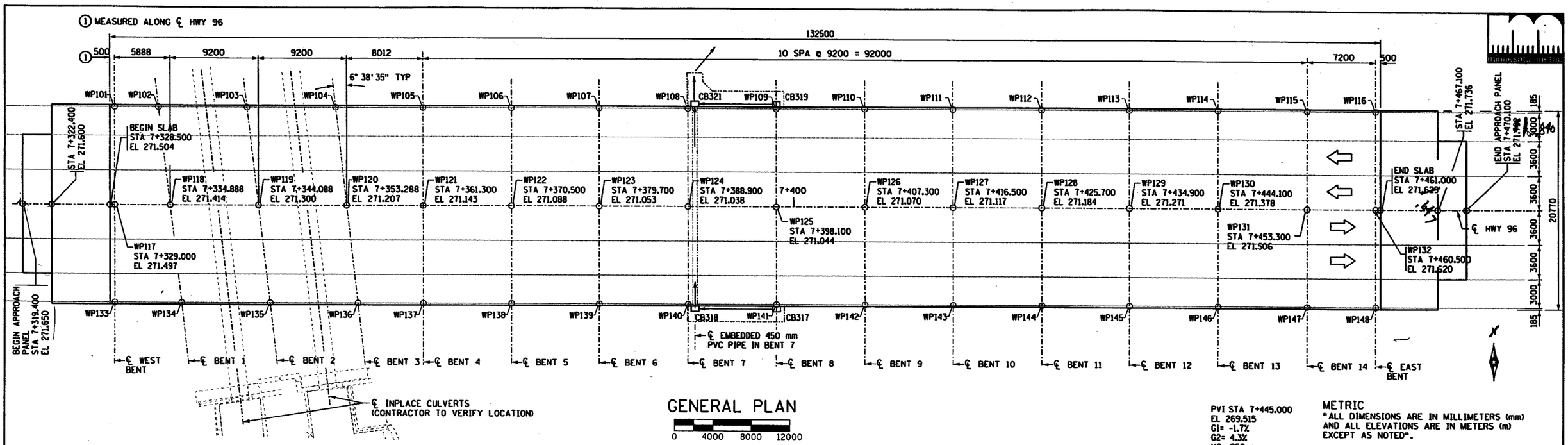
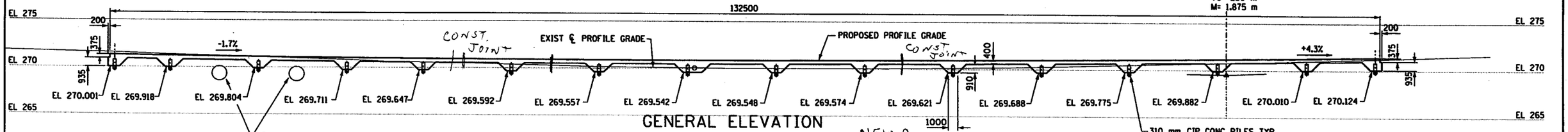


GENERAL PLAN

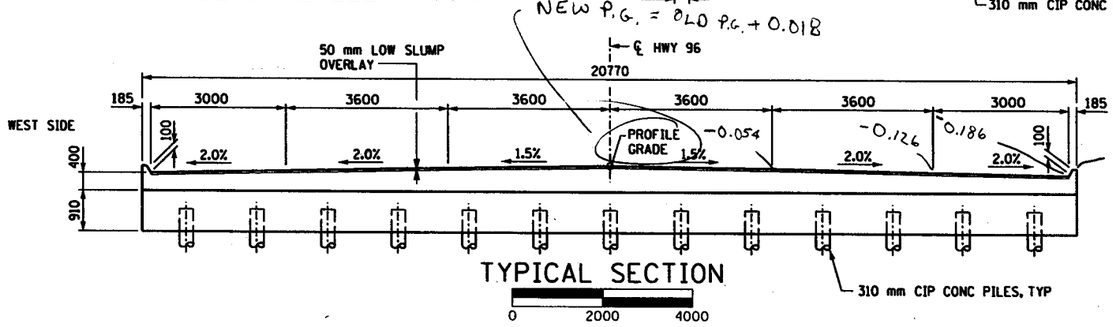
0 4000 8000 12000

PVI STA 7+445.000
EL 269.515
G1= -1.7%
G2= 4.3%
VC= 250 m
M= 1.875 m

METRIC
"ALL DIMENSIONS ARE IN MILLIMETERS (mm) AND ALL ELEVATIONS ARE IN METERS (m) EXCEPT AS NOTED".



GENERAL ELEVATION



TYPICAL SECTION

0 2000 4000

SUMMARY OF QUANTITIES

	ITEM	UNIT	QUANTITY
2301.553	BRIDGE APPROACH PANELS	m2	340 (P)
① 2401.501	STRUCTURE CONCRETE (1A43)	m3	24 (P)
2401.512	BRIDGE SLAB CONCRETE (3Y36)	m2	2752 (P)
① 2401.541	REINFORCEMENT BARS	kg	2370 (P)
2401.541	REINFORCEMENT BARS (EPOXY COATED)	kg	173040 (P)
2401.601	STRUCTURE EXCAVATION	LS	1
2402.591	EXPANSION JOINT DEVICES TYPE 100	m	42 (P)
2404.501	CONCRETE OVERLAY TYPE (3U17A)	m2	3038 (P)
2433.516	ANCHORAGES TYPE REINFORCING BARS	EACH	16
② 2452.507	C-I-P CONCRETE PILING DELIVERED 310 mm	m	5555
② 2452.508	C-I-P CONCRETE PILING DRIVEN 310 mm	m	5555
2452.519	C-I-P CONCRETE TEST PILE, 23 m LONG, 310 mm	EACH	1
2452.519	C-I-P CONCRETE TEST PILE, 30 m LONG, 310 mm	EACH	2
2452.519	C-I-P CONCRETE TEST PILE, 33 m LONG, 310 mm	EACH	1
2452.519	C-I-P CONCRETE TEST PILE, 36 m LONG, 310 mm	EACH	3
2452.519	C-I-P CONCRETE TEST PILE, 25 m LONG, 310 mm	EACH	1

① STORM SEWER SUPPORT
② INCLUDES 160 m FOR STORM SEWER SUPPORT

1.345

LIST OF SHEETS

NO	DESCRIPTION
B1	GENERAL PLAN & ELEVATION
B2	WORKING POINTS
B3	SLAB PLAN
B4	TYPICAL SECTIONS
B5	TYPICAL SECTIONS
B6	STORM SEWER SUPPORT DETAILS
B7	BAR LIST AND SUMMARY OF QUANTITIES
B8	WATERPROOF EXPANSION DEVICE
B9-B11	BRIDGE APPROACH PANELS / PAVEMENT JOINTS
B12	BRIDGE SURVEY
B13	BRIDGE SURVEY PLAN & PROFILE

BM ELEV 270.486 (MSL 1929 ADJ)

MnDOT MONUMENT NO 6224 G
TOP OF AQUEDUCT SOUTH SIDE HWY 96

CONSTRUCTION NOTES

THE 1995 EDITION OF THE MN/DOT "STANDARD SPECIFICATIONS FOR CONSTRUCTION" SHALL GOVERN.
THE FIRST TWO DIGITS OF EACH BAR MARK INDICATE THE BAR NUMBER WHICH APPROXIMATE THE NOMINAL DIAMETER OF THE BAR IN MILLIMETERS.
THE BARS MARKED WITH THE SUFFIX "E" SHALL BE EPOXY COATED.
DRAWINGS ARE NOT TO BE SCALED.

1.87

2018 PROJECTED TRAFFIC VOLUMES	
15500	ADT (1998)
23000	ADT (2018)
7.5%	HCADT (2018)

SEH

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA
SIGNED Nancy Daubenberger
DATE APRIL 19, 1999 REG NO 25151

FED PROJ NO IM494 - 4 (235)

DESIGN DATA

1996 (AND CURRENT INTERIM) A.A.S.H.T.O. DESIGN SPECIFICATIONS.
LOAD FACTOR DESIGN METHOD
MS22.5 LIVE LOAD
DEAD LOAD INCLUDES 0.8 kN/m² ALLOWANCE FOR FUTURE OVERLAY MODIFICATIONS.
MAXIMUM ALLOWABLE DESIGN STRESSES:
REINFORCED CONCRETE:
f'c = 28 MPa, n=8
fy = 420 MPa FOR REINFORCEMENT
DESIGN SPEED = 90 Km/h
APPROXIMATE DECK AREA IS 2752 m²
OPERATING RATING = MS33

MINNESOTA
DEPARTMENT OF TRANSPORTATION

BRIDGE NO 62590

IDENTIFICATION NO 209
CSAH 96 SUPPORTED SLAB
3.2 km W OF JCT OF CSAH 96 & CENTERVILLE RD
132.5 m SUPPORTED SLAB SPANS
4-3600 mm LANE

SEC 18 & 19 TWP 30 N R 22 W
CITIES OF NORTH OAKS & VADNAIS HEIGHTS RAMSEY CO

DATED: 4-12-99

STATE BRIDGE ENGINEER

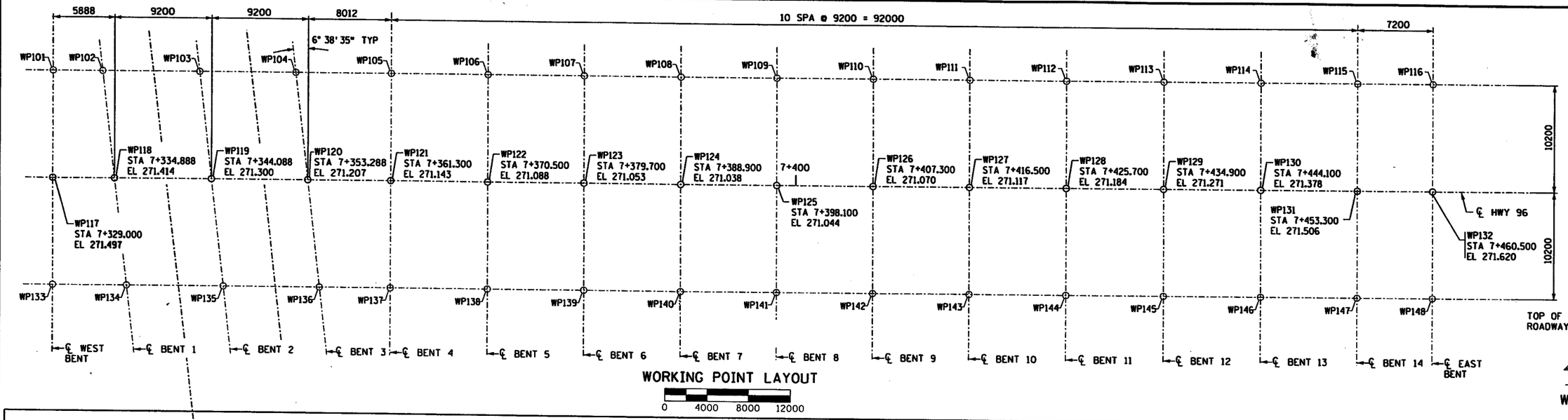
DES: MAW	DR: MAW	62590	
CHK: NTD	CHK: NTD		

