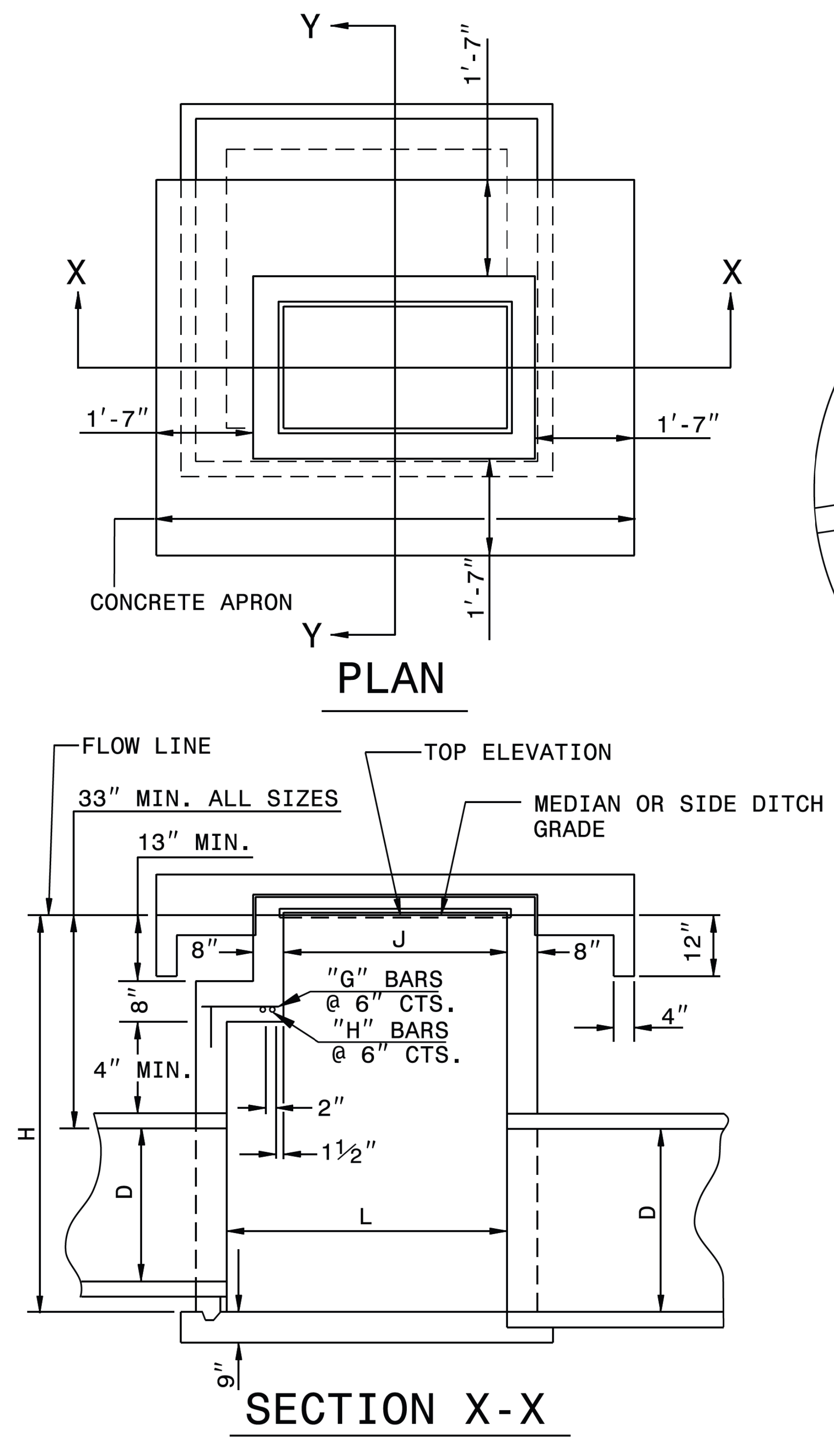
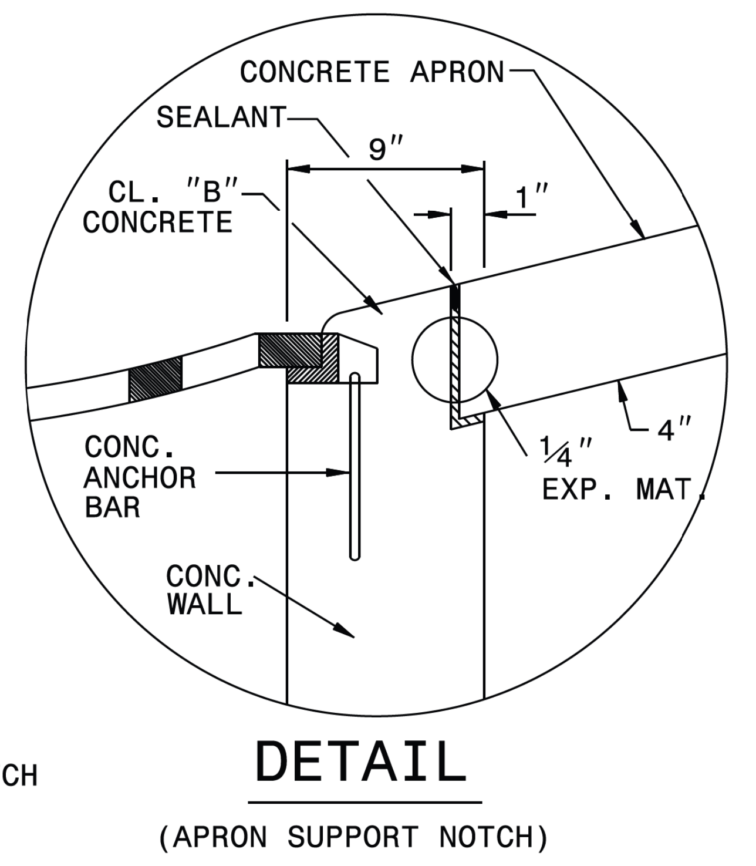
PROJECT REFERENCE NO.	SHEET NO.
R-5709C	2C-2

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

ENGLISH DETAIL DRAWING FOR
CONCRETE MEDIAN DROP INLET TYPE 'A'
EXTRA DEPTH OVER 12′ TO 25′
12″ THRU 72″ PIPE

SHEET 1 OF 2
840D17





GENERAL NOTES:

USE CLASS "B" CONCRETE THROUGHOUT.

PROVIDE DROP INLETS WITH STEPS 12″ ON CENTER. USE STEPS WHICH COMPLY WITH STD. DRAWING 840.66.

OPTIONAL CONSTRUCTION - MONOLITHIC POUR, 2″ KEYWAY, OR #4 BAR DOWELS AT 12″ CENTERS AS DIRECTED BY THE ENGINEER.

USE FORMS FOR THE CONSTRUCTION OF THE BOTTOM SLAB.

IF REINFORCED CONCRETE PIPE IS SET IN BOTTOM SLAB OF BOX, ADD TO SLAB AS SHOWN ON STD. NO. 840.00.

WHEN PAYMENT FOR THE DROP INLET IS MADE ON A PER EACH BASIS, THE CONCRETE APRON WILL BE CONSIDERED PART OF THE DROP INLET.

CONSTRUCT WITH PIPE CROWNS MATCHING.

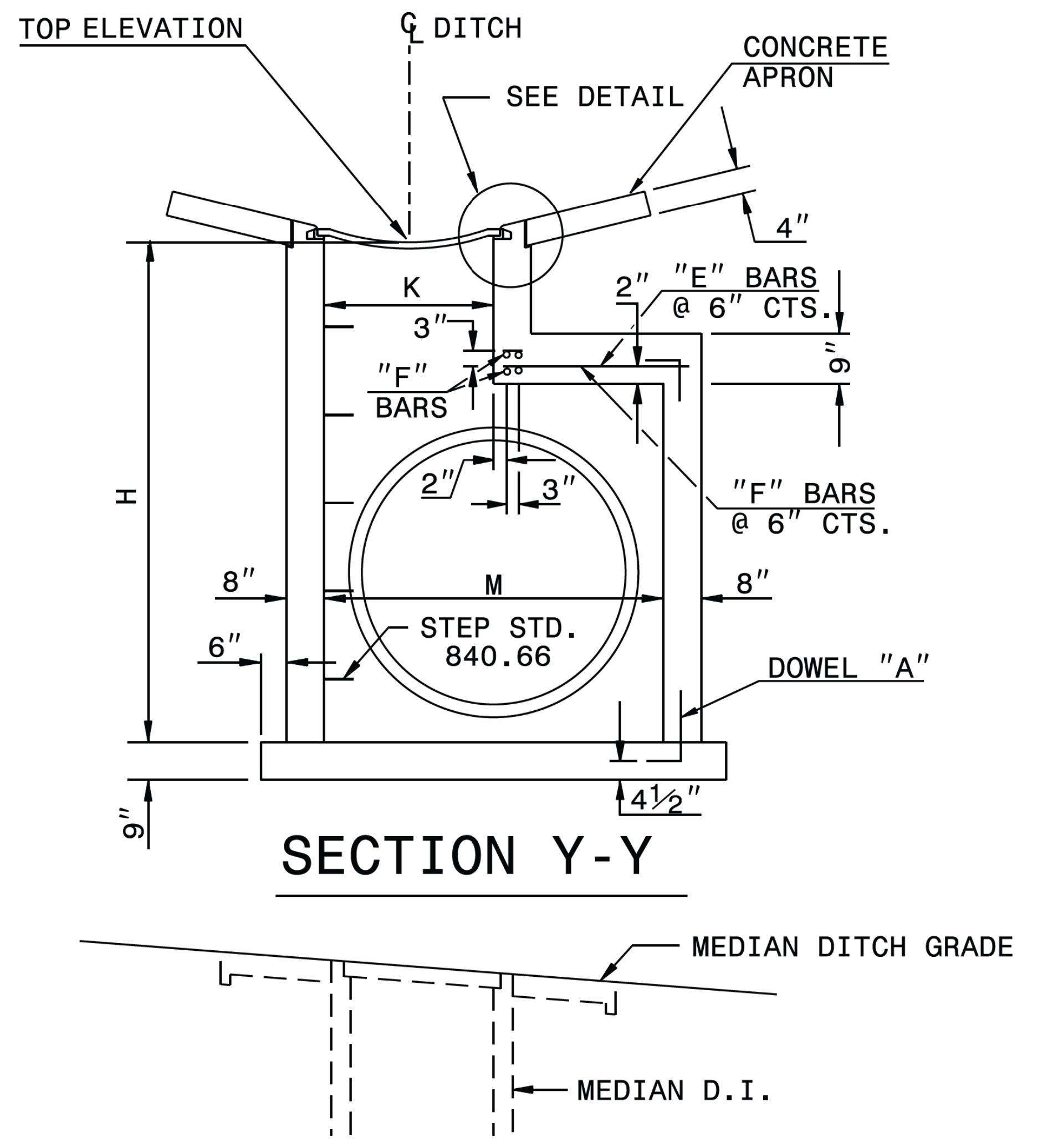
USE STANDARD FRAMES AND GRATES 840.22 (SHOWN), 840.24(SHOWN), 840.20, 840.29, AND 840.33.

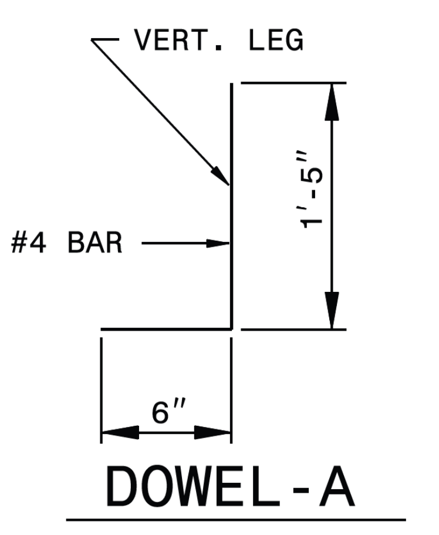
SEE STANDARD DRAWING 840.25 FOR ATTACHMENT OF FRAMES AND GRATES NOT SHOWN.

CHAMFER ALL EXPOSED CORNERS 1″.

DRAWING NOT TO SCALE.

MAX. DEPTH OF THIS STRUCTURE FROM TOP OF BOTTOM SLAB TO TOP ELEVATION IS 25 FEET.





STATE OF
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RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR
CONCRETE MEDIAN DROP INLET TYPE 'A'
EXTRA DEPTH OVER 12′ TO 25′
12″ THRU 72″ PIPE

SHEET 1 OF 2
840D17

STATE OF
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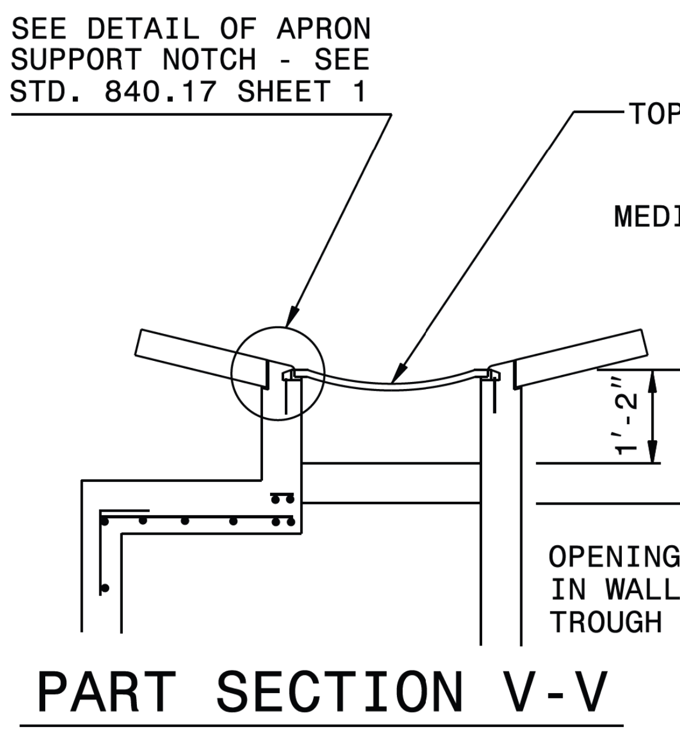
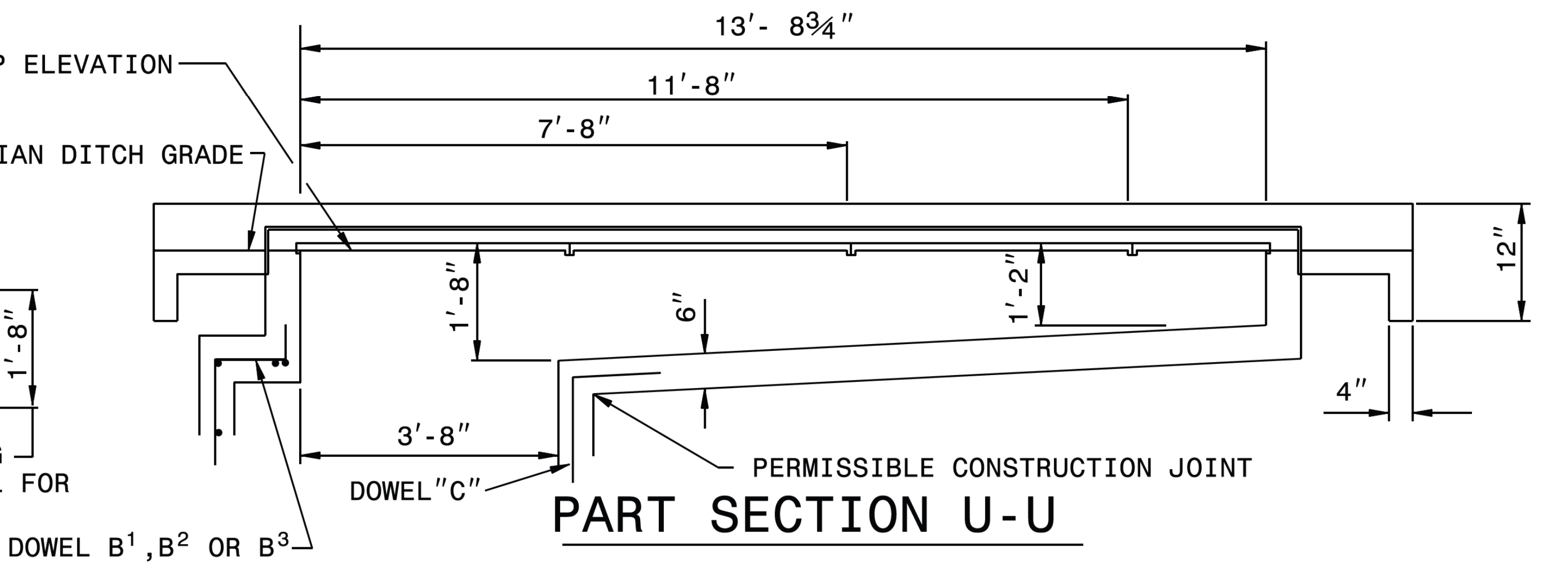
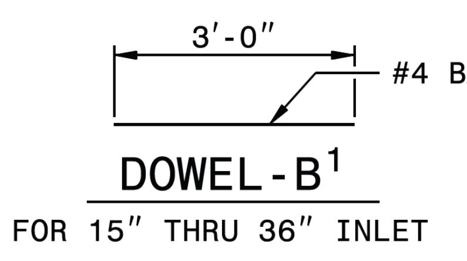
RALEIGH, N.C.

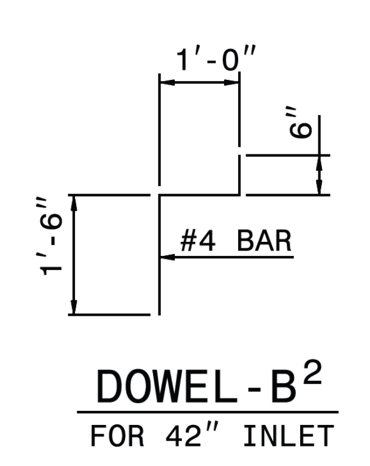
ENGLISH DETAIL DRAWING FOR
CONCRETE MEDIAN DROP INLET TYPE 'A'
EXTRA DEPTH OVER 12′ TO 25′
12″ THRU 72″ PIPE

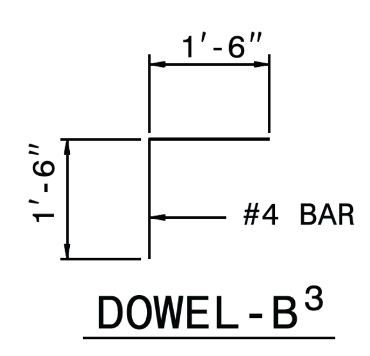
SHEET 2 OF 2
840D17

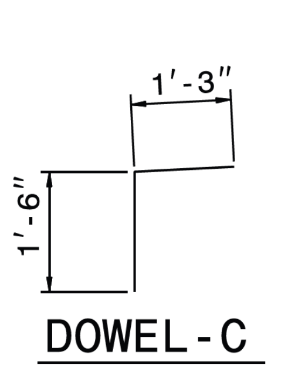


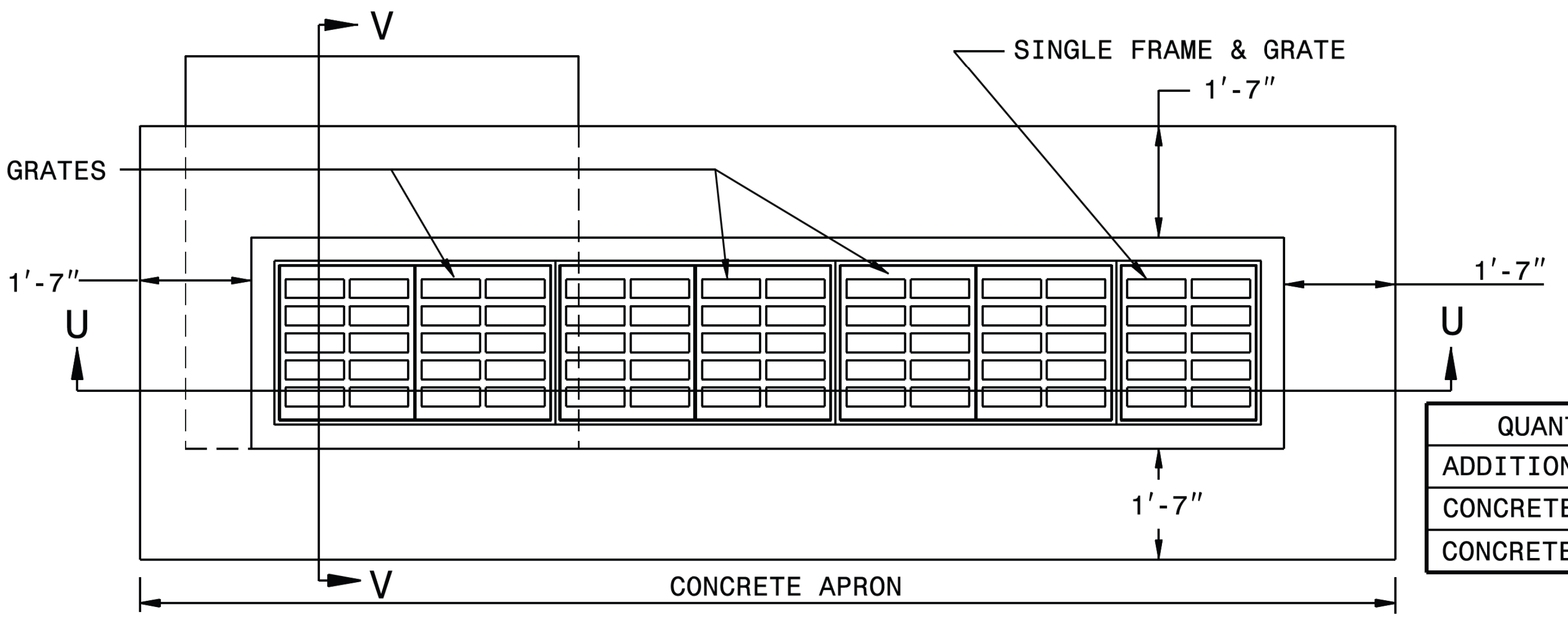












QUANTITY TO BE ADDED FOR EACH 2′ INCREMENT INLET OPENING						
ADDITIONAL INLETS	2′-0″	4′-0″	6′-0″	8′-0″	10′-0″	12′-0″
CONCRETE CU. YDS.	0.191	0.417	0.665	0.897	1.145	1.380
CONCRETE APRON CU. YDS.	0.074	0.148	0.222	0.296	0.370	0.444

MIN. DIMENSIONS AND QUANTITIES FOR CONCRETE GRATED DROP INLET(BASED ON MIN. HEIGHT, H)

DIMENSIONS OF BOX AND PIPE						REINFORCING STEEL - NO. 4 BARS									CU YDS CONC. IN BOX					DEDUCTIONS FOR ONE PIPE	
PIPE	SPAN	WIDTH	SPAN	WIDTH	HEIGHT	BARS E		BARS F		BARS G		BARS H		TOTAL	BOTTOM SLAB	H TOTAL	H PER FT HT	APRON	TOTAL		
D	J	K	L	M	H	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	LBS.						C.S.	R.C.
12″	3′-8″	2′-0″	3′-8″	2′-0″	3′-9″	—	—	—	—	—	—	—	—	—	0.362	0.926	0.247	0.395	1.683	0.015	0.024
15″	3′-8″	2′-0″	3′-8″	2′-0″	4′-0″	—	—	—	—	—	—	—	—	—	0.362	0.988	0.247	0.395	1.745	0.023	0.036
18″				2′-0″	4′-3″	—	—	—	—	—	—	—	—	—	0.362	1.050	0.247		1.807	0.033	0.049
24″				2′-10″	4′-9″	8	1′-5″	6	4′-9″	—	—	—	—	27	0.444	1.362	0.278		2.201	0.059	0.085
30″			3′-8″	3′-5″	5′-3″	8	2′-0″	7	4′-9″	—	—	—	—	33	0.502	1.644	0.288		2.541	0.092	0.127
36″			4′-0″	4′-0″	5′-9″	8	2′-5″	8	4′-11″	4	0′-9″	2	4′-11″	47	0.560	1.931	0.321		2.920	0.132	0.178
42″			4′-10″	4′-10″	6′-3″	10	3′-1″	9	5′-7″		1′-5″	3	5′-7″	67	0.704	2.500	0.370		3.677	0.180	0.243
48″			5′-4″	5′-4″	6′-9″	11	3′-7″	10	6′-1″		1′-11″	4	6′-1″	87	0.823	3.013	0.407		4.315	0.235	0.317
54″			6′-0″	6′-0″	7′-3″	12	4′-1″	11	6′-7″		2′-5″	5	6′-7″	107	0.951	3.589	0.444		5.072	0.297	0.401
60″			6′-6″	6′-6″	7′-9″	13	4′-9″	12	7′-3″		3′-1″	6	7′-3″	135	1.311	4.539	0.494		6.170	0.367	0.495
66″			7′-2″	7′-2″	8′-3″	14	5′-4″	14	7′-10″		3′-7″	7	7′-10″	168	1.136	5.061	0.537		6.901	0.444	0.599
72″	3′-8″	2′-0″	7′-8″	7′-8″	8′-9″	15	5′-11″	15	8′-5″	4	4′-3″	8	8′-5″	199	1.500	5.860	0.580	0.395	7.868	0.528	0.713

STATE OF
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RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR
CONCRETE MEDIAN DROP INLET TYPE 'A'
EXTRA DEPTH OVER 12′ TO 25′
12″ THRU 72″ PIPE

SHEET 2 OF 2
840D17

SEAL 33144
NICOLE M. HACKLER
14/2024
Signed by:
Nicole M. Hackler
5884323D34164C5...

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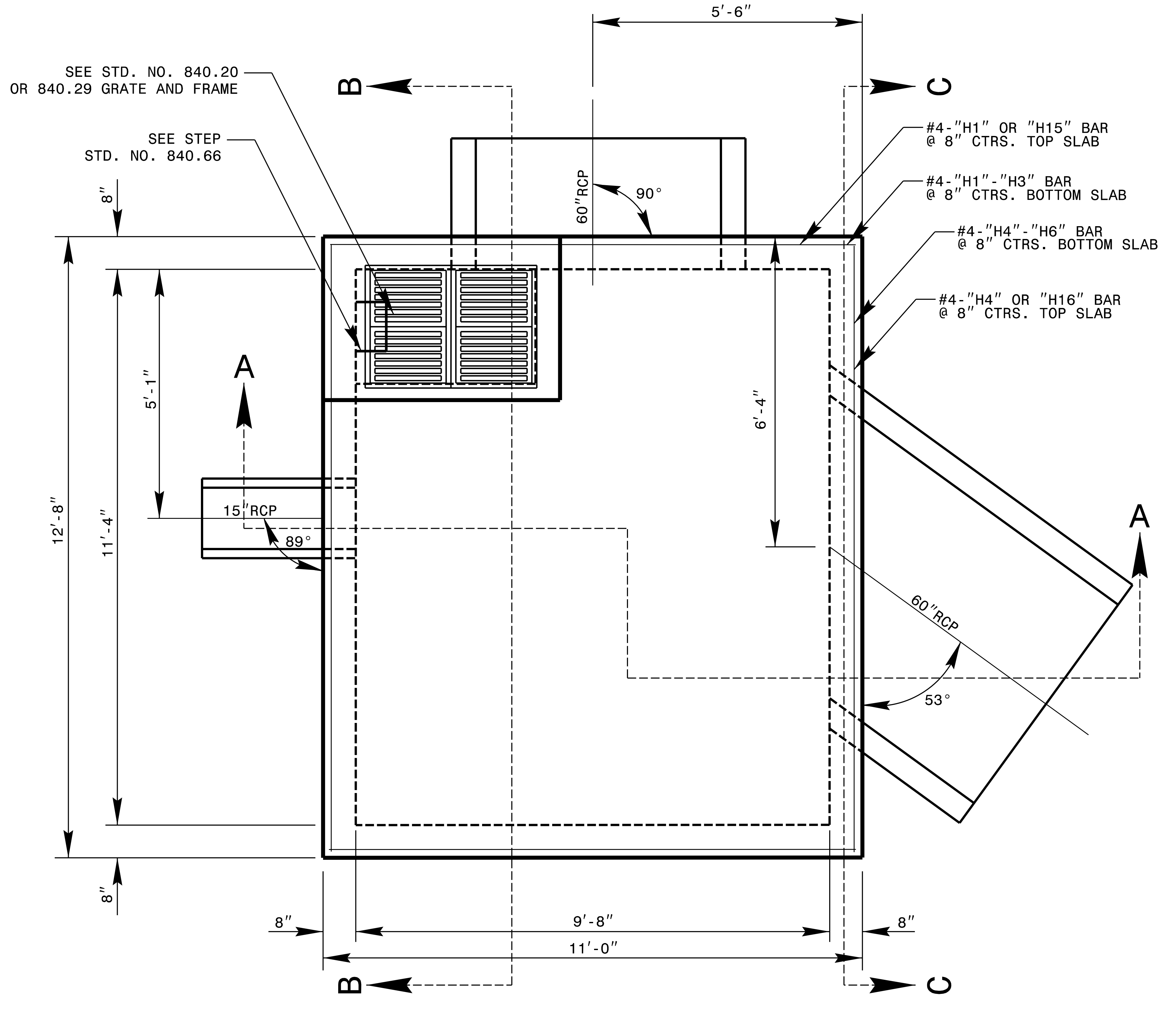
CONTRACT STANDARDS AND DEVELOPMENT UNIT
Office 919-707-6950 FAX 919-250-4119

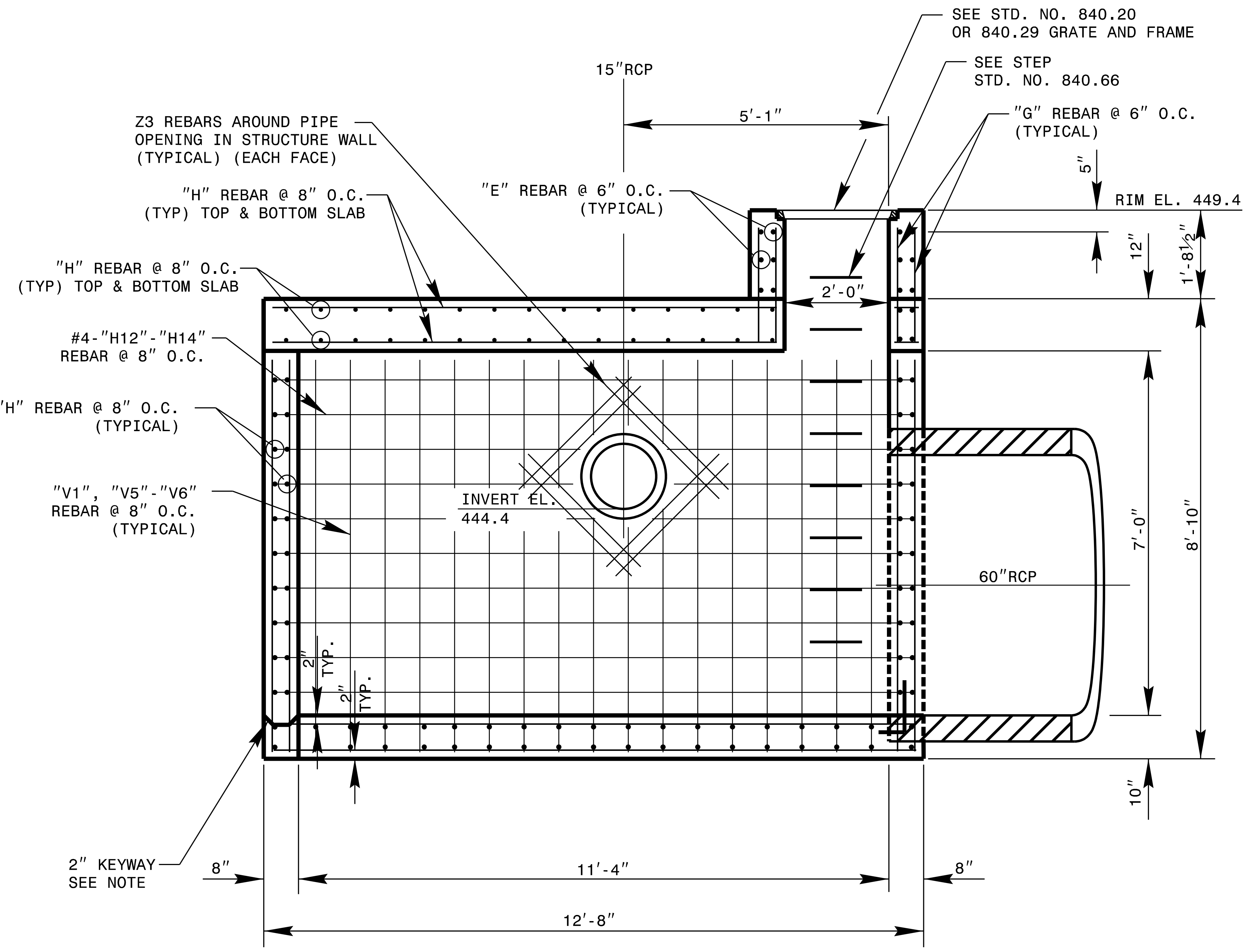
SEE PLATE FOR TITLE

ORIGINAL BY: 2002 STD.840.17 DATE:
MODIFIED BY: K.A. KEMPF DATE: 07-06-09
CHECKED BY: DATE:
FILE SPEC.: /stand/840d17 Extra Depth 2GI.dgn

PROJECT REFERENCE NO.	SHEET NO.
R-5709C	2C-3



PLAN VIEW



SECTION B-B

GENERAL NOTES:

USE CLASS "AA" CONCRETE THROUGHOUT.

IF REINFORCED CONCRETE PIPE IS SET IN BASE SLAB OR BOX,
ADD TO BASE AS SHOWN ON STD. NO. 840.00.

CHAMFER ALL EXPOSED CORNERS 1 INCH.

OPTIONAL CONSTRUCTION - MONOLITHIC POUR 2" KEYWAY OR #4 BAR
DOWELS AT 12" CENTERS AS DIRECTED BY THE ENGINEER.

USE FORMS FOR CONSTRUCTION OF BOTTOM SLAB.

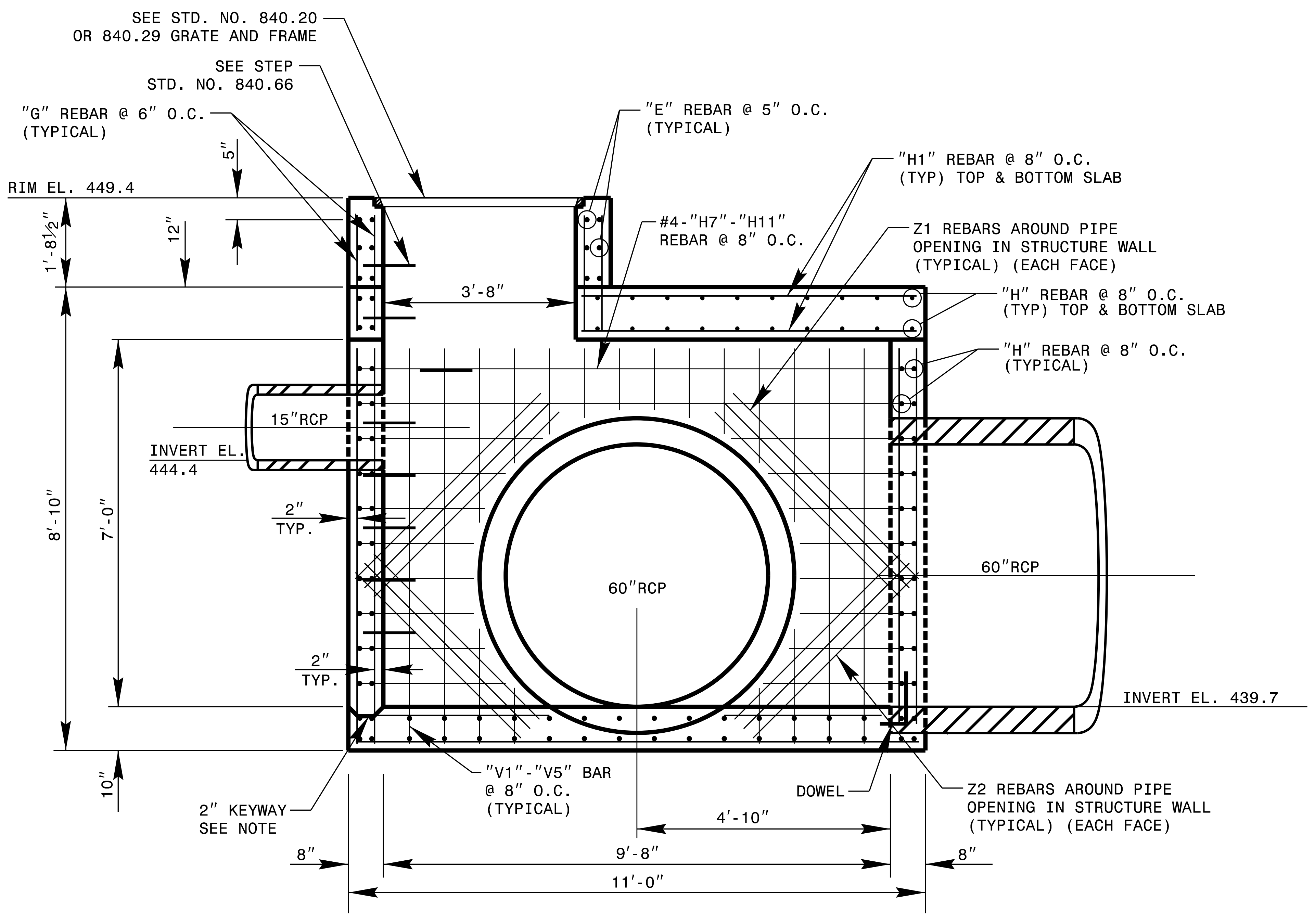
ALL JUNCTION BOXES OVER 3'-6" IN DEPTH TO BE PROVIDED WITH
STEPS 12" ON CENTER. STEPS SHALL BE IN ACCORDANCE WITH
STD. NO. 840.66.

REINFORCING STEEL TO BE POSITIONED AS DIRECTED BY THE ENGINEER.

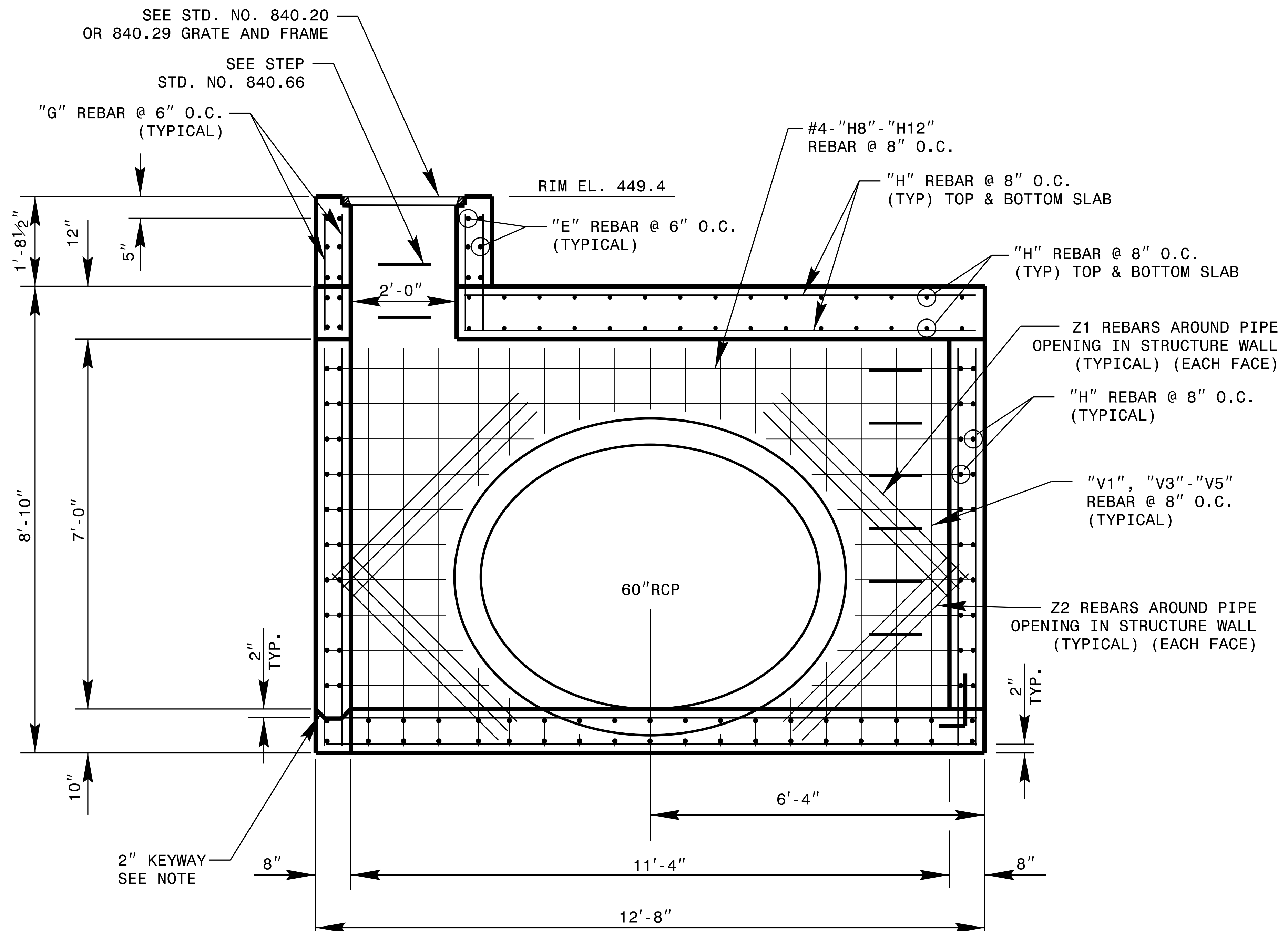
BILL OF MATERIALS

BAR	NO.	SIZE	LENGTH	WEIGHT
E1	12	#4	4'-8"	37
E2	12	#4	3'-0"	24
G	60	#4	2'-2"	87
H1	64	#4	10'-8"	456
H2	12	#4	10'-0"	80
H3	4	#4	3'-8"	10
H4	51	#4	12'-4"	420
H5	9	#4	11'-8"	70
H6	4	#4	4'-2"	11
H7	24	#4	10'-8"	171
H8	8	#4	3'-6"	19
H9	16	#4	2'-10"	30
H10	16	#4	2'-5"	26
H11	24	#4	2'-2"	35
H12	18	#4	12'-4"	148
H13	6	#4	5'-9"	23
H14	6	#4	4'-7"	18
H15	6	#4	6'-4"	25
H16	10	#4	9'-8"	65
V1	82	#4	7'-5"	406
V2	4	#4	3'-3"	9
V3	16	#4	2'-1"	22
V4	8	#4	1'-7"	8
V5	28	#4	1'-2"	22
V6	6	#4	4'-2"	17
Z1	24	#4	5'-0"	80
Z2	24	#4	4'-5"	71
Z3	16	#4	3'-8"	39
DOWEL	16	#4	1'-8"	69
TOTAL REINF. STEEL (LBS.)				2,498
TOTAL CLASS "AA" CONC.(CU.YDS.)				15.6

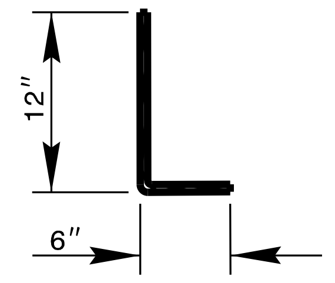
*CONCRETE FOR PIPE BASE PAD
PER STD. NO. 840.00 NOT INCLUDED



SECTION A-A



SECTION C-C



DOWEL

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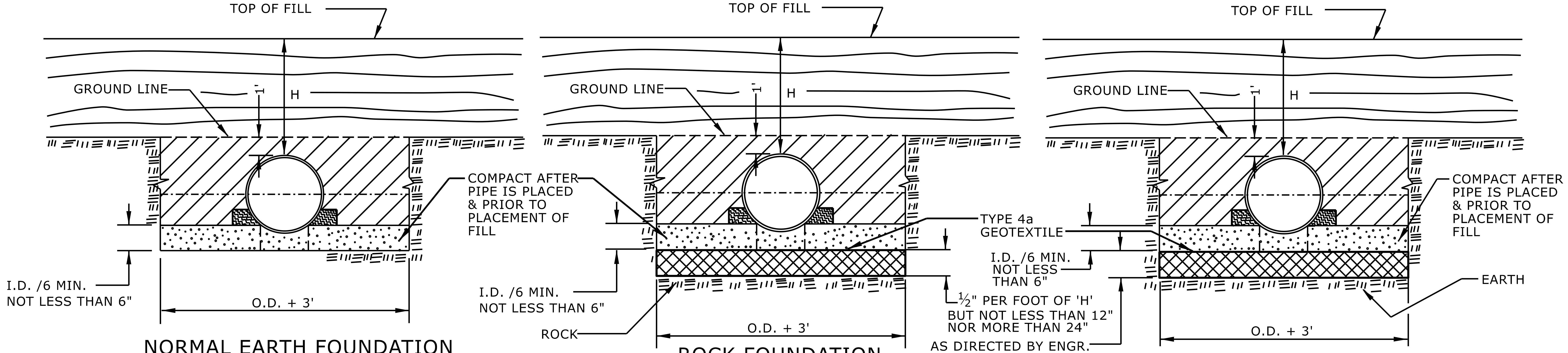
NORTH CAROLINA PROFESSIONAL ENGINEER
SEAL
51579
AARON LEE STROUD
10/21/2024
DocuSigned by:
Aaron Lee Stroud
A363958B41E6443...

SPECIAL DETAIL
TRAFFIC BEARING
DROP INLET BOX #0602

DRAWN BY: ALS DATE: APR 2024
CHECKED BY: JWG DATE: APR 2024
DESIGN ENGINEER OF RECORD: ALS DATE: APR 2024

10/14/2024
R:\Structures\Design\Structures\Special Boxes + Headwall\2902.dgn
default

PROJECT REFERENCE NO.	SHEET NO.
R-5709C	2C-4

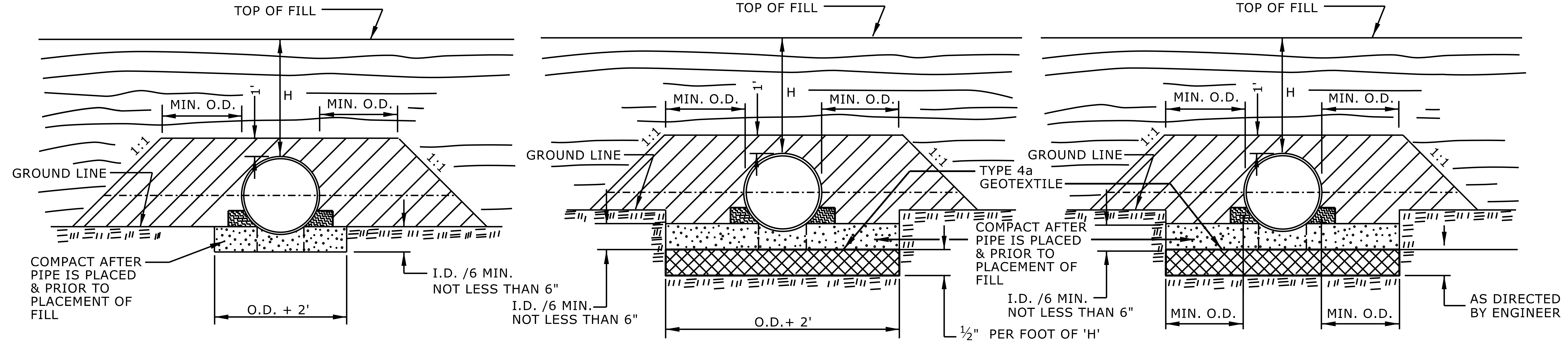


NORMAL EARTH FOUNDATION

ROCK FOUNDATION

UNSUITABLE MATERIAL FOUNDATION

PIPE IN TRENCH



NORMAL EARTH FOUNDATION

ROCK FOUNDATION

UNSUITABLE MATERIAL FOUNDATION

PIPE ABOVE GROUND

GENERAL NOTES:

I.D. = THE MAXIMUM HORIZONTAL INSIDE DIAMETER DIMENSION.

O.D. = THE MAXIMUM HORIZONTAL OUTSIDE DIAMETER DIMENSION.

