STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BK-5109	1	

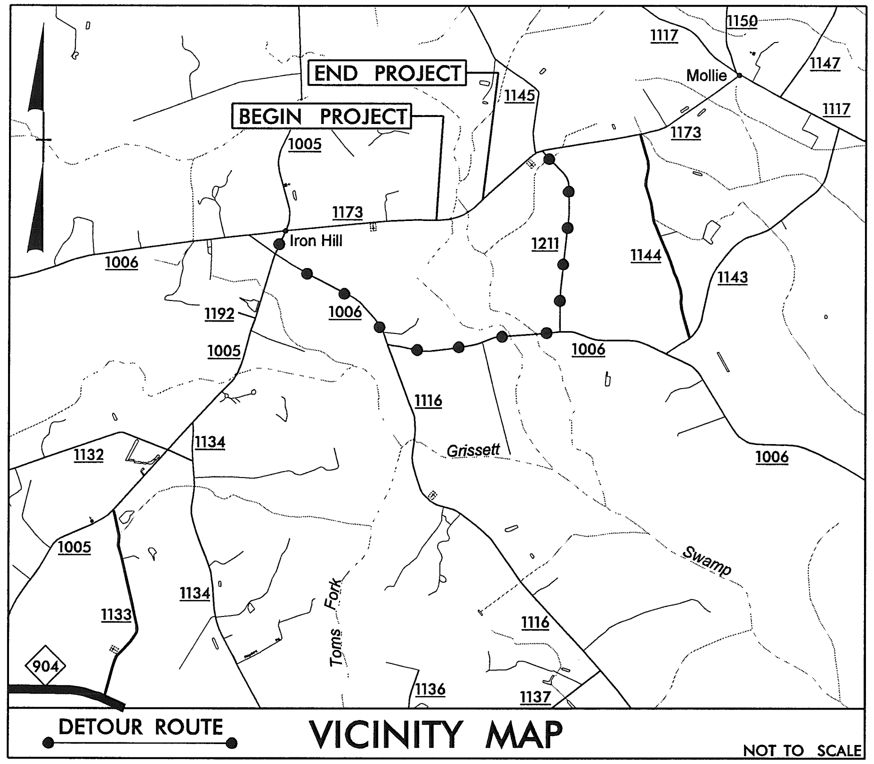
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION

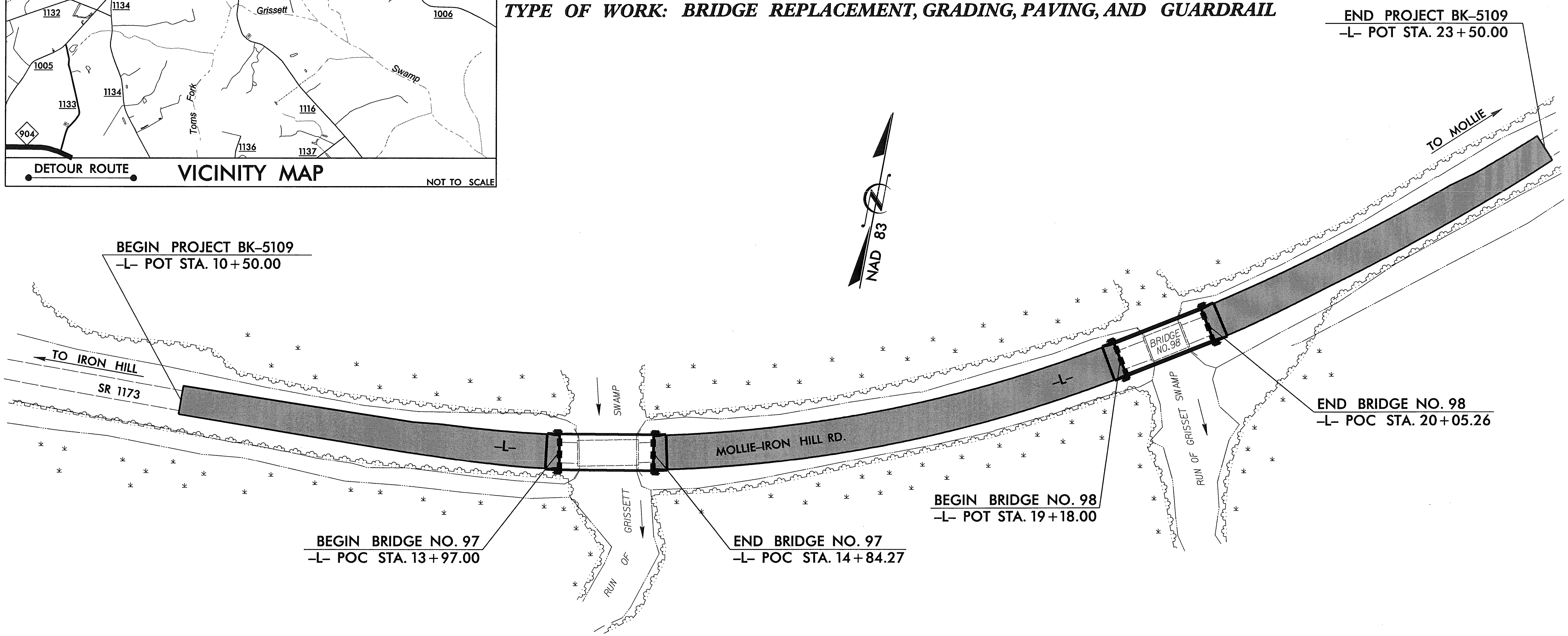
FORMERLY PROJECTS MA06008B AND MA06009B

COLUMBUS COUNTY

LOCATION: BRIDGE NO. 97 & BRIDGE NO. 98 OVER RUN OF GRISSETT SWAMP ON SR 1173 (MOLLIE-IRON HILL RD.) BETWEEN SR 1005 (PEACOCK RD.) AND SR 1145 (JIM JOLLY RD.).

TYPE OF WORK: BRIDGE REPLACEMENT, GRADING, PAVING, AND GUARDRAIL





PROJECT: BK-5109

GRAPHIC SCALES

25 0 25 50
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2004 = 500
ADT 2025 =
DHV = %
D = %
T = 10 % *
V = 55 MPH
* TTST % DUAL %
FUNCTIONAL CLASS: RURAL LOCAL ROUTE

PROJECT LENGTH

LENGTH ROADWAY PROJECT BK-5109 = 0.213mi.
LENGTH STRUCTURE PROJECT BK-5109 = 0.033mi.
TOTAL LENGTH STATE PROJECT BK-5109 = 0.246mi.

NCDOT CONTACT: MIKE SUMMERS
BRIDGE MAINTENANCE UNIT-PROJECT MANAGER

STEWART
421 Fayetteville Street Mall
Suite 400
Raleigh, NC 27601
T 919.380.8750
F 919.380.8752
www.stewart-eng.com

Prepared in the Office of:
STEWART ENGINEERING
For
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:

DAVID RUGGLES, PE
PROJECT ENGINEER

LETTING DATE:

DREW BAIRD, PE
PROJECT DESIGN ENGINEER

STRUCTURE ENGINEER
10-30-09
SIGNATURE: P.E.
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 11725 DAVID RUGGLES

ROADWAY DESIGN ENGINEER
10/30/09
SIGNATURE: P.E.
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 24467 STEWART A. BAIRD

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

STATE DESIGN ENGINEER P.E.

09/08/99

10/30/2009
...\BK-5109_rdy_plansheets.dgn

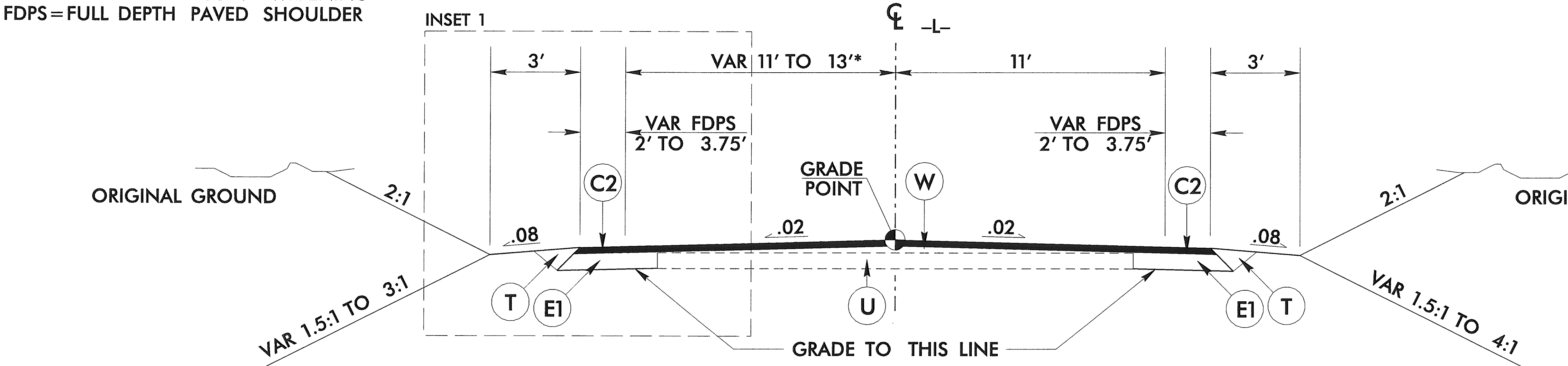
PROJECT REFERENCE NO.	SHEET NO.
BK-5109	2

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER STEWART A. BAIRD

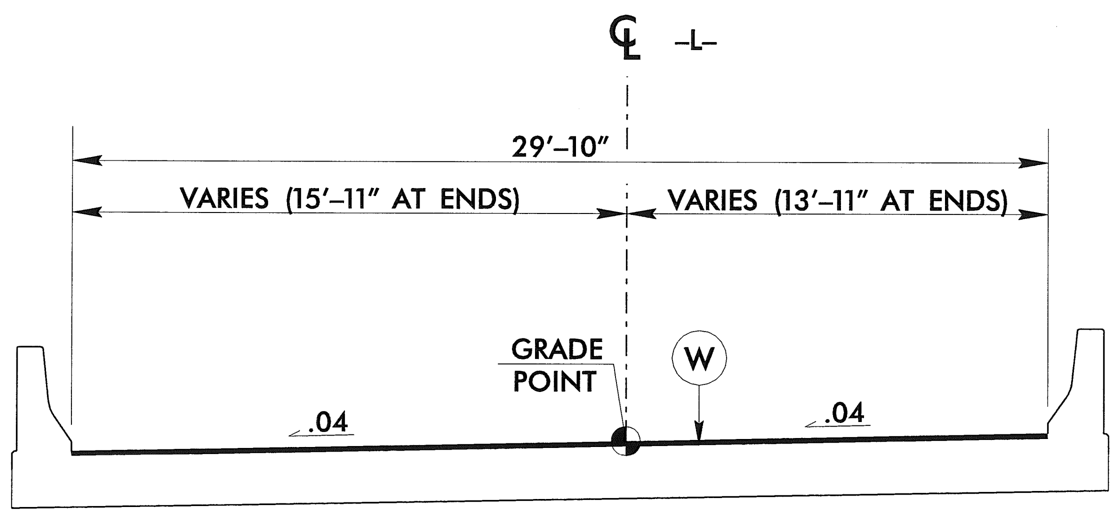
10/30/09

*11′ LANE WIDTH + 2′ CURVE WIDENING
FDPS = FULL DEPTH PAVED SHOULDER



ROADWAY TYPICAL SECTION

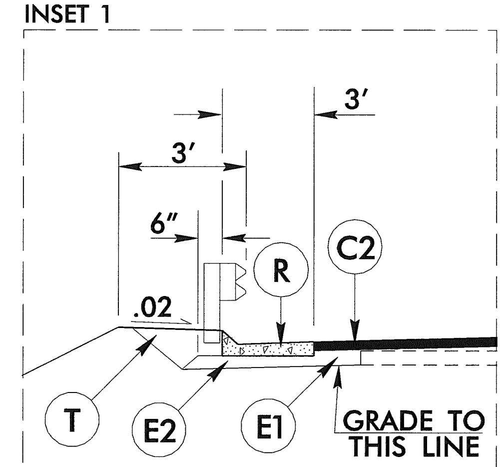
-L- 10+50.00 TO 13+97.00 (WP #1)
-L- 14+84.27 (WP #2) TO 19+18.00 (WP #1)
-L- 20+05.26 (WP #2) TO 23+50.00



STRUCTURE TYPICAL SECTION

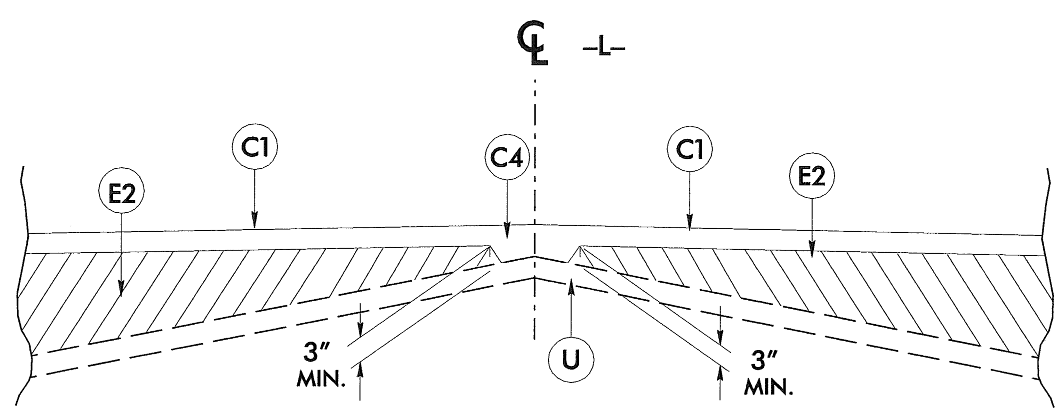
-L- 13+97.00 (WP #1) TO 14+84.27 (WP #2)
-L- 19+18.00 (WP #1) TO 20+05.26 (WP #2)
NOTE: SEE SHEET 9 & 18 FOR PAVEMENT DEPTH ON TOP OF BRIDGE.

INSET 1



USE INSET 1 AT THE FOLLOWING LOCATIONS:
-L- 13+41.00 TO 13+86.00 (BEGIN APP. SLAB)
-L- 14+95.27 (END APP. SLAB) TO 17+00.00
-L- 17+00.00 TO 19+07.00 (BEGIN APP. SLAB)
-L- 20+16.26 (END APP. SLAB) TO 22+04.00

PAVEMENT SCHEDULE	
C1	PROP. APPROX. 1¼″ ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 137.5 LBS. PER SQ. YD.
C2	PROP. APPROX. 2 ″ ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C4	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1″ DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 1½″ IN DEPTH.
E1	PROP. APPROX. 6″ ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 342 LBS. PER SQ. YD. IN EACH OF 2 LAYERS.
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1″ DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3″ IN DEPTH OR GREATER THAN 5½″ IN DEPTH.
R	SHOULDER BERM GUTTER.
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL).



Detail Showing Method of Wedging

6/2/99

$$$$$$SYSTIME$$$$$$
$$$$$$$$$$$$$DGN$$$$$$$$$$$$$
$$$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
BK-5109	3
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

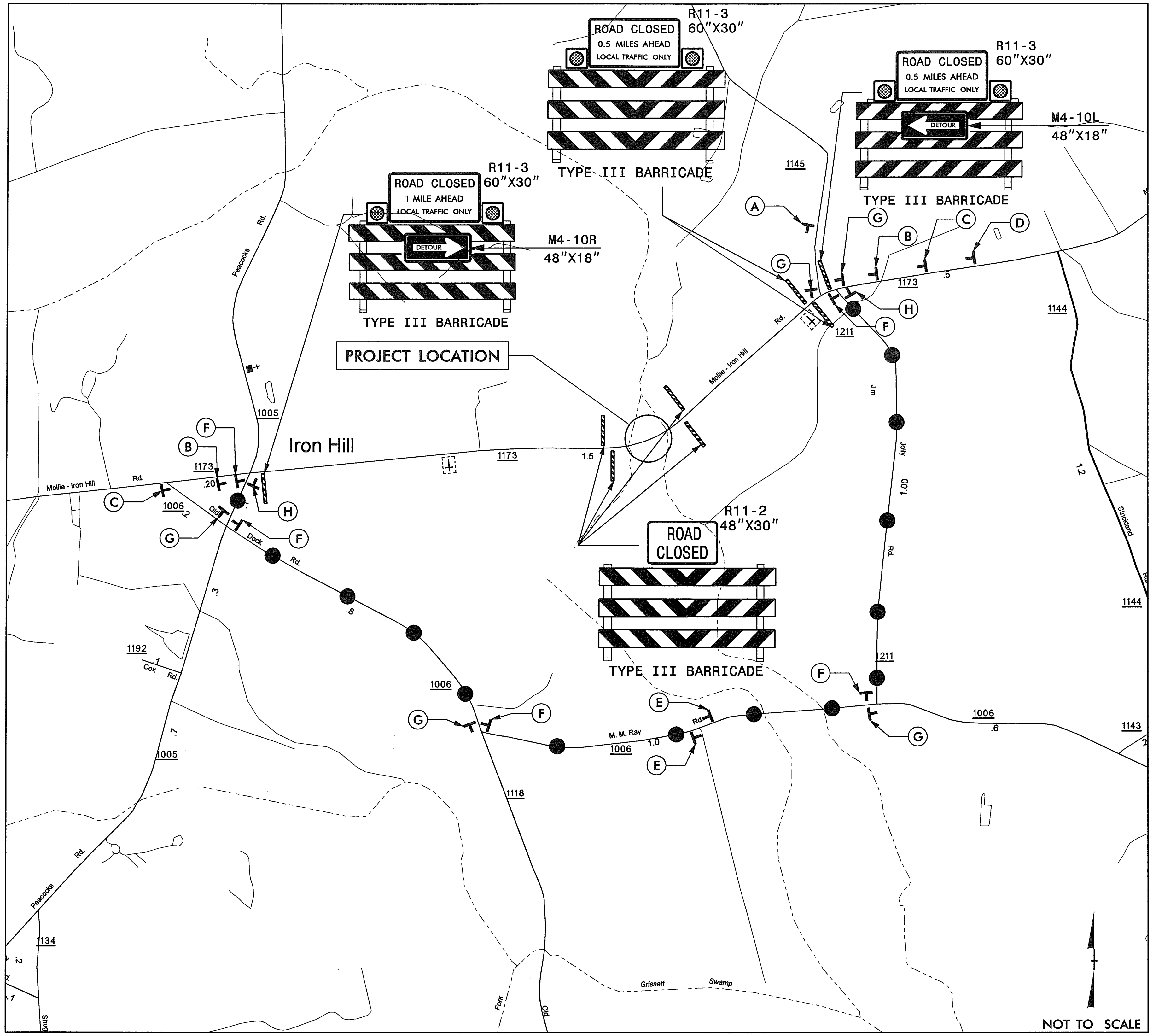
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 8725 DAVID B. RUGGLES

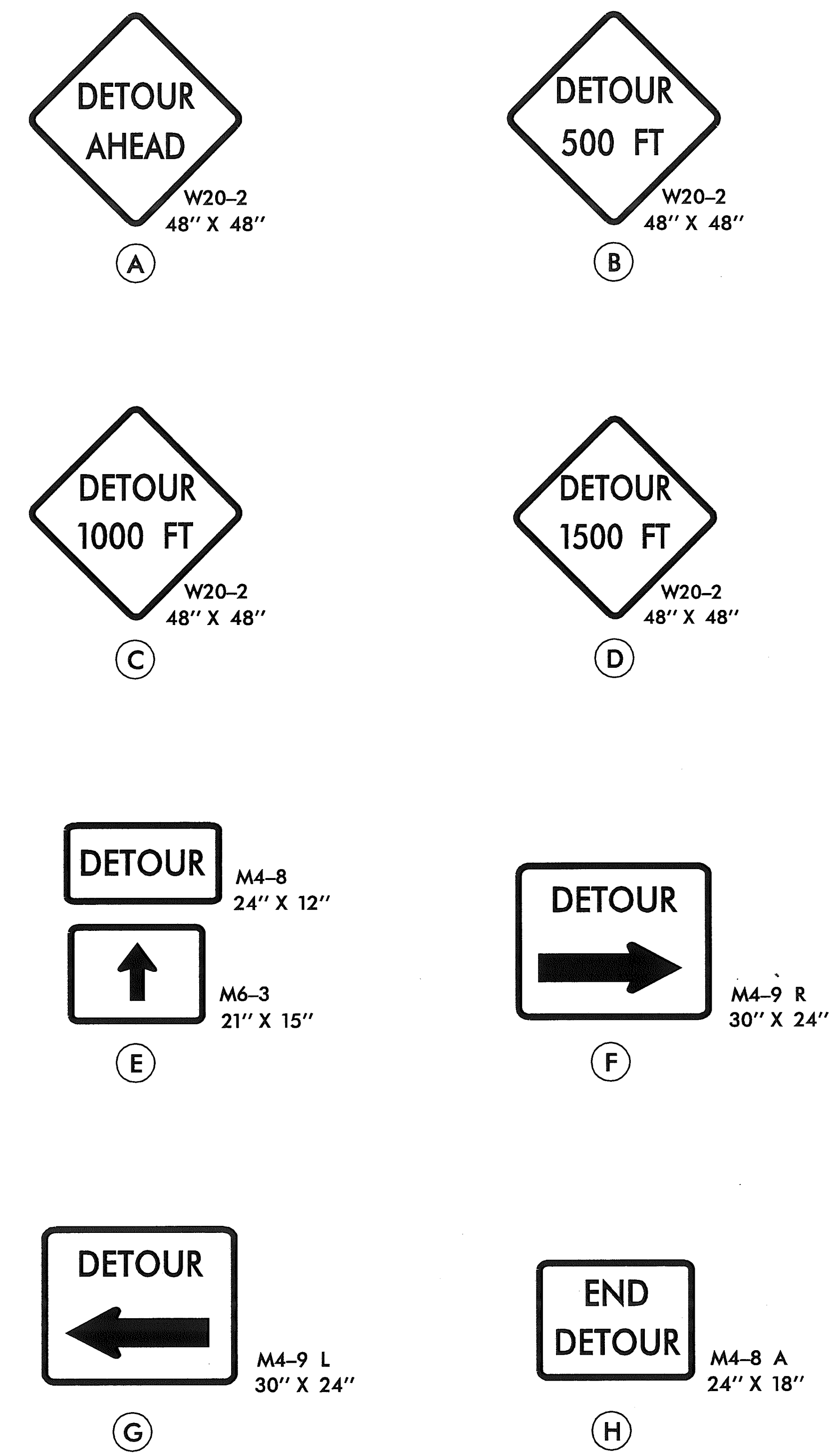
David Ruggles

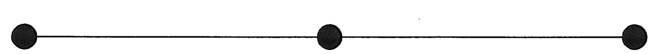
10-30-09

8/17/99

REVISIONS







DETOUR ROUTE

10/30/2009 ...\BK-5109_rdy_plansheets.dgn

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL STEWART A. BAIRD

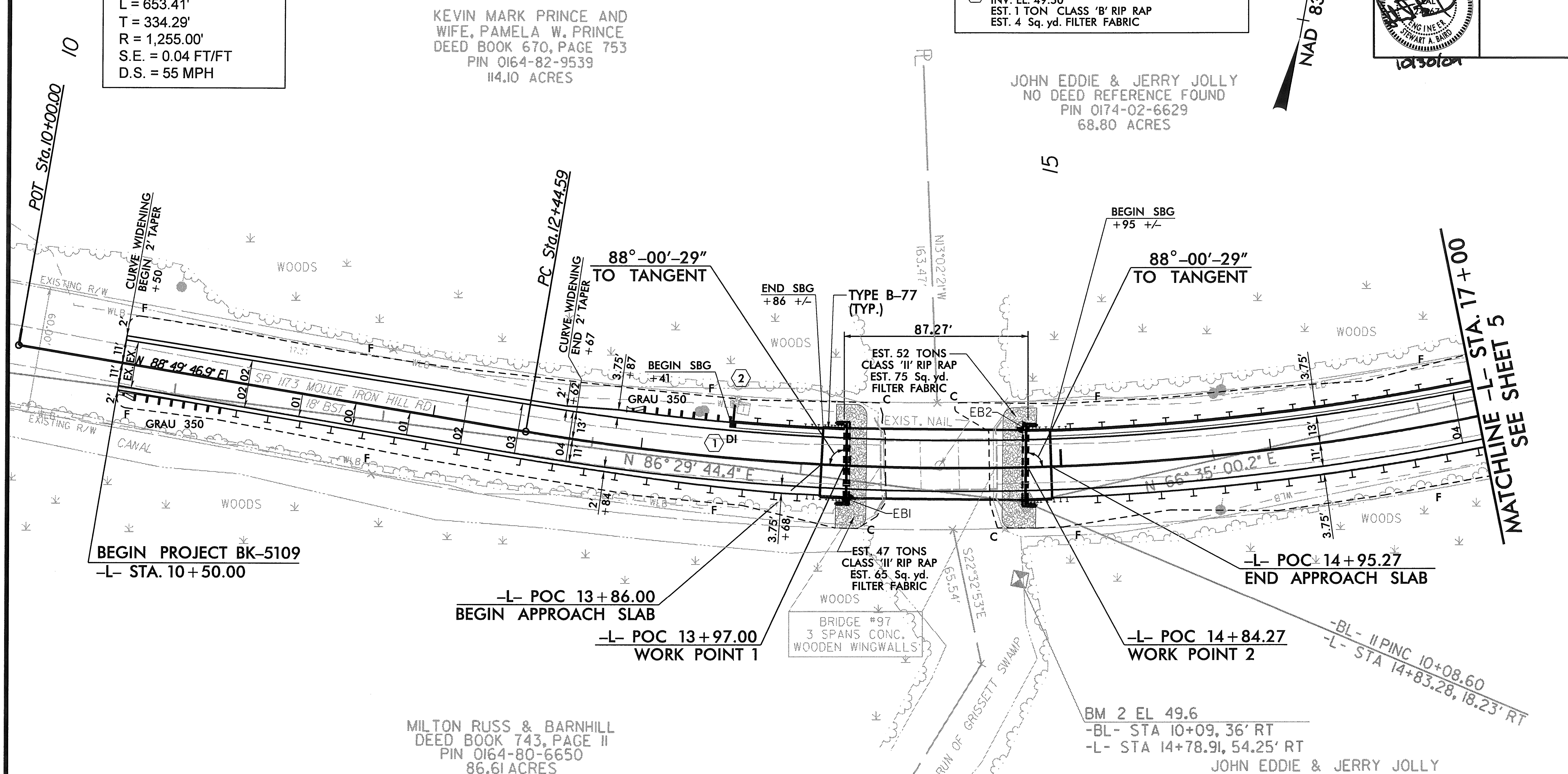
10/30/09

-L-
PI Sta 15+78.88
△ = 29° 49' 50.3" (LT)
D = 4° 33' 55.4"
L = 653.41'
T = 334.29'
R = 1,255.00'
S.E. = 0.04 FT/FT
D.S. = 55 MPH

DRAINAGE SUMMARY

(1) DROP INLET (STD. 840.18, 840.27, and 846.04)
TOP EL. 52.58
INV. EL. 49.58

(2) OUTLET 8'-12" RCP
INV. EL. 49.50
EST. 1 TON CLASS 'B' RIP RAP
EST. 4 Sq. yd. FILTER FABRIC



NOTES

1. PILES FOR END BENTS NO. 1 AND NO. 2 SHALL BE DRIVEN TO A MINIMUM BEARING CAPACITY OF 50 TONS EACH.

2. THE QUANTITY OF RIP RAP TO BE PAID FOR WILL BE THE ACTUAL NUMBER OF TONS OF EACH CLASS OF RIP RAP WHICH HAS BEEN INCORPORATED INTO THE COMPLETED AND ACCEPTED WORK. THE RIP RAP WILL BE MEASURED BY BEING WEIGHED IN TRUCKS ON CERTIFIED PLATFORM SCALES OR OTHER CERTIFIED WEIGHING DEVICES. THE QUANTITY OF RIP RAP WILL BE PAID FOR AT THE CONTRACT UNIT PRICE PER TON.

PLAIN RIP RAP CLASS II (2'-0" THICK)	
END BENT NO. 1	47 TONS
END BENT NO. 2	52 TONS
TOTAL	99 TONS

3. THIS STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH THE FHWA'S TECHNICAL ADVISORY T5140.20 (SCOUR AT BRIDGES).

4. WHEN DRIVING PILES, THE MAXIMUM BLOW COUNT SHALL NOT BE EXCEEDED.

5. THE EXISTING BRIDGE SUBSTRUCTURE SHALL BE REMOVED BY SAWING AND/OR NON-SHATTERING METHODS SUCH THAT DEBRIS WILL NOT FALL INTO THE WATER.

6. PILES AT END BENT NO. 1 AND END BENT NO. 2 SHALL BE DRIVEN TO AN ELEVATION NO HIGHER THAN 6 FT AND SATISFY THE BEARING CAPACITY.

7. STEEL PILE POINTS (WITH TEETH) ARE REQUIRED FOR PILES AT END BENT NO. 1 AND END BENT NO. 2.

8. CONTRACTOR SHALL RESTRIKE ALL PILES AT LEAST 24 HOURS AFTER INSTALLATION TO CONFIRM THAT THE MAXIMUM BEARING CAPACITY OF 50 TONS HAS BEEN ACHIEVED.

