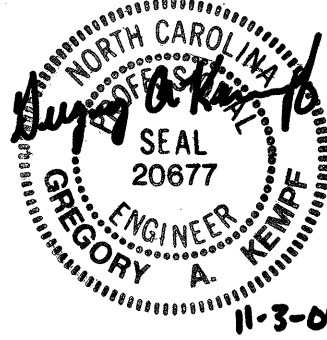
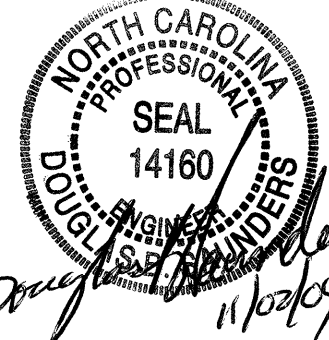


ROADWAY DESIGN ENGINEER



HYDRAULICS ENGINEER

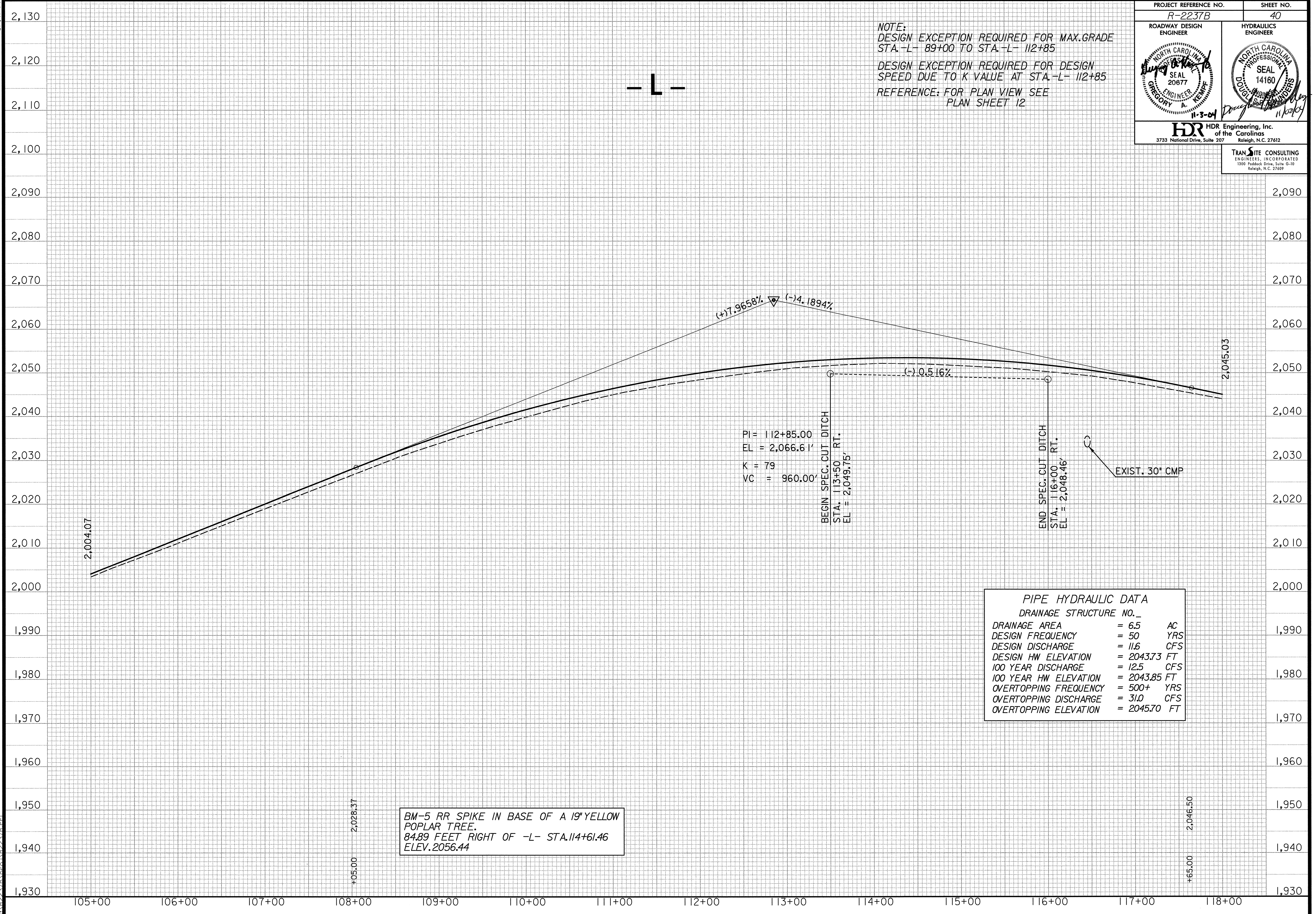


HDR Engineering, Inc. of the Carolinas
3733 National Drive, Suite 207 Raleigh, N.C. 27612

TRAN SITE CONSULTING ENGINEERS, INCORPORATED
1300 Piedmont Drive, Suite G-10 Raleigh, N.C. 27609

NOTE:
DESIGN EXCEPTION REQUIRED FOR MAX.GRADE
STA. -L- 89+00 TO STA. -L- 112+85
DESIGN EXCEPTION REQUIRED FOR DESIGN
SPEED DUE TO K VALUE AT STA. -L- 112+85
REFERENCE: FOR PLAN VIEW SEE
PLAN SHEET 12

- L -



PI = 112+85.00
EL = 2,066.61'
K = 79
VC = 960.00'

BEGIN SPEC. CUT DITCH
STA. 113+50 RT.
EL = 2,049.75'

END SPEC. CUT DITCH
STA. 116+00 RT.
EL = 2,048.46'

EXIST. 30' CMP

PIPE HYDRAULIC DATA		
DRAINAGE STRUCTURE NO. _		
DRAINAGE AREA	= 6.5	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 11.6	CFS
DESIGN HW ELEVATION	= 2043.73	FT
100 YEAR DISCHARGE	= 12.5	CFS
100 YEAR HW ELEVATION	= 2043.85	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 31.0	CFS
OVERTOPPING ELEVATION	= 2045.70	FT

BM-5 RR SPIKE IN BASE OF A 19" YELLOW
POPLAR TREE.
84.89 FEET RIGHT OF -L- STA. 114+61.46
ELEV. 2056.44

5/14/99
11/02/2004
10:24:02 AM
R-2237B.dwg
R-2237B.dwg