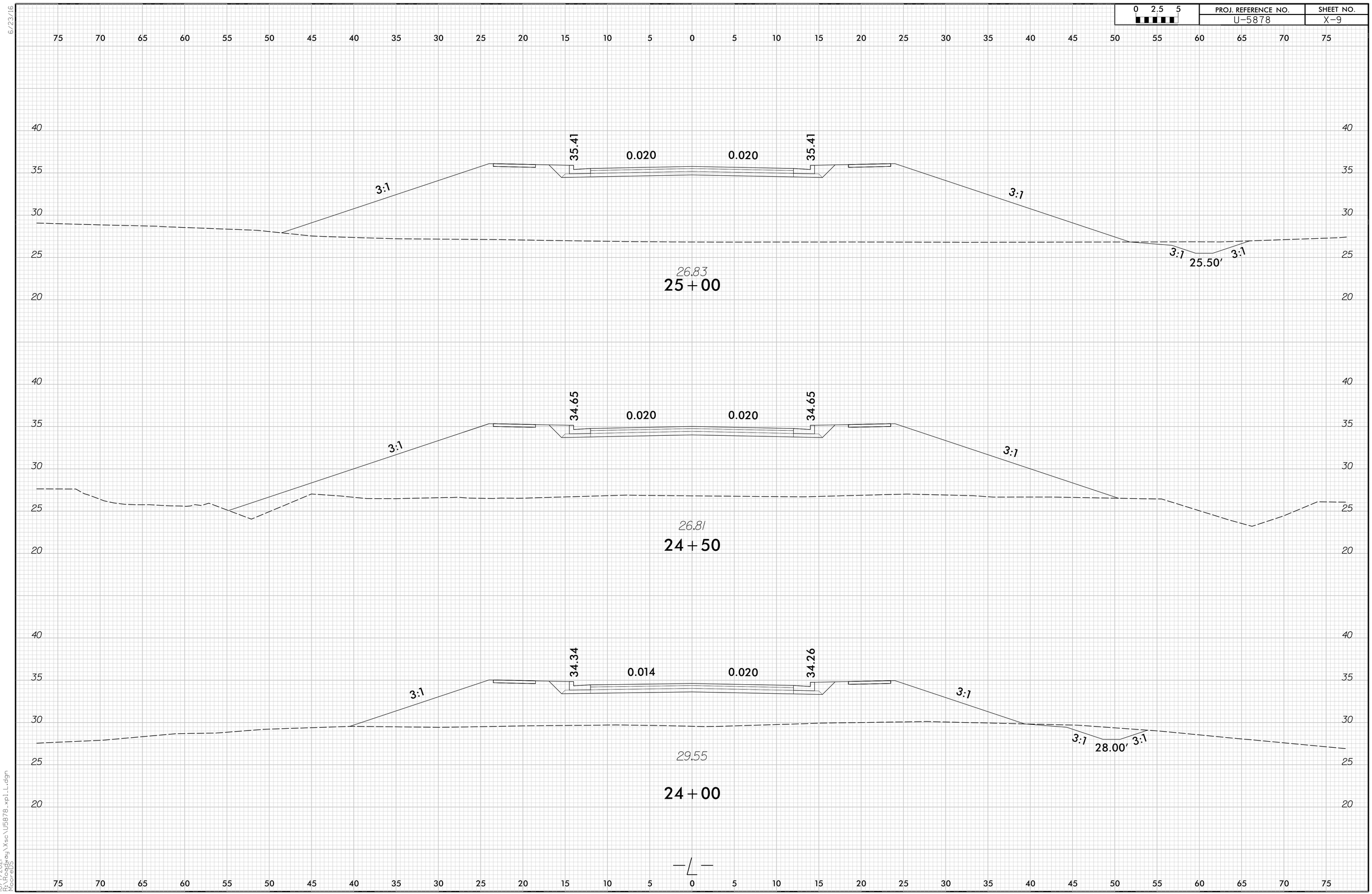
6/23/16

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	U-5878	X-9



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Moore, Ben

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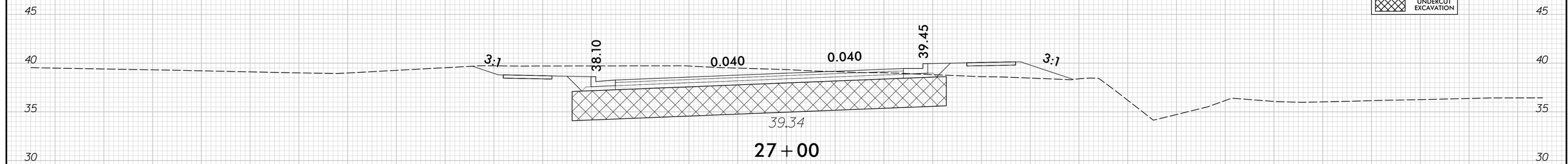
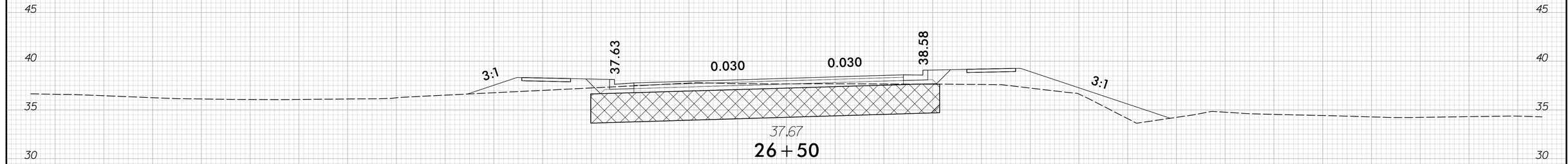
6/23/16

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	U-5878	X-10

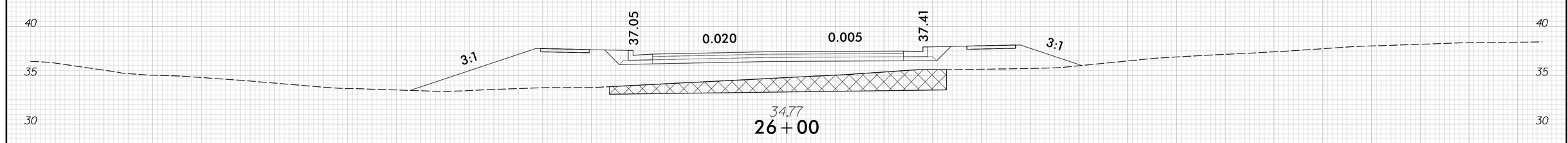
UNDERCUT EXCAVATION



27 + 00

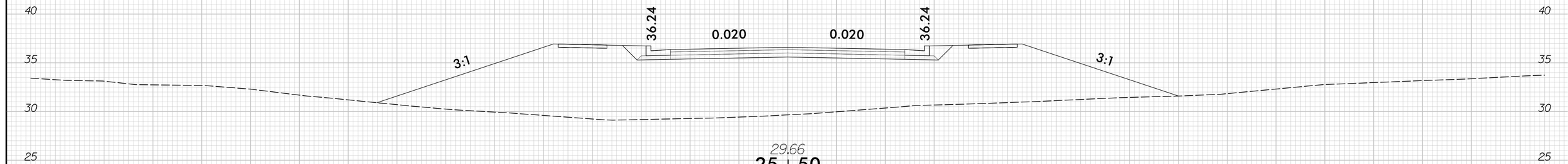


26 + 50



26 + 00

BEGIN UNDERCUT –L– STA. 25 + 75.00



25 + 50

–L–

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Morris

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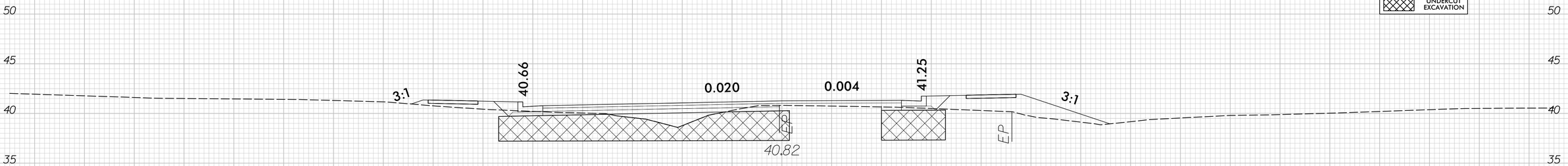
6/23/16

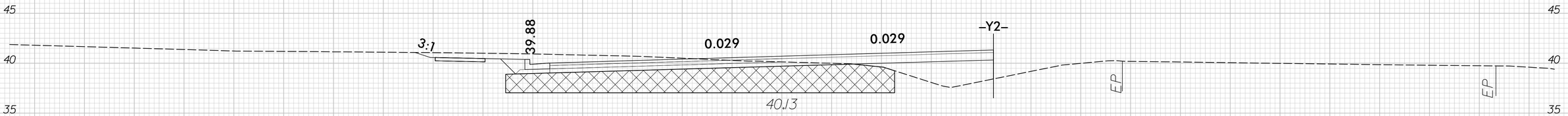
0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	U-5878	X-11

END UNDERCUT –L– STA. 29+40.00

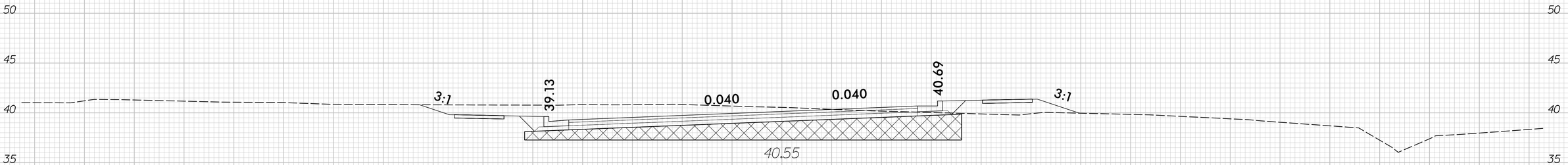
UNDERCUT EXCAVATION



29+00



28+50



28+00

27+50

–L–

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Moore, Bill

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6/23/16

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	U-5878	X-12

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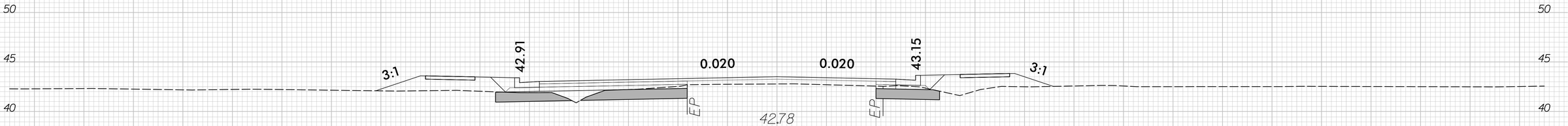
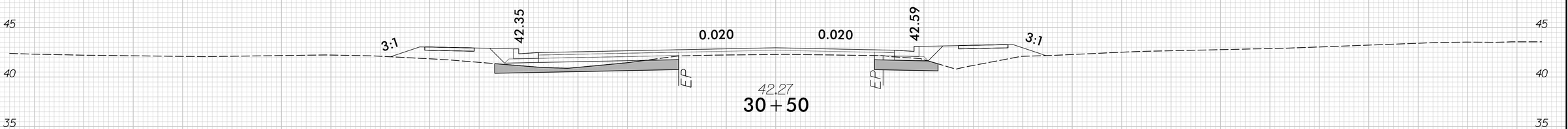
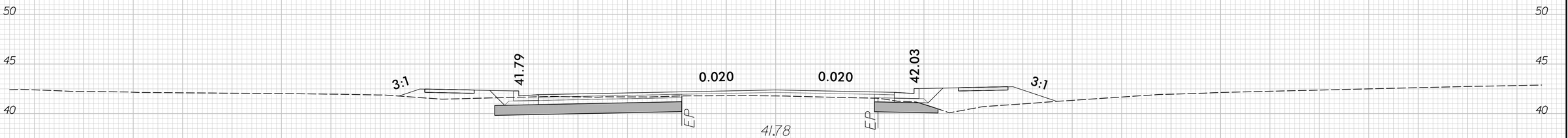
SHALLOW UNDERCUT EXCAVATION



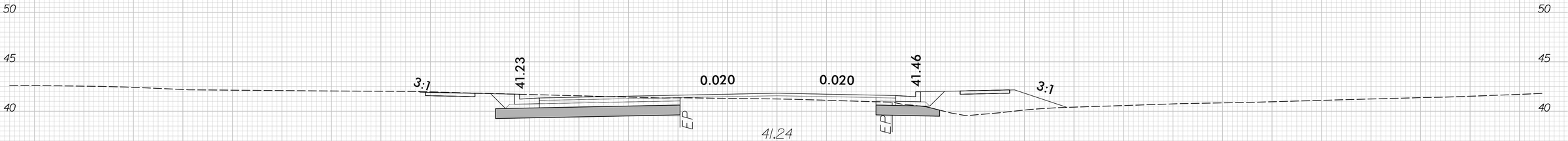
42.78
31 + 00



42.27
30 + 50



41.78
30 + 00



41.24
29 + 50

BEGIN SHALLOW UNDERCUT –L– STA. 29 + 40.00

–L–

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

10/7/2021
R. Rodney
Morrison

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0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	U-5878	X-13

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SHALLOW UNDERCUT EXCAVATION

45
40
50
45
40
35

EP

44.71
32+00

END TIP PROJECT –L– STA. 31+94.84
END SHALLOW UNDERCUT –L– STA. 31+94.00

3:1 43.47 0.020 0.018 43.74 3:1

EP EP

43.55
31+50

–L–

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

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Moore, Eric

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6/23/16

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	U-5878	X-14

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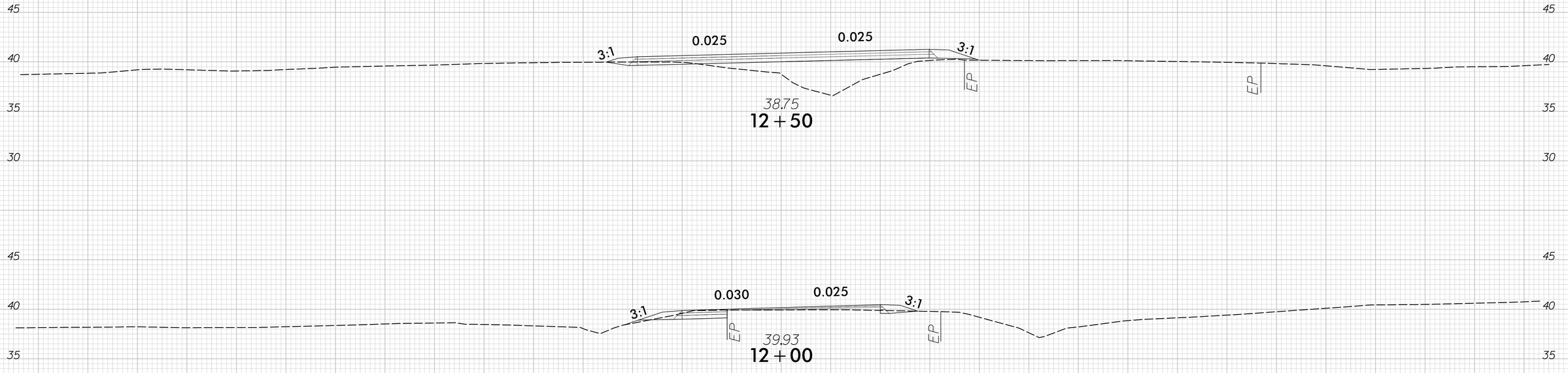

