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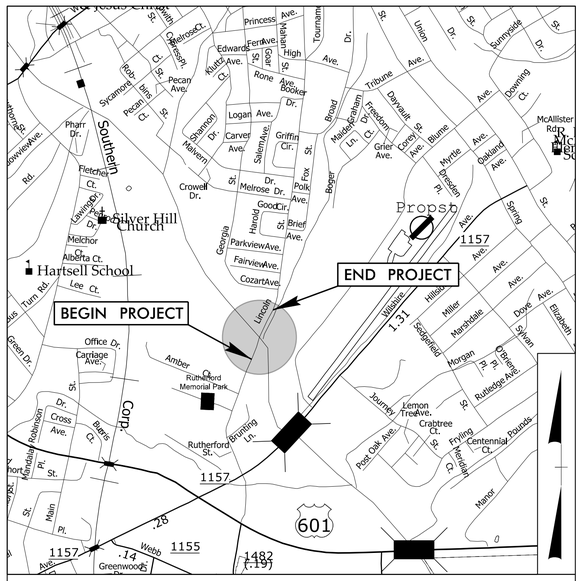
09/08/99

See Sheet 1A For Index of Sheets



VICINITY MAP NOT TO SCALE

EXISTING OFFSITE DETOUR (CITY MAINTAINED)

CITY OF CONCORD
NORTH CAROLINA

STATE	CITY PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	LINCOLN ST	1	

CABARRUS COUNTY

LOCATION: BRIDGE REPLACEMENT OF LINCOLN STREET CROSSING IRISH BUFFALO CREEK

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

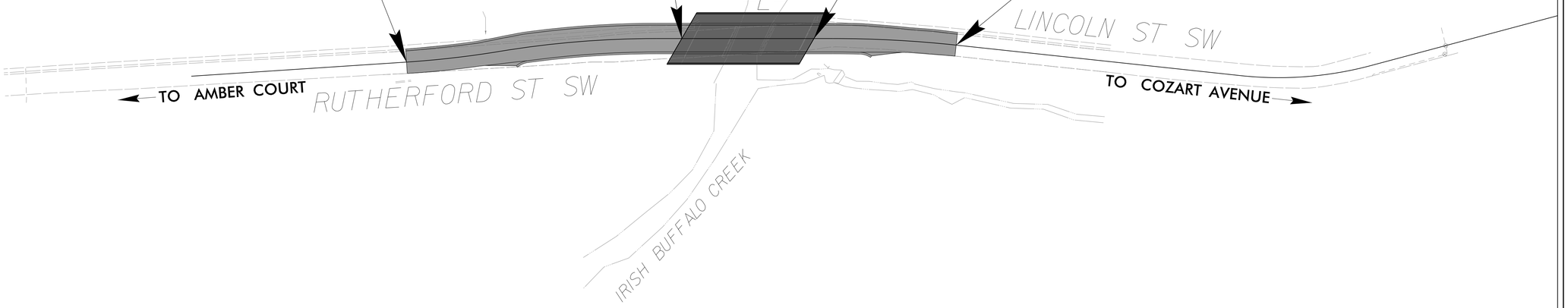
NAD 83

BEGIN PROJECT
–L– STA. 10+25.00

BEGIN BRIDGE
–L– STA. 13+13.56

END BRIDGE
–L– STA. 14+51.44

END PROJECT
–L– STA. 16+00.00



LENGTH OF ROADWAY = 0.08 MILES

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2018 = 1,900

V = 30 MPH

FUNC CLASS = MINOR COLLECTOR
SUB–REGIONAL TIER

PROJECT LENGTH

LENGTH OF ROADWAY = 0.08 MILES
LENGTH OF STRUCTURE = 0.03 MILES
TOTAL LENGTH OF PROJECT = 0.11 MILES

Prepared in the Office of:
Stantec
801 Jones Franklin Road, Suite 300
Raleigh, NC 27606
Tel. (919) 851-6000
Fax. (919) 851-7024
www.stantec.com
License No. F-0672

FOR THE CITY OF CONCORD

2024 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
AUGUST 2023

LETTING DATE:
JUNE 2024

STEVE SMALLWOOD, PE
PROJECT ENGINEER

JAMIE WILLIAMS, PE
CITY OF CONCORD

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 48622 BRAD T. SMITH

DocuSigned by: Brad T. Smith 92A7B7528237403...
SIGNATURE: *P.E.* 12/22/2023

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 022037 STEPHEN T. SMALLWOOD

DocuSigned by: Stephen T. Smallwood 24D97F482A25453...
SIGNATURE: *P.E.* 12/22/2023

12/22/2023
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tfhoppe

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PROJECT REFERENCE NO.	SHEET NO.
LINCOLN ST	1-A

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 042037 ENGINEER JOSEPH T. SMALLWOOD

12/22/2023

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

INDEX OF SHEETS

2024 ROADWAY ENGLISH STANDARD DRAWINGS

The following Roadway Standards as appear in "Roadway Standard Drawings" Highway Design Branch - N. C. Department of Transportation - Raleigh, N. C., Dated January, 2024 are applicable to this project and by reference hereby are considered a part of these plans:

STD.NO.	TITLE
DIVISION 2 - EARTHWORK	
200.03	Method of Clearing - Method III
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superelevation - Two Lane Pavement
225.06	Method of Grading Sight Distance at Intersections
235.01	Embankment Monitoring
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
DIVISION 6 - ASPHALT BASES AND PAVEMENTS	
654.01	Pavement Repairs for superpave mix types
DIVISION 8 - INCIDENTALS	
815.02	Subsurface Drain
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
840.25	Anchorage for Frames - Brick or Concrete or Precast
840.45	Precast Drainage Structure840.66 Drainage Structure Steps
846.01	Concrete Curb, Gutter and Curb & Gutter
848.01	Concrete Sidewalk
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units
866.01	Chain Link Fence
876.01	Guide for Rip Rap in Channels and Ditches
876.02	Guide for Rip Rap at Pipe Outlets
876.03	Drainage Ditches with Class 'A' Rip Rap
876.04	Drainage Ditches with Class 'B' Rip Rap

GENERAL NOTES: 2024 SPECIFICATIONS

GRADING AND SURFACING OR RESURFACING AND WIDENING:

THE GRADE LINES SHOWN DENOTE THE FINISHED ELEVATION OF THE PROPOSED SURFACING AT GRADE POINTS SHOWN ON THE TYPICAL SECTIONS. WHERE NO GRADE LINES ARE SHOWN, THE PROFILES SHOWN DENOTE THE TOP ELEVATION OF THE EXISTING PAVEMENT ALONG THE CENTER LINE OF SURVEY ON WHICH THE PROPOSED RESURFACING WILL BE PLACED. GRADE LINES MAY BE ADJUSTED BY THE ENGINEER IN ORDER TO SECURE A PROPER TIE-IN.

CLEARING:

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

SUPERELEVATION:

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

SUBSURFACE DRAINS:

SUBSURFACE DRAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 815.02 AT LOCATIONS DIRECTED BY THE ENGINEER.

GUARDRAIL:

THE GUARDRAIL LOCATIONS SHOWN ON THE PLANS MAY BE ADJUSTED DURING CONSTUCTION AS DIRECTED BY THE ENGINEER. THE CONTRACTOR SHOULD CONSULT WITH THE ENGINEER PRIOR TO ORDERING GUARDRAIL MATERIAL.

TEMPORARY SHORING:

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

SUBSURFACE PLANS:

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

END BENTS:

THE ENGINEER SHALL CHECK THE STRUCTURE END BENT PLANS, DETAILS, AND CROSS-SECTION PRIOR TO SETTING OF THE SLOPE STAKES FOR THE EMBANKMENT OR EXCAVATION APPROACHING A BRIDGE.

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE Century Link, City Of Concord.

Dominion Energy, Duke Energy

ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS, EXCEPT AS SHOWN ON THE PLANS.

PER CITY OF CONCORD CODE OF ORDINANCE CHAPTER 62, ARTICLE 3, SECTION 62-98 (2) ALL MATERIALS, EQUIPTMENT, LABOR, AND WORKMANSHIP ASSOCIATED WITH PUBLIC WATER AND/OR SEWER EXTENSION AND/OR MODIFICATION SHALL BE IN ACCORDANCE WITH AND SUBJECT TO THE WATER AND SEWER AUTHORITY OF CABARRUS COUNTY'S STANDARD SPECIFICATIONS: THE CITY OF CONCORD'S ORDINANCES, POLICIES, AND STANDARD SPECIFICATIONS, AND THE NORTH CAROLINA ADMINISTRATIVE CODE FOR WASTEWATER COLLECTION AND WATER DISTRIBUTION SYSTEMS. IN THE EVENT OF CONFLICT BETWEEN THE WATER AND SEWER AUTHORITY OF CABARRUS COUNTY'S STANDARD SPECIFICATIONS: THE CITY OF CONCORD'S ORDINANCES, POLICIES, AND STANDARD SPECIFICATIONS, OR THE NORTH CAROLINA ADMINISTRATIVE CODE, THE MORE RESTRICTIVE REQUIREMENTS SHALL APPLY.

REVIEW AND APPROVAL OF THE PLANS DOES NOT RELIEVE THE OWNER, CONTRACTOR, OR DEVELOPER FROM MEETING THE REQUIREMENTS OF THE CITY OF CONCORD'S OR CABARRUS COUNTY ORDINANCES, POLICIES, AND STANDARD SPECIFICATIONS, (AS APPLICABLE), CONCORD WATER & SEWER POLICIES AND TECHNICAL SPECIFICATIONS, THE "STANDARD SPECIFICATION FOR WASTEWATER COLLECTION & WASTE DISTRIBUTION FOR CABARRUS COUNTY (WSACC MANUAL) AND ANY OTHER LOCAL, STATE, AND FEDERAL REGULATIONS & APPROVALS.

THE CONTRACTOR MUST CONTACT THE CITY OF CONCORD ENGINEERING CONSTRUCTION MANAGER AT 704-920-5425 AT LEAST 24-HOURS PRIOR TO INITIATING ANY CONSTRUCTION ACTIVITY.

THE EXISTING WATER MAIN VALVE RIMS AND STEMS AND THE EXISTING SEWER MAIN MANHOLES RIMS ARE TO BE RAISED OR LOWERED TO FINAL GRADE, AS APPLICABLE, AND AT LEAST 3-FT OF GROUND COVER IS TO BE MAINTAINED OVER THE EXISTING UTILITIES AT ALL TIMES PER THE CITY OF CONCORD CODE OF ORDINANCE CHAPTER 62, ARTICLE 3, SECTION 62-98.

PER THE CITY OF CONCORD CODE OF ORDINANCE CHAPTER 62, ARTICLE 3, SECTION 62-98 - THE FOLLOWING MINIMUM SEPARATIONS MUST BE INDICATED, UNLESS OTHERWISED APPROVED BY THE CITY.

A MINIMUM HORIZONTAL SEPARATION OF FIVE FEET SHALL BE MAINTAINED BETWEEN ANY TYPE OF MAINTENANCE OBSTRUCTION AND THE CITY'S WATER DISTRIBUTION LINES, WASTEWATER COLLECTION LINES, AND ASSOCIATED APPURTENANCES, UNLESS AN EXCEPTION IS GRANTED. GREATER SEPARATION DISTANCES MAY BE REQUIRED AS SPECIFIED BY FEDERAL, STATE, OR LOCAL REGULATIONS.

A MINIMUM VERTICAL SEPARATION OF TWO FEET SHALL BE MAINTAINED BETWEEN ANY TYPE OF MAINTENANCE OBSTRUCTION, INCLUDING BUT NOT LIMITED TO ANY OTHER UTILITY PROVIDER'S LINES OR EQUIPTMENT, AND THE CITY WATER DISTRIBUTION LINES, WASTEWATER COLLECTION LINES, AND ASSOCIATED APPURTENANCES, UNLESS AN EXCEPTION IS GRANTED. IF AN EXCEPTION IS GRANTED, A MINIMUM VERTICAL SEPARATION OF ONE FOOT MUST BE MAINTAINED AND THE CITY WATER DISTRIBUTION LINES, WASTEWATER COLLECTION LINES, AND ASSOCIATED APPURTNENANCES SHALL BE CONSTRUCTED OF DUCTILE IRON PIPE OR AN APPROVED FERROUS MATERIAL WITH JOINTS THAT ARE EQUIVALENT TO POTABLE WATER MAIN STANDARDS FOR A DISTANCE OF TEN FEET ON EITHER SIDE OF THE POINT OF CROSSING. GREATER SEPARATION DISTANCES MAY BE REQUIRED AS SPECIFIED BY FEDERAL, STATE, OR LOCAL REGULATIONS.

A MINIMUM HORIZONTAL SEPARATION OF TEN FEET SHALL BE MAINTAINED BETWEEN THE CITY WATER DISTRIBUTION SYSTEM AND WASTEWATER COLLECTION LINES, AND ASSOCIATED APPURTENANCES, UNLESS AN EXCEPTION IS GRANTED.

RIGHT-OF-WAY MARKERS:

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

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9/10/2021

PROJECT REFERENCE NO.	SHEET NO.
LINCOLN ST	1-B

STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

Note: Not to Scale

BOUNDARIES AND PROPERTY:

- State Line
- County Line
- Township Line
- City Line
- Reservation Line
- Property Line
- Existing Iron Pin (EIP) — EIP
- Computed Property Corner
- Existing Concrete Monument (ECM) — 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:

- Primary Horiz Control Point
- Primary Horiz and Vert Control Point
- Secondary Horiz and Vert Control Point
- Vertical Benchmark
- Existing Right of Way Monument
- Proposed Right of Way Monument (Rebar and Cap)
- Proposed Right of Way Monument (Concrete)
- Existing Permanent Easement Monument
- Proposed Permanent Easement Monument (Rebar and Cap)
- Existing C/A Monument
- Proposed C/A Monument (Rebar and Cap)
- Proposed C/A Monument (Concrete)
- Existing Right of Way Line
- Proposed Right of Way Line — RW
- Existing Control of Access Line — CA
- Proposed Control of Access Line — CA
- Proposed ROW and CA Line — RW CA
- Existing Easement Line — E
- Proposed Temporary Construction Easement — E
- Proposed Temporary Drainage Easement — TDE
- Proposed Permanent Drainage Easement — PDE
- Proposed Permanent Drainage/Utility Easement — DUE
- Proposed Permanent Utility Easement — PUE
- Proposed Temporary Utility Easement — TUE
- Proposed Aerial Utility Easement — AUE

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:

** SUE – Subsurface Utility Engineering*
LOS – Level of Service – A,B,C or D (Accuracy)

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 Test Hole (SUE – LOS A)*
- U/G Power Line (SUE – LOS B)* — P
- U/G Power Line (SUE – LOS C)* — P
- U/G Power Line (SUE – LOS D)* — 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 Test Hole (SUE – LOS A)*
- U/G Telephone Cable (SUE – LOS B)* — T
- U/G Telephone Cable (SUE – LOS C)* — T
- U/G Telephone Cable (SUE – LOS D)* — T
- U/G Telephone Conduit (SUE – LOS B)* — TC
- U/G Telephone Conduit (SUE – LOS C)* — TC
- U/G Telephone Conduit (SUE – LOS D)* — TC
- U/G Fiber Optics Cable (SUE – LOS B)* — T FO
- U/G Fiber Optics Cable (SUE – LOS C)* — T FO
- U/G Fiber Optics Cable (SUE – LOS D)* — T FO

WATER:

- Water Manhole — W
- Water Meter
- Water Valve
- Water Hydrant
- U/G Water Line Test Hole (SUE – LOS A)*
- U/G Water Line (SUE – LOS B)* — W
- U/G Water Line (SUE – LOS C)* — W
- U/G Water Line (SUE – LOS D)* — W
- Above Ground Water Line — A/G Water

TV:

- TV Pedestal — C
- TV Tower
- U/G TV Cable Hand Hole — HH
- U/G TV Test Hole (SUE – LOS A)*
- U/G TV Cable (SUE – LOS B)* — TV
- U/G TV Cable (SUE – LOS C)* — TV
- U/G TV Cable (SUE – LOS D)* — TV
- U/G Fiber Optic Cable (SUE – LOS B)* — TV FO
- U/G Fiber Optic Cable (SUE – LOS C)* — TV FO
- U/G Fiber Optic Cable (SUE – LOS D)* — TV FO

GAS:

- Gas Valve
- Gas Meter
- U/G Gas Line Test Hole (SUE – LOS A)*
- U/G Gas Line (SUE – LOS B)* — G
- U/G Gas Line (SUE – LOS C)* — G
- U/G Gas Line (SUE – LOS D)* — 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 Force Main Line Test Hole (SUE – LOS A)*
- SS Force Main Line (SUE – LOS B)* — FSS
- SS Force Main Line (SUE – LOS C)* — FSS
- SS Force Main Line (SUE – LOS D)* — FSS

MISCELLANEOUS:

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

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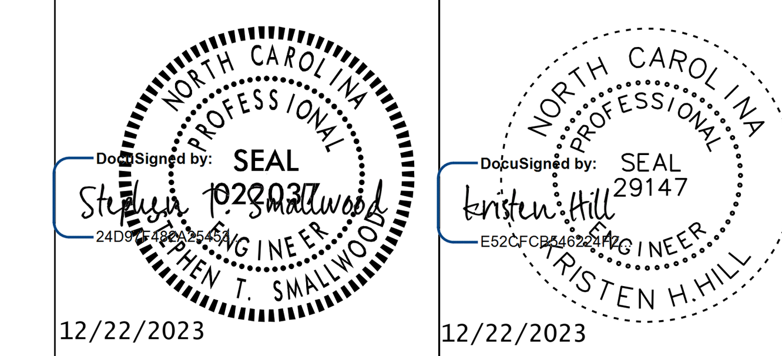
PROJECT REFERENCE NO.	SHEET NO.
LINCOLN ST	2A-1
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER



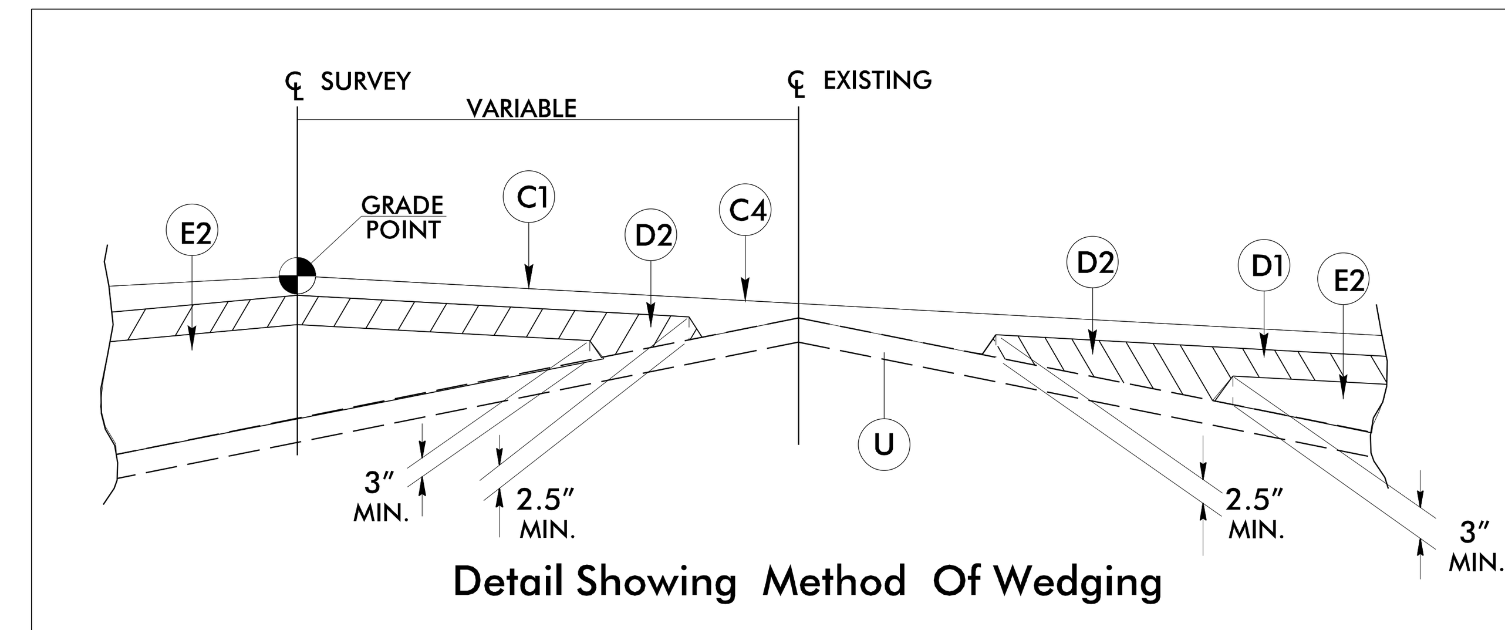
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PAVEMENT SCHEDULE

FINAL PAVEMENT DESIGN PROVIDED BY SM&E

C1	PROP. APPROX. 1.5" ASPHALT CONCRETE SURFACE COURSE TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD.	J1	PROP. 6" AGGREGATE BASE COURSE.
C2	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.	R1	2'-6" CONCRETE CURB AND GUTTER.
C4	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 TO EXCEED 1.5" IN DEPTH.	S	4" CONCRETE SIDEWALK.
D1	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	T	EARTH MATERIAL.
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 2½" IN DEPTH OR GREATER THAN 4" IN DEPTH.	U	EXISTING PAVEMENT.
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAILS).
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5½" IN DEPTH.		

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



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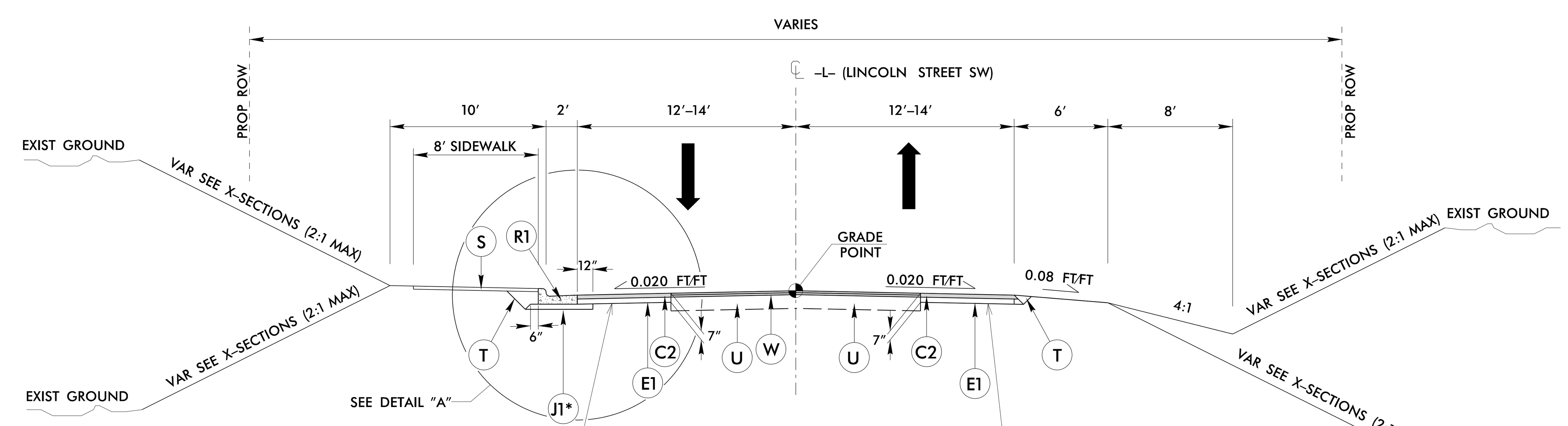
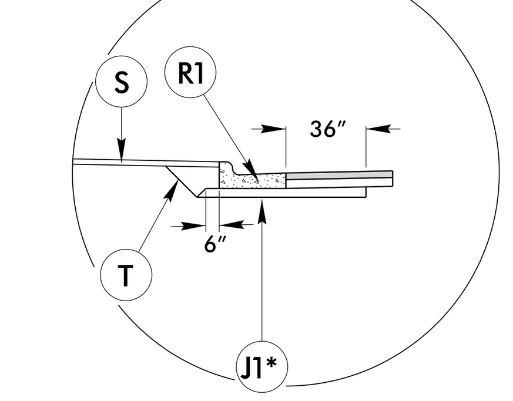
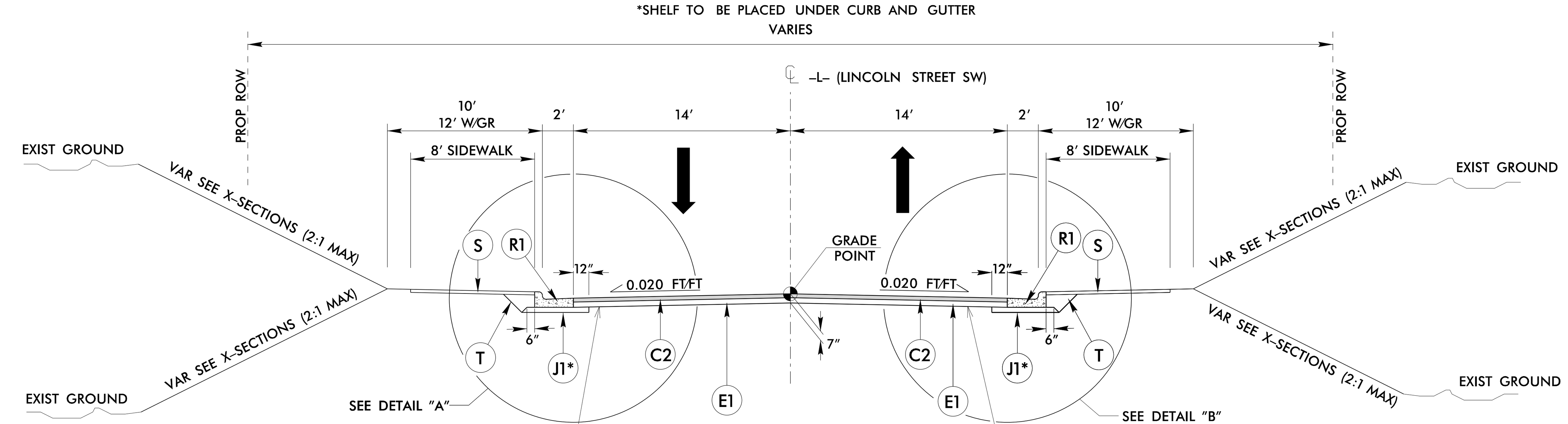


TYPICAL SECTION NO. 1

-L- STA. 10+25.00 TO 11+50.00
-L- STA. 15+00.00 TO 16+00.00
*SHELF TO BE PLACED UNDER CURB AND GUTTER

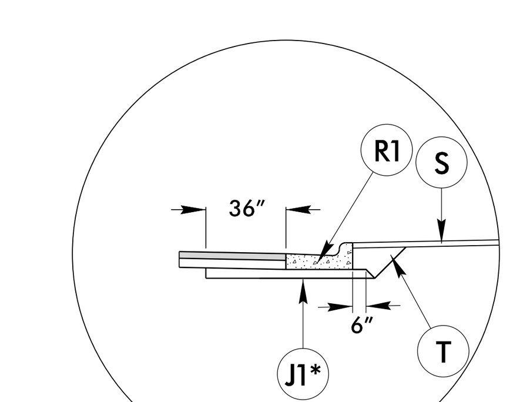


ALTERNATE PAVEMENT DESIGN DETAIL "A"

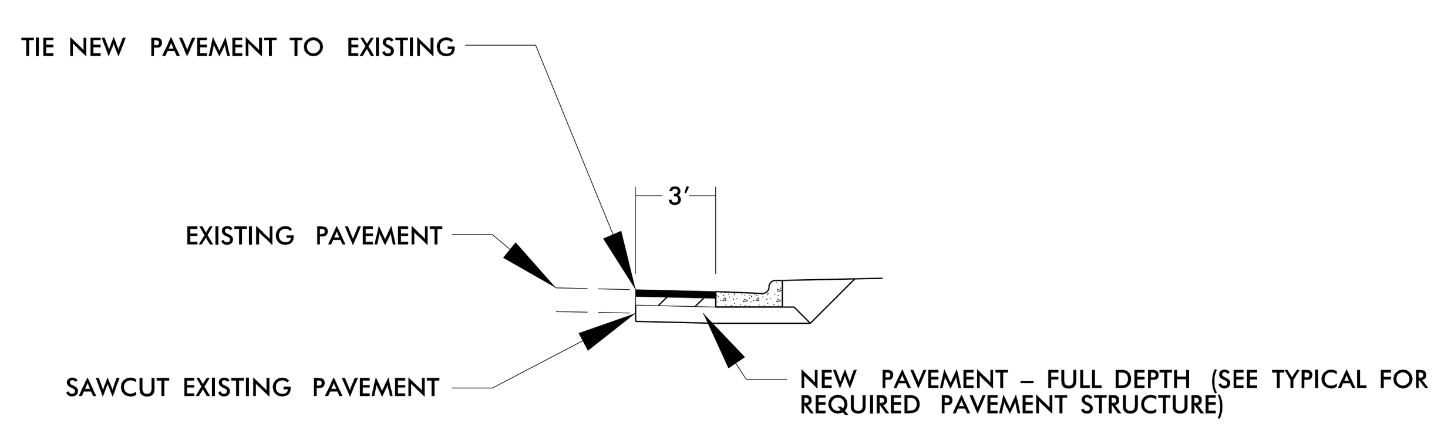


TYPICAL SECTION NO. 2

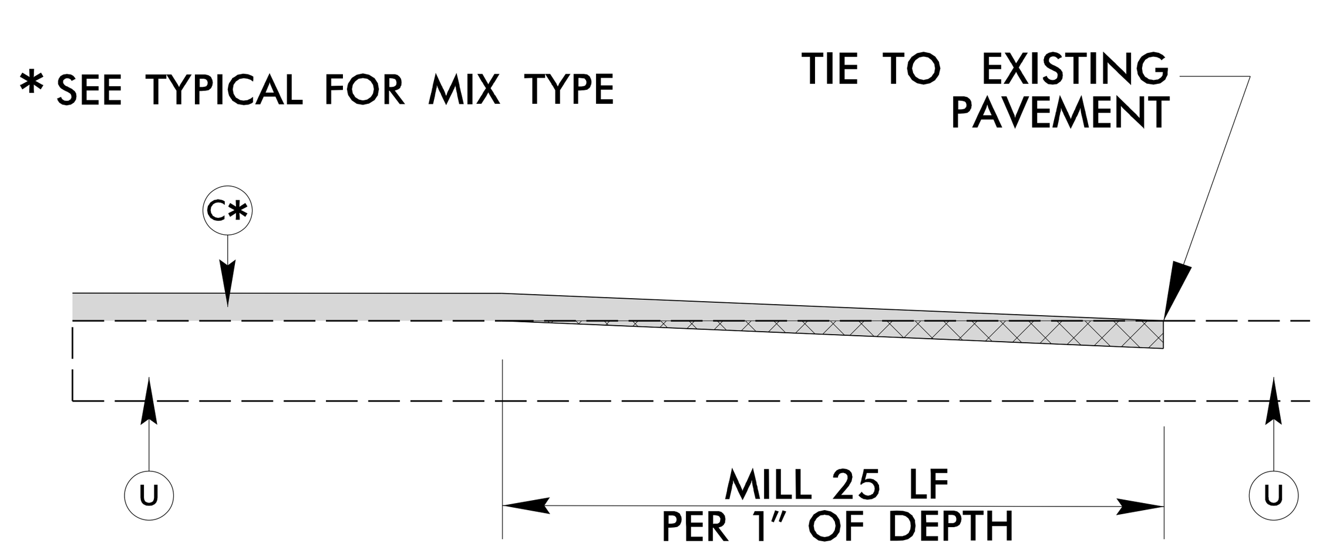
-L- STA. 11+50.00 TO 13+13.56
-L- STA. 14+51.44 TO 15+00.00
*SHELF TO BE PLACED UNDER CURB AND GUTTER



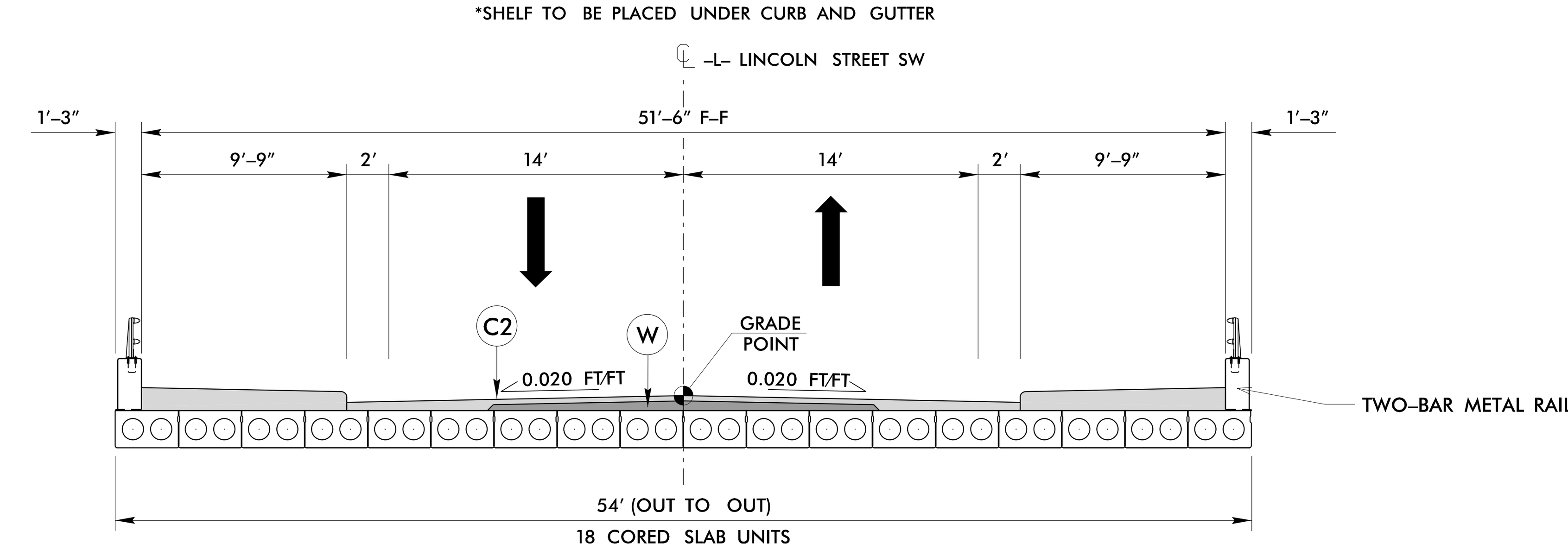
ALTERNATE PAVEMENT DESIGN DETAIL "B"



MINIMUM WIDENING AND SAWCUT DIMENSIONS



INCIDENTAL MILLING TIE-IN DETAIL FOR OVERLAY (PROFILE VIEW)



TYPICAL SECTION NO. 3

-L- STA. 13+13.56 (BEGIN BRIDGE) TO 14+51.44 (END BRIDGE)

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8/17/99

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
LINCOLN ST BRG	2D-1
R/W SHEET NO.	

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 49672 ENGINEER BRAD T SMITH

DocuSigned by: SEAL

12/22/2023

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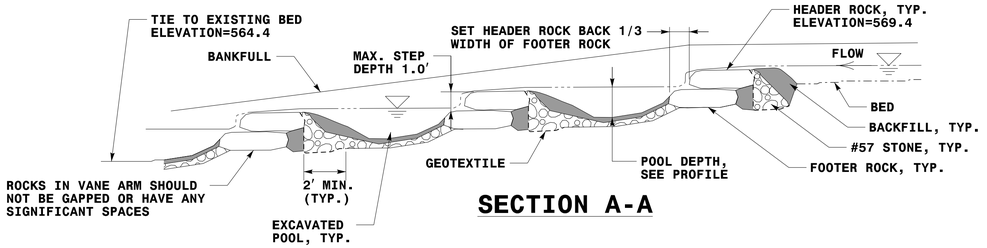
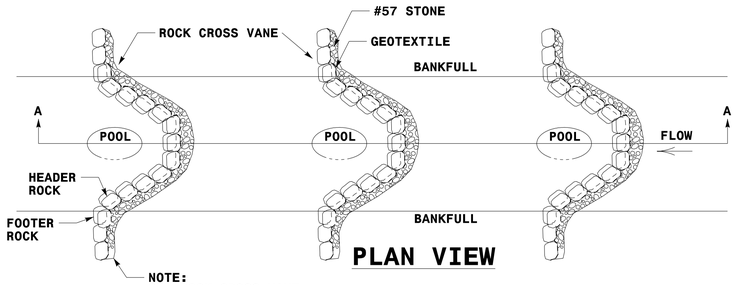


SECTION A-A

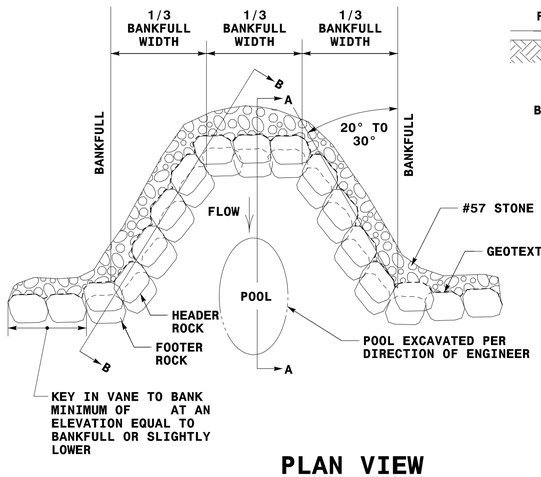


PLAN VIEW

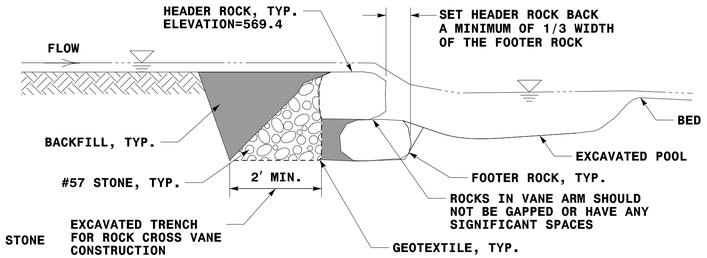
STEP POOL DETAIL

NOT TO SCALE

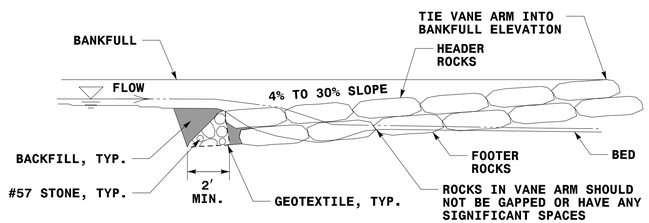
NOTES:
1) STEPS TO BE SPACED 8' TO 12' APART.
2) POOL SPACING SHALL BE INVERSELY PROPORTIONAL TO STREAM SLOPE, AND DIRECTLY PROPORTIONAL TO BANKFULL WIDTH.
3) POOL DEPTHS AT BANKFULL ELEVATION SHALL BE TYPICALLY 2 TO 3 TIMES DEEPER THAN STEP DEPTHS AT BANKFULL ELEVATION.
4) ADEQUATE NUMBER OF FOOTER BOULDERS TO BE USED IN ORDER TO HOLD UP THE BOULDERS AT HEAD OF STEPS DURING HIGH ENERGY/HIGH FLOW EVENTS.
5) STEP POOL DEPTH SHOULD BE 2 TO 3 TIMES BANKFULL DEPTH.



PLAN VIEW



SECTION A-A



SECTION B-B

	BOULDER DIMENSIONS (FT)		
STATION	HEIGHT	LENGTH	WIDTH
	1.0'	3.0'	2.5'

ROCK CROSS VANE DETAIL FOR STEP POOLS

NOT TO SCALE

NOTES:
1) DEEPEST PART OF POOL TO BE IN LINE WITH WHERE VANE ARM TIES INTO BANKFULL.
2) DO NOT EXCAVATE POOL TOO CLOSE TO FOOTER BOULDERS.
3) CLASS "A" STONE CAN BE USED TO REDUCE VOIDS BETWEEN HEADERS AND FOOTERS.
4) COMPACT BACKFILL TO EXTENT POSSIBLE OR AT THE DIRECTION OF THE ENGINEER.
5) POOL DEPTH SHOULD BE 2 TO 3 TIMES BANKFULL DEPTH.

12/22/2023
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5/9/05

COMPUTED BY: THH DATE: 04/05/23
CHECKED BY: DATE:

PROJECT REFERENCE NO.	SHEET NO.
LINCOLN ST	3B-1

SUMMARY OF EARTHWORK

(IN CUBIC YARDS)

STATION	STATION	UNCL. EXCAV.	UNDERCUT EXCAV.	EMBANK. +20%	BORROW	WASTE
SUMMARY NO. 1						
–L– 10+25.00	–L– 13+13.56	565		1,711	1,146	
SUB TOTAL SUMMARY NO. 1		565		1,711	1,146	
SUMMARY NO. 2						
–L– 14+51.44	–L– 16+00.00	24		917	893	
SUBTOTAL SUMMARY NO. 2		24		917	893	
PROJECT SUBTOTALS:		589		2,628	2,039	
LOSS DUE TO CLEARING & GRUBBING		50			–50	
WASTE IN LIEU OF BORROW						
PROJECT TOTALS:		639		2,628	1,989	
5% TO REPLACE TOP SOIL ON BORROW PIT					99	
GRAND TOTALS:		639		2,628	2,088	
SAY:		700			2,200	

ESTIMATED UNDERCUT: 450 CY
ESTIMATED SHALLOW UNDERCUT: 100 CY
ESTIMATED DDE: 810 CY

Earthwork quantities are calculated by Stantec. These earthwork quantities are based in part on subsurface data provided by S&ME.

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

PAVEMENT REMOVAL SUMMARY

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	YD^2
–L–	11+50.00	13+15.00	CL	516
–L–	14+52.00	15+00.00	CL	157
			TOTAL:	673
			SAY:	700

CURB AND GUTTER SUMMARY

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	LENGTH
–L–	10+25.00	16+00.00	LT	578′
–L–	11+37.75	15+12.20	RT	371′
			TOTAL:	949′
			SAY:	950′

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

GUARDRAIL SUMMARY

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH			WARRANT POINT		"N" DIST. FROM E.O.L.	TOTAL SHOUL. WIDTH	FLARE LENGTH		W		ANCHORS									IMPACT ATTENUATOR TYPE 350			SINGLE FACED GUARDRAIL	REMOVE EXISTING GUARDRAIL	REMOVE AND STOCKPILE EXISTING GUARDRAIL	REMARKS
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	TYPE III	TL–2								EA	G	NG				
–L–	12+37.68	12+98.69	RT	56.25			12+98.69 (BRIDGE)		11.75	N/A	50′	N/A	1′	N/A	1	1														
–L–	12+69.17	13+28.43	LT	56.25				13+28.43 (BRIDGE)	11.75	N/A	N/A	50′	N/A	1′	1	1														
–L–	14+36.57	14+96.83	RT	56.25				14+36.57 (BRIDGE)	11.75	N/A	N/A	50′	N/A	1′	1	1														
–L–	14+66.31	15+24.85	LT	56.25			14+66.31 (BRIDGE)		11.75	N/A	50′	N/A	1′	N/A	1	1														
SHEET TOTALS				225											4	4														
LESS ANCHOR DEDUCTIONS																														
TL–2		4	@ 25	–100																										
TYPE III		4	@ 18.75	–75																										
TOTALS				50																										
SAY				50											4	4														

ADDITIONAL GUARDRAIL POST = 5 EACH

12/22/2023
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MH3780

COMPUTED BY: BTS DATE: 5/19/2023

CHECKED BY: DATE:

PROJECT NO.	SHEET NO.
Lincoln St Bridge	3D-1

City of Concord

Transportation Department

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

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

LINE & STATION	OFFSET	STRUCTURE NUMBER		TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	MINIMUM REQUIRED SLOPE	Drainage Pipe (RCP, CSP, CAAP, HDPE, PVC, or PP PIPE)									R. C. PIPE CLASS IV					15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE		ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE)	REINFORCED ENDWALLS	DRAINAGE STRUCTURE	QUANTITIES FOR DRAINAGE STRUCTURES NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)			C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03				CONCRETE TRANSITIONAL SECTION		OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	CONCRETE BRIDGE APPROACH D.I. STD. 840.13	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATES STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26	G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27	G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28	G.D.I. (W.S. FLAT) FRAME WITH GRATE STD. 840.20	G.D.I. (W.S. FLAT) FRAME W/ 2 GRATES STD. 840.20	G.D.I. (W.S. SAG) FRAME W/ GRATE STD. 840.22	G.D.I. (W.S. SAG) FRAME W/ 2 GRATES STD. 840.22	G.D.I. (N.S. SAG) FRAME W/ GRATE STD. 840.24	G.D.I. (N.S. SAG) FRAME W/ 2 GRATES STD. 840.24	G.D.I. (N.S. FLAT) FRAME W/ GRATE STD. 840.29	G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29	DRIVEWAY D.I. STD. 840.30	FRAME W/ GRATE FOR DRIVEWAY STD. 840.30	J.B. STD. 840.31 OR STD. 840.32	ANGLED VANE GRATES AND FRAMES STD. 840.33	T.B.J.B. STD. 840.34	T.B.D.I. STD. 840.35	T.B.D.I. FOR STEEL GRATES STD. 840.36	STEEL FRAME WITH TWO GRATES STD. 840.37	TEMP STEEL PLATE COVER MASONRY DRAINAGE	SPRING BOX STD. 840.41		M.H. STD. 840.51, STD. 840.52, OR STD. 840.53	M.H. FRAME AND COVER STD. 840.54			CONVERT EXISTING C.B. TO J.B.	CONVERT EXISTING C.B. TO D.I.	CONVERT EXISTING D.I. TO J.B.	CONVERT EXISTING J.B. TO D.I.	ADJUST C.B.	ADJUST D.I.		15" DRAINAGE PIPE ELBOW		FLOWABLE FILL	CONCRETE COLLARS CL. "B" STD. 840.72	CONCRETE AND BRICK PIPE PLUG STD. 840.71	PIPE REMOVAL	REMARKS
SIZE THICKNESS OR GAUGE		FROM	TO	FT.	FT.	FT.	%	15	18	24		DO NOT USE RCP	DO NOT USE CSP	DO NOT USE HDPE	DO NOT USE PVC	DO NOT USE PP PIPE	15	18	24	30						CY	CY	MASONRY CY	0' THRU 5' EACH	A 5' THRU 10' LIN. FT.	B 10' AND ABOVE LIN. FT.		GRATE TYPE E	F	G		D.I. STD. 852.04 OR STD. 852.06	C.B. STD. 852.05																																						CY	CY	CY	LIN. FT.	
L 10+85	14 LT	0401		597.1																									1			1			1																																															
		0401	0402		593.8	588.5	0.9										64																																																																	246	Remove existing 15" HDPE
L 11+52	16 LT	0402		591.8																									1			1			1																																															
		0402	0405		588.5	582.5	0.9										136																																																																		
L 12+87	16 RT	0403		586.0																									1			1		1																																																
		0403	0405		582.7	582.5											32																																																																		
L 12+87	16 LT	0405		586.0																									1	2.5		1			1																																															
		0405	0406		578.5	576.5	1.1	60																																																																										
L 14+91	16 LT	0407		582.0																									1			1			1																																															
		0407	0408		578.7	578.5											32																																																																		
L 14+91	16 RT	0408		582.0																									1			1		1																																																
		0408	0409		578.5	575.3		28																																																															2						
L 15+91	37 LT	0410		575.0																																																																													
		0410	0411		575.0	574.8														24																																																														
L 15+91	14 LT	0411		580.4																									1	0.6		1			1																																													61	Remove existing 30" RCP
		0411	0412		574.8	574.4														52																																																														
SHEET TOTALS								88									264			76									7	3.1		7		2	5																																															2					307	
PROJECT TOTALS								88									264			76									7	3.1		7		2	5																																															2					307	

ABBREVIATIONS

C.A.A.	CORRUGATED ALUMINIUM ALLOY
C.B.	CATCH BASIN
C.S.	CORRUGATED STEEL
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
H.D.P.E.	HIGH DENSITY POLYETHYLENE
J.B.	JUNCTION BOX
M.H.	MANHOLE
N.S.	NARROW SLOT
P.V.C.	POLYVINYL CHLORIDE
R.C.	REINFORCED CONCRETE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX
W.S.	WIDE SLOT

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COMPUTED BY: __J.Daily__ DATE: ___9/8/23___
CHECKED BY: ____L. Campos_ DATE: __9/8/23_

(2-3-23)

PROJECT NO.	SHEET NO.
Lincoln St	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	200
				TOTAL LF:	200

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

SUMMARY OF AGGREGATE SUBGRADE/STABILIZATION

LINE	Station	Station	Aggregate Type* ASU(1/2)/ AST	Aggregate Thickness INCHES [8" for ASU(2)]	Shallow Undercut CY	Class IV Subgrade Stabilization TONS	Geotextile for Subgrade Stabilization SY	Stabilizer Aggregate TONS	Class IV Aggregate Stabilization TONS
CONTINGENCY			ASU	12	100	200	300		
			TOTAL CY/TONS/SY:		100	200**	300**	0	0

*ASU(1/2) = Aggregate Subgrade (Type 1 or 2)
*AST = Aggregate Stabilization
**Total tons of "Class IV Subgrade Stabilization" and total square yards of "Geotextile for Subgrade Stabilization" are only the estimated quantities for ASU(1/2)/AST and may only represent a portion of the subgrade stabilization and geotextile quantities shown in the Item Sheets of the Proposal.