9. PILING SHALL BE DRIVEN CONTINUOUSLY IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS SECTION 450-8 TO THE ESTIMATED LENGTH SHOWN ON THE PLANS (OR PAST MINIMUM TIP ELEVATION) UNTIL THE LOAD IS OBTAINED. IF LOAD IS STILL NOT OBTAINED AT THIS POINT, THE CONTRACTOR MAY SUSPEND DRIVING AND ALLOW THE PILE TO SET BEFORE RESUMING PILE DRIVING. WHEN DRIVING IS RESUMED, THE HAMMER SHALL BE WARM AND OPERATED A SUFFICIENT NUMBER OF BLOWS TO OVERCOME THE FRICTION FORCE (MIN. 10 BLOWS) BEFORE FINAL BEARING IS CHECKED.

DENOTES GEOTECHNICAL BORING HOLE LOCATIONS

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NGS "OPUS" METHOD FOR MONUMENT "GPS 2" WITH NAD 1983/CORS 96 STATE PLANE GRID COORDINATES OF NORTHING: 141,802.30(ft) EASTING: 2,069,122.13(ft) THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 1.000055935 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "GPS 2" TO -L- STATION 10+00.00 IS 807.65' & S89°34'33.02"E ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES VERTICAL DATUM USED IS NAVD 88

REVISIONS

8/17/99

10/30/2009 BK-5109_rdy_plansheets.dgn

8/17/99

REVISIONS

-L-	
PI Sta 15+78.88	PI Sta 21+32.40
△ = 29° 49' 50.3" (LT)	△ = 12° 05' 15.4" (LT)
D = 4° 33' 55.4"	D = 3° 00' 56.0"
L = 653.41'	L = 400.84'
T = 334.29'	T = 201.17'
R = 1,255.00'	R = 1,900.00'
S.E. = 0.04 FT/FT	S.E. = 0.04 FT/FT
D.S. = 55 MPH	D.S. = 55 MPH

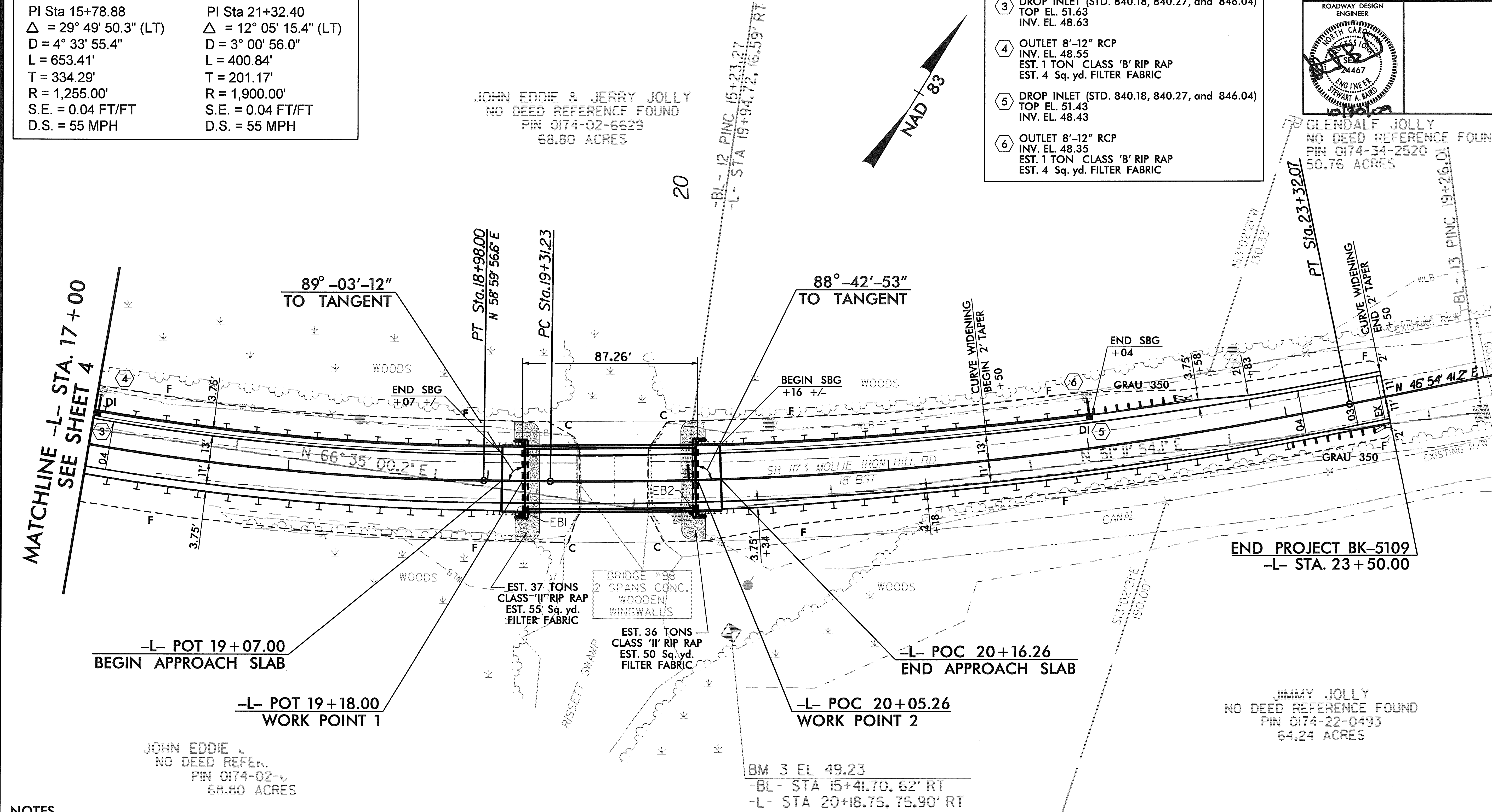
DRAINAGE SUMMARY

(3) DROP INLET (STD. 840.18, 840.27, and 846.04)
TOP EL. 51.63
INV. EL. 48.63

(4) OUTLET 8'-12" RCP
INV. EL. 48.55
EST. 1 TON CLASS 'B' RIP RAP
EST. 4 Sq. yd. FILTER FABRIC

(5) DROP INLET (STD. 840.18, 840.27, and 846.04)
TOP EL. 51.43
INV. EL. 48.43

(6) OUTLET 8'-12" RCP
INV. EL. 48.35
EST. 1 TON CLASS 'B' RIP RAP
EST. 4 Sq. yd. FILTER FABRIC



NOTES

1. PILES FOR END BENTS NO. 1 AND NO. 2 SHALL BE DRIVEN TO A MINIMUM BEARING CAPACITY OF 50 TONS EACH.

2. THE QUANTITY OF RIP RAP TO BE PAID FOR WILL BE THE ACTUAL NUMBER OF TONS OF EACH CLASS OF RIP RAP WHICH HAS BEEN INCORPORATED INTO THE COMPLETED AND ACCEPTED WORK. THE RIP RAP WILL BE MEASURED BY BEING WEIGHED IN TRUCKS ON CERTIFIED PLATFORM SCALES OR OTHER CERTIFIED WEIGHING DEVICES. THE QUANTITY OF RIP RAP WILL BE PAID FOR AT THE CONTRACT UNIT PRICE PER TON.

PLAIN RIP RAP CLASS II (2'-0" THICK)	
END BENT NO. 1	37 TONS
END BENT NO. 2	36 TONS
TOTAL	73 TONS

3. THIS STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH THE FHWA'S TECHNICAL ADVISORY T5140.20 (SCOUR AT BRIDGES).

4. WHEN DRIVING PILES, THE MAXIMUM BLOW COUNT SHALL NOT BE EXCEEDED.

5. THE EXISTING BRIDGE SUBSTRUCTURE SHALL BE REMOVED BY SAWING AND/OR NON-SHATTERING METHODS SUCH THAT DEBRIS WILL NOT FALL INTO THE WATER.

6. PILES AT END BENT NO. 1 AND END BENT NO. 2 SHALL BE DRIVEN TO AN ELEVATION NO HIGHER THAN 7 FT AND SATISFY THE BEARING CAPACITY.

7. STEEL PILE POINTS (WITH TEETH) ARE REQUIRED FOR PILES AT END BENT NO. 1 AND END BENT NO. 2.

8. CONTRACTOR SHALL RESTRIKE ALL PILES AT LEAST 24 HOURS AFTER INSTALLATION TO CONFIRM THAT THE MAXIMUM BEARING CAPACITY OF 50 TONS HAS BEEN ACHIEVED.

9. PILING SHALL BE DRIVEN CONTINUOUSLY IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS SECTION 450-8 TO THE ESTIMATED LENGTH SHOWN ON THE PLANS (OR PAST MINIMUM TIP ELEVATION) UNTIL THE LOAD IS OBTAINED. IF LOAD IS STILL NOT OBTAINED AT THIS POINT, THE CONTRACTOR MAY SUSPEND DRIVING AND ALLOW THE PILE TO SET BEFORE RESUMING PILE DRIVING. WHEN DRIVING IS RESUMED, THE HAMMER SHALL BE WARM AND OPERATED A SUFFICIENT NUMBER OF BLOWS TO OVERCOME THE FRICTION FORCE (MIN. 10 BLOWS) BEFORE FINAL BEARING IS CHECKED.

DENOTES GEOTECHNICAL BORING HOLE LOCATIONS

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NGS "OPUS" METHOD FOR MONUMENT "GPS 2" WITH NAD 1983/CORS 96 STATE PLANE GRID COORDINATES OF NORTHING: 141,802.30(ft) EASTING: 2,069,122.13(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 1.000055935
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "GPS 2" TO -L- STATION 10+00.00 IS 807.65' & S89°34'33.02"E
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

10/30/2009
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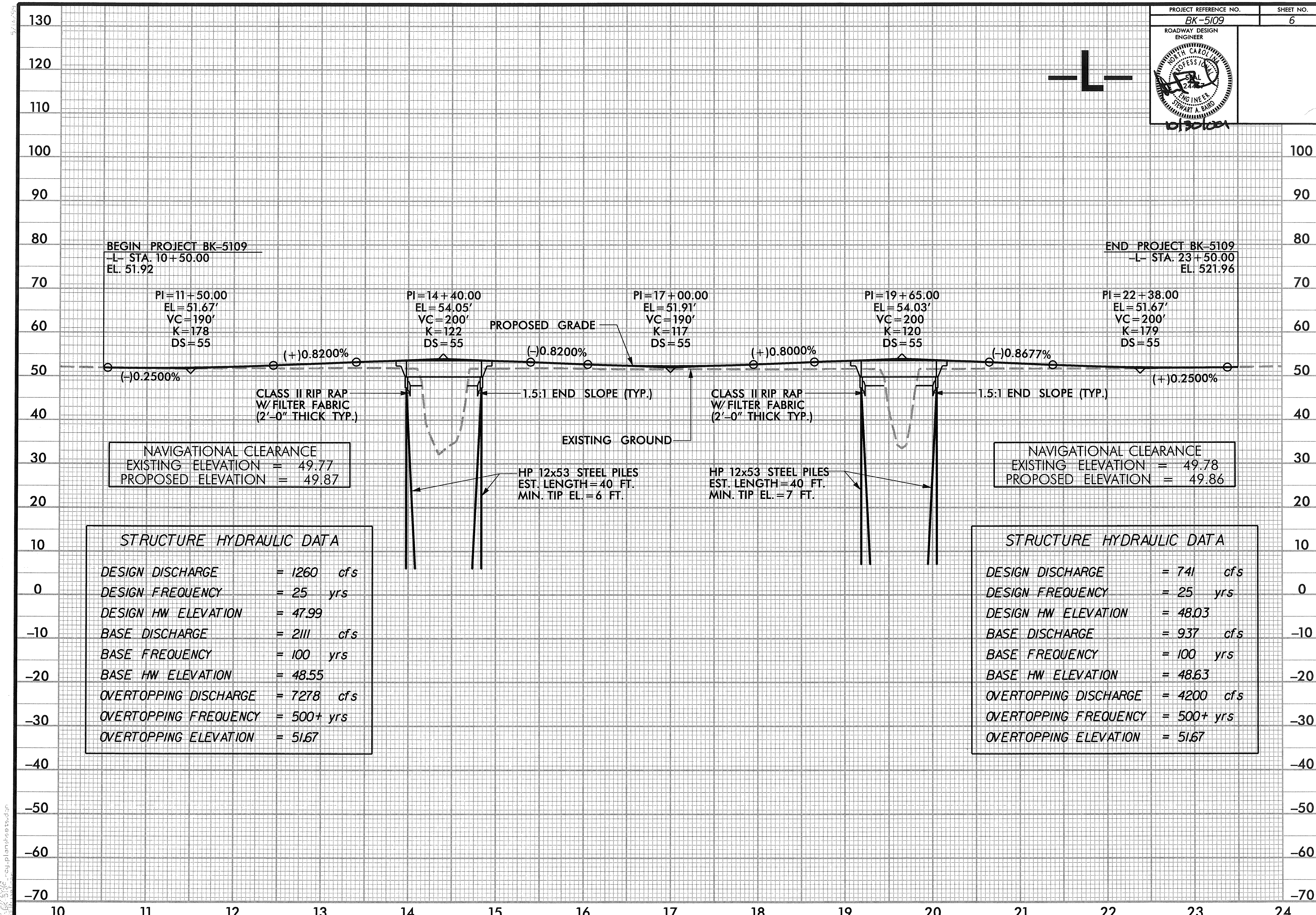
PROJECT REFERENCE NO.	SHEET NO.
BK-5109	6

ROADWAY DESIGN ENGINEER

-L-



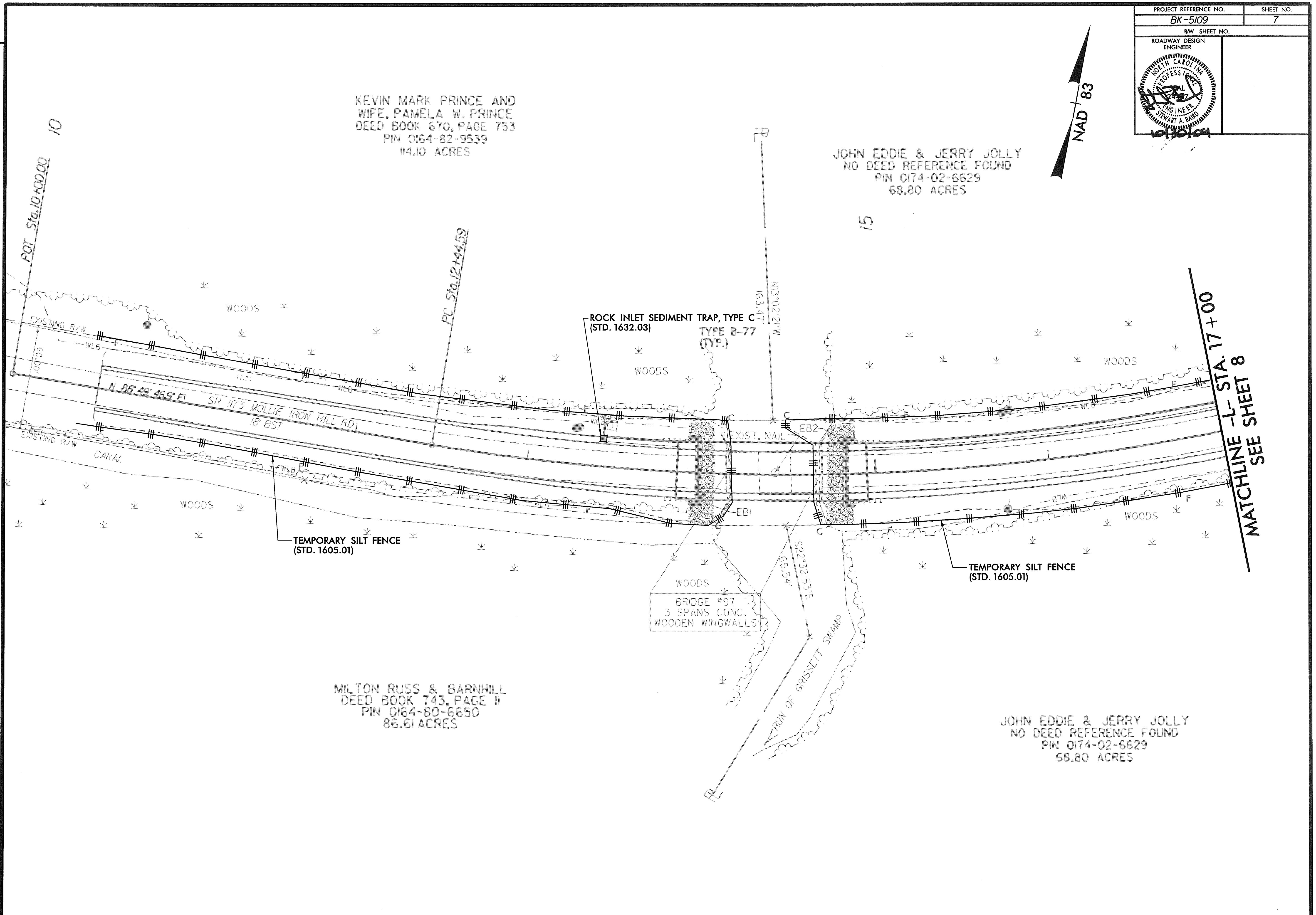
STRUCTURE HYDRAULIC DATA

DESIGN DISCHARGE	=	1260 cfs
DESIGN FREQUENCY	=	25 yrs
DESIGN HW ELEVATION	=	47.99
BASE DISCHARGE	=	2111 cfs
BASE FREQUENCY	=	100 yrs
BASE HW ELEVATION	=	48.55
OVERTOPPING DISCHARGE	=	7278 cfs
OVERTOPPING FREQUENCY	=	500+ yrs
OVERTOPPING ELEVATION	=	51.67

STRUCTURE HYDRAULIC DATA

DESIGN DISCHARGE	=	741 cfs
DESIGN FREQUENCY	=	25 yrs
DESIGN HW ELEVATION	=	48.03
BASE DISCHARGE	=	937 cfs
BASE FREQUENCY	=	100 yrs
BASE HW ELEVATION	=	48.63
OVERTOPPING DISCHARGE	=	4200 cfs
OVERTOPPING FREQUENCY	=	500+ yrs
OVERTOPPING ELEVATION	=	51.67

REVISIONS



10/30/2009
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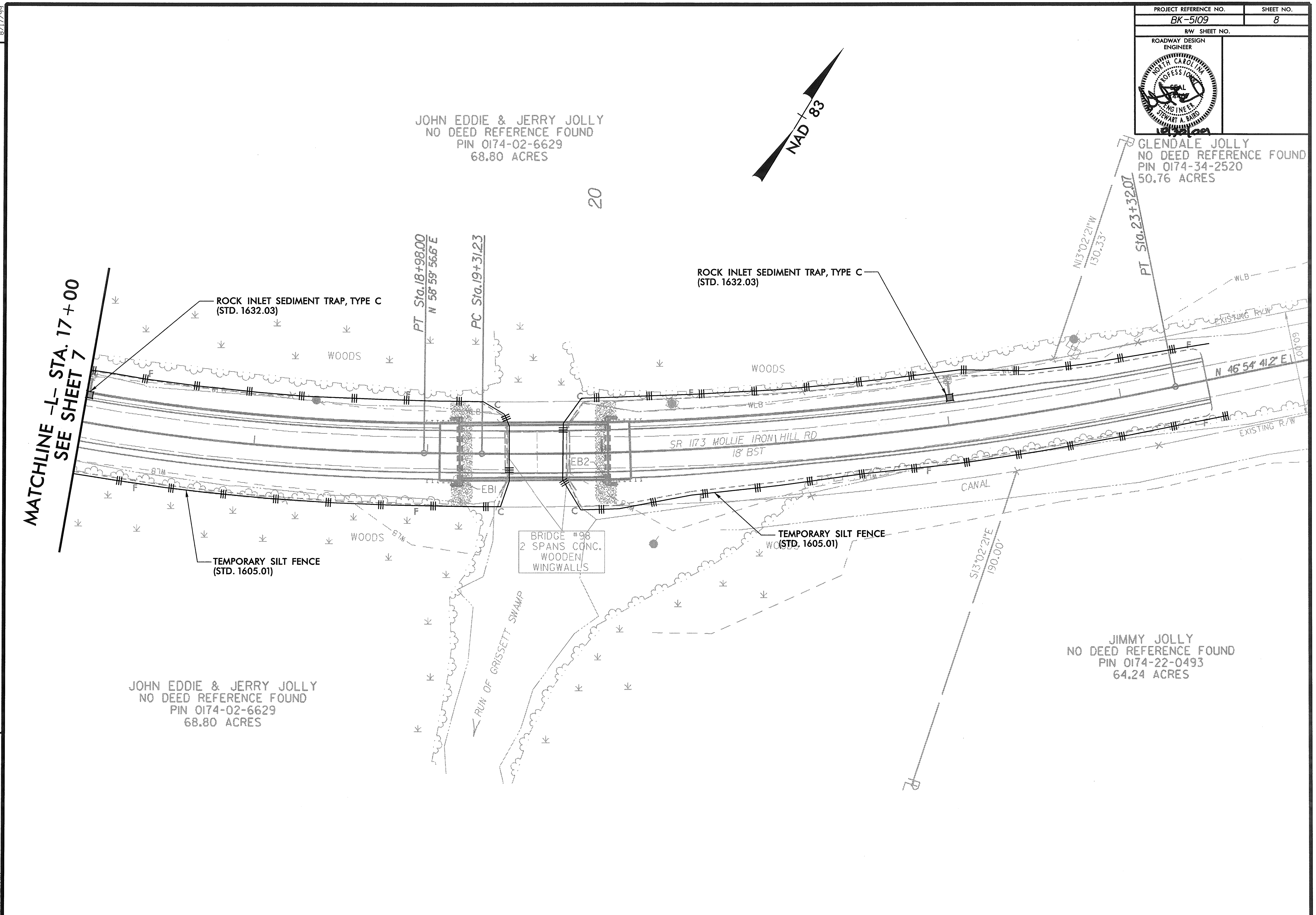
PROJECT REFERENCE NO.	SHEET NO.
BK-5109	8
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	



REVISIONS

8/17/99

10/30/2009
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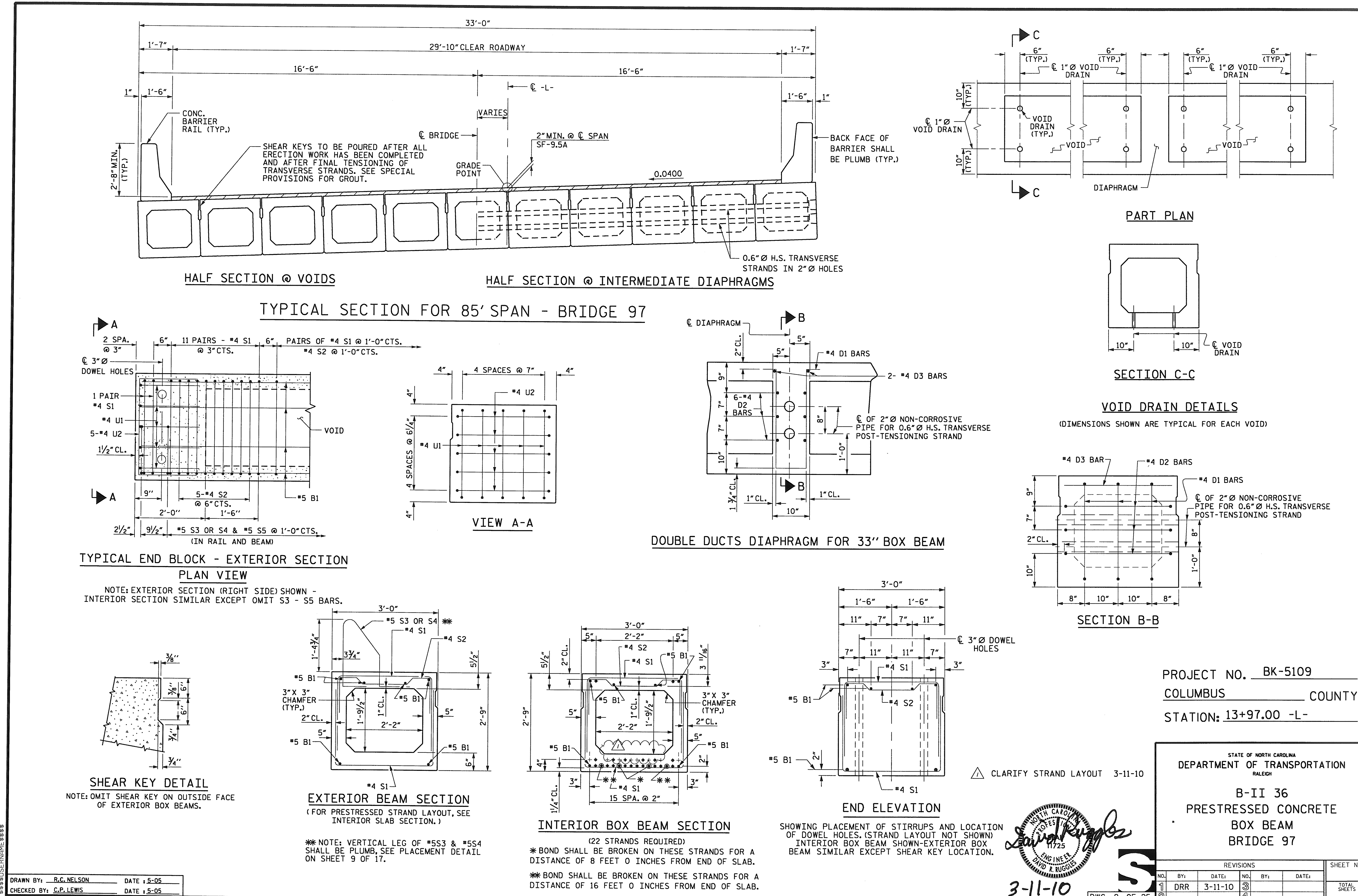
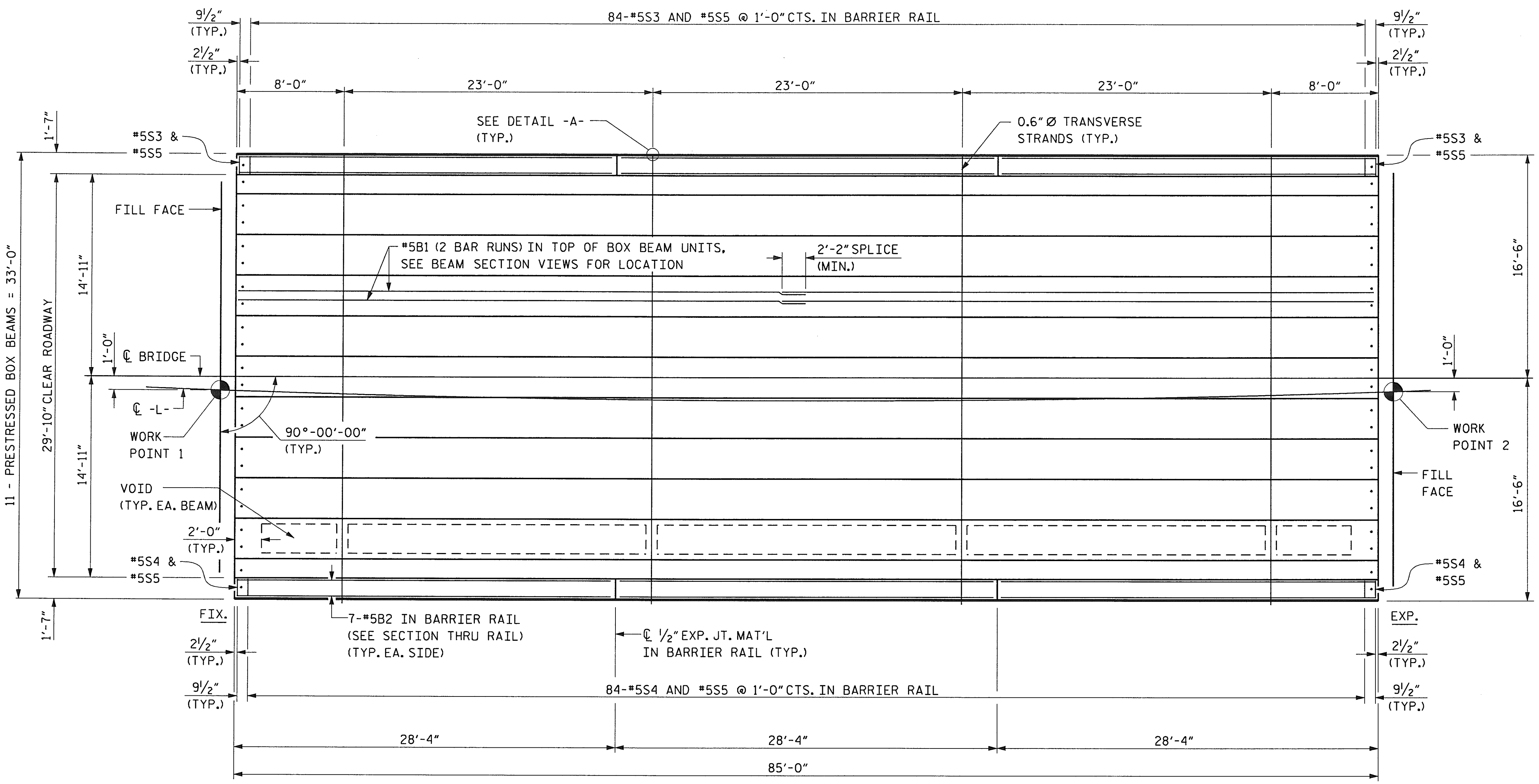
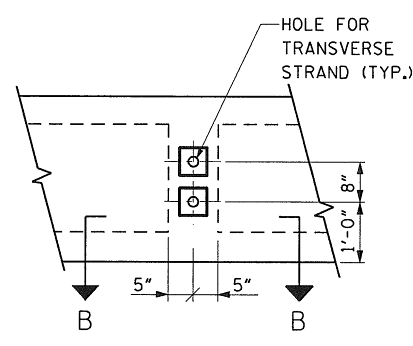


