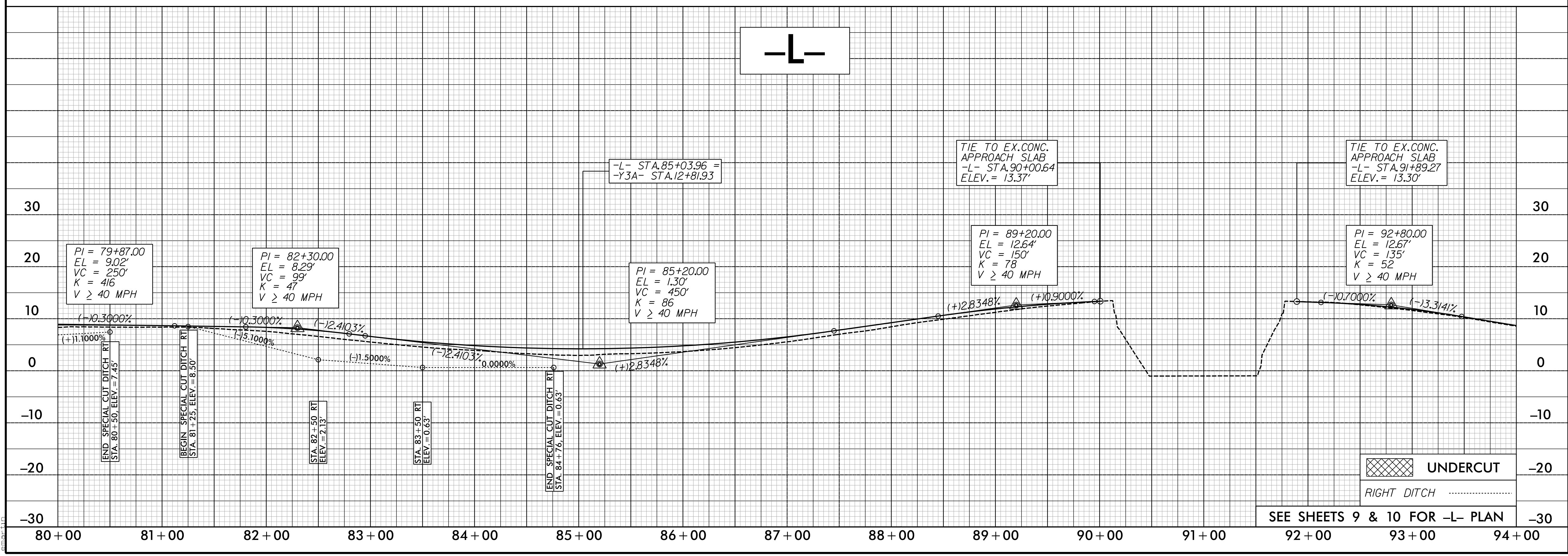
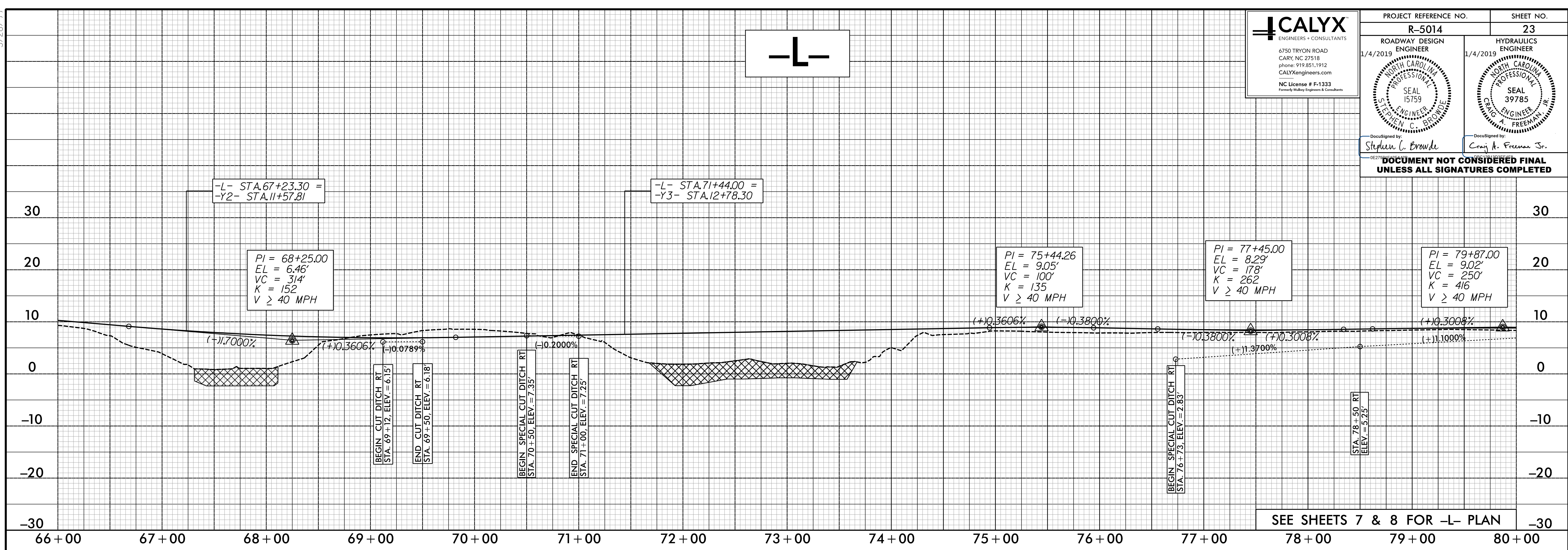


5/28/19

CALYX
ENGINEERS + CONSULTANTS
6750 TRYON ROAD
CARY, NC 27518
phone: 919.851.1912
CALYXEngineers.com
NC License # F-1333
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PROJECT REFERENCE NO. R-5014	SHEET NO. 23
ROADWAY DESIGN ENGINEER 1/4/2019	HYDRAULICS ENGINEER 1/4/2019
DocuSigned by: Stephen C. Browde DocuSigned by: Craig A. Freeman Jr.	