SUMMARY OF SETTLEMENT GAUGES

Gauge No.	LINE and Station	Offset	
		Distance FT	Direction LT/RT
1	14+50	30	RT
	TOTAL GAUGES (EACH):		1

SUMMARY OF EMBANKMENT WAITING PERIODS

LINE	Station	Station	MONTHS
L	14+25	14+50	3

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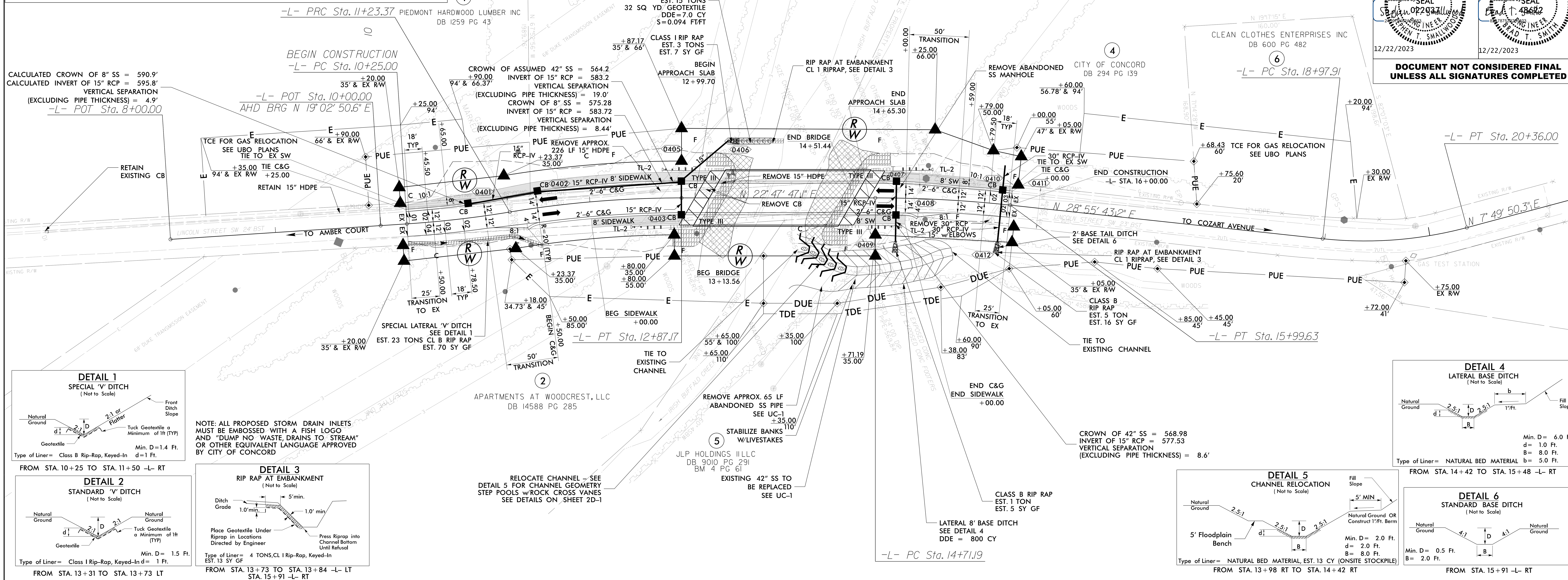
PROJECT REFERENCE NO.	SHEET NO.
LINCOLN ST	04
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
SEAL 022037 — 12/22/2023	SEAL 48692 — 12/22/2023

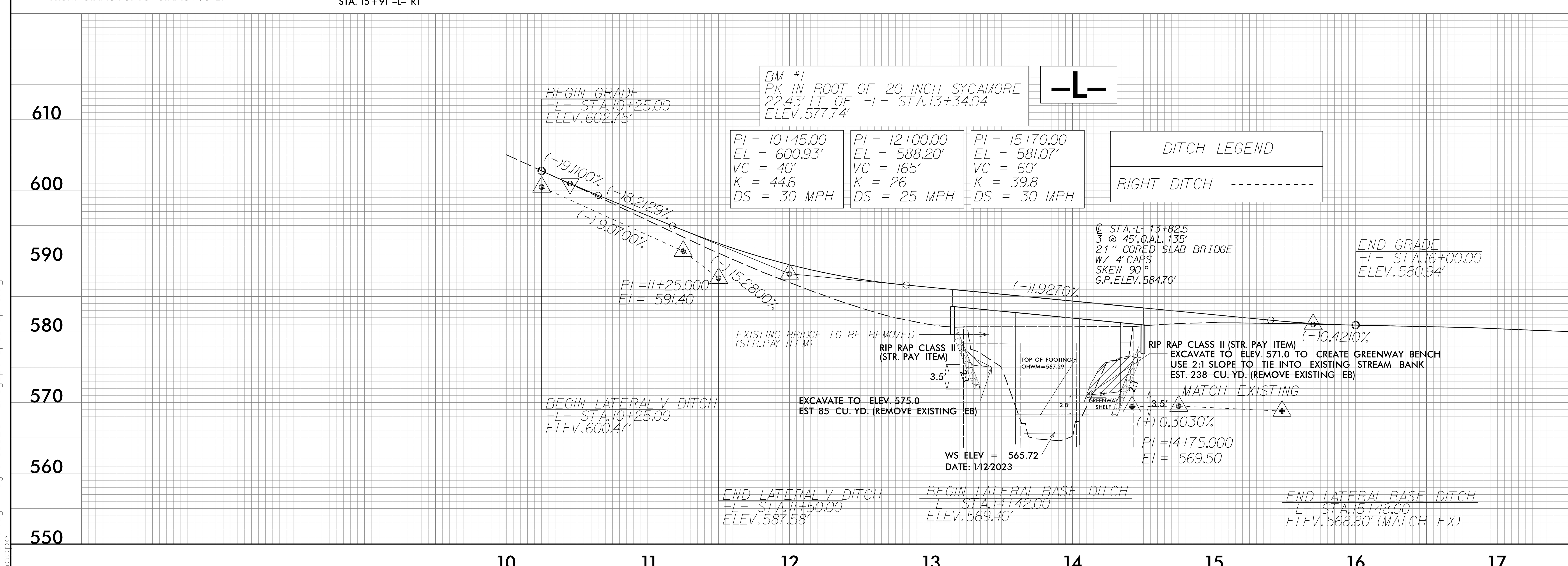
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

-L-

PI Sta 10+74.22	PI Sta 12+05.45	PI Sta 15+35.47	PI Sta 19+67.74
△ = 5° 38' 09.9" (LT)	△ = 9° 23' 06.4" (RT)	△ = 6° 07' 56.0" (RT)	△ = 21° 05' 52.8" (LT)
D = 5° 43' 46.5"	D = 5° 43' 46.5"	D = 4° 46' 28.7"	D = 15° 16' 43.9"
L = 98.37'	L = 163.80'	L = 128.43'	L = 138.09'
T = 49.22'	T = 82.08'	T = 64.28'	T = 69.83'
R = 1,000.00'	R = 1,000.00'	R = 1,200.00'	R = 375.00'
e = NC	e = NC	e = NC	e = EX



NAD 83
PIEDMONT HARDWOOD LUMBER INC DB 1331 PG 175
PIEDMONT HARDWOOD LUMBER INC DB 1259 PG 43
-L- PRC Sta. 11+23.37
BEGIN CONSTRUCTION -L- PC Sta. 10+25.00
-L- POT Sta. 10+00.00 AHD BRG N 19° 02' 50.6" E
-L- POT Sta. 8+00.00
CALCULATED CROWN OF 8" SS = 590.9'
CALCULATED INVERT OF 15" RCP = 595.8'
VERTICAL SEPARATION (EXCLUDING PIPE THICKNESS) = 4.9'
CROWN OF ASSUMED 42" SS = 564.2
INVERT OF 15" RCP = 583.2
VERTICAL SEPARATION (EXCLUDING PIPE THICKNESS) = 19.0'
CROWN OF 8" SS = 575.28
INVERT OF 15" RCP = 583.72
VERTICAL SEPARATION (EXCLUDING PIPE THICKNESS) = 8.44'
STANDARD 'V' DITCH CLASS I RIP RAP SEE DETAIL 2 EST. 15 TONS 32 SQ YD GEOTEXTILE DDE=7.0 CY S=0.094 FT/FT
CLASS I RIP RAP EST. 3 TONS EST. 7 SY GF
BEGIN APPROACH SLAB 12+99.70
RIP RAP AT EMBANKMENT CL 1 RIPRAP, SEE DETAIL 3
END BRIDGE 14+51.44
END APPROACH SLAB 14+65.30
REMOVE ABANDONED SS MANHOLE
CITY OF CONCORD DB 294 PG 139
CLEAN CLOTHES ENTERPRISES INC DB 600 PG 482
-L- PC Sta. 18+97.91
-L- PT Sta. 20+36.00
TCE FOR GAS RELOCATION SEE UBO PLANS
RETAIN EXISTING CB
RETAIN 15" HDPE
REMOVE APPROX. 226 LF 15" HDPE
REMOVE 15" HDPE
REMOVE CB
REMOVE 30" RCP TL-2 30" RCP-IV 15" w/ELBOWS
END CONSTRUCTION -L- STA. 16+00.00
N 22° 47' 47.1" E
N 28° 55' 43.2" E
N 7° 49' 50.3" E
TO AMBER COURT
TO COZART AVENUE
2' BASE TAIL DITCH SEE DETAIL 6
RIP RAP AT EMBANKMENT CL 1 RIPRAP, SEE DETAIL 3
BEG BRIDGE 13+13.56
BEG SIDEWALK +00.00
-L- PT Sta. 12+87.17
-L- PT Sta. 15+99.63
SPECIAL LATERAL 'V' DITCH SEE DETAIL 1 EST. 23 TONS CL B RIP RAP EST. 70 SY GF
TIE TO EXISTING CHANNEL
CLASS B RIP RAP EST. 5 TON EST. 16 SY GF
APARTMENTS AT WOODCREST, LLC DB 14588 PG 285
REMOVE APPROX. 65 LF ABANDONED SS PIPE SEE UC-1
STABILIZE BANKS W/LIVESTAKES
JLP HOLDINGS II LLC DB 9010 PG 291 BM 4 PG 61
EXISTING 42" SS TO BE REPLACED SEE UC-1
RELOCATE CHANNEL - SEE DETAIL 5 FOR CHANNEL GEOMETRY STEP POOLS w/ROCK CROSS VANES SEE DETAILS ON SHEET 2D-1
END C&G END SIDEWALK +00.00
CROWN OF 42" SS = 568.98
INVERT OF 15" RCP = 577.53
VERTICAL SEPARATION (EXCLUDING PIPE THICKNESS) = 8.6'
CLASS B RIP RAP EST. 1 TON EST. 5 SY GF
LATERAL 8' BASE DITCH SEE DETAIL 4 DDE = 800 CY
-L- PC Sta. 14+71.19
NOTE: ALL PROPOSED STORM DRAIN INLETS MUST BE EMBOSSED WITH A FISH LOGO AND "DUMP NO WASTE, DRAINS TO STREAM" OR OTHER EQUIVALENT LANGUAGE APPROVED BY CITY OF CONCORD
DETAIL 1 SPECIAL 'V' DITCH (Not to Scale)
Type of Liner= Class B Rip-Rap, Keyed-In Min. D=1.4 Ft. d=1 Ft.
FROM STA. 10+25 TO STA. 11+50 -L- RT
DETAIL 2 STANDARD 'V' DITCH (Not to Scale)
Type of Liner= Class I Rip-Rap, Keyed-In Min. D= 1.5 Ft. d= 1 Ft.
FROM STA. 13+31 TO STA. 13+73 LT
DETAIL 3 RIP RAP AT EMBANKMENT (Not to Scale)
Place Geotextile Under Riprap in Locations Directed by Engineer
Press Riprap into Channel Bottom Until Refusal
Type of Liner= 4 TONS,CL I Rip-Rap, Keyed-In EST. 13 SY GF
FROM STA. 13+73 TO STA. 13+84 -L- LT STA. 15+91 -L- RT
DETAIL 4 LATERAL BASE DITCH (Not to Scale)
Min. D= 6.0 Ft. d= 1.0 Ft. B= 8.0 Ft. b= 5.0 Ft.
Type of Liner= NATURAL BED MATERIAL
FROM STA. 14+42 TO STA. 15+48 -L- RT
DETAIL 5 CHANNEL RELOCATION (Not to Scale)
5' Floodplain Bench
Natural Ground OR Construct 1' Ft. Berm
Min. D= 2.0 Ft. d= 2.0 Ft. B= 8.0 Ft.
Type of Liner= NATURAL BED MATERIAL, EST. 13 CY (ONSITE STOCKPILE)
FROM STA. 13+98 RT TO STA. 14+42 RT
DETAIL 6 STANDARD BASE DITCH (Not to Scale)
Min. D= 0.5 Ft. B= 2.0 Ft.
FROM STA. 15+91 -L- RT



BM #1 PK IN ROOT OF 20 INCH SYCAMORE 22.43' LT OF -L- STA.13+34.04 ELEV.577.74'
-L-
PI = 10+45.00 EL = 600.93' VC = 40' K = 44.6 DS = 30 MPH
PI = 12+00.00 EL = 588.20' VC = 165' K = 26 DS = 25 MPH
PI = 15+70.00 EL = 581.07' VC = 60' K = 39.8 DS = 30 MPH
DITCH LEGEND
RIGHT DITCH
BEGIN GRADE -L- STA.10+25.00 ELEV.602.75'
END GRADE -L- STA.16+00.00 ELEV.580.94'
℄ STA.-L- 13+82.5 3 @ 45.0 AL 135' 21" CORED SLAB BRIDGE W/ 4' CAPS SKEW 90° G.P.ELEV.584.70'
PI =11+25.000 El = 591.40
PI =14+75.000 El = 569.50
EXISTING BRIDGE TO BE REMOVED (STR.PAY ITEM)
RIP RAP CLASS II (STR. PAY ITEM)
EXCAVATE TO ELEV. 571.0 TO CREATE GREENWAY BENCH USE 2:1 SLOPE TO TIE INTO EXISTING STREAM BANK EST. 238 CU. YD. (REMOVE EXISTING EB)
EXCAVATE TO ELEV. 575.0 EST 85 CU. YD. (REMOVE EXISTING EB)
MATCH EXISTING
WS ELEV = 565.72 DATE: 1/12/2023
BEGIN LATERAL V DITCH -L- STA.10+25.00 ELEV.600.47'
END LATERAL V DITCH -L- STA.11+50.00 ELEV.587.58'
BEGIN LATERAL BASE DITCH -L- STA.14+42.00 ELEV.569.40'
END LATERAL BASE DITCH -L- STA.15+48.00 ELEV.568.80' (MATCH EX)
610 600 590 580 570 560 550
10 11 12 13 14 15 16 17

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 5400	CFS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 578.5	FT
BASE DISCHARGE	= 7100	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 580.5	FT
OVERTOPPING DISCHARGE	= 6500	CFS
OVERTOPPING FREQUENCY	= 100-	YRS
OVERTOPPING ELEVATION	= 578.5*	FT

*NOTE LOCATION OF OVERTOPPING

DATE OF SURVEY = 01/12/2023

W.S.ELEVATION AT DATE OF SURVEY = 565.72 FT

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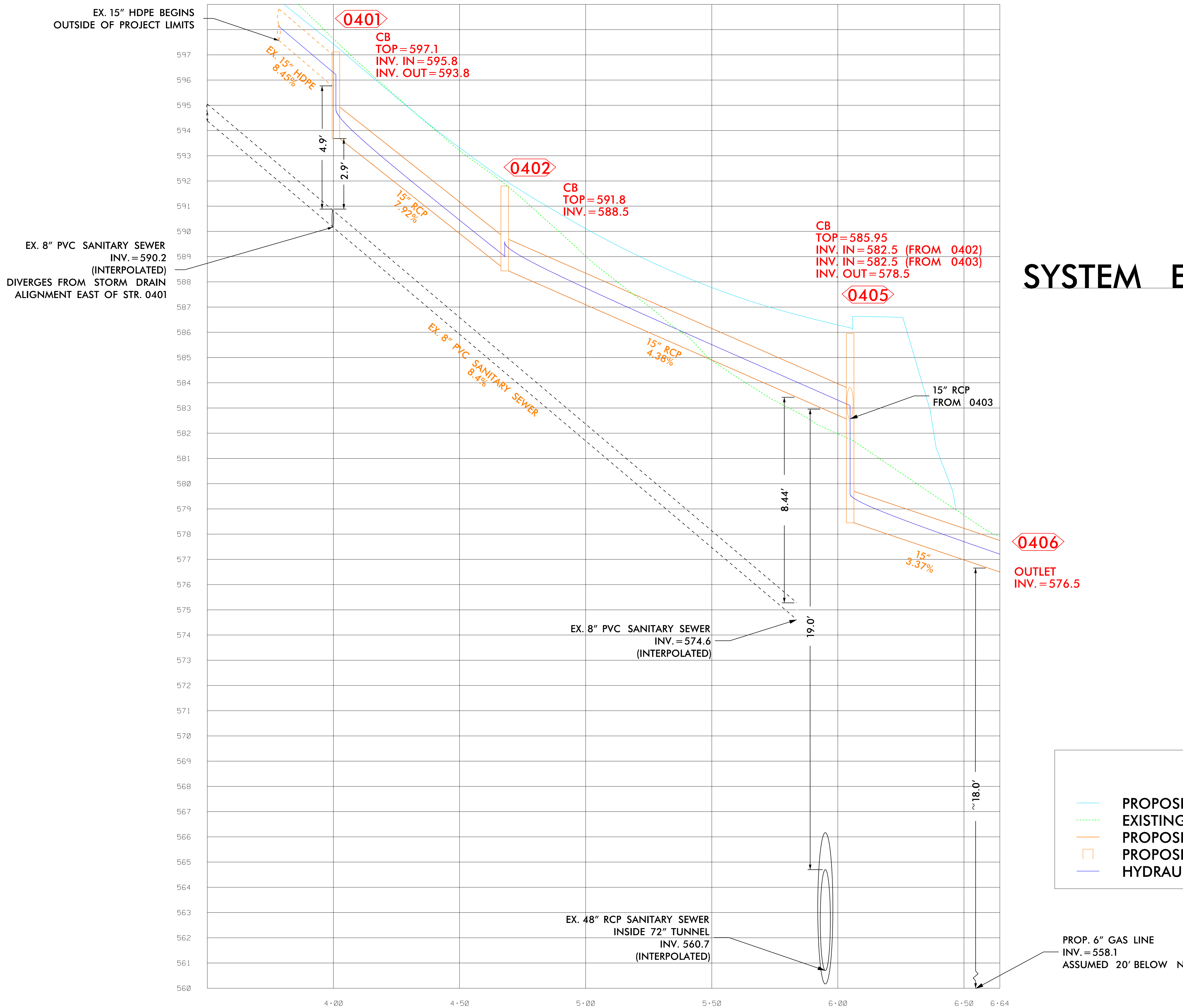
PROJECT REFERENCE NO.	SHEET NO.
LINCOLN ST	PFL-1
R/W SHEET NO.	

NOTE: STORM DRAIN PROFILES ARE PROVIDED FOR INFORMATIONAL PURPOSES ONLY. EXISTING UTILITIES ARE DEPICTED BASED ON THE BEST AVAILABLE INFORMATION AT TIME OF DESIGN. CONTRACTOR TO VERIFY HORIZONTAL AND VERTICAL LOCATION OF EXISTING AND RELOCATED UTILITIES PRIOR TO CONSTRUCTION

SYSTEM EX0401 – 0406



LEGEND

- PROPOSED SURFACE
- EXISTING GROUND
- PROPOSED STORM DRAIN PIPE
- PROPOSED STRUCTURE
- HYDRAULIC GRADE LINE

5/14/99

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...raulics\Design\Calculations\Lincoln St Br_Hyd_pfl_storm drain_psh.dgn

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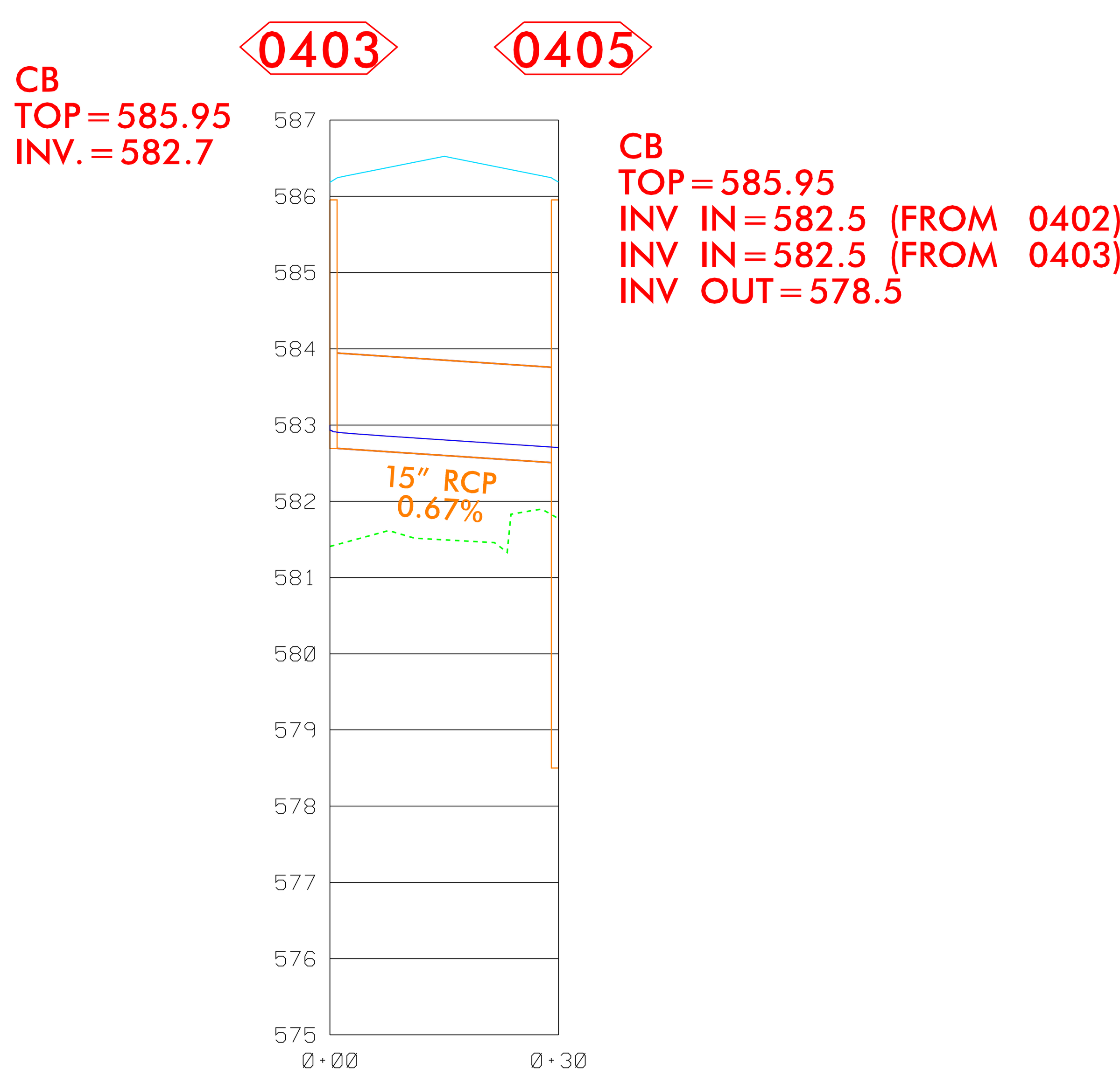
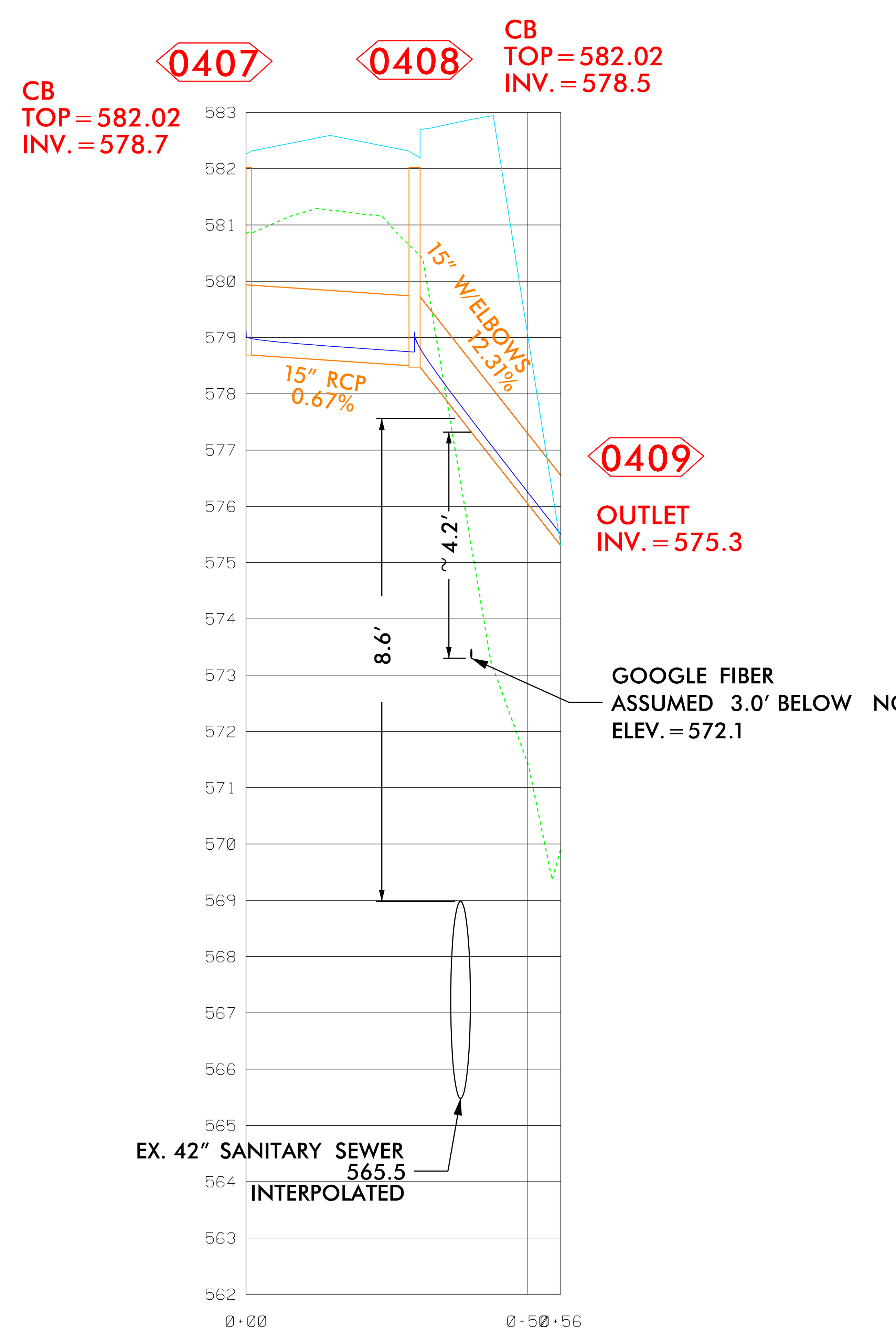
PROJECT REFERENCE NO.	SHEET NO.
LINCOLN ST	PFL-2
R/W SHEET NO.	

NOTE: STORM DRAIN PROFILES ARE PROVIDED FOR INFORMATIONAL PURPOSES ONLY. EXISTING UTILITIES ARE DEPICTED BASED ON THE BEST AVAILABLE INFORMATION AT TIME OF DESIGN. CONTRACTOR TO VERIFY HORIZONTAL AND VERTICAL LOCATION OF EXISTING AND RELOCATED UTILITIES PRIOR TO CONSTRUCTION

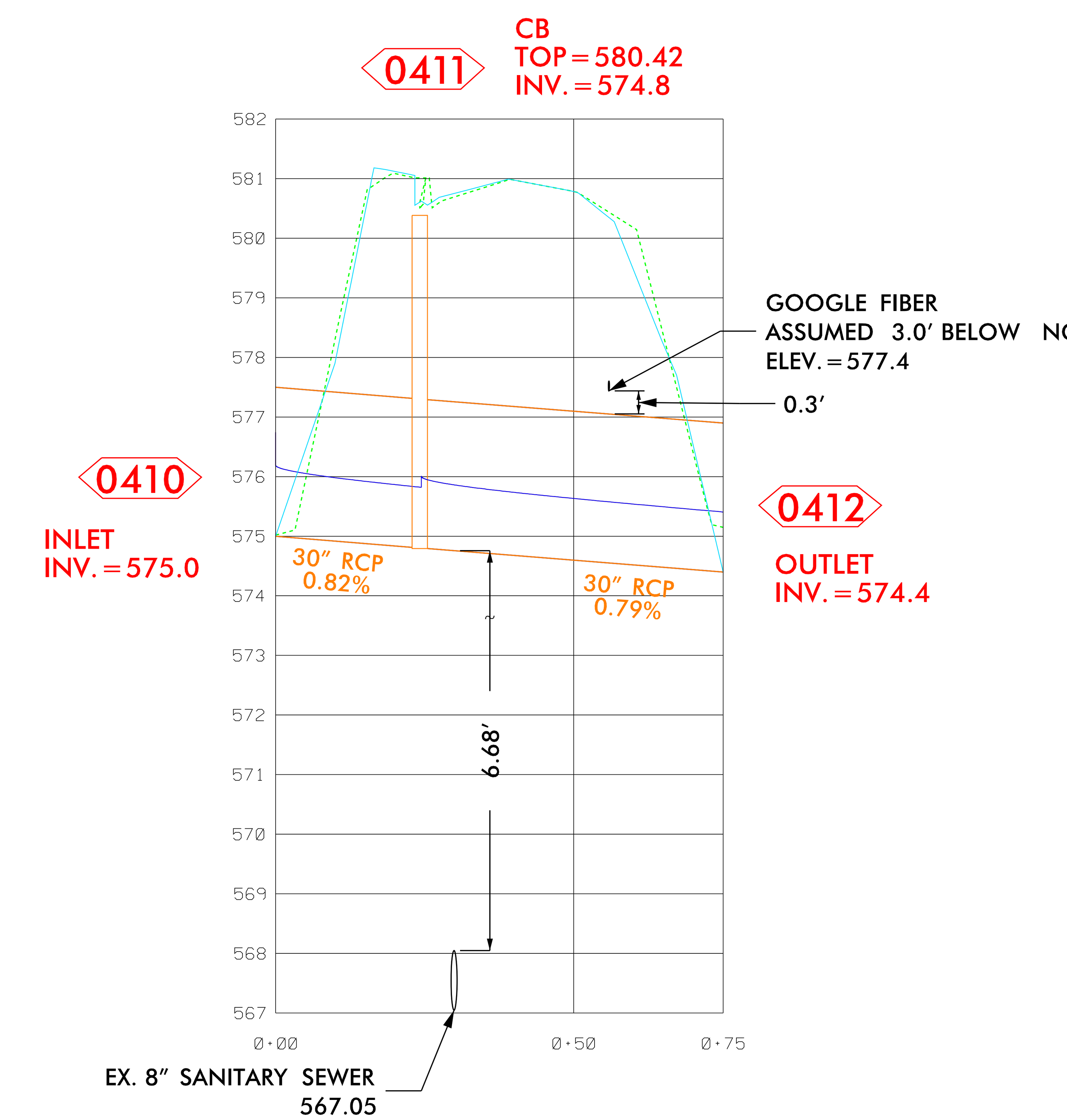
SYSTEM 0403 – 0405



SYSTEM 0407 – 0409



SYSTEM 0410 – 0412



LEGEND

- PROPOSED SURFACE
- EXISTING GROUND
- PROPOSED STORM DRAIN PIPE
- PROPOSED STRUCTURE
- HYDRAULIC GRADE LINE

5/14/99
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PROJECT: LINCOLN ST BRG

CITY OF CONCORD

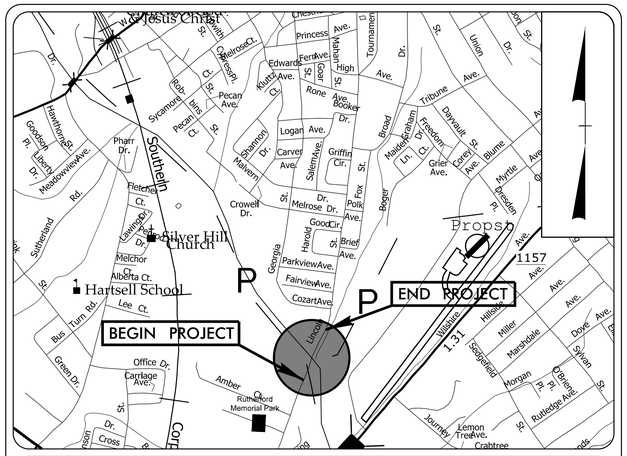
PLAN FOR PROPOSED HIGHWAY EROSION CONTROL

CABARRUS COUNTY

LOCATION: BRIDGE REPLACEMENT OF LINCOLN STREET CROSSING IRISH BUFFALO CREEK

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

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

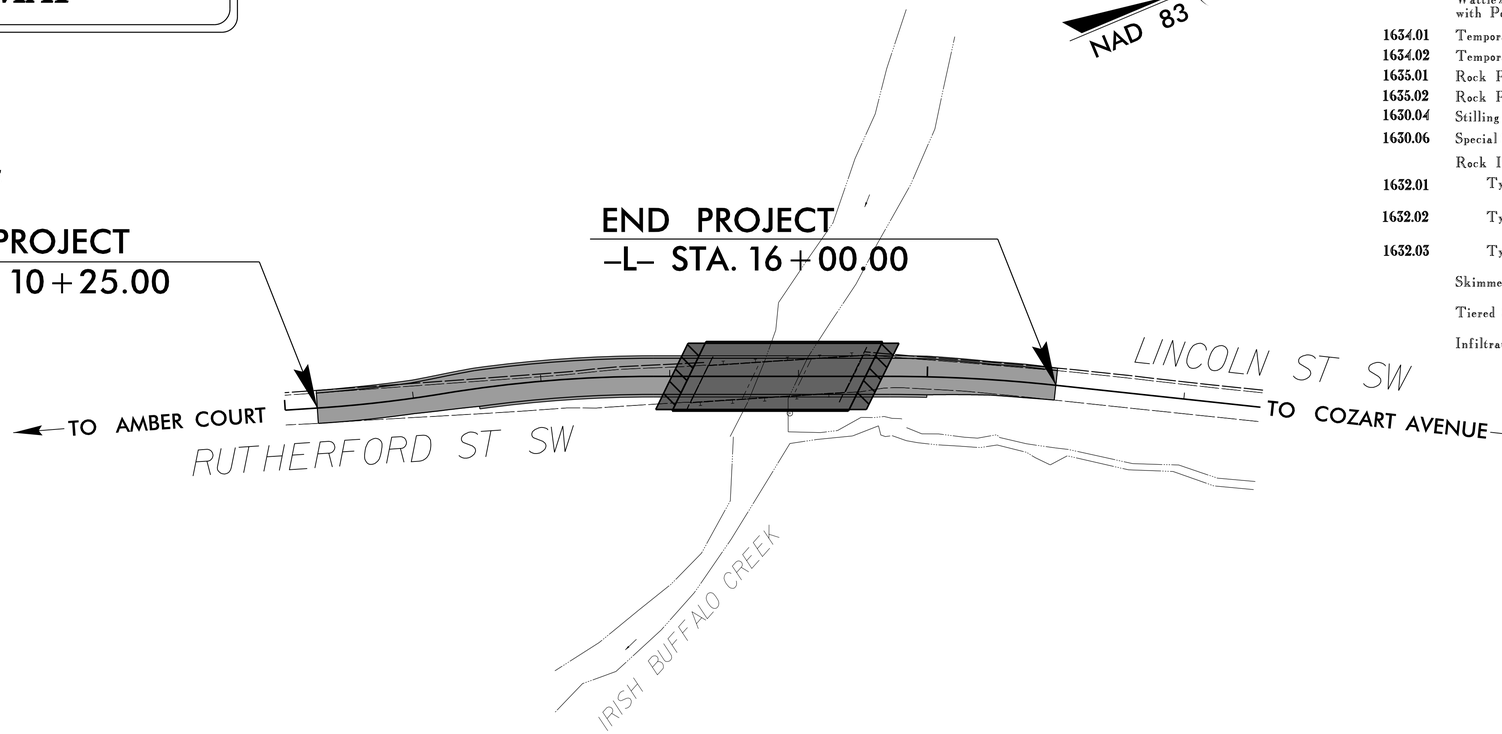


VICINITY MAP
NOT TO SCALE

RIVER BASIN: YADKIN PEE–DEE

BEGIN PROJECT
–L– STA. 10+25.00

END PROJECT
–L– STA. 16+00.00



NAD 83

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	
1630.06	Special 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	

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

THIS PROJECT HAS BEEN DESIGNED TO SENSITIVE WATERSHED STANDARDS.

ENVIRONMENTALLY SENSITIVE AREA(S) EXIST ON THIS PROJECT

Refer To E. C. Special Provisions for Special Considerations.

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.

Mead&Hunt

Prepared In the Office of:

Mead&Hunt
111 E. Hargett Street, Suite 300
Raleigh, North Carolina 27601
919-714-8670 | meadhunt.com
NC License No. F-1235

Designed by:

BRAD T. SMITH ***3520***
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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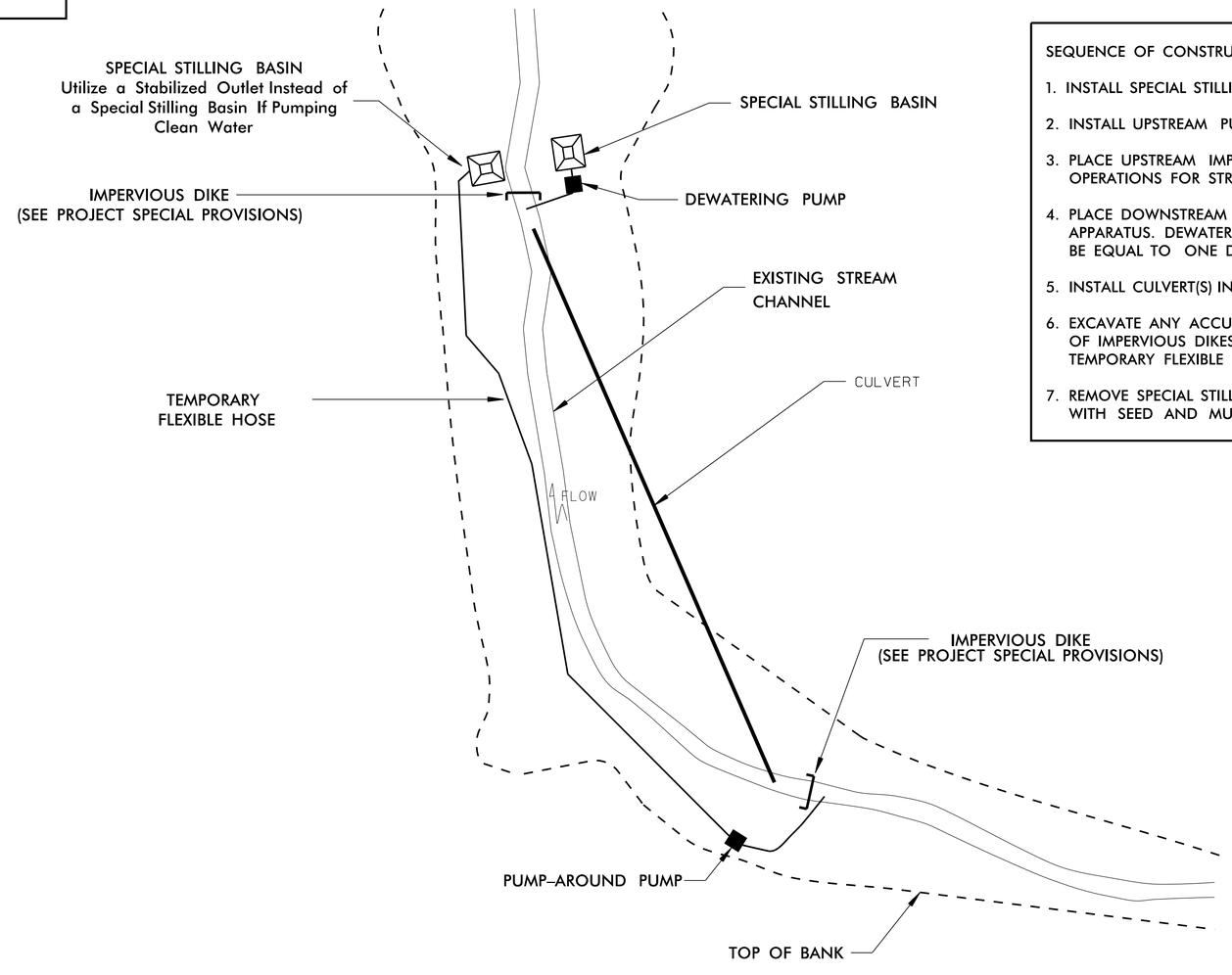
PROJECT REFERENCE NO.	SHEET NO.
LINCOLN ST BRG	EC-2

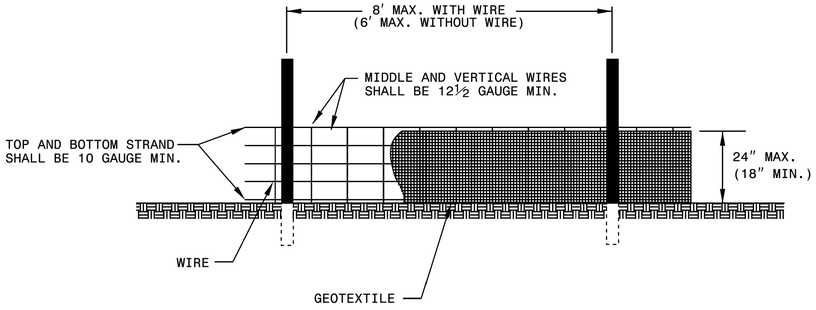
EXAMPLE OF PUMP–AROUND OPERATION

NOTES:
1) All excavation shall be performed in only dry or isolated areas of the work zone.
2) Impervious dikes are to be used to isolate work from stream flow when necessary.
3) Maintenance of stream flow operations shall be incidental to the work. This includes polyethylene sheeting, diversion pipes, pumps and hoses.
4) Pumps and hoses shall be of sufficient size to dewater the work area.



SEQUENCE OF CONSTRUCTION FOR TYPICAL WORK AREA

1. INSTALL SPECIAL STILLING BASIN(S).
2. INSTALL UPSTREAM PUMP AND TEMPORARY FLEXIBLE HOSE.
3. PLACE UPSTREAM IMPERVIOUS DIKE AND BEGIN PUMPING OPERATIONS FOR STREAM DIVERSION.
4. PLACE DOWNSTREAM IMPERVIOUS DIKE AND PUMPING APPARATUS. DEWATER ENTRAPPED AREA. AREA TO BE DEWATERED SHALL BE EQUAL TO ONE DAY'S WORK.
5. INSTALL CULVERT(S) IN ACCORDANCE WITH THE PLANS.
6. EXCAVATE ANY ACCUMULATED SILT AND DEWATER BEFORE REMOVAL OF IMPERVIOUS DIKES. REMOVE IMPERVIOUS DIKES, PUMPS, AND TEMPORARY FLEXIBLE HOSE. (DOWNSTREAM IMPERVIOUS DIKES FIRST).
7. REMOVE SPECIAL STILLING BASIN(S) AND BACKFILL. STABILIZE DISTURBED AREA WITH SEED AND MULCH.