33'-0"
1'-7"
29'-10" CLEAR ROADWAY
1'-7"
16'-6"
16'-6"
℄ -L-
1" 1'-6"
1'-6" 1"
CONC. BARRIER RAIL (TYP.)
VARIES
℄ BRIDGE
2" MIN. @ ℄ SPAN SF-9.5A
BACK FACE OF BARRIER SHALL BE PLUMB (TYP.)
2'-8" MIN. (TYP.)
SHEAR KEYS TO BE POURED AFTER ALL ERECTION WORK HAS BEEN COMPLETED AND AFTER FINAL TENSIONING OF TRANSVERSE STRANDS. SEE SPECIAL PROVISIONS FOR GROUT.
GRADE POINT
0.0400
0.6" Ø H.S. TRANSVERSE STRANDS IN 2" Ø HOLES
HALF SECTION @ VOIDS
HALF SECTION @ INTERMEDIATE DIAPHRAGMS
TYPICAL SECTION FOR 85' SPAN - BRIDGE 97
C
6" (TYP.)
6" (TYP.)
℄ 1" Ø VOID DRAIN
10" (TYP.)
℄ 1" Ø VOID DRAIN
VOID DRAIN (TYP.)
VOID
DIAPHRAGM
PART PLAN
10"
10"
℄ VOID DRAIN
SECTION C-C
VOID DRAIN DETAILS
(DIMENSIONS SHOWN ARE TYPICAL FOR EACH VOID)
A
2 SPA. @ 3"
6"
11 PAIRS - #4 S1 @ 3" CTS.
6"
PAIRS OF #4 S1 @ 1'-0" CTS. #4 S2 @ 1'-0" CTS.
℄ 3" Ø DOWEL HOLES
1 PAIR #4 S1
#4 U1
5-#4 U2
1 1/2" CL.
VOID
9"
5-#4 S2 @ 6" CTS.
#5 B1
2'-0"
1'-6"
2 1/2"
9 1/2"
#5 S3 OR S4 & #5 S5 @ 1'-0" CTS. (IN RAIL AND BEAM)
TYPICAL END BLOCK - EXTERIOR SECTION
PLAN VIEW
NOTE: EXTERIOR SECTION (RIGHT SIDE) SHOWN - INTERIOR SECTION SIMILAR EXCEPT OMIT S3 - S5 BARS.
4"
4 SPACES @ 7"
4"
#4 U2
#4 U1
4 SPACES @ 6 1/4"
VIEW A-A
℄ DIAPHRAGM
B
5"
5"
#4 D1 BARS
2" CL.
2- #4 D3 BARS
9"
6-#4 D2 BARS
7"
7"
8"
℄ OF 2" Ø NON-CORROSIVE PIPE FOR 0.6" Ø H.S. TRANSVERSE POST-TENSIONING STRAND
10"
1'-0"
1 3/4" CL.
1" CL.
1" CL.
10"
DOUBLE DUCTS DIAPHRAGM FOR 33" BOX BEAM
#4 D3 BAR
#4 D2 BARS
#4 D1 BARS
℄ OF 2" Ø NON-CORROSIVE PIPE FOR 0.6" Ø H.S. TRANSVERSE POST-TENSIONING STRAND
9"
7"
2" CL.
8"
10"
1'-0"
8" 10" 10" 8"
SECTION B-B
3/8"
3/8"
6"
6"
3/4"
3/4"
SHEAR KEY DETAIL
NOTE: OMIT SHEAR KEY ON OUTSIDE FACE OF EXTERIOR BOX BEAMS.
3'-0"
#5 S3 OR S4 **
#4 S1
#4 S2
1'-4 3/4"
3 3/4"
5 1/2"
#5 B1
#5 B1
3" X 3" CHAMFER (TYP.)
1" CL.
1'-9 1/2"
2" CL.
2'-2"
5"
5"
2'-9"
#5 B1
#5 B1
6"
#4 S1
EXTERIOR BEAM SECTION
(FOR PRESTRESSED STRAND LAYOUT, SEE INTERIOR SLAB SECTION.)
** NOTE: VERTICAL LEG OF #5S3 & #5S4 SHALL BE PLUMB, SEE PLACEMENT DETAIL ON SHEET 9 OF 17.
3'-0"
5" 2'-2" 5"
#4 S2
#4 S1
#5 B1
5 1/2"
2" CL.
3 11/16"
#5 B1
3" X 3" CHAMFER (TYP.)
1" CL.
1'-9 1/2"
2" CL.
5"
2'-2"
5"
2'-9"
#5 B1
#5 B1
4"
2"
3"
3"
** * **
#4 S1
15 SPA. @ 2"
1 1/4" CL.
INTERIOR BOX BEAM SECTION
(22 STRANDS REQUIRED)
* BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 8 FEET 0 INCHES FROM END OF SLAB.
** BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 16 FEET 0 INCHES FROM END OF SLAB.
3'-0"
1'-6" 1'-6"
11" 7" 7" 11"
7" 11" 11" 7"
℄ 3" Ø DOWEL HOLES
3"
3"
#4 S1
#5 B1
#4 S2
#5 B1
2"
#4 S1
END ELEVATION
SHOWING PLACEMENT OF STIRRUPS AND LOCATION OF DOWEL HOLES. (STRAND LAYOUT NOT SHOWN) INTERIOR BOX BEAM SHOWN-EXTERIOR BOX BEAM SIMILAR EXCEPT SHEAR KEY LOCATION.
1 CLARIFY STRAND LAYOUT 3-11-10
PROJECT NO. BK-5109
COLUMBUS COUNTY
STATION: 13+97.00 -L-
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
B-II 36
PRESTRESSED CONCRETE
BOX BEAM
BRIDGE 97
NORTH CAROLINA PROFESSIONAL ENGINEER 1725 DAVID R. RUGGIES
3-11-10
DWG. 9 OF 25
REVISIONS
NO. BY: DATE: NO. BY: DATE:
1 DRR 3-11-10 3
2 4
SHEET NO.
TOTAL SHEETS
DRAWN BY: R.C. NELSON DATE: 5-05
CHECKED BY: C.P. LEWIS DATE: 5-05

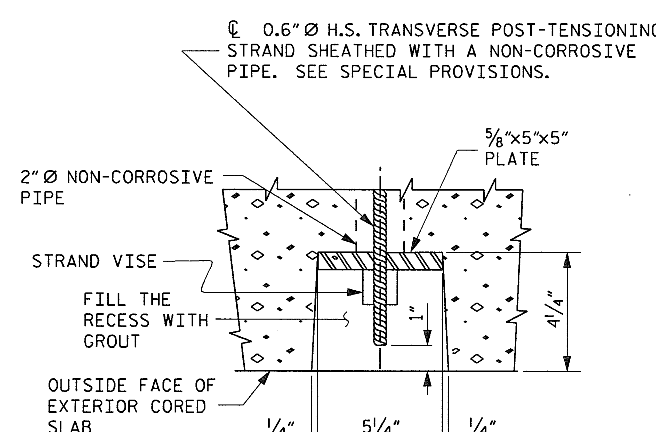


PLAN - BRIDGE 97

NOTE:
BEAMS ARE PLACED PARALLEL TO LONG CHORD FROM WORK POINT 1 TO WORK POINT 2.



ELEVATION



SECTION B-B

DETAIL -A-

NOT TO SCALE

PROJECT NO. BK-5109
COLUMBUS COUNTY
STATION: 13+97.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
PLAN OF SPAN
AND DETAILS
BRIDGE 97

NORTH CAROLINA ... 725 ENGINEER DAVID R. RUGGLES

David Ruggles
10-30-09

S

DWG. 10 OF 25

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS
2			4			

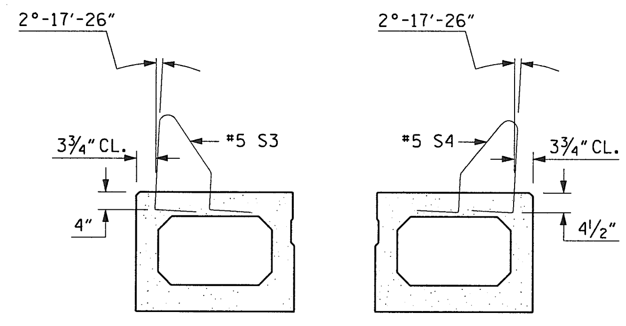
DRAWN BY: A. P. TUAZAMA DATE: 5-05
CHECKED BY: C. P. LEWIS DATE: 5-05

$$$$SYSTIME$$$$ $$$$USERNAME$$$$ $$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$

BOX BEAMS REQUIRED			
	NUMBER	LENGTH	TOTAL LENGTH
EXTERIOR B.B.	2	85'-0"	170'-0"
INTERIOR B.B.	9	85'-0"	765'-0"
TOTAL	11		935'-0"

DEAD LOAD DEFLECTION AND CAMBER	
	0.6 "Ø L.R. STRAND
CAMBER (BEAM ALONE IN PLACE)	3/4" ↑
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD ✻✻	1 1/4" ↓
FINAL CAMBER	2" ↑

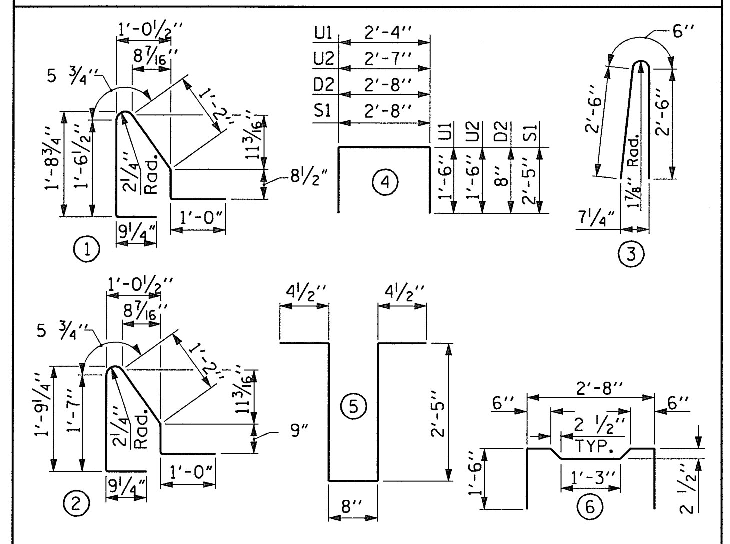
✻✻ INCLUDES FUTURE WEARING SURFACE



PLACEMENT OF S3 & S4 BARS

GRADE 270 STRANDS	
	0.6" Ø L.R.
AREA (SQUARE INCHES)	0.217
ULTIMATE STRENGTH (LBS. PER STRAND)	58,600
APPLIED PRESTRESS (LBS. PER STRAND)	44,000

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL FOR ONE BOX BEAM SECTION

BAR	NUMBER	SIZE	TYPE	LEFT EXT. UNIT LENGTH	LEFT EXT. UNIT WEIGHT	INTERIOR UNIT LENGTH	INTERIOR UNIT WEIGHT	RIGHT EXT. UNIT LENGTH	RIGHT EXT. UNIT WEIGHT
B1	12	#5	STR	43'-5"	543	43'-5"	543	43'-5"	543
D1	12	#4	5	6'-3"	50	6'-3"	50	6'-3"	50
D2	24	#4	4	4'-0"	64	4'-0"	64	4'-0"	64
D3	8	#4	STR	2'-8"	14	2'-8"	14	2'-8"	14
S1	208	#4	4	7'-6"	1,042	7'-6"	1,042	7'-6"	1,042
S2	88	#4	6	5'-10"	343	5'-10"	343	5'-10"	343
✻ S3	86	#5	1	5'-8"	508				
✻ S4	86	#5	2					5'-9"	516
U1	10	#4	4	5'-4"	36	5'-4"	36	5'-4"	36
U2	10	#4	4	5'-7"	37	5'-7"	37	5'-7"	37
REINFORCING STEEL			LBS.		2,129		2,129		2,129
✻ EPOXY COATED REINF. STEEL			LBS.		508				516
5,500 P.S.I. CONCRETE			CU. YDS.		15.1		15.1		15.1
0.6 "Ø L.R. STRANDS			No.		22		22		22

NOTES

ALL PRESTRESSING STRANDS SHALL BE 7-WIRE LOW RELAXATION GRADE 270 STRANDS AND SHALL CONFORM TO AASHTO M203 EXCEPT FOR SAMPLING REQUIREMENTS WHICH SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

ALL REINFORCING STEEL CAST WITH THE BOX BEAM SECTIONS SHALL BE GRADE 60 AND SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE BOX BEAMS.

RECESSES FOR TRANSVERSE STRANDS SHALL BE GROUTED AFTER THE TENSIONING OF THE STRANDS.

THE 3" Ø DOWEL HOLES AT FIXED ENDS OF SLAB SECTIONS SHALL BE FILLED WITH GROUT. THE 3" Ø DOWEL HOLES AT EXPANSION ENDS OF SLAB SECTIONS SHALL BE FILLED WITH JOINT SEALER MATERIAL TO 1 1/2" ABOVE THE TOP OF DOWELS AND THEN FILLED WITH GROUT.

THE JOINT SEALER MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF TYPE B LOW MODULUS SILICONE SEALANT. THE 2" Ø BACKER ROD SHALL CONFORM TO THE REQUIREMENTS OF TYPE M BOND BREAKER. THE 12" WIDE BOND BREAKING TAPE SHALL BE CENTERED OVER THE JOINT AND CONFORM TO THE REQUIREMENTS OF TYPE N BOND BREAKER. SEE SECTION 1028 OF THE STANDARD SPECIFICATIONS.

WHEN BOX BEAMS ARE CAST, A POSITIVE HOLD-DOWN SYSTEM SHALL BE EMPLOYED TO PREVENT VOIDS FROM RISING OR MOVING SIDEWAYS. THIS SYSTEM SHALL BE DESIGNED TO BE LEFT IN PLACE UNTIL THE CONCRETE HAS REACHED RELEASE STRENGTH. AT LEAST THREE WEEKS PRIOR TO CASTING BOX BEAMS, THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER FOR REVIEW AND COMMENT, DETAILED DRAWINGS OF THE PROPOSED HOLD-DOWN SYSTEM. IN ADDITION TO STRUCTURAL DETAILS, LOCATION AND SPACING OF THE HOLD-DOWNS SHALL BE INDICATED.

THE MINIMUM CONCRETE STRENGTH AT 28 DAYS SHALL BE 5500 PSI.

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE BOX BEAM UNIT SHALL BE DONE WHEN THE CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 4100 PSI.

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE BOX BEAM UNIT ENDS.

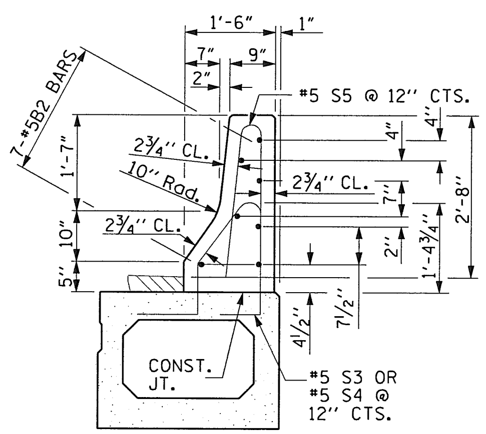
APPLY EPOXY PROTECTIVE COATING TO BOX BEAM UNIT ENDS. FOR EPOXY PROTECTIVE COATING, SEE SPECIAL PROVISIONS.

VERTICAL GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE BARRIER RAIL AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. A VERTICAL CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN BARRIER RAIL EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT MIDPOINT OF BARRIER RAIL SEGMENTS LESS THAN 20 FEET IN LENGTH AND NO CONTRACTION JOINTS ARE REQUIRED FOR THOSE SEGMENTS LESS THAN 10 FEET IN LENGTH.

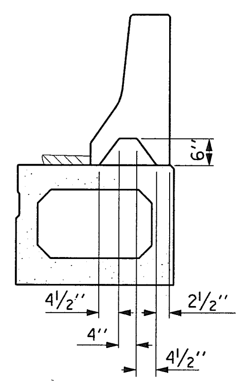
FOR ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

FOR PRESTRESSED CONCRETE MEMBERS, SEE SPECIAL PROVISIONS.

FOR PRESTRESSED CONCRETE BOX BEAMS, SEE SPECIAL PROVISIONS.

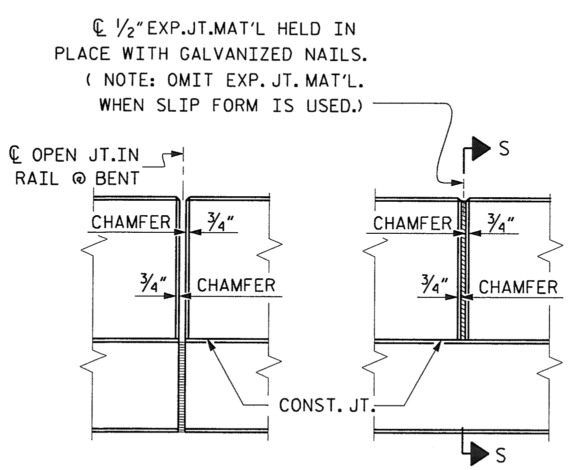


SECTION THRU RAIL



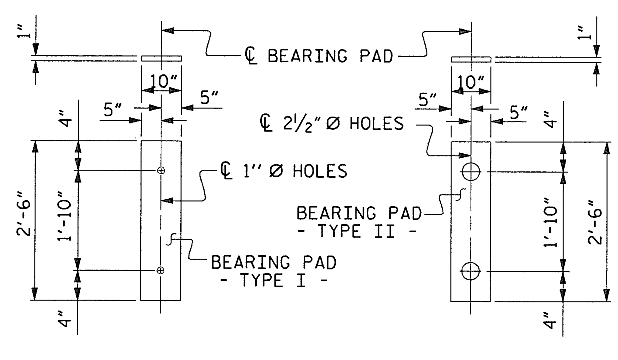
SECTION S-S

AT DAM IN OPEN JOINT (THIS IS TO BE USED ONLY WHEN SLIP FORM IS USED)



ELEVATION AT EXPANSION JOINTS

BARRIER RAIL DETAILS



FIXED END (TYPE I - 11 REQ'D)

EXPANSION END (TYPE II - 11 REQ'D)

ELASTOMERIC BEARING DETAILS- BRIDGE 97

NOTE: ELASTOMERIC BEARINGS SHALL BE 60 DUROMETER

BILL OF MATERIAL FOR CONCRETE BARRIER RAIL

BAR	BARS PER SPAN					TOTAL NO.	SIZE	TYPE	LENGTH	WEIGHT
		SPAN A								
✻ B2		42				42	# 5	STR.	28'-0"	1,227
✻ S5		172				172	# 5	3	5'-6"	987
✻ EPOXY COATED REINFORCING STEEL LBS.										2,214
CLASS AA CONCRETE CU.YDS.										19.8
TOTAL LIN. FT. OF CONCRETE BARRIER RAIL										170.0

PROJECT NO. BK-5109

COLUMBUS COUNTY

STATION: 13+97.00 -L-

David R. Ruggles

10-30-09

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 11725 DAVID R. RUGGLES

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

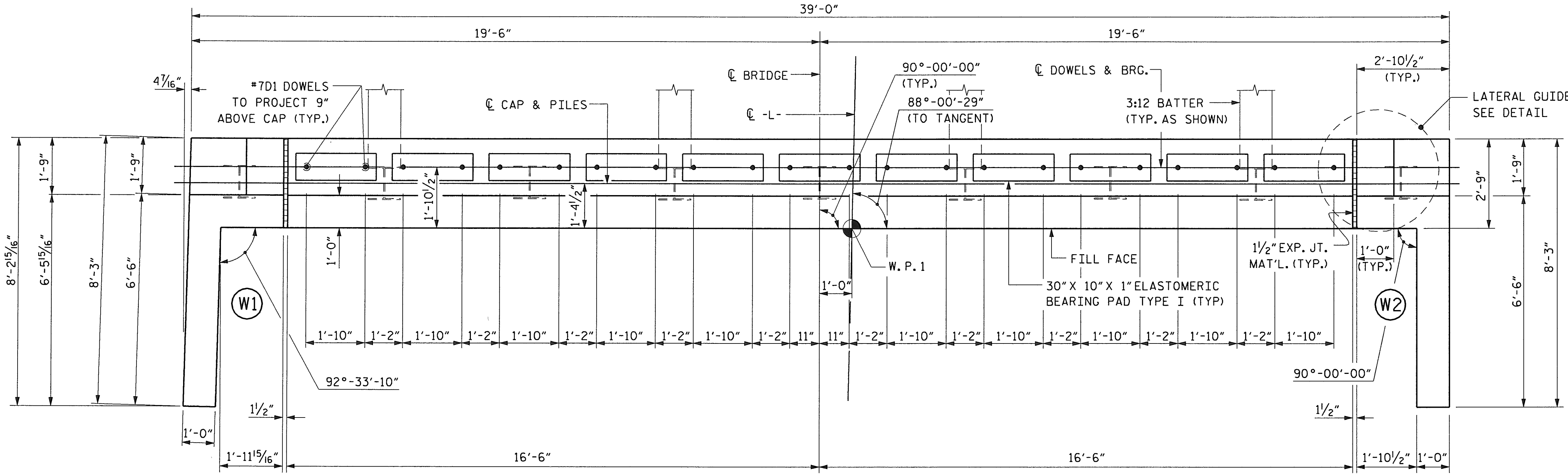
B-II 36
PRESTRESSED CONCRETE BOX BEAM BILL OF MATERIAL BRIDGE 97

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS
2			4			

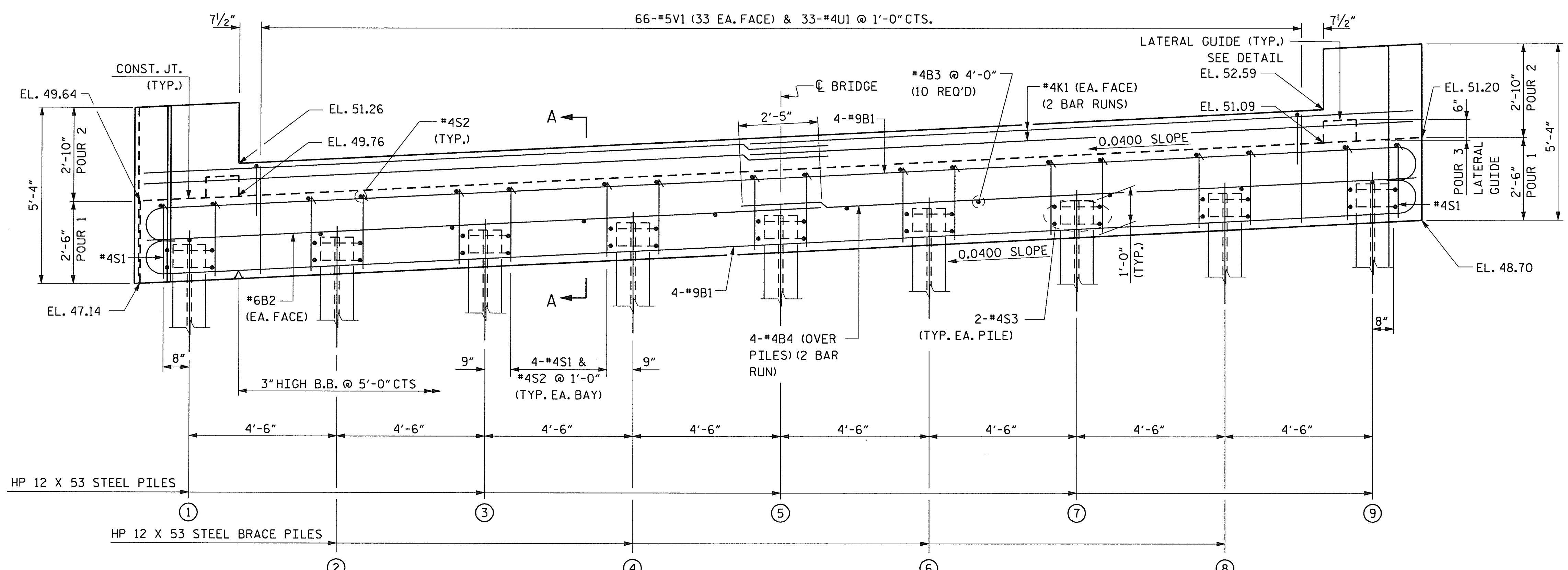
DWG. 11 OF 25

DRAWN BY: R.C. NELSON DATE: 5-05
CHECKED BY: C. P. LEWIS DATE: 5-05

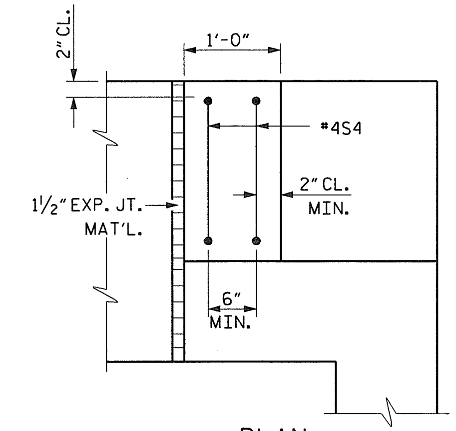
$$$$$SYSTIME$$$$$ $$$$$USERNAME$$$$$ $$$$$DGN$$$$$



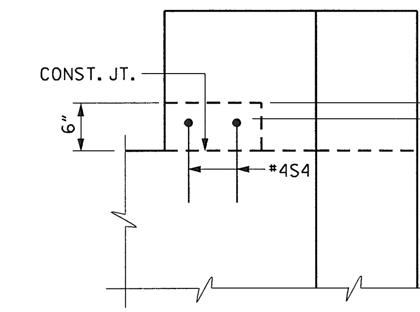
PLAN - BRIDGE 97



ELEVATION OF CAP - BRIDGE 97



PLAN



ELEVATION

LATERAL GUIDE DETAILS

TOP OF PILE ELEVATIONS	
PILE NO.	ELEVATION
P1	48.22
P2	48.40
P3	48.58
P4	48.76
P5	48.94
P6	49.12
P7	49.30
P8	49.48
P9	49.66

NOTES:
STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.

THE LATERAL GUIDE AT EACH END OF THE CAP IS NOT TO BE POURED UNTIL AFTER CORED SLAB UNITS ARE IN PLACE.

THE CONTRACTOR SHALL PROVIDE FOR INSTALLATION OF THE 4" DIAMETER DRAIN PIPE THROUGH THE WING WALL AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILLS, SEE THE ROADWAY PLANS. REINFORCING STEEL IN THE WING WALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.