STATE PROJ NO SP 62-696-09

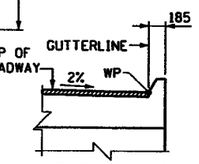
SHEET NO B1 OF B13 SHEETS

I:\struct\hwy96\hwy96gpe.dgn 19 APR 99

PILE CUT OFF = P.G. - 1.00 m



WORKING POINT LAYOUT



WORKING POINT SCHEMATIC

POINT	STATION	X COORDINATE	Y COORDINATE	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	TOP OF SLAB	POINT
101	7+329.000	174794.635	62543.602																																																		271.311	101
102	7+333.700	174799.334	62543.688	4700																																																		271.244	102
103	7+342.900	174808.532	62543.857		9200																																																	271.128	103
104	7+352.100	174817.731	62544.026			9200																																																271.032	104
105	7+361.300	174826.929	62544.196				9200																																															270.957	105
106	7+370.500	174836.128	62544.365					9200																																														270.902	106
107	7+379.700	174845.326	62544.534						9200																																													270.867	107
108	7+388.900	174854.525	62544.703							9200																																												270.852	108
109	7+398.100	174863.723	62544.872								9200																																											270.858	109
110	7+407.300	174872.921	62545.041									9200																																										270.884	110
111	7+416.500	174882.120	62545.210										9200																																									270.931	111
112	7+425.700	174891.318	62545.380											9200																																								270.998	112
113	7+434.900	174900.517	62545.549												9200																																							271.085	113
114	7+444.100	174909.715	62545.718													9200																																						271.192	114
115	7+453.300	174918.914	62545.887														9200																																					271.320	115
116	7+460.500	174926.112	62546.019															7200																																				271.434	116
117	7+329.000	174794.822	62533.403	10200															131895																																			271.497	117
118	7+334.888	174800.709	62533.512	11777	10269															5888																																		271.414	118
119	7+344.088	174809.908	62533.681		14559	10269															9200																																271.300	119
120	7+353.288	174819.106	62533.850			14559	10269															9200																														271.207	120
121	7+361.300	174827.117	62533.997				13736	10200															9200																													271.143	121
122	7+370.500	174836.315	62534.166					13736	10200															8012																												271.088	122
123	7+379.700	174845.514	62534.336						13736	10200															9200																											271.053	123
124	7+388.900	174854.712	62534.505							13736	10200															9200																										271.038	124
125	7+398.100	174863.911	62534.674								13736	10200															9200																								271.044	125
126	7+407.300	174873.109	62534.843									13736	10200															9200																							271.070	126
127	7+416.500	174882.307	62535.012										13736	10200															9200																						271.117	127
128	7+425.700	174891.506	62535.181											13736	10200															9200																					271.184	128
129	7+434.900	174900.704	62535.350												13736	10200															9200																				271.271	129
130	7+444.100	174909.903	62535.520													13736	10200															9200																			271.378	130
131	7+453.300	174919.101	62535.689														13736	10200															9200																		271.506	131
132	7+460.500	174926.300	62535.821															12485	10200															9200																	271.620	132
133	7+329.000	174795.010	62523.205	20400															133073	10200														7200																271.311	133
134	7+336.076	174802.085	62523.335	21592	20538															12414	10269														11895															271.212	134
135	7+345.276	174811.283	62523.504	26097	23456	20538															14559	10269													7076														271.101	135
136	7+354.476	174820.481	62523.674		29117	23456	20538															14559	10269												9200													271.011	136
137	7+361.300	174827.304	62523.799			27472	22379	20400															12970	10200											9200												270.957	137
138	7+370.500	174836.503	62523.968				27472	22379	20400															13736	10200										6824										270.902	138
139	7+379.700	174845.701	62524.137					27472	22379	20400															13736	10200									9200									270.867	139
140	7+388.900	174854.900	62524.306						27472	22379	20400															13736	10200									9200								270.852	140
141	7+398.100	174864.098	62524.476							27472	22379	20400															13736	10200									9200							270.858	141
142	7+407.300	174873.297	62524.645								27472	22379	20400															13736	10200									9200						270.884	142
143	7+416.500	174882.495	62524.814									27472	22379	20400															13736	10200									9200					270.931	143
144	7+425.700	174891.693	62524.983										27472	22379	20400															13736	10200									9200				270.998	144
145	7+434.900	174900.892	62525.152											27472	22379	20400															13736	10200									9200			271.085	145
146	7+444.100	174910.090	62525.321												27472	22379	20400															13736	10200									9200		271.192	146
147	7+453.300	174919.289	62525.491													27472	22379	20400															13736	10200									9200	271.320	147
148	7+460.500	174926.488	62525.623														26175	21633	20400															12485	10200									7200	271.434	148

J:\STRUCT\HWY96\HWY96WPI.DGN 13 APR 99

minnesota metric

SEH

CERTIFIED BY Nancy Daubenberger PROFESSIONAL ENGINEER
REG NO 25151 DATE 4-15-1999

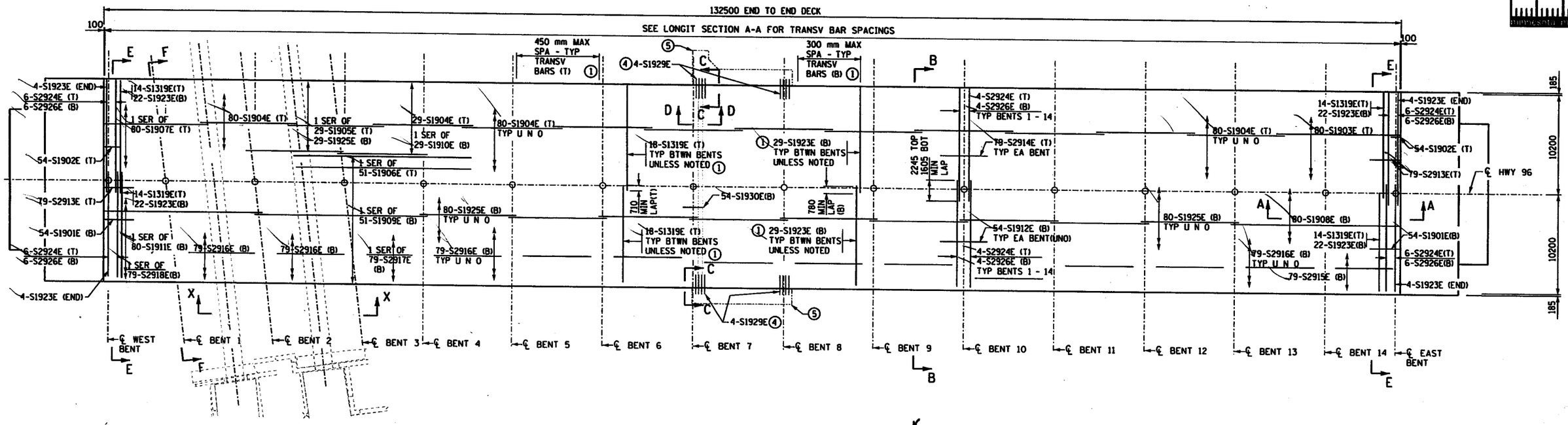
TITLE: WORKING POINTS
SP 62-696-09

DES: MAW	DR: MAW	APPROVED: 4-19-99
CHK: NTD	CHK: NTD	

SHEET NO B2 OF B13 SHEETS

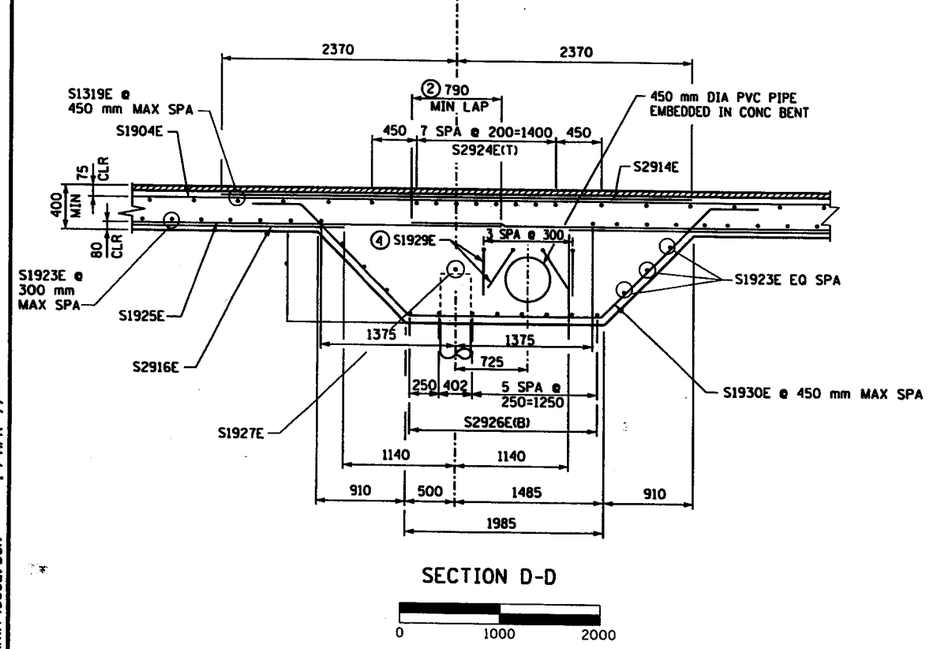
BRIDGE NO 62590

754



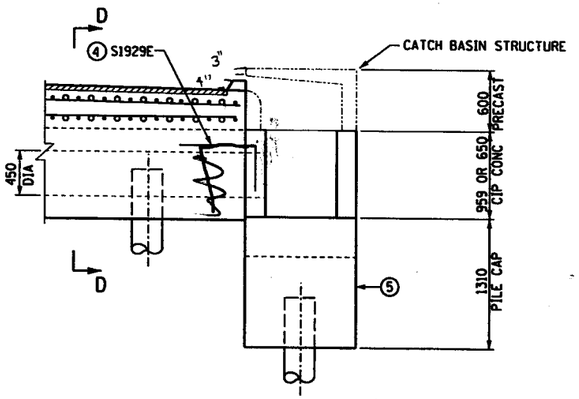
SLAB PLAN

0 4000 8000 12000



SECTION D-D

0 1000 2000



SECTION C-C

0 1000 2000

NOTES:

SEE SHEET B4 FOR SECTIONS A-A & B-B.

SEE SHEET B5 FOR SECTIONS E-E & F-F.

SEE SHEET B7 FOR BAR LIST AND SUMMARY OF QUANTITIES.

① SKEW TRANSVERSE REINF BETWEEN BENTS 1, 2 &3.
FLARE TRANSVERSE REINF BETWEEN WEST BENT AND BENT 1 AND BENTS 3 & 4.

④ ANCHORAGES TYPE REINFORCING BARS. MAINTAIN 75 mm CLR MIN.

⑤ SEE SHEET B6 FOR DETAILS AT SUPPORTED STORM SEWER STRUCTURE.

J:\STRUCT\HWY96\HWY96SS2.DGN 19 APR 99

CERTIFIED BY Nancy Daubenberger PROFESSIONAL ENGINEER
REG NO 25151 DATE 4-19-1999

TITLE: SLAB PLAN
SP 62-696-09

DES: NTD	DR: MAW	APPROVED: 4-19-99
CHK: JAJ	CHK: NTD	

SHEET NO B3 OF B13 SHEETS

BRIDGE NO 62590

COMPUTED PILE LOADS-kN/PILE	
WEST AND EAST BENTS	
DEAD LOAD *	210.6
LIVE LOAD	211.3
DESIGN LOAD	421.9

* INCLUDES DOWNDRAG PILE LOAD 80 kN

COMPUTED PILE LOADS-kN/PILE	
BENTS 1 THRU 14	
DEAD LOAD *	293.6
LIVE LOAD	199.6
DESIGN LOAD	493.4

* INCLUDES DOWNDRAG PILE LOAD 80 kN

COMPUTED PILE LOADS-kN/PILE	
STORM SEWER CROSSING	
DEAD LOAD *	327.4
LIVE LOAD	199.6
DESIGN LOAD	527.0

* INCLUDES DOWNDRAG PILE LOAD 80 kN

PILE NOTES:

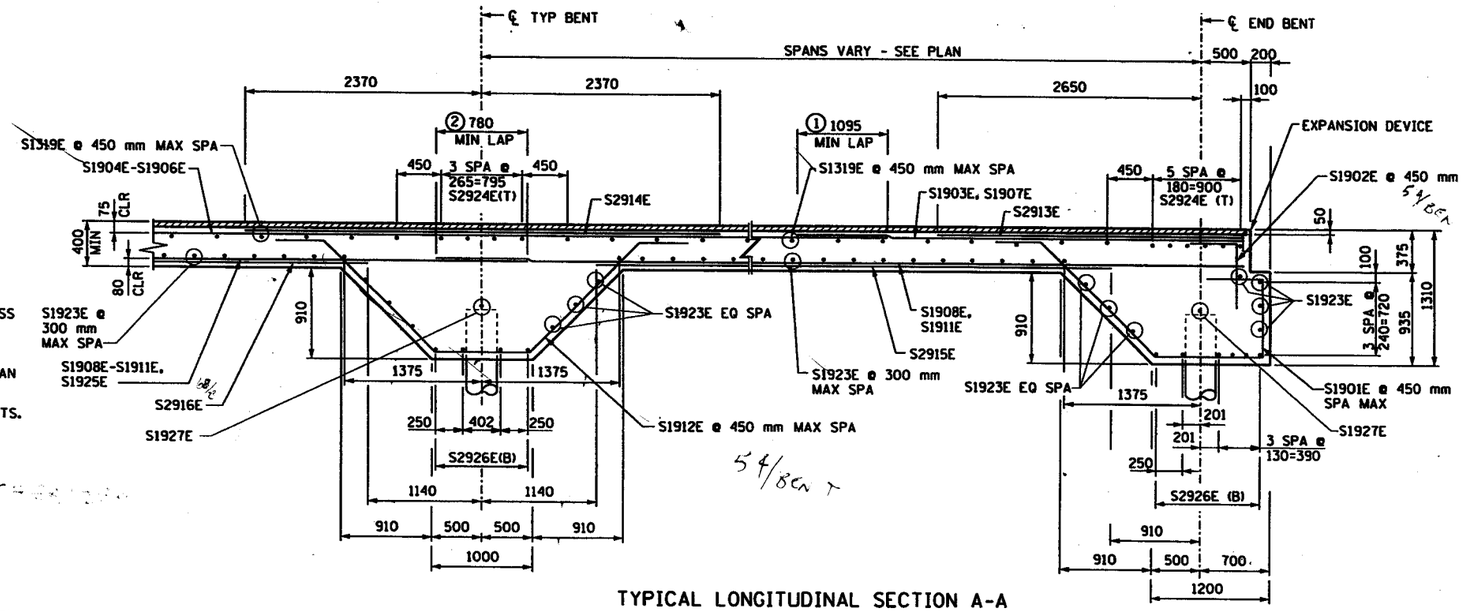
1 CIP TEST PILES 23 m LONG 310 mm.
1 CIP TEST PILES 25 m LONG 310 mm.
2 CIP TEST PILES 30 m LONG 310 mm.
1 CIP TEST PILES 33 m LONG 310 mm.
3 CIP TEST PILES 36 m LONG 310 mm.
29 CIP PILING EST LENGTH 21 m LONG 310 mm.
13 CIP PILING EST LENGTH 23 m LONG 310 mm.
13 CIP PILING EST LENGTH 24 m LONG 310 mm.
37 CIP PILING EST LENGTH 27 m LONG 310 mm.
12 CIP PILING EST LENGTH 30 m LONG 310 mm.
Ⓐ 93 CIP PILING EST LENGTH 32 m LONG 310 mm.
205 CIP PILING 310 mm REQUIRED TOTAL FOR BRIDGE.
PILE SPACING SHOWN IS AT BOTTOM OF FOOTING.
PILES TO HAVE A NOMINAL DIAMETER OF 310 mm.