H = THE FILL HEIGHT MEASURED VERTICALLY AT ANY POINT ALONG THE PIPE FROM THE TOP OF THE PIPE TO THE TOP OF THE EMBANKMENT AT THAT POINT.

▤ APPROVED SUITABLE LOCAL MATERIAL.

■ TAKE CARE TO FULLY COMPACT HAUNCH ZONE OF PIPE BACKFILL.

░ LOOSELY PLACED SELECT MATERIAL CLASS III OR CLASS II, TYPE 1 FOR PIPE BEDDING. LEAVE SECTION DIRECTLY BENEATH PIPE UNCOMPACTED AS PIPE SEATING AND BACKFILL WILL ACCOMPLISH COMPACTION.

DO NOT OPERATE HEAVY EQUIPMENT OVER ANY PIPE CULVERT UNTIL THE PIPE CULVERT HAS BEEN PROPERLY BACKFILLED AND COVERED WITH AT LEAST 3 FEET OF APPROVED MATERIAL.

REFER TO NCDOT PIPE MATERIAL SELECTION GUIDE AND STANDARD SPECIFICATIONS FOR ALLOWABLE PIPE FILL HEIGHTS AND PIPE SPECIFICATIONS.

-·-·-·-·- SPRINGLINE OF PIPE

▨ SELECT BACKFILL MATERIAL CLASS III OR CLASS II, TYPE 1 ABOVE AND BELOW SPRINGLINE.

≡ UNDISTURBED EARTH MATERIAL

▩ SELECT MATERIAL CLASS V OR VI FOR FOUNDATION CONDITIONING. ENCAPSULATE WITH TYPE IV GEOTEXTILE AS DIRECTED BY THE ENGINEER.

STATE OF
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RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
METHOD OF PIPE INSTALLATION
FLEXIBLE PIPE

SHEET 1 OF 2
300.01

SEAL
033144
NICOLE M. HACKLER
10/24/2024
Signed by:
Nicole M. Hackler
5884323D34164C5...

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Office 919-707-6950 FAX 919-250-4119

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MODIFIED BY: DATE:
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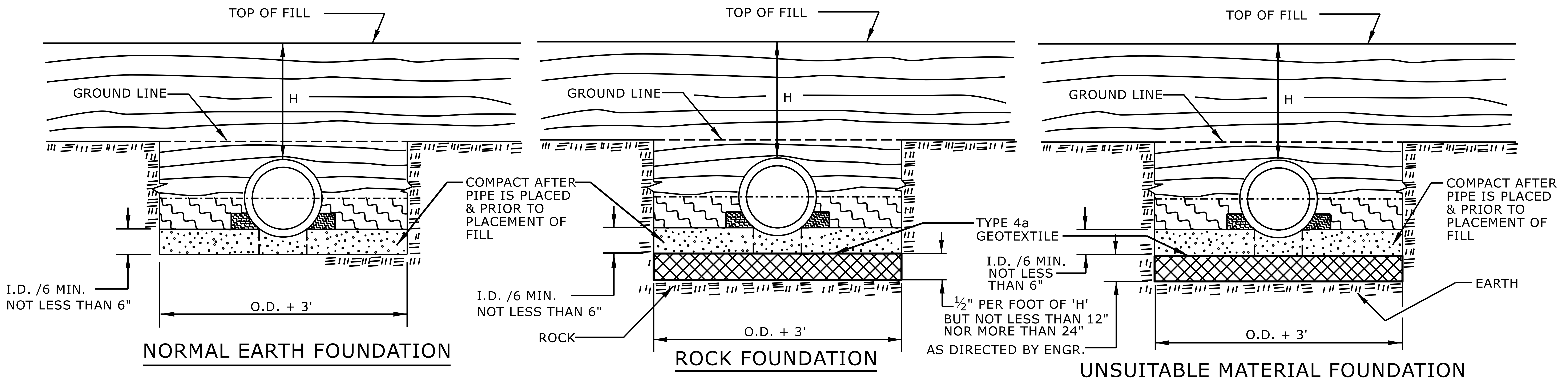
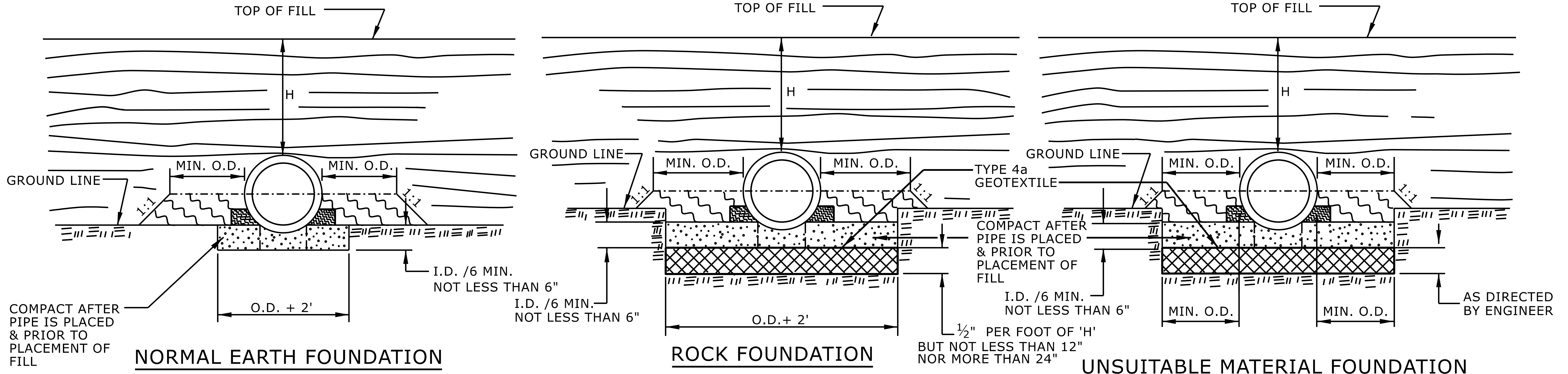
FILE SPEC.:

PROJECT REFERENCE NO.	SHEET NO.
R-5709C	2C-5



PIPE IN TRENCH



PIPE ABOVE GROUND

GENERAL NOTES:

I.D. = THE MAXIMUM HORIZONTAL INSIDE DIAMETER DIMENSION.

O.D. = THE MAXIMUM HORIZONTAL OUTSIDE DIAMETER DIMENSION.

H = THE FILL HEIGHT MEASURED VERTICALLY AT ANY POINT ALONG THE PIPE FROM THE TOP OF THE PIPE TO THE TOP OF THE EMBANKMENT AT THAT POINT.

≋	APPROVED SUITABLE LOCAL MATERIAL.
▩	TAKE CARE TO FULLY COMPACT HAUNCH ZONE OF PIPE BACKFILL.
⁙	LOOSELY PLACED SELECT MATERIAL CLASS III OR CLASS II, TYPE 1 FOR PIPE BEDDING. LEAVE SECTION DIRECTLY BENEATH PIPE UNCOMPACTED AS PIPE SEATING AND BACKFILL WILL ACCOMPLISH COMPACTION.

DO NOT OPERATE HEAVY EQUIPMENT OVER ANY PIPE CULVERT UNTIL THE PIPE CULVERT HAS BEEN PROPERLY BACKFILLED AND COVERED WITH AT LEAST 3 FEET OF APPROVED MATERIAL.

REFER TO NCDOT PIPE MATERIAL SELECTION GUIDE AND STANDARD SPECIFICATIONS FOR ALLOWABLE PIPE FILL HEIGHTS AND PIPE SPECIFICATIONS.

-·-·-·-·-	SPRINGLINE OF PIPE
⌇⌇⌇	SELECT BACKFILL MATERIAL CLASS III OR CLASS II, BELOW SPRINGLINE.
≡	UNDISTURBED EARTH MATERIAL
▦	SELECT MATERIAL CLASS V OR VI FOR FOUNDATION CONDITIONING. ENCAPSULATE WITH TYPE IV GEOTEXTILE AS DIRECTED BY THE ENGINEER.

STATE OF
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DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
METHOD OF PIPE INSTALLATION
RIGID PIPE

SHEET 2 OF 2
300.01

10/24/2024
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NICOLE M. HACKLER
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5884323D34164C5...

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CHECKED BY: DATE:
FILE SPEC.:

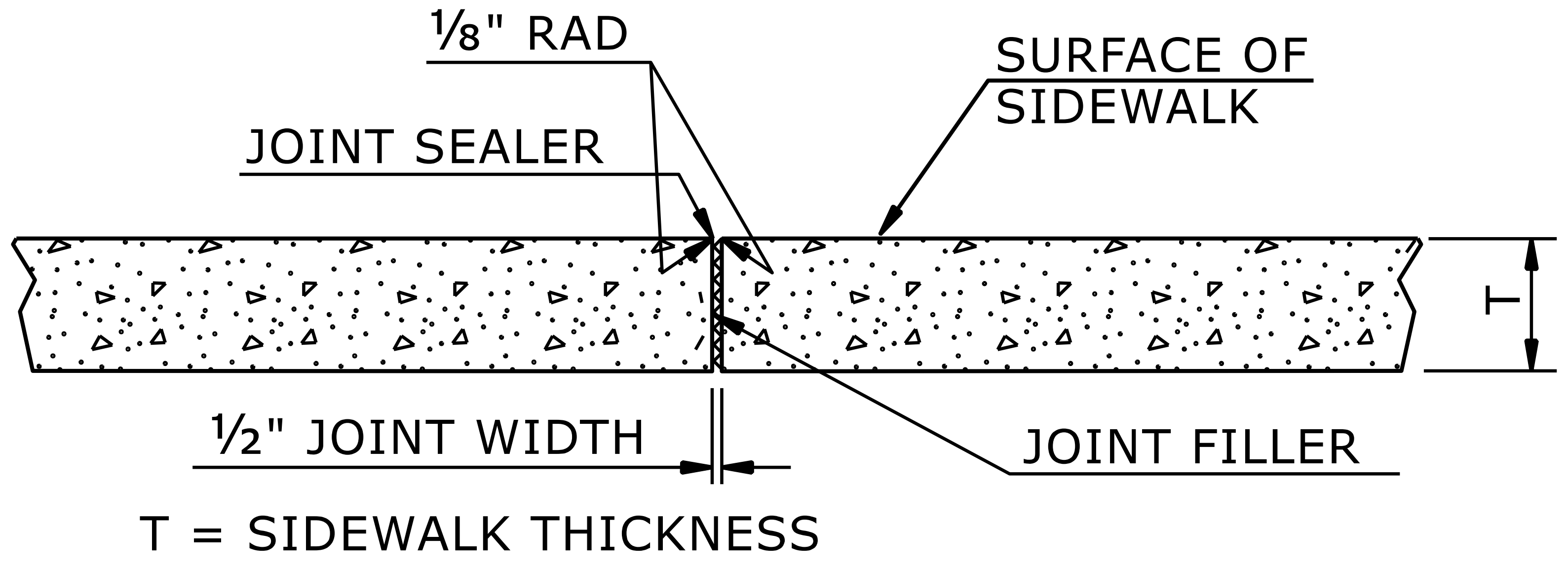
PROJECT REFERENCE NO.	SHEET NO.
R-5709C	2C-6

NOTES:

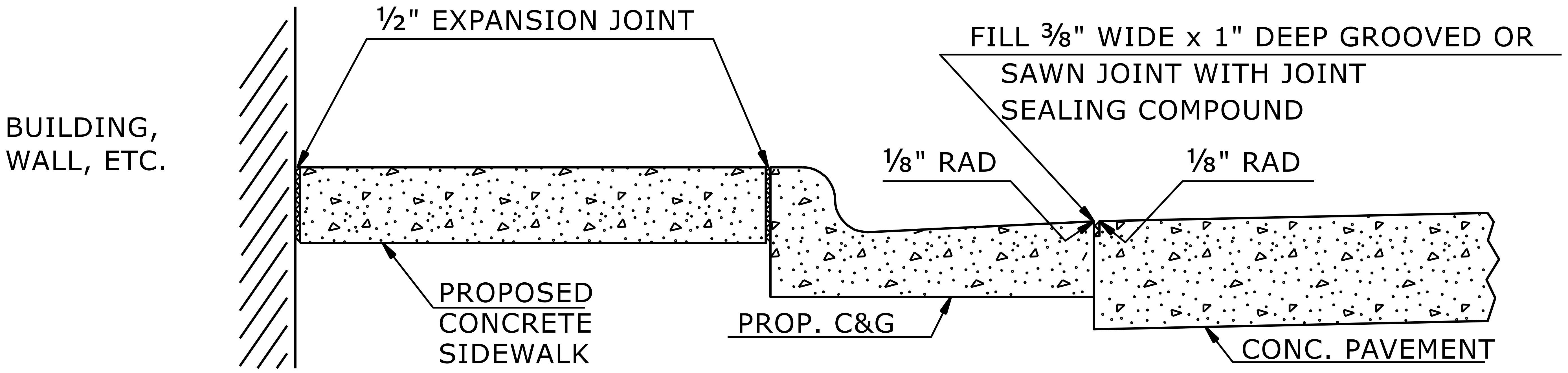
CONSTRUCT STANDARD SIDEWALK 5' WIDE AND
4" THICK UNLESS OTHERWISE DENOTED ON PLANS.

PLACE A GROOVE JOINT 1" DEEP WITH ⅛" RADII
IN THE CONCRETE SIDEWALK AT 5' INTERVALS.
ONE ½" EXPANSION JOINT WILL BE REQUIRED AT 50'
INTERVALS. A ½" EXPANSION JOINT WILL BE REQUIRED
WHERE THE SIDEWALK JOINS ANY RIGID STRUCTURE.

SEE STD. DWG. 848.06 FOR CURB RAMP LOCATION
REQUIREMENTS AND CONSTRUCTION GUIDELINES.



TRANSVERSE EXPANSION JOINT
IN SIDEWALK



DETAILS SHOWING JOINTS IN CONCRETE SIDEWALK

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DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
CONCRETE SIDEWALK

SEAL
033144
NICOLE M. HACKLER
10/24/2024

Signed by:
Nicole M. Hackler
5884323D34164C5...

SHEET 1 OF 1
848D01

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AND DEVELOPMENT UNIT
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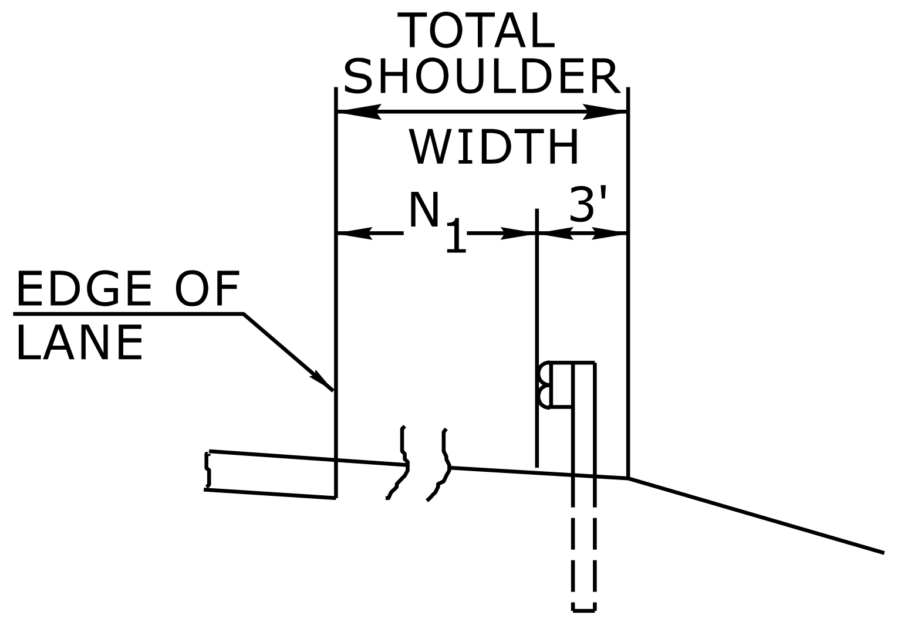
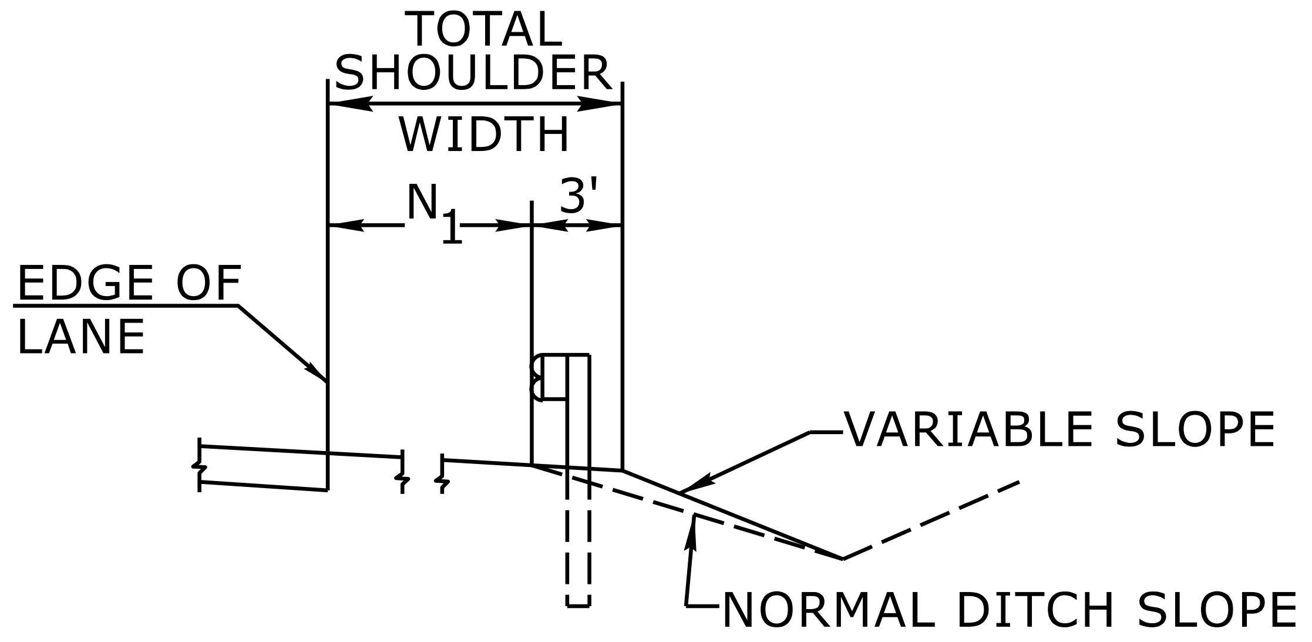
FILE SPEC.: ______

PROJECT REFERENCE NO.	SHEET NO.
R-5709C	2C-7

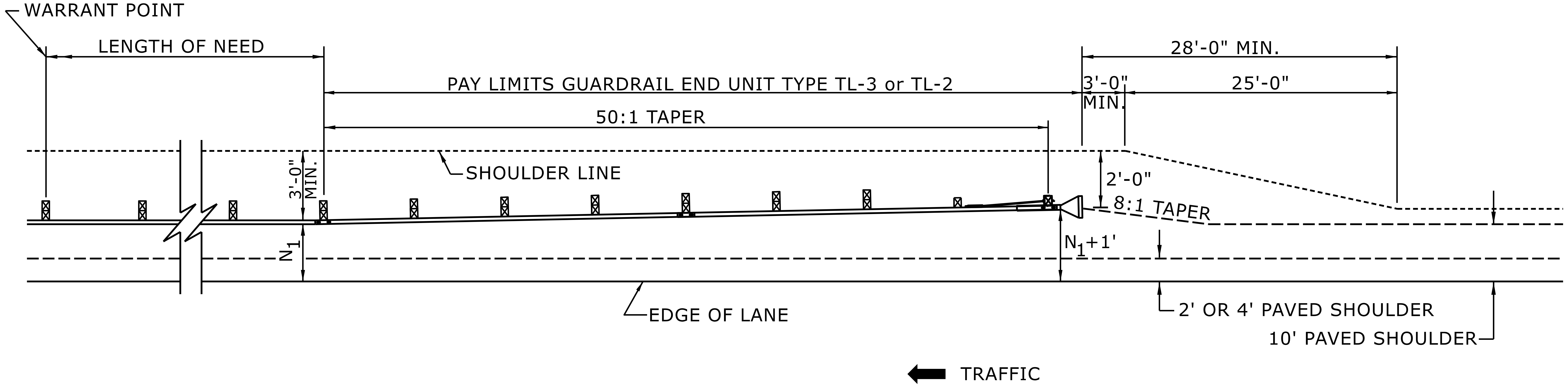


FILL SECTION



CUT SECTION

"N_1"= DISTANCE FROM EDGE OF LANE TO FACE OF GUARDRAIL WHERE GUARDRAIL IS PARALLEL TO LANE.



FOR POSTED SPEEDS ≥ 45mph USE GREU TYPE TL-3
FOR POSTED SPEEDS < 45mph USE GREU TYPE TL-2

DETAIL OF BEGINNING OF GUARDRAIL IN CUT OR FILL SECTION

STATE OF
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DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

SHEET 6 OF 15
862D01

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NICOLE M. HACKLER
10/24/2024

Signed by:
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ORIGINAL BY: S.CALHOUN DATE: 7-25-2024
MODIFIED BY: DATE:
CHECKED BY: DATE:
FILE SPEC.:

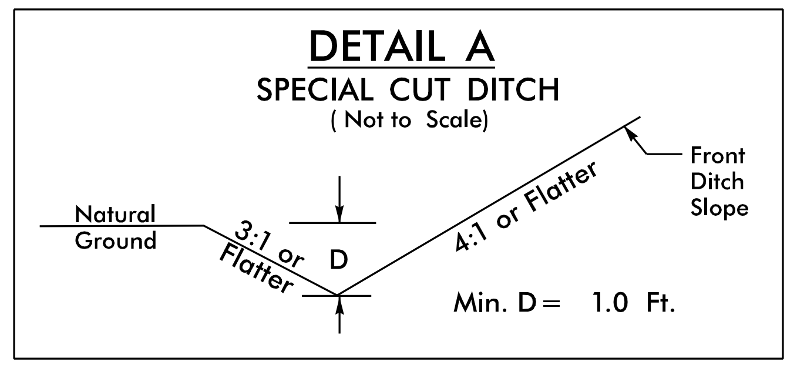
PROJECT REFERENCE NO.	SHEET NO.
R-5709C	2D-1

R/W SHEET NO.

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
SEAL 040878 MARY E. MAYS YAHL 10/15/2024 Signed by: Mary Mays Yahl 8BE1E2E9BC7E48D...	SEAL 51640 COURTLAND A. HOFFMAN 10/14/2024 Signed by: Courtland Hoffman 93469E2FB738480...

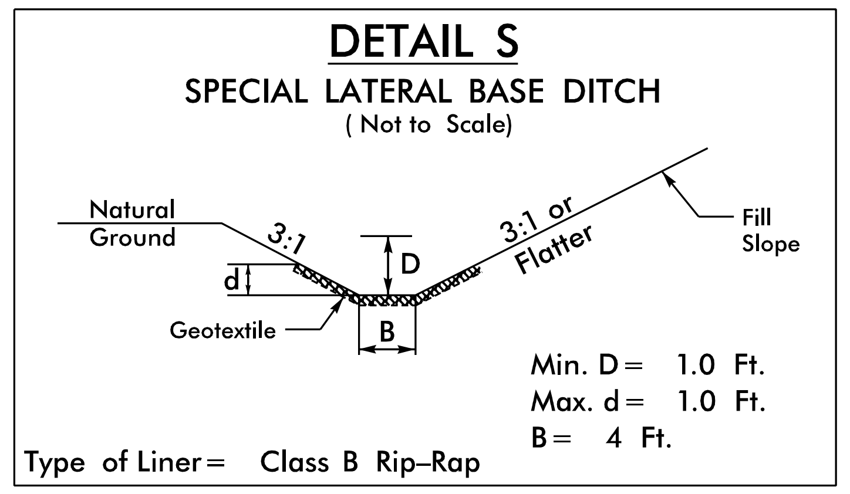
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DETAIL A



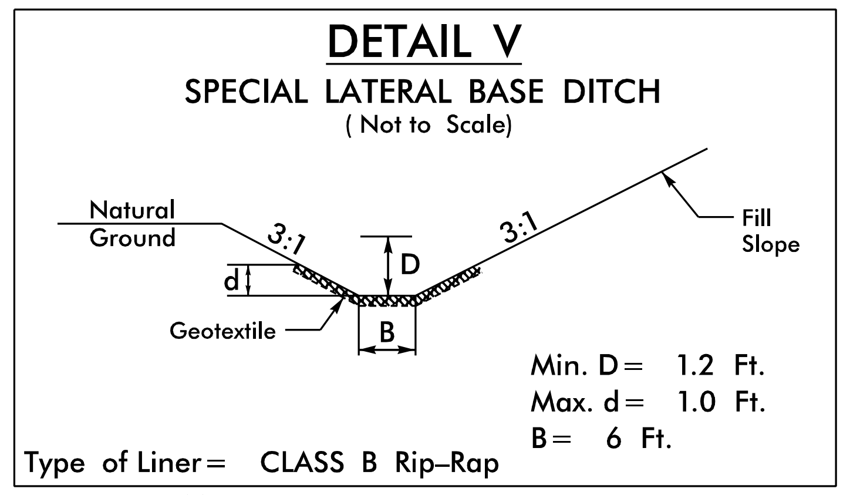
–L– FROM STA. 376+00 TO STA. 376+36 LT
–L– FROM STA. 384+50 TO STA. 385+00 LT
–L– FROM STA. 398+50 TO STA. 400+40 LT
–L– FROM STA. 415+64 TO STA. 417+00 LT
–L– FROM STA. 424+00 TO STA. 424+82 LT
–L– FROM STA. 428+00 TO STA. 428+50 RT
–L– FROM STA. 435+44 TO STA. 438+50 LT
–L– FROM STA. 464+50 TO STA. 465+50 LT
–L– FROM STA. 472+00 TO STA. 477+75 LT
–L– FROM STA. 484+00 TO STA. 487+50 LT
–L– FROM STA. 524+50 TO STA. 532+00 LT
–L– FROM STA. 544+00 TO STA. 549+50 LT
–L– FROM STA. 551+50 TO STA. 552+00 LT
–L– FROM STA. 573+00 TO STA. 573+50 LT
–L– FROM STA. 578+00 TO STA. 580+29 LT
–L– FROM STA. 592+50 TO STA. 596+00 RT
–L– FROM STA. 623+50 TO STA. 643+00 RT
–L– FROM STA. 642+50 TO STA. 670+50 LT
–L– FROM STA. 656+00 TO STA. 665+15 RT
–L– FROM STA. 671+20 TO STA. 676+00 LT
–L– FROM STA. 676+50 TO STA. 678+50 LT
–L– FROM STA. 681+00 TO STA. 684+00 RT
–L– FROM STA. 685+50 TO STA. 690+00 LT
–L– FROM STA. 692+00 TO STA. 696+00 RT
–L– FROM STA. 701+00 TO STA. 707+50 RT
–L– FROM STA. 708+66 TO STA. 710+03 LT
–L– FROM STA. 710+00 TO STA. 711+50 RT
–L– FROM STA. 715+00 TO STA. 715+50 LT
–L– FROM STA. 725+50 TO STA. 726+50 RT
–L– FROM STA. 726+50 TO STA. 731+50 LT
–L– FROM STA. 730+00 TO STA. 731+50 RT
–L– FROM STA. 733+50 TO STA. 736+00 LT
–L– FROM STA. 736+00 TO STA. 736+50 RT
–L– FROM STA. 743+00 TO STA. 745+00 LT
–L– FROM STA. 745+00 TO STA. 747+00 RT
–L– FROM STA. 746+50 TO STA. 751+00 LT
–L– FROM STA. 753+50 TO STA. 755+00 LT
–L– FROM STA. 756+50 TO STA. 757+00 RT
–L– FROM STA. 766+50 TO STA. 768+00 LT
–L– FROM STA. 769+50 TO STA. 772+50 RT
–L– FROM STA. 773+48 TO STA. 775+50 RT
–L– FROM STA. 778+50 TO STA. 782+50 LT
–L– FROM STA. 778+50 TO STA. 779+50 RT
–L– FROM STA. 786+00 TO STA. 786+97 LT
–L– FROM STA. 786+50 TO STA. 794+37 RT
–L– FROM STA. 795+28 TO STA. 795+65 RT
–L– FROM STA. 812+30 TO STA. 812+33 RT
–L– FROM STA. 814+00 TO STA. 815+00 RT
–L– FROM STA. 815+00 TO STA. 816+50 LT
–L– FROM STA. 818+50 TO STA. 820+50 RT
–L– FROM STA. 821+50 TO STA. 822+96 LT
–L– FROM STA. 822+50 TO STA. 822+64 RT
–L– FROM STA. 826+50 TO STA. 827+50 RT
–L– FROM STA. 832+00 TO STA. 834+00 LT
–L– /–Y11A– FROM STA. 376+00 TO STA. 376+39 RT
–Y21– FROM STA. 10+81 TO STA. 11+50 LT
–Y21– FROM STA. 10+71 TO STA. 12+00 RT
–Y22– FROM STA. 11+00 TO STA. 11+50 LT
–Y24A– FROM STA. 10+70 TO STA. 11+00 LT
–Y24A– FROM STA. 11+50 TO STA. 12+50 RT
–Y26– FROM STA. 14+00 TO STA. 14+50 RT
–Y26– FROM STA. 18+50 TO STA. 23+50 RT
–Y26A– FROM STA. 13+00 TO STA. 15+10 RT

DETAIL S



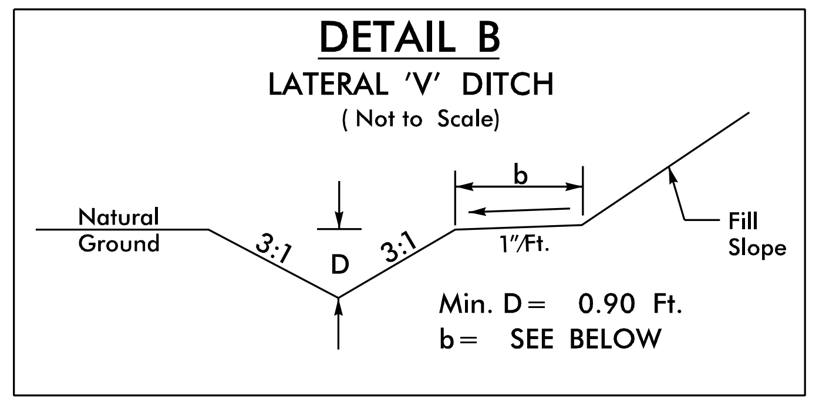
–L– FROM STA. 431+00 TO STA. 432+50 LT
–L– FROM STA. 543+00 TO STA. 545+48 RT
–Y14– FROM STA. 13+00 TO STA. 14+50 LT

DETAIL V



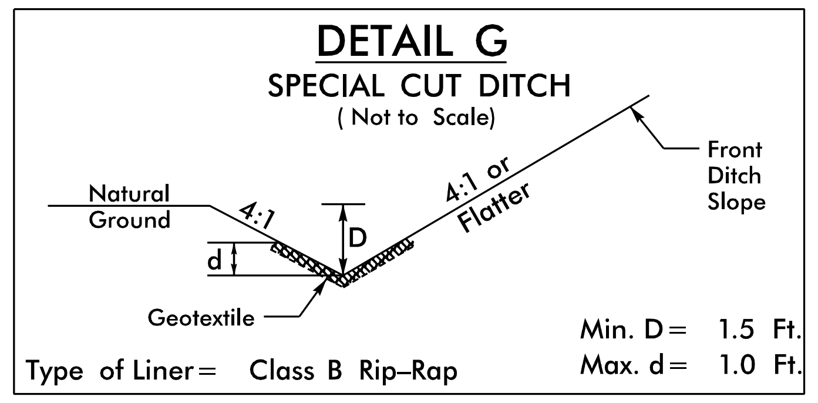
–L– FROM STA. 715+50 TO STA. 717+00 LT

DETAIL B



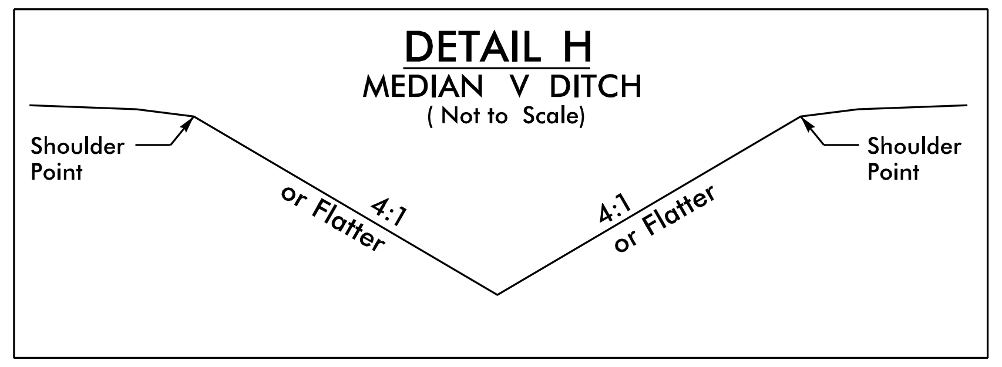
–L– FROM STA. 367+50 TO STA. 371+50 RT, b=5', DDE=122 CY
–L– FROM STA. 391+00 TO STA. 393+00 RT, b=2', DDE=19 CY
–L– FROM STA. 393+50 TO STA. 396+00 LT, b=2', DDE=228 CY
–L– FROM STA. 465+00 TO STA. 466+69 RT, b=2', DDE=83 CY
–L– FROM STA. 471+50 TO STA. 473+75 RT, b=5', DDE=48 CY
–L– FROM STA. 474+35 TO STA. 477+67 RT, b=5', DDE=112 CY
–L– FROM STA. 499+50 TO STA. 502+00 RT; b=2', DDE=190 CY
–L– FROM STA. 707+50 TO STA. 708+27 RT, b=5', DDE=56 CY
–L– FROM STA. 711+50 TO STA. 716+40 RT, b=5', DDE=425 CY
–L– FROM STA. 736+50 TO STA. 737+93 RT, b=2', DDE=124 CY
–L– FROM STA. 743+50 TO STA. 745+00 RT, b=5', DDE=105 CY
–L– FROM STA. 747+00 TO STA. 748+50 RT, b=5', DDE=23 CY
–L– FROM STA. 750+11 TO STA. 756+50 RT, b=5', DDE=100 CY
–L– FROM STA. 751+00 TO STA. 753+50 LT, b=5', DDE=79 CY
–L– FROM STA. 768+00 TO STA. 772+00 LT, b=4', DDE=144 CY
–L– FROM STA. 806+50 TO STA. 808+00 RT, b=5', DDE=199 CY

DETAIL G



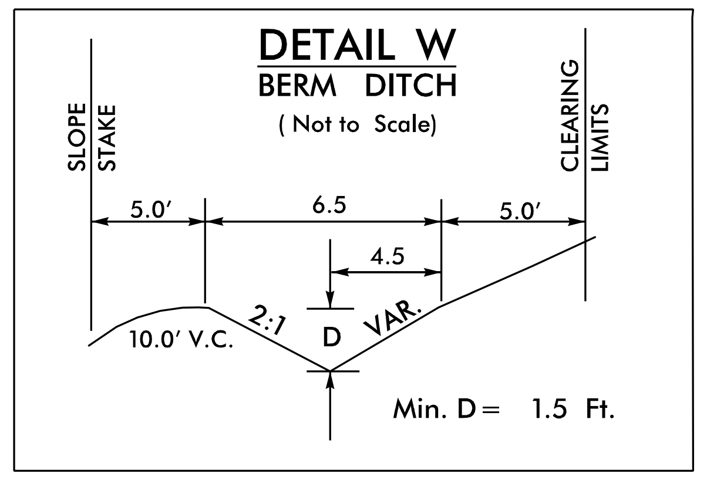
–L– FROM STA. 385+00 TO STA. 386+00 LT
–L– FROM STA. 471+00 TO STA. 471+50 LT
–L– FROM STA. 541+00 TO STA. 542+00 RT
–L– FROM STA. 772+00 TO STA. 774+00 LT
–L– FROM STA. 772+50 TO STA. 773+48 RT
–LX1– FROM STA. 12+67.14 TO 18+68.19 LT

DETAIL H



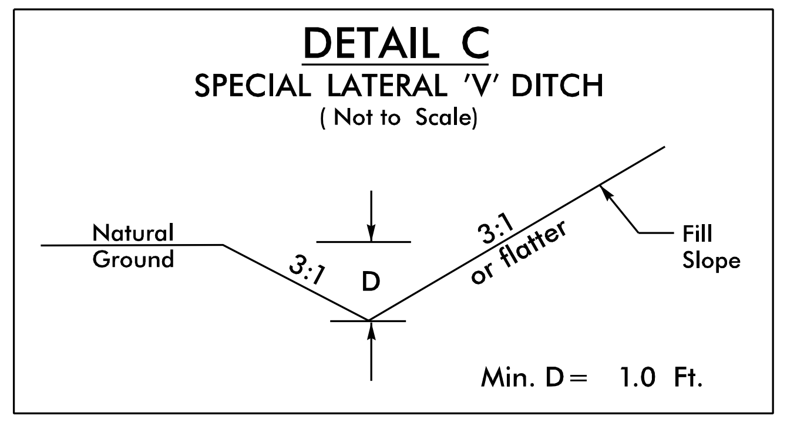
–L– FROM STA. 368+04 TO STA. 368+50 Median
–L– FROM STA. 389+50 TO STA. 390+50 Median
–L– FROM STA. 397+50 TO STA. 398+52 Median
–L– FROM STA. 398+52 TO STA. 399+00 Median
–L– FROM STA. 415+00 TO STA. 416+00 Median
–L– FROM STA. 437+50 TO STA. 438+28 Median
–L– FROM STA. 458+00 TO STA. 460+00 Median
–L– FROM STA. 465+00 TO STA. 466+50 Median
–L– FROM STA. 473+00 TO STA. 477+00 Median
–L– FROM STA. 478+00 TO STA. 483+94 Median
–L– FROM STA. 513+00 TO STA. 515+00 Median
–L– FROM STA. 524+50 TO STA. 527+50 Median
–L– FROM STA. 547+50 TO STA. 549+33 Median
–L– FROM STA. 562+50 TO STA. 563+50 Median
–L– FROM STA. 572+00 TO STA. 575+50 Median
–L– FROM STA. 582+50 TO STA. 587+61 Median
–L– FROM STA. 594+00 TO STA. 605+56 Median
–L– FROM STA. 612+00 TO STA. 616+50 Median
–L– FROM STA. 629+00 TO STA. 633+50 Median
–L– FROM STA. 640+00 TO STA. 647+75 Median
–L– FROM STA. 654+00 TO STA. 659+00 Median
–L– FROM STA. 659+50 TO STA. 665+15 Median
–L– FROM STA. 696+00 TO STA. 697+50 Median
–L– FROM STA. 701+00 TO STA. 706+00 Median
–L– FROM STA. 716+39 TO STA. 717+50 Median
–L– FROM STA. 724+50 TO STA. 727+00 Median
–L– FROM STA. 752+00 TO STA. 753+00 Median
–L– FROM STA. 758+00 TO STA. 760+00 Median
–L– FROM STA. 763+50 TO STA. 764+50 Median
–L– FROM STA. 773+41 TO STA. 775+00 Median
–L– FROM STA. 778+50 TO STA. 779+00 Median
–L– FROM STA. 780+50 TO STA. 781+50 Median
–L– FROM STA. 788+50 TO STA. 790+50 Median
–L– FROM STA. 796+26 TO STA. 803+50 Median
–L– FROM STA. 810+67 TO STA. 815+00 Median
–L– FROM STA. 817+00 TO STA. 817+37 Median

DETAIL W



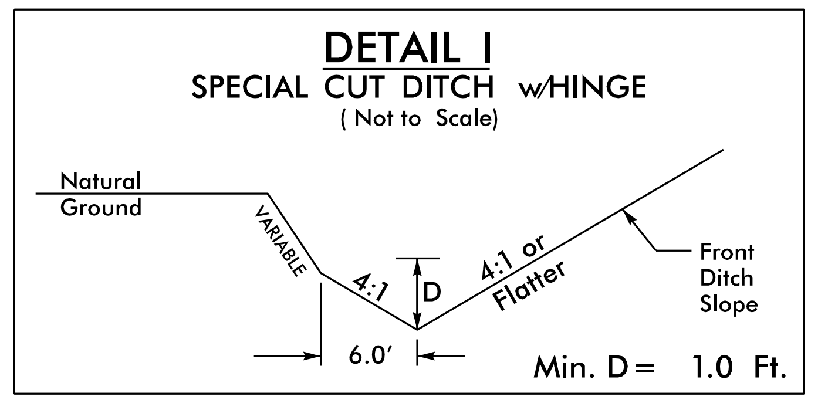
–L– FROM STA. 378+50 TO STA. 384+50 LT

DETAIL C



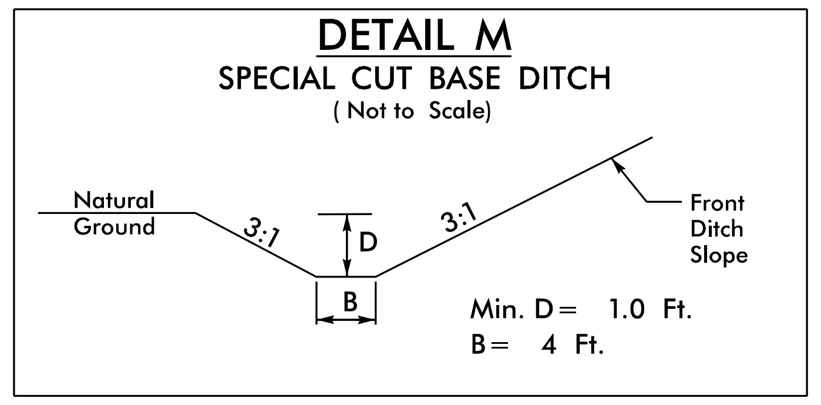
–L– FROM STA. 467+49 TO STA. 468+04 RT
–L– FROM STA. 479+00 TO STA. 480+50 RT
–L– FROM STA. 502+00 TO STA. 503+00 RT
–L– FROM STA. 505+35 TO STA. 506+00 RT
–L– FROM STA. 545+48 TO STA. 547+00 RT
–L– FROM STA. 568+50 TO STA. 569+00 LT
–L– FROM STA. 716+39 TO STA. 724+00 RT
–Y11A– FROM STA. 11+00 TO STA. 11+50 LT
–Y14– FROM STA. 11+00 TO STA. 14+50 RT
–Y15– FROM STA. 11+75 TO STA. 14+50 LT
–Y15– FROM STA. 12+50 TO STA. 14+50 RT
–Y20– FROM STA. 13+00 TO STA. 14+90 LT
–Y20– FROM STA. 13+00 TO STA. 15+10 RT
–Y23– FROM STA. 10+85 TO STA. 11+50 RT
–Y23– FROM STA. 10+96 TO STA. 12+00 LT
–Y26– FROM STA. 11+13 TO STA. 14+00 RT
–Y26– FROM STA. 15+00 TO STA. 18+50 RT
–Y27– FROM STA. 11+12 TO STA. 12+32 RT

DETAIL I



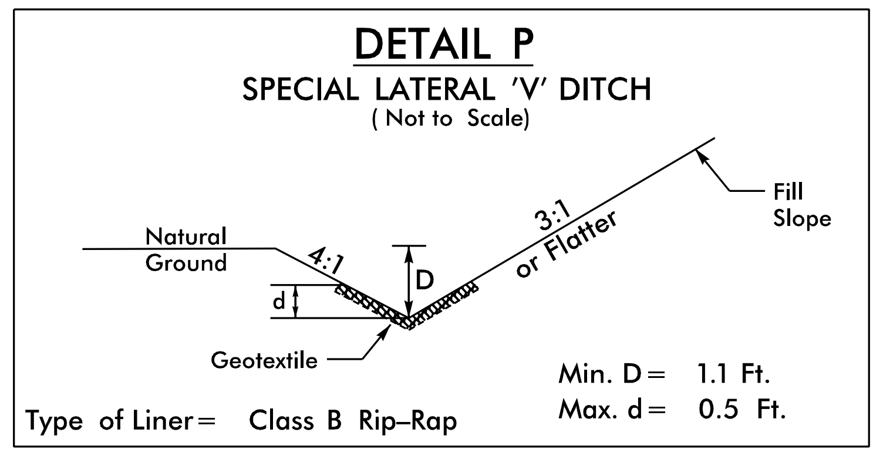
–L– FROM STA. 330+50 TO STA. 333+50 LT
–L– FROM STA. 352+50 TO STA. 359+50 LT

DETAIL M



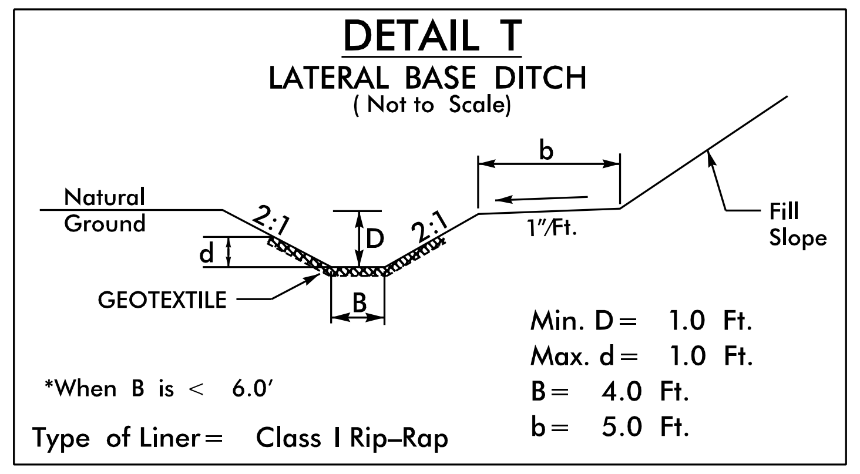
–L– FROM STA. 445+50 TO STA. 447+00 LT
–L– FROM STA. 592+00 TO STA 593+50 LT
–Y24– FROM STA. 12+50 TO STA. 14+75 LT

DETAIL P



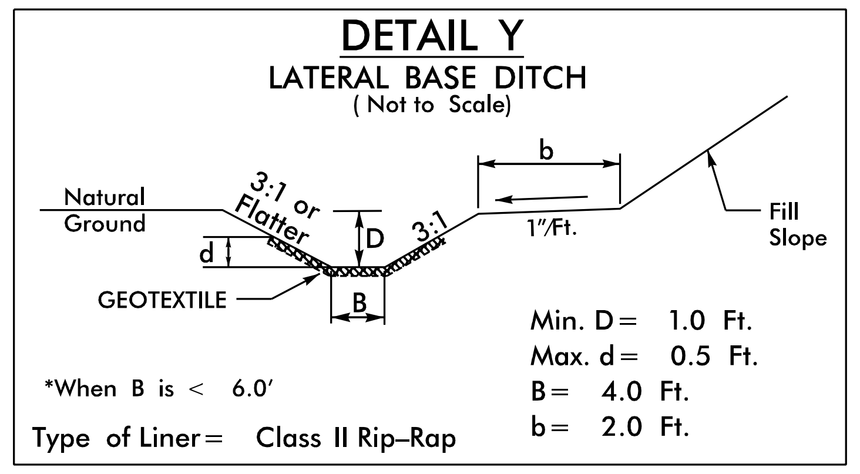
–L– FROM STA. 542+00 TO STA. 543+00 RT
–Y12– FROM STA. 11+07 TO STA. 12+00 RT

DETAIL T



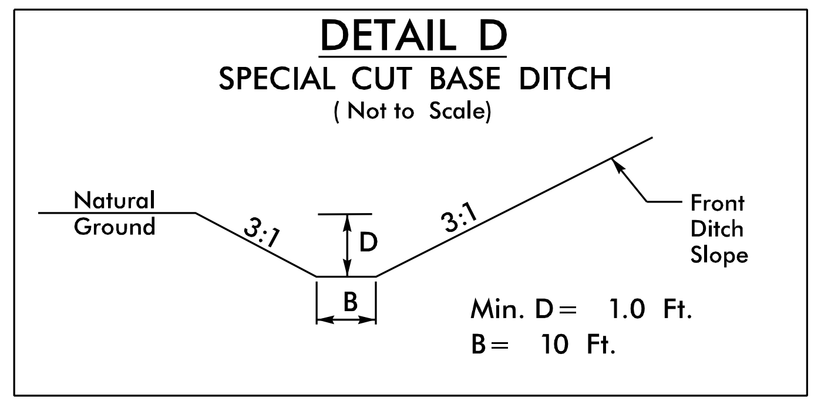
–LX1– FROM STA. 10+00 TO 12+67.14 LT, DDE=248 CY