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UNDERCUT
 RIGHT DITCH

K:\2018\Projects\Roadway\Projects\R5014_rdy.pfl_23.dgn

5/28/19

NV5
 NV5 ENGINEERS & CONSULTANTS, INC.
 6750 TRYON ROAD
 CARY, NC 27518
 P: 919.851.1912 www.nv5.com

PROJECT REFERENCE NO. **R-5014** SHEET NO. **24**

ROADWAY DESIGN ENGINEER 3/31/2021
 HYDRAULICS ENGINEER 4/1/2021

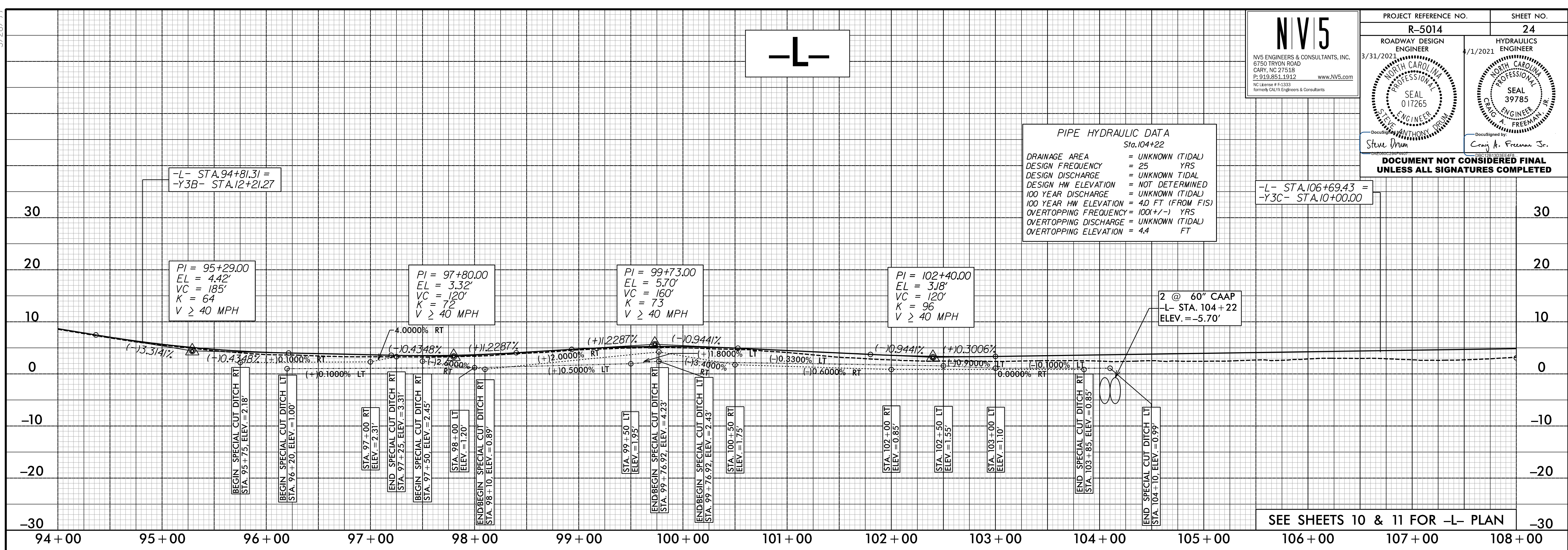
SEAL 017265
 SEAL 39785

DocuSigned by:
 Steve Drum
 DocuSigned by:
 Craig A. Freeman Jr.

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PIPE HYDRAULIC DATA
 Sta.104+22

DRAINAGE AREA	= UNKNOWN (TIDAL)
DESIGN FREQUENCY	= 25 YRS
DESIGN DISCHARGE	= UNKNOWN TIDAL
DESIGN HW ELEVATION	= NOT DETERMINED
100 YEAR DISCHARGE	= UNKNOWN (TIDAL)
100 YEAR HW ELEVATION	= 40 FT (FROM FIS)
OVERTOPPING FREQUENCY	= 100(+/-) YRS
OVERTOPPING DISCHARGE	= UNKNOWN (TIDAL)
OVERTOPPING ELEVATION	= 4.4 FT

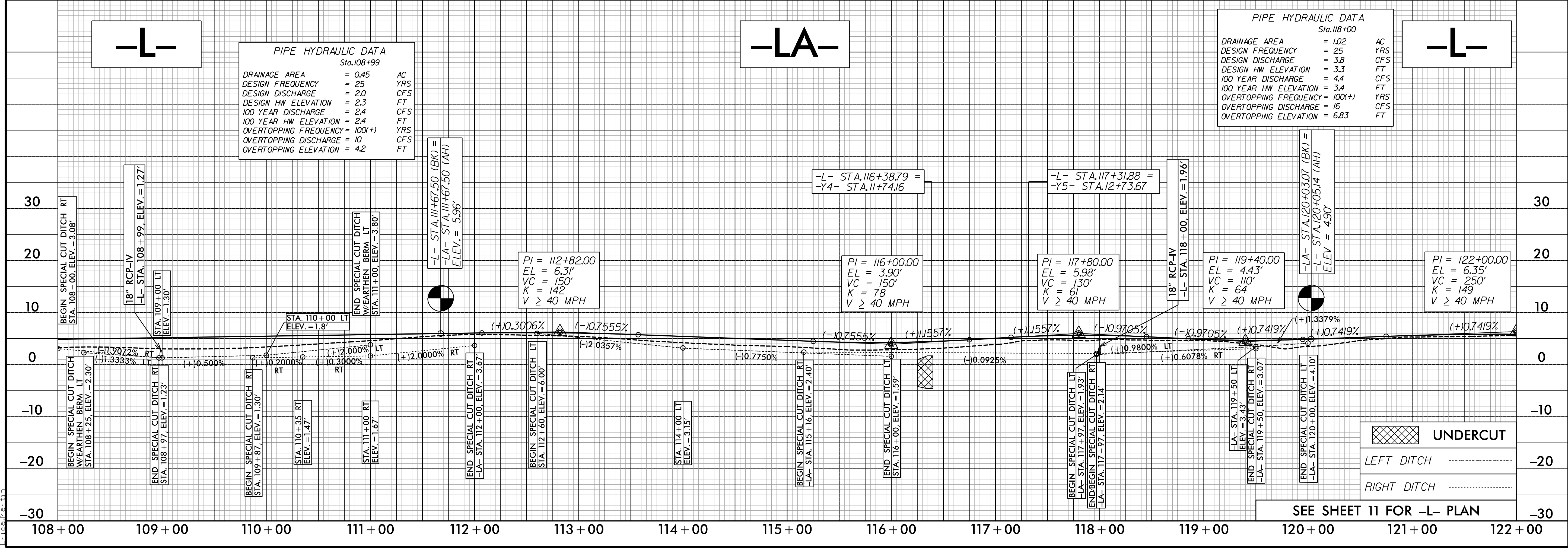


PIPE HYDRAULIC DATA
 Sta.108+99

DRAINAGE AREA	= 0.45	AC
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 2.0	CFS
DESIGN HW ELEVATION	= 2.3	FT
100 YEAR DISCHARGE	= 2.4	CFS
100 YEAR HW ELEVATION	= 2.4	FT
OVERTOPPING FREQUENCY	= 100(+)	YRS
OVERTOPPING DISCHARGE	= 10	CFS
OVERTOPPING ELEVATION	= 4.2	FT

PIPE HYDRAULIC DATA
 Sta.118+00

DRAINAGE AREA	= 1.02	AC
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 3.8	CFS
DESIGN HW ELEVATION	= 3.3	FT
100 YEAR DISCHARGE	= 4.4	CFS
100 YEAR HW ELEVATION	= 3.4	FT
OVERTOPPING FREQUENCY	= 100(+)	YRS
OVERTOPPING DISCHARGE	= 16	CFS
OVERTOPPING ELEVATION	= 6.83	FT



UNDERCUT

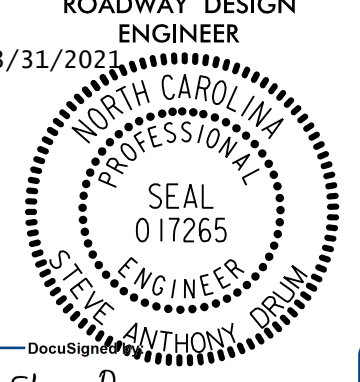
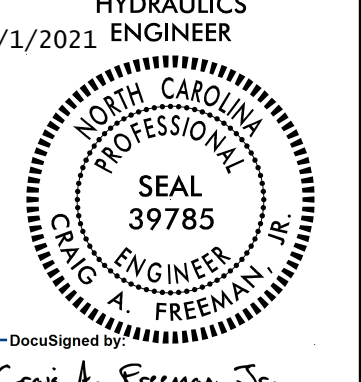
LEFT DITCH