DRIVE ALL WEST BENT AND EAST BENT PILES TO NOT LESS THAN 430 kN/PILE.
DRIVE INTERIOR BENT PILES AT STORM SEWER CROSSING TO NOT LESS THAN 530 kN/PILE.
DRIVE ALL OTHER INTERIOR BENT PILES TO NOT LESS THAN 500 kN/PILE.

Ⓐ INCLUDES 5 PILES 32 m LONG FOR STORM SEWER SUPPORTS.

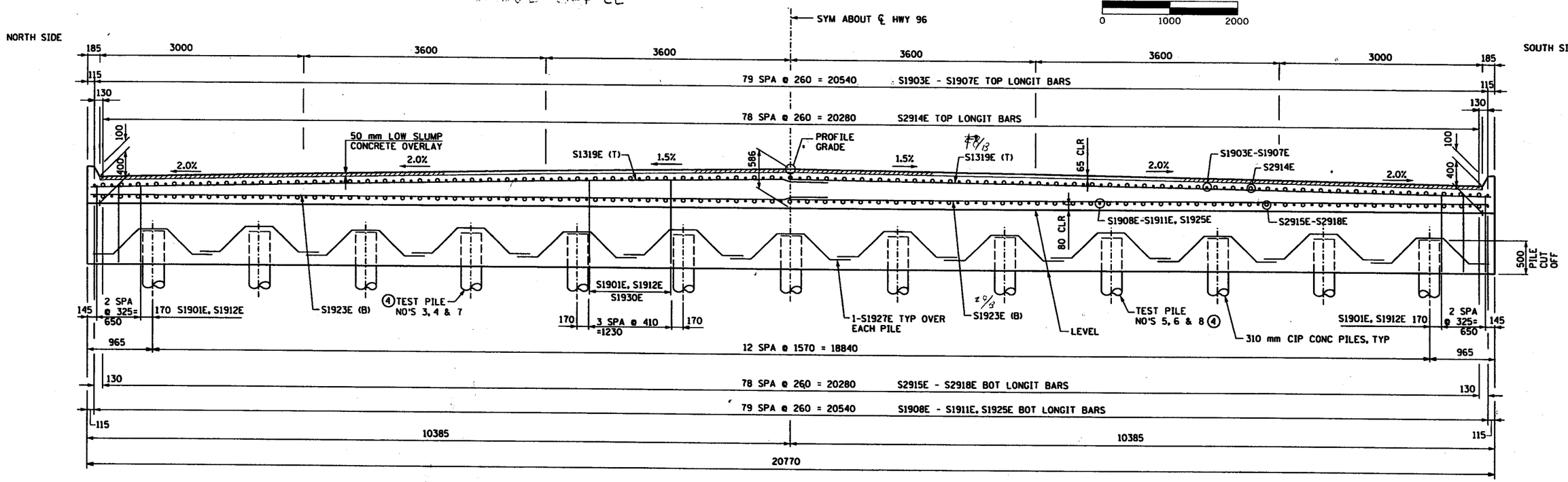
PAY SPLICES FOR OVER AUTHORIZED FOR DRIVING OUT ALL

TEST PILE - 100% OF BEARING REQ'D - ASK BRIDGE OFFICE



TYPICAL LONGITUDINAL SECTION A-A

0 1000 2000



TYPICAL TRANSVERSE SECTION B-B

(BENTS 4 THRU 14)

0 1000 2000

NOTES:
SEE SHEET B7 FOR BAR LIST AND SUMMARY OF QUANTITIES.

① CENTER SPLICE AT MIDSPAN.
② CENTER SPLICE OVER PILES.
④ SEE SHEET B13 FOR TEST PILE LOCATIONS.

CERTIFIED BY Nancy J. Daubenberger PROFESSIONAL ENGINEER
REG NO 25151 DATE 4-19-1999

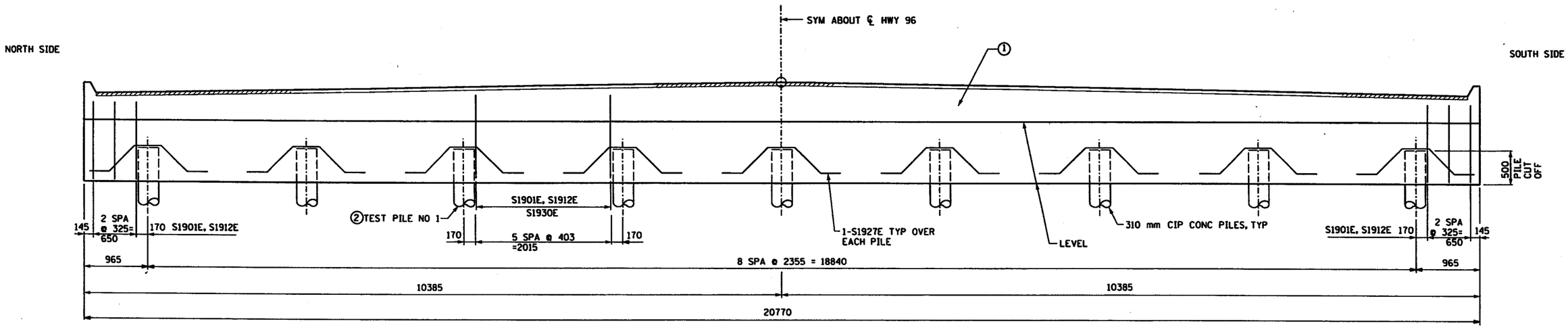
TITLE: TYPICAL SECTIONS
SP 62-696-09

DES: NTD	DR: MAW	APPROVED: 4-19-99
CHK: JAJ	CHK: NTD	

SHEET NO B4 OF B13 SHEETS

BRIDGE NO 62590

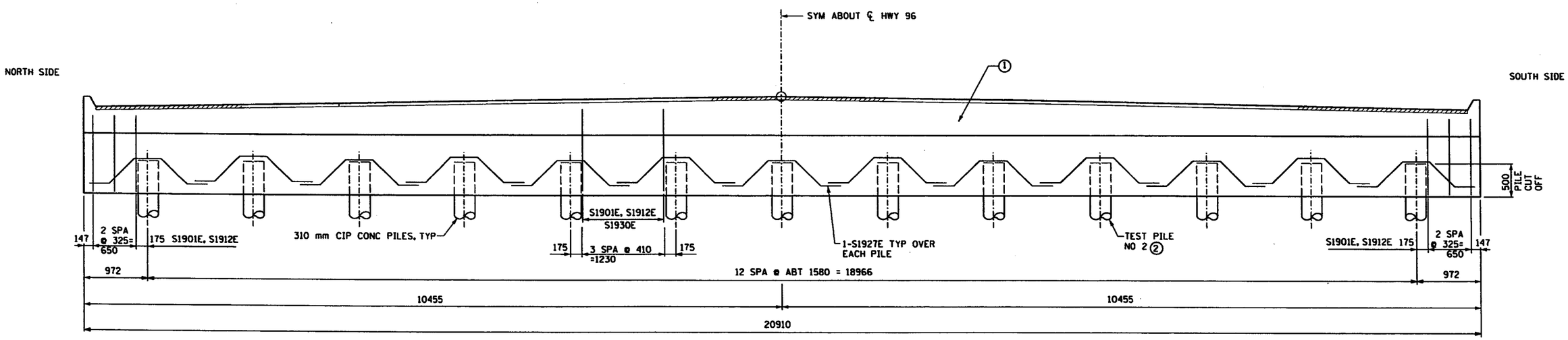
J:\STRUCT\HWY96\HWY96SSI.DGN 19 APR 99



TRANSVERSE SECTION E-E

(EAST AND WEST BENTS)

0 1000 2000



TRANSVERSE SECTION F-F

(SKEWED BENTS 1, 2 AND 3)

0 1000 2000

NOTES:

1. SEE SHEET B4, TYPICAL TRANSVERSE SECTION B-B, FOR SLAB TYPICAL TRANSVERSE SECTION AND ADDITIONAL DETAILS.
2. SEE SHEET B13 FOR TEST PILE LOCATIONS.

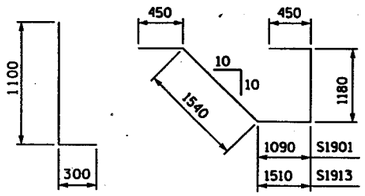
J:\STRUCT\HWY96\HWY96SS1.DGN 15 APR 99

CERTIFIED BY Nancy Daubenberger PROFESSIONAL ENGINEER REG NO 25151 DATE 4-15-1999	TITLE: TYPICAL SECTIONS SP 62-696-09	DES: NTD	DR: MAW	APPROVED: 4-19-99	BRIDGE NO 62590
		CHK: JAJ	CHK: NTD	SHEET NO B5 OF B13 SHEETS	

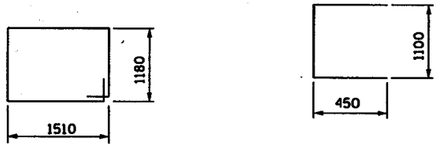
BILL OF REINFORCEMENT
STORM SEWER SUPPORT

MARK	NO	LENGTH	SHAPE	LOCATION
S1901	18	4710	BENT	ENDS
S1902	16	2000	BENT	ENDS
S2503	12	10000	STR	BOT SLAB
S1904	12	1520	STR	TRANS SLAB
S1905	12	10000	STR	TOP SLAB
S1906	14	5880	BENT	TIES
S2907	39	1120	STR	TRANS (T&B)
S1908	36	1120	STR	TRANS (B)
S1309	32	1120	STR	TRANS (T)
S1910	20	1120	STR	CB LOWER
S1611	72	1400	BENT	DOWELS
S1912	6	3400	STR	BOT SLAB
S1913	6	5130	BENT	ENDS
S1914	20	1520	STR	CB LOWER
S2915	16	3350	STR	T&B SLAB
S1916	40	600	BENT	CORNERS
S1917	28	700	STR	DIAG AT PIPES

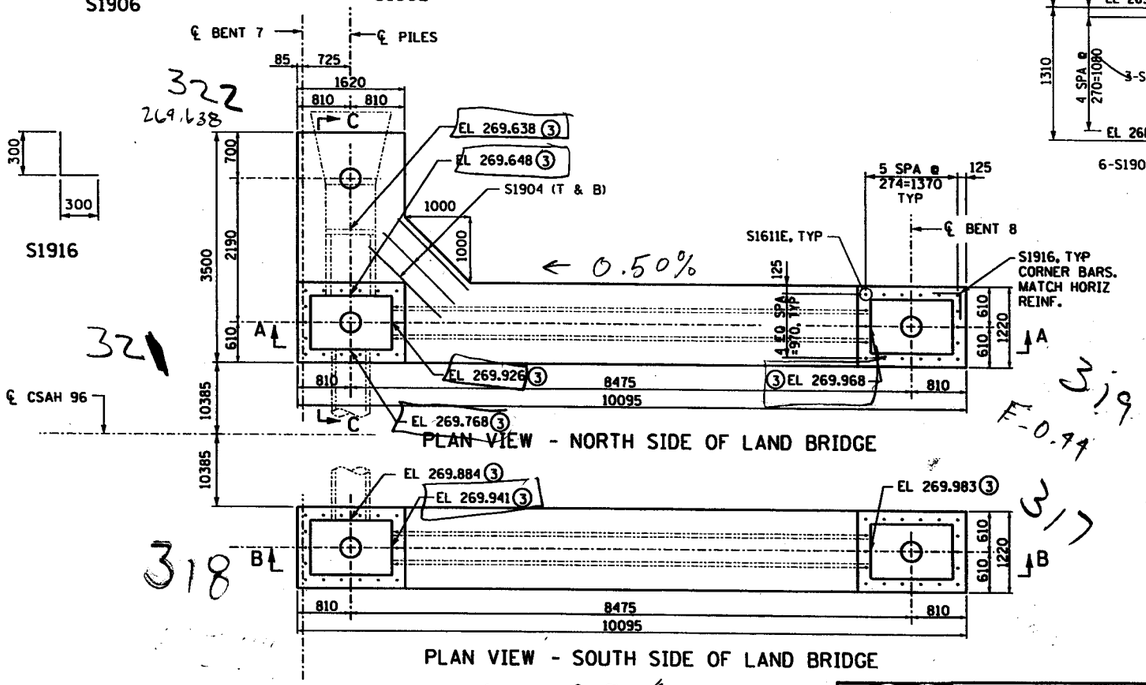
ADDITIONAL REINFORCEMENT BARS 2370 kg
ADDITIONAL CIP CONC PILING (5 AT 32 m LONG = 160 m)