DETAIL Y



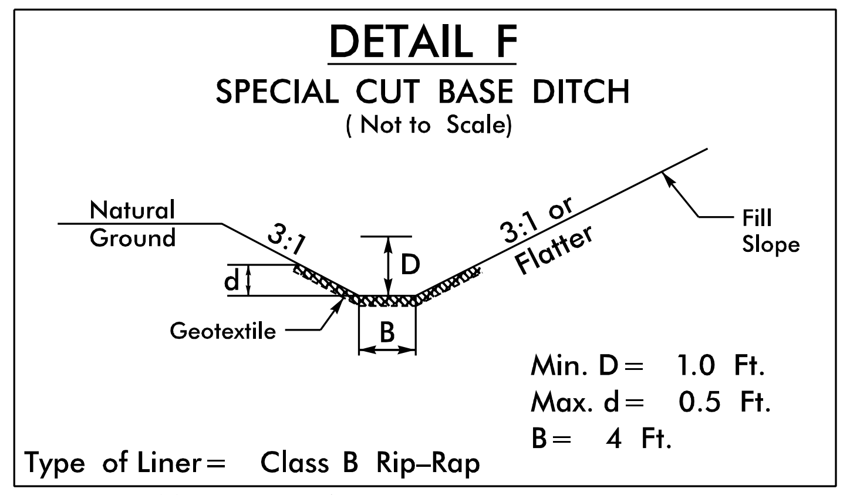
–Y11C– FROM STA. 10+67 TO STA. 11+28 RT, DDE=52 CY

DETAIL D



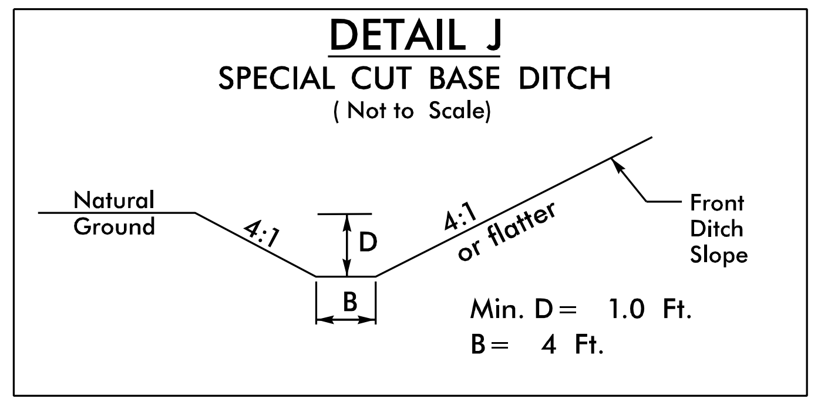
–Y14– FROM STA. 11+00 TO STA. 13+00 LT

DETAIL F



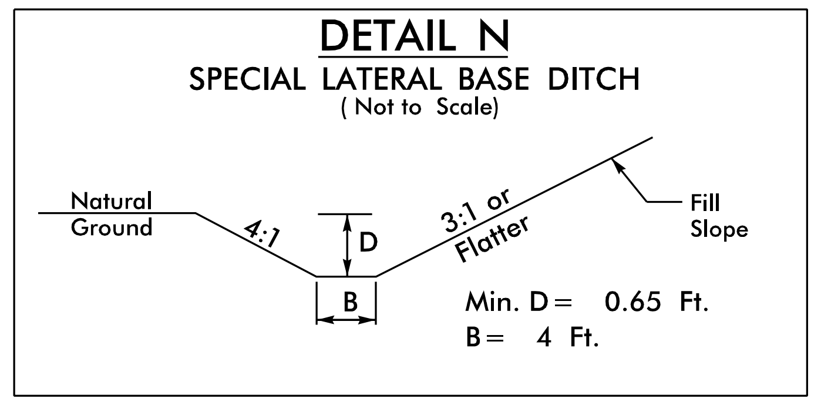
–L– FROM STA. 426+00 LT TO STA. 431+00 LT

DETAIL J



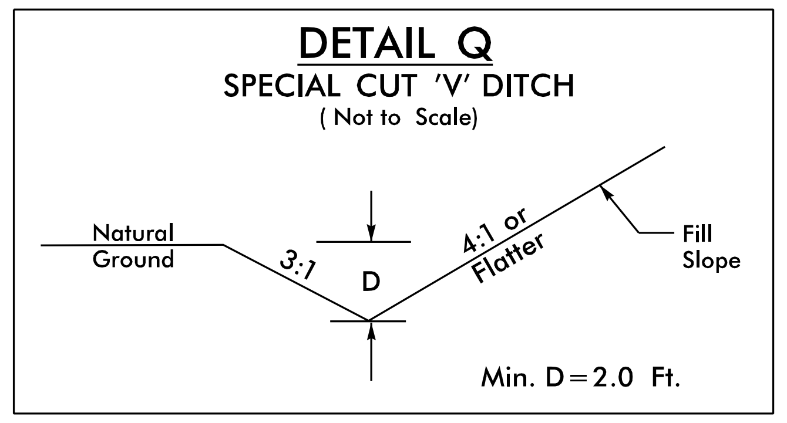
–L– FROM STA. 596+00 TO STA. 607+00 RT
–L– FROM STA. 718+50 TO STA. 719+00 LT

DETAIL N



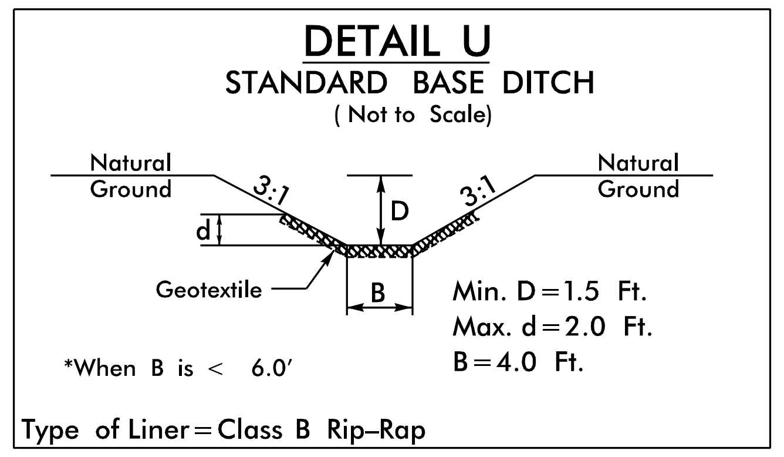
–L– FROM STA. 391+00 TO STA. 393+00 RT
–L– FROM STA. 505+50 TO STA. 506+00 RT

DETAIL Q



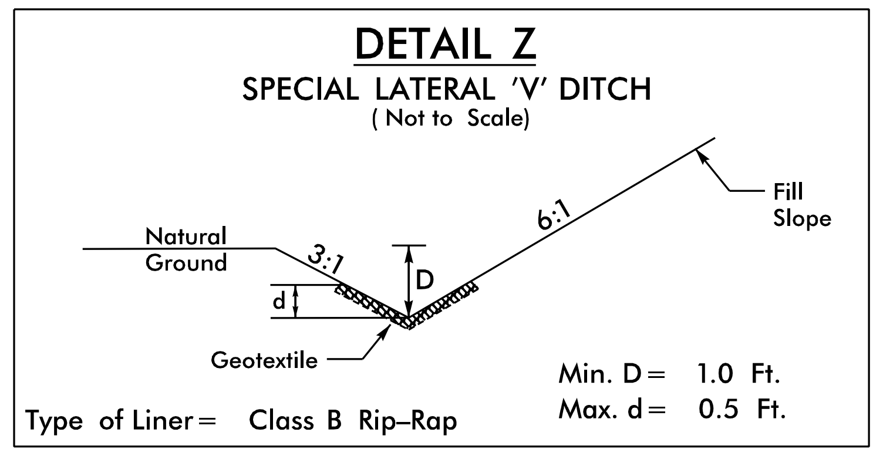
–L– FROM STA. 480+50 TO STA. 481+50 RT
–L– FROM STA. 489+50 TO STA. 498+00 RT
–L– FROM STA. 496+00 TO STA. 497+50 LT
–L– FROM STA. 506+00 TO STA. 507+50 RT
–L– FROM STA. 787+79 TO STA. 800+30 LT

DETAIL U



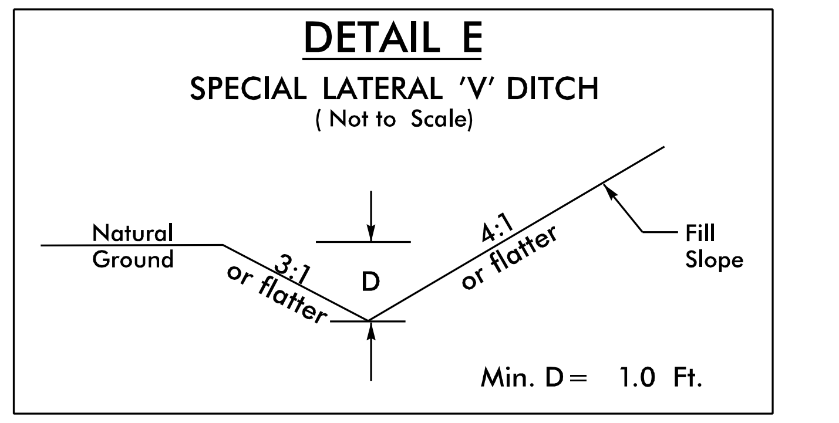
–L– STA. 644+46 LT; S=0.33%; L=60'; B=4'
Beg. El.=364.00; End El.=362.00; DDE=62 CY; 40 TON RIP–RAP

DETAIL Z



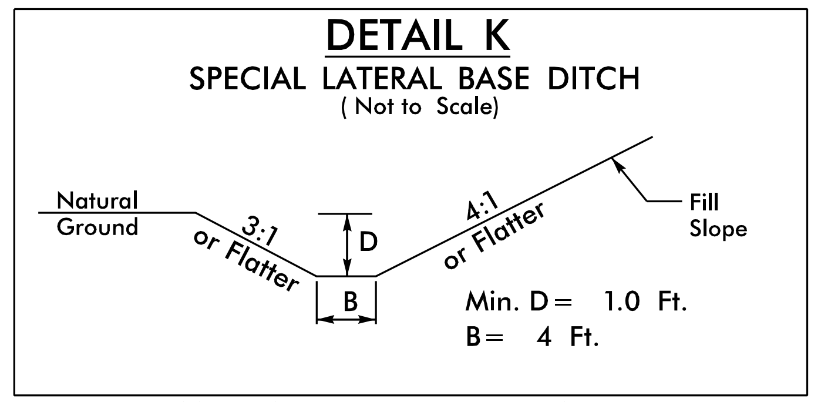
–Y13– FROM STA. 15+50 TO STA. 19+00 LT, DDE=825

DETAIL E



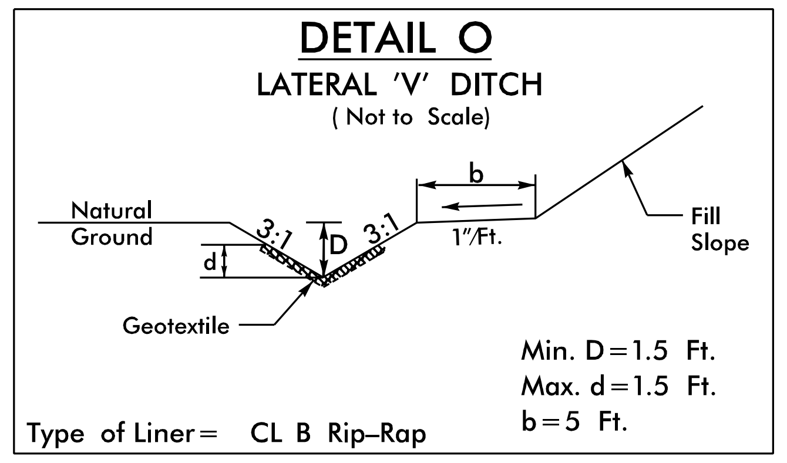
–L– FROM STA. 368+00 TO STA. 371+00 LT
–L– FROM STA. 379+50 TO STA. 380+50 RT
–L– FROM STA. 387+50 TO STA. 389+50 LT
–L– FROM STA. 426+00 TO STA. 428+50 RT
–L– FROM STA. 477+75 TO STA. 479+00 LT
–L– FROM STA. 480+50 TO STA. 483+00 LT
–L– FROM STA. 507+50 TO STA. 511+50 LT
–L– FROM STA. 524+50 TO STA. 526+91 RT
–L– FROM STA. 573+50 TO STA. 576+83 LT
–L– FROM STA. 686+20 TO STA. 686+90 RT
–L– FROM STA. 698+00 TO STA. 700+50 LT
–L– FROM STA. 767+50 TO STA. 769+50 RT
–L– FROM STA. 832+50 TO STA. 834+00 LT

DETAIL K



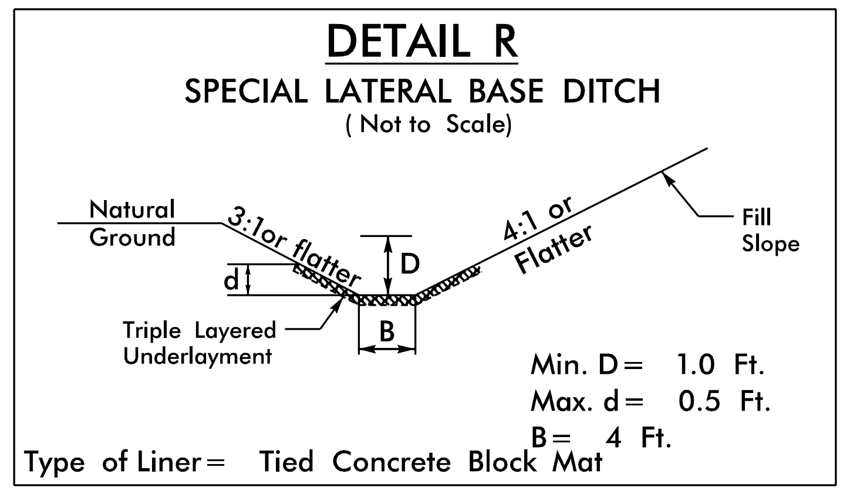
–L– FROM STA. 499+34 TO STA. 501+00 LT
–L– FROM STA. 717+00 TO STA. 718+50 LT
–L– FROM STA. 810+49 TO STA. 812+30 RT

DETAIL O



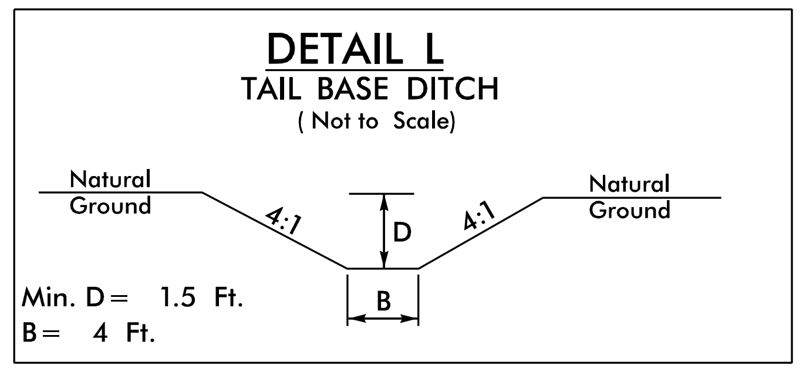
–L– FROM STA. 499+00 TO STA. 499+37 RT, DDE=43 CY
–L– FROM STA. 731+50 TO STA. 733+27 RT, DDE=122 CY

DETAIL R



–L– FROM STA. 418+00 TO STA. 420+50 LT

DETAIL L



–L– STA. 665+15 RT; S=0.04%; L=60';
Beg El.=358.94; End El.=358.68; DDE=33 CY
–L– STA. 773+35 LT (RT OF RR); S=1.25%; L=40';
Beg El.=297.00; End El.=296.50; DDE=22 CY
–L– STA. 773+35 LT (LT OF RR); S=1.08%; L=28';
Beg. El.=296.19; End El.=295.89; DDE=16 CY
–L– STA. 774+00 LT; S=5.24%; L=63';
Beg El.=299.80; End El.=296.50; DDE=35 CY
–L– STA. 812+30 RT; S=0.00%; L=68';
Beg El.=280.58; End El.=280.58; DDE=120 CY

RK&K
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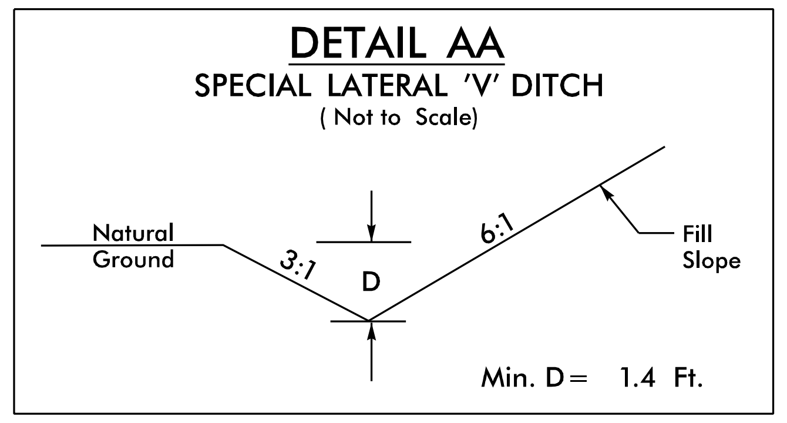
default

PROJECT REFERENCE NO.	SHEET NO.
R-5709C	2D-2
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
10/15/2024 SEAL 040878 MARY E. MAYS YAHL Signed by: Mary Mays Yahl 8BE1E2E9BC7E48D...	10/14/2024 SEAL 51640 COURTLAND A. HOFFMAN Signed by: Courtland Hoffman 93469E2FB738480...

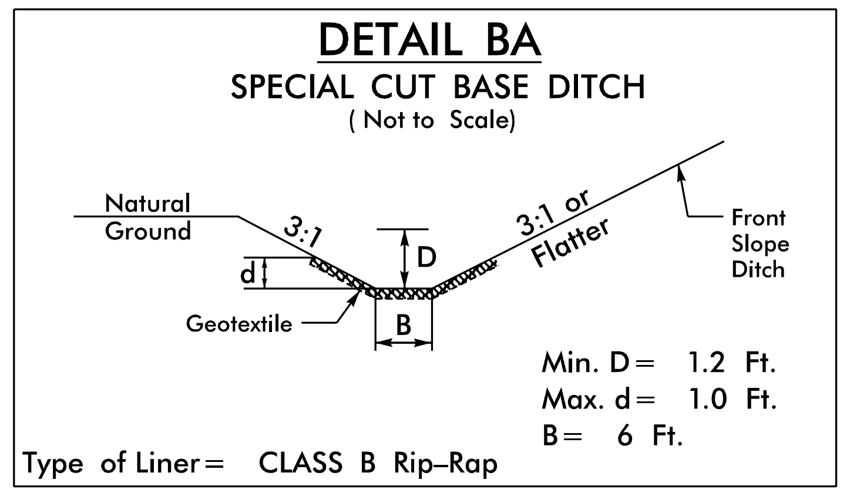
DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

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



–Y13– FROM STA. 11+50 TO STA. 12+00 LT

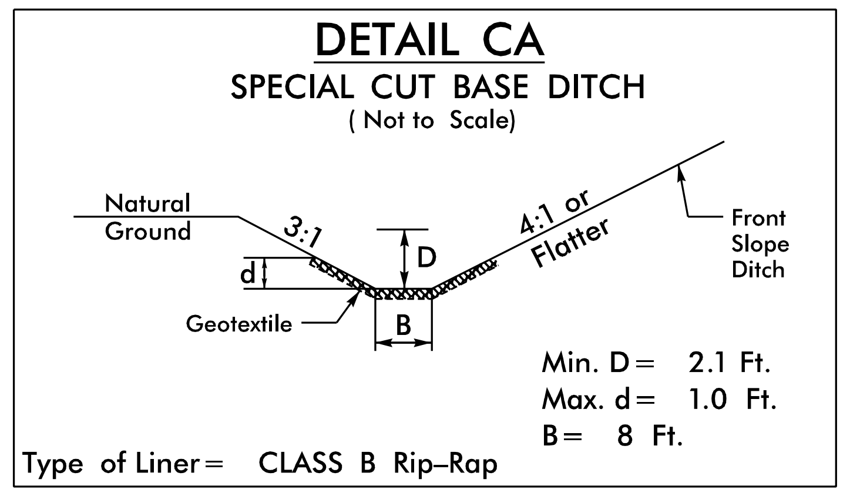
DETAIL BA
SPECIAL CUT BASE DITCH
(Not to Scale)



Type of Liner = CLASS B Rip–Rap

–Y14– FROM STA. 11+00 TO STA. 13+00 LT

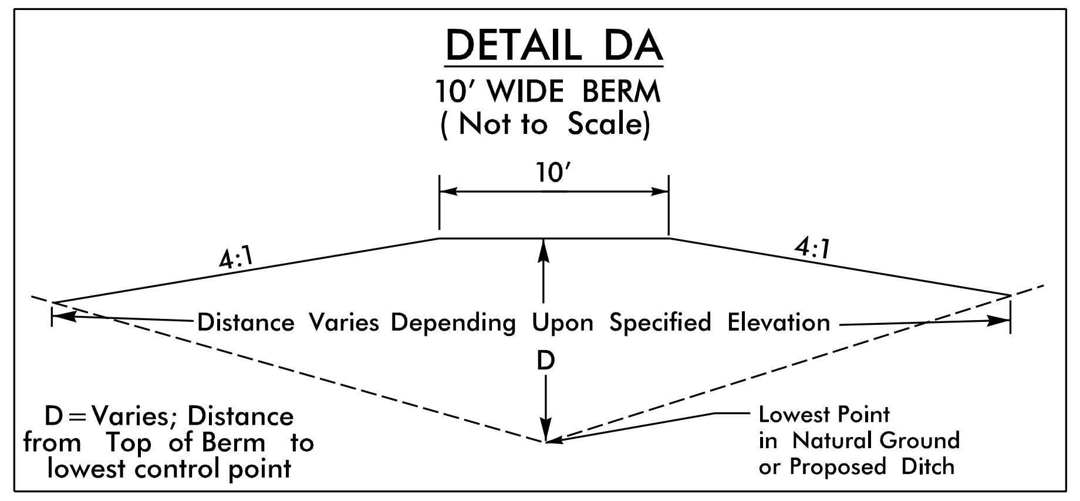
DETAIL CA
SPECIAL CUT BASE DITCH
(Not to Scale)



Type of Liner = CLASS B Rip–Rap

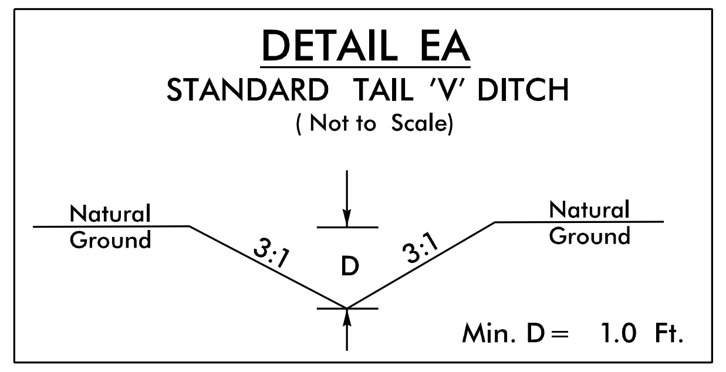
–Y14– FROM STA. 10+50 TO STA. 11+00 LT

DETAIL DA
10' WIDE BERM
(Not to Scale)



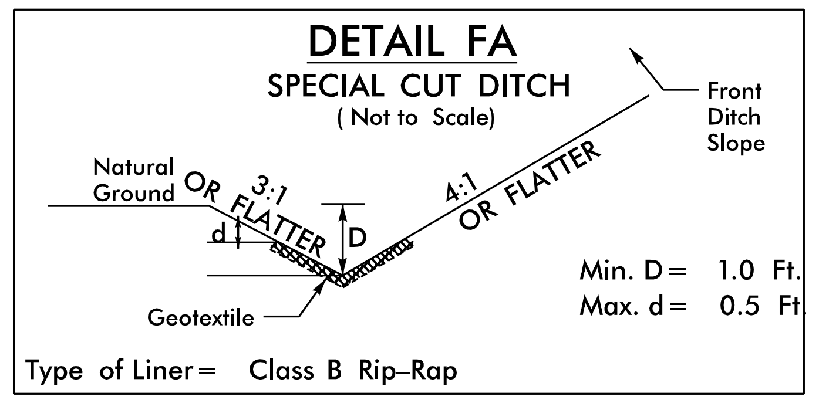
–L– STA. 386+00 LT; TOP ELEVATION = 447.3
–L– STA. 407+50 LT; TOP ELEVATION = 447.8
–L– STA. 471+50 LT; TOP ELEVATION = 447.0
–L– STA. 518+75 LT; TOP ELEVATION = 447.5
–L– STA. 708+44 LT; TOP ELEVATION = 349.2

DETAIL EA
STANDARD TAIL 'V' DITCH
(Not to Scale)



–L– STA. 321+36.60 TO STA. 323+00 RT; S = 0.79%; L = 163';
Beg. El. = 438.29; End El. = 437.00; DDE = 18 CY
–L– STA. 448+96 TO STA. 449+78 LT; S = 0.33%; L = 82';
Beg. El. = 473.74; End El. = 473.47; DDE = 5 CY
–L– STA. 656+70 LT; ; S = 0.85%; L = 39';
Beg. El. = 362.33; End El. = 362.00; DDE = 4 CY
–L– STA. 666+29 TO STA. 667+00 RT; S = 0.66%; L = 76';
Beg. El. = 359.25; End El. = 358.75; DDE = 19 CY
–L– FROM STA. 772+50 TO 773+30 LT (RT OF RR); S = 6.34%; L = 82';
Beg El. = 301.7; End El. = 296.5; DDE = 9 CY
–L– FROM STA. 772+94 TO 773+36 LT; S = 6.45%; L = 62';
Beg El. = 301.0; End El. = 297.0; DDE = 7 CY
–Y13– STA. 12+00 RT; ; S = 0.48%; L = 44';
Beg. El. = 473+95; End El. = 473.74; DDE = 4 CY
–LX1– FROM STA. 10+00 LT; S = 3.75%; L = 88';
Beg El. = 402.0; End El. = 398.7; DDE = 80 CY

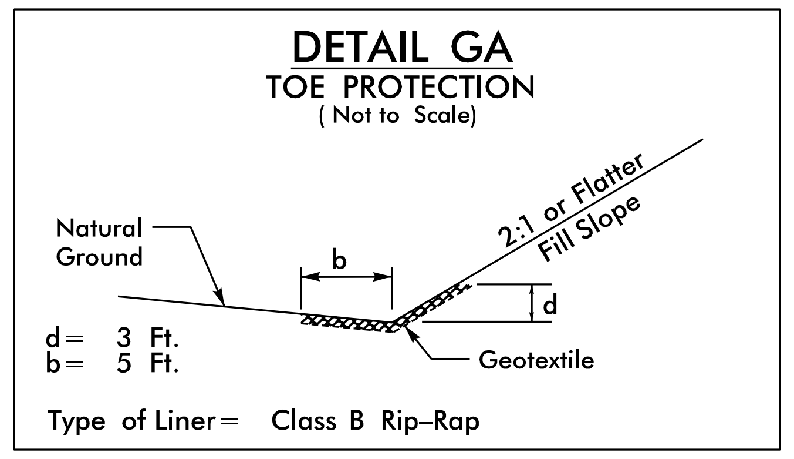
DETAIL FA
SPECIAL CUT DITCH
(Not to Scale)



Type of Liner = Class B Rip–Rap

–L– FROM STA. 458+50 TO STA. 459+50 LT
–L– FROM STA. 700+50 TO STA. 708+27 LT
–L– FROM STA. 492+50 TO STA. 499+34 LT

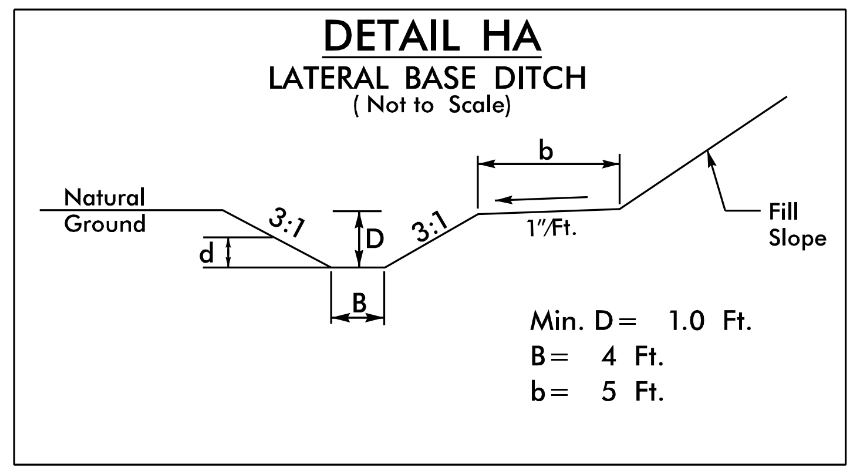
DETAIL GA
TOE PROTECTION
(Not to Scale)



Type of Liner = Class B Rip–Rap

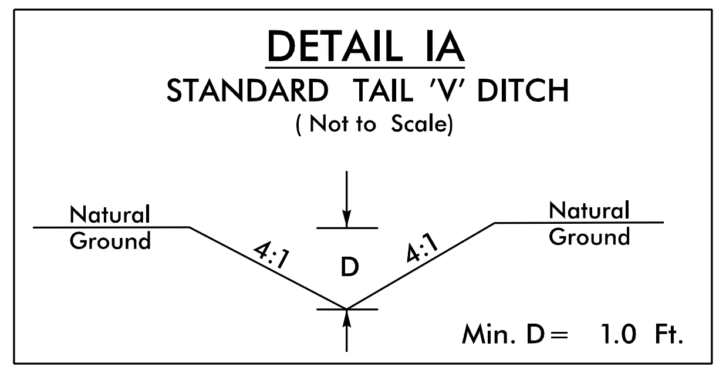
–L– FROM STA. 337+00 TO STA. 338+50 RT
–L– FROM STA. 396+00 TO STA. 397+50 LT
–L– FROM STA. 419+00 TO STA. 421+50 RT
–L– FROM STA. 438+50 TO STA. 445+00 LT
–L– FROM STA. 556+50 TO STA. 560+00 RT
–L– FROM STA. 557+80 TO STA. 559+75 LT
–L– FROM STA. 561+50 TO STA. 565+50 LT
–L– FROM STA. 564+65 TO STA. 568+00 RT
–L– FROM STA. 585+00 TO STA. 587+60 LT
–L– FROM STA. 590+00 TO STA. 591+50 LT
–L– FROM STA. 614+00 TO STA. 616+93 LT
–L– FROM STA. 808+80 TO STA. 810+07 LT
–L– FROM STA. 831+30 TO STA. 832+00 LT
–L– FROM STA. 831+30 TO STA. 832+00 RT
–Y11B– FROM STA. 10+35 TO STA. 11+40 RT
–Y11D– FROM STA. 12+53 TO STA. 14+75 LT
–Y26– FROM STA. 13+50 LT TO STA. 14+50 LT

DETAIL HA
LATERAL BASE DITCH
(Not to Scale)



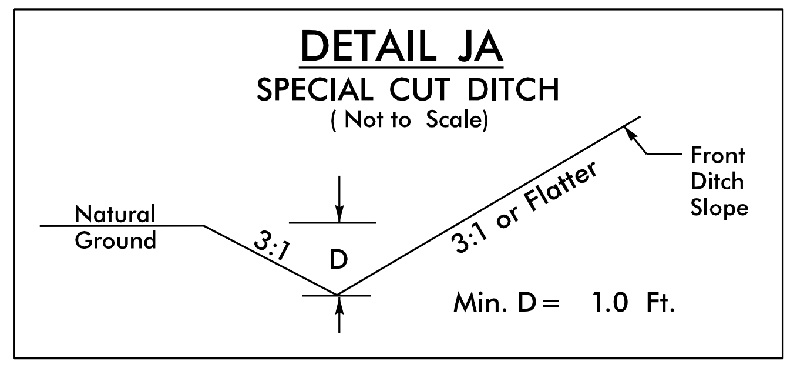
–L– FROM STA. 607+00 TO STA. 610+77 RT, DDE = 432 CY
–L– FROM STA 612+00 TO STA. 622+00 RT, DDE = 3,105 CY
–L– FROM STA 811+07 TO STA. 812+30 RT, DDE = 265 CY

DETAIL IA
STANDARD TAIL 'V' DITCH
(Not to Scale)



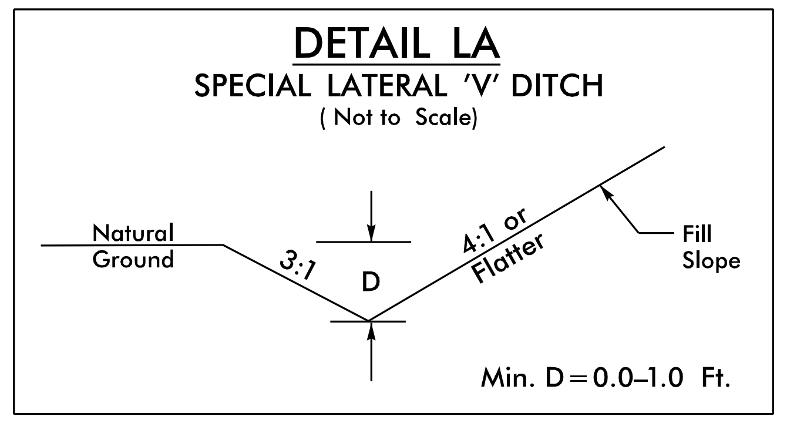
–L– FROM STA. 479+00 TO 479+18 RT; L = 74'
S = 0.95%; Beg El. = 436.7; End El. = 436.0; DDE = 11 CY
–L– FROM STA. 527+84 TO 528+41 RT; L = 113'
S = 2.27%; Beg El. = 426.4; End El. = 429.0; DDE = 17 CY
–L– FROM STA. 526+91 TO 527+36 RT; L = 120'
S = 3.48%; Beg El. = 431.17; End El. = 427.0; DDE = 18 CY
–Y26A– FROM STA. 11+00 LT; L = 219'
S = 2.28%; Beg El. = 283.0; End El. = 278.0; DDE = 24 CY

DETAIL JA
SPECIAL CUT DITCH
(Not to Scale)



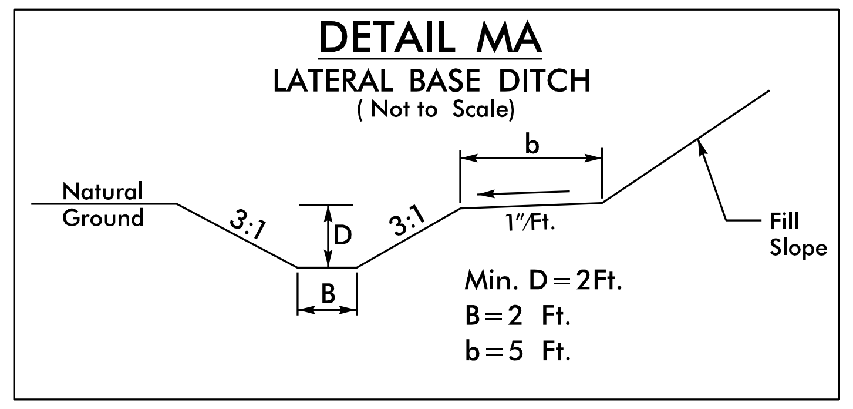
–L– FROM STA. 579+50 TO STA. 582+17 RT
–L– FROM STA. 690+00 TO STA. 692+00 RT
–L– FROM STA. 808+00 TO STA. 809+11 RT
–Y24A– FROM STA. 11+00 TO STA. 11+88 LT

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



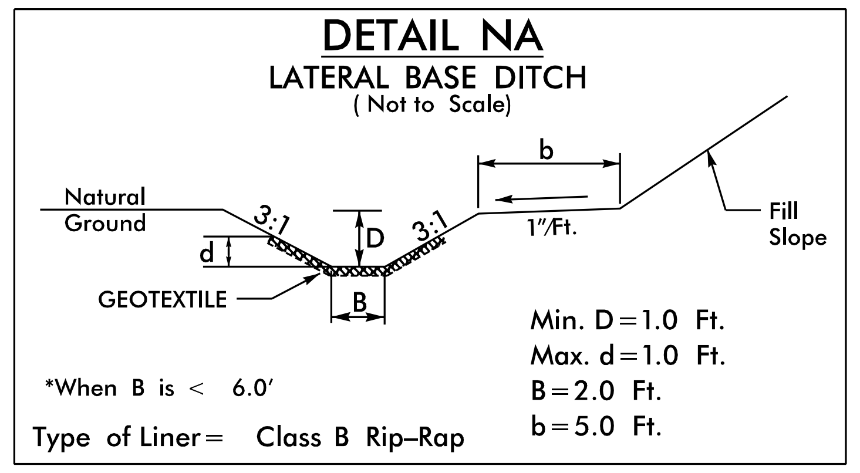
–L– FROM STA. 334+00 TO STA. 334+25 RT

DETAIL MA
LATERAL BASE DITCH
(Not to Scale)



–L– FROM STA. 574+65 TO STA. 575+50 RT, DDE = 48 CY

DETAIL NA
LATERAL BASE DITCH
(Not to Scale)

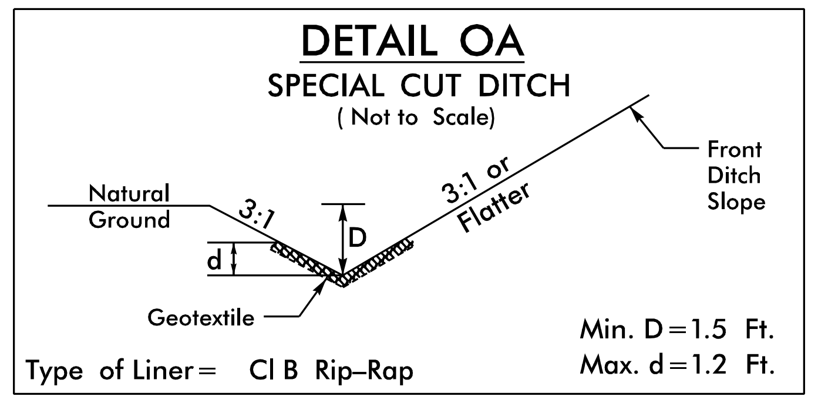


*When B is < 6.0'

Type of Liner = Class B Rip–Rap

–L– FROM STA. 360+50 TO STA. 362+00 RT, DDE = 6 CY

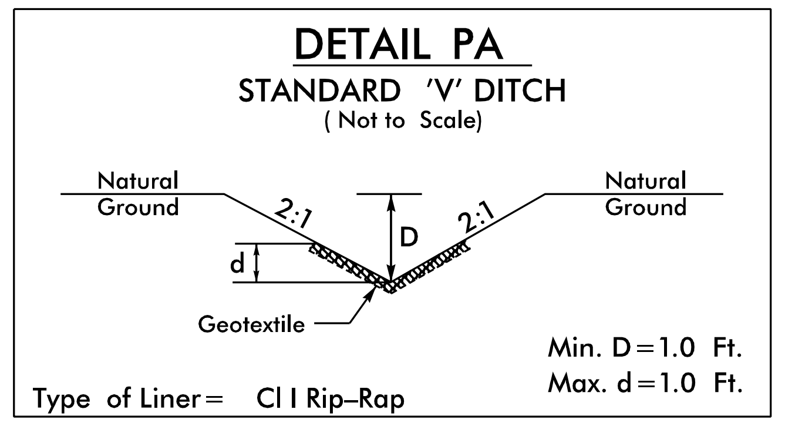
DETAIL OA
SPECIAL CUT DITCH
(Not to Scale)



Type of Liner = Cl B Rip–Rap

–L– FROM STA. 489+50 TO STA. 498+00 RT

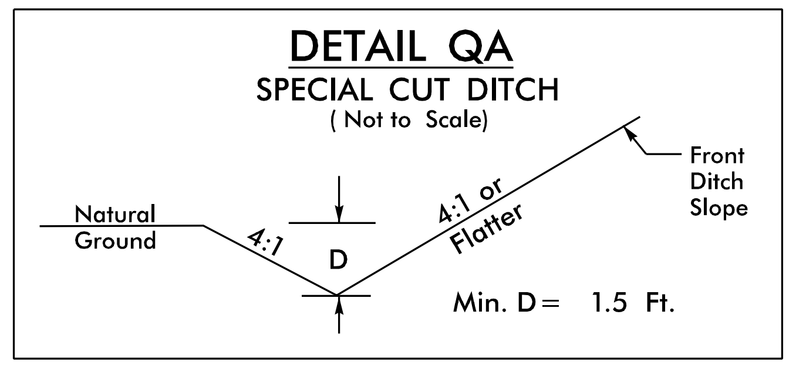
DETAIL PA
STANDARD 'V' DITCH
(Not to Scale)



Type of Liner = Cl I Rip–Rap

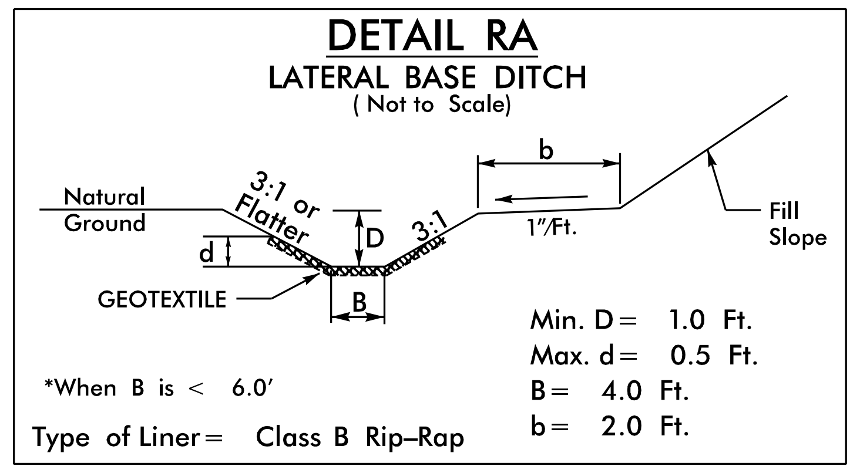
–L– FROM STA. 686+92 TO STA. 687+42 RT; S = 5.00%; L = 50';
Beg El. = 343.60 TO End El. = 341.08; DDE = 6 CY

DETAIL QA
SPECIAL CUT DITCH
(Not to Scale)



–L– FROM STA. 328+00 TO STA. 330+00 LT
–L– FROM STA. 336+00 TO STA. 339+00 LT
–L– FROM STA. 348+50 TO STA. 352+00 RT
–L– FROM STA. 358+00 TO STA. 358+88 RT
–L– FROM STA. 359+50 TO STA. 360+50 LT
–LX1– FROM STA. 18+68.19 TO 26+18.97 LT
–Y10– FROM STA. 15+00 TO STA. 15+85 RT
–Y10– FROM STA. 18+00 TO STA. 19+50 RT

DETAIL RA
LATERAL BASE DITCH
(Not to Scale)

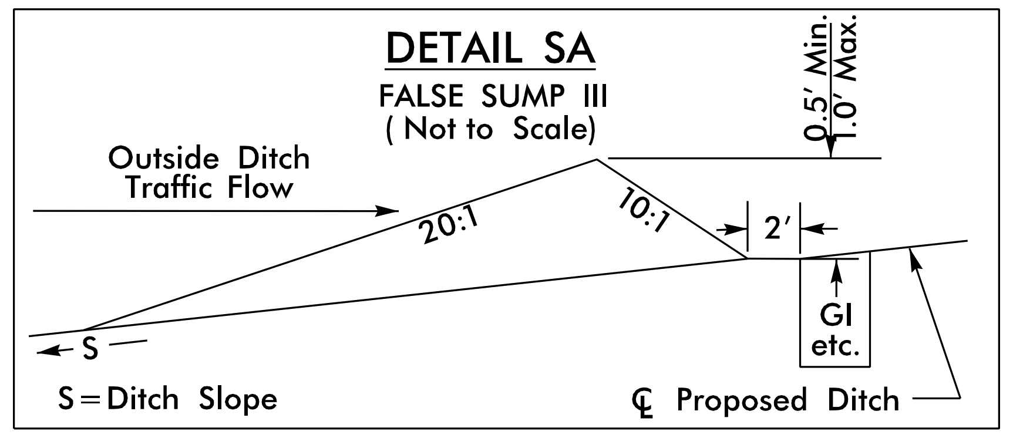


*When B is < 6.0'

Type of Liner = Class B Rip–Rap

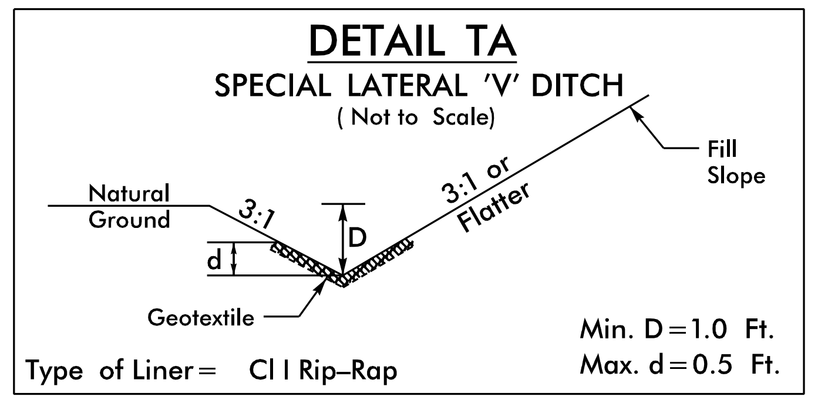
–L– FROM STA. 402+50 TO STA. 407+50 LT, DDE = 766 CY
–L– FROM STA. 557+00 TO STA. 557+75 LT, DDE = 23 CY
–L– FROM STA. 737+93 TO STA. 741+34 RT, DDE = 358 CY
–Y11E– FROM STA. 10+64 TO STA. 11+50 RT, DDE = 78 CY

DETAIL SA
FALSE SUMP III
(Not to Scale)



–L– STA. 385+12 RT
–L– STA. 422+00 RT
–L– STA. 555+63 RT
–L– STA. 569+00 RT
–L– STA. 644+63 LT

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



Type of Liner = Cl I Rip–Rap

–Y11– FROM STA. 11+08 TO STA. 11+50 RT

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8/17/99

PROJECT REFERENCE NO.	SHEET NO.
R-5709C	2D-3
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
10/15/2024 SEAL 040878 MARY E. MAYS YAHL Signed by: Mary Mays Yahl 8BE1F2F9BC7F48D...	10/14/2024 SEAL 51640 COURTLAND A. HOFFMAN Signed by: Courtland Hoffman 93469E2FB738480...

