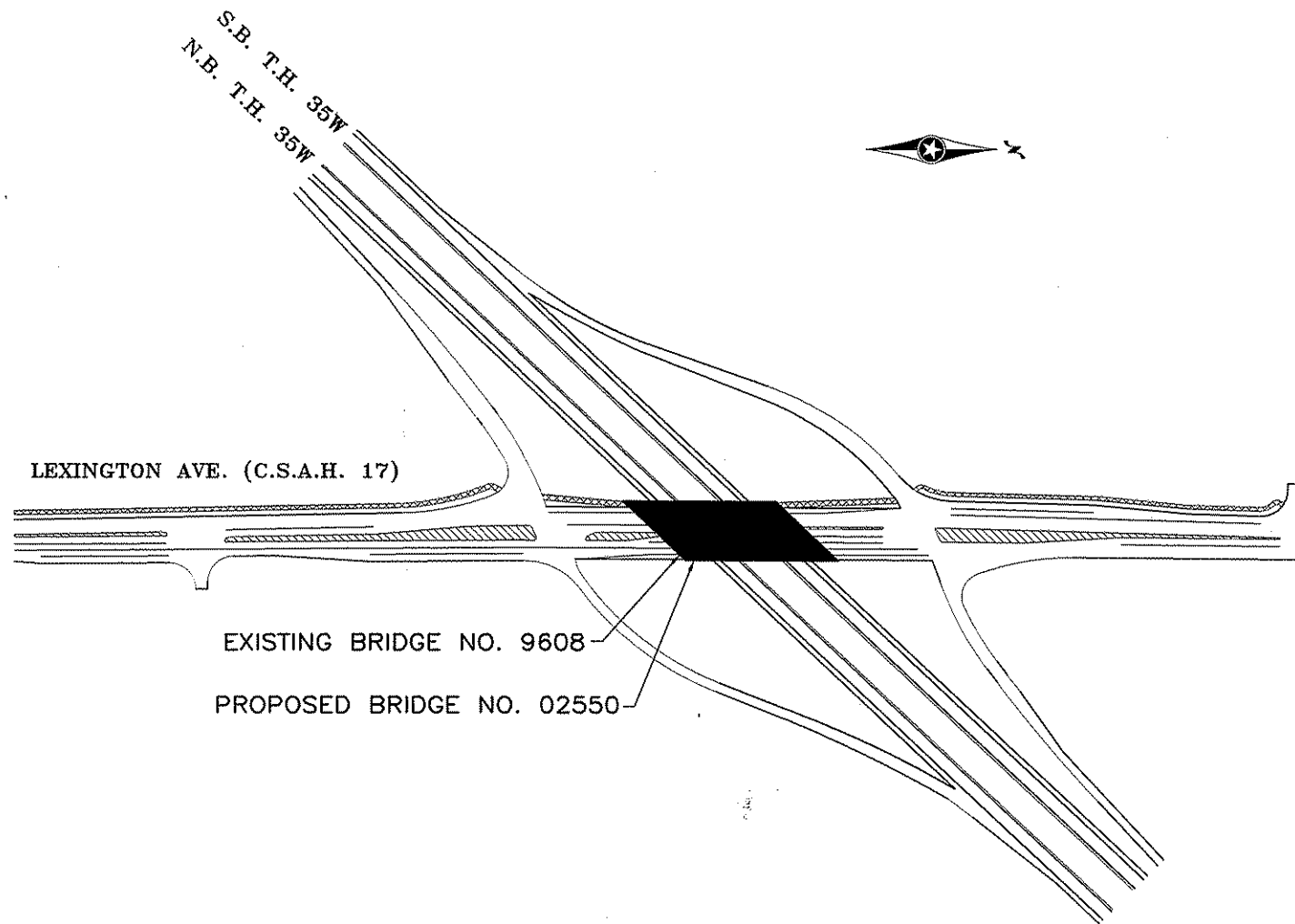


**C.S.A.H. 17 (LEXINGTON AVE.)  
OVER T.H. 35W  
BRIDGE NO. 02550**  
ANOKA COUNTY, MINNESOTA



DESIGN DATA	
1996 And Current Interim AASHTO Design Specifications	
MS22.5 Live Loading	
Load Factor Design Method	
Includes 0.82 kN/m <sup>2</sup> Allowance For Future Wearing Course Modifications.	
Maximum Allowable Design Stresses:	
Reinforced Concrete:	
fc' = 28 MPa, n = 8	
fy = 414 MPa, Reinforcement	
Prestressed Concrete:	
fc' = 56 MPa	
n = 1	
f's = 1862 MPa (15mm Strands - Low Relaxation)	
Deck Area = 3007 sq.m.	
Projected A.D.T. For 2015 = 17,200	
Design Speed 70 km/h Over	
Operating Rating MS55.5	

LIST OF SHEETS	
B1	COVER SHEET
B2	GENERAL PLAN AND ELEVATION
B3	BRIDGE LAYOUT
B4	ARCHITECTURAL DETAILS
B5 - B11	SOUTH ABUTMENT DETAILS
B12 - B18	NORTH ABUTMENT DETAILS
B19 - B22	PIER DETAILS
B23	FRAMING PLAN
B24	BEAM DETAILS
B25 - B27	BRIDGE DECK DETAILS
B28 - B29	CONCRETE RAILING (TYPE F)
B30	ORNAMENTAL METAL RAILING
B31	BILLS OF REINFORCEMENT
B32	SUMMARY OF QUANTITIES
B33	CONCRETE SLOPE PAVING
B34 - B36	WATERPROOF EXPANSION DEVICES
B37 - B42	B-DETAILS
B43	AS-BUILT BRIDGE DATA
B44 - B45	BRIDGE SURVEY PLAN & PROFILES
B46	SOIL BORINGS
B47	BRIDGE SURVEY

**CONSTRUCTION NOTES**

The 1995 Edition of The Minnesota Department of Transportation "Standard Specifications For Construction" Shall Govern.

All Dimensions Are in Units of Millimeters And Elevations Are in Meters Unless Noted Otherwise.

Bridge Seat Reinforcement Shall Be Carefully Placed to Avoid Interference With Drilling Holes For Anchor Rods. The Superstructure Beams Shall Be Erected in Final Position Prior to Drilling Holes For And Placing Anchor Rods.

The First Digit or The First Two Digits Following The Alphanumeric Character of Each Bar Mark Indicate The Bar Size.

Bars Marked With The Suffix "E" Shall Be Epoxy Coated.

All Reinforcement Shall Be 50mm Clear, Unless Shown or Noted Otherwise.

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.

ENGR. *Seymour G. Eichen* Reg. No. 14546 Date 3/6/97

**SRI** CONSULTING GROUP, INC.

SCHEDULE OF QUANTITIES FOR ENTIRE BRIDGE			
ITEM NO.	ITEM	UNIT	QUANTITY
2401.501	STRUCTURAL CONCRETE (1A43)	m3	640 (P)
2401.501	STRUCTURAL CONCRETE (3Y43)	m3	846 (P)
2401.512	BRIDGE SLAB CONCRETE (3Y36)	m2	3007 (P)
2401.513	TYPE F RAILING CONCRETE (3Y46)	m	88 (P)
2401.513	TYPE F (MOD.) RAILING CONCRETE (3Y46)	m	115 (P)
2401.513	TYPE SPECIAL RAILING CONCRETE (3Y46)	m	115 (P)
2401.516	RAISED MEDIAN CONCRETE (3Y46)	m2	107 (P)
2401.541	REINFORCEMENT BARS	kg	30980 (P)
2401.541	REINFORCEMENT BARS (EPOXY COATED)	kg	135260 (P)
0401.601	STRUCTURE EXCAVATION	LUMP SUM	1
2402.583	ORNAMENTAL METAL RAILING TYPE SPECIAL	m	115 (P)
2402.591	EXPANSION JOINT DEVICES TYPE 100	m	98 (P)
2402.595	BEARING ASSEMBLY	EACH	56 (P)
2404.501	CONCRETE OVERLAY (3U17A)	m2	3328 (P)
2405.502	PRESTRESSED CONCRETE BEAMS, 1830mm	m	1198 (P)
2405.511	DIAPHRAGMS FOR TYPE 1830 P/S BEAMS	m	195 (P)
2442.501	REMOVE OLD BRIDGE	LUMP SUM	1

ITEM NO.	ITEM	UNIT	QUANTITY
2452.507	C-I-P CONCRETE PILING DELIVERED 305mm	m	2376
2452.508	C-I-P CONCRETE PILING DRIVEN 305mm	m	2376
2452.519	C-I-P CONC. TEST PILES; 12 m LONG 305mm	EACH	6
0502.603	DRAINAGE SYSTEM TYPE B910M	LUMP SUM	1
2514.501	CONCRETE SLOPE PAVING	m2	390 (P)
2545.509	CONDUIT SYSTEM (SIGNALS)	LUMP SUM	1

B.M. ELEV. 282.051 (1929 MSL Adj.)  
DISK N.E. CORNER BRIDGE NO. 9608



**ANOKA COUNTY**

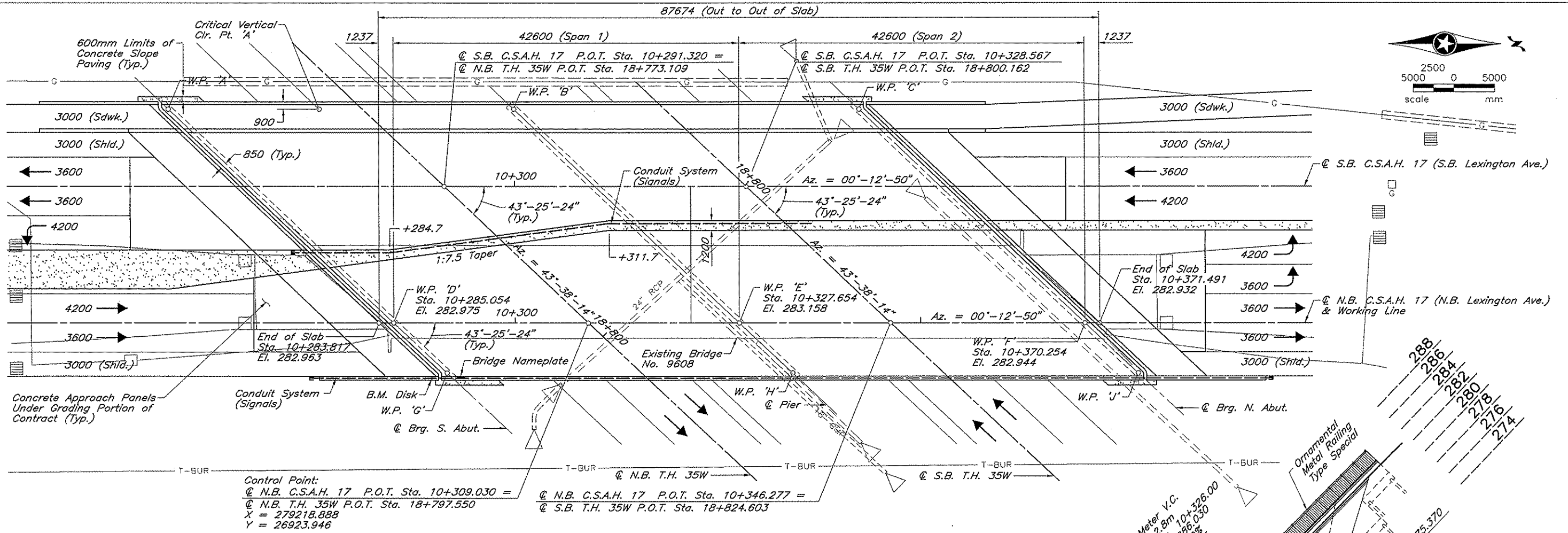
**BRIDGE NO. 02550**

C.S.A.H. 17 (LEXINGTON AVE.) OVER T.H. 35W  
1830mm PRESTRESSED CONCRETE BEAMS:  
42.6m AND 42.6m SPANS  
30m ROADWAY INCLUDING SHOULDERS - 3m SIDEWALK

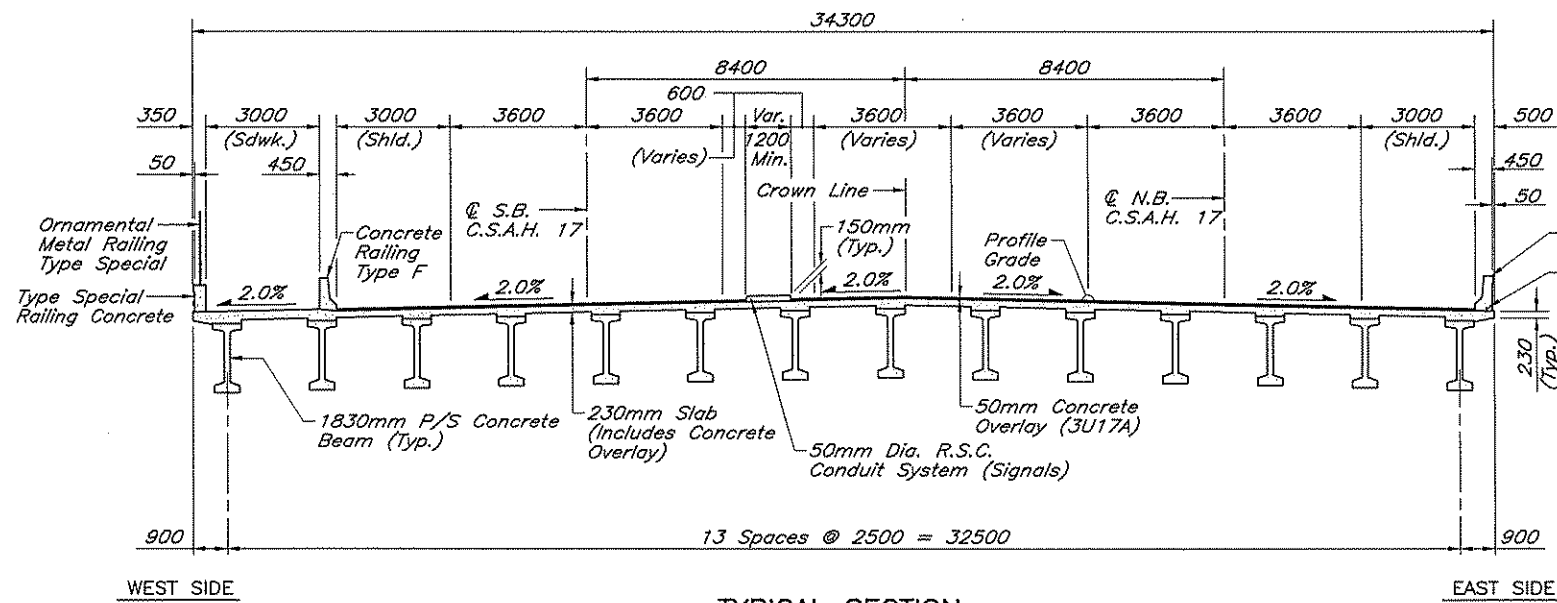
BRIDGE I.D. NO. 501  
SEC. 23 & 24, T31N, R23W, ANOKA COUNTY

APPROVED: *James E. ...*  
ANOKA COUNTY ENGINEER

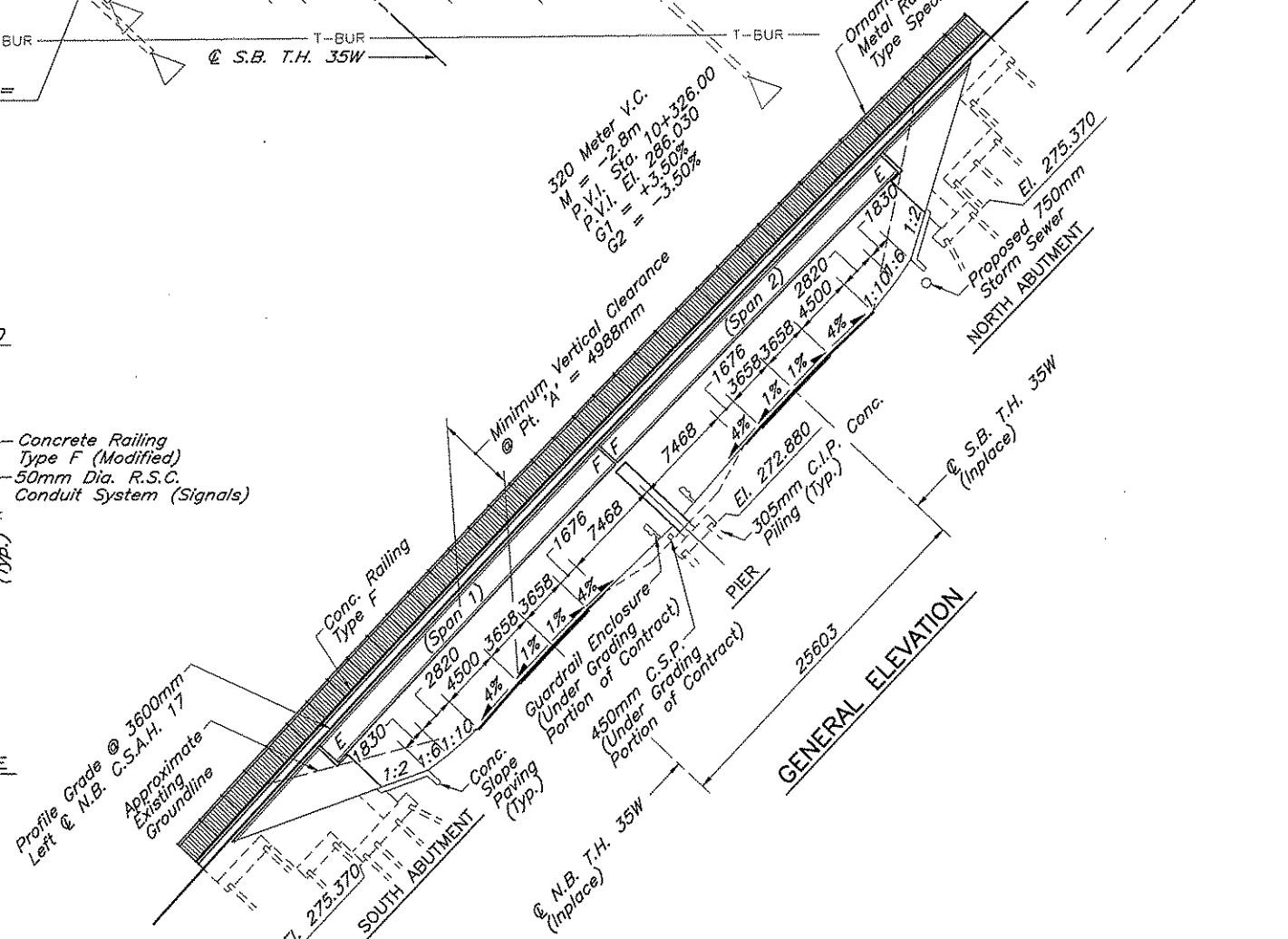
APPROVED: *Donald J. ...*  
STATE BRIDGE ENGINEER



GENERAL PLAN



TYPICAL SECTION



GENERAL ELEVATION

NO	DATE	BY	CKD	APPR	REVISION
NAME: H:\STRUC\003\2413\M13GPE.DWG DATE: MAR 06, 1997 TIME: 10:22 AM					

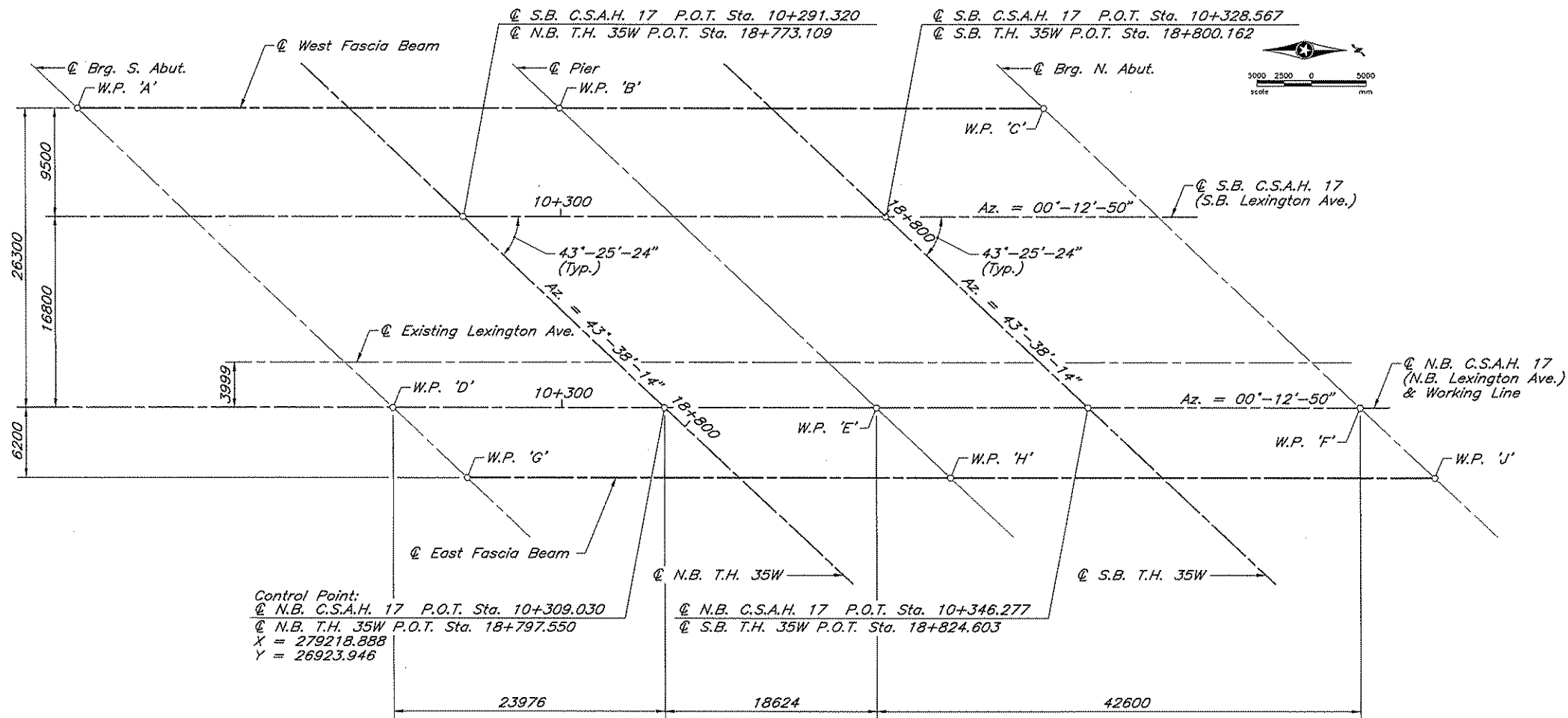
STATE AID PROJ. NO. 02-617-11	I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Registered Professional Engineer under the laws of the State of Minnesota.  Date 3/6/97 Reg. No. 19632
BRIDGE NO. 02550	

DRAWN BY J. HAMRE	DATE 3/97
DESIGNED BY L. ERICKSON	3/97
CHECKED BY C. SCHMIDT	3/97
COMM. NO. 0962413	

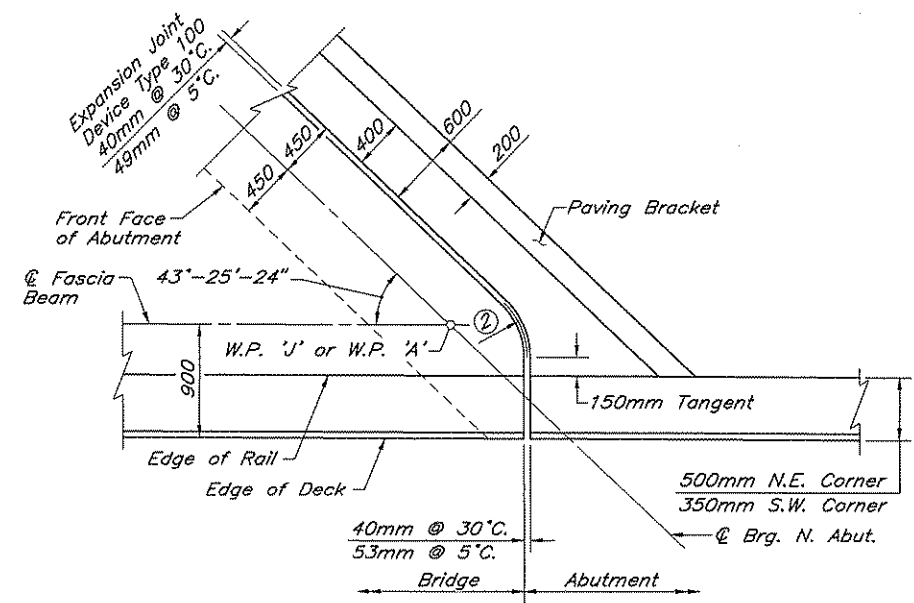


ANOKA COUNTY
C.S.A.H. 17 (LEXINGTON AVE.) OVER T.H. 35W
GENERAL PLAN AND ELEVATION

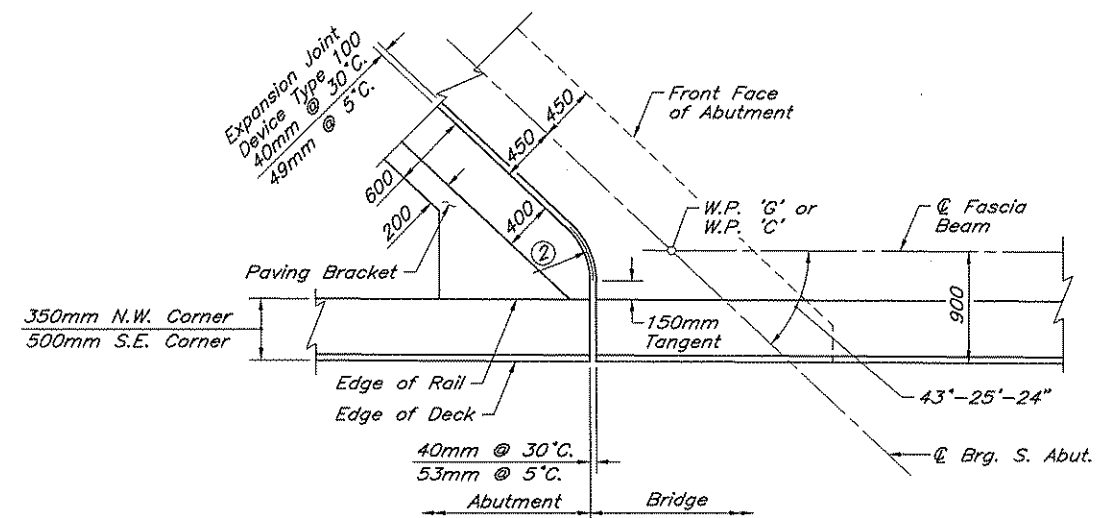
SHEET B2 OF B47
--------------------------



WORKING POINT LAYOUT



N.E. CORNER DETAIL  
(S.W. CORNER SIMILAR)



S.E. CORNER DETAIL  
(N.W. CORNER SIMILAR)

NOTES:

- ① Station on @ N.B. C.S.A.H. 17.
- ② 600mm Radius at Center of Expansion Device.
- ③ 80mm at Fixed Bearings.
- ④ 2240mm at Fixed Bearings.

DIMENSIONS BETWEEN WORKING POINTS (m)										COORDINATES		ELEVATION			
POINT	STATION ⑦	A	B	C	D	E	F	G	H	X	Y	TOP OF FINISHED DECK	FINISHED DECK TO BR. SEAT	BRIDGE SEAT	POINT
A	10+257.265									279192.395	26872.280	282.451	2.305	280.146	A
B	10+299.865	42.600								279192.554	26914.879	282.893	2.253	280.640	B
C	10+342.465		42.600							279192.713	26957.479	282.938	2.305	280.633	C
D	10+285.054	38.261	30.184							279218.798	26899.970	282.975	-	-	D
E	10+327.654	75.142	38.261	30.184	42.600					279218.957	26942.570	283.158	-	-	E
F	10+370.254		75.142	38.261		42.600				279219.116	26985.170	282.944	-	-	F
G	10+291.605		33.533	60.357	9.020	36.578				279225.023	26906.498	282.905	2.305	280.600	G
H	10+334.205	83.522		33.533	49.540	9.020	36.578	42.600		279225.182	26949.098	283.027	2.253	280.774	H
J	10+376.805	123.879	83.522			49.540	9.020	42.600		279225.341	26991.697	282.752	2.305	280.447	J

	TOP OF ROADWAY TO BRIDGE SEAT (mm)		
	SOUTH ABUTMENT	PIER	NORTH ABUTMENT
SLAB THICKNESS	230	230	230
STOOL HEIGHT	100	100	100
BEAM HEIGHT	1830	1830	1830
BEARING HEIGHT	145	93 ③	145
TOTAL	2305	2253 ④	2305

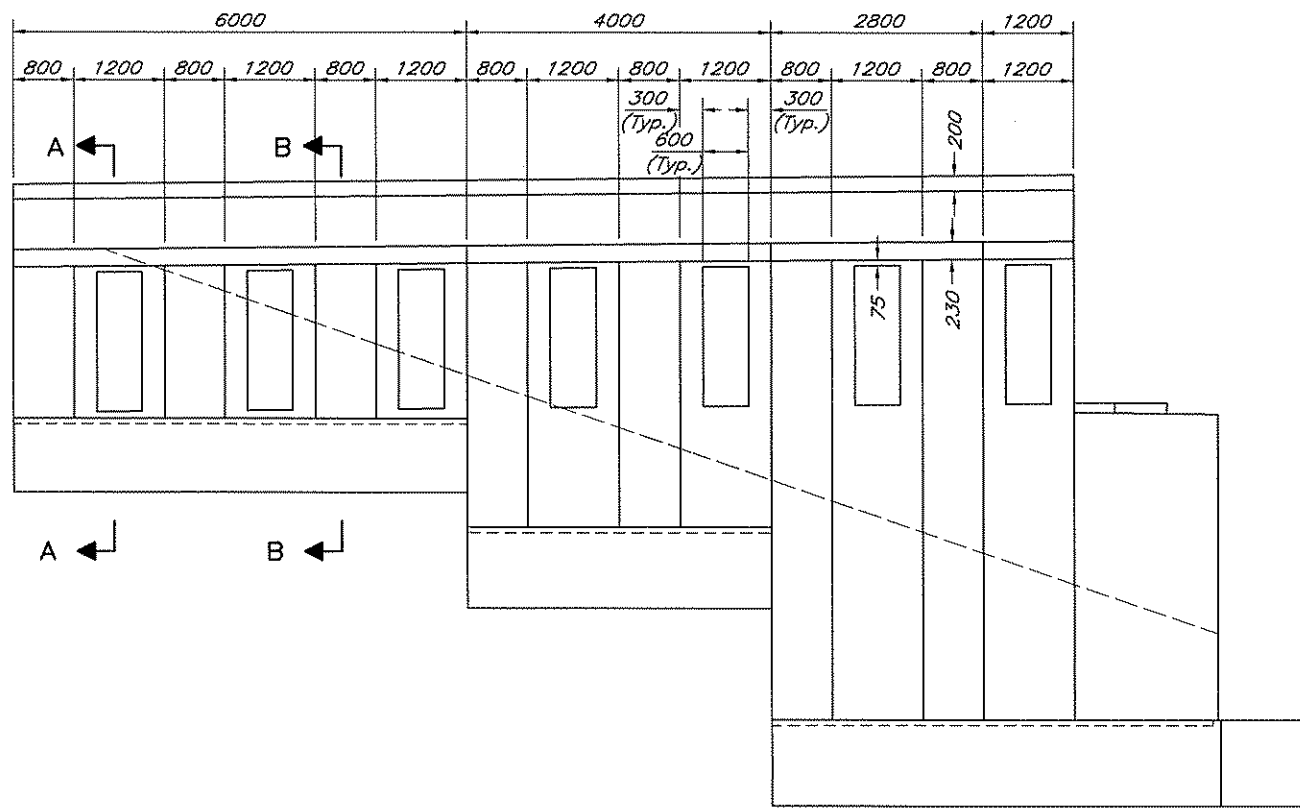
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NAME: H:\STRUC\003\2413\M13WPL.DWG DATE: MAR 04, 1997 TIME: 8:12 AM					

STATE AID PROJ. NO.	02-617-11
BRIDGE NO.	02550
I hereby certify that this plan, specification or report 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.	
 Date: 3/6/97 Reg. No. 19632	

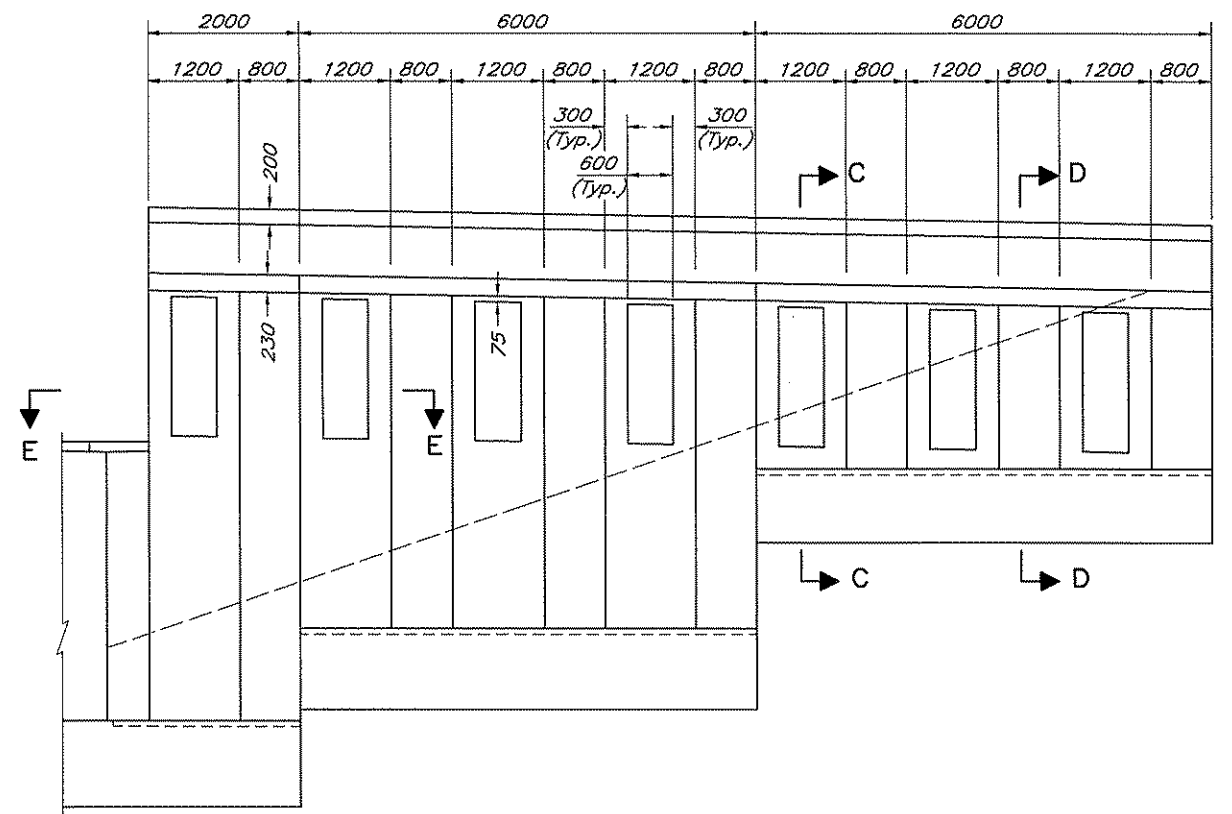
DRAWN BY	DATE
J. HAMRE	3/97
DESIGNED BY	DATE
R. SPANJERS	3/97
CHECKED BY	DATE
L. ERICKSON	3/97
COMM. NO.	0962413

ANOKA COUNTY  
 C.S.A.H. 17 (LEXINGTON AVE.) OVER T.H. 35W  
 BRIDGE LAYOUT

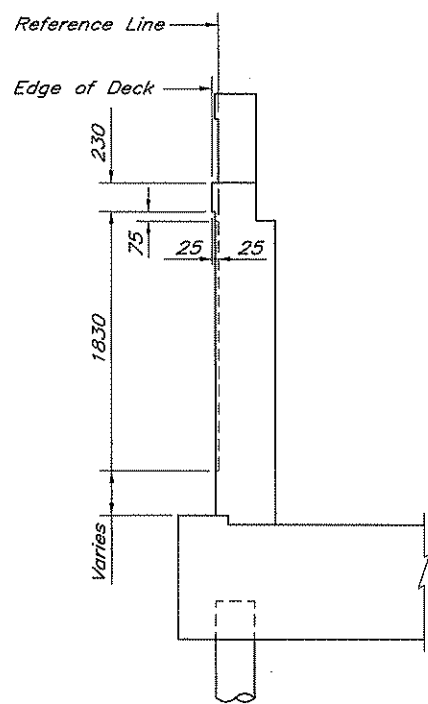
SHEET  
 B3  
 OF  
 B47



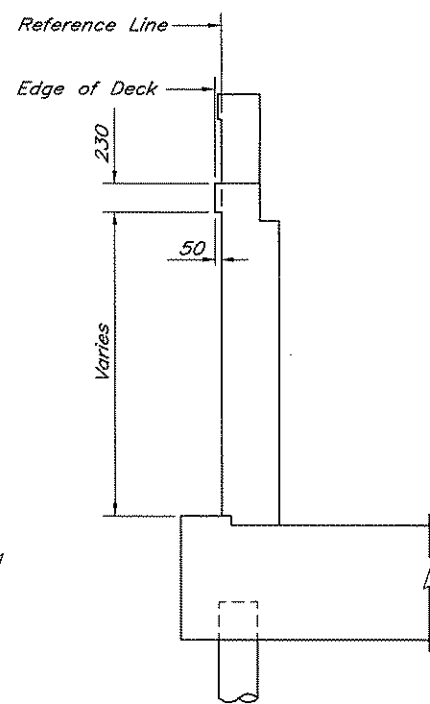
**SOUTHEAST WINGWALL ARCHITECTURAL DETAIL**  
(NORTHWEST SIMILAR)



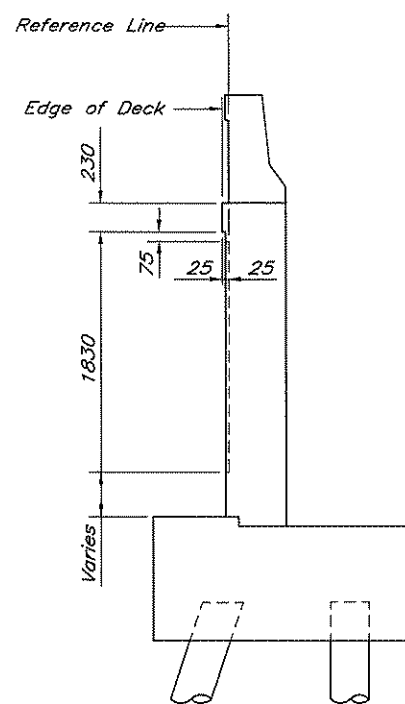
**SOUTHWEST WINGWALL ARCHITECTURAL DETAIL**  
(NORTHEAST SIMILAR)



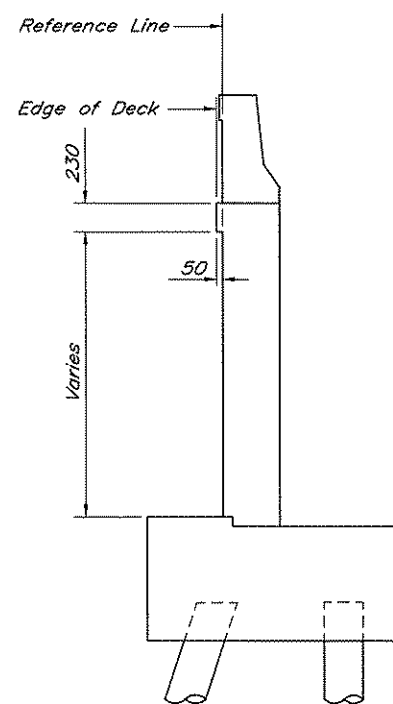
**SECTION A-A**



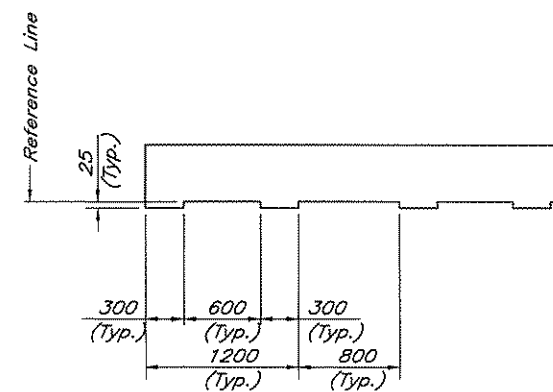
**SECTION B-B**



**SECTION C-C**



**SECTION D-D**



**SECTION E-E**

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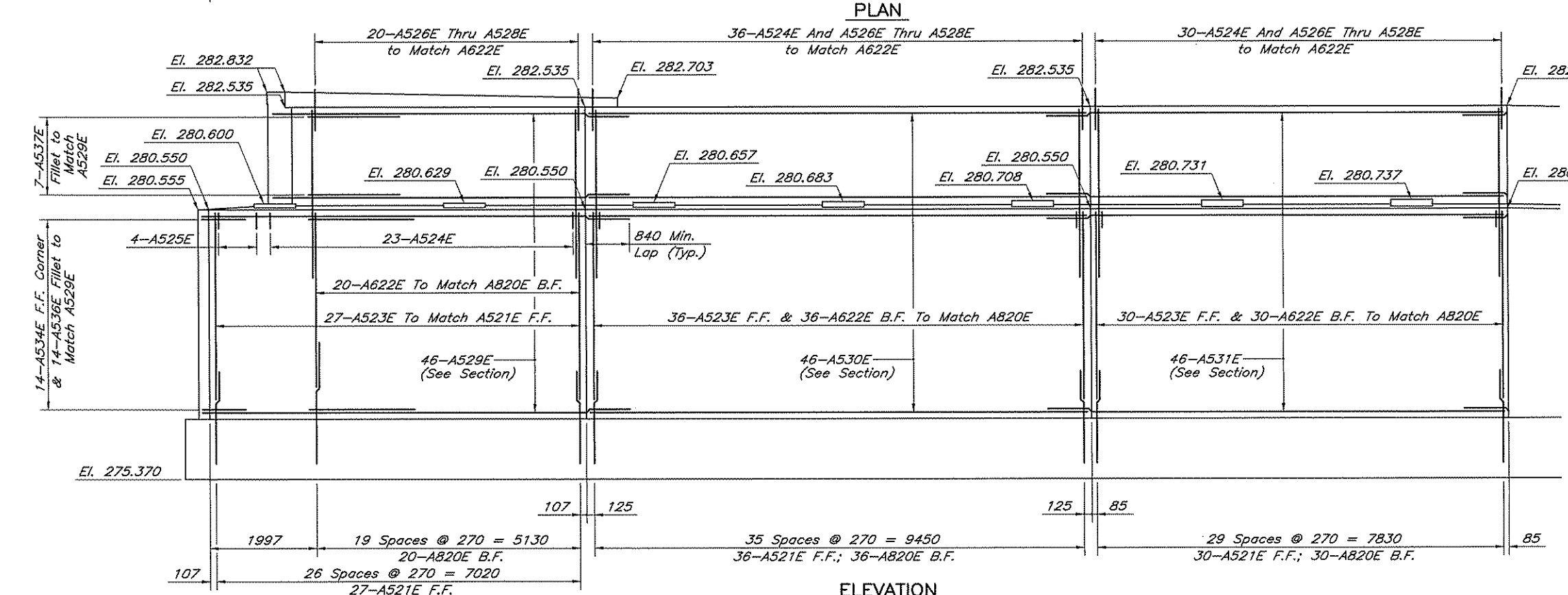
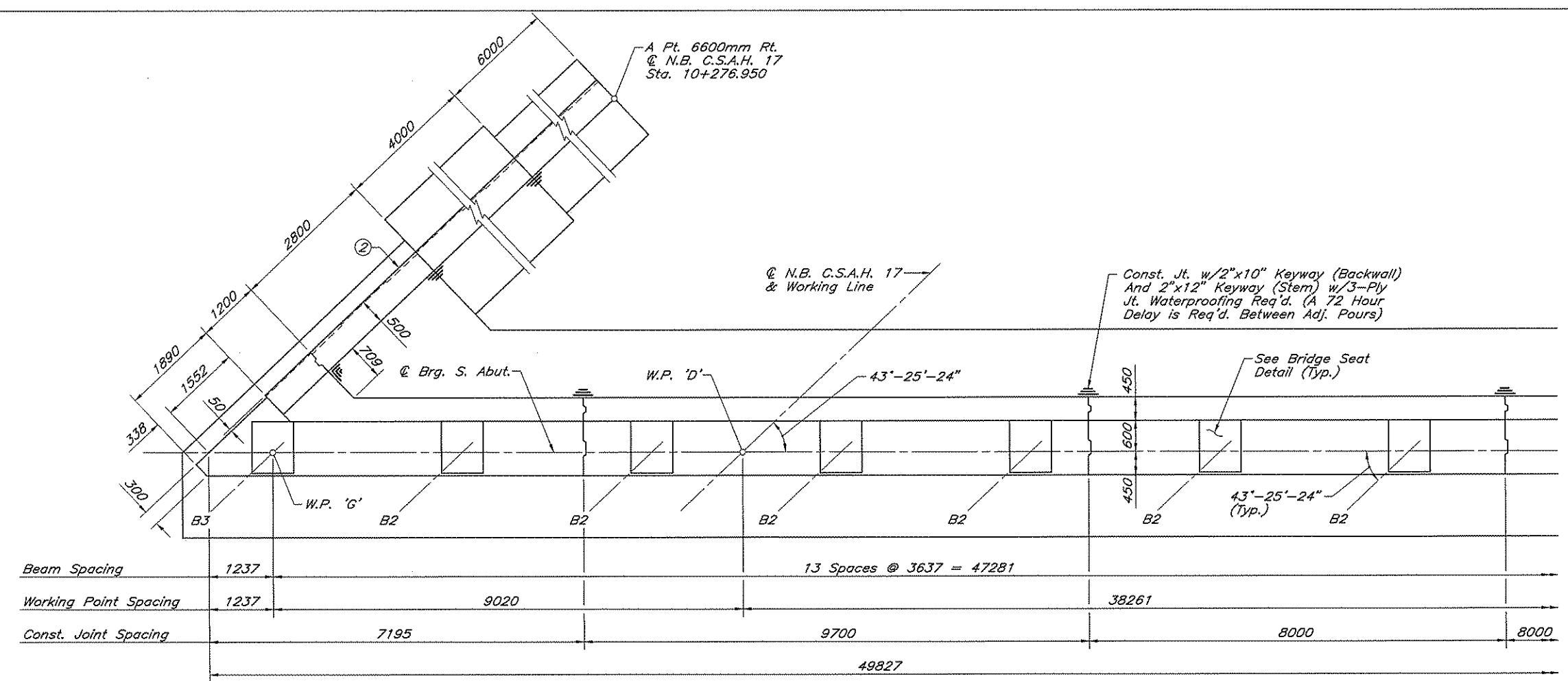
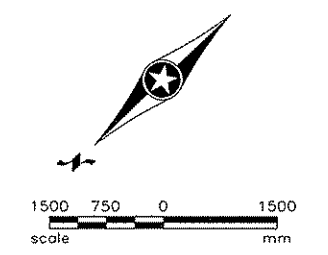
STATE AID PROJ. NO. 02-617-11	I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Registered Professional Engineer under the laws of the State of Minnesota. <i>Robert L. Spanjers</i> Date: 3/6/97 Reg. No. 19632
BRIDGE NO. 02550	

DRAWN BY J. HOFFMAN	DATE 3/97
DESIGNED BY R. SPANJERS	3/97
CHECKED BY L. ERICKSON	3/97
COMM. NO. 0962413	



ANOKA COUNTY
C.S.A.H. 17 (LEXINGTON AVE.) OVER 35W
ARCHITECTURAL DETAILS

SHEET B4 OF B47
--------------------------



- NOTES:**
1. E.F. Denotes Each Face  
F.F. Denotes Front Face  
B.F. Denotes Back Face  
E.J. Denotes Each Joint  
D.B.A. Denotes Dowel Bar Assembly
  2. For Architectural Details, See Sheet B4.