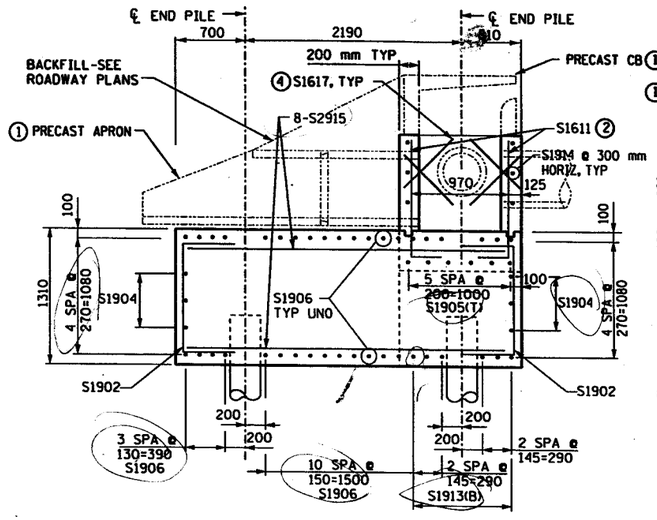


S1611 S1901, S1913

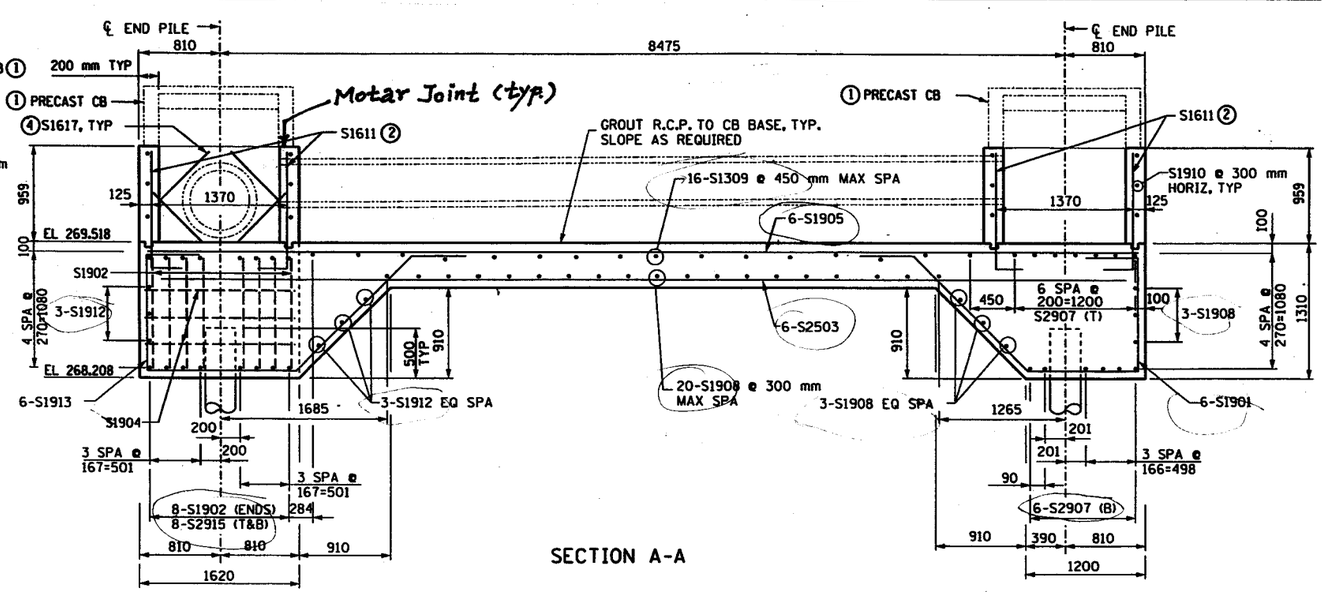


S1906 S1902

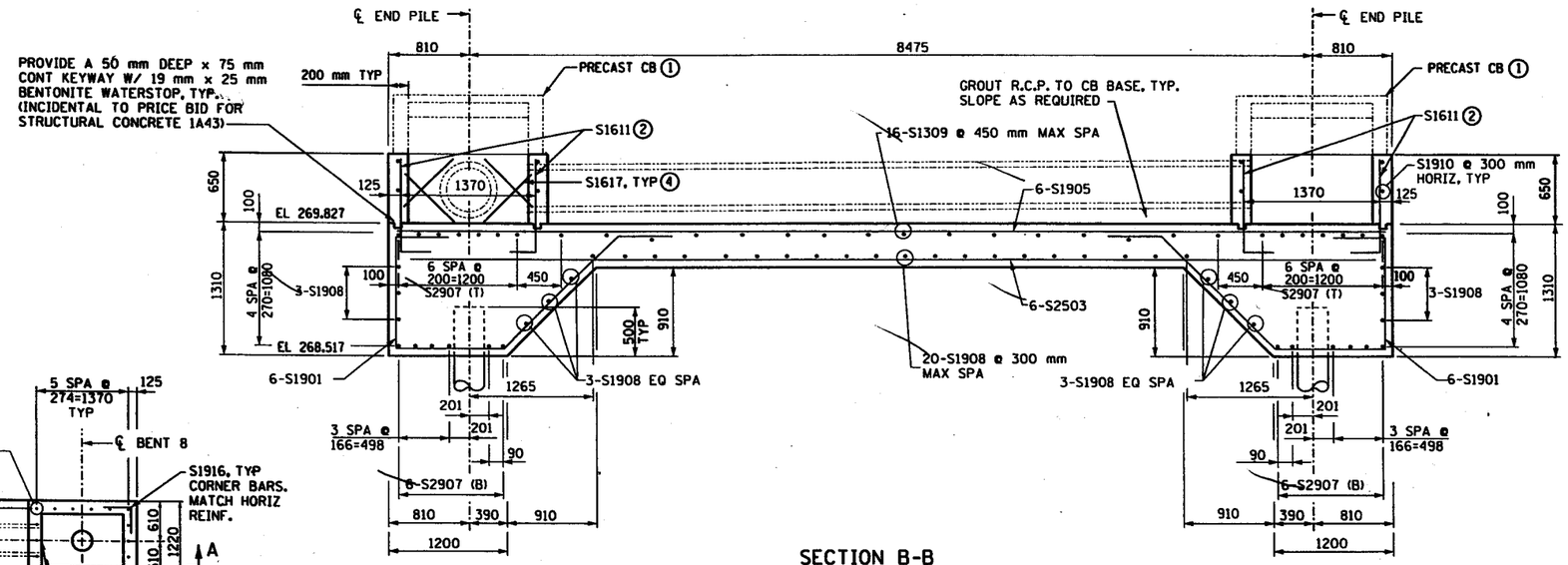




SECTION C-C



SECTION A-A



SECTION B-B

NOTES

PLACE ALL REINF 75 mm CLR UNLESS NOTED OTHERWISE.

① SEE ROADWAY PLANS.
② PULL UP TO 50 mm CLR TOP.
③ PIPE INVERT ELEVATIONS. SEE ROADWAY PLANS.
④ TYP DIAGONAL AT PIPE OPENINGS.

24
272.939
3.40%
269.530

J:\STRUCT\HWY96\HY96CBDT.DGN 19 APR 99

CERTIFIED BY Nancy Dornbusch PROFESSIONAL ENGINEER
REG NO 25151 DATE 4-19-1999

TITLE: STORM SEWER SUPPORT DETAILS
SP 62-696-09

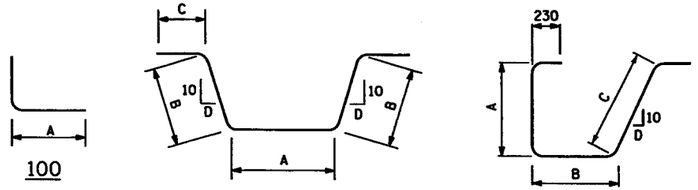
DES: NTD DR: MAW APPROVED: 4-19-99
CHK: PES CHK: NTD

SHEET NO B6 OF B13 SHEETS

BRIDGE NO 62590

BAR MARK	NO OF SERIES	NO OF BARS	LENGTH	TYPE	DIMENSION A	B	C	D	LOCATION
SUPERSTRUCTURE DECK									
EPOXY COATED BARS									
S1901E		108	4090	203	780	1090	1540	10	SLAB ENDS
S1902E		108	1100	100	650				SLAB ENDS
S1903E		80	12650	STR					SLAB TOP
S1904E		829	10300	STR					SLAB TOP
S1905E	1	29	9870	STR					SLAB TOP
			10300						
S1906E	1	51	16890	STR					SLAB TOP
			18560						
S1907E	1	80	10140	STR					SLAB TOP
			12530						
S1908E		80	17250	STR					SLAB BOT
S1909E	1	51	16590	STR					SLAB BOT
			18280						
S1910E	1	29	9150	STR					SLAB BOT
			10000						
S1911E	1	80	14740	STR					SLAB BOT
			17130						
S1912E	2	~~702~~	4900	118	920	1540	450	10	SLAB AT BENTS
S2913E		160	3100	STR					SLAB TOP ENDS
S2914E		1106	4740	STR					SLAB TOP BENTS
S2915E		~~79~~	5150	STR					SLAB B EAST END
S2916E		~~948~~	6920	STR					SLAB B BTWN BENTS
S2917E	1	79	4540	STR					SLAB BOT
			6920						
S2918E	1	79	2640	STR					SLAB BOT
			5530						
S1319E		~~524~~	10810	STR					TRANSV TOP
S1923E	60	~~860~~	10800	STR					TRANSV BOT
S2924E	80	~~144~~	11500	STR					TRANSV TOP
S1925E		749	9980	STR					SLAB BOT
S2926E	~~48~~	~~144~~	11150	STR					TRANSV TOP
S1927E	65	~~200~~	2080	118	400	540	300	10	PILE TOPS
S1929E		~~16~~	1260	100	800				ANCHORAGES
S1930E		~~64~~	5960	118	1920	1570	450	10	SLAB AT BENT 7

BAR BENDING DIAGRAMS



* BAR TYPE USES STANDARD STIRRUP AND TIE HOOKS.

NOTE
BENT BAR DIMENSIONS GIVEN ARE OUT-TO-OUT. ACTUAL BAR LENGTHS SHALL BE DETERMINED BASED ON DIMENSIONS SHOWN IN THE BAR BENDING DIAGRAMS. TOTAL BAR LENGTHS SHOWN ARE FOR USE IN COMPUTING REINFORCEMENT BAR WEIGHTS FOR PAYMENT ONLY.

SUMMARY OF QUANTITIES FOR SUPERSTRUCTURE

	ITEM	UNIT	QUANTITY
(3)	BRIDGE SLAB CONCRETE (3Y36)	m2	2752
	REINFORCEMENT BARS (EPOXY COATED)	kg	173040
	EXPANSION JOINT DEVICES TYPE 100	m	42
(3)(4)	CONCRETE OVERLAY TYPE (3U17A)	m2	3038
(1)	BRIDGE NAME PLATE	EACH	1
(2)	BENCH MARK DISK	EACH	1
(5)	ANCHORAGES TYPE REINFORCING BARS	EACH	16

(1) INCLUDED IN PRICE BID FOR OTHER ITEMS.

(2) STATE WILL FURNISH DISK. BEND PRONGS OUTWARD TO ANCHOR DISK IN CONCRETE. BOTTOM OF DISK TOP TO BE PLACED FLUSH WITH CONCRETE.

(3) THE APPROXIMATE CONCRETE QUANTITIES ARE:
BRIDGE SLAB CONCRETE
1825 m3
CONCRETE OVERLAY
152 m3

(4) INCLUDES 340 m2 FOR BRIDGE APPROACH PANELS.

(5) INCLUDES THE FOLLOWING WEIGHT OF EPOXY COATED REINFORCING BARS 45 kg.