RIGHT DITCH

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5/28/99

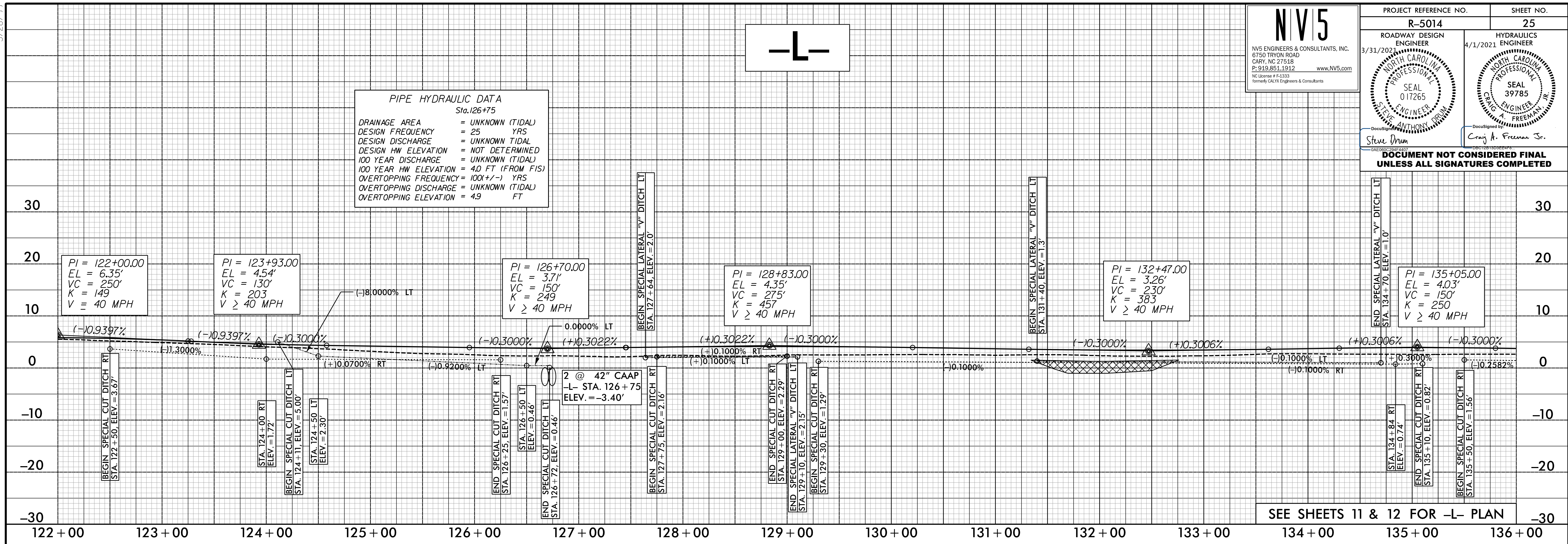
NV5
 NV5 ENGINEERS & CONSULTANTS, INC.
 6750 TRYON ROAD
 CARY, NC 27518
 P: 919.851.1912
 F: 919.851.1912
 www.NV5.com
 formerly CALYX Engineers & Consultants

PROJECT REFERENCE NO. R-5014	SHEET NO. 25
ROADWAY DESIGN ENGINEER 3/31/2021	HYDRAULICS ENGINEER 4/1/2021
	

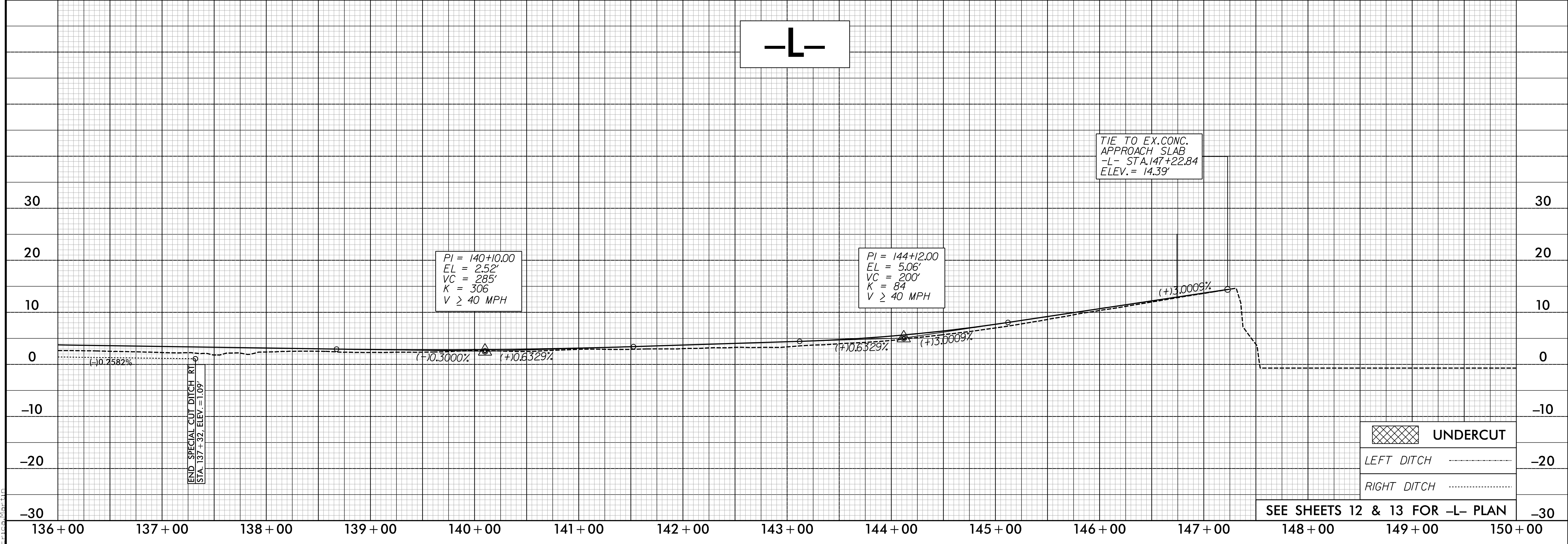
**DOCUMENT NOT CONSIDERED FINAL
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PIPE HYDRAULIC DATA
 Sta. 126+75

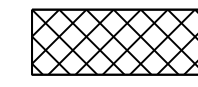
DRAINAGE AREA = UNKNOWN (TIDAL)
 DESIGN FREQUENCY = 25 YRS
 DESIGN DISCHARGE = UNKNOWN TIDAL
 DESIGN HW ELEVATION = NOT DETERMINED
 100 YEAR DISCHARGE = UNKNOWN (TIDAL)
 100 YEAR HW ELEVATION = 4.0 FT (FROM FIS)
 OVERTOPPING FREQUENCY = 100X(+/-) YRS
 OVERTOPPING DISCHARGE = UNKNOWN (TIDAL)
 OVERTOPPING ELEVATION = 4.9 FT