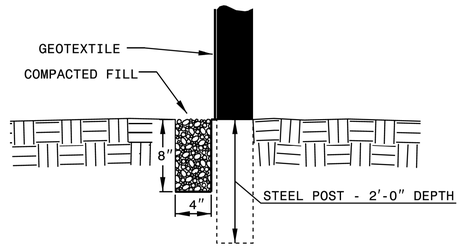
NOTES

USE GEOTEXTILE A MINIMUM OF 36″ IN WIDTH AND FASTEN ADEQUATELY TO THE POSTS AND WIRE AS DIRECTED.

USE WIRE A MINIMUM OF 32″ IN WIDTH AND WITH A MINIMUM OF 5 LINE WIRES WITH 12″ VERTICAL SPACING.

PROVIDE 5′-0″ STEEL POST OF THE SELF-FASTENER ANGLE STEEL TYPE.

FOR MECHANICAL SLICING METHOD INSTALLATION, GEOTEXTILE SHALL BE A MAXIMUM OF 18″ ABOVE GROUND SURFACE.



EXTENSION OF GEOTEXTILE AND WIRE INTO TRENCH

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

1-24

ROADWAY STANDARD DRAWING FOR
TEMPORARY SILT FENCE

SHEET 1 OF 1
1605.01

NOTES

USE NO. 5 OR NO. 57 STONE FOR SEDIMENT CONTROL STONE.

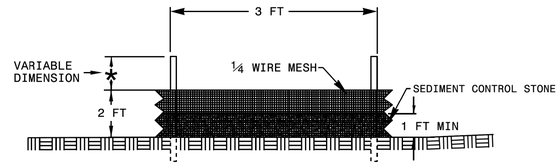
USE HARDWARE CLOTH 24 GAUGE WIRE MESH WITH ¼ INCH MESH OPENINGS.

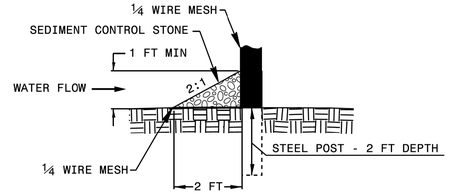
INSTALL 5 FT. SELF FASTENER ANGLE STEEL POST 2 FT. DEEP MINIMUM.

ATTACH HARDWARE CLOTH TO POSTS WITH WIRE STAPLE OR OTHER ACCEPTABLE METHODS.

SPACE POSTS A MAXIMUM OF 3 FT.

FOR INSTALLATION BETWEEN SECTIONS OF SILT FENCE, EXTEND SEDIMENT CONTROL STONE A MINIMUM OF 12″ ON EACH SIDE OF SPECIAL SEDIMENT CONTROL FENCE SECTION.



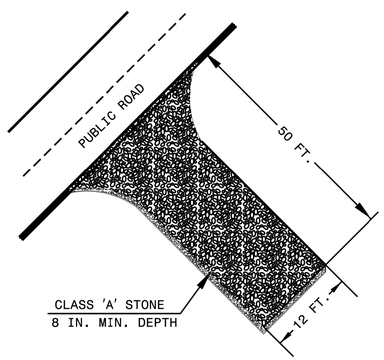


STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

1-24

ROADWAY STANDARD DRAWING FOR
SPECIAL SEDIMENT CONTROL FENCE

SHEET 1 OF 1
1606.01



NOTES

1. PROVIDE TURNING RADIUS SUFFICIENT TO ACCOMMODATE LARGE TRUCKS.
2. LOCATE ENTRANCES TO PROVIDE FOR UTILIZATION BY ALL CONSTRUCTION VEHICLES.
3. MUST BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR DIRECT FLOW OF MUD ONTO STREETS. PERIODIC TOPDRESSING WITH STONE WILL BE NECESSARY.
4. ANY MATERIAL TRACKED ONTO THE ROADWAY MUST BE CLEANED UP IMMEDIATELY.
5. LOCATE GRAVEL CONSTRUCTION ENTRANCE AT ALL POINTS OF INGRESS AND EGRESS UNTIL SITE IS STABILIZED. PROVIDE FREQUENT CHECKS OF THE DEVICE AND TIMELY MAINTENANCE.
6. NUMBER AND LOCATION OF CONSTRUCTION ENTRANCES TO BE DETERMINED BY THE ENGINEER.
7. USE CLASS 'A' STONE OR OTHER COARSE AGGREGATE APPROVED BY THE ENGINEER.
8. INSTALL CONSTRUCTION ENTRANCES IN A WAY TO PREVENT VEHICLES FROM BYPASSING CONSTRUCTION ENTRANCE LEAVING PROJECT SITE.

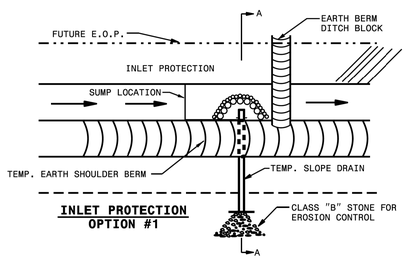
NOTE: PLACE GEOTEXTILE FOR DRAINAGE BENEATH STONE

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

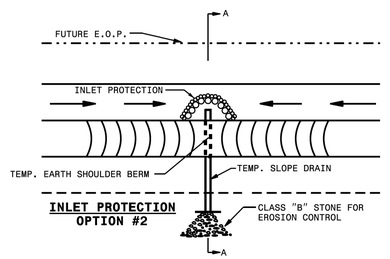
1-24

ROADWAY STANDARD DRAWING FOR
GRAVEL CONSTRUCTION ENTRANCE

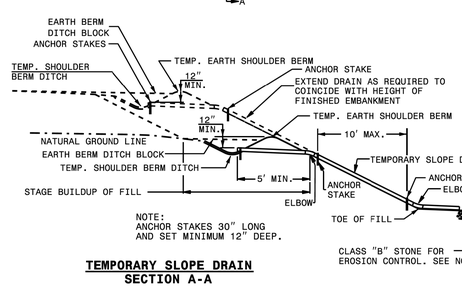
SHEET 1 OF 1
1607.01



INLET PROTECTION
OPTION #1

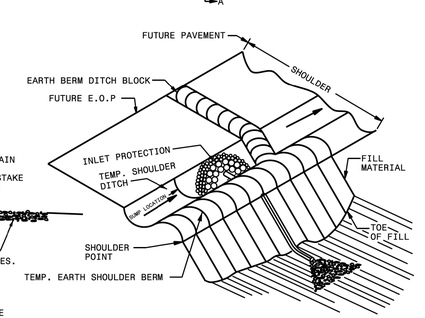


INLET PROTECTION
OPTION #2



NOTE:
ANCHOR STAKES 30″ LONG
AND SET MINIMUM 12″ DEEP.

TEMPORARY SLOPE DRAIN
SECTION A-A



ISOMETRIC VIEW
OPTION #1

NOTES

1. OPEN END PIPE WITH SUMP AND MINIMUM SETBACK AND PROPER COMPACTION IS AN ACCEPTABLE INLET TREATMENT FOR STAGED CONSTRUCTION WHEN NOT LEFT IN PLACE FOR MORE THAN 30 DAYS.
2. AT INLETS A STANDARD T-SECTION MAY BE INSTALLED FOR MULTI-DIRECTION FLOW AND ELBOWS FOR SINGLE-DIRECTION FLOW AS DIRECTED.
3. EXTEND SLOPE DRAINS TO BOTTOM OF SLOPE, SEDIMENT BASINS AND EROSION CONTROL MEASURES.
4. USE CLASS B STONE FOR EROSION CONTROL AT OUTLET LOCATIONS.
5. USE MAXIMUM SLOPE DRAIN SPACING OF 200 FT MEASURED ALONG TOP OF SLOPE.

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

1-24

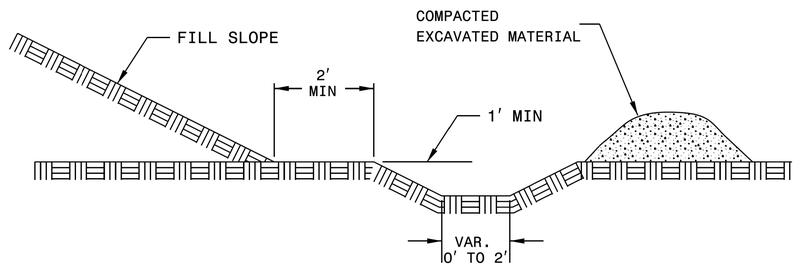
ROADWAY STANDARD DRAWING FOR
GUIDE FOR TEMPORARY BERMS AND SLOPE DRAIN

SHEET 1 OF 1
1622.01

NOTES

EXCAVATE TEMPORARY SILT DITCH WITH NON-VERTICAL SIDE SLOPES AND NOT GREATER THAN 1.5:1 SLOPE.

STABILIZE TEMPORARY SILT DITCH AS DIRECTED.



CROSS SECTIONAL VIEW

1-24 STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

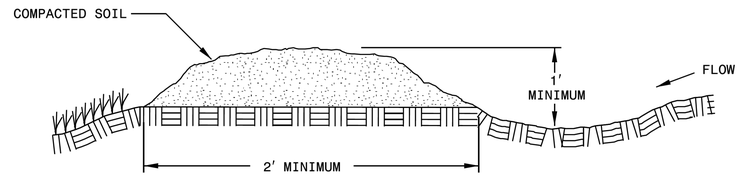
ROADWAY STANDARD DRAWING FOR
TEMPORARY SILT DITCH

SHEET 1 OF 1
1630.03

NOTES

EXCAVATE TEMPORARY DIVERSION WITH NON-VERTICAL SIDE SLOPES AND NOT GREATER THAN 1.5:1 SLOPE.

STABILIZE TEMPORARY DIVERSION AS DIRECTED.

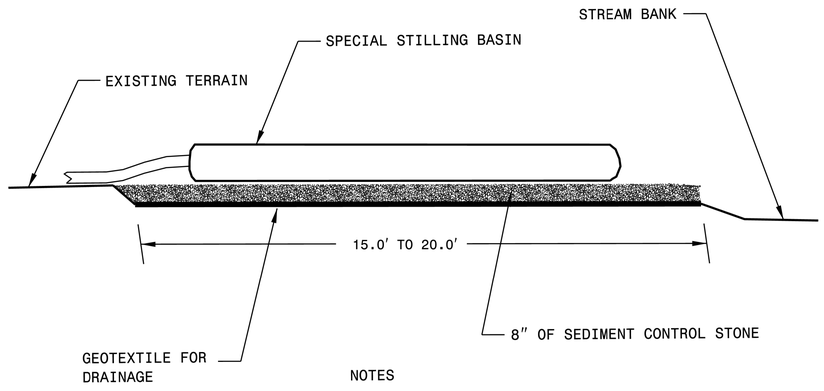


CROSS SECTIONAL VIEW

1-24 STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

ROADWAY STANDARD DRAWING FOR
TEMPORARY DIVERSION

SHEET 1 OF 1
1630.05



NOTES

USE NO. 5 OR NO. 57 STONE FOR SEDIMENT CONTROL STONE.

PROVIDE STABILIZED OUTLET TO STREAM BANK.

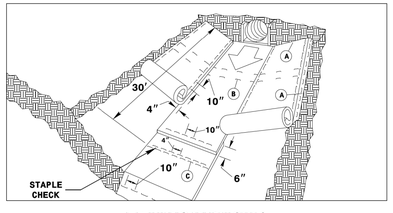
WOOD PALLETS MAY BE USED IN LIEU OF STONE AND GEOTEXTILE AS DIRECTED. A SUFFICIENT NUMBER OF PALLETS MUST BE PROVIDED TO ELEVATE THE ENTIRE SPECIAL STILLING BASIN ABOVE NATURAL GROUND.

NOT TO SCALE

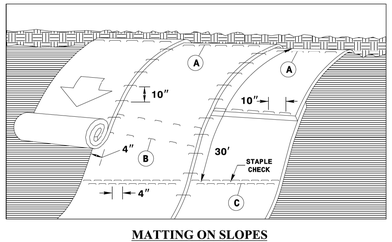
1-24 STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

ROADWAY STANDARD DRAWING FOR
SPECIAL STILLING BASIN

SHEET 1 OF 1
1630.06



MATTING IN DITCHES



MATTING ON SLOPES

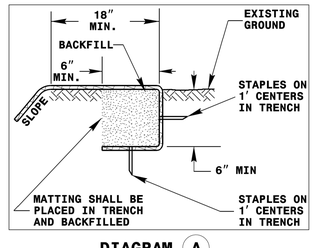


DIAGRAM (A)

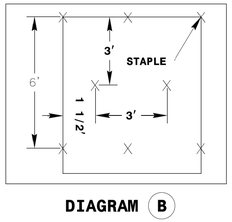


DIAGRAM (B)

STAPLE CHECK PATTERN

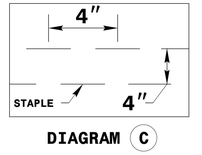


DIAGRAM (C)

NOTES

THIS DETAIL APPLIES TO STRAW, EXCELSIOR, COIR FIBER MAT AND PERMANENT SOIL REINFORCEMENT MAT (PSRM) INSTALLATION AND AS DIRECTED.

STAPLES SHALL BE NO. 11 GAUGE STEEL WIRE FORMED INTO A "U" SHAPE WITH A MINIMUM THROAT WIDTH OF 1 INCH AND NOT LESS THAN 6 INCHES IN LENGTH.

TRENCH ALL UPSLOPE EDGES OF MATTING THAT ARE NOT OVERLAPPED BY ANOTHER SECTION OF MATTING.

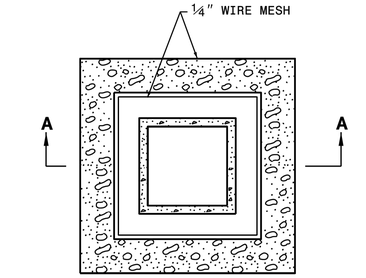
NOT TO SCALE

1-24 STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

ROADWAY STANDARD DRAWING FOR
MATTING INSTALLATION

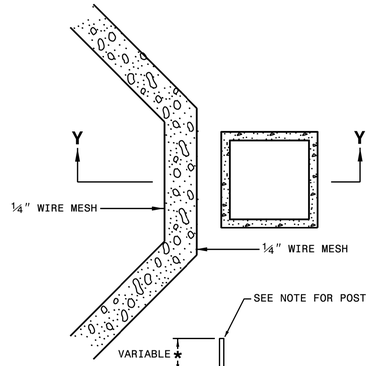
SHEET 1 OF 1
1631.01

PROJECT REFERENCE NO.	SHEET NO.
LINCOLN ST BRG	EC-2C



SECTION A-A

MULTI-DIRECTIONAL FLOW



SECTION Y-Y

SINGLE-DIRECTIONAL FLOW

NOTES

USE NO. 5 OR NO. 57 STONE FOR SEDIMENT CONTROL STONE.

USE 24 GAUGE MINIMUM WIRE MESH HARDWARE CLOTH WITH ¼ INCH MESH OPENINGS.

ATTACH HARDWARE CLOTH TO POSTS WITH PLASTIC TIES, WIRE FASTENERS, OR OTHER APPROVED ATTACHMENT DEVICE.

INSTALL WIRE MESH UNDER SEDIMENT CONTROL STONE.

USE 5' STEEL POST, INSTALLED 2' DEEP MINIMUM, AND OF THE SELF-FASTENER ANGLE STEEL TYPE.

SPACE POST A MAXIMUM OF 4'.

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

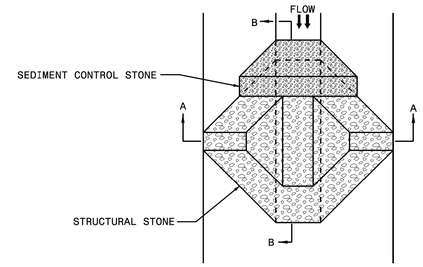
1-24

ROADWAY STANDARD DRAWING FOR

ROCK INLET SEDIMENT TRAP TYPE C

SHEET 1 OF 1

1632.03

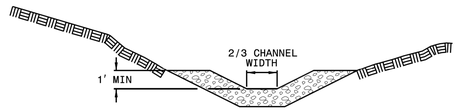


PLAN

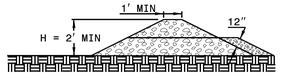
NOTES

USE CLASS B EROSION CONTROL STONE FOR STRUCTURAL STONE.

USE NO. 5 OR NO. 57 STONE FOR SEDIMENT CONTROL STONE.



SECTION A-A



SECTION B-B

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

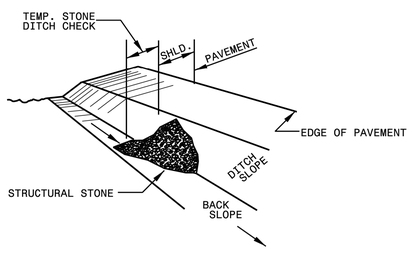
1-24

ROADWAY STANDARD DRAWING FOR

TEMPORARY ROCK SILT CHECK TYPE A

SHEET 1 OF 1

1633.01

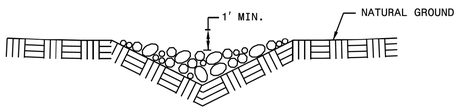


ISOMETRIC VIEW

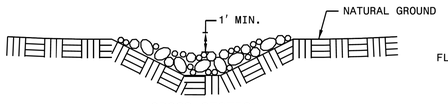
NOTES

USE CLASS B EROSION CONTROL STONE FOR STRUCTURAL STONE.

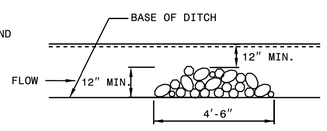
THE ENGINEER MAY DIRECT THE OPTION OF CLASS A STONE FOR SITES HAVING LESS THAN ONE (1) ACRE DRAINAGE AREA AND A DITCH GRADE LESS THAN 3%.



CROSS SECTION VEE DITCH



CROSS SECTION TRAPEZOIDAL DITCH



ELEVATION VIEW

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

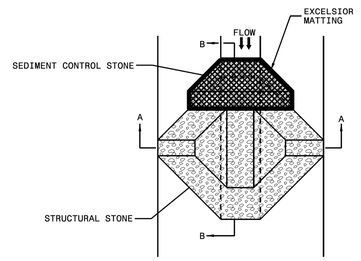
1-24

ROADWAY STANDARD DRAWING FOR

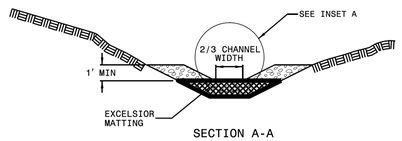
TEMPORARY ROCK SILT CHECK TYPE B

SHEET 1 OF 1

1633.02



PLAN



SECTION A-A

NOTES:

USE CLASS B EROSION CONTROL STONE FOR STRUCTURAL STONE.

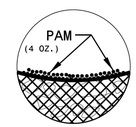
USE NO. 5 OR NO. 57 STONE FOR SEDIMENT CONTROL STONE.

DO NOT APPLY FLOCCULANT TO A TEMPORARY ROCK SILT CHECK THAT SERVES AS A STORMWATER DISCHARGE OUTFALL.

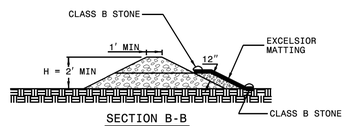
USE EXCELSIOR FOR MATTING MATERIAL AND ANCHOR MATTING SECTION AT TOP AND BOTTOM WITH CLASS B STONE.

PRIOR TO FLOCCULANT APPLICATION, OBTAIN A SOIL SAMPLE FROM PROJECT LOCATION, AND FROM OFFSITE MATERIAL, AND ANALYZE FOR APPROPRIATE FLOCCULANT TO BE APPLIED TO EACH ROCK SILT CHECK.

INITIALLY APPLY 4 OUNCES OF FLOCCULANT TO TOP OF MATTING SECTION AND AFTER EVERY RAINFALL EVENT THAT EQUALS OR EXCEEDS 0.50 INCHES.



INSET A



SECTION B-B

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

1-24

ROADWAY STANDARD DRAWING FOR

TEMPORARY ROCK SILT CHECK TYPE A WITH EXCELSIOR MATTING AND FLOCCULANT

SHEET 1 OF 1

1633.03

PROJECT REFERENCE NO.	SHEET NO.
LINCOLN ST BRG	EC-2D

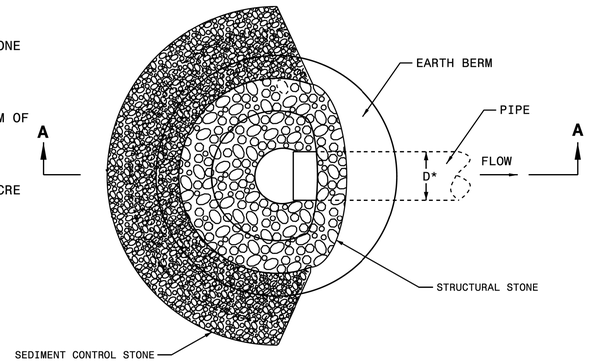
NOTES

USE CLASS A EROSION CONTROL STONE FOR STRUCTURAL STONE.

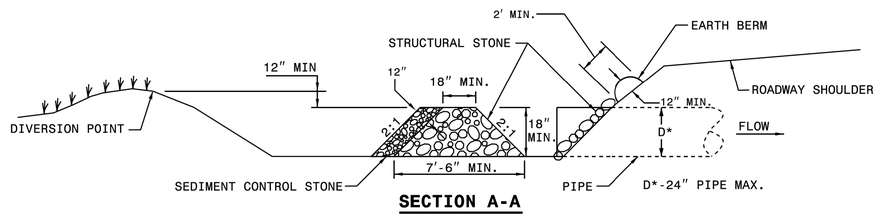
USE NO. 5 OR NO. 57 STONE FOR SEDIMENT CONTROL STONE.

CONSTRUCT TOP OF BERM A MINIMUM OF ONE FOOT BELOW THE SHOULDER OR DIVERSION POINT.

PROVIDE A TOTAL SEDIMENT TRAP VOLUME OF 3600± CUBIC FEET PER ACRE OF DISTURBED AREA. SOME OF THE REQUIRED VOLUME MAY BE PROVIDED BY UP OR DOWNSTREAM CONTROLS.



PLAN



SECTION A-A

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

1-24

ROADWAY STANDARD DRAWING FOR

ROCK PIPE INLET SEDIMENT TRAP TYPE B

SHEET 1 OF 1

1635.02

PROJECT REFERENCE NO.	SHEET NO.
LINCOLN ST BRG	EC-3

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.

PROJECT REFERENCE NO.	SHEET NO.
LINCOLN ST BRG	EC-04/CONST.04
R/W SHEET NO.	

NAD 83/2011

-L- POT Sta. 8+00.00

BEGIN CONSTRUCTION
-L- PC Sta. 10+25.00

-L- POT Sta. 10+00.00

-L- PT Sta. 15+99.63

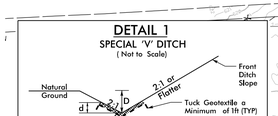
Sta.= STA 10+25 TO 11+25 -L- RT
Q= 1.73 cfs
V= 3.11 ft/s
d= 0.3 ft
s= 0.091 ft/ft
n=0.055
Liner=CLASS B

Sta.= STA 11+25 TO 11+50 -L- RT
Q= 1.73 cfs
V= 3.78 ft/s
d= 0.5 ft
s= 0.153 ft/ft
n=0.055
Liner=CLASS B

Sta.= STA 13+31 TO 13+71 -L- LT
Q= 6.50 cfs
V= 4.65 ft/s
d= 0.8 ft
s= 0.310 ft/ft
n=0.055
Liner=CLASS I

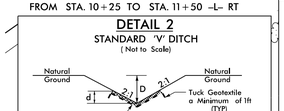
Sta.= STA 14+42 TO 15+30 -L- LT
Q= .209 cfs
V= 3.7 ft/s
d= 3.4 ft
s= 0.003 ft/ft
n=0.035
Liner=NATURAL BED MATERIAL

DETAIL 1
SPECIAL 'V' DITCH
(Not to Scale)



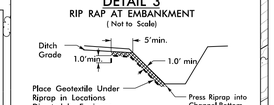
Min. D=1.4 Ft.
Type of Liner= Class B Rip-Rap, Keyed-In d=1 Ft.
FROM STA. 10+25 TO STA. 11+50 -L- RT

DETAIL 2
STANDARD 'V' DITCH
(Not to Scale)



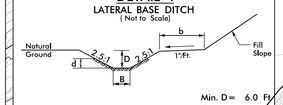
Min. D= 1.5 Ft.
Type of Liner= Class I Rip-Rap, Keyed-In d= 1 Ft.
FROM STA. 13+31 TO STA. 13+73 LT

DETAIL 3
RIP RAP AT EMBANKMENT
(Not to Scale)



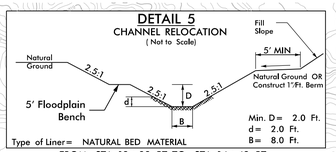
Type of Liner= 4 TONS,CL I Rip-Rap, Keyed-In
FROM STA. 13+73 TO STA. 13+84 -L- LT
STA. 15+91 -L- RT

DETAIL 4
LATERAL BASE DITCH
(Not to Scale)



Min. D= 6.0 Ft
d= 1.0 Ft.
B= 8.0 Ft.
Type of Liner= NATURAL BED MATERIAL b= 5.0 Ft.
FROM STA. 14+42 TO STA. 15+48 -L- RT

DETAIL 5
CHANNEL RELOCATION
(Not to Scale)



Min. D= 2.0 Ft.
d= 2.0 Ft.
B= 8.0 Ft.
Type of Liner= NATURAL BED MATERIAL
FROM STA. 13+98 RT TO STA. 14+42 RT

DETAIL 6
STANDARD BASE DITCH
(Not to Scale)

Min. D= 0.5 Ft.
B= 2.0 Ft.
FROM STA. 15+91 -L- RT

NOTE:
LIMITS OF DISTURBANCE (LOD) — — — —
TOTAL DISTURBED AREA = 1.45 ACRES

CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 04

NOTE:
UTILIZE SPECIAL STILLING BASINS FOR DRILLED PIERS.

NOTE:
PLACE TEMPORARY ROCK SILT CHECKS TYPE – A AT DRAINAGE OUTLETS.

NOTE:
PERIMETER EROSION CONTROL MEASURES SHALL BE INSTALLED DURING CLEARING AND GRUBBING PHASE.

ENVIRONMENTALLY SENSITIVE AREA
SEE PROJECT SPECIAL PROVISIONS

NOTE: ALL PROPOSED STORM DRAIN INLETS MUST BE EMBOSSED WITH A FISH LOGO" AND "DUMP NO WASTE, DRAINS TO STREAM" OR OTHER EQUIVALENT LANGUAGE APPROVED BY CITY OF CONCORD

SPECIAL LATERAL 'V' DITCH
SEE DETAIL 1

STANDARD 'V' DITCH
CLASS I RIP RAP
SEE DETAIL 2
EST. 15 TONS
32 SQ YD GEOTEXTILE
DDE=7.0 CY
S=0.094 FT/FT

IMPERVIOUS DIKE

CLASS I RIP RAP
EST. 3 TONS
EST. 7 SY GF

RIP RAP AT EMBANKMENT
CL I RIPRAP, 24" DEPTH, 2:1

REMOVE APPROX. 226 LF 15" HDPE

RETAIN 15" HDPE

RETAIN EXISTING CB

DS EX040(10F=632.07' INV=629.77'

EXCAVATE

TO TUBER COURT

TO CEDAR AVENUE

REMOVE ABANDONED SS MANHOLE

30" RCP-IV

END CONSTRUCTION
-L- STA 16+00.00

LATERAL 8' BASE DITCH
SEE DETAIL 6

CLASS B RIP RAP
EST. 5 TON
EST. 16 SY GF
TIE TO EXISTING CHANNEL

EXISTING 42" RCP TO BE REPLACED
STEP POOLS w/ROCK CROSS VANES
STABILIZE BANKS w/LIVESTAKES

RELOCATE CHANNEL – SEE DETAIL 5 FOR CHANNEL GEOMETRY
SEE DETAILS ON SHEET 2D-1

CLASS B RIP RAP
EST. 1 TON
EST. 5 SY GF

LATERAL 8' BASE DITCH
SEE DETAIL 4

REMOVE APPROX. 65 LF ABANDONED SS PIPE
SEE SEWER PLANS

TIE TO EXISTING CHANNEL

MUSH BRIAD CREEK

WOODS

EXISTING R/W

-L-

BEGIN SPECIAL LATERAL 'V' DITCH
-L- STA 10+25 RT
ELEV=600.47'

BEGIN GRADE
-L- STA.10+25.00
ELEV.602.75'

PI = 10+45.00
EL = 600.93'
VC = 40'
K = 44.6
DS = 30 MPH

PI = 12+00.00
EL = 588.20'
VC = 165'
K = 26
DS = 25 MPH

PI = 15+70.00
EL = 581.07'
VC = 60'
K = 39.8
DS = 30 MPH

BEGIN LATERAL 8' BASE DITCH
-L- STA 14+42 RT
ELEV=569.40'

LATERAL 8' BASE DITCH
-L- STA 14+75 RT
ELEV=569.50' (MATCH EXISTING)

END GRADE
-L- STA.16+00.00
ELEV.580.94'

(-)9.1400%

(-)18.2129%

(-)7.9070%

(-)15.2800%

(-)11.9270%

(-)0.4210%

(+)0.3030%

REMOVE EXISTING BRIDGE

PROPOSED 100 YR WSEL ELEV.=580.5'

PROPOSED 25 YR WSEL ELEV.=578.5'

SPECIAL LATERAL 'V' DITCH
-L- STA 11+25 RT
ELEV=591.40'

END SPECIAL LATERAL 'V' DITCH
-L- STA 11+50 RT
ELEV=587.58'

EXCAVATE TO ELEV 575.0
EST. 85 CU. YD. (REMOVE EXISTING EB)

WS ELEV=565.72
DATE: 1/12/2023

NATURAL GROUND AT UPSTREAM FACE OF EXISTING STRUCTURE

MATCH EXISTING

END LATERAL 8' BASE DITCH
-L- STA 15+48 RT
ELEV=568.80' (MATCH EXISTING)

EXCAVATE TO ELEV 571.0 TO CREATE GREENWAY BENCH
USE 2:1 SLOPE TO TIE INTO EXISTING STREAM BANK
EST. 238 CU. YD. (REMOVE EXISTING EB)

PROJECT REFERENCE NO.	SHEET NO.
LINCOLN ST BRG	EC-05/CONST.04
R/W SHEET NO.	

NAD 83/2011

-L- POT Sta. 8+00.00

Sta.= STA 10+25 TO 11+25 -L- RT
Q= 1.73 cfs
V= 3.11 ft/s
d= 0.5 ft
s= 0.091 ft/ft
n=0.055
Liner=CLASS B

Sta.= STA 11+25 TO 11+50 -L- RT
Q= 1.73 cfs
V= 3.78 ft/s
d= 0.5 ft
s= 0.153 ft/ft
n=0.055
Liner=CLASS B

BEGIN CONSTRUCTION
-L- PC Sta. 10+25.00

-L- POT Sta. 10+00.00

RETAIN EXISTING CB

RETAIN 15" HDPE

REMOVE APPROX. 226 LF 15" HDPE

REMOVE 15" RCP

REMOVE 30" RCP

REMOVE 39 RCP

REMOVE 42" RCP

REMOVE ABANDONED SS MANHOLE

REMOVE APPROX. 65 LF ABANDONED SS PIPE SEE SEWER PLANS

TIE TO EXISTING CHANNEL

EXISTING 42" TO BE REPLACED SEE SEWER PLANS STABILIZE BANKS W/LIVESTAKES

RELOCATE CHANNEL – SEE DETAIL 5 FOR CHANNEL GEOMETRY STEP POOLS w/ROCK CROSS VANES SEE DETAILS ON SHEET 2D-1

END CONSTRUCTION -L- STA. 16+00.00

-L- PT Sta. 15+99.63

IMPERVIOUS DIKE

STANDARD 'V' DITCH CLASS I RIP RAP SEE DETAIL 2 EST. 15 TONS 32 SQ YD GEOTEXTILE DDE=7.0 CY S=0.094 FT/FT

CLASS I RIP RAP EST. 3 TONS EST. 7 SY GF

RIP RAP AT EMBANKMENT CL I RIP RAP SEE DETAIL 3

CLASS B RIP RAP EST. 5 TON EST. 16 SY GF TIE TO EXISTING CHANNEL

CLASS B RIP RAP EST. 1 TON EST. 5 SY GF

LATERAL 8' BASE DITCH SEE DETAIL 4

2' BASE TAIL DITCH SEE DETAIL 6

NOTE: ALL PROPOSED STORM DRAIN INLETS MUST BE EMBOSSED WITH A FISH LOGO" AND "DUMP NO WASTE, DRAINS TO STREAM" OR OTHER EQUIVALENT LANGUAGE APPROVED BY CITY OF CONCORD

SPECIAL LATERAL 'V' DITCH SEE DETAIL 1

TO AMBER COURT

TO COZART AVENUE

LINCOLN STREET SW 23'± BST

EXISTING R/W

GAS TEST STATION

NOTE:
LIMITS OF DISTURBANCE (LOD) – – – –
TOTAL DISTURBED AREA = 1.45 ACRES

FINAL GRADE EROSION CONTROL FOR CONSTRUCTION SHEET 04

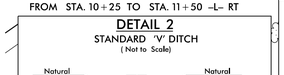
NOTE:
UTILIZE SPECIAL STILLING BASINS FOR DRILLED PIERS.

NOTE:
PLACE MATTING FOR EROSION CONTROL ON 2:1 OR STEEPER SLOPES AS WORK ALLOWS

DETAIL 1
SPECIAL 'V' DITCH
(Not to Scale)

Min. D=1.4 Ft.
d=1 Ft.
Type of Liner= Class B Rip-Rap, Keyed-In
FROM STA. 10+25 TO STA. 11+50 -L- RT

DETAIL 2
STANDARD 'V' DITCH
(Not to Scale)

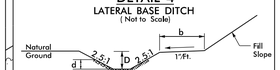


Min. D= 1.5 Ft.
Type of Liner= Class I Rip-Rap, Keyed-In d= 1 Ft.
FROM STA. 13+31 TO STA. 13+73 LT

DETAIL 3
RIP RAP AT EMBANKMENT
(Not to Scale)

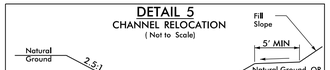
Type of Liner= 4 TONS,CL I Rip-Rap, Keyed-In
FROM STA. 13+73 TO STA. 13+84 -L- LT
STA. 15+91 -L- RT

DETAIL 4
LATERAL BASE DITCH
(Not to Scale)



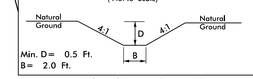
Min. D= 6.0 Ft
d= 1.0 Ft.
B= 8.0 Ft.
Type of Liner= NATURAL BED MATERIAL b= 5.0 Ft.
FROM STA. 14+42 TO STA. 15+48 -L- RT

DETAIL 5
CHANNEL RELOCATION
(Not to Scale)



Min. D= 2.0 Ft.
d= 2.0 Ft.
B= 8.0 Ft.
Type of Liner= NATURAL BED MATERIAL
FROM STA. 13+98 RT TO STA. 14+42 RT

DETAIL 6
STANDARD BASE DITCH
(Not to Scale)



Min. D= 0.5 Ft.
B= 2.0 Ft.
FROM STA. 15+91 -L- RT

Sta.= STA 13+31 TO 13+71 -L- LT
Q= 6.50 cfs
V= 6.65 ft/s
d= 0.8 ft
s= 0.310 ft/ft
n=0.055
Liner=CLASS I

Sta.= STA 14+42 TO 15+30 -L- LT
Q= 209 cfs
V= 3.7 ft/s
d= 3.4 ft
s= 0.003 ft/ft
n=0.035
Liner=NATURAL BED MATERIAL

-L-

BEGIN SPECIAL LATERAL 'V' DITCH
-L- STA 10+25 RT
ELEV=600.47'

BEGIN GRADE
-L- STA.10+25.00
ELEV.602.75'

PI = 10+45.00
EL = 600.93'
VC = 40'
K = 44.6
DS = 30 MPH

PI = 12+00.00
EL = 588.20'
VC = 165'
K = 26
DS = 25 MPH

PI = 15+70.00
EL = 581.07'
VC = 60'
K = 39.8
DS = 30 MPH

BEGIN LATERAL 8' BASE DITCH
-L- STA 14+42 RT
ELEV=569.40'

LATERAL 8' BASE DITCH
-L- STA 14+75 RT
ELEV=569.50' (MATCH EXISTING)

END GRADE
-L- STA.16+00.00
ELEV.580.94'

(-)9.1900%

(-)18.2129%

(-)30.1600%

(-)15.2800%

(-)11.9270%

(-)0.4210%

(+)0.3030%

SPECIAL LATERAL 'V' DITCH
-L- STA 11+25 RT
ELEV=591.40'

END SPECIAL LATERAL 'V' DITCH
-L- STA 11+50 RT
ELEV=587.58'

REMOVE EXISTING BRIDGE

PROPOSED 100 YR WSEL ELEV.=580.5'

PROPOSED 25 YR WSEL ELEV.=578.5'

EXCAVATE TO ELEV. 575.0 EST. 85 CU. YD. (REMOVE EXISTING EB)

WS ELEV=565.72 DATE: 1/22/2023

NATURAL GROUND AT UPSTREAM FACE OF EXISTING STRUCTURE

MATCH EXISTING

END LATERAL 8' BASE DITCH
-L- STA 15+48 RT
ELEV=568.80' (MATCH EXISTING)

EXCAVATE TO ELEV. 571.0 TO CREATE GREENWAY BENCH USE 2:1 SLOPE TO TIE INTO EXISTING STREAM BANK EST. 238 CU. YD. (REMOVE EXISTING EB)

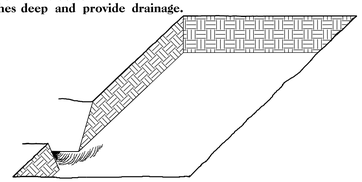
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	LINCOLN ST 3RG	RF-1	
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	

PLANTING DETAILS

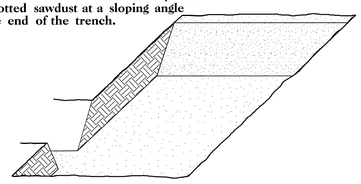
SEEDLING / LINER 3AREROOT PLANTING DETAIL

HEALING IN

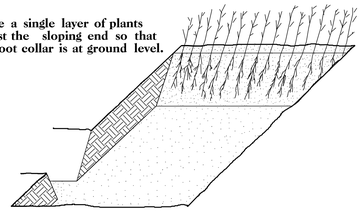
1. Locate a healing-in site in a shady, well protected area.
2. Excavate a flat bottom trench 12 inches deep and provide drainage.



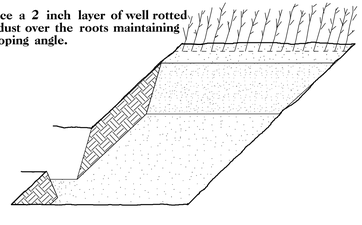
3. 3ackfill the trench with 2 inches well rotted sawdust. Place a 2 inch layer of well rotted sawdust at a sloping angle at one end of the trench.



4. Place a single layer of plants against the sloping end so that the root collar is at ground level.

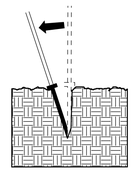


5. Place a 2 inch layer of well rotted sawdust over the roots maintaining a sloping angle.

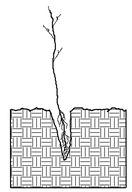


6. Repeat layers of plants and sawdust as necessary and water thoroughly.

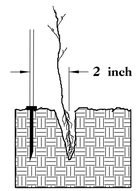
DL33LE PLANTING METHOD
USING THE K3C PLANTING 3AR



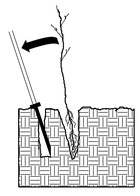
1. Insert planting bar as shown and pull handle toward planter.



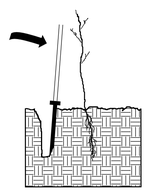
2. Remove planting bar and place seedling at correct depth.



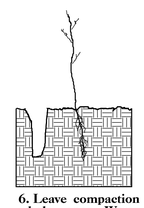
3. Insert planting bar 2 inches toward planter from seedling.



4. Pull handle of bar toward planter, firming soil at bottom.



5. Push handle forward firming soil at top.



6. Leave compaction hole open. Water thoroughly.

PLANTING NOTES:

PLANTING 3AG
During planting, seedlings shall be kept in a moist canvas bag or similar container to prevent the root systems from drying.

K3C PLANTING 3AR
Planting bar shall have a blade with a triangular cross section, and shall be 12 inches long, 4 inches wide and 1 inch thick at center.

ROOT PRUNING
All seedlings shall be root pruned, if neeessary, so that no roots extend more than 10 inches below the root collar.

REFORESTATION

☐ TREE REFORESTATION SHALL 3E PLANTED 6 FT. TO 10 FT. ON CENTER, RANDOM SPACING, AVERAGING 8 FT. ON CENTER, APPROXIMATELY 680 PLANTS PER ACRE.

REFORESTATION

MIXTURE, TYPE, SIZE, AND FURNISH SHALL CONFORM TO THE FOLLOWING:

25%	LIRIODENDRON TULIPIFERA	TULIP POPLAR	12 in – 18 in 3R
25%	PLATANUS OCCIDENTALIS	AMERICAN SYCAMORE	12 in – 18 in 3R
25%	FRAXINUS PENNSYLVANICA	3LACK GUM	12 in – 18 in 3R
25%	3ETULA NIGRA	RIVER 3IRCH	12 in – 18 in 3R

REFORESTATION DETAIL SHEET

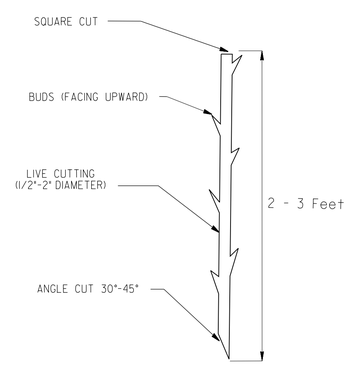
N.C.D.O.T. - ROADSIDE ENVIRONMENTAL UNIT

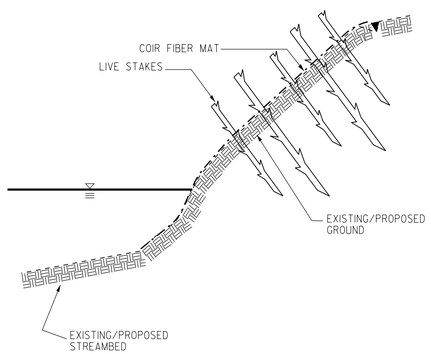
PROJECT REFERENCE NO.	SHEET NO.
LINCOLN ST BRG	RF-2

PLANTING DETAILS

LIVE STAKES PLANTING DETAIL

LIVE STAKE

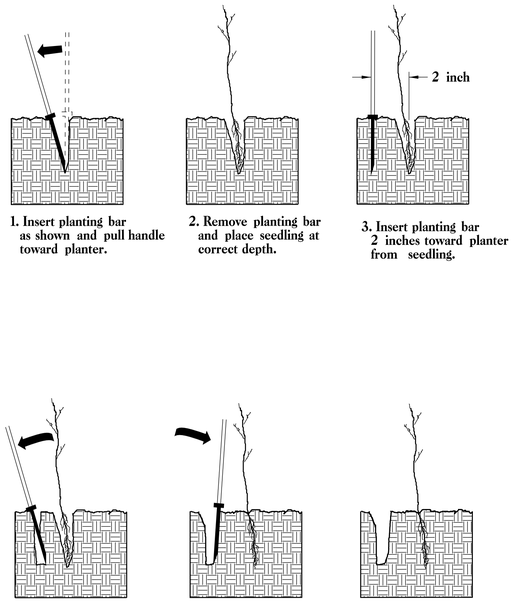




BANK STABILIZATION WITH LIVE STAKES

NOTE:
LIVE STAKES SHALL BE SPACED APPROXIMATELY 4 FEET ON CENTER
LIVE STAKES SHALL BE DRIVEN UNTIL APPROXIMATELY 3/4 OF LIVE STAKE IS WITHIN GROUND

BAREROOT PLANTING DETAIL
DIBBLE PLANTING METHOD
USING THE KBC PLANTING BAR



1. Insert planting bar as shown and pull handle toward planter.
2. Remove planting bar and place seedling at correct depth.
3. Insert planting bar 2 inches toward planter from seedling.
4. Pull handle of bar toward planter, firming soil at bottom.
5. Push handle forward firming soil at top.
6. Leave compaction hole open. Water thoroughly.

PLANTING NOTES:

PLANTING BAG
During planting, seedlings shall be kept in a moist canvas bag or similar container to prevent the root systems from drying.

KBC PLANTING BAR
Planting bar shall have a blade with a triangular cross section, and shall be 12 inches long, 4 inches wide and 1 inch thick at center.

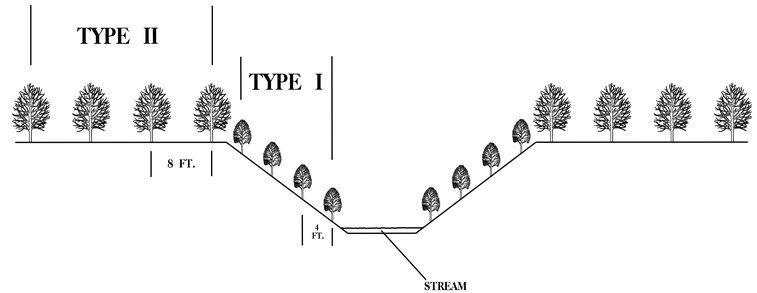
ROOT PRUNING
All seedlings shall be root pruned, if necessary, so that no roots extend more than 10 inches below the root collar.

☐ TYPE 1 STREAMBANK REFORESTATION SHALL BE PLANTED 3 FT. TO 5 FT. ON CENTER, RANDOM SPACING, AVERAGING 4 FT. ON CENTER, APPROXIMATELY 2724 PLANTS PER ACRE.

☐ TYPE 2 STREAMBANK REFORESTATION SHALL BE PLANTED 6 FT. TO 10 FT. ON CENTER, RANDOM SPACING, AVERAGING 8 FT. ON CENTER, APPROXIMATELY 680 PLANTS PER ACRE.

