

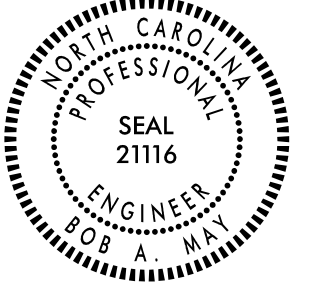
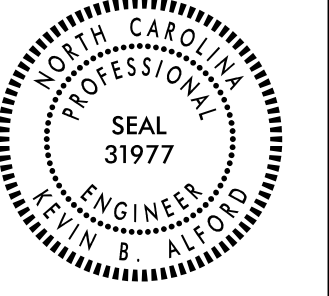
5/28/99

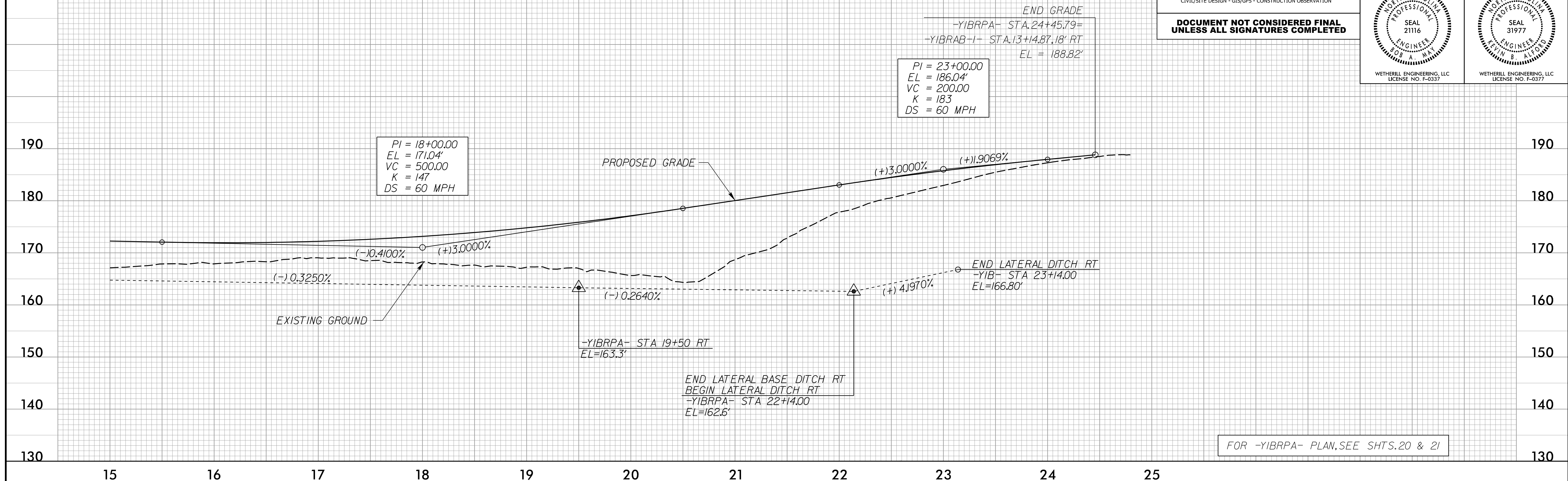
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WETHERILL ENGINEERING
 1223 Jones Franklin Rd.
 Raleigh, N.C. 27606
 License No. F-0377
 Bus: 919 851 8077
 Fax: 919 851 8107

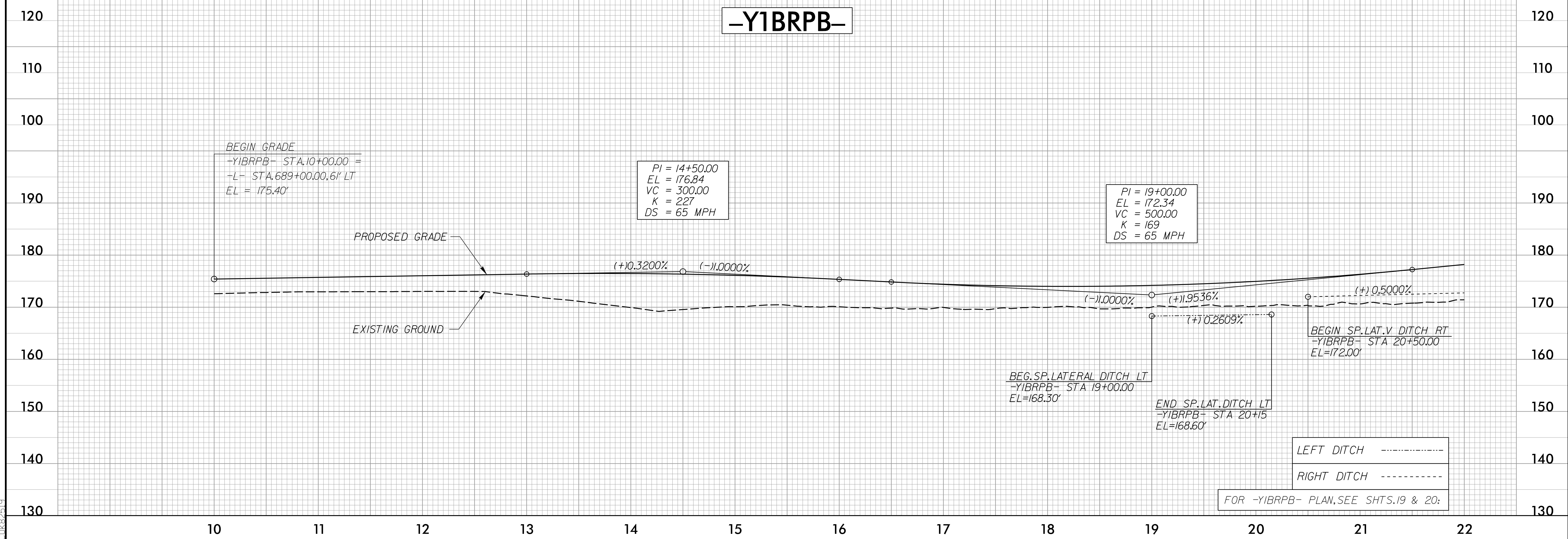
TRANSPORTATION PLANNING/DESIGN • BRIDGE/STRUCTURE DESIGN
 CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

**DOCUMENT NOT CONSIDERED FINAL
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PROJECT REFERENCE NO. 1-5987B	SHEET NO. 92
ROADWAY DESIGN ENGINEER 	HYDRAULICS ENGINEER 
WETHERILL ENGINEERING, LLC LICENSE NO. F-0337	WETHERILL ENGINEERING, LLC LICENSE NO. F-0377



-YIBRPB-



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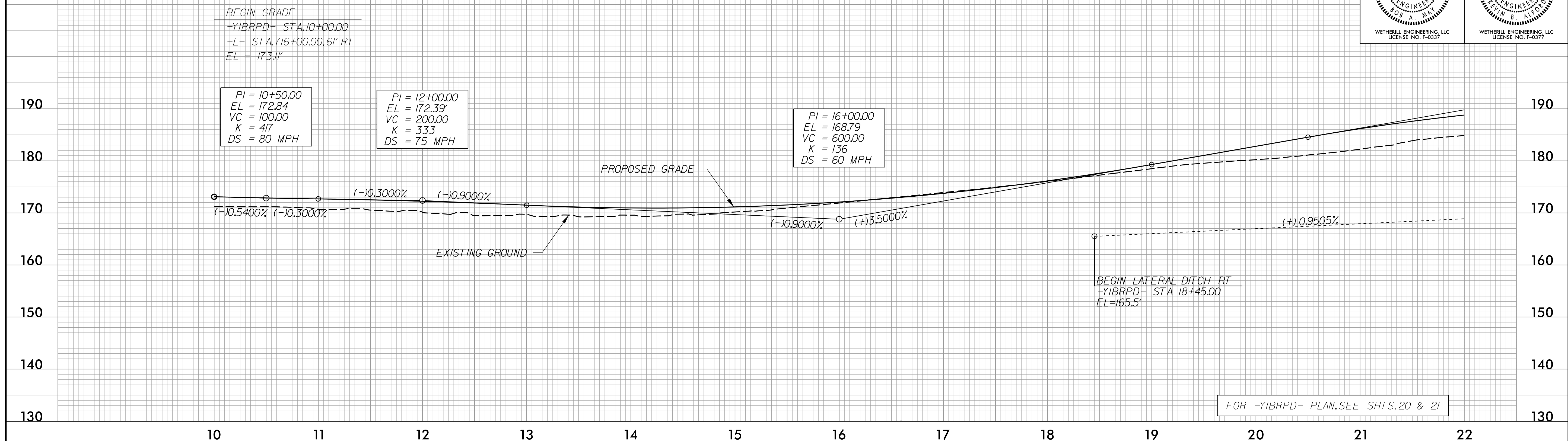
-YIBRPD-

WETHERILL ENGINEERING
 1223 Jones Franklin Rd.
 Raleigh, N.C. 27606
 License No. F-0377
 Bus: 919 851 8077
 Fax: 919 851 8107

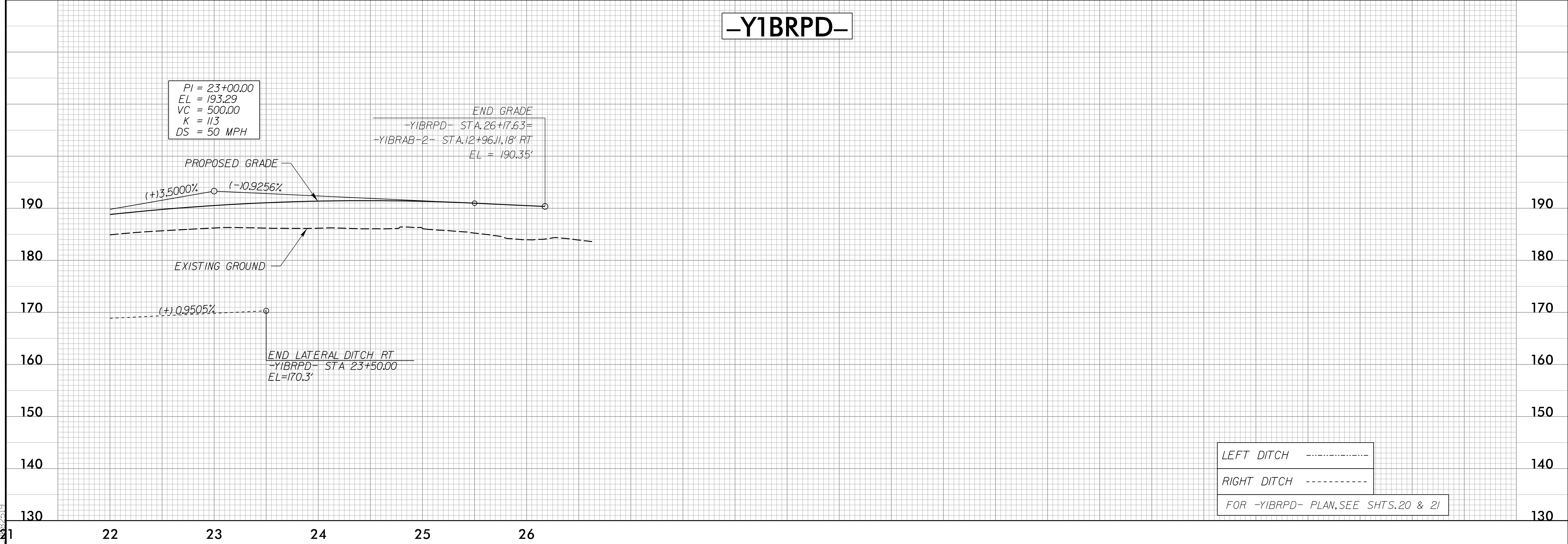
TRANSPORTATION PLANNING/DESIGN • BRIDGE/STRUCTURE DESIGN
 CIVIL/SITE DESIGN • GIS/GPS • CONSTRUCTION OBSERVATION