NO.	DATE	BY	CKD	APPR	REVISION
NAME: H:\STRUC\003\2413\M13SA01.DWG DATE: MAR 06, 1997 TIME: 10:24 AM					

STATE AID PROJ. NO.  
02-617-11

BRIDGE NO.  
02550

I hereby certify that this plan, specification or report 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.

*Robert A. Gump*  
Date: 3/6/97 Reg. No. 19632

DRAWN BY DATE  
J. HOFFMAN 3/97

DESIGNED BY  
R. SPANJERS 3/97

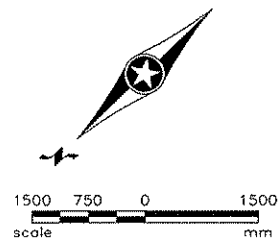
CHECKED BY  
L. ERICKSON 3/97

COMM. NO.  
0962413

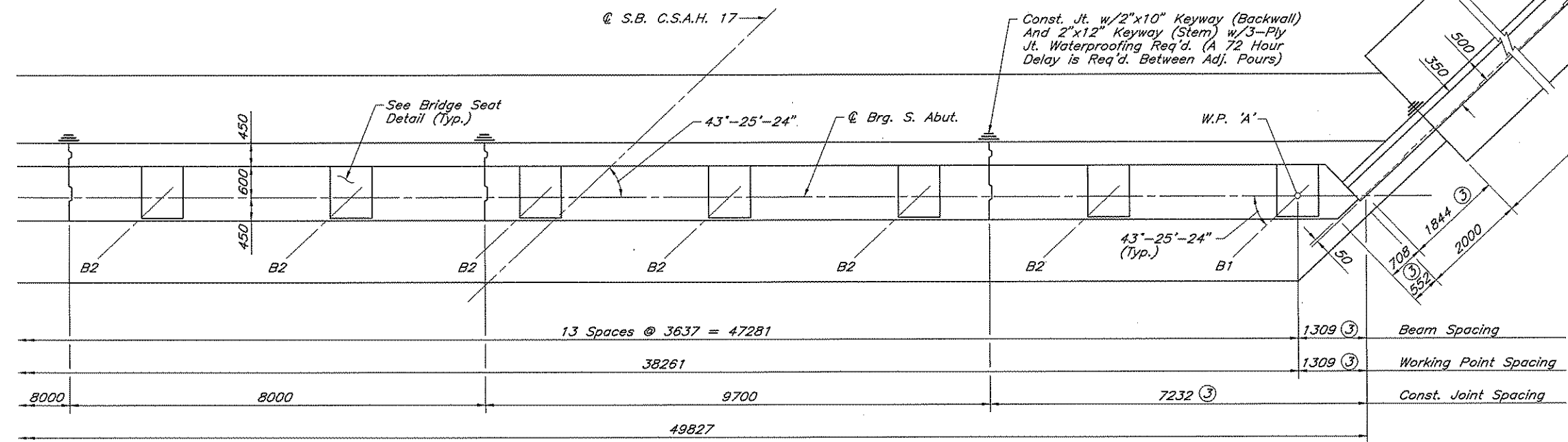


ANOKA COUNTY  
C.S.A.H. 17 (LEXINGTON AVE.) OVER T.H. 35W  
SOUTH ABUTMENT DETAILS  
(SHEET 1 OF 7)

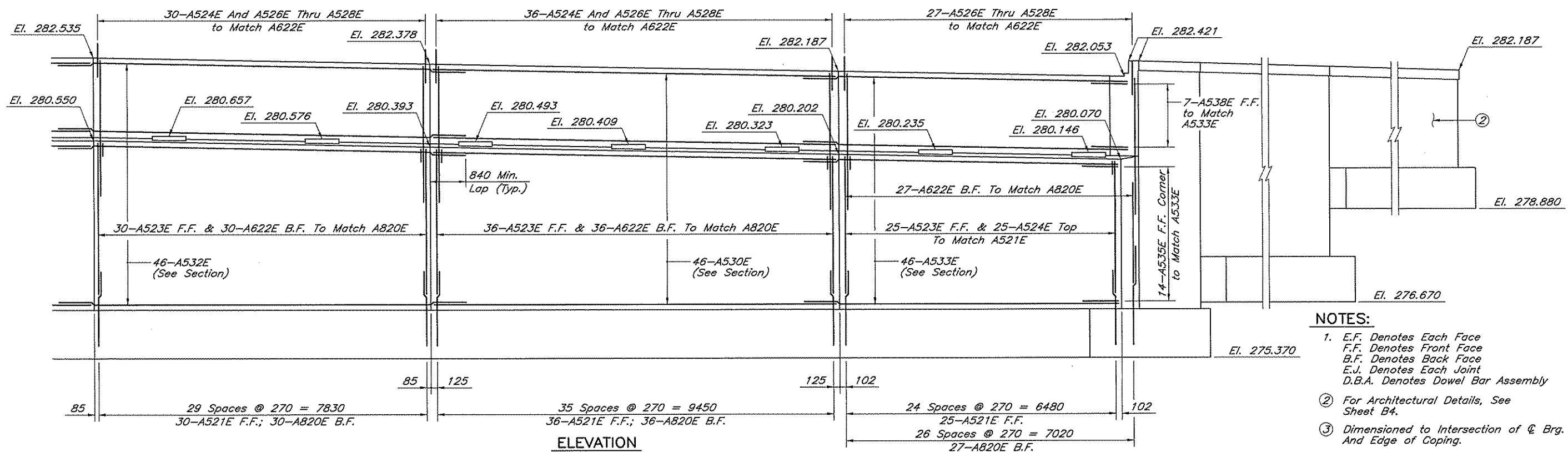
SHEET  
B5  
OF  
B47



A Pt. 26850mm Lt.  
@ N.B. C.S.A.H. 17  
Sta. 10+242.470



PLAN



ELEVATION

- NOTES:
- E.F. Denotes Each Face  
F.F. Denotes Front Face  
B.F. Denotes Back Face  
E.J. Denotes Each Joint  
D.B.A. Denotes Dowel Bar Assembly
  - For Architectural Details, See Sheet B4.
  - Dimensioned to Intersection of @ Brg. And Edge of Coping.

NO	DATE	BY	CKD	APPR	REVISION
NAME: H:\STRUC\003\2413\M13SA02.DWG DATE: MAR 06, 1997 TIME: 10:25 AM					

STATE AID PROJ. NO.  
02-617-11

BRIDGE NO.  
02550

I hereby certify that this plan, specification or report 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.

Date: 3/6/97 Reg. No. 19632

DRAWN BY  
J. HOFFMAN 3/97

DESIGNED BY  
R. SPANJERS 3/97

CHECKED BY  
L. ERICKSON 3/97

COMM. NO.  
0962413




ANOKA COUNTY  
C.S.A.H. 17 (LEXINGTON AVE.) OVER T.H. 35W  
SOUTH ABUTMENT DETAILS  
(SHEET 2 OF 7)

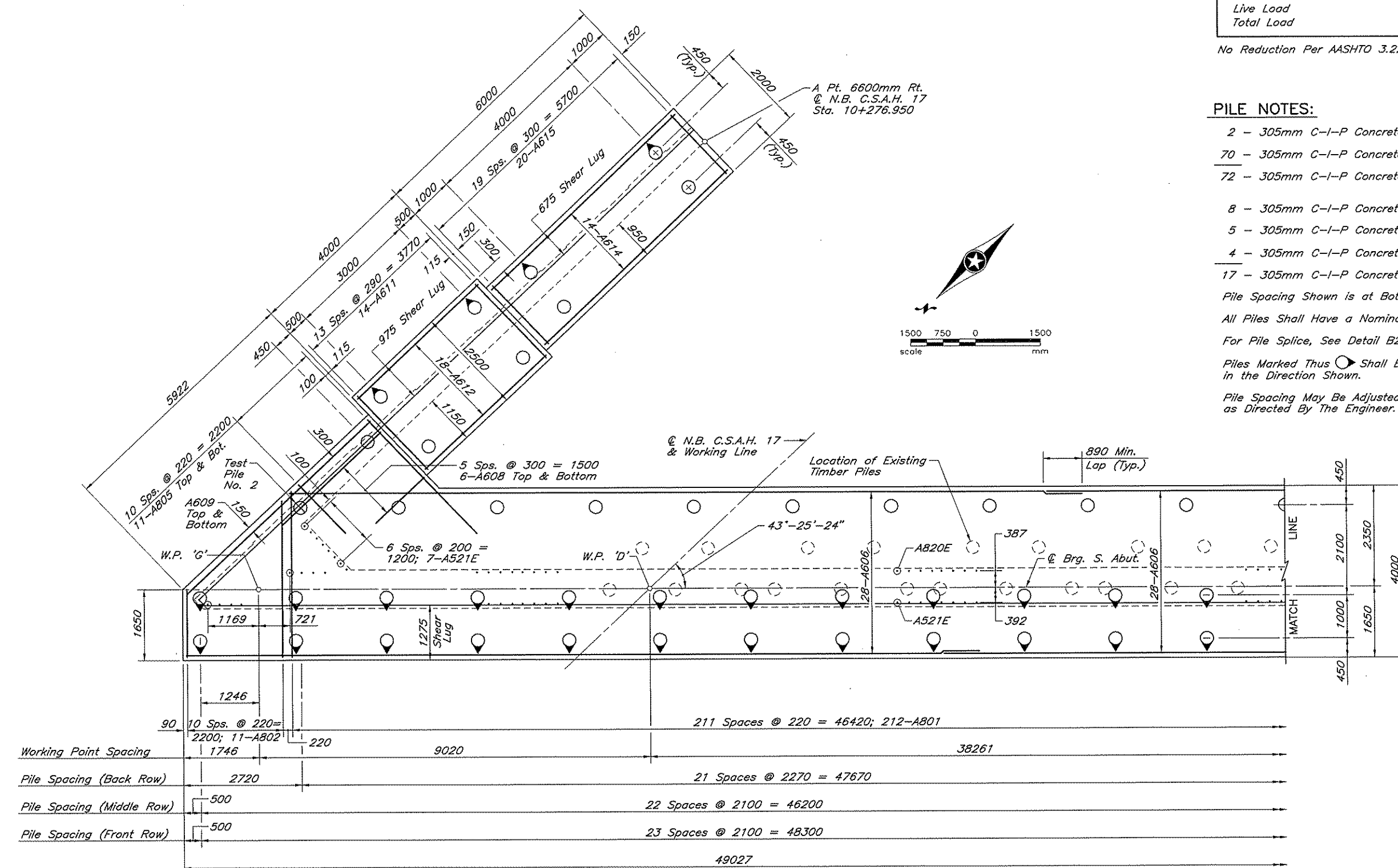
SHEET  
B6  
OF  
B47

COMPUTED PILE LOADS		KN/PILE
Dead Load + Earth Pressure		447
Live Load		39
<b>Total Load</b>		<b>486</b>

No Reduction Per AASHTO 3.22.1 Group I Loading

**PILE NOTES:**

- 2 - 305mm C-I-P Concrete Test Piles, 12 Meters Long
  - 70 - 305mm C-I-P Concrete Piles, Estimated Length 9 Meters.
  - 72 - 305mm C-I-P Concrete Piles Required For South Abutment.
  
  - 8 - 305mm C-I-P Concrete Piles, Estimated Length 13 Meters.
  - 5 - 305mm C-I-P Concrete Piles, Estimated Length 11 Meters.
  - 4 - 305mm C-I-P Concrete Piles, Estimated Length 12 Meters.
  - 17 - 305mm C-I-P Concrete Piles Required For Wingwalls.
- Pile Spacing Shown is at Bottom of Footing.  
 All Piles Shall Have a Nominal Diameter of 305mm.  
 For Pile Splice, See Detail B201M.  
 Piles Marked Thus  Shall Be Battered 250mm Per Meter in the Direction Shown.  
 Pile Spacing May Be Adjusted to Clear Existing Timber Piling as Directed By The Engineer.



**HALF FOOTING PLAN**

NO	DATE	BY	CHKD	APPR	REVISION
NAME: H:\STRUC\003\2413\M13SA03.DWG DATE: MAR 04, 1997 TIME: 8:60 AM					

STATE AID PROJ. NO.  
02-617-11

BRIDGE NO.  
02550

I hereby certify that this plan, specification or report 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.

*Robert A. Spanjers*  
Date: 3/6/97 Ref. No. 19632

DRAWN BY  
J. HOFFMAN

DATE  
3/97

DESIGNED BY  
R. SPANJERS

CHECKED BY  
L. ERICKSON

DATE  
3/97

COMM. NO.  
0962413



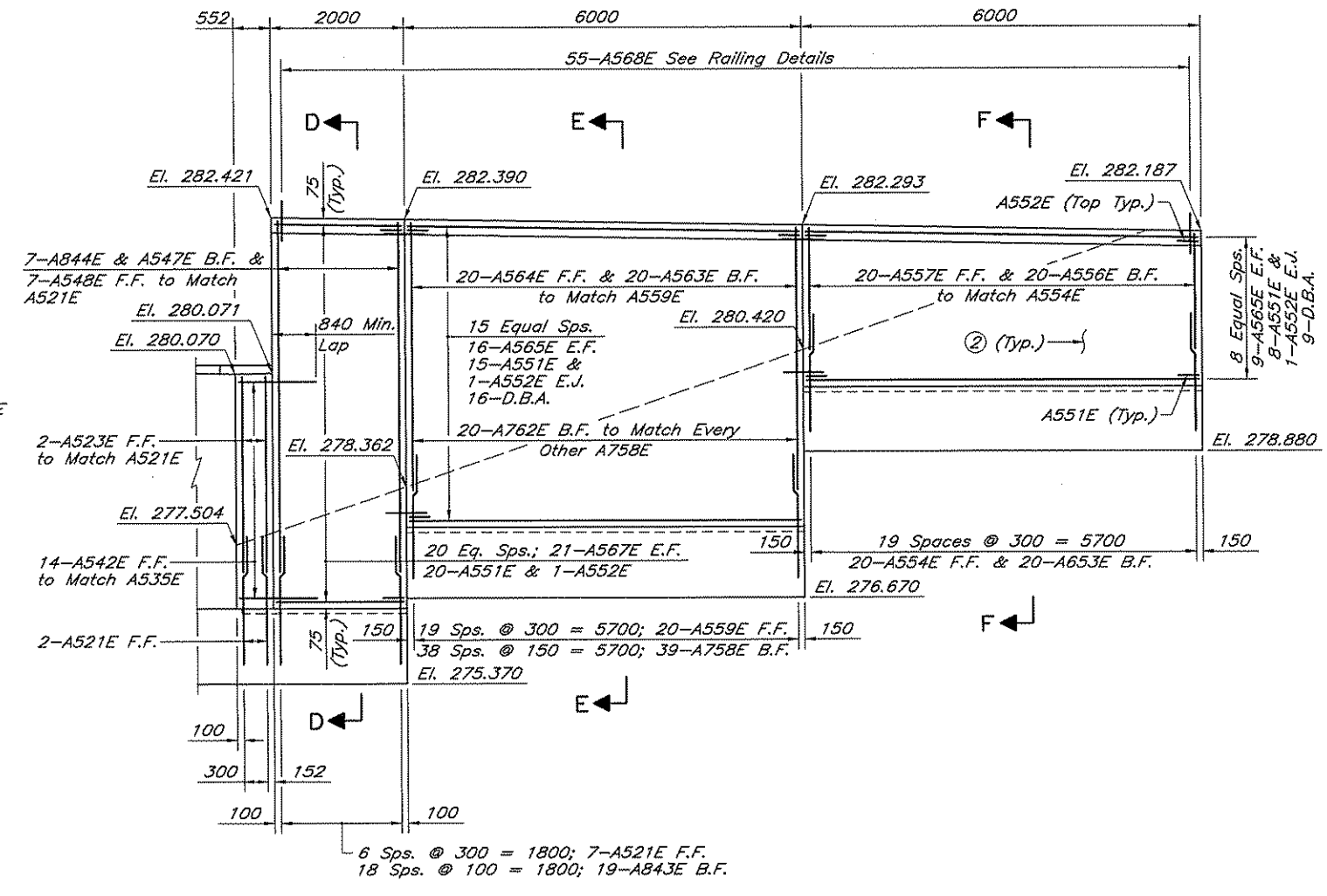
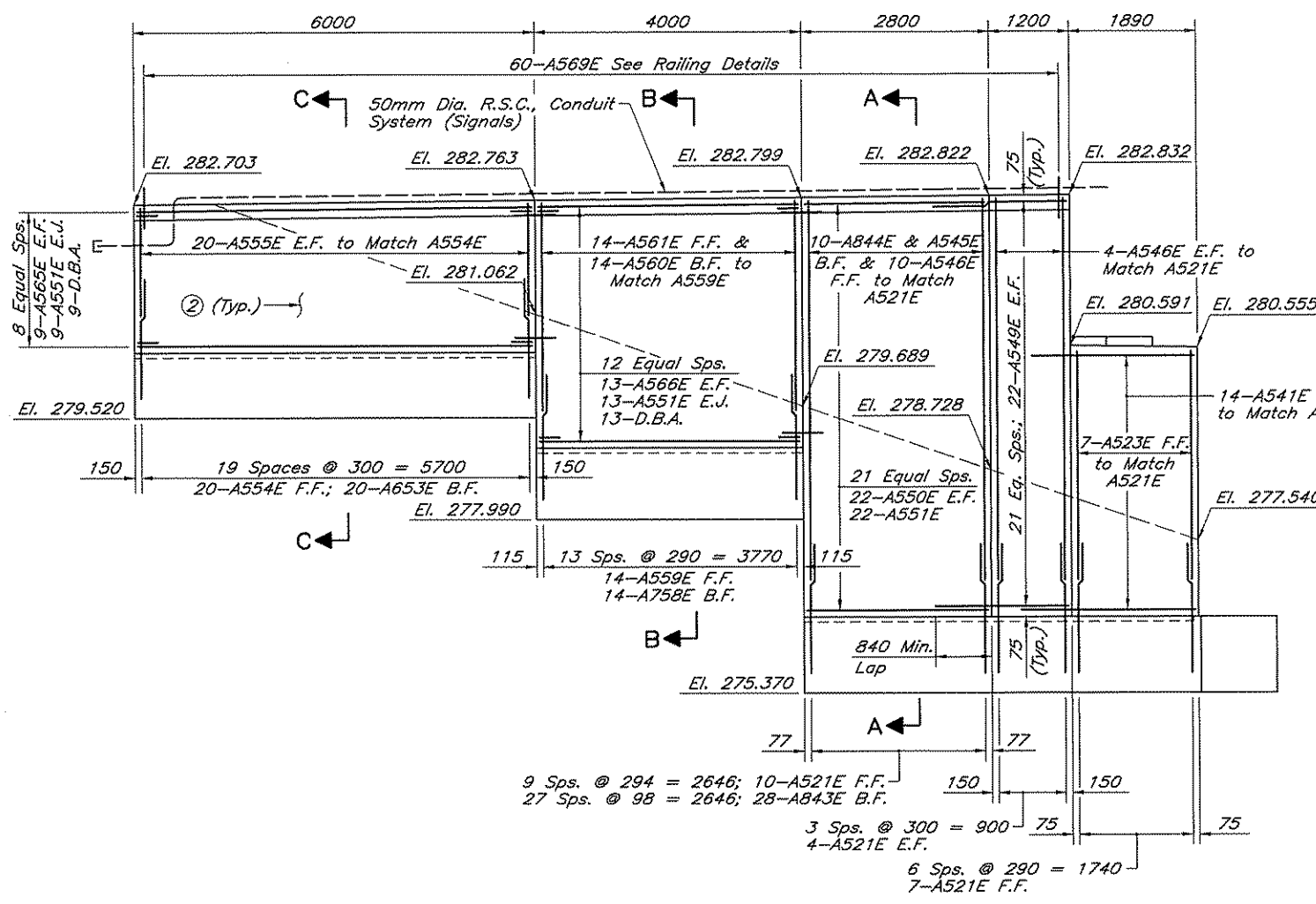
ANOKA COUNTY  
C.S.A.H. 17 (LEXINGTON AVE.) OVER T.H. 35W  
SOUTH ABUTMENT DETAILS  
(SHEET 3 OF 7)

SHEET  
B7  
OF  
B47



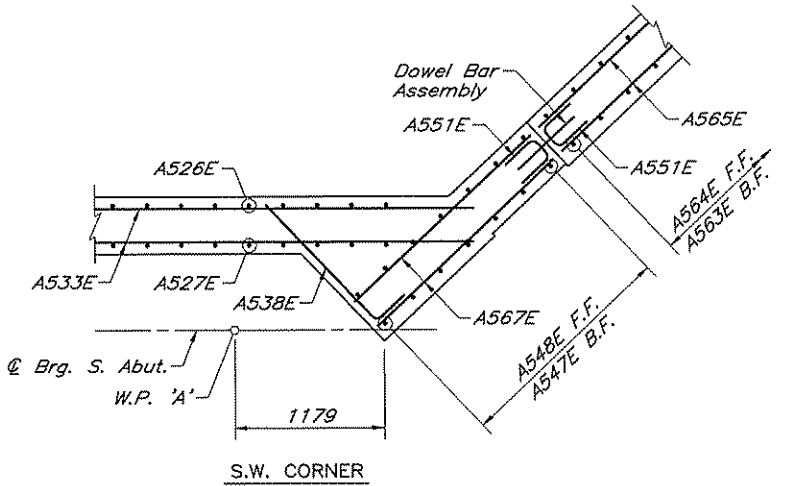
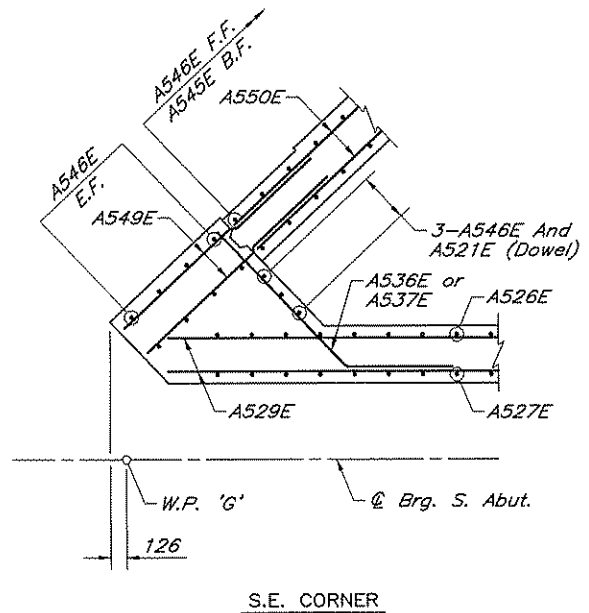






SOUTHEAST WINGWALL ELEVATION

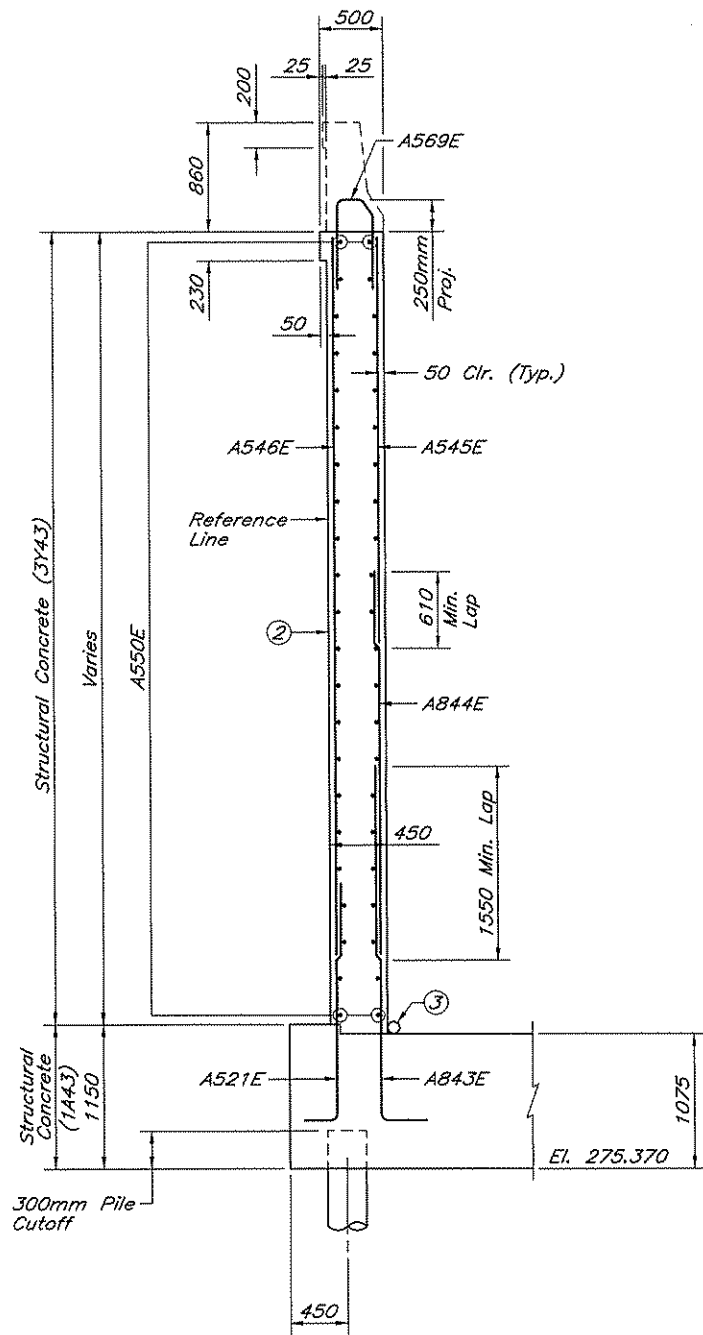
SOUTHWEST WINGWALL ELEVATION



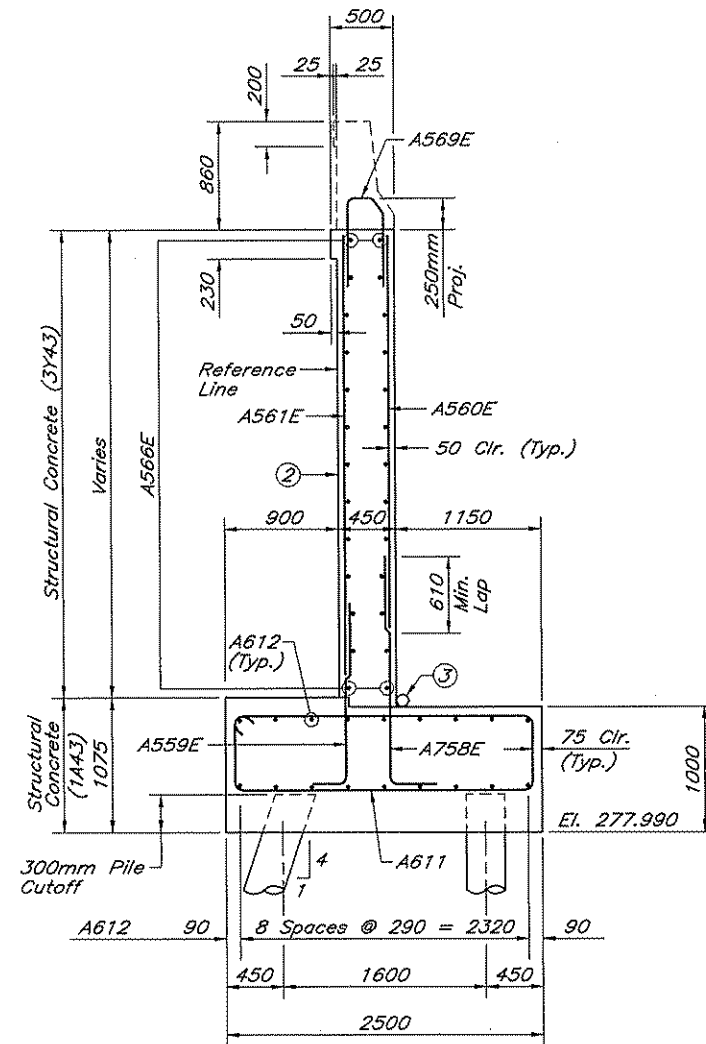
CORNER DETAILS

- NOTES:**
- E.F. Denotes Each Face  
F.F. Denotes Front Face  
B.F. Denotes Back Face  
E.J. Denotes Each Joint  
D.B.A. Denotes Dowel Bar Assembly
  - For Architectural Details, See Sheet B4.

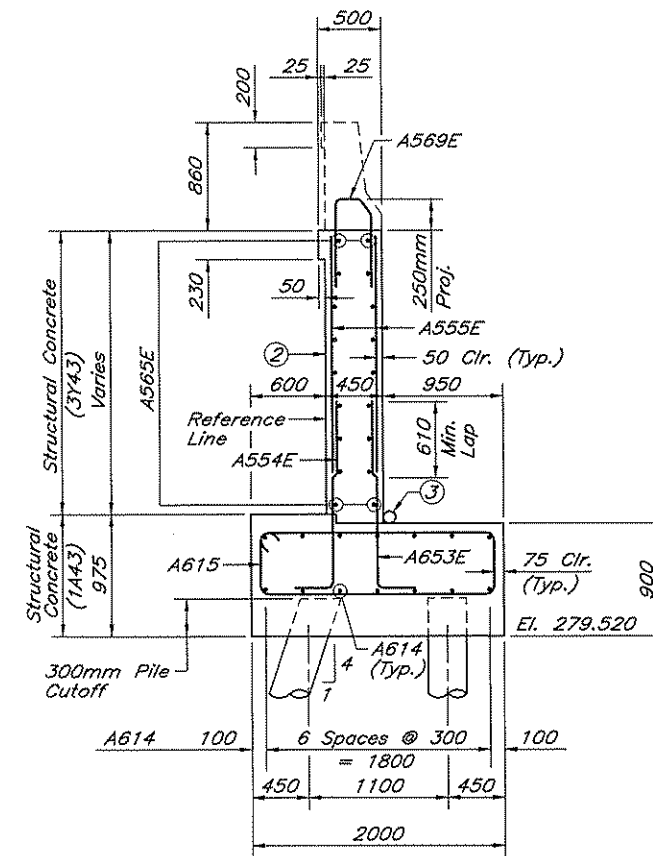
NAME: H:\STRUC\003\2413\M13SA05.DWG DATE: MAR 04, 1997 TIME: 9:14 AM				STATE AID PROJ. NO. 02-617-11		I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Registered Professional Engineer under the laws of the State of Minnesota. <i>Robert G. Spangler</i> Date: 3/6/97 Reg. No. 19632		DRAWN BY DATE J. HOFFMAN 3/97 DESIGNED BY R. SPANJERS 3/97 CHECKED BY L. ERICKSON 3/97 COMM. NO. 0962413		<b>SRF CONSULTING GROUP, INC.</b>		<b>ANOKA COUNTY</b> C.S.A.H. 17 (LEXINGTON AVE.) OVER T.H. 35W <b>SOUTH ABUTMENT DETAILS</b> (SHEET 5 OF 7)		SHEET B9 OF B47
REVISION NO. DATE BY CKD APPR				BRIDGE NO. 02550		Date: 3/6/97 Reg. No. 19632		COMM. NO. 0962413		SHEET B9 OF B47		5-1-97		



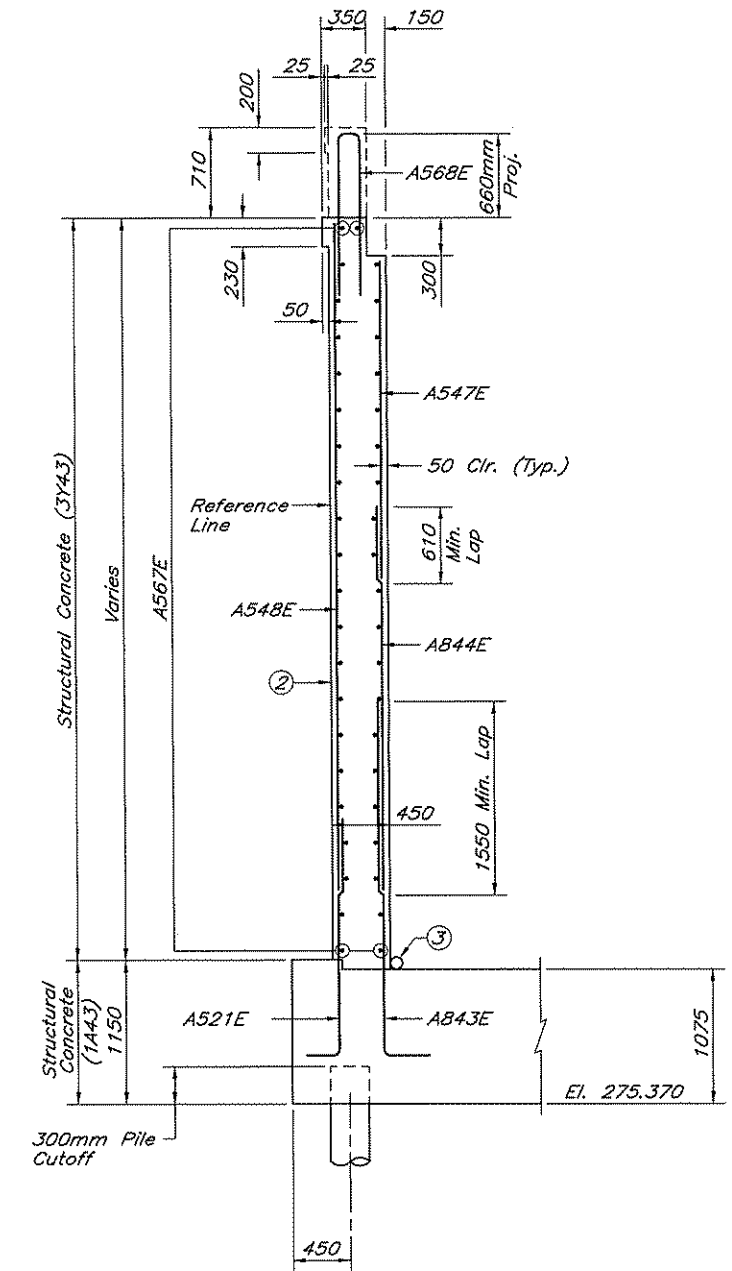
SECTION A-A



SECTION B-B



SECTION C-C



SECTION D-D

NOTES:

1. E.F. Denotes Each Face  
F.F. Denotes Front Face  
B.F. Denotes Back Face  
E.J. Denotes Each Joint  
D.B.A. Denotes Dowel Bar Assembly
- ② For Architectural Details, See Sheet B4.
- ③ 100mm Dia. Perforated Pipe, See Detail B910M (Drainage System).