☐ NOTE: TYPE 1 AND TYPE 2 STREAMBANK REFORESTATION SHALL BE PAID FOR AS "STREAMBANK REFORESTATION"

STREAMBANK REFORESTATION TYPICAL



STREAMBANK REFORESTATION

MIXTURE, TYPE, SIZE, AND FURNISH SHALL CONFORM TO THE FOLLOWING:

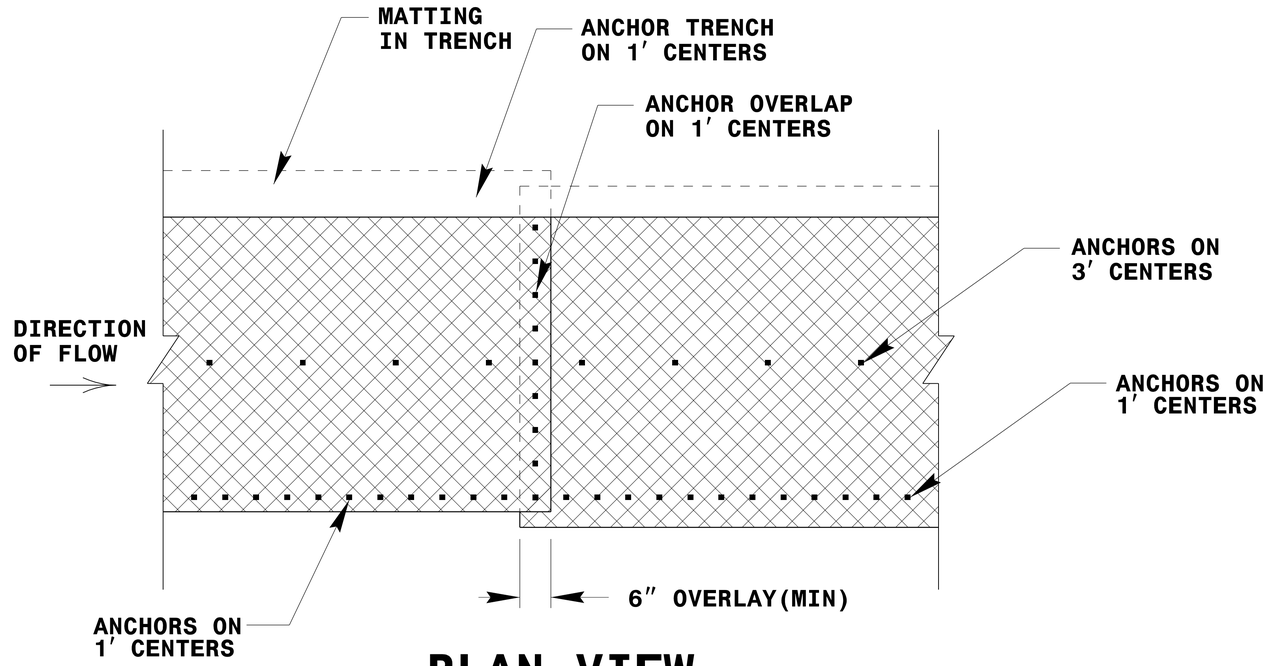
TYPE 1			
50%	SALIX NIGRA	BLACK WILLOW	2 ft – 3 ft LIVE STAKES
50%	CORNUS AMOMUM	SILKY DOGWOOD	2 ft – 3 ft LIVE STAKES
TYPE 2			
25%	LIRIODENDRON TULIPIFERA	TULIP POPLAR	12 in – 18 in BR
25%	PLATANUS OCCIDENTALIS	SYCAMORE	12 in – 18 in BR
25%	PRUNUS SEROTINA	BLACK CHERRY	12 in – 18 in BR
25%	BETULA NIGRA	RIVER BIRCH	12 in – 18 in BR

☐ SEE PLAN SHEETS FOR AREAS TO BE PLANTED

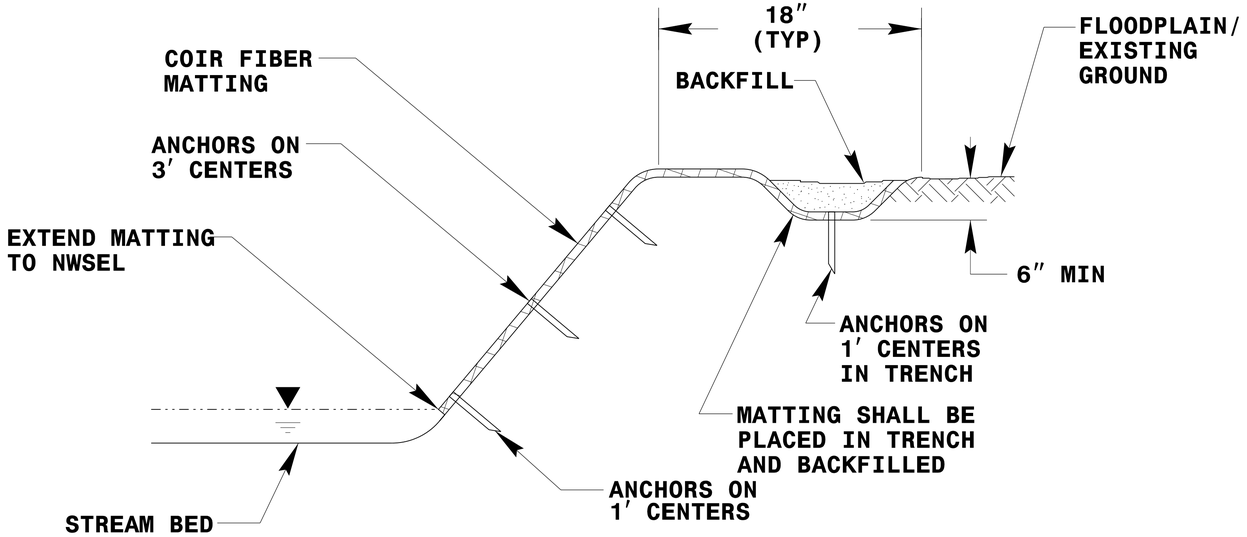
STREAMBANK REFORESTATION
DETAIL SHEET 1 OF 2

N.C.D.O.T. - ROADSIDE ENVIRONMENTAL UNIT

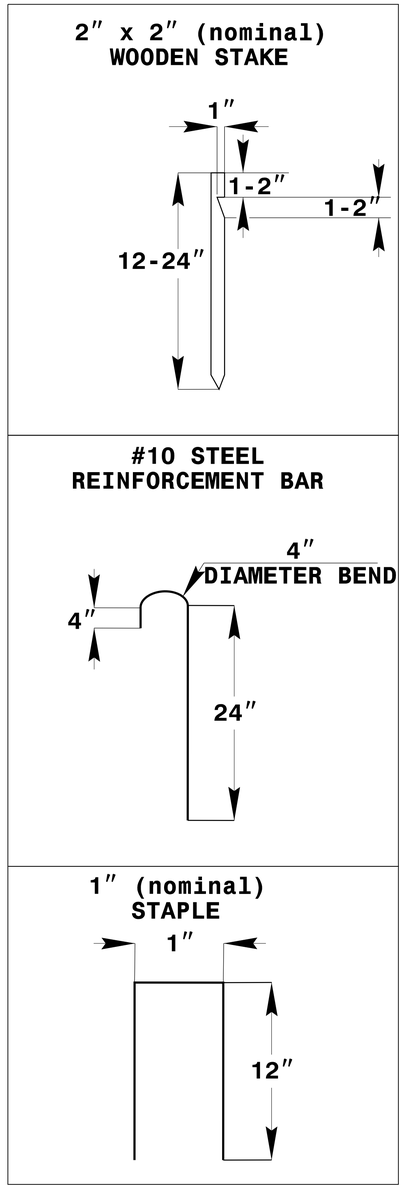
PROJECT REFERENCE NO.	SHEET NO.
LINCOLN ST BRG	RF-3



PLAN VIEW



TYPICAL CROSS SECTION



ANCHOR OPTIONS

COIR FIBER MATTING DETAIL

NOT TO SCALE

STREAMBANK REFORESTATION
DETAIL SHEET 2 OF 2
N.C.D.O.T.- ROADSIDE ENVIRONMENTAL UNIT

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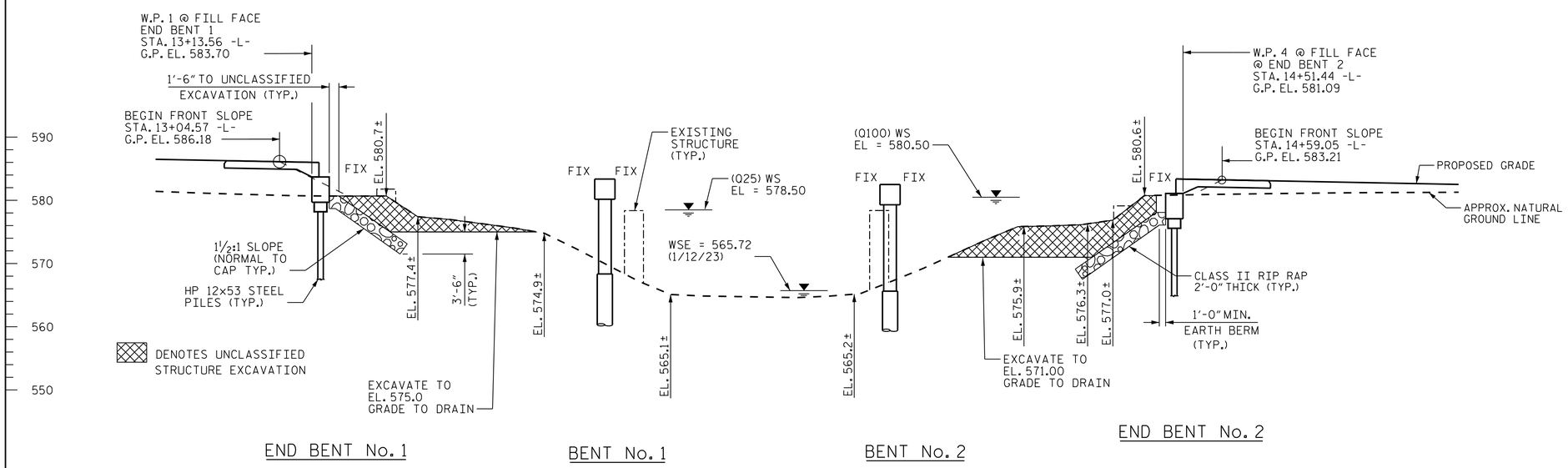
13+00 13+50 14+00 14+50 15+00

(-)8.2129% (-)1.9270%

PI = 12+00.00
EL = 588.20'
VC = 165'

SPAN A SPAN B SPAN C

GRADE DATA ℄ SURVEY -L-



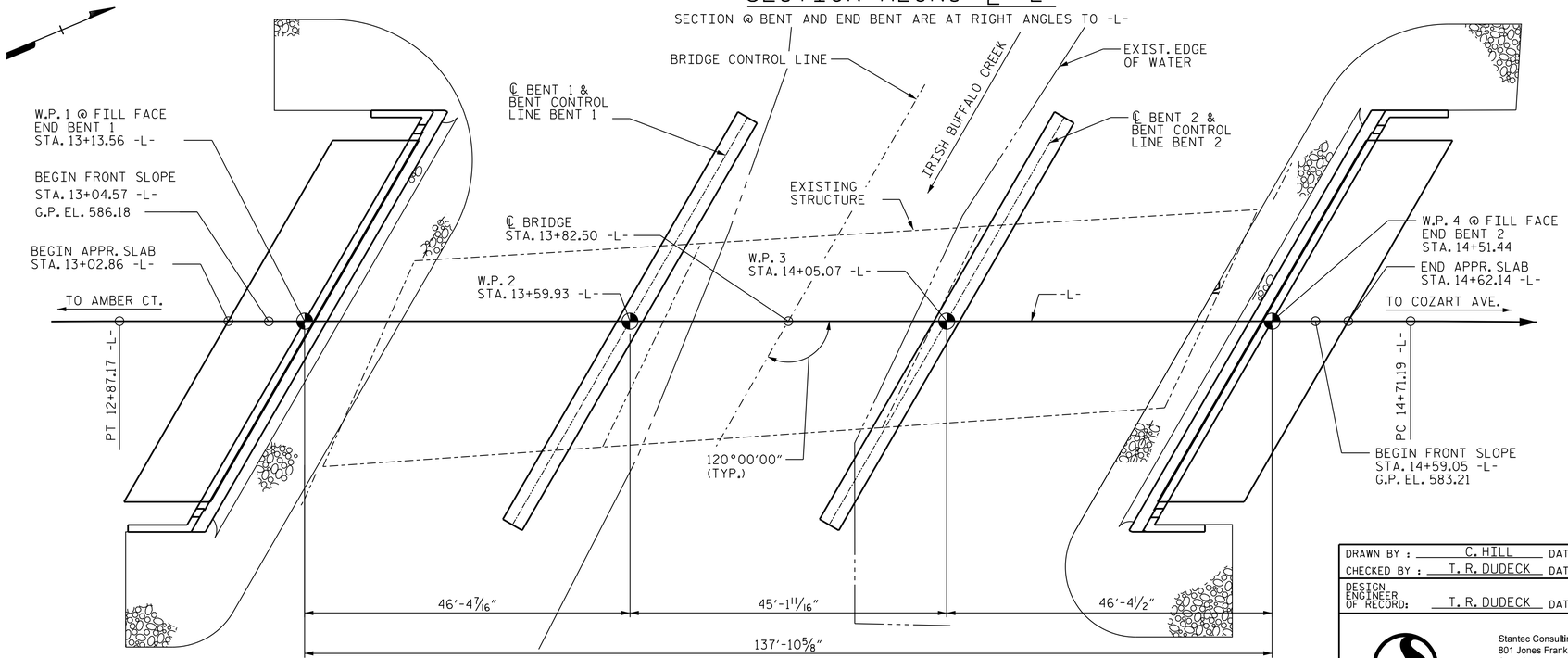
END BENT No. 1 BENT No. 1 BENT No. 2 END BENT No. 2

HYDRAULIC DESIGN DATA

DESIGN DISCHARGE	5400 CFS.
FREQUENCY	25 YR.
DESIGN HIGH WATER EL.	578.5
DRAINAGE AREA	36.4 SQ. MI.
BASE DISCHARGE(Q100)	7100 CFS.
BASE HIGH WATER EL.	580.5
OVERTOPPING FLOOD DATA	
OVERTOPPING DISCHARGE	6500+ CFS.
FREQUENCY	100+ YR.
OVERTOPPING EL.	578.5
RIVER STATION	29791

SECTION ALONG ℄ -L-

SECTION @ BENT AND END BENT ARE AT RIGHT ANGLES TO -L-



PLAN

PILES AND COLUMNS NOT SHOWN IN PLAN VIEW

PROJECT NO. N/A

CABARRUS COUNTY

STATION: 13+82.50

SHEET 1 OF 5 REPLACES BRIDGE #120320

CITY OF CONCORD, NC

GENERAL DRAWING

FOR BRIDGE OVER IRISH BUFFALO CREEK
ON LINCOLN STREET (-L-)
BETWEEN COZART AVE. AND
AMBER CT.

DRAWN BY : C. HILL DATE : 3/27/23
CHECKED BY : T. R. DUDECK DATE : 3/27/23
DESIGN ENGINEER OF RECORD: T. R. DUDECK DATE : 12/20/23

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NORTH CAROLINA PROFESSIONAL SEAL 31462 ENGINEER THOMAS RUDECK
Tommy Dudeck
12/20/2023

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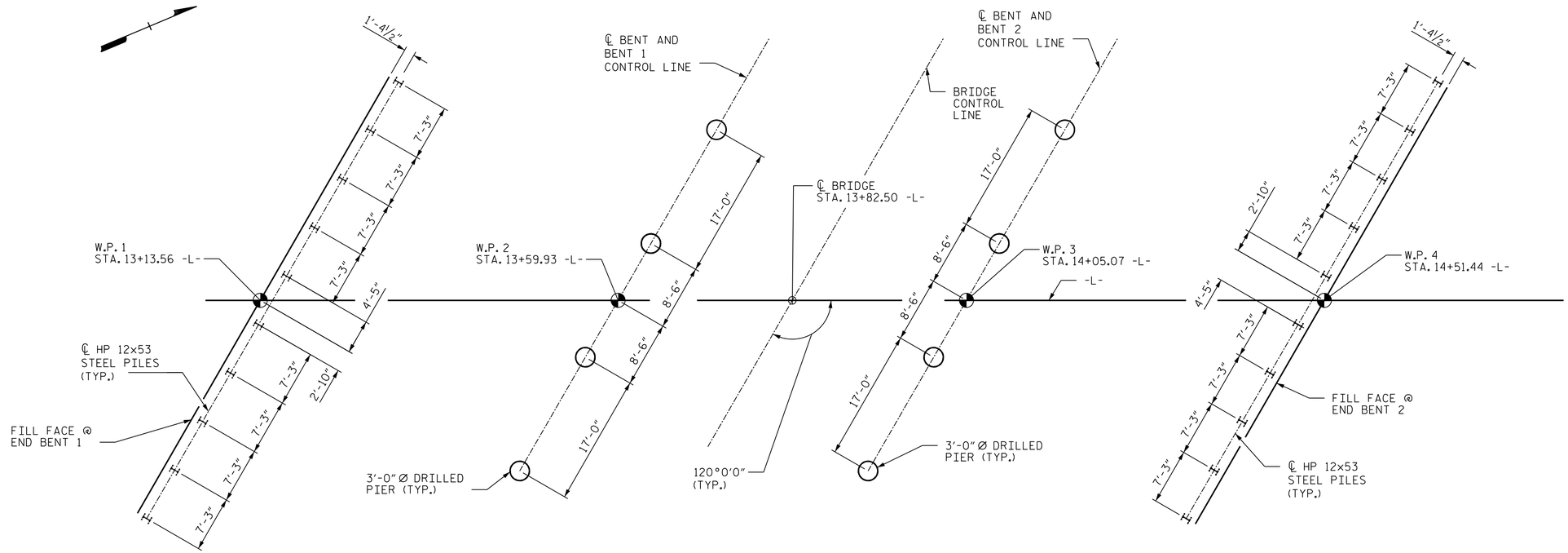

END BENT 1 BENT 1 BENT 2 END BENT 2

FOUNDATION LAYOUT

DIMENSIONS LOCATING PILES AND DRILLED PIERS ARE SHOWN TO CENTERLINE OF PILES AND DRILLED PILES

NOTES:

1. FOR PILES, SEE SPECIAL PROVISION AND SECTION 450 OF THE STANDARD SPECIFICATIONS.
2. IT HAS BEEN ESTIMATED THAT A HAMMER WITH AN EQUIVALENT RATED ENERGY IN THE RANGE OF 30-40 FT-LBS PER BLOW WILL BE REQUIRED TO DRIVE PILES AT END BENT NO. 1 AND END BENT NO. 2.
3. FOR DRILLED PIERS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.
4. PERMANENT STEEL CASINGS MAY BE REQUIRED FOR DRILLED PIERS AT BENT NO. 1 AND BENT NO. 2. IF REQUIRED, DO NOT EXTEND PERMANENT CASINGS BEYOND THE TOP OF BEDROCK WITHOUT PRIOR APPROVAL FROM THE ENGINEER. THE ENGINEER WILL DETERMINE THE NEED FOR PERMANENT CASINGS.
5. MONITOR THE APPROACH FILL AT END BENT NO. 2 RIGHT LANE FOR SETTLEMENT AFTER CONSTRUCTING THE APPROACH FILL TO GRADE. CONSTRUCT THE APPROACH SLAB AFTER THE SETTLEMENT RATE IS LESS THAN 0.10 INCH OVER A PERIOD OF FOUR WEEKS.

DRAWN BY : J. B. GEILE DATE : 04/11/23
CHECKED BY : T. R. DUDECK DATE : 07/13/23
DESIGN ENGINEER OF RECORD: T. R. DUDECK DATE : 12/20/23

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NORTH CAROLINA PROFESSIONAL SEAL 31462 ENGINEER THOMAS RUSSELL DUDECK
Thomas Russell Dudeck
12/20/2023

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PROJECT NO. N/A
CABARRUS COUNTY
STATION: 13+82.50

SHEET 2 OF 5

CITY OF CONCORD, NC

GENERAL DRAWING

FOR BRIDGE OVER IRISH BUFFALO CREEK ON LINCOLN STREET (-L-) BETWEEN COZART AVE. AND AMBER CT.

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SUMMARY OF PILE INFORMATION/ INSTALLATION

(BLANK ENTRIES INDICATE ITEM IS NOT APPLICABLE TO STRUCTURE)

END BENT/ BENT NO. PILE (s) #-# (e.g., "BENT 1, PILES 1-5")	FACTORED RESISTANCE PER PILE TONS	PILE CUT-OFF (TOP OF PILE) ELEVATION FT	ESTIMATED PILE LENGTH PER PILE FT	SCOUR CRITICAL ELEVATION FT	MIN. PILE TIP (TIP NO HIGHER THAN) ELEV FT	REQUIRED DRIVING RESISTANCE (RDR)✱✱ PER PILE TONS	TOTAL PILE REDRIVES QUANTITY EACH	PREDRILLING LENGTH PER PILE LIN FT	PREDRILLING ELEVATION (ELEV NOT TO PREDRILL BELOW) FT	MAXIMUM PREDRILLING DIA INCHES	PILE EXCAVATION (BOTTOM OF HOLE) ELEV FT	PILE EXC NOT IN SOIL PER PILE LIN FT	PILE EXC IN SOIL PER PILE LIN FT
END BENT 1	91	581.8	20			155							
END BENT 2	91	579.3	30			185							

✱ PREDRILLING FOR PILES IS REQUIRED FOR END BENTS/ BENT WITH A PREDRILLING LENGTH AND AT THE CONTRACTOR'S OPTION FOR END BENTS/ BENTS WITH PREDRILLING INFORMATION BUT NO PREDRILLING LENGTH.

✱✱ $RDR = \frac{\text{FACTORED RESISTANCE + FACTORED DOWNDRAY LOAD + FACTORED DEAD LOAD}}{\text{DYNAMIC RESISTANCE FACTOR}} + \text{NORMAL DOWNDRAG RESISTANCE} + \frac{\text{NORMAL SCOUR RESISTANCE}}{\text{SCOUR RESISTANCE FACTOR}}$

PILE DESIGN INFORMATION

(BLANK ENTRIES INDICATE ITEM IS NOT APPLICABLE TO STRUCTURE)

END BENT/ BENT NO. PILE (s) #-# (e.g., "BENT 1, PILES 1-5")	FACTORED AXIAL LOAD PER PILE TONS	FACTORED DOWNDRAG LOAD PER PILE FT	FACTORED DEAD LOAD✱ PER PILE TONS	DYNAMIC RESISTANCE FACTOR	NOMINAL DOWNDRAG RESISTANCE PER PILE TONS	NOMINAL SCOUR RESISTANCE PER PILE TONS	SCOUR RESISTANCE FACTOR (DEFAULT=1.00)
END BENT 1	91			0.60			1.00
END BENT 2	91	12		0.60	9		1.00

✱ FACTORED DEAD LOAD IS FACTORED WEIGHT OF PILE ABOVE THE GROUND LINE.

SUMMARY OF DRILLED PIER INFORMATION/ INSTALLATION

(BLANK ENTRIES INDICATE ITEM IS NOT APPLICABLE TO STRUCTURE)

END BENT/ BENT NO. PILE (s) #-# (e.g., "BENT 1, PILES 1-3")	FACTORED RESISTANCE PER PIER TONS	MINIMUM PIER TIP (TIP NO HIGHER THAN) ELEV. FT	REQUIRED TIP RESISTANCE PER PIER TSF	SCOUR CRITICAL ELEVATION FT	MIN. DRILLED PIER PENETRATION INTO ROCK PER PIER LIN FT	DRILLED PIER LENGTH✱ PER PIER LIN FT	DRILLED PIER LENGTH NOT IN SOIL✱ PER PIER LIN FT	DRILLED PIER LENGTH IN SOIL✱ PER PIER LIN FT	PERMANENT STEEL CASING REQUIRED? YES OR MAYBE	PERMANENT STEEL CASING TIP ELEVATION (ELEV NOT TO EXTEND CASING BELOW) FT	PERMANENT STEEL CASING LENGTH✱✱ PER PIER LIN FT
BENT 1	258	552.0		545	7.0		7.0	14.0	MAYBE	TOP OF BEDROCK	18.0
BENT 2	258	552.0		545	7.0		7.0	14.0	MAYBE	TOP OF BEDROCK	18.0
TOTAL QTY:						168.0					144

✱ DRILLED PIER LENGTH, DRILLED PIER LENGTH NOT IN SOIL AND DRILLED PIER LENGTH IN SOIL REPRESENT ESTIMATED DRILLED PIER QUANTITIES AND ARE MEASURED AND PAID FOR AS EITHER "36 INCH DIA. DRILLED PIERS" OR "36 INCH DIA. DRILLED PIERS NOT IN SOIL" AND "36 INCH DIA. DRILLED PIERS IN SOIL" IN ACCORDANCE WITH ARTICLE 411-7 OF THE NCDOT STANDARD SPECIFICATIONS.
✱✱ PERMANENT STEEL CASING LENGTH EQUALS THE DIFFERENCE BETWEEN THE GROUND LINE OR TOP OF DRILLED PIER ELEVATION, WHICHEVER IS HIGHER, AND THE PERMANENT CASING TIP ELEVATION AND IS MEASURED AND PAID FOR AS "PERMANENT STEEL CASING FOR 36"DIA. DRILLED PIER" IN ACCORDANCE WITH ARTICLE 411-7 OF THE NCDOT STANDARD SPECIFICATIONS.

NOTES:

1. THE PILE FOUNDATION TABLES ARE BASED ON THE BRIDGE SUBSTRUCTURE DESIGN AND FOUNDATION RECOMMENDATIONS SEALED BY A NORTH CAROLINA PROFESSIONAL ENGINEER (THOMAS J. DAILY, 045672) ON 06-13-2023.
2. TOTAL PILE DRIVING EQUIPMENT SETUP QUANTITY (NOT SHOWN IN PILE FOUNDATION TABLES) EQUALS THE NUMBER OF DRIVEN PILES, I.E., THE NUMBER OF PILES WITH A REQUIRED DRIVING RESISTANCE.
3. THE ENGINEER WILL DETERMINE THE NEED FOR PDA TESTING, PIPE PILE PLATES, PERMANENT STEEL CASING, SPTS, CSL TESTING, SID INSPECTIONS AND PITS WHEN THESE ITEMS MAY BE REQUIRED.

DRAWN BY : K. A. WOYAHN DATE : 07/06/23
CHECKED BY : T. R. DUDECK DATE : 08/23/23
DESIGN ENGINEER OF RECORD: T. R. DUDECK DATE : 12/20/23

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NORTH CAROLINA PROFESSIONAL SEAL 31462 ENGINEER THOMAS J. DAILY
12/20/2023

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CABARRUS COUNTY
STATION: 13+82.50

SHEET 3 OF 5

CITY OF CONCORD, NC

FOUNDATION LAYOUT TABLES

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
2			4			25

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SUMMARY OF PILE ACCESSORIES

(BLANK ENTRIES INDICATE ITEM IS NOT APPLICABLE TO STRUCTURE)

END BENT/ BENT NO. PILE (s) #-# (e.g., "BENT 1, PILES 1-5")	PIPE PILE PLATES REQUIRED YES OR MAYBE	STEEL PILE POINTS			STEEL PILE TIPS REQUIRED? YES
		PIPE PILE CUTTING SHOES REQUIRED? YES	PIPE PILE CONICAL POINTS REQUIRED? YES	H-PILE POINTS REAUIRED? YES	
END BENT 1	YES			YES	
TOTAL QTY.				10	

SUMMARY OF DRILLED PIER TESTING

(BLANK ENTRIES INDICATE ITEM IS NOT APPLICABLE TO STRUCTURE)

END BENT/ BENT NO. PILE (s) #-# (e.g., "BENT 1, PIERS 1-3")	STANDARD PENETRATION TEST (SPT) REQUIRED? YES OR MAYBE	CROSSHOLE SONIC LOGGING (CSL) REQUIRED? YES OR MAYBE	TOTAL CSL TUBE LENGTH (FOR ALL TUBES) PER PIER LIN FT	SHAFT INSPECTION DEVICE (SID) REQUIRED? YES OR MAYBE	PILE INTEGRITY TEST (PIT) REQUIRED? MAYBE
BENT 1		YES	90.0		
BENT 2		YES	90.0		
TOTAL QTY.			720.0		

✳CSL TUBES ARE REQUIRED IF CSL TESTING IS OR MAY BE REQUIRED. THE NUMBER OF CSL TUBES PER DRILLED PIER IS EQUAL TO ONE TUBE PER FOOT OF DESIGN PIER DIAMETER WITH AT LEAST 4 TUBES PER PIER. THE LENGTH OF EACH CSL TUBE IS EQUAL TO THE DRILLED PIER LENGTH PLUS 1.5 FT.

PROJECT NO. N/A

CABARRUS COUNTY

STATION: 13+82.50

SHEET 4 OF 5

CITY OF CONCORD, NC

FOUNDATION LAYOUT TABLES

DRAWN BY : K. A. WOYAHN DATE : 07/06/23

CHECKED BY : T. R. DUDECK DATE : 08/23/23

DESIGN ENGINEER OF RECORD: T. R. DUDECK DATE : 12/20/23

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NORTH CAROLINA PROFESSIONAL SEAL 31462 ENGINEER THOMAS R. DUDECK

12/20/2023

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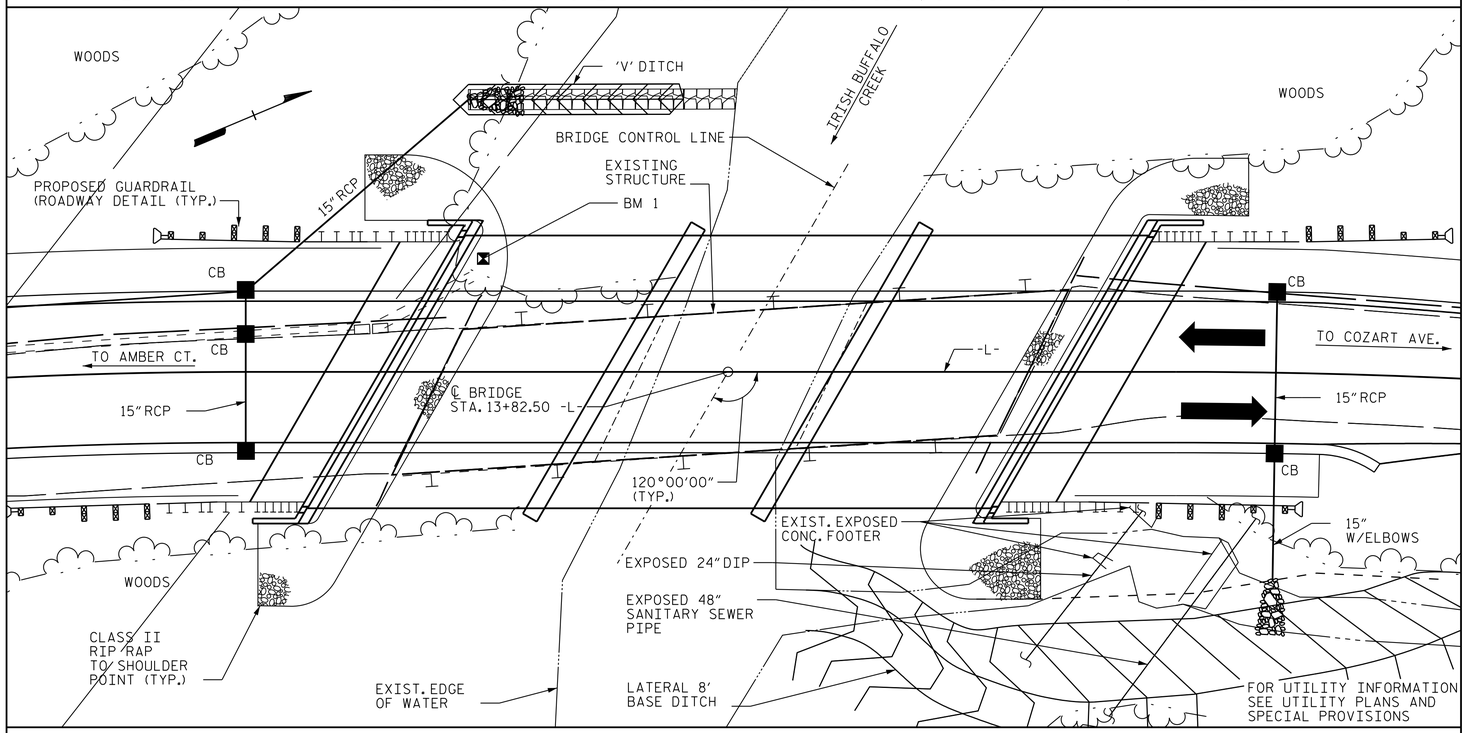
BM #1: PK IN ROOT OF 20 INCH SYCAMORE N600562.602 E1528754.836, STA. 13+08.51 -L-, 5.61' LT. EL. 577.74



LOCATION SKETCH

NOTES

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING

THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

REMOVAL OF THE EXISTING BRIDGE SHALL BE PERFORMED IN A MANNER THAT PREVENTS DEBRIS FROM FALLING INTO THE WATER. THE CONTRACTOR SHALL SUBMIT DEMOLITION PLANS FOR REVIEW AND REMOVE THE BRIDGE IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 40 FT EACH SIDE OF CENTERLINE ROADWAY AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION. SEE SECTION 412 OF THE STANDARD SPECIFICATIONS.

THE SUBSTRUCTURE OF THE EXISTING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVALIABLE. SINCE THIS INFORMATION IS SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR, THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE DEPARTMENT OF TRANSPORTATION FOR ANY DELAYS OR ADDITIONAL COST INCURRED BASED ON DIFFERENCES BETWEEN THE EXISTING BRIDGE SUBSTRUCTURE SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

THIS STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH "HEC 18- EVALUATING SCOUR AT BRIDGES."

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

ASPHALT WEARING SURFACE IS INCLUDED IN ROADWAY QUANTITY ON ROADWAY PLANS.

FOR ASBESTOS ASSESSMENT FOR BRIDGE DEMOLITION AND RENOVATION ACTIVITIES, SEE SPECIAL PROVISIONS.

INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE AT STATION 13+82.50."

FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE AT STA. 13+82.50 -L-	3'-0" DIA. DRILLED PIERS IN SOIL	3'-0" DIA. DRILLED PIERS NOT IN SOIL	CSL TESTING	UNCLASSIFIED STRUCTURE EXCAVATION	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES	HP 12 X 53 STEEL PILES		STEEL PILE POINTS	TWO BAR METAL RAIL	1'-2" X 3'-4¼" CONCRETE PARAPET	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	3'-0" X 1'-9" PRESTRESSED CONCRETE CORED SLABS	
	LUMP SUM	LIN. FT.	LIN. FT.	EA.	LUMP SUM	CU. YDS.	LUMP SUM	LBS.	LBS.	EA.	NO.	LIN. FT.	EA.	LIN.FT.	LIN. FT.	TONS	SQ.YDS.	LUMP SUM	NO.	LIN. FT.
SUPERSTRUCTURE							LUMP SUM							255.5	270.0			LUMP SUM	102	4590.0
END BENT NO. 1					LUMP SUM	26.9		4335		10	10	200	10			295	328			
BENT NO. 1		56.0	28.0	1		32.4		15533	2256											
BENT NO. 2		56.0	28.0	1		32.1		14630	2166											
END BENT NO. 2					LUMP SUM	26.9		4335		10	10	200				327	364			
TOTAL	LUMP SUM	112.0	56.0	2	LUMP SUM	118.3	LUMP SUM	38833	4422	20	20	400		255.5	270.0	622	692	LUMP SUM	102	4590.0

PROJECT NO. N/A

CABARRUS COUNTY

STATION: 13+82.50

SHEET 5 OF 5

DRAWN BY : C. HILL DATE : 3/27/23

CHECKED BY : T. R. DUDECK DATE : 3/27/23

DESIGN ENGINEER OF RECORD: T. R. DUDECK DATE : 12/20/23

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NORTH CAROLINA PROFESSIONAL SEAL 31462 ENGINEER THOMAS RYAN DUDECK

Thomas Dudeck

12/20/2023

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

CITY OF CONCORD, NC

GENERAL DRAWING

FOR BRIDGE IRISH BUFFALO CREEK ON LINCOLN STREET (-L-) BETWEEN COZART AVE. AND AMBER CT.

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

SHEET NO. S-5

TOTAL SHEETS 25

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LOAD AND RESISTANCE FACTOR RATING (LRFD) SUMMARY FOR PRESTRESSED CONCRETE GIRDERS

LEVEL		VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING	MINIMUM RATING FACTORS (RF)	TONS = W X RF	STRENGTH I LIMIT STATE											SERVICE III LIMIT STATE						COMMENT NUMBER
								MOMENT					SHEAR						MOMENT					
							LIVELOAD FACTORS	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	LIVELOAD FACTORS	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING		HL-93(Inv)	N/A	1	1.02	--	1.75	0.730	1.86	45'	EL	21.90	0.726	1.02	45'	EL	**1.50**	0.80	0.730	2.14	45'	EL	21.90	
		HL-93(Opr)	N/A	--	1.35	--	1.35	0.730	2.41	45'	EL	21.90	0.726	1.35	45'	EL	1.50	N/A	--	--	--	--	--	
		HS-20(Inv)	36.000	2	1.22	43.9	1.75	0.730	2.28	45'	EL	21.90	0.726	1.22	45'	EL	**1.50**	0.80	0.730	2.63	45'	EL	21.90	
		HS-20(Opr)	36.000	--	1.61	58.0	1.35	0.730	2.95	45'	EL	21.90	0.726	1.61	45'	EL	1.50	N/A	--	--	--	--	--	
LEGAL LOAD RATING	SV	SNSH	13.500	--	3.56	48.1	1.4	0.730	5.56	45'	EL	21.90	0.726	3.56	45'	EL	1.50	0.80	0.730	5.13	45'	EL	21.90	
		SNGARBS2	20.000	--	1.48	29.6	1.4	0.730	2.45	45'	EL	21.90	0.726	1.48	45'	EL	1.50	0.80	0.730	2.26	45'	EL	21.90	
		SNAGRIS2	22.000	--	1.42	31.2	1.4	0.730	2.25	45'	EL	21.90	0.726	1.42	45'	EL	1.50	0.80	0.730	2.08	45'	EL	21.90	
		SNCOTTS3	27.250	--	1.53	41.7	1.4	0.730	2.39	45'	EL	21.90	0.726	1.53	45'	EL	1.50	0.80	0.730	2.20	45'	EL	21.90	
		SNAGGRS4	34.925	--	1.43	49.9	1.4	0.730	2.14	45'	EL	21.90	0.726	1.43	45'	EL	1.50	0.80	0.730	1.98	45'	EL	21.90	
		SNS5A	35.550	--	1.73	61.5	1.4	0.730	2.77	45'	EL	21.90	0.726	1.73	45'	EL	1.50	0.80	0.730	2.56	45'	EL	21.90	
		SNS6A	39.950	--	2.42	96.7	1.4	0.730	4.36	45'	EL	17.40	0.726	2.42	45'	EL	1.50	0.80	0.730	4.06	45'	EL	17.40	
		SNS7B	42.000	--	2.58	108.4	1.4	0.730	4.49	45'	EL	21.90	0.726	2.58	45'	EL	1.50	0.80	0.730	**4.15**	45'	EL	21.90	
	TTST	TNAGRIT3	33.000	--	1.67	55.1	1.4	0.730	2.76	45'	EL	21.90	0.726	1.67	45'	EL	1.50	0.80	0.730	2.55	45'	EL	21.90	
		TNT4A	33.075	--	1.61	53.3	1.4	0.730	2.79	45'	EL	21.90	0.726	1.61	45'	EL	1.50	0.80	0.730	2.58	45'	EL	21.90	
		TNT6A	41.600	--	1.56	64.9	1.4	0.730	2.34	45'	EL	21.90	0.726	1.56	45'	EL	1.50	0.80	0.730	2.16	45'	EL	21.90	
		TNT7A	42.000	--	1.43	60.1	1.4	0.730	2.39	45'	EL	21.90	0.726	1.43	45'	EL	1.50	0.80	0.730	2.21	45'	EL	21.90	
		TNT7B	42.000	--	1.36	57.1	1.4	0.730	2.48	45'	EL	21.90	0.726	1.36	45'	EL	1.50	0.80	0.730	2.30	45'	EL	21.90	
		TNAGRIT4	43.000	--	1.31	56.3	1.4	0.730	2.37	45'	EL	21.90	0.726	1.31	45'	EL	1.50	0.80	0.730	2.19	45'	EL	21.90	
		TNAGT5A	45.000	--	1.34	60.3	1.4	0.730	2.20	45'	EL	21.90	0.726	1.34	45'	EL	1.50	0.80	0.730	2.03	45'	EL	21.90	
		TNAGT5B	45.000	3	1.23	55.4	1.4	0.730	2.15	45'	EL	21.90	0.726	1.23	45'	EL	1.50	0.80	0.730	1.99	45'	EL	21.90	

LOAD FACTORS:

DESIGN LOAD RATING FACTORS	LIMIT STATE	γ_{DC}	γ_{DW}
	STRENGTH I	1.25	1.50
	SERVICE III	1.00	1.00

NOTES:

MINIMUM RATING FACTORS ARE BASED ON THE STRENGTH I AND SERVICE III LIMIT STATES.

ALLOWABLE STRESSES FOR SERVICE III LIMIT STATE ARE AS REQUIRED FOR DESIGN.

(#) CONTROLLING LOAD RATING

(1) DESIGN LOAD RATING (HL-93)

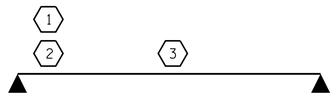
(2) DESIGN LOAD RATING (HS-20)

(3) LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

I - INTERIOR GIRDER
EL - EXTERIOR LEFT GIRDER
ER - EXTERIOR RIGHT GIRDER



LRFR SUMMARY

FOR SPAN A

PROJECT NO. N/A

CABARRUS COUNTY

STATION: 13+82.50

DRAWN BY : K. A. WOYAHN DATE : 05/15/23
CHECKED BY : T. R. DUDECK DATE : 08/23/23
DESIGN ENGINEER OF RECORD: T. R. DUDECK DATE : 12/20/23

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NORTH CAROLINA PROFESSIONAL SEAL 31462 ENGINEER THOMAS RYAN DUDECK
12/20/2023

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CITY OF CONCORD, NC

STANDARD
LRFR SUMMARY FOR
45' CORED SLAB UNIT
60° SKEW & 120° SKEW
(NON-INTERSTATE TRAFFIC)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6
1			3			TOTAL SHEETS
2			4			25

STD. NO. 21LRFR1_60&120S_45L

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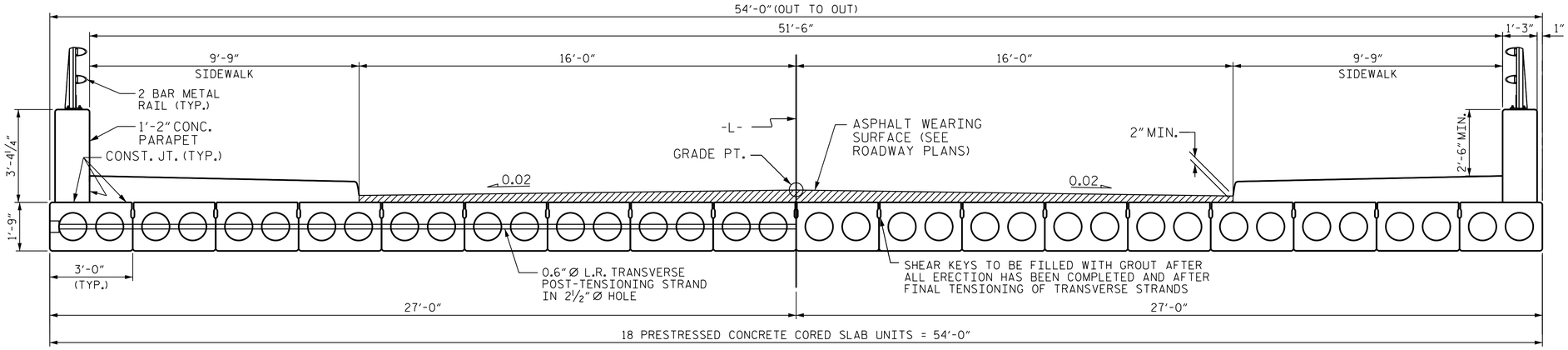


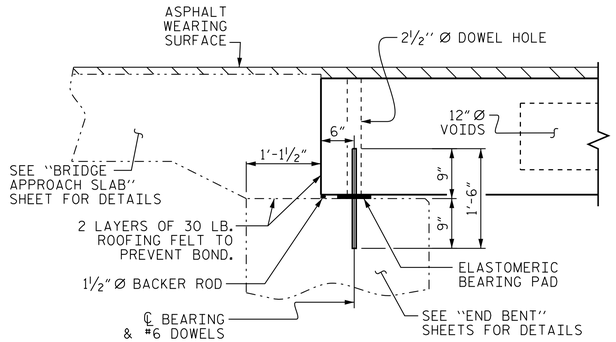
HALF SECTION
AT INTERMEDIATE DIAPHRAGMS

HALF SECTION
THROUGH VOIDS

TYPICAL SECTION

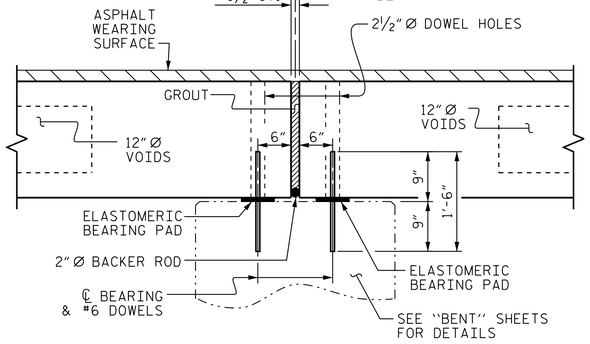
3 NON-COMPOSITE SIMPLE SPANS ON 21" CORED SLAB UNITS WITH ASPHALT WEARING SURFACE

FIXED END

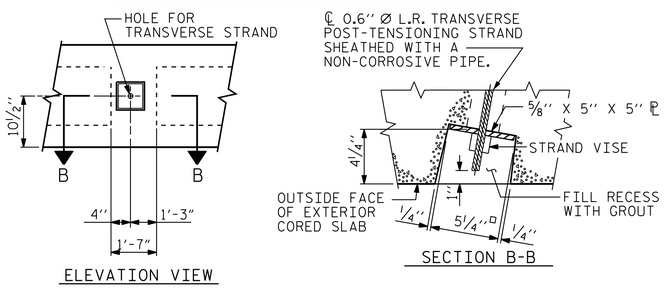


SECTION AT END BENT

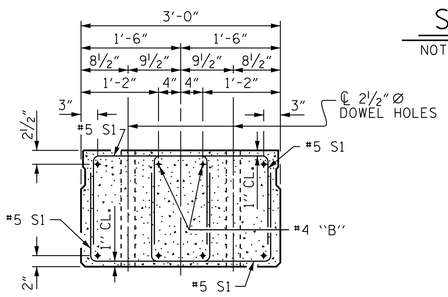
FIXED END FIXED END



SECTION AT BENT

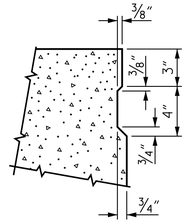


GROUTED RECESS AT END OF POST-TENSIONED STRAND OF CORED SLABS



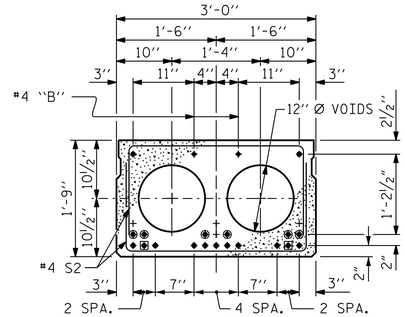
END ELEVATION

SHOWING PLACEMENT OF DOUBLE STIRRUPS AND LOCATION OF DOWEL HOLES. (STRAND LAYOUT NOT SHOWN.) INTERIOR SLAB UNIT SHOWN-EXTERIOR SLAB UNIT SIMILAR EXCEPT SHEAR KEY LOCATION.