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10/7/2021
R. Rodney
Moore

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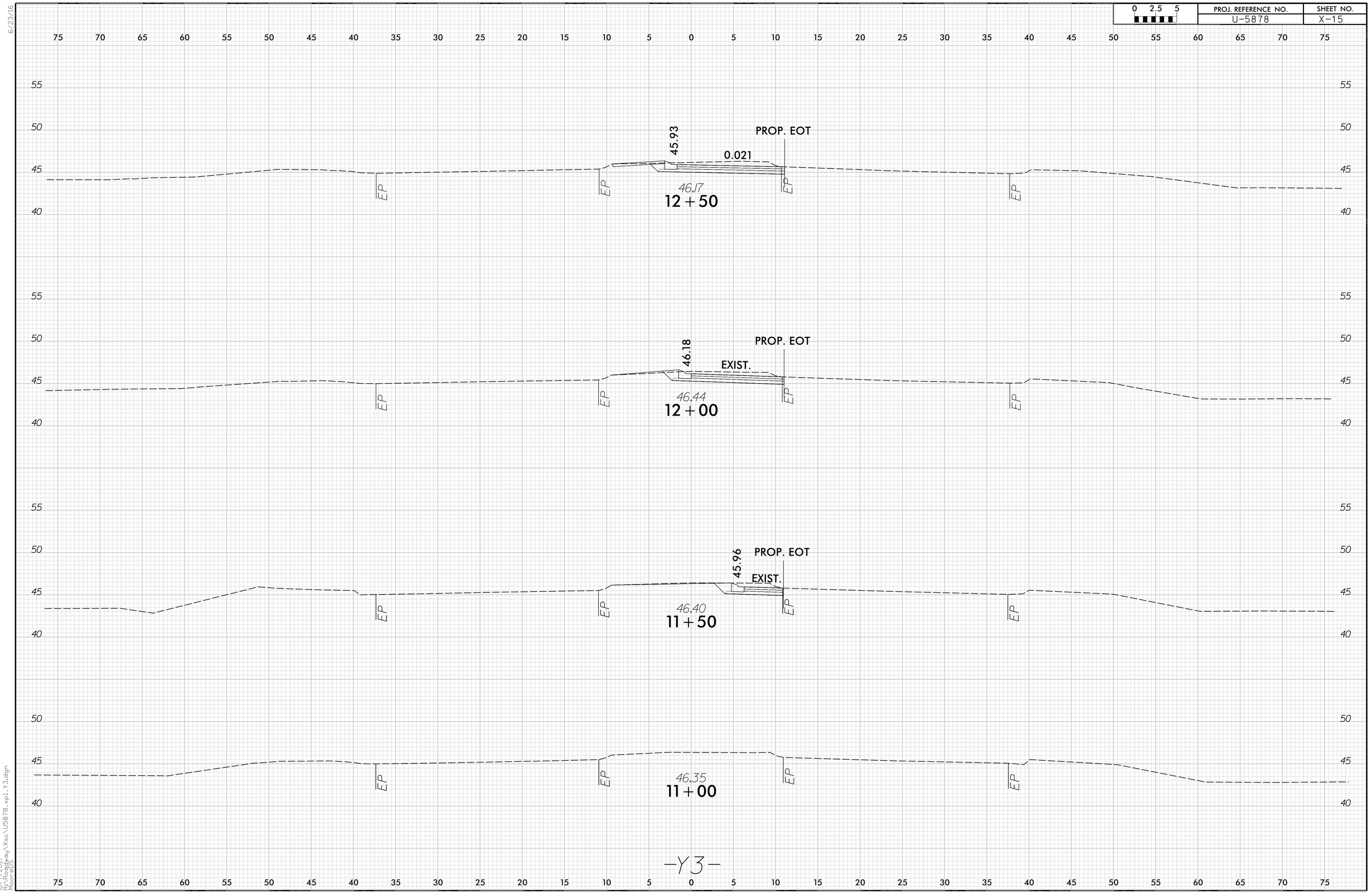
0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	U-5878	X-15



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Moore, Ryan

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6/23/16

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	U-5878	X-16

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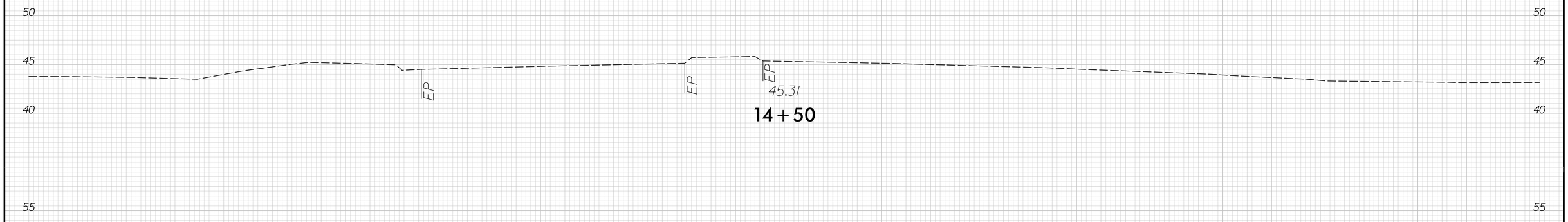

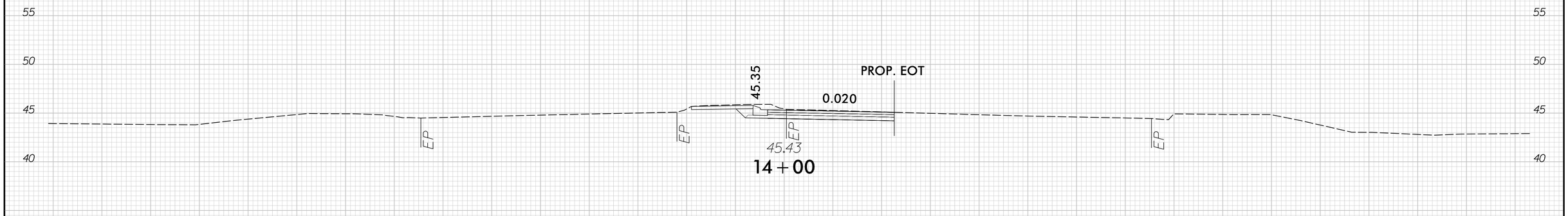

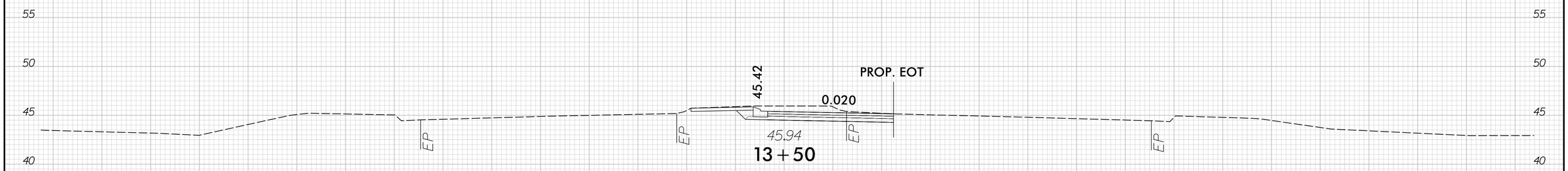

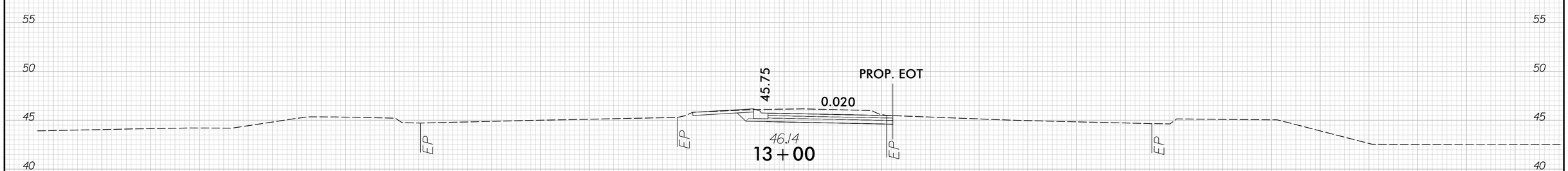

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Morelli

DocuSign Envelope ID: 59F1B6FA-292C-4008-81EE-8B6FA65C69B0

TIP PROJECT: U-5878

CONTRACT: DC00185

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-5878	1	

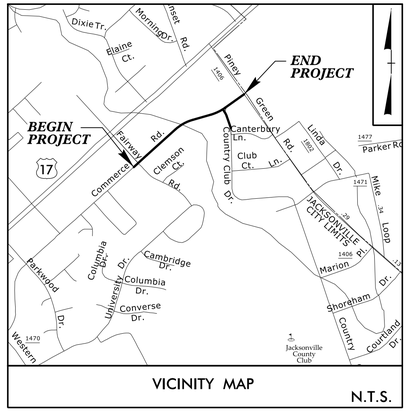
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
44694.1.1	N/A	P.E.
44694.2.1	N/A	ROW & UTIL
44694.3.1	N/A	CONSTRUCTION

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

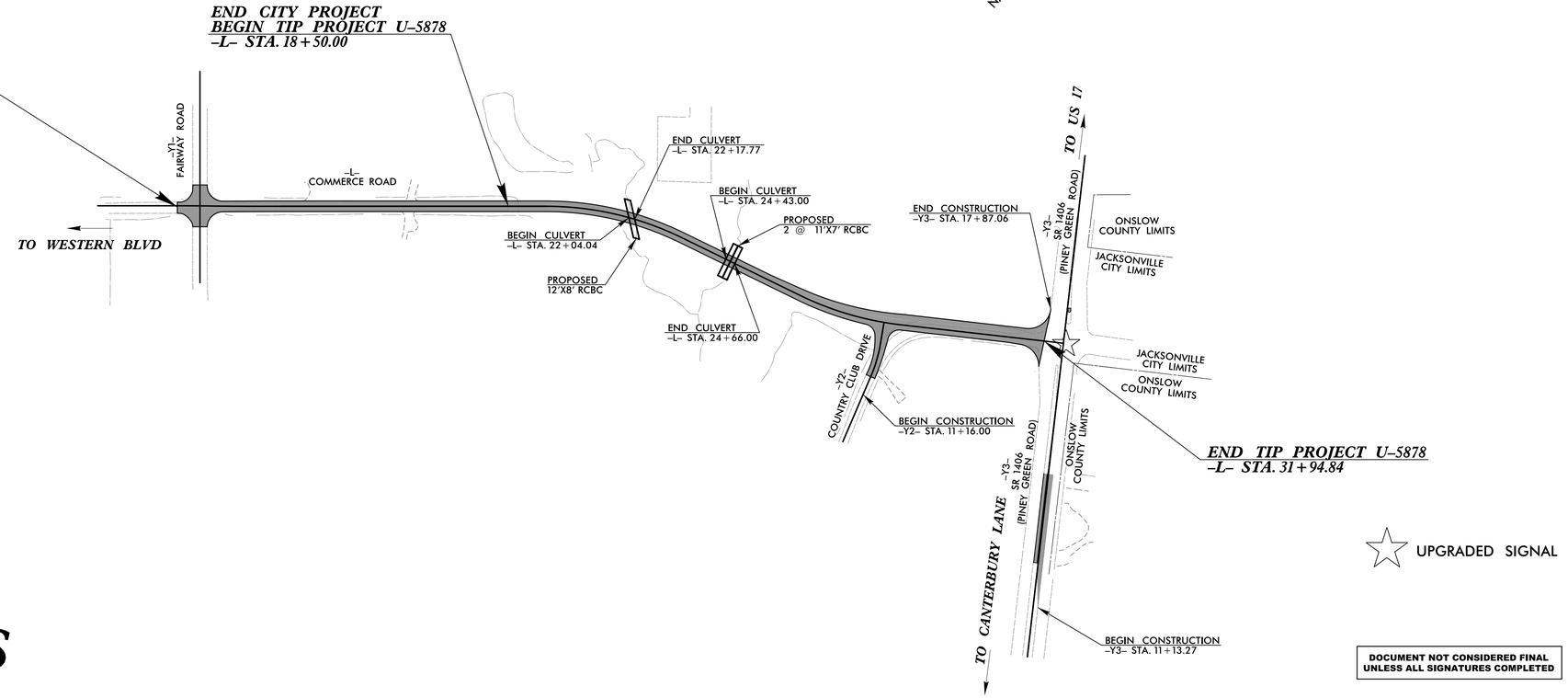
ONSLOW COUNTY

LOCATION: EXTENSION OF COMMERCE ROAD FROM FAIRWAY ROAD TO PINEY GREEN ROAD (SR 1406) AT COUNTRY CLUB DRIVE

TYPE OF WORK: GRADING, PAVING, DRAINAGE & CULVERTS



100% Plans



STRUCTURES

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DESIGN DATA

ADT 2021 = 1,900
ADT 2041 = 7,900
K = 9
T = 4%
V = 30 MPH

* TTST=1%, DUALS=3%

FUNC. CLASSIFICATION: MAJOR COLLECTOR

PROJECT LENGTH

LENGTH OF CITY PROJECT = 0.127 MILES

LENGTH OF ROADWAY TIP PROJECT U-5878 = 0.251 MILES

LENGTH OF STRUCTURE TIP PROJECT U-5878 = 0.004 MILES

TOTAL LENGTH OF TIP PROJECT U-5878 = 0.255 MILES

NCDOT CONTACT: BRIAN HARDING
NCDOT DIVISION 3

PLANS PREPARED FOR THE NCDOT BY:
STV ENGINEERS, INC.
1600 Perimeter Park Dr., Suite 225, Morrisville, NC 27560
NC License Number F-0991

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
AUGUST 7, 2018

LETTING DATE:
JUNE 30, 2022

JASON T. GRISCOM, PE
PROJECT ENGINEER

CYNTHIA LI, EI
PROJECT DESIGN ENGINEER

STRUCTURAL ENGINEER

DocuSigned by:
Jason Griscom
E4ACDE41C4A8A...

NORTH CAROLINA PROFESSIONAL SEAL 029429 ENGINEER JASON T. GRISCOM
5/31/2022

P.E.