**DOCUMENT NOT CONSIDERED FINAL
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PROJECT REFERENCE NO. <i>1-5987B</i>	SHEET NO. <i>94</i>
ROADWAY DESIGN ENGINEER <i>BOB A. MAY</i>	HYDRAULICS ENGINEER <i>KEVIN S. ALDRED</i>
SEAL 21116	SEAL 31977
WETHERILL ENGINEERING, LLC LICENSE NO. F-0337	WETHERILL ENGINEERING, LLC LICENSE NO. F-0377



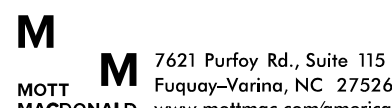

-YIBRPD-



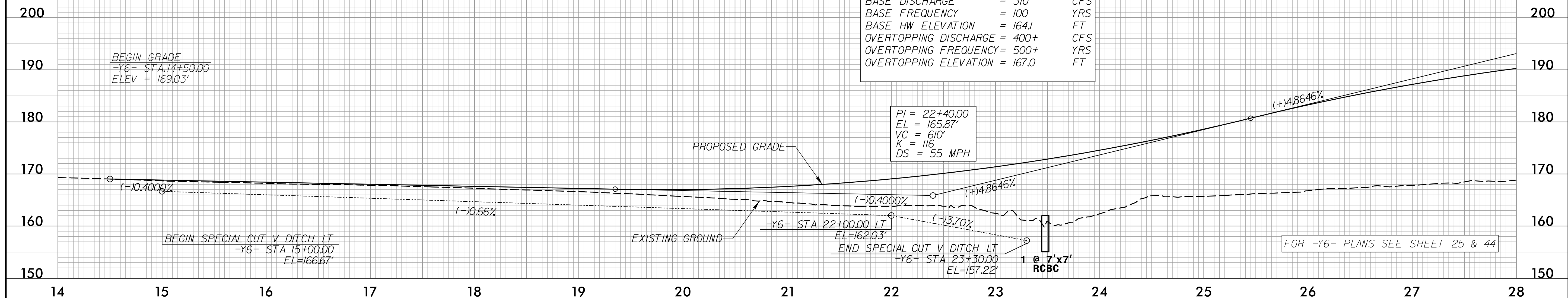
4/18/2002
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5/14/99

-Y6-

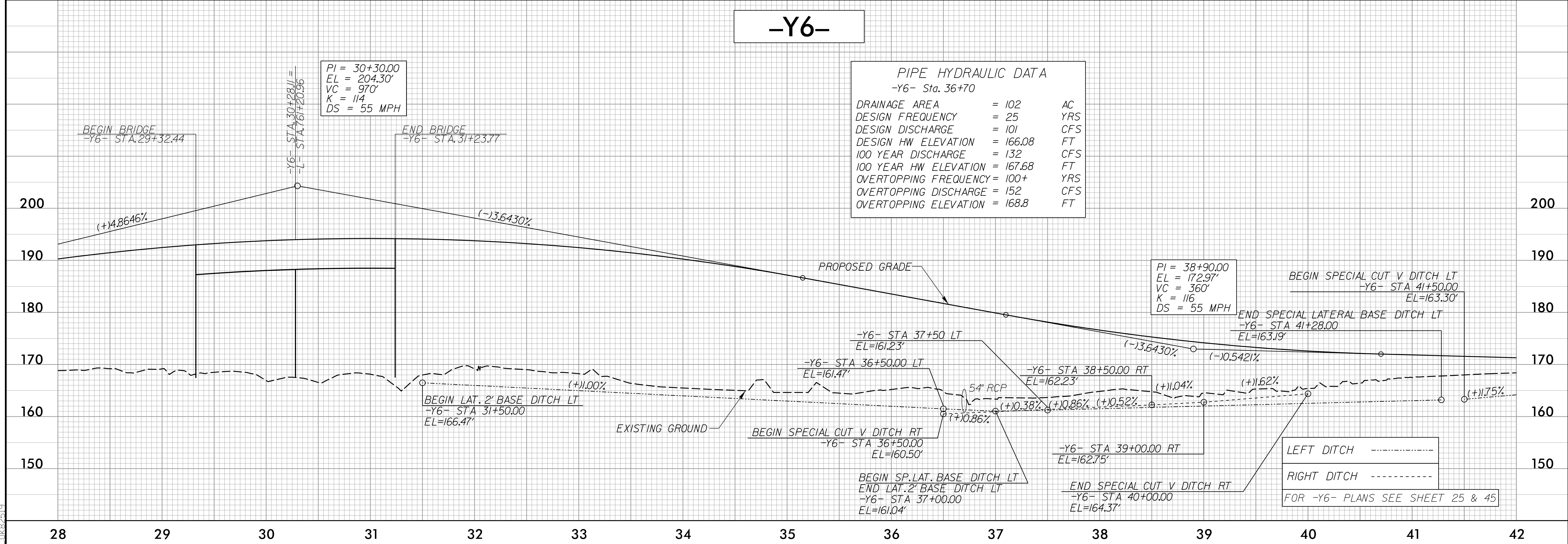
PROJECT REFERENCE NO. 1-5987B	SHEET NO. 95
ROADWAY DESIGN ENGINEER DAVID C. WALKER NORTH CAROLINA PROFESSIONAL SEAL 22606 MOTT MACDONALD I & E, LLC LICENSE NO. F-0669	HYDRAULICS ENGINEER DAVID B. ALDRED NORTH CAROLINA PROFESSIONAL SEAL 31977 WETHERILL ENGINEERING, LLC LICENSE NO. F-0377
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
Prepared in the Office of:	
 M 7621 Purfoy Rd., Suite 115 Fuquay-Varina, NC 27526 MOTT MACDONALD www.mottmac.com/america	
 1223 Jones Franklin Rd. Raleigh, NC 27606 License No. F-0377 PLS: 919 851 8077 Fax: 919 851 8107	

DESIGN DISCHARGE	= 230	CFS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 162.8	FT
BASE DISCHARGE	= 310	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 164.1	FT
OVERTOPPING DISCHARGE	= 400+	CFS
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING ELEVATION	= 167.0	FT



-Y6-

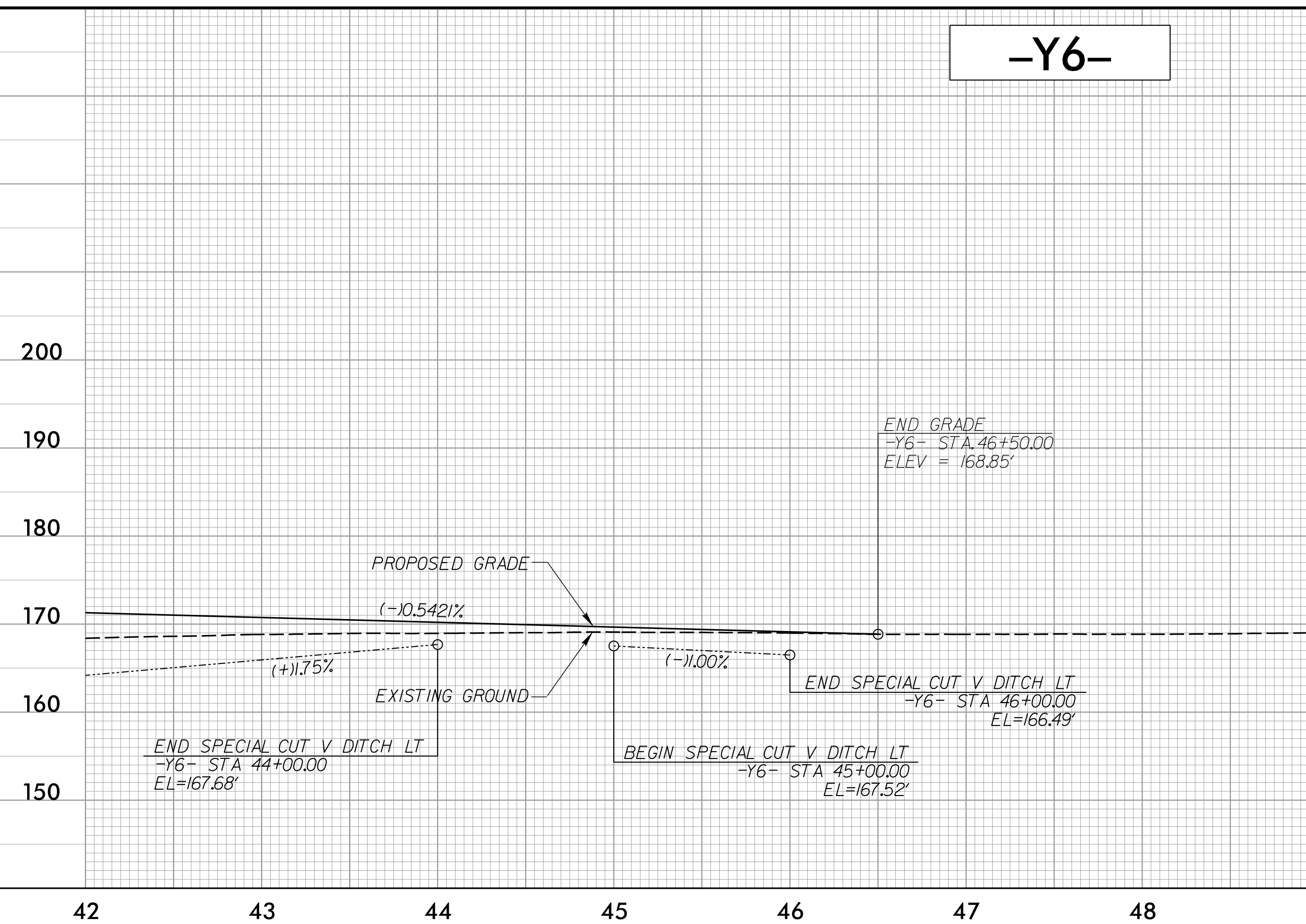
-Y6- Sta. 36+70		
DRAINAGE AREA	= 102	AC
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 101	CFS
DESIGN HW ELEVATION	= 166.08	FT
100 YEAR DISCHARGE	= 132	CFS
100 YEAR HW ELEVATION	= 167.68	FT
OVERTOPPING FREQUENCY	= 100+	YRS
OVERTOPPING DISCHARGE	= 152	CFS
OVERTOPPING ELEVATION	= 168.8	FT