J:\STRUCT\HWY96\HWY96SSB.DGN 13 APR 99

minnesota metric

SEH

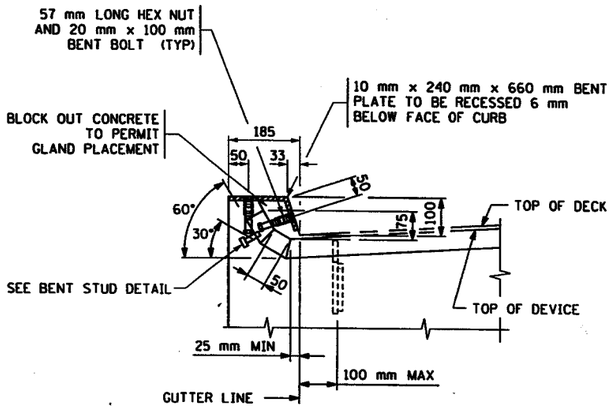
CERTIFIED BY Nancy Daubenberger PROFESSIONAL ENGINEER
REG NO 25151 DATE 4-15-1999

TITLE: BAR LIST & SUMMARY OF QUANTITIES SP 62-696-09

DES: MAW DR: MAW APPROVED: 4-19-99
CHK: NTD CHK: NTD

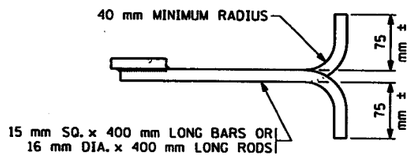
SHEET NO B7 OF B13 SHEETS

BRIDGE NO 62590

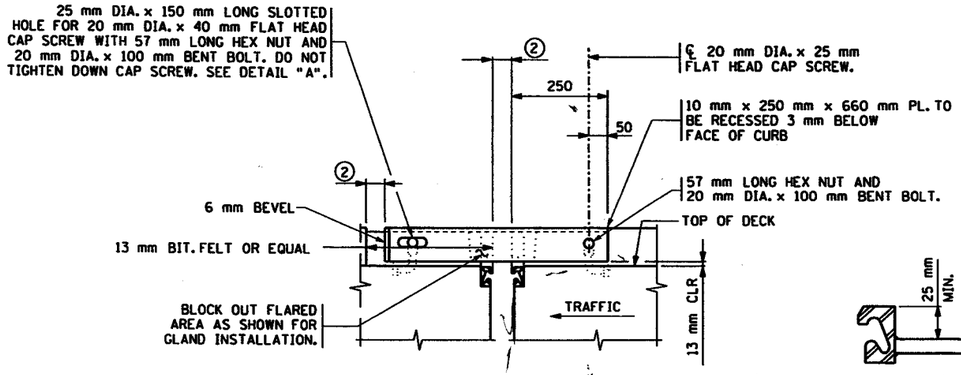


SECTION THROUGH CURB

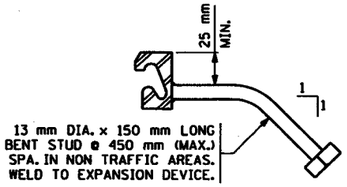
(DESIGN B4 CURB)



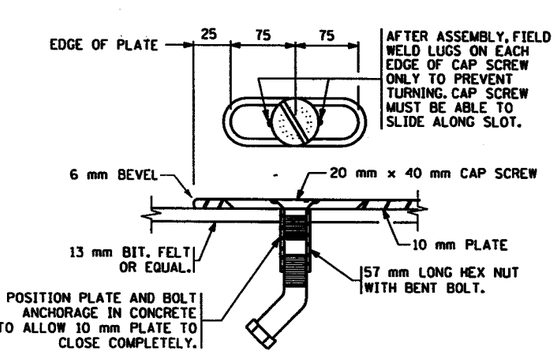
BAR-ROD DETAIL



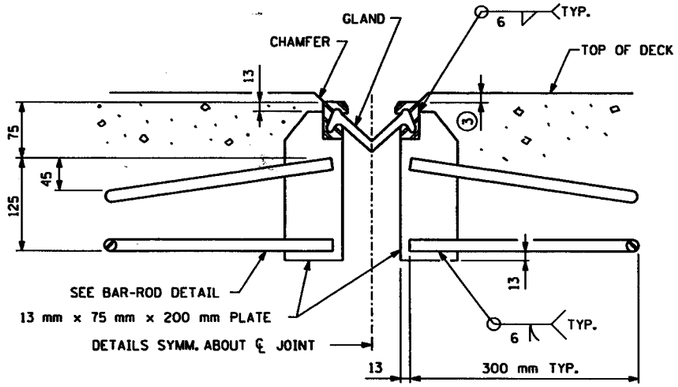
CURB ELEVATION



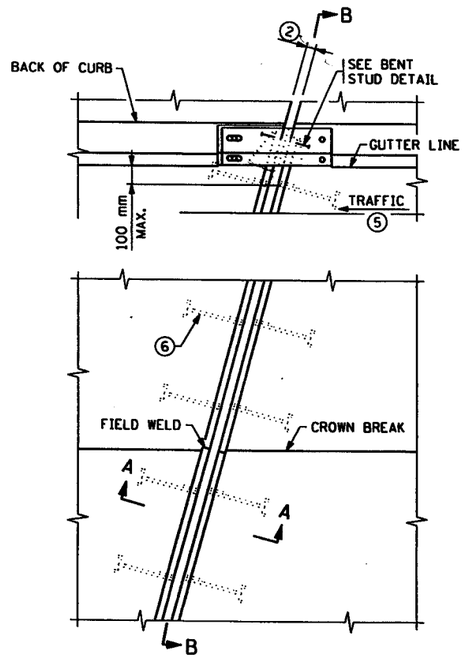
BENT STUD DETAIL



DETAIL "A"

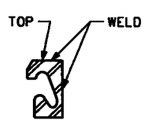


SECTION A-A

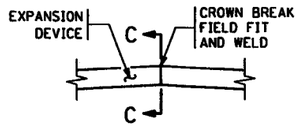


PLAN VIEW @ EXPANSION DEVICE

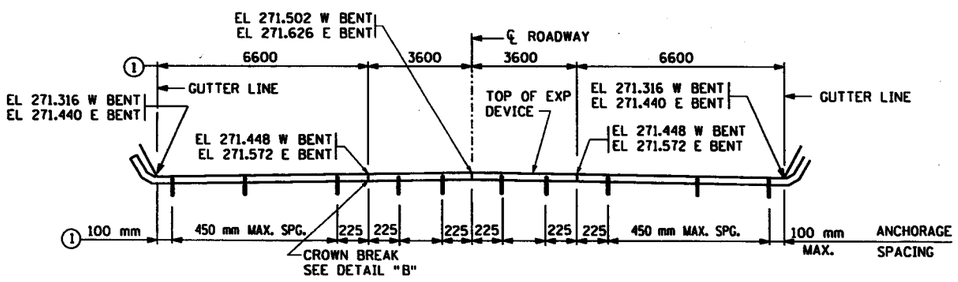
(WITH STRAIGHT DEVICE)



SECTION C-C



DETAIL B



SECTION B-B ~ ALONG ℄ JOINT

(ELEVATIONS SHOWN ARE 3 mm BELOW TOP OF SLAB @ ℄ JT.)

NOTES

GALVANIZE STRUCTURAL STEEL AFTER FABRICATION AS PER SPEC. 3394. GALVANIZE FASTENERS AS PER SPEC. 3392.

JOINTS IN EXTRUSION SHALL BE LOCATED AT BREAKS IN TRANSVERSE PROFILE AND AS OTHERWISE REQUIRED. JOINTS SHALL BE CLOSE FIT AND WELDED. REPAIR AFTER WELDING AS PER SPEC. 2471.3L.

STRUCTURAL STEEL SHALL COMPLY WITH SPEC. 3306 OR SPEC. 3309.

EXPANSION DEVICE SHALL BE STRAIGHTENED TO A TOLERANCE OF 1 mm IN 1 METER.

CAP SCREWS SHALL BE COUNTERSUNK 2 mm BELOW TOP OF PLATE.

LENGTH OF PAYMENT FOR DEVICE IS FROM OUT TO OUT OF EXTRUSION ALONG CENTERLINE OF JOINT.

① DIMENSIONS ARE ALONG CENTERLINE OF JOINT.

② 50 mm 23° C.

③ 3 mm (6 mm MAX.) 13 mm (16 mm MAX.) WHEN SNOWPLOW FINGERS ARE USED. SNOWPLOW FINGERS ARE REQUIRED FOR SKEWS OVER 15° AND LESS THAN 50°.

④ SEE SUPERSTRUCTURE DETAILS FOR RADIUS.

⑤ SEE SHEET 1 FOR DIRECTION OF TRAFFIC.

⑥ PLACE BAR-ROD NORMAL TO JOINT ON NEW BRIDGES AND JOINT REPLACEMENTS. ON JOINT REPLACEMENTS WHEN SKEW IS OVER 15° AND LESS THAN 50° BEND RODS PARALLEL TO ℄ ROADWAY.

J:\STRUCTNHWY96\HW967627.DGN 13 APR 99

APPROVED: _____

STATE BRIDGE ENGINEER

NOTE: ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.

minnesota metric

SEH

CERTIFIED BY Nancy Daubenberger PROFESSIONAL ENGINEER

REG NO 25151 DATE 4-15-1999

TITLE: WATERPROOF EXPANSION DEVICE (WITH DESIGN B4 CURB) SP 62-696-09

DES: MnDOT/MAW	DR: MnDOT/MAW	APPROVED: 4-19-99
CHK: NTD	CHK: NTD	

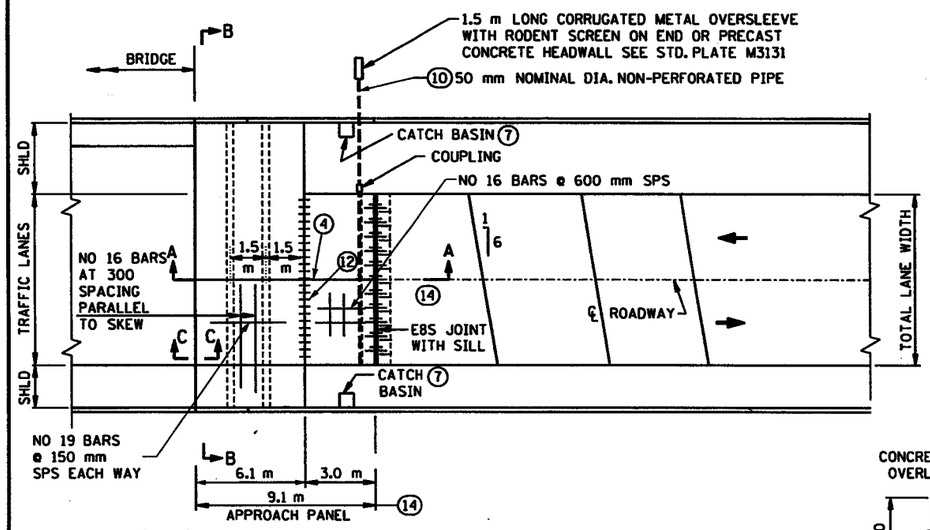
SHEET NO B8 OF B13 SHEETS

BRIDGE NO 62590

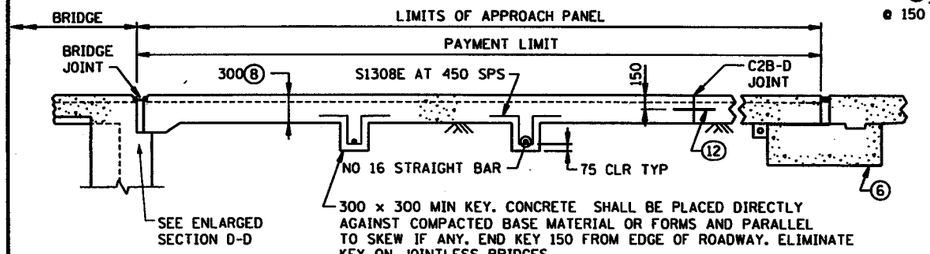
MODIFIED

FIG. 5-397.627M

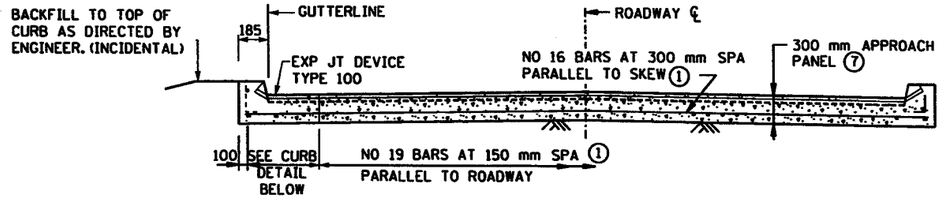
651-A90-2079



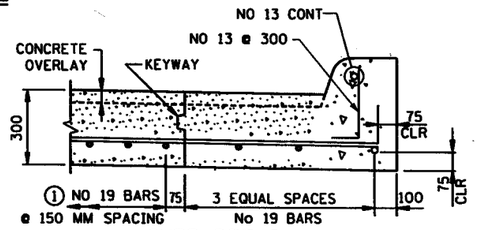
DIVIDED-URBAN ROADWAY PLAN
PARALLEL & NONPARALLEL WINGWALLS



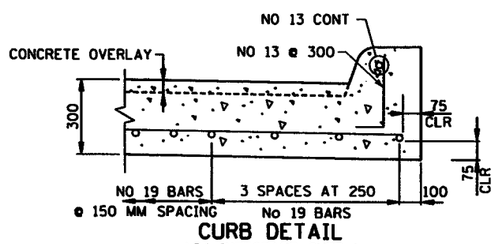
SECTION A-A
(SOME REINFORCEMENT NOT SHOWN)