PROJECT NO. BK-5109
COLUMBUS COUNTY
STATION: 13+97.00 -L-
SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 1
BRIDGE 97

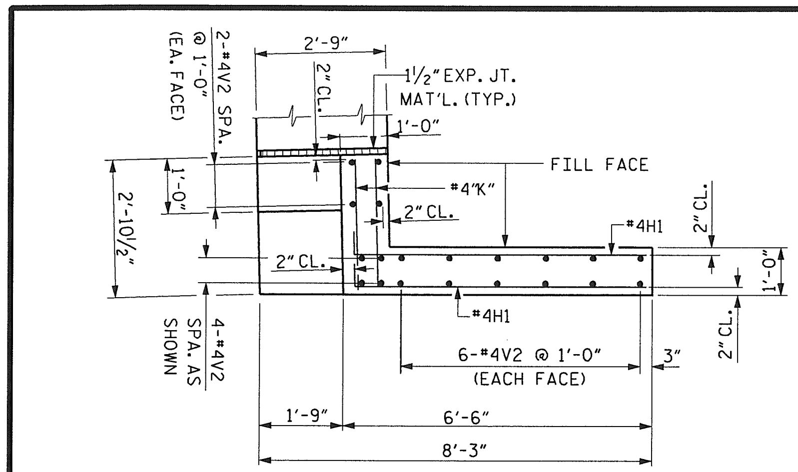
10-30-09

REVISIONS							
NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.	
1			3			TOTAL SHEETS	
2			4				

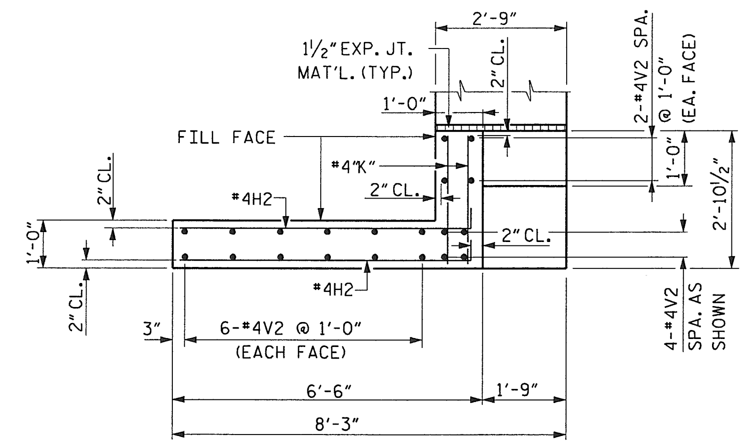
DWG. 12 OF 25

DRAWN BY: A. P. TUAZAMA DATE: 5-05
CHECKED BY: C. P. LEWIS DATE: 5-05

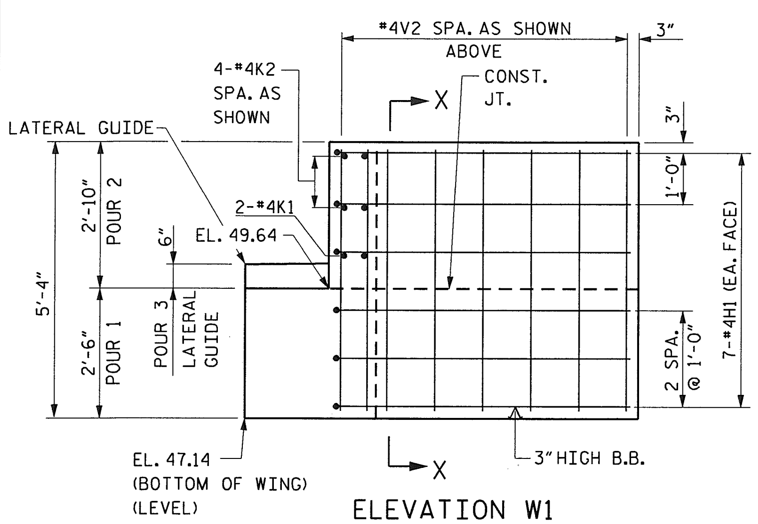
$$$$$$SYSTIME$$$$$ $$$$$$$$$DGN$$$$$$$$$$$$$$$$$ $$$$$USERNAME$$$$



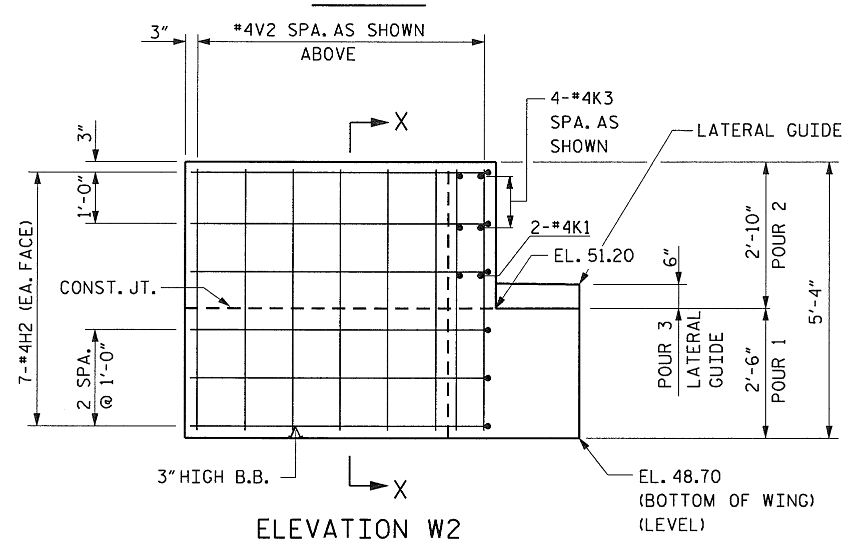
PLAN W1



PLAN W2



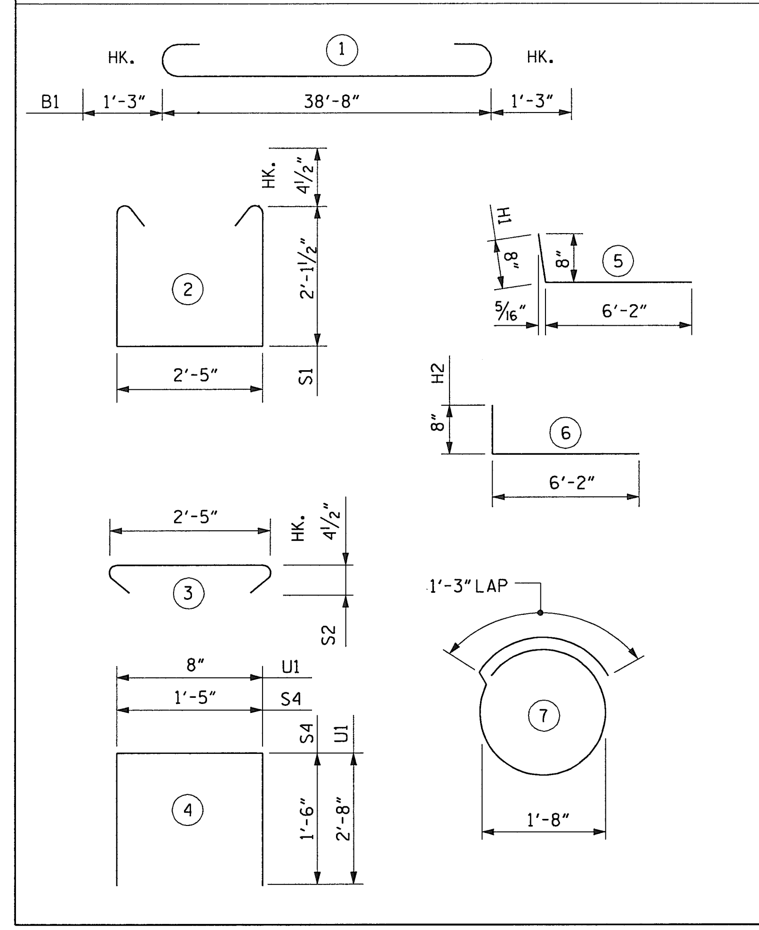
ELEVATION W1



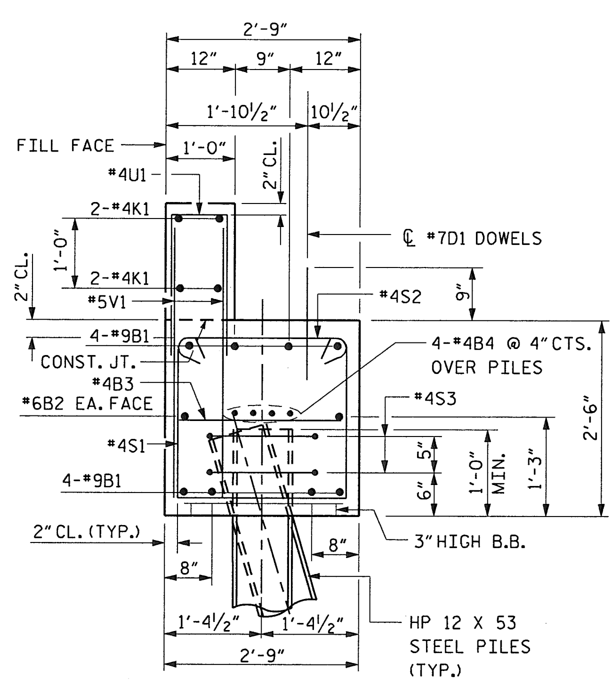
ELEVATION W2

BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT

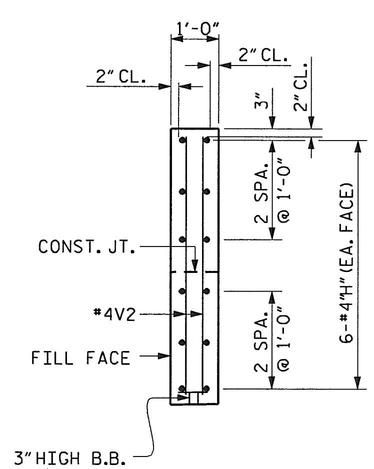


BILL OF MATERIAL					
END BENT 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	41'-2"	1,120
B2	2	#6	STR.	38'-8"	116
B3	10	#4	STR.	2'-5"	16
B4	8	#4	STR.	20'-7"	110
D1	22	#7	STR.	1'-6"	67
H1	14	#4	5	6'-10"	64
H2	14	#4	6	6'-10"	64
K1	8	#4	STR.	20'-7"	110
K2	4	#4	STR.	2'-7"	7
K3	4	#4	STR.	2'-6"	7
S1	34	#4	2	7'-5"	168
S2	34	#4	3	3'-2"	72
S3	18	#4	7	6'-6"	78
S4	4	#4	4	4'-5"	12
U1	33	#4	STR.	6'-0"	132
V1	66	#5	STR.	3'-8"	252
V2	40	#4	STR.	4'-11"	131
TOTAL REINFORCING STEEL = LBS					2,526
CLASS A CONCRETE					
POUR 1 (CAP & LOWER PART OF WINGS)					11.0
POUR 2 (UPPER PART OF WINGS)					3.6
POUR 3 (LATERAL GUIDE)					0.1
TOTAL CU. YARDS					14.7
HP 12 X 53 STEEL PILES NO.					9
LIN. FT.					360
STEEL PILE POINTS NO.					9

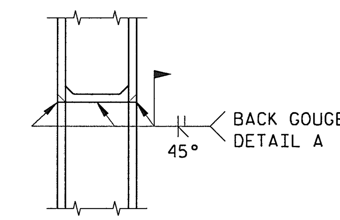


SECTION A-A

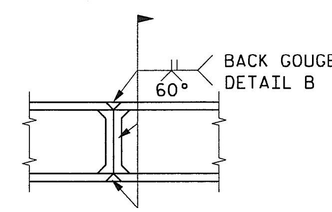
NOTE: PILE BATTER SHALL BE 3 : 12



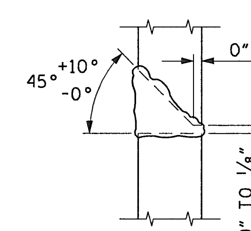
SECTION X-X



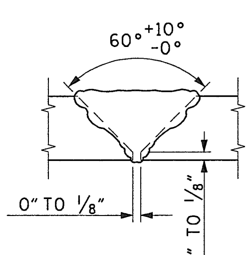
∗ PILE VERTICAL



∗ PILE HORIZONTAL OR VERTICAL



DETAIL A



DETAIL B

∗ POSITION OF PILE DURING WELDING

PILE SPLICE DETAILS

PROJECT NO. BK-5109

COLUMBUS COUNTY

STATION: 13+97.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 1
BRIDGE 97

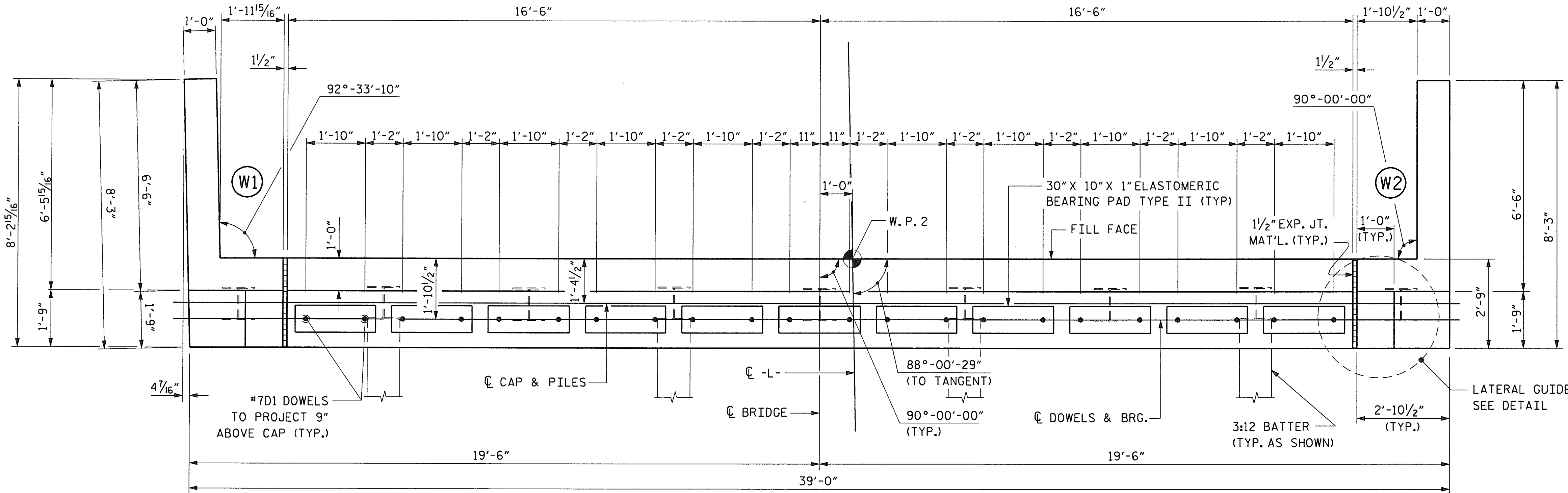
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 11725 DAVID R. RUGGLES

David Ruggles
10-30-09

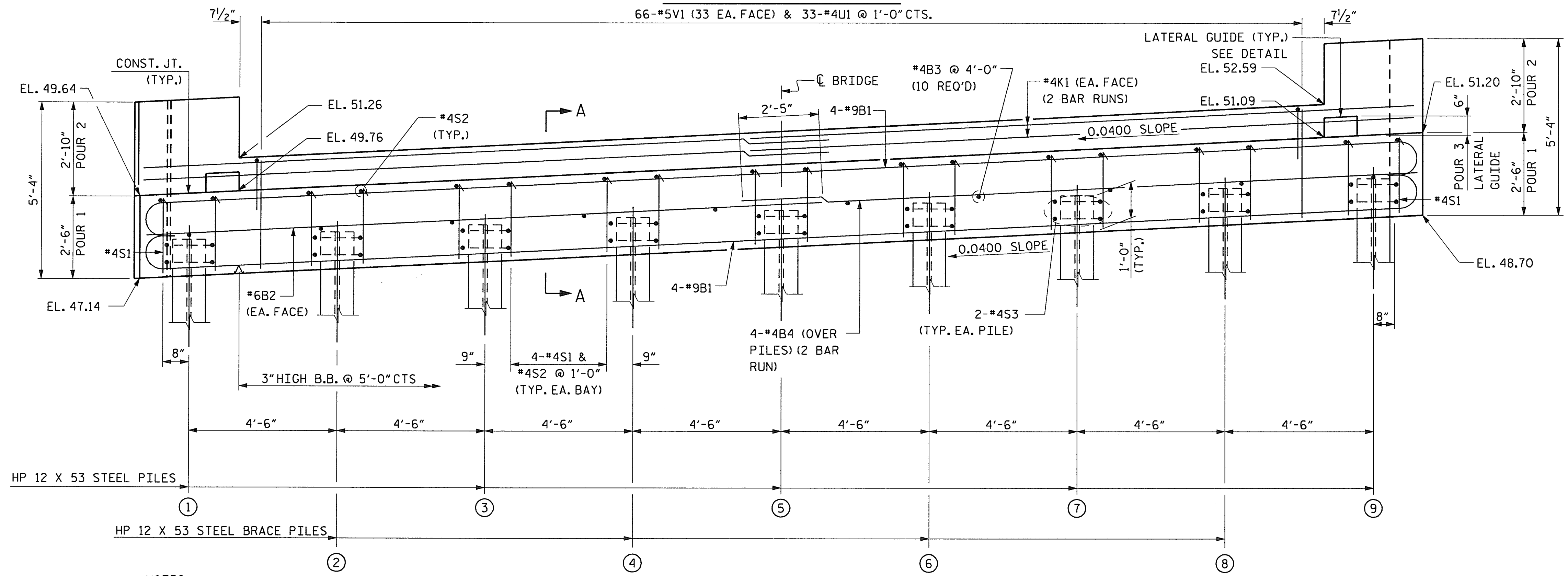
REVISIONS							SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:		
1			3				TOTAL SHEETS
2			4				

DWG. 13 OF 25

DRAWN BY: A. P. TUAZAMA	DATE: 5-05
CHECKED BY: R.C. NELSON	DATE: 5-05



PLAN - BRIDGE 97



ELEVATION OF CAP - BRIDGE 97

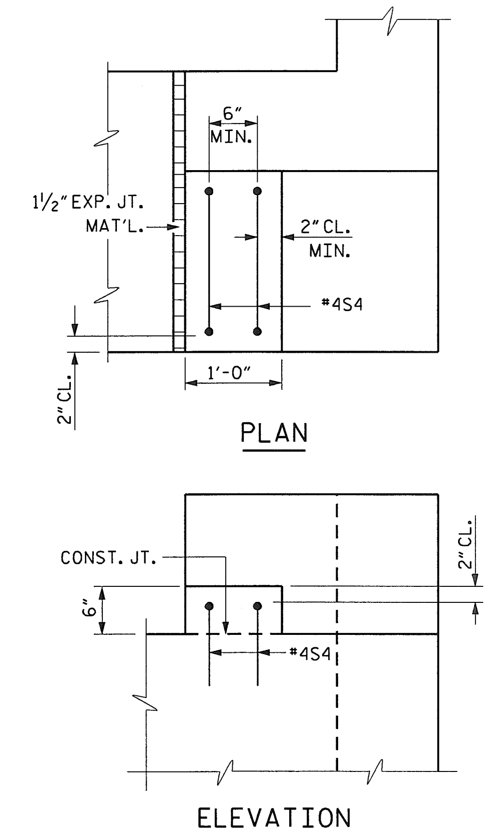
NOTES:

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.

THE LATERAL GUIDE AT EACH END OF THE CAP IS NOT TO BE POURED UNTIL AFTER CORED SLAB UNITS ARE IN PLACE.

THE CONTRACTOR SHALL PROVIDE FOR INSTALLATION OF THE 4" DIAMETER DRAIN PIPE THROUGH THE WING WALL AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILLS, SEE THE ROADWAY PLANS. REINFORCING STEEL IN THE WING WALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.

FOR PILE SPLICE DETAILS, SEE END BENT 1, SHEET 2 OF 2.



LATERAL GUIDE DETAILS

TOP OF PILE ELEVATIONS

PILE NO.	ELEVATION
P1	48.22
P2	48.40
P3	48.58
P4	48.76
P5	48.94
P6	49.12
P7	49.30
P8	49.48
P9	49.66

PROJECT NO. BK-5109

COLUMBUS COUNTY

STATION: 13+97.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 2
BRIDGE 97

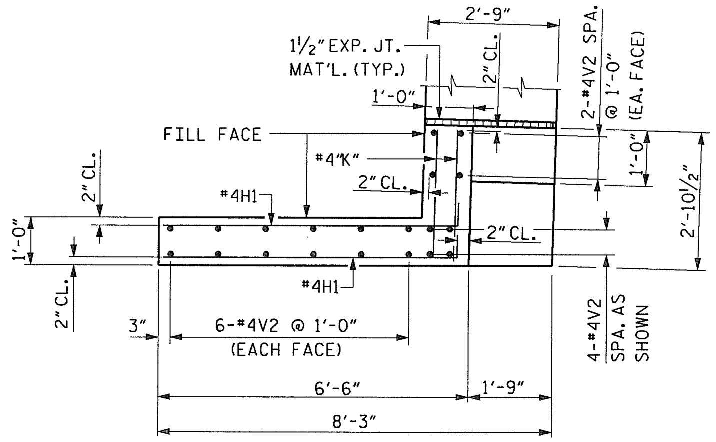
David Ruggles
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 11725 DAVID R. RUGGLES
10-30-09

REVISIONS								SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:			S
1			3					TOTAL SHEETS
2			4					

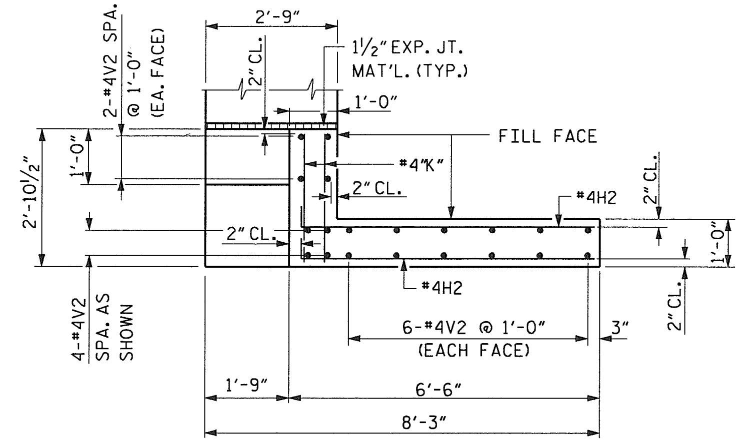
DWG. 14 OF 25

DRAWN BY: A. P. TUAZAMA DATE: 5-05
CHECKED BY: C. P. LEWIS DATE: 5-05

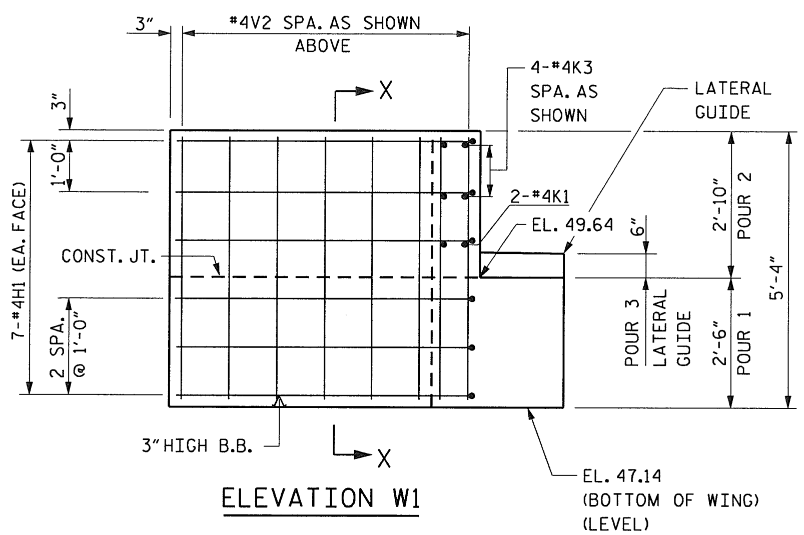
$$$$SYSTIME$$$$ $$$$$$$$$DGN$$$$$$$$$ $$$$USERNAME$$$$



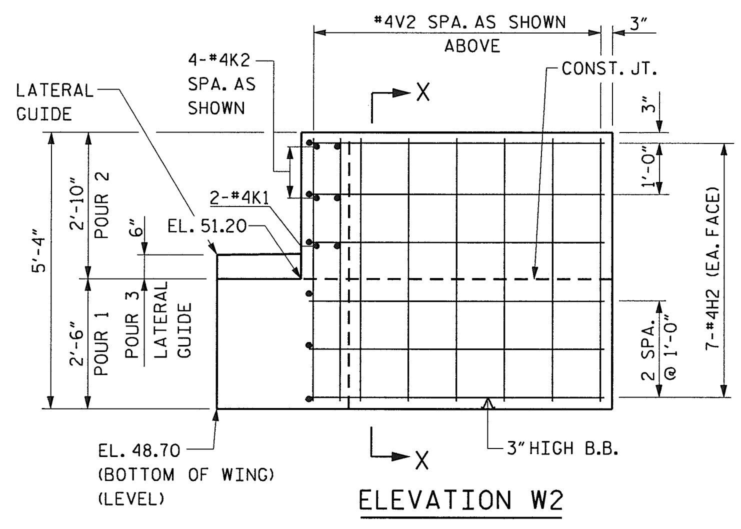
PLAN W1



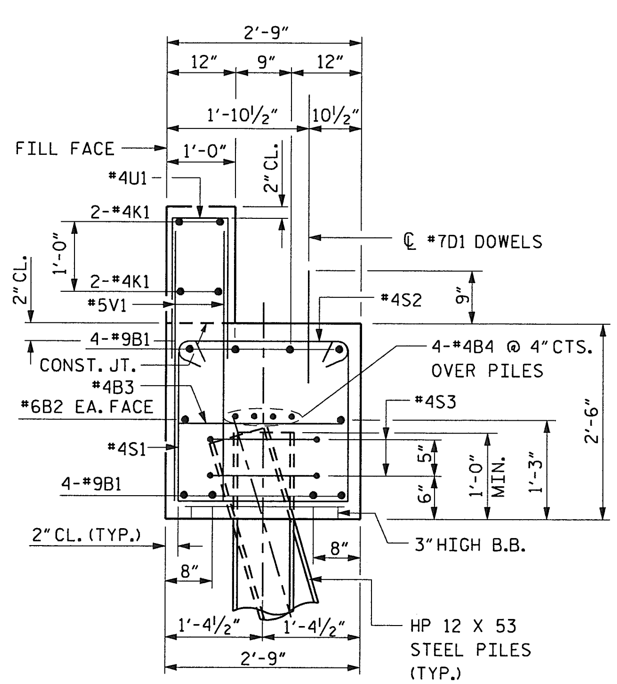
PLAN W2



ELEVATION W1

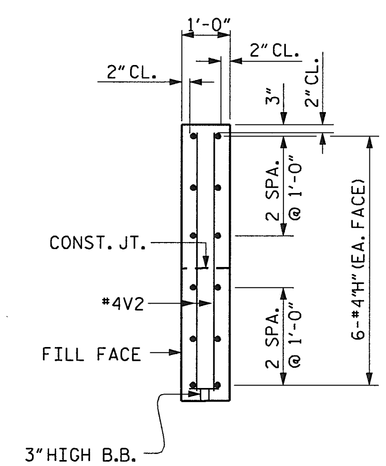


ELEVATION W2



SECTION A-A

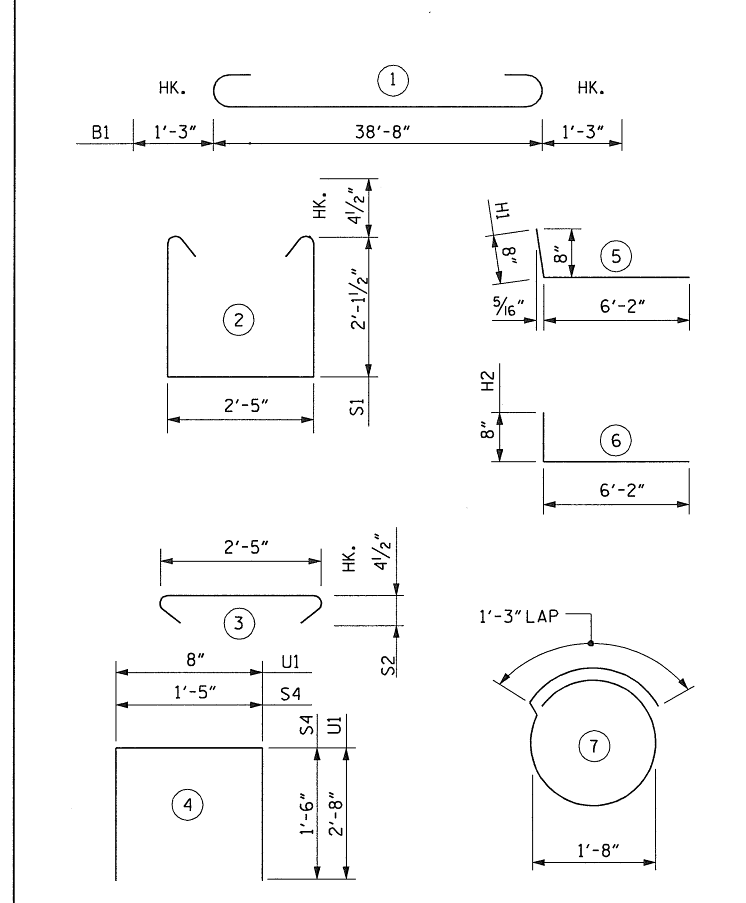
NOTE: PILE BATTER SHALL BE 3 : 12



SECTION X-X

BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT



BILL OF MATERIAL					
END BENT 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	41'-2"	1,120
B2	2	#6	STR.	38'-8"	116
B3	10	#4	STR.	2'-5"	16
B4	8	#4	STR.	20'-7"	110
D1	22	#7	STR.	1'-6"	67
H1	14	#4	5	6'-10"	64
H2	14	#4	6	6'-10"	64
K1	8	#4	STR.	20'-7"	110
K2	4	#4	STR.	2'-7"	7
K3	4	#4	STR.	2'-6"	7
S1	34	#4	2	7'-5"	168
S2	34	#4	3	3'-2"	72
S3	18	#4	7	6'-6"	78
S4	4	#4	4	4'-5"	12
U1	33	#4	STR.	6'-0"	132
V1	66	#5	STR.	3'-8"	252
V2	40	#4	STR.	4'-11"	131
TOTAL REINFORCING STEEL = LBS					2,526
CLASS A CONCRETE					
POUR 1 (CAP & LOWER PART OF WINGS)					11.0
POUR 2 (UPPER PART OF WINGS)					3.6
POUR 3 (LATERAL GUIDE)					0.1
TOTAL CU. YARDS					14.7
HP 12 X 53 STEEL PILES				NO.	9
				LIN. FT.	360
STEEL PILE POINTS				NO.	9