4/16/2002
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DWG: 25/95

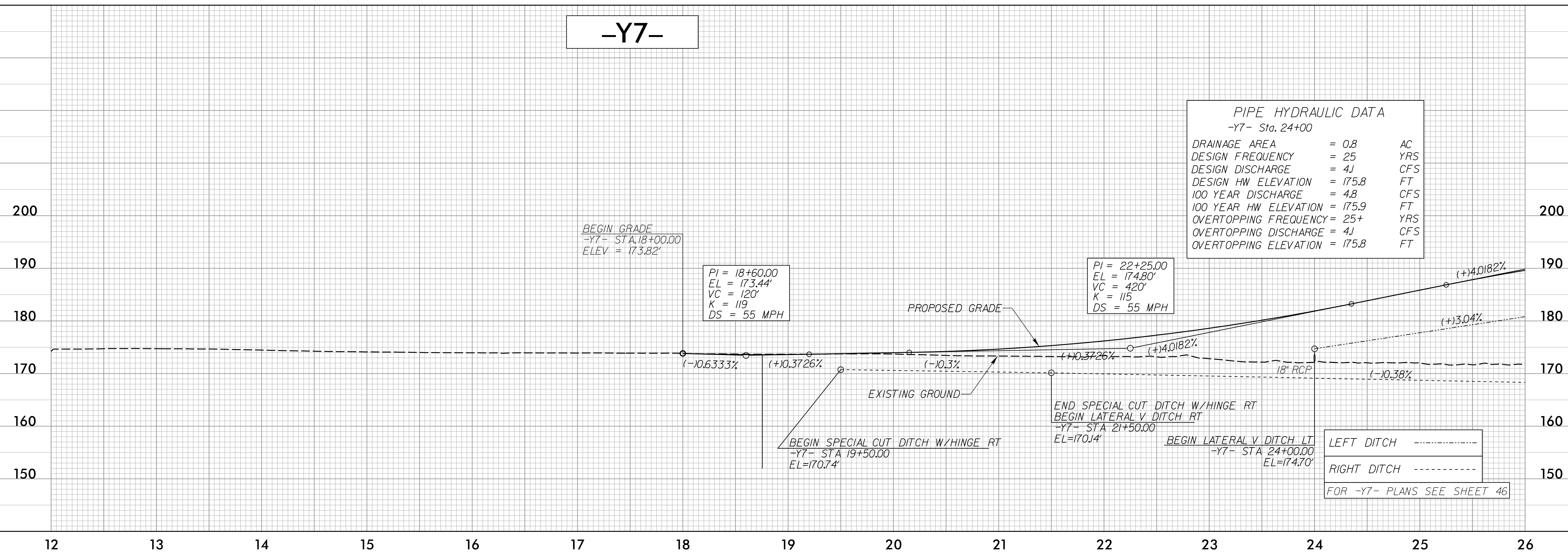
5/14/99

-Y6-



FOR -Y6- PLANS SEE SHEET 45

-Y7-



PIPE HYDRAULIC DATA		
-Y7- Sta. 24+00		
DRAINAGE AREA	= 0.8	AC
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 4.1	CFS
DESIGN HW ELEVATION	= 175.8	FT
100 YEAR DISCHARGE	= 4.8	CFS
100 YEAR HW ELEVATION	= 175.9	FT
OVERTOPPING FREQUENCY	= 25+	YRS
OVERTOPPING DISCHARGE	= 4.1	CFS
OVERTOPPING ELEVATION	= 175.8	FT

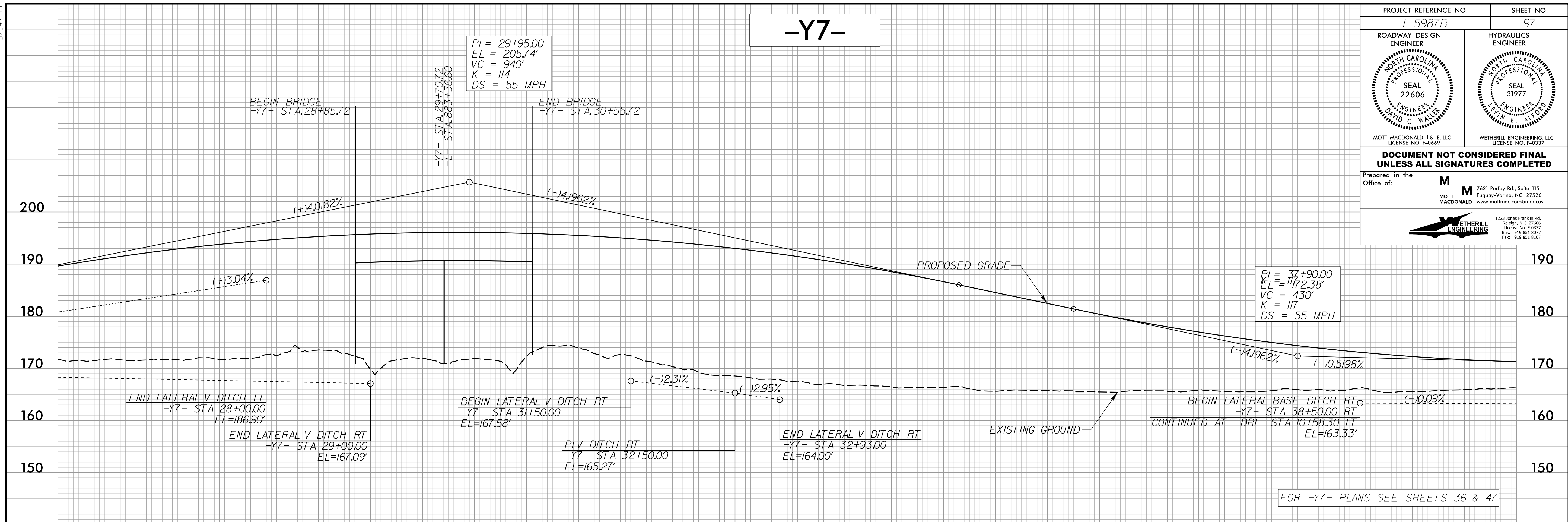
LEFT DITCH -----
 RIGHT DITCH -----
 FOR -Y7- PLANS SEE SHEET 46

PROJECT REFERENCE NO. 1-5987B	SHEET NO. 96
ROADWAY DESIGN ENGINEER MOTT MACDONALD 1 & E, LLC LICENSE NO. F-0669	HYDRAULICS ENGINEER WETHERILL ENGINEERING, LLC LICENSE NO. F-0377
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
Prepared in the Office of:	
7621 Purfoy Rd., Suite 115 Fuquay-Varina, NC 27526 MOTT MACDONALD www.mottmac.com/americas	
1223 Jones Franklin Rd. Raleigh, N.C. 27606 License No. F-0377 Dist. 919 851 8077 Fax: 919 851 8107	

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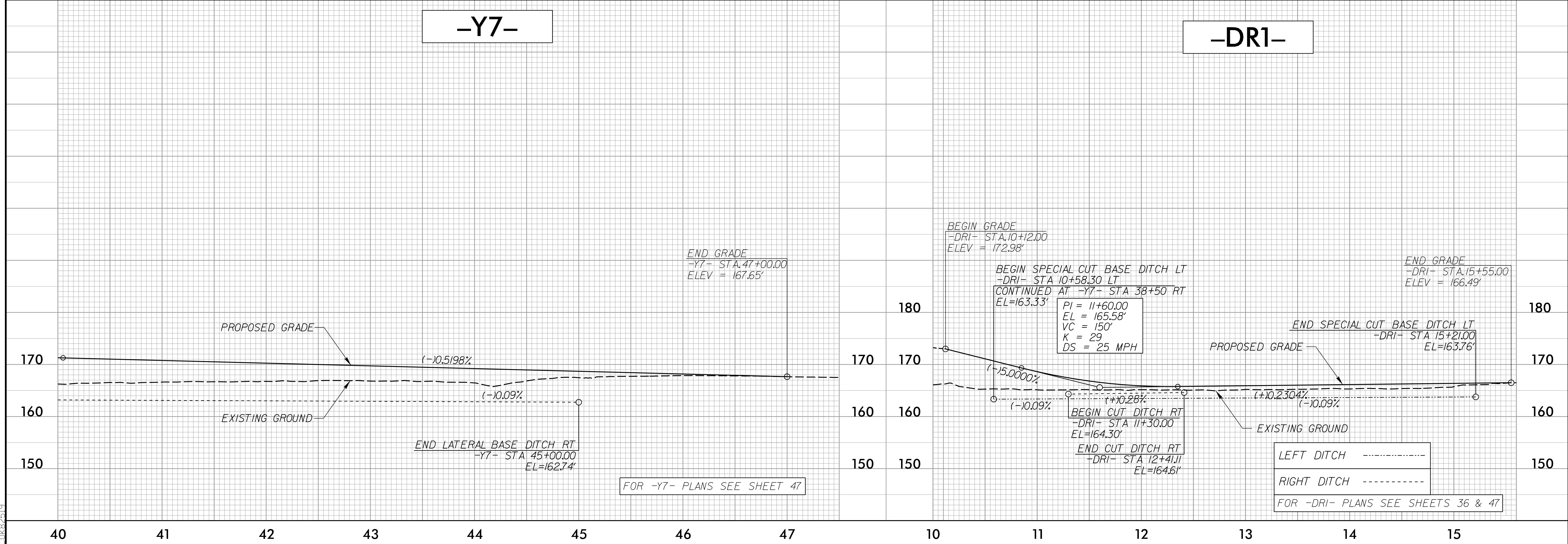
PROJECT REFERENCE NO. 1-5987B		SHEET NO. 97	
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
MOTT MACDONALD I & E, LLC LICENSE NO. F-0669		WETHERILL ENGINEERING, LLC LICENSE NO. F-0337	
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Prepared in the Office of:			



26 27 28 29 30 31 32 33 34 35 36 37 38 39 40

-Y7-

-DRI-



40 41 42 43 44 45 46 47 10 11 12 13 14 15

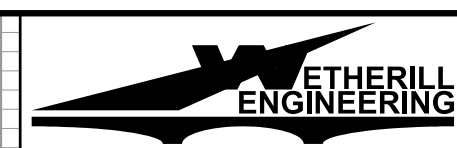
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FOR -Y7- PLANS SEE SHEET 47

FOR -DRI- PLANS SEE SHEETS 36 & 47

5/28/99

-SR3-



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Fax: 919 851 8107

PROJECT REFERENCE NO. 1-5987B		SHEET NO. 98
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	
WETHERILL ENGINEERING, LLC LICENSE NO. F-0377		

TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

**DOCUMENT NOT CONSIDERED FINAL
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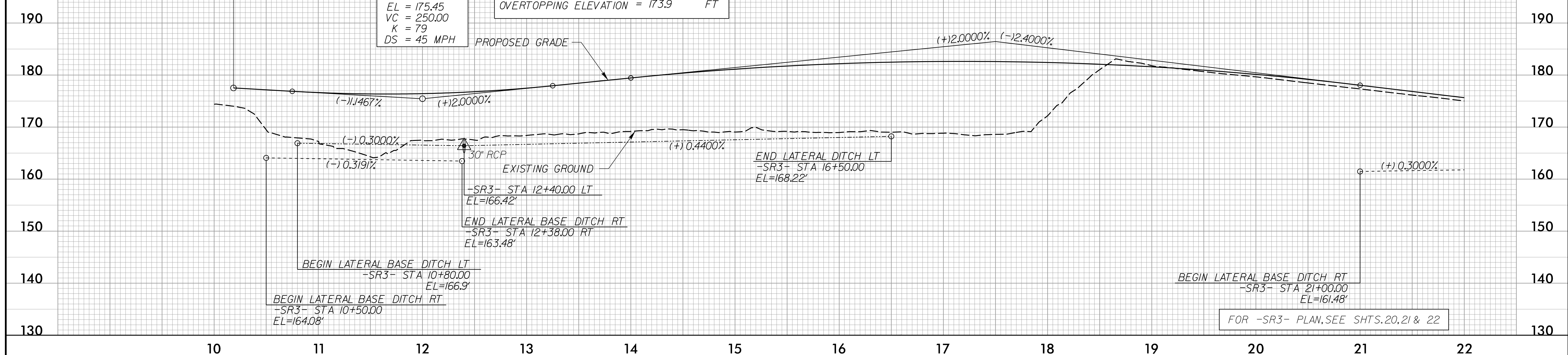
PIPE HYDRAULIC DATA
-SR3- Sta. 12+40