SIGNATURE:

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

5/31/2022
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melvinle

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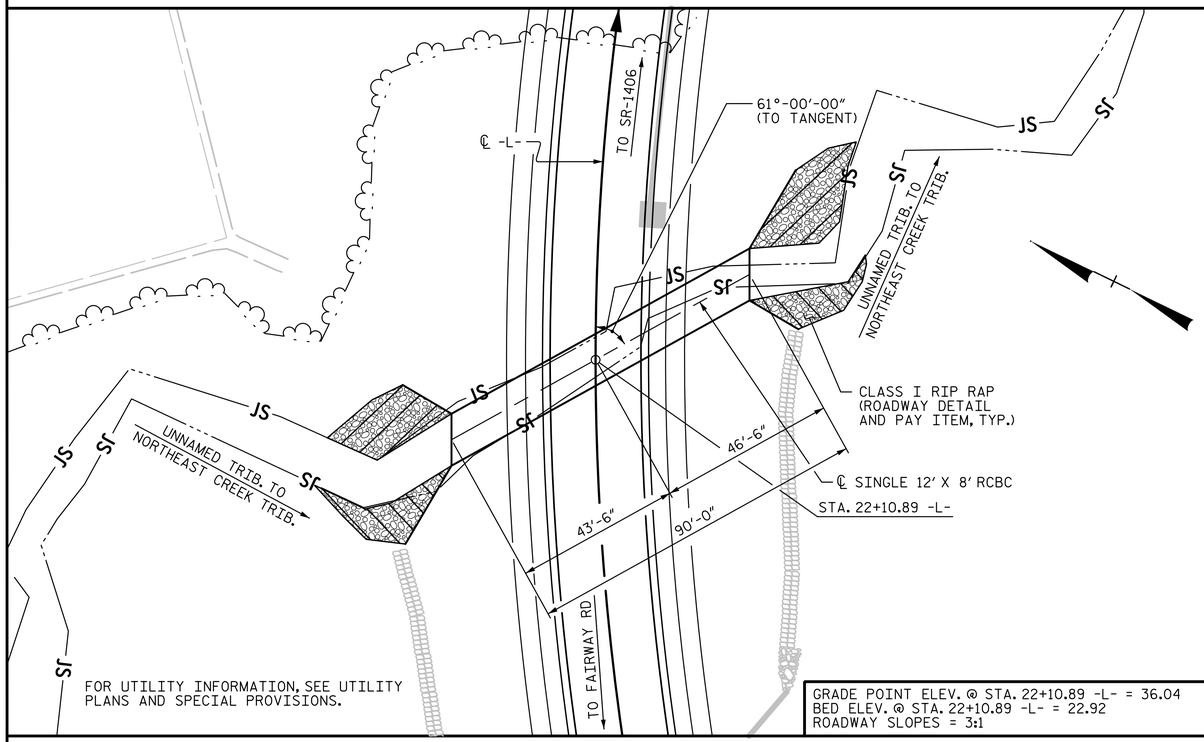
BENCHMARK BM#1: RR SPIKE SET IN 18"HARDWOOD, STA. 22+11 -L-, 269' RT., N=380058 E=2486490, EL. 36.86



GRADE POINT ELEV. @ STA. 22+10.89 -L- = 36.04
BED ELEV. @ STA. 22+10.89 -L- = 22.92
ROADWAY SLOPES = 3:1

LOCATION SKETCH

NOTES:

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

DESIGN FILL = 4.84' MIN. AND 5.89' MAX.

FOR OTHER DESIGN DATA AND NOTES SEE STANDARD NOTE SHEET.

3"Ø WEEP HOLES INDICATED TO BE IN ACCORDANCE WITH THE SPECIFICATIONS.

CONCRETE IN CULVERT TO BE POURED IN THE FOLLOWING ORDER:
1. WING FOOTINGS AND FLOOR SLAB INCLUDING 4" OF ALL VERTICAL WALLS.
2. THE REMAINING PORTIONS OF THE WALLS AND WINGS FULL HEIGHT FOLLOWED BY THE SILLS, BAFFLES, ROOF SLAB AND HEADWALLS.

THE RESIDENT ENGINEER SHALL CHECK THE LENGTH OF CULVERT BEFORE STAKING IT OUT TO MAKE CERTAIN THAT IT WILL PROPERLY TAKE CARE OF THE FILL.

DIMENSIONS FOR WING LAYOUT AS WELL AS ADDITIONAL REINFORCING STEEL EMBEDDED IN BARREL ARE SHOWN ON WING SHEET.

TRANSVERSE CONSTRUCTION JOINTS SHALL BE USED IN THE BARREL, SPACED TO LIMIT THE POURS TO A MAXIMUM OF 70 FEET. LOCATION OF JOINTS SHALL BE SUBJECT TO APPROVAL OF THE ENGINEER.

AT THE CONTRACTOR'S OPTION, HE MAY SPLICE THE VERTICAL REINFORCING STEEL IN THE INTERIOR FACE OF EXTERIOR WALL ABOVE LOWER WALL CONSTRUCTION JOINT. THE SPLICE LENGTH SHALL BE 1'-10"FOR THE #4 BARS. EXTRA WEIGHT OF STEEL DUE TO THE SPLICES SHALL BE PAID FOR BY THE CONTRACTOR.

FOR CULVERT DIVERSION DETAILS AND PAY ITEM, SEE EROSION CONTROL PLANS.

A 3 FOOT STRIP OF FILTER FABRIC SHALL BE ATTACHED TO THE FILL FACE OF THE WING COVERING THE ENTIRE LENGTH OF THE EXPANSION JOINT.

NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE STREAM BED AT THE PROJECT SITE DURING CULVERT CONSTRUCTION. NATIVE MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT CONDITIONS. PAYMENT FOR PLACEMENT OF NATIVE MATERIAL IN THE BARREL, WHICH INCLUDES BUT IS NOT LIMITED TO PLACING NATIVE MATERIAL IN THE BARREL AND ALL TOOLS, EQUIPMENT, AND LABOR NECESSARY SHALL BE INCLUDED IN THE LUMP SUM PRICE BID FOR "CULVERT EXCAVATION @ STA. 22+10.89 -L-".

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

HYDRAULIC DATA

DESIGN DISCHARGE	=	490	CFS
FREQUENCY OF DESIGN FLOOD	=	25	YRS.
DESIGN HIGH WATER ELEVATION	=	30.8	
DRAINAGE AREA	=	0.79	SQ. MI.
BASE DISCHARGE (Q100)	=	600	CFS
BASE HIGH WATER ELEVATION	=	32.0	

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	=	842	CFS
FREQUENCY OF OVERTOPPING FLOOD	=	>500	YRS.
OVERTOPPING FLOOD ELEVATION	=	35.1	

OVERTOPS LEFT SHOULDER @ STA. 24+00± -L-

-L- CURVE DATA

P.I. STA. = 21+75.99 -L-
Δ = 26°-00'-15.0"(RT)
D = 8°-11'-06.4"
R = 700'
T = 161.63'
L = 317.70'

TOTAL STRUCTURE QUANTITIES

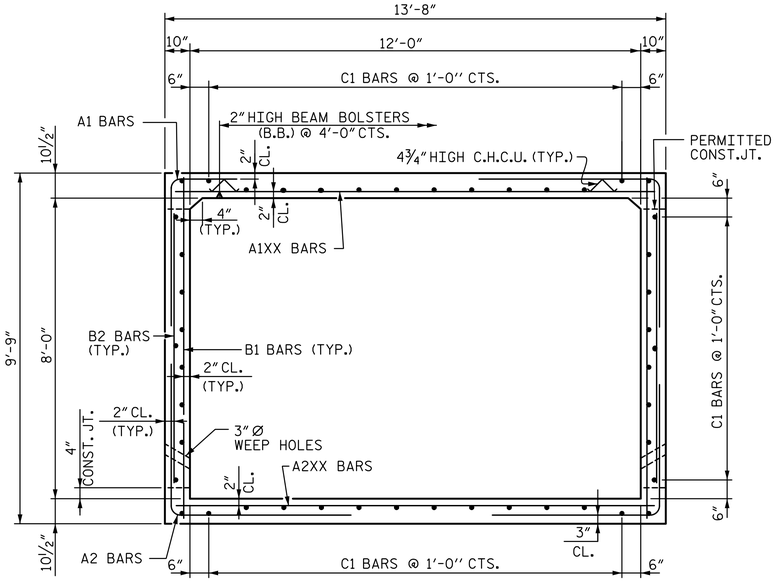
CULVERT EXCAVATION @ STA. 22+10.89 -L-	LUMP SUM
FOUNDATION CONDITIONING MATERIAL, BOX CULVERT	112 TONS

CLASS A CONCRETE

BARREL @ 1.384 CU.YDS./FT.	124.6 CU.YDS.
WINGS, ETC.	39.1 CU.YDS.
TOTAL	163.7 CU.YDS.

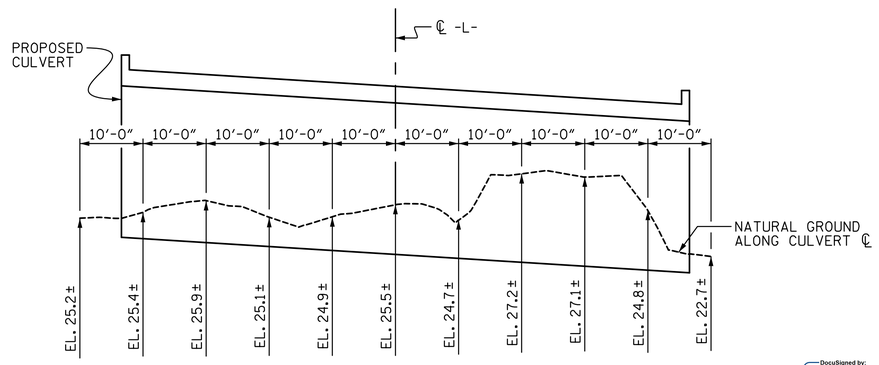
REINFORCING STEEL

BARREL	19,630 LBS.
WINGS, ETC.	2,322 LBS.
TOTAL	21,952 LBS.



RIGHT ANGLE SECTION OF BARREL

THERE ARE 46 "C" BARS IN SECTION OF BARREL.
MINIMUM SPLICE LENGTH FOR "C" BARS IS 1'-10".



PROFILE ALONG ℄ CULVERT

DocuSigned by:
Jason Grissom
E4ACDE421F244BA...

NORTH CAROLINA PROFESSIONAL SEAL 029429 ENGINEER JASON T. GRISSOM
10/12/2021

STV 100 Years
STV ENGINEERS, INC.
900 West Trade St., Suite 715
Charlotte, NC 28202
NC License Number F-0991

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PROJECT NO. U-5878
ONSLOW COUNTY
STATION: 22+11.00 -L-

SHEET 1 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SINGLE 12'-0"X 8'-0"
CONCRETE BOX CULVERT
ON COMMERCE ROAD BETWEEN
FAIRWAY RD. AND SR 1406

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C1-1
1			3			TOTAL SHEETS
2			4			10

DRAWN BY :	CL	DATE : 6-18
CHECKED BY :	JAD	DATE : 7-18
DESIGN ENGINEER OF RECORD :	JTG	DATE : 9-18

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LOAD AND RESISTANCE FACTOR RATING (LRFR) SUMMARY FOR REINFORCED CONCRETE BOX CULVERTS

LEVEL		VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING (#)	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE									COMMENT NUMBER
							LIVE-LOAD FACTORS (γ_{LL})	MOMENT				SHEAR				
								RATING FACTOR	BOX NO.	ELEMENT TYPE	DISTANCE FROM LEFT END OF ELEMENT (ft)	RATING FACTOR	BOX NO.	ELEMENT TYPE	DISTANCE FROM LEFT END OF ELEMENT (ft)	
DESIGN LOAD RATING		HL-93 (INVENTORY)	N/A	1	1.04	--	1.75	1.04	1	TOP SLAB	6.83′	1.62	1	BOTTOM SLAB	1.46′	
		HL-93 (OPERATING)	N/A		1.35	--	1.35	1.35	1	TOP SLAB	6.83′	2.10	1	BOTTOM SLAB	1.46′	
		HS-20 (INVENTORY)	36.000	2	1.20	43.200	1.75	1.20	1	TOP SLAB	6.83′	2.23	1	TOP SLAB	1.58′	
		HS-20 (OPERATING)	36.000		1.55	55.800	1.35	1.55	1	TOP SLAB	6.83′	2.89	1	TOP SLAB	1.58′	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		2.17	29.295	1.40	2.17	1	TOP SLAB	6.83′	4.06	1	TOP SLAB	1.58′	
		SNGARBS2	20.000		2.04	40.800	1.40	2.04	1	TOP SLAB	6.83′	3.80	1	TOP SLAB	1.58′	
		SNAGRIS2	22.000		2.17	47.740	1.40	2.17	1	TOP SLAB	6.83′	4.06	1	TOP SLAB	1.58′	
		SNCOTTS3	27.250	3	1.30	35.425	1.40	1.30	1	TOP SLAB	6.83′	2.02	1	BOTTOM SLAB	1.46′	
		SNAGGRS4	34.925		1.43	49.943	1.40	1.43	1	TOP SLAB	6.83′	2.04	1	BOTTOM SLAB	12.20′	
		SNS5A	35.550		1.58	56.169	1.40	1.58	1	TOP SLAB	6.83′	2.35	1	BOTTOM SLAB	1.46′	
		SNS6A	39.950		1.41	56.330	1.40	1.41	1	TOP SLAB	6.83′	1.91	1	BOTTOM SLAB	12.20′	
		SNS7B	42.000		1.39	58.380	1.40	1.39	1	TOP SLAB	6.83′	1.88	1	BOTTOM SLAB	12.20′	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		2.17	71.610	1.40	2.17	1	TOP SLAB	6.83′	2.89	1	BOTTOM SLAB	1.46′	
		TNT4A	33.075		1.55	51.266	1.40	1.55	1	TOP SLAB	6.83′	2.41	1	BOTTOM SLAB	1.46′	
		TNT6A	41.600		1.43	59.488	1.40	1.43	1	TOP SLAB	6.83′	2.12	1	BOTTOM SLAB	1.46′	
		TNT7A	42.000		1.49	62.580	1.40	1.49	1	TOP SLAB	6.83′	2.26	1	BOTTOM SLAB	1.46′	
		TNT7B	42.000		1.43	60.060	1.40	1.43	1	TOP SLAB	6.83′	2.05	1	BOTTOM SLAB	1.46′	
		TNAGRIT4	43.000		1.55	66.650	1.40	1.55	1	TOP SLAB	6.83′	2.41	1	BOTTOM SLAB	1.46′	
		TNAGT5A	45.000		1.55	69.750	1.40	1.55	1	TOP SLAB	6.83′	2.41	1	BOTTOM SLAB	1.46′	
		TNAGT5B	45.000		1.55	69.750	1.40	1.55	1	TOP SLAB	6.83′	2.41	1	BOTTOM SLAB	1.46′	

LOAD FACTORS:

DESIGN LOAD RATING FACTORS

LOAD TYPE	MAX FACTOR	MIN FACTOR
DC	1.25	0.90
DW	1.50	0.65
EV	1.30	0.90
EH	1.35	0.90
ES	1.35	0.90
LS	1.75	--
WA	1.00	--

NOTE:

RATING FACTORS ARE BASED ON THE STRENGTH I LIMIT STATE.

COMMENTS:

1.
2.
3.
4.

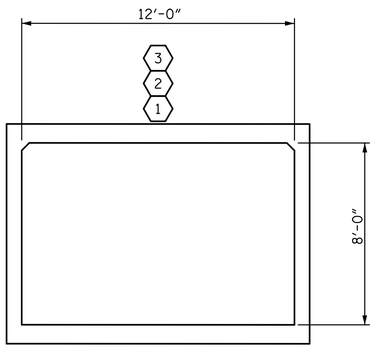
(#) CONTROLLING LOAD RATING

(1) DESIGN LOAD RATING (HL-93)

(2) DESIGN LOAD RATING (HS-20)

(3) LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE



LRFR SUMMARY

(LOOKING DOWNSTREAM)

DocuSigned by: Jason Grissom E4ACDE421F244BA...