NO	DATE	BY	CKD	APPR	REVISION
NAME: H:\STRUC\003\2413\M13SA06.DWG DATE: MAR 04, 1997 TIME: 9:18 AM					

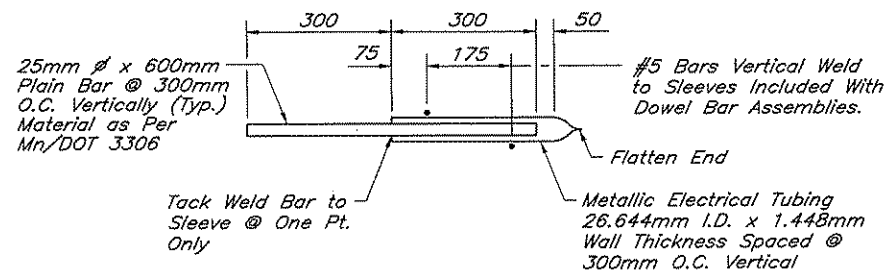
STATE AID PROJ. NO. 02-617-11	I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Registered Professional Engineer under the laws of the State of Minnesota. <i>Ruth L. Spanjers</i> Date: 3/6/97 Reg. No. 19632
BRIDGE NO. 02550	

DRAWN BY J. HOFFMAN	DATE 3/97
DESIGNED BY R. SPANJERS	DATE 3/97
CHECKED BY L. ERICKSON	DATE 3/97
COMM. NO. 0962413	

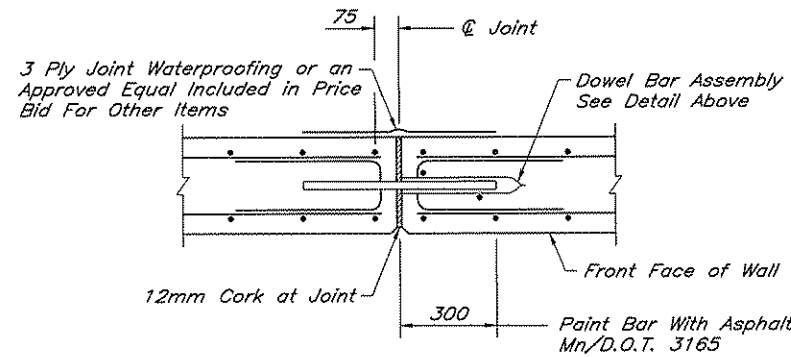
**SRF CONSULTING GROUP, INC.**

ANOKA COUNTY  
C.S.A.H. 17 (LEXINGTON AVE.) OVER T.H. 35W  
SOUTH ABUTMENT DETAILS  
(SHEET 6 OF 7)

SHEET  
B10  
OF  
B47



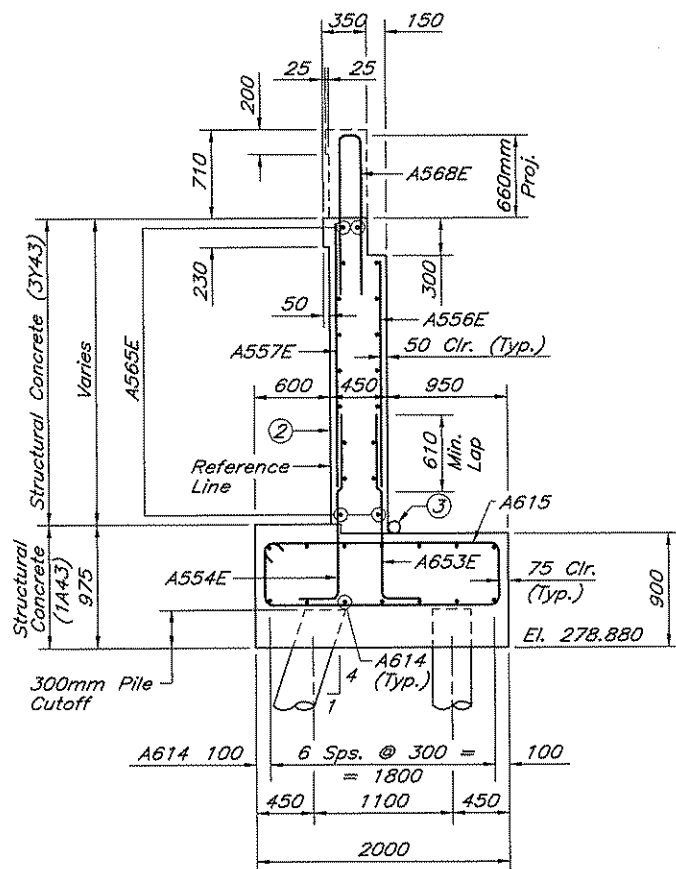
DETAIL A



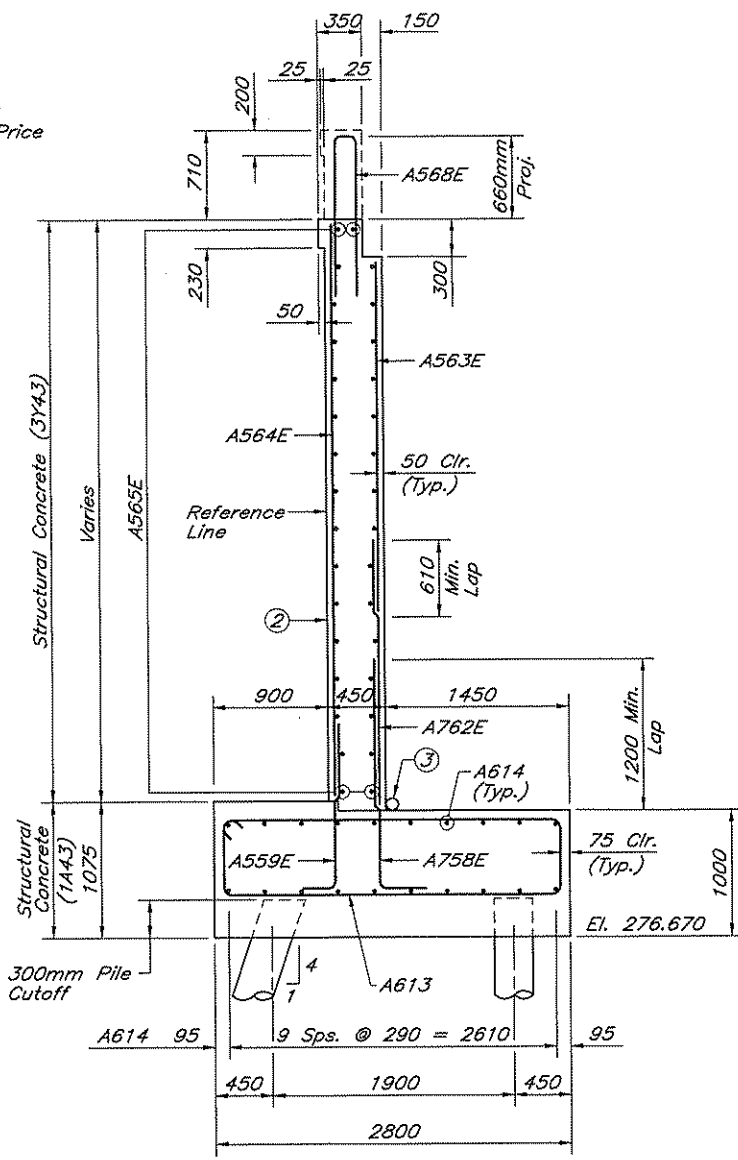
Cork Shall Comply With Mn/D.O.T. 3702 Secure Cork With 63mm Long 11 Gauge Copper Nails Abt. 450mm O.C. Cork And Nails Included in Price Bid For Other Items.

DOWEL BAR ASSEMBLY DETAIL

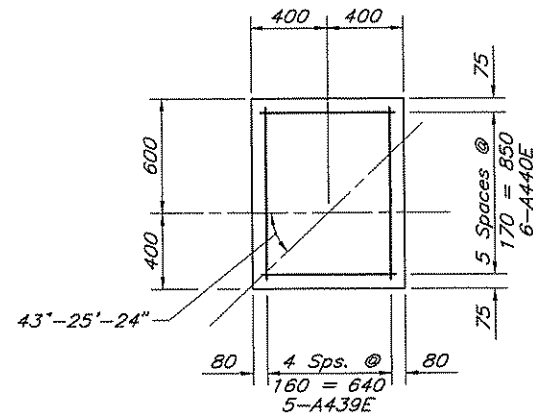
Material And Placing to Be Included in Price Bid For Other Items



SECTION F-F



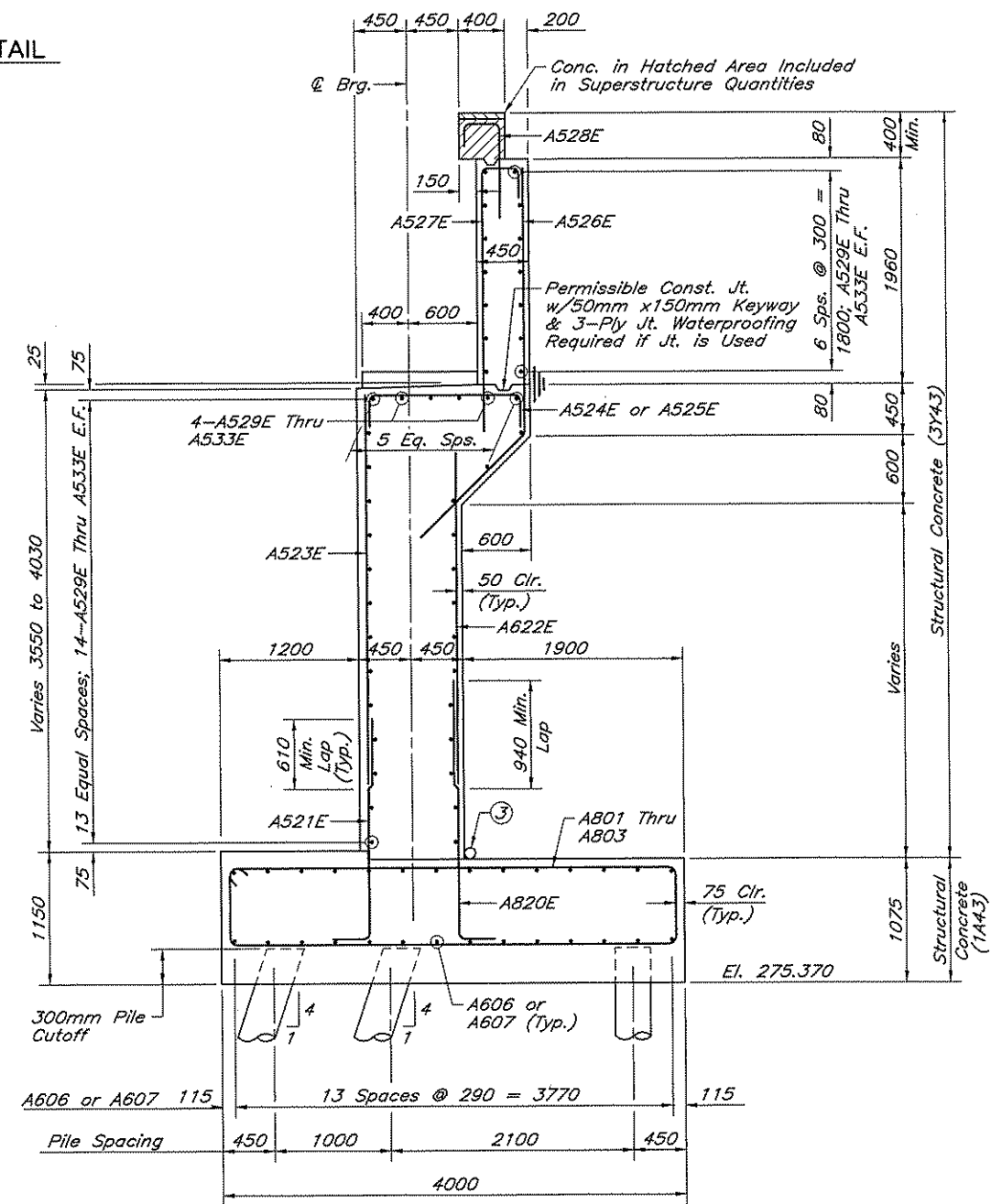
SECTION E-E



BRIDGE SEAT DETAIL

NOTES:

1. E.F. Denotes Each Face  
F.F. Denotes Front Face  
B.F. Denotes Back Face  
E.J. Denotes Each Joint  
D.B.A. Denotes Dowel Bar Assembly
2. For Architectural Details, See Sheet B4.
3. 100mm Dia. Perforated Pipe, See Detail B910M (Drainage System).



TYPICAL SECTION

NO	DATE	BY	CKD	APPR	REVISION
NAME: H:\STRUC\003\2413\M13SA07.DWG DATE: MAR 06, 1997 TIME: 10:28 AM					

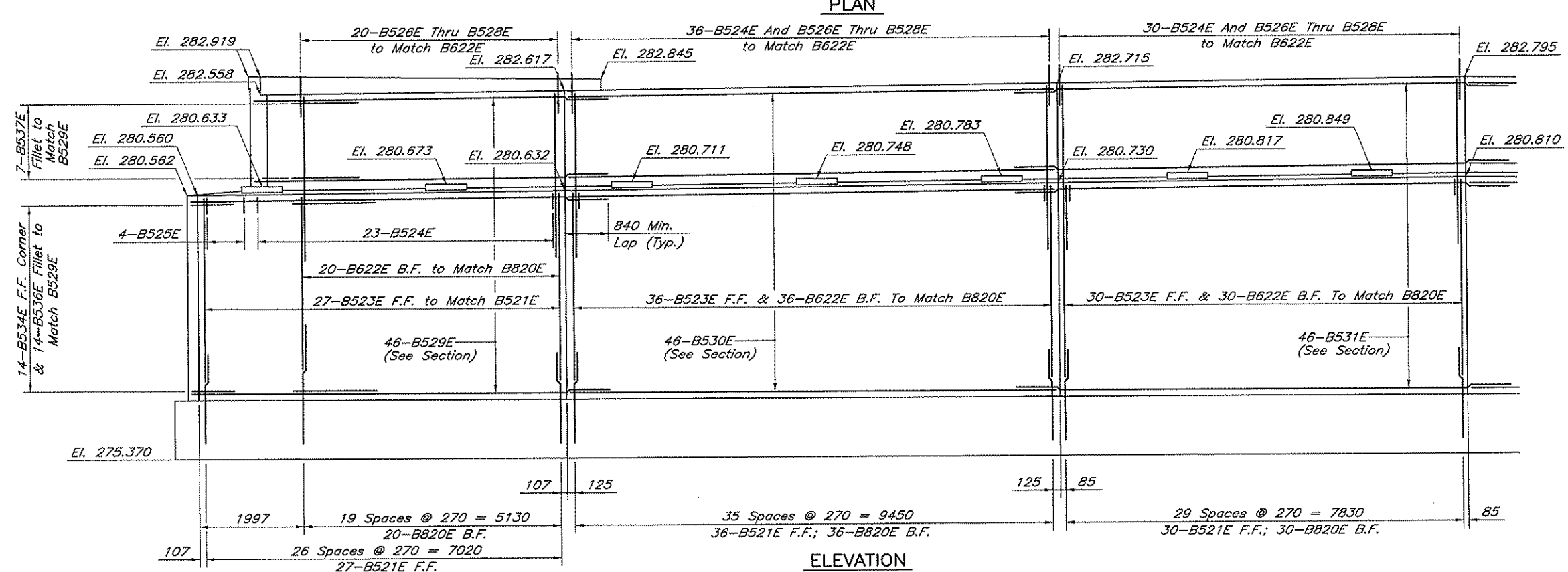
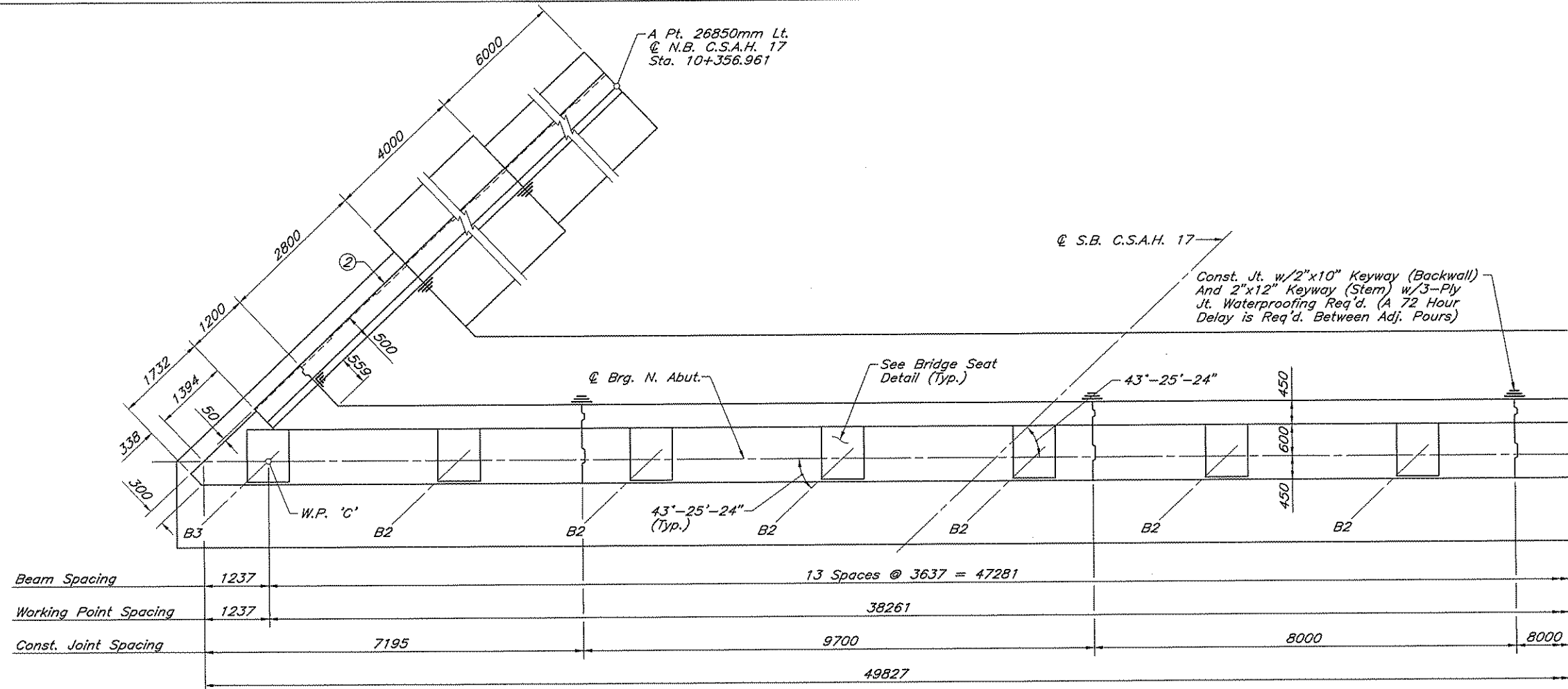
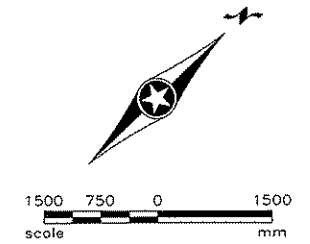
STATE AID PROJ. NO.	02-617-11
BRIDGE NO.	02550
I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Registered Professional Engineer under the laws of the State of Minnesota.	
Date	3/6/97
Reg. No.	19632

DRAWN BY	J. HOFFMAN	DATE	3/97
DESIGNED BY	R. SPANJERS	DATE	3/97
CHECKED BY	L. ERICKSON	DATE	3/97
COMM. NO.	0982413		

**SRF CONSULTING GROUP, INC.**

ANOKA COUNTY
C.S.A.H. 17 (LEXINGTON AVE.) OVER T.H. 35W
SOUTH ABUTMENT DETAILS
(SHEET 7 OF 7)

SHEET	B11
OF	B47



ELEVATION

- NOTES:
- E.F. Denotes Each Face  
 F.F. Denotes Front Face  
 B.F. Denotes Back Face  
 E.J. Denotes Each Joint  
 D.B.A. Denotes Dowel Bar Assembly
  - For Architectural Details, See Sheet B4.

NO	DATE	BY	CKD	APPR	REVISION
NAME: H:\STRUC\003\2413\M13NA01.DWG DATE: MAR 06, 1997 TIME: 10:31 AM					

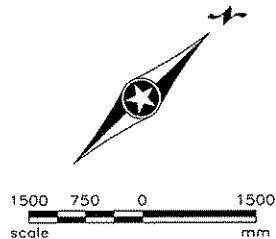
STATE AID PROJ. NO. 02-617-11	I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Registered Professional Engineer under the laws of the State of Minnesota.  <i>Kurti Spajin</i> Date: 3/6/97 Reg. No. 19632
BRIDGE NO. 02550	

DRAWN BY J. HOFFMAN	DATE 3/97
DESIGNED BY R. SPANJERS	DATE 3/97
CHECKED BY L. ERICKSON	DATE 3/97
COMM. NO. 0982413	

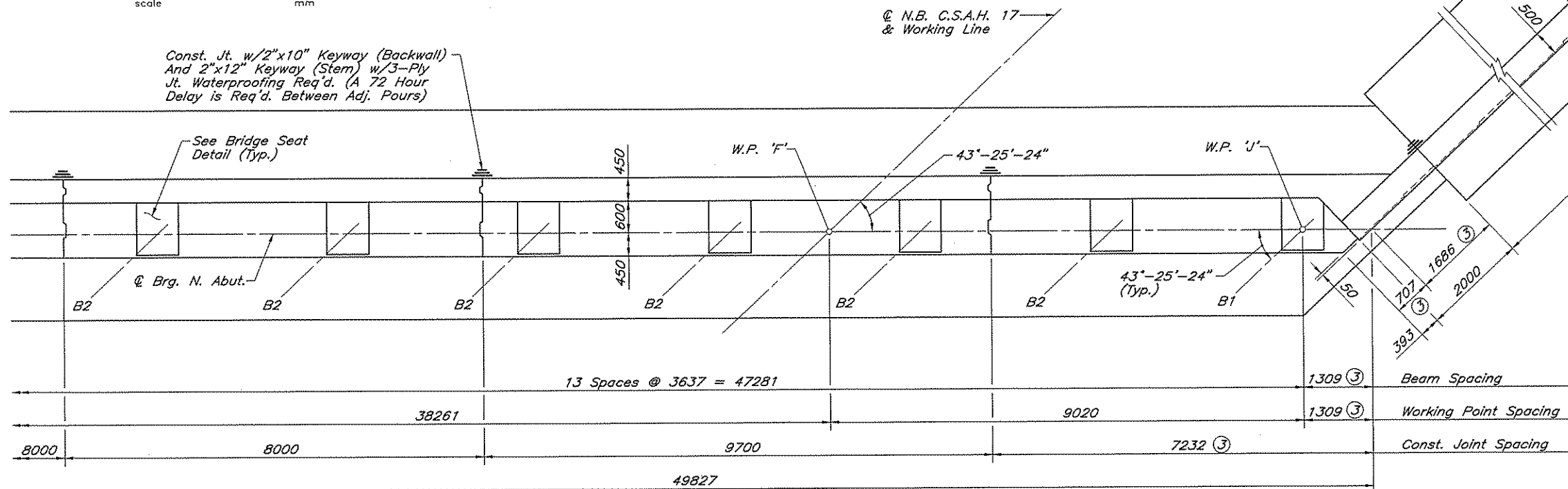


ANOKA COUNTY  
 C.S.A.H. 17 (LEXINGTON AVE.) OVER T.H. 35W  
 NORTH ABUTMENT DETAILS  
 (SHEET 1 OF 7)

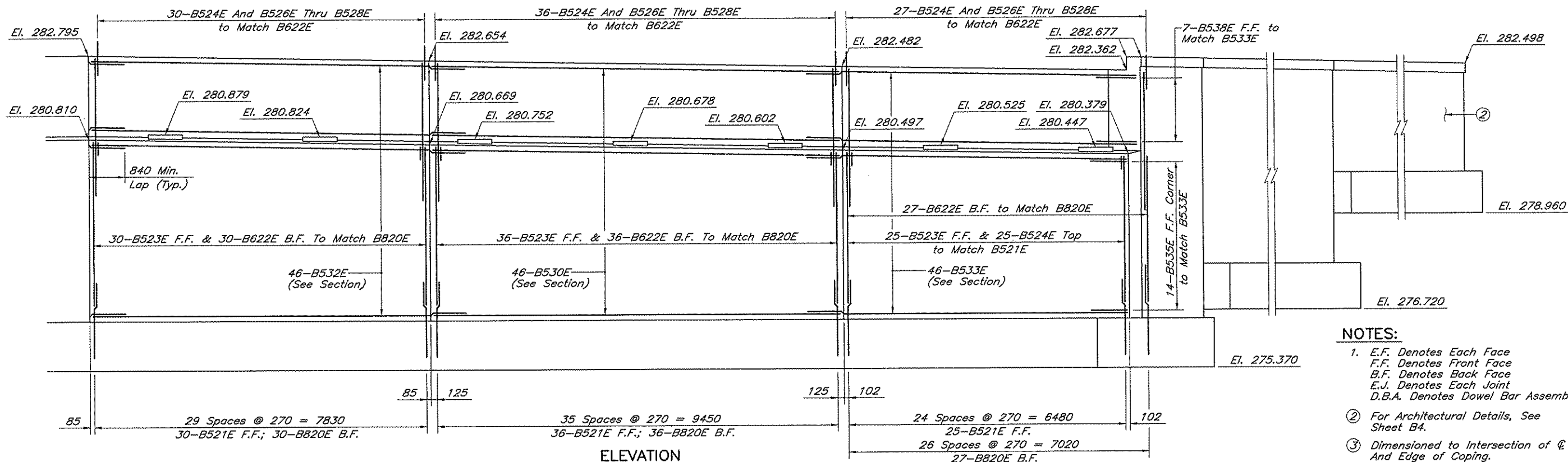
SHEET  
 B12  
 OF  
 B47



Const. Jt. w/2"x10" Keyway (Backwall) And 2"x12" Keyway (Stem) w/3-Ply Jt. Waterproofing Req'd. (A 72 Hour Delay is Req'd. Between Adj. Pours)



PLAN



ELEVATION

NOTES:

1. E.F. Denotes Each Face  
F.F. Denotes Front Face  
B.F. Denotes Back Face  
E.J. Denotes Each Joint  
D.B.A. Denotes Dowel Bar Assembly
2. For Architectural Details, See Sheet B4.
3. Dimensioned to Intersection of  $\phi$  Brg. And Edge of Coping.

NO.	DATE	BY	CHKD	APPR	REVISION
NAME: H:\STRUC\003\2413\M13NA02.DWG DATE: MAR 06, 1997 TIME: 10:34 AM					

STATE AID PROJ. NO. 02-617-11	I hereby certify that this plan, specification or report 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.  <i>R. Spanjers</i> Date: 3/6/97 Reg. No. A632
BRIDGE NO. 02550	

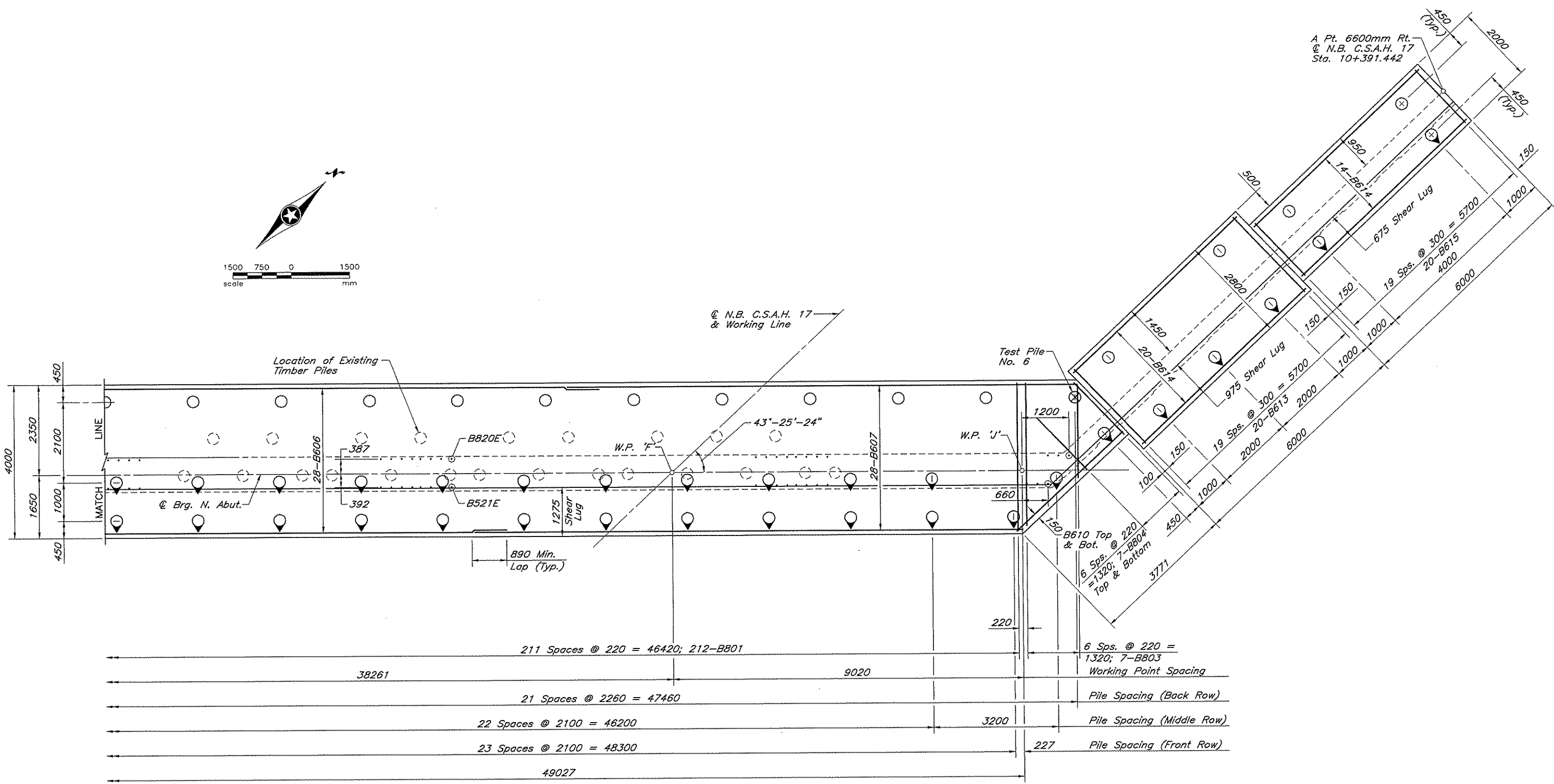
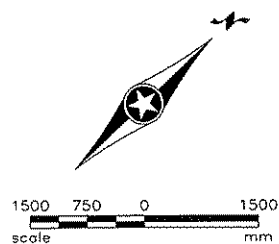
DRAWN BY J. HOFFMAN	DATE 3/97
DESIGNED BY R. SPANJERS	DATE 3/97
CHECKED BY L. ERICKSON	DATE 3/97
COMM. NO. 0962413	



ANOKA COUNTY
C.S.A.H. 17 (LEXINGTON AVE.) OVER T.H. 35W
NORTH ABUTMENT DETAILS
(SHEET 2 OF 7)

SHEET	B13
OF	B47





HALF FOOTING PLAN

NO	DATE	BY	CHKD	APPR	REVISION

NAME: H:\STRUC\003\2413\M13NA04.DWG DATE: MAR 04, 1997 TIME: 11:01 AM

STATE AID PROJ. NO.  
02-617-11

BRIDGE NO.  
02550

I hereby certify that this plan, specification or report 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.

*Robert G. Spanjers*  
Date: 3/6/97 Reg. No. 19632

DRAWN BY DATE  
J. HOFFMAN 3/97

DESIGNED BY  
R. SPANJERS 3/97

CHECKED BY  
L. ERICKSON 3/97

COMM. NO.  
0962413

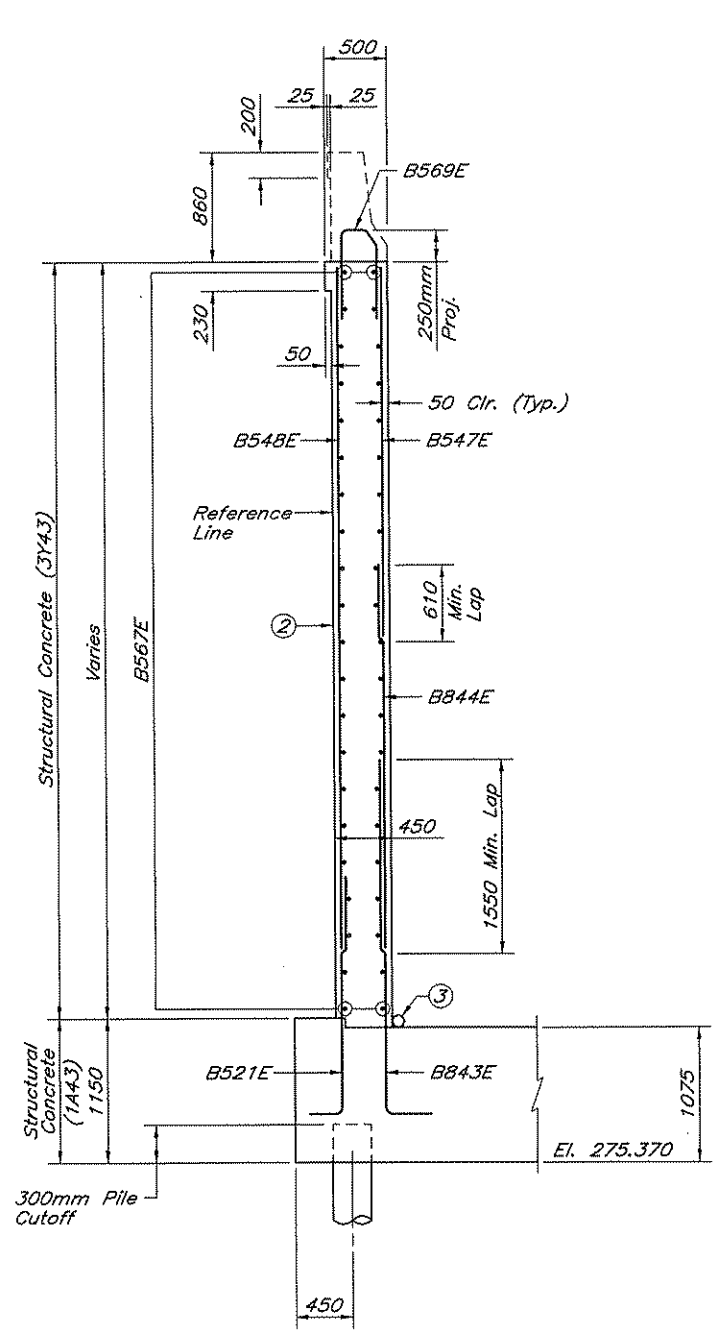


ANOKA COUNTY  
C.S.A.H. 17 (LEXINGTON AVE.) OVER T.H. 35W  
NORTH ABUTMENT DETAILS  
(SHEET 4 OF 7)

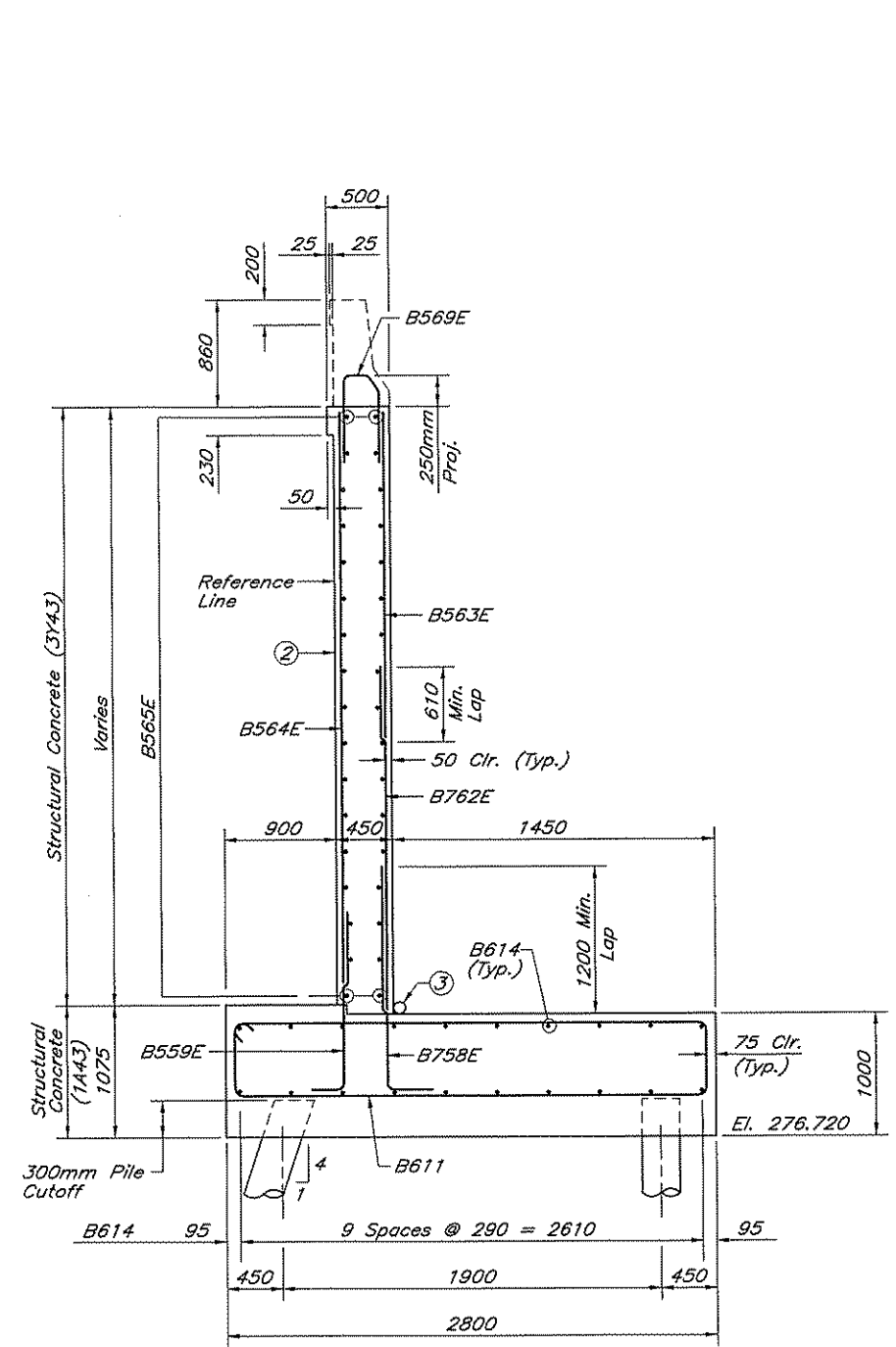
SHEET  
B15  
OF  
B47



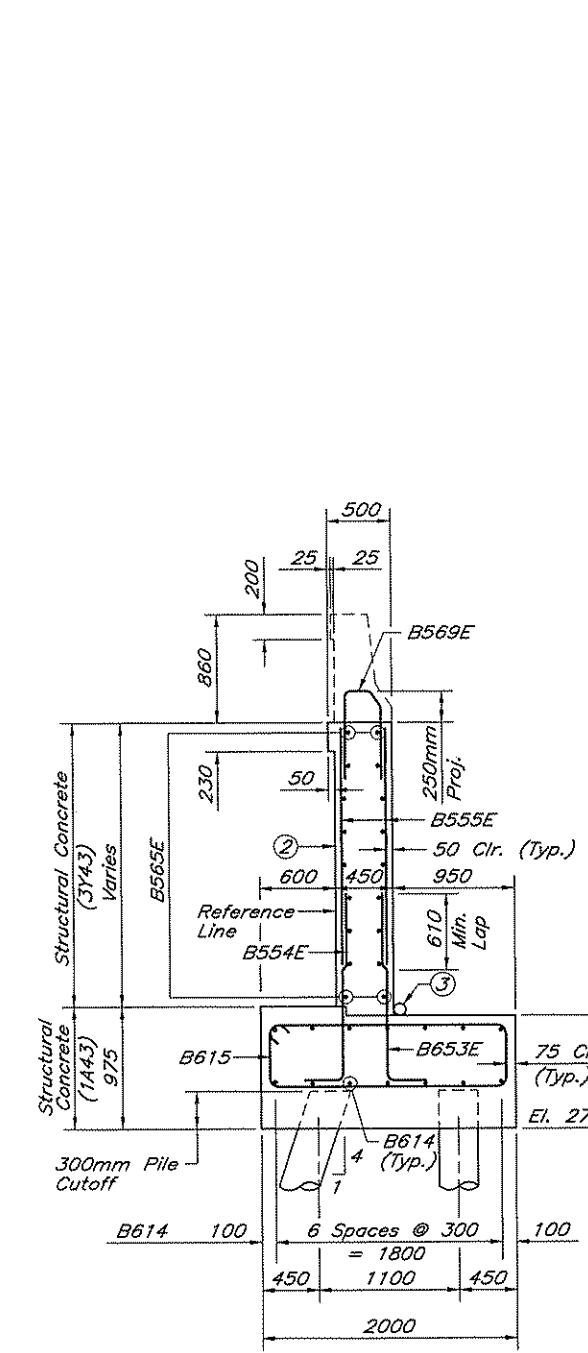




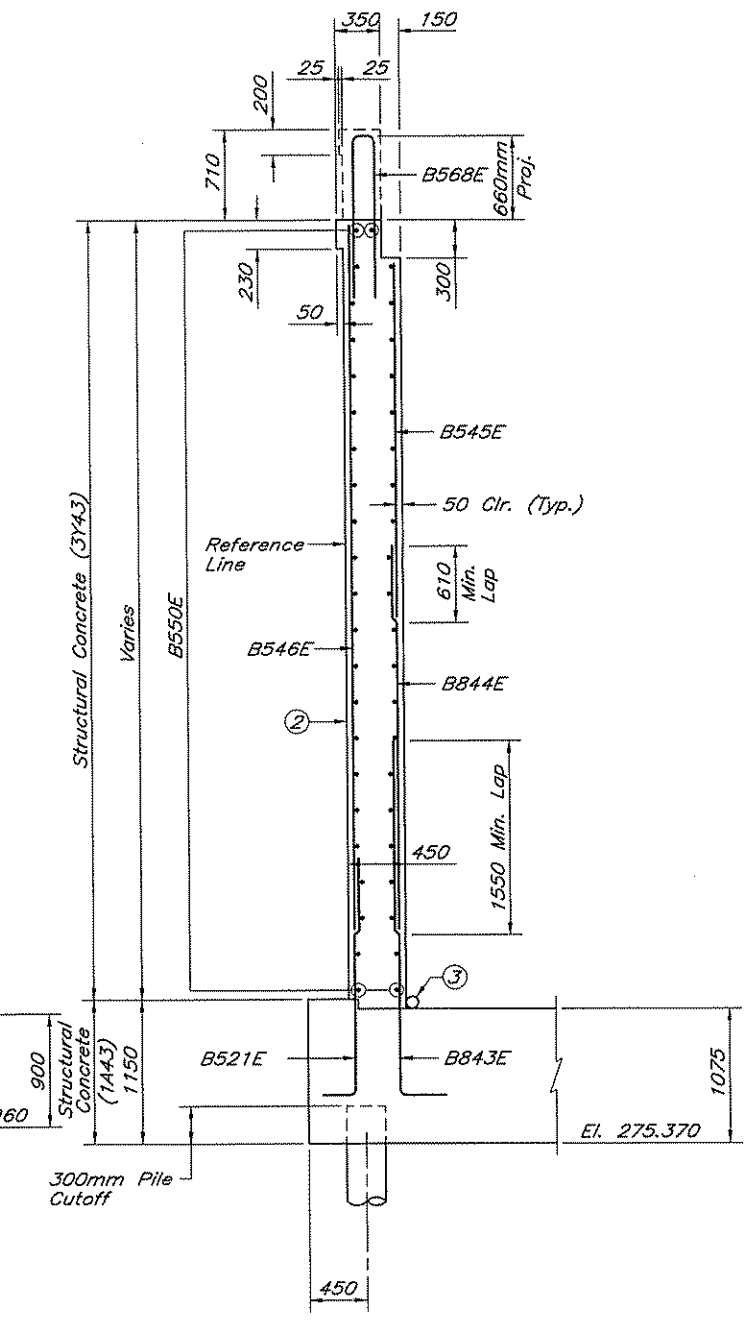
SECTION A-A



SECTION B-B



SECTION C-C



SECTION D-D

- NOTES:**
1. E.F. Denotes Each Face  
F.F. Denotes Front Face  
B.F. Denotes Back Face  
E.J. Denotes Each Joint  
D.B.A. Denotes Dowel Bar Assembly
  - ② For Architectural Details, See Sheet B4.
  - ③ 100mm Dia. Perforated Pipe, See Detail B910M (Drainage System).