DRAINAGE AREA	= 4.3	AC
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 22	CFS
DESIGN HW ELEVATION	= 168.8	FT
100 YEAR DISCHARGE	= 26	CFS
100 YEAR HW ELEVATION	= 169.0	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 66	CFS
OVERTOPPING ELEVATION	= 173.9	FT

BEGIN GRADE
-SR3- STA. 10+18.61=
-YIB- STA. 37'+13.35', 18' LT
ELEV = 177.53'

PI = 12+60.00
EL = 175.45
VC = 250.00
K = 79
DS = 45 MPH

PI = 17+50.00
EL = 186.45
VC = 700.00
K = 159
DS = 60 MPH



FOR -SR3- PLAN, SEE SHTS. 20, 21 & 22

-SR3-

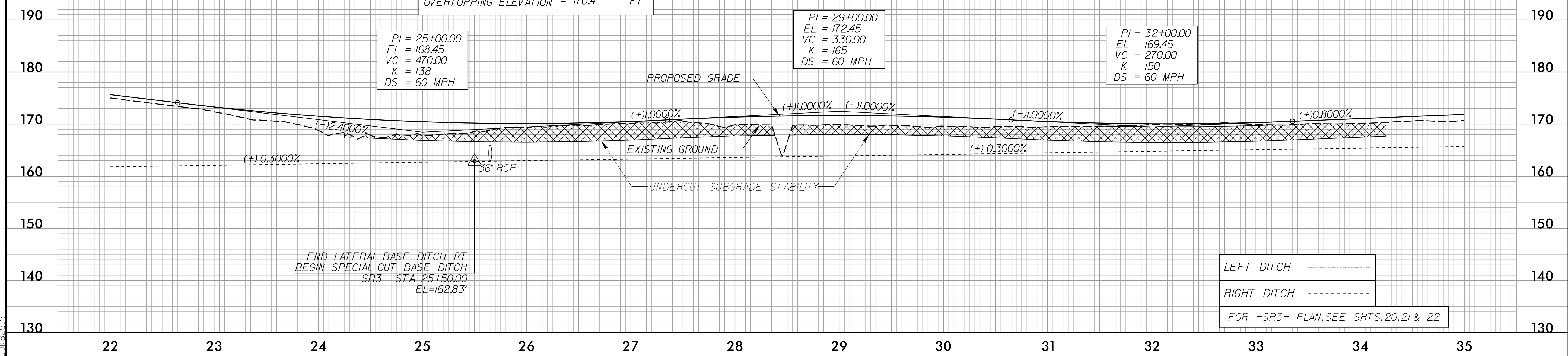
PIPE HYDRAULIC DATA
-SR3- Sta. 25+65

DRAINAGE AREA	= 4.8	AC
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 31	CFS
DESIGN HW ELEVATION	= 165.8	FT
100 YEAR DISCHARGE	= 36	CFS
100 YEAR HW ELEVATION	= 166.0	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 93	CFS
OVERTOPPING ELEVATION	= 170.4	FT

PI = 25+00.00
EL = 168.45
VC = 470.00
K = 138
DS = 60 MPH

PI = 29+00.00
EL = 172.45
VC = 330.00
K = 165
DS = 60 MPH

PI = 32+00.00
EL = 169.45
VC = 270.00
K = 150
DS = 60 MPH



LEFT DITCH -----
RIGHT DITCH -----
FOR -SR3- PLAN, SEE SHTS. 20, 21 & 22

4/18/2002
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5/28/99

-SR3-

BM#69 ELEV = 176.70'
TIE SPIKE SET IN 22" PINE
SR3 STA 47+53 - 202' RT

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CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

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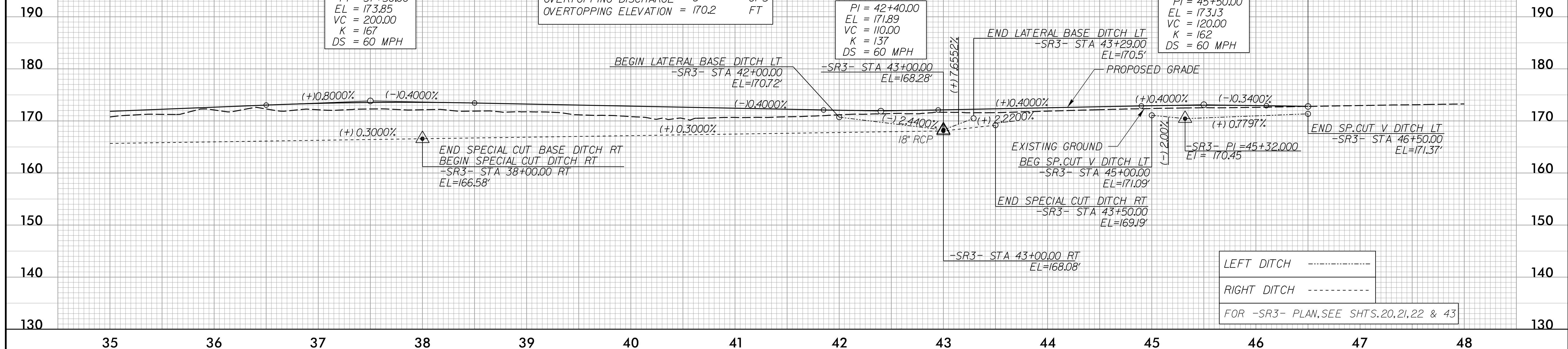
PROJECT REFERENCE NO. <i>1-5987B</i>	SHEET NO. 99
ROADWAY DESIGN ENGINEER 	HYDRAULICS ENGINEER
WETHERILL ENGINEERING, LLC LICENSE NO. F-0377	WETHERILL ENGINEERING, LLC LICENSE NO. F-0377

PIPE HYDRAULIC DATA		
-SR3- Sta. 43+00		
DRAINAGE AREA	= 0.6	AC
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 1.7	CFS
DESIGN HW ELEVATION	= 169J	FT
100 YEAR DISCHARGE	= 2.0	CFS
100 YEAR HW ELEVATION	= 169J	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 8	CFS
OVERTOPPING ELEVATION	= 170.2	FT

PI = 37+50.00
EL = 173.85
VC = 200.00
K = 167
DS = 60 MPH

PI = 42+40.00
EL = 171.89
VC = 110.00
K = 137
DS = 60 MPH

PI = 45+50.00
EL = 173.13
VC = 120.00
K = 162
DS = 60 MPH



LEFT DITCH -----
 RIGHT DITCH -----
 FOR -SR3- PLAN, SEE SHTS. 20, 21, 22 & 43

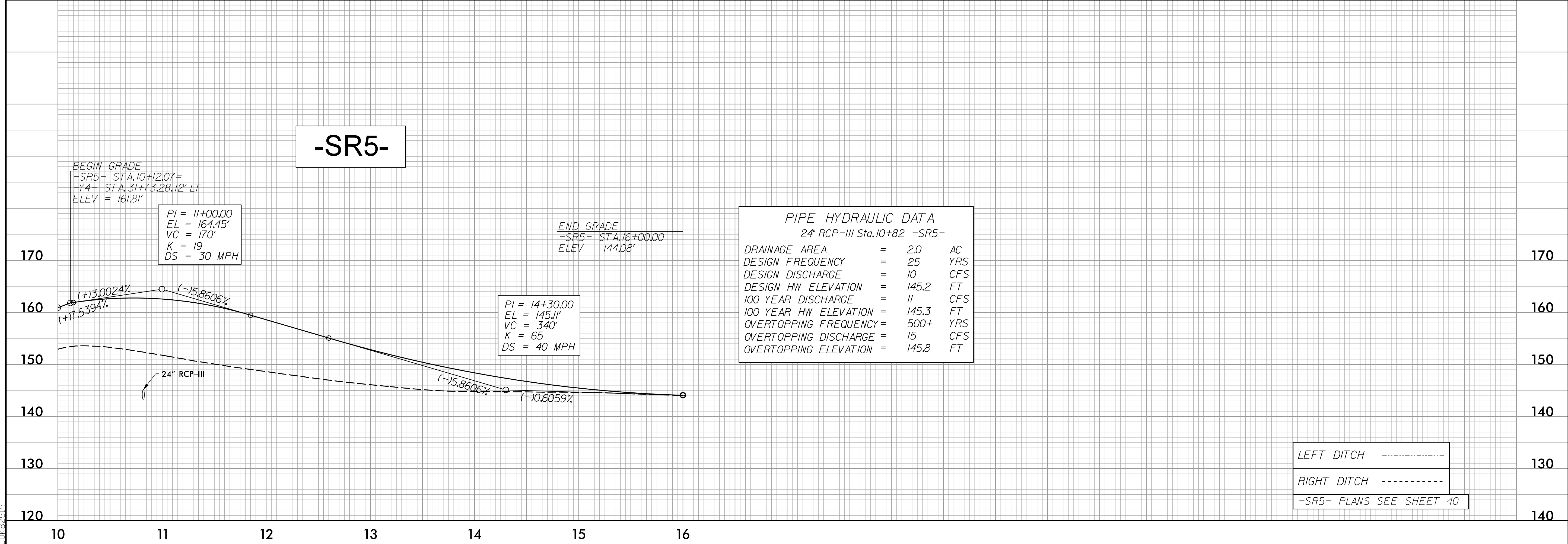
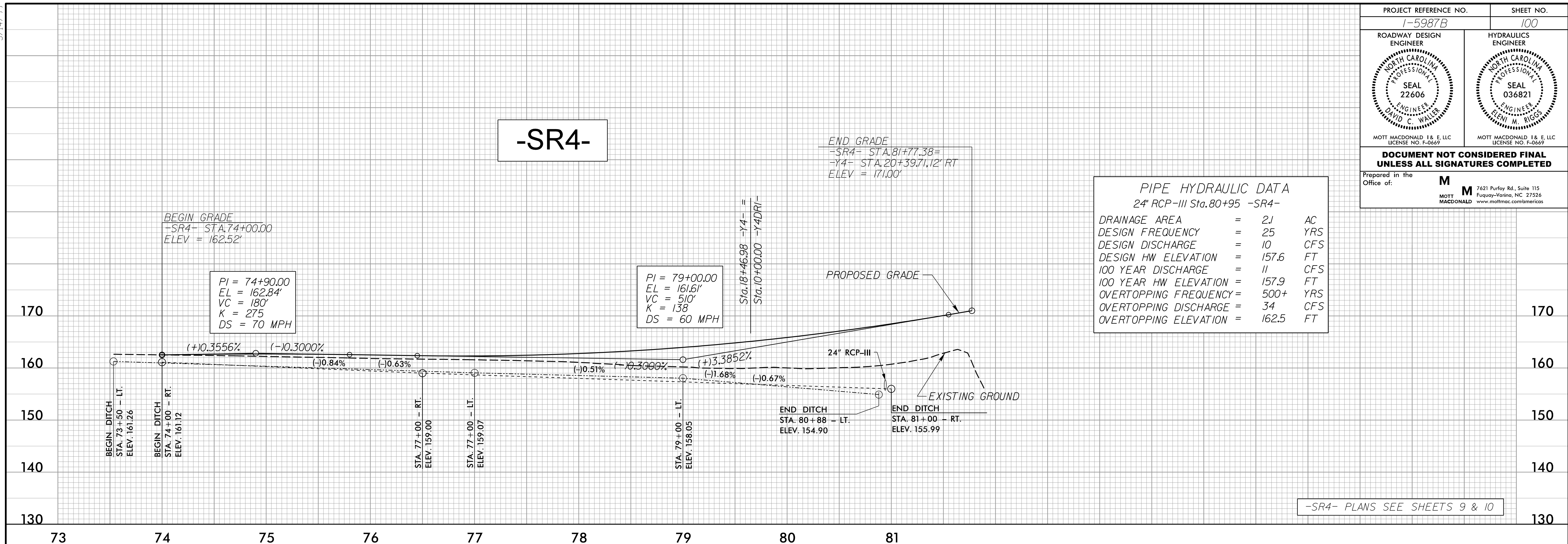
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5/14/99