SEE SHEETS 11 & 12 FOR -L- PLAN



SEE SHEETS 12 & 13 FOR -L- PLAN

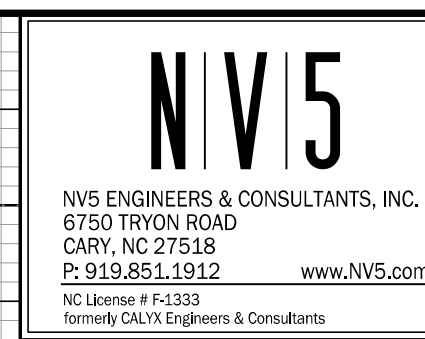
 UNDERCUT

 LEFT DITCH

 RIGHT DITCH

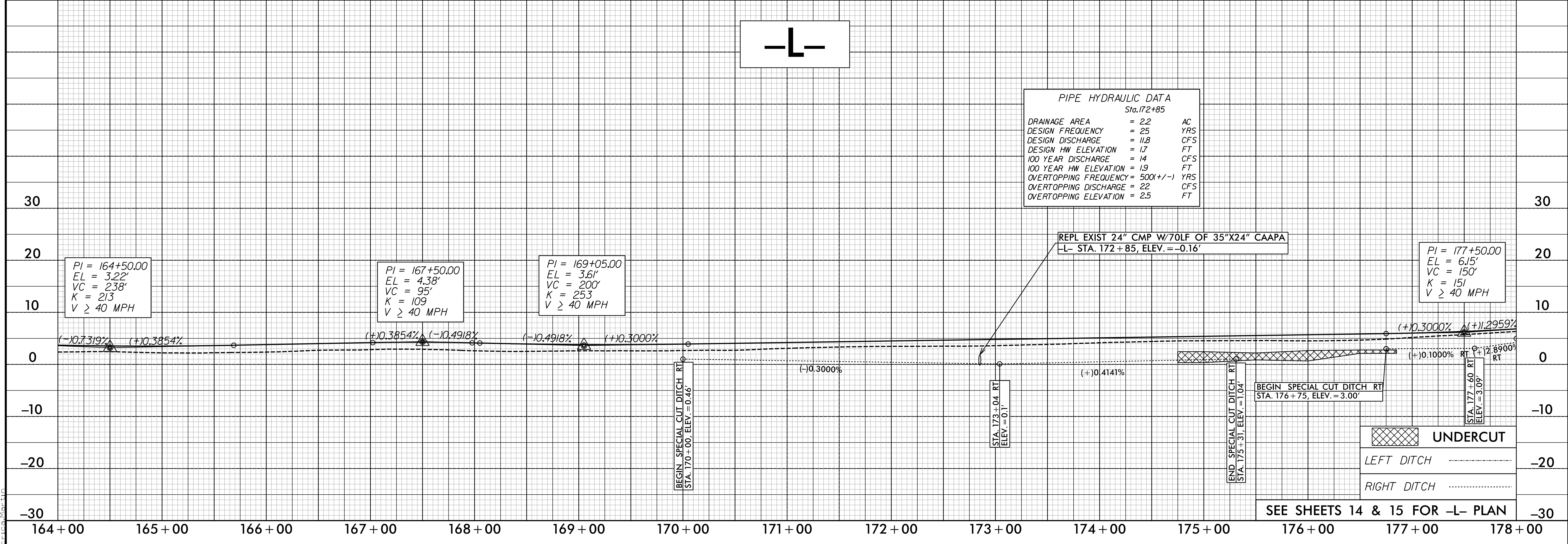
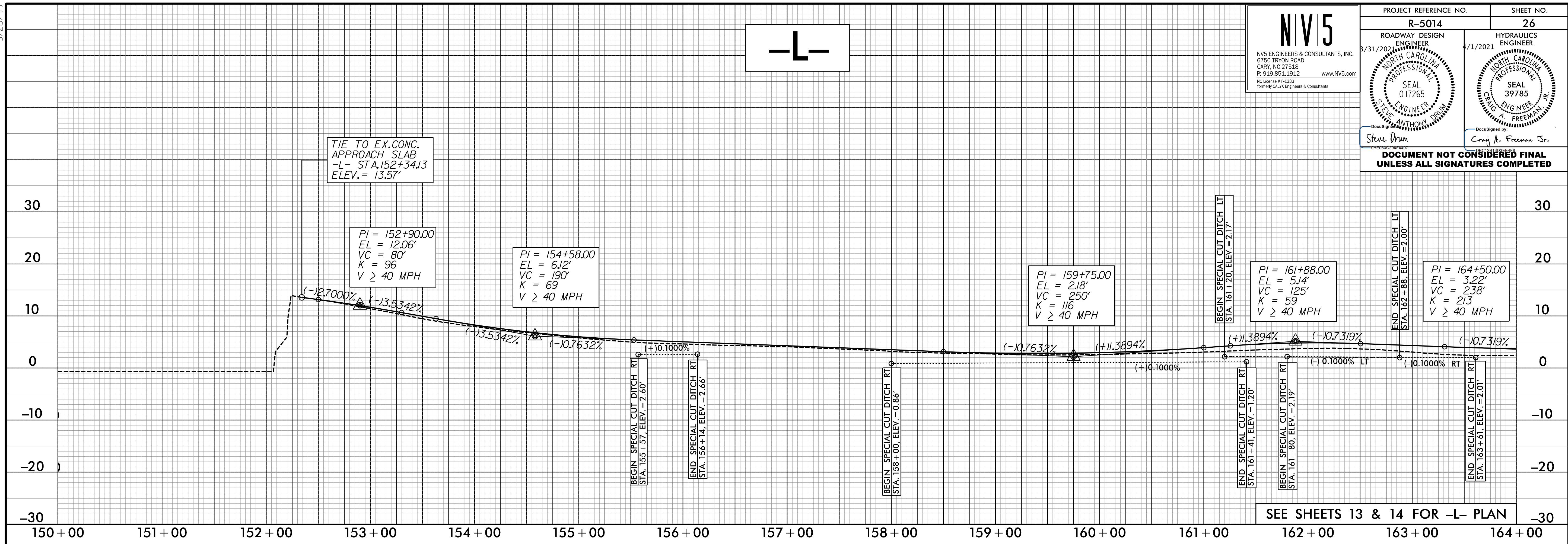
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5/28/19



PROJECT REFERENCE NO. R-5014	SHEET NO. 26
ROADWAY DESIGN ENGINEER 8/31/2021 NORTH CAROLINA PROFESSIONAL SEAL 017265 STEVE DRUM	HYDRAULICS ENGINEER 4/1/2021 NORTH CAROLINA PROFESSIONAL SEAL 39785 CRAIG FREEMAN JR.