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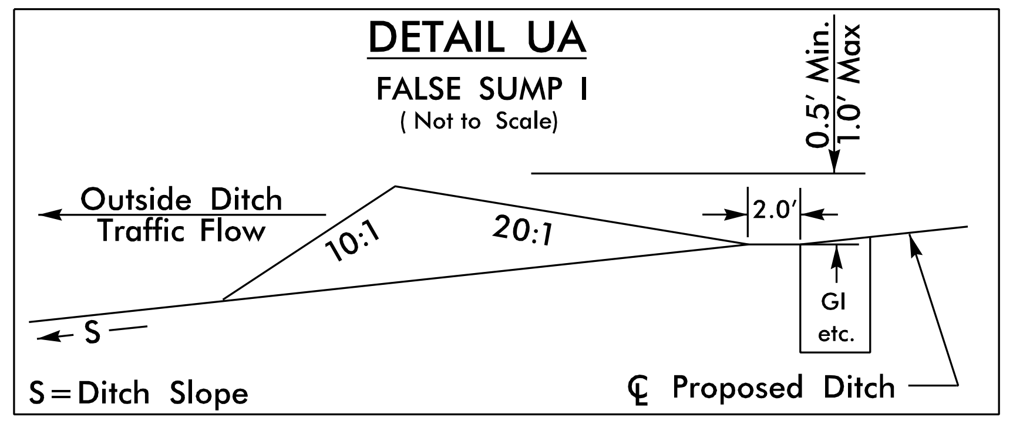
DETAIL UA

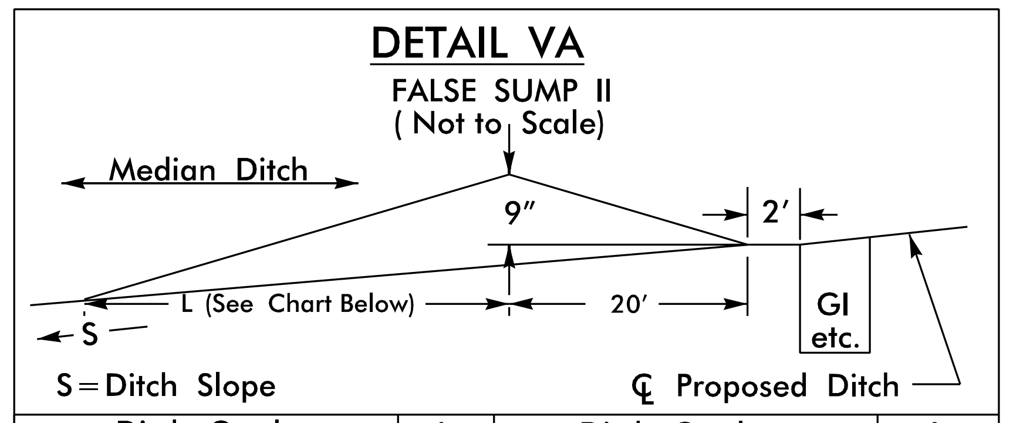
FALSE SUMP I
(Not to Scale)



–L– STA. 339 + 30 LT
–L– STA. 361 + 05 LT
–L– STA. 378 + 00 LT
–L– STA. 390 + 00 RT
–L– STA. 397 + 31 LT
–L– STA. 402 + 00 LT
–L– STA. 421 + 88 LT
–L– STA. 529 + 00 LT
–L– STA. 555 + 80 LT
–Y11A– STA. 11 + 39 LT

DETAIL VA

FALSE SUMP II
(Not to Scale)

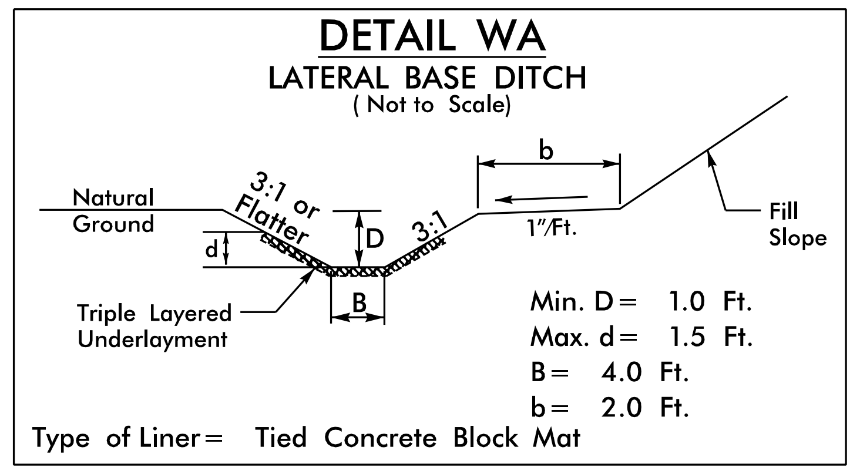


Ditch Grade	L	Ditch Grade	L
0.0% To 2.0%	20'	Over 4.0% To 6.0%	40'
Over 2.0% To 4.0%	30'	Over 6.0%	50'

–L– STA. 359 + 23 MEDIAN
–L– STA. 361 + 05 MEDIAN
–L– STA. 376 + 31 MEDIAN
–L– STA. 387 + 14 MEDIAN
–L– STA. 400 + 78 MEDIAN
–L– STA. 401 + 63 MEDIAN
–L– STA. 407 + 62 MEDIAN
–L– STA. 413 + 00 MEDIAN
–L– STA. 426 + 00 MEDIAN
–L– STA. 453 + 00 MEDIAN
–L– STA. 489 + 00 MEDIAN
–L– STA. 507 + 00 MEDIAN
–L– STA. 528 + 69 MEDIAN
–L– STA. 555 + 63 MEDIAN
–L– STA. 607 + 35 MEDIAN
–L– STA. 633 + 64 MEDIAN
–L– STA. 650 + 39 MEDIAN
–L– STA. 699 + 57 MEDIAN
–L– STA. 708 + 43 MEDIAN
–L– STA. 731 + 49 MEDIAN
–L– STA. 740 + 50 MEDIAN
–L– STA. 758 + 00 MEDIAN
–L– STA. 782 + 69 MEDIAN

DETAIL WA

LATERAL BASE DITCH
(Not to Scale)



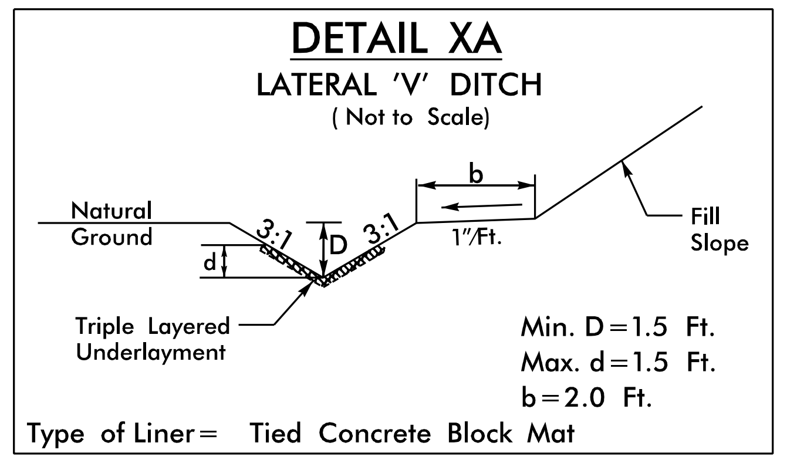
Min. D = 1.0 Ft.
Max. d = 1.5 Ft.
B = 4.0 Ft.
b = 2.0 Ft.

Type of Liner = Tied Concrete Block Mat

–L– FROM STA. 389 + 50 TO STA. 393 + 00 LT, DDE = 464 CY

DETAIL XA

LATERAL 'V' DITCH
(Not to Scale)



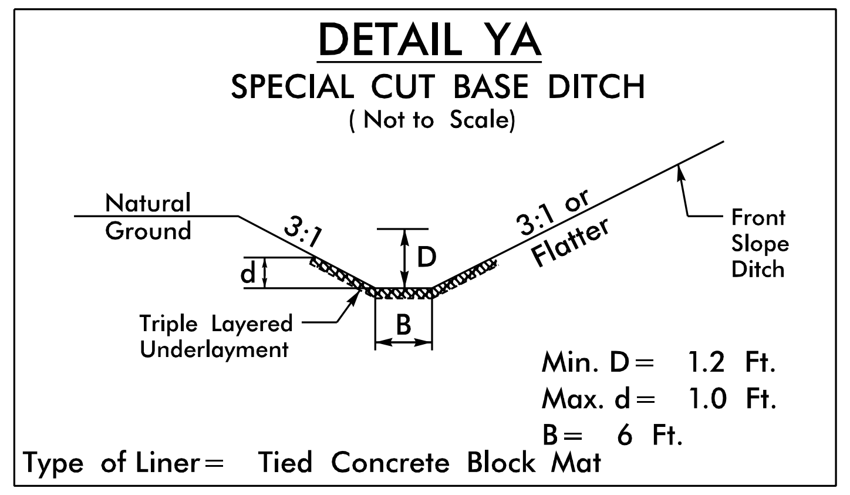
Min. D = 1.5 Ft.
Max. d = 1.5 Ft.
b = 2.0 Ft.

Type of Liner = Tied Concrete Block Mat

–L– FROM STA. 393 + 00 TO STA. 393 + 50 LT, DDE = 93 CY
–L– FROM STA. 407 + 50 TO STA 415 + 64 LT, DDE = 1,311 CY

DETAIL YA

SPECIAL CUT BASE DITCH
(Not to Scale)



Min. D = 1.2 Ft.
Max. d = 1.0 Ft.
B = 6 Ft.

Type of Liner = Tied Concrete Block Mat

–L– FROM STA. 415 + 64 TO STA. 417 + 00 LT

DETAIL ZA

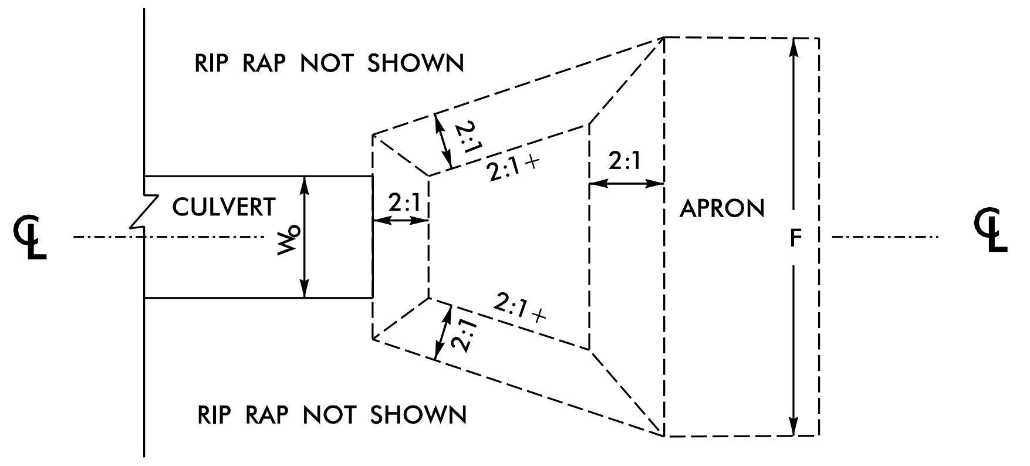
RIP–RAPPED ENERGY DISSIPATOR BASIN

DIM. (ft)	RIP RAP BASIN #		
	1	2	3
A	2		
B	1.5		
C	2		
D	2		
E	10		
F	37		
G	20		

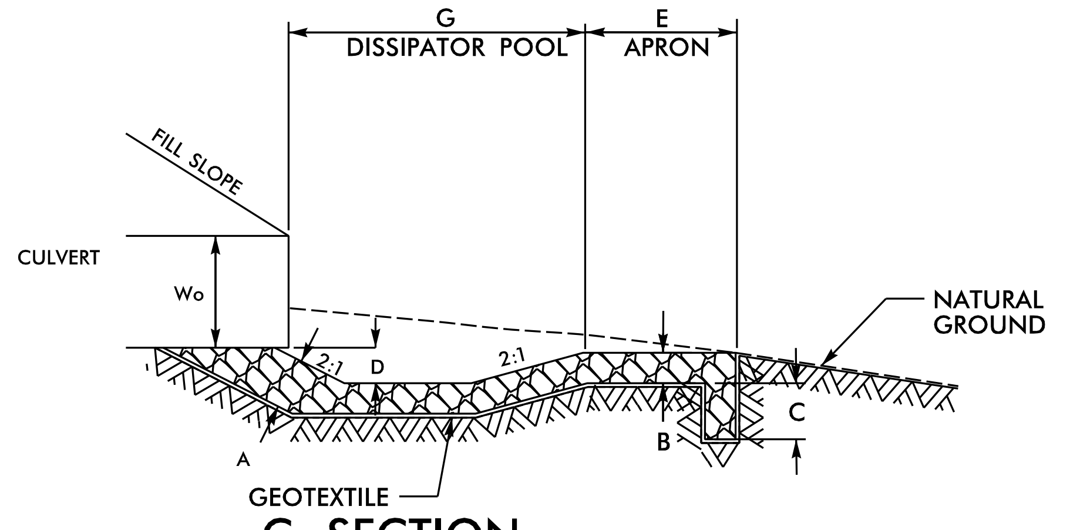
ALL DIMENSIONS APPROXIMATE

BASIN #	1	2	3
EST GEOTEXTILE (SY)	140		
EST TON CL 'I' RIPRAP	91		
DDE (CY)	55		

BASIN #	LOCATION (AT OUTLET)
1	–L– STA 312 + 00 RT
2	
3	



PLAN



℄ SECTION

7/08

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PROJECT REFERENCE NO.	SHEET NO.
R-5709C	2G-1

GEOTECHNICAL ENGINEER

SEAL 024955 MARGARET M. SWEITZER

DocuSigned by:
Margaret M. Sweitzer 9/15/2024
4AC688A0680C4F3...
SIGNATURE DATE

ENGINEER

SIGNATURE DATE

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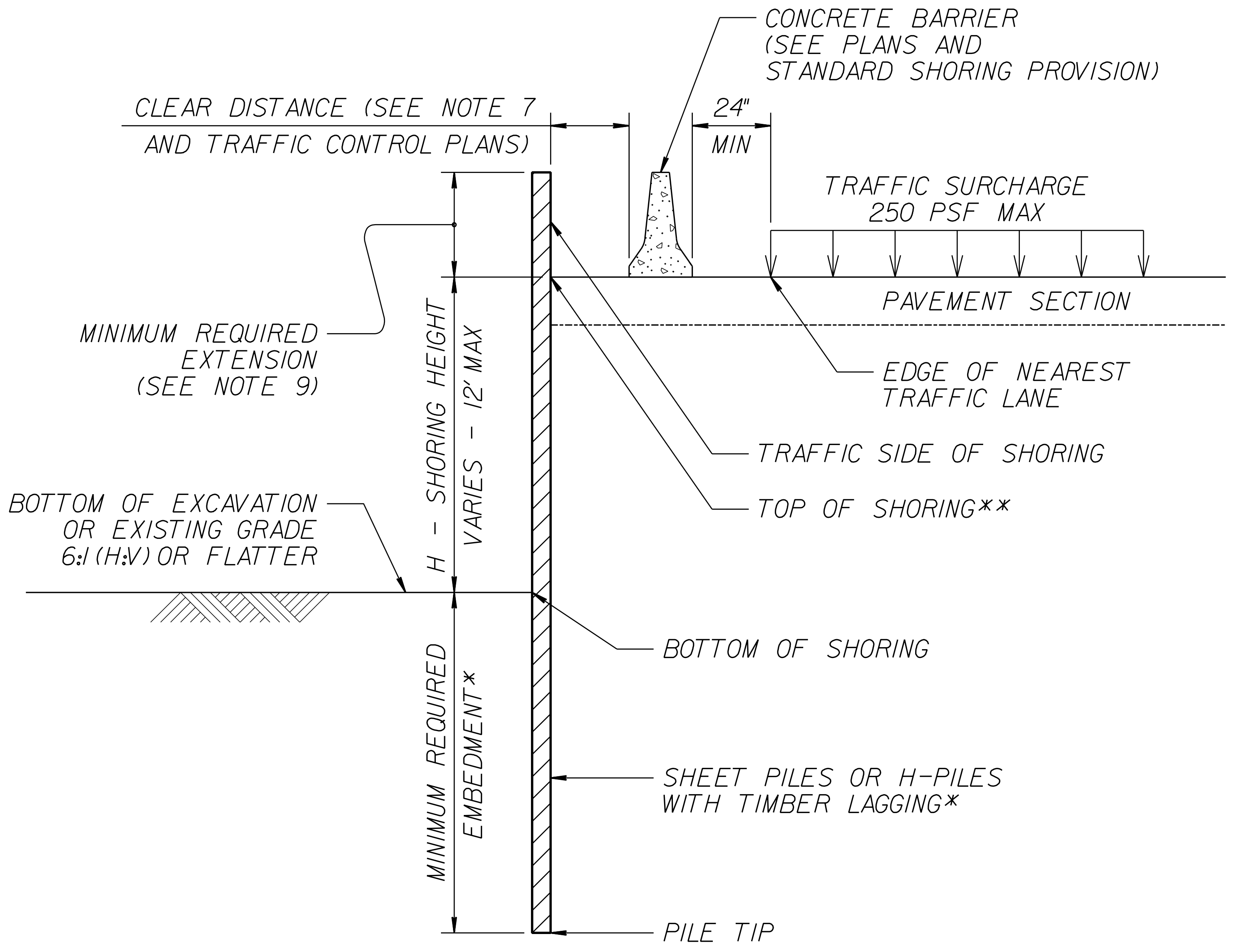
GROUNDWATER CONDITION (SEE NOTE 6)	H SHORING HEIGHT (FT)	SLOPE OR SURCHARGE CASE WITH NO TRAFFIC IMPACT					SURCHARGE CASE WITH TRAFFIC IMPACT				
		SHEET PILES		H-PILES WITH TIMBER LAGGING			SHEET PILES		H-PILES WITH TIMBER LAGGING		
		MINIMUM REQUIRED EMBEDMENT (FT)	MINIMUM REQUIRED SECTION MODULUS (IN^3/FT)	MINIMUM REQUIRED EMBEDMENT* (FT) (SEE NOTE 10)			MINIMUM REQUIRED EMBEDMENT (FT)	MINIMUM REQUIRED SECTION MODULUS (IN^3/FT)	MINIMUM REQUIRED EMBEDMENT* (FT) (SEE NOTE 10)		
				HP 10x42	HP 12x53	HP 14x73			HP 10x42	HP 12x53	HP 14x73
GROUNDWATER ELEVATION BEWTEEN BOTTOM OF SHORING AND PILE TIP	< 6	11.5	4.5	11.5	11.5	11.5	16.0	12.0	13.0	13.0	13.0
	7	13.0	7.0	13.0	13.0	13.0	17.0	14.5	14.5	14.5	14.5
	8	15.0	10.0	--	15.0	15.0	18.0	17.0	--	15.5	15.5
	9	17.0	14.0	--	17.0	17.0	19.0	20.0	--	17.0	17.0
	10	18.5	19.5	--	--	18.5	20.0	23.5	--	--	18.5
	11	20.5	26.0	--	--	--	21.0	28.0	--	--	20.0
	12	22.5	33.0	--	--	--	22.0	33.0	--	--	21.5
GROUNDWATER ELEVATION BELOW PILE TIP	< 6	7.5	3.0	8.0	8.0	8.0	11.0	10.0	9.5	9.5	9.5
	7	8.5	4.5	9.5	9.5	9.5	12.0	12.0	10.5	10.5	10.5
	8	10.0	6.5	10.5	10.5	10.5	12.5	14.0	11.5	11.5	11.5
	9	11.0	9.5	--	12.0	12.0	13.5	16.5	--	12.5	12.5
	10	12.5	13.0	--	--	13.5	14.0	19.5	--	13.5	13.5
	11	13.5	17.0	--	--	14.5	15.0	22.5	--	--	14.5
	12	15.0	21.5	--	--	16.0	16.0	25.5	--	--	15.5

MINIMUM REQUIRED EMBEDMENT AND SECTION MODULUS

*DO NOT USE H-PILES WITH TIMBER LAGGING FOR GROUNDWATER CONDITION, SHORING HEIGHT AND H-PILE SIZE SHOWN IF MINIMUM REQUIRED EMBEDMENT IS "--".

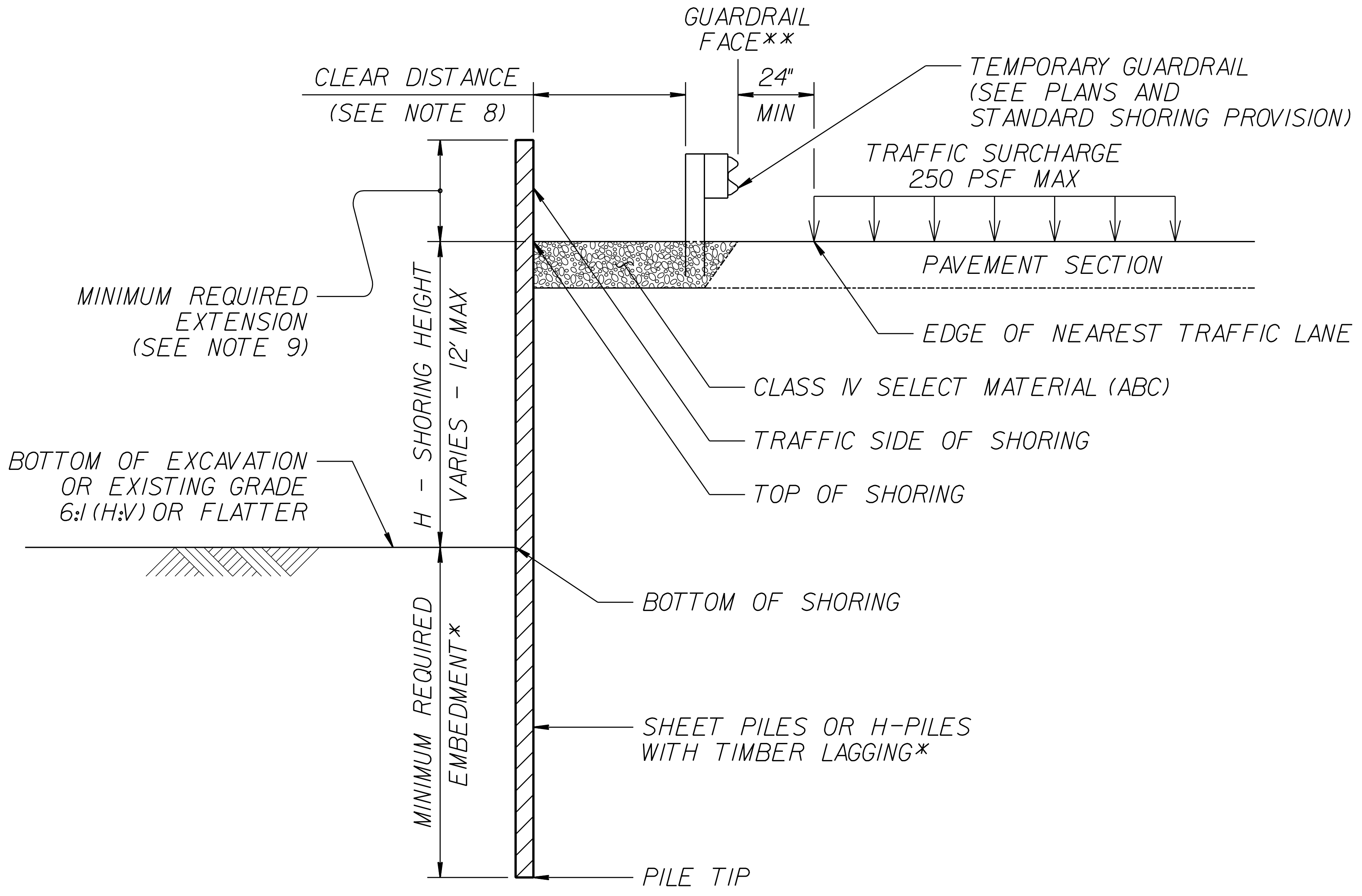
NOTES:

1. AT THE CONTRACTOR'S OPTION, USE STANDARD TEMPORARY SHORING AS NOTED IN THE PLANS.
2. FOR STANDARD TEMPORARY SHORING, SEE STANDARD SHORING PROVISION.
3. STANDARD TEMPORARY SHORING IS BASED ON THE FOLLOWING IN-SITU ASSUMED SOIL PARAMETERS:
   UNIT WEIGHT, γ = 120 PCF
   FRICTION ANGLE, ϕ = 30 DEGREES
   COHESION, c = 0 PSF
4. DO NOT USE STANDARD TEMPORARY SHORING IF ASSUMED SOIL PARAMETERS ARE NOT APPLICABLE.
5. DO NOT USE STANDARD TEMPORARY SHORING WHEN VERY LOOSE OR SOFT SOIL OR MUCK IS WITHIN THE EMBEDMENT DEPTH.
6. USE GROUNDWATER ELEVATION NOTED IN THE PLANS. IF NO GROUNDWATER ELEVATION IS SHOWN IN THE PLANS, USE "GROUNDWATER ELEVATION BETWEEN BOTTOM OF SHORING AND PILE TIP" FOR GROUNDWATER CONDITION. DO NOT USE STANDARD TEMPORARY SHORING IF GROUNDWATER IS ABOVE BOTTOM OF SHORING.
7. AT THE CONTRACTOR'S OPTION OR IF AVAILABLE CLEAR DISTANCE IS LESS THAN THE MINIMUM REQUIRED FOR CONCRETE BARRIER, SET BARRIER NEXT TO AND UP AGAINST TRAFFIC SIDE OF PILES AND USE "SURCHARGE CASE WITH TRAFFIC IMPACT".
8. AT THE CONTRACTOR'S OPTION OR IF AVAILABLE CLEAR DISTANCE IS LESS THAN 4' FOR TEMPORARY GUARDRAIL, ATTACH GUARDRAIL TO TRAFFIC SIDE OF PILES AS SHOWN IN THE PLANS AND USE "SURCHARGE CASE WITH TRAFFIC IMPACT".
9. MINIMUM REQUIRED EXTENSION IS 6" FOR "SLOPE OR SURCHARGE CASE WITH NO TRAFFIC IMPACT" AND 32" FOR "SURCHARGE CASE WITH TRAFFIC IMPACT".
10. MINIMUM REQUIRED EMBEDMENT FOR H-PILES WITH TIMBER LAGGING IS BASED ON DRIVEN H-PILES AT MAXIMUM 6' SPACING. AT THE CONTRACTOR'S OPTION, EMBEDMENT DEPTHS MAY BE REDUCED BY 25% FOR DRILLED-IN H-PILES.
11. SUBMIT A "STANDARD TEMPORARY SHORING SELECTION FORM" AT LEAST 7 DAYS BEFORE STARTING TEMPORARY SHORING CONSTRUCTION. UP TO 3 SHORING LOCATIONS MAY BE INCLUDED ON EACH FORM. STANDARD SHORING SELECTION FORMS ARE AVAILABLE FROM:
    connect.ncdot.gov/resources/Geological/Pages/Geotech_Forms_Details.aspx
12. CONTACT THE ENGINEER IF PILES DO NOT ATTAIN THE MINIMUM REQUIRED EMBEDMENT.



CONCRETE BARRIER

**TOP OF SHORING = EDGE OF PAVEMENT

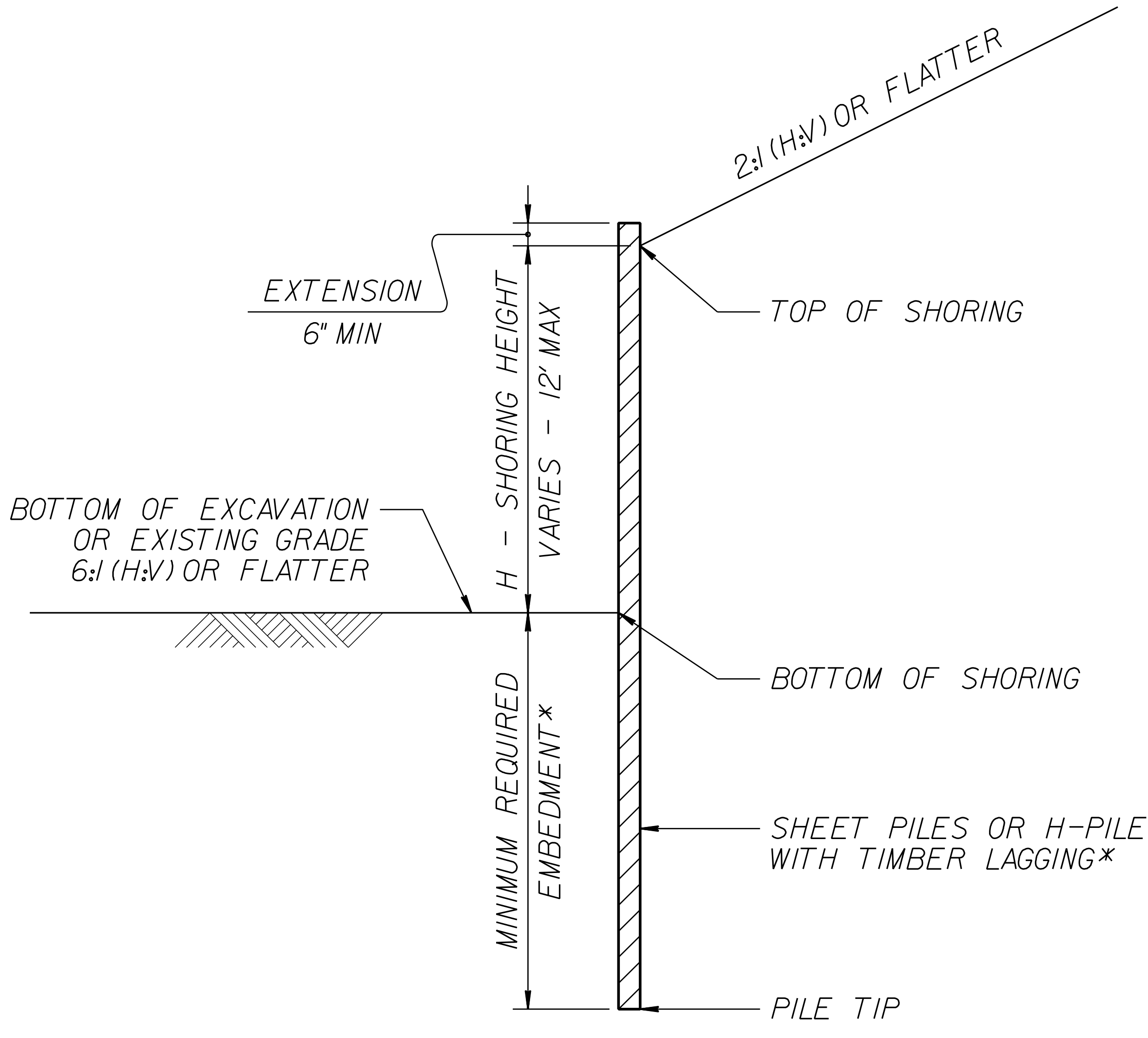


TEMPORARY GUARDRAIL

**GUARDRAIL FACE = EDGE OF PAVEMENT

STANDARD TEMPORARY SHORING

(SURCHARGE CASE)
*SEE TABLE ABOVE.



STANDARD TEMPORARY SHORING

(SLOPE CASE)
*SEE TABLE ABOVE.

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DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

STANDARD DETAIL NO. 1801.01

STANDARD TEMPORARY SHORING

DATE: 11-19-13

PROJECT REFERENCE NO.	SHEET NO.
R-5709C	2G-2

GEOTECHNICAL ENGINEER

SEAL 024955

MARGARET M. SWEITZER

DocuSigned by:
Margaret M. Sweitzer
4AC888A0680C4F3...
2024

SIGNATURE	DATE

ENGINEER

SIGNATURE	DATE

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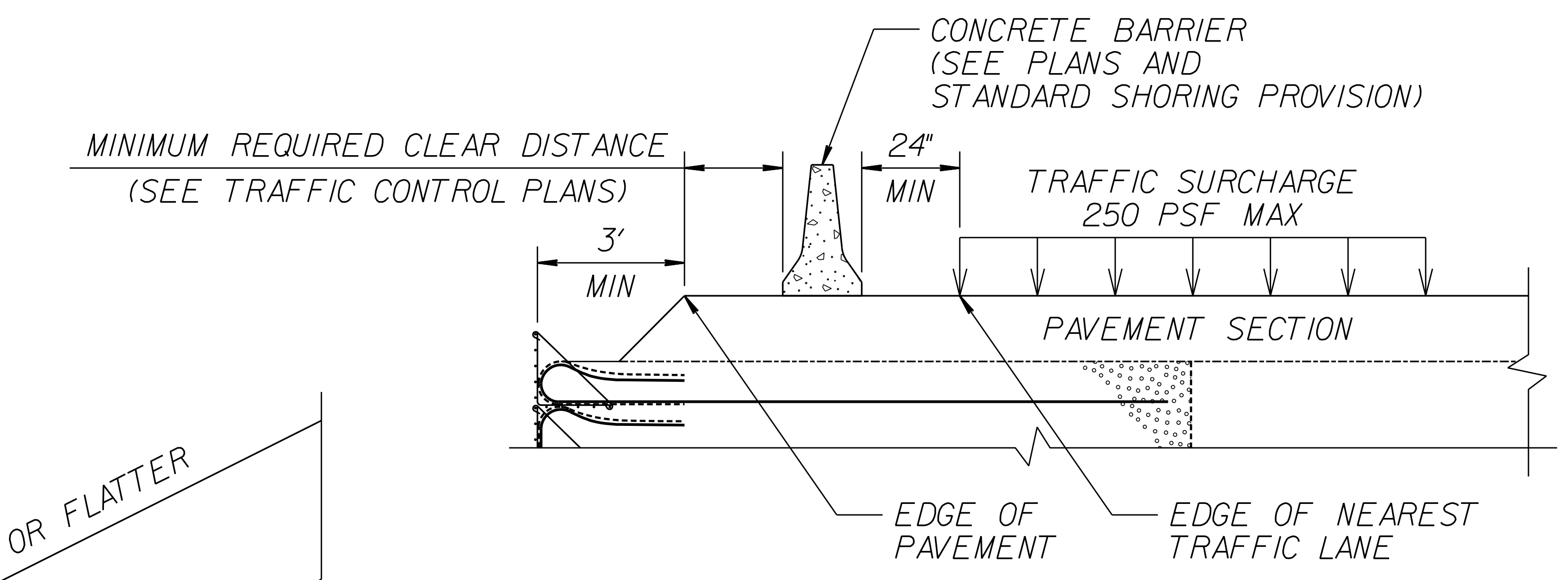
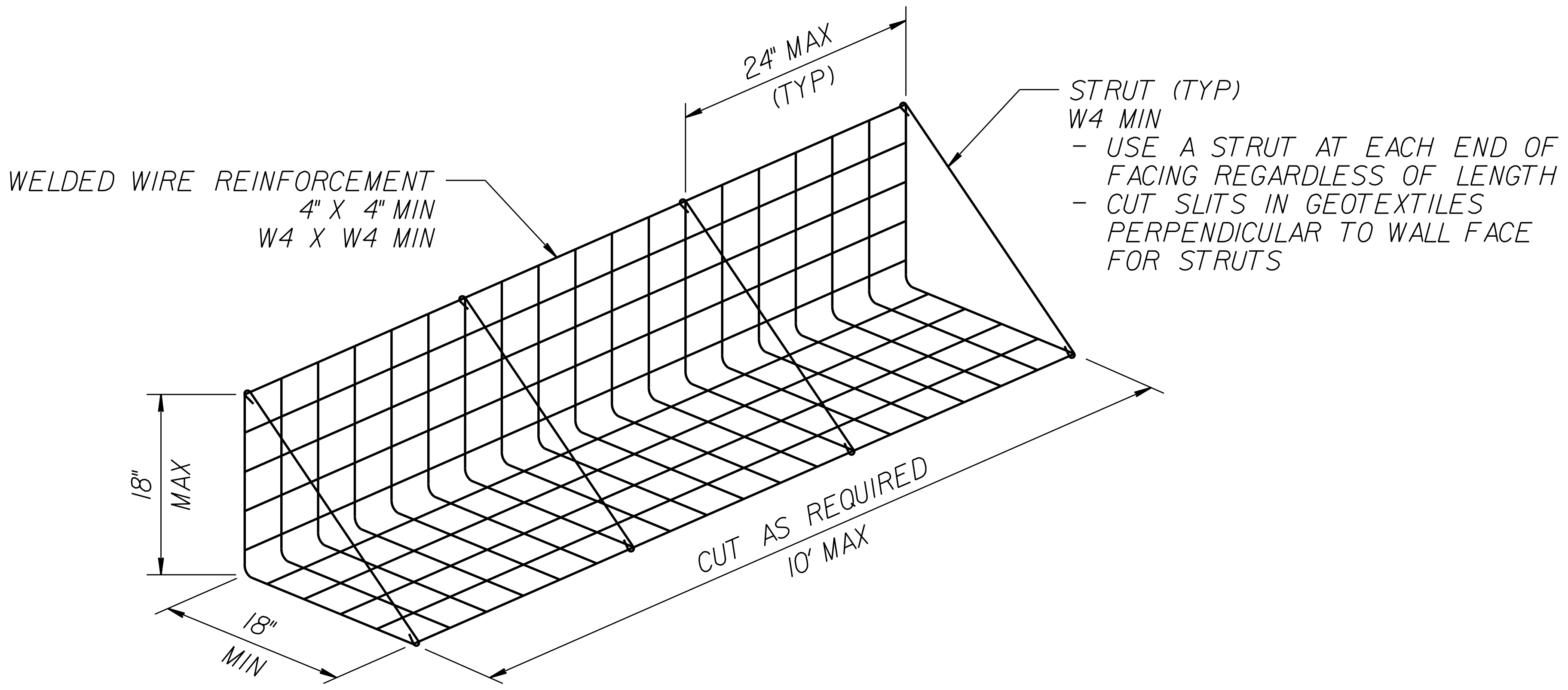
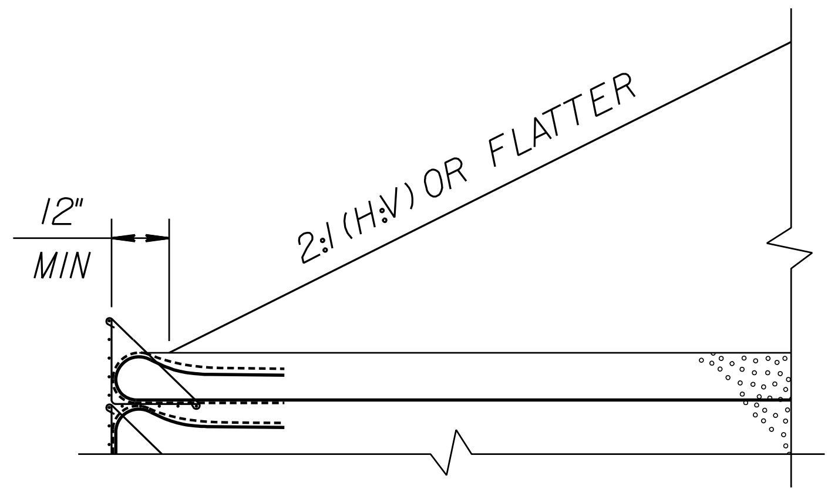


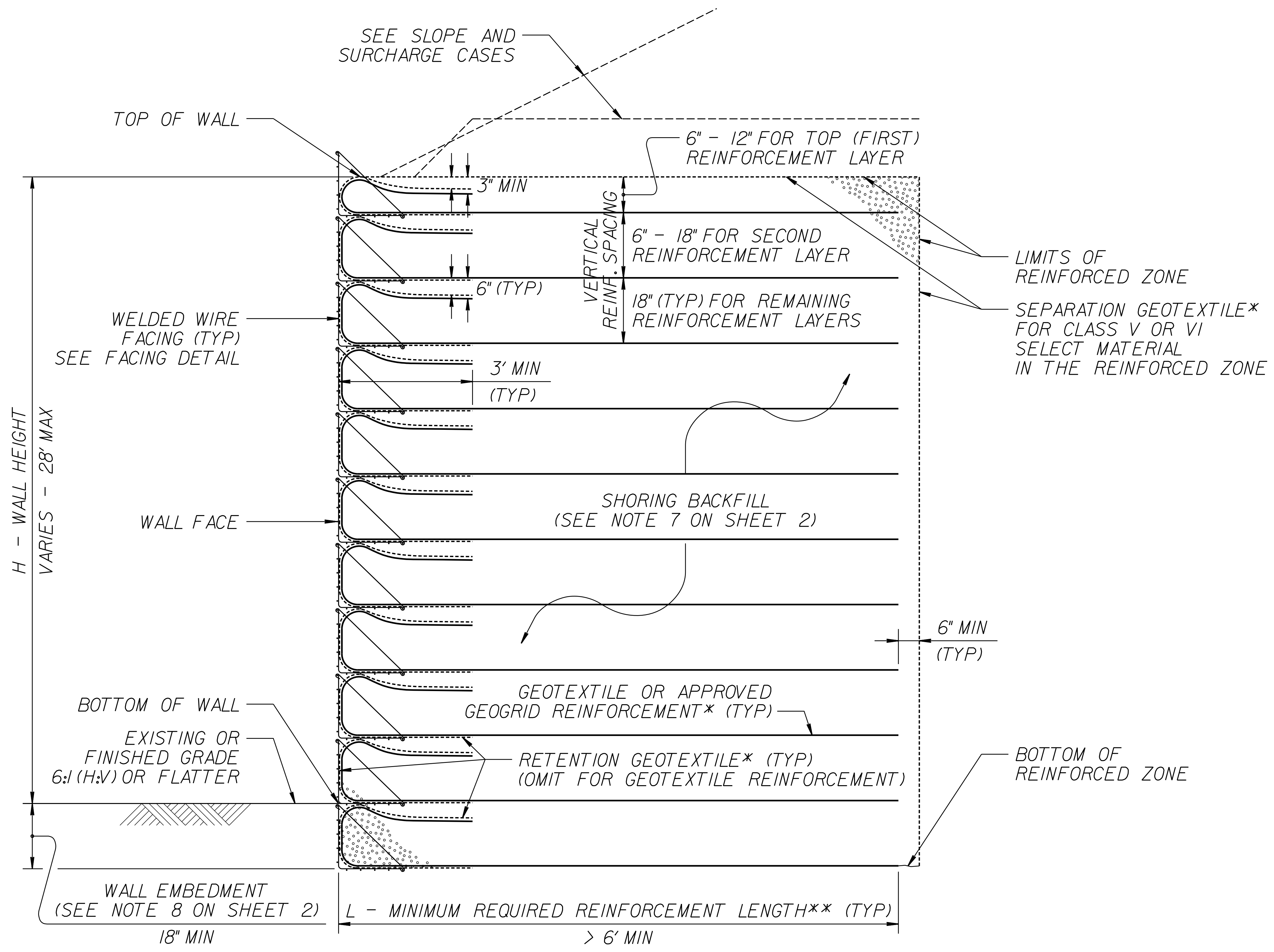
SURCHARGE CASE



FACING DETAIL

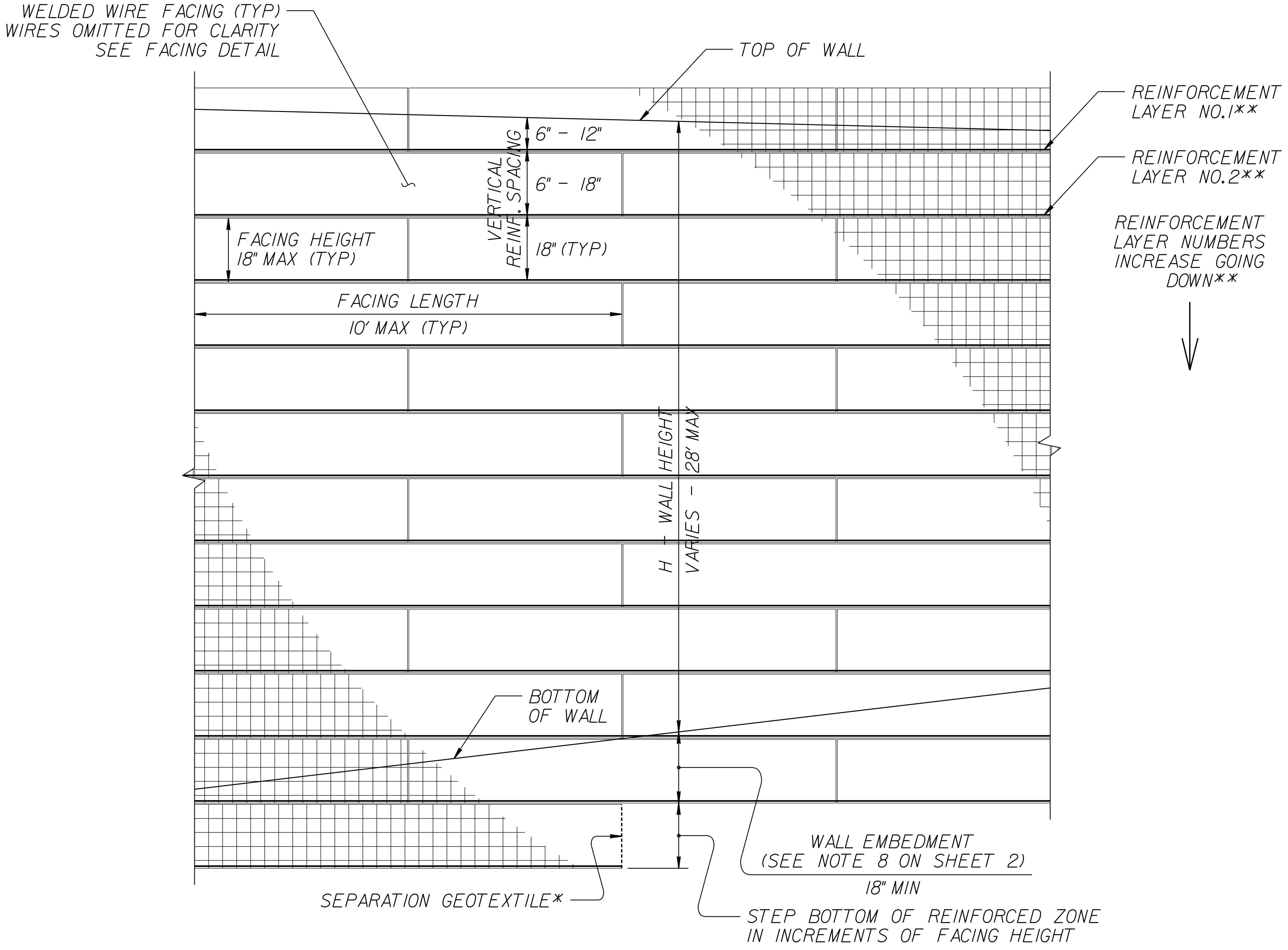


SLOPE CASE



STANDARD TEMPORARY WALL

(FOR STANDARD TEMPORARY WALLS ON STRUCTURES,
SEE TEMPORARY WALL ON STRUCTURE DETAIL ON SHEET 2.)
*SEE GEOSYNTHETIC PLACEMENT DETAILS ON SHEET 2.
**SEE REINFORCEMENT TABLES ON SHEET 3.



STANDARD TEMPORARY WALL – PARTIAL ELEVATION

*SEE GEOSYNTHETIC PLACEMENT DETAILS ON SHEET 2.
**SEE REINFORCEMENT TABLES ON SHEET 3.