PROJECT NO. BK-5109

COLUMBUS COUNTY

STATION: 13+97.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 2
BRIDGE 97

NORTH CAROLINA PROFESSIONAL SEAL 11725 ENGINEER DAVID R. RUGGLES

David Ruggles

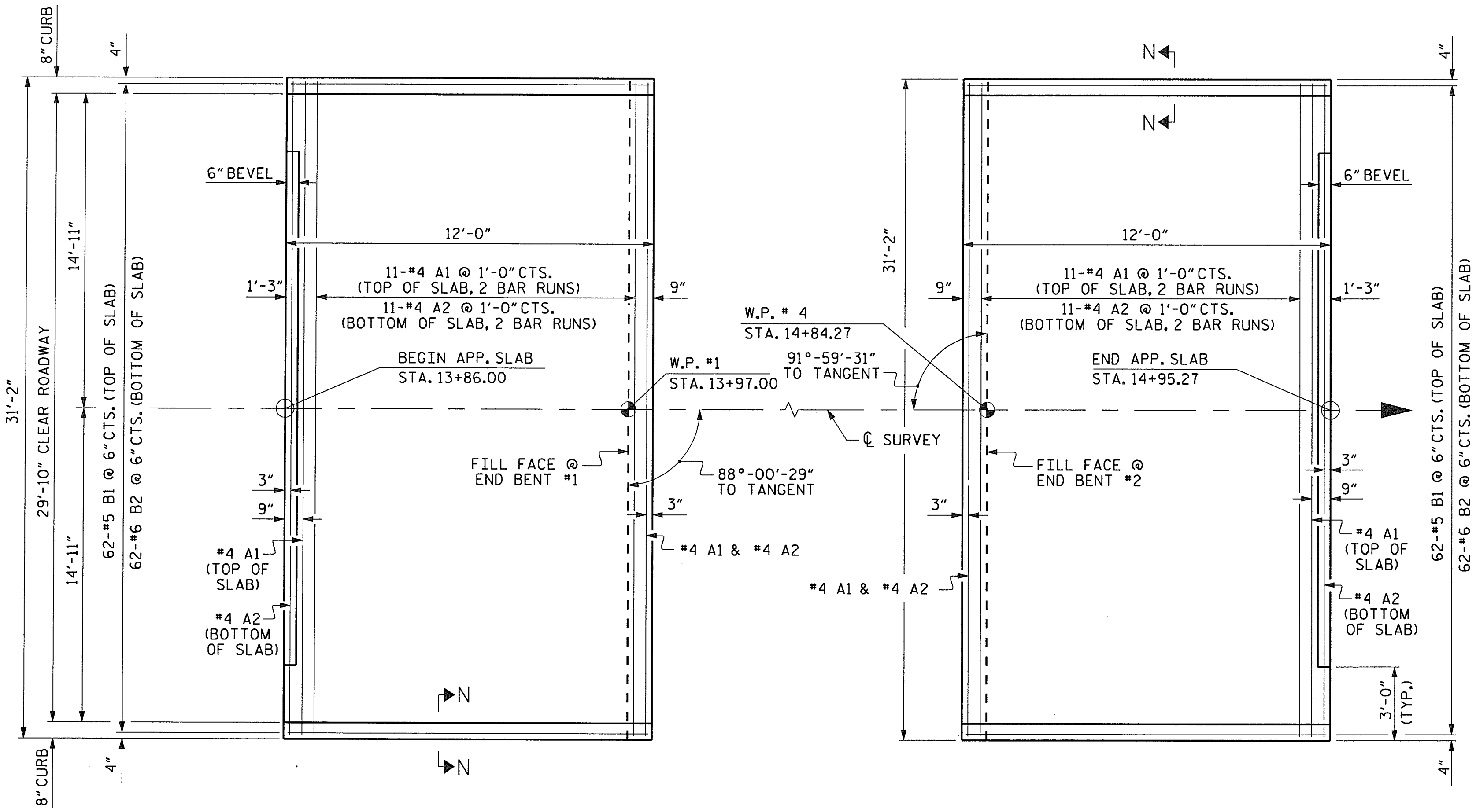
10-30-09

DWG. 15 OF 25

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS
2			4			

DRAWN BY: A. P. TUAZAMA DATE: 5-05
CHECKED BY: R. C. NELSON DATE: 5-05

$$$$SYSTIME$$$$ $$$$$DGN$$$$ $$$$USERNAME$$$$



PLAN @ END BENT #1 - BRIDGE 97

PLAN @ END BENT #2 - BRIDGE 97

NOTES

FOR BRIDGE APPROACH FILL INCLUDING FABRIC, 4" Ø DRAINAGE PIPE, AND #78M STONE BACKFILL, SEE ROADWAY STD. DWG. 422.10.

APPROACH SLAB SHALL NOT BE CONSTRUCTED PRIOR TO COMPLETION OF THE BRIDGE DECK.

FABRIC SHALL BE TYPE 1 ENGINEERING FABRIC IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS SECTION 1056.

#78M STONE BACKFILL (CLASS V SELECT MATERIAL) SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS SECTION 1016.

#78M STONE BACKFILL IS TO BE CONTINUOUS ALONG FILL FACE OF BACKWALL FROM OUTSIDE EDGE TO OUTSIDE EDGE OF APPROACH SLAB.

FOR THE 4" Ø DRAINAGE PIPE OUTLET(S), SEE ROADWAY STANDARD DRAWINGS.

AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED. SEE ROADWAY PLANS.

THE 6" COMP. A.B.C. SHALL BE FLUSH WITH THE ROADWAY END OF THE APPROACH SLAB AND SHALL EXTEND 1'-0" OUTSIDE OF EACH EDGE OF THE APPROACH SLAB.

THE CONTRACTOR MAY USE 4" TYPE B-25.0B ASPHALT CONCRETE BASE COURSE IN LIEU OF 6" COMP. A.B.C. IF THIS OPTION IS USED, THE BASE COURSE SHALL BE FLUSH WITH THE ROADWAY END OF THE APPROACH SLAB, AND THE WIDTH SHALL BE THE SAME AS THAT OF THE APPROACH SLAB.

THE CONTRACTOR MAY USE 5" CLASS "A" CONCRETE BASE IN LIEU OF 6" COMP. A.B.C. IF THIS OPTION IS USED, THE CONCRETE BASE SHALL BE FLUSH WITH THE ROADWAY END OF THE APPROACH SLAB, AND THE WIDTH SHALL BE THE SAME AS THAT OF THE APPROACH SLAB. THE CONCRETE BASE SHALL BE FINISHED TO A SMOOTH SURFACE AND A LAYER OF 30 LB ROOFING FELT SHALL BE PLACED BETWEEN THE CONCRETE BASE AND THE APPROACH SLAB TO PREVENT BOND. THE APPROACH SLAB SHALL NOT BE CAST UNTIL THE CONCRETE BASE HAS REACHED AN AGE OF THREE CURING DAYS.

APPROACH SLAB GROOVING IS NOT REQUIRED.

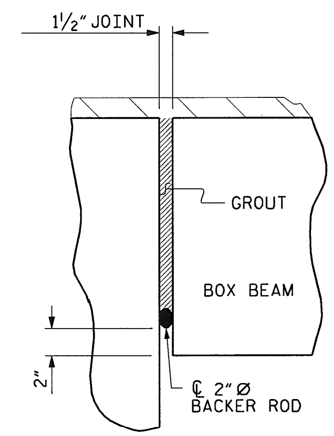
BILL OF MATERIAL

APPROACH SLAB AT EB #1

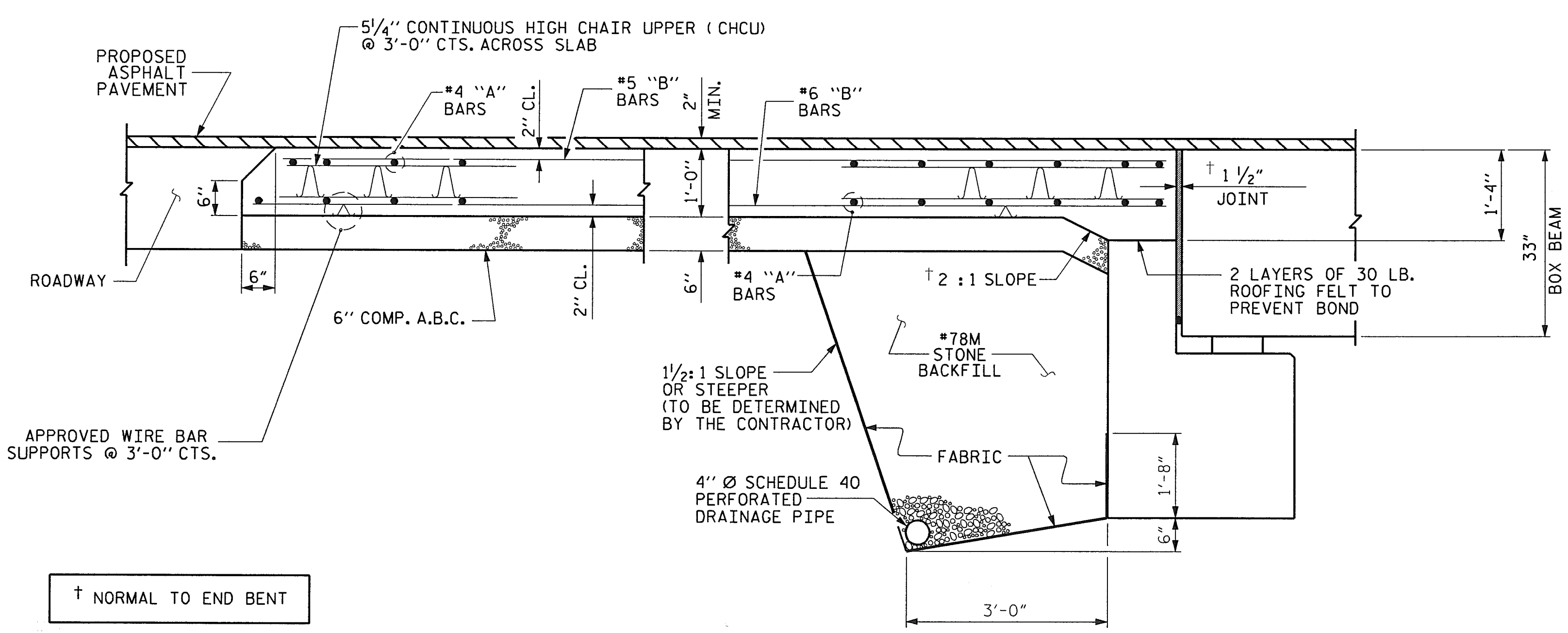
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A	26	#4	STR	16'-5"	285
A	26	#4	STR	16'-4"	284
*B	62	#5	STR	11'-2"	722
B	62	#6	STR	11'-8"	1086
REINFORCING STEEL				LBS.	1370
* EPOXY COATED REINFORCING STEEL				LBS.	1007
CLASS AA CONCRETE				C. Y.	14.3

APPROACH SLAB AT EB #2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A	26	#4	STR	16'-5"	285
A	26	#4	STR	16'-4"	284
*B	62	#5	STR	11'-2"	722
B	62	#6	STR	11'-8"	1086
REINFORCING STEEL				LBS.	1370
* EPOXY COATED REINFORCING STEEL				LBS.	1007
CLASS AA CONCRETE				C. Y.	14.3

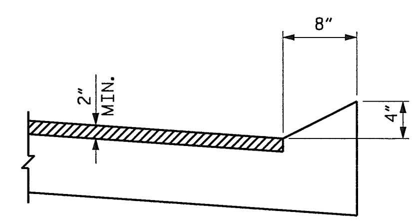


JOINT DETAIL

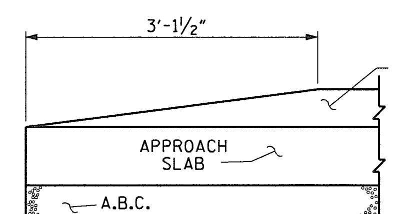


† NORMAL TO END BENT

SECTION THRU SLAB



SECTION N-N



END OF CURB WITHOUT SHOULDER BERM GUTTER

CURB DETAILS

PROJECT NO. BK-5109

COLUMBUS COUNTY

STATION: 13+97.00 -L-

SHEET 1 OF 2

NORTH CAROLINA SEAL 11725 ENGINEER DAVID R. RUGGLES

David Ruggles

10-30-09

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB FOR PRESTRESSED CONCRETE BOX BEAM UNIT BRIDGE 97

ASSEMBLED BY : JCH	DATE : 10-09
CHECKED BY : DRR	DATE : 10-09
DRAWN BY : KMM 3-08	
CHECKED BY : GM 3-08	

REVISIONS

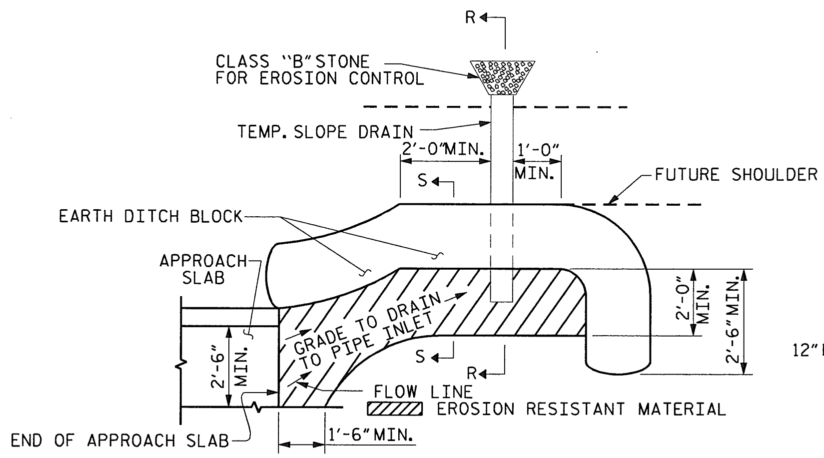
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO.

TOTAL SHEETS

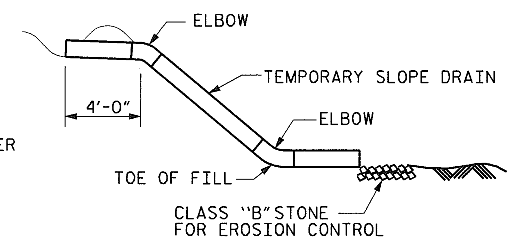
DWG. 16 OF 25

(SHT 2) STD. NO. BAS13

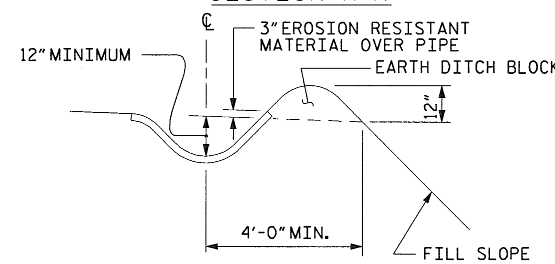


NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN. 2" DEPTH, 2) EROSION CONTROL MAT, OR 3) CONCRETE, AS DIRECTED BY THE ENGINEER. THE SLOPE DRAIN SHALL CONSIST OF A NON-PERFORATED TEMPORARY DRAINAGE PIPE, 12 INCHES IN DIAMETER.

PLAN VIEW



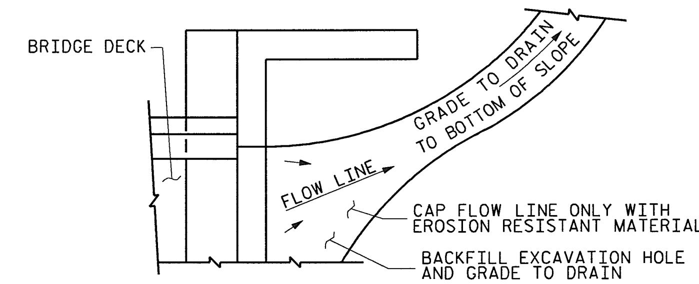
SECTION R-R



SECTION S-S

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT TO THE STRUCTURE. THE CONTRACTOR WILL BE REQUIRED TO REMOVE THESE MATERIALS PRIOR TO CONSTRUCTION OF THE APPROACH SLAB.

TEMPORARY DRAINAGE DETAIL

PROJECT NO. BK-5109

COLUMBUS COUNTY

STATION: 13+97.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB DETAILS BRIDGE 97

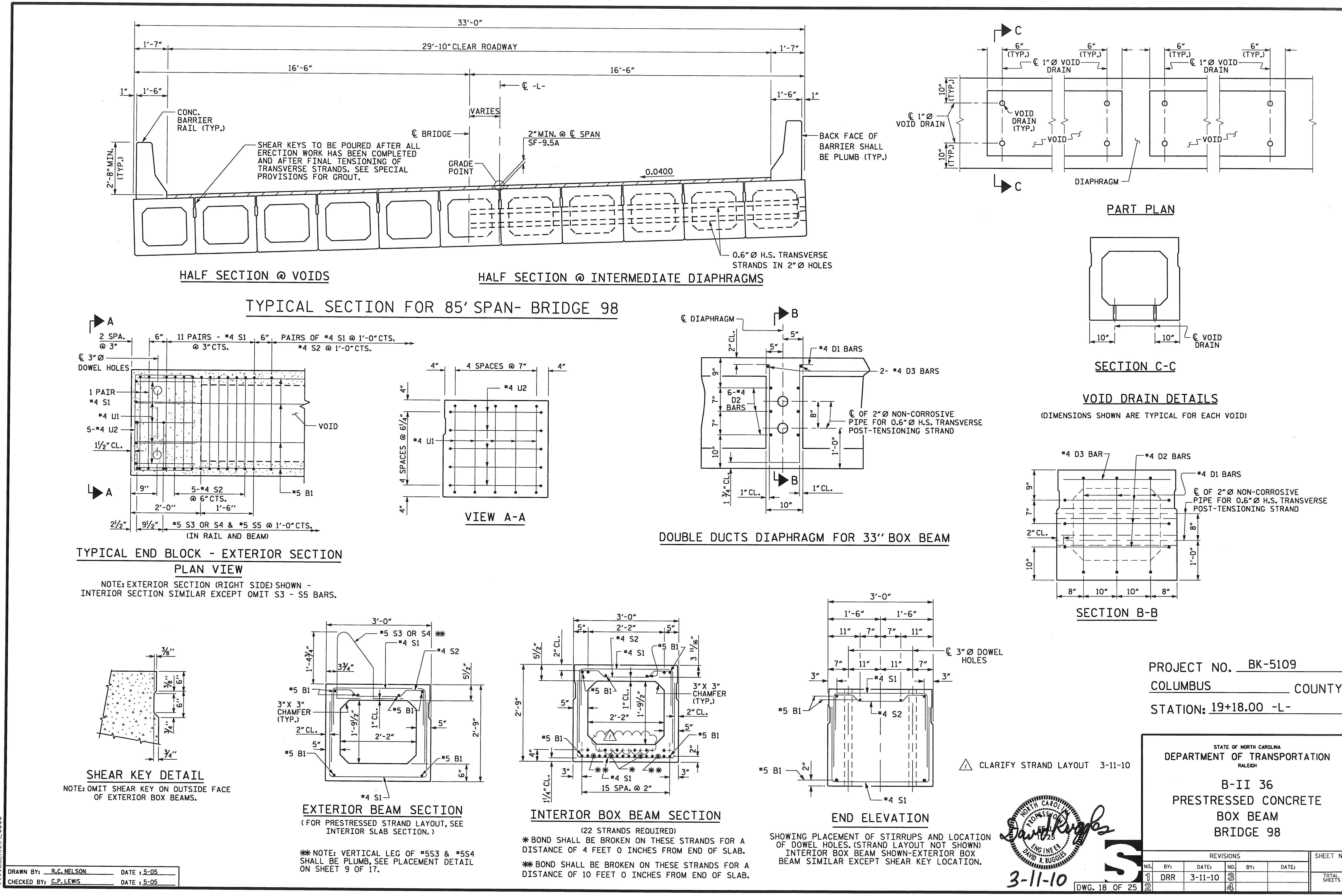
David Ruggles
NORTH CAROLINA SEAL 11725 ENGINEER DAVID R. RUGGLES
10-30-09

REVISIONS								SHEET NO.
NO.	BY:	DATE:		NO.	BY:	DATE:		
1				3				TOTAL SHEETS
2				4				

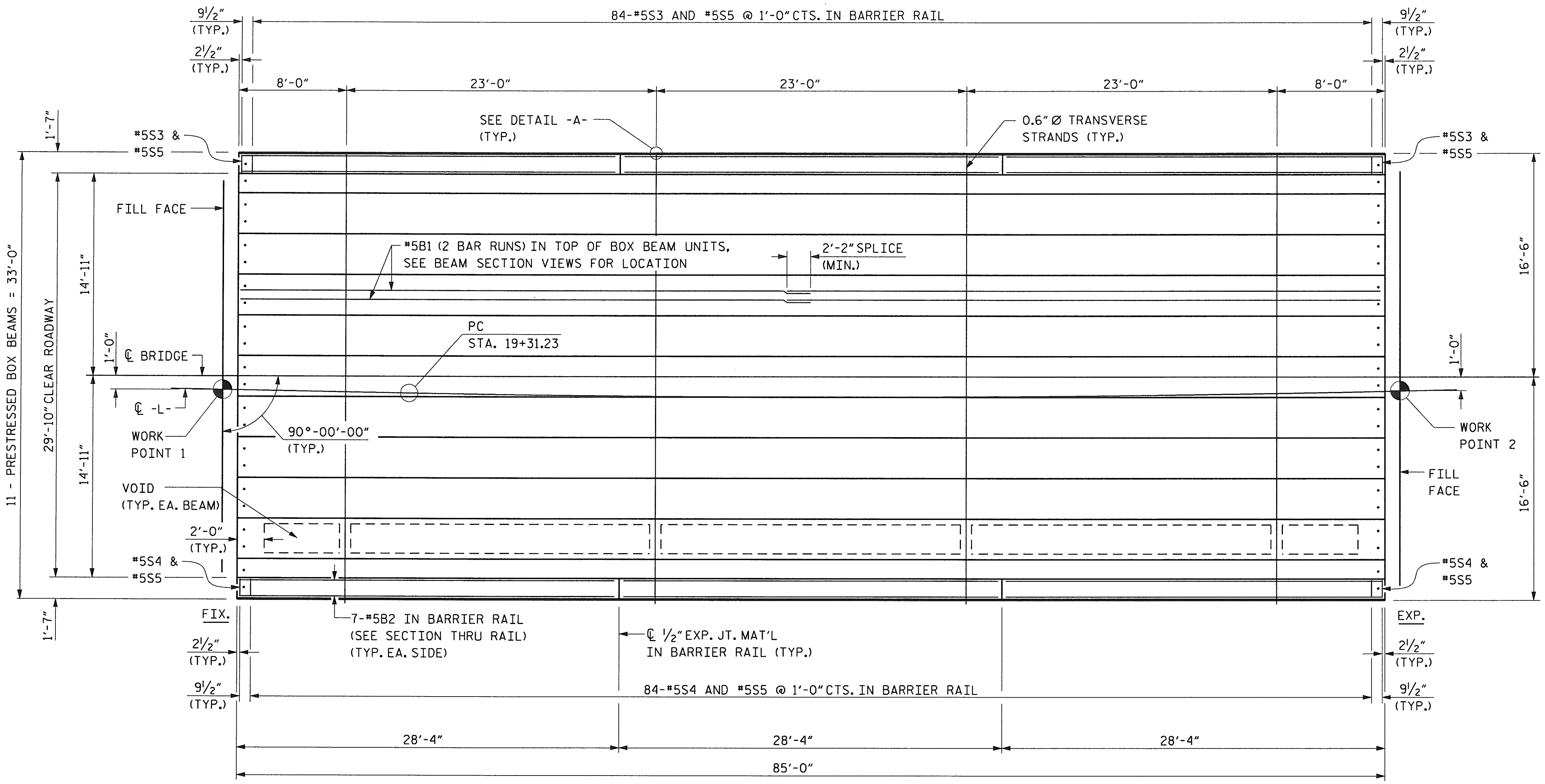
DWG. 17 OF 25

STD. NO. BAS10

ASSEMBLED BY : JCH	DATE : 10/5/09
CHECKED BY : DRR	DATE : 10/5/09
DRAWN BY : FCJ 11/88	REV. 10/17/00 RWW/LES
CHECKED BY : ARB 11/88	REV. 5/7/03 RWW/JTE
	REV. 5/1/06R MAA/KMM

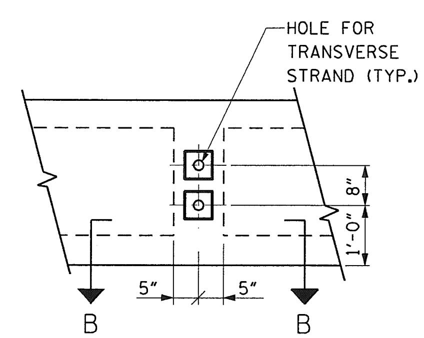


TYPICAL SECTION FOR 85' SPAN- BRIDGE 98
HALF SECTION @ VOIDS
HALF SECTION @ INTERMEDIATE DIAPHRAGMS
33'-0"
29'-10" CLEAR ROADWAY
16'-6"
1'-7"
CONC. BARRIER RAIL (TYP.)
SHEAR KEYS TO BE POURED AFTER ALL ERECTION WORK HAS BEEN COMPLETED AND AFTER FINAL TENSIONING OF TRANSVERSE STRANDS. SEE SPECIAL PROVISIONS FOR GROUT.
℄ BRIDGE
GRADE POINT
VARIES
℄ -L-
2" MIN. @ ℄ SPAN SF-9.5A
0.0400
BACK FACE OF BARRIER SHALL BE PLUMB (TYP.)
0.6"Ø H.S. TRANSVERSE STRANDS IN 2"Ø HOLES
PART PLAN
℄ 1"Ø VOID DRAIN
VOID DRAIN (TYP.)
DIAPHRAGM
SECTION C-C
VOID DRAIN DETAILS
(DIMENSIONS SHOWN ARE TYPICAL FOR EACH VOID)
TYPICAL END BLOCK - EXTERIOR SECTION
PLAN VIEW
NOTE: EXTERIOR SECTION (RIGHT SIDE) SHOWN - INTERIOR SECTION SIMILAR EXCEPT OMIT S3 - S5 BARS.
11 PAIRS - #4 S1 @ 3" CTS.
PAIRS OF #4 S1 @ 1'-0" CTS. #4 S2 @ 1'-0" CTS.
℄ 3"Ø DOWEL HOLES
#5 S3 OR S4 & #5 S5 @ 1'-0" CTS. (IN RAIL AND BEAM)
VIEW A-A
DOUBLE DUCTS DIAPHRAGM FOR 33" BOX BEAM
℄ OF 2"Ø NON-CORROSIVE PIPE FOR 0.6"Ø H.S. TRANSVERSE POST-TENSIONING STRAND
SECTION B-B
SHEAR KEY DETAIL
NOTE: OMIT SHEAR KEY ON OUTSIDE FACE OF EXTERIOR BOX BEAMS.
EXTERIOR BEAM SECTION
(FOR PRESTRESSED STRAND LAYOUT, SEE INTERIOR SLAB SECTION.)
** NOTE: VERTICAL LEG OF #5S3 & #5S4 SHALL BE PLUMB, SEE PLACEMENT DETAIL ON SHEET 9 OF 17.
INTERIOR BOX BEAM SECTION
(22 STRANDS REQUIRED)
* BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 4 FEET 0 INCHES FROM END OF SLAB.
** BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 10 FEET 0 INCHES FROM END OF SLAB.
END ELEVATION
SHOWING PLACEMENT OF STIRRUPS AND LOCATION OF DOWEL HOLES. (STRAND LAYOUT NOT SHOWN) INTERIOR BOX BEAM SHOWN-EXTERIOR BOX BEAM SIMILAR EXCEPT SHEAR KEY LOCATION.
℄ 3"Ø DOWEL HOLES
CLARIFY STRAND LAYOUT 3-11-10
PROJECT NO. BK-5109
COLUMBUS COUNTY
STATION: 19+18.00 -L-
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
B-II 36
PRESTRESSED CONCRETE
BOX BEAM
BRIDGE 98
REVISIONS
1 DRR 3-11-10
DRAWN BY: R.C. NELSON DATE: 5-05
CHECKED BY: C.P. LEWIS DATE: 5-05
DWG. 18 OF 25
3-11-10

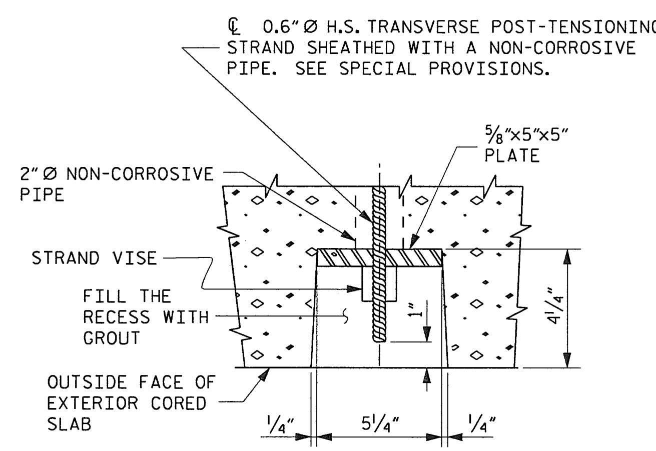


PLAN-BRIDGE 98

NOTE:
BEAMS ARE PLACED PARALLEL TO LONG CHORD FROM WORK POINT 1 TO WORK POINT 2.