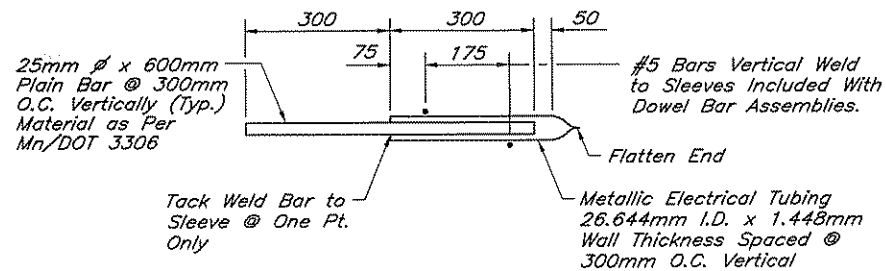
NO.	DATE	BY	CKD	APPR	REVISION
NAME: H:\STRUC\003\2413\M13NA06.DWG DATE: MAR 06, 1997 TIME: 10:42 AM					

STATE AID PROJ. NO. 02-617-11	I hereby certify that this plan, specification or report 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. <i>Roy U. Spanjers</i> Date: 3/6/97 Reg. No. 9632
BRIDGE NO. 02550	

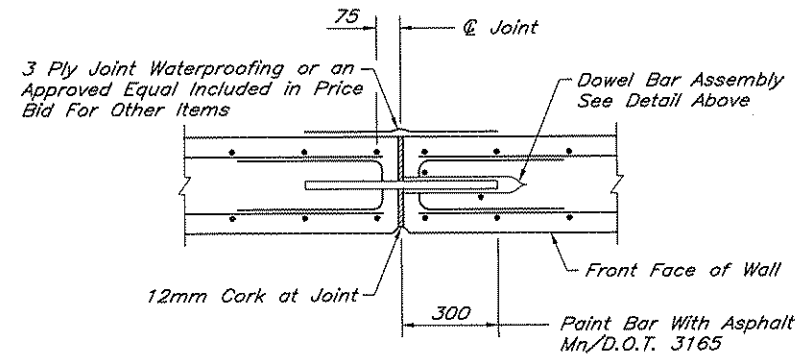
DRAWN BY J. HOFFMAN	DATE 3/97
DESIGNED BY R. SPANJERS	DATE 3/97
CHECKED BY L. ERICKSON	DATE 3/97
COMM. NO. 0962413	

**SRF CONSULTING GROUP, INC.**

<b>ANOKA COUNTY</b>		<b>SHEET B17 OF B47</b>
C.S.A.H. 17 (LEXINGTON AVE.) OVER T.H. 35W		
NORTH ABUTMENT DETAILS (SHEET 6 OF 7)		

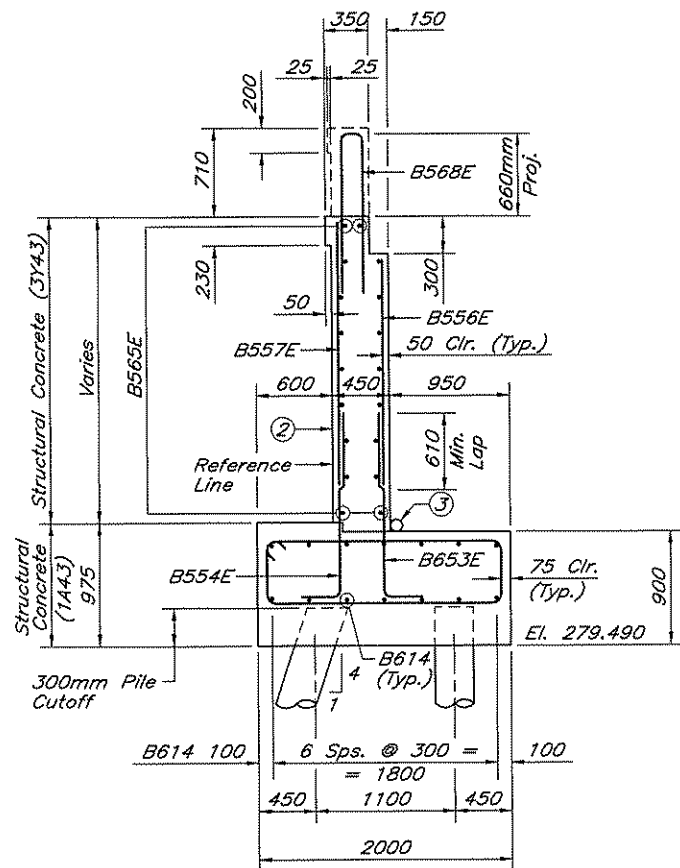


DETAIL A

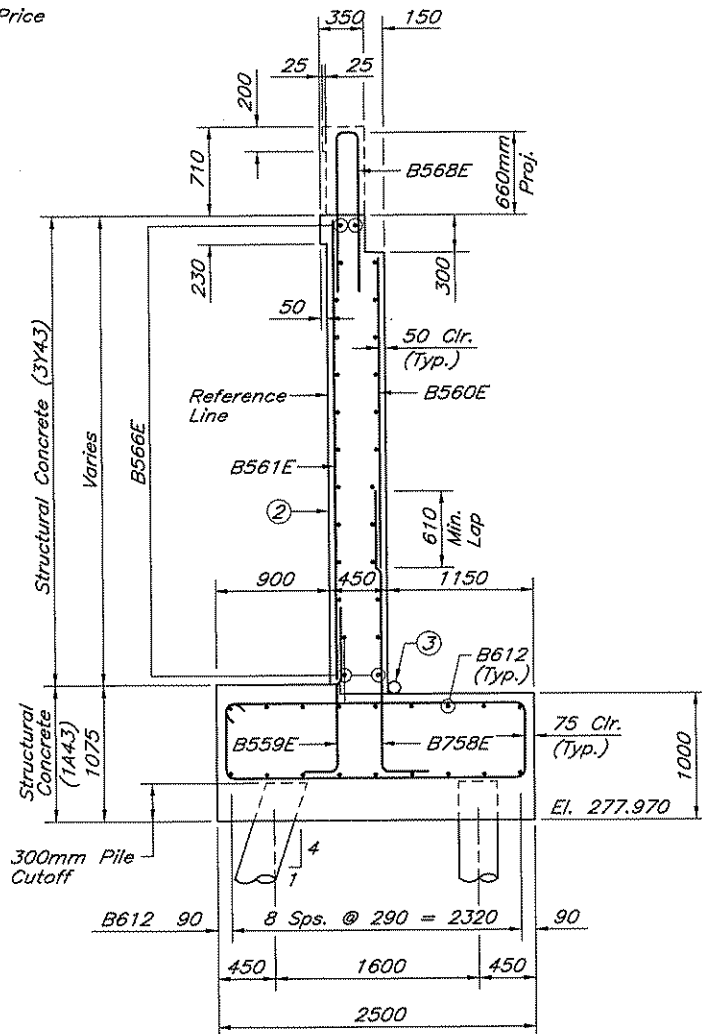


DOWEL BAR ASSEMBLY DETAIL

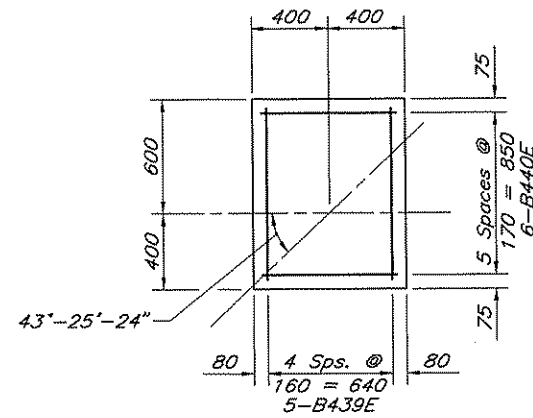
Material And Placing to Be Included in Price Bid For Other Items



SECTION F-F



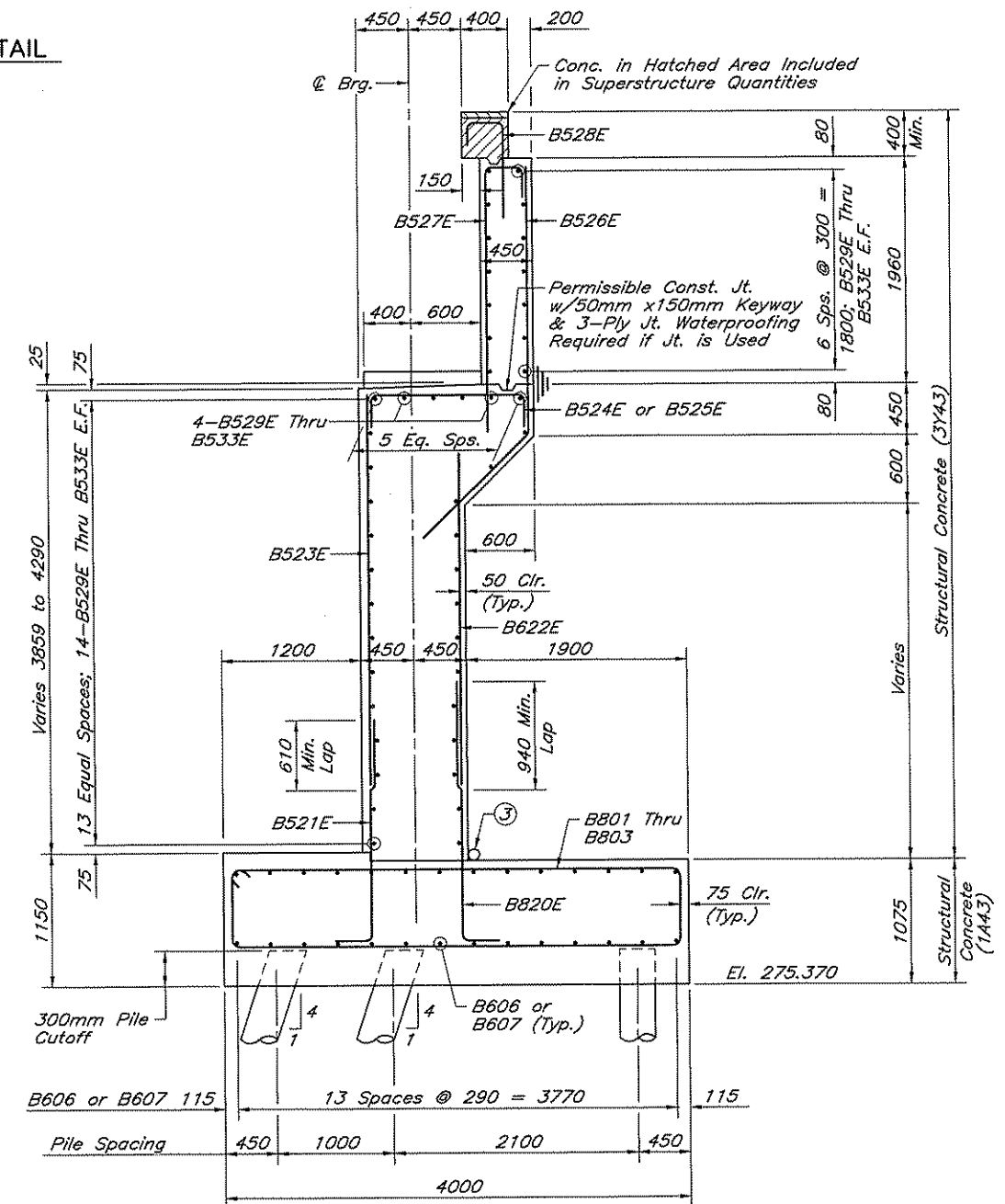
SECTION E-E



BRIDGE SEAT DETAIL

NOTES:

1. E.F. Denotes Each Face  
F.F. Denotes Front Face  
B.F. Denotes Back Face  
E.J. Denotes Each Joint  
D.B.A. Denotes Dowel Bar Assembly
2. For Architectural Details, See Sheet B4.
3. 100mm Dia. Perforated Pipe, See Detail B910M (Drainage System).



TYPICAL SECTION

NO	DATE	BY	CHKD	APPR	REVISION
NAME: H:\STRUC\003\2413\M13NA07.DWG DATE: MAR 04, 1997 TIME: 1:14 PM					

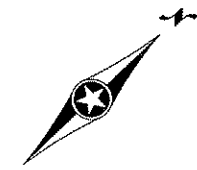
STATE AID PROJ. NO. 02-617-11	I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Registered Professional Engineer under the laws of the State of Minnesota.  Robert U. Spangier Date 3/6/97 Reg. No. 19632
BRIDGE NO. 02550	

DRAWN BY J. HOFFMAN	DATE 3/97
DESIGNED BY R. SPANJERS	DATE 3/97
CHECKED BY L. ERICKSON	DATE 3/97
COMM. NO. 0962413	

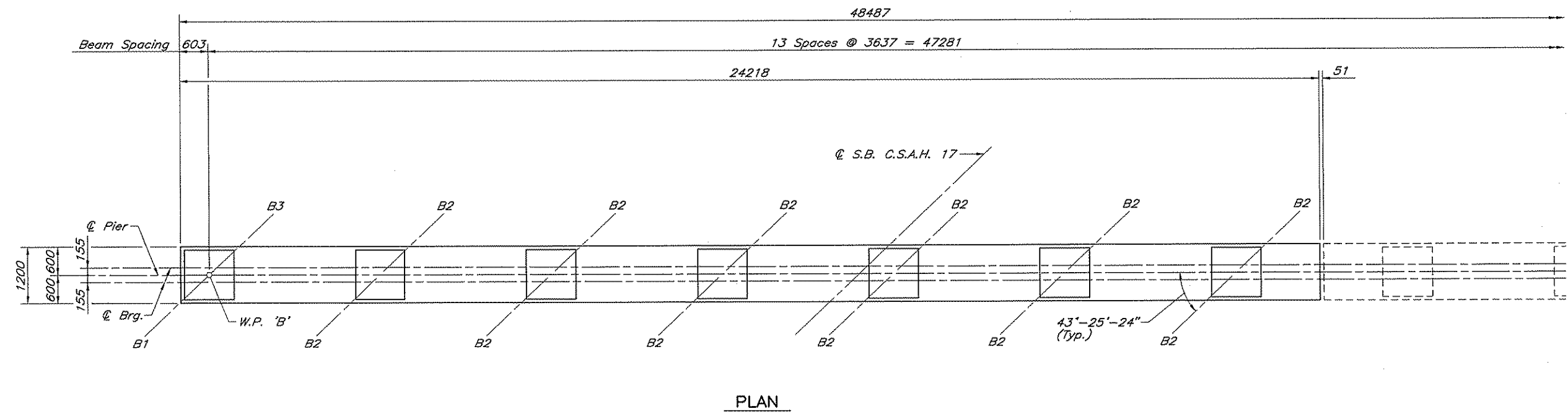
**SRF CONSULTING GROUP, INC.**

ANOKA COUNTY  
C.S.A.H. 17 (LEXINGTON AVE.) OVER T.H. 35W  
NORTH ABUTMENT DETAILS  
(SHEET 7 OF 7)

SHEET	B18
OF	B47

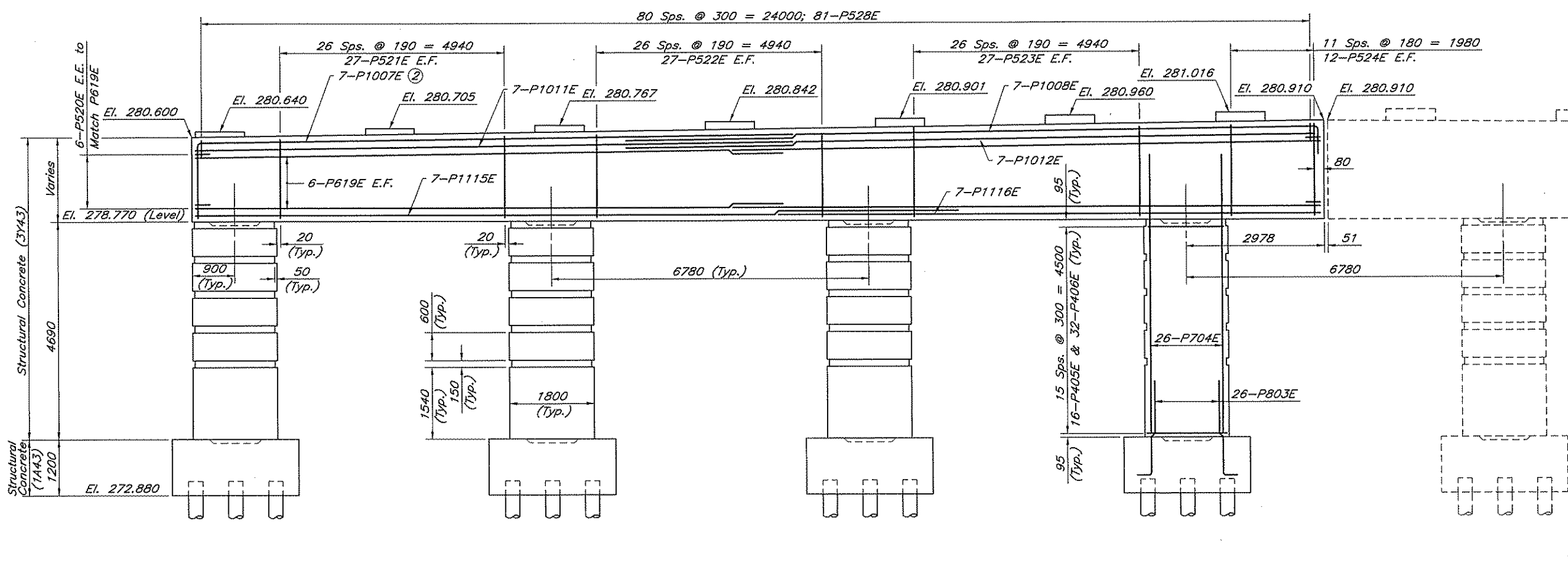


BAR SIZE	LAP LENGTH
11	3840
10	3560
6	1070

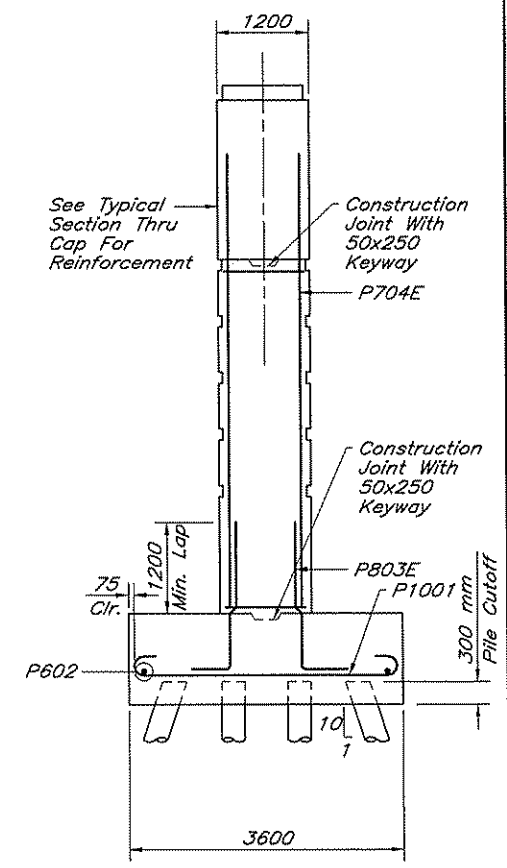


PLAN

- NOTE:
- E.F. Denotes Each Face  
E.E. Denotes Each End  
U.N.O. Denotes Unless Noted Otherwise
  - Lap Leg With P704E.



ELEVATION



END VIEW

NO	DATE	BY	CKD	APPR	REVISION
NAME: H:\STRUC\003\2413\M13PD01.DWG DATE: MAR 06, 1997 TIME: 10:43 AM					

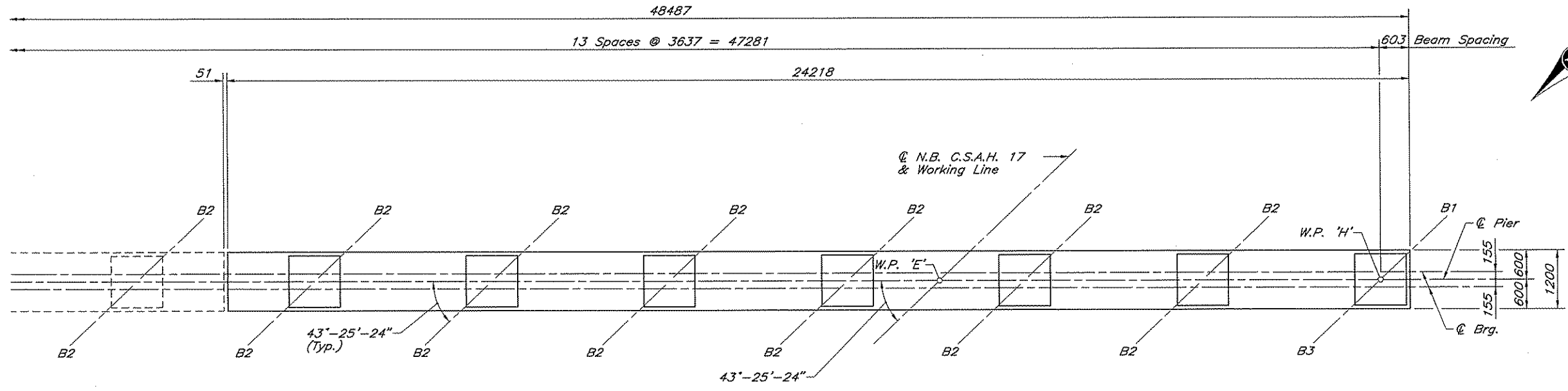
STATE AID PROJ. NO.	02-617-11
BRIDGE NO.	02550
I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Registered Professional Engineer under the laws of the State of Minnesota.	
 Date: 3/6/97 Reg. No. 19632	

DRAWN BY	J. HOFFMAN	DATE	3/97
DESIGNED BY	D. THOMAS	DATE	3/97
CHECKED BY	R. SPANJERS	DATE	3/97
COMM. NO.	0962413		



ANOKA COUNTY
C.S.A.H. 17 (LEXINGTON AVE.) OVER T.H. 35W
PIER DETAILS
(SHEET 1 OF 4)

SHEET	B19
OF	B47

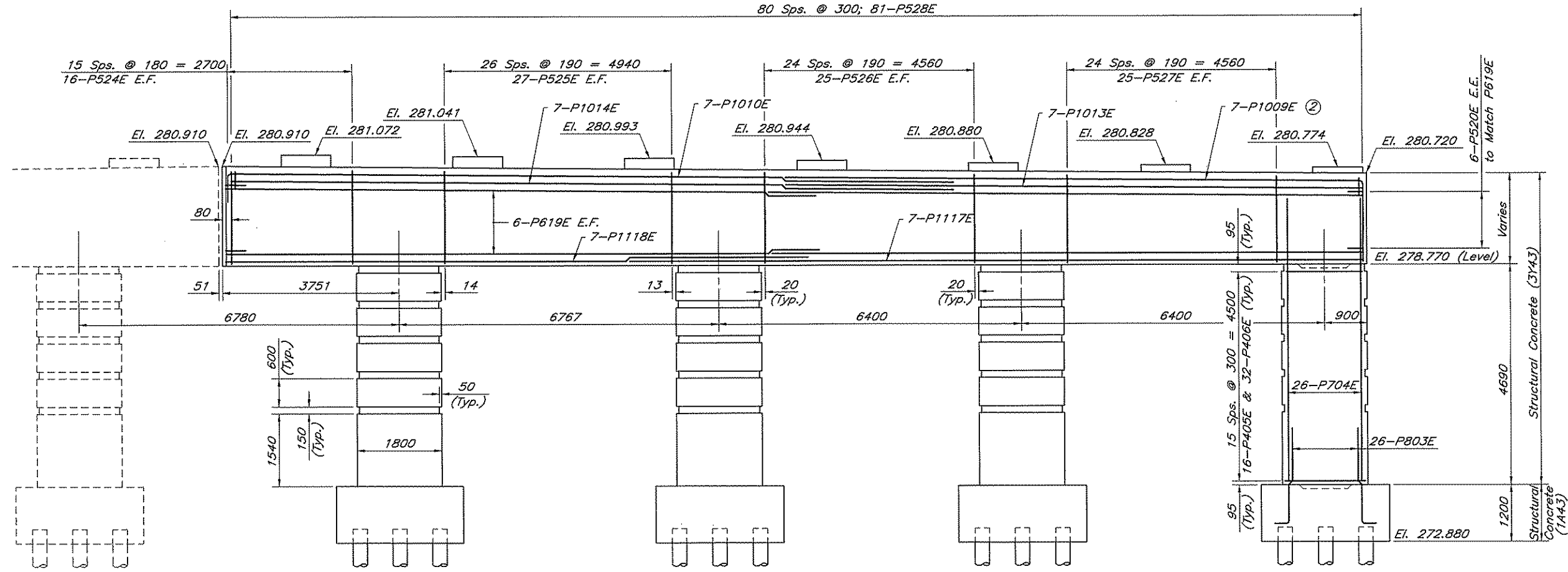


PLAN

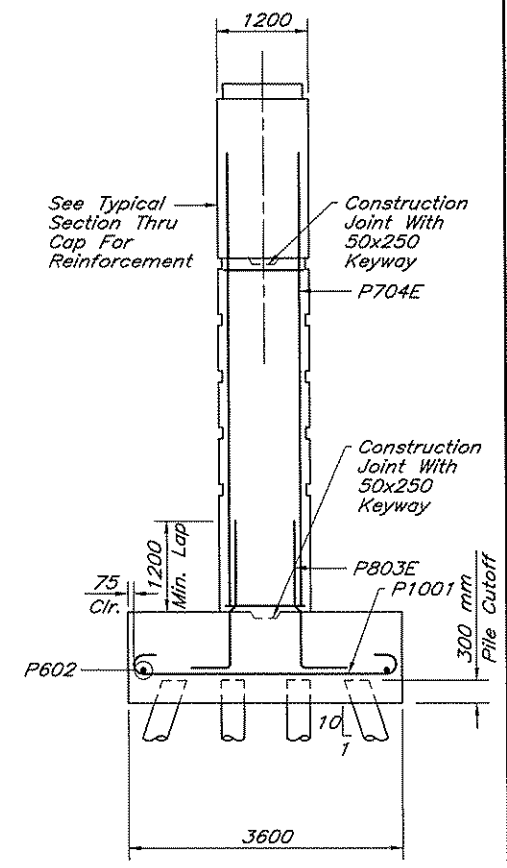
CAP BARS MINIMUM LAP TABLE	
BAR SIZE	LAP LENGTH
11	3840
10	3560
6	1070

**NOTE:**

- E.F. Denotes Each Face  
E.E. Denotes Each End  
U.N.O. Denotes Unless Noted Otherwise
- Lap Leg With P704E



ELEVATION



END VIEW

NO.	DATE	BY	CKD	APPR	REVISION
NAME: H:\STRUC\003\2413\M13PD02.DWG DATE: MAR 06, 1997 TIME: 10:45 AM					

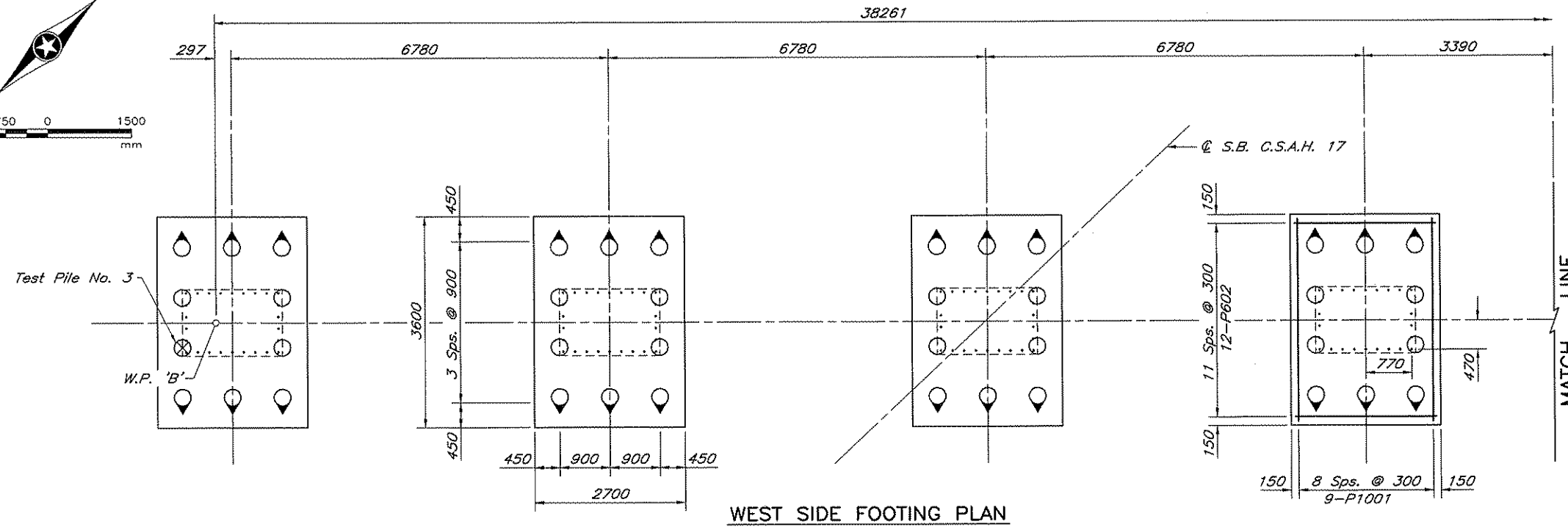
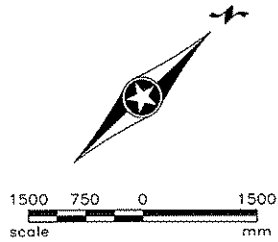
STATE AID PROJ. NO. 02-617-11	I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Registered Professional Engineer under the laws of the State of Minnesota.  Robert A. Gumpin Date: 3/6/97 Reg. No. 19632
BRIDGE NO. 02550	

DRAWN BY J. HOFFMAN	DATE 3/97
DESIGNED BY D. THOMAS	DATE 3/97
CHECKED BY L. ERICKSON	DATE 3/97
COMM. NO. 0962413	



ANOKA COUNTY
C.S.A.H. 17 (LEXINGTON AVE.) OVER T.H. 35W
PIER DETAILS
(SHEET 2 OF 4)

SHEET	B20
OF	B47

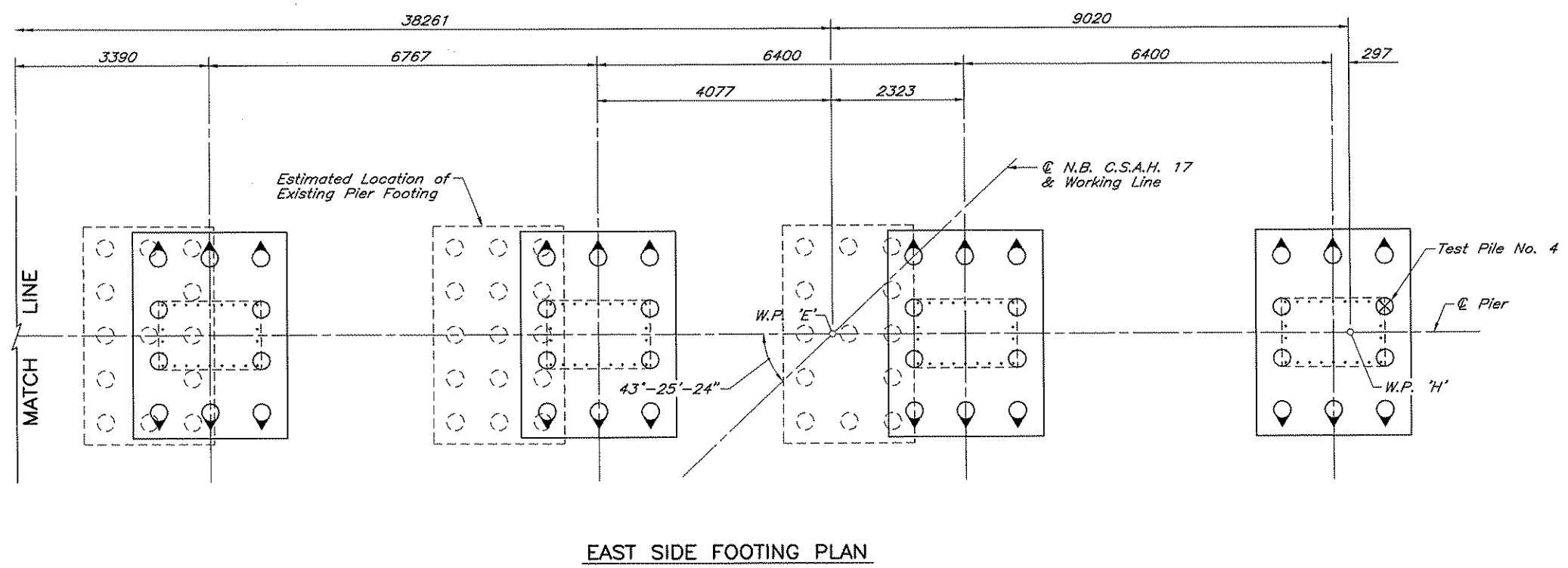


COMPUTED PILE LOADS:	KN/PILE
Dead Load:	413
Live Load:	103
* Total:	516

\* No Reduction Per AASHTO 3.22.1 Group I Loading

**PILE NOTES:**

- 2 - 305mm C-I-P Concrete Test Piles, 12m. Long
  - 78 - 305mm C-I-P Concrete Piles, Estimated Length 9m.
  - 80 - 305mm C-I-P Concrete Piles Required For Pier
- Pile Spacing Shown is at Bottom of Footing.  
 All Piles Shall Have a Nominal Diameter of 305mm.  
 For Pile Splice, See Detail B201M.  
 Piles Marked Thus Shall Be Battered 100mm To 1000mm in the Direction Shown.



STATE AID PROJ. NO. 02-617-11  
 BRIDGE NO. 02550  
 I hereby certify that this plan, specification or report 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.  
 Robert L. Hoffman  
 Date 3/6/97 Reg. No. 19632

DRAWN BY J. HOFFMAN DATE 3/97  
 DESIGNED BY D. THOMAS 3/97  
 CHECKED BY R. SPANJERS 3/97  
 COMM. NO. 0962413

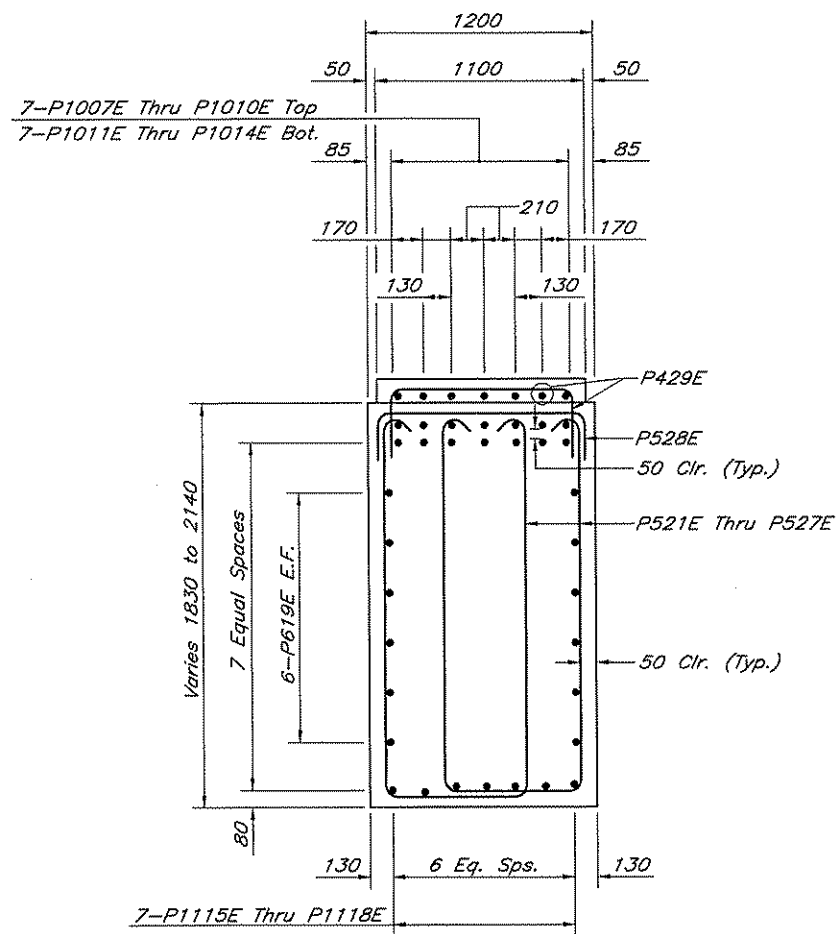


ANOKA COUNTY  
 C.S.A.H. 17 (LEXINGTON AVE.) OVER T.H. 35W  
 PIER DETAILS  
 (SHEET 3 OF 4)

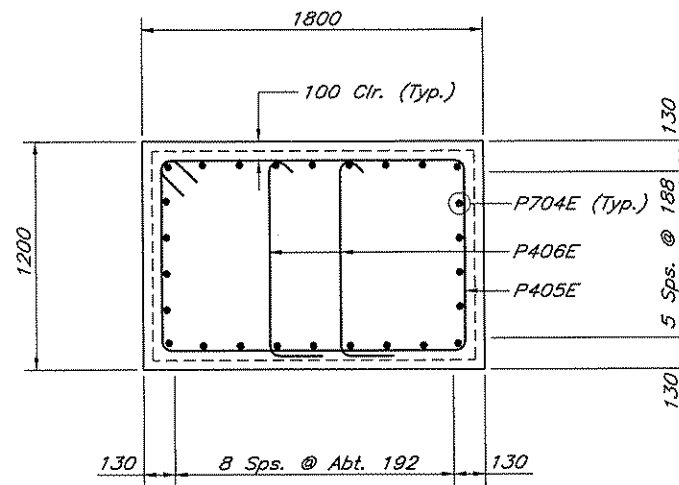
SHEET B21 OF B47

NO	DATE	BY	CHKD	APPR	REVISION

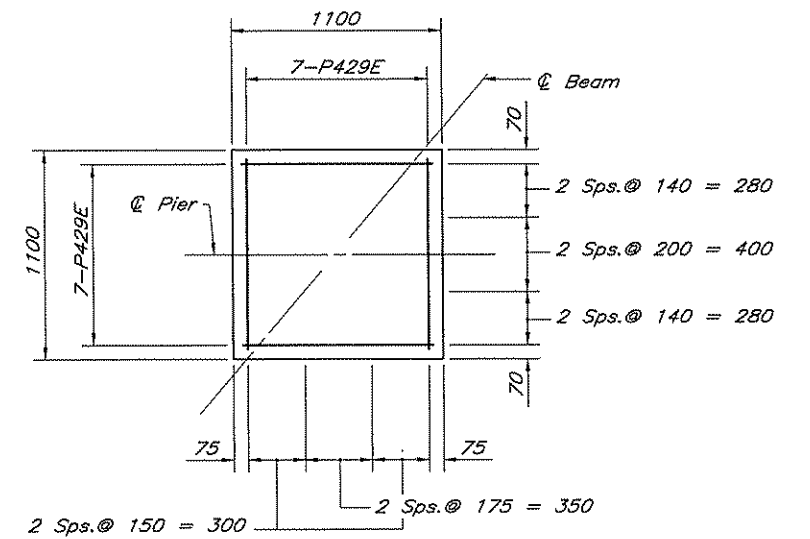
NAME: H:\STRUC\003\2413\M13PD03.DWG DATE: MAR 04, 1997 TIME: 2:13 PM



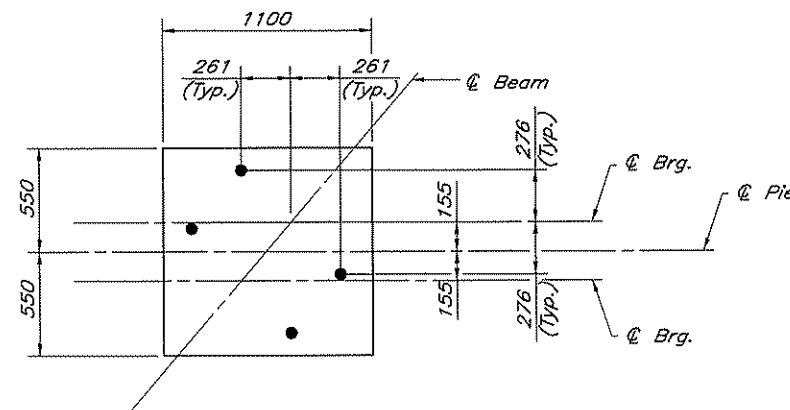
TYPICAL SECTION THRU CAP



TYPICAL SECTION THRU COLUMN



BRIDGE SEAT DETAIL



ANCHOR ROD PLACEMENT DETAIL  
(BEAMS B4 - B11 & B18 - B25)

NO.	DATE	BY	CKD	APPR	REVISION
NAME: H:\STRUC\003\2413\M13PD04.DWG DATE: MAR 06, 1997 TIME: 10:47 AM					

STATE AID PROJ. NO. 02-617-11	I hereby certify that this plan, specification or report 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. <i>Robert A. Spanjers</i> Date <u>3/6/97</u> Reg. No. <u>19632</u>
BRIDGE NO. 02550	

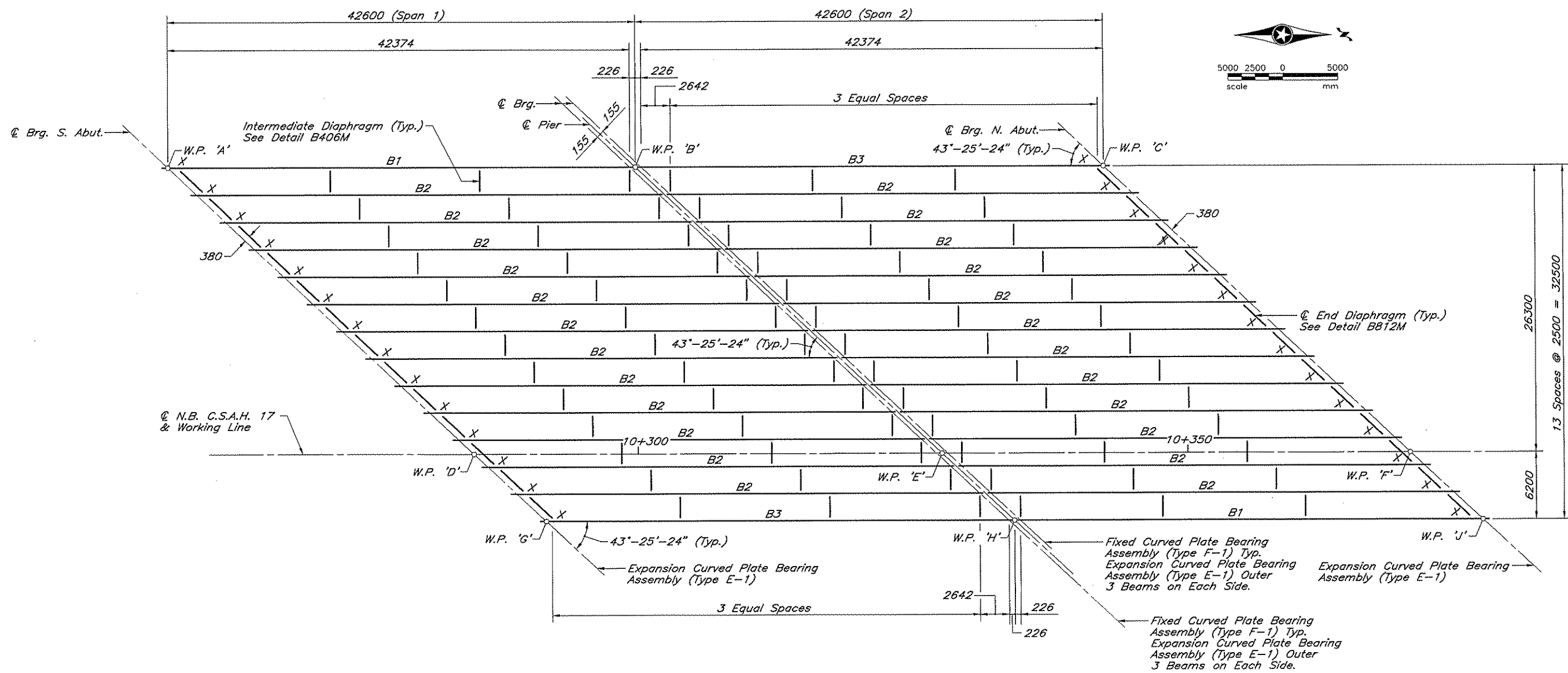
DRAWN BY J. HAMRE	DATE 3/97
DESIGNED BY D. THOMAS	DATE 3/97
CHECKED BY R. SPANJERS	DATE 3/97
COMM. NO. 0952413	

**SRF** CONSULTING GROUP, INC.

ANOKA COUNTY  
C.S.A.H. 17 (LEXINGTON AVE.) OVER T.H. 35W  
PIER DETAILS  
(SHEET 4 OF 4)

SHEET  
B22  
OF  
B47





FRAMING PLAN

NO.	DATE	BY	CHKD	APPR	REVISION
NAME: H:\STRUC\003\2413\M13FP01.DWG DATE: MAR 04, 1997 TIME: 2:40 PM					

STATE AID PROJ. NO.	02-617-11
BRIDGE NO.	02550

I hereby certify that this plan, specification or report 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.