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GEOTECHNICAL
ENGINEERING UNIT

STANDARD DETAIL NO. 1801.02

STANDARD
TEMPORARY WALL
SHEET 1 OF 3

DATE: 11-19-13

PROJECT REFERENCE NO.	SHEET NO.
R-5709C	2G-3

GEOTECHNICAL ENGINEER	ENGINEER
SEAL 024955 MARGARET M. SWEITZER DocuSigned by: Margaret M. Sweitzer 9/5/2024 4AC688A0680C4F3... SIGNATURE DATE	SIGNATURE DATE

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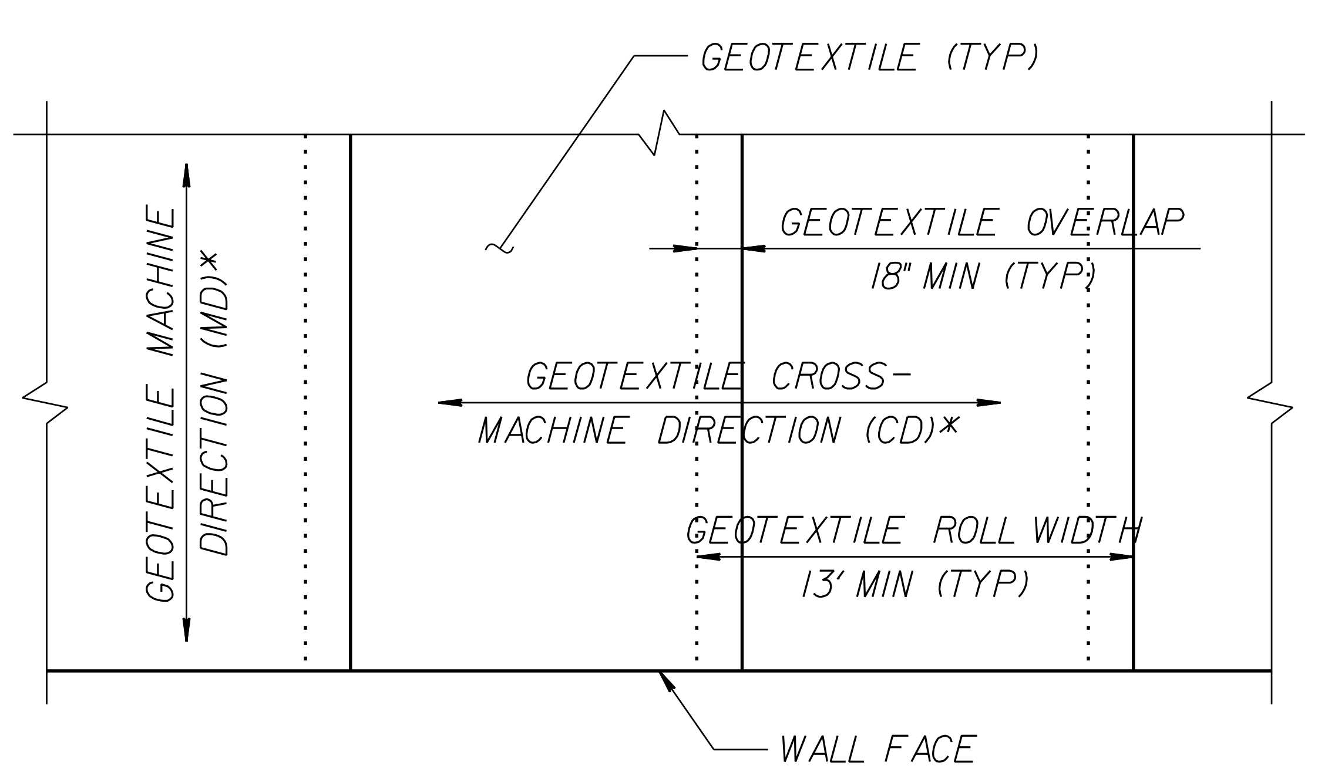
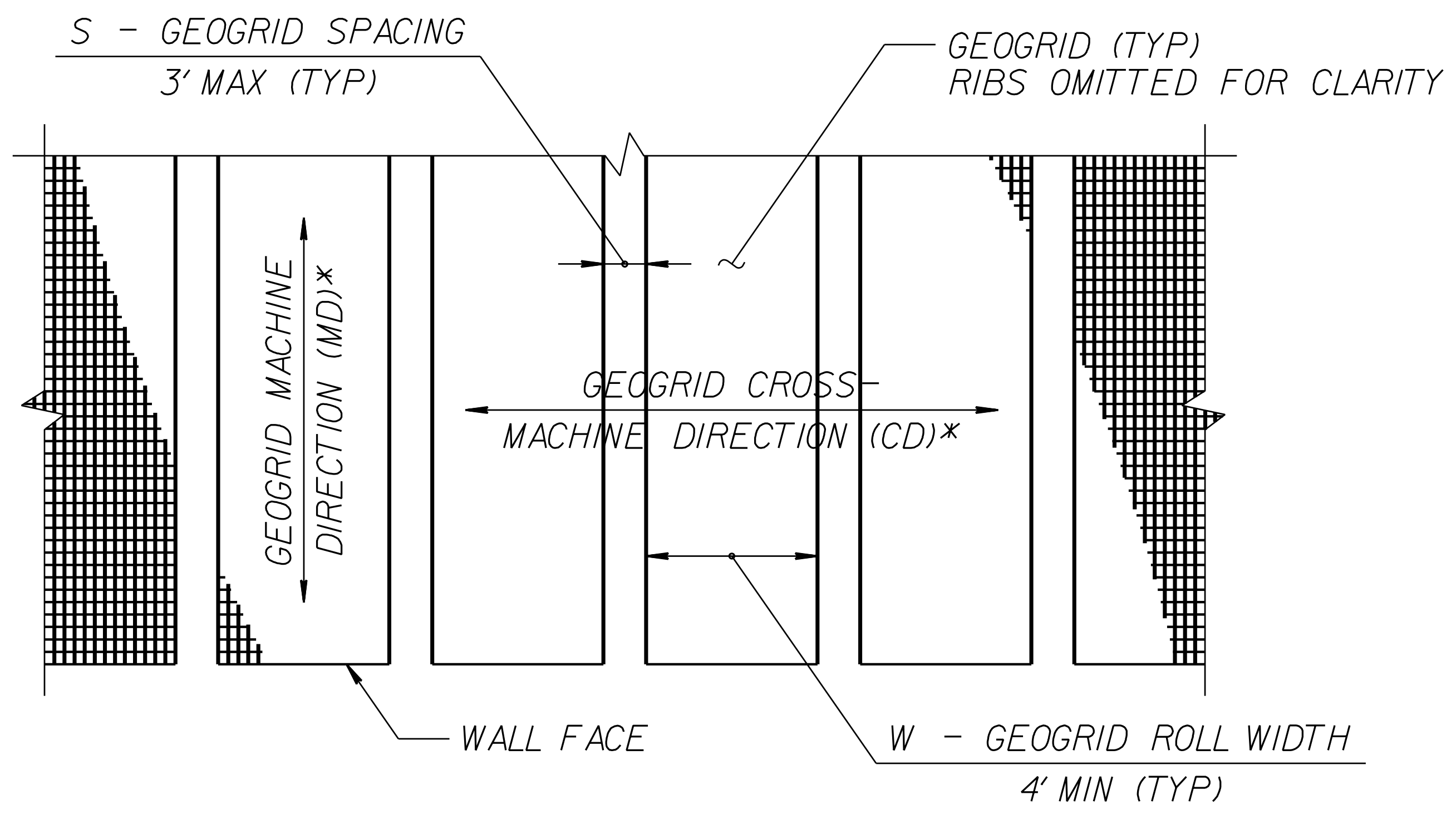


GEOTEXTILE PLACEMENT

(100% COVERAGE MIN FOR GEOTEXTILE REINFORCEMENT)



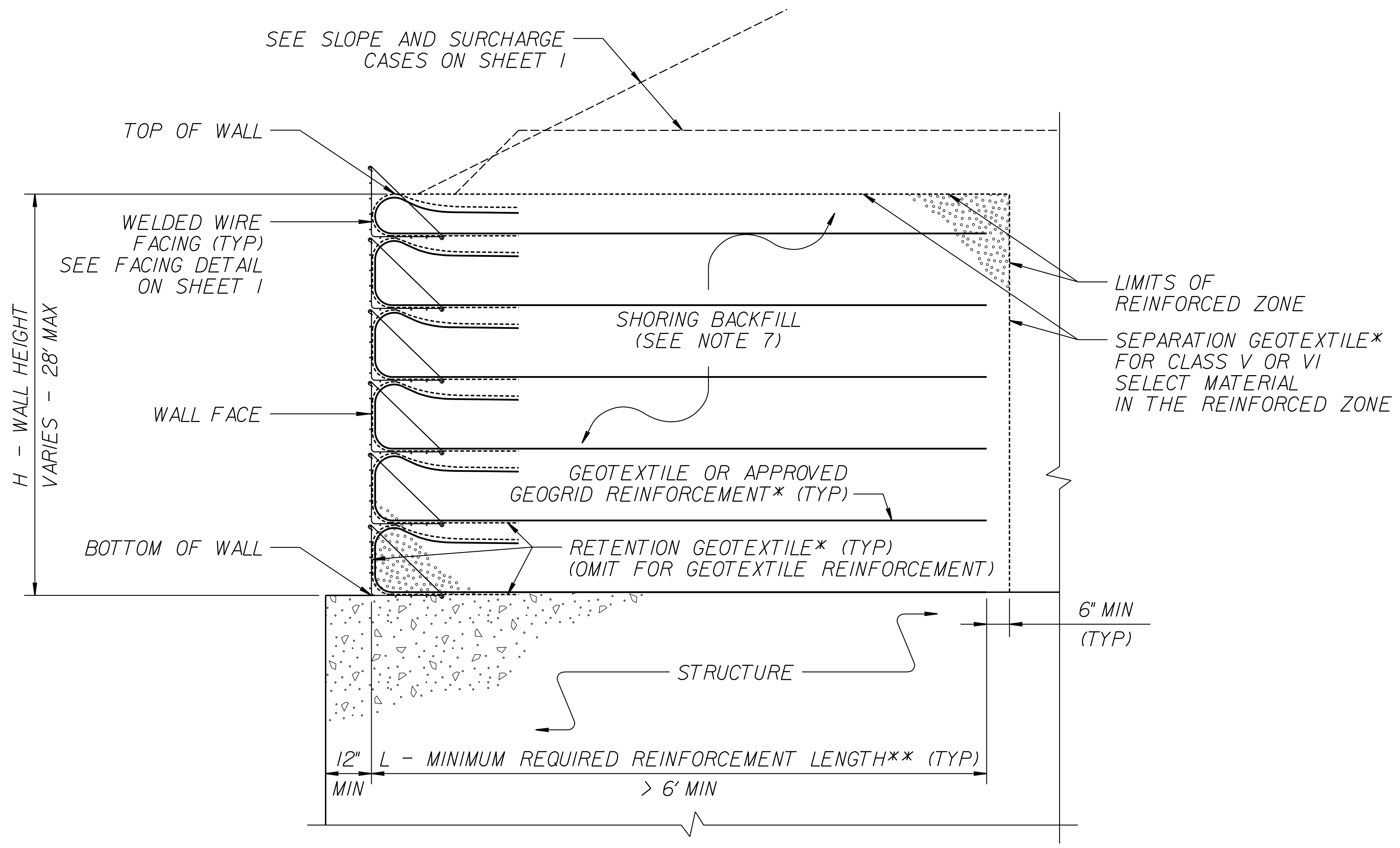
GEOGRID PLACEMENT

(80% COVERAGE MIN FOR GEOGRID REINFORCEMENT – $\frac{W}{W+S} \times 100 \geq 80\%$, SEE NOTE 11)

GEOSYNTHETIC PLACEMENT DETAILS

(PLAN VIEW)

***SEE NOTE 12.**



TEMPORARY WALL ON STRUCTURE DETAIL

***SEE GEOSYNTHETIC PLACEMENT DETAILS.**

****SEE REINFORCEMENT TABLES ON SHEET 3.**

NOTES:

1. —AT THE CONTRACTOR'S OPTION, USE STANDARD TEMPORARY WALLS AS NOTED IN THE PLANS.
2. FOR STANDARD TEMPORARY WALLS, SEE STANDARD SHORING PROVISION.
3. STANDARD TEMPORARY WALLS ARE BASED ON THE FOLLOWING IN-SITU ASSUMED SOIL PARAMETERS:
    UNIT WEIGHT, γ = 120 PCF
    FRICTION ANGLE, ϕ = 30 DEGREES
    COHESION, c = 0 PSF
4. DO NOT USE STANDARD TEMPORARY WALLS IF ASSUMED SOIL PARAMETERS ARE NOT APPLICABLE.
5. DO NOT USE STANDARD TEMPORARY WALLS WHEN VERY LOOSE OR SOFT SOIL OR MUCK IS BELOW TEMPORARY WALLS.
6. USE GROUNDWATER ELEVATION NOTED IN THE PLANS. IF NO GROUNDWATER ELEVATION IS SHOWN IN THE PLANS, ASSUME GROUNDWATER DEPTH IS LESS THAN 7' BELOW BOTTOM OF REINFORCED ZONE. DO NOT USE STANDARD TEMPORARY WALLS IF GROUNDWATER OR FLOOD ELEVATION IS ABOVE BOTTOM OF REINFORCED ZONE.
7. DO NOT USE A-2-4 SOIL FOR STANDARD TEMPORARY WALLS AROUND CULVERTS OR IN THE REINFORCED ZONE OF STANDARD TEMPORARY WALLS FOR SLOPE CASES. DO NOT USE CLASS VI SELECT MATERIAL IN THE REINFORCED ZONE OF STANDARD TEMPORARY WALLS WITH GEOTEXTILE REINFORCEMENT.
8. WALL EMBEDMENT IS NOT REQUIRED FOR STANDARD TEMPORARY WALLS ON STRUCTURES OR ROCK AS DETERMINED BY THE ENGINEER.
9. DO NOT USE MORE THAN 4 DIFFERENT REINFORCEMENT STRENGTHS FOR EACH STANDARD TEMPORARY WALL.
10. GEOGRIDS FOR GEOGRID REINFORCEMENT ARE APPROVED FOR SHORT TERM DESIGN STRENGTHS (3-YEAR DESIGN LIFE) IN THE MD AND CD BASED ON MATERIAL TYPE. THE LIST OF APPROVED GEOGRIDS WITH DESIGN STRENGTHS IS AVAILABLE FROM: connect.ncdot.gov/resources/Geological/Pages/Products.aspx
    DEFINE MATERIAL TYPE FROM THE WEBSITE ABOVE FOR SHORING BACKFILL AS FOLLOWS:

MATERIAL TYPE	SHORING BACKFILL
BORROW	A-2-4 SOIL
FINE AGGREGATE	CLASS II, TYPE I OR CLASS III SELECT MATERIAL
COARSE AGGREGATE	CLASS V OR VI SELECT MATERIAL

11. FOR GEOGRID REINFORCEMENT WITH LESS THAN 100% COVERAGE, STAGGER REINFORCEMENT SO GEOGRIDS ARE CENTERED OVER GAPS IN THE REINFORCEMENT LAYER BELOW.
12. AT THE CONTRACTOR'S OPTION, REINFORCEMENT MAY BE INSTALLED WITH THE MD PARALLEL TO THE WALL FACE IF BOTH OF THE FOLLOWING CONDITIONS OCCUR:
    - W (REINFORCEMENT ROLL WIDTH) ≥ (MINIMUM REQUIRED REINFORCEMENT LENGTH) + 4.5' AND
    - REINFORCEMENT STRENGTH IN CD ≥ MINIMUM REQUIRED REINFORCEMENT STRENGTH IN MD.
13. SUBMIT A "STANDARD TEMPORARY WALL SELECTION FORM" AT LEAST 7 DAYS BEFORE STARTING TEMPORARY WALL CONSTRUCTION. STANDARD SHORING SELECTION FORMS ARE AVAILABLE FROM: connect.ncdot.gov/resources/Geological/Pages/Geotech_Forms_Details.aspx
14. DO NOT PLACE SHORING BACKFILL OR REINFORCEMENT UNTIL EXCAVATION DIMENSIONS AND FOUNDATION MATERIAL ARE APPROVED.
15. FOR STANDARD TEMPORARY WALLS WITH PILE FOUNDATIONS IN THE REINFORCED ZONE, DRIVE PILES THROUGH REINFORCEMENT AFTER CONSTRUCTING TEMPORARY WALLS.
16. DO NOT SPLICE OR OVERLAP REINFORCEMENT SO SEAMS ARE PARALLEL TO THE WALL FACE.
17. CONTACT THE ENGINEER WHEN EXISTING OR FUTURE OBSTRUCTIONS SUCH AS FOUNDATIONS, PAVEMENTS, PIPES, INLETS OR UTILITIES WILL INTERFERE WITH REINFORCEMENT.
18. FOR STANDARD TEMPORARY WALLS WITH INTERIOR ANGLES LESS THAN 90 DEGREES, WRAP GEOSYNTHETICS AT ACUTE CORNERS AS DIRECTED BY THE ENGINEER.
19. FOR STANDARD TEMPORARY WALLS WITH TOP OF WALL WITHIN 5' OF FINISHED GRADE, REMOVE TOP FACING AND INCORPORATE TOP REINFORCEMENT LAYER INTO FILL WHEN PLACING FILL IN FRONT OF WALL.

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DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

STANDARD DETAIL NO. 1801.02

STANDARD
TEMPORARY WALL
SHEET 2 OF 3

DATE: 10-19-21

PROJECT REFERENCE NO.	SHEET NO.
R-5709C	2G-4

GEOTECHNICAL ENGINEER

SEAL 024955
MARGARET M. SWEITZER

DocuSigned by:
Margaret M. Sweitzer [illegible]/5/2024
4AC688A0680C4F3...
SIGNATURE DATE

ENGINEER

SIGNATURE DATE

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SLOPE OR SURCHARGE CASE	GROUNDWATER DEPTH BELOW BOTTOM OF REINFORCED ZONE (SEE NOTE 6 ON SHEET 2) (FT)	SHORING BACKFILL TYPE IN THE REINFORCED ZONE (SEE NOTE 7 ON SHEET 2)	H - WALL HEIGHT (FT)																							
			< 4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
SLOPE CASE	> 0	CLASS II,TYPE I, CLASS III,CLASS V OR CLASS VI SELECT MATERIAL	6	6	7	8	9	11	12	13	13	14	15	16	17	18	19	20	21	22	23	24	24	25	26	27	27
SURCHARGE CASE	> 0 TO 7 FOR H < 20′ > 0 TO 10 FOR H ≥ 20′	ALL SHORING BACKFILL TYPES	6	7	7	8	8	9	9	10	11	11	12	12	13	14	14	15	16	17	17	18	19	19	20	21	22
	> 7 FOR H < 20′ > 10 FOR H ≥ 20′	A-2-4 SOIL	6	6	7	8	8	9	9	10	11	11	12	12	13	14	14	15	16	16	17	18	18	19	20	20	21
		CLASS II,TYPE I OR CLASS III SELECT MATERIAL	6	6	7	7	8	8	9	10	10	11	11	12	12	13	14	15	15	16	16	17	17	18	18	19	20
		CLASS V OR CLASS VI SELECT MATERIAL	6	6	7	7	7	8	8	9	9	10	10	11	12	13	13	14	14	15	15	16	17	17	18	19	19

L – MINIMUM REQUIRED REINFORCEMENT LENGTH (FT)

(FOR ALL REINFORCEMENT TYPES)

WALL HEIGHT (H) + WALL EMBEDMENT (FT)	NUMBER OF REINFORCEMENT LAYERS*
2.5 - 4	3
4 - 5.5	4
5.5 - 7	5
7 - 8.5	6
8.5 - 10	7
10 - 11.5	8
11.5 - 13	9
13 - 14.5	10
14.5 - 16	11
16 - 17.5	12
17.5 - 19	13
19 - 20.5	14
20.5 - 22	15
22 - 23.5	16
23.5 - 25	17
25 - 26.5	18
26.5 - 28	19
28 - 29.5	20

*BASED ON VERTICAL REINFORCEMENT SPACING SHOWN ON SHEET 1.

REINFORCEMENT LAYER NUMBER*	SHORING BACKFILL TYPE IN THE REINFORCED ZONE (SEE NOTE 7 ON SHEET 2)				
	SLOPE CASE		SURCHARGE CASE		
	CLASS II,TYPE I OR CLASS III SELECT MATERIAL	CLASS V SELECT MATERIAL	A-2-4 SOIL	CLASS II,TYPE I OR CLASS III SELECT MATERIAL	CLASS V SELECT MATERIAL
1	2400	2400	2400	2400	2400
2	2400	2400	2400	2400	2400
3	2400	2400	2400	2400	2400
4	2400	2400	2500	2400	2400
5	2500	2400	3000	2400	2400
6	3000	2400	3500	2800	2400
7	3500	2700	4000	3200	2600
8	4000	3100	4500	3600	2900
9	4500	3500	5000	4000	3200
10	5000	3900	5500	4400	3500
11	5500	4300	6000	4800	3800
12	6000	4700	6500	5200	4100
13	6500	5100	7000	5600	4400
14	7000	5400	7500	6000	4700
15	7500	5800	8000	6400	5000
16	8000	6200	8500	6800	5300
17	8500	6600	9000	7200	5600
18	9000	7000	9500	7600	5900
19	9500	7400	10000	8000	6200
20	10000	7800	10500	8400	6500

GEOTEXTILE REINFORCEMENT ULTIMATE TENSILE STRENGTH (LB/FT)

REINFORCEMENT LAYER NUMBER*	SHORING BACKFILL TYPE IN THE REINFORCED ZONE (SEE NOTE 7 ON SHEET 2)				
	SLOPE CASE		SURCHARGE CASE		
	CLASS II,TYPE I OR CLASS III SELECT MATERIAL	CLASS V OR CLASS VI SELECT MATERIAL	A-2-4 SOIL	CLASS II,TYPE I OR CLASS III SELECT MATERIAL	CLASS V OR CLASS VI SELECT MATERIAL
1	240	200	340	290	240
2	380	310	520	430	350
3	530	420	700	570	460
4	690	550	870	720	570
5	860	690	1050	860	680
6	1030	830	1220	1000	790
7	1200	970	1400	1150	900
8	1370	1110	1580	1290	1010
9	1550	1240	1750	1430	1120
10	1720	1380	1930	1580	1230
11	1890	1520	2100	1720	1340
12	2060	1660	2280	1860	1450
13	2240	1800	2450	2010	1560
14	2410	1940	2630	2150	1670
15	2580	2080	2800	2290	1780
16	2750	2220	2980	2440	1890
17	2930	2360	3160	2580	2000
18	3100	2500	3330	2720	2110
19	3270	2640	3510	2860	2220
20	3440	2780	3690	3000	2330

GEOGRID REINFORCEMENT SHORT–TERM DESIGN STRENGTH (LB/FT)

(SEE NOTE 10 ON SHEET 2.)

MINIMUM REQUIRED REINFORCEMENT STRENGTH IN MD

(SEE NOTE 9 ON SHEET 2.)
*SEE PARTIAL ELEVATION ON SHEET 1
FOR REINFORCEMENT LAYER NUMBERING.

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GEOTECHNICAL ENGINEERING UNIT

STANDARD DETAIL NO. 1801.02

STANDARD
TEMPORARY WALL
SHEET 3 OF 3

DATE: 11-19-13

COMPUTED BY: AM	DATE: 08/01/2024
CHECKED BY: JTC	DATE: 08/08/2024

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF EARTHWORK

IN CUBIC YARDS

CHAIN	BEGINNING STATION	ENDING STATION	UNCL. EXCA. C.Y.	UNDERCUT C.Y.	EMBANK. +% C.Y.	BORROW C.Y.	WASTE C.Y.
PHASE 1 - SECTION 1							
SUMMARY 1							
-L-/-LX1-	312+00.00	328+00.00	1,778		3,541	1,763	
-L- LT	328+00.00	362+00.00	17,503	2,110	12,646		6,967
-Y10-	13+75.00	19+75.00	298		364	66	
SUBTOTAL			**19,579**	**2,110**	**16,550**	**1,829**	**6,967**
PHASE 1 - SECTION 2							
SUMMARY 2							
-L- LT	361+50.00	384+00.00	7,026	310	7,934	908	310
-L- RT	361+50.00	391+50.00	3,704		23,822	20,118	
-L- RT	391+50.00	421+50.00	308		217,192	216,884	
-L- RT	421+50.00	451+50.00	3,132	160	46,262	43,130	160
-L- RT	451+50.00	481+50.00	94		44,362	44,268	
-L- RT	481+50.00	511+50.00	4,575		31,204	26,629	
-L- RT	511+50.00	541+50.00	2,807		33,517	30,710	
-L- RT	541+50.00	571+50.00	11,270	7,700	93,836	82,566	7,700
-L- RT	571+50.00	601+50.00	3,100		27,948	24,848	
-L- RT	601+50.00	631+50.00	1,202		26,455	25,253	
-L- RT	631+50.00	661+50.00	5,979	1,450	23,330	17,351	1,450
-L- RT	661+50.00	691+50.00	2,671	500	20,882	18,211	500
-L- RT	691+50.00	721+50.00	6,485	4,780	24,817	18,332	4,780
-L- RT	721+50.00	751+50.00	3,344	7,240	24,012	20,668	7,240
-L- RT	751+50.00	781+50.00	3,245	5,950	13,867	10,622	5,950
-L- RT	781+50.00	811+50.00	2,842	1,050	18,506	15,664	1,050
-L- RT	811+50.00	823+00.00	16	1,360	5,858	5,842	1,360
-RAB_L2-	10+00.00	14+02.12	14	400	5,232	5,218	400
-L2B-	825+05.18	835+30.00	39		3,253	3,214	
-Y11-	10+48.18	12+45.00	7		238	231	
-Y11A-	10+25.00	12+18.70	26		593	567	
-Y11C-	10+15.00	11+85.66	2		446	444	
-Y11D-	10+00.00	15+25.90	6		21,506	21,500	
-Y12A-	10+46.49	17+70.89	34		1,212	1,178	
-Y14-	10+95.00	15+63.31	466		5,929	5,463	
-Y15-	11+75.00	15+09.60	8		1,219	1,211	
-Y16-	14+25.00	18+71.79	33		2,155	2,122	
-Y18-	12+25.00	15+17.08	51		139	88	
-Y19-	10+75.00	14+89.35	81		1,248	1,167	
-Y20-	12+85.00	15+29.36	9		202	193	
-Y22-	10+15.00	11+98.92	55		114	59	
-Y24-	11+65.00	15+24.06	583		559	136	160
-Y25-	13+65.00	15+39.93	105		17		88
-Y27-	9+50.00	13+06.46	34		1,241	1,207	
-DR7-	10+60.00	11+90.59			486	486	
-DR8-	10+85.00	12+10.60	33		511	478	
-DR10-	10+60.00	12+74.60	61		557	496	
-L-/-DET_RAB-	816+67.07	829+44.33	2,473		270		2,203
-DET_Y27-	10+70.00	15+64.13	1,339		1,272		67
SUBTOTAL			**67,259**	**30,900**	**732,206**	**667,466**	**33,418**
PHASE 2 - SECTION 1							
SUMMARY 3							
-L- RT	328+00.00	362+00.00	4,104		11,828	7,724	
SUBTOTAL			**4,104**		**11,828**	**7,724**	

CHAIN	BEGINNING STATION	ENDING STATION	UNCL. EXCA. C.Y.	UNDERCUT C.Y.	EMBANK. +% C.Y.	BORROW C.Y.	WASTE C.Y.
PHASE 2 - SECTION 2							
SUMMARY 4							
-L- LT	384+00.00	414+00.00	3,122		17,328	14,206	
-L- LT	414+00.00	444+00.00	5,917		11,515	5,788	190
-L- LT	444+00.00	448+00.00	14		1,716	1,702	
-L- LT	449+50.00	479+50.00	4,140		10,230	6,090	
-L- LT	479+50.00	509+50.00	4,510		13,100	8,590	
-L- LT	509+50.00	539+50.00	2,900		9,696	6,796	
-L- LT	539+50.00	552+00.00	834		5,986	5,152	
-L- LT	562+00.00	592+00.00	2,277		27,431	25,154	
-L- LT	592+00.00	622+00.00	1,512		14,455	12,943	
-L- LT	622+00.00	652+00.00	2,344		8,831	6,487	
-L- LT	652+00.00	682+00.00	7,867		8,843	1,886	910
-L- LT	682+00.00	712+00.00	6,086		5,770	2,954	3,270
-L- LT	712+00.00	742+00.00	3,107		13,345	10,968	730
-L- LT	742+00.00	772+00.00	4,500		6,683	4,433	2,250
-L- LT	772+00.00	799+00.00	4,394		5,596	2,132	930
-L- LT	802+00.00	823+00.00	2,831		3,898	2,087	1,020
-L- LT	448+00.00	449+50.00	151		992	841	
-L- LT	552+00.00	562+00.00	1,881		12,517	10,636	
-L- LT	799+00.00	802+00.00	167		148		19
-Y11B-	10+47.00	13+25.00	7		139	132	
-Y11E-	10+47.44	12+75.00	15		172	157	
-Y12-	10+59.00	12+25.00	23		294	271	
-Y13-	10+48.66	19+15.00	4,592		868		3,724
-Y17-	10+59.03	13+25.00	385		12		373
-Y20A-	10+47.00	11+60.00	29		2		27
-Y21-	10+59.33	12+75.00	325		54		271
-Y23-	10+59.48	12+23.24	8		88	80	
-Y24A-	10+47.00	12+75.00	54		13		41
-Y26-	10+79.52	26+00.00	3,145	1,550	2,616	621	2,700
-Y26A-	10+29.60	15+25.22	170	140	1,492	1,382	200
-SR1-	15+00.00	17+65.85	3		89	86	
SUBTOTAL			**67,310**	**1,690**	**183,917**	**131,572**	**16,655**
SUMMARY 5							
-DET_RAB-	11+50.00	26+50.00	490		1,933	1,443	
-DET_Y27-	11+00.00	16+00.00	853		185		669
SUBTOTAL			**1,343**		**2,118**	**1,443**	**669**
SHEET TOTALS			**159,595**	**34,700**	**946,620**	**810,034**	**57,710**
LOSS DUE TO CLEARING AND GRUBBING			**-3,600**			**3,600**	
MATERIAL FOR SHOULDER CONSTRUCTION					**42,792**	**42,792**	
ADDITIONAL UNDERCUT				**4,000**	**4,800**	**4,800**	**4,000**
GRADE POINT UNDERCUT				**1,000**	**1,200**	**1,200**	**1,000**
SELECT MATERIAL IN LIEU OF BORROW					**-19,800**	**-19,800**	
EARTH WASTE IN LIEU OF BORROW						**-12,210**	**-11,541**
PROJECT TOTAL			**155,995**	**39,700**	**975,612**	**830,416**	**51,169**
EST. 5% TO REPLACE TOP SOIL ON BORROW PIT						**41,521**	
GRAND TOTAL			**155,995**			**871,937**	
SAY			**156,000**			**872,000**	

COMPUTED BY: AM DATE: 08/01/2024
CHECKED BY: JTC DATE: 08/08/2024

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF EARTHWORK

IN CUBIC YARDS

CHAIN	BEGINNING STATION	ENDING STATION	UNCL. EXCA. C.Y.	UNDERCUT C.Y.	EMBANK. +% C.Y.	BORROW C.Y.	WASTE C.Y.

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

-L-, -Y13-, -Y25-, & -Y26- PAVEMENT STRUCTURE VOLUME = 11,710 CY
DRAINAGE DITCH EXCAVATION = 10,920 C.Y.
SHALLOW UNDERCUT = 2,910 C.Y.
SHALLOW UNDERCUT (CONTINGENCY) = 1,000 C.Y.
UNCLASSIFIED EXCAVATION UNSUITABLE FOR TOP 3' OF EMBANKMENT = 6,750 C.Y.

TOTAL UNCLASSIFIED EXCAVATION - ACCEPTABLE = 6,750 C.Y.
BUT NOT TO BE USED IN TOP 3' OF EMBANKMENT OR BACKFILL

-L-	**353+75.00**	**356+25.00**
-L-	**379+75.00**	**382+25.00**
-L-	**648+75.00**	**650+25.00**
-L-	**687+25.00**	**689+25.00**
-L-	**723+75.00**	**730+75.00**
-L-	**742+75.00**	**746+75.00**
-L-	**806+25.00**	**809+25.00**
-RAB_L2-	**10+00.00**	**10+25.00**
-Y23-	**10+75.00**	**11+75.00**
-Y26-	**19+00.00**	**21+25.00**
-Y27-	**11+25.00**	**12+25.00**

CHAIN	BEGINNING STATION	ENDING STATION	UNCL. EXCA. C.Y.	UNDERCUT C.Y.	EMBANK. +% C.Y.	BORROW C.Y.	WASTE C.Y.

COMPUTED BY: AM DATE: 08/01/2024
CHECKED BY: JTC DATE: 08/08/2024

"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

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

GUARDRAIL SUMMARY

IN LINEAR FEET

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 MASH TL-3		DOUBLE FACED CONCRETE BARRIER	SINGLE FACED CONCRETE BARRIER	REMOVE EXISTING GUARDRAIL	REMARKS
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	GREU TL-3	GREU TL-2	CAT-1	AT-1	B-77	TYPE-III	TYPE-III (SC)	TES	G	NG				
-L-	389+45.01	402+42.43	RT	1,275.00	55.00		391+00.00		6.90' - 10.00'	13.00' - 15.00'	50.00'		0.00'		1													
-L-	403+25.32	419+00.00	RT	1,506.25	157.00		404+00.00	418+60.00	9.50'-10.00'	13.20' - 14.25'		6.25'		0.00'			1											
-L-	497+71.21	501+53.53	RT	393.75			498+50.00	501+00.00	10.00'	14.00'	50.00'	6.25'	0.00'	0.00'	1		1											
-L-	542+32.60	547+10.64	RT	418.75	91.00		543+00.00	547+00.00	10.00'	14.00'	50.00'	6.25'	0.00'	0.00'	1		1											
-L-	555+70.63	567+68.06	RT	1,206.25			557+50.00	567+50.00	10.00'	14.00'	50.00'	6.25'	0.00'	0.00'	1		1											
-L-	572+94.08	575+08.50	RT	218.75			573+50.00	575+00.00	10.00'	14.00'	50.00'	6.25'	0.00'	0.00'	1		1											
-L-	715+03.57	716+63.72	RT	168.75			716+41.26		10.00'	14.00'	50.00'	6.25'	0.00'	0.00'	1		1											
-L-	389+88.75	396+95.48	LT	731.25			396+00.00	390+00.00	10.00'	14.00'	50.00'	6.25'	0.55'	0.00'	1		1											
-L-	401+94.01	410+20.72	LT	818.75			409+65.75	402+50.00	10.00'	14.00'	50.00'	6.25'	0.00'	0.00'	1		1											
-L-	557+41.34	560+91.68	LT	356.25			560+00.00	558+00.00	10.00'	14.00'	50.00'	6.25'	0.00'	0.00'	1		1											
-L-	561+34.12	568+20.74	LT	693.75			567+00.00	561+52.15	10.00'	14.00'	50.00'	6.25'	0.00'	0.00'	1		1											
-Y11D-	11+26.60	15+01.63	RT	337.50	59.00		13+00.00		4.00' - 9.51'	7.10' - 11.63'	50.00'		1.00'		1													
-Y11D-	13+38.78	14+88.88	LT	100.00	59.00		14+50.00		4.00' - 6.90'	8.00' - 13.00'	50.00'		1.00'		1													
-SR1-	10+61.02	10+61.02	CL	25.00			10+75.00															2						
-L-	388+84.02	397+89.28	LT																								894.88	
-L-	401+84.04	422+46.21	LT																								2050.25	
-L-	807+08.79	807+84.61	LT																								75.83	
-L-	389+33.12	397+85.00	MED LT																								849.13	
-L-	401+69.25	421+35.16	MED LT																								1973.63	
SUBTOTAL				**8,250.00**	**421.00**										12		10					2					5,843.73	
	LESS ANCHOR DEDUCTIONS																											
	GREU TL-3 (50.00')		12	-600.00																								
	GREU TL-2 (25.00')																											
	CAT-1 (6.25')		10	-62.50																								
	AT-1 (6.25')																											
	B-77 (22.875')																											
	TYPE-III (18.75')																											
	TYPE-III SC (18.75')																											
	ADDITIONAL POSTS		**10**																									
TOTAL GUARDRAIL =				**7,587.50**	**421.00**										12		10					2					5,843.73	
SAY				**7600.00**	**430.00**										**12**		**10**					**2**					**5,850**	

TEMPORARY GUARDRAIL SUMMARY

IN LINEAR FEET

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 MASH TL-3		DOUBLE FACED CONCRETE BARRIER	SINGLE FACED CONCRETE BARRIER	REMOVE EXISTING GUARDRAIL	REMARKS
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	GREU TL-3	GREU TL-2	CAT-1	AT-1	B-77	TPYE-III	TPYE-III (SC)	TES	G	NG				
-L-	403+33.19		LT MED	50.00							50		1		1													
SUBTOTAL				50.00							50		1		1													
	LESS ANCHOR DEDUCTIONS																											
	GREU TL-3 (50.00')		1	-50.00																								
	GREU TL-2 (25.00')																											
	CAT-1 (6.25')																											
	AT-1 (6.25')																											
	B-77 (22.875')																											
	TYPE-III (18.75')																											
	TYPE-III SC (18.75')																											
TOTAL GUARDRAIL =																												
SAY											50		1		1													

COMPUTED BY: AM DATE: 08/01/2024
CHECKED BY: JTC DATE: 08/08/2024

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

REMOVAL OF EXISTING ASPHALT PAVEMENT

IN SQUARE YARDS

LINE	STATION	STATION	LOCATION	LENGTH OR AREA	WIDTH	SQUARE YARDS
L	328+00	337+00	LT/RT	10032.98		1,114.78
L	341+00	358+00	LT/RT	31370.14		3,485.57
L	359+50	362+18	LT/RT	6569.56		729.95
L	361+50	367+50	LT/RT	5,536.96		615.22
L	371+00	376+50	LT/RT	19,257.20		2,139.69
L	377+18	413+00	LT	11,863.83		1,318.20
L	377+63	400+06	LT	5,249.76		583.31
L	401+70	413+00	LT	11,782.18		1,309.13
L	416+50	425+38	LT	7,072.55		785.84
L	425+36	436+00	LT	13,865.26		1,540.58
L	435+50	446+00	LT	15,245.19		1,693.91
L	448+50	477+50	LT	16,316.36		1,812.93
L	450+00	477+50	LT	27,292.87		3,032.54
L	477+50	478+00	LT	1,219.19		135.47
L	481+00	497+00	LT	18,532.36		2,059.15
L	500+50	509+00	LT	12,325.89		1,369.54
L	511+00	516+00	LT	14,035.62		1,559.51
L	519+00	556+00	LT	65,872.99		7,319.22
L	569+50	581+50	LT	29,853.48		3,317.05
L	591+00	595+50	LT	10,919.07		1,213.23
L	599+00	613+00	LT	34,294.70		3,810.52
L	617+00	671+57	LT	130,202.31		14,466.92
L	671+57	710+49	LT	46,529.80		5,169.98
L	670+86	716+00	LT	9,911.41		1,101.27
L	710+74	716+00	LT	4,121.07		457.90
L	720+00	728+50	LT	19,682.78		2,186.98
L	732+50	787+51	LT	75,433.85		8,381.54
L	787+51	817+61	LT	8,400.58		933.40
L	789+67	800+70	LT	15,854.56		1,761.62
L	801+25	817+15	LT	25,696.70		2,855.19
L	817+60	823+00	LT/RT	6,776.10		752.90
L	823+00	824+26	LT	4,259.56		473.28
L2B	824+26	835+30	LT/RT	19,325.97		2,147.33
Y11	10+85	12+45	LT/RT	4,550.95		505.66
Y11A	10+00	12+58	LT/RT	2,588.38		287.60
Y11C	11+50	12+33	LT/RT	3,166.43		351.83
Y12	10+55	11+00	LT/RT	2,843.95		315.99
				SHEET TOTAL		83,094.73

LINE	STATION	STATION	LOCATION	LENGTH OR AREA	WIDTH	SQUARE YARDS
Y12A	9+98	11+25	LT/RT	4,929.00		547.67
Y12A	16+50	18+31	LT/RT	4,888.41		543.16
Y13	10+76	19+15	LT/RT	19,646.81		2,182.98
Y14	10+95	16+23	LT/RT	6,645.15		738.35
Y15	13+67	15+46	LT/RT	1,903.54		211.50
Y16	14+25	16+50	LT/RT	1,896.13		210.68
Y16	18+00	19+33	LT/RT	3,015.20		335.02
Y17	10+59	12+00	LT/RT	4,549.19		505.47
Y18	15+00	15+54	LT/RT	1,397.32		155.26
Y19	10+75	15+48	LT/RT	10,046.20		1,116.24
Y20	15+00	15+89	LT/RT	3,529.93		392.21
Y20A	10+74	11+60	LT/RT	1,817.33		201.93
Y22	10+15	12+58	LT/RT	4,329.89		481.10
Y24	11+77	15+83	LT/RT	6,489.95		721.11
Y25	15+00	15+99	RT	4,016.55		446.28
Y26	10+52	10+82	LT	881.24		97.92
Y26	13+87	18+73	LT	14,765.87		1,640.65
Y26	18+96	25+01	LT	21,669.40		2,407.71
Y27	10+00	13+25	RT	6,070.01		674.45
TEMPORARY PAVEMENT REMOVAL:						27,720.00
				Sheet TOTAL		41,329.68
				Sheet 1 TOTAL		83,094.73
				TOTAL		124,424.41
				SAY		**124,430**

6/16/99

9/3/2024
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6/16/99

COMPUTED BY:	AM	DATE:	08/01/2024
CHECKED BY:	JTC	DATE:	08/08/2024

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
R-5709C	3B-5

SHOULDER BERM GUTTER

IN LINEAR FEET

LINE	STATION	STATION	SIDE	GROSS LENGTH	DEDUCTIONS DRIVES	DEDUCTIONS OTHERS	NET LENGTH
L	389+95.00	396+00.00	LT	597.27			597.27
L	389+95.00	397+00.32	RT	714.96			714.96
L	400+00.00	401+99.24	RT	203.31			203.31
L	402+00.45	409+70.76	LT	758.72			758.72
Y11D	14+00.01	15+16.86	LT	149.40			149.40
Y11D	12+47.06	15+10.20	RT	300.59			300.59
L	403+52.49	418+50.01	RT	1,576.97			1,576.97
L	497+99.88	501+46.89	RT	347.41			347.41
L	543+45.00	547+04.39	RT	363.82			363.82
L	557+47.69	560+41.69	LT	294.10			294.10
L	557+49.41	561+62.05	RT	412.64			412.64
L	561+40.63	567+47.63	LT	607.26			607.26
L	564+47.22	567+61.81	RT	314.59			314.59
L	573+44.07	575+02.16	RT	158.22			158.22
L	715+53.36	716+57.47	RT	103.90			103.90
					TOTAL		6,903.17
					SAY		**6,910**

BREAKING OF EXISTING ASPHALT PAVEMENT

IN SQUARE YARDS

LINE	STATION	STATION	LOCATION	LENGTH OR AREA	WIDTH	SQUARE YARDS
L	337+00	341+00	RT	9,990.94		1,110.10
L	358+00	359+50	RT	3,642.86		404.76
L	367+50	371+00	LT/RT	9,573.27		1,063.70
L	413+00	416+50	LT	8,547.56		949.73
L	446+00	448+50	LT	8,698.13		966.46
L	478+00	481+00	LT	7,502.16		833.57
L	497+00	500+50	LT	8,443.92		938.21
L	509+00	511+00	LT	4,749.26		527.70
L	516+00	519+00	LT	7,178.93		797.66
L	556+00	569+50	LT	32,401.23		3,600.14
L	581+50	591+00	LT	25,461.63		2,829.07
L	595+50	599+00	LT	8,565.61		951.73
L	613+00	617+00	LT	13,912.58		1,545.84
L	716+00	720+00	LT	9,633.20		1,070.36
L	728+50	732+50	LT	9,584.21		1,064.91
Y14	13+00	15+50	LT/RT	5,647.41		627.49
Y15	14+00	15+00	LT/RT	2,092.47		232.50
Y16	16+50	18+50	LT/RT	7,690.85		854.54
				TOTAL		20,368.47
				SAY		**20,370**

WILDLIFE FENCE

IN LINEAR FEET

STATION TO STATION	LT. OR RT.	A FABRIC L.F.	B END BRACE	C CORNER BRACE	D LINE BRACE	E 4" POSTS	F 5" POSTS
387+50.00 TO 400+64.30	LT	1,317.76	8	10	2	66	52
387+50.00 TO 402+17.53	RT	1,567.97	8	14		80	58
410+26.00 TO 421+92.00	LT	1,180.43	8	5	2	64	37
410+05.00 TO 421+92.00	RT	1,338.95	8	10	2	67	52
		0.00				0	0
TOTAL		5,405.11				278	199
SAY		**5,410**				**280**	**200**

CONCRETE EXPRESSWAY GUTTER

IN LINEAR FEET

LINE	STATION	STATION	SIDE	GROSS LENGTH	DEDUCTIONS DRIVES	DEDUCTIONS OTHERS	NET LENGTH
-L-	482+53.89	489+16.12		663.76	30.00		633.76
-RAB_L2-	10+00.00	14+02.12		389.56			389.56
							0.00
					TOTAL		1,023.32
					SAY		**1,030**

9/3/2024
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COMPUTED BY:	CAH	DATE:	11/30/2023
CHECKED BY:	SCJ	DATE:	11/30/2023

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
R-5709C	3D-1

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" & UNDER)

LINE & STATION SIZE THICKNESS OR GAUGE	OFFSET		STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	% MINIMUM REQUIRED SLOPE	DRAINAGE PIPE (RCP, CSP, CAAP, HDPE, PP or PVC) 15"	18"	24"	30"	36"	42"	48"	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE, PP, OR PVC	C.S. PIPE 42" .109
SHEET 2B-1																				
- L2- 643+00.00			X101																	
- L2- 643+00.00			X102																	
- L2- 643+00.00			X103																	
- L2- 643+00.00			X104																	
- L2- 643+00.00			X105																	
- L2- 643+00.00			X106																	
- L2- 643+00.00			X107						40								X	X		
SHEET 2B-19																				
- L2- 370+00.00	-6	LT	T100		503.0															
- L2- 370+00.00		LT	T100	T101		496.8	496.7	0.4%			40						X	X		
- L2- 369+59.57	-1	LT	T101		503.6															
- L2- 377+82.85	-30	LT	T102		492.6															
- L2- 377+82.85		LT	T102	T103		485.7	485.6	1.0%												
- L2- 377+66.27	-30	LT	T103		492.9															
- L2- 400+56.52	-10	LT	T104		476.0															
- L2- 400+56.52		LT	T104	3412		466.5	466.4	0.4%			16						X	X		
- L2- 416+09.43	-12	LT	T105		433.5															
- L2- 416+09.43		LT	T105	3502		425.6	424.6	4.1%												
- L2- 435+46.14	-19	LT	T106		488.1															
- L2- 435+46.14		LT	T106	3605		480.7	480.6	1.3%		20							X	X		
- L2- 438+50.00	-15	LT	T107		487.5															
- L2- 438+50.00		LT	T107	3605		484.8	480.6	0.5%												
- L2- 458+13.31	-15	LT	T108		448.4															
- L2- 458+13.31		LT	T108	T109		445.7	445.0	26%												
- L2- 471+25.84	-17	LT	T110		446.4															
- L2- 471+25.84		LT	T110	T111		444.2	441.1	11%												
- L2- 410+00.00	-13	LT	T134		446.0															
- L2- 410+00.00		LT	T134	3416		444.1	444.0	2.0%	12											
SHEET 2B-20																				
- L2- 498+84.87	-26	LT	T112		414.0															
- L2- 498+84.87		LT	T112	4102		409.4	408.5	0.5%												
- L2- 545+56.59	-19	LT	T116		403.8															
- L2- 545+56.59		LT	T116	4402		397.1	394.3	1.6%			28									
- L2- 480+78.16	-15	LT	T125		442.0															
- L2- 480+78.16		LT	T125	T126		439.8	437.4	0.4%												
- L2- 495+50.00	-19	LT	T135		420.3															
- L2- 495+50.00		LT	T135	T136		418.1	417.0	0.6%												
- L2- 518+80.66	-20	LT	T113		445.0															
- L2- 518+80.66		LT	T113	T113A		442.8	439.3	15%												
- Y17- 10+87.44		RT	T115	T115A		431.1	430.7	0.5%												
- L2- 552+50.00		CL	T117	T117A		403.1	400.7	0.5%												
- L2- 464+35.00	-11	LT	T158		452.0															
- L2- 464+35.00		LT	T158	T159		449.3	448.8	0.5%												
SHEET TOTALS									52	20	84	0	0	0	0					0

LINE & STATION	STRUCTURE NO. FROM	STRUCTURE NO. TO	R.C. PIPE CLASS III 15"	18"	24"	30"	36"	42"	48"	R.C. PIPE CLASS IV 15"	18"	24"	30"	36"	42"	48"	PIPE AS NOTED 6" HDPE	15" RCP-V	18" RCP-V	24" RCP-V	36" RCP-V	42" RCP-V	48" RCP-V	36" R.C. Pipe Culvert, Contractor Design	30" Welded Steel (In Soil)	30" Welded Steel (Not in Soil)	36" Welded Steel (In Soil)	36" Welded Steel (Not in Soil)	42" Welded Steel (In Soil)	42" Welded Steel (Not in Soil)	48" Welded Steel (In Soil)	48" Welded Steel (Not in Soil)	30" R.C. PIPE CULVERTS, CONTRACTOR DESIGN	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY
SHEET 2B-1																																		
- L2- 643+00.00	X101																			72														
- L2- 643+00.00	X102																			76														
- L2- 643+00.00	X103										8																							
- L2- 643+00.00	X104																	60																
- L2- 643+00.00	X105																	100																
- L2- 643+00.00	X106																	64																
- L2- 643+00.00	X107																																	
SHEET 2B-19																																		
- L2- 370+00.00	T100																																	
- L2- 370+00.00	T100	T101																																
- L2- 369+59.57	T101																																	
- L2- 377+82.85	T102																																	
- L2- 377+82.85	T102	T103				16																												
- L2- 377+66.27	T103																																	
- L2- 400+56.52	T104																																	
- L2- 400+56.52	T104	3412																																
- L2- 416+09.43	T105																																	
- L2- 416+09.43	T105	3502				48																												
- L2- 435+46.14	T106																																	
- L2- 435+46.14	T106	3605																																
- L2- 438+50.00	T107																																	
- L2- 438+50.00	T107	3605	292																															
- L2- 458+13.31	T108																																	
- L2- 458+13.31	T108	T109			112																													
- L2- 471+25.84	T110																																	
- L2- 471+25.84	T110	T111									104																							
- L2- 410+00.00	T134																																	
- L2- 410+00.00	T134	3416																																
SHEET 2B-20																																		
- L2- 498+84.87	T112																																	
- L2- 498+84.87	T112	4102				56																												
- L2- 545+56.59	T116																																	
- L2- 545+56.59	T116	4402																																
- L2- 480+78.16	T125																																	
- L2- 480+78.16	T125	T126		136																														
- L2- 495+50.00	T135																																	
- L2- 495+50.00	T135	T136		92																														
- L2- 518+80.66	T113																																	
- L2- 518+80.66	T113	T113A									112																							
- Y17- 10+87.44	T115	T115A																80																
- L2- 552+50.00	T117	T117A																100																
- L2- 464+35.00	T158																																	
- L2- 464+35.00	T158	T159	108																															
SHEET TOTALS			400	228	112	120	0	0	0	0	224	0	0	0	0	0	0	404	0	148	0	0	0	0	0	0	0	0	0	0	0	0	0	0