ELEVATION



SECTION B-B

DETAIL -A-

NOT TO SCALE

PROJECT NO. BK-5109

COLUMBUS COUNTY

STATION: 19+18.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
PLAN OF SPAN
AND DETAILS
BRIDGE 98

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 11725 DAVID R. RUGGLES

David R. Ruggles

10-30-09

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS
2			4			

S

DWG. 19 OF 25

DRAWN BY: A. P. TUAZAMA DATE: 5-05
CHECKED BY: C. P. LEWIS DATE: 5-05

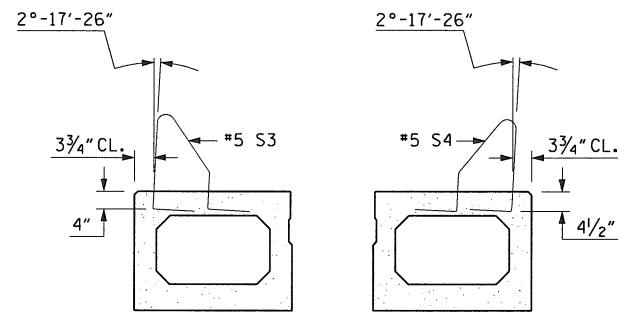
$$$$SYSTIME$$$$ $$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$ $$$$USERNAME$$$$

BOX BEAMS REQUIRED			
	NUMBER	LENGTH	TOTAL LENGTH
EXTERIOR B.B.	2	85'-0"	170'-0"
INTERIOR B.B.	9	85'-0"	765'-0"
TOTAL	11		935'-0"

DEAD LOAD DEFLECTION AND CAMBER	
	0.6 "Ø L.R. STRAND
CAMBER (BEAM ALONE IN PLACE)	3/4" ↑
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD **	1 1/4" ↓
FINAL CAMBER	2" ↑

** INCLUDES FUTURE WEARING SURFACE

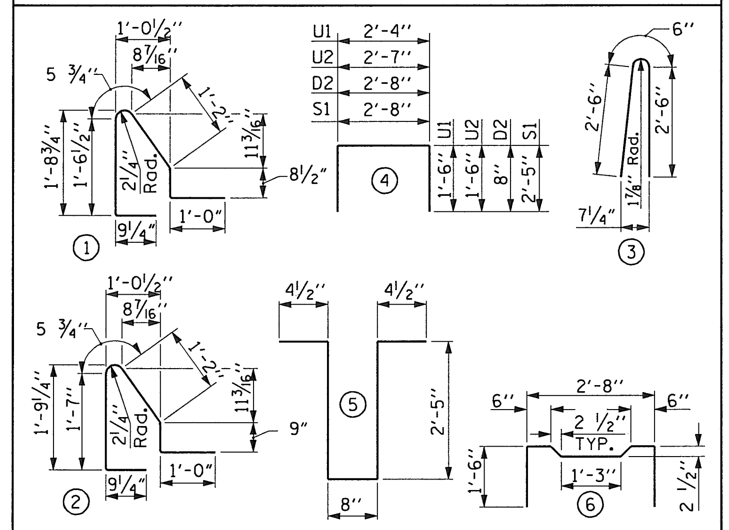
GRADE 270 STRANDS	
	0.6" Ø L.R.
AREA (SQUARE INCHES)	0.217
ULTIMATE STRENGTH (LBS. PER STRAND)	58,600
APPLIED PRESTRESS (LBS. PER STRAND)	44,000



LEFT RIGHT

PLACEMENT OF S3 & S4 BARS

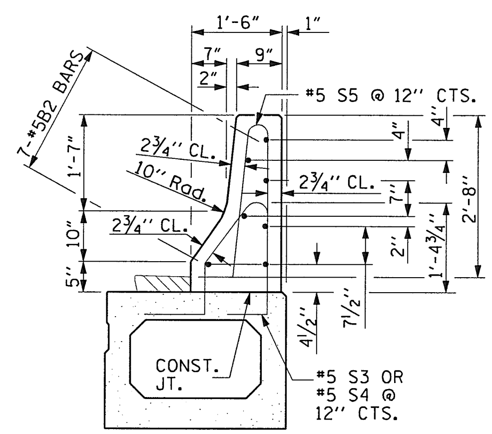
BAR TYPES



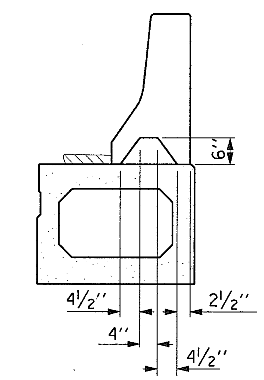
ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL FOR ONE BOX BEAM SECTION									
				LEFT EXT. UNIT		INTERIOR UNIT		RIGHT EXT. UNIT	
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	LENGTH	WEIGHT	LENGTH	WEIGHT
B1	12	#5	STR	43'-5"	543	43'-5"	543	43'-5"	543
D1	12	#4	5	6'-3"	50	6'-3"	50	6'-3"	50
D2	24	#4	4	4'-0"	64	4'-0"	64	4'-0"	64
D3	8	#4	STR	2'-8"	14	2'-8"	14	2'-8"	14
S1	208	#4	4	7'-6"	1,042	7'-6"	1,042	7'-6"	1,042
S2	88	#4	6	5'-10"	343	5'-10"	343	5'-10"	343
* S3	86	#5	1	5'-8"	508				
* S4	86	#5	2					5'-9"	516
U1	10	#4	4	5'-4"	36	5'-4"	36	5'-4"	36
U2	10	#4	4	5'-7"	37	5'-7"	37	5'-7"	37
REINFORCING STEEL				LBS.	2,129		2,129		2,129
* EPOXY COATED REINF. STEEL				LBS.	508				516
5,500 P.S.I. CONCRETE				CU. YDS.	15.1		15.1		15.1
0.6 "Ø L.R. STRANDS No.					22		22		22

BILL OF MATERIAL FOR CONCRETE BARRIER RAIL						
BAR	BARS PER SPAN	TOTAL NO.	SIZE	TYPE	LENGTH	WEIGHT
	SPAN A					
* B2	42	42	# 5	STR.	28'-0"	1,227
* S5	172	172	# 5	3	5'-6"	987
* EPOXY COATED REINFORCING STEEL LBS.						2,214
CLASS AA CONCRETE CU.YDS.						19.8
TOTAL LIN. FT. OF CONCRETE BARRIER RAIL						170.0

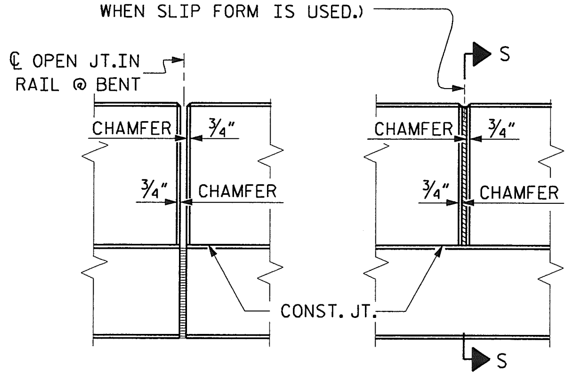


SECTION THRU RAIL



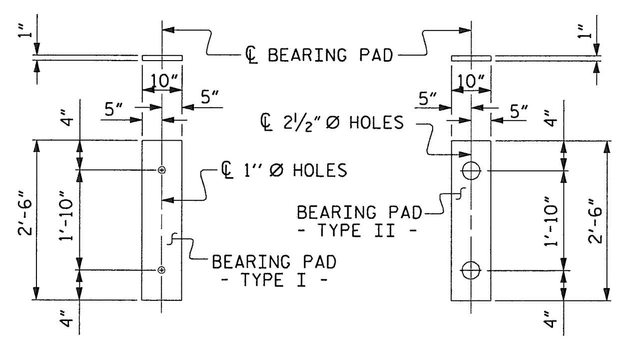
SECTION S-S
AT DAM IN OPEN JOINT
(THIS IS TO BE USED ONLY WHEN SLIP FORM IS USED)

℄ 1/2" EXP.JT.MAT'L HELD IN PLACE WITH GALVANIZED NAILS.
(NOTE: OMIT EXP. JT. MAT'L. WHEN SLIP FORM IS USED.)



ELEVATION AT EXPANSION JOINTS

BARRIER RAIL DETAILS



FIXED END
(TYPE I - 11 REQ'D)

EXPANSION END
(TYPE II - 11 REQ'D)

ELASTOMERIC BEARING DETAILS-BRIDGE 98

NOTE: ELASTOMERIC BEARINGS SHALL BE 60 DUROMETER

NOTES

ALL PRESTRESSING STRANDS SHALL BE 7-WIRE LOW RELAXATION GRADE 270 STRANDS AND SHALL CONFORM TO AASHTO M203 EXCEPT FOR SAMPLING REQUIREMENTS WHICH SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

ALL REINFORCING STEEL CAST WITH THE BOX BEAM SECTIONS SHALL BE GRADE 60 AND SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE BOX BEAMS.

RECESSES FOR TRANSVERSE STRANDS SHALL BE GROUTED AFTER THE TENSIONING OF THE STRANDS.

THE 3" Ø DOWEL HOLES AT FIXED ENDS OF SLAB SECTIONS SHALL BE FILLED WITH GROUT. THE 3" Ø DOWEL HOLES AT EXPANSION ENDS OF SLAB SECTIONS SHALL BE FILLED WITH JOINT SEALER MATERIAL TO 1 1/2" ABOVE THE TOP OF DOWELS AND THEN FILLED WITH GROUT.

THE JOINT SEALER MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF TYPE B LOW MODULUS SILICONE SEALANT. THE 2" Ø BACKER ROD SHALL CONFORM TO THE REQUIREMENTS OF TYPE M BOND BREAKER. THE 12" WIDE BOND BREAKING TAPE SHALL BE CENTERED OVER THE JOINT AND CONFORM TO THE REQUIREMENTS OF TYPE N BOND BREAKER. SEE SECTION 1028 OF THE STANDARD SPECIFICATIONS.

WHEN BOX BEAMS ARE CAST, A POSITIVE HOLD-DOWN SYSTEM SHALL BE EMPLOYED TO PREVENT VOIDS FROM RISING OR MOVING SIDEWAYS. THIS SYSTEM SHALL BE DESIGNED TO BE LEFT IN PLACE UNTIL THE CONCRETE HAS REACHED RELEASE STRENGTH. AT LEAST THREE WEEKS PRIOR TO CASTING BOX BEAMS, THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER FOR REVIEW AND COMMENT, DETAILED DRAWINGS OF THE PROPOSED HOLD-DOWN SYSTEM. IN ADDITION TO STRUCTURAL DETAILS, LOCATION AND SPACING OF THE HOLD-DOWNS SHALL BE INDICATED.

THE MINIMUM CONCRETE STRENGTH AT 28 DAYS SHALL BE 5500 PSI.

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE BOX BEAM UNIT SHALL BE DONE WHEN THE CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 4100 PSI.

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE BOX BEAM UNIT ENDS.

APPLY EPOXY PROTECTIVE COATING TO BOX BEAM UNIT ENDS. FOR EPOXY PROTECTIVE COATING, SEE SPECIAL PROVISIONS.

VERTICAL GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE BARRIER RAIL AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. A VERTICAL CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN BARRIER RAIL EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT MIDPOINT OF BARRIER RAIL SEGMENTS LESS THAN 20 FEET IN LENGTH AND NO CONTRACTION JOINTS ARE REQUIRED FOR THOSE SEGMENTS LESS THAN 10 FEET IN LENGTH.

FOR ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

FOR PRESTRESSED CONCRETE MEMBERS, SEE SPECIAL PROVISIONS.

FOR PRESTRESSED CONCRETE BOX BEAMS, SEE SPECIAL PROVISIONS.

PROJECT NO. BK-5109

COLUMBUS COUNTY

STATION: 19+18.00 -L-

10-30-09

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

B-II 36
PRESTRESSED CONCRETE
BOX BEAM
BILL OF MATERIAL
BRIDGE 98

REVISIONS								SHEET NO.
NO.	BY:	DATE:		NO.	BY:	DATE:		
1				3				TOTAL SHEETS
2				4				

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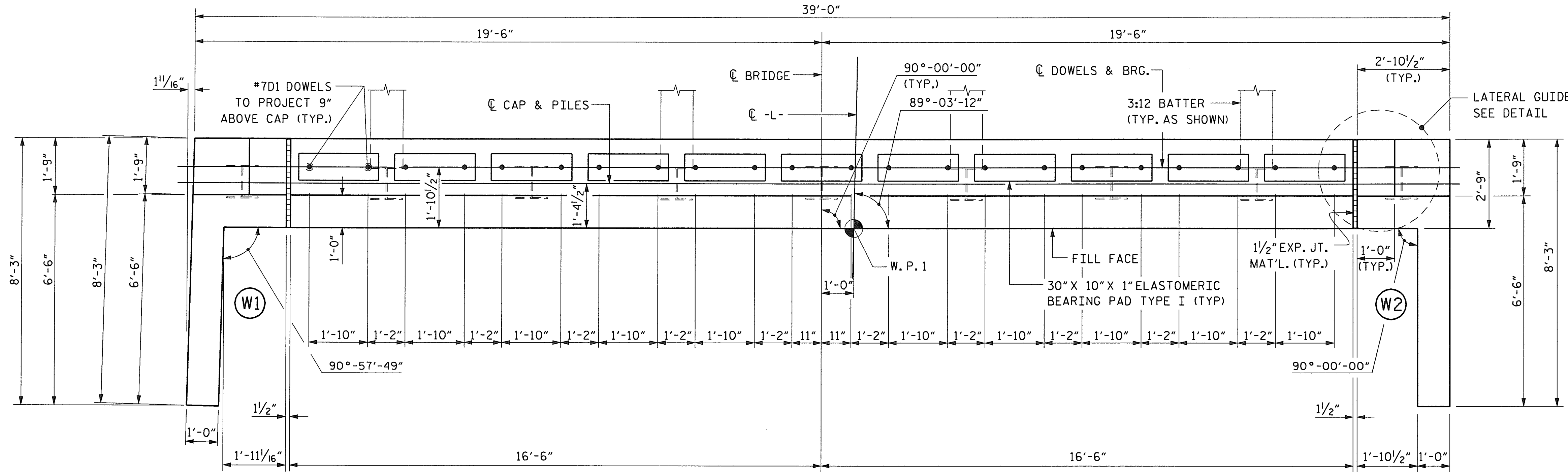
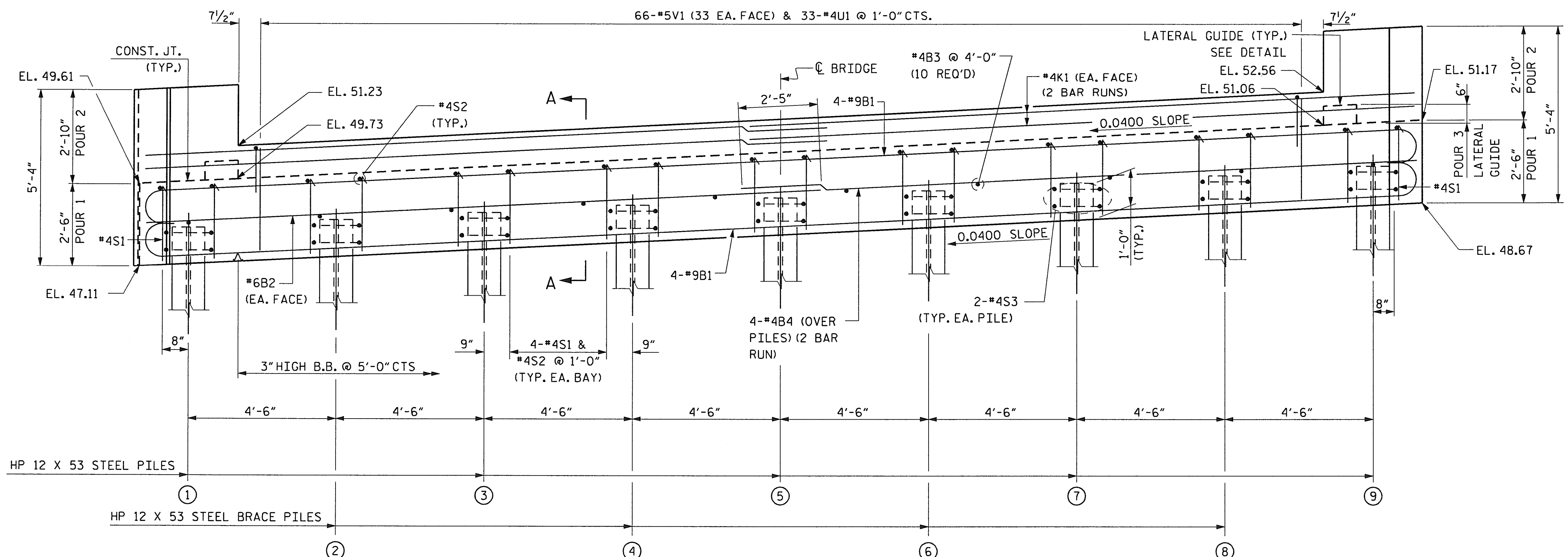
DWG. 20 OF 25

DRAWN BY:	R.C. NELSON	DATE: 5-05
CHECKED BY:	C. P. LEWIS	DATE: 5-05

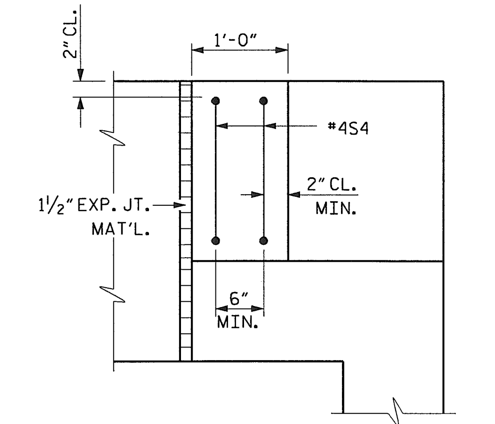
$$$$SYSTIME$$$$
$$$$DGN$$$$
$$$$USERNAME$$$$



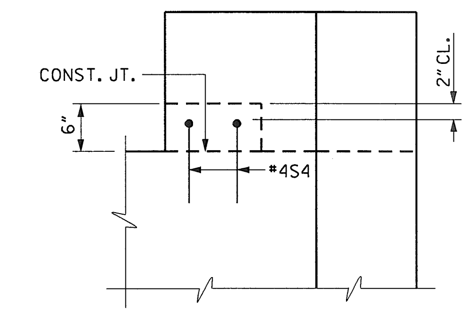
PLAN - BRIDGE 98



ELEVATION OF CAP - BRIDGE 98



PLAN



ELEVATION

LATERAL GUIDE DETAILS

TOP OF PILE ELEVATIONS

PILE NO.	ELEVATION
P1	48.20
P2	48.37
P3	48.55
P4	48.73
P5	48.91
P6	49.09
P7	49.27
P8	49.45
P9	49.63

NOTES:

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.

THE LATERAL GUIDE AT EACH END OF THE CAP IS NOT TO BE POURED UNTIL AFTER CORED SLAB UNITS ARE IN PLACE.

THE CONTRACTOR SHALL PROVIDE FOR INSTALLATION OF THE 4" DIAMETER DRAIN PIPE THROUGH THE WING WALL AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILLS, SEE THE ROADWAY PLANS. REINFORCING STEEL IN THE WING WALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.

PROJECT NO. BK-5109

COLUMBUS COUNTY

STATION: 19+18.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 1
BRIDGE 98

NORTH CAROLINA SEAL 11725 ENGINEER DAVID R. RUGGLES

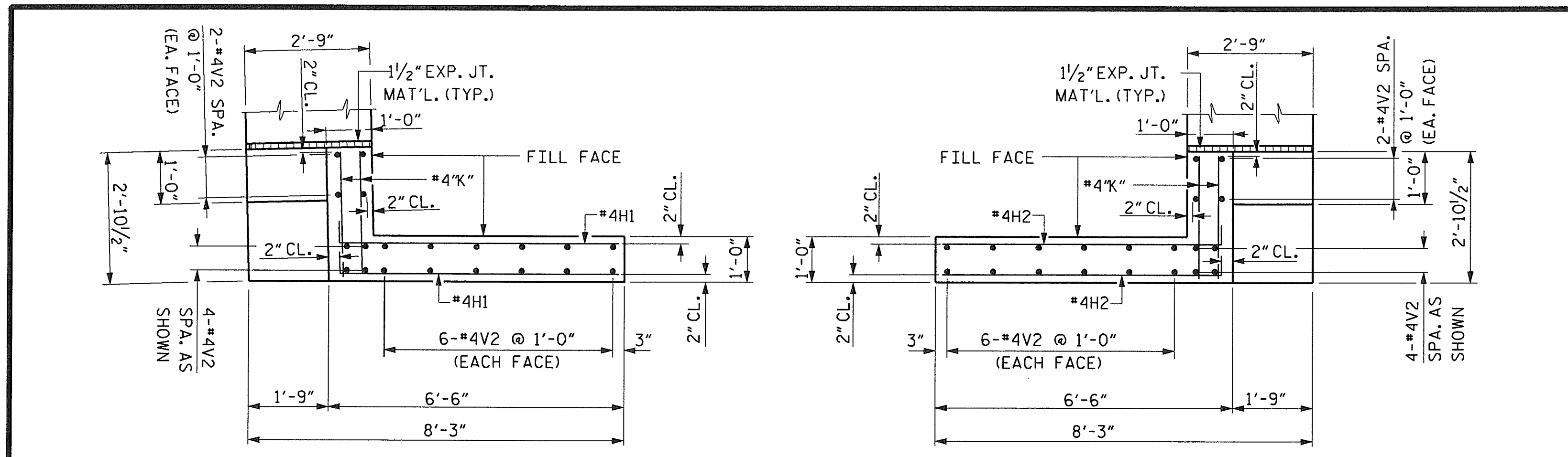
10-30-09

REVISIONS								SHEET NO.
NO.	BY:	DATE:		NO.	BY:	DATE:		TOTAL SHEETS
1				3				
2				4				

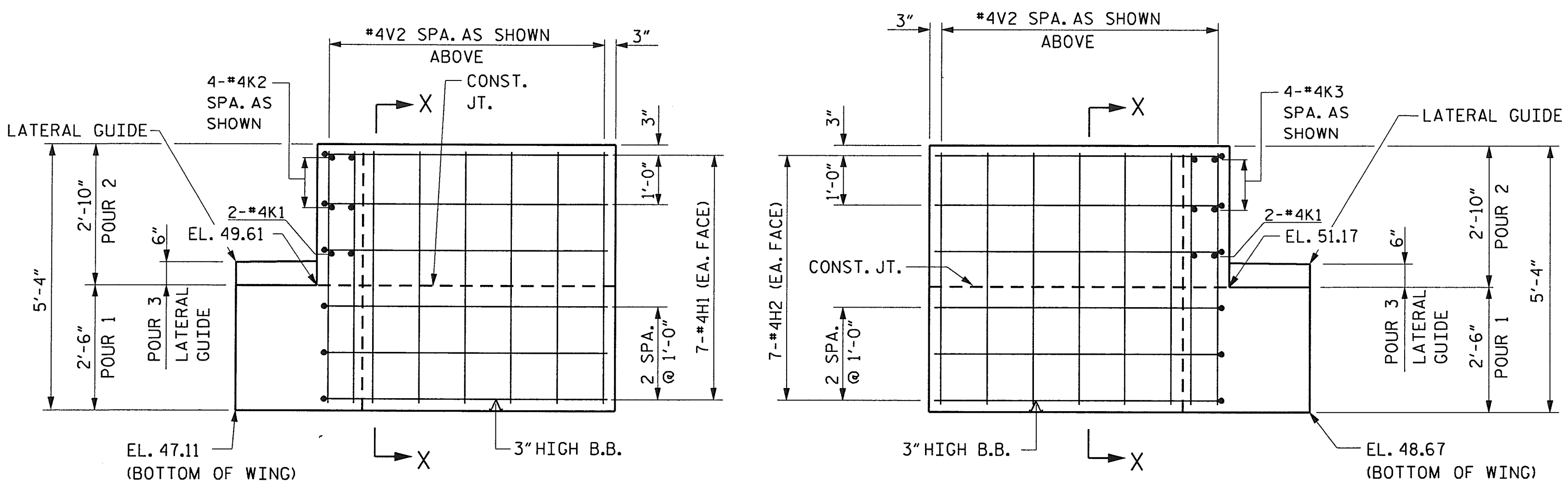
DWG. 21 OF 25

DRAWN BY: A. P. TUAZAMA DATE : 5-05
CHECKED BY: C. P. LEWIS DATE : 5-05

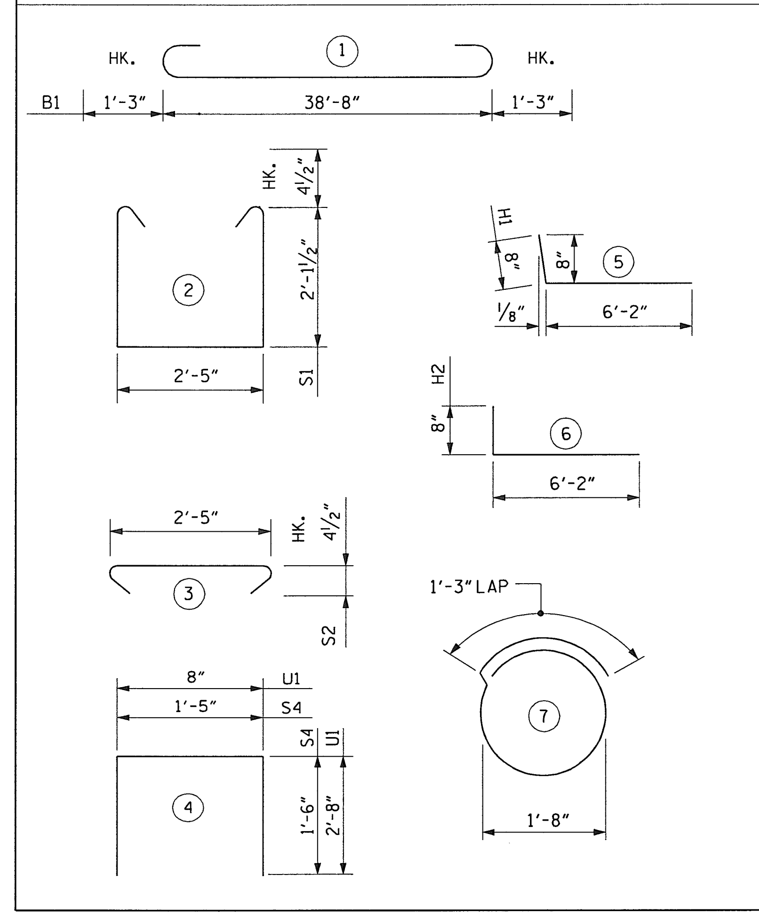
$$$$$$SYSTIME$$$$$
$$$$$$USERNAME$$$$$
$$$$$$DGN$$$$$$$$$$



PLAN W1 PLAN W2



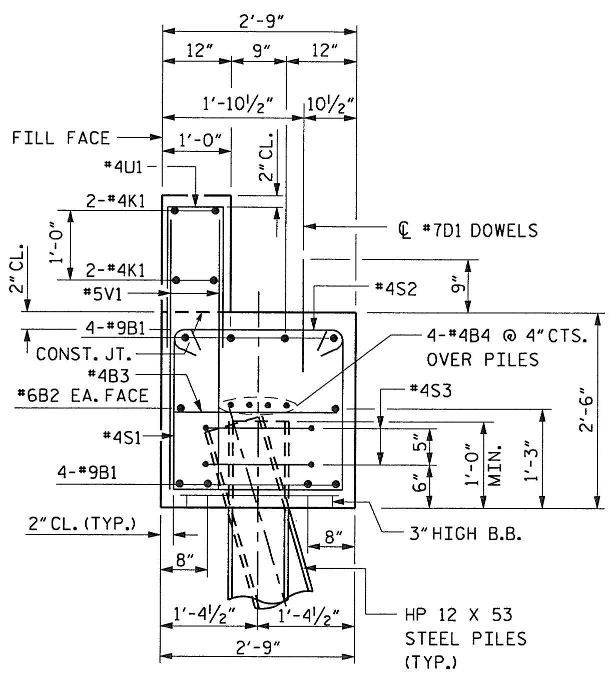
ELEVATION W1 ELEVATION W2



BILL OF MATERIAL

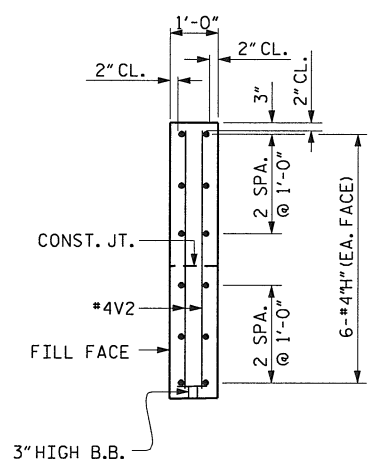
END BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	41'-2"	1,120
B2	2	#6	STR.	38'-8"	116
B3	10	#4	STR.	2'-5"	16
B4	8	#4	STR.	20'-7"	110
D1	22	#7	STR.	1'-6"	67
H1	14	#4	5	6'-10"	64
H2	14	#4	6	6'-10"	64
K1	8	#4	STR.	20'-7"	110
K2	4	#4	STR.	2'-7"	7
K3	4	#4	STR.	2'-6"	7
S1	34	#4	2	7'-5"	168
S2	34	#4	3	3'-2"	72
S3	18	#4	7	6'-6"	78
S4	4	#4	4	4'-5"	12
U1	33	#4	STR.	6'-0"	132
V1	66	#5	STR.	3'-8"	252
V2	40	#4	STR.	4'-11"	131
TOTAL REINFORCING STEEL = LBS					2,526
CLASS A CONCRETE					
POUR 1 (CAP & LOWER PART OF WINGS)					11.0
POUR 2 (UPPER PART OF WINGS)					3.6
POUR 3 (LATERAL GUIDE)					0.1
TOTAL CU. YARDS					14.7
HP 12 X 53 STEEL PILES			NO.		9
			LIN. FT.		360
STEEL PILE POINTS			NO.		9