PROJECT REFERENCE NO. 1-5987B	SHEET NO. 100
ROADWAY DESIGN ENGINEER MOTT MACDONALD I & E, LLC LICENSE NO. F-0669	HYDRAULICS ENGINEER MOTT MACDONALD I & E, LLC LICENSE NO. F-0669

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MOTT MACDONALD I & E, LLC
7621 Purfoy Rd., Suite 115
Fuquay-Varina, NC 27526
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5/14/99

PROJECT REFERENCE NO. 1-5987B	SHEET NO. 101
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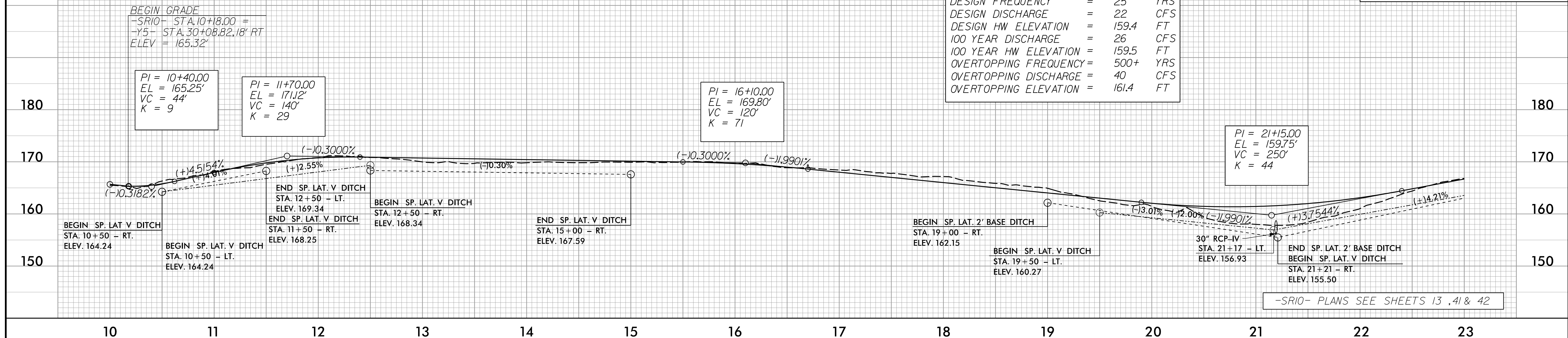
DOCUMENT NOT CONSIDERED FINAL
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-SR10-

PIPE HYDRAULIC DATA
30" RCP-IV Sta. 21+19 -SR10-

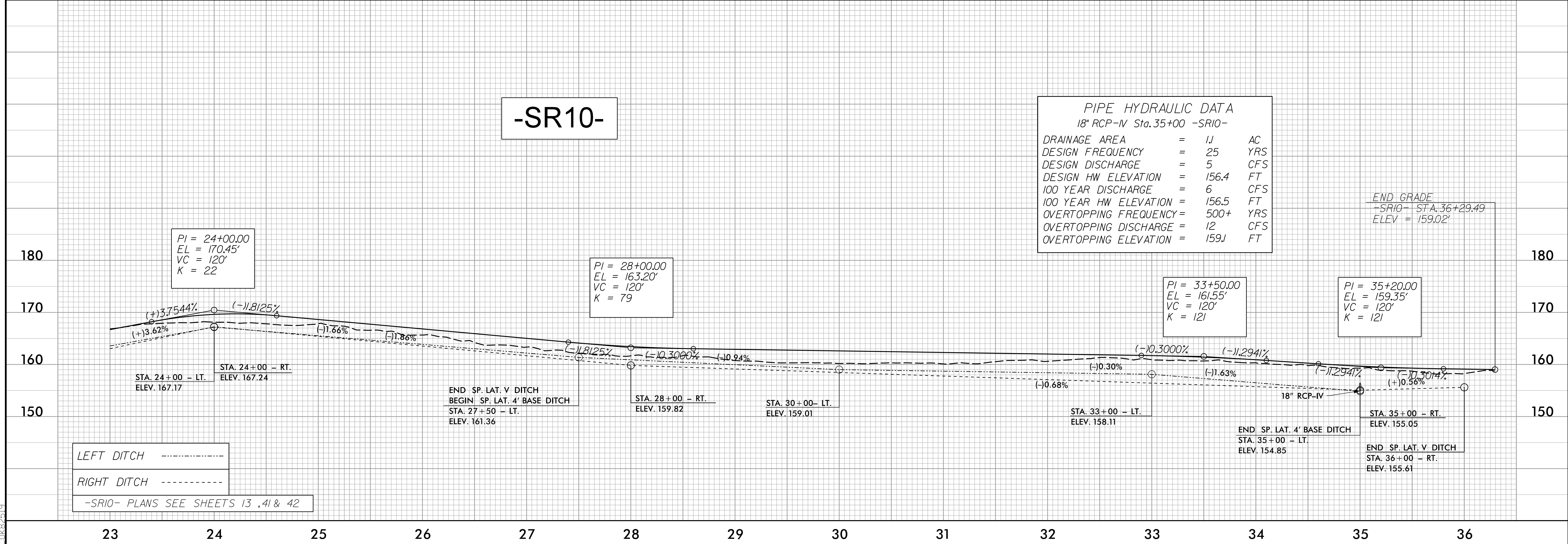
DRAINAGE AREA	=	6.7	AC
DESIGN FREQUENCY	=	25	YRS
DESIGN DISCHARGE	=	22	CFS
DESIGN HW ELEVATION	=	159.4	FT
100 YEAR DISCHARGE	=	26	CFS
100 YEAR HW ELEVATION	=	159.5	FT
OVERTOPPING FREQUENCY	=	500+	YRS
OVERTOPPING DISCHARGE	=	40	CFS
OVERTOPPING ELEVATION	=	161.4	FT



-SR10-

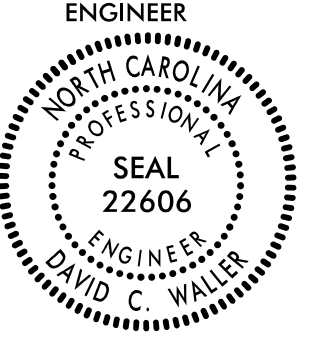
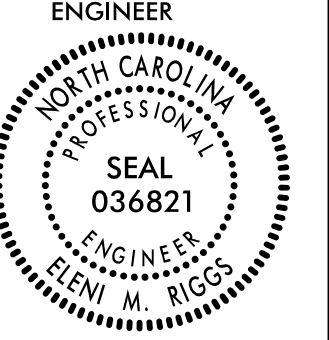
PIPE HYDRAULIC DATA
18" RCP-IV Sta. 35+00 -SR10-

DRAINAGE AREA	=	1.1	AC
DESIGN FREQUENCY	=	25	YRS
DESIGN DISCHARGE	=	5	CFS
DESIGN HW ELEVATION	=	156.4	FT
100 YEAR DISCHARGE	=	6	CFS
100 YEAR HW ELEVATION	=	156.5	FT
OVERTOPPING FREQUENCY	=	500+	YRS
OVERTOPPING DISCHARGE	=	12	CFS
OVERTOPPING ELEVATION	=	159.1	FT