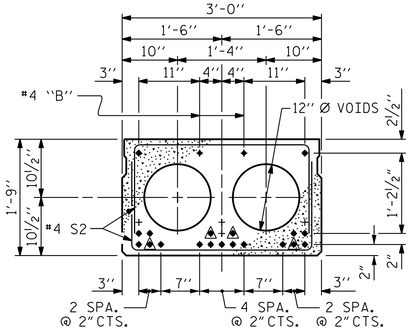


SHEAR KEY DETAIL

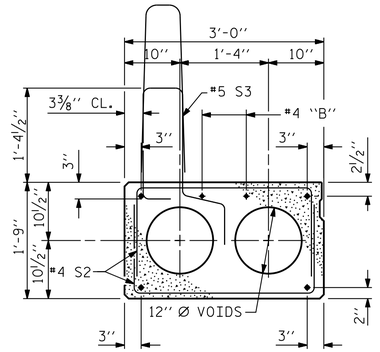
NOTE: OMIT SHEAR KEY ON OUTSIDE FACE OF EXTERIOR CORED SLABS.



INTERIOR SLAB SECTION (40' & 45' UNIT)
(13 STRANDS REQUIRED)



INTERIOR SLAB SECTION (50' & 55' UNIT)
(19 STRANDS REQUIRED)



EXT. SLAB SECTION

(FOR PRESTRESSED STRAND LAYOUT, SEE INTERIOR SLAB SECTION.)

▲ BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 6'-0" FROM END OF CORED SLAB UNIT. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.

■ BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 2'-0" FROM END OF CORED SLAB UNIT. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.

● OPTIONAL FULL LENGTH DEBONDED STRANDS. THESE STRANDS ARE NOT REQUIRED. IF THE FABRICATOR CHOOSES TO INCLUDE THESE STRANDS IN THE CORED SLAB UNIT, THE STRANDS SHALL BE DEBONDED FOR THE FULL LENGTH OF THE UNIT AT NO ADDITIONAL COST. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.

DEBONDING LEGEND

0.6" Ø LOW RELAXATION STRAND LAYOUT

PROJECT NO. N/A

CABARRUS COUNTY

STATION: 13+82.50

SHEET 1 OF 3

DRAWN BY : J. B. GEILE DATE : 04/11/23
CHECKED BY : T. R. DUDECK DATE : 08/23/23
DESIGN ENGINEER OF RECORD: T. R. DUDECK DATE : 12/20/23

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NORTH CAROLINA PROFESSIONAL SEAL 31462 ENGINEER THOMAS R. DUDECK
12/20/2023

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CITY OF CONCORD, NC

SUPERSTRUCTURE
3'-0" X 1'-9"
PRESTRESSED CONCRETE CORED SLAB UNIT
90° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			25

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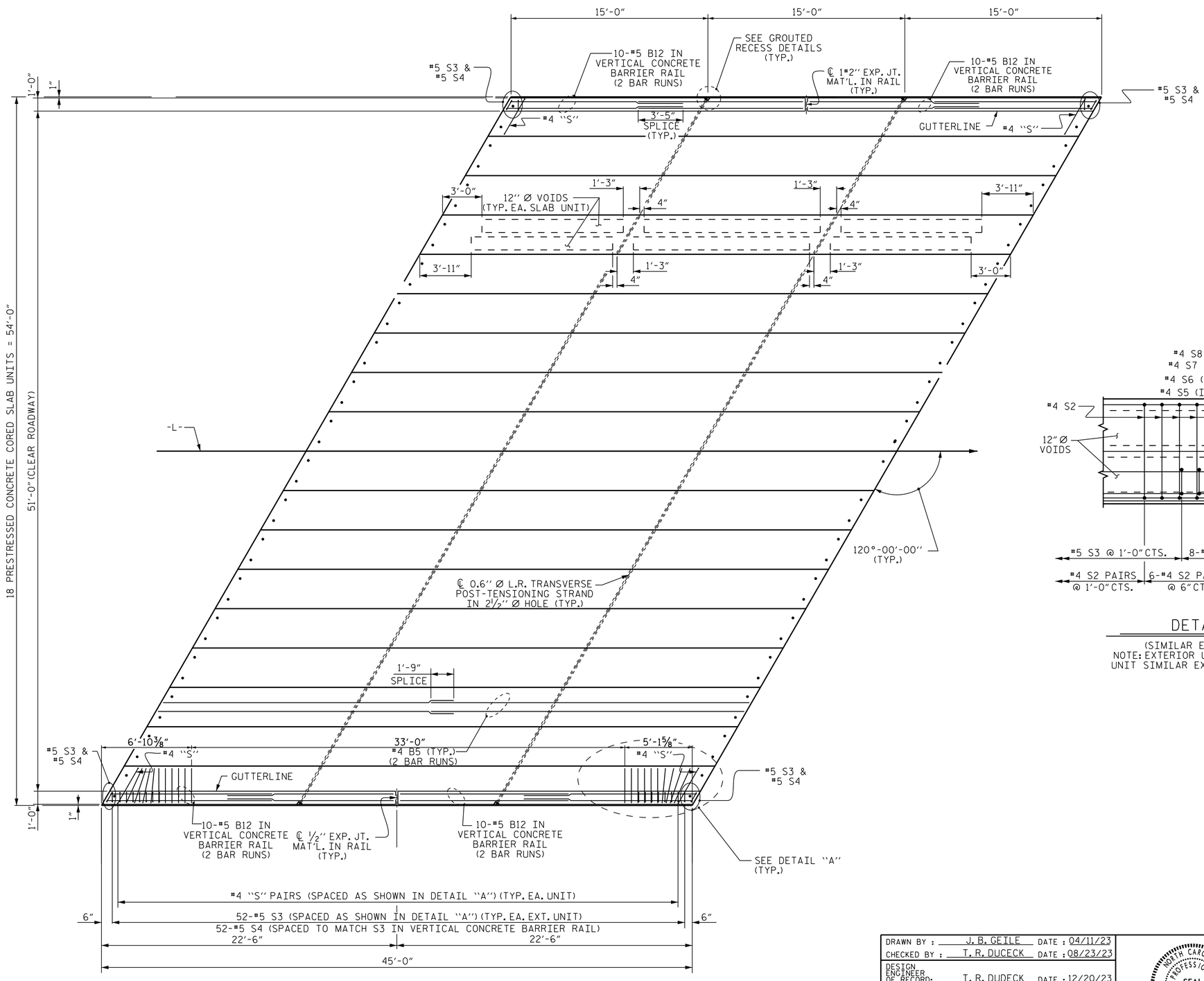
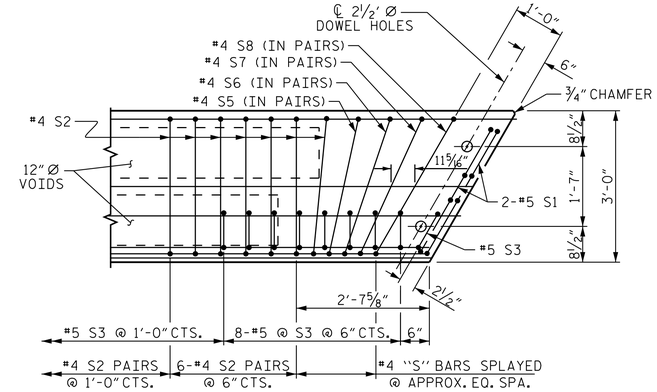


PLAN OF UNIT



DETAIL "A"

(SIMILAR EACH END OF UNIT)
NOTE: EXTERIOR UNIT SHOWN - INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S3 BARS.

PROJECT NO. N/A

CABARRUS COUNTY

STATION: 13+82.50

SHEET 2 OF 3

CITY OF CONCORD, NC

PLAN OF 45' UNIT
36'-10" CLEAR ROADWAY
120° SKEW

DRAWN BY :	J. B. GEILE DATE : 04/11/23
CHECKED BY :	T. R. DUCECK DATE : 08/23/23
DESIGN ENGINEER OF RECORD:	T. R. DUDECK DATE : 12/20/23

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NORTH CAROLINA PROFESSIONAL SEAL 31462 ENGINEER THOMAS RUDECK
Thomas Rudeck
12/20/2023

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REVISIONS					
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1			3		
2			4		

SHEET NO. S-8

TOTAL SHEETS 25

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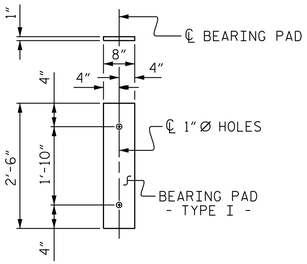


FIXED END
(TYPE I - 108 REQ'D)

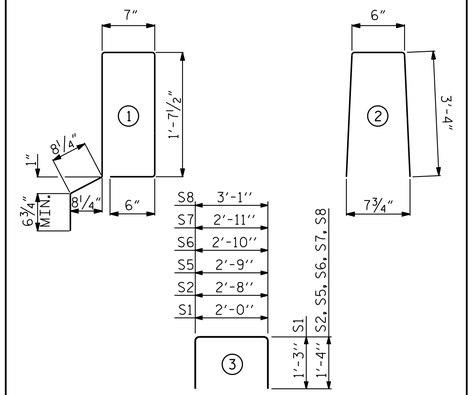
ELASTOMERIC BEARING DETAILS

ELASTOMER IN ALL BEARINGS SHALL BE 50 DUROMETER HARDNESS.

BILL OF MATERIAL FOR ONE 45' CORED SLAB UNIT

				EXTERIOR UNIT		INTERIOR UNIT	
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	LENGTH	WEIGHT
B5	4	#4	STR	23'-3"	62	23'-3"	62
S1	8	#5	3	4'-6"	38	4'-6"	38
S2	92	#4	3	5'-4"	328	5'-4"	328
✱ S3	54	#5	1	5'-7"	314		
S5	4	#4	3	5'-5"	14	5'-5"	14
S6	4	#4	3	5'-6"	15	5'-6"	15
S7	4	#4	3	5'-7"	15	5'-7"	15
S8	4	#4	3	5'-9"	15	5'-9"	15
REINFORCING STEEL			LBS.		487		487
✱EPOXY COATED REINFORCING STEEL			LBS.		314		
5000 P.S.I. CONCRETE			CU. YDS.		6.6		6.6
0.6"Ø L.R. STRANDS			No.		13		13

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

NOTES

ALL PRESTRESSING STRANDS SHALL BE 7-WIRE LOW RELAXATION GRADE 270 STRANDS AND SHALL CONFORM TO AASHTO M203 EXCEPT FOR SAMPLING REQUIREMENTS WHICH SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

ALL REINFORCING STEEL CAST WITH THE CORED SLAB SECTIONS SHALL BE GRADE 60 AND SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE CORED SLABS.

RECESSES FOR TRANSVERSE STRANDS SHALL BE GROUTED AFTER THE TENSIONING OF THE STRANDS.

THE 2½"Ø DOWEL HOLES AT FIXED ENDS OF SLAB SECTIONS SHALL BE FILLED WITH NON-SHRINK GROUT.

THE BACKER RODS SHALL CONFORM TO THE REQUIREMENTS OF TYPE M BOND BREAKER. SEE SECTION 1028 OF THE STANDARD SPECIFICATIONS.

WHEN CORED SLABS ARE CAST, AN INTERNAL HOLD-DOWN SYSTEM SHALL BE EMPLOYED TO PREVENT VOIDS FROM RISING OR MOVING SIDEWAYS. AT LEAST SIX WEEKS PRIOR TO CASTING CORED SLABS, THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER FOR REVIEW AND COMMENT, DETAILED DRAWINGS OF THE PROPOSED HOLD-DOWN SYSTEM. IN ADDITION TO STRUCTURAL DETAILS, LOCATION AND SPACING OF THE HOLD-DOWNS SHALL BE INDICATED.

ALL REINFORCING STEEL IN THE VERTICAL CONCRETE BARRIER RAIL SHALL BE EPOXY COATED.

PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE CORED SLAB UNIT ENDS.

APPLY EPOXY PROTECTIVE COATING TO CORED SLAB UNIT ENDS.

GROOVED CONTRACTION JOINTS, ½" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE BARRIER RAIL AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. A CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN BARRIER RAIL EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT MIDPOINT OF BARRIER RAIL SEGMENTS LESS THAN 20 FEET IN LENGTH AND NO CONTRACTION JOINTS ARE REQUIRED FOR THOSE SEGMENTS LESS THAN 10 FEET IN LENGTH.

FLAME CUTTING OF THE TRANSVERSE POST-TENSIONING STRAND IS NOT ALLOWED.

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE CORED SLAB UNIT SHALL BE DONE WHEN THE CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN THE REQUIRED STRENGTH SHOWN IN THE "CONCRETE RELEASE STRENGTH" TABLE.

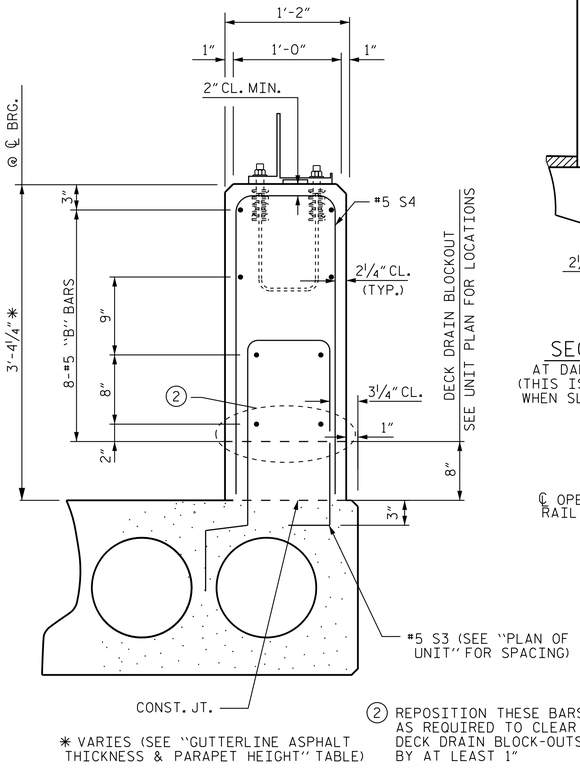
FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

THE PERMITTED THREADED INSERTS ARE DETAILED AS AN OPTION FOR THE CONTRACTOR TO ATTACH FALSEWORK AND FORMWORK DURING CONSTRUCTION.

THE PERMITTED THREADED INSERTS IN THE EXTERIOR UNITS SHALL BE SIZED BY THE CONTRACTOR, SPACED AT 4'-0" CENTERS AND GALVANIZED IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS. STAINLESS STEEL THREADED INSERTS MAY BE USED AS AN ALTERNATE.

THE PERMITTED THREADED INSERTS SHALL BE GROUTED BY THE CONTRACTOR IMMEDIATELY FOLLOWING REMOVAL OF THE FALSEWORK.

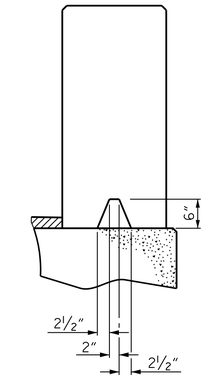
THE COST OF THE PERMITTED THREADED INSERTS SHALL BE INCLUDED IN THE PRICE BID FOR THE PRECAST UNITS.



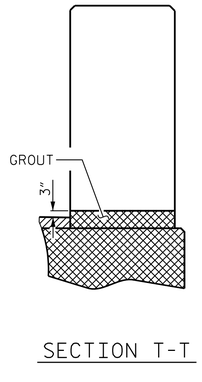
✱ VARIES (SEE "GUTTERLINE ASPHALT THICKNESS & PARAPET HEIGHT" TABLE)

② REPOSITION THESE BARS AS REQUIRED TO CLEAR DECK DRAIN BLOCK-OUTS BY AT LEAST 1"

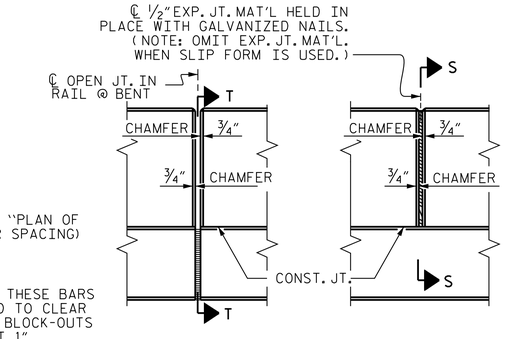
SECTION THRU CONC. PARAPET



SECTION S-S
AT DAM IN OPEN JOINT
(THIS IS TO BE USED ONLY WHEN SLIP FORM IS USED)



SECTION T-T



ELEVATION AT EXPANSION JOINTS

VERTICAL CONCRETE PARAPET SECTION

BILL OF MATERIAL FOR CONCRETE PARAPET FOR ONE SPAN

BAR	BARS PER PAIR OF EXTERIOR UNITS 45' UNIT	TOTAL NO.	SIZE	TYPE	LENGTH	WEIGHT
✱B12	80	80	#5	STR	14'-2"	1182
✱ S4	104	104	#5	2	5'-8"	615
✱EPOXY COATED REINFORCING STEEL				LBS.		1797
CLASS AA CONCRETE				CU.YDS.		10.6
TOTAL CONCRETE PARAPET				LN. FT.		90.00

GUTTERLINE ASPHALT THICKNESS & PARAPET HEIGHT

51'-0" CLEAR ROADWAY	ASPHALT OVERLAY THICKNESS @ MID-SPAN	PARAPET HEIGHT @ MID-SPAN
	SUPERED SECTION	
45' UNIT	2"	3'-8"

CORED SLABS REQUIRED

	NUMBER	LENGTH	TOTAL LENGTH
45' UNIT			
EXTERIOR C.S.	6	45'-0"	270'-0"
INTERIOR C.S.	48	45'-0"	2,160'-0"
TOTAL	54	45'-0"	2,430'-0"

(SPANS A, B, AND C)

DEAD LOAD DEFLECTION AND CAMBER

	3'-0" x 1'-9"
45' CORED SLAB UNIT	0.6"Ø L.R. STRAND
CAMBER (SLAB ALONE IN PLACE)	⅞" ↑
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD✱✱	⅛" ↓
FINAL CAMBER	¾" ↑

✱✱ INCLUDES FUTURE WEARING SURFACE

DRAWN BY : J. B. GEILE DATE : 04/11/23
CHECKED BY : T. R. DUDECK DATE : 08/25/23
DESIGN ENGINEER OF RECORD: T. R. DUDECK DATE : 12/20/23

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12/20/2023

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CITY OF CONCORD, NC

3'-0" X 1'-9"
PRESTRESSED CONCRETE
CORED SLAB UNIT

120° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			TOTAL SHEETS
2			4			25

PROJECT NO. N/A
CABARRUS COUNTY
STATION: 13+82.50

SHEET 3 OF 3

STD. NO. 21"PCS3_39_120S

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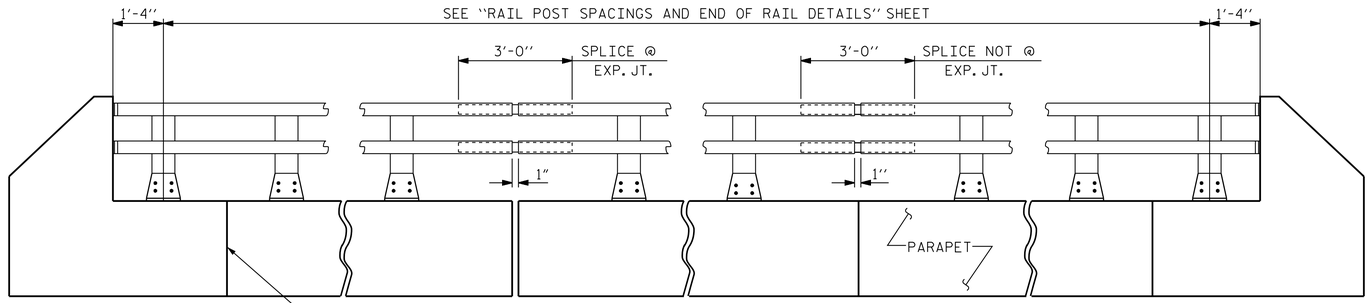
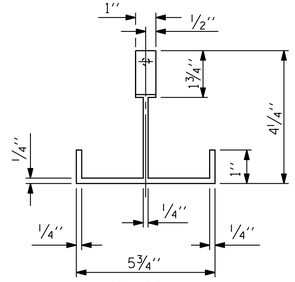
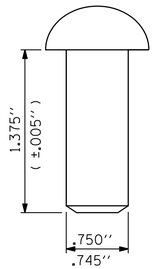


ELEVATION

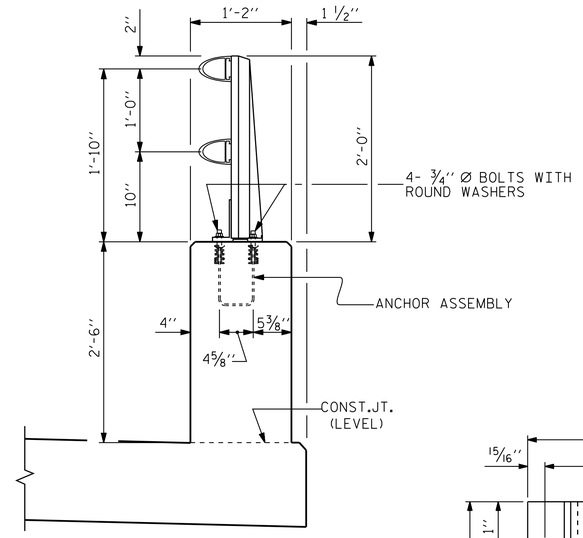
NOTE : FOR ATTACHMENT OF METAL RAIL TO END POST, SEE STANDARD NO. BMR2.



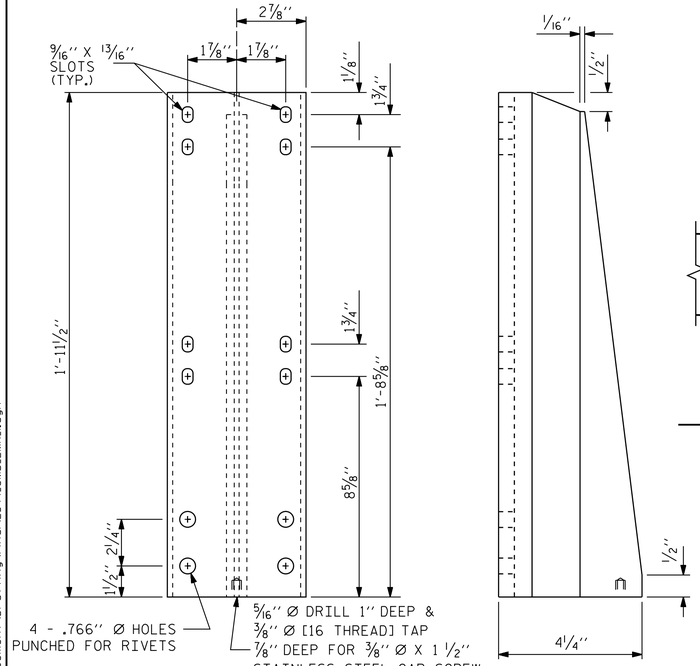
PLAN



RIVET DETAIL



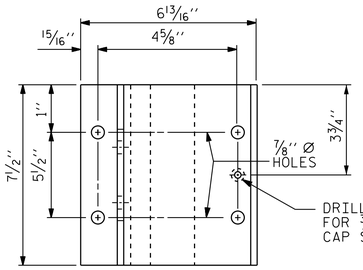
SECTION THRU PARAPET AND RAIL



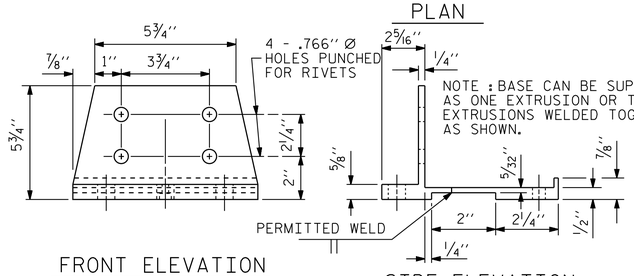
FRONT ELEVATION

SIDE ELEVATION

DETAILS OF POST



PLAN



FRONT ELEVATION

SIDE ELEVATION

POST BASE DETAILS

NOTES

AT THE CONTRACTOR'S OPTION, METAL RAIL MAY BE EITHER ALUMINUM OR GALVANIZED STEEL IN ACCORDANCE WITH THE REQUIREMENTS OF THE GENERAL NOTES AND THE FOLLOWING SPECIFICATIONS FOR THE ALTERNATE MATERIALS; HOWEVER, THE CONTRACTOR WILL BE REQUIRED TO USE THE SAME RAIL MATERIAL ON ALL STRUCTURES ON THE PROJECT FOR WHICH METAL RAIL IS DESIGNATED.

UNLESS OTHERWISE REQUIRED IN THE CONTRACT DOCUMENTS, THE CONTRACTOR HAS THE OPTION TO USE AN ALTERNATE TO THE 2 BAR METAL RAIL. THE ALTERNATE RAIL SHALL MEET THE REQUIREMENTS OF THE AASHTO LRFDBRIDGE DESIGN SPECIFICATIONS AND MUST BE LISTED ON THE DEPARTMENT'S APPROVED PRODUCTS LIST (APL) UNDER "2 BAR METAL RAIL ALTERNATE". ADJUSTMENTS TO THE CONCRETE PARAPET WILL NOT BE ALLOWED.

ALUMINUM RAILS

MATERIAL FOR POSTS, BASES AND RAILS, EXPANSION BARS AND CLAMP BARS SHALL BE ASTM B-221 ALLOY 6061-T6.

MATERIAL FOR RIVETS SHALL BE ASTM B316 ALLOY 6061-T6. RIVETS SHALL BE STANDARD BUTTON HEAD AND CONE POINT COLD DRIVEN AS PER DRAWING.

THE BASE OF RAIL POSTS, OR ANY OTHER ALUMINUM SURFACE IN CONTACT WITH CONCRETE SHALL BE THOROUGHLY COATED WITH AN ALUMINUM IMPREGNATED CAULKING COMPOUND OF APPROVED QUALITY.

MATERIAL FOR SHIMS TO BE ASTM B209 ALLOY 6061-T6.

GALVANIZED STEEL RAILS

MATERIAL AND GALVANIZING ARE TO CONFORM TO THE FOLLOWING SPECIFICATIONS:

POST, POST BASES, RAILS, EXPANSION BARS AND CLAMP BARS: AASHTO M270 GRADE 36 STRUCTURAL STEEL - GALVANIZED TO AASHTO M111.

RIVETS: RIVETS SHALL MEET THE REQUIREMENTS OF ASTM A502 FOR GRADE 1 RIVETS.

THE CUT ENDS OF GALVANIZED STEEL RAILING, AFTER GRINDING SMOOTH SHALL BE GIVEN TWO COATS OF ZINC RICH PAINT MEETING THE REQUIREMENTS OF FEDERAL SPECIFICATION MIL-P-26915 USAF TYPE 1, OR OF FEDERAL SPECIFICATIONS TT-P-641.

SHIMS: SHIMS SHALL MEET THE REQUIREMENTS OF ASTM A570 FOR GRADE 33 OR A611 FOR GRADE C AND SHALL BE GALVANIZED IN ACCORDANCE WITH AASHTO M111.

RAIL CAPS: RAIL CAPS SHALL MEET THE REQUIREMENTS OF ASTM A570 FOR GRADE 33 OR A611 FOR GRADE C AND SHALL BE GALVANIZED IN ACCORDANCE WITH AASHTO M111.

GENERAL NOTES

RAILING SHALL BE CONTINUOUS FROM END POST TO END POST OF BRIDGE. EACH JOINT IN RAIL LENGTH SHALL BE SPLICED AS DETAILED. PANEL LENGTHS OF RAIL SHALL BE ATTACHED TO A MINIMUM OF THREE POSTS.

FOR END OF RAIL TO CLEAR FACE OF CONCRETE END POST DIMENSION, SEE STANDARD NO. BMR2.

CAP SCREWS SHALL BE ASTM F593 ALLOY 305 STAINLESS STEEL. WASHERS SHALL MEET THE REQUIREMENTS OF ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL.

CERTIFIED MILL REPORTS ARE REQUIRED FOR RAILS AND POSTS. SHOP INSPECTION IS NOT REQUIRED.

METAL RAIL POSTS SHALL BE SET NORMAL TO CURB GRADE.

METHOD OF MEASUREMENT FOR METAL RAILS: FOR LENGTH OF METAL RAILS TO BE PAID FOR, SEE THE STANDARD SPECIFICATIONS.

CURVED RAIL USAGE: WHERE RAILS ARE TO BE USED ON BRIDGES ON HORIZONTAL AND/OR VERTICAL CURVATURE THE CONTRACTOR MAY, AT HIS OPTION, HAVE THE REQUIRED CURVATURE IN THE RAIL FORMED IN THE SHOP OR IN THE FIELD. IN EITHER EVENT, THE RAIL SHALL CONFORM WITHOUT BUCKLING OR KINKING TO THE REQUIRED CURVATURE IN A UNIFORM MANNER ACCEPTABLE TO THE ENGINEER.

TO INSURE FUTURE IDENTIFICATION OF THE FABRICATOR, A PERMANENT IDENTIFYING MARK SHALL BE PLACED ON EACH POST. THE METHOD OF MARKING AND LOCATION SHALL BE SUCH THAT IT DOES NOT DETRACT FROM THE APPEARANCE OF THE POST, BUT REMAINS VISIBLE AFTER RAIL PLACEMENT.

SHIMS SHALL BE USED AS NECESSARY FOR POST ALIGNMENT.

ALLOY 6351-T5 MAY BE SUBSTITUTED FOR ALLOY 6061-T6 WHERE APPLICABLE.

MINOR VARIATIONS IN DETAILS OF METAL RAIL WILL BE CONSIDERED. DETAILS OF SUCH VARIATIONS, IF DESIRED, SHALL BE SUBMITTED FOR APPROVAL.

GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE PARAPET AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. A CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN PARAPET EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT MIDPOINT OF PARAPET SEGMENTS LESS THAN 20 FEET IN LENGTH AND NO CONTRACTION JOINTS ARE REQUIRED FOR THOSE SEGMENTS LESS THAN 10 FEET IN LENGTH.

PAY LENGTH = 255.5 LIN. FT.

PROJECT NO. N/A

CABARRUS COUNTY

STATION: 13+82.50

SHEET 1 OF 3

DRAWN BY : K. A. WOYAHN DATE : 05/15/23
CHECKED BY : T. R. DUDECK DATE : 08/24/23
DESIGN ENGINEER OF RECORD: T. R. DUDECK DATE : 12/20/23

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NORTH CAROLINA PROFESSIONAL SEAL 31462 ENGINEER THOMAS RUDECK
Tommy Dudeck
12/20/2023

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CITY OF CONCORD, NC

STANDARD

2 BAR METAL RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			25

STD. NO. BMR3

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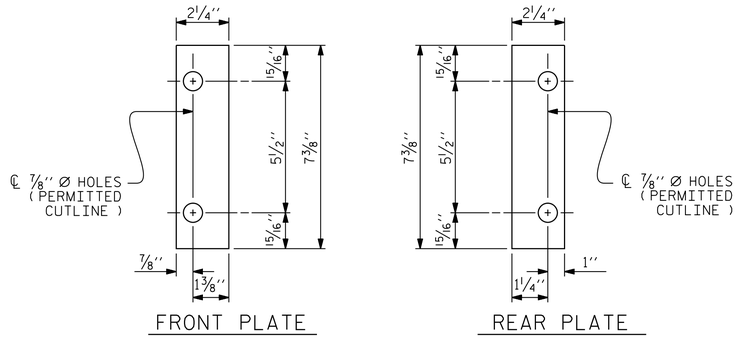
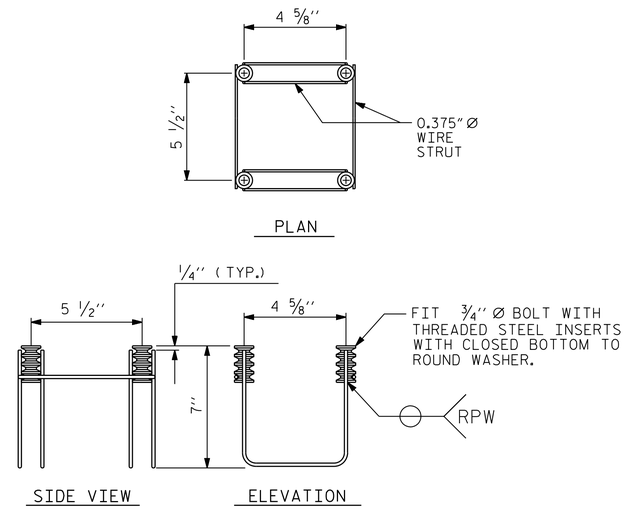


SHIM DETAILS

NOTE :
SHIMS MAY BE CUT ALONG PERMITTED CUTLINE OR SLOTTED TO EDGE OF PLATE TO FACILITATE PLACEMENT.



4-BOLT METAL RAIL ANCHOR ASSEMBLY

(ASSEMBLIES REQUIRED)

NOTES

STRUCTURAL CONCRETE ANCHOR ASSEMBLY

THE STRUCTURAL CONCRETE ANCHOR ASSEMBLY SHALL CONSIST OF THE FOLLOWING COMPONENTS :

A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 2'' FOR ¾'' FERRULES.

B. 4 - ¾'' Ø X 2½'' BOLTS WITH WASHERS. BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE ¾'' Ø X 2½'' GALVANIZED BOLTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.

C. WIRE STRUT SHOWN IN THE CONCRETE ANCHOR ASSEMBLY DETAIL IS THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI. AS AN OPTION, A 7/16'' Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.

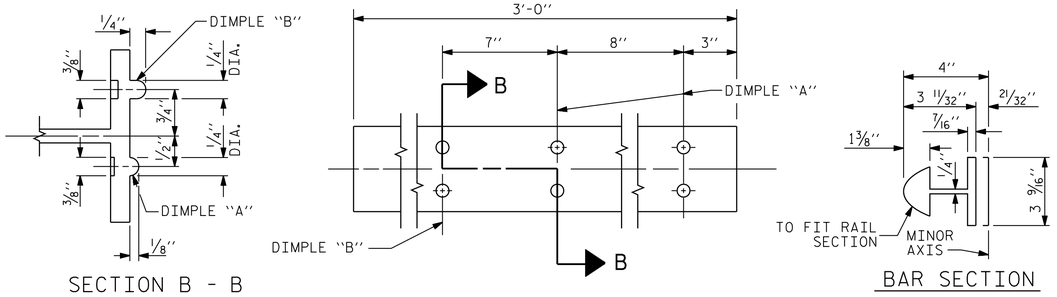
D. THE METAL RAIL ANCHOR ASSEMBLIES TO BE HOT DIPPED GALVANIZED TO CONFORM TO REQUIREMENTS OF AASHTO M111.

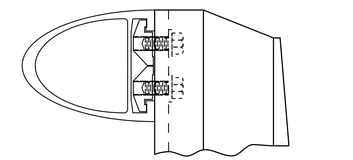
E. THE COST OF THE METAL RAIL ANCHOR ASSEMBLY WITH BOLTS AND WASHERS COMPLETE IN PLACE SHALL BE INCLUDED IN THE PRICE BID FOR LINEAR FEET OF METAL RAIL.

F. BOLTS TO BE TIGHTENED ONE-HALF TURN WITH A WRENCH FROM A FINGER-TIGHT POSITION.

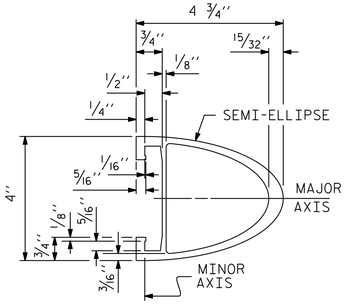
THE CONTRACTOR MAY USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF THE METAL RAIL ANCHOR ASSEMBLY. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE ¾" Ø BOLT IS 10 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE THE STANDARD SPECIFICATIONS.

WHEN ADHESIVELY ANCHORED ANCHOR BOLTS ARE USED, BOLTS SHALL MEET THE REQUIREMENTS OF ASTM F593 ALLOY 304 STAINLESS STEEL WITH MINIMUM 75,000 PSI ULTIMATE STRENGTH. NUTS SHALL MEET THE REQUIREMENTS OF ASTM F594 ALLOY 304 STAINLESS STEEL AND WASHERS SHALL MEET THE REQUIREMENTS OF ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL.

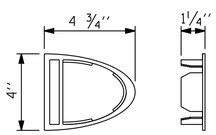




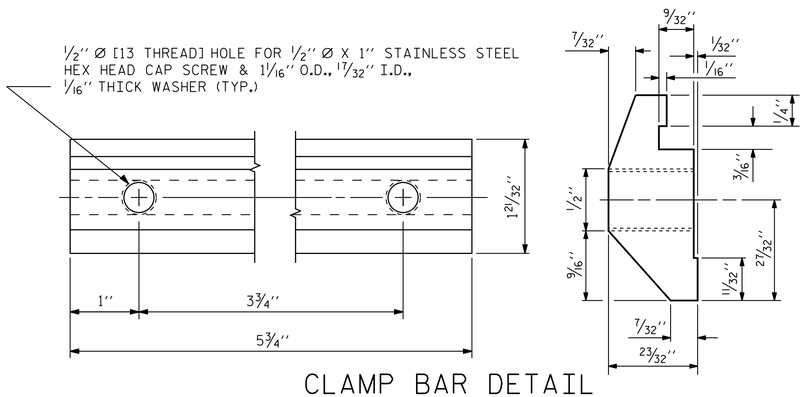
CLAMP ASSEMBLY



RAIL SECTION



RAIL CAP



CLAMP BAR DETAIL

(4 REQUIRED PER POST)

PROJECT NO. N/A

CABARRUS COUNTY

STATION: 13+82.50

SHEET 2 OF 3

DRAWN BY :	K. A. WOYAHN DATE : 05/15/23
CHECKED BY :	T. R. DUDECK DATE : 08/24/23
DESIGN ENGINEER OF RECORD:	T. R. DUDECK DATE : 12/20/23

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NORTH CAROLINA PROFESSIONAL SEAL 31462 ENGINEER THOMAS RUSSELL DUDECK
Tommy Dudeck
12/20/2023

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

CITY OF CONCORD, NC

STANDARD

2 BAR METAL RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11
1			3			TOTAL SHEETS
2			4			25

STD. NO. BMR4

12/20/2023
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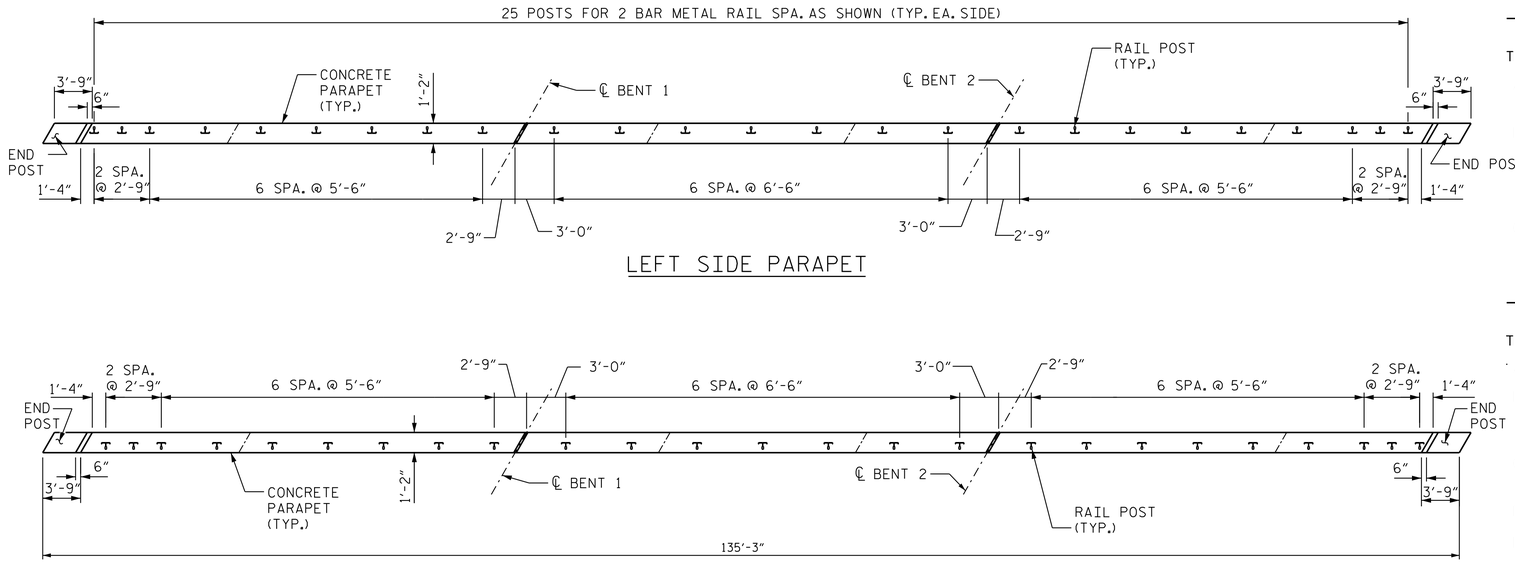
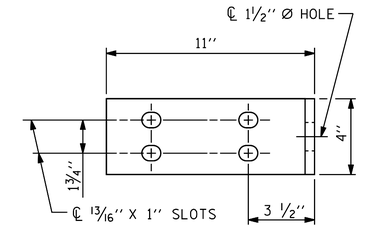


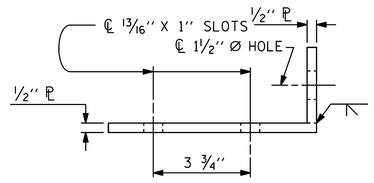
LEFT SIDE PARAPET

RIGHT SIDE PARAPET

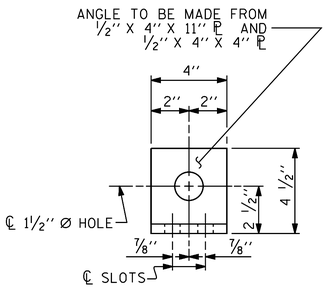
PLAN OF RAIL POST SPACINGS



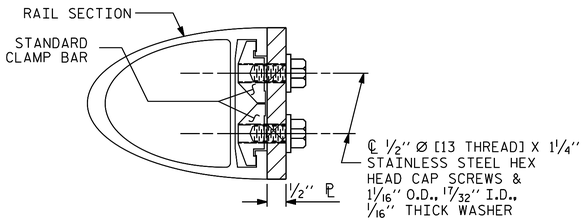
ELEVATION



TOP VIEW

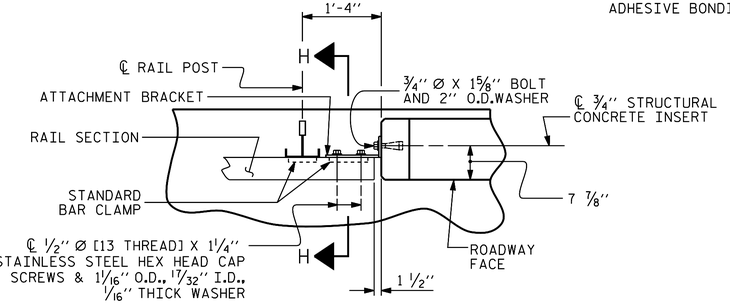


END VIEW (FIX AND EXP.)

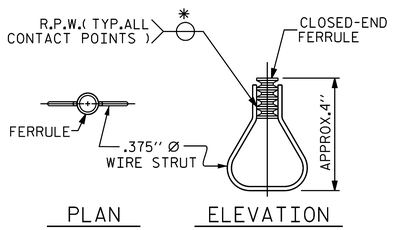


SECTION H-H (FIX)

FIXED



PLAN - RAIL AND END POST



PLAN ELEVATION

STRUCTURAL CONCRETE INSERT

*EACH WELDED ATTACHMENT OF WIRE TO FERRULE SHALL DEVELOP THE TENSILE STRENGTH OF THE WIRE.

DETAILS FOR ATTACHING METAL RAIL TO END POST

NOTES

STRUCTURAL CONCRETE INSERT

THE STRUCTURAL CONCRETE INSERT ASSEMBLY SHALL CONSIST OF THE FOLLOWING COMPONENTS:

A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 1½".

B. 1 - ¾" Ø X 1⅝" BOLT WITH WASHER. BOLT SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLT AND WASHER SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLT AND WASHER MAY BE USED AS AN ALTERNATE FOR THE ¾" Ø X 1⅝" GALVANIZED BOLT AND WASHER. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)

C. WIRE STRUT SHOWN IN THE CONCRETE INSERT ASSEMBLY DETAIL IS THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI. AS AN OPTION, A 7/16" Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.