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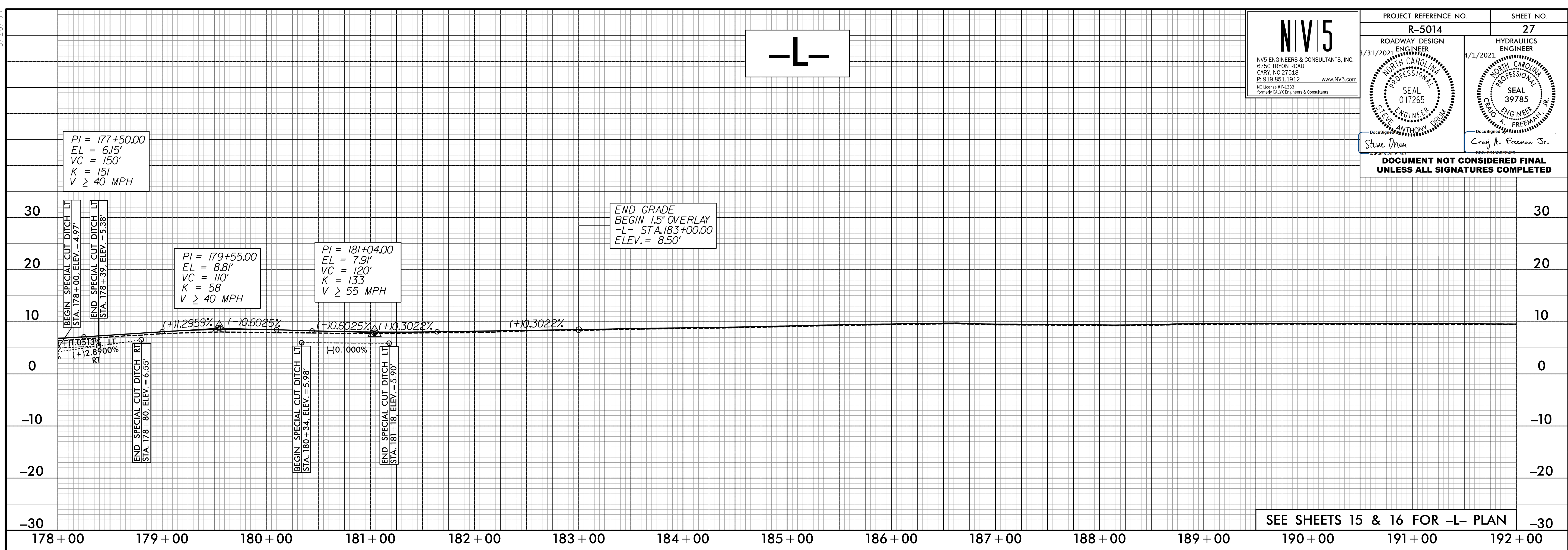
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5/28/99

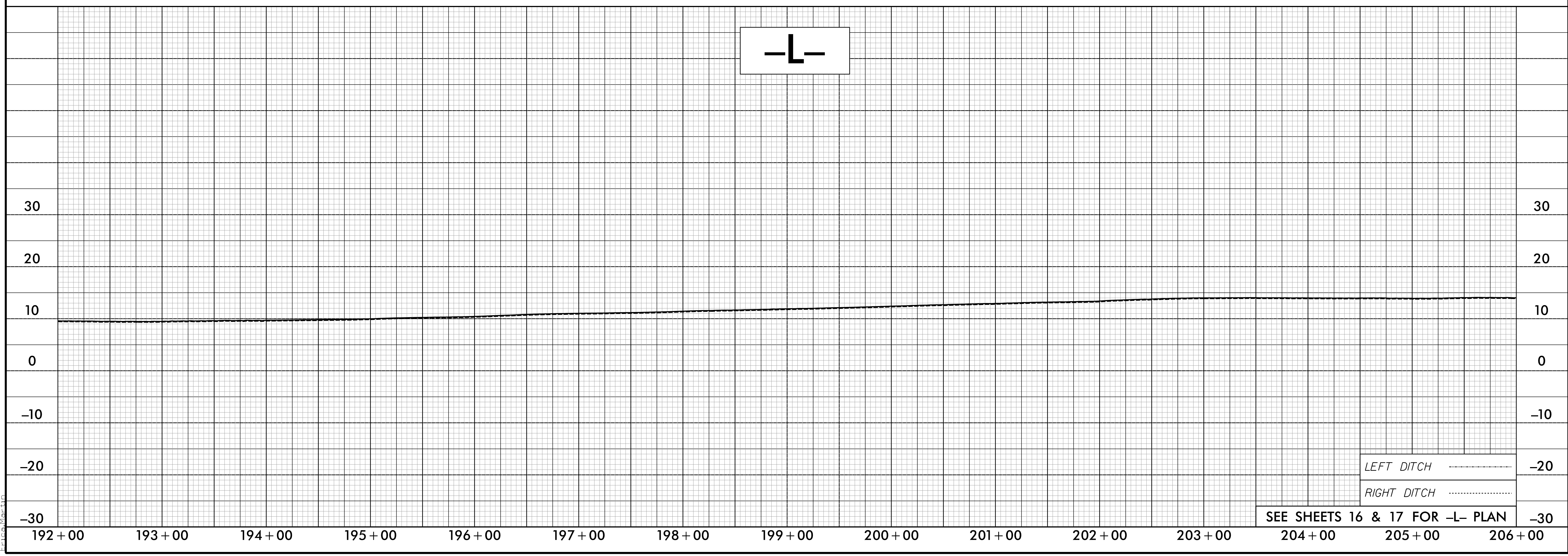


PROJECT REFERENCE NO. R-5014	SHEET NO. 27
ROADWAY DESIGN ENGINEER 8/31/2021 NORTH CAROLINA PROFESSIONAL SEAL 017265 STEVE ANTHONY DROWN	HYDRAULICS ENGINEER 4/1/2021 NORTH CAROLINA PROFESSIONAL SEAL 39785 CRAIG A. FREEMAN JR.

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SEE SHEETS 15 & 16 FOR -L- PLAN



LEFT DITCH -20

RIGHT DITCH -20

SEE SHEETS 16 & 17 FOR -L- PLAN

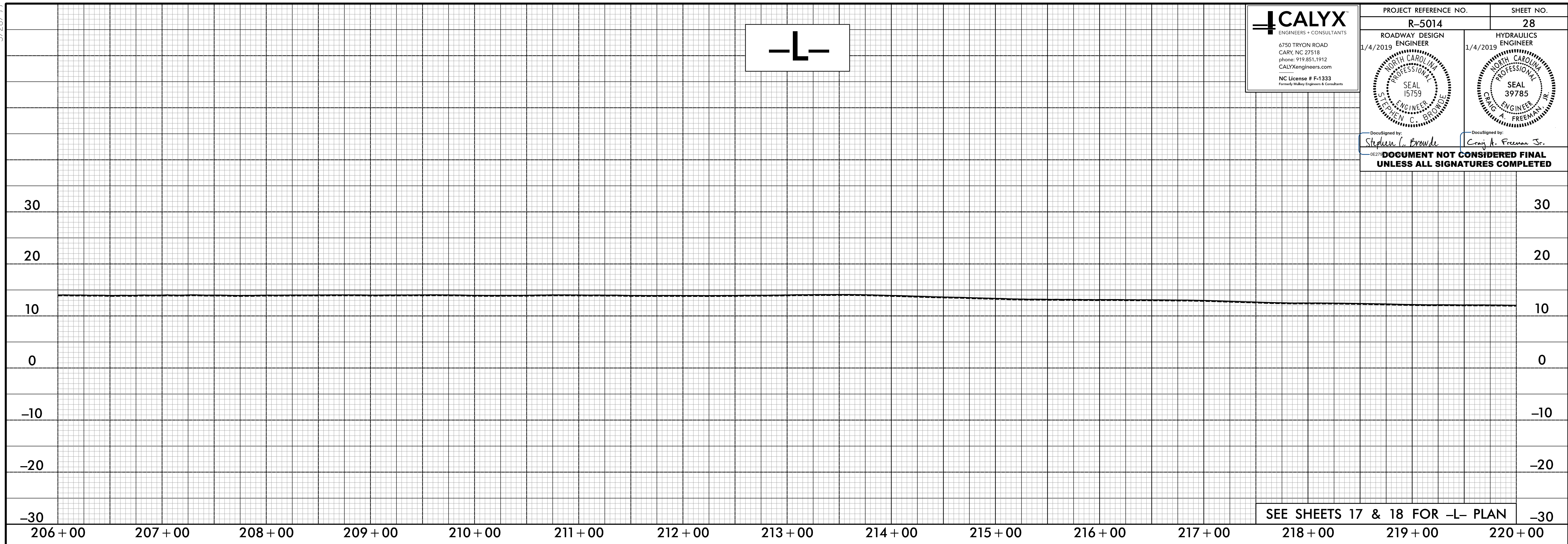
3/21/2021
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5/28/19