NORTH CAROLINA PROFESSIONAL SEAL 029429 ENGINEER JASON T. GRISSOM

10/12/2021

STV 100 Years

STV ENGINEERS, INC.
900 West Trade St., Suite 715
Charlotte, NC 28202
NC License Number F-0991

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. U-5878

ONSLOW COUNTY

STATION: 22+11.00 -L-

SHEET 2 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

LRFR SUMMARY FOR REINFORCED CONCRETE BOX CULVERTS
(NON-INTERSTATE TRAFFIC)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C1-2
1			3			TOTAL SHEETS
2			4			10

DRAWN BY : CL DATE : 6-18
CHECKED BY : JAD DATE : 7-18
DESIGN ENGINEER OF RECORD : JTG DATE : 9-18

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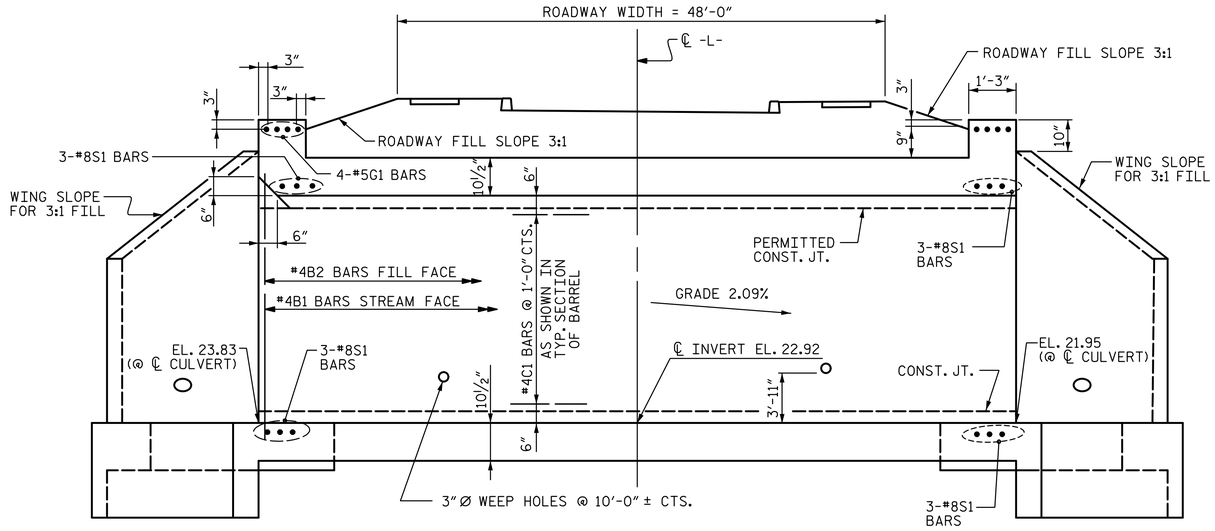
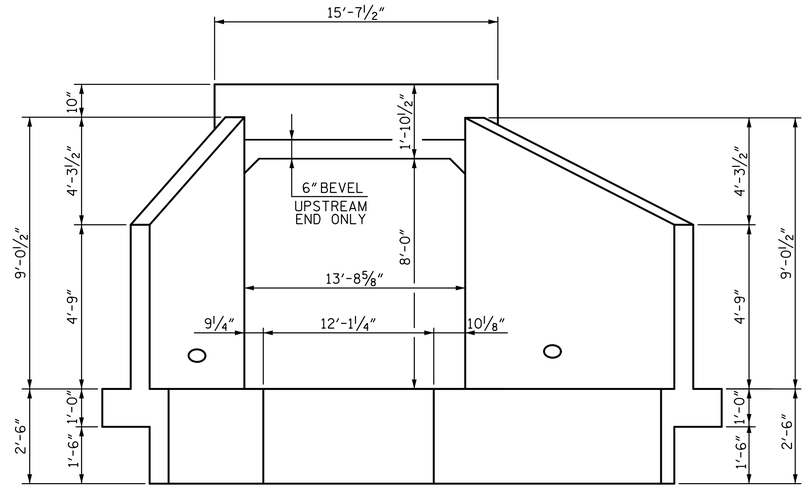
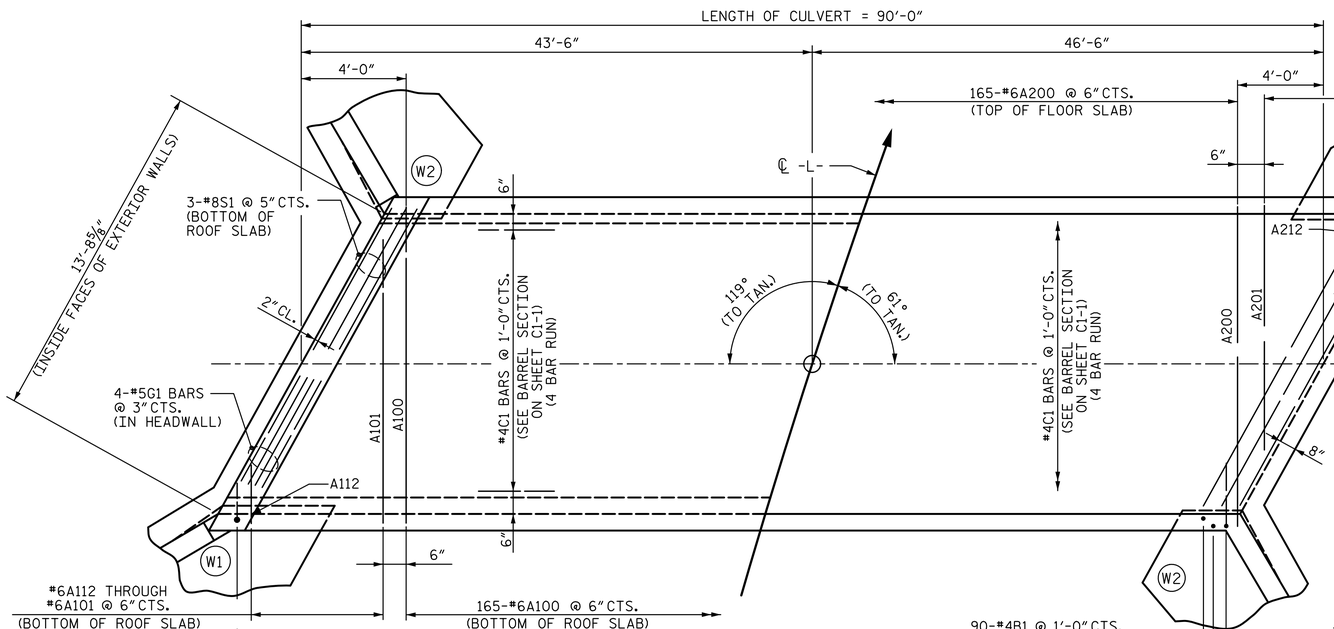


CULVERT SECTION NORMAL TO ROADWAY



END ELEVATION NORMAL TO SKEW

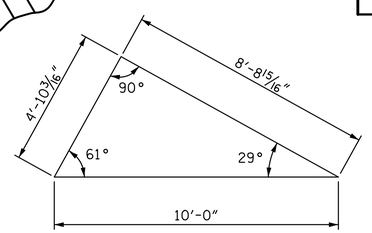
(INLET END SHOWN, OUTLET END SIMILAR)



PART PLAN - ROOF SLAB

PART PLAN - FLOOR SLAB

(SILLS AND BAFFLES NOT SHOWN FOR CLARITY)



SKEW TRIANGLE

BILL OF REINFORCING FOR BARREL

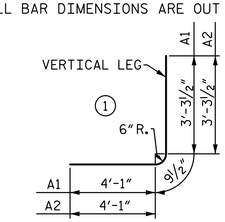
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	350	#5	①	8′-2″	2981
A2	350	#5	①	8′-2″	2981
A100	165	#6	STR	13′-3″	3284
A101	2	#6	STR	12′-7″	38
A102	2	#6	STR	11′-8″	35
A103	2	#6	STR	10′-9″	32
A104	2	#6	STR	9′-11″	30
A105	2	#6	STR	9′-0″	27
A106	2	#6	STR	8′-1″	24
A107	2	#6	STR	7′-2″	22
A108	2	#6	STR	6′-3″	19
A109	2	#6	STR	5′-5″	16
A110	2	#6	STR	4′-6″	14
A111	2	#6	STR	3′-7″	11
A112	2	#6	STR	2′-8″	8

TOTAL REINFORCING STEEL 19,630 LBS.

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A200	165	#6	STR	13′-3″	3284
A201	2	#6	STR	12′-7″	38
A202	2	#6	STR	11′-8″	35
A203	2	#6	STR	10′-9″	32
A204	2	#6	STR	9′-11″	30
A205	2	#6	STR	9′-0″	27
A206	2	#6	STR	8′-1″	24
A207	2	#6	STR	7′-2″	22
A208	2	#6	STR	6′-3″	19
A209	2	#6	STR	5′-5″	16
A210	2	#6	STR	4′-6″	14
A211	2	#6	STR	3′-7″	11
A212	2	#6	STR	2′-8″	8
B1	180	#4	STR	9′-4″	1122
B2	360	#4	STR	7′-8″	1844
C1	184	#4	STR	23′-10″	2929
D1	8	#6	STR	1′-5″	17
D2	8	#6	STR	1′-11″	23
G1	8	#5	STR	15′-2″	127
S1	12	#8	STR	15′-2″	486

BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT.



PROJECT NO. U-5878

ONSLOW COUNTY

STATION: 22+11.00 -L-

SHEET 3 OF 5

DocuSigned by: Jason Griscom E4ACDE421F244BA...

NORTH CAROLINA PROFESSIONAL SEAL 029429 ENGINEER JASON T. GRISCOM

10/12/2021

STV 100 Years

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SINGLE 12′-0″ X 8′-0″ CONCRETE BOX CULVERT 61°-00′-00″ SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C1-3
1			3			TOTAL SHEETS
2			4			10

DRAWN BY :	CL	DATE :	6-18
CHECKED BY :	JAD	DATE :	7-18
DESIGN ENGINEER OF RECORD :	JTG	DATE :	9-18

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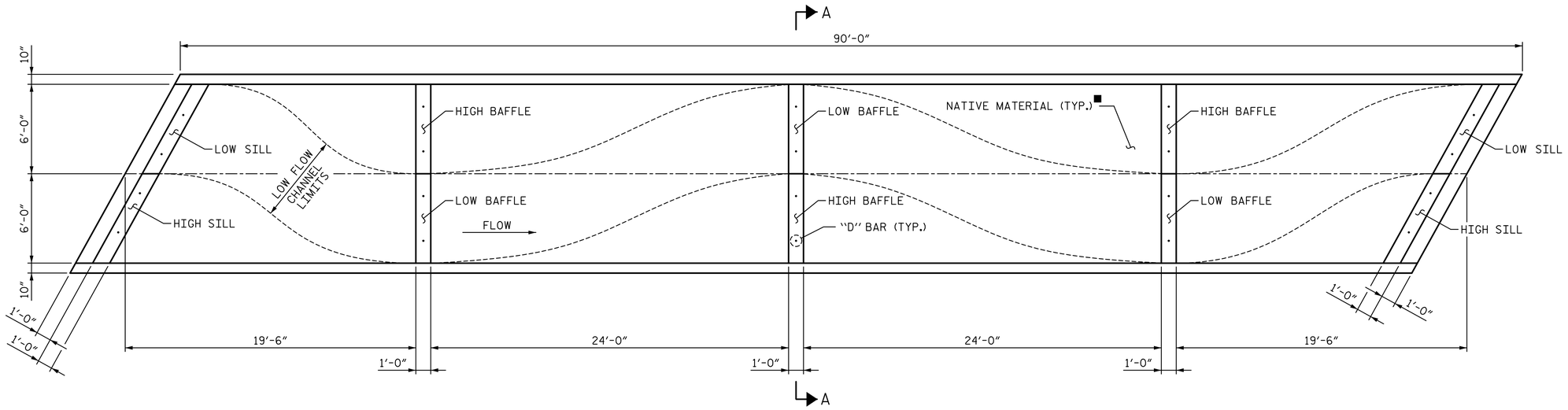
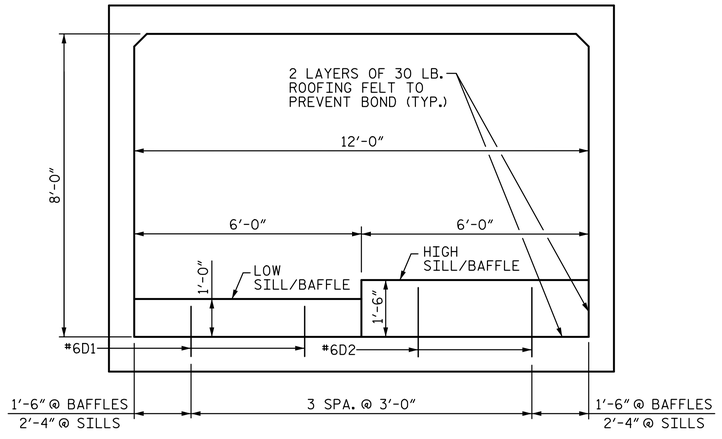


PLAN VIEW - LOCATION OF SILLS AND BAFFLES

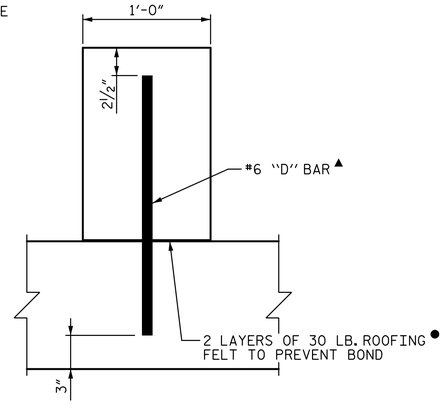
■ NATIVE MATERIAL SHALL BE USED TO BACKFILL THE CULVERT BETWEEN SILLS/BAFFLES. SEE NOTE ON SHEET C1-1.



SECTION A-A

SECTION AT BAFFLE SHOWN. SECTIONS AT OTHER SILLS AND BAFFLES ARE SIMILAR EXCEPT THAT THE LOW/HIGH SILLS/BAFFLES ALTERNATE. SEE PLAN VIEW FOR LOCATIONS.

● THE COST OF THE ROOFING FELT IS INCIDENTAL AND SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.



SECTION THROUGH SILL AND BAFFLE

▲ DOWELS MAY BE PUSHED INTO GREEN CONCRETE AFTER SLAB HAS BEEN FLOAT FINSIHED.

DocuSigned by: Jason Grissom E4ACDE6421F34BBA...