LINE & STATION	STRUCTURE NO. FROM	STRUCTURE NO. TO	QUANTITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0')	LIN. FT. A 5.0' THRU 10.0'	LIN. FT. B 10.0' AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	CONCRETE TRANSITIONAL SECTION DROP INLET	CONCRETE TRANSITIONAL SECTION CATCH BASIN	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATE STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. FRAME WITH TWO FLAT GRATES STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	G.D.I. (N.S.) FR. WITH TWO FLAT GRATES. STD. 840.29	J.B. STD. 840.31 OR 840.32	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 GRATE AND FRAME STD. 840.37	M.H. FRAME AND COVER STD. 840.54	SPRING BOX STD. 840.41	M.H. STD. 840.51, STD. 840.52, OR STD. 840.53	15" DRAINAGE PIPE ELBOW	18" DRAINAGE PIPE ELBOW	24" DRAINAGE PIPE ELBOW	30" DRAINAGE PIPE ELBOW	TEMP STEEL PLATE COVER MASONRY DRAINAGE	ADJUST CB	ADJUST DI	BERM DRAINAGE OUTLET STD. 850.10 (4" CONCRETE PAVED DITCH SY)	BERM DRAINAGE OUTLET STD. 850.11 (4" CONCRETE PAVED DITCH SY)	ENERGY DISSIPATOR BASIN - EACH	FLOWABLE FILL (CY)	CONC. COLLARS CL. "B" C.Y. STD. 840.72	PIPE REMOVAL LIN. FT.	REMARKS
SHEET 2B-1																																										
- L2- 643+00.00	X101																																								72	
- L2- 643+00.00	X102																																								76	
- L2- 643+00.00	X103																																							0.065	8	
- L2- 643+00.00	X104																																								60	
- L2- 643+00.00	X105																																								100	
- L2- 643+00.00	X106																																								64	
- L2- 643+00.00	X107																																								40	
SHEET 2B-19																																										
- L2- 370+00.00	T100		1	1.3																				1	1																	
- L2- 370+00.00	T100	T101																																							40	
- L2- 369+59.57	T101		1	1.9																				1	1																	
- L2- 377+82.85	T102		1	1.9																				1	1																	
- L2- 377+82.85	T102	T103																																							16	
- L2- 377+66.27	T103		1	2.3																				1	1																	
- L2- 400+56.52	T104		1	4.5												1		1																								
- L2- 400+56.52	T104	3412																																							16	
- L2- 416+09.43	T105		1	2.9												1		1																								
- L2- 416+09.43	T105	3502																																							48	
- L2- 435+46.14	T106		1	2.4																			1				1															
- L2- 435+46.14	T106	3605																																							20	
- L2- 438+50.00	T107		1													1			1																							
- L2- 438+50.00	T107	3605																																							292	
- L2- 458+13.31	T108		1														1		1																							
- L2- 458+13.31	T108	T109																																					13			
- L2- 471+25.84	T110		1														1		1																							
- L2- 471+25.84	T110	T111																																					7			
- L2- 410+00.00	T134		1														1		1																							
- L2- 410+00.00	T134	3416																																							12	
SHEET 2B-20																																										
- L2- 498+84.87	T112		1													1			1																							
- L2- 498+84.87	T112	4102																																					10			
- L2- 545+56.59	T116		1	1.7													1		1																							
- L2- 545+56.59	T116	4402																																							28	
- L2- 480+78.16	T125		1														1		1																							
- L2- 480+78.16	T125	T126																																					9			
- L2- 495+50.00	T135		1													1			1																							
- L2- 495+50.00	T135	T136																																					6			
- L2- 518+80.66	T113		1														1		1																							
- L2- 518+80.66	T113	T113A																																					7			
- Y17- 10+87.44	T115	T115A																																					4	0.399		
- L2- 552+50.00	T117	T117A																																							100	
- L2- 464+35.00	T158		1													1			1																							
- L2- 464+35.00	T158	T159																																					5			
SHEET TOTALS			17	18.91	0	0	0	0	0	0	0	0	0	0	0	6	6	2	10	0	0	0	1	0	4	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	61	0.464	992	

*TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B')

ABBREVIATIONS

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

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8/17/99

COMPUTED BY:	CAH	DATE:	11/30/2023
CHECKED BY:	SCJ	DATE:	11/30/2023

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
R-5709C	3D-2

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" & UNDER)

LINE & STATION / SIZE / THICKNESS OR GAUGE	OFFSET		STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	% MINIMUM REQUIRED SLOPE	DRAINAGE PIPE (RCP, CSP, CAAP, HDPE, PP or PVC) 15"	DRAINAGE PIPE 18"	DRAINAGE PIPE 24"	DRAINAGE PIPE 30"	DRAINAGE PIPE 36"	DRAINAGE PIPE 42"	DRAINAGE PIPE 48"	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE, PP, OR PVC
SHEET 2B-20 (cont.)																			
- L2- 561+00.00	-13	LT	T132		368.0														
- L2- 561+00.00		LT	T132	T133		365.0	349.8	0.8%											
- L2- 565+62.50	-24	LT	T130		367.7														
- L2- 565+62.50		LT	T130	T131		365.0	351.3	0.8%											
- L2- 648+50.00		LT	T141	T142		365.4	364.7	0.6%											
SHEET 2B-21																			
- L2- 575+28.88	-19	LT	T118		384.2														
- L2- 575+28.88		LT	T118	4608		382.0	381.3	2.3%		28									
- L2- 589+62.50		LT	T127	T128		382.5	382.0	0.5%			112								
- L2- 609+50.00		LT	T129	4904		378.8	378.6	0.6%		28									
- L2- 620+00.00	-20	LT	T119A		378.8														
- L2- 620+00.00		LT	T119A	T119		376.2	375.0	0.5%	248										
- L2- 617+50.00	-3	LT	T119		380.0														
- L2- 617+50.00		LT	T119	4908		375.0	374.5	0.5%	100										
- L2- 664+65.00		LT	T139	T140		359.2	359.1	0.7%											
- L2- 643+00.00	-11	LT	T120B		372.4														
- L2- 643+00.00		LT	T120B	T120		368.1	367.3	0.04			56								
- L2- 648+50.00		LT	T141	T142		365.4	364.7	0.6%											
- L2- 671+75.00		LT	T137	T138		362.5	361.8	0.01											
- L2- 686+52.11	-15	LT	T121		349.4														
- L2- 686+52.11		LT	T121	T121A		346.7	345.3	0.02											
- L2- 708+09.50	-20	LT	T143		348.0														
- L2- 708+09.50		LT	T143	T143A		344.1	344.0	0.6%											
SHEET 2B-22																			
- L2- 716+25.87	-18	LT	T122		328.0														
- L2- 716+25.87		LT	T122	T122A		322.5	321.3	0.6%											
- L2- 731+29.91	-15	LT	T144		332.0														
- L2- 731+29.91		LT	T144	T145		327.9	327.2	0.5%			184								
- L2- 733+15.00	-15	LT	T145		330.8														
- L2- 733+15.00		LT	T145	T146		327.2	326.8	0.5%											
- L2- 742+00.00		LT	T148	T149		312.6	311.2	1.1%											
- L2- 747+75.00	-8	LT	T123		309.5														
- L2- 747+75.00		LT	T123	5901		306.8	306.2	0.5%	84										
- L2- 797+69.00	-20	LT	T152		294.1														
- L2- 797+69.00		LT	T152	T153		290.1	289.1	2.3%		124									
- L2- 796+43.32	-8	LT	T153		293.0														
- L2- 796+43.32		LT	T153	T154		289.1	288.8	0.8%											
SHEET TOTALS									432	180	352	0	0	0	0				

LINE & STATION	FROM	TO	R.C. PIPE CLASS III 15"	CLASS III 18"	CLASS III 24"	CLASS III 30"	CLASS III 36"	CLASS III 42"	CLASS III 48"	R.C. PIPE CLASS IV 15"	CLASS IV 18"	CLASS IV 24"	CLASS IV 30"	CLASS IV 36"	CLASS IV 42"	CLASS IV 48"	PIPE AS NOTED 6" HDPE	15" RCP-V	18" RCP-V	24" RCP-V	36" RCP-V	42" RCP-V	48" RCP-V	30" Welded Steel (In Soil)	30" Welded Steel (Not in Soil)	36" Welded Steel (In Soil)	36" Welded Steel (Not in Soil)	42" Welded Steel (In Soil)	42" Welded Steel (Not in Soil)	48" Welded Steel (In Soil)	48" Welded Steel (Not in Soil)	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY
SHEET 2B-20 (cont.)																																
- L2- 561+00.00	T132																															
- L2- 561+00.00	T132	T133		156																												
- L2- 565+62.50	T130																															
- L2- 565+62.50	T130	T131	160																													
- L2- 648+50.00	T141	T142		112																												
SHEET 2B-21																																
- L2- 575+28.88	T118																															
- L2- 575+28.88	T118	4608																														
- L2- 589+62.50	T127	T128																														
- L2- 609+50.00	T129	4904																														
- L2- 620+00.00	T119A																															
- L2- 620+00.00	T119A	T119																														
- L2- 617+50.00	T119																															
- L2- 617+50.00	T119	4908																														
- L2- 664+65.00	T139	T140																			104											
- L2- 643+00.00	T120B																															
- L2- 643+00.00	T120B	T120																														
- L2- 648+50.00	T141	T142		112																												
- L2- 671+75.00	T137	T138																84														
- L2- 686+52.11	T121																															
- L2- 686+52.11	T121	T121A										128																				
- L2- 708+09.50	T143																															
- L2- 708+09.50	T143	T143A					112																									
SHEET 2B-22																																
- L2- 716+25.87	T122																															
- L2- 716+25.87	T122	T122A					108																									
- L2- 731+29.91	T144																															
- L2- 731+29.91	T144	T145																														
- L2- 733+15.00	T145																															
- L2- 733+15.00	T145	T146			104																											
- L2- 742+00.00	T148	T149	100																													
- L2- 747+75.00	T123																															
- L2- 747+75.00	T123	5901																														
- L2- 797+69.00	T152																															
- L2- 797+69.00	T152	T153																														
- L2- 796+43.32	T153																															
- L2- 796+43.32	T153	T154			96																											
SHEET TOTALS			260	380	200	0	220	0	0	0	0	128	0	0	0	0	0	84	0	0	104	0	0	0	0	0	0	0	0	0	0	0

LINE & STATION	FROM	TO	QUANTITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0')	*TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') LIN. FT. A 5.0' THRU 10.0'	LIN. FT. B 10.0' AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	CONCRETE TRANSITIONAL SECTION DROP INLET	CONCRETE TRANSITIONAL SECTION CATCH BASIN	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATE STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. FRAME WITH TWO FLAT GRATES STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	G.D.I. (N.S.) FR. WITH TWO FLAT GRATES. STD. 840.29	J.B. STD. 840.31 OR 840.32	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 GRATE AND FRAME STD. 840.37	M.H. FRAME AND COVER STD. 840.54	SPRING BOX STD. 840.41	15" DRAINAGE PIPE ELBOW	18" DRAINAGE PIPE ELBOW	24" DRAINAGE PIPE ELBOW	30" DRAINAGE PIPE ELBOW	TEMP STEEL PLATE COVER MASONRY DRAINAGE	ADJUST CB	ADJUST DI	BERM DRAINAGE OUTLET STD. 850.10 (4" CONCRETE PAVED DITCH SY)	BERM DRAINAGE OUTLET STD. 850.11 (4" CONCRETE PAVED DITCH SY)	ENERGY DISSIPATOR BASIN - EACH	FLOWABLE FILL (CY)	CONC. COLLARS CL. "B" C.Y. STD. 840.72	PIPE REMOVAL LIN. FT.	REMARKS
SHEET 2B-20 (cont.)																																									
- L2- 561+00.00	T132		1												1		1																								
- L2- 561+00.00	T132	T133																																					10			
- L2- 565+62.50	T130		1												1		1																								
- L2- 565+62.50	T130	T131																																					7			
- L2- 648+50.00	T141	T142																																					7			
SHEET 2B-21																																									
- L2- 575+28.88	T118		1													1		1																							
- L2- 575+28.88	T118	4608																																							28	
- L2- 589+62.50	T127	T128																																					7			
- L2- 609+50.00	T129	4904																																							28	
- L2- 620+00.00	T119A		1													1		1																							
- L2- 620+00.00	T119A	T119																																							248	
- L2- 617+50.00	T119		1	0.1											1			1																							
- L2- 617+50.00	T119	4908																																							100	
- L2- 664+65.00	T139	T140																																								
- L2- 643+00.00	T120B		1												1			1																							
- L2- 643+00.00	T120B	T120																																							52	
- L2- 648+50.00	T141	T142																																					7			
- L2- 671+75.00	T137	T138																																								
- L2- 686+52.11	T121		1													1		1																							
- L2- 686+52.11	T121	T121A																																					15			
- L2- 708+09.50	T143		1												1			1																							
- L2- 708+09.50	T143	T143A																																					29			
SHEET 2B-22																																									
- L2- 716+25.87	T122		1	0.5											1			1																							
- L2- 716+25.87	T122	T122A																																					28			
- L2- 731+29.91	T144		1												1			1																							
- L2- 731+29.91	T144	T145																																							184	
- L2- 733+15.00	T145		1												1			1																							
- L2- 733+15.00	T145	T146																																					12			
- L2- 742+00.00	T148	T149																																					5			
- L2- 747+75.00	T123		1												1			1																							
- L2- 747+75.00	T123	5901																																							84	
- L2- 797+69.00	T152		1																		1					1																
- L2- 797+69.00	T152	T153																																							124	
- L2- 796+43.32	T153		1												1			1																							
- L2- 796+43.32	T153	T154																																					11			
SHEET TOTALS			14	0.61	0	0	0	0	0	0	0	0	0	0	10	3	2	11	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	138	0	848	

ABBREVIATIONS

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

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9/4/2024
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amacpherson

PROJECT REFERENCE NO.	SHEET NO.
R-5709C	3D-3

COMPUTED BY:	CAH	DATE:	11/30/2023
CHECKED BY:	SCJ	DATE:	11/30/2023

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

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" & UNDER)

LINE & STATION SIZE THICKNESS OR GAUGE	OFFSET		STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	% MINIMUM REQUIRED SLOPE
SHEET 2B-22 (cont.)								
- L2- 752+92.95	-13	LT	T124		305.8			
- L2- 752+92.95		LT	T124	5905		302.1	301.7	0.5%
- L2- 773+50.00		RT	T150	T151		299.2	299.0	1.6%
- L2- 773+47.58	-15	LT	T151		302.0			
- L2- 806+58.67	-12	LT	T155		286.3			
- L2- 806+58.67		LT	T155	T156		283.1	282.9	0.4%
- L2- 810+90.00	-16	LT	T157		285.0			
- L2- 810+90.00		LT	T157	T160		281.4	281.3	0.5%
- L2- 810+40.46	-12	LT	T160		289.2			
- L2- 810+40.46		LT	T160	6304		281.3	281.2	0.4%
SHEET TOTALS								

LINE & STATION	DRAINAGE PIPE (RCP, CSP, CAAP, HDPE, PP or PVC) 15"	18"	24"	30"	36"	42"	48"	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE, PP, OR PVC
SHEET 2B-22 (cont.)											
- L2- 752+92.95											
- L2- 752+92.95			48								
- L2- 773+50.00											
- L2- 773+47.58											
- L2- 806+58.67											
- L2- 806+58.67											
- L2- 810+90.00											
- L2- 810+90.00		48									
- L2- 810+40.46											
- L2- 810+40.46					36						
SHEET TOTALS	0	48	48	0	36	0	0				

LINE & STATION	R.C. PIPE CLASS III 15"	18"	24"	30"	36"	42"	48"	R.C. PIPE CLASS IV 15"	18"	24"	30"	36"	42"	48"
SHEET 2B-22 (cont.)														
- L2- 752+92.95														
- L2- 752+92.95														
- L2- 773+50.00			92											
- L2- 773+47.58														
- L2- 806+58.67														
- L2- 806+58.67				104										
- L2- 810+90.00														
- L2- 810+90.00														
- L2- 810+40.46														
- L2- 810+40.46														
SHEET TOTALS	0	0	92	104	0	0	0	0	0	0	0	0	0	0

LINE & STATION	PIPE AS NOTED 6" HDPE	15" RCP-V	18" RCP-V	24" RCP-V	36" RCP-V	42" RCP-V	48" RCP-V	30" Welded Steel (In Soil)	30" Welded Steel (Not in Soil)	36" Welded Steel (In Soil)	36" Welded Steel (Not in Soil)	42" Welded Steel (In Soil)	42" Welded Steel (Not in Soil)	48" Welded Steel (In Soil)	48" Welded Steel (Not in Soil)	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY
SHEET 2B-22 (cont.)																
- L2- 752+92.95																
- L2- 752+92.95																
- L2- 773+50.00																
- L2- 773+47.58																
- L2- 806+58.67																
- L2- 806+58.67																
- L2- 810+90.00																
- L2- 810+90.00																
- L2- 810+40.46																
- L2- 810+40.46																
SHEET TOTALS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

LINE & STATION	QUANTITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0')	*TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') LIN. FT. A 5.0' THRU 10.0'	B 10.0' AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	CONCRETE TRANSITIONAL SECTION DROP INLET	CATCH BASIN
SHEET 2B-22 (cont.)									
- L2- 752+92.95	1								
- L2- 752+92.95									
- L2- 773+50.00									
- L2- 773+47.58	1								
- L2- 806+58.67	1								
- L2- 806+58.67									
- L2- 810+90.00	1								
- L2- 810+90.00									
- L2- 810+40.46	1	4.4							
- L2- 810+40.46									
SHEET TOTALS	5	4.42	0	0	0	0	0	0	0

LINE & STATION	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATE STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. FRAME WITH TWO FLAT GRATES STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	G.D.I. (N.S.) FR. WITH TWO FLAT GRATES. STD. 840.29	J.B. STD. 840.31 OR 840.32	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 GRATE AND FRAME STD. 840.37	M.H. FRAME AND COVER STD. 840.54	SPRING BOX STD. 840.41
SHEET 2B-22 (cont.)																
- L2- 752+92.95				1			1									
- L2- 752+92.95																
- L2- 773+50.00																
- L2- 773+47.58					1		1									
- L2- 806+58.67					1		1									
- L2- 806+58.67																
- L2- 810+90.00				1			1									
- L2- 810+90.00																
- L2- 810+40.46										1					1	
- L2- 810+40.46																
SHEET TOTALS	0	0	0	2	2	0	4	0	0	1	0	0	0	0	1	0

LINE & STATION	15" DRAINAGE PIPE ELBOW	18" DRAINAGE PIPE ELBOW	24" DRAINAGE PIPE ELBOW	30" DRAINAGE PIPE ELBOW	TEMP STEEL PLATE COVER MASONRY DRAINAGE	ADJUST CB	ADJUST DI	BERM DRAINAGE OUTLET STD. 850.10 (4" CONCRETE PAVED DITCH SY)	BERM DRAINAGE OUTLET STD. 850.11 (4" CONCRETE PAVED DITCH SY)	ENERGY DISSIPATOR BASIN - EACH	FLOWABLE FILL (CY)	CONC. COLLARS CL. "B" C.Y. STD. 840.72	PIPE REMOVAL LIN. FT.	REMARKS
SHEET 2B-22 (cont.)														
- L2- 752+92.95														
- L2- 752+92.95													48	
- L2- 773+50.00											11			
- L2- 773+47.58														
- L2- 806+58.67														
- L2- 806+58.67											19			
- L2- 810+90.00														
- L2- 810+90.00													48	
- L2- 810+40.46														
- L2- 810+40.46													36	
SHEET TOTALS	0	0	0	0	0	0	0	0	0	0	30	0	132	

ABBREVIATIONS

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

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8/17/99

COMPUTED BY:	CJP	DATE:	Aug. 20, 2024
CHECKED BY:	CAH	DATE:	Aug. 22, 2024

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
R-5709C	3D-4

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" & UNDER)

LINE & STATION	OFFSET		STRUCTURE NO.		TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	% MINIMUM REQUIRED SLOPE	DRAINAGE PIPE (RCP, CSP, CAAP, HDPE, PP or PVC)										R.C. PIPE CLASS III							R.C. PIPE CLASS IV							PIPE AS NOTED															ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE)	QUANTITIES FOR DRAINAGE STRUCTURES	*TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B')		C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03			CONCRETE TRANSITIONAL SECTION		D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATE STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. FRAME WITH TWO FLAT GRATES STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	G.D.I. (N.S.) FR. WITH TWO FLAT GRATES. STD. 840.29	J.B. STD. 840.31 OR 840.32	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 GRATE AND FRAME STD. 840.37	M.H. FRAME AND COVER STD. 840.54	SPRING BOX STD. 840.41	15" DRAINAGE PIPE ELBOW	18" DRAINAGE PIPE ELBOW	24" DRAINAGE PIPE ELBOW	30" DRAINAGE PIPE ELBOW	TEMP STEEL PLATE COVER MASONRY DRAINAGE	ADJUST CB	ADJUST DI	BERM DRAINAGE OUTLET STD. 850.10 (4" CONCRETE PAVED DITCH SY)	BERM DRAINAGE OUTLET STD. 850.11 (4" CONCRETE PAVED DITCH SY)	ENERGY DISSIPATOR BASIN - EACH	FLOWABLE FILL (CY)	CONC. COLLARS CL. "B" C.Y. STD. 840.72	PIPE REMOVAL LIN. FT.	REMARKS
SIZE THICKNESS OR GAUGE			FROM	TO					15"	18"	24"	30"	36"	42"	48"	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE, PP, OR PVC	15"	18"	24"	30"	36"	42"	48"	15"	18"	24"	30"	36"	42"	48"	6" HDPE	15" RCP-V	18" RCP-V	24" RCP-V	36" RCP-V	42" RCP-V	48" RCP-V	30" Welded Steel (In Soil)	30" Welded Steel (Not in Soil)	36" Welded Steel (In Soil)	36" Welded Steel (Not in Soil)	42" Welded Steel (In Soil)	42" Welded Steel (Not in Soil)	48" Welded Steel (In Soil)	48" Welded Steel (Not in Soil)	CY	PER EACH (0' THRU 5.0')	LIN. FT. A 5.0' THRU 10.0'	LIN. FT. B 10.0' AND ABOVE		TYPE OF GRATE E	F	G	DROP INLET	CATCH BASIN																														
SHEET 4																																																																																								
- L1- 320+50.00	17	RT	405		436.4																																													1												1			1																							
- L1- 320+50.00	17	LT	405	406		431.4	430.0	0.5%												68																																																																				
L1 313+44	13	LT	407																											36																																																								7.2		42	
L1 316+75	75	RT	420						24																																																																															
SHEET 5																																																																																							
- L1- 322+50.00	11	RT	501		438.6																																													1												1			1																							
L1 321+50	14	RT	501	405		435.8	433.6	0.5%												200																																																																				
L1 326+93	75	RT	502						24										X																																																																						
L1 328+24	76	RT	504						40										X																																																																						
L1 333+09	75	RT	508						32										X																																																																				54	PIPE REMOVAL 18" RCP
SHEET 6																																																																																						
- L1- 337+13.00	10	LT	601		447.9																																													1												1			1																							
- L1- 337+13.00		LT	601	602		444.7	444.4	0.4%												112																																																																		28	PIPE REMOVAL 15" RCP
- L1- 339+50.00	75	LT	604		447.2																																													1	1.3										1					1																						
- L1- 339+50.00		LT	604	603		440.9	439.5	0.4%																	116																																																															
- L1- 341+80.00	75	LT	605		453.2																																													1	0.8										1					1																						
- L1- 341+80.00		LT	605	604		447.4	441.5	0.5%																228																																																															
- L1- 342+60.00	75	LT	606		456.1																																													1	0.8										1					1																						
- L1- 342+60.00		LT	606	605		450.4	447.4	0.5%																76																																																													40	PIPE REMOVAL 15" RCP, 18" CMP
- L1- 344+10.00	75	LT	607		461.8																																													1	0.8										1					1																						
- L1- 344+10.00		LT	607	606		456.1	450.4	0.5%																148																																																															
- L1- 345+40.00	75	LT	608		466.8																																													1	0.8										1					1																						
- L1- 345+40.00		LT	608	607		461.0	456.1	0.5%																128																																																													108	PIPE REMOVAL 4 @ 15 RCP
- L1- 348+25.00	90	LT	609		476.9																																													1											1					1																						
- L1- 348+25.00		LT	609	608		472.4	461.0	0.5%																284																																																															
- L1- 347+79.70	2	LT	610		480.0																																													1							1									1					1																		
- L1- 347+79.70		LT	610	611		476.8	476.6	0.5%																											72																																																						
- L1- 348+51.05	10	RT	611		480.4																																													1												1				1																						
- L1- 348+51.05		RT	611	609		476.6	474.2	0.5%																			104																																																															
- Y10- 18+00.00		RT	612	609		475.8	472.4	0.4%																48																									3.4																																									
- L1- 337+13.40	19	RT	615		448.9																																													1																							1	1															
- L1- 337+13.40		RT	615	601		445.6	445.2	0																			28																																																																
- L1- 337+13.40		RT	620						24										X																																																																							
SHEET TOTALS									144	0	0	0	0	0	0					380	0	0	0	912	116	0	132	0	0	36	0	0	0	0	72	0	0	0	0	0	0	0	0	0	0	0	0	0	3.4	12	4.3	0	0	0	0	0	1	0	0	0	6	4	0	0	4	7	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	7.2	0	272	

ABBREVIATIONS

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

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default

8/17/99

COMPUTED BY:	CJP	DATE:	Apr. 2, 2021
CHECKED BY:	CAH	DATE:	Apr. 9, 2021

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
R-5709C	3D-5

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" & UNDER)

LINE & STATION / SIZE / THICKNESS OR GAUGE	OFFSET		STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	% MINIMUM REQUIRED SLOPE
SHEET 7								
- L1- 357+00.00	-10	LT	701		486.6			
- L1- 357+00.00		LT	701	702		483.9	483.7	0.5%
- L1- 357+50.00	19	RT	702		487.8			
- L1- 357+50.00		RT	702	703		483.7	482.1	0.4%
- L1- 358+50.00	0	CL	703		484.9			
- L1- 358+50.00		CL	703	804		482.1	481.7	0.5%
- L1- 350+00.00	-82	LT	715		481.2			
- L1- 350+00.00		LT	715	609		476.4	473.4	0.5%
SHEET 8								
- L1- 359+46.00		LT	801	804		481.2	480.0	0.4%
- L1- 361+25.00	-75	LT	802		488.1			
- L1- 361+25.00		LT	802	803		485.9	484.9	0.6%
- L1- 361+25.00	0	CL	803		489.1			
- L1- 361+25.00		CL	803	804		484.4	481.0	0.5%
- L1- 359+43.00	0	CL	804		485.7			
- L1- 359+43.00		CL	804	805		480.0	479.7	0.4%
- L2- 369+99.96		LT	806	807		499.0	494.2	0.4%
SHEET TOTALS								

LINE & STATION	FROM	TO	DRAINAGE PIPE (RCP, CSP, CAAP, HDPE, PP or PVC) 15"	18"	24"	30"	36"	42"	48"	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE, PP, OR PVC	R.C. PIPE CLASS III 15"	18"	24"	30"	36"	42"	48"	R.C. PIPE CLASS IV 15"	18"	24"	30"	36"	42"	48"
SHEET 7																											
- L1- 357+00.00	701																										
- L1- 357+00.00	701	702												56													
- L1- 357+50.00	702																										
- L1- 357+50.00	702	703												100													
- L1- 358+50.00	703																										
- L1- 358+50.00	703	804												92													
- L1- 350+00.00	715																										
- L1- 350+00.00	715	609														172											
SHEET 8																											
- L1- 359+46.00	801	804																80									
- L1- 361+25.00	802																										
- L1- 361+25.00	802	803													76												
- L1- 361+25.00	803																										
- L1- 361+25.00	803	804														180											
- L1- 359+43.00	804																										
- L1- 359+43.00	804	805																88									
- L2- 369+99.96	806	807														188											
SHEET TOTALS			0	0	0	0	0	0	0					248	76	540	0	168	0	0	0	0	0	0	0	0	0

LINE & STATION	FROM	TO	PIPE AS NOTED 6" HDPE	15" RCP-V	18" RCP-V	24" RCP-V	36" RCP-V	42" RCP-V	48" RCP-V	30" Welded Steel (In Soil)	30" Welded Steel (Not in Soil)	36" Welded Steel (In Soil)	36" Welded Steel (Not in Soil)	42" Welded Steel (In Soil)	42" Welded Steel (Not in Soil)	48" Welded Steel (In Soil)	48" Welded Steel (Not in Soil)	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY
SHEET 7																		
- L1- 357+00.00	701																	
- L1- 357+00.00	701	702																
- L1- 357+50.00	702																	
- L1- 357+50.00	702	703																
- L1- 358+50.00	703																	
- L1- 358+50.00	703	804																
- L1- 350+00.00	715																	
- L1- 350+00.00	715	609																
SHEET 8																		
- L1- 359+46.00	801	804																
- L1- 361+25.00	802																	
- L1- 361+25.00	802	803																
- L1- 361+25.00	803																	
- L1- 361+25.00	803	804																
- L1- 359+43.00	804																	
- L1- 359+43.00	804	805																
- L2- 369+99.96	806	807																
SHEET TOTALS			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

LINE & STATION	FROM	TO	QUANTITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0')	*TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL. 'B') LIN. FT. A 5.0' THRU 10.0'	LIN. FT. B 10.0' AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	CONCRETE TRANSITIONAL SECTION DROP INLET	CATCH BASIN	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATE STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. FRAME WITH TWO FLAT GRATES STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	G.D.I. (N.S.) FR. WITH TWO FLAT GRATES. STD. 840.29	J.B. STD. 840.31 OR 840.32	T.B.J.B. STD. 840.34	T.B.D.I. STD. 840.35
SHEET 7																							
- L1- 357+00.00	701		1																1				1
- L1- 357+00.00	701	702																					
- L1- 357+50.00	702		1							1								1					1
- L1- 357+50.00	702	703																					
- L1- 358+50.00	703		1												1				1				
- L1- 358+50.00	703	804																					
- L1- 350+00.00	715		1											1					1				
- L1- 350+00.00	715	609																					
SHEET 8																							
- L1- 359+46.00	801	804																					
- L1- 361+25.00	802		1													1			1				
- L1- 361+25.00	802	803																					
- L1- 361+25.00	803		1											1					1				
- L1- 361+25.00	803	804																					
- L1- 359+43.00	804		1	0.8										1					1				
- L1- 359+43.00	804	805																					
- L2- 369+99.96	806	807																					
SHEET TOTALS			7	0.75	0	0	0	0	0	1	0	0	0	3	1	1	0	1	6	0	0	0	2

LINE & STATION	FROM	TO	T.B.D.I FOR STEEL GRATES STD. 840.36	STEEL GRATE AND FRAME STD. 840.37	M.H. FRAME AND COVER STD. 840.54	SPRING BOX STD. 840.41	15" DRAINAGE PIPE ELBOW	18" DRAINAGE PIPE ELBOW	24" DRAINAGE PIPE ELBOW	30" DRAINAGE PIPE ELBOW	TEMP STEEL PLATE COVER MASONRY DRAINAGE	ADJUST CB	ADJUST DI	BERM DRAINAGE OUTLET STD. 850.10 (4" CONCRETE PAVED DITCH SY)	BERM DRAINAGE OUTLET STD. 850.11 (4" CONCRETE PAVED DITCH SY)	ENERGY DISSIPATOR BASIN - EACH	FLOWABLE FILL (CY)	CONC. COLLARS CL. "B" C.Y. STD. 840.72	PIPE REMOVAL LIN. FT.	REMARKS
SHEET 7																				
- L1- 357+00.00	701																			
- L1- 357+00.00	701	702																		
- L1- 357+50.00	702																			
- L1- 357+50.00	702	703																		
- L1- 358+50.00	703																			
- L1- 358+50.00	703	804																		
- L1- 350+00.00	715																			
- L1- 350+00.00	715	609																		
SHEET 8																				
- L1- 359+46.00	801	804																		
- L1- 361+25.00	802																			
- L1- 361+25.00	802	803																		
- L1- 361+25.00	803																			
- L1- 361+25.00	803	804																		
- L1- 359+43.00	804																			
- L1- 359+43.00	804	805															3			
- L2- 369+99.96	806	807															5.2			
SHEET TOTALS			0	0	0	0	0	0	0	0	0	0	0	0	0	0	8.2	0	0	

ABBREVIATIONS

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

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amacpherson

COMPUTED BY: CJP DATE: Apr. 2, 2021

CHECKED BY: CAH DATE: Apr. 9, 2021

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
R-5709C	3D-6

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" & UNDER)

LINE & STATION	OFFSET		STRUCTURE NO.		TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	% MINIMUM REQUIRED SLOPE	DRAINAGE PIPE (RCP, CSP, CAAP, HDPE, PP or PVC)											R.C. PIPE CLASS III							R.C. PIPE CLASS IV						
SIZE									15"	18"	24"	30"	36"	42"	48"					15"	18"	24"	30"	36"	42"	48"	15"	18"	24"	30"	36"	42"	48"
THICKNESS OR GAUGE			FROM	TO												DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE, PP, OR PVC														
SHEET 9																																	
- L2- 376+00.00	-10	LT	901		494.3																												
- L2- 376+00.00		LT	901	902		491.3	491.0	0.5%																				68					
- L2- 376+65.11	-17	LT	902		494.4																												
- L2- 376+65.11		LT	902	903		491.0	485.4	0.5%																				124					
- Y11- 10+64.18		LT	905	918		491.8	490.3	0.4%																52									
- Y11- 10+60.46	-10	LT	918		495.3																												
- Y11- 10+60.46		LT	918	904		490.3	485.9	0.4%																80									
- L2- 377+61.71		LT	909	904		488.4	485.9	0.4%					32				X	X	X														
- L2- 377+70.05	-63	LT	904		491.5																												
- L2- 377+70.05		LT	904	903		485.9	485.6	0.5%																48									
- L2- 377+88.00	-20	LT	903		492.9																												
- L2- 377+88.00		LT	903	917		483.9	482.3	0.6%																88									
- Y11A- 11+50.00	-30	LT	910		490.0																												
- Y11A- 11+50.00		LT	910	916		488.1	488.0	0.5%																			36						
- Y11A- 11+69.55	2	RT	916		492.1																												
- Y11A- 11+69.55		RT	916	917		488.0	484.1	0.6%																			116						
- L2- 377+88.11	67	RT	917		487.7																												
- L2- 377+88.11		RT	917	906		482.3	481.8	0.6%																24									
- L2- 378+50.00	-118	LT	914		505.0																												
- L2- 378+50.00		LT	914	915		495.3	489.3	1.2%		40						X			X														
- L2- 384+50.00	-123	LT	919		496.0																												
- L2- 384+50.00		LT	919	920		487.7	477.9	0.8%	44							X			X														
-Y11A- 10+96.34	-23	LT	921						72																								
SHEET 10																																	
- L2- 385+00.00	75	RT	1001		476.9																												
- L2- 385+00.00		RT	1001	1016		474.1	470.7	0.6%	84								X	X	X														
- L2- 385+80.00		LT	1002	1016		474.1	468.4	0.4%																									
- L2- 385+80.00	69	RT	1016		475.5																												
- L2- 385+80.00		RT	1016	1004		468.4	467.5	0.4%																	24								
- L2- 387+00.00	0	CL	1003		475.4																												
- L2- 387+00.00		CL	1003	1005		472.6	469.9	0.7%												296													
- L2- 391+00.00	0	RT	1010		473.8																												
- L2- 391+00.00		RT	1010	1005		471.1	469.9	0.7%												96													
- L2- 390+00.00	0	CL	1005		472.7																												
- L2- 390+00.00		CL	1005	1026		469.7	469.1	0.9%													56												
- L2- 390+00.00	56	RT	1026		475.5																												
- L2- 390+00.00		RT	1026	1006		469.1	467.9	1.0%													28												
- L2- 390+00.00	84	RT	1006		471.4																												
SHEET TOTALS									200	40	0	0	32	0	0					392	84	0	0	292	24	0	152	192	0	0	0	0	0

LINE & STATION	STRUCTURE NO.		PIPE AS NOTED															ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE)	QUANTITIES FOR DRAINAGE STRUCTURES	*TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B')		C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03			CONCRETE TRANSITIONAL SECTION	
SIZE			6"	15"	18"	24"	36"	42"	48"	30"	30"	36"	36"	42"	42"	48"	48"			LIN. FT. A	B		TYPE OF GRATE				
THICKNESS OR GAUGE	FROM	TO	HDPE	RCP-V	RCP-V	RCP-V	RCP-V	RCP-V	RCP-V	Welded Steel (In Soil)	Welded Steel (Not in Soil)	Welded Steel (In Soil)	Welded Steel (Not in Soil)	Welded Steel (In Soil)	Welded Steel (Not in Soil)	Welded Steel (In Soil)	Welded Steel (Not in Soil)	CY	PER EACH (0' THRU 5.0')	5.0' THRU 10.0'	10.0' AND ABOVE		E	F	G	DROP INLET	CATCH BASIN
SHEET 9																											
- L2- 376+00.00	901																		1								
- L2- 376+00.00	901	902																									
- L2- 376+65.11	902																		1							1	
- L2- 376+65.11	902	903																									
- Y11- 10+64.18	905	918																3.4									
- Y11- 10+60.46	918																		1							1	
- Y11- 10+60.46	918	904																									
- L2- 377+61.71	909	904																3.4									
- L2- 377+70.05	904																		1	0.7							
- L2- 377+70.05	904	903																									
- L2- 377+88.00	903																		1	4.0						1	
- L2- 377+88.00	903	917																									
- Y11A- 11+50.00	910																		1								
- Y11A- 11+50.00	910	916																									
- Y11A- 11+69.55	916																		1							1	
- Y11A- 11+69.55	916	917																									
- L2- 377+88.11	917																		1	0.4							
- L2- 377+88.11	917	906																									
- L2- 378+50.00	914																		1	4.7							
- L2- 378+50.00	914	915																									
- L2- 384+50.00	919																		1	3.3							
- L2- 384+50.00	919	920																									
-Y11A- 10+96.34	921																										
SHEET 10																											
- L2- 385+00.00	1001																		1								
- L2- 385+00.00	1001	1016																									
- L2- 385+80.00	1002	1016													76	76			4.5								
- L2- 385+80.00	1016																		1	2.1							
- L2- 385+80.00	1016	1004																									
- L2- 387+00.00	1003																		1								
- L2- 387+00.00	1003	1005																									
- L2- 391+00.00	1010																		1								
- L2- 391+00.00	1010	1005																									
- L2- 390+00.00	1005																		1								
- L2- 390+00.00	1005	1026																									
- L2- 390+00.00	1026																		1	1.4							
- L2- 390+00.00	1026	1006																									
- L2- 390+00.00	1006																		1								
SHEET TOTALS			0	0	0	0	0	0	0	0	0	0	0	76	76	0	0	11.3	17	16.6	0	0	0	0	0	4	0

LINE & STATION	STRUCTURE NO. FROM	STRUCTURE NO. TO	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATE STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. FRAME WITH TWO FLAT GRATES STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	G.D.I. (N.S.) FR. WITH TWO FLAT GRATES. STD. 840.29	J.B. STD. 840.31 OR 840.32	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 GRATE AND FRAME STD. 840.37	M.H. FRAME AND COVER STD. 840.54	SPRING BOX STD. 840.41	15" DRAINAGE PIPE ELBOW	18" DRAINAGE PIPE ELBOW	24" DRAINAGE PIPE ELBOW	30" DRAINAGE PIPE ELBOW	TEMP STEEL PLATE COVER MASONRY DRAINAGE	ADJUST CB	ADJUST DI	BERM DRAINAGE OUTLET STD. 850.10 (4" CONCRETE PAVED DITCH SY)	BERM DRAINAGE OUTLET STD. 850.11 (4" CONCRETE PAVED DITCH SY)	ENERGY DISSIPATOR BASIN - EACH	FLOWABLE FILL (CY)	CONC. COLLARS CL. "B" C.Y. STD. 840.72	PIPE REMOVAL LIN. FT.	REMARKS
SHEET 9																																
- L2- 376+00.00	901					1			1																							
- L2- 376+00.00	901	902																														
- L2- 376+65.11	902														1	1																
- L2- 376+65.11	902	903																											8.1			
- Y11- 10+64.18	905	918																														
- Y11- 10+60.46	918														1	1																
- Y11- 10+60.46	918	904																													85	
- L2- 377+61.71	909	904																														
- L2- 377+70.05	904											1					1															
- L2- 377+70.05	904	903																														
- L2- 377+88.00	903														1	1																
- L2- 377+88.00	903	917																														
- Y11A- 11+50.00	910						1		1																							
- Y11A- 11+50.00	910	916																														
- Y11A- 11+69.55	916														1	1																
- Y11A- 11+69.55	916	917																											2.2			
- L2- 377+88.11	917											1					1															
- L2- 377+88.11	917	906																														
- L2- 378+50.00	914																										11						
- L2- 378+50.00	914	915																			2												
- L2- 384+50.00	919																										11						
- L2- 384+50.00	919	920																		2													
-Y11A- 10+96.34	921																															
SHEET 10																																
- L2- 385+00.00	1001					1			1																							
- L2- 385+00.00	1001	1016																														
- L2- 385+80.00	1002	1016																											3		96	
- L2- 385+80.00	1016											1					1															
- L2- 385+80.00	1016	1004																														
- L2- 387+00.00	1003					1			1																							
- L2- 387+00.00	1003	1005																														
- L2- 391+00.00	1010					1		1																								
- L2- 391+00.00	1010	1005																											16			
- L2- 390+00.00	1005					1			1																							
- L2- 390+00.00	1005	1026																														
- L2- 390+00.00	1026					1		1																								
- L2- 390+00.00	1026	1006																														
- L2- 390+00.00	1006					1			1																							
SHEET TOTALS			0	0	0	7	1	2	6	0	0	3	0	0	4	4	3	0	2	2	0	0	0	0	0	22	0	0	29	0	181	

ABBREVIATIONS

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

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8/17/99

COMPUTED BY:	CJP	DATE:	Apr. 2, 2021
CHECKED BY:	CAH	DATE:	Apr. 9, 2021

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
R-5709C	3D-7

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" & UNDER)

LINE & STATION SIZE THICKNESS OR GAUGE	OFFSET		STRUCTURE NO.		TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	% MINIMUM REQUIRED SLOPE	DRAINAGE PIPE (RCP, CSP, CAAP, HDPE, PP or PVC)										
			FROM	TO					15"	18"	24"	30"	36"	42"	48"	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE, PP, OR PVC
SHEET 10 (cont.)																			
- L2- 390+00.00		RT	1006	1018		467.9	450.0	5.8%		116						X			X
- L2- 390+10.00	-55	LT	1019		475.0														
- L2- 390+10.00		LT	1019	1014		472.7	472.7	0.5%											
- L2- 390+00.00	-55	LT	1014		474.9														
- L2- 390+00.00		LT	1014	1015		472.7	462.2	2.0%	48							X			X
- L2- 397+50.00	-75	LT	1012		477.6														
- L2- 397+50.00		LT	1012	1013		473.0	460.5	0.5%	156							X			X
SHEET 11																			
- L2- 400+40.00		LT	1101	1121		474.8	471.4	1.4%				20					X	X	X
- L2- 400+45.00	-70	LT	1121		476.9														
- L2- 400+45.00		LT	1121	1112		471.4	466.4	0.4%											
- L2- 401+50.00	1	RT	1122		477.1														
- L2- 401+50.00		RT	1122	1112		474.3	467.6	0.5%											
- L2- 400+64.84	1	RT	1112		478.4														
- L2- 400+64.84		RT	1112	1102		466.4	456.1	0.4%											
- Y11D- 14+02.00	-16	LT	1126		471.0														
- Y11D- 14+02.00		LT	1126	1127		467.4	460.9	1.7%	36							X			X
- Y11D- 12+50.00	-26	LT	1124		451.5														
- Y11D- 12+50.00		LT	1124	1108		448.8	448.0	0.5%											
- Y11D- 12+50.00	12	RT	1108		455.5														
- Y11D- 12+50.00		RT	1108	1109		443.5	441.8	0.5%	40								X	X	
- Y11B- 11+50.00	20	RT	1113		482.8														
- Y11B- 11+50.00		RT	1113	1114		479.7	465.8	0.5%	100								X	X	X
- L2- 402+00.00	-94	LT	1114		468.9														
- L2- 402+00.00		LT	1114	1115		465.8	462.2	0.5%	48								X	X	X
- L2- 406+84.00		LT	1104	1125		443.5	439.3	0.4%											
- L2- 407+26.53		RT	1125	1106		439.3	435.0	0.4%											
- L2- 407+50.00	56	RT	1128		462.2														
- L2- 407+50.00		RT	1128	1105		457.9	453.5	0.5%											
- L2- 407+50.00	1	RT	1105		457.5														
- L2- 407+50.00		RT	1105	1111		453.3	449.9	0.5%											
- L2- 407+50.00	-56	LT	1111		458.9														
- L2- 407+50.00		LT	1111	1103		449.9	445.5	0.6%											
- L2- 409+65.75	-56	LT	1107		451.6														
- L2- 409+65.75		LT	1107	1110		447.3	438.6	0.4%		44						X			X
- L2- 410+00.00	0	RT	1116		448.0														
- L2- 410+00.00		RT	1116	1101		444.0	436.3	0.5%											
- L2- 411+25.00	158	RT	1117		443.6														
- L2- 411+25.00		RT	1117	1133		439.6	435.7	0.5%											
SHEET TOTALS									428	160	0	20	0	0	0				

LINE & STATION	R.C. PIPE CLASS III							R.C. PIPE CLASS IV							PIPE AS NOTED															ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE)
	15"	18"	24"	30"	36"	42"	48"	15"	18"	24"	30"	36"	42"	48"	6"	15"	18"	24"	36"	42"	48"	30"	30"	36"	36"	42"	42"	48"	48"	
															HDPE	RCP-V	RCP-V	RCP-V	RCP-V	RCP-V	RCP-V	Welded Steel (In Soil)	Welded Steel (Not in Soil)	Welded Steel (In Soil)	Welded Steel (Not in Soil)	Welded Steel (In Soil)	Welded Steel (Not in Soil)	Welded Steel (In Soil)	Welded Steel (Not in Soil)	CY
SHEET 10 (cont.)																														
- L2- 390+00.00																														
- L2- 390+10.00																														
- L2- 390+10.00	8																													
- L2- 390+00.00																														
- L2- 390+00.00																														
- L2- 397+50.00																														
- L2- 397+50.00																														
SHEET 11																														
- L2- 400+40.00																														
- L2- 400+45.00																														
- L2- 400+45.00											72																			
- L2- 401+50.00																														
- L2- 401+50.00	84																													
- L2- 400+64.84																														
- L2- 400+64.84											140																			
- Y11D- 14+02.00																														
- Y11D- 14+02.00																														
- Y11D- 12+50.00																														
- Y11D- 12+50.00	40																													
- Y11D- 12+50.00																														
- Y11D- 12+50.00																														
- Y11B- 11+50.00																														
- Y11B- 11+50.00																														
- L2- 402+00.00																														
- L2- 402+00.00																														
- L2- 406+84.00																												64	64	4.9
- L2- 407+26.53														132																
- L2- 407+50.00																														
- L2- 407+50.00	56																													
- L2- 407+50.00																														
- L2- 407+50.00		56																												
- L2- 407+50.00																														
- L2- 407+50.00		44																												
- L2- 409+65.75																														
- L2- 409+65.75																														
- L2- 410+00.00																														
- L2- 410+00.00	400																													
- L2- 411+25.00																														
- L2- 411+25.00	176																													
SHEET TOTALS	764	100	0	0	0	0	0	0	0	0	212	0	0	132	0	0	0	0	0	0	0	0	0	0	0	0	0	64	64	4.9