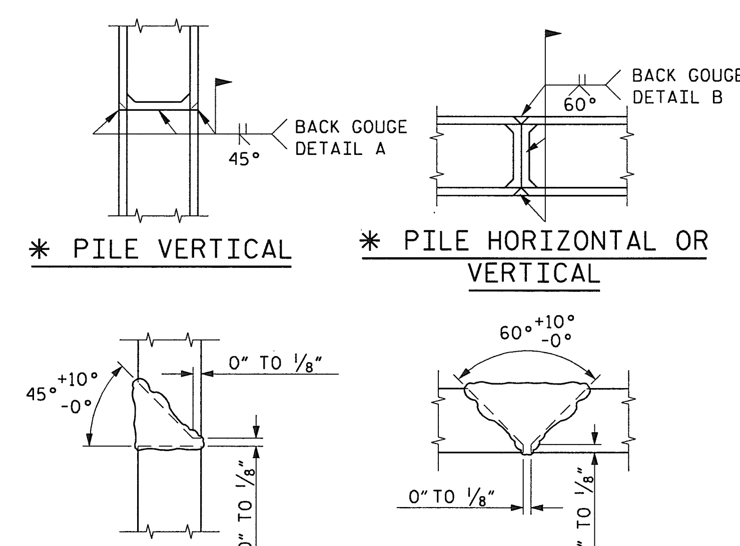


SECTION A-A

NOTE: PILE BATTER SHALL BE 3 : 12



SECTION X-X



∗ PILE VERTICAL ∗ PILE HORIZONTAL OR VERTICAL

DETAIL A DETAIL B

∗ POSITION OF PILE DURING WELDING

PILE SPLICE DETAILS

PROJECT NO. BK-5109

COLUMBUS COUNTY

STATION: 19+18.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 1
BRIDGE 98

NORTH CAROLINA PROFESSIONAL SEAL 11725 ENGINEER DAVID R. RUGGLES

David Ruggles

10-30-09

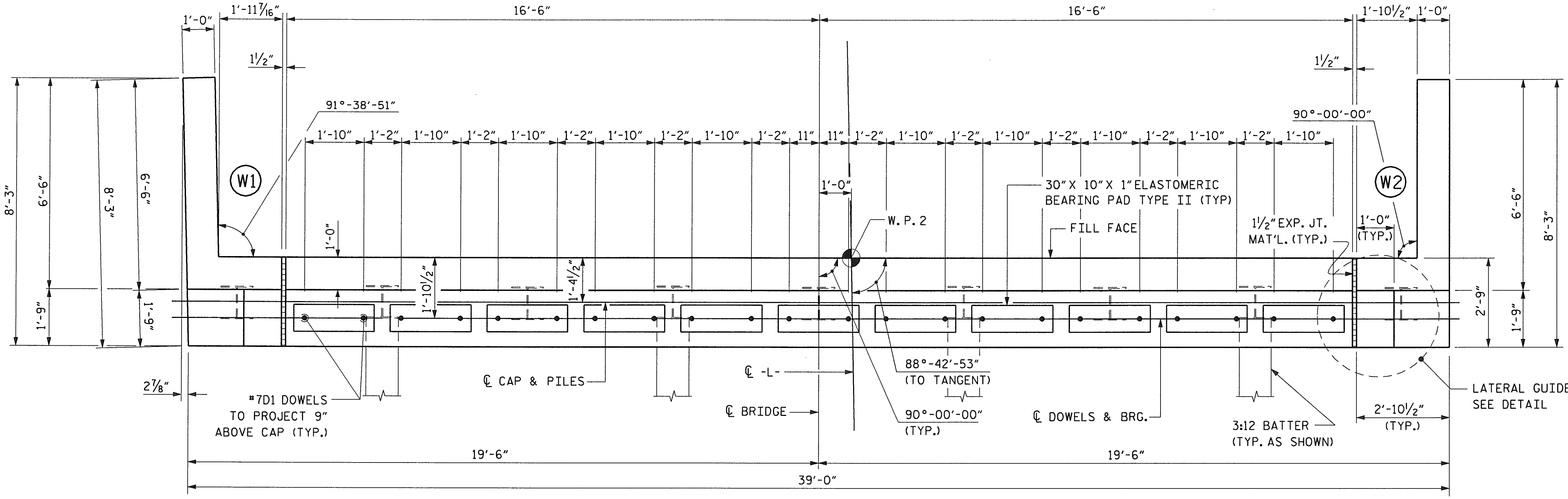
S

DWG. 22 OF 25

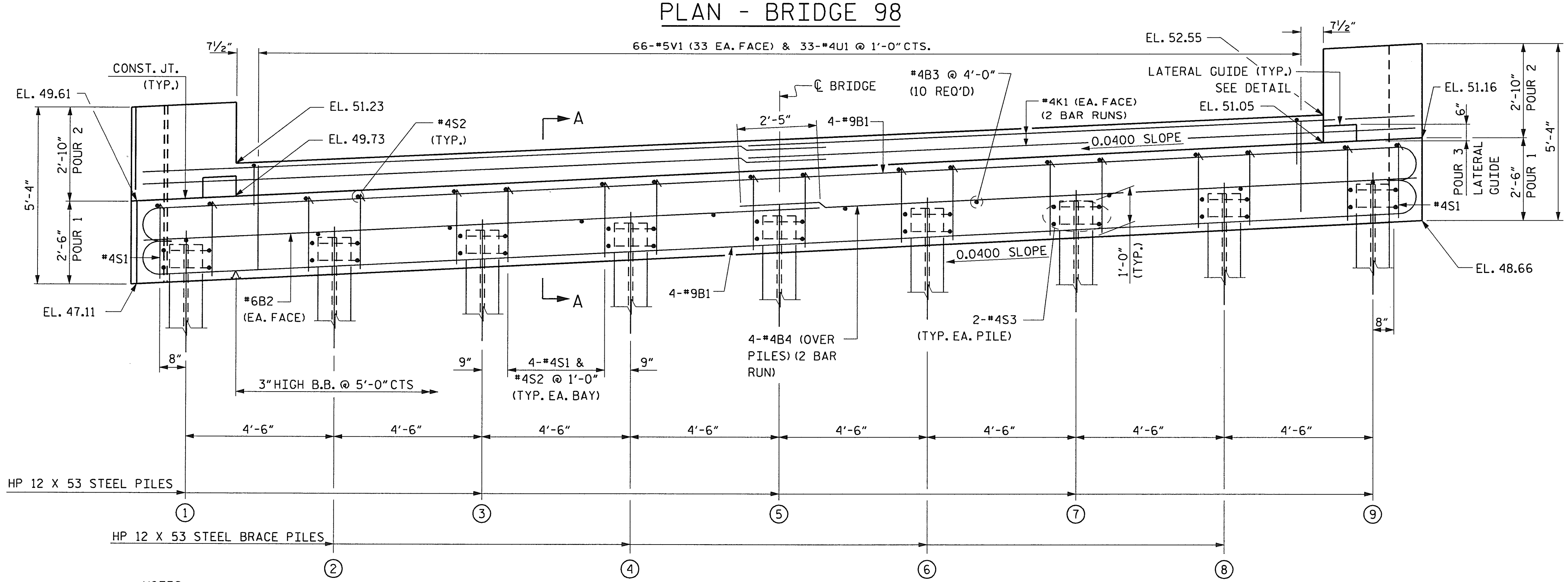
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS
2			4			

DRAWN BY: A. P. TUAZAMA DATE: 5-05
CHECKED BY: R.C. NELSON DATE: 5-05

$$$$$$SYSTIME$$$$$ $$$$$$$$$$$$DGN$$$$$$$$$$ $$$$USERNAME$$$$



PLAN - BRIDGE 98



ELEVATION OF CAP - BRIDGE 98

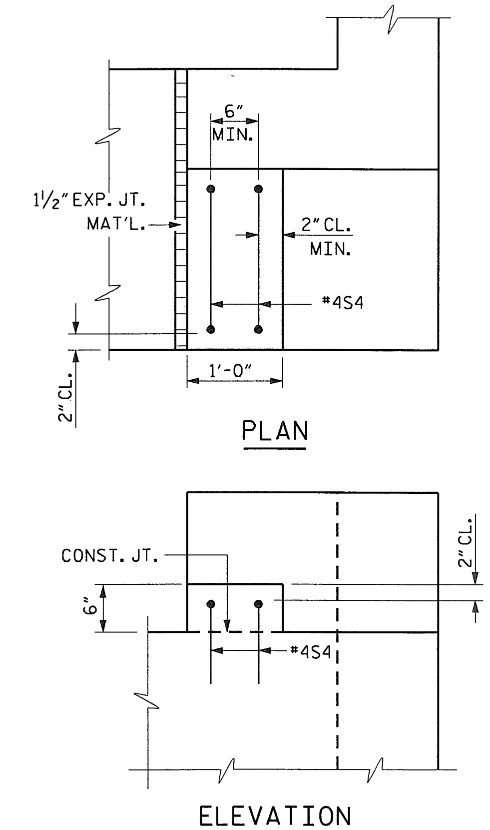
NOTES:

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.

THE LATERAL GUIDE AT EACH END OF THE CAP IS NOT TO BE POURED UNTIL AFTER CORED SLAB UNITS ARE IN PLACE.

THE CONTRACTOR SHALL PROVIDE FOR INSTALLATION OF THE 4" DIAMETER DRAIN PIPE THROUGH THE WING WALL AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILLS. SEE THE ROADWAY PLANS. REINFORCING STEEL IN THE WING WALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.

FOR PILE SPLICE DETAILS, SEE END BENT 1, SHEET 2 OF 2.



LATERAL GUIDE DETAILS

TOP OF PILE ELEVATIONS	
PILE NO.	ELEVATION
P1	48.19
P2	48.37
P3	48.55
P4	48.73
P5	48.91
P6	49.09
P7	49.27
P8	49.45
P9	49.63

PROJECT NO. BK-5109

COLUMBUS COUNTY

STATION: 19+18.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 2
BRIDGE 98

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 11725 DAVID R. RUGGLES

10-30-09

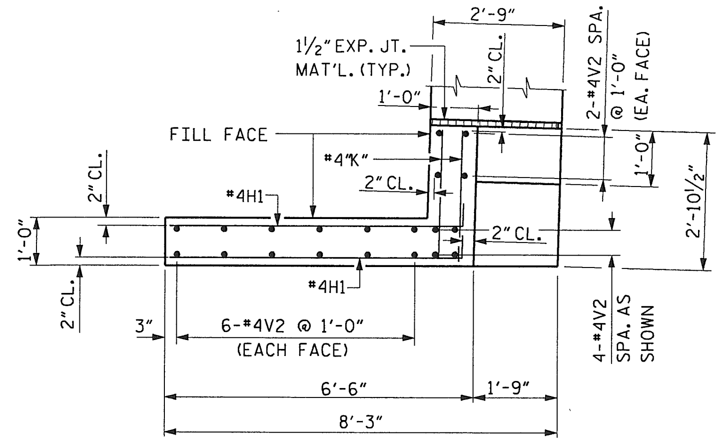
S

DWG. 23 OF 25

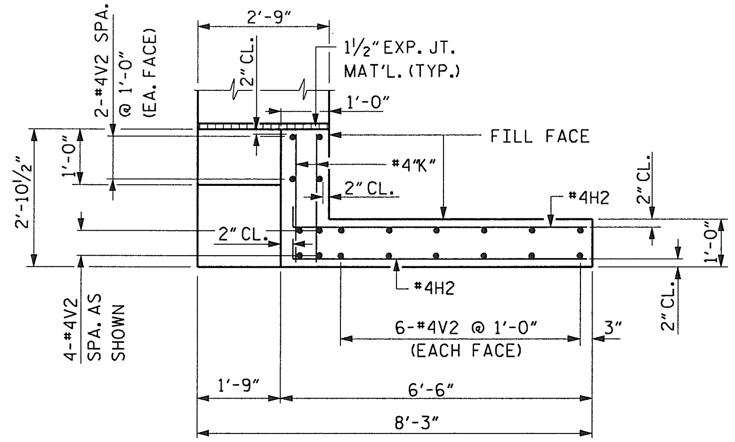
REVISIONS								SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:			TOTAL SHEETS
1			3					
2			4					

DRAWN BY:	A. P. TUAZAMA	DATE : 5-05
CHECKED BY:	C. P. LEWIS	DATE : 5-05

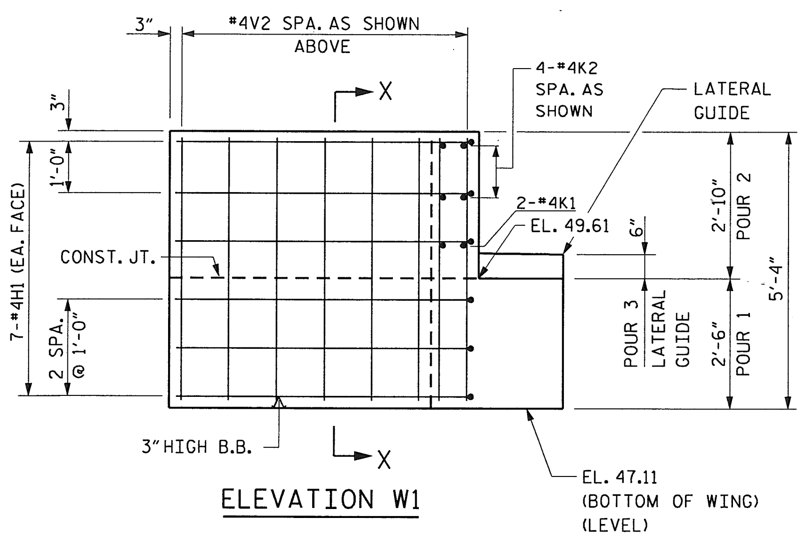
$$$$SYSTIME$$$$ $$$$$$DGN$$$$$$$$$$$$$$$$$$ $$$$USERNAME$$$$



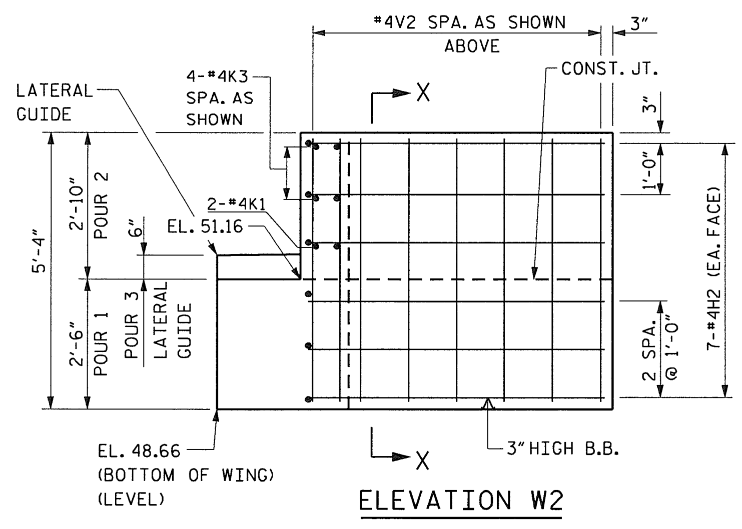
PLAN W1



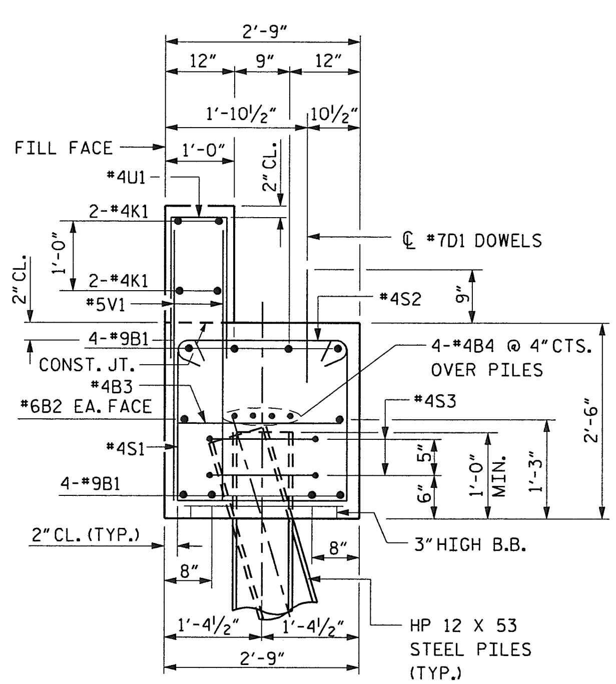
PLAN W2



ELEVATION W1

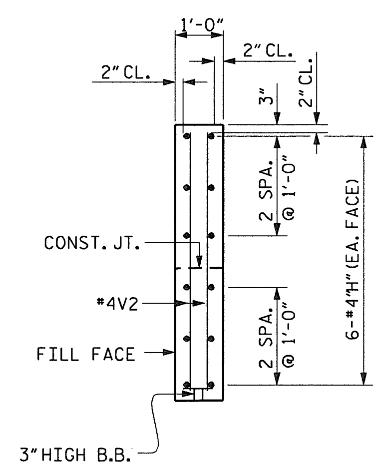


ELEVATION W2



SECTION A-A

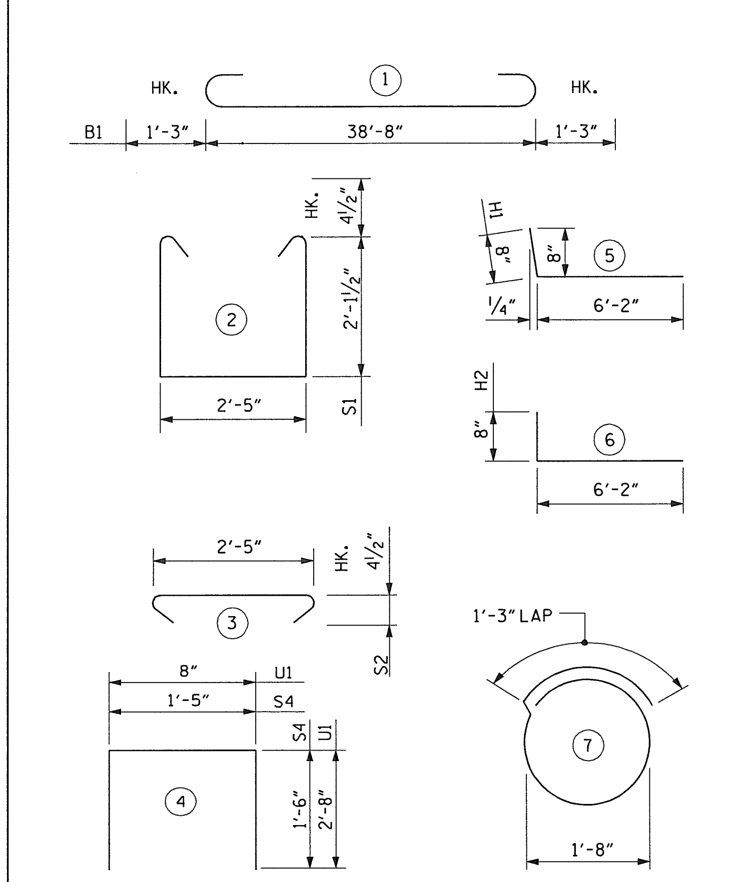
NOTE: PILE BATTER SHALL BE 3 : 12



SECTION X-X

BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT



BILL OF MATERIAL

END BENT 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	41'-2"	1,120
B2	2	#6	STR.	38'-8"	116
B3	10	#4	STR.	2'-5"	16
B4	8	#4	STR.	20'-7"	110
D1	22	#7	STR.	1'-6"	67
H1	14	#4	5	6'-10"	64
H2	14	#4	6	6'-10"	64
K1	8	#4	STR.	20'-7"	110
K2	4	#4	STR.	2'-7"	7
K3	4	#4	STR.	2'-6"	7
S1	34	#4	2	7'-5"	168
S2	34	#4	3	3'-2"	72
S3	18	#4	7	6'-6"	78
S4	4	#4	4	4'-5"	12
U1	33	#4	STR.	6'-0"	132
V1	66	#5	STR.	3'-8"	252
V2	40	#4	STR.	4'-11"	131
TOTAL REINFORCING STEEL = LBS					2,526
CLASS A CONCRETE					
POUR 1 (CAP & LOWER PART OF WINGS)					11.0
POUR 2 (UPPER PART OF WINGS)					3.6
POUR 3 (LATERAL GUIDE)					0.1
			TOTAL CU. YARDS		14.7
HP 12 X 53 STEEL PILES			NO.		9
			LIN. FT.		360
STEEL PILE POINTS			NO.		9

PROJECT NO. BK-5109

COLUMBUS COUNTY

STATION: 19+18.00 -L-

SHEET 2 OF 2

David Ruggles

10-30-09

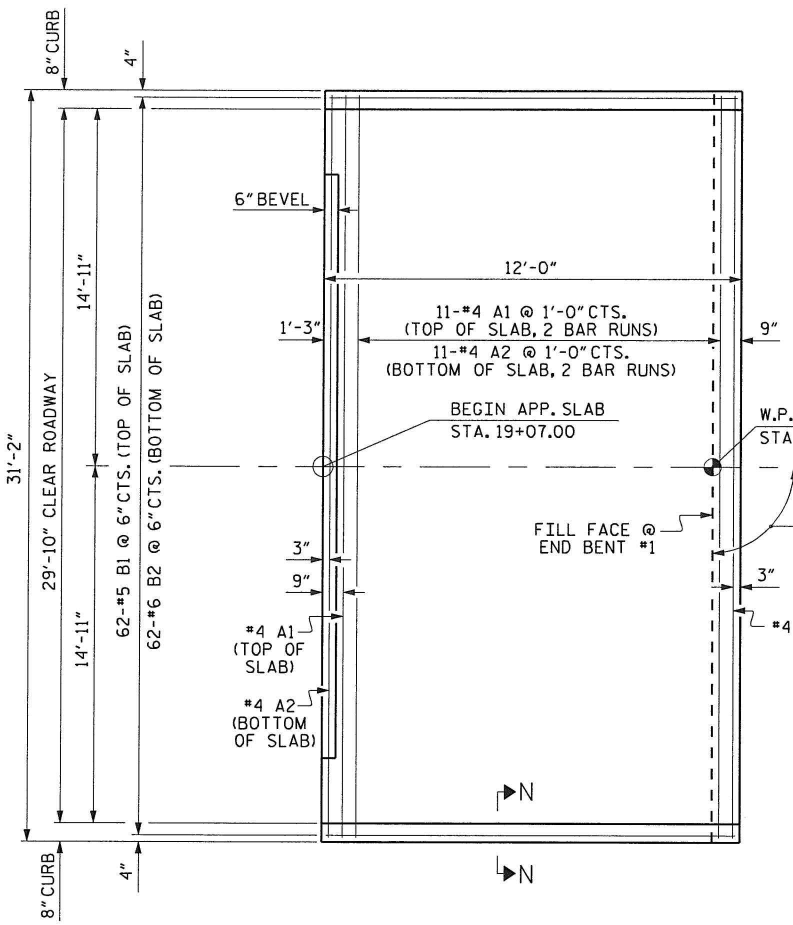
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 2
BRIDGE 98

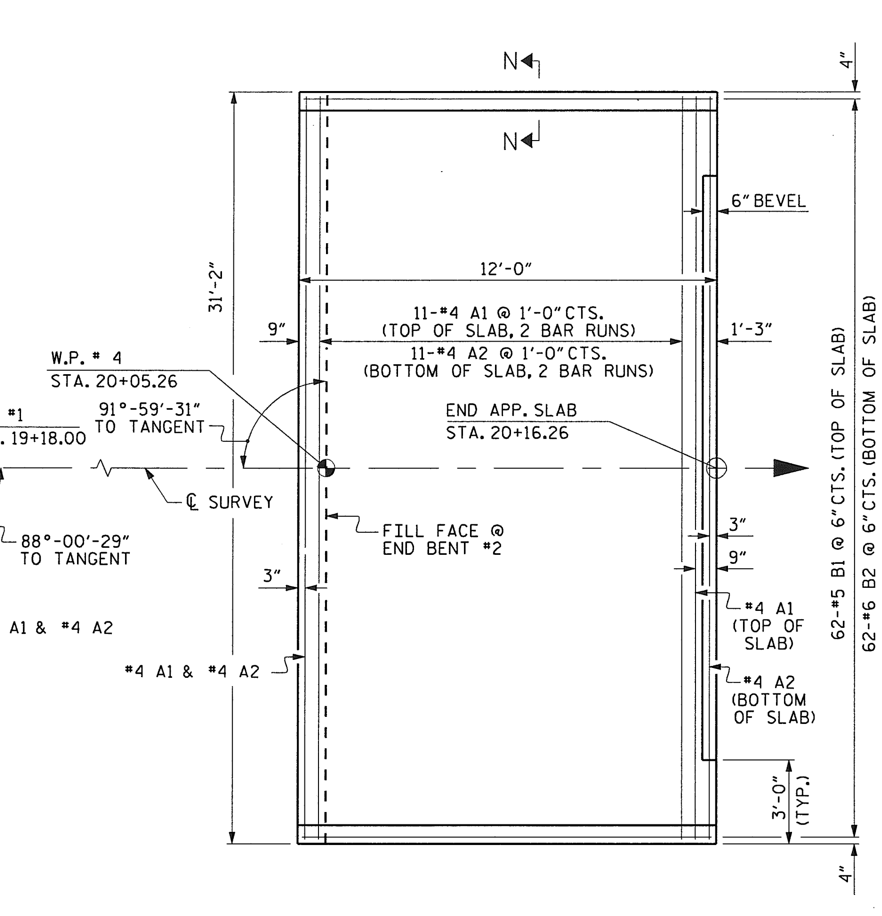
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS
2			4			

DWG. 24 OF 25

DRAWN BY:	A. P. TUAZAMA	DATE : 5-05
CHECKED BY:	R. C. NELSON	DATE : 5-05



PLAN @ END BENT #1 - BRIDGE 98



PLAN @ END BENT #2 - BRIDGE 98

NOTES

FOR BRIDGE APPROACH FILL INCLUDING FABRIC, 4" Ø DRAINAGE PIPE, AND #78M STONE BACKFILL, SEE ROADWAY STD. DWG. 422.10.

APPROACH SLAB SHALL NOT BE CONSTRUCTED PRIOR TO COMPLETION OF THE BRIDGE DECK.

FABRIC SHALL BE TYPE 1 ENGINEERING FABRIC IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS SECTION 1056.

#78M STONE BACKFILL (CLASS V SELECT MATERIAL) SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS SECTION 1016.

#78M STONE BACKFILL IS TO BE CONTINUOUS ALONG FILL FACE OF BACKWALL FROM OUTSIDE EDGE TO OUTSIDE EDGE OF APPROACH SLAB.

FOR THE 4" Ø DRAINAGE PIPE OUTLET(S), SEE ROADWAY STANDARD DRAWINGS.

AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED. SEE ROADWAY PLANS.

THE 6" COMP. A.B.C. SHALL BE FLUSH WITH THE ROADWAY END OF THE APPROACH SLAB AND SHALL EXTEND 1'-0" OUTSIDE OF EACH EDGE OF THE APPROACH SLAB.

THE CONTRACTOR MAY USE 4" TYPE B-25.0B ASPHALT CONCRETE BASE COURSE IN LIEU OF 6" COMP. A.B.C. IF THIS OPTION IS USED, THE BASE COURSE SHALL BE FLUSH WITH THE ROADWAY END OF THE APPROACH SLAB, AND THE WIDTH SHALL BE THE SAME AS THAT OF THE APPROACH SLAB.

THE CONTRACTOR MAY USE 5" CLASS "A" CONCRETE BASE IN LIEU OF 6" COMP. A.B.C. IF THIS OPTION IS USED, THE CONCRETE BASE SHALL BE FLUSH WITH THE ROADWAY END OF THE APPROACH SLAB, AND THE WIDTH SHALL BE THE SAME AS THAT OF THE APPROACH SLAB. THE CONCRETE SHALL BE FINISHED TO A SMOOTH SURFACE AND A LAYER OF 30 LB ROOFING FELT SHALL BE PLACED BETWEEN THE CONCRETE BASE AND THE APPROACH SLAB TO PREVENT BOND. THE APPROACH SLAB SHALL NOT BE CAST UNTIL THE CONCRETE BASE HAS REACHED AN AGE OF THREE CURING DAYS.

