PROJECT REFERENCE NO.	SHEET NO.
R-2582A	28

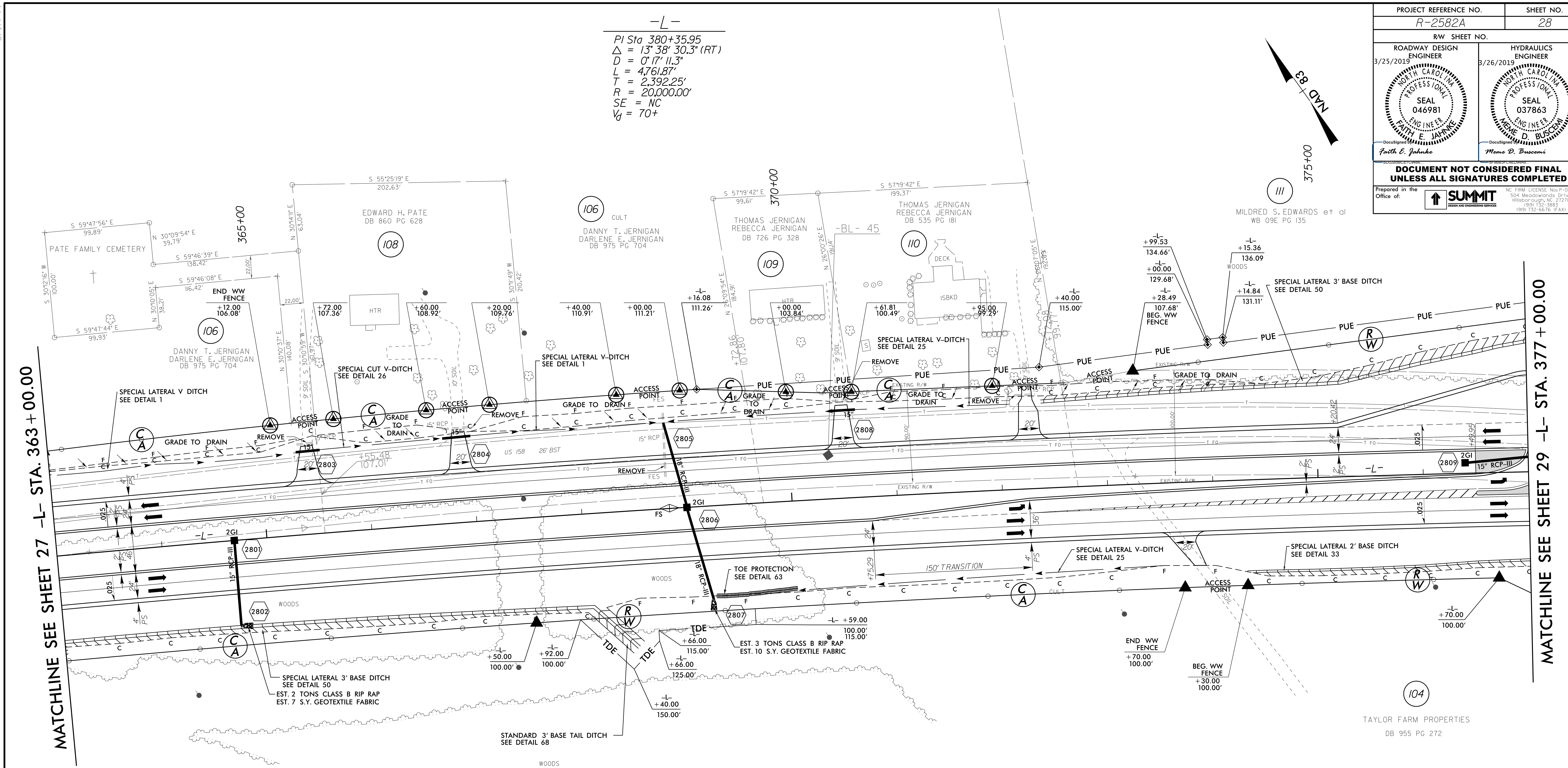
R/W SHEET NO.

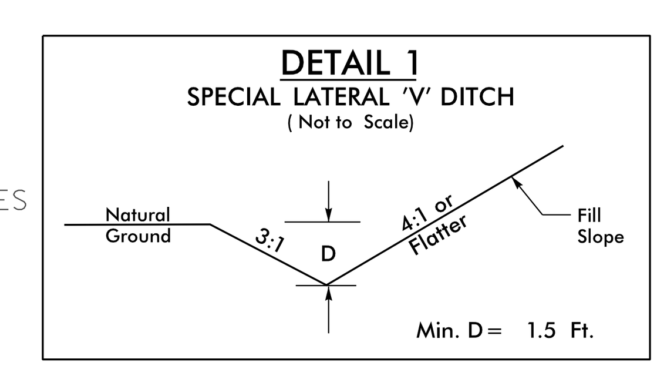
ROADWAY DESIGN ENGINEER — 3/25/2019 — SEAL 046981 — FAITH E. JAHNKE — Faith E. Jahnke

HYDRAULICS ENGINEER — 3/26/2019 — SEAL 037863 — MEME D. BUSCEMI — Meme D. Buscemi

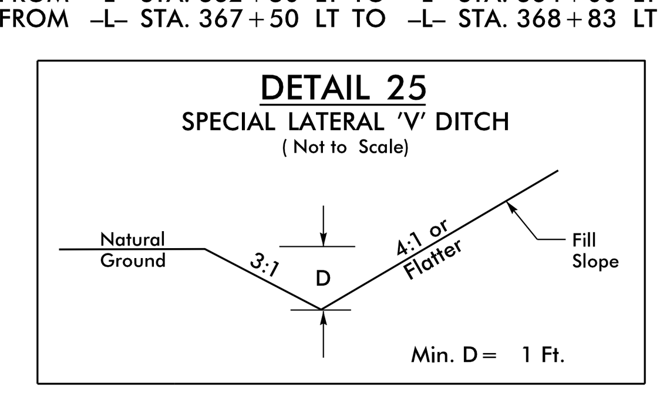
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared in the Office of: SUMMIT — NC FIRM LICENSE No. P-0339, 504 Meadowlands Drive, Hillsborough, NC 27278, (919) 732-3883, (919) 732-6676 (FAX)

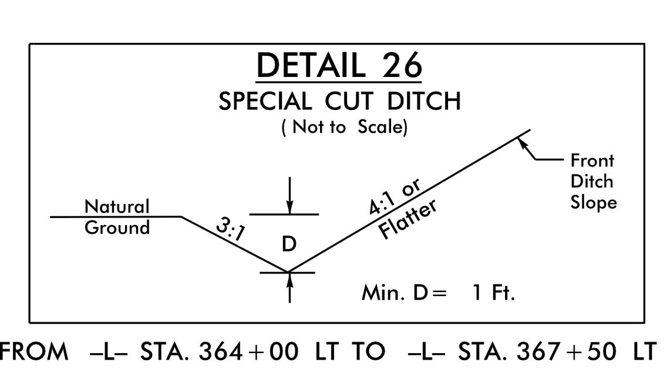




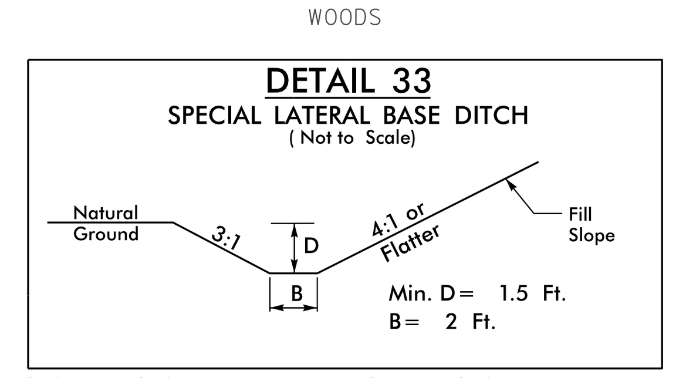
FROM -L- STA. 362+50 LT TO -L- STA. 364+00 LT
FROM -L- STA. 367+50 LT TO -L- STA. 368+83 LT



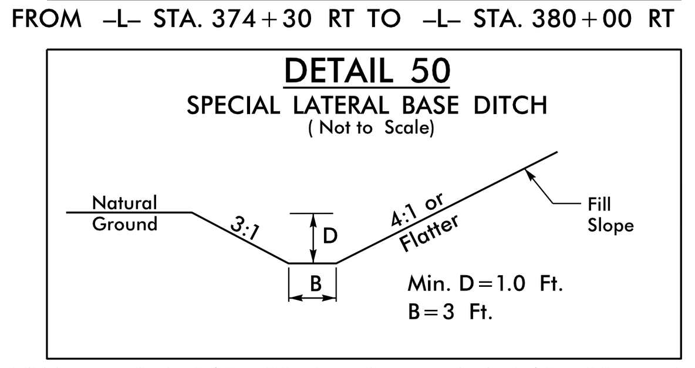
FROM -L- STA. 368+83 LT TO -L- STA. 372+10 LT
FROM -L- STA. 370+00 RT TO -L- STA. 373+50 RT



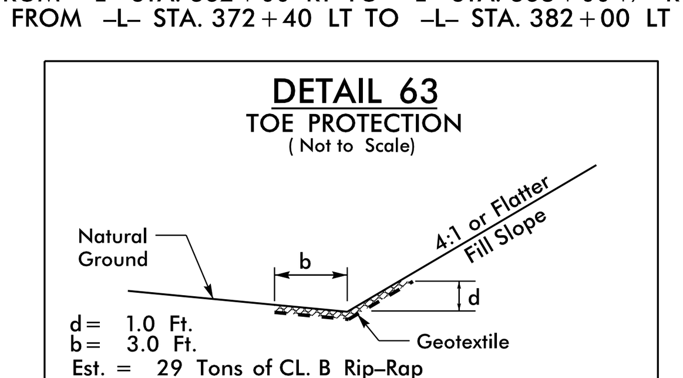
FROM -L- STA. 364+00 LT TO -L- STA. 367+50 LT



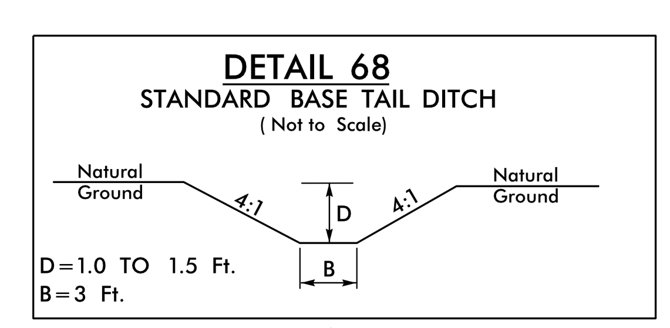
FROM -L- STA. 374+30 RT TO -L- STA. 380+00 RT



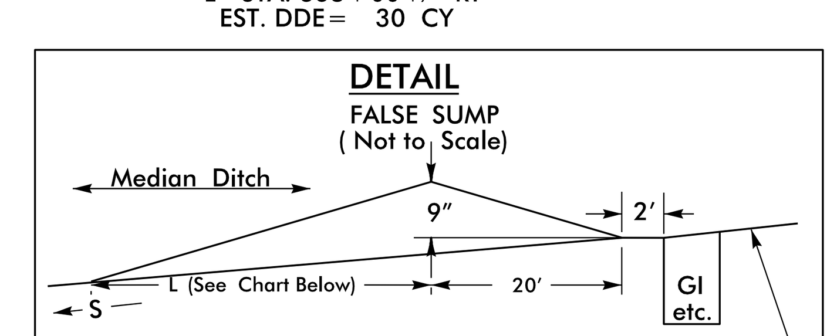
FROM -L- STA. 362+00 RT TO -L- STA. 368+00+/- RT
FROM -L- STA. 372+40 LT TO -L- STA. 382+00 LT



FROM STA. -L- 369+20 RT TO STA. -L- 370+00 RT



-L- STA. 368+00+/- RT
EST. DDE= 30 CY



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'

FROM -L- STA. 365+85 M

SEE SHEET 50 FOR -L- PROFILE
SEE SHEET 2B-9 FOR INTERSECTION DETAIL

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
R-2582A	29

R/W SHEET NO.

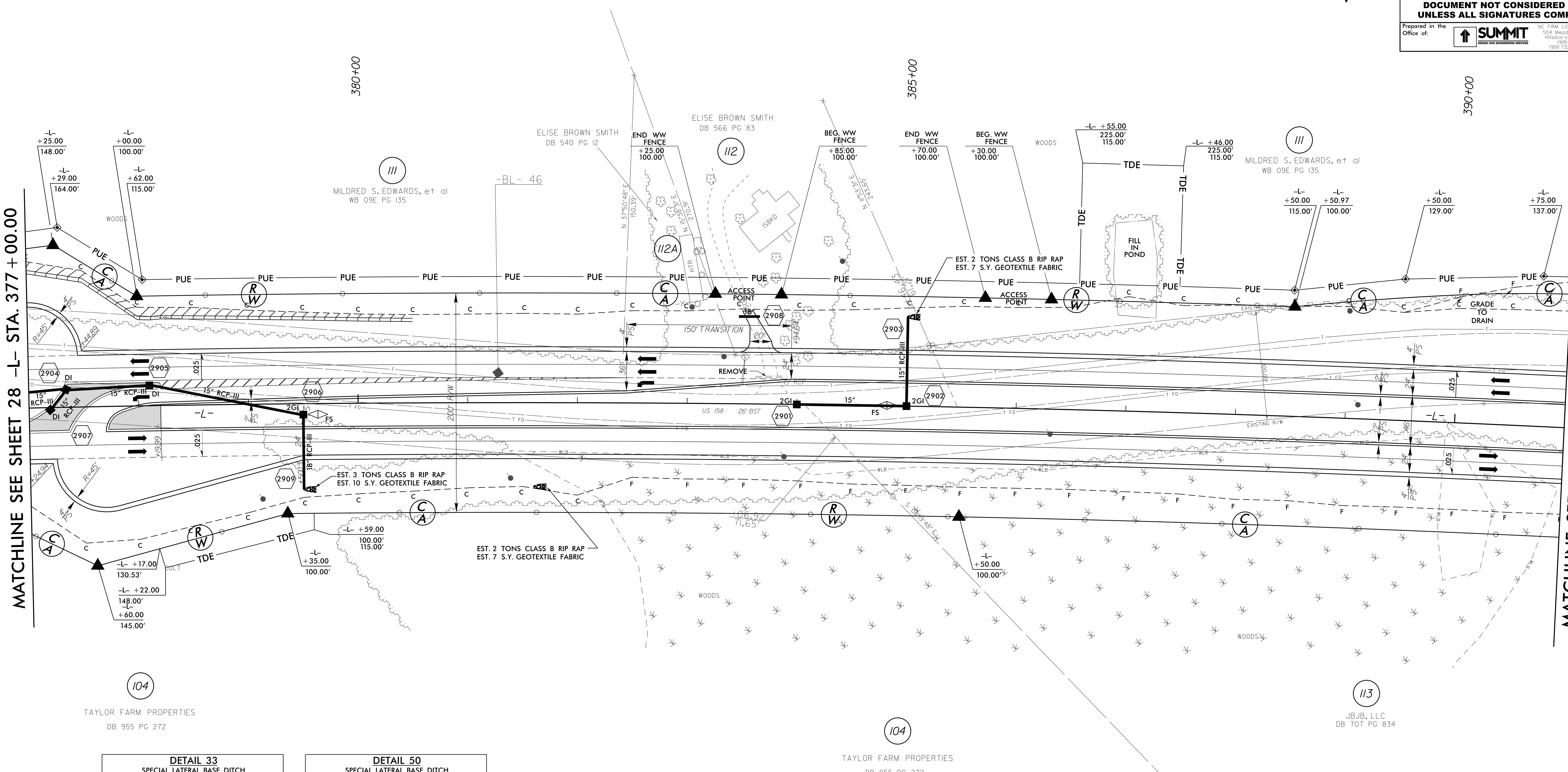
ROADWAY DESIGN ENGINEER — 3/25/2019 — NORTH CAROLINA PROFESSIONAL SEAL 046981 ENGINEER FAITH E. JAHNKE — DocuSigned by: Faith E. Jahnke — BD02B5BCE7C9466...

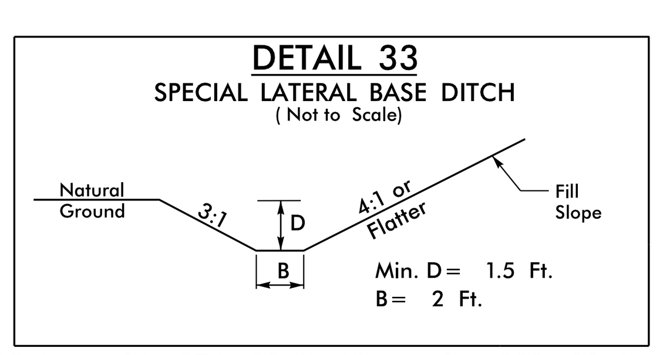
HYDRAULICS ENGINEER — 3/26/2019 — NORTH CAROLINA PROFESSIONAL SEAL 037863 ENGINEER MEME D. BUSCEMI — DocuSigned by: Meme D. Buscemi — 8F9BB3FC4ED94A9...

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

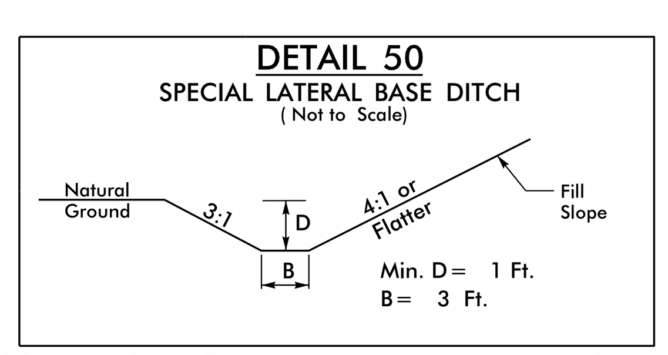
Prepared in the Office of: SUMMIT DESIGN AND ENGINEERING SERVICES
NC FIRM LICENSE No: P-0339
504 Meadowlands Drive
Hillsborough, NC 27278
(919) 732-3883
(919) 732-6676 (FAX)

-L-
PI Sta 380+35.95
Δ = 13° 38′ 30.3″ (RT)
D = 0° 17′ 11.3″
L = 4,761.87′
T = 2,392.25′
R = 20,000.00′
SE = NC
V_d = 70+

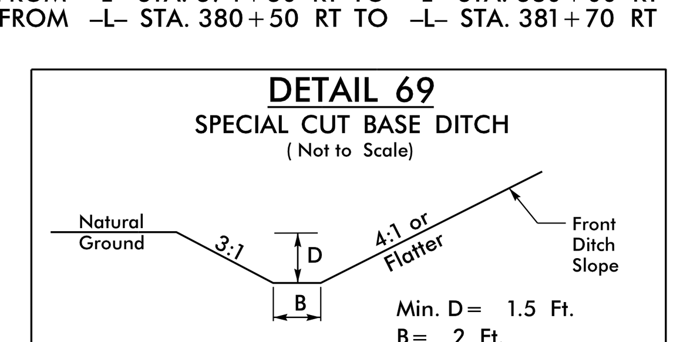




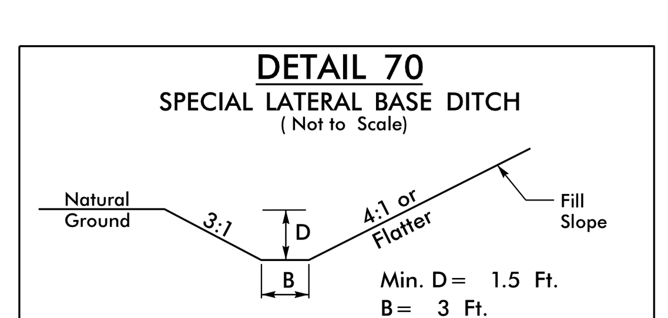
FROM -L- STA. 374+30 RT TO -L- STA. 380+00 RT
FROM -L- STA. 380+50 RT TO -L- STA. 381+70 RT



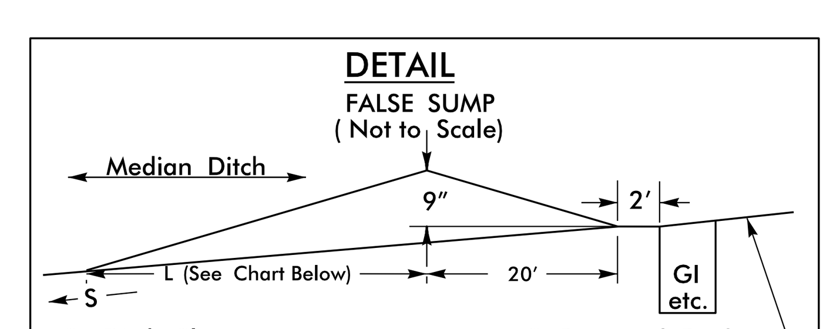
FROM -L- STA. 372+40 LT TO -L- STA. 382+00 LT



FROM -L- STA. 380+00 RT TO -L- STA. 380+50 RT



FROM -L- STA. 382+00 LT TO -L- STA. 391+30 LT



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. 379+60 M
-L- STA. 384+83 M

SEE SHEET 50 FOR -L- PROFILE
SEE SHEET 2B-9 FOR INTERSECTION DETAIL

25-MAR-2019 09:03
R-2582A_Rdy_psh_29.dgn

PROJECT REFERENCE NO.	SHEET NO.
R-2582A	30
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER — 3/25/2019 — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 046981 FAITH E. JAHNKE — DocuSigned by: Faith E. Jahnke

HYDRAULICS ENGINEER — 3/26/2019 — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 037863 MEMO D. BUSCEMI — DocuSigned by: Memo D. Buscemi

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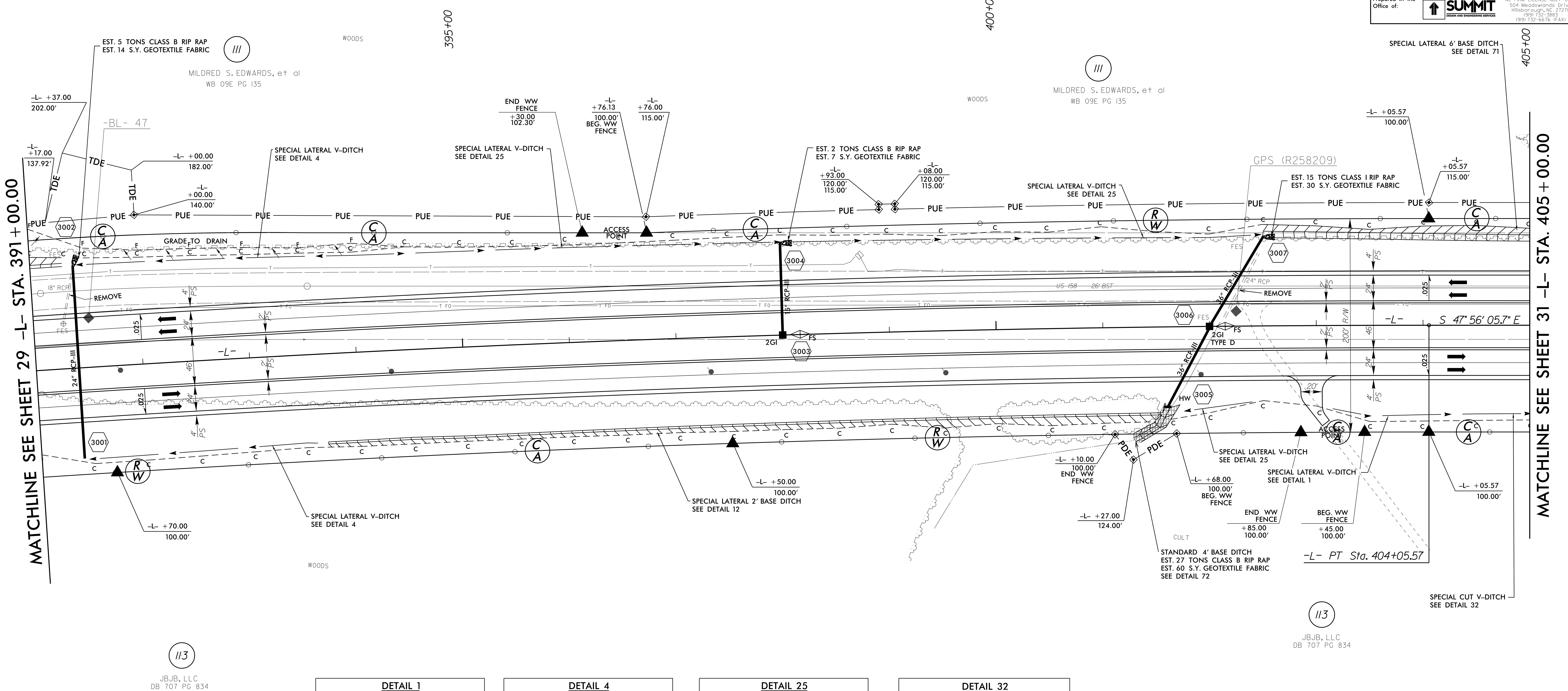
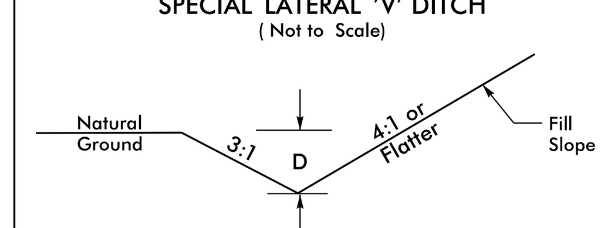
-L-
PI Sta 380+35.95
Δ = 13° 38' 30.3" (RT)
D = 0° 17' 11.3"
L = 4,761.87'
T = 2,392.25'
R = 20,000.00'
SE = NC
V_d = 70+

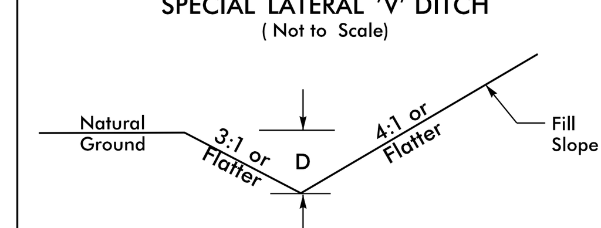


DETAIL 1 — SPECIAL LATERAL 'V' DITCH (Not to Scale)



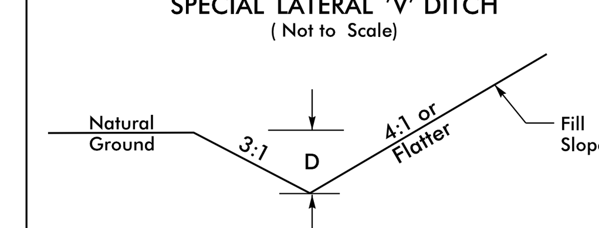
FROM -L- STA. 403+15 RT TO -L- STA. 404+00 RT

DETAIL 4 — SPECIAL LATERAL 'V' DITCH (Not to Scale)



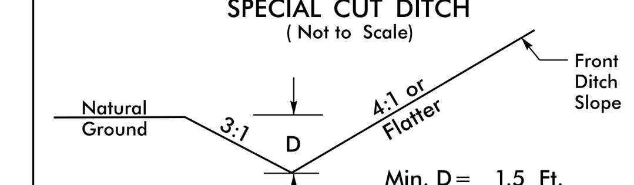
FROM -L- STA. 391+40 LT TO -L- STA. 394+00 LT
FROM -L- STA. 391+40 RT TO -L- STA. 393+70 RT

DETAIL 25 — SPECIAL LATERAL 'V' DITCH (Not to Scale)



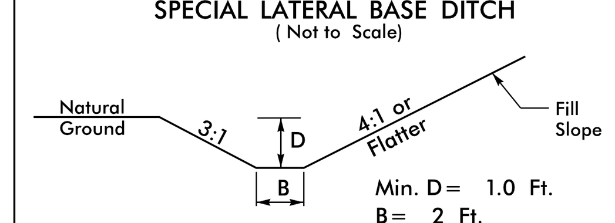
FROM -L- STA. 394+00 LT TO -L- STA. 402+50 LT
FROM -L- STA. 401+70 RT TO -L- STA. 402+50 RT

DETAIL 32 — SPECIAL CUT DITCH (Not to Scale)



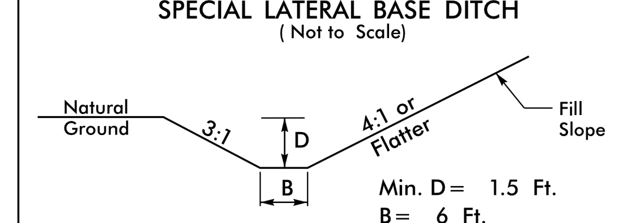
FROM -L- STA. 404+00 RT TO -L- STA. 406+00 RT

DETAIL 12 — SPECIAL LATERAL BASE DITCH (Not to Scale)



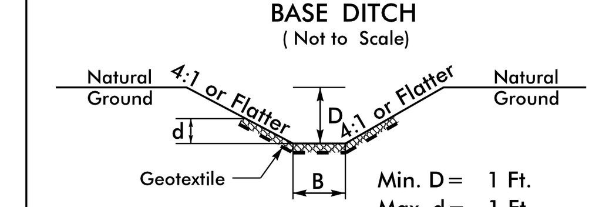
FROM -L- STA. 393+70 RT TO -L- STA. 401+50 RT

DETAIL 71 — SPECIAL LATERAL BASE DITCH (Not to Scale)



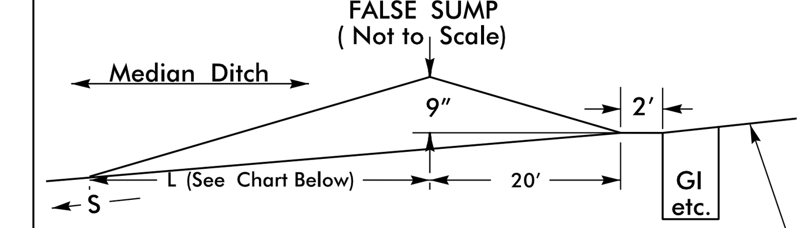
FROM -L- STA. 402+50 LT TO -L- STA. 410+00 LT

DETAIL 72 — BASE DITCH (Not to Scale)



*When B is < 6.0'
Est. = 27 Tons of CL. B Rip-Rap
Geotextile = 60 SY
-L- STA. 401+60 +/- RT
EST. DDE=60 CY

DETAIL — FALSE SUMP (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'

FROM -L- STA. 398+24 M
FROM -L- STA. 402+24 M

SEE SHEET 51 FOR -L- PROFILE

PROJECT REFERENCE NO.	SHEET NO.
R-2582A	31
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NOT A CERTIFIED DOCUMENT AS TO THE ORIGINAL DOCUMENT BUT ONLY AS TO THE REVISIONS.	NOT A CERTIFIED DOCUMENT AS TO THE ORIGINAL DOCUMENT BUT ONLY AS TO THE REVISIONS.
THIS DOCUMENT ORIGINALLY ISSUED AND SEALED BY : FAITH E. JAHNKE LIC. NO. 046981 ON 4/10/19	THIS DOCUMENT ORIGINALLY ISSUED AND SEALED BY : MEME D. BUSCEMI LIC. NO. 037863 ON 4/10/19
THIS DOCUMENT IS ONLY CERTIFIED AS TO THE REVISIONS.	THIS DOCUMENT IS ONLY CERTIFIED AS TO THE REVISIONS.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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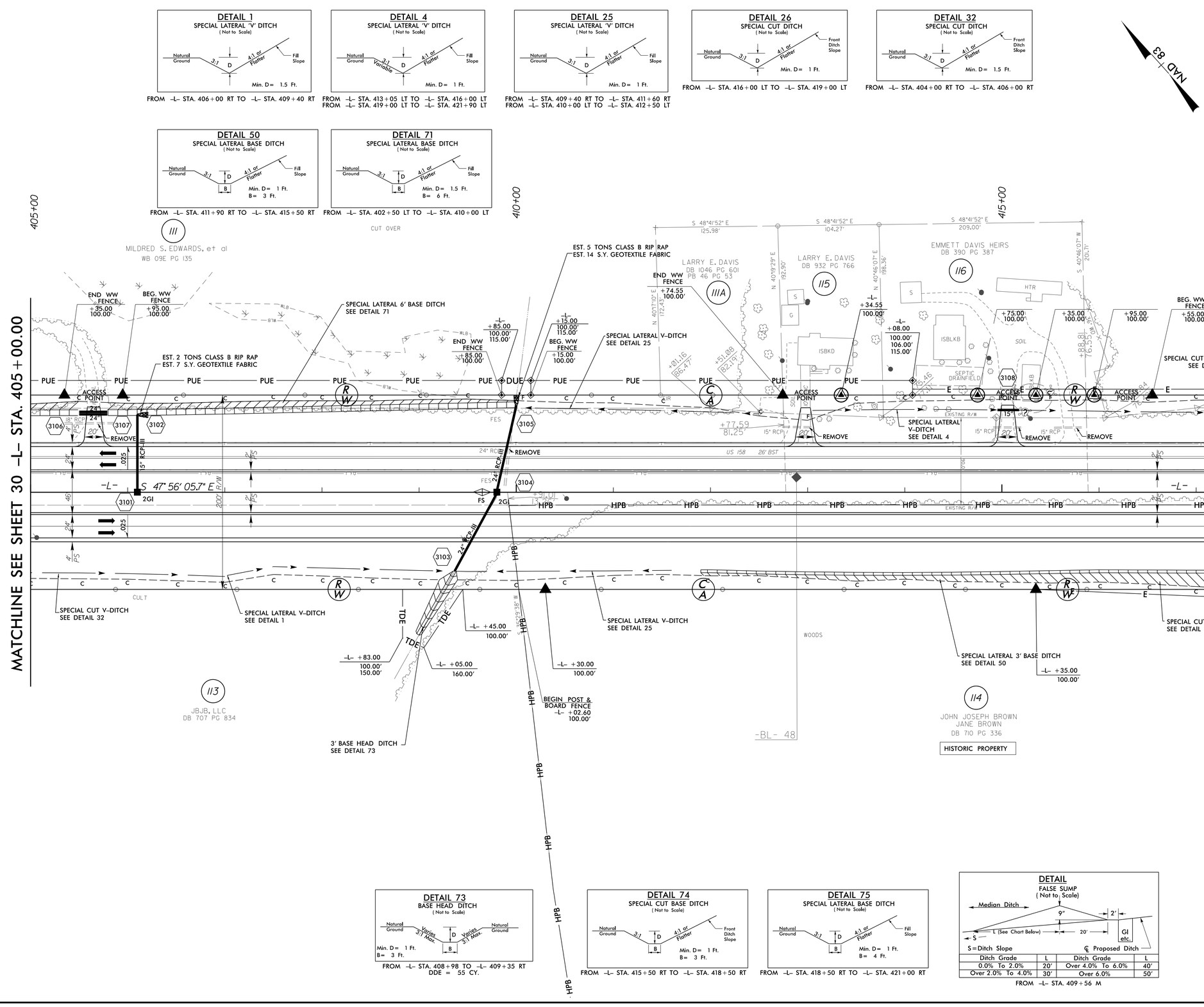
NC FIRM LICENSE No: P-0339
504 Meadowlands Drive
Hillsborough, NC 27278
(919) 732-3883
(919) 732-6676 (FAX)

NAD 83

REVISIONS

R/W REV.03/09/20 (FEJ): PARCEL III WAS SUBDIVIDED TO CREATE PARCEL IIIA.

8/17/99



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

FROM -L- STA. 406+00 RT TO -L- STA. 409+40 RT

DETAIL 4
SPECIAL LATERAL 'V' DITCH
(Not to Scale)

FROM -L- STA. 413+05 LT TO -L- STA. 416+00 LT
FROM -L- STA. 419+00 LT TO -L- STA. 421+90 LT

DETAIL 25
SPECIAL LATERAL 'V' DITCH
(Not to Scale)

FROM -L- STA. 409+40 RT TO -L- STA. 411+60 RT
FROM -L- STA. 410+00 LT TO -L- STA. 412+50 LT

DETAIL 26
SPECIAL CUT DITCH
(Not to Scale)

FROM -L- STA. 416+00 LT TO -L- STA. 419+00 LT

DETAIL 32
SPECIAL CUT DITCH
(Not to Scale)

FROM -L- STA. 404+00 RT TO -L- STA. 406+00 RT

DETAIL 50
SPECIAL LATERAL BASE DITCH
(Not to Scale)

FROM -L- STA. 411+90 RT TO -L- STA. 415+50 RT

DETAIL 71
SPECIAL LATERAL BASE DITCH
(Not to Scale)

FROM -L- STA. 402+50 LT TO -L- STA. 410+00 LT

DETAIL 73
BASE HEAD DITCH
(Not to Scale)

FROM -L- STA. 408+98 TO -L- 409+35 RT
DDE = 55 CY.

DETAIL 74
SPECIAL CUT BASE DITCH
(Not to Scale)

FROM -L- STA. 415+50 RT TO -L- STA. 418+50 RT

DETAIL 75
SPECIAL LATERAL BASE DITCH
(Not to Scale)

FROM -L- STA. 418+50 RT TO -L- STA. 421+00 RT

DETAIL
FALSE SUMP
(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'

FROM -L- STA. 409+56 M

SEE SHEET 51 FOR -L- PROFILE

13-MAR-2020 14:32
R-2582A_Sheet_31.dgn
Faith Jahnke

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
R-2582A	32
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER — 4/10/2019 — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 046981 — FAITH E. JAHNKE — Faith E. Jahnke

HYDRAULICS ENGINEER — 4/10/2019 — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 037863 — MEMO D. BUSCEMI — Memo D. Buscemi

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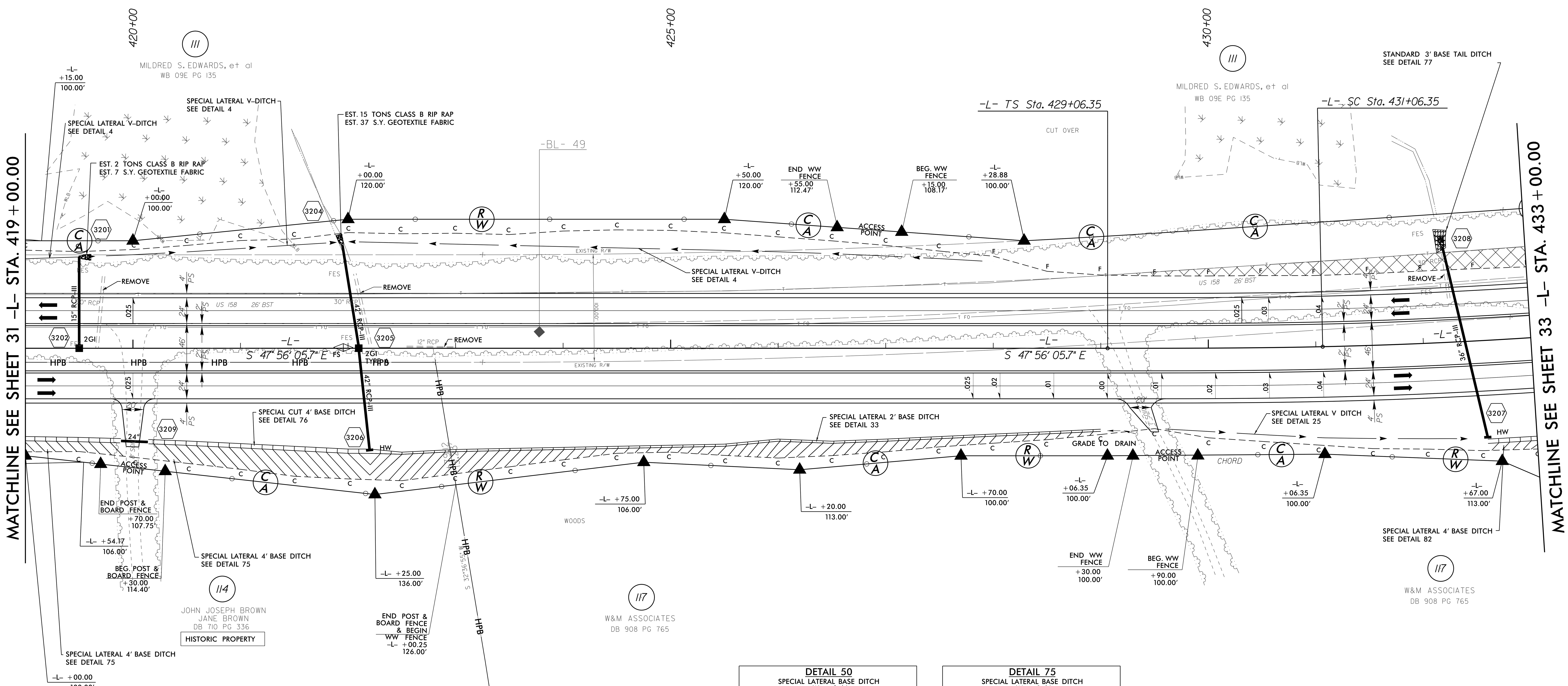
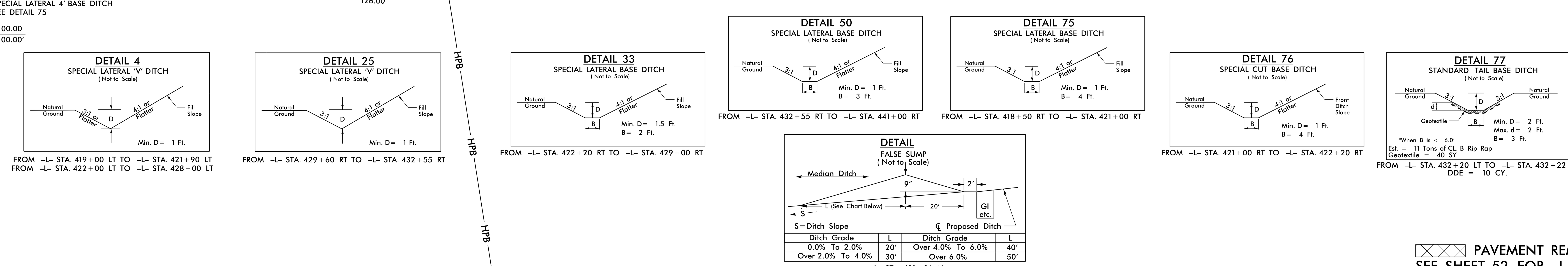
-L-

PIs Sta 430+39.69	PI Sta 439+89.95	PIs Sta 449+18.50
Θs = 1° 15' 33.3"	Δ = 21° 58' 47.6" (LT)	Θs = 1° 15' 33.3"
Ls = 200.00'	D = 1° 15' 33.3"	Ls = 200.00'
LT = 133.34'	L = 1,745.48'	LT = 133.34'
ST = 66.67'	T = 883.60'	ST = 66.67'
	R = 4,550.00'	
	SE = .04	
	Vd = 70+	





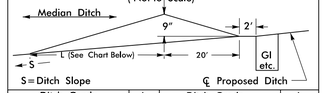
Ditch Grade	L	Ditch Grade	L
0.0% To 2.0%	20'	Over 4.0% To 6.0%	40'
Over 2.0% To 4.0%	30'	Over 6.0%	50'

-L- STA. 421+86 M

PAVEMENT REMOVAL

SEE SHEET 52 FOR -L- PROFILE

10-APR-2019 16:33 R-2582A_Rdy_psh_32.dgn



PROJECT REFERENCE NO.	SHEET NO.
R-2582A	33
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
8/13/2020
SEAL 046981
FAITH E. JAHNKE
DocuSigned by:
Faith E. Jahnke
BD02B5BCE7C9466...

HYDRAULICS ENGINEER
NOT A CERTIFIED DOCUMENT AS TO THE ORIGINAL DOCUMENT BUT ONLY AS TO THE REVISIONS.
THIS DOCUMENT ORIGINALLY ISSUED AND SEALED BY :
MEME D. BUSCEMI
LIC. NO. 037863
ON
3/26/19
THIS DOCUMENT IS ONLY CERTIFIED AS TO THE REVISIONS.

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SUMMIT
DESIGN AND ENGINEERING SERVICES
NC FIRM LICENSE No: P-0339
504 Meadowlands Drive
Hillsborough, NC 27278
(919) 732-3883
(919) 732-6676 (FAX)

HYDRAULICS ENGINEER
8/13/2020
SEAL 049357
JOY SADDLER
DocuSigned by:
Joy Saddler
A947BCDC06A54A5...

REVISIONS

CONSTRUCTION REVISION: THE CROSSOVER ALIGNMENTS, -L_CR_EBL- AND -L_CR_WBL-, HAVE BEEN REVISED TO AVOID WETLAND IMPACTS AROUND -L- STA.453+50.00 RT. THE NEW ALIGNMENTS ARE -L_CR_EBL_REV- AND -L_CR_WBL_REV-. JPM 7/7/2020

8/17/99

-L-

PIs Sta 430+39.69
θs = 1° 15′ 33.3″
Ls = 200.00′
LT = 133.34′
ST = 66.67′

PI Sta 439+89.95
△ = 21° 58′ 47.6″ (LT)
D = 1° 15′ 33.3″
L = 1,745.48′
T = 883.60′
R = 4,550.00′
SE = .04
V_d = 70+

PIs Sta 449+18.50
θs = 1° 15′ 33.3″
Ls = 200.00′
LT = 133.34′
ST = 66.67′

-Y18-

PI Sta 13+48.39
△ = 17° 31′ 31.2″ (RT)
D = 5° 16′ 50.6″
L = 331.87′
T = 167.24′
R = 1,085.00′
SE = NC
V_d = 50+

-L_CR_EBL_REV-

PI Sta 14+15.18
△ = 13° 57′ 53.4″ (LT)
D = 1° 41′ 24.5″
L = 826.25′
T = 415.18′
R = 3,390.00′
SE = .05
Vd = 55

DETAIL
FALSE SUMP
(Not to Scale)

Median Ditch
9″
2′
L (See Chart Below)
20′
GI etc.
S
S = Ditch Slope
℄ Proposed Ditch

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′

FROM -L- STA. 439+76 M

FROM -L- STA. 441+50 RT TO -L- STA. 442+81.54 RT
FROM -L- 442+81.49 LT TO -L- 447+06.58 LT
FROM -L_CR_EBL_REV- 10+00 RT TO -L_CR_EBL_REV- 16+21.44 RT
FROM -Y18- 10+90 RT TO -Y18- 11+50 RT

FROM -L- STA. 435+50 LT TO -L- STA. 442+00 LT

FROM -L- STA. 432+55 RT TO -L- STA. 441+00 RT

FROM STA. -L- 443+00 TO STA. -L- 444+50

▨ PAVEMENT REMOVAL
SEE SHEET 52 FOR -L- PROFILE
SEE SHEET 64 FOR -Y18- PROFILE
SEE SHEET 68 FOR -L_CR_EBL_REV- & -L_CR_WBL_REV- PROFILE
SEE SHEET 2B-9 FOR INTERSECTION DETAIL
SEE SHEET 2B-17 FOR INTERSECTION DETAIL

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
R-2582A	34
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER — 8/13/2020 — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 046981 FAITH E. JAHNKE — DocuSigned by: Faith E. Jahnke

HYDRAULICS ENGINEER — NOT A CERTIFIED DOCUMENT AS TO THE ORIGINAL DOCUMENT BUT ONLY AS TO THE REVISIONS. THIS DOCUMENT ORIGINALLY ISSUED AND SEALED BY: MEME D. BUSCEMI LIC. NO. 037863 ON 3/26/19. THIS DOCUMENT IS ONLY CERTIFIED AS TO THE REVISIONS.