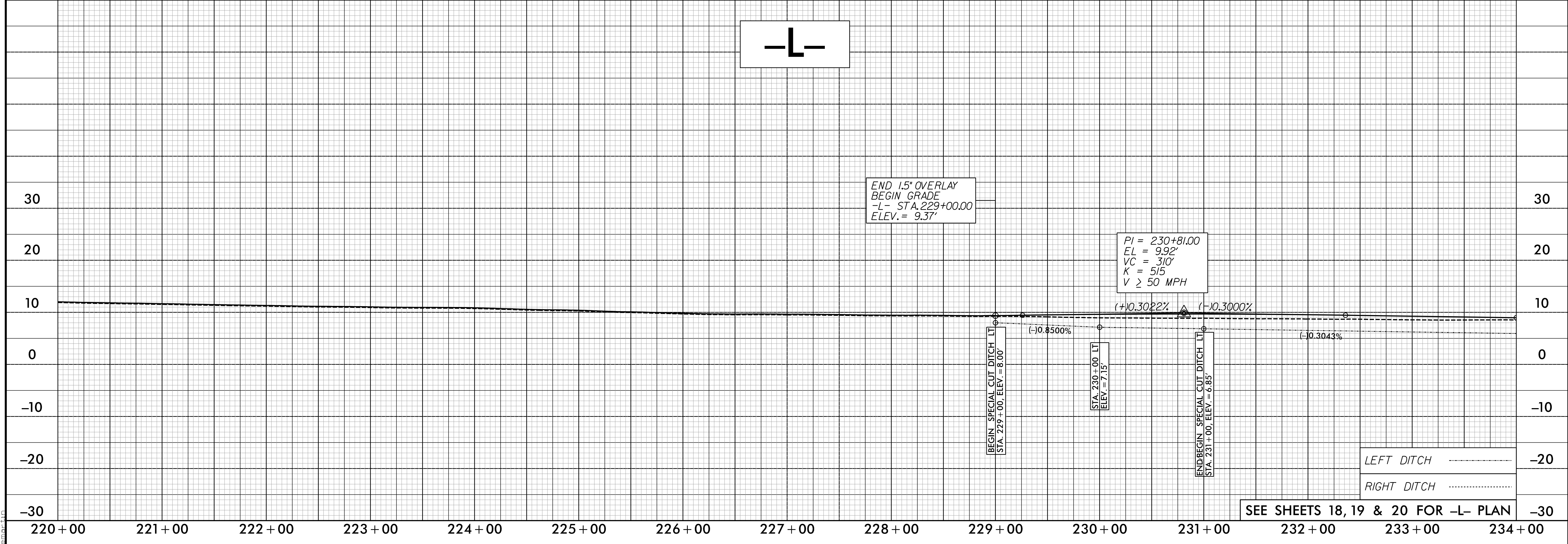
CALYX
ENGINEERS + CONSULTANTS
6750 TRYON ROAD
CARY, NC 27518
phone: 919.851.1912
CALYXengineers.com
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PROJECT REFERENCE NO. R-5014	SHEET NO. 28
ROADWAY DESIGN 1/4/2019 ENGINEER	HYDRAULICS 1/4/2019 ENGINEER
DocuSigned by: <i>Stephen C. Browde</i>	DocuSigned by: <i>Craig H. Freeman Jr.</i>

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-L-

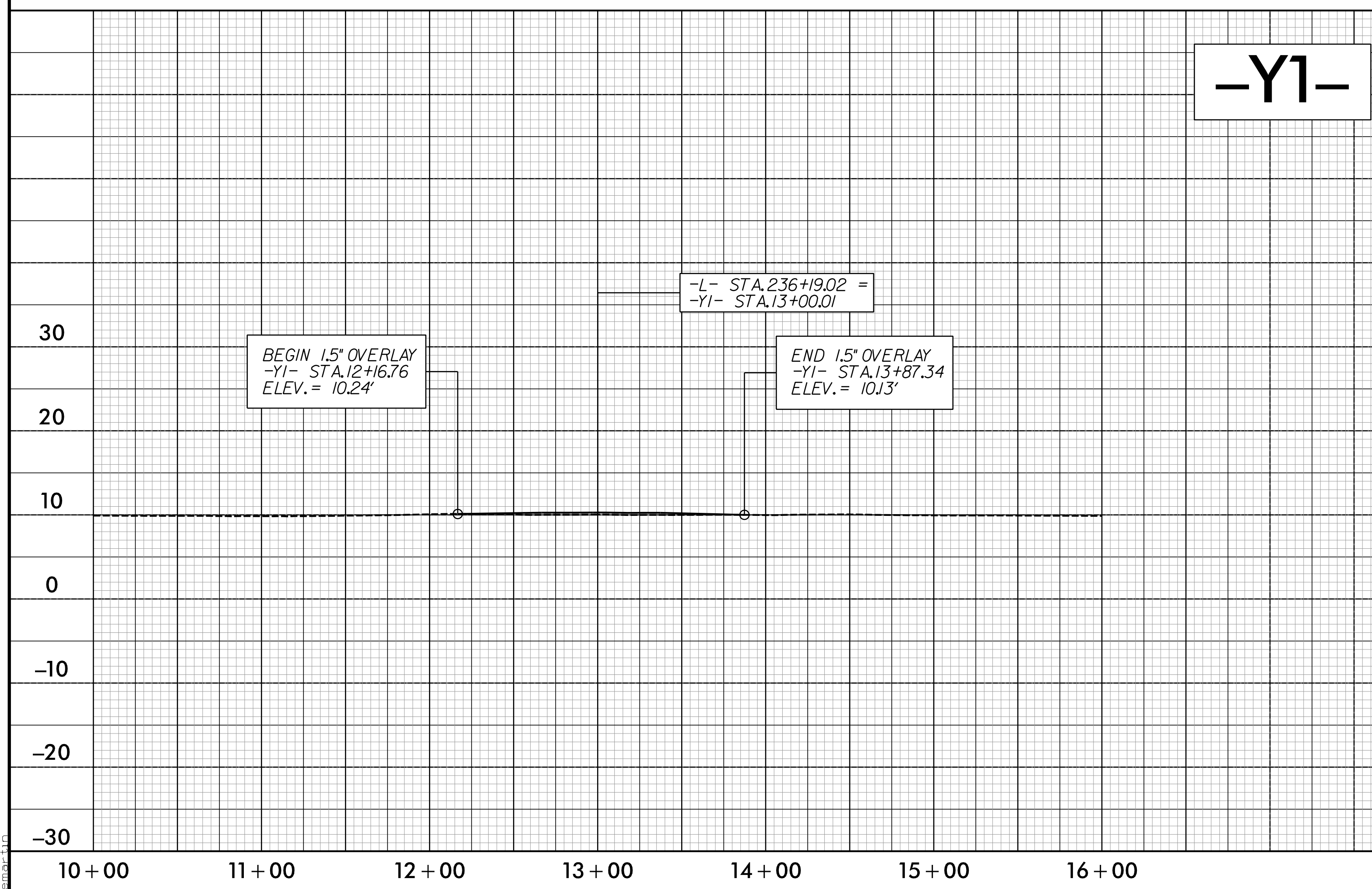
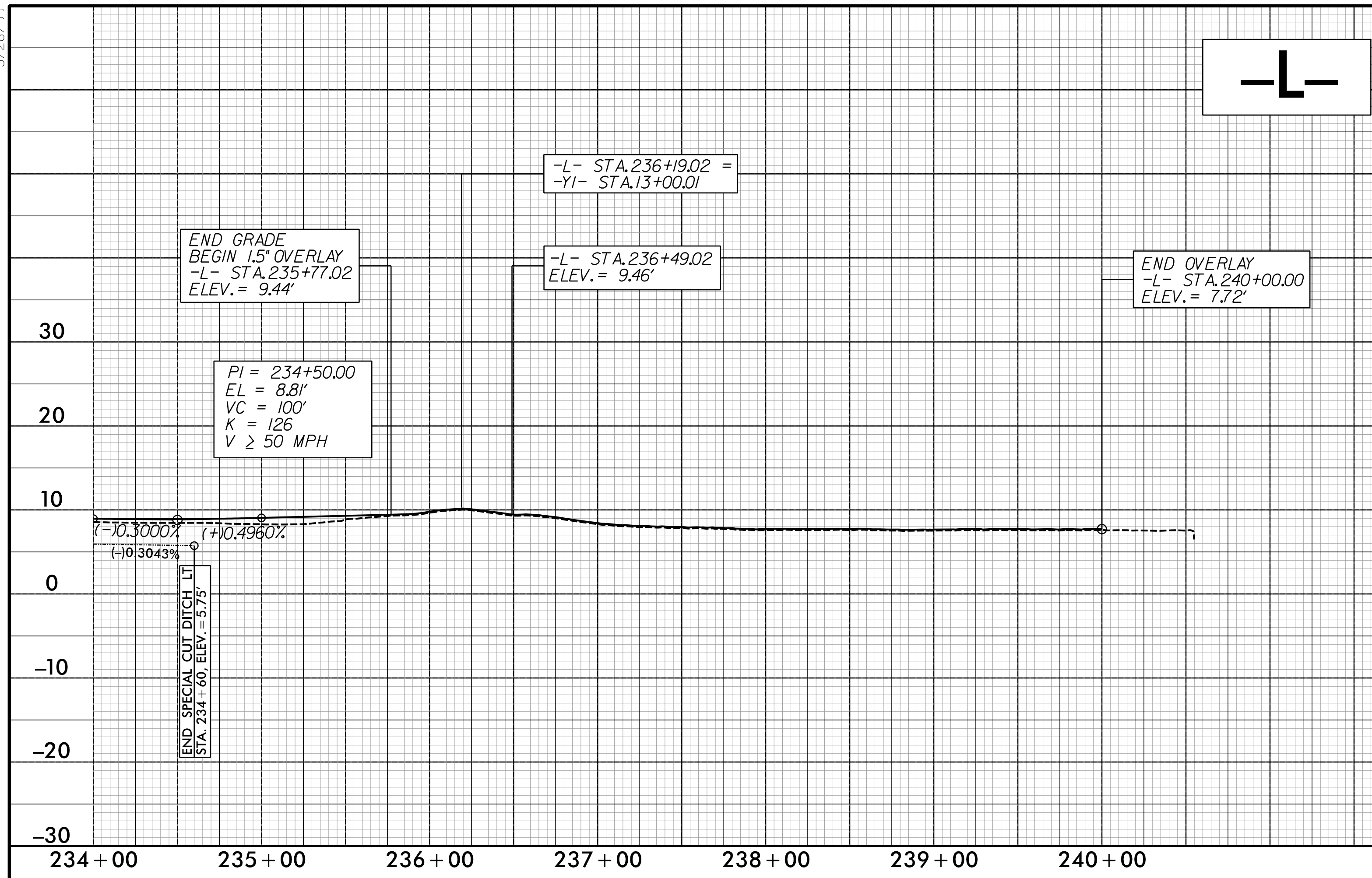