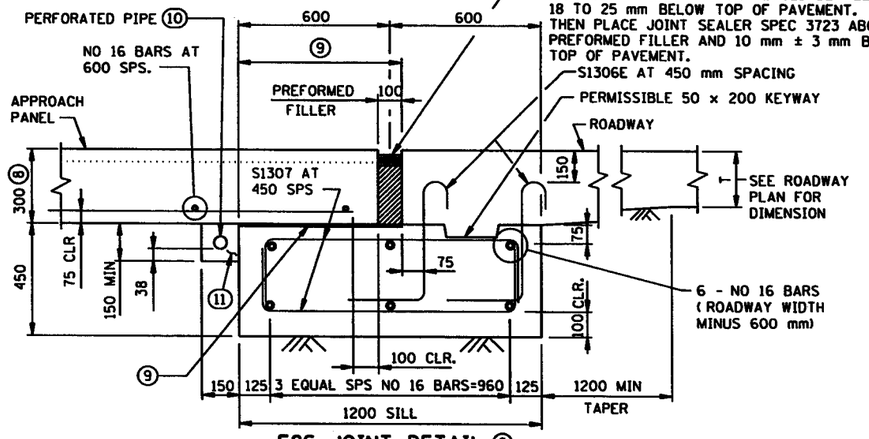
SECTION B-B
(SEE ROADWAY PLAN VIEW)



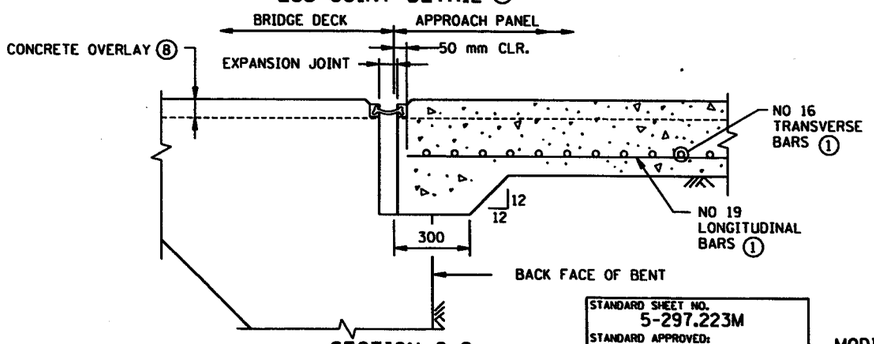
CURB DETAIL
(B424 MODIFIED CURB AND GUTTER)



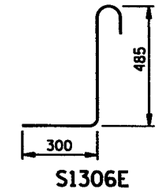
CURB DETAIL
(B4 INTEGRANT CURB)



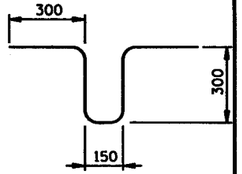
E8S JOINT DETAIL (6)



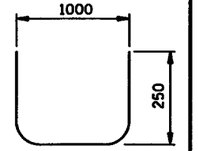
SECTION C-C



S1306E



S1308E



S1307E

NOTES:

(1) ALL REINFORCEMENT IN APPROACH PANEL, SILL AND CURB SHALL BE GRADE 60 AND EPOXY COATED AS PER SPEC. 3301.

(4) L2KT OR L1T LONGITUDINAL JOINTS AS REQUIRED SEE STANDARD PAVEMENT JOINT SHEET FOR DETAILS.

(5) EDGE OF PANEL PERPENDICULAR TO GUTTER FOR SKEWS OVER 45°.

(6) 450 mm x 1200 mm CONCRETE SILL UNDER TRAFFIC LANES ONLY WHEN MAINLINE ROADWAY PAVEMENT IS CONCRETE. CONCRETE SILL AND CURBING IF REQUIRED IS INCLUDED IN APPROACH PANEL PAY ITEM.

(7) LOCATION MAY BE ON OR OFF THE APPROACH PANEL AS DETERMINED BY THE DESIGNER. SEE ROAD DESIGN MANUAL CHAPTER 7 FOR CATCH BASIN INFORMATION.

(8) APPROACH SLAB THICKNESS SHOWN INCLUDES ANY CONCRETE OVERLAY THAT MAY BE REQUIRED. CHECK BRIDGE PLANS FOR OVERLAYS. CONCRETE OVERLAYS TO BE INCLUDED IN BRIDGE QUANTITIES AND DONE AT THE SAME TIME BY BRIDGE CONTRACTOR.

(9) 3 mm THICK PLASTIC SHEETING SPEC. 3756 TO BREAK BOND. COVER AREA SHOWN IN DETAIL.

(10) 50 mm NOMINAL DIA. THERMOPLASTIC PIPE, AS PER ASTM 1785, 1120, OR 2120, SCHEDULE 80. SLOPE PIPE TO DITCH ON LOW SIDE. FURNISHING AND INSTALLING DRAIN SYSTEM SHALL BE INCIDENTAL, WITH NO DIRECT PAYMENT. WRAP PERFORATED PIPE WITH GEOTEXTILE AS PER SPEC.3733. 1% MINIMUM SLOPE.

(11) BACKFILL WITH FINE AGGREGATE, SPEC. 3149, MODIFIED TO 0-3% PASSING A NO. 200 SIEVE.

(12) CONTRACTION JOINT C2B-D WITH 38 mm DIA x 450 mm LG EPOXY COATED DOWEL BARS AT 300 mm SPACING PARALLEL TO ℄ OF ROADWAY. CAGES NOT REQUIRED.

STANDARD SHEET NO.
5-297.223M
STANDARD APPROVED:
FEBRUARY 24, 1994

MODIFIED

J:\STRUCT\HWY96\HWY96224.DGN 19 APR 99

CERTIFIED BY Nancy Daubenberger PROFESSIONAL ENGINEER
REG NO 25151 DATE 4-19-1999

TITLE: BRIDGE APPROACH PANEL WITH OR WITHOUT CONCRETE OVERLAY CONCRETE ROADWAY
SP 62-696-09

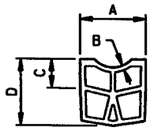
DES: MnDOT/MAW	DR: MnDOT/MAW	APPROVED: 4-19-99
CHK: NTD	CHK: NTD	

SHEET NO B9 OF B13 SHEETS

BRIDGE NO 62590

REQUIRED DIMENSIONS

JOINT TYPE	TRANSVERSE
NOMINAL SEALER SIZE	21 mm USE IN ALL 10 JOINTS
A	20 mm +3.6 -1.3
B	2 mm ±0.5
C	15 mm MIN.
D	20 mm MIN.
WEB AND WALL THICKNESS, UNLESS NOTED	0.8 mm MIN.



SPEC. REFERENCE 3721

TYPICAL SHAPE FOR SATISFACTORY INSTALLATION IN JOINT (5 CELL MIN.)

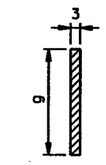
NOTES:

"A" DIMENSION SHALL APPLY AT ANY POINT THROUGHOUT "C" DEPTH. IN ITS FINAL POSITION, THE TOP CORNERS OF THE PREFORMED JOINT SEALER SHALL BE PLACED NOT LESS THAN 3 mm, NOR MORE THAN 7 mm BELOW THE PAVEMENT SURFACE.

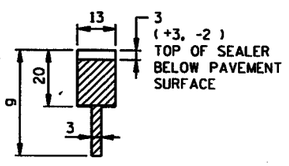
SHARP INTERNAL CORNERS WILL NOT BE PERMITTED. ALL CORNERS SHALL BE PROVIDED WITH SUITABLE FILLET. CURRENTLY APPROVED CONFIGURATIONS ARE ON FILE IN THE MATERIALS ENGINEERING SECTION, MINNESOTA DEPARTMENT OF TRANSPORTATION.

CONTRACTION JOINT SEALER

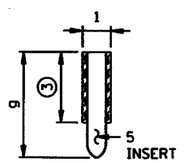
PREFORMED ELASTIC TYPE



DETAIL A
FORMED & SAWED



DETAIL B ②
SAWED

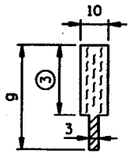


DETAIL C
FORMED
(INSERT TO BE REMOVED)

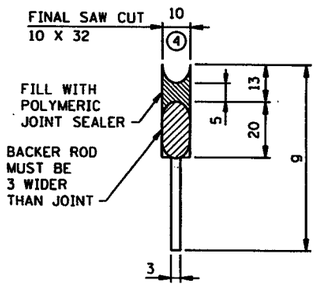
CLASS DESIGNATION		JOINT DETAIL	JOINT SEALER SPEC.
WITHOUT DOWELS	WITH DOWELS		
C1A	C1A-D	A	UNSEALED
C2B	C2B-D	B	3720
C2X	C2X-D	B OR C	3720
C3D	C3D-D	D	3721
C3X	C3X-D	C OR D	3721
C4E	C4E-D	E	POLYMERIC

CONTRACTION JOINT DEPTH & DOWEL BAR TABLE ⑤

PAVEMENT THICKNESS T	CONCRETE BASE JOINT DEPTH g	DOWEL BAR DIAMETER
150-160	32	25
165-265	50	32
270-320	—	38
325-355	—	44



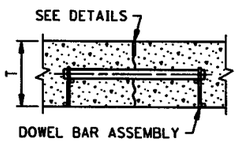
DETAIL D
SAWED



DETAIL E
SAWED

LEGEND — EXAMPLE C2B-D

- C = CONTRACTION JOINT
- NO. = SEALANT TYPE
  - 1 = UNSEALED
  - 2 = 3720
  - 3 = 3721
  - 4 = MOISTURE CURED POLYMERIC
- LETTER = DETAIL
  - X = MORE THAN 1 DETAIL
- -D = DOWEL BARS



SECTION AT JOINT

CONTRACTION JOINT NOTES:

IN CONCRETE BASE CONSTRUCTION THE CONTRACTION JOINTS SHALL BE SPACED AT 9 m INTERVALS AND AT RIGHT ANGLES TO THE LONGITUDINAL JOINTS, EXCEPT AS NOTED BELOW. WHERE THE CONCRETE BASE IS CONSTRUCTED ADJACENT TO EXISTING PAVEMENT OR BASE, THE CONTRACTION JOINTS IN THE NEW BASE SHALL MATCH THOSE IN THE EXISTING PAVEMENT OR BASE, EXCEPT THAT THE SPACING SHALL NOT BE LESS THAN 4.6 m, NOR MORE THAN 9 m.

JOINT WIDTH TOLERANCES: + 2 mm AND - 1 mm.

GENERAL NOTES:

SEE THE FOLLOWING STANDARD PLATES AND STANDARD PLAN SHEET FOR ADDITIONAL DETAILS: DOWEL BAR ASSEMBLY, M1103; CONSTRUCTION OF HEADER JOINTS, M1150; AND CONCRETE MAINLINE PAVEMENT ON 5-297.217M & .219M.

SEE PAVING LAYOUTS IN THE PLANS FOR JOINT CLASS DESIGNATION TO BE USED AND SPECIAL REINFORCEMENT REQUIRED.

CONTRACTION JOINTS

DESIGN C

NOTES:

① DESIGN C3X OR C3X-D - PRIOR TO INSTALLING PREFORMED JOINT SEALER IN THE FORMED JOINT (DETAIL C), THE JOINT SHALL BE WIDENED TO A NOMINAL WIDTH OF 10 mm BY SAWING ALONG THE FULL LENGTH OF THE FORMED JOINT.

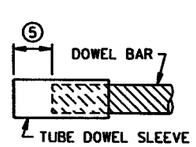
DESIGN C2X OR C2X-D - PRIOR TO SEALING FORMED JOINT (DETAIL C), WITH HOT POUR SEALER, THE JOINT SHALL BE WIDENED TO A NOMINAL WIDTH WIDTH OF 13 mm FOR A DEPTH OF 20 mm, + 3 mm, 2 mm, BY SAWING ALONG THE FULL LENGTH OF THE FORMED JOINT. THE SEALER SHALL BE FILLED TO THE SAME DEPTH AS SHOWN IN DETAIL B.

② DESIGN C2B OR C2B-D - PRIOR TO SEALING JOINT (DETAIL B) WITH HOT POUR JOINT SEALER, A STRIP OF PAPER 13 mm WIDE SHALL BE PLACED ON THE BOTTOM OF THE 13 mm WIDE JOINT.

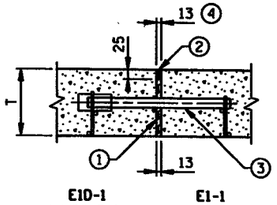
③ WHEN USING PREFORMED JOINT SEALER, THE DEPTH SHALL BE 5 mm MORE THAN THE PREFORMED SEALER, WHEN COMPRESSED, TO FIT THE JOINT DESIGN WIDTH.

④ THE JOINT FACES SHALL BE CLEANED AND DRIED BY SANDBLASTING AND AIR BLASTING. PRIOR TO SEALING THE JOINT, A 13 mm DIA. CLOSED CELL BACKER ROD SHALL BE PLACED SUCH THAT THE TOP OF THE BACKER ROD IS 13 mm BELOW THE SURFACE OF THE PAVEMENT. POLYMERIC SHALL BE TOOLED INTO THE JOINT MAINTAINING A SEALANT BEAD THICKNESS OF 5 mm.

⑤ FOR UNBONDED OVERLAYS, THE JOINT DEPTH "g" SHALL BE T/3 mm.
FOR CONCRETE PAVEMENT, THE JOINT DEPTH "g" SHALL BE T/4 mm.