*Robert G. Spangier*  
 Date: 3/4/97 Reg. No. 19632

DRAWN BY	DATE
J. HOFFMAN	3/97
DESIGNED BY	
R. SPANJERS	3/97
CHECKED BY	
L. ERICKSON	3/97
COMM. NO.	
0962413	

**SRF** CONSULTING GROUP, INC.

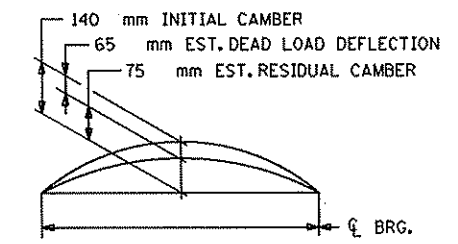
ANOKA COUNTY  
 C.S.A.H. 17 (LEXINGTON AVE.) OVER T.H. 35W  
 FRAMING PLAN

SHEET B23 OF B47

Y DISTANCES (IN MILLIMETERS)			
	NO.	CL. SPAN	END
STRAIGHT STRANDS	34	112	
DRAPED STRANDS	12	225	1605
TOTAL STRANDS	46	142	

Y = DISTANCE TO CENTER OF GRAVITY OF STRANDS FROM BOTTOM OF BEAM. ALL STRANDS SPACED 50 mm CENTER TO CENTER, HORIZONTALLY AND VERTICALLY, EXCEPT AS NOTED.

□ A TOLERANCE OF ± 25 mm WILL BE PERMITTED IN THIS DIMENSION.

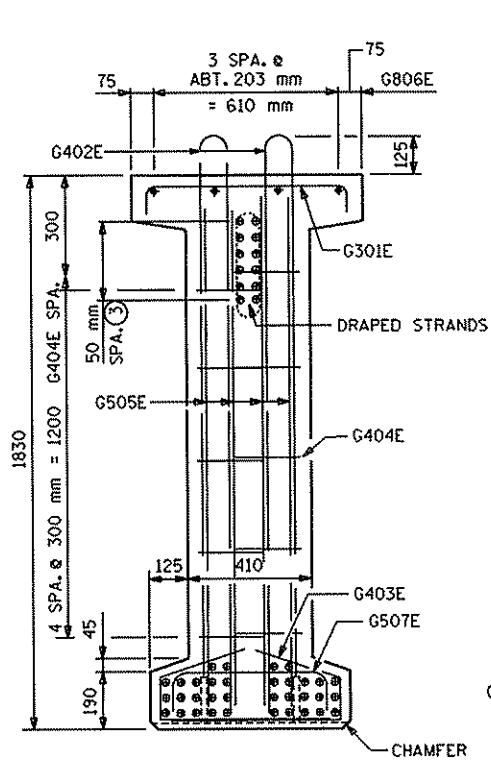


**CAMBER DIAGRAM**

INITIAL CAMBER IS GIVEN AFTER DIAPHRAGMS ARE IN PLACE.

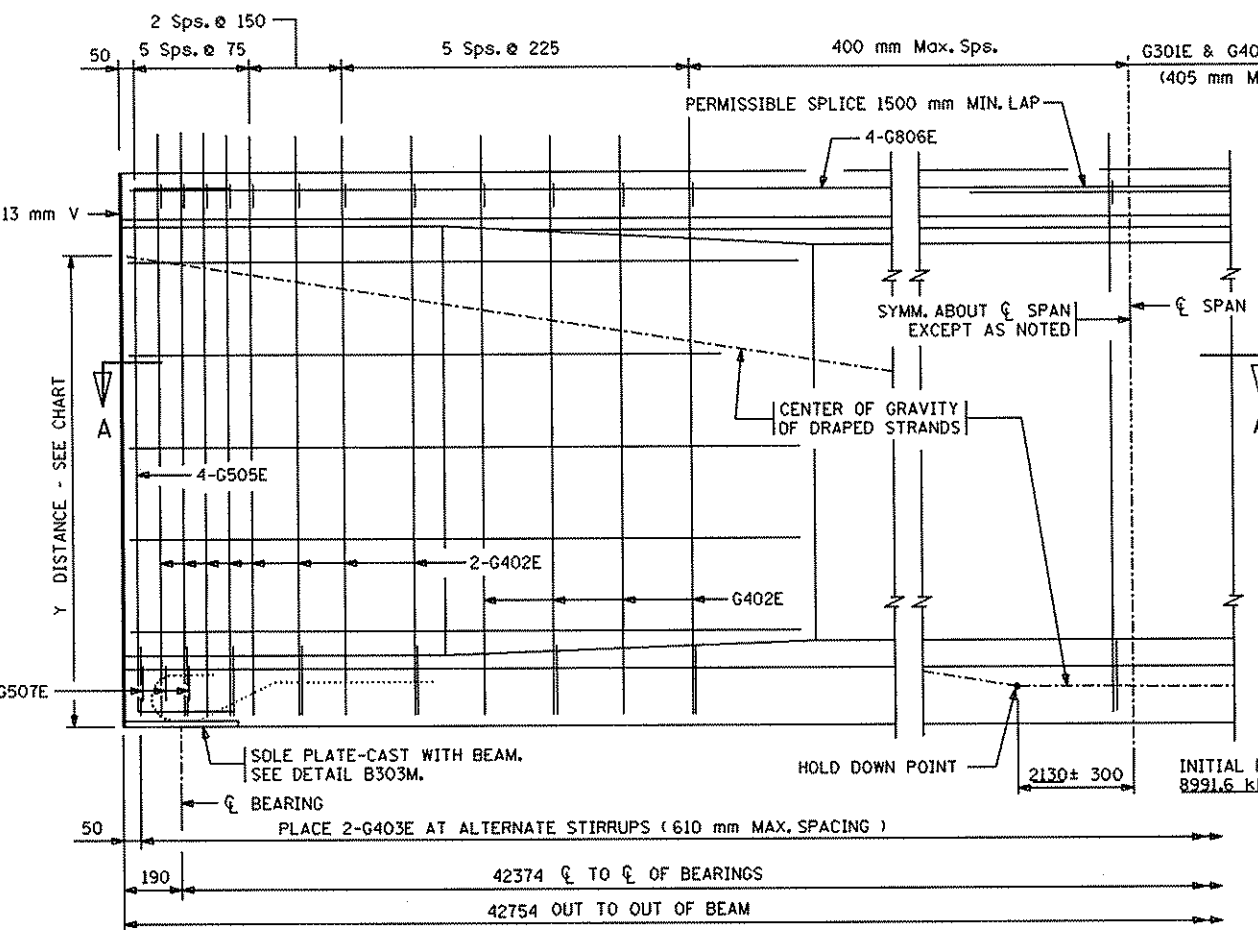
DEAD LOAD DEFLECTION SHOWN IS FOR WEIGHT OF SLAB, WEARING COURSE, RAILING, SIDEWALK AND MEDIAN WHERE APPLICABLE.

ENGINEER WILL TAKE ELEVATIONS AT TOP OF BEAMS AFTER ERECTION AND WILL ALLOW FOR DEFLECTION SHOWN TO ENABLE CONTRACTOR TO BUILD FORMS TO CORRECT GRADE AND SPECIFIED SLAB THICKNESS.

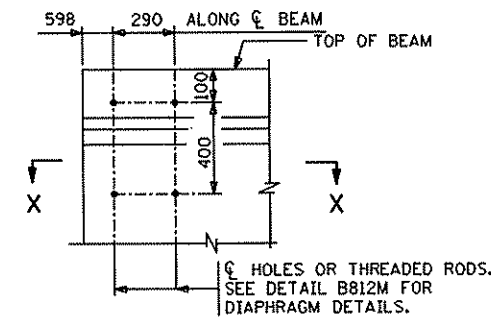


**END VIEW**

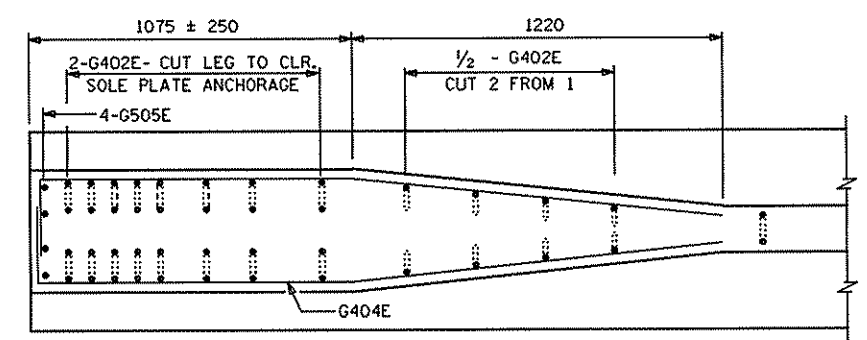
CUT STRANDS FLUSH WITH CONCRETE. PAINT ENDS WITH AN APPROVED GRAY EPOXY EXCEPT AS NOTED.



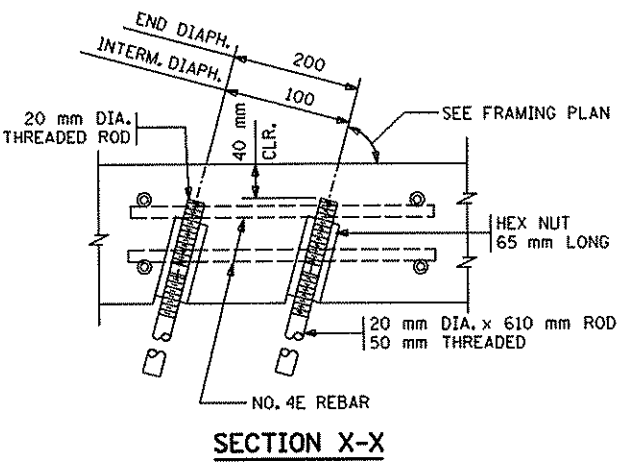
**BEAM ELEVATION**



**CONCRETE END DIAPHRAGMS**

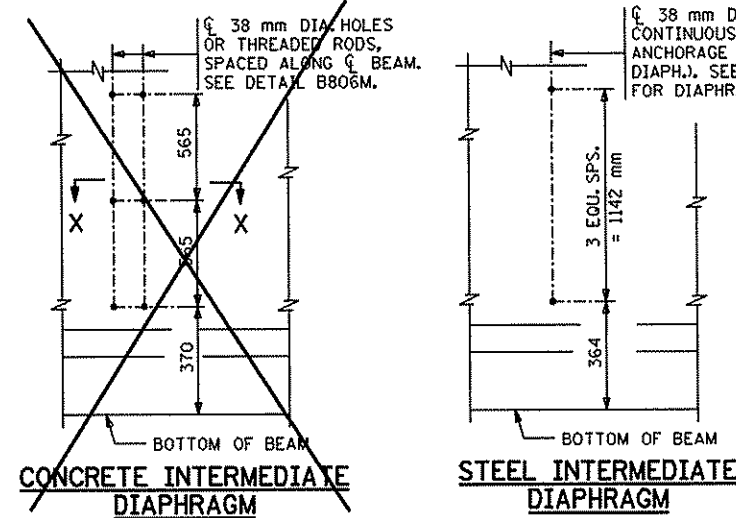


**SECTION A-A**



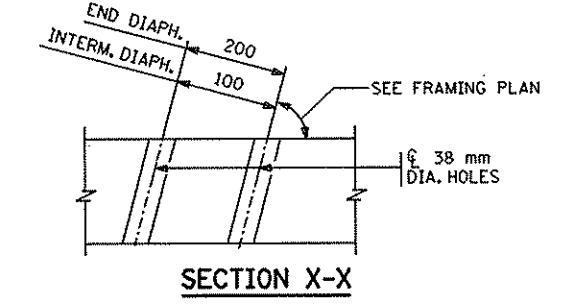
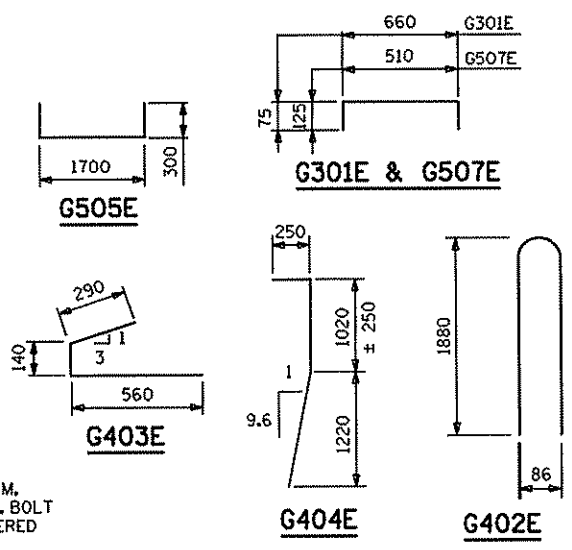
**SECTION X-X**

USE AT FACIA BEAM AND INTERIOR BEAMS WITH STAGGERED DIAPHRAGMS



**CONCRETE INTERMEDIATE DIAPHRAGM**

**STEEL INTERMEDIATE DIAPHRAGM**



**SECTION X-X**

**GENERAL NOTES**

- PRECASTER SHALL PROVIDE STEEL DIAPHRAGM FABRICATOR WITH LOCATION OF WEB TAPER IF DIAPHRAGM FALLS ON TAPERED PORTION OF WEB.
- PRESTRESSING STRANDS SHALL BE 15 mm DIA. 7-WIRE LOW RELAXATION STRAND, CONFORMING TO ASTM A416M, GRADE 1860.
- TOPS OF BEAMS SHALL BE ROUGH FLOATED AND BROOMED TRANSVERSELY FOR BOND.
- PROVIDE HANDLING HOOKS OR DEVICES AS REQUIRED BY CONTRACTOR.
- EACH BEAM SHALL BE MARKED, SHOWING BRIDGE NUMBER, CASTING DATE, AND INDIVIDUAL IDENTIFICATION LETTERS AND NUMBERS. MARKINGS SHALL BE MADE ON THE FACE OF THE BEAM, NEAR THE END, SO LOCATED THAT THEY WILL BE EXPOSED AFTER THE END DIAPHRAGMS HAVE BEEN CAST. FACIA BEAMS SHALL BE MARKED ON THE INSIDE FACE. ALL MARKINGS SHALL BE STENCILED AND BE CLEARLY LEGIBLE. FOR LOCATION OF BEAMS, SEE FRAMING PLAN.
- ALL MATERIAL AND WORK SHOWN OR NOTED ON THIS SHEET SHALL BE INCLUDED IN UNIT PRICE BID FOR PRESTRESSED CONCRETE BEAMS. SEE SPEC. 2405.
- SEE FRAMING PLAN FOR BEAM END MARKED "X" AND DIAPHRAGM SPACING.
- APPROXIMATE WEIGHT OF BEAM IS 53.8 METRIC TONS.
- AS AN ALTERNATE TO THE DIAPHRAGM ANCHORAGES SHOWN, THE CONTRACTOR MAY SUBMIT DETAILS OF A CAST-IN-PLACE ANCHORAGE TO THE ENGINEER FOR APPROVAL. ANCHORAGE MUST PROVIDE AN ULTIMATE PULL OUT STRENGTH OF 67 kN PER ANCHORAGE.

MINIMUM CONCRETE STRENGTH - MPa		
	① f'c	② f'c
REQUIRED MIN. CONCRETE STRENGTH	49	56

- ① MINIMUM CONCRETE STRENGTH AT TIME OF PRESTRESSED TRANSFER.
- ② MINIMUM CONCRETE STRENGTH WHEN BEAM CAN BE TRANSPORTED AND INSTALLED.
- ③ DRAPED STRANDS.
- ④ STRAIGHT STRANDS.

BEAMS B1-B3

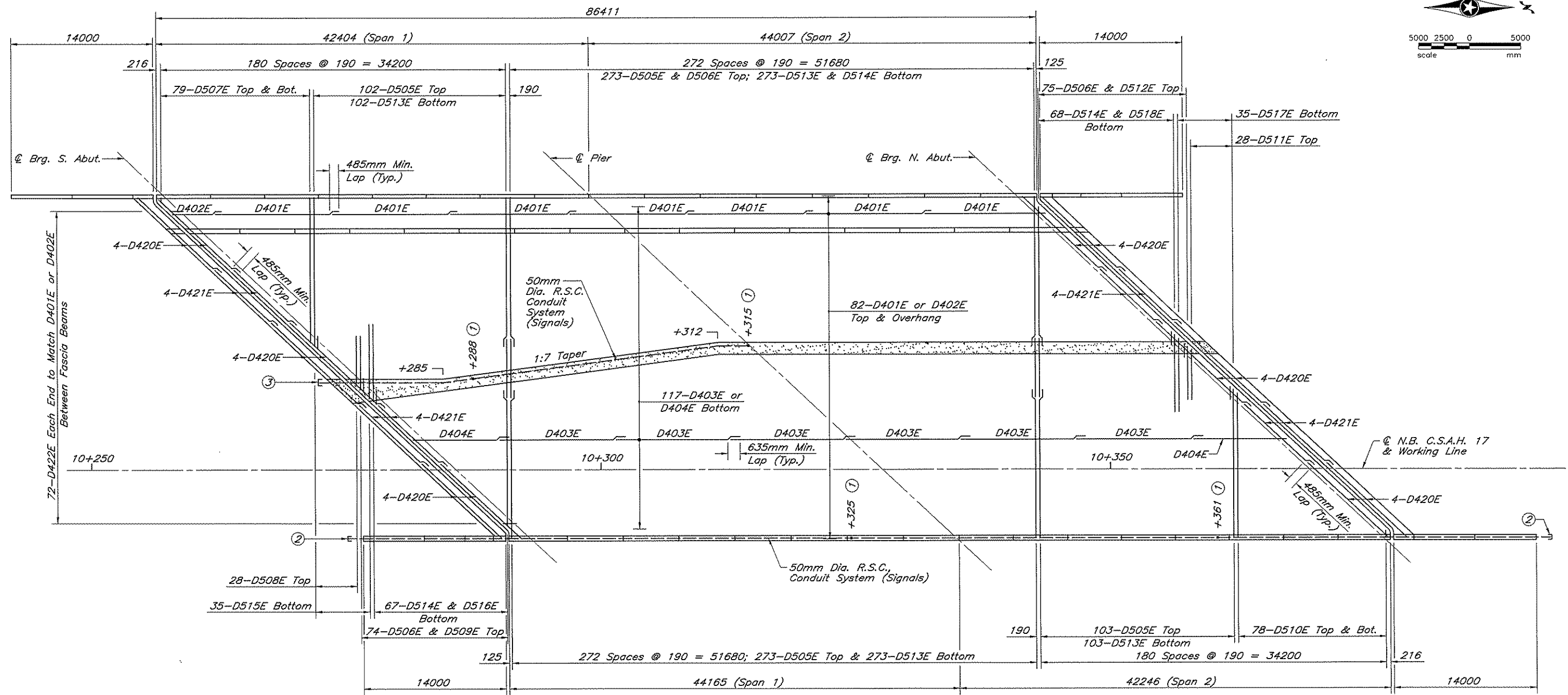
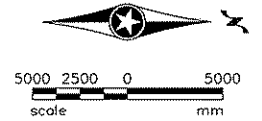
APPROVED: XXXXXXXX XX, 1995  
STATE BRIDGE ENGINEER

CERTIFIED BY: *Paul S. Gajjar*  
PROFESSIONAL ENGINEER  
REG. NO. 1632 9/6 1997

TITLE: 1830 mm PRESTRESSED CONCRETE BEAM (PRETENSIONED) TYPE 1830-43  
S.A.P. 02-617-11

DES: CCS DR: JEH  
CHK: LAE CHK: CCS

APPROVED: \_\_\_\_\_  
BRIDGE NO. 02550  
SHEET NO. B24 OF B47 SHEETS



BRIDGE DECK LAYOUT

- NOTES:**
- ① 200 x 200 x 100 Junction Box.
  - ② Bury Conduit 600mm Below Top of Wingwall. Extend Conduit 600mm Past End of Wall And Cap End. See Abutment Details.
  - ③ Extend Conduit 600mm And Cap End.

1	3/18/97	GMS	RAS	RAS	CHANGE LOCATIONS OF JUNCTION BOXES.
NO	DATE	BY	CKD	APPR	REVISION
NAME: H:\STRUC\003\2413\M13BDD1.DWG DATE: MAR 19, 1997 TIME: 9:02 AM					

STATE AID PROJ. NO.  
02-617-11

BRIDGE NO.  
02550

I hereby certify that this plan, specification or report 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.

*Robert G. Spangier*  
Date 3/19/97 Reg. No. 19632

DRAWN BY  
J. HOFFMAN  
DATE  
3/97

DESIGNED BY  
R. SPANJERS  
DATE  
3/97

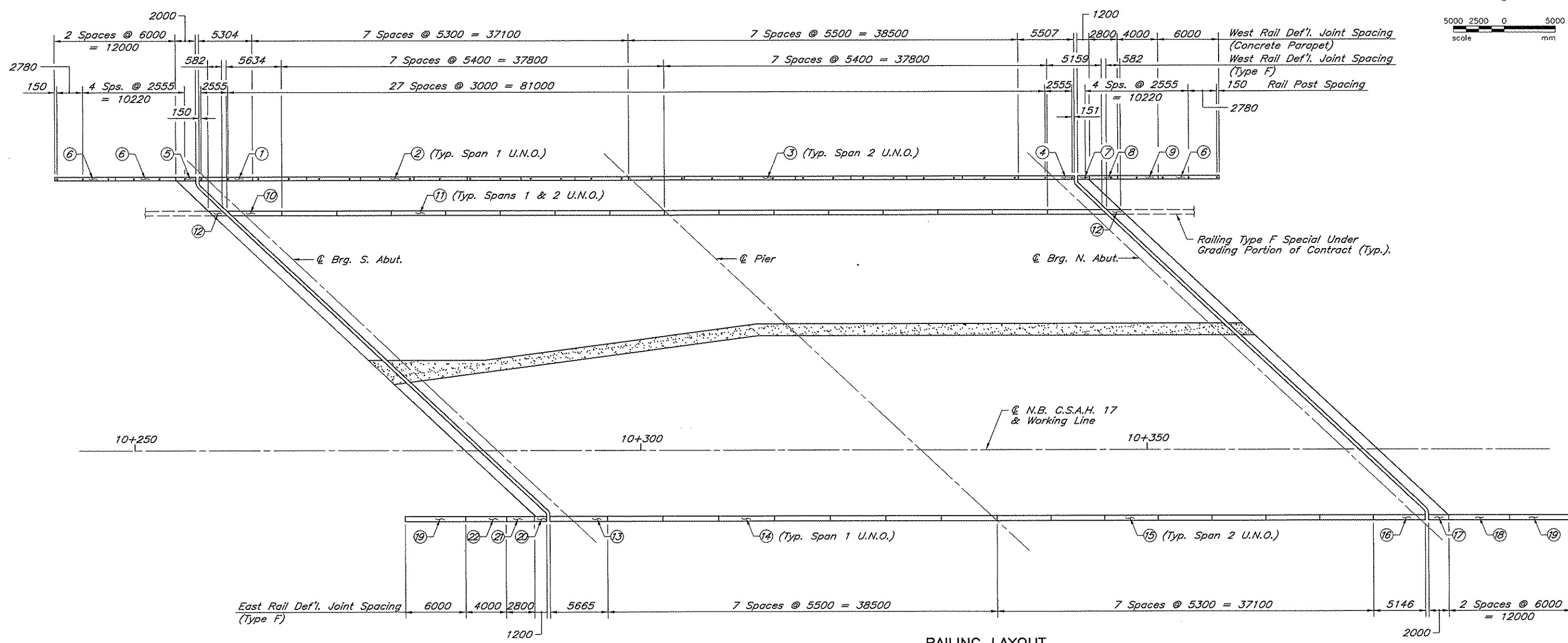
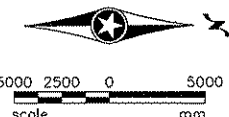
CHECKED BY  
L. ERICKSON  
DATE  
3/97

COMM. NO.  
0962413



ANOKA COUNTY  
C.S.A.H. 17 (LEXINGTON AVE.) OVER T.H. 35W  
BRIDGE DECK DETAILS  
(SHEET 1 OF 3)

SHEET  
B25  
OF  
B47

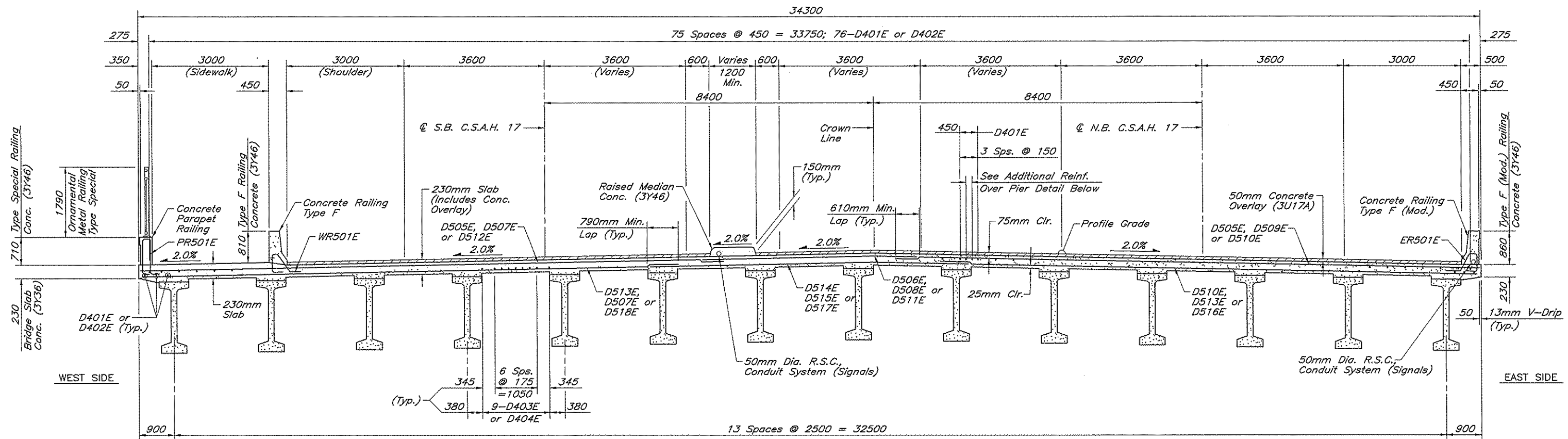


**RAILING LAYOUT**

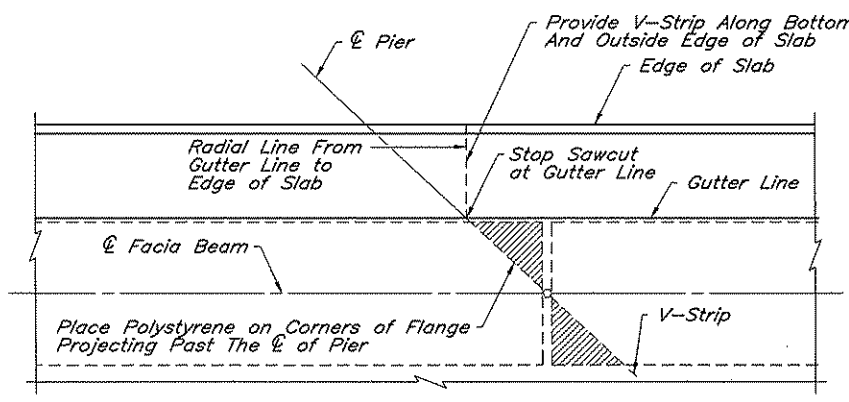
**RAILING REINFORCEMENT:**

- |  |   |   |
|--|---|---|
| <p><b>PARAPET RAIL</b></p> <ul style="list-style-type: none"> <li>① 20-PR501E, 1-PR502E &amp; 6-PR403E</li> <li>② 21-PR501E &amp; 6-PR404E</li> <li>③ 21-PR501E &amp; 6-PR405E</li> <li>④ 21-PR501E, 1-PR502E &amp; 6-PR406E</li> <li>⑤ 9-Abutment Bars, 1-PR502E &amp; 6-PR407E</li> <li>⑥ 23-Abutment Bars &amp; 6-PR408E</li> <li>⑦ 6-Abutment Bars, 1-PR502E &amp; 6-PR409E</li> <li>⑧ 12-Abutment Bars &amp; 6-PR410E</li> <li>⑨ 16-Abutment Bars &amp; 6-PR411E</li> </ul> | <p><b>WEST F-RAIL</b></p> <ul style="list-style-type: none"> <li>⑩ 21-WR501E &amp; WR502E, 1-WR503E &amp; 8-WR507E</li> <li>⑪ 20-WR501E &amp; WR502E &amp; 4-WR508E</li> <li>⑫ See Railing Details</li> </ul> | <p><b>EAST F-RAIL (MODIFIED)</b></p> <ul style="list-style-type: none"> <li>⑬ 21-ER501E &amp; ER502E, 1-ER503E &amp; 4-ER509E</li> <li>⑭ 21-ER501E &amp; ER502E &amp; 4-ER510E</li> <li>⑮ 20-ER501E &amp; ER502E &amp; 4-ER511E</li> <li>⑯ 19-ER501E &amp; ER502E, 1-ER503E &amp; 4-ER512E</li> <li>⑰ 9-Abutment Bars &amp; ER502E, 1-ER503E &amp; 4-ER514E</li> <li>⑱ 22-Abutment Bars &amp; ER502E &amp; 4-ER515E</li> <li>⑲ 26-Abutment Bars, 24-ER502E, 1-ER504E, 1-ER505E, 2-ER515E &amp; 2-ER516E</li> <li>⑳ 6-Abutment Bars &amp; ER502E, 1-ER503E &amp; 4-ER517E</li> <li>㉑ 12-Abutment Bars &amp; ER502E, 4-ER518E</li> <li>㉒ 16-Abutment Bars &amp; ER502E, 4-ER519E</li> </ul> |
|--|---|---|

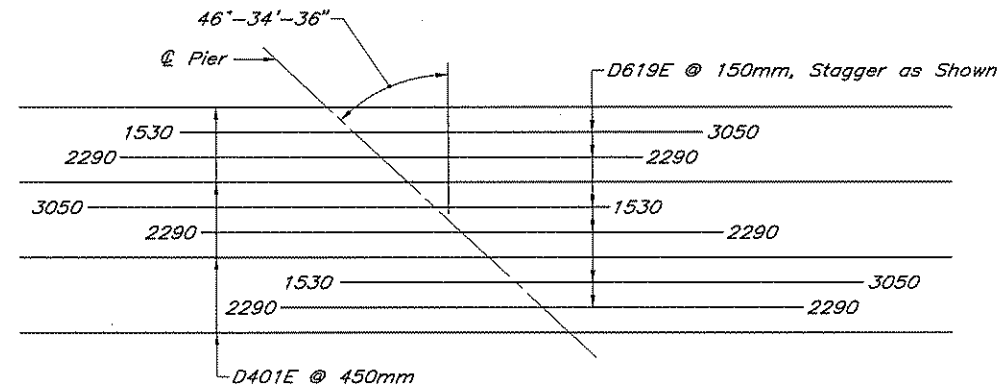
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="font-size: 8px;">NO</td> <td style="font-size: 8px;">DATE</td> <td style="font-size: 8px;">BY</td> <td style="font-size: 8px;">CHKD</td> <td style="font-size: 8px;">APPR</td> <td style="font-size: 8px;">REVISION</td> </tr> <tr> <td colspan="6" style="font-size: 8px;">NAME: H:\STRUC\003\2413\M13BDD2.DWG DATE: MAR 06, 1997 TIME: 10:49 AM</td> </tr> </table>	NO	DATE	BY	CHKD	APPR	REVISION	NAME: H:\STRUC\003\2413\M13BDD2.DWG DATE: MAR 06, 1997 TIME: 10:49 AM						<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="font-size: 8px;">STATE AID PROJ. NO.</td> <td style="font-size: 8px;">02-617-11</td> </tr> <tr> <td style="font-size: 8px;">BRIDGE NO.</td> <td style="font-size: 8px;">02550</td> </tr> </table>	STATE AID PROJ. NO.	02-617-11	BRIDGE NO.	02550	<p style="font-size: 8px;">I hereby certify that this plan, specification or report 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.</p> <p style="text-align: center; font-size: 12px;"><i>Robert A. Spanjers</i></p> <p style="font-size: 8px;">Date: 3/6/97 Reg. No. 19632</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="font-size: 8px;">DRAWN BY</td> <td style="font-size: 8px;">DATE</td> </tr> <tr> <td style="font-size: 8px;">J. HOFFMAN</td> <td style="font-size: 8px;">3/97</td> </tr> <tr> <td style="font-size: 8px;">DESIGNED BY</td> <td style="font-size: 8px;">DATE</td> </tr> <tr> <td style="font-size: 8px;">R. SPANJERS</td> <td style="font-size: 8px;">3/97</td> </tr> <tr> <td style="font-size: 8px;">CHECKED BY</td> <td style="font-size: 8px;">DATE</td> </tr> <tr> <td style="font-size: 8px;">L. ERICKSON</td> <td style="font-size: 8px;">3/97</td> </tr> <tr> <td style="font-size: 8px;">COMM. NO.</td> <td style="font-size: 8px;">0962413</td> </tr> </table>	DRAWN BY	DATE	J. HOFFMAN	3/97	DESIGNED BY	DATE	R. SPANJERS	3/97	CHECKED BY	DATE	L. ERICKSON	3/97	COMM. NO.	0962413	<p><b>ANOKA COUNTY</b></p> <p>C.S.A.H. 17 (LEXINGTON AVE.) OVER T.H. 35W</p> <p><b>BRIDGE DECK DETAILS</b></p> <p>(SHEET 2 OF 3)</p>	<p><b>SHEET</b></p> <p>B26</p> <p><b>OF</b></p> <p>B47</p>
NO	DATE	BY	CHKD	APPR	REVISION																														
NAME: H:\STRUC\003\2413\M13BDD2.DWG DATE: MAR 06, 1997 TIME: 10:49 AM																																			
STATE AID PROJ. NO.	02-617-11																																		
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COMM. NO.	0962413																																		



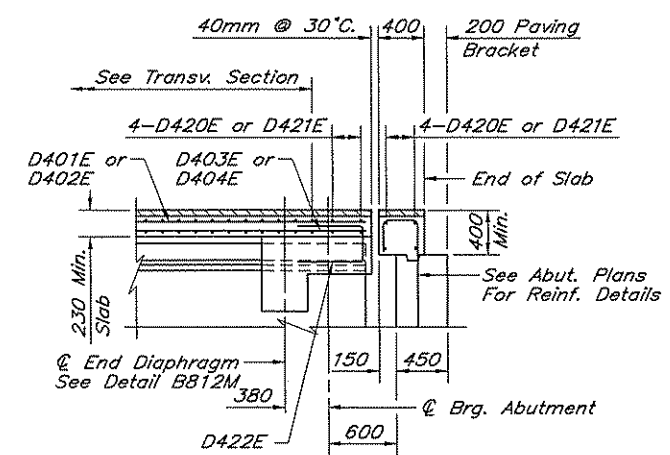
TYPICAL SECTION



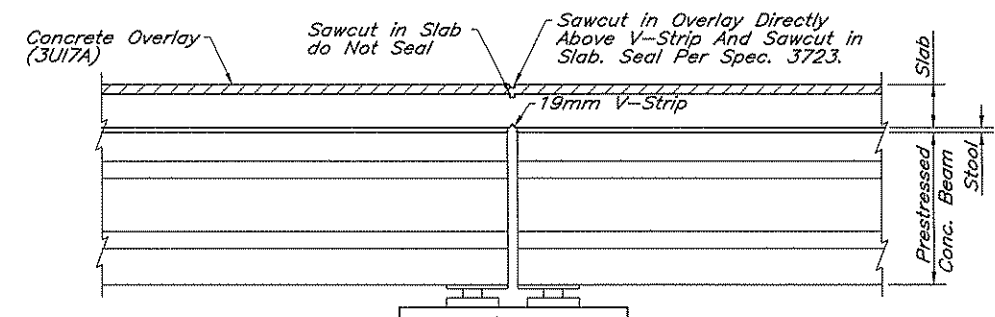
PLAN VIEW



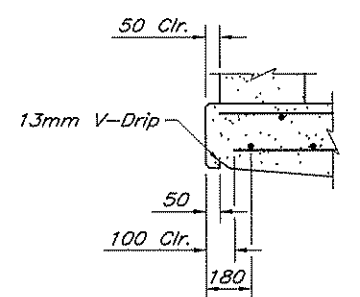
ADDITIONAL TOP LONGITUDINAL REINFORCEMENT OVER PIER



LONGITUDINAL SECTION  
(DIM'S. SHOWN ARE PERP. TO <math>\text{C}</math> BRG.)