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5/28/19

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PROJECT REFERENCE NO. R-5014	SHEET NO. 29
ROADWAY DESIGN 1/4/2019 ENGINEER	HYDRAULICS 1/4/2019 ENGINEER
DocuSigned by: <i>Stephen C. Browde</i> <i>Craig H. Freeman Jr.</i> DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

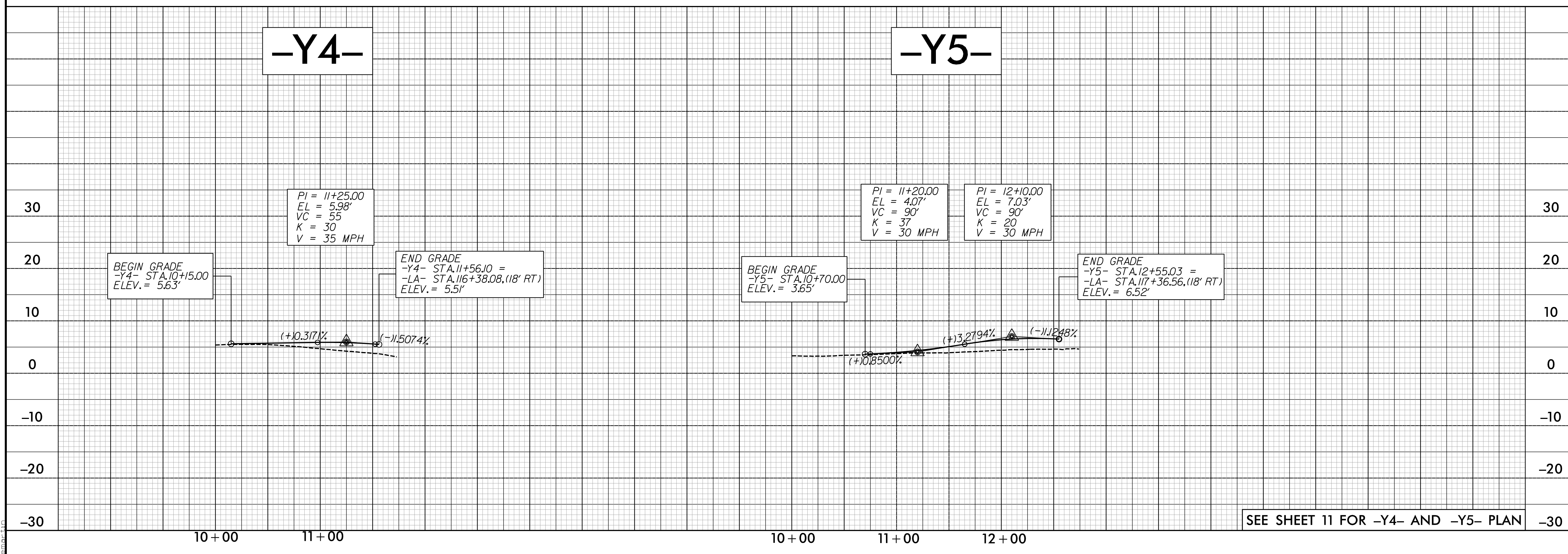
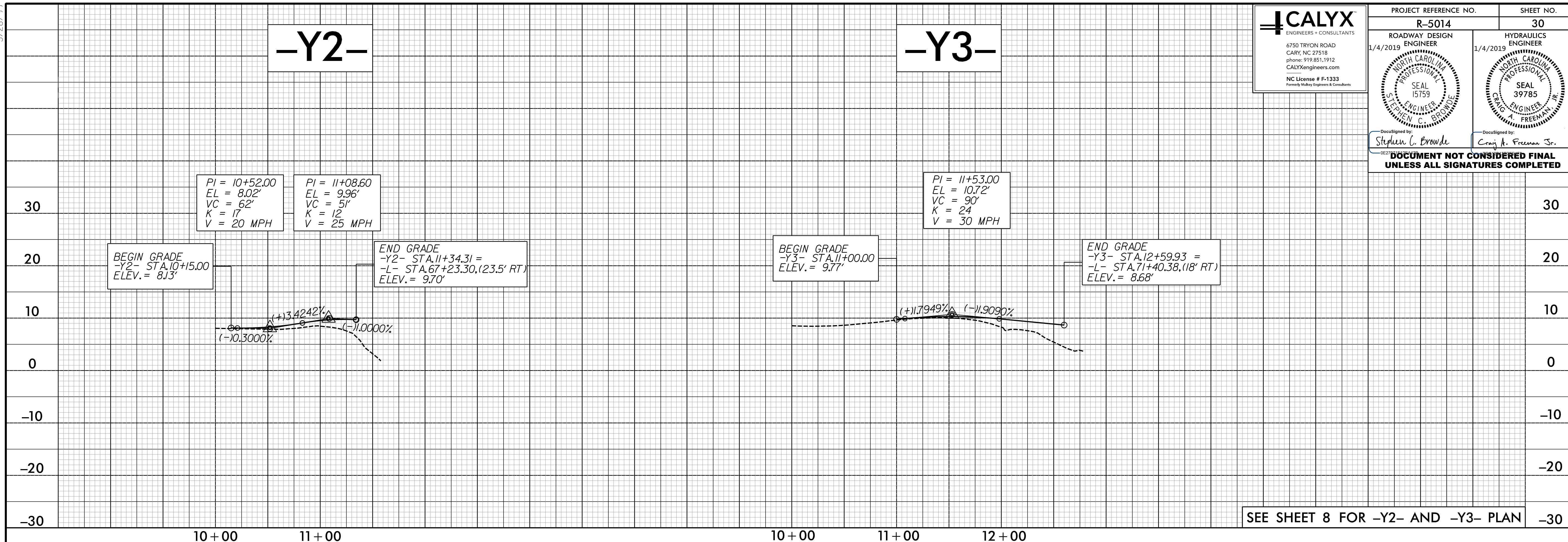