NOTES

METAL RAIL TO END POST CONNECTION

THE METAL RAIL TO END POST CONNECTION SHALL CONSIST OF THE FOLLOWING COMPONENTS:

A. ½" PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 AND SHALL BE GALVANIZED AFTER FABRICATION.

B. ¾" STRUCTURAL CONCRETE INSERT SHALL HAVE A WORKING LOAD SHEAR CAPACITY OF 4800 LBS. THE FERRULES SHALL ENGAGE A ¾"Ø X 1⅝" BOLT WITH 2" O.D. WASHER IN PLACE. THE ¾"Ø X 1⅝" BOLT SHALL HAVE N. C. THREADS.

C. CAP SCREWS FOR RAIL ATTACHMENT TO ANGLE SHALL CONFORM TO THE REQUIREMENTS OF ASTM F593 ALLOY 305 STAINLESS STEEL. CAP SCREWS TO BE CENTERED IN SLOTS AT 60°F.

D. STANDARD CLAMP BARS (SEE METAL RAIL SHEET).

E. ½" Ø PIPE SLEEVES (IF REQUIRED) TO BE GALVANIZED.

THE COST OF THE STANDARD CLAMP BARS AND CAP SCREWS USED IN THE METAL RAIL TO END POST CONNECTION SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR LINEAR FEET OF 1 OR 2 BAR METAL RAILS.

THE ¾" STRUCTURAL CONCRETE INSERT WITH BOLT SHALL BE ASSEMBLED IN THE SHOP.

THE COST OF THE ¾" STRUCTURAL CONCRETE INSERT ASSEMBLY, AND THE ½" PLATES COMPLETE IN PLACE SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

THE CONTRACTOR, AT HIS OPTION, MAY USE AN ADHESIVE BONDING SYSTEM IN LIEU OF THE STRUCTURAL CONCRETE INSERT EMBEDDED IN THE END POST. IF THE ADHESIVE BONDING SYSTEM IS USED, THE ¾" Ø X 1⅝" BOLT WITH WASHER SHALL BE REPLACED WITH A ¾"Ø X 6½" BOLT AND 2" O.D. WASHER. ALL SPECIFICATIONS THAT APPLY TO THE ¾" Ø X 1⅝" BOLT SHALL APPLY TO THE ¾"Ø X 6 ½" BOLT. FIELD TESTING OF THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.

PROJECT NO. N/A

CABARRUS COUNTY

STATION: 13+82.50

SHEET 3 OF 3

DRAWN BY : K. A. WOYAHN DATE : 05/17/23
CHECKED BY : T. R. DUDECK DATE : 08/23/23
DESIGN ENGINEER OF RECORD: T. R. DUDECK DATE : 12/20/23

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Tommy Dudeck
12/20/2023

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CITY OF CONCORD, NC

STANDARD

RAIL POST SPACINGS AND END OF RAIL DETAILS

FOR ONE OR TWO BAR METAL RAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS
2			4			25

STD. NO. BMR2

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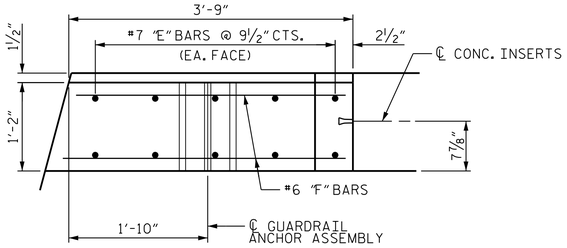


NOTES

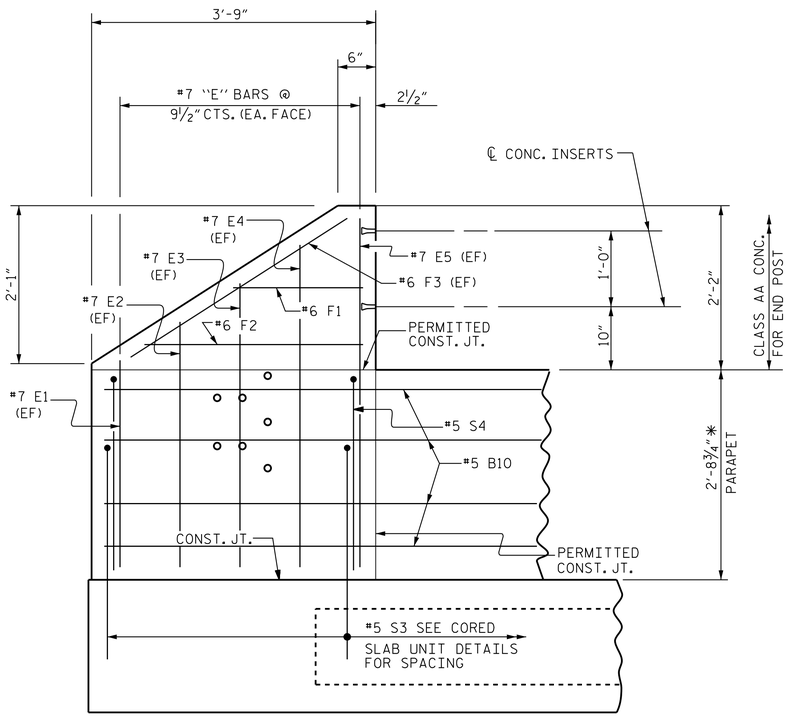
ALL REINFORCING STEEL IN PARAPETS AND END POSTS SHALL BE EPOXY COATED.

BILL OF MATERIAL

FOUR END POSTS

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳E1	8	#7	STR	2'-8"	44
✳E2	8	#7	STR	3'-2"	52
✳E3	8	#7	STR	3'-8"	60
✳E4	8	#7	STR	4'-3"	69
✳E5	8	#7	STR	4'-7"	75
✳F1	8	#6	STR	1'-8"	20
✳F2	8	#6	STR	2'-10"	34
✳F3	8	#6	STR	3'-4"	40
✳EPOXY COATED REINFORCING STEEL				LBS.	394
CLASS AA CONCRETE				C.Y.	0.8

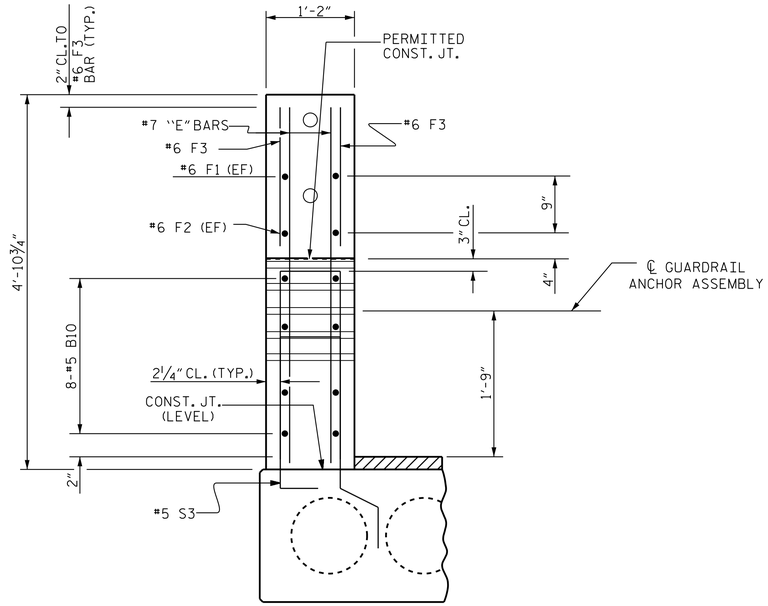
✳DENOTES EPOXY COATED REINFORCING



ELEVATION

(EF) DENOTES BAR IN EA. FACE

✳VARIES (SEE "GUTTERLINE ASPHALT THICKNESS & PARAPET HEIGHT" TABLE) (SEE SHEET S-9)



END VIEW

PROJECT NO. N/A

CABARRUS COUNTY

STATION: 13+82.50

DRAWN BY : K. A. WOYAHN DATE : 5/23/23

CHECKED BY : T. R. DUDECK DATE : 08/23/23

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12/20/2023

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CITY OF CONCORD, NC

SUPERSTRUCTURE

CONCRETE PARAPET AND END POST DETAILS

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1			3			TOTAL SHEETS
2			4			25

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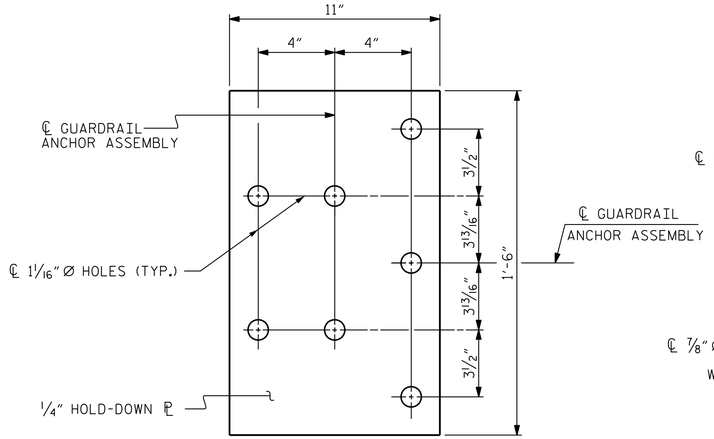
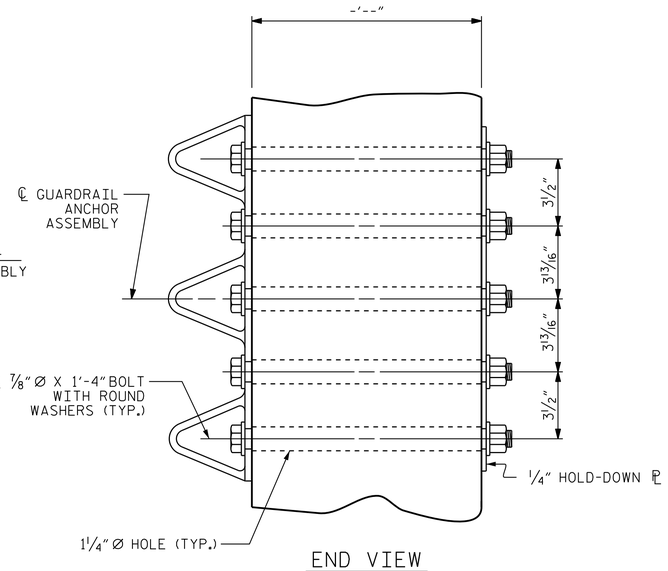


PLAN



END VIEW

GUARDRAIL ANCHOR ASSEMBLY DETAILS

NOTES

THE GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF A 1/4'' HOLD DOWN PLATE AND 7 - 7/8'' Ø BOLTS WITH NUTS AND WASHERS.

THE HOLD-DOWN PLATE SHALL CONFORM TO AASHTO M270 GRADE 36. AFTER FABRICATION, THE HOLD-DOWN PLATE SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH AASHTO M111.

BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M291. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 7/8'' Ø GALVANIZED BOLTS, NUTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.

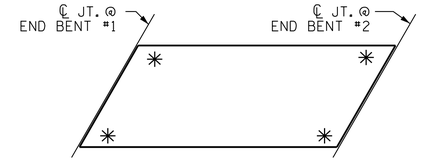
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF THE PARAPET. FOR POINTS OF ATTACHMENT, SEE SKETCH.

AFTER INSTALLATION, THE EXPOSED THREAD OF THE BOLT SHALL BE BURRED WITH A SHARP POINTED TOOL.

THE COST OF THE GUARDRAIL ANCHOR ASSEMBLIES WITH BOLTS, NUTS AND WASHERS COMPLETE IN PLACE, SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

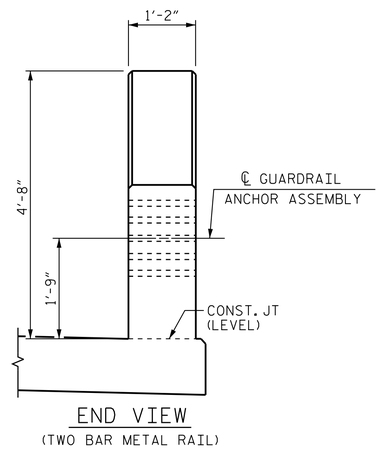
THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE END POST TO CLEAR ASSEMBLY BOLTS.

THE 1 1/4'' Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.

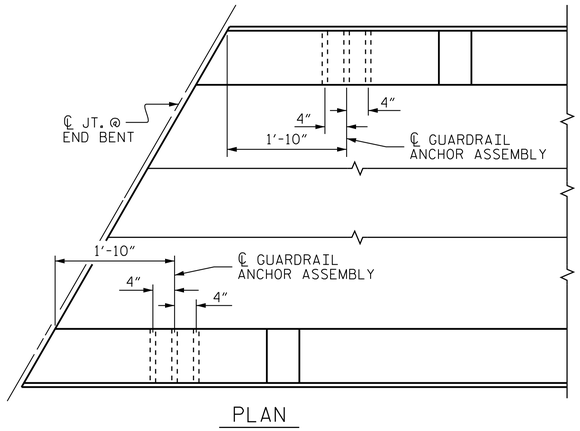


SKETCH SHOWING POINTS OF ATTACHMENT

✳ LOCATION OF GUARDRAIL ATTACHMENT



END VIEW
(TWO BAR METAL RAIL)



PLAN

LOCATION OF GUARDRAIL ANCHOR AT END POST

PROJECT NO. N/A

CABARRUS COUNTY

STATION: 13+82.50

DRAWN BY : K. A. WOYAHN DATE : 05/17/23
CHECKED BY : T. R. DUDECK DATE : 08/23/23
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Tommy Dudeck
12/20/2023

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CITY OF CONCORD, NC

STANDARD

GUARDRAIL ANCHORAGE DETAILS FOR METAL RAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14
1			3			TOTAL SHEETS
2			4			25

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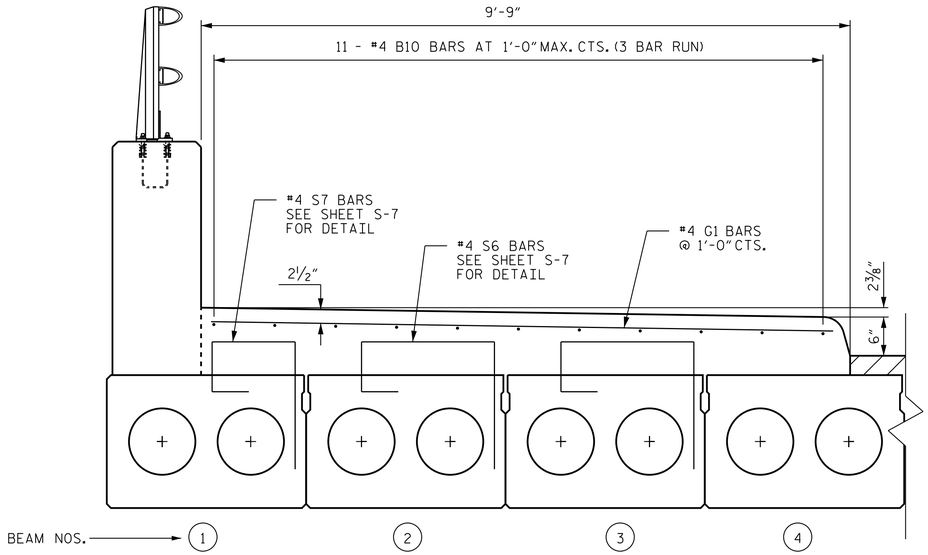
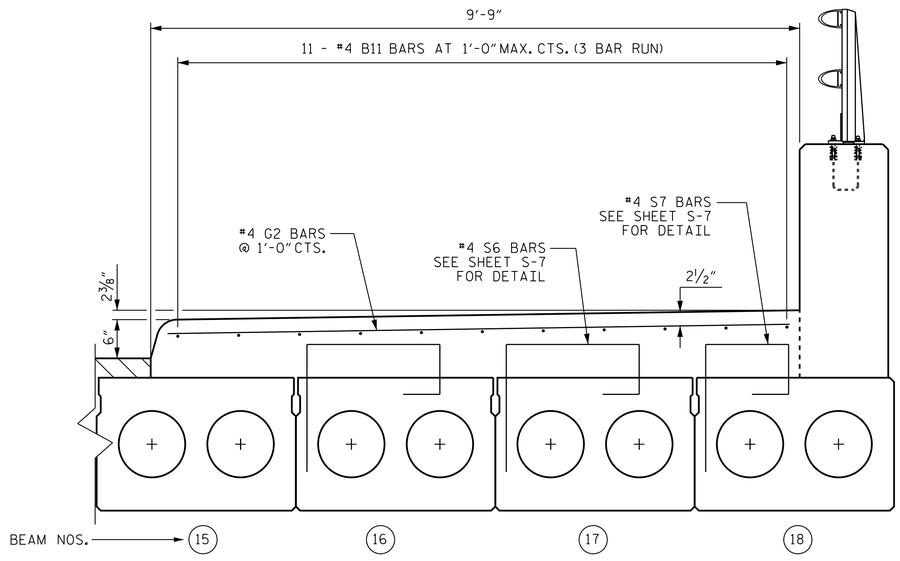


LEFT SIDEWALK



RIGHT SIDEWALK

BILL OF MATERIAL

LEFT SIDEWALK

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ G1	70	#4	STR	9'-3"	433
✳ B10	33	#4	STR	46'-4"	1021
✳ EPOXY COATED REINFORCING STEEL				LBS.	1454
CLASS AA CONCRETE				C.Y.	29.3

RIGHT SIDEWALK

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ G2	70	#4	STR	9'-3"	433
✳ B11	33	#4	STR	46'-4"	1021
✳ EPOXY COATED REINFORCING STEEL				LBS.	1454
CLASS AA CONCRETE				C.Y.	29.3

SPLICE LENGTHS

BAR SIZE	EPOXY COATED
#4	2'-0"

PROJECT NO. N/A

CABARRUS COUNTY

STATION: 13+82.50

DRAWN BY : K. A. WOYAHN DATE : 05/24/23

CHECKED BY : T. R. DUDECK DATE : 08/23/23

DESIGN ENGINEER OF RECORD: T. R. DUDECK DATE : 12/20/23

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NORTH CAROLINA PROFESSIONAL SEAL 31462 ENGINEER TIMOTHY R. DUDECK

Timothy R. Dudeck
12/20/2023

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SIDEWALK DETAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
1			3			TOTAL SHEETS
2			4			25

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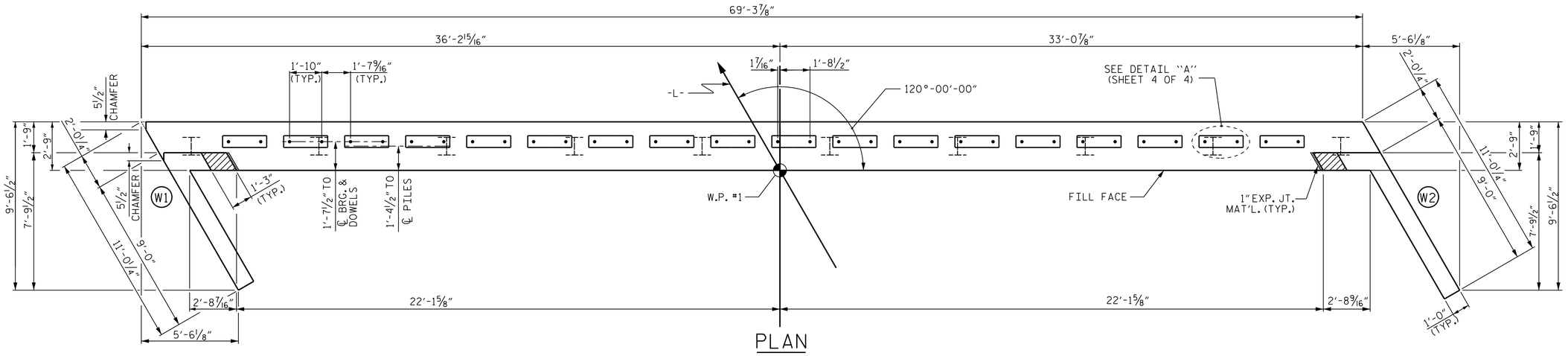
NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.

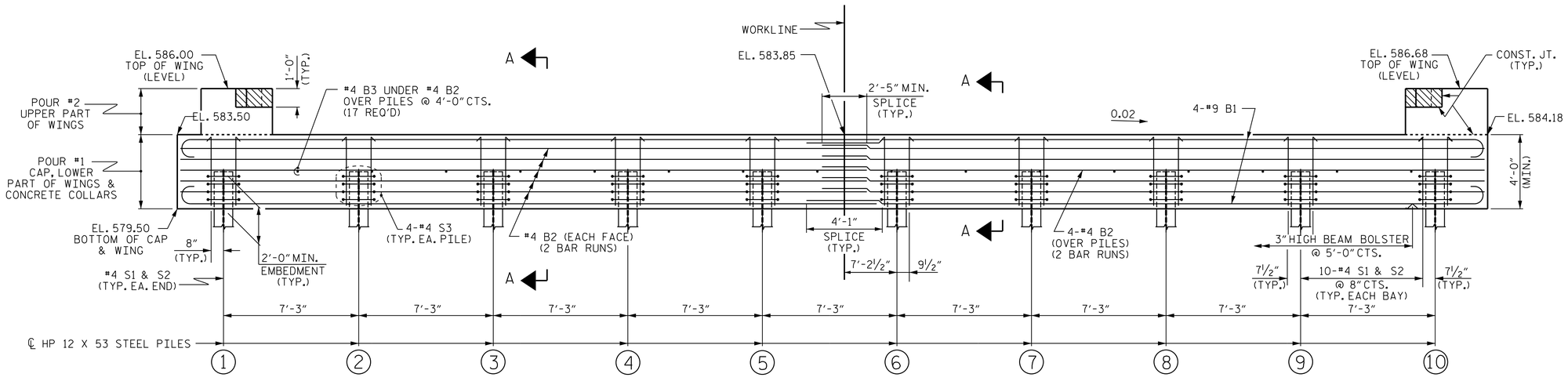
THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE VERTICAL CONCRETE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.

FOR WING DETAILS, SEE SHEET 3 OF 4.



PLAN



ELEVATION

WINGS NOT SHOWN FOR CLARITY.
FOR SECTION A-A, SEE SHEET 4 OF 4.
CONCRETE COLLARS FOR STEEL PILES NOT SHOWN IN PLAN AND ELEVATION VIEWS FOR CLARITY.

TOP OF PILE ELEVATIONS	
1	581.61
2	581.68
3	581.75
4	581.82
5	581.89
6	581.96
7	582.03
8	582.10
9	582.17
10	582.24

PROJECT NO. N/A

CABARRUS COUNTY

STATION: 13+82.50

SHEET 1 OF 4

DRAWN BY : J. B. GEILE DATE : 04/13/23
CHECKED BY : T. R. DUDECK DATE : 08/23/23
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12/20/2023

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CITY OF CONCORD, NC

SUBSTRUCTURE

END BENT No. 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-16
1			3			TOTAL SHEETS
2			4			25

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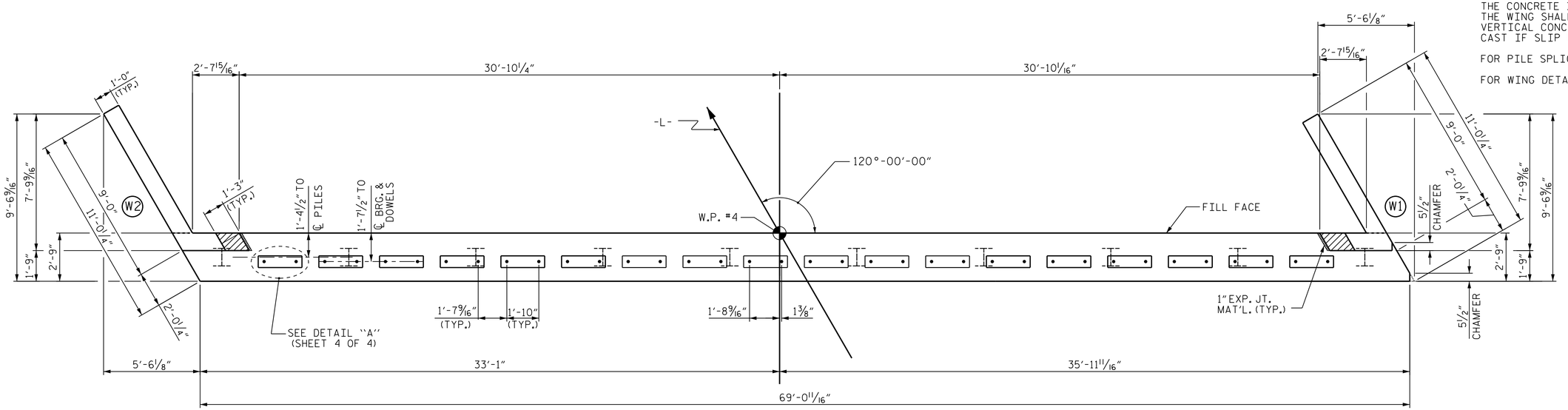
NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.

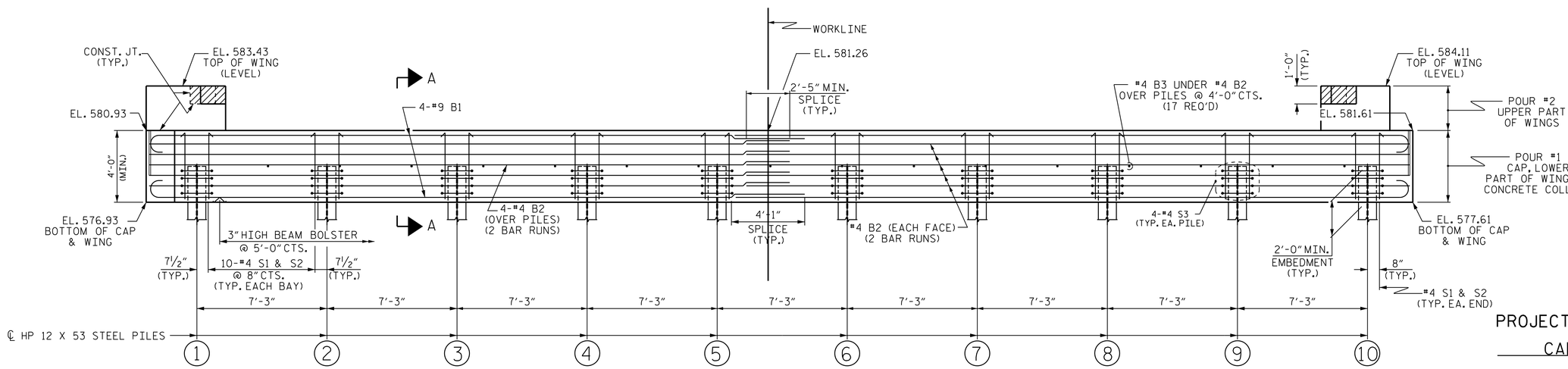
THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE VERTICAL CONCRETE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.

FOR WING DETAILS, SEE SHEET 3 OF 4.



PLAN



ELEVATION

WINGS NOT SHOWN FOR CLARITY.
FOR SECTION A-A, SEE SHEET 4 OF 4.
CONCRETE COLLARS FOR STEEL PILES NOT SHOWN IN PLAN AND ELEVATION VIEWS FOR CLARITY.
SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL", SHEET 4 OF 4.

TOP OF PILE ELEVATIONS	
1	579.03
2	579.09
3	579.16
4	579.23
5	579.30
6	579.37
7	579.44
8	579.51
9	579.58
10	579.65

PROJECT NO. N/A

CABARRUS COUNTY

STATION: 13+82.50

SHEET 2 OF 4

DRAWN BY : J. B. GEILE DATE : 04/12/23
CHECKED BY : T. R. DUDECK DATE : 08/23/23
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12/20/2023

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CITY OF CONCORD, NC

SUBSTRUCTURE

END BENT No. 2

REVISIONS					
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1			3		
2			4		

SHEET NO. S-17

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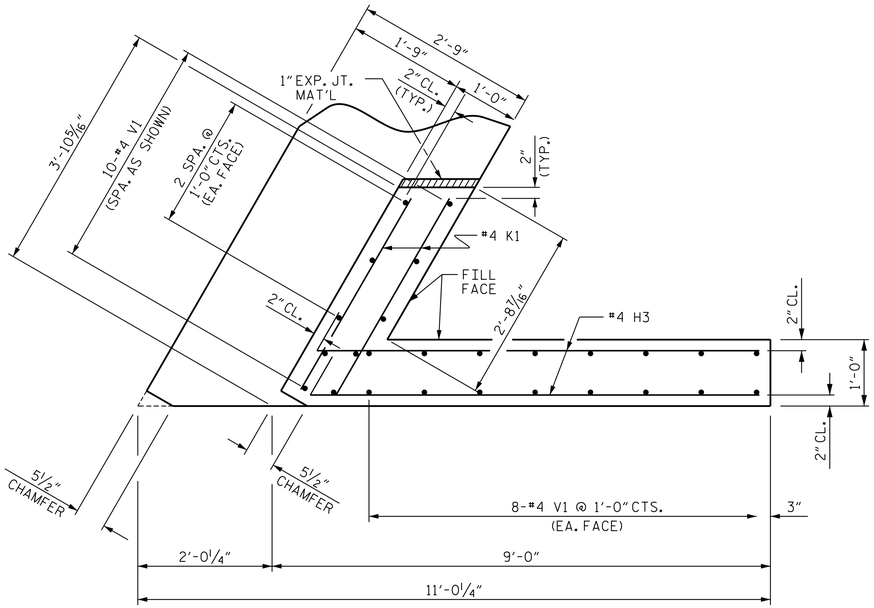
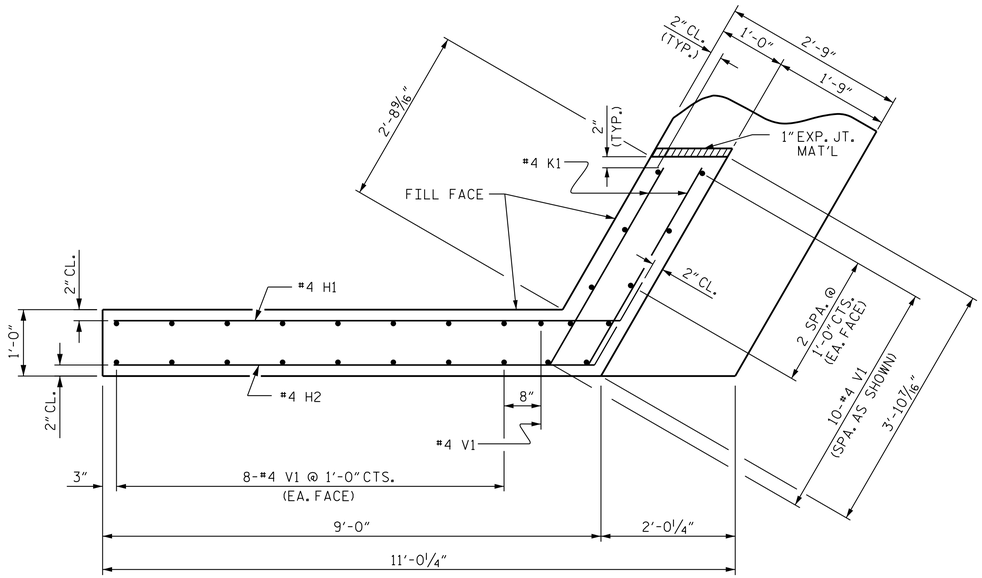
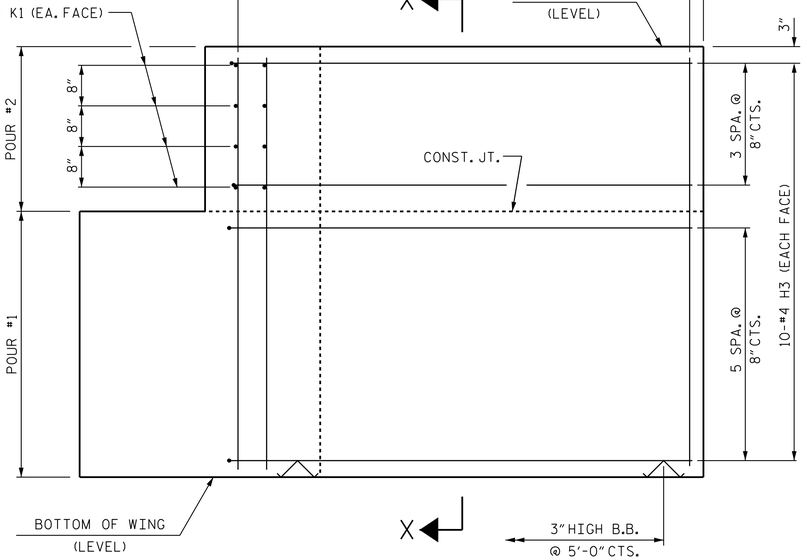


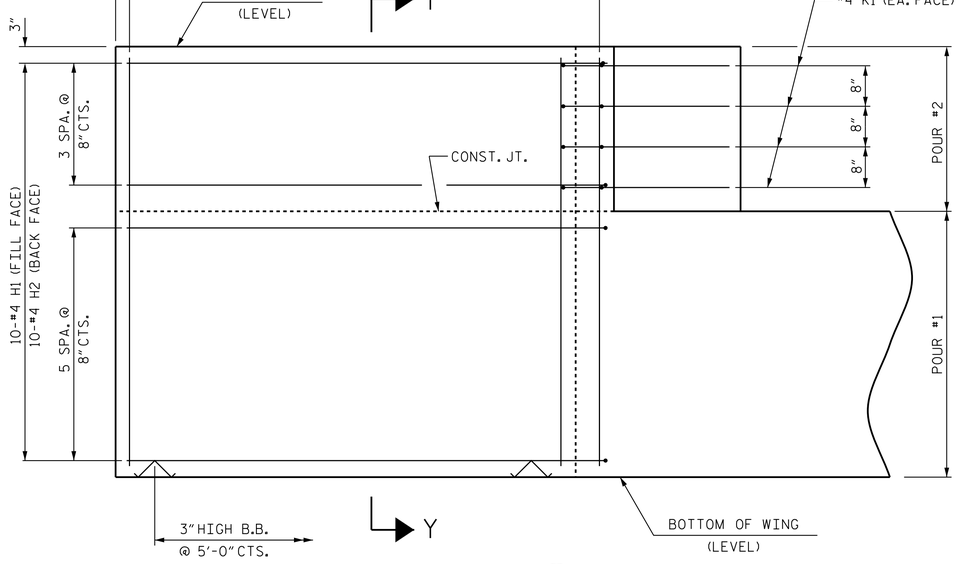
PLAN OF WING (W1)



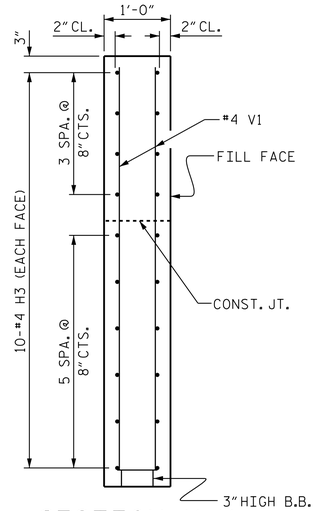
PLAN OF WING (W2)



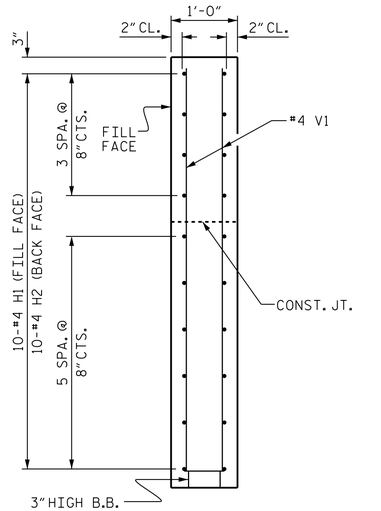
ELEVATION OF WING (W1)



ELEVATION OF WING (W2)



SECTION X-X



SECTION Y-Y

WING DETAILS

PROJECT NO. N/A

CABARRUS COUNTY

STATION: 13+82.50

SHEET 3 OF 4

DRAWN BY :	J. B. GEILE DATE : 04/13/23
CHECKED BY :	T. R. DUDECK DATE : 08/23/23
DESIGN ENGINEER OF RECORD:	T. R. DUDECK DATE : 12/20/23

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NORTH CAROLINA PROFESSIONAL SEAL 31462 ENGINEER THOMAS R. DUDECK
Thomas R. Dudeck
12/20/2023

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CITY OF CONCORD, NC

SUBSTRUCTURE

END BENT
WING DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-18
1			3			TOTAL SHEETS
2			4			25

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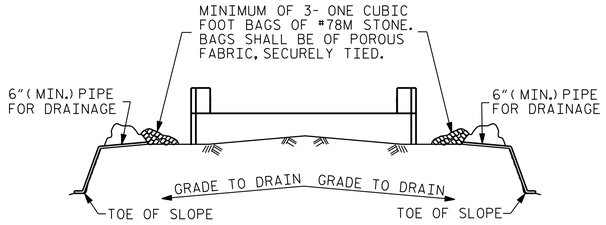
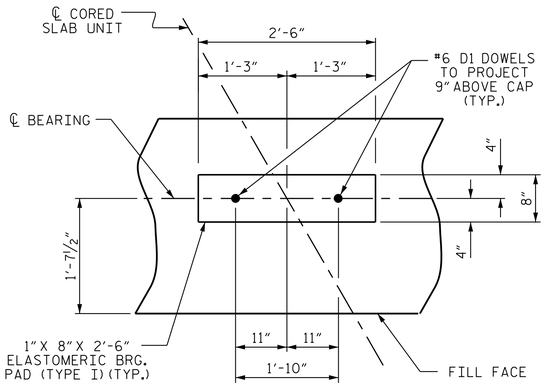


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR EFFECTIVENESS.

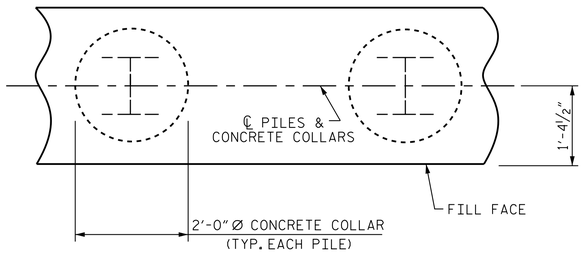
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT

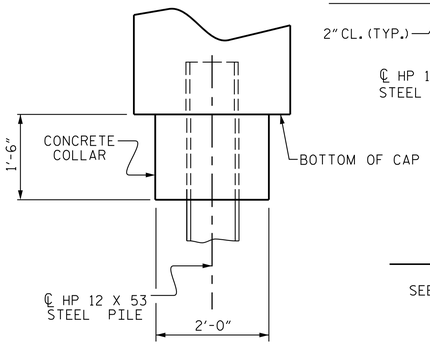


DETAIL "A"

(END BENT No. 1 SHOWN, END BENT No. 2 SIMILAR BY ROTATION)



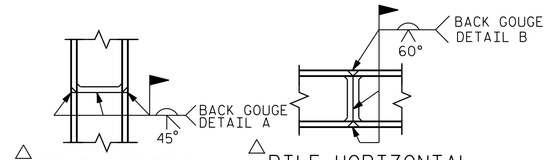
PLAN



ELEVATION

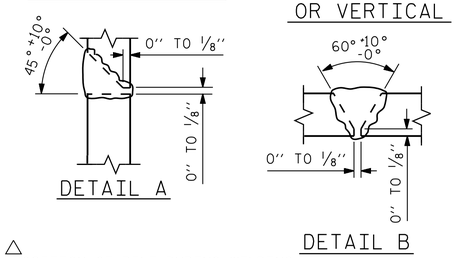
CORROSION PROTECTION FOR STEEL PILES DETAIL

(END BENT No. 1 SHOWN, END BENT No. 2 SIMILAR BY ROTATION)



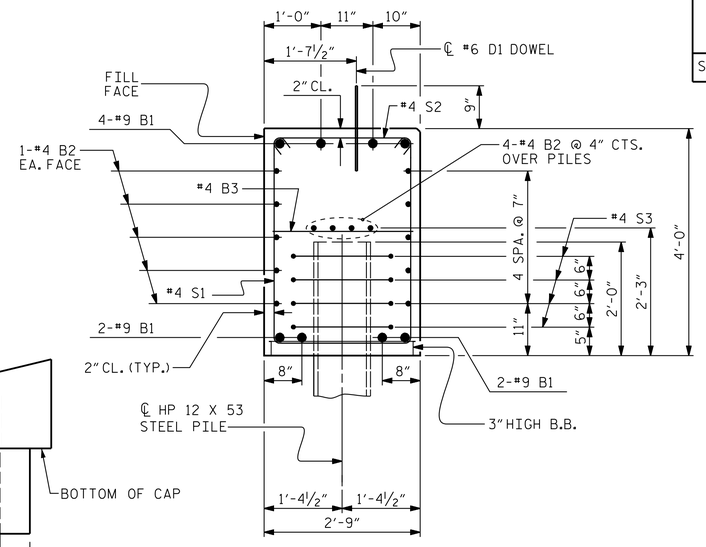
△ PILE VERTICAL

△ PILE HORIZONTAL OR VERTICAL



△ POSITION OF PILE DURING WELDING.

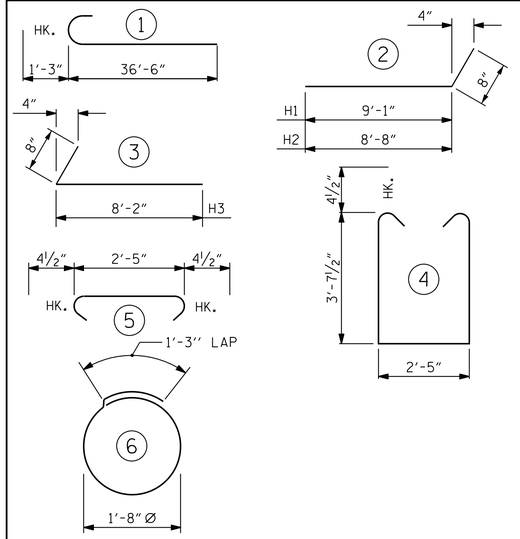
PILE SPLICE DETAILS



SECTION A-A

(CONCRETE COLLAR NOT SHOWN FOR CLARITY. SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL.")

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

END BENT No. 1	END BENT No. 2
HP 12 X 53 STEEL PILES NO: 10 LIN. FT.= 200	HP 12 X 53 STEEL PILES NO: 10 LIN. FT.= 300
PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES NO: 10	PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES NO: 10
STEEL PILE POINTS NO: 10	

BILL OF MATERIAL

FOR ONE END BENT

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	16	#9	1	37'-9"	2054
B2	28	#4	STR	35'-8"	667
B3	17	#4	STR	2'-5"	27
D1	36	#6	STR	1'-6"	81
H1	10	#4	2	9'-9"	65
H2	10	#4	2	9'-4"	62
H3	20	#4	3	8'-10"	118
K1	16	#4	STR	3'-3"	35
S1	92	#4	4	10'-5"	640
S2	92	#4	5	3'-2"	194
S3	40	#4	6	6'-6"	174
V1	53	#4	STR	6'-2"	218

REINFORCING STEEL (FOR ONE END BENT) 4335 LBS.

CLASS A CONCRETE BREAKDOWN (FOR ONE END BENT)

POUR #1 CAP, LOWER PART OF WINGS & COLLARS 24.7 C.Y.

POUR #2 UPPER PART OF WINGS 2.2 C.Y.

TOTAL CLASS A CONCRETE 26.9 C.Y.

DRAWN BY : J. B. GEILE DATE : 04/13/23
CHECKED BY : T. R. DUDECK DATE : 08/24/23
DESIGN ENGINEER OF RECORD: T. R. DUDECK DATE : 12/20/23

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Tommy Dudeck
12/20/2023

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CITY OF CONCORD, NC

SUBSTRUCTURE

END BENT Nos. 1 & 2 DETAILS

PROJECT NO. N/A

CABARRUS COUNTY

STATION: 13+82.50

SHEET 4 OF 4

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
2			4			25

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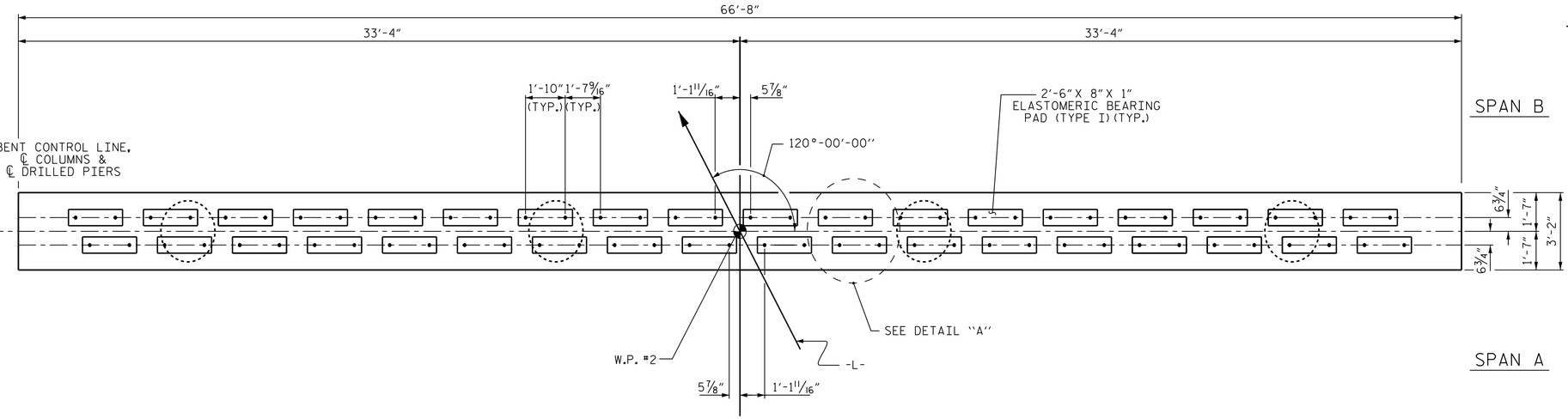


NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.

HOOKS ON ″V″ BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.