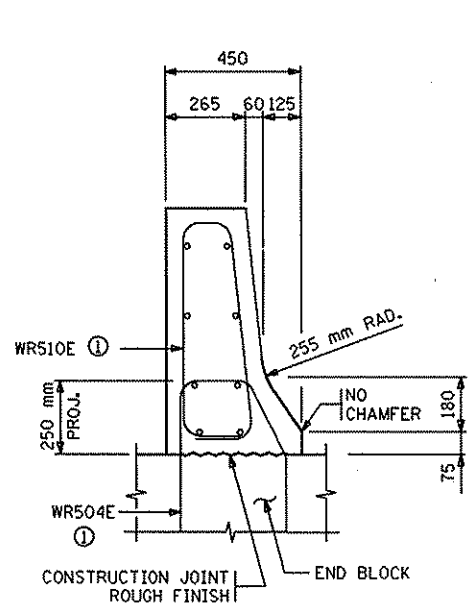
ELEVATION  
SAWCUT DETAIL AT <math>\text{C}</math> OF PIER  
(CONTINUOUS SLAB OVER PRESTRESSED BEAM)



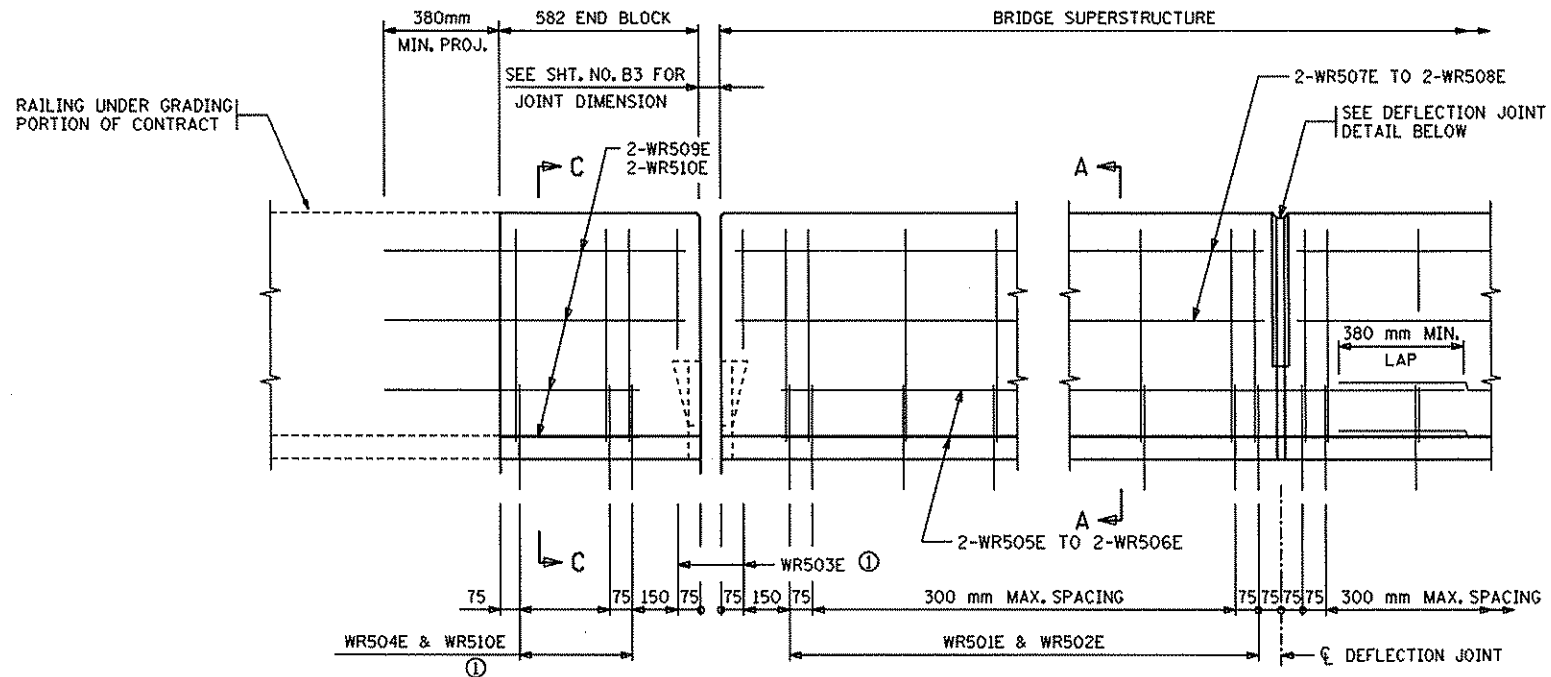
EDGE OF SLAB DETAIL

NO. DATE BY CKD APPR NAME: H:\STRUC\003\2413\M13BDD3.DWG DATE: MAR 06, 1997 TIME: 11:10 AM			STATE AID PROJ. NO. 02-617-11 BRIDGE NO. 02550		I hereby certify that this plan, specification or report 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. <i>Paul C. Spangiers</i> Date: 3/6/97 Reg. No. 19632		DRAWN BY DATE J. HOFFMAN 1/97 DESIGNED BY R. SPANJERS 1/97 CHECKED BY L. ERICKSON 1/97 COMM. NO. 0962413		ANOKA COUNTY C.S.A.H. 17 (LEXINGTON AVE.) OVER T.H. 35W BRIDGE DECK DETAILS (SHEET 3 OF 3)		SHEET B27 OF B47
---	--	--	---	--	---	--	---	--	---	--	---------------------------



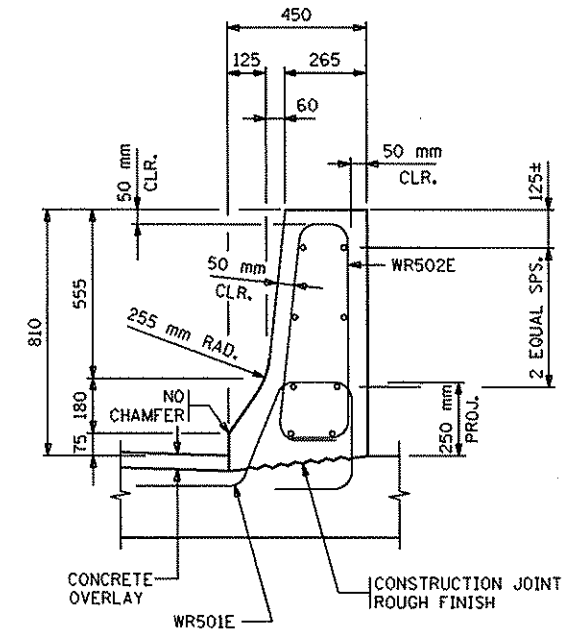


SECTION C-C

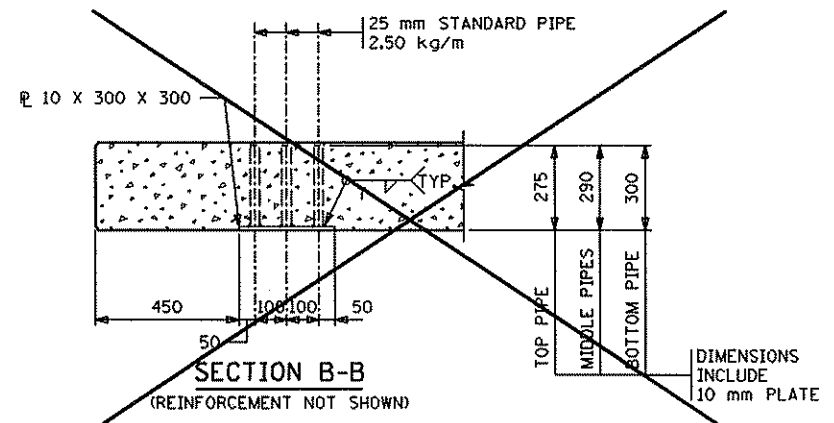


EXPANSION JOINT  
(EXPANSION DEVICE NOT SHOWN)  
INSIDE ELEVATION OF RAILING

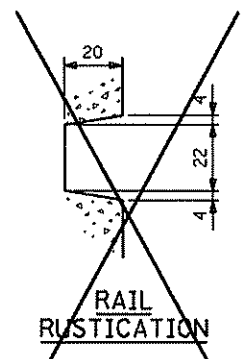
DEFLECTION JOINT



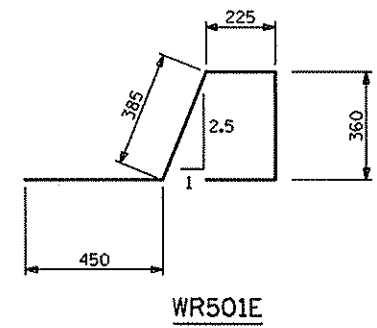
SECTION A-A



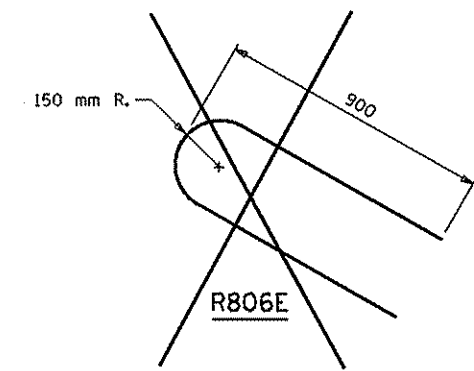
SECTION B-B  
(REINFORCEMENT NOT SHOWN)



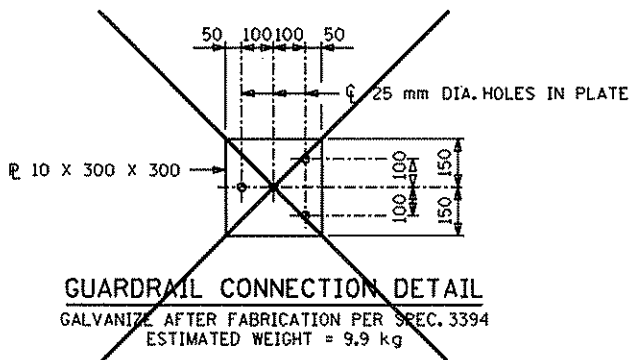
RAIL RUSTICATION



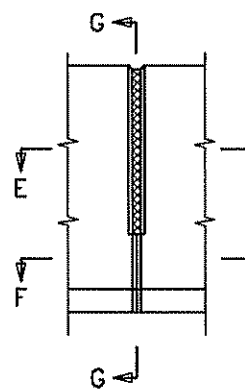
WR501E



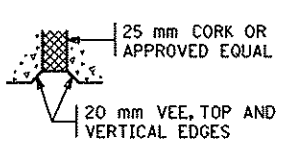
R806E



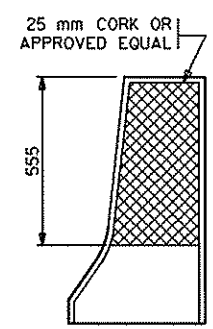
GUARDRAIL CONNECTION DETAIL  
GALVANIZE AFTER FABRICATION PER SPEC. 3394  
ESTIMATED WEIGHT = 9.9 kg



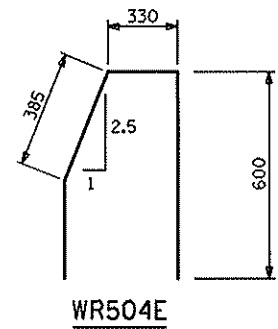
SECTION E-E



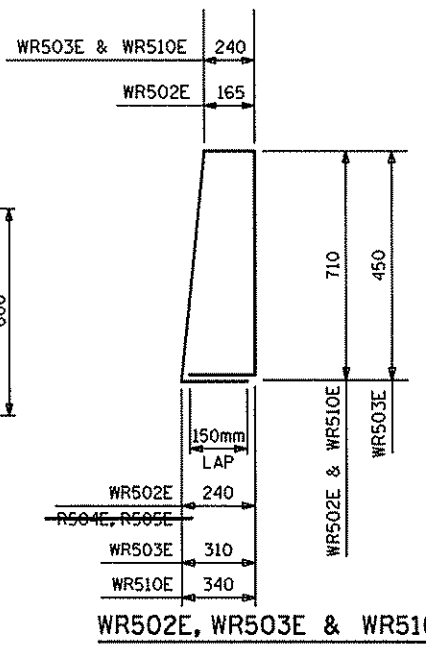
SECTION F-F



SECTION G-G



WR504E



WR502E, WR503E & WR510E

BILL OF REINFORCEMENT FOR RAILING				
BAR	NO.	LENGTH	SHAPE	LOCATION
WR501E	322	1620		RAIL DOWEL
WR502E	322	1980		RAIL VERTICAL
WR503E	4	1610		RAIL VERTICAL
WR504E	6	1560		RAIL DOWEL
WR505E	8	7550		RAIL LONGITUDINAL
WR506E	16	18280		RAIL LONGITUDINAL
WR507E	16	2960		RAIL LONGITUDINAL
WR508E	56	5270		RAIL LONGITUDINAL
WR509E	8	920		RAIL LONGITUDINAL
WR510E	6	2160		RAIL VERTICAL

GENERAL NOTES

- CONCRETE RAILING = 642 kg/m (0.267 m<sup>3</sup>/m)
- FINISH ALL EDGES OF RAIL WITH 13 mm VEE, EXCEPT WHERE OTHERWISE NOTED.
- SEE SUPERSTRUCTURE SHEET FOR JOINT SPACING.
- RAIL QUANTITIES ARE INCLUDED IN SUMMARY OF QUANTITIES FOR SUPERSTRUCTURE.
- MAXIMUM SPACING OF CONCRETE DEFLECTION JOINTS SHALL BE 6 METERS.
- RAIL TO BE CONCRETE MIX NO. 3Y46.
- ① PLACE ALONG SKEW.

APPROVED: XXXXXXXX XX, 1995  
STATE BRIDGE ENGINEER

S.A.P. 02-617-11  
CERTIFIED BY: Robert A. Spang  
PROFESSIONAL ENGINEER  
REG. NO. 19632 3/6 1997

TITLE: CONCRETE RAILING (TYPE F)  
WITH INTEGRAL END POST  
(WITH CONCRETE OVERLAY)

DES: RAS	DR: JEH	APPROVED: 5-1-97	BRIDGE NO. 02550
CHK: LAE	CHK: RAS		
SHEET NO. B29 OF B47 SHEETS			

MODIFIED FIG. 5-397.117M





**BILL OF REINFORCEMENT : SOUTH ABUTMENT**

MARK	NO	SIZE	LENGTH	SHAPE	DIMENSION			LOCATION
					A	B	C	
A801	212	8	9620	1	3850	700		FOOTING TRANS.
A802	1 SERIES OF 11	8	5040	1	1560	700		FOOTING TRANS.
A803	1 SERIES OF 7	8	6820	1	2450	700		FOOTING TRANS.
A804	16	8	2300	15	1740	280		FOOTING TRANS.
A805	2 SERIES OF 11	8	2120	15	1560	280		FOOTING TRANS.
A606	56	6	18280	STRT				FOOTING LONG.
A607	28	6	15840	STRT				FOOTING LONG.
A608	2 SERIES OF 6	6	1550	STRT				FOOTING LONG.
A609	2	6	5770	STRT				FOOTING LONG.
A610	2	6	3780	STRT				FOOTING LONG.
A611	14	6	6350	1	2350	625		FOOTING TRANS.
A612	18	6	3850	STRT				FOOTING LONG.
A613	20	6	6950	1	2650	625		FOOTING TRANS.
A614	48	6	5850	STRT				FOOTING LONG.
A615	40	6	5150	1	1850	525		FOOTING TRANS.
A820E	179	8	2730	7	2325			DOWEL
A521E	221	5	2240	7	1940			DOWEL
A622E	179	6	2780	STRT				STEM VERT.
A523E	193	5	3500	STRT				STEM VERT.
A524E	180	5	2000	6	1400	300		STEM TOP
A525E	1 SERIES OF 4	5	990	6	390	300		STEM TOP
A526E	179	5	3490	11	2330	1000		BACKWALL
A527E	179	5	3170	5	2520	350		BACKWALL
A528E	179	5	1520	5	950	300		END BLOCK
A529E	46	5	8210	STRT				STEM HORIZ.
A530E	92	5	9700	STRT				STEM HORIZ.
A531E	46	5	8840	STRT				STEM HORIZ.
A532E	46	5	9680	STRT				STEM HORIZ.
A533E	46	5	8960	STRT				STEM HORIZ.
A534E	14	5	1090	11	840	1057		CORNER
A535E	14	5	1680	11	840	946		CORNER
A536E	14	5	2840	11	2000	1057		FILLET
A537E	7	5	2430	11	1590	1057		FILLET
A538E	7	5	1600	7	1300			FILLET
A439E	70	5	1500	6	900	300		BR. SEAT
A440E	84	5	1300	6	700	300		BR. SEAT
A541E	14	5	2930	7	2680			WALL HORIZ.
A542E	14	5	1340	STRT				WALL HORIZ.
A843E	47	8	3320	7	2915			WALL DOWEL
A844E	17	8	3100	STRT				WALL VERT.
A545E	10	5	3250	STRT				WALL VERT.
A546E	21	5	5780	STRT				WALL VERT.
A547E	7	5	2550	STRT				WALL VERT.
A548E	7	5	5380	STRT				WALL VERT.
A549E	44	5	1990	STRT				WALL HORIZ.
A550E	44	5	2700	STRT				WALL HORIZ.
A551E	132	5	950	6	350	300		WALL ENDS
A552E	5	5	800	6	200	300		WALL ENDS
A653E	40	6	1840	7	1540			WALL DOWEL
A554E	40	5	1840	7	1540			WALL DOWEL
A555E	40	5	1970	STRT				WALL VERT.
A556E	20	5	1830	STRT				WALL VERT.
A557E	20	5	2140	STRT				WALL VERT.
A758E	53	7	2260	7	1900			WALL DOWEL
A559E	34	5	1790	7	1490			WALL DOWEL
A560E	14	5	3170	STRT				WALL VERT.
A561E	14	5	3580	STRT				WALL VERT.
A762E	20	7	2150	STRT				WALL VERT.
A563E	20	5	2830	STRT				WALL VERT.
A564E	20	5	4490	STRT				WALL VERT.
A565E	68	5	5900	STRT				WALL HORIZ.
A566E	26	5	3900	STRT				WALL HORIZ.
A567E	42	5	1900	STRT				WALL HORIZ.
A568E	55	5	2740	6	200	1270		WEST RAIL
A569E	60	5	2000	20	860	260	380	EAST RAIL

**BILL OF REINFORCEMENT : NORTH ABUTMENT**

MARK	NO	SIZE	LENGTH	SHAPE	DIMENSION			LOCATION
					A	B	C	
B801	212	8	9620	1	3850	700		FOOTING TRANS.
B802	1 SERIES OF 11	8	5040	1	1560	700		FOOTING TRANS.
B803	1 SERIES OF 7	8	6820	1	2450	700		FOOTING TRANS.
B804	14	8	2450	15	1890	280		FOOTING TRANS.
B805	2 SERIES OF 10	8	2185	15	1625	280		FOOTING TRANS.
B606	56	6	18280	STRT				FOOTING LONG.
B607	28	6	15780	STRT				FOOTING LONG.
B608	2 SERIES OF 6	6	1100	STRT				FOOTING LONG.
B609	2	6	5720	STRT				FOOTING LONG.
B610	2	6	3740	STRT				FOOTING LONG.
B611	14	6	6350	1	2350	625		FOOTING TRANS.
B612	18	6	3850	STRT				FOOTING LONG.
B613	20	6	6950	1	2650	625		FOOTING TRANS.
B614	48	6	5850	STRT				FOOTING LONG.
B615	40	6	5150	1	1850	525		FOOTING TRANS.
B820E	179	8	2730	7	2325			DOWEL
B521E	220	5	2200	7	1900			DOWEL
B622E	179	6	3050	STRT				STEM VERT.
B523E	192	5	3810	STRT				STEM VERT.
B524E	182	5	2000	6	1400	300		STEM TOP
B525E	1 SERIES OF 4	5	990	6	390	300		STEM TOP
B526E	179	5	3490	11	2330	1000		BACKWALL
B527E	179	5	3170	5	2520	350		BACKWALL
B528E	179	5	1520	5	950	300		END BLOCK
B529E	46	5	8210	STRT				STEM HORIZ.
B530E	92	5	9700	STRT				STEM HORIZ.
B531E	46	5	9680	STRT				STEM HORIZ.
B532E	46	5	8840	STRT				STEM HORIZ.
B533E	46	5	9440	STRT				STEM HORIZ.
B534E	14	5	1090	11	840	1057		CORNER
B535E	14	5	1680	11	840	946		CORNER
B536E	14	5	2700	11	1860	1057		FILLET
B537E	7	5	2280	11	1440	1057		FILLET
B538E	7	5	1600	7	1300			FILLET
B439E	70	5	1500	6	900	300		BR. SEAT
B440E	84	5	1300	6	700	300		BR. SEAT
B541E	14	5	2780	7	2530			WALL HORIZ.
B542E	14	5	1190	STRT				WALL HORIZ.
B843E	47	8	3320	7	2915			WALL DOWEL
B844E	17	8	3100	STRT				WALL VERT.
B545E	10	5	3040	STRT				WALL VERT.
B546E	21	5	5900	STRT				WALL VERT.
B547E	7	5	3110	STRT				WALL VERT.
B548E	7	5	5670	STRT				WALL VERT.
B549E	44	5	1990	STRT				WALL HORIZ.
B550E	44	5	2700	STRT				WALL HORIZ.
B551E	134	5	950	6	350	300		WALL ENDS
B552E	5	5	800	6	200	300		WALL ENDS
B653E	40	6	1840	7	1540			WALL DOWEL
B554E	40	5	1840	7	1540			WALL DOWEL
B555E	40	5	2340	STRT				WALL VERT.
B556E	20	5	1820	STRT				WALL VERT.
B557E	20	5	2120	STRT				WALL VERT.
B758E	53	7	2260	7	1900			WALL DOWEL
B559E	34	5	1790	7	1490			WALL DOWEL
B560E	14	5	3000	STRT				WALL VERT.
B561E	14	5	3700	STRT				WALL VERT.
B762E	20	7	2150	STRT				WALL VERT.
B563E	20	5	3350	STRT				WALL VERT.
B564E	20	5	4700	STRT				WALL VERT.
B565E	70	5	5900	STRT				WALL HORIZ.
B566E	26	5	3900	STRT				WALL HORIZ.
B567E	42	5	1900	STRT				WALL HORIZ.
B568E	57	5	2740	6	200	1270		WEST RAIL
B569E	57	5	2000	20	860	260	380	EAST RAIL

**BILL OF REINFORCEMENT : DECK**

MARK	NO	SIZE	LENGTH	SHAPE	DIMENSION			LOCATION
					A	B	C	
D401E	574	4	12190	STRT				LONG. TOP & OH
D402E	82	4	4340	STRT				LONG. TOP & OH
D403E	702	4	12190	STRT				LONG. BOTTOM
D404E	234	4	8790	STRT				LONG. BOTTOM
D505E	751	5	14905	STRT				TRANS. TOP
D506E	422	5	5610	STRT				TRANS. TOP
D507E	2 SERIES OF 79	5	830	STRT				TRANS. T & B
D508E	1 SERIES OF 28	5	740	STRT				TRANS. TOP
D509E	1 SERIES OF 74	5	780	STRT				TRANS. TOP
D510E	2 SERIES OF 78	5	980	STRT				TRANS. T & B
D511E	1 SERIES OF 28	5	715	STRT				TRANS. TOP
D512E	1 SERIES OF 75	5	750	STRT				TRANS. TOP
D513E	751	5	13695	STRT				TRANS. BOTTOM
D514E	408	5	8290	STRT				TRANS. BOTTOM
D515E	1 SERIES OF 35	5	2080	STRT				TRANS. BOTTOM
D516E	1 SERIES OF 67	5	880	STRT				TRANS. BOTTOM
D517E	1 SERIES OF 35	5	2050	STRT				TRANS. BOTTOM
D518E	1 SERIES OF 68	5	850	STRT				TRANS. BOTTOM
D619E	150	6	4580	STRT				OVER PIER
D420E	48	4	11885	STRT				END BLOCK
D421E	32	4	7760	STRT				END BLOCK
D422E	144	4	2850	6	470	1190		END OF SLAB

**BILL OF REINFORCEMENT : PIER**

MARK	NO	SIZE	LENGTH	SHAPE	DIMENSION			LOCATION
					A	B	C	
P1001	72	10	4330	15	3450	440		FOOTING
P602	96	6	2970	15	2550	210		FOOTING
P803E	208	8	2510	7	2100			DOWEL
P704E	208	7	6190	STRT				COLUMN VERT.
P405E	128	4	5440	1	1600	1000		COLUMN TIE
P406E	256	4	1330	8	210	1000		COLUMN TIE
P1007E	7	10	14530	7	12800			CAP TOP
P1008E	7	10	15540	7	14880			CAP TOP
P1009E	7	10	14080	7	12230			CAP TOP
P1010E	7	10	16010	7	15450			CAP TOP
P1011E	7	10	12800	STRT				CAP TOP
P1012E	7	10	14880	STRT				CAP TOP
P1013E	7	10	12230	STRT				CAP TOP
P1014E	7	10	15450	STRT				CAP TOP
P1115E	7	11	16330	STRT				CAP BOTTOM
P1116E	7	11	11630	STRT				CAP BOTTOM
P1117E	7	11	15570	STRT				CAP BOTTOM
P1118E	7	11	12390	STRT				CAP BOTTOM
P619E	48	6	12600	STRT				CAP SIDES
P520E	24	5	1990	6	1070	460		CAP ENDS
P521E	54	5	4					

SUMMARY OF QUANTITIES : S. ABUTMENT		
ITEM	UNIT	QUANTITY
STRUCTURAL CONCRETE (1A43)	m3	273
STRUCTURAL CONCRETE (3Y43)	m3	300
REINFORCEMENT BARS	kg	14200
REINFORCEMENT BARS (EPOXY COATED)	kg	16725
③ C-I-P CONCRETE PILING DELIVERED 305mm	m	837
③ C-I-P CONCRETE PILING DRIVEN 305mm	m	837
② C-I-P CONC. TEST PILES, 12m. LONG 305mm	Each	2
② 3-PLY JOINT WATERPROOFING	m	100
② DOWEL BAR ASSEMBLY	Each	47
CONCRETE SLOPE PAVING	m2	195

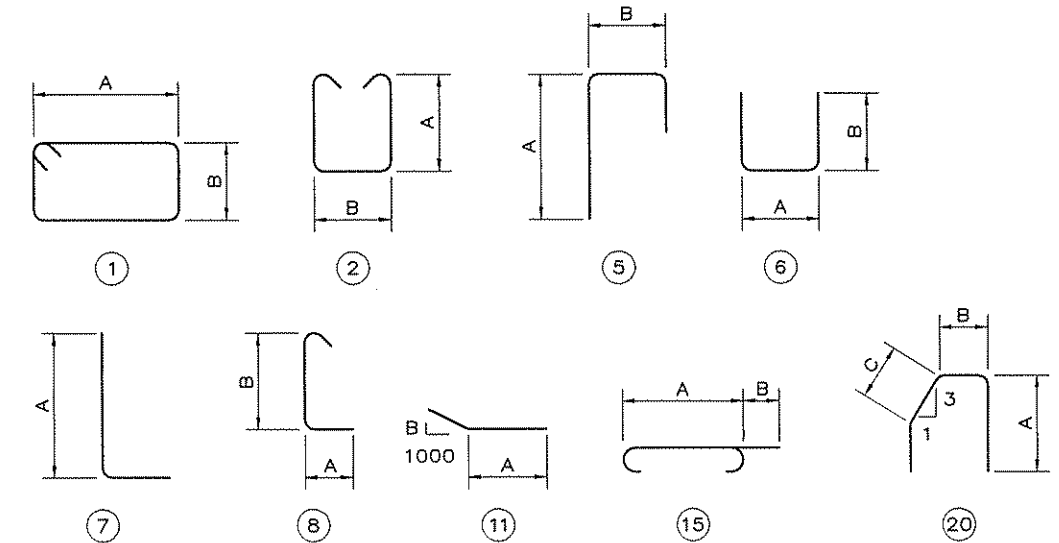
SUMMARY OF QUANTITIES : N. ABUTMENT		
ITEM	UNIT	QUANTITY
STRUCTURAL CONCRETE (1A43)	m3	273
STRUCTURAL CONCRETE (3Y43)	m3	310
REINFORCEMENT BARS	kg	14145
REINFORCEMENT BARS (EPOXY COATED)	kg	17005
③ C-I-P CONCRETE PILING DELIVERED 305mm	m	837
③ C-I-P CONCRETE PILING DRIVEN 305mm	m	837
② C-I-P CONC. TEST PILES, 12m. LONG 305mm	Each	2
② 3-PLY JOINT WATERPROOFING	m	100
② DOWEL BAR ASSEMBLY	Each	48
CONCRETE SLOPE PAVING	m2	195

SUMMARY OF QUANTITIES : PIER		
ITEM	UNIT	QUANTITY
STRUCTURAL CONCRETE (1A43)	m3	94
STRUCTURAL CONCRETE (3Y43)	m3	201
REINFORCEMENT BARS	kg	2635
REINFORCEMENT BARS (EPOXY COATED)	kg	20350
③ C-I-P CONCRETE PILING DELIVERED 305mm	m	702
③ C-I-P CONCRETE PILING DRIVEN 305mm	m	702
③ C-I-P CONC. TEST PILES, 12m. LONG 305mm	Each	2

SUMMARY OF QUANTITIES : SUPERSTRUCTURE		
ITEM	UNIT	QUANTITY
⑨ STRUCTURAL CONCRETE (3Y43)	m3	35
⑧ BRIDGE SLAB CONCRETE (3Y36)	m2	3007
⑧ TYPE F RAILING CONCRETE (3Y46)	m	88
⑦ TYPE F (MOD.) RAILING CONCRETE (3Y46)	m	115
⑦ TYPE SPECIAL RAILING CONCRETE (3Y46)	m	115
⑤ RAISED MEDIAN CONCRETE (3Y46)	m2	107
④ REINFORCEMENT BARS (EPOXY COATED)	kg	81180
ORNAMENTAL METAL RAILING TYPE SPECIAL	m	115
EXPANSION JOINT DEVICES TYPE 100		98
BEARING ASSEMBLY	Each	56
⑩ CONCRETE OVERLAY (3U17A)	m2	3328
PRESTRESSED CONCRETE BEAMS 1830mm	m	1198
DIAPHRAGMS FOR TYPE 1830 P/S CONC. BEAMS	m	195
⑫ FIXED CURVED PLATE BEARING ASSY. TYPE F-1	Each	16
⑫ EXP. CURVED PLATE BEARING ASSY. TYPE E-1	Each	28
⑫ EXP. CURVED PLATE BEARING ASSY. TYPE E-2	Each	12
① B.M. DISK	Each	1
② BRIDGE NAME PLATE	Each	1
② JOINT FILLER, 25x555x350 RAIL DEFL. JT.	Each	35
② JOINT FILLER, 25x710x325 RAIL DEFL. JT.	Each	20
② CONDUIT SYSTEM (SIGNALS)	Lump Sum	1
⑪ P/S CONCRETE BEAMS TYPE 1830 - 43	Each	28

SUMMARY OF QUANTITIES : CONDUIT SYSTEM (SIGNALS) ⑮		
ITEM	UNIT	QUANTITY
50mm R.S.C.	m	184
50mm DIA. END CAPS	Each	3
50mm DIA. EXP. FITTINGS	Each	3
200x200x100 ELECT. OUTLET JCT. BOX	Each	4

BAR SHAPES:



SUMMARY OF QUANTITIES NOTES:

- ① State Will Furnish Disk. Bend Prongs Outward to Anchor Disk in Concrete. Bottom of Disk Top to be Placed Flush With Concrete. Payment For Placing to be Included in Price Bid For Other Items.
- ② To Be Included in Price Bid For Other Items.
- ③ Does Not Include Test Piles.
- ④ Includes Railings And End Diaphragm Reinforcement.
- ⑤ Raised Median Concrete (3Y46) Volume is Approximately 22 m3.
- ⑥ Type F (Mod.) Railing Concrete (3Y46) Volume is Approximately 34 m3.
- ⑦ Type Special Railing Concrete (3Y46) is Approximately 25 m3.
- ⑧ Bridge Slab Concrete (3Y36) Volume is Approximately 654 m3. Using an Average Stool Height of 85mm, And Includes End Blocks.
- ⑨ Includes End Diaphragm Concrete.
- ⑩ Concrete Overlay (3U17A) Area Includes 2522 m2 For The Deck And 806 m2 For The Approach Panels. Volume is Approximately 167 m3.
- ⑪ Payment For Beams Included in Item "Prestressed Concrete Beams 1830" Per Meter.
- ⑫ Payment For Bearings Included in Item "Bearing Assembly" Per Each.
- ⑬ For Contractors Convenience Only, Cut to Fit.
- ⑭ Type F Railing Concrete (3Y46) Volume is Approximately 24 m3.
- ⑮ Quantities Listed Above Are For Informational Purposes. Any Additional Minor Items or Slight Changes in Quantities Required Shall be Furnished by The Contractor With no Additional Compensation.

NO	DATE	BY	CKD	APPR	REVISION
NAME: H:\STRUC\003\2413\M13QTY.DWG DATE: MAR 06, 1997 TIME: 8:54 AM					

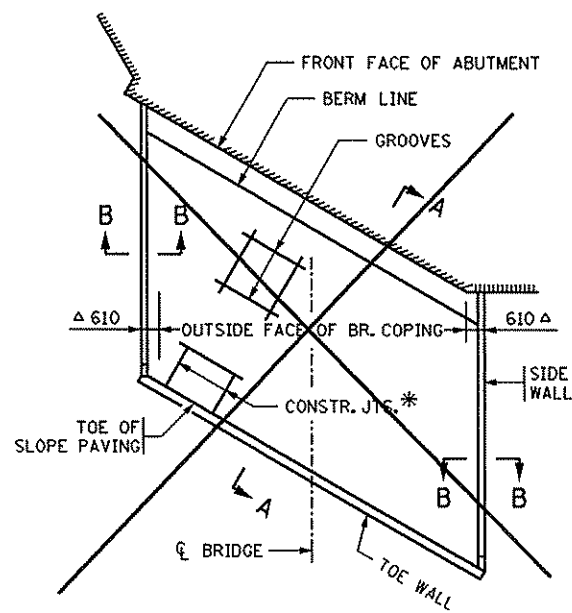
STATE AID PROJ. NO. 02-617-11	I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Registered Professional Engineer under the laws of the State of Minnesota.  Robert L. Hamre Date: 3/6/97 Reg. No. 19632
BRIDGE NO. 02550	

DRAWN BY J. HAMRE	DATE 3/97
DESIGNED BY R. SPANJERS	DATE 3/97
CHECKED BY L. ERICKSON	DATE 3/97
COMM. NO. 0962413	

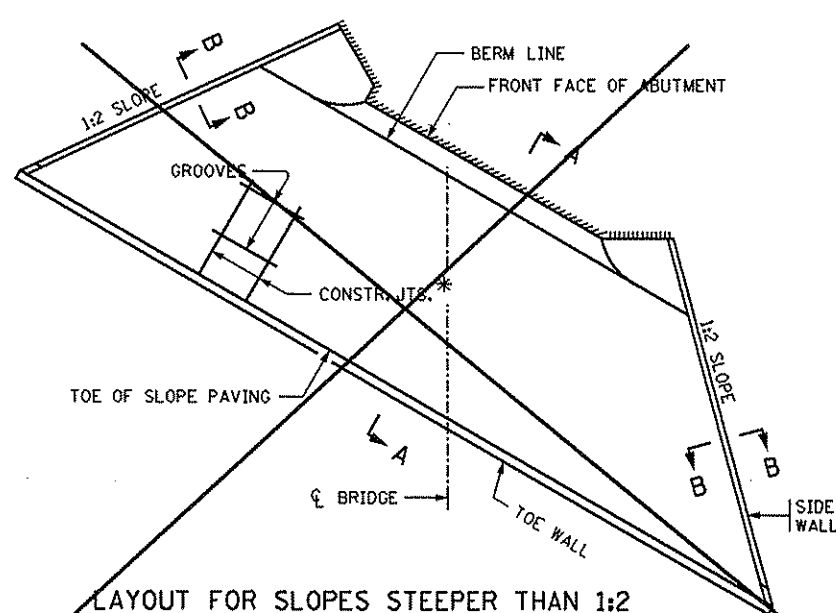
**SRF** CONSULTING GROUP, INC.

ANOKA COUNTY
C.S.A.H. 17 (LEXINGTON AVE.) OVER T.H. 35W
SUMMARY OF QUANTITIES

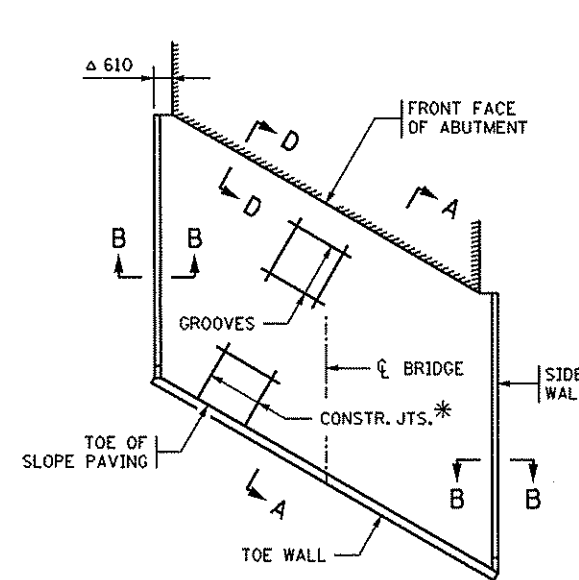
SHEET
B32
OF
B47



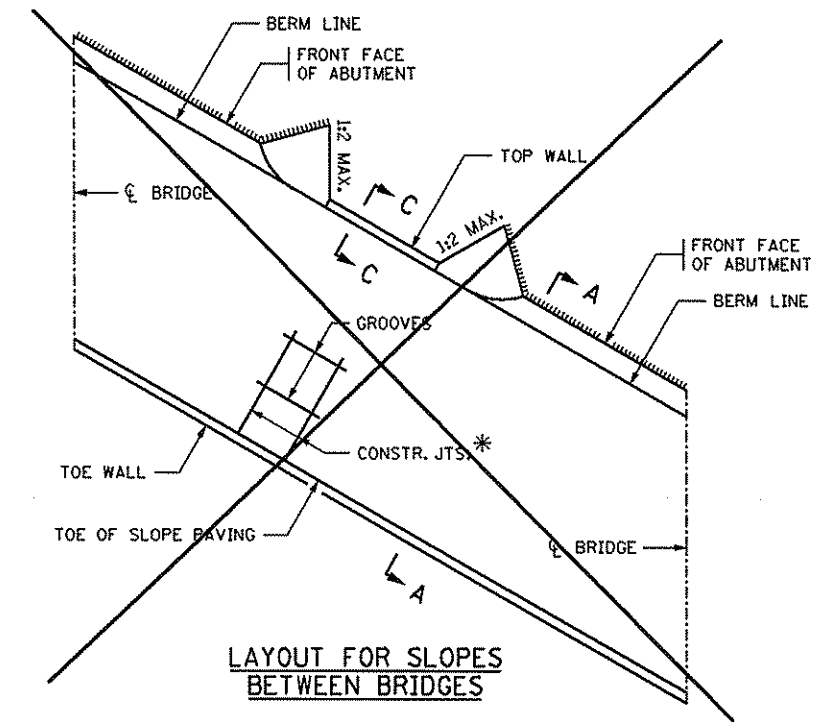
LAYOUT FOR SLOPES 1:2 OR FLATTER



LAYOUT FOR SLOPES STEEPER THAN 1:2



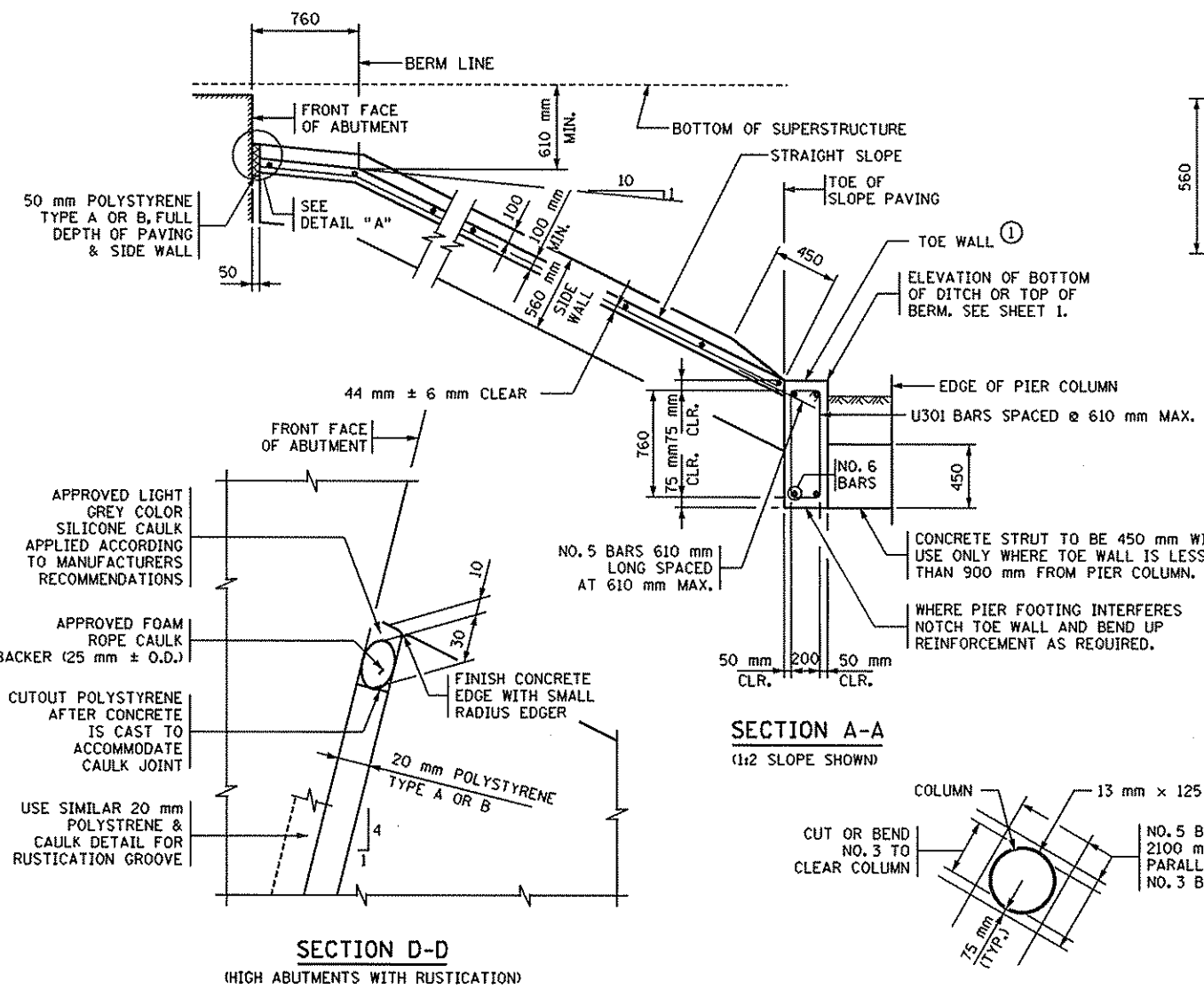
LAYOUT FOR SLOPES AT HIGH ABUTMENTS



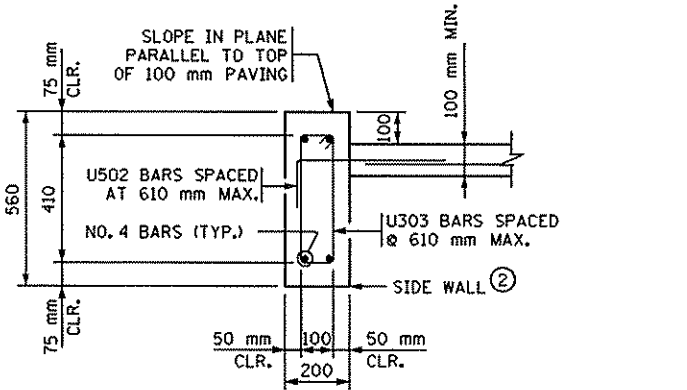
LAYOUT FOR SLOPES BETWEEN BRIDGES

△ 610 mm FOR TANGENT BRIDGE SUPERSTRUCTURES. VARIES 610 mm MINIMUM FOR CURVED BRIDGE SUPERSTRUCTURE.

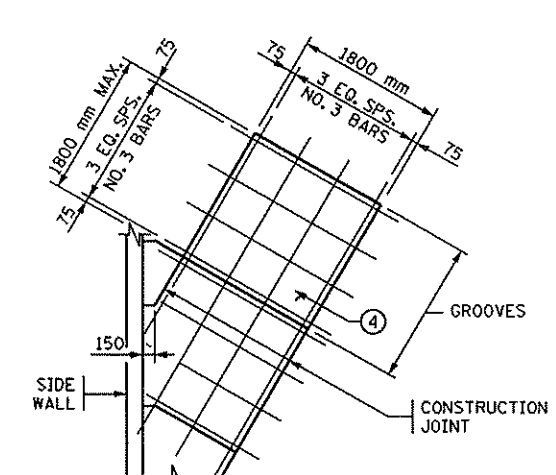
\* VERTICAL CONSTRUCTION JOINTS MAY BE CONSTRUCTED PARALLEL TO CL OF BRIDGE FOR SKEWS TO 10° ONLY.