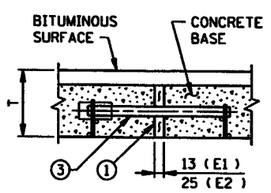


DOWEL BAR SLEEVE DETAIL



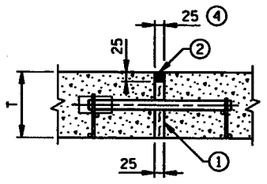
E1D-1 (W/DOWELS) E1-1 (W/O DOWELS)

DETAIL A



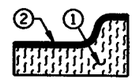
E1DB & E2DB (W/DOWELS) E1B & E2B (W/O DOWELS)

DETAIL B

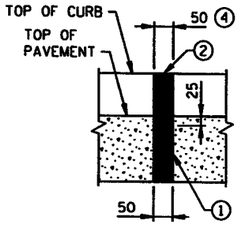


E2D-1 (W/DOWELS) E2-1 (W/O DOWELS)

DETAIL C



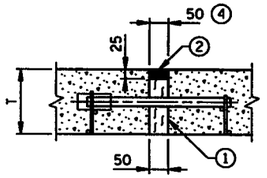
SECTION THRU CURB E2-1



E4-1 (W/O DOWELS)

DETAIL D

SECTION THRU CURB E4-1



E4D-1
(W/DOWELS)

DETAIL E

EXPANSION JOINTS

CLASS DESIGNATION		JOINT DETAIL	JOINT SEALER SPEC.
WITH DOWELS	WITHOUT DOWELS		
E1D-1	E1-1	A	②
E1DB	E1B	B	UNSEALED
E2D-1	E2-1	C	②
E2DB	E2B	B	UNSEALED
	E4-1	D	②
E4D-1		E	②

LEGEND

- E = EXPANSION JOINT
- NO. = JOINT REFERENCE
- -1 = HOT POURED SEAL ②
- D = DOWEL BARS
- B = CONCRETE BASE
- S = CONCRETE SILL

EXAMPLE — E1D-1

- -1 = HOT POURED SEAL ②
- D = DOWEL BARS
- NO. = JOINT REFERENCE
- E = EXPANSION JOINT

NOTES:

① PREFORMED JOINT FILLER MATERIAL, SPEC. 3702.

② JOINT SEALER SPEC. 3723. TOP OF SEALER, FLUSH TO 3 mm BELOW TOP OF PAVEMENT SURFACE. MAKE TOP OF SEALER FOR CURB SECTION E JOINTS FLUSH WITH SURFACE ± 3 mm.

③ DOWEL BAR ASSEMBLY, SEE STANDARD PLATE M1103.

④ JOINT WIDTH IS EQUAL TO HALF OF THE JOINT NUMBER IN 13 mm. INTERVALS (i.e. E1 = 13 mm, E2 = 25 mm, E3 = 38 mm, E4 = 50 mm, E8 = 100 mm).

⑤ SPACE FROM END OF DOWEL BAR TO END OF SLEEVE TO BE EQUAL TO EXPANSION JOINT WIDTH.

EXPANSION JOINTS

DESIGN E

NOTE: ALL DIMENSIONS ARE IN MILLIMETERS, EXCEPT AS NOTED.

J:\STRUCT\HWY96\HW962211.DGN 13 APR 99

REVISION DATE 1-12-99

STANDARD APPROVED: JANUARY 25, 1993

CERTIFIED BY Nancy Daubenberger PROFESSIONAL ENGINEER
REG NO 25151 DATE 4-15-1999

STANDARD SHEET NO. 5-297.221M (1 OF 2)

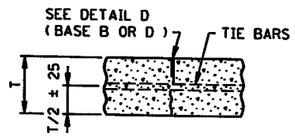
TITLE: PAVEMENT JOINTS
CONTRACTION (DESIGN C) AND EXPANSION (DESIGN E)

TITLE: PAVEMENT JOINTS
SP 62-696-09

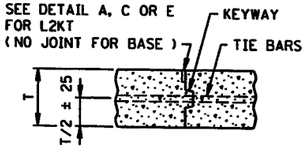
DES: MnDOT DR: MnDOT APPROVED: 4-19-99
CHK: CHK:

SHEET NO B10 OF B13 SHEETS

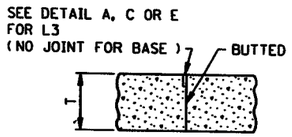
BRIDGE NO 62590



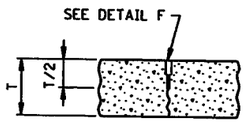
L1, L1T, L1B & L1TB



L2KT & L2KTB



L3 & L3B



L4

LONGITUDINAL JOINT CLASS DESIGNATION, DETAIL & SEALER SPECIFICATION TABLE

CLASS DESIGNATION				JOINT DETAIL	JOINT SEALER SPECIFICATION
WITHOUT TIE BARS	WITH TIE BARS	WITH KEYWAY & TIE BARS	BUTTED		
L1H	L1TH			B	3723
L1BU	L1TBU			A OR B	UNSEALED
		L2KTH		D OR E	3723
		L2KTS		C	POLYMERIC
			L3H	D OR E	3723
			L3S	C	POLYMERIC
L4S				F	POLYMERIC

LONGITUDINAL JOINT DEPTH TABLE ③

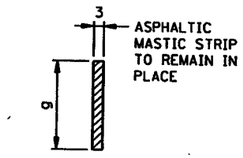
PAVEMENT THICKNESS T	CONCRETE BASE JOINT DEPTH 9
150-165	50
170-190	57
195-215	65
220-230	70
235-240	75
245-360	—

LEGEND

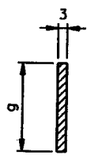
L = LONGITUDINAL JOINT
NO. = JOINT REFERENCE
K = KEYWAY
T = TIE BARS
B = CONCRETE BASE
U = UNSEALED
H = HOT POUR
S = MOISTURE CURED POLYMERIC

JOINT REFERENCE NUMBERS

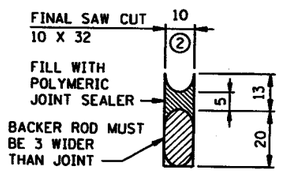
1 = SAWED TO A DEPTH OF T/3
2 = KEYED CONSTRUCTION JOINT
3 = BUTTED CONSTRUCTION JOINT
4 = SAWED TO A DEPTH OF T/2



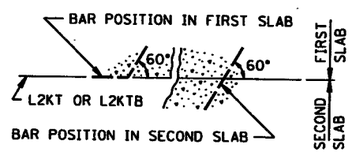
DETAIL A
(FORMED & UNSEALED)



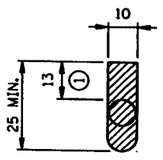
DETAIL B
(SAWED & SEALER, SPEC. 3723)
(BASE JOINTS UNSEALED)



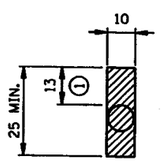
DETAIL C
(SAWED)



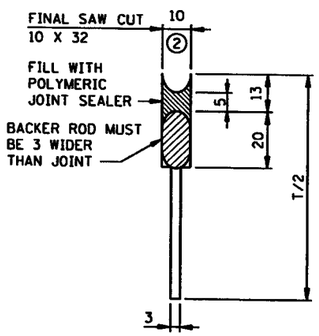
TIE BAR BENDING DETAIL



DETAIL D
(FORMED & SEALED SPEC. 3723)



DETAIL E
(SAWED & SEALER SPEC. 3723)



DETAIL F
(SAWED)

LONGITUDINAL JOINT NOTES:

TIE BARS FOR L1TB JOINTS SHALL BE THE SAME SIZE AND SPACING AS SHOWN ON STANDARD PLAN SHEETS 5-297.217M & .219M.

EXCEPT WHEN NOTED OTHERWISE IN THE PLANS, THE TIE BAR SPACING FOR ALL L2KT AND L2KTB JOINTS SHALL BE 0.8 m C. TO C. AND BENT 60° AS SHOWN.

TIE BARS IN THE L2KT AND L2KTB JOINTS SHALL BE THE SAME SIZE AND LENGTH AS USED FOR THE L1T OR L1TB JOINTS, WHEN TYING PAVEMENT TO PAVEMENT OR BASE TO BASE. TIE BARS IN THE L2KT OR L2KTB JOINTS SHALL BE NO. 13 X 0.8 m, WHEN TYING CURB AND GUTTER TO PAVEMENT OR BASE.

ALL TIE BARS SHALL MEET THE REQUIREMENTS OF GRADE 420 FOR AASHTO M-31 OR M-53.

NORMALLY, TIED PAVEMENT WIDTHS SHALL NOT EXCEED 8 METERS, EXCEPT BRIDGE APPROACH PANELS AND PAVEMENT TAPERS.

JOINT WIDTH TOLERANCE IS + 2 mm TO - 1 mm.

SPEC. 3723 SEALER - TOP OF SEALER FLUSH TO - 4 mm BELOW TOP OF PAVEMENT SURFACE.

① THE JOINT FACES SHALL BE CLEANED AND DRIED BY SANDBLASTING AND AIR BLASTING. PRIOR TO SEALING THE JOINT, A CLOSED CELL BACKER ROD CAPABLE OF WITHSTANDING SEALANT TEMPERATURES OF 205 DEGREES C, WITH A DIAMETER 3 mm LARGER THAN THE JOINT OPENING, MAY BE PLACED 13 mm BELOW THE TOP OF THE PAVEMENT.

② THE JOINT FACES SHALL BE CLEANED AND DRIED BY SANDBLASTING AND AIR BLASTING. PRIOR TO SEALING THE JOINT, A 13 mm DIAMETER CLOSED CELL BACKER ROD SHALL BE PLACED SUCH THAT THE TOP OF THE BACKER ROD IS 13 mm BELOW THE SURFACE OF THE PAVEMENT. POLYMERIC SHALL BE TOOLED INTO THE JOINT MAINTAINING A SEALANT BEAD THICKNESS OF 5 mm.

③ FOR CONCRETE PAVEMENT THE JOINT DEPTH "9" SHALL BE T/3 mm.

GENERAL NOTES:

SEE THE FOLLOWING STANDARD PLATES AND STANDARD PLAN SHEETS FOR ADDITIONAL DETAILS: DOWEL BAR ASSEMBLY M1103, PAVEMENT KEYWAY M1141 AND CONCRETE PAVEMENT 5-297.217M - .219M.

SEE PAVING LAYOUTS IN THE PLANS FOR JOINT CLASS DESIGNATIONS TO BE USED & SPECIAL REINFORCEMENT REQUIRED.

NOTE: ALL DIMENSIONS ARE IN MILLIMETERS, EXCEPT AS NOTED.

J:\STRUCT\HWY96\HW962212.DGN 13 APR 99

REVISION DATE 1-12-99

minnesota metric

ESEH

CERTIFIED BY Nancy Daubenberger PROFESSIONAL ENGINEER
REG NO 25151 DATE 4-15-1999

STANDARD SHEET NO. 5-297.221M (2 OF 2)
STANDARD APPROVED: JANUARY 25, 1993

TITLE: PAVEMENT JOINTS
LONGITUDINAL (DESIGN L)

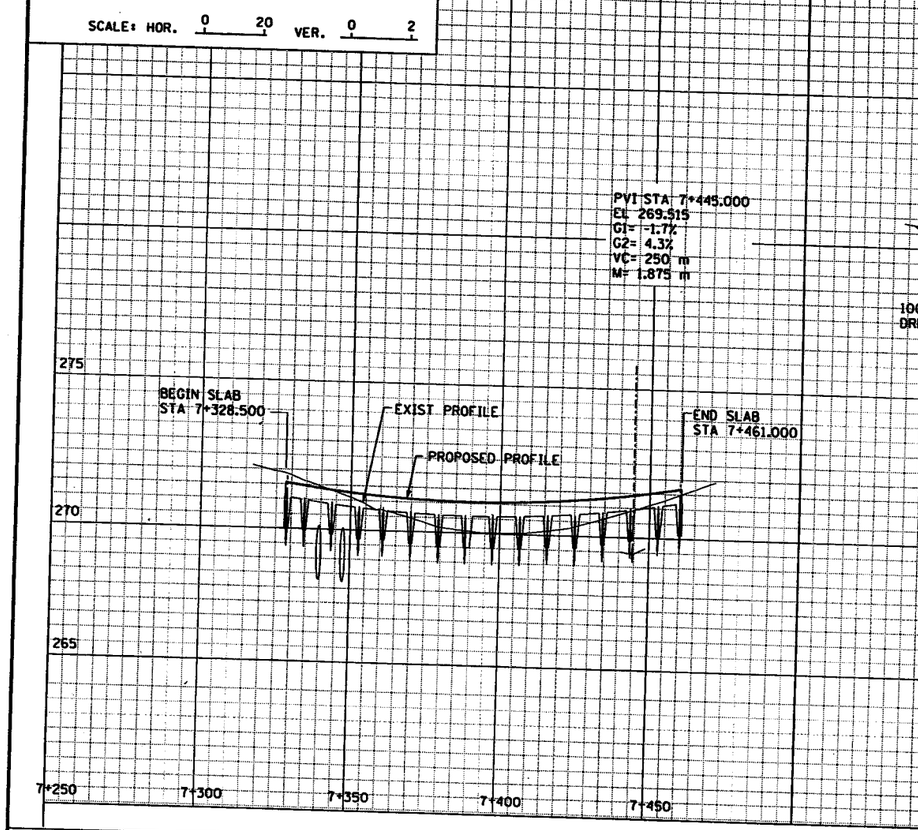
TITLE: PAVEMENT JOINTS
SP 62-696-09

DES: MnDOT	DR: MnDOT	APPROVED: 4-19-99
CHK:	CHK:	