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5/28/2018



PROJECT REFERENCE NO. R-5014	SHEET NO. 30
ROADWAY DESIGN 1/4/2019 ENGINEER	HYDRAULICS 1/4/2019 ENGINEER
6750 TRYON ROAD CARY, NC 27518 phone: 919.851.1912 CALYXEngineers.com	SEAL 15759 SEAL 39785
NC License # F-1333 Formerly Under Engineers & Consultants	SEAL STEPHEN C. BROUDE SEAL CRAIG A. FREEMAN JR.
Designed by: <u>Stephen C. Broude</u> Checked by: <u>Craig A. Freeman Jr.</u> DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



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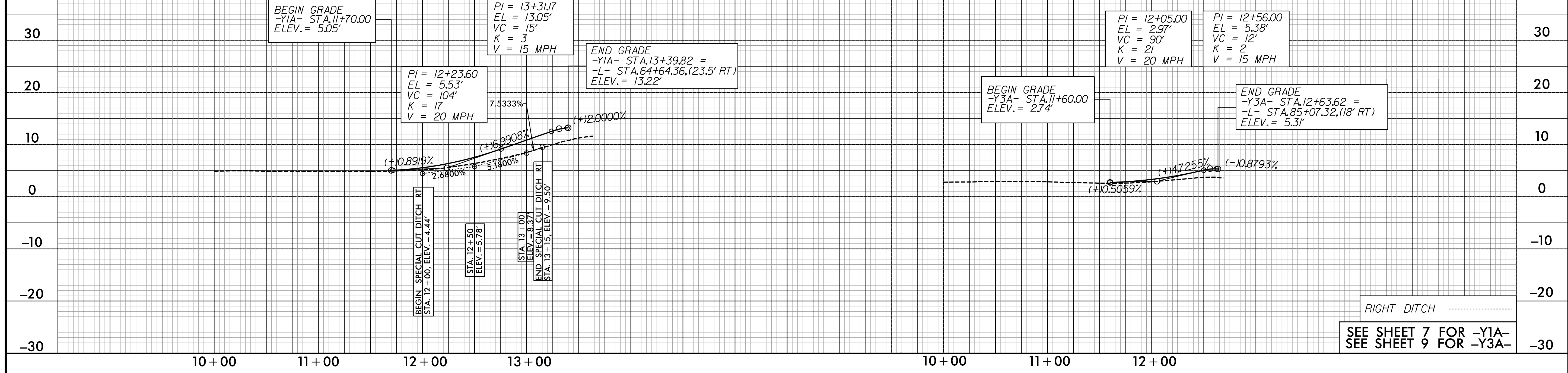


PROJECT REFERENCE NO. R-5014	SHEET NO. 31
ROADWAY DESIGN 1/4/2019 ENGINEER	HYDRAULICS 1/4/2019 ENGINEER
6750 TRYON ROAD CARY, NC 27518 phone: 919.851.1912 CALYXEngineers.com NC License # F-1333 Formerly Huber Engineers & Consultants	SEAL 15759 SEAL 39785 CRAIG FREEMAN, JR. NORTH CAROLINA PROFESSIONAL ENGINEER

DocuSigned by: Stephen C. Browde
DocuSigned by: Craig A. Freeman, Jr.
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-Y1A-

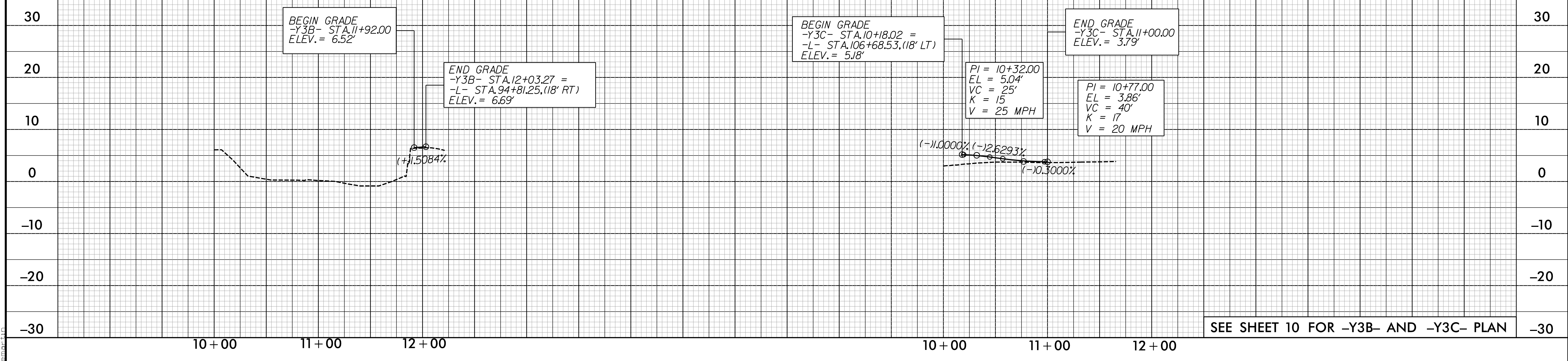
-Y3A-



RIGHT DITCH
SEE SHEET 7 FOR -Y1A-
SEE SHEET 9 FOR -Y3A-

-Y3B-

-Y3C-



SEE SHEET 10 FOR -Y3B- AND -Y3C- PLAN