SECTION A-A (1:2 SLOPE SHOWN)



SECTION B-B NORMAL TO SLOPE

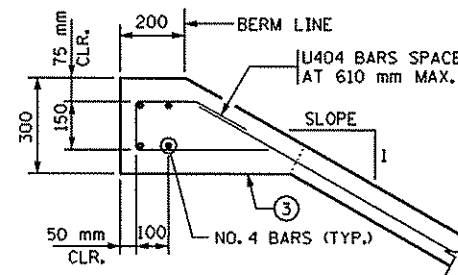


PAVING DETAIL

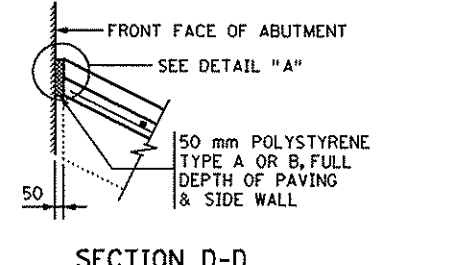
CONCRETE & REINFORCEMENT UNIT QUANTITIES

- ① 0.273 m<sup>3</sup> OF CONCRETE/METER  
10.88 kg OF REINFORCEMENT/METER
- ② 0.112 m<sup>3</sup> OF CONCRETE/METER  
6.62 kg OF REINFORCEMENT/METER
- ③ 0.140 m<sup>3</sup> OF CONCRETE/METER  
5.48 kg OF REINFORCEMENT/METER  
BASED ON A SLOPE OF 1:2.
- ④ 0.100 m<sup>3</sup> OF CONCRETE/m<sup>2</sup>  
2.49 kg OF REINFORCEMENT/m<sup>2</sup>

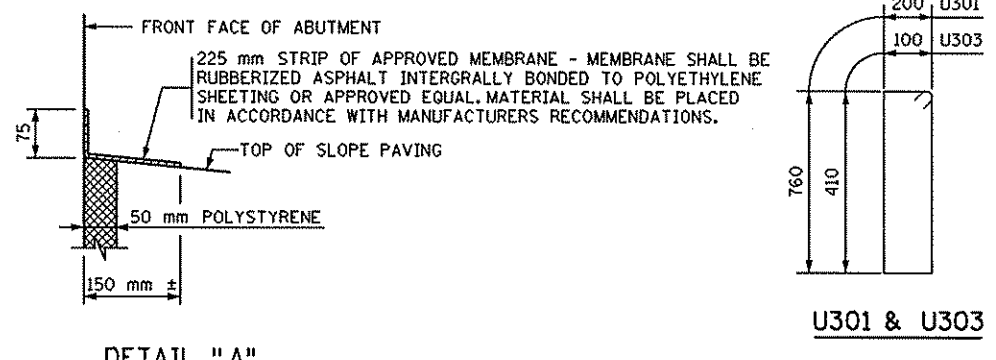
NOTE:  
SLOPES ARE EXPRESSED AS A RATIO OF VERTICAL DISTANCE : HORIZONTAL DISTANCE.



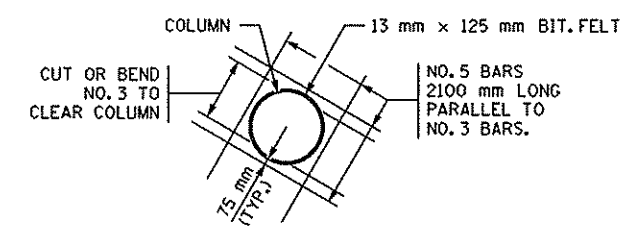
SECTION C-C



SECTION D-D (HIGH ABUTMENTS WITHOUT RUSTICATION)



DETAIL "A" SLOPE PAVING AS PER SPEC. 2514.



DETAIL WHERE PIER COLUMN EXTENDS THRU SLOPE PAVING

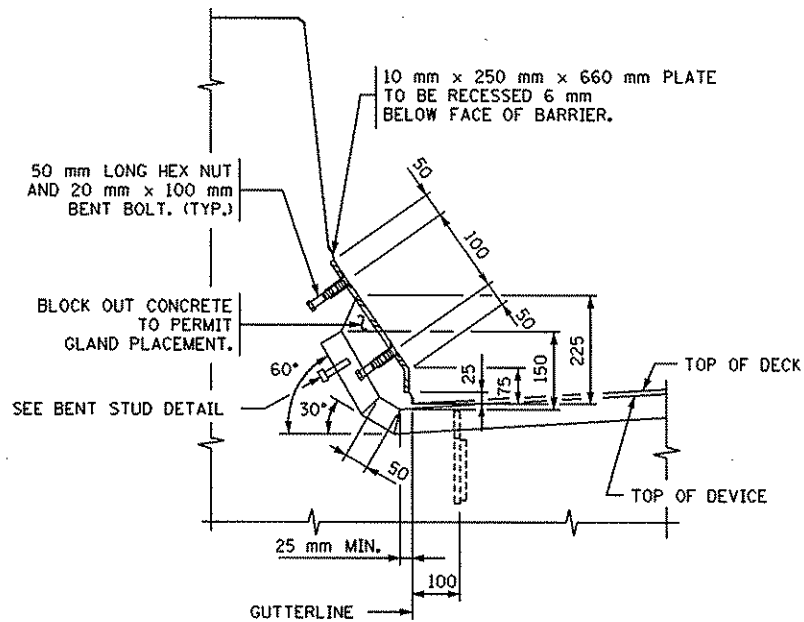
APPROVED: XXXXXXXX XX, 1995  
STATE BRIDGE ENGINEER

CERTIFIED BY: *[Signature]*  
PROFESSIONAL ENGINEER  
REG. NO. 19632 36 1997

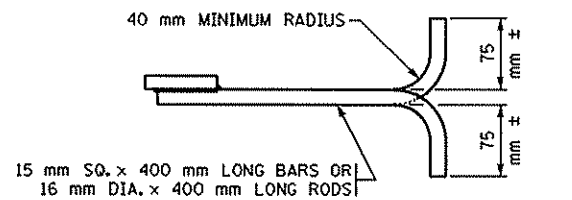
TITLE: CONCRETE SLOPE PAVING UNDER BRIDGES

S.A.P. 02-617-11  
DES: RAS DR: JEH  
CHK: LAE CHK: RAS  
APPROVED: 5-1-97  
BRIDGE NO. 02550  
SHEET NO. B33 OF B47 SHEETS

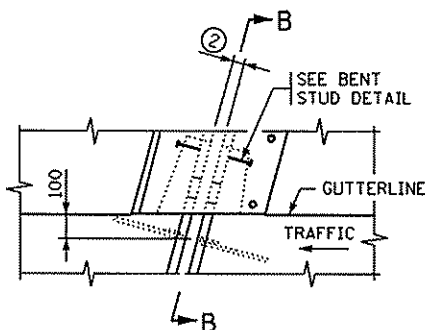
FIG. 5-397.301M



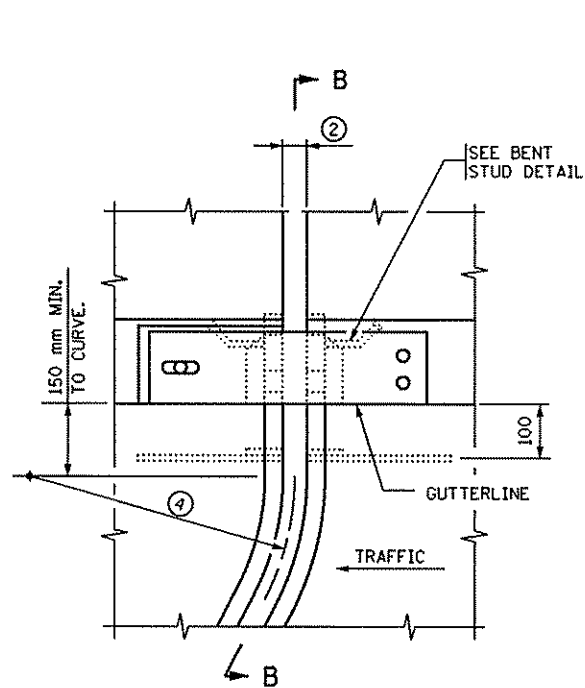
**SECTION THROUGH RAILING**  
(TYPE F RAILING)



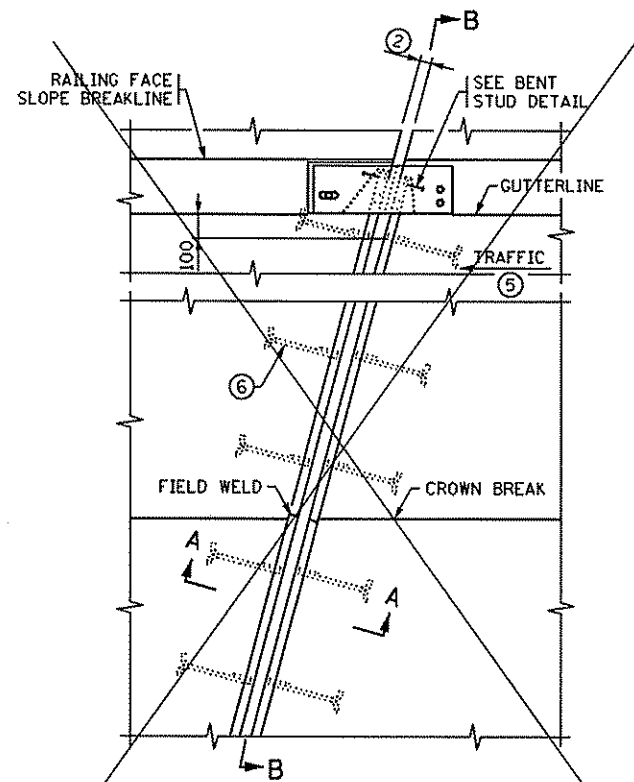
**BAR-ROD DETAIL**



**PLAN VIEW @ EXPANSION DEVICE**  
(MEDIAN OR SIDEWALK ALTERNATE)

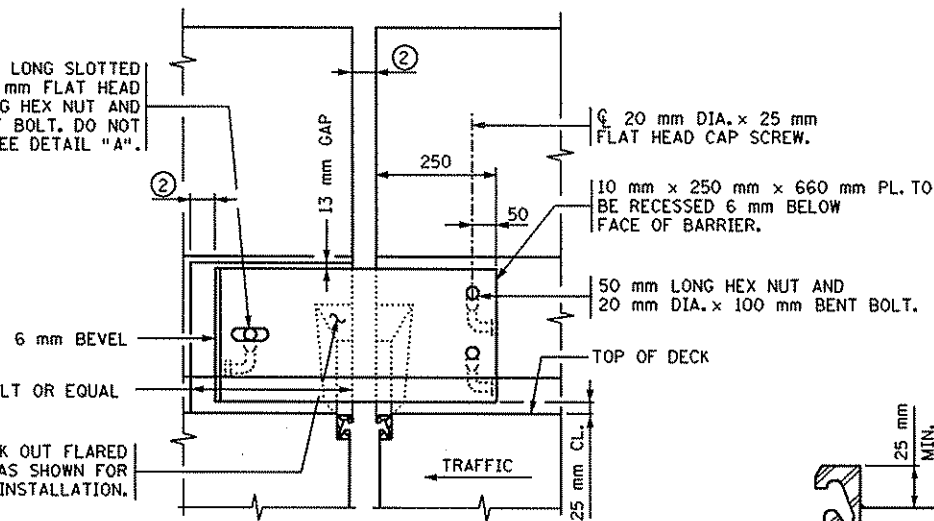


**PLAN VIEW @ EXPANSION DEVICE**  
(WITH CURVED DEVICE ALTERNATE)

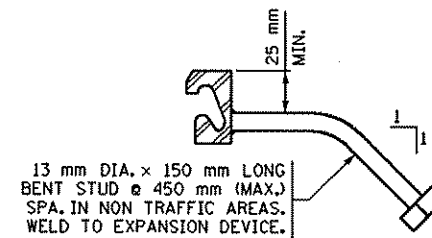


**PLAN VIEW @ EXPANSION DEVICE**  
(WITH STRAIGHT DEVICE)

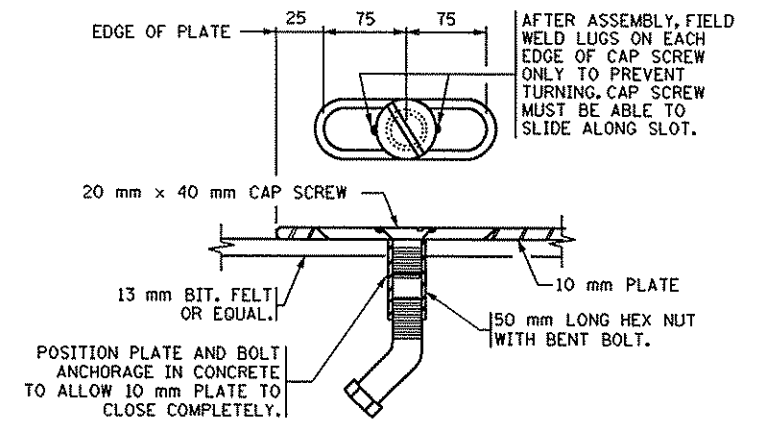
25 mm DIA. x 150 mm LONG SLOTTED HOLE FOR 20 mm DIA. x 40 mm FLAT HEAD CAP SCREW WITH 50 mm LONG HEX NUT AND 20 mm DIA. x 100 mm BENT BOLT. DO NOT TIGHTEN DOWN CAP SCREW. SEE DETAIL "A".



**RAILING ELEVATION**



**BENT STUD DETAIL**



**DETAIL "A"**

**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.

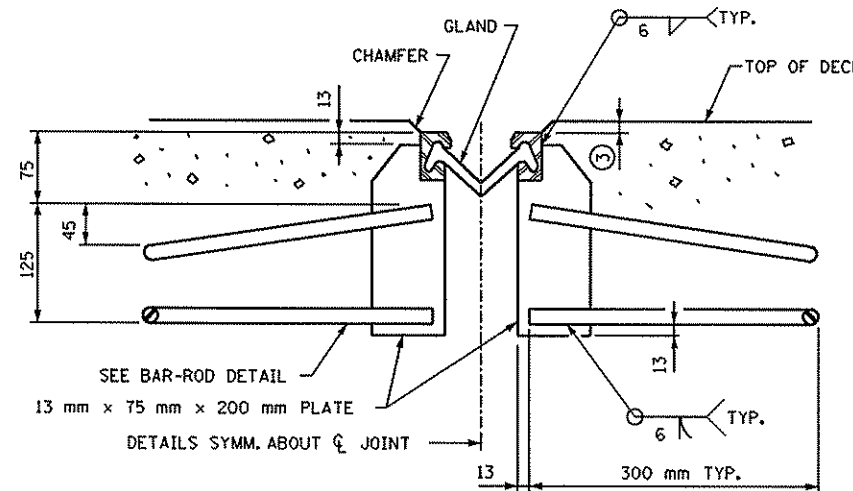
② SEE SHEET B3 FOR DIMENSIONS

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

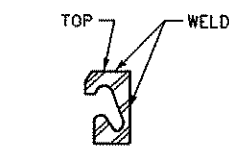
④ SEE SUPERSTRUCTURE DETAILS FOR RADIUS.

⑤ SEE SHEET 2 FOR DIRECTION OF TRAFFIC.

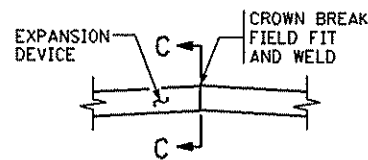
⑥ PLACE BAR-ROD NORMAL TO JOINT ON NEW BRIDGES AND JOINT REPLACEMENTS. ON JOINT REPLACEMENTS WHEN SKEW IS OVER 15° AND LESS THAN 50° BEND RODS PARALLEL TO  $\phi$  ROADWAY.



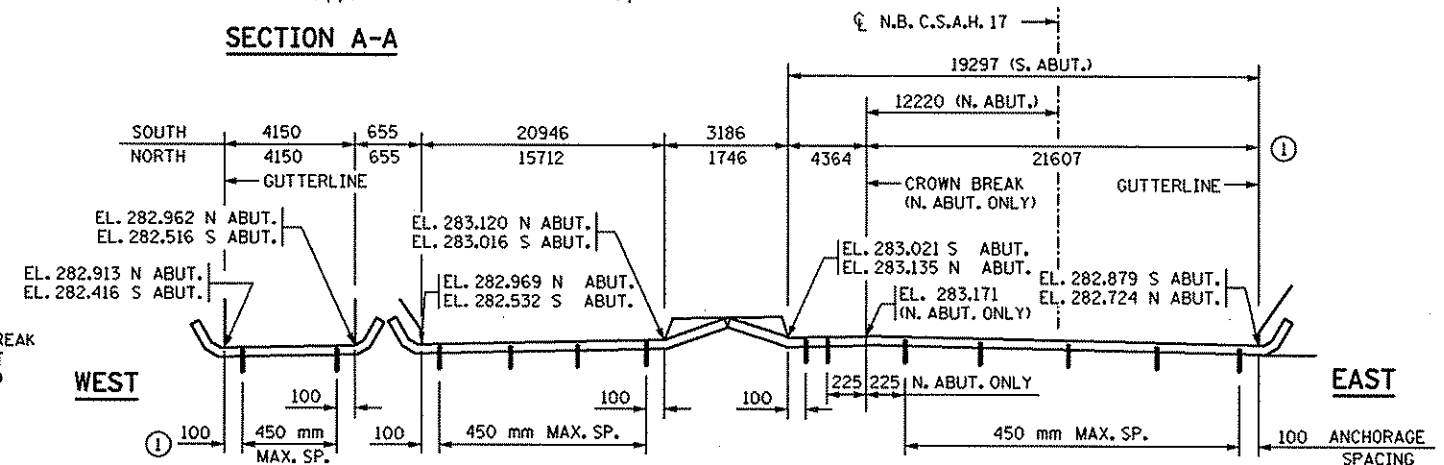
**SECTION A-A**



**SECTION C-C**



**DETAIL B**



**SECTION B-B ~ ALONG @ JOINT**

(ELEVATIONS SHOWN ARE 3 mm BELOW TOP OF SLAB @  $\phi$  JT.)  
(ELEVATIONS SHOWN ARE 13 mm BELOW TOP OF SLAB @  $\phi$  JT.)

APPROVED: MONTH DATE, 1996

STATE BRIDGE ENGINEER

S.A.P. 02-617-11

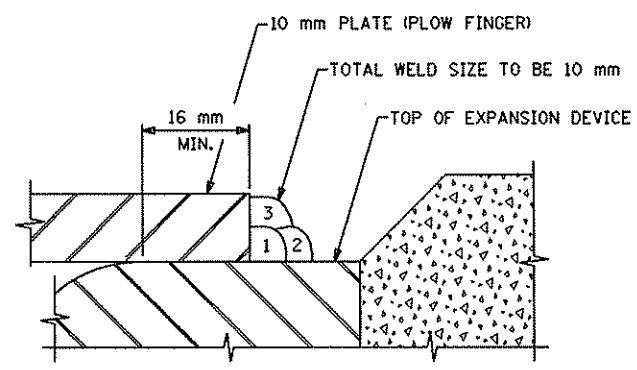
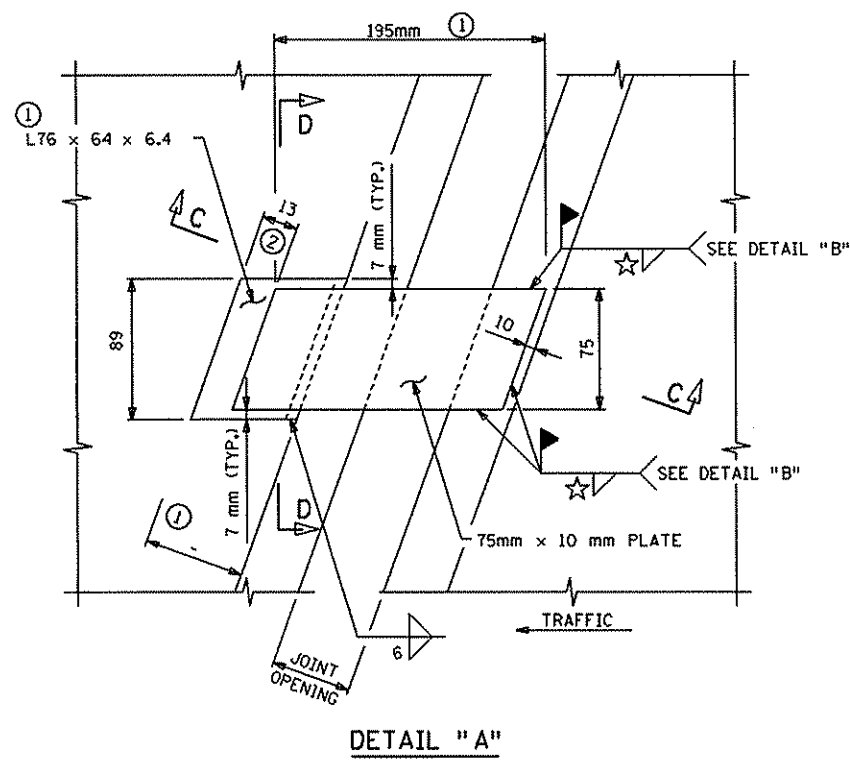
CERTIFIED BY: *Robert H. Spang*  
PROFESSIONAL ENGINEER  
REG. NO. *PL632* 36 1997

TITLE:  
**WATERPROOF EXPANSION DEVICE**  
(WITH TYPE F BARRIER)

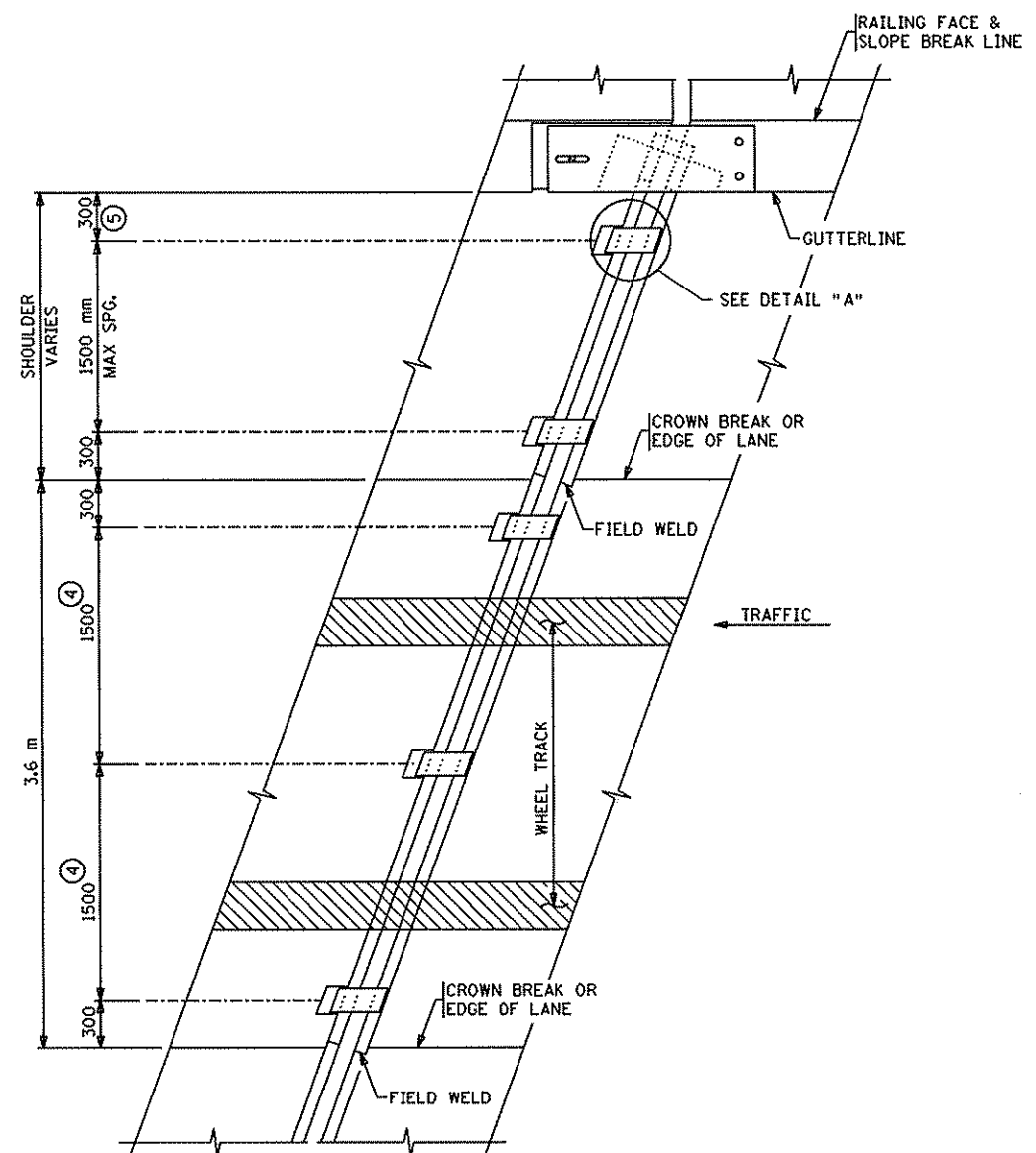
DES: RAS DR: JEH  
CHK: LAE CHK: RAS  
APPROVED: *5-1-97*

FIG. 5-397.627M  
BRIDGE NO. 02550  
SHEET NO. B34 OF B47 SHEETS

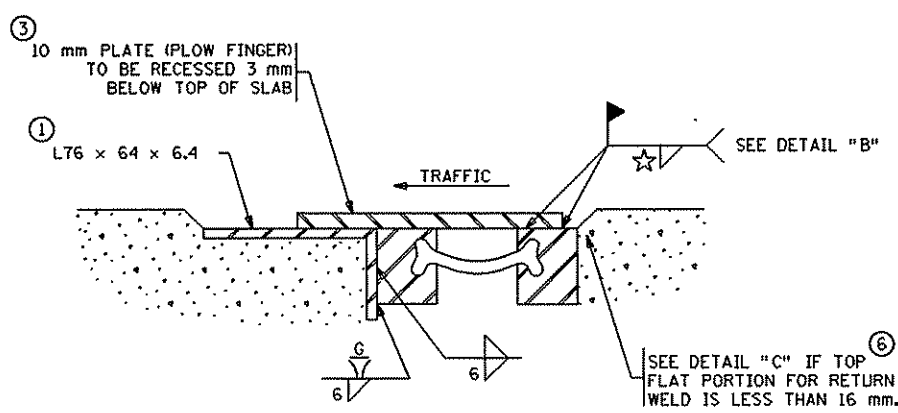




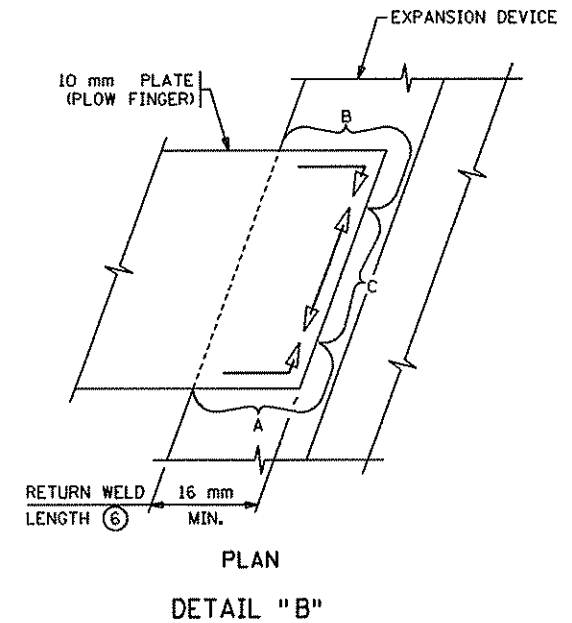
SECTION THRU WELD



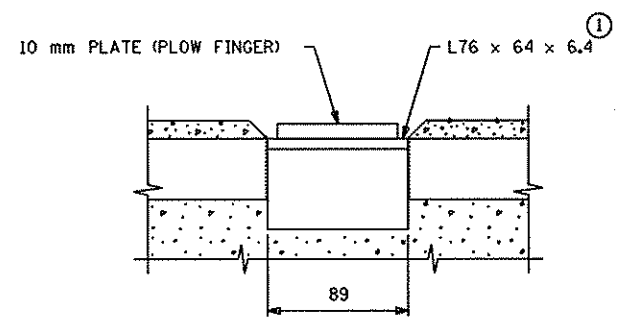
PLAN VIEW AT EXPANSION DEVICE



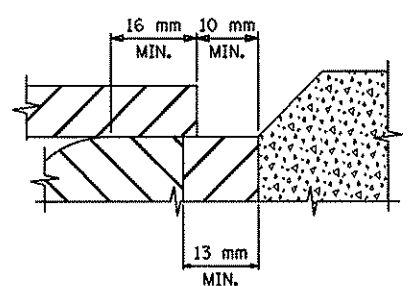
SECTION C-C



PLAN DETAIL "B"



SECTION D-D



DETAIL "C"

☆ WELDING PROCEDURE FOR PLOW FINGERS

- A. ALL WELDING SHALL BE DONE WITH 3 mm AWS SPEC. 5.1 TYPE E7016 OR E7018 ELECTRODE.
- B. WELD PASS 1 IN AREAS A AND B FIRST, THEN AREA C, FOLLOW WITH PASSES 2 AND 3 IN SAME ORDER AS SHOWN IN DETAIL "B".
- C. REMOVE ALL WELD SLAG AND OTHER RESIDUE BETWEEN PASSES.
- D. ALLOW AT LEAST 5 MINUTES COOLING TIME BETWEEN EACH OF NINE WELD PASSES.
- E. REPAIR ALL GALVANIZING DAMAGED BY REMOVAL AND WELDING, IN ACCORDANCE WITH SPEC. 2471.3L

NOTES

- DO NOT GALVANIZE PLOW FINGERS.
- ① VARIES WITH SKEW AND EXPANSION OPENING.
- ② MINIMUM IN CLOSED POSITION.
- ③ EVERY SNOW PLOW FINGER SHALL HAVE FULL AND DIRECT BEARING ON THE PLATE THAT IS LOCATED UNDER THE MOVEMENT SIDE OF THE FINGER. (NO CLICKING NOISE WILL BE ALLOWED.)
- ④ MODIFY IF LANE WIDTH DIFFERS FROM 3.6 METERS.
- ⑤ OMIT LAST PLOW FINGER ON DEVICE WITH CURVED END.
- ⑥ ADD BACKING BAR AS REQUIRED: 13 mm MIN. THICKNESS, 38 mm DEEP.

APPROVED: XXXXXXXX XX, 1995  
STATE BRIDGE ENGINEER

S.A.P. 02-617-11  
CERTIFIED BY: *Robert H. Spitzer*  
PROFESSIONAL ENGINEER  
REG. NO. 91632 3/6 1992

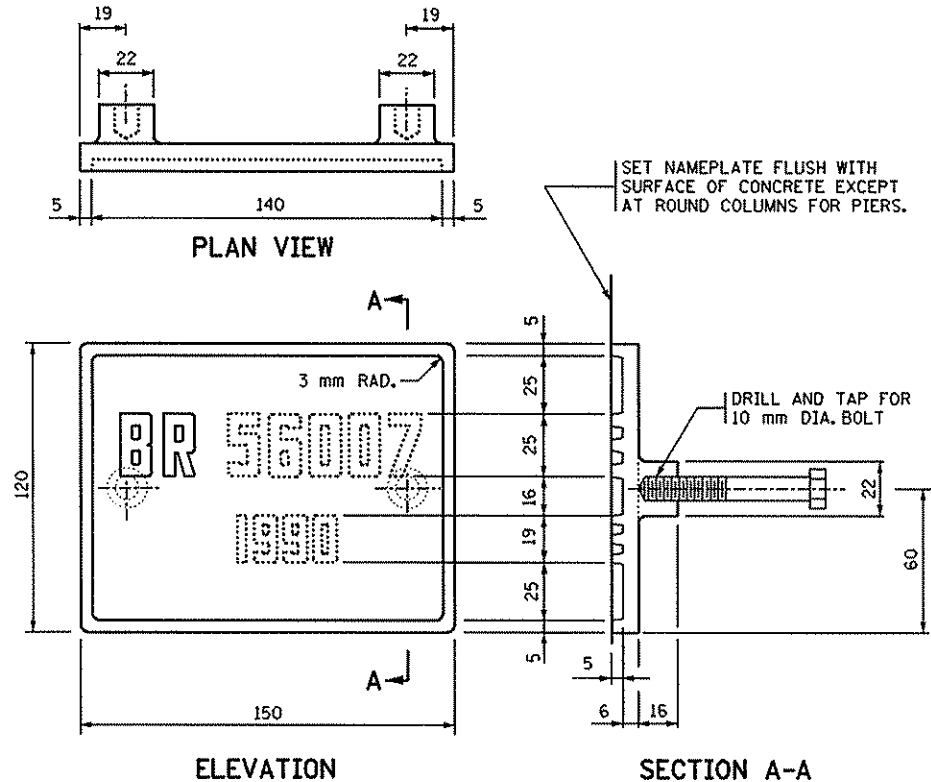
TITLE: WATERPROOF EXPANSION DEVICE  
SNOW PLOW PROTECTION  
(USE ON SKEWS OVER 15° AND LESS THAN 50°)

DES: RAS DR: JEH  
CHK: LAE CHK: RAS  
APPROVED: 5-1-97  
SHEET NO. B35 OF B47 SHEETS

FIG. 5-397.628M  
BRIDGE NO. 02550

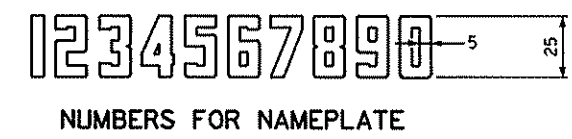
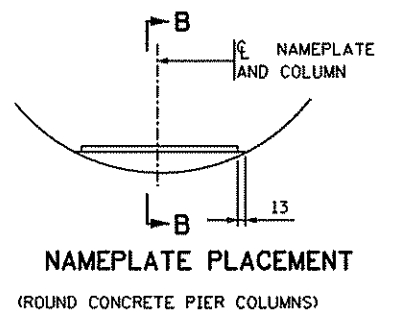




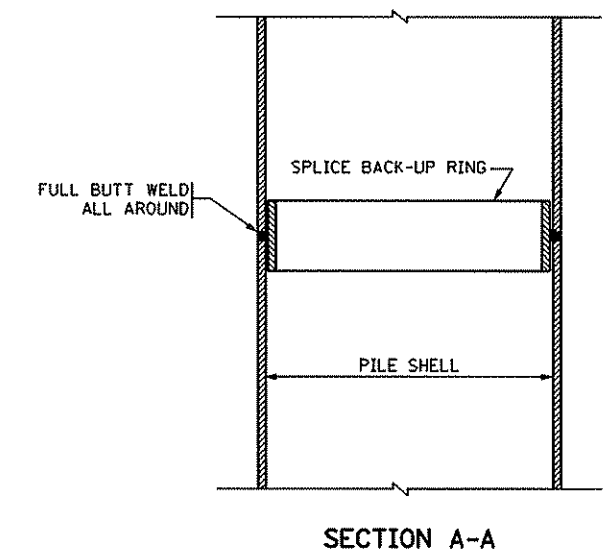
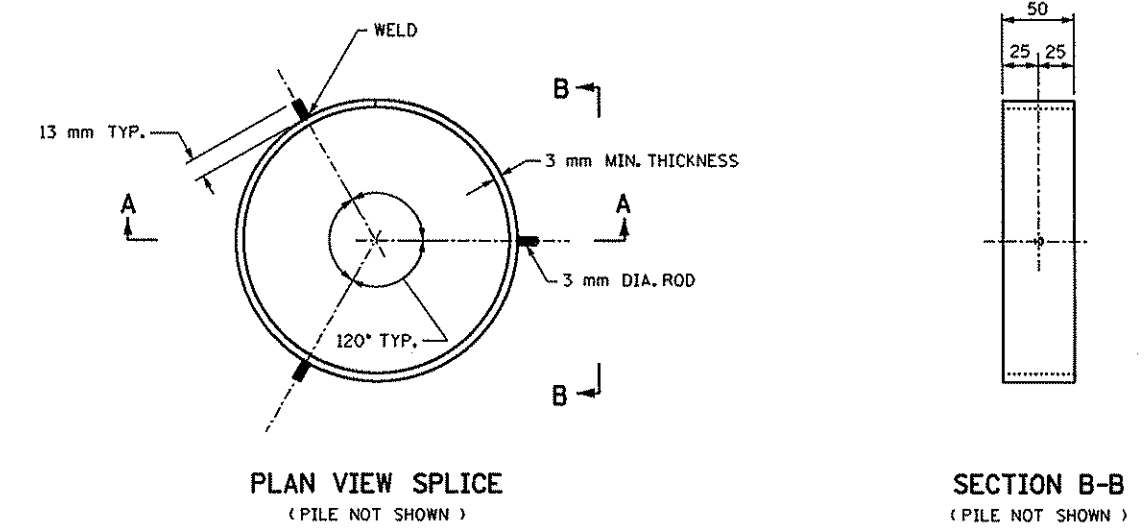


THE DASHED NUMBERS SHOWN ABOVE ARE FOR ILLUSTRATION. DATA TO BE SHOWN ON NAMEPLATE IS AS FOLLOWS:

BRIDGE 02550  
YEAR 1997



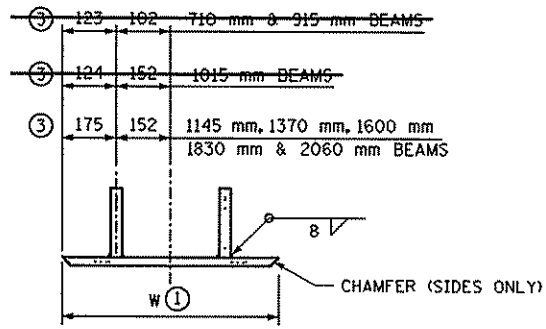
- NOTES:**
- NO SHOP DRAWING REQUIRED.
  - MATERIAL SHALL COMPLY WITH SPEC. 3327.
  - LETTERS AND NUMBERS SHALL CONFORM TO THOSE SHOWN.
  - DRAFT ON LETTERS AND NUMBERS SHALL NOT BE MORE THAN 75 mm IN 300 mm.
  - HORIZONTAL SPACING OF LETTERS AND NUMBERS SHALL PRODUCE A BALANCED LAYOUT IN PROPORTION TO SPACING SHOWN.
  - TOP SURFACE OF LETTERS, NUMBERS AND FRAMES SHALL BE BURNISHED.
  - FURNISH 2 STEEL BOLTS 10 mm DIA. x 75 mm LONG WITH EACH PLATE.
  - ALL DIMENSIONS FOR 19 mm HIGH LETTERS AND NUMBERS SHALL BE IN DIRECT PROPORTION TO THOSE SHOWN FOR THE 25 mm HIGH LETTERS AND NUMBERS.



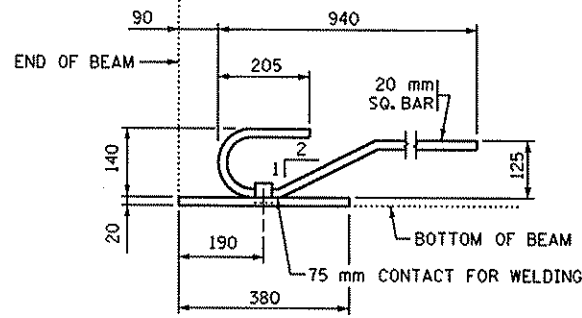
- NOTES:**
- APPROVED COMMERCIAL PILE SPLICE BACK-UP RING MAY BE USED IN LIEU OF THE TYPE DETAILED. BACK-UP RING SHALL HAVE A TIGHT FIT.
  - WELDING ELECTRODE SHALL BE A.W.S. TYPE E7016 OR E7018 (LOW-HYDROGEN).
  - LOW-HYDROGEN ELECTRODES SHALL BE SUPPLIED IN HERMETICALLY (AIR-TIGHT) SEALED CONTAINERS.
  - LOW-HYDROGEN ELECTRODES SHALL BE STORED IN HOLDING OVENS AT A TEMPERATURE OF NOT LESS THAN 121° C.
  - LOW-HYDROGEN ELECTRODES SHALL BE PLACED IN A HOLDING OVEN FOR AT LEAST 8 HOURS IF THEY HAVE BEEN EXPOSED TO THE ATMOSPHERE FOR MORE THAN 2 HOURS.
  - ELECTRODES WHICH HAVE BECOME WET, SOILED OR DAMAGED SHALL NOT BE USED.
  - WELDING SHALL NOT BE DONE WHEN THE AMBIENT TEMPERATURE IS LOWER THAN -18° C. OR WHEN THE PILE IS WET OR EXPOSED TO FALLING RAIN OR SNOW. WHEN THE PILE METAL TEMPERATURE IS BELOW 0° C., THE PILE METAL IN THE AREA OF THE WELD SHALL BE HEATED TO A MINIMUM TEMPERATURE OF 21° C. AND MAINTAINED AT THIS TEMPERATURE DURING WELDING.

APPROVED: <u>XX, 1995</u>	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	REVISION	DETAIL NO.
STATE BRIDGE ENGINEER	<b>BRIDGE NAMEPLATE FOR NEW BRIDGES</b>		<b>B101M</b>

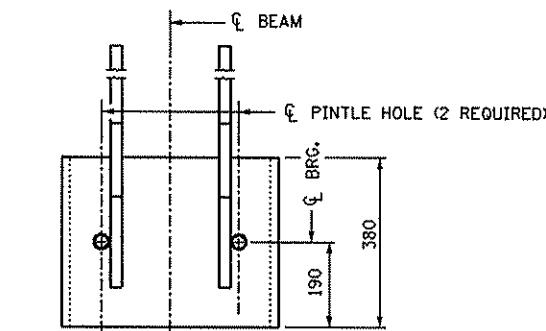
APPROVED: _____	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	REVISION	DETAIL NO.
STATE BRIDGE ENGINEER	<b>PILE SPLICE CAST IN PLACE CONCRETE PILES</b>		<b>B201M</b>



FRONT VIEW

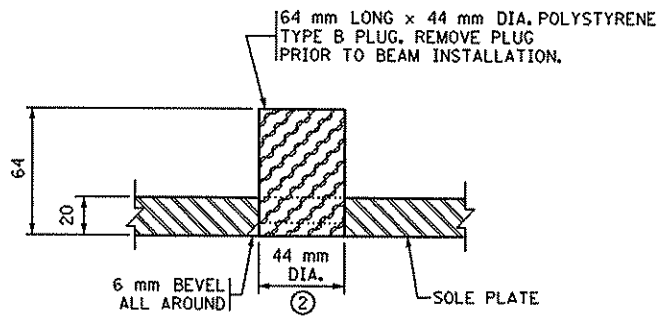


SIDE VIEW



TOP VIEW

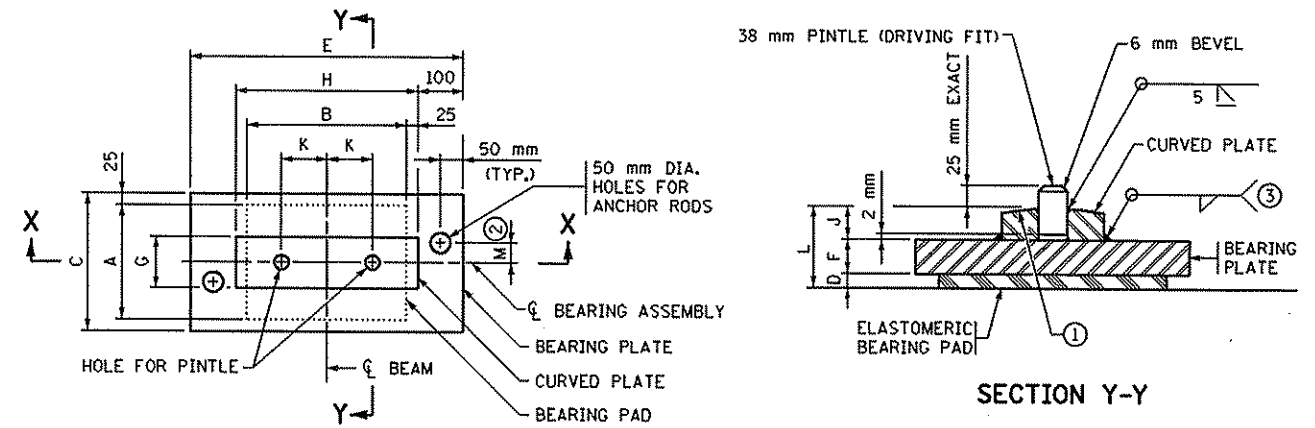
BEAM SIZE	W VALUE (mm)
710 mm, 915 mm	450
1015 mm	552
1145 mm, 1370 mm, 1600 mm, 1830 mm, 2060 mm	654



PINTLE HOLE DETAIL

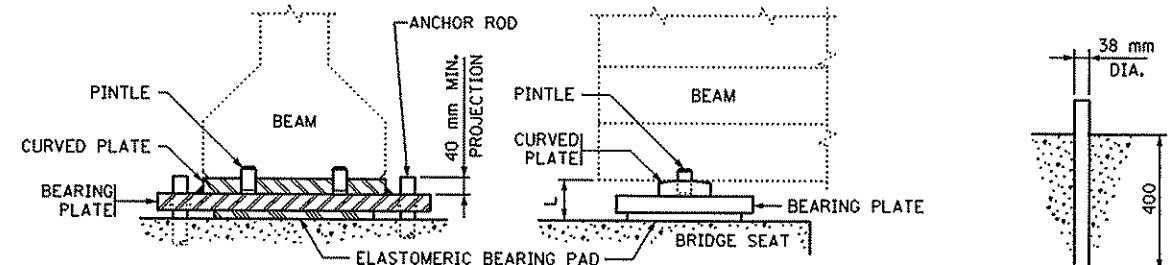
NOTES:

- MATERIAL TO BE STRUCTURAL STEEL PER SPEC. 3306.
- SOLE PLATE FOR BEARING ASSEMBLY TO BE HOT DIPPED GALVANIZED PER SPEC. 3394 AFTER FABRICATION.
- PINTLE HOLES SHALL BE FREE OF ZINC BUILD UP FROM GALVANIZING.
- PAYMENT FOR SOLE PLATES TO BE INCLUDED IN PRICE BID FOR PRESTRESSED CONCRETE BEAMS.
- ① DIMENSION "W" TO BE THE WIDTH AT THE BOTTOM FLANGE OF THE BEAM MINUS 6 mm.
- ② FOR 38 mm DIA. PINTLES.
- ③ THESE DIMENSIONS MAY BE MODIFIED TO CLEAR PRESTRESSED STRANDS, HOWEVER, CHANGES MUST BE APPROVED BY THE ENGINEER.