LINE & STATION	QUANTITIES FOR DRAINAGE STRUCTURES	*TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') LIN. FT.		C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE			CONCRETE TRANSITIONAL SECTION		D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATE STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. FRAME WITH TWO FLAT GRATES STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	G.D.I. (N.S.) FR. WITH TWO FLAT GRATES. STD. 840.29	J.B. STD. 840.31 OR 840.32	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 GRATE AND FRAME STD. 840.37	M.H. FRAME AND COVER STD. 840.54	SPRING BOX STD. 840.41	15" DRAINAGE PIPE ELBOW	18" DRAINAGE PIPE ELBOW	24" DRAINAGE PIPE ELBOW	30" DRAINAGE PIPE ELBOW	TEMP STEEL PLATE COVER MASONRY DRAINAGE	ADJUST CB	ADJUST DI	BERM DRAINAGE OUTLET STD. 850.10 (4" CONCRETE PAVED DITCH SY)	BERM DRAINAGE OUTLET STD. 850.11 (4" CONCRETE PAVED DITCH SY)	ENERGY DISSIPATOR BASIN - EACH	FLOWABLE FILL (CY)	CONC. COLLARS CL. "B" C.Y. STD. 840.72	PIPE REMOVAL LIN. FT.	REMARKS
	PER EACH (0' THRU 5.0')	A 5.0' THRU 10.0'	B 10.0' AND ABOVE		E	F	G	DROP INLET	CATCH BASIN																														
SHEET 10 (cont.)																																							
- L2- 390+00.00																											2												
- L2- 390+10.00	1												1		1																								
- L2- 390+10.00																																							
- L2- 390+00.00	1												1		1																								
- L2- 390+00.00																										2													
- L2- 397+50.00	1												1			1																							
- L2- 397+50.00																										2													
SHEET 11																																							
- L2- 400+40.00																																							
- L2- 400+45.00	1	0.4																	1					1															
- L2- 400+45.00																																						96	
- L2- 401+50.00	1												1			1																							
- L2- 401+50.00																																							
- L2- 400+64.84	1	5.0	2.0										1			1																							
- L2- 400+64.84																																							
- Y11D- 14+02.00	1												1					1																					
- Y11D- 14+02.00																										2													
- Y11D- 12+50.00	1												1		1																								
- Y11D- 12+50.00																																							
- Y11D- 12+50.00	1	5.0	2.0										1					1																					
- Y11D- 12+50.00																																							
- Y11B- 11+50.00	1												1			1																							
- Y11B- 11+50.00																																							
- L2- 402+00.00	1												1			1																							
- L2- 402+00.00																																							
- L2- 406+84.00																																				8.7		50	
- L2- 407+26.53																																					1.0126		
- L2- 407+50.00	1												1		1																								
- L2- 407+50.00																																							
- L2- 407+50.00	1												1			1																							
- L2- 407+50.00																																							
- L2- 407+50.00	1	4.0											1		1																								
- L2- 407+50.00																																							
- L2- 409+65.75	1												1		1																								
- L2- 409+65.75																																							
- L2- 410+00.00	1												1			1																							
- L2- 410+00.00																																							
- L2- 411+25.00	1												1		1																								
- L2- 411+25.00																																							
SHEET TOTALS	17	14.45	4	0	0	0	0	0	0	0	0	0	16	0	7	7	0	2	1	0	0	0	0	1	0	6	2	0	0	0	0	0	0	0	0	8.7	1.0126	146	

ABBREVIATIONS

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

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icrocker

8/17/99

COMPUTED BY:	CJP	DATE:	Apr. 2, 2021
CHECKED BY:	CAH	DATE:	Apr. 9, 2021

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
R-5709C	3D-8

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" & UNDER)

LINE & STATION SIZE THICKNESS OR GAUGE	OFFSET		STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	% MINIMUM REQUIRED SLOPE	DRAINAGE PIPE (RCP, CSP, CAAP, HDPE, PP or PVC) 15"	18"	24"	30"	36"	42"	48"	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE, PP, OR PVC
SHEET 12																			
- L2- 414+00.00	10	RT	1201		439.1														
- L2- 414+00.00		RT	1201	1202		436.3	433.8	0.5%											
- L2- 415+17.00	91	RT	1221		438.0														
- L2- 415+17.00		RT	1221	1214		434.0	433.4	1.2%											
- L2- 413+00.00	128	RT	1233		439.7														
- L2- 413+00.00		RT	1233	1221		435.7	434.0	0.7%											
- L2- 420+56.60	-78	LT	1227		441.1														
- L2- 420+56.60		LT	1227	1220		436.7	433.7	0.5%											
- L2- 422+00.00	-75	LT	1217		447.8														
- L2- 422+00.00		LT	1217	1220		445.2	433.7	0.4%	156								×	×	
- L2- 422+00.00	75	RT	1219		447.8														
- L2- 422+00.00		RT	1219	1225		444.8	424.8	0.5%											
- Y11E- 10+75.95	0	LT	1222		461.2														
- Y11E- 10+75.95		LT	1222	1223		457.8	455.6	1.0%											
- L2- 426+10.00	0	CL	1212		460.9														
- L2- 426+10.00		CL	1212	1226		455.7	455.4	0.5%											
- L2- 417+25.00	4	RT	1205		438.0														
- L2- 417+25.00		RT	1205	1216		435.3	435.1	0.5%											
- L2- 417+25.00	56	RT	1216		439.6														
- L2- 417+25.00		RT	1216	1224		435.1	426.9	0.5%	52							×			×
-Y11C- 10+54.00		LT	1230												28		×	×	×
SHEET 13																			
- L2- 435+44.35		LT	1307	1308		483.4	483.2	0.4%											
- Y12- 10+61.19	-2	LT	1308		489.1														
- Y12- 10+61.19		LT	1308	1304		483.2	477.4	0.4%											
- L2- 433+57.00	18	RT	1302		485.1														
- L2- 433+57.00		RT	1302	1303		482.4	482.3	0.1%											
- L2- 433+80.00	18	RT	1303		485.7														
- L2- 433+80.00		RT	1303	1304		482.3	479.1	0.4%											
- L2- 435+57.00	-1	LT	1305		486.3														
- L2- 435+57.00		LT	1305	1304		480.6	479.1	0.5%											
- L2- 435+00.00	11	RT	1304		488.8														
- L2- 435+00.00		RT	1304	1306		477.4	473.3	0.4%											
- Y12A- 17+35.95	-8	LT	1309		488.2														
- Y12A- 17+35.95		LT	1309	1310		485.2	484.6	0.5%											
SHEET TOTALS									208	0	0	0	0	0	28				

LINE & STATION	R.C. PIPE CLASS III 15"	18"	24"	30"	36"	42"	48"	R.C. PIPE CLASS IV 15"	18"	24"	30"	36"	42"	48"	PIPE AS NOTED 6" HDPE	15" RCP-V	18" RCP-V	24" RCP-V	36" RCP-V	42" RCP-V	48" RCP-V	30" Welded Steel (In Soil)	30" Welded Steel (Not in Soil)	36" Welded Steel (In Soil)	36" Welded Steel (Not in Soil)	42" Welded Steel (In Soil)	42" Welded Steel (Not in Soil)	48" Welded Steel (In Soil)	48" Welded Steel (Not in Soil)	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY
SHEET 12																														
- L2- 414+00.00																														
- L2- 414+00.00	164																													
- L2- 415+17.00																														
- L2- 415+17.00	44																													
- L2- 413+00.00																														
- L2- 413+00.00	220																													
- L2- 420+56.60																														
- L2- 420+56.60															36															
- L2- 422+00.00																														
- L2- 422+00.00																														
- L2- 422+00.00																														
- L2- 422+00.00	280																													
- Y11E- 10+75.95																														
- Y11E- 10+75.95	100																													
- L2- 426+10.00																														
- L2- 426+10.00	100																													
- L2- 417+25.00																														
- L2- 417+25.00	52																													
- L2- 417+25.00																														
- L2- 417+25.00																														
-Y11C- 10+54.00																														
SHEET 13																														
- L2- 435+44.35					72																									3.4
- Y12- 10+61.19																														
- Y12- 10+61.19					72																									
- L2- 433+57.00																														
- L2- 433+57.00	20																													
- L2- 433+80.00																														
- L2- 433+80.00	120																													
- L2- 435+57.00																														
- L2- 435+57.00	56																													
- L2- 435+00.00																														
- L2- 435+00.00					84																									
- Y12A- 17+35.95																														
- Y12A- 17+35.95		80																												
SHEET TOTALS	1156	80	0	0	228	0	0	0	0	0	0	0	0	0	36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3.4

LINE & STATION	QUANTITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0')	*TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') LIN. FT. A 5.0' THRU 10.0'	B 10.0' AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	CONCRETE TRANSITIONAL SECTION DROP INLET	CATCH BASIN	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATE STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. FRAME WITH TWO FLAT GRATES STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	G.D.I. (N.S.) FR. WITH TWO FLAT GRATES. STD. 840.29	J.B. STD. 840.31 OR 840.32	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 GRATE AND FRAME STD. 840.37	M.H. FRAME AND COVER STD. 840.54	SPRING BOX STD. 840.41	15" DRAINAGE PIPE ELBOW	18" DRAINAGE PIPE ELBOW	24" DRAINAGE PIPE ELBOW	30" DRAINAGE PIPE ELBOW	TEMP STEEL PLATE COVER MASONRY DRAINAGE	ADJUST CB	ADJUST DI	BERM DRAINAGE OUTLET STD. 850.10 (4" CONCRETE PAVED DITCH SY)	BERM DRAINAGE OUTLET STD. 850.11 (4" CONCRETE PAVED DITCH SY)	ENERGY DISSIPATOR BASIN - EACH	FLOWABLE FILL (CY)	CONC. COLLARS CL. "B" C.Y. STD. 840.72	PIPE REMOVAL LIN. FT.	REMARKS
SHEET 12																																							
- L2- 414+00.00	1												1			1																							
- L2- 414+00.00																																							
- L2- 415+17.00	1												1			1																							
- L2- 415+17.00																																							
- L2- 413+00.00	1												1		1																								
- L2- 413+00.00																																							
- L2- 420+56.60	1																								1														
- L2- 420+56.60																																			8.2		32	
- L2- 422+00.00	1												1			1																							
- L2- 422+00.00																																							
- L2- 422+00.00	1												1			1																							
- L2- 422+00.00																																							
- Y11E- 10+75.95	1							1														1	1																
- Y11E- 10+75.95																																			8.1			
- L2- 426+10.00	1	0.2											1			1																							
- L2- 426+10.00																																							
																																					25	
- L2- 417+25.00	1												1			1																							
- L2- 417+25.00																																							
- L2- 417+25.00	1												1		1																								
- L2- 417+25.00																																							
-Y11C- 10+54.00																																							
SHEET 13																																							
- L2- 435+44.35																																							
- Y12- 10+61.19	1	0.9						1														1	1																
- Y12- 10+61.19																																			4.6			
- L2- 433+57.00	1							1														1	1																
- L2- 433+57.00																																							
- L2- 433+80.00	1							1														1	1																
- L2- 433+80.00																																					142	
- L2- 435+57.00	1	0.7										1					1																						
- L2- 435+57.00																																							
- L2- 435+00.00	1	5.0	1.5																1					1															
- L2- 435+00.00																																							
- Y12A- 17+35.95	1							1														1	1																
- Y12A- 17+35.95																																							
SHEET TOTALS	16	6.807	1.48	0	0	0	0	5	0	0	0	1	8	0	2	6	1	0	1	0	0	5	5	1	1	0	0	0	0	0	0	0	0	0	0	21	0	199	

ABBREVIATIONS

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

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8/17/99

PROJECT REFERENCE NO.	SHEET NO.
R-5709C	3D-9

COMPUTED BY: CJP DATE: Apr. 2, 2021
CHECKED BY: CAH DATE: Apr. 9, 2021

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

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" & UNDER)

LINE & STATION	OFFSET		STRUCTURE NO.		TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	% MINIMUM REQUIRED SLOPE	DRAINAGE PIPE (RCP, CSP, CAAP, HDPE, PP or PVC)											R.C. PIPE CLASS III							R.C. PIPE CLASS IV						
SIZE									15"	18"	24"	30"	36"	42"	48"					15"	18"	24"	30"	36"	42"	48"	15"	18"	24"	30"	36"	42"	48"
THICKNESS OR GAUGE			FROM	TO												DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE, PP, OR PVC														
SHEET 14																																	
- L2- 447+00.00		LT	1401	1402		470.1	469.4	0.4%																	76								
- L2- 448+82.27	-18	LT	1407		475.5																												
- L2- 448+82.27		LT	1407	1406		472.4	471.9	0.5%												152													
- L2- 447+33.93	16	RT	1406		476.9																												
- L2- 447+33.93		RT	1406	1402		471.9	471.6	0.7%												40													
- L2- 447+00.00	-9	LT	1402		474.6																												
- L2- 447+00.00		LT	1402	1403		469.4	462.4	0.5%																	148								
-Y14- 14+00.00	49	RT	1413						40																								
-Y14- 13+50.00	43	RT	1414						28																								
-Y14- 12+00.00	31	RT	1415						36																								
- Y13- 11+33.60	0	CL	1410		476.8																												
- Y13- 11+33.60		CL	1410	1411		474.0	473.7	0.4%													92												
- L2- 452+98.83	7	RT	1408		463.4																												
- L2- 452+98.83		RT	1408	1409		460.7	456.1	0.5%												80													
-L2- 454+00	-92	LT	1412							28																							
SHEET 15																																	
- L2- 458+99.23	0	CL	1501		450.1																												
- L2- 458+99.23		CL	1501	1502		447.1	446.1	0.4%												88													
- L2- 460+49.99		LT	1506	1507		446.1	445.6	0.4%																								164	
-L2- 461+75.42	-78	LT	1512						32																								
-L2- 462+00.00	-76	LT	1513						36																								
-Y15- 13+63.69	28	RT	1509						36																								
-Y15- 13+63.69	-28	LT	1510						32																								
-Y15- 12+32.00	-25	LT	1511						36																								
- L2- 468+23.82	-18	LT	1503		454.0																												
- L2- 468+23.82		LT	1503	1508		450.1	449.5	0.4%												124													
- L2- 467+10.70	105	RT	1504		455.1																												
- L2- 467+10.70		RT	1504	1505		449.5	446.0	0.4%												48													
SHEET TOTALS									276	28	0	0	0	0	0					532	92	0	0	0	224	0	0	0	0	0	0	164	0

LINE & STATION	FROM	TO	PIPE AS NOTED															ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE)	QUANTITIES FOR DRAINAGE STRUCTURES	*TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B')		C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03			CONCRETE TRANSITIONAL SECTION	
SIZE			6"	15"	18"	24"	36"	42"	48"	30"	30"	36"	36"	42"	42"	48"	48"			LIN. FT. A	LIN. FT. B		TYPE OF GRATE				
THICKNESS OR GAUGE			HDPE	RCP-V	RCP-V	RCP-V	RCP-V	RCP-V	RCP-V	Welded Steel (In Soil)	Welded Steel (Not in Soil)	Welded Steel (In Soil)	Welded Steel (Not in Soil)	Welded Steel (In Soil)	Welded Steel (Not in Soil)	Welded Steel (In Soil)	Welded Steel (Not in Soil)	CY	PER EACH (0' THRU 5.0')	5.0' THRU 10.0'	10.0' AND ABOVE		E	F	G	DROP INLET	CATCH BASIN
SHEET 14																											
- L2- 447+00.00	1401	1402																4.5									
- L2- 448+82.27	1407																		1							1	
- L2- 448+82.27	1407	1406																									
- L2- 447+33.93	1406																		1							1	
- L2- 447+33.93	1406	1402																									
- L2- 447+00.00	1402																		1	0.2							
- L2- 447+00.00	1402	1403																									
-Y14- 14+00.00	1413																										
-Y14- 13+50.00	1414																										
-Y14- 12+00.00	1415																										
- Y13- 11+33.60	1410																		1							1	
- Y13- 11+33.60	1410	1411																									
- L2- 452+98.83	1408																		1								
- L2- 452+98.83	1408	1409																									
-L2- 454+00	1412																										
SHEET 15																											
- L2- 458+99.23	1501																		1								
- L2- 458+99.23	1501	1502																									
- L2- 460+49.99	1506	1507																4.5									
-L2- 461+75.42	1512																										
-L2- 462+00.00	1513																										
-Y15- 13+63.69	1509																										
-Y15- 13+63.69	1510																										
-Y15- 12+32.00	1511																										
- L2- 468+23.82	1503																		1							1	
- L2- 468+23.82	1503	1508																									
- L2- 467+10.70	1504																		1	0.6						1	
- L2- 467+10.70	1504	1505																									
SHEET TOTALS			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	8	0.88	0	0	0	0	0	5	0

LINE & STATION	FROM	TO	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATE STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. FRAME WITH TWO FLAT GRATES STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	G.D.I. (N.S.) FR. WITH TWO FLAT GRATES. STD. 840.29	J.B. STD. 840.31 OR 840.32	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 GRATE AND FRAME STD. 840.37	M.H. FRAME AND COVER STD. 840.54	SPRING BOX STD. 840.41	15" DRAINAGE PIPE ELBOW	18" DRAINAGE PIPE ELBOW	24" DRAINAGE PIPE ELBOW	30" DRAINAGE PIPE ELBOW	TEMP STEEL PLATE COVER MASONRY DRAINAGE	ADJUST CB	ADJUST DI	BERM DRAINAGE OUTLET STD. 850.10 (4" CONCRETE PAVED DITCH SY)	BERM DRAINAGE OUTLET STD. 850.11 (4" CONCRETE PAVED DITCH SY)	ENERGY DISSIPATOR BASIN - EACH	FLOWABLE FILL (CY)	CONC. COLLARS CL. "B" C.Y. STD. 840.72	PIPE REMOVAL LIN. FT.	REMARKS
SHEET 14																																
- L2- 447+00.00	1401	1402																											4.4			
- L2- 448+82.27	1407														1	1																
- L2- 448+82.27	1407	1406																														
- L2- 447+33.93	1406														1	1																
- L2- 447+33.93	1406	1402																														
- L2- 447+00.00	1402					1				1																						
- L2- 447+00.00	1402	1403																														
-Y14- 14+00.00	1413																														55	
-Y14- 13+50.00	1414																														20	
-Y14- 12+00.00	1415																														22	
- Y13- 11+33.60	1410														1	1																
- Y13- 11+33.60	1410	1411																													52	
- L2- 452+98.83	1408					1				1																						
- L2- 452+98.83	1408	1409																														
-L2- 454+00	1412																														23	
SHEET 15																																
- L2- 458+99.23	1501					1				1																						
- L2- 458+99.23	1501	1502																											4			
- L2- 460+49.99	1506	1507																														
-L2- 461+75.42	1512																															
-L2- 462+00.00	1513																															
-Y15- 13+63.69	1509																														64	
-Y15- 13+63.69	1510																															
-Y15- 12+32.00	1511																															
- L2- 468+23.82	1503														1	1																
- L2- 468+23.82	1503	1508																														
- L2- 467+10.70	1504														1	1																
- L2- 467+10.70	1504	1505																														
SHEET TOTALS			0	0	0	3	0	0	0	3	0	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0	0	0	8.4	0	236	

ABBREVIATIONS

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

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8/17/99

COMPUTED BY:	CJP	DATE:	Apr. 2, 2021
CHECKED BY:	CAH	DATE:	Apr. 9, 2021

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
R-5709C	3D-10

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" & UNDER)

LINE & STATION	OFFSET		STRUCTURE NO.		TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	% MINIMUM REQUIRED SLOPE	DRAINAGE PIPE (RCP, CSP, CAAP, HDPE, PP or PVC)											R.C. PIPE CLASS III							R.C. PIPE CLASS IV						
SIZE / THICKNESS OR GAUGE			FROM	TO					15"	18"	24"	30"	36"	42"	48"	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE, PP, OR PVC	15"	18"	24"	30"	36"	42"	48"	15"	18"	24"	30"	36"	42"	48"
SHEET 16																																	
- L2- 476+93.00	0	CL	1601		445.1																												
- L2- 476+93.00		CL	1601	1602		441.3	441.1	0.5%												68													
- L2- 479+63.26	-18	LT	1603		448.5																												
- L2- 479+63.26		LT	1603	1602		445.5	441.1	2.9%													200												
- L2- 477+75.01		LT	1605	1602		442.5	440.6	0.4%														64											
- L2- 477+59.94	-17	LT	1602		448.3																												
- L2- 477+59.94		LT	1602	1606		440.6	437.6	0.4%														144											
-L2- 480+00	-75	LT	1613							60																							
- L2- 481+00.00		LT	1608	1607		443.0	441.4	0.5%														88											
- L2- 481+00.00	8	RT	1607		446.5																												
- L2- 481+00.00		RT	1607	1609		441.4	440.0	0.7%														76											
-L- 480+00.00	92	RT	1612								48																						
- L2- 471+50.00		LT	1610	1611		444.3	440.8	0.4%																								328	
-L- 469+80.47	-82	LT	1614						24																								
-L- 471+70.46	97	RT	1615						56																								
-L- 475+68.11	96	RT	1616						64																								
-L- 483+00.00	78	RT	1617						40																								
SHEET 17																																	
- L2- 489+00.00	0	CL	1704		437.5																												
- L2- 489+00.00		CL	1704	1702		434.8	434.6	0.5%												56													
- L2- 489+02.26	56	RT	1702		439.9																												
- L2- 489+02.26		RT	1702	1701		434.6	434.6	0.6%												8													
- L2- 489+14.12	56	RT	1701		439.6																												
- L2- 489+14.12		RT	1701	1703		434.6	434.5	0.6%												44													
-L- 489+84.12	78	RT	1709							24																							
-L- 493+45.77	77	RT	1711							32																							
-L- 486+77.98	-72	LT	1708						24																								
- L2- 493+00.00	-8	LT	1705		427.9																												
- L2- 493+00.00		LT	1705	1707		425.1	424.2	0.4%												88													
-L- 496+50.00	78	RT	1710							52																							
SHEET TOTALS									208	168	48	0	0	0	0					264	200	372	0	0	0	0	0	0	0	0	0	328	0

LINE & STATION	STRUCTURE NO. FROM	TO	PIPE AS NOTED 6" HDPE	15" RCP-V	18" RCP-V	24" RCP-V	36" RCP-V	42" RCP-V	48" RCP-V	30" Welded Steel (In Soil)	30" Welded Steel (Not in Soil)	36" Welded Steel (In Soil)	36" Welded Steel (Not in Soil)	42" Welded Steel (In Soil)	42" Welded Steel (Not in Soil)	48" Welded Steel (In Soil)	48" Welded Steel (Not in Soil)	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	QUANTITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0')	*TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') LIN. FT. A 5.0' THRU 10.0'	LIN. FT. B 10.0' AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	CONCRETE TRANSITIONAL SECTION DROP INLET	CATCH BASIN
SHEET 16																											
- L2- 476+93.00	1601																		1								
- L2- 476+93.00	1601	1602																									
- L2- 479+63.26	1603																		1							1	
- L2- 479+63.26	1603	1602																									
- L2- 477+75.01	1605	1602																									
- L2- 477+59.94	1602																		1	2.7						1	
- L2- 477+59.94	1602	1606																									
-L2- 480+00	1613																										
- L2- 481+00.00	1608	1607																									
- L2- 481+00.00	1607																		1	0.1							
- L2- 481+00.00	1607	1609																									
-L- 480+00.00	1612																										
- L2- 471+50.00	1610	1611																6									
-L- 469+80.47	1614																										
-L- 471+70.46	1615																										
-L- 475+68.11	1616																										
-L- 483+00.00	1617																										
SHEET 17																											
- L2- 489+00.00	1704																		1								
- L2- 489+00.00	1704	1702																									
- L2- 489+02.26	1702																		1	0.3							
- L2- 489+02.26	1702	1701																									
- L2- 489+14.12	1701																		1	0.0							
- L2- 489+14.12	1701	1703																									
-L- 489+84.12	1709																										
-L- 493+45.77	1711																										
-L- 486+77.98	1708																										
- L2- 493+00.00	1705																		1								
- L2- 493+00.00	1705	1707																									
-L- 496+50.00	1710																										
SHEET TOTALS			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	8	3.112	0	0	0	0	0	2	0

LINE & STATION	STRUCTURE NO. FROM	TO	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATE STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. FRAME WITH TWO FLAT GRATES STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	G.D.I. (N.S.) FR. WITH TWO FLAT GRATES. STD. 840.29	J.B. STD. 840.31 OR 840.32	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 GRATE AND FRAME STD. 840.37	M.H. FRAME AND COVER STD. 840.54	SPRING BOX STD. 840.41	15" DRAINAGE PIPE ELBOW	18" DRAINAGE PIPE ELBOW	24" DRAINAGE PIPE ELBOW	30" DRAINAGE PIPE ELBOW	TEMP STEEL PLATE COVER MASONRY DRAINAGE	ADJUST CB	ADJUST DI	BERM DRAINAGE OUTLET STD. 850.10 (4" CONCRETE PAVED DITCH SY)	BERM DRAINAGE OUTLET STD. 850.11 (4" CONCRETE PAVED DITCH SY)	ENERGY DISSIPATOR BASIN - EACH	FLOWABLE FILL (CY)	CONC. COLLARS CL. "B" C.Y. STD. 840.72	PIPE REMOVAL LIN. FT.	REMARKS
SHEET 16																																
- L2- 476+93.00	1601					1				1																					141	
- L2- 476+93.00	1601	1602																														
- L2- 479+63.26	1603														1	1																
- L2- 479+63.26	1603	1602																														
- L2- 477+75.01	1605	1602																											3.3			
- L2- 477+59.94	1602														1	1																
- L2- 477+59.94	1602	1606																													166	
-L2- 480+00	1613																															
- L2- 481+00.00	1608	1607																											3.2		21	
- L2- 481+00.00	1607					1				1																						
- L2- 481+00.00	1607	1609																														
-L- 480+00.00	1612																															
- L2- 471+50.00	1610	1611																											3.4			
-L- 469+80.47	1614																															
-L- 471+70.46	1615																															
-L- 475+68.11	1616																															
-L- 483+00.00	1617																															
SHEET 17																																
- L2- 489+00.00	1704					1			1																							
- L2- 489+00.00	1704	1702																														
- L2- 489+02.26	1702					1					1																					
- L2- 489+02.26	1702	1701																														
- L2- 489+14.12	1701					1					1																					
- L2- 489+14.12	1701	1703																														
-L- 489+84.12	1709																															
-L- 493+45.77	1711																															
-L- 486+77.98	1708																															
- L2- 493+00.00	1705					1			1																							
- L2- 493+00.00	1705	1707																											8.3			
-L- 496+50.00	1710																														51	
SHEET TOTALS			0	0	0	6	0	0	2	2	2	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	18	0	379	

ABBREVIATIONS

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

REMARKS

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COMPUTED BY:	CJP	DATE:	Apr. 2, 2021
CHECKED BY:	CAH	DATE:	Apr. 9, 2021

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
R-5709C	3D-11

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" & UNDER)

LINE & STATION	OFFSET		STRUCTURE NO.		TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	% MINIMUM REQUIRED SLOPE	DRAINAGE PIPE (RCP, CSP, CAAP, HDPE, PP or PVC)											R.C. PIPE CLASS III							R.C. PIPE CLASS IV						
SIZE									15"	18"	24"	30"	36"	42"	48"					15"	18"	24"	30"	36"	42"	48"	15"	18"	24"	30"	36"	42"	48"
THICKNESS OR GAUGE			FROM	TO												DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE, PP, OR PVC														
SHEET 18																																	
- L2- 499+33.85		LT	1801	1802		413.0	408.5	0.4%																	80								
- L2- 499+33.85	0	CL	1802		417.4																												
- L2- 499+33.85		CL	1802	1809		408.5	405.5	0.4%																	56								
- L2- 498+35.03	56	RT	1803		419.4																												
- L2- 498+35.03		RT	1803	1809		416.4	415.5	0.4%													96												
- L2- 499+33.85	56	RT	1809		419.8																												
- L2- 499+33.85		RT	1809	1804		405.5	402.8	0.4%																	48								
-L- 501+68.84	-75	LT	1807								52																						
-L- 502+96.47	95	RT	1808						52																								
- L2- 506+95.00	0	CL	1805		438.6																												
- L2- 506+95.00		CL	1805	1806		435.9	434.8	0.6%												88													
- L2- 497+90.00	-12	LT	1810		419.3																												
- L2- 497+90.00		LT	1810	1802		416.6	413.4	0.5%												144													
SHEET 19																																	
- L2- 523+08.80		LT	1906	1907		443.9	439.3																										
- L2- 521+74.31	0	CL	1902		443.8																												
- L2- 521+74.31		CL	1902	1903		441.1	440.6	0.5%												136													
- L2- 523+08.80	-18	LT	1903		444.7																												
- L2- 523+08.80		LT	1903	1904		440.6	438.4	0.5%												132													
-L- 513+79.65	79	RT	1908						28																								
SHEET 20																																	
- L2- 528+61.75	-68	LT	2002		436.1																												
- L2- 528+61.75		LT	2002	2001		432.6	432.4	0.4%														64											
- L2- 528+51.50	-3	LT	2001		439.0																												
- L2- 528+51.50		LT	2001	2003		432.4	429.3	0.4%														92											
- L2- 532+01.74	-11	LT	2004		435.3																												
- L2- 532+01.74		LT	2004	2011		432.6	431.9	0.5%												28													
- Y17- 10+58.93	-14	LT	2007		435.7																												
- Y17- 10+58.93		LT	2007	2011		432.5	431.9	0.2%												60													
- L2- 532+30.21	-12	LT	2011		436.1																												
- L2- 532+30.21		LT	2011	2005		431.9	430.6	0.4%												32													
- L2- 533+88.82	-18	LT	2006		434.2																												
- L2- 533+88.82		LT	2006	2005		431.1	430.6	0.5%												140													
- L2- 532+49.98	13	RT	2005		436.0																												
SHEET TOTALS									80	0	52	0	0	0	0					760	96	156	0	0	184	0	0	0	0	0	0	0	0

LINE & STATION	STRUCTURE NO.		PIPE AS NOTED															ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE)	QUANTITIES FOR DRAINAGE STRUCTURES	*TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B')		C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03			CONCRETE TRANSITIONAL SECTION	
SIZE			6"	15"	18"	24"	36"	42"	48"	30"	30"	36"	36"	42"	42"	48"	48"			LIN. FT. A	B		TYPE OF GRATE				
THICKNESS OR GAUGE	FROM	TO	HDPE	RCP-V	RCP-V	RCP-V	RCP-V	RCP-V	RCP-V	Welded Steel (In Soil)	Welded Steel (Not in Soil)	Welded Steel (In Soil)	Welded Steel (Not in Soil)	Welded Steel (In Soil)	Welded Steel (Not in Soil)	Welded Steel (In Soil)	Welded Steel (Not in Soil)	CY	PER EACH (0' THRU 5.0')	5.0' THRU 10.0'	10.0' AND ABOVE		E	F	G	DROP INLET	CATCH BASIN
SHEET 18																											
- L2- 499+33.85	1801	1802																4.5									
- L2- 499+33.85	1802																		1	3.9							
- L2- 499+33.85	1802	1809																									
- L2- 498+35.03	1803																		1								
- L2- 498+35.03	1803	1809																									
- L2- 499+33.85	1809																		1	5.0	4.3						
- L2- 499+33.85	1809	1804																									
-L- 501+68.84	1807																										
-L- 502+96.47	1808																										
- L2- 506+95.00	1805																		1								
- L2- 506+95.00	1805	1806																									
- L2- 497+90.00	1810																		1								
- L2- 497+90.00	1810	1802																									
SHEET 19																											
- L2- 523+08.80	1906	1907							172									6									
- L2- 521+74.31	1902																		1								
- L2- 521+74.31	1902	1903																									
- L2- 523+08.80	1903																		1							1	
- L2- 523+08.80	1903	1904																									
-L- 513+79.65	1908																										
SHEET 20																											
- L2- 528+61.75	2002																		1								
- L2- 528+61.75	2002	2001																									
- L2- 528+51.50	2001																		1	1.6							
- L2- 528+51.50	2001	2003																									
- L2- 532+01.74	2004																		1								
- L2- 532+01.74	2004	2011																									
- Y17- 10+58.93	2007																		1							1	
- Y17- 10+58.93	2007	2011																									
- L2- 532+30.21	2011																		1								
- L2- 532+30.21	2011	2005																									
- L2- 533+88.82	2006																		1							1	
- L2- 533+88.82	2006	2005																									
- L2- 532+49.98	2005																		1	0.4						1	
SHEET TOTALS			0	0	0	0	0	0	172	0	0	0	0	0	0	0	0	10.5	14	10.84	4.2601	0	0	0	0	4	0

LINE & STATION	STRUCTURE NO.		D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATE STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. FRAME WITH TWO FLAT GRATES STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	G.D.I. (N.S.) FR. WITH TWO FLAT GRATES. STD. 840.29	J.B. STD. 840.31 OR 840.32	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 GRATE AND FRAME STD. 840.37	M.H. FRAME AND COVER STD. 840.54	SPRING BOX STD. 840.41	15" DRAINAGE PIPE ELBOW	18" DRAINAGE PIPE ELBOW	24" DRAINAGE PIPE ELBOW	30" DRAINAGE PIPE ELBOW	TEMP STEEL PLATE COVER MASONRY DRAINAGE	ADJUST CB	ADJUST DI	BERM DRAINAGE OUTLET STD. 850.10 (4" CONCRETE PAVED DITCH SY)	BERM DRAINAGE OUTLET STD. 850.11 (4" CONCRETE PAVED DITCH SY)	ENERGY DISSIPATOR BASIN - EACH	FLOWABLE FILL (CY)	CONC. COLLARS CL. "B" C.Y. STD. 840.72	PIPE REMOVAL LIN. FT.	REMARKS
	FROM	TO																														
SHEET 18																																
- L2- 499+33.85	1801	1802																											8.7			
- L2- 499+33.85	1802				1				1																							
- L2- 499+33.85	1802	1809																														
- L2- 498+35.03	1803					1			1																							
- L2- 498+35.03	1803	1809																														
- L2- 499+33.85	1809				1			1																								
- L2- 499+33.85	1809	1804																														
-L- 501+68.84	1807																														62	
-L- 502+96.47	1808																														48	
- L2- 506+95.00	1805					1					1																					
- L2- 506+95.00	1805	1806																														
- L2- 497+90.00	1810					1			1																							
- L2- 497+90.00	1810	1802																														
SHEET 19																																
- L2- 523+08.80	1906	1907																											4			
- L2- 521+74.31	1902					1				1																						
- L2- 521+74.31	1902	1903																														
- L2- 523+08.80	1903															1	1															
- L2- 523+08.80	1903	1904																														
-L- 513+79.65	1908																															
SHEET 20																																
- L2- 528+61.75	2002					1				1																						
- L2- 528+61.75	2002	2001																											3.4			
- L2- 528+51.50	2001					1				1																						
- L2- 528+51.50	2001	2003																														
- L2- 532+01.74	2004					1				1																						
- L2- 532+01.74	2004	2011																														
- Y17- 10+58.93	2007															1	1															
- Y17- 10+58.93	2007	2011																														
- L2- 532+30.21	2011											1					1															
- L2- 532+30.21	2011	2005																														
- L2- 533+88.82	2006															1	1															
- L2- 533+88.82	2006	2005																														
- L2- 532+49.98	2005															1	1															
SHEET TOTALS			0	0	2	7	0	1	3	4	1	1	0	0	4	4	1	0	0	0	0	0	0	0	0	0	0	0	16	0	110	

ABBREVIATIONS

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

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COMPUTED BY:	CJP	DATE:	Apr. 2, 2021
CHECKED BY:	CAH	DATE:	Apr. 9, 2021

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
R-5709C	3D-12

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" & UNDER)

LINE & STATION	OFFSET		STRUCTURE NO.		TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	% MINIMUM REQUIRED SLOPE	DRAINAGE PIPE (RCP, CSP, CAAP, HDPE, PP or PVC)										
SIZE THICKNESS OR GAUGE			FROM	TO					15"	18"	24"	30"	36"	42"	48"	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE, PP, OR PVC
SHEET 20																			
- L2- 532+49.98		RT	2005	2008		430.6	429.7	0.5%											
- Y16- 18+25.27	2	RT	2008		432.9														
- Y16- 18+25.27		RT	2008	2009		429.7	424.0	0.5%											
- Y16- 16+89.12	17	RT	2009		427.0														
- Y16- 16+89.12		RT	2009	2010		424.0	419.2	0.5%	116								×	×	
- Y16- 15+62.89	17	RT	2010		422.4														
- Y16- 15+62.89		RT	2010	2014		419.2	416.3	0.5%	112								×	×	
- Y16- 14+42.35	16	RT	2014		419.9														
- Y16- 14+42.35		RT	2014	4315		416.3	416.2	0.7%											
- Y16- 14+37.79	16	RT	2015		419.9														
- Y16- 14+37.79		RT	2015	2018		416.2	415.8	0.7%											
- L2- 532+00.00	-79	LT	2018		419.9														
- L2- 532+30.21		LT	2012							8									
- L2- 532+30.21		LT	2013							24									
- L2- 532+00.00		LT	2016																
- L2- 532+00.00		LT	2016	2017		432.3	431.4												
SHEET 21																			
- L2- 542+24.00	-10	LT	2105		415.7														
- L2- 542+24.00		LT	2105	2116		410.2	406.0	0.4%											
- L2- 543+09.62	2	RT	2104		415.5														
- L2- 543+09.62		RT	2104	2103		412.4	409.8	0.5%											
- L2- 544+00.00	-19	LT	2103		413.2														
- L2- 544+00.00		LT	2103	2102		409.8	404.7	0.5%											
- L2- 547+49.08	7	RT	2101		406.1														
- L2- 547+49.08		RT	2101	2102		403.1	398.4	0.4%											
- L2- 545+50.00		LT	2106	2102		403.8	397.9	0.7%											
- L2- 545+50.00	9	RT	2102		408.7														
- L2- 545+50.00		RT	2102	2107		394.2	385.1	0.4%											
- L2- 545+48.02	127	RT	2107		388.6														
- L2- 545+48.02		RT	2107	2112		385.1	381.1	0.4%				60					×	×	
- L2- 545+47.93	185	RT	2112		385.4														
- L2- 545+47.93		RT	2112	2111		381.1	379.9	0.4%				16					×	×	
- L2- 545+42.97	197	RT	2111		384.2														
- L2- 545+42.97		RT	2111	2113		379.9	379.9	0.5%											
- L2- 545+47.28	197	RT	2113		384.2														
- L2- 545+47.28		RT	2113	2114		379.9	379.7	0.5%											
- L2- 545+93.03	197	RT	2114		384.2														
- L2- 545+93.03		RT	2114	2110		379.7	379.7	0.5%											
- L2- 545+97.35	197	RT	2110		384.2														
- L2- 545+97.35	197	RT	2110	2115		379.7	378.7	0.5%											
- L2- 545+93.03		RT	2115		384.2														
SHEET TOTALS									228	32	0	76	0	0	0				

LINE & STATION	STRUCTURE NO.		R.C. PIPE CLASS III							R.C. PIPE CLASS IV							PIPE AS NOTED														
SIZE	FROM	TO	15"	18"	24"	30"	36"	42"	48"	15"	18"	24"	30"	36"	42"	48"	6"	15"	18"	24"	36"	42"	48"	30"	30"	36"	36"	42"	42"	48"	48"
THICKNESS OR GAUGE																	HDPE	RCP-V	RCP-V	RCP-V	RCP-V	RCP-V	RCP-V	Welded Steel (In Soil)	Welded Steel (Not in Soil)	Welded Steel (In Soil)	Welded Steel (Not in Soil)	Welded Steel (In Soil)	Welded Steel (Not in Soil)	Welded Steel (In Soil)	Welded Steel (Not in Soil)
SHEET 20																															
- L2- 532+49.98	2005	2008	96																												
- Y16- 18+25.27	2008																														
- Y16- 18+25.27	2008	2009	128																												
- Y16- 16+89.12	2009																														
- Y16- 16+89.12	2009	2010																													
- Y16- 15+62.89	2010																														
- Y16- 15+62.89	2010	2014																													
- Y16- 14+42.35	2014																														
- Y16- 14+42.35	2014	4315	4																												
- Y16- 14+37.79	2015																														
- Y16- 14+37.79	2015	2018	32																												
- L2- 532+00.00	2018																														
- L2- 532+30.21	2012																														
- L2- 532+30.21	2013																														
- L2- 532+00.00	2016																														
- L2- 532+00.00	2016	2017																152													
SHEET 21																															
- L2- 542+24.00	2105																														
- L2- 542+24.00	2105	2116	104																												
- L2- 543+09.62	2104																														
- L2- 543+09.62	2104	2103	92																												
- L2- 544+00.00	2103																														
- L2- 544+00.00	2103	2102	152																												
- L2- 547+49.08	2101																														
- L2- 547+49.08	2101	2102		196																											
- L2- 545+50.00	2106	2102			100																										
- L2- 545+50.00	2102																														
- L2- 545+50.00	2102	2107				116																									
- L2- 545+48.02	2107																														
- L2- 545+48.02	2107	2112																													
- L2- 545+47.93	2112																														
- L2- 545+47.93	2112	2111																													
- L2- 545+42.97	2111																														
- L2- 545+42.97	2111	2113				4																									
- L2- 545+47.28	2113																														
- L2- 545+47.28	2113	2114				48																									
- L2- 545+93.03	2114																														
- L2- 545+93.03	2114	2110				28																									
- L2- 545+97.35	2110																														
- L2- 545+97.35	2110	2115				32																									
- L2- 545+93.03	2115																														
SHEET TOTALS			608	196	100	228	0	0	0	0	0	0	0	0	0	0	0	152	0	0	0	0	0	0	0	0	0	0	0	0	0

LINE & STATION	STRUCTURE NO.		ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE)	QUANTITIES FOR DRAINAGE STRUCTURES	*TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B')		C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03			CONCRETE TRANSITIONAL SECTION		D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATE STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. FRAME WITH TWO FLAT GRATES STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	G.D.I. (N.S.) FR. WITH TWO FLAT GRATES. STD. 840.29	J.B. STD. 840.31 OR 840.32	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 GRATE AND FRAME STD. 840.37	M.H. FRAME AND COVER STD. 840.54	SPRING BOX STD. 840.41	15" DRAINAGE PIPE ELBOW	18" DRAINAGE PIPE ELBOW	24" DRAINAGE PIPE ELBOW	30" DRAINAGE PIPE ELBOW	TEMP STEEL PLATE COVER MASONRY DRAINAGE	ADJUST CB	ADJUST DI	BERM DRAINAGE OUTLET STD. 850.10 (4" CONCRETE PAVED DITCH SY)	BERM DRAINAGE OUTLET STD. 850.11 (4" CONCRETE PAVED DITCH SY)	ENERGY DISSIPATOR BASIN - EACH	FLOWABLE FILL (CY)	CONC. COLLARS CL. "B" C.Y. STD. 840.72	PIPE REMOVAL LIN. FT.	REMARKS
SIZE	FROM	TO			LIN. FT. A	B		TYPE OF GRATE																																		
THICKNESS OR GAUGE			CY	PER EACH (0' THRU 5.0')	5.0' THRU 10.0'	10.0' AND ABOVE		E	F	G	DROP INLET	CATCH BASIN																														
SHEET 20																																										
- L2- 532+49.98	2005	2008																																								
- Y16- 18+25.27	2008			1							1															1	1															
- Y16- 18+25.27	2008	2009																																							27	
- Y16- 16+89.12	2009			1			1			1																																
- Y16- 16+89.12	2009	2010																																							121	
- Y16- 15+62.89	2010			1			1			1																																
- Y16- 15+62.89	2010	2014																																							108	
- Y16- 14+42.35	2014			1			1			1																																
- Y16- 14+42.35	2014	4315																																								
- Y16- 14+37.79	2015			1			1			1																																
- Y16- 14+37.79	2015	2018																																								
- L2- 532+00.00	2018																																	1								
- L2- 532+30.21	2012																																							0.3528		
- L2- 532+30.21	2013																																							0.3528		
- L2- 532+00.00	2016																1		1																							
- L2- 532+00.00	2016	2017																																					2.5			
SHEET 21																																										
- L2- 542+24.00	2105			1	0.5											1				1																						
- L2- 542+24.00	2105	2116																																								
- L2- 543+09.62	2104			1																						1	1															
- L2- 543+09.62	2104	2103																																								
- L2- 544+00.00	2103			1																						1	1															
- L2- 544+00.00	2103	2102																																								
- L2- 547+49.08	2101			1												1				1																						
- L2- 547+49.08	2101	2102																																								
- L2- 545+50.00	2106	2102																																					6.5			
- L2- 545+50.00	2102			1	5.0	4.5																1						1														
- L2- 545+50.00	2102	2107																																								
- L2- 545+48.02	2107			1												1				1																						
- L2- 545+48.02	2107	2112																																								
- L2- 545+47.93	2112																																		1							
- L2- 545+47.93	2112	2111																																								
- L2- 545+42.97	2111																																	1								
- L2- 545+42.97	2111	2113																																								
- L2- 545+47.28	2113																																	1								
- L2- 545+47.28	2113	2114																																								
- L2- 545+93.03	2114																																	1								
- L2- 545+93.03	2114	2110																																								
- L2- 545+97.35	2110																																	1								
- L2- 545+97.35	2110	2115																																								
- L2- 545+93.03	2115																																	1								
SHEET TOTALS			0	11	5.5	4.4554	4	0	0	4	1	0	0	0	0	3	1	0	1	3	0	1	0	0	3	3	1	0	0	0	0	0	0	6	1	0	0	0	9	0.7056	256	

ABBREVIATIONS

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

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8/17/99

COMPUTED BY:	CJP	DATE:	Apr. 2, 2021
CHECKED BY:	CAH	DATE:	Apr. 9, 2021

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
R-5709C	3D-13

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" & UNDER)

LINE & STATION SIZE THICKNESS OR GAUGE	OFFSET		STRUCTURE NO.		TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	% MINIMUM REQUIRED SLOPE	DRAINAGE PIPE (RCP, CSP, CAAP, HDPE, PP or PVC)										
			FROM	TO					15"	18"	24"	30"	36"	42"	48"	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE, PP, OR PVC
SHEET 21 (cont.)																			
- L2- 546+90.00	56	RT	2117		408.3														
- L2- 546+90.00		RT	2117	2108		405.3	405.2	0.4%											
- L2- 547+00.00	56	RT	2108		408.2														
- L2- 547+00.00		RT	2108	2109		405.2	394.5	0.4%		48						X			X
SHEET 22																			
- L2- 555+50.00	75	RT	2204		393.0														
- L2- 555+50.00		RT	2204	2203		390.0	387.4	0.5%											
- L2- 555+50.00	0	CL	2203		390.4														
- L2- 555+50.00		CL	2203	2218		387.4	387.1	0.5%											
- L2- 555+67.00	-75	LT	2218		392.2														
- L2- 555+67.00		LT	2218	2219		387.1	381.0	0.8%											
- L2- 558+64.95		LT	2215	2222		365.7	350.1	0.3%											
- L- 560+50.00	-80	LT	2221							104									
- L2- 560+02.49	-56	LT	2205		379.7														
- L2- 560+02.49		LT	2205	2206		374.2	366.6	0.4%	44								X	X	
- L2- 561+60.00	56	RT	2207		376.3														
- L2- 561+60.00		RT	2207	2208		373.5	366.1	0.4%											
- L2- 560+40.00	56	RT	2208		380.6														
- L2- 560+40.00		RT	2208	2209		366.1	349.8	0.5%	92								X	X	
- L2- 563+75.00	-56	LT	2217		375.1														
- L2- 563+75.00		LT	2217	2210		372.4	372.3	0.5%											
- L2- 563+50.27	-56	LT	2210		375.1														
- L2- 563+50.27		LT	2210	2201		372.3	370.1	0.5%											
- L2- 563+50.27	0	CL	2201		372.8														
- L2- 563+50.27		CL	2201	2202		369.8	369.1	0.5%											
- L2- 564+47.65	56	RT	2211		375.6														
- L2- 564+47.65		RT	2211	2212		372.8	372.4	0.4%											
- L2- 565+93.62	56	RT	2212		377.3														
- L2- 565+93.62		RT	2212	2202		372.4	372.2	0.5%											
- L2- 565+93.85	-7	LT	2202		376.2														
- L2- 565+93.85		LT	2202	2202		368.6	367.8	0.4%											
-L- 552+78.83	-75	LT	2220							48									
- L2- 555+67.00		LT	2223			383.0	381.0		12							X	X	X	
-L2- 559+33	0	CL	2222	2216															
SHEET TOTALS									148	200	0	0	0	0	0				