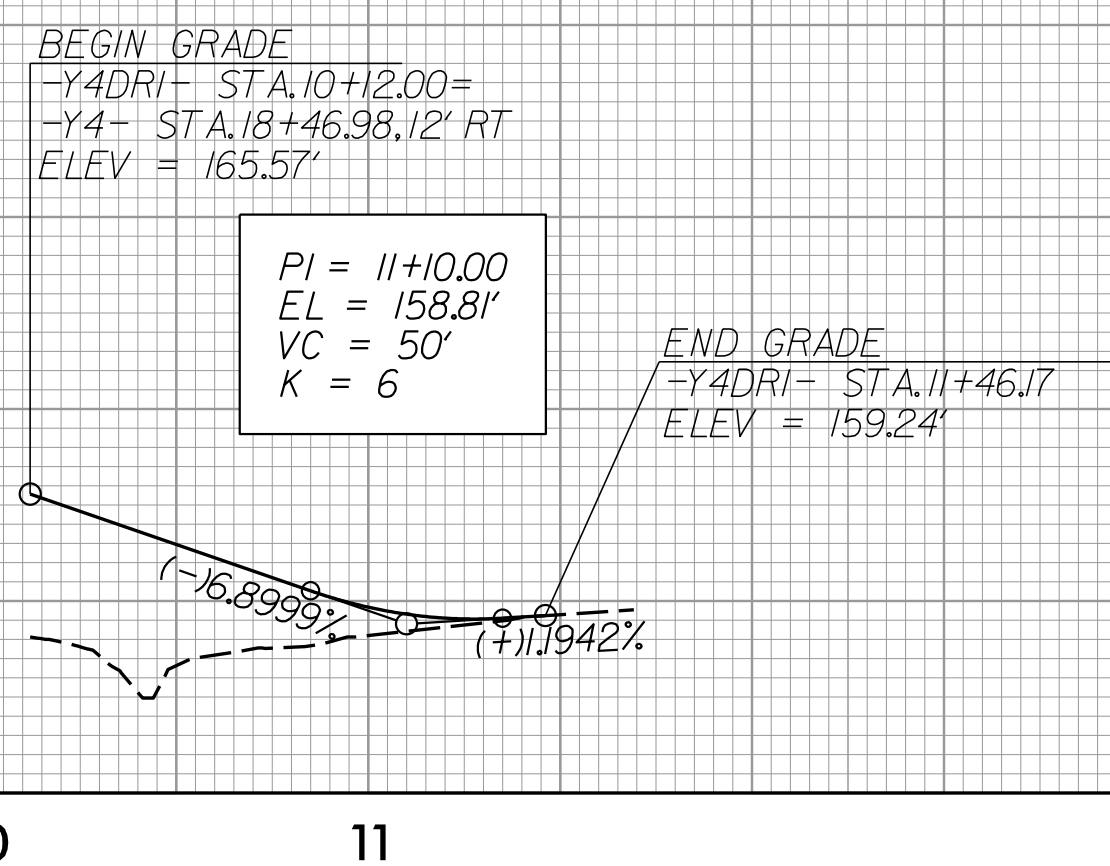


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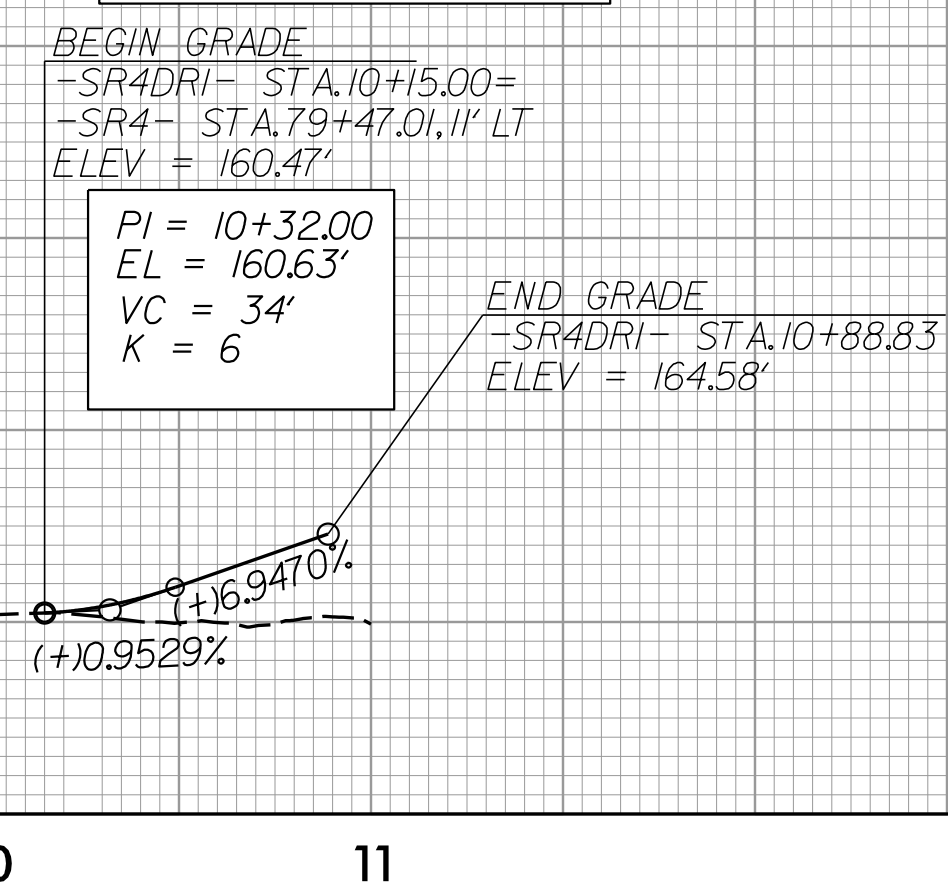
5/14/99

PROJECT REFERENCE NO. 1-5987B	SHEET NO. 102
ROADWAY DESIGN ENGINEER MOTT MACDONALD I & E, LLC LICENSE NO. F-0669	HYDRAULICS ENGINEER MOTT MACDONALD I & E, LLC LICENSE NO. F-0669
	
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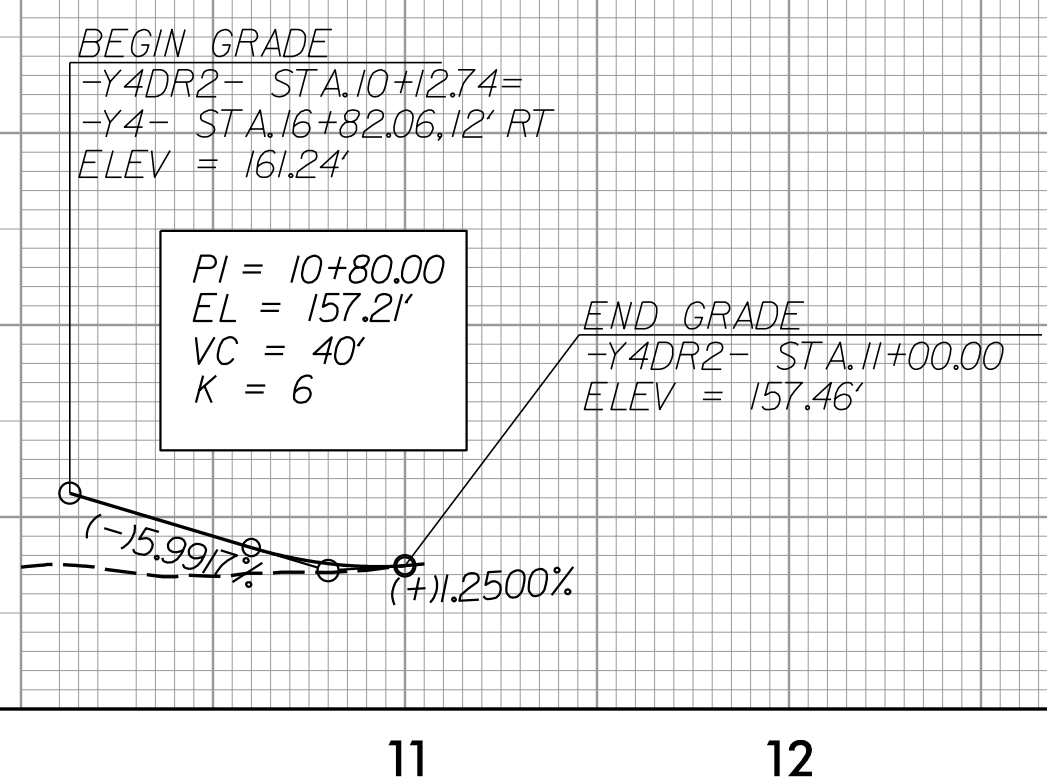
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-SR4DR1-

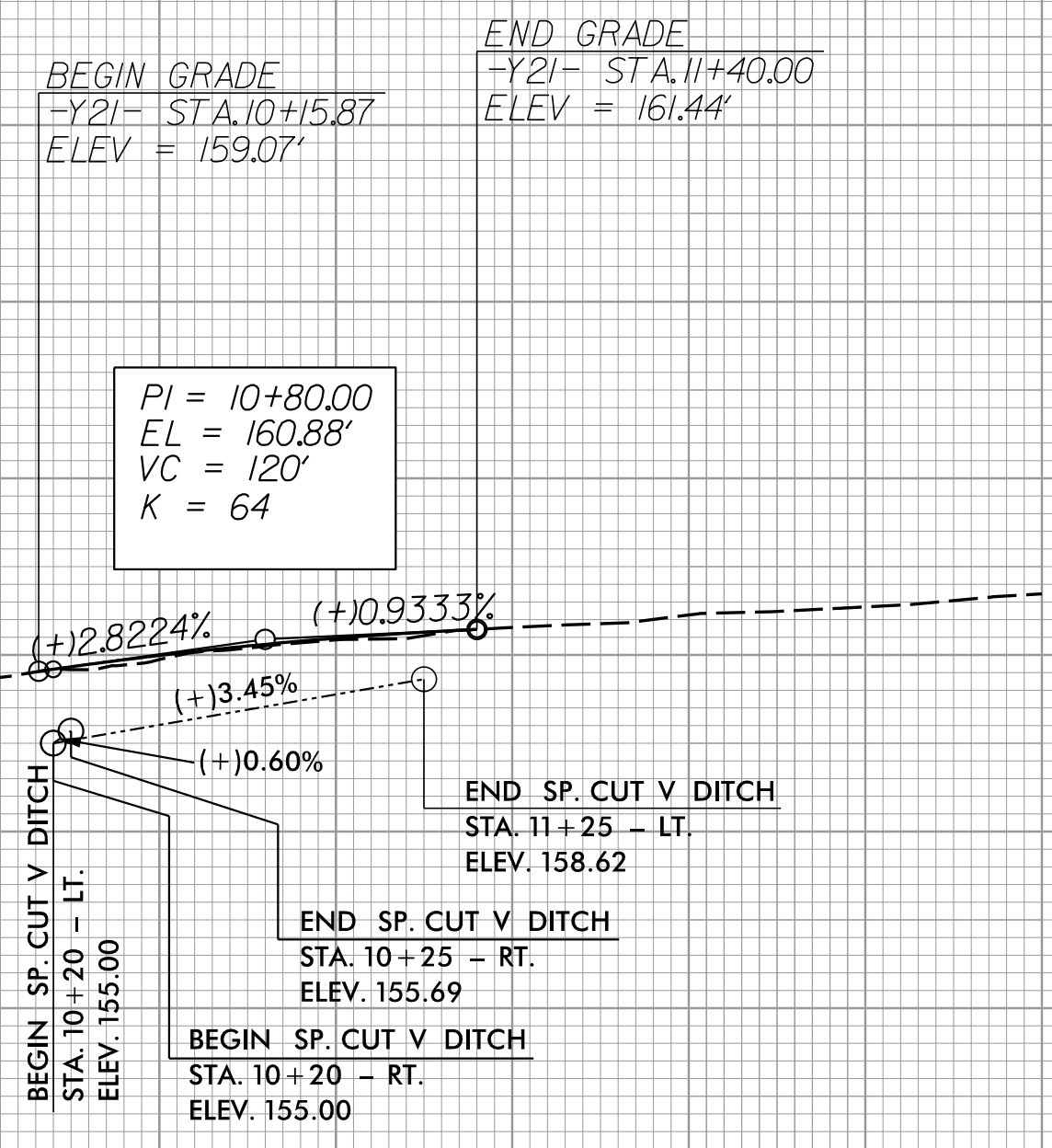


-Y4DR2-



-Y4DR1- PLANS SEE SHEET 10
-SR4DR1- PLANS SEE SHEET 10
-Y4DR2- PLANS SEE SHEET 39

-Y21-



LEFT DITCH -----
RIGHT DITCH -----
-Y21- PLANS SEE SHEET 12

4/18/2002
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5/28/99

PROJECT REFERENCE NO. I-5987B	SHEET NO. 103
ROADWAY DESIGN ENGINEER DAVID C. WALKER NORTH CAROLINA PROFESSIONAL SEAL 22606 MOTT MACDONALD I & E, LLC LICENSE NO. F-0669	HYDRAULICS ENGINEER RENI M. RIGGS NORTH CAROLINA PROFESSIONAL SEAL 036821 MOTT MACDONALD I & E, LLC LICENSE NO. F-0669

-EY18-

PIPE HYDRAULIC DATA
2 @ 42" RCP-IV Sta.25+00 -EY18-

DRAINAGE AREA	=	81.7	AC
DESIGN FREQUENCY	=	25	YRS
DESIGN DISCHARGE	=	88	CFS
DESIGN HW ELEVATION	=	166J	FT
100 YEAR DISCHARGE	=	115	CFS
100 YEAR HW ELEVATION	=	166.4	FT
OVERTOPPING FREQUENCY	=	25+	YRS
OVERTOPPING DISCHARGE	=	98	CFS
OVERTOPPING ELEVATION	=	167J	FT

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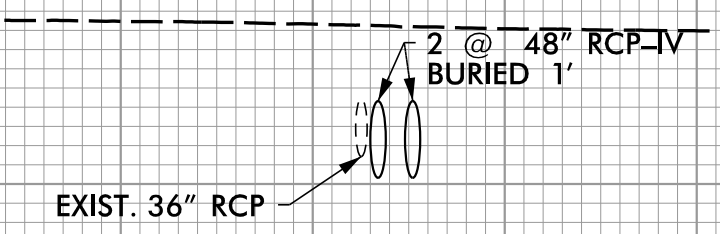
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Fuquay-Varina, NC 27526
www.mottmcc.com/americas