SHEET NO B110F B13 SHEETS

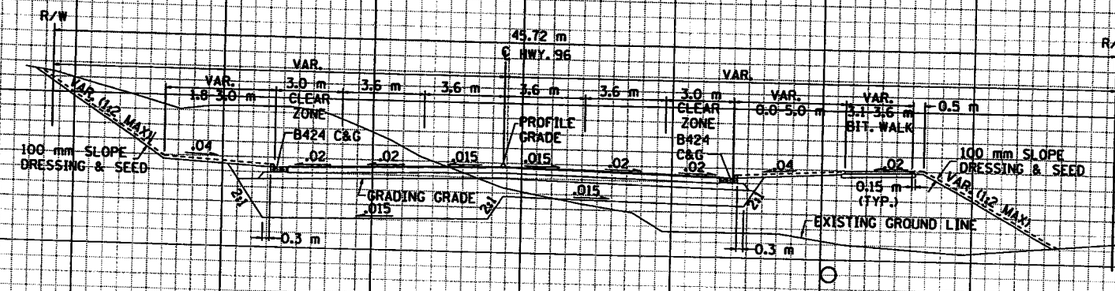
BRIDGE NO 62590

SCALE: HOR. 0 20 VER. 0 2



TYPICAL SECTIONS & PERTINENT DATA

SCALES AS SHOWN



TYPICAL ROADWAY SECTION HWY 96

LOCATION ENGINEER'S OBSERV AT BRIDGE SITE

1. SPECIAL FEATURES: WATERFALLS,DAMS, FLOODS, SLIDING BANKS, RECREATIONAL BOATING.

2. OTHER BRIDGES OR CULVERTS OVER THE SAME STREAM (PARTICULARLY STRUCTURES WHICH CARRY HIGH WATER WITHOUT OVERFLOW OF ROADWAY):GIVEN LOCATION,TYPE LENGTH, HEIGHT ABOVE HIGH WATER, CROSS-SECTIONAL AREA ETC.

3. APPARENT HIGHWATER ELEVATION OBTAINED FROM:

4. OTHER DATA: APPROX. VELOCITY OF WATER AT TIM SURVEY.

HYDRAULIC RECOMMENDATIONS DAT

STREAM .....

FLOOD OF RECORD ( ) .....

MAXIMUM OBSERVED HIGHWATER ELEV. ( ) ..... m

DESIGN FLOOD (YEAR FREQUENCY) ..... m³/s

DESIGN STAGE ..... m

TOTAL STAGE INCREASE ..... m

DESIGN MEAN VELOCITY THROUGH STRUCTURE ..... m/s

LOW MEMBER AT OR ABOVE ELEVATION .....

MIN. WATERWAY AREA REQUIRED BELOW ELEV. .... AT RIGHT ANGLE TO CHANNEL ..... m²

BASIC FLOOD (100 YEAR FREQUENCY) ..... m³/s

STAGE ..... m

TOTAL STAGE INCREASE ..... m

MEAN VELOCITY THROUGH STRUCTURE ..... m/s

APPROX. FLOWLINE ELEV. .... SKEW ANGLE .... DEG.

ESTIMATED PIER SCOUR ELEV. (YR FREQUENCY) .....

DESIGN STAGE AND STAGE ARE TAILWATER ELEVATIONS AT

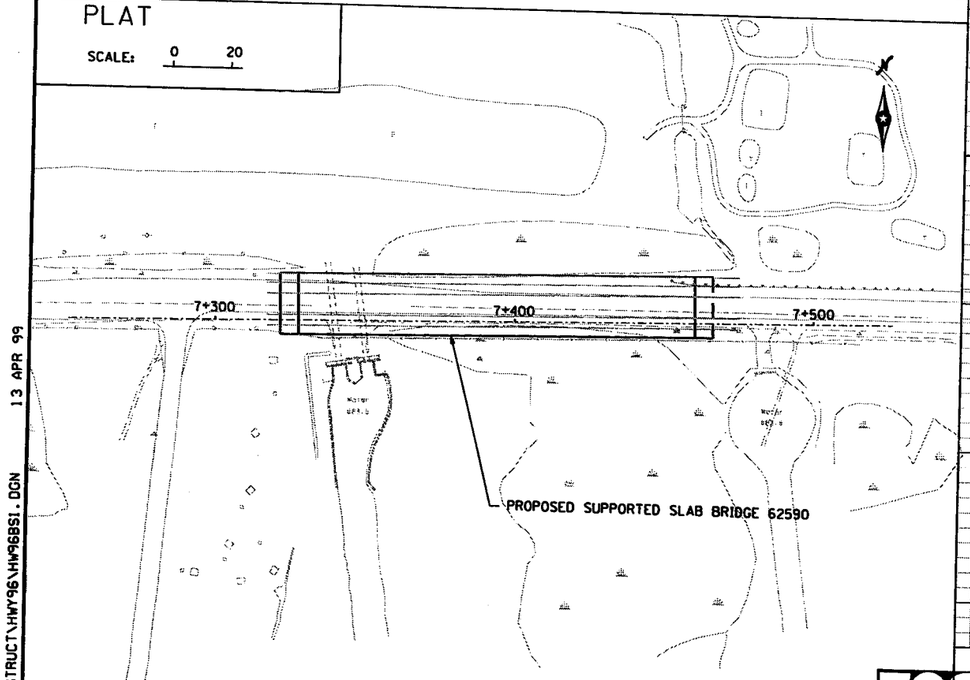
BRIDGE SURVEY SHEETS MADE FROM : SEH SURVEY ELECTRONIC FIELD NOTES DATED

BENCH MARK ELEVATION 270.486 (MSL 1929 ADJ)

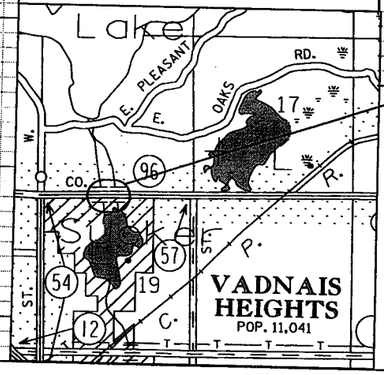
LOCATION MnDOT MONUMENT NO 6224G TOP OF AQUEDUCT SOUTH SIDE OF CSAH 96

PLAT

SCALE: 0 20



INDEX MAP (FOUR SECTIONS)



PROJECT LOCATION

BRIDGE SURVEY

PROPOSED BRIDGE LOCATED 3.2 Km W OF J OF CSAH 96 AND CENTERVILLE ROAD

SEC 18 & 19 TWP 30 N R 22 W

CITY OF NORTH OAKS & VADNAIS HEIGHTS COUNTY RAMSEY

BRIDGE NO 62590

J:\STRUCT\HWY96\HW96BSI.DGN 13 APR 99

minnesota metric

SEH

CERTIFIED BY Navied Daubenberger PROFESSIONAL ENGINEER

REG NO 25151 DATE 4-15-1999

TITLE: BRIDGE SURVEY

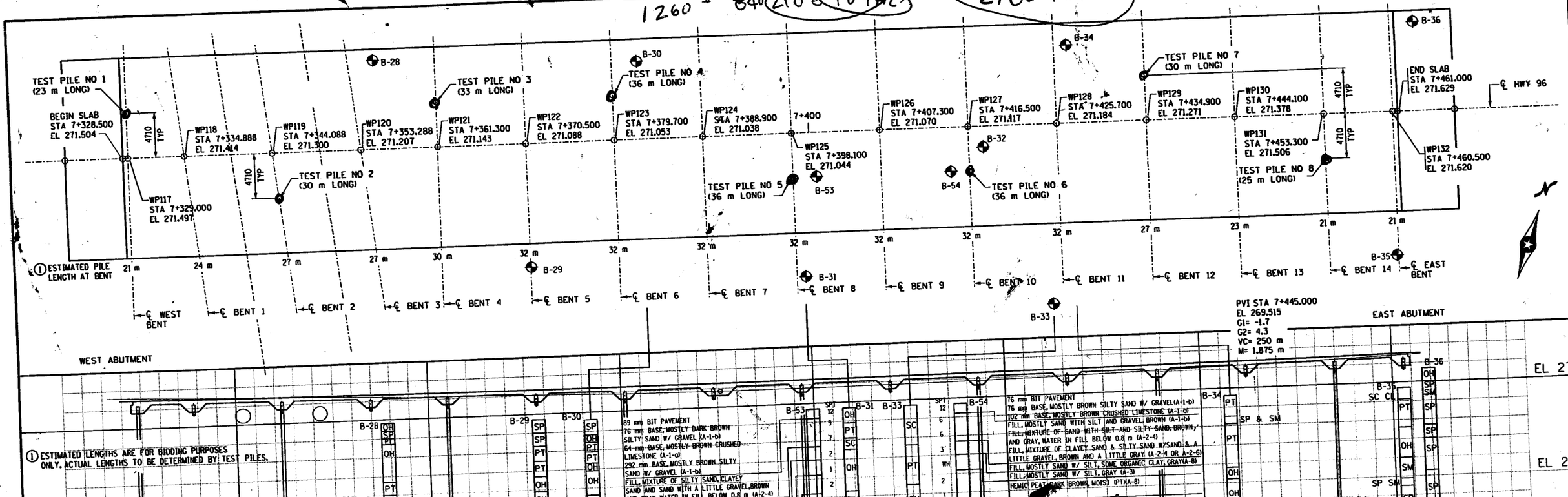
SP 62-696-09

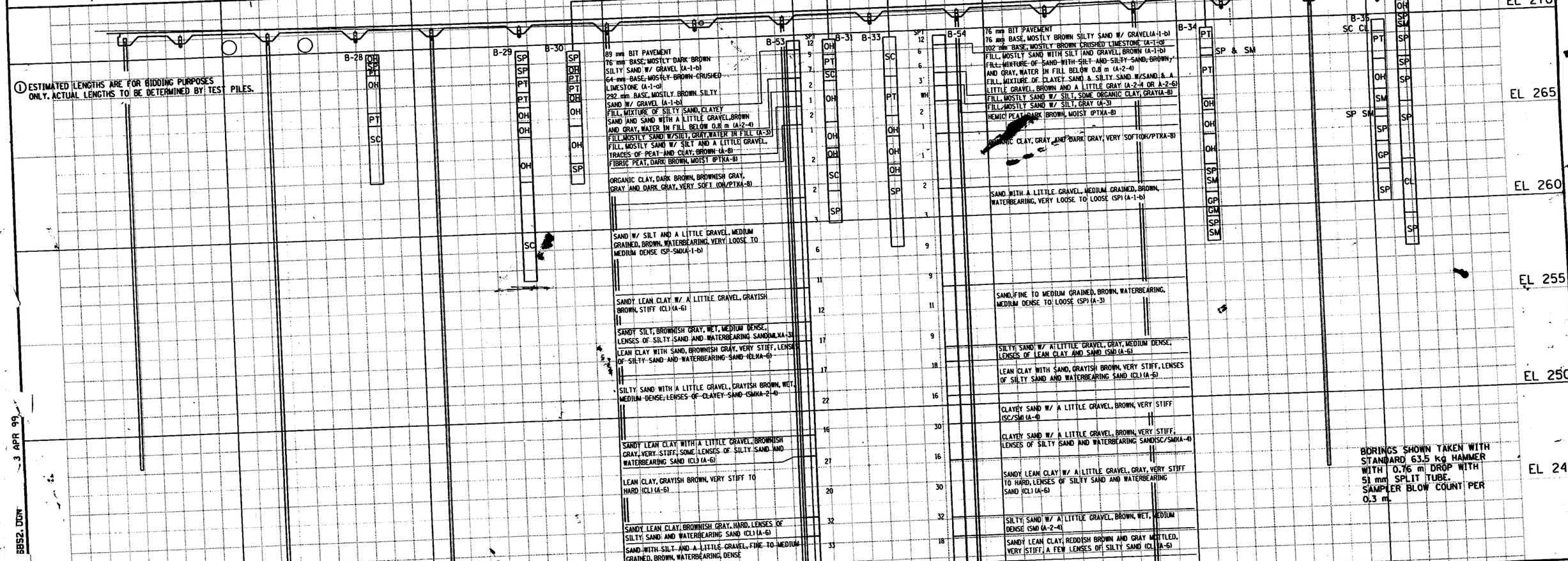
DES: MAW	DR: MAW	APPROVED: 4-19-99
CHK: NTD	CHK: NTD	

SHEET NO B12 OF B13 SHEETS

BRIDGE NO 62590

1260 + 840 (2100 TOTAL) 2100 TOTAL





CERTIFIED BY Nancy Daubenberger PROFESSIONAL ENGINEER
REG NO 25151 DATE 4-15-1999

TITLE: BRIDGE SURVEY PLAN AND PROFILE
SP 62-696-09

DES: MAW DR: MAW APPROVED: 4-19-99
CHK: NTD CHK: NTD

SHEET NO B13 OF B13 SHEETS

BRIDGE NO 62590

3 APR 99 5852.DGN \HWY96