APPROACH SLAB GROOVING IS NOT REQUIRED.

FOR TEMPORARY DRAINAGE DETAIL AND TEMPORARY BERM AND SLOPE DRAIN DETAILS, SEE DWG. 17

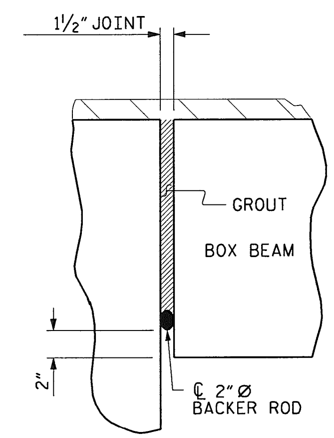
BILL OF MATERIAL

APPROACH SLAB AT EB #1

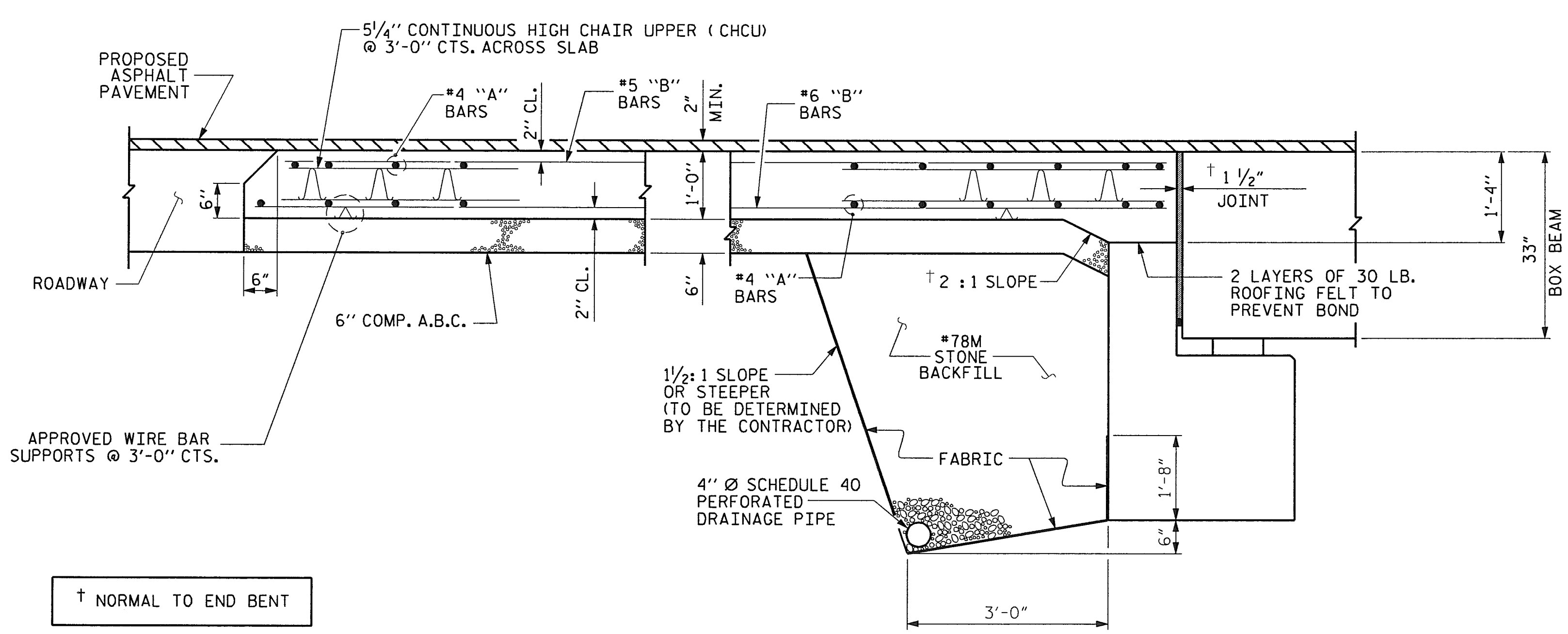
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A	26	#4	STR	16'-5"	285
A	26	#4	STR	16'-4"	284
* B	62	#5	STR	11'-2"	722
B	62	#6	STR	11'-8"	1086
REINFORCING STEEL				LBS.	1370
* EPOXY COATED REINFORCING STEEL				LBS.	1007
CLASS AA CONCRETE				C. Y.	14.3

APPROACH SLAB AT EB #2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A	26	#4	STR	16'-5"	285
A	26	#4	STR	16'-4"	284
* B	62	#5	STR	11'-2"	722
B	62	#6	STR	11'-8"	1086
REINFORCING STEEL				LBS.	1370
* EPOXY COATED REINFORCING STEEL				LBS.	1007
CLASS AA CONCRETE				C. Y.	14.3

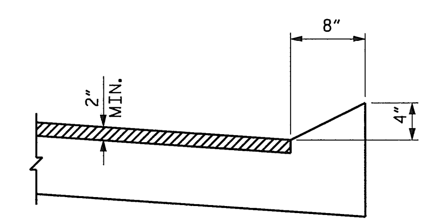


JOINT DETAIL

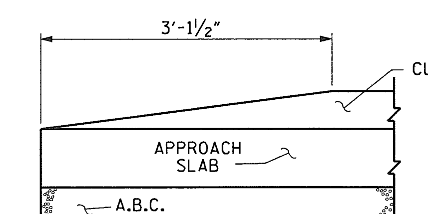


† NORMAL TO END BENT

SECTION THRU SLAB



SECTION N-N



END OF CURB WITHOUT SHOULDER BERM GUTTER

CURB DETAILS

PROJECT NO. BK-5109

COLUMBUS COUNTY

STATION: 19+18.00 -L-

SEAL 11725 ENGINEER DAVID R. RUGGLES

10-30-09

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB FOR PRESTRESSED CONCRETE BOX BEAM UNIT BRIDGE 98

REVISIONS								SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:			
1			3					TOTAL SHEETS
2			4					

S

DWG. 25 OF 25

ASSEMBLED BY : JCH DATE : 10-09
CHECKED BY : DRR DATE : 10-09
DRAWN BY : KMM 3-08
CHECKED BY : GM 3-08

(SHT 2) STD. NO. BAS13

10/28/2009
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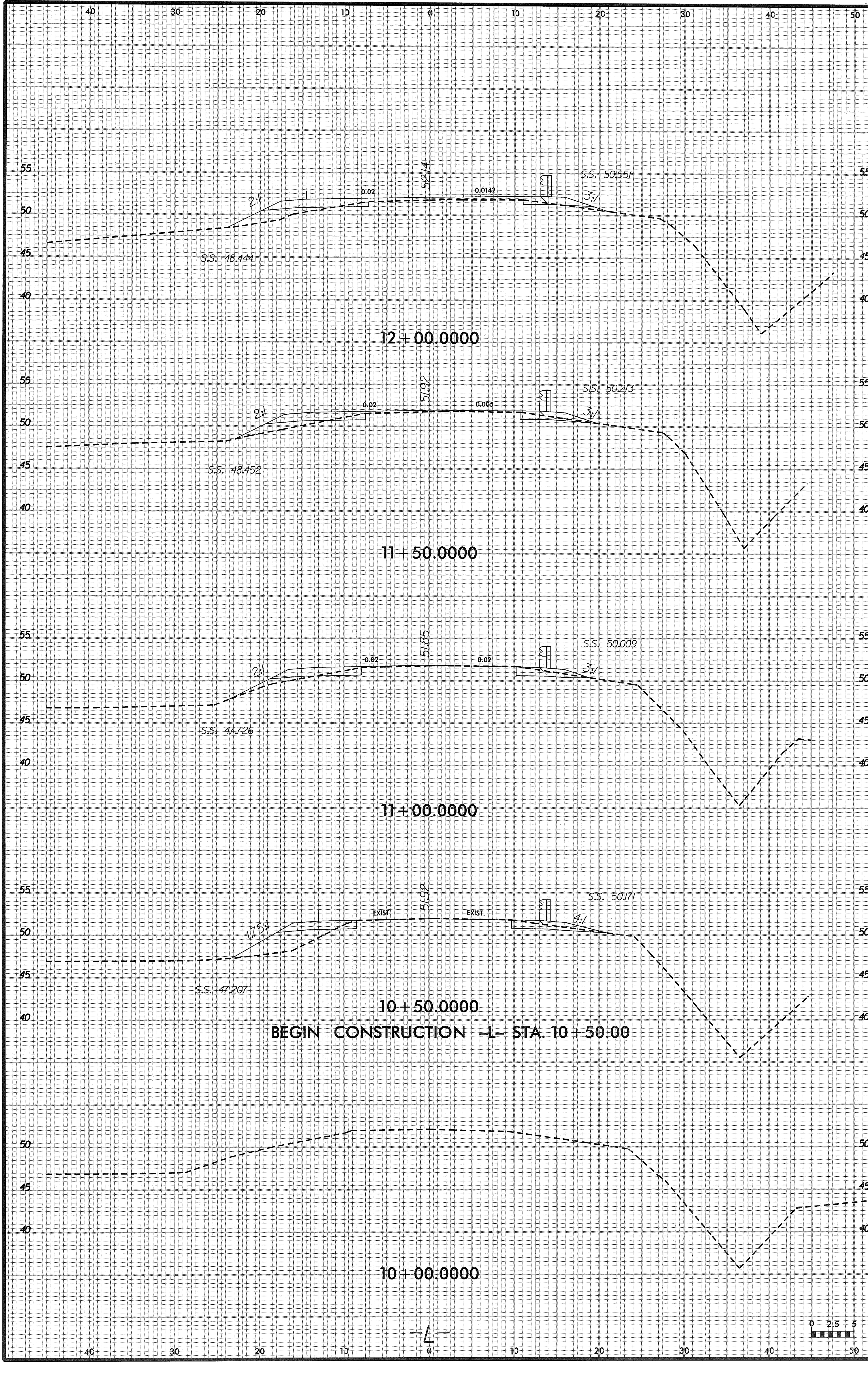
USER: jhefner

10/26/98



PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
BK-5109	X-1	

10/28/2009
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USER:jhefner

10/26/98

PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
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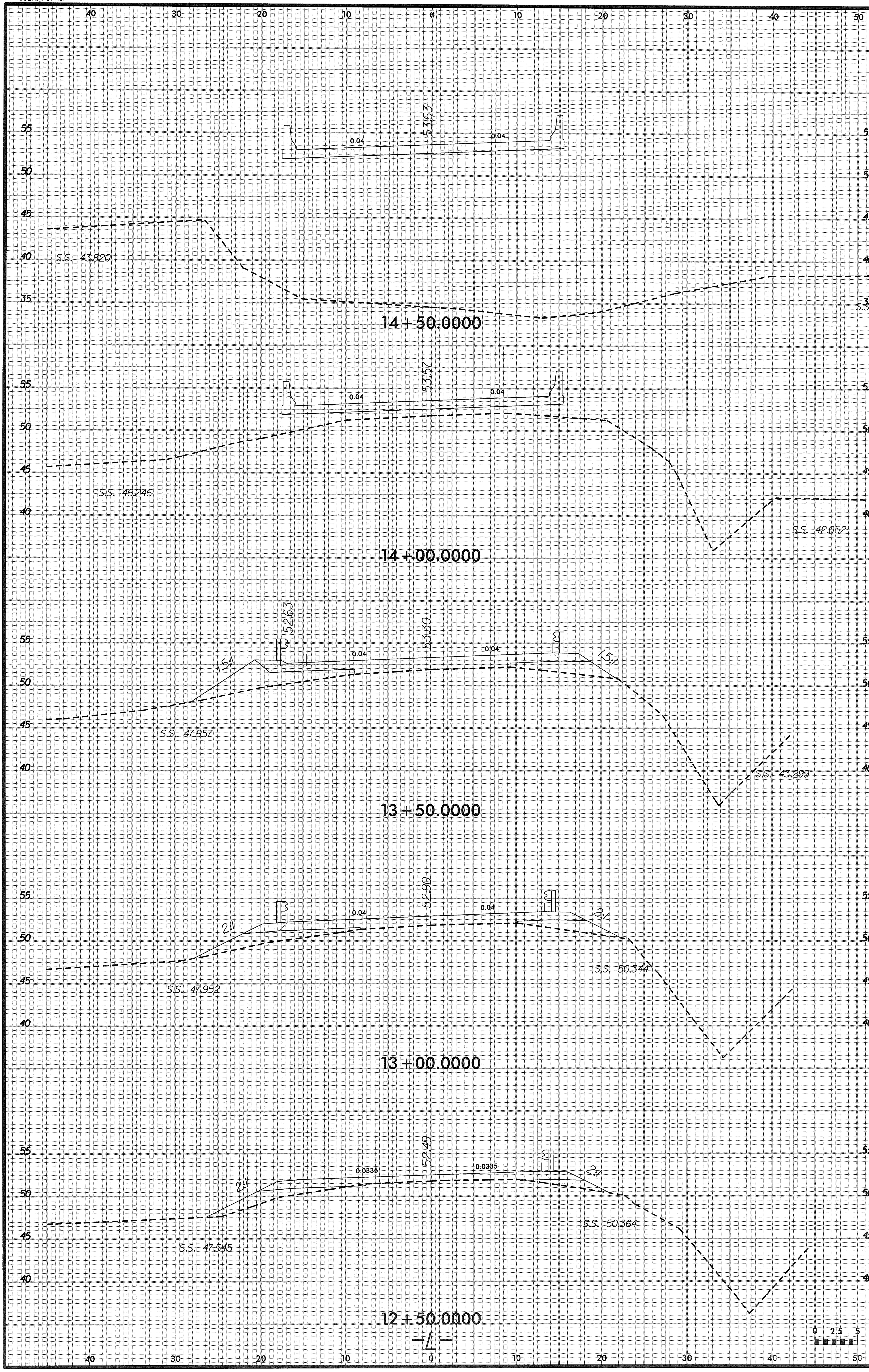

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USER:jhefner

10/26/98

PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
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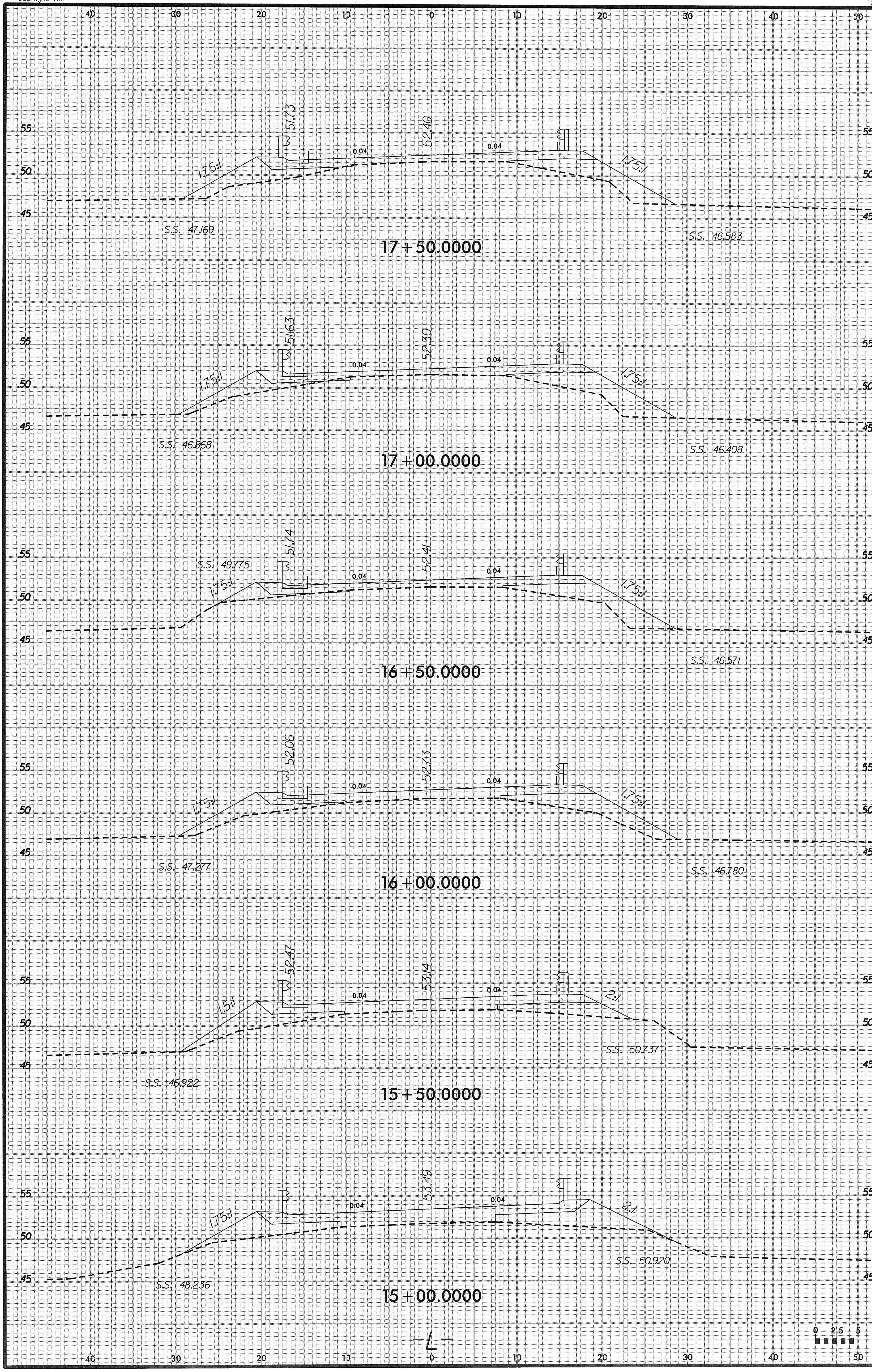

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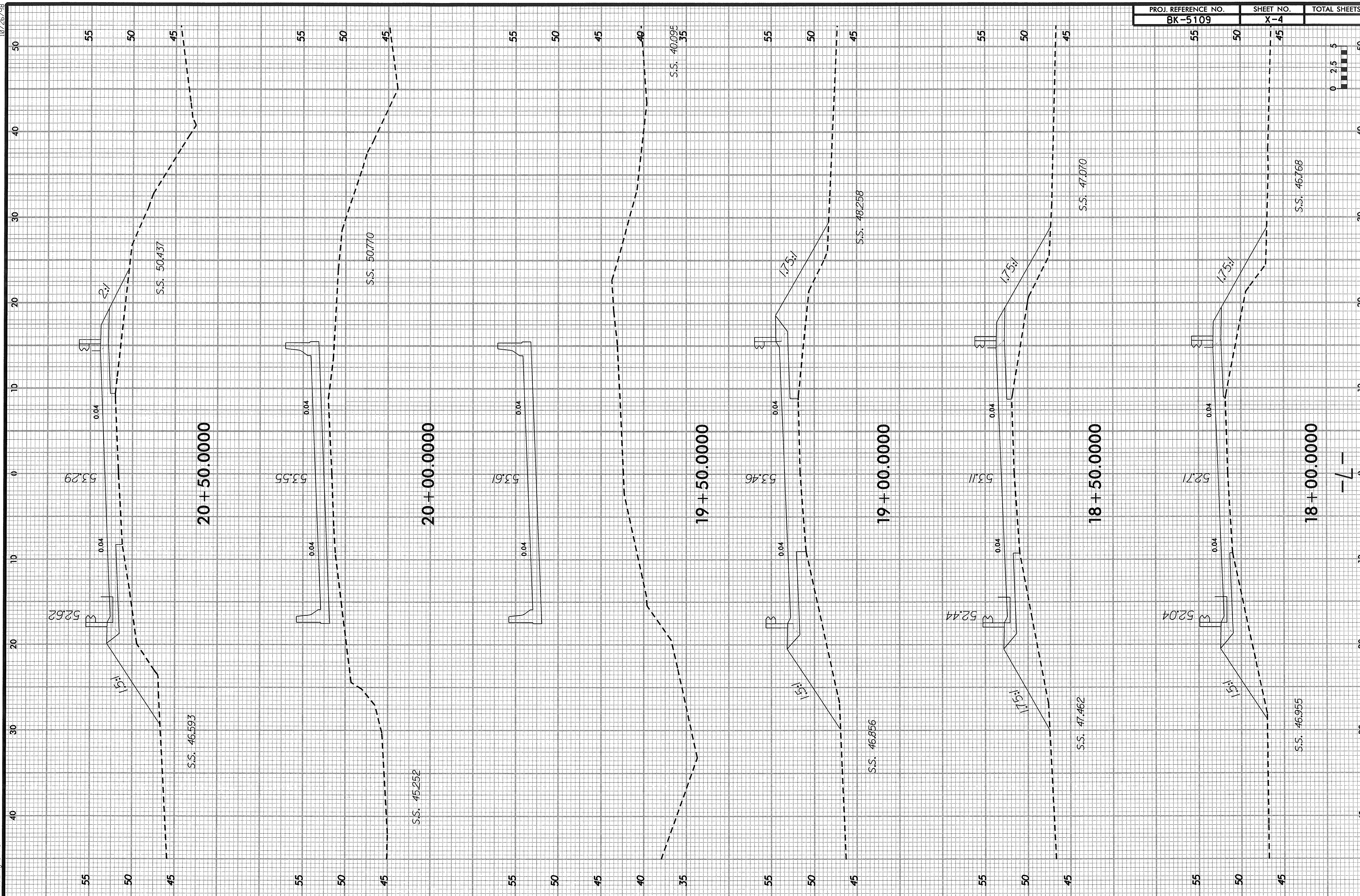
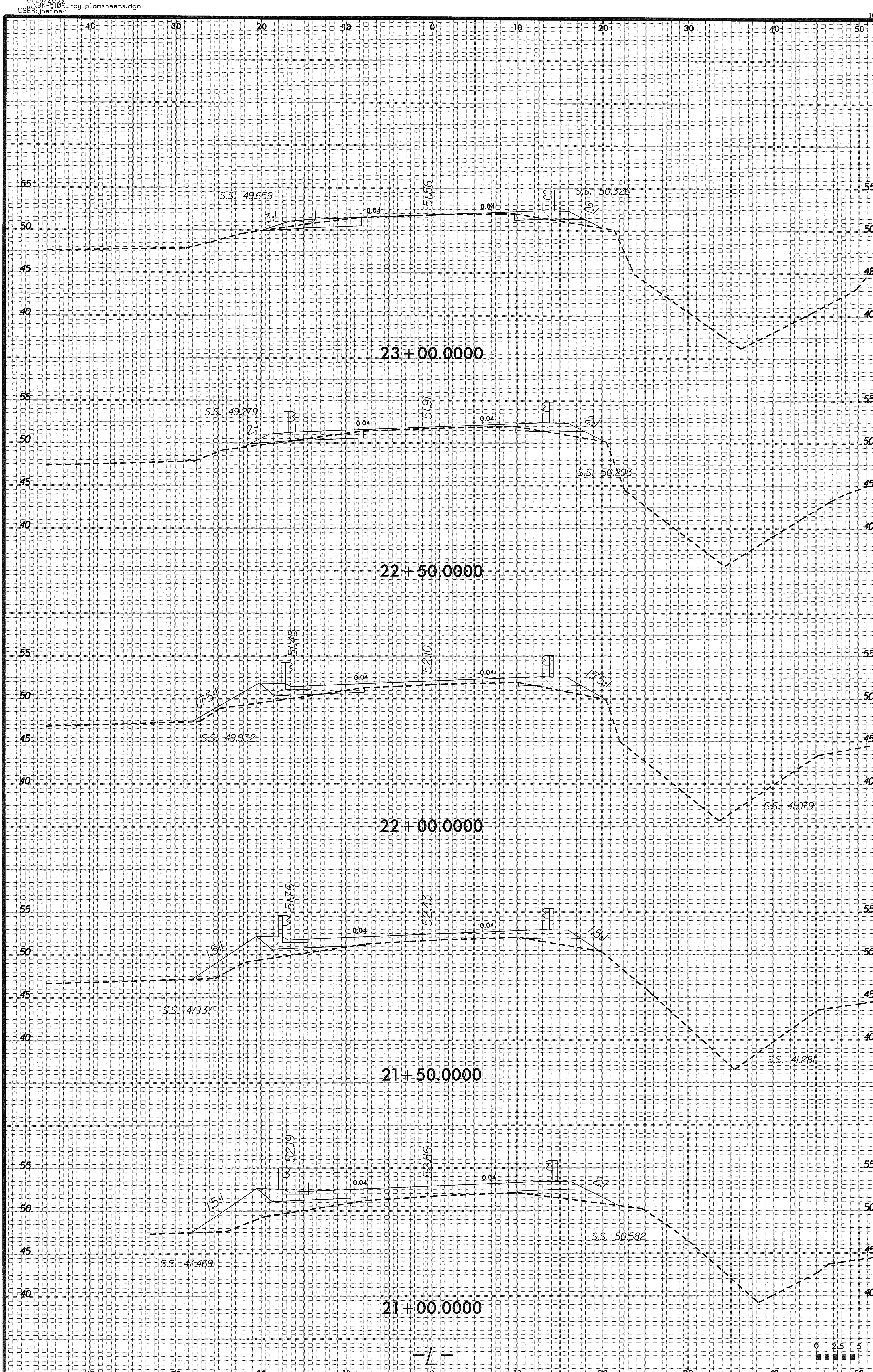


10/28/2009
...\BK-5109_rdy_plansheets.dgn
USER:jhefner

10/26/98



PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
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10/28/2009
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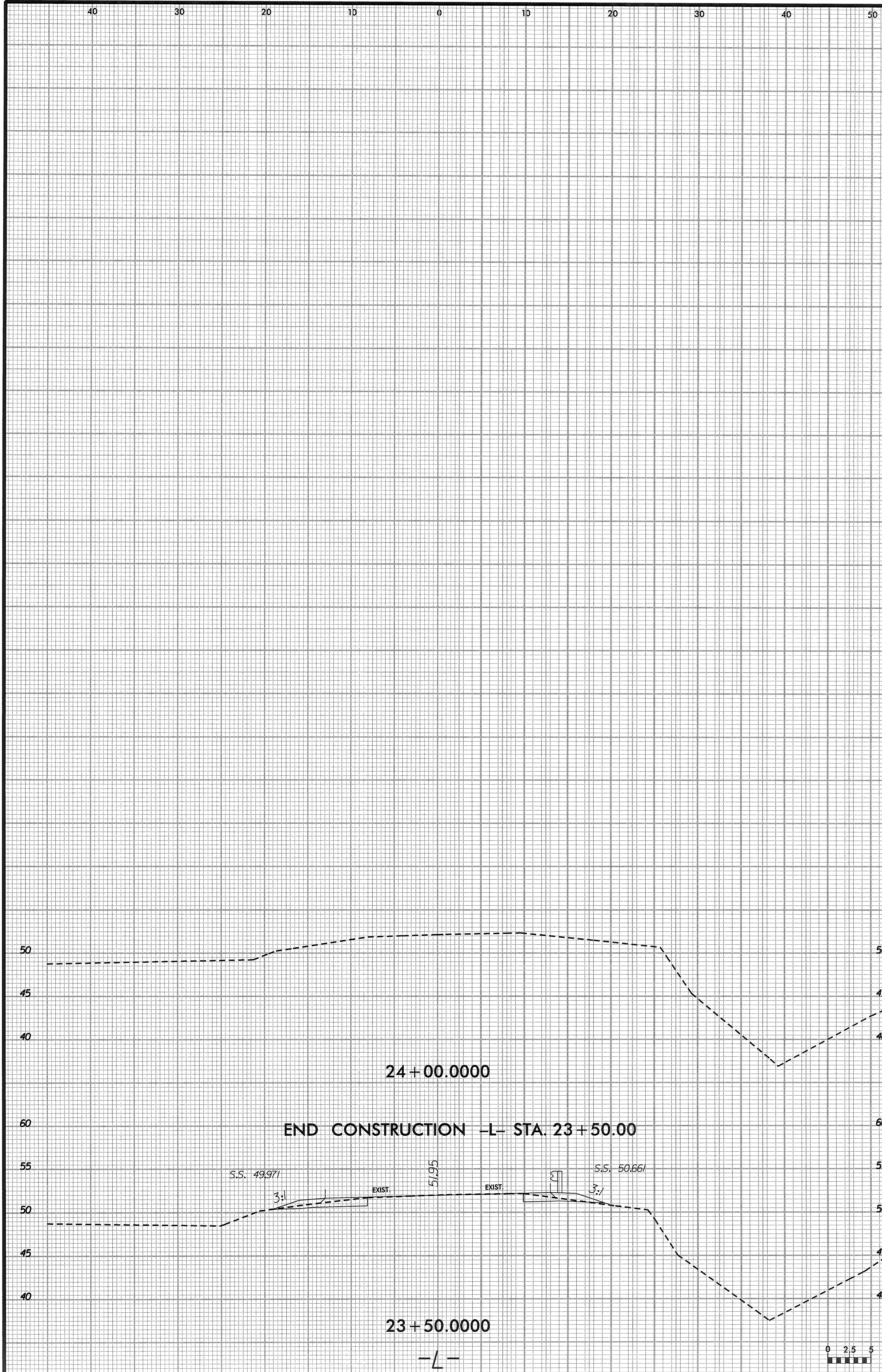
USER:jhefner

10/26/98



PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
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