-EY18-

PIPE HYDRAULIC DATA
2 @ 48" RCP-IV Sta.40+70 -EY18-

DRAINAGE AREA	=	199.8	AC
DESIGN FREQUENCY	=	25	YRS
DESIGN DISCHARGE	=	140	CFS
DESIGN HW ELEVATION	=	165J	FT
100 YEAR DISCHARGE	=	190	CFS
100 YEAR HW ELEVATION	=	166.5	FT
OVERTOPPING FREQUENCY	=	100+	YRS
OVERTOPPING DISCHARGE	=	200	CFS
OVERTOPPING ELEVATION	=	167.0	FT



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

-EY18- PLANS SEE SHEETS 5 & 6

4/18/2002
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5/28/99

PROJECT REFERENCE NO. I-5987B	SHEET NO. 104
ROADWAY DESIGN ENGINEER DAVID C. WALKER SEAL 22606 NORTH CAROLINA PROFESSIONAL ENGINEERS	HYDRAULICS ENGINEER REMI W. RIGGS SEAL 036821 NORTH CAROLINA PROFESSIONAL ENGINEERS
MOTT MACDONALD I & E, LLC LICENSE NO. F-0669	
MOTT MACDONALD I & E, LLC LICENSE NO. F-0669	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
Prepared in the Office of: M MOTT MACDONALD 7621 Purfoy Rd., Suite 115 Fayetteville, NC 27226 www.mottmac.com/americas	

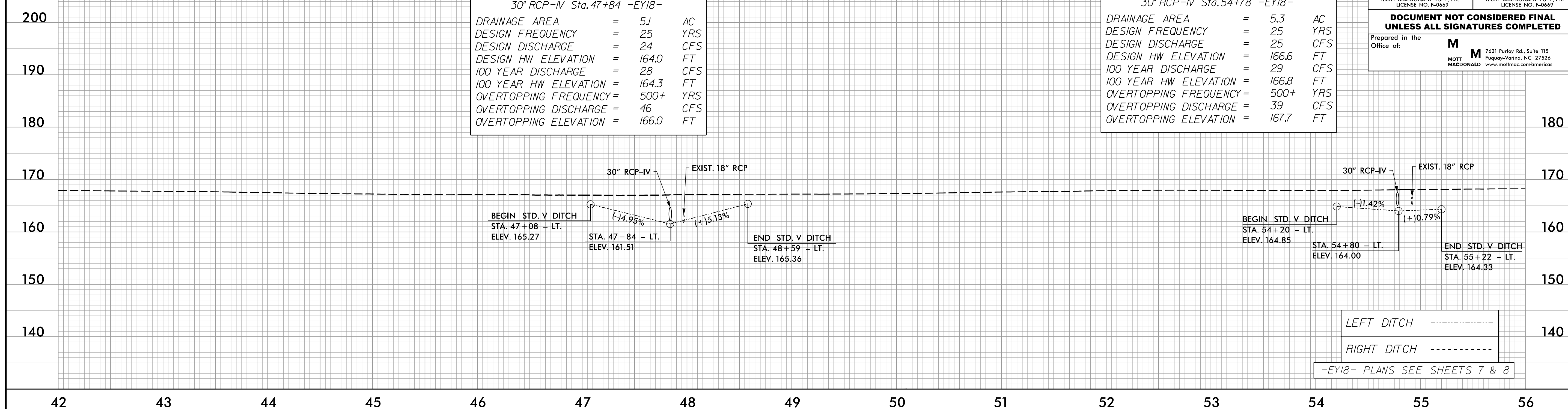
-EY18-

PIPE HYDRAULIC DATA
30" RCP-IV Sta. 47+84 -EY18-

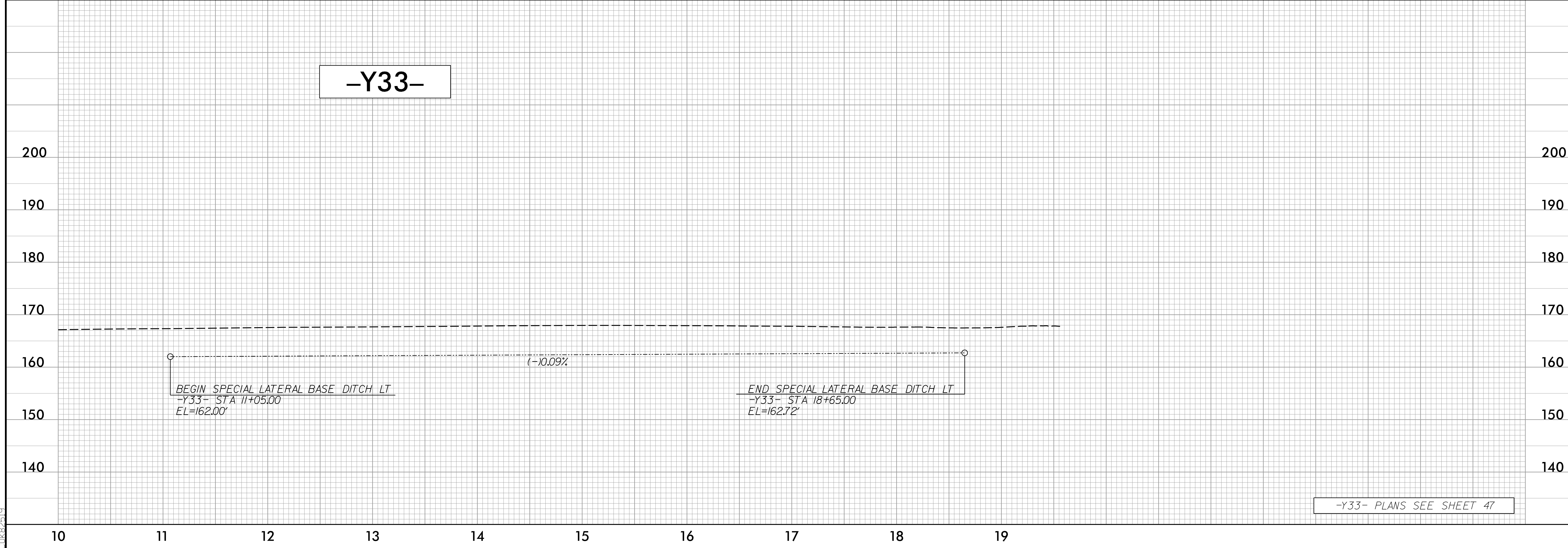
DRAINAGE AREA	=	5.1	AC
DESIGN FREQUENCY	=	25	YRS
DESIGN DISCHARGE	=	24	CFS
DESIGN HW ELEVATION	=	164.0	FT
100 YEAR DISCHARGE	=	28	CFS
100 YEAR HW ELEVATION	=	164.3	FT
OVERTOPPING FREQUENCY	=	500+	YRS
OVERTOPPING DISCHARGE	=	46	CFS
OVERTOPPING ELEVATION	=	166.0	FT

PIPE HYDRAULIC DATA
30" RCP-IV Sta. 54+78 -EY18-

DRAINAGE AREA	=	5.3	AC
DESIGN FREQUENCY	=	25	YRS
DESIGN DISCHARGE	=	25	CFS
DESIGN HW ELEVATION	=	166.6	FT
100 YEAR DISCHARGE	=	29	CFS
100 YEAR HW ELEVATION	=	166.8	FT
OVERTOPPING FREQUENCY	=	500+	YRS
OVERTOPPING DISCHARGE	=	39	CFS
OVERTOPPING ELEVATION	=	167.7	FT



-Y33-

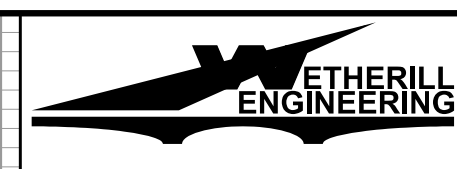
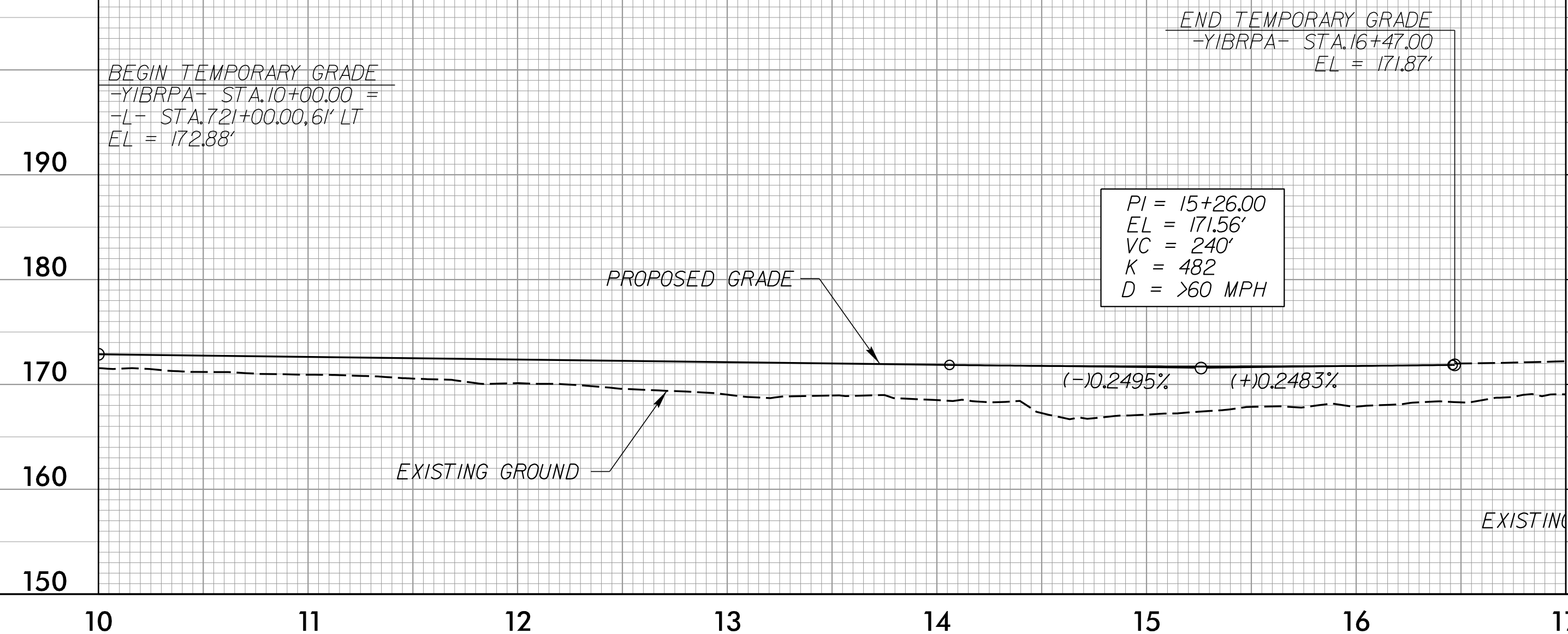