LINE & STATION	R.C. PIPE CLASS III							R.C. PIPE CLASS IV							PIPE AS NOTED															ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE)
	15"	18"	24"	30"	36"	42"	48"	15"	18"	24"	30"	36"	42"	48"	6" HDPE	15" RCP-V	18" RCP-V	24" RCP-V	36" RCP-V	42" RCP-V	48" RCP-V	30" Welded Steel (In Soil)	30" Welded Steel (Not in Soil)	36" Welded Steel (In Soil)	36" Welded Steel (Not in Soil)	42" Welded Steel (In Soil)	42" Welded Steel (Not in Soil)	48" Welded Steel (In Soil)	48" Welded Steel (Not in Soil)	CY
SHEET 21 (cont.)																														
- L2- 546+90.00																														
- L2- 546+90.00		8																												
- L2- 547+00.00																														
- L2- 547+00.00																														
SHEET 22																														
- L2- 555+50.00																														
- L2- 555+50.00		72																												
- L2- 555+50.00																														
- L2- 555+50.00		80																												
- L2- 555+67.00																														
- L2- 555+67.00		136																												
- L2- 558+64.95																										66	66			3.8
- L- 560+50.00																														
- L2- 560+02.49																														
- L2- 560+02.49																														
- L2- 561+60.00																														
- L2- 561+60.00	120																													
- L2- 560+40.00																														
- L2- 560+40.00																														
- L2- 563+75.00																														
- L2- 563+75.00	24																													
- L2- 563+50.27																														
- L2- 563+50.27	56																													
- L2- 563+50.27																														
- L2- 563+50.27		240																												
- L2- 564+47.65																														
- L2- 564+47.65	144																													
- L2- 565+93.62																														
- L2- 565+93.62	64																													
- L2- 565+93.85																														
- L2- 565+93.85			256																											
-L- 552+78.83																														
- L2- 555+67.00																														
-L2- 559+33													176																	
SHEET TOTALS	408	536	256	0	0	0	0	0	0	0	0	0	176	0	0	0	0	0	0	0	0	0	0	0	0	66	66	0	0	3.8

LINE & STATION	QUANTITIES FOR DRAINAGE STRUCTURES	*TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') LIN. FT.		C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE			CONCRETE TRANSITIONAL SECTION		D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATE STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. FRAME WITH TWO FLAT GRATES STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	G.D.I. (N.S.) FR. WITH TWO FLAT GRATES. STD. 840.29	J.B. STD. 840.31 OR 840.32	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 GRATE AND FRAME STD. 840.37	M.H. FRAME AND COVER STD. 840.54	SPRING BOX STD. 840.41	15" DRAINAGE PIPE ELBOW	18" DRAINAGE PIPE ELBOW	24" DRAINAGE PIPE ELBOW	30" DRAINAGE PIPE ELBOW	TEMP STEEL PLATE COVER MASONRY DRAINAGE	ADJUST CB	ADJUST DI	BERM DRAINAGE OUTLET STD. 850.10 (4" CONCRETE PAVED DITCH SY)	BERM DRAINAGE OUTLET STD. 850.11 (4" CONCRETE PAVED DITCH SY)	ENERGY DISSIPATOR BASIN - EACH	FLOWABLE FILL (CY)	CONC. COLLARS CL. "B" C.Y. STD. 840.72	PIPE REMOVAL LIN. FT.	REMARKS
	PER EACH (0' THRU 5.0')	A 5.0' THRU 10.0'	B 10.0' AND ABOVE		E	F	G	DROP INLET	CATCH BASIN																														
SHEET 21 (cont.)																																							
- L2- 546+90.00	1												1		1																								
- L2- 546+90.00																																							
- L2- 547+00.00	1												1		1																								
- L2- 547+00.00																																							
SHEET 22																																							
- L2- 555+50.00	1												1				1																						
- L2- 555+50.00																																							
- L2- 555+50.00	1												1				1																						
- L2- 555+50.00																																							
- L2- 555+67.00	1	0.1											1				1																						
- L2- 555+67.00																																							
- L2- 558+64.95																																				5.9	0.8856		
- L- 560+50.00																																						61	
- L2- 560+02.49	1	0.4											1					1																					
- L2- 560+02.49																																						12	
- L2- 561+60.00	1												1					1																					
- L2- 561+60.00																																							
- L2- 560+40.00	1	5.0	4.4										1					1																					
- L2- 560+40.00																																							
- L2- 563+75.00	1												1					1																					
- L2- 563+75.00																																							
- L2- 563+50.27	1												1					1																					
- L2- 563+50.27																																							
- L2- 563+50.27	1												1				1																						
- L2- 563+50.27																																							
- L2- 564+47.65	1												1					1																					
- L2- 564+47.65																																							
- L2- 565+93.62	1												1					1																					
- L2- 565+93.62																																						59	
- L2- 565+93.85	1	2.6											1																										
- L2- 565+93.85																																							
-L- 552+78.83																																						61	
- L2- 555+67.00																																					0.399		
-L2- 559+33																																							
SHEET TOTALS	14	8.178	4.4396	0	0	0	0	0	0	0	0	0	14	0	2	0	4	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5.9	1.2846	193	

ABBREVIATIONS

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

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COMPUTED BY:	CJP	DATE:	Apr. 2, 2021
CHECKED BY:	CAH	DATE:	Apr. 9, 2021

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
R-5709C	3D-14

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" & UNDER)

LINE & STATION SIZE THICKNESS OR GAUGE	OFFSET		STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	% MINIMUM REQUIRED SLOPE	DRAINAGE PIPE (RCP, CSP, CAAP, HDPE, PP or PVC) 15"	18"	24"	30"	36"	42"	48"	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE, PP, OR PVC
SHEET 23																			
- L2- 569+11.97	75	RT	2304		383.0														
- L2- 569+11.97		RT	2304	2306		380.3	380.0	0.5%											
- L2- 570+22.90	18	RT	2305		389.1														
- L2- 570+22.90		RT	2305	2306		386.0	380.0	0.7%											
- L2- 569+12.28	-9	LT	2306		384.9														
- L2- 569+12.28		LT	2306	2302		374.8	368.6	0.5%											
- L2- 568+50.00	-8	LT	2302		383.3														
- L2- 568+50.00		LT	2302	2303		367.8	367.6	0.4%											
- L2- 568+51.29	-91	LT	2303		374.3														
- L2- 568+51.29		LT	2303	2307		367.6	357.0	0.5%											
- L2- 566+64.62		LT	2301	2316		355.5	353.3	0.4%											
- L2- 566+64.62		LT	2316	2314		353.3	350.9	0.4%											
-L- 571+31.17	78	RT	2318						28										
-L- 574+98.52	-91	LT	2319						24										
- L2- 575+50.00		LT	2312	2308		383.5	381.3	0.4%											
- L2- 576+83.00	-1	LT	2311		387.3														
- L2- 576+83.00		LT	2311	2308		384.6	384.2	0.6%											
- L2- 575+50.00	0	CL	2308		387.9														
- L2- 575+50.00		CL	2308	2317		381.3	378.8	0.5%											
- L2- 574+97.25	57	RT	2309		390.3														
- L2- 574+97.25		RT	2309	2310		381.3	376.5	0.4%	48							X			X
-L2- 576+26.52	-83	LT	2320						40										
-Y18- 14+20.55	23	RT	2315						48										
-Y18- 13+46.88	20	RT	2313						32										
-Y18- 12+70.54	20	RT	2314						32										
SHEET 24																			
-L- 581+03.66	77	RT	2406						40										
-L- 581+81.32	77	RT	2407						28										
- L2- 587+60.68	0	CL	2401		385.4														
- L2- 587+60.68		CL	2401	2402		383.1	382.8	0.6%											
SHEET TOTALS									320	0	0	0	0	0	0				

LINE & STATION	STRUCTURE NO. FROM	TO	R.C. PIPE CLASS III 15"	18"	24"	30"	36"	42"	48"	R.C. PIPE CLASS IV 15"	18"	24"	30"	36"	42"	48"	PIPE AS NOTED 6" HDPE	15" RCP-V	18" RCP-V	24" RCP-V	36" RCP-V	42" RCP-V	48" RCP-V	30" Welded Steel (In Soil)	30" Welded Steel (Not in Soil)	36" Welded Steel (In Soil)	36" Welded Steel (Not in Soil)	42" Welded Steel (In Soil)	42" Welded Steel (Not in Soil)	48" Welded Steel (In Soil)	48" Welded Steel (Not in Soil)	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY
SHEET 23																																
- L2- 569+11.97	2304																															
- L2- 569+11.97	2304	2306	84																													
- L2- 570+22.90	2305																															
- L2- 570+22.90	2305	2306	112																													
- L2- 569+12.28	2306																															
- L2- 569+12.28	2306	2302	60																													
- L2- 568+50.00	2302																															
- L2- 568+50.00	2302	2303			84																											
- L2- 568+51.29	2303																															
- L2- 568+51.29	2303	2307			172																											
- L2- 566+64.62	2301	2316																												64	64			3.8
- L2- 566+64.62	2316	2314						140																								
-L- 571+31.17	2318																															
-L- 574+98.52	2319																															
- L2- 575+50.00	2312	2308			84																											
- L2- 576+83.00	2311																															
- L2- 576+83.00	2311	2308	132																													
- L2- 575+50.00	2308																															
- L2- 575+50.00	2308	2317			100																											
- L2- 574+97.25	2309																															
- L2- 574+97.25	2309	2310																														
-L2- 576+26.52	2320																															
-Y18- 14+20.55	2315																															
-Y18- 13+46.88	2313																															
-Y18- 12+70.54	2314																															
SHEET 24																																
-L- 581+03.66	2406																															
-L- 581+81.32	2407																															
- L2- 587+60.68	2401																															
- L2- 587+60.68	2401	2402									76																					
SHEET TOTALS			388	0	440	0	0	140	0	0	76	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	64	64	0	0	3.8

LINE & STATION	STRUCTURE NO. FROM	TO	QUANTITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0')	*TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') LIN. FT. A 5.0' THRU 10.0'	LIN. FT. B 10.0' AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	CONCRETE TRANSITIONAL SECTION DROP INLET	CATCH BASIN	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATE STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. FRAME WITH TWO FLAT GRATES STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	G.D.I. (N.S.) FR. WITH TWO FLAT GRATES. STD. 840.29
SHEET 23																				
- L2- 569+11.97	2304		1												1				1	
- L2- 569+11.97	2304	2306																		
- L2- 570+22.90	2305		1							1										
- L2- 570+22.90	2305	2306																		
- L2- 569+12.28	2306		1	5.0	0.0										1		1			
- L2- 569+12.28	2306	2302																		
- L2- 568+50.00	2302		1	5.0	5.4										1		1			
- L2- 568+50.00	2302	2303																		
- L2- 568+51.29	2303		1	1.7											1				1	
- L2- 568+51.29	2303	2307																		
- L2- 566+64.62	2301	2316																		
- L2- 566+64.62	2316	2314																		
-L- 571+31.17	2318																			
-L- 574+98.52	2319																			
- L2- 575+50.00	2312	2308																		
- L2- 576+83.00	2311		1												1			1		
- L2- 576+83.00	2311	2308																		
- L2- 575+50.00	2308		1	1.5											1		1			
- L2- 575+50.00	2308	2317																		
- L2- 574+97.25	2309		1	4.1											1		1			
- L2- 574+97.25	2309	2310																		
-L2- 576+26.52	2320																			
-Y18- 14+20.55	2315																			
-Y18- 13+46.88	2313																			
-Y18- 12+70.54	2314																			
SHEET 24																				
-L- 581+03.66	2406																			
-L- 581+81.32	2407																			
- L2- 587+60.68	2401		1													1		1		
- L2- 587+60.68	2401	2402																		
SHEET TOTALS			9	17.3	5.4504	0	0	0	0	1	0	0	0	0	7	1	4	2	2	0

LINE & STATION	STRUCTURE NO. FROM	TO	J.B. STD. 840.31 OR 840.32	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 GRATE AND FRAME STD. 840.37	M.H. FRAME AND COVER STD. 840.54	SPRING BOX STD. 840.41	15" DRAINAGE PIPE ELBOW	18" DRAINAGE PIPE ELBOW	24" DRAINAGE PIPE ELBOW	30" DRAINAGE PIPE ELBOW	TEMP STEEL PLATE COVER MASONRY DRAINAGE	ADJUST CB	ADJUST DI	BERM DRAINAGE OUTLET STD. 850.10 (4" CONCRETE PAVED DITCH SY)	BERM DRAINAGE OUTLET STD. 850.11 (4" CONCRETE PAVED DITCH SY)	ENERGY DISSIPATOR BASIN - EACH	FLOWABLE FILL (CY)	CONC. COLLARS CL. "B" C.Y. STD. 840.72	PIPE REMOVAL LIN. FT.	REMARKS
SHEET 23																							
- L2- 569+11.97	2304																						
- L2- 569+11.97	2304	2306																					
- L2- 570+22.90	2305					1	1																
- L2- 570+22.90	2305	2306																					
- L2- 569+12.28	2306																						
- L2- 569+12.28	2306	2302																					
- L2- 568+50.00	2302																						
- L2- 568+50.00	2302	2303																					
- L2- 568+51.29	2303																						
- L2- 568+51.29	2303	2307																					
- L2- 566+64.62	2301	2316																			8.3	0.8856		
- L2- 566+64.62	2316	2314																					
-L- 571+31.17	2318																						30	
-L- 574+98.52	2319																						43	
- L2- 575+50.00	2312	2308																					
- L2- 576+83.00	2311																						
- L2- 576+83.00	2311	2308																					
- L2- 575+50.00	2308																						
- L2- 575+50.00	2308	2317																					
- L2- 574+97.25	2309																						
- L2- 574+97.25	2309	2310																					
-L2- 576+26.52	2320																				3.8			
-Y18- 14+20.55	2315																						
-Y18- 13+46.88	2313																						
-Y18- 12+70.54	2314																						
SHEET 24																							
-L- 581+03.66	2406																						
-L- 581+81.32	2407																						
- L2- 587+60.68	2401																						
- L2- 587+60.68	2401	2402																					
SHEET TOTALS			0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	12	0.8856	73	

ABBREVIATIONS

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

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COMPUTED BY: CJP DATE: Apr. 2, 2021
CHECKED BY: CAH DATE: Apr. 9, 2021

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
R-5709C	3D-15

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" & UNDER)

LINE & STATION	OFFSET		STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	% MINIMUM REQUIRED SLOPE	DRAINAGE PIPE (RCP, CSP, CAAP, HDPE, PP or PVC)							DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE, PP, OR PVC	R.C. PIPE CLASS III							R.C. PIPE CLASS IV						
SIZE									15"	18"	24"	30"	36"	42"	48"					15"	18"	24"	30"	36"	42"	48"	15"	18"	24"	30"	36"	42"	48"
THICKNESS OR GAUGE																																	
SHEET 25																																	
-L- 594+71.92	78	RT	2507						28																								
-L- 600+73.49	-78	RT	2508						48																								
- L2- 605+55.00	-10	LT	2505		383.1																												
- L2- 605+55.00		LT	2505	2506		380.3	380.1	0.5%												52													
- L2- 606+00.00	19	RT	2506		384.5																												
- L2- 606+00.00		RT	2506	2501		380.1	379.4	0.6%												148													
SHEET 26																																	
-L- 607+50.67	-87	LT	2610																														
- L2- 607+50.00	0	CL	2601		382.2																												
- L2- 607+50.00		CL	2601	2604		379.2	378.6	0.5%													196												
- L2- 609+50.00	0	CL	2604		383.0																												
- L2- 609+50.00		CL	2604	2603		378.6	377.6	0.5%													96												
- L2- 610+50.00		RT	2605			377.3	376.9	0.4%																									
- L2- 613+62.50	96	RT	2611										28				×	×	×														
- L2- 617+18.83	95	RT	2612										44				×	×	×														
- L2- 616+50.00		RT	2609	2608		375.5	374.4	0.4%																		88							
- L2- 616+50.00	10	RT	2608		383.3																												
- L2- 616+50.00		RT	2608	2607		374.4	373.3	0.4%																									
- L2- 616+50.00	-85	LT	2607		378.0																												
- L2- 616+50.00		LT	2607	2606		373.3	373.0	0.4%																									
SHEET 27																																	
- L2- 622+00.00	0	CL	2701		380.4																												
- L2- 622+00.00		CL	2701	2702		377.7	377.3	0.6%												88													
- L2- 624+73.00	-19	LT	2703		382.7																												
- L2- 624+73.00		LT	2703	2704		379.4	378.0	0.4%												100													
- L2- 633+50.00	0	CL	2705		377.7																												
- L2- 633+50.00		CL	2705	2706		374.9	373.5	0.5%												92													
SHEET TOTALS									76	0	0	0	72	0	0					480	292	0	0	0	0	88	0	0	0	0	0	0	0

LINE & STATION	PIPE AS NOTED 6" HDPE	15" RCP-V	18" RCP-V	24" RCP-V	36" RCP-V	42" RCP-V	48" RCP-V	30" Welded Steel (In Soil)	30" Welded Steel (Not in Soil)	36" Welded Steel (In Soil)	36" Welded Steel (Not in Soil)	42" Welded Steel (In Soil)	42" Welded Steel (Not in Soil)	48" Welded Steel (In Soil)	48" Welded Steel (Not in Soil)	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	QUANTITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0')	*TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') LIN. FT. A 5.0' THRU 10.0'	LIN. FT. B 10.0' AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	CONCRETE TRANSITIONAL SECTION DROP INLET	CATCH BASIN
SHEET 25																									
-L- 594+71.92																									
-L- 600+73.49																									
- L2- 605+55.00																	1								
- L2- 605+55.00																									
- L2- 606+00.00																	1							1	
- L2- 606+00.00																									
SHEET 26																									
-L- 607+50.67																									
- L2- 607+50.00																	1								
- L2- 607+50.00																									
- L2- 609+50.00																	1								
- L2- 609+50.00																									
- L2- 610+50.00												84	84												
- L2- 613+62.50																4.5									
- L2- 617+18.83																									
- L2- 616+50.00																6									
- L2- 616+50.00																	1	3.9							
- L2- 616+50.00														48	48										
- L2- 616+50.00																	1								
- L2- 616+50.00														28	28										
SHEET 27																									
- L2- 622+00.00																	1								
- L2- 622+00.00																									
- L2- 624+73.00																	1							1	
- L2- 624+73.00																									
- L2- 633+50.00																	1								
- L2- 633+50.00																									
SHEET TOTALS	0	0	0	0	0	0	0	0	0	0	0	84	84	76	76	10.5	9	3.903	0	0	0	0	0	2	0

LINE & STATION	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATE STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. FRAME WITH TWO FLAT GRATES STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	G.D.I. (N.S.) FR. WITH TWO FLAT GRATES. STD. 840.29	J.B. STD. 840.31 OR 840.32	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 GRATE AND FRAME STD. 840.37	M.H. FRAME AND COVER STD. 840.54	SPRING BOX STD. 840.41	15" DRAINAGE PIPE ELBOW	18" DRAINAGE PIPE ELBOW	24" DRAINAGE PIPE ELBOW	30" DRAINAGE PIPE ELBOW	TEMP STEEL PLATE COVER MASONRY DRAINAGE	ADJUST CB	ADJUST DI	BERM DRAINAGE OUTLET STD. 850.10 (4" CONCRETE PAVED DITCH SY)	BERM DRAINAGE OUTLET STD. 850.11 (4" CONCRETE PAVED DITCH SY)	ENERGY DISSIPATOR BASIN - EACH	FLOWABLE FILL (CY)	CONC. COLLARS CL. "B" C.Y. STD. 840.72	PIPE REMOVAL LIN. FT.	REMARKS
SHEET 25																														
-L- 594+71.92																														
-L- 600+73.49																													45	
- L2- 605+55.00				1			1																							
- L2- 605+55.00																														
- L2- 606+00.00													1	1																
- L2- 606+00.00																														
SHEET 26																														
-L- 607+50.67																														
- L2- 607+50.00				1		1																								
- L2- 607+50.00																														
- L2- 609+50.00				1		1																								
- L2- 609+50.00																														
- L2- 610+50.00																														
- L2- 613+62.50																														
- L2- 617+18.83																														
- L2- 616+50.00																														
- L2- 616+50.00			1			1																							39	
- L2- 616+50.00																														
- L2- 616+50.00			1			1																								
- L2- 616+50.00																														
SHEET 27																														
- L2- 622+00.00				1		1																								
- L2- 622+00.00																														
- L2- 624+73.00													1	1																
- L2- 624+73.00																														
- L2- 633+50.00					1	1																								
- L2- 633+50.00																													70	
SHEET TOTALS	0	0	2	4	1	6	1	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	154	

ABBREVIATIONS

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

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icrocker

8/17/99

COMPUTED BY: CJP DATE: Apr. 2, 2021
CHECKED BY: CAH DATE: Apr. 9, 2021

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
R-5709C	3D-16

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" & UNDER)

LINE & STATION	OFFSET		STRUCTURE NO. FROM	TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	% MINIMUM REQUIRED SLOPE
SHEET 28								
-L- 638+24.05	91	RT	2806					
-L- 641+83.17	-75	LT	2807					
- L2- 644+50.00		LT	2808			365.9	365.5	1.4%
- L2- 643+00.00		RT	2803	2802		368.5	368.1	0.5%
- L2- 643+00.00	-6	LT	2802		372.4			
- L2- 643+00.00		LT	2802	2801		368.1	367.8	0.5%
- L2- 647+75.00	-8	LT	2805		371.0			
- L2- 647+75.00		LT	2805	2804		366.1	364.9	0.5%
SHEET 29								
- L2- 649+55.00	-19	LT	2901		370.0			
- L2- 649+55.00		LT	2901	2902		366.8	364.4	0.5%
- L2- 656+70.20	0	CL	2906		364.5			
- L2- 656+70.20		CL	2906	2905		362.5	362.3	0.6%
-L- 657+76.03	89	RT	2904					
-L- 659+36.39	93	RT	2908					
-L- 662+72.55	92	RT	2910					
SHEET 30								
- L2- 665+15.20		LT	3001	3002		359.7	359.3	0.4%
- L2- 665+15.20	0	CL	3002		363.0			
- L2- 665+15.20		CL	3002	3003		359.3	359.0	0.5%
- L2- 665+20.00		LT	3006	3003		359.7	358.9	0.4%
-L- 663+05.79	87	RT	3008					
- L2- 665+20.00		LT	3007					
-L- 675+72.10	79	RT	3009					
SHEET TOTALS								

LINE & STATION	STRUCTURE NO. FROM	TO	DRAINAGE PIPE (RCP, CSP, CAAP, HDPE, PP or PVC)											R.C. PIPE CLASS III						
SIZE			15"	18"	24"	30"	36"	42"	48"					15"	18"	24"	30"	36"	42"	48"
THICKNESS OR GAUGE										DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE, PP, OR PVC							
SHEET 28																				
-L- 638+24.05	2806			32																
-L- 641+83.17	2807			36																
- L2- 644+50.00	2808																			
- L2- 643+00.00	2803	2802																96		
- L2- 643+00.00	2802																			
- L2- 643+00.00	2802	2801																76		
- L2- 647+75.00	2805																			
- L2- 647+75.00	2805	2804												92						
SHEET 29																				
- L2- 649+55.00	2901																			
- L2- 649+55.00	2901	2902																		
- L2- 656+70.20	2906																			
- L2- 656+70.20	2906	2905												76						
-L- 657+76.03	2904		24																	
-L- 659+36.39	2908		28																	
-L- 662+72.55	2910		24																	
SHEET 30																				
- L2- 665+15.20	3001	3002																		
- L2- 665+15.20	3002																			
- L2- 665+15.20	3002	3003																		
- L2- 665+20.00	3006	3003																		
-L- 663+05.79	3008		24																	
- L2- 665+20.00	3007														72					
-L- 675+72.10	3009		28																	
SHEET TOTALS			128	68	0	0	0	0	0					168	72	0	0	172	0	0

LINE & STATION	STRUCTURE NO. FROM	TO	R.C. PIPE CLASS IV							PIPE AS NOTED														
SIZE			15"	18"	24"	30"	36"	42"	48"	6"	15"	18"	24"	36"	42"	48"	30"	30"	36"	36"	42"	42"	48"	48"
THICKNESS OR GAUGE										HDPE	RCP-V	RCP-V	RCP-V	RCP-V	RCP-V	RCP-V	Welded Steel (In Soil)	Welded Steel (Not in Soil)	Welded Steel (In Soil)	Welded Steel (Not in Soil)	Welded Steel (In Soil)	Welded Steel (Not in Soil)	Welded Steel (In Soil)	Welded Steel (Not in Soil)
SHEET 28																								
-L- 638+24.05	2806																							
-L- 641+83.17	2807																							
- L2- 644+50.00	2808																		108	108				
- L2- 643+00.00	2803	2802																						
- L2- 643+00.00	2802																							
- L2- 643+00.00	2802	2801																						
- L2- 647+75.00	2805																							
- L2- 647+75.00	2805	2804																						
SHEET 29																								
- L2- 649+55.00	2901																							
- L2- 649+55.00	2901	2902	56																					
- L2- 656+70.20	2906																							
- L2- 656+70.20	2906	2905																						
-L- 657+76.03	2904																							
-L- 659+36.39	2908																							
-L- 662+72.55	2910																							
SHEET 30																								
- L2- 665+15.20	3001	3002					76																	
- L2- 665+15.20	3002																							
- L2- 665+15.20	3002	3003					84																	
- L2- 665+20.00	3006	3003					160																	
-L- 663+05.79	3008																							
- L2- 665+20.00	3007																							
-L- 675+72.10	3009																							
SHEET TOTALS			56	0	0	0	320	0	0	0	0	0	0	0	0	0	0	0	108	108	0	0	0	0

LINE & STATION	STRUCTURE NO. FROM	TO	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE)	QUANTITIES FOR DRAINAGE STRUCTURES	*TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B')		C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03			CONCRETE TRANSITIONAL SECTION	
					LIN. FT.			TYPE OF GRATE				
					A	B						
			CY	PER EACH (0' THRU 5.0')	5.0' THRU 10.0'	10.0' AND ABOVE		E	F	G	DROP INLET	CATCH BASIN
SHEET 28												
-L- 638+24.05	2806											
-L- 641+83.17	2807											
- L2- 644+50.00	2808		3.8									
- L2- 643+00.00	2803	2802	3.4									
- L2- 643+00.00	2802			1								
- L2- 643+00.00	2802	2801										
- L2- 647+75.00	2805			1								
- L2- 647+75.00	2805	2804										
SHEET 29												
- L2- 649+55.00	2901			1							1	
- L2- 649+55.00	2901	2902										
- L2- 656+70.20	2906			1								
- L2- 656+70.20	2906	2905										
-L- 657+76.03	2904											
-L- 659+36.39	2908											
-L- 662+72.55	2910											
SHEET 30												
- L2- 665+15.20	3001	3002	4.5									
- L2- 665+15.20	3002			1								
- L2- 665+15.20	3002	3003										
- L2- 665+20.00	3006	3003										
-L- 663+05.79	3008											
- L2- 665+20.00	3007											
-L- 675+72.10	3009											
SHEET TOTALS			11.7	5	0	0	0	0	0	0	1	0

LINE & STATION	STRUCTURE NO. FROM	TO	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATE STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. FRAME WITH TWO FLAT GRATES STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	G.D.I. (N.S.) FR. WITH TWO FLAT GRATES. STD. 840.29	J.B. STD. 840.31 OR 840.32	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 GRATE AND FRAME STD. 840.37	M.H. FRAME AND COVER STD. 840.54	SPRING BOX STD. 840.41	15" DRAINAGE PIPE ELBOW	18" DRAINAGE PIPE ELBOW	24" DRAINAGE PIPE ELBOW	30" DRAINAGE PIPE ELBOW	TEMP STEEL PLATE COVER MASONRY DRAINAGE	ADJUST CB	ADJUST DI	BERM DRAINAGE OUTLET STD. 850.10 (4" CONCRETE PAVED DITCH SY)	BERM DRAINAGE OUTLET STD. 850.11 (4" CONCRETE PAVED DITCH SY)	ENERGY DISSIPATOR BASIN - EACH	FLOWABLE FILL (CY)	CONC. COLLARS CL. "B" C.Y. STD. 840.72	PIPE REMOVAL LIN. FT.	REMARKS
SHEET 28																																
-L- 638+24.05	2806																															
-L- 641+83.17	2807																															
- L2- 644+50.00	2808																															
- L2- 643+00.00	2803	2802																														
- L2- 643+00.00	2802						1	1																								
- L2- 643+00.00	2802	2801																												6.4			
- L2- 647+75.00	2805					1			1																							
- L2- 647+75.00	2805	2804																														
SHEET 29																																
- L2- 649+55.00	2901														1	1																
- L2- 649+55.00	2901	2902																													85	
- L2- 656+70.20	2906						1		1																							
- L2- 656+70.20	2906	2905																												3.3			
-L- 657+76.03	2904																															
-L- 659+36.39	2908																															
-L- 662+72.55	2910																															
SHEET 30																													3.6			
- L2- 665+15.20	3001	3002																														
- L2- 665+15.20	3002						1		1																							
- L2- 665+15.20	3002	3003																														
- L2- 665+20.00	3006	3003																														
-L- 663+05.79	3008																															
- L2- 665+20.00	3007																														100	
-L- 675+72.10	3009																															
SHEET TOTALS			0	0	0	1	3	1	3	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	13	0	185	

ABBREVIATIONS

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

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icrocker

8/17/99

COMPUTED BY:	CJP	DATE:	Apr. 2, 2021
CHECKED BY:	CAH	DATE:	Apr. 9, 2021

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
R-5709C	3D-17

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" & UNDER)

LINE & STATION SIZE THICKNESS OR GAUGE	OFFSET		STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	% MINIMUM REQUIRED SLOPE	DRAINAGE PIPE (RCP, CSP, CAAP, HDPE, PP or PVC) 15"	18"	24"	30"	36"	42"	48"	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE, PP, OR PVC
SHEET 31																			
- L2- 681+00.00	0	CL	3108		356.2														
- L2- 681+00.00		CL	3108	3107		354.0	353.8	0.5%											
-L- 679+26.64	79	RT	3109						32										
-L- 682+76.66	-78	LT	3110						36										
-L- 680+50.72	78	RT	3111						32										
-L- 685+96.24	89	RT	3112						24										
- L2- 686+92.39		LT	3101	3102		348.8	347.0	0.5%											
- L2- 686+92.39	0	CL	3102		351.5														
- L2- 686+92.39		CL	3102	3103		347.0	345.3	0.6%											
SHEET 32																			
-L- 690+49.74	-78	LT	3205						28										
-L- 691+82.67	77	RT	3206						28										
- L2- 699+44.32	-9	LT	3201		359.8														
- L2- 699+44.32		LT	3201	3202		356.5	355.3	0.5%											
- L2- 701+13.82	-20	LT	3203		358.8														
- L2- 701+13.82		LT	3203	3202		355.6	355.3	0.4%											
- L2- 700+08.24	11	RT	3202		359.7														
- L2- 700+08.24		RT	3202	3204		355.3	354.2	0.5%											
-L- 695+00.21	-77	LT	3207						52										
-L- 699+32.32	75	RT	3208						20										
SHEET 33																			
-L2- 705+00.00		LT	3317									24					X	X	X
-L2- 707+00.00		LT	3318									24					X	X	X
-L- 713+85.55	**-75**	LT	3319							28									
- L2- 708+27.81		LT	3314									24					X	X	X
-L- 703+69.77	83	RT	3315						16										
- L2- 708+27.21		LT	3310	3313		345.5	345.0	0.6%											
- L2- 708+27.81	-8	LT	3313		349.8														
- L2- 708+27.81		LT	3313	3311		345.0	344.0	0.6%											
- L2- 709+93.54	-7	LT	3301		346.4														
- L2- 709+93.54		LT	3301	3302		343.1	342.8	0.7%											
- L2- 710+63.31	4	RT	3302		346.3														
- L2- 710+63.31		RT	3302	3303		342.8	340.4	0.5%											
- Y21- 10+97.76		LT	3312	3304		341.8	341.3	0.5%											
- Y21- 10+74.00	-18	LT	3304		345.7														
- Y21- 10+74.00		LT	3304	3305		341.3	340.7	0.5%											
-L- 712+58.51	RT	LT	3316						36										
- L2- 716+40.49		LT	3309	3306		323.5	322.5	0.4%											
- L2- 716+38.61	0	CL	3306		331.3														
- L2- 716+38.61		CL	3306	3307		322.5	321.9	0.4%											
- L2- 716+55.47	56	RT	3307		334.0														
- L2- 716+55.47		RT	3307	3308		321.9	321.4	0.4%											
-L2- 715+20.34	-76	LT	3320							28									
SHEET TOTALS									304	56	0	72	0	0	0				

LINE & STATION	STRUCTURE NO. FROM	STRUCTURE NO. TO	R.C. PIPE CLASS III 15"	18"	24"	30"	36"	42"	48"	R.C. PIPE CLASS IV 15"	18"	24"	30"	36"	42"	48"
SHEET 31																
- L2- 681+00.00	3108															
- L2- 681+00.00	3108	3107		80												
-L- 679+26.64	3109															
-L- 682+76.66	3110															
-L- 680+50.72	3111															
-L- 685+96.24	3112															
- L2- 686+92.39	3101	3102												76		
- L2- 686+92.39	3102															
- L2- 686+92.39	3102	3103												108		
SHEET 32																
-L- 690+49.74	3205															
-L- 691+82.67	3206															
- L2- 699+44.32	3201															
- L2- 699+44.32	3201	3202	68													
- L2- 701+13.82	3203															
- L2- 701+13.82	3203	3202	108													
- L2- 700+08.24	3202															
- L2- 700+08.24	3202	3204	64													
-L- 695+00.21	3207															
-L- 699+32.32	3208															
SHEET 33																
-L2- 705+00.00	3317															
-L2- 707+00.00	3318															
-L- 713+85.55	3319															
- L2- 708+27.81	3314															
-L- 703+69.77	3315															
- L2- 708+27.21	3310	3313											68			
- L2- 708+27.81	3313															
- L2- 708+27.81	3313	3311											96			
- L2- 709+93.54	3301															
- L2- 709+93.54	3301	3302	72													
- L2- 710+63.31	3302															
- L2- 710+63.31	3302	3303	80													
- Y21- 10+97.76	3312	3304										56				
- Y21- 10+74.00	3304															
- Y21- 10+74.00	3304	3305										72				
-L- 712+58.51	3316															
- L2- 716+40.49	3309	3306														
- L2- 716+38.61	3306															
- L2- 716+38.61	3306	3307							60							
- L2- 716+55.47	3307															
- L2- 716+55.47	3307	3308							52							
-L2- 715+20.34	3320															
SHEET TOTALS			392	80	0	0	0	0	112	0	0	128	164	184	0	0

LINE & STATION	STRUCTURE NO. FROM	STRUCTURE NO. TO	PIPE AS NOTED 6" HDPE	15" RCP-V	18" RCP-V	24" RCP-V	36" RCP-V	42" RCP-V	48" RCP-V	30" Welded Steel (In Soil)	30" Welded Steel (Not in Soil)	36" Welded Steel (In Soil)	36" Welded Steel (Not in Soil)	42" Welded Steel (In Soil)	42" Welded Steel (Not in Soil)	48" Welded Steel (In Soil)	48" Welded Steel (Not in Soil)	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY
SHEET 31																		
- L2- 681+00.00	3108																	
- L2- 681+00.00	3108	3107																
-L- 679+26.64	3109																	
-L- 682+76.66	3110																	
-L- 680+50.72	3111																	
-L- 685+96.24	3112																	
- L2- 686+92.39	3101	3102																3.4
- L2- 686+92.39	3102																	
- L2- 686+92.39	3102	3103																
SHEET 32																		
-L- 690+49.74	3205																	
-L- 691+82.67	3206																	
- L2- 699+44.32	3201																	
- L2- 699+44.32	3201	3202																
- L2- 701+13.82	3203																	
- L2- 701+13.82	3203	3202																
- L2- 700+08.24	3202																	
- L2- 700+08.24	3202	3204																
-L- 695+00.21	3207																	
-L- 699+32.32	3208																	
SHEET 33																		
-L2- 705+00.00	3317																	
-L2- 707+00.00	3318																	
-L- 713+85.55	3319																	
- L2- 708+27.81	3314																	
-L- 703+69.77	3315																	
- L2- 708+27.21	3310	3313																
- L2- 708+27.81	3313																	
- L2- 708+27.81	3313	3311																
- L2- 709+93.54	3301																	
- L2- 709+93.54	3301	3302																
- L2- 710+63.31	3302																	
- L2- 710+63.31	3302	3303																
- Y21- 10+97.76	3312	3304																
- Y21- 10+74.00	3304																	
- Y21- 10+74.00	3304	3305																
-L- 712+58.51	3316																	
- L2- 716+40.49	3309	3306															50	50	4.9
- L2- 716+38.61	3306																	
- L2- 716+38.61	3306	3307																
- L2- 716+55.47	3307																	
- L2- 716+55.47	3307	3308																
-L2- 715+20.34	3320																	
SHEET TOTALS			0	0	0	0	0	0	0	0	0	0	0	0	0	50	50	8.3

LINE & STATION	STRUCTURE NO. FROM	STRUCTURE NO. TO	QUANTITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0')	*TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') LIN. FT. A 5.0' THRU 10.0'	LIN. FT. B 10.0' AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	CONCRETE TRANSITIONAL SECTION DROP INLET	CATCH BASIN	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATE STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. FRAME WITH TWO FLAT GRATES STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	G.D.I. (N.S.) FR. WITH TWO FLAT GRATES. STD. 840.29	J.B. STD. 840.31 OR 840.32	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 GRATE AND FRAME STD. 840.37
SHEET 31																									
- L2- 681+00.00	3108		1													1	1								
- L2- 681+00.00	3108	3107																							
-L- 679+26.64	3109																								
-L- 682+76.66	3110																								
-L- 680+50.72	3111																								
-L- 685+96.24	3112																								
- L2- 686+92.39	3101	3102																							
- L2- 686+92.39	3102		1												1			1							
- L2- 686+92.39	3102	3103																							
SHEET 32																									
-L- 690+49.74	3205																								
-L- 691+82.67	3206																								
- L2- 699+44.32	3201		1												1			1							
- L2- 699+44.32	3201	3202																							
- L2- 701+13.82	3203		1							1														1	1
- L2- 701+13.82	3203	3202																							
- L2- 700+08.24	3202		1							1														1	1
- L2- 700+08.24	3202	3204																							
-L- 695+00.21	3207																								
-L- 699+32.32	3208																								
SHEET 33																									
-L2- 705+00.00	3317																								
-L2- 707+00.00	3318																								
-L- 713+85.55	3319																								
- L2- 708+27.81	3314																								
-L- 703+69.77	3315																								
- L2- 708+27.21	3310	3313																							
- L2- 708+27.81	3313		1												1			1							
- L2- 708+27.81	3313	3311																							
- L2- 709+93.54	3301		1												1			1							
- L2- 709+93.54	3301	3302																							
- L2- 710+63.31	3302		1							1														1	1
- L2- 710+63.31	3302	3303																							
- Y21- 10+97.76	3312	3304																							
- Y21- 10+74.00	3304		1							1														1	1
- Y21- 10+74.00	3304	3305																							
-L- 712+58.51	3316																								
- L2- 716+40.49	3309	3306																							
- L2- 716+38.61	3306		1	3.8										1				1							
- L2- 716+38.61	3306	3307																							
- L2- 716+55.47	3307		1	5.0	2.0									1			1								
- L2- 716+55.47	3307	3308																							
-L2- 715+20.34	3320																								
SHEET TOTALS			11	8.757	2.0333	0	0	0	0	4	0	0	0	2	4	1	2	5	0	0	0	0	0	4	4

LINE & STATION	STRUCTURE NO. FROM	STRUCTURE NO. TO	M.H. FRAME AND COVER STD. 840.54	SPRING BOX STD. 840.41	15" DRAINAGE PIPE ELBOW	18" DRAINAGE PIPE ELBOW	24" DRAINAGE PIPE ELBOW	30" DRAINAGE PIPE ELBOW	TEMP STEEL PLATE COVER MASONRY DRAINAGE	ADJUST CB	ADJUST DI	CONV DI TO JBMH	BERM DRAINAGE OUTLET STD. 850.10 (4" CONCRETE PAVED DITCH SY)	BERM DRAINAGE OUTLET STD. 850.11 (4" CONCRETE PAVED DITCH SY)	ENERGY DISSIPATOR BASIN - EACH	FLOWABLE FILL (CY)	CONC. COLLARS CL. "B" C.Y. STD. 840.72	PIPE REMOVAL LIN. FT.	REMARKS
SHEET 31																			
- L2- 681+00.00	3108																		
- L2- 681+00.00	3108	3107																	
-L- 679+26.64	3109																	40	
-L- 682+76.66	3110																	29	
-L- 680+50.72	3111																	26	
-L- 685+96.24	3112																	25	
- L2- 686+92.39	3101	3102														3.5			
- L2- 686+92.39	3102																		
- L2- 686+92.39	3102	3103																162	
SHEET 32																			
-L- 690+49.74	3205															3.4		21	
-L- 691+82.67	3206																	32	
- L2- 699+44.32	3201																	42	
- L2- 699+44.32	3201	3202																30	
- L2- 701+13.82	3203																		
- L2- 701+13.82	3203	3202																	
- L2- 700+08.24	3202																		
- L2- 700+08.24	3202	3204																	
-L- 695+00.21	3207																		
-L- 699+32.32	3208																	25	
SHEET 33																			
-L2- 705+00.00	3317																		
-L2- 707+00.00	3318																		
-L- 713+85.55	3319																		
- L2- 708+27.81	3314																		
-L- 703+69.77	3315																	45	
- L2- 708+27.21	3310	3313														6.1			
- L2- 708+27.81	3313																		
- L2- 708+27.81	3313	3311																	
- L2- 709+93.54	3301																		
- L2- 709+93.54	3301	3302																40	
- L2- 710+63.31	3302																		
- L2- 710+63.31	3302	3303																	
- Y21- 10+97.76	3312	3304																	
- Y21- 10+74.00	3304																		
- Y21- 10+74.00	3304	3305																85	
-L- 712+58.51	3316																	20	
- L2- 716+40.49	3309	3306														10			
- L2- 716+38.61	3306																		
- L2- 716+38.61	3306	3307																	
- L2- 716+55.47	3307																		
- L2- 716+55.47	3307	3308																	
-L2- 715+20.34	3320																		
SHEET TOTALS			0	0	0	0	0	0	0	0	0	0	0	0	0	23	0	622	

ABBREVIATIONS

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

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jcrocker

8/17/99

COMPUTED BY:	CJP	DATE:	Apr. 2, 2021
CHECKED BY:	CAH	DATE:	Apr. 9, 2021

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
R-5709C	3D-18

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" & UNDER)

LINE & STATION	OFFSET		STRUCTURE NO.		TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	% MINIMUM REQUIRED SLOPE	DRAINAGE PIPE (RCP, CSP, CAAP, HDPE, PP or PVC)										R.C. PIPE CLASS III							R.C. PIPE CLASS IV							PIPE AS NOTED															ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE)	QUANTITIES FOR DRAINAGE STRUCTURES	*TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B')		C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03			CONCRETE TRANSITIONAL SECTION		D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATE STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. FRAME WITH TWO FLAT GRATES STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	G.D.I. (N.S.) FR. WITH TWO FLAT GRATES. STD. 840.29	J.B. STD. 840.31 OR 840.32	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 GRATE AND FRAME STD. 840.37	M.H. FRAME AND COVER STD. 840.54	SPRING BOX STD. 840.41	15" DRAINAGE PIPE ELBOW	18" DRAINAGE PIPE ELBOW	24" DRAINAGE PIPE ELBOW	30" DRAINAGE PIPE ELBOW	TEMP STEEL PLATE COVER MASONRY DRAINAGE	ADJUST CB	ADJUST DI	BERM DRAINAGE OUTLET STD. 850.10 (4" CONCRETE PAVED DITCH SY)	BERM DRAINAGE OUTLET STD. 850.11 (4" CONCRETE PAVED DITCH SY)	ENERGY DISSIPATOR BASIN - EACH	FLOWABLE FILL (CY)	CONC. COLLARS CL. "B" C.Y. STD. 840.72	PIPE REMOVAL LIN. FT.	ABBREVIATIONS C.B. CATCH BASIN N.D.I. NARROW DROP INLET D.I. DROP INLET G.D.I. GRATED DROP INLET G.D.I.(N.S.) (NARROW SLOT) J.B. JUNCTION BOX M.H. MANHOLE T.B.D.I. TRAFFIC BEARING DROP INLET T.B.J.B. TRAFFIC BEARING JUNCTION BOX
SIZE									15"	18"	24"	30"	36"	42"	48"	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE, PP, OR PVC	15"	18"	24"	30"	36"	42"	48"	15"	18"	24"	30"	36"	42"	48"	6"	15"	18"	24"	36"	42"	48"	30"	30"	36"	36"	42"	42"	48"	48"			LIN. FT.			TYPE OF GRATE																																
THICKNESS OR GAUGE			FROM	TO																														HDPE	RCP-V	RCP-V	RCP-V	RCP-V	RCP-V	RCP-V	Welded Steel (In Soil)	Welded Steel (Not in Soil)	Welded Steel (In Soil)	Welded Steel (Not in Soil)	Welded Steel (In Soil)	Welded Steel (Not in Soil)	Welded Steel (In Soil)	Welded Steel (Not in Soil)	CY	PER EACH (0' THRU 5.0')	A 5.0' THRU 10.0'	B 10.0' AND ABOVE		E	F	G	DROP INLET	CATCH BASIN																														REMARKS
SHEET 34																																																																																								
-L- 720+17.70	85	RT	3403						56																																																																																
- L2- 723+70.00	-11	LT	3401		345.8																																													1							1														1	1																	
- L2- 723+70.00		LT	3401	3402		342.5	338.1	1.1%												112																																																																				
-L- 727+00.00	78	RT	3404						32																																																																															
-L- 729+31.63	78	RT	3405						28																																																																														32	
-L- 729+95.89	78	RT	3406						24																																																																														21	
-L- 718+72.01	-76	LT	3407							24																																																																														
-L- 720+86.95	-77	LT	3408							28																																																																													
SHEET 35																																																																																								
- L2- 731+36.60		LT	3501	3502		331.2	330.4	0.4%															72																										2.3																																					3.3			
- L2- 731+36.60	0	CL	3502		334.4																																													1												1			1																								
- L2- 731+36.60		CL	3502	3503		330.4	330.1	0.4%															84																																																																	
-L- 733+27.41	-79	LT	3509						24																																																																															29	
-L- 734+97.61	-81	RT	3506						20																																																																														22	
- L2- 740+36.60		RT	3508									44					×	×	×																																																																				36	
- L2- 740+36.60	2	RT	3504		317.9																																													1												1			1																								
- L2- 740+36.60		RT	3504	3505		315.1	313.6	0.01												84																																																																						
SHEET 36																																																																																								
- L2- 748+61.00	0	CL	3601		308.9																																													1												1			1																								
- L2- 748+61.00		CL	3601	3602		306.2	303.1	0.6%												100																																																																						
- L2- 748+70.00	98	RT	3602		305.8																																													1												1				1																							
- L2- 748+70.00		RT	3602	3609		303.1	302.2	0.9%	44								×	×																																																																							
- Y22- 11+00.00	-35	LT	3609		304.9																																													1												1				1																							
- Y22- 11+00.00		LT	3609	3610		302.2	301.2	1.1%	24								×	×																																																																							13	
- Y22- 10+77.18	-21	LT	3610		304.6																																													1			1		1																																						
-L- 745+34.37	80	RT	3617						28																																																																															21	
- L2- 752+41.82		LT	3604	3605		303.0	301.8	0.4%																								84																		3.4																																					7.1			
- L2- 752+48.55	8	RT	3605		307.6																																													1	1.0										1				1																								
- L2- 752+48.55		RT	3605	3606		301.6	300.4	0.4%																								84																																																													
- L2- 758+00.00	0	CL	3607		314.9																																													1												1			1																								
- L2- 758+00.00		CL	3607	3608		312.9	312.7	0.5%												76																																																																							
SHEET TOTALS									280	52	0	44	0	0	0					372	0	0	156	0	0	0	0	0	0	0	168	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5.7	9	0.961	0	1	0	1	0	1	0	0	0	1	6	0	0	5	2	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	10	0	174	

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