NORTH CAROLINA PROFESSIONAL SEAL 029429 ENGINEER JASON T. GRISSOM

10/12/2021

STV 100 Years

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PROJECT NO. U-5878

ONSLOW COUNTY

STATION: 22+11.00 -L-

SHEET 4 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SILL AND BAFFLE DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C1-4
1			3			TOTAL SHEETS
2			4			10

DRAWN BY :	CL	DATE : 6-18
CHECKED BY :	JAD	DATE : 7-18
DESIGN ENGINEER OF RECORD :	JTG	DATE : 9-18

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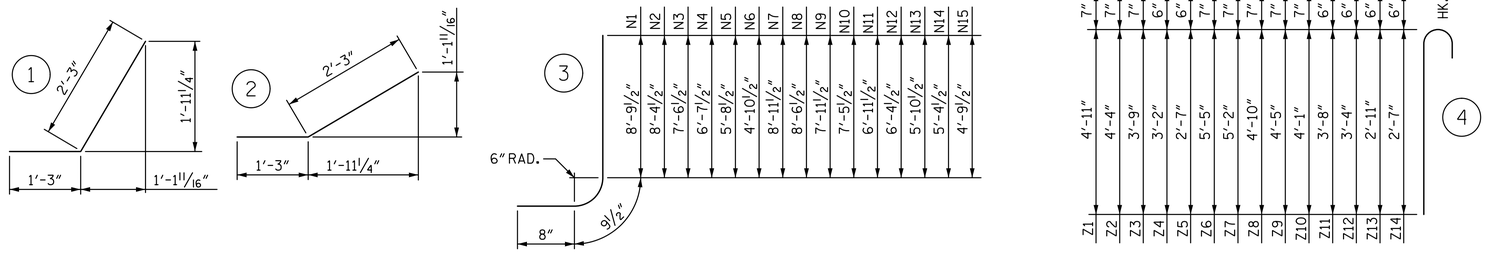
BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT.



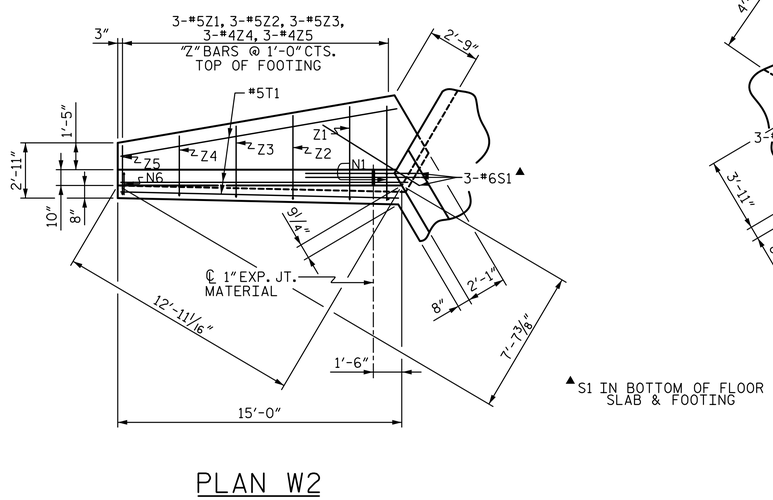
BILL OF MATERIAL - WINGS

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
H1	12	#4	STR	13'-1"	105
H2	4	#4	STR	11'-10"	32
H3	4	#4	STR	6'-9"	18
H4	24	#4	①	3'-6"	56
H5	4	#4	STR	13'-8"	37
H6	12	#4	STR	23'-1"	185
H7	4	#4	STR	20'-10"	56
H8	4	#4	STR	12'-4"	33
H9	4	#4	STR	3'-10"	10
H10	24	#4	②	3'-6"	56
H11	4	#4	STR	23'-5"	63
N1	4	#5	③	10'-3"	43
N2	4	#5	③	9'-10"	41
N3	6	#5	③	9'-0"	56
N4	6	#5	③	8'-1"	51
N5	6	#4	③	7'-2"	29
N6	6	#4	③	6'-4"	25
N7	4	#5	③	10'-5"	43
N8	6	#5	③	10'-0"	63
N9	6	#5	③	9'-5"	59
N10	6	#5	③	8'-11"	56
N11	6	#5	③	8'-5"	53
N12	6	#5	③	7'-10"	49
N13	6	#4	③	7'-4"	29
N14	6	#4	③	6'-10"	27
N15	6	#4	③	6'-3"	25
S1	12	#6	STR	6'-0"	108
T1	6	#5	STR	14'-6"	91
T2	6	#5	STR	24'-6"	153

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
V1	4	#4	STR	8'-3"	22
V2	4	#4	STR	7'-10"	21
V3	6	#4	STR	6'-11"	28
V4	6	#4	STR	6'-0"	24
V5	6	#4	STR	5'-2"	21
V6	6	#4	STR	4'-3"	17
V7	4	#4	STR	8'-5"	22
V8	6	#4	STR	7'-11"	32
V9	6	#4	STR	7'-5"	30
V10	6	#4	STR	6'-11"	28
V11	6	#4	STR	6'-4"	25
V12	6	#4	STR	5'-10"	23
V13	6	#4	STR	5'-4"	21
V14	6	#4	STR	4'-9"	19
V15	6	#4	STR	4'-3"	17
Z1	6	#5	④	5'-6"	34
Z2	6	#5	④	4'-11"	31
Z3	6	#5	④	4'-4"	27
Z4	6	#4	④	3'-8"	15
Z5	6	#4	④	3'-1"	12
Z6	4	#5	④	6'-0"	25
Z7	4	#5	④	5'-9"	24
Z8	6	#5	④	5'-5"	34
Z9	6	#5	④	5'-0"	31
Z10	6	#5	④	4'-8"	29
Z11	6	#4	④	4'-2"	17
Z12	6	#4	④	3'-10"	15
Z13	6	#4	④	3'-5"	14
Z14	6	#4	④	3'-1"	12

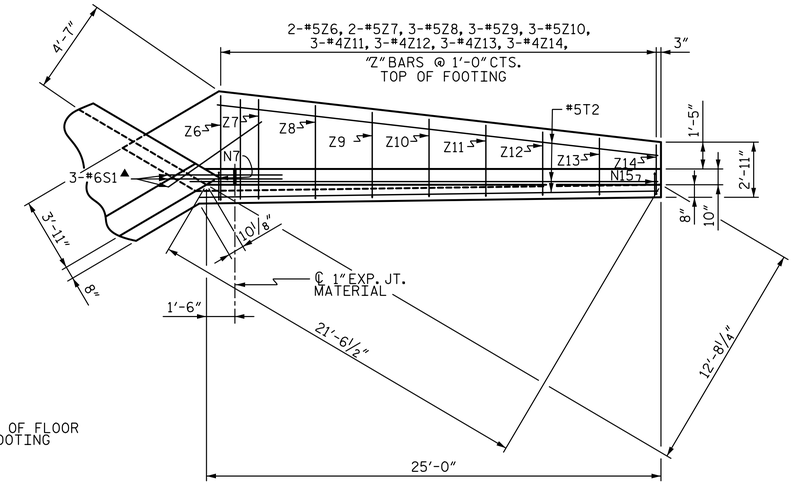
REINFORCING STEEL
FOR 4 WINGS 2,322

CLASS A CONCRETE
4 WINGS 31.6 CY
2 HEADWALLS 1.4 CY
2 END CURTAIN WALLS 3.9 CY
SILLS/BAFFLES 2.2 CY
TOTAL 39.1 CY

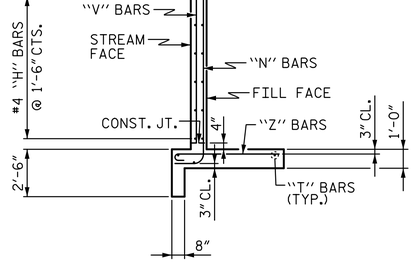


▲S1 IN BOTTOM OF FLOOR SLAB & FOOTING

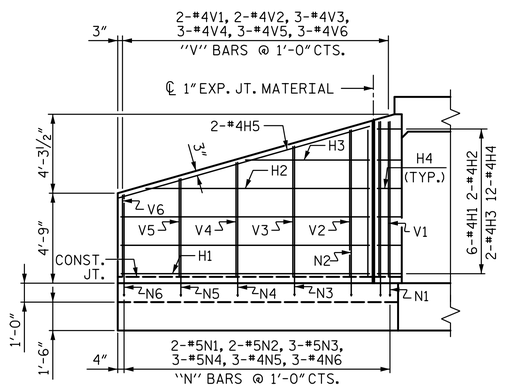
PLAN W2



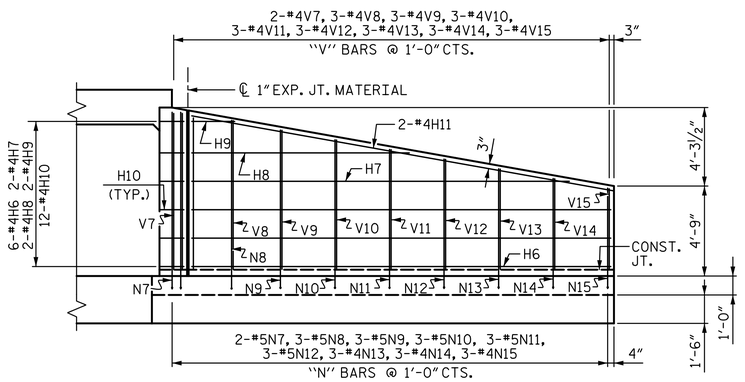
PLAN W1



TYPICAL WING SECTION



ELEVATION W2



ELEVATION W1

DocuSigned by: Jason Griscon E4ACDE421F244BA...

NORTH CAROLINA PROFESSIONAL SEAL 029429 ENGINEER JASON T. GRISCON
10/12/2021

STV 100 Years
STV ENGINEERS, INC.
900 West Trade St., Suite 715
Charlotte, NC 28202
NC License Number F-0991

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PROJECT NO. U-5878
ONSLOW COUNTY
STATION: 22+11.00 -L-

SHEET 5 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

WINGS FOR CONCRETE BOX CULVERT

H=8'-0" SLOPE=3:1
61° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C1-5
1			3			TOTAL SHEETS
2			4			10

DRAWN BY :	CL	DATE : 6-18
CHECKED BY :	JAD	DATE : 7-18
DESIGN ENGINEER OF RECORD :	JTG	DATE : 9-18

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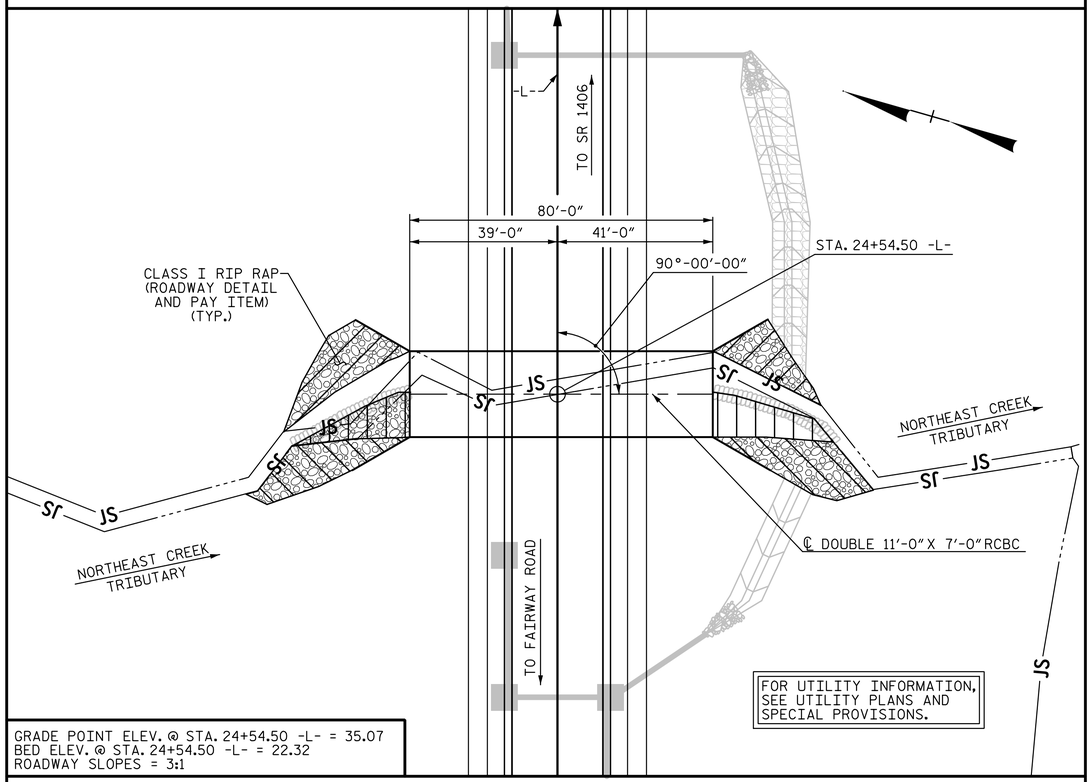
BENCHMARK BM#1: RR SPIKE SET IN 18" HARDWOOD, STA. 22+11 -L-, 269' RT., N=380058 E=2486490, EL. 36.86



GRADE POINT ELEV. @ STA. 24+54.50 -L- = 35.07
BED ELEV. @ STA. 24+54.50 -L- = 22.32
ROADWAY SLOPES = 3:1

LOCATION SKETCH

NOTES:

ASSUMED LIVE LOAD----------HL-93 OR ALTERNATE LOADING.

DESIGN FILL----------6.47' MAX. AND 5.26' MIN.

FOR OTHER DESIGN DATA AND NOTES SEE STANDARD NOTE SHEET.

3"Ø WEEP HOLES INDICATED TO BE IN ACCORDANCE WITH THE SPECIFICATIONS.

CONCRETE IN CULVERT TO BE POURED IN THE FOLLOWING ORDER:
1. WING FOOTINGS AND FLOOR SLAB INCLUDING 4" OF ALL VERTICAL WALLS.
2. THE REMAINING PORTIONS OF THE WALLS AND WINGS FULL HEIGHT FOLLOWED BY THE SILLS, BAFFLES, ROOF SLAB AND HEADWALLS.

THE RESIDENT ENGINEER SHALL CHECK THE LENGTH OF THE CULVERT BEFORE STAKING IT OUT TO MAKE CERTAIN THAT IT WILL PROPERLY TAKE CARE OF THE FILL.

DIMENSIONS FOR WING LAYOUT AS WELL AS ADDITIONAL REINFORCING STEEL EMBEDDED IN BARREL ARE SHOWN ON THE WING SHEET.

TRANSVERSE CONSTRUCTION JOINTS SHALL BE USED IN THE BARREL, SPACED TO LIMIT POURS TO A MAXIMUM OF 70 FT. LOCATION OF JOINTS SHALL BE SUBJECT TO APPROVAL OF THE ENGINEER.

AT THE CONTRACTOR'S OPTION, HE MAY SPLICE THE VERTICAL REINFORCING STEEL IN THE INTERIOR FACE OF THE EXTERIOR WALL AND BOTH FACES OF INTERIOR WALL ABOVE LOWER WALL CONSTRUCTION JOINT. THE SPLICE LENGTH SHALL BE 1'-10" FOR THE #4 BARS. EXTRA WEIGHT OF STEEL DUE TO SPLICES SHALL BE PAID FOR BY THE CONTRACTOR.

STEEL IN THE BOTTOM SLAB MAY BE SPLICED AT THE PERMITTED CONSTRUCTION JOINT AT THE CONTRACTOR'S OPTION. EXTRA WEIGHT OF STEEL DUE TO THE SPLICES SHALL BE PAID FOR BY THE CONTRACTOR.

FOR CULVERT DIVERSION DETAILS AND PAY ITEM, SEE EROSION CONTROL PLANS.

A 3 FOOT STRIP OF FILTER FABRIC SHALL BE ATTACHED TO THE FILL FACE OF THE WING COVERING THE ENTIRE LENGTH OF THE EXPANSION JOINT.

NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE STREAM BED OR FLOODPLAIN AT THE PROJECT SITE DURING CULVERT CONSTRUCTION. ONLY MATERIAL THAT IS EXCAVATED FROM THE STREAM BED MAY BE USED TO LINE THE LOW FLOW CULVERT BARREL. RIP RAP MAY BE USED TO SUPPLEMENT THE NATIVE MATERIAL IN THE HIGH FLOW CULVERT BARREL. IF RIP RAP IS USED TO LINE THE HIGH FLOW CULVERT BARRELS, NATIVE MATERIAL SHOULD BE PLACED ON TOP TO FILL VOIDS AND PROVIDE A FLAT SURFACE FOR ANIMAL PASSAGE. NATIVE MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT CONDITIONS. PAYMENT FOR PLACEMENT OF NATIVE MATERIAL IN THE BARRELS, WHICH INCLUDES BUT IS NOT LIMITED TO PLACING NATIVE MATERIAL IN THE BARRELS, PLACING RIP RAP IN THE BARRELS, AND ALL TOOLS, EQUIPMENT, AND LABOR NECESSARY SHALL BE INCLUDED IN LUMP SUM PRICE BID FOR "CULVERT EXCAVATION" @ STA. 24+54.50 -L-".

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

HYDRAULIC DATA

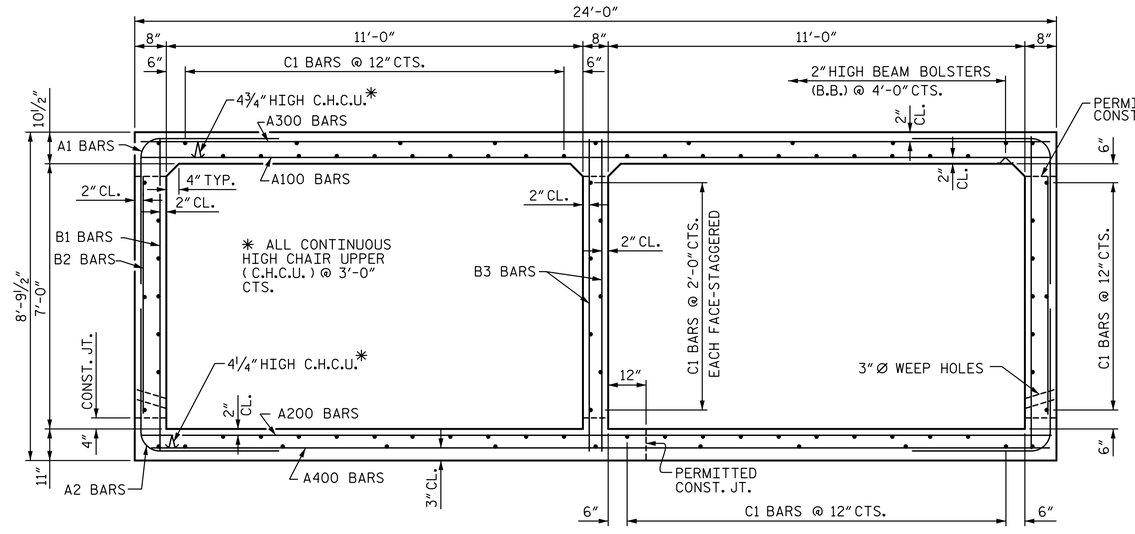
DESIGN DISCHARGE	=	230 CFS
FREQUENCY OF DESIGN FLOOD	=	25 YRS.
DESIGN HIGH WATER ELEVATION	=	26.4
DRAINAGE AREA	=	0.225 SQ. MI.
BASIC DISCHARGE (Q100)	=	270 CFS
BASIC HIGH WATER ELEVATION	=	26.6

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	=	1675 CFS
FREQUENCY OF OVERTOPPING FLOOD	=	>500 YRS.
OVERTOPPING FLOOD ELEVATION	=	35.0

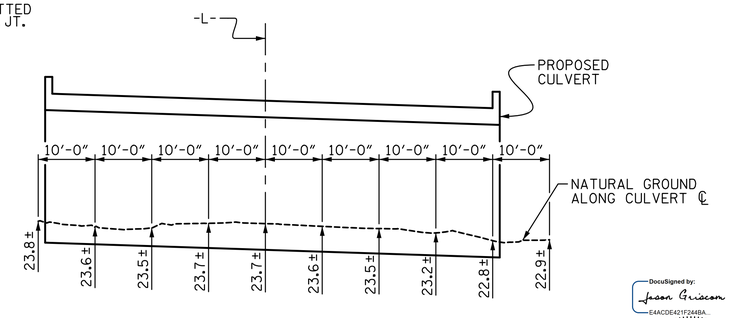
TOTAL STRUCTURE QUANTITIES

CULVERT EXCAVATION @ STA. 24+54.50 -L-	LUMP SUM
FOUNDATION CONDITIONING MATERIAL, BOX CULVERT:	158 TONS
CLASS A CONCRETE	
BARREL @ 2.119 CU.YDS./FT.	169.5 CU.YDS.
WINGS, ETC.	36.3 CU.YDS.
TOTAL	205.8 CU.YDS.
REINFORCING STEEL	
BARREL	33,406 LBS.
WINGS, ETC.	1,712 LBS.
TOTAL	35,118 LBS.



RIGHT ANGLE SECTION OF BARREL

THERE ARE 85 "C" BARS IN SECTION OF BARREL.
MINIMUM SPLICE FOR "C" BARS IS 1'-10".



PROFILE ALONG ℄ CULVERT

I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS

PROJECT NO. U-5878
ONSLOW COUNTY
STATION: 24+54.50 -L-

SHEET 1 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DOUBLE 11'-0" X 7'-0"
CONCRETE BOX CULVERT
ON COMMERCE ROAD BETWEEN
FAIRWAY RD. AND SR 1406

DocuSigned by: Jason Griscon E4ACDE421F244BA...

NORTH CAROLINA PROFESSIONAL SEAL 029429 ENGINEER JASON T. GRISCOM
10/12/2021

STV 100 Years
STV ENGINEERS, INC.
900 West Trade St., Suite 715
Charlotte, NC 28202
NC License Number F-0991

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NO.	BY:	DATE:	NO.	BY:	DATE:	C2-1
1			3			TOTAL SHEETS
2			4			10

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CHECKED BY : JAD DATE : 7-18
DESIGN ENGINEER OF RECORD : JTG DATE : 9-18

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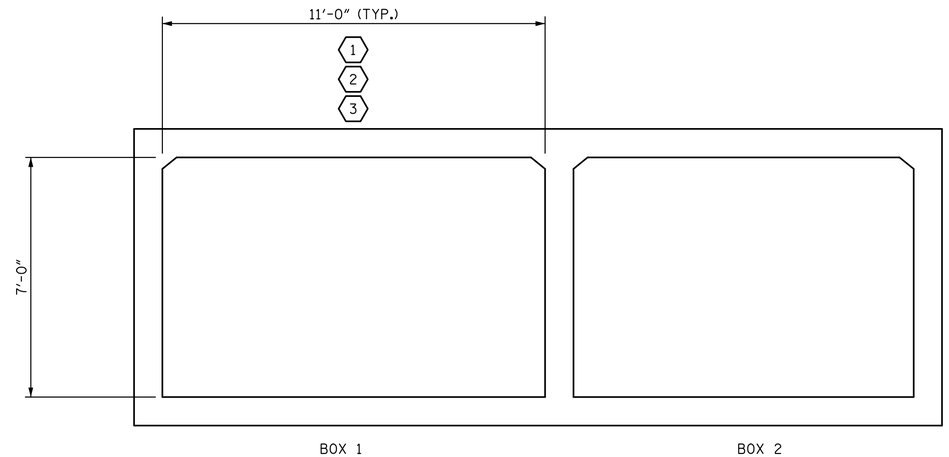
LOAD AND RESISTANCE FACTOR RATING (LRFR) SUMMARY FOR REINFORCED CONCRETE BOX CULVERTS

LEVEL		VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING (#)	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE									COMMENT NUMBER
							LIVE-LOAD FACTORS (γ_{LL})	MOMENT				SHEAR				
								RATING FACTOR	BOX NO.	ELEMENT TYPE	DISTANCE FROM LEFT END OF ELEMENT (ft)	RATING FACTOR	BOX NO.	ELEMENT TYPE	DISTANCE FROM LEFT END OF ELEMENT (ft)	
DESIGN LOAD RATING		HL-93 (INVENTORY)	N/A	1	1.01	--	1.75	1.01	1 & 2	TOP SLAB	5.00′	1.39	1 & 2	BOTTOM SLAB	11.04′	
		HL-93 (OPERATING)	N/A		1.30	--	1.35	1.30	1 & 2	TOP SLAB	5.00′	1.80	1 & 2	BOTTOM SLAB	11.04′	
		HS-20 (INVENTORY)	36.000	2	1.16	41.760	1.75	1.16	1 & 2	TOP SLAB	5.00′	1.39	1 & 2	BOTTOM SLAB	11.04′	
		HS-20 (OPERATING)	36.000		1.50	54.000	1.35	1.50	1 & 2	TOP SLAB	5.00′	1.80	1 & 2	BOTTOM SLAB	11.04′	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		2.11	28.485	1.40	2.11	1 & 2	TOP SLAB	5.00′	3.06	1 & 2	TOP SLAB	11.04′	
		SNGARBS2	20.000		1.97	39.400	1.40	1.97	1 & 2	TOP SLAB	5.00′	2.76	1 & 2	BOTTOM SLAB	11.04′	
		SNAGRIS2	22.000		2.11	46.420	1.40	2.11	1 & 2	TOP SLAB	5.00′	2.54	1 & 2	BOTTOM SLAB	11.04′	
		SNCOTTS3	27.250	3	1.26	34.335	1.40	1.26	1 & 2	TOP SLAB	5.00′	1.83	1 & 2	TOP SLAB	11.04′	
		SNAGGRS4	34.925		1.41	49.244	1.40	1.41	1 & 2	TOP SLAB	5.00′	1.65	1 & 2	BOTTOM SLAB	11.04′	
		SNS5A	35.550		1.61	57.236	1.40	1.61	1 & 2	TOP SLAB	5.00′	1.81	1 & 2	BOTTOM SLAB	11.04′	
		SNS6A	39.950		1.42	56.729	1.40	1.42	1 & 2	TOP SLAB	5.00′	1.66	1 & 2	BOTTOM SLAB	11.04′	
		SNS7B	42.000		1.46	61.320	1.40	1.46	1 & 2	TOP SLAB	5.00′	1.61	1 & 2	BOTTOM SLAB	11.04′	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.90	62.700	1.40	2.11	1 & 2	TOP SLAB	5.00′	1.90	1 & 2	BOTTOM SLAB	11.04′	
		TNT4A	33.075		1.50	49.613	1.40	1.50	1 & 2	TOP SLAB	5.00′	1.97	1 & 2	BOTTOM SLAB	11.04′	
		TNT6A	41.600		1.54	64.064	1.40	1.54	1 & 2	TOP SLAB	5.00′	1.71	1 & 2	BOTTOM SLAB	11.04′	
		TNT7A	42.000		1.51	63.420	1.40	1.51	1 & 2	TOP SLAB	5.00′	1.65	1 & 2	BOTTOM SLAB	11.04′	
		TNT7B	42.000		1.43	60.060	1.40	1.43	1 & 2	TOP SLAB	5.00′	1.76	1 & 2	BOTTOM SLAB	11.04′	
		TNAGRIT4	43.000		1.50	64.500	1.40	1.50	1 & 2	TOP SLAB	5.00′	1.65	1 & 2	BOTTOM SLAB	11.04′	
		TNAGT5A	45.000		1.68	75.600	1.40	1.68	1 & 2	TOP SLAB	5.00′	1.70	1 & 2	BOTTOM SLAB	11.04′	
		TNAGT5B	45.000		1.41	63.450	1.40	1.50	1 & 2	TOP SLAB	5.00′	1.41	1 & 2	BOTTOM SLAB	11.04′	



LRFR SUMMARY

(LOOKING DOWNSTREAM)

LOAD FACTORS:

DESIGN LOAD RATING FACTORS

LOAD TYPE	MAX FACTOR	MIN FACTOR
DC	1.25	0.90
DW	1.50	0.65
EV	1.30	0.90
EH	1.35	0.90
ES	1.35	0.90
LS	1.75	--
WA	1.00	--

NOTE:

RATING FACTORS ARE BASED ON THE STRENGTH I LIMIT STATE.

COMMENTS:

1.
2.
3.
4.

(#) CONTROLLING LOAD RATING

(1) DESIGN LOAD RATING (HL-93)

(2) DESIGN LOAD RATING (HS-20)

(3) LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

DocuSigned by: Jason Griscom E4ACDE421F244BA...

NORTH CAROLINA PROFESSIONAL SEAL 029429 ENGINEER JASON T. GRISCOM

10/12/2021

STV 100 Years
STV ENGINEERS, INC.
900 West Trade St., Suite 715
Charlotte, NC 28202
NC License Number F-0991

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PROJECT NO. U-5878

ONSLOW COUNTY

STATION: 24+54.50 -L-

SHEET 2 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

LRFR SUMMARY FOR REINFORCED CONCRETE BOX CULVERTS
(NON-INTERSTATE TRAFFIC)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C2-2
1			3			TOTAL SHEETS
2			4			10

DRAWN BY : CL DATE : 6-18
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DESIGN ENGINEER OF RECORD : JTG DATE : 9-18