FOR DRILLED PIERS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR ″REINFORCING STEEL″ AND ″SPIRAL COLUMN REINFORCING STEEL.″

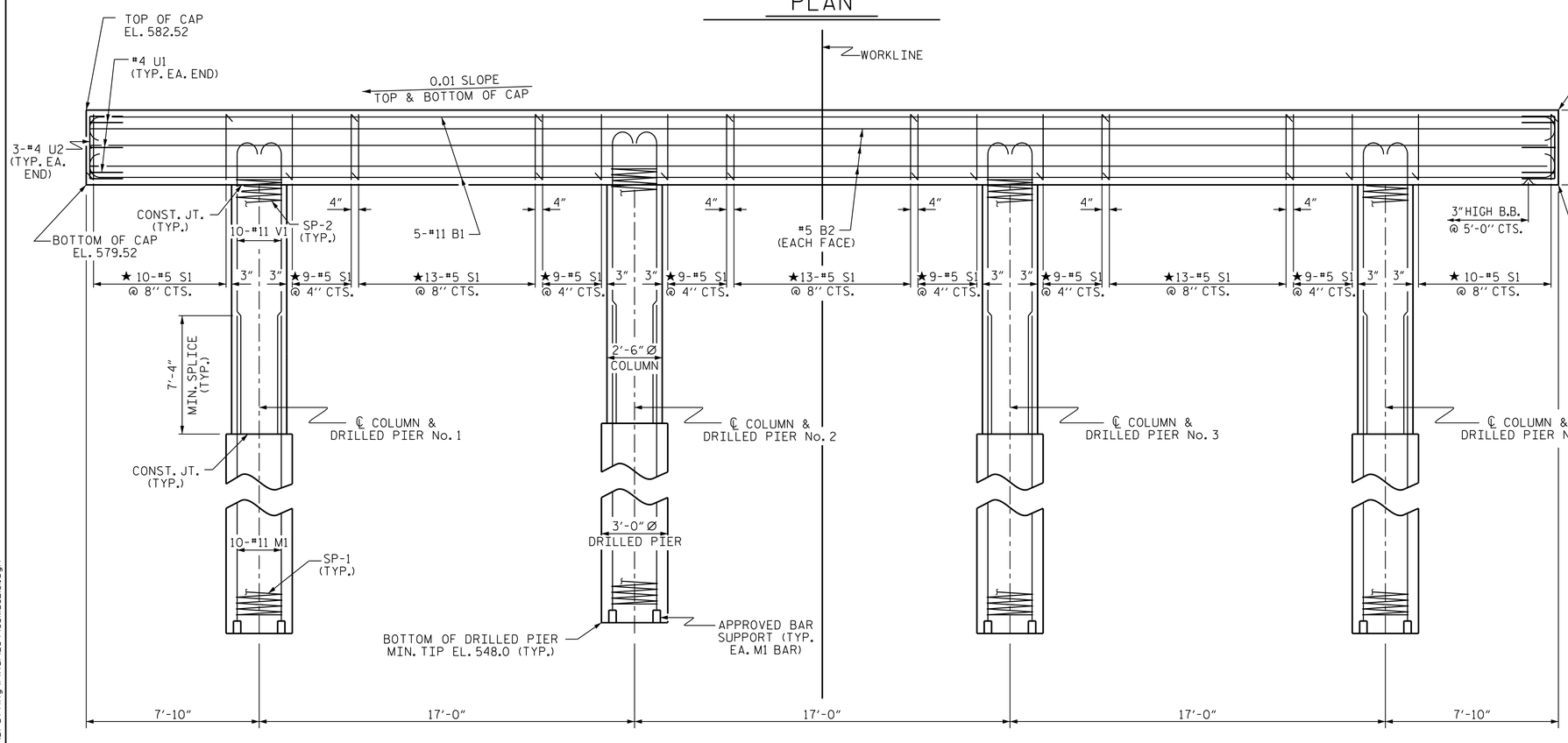
★ INVERT ALTERNATE STIRRUPS.

THE LOCATION OF THE CONSTRUCTION JOINT IN THE DRILLED PIERS IS BASED ON AN APPROXIMATE GROUND LINE ELEVATION. IF THE CONSTRUCTION JOINT IS ABOVE THE ACTUAL GROUND LINE ELEVATION, THE CONTRACTOR SHALL PLACE THE CONSTRUCTION JOINT ONE FOOT BELOW THE GROUND LINE.

DRILLED PIERS SHALL BE TERMINATED ONE FOOT ± ABOVE NORMAL WATER SURFACE ELEVATION FOR SHAFTS LOCATED IN WATER.

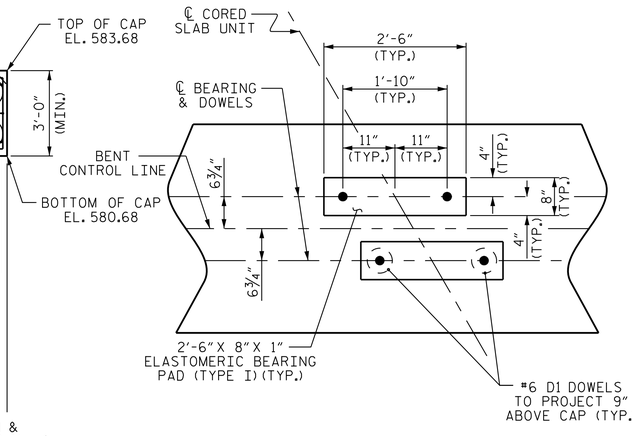
THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR DRILLED PIERS IS DETAILED WITH 3 FEET OF EXTRA LENGTH.

PLAN



ELEVATION

DIMENSIONS & REINFORCING STEEL ARE TYPICAL FOR EACH COLUMN & DRILLED PIER UNLESS OTHERWISE NOTED.



DETAIL ″A″

(DIMENSIONS ARE TYPICAL EACH BEARING)

PROJECT NO. N/A

CABARRUS COUNTY

STATION: 13+82.50

SHEET 1 OF 2

DRAWN BY :	K. A. WOYAHN DATE : 04/13/23
CHECKED BY :	T. R. DUDECK DATE : 08/23/23
DESIGN ENGINEER OF RECORD:	T. R. DUDECK DATE : 12/20/23

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NORTH CAROLINA PROFESSIONAL SEAL 31462 ENGINEER THOMAS R. DUDECK
Docusigned by: Tommy Dudeck
12/20/2023

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CITY OF CONCORD, NC

SUBSTRUCTURE

BENT 1

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
2			4			25

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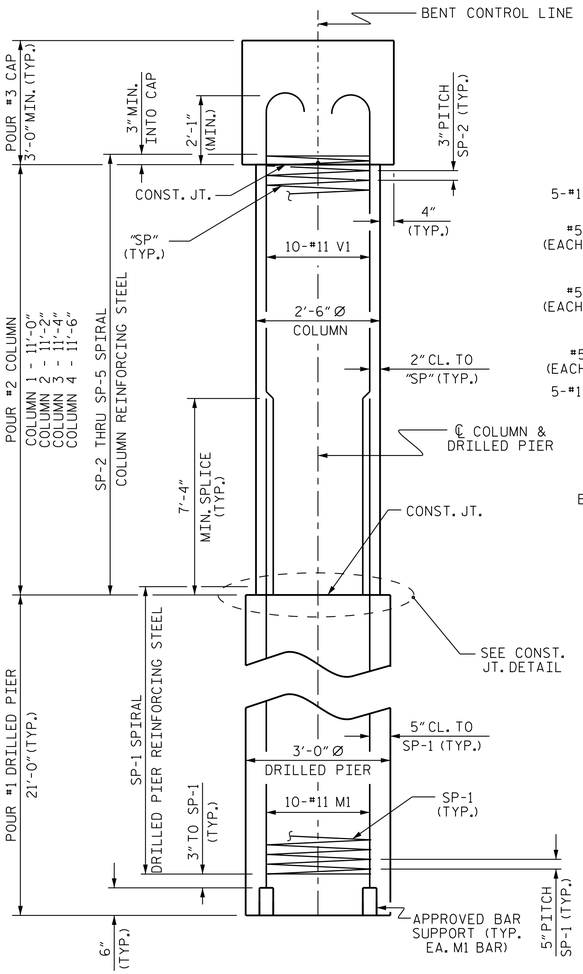
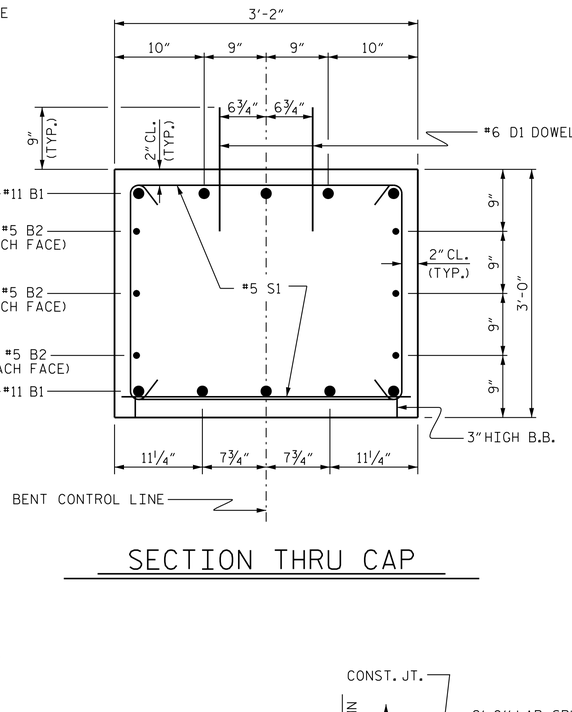


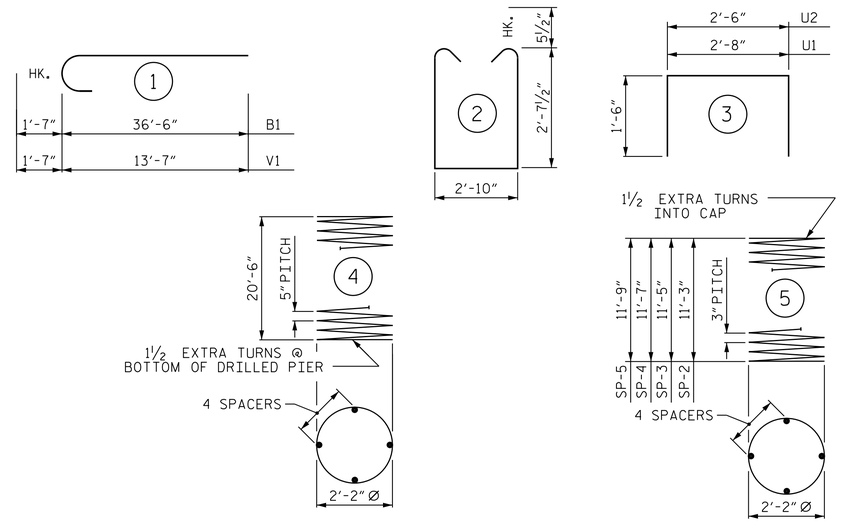
END ELEVATION



SECTION THRU CAP

CONSTRUCTION JOINT DETAIL

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

FOR ONE BENT

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	20	#11	1	38'-1"	4047
B2	12	#5	STR	35'-4"	442
D1	72	#6	STR	1'-6"	162
M1	40	#11	STR	30'-10"	6553
S1	113	#5	2	9'-0"	1061
U1	6	#4	3	5'-8"	23
U2	6	#4	3	5'-6"	22
V1	40	#11	1	15'-2"	3223

REINFORCING STEEL (FOR ONE BENT) 15533 LBS.

SP-1	4	#5	4	337'-6"	1408
SP-2	1	#4	5	310'-8"	208
SP-3	1	#4	5	315'-2"	211
SP-4	1	#4	5	319'-7"	213
SP-5	1	#4	5	324'-1"	216

SPIRAL COLUMN REINFORCING STEEL (FOR ONE BENT) 2256 LBS.

✳ THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR

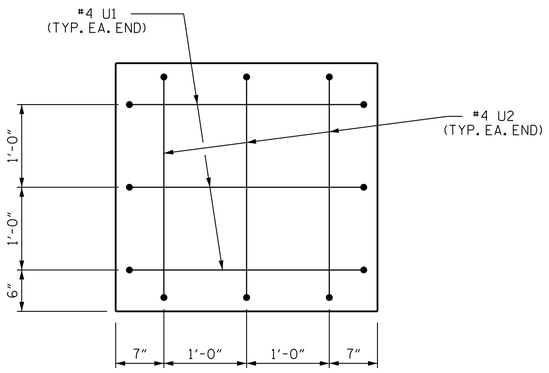
✳✳ THE SP-2 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR

CLASS A CONCRETE BREAKDOWN (FOR ONE BENT)

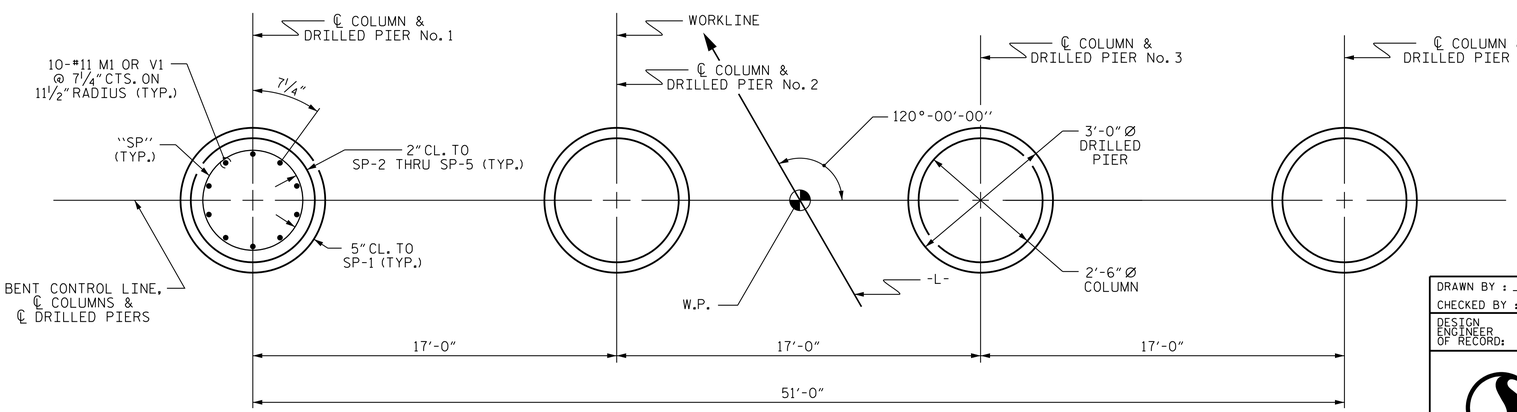
POUR #2 (COLUMNS)	8.2 C.Y.
POUR #3 (CAP)	24.2 C.Y.
TOTAL CLASS A CONCRETE	32.4 C.Y.

DRILLED PIERS: (FOR ONE BENT)

DRILLED PIER CONCRETE POUR #1 (DRILLED PIERS)	22.0 C.Y.
3'-0" Ø DRILLED PIER NOT IN SOIL	28.0 LIN. FT.
3'-0" Ø DRILLED PIER IN SOIL	56.0 LIN. FT.
PERMANENT STEEL CASING FOR 3'-0" Ø DRILLED PIER	72.0 LIN. FT.
CSL TUBES	360.0 LIN. FT.



END OF CAP VIEW
(TYPICAL BOTH ENDS)



PLAN OF DRILLED PIERS & COLUMNS

PROJECT NO. N/A

CABARRUS COUNTY

STATION: 13+82.50

SHEET 2 OF 2

CITY OF CONCORD, NC

SUBSTRUCTURE

BENT No. 1

DRAWN BY : J. B. GEILE DATE : 04/13/23
CHECKED BY : T. R. DUDECK DATE : 08/23/23
DESIGN ENGINEER OF RECORD: T. R. DUDECK DATE : 12/20/23

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Tommy Dudeck
12/20/2023

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2			4			25

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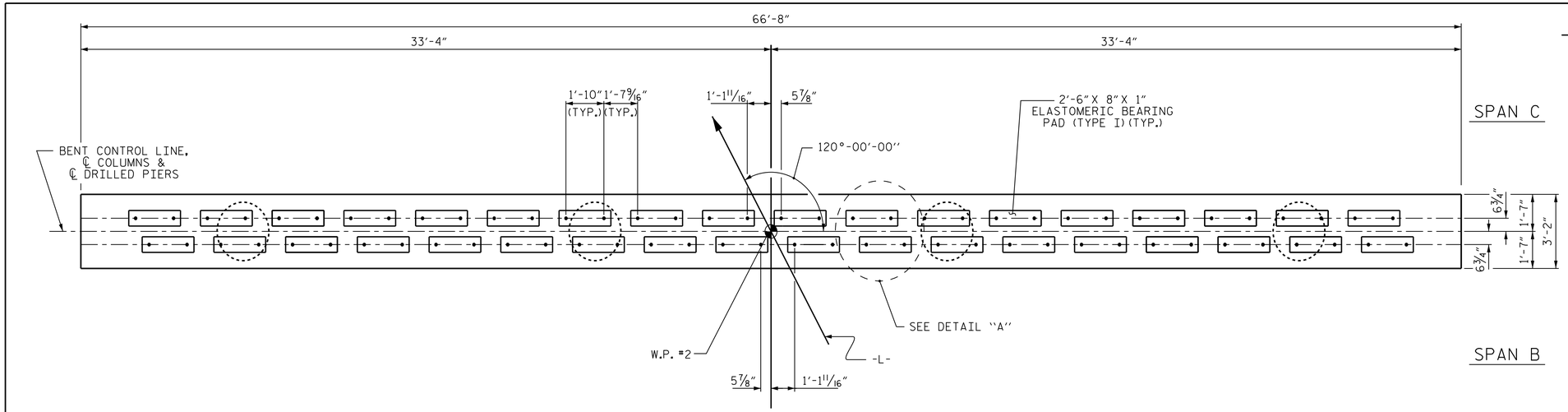
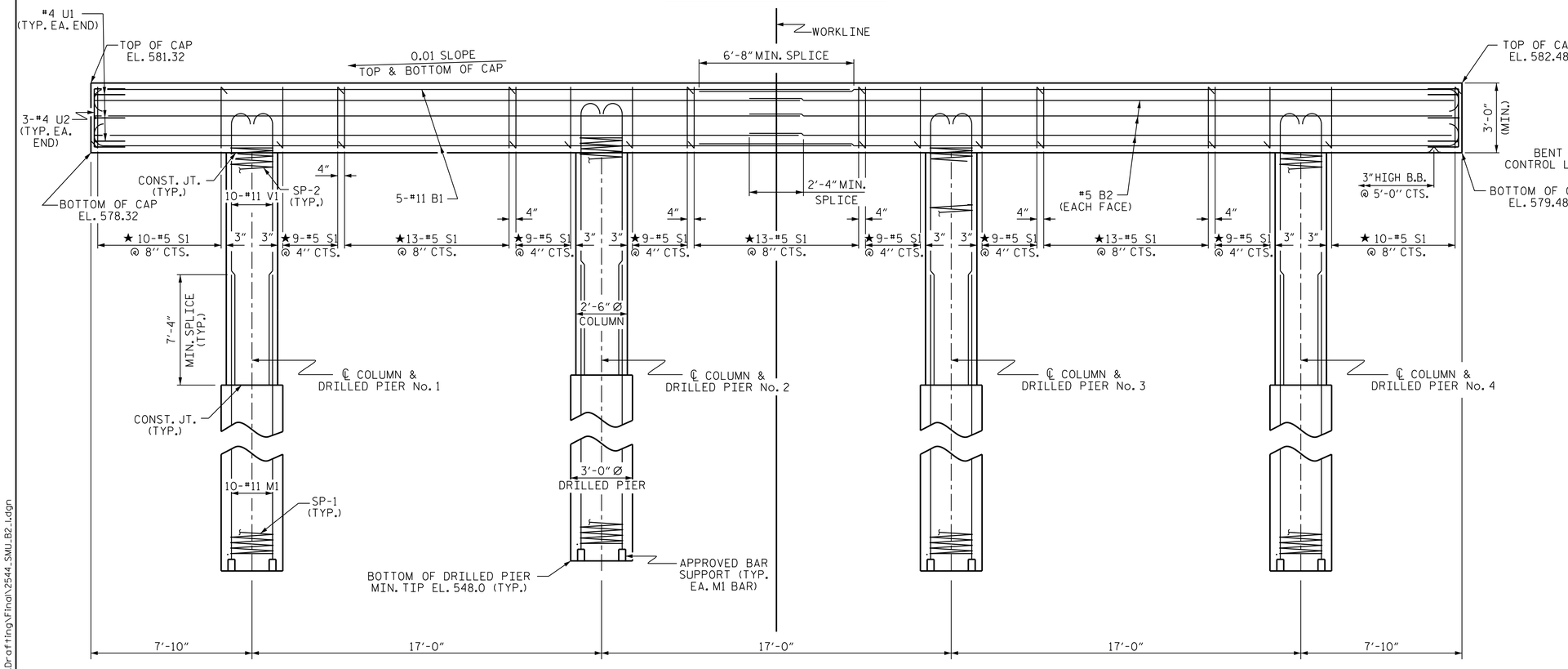
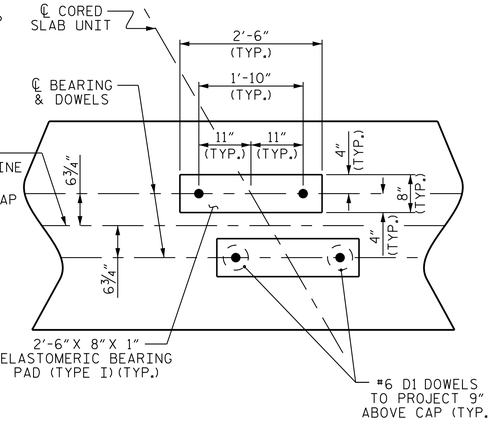


PLAN



ELEVATION

DIMENSIONS & REINFORCING STEEL ARE TYPICAL FOR EACH COLUMN & DRILLED PIER UNLESS OTHERWISE NOTED.



DETAIL ″A″

(DIMENSIONS ARE TYPICAL EACH BEARING)

NOTES

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HOOKS ON ″V″ BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.

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PROJECT NO. N/A

CABARRUS COUNTY

STATION: 13+82.50

SHEET 1 OF 2

DRAWN BY :	K. A. WOYAHN DATE : 04/13/23
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Thomas Dudeck
12/20/2023

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CITY OF CONCORD, NC

SUBSTRUCTURE

BENT No. 2

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
2			4			25

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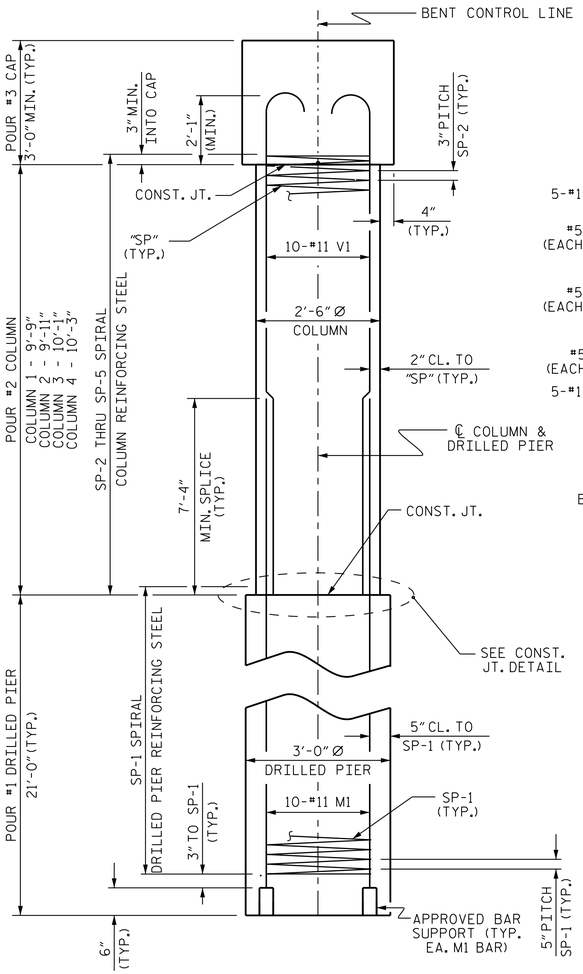
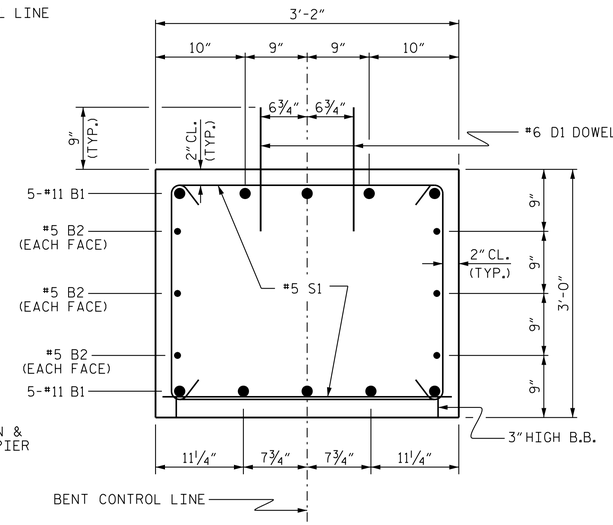
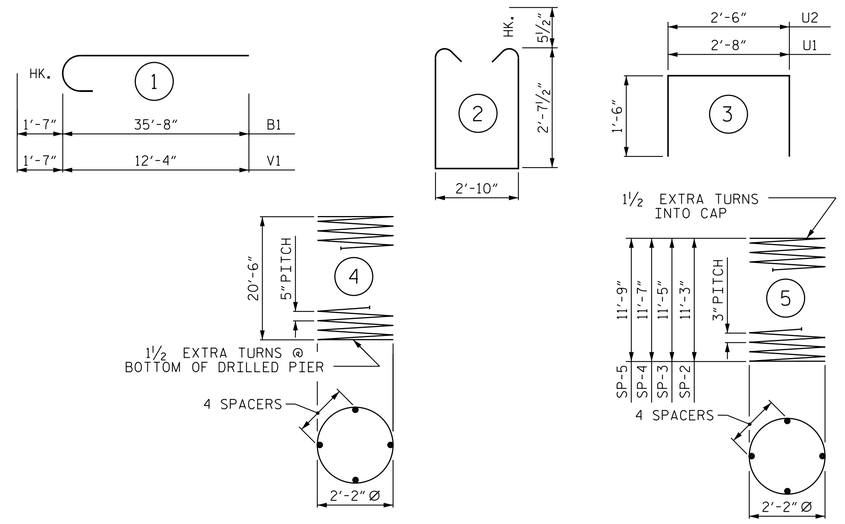


END ELEVATION



SECTION THRU CAP

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

FOR ONE BENT

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	20	#11	1	38'-1"	4047
B2	12	#5	STR	35'-4"	442
D1	72	#6	STR	1'-6"	162
M1	40	#11	STR	27'-10	5915
S1	113	#5	2	9'-0"	1061
U1	6	#4	3	5'-8"	23
U2	6	#4	3	5'-6"	22
V1	40	#11	1	13'-11"	2958

REINFORCING STEEL (FOR ONE BENT) 14630 LBS.

SP-1	4	#5	4	337'-6"	1408
SP-2	1	#4	5	277'-3"	185
SP-3	1	#4	5	281'-9"	188
SP-4	1	#4	5	286'-2"	191
SP-5	1	#4	5	290'-8"	194

SPIRAL COLUMN REINFORCING STEEL (FOR ONE BENT) 2166 LBS.

✳ THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR

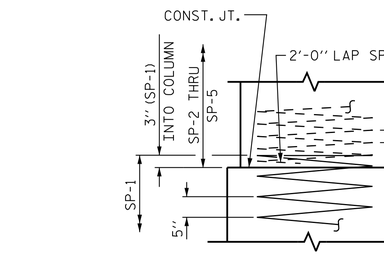
✳✳ THE SP-2 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR

CLASS A CONCRETE BREAKDOWN (FOR ONE BENT)

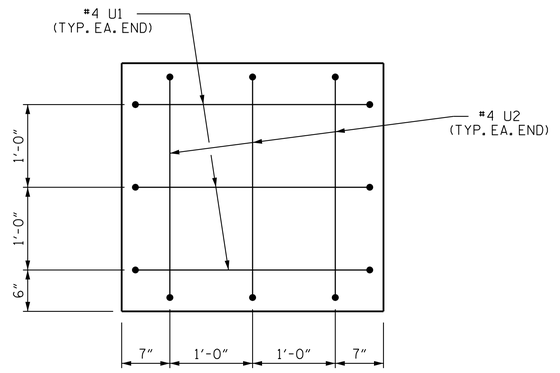
POUR #2 (COLUMNS)	7.3 C.Y.
POUR #3 (CAP)	24.2 C.Y.
TOTAL CLASS A CONCRETE	32.1 C.Y.

DRILLED PIERS: (FOR ONE BENT)

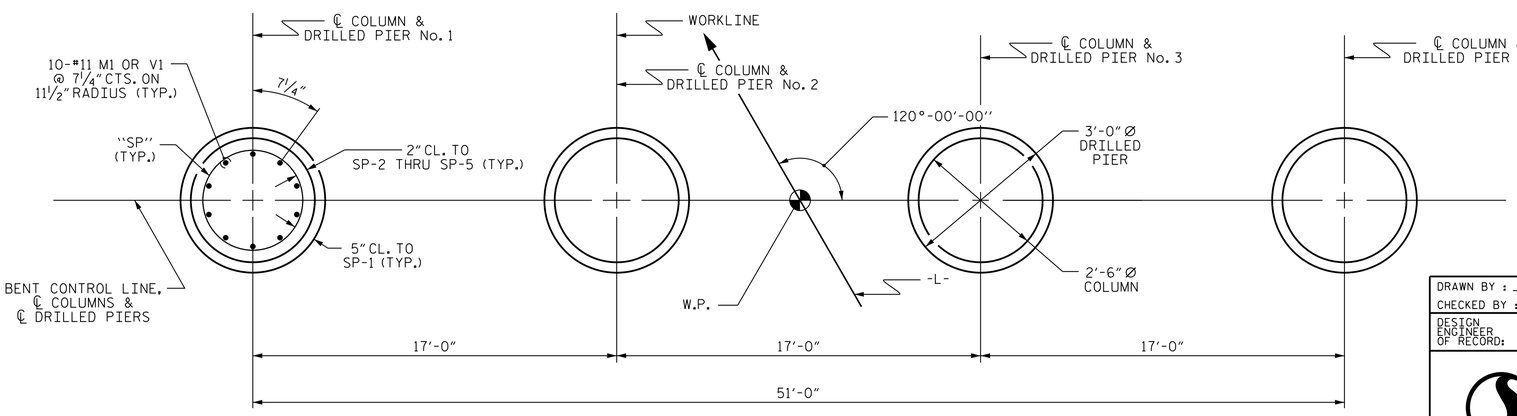
DRILLED PIER CONCRETE POUR #1 (DRILLED PIERS)	22.0 C.Y.
3'-0" Ø DRILLED PIER NOT IN SOIL	28.0 LIN. FT.
3'-0" Ø DRILLED PIER IN SOIL	56.0 LIN. FT.
PERMANENT STEEL CASING FOR 3'-0" Ø DRILLED PIER	72.0 LIN. FT.
CSL TUBES	360.0 LIN. FT.



CONSTRUCTION JOINT DETAIL



END OF CAP VIEW
(TYPICAL BOTH ENDS)



PLAN OF DRILLED PIERS & COLUMNS

DRAWN BY : J. B. GEILE DATE : 04/13/23
CHECKED BY : T. R. DUDECK DATE : 08/23/23
DESIGN ENGINEER OF RECORD: T. R. DUDECK DATE : 12/20/23

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www.stantec.com
License No. F-0672

NORTH CAROLINA PROFESSIONAL SEAL 31462 ENGINEER THOMAS RUDECK
Tommy Rudeck
12/20/2023

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. N/A
CABARRUS COUNTY
STATION: 13+82.50

SHEET 2 OF 2

CITY OF CONCORD, NC

SUBSTRUCTURE

BENT No. 2 DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-23
1			3			TOTAL SHEETS
2			4			25

STD. NO. DP_BT_39_120S_<50'

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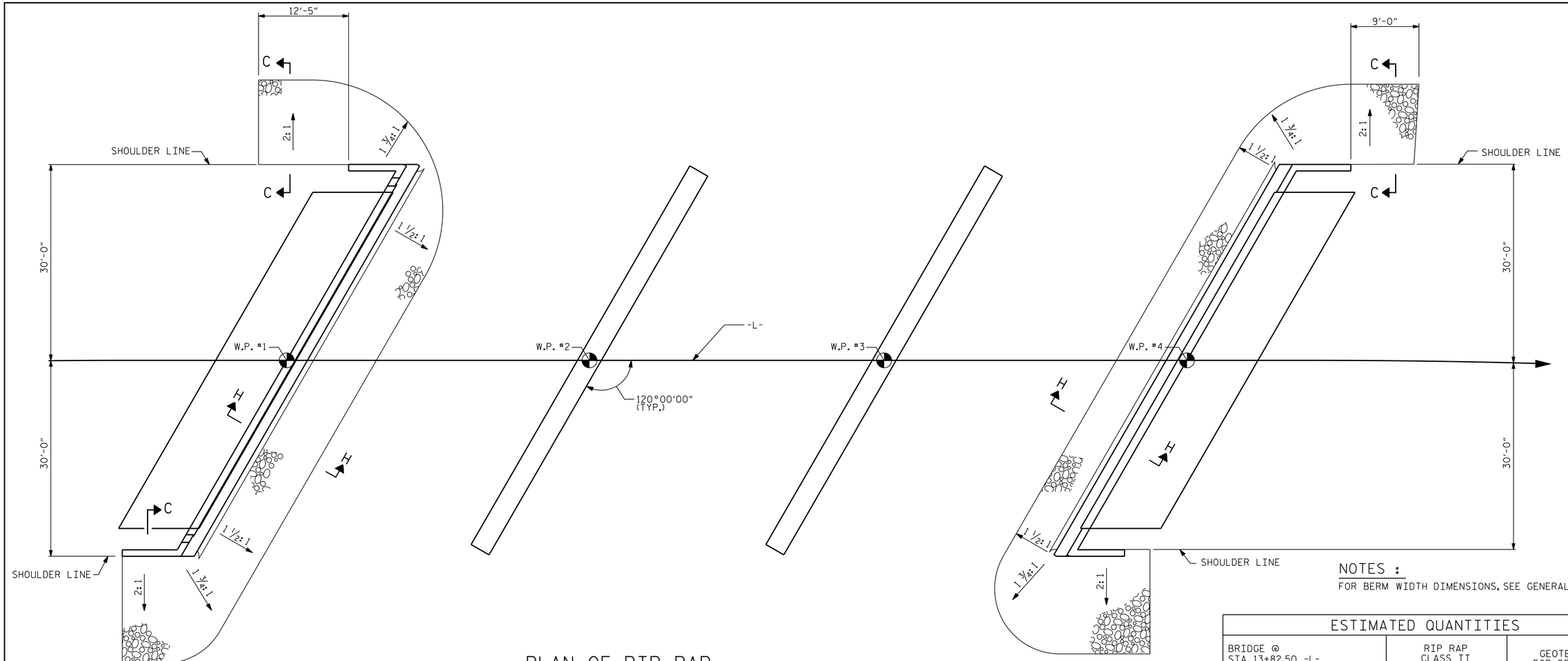
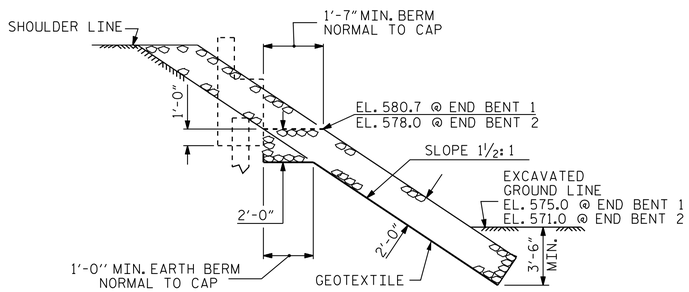


PLAN OF RIP RAP

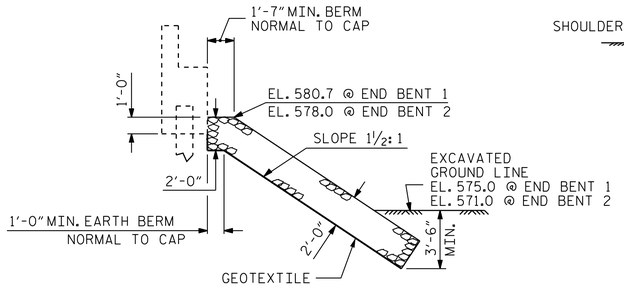
NOTES :

FOR BERM WIDTH DIMENSIONS, SEE GENERAL DRAWING.

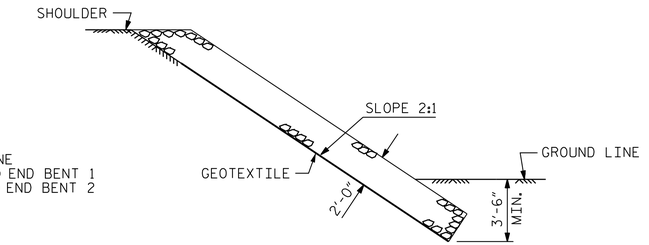
ESTIMATED QUANTITIES		
BRIDGE @ STA. 13+82.50 -L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	295	328
END BENT 2	327	364



SECTION H-H



℄ SECTION BERM RIP RAPPED



SECTION C-C

PROJECT NO. N/A

CABARRUS COUNTY

STATION: 13+82.50

DRAWN BY :	K. A. WOYAHN	DATE :	05/16/23
CHECKED BY :	T. R. DUDECK	DATE :	08/23/23
DESIGN ENGINEER OF RECORD:	T. R. DUDECK	DATE :	12/20/23

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NORTH CAROLINA PROFESSIONAL SEAL 31462 ENGINEER THOMAS RANDALL DUDECK
Tommy Dudeck
12/20/2023

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CITY OF CONCORD, NC

STANDARD

RIP RAP DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-24
1			3			TOTAL SHEETS
2			4			25

STD. NO. RR1

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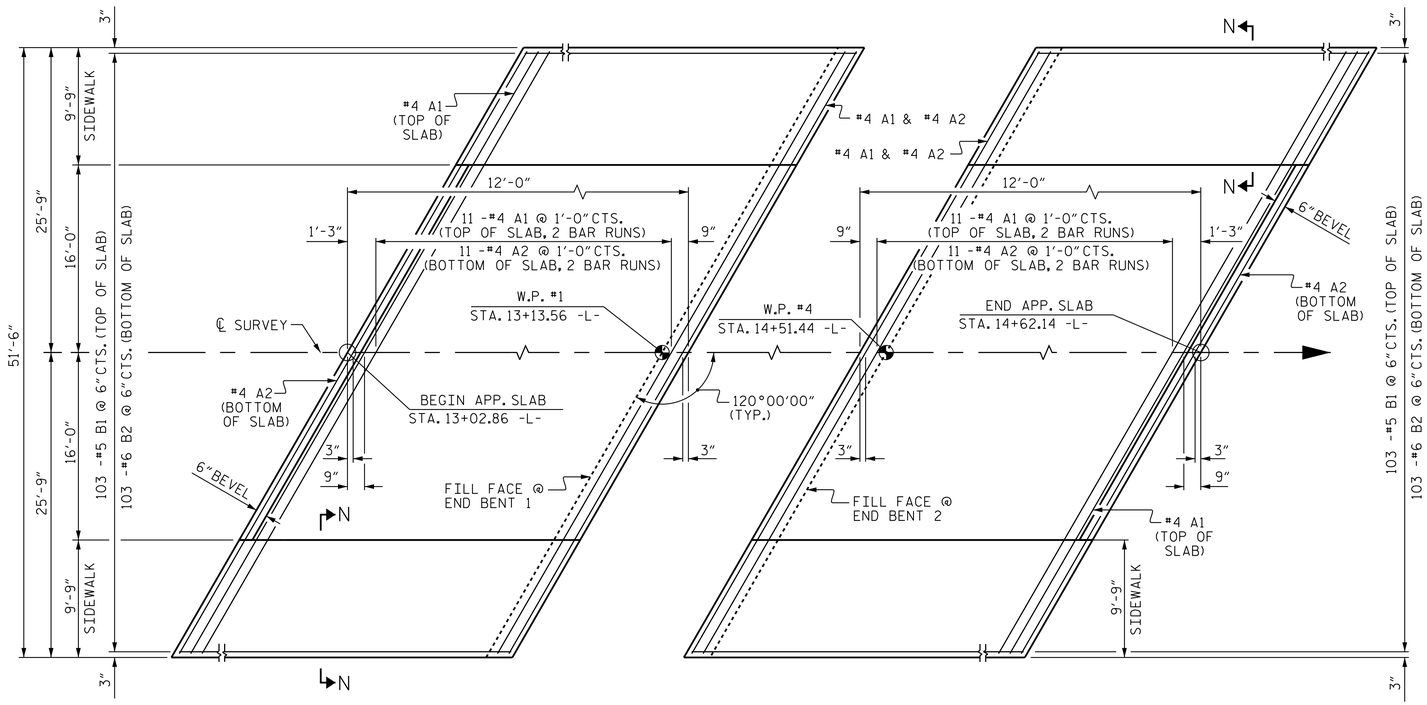
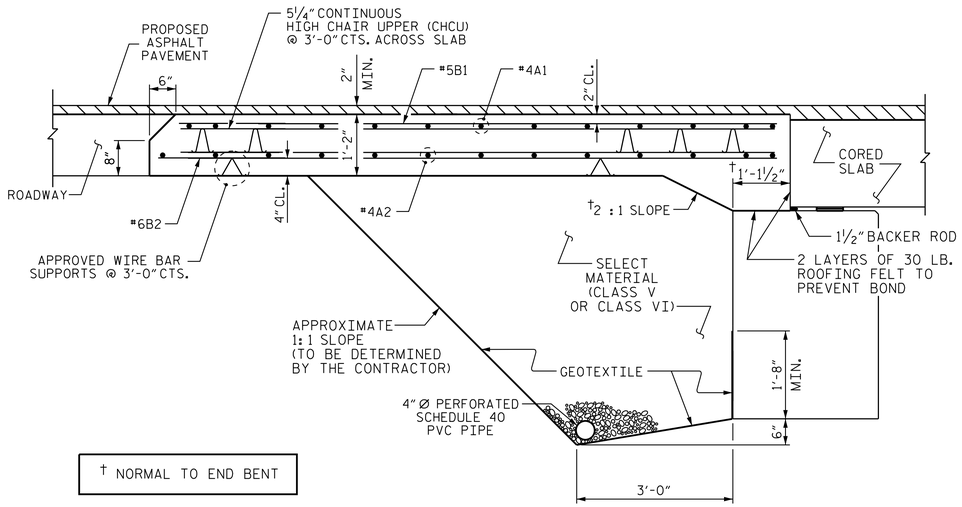


PLAN @ END BENT 1 PLAN @ END BENT 2

DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS



† NORMAL TO END BENT

SECTION THRU SLAB

(TYPE II - MODIFIED APPROACH FILL)

NOTES

FOR BRIDGE APPROACH FILL INCLUDING GEOTEXTILE, 4" Ø DRAINAGE PIPE, AND SELECT MATERIAL BACKFILL, SEE ROADWAY PLANS.

GEOTEXTILE SHALL BE TYPE 1 IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS SECTION 1056.

SELECT MATERIAL BACKFILL (CLASS V OR CLASS VI) SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS SECTION 1016.

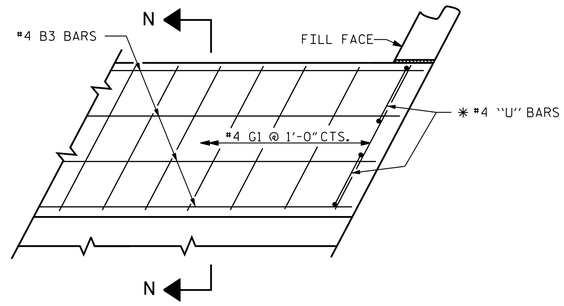
SELECT MATERIAL BACKFILL IS TO BE CONTINUOUS ALONG FILL FACE OF BACKWALL FROM OUTSIDE EDGE TO OUTSIDE EDGE OF APPROACH SLAB.

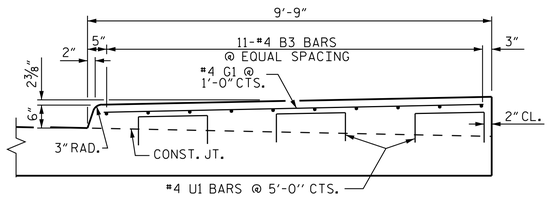
AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED. SEE ROADWAY PLANS.

FOR THE 4" Ø DRAINAGE PIPE OUTLET(S), SEE ROADWAY STANDARD DRAWINGS.

APPROACH SLAB GROOVING IS NOT REQUIRED.

SPLICE LENGTHS		
BAR SIZE	EPOXY COATED	UNCOATED
#4	2'-0"	1'-7"
#5	2'-5"	2'-0"
#6	3'-7"	2'-5"





SECTION N-N

BILL OF MATERIAL

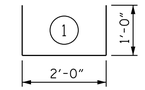
APPROACH SLAB AT EB 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱ A1	22	#4	STR	30'-6"	448
A	22	#4	STR	30'-4"	446
.	.	.	.	.	.
✱ B1	103	#5	STR	11'-2	1200
B2	103	#6	STR	11'-8"	1805.
✱ B3	22	#4	STR	11'-8"	171.
✱ G1	26	#4	STR	9'-1"	158
✱ U1	12	#4	1	4'-0"	32
REINFORCING STEEL				LBS.	2251.
✱ EPOXY COATED . REINFORCING STEEL				LBS.	2009
CLASS AA CONCRETE				C.Y.	34.6

APPROACH SLAB AT EB 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱ A1	22	#4	STR	30'-6"	448
A	22	#4	STR	30'-4"	446
✱ B1	103	#5	STR	11'-2	1200
B2	103	#6	STR	11'-8"	1805
✱ B3	22	#4	STR	11'-8"	171
✱ G1	14	#4	STR	9'-1"	158
✱ U1	12	#4	1	4'-0"	32
REINFORCING STEEL				LBS.	2251.
✱ EPOXY COATED . REINFORCING STEEL				LBS.	2009
CLASS AA CONCRETE				C.Y.	34.6

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

PROJECT NO. N/A

CABARRUS COUNTY

STATION: 13+82.50

DRAWN BY : K. A. WOYAHN DATE : 5/22/23

CHECKED BY : T. R. DUDECK DATE : 08/23/23

DESIGN ENGINEER OF RECORD: T. R. DUDECK DATE : 12/20/23

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NORTH CAROLINA PROFESSIONAL SEAL 31462 ENGINEER THOMAS R. DUDECK

12/20/2023

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CITY OF CONCORD, NC

STANDARD

BRIDGE APPROACH SLAB FOR PRESTRESSED CONCRETE CORED SLAB

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

SHEET NO. S-25

TOTAL SHEETS 25

(SHT 1b) STD. NO. BAS3

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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.