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-Y1BRPA- TEMPORARY GRADE

SEE SHT.91 & 92 FOR
-Y1BRPA- PROPOSED PROFILE



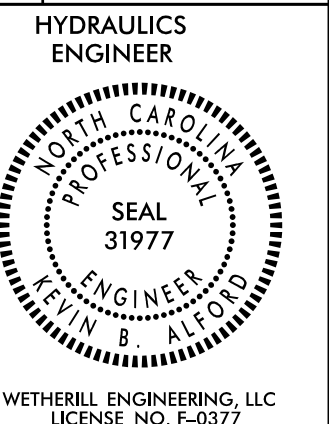
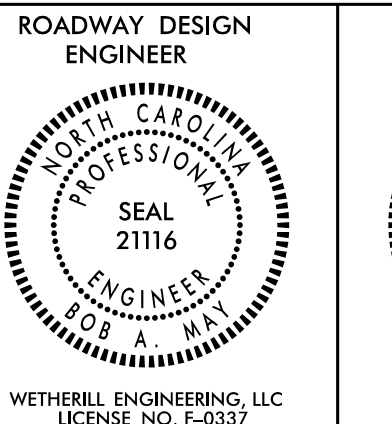
1223 Jones Franklin Rd.
Raleigh, N.C. 27606
License No. F-0377
Bus: 919 851 8077
Fax: 919 851 8107

TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

**DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED**

PROJECT REFERENCE NO.
1-5987B

SHEET NO.
105

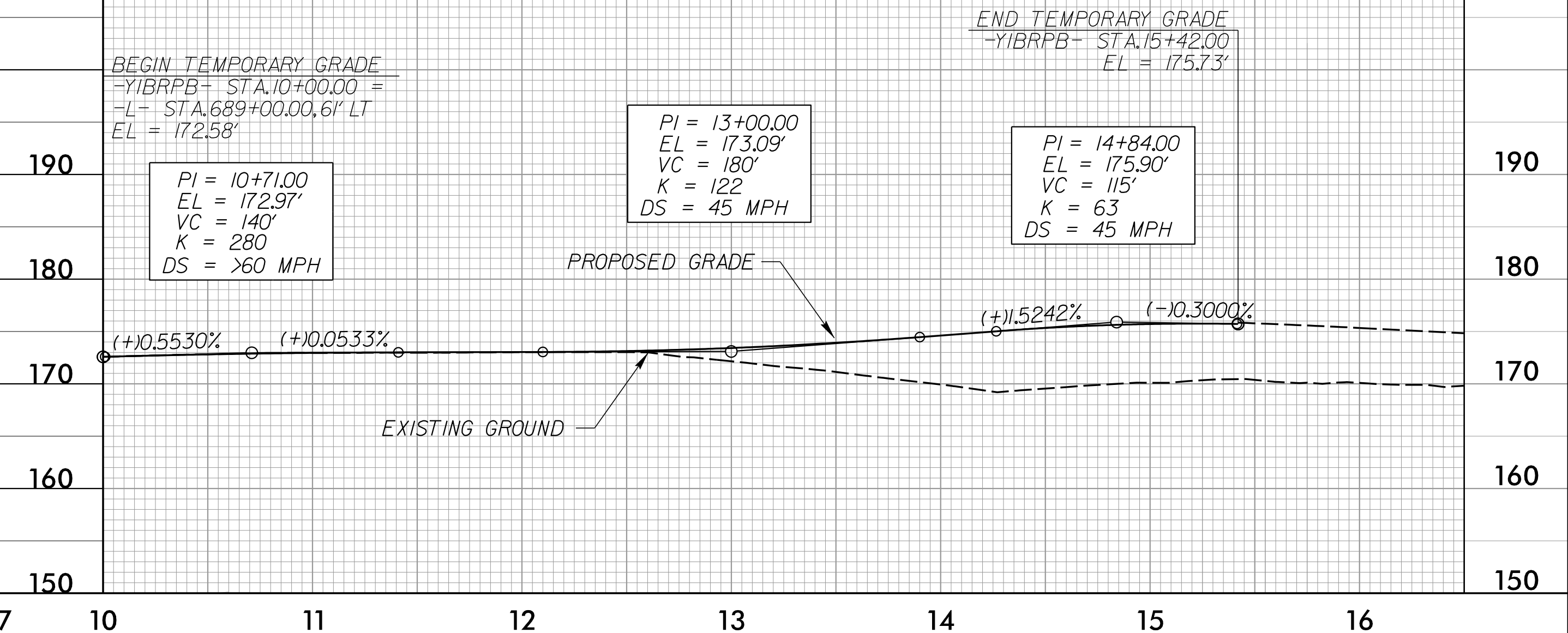


WETHERILL ENGINEERING, LLC
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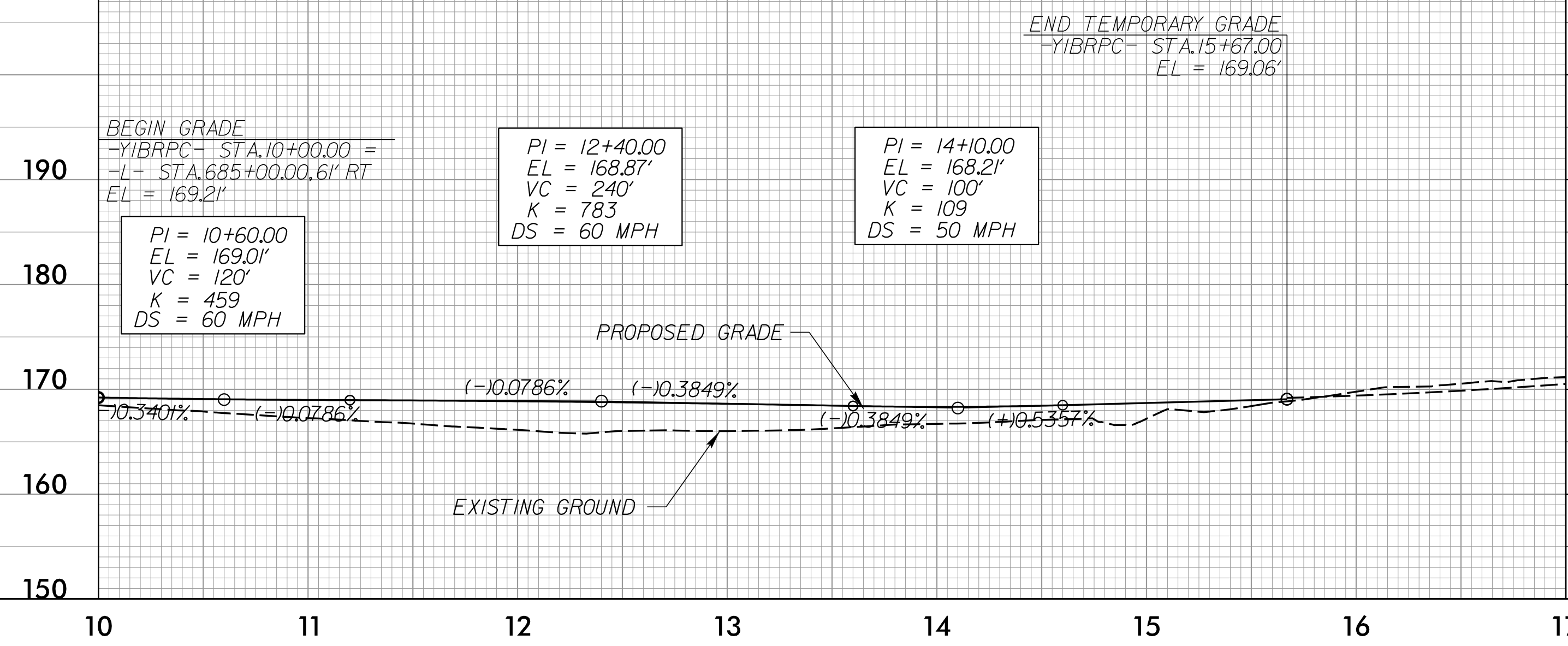
-Y1BRPB- TEMPORARY GRADE

SEE SHT.92 & 93 FOR
-Y1BRPB- PROPOSED PROFILE



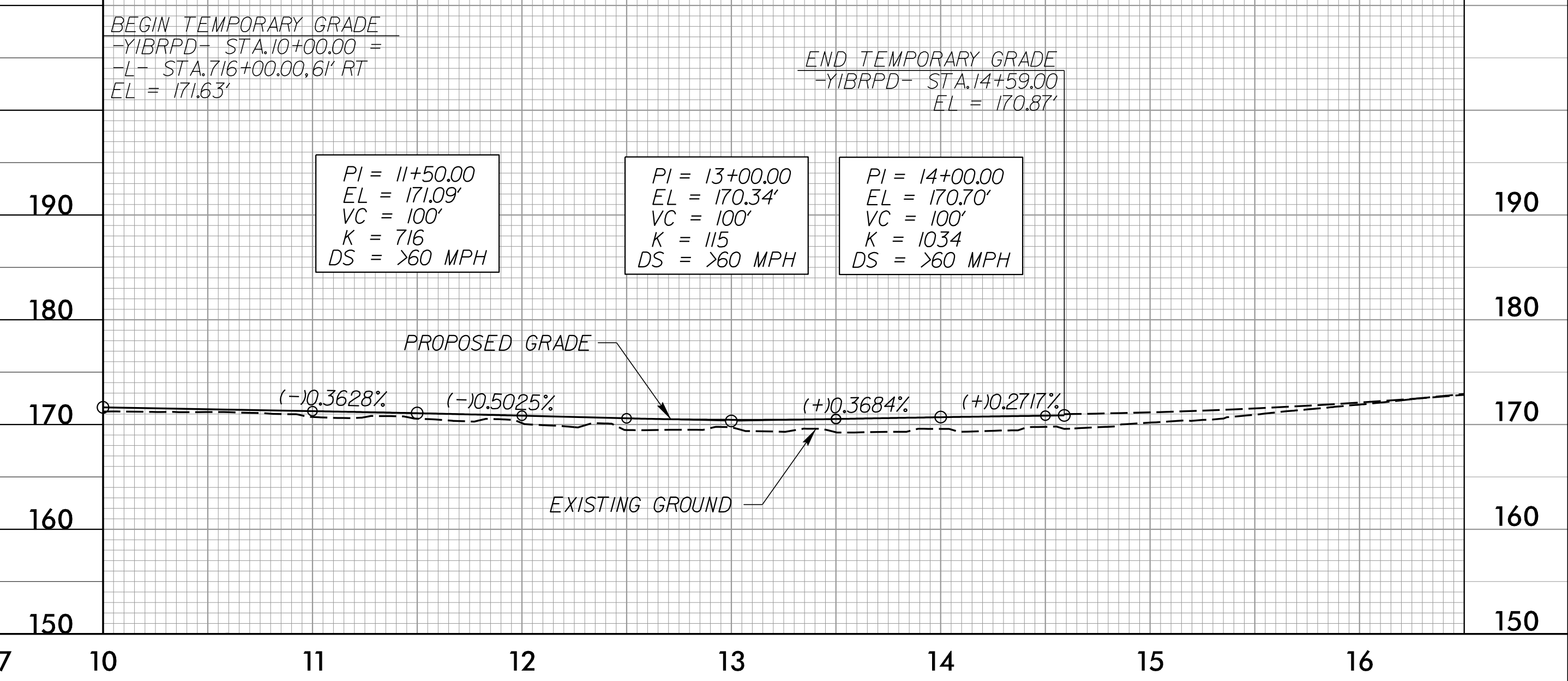
-Y1BRPC- TEMPORARY GRADE

SEE SHT.93 FOR -Y1BRPD-
PROPOSED PROFILE



-Y1BRPD- TEMPORARY GRADE

SEE SHT.94 FOR -Y1BRPD-
PROPOSED PROFILE



4/16/2002
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