PLAN

SECTION Y-Y



SECTION X-X

END ELEVATION (ANCHOR RODS NOT SHOWN)

ANCHOR ROD DETAIL

ASSEMBLY TYPE	LOCATION	BEAM SIZE	BEARING PAD SIZE		SHAPE FACTOR	BEARING PLATE SIZE			CURVED PLATE SIZE			PINTLE DIA.	PINTLE DISTANCE	ANCHOR ROD OFFSET	ASSY. HEIGHT	
			A	B		C	E	F	G	H	J					
			TABLE (ALL DIMENSIONS IN mm)													
F-1	PIER	1830	300	610	13	7.7	350	860	32	115	660	35	38	K ④	M ②	L

NOTES:

- ELASTOMERIC MATERIALS & PAD CONSTRUCTION SHALL COMPLY WITH SPEC. 3741.
- ALL STEEL PLATES SHALL COMPLY WITH SPEC. 3306.
- ANCHOR RODS SHALL COMPLY WITH SPEC. 3385 TYPE A. GALVANIZE PER SPEC. 3392.
- ALL PLATES SHALL BE FLAT AFTER FABRICATION AND GALVANIZING. WELDING DISTORTION OF BEARING PLATES SHALL BE STRAIGHTENED TO WITHIN 2 mm OF FLATNESS BY MECHANICAL MEANS WITHOUT DAMAGE TO THE ZINC COATING.
- PINTLES SHALL COMPLY WITH SPEC. 3309.
- GALVANIZE STRUCTURAL STEEL BEARING ASSEMBLY AFTER FABRICATION PER SPEC. 3394, EXCEPT AS NOTED.
- PAYMENT FOR BEARING ASSEMBLY SHALL INCLUDE ALL MATERIAL ON THIS DETAIL.
- ① THE RADIUS OF THE CURVED PLATE SHALL BE 400 mm MIN. AND 600 mm MAX. FINISH TO 6.35 MICROMETERS. THE FINISHED THICKNESS OF THE PLATE MAY BE 2 mm LESS THAN SHOWN.
- ② OFFSET MAY BE OPPOSITE OF THAT SHOWN. SEE ANCHOR ROD LAYOUT FOR DETAILS.
- ③ WELDING PER SPEC. 2471.
- ④ SEE DETAIL B303M FOR PINTLE DISTANCE K.

DESIGN DATA:

MAXIMUM HORIZONTAL LOAD IS 312 kN FOR 38 mm DIA. PINTLES.

APPROVED: _____	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	REVISION	DETAIL NO. B303M
STATE BRIDGE ENGINEER	SOLE PLATE PRESTRESSED CONCRETE BEAMS (FOR BEARINGS WITH PINTLES)		

APPROVED: _____	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	REVISION	DETAIL NO. B310M
STATE BRIDGE ENGINEER	CURVED PLATE BEARING ASSEMBLY (PRESTRESSED CONCRETE BEAMS) (FIXED)		

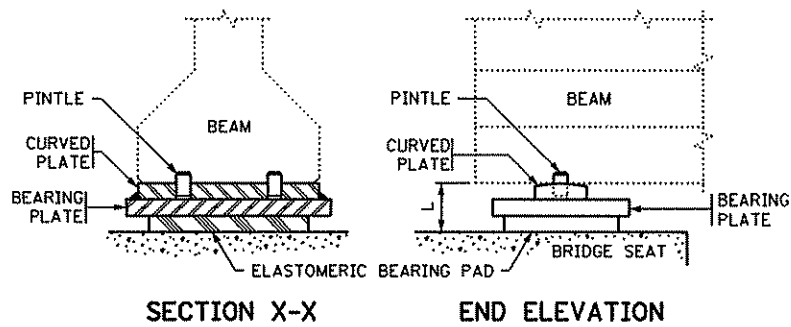
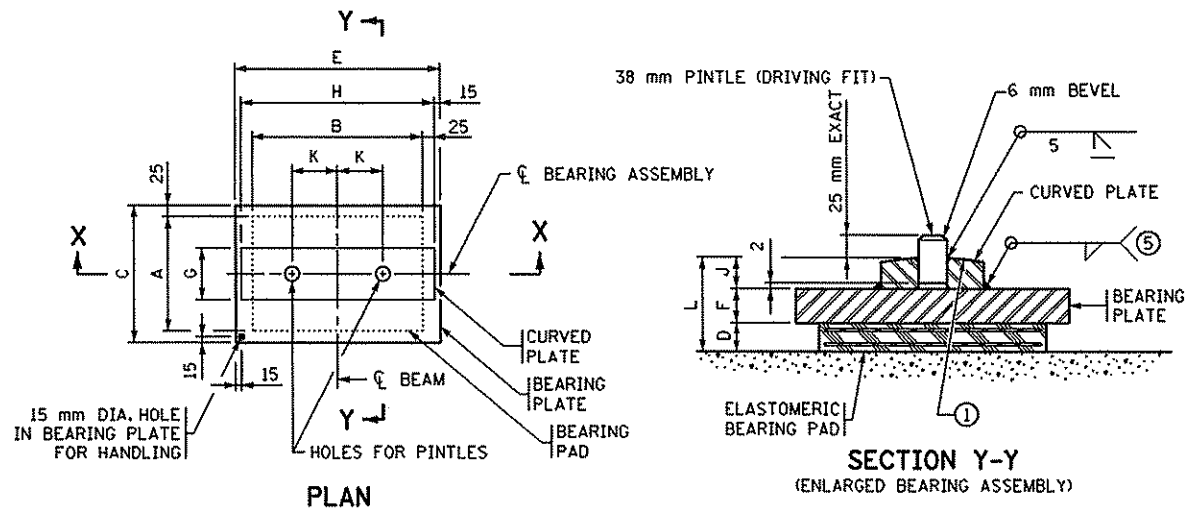


TABLE (ALL DIMENSIONS IN mm)

ASSEMBLY TYPE	LOCATION	BEAM SIZE	BEARING PAD SIZE			STEEL PLATES		LAMINATES		SHAPE FACTOR	BEARING PLATE SIZE			CURVED PLATE SIZE			PINTLE DIA.	PINTLE DISTANCE	ASSY. HEIGHT
			A	B	D	NO.	THICK.	NO.	THICK.		C	E	F	G	H	J			
E-1	ABUTMENTS	1830	250	610	80	6	3	5	10	8.9	300	690	30	115	660	35	38	203	145
E-2	PIER	1830	250	610	28	2	3	1	10	8.9	300	690	30	115	660	35	38	203	93

**NOTES:**

ELASTOMERIC MATERIALS & PAD CONSTRUCTION SHALL COMPLY WITH SPEC. 3741.

ALL STEEL PLATES SHALL COMPLY WITH SPEC. 3306

ALL PLATES SHALL BE FLAT AFTER FABRICATION AND GALVANIZING. WELDING DISTORTION OF BEARING PLATES SHALL BE STRAIGHTENED TO WITHIN 2 mm OF FLATNESS BY MECHANICAL MEANS WITHOUT DAMAGE TO THE ZINC COATING.

PINTLES SHALL COMPLY WITH SPEC. 3309.

GALVANIZE STRUCTURAL STEEL BEARING ASSEMBLY AFTER FABRICATION PER SPEC. 3394, EXCEPT AS NOTED.

PAYMENT FOR BEARING ASSEMBLY SHALL INCLUDE ALL MATERIAL ON THIS DETAIL.

① THE RADIUS OF THE CURVED PLATE SHALL BE 400 mm MIN. AND 600 mm MAX. FINISH TO 6.35 MICROMETERS. THE FINISHED THICKNESS OF THE PLATE MAY BE 2 mm LESS THAN SHOWN.

② DO NOT GALVANIZE THESE PLATES.

③ THE TOTAL THICKNESS SHOWN INCLUDES THE STEEL PLATES.

④ SEE DETAIL B303M FOR PINTLE DISTANCE K.

⑤ WELDING PER SPEC. 2471.

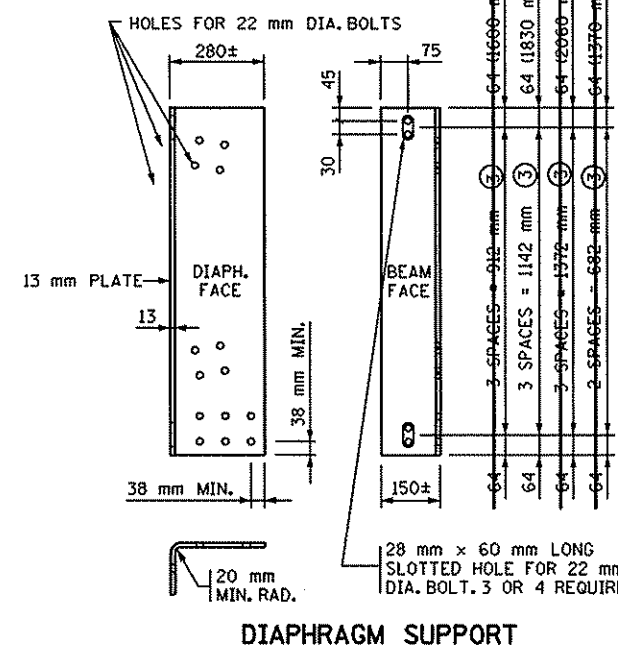
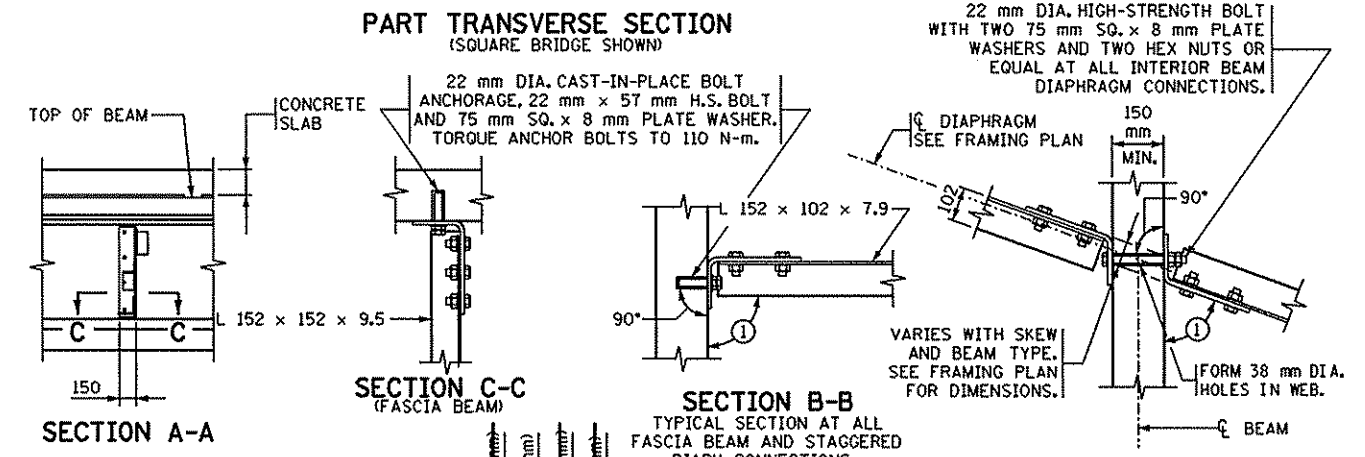
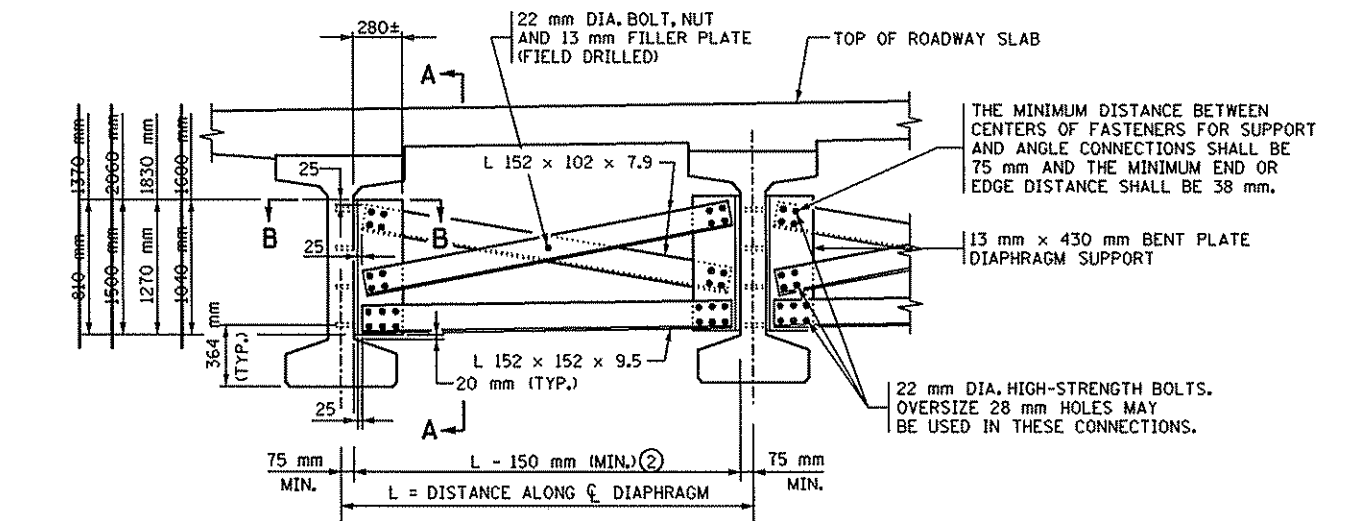
**DESIGN DATA:**

MAXIMUM HORIZONTAL LOAD IS 312 kN FOR 38 mm DIA. PINTLES.

APPROVED: \_\_\_\_\_  
STATE BRIDGE ENGINEER

STATE OF MINNESOTA  
DEPARTMENT OF TRANSPORTATION  
**CURVED PLATE BEARING ASSEMBLY**  
(PRESTRESSED CONCRETE BEAMS)  
(EXPANSION)

REVISION  
DETAIL NO.  
**B311M**



**NOTES:**

ALL STEEL SHALL CONFORM TO SPEC. 3306.

ALL STRUCTURAL STEEL SHOWN ON THIS DETAIL, INCLUDING BOLTS AND WASHERS, SHALL BE INCLUDED IN THE PAYMENT FOR DIAPHRAGMS FOR PRESTRESSED BEAMS.

DIAPHRAGMS OVER THE PIERS ARE CONSIDERED TO BE INTERMEDIATE IF THE SLAB IS CONTINUOUS.

FOR BOLT LENGTHS GREATER THAN 215 mm, USE HIGH STRENGTH BOLTS PER SPEC, SAE GRADE 5 OR BETTER. SEE SPEC. 2405.3M FOR INSTALLATION.

FABRICATOR SHALL OBTAIN END BLOCK LOCATION FROM PRECASTOR TO DETERMINE DIAPHRAGM LENGTHS AT BEAM ENDS.

① FOR SKEW ANGLES UNDER 20°, USE 90° LESS THE SKEW ANGLE. FOR ANGLES OVER 20°, USE 90°.

② IF DIAPHRAGMS ARE USED AT ENDS OF BEAMS, REDUCE THE LENGTH FOR END BLOCKS ACCORDINGLY.

③ BOLT HOLES SHALL BE SPACED SO AS TO MISS PRESTRESSED STRANDS IN CONCRETE BEAMS. SEE PRESTRESSED CONCRETE BEAM SHEETS FOR MORE INFORMATION.

APPROVED: XX, 1995  
STATE BRIDGE ENGINEER

STATE OF MINNESOTA  
DEPARTMENT OF TRANSPORTATION  
**STEEL INTERMEDIATE BOLTED DIAPHRAGM**  
FOR 1370 mm - 2060 mm PRESTRESSED CONCRETE BEAMS

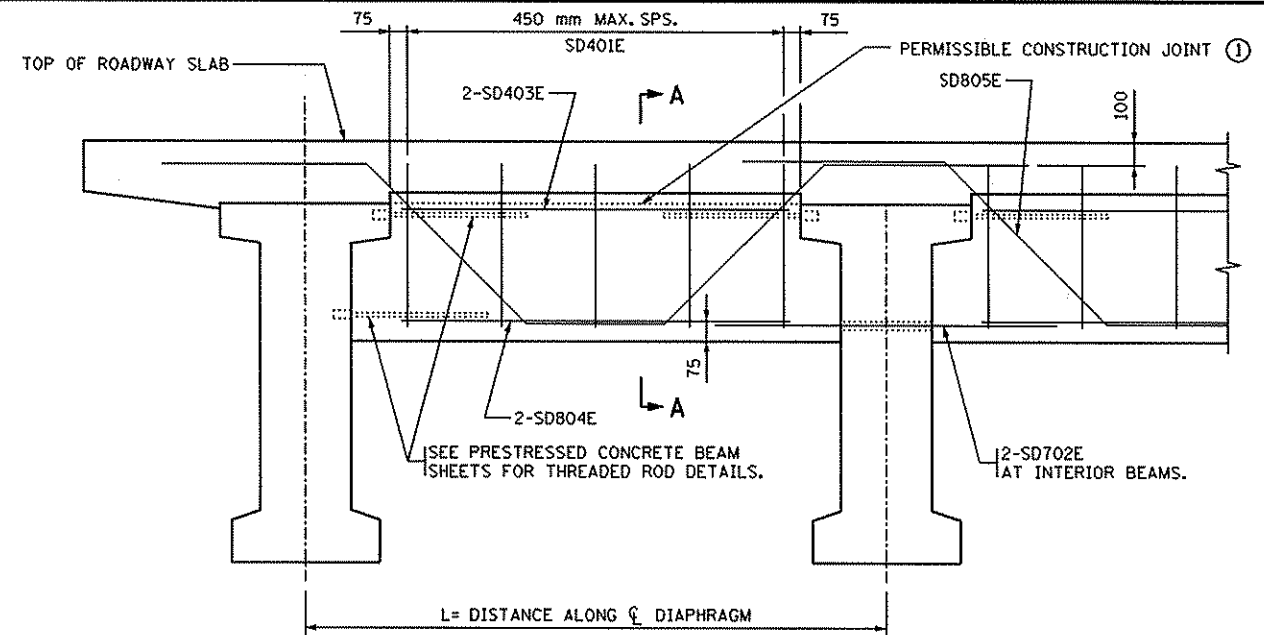
REVISION  
DETAIL NO.  
**B406M**

CERTIFIED BY: *Robert G. Morgan*  
PROFESSIONAL ENGINEER  
REG. NO. 19632 3/6 1987

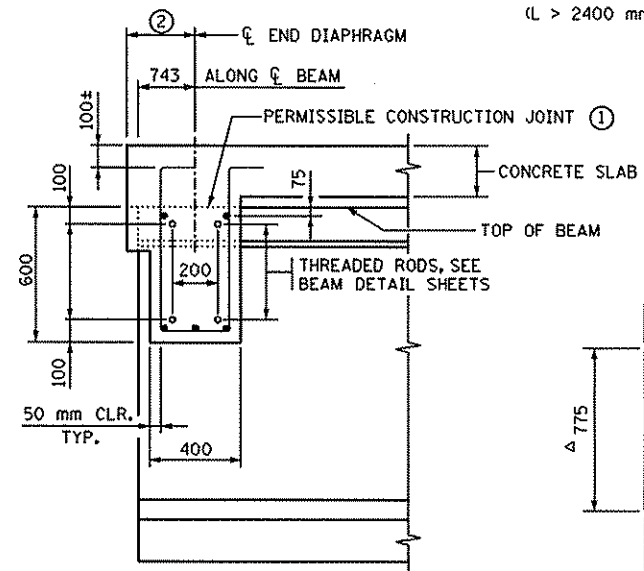
TITLE:  
**B-DETAILS**

DES: RAS DR: JEH  
CHK: LAE CHK: RAS  
APPROVED: 5-1-97

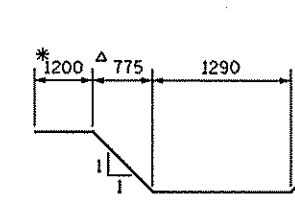
BRIDGE NO.  
**02550**



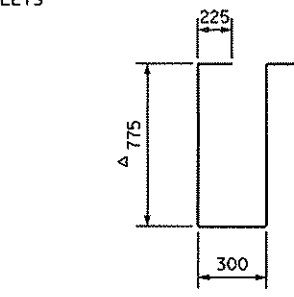
**PART TRANSVERSE SECTION**  
(L > 2400 mm SHOWN)



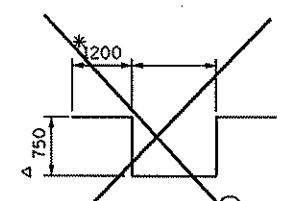
**SECTION A-A**



**SD805E**  
(IF L > 2400 mm)



**SD401E**



**SD506E**  
(IF L ≤ 2400 mm)

\*CHECK LENGTH OVER FACIA BEAM  
Δ BASED ON 100 mm STOOL

LONGITUDINAL REINFORCEMENT IN BOTTOM OF DIAPHRAGM				
DISTANCE "L" ALONG CL OF DIAPHRAGM	BARS REQUIRED			
	STRAIGHT		BENT	
	NO.	SIZE	NO.	SIZE
UP TO 2400 mm	2	6E	1	5E
OVER 2400 mm TO 3350 mm	2	7E	1	6E
OVER 3350 mm TO 3960 mm	2	8E	1	8E
OVER 3960 mm TO 4570 mm	2	9E	1	10E
OVER 4570 mm TO 5485 mm	2	11E	1	11E

BILL OF REINFORCEMENT FOR END DIAPHRAGM				
BAR	NO.	LENGTH	SHAPE	LOCATION
SD401E	182	2300 mm		VERTICAL TIE
SD702E	48	1525 mm		LONG. THRU BEAM
SD403E	52	2385 mm		LONG. TOP
SD804E	52	2900 mm		LONG. BOTTOM
SD805E	26	5880 mm		LONGITUDINAL
SD506E				LONGITUDINAL

- NOTES:**
- DIAPHRAGM CONCRETE TO BE MIX NO. 3Y43.
  - ALL DIAPHRAGM CONCRETE AND REINFORCEMENT BARS SHOWN ON THIS DETAIL TO BE INCLUDED IN PAYMENT FOR SUPERSTRUCTURE QUANTITIES.
  - THREADED RODS ARE INCLUDED IN PAYMENT FOR PRESTRESSED CONCRETE BEAMS.
  - ① USE OF CONSTRUCTION JOINT REQUIRES CLEARANCE FOR EXPANSION DEVICE. WHEN CONSTRUCTION JOINT IS USED AT THIS LOCATION, DIAPHRAGM FALSEWORK SHALL REMAIN IN PLACE UNTIL COMPLETION OF SLAB CURING PERIOD.
  - ② PERPENDICULAR TO CENTERLINE OF DIAPHRAGM. SEE PLANS FOR DIMENSIONS.

APPROVED: XX, 1995  
STATE BRIDGE ENGINEER

STATE OF MINNESOTA  
DEPARTMENT OF TRANSPORTATION  
**CONCRETE END DIAPHRAGM**  
(1600 mm - 2060 mm PRESTRESSED CONCRETE BEAMS)  
(PARAPET ABUTMENT)

REVISION

DETAIL NO.  
**B812M**

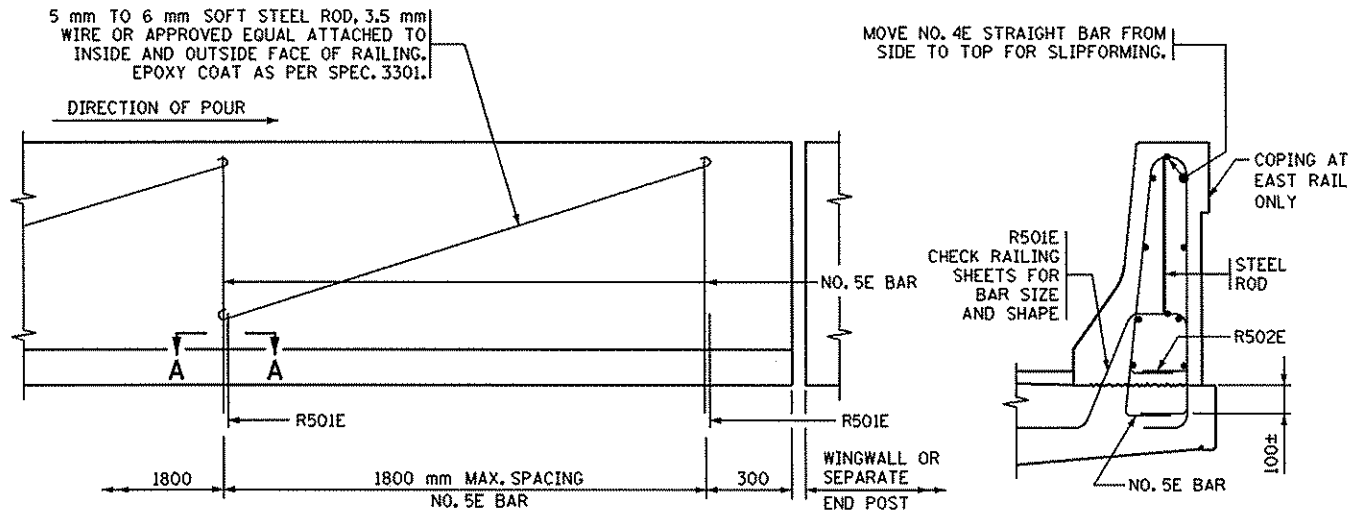
CERTIFIED BY: *Robert G. Sauer*  
REG. NO. 19632 3/6 1997  
PROFESSIONAL ENGINEER

TITLE:  
**B-DETAILS**

DES: RAS DR: JEH  
CHK: LAE CHK: RAS  
APPROVED: 5-1-97

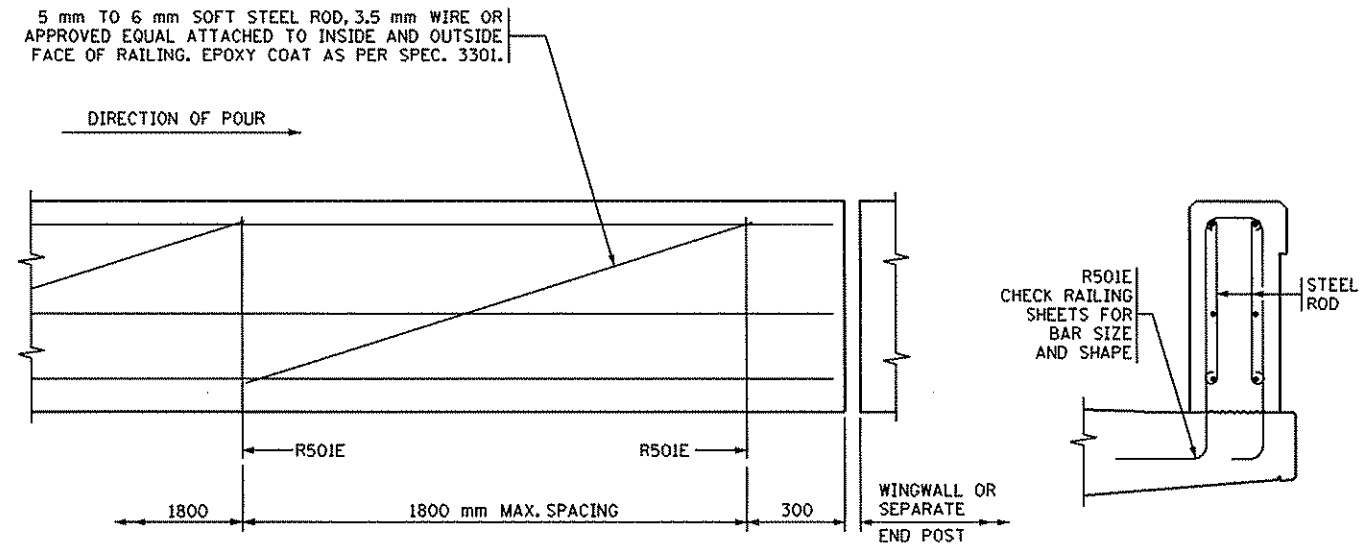
BRIDGE NO.  
02550

SHEET NO. B40 OF B47 SHEETS



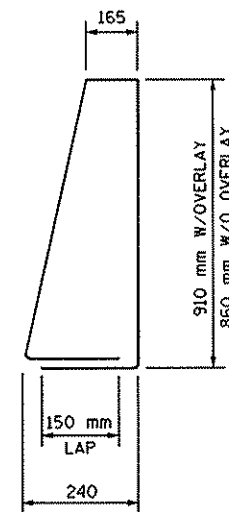
INSIDE ELEVATION OF RAILING

RAILING SECTION

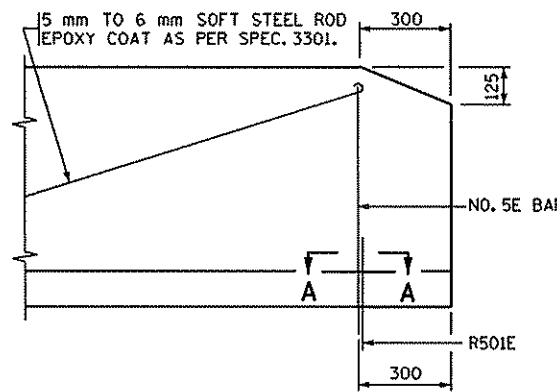


INSIDE ELEVATION OF RAILING

RAILING SECTION (FENCE NOT SHOWN)



NO. 5E BAR



INSIDE ELEVATION OF RAILING AT END OF WINGWALL

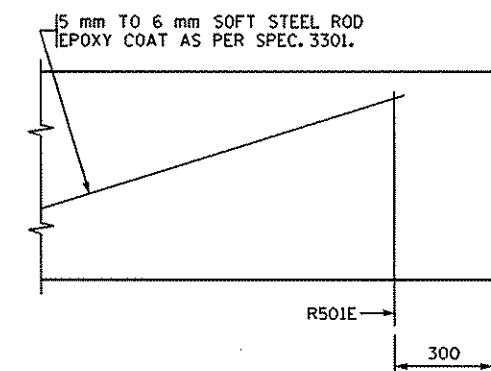
NOTES:

CONTRACTOR WILL TOOL V-GROOVE AT DEFLECTION JOINTS AT TIME RAIL IS CAST AND SHALL EXTEND V-GROOVE AROUND ENTIRE PERIMETER OF RAIL.

FOR ADDITIONAL DIMENSIONS, DETAILS, REINFORCEMENT AND NOTES SEE RAILING SHEET.

FORM RAIL FOR A MINIMUM OF 1200 mm ON EACH SIDE OF EXPANSION DEVICES, LIGHT STANDARDS AND DECK DRAIN BOX OUTS.

PAY QUANTITIES WILL NOT BE ADJUSTED AS A RESULT OF SELECTING THIS ALTERNATE.



INSIDE ELEVATION OF RAILING AT END OF WINGWALL

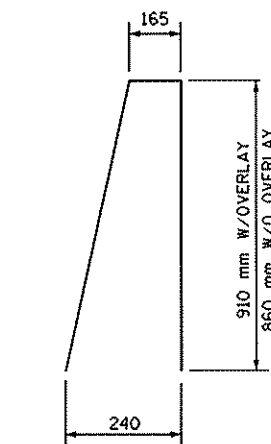
NOTES:

CONTRACTOR WILL TOOL V-GROOVE AT DEFLECTION JOINTS AT TIME RAIL IS CAST AND SHALL EXTEND V-GROOVE AROUND ENTIRE PERIMETER OF RAIL.

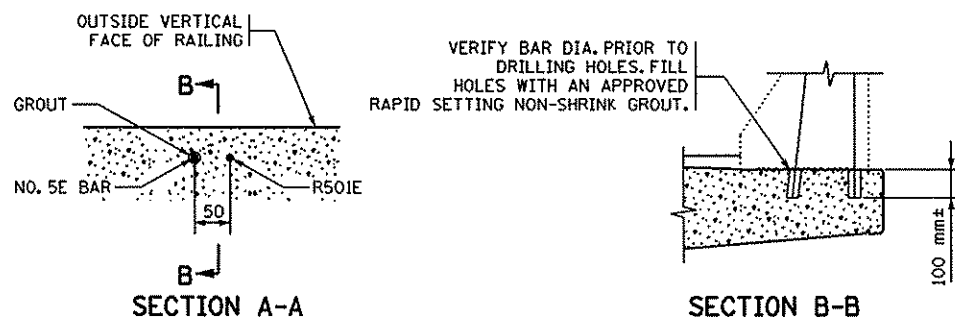
FOR ADDITIONAL DIMENSIONS, DETAILS, REINFORCEMENT AND NOTES SEE RAILING SHEET.

FORM RAIL FOR A MINIMUM OF 1200 mm ON EACH SIDE OF EXPANSION DEVICES, LIGHT STANDARDS AND DECK DRAIN BOX OUTS.

PAY QUANTITIES WILL NOT BE ADJUSTED AS A RESULT OF SELECTING THIS ALTERNATE.



NO. 5E BAR DRILLED IN ALTERNATE



INSTALLATION DETAILS FOR NO. 5E BAR (DRILLED IN ALTERNATE)

APPROVED: XX, 1995	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	REVISION	DETAIL NO.
STATE BRIDGE ENGINEER	CONCRETE RAILING (TYPE F) SLIPFORM ALTERNATE		B830M

APPROVED: XX, 1995	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	REVISION	DETAIL NO.
STATE BRIDGE ENGINEER	CONCRETE PARAPET RAILING (SLIPFORM ALTERNATE)		B831M

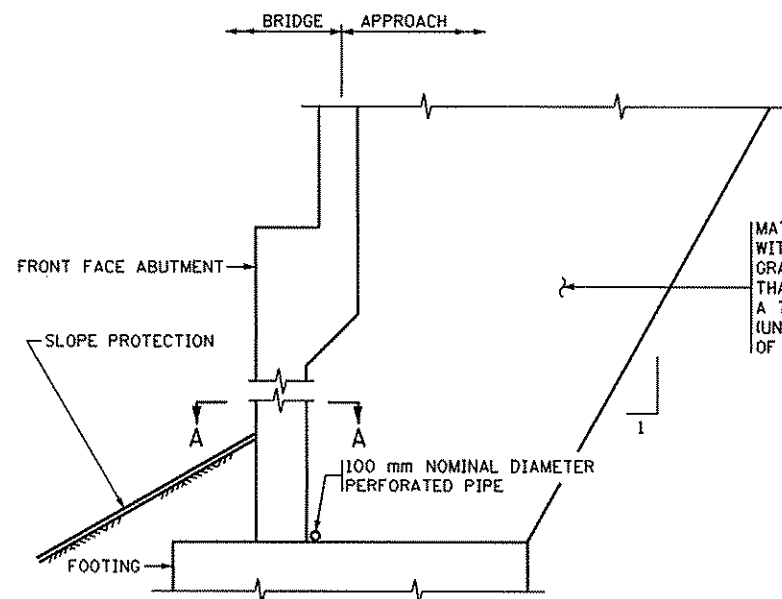
**SUMMARY OF QUANTITIES FOR DRAINAGE SYSTEM**

ITEM	QUANTITY	UNIT
100 mm DIA. PERFORATED PIPE	149000	mm
100 mm DIA. NON-PERFORATED PIPE	25000	mm
45° ELBOW	4	EACH
100 mm DIA. CAP END	6	EACH
100 mm DIA. COUPLING	-	EACH
PIPE SLEEVE	4	EACH
① PRECAST CONCRETE HEADWALL	4	EACH
45° WYE	2	EACH
90° ELBOW	16	EACH

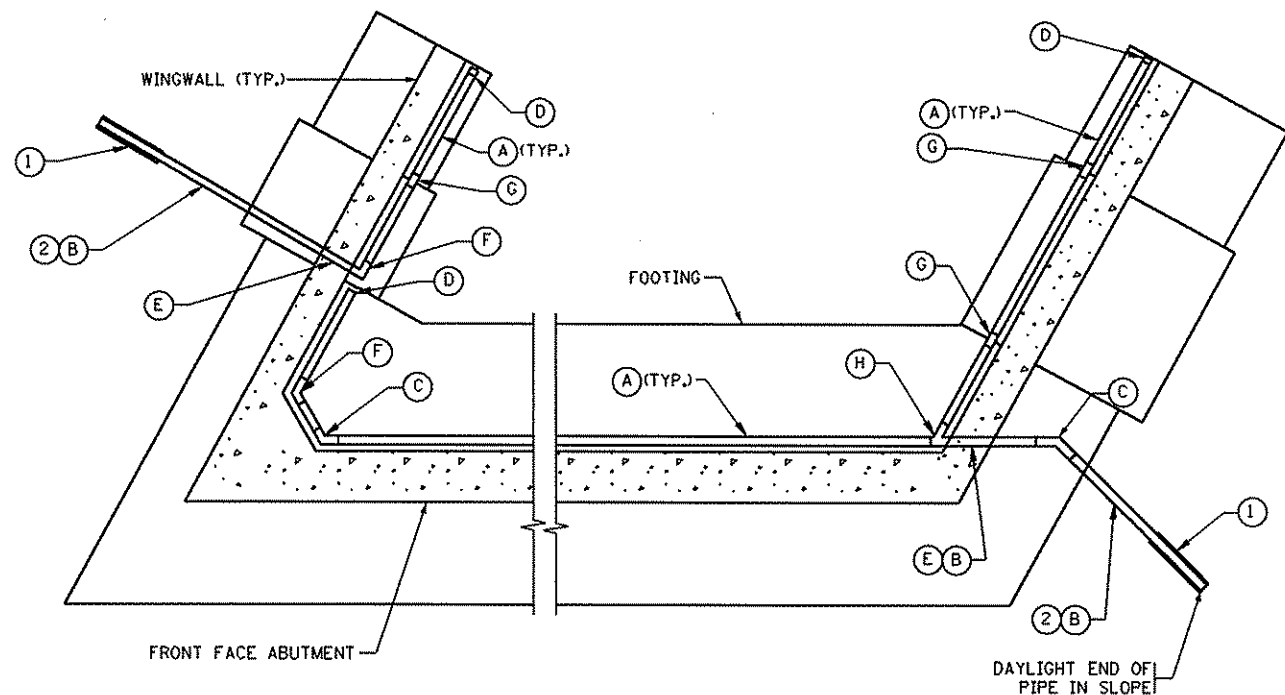
THE SUMMARY OF QUANTITIES FOR DRAINAGE SYSTEM IS AS SHOWN ABOVE. ANY ADDITIONAL MINOR ITEMS OR SLIGHT CHANGES OF QUANTITIES REQUIRED SHALL BE FURNISHED BY THE CONTRACTOR WITH NO ADDITIONAL COMPENSATION.

PAYMENT WILL BE INCLUDED IN THE SINGLE LUMP SUM PRICE FOR ITEM 0502.603 DRAINAGE SYSTEM, TYPE (B910M).

MATERIAL SHALL COMPLY WITH SPEC. 3149.2B SELECT GRANULAR BORROW, MODIFIED SO THAT NO MORE THAN 10% PASSES A 75 MICROMETER SIEVE. (UNDER GRADING PORTION OF CONTRACT)



**SECTION THRU ABUTMENT**



**SECTION A-A**

**MODIFIED**

APPROVED: XX, 1995

STATE OF MINNESOTA  
DEPARTMENT OF TRANSPORTATION

REVISION

DETAIL NO.

**DRAINAGE SYSTEM  
FOR HIGH ABUTMENTS**

**B910M**

STATE BRIDGE ENGINEER

H:/STRUC/BDETAIL.DGN

S.A.P. 02-617-11

**NOTES:**

ALL PIPE SHALL BE AS PER SPEC. 3245.

WRAP PERFORATED PIPE WITH GEOTEXTILE AS PER SPEC. 3733, TYPE 1. ATTACH TO PIPE AS PER SPEC. 2502.

- ① PRECAST CONCRETE HEADWALL
- ② 3 mm PER 300 mm MINIMUM SLOPE.
- A 100mm DIA. PERFORATED PIPE.
- B 100mm DIA. NON-PERFORATED PIPE.
- C 45° ELBOW
- D 100mm DIA. END CAP
- E