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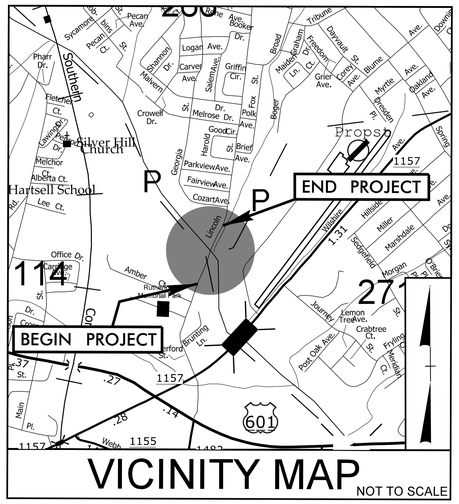
REV. 6-16-95	EEM	(/) RGW	REV. 5-7-03	RWW	(/) JTE	REV. 10-1-11	MAA	(/) GM
REV. 8-16-99	RWW	(/) LES	REV. 5-1-06	TLA	(/) GM	REV. 12-17	MAA	(/) THC

ENGLISH

JANUARY, 1990

STD. NO. SN

09/08/09



CITY OF CONCORD
NORTH CAROLINA

UTILITIES BY OTHERS PLANS
CABARRUS COUNTY

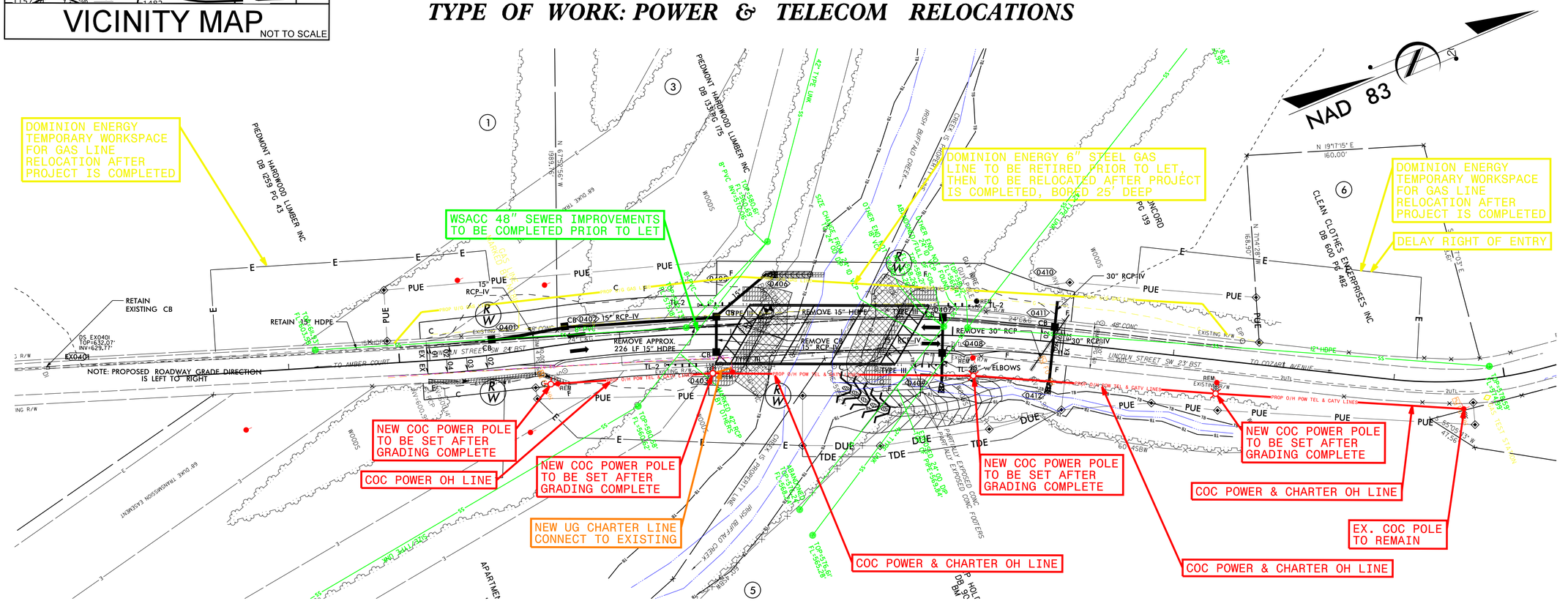
T.I.P. NO.	SHEET NO.
	UO-1

NOTE:
ALL UTILITY WORK SHOWN ON THIS SHEET WILL BE DONE BY OTHERS. NO PAYMENT WILL BE MADE TO THE CONTRACTOR FOR UTILITY WORK SHOWN ON THIS SHEET.

LOCATION: BRIDGE REPLACEMENT OF LINCOLN STREET CROSSING IRISH BUFFALO CREEK

TYPE OF WORK: POWER & TELECOM RELOCATIONS

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



GRAPHIC SCALES

25 12.5 0 25 50
PLANS

INDEX OF SHEETS

SHEET NO.:	*DESCRIPTION:*
UO-1	*TITLE SHEET*

UTILITY OWNERS WITH CONFLICTS

(A) POWER – CITY OF CONCORD (COC)
(B) TELECOM – WINDSTREAM
(C) TELECOM – CHARTER
(D) TELECOM – GOOGLE FIBER
(E) GAS – DOMINION ENERGY
(F) SEWER – WATER SEWER AUTHORITY OF CABARRUS COUNTY (WSACC)

PREPARED IN THE OFFICE OF:

Mead&Hunt

111 E. Hargett Street, Suite 300
Raleigh, North Carolina 27601
919-714-8670 | meadhunt.com
NC License No. F-1235

BETSY WATSON, PE	*PROJECT MANAGER*
JENNIFER SMITH-MORTON, PE	*PROJECT UTILITY MANAGER*
JENNIFER SMITH-MORTON, PE	*PROJECT UTILITY COORDINATOR*

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STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CROSS-SECTION SUMMARY

PROJ. REFERENCE NO.	SHEET NO.
Lincoln St	X-1A

Approximate quantities only. Unclassified excavation, borrow excavation, shoulder borrow, fine grading, clearing and grubbing, breaking of existing pavement and removal of existing pavement will be paid for at the lump sum price for "Grading".

NOTE: EMBANKMENT COLUMN DOES NOT INCLUDE BACKFILL FOR UNDERCUT

Station L	Uncl. Exc. (cu. yd.)	Embt (cu. yd.)
10+25.00	0	0
10+50.00	7	0
10+75.00	81	8
11+00.00	152	17
11+25.00	150	14
11+50.00	108	30
11+75.00	40	59
12+00.00	17	84
12+25.00	10	134
12+50.00	0	225
12+75.00	0	308
13+00.00	0	349
13+13.56	0	198
Station **L**	**Uncl. Exc.** **(cu. yd.)**	**Embt** **(cu. yd.)**
14+51.44	0	0
14+75.00	0	364
15+00.00	0	235
15+25.00	6	94
15+50.00	7	50
15+75.00	5	15
16+00.00	6	6

6/23/16

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	LINCOLN ST	X-1

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 80 85 90 95

620 615 610 605 600 595 590 585 580

2:1

602.55

0.009

0.050

EX. SS LINE
APPROX. LOCATION

602.75

10+25.00

605.04

10+00.00

620 615 610 605 600 595 590 585 580

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 80 85 90 95

12/22/2023
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6/23/16

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	LINCOLN ST	X-2

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 80 85 90 95

615 610 605 600 595 590 585 580

2:1

598.11

0.020

0.022

2:1

2:1

596.00

EX. SS LINE
APPROX. LOCATION

598.14

10+75.00

626 615 610 605 600 595 590 585 580

2:1

600.18

0.020

0.036

2:1

2:1

598.20

EX. SS LINE
APPROX. LOCATION

600.47

10+50.00

575

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 80 85 90 95

12/22/2023
L:\Roadway\CorridorModeling\171002544_Rdy_xpll.dgn
thoppe

6/23/16

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	LINCOLN ST	X-3

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 80 85 90 95

610 605 600 595 590 585 580 575 570 615

2:1

593.99

0.020

0.020

2:1

2:1

591.40

EX SS LINE APPROX LOCATION

593.41

EX S APPROX

11+25.00

2:1

596.05

0.020

0.020

2:1

2:1

593.73

EX SS LINE APPROX LOCATION

595.74

11+00.00

—L—

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 80 85 90 95

610 605 600 595 590 585 580 575 570 615

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thoppe

6/23/16

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	LINCOLN ST	X-4

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 80 85 90 95

600
595
590
585
580
575
570
565

590.48 590.48
0.020 0.020
2:1 2:1
EX SS LINE APPROX LOCATION
588.95
EX SS LINE APPROX LOCATION

11+75.00

592.11 592.11
0.020 0.020
2:1 2:1
EX SS LINE APPROX LOCATION
591.12
EX SS LINE APPROX LOCATION

11+50.00

12/22/2023
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thoppe

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	LINCOLN ST	X-5

6/23/16

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 80 85 90 95

595
590
585
580
575
570
565
560

587.95 587.95

0.020 0.020

4:1

2:1

EX SS LINE
APPROX LOCATION

585.11

12+25.00

589.10 589.10

0.020 0.020

2:1 2:1

EX SS LINE
APPROX LOCATION

586.98

EX SS LINE
APPROX LOCATION

12+00.00

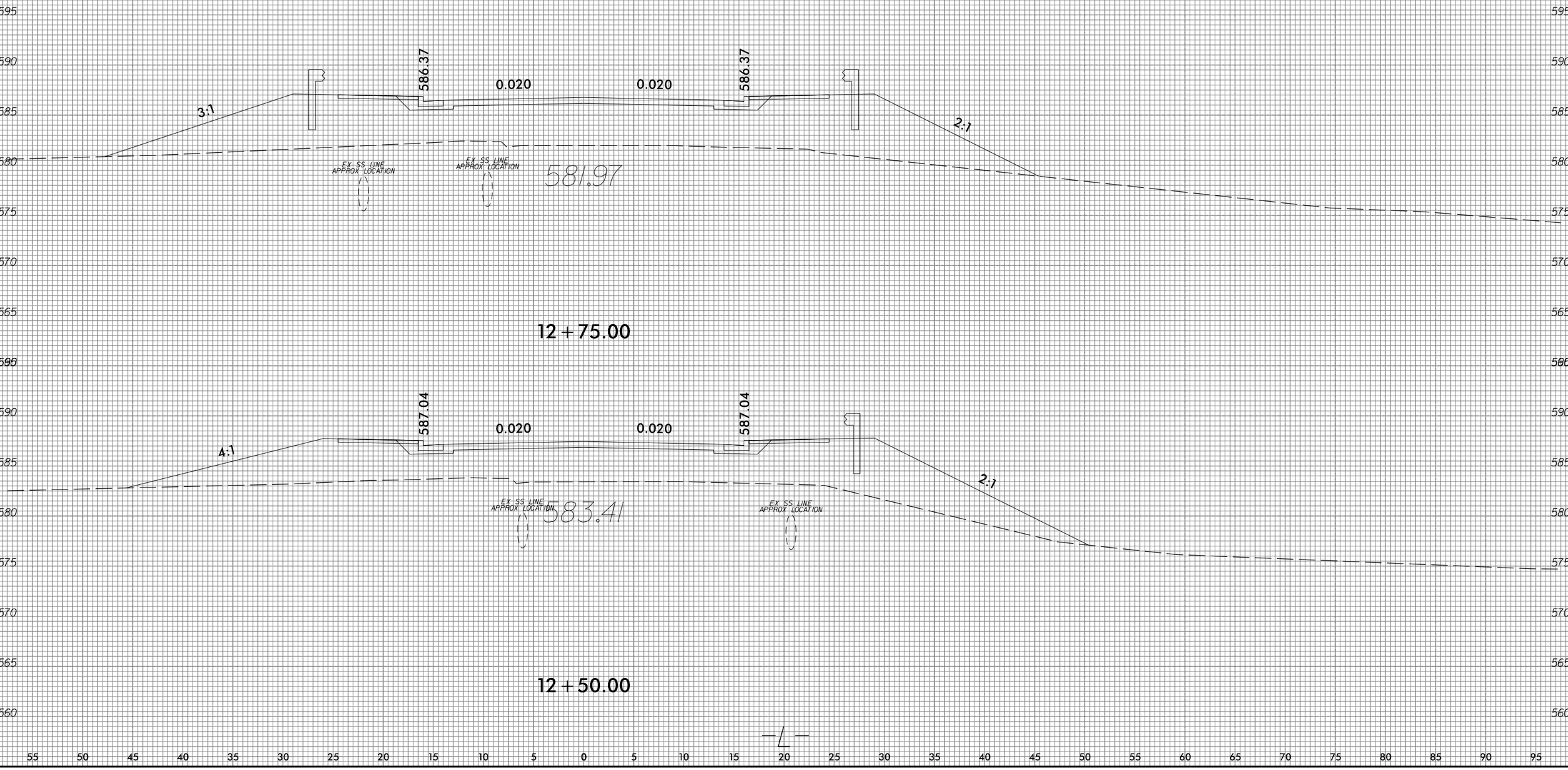
12/22/2023
U:\Roadway\CorridorModeling\171002544_Rdy_xpll.dgn
thoppe

6/23/16

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	LINCOLN ST	X-6

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 80 85 90 95

595 590 585 580 575 570 565 560



12 + 75.00

12 + 50.00

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thoppe

6/23/16

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	LINCOLN ST	X-7

590 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 80 85 90 95 590

585 580 575 570 565

0.020 0.020

574.77

13+50.00

590 585 580 575 570 565

0.020 0.020

580.68

13+25.00

590 585 580 575 570 565

585.87 585.87

0.020 0.020

2:1 2:1

581.02

EX SS LINE APPROX LOCATION

EX SS LINE APPROX LOCATION

13+00.00

560

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 80 85 90 95

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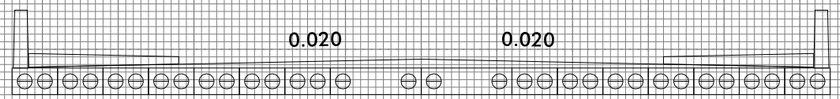
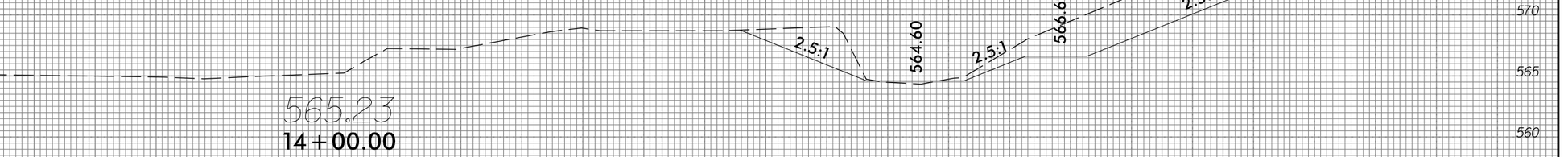
6/23/16

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	LINCOLN ST	X-8

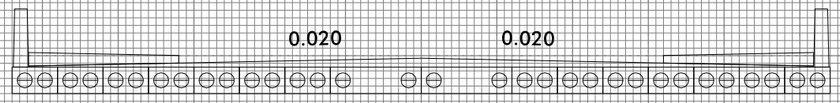
55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95

590 585 580 575 570 565 560 555





565.23
14+00.00



564.86
13+75.00

—L—

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thoppe

6/23/16

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	LINCOLN ST	X-9

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 80 85 90 95

590 585 580 575 570 565 560

582.50 0.020 0.020 582.50

2:1 2:1 12:1 2.5:1 2.5:1

569.50

EX SS LINE APPROX LOCATION

581.17

EX SS LINE APPROX LOCATION

EX SS LINE APPROX LOCATION

14+75.00

0.020 0.020

580.85

2:1 12:1 2.5:1 2.5:1

569.42

EX SS LINE APPROX LOCATION

EX SS LINE APPROX LOCATION

14+50.00

0.020 0.020

575.85

1.5:1 8.2:1 8.8:1 12:1 2.25:1 2.25:1 2.3:1

567.31 0.024 0.032

EX SS LINE APPROX LOCATION

14+25.00

12/22/2023
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thoppe

6/23/16

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	LINCOLN ST	X-10

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 80 85 90 95

590 585 580 575 570 565

581.11 0.020 0.020 2:1 2:1

EX SS LINE APPROX LOCATION

581.17

15+50.00

581.56 0.020 0.020 2:1 2:1 12:1 2.5:1 568.93 2.5:1

EX SS LINE APPROX LOCATION

581.24

15+25.00

582.02 0.020 0.020 2:1 2:1 12:1 2.5:1 569.25 2.5:1

EX SS LINE APPROX LOCATION

581.28

15+00.00

-7-

12/22/2023
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thoppe

6/23/16

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	LINCOLN ST	X-11

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 80 85 90 95

585
580
575
570
565

EX. SS LINE APPROX. LOCATION 580.84

16+25.00

580.45 2:1 0.031 0.019

EX. SS LINE APPROX. LOCATION 580.94

16+00.00

580.77 2:1 0.020 0.020

EX. SS LINE APPROX. LOCATION 581.06

15+75.00

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PROJECT: LINCOLN STREET

CITY OF CONCORD
NORTH CAROLINA

SIGNING & PAVEMENT MARKING PLAN
CABARRUS COUNTY
LOCATION: BRIDGE REPLACEMENT OF LINCOLN STREET OVER IRISH BUFFALO CREEK

PROJECT NAME	SHEET NO.
LINCOLN ST	SPM-1

APPROVED: Docusigned by: Betsy L. Watson 35E67BB34F8743F...

DATE: 12/18/2023

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 29449 ENGINEER BETSY L. WATSON

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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 2024 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

STD. NO.	TITLE
904.10	ORIENTATION OF GROUND MOUNTED SIGNS
904.50	MOUNTING OF TYPE 'D', 'E', AND 'F' SIGNS ON 'U' CHANNEL SUPPORTS
1205.01	PAVEMENT MARKINGS - LINE TYPES & OFFSETS
1205.02	PAVEMENT MARKINGS - 2 LANE & MULTILANE ROADWAYS
1205.12	PAVEMENT MARKINGS - BRIDGES
1250.01	RAISED PAVEMENT MARKERS - INSTALLATION SPACING
1251.01	RAISED PAVEMENT MARKERS - RAISED
1261.01	GUARDRAIL AND BARRIER DELINEATORS - INSTALLATION SPACING
1261.02	GUARDRAIL & BARRIER DELINEATORS - TYPES AND MOUNTING
1262.01	GUARDRAIL END DELINEATION

SIGNING GENERAL NOTES

. SIGNS FURNISHED BY CONTRACTOR.

. 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' 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-ERECTION SHALL IMMEDIATELY FOLLOW THE REMOVAL.

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

. SEE ROADWAY PLANS FOR GUARD/GUIDE RAIL DETAILS.

FINAL PAVEMENT MARKING SCHEDULE

SYMBOL	DESCRIPTION	PAY ITEM	
T1	WHITE EDGELINE	(4", 90 MILS)	THERMOPLASTIC
T13	YELLOW DOUBLE CENTER	(4", 90 MILS)	THERMOPLASTIC

PAVEMENT MARKING GENERAL NOTES

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

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

ROAD NAME	MARKING	MARKER
ALL ROADS	THERMOPLASTIC	RAISED

B) TIE PROPOSED PAVEMENT MARKING LINES TO EXISTING PAVEMENT MARKING LINES.
C) REMOVE/REPLACE ANY CONFLICTING/DAMAGED PAVEMENT MARKINGS AND MARKERS.
D) PASSING ZONES WILL BE DETERMINED IN THE FIELD AND MUST BE APPROVED BY THE ENGINEER.

PLAN PREPARED BY:

BETSY L. WATSON, P.E. SENIOR TRANSPORTATION ENGINEER

ROSI R. HENNEIN TRANSPORTATION DESIGNER

Stantec

Stantec Consulting Services Inc.
801 Jones Franklin Road
Suite 300
Raleigh, NC 27606
Tel. (919) 851-6866
Fax. (919) 851-7024
www.stantec.com
License No. F-0672

INDEX

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401 QUANTITY REQ'D 3

24 X 30
R2-1

ONE SIGN POST PER SIGN

402 QUANTITY REQ'D 2

30 X 30
W8-13

ONE SIGN POST PER SIGN

SIGN NUMBER: 301
TYPE: D
QUANTITY: 1

SIGN WIDTH: 60″
HEIGHT: 42″
TOTAL AREA: 17.5 Sq.Ft.

BORDER TYPE: FLUSH
RADII: 3″
WIDTH: 0.75″
RECESS: 0″

NO. Z BARS:
LENGTH:

BACKG COLOR: Green
COPY COLOR: White

SYMBOL	X	Y	WID	HT

MAT'L: 0.125″ (3.2MM) ALUMINUM

USE NOTES

1. Legend and border (except those that are colored black) shall be direct applied Grade C sheeting.
2. Background shall be Grade C reflective sheeting.

DESIGN BY: RRH
PROJECT ID: LINCOLN ST
CHECKED BY: BLW
DIV: 10
DATE: Aug 31, 2023

MOUNT ON TWO U-POSTS

Spacing Factor is 1 unless specified otherwise

LETTER POSITIONS

Letter spacings are to start of next letter

																						Series/Size Text Length
	R	u	t	h	e	r	f	o	r	d		S	t									D 2000
5.7	4.9	4.2	3.1	4.4	4.4	2.6	2.6	4.6	2.8	3.6	4.5	4.4	2.4	5.7								48.6
	E	N	D	S																		D 2000
22	3.9	4.6	4.2	3.4	22																	16
	L	i	n	c	o	l	n		S	t												D 2000
11.6	4.5	2.2	4.4	4.1	4.6	2.2	3.5	4.5	4.4	2.4	11.6											36.8
	B	E	G	I	N	S																D 2000
18.9	4.3	3.9	4.5	2	4.3	3.4	18.9															22.3

SIGN NUMBER: 302
TYPE: D
QUANTITY: 1

SIGN WIDTH: 60″
HEIGHT: 42″
TOTAL AREA: 17.5 Sq.Ft.

BORDER TYPE: FLUSH
RADII: 3″
WIDTH: 0.75″
RECESS: 0″

NO. Z BARS:
LENGTH:

BACKG COLOR: Green
COPY COLOR: White

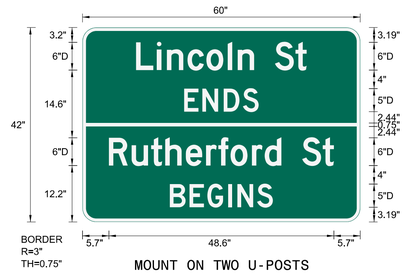
SYMBOL	X	Y	WID	HT

MAT'L: 0.125″ (3.2MM) ALUMINUM

USE NOTES

1. Legend and border (except those that are colored black) shall be direct applied Grade C sheeting.
2. Background shall be Grade C reflective sheeting.

DESIGN BY: RRH
PROJECT ID: LINCOLN ST
CHECKED BY: BLW
DIV: 10
DATE: Aug 31, 2023



MOUNT ON TWO U-POSTS

Spacing Factor is 1 unless specified otherwise

LETTER POSITIONS

Letter spacings are to start of next letter

																						Series/Size Text Length
	L	i	n	c	o	l	n		S	t												D 2000
11.6	4.5	2.2	4.4	4.1	4.6	2.2	3.5	4.5	4.4	2.4	11.6											36.8
	E	N	D	S																		D 2000
22	3.9	4.6	4.2	3.4	22																	16
	R	u	t	h	e	r	f	o	r	d		S	t									D 2000
5.7	4.9	4.2	3.1	4.4	4.4	2.6	2.6	4.6	2.8	3.6	4.5	4.4	2.4	5.7								48.6
	B	E	G	I	N	S																D 2000
18.9	4.3	3.8	4.5	2	4.3	3.4	18.9															22.3

PROJECT NAME	SHEET NO.
LINCOLN ST	SPM-2

APPROVED: Docusigned by: Betsy L. Watson 3E6E7BB34F8743F...

DATE: 12/18/2023

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 29449 ENGINEER BETSY L. WATSON

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Stantec

TYPE 'D' & 'E' SIGNS

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PROJECT NOTES

1 SIGN ERECTION, RELOCATE TYPE E (GROUND MOUNTED)
2 DISPOSAL OF SIGN SYSTEM, U-CHANNEL
3 DISPOSAL OF SUPPORT, U-CHANNEL

PROJECT NAME	SHEET NO.
LINCOLN ST	SPM-3

APPROVED: Docusigned by: Betsy L. Watson 3E6E7BB34F8743F...

DATE: 12/18/2023

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 29449 ENGINEER BETSY L. WATSON

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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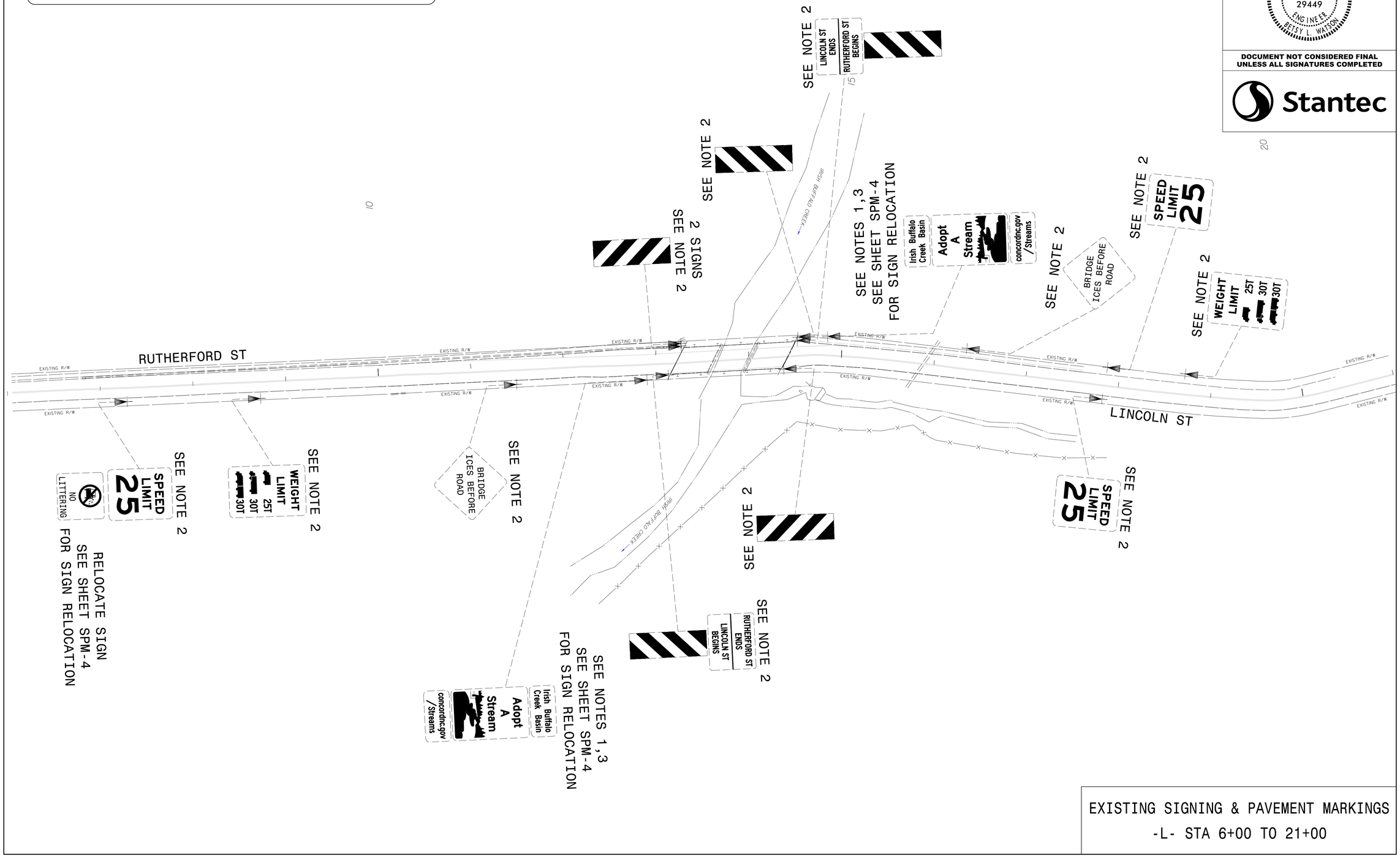

EXISTING SIGNING & PAVEMENT MARKINGS
-L- STA 6+00 TO 21+00

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THERMOPLASTIC PAVEMENT MARKING LEGEND
(T1) WHITE EDGELINE (4")
(T13) YELLOW DOUBLE CENTER (4")

PROJECT NAME	SHEET NO.
LINCOLN ST	SPM-4

APPROVED: Betsy L. Watson (DocuSigned by: 35E676B34F8743F...)

DATE: 12/18/2023

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 29449 ENGINEER BETSY L. WATSON

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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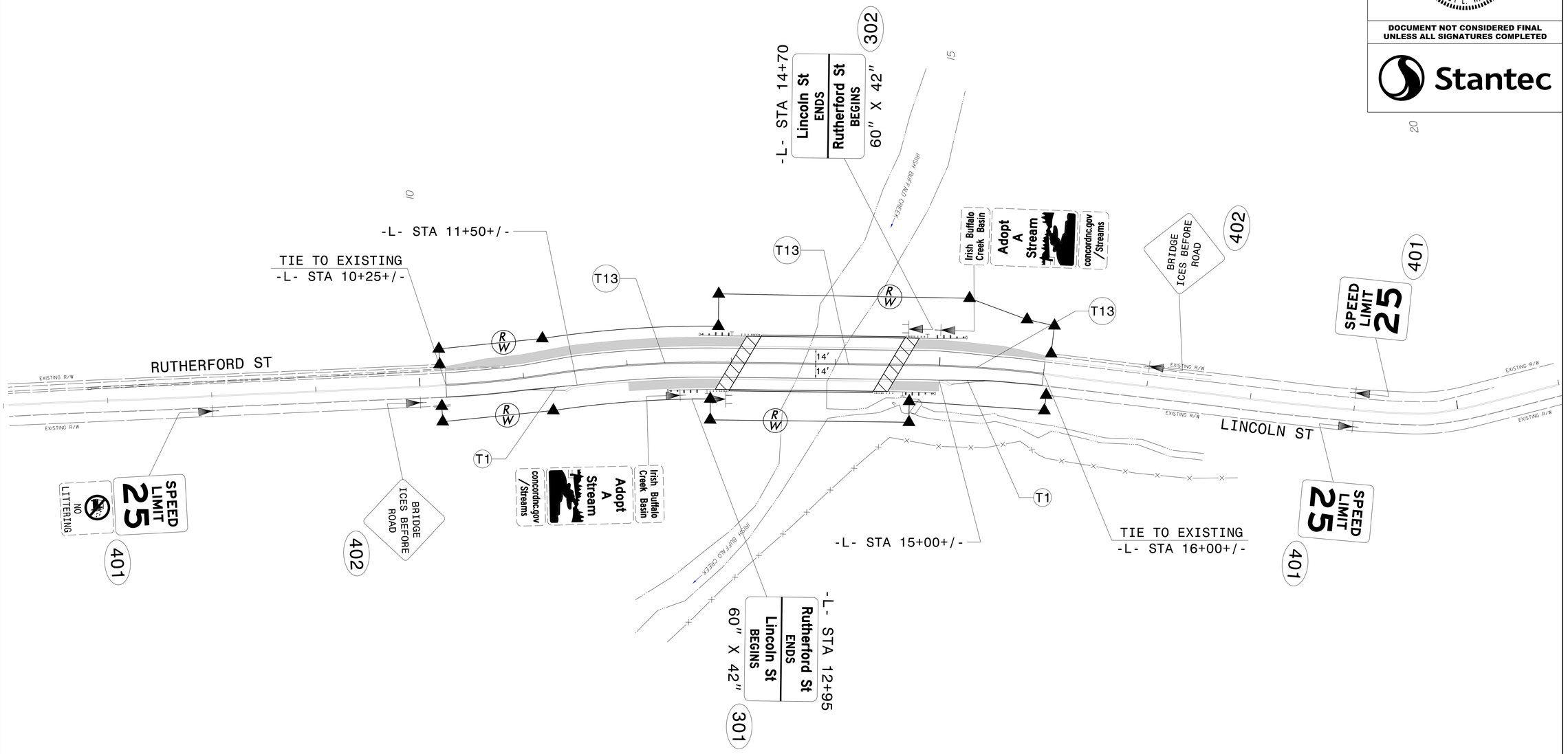


PROPOSED SIGNING & PAVEMENT MARKINGS

-L- STA 6+00 TO 21+00

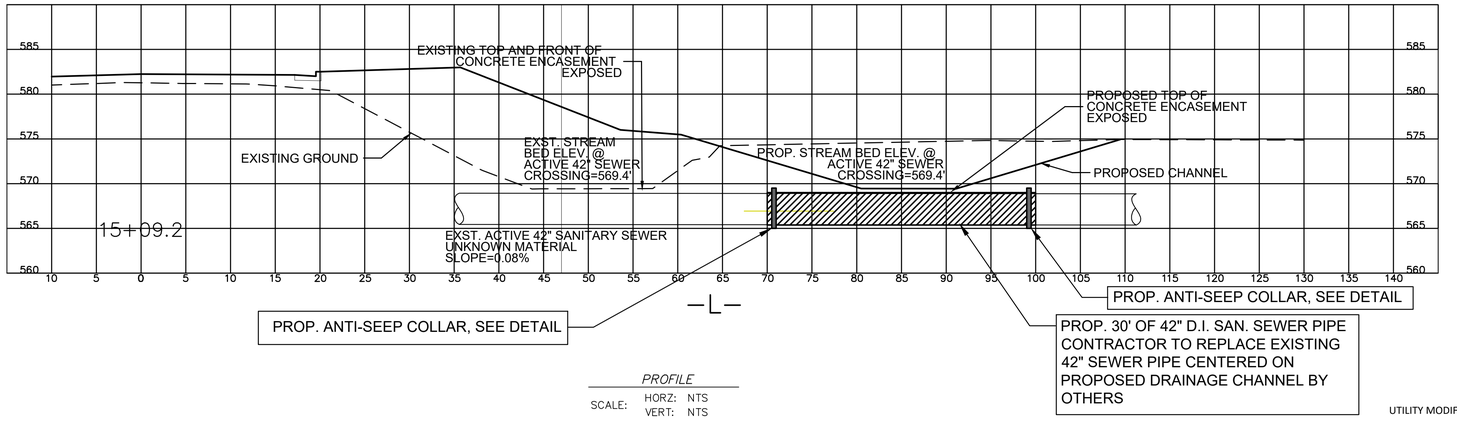
SHEET: UC-1
LINCOLN ST. BRIDGE
SANITARY SEWER REPLACEMENT
PLAN & PROFILE
PROJECT # : 2020-099

PREPARED BY
ENGINEERING DEPARTMENT
CITY OF CONCORD
P.O. BOX 308
CONCORD N.C. 28026
(704) 920-5425

1/2/2024
Engineer's Seal

Surveyor's Seal

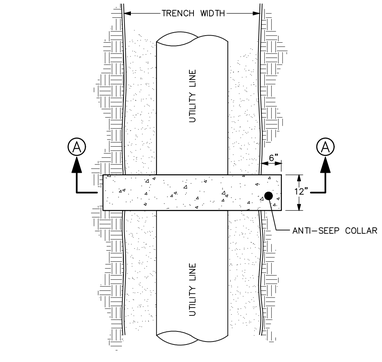
CROSS SECTION
ALONG EXIST. 42" SANITARY SEWER



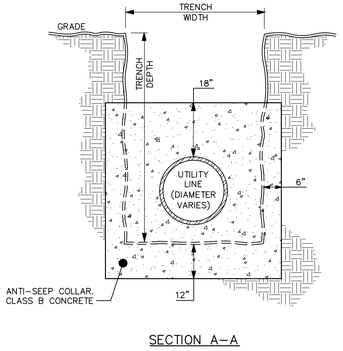
PROFILE
SCALE: HORZ: NTS
VERT: NTS

GENERAL UTILITY NOTES:

1. PER CITY OF CONCORD CODE OF ORDINANCE CHAPTER 62, ARTICLE 3, SECTION 62-98 (2) ALL MATERIALS, EQUIPMENT, LABOR, AND WORKMANSHIP ASSOCIATED WITH PUBLIC WATER AND /OR SEWER EXTENSION AND/OR MODIFICATION SHALL BE IN ACCORDANCE WITH AND SUBJECT TO THE WATER AND SEWER AUTHORITY OF CABARRUS COUNTY'S STANDARD SPECIFICATIONS; THE CITY OF CONCORD'S ORDINANCES, POLICIES, AND STANDARD SPECIFICATIONS, AND THE NORTH CAROLINA ADMINISTRATIVE CODE FOR WASTEWATER COLLECTION AND WATER DISTRIBUTION SYSTEMS. IN THE EVENT OF CONFLICT BETWEEN THE WATER AND SEWER AUTHORITY OF CABARRUS COUNTY'S STANDARD SPECIFICATIONS, THE CITY OF CONCORD'S ORDINANCES, POLICIES, AND STANDARD SPECIFICATIONS, OR THE NORTH CAROLINA ADMINISTRATIVE CODE, THE MORE RESTRICTIVE REQUIREMENTS SHALL APPLY.
2. REVIEW AND APPROVAL OF THE PLANS DOES NOT RELIEVE THE OWNER, CONTRACTOR, OR DEVELOPER FROM MEETING THE REQUIREMENTS OF THE CITY OF CONCORD'S OR CABARRUS COUNTY ORDINANCES, POLICIES, AND STANDARD SPECIFICATIONS, (AS APPLICABLE), CONCORD WATER & SEWER POLICIES AND TECHNICAL SPECIFICATIONS, THE "STANDARD SPECIFICATION FOR WASTEWATER COLLECTION & WASTE DISTRIBUTION FOR CABARRUS COUNTY (WSACC MANUAL) AND ANY OTHER LOCAL, STATE, AND FEDERAL REGULATIONS & APPROVALS.
3. THE CONTRACTOR MUST CONTACT THE CITY OF CONCORD ENGINEERING CONSTRUCTION MANAGER AT 704-920-5425 AT LEAST 24-HOURS PRIOR TO INITIATING ANY CONSTRUCTION ACTIVITY.

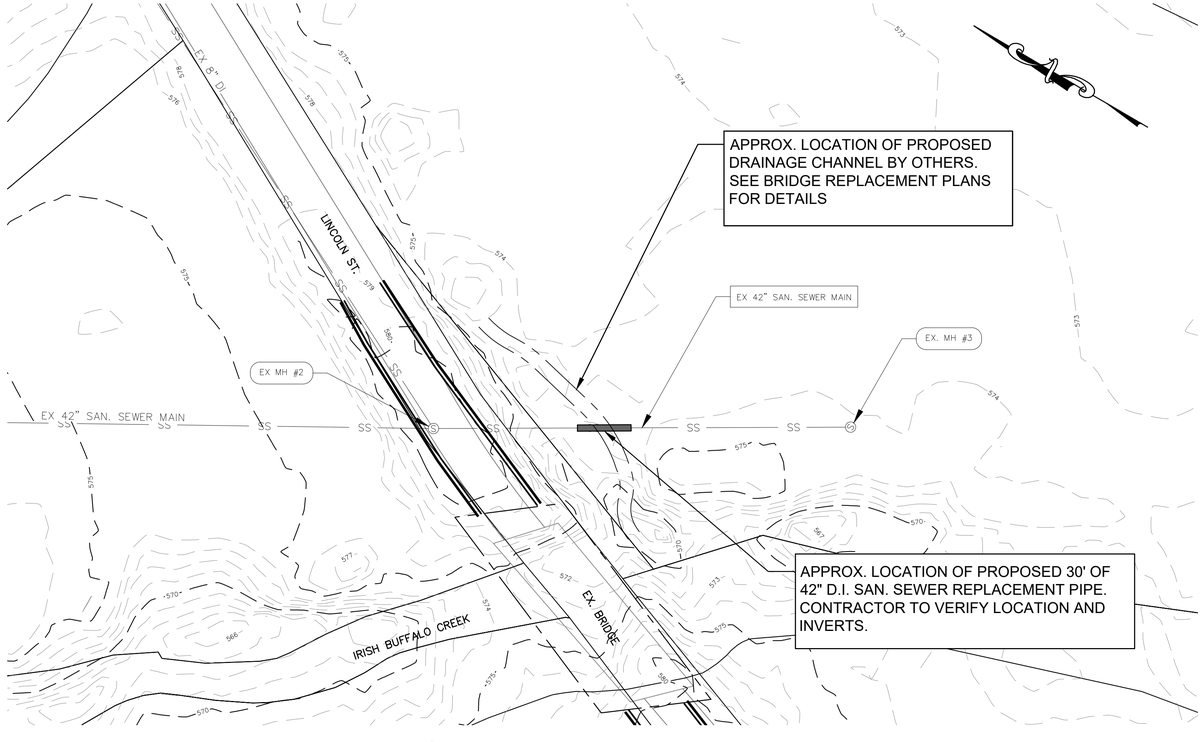


PLAN VIEW



SECTION A-A

ANTI-SEEP COLLAR



PLAN
SCALE: 1" = 40'

UTILITY MODIFICATION SPECIAL PROVISIONS:

1. PRIOR TO UTILITY INSTALLATION, THE CONTRACTOR MUST ATTEND AN ONSITE PRE-CONSTRUCTION MEETING WITH THE CITY OF CONCORD WATER RESOURCE STAFF, AND CITY OF CONCORD CONSTRUCTION INSPECTION STAFF. ANY TEMPORARY BY-PASS PUMPING AND/OR TEMPORARY SYSTEM STORAGE MUST BE AUTHORIZED BY CITY OF CONCORD WATER RESOURCE STAFF AND CITY OF CONCORD ENGINEERING STAFF PRIOR TO INITIATING ANY MODIFICATIONS TO THE CITY'S SYSTEM AND ITS OPERATIONS.
2. THE CONTRACTOR MUST SUBMIT FOR REVIEW AND APPROVAL THE BYPASS PUMPING PLAN AND EQUIPMENT AND/OR THE SYSTEM STORAGE PLAN WITH CALCULATIONS, SUPPORTING FLOW MONITORING DATA AND MATERIALS THAT ENSURES THE SYSTEM HAS CAPACITY TO STORE THE WASTEWATER WITH AT LEAST SIX INCHES FROM THE ELEVATION WHERE WASTEWATER COULD ESCAPE TO DAYLIGHT. THE CONTRACTOR WILL BE REQUIRED TO PROVIDE THE CITY OF CONCORD PERSONNEL WITH A DETAILED BYPASS PUMPING PLAN FOR THE PURPOSE OF RELOCATING THE EXISTING 8-INCH SEWER MAIN. THIS DETAILED BYPASS PUMPING PLAN WILL INCLUDE, BUT NOT BE LIMITED TO, THE FOLLOWING ITEMS:

A. TYPE/SIZE/DESIGN PARAMETERS OF PUMPS THAT WILL BE UTILIZED, INCLUDING THE SUPPLIER'S NAME AND CONTACT INFORMATION (NOTE: REDUNDANT PUMPS ARE REQUIRED); PROJECTED INITIAL FLOW AND PEAK SEWER FLOW (SEE ATTACHED BYPASS PUMP OPERATION CONTINGENCY ACTION PLAN FOR ADDITIONAL INFORMATION).

B. GENERAL WORK PLAN HIGHLIGHTING THE DIFFERENT STEPS REQUIRED TO COMPLETE THE BYPASS PUMPING OPERATION TASK (I.E. SUCTION/DISCHARGE MANHOLE LOCATIONS, A LIST OF MATERIALS/EQUIPMENT TO BE USED, ESTIMATED NUMBER OF WORKERS AND THEIR CORRESPONDING JOB CLASSIFICATIONS, PROJECTED TIME FRAME OF OPERATION, SUMMARY OF TYPICAL ROUTINE INSPECTIONS REGARDING BYPASS PUMP SYSTEM, EMERGENCY PLAN IF NEEDED, ETC.).

3. THE CONTRACTOR SHOULD PROVIDE THE CITY OF CONCORD PERSONNEL WITH A SEQUENCE OF CONSTRUCTION OPERATIONS AND PROJECTED TIMELINES FOR PROPOSED UTILITY WORK REQUIRED ON THE PROJECT (ELECTRIC, WATER, SEWER). THIS SEQUENCE OF OPERATIONS SHOULD INCLUDE A SUMMARY OF HOW EXISTING UTILITIES WILL BE PROTECTED DURING CONSTRUCTION OPERATIONS.
4. CONTRACTOR SHALL SUBMIT THE SHOP DRAWINGS/CATALOG CUTS THAT RELATE TO PROPOSED SEWER FACILITIES THAT WILL BE OPERATE AND MAINTAIN BY THE CITY (I.E. PIPING, MANHOLES, COUPLINGS, END CONNECTIONS, ETC.) TO CITY OF CONCORD CONSTRUCTION MANAGER FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION.
5. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY AND/OR ALL ASSOCIATED COSTS, FINES, FEES OR LEVIES, INCLUDING BUT NOT LIMITED TO: CITY'S LABOR, EQUIPMENT, ADMINISTRATIVE COSTS, AND/OR LEGAL FEES; FINES IMPOSED BY ANY REGULATORY AGENCIES; AND/OR ANY THIRD PARTY CLAIMS WHICH MIGHT BE RESULTANT OF SANITARY SEWER OVERFLOWS AND/OR SUBSEQUENT ENVIRONMENTAL IMPACTS CAUSED BY THE CONTRACTOR DURING THE PERFORMANCE OF THE CONSTRUCTION ACTIVITIES WITHIN THIS CONTRACT.
6. ALL EXCAVATION IS CONSIDERED UNCLASSIFIED. ANY PRELIMINARY GEOTECHNICAL INFORMATION SHOULD NOT BE CONSIDERED EXHAUSTIVE, AND THE CONTRACTOR SHOULD PERFORM ITS OWN INVESTIGATION BEFORE BIDDING THE JOB.

LINCOLN ST. BRIDGE
SANITARY SEWER REPLACEMENT
PLAN & PROFILE
PROJECT # : 2020-099

REV. #	DATE	DESCRIPTION	BY

DESIGNED BY: EAB
DRAWN BY: BCC
CHECKED BY: EAB
SCALE: AS SHOWN
DATE: 12/14/23
PROJECT NUMBER: 2020-099
SHEET: UC-1 OF: 1

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