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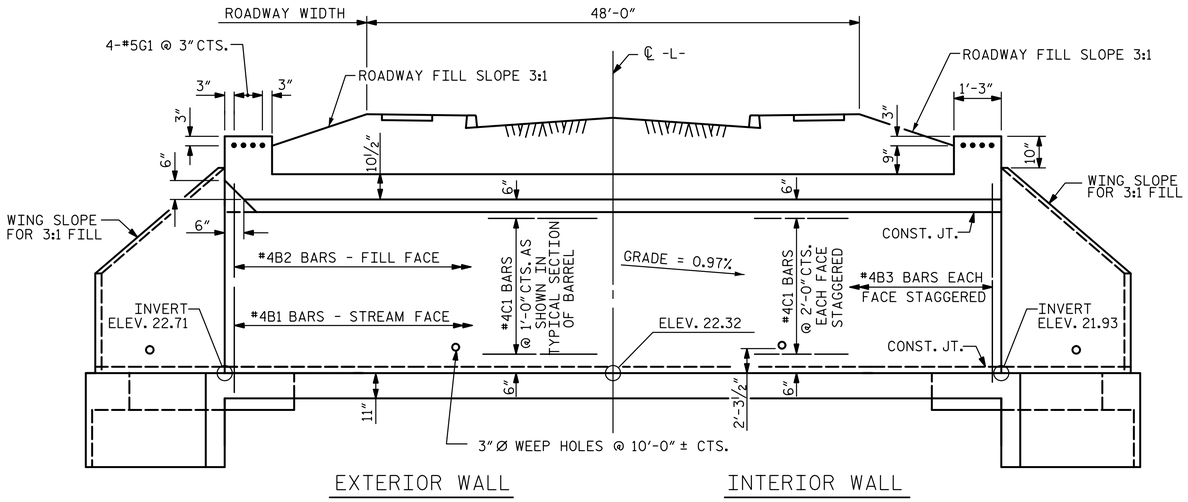
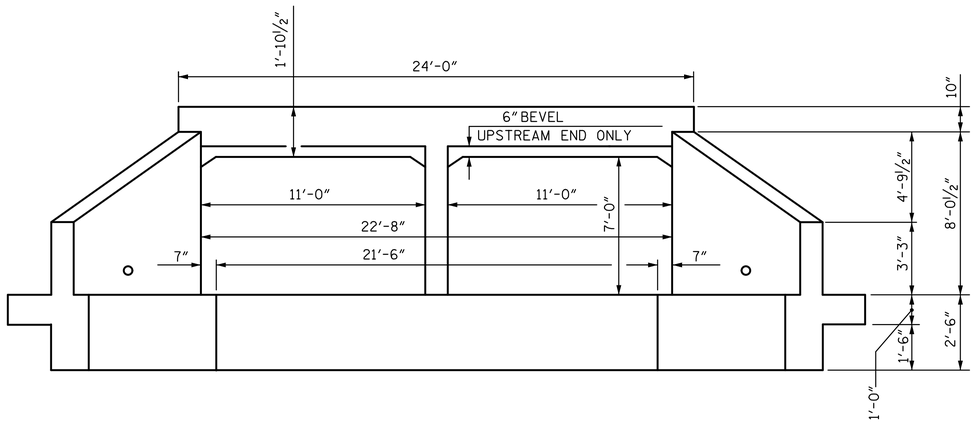
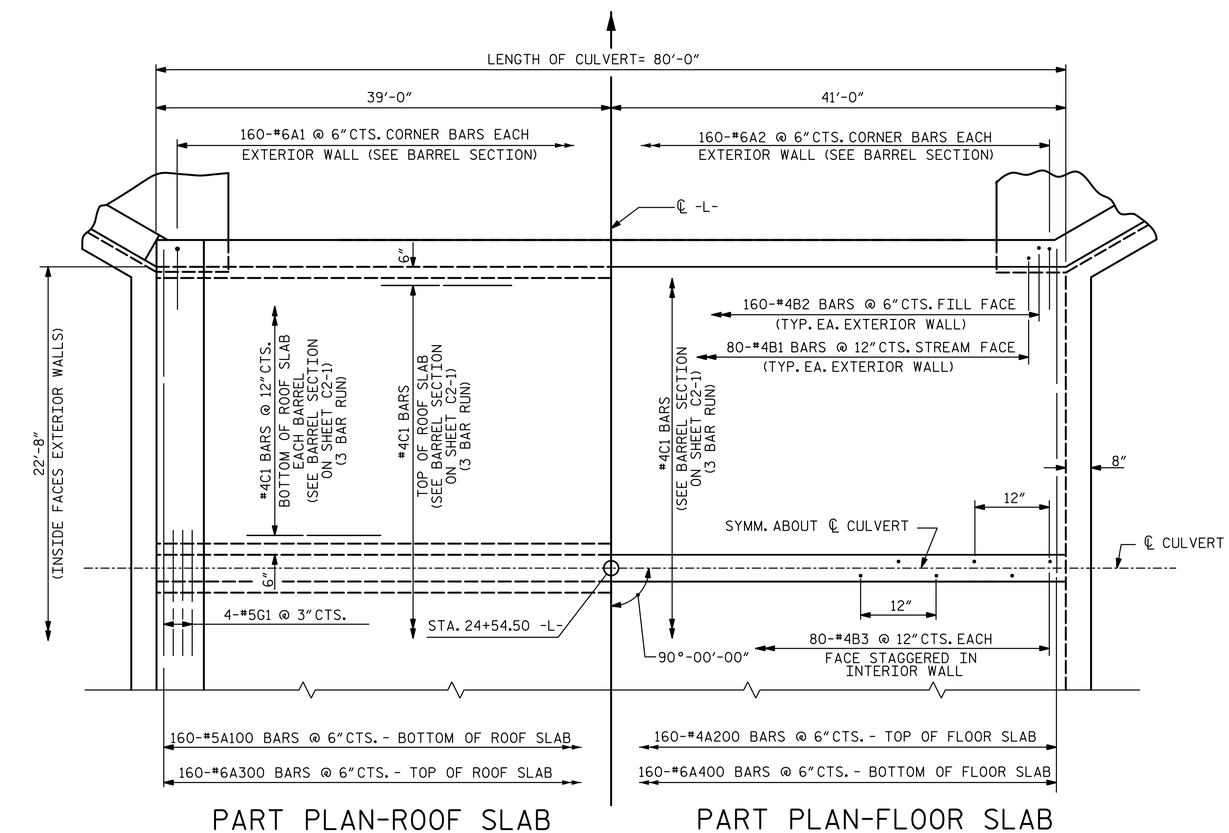


CULVERT SECTION NORMAL TO ROADWAY



END ELEVATION

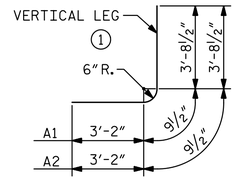


PART PLAN-ROOF SLAB

PART PLAN-FLOOR SLAB

(SILLS AND BAFFLES NOT SHOWN FOR CLARITY)

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF REINFORCING FOR BARREL

MARK	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	320	#6	①	7'-8"	3,685
A2	320	#6	①	7'-8"	3,685
A100	160	#5	STR	23'-7"	3,936
A200	160	#4	STR	23'-7"	2,521
A300	160	#6	STR	23'-7"	5,668
A400	160	#6	STR	23'-7"	5,668
B1	160	#4	STR	8'-4"	891
B2	320	#4	STR	6'-8"	1,425
B3	160	#4	STR	8'-4"	891
C1	255	#4	STR	27'-10"	4,741
G1	8	#5	STR	23'-7"	197
D1	8	#6	STR	1'-5"	17
D2	8	#6	STR	1'-11"	23
D3	16	#6	STR	2'-5"	58

TOTAL BARREL REINFORCING STEEL = 33,406 LBS.

DocuSigned by: Jason Griscom E4ACDE421F1448A...

NORTH CAROLINA PROFESSIONAL SEAL 029429 ENGINEER JASON T. GRISCOM

10/12/2021

STV 100 Years

STV ENGINEERS, INC.
900 West Trade St., Suite 715
Charlotte, NC 28202
NC License Number F-0991

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PROJECT NO. U-5878

ONSLOW COUNTY

STATION: 24+54.50 -L-

SHEET 3 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DOUBLE 11'-0" X 7'-0" CONCRETE BOX CULVERT 90°-00'-00" SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C2-3
1			3			TOTAL SHEETS
2			4			10

DRAWN BY :	CL	DATE : 6-18
CHECKED BY :	JAD	DATE : 7-18
DESIGN ENGINEER OF RECORD :	JTG	DATE : 9-18

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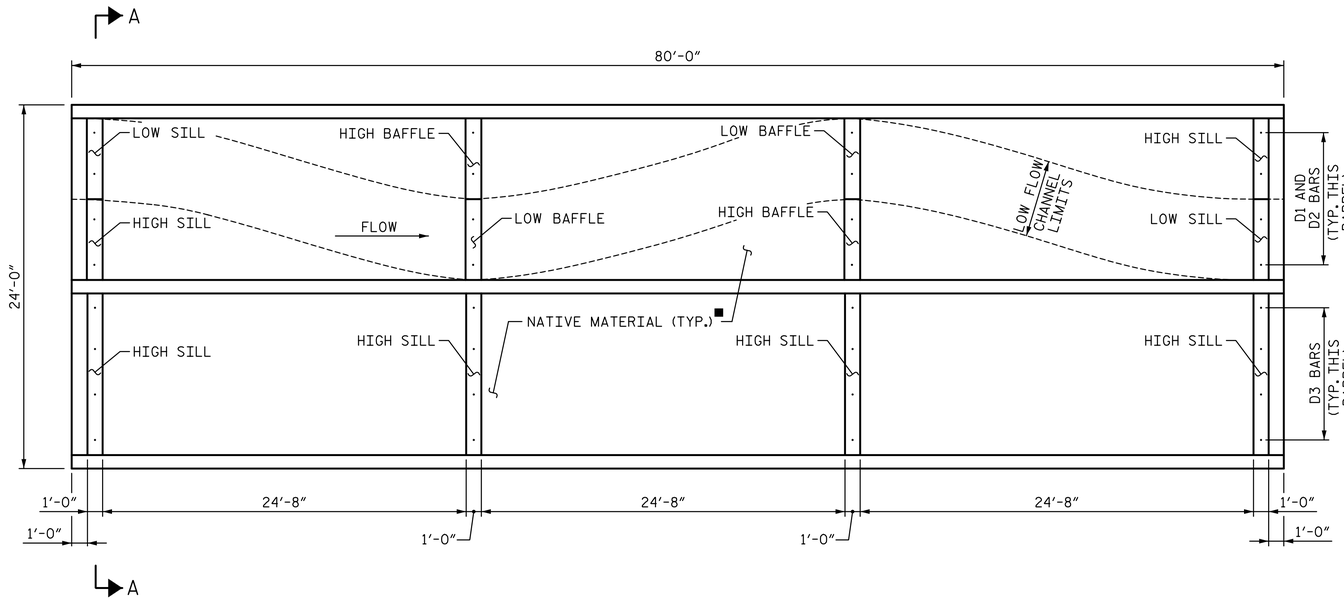
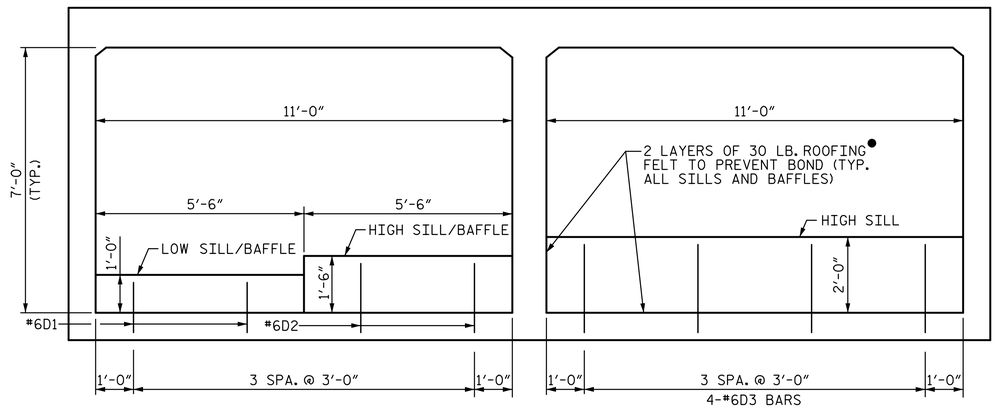


PLAN VIEW - LOCATION OF SILLS AND BAFFLES

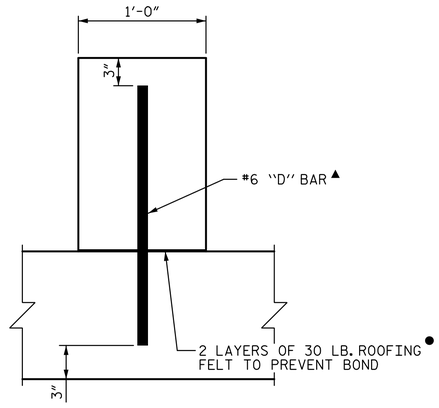
■ NATIVE MATERIAL SHALL BE USED TO BACKFILL THE CULVERT BETWEEN SILLS/BAFFLES. SEE NOTE ON SHEET C2-1.



SECTION A-A

SECTION AT INLET END SHOWN. SECTIONS AT OTHER SILLS AND BAFFLES ARE SIMILAR EXCEPT THAT THE LOW SILL AND BAFFLE ALTERNATE. SEE PLAN VIEW FOR LOCATIONS.

● THE COST OF THE ROOFING FELT IS INCIDENTAL AND SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.



SECTION THROUGH SILL AND BAFFLE

▲ DOWELS MAY BE PUSHED INTO GREEN CONCRETE AFTER SLAB HAS BEEN FLOAT FINSIHED.

DocuSigned by: Jason Griscon E4ACDE42171348A...

NORTH CAROLINA PROFESSIONAL SEAL 029429 ENGINEER JASON T. GRISCOM

10/12/2021

STV 100 Years

STV ENGINEERS, INC.
900 West Trade St., Suite 715
Charlotte, NC 28202
NC License Number F-0991

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PROJECT NO. U-5878

ONSLOW COUNTY

STATION: 24+54.50 -L-

SHEET 4 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SILL AND BAFFLE DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C2-4
1			3			TOTAL SHEETS
2			4			10

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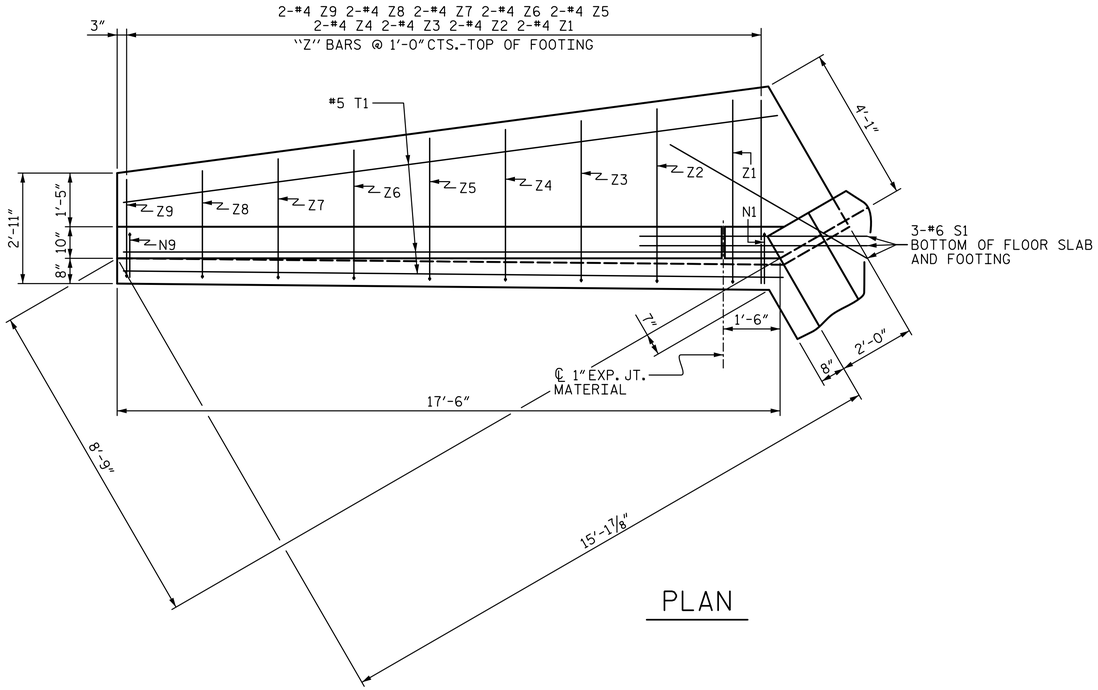
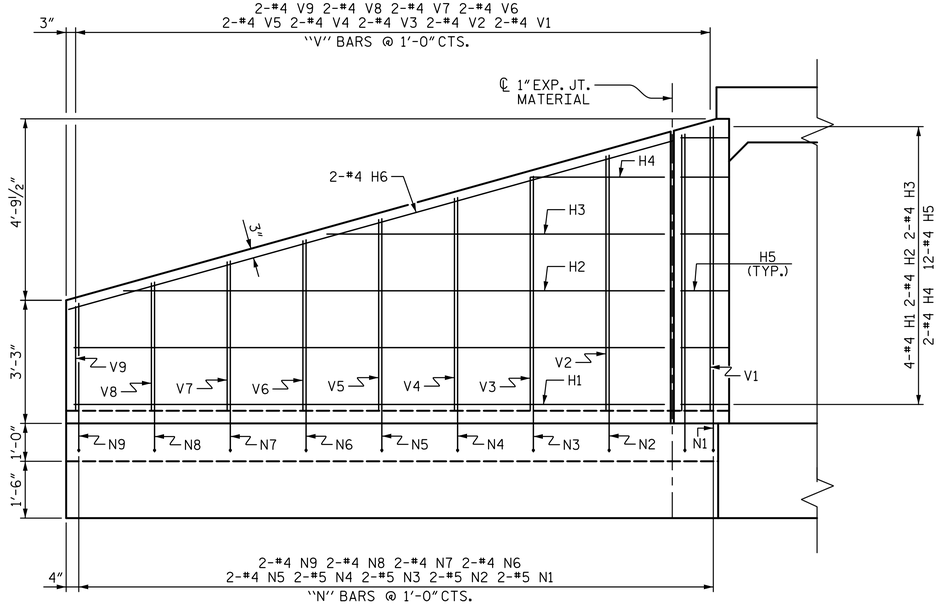
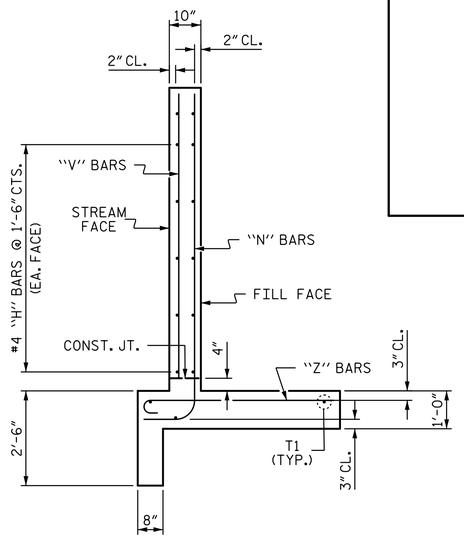