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HYDRAULICS ENGINEER — 8/13/2020 — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 049357 JOY SADDLER — DocuSigned

REVISIONS

CONSTRUCTION REVISION: THE CROSSOVER ALIGNMENTS, -L_CR_EBL- AND -L_CR_WBL- HAVE BEEN REVISED TO AVOID NEW WETLAND IMPACTS THAT START AROUND -L- STA.453+52.00 RT. THE NEW ALIGNMENTS ARE -L_CR_EBL_REV- AND -L_CR_WBL_REV-. SLOPES WERE MADE STEEPER ON THE LEFT SIDE FROM STA 447+00.00 TO THE END OF THE PROJECT TO AVOID FILLING IN THE POND. JPM 7/7/2020

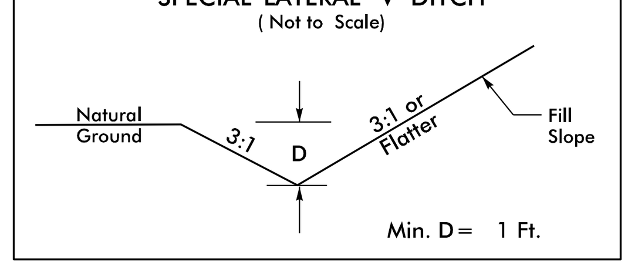
-L-

PIs Sta 430+39.69	PI Sta 439+89.95	PIs Sta 449+18.50
Θs = 1°15′ 33.3″	Δ = 21° 58′ 47.6″ (LT)	Θs = 1°15′ 33.3″
Ls = 200.00′	D = 1°15′ 33.3″	Ls = 200.00′
LT = 133.34′	L = 1,745.48′	LT = 133.34′
ST = 66.67′	T = 883.60′	ST = 66.67′
	R = 4,550.00′	
	SE = .04	
	V_d = 70+	

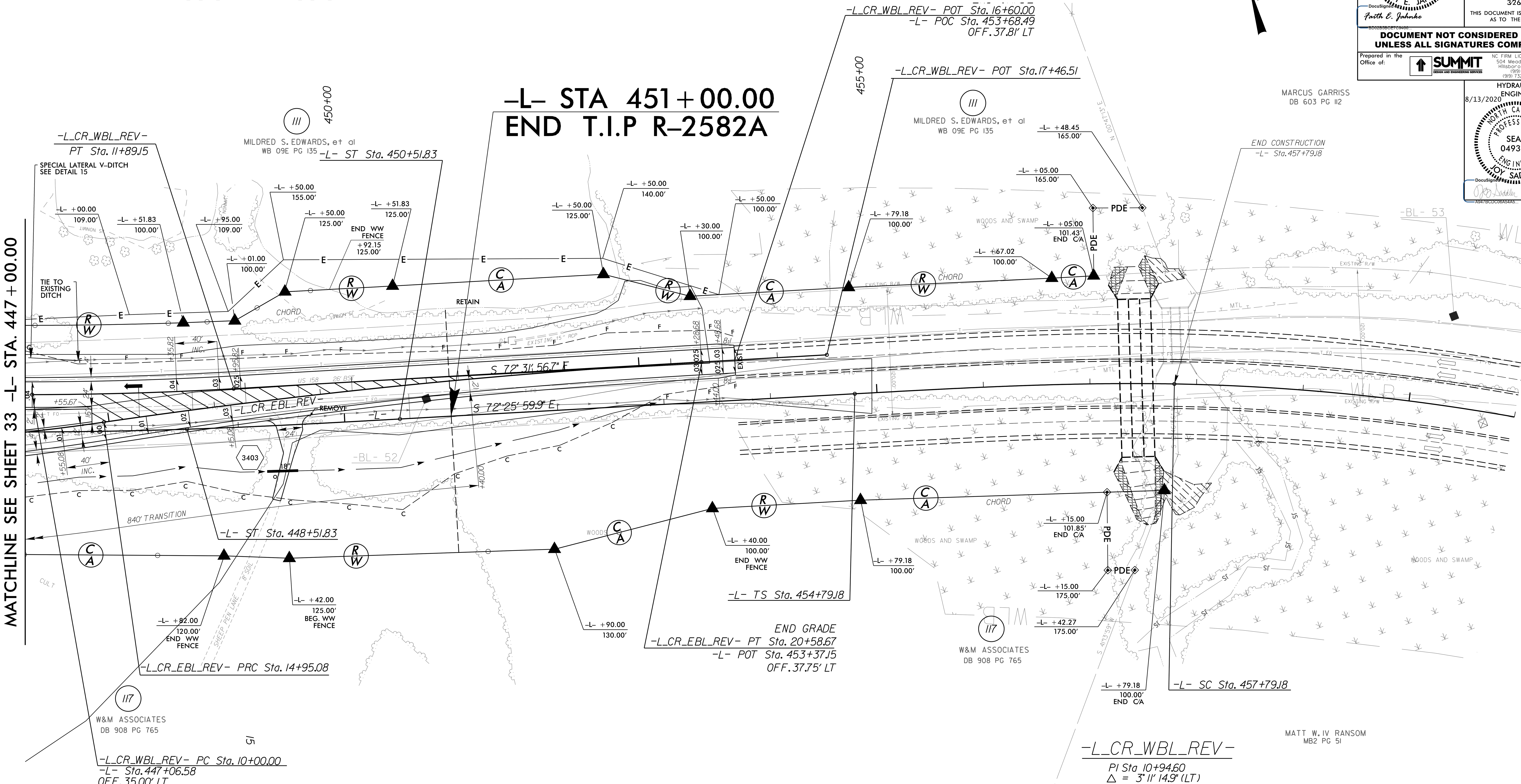
-L-

PIs Sta 456+79.23	PI Sta 460+08.87	PIs Sta 463+36.68
Θs = 4°12′ 46.5″	Δ = 12° 50′ 53.3″ (RT)	Θs = 4°12′ 46.5″
Ls = 300.00′	D = 2° 48′ 31.0″	Ls = 300.00′
LT = 200.06′	L = 457.45′	LT = 200.06′
ST = 100.05′	T = 229.69′	ST = 100.05′
	R = 2,040.00′	
	SE = .06	
	V_d = 70	

DETAIL 15
SPECIAL LATERAL 'V' DITCH (Not to Scale)



FROM -L_CR_EBL_REV- 10+00 RT TO -L_CR_EBL_REV- 16+21.44 RT
FROM -L_CR_WBL_REV- 10+00 LT TO -L_CR_WBL_REV- 10+43.09 LT



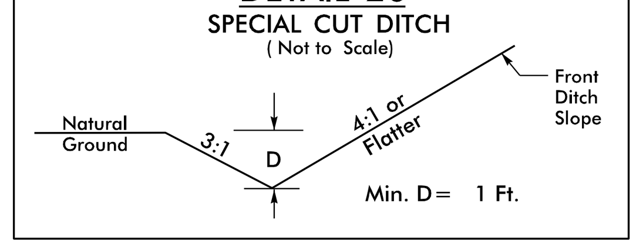
-L_CR_WBL_REV-

PI Sta 10+94.60
Δ = 3° 11′ 14.9″ (LT)
D = 1° 41′ 06.6″
L = 189.15′
T = 94.60′
R = 3,400.00′
SE = .04
Vd = 60

-L_CR_EBL_REV-

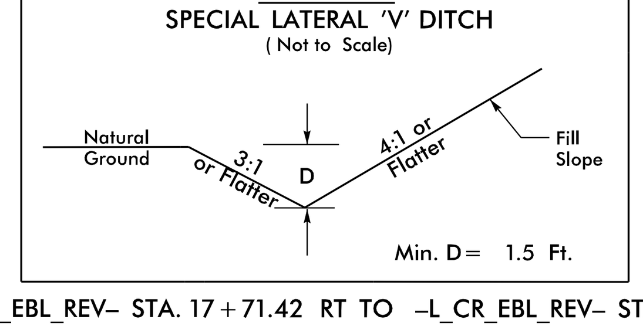
PI Sta 12+48.69	PI Sta 17+77.05
Δ = 13° 30′ 27.5″ (LT)	Δ = 4° 58′ 04.5″ (RT)
D = 2° 43′ 42.1″	D = 0° 52′ 53.3″
L = 495.08′	L = 563.59′
T = 248.69′	T = 281.97′
R = 2,100.00′	R = 6,500.00′
SE = .05	SE = .03
Vd = 55	Vd = 60

DETAIL 26
SPECIAL CUT DITCH (Not to Scale)



FROM -L_CR_EBL_REV- STA. 16+21.44 RT TO -L_CR_EBL_REV- STA. 17+71.42 RT

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



FROM TO -L_CR_EBL_REV- STA. 17+71.42 RT TO -L_CR_EBL_REV- STA. 20+52 RT

SEE SHEET 53 FOR -L- PROFILE
SEE SHEET 68 FOR -L_CR_EBL_REV- & -L_CR_WBL_REV- PROFILE

13-AUG-2020 08:46
R-2582A_Rdy_psh_34.dgn
faithjahnke

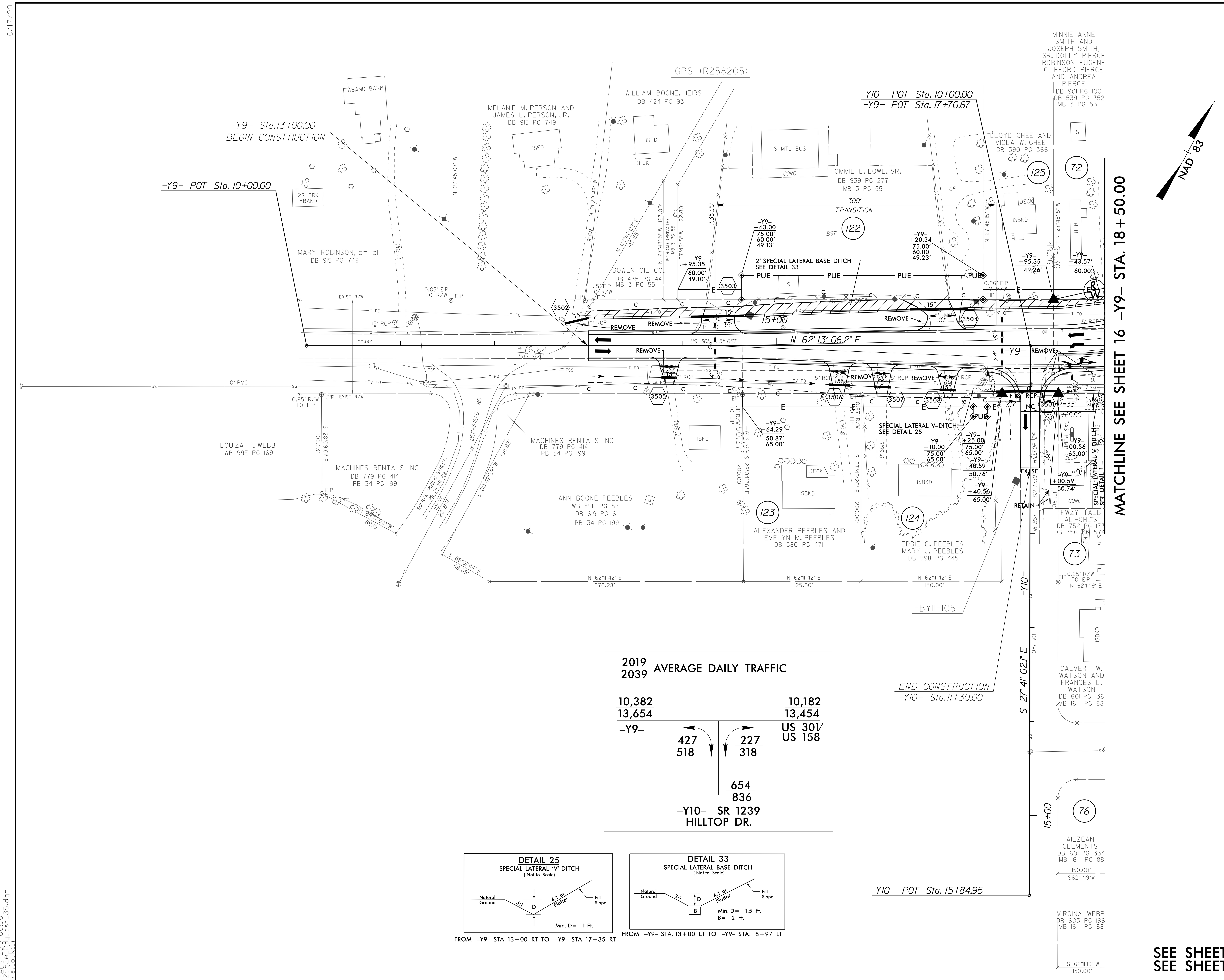
PROJECT REFERENCE NO.	SHEET NO.
R-2582A	35
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER — 4/5/2019 — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 046981 FAITH E. JAHNKE — DocuSigned by: Faith E. Jahnke

HYDRAULICS ENGINEER — 4/5/2019 — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 037863 MEMO D. BUSCEMI — DocuSigned by: Memo D. Buscemi

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared in the Office of: SUMMIT DESIGN AND ENGINEERING SERVICES — NC FIRM LICENSE No: P-0339, 504 Meadowlands Drive, Hillsborough, NC 27278, (919) 732-3883, (919) 732-6676 (FAX)



8/17/99
-Y9- Sta.13+00.00
BEGIN CONSTRUCTION
-Y9- POT Sta. 10+00.00
-Y10- POT Sta. 10+00.00
-Y9- POT Sta. 17+70.67
GPS (R258205)
MELANIE M. PERSON AND JAMES L. PERSON, JR. DB 915 PG 749
WILLIAM BOONE, HEIRS DB 424 PG 93
MINNIE ANNE SMITH AND JOSEPH SMITH, SR. DOLLY PIERCE ROBINSON EUGENE CLIFFORD PIERCE AND ANDREA PIERCE DB 901 PG 100 DB 539 PG 352 MB 3 PG 55
LLOYD GHEE AND VIOLA W. GHEE DB 390 PG 366
TOMMIE L. LOWE, SR. DB 939 PG 277 MB 3 PG 55
MARY ROBINSON, et al DB 915 PG 749
GOWEN OIL CO. DB 435 PG 44 MB 3 PG 55
300' TRANSITION
2' SPECIAL LATERAL BASE DITCH SEE DETAIL 33
N 62° 13' 06.2" E
LOUIZA P. WEBB WB 99E PG 169
MACHINES RENTALS INC DB 779 PG 414 PB 34 PG 199
ANN BOONE PEEBLES WB 89E PG 87 DB 619 PG 6 PB 34 PG 199
ALEXANDER PEEBLES AND EVELYN M. PEEBLES DB 580 PG 471
EDDIE C. PEEBLES MARY J. PEEBLES DB 898 PG 445
SPECIAL LATERAL V-DITCH SEE DETAIL 25
FWZY TALB ALI-GHUS DB 752 PG 173 DB 756 PG 524
CALVERT W. WATSON AND FRANCES L. WATSON DB 601 PG 138 MB 16 PG 88
AILZEAN CLEMENTS DB 601 PG 334 MB 16 PG 88
VIRGINA WEBB DB 603 PG 186 MB 16 PG 88
-BY11-105-
END CONSTRUCTION -Y10- Sta.11+30.00
-Y10- POT Sta. 15+84.95
S 27° 41' 02.1" E
MATCHLINE SEE SHEET 16 -Y9- STA. 18+50.00
NAD 83
2019 / 2039 AVERAGE DAILY TRAFFIC
10,382 / 13,654 -Y9-
10,182 / 13,454 US 301/ US 158
427 / 518
227 / 318
654 / 836
-Y10- SR 1239 HILLTOP DR.
DETAIL 25 SPECIAL LATERAL 'V' DITCH (Not to Scale)
Natural Ground 3:1 D 4:1 or Flatter Fill Slope Min. D= 1 Ft.
FROM -Y9- STA. 13+00 RT TO -Y9- STA. 17+35 RT
DETAIL 33 SPECIAL LATERAL BASE DITCH (Not to Scale)
Natural Ground 3:1 D B 4:1 or Flatter Fill Slope Min. D= 1.5 Ft. B= 2 Ft.
FROM -Y9- STA. 13+00 LT TO -Y9- STA. 18+97 LT
05-APR-2019 08:36 R-2582A_Rdy_psh_35.dgn

SEE SHEET 57 FOR -Y9- PROFILE
SEE SHEET 60 FOR -Y10- PROFILE

PROJECT REFERENCE NO.	SHEET NO.
R-2582A	36
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
3/25/2019 SEAL 046981 FAITH E. JAHNKE — DocuSigned by: Faith E. Jahnke	3/26/2019 SEAL 037863 MEME D. BUSCEMI — DocuSigned by: Meme D. Buscemi

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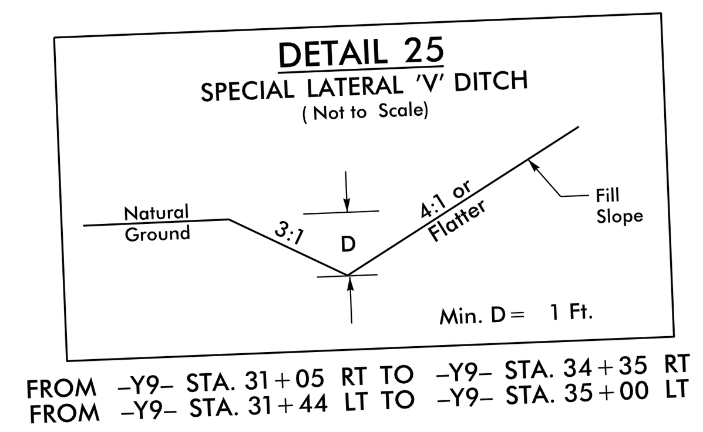
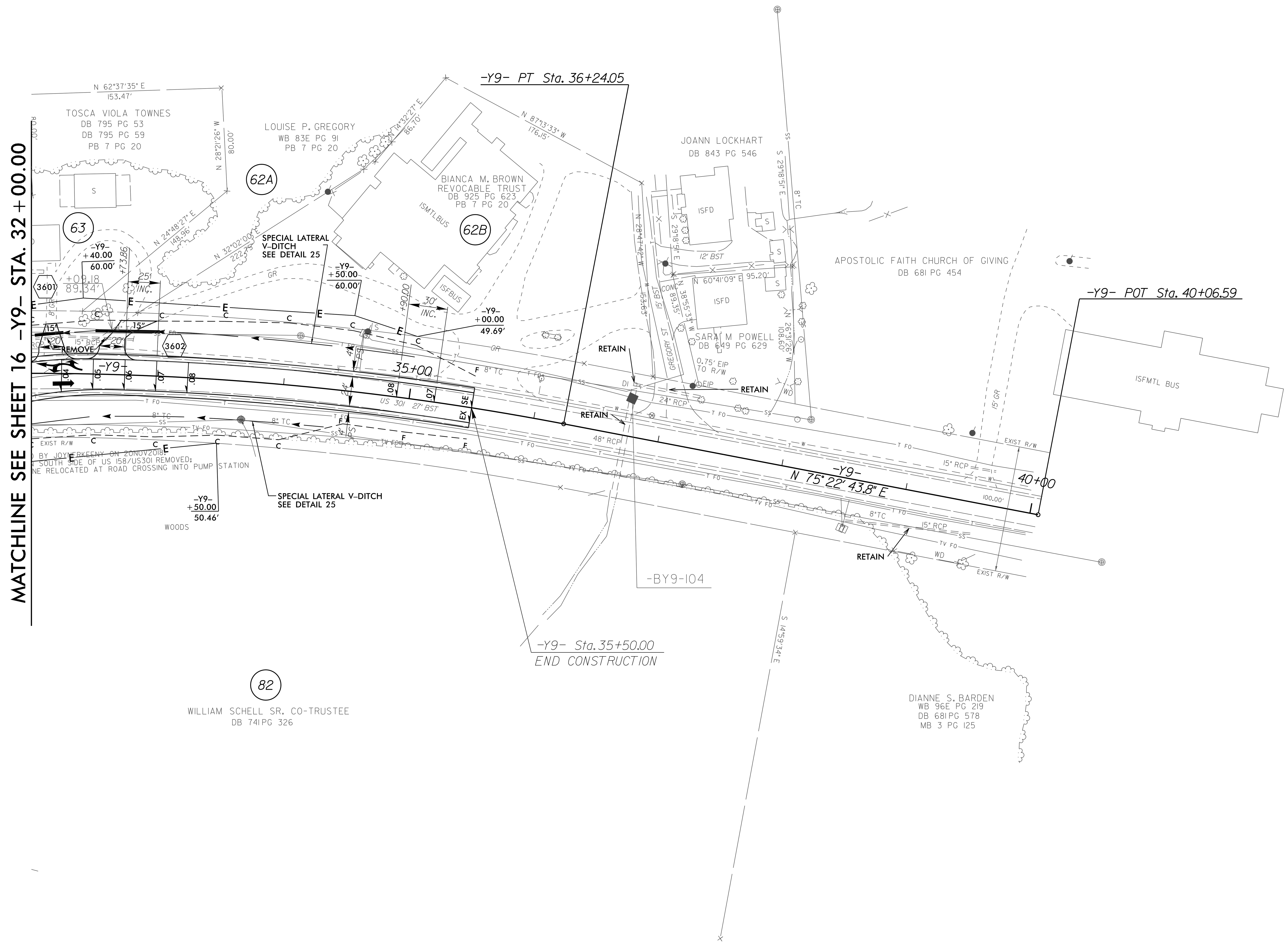
Prepared in the Office of: SUMMIT DESIGN AND ENGINEERING SERVICES
NC FIRM LICENSE No: P-0339
504 Meadowlands Drive
Hillsborough, NC 27278
(919) 732-3883
(919) 732-6676 (FAX)

-Y9-
PI Sta 33+67.93
Δ = 13° 09' 37.6" (RT)
D = 2° 33' 28.3"
L = 514.51'
T = 258.39'
R = 2,240.00'
SE = .08
V_d = 60+





SEE SHEET 57 FOR -Y9- PROFILE

PROJECT REFERENCE NO.	SHEET NO.
R-2582A	37

ROADWAY DESIGN ENGINEER
4/5/2019
NORTH CAROLINA PROFESSIONAL SEAL 046981 ENGINEER FAITH E. JAHNKE
DocuSigned by: Faith E. Jahnke
BD02B5BCE7C9466...

HYDRAULICS ENGINEER
4/5/2019
NORTH CAROLINA PROFESSIONAL SEAL 037863 ENGINEER MEME D. BUSCEMI
DocuSigned by: Meme D. Buscemi
8E9BB3FC4ED94A8...

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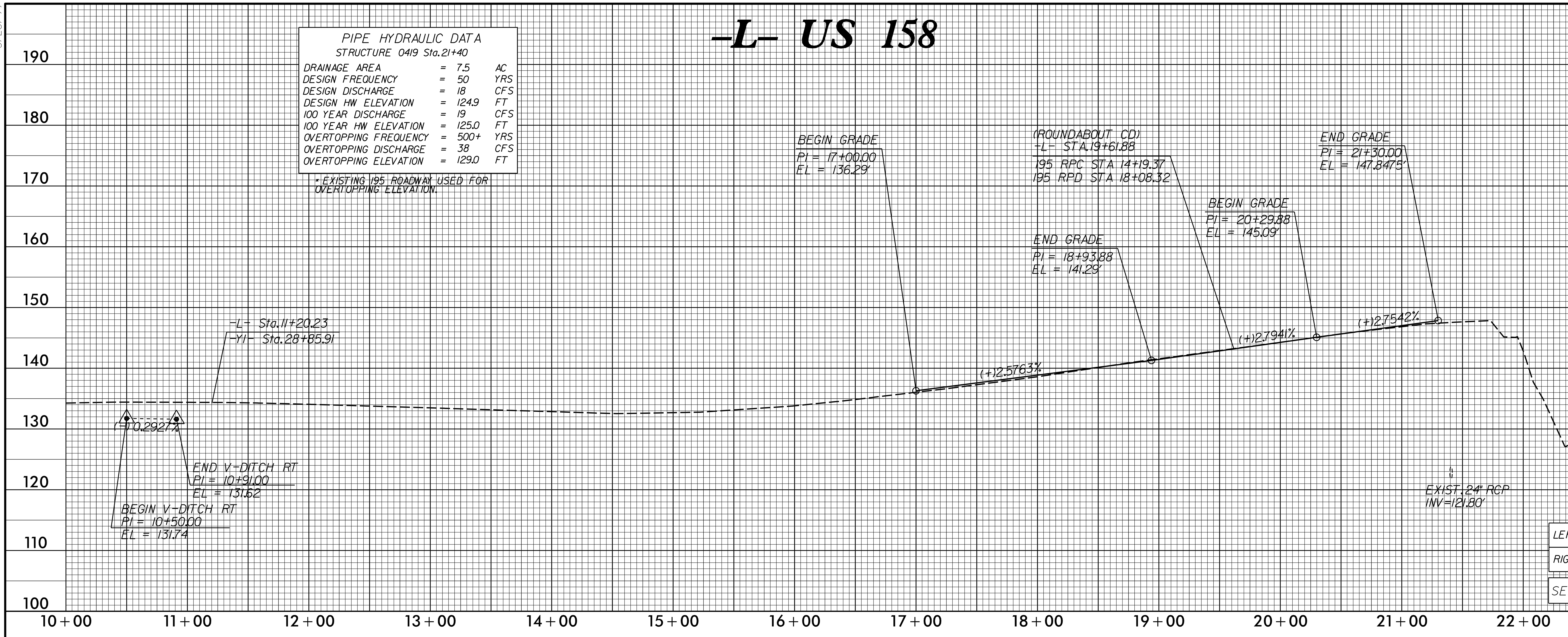
-L- US 158

PIPE HYDRAULIC DATA
STRUCTURE 0419 Sta.21+40

DRAINAGE AREA	=	7.5	AC
DESIGN FREQUENCY	=	50	YRS
DESIGN DISCHARGE	=	18	CFS
DESIGN HW ELEVATION	=	124.9	FT
100 YEAR DISCHARGE	=	19	CFS
100 YEAR HW ELEVATION	=	125.0	FT
OVERTOPPING FREQUENCY	=	500+	YRS
OVERTOPPING DISCHARGE	=	38	CFS
OVERTOPPING ELEVATION	=	129.0	FT

* EXISTING I95 ROADWAY USED FOR OVERTOPPING ELEVATION.



-L- US 158

PI = 26+00.00
EL = 148.5779'
VC = 100'
K = 51
V = 40mph

BM #1: R/R SPIKE IN 22" OAK
-BL- STA 22+25.00, 99.00' RT
-L- STA 30+99.14, 114.31' RT
EL 128.73'

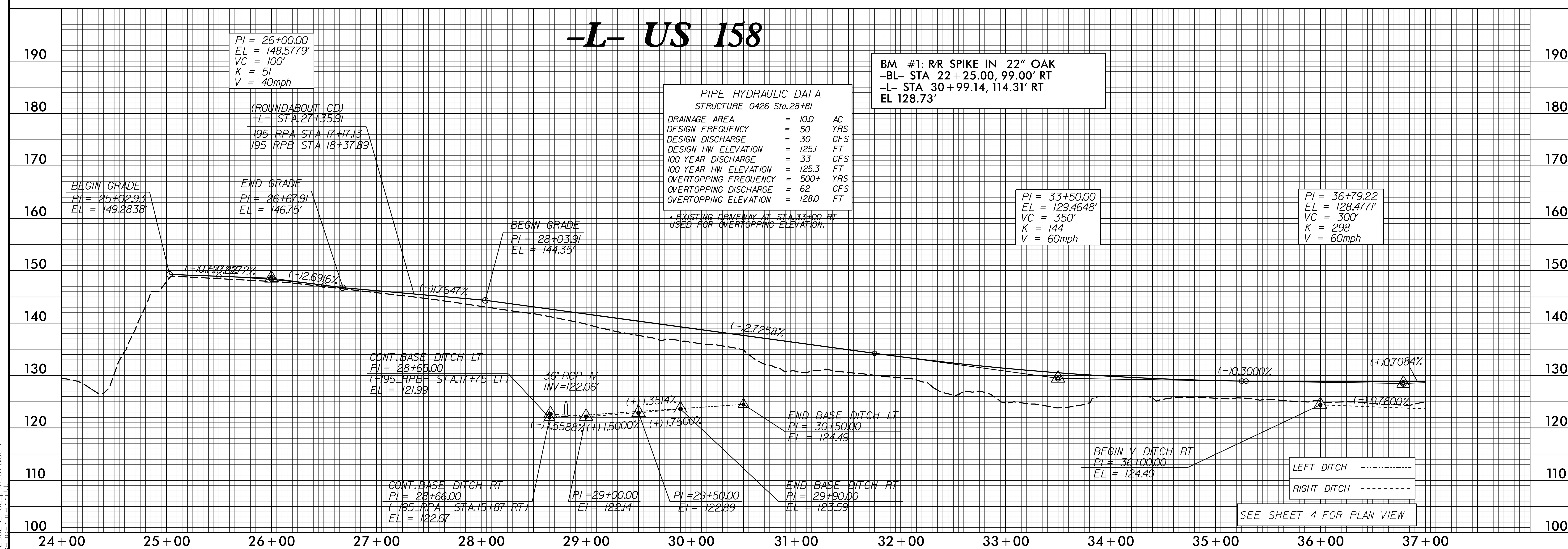
PIPE HYDRAULIC DATA
STRUCTURE 0426 Sta.28+81

DRAINAGE AREA	=	10.0	AC
DESIGN FREQUENCY	=	50	YRS
DESIGN DISCHARGE	=	30	CFS
DESIGN HW ELEVATION	=	125.1	FT
100 YEAR DISCHARGE	=	33	CFS
100 YEAR HW ELEVATION	=	125.3	FT
OVERTOPPING FREQUENCY	=	500+	YRS
OVERTOPPING DISCHARGE	=	62	CFS
OVERTOPPING ELEVATION	=	128.0	FT

* EXISTING DRIVEWAY AT STA.33+00 RT USED FOR OVERTOPPING ELEVATION.

PI = 33+50.00
EL = 129.4648'
VC = 350'
K = 144
V = 60mph

PI = 36+79.22
EL = 128.4771'
VC = 300'
K = 298
V = 60mph



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PROJECT REFERENCE NO.	SHEET NO.
R-2582A	38

ROADWAY DESIGN ENGINEER — 4/5/2019 — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 046981 FAITH E. JAHNKE — DocuSigned by: Faith E. Jahnke

HYDRAULICS ENGINEER — 4/5/2019 — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 037863 MEMIE D. BUSCEMI — DocuSigned by: Memie D. Buscemi

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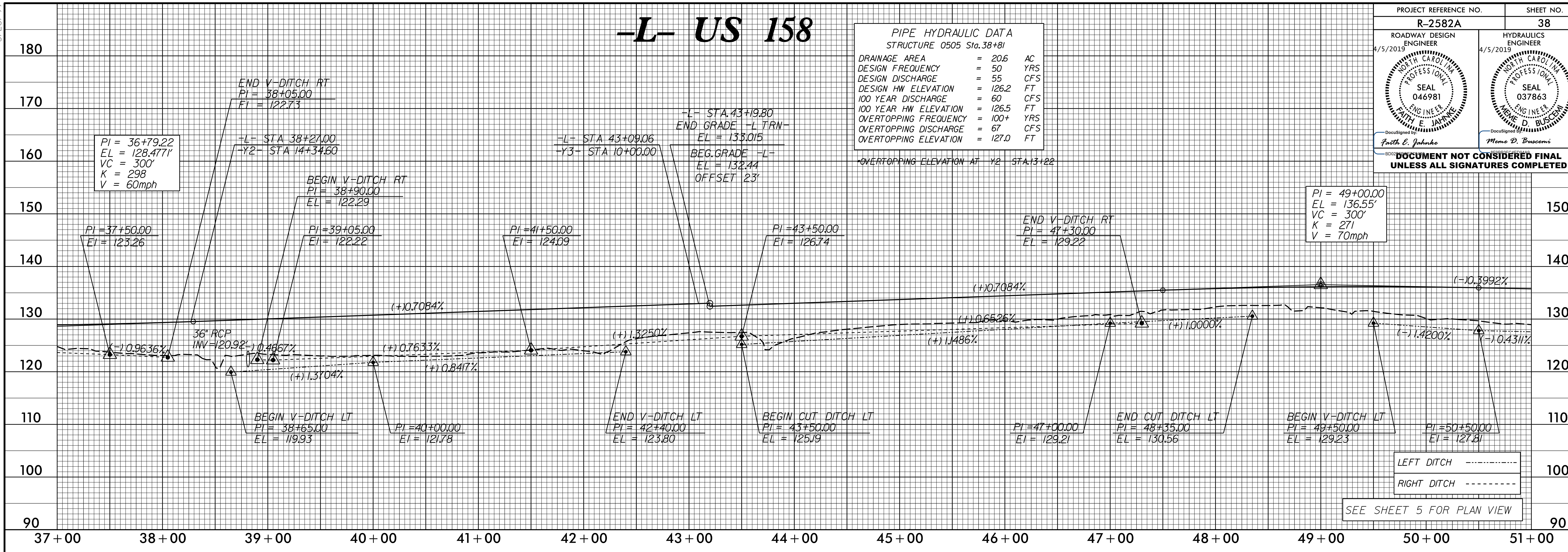
-L- US 158

PIPE HYDRAULIC DATA
STRUCTURE 0505 Sta.38+81

DRAINAGE AREA	=	20.6	AC
DESIGN FREQUENCY	=	50	YRS
DESIGN DISCHARGE	=	55	CFS
DESIGN HW ELEVATION	=	126.2	FT
100 YEAR DISCHARGE	=	60	CFS
100 YEAR HW ELEVATION	=	126.5	FT
OVERTOPPING FREQUENCY	=	100+	YRS
OVERTOPPING DISCHARGE	=	67	CFS
OVERTOPPING ELEVATION	=	127.0	FT

*OVERTOPPING ELEVATION AT Y2 STA.13+22



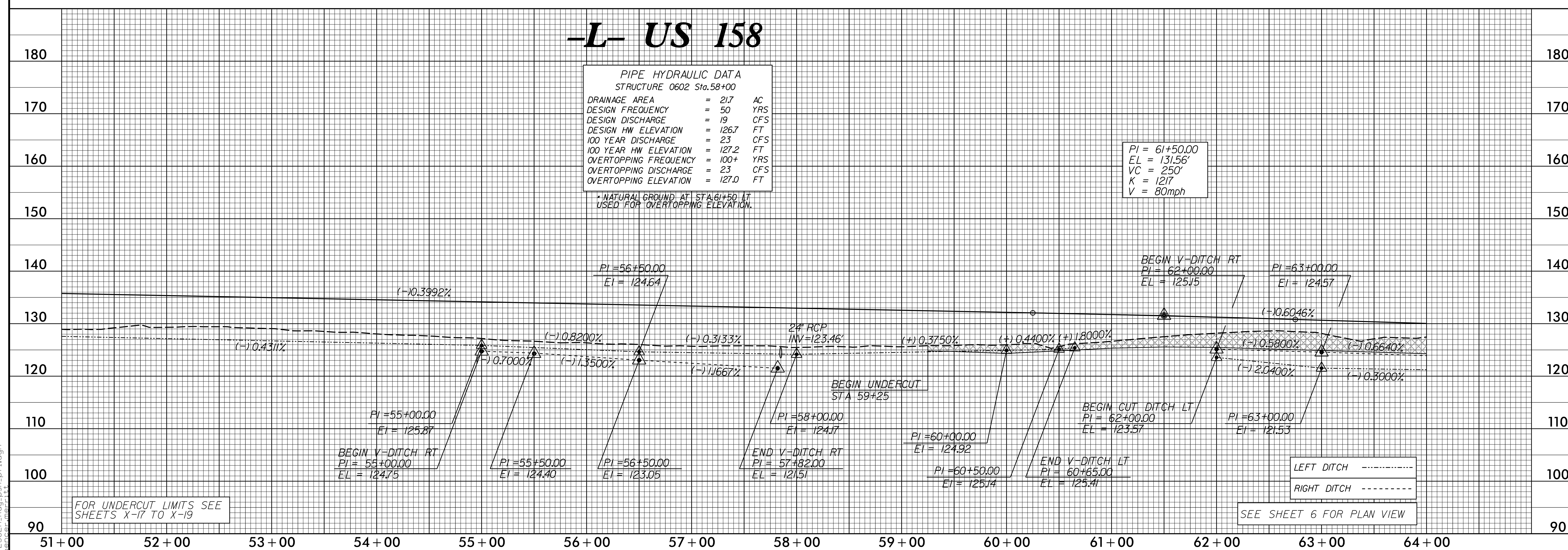
PI = 36+79.22
EL = 128.4771'
VC = 300'
K = 298
V = 60mph
END V-DITCH RT
PI = 38+05.00
EI = 122.73
-L- STA 38+27.00
-Y2- STA 14+34.60
BEGIN V-DITCH RT
PI = 38+90.00
EL = 122.29
PI = 37+50.00
EI = 123.26
PI = 39+05.00
EI = 122.22
PI = 41+50.00
EI = 124.09
-L- STA 43+09.06
-Y3- STA 10+00.00
-L- STA 43+19.80
END GRADE -L TRN-
EL = 133.015
BEG. GRADE -L-
EL = 132.44
OFFSET 23'
PI = 43+50.00
EI = 126.74
END V-DITCH RT
PI = 47+30.00
EL = 129.22
PI = 49+00.00
EL = 136.55'
VC = 300'
K = 271
V = 70mph
(+)0.7084%
(-)0.3992%
(-)0.9636%
36" RCP
INV=120.92'
(-)0.4667%
(+)1.3704%
(+)0.7633%
(+)0.8417%
(+)1.3250%
(+)0.6526%
(+)1.1486%
(+)1.0000%
(-)1.4200%
(-)0.4311%
BEGIN V-DITCH LT
PI = 38+65.00
EL = 119.93
PI = 40+00.00
EI = 121.78
END V-DITCH LT
PI = 42+40.00
EL = 123.80
BEGIN CUT DITCH LT
PI = 43+50.00
EL = 125.19
PI = 47+00.00
EI = 129.21
END CUT DITCH LT
PI = 48+35.00
EL = 130.56
BEGIN V-DITCH LT
PI = 49+50.00
EL = 129.23
PI = 50+50.00
EI = 127.81
LEFT DITCH
RIGHT DITCH
SEE SHEET 5 FOR PLAN VIEW
90 100 110 120 130 140 150 160 170 180
37+00 38+00 39+00 40+00 41+00 42+00 43+00 44+00 45+00 46+00 47+00 48+00 49+00 50+00 51+00

-L- US 158

PIPE HYDRAULIC DATA
STRUCTURE 0602 Sta.58+00

DRAINAGE AREA	=	21.7	AC
DESIGN FREQUENCY	=	50	YRS
DESIGN DISCHARGE	=	19	CFS
DESIGN HW ELEVATION	=	126.7	FT
100 YEAR DISCHARGE	=	23	CFS
100 YEAR HW ELEVATION	=	127.2	FT
OVERTOPPING FREQUENCY	=	100+	YRS
OVERTOPPING DISCHARGE	=	23	CFS
OVERTOPPING ELEVATION	=	127.0	FT

* NATURAL GROUND AT STA.61+50 LT USED FOR OVERTOPPING ELEVATION.



PI = 61+50.00
EL = 131.56'
VC = 250'
K = 121.7
V = 80mph
(-)0.3992%
PI = 56+50.00
EI = 124.64
BEGIN V-DITCH RT
PI = 62+00.00
EL = 125.15
PI = 63+00.00
EI = 124.57
(+)0.6046%
(-)0.4311%
(-)0.8200%
(-)0.7000%
(-)1.3500%
(-)0.3133%
(-)1.1667%
24" RCP
INV=123.46'
(+)0.3750%
(+)0.4400%
(+)1.8000%
(-)0.5800%
(-)0.6640%
(-)2.0400%
(-)0.3600%
BEGIN UNDERCUT
STA 59+25
PI = 55+00.00
EI = 125.87
BEGIN V-DITCH RT
PI = 55+00.00
EL = 124.75
PI = 55+50.00
EI = 124.40
PI = 56+50.00
EI = 123.05
PI = 58+00.00
EI = 124.17
END V-DITCH RT
PI = 57+82.00
EL = 121.51
PI = 60+00.00
EI = 124.92
PI = 60+50.00
EI = 125.14
BEGIN CUT DITCH LT
PI = 62+00.00
EL = 123.57
END V-DITCH LT
PI = 60+65.00
EL = 125.41
PI = 63+00.00
EI = 121.53
LEFT DITCH
RIGHT DITCH
FOR UNDERCUT LIMITS SEE SHEETS X-17 TO X-19
SEE SHEET 6 FOR PLAN VIEW
90 100 110 120 130 140 150 160 170 180
51+00 52+00 53+00 54+00 55+00 56+00 57+00 58+00 59+00 60+00 61+00 62+00 63+00 64+00

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PROJECT REFERENCE NO.	SHEET NO.
R-2582A	39

ROADWAY DESIGN ENGINEER — 4/5/2019 — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 046981 — FAITH E. JAHNKE — DocuSigned by: Faith E. Jahnke

HYDRAULICS ENGINEER — 4/5/2019 — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 037863 — MEMIE D. BUSCEMI — DocuSigned by: Memo D. Buscemi

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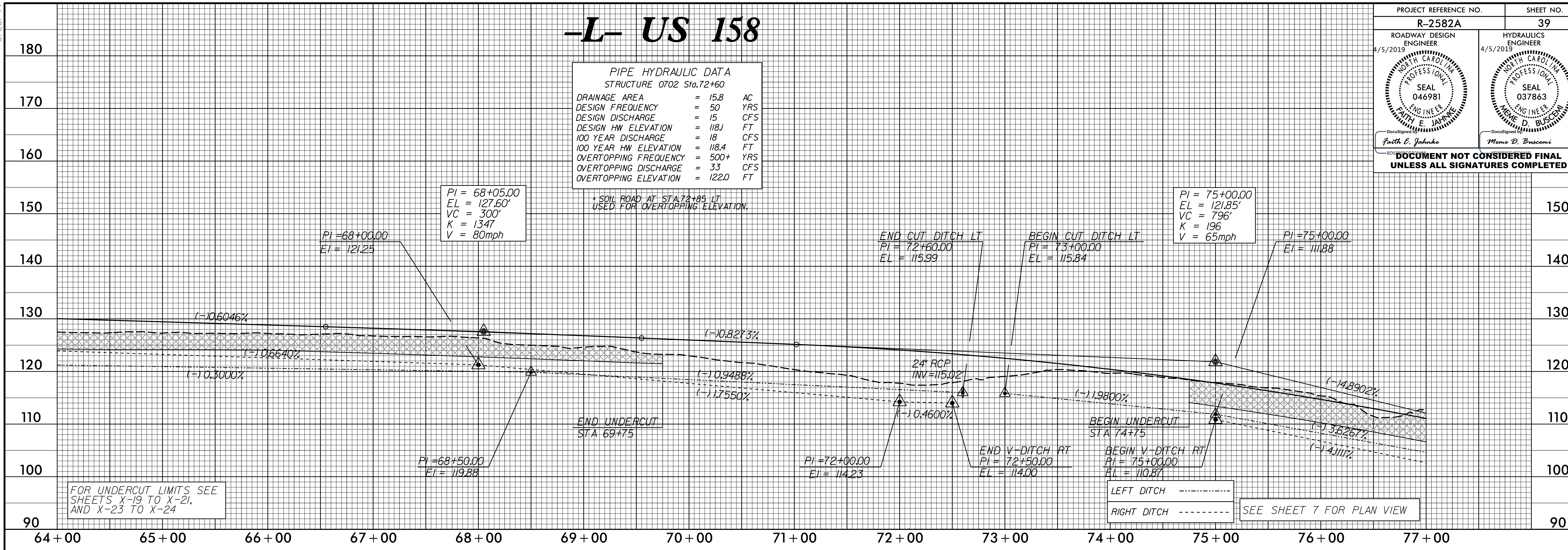
-L- US 158

PIPE HYDRAULIC DATA

STRUCTURE 0702 Sta.72+60

DRAINAGE AREA	=	15.8	AC
DESIGN FREQUENCY	=	50	YRS
DESIGN DISCHARGE	=	15	CFS
DESIGN HW ELEVATION	=	118.1	FT
100 YEAR DISCHARGE	=	18	CFS
100 YEAR HW ELEVATION	=	118.4	FT
OVERTOPPING FREQUENCY	=	500+	YRS
OVERTOPPING DISCHARGE	=	33	CFS
OVERTOPPING ELEVATION	=	122.0	FT

* SOIL ROAD AT STA.72+85 LT USED FOR OVERTOPPING ELEVATION.