PLAN



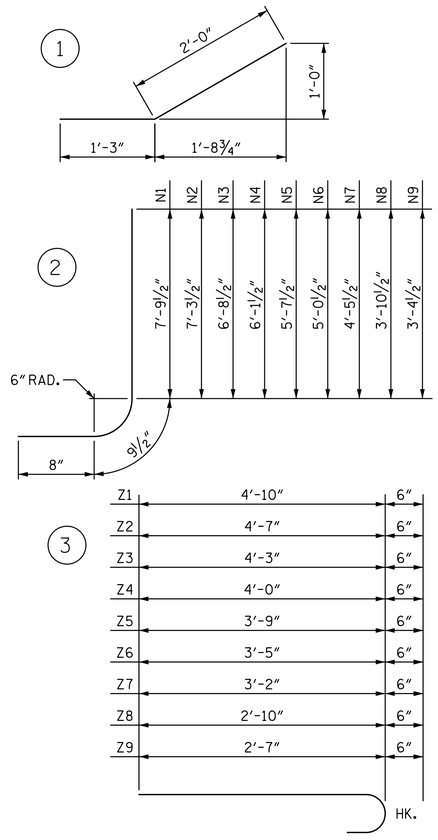
ELEVATION



TYPICAL WING SECTION

BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT.



BILL OF MATERIAL-WINGS

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
H1	16	#4	STR	15'-7"	167
H2	8	#4	STR	14'-3"	76
H3	8	#4	STR	8'-10"	47
H4	8	#4	STR	3'-6"	19
H5	48	#4	①	3'-3"	104
H6	8	#4	STR	16'-2"	86
N1	8	#5	②	9'-3"	77
N2	8	#5	②	8'-9"	73
N3	8	#5	②	8'-2"	68
N4	8	#5	②	7'-7"	63
N5	8	#4	②	7'-1"	38
N6	8	#4	②	6'-6"	35
N7	8	#4	②	5'-11"	32
N8	8	#4	②	5'-4"	29
N9	8	#4	②	4'-10"	26
S1	12	#6	STR	6'-0"	108
T1	12	#5	STR	17'-5"	218
V1	8	#4	STR	7'-3"	39
V2	8	#4	STR	6'-8"	36
V3	8	#4	STR	6'-1"	33
V4	8	#4	STR	5'-7"	30
V5	8	#4	STR	5'-0"	27
V6	8	#4	STR	4'-5"	24
V7	8	#4	STR	3'-11"	21
V8	8	#4	STR	3'-4"	18
V9	8	#4	STR	2'-9"	15
Z1	8	#4	③	5'-4"	29
Z2	8	#4	③	5'-1"	27
Z3	8	#4	③	4'-9"	25
Z4	8	#4	③	4'-6"	24
Z5	8	#4	③	4'-3"	23
Z6	8	#4	③	3'-11"	21
Z7	8	#4	③	3'-8"	20
Z8	8	#4	③	3'-4"	18
Z9	8	#4	③	3'-1"	16

TOTAL REINFORCING STEEL FOR 4 WINGS 1,712 LBS

CLASS A CONCRETE

4 WINGS	24.6 CY
2 HEADWALLS	2.2 CY
2 END CURTAIN WALLS	4.2 CY
SILLS/BAFFLES	5.3 CY
TOTAL	36.3 CY

DocuSigned by: Jason Griscom E4ACDE421F2448A...

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PROJECT NO. U-5878

ONSLOW COUNTY

STATION: 24+54.50 -L-

SHEET 5 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

WINGS FOR CONCRETE BOX CULVERT

H=7'-0" SLOPE=3:1
90° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C2-5
1			3			TOTAL SHEETS
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STANDARD NOTES

DESIGN DATA:

SPECIFICATIONS	A.A.S.H.T.O. (CURRENT)
LIVE LOAD	SEE PLANS
IMPACT ALLOWANCE	SEE A.A.S.H.T.O.
STRESS IN EXTREME FIBER OF STRUCTURAL STEEL - AASHTO M270 GRADE 36	20,000 LBS. PER SQ. IN.
- AASHTO M270 GRADE 50W	27,000 LBS. PER SQ. IN.
- AASHTO M270 GRADE 50	27,000 LBS. PER SQ. IN.
REINFORCING STEEL IN TENSION - GRADE 60	24,000 LBS. PER SQ. IN.
CONCRETE IN COMPRESSION	1,200 LBS. PER SQ. IN.
CONCRETE IN SHEAR	SEE A.A.S.H.T.O.
STRUCTURAL TIMBER - TREATED OR UNTREATED EXTREME FIBER STRESS	1,800 LBS. PER SQ. IN.
COMPRESSION PERPENDICULAR TO GRAIN OF TIMBER	375 LBS. PER SQ. IN.
EQUIVALENT FLUID PRESSURE OF EARTH	30 LBS. PER CU. FT. (MINIMUM)

MATERIAL AND WORKMANSHIP:

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 2018 "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" OF THE N. C. DEPARTMENT OF TRANSPORTATION.

STEEL SHEET PILING FOR PERMANENT OR TEMPORARY APPLICATIONS SHALL BE HOT ROLLED.

CONCRETE:

UNLESS OTHERWISE REQUIRED ON PLANS, CLASS A CONCRETE SHALL BE USED FOR ALL PORTIONS OF ALL STRUCTURES WITH THE EXCEPTION THAT: CLASS AA CONCRETE SHALL BE USED IN BRIDGE SUPERSTRUCTURES, ABUTMENT BACKWALLS, AND APPROACH SLABS; AND CLASS B CONCRETE SHALL BE USED FOR SLOPE PROTECTION AND RIP RAP.

CONCRETE CHAMFERS:

UNLESS OTHERWISE NOTED ON THE PLANS, ALL EXPOSED CORNERS ON STRUCTURES SHALL BE CHAMFERED ¾" WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO 1½" RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A ¼" FINISHING TOOL UNLESS OTHERWISE REQUIRED ON PLANS; AND CORNERS OF EXPANSION JOINTS IN THE ROADWAY FACES AND TOPS OF CURBS AND SIDEWALKS SHALL BE ROUNDED TO A ¼" RADIUS WITH A FINISHING STONE OR TOOL UNLESS OTHERWISE REQUIRED ON PLANS.

DOWELS:

DOWELS WHEN INDICATED ON PLANS AS FOR CULVERT EXTENSIONS, SHALL BE EMBEDDED AT LEAST 12" INTO THE OLD CONCRETE AND GROUTED INTO PLACE WITH 1:2 CEMENT MORTAR.

ALLOWANCE FOR DEAD LOAD DEFLECTION, SETTLEMENT, ETC. IN CASTING SUPERSTRUCTURES:

BRIDGES SHALL BE BUILT ON THE GRADE OR VERTICAL CURVE SHOWN ON PLANS. SLABS, CURBS AND PARAPETS SHALL CONFORM TO THE GRADE OR CURVE.

ALL DIMENSIONS WHICH ARE GIVEN IN SECTION AND ARE AFFECTED BY DEAD LOAD DEFLECTIONS ARE DIMENSIONS AT CENTER LINE OF BEARING UNLESS OTHERWISE NOTED ON PLANS. IN SETTING FORMS FOR STEEL BEAM BRIDGES AND PRESTRESSED CONCRETE GIRDER BRIDGES, ADJUSTMENTS SHALL BE MADE DUE TO THE DEAD LOAD DEFLECTIONS FOR THE ELEVATIONS SHOWN. WHERE BLOCKS ARE SHOWN OVER BEAMS FOR BUILDING UP TO THE SLAB, THE VERTICAL DIMENSIONS OF THE BLOCKS SHALL BE ADJUSTED BETWEEN BEARINGS TO COMPENSATE FOR DEAD LOAD DEFLECTIONS, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER. WHERE BOTTOM OF SLAB IS IN LINE WITH BOTTOM OF TOP FLANGES, DEPTH OF SLAB BETWEEN BEARINGS SHALL BE ADJUSTED TO COMPENSATE FOR DEAD LOAD DEFLECTION, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER.

IN SETTING FALSEWORK AND FORMS FOR REINFORCED CONCRETE SPANS, AN ALLOWANCE SHALL BE MADE FOR DEAD LOAD DEFLECTIONS, SETTLEMENT OF FALSEWORK, AND PERMANENT CAMBER WHICH SHALL BE PROVIDED FOR IN ADDITION TO THE ELEVATIONS SHOWN. AFTER REMOVAL OF THE FALSEWORK, THE FINISHED STRUCTURES SHALL CONFORM TO THE PROFILE AND ELEVATIONS SHOWN ON THE PLANS AND CONSTRUCTION ELEVATIONS FURNISHED BY THE ENGINEER.

DETAILED DRAWINGS FOR FALSEWORK OR FORMS FOR BRIDGE SUPERSTRUCTURE AND ANY STRUCTURE OR PARTS OF A STRUCTURE AS NOTED ON THE PLANS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL BEFORE CONSTRUCTION OF THE FALSEWORK OR FORMS IS STARTED.

REINFORCING STEEL:

ALL REINFORCING STEEL SHALL BE DEFORMED. DIMENSIONS RELATIVE TO PLACEMENT OF REINFORCING ARE TO CENTERS OF BARS UNLESS OTHERWISE INDICATED IN THE PLANS. DIMENSIONS ON BAR DETAILS ARE TO CENTERS OF BARS OR ARE OUT TO OUT AS INDICATED ON PLANS.

WIRE BAR SUPPORTS SHALL BE PROVIDED FOR REINFORCING STEEL WHERE INDICATED ON THE PLANS. WHEN BAR SUPPORT PIECES ARE PLACED IN CONTINUOUS LINES, THEY SHALL BE SO PLACED THAT THE ENDS OF THE SUPPORTING WIRES SHALL BE LAPPED TO LOCK LEGS ON ADJOINING PIECES.

STRUCTURAL STEEL:

AT THE CONTRACTOR'S OPTION, HE MAY SUBSTITUTE ⅞" Ø SHEAR STUDS FOR THE ¾" Ø STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - ⅞" Ø STUDS FOR 4 - ¾" Ø STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF ⅞" Ø STUDS ALONG THE BEAM AS SHOWN FOR ¾" Ø STUDS BASED ON THE RATIO OF 3 - ⅞" Ø STUDS FOR 4 - ¾" Ø STUDS. STUDS OF THE LENGTH SPECIFIED ON THE PLANS MUST BE PROVIDED. THE MAXIMUM SPACING SHALL BE 2'-0".

EXCEPT AT THE INTERIOR SUPPORTS OF CONTINUOUS BEAMS WHERE THE COVER PLATE IS IN CONTACT WITH BEARING PLATE, THE CONTRACTOR MAY, AT HIS OPTION, SUBSTITUTE FOR THE COVER PLATES DESIGNATED ON THE PLANS COVER PLATES OF THE EQUIVALENT AREA PROVIDED THESE PLATES ARE AT LEAST 5/16" IN THICKNESS AND DO NOT EXCEED A WIDTH EQUAL TO THE FLANGE WIDTH LESS 2" OR A THICKNESS EQUAL TO 2 TIMES THE FLANGE THICKNESS. THE SIZE OF FILLET WELDS SHALL CONFORM TO THE REQUIREMENTS OF THE CURRENT ANSI/AASHTO/AWS "BRIDGE WELDING CODE". ELECTROSLAG WELDING WILL NOT BE PERMITTED.

WITH THE SOLE EXCEPTION OF EDGES AT SURFACES WHICH BEAR ON OTHER SURFACES, ALL SHARP EDGES AND ENDS OF SHAPES AND PLATES SHALL BE SLIGHTLY ROUNDED BY SUITABLE MEANS TO A RADIUS OF APPROXIMATELY 1/16 INCH OR EQUIVALENT FLAT SURFACE AT A SUITABLE ANGLE PRIOR TO PAINTING, GALVANIZING, OR METALLIZING.

HANDRAILS AND POSTS:

METAL STANDARDS AND FACES OF THE CONCRETE END POSTS FOR THE METAL RAIL SHALL BE SET NORMAL TO THE GRADE OF THE CURB, UNLESS OTHERWISE SHOWN ON PLANS. THE METAL RAIL AND TOPS OF CONCRETE POSTS USED WITH THE ALUMINUM RAIL SHALL BE BUILT PARALLEL TO THE GRADE OF THE CURB.

METAL HANDRAILS SHALL BE IN ACCORDANCE WITH THE PLANS. RAILS SHALL BE AS MANUFACTURED FOR BRIDGE RAILING. CASTINGS SHALL BE OF A UNIFORM APPEARANCE. FINS AND OTHER DEFORMATIONS RESULTING FROM CASTING OR OTHERWISE SHALL BE REMOVED IN A MANNER SO THAT A UNIFORM COLORING OF THE COMPLETED CASTING SHALL BE OBTAINED. CASTINGS WITH DISCOLORATIONS OR OF NON-UNIFORM COLORING WILL NOT BE ACCEPTED. CERTIFIED MILL REPORTS ARE REQUIRED FOR METAL RAILS AND POSTS.

SPECIAL NOTES:

GENERALLY, IN CASE OF DISCREPANCY, THIS STANDARD SHEET OF NOTES SHALL GOVERN OVER THE SPECIFICATIONS, BUT THE REMAINDER OF THE PLANS SHALL GOVERN OVER NOTES HEREON, AND SPECIAL PROVISIONS SHALL GOVERN OVER ALL. SEE SPECIFICATIONS ARTICLE 105-4.

ENGLISH

JANUARY, 1990