180
170
160
150
140
130
120
110
100
90
PI = 68+05.00
EL = 127.60'
VC = 300'
K = 1347
V = 80mph
PI =68+00.00
El = 121.25
(-)0.6046%
(-)0.6640%
(-)0.3000%
PI =68+50.00
El = 119.88
END UNDERCUT
STA 69+75
(-)0.8273%
(-)0.9488%
(-)1.7550%
END CUT DITCH LT
PI = 72+60.00
EL = 115.99
BEGIN CUT DITCH LT
PI = 73+00.00
EL = 115.84
24" RCP
INV=115.02'
(-) 0.4600%
PI =72+00.00
El = 114.23
END V-DITCH RT
PI = 72+50.00
EL = 114.00
(-)1.9800%
BEGIN UNDERCUT
STA 74+75
BEGIN V-DITCH RT
PI = 75+00.00
EL = 110.87
PI = 75+00.00
EL = 121.85'
VC = 796'
K = 196
V = 65mph
PI =75+00.00
El = 111.88
(-)4.8902%
(-) 3.6267%
(-) 4.1111%
FOR UNDERCUT LIMITS SEE SHEETS X-19 TO X-21, AND X-23 TO X-24
LEFT DITCH
RIGHT DITCH
SEE SHEET 7 FOR PLAN VIEW
64+00
65+00
66+00
67+00
68+00
69+00
70+00
71+00
72+00
73+00
74+00
75+00
76+00
77+00

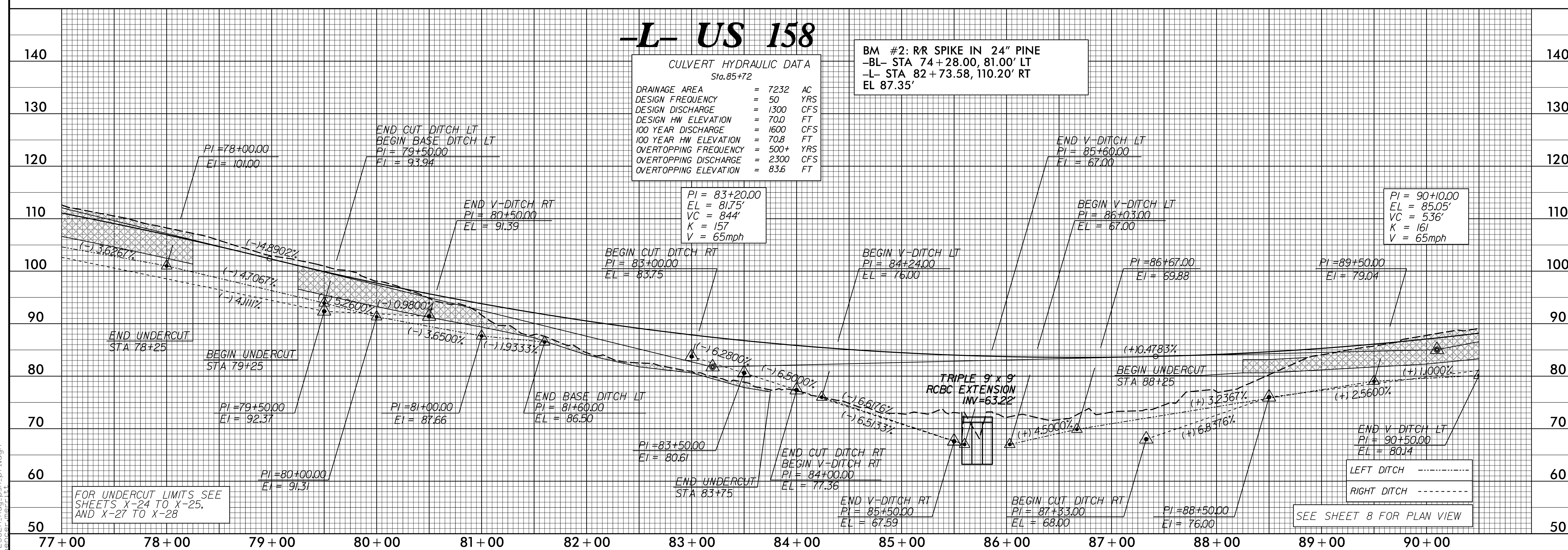
-L- US 158

CULVERT HYDRAULIC DATA

Sta.85+72

DRAINAGE AREA	=	7232	AC
DESIGN FREQUENCY	=	50	YRS
DESIGN DISCHARGE	=	1300	CFS
DESIGN HW ELEVATION	=	70.0	FT
100 YEAR DISCHARGE	=	1600	CFS
100 YEAR HW ELEVATION	=	70.8	FT
OVERTOPPING FREQUENCY	=	500+	YRS
OVERTOPPING DISCHARGE	=	2300	CFS
OVERTOPPING ELEVATION	=	83.6	FT

BM #2: R/R SPIKE IN 24" PINE
-BL- STA 74+28.00, 81.00' LT
-L- STA 82+73.58, 110.20' RT
EL 87.35'



140
130
120
110
100
90
80
70
60
50
PI =78+00.00
El = 101.00
(-) 3.6267%
(-)4.8902%
(-) 4.7067%
(-) 4.1111%
END CUT DITCH LT
BEGIN BASE DITCH LT
PI = 79+50.00
El = 93.94
END V-DITCH RT
PI = 80+50.00
EL = 91.39
(-) 5.2600%
(-) 0.9800%
(-) 3.6500%
(-) 1.9333%
END UNDERCUT
STA 78+25
BEGIN UNDERCUT
STA 79+25
PI =79+50.00
El = 92.37
PI =80+00.00
El = 91.31
PI =81+00.00
El = 87.66
END BASE DITCH LT
PI = 81+60.00
EL = 86.50
PI = 83+20.00
EL = 81.75'
VC = 844'
K = 157
V = 65mph
BEGIN CUT DITCH RT
PI = 83+00.00
EL = 83.75
(-) 6.2800%
(-) 6.5000%
PI =83+50.00
El = 80.61
END UNDERCUT
STA 83+75
BEGIN V-DITCH LT
PI = 84+24.00
EL = 76.00
(-) 6.6176%
(-) 6.5133%
END CUT DITCH RT
BEGIN V-DITCH RT
PI = 84+00.00
EL = 77.36
END V-DITCH RT
PI = 85+50.00
EL = 67.59
TRIPLE 9' x 9'
RCBC EXTENSION
INV=63.22'
END V-DITCH LT
PI = 85+60.00
El = 67.00
BEGIN V-DITCH LT
PI = 86+03.00
EL = 67.00
(+) 4.5000%
PI =86+67.00
El = 69.88
BEGIN CUT DITCH RT
PI = 87+33.00
EL = 68.00
(+)0.4783%
BEGIN UNDERCUT
STA 88+25
(+) 3.2367%
(+) 6.8376%
PI =88+50.00
El = 76.00
PI =89+50.00
El = 79.04
PI = 90+10.00
EL = 85.05'
VC = 536'
K = 161
V = 65mph
(+) 1.1000%
(+) 2.5600%
END V-DITCH LT
PI = 90+50.00
EL = 80.14
LEFT DITCH
RIGHT DITCH
SEE SHEET 8 FOR PLAN VIEW
FOR UNDERCUT LIMITS SEE SHEETS X-24 TO X-25, AND X-27 TO X-28
77+00
78+00
79+00
80+00
81+00
82+00
83+00
84+00
85+00
86+00
87+00
88+00
89+00
90+00

05-APR-2019 09:11
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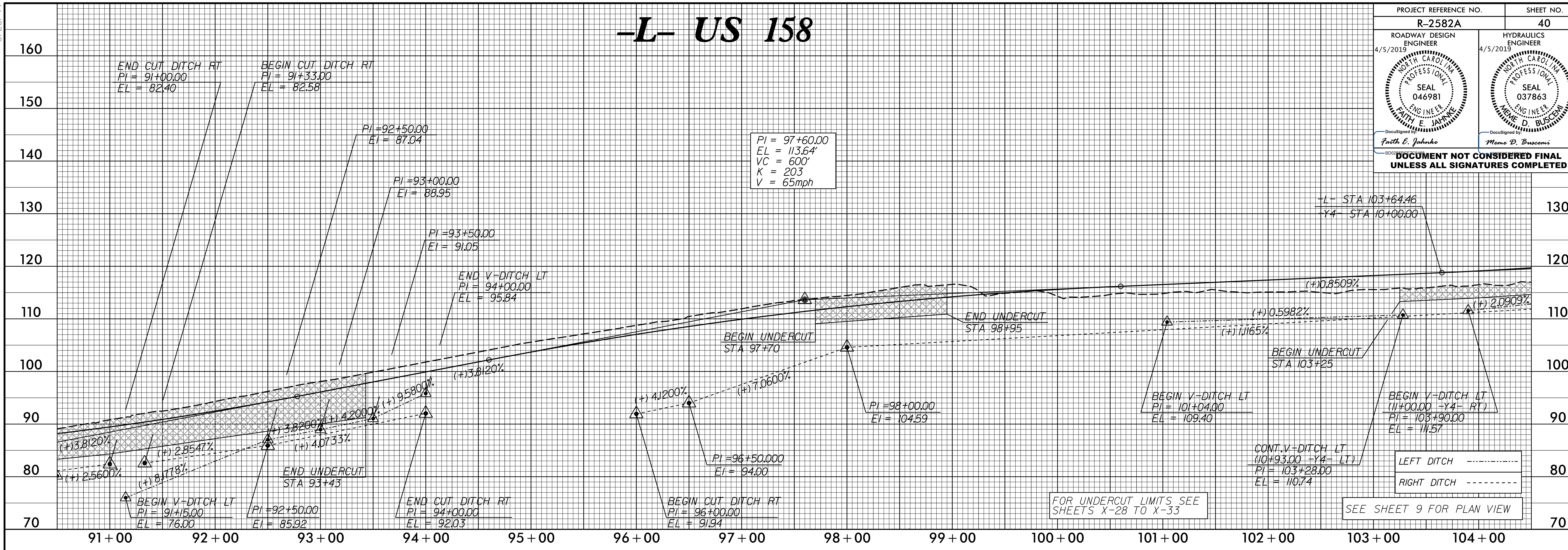
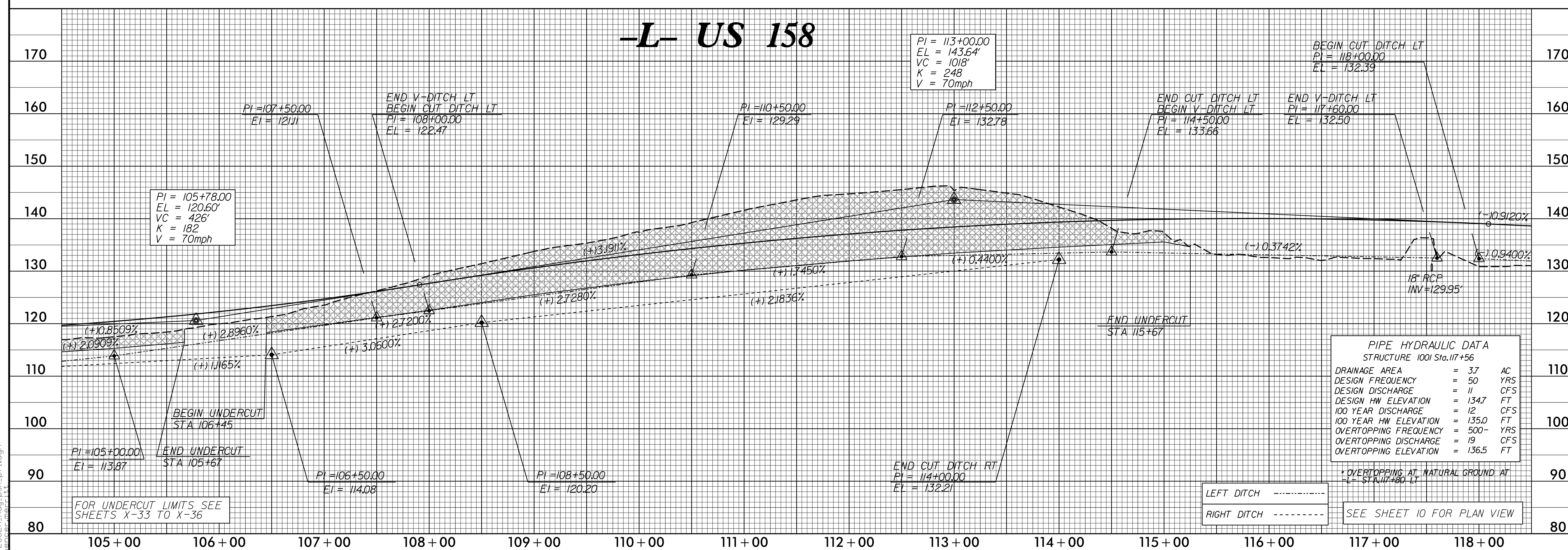
PROJECT REFERENCE NO.	SHEET NO.
R-2582A	40

ROADWAY DESIGN ENGINEER 4/5/2019 — SEAL 046981, NORTH CAROLINA PROFESSIONAL ENGINEER, FAITH E. JAHNKE — DocuSigned by: Faith E. Jahnke

HYDRAULICS ENGINEER 4/5/2019 — SEAL 037863, NORTH CAROLINA PROFESSIONAL ENGINEER, MEME D. BUSCEMI — DocuSigned by: Meme D. Buscemi

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED


-L- US 158
END CUT DITCH RT PI = 91+00.00 EL = 82.40
BEGIN CUT DITCH RT PI = 91+33.00 EL = 82.58
PI =92+50.00 El = 87.04
PI =93+00.00 El = 88.95
PI =93+50.00 El = 91.05
END V-DITCH LT PI = 94+00.00 EL = 95.84
PI = 97+60.00 EL = 113.64' VC = 600' K = 203 V = 65mph
-L- STA 103+64.46 -Y4- STA 10+00.00
(+)0.8509%
(+) 2.0909%
(+) 0.5982%
(+) 1.1165%
END UNDERCUT STA 98+95
BEGIN UNDERCUT STA 97+70
BEGIN UNDERCUT STA 103+25
(+)3.8120%
(+) 4.1200%
(+) 7.0600%
(+) 9.5800%
(+) 4.2000%
(+) 3.8200%
(+) 4.0733%
(+) 2.8547%
(+)3.8120%
(+) 2.5600%
(+) 8.1178%
END UNDERCUT STA 93+43
PI =98+00.00 El = 104.59
BEGIN V-DITCH LT PI = 101+04.00 EL = 109.40
BEGIN V-DITCH LT (111+00.00 -Y4- RT) PI = 103+90.00 EL = 111.57
CONT. V-DITCH LT (110+93.00 -Y4- LT) PI = 103+28.00 EL = 110.74
PI =96+50.000 El = 94.00
BEGIN V-DITCH LT PI = 91+15.00 EL = 76.00
PI =92+50.00 El = 85.92
END CUT DITCH RT PI = 94+00.00 EL = 92.03
BEGIN CUT DITCH RT PI = 96+00.00 EL = 91.94
FOR UNDERCUT LIMITS SEE SHEETS X-28 TO X-33
LEFT DITCH
RIGHT DITCH
SEE SHEET 9 FOR PLAN VIEW
160 150 140 130 120 110 100 90 80 70
91+00 92+00 93+00 94+00 95+00 96+00 97+00 98+00 99+00 100+00 101+00 102+00 103+00 104+00


-L- US 158
PI = 113+00.00 EL = 143.64' VC = 1018' K = 248 V = 70mph
BEGIN CUT DITCH LT PI = 118+00.00 EL = 132.39
END V-DITCH LT BEGIN CUT DITCH LT PI = 108+00.00 EL = 122.47
PI =107+50.00 El = 121.11
PI =110+50.00 El = 129.29
PI =112+50.00 El = 132.78
END CUT DITCH LT BEGIN V-DITCH LT PI = 114+50.00 EL = 133.66
END V-DITCH LT PI = 117+60.00 EL = 132.50
PI = 105+78.00 EL = 120.60' VC = 426' K = 182 V = 70mph
(-)0.9120%
(-)0.9400%
(-) 0.3742%
18" RCP INV=129.95'
(+)3.1911%
(+) 1.7450%
(+) 0.4400%
(+) 2.7280%
(+) 2.1836%
(+) 2.7200%
(+) 3.0600%
(+) 2.8960%
(+)0.8509%
(+) 2.0909%
(+) 1.1165%
END UNDERCUT STA 115+67
BEGIN UNDERCUT STA 106+45
END UNDERCUT STA 105+67
PI =105+00.00 El = 113.87
PI =106+50.00 El = 114.08
PI =108+50.00 El = 120.20
END CUT DITCH RT PI = 114+00.00 EL = 132.21
PIPE HYDRAULIC DATA
STRUCTURE 1001 Sta.117+56
DRAINAGE AREA = 3.7 AC
DESIGN FREQUENCY = 50 YRS
DESIGN DISCHARGE = 11 CFS
DESIGN HW ELEVATION = 134.7 FT
100 YEAR DISCHARGE = 12 CFS
100 YEAR HW ELEVATION = 135.0 FT
OVERTOPPING FREQUENCY = 500- YRS
OVERTOPPING DISCHARGE = 19 CFS
OVERTOPPING ELEVATION = 136.5 FT
* OVERTOPPING AT NATURAL GROUND AT -L- STA.117+80 LT
FOR UNDERCUT LIMITS SEE SHEETS X-33 TO X-36
LEFT DITCH
RIGHT DITCH
SEE SHEET 10 FOR PLAN VIEW
170 160 150 140 130 120 110 100 90 80
105+00 106+00 107+00 108+00 109+00 110+00 111+00 112+00 113+00 114+00 115+00 116+00 117+00 118+00

5/28/99

05-APR-2019 09:11 R-2582A_Rdy_psh_pf1.dgn

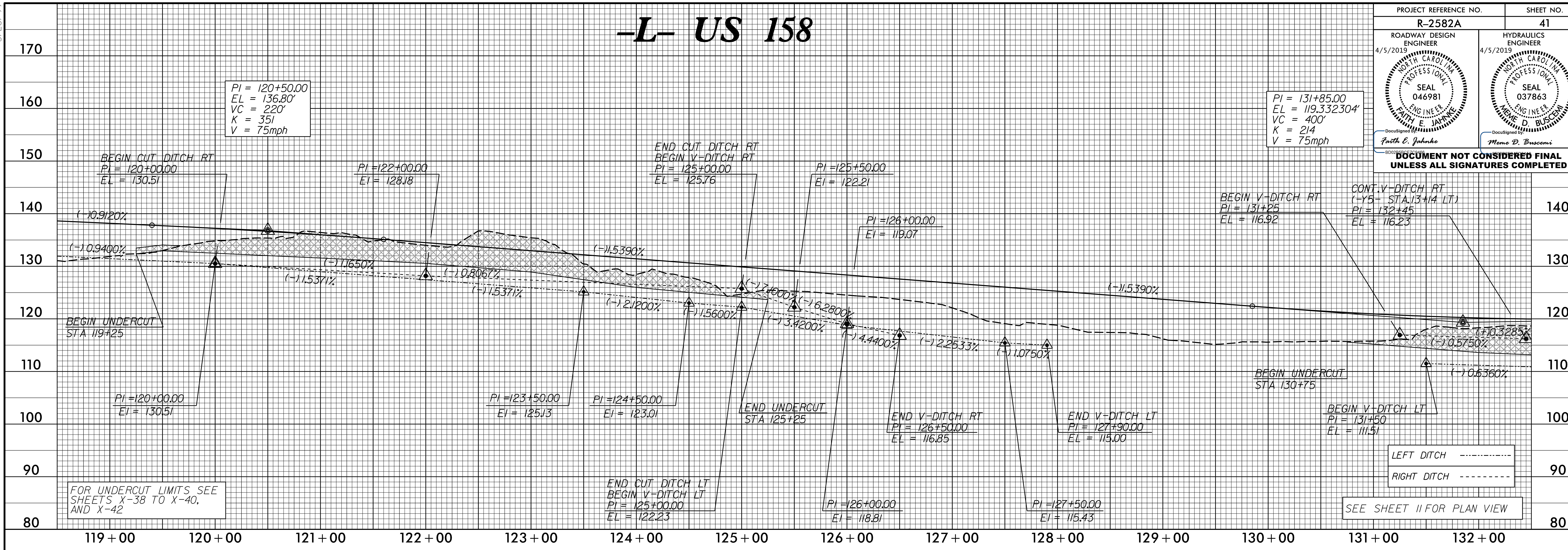
PROJECT REFERENCE NO.	SHEET NO.
R-2582A	41

ROADWAY DESIGN ENGINEER — 4/5/2019 — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 046981 — FAITH E. JAHNKE — DocuSigned by: Faith E. Jahnke

HYDRAULICS ENGINEER — 4/5/2019 — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 037863 — MEMO D. BUSCEMI — DocuSigned by: Memo D. Buscemi

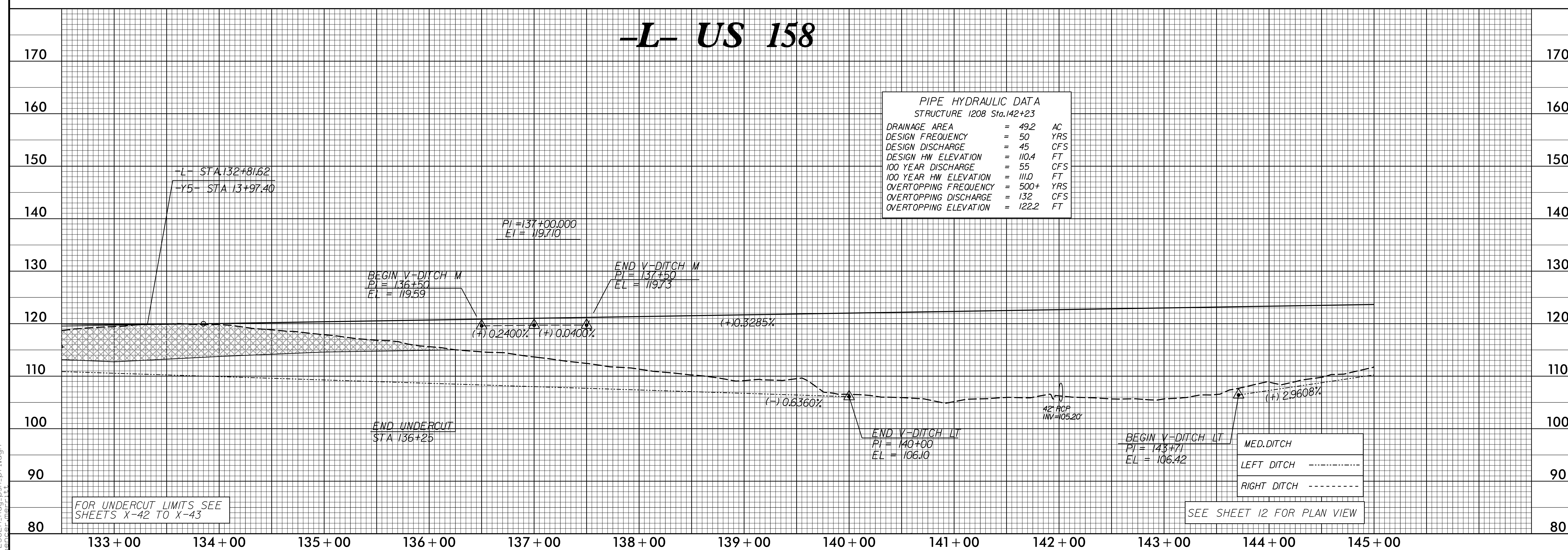
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

-L- US 158



5/28/99
PI = 120+50.00
EL = 136.80'
VC = 220'
K = 351
V = 75mph
BEGIN CUT DITCH RT
PI = 120+00.00
EL = 130.51
PI =122+00.00
EI = 128.18
END CUT DITCH RT
BEGIN V-DITCH RT
PI = 125+00.00
EL = 125.76
PI =125+50.00
EI = 122.21
PI =126+00.00
EI = 119.07
PI = 131+85.00
EL = 119.332304'
VC = 400'
K = 214
V = 75mph
BEGIN V-DITCH RT
PI = 131+25
EL = 116.92
CONT.V-DITCH RT
(-Y5- STA.13+14 LT)
PI = 132+45
EL = 116.23
(-)0.9120%
(-)0.9400%
(-)1.1650%
(-)1.5371%
(-)0.8067%
(-)1.5371%
(-)1.5390%
(-)2.1200%
(-)1.5600%
(-)3.4200%
(-)6.2800%
(-)4.4400%
(-)2.2533%
(-)1.0750%
(-)1.5390%
(+)0.3285%
(-)0.5750%
(-)0.6360%
BEGIN UNDERCUT
STA 119+25
PI =120+00.00
EI = 130.51
PI =123+50.00
EI = 125.13
PI =124+50.00
EI = 123.01
END UNDERCUT
STA 125+25
END V-DITCH RT
PI = 126+50.00
EL = 116.85
END V-DITCH LT
PI = 127+90.00
EL = 115.00
BEGIN UNDERCUT
STA 130+75
BEGIN V-DITCH LT
PI = 131+50
EL = 111.51
LEFT DITCH
RIGHT DITCH
END CUT DITCH LT
BEGIN V-DITCH LT
PI = 125+00.00
EL = 122.23
PI =126+00.00
EI = 118.81
PI =127+50.00
EI = 115.43
FOR UNDERCUT LIMITS SEE SHEETS X-38 TO X-40, AND X-42
SEE SHEET 11 FOR PLAN VIEW
170
160
150
140
130
120
110
100
90
80
119+00
120+00
121+00
122+00
123+00
124+00
125+00
126+00
127+00
128+00
129+00
130+00
131+00
132+00

-L- US 158



-L- STA.132+81.62
-Y5- STA 13+97.40
PI =137+00.000
EI = 119.710
BEGIN V-DITCH M
PI = 136+50
EL = 119.59
END V-DITCH M
PI = 137+50
EL = 119.73
(+)0.2400%
(+)0.0400%
(+)0.3285%
(-)0.6360%
(+)2.9608%
END UNDERCUT
STA 136+25
END V-DITCH LT
PI = 140+00
EL = 106.10
42" RCP
INV=105.20'
BEGIN V-DITCH LT
PI = 143+71
EL = 106.42
MED.DITCH
LEFT DITCH
RIGHT DITCH
FOR UNDERCUT LIMITS SEE SHEETS X-42 TO X-43
SEE SHEET 12 FOR PLAN VIEW
170
160
150
140
130
120
110
100
90
80
133+00
134+00
135+00
136+00
137+00
138+00
139+00
140+00
141+00
142+00
143+00
144+00
145+00

PIPE HYDRAULIC DATA
STRUCTURE 1208 Sta.142+23

DRAINAGE AREA	=	49.2	AC
DESIGN FREQUENCY	=	50	YRS
DESIGN DISCHARGE	=	45	CFS
DESIGN HW ELEVATION	=	110.4	FT
100 YEAR DISCHARGE	=	55	CFS
100 YEAR HW ELEVATION	=	111.0	FT
OVERTOPPING FREQUENCY	=	500+	YRS
OVERTOPPING DISCHARGE	=	132	CFS
OVERTOPPING ELEVATION	=	122.2	FT

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mspencer_merritt

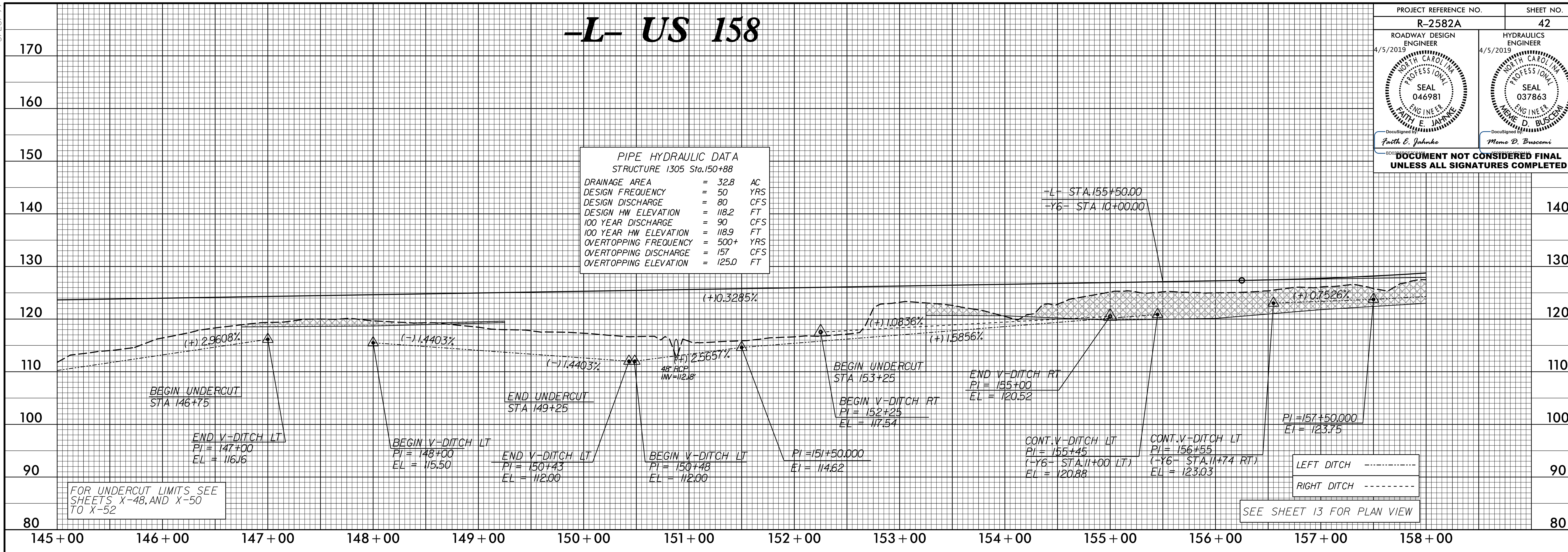
PROJECT REFERENCE NO.	SHEET NO.
R-2582A	42

ROADWAY DESIGN ENGINEER — 4/5/2019 — SEAL 046981 — FAITH E. JAHNKE — DocuSigned by: Faith E. Jahnke

HYDRAULICS ENGINEER — 4/5/2019 — SEAL 037863 — MEMO D. BUSCEMI — DocuSigned by: Memo D. Buscemi

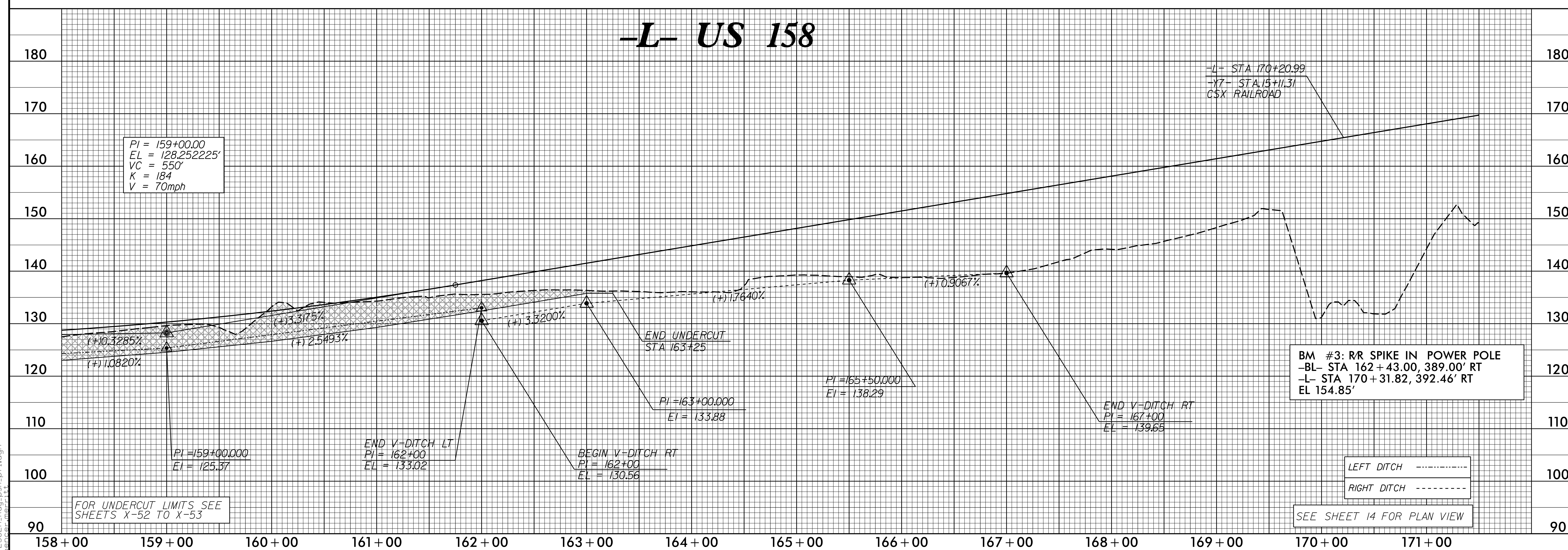
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

-L- US 158



5/28/99
PIPE HYDRAULIC DATA
STRUCTURE 1305 Sta.150+88
DRAINAGE AREA = 32.8 AC
DESIGN FREQUENCY = 50 YRS
DESIGN DISCHARGE = 80 CFS
DESIGN HW ELEVATION = 118.2 FT
100 YEAR DISCHARGE = 90 CFS
100 YEAR HW ELEVATION = 118.9 FT
OVERTOPPING FREQUENCY = 500+ YRS
OVERTOPPING DISCHARGE = 157 CFS
OVERTOPPING ELEVATION = 125.0 FT
-L- STA.155+50.00
-Y6- STA 10+00.00
(+) 2.9608%
(-) 1.4403%
(-) 1.4403%
(+) 2.5657%
(+)0.3285%
(+) 1.0836%
(+) 1.5856%
(+) 0.7526%
48" RCP
INV=112.18
BEGIN UNDERCUT
STA 146+75
END V-DITCH LT
PI = 147+00
EL = 116.16
BEGIN V-DITCH LT
PI = 148+00
EL = 115.50
END UNDERCUT
STA 149+25
END V-DITCH LT
PI = 150+43
EL = 112.00
BEGIN V-DITCH LT
PI = 150+48
EL = 112.00
PI =151+50.000
El = 114.62
BEGIN UNDERCUT
STA 153+25
BEGIN V-DITCH RT
PI = 152+25
EL = 117.54
END V-DITCH RT
PI = 155+00
EL = 120.52
CONT.V-DITCH LT
PI = 155+45
(-Y6- STA.11+00 LT)
EL = 120.88
CONT.V-DITCH LT
PI = 156+55
(-Y6- STA.11+74 RT)
EL = 123.03
PI =157+50.000
El = 123.75
LEFT DITCH
RIGHT DITCH
FOR UNDERCUT LIMITS SEE
SHEETS X-48, AND X-50
TO X-52
SEE SHEET 13 FOR PLAN VIEW
170
160
150
140
130
120
110
100
90
80
145+00
146+00
147+00
148+00
149+00
150+00
151+00
152+00
153+00
154+00
155+00
156+00
157+00
158+00

-L- US 158



PI = 159+00.00
EL = 128.252225'
VC = 550'
K = 184
V = 70mph
-L- STA 170+20.99
-Y7- STA.15+11.31
CSX RAILROAD
(+)0.3285%
(+)1.0820%
(+)3.3175%
(+) 2.5493%
(+) 3.3200%
(+)1.7640%
(+)0.9067%
END UNDERCUT
STA 163+25
PI =163+00.000
El = 133.88
PI =165+50.000
El = 138.29
END V-DITCH RT
PI = 167+00
EL = 139.65
PI =159+00.000
El = 125.37
END V-DITCH LT
PI = 162+00
EL = 133.02
BEGIN V-DITCH RT
PI = 162+00
EL = 130.56
BM #3: R/R SPIKE IN POWER POLE
-BL- STA 162+43.00, 389.00' RT
-L- STA 170+31.82, 392.46' RT
EL 154.85'
LEFT DITCH
RIGHT DITCH
FOR UNDERCUT LIMITS SEE
SHEETS X-52 TO X-53
SEE SHEET 14 FOR PLAN VIEW
05-APR-2019 09:12
R-2582A_Rdy_psh_pf1.dgn
180
170
160
150
140
130
120
110
100
90
158+00
159+00
160+00
161+00
162+00
163+00
164+00
165+00
166+00
167+00
168+00
169+00
170+00
171+00

PROJECT REFERENCE NO.	SHEET NO.
R-2582A	43

ROADWAY DESIGN ENGINEER — 3/25/2019 — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 046981 FAITH E. JAHNKE — DocuSigned by: Faith E. Jahnke BD02B5BCE7C9466...

HYDRAULICS ENGINEER — 3/26/2019 — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 037863 MEME D. BUSCEMI — DocuSigned by: Meme D. Buscemi 8F9BB3FC4ED94A9...

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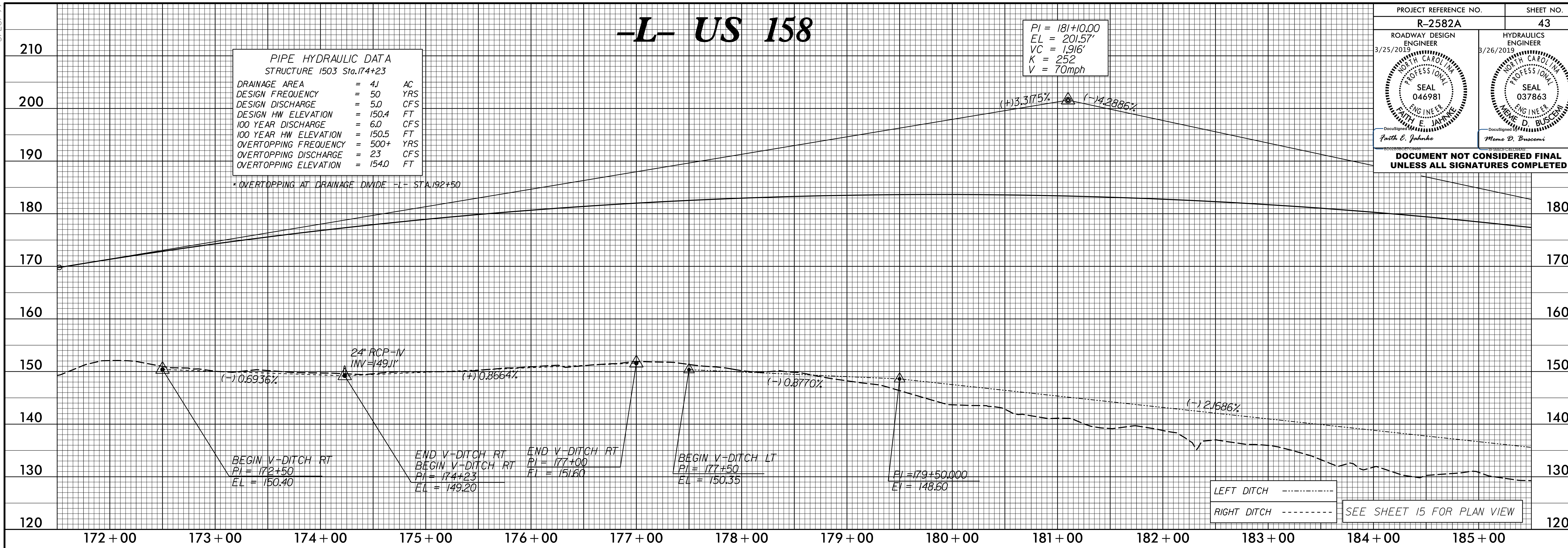
-L- US 158

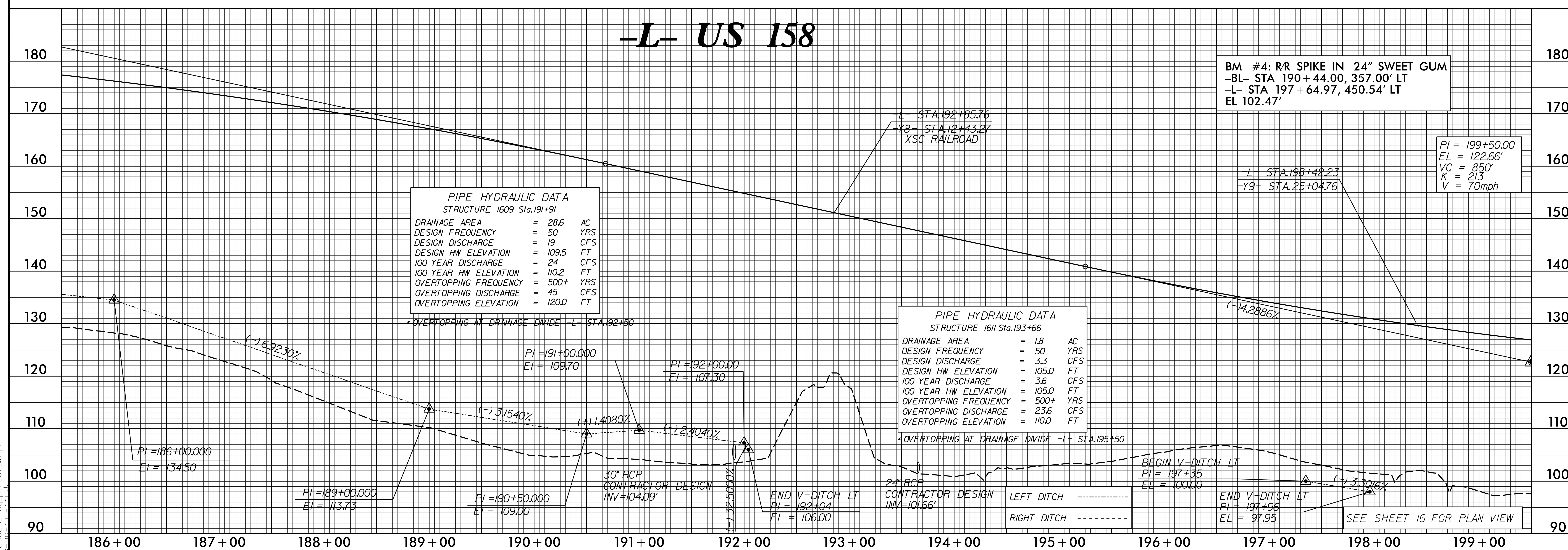


PIPE HYDRAULIC DATA
STRUCTURE 1503 Sta.174+23

DRAINAGE AREA	=	4.1	AC
DESIGN FREQUENCY	=	50	YRS
DESIGN DISCHARGE	=	5.0	CFS
DESIGN HW ELEVATION	=	150.4	FT
100 YEAR DISCHARGE	=	6.0	CFS
100 YEAR HW ELEVATION	=	150.5	FT
OVERTOPPING FREQUENCY	=	500+	YRS
OVERTOPPING DISCHARGE	=	23	CFS
OVERTOPPING ELEVATION	=	154.0	FT

* OVERTOPPING AT DRAINAGE DIVIDE -L- STA.192+50

-L- US 158



PIPE HYDRAULIC DATA
STRUCTURE 1609 Sta.191+91

DRAINAGE AREA	=	28.6	AC
DESIGN FREQUENCY	=	50	YRS
DESIGN DISCHARGE	=	19	CFS
DESIGN HW ELEVATION	=	109.5	FT
100 YEAR DISCHARGE	=	24	CFS
100 YEAR HW ELEVATION	=	110.2	FT
OVERTOPPING FREQUENCY	=	500+	YRS
OVERTOPPING DISCHARGE	=	45	CFS
OVERTOPPING ELEVATION	=	120.0	FT

* OVERTOPPING AT DRAINAGE DIVIDE -L- STA.192+50

PIPE HYDRAULIC DATA
STRUCTURE 1611 Sta.193+66

DRAINAGE AREA	=	1.8	AC
DESIGN FREQUENCY	=	50	YRS
DESIGN DISCHARGE	=	3.3	CFS
DESIGN HW ELEVATION	=	105.0	FT
100 YEAR DISCHARGE	=	3.6	CFS
100 YEAR HW ELEVATION	=	105.0	FT
OVERTOPPING FREQUENCY	=	500+	YRS
OVERTOPPING DISCHARGE	=	23.6	CFS
OVERTOPPING ELEVATION	=	110.0	FT

* OVERTOPPING AT DRAINAGE DIVIDE -L- STA.195+50

25-MAR-2019 10:17
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PROJECT REFERENCE NO.	SHEET NO.
R-2582A	44

ROADWAY DESIGN ENGINEER 8/20/2020 — SEAL 046981 — NORTH CAROLINA PROFESSIONAL ENGINEER — FAITH E. JAHNKE — DocuSigned by: Faith E. Jahnke

HYDRAULICS ENGINEER 8/20/2020 — SEAL 037863 — NORTH CAROLINA PROFESSIONAL ENGINEER — MEME D. BUSCEMI — DocuSigned by: Meme D. Buscemi

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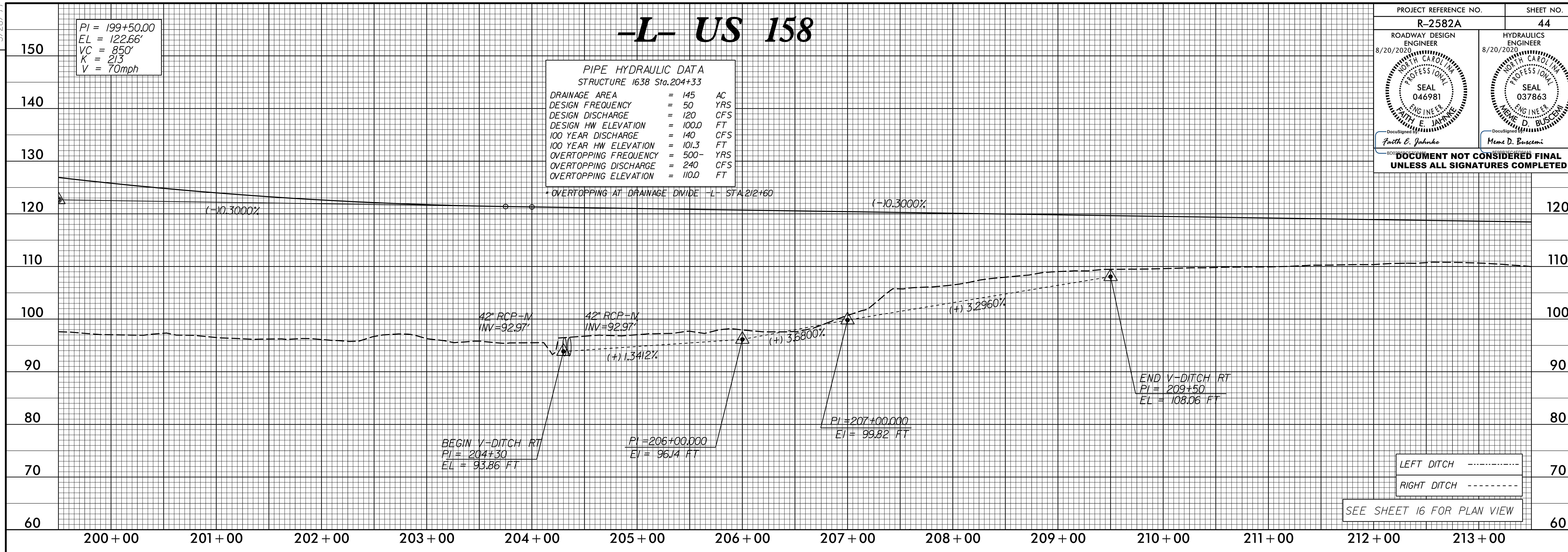
REVISIONS

CONST REV 08/18/20 (FEJ):CORRECTED SHEET ELEVATION LABELS FOR -L- STA 199+50 TO STA 213+50.

5/28/99

-L- US 158

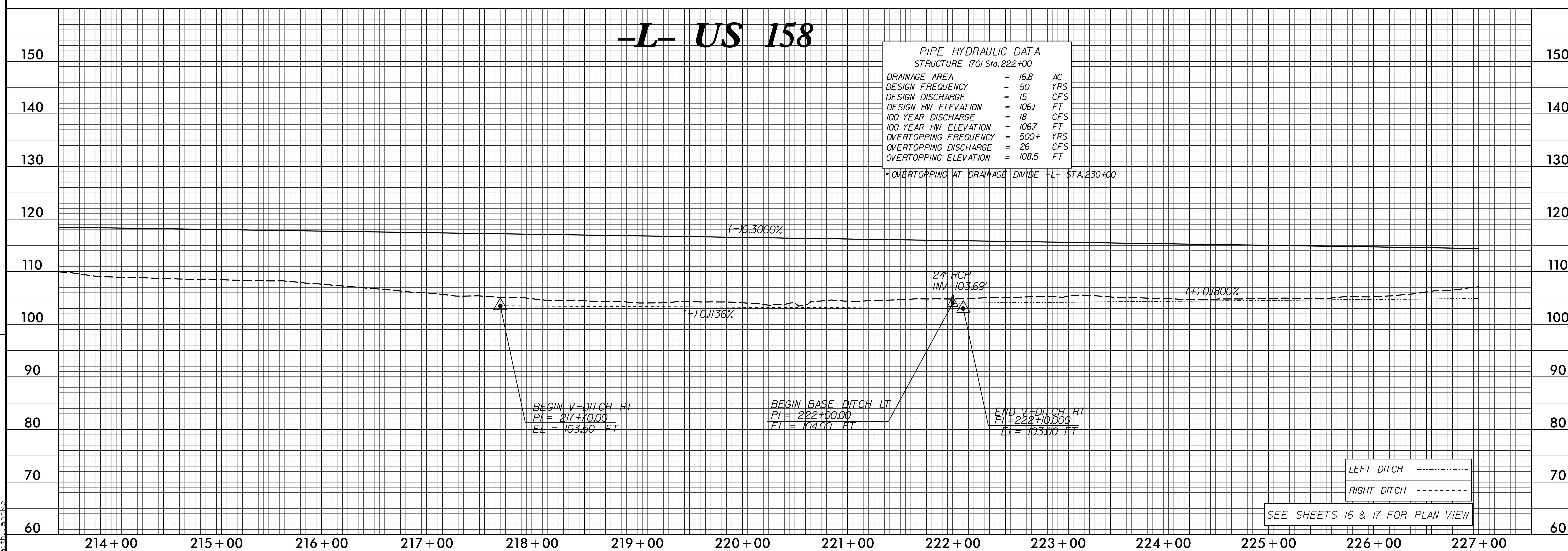


PIPE HYDRAULIC DATA
STRUCTURE 1638 Sta.204+33

DRAINAGE AREA	=	1.45	AC
DESIGN FREQUENCY	=	50	YRS
DESIGN DISCHARGE	=	120	CFS
DESIGN HW ELEVATION	=	100.0	FT
100 YEAR DISCHARGE	=	140	CFS
100 YEAR HW ELEVATION	=	101.3	FT
OVERTOPPING FREQUENCY	=	500-	YRS
OVERTOPPING DISCHARGE	=	240	CFS
OVERTOPPING ELEVATION	=	110.0	FT

* OVERTOPPING AT DRAINAGE DIVIDE -L- STA.212+60

-L- US 158



PIPE HYDRAULIC DATA
STRUCTURE 1701 Sta.222+00

DRAINAGE AREA	=	16.8	AC
DESIGN FREQUENCY	=	50	YRS
DESIGN DISCHARGE	=	15	CFS
DESIGN HW ELEVATION	=	106.1	FT
100 YEAR DISCHARGE	=	18	CFS
100 YEAR HW ELEVATION	=	106.7	FT
OVERTOPPING FREQUENCY	=	500+	YRS
OVERTOPPING DISCHARGE	=	26	CFS
OVERTOPPING ELEVATION	=	108.5	FT

* OVERTOPPING AT DRAINAGE DIVIDE -L- STA.230+00

18-AUG-2020 09:18
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Faith Jahnke

PROJECT REFERENCE NO.	SHEET NO.
R-2582A	45

ROADWAY DESIGN ENGINEER 8/20/2020 — NORTH CAROLINA PROFESSIONAL SEAL 046981 ENGINEER FAITH E. JAHNKE — DocuSigned by: Faith E. Jahnke BD02B5BCE7C9466...

HYDRAULICS ENGINEER 8/20/2020 — NORTH CAROLINA PROFESSIONAL SEAL 037863 ENGINEER MEME D. BUSCEMI — DocuSigned by: Meme D. Buscemi 8F9BB3FC4ED94A9...

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS

CONST REV 08/18/20 (FEJ): CORRECTED SHEET ELEVATION LABELS FOR -L- STA 240+50 TO STA 254+50.

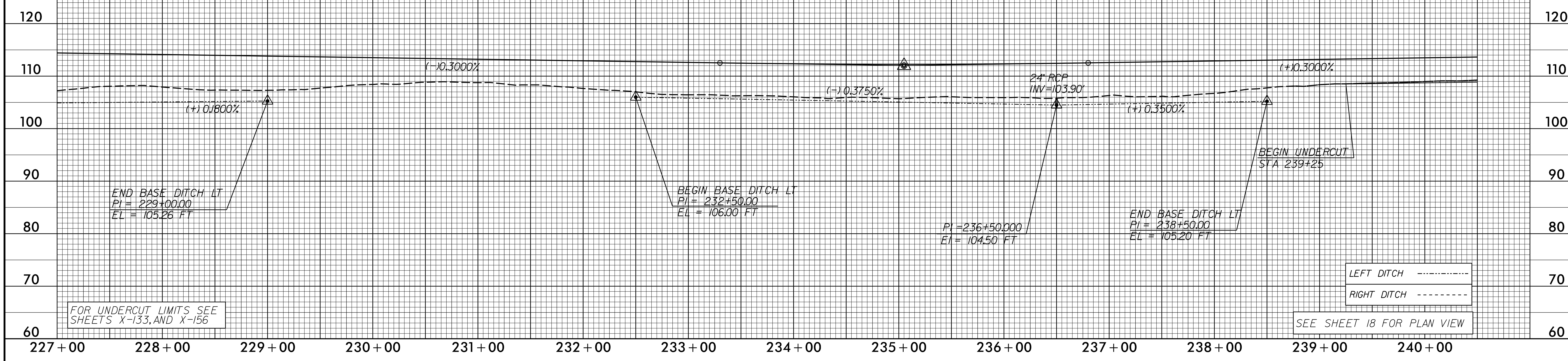
5/28/99

-L- US 158

PIPE HYDRAULIC DATA
STRUCTURE 1803 Sta. 236+50

DRAINAGE AREA	=	9.9	AC
DESIGN FREQUENCY	=	50	YRS
DESIGN DISCHARGE	=	11	CFS
DESIGN HW ELEVATION	=	106.3	FT
100 YEAR DISCHARGE	=	13	CFS
100 YEAR HW ELEVATION	=	106.5	FT
OVERTOPPING FREQUENCY	=	500+	YRS
OVERTOPPING DISCHARGE	=	40	CFS
OVERTOPPING ELEVATION	=	112.3	FT

PI = 235+05.00
EL = 111.995'
VC = 350'
K = 583
V = 80mph



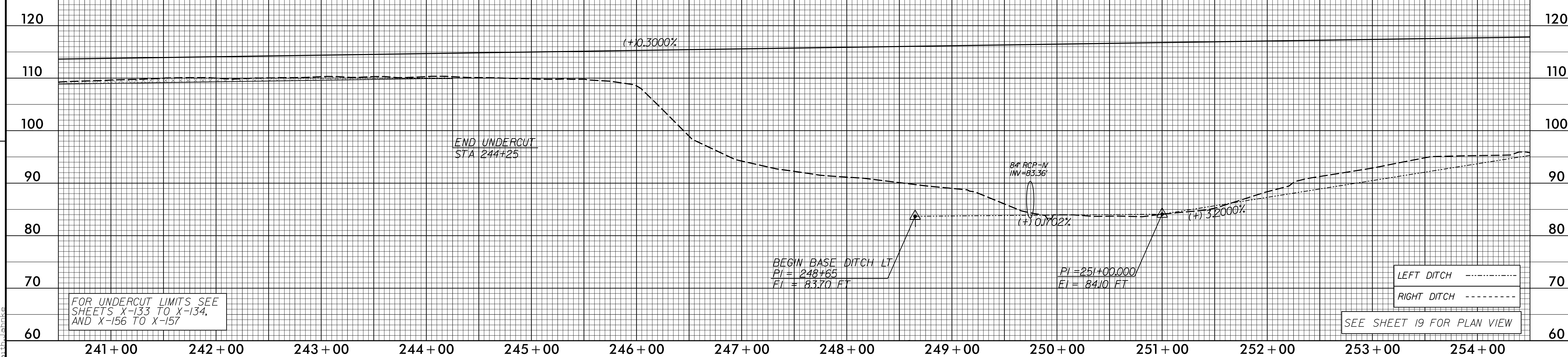
-L- US 158

BM #5: R/R SPIKE IN 14" PINE
-BL- STA 239+02.00, 461.00' RT
-L- STA 249+27.56, 467.12' RT
EL 107.76'

PIPE HYDRAULIC DATA
STRUCTURE 1913 Sta. 249+74

DRAINAGE AREA	=	505	AC
DESIGN FREQUENCY	=	50	YRS
DESIGN DISCHARGE	=	290	CFS
DESIGN HW ELEVATION	=	92.7	FT
100 YEAR DISCHARGE	=	350	CFS
100 YEAR HW ELEVATION	=	94.7	FT
OVERTOPPING FREQUENCY	=	500+	YRS
OVERTOPPING DISCHARGE	=	684	CFS
OVERTOPPING ELEVATION	=	110.0	FT

* OVERTOPPING AT DRAINAGE DIVIDE -L- STA. 241+50



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faith.jahnke

PROJECT REFERENCE NO.	SHEET NO.
R-2582A	46

ROADWAY DESIGN ENGINEER 8/20/2020 — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 046981 FAITH E. JAHNKE — DocuSigned by: Faith E. Jahnke

HYDRAULICS ENGINEER 8/20/2020 — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 037863 MEME D. BUSCEMI — DocuSigned by: Meme D. Buscemi

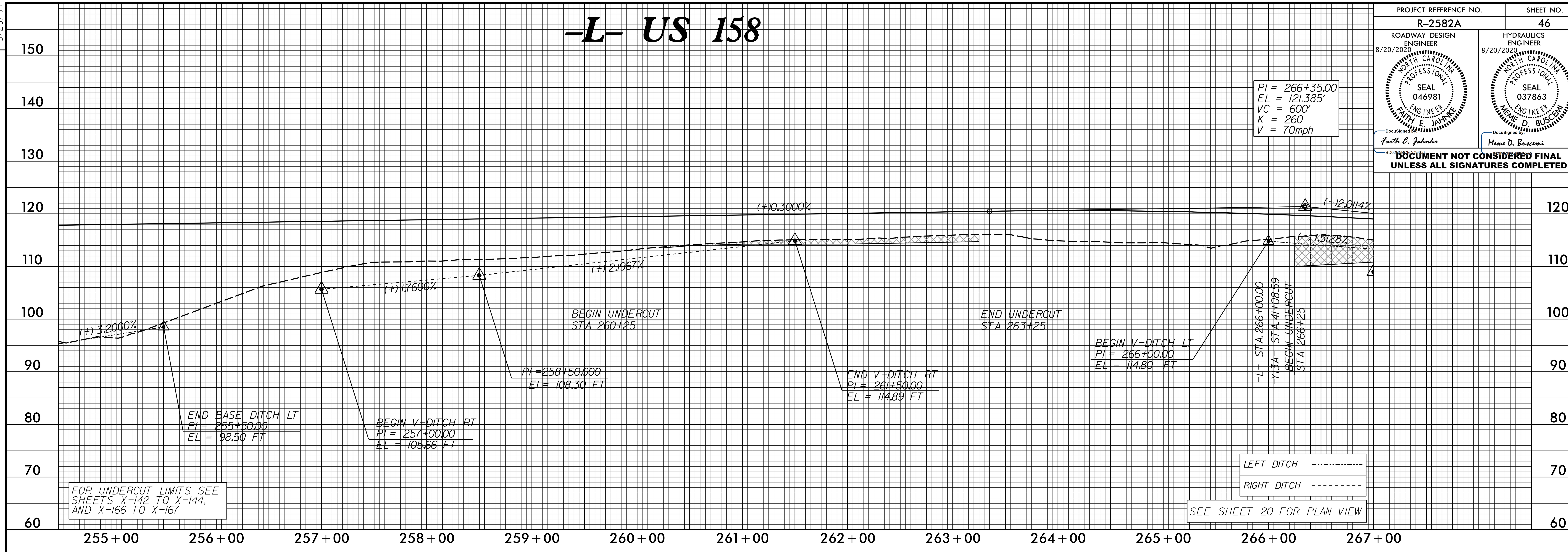
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS

CONST REV 08/18/20 (FEJ): CORRECTED SHEET ELEVATION LABELS FOR -L- STA 254+50 TO STA 267+00.

5/28/99

-L- US 158



PI = 266+35.00
EL = 121.385'
VC = 600'
K = 260
V = 70mph
(+)0.3000%
(-)2.0114%
(-)1.5128%
(+)2.1967%
(+)1.7600%
(+)3.2000%
BEGIN UNDERCUT STA 260+25
END UNDERCUT STA 263+25
END BASE DITCH LT PI = 255+50.00 EL = 98.50 FT
BEGIN V-DITCH RT PI = 257+00.00 EL = 105.66 FT
PI = 258+50.000 EI = 108.30 FT
END V-DITCH RT PI = 261+50.00 EL = 114.89 FT
BEGIN V-DITCH LT PI = 266+00.00 EL = 114.80 FT
-L- STA 266+00.00
-Y13A- STA 41+08.59
BEGIN UNDERCUT STA 266+25
FOR UNDERCUT LIMITS SEE SHEETS X-142 TO X-144, AND X-166 TO X-167
LEFT DITCH
RIGHT DITCH
SEE SHEET 20 FOR PLAN VIEW
150
140
130
120
110
100
90
80
70
60
255+00
256+00
257+00
258+00
259+00
260+00
261+00
262+00
263+00
264+00
265+00
266+00
267+00

-L- US 158

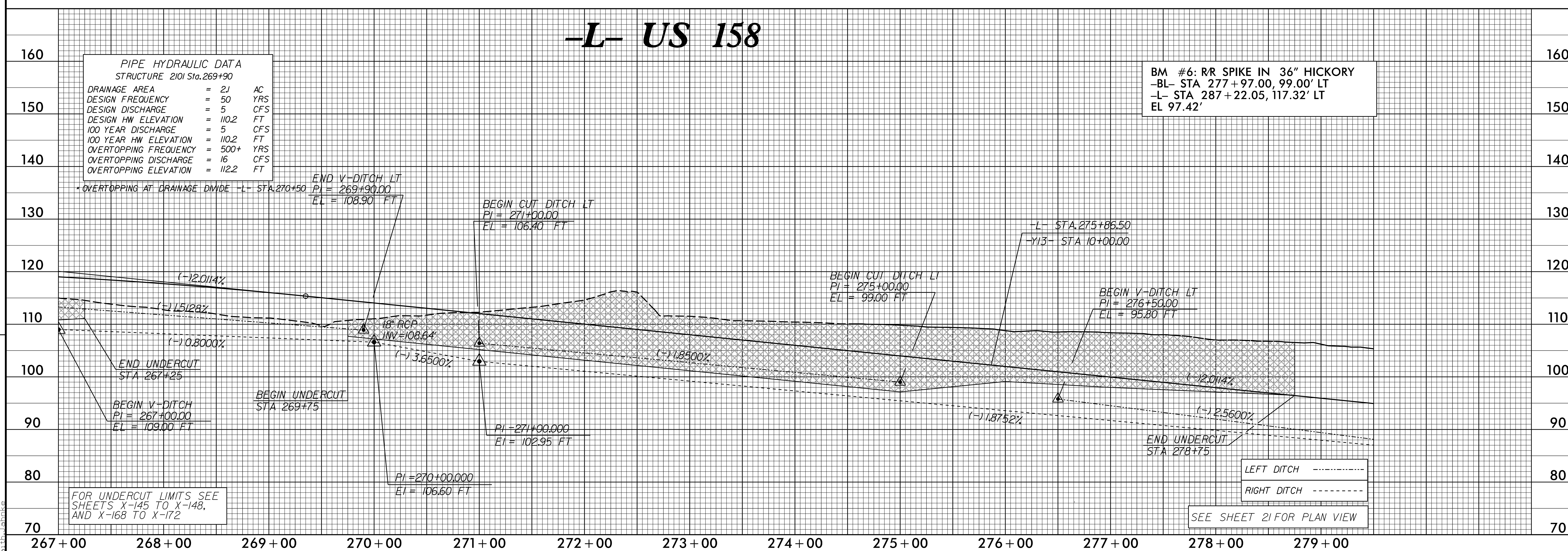
PIPE HYDRAULIC DATA

STRUCTURE 2101 Sta. 269+90

DRAINAGE AREA	=	2.1	AC
DESIGN FREQUENCY	=	50	YRS
DESIGN DISCHARGE	=	5	CFS
DESIGN HW ELEVATION	=	110.2	FT
100 YEAR DISCHARGE	=	5	CFS
100 YEAR HW ELEVATION	=	110.2	FT
OVERTOPPING FREQUENCY	=	500+	YRS
OVERTOPPING DISCHARGE	=	16	CFS
OVERTOPPING ELEVATION	=	112.2	FT

* OVERTOPPING AT DRAINAGE DIVIDE -L- STA.270+50

BM #6: R/R SPIKE IN 36" HICKORY
-BL- STA 277+97.00, 99.00' LT
-L- STA 287+22.05, 117.32' LT
EL 97.42'



END V-DITCH LT PI = 269+90.00 EL = 108.90 FT
BEGIN CUT DITCH LT PI = 271+00.00 EL = 106.40 FT
-L- STA 275+86.50
-Y13- STA 10+00.00
BEGIN CUT DITCH LT PI = 275+00.00 EL = 99.00 FT
BEGIN V-DITCH LT PI = 276+50.00 EL = 95.80 FT
(-)2.0114%
(-)1.5128%
(-)0.8000%
18" RCP INV=108.64'
(-)3.6500%
(-)1.8500%
(-)1.8752%
(-)2.5600%
END UNDERCUT STA 267+25
BEGIN V-DITCH PI = 267+00.00 EL = 109.00 FT
BEGIN UNDERCUT STA 269+75
PI = 271+00.000 EI = 102.95 FT
PI = 270+00.000 EI = 106.60 FT
END UNDERCUT STA 278+75
FOR UNDERCUT LIMITS SEE SHEETS X-145 TO X-148, AND X-168 TO X-172
LEFT DITCH
RIGHT DITCH
SEE SHEET 21 FOR PLAN VIEW
160
150
140
130
120
110
100
90
80
70
267+00
268+00
269+00
270+00
271+00
272+00
273+00
274+00
275+00
276+00
277+00
278+00
279+00

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faith.jahnke

PROJECT REFERENCE NO.	SHEET NO.
R-2582A	47

ROADWAY DESIGN ENGINEER 4/5/2019 — NORTH CAROLINA PROFESSIONAL SEAL 046981 ENGINEER FAITH E. JAHNKE — DocuSigned by: Faith E. Jahnke BD02B5BCE7C9466...

HYDRAULICS ENGINEER 4/5/2019 — NORTH CAROLINA PROFESSIONAL SEAL 037863 ENGINEER MEME D. BUSCEMI — DocuSigned by: Meme D. Buscemi 8E9BB3FC4FD94A9...

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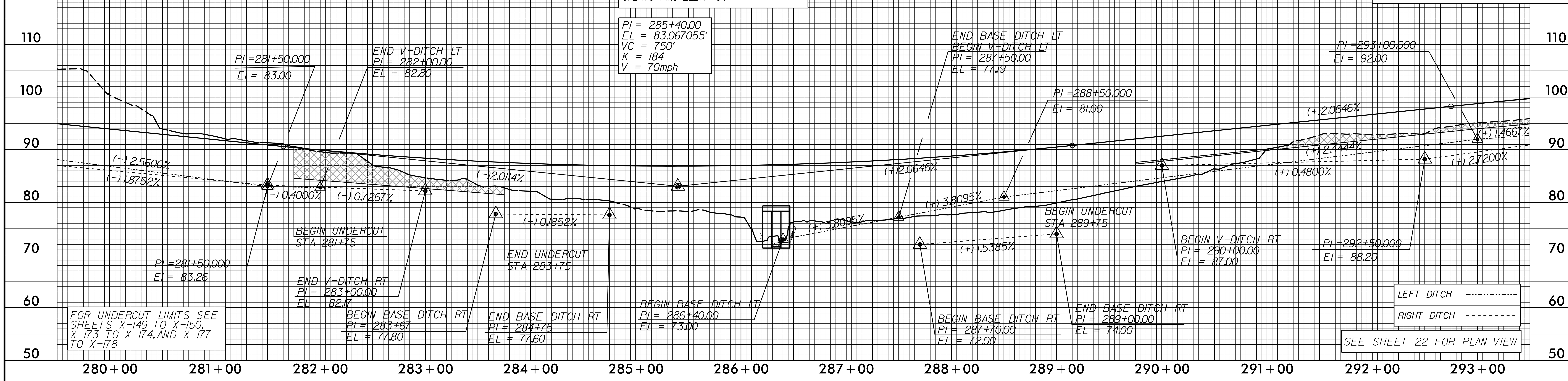
-L- US 158

CULVERT HYDRAULIC DATA
Sta. 286+51

DRAINAGE AREA	=	2176	AC
DESIGN FREQUENCY	=	50	YRS
DESIGN DISCHARGE	=	650	CFS
DESIGN HW ELEVATION	=	77.0	FT
100 YEAR DISCHARGE	=	800	CFS
100 YEAR HW ELEVATION	=	77.4	FT
OVERTOPPING FREQUENCY	=	500+	YRS
OVERTOPPING DISCHARGE	=	2600	CFS
OVERTOPPING ELEVATION	=	86.9	FT



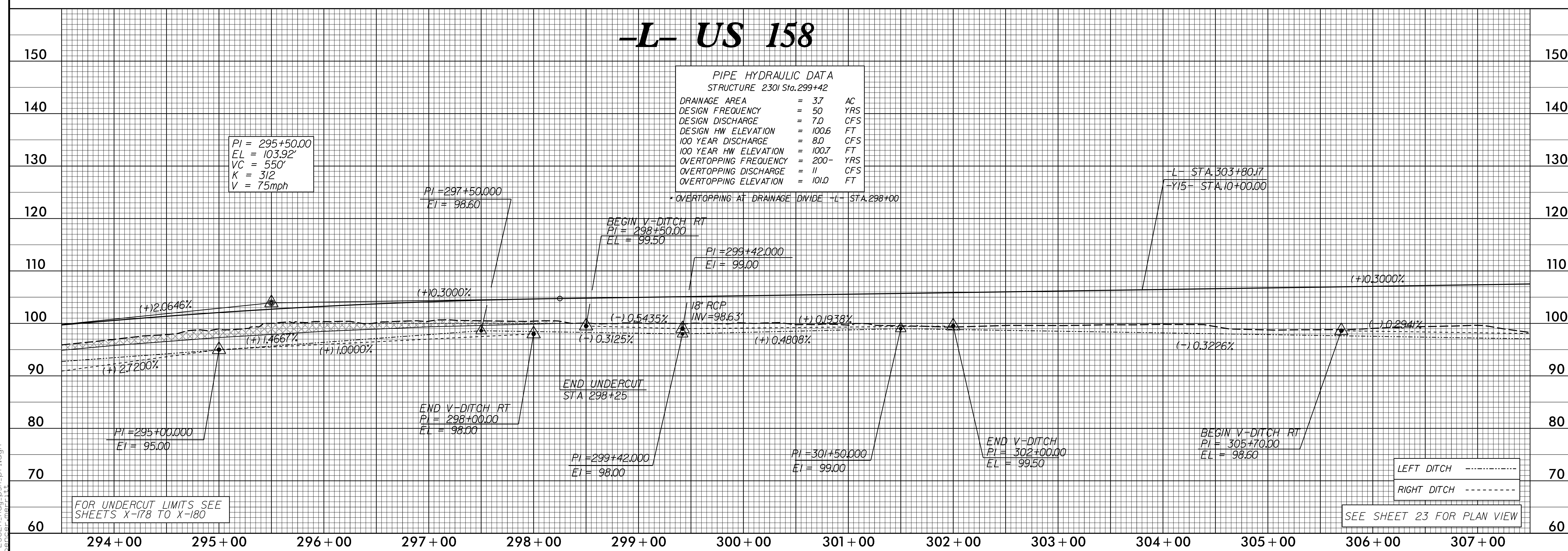
PI = 285+40.00
EL = 83.067055'
VC = 750'
K = 184
V = 70mph
PI =281+50.000 El = 83.00
END V-DITCH LT PI = 282+00.00 EL = 82.80
END BASE DITCH LT
BEGIN V-DITCH LT PI = 287+50.00 EL = 77.19
PI =288+50.000 El = 81.00
PI =293+00.000 El = 92.00
(+)2.0646%
(+)1.4667%
(+)2.4444%
(+)2.7200%
(+)0.4800%
(-)2.5600%
(-)1.8752%
(-)0.4000%
(-)0.7267%
(-)2.0114%
(-)0.1852%
(+)2.0646%
(+)3.8095%
(+)1.8095%
(+)1.5385%
BEGIN UNDERCUT STA 281+75
BEGIN UNDERCUT STA 289+75
END UNDERCUT STA 283+75
PI =281+50.000 El = 83.26
END V-DITCH RT PI = 283+00.00 EL = 82.17
BEGIN BASE DITCH RT PI = 283+67 EL = 77.80
END BASE DITCH RT PI = 284+75 EL = 77.60
BEGIN BASE DITCH LT PI = 286+40.00 EL = 73.00
BEGIN BASE DITCH RT PI = 287+70.00 EL = 72.00
END BASE DITCH RT PI = 289+00.00 EL = 74.00
BEGIN V-DITCH RT PI = 290+00.00 EL = 87.00
PI =292+50.000 El = 88.20
FOR UNDERCUT LIMITS SEE SHEETS X-149 TO X-150, X-173 TO X-174, AND X-177 TO X-178
LEFT DITCH
RIGHT DITCH
SEE SHEET 22 FOR PLAN VIEW
140 130 120 110 100 90 80 70 60 50
280+00 281+00 282+00 283+00 284+00 285+00 286+00 287+00 288+00 289+00 290+00 291+00 292+00 293+00

-L- US 158

PIPE HYDRAULIC DATA
STRUCTURE 2301 Sta. 299+42

DRAINAGE AREA	=	3.7	AC
DESIGN FREQUENCY	=	50	YRS
DESIGN DISCHARGE	=	7.0	CFS
DESIGN HW ELEVATION	=	100.6	FT
100 YEAR DISCHARGE	=	8.0	CFS
100 YEAR HW ELEVATION	=	100.7	FT
OVERTOPPING FREQUENCY	=	200-	YRS
OVERTOPPING DISCHARGE	=	11	CFS
OVERTOPPING ELEVATION	=	101.0	FT

* OVERTOPPING AT DRAINAGE DIVIDE -L- STA. 298+00



PI = 295+50.00
EL = 103.92'
VC = 550'
K = 312
V = 75mph
PI =297+50.000 El = 98.60
BEGIN V-DITCH RT PI = 298+50.00 EL = 99.50
PI =299+42.000 El = 99.00
-L- STA. 303+80.17
-Y15- STA. 10+00.00
(+)0.3000%
(+)0.3000%
(+)2.0646%
(+)1.4667%
(+)2.7200%
(+)1.0000%
(-)0.5435%
(-)0.3125%
18" RCP INV=98.63'
(+)0.1938%
(+)0.4808%
(-)0.3226%
(-)0.2941%
END UNDERCUT STA 298+25
END V-DITCH RT PI = 298+00.00 EL = 98.00
PI =295+00.000 El = 95.00
PI =299+42.000 El = 98.00
PI =301+50.000 El = 99.00
END V-DITCH PI = 302+00.00 EL = 99.50
BEGIN V-DITCH RT PI = 305+70.00 EL = 98.60
FOR UNDERCUT LIMITS SEE SHEETS X-178 TO X-180
LEFT DITCH
RIGHT DITCH
SEE SHEET 23 FOR PLAN VIEW
150 140 130 120 110 100 90 80 70 60
294+00 295+00 296+00 297+00 298+00 299+00 300+00 301+00 302+00 303+00 304+00 305+00 306+00 307+00

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PROJECT REFERENCE NO.	SHEET NO.
R–2582A	48

ROADWAY DESIGN ENGINEER — 3/25/2019 — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 046981 FAITH E. JAHNKE — DocuSigned by: Faith E. Jahnke BD02B5BCE7C9466...

HYDRAULICS ENGINEER — 3/26/2019 — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 037863 MEME D. BUSCEMI — DocuSigned by: Meme D. Buscemi 8F9BB3FC4ED94A9...

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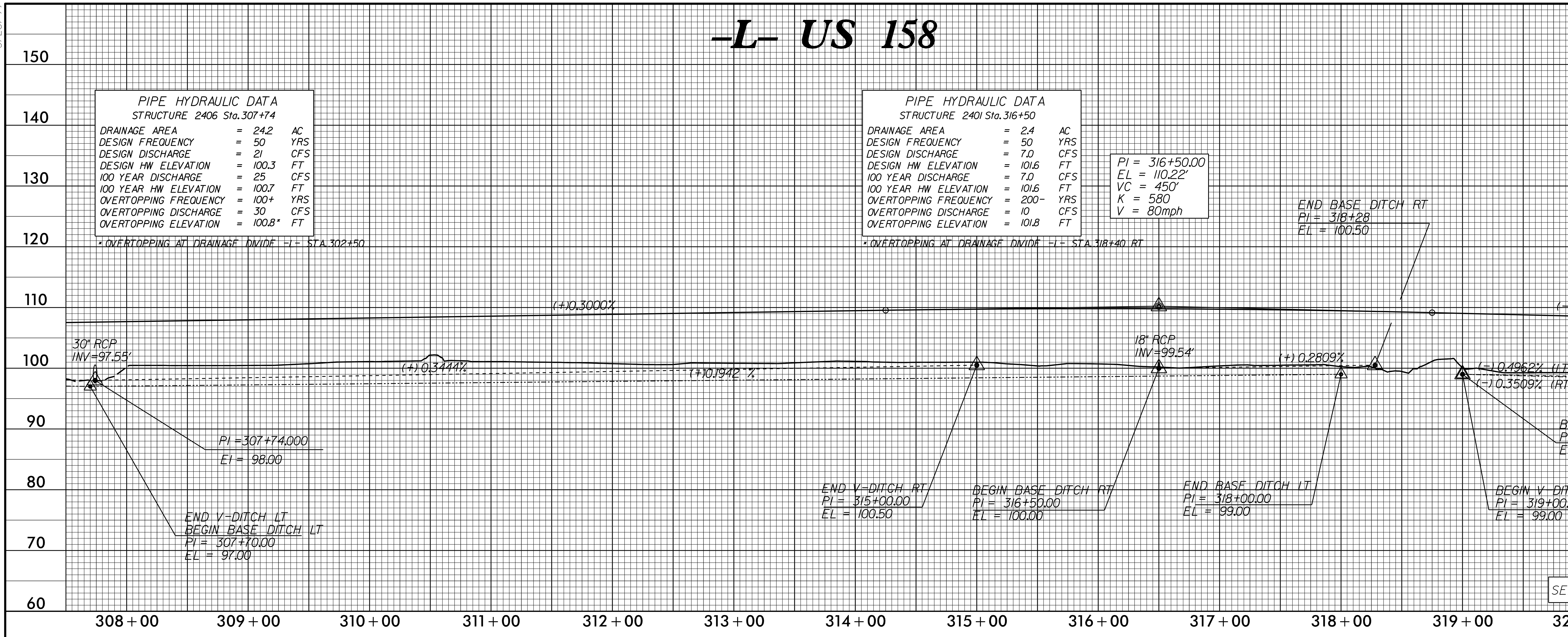
-L- US 158



PIPE HYDRAULIC DATA
STRUCTURE 2406 Sta. 307+74

DRAINAGE AREA	=	24.2	AC
DESIGN FREQUENCY	=	50	YRS
DESIGN DISCHARGE	=	21	CFS
DESIGN HW ELEVATION	=	100.3	FT
100 YEAR DISCHARGE	=	25	CFS
100 YEAR HW ELEVATION	=	100.7	FT
OVERTOPPING FREQUENCY	=	100+	YRS
OVERTOPPING DISCHARGE	=	30	CFS
OVERTOPPING ELEVATION	=	100.8*	FT

* OVERTOPPING AT DRAINAGE DIVIDE -L- STA 302+50

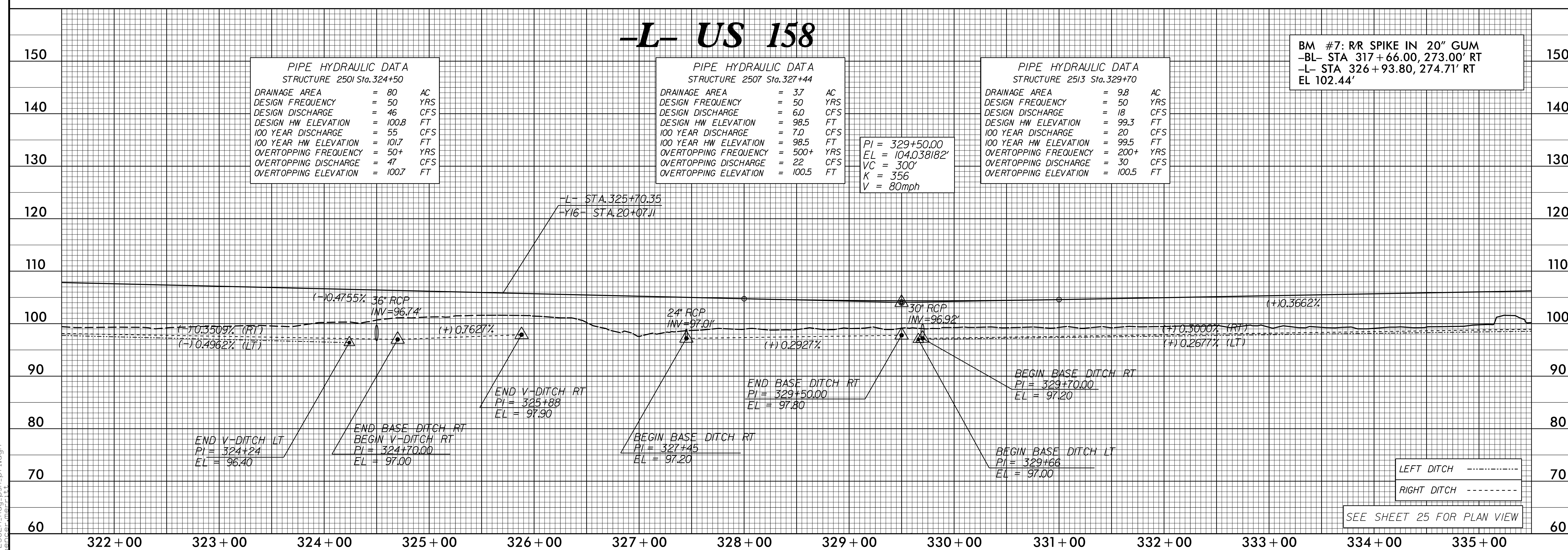
PIPE HYDRAULIC DATA
STRUCTURE 2401 Sta. 316+50

DRAINAGE AREA	=	2.4	AC
DESIGN FREQUENCY	=	50	YRS
DESIGN DISCHARGE	=	7.0	CFS
DESIGN HW ELEVATION	=	101.6	FT
100 YEAR DISCHARGE	=	7.0	CFS
100 YEAR HW ELEVATION	=	101.6	FT
OVERTOPPING FREQUENCY	=	200-	YRS
OVERTOPPING DISCHARGE	=	10	CFS
OVERTOPPING ELEVATION	=	101.8	FT

* OVERTOPPING AT DRAINAGE DIVIDE -L- STA 318+40 RT

-L- US 158

BM #7: R/R SPIKE IN 20" GUM
-BL- STA 317+66.00, 273.00' RT
-L- STA 326+93.80, 274.71' RT
EL 102.44'



PIPE HYDRAULIC DATA
STRUCTURE 2501 Sta. 324+50

DRAINAGE AREA	=	80	AC
DESIGN FREQUENCY	=	50	YRS
DESIGN DISCHARGE	=	46	CFS
DESIGN HW ELEVATION	=	100.8	FT
100 YEAR DISCHARGE	=	55	CFS
100 YEAR HW ELEVATION	=	101.7	FT
OVERTOPPING FREQUENCY	=	50+	YRS
OVERTOPPING DISCHARGE	=	47	CFS
OVERTOPPING ELEVATION	=	100.7	FT

PIPE HYDRAULIC DATA
STRUCTURE 2507 Sta. 327+44

DRAINAGE AREA	=	3.7	AC
DESIGN FREQUENCY	=	50	YRS
DESIGN DISCHARGE	=	6.0	CFS
DESIGN HW ELEVATION	=	98.5	FT
100 YEAR DISCHARGE	=	7.0	CFS
100 YEAR HW ELEVATION	=	98.5	FT
OVERTOPPING FREQUENCY	=	500+	YRS
OVERTOPPING DISCHARGE	=	22	CFS
OVERTOPPING ELEVATION	=	100.5	FT

PIPE HYDRAULIC DATA
STRUCTURE 2513 Sta. 329+70

DRAINAGE AREA	=	9.8	AC
DESIGN FREQUENCY	=	50	YRS
DESIGN DISCHARGE	=	18	CFS
DESIGN HW ELEVATION	=	99.3	FT
100 YEAR DISCHARGE	=	20	CFS
100 YEAR HW ELEVATION	=	99.5	FT
OVERTOPPING FREQUENCY	=	200+	YRS
OVERTOPPING DISCHARGE	=	30	CFS
OVERTOPPING ELEVATION	=	100.5	FT

PROJECT REFERENCE NO.	SHEET NO.
R-2582A	49

ROADWAY DESIGN ENGINEER 4/5/2019 — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 046981 FAITH E. JAHNKE — Faith E. Jahnke

HYDRAULICS ENGINEER 4/5/2019 — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 037863 MEMO D. BUSCEMI — Memo D. Buscemi

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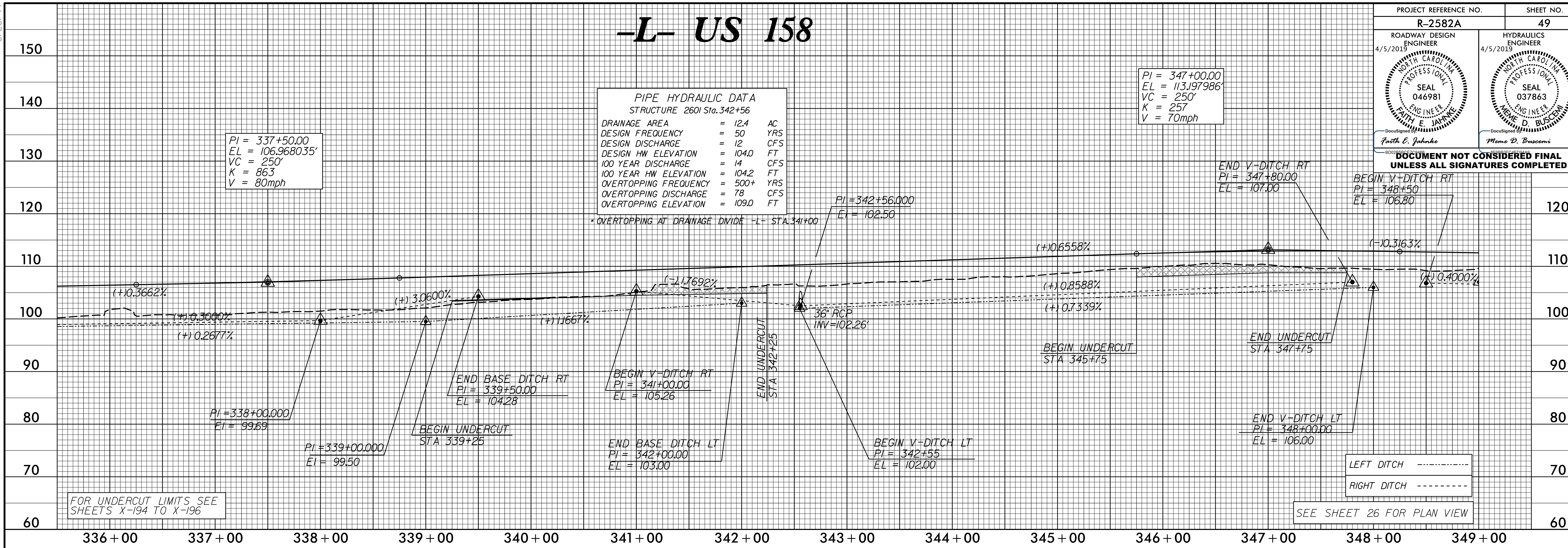
-L- US 158

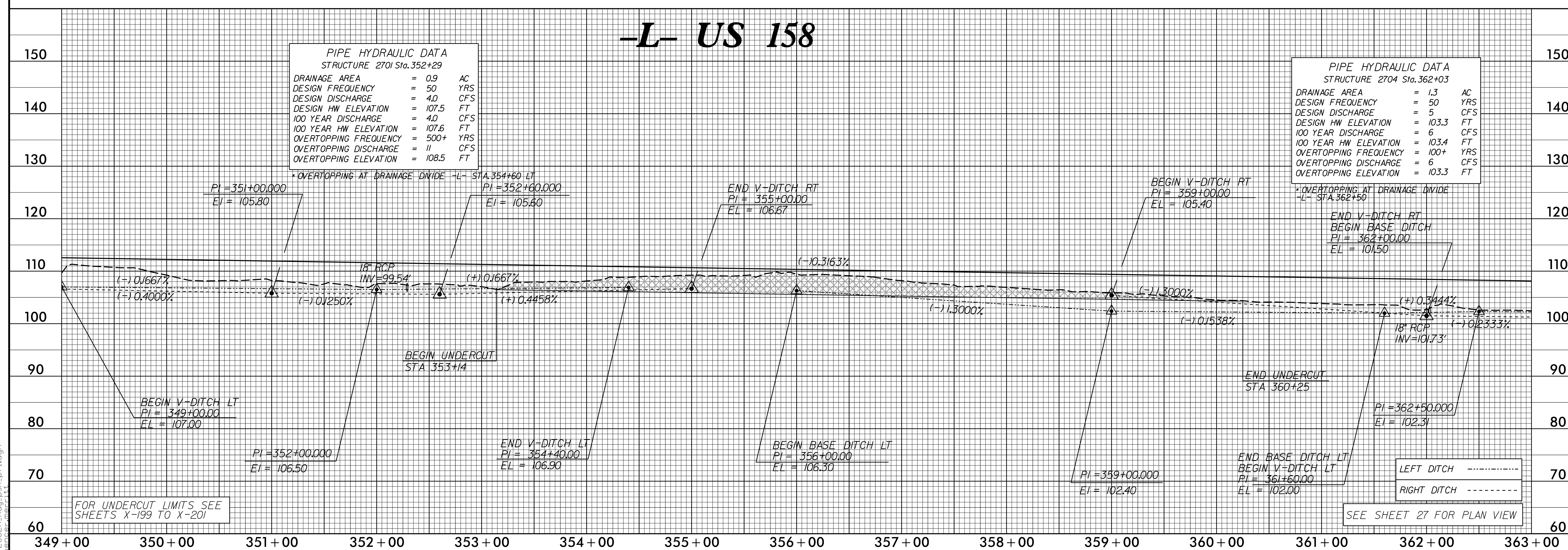


5/28/99
PI = 337+50.00
EL = 106.968035'
VC = 250'
K = 863
V = 80mph
PI = 347+00.00
EL = 113.197986'
VC = 250'
K = 257
V = 70mph
* OVERTOPPING AT DRAINAGE DIVIDE -L- STA.341+00
PI =342+56.000
El = 102.50
END V-DITCH RT
PI = 347+80.00
EL = 107.00
BEGIN V-DITCH RT
PI = 348+50
EL = 106.80
(+)0.6558%
(-)0.3163%
(+)0.3662%
(-)1.7692%
(+)0.8588%
(+)0.7339%
(+) 0.4000%
(+) 3.0600%
(+) 0.3000%
(+) 0.2677%
(+) 1.1667%
36" RCP
INV=102.26'
BEGIN UNDERCUT
STA 345+75
END UNDERCUT
STA 347+75
END UNDERCUT
STA 342+25
END BASE DITCH RT
PI = 339+50.00
EL = 104.28
BEGIN V-DITCH RT
PI = 341+00.00
EL = 105.26
PI =338+00.000
El = 99.69
BEGIN UNDERCUT
STA 339+25
PI =339+00.000
El = 99.50
END BASE DITCH LT
PI = 342+00.00
EL = 103.00
BEGIN V-DITCH LT
PI = 342+55
EL = 102.00
END V-DITCH LT
PI = 348+00.00
EL = 106.00
LEFT DITCH
RIGHT DITCH
FOR UNDERCUT LIMITS SEE SHEETS X-194 TO X-196
SEE SHEET 26 FOR PLAN VIEW
150
140
130
120
110
100
90
80
70
60
336+00
337+00
338+00
339+00
340+00
341+00
342+00
343+00
344+00
345+00
346+00
347+00
348+00
349+00

PIPE HYDRAULIC DATA
STRUCTURE 2601 Sta. 342+56

DRAINAGE AREA	=	12.4	AC
DESIGN FREQUENCY	=	50	YRS
DESIGN DISCHARGE	=	12	CFS
DESIGN HW ELEVATION	=	104.0	FT
100 YEAR DISCHARGE	=	14	CFS
100 YEAR HW ELEVATION	=	104.2	FT
OVERTOPPING FREQUENCY	=	500+	YRS
OVERTOPPING DISCHARGE	=	78	CFS
OVERTOPPING ELEVATION	=	109.0	FT

-L- US 158



* OVERTOPPING AT DRAINAGE DIVIDE -L- STA.354+60 LT
PI =351+00.000
El = 105.80
PI =352+60.000
El = 105.60
END V-DITCH RT
PI = 355+00.00
EL = 106.67
BEGIN V-DITCH RT
PI = 359+00.00
EL = 105.40
* OVERTOPPING AT DRAINAGE DIVIDE -L- STA.362+50
END V-DITCH RT
BEGIN BASE DITCH
PI = 362+00.00
EL = 101.50
18" RCP
INV=99.54'
(-) 0.1667%
(-) 0.4000%
(-) 0.1250%
(+) 0.1667%
(+) 0.4458%
(-)0.3163%
(-) 1.3000%
(-) 1.3000%
(-) 0.1538%
(+) 0.3444%
(-) 0.2333%
18" RCP
INV=101.73'
BEGIN UNDERCUT
STA 353+14
END UNDERCUT
STA 360+25
BEGIN V-DITCH LT
PI = 349+00.00
EL = 107.00
PI =352+00.000
El = 106.50
END V-DITCH LT
PI = 354+40.00
EL = 106.90
BEGIN BASE DITCH LT
PI = 356+00.00
EL = 106.30
PI =359+00.000
El = 102.40
END BASE DITCH LT
BEGIN V-DITCH LT
PI = 361+60.00
EL = 102.00
PI =362+50.000
El = 102.31
LEFT DITCH
RIGHT DITCH
FOR UNDERCUT LIMITS SEE SHEETS X-199 TO X-201
SEE SHEET 27 FOR PLAN VIEW
150
140
130
120
110
100
90
80
70
60
349+00
350+00
351+00
352+00
353+00
354+00
355+00
356+00
357+00
358+00
359+00
360+00
361+00
362+00
363+00

PIPE HYDRAULIC DATA
STRUCTURE 2701 Sta. 352+29

DRAINAGE AREA	=	0.9	AC
DESIGN FREQUENCY	=	50	YRS
DESIGN DISCHARGE	=	4.0	CFS
DESIGN HW ELEVATION	=	107.5	FT
100 YEAR DISCHARGE	=	4.0	CFS
100 YEAR HW ELEVATION	=	107.6	FT
OVERTOPPING FREQUENCY	=	500+	YRS
OVERTOPPING DISCHARGE	=	11	CFS
OVERTOPPING ELEVATION	=	108.5	FT

PIPE HYDRAULIC DATA
STRUCTURE 2704 Sta. 362+03

DRAINAGE AREA	=	1.3	AC
DESIGN FREQUENCY	=	50	YRS
DESIGN DISCHARGE	=	5	CFS
DESIGN HW ELEVATION	=	103.3	FT
100 YEAR DISCHARGE	=	6	CFS
100 YEAR HW ELEVATION	=	103.4	FT
OVERTOPPING FREQUENCY	=	100+	YRS
OVERTOPPING DISCHARGE	=	6	CFS
OVERTOPPING ELEVATION	=	103.3	FT

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PROJECT REFERENCE NO.	SHEET NO.
R–2582A	50

ROADWAY DESIGN ENGINEER — 4/5/2019 — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 046981 FAITH E. JAHNKE — DocuSigned by: Faith E. Jahnke

HYDRAULICS ENGINEER — 4/5/2019 — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 037863 MEME D. BUSCEMI — DocuSigned by: Meme D. Buscemi

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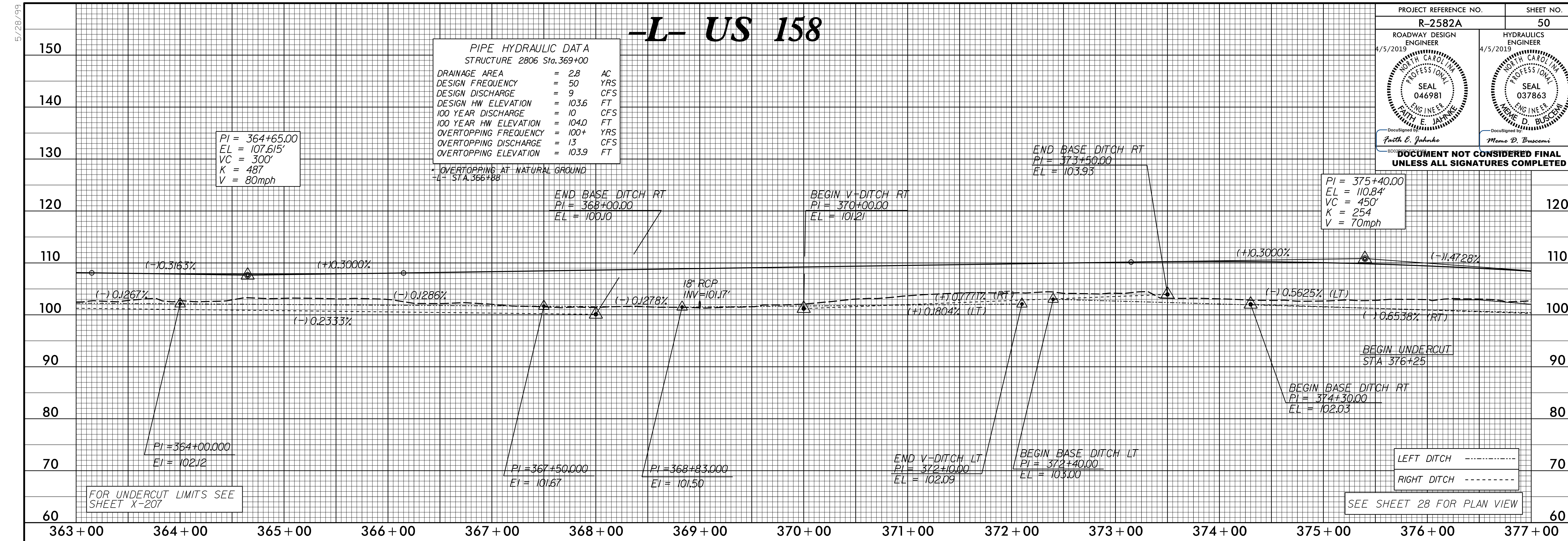
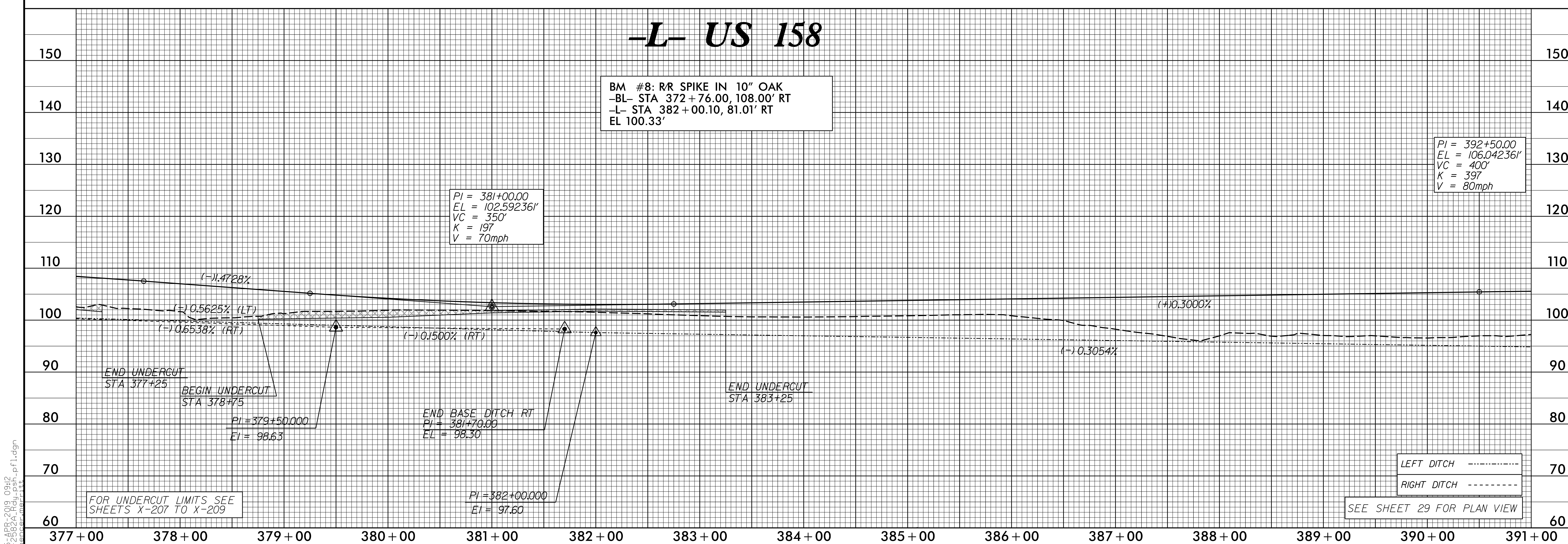

5/28/99
-L- US 158
PIPE HYDRAULIC DATA
STRUCTURE 2806 Sta.369+00
DRAINAGE AREA = 2.8 AC
DESIGN FREQUENCY = 50 YRS
DESIGN DISCHARGE = 9 CFS
DESIGN HW ELEVATION = 103.6 FT
100 YEAR DISCHARGE = 10 CFS
100 YEAR HW ELEVATION = 104.0 FT
OVERTOPPING FREQUENCY = 100+ YRS
OVERTOPPING DISCHARGE = 13 CFS
OVERTOPPING ELEVATION = 103.9 FT
* OVERTOPPING AT NATURAL GROUND -L- STA.366+88
PI = 364+65.00 EL = 107.615' VC = 300' K = 487 V = 80mph
END BASE DITCH RT PI = 368+00.00 EL = 100.10
BEGIN V-DITCH RT PI = 370+00.00 EL = 101.21
END BASE DITCH RT PI = 373+50.00 EL = 103.93
PI = 375+40.00 EL = 110.84' VC = 450' K = 254 V = 70mph
(-)0.3163%
(+)0.3000%
(+)0.3000%
(-)1.4728%
(-) 0.1267%
(-) 0.1286%
(-) 0.1278%
18" RCP INV=101.17'
(+) 0.7717% (RT)
(+) 0.1804% (LT)
(-) 0.5625% (LT)
(-) 0.6538% (RT)
(-) 0.2333%
BEGIN UNDERCUT STA 376+25
BEGIN BASE DITCH RT PI = 374+30.00 EL = 102.03
PI =364+00.000 El = 102.12
PI =367+50.000 El = 101.67
PI =368+83.000 El = 101.50
END V-DITCH LT PI = 372+10.00 EL = 102.09
BEGIN BASE DITCH LT PI = 372+40.00 EL = 103.00
LEFT DITCH
RIGHT DITCH
FOR UNDERCUT LIMITS SEE SHEET X-207
SEE SHEET 28 FOR PLAN VIEW
150 140 130 120 110 100 90 80 70 60
363+00 364+00 365+00 366+00 367+00 368+00 369+00 370+00 371+00 372+00 373+00 374+00 375+00 376+00 377+00


-L- US 158
BM #8: R/R SPIKE IN 10" OAK
-BL- STA 372+76.00, 108.00' RT
-L- STA 382+00.10, 81.01' RT
EL 100.33'
PI = 392+50.00 EL = 106.042361' VC = 400' K = 397 V = 80mph
PI = 381+00.00 EL = 102.592361' VC = 350' K = 197 V = 70mph
(-)1.4728%
(-) 0.5625% (LT)
(-) 0.6538% (RT)
(-) 0.1500% (RT)
(+)0.3000%
(-) 0.3054%
END UNDERCUT STA 377+25
BEGIN UNDERCUT STA 378+75
END UNDERCUT STA 383+25
PI =379+50.000 El = 98.63
END BASE DITCH RT PI = 381+70.00 EL = 98.30
PI =382+00.000 El = 97.60
LEFT DITCH
RIGHT DITCH
FOR UNDERCUT LIMITS SEE SHEETS X-207 TO X-209
SEE SHEET 29 FOR PLAN VIEW
150 140 130 120 110 100 90 80 70 60
377+00 378+00 379+00 380+00 381+00 382+00 383+00 384+00 385+00 386+00 387+00 388+00 389+00 390+00 391+00
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PROJECT REFERENCE NO.	SHEET NO.
R-2582A	51

ROADWAY DESIGN ENGINEER — 4/5/2019 — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 046981 FAITH E. JAHNKE — DocuSigned by: Faith E. Jahnke

HYDRAULICS ENGINEER — 4/5/2019 — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 037863 MEME D. BUSCEMI — DocuSigned by: Meme D. Buscemi

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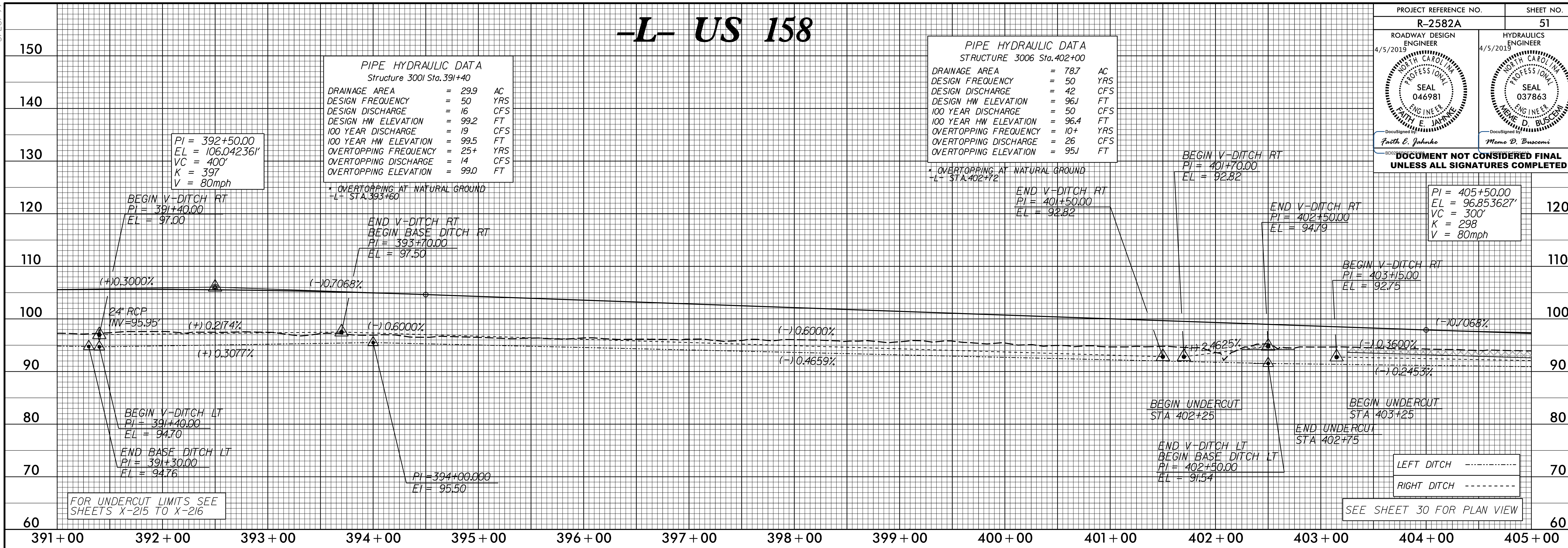
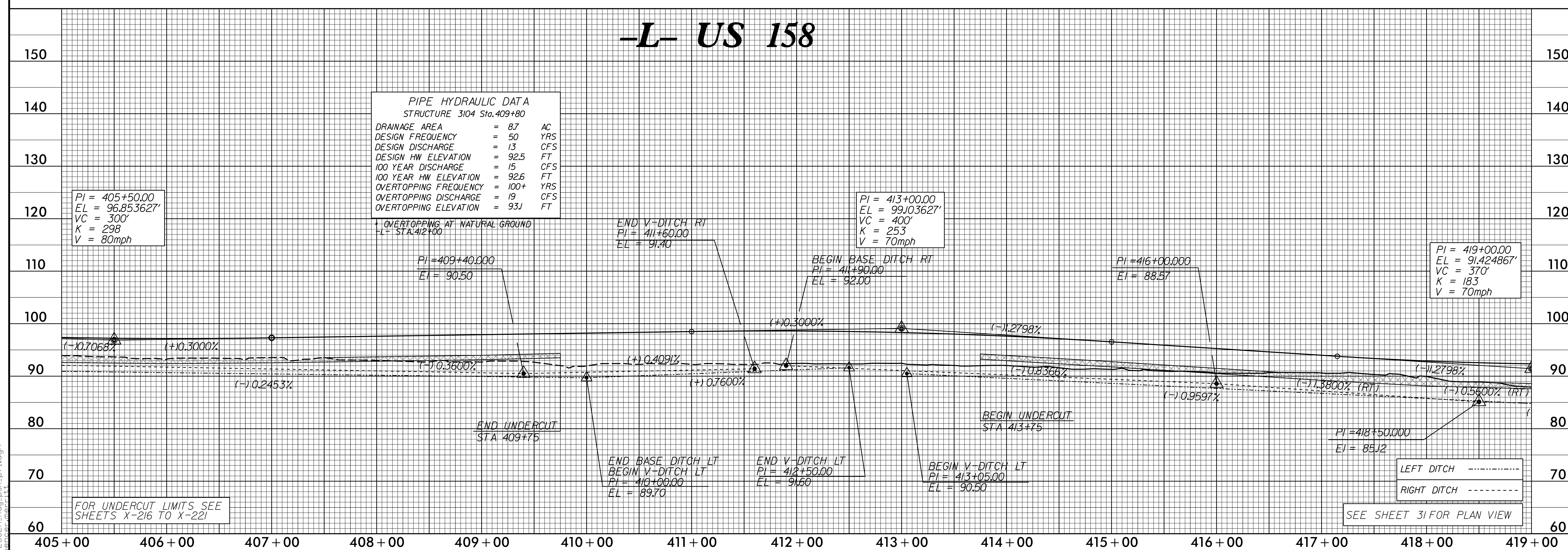
-L- US 158



PIPE HYDRAULIC DATA
Structure 3001 Sta. 391+40
DRAINAGE AREA = 29.9 AC
DESIGN FREQUENCY = 50 YRS
DESIGN DISCHARGE = 16 CFS
DESIGN HW ELEVATION = 99.2 FT
100 YEAR DISCHARGE = 19 CFS
100 YEAR HW ELEVATION = 99.5 FT
OVERTOPPING FREQUENCY = 25+ YRS
OVERTOPPING DISCHARGE = 14 CFS
OVERTOPPING ELEVATION = 99.0 FT
* OVERTOPPING AT NATURAL GROUND -L- STA. 393+60
PIPE HYDRAULIC DATA
STRUCTURE 3006 Sta. 402+00
DRAINAGE AREA = 78.7 AC
DESIGN FREQUENCY = 50 YRS
DESIGN DISCHARGE = 42 CFS
DESIGN HW ELEVATION = 96.1 FT
100 YEAR DISCHARGE = 50 CFS
100 YEAR HW ELEVATION = 96.4 FT
OVERTOPPING FREQUENCY = 10+ YRS
OVERTOPPING DISCHARGE = 26 CFS
OVERTOPPING ELEVATION = 95.1 FT
* OVERTOPPING AT NATURAL GROUND -L- STA. 402+72
PI = 392+50.00
EL = 106.042361'
VC = 400'
K = 397
V = 80mph
BEGIN V-DITCH RT
PI = 391+40.00
EL = 97.00
END V-DITCH RT
BEGIN BASE DITCH RT
PI = 393+70.00
EL = 97.50
(+)0.3000%
(-)0.7068%
24" RCP
INV=95.95'
(+) 0.2174%
(-) 0.6000%
(+) 0.3077%
(-) 0.6000%
(-) 0.4659%
BEGIN V-DITCH LT
PI = 391+40.00
EL = 94.70
END BASE DITCH LT
PI = 391+30.00
EL = 94.76
PI = 394+00.000
EI = 95.50
FOR UNDERCUT LIMITS SEE SHEETS X-215 TO X-216
BEGIN V-DITCH RT
PI = 401+70.00
EL = 92.82
END V-DITCH RT
PI = 401+50.00
EL = 92.82
END V-DITCH RT
PI = 402+50.00
EL = 94.79
PI = 405+50.00
EL = 96.853627'
VC = 300'
K = 298
V = 80mph
BEGIN V-DITCH RT
PI = 403+15.00
EL = 92.75
(-)0.7068%
(+) 2.4625%
(-) 0.3600%
(-) 0.2453%
BEGIN UNDERCUT
STA 402+25
BEGIN UNDERCUT
STA 403+25
END UNDERCUT
STA 402+75
END V-DITCH LT
BEGIN BASE DITCH LT
PI = 402+50.00
EL = 91.54
LEFT DITCH
RIGHT DITCH
SEE SHEET 30 FOR PLAN VIEW
150 140 130 120 110 100 90 80 70 60
391+00 392+00 393+00 394+00 395+00 396+00 397+00 398+00 399+00 400+00 401+00 402+00 403+00 404+00 405+00

-L- US 158



PIPE HYDRAULIC DATA
STRUCTURE 3104 Sta. 409+80
DRAINAGE AREA = 8.7 AC
DESIGN FREQUENCY = 50 YRS
DESIGN DISCHARGE = 13 CFS
DESIGN HW ELEVATION = 92.5 FT
100 YEAR DISCHARGE = 15 CFS
100 YEAR HW ELEVATION = 92.6 FT
OVERTOPPING FREQUENCY = 100+ YRS
OVERTOPPING DISCHARGE = 19 CFS
OVERTOPPING ELEVATION = 93.1 FT
* OVERTOPPING AT NATURAL GROUND -L- STA. 412+00
PI = 405+50.00
EL = 96.853627'
VC = 300'
K = 298
V = 80mph
PI = 409+40.000
EI = 90.50
END V-DITCH RT
PI = 411+60.00
EL = 91.40
PI = 413+00.00
EL = 99.103627'
VC = 400'
K = 253
V = 70mph
BEGIN BASE DITCH RT
PI = 411+90.00
EL = 92.00
PI = 416+00.000
EI = 88.57
PI = 419+00.00
EL = 91.424867'
VC = 370'
K = 183
V = 70mph
(-)0.7068%
(+)0.3000%
(-) 0.3600%
(-) 0.2453%
(+) 0.4091%
(+) 0.7600%
(+)0.3000%
(-)1.2798%
(-) 0.8366%
(-) 0.9597%
(-)1.3800% (RT)
(-)1.2798%
(-) 0.5600% (RT)
END UNDERCUT
STA 409+75
BEGIN UNDERCUT
STA 413+75
END BASE DITCH LT
BEGIN V-DITCH LT
PI = 410+00.00
EL = 89.70
END V-DITCH LT
PI = 412+50.00
EL = 91.60
BEGIN V-DITCH LT
PI = 413+05.00
EL = 90.50
PI = 418+50.000
EI = 85.12
FOR UNDERCUT LIMITS SEE SHEETS X-216 TO X-221
LEFT DITCH
RIGHT DITCH
SEE SHEET 31 FOR PLAN VIEW
150 140 130 120 110 100 90 80 70 60
405+00 406+00 407+00 408+00 409+00 410+00 411+00 412+00 413+00 414+00 415+00 416+00 417+00 418+00 419+00

5/28/99
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PROJECT REFERENCE NO.	SHEET NO.
R-2582A	52

HYDRAULICS ENGINEER	ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
8/17/2020 NORTH CAROLINA PROFESSIONAL SEAL 049357 ENGINEER JOY SADDLER DocuSigned by: A947BCDC06A54A5... FOR REVISIONS ONLY	NOT A CERTIFIED DOCUMENT AS TO THE ORIGINAL DOCUMENT BUT ONLY AS TO THE REVISIONS. THIS DOCUMENT ORIGINALLY ISSUED AND SEALED BY : FAITH E. JAHNKE LIC. NO. 046981 ON 4/5/19 THIS DOCUMENT IS ONLY CERTIFIED AS TO THE REVISIONS.	NOT A CERTIFIED DOCUMENT AS TO THE ORIGINAL DOCUMENT BUT ONLY AS TO THE REVISIONS. THIS DOCUMENT ORIGINALLY ISSUED AND SEALED BY : MEME D. BUSCEMI LIC. NO. 037863 ON 4/5/19 THIS DOCUMENT IS ONLY CERTIFIED AS TO THE REVISIONS.

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REVISIONS

CONSTRUCTION REVISION: THE CROSSOVER ALIGNMENTS -L_CR_EBL- AND -L_CR_WBL- HAVE BEEN REVISED TO AVOID WETLAND IMPACTS AROUND -L- STA 453+50.00 RT. AS A RESULT THE DITCHES ON THE LEFT AND RIGHT HAVE BEEN REVISED STARTING AT -L- STA 441+50.00. JPM 7/7/2020

5/28/99

-L- US 158

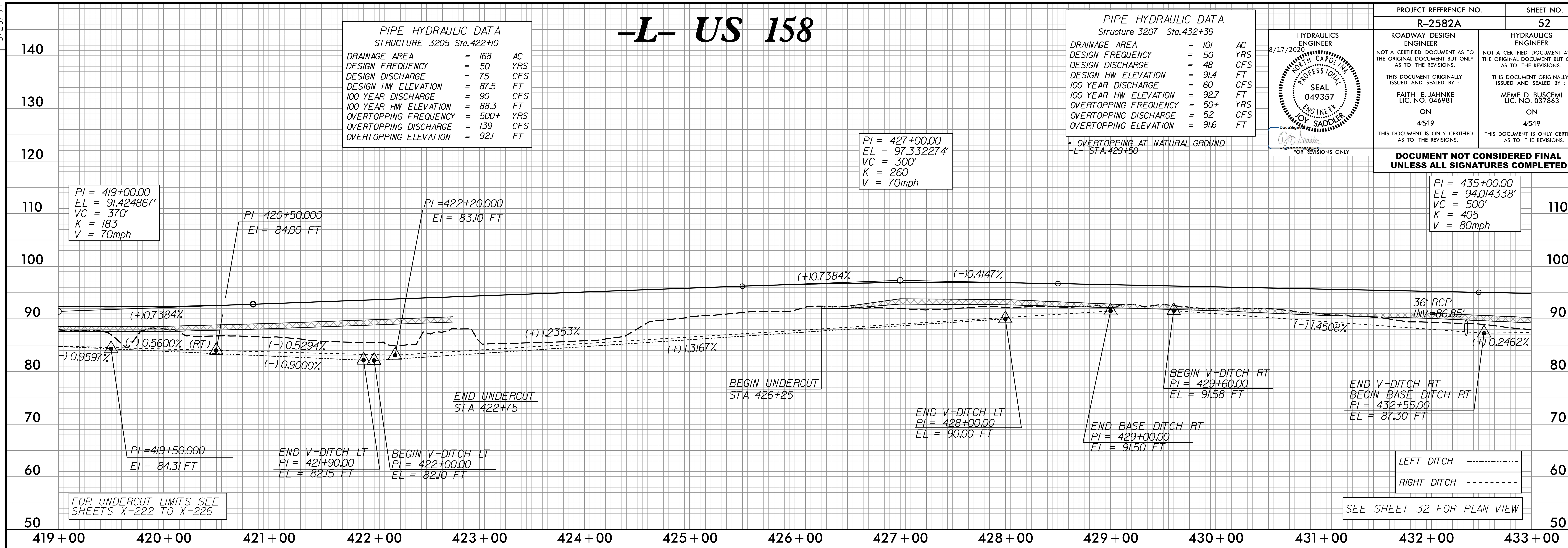
PIPE HYDRAULIC DATA
STRUCTURE 3205 Sta. 422+10

DRAINAGE AREA	=	168	AC
DESIGN FREQUENCY	=	50	YRS
DESIGN DISCHARGE	=	75	CFS
DESIGN HW ELEVATION	=	87.5	FT
100 YEAR DISCHARGE	=	90	CFS
100 YEAR HW ELEVATION	=	88.3	FT
OVERTOPPING FREQUENCY	=	500+	YRS
OVERTOPPING DISCHARGE	=	139	CFS
OVERTOPPING ELEVATION	=	92.1	FT

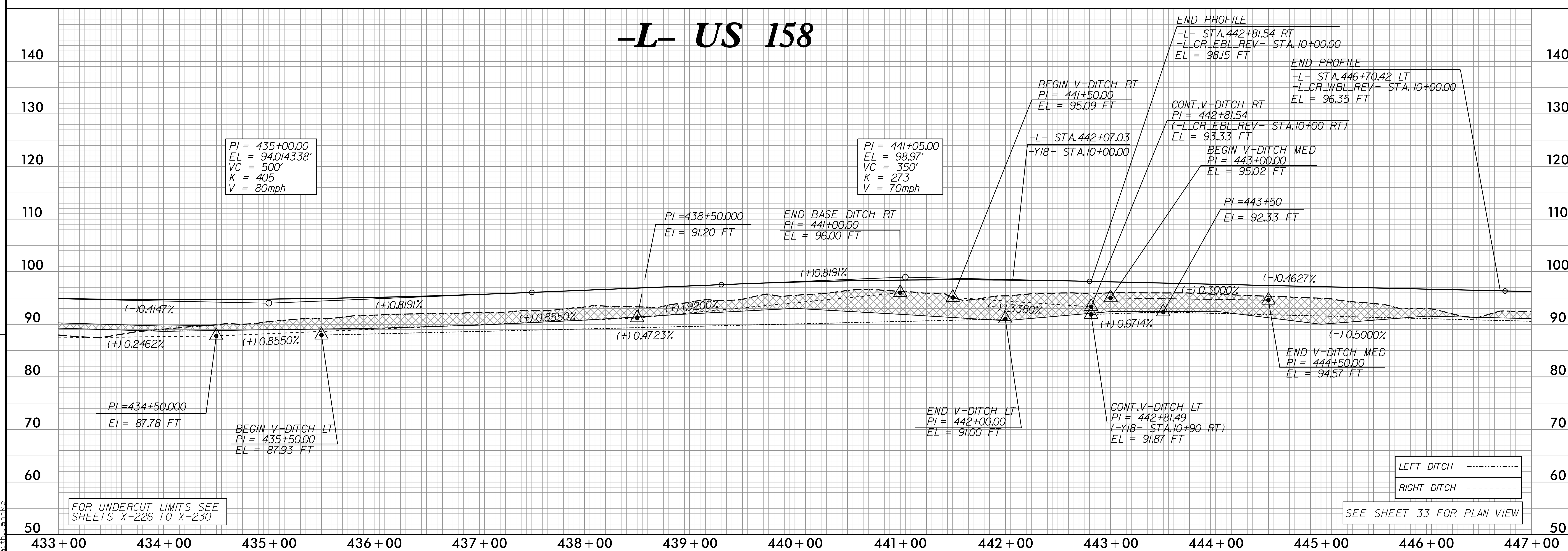
PIPE HYDRAULIC DATA
Structure 3207 Sta. 432+39

DRAINAGE AREA	=	101	AC
DESIGN FREQUENCY	=	50	YRS
DESIGN DISCHARGE	=	48	CFS
DESIGN HW ELEVATION	=	91.4	FT
100 YEAR DISCHARGE	=	60	CFS
100 YEAR HW ELEVATION	=	92.7	FT
OVERTOPPING FREQUENCY	=	50+	YRS
OVERTOPPING DISCHARGE	=	52	CFS
OVERTOPPING ELEVATION	=	91.6	FT

* OVERTOPPING AT NATURAL GROUND -L- STA. 429+50



-L- US 158



17-AUG-2020 08:05
R-2582A_Rdy_psh_pf1.dgn
Faith Jahnke

PROJECT REFERENCE NO.	SHEET NO.
R-2582A	53

HYDRAULICS ENGINEER 8/13/2020 — SEAL 049357 NORTH CAROLINA PROFESSIONAL ENGINEER JOY SADDLER — FOR REVISIONS ONLY

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HYDRAULICS ENGINEER — NOT A CERTIFIED DOCUMENT AS TO THE ORIGINAL DOCUMENT BUT ONLY AS TO THE REVISIONS. THIS DOCUMENT ORIGINALLY ISSUED AND SEALED BY: MEME D. BUSCEMI LIC. NO. 037863 ON 4/5/19 THIS DOCUMENT IS ONLY CERTIFIED AS TO THE REVISIONS.

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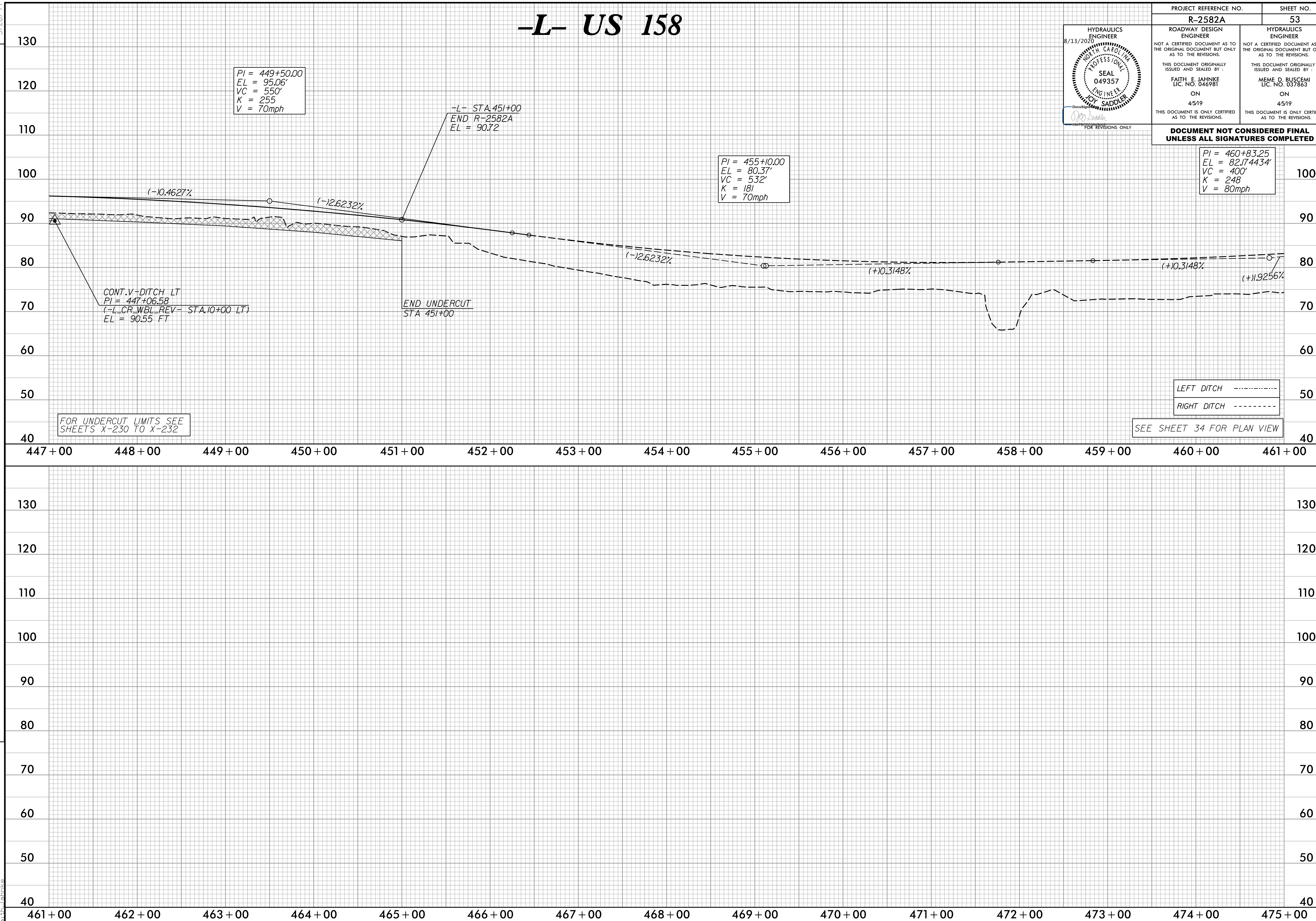
-L- US 158



CONSTRUCTION REVISION: L_CR_WBL_REV DITCH CALLOUT ADDED.JPM 7/7/2020

5/28/99

13-AUG-2020 08:47 R-2582A_Rdy_psh_pf1.dgn Faith.Jahnke

PROJECT REFERENCE NO.	SHEET NO.
R-2582A	54

ROADWAY DESIGN ENGINEER
4/5/2019
NORTH CAROLINA PROFESSIONAL SEAL 046981 ENGINEER FAITH E. JAHNKE
DocuSigned by: Faith E. Jahnke
BD02B5BCE7C9466...

HYDRAULICS ENGINEER
4/5/2019
NORTH CAROLINA PROFESSIONAL SEAL 037863 ENGINEER MEME D. BUSCEMI
DocuSigned by: Meme D. Buscemi
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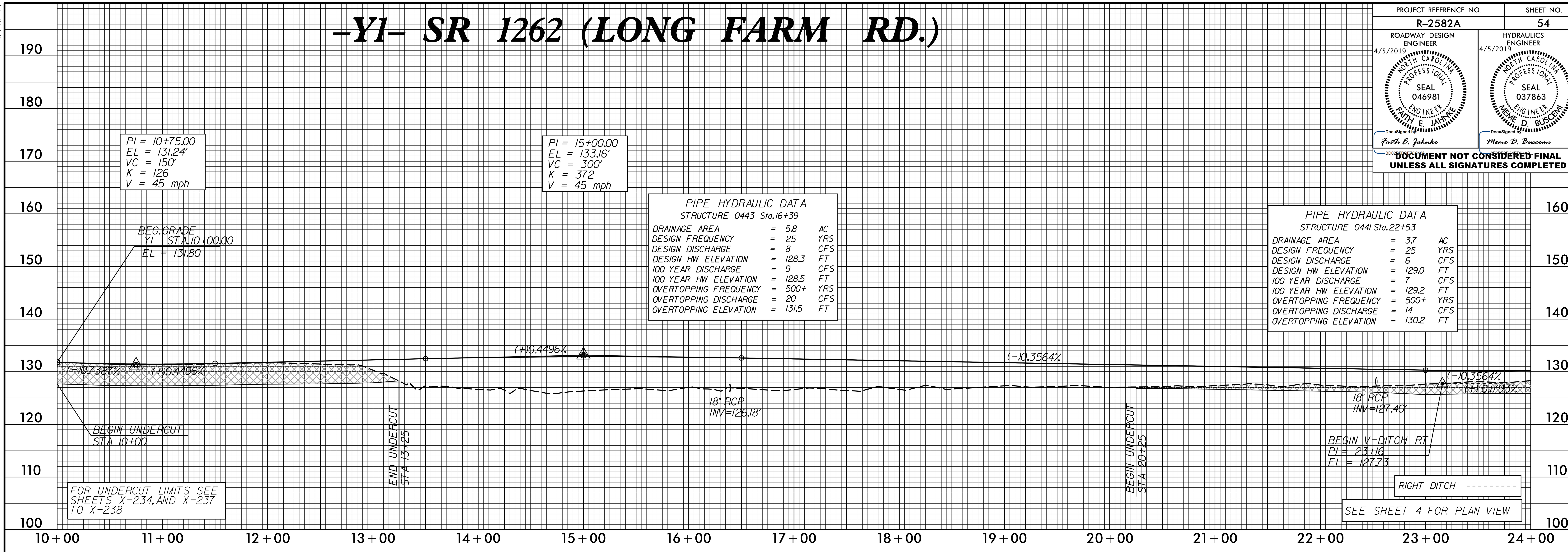
-Y1- SR 1262 (LONG FARM RD.)



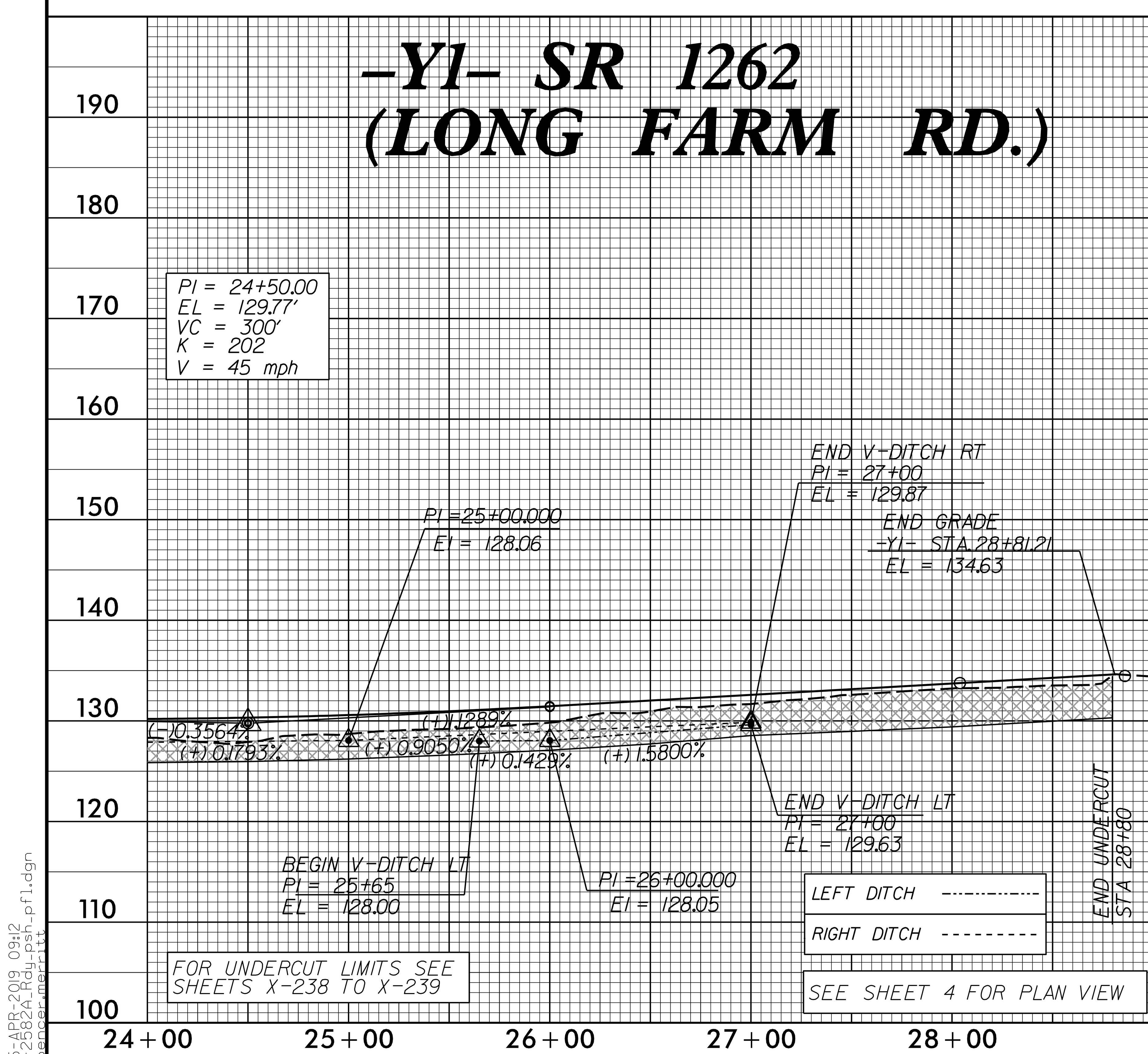
PIPE HYDRAULIC DATA
STRUCTURE 0443 Sta.16+39

DRAINAGE AREA	=	5.8	AC
DESIGN FREQUENCY	=	25	YRS
DESIGN DISCHARGE	=	8	CFS
DESIGN HW ELEVATION	=	128.3	FT
100 YEAR DISCHARGE	=	9	CFS
100 YEAR HW ELEVATION	=	128.5	FT
OVERTOPPING FREQUENCY	=	500+	YRS
OVERTOPPING DISCHARGE	=	20	CFS
OVERTOPPING ELEVATION	=	131.5	FT

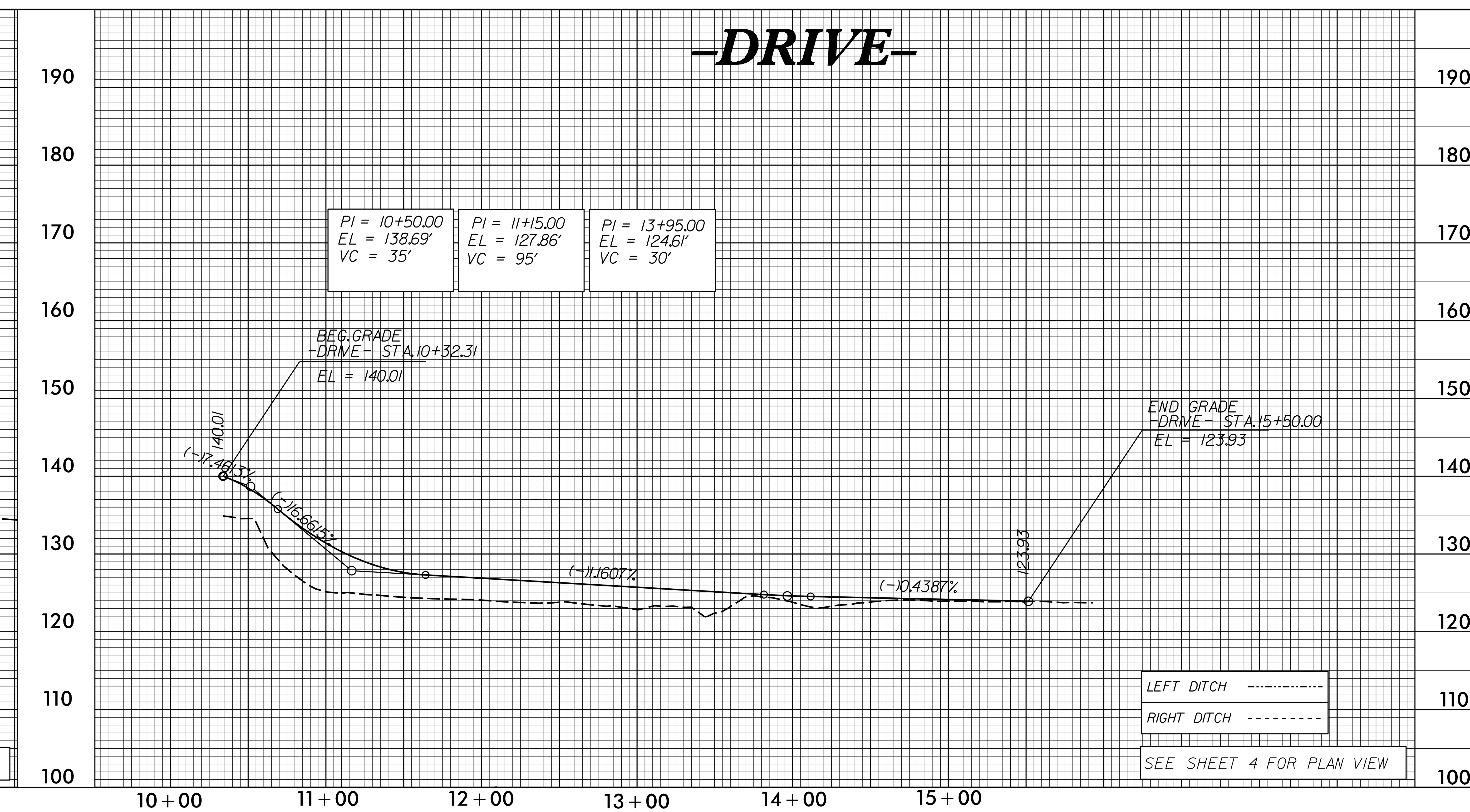
PIPE HYDRAULIC DATA
STRUCTURE 0441 Sta.22+53

DRAINAGE AREA	=	3.7	AC
DESIGN FREQUENCY	=	25	YRS
DESIGN DISCHARGE	=	6	CFS
DESIGN HW ELEVATION	=	129.0	FT
100 YEAR DISCHARGE	=	7	CFS
100 YEAR HW ELEVATION	=	129.2	FT
OVERTOPPING FREQUENCY	=	500+	YRS
OVERTOPPING DISCHARGE	=	14	CFS
OVERTOPPING ELEVATION	=	130.2	FT

-Y1- SR 1262 (LONG FARM RD.)



-DRIVE-



PROJECT REFERENCE NO.	SHEET NO.
R-2582A	55

ROADWAY DESIGN ENGINEER 4/5/2019 — SEAL 046981 — FAITH E. JAHNKE — Faith E. Jahnke

HYDRAULICS ENGINEER 4/5/2019 — SEAL 037863 — MEMÉ D. BUSCEMI — Meme D. Buscemi

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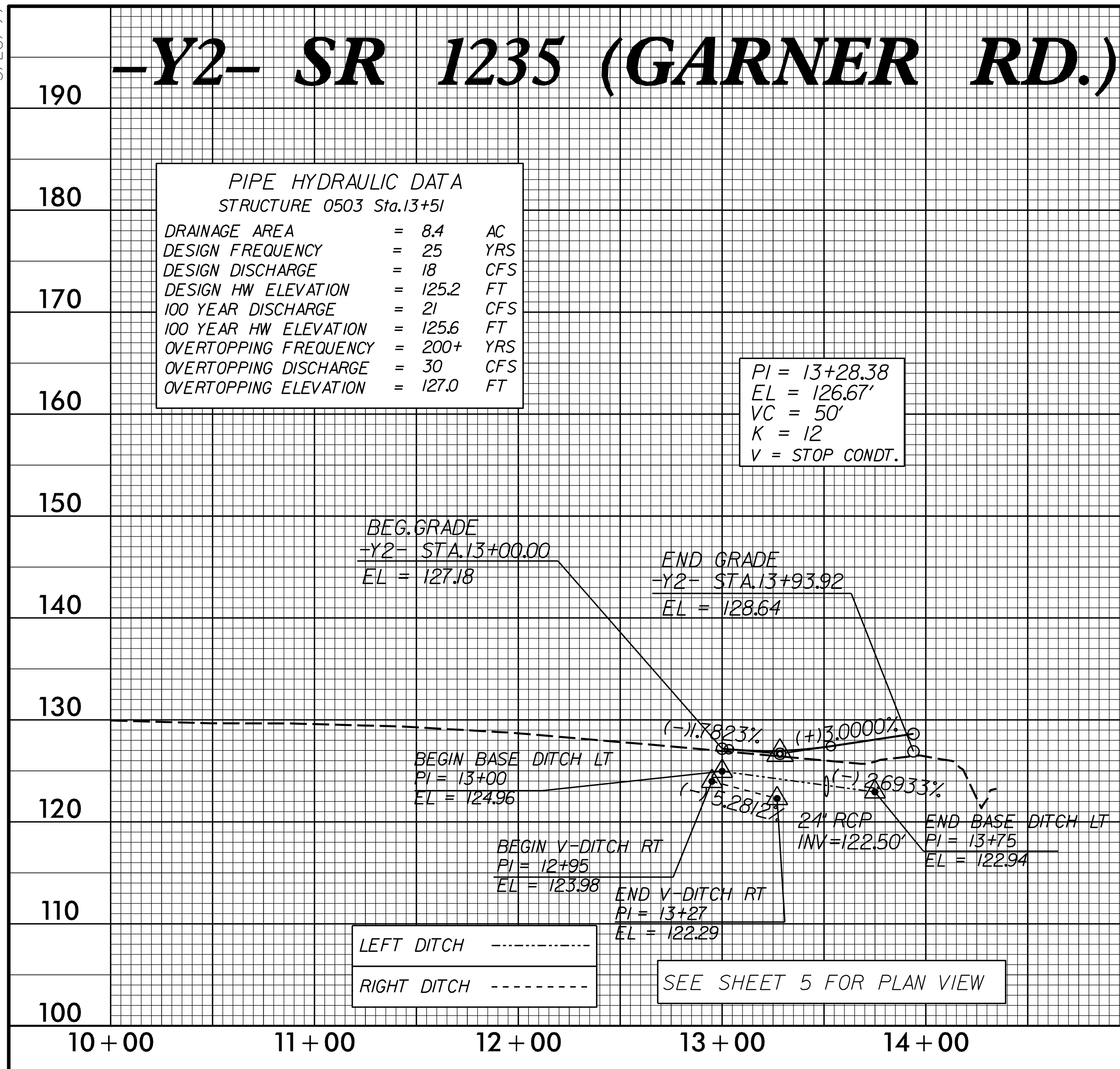
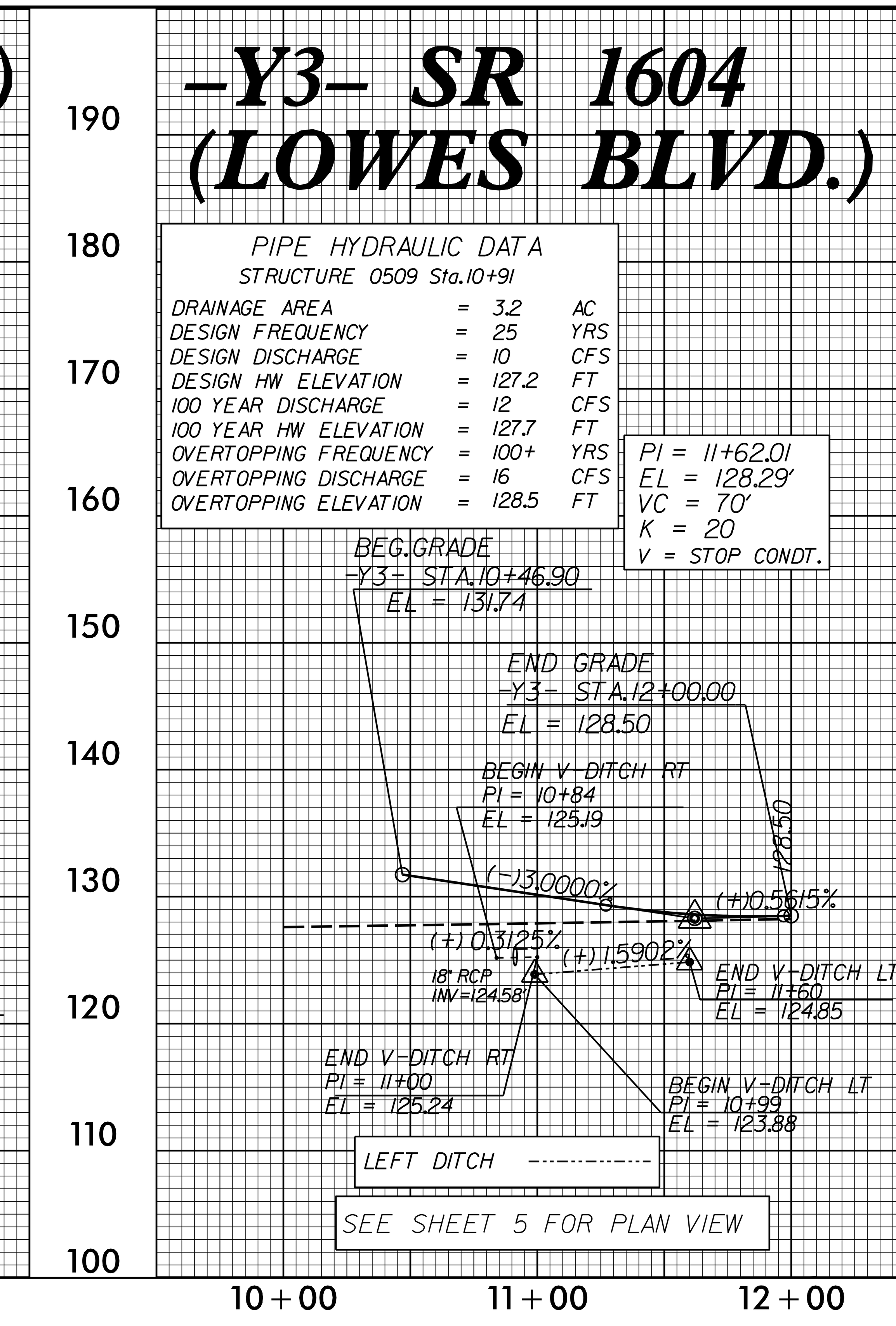
-Y2- SR 1235 (GARNER RD.)



PIPE HYDRAULIC DATA
STRUCTURE 0503 Sta. 13+51

DRAINAGE AREA	=	8.4	AC
DESIGN FREQUENCY	=	25	YRS
DESIGN DISCHARGE	=	18	CFS
DESIGN HW ELEVATION	=	125.2	FT
100 YEAR DISCHARGE	=	21	CFS
100 YEAR HW ELEVATION	=	125.6	FT
OVERTOPPING FREQUENCY	=	200+	YRS
OVERTOPPING DISCHARGE	=	30	CFS
OVERTOPPING ELEVATION	=	127.0	FT

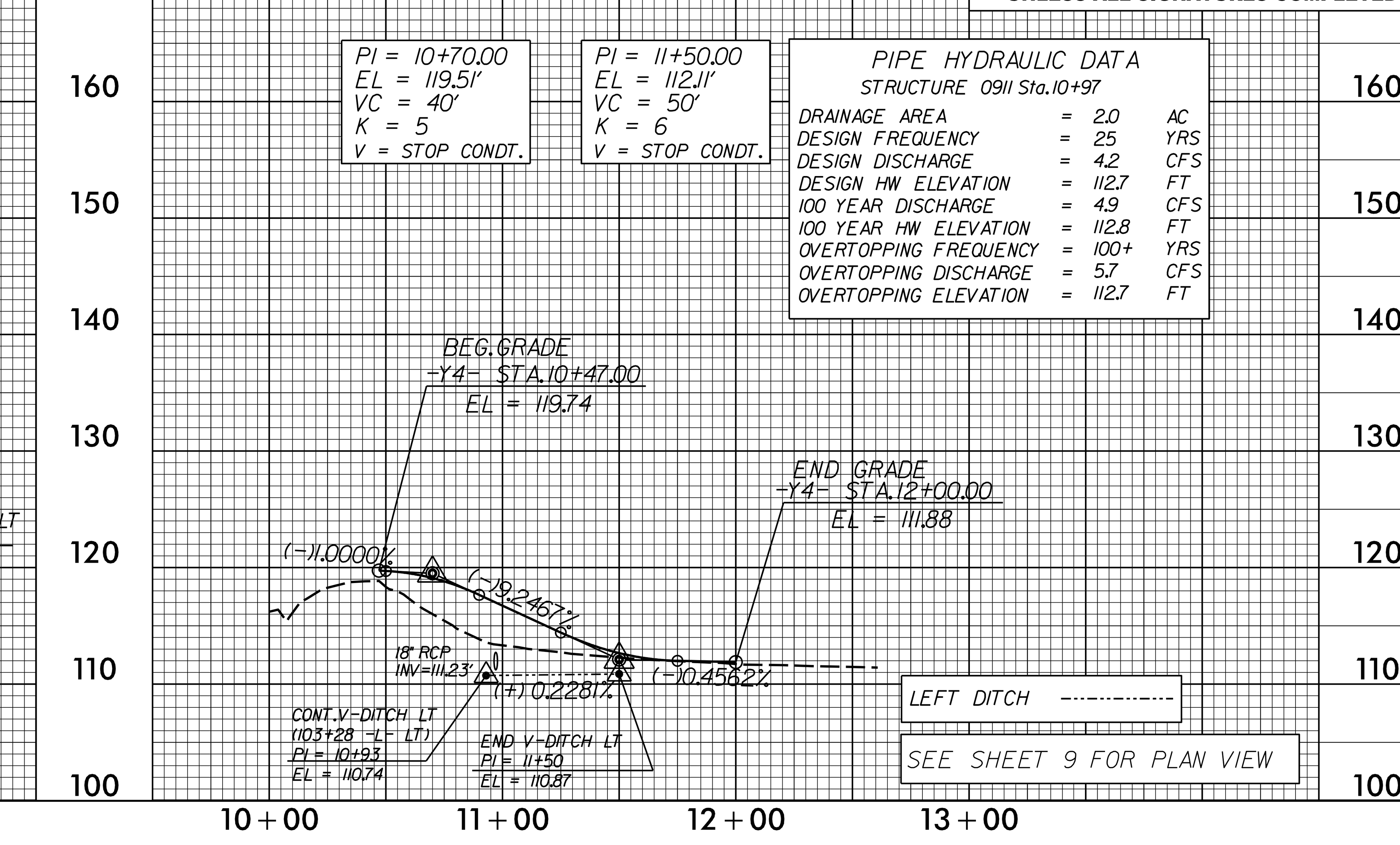
-Y3- SR 1604 (LOWES BLVD.)



PIPE HYDRAULIC DATA
STRUCTURE 0509 Sta. 10+91

DRAINAGE AREA	=	3.2	AC
DESIGN FREQUENCY	=	25	YRS
DESIGN DISCHARGE	=	10	CFS
DESIGN HW ELEVATION	=	127.2	FT
100 YEAR DISCHARGE	=	12	CFS
100 YEAR HW ELEVATION	=	127.7	FT
OVERTOPPING FREQUENCY	=	100+	YRS
OVERTOPPING DISCHARGE	=	16	CFS
OVERTOPPING ELEVATION	=	128.5	FT

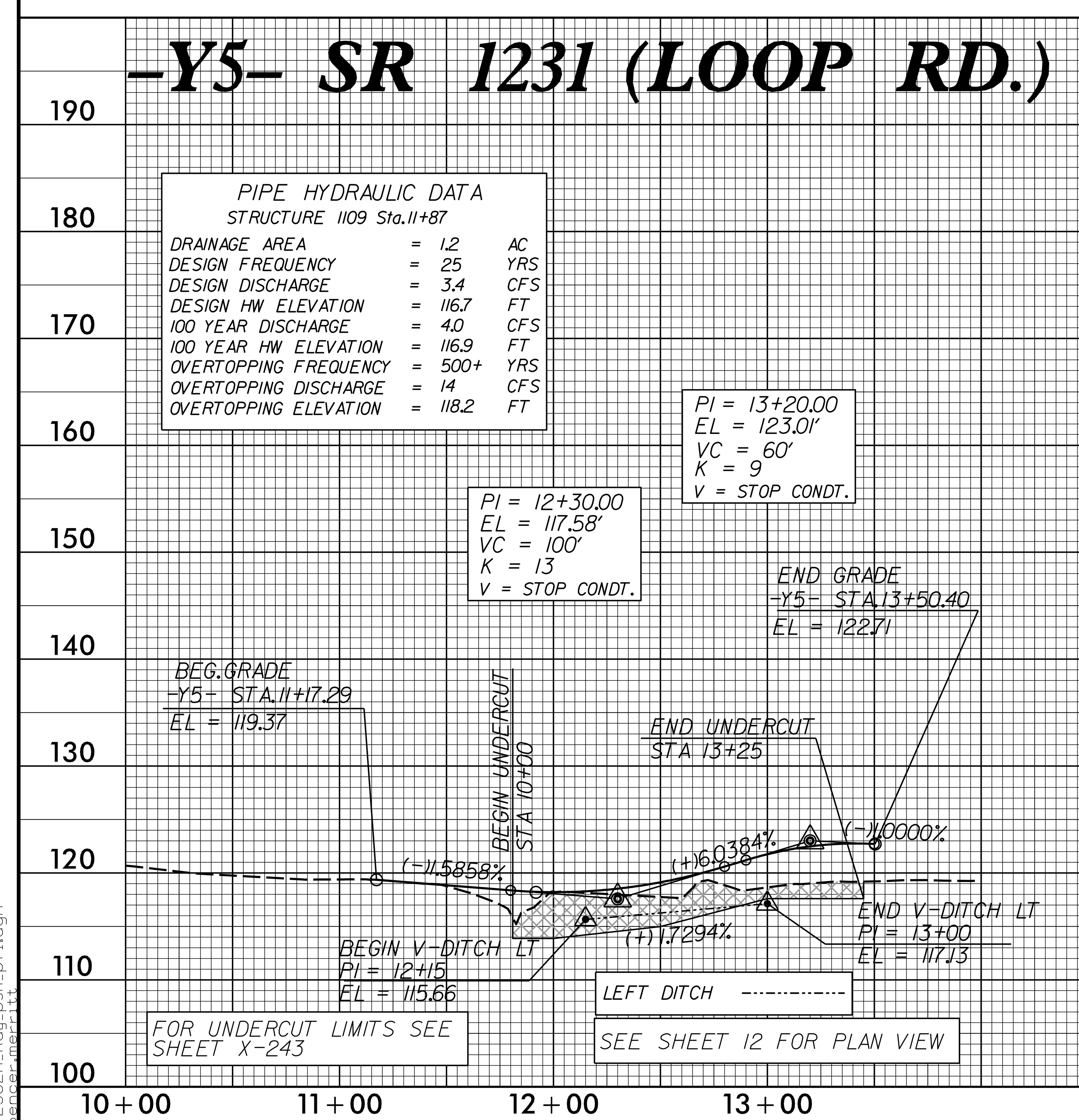
-Y4-



PIPE HYDRAULIC DATA
STRUCTURE 0911 Sta. 10+97

DRAINAGE AREA	=	2.0	AC
DESIGN FREQUENCY	=	25	YRS
DESIGN DISCHARGE	=	4.2	CFS
DESIGN HW ELEVATION	=	112.7	FT
100 YEAR DISCHARGE	=	4.9	CFS
100 YEAR HW ELEVATION	=	112.8	FT
OVERTOPPING FREQUENCY	=	100+	YRS
OVERTOPPING DISCHARGE	=	5.7	CFS
OVERTOPPING ELEVATION	=	112.7	FT

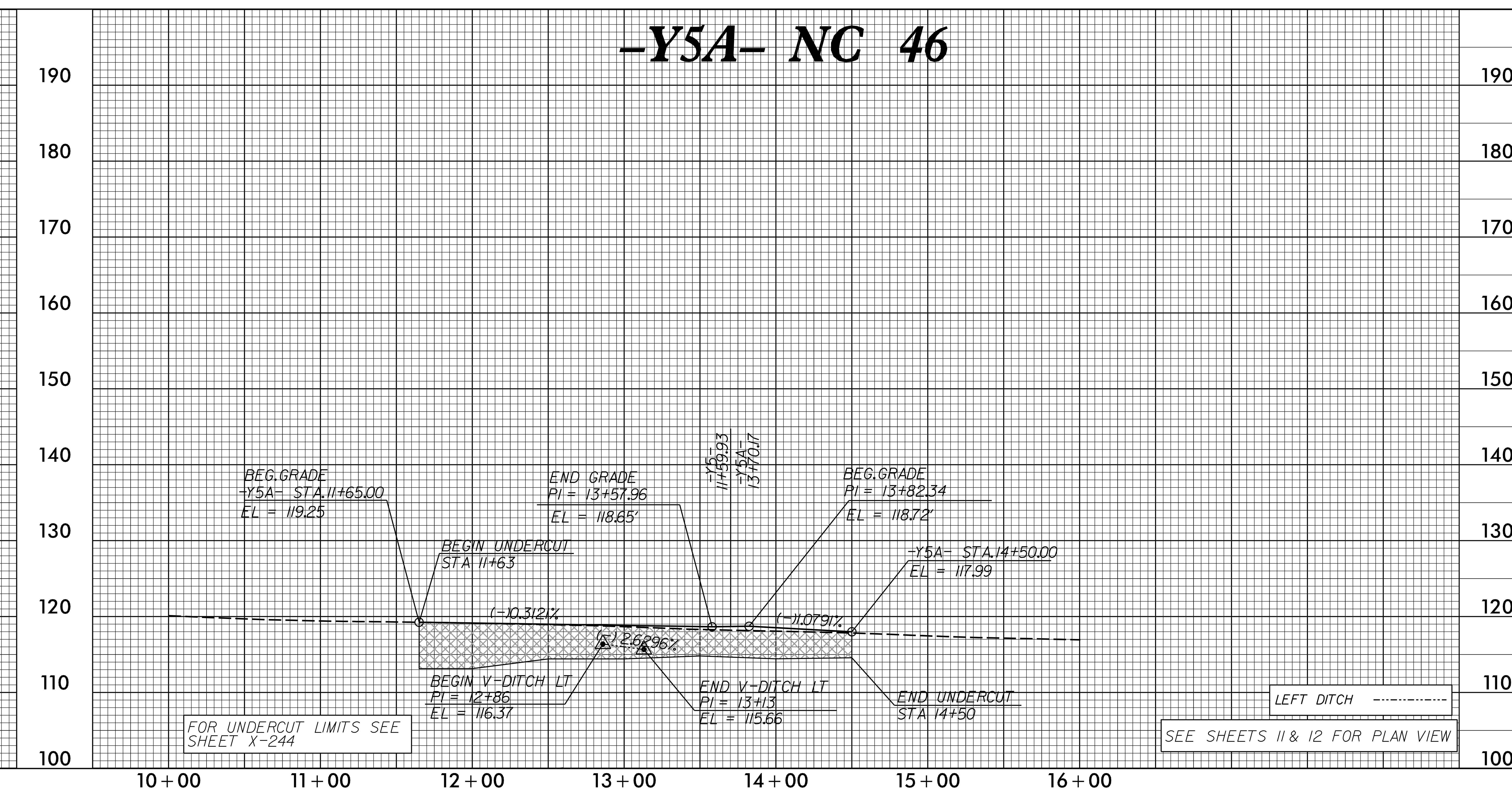
-Y5- SR 1231 (LOOP RD.)



PIPE HYDRAULIC DATA
STRUCTURE 1109 Sta. 11+87

DRAINAGE AREA	=	1.2	AC
DESIGN FREQUENCY	=	25	YRS
DESIGN DISCHARGE	=	3.4	CFS
DESIGN HW ELEVATION	=	116.7	FT
100 YEAR DISCHARGE	=	4.0	CFS
100 YEAR HW ELEVATION	=	116.9	FT
OVERTOPPING FREQUENCY	=	500+	YRS
OVERTOPPING DISCHARGE	=	14	CFS
OVERTOPPING ELEVATION	=	118.2	FT

-Y5A- NC 46



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PROJECT REFERENCE NO.	SHEET NO.
R-2582A	56

ROADWAY DESIGN ENGINEER — 4/5/2019 — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 046981 FAITH E. JAHNKE — DocuSigned by: Faith E. Jahnke

HYDRAULICS ENGINEER — 4/5/2019 — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 037863 MEME D. BUSCEMI — DocuSigned by: Meme D. Buscemi

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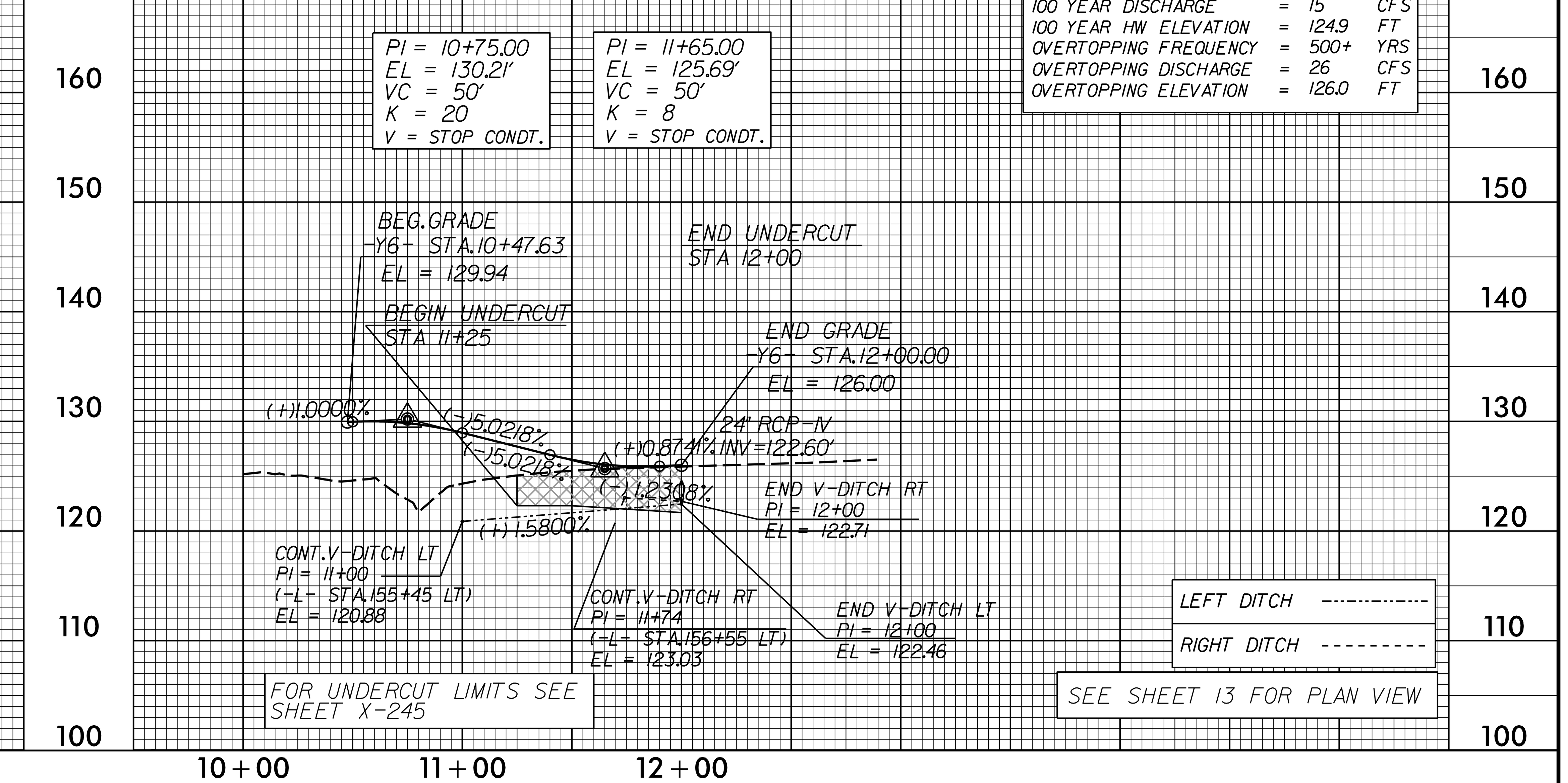
-Y6- NC 46



PIPE HYDRAULIC DATA
STRUCTURE 1313 Sta.12+00

DRAINAGE AREA	=	7.8	AC
DESIGN FREQUENCY	=	25	YRS
DESIGN DISCHARGE	=	13	CFS
DESIGN HW ELEVATION	=	124.8	FT
100 YEAR DISCHARGE	=	15	CFS
100 YEAR HW ELEVATION	=	124.9	FT
OVERTOPPING FREQUENCY	=	500+	YRS
OVERTOPPING DISCHARGE	=	26	CFS
OVERTOPPING ELEVATION	=	126.0	FT

SEE SHEET 13 FOR PLAN VIEW

5/28/99

PROJECT REFERENCE NO.	SHEET NO.
R-2582A	57

ROADWAY DESIGN ENGINEER — 4/5/2019 — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 046981 FAITH E. JAHNKE — DocuSigned by: Faith E. Jahnke

HYDRAULICS ENGINEER — 4/5/2019 — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 037863 MEME D. BUSCEMI — DocuSigned by: Meme D. Buscemi

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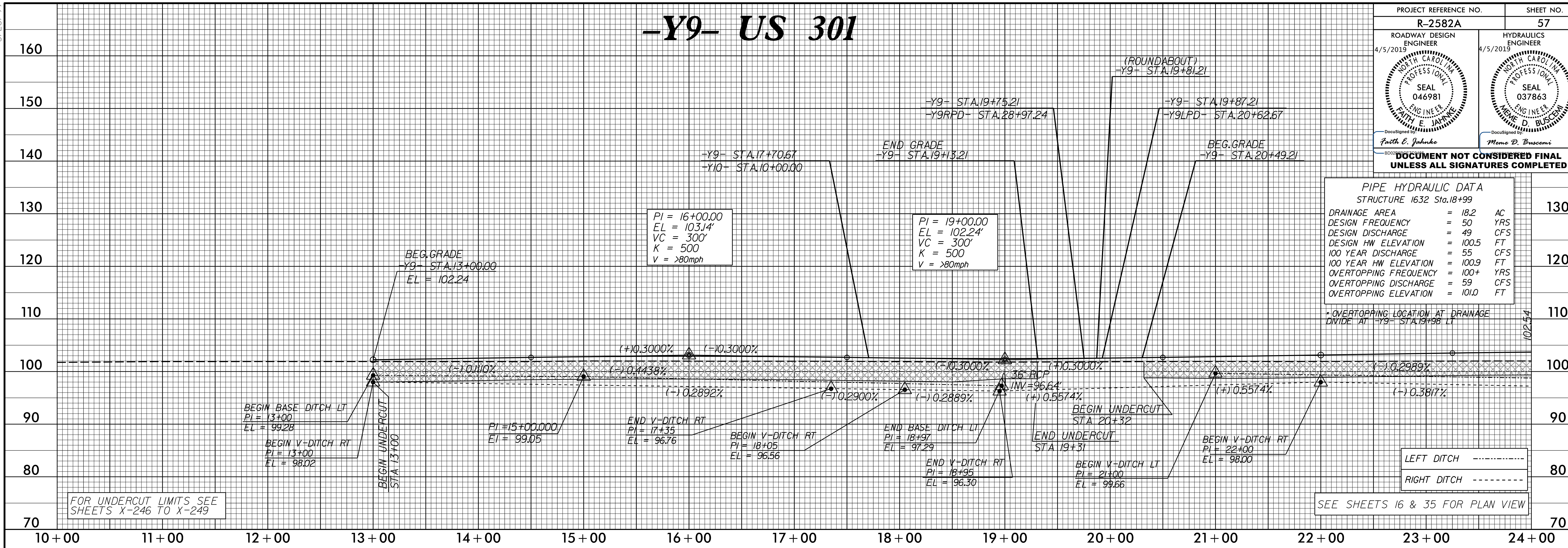
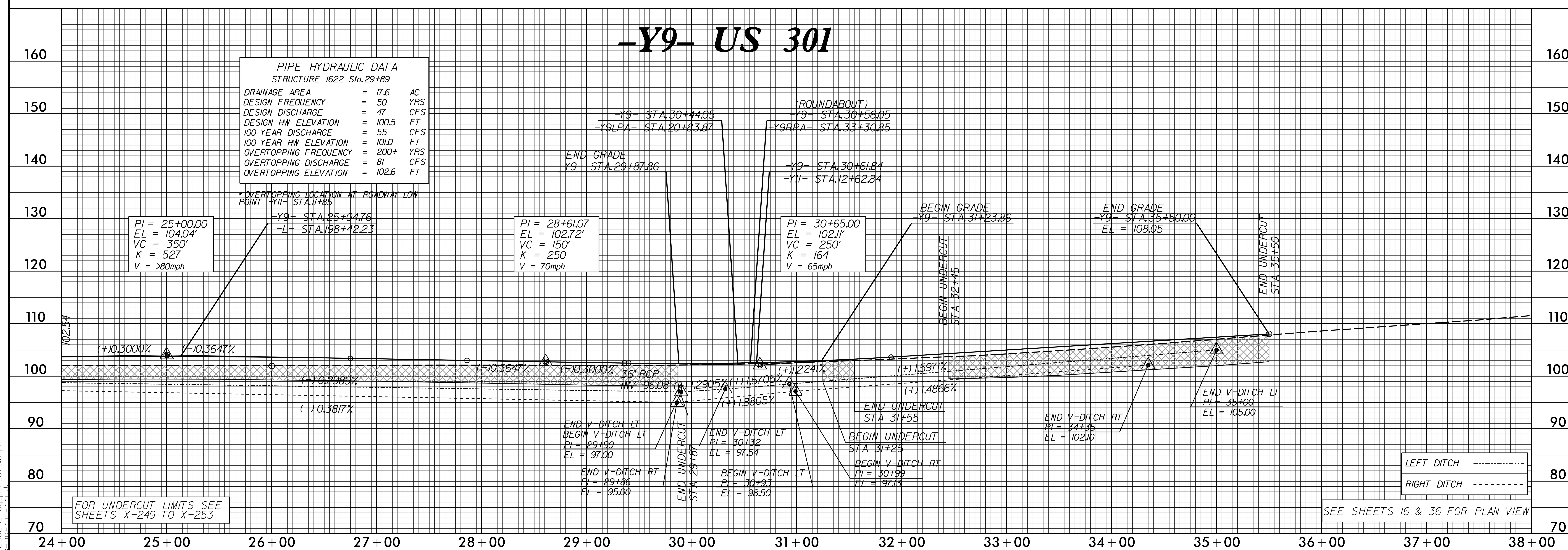

-Y9- US 301
(ROUNDABOUT)
-Y9- STA.19+81.21
-Y9- STA.19+75.21
-Y9RPD- STA.28+97.24
-Y9- STA.19+87.21
-Y9LPD- STA.20+62.67
END GRADE
-Y9- STA.19+13.21
BEG. GRADE
-Y9- STA.20+49.21
-Y9- STA.17+70.67
-Y10- STA.10+00.00
PI = 16+00.00
EL = 103.14'
VC = 300'
K = 500
V = >80mph
PI = 19+00.00
EL = 102.24'
VC = 300'
K = 500
V = >80mph
BEG. GRADE
-Y9- STA.13+00.00
EL = 102.24
PIPE HYDRAULIC DATA
STRUCTURE 1632 Sta.18+99
DRAINAGE AREA = 18.2 AC
DESIGN FREQUENCY = 50 YRS
DESIGN DISCHARGE = 49 CFS
DESIGN HW ELEVATION = 100.5 FT
100 YEAR DISCHARGE = 55 CFS
100 YEAR HW ELEVATION = 100.9 FT
OVERTOPPING FREQUENCY = 100+ YRS
OVERTOPPING DISCHARGE = 59 CFS
OVERTOPPING ELEVATION = 101.0 FT
* OVERTOPPING LOCATION AT DRAINAGE DIVIDE AT -Y9- STA.19+98 LT
102.54
(+)0.3000%
(-)0.3000%
(-)0.1110%
(-)0.4438%
(-)0.2892%
(-)0.2900%
(-)0.3000%
(-)0.2889%
(+)0.3000%
(+)0.5574%
(+)0.5574%
(-)0.2989%
(-)0.3817%
36" RCP
INV=96.64'
BEGIN BASE DITCH LT
PI = 13+00
EL = 99.28
BEGIN V-DITCH RT
PI = 13+00
EL = 98.02
BEGIN UNDERCUT
STA 13+00
PI =15+00.000
El = 99.05
END V-DITCH RT
PI = 17+35
EL = 96.76
BEGIN V-DITCH RT
PI = 18+05
EL = 96.56
END BASE DITCH LT
PI = 18+97
EL = 97.29
END V-DITCH RT
PI = 18+95
EL = 96.30
END UNDERCUT
STA 19+31
BEGIN UNDERCUT
STA 20+32
BEGIN V-DITCH LT
PI = 21+00
EL = 99.66
BEGIN V-DITCH RT
PI = 22+00
EL = 98.00
LEFT DITCH
RIGHT DITCH
FOR UNDERCUT LIMITS SEE SHEETS X-246 TO X-249
SEE SHEETS 16 & 35 FOR PLAN VIEW
160
150
140
130
120
110
100
90
80
70
10+00
11+00
12+00
13+00
14+00
15+00
16+00
17+00
18+00
19+00
20+00
21+00
22+00
23+00
24+00


-Y9- US 301
PIPE HYDRAULIC DATA
STRUCTURE 1622 Sta.29+89
DRAINAGE AREA = 17.6 AC
DESIGN FREQUENCY = 50 YRS
DESIGN DISCHARGE = 47 CFS
DESIGN HW ELEVATION = 100.5 FT
100 YEAR DISCHARGE = 55 CFS
100 YEAR HW ELEVATION = 101.0 FT
OVERTOPPING FREQUENCY = 200+ YRS
OVERTOPPING DISCHARGE = 81 CFS
OVERTOPPING ELEVATION = 102.6 FT
* OVERTOPPING LOCATION AT ROADWAY LOW POINT -Y11- STA.11+85
-Y9- STA.30+44.05
-Y9LPA- STA.20+83.87
(ROUNDABOUT)
-Y9- STA.30+56.05
-Y9RPA- STA.33+30.85
END GRADE
-Y9- STA.29+87.86
-Y9- STA.30+61.84
-Y11- STA.12+62.84
PI = 25+00.00
EL = 104.04'
VC = 350'
K = 527
V = >80mph
-Y9- STA.25+04.76
-L- STA.198+42.23
PI = 28+61.07
EL = 102.72'
VC = 150'
K = 250
V = 70mph
PI = 30+65.00
EL = 102.11'
VC = 250'
K = 164
V = 65mph
BEGIN GRADE
-Y9- STA.31+23.86
END GRADE
-Y9- STA.35+50.00
EL = 108.05
BEGIN UNDERCUT
STA 32+45
END UNDERCUT
STA 35+50
102.54
(+)0.3000%
(-)0.3647%
(-)0.2989%
(-)0.3817%
(-)0.3647%
(-)0.3000%
36" RCP
INV=96.08'
(-)1.2905%
(+)1.5705%
(+)1.8805%
(+)1.2241%
(+)1.5971%
(+)1.4866%
END V-DITCH LT
BEGIN V-DITCH LT
PI = 29+90
EL = 97.00
END V-DITCH RT
PI = 29+86
EL = 95.00
END UNDERCUT
STA 29+87
END V-DITCH LT
PI = 30+32
EL = 97.54
BEGIN V-DITCH LT
PI = 30+93
EL = 98.50
END UNDERCUT
STA 31+55
BEGIN UNDERCUT
STA 31+25
BEGIN V-DITCH RT
PI = 30+99
EL = 97.13
END V-DITCH RT
PI = 34+35
EL = 102.10
END V-DITCH LT
PI = 35+00
EL = 105.00
LEFT DITCH
RIGHT DITCH
FOR UNDERCUT LIMITS SEE SHEETS X-249 TO X-253
SEE SHEETS 16 & 36 FOR PLAN VIEW
160
150
140
130
120
110
100
90
80
70
24+00
25+00
26+00
27+00
28+00
29+00
30+00
31+00
32+00
33+00
34+00
35+00
36+00
37+00
38+00

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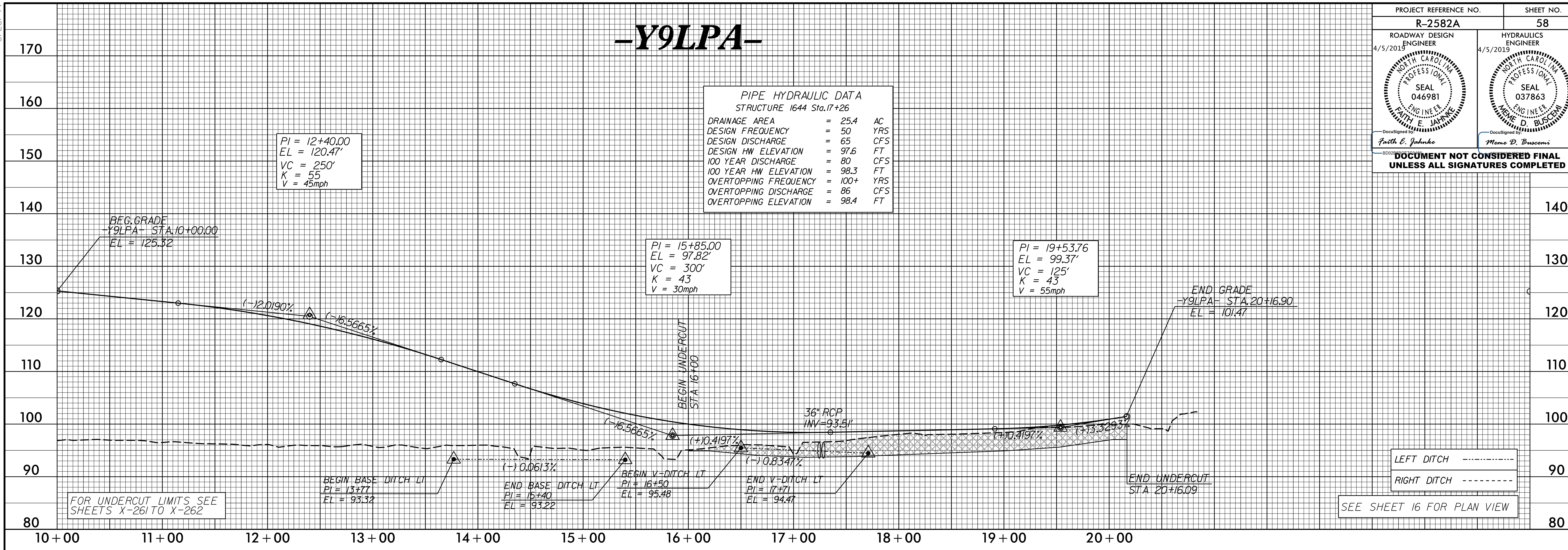
PROJECT REFERENCE NO.	SHEET NO.
R-2582A	58

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
4/5/2019	4/5/2019
NORTH CAROLINA PROFESSIONAL SEAL 046981 ENGINEER FAITH E. JAHNKE	NORTH CAROLINA PROFESSIONAL SEAL 037863 ENGINEER MEME D. BUSCEMI
DocuSigned by: Faith E. Jahnke BD02B5BCF7C9466...	DocuSigned by: Meme D. Buscemi 8E9BB3EC4ED04A0...

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

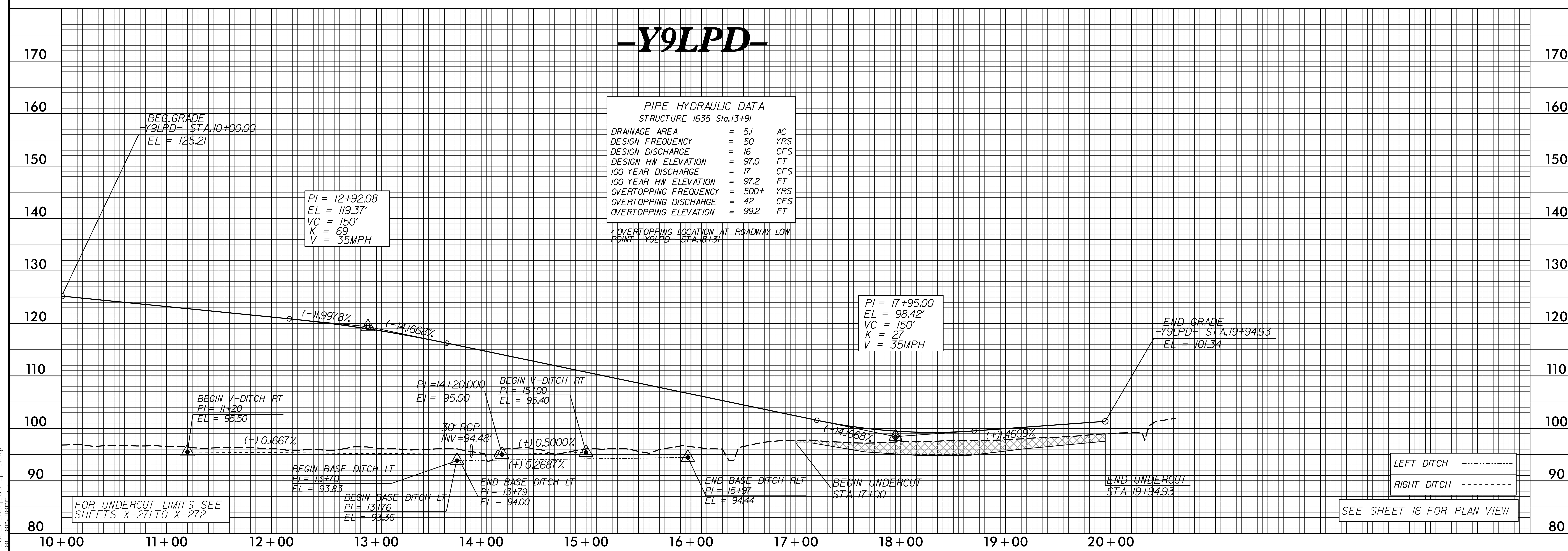
-Y9LPA-


5/28/99
BEG.GRADE
-Y9LPA- STA.10+00.00
EL = 125.32
PI = 12+40.00
EL = 120.47'
VC = 250'
K = 55
V = 45mph
PI = 15+85.00
EL = 97.82'
VC = 300'
K = 43
V = 30mph
PI = 19+53.76
EL = 99.37'
VC = 125'
K = 43
V = 55mph
END GRADE
-Y9LPA- STA.20+16.90
EL = 101.47
(-)2.0190%
(-)6.5665%
(-)6.5665%
(+)0.4197%
(+)0.4197%
(+)3.3293%
(-) 0.0613%
(-) 0.8347%
BEGIN UNDERCUT
STA 16+00
36" RCP
INV=93.51'
BEGIN BASE DITCH LT
PI = 13+77
EL = 93.32
END BASE DITCH LT
PI = 15+40
EL = 93.22
BEGIN V-DITCH LT
PI = 16+50
EL = 95.48
END V-DITCH LT
PI = 17+71
EL = 94.47
END UNDERCUT
STA 20+16.09
FOR UNDERCUT LIMITS SEE
SHEETS X-261 TO X-262
LEFT DITCH
RIGHT DITCH
SEE SHEET 16 FOR PLAN VIEW
170
160
150
140
130
120
110
100
90
80
10+00
11+00
12+00
13+00
14+00
15+00
16+00
17+00
18+00
19+00
20+00

PIPE HYDRAULIC DATA
STRUCTURE 1644 Sta.17+26

DRAINAGE AREA	=	25.4	AC
DESIGN FREQUENCY	=	50	YRS
DESIGN DISCHARGE	=	65	CFS
DESIGN HW ELEVATION	=	97.6	FT
100 YEAR DISCHARGE	=	80	CFS
100 YEAR HW ELEVATION	=	98.3	FT
OVERTOPPING FREQUENCY	=	100+	YRS
OVERTOPPING DISCHARGE	=	86	CFS
OVERTOPPING ELEVATION	=	98.4	FT

-Y9LPD-


BEG.GRADE
-Y9LPD- STA.10+00.00
EL = 125.21
PI = 12+92.08
EL = 119.37'
VC = 150'
K = 69
V = 35MPH
PI = 17+95.00
EL = 98.42'
VC = 150'
K = 27
V = 35MPH
END GRADE
-Y9LPD- STA.19+94.93
EL = 101.34
(-)1.9978%
(-)4.1668%
(-)4.1668%
(+)1.4609%
(-) 0.1667%
(+) 0.5000%
(+) 0.2687%
BEGIN V-DITCH RT
PI = 11+20
EL = 95.50
PI =14+20.000
El = 95.00
BEGIN V-DITCH RT
PI = 15+00
EL = 95.40
30" RCP
INV=94.48'
BEGIN BASE DITCH LT
PI = 13+70
EL = 93.83
BEGIN BASE DITCH LT
PI = 13+76
EL = 93.36
END BASE DITCH LT
PI = 13+79
EL = 94.00
END BASE DITCH RLT
PI = 15+97
EL = 94.44
BEGIN UNDERCUT
STA 17+00
END UNDERCUT
STA 19+94.93
FOR UNDERCUT LIMITS SEE
SHEETS X-271 TO X-272
LEFT DITCH
RIGHT DITCH
SEE SHEET 16 FOR PLAN VIEW
170
160
150
140
130
120
110
100
90
80
10+00
11+00
12+00
13+00
14+00
15+00
16+00
17+00
18+00
19+00
20+00
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PIPE HYDRAULIC DATA
STRUCTURE 1635 Sta.13+91

DRAINAGE AREA	=	5.1	AC
DESIGN FREQUENCY	=	50	YRS
DESIGN DISCHARGE	=	16	CFS
DESIGN HW ELEVATION	=	97.0	FT
100 YEAR DISCHARGE	=	17	CFS
100 YEAR HW ELEVATION	=	97.2	FT
OVERTOPPING FREQUENCY	=	500+	YRS
OVERTOPPING DISCHARGE	=	42	CFS
OVERTOPPING ELEVATION	=	99.2	FT

* OVERTOPPING LOCATION AT ROADWAY LOW POINT -Y9LPD- STA.18+31

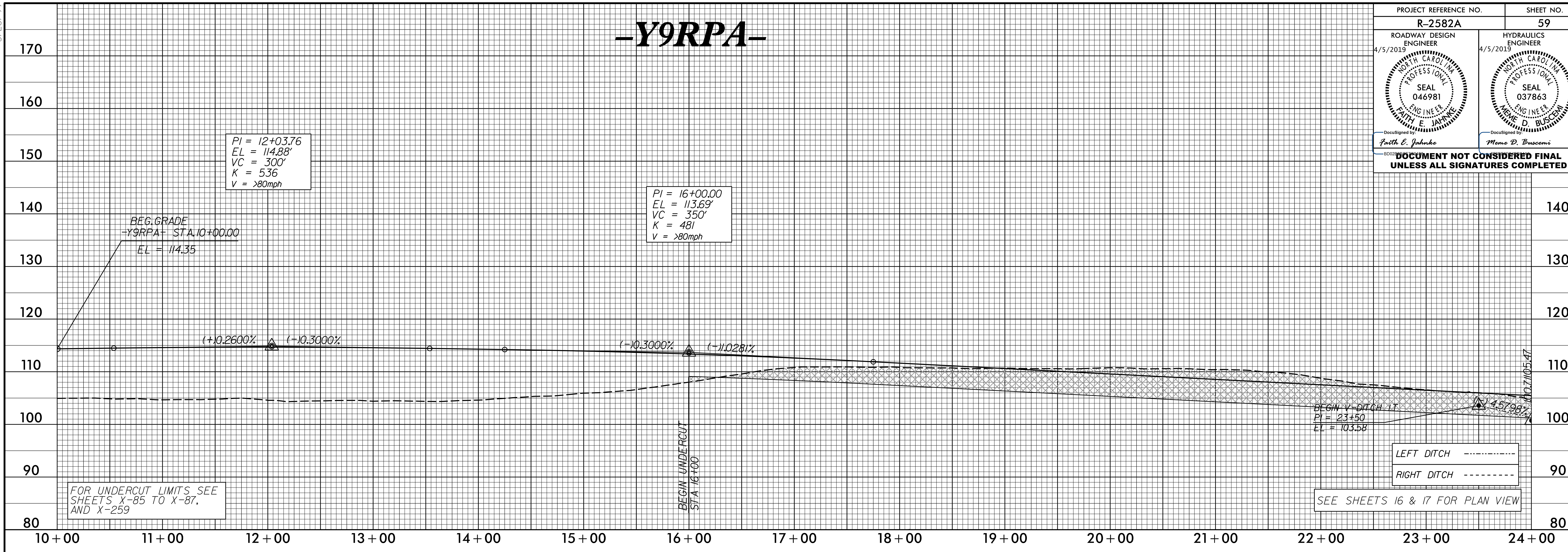
PROJECT REFERENCE NO.	SHEET NO.
R-2582A	59

ROADWAY DESIGN ENGINEER — 4/5/2019 — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 046981 FAITH E. JAHNKE — DocuSigned by: Faith E. Jahnke

HYDRAULICS ENGINEER — 4/5/2019 — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 037863 MEMO D. BUSCEMI — DocuSigned by: Memo D. Buscemi

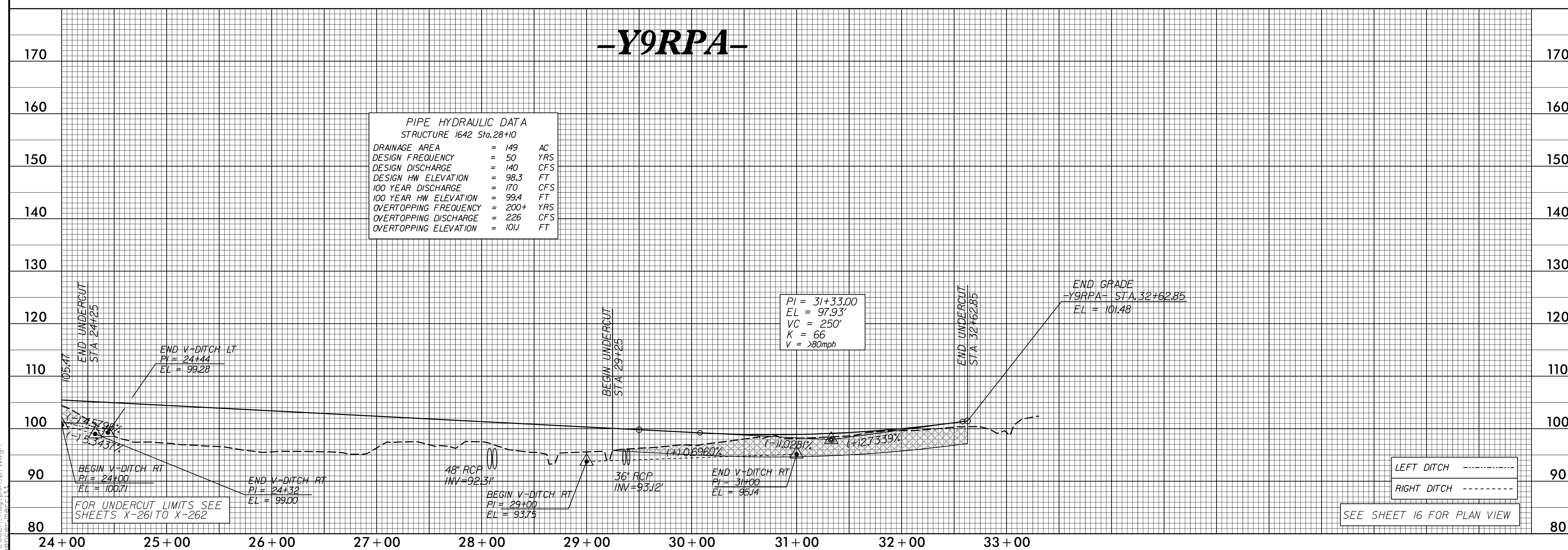
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

-Y9RPA-



5/28/99
PI = 12+03.76
EL = 114.88'
VC = 300'
K = 536
V = >80mph
PI = 16+00.00
EL = 113.69'
VC = 350'
K = 481
V = >80mph
BEG. GRADE
-Y9RPA- STA.10+00.00
EL = 114.35
(+)0.2600%
(-)0.3000%
(-)0.3000%
(-)1.0281%
BEGIN UNDERCUT
STA 16+00
BEGIN V-DITCH LT
PI = 23+50
EL = 103.58
4.5798%
100.7/105.47
FOR UNDERCUT LIMITS SEE
SHEETS X-85 TO X-87,
AND X-259
LEFT DITCH
RIGHT DITCH
SEE SHEETS 16 & 17 FOR PLAN VIEW
170
160
150
140
130
120
110
100
90
80
10+00
11+00
12+00
13+00
14+00
15+00
16+00
17+00
18+00
19+00
20+00
21+00
22+00
23+00
24+00

-Y9RPA-



END UNDERCUT
STA 24+25
105.47
END V-DITCH LT
PI = 24+44
EL = 99.28
(-)4.5798%
(-)5.3437%
BEGIN V-DITCH RT
PI = 24+00
EL = 100.71
END V-DITCH RT
PI = 24+32
EL = 99.00
48" RCP
INV=92.31'
BEGIN V-DITCH RT
PI = 29+00
EL = 93.75
BEGIN UNDERCUT
STA 29+25
36" RCP
INV=93.12'
(+)0.6960%
(-)1.0281%
(+)2.7339%
END V-DITCH RT
PI = 31+00
EL = 95.14
PI = 31+33.00
EL = 97.93'
VC = 250'
K = 66
V = >80mph
END UNDERCUT
STA 32+62.85
END GRADE
-Y9RPA- STA.32+62.85
EL = 101.48
FOR UNDERCUT LIMITS SEE
SHEETS X-261 TO X-262
LEFT DITCH
RIGHT DITCH
SEE SHEET 16 FOR PLAN VIEW
170
160
150
140
130
120
110
100
90
80
24+00
25+00
26+00
27+00
28+00
29+00
30+00
31+00
32+00
33+00

PIPE HYDRAULIC DATA
STRUCTURE 1642 Sta.28+10

DRAINAGE AREA	=	149	AC
DESIGN FREQUENCY	=	50	YRS
DESIGN DISCHARGE	=	140	CFS
DESIGN HW ELEVATION	=	98.3	FT
100 YEAR DISCHARGE	=	170	CFS
100 YEAR HW ELEVATION	=	99.4	FT
OVERTOPPING FREQUENCY	=	200+	YRS
OVERTOPPING DISCHARGE	=	226	CFS
OVERTOPPING ELEVATION	=	101.1	FT

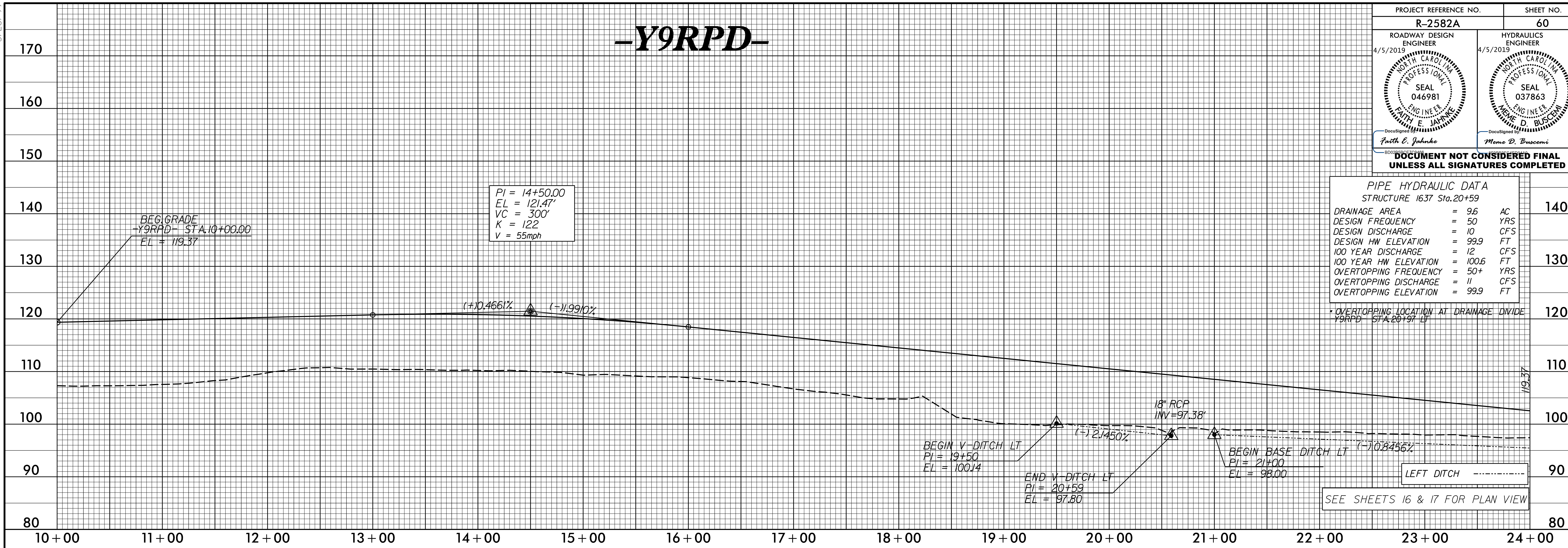
PROJECT REFERENCE NO.	SHEET NO.
R–2582A	60

ROADWAY DESIGN ENGINEER
4/5/2019
NORTH CAROLINA PROFESSIONAL SEAL 046981 ENGINEER FAITH E. JAHNKE
DocuSigned by: Faith E. Jahnke
BD02B5BCE7C9466...

HYDRAULICS ENGINEER
4/5/2019
NORTH CAROLINA PROFESSIONAL SEAL 037863 ENGINEER MEME D. BUSCEMI
DocuSigned by: Meme D. Buscemi
8E9BB3FC4ED94A9...

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

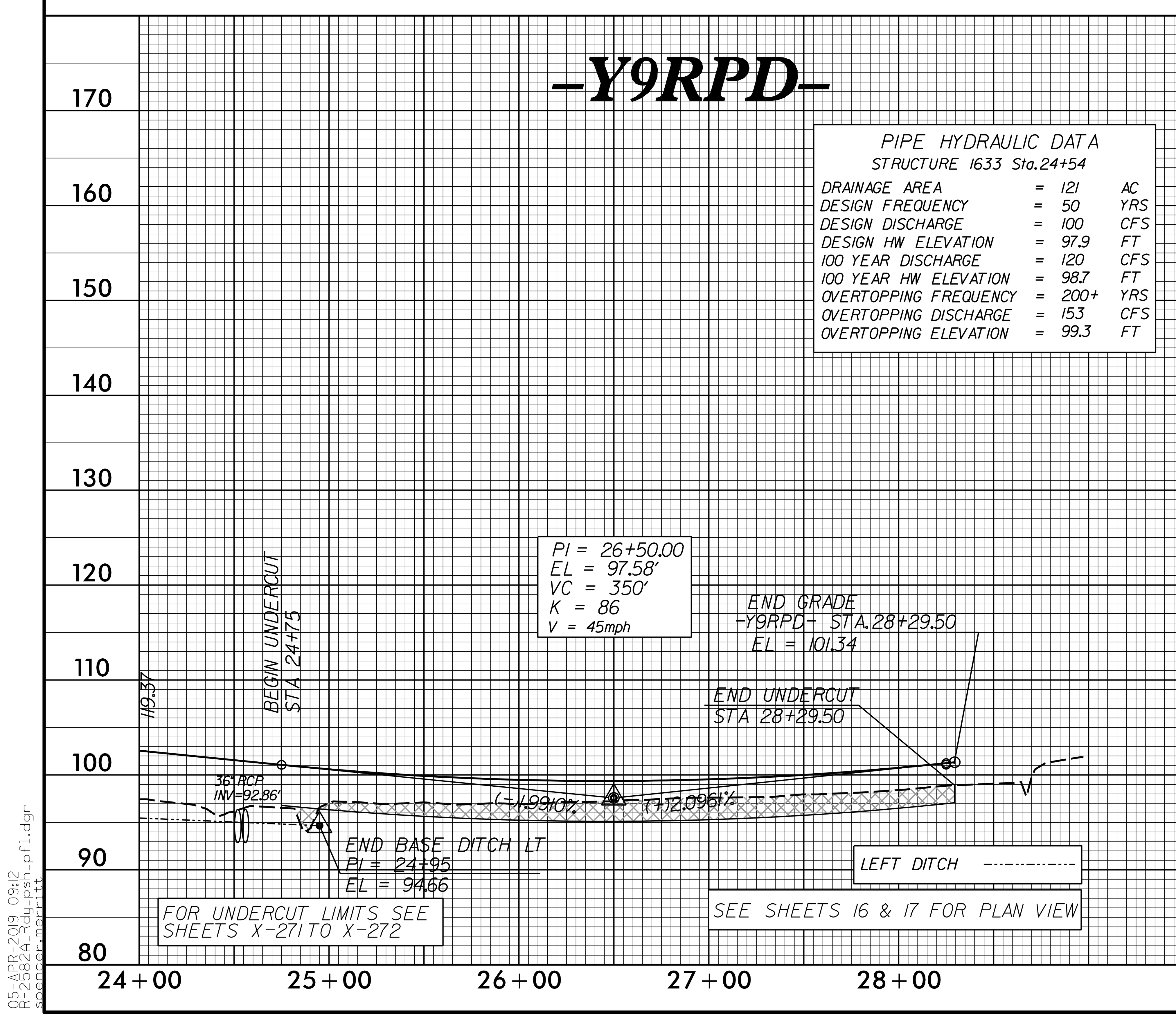
-Y9RPD-



PIPE HYDRAULIC DATA
STRUCTURE 1637 Sta.20+59

DRAINAGE AREA	=	9.6	AC
DESIGN FREQUENCY	=	50	YRS
DESIGN DISCHARGE	=	10	CFS
DESIGN HW ELEVATION	=	99.9	FT
100 YEAR DISCHARGE	=	12	CFS
100 YEAR HW ELEVATION	=	100.6	FT
OVERTOPPING FREQUENCY	=	50+	YRS
OVERTOPPING DISCHARGE	=	11	CFS
OVERTOPPING ELEVATION	=	99.9	FT

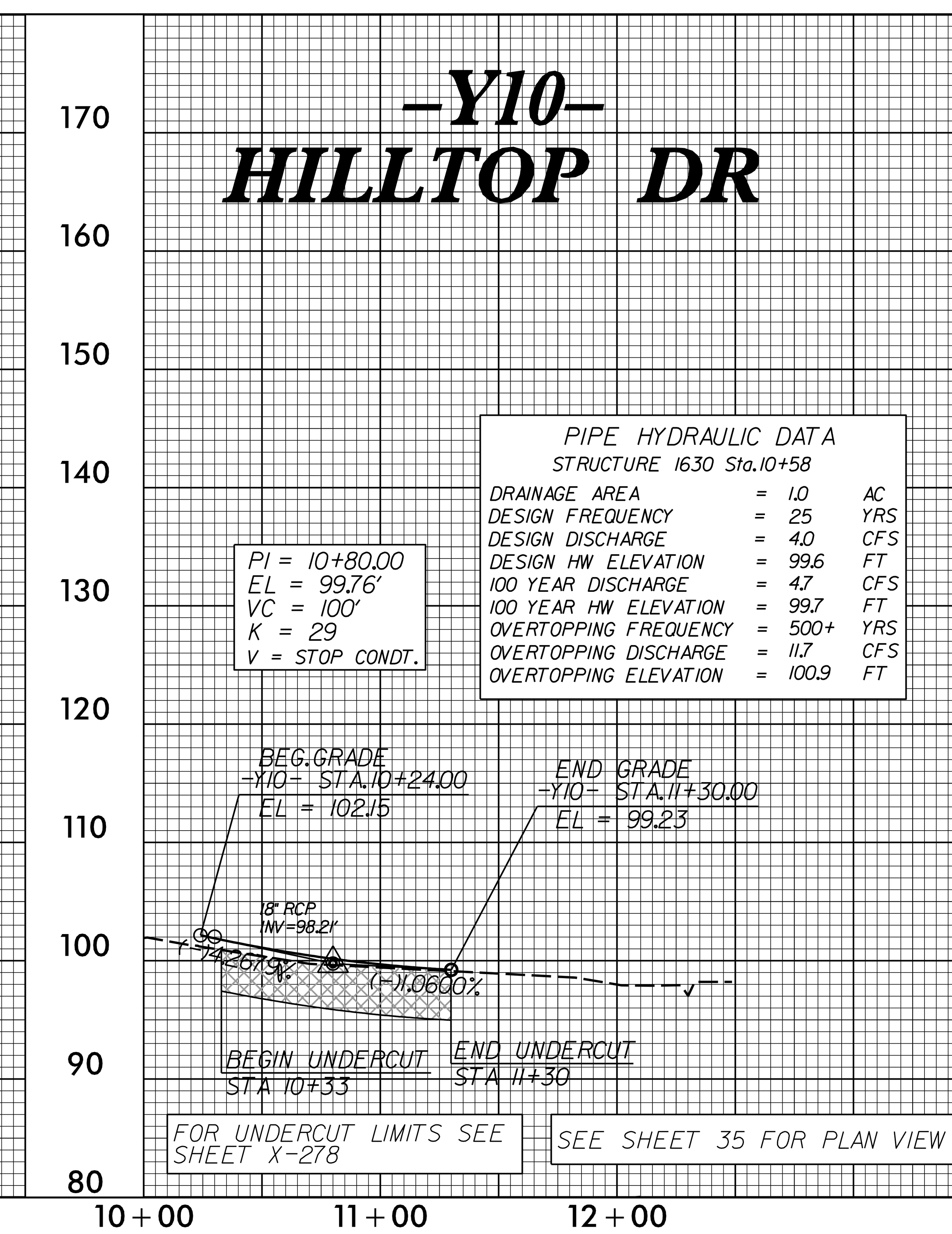
-Y9RPD-



PIPE HYDRAULIC DATA
STRUCTURE 1633 Sta.24+54

DRAINAGE AREA	=	121	AC
DESIGN FREQUENCY	=	50	YRS
DESIGN DISCHARGE	=	100	CFS
DESIGN HW ELEVATION	=	97.9	FT
100 YEAR DISCHARGE	=	120	CFS
100 YEAR HW ELEVATION	=	98.7	FT
OVERTOPPING FREQUENCY	=	200+	YRS
OVERTOPPING DISCHARGE	=	153	CFS
OVERTOPPING ELEVATION	=	99.3	FT

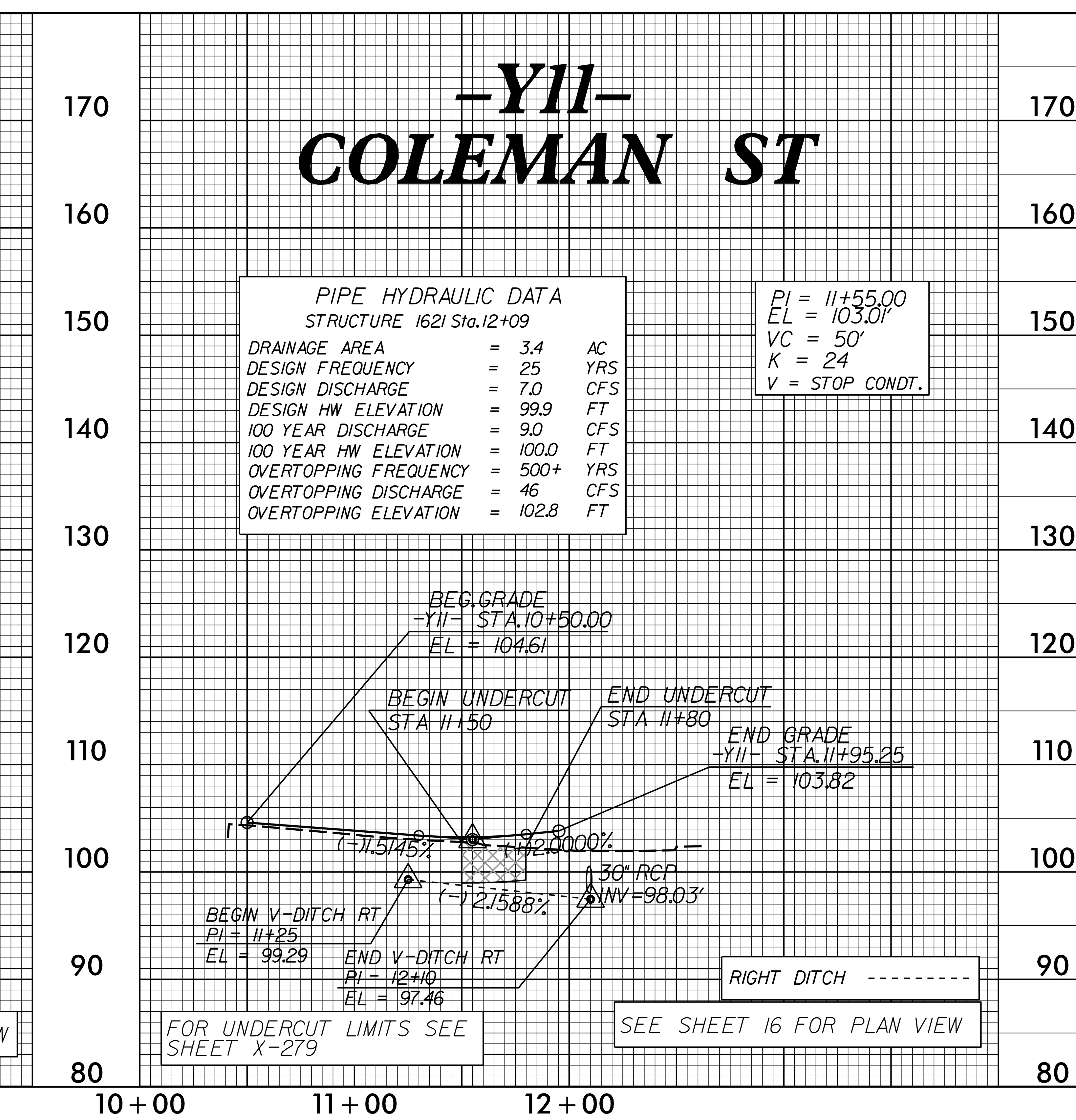
-Y10-
HILLTOP DR



PIPE HYDRAULIC DATA
STRUCTURE 1630 Sta.10+58

DRAINAGE AREA	=	1.0	AC
DESIGN FREQUENCY	=	25	YRS
DESIGN DISCHARGE	=	4.0	CFS
DESIGN HW ELEVATION	=	99.6	FT
100 YEAR DISCHARGE	=	4.7	CFS
100 YEAR HW ELEVATION	=	99.7	FT
OVERTOPPING FREQUENCY	=	500+	YRS
OVERTOPPING DISCHARGE	=	11.7	CFS
OVERTOPPING ELEVATION	=	100.9	FT

-Y11-
COLEMAN ST



PIPE HYDRAULIC DATA
STRUCTURE 1621 Sta.12+09

DRAINAGE AREA	=	3.4	AC
DESIGN FREQUENCY	=	25	YRS
DESIGN DISCHARGE	=	7.0	CFS
DESIGN HW ELEVATION	=	99.9	FT
100 YEAR DISCHARGE	=	9.0	CFS
100 YEAR HW ELEVATION	=	100.0	FT
OVERTOPPING FREQUENCY	=	500+	YRS
OVERTOPPING DISCHARGE	=	46	CFS
OVERTOPPING ELEVATION	=	102.8	FT

5/28/99

PROJECT REFERENCE NO.	SHEET NO.
R-2582A	61

ROADWAY DESIGN ENGINEER — 4/5/2019 — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 046981 FAITH E. JAHNKE — DocuSigned by: Faith E. Jahnke

HYDRAULICS ENGINEER — 4/5/2019 — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 037863 MEMO D. BUSCEMI — DocuSigned by: Memo D. Buscemi

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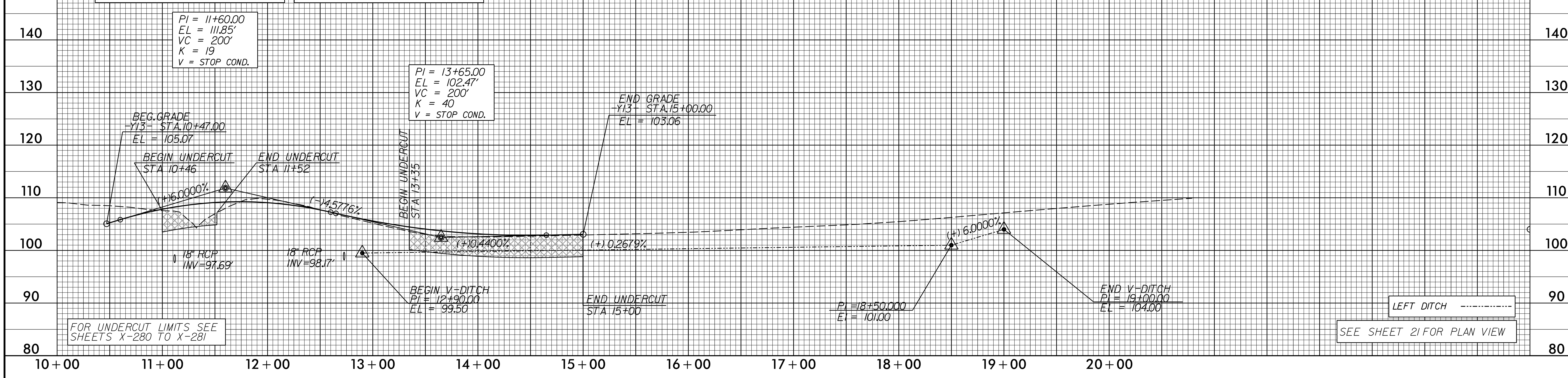
-Y13- OLD HIGHWAY RD.

PIPE HYDRAULIC DATA
STRUCTURE 2114 Sta.11+12

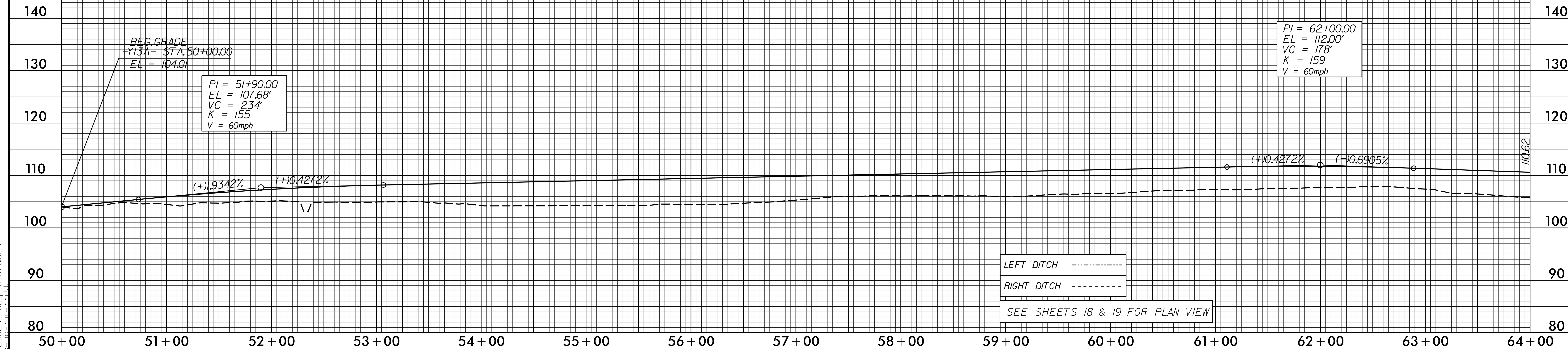
DRAINAGE AREA	=	1.5	AC
DESIGN FREQUENCY	=	25	YRS
DESIGN DISCHARGE	=	3	CFS
DESIGN HW ELEVATION	=	99.4	FT
100 YEAR DISCHARGE	=	4	CFS
100 YEAR HW ELEVATION	=	99.6	FT
OVERTOPPING FREQUENCY	=	500+	YRS
OVERTOPPING DISCHARGE	=	27	CFS
OVERTOPPING ELEVATION	=	107.8	FT

PIPE HYDRAULIC DATA
STRUCTURE 2112 Sta.12+73

DRAINAGE AREA	=	15	AC
DESIGN FREQUENCY	=	25	YRS
DESIGN DISCHARGE	=	8	CFS
DESIGN HW ELEVATION	=	101.2	FT
100 YEAR DISCHARGE	=	13	CFS
100 YEAR HW ELEVATION	=	102.2	FT
OVERTOPPING FREQUENCY	=	200-	YRS
OVERTOPPING DISCHARGE	=	17	CFS
OVERTOPPING ELEVATION	=	102.9	FT



-Y13A- NEW SERVICE RD.



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spencer.merritt

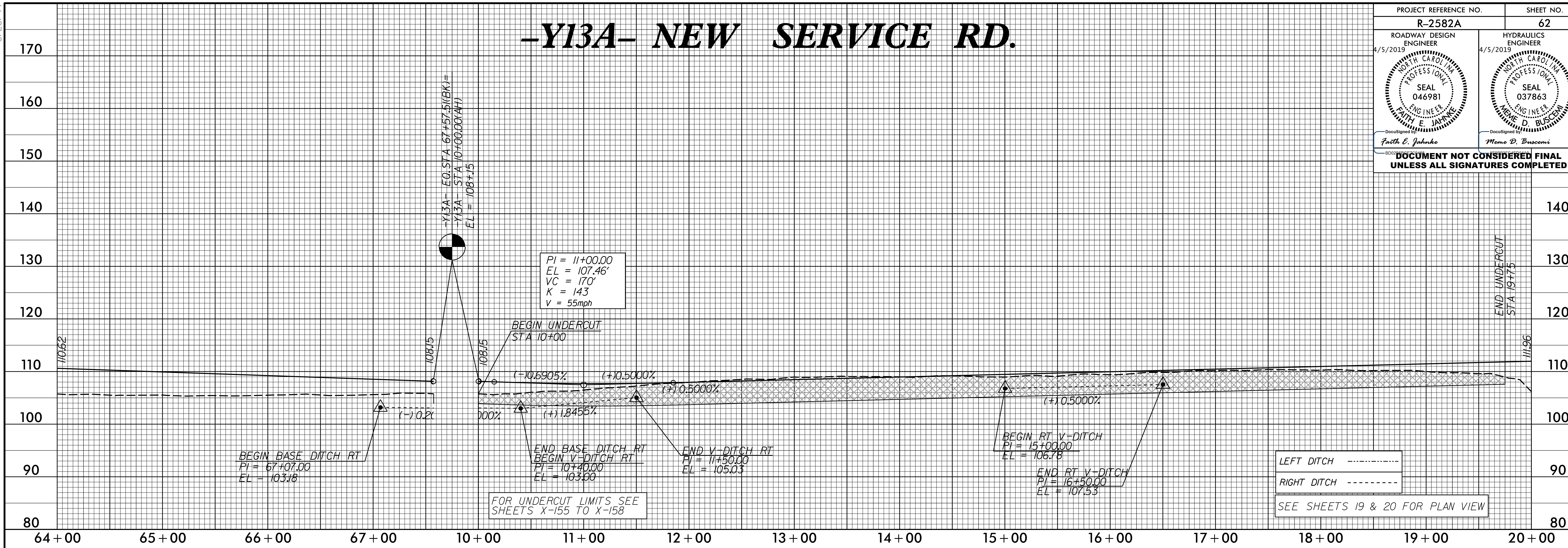
PROJECT REFERENCE NO.	SHEET NO.
R-2582A	62

ROADWAY DESIGN ENGINEER — 4/5/2019 — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 046981 FAITH E. JAHNKE — DocuSigned by: Faith E. Jahnke

HYDRAULICS ENGINEER — 4/5/2019 — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 037863 MEME D. BUSCEMI — DocuSigned by: Meme D. Buscemi

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

-Y13A- NEW SERVICE RD.



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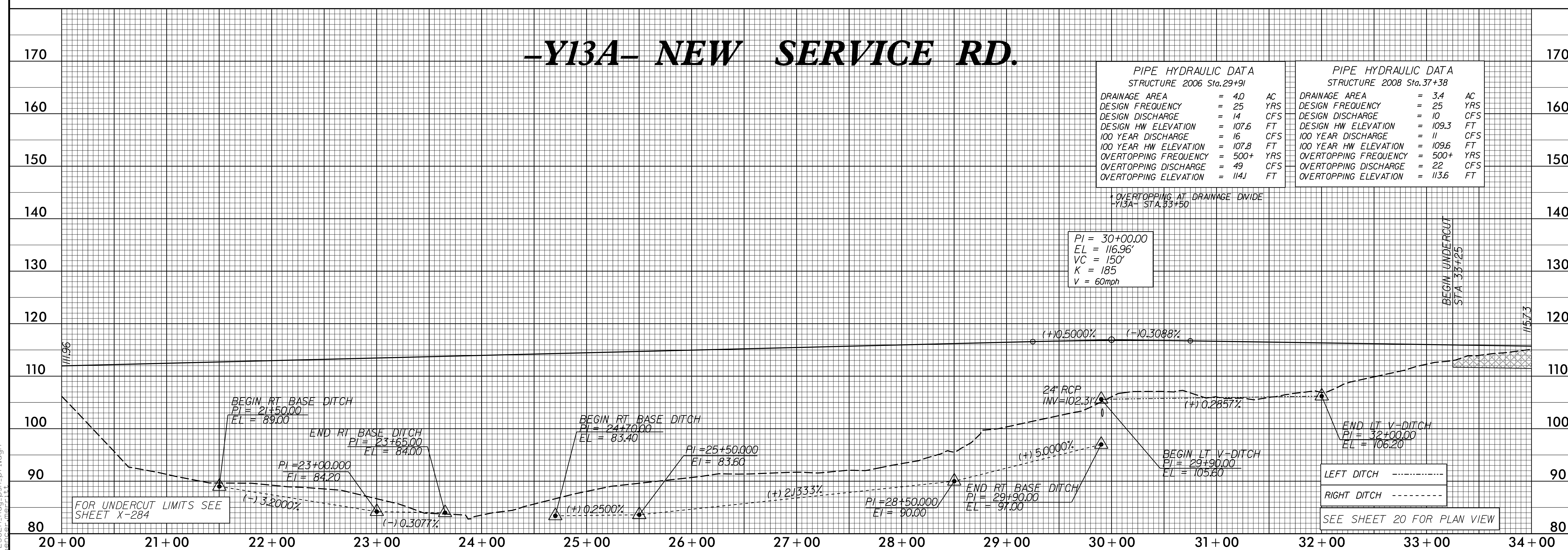

PIPE HYDRAULIC DATA
STRUCTURE 2006 Sta.29+91

DRAINAGE AREA	=	4.0	AC
DESIGN FREQUENCY	=	25	YRS
DESIGN DISCHARGE	=	14	CFS
DESIGN HW ELEVATION	=	107.6	FT
100 YEAR DISCHARGE	=	16	CFS
100 YEAR HW ELEVATION	=	107.8	FT
OVERTOPPING FREQUENCY	=	500+	YRS
OVERTOPPING DISCHARGE	=	49	CFS
OVERTOPPING ELEVATION	=	114.1	FT

PIPE HYDRAULIC DATA
STRUCTURE 2008 Sta.37+38

DRAINAGE AREA	=	3.4	AC
DESIGN FREQUENCY	=	25	YRS
DESIGN DISCHARGE	=	10	CFS
DESIGN HW ELEVATION	=	109.3	FT
100 YEAR DISCHARGE	=	11	CFS
100 YEAR HW ELEVATION	=	109.6	FT
OVERTOPPING FREQUENCY	=	500+	YRS
OVERTOPPING DISCHARGE	=	22	CFS
OVERTOPPING ELEVATION	=	113.6	FT

5/28/99

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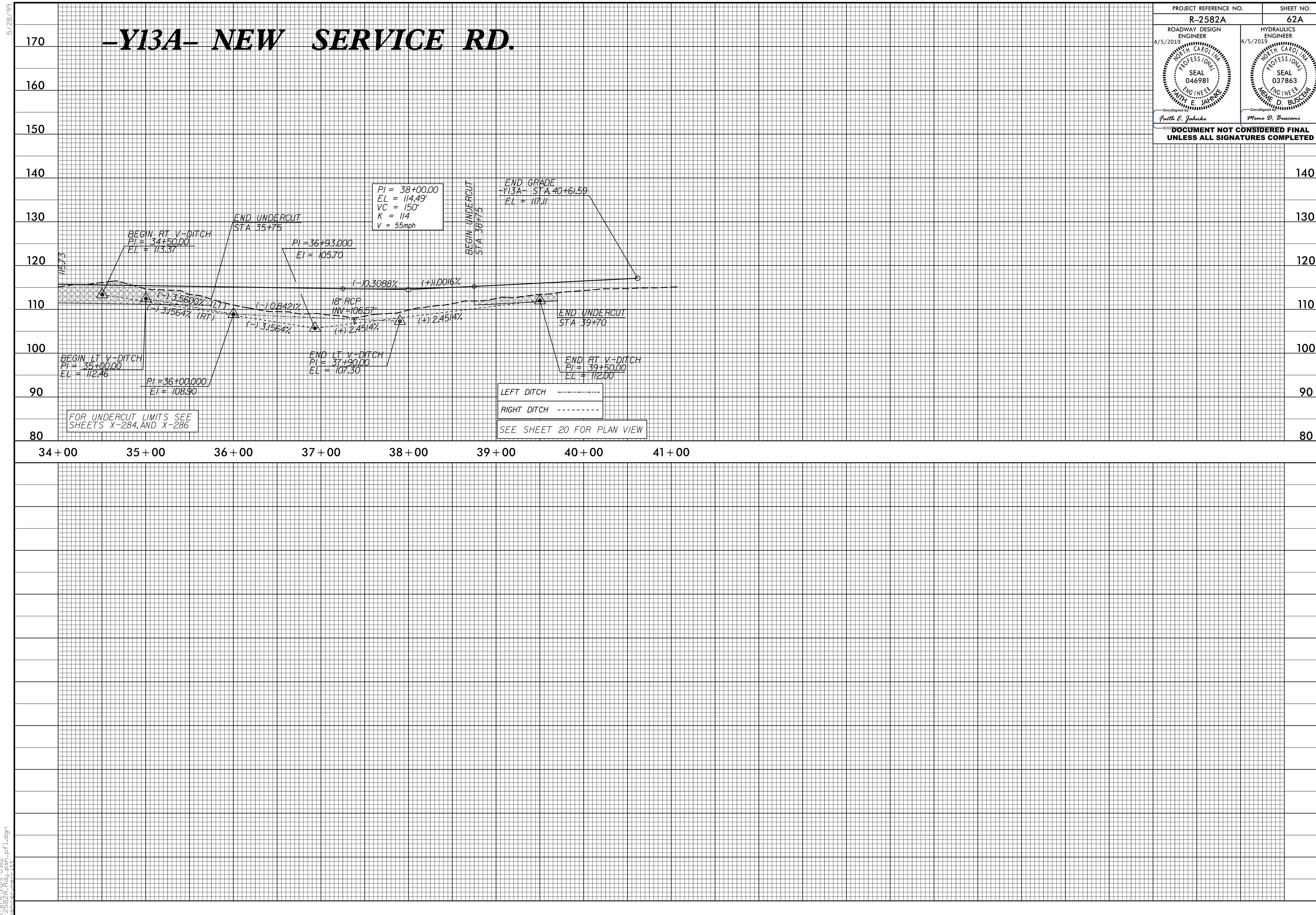
PROJECT REFERENCE NO.	SHEET NO.
R–2582A	62A

ROADWAY DESIGN ENGINEER
4/5/2019
NORTH CAROLINA PROFESSIONAL SEAL 046981 ENGINEER FAITH E. JAHNKE
DocuSigned by: Faith E. Jahnke
BD02B5BCE7C9466...

HYDRAULICS ENGINEER
4/5/2019
NORTH CAROLINA PROFESSIONAL SEAL 037863 ENGINEER MEME D. BUSCEMI
DocuSigned by: Meme D. Buscemi
8E9BB3FC4ED94A9...

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

–Y13A– NEW SERVICE RD.



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spencer.merritt

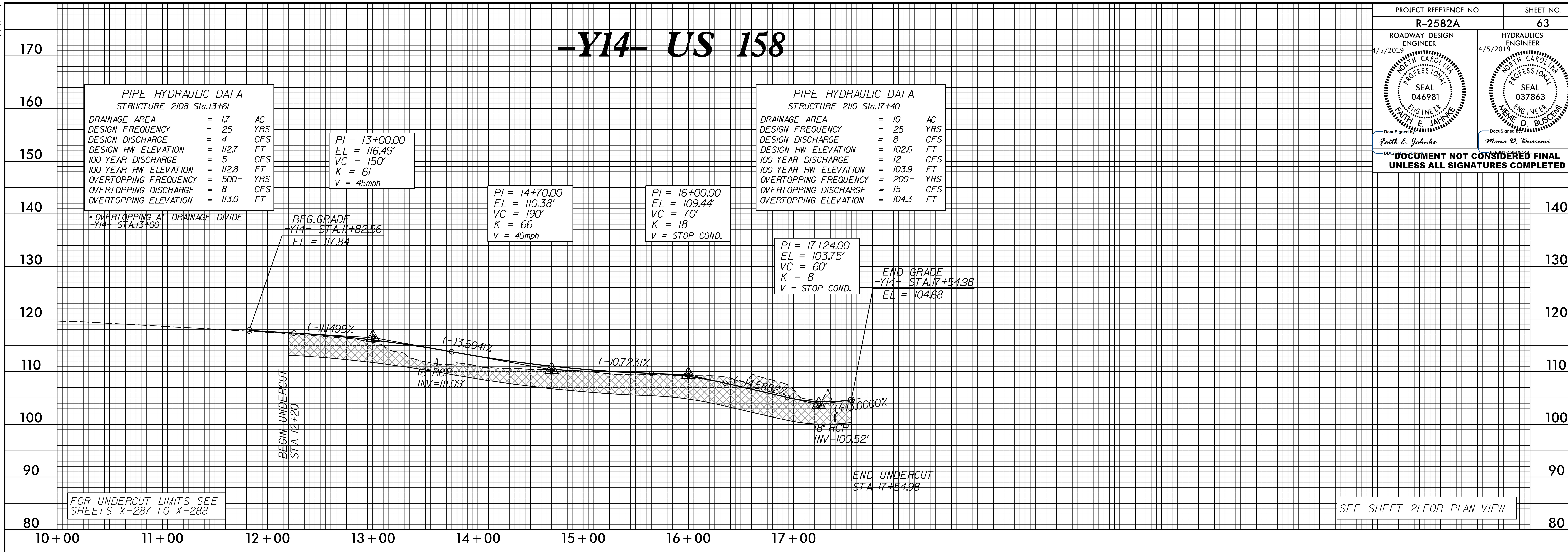
PROJECT REFERENCE NO.	SHEET NO.
R-2582A	63

ROADWAY DESIGN ENGINEER — 4/5/2019 — NORTH CAROLINA PROFESSIONAL SEAL 046981 ENGINEER FAITH E. JAHNKE — DocuSigned by: Faith E. Jahnke — BD02B5BCE7C9466...

HYDRAULICS ENGINEER — 4/5/2019 — NORTH CAROLINA PROFESSIONAL SEAL 037863 ENGINEER MEME D. BUSCEMI — DocuSigned by: Meme D. Buscemi — 8E9BB3FC4ED94A9...

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

-Y14- US 158



PIPE HYDRAULIC DATA
STRUCTURE 2108 Sta. 13+61

DRAINAGE AREA	=	1.7	AC
DESIGN FREQUENCY	=	25	YRS
DESIGN DISCHARGE	=	4	CFS
DESIGN HW ELEVATION	=	112.7	FT
100 YEAR DISCHARGE	=	5	CFS
100 YEAR HW ELEVATION	=	112.8	FT
OVERTOPPING FREQUENCY	=	500-	YRS
OVERTOPPING DISCHARGE	=	8	CFS
OVERTOPPING ELEVATION	=	113.0	FT

* OVERTOPPING AT DRAINAGE DIVIDE -Y14- STA. 13+00

PIPE HYDRAULIC DATA
STRUCTURE 2110 Sta. 17+40

DRAINAGE AREA	=	10	AC
DESIGN FREQUENCY	=	25	YRS
DESIGN DISCHARGE	=	8	CFS
DESIGN HW ELEVATION	=	102.6	FT
100 YEAR DISCHARGE	=	12	CFS
100 YEAR HW ELEVATION	=	103.9	FT
OVERTOPPING FREQUENCY	=	200-	YRS
OVERTOPPING DISCHARGE	=	15	CFS
OVERTOPPING ELEVATION	=	104.3	FT

-Y15- SR 1311

PROJECT REFERENCE NO.	SHEET NO.
R-2582A	64

HYDRAULICS ENGINEER
8/13/2020
SEAL 049357 — NORTH CAROLINA PROFESSIONAL ENGINEER — JOY SADDLER
FOR REVISIONS ONLY

ROADWAY DESIGN ENGINEER
NOT A CERTIFIED DOCUMENT AS TO THE ORIGINAL DOCUMENT BUT ONLY AS TO THE REVISIONS.
THIS DOCUMENT ORIGINALLY ISSUED AND SEALED BY :
FAITH E. JAHNKE
LIC. NO. 046981
ON
4/5/19
THIS DOCUMENT IS ONLY CERTIFIED AS TO THE REVISIONS.

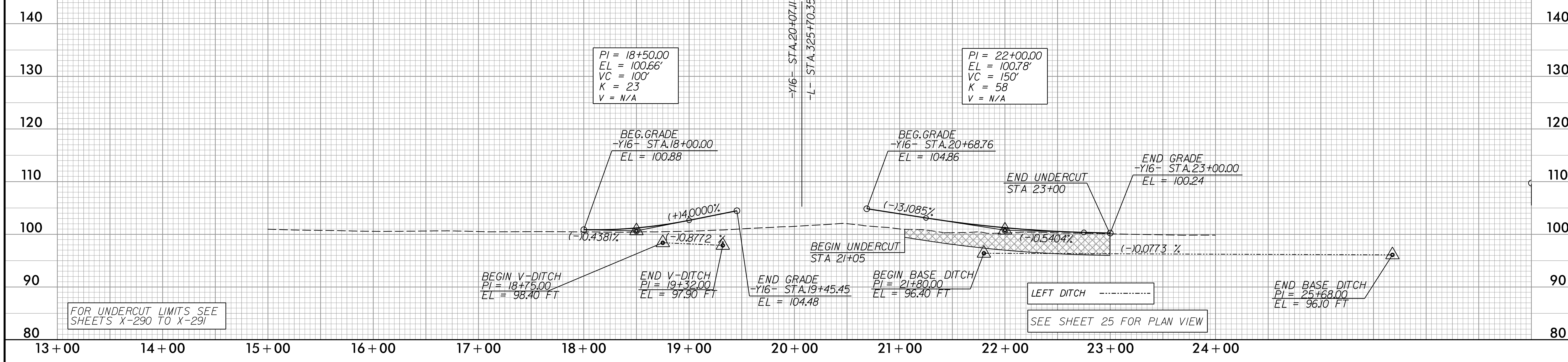
HYDRAULICS ENGINEER
NOT A CERTIFIED DOCUMENT AS TO THE ORIGINAL DOCUMENT BUT ONLY AS TO THE REVISIONS.
THIS DOCUMENT ORIGINALLY ISSUED AND SEALED BY :
MEME D. BUSCEMI
LIC. NO. 037863
ON
4/5/19
THIS DOCUMENT IS ONLY CERTIFIED AS TO THE REVISIONS.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

5/28/99

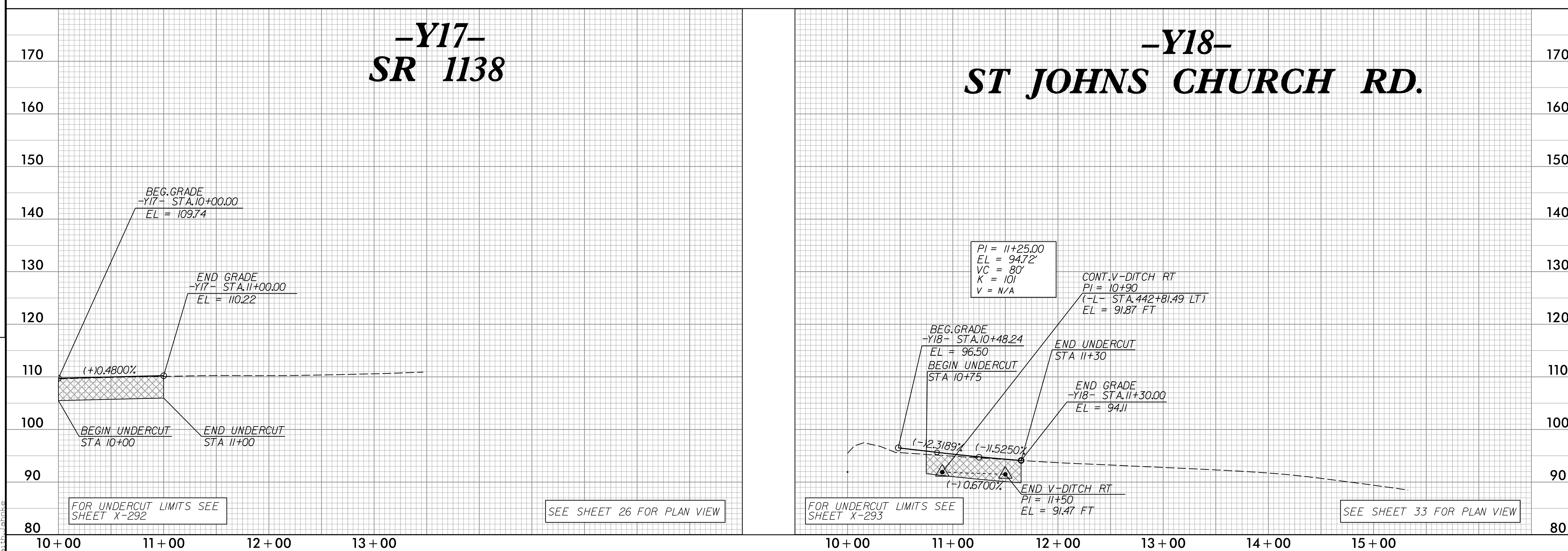
CONSTRUCTION REVISION: ELEVATION AT Y-18 STA 10-90 REVISED.JPM 7/7/2020

-Y16- SR 1301 / SR 1128
CORNWALLIS RD /OCCONEECCHEE NECK RD



-Y17- SR 1138

-Y18- ST JOHNS CHURCH RD.



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R-2582A_Rdy_psh_pfl.dgn
faithjahnke

PROJECT REFERENCE NO.	SHEET NO.
R-2582A	65

ROADWAY DESIGN ENGINEER — 8/20/2020 — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 046981 FAITH E. JAHNKE — DocuSigned by: Faith E. Jahnke

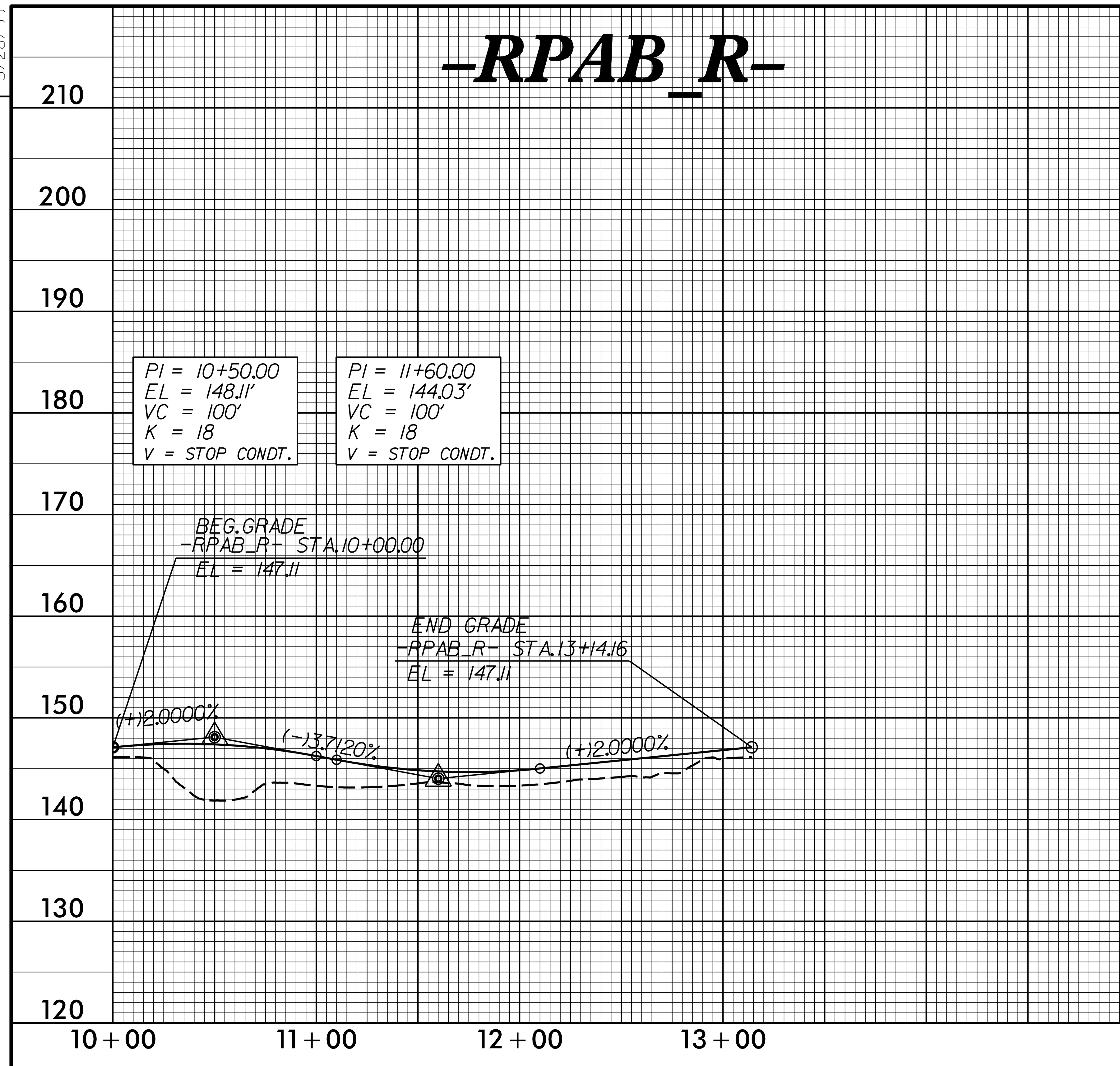
HYDRAULICS ENGINEER — 8/20/2020 — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 037863 MEME D. BUSCEMI — DocuSigned by: Meme D. Buscemi

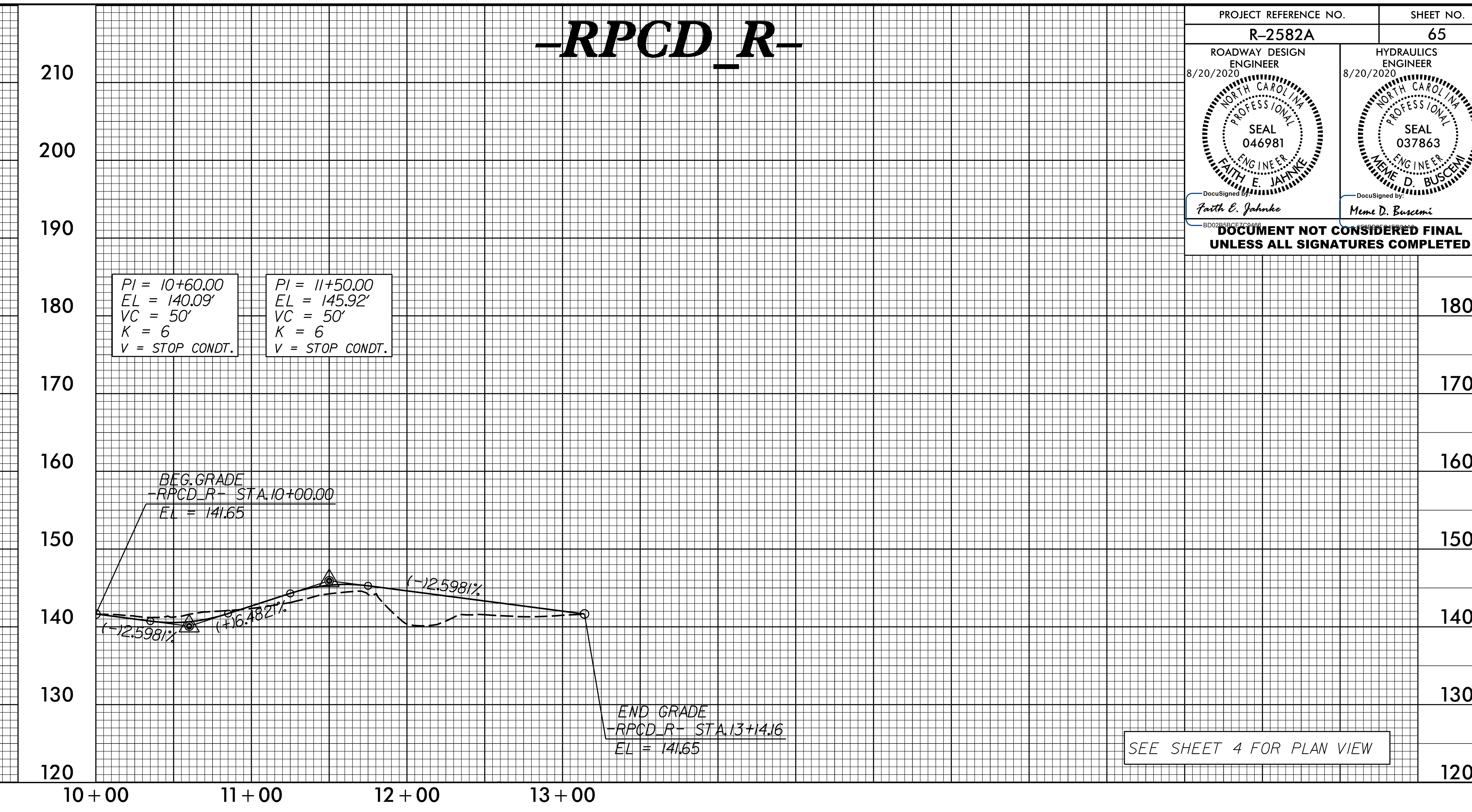
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

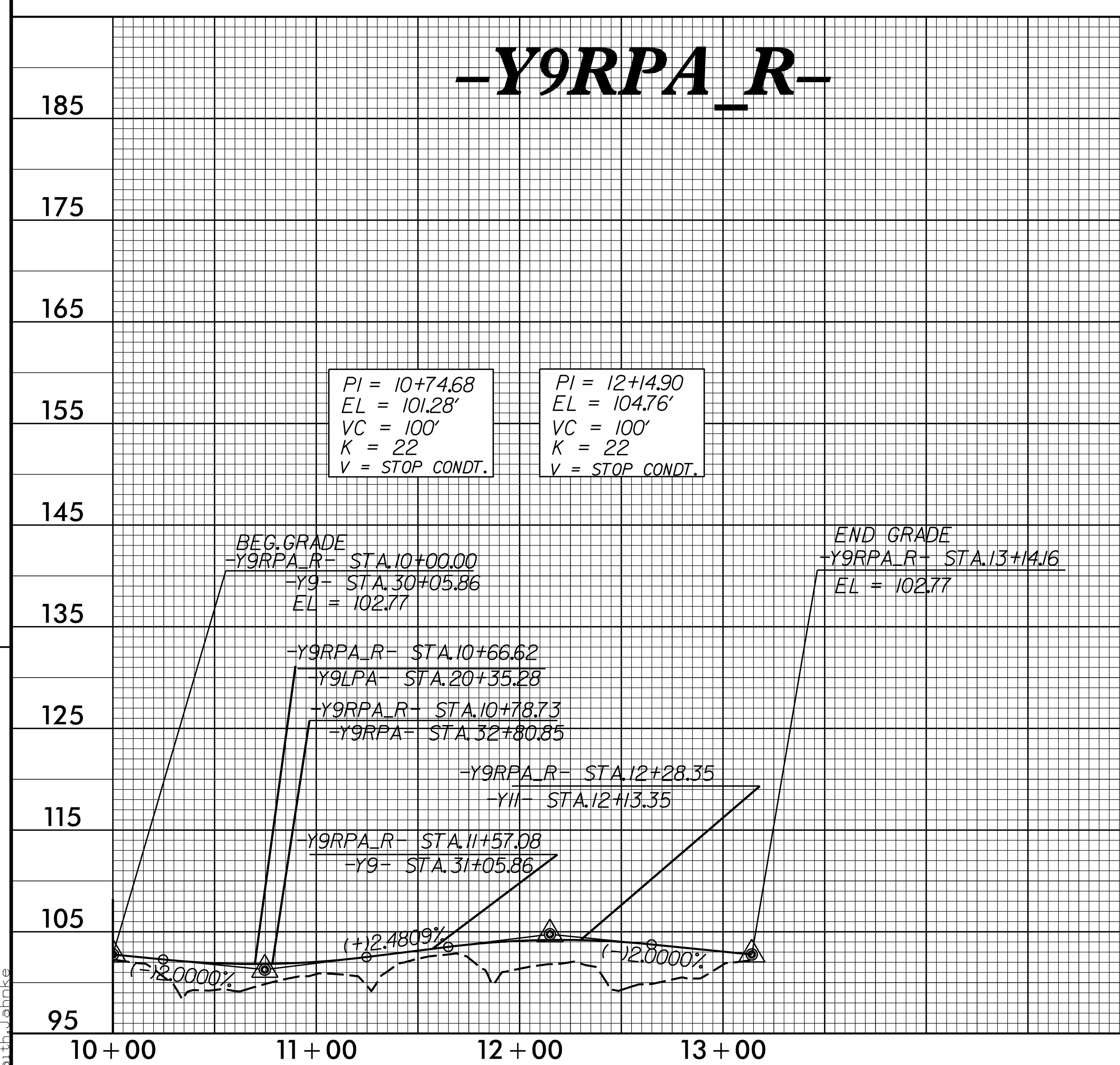
REVISIONS

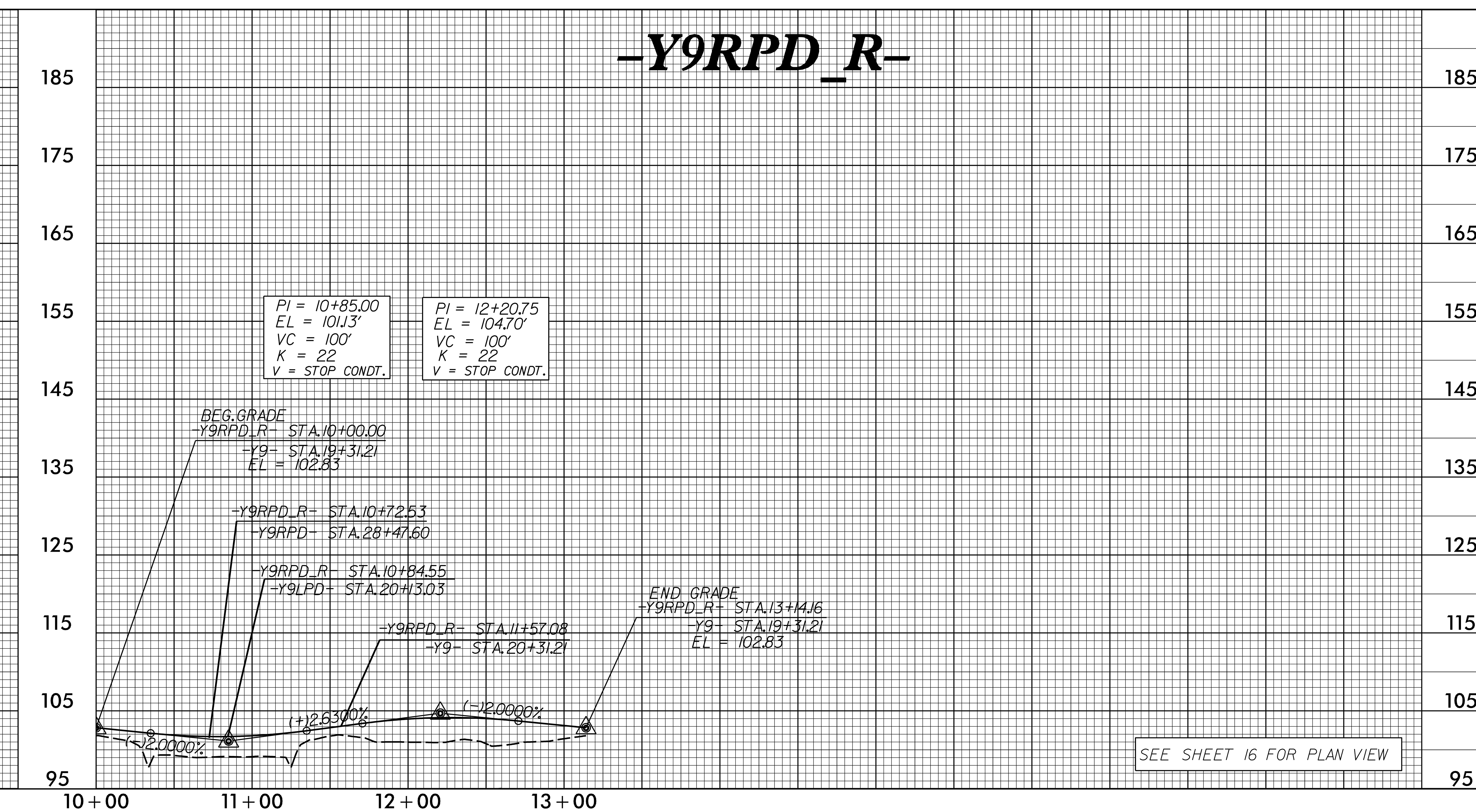
CONST REV 08/18/20 (FEJ): CORRECTED SHEET ELEVATION LABELS FOR -Y9RPA_R- AND -Y9RPD_R-.

5/28/99







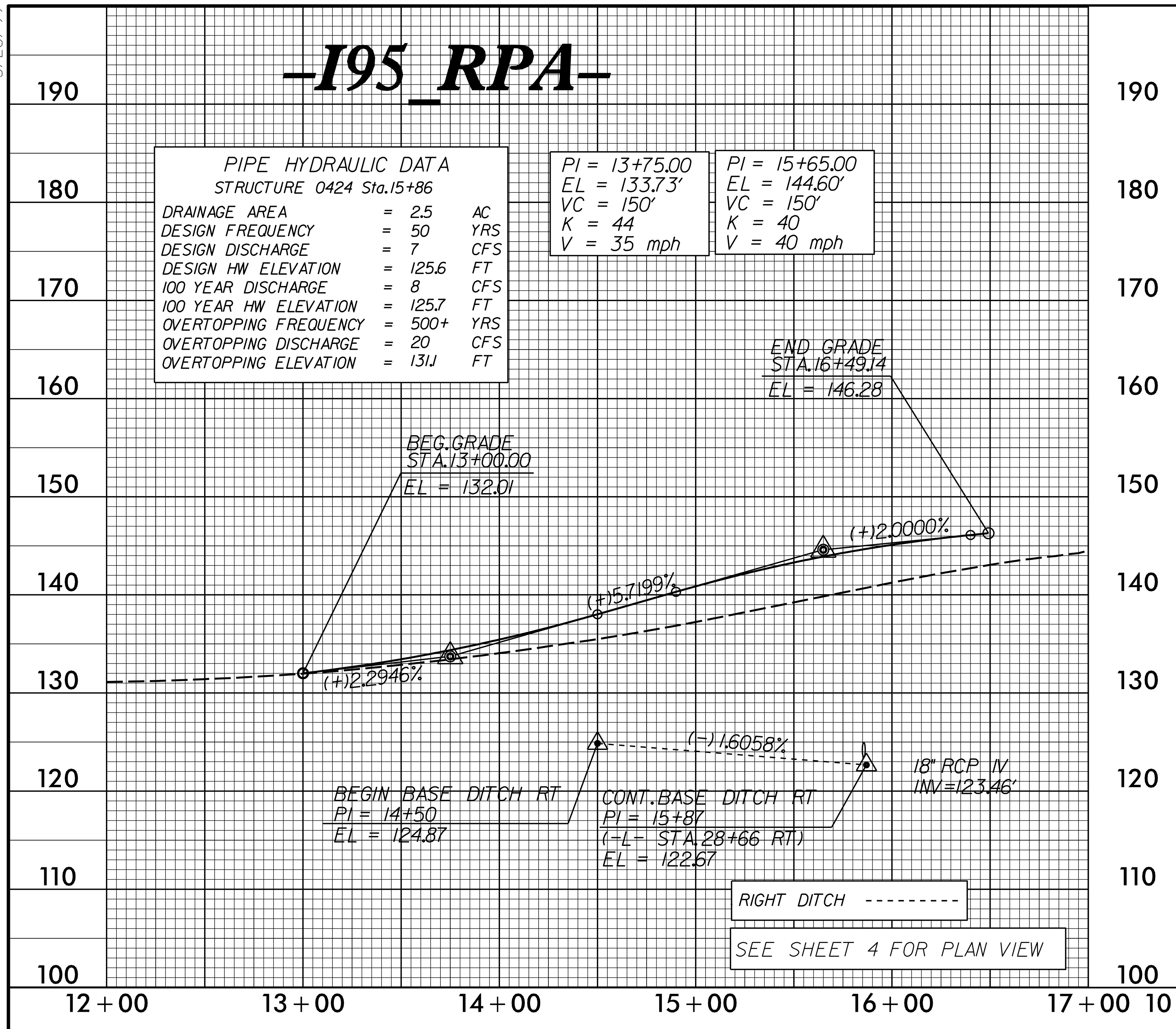


PROJECT REFERENCE NO.	SHEET NO.
R-2582A	66

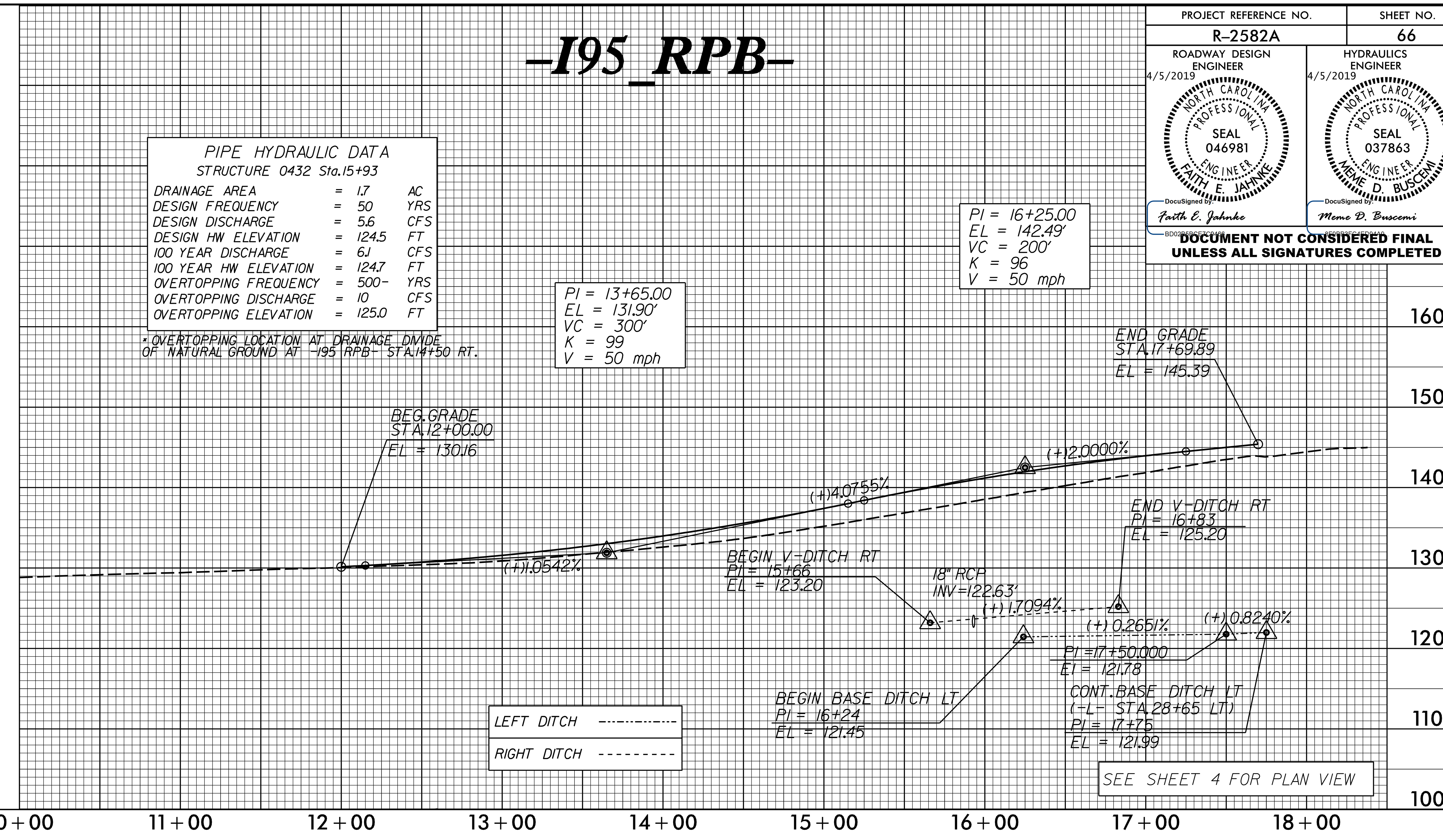
ROADWAY DESIGN ENGINEER — 4/5/2019 — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 046981 FAITH E. JAHNKE — DocuSigned by: Faith E. Jahnke

HYDRAULICS ENGINEER — 4/5/2019 — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 037863 MEMO D. BUSCEMI — DocuSigned by: Memo D. Buscemi

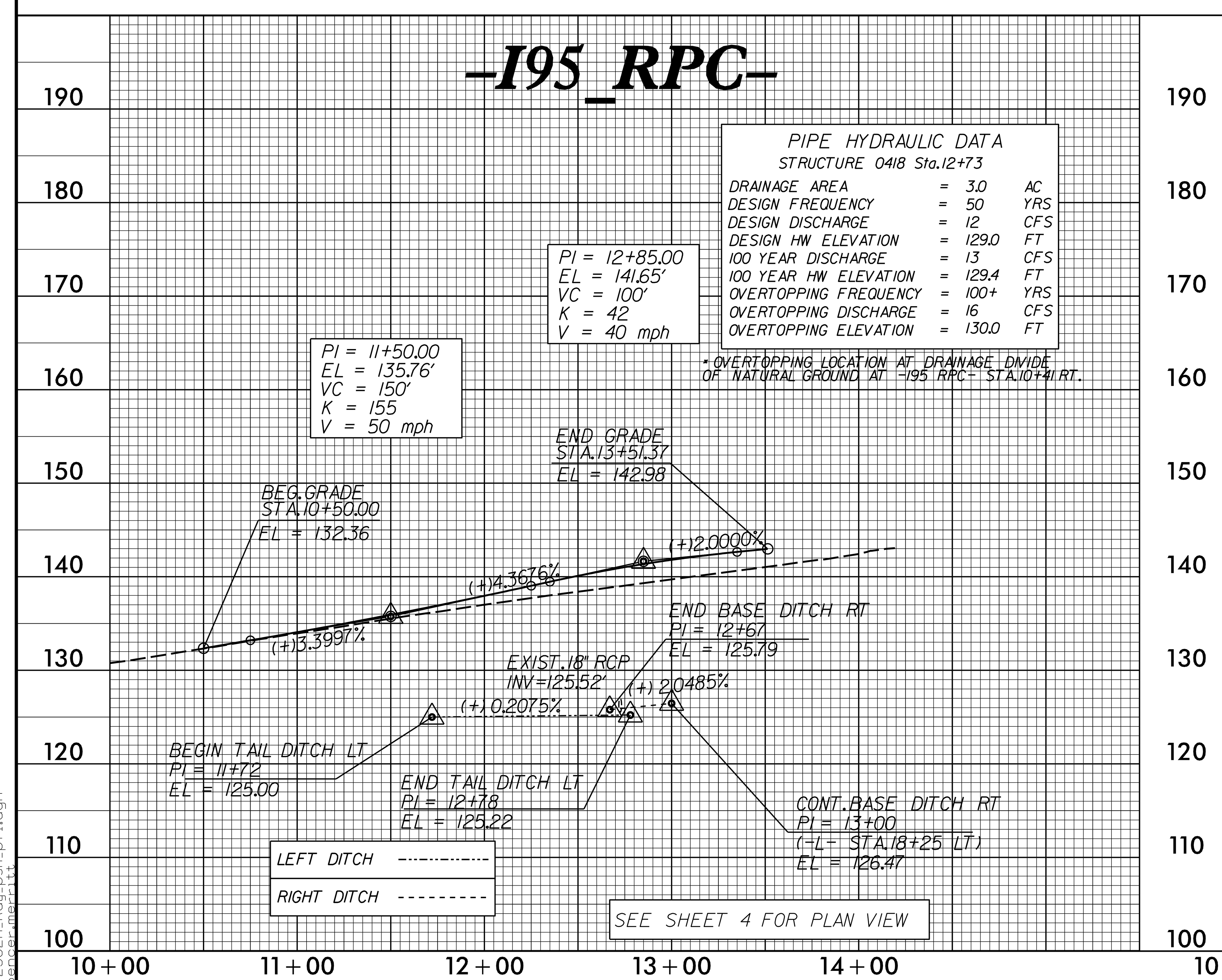
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



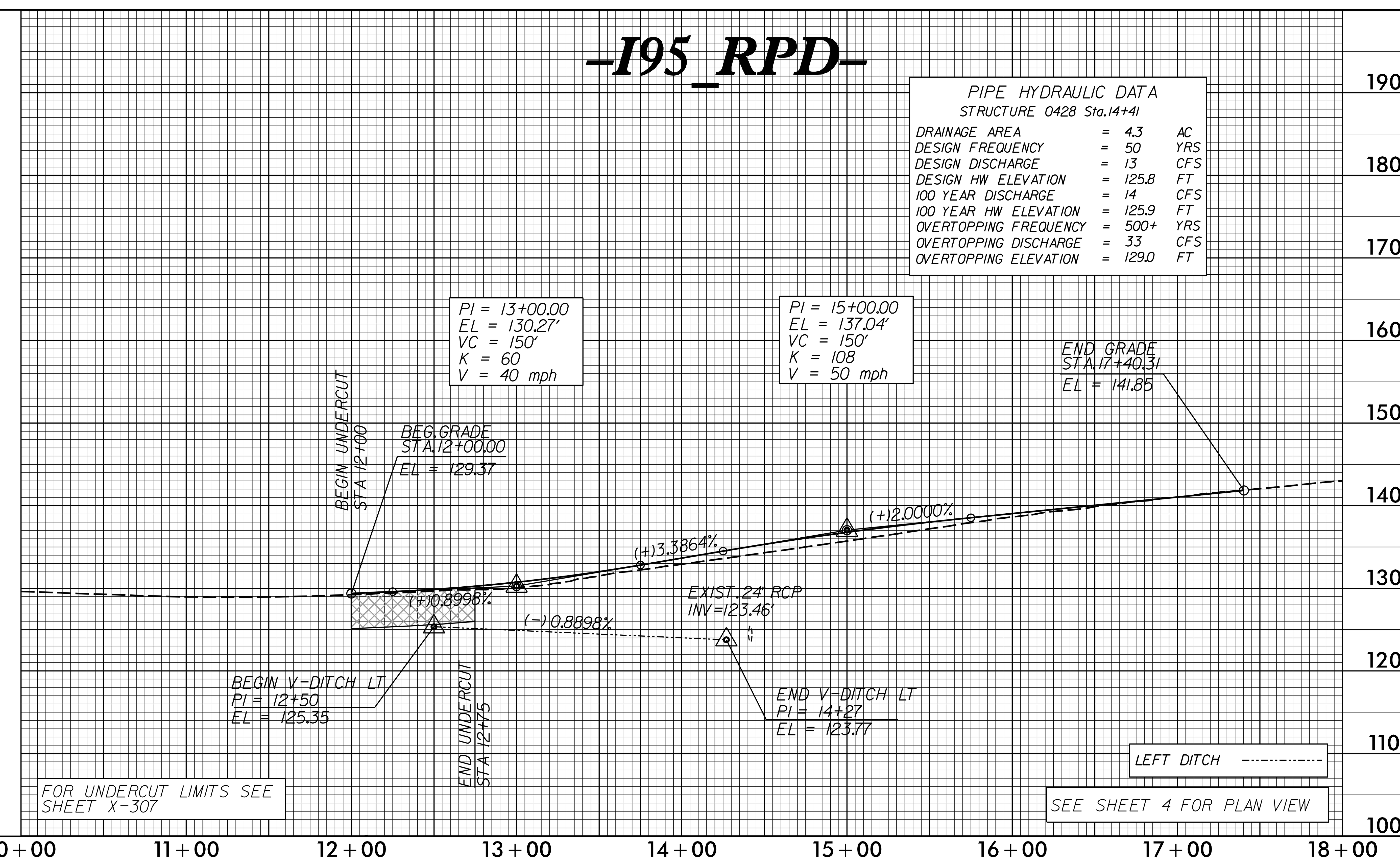
-I95_RPA-
PIPE HYDRAULIC DATA
STRUCTURE 0424 Sta.15+86
DRAINAGE AREA = 2.5 AC
DESIGN FREQUENCY = 50 YRS
DESIGN DISCHARGE = 7 CFS
DESIGN HW ELEVATION = 125.6 FT
100 YEAR DISCHARGE = 8 CFS
100 YEAR HW ELEVATION = 125.7 FT
OVERTOPPING FREQUENCY = 500+ YRS
OVERTOPPING DISCHARGE = 20 CFS
OVERTOPPING ELEVATION = 131.1 FT
PI = 13+75.00 EL = 133.73' VC = 150' K = 44 V = 35 mph
PI = 15+65.00 EL = 144.60' VC = 150' K = 40 V = 40 mph
END GRADE STA.16+49.14 EL = 146.28
BEG.GRADE STA.13+00.00 EL = 132.01
(+)2.0000%
(+)5.7199%
(+)2.2946%
(-) 1.6058%
18" RCP IV INV=123.46'
BEGIN BASE DITCH RT PI = 14+50 EL = 124.87
CONT.BASE DITCH RT PI = 15+87 (-L- STA.28+66 RT) EL = 122.67
RIGHT DITCH
SEE SHEET 4 FOR PLAN VIEW



-I95_RPB-
PIPE HYDRAULIC DATA
STRUCTURE 0432 Sta.15+93
DRAINAGE AREA = 1.7 AC
DESIGN FREQUENCY = 50 YRS
DESIGN DISCHARGE = 5.6 CFS
DESIGN HW ELEVATION = 124.5 FT
100 YEAR DISCHARGE = 6.1 CFS
100 YEAR HW ELEVATION = 124.7 FT
OVERTOPPING FREQUENCY = 500- YRS
OVERTOPPING DISCHARGE = 10 CFS
OVERTOPPING ELEVATION = 125.0 FT
* OVERTOPPING LOCATION AT DRAINAGE DIVIDE OF NATURAL GROUND AT -I95 RPB- STA.14+50 RT.
PI = 13+65.00 EL = 131.90' VC = 300' K = 99 V = 50 mph
PI = 16+25.00 EL = 142.49' VC = 200' K = 96 V = 50 mph
END GRADE STA.17+69.89 EL = 145.39
BEG.GRADE STA.12+00.00 EL = 130.16
(+)2.0000%
(+)4.0755%
(+)1.0542%
END V-DITCH RT PI = 16+83 EL = 125.20
BEGIN V-DITCH RT PI = 15+66 EL = 123.20
18" RCP INV=122.63'
(+) 1.7094%
(+) 0.2651%
(+) 0.8240%
PI =17+50.000 EL = 121.78
BEGIN BASE DITCH LT PI = 16+24 EL = 121.45
CONT.BASE DITCH LT (-L- STA.28+65 LT) PI = 17+75 EL = 121.99
LEFT DITCH
RIGHT DITCH
SEE SHEET 4 FOR PLAN VIEW



-I95_RPC-
PIPE HYDRAULIC DATA
STRUCTURE 0418 Sta.12+73
DRAINAGE AREA = 3.0 AC
DESIGN FREQUENCY = 50 YRS
DESIGN DISCHARGE = 12 CFS
DESIGN HW ELEVATION = 129.0 FT
100 YEAR DISCHARGE = 13 CFS
100 YEAR HW ELEVATION = 129.4 FT
OVERTOPPING FREQUENCY = 100+ YRS
OVERTOPPING DISCHARGE = 16 CFS
OVERTOPPING ELEVATION = 130.0 FT
* OVERTOPPING LOCATION AT DRAINAGE DIVIDE OF NATURAL GROUND AT -I95 RPC- STA.10+41 RT.
PI = 12+85.00 EL = 141.65' VC = 100' K = 42 V = 40 mph
PI = 11+50.00 EL = 135.76' VC = 150' K = 155 V = 50 mph
END GRADE STA.13+51.37 EL = 142.98
BEG.GRADE STA.10+50.00 EL = 132.36
(+)2.0000%
(+)4.3676%
(+)3.3997%
END BASE DITCH RT PI = 12+67 EL = 125.79
EXIST.18" RCP INV=125.52'
(+) 2.0485%
(+) 0.2075%
BEGIN TAIL DITCH LT PI = 11+72 EL = 125.00
END TAIL DITCH LT PI = 12+78 EL = 125.22
CONT.BASE DITCH RT PI = 13+00 (-L- STA.18+25 LT) EL = 126.47
LEFT DITCH
RIGHT DITCH
SEE SHEET 4 FOR PLAN VIEW



-I95_RPD-
PIPE HYDRAULIC DATA
STRUCTURE 0428 Sta.14+41
DRAINAGE AREA = 4.3 AC
DESIGN FREQUENCY = 50 YRS
DESIGN DISCHARGE = 13 CFS
DESIGN HW ELEVATION = 125.8 FT
100 YEAR DISCHARGE = 14 CFS
100 YEAR HW ELEVATION = 125.9 FT
OVERTOPPING FREQUENCY = 500+ YRS
OVERTOPPING DISCHARGE = 33 CFS
OVERTOPPING ELEVATION = 129.0 FT
PI = 13+00.00 EL = 130.27' VC = 150' K = 60 V = 40 mph
PI = 15+00.00 EL = 137.04' VC = 150' K = 108 V = 50 mph
END GRADE STA.17+40.31 EL = 141.85
BEGIN UNDERCUT STA 12+00
BEG.GRADE STA.12+00.00 EL = 129.37
(+)2.0000%
(+)3.3864%
(+)0.8998%
(-) 0.8898%
EXIST.24" RCP INV=123.46'
BEGIN V-DITCH LT PI = 12+50 EL = 125.35
END UNDERCUT STA 12+75
END V-DITCH LT PI = 14+27 EL = 123.77
FOR UNDERCUT LIMITS SEE SHEET X-307
LEFT DITCH
SEE SHEET 4 FOR PLAN VIEW

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PROJECT REFERENCE NO.	SHEET NO.
R-2582A	67

HYDRAULICS ENGINEER 8/13/2020 — SEAL 049357 NORTH CAROLINA PROFESSIONAL ENGINEER JOY SADDLER — FOR REVISIONS ONLY

ROADWAY DESIGN ENGINEER 8/13/2020 — SEAL 046981 NORTH CAROLINA PROFESSIONAL ENGINEER FAITH E. JAHNKE — Faith E. Jahnke

HYDRAULICS ENGINEER
NOT A CERTIFIED DOCUMENT AS TO THE ORIGINAL DOCUMENT BUT ONLY AS TO THE REVISIONS.
THIS DOCUMENT ORIGINALLY ISSUED AND SEALED BY:
MEME D. BUSCEMI
LIC. NO. 037863
ON
4/5/19
THIS DOCUMENT IS ONLY CERTIFIED AS TO THE REVISIONS.

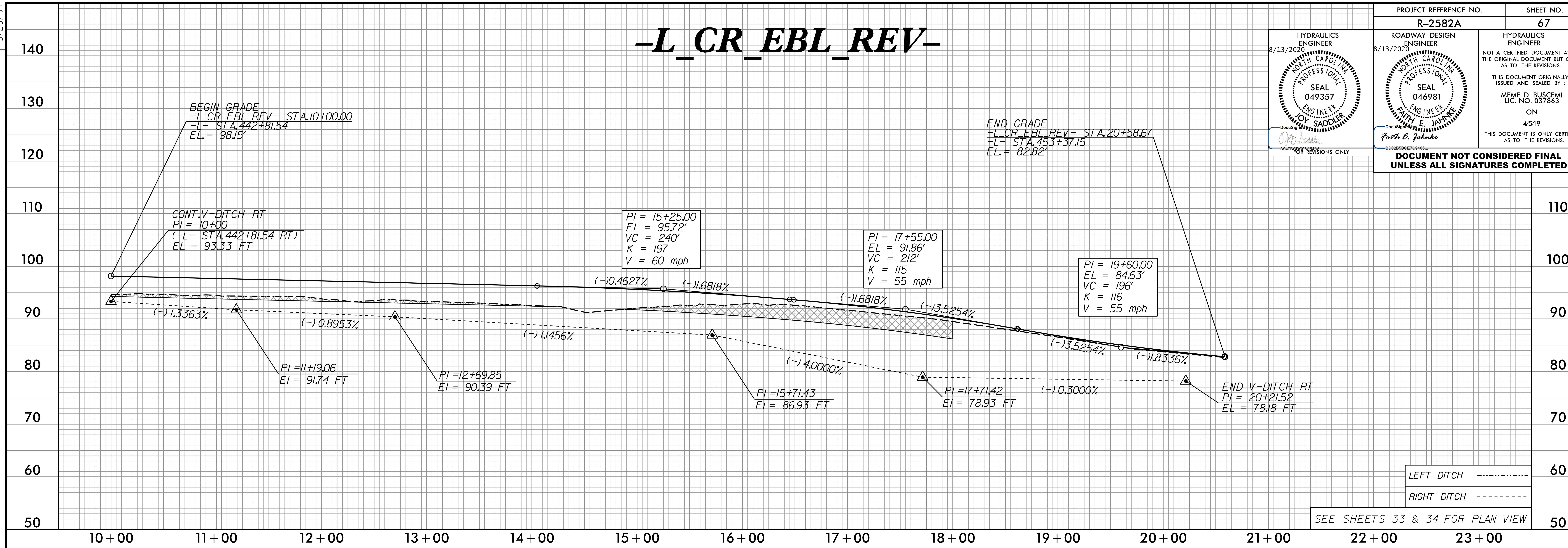
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

5/28/99

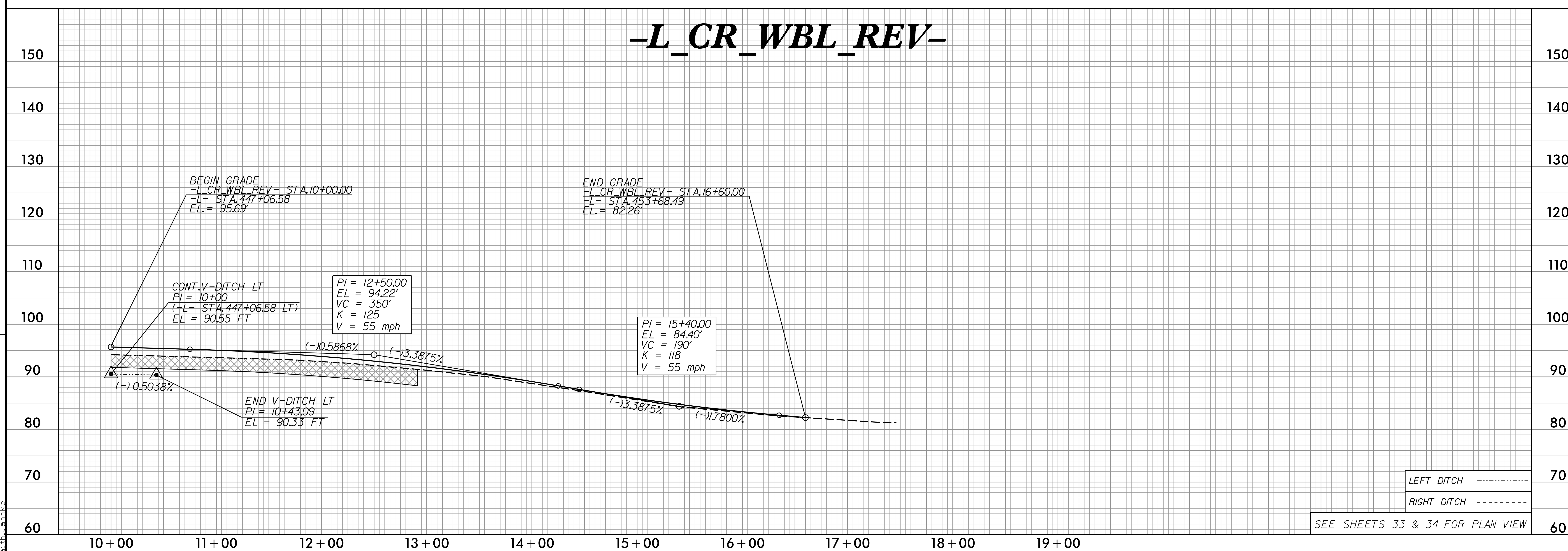
REVISIONS

CONSTRUCTION REVISION: THE CROSSOVER ALIGNMENTS, -L_CR_EBL- AND -L_CR_WBL-, HAVE BEEN REVISED TO AVOID WETLAND IMPACTS AROUND -L- STA.453+50.00 RT. THE REVISED VERTICAL ALIGNMENTS ARE -L_CR_EBL_REV- AND -L_CR_WBL_REV-. JPM 7/7/2020

-L_CR_EBL_REV-



-L_CR_WBL_REV-



13-AUG-2020 08:47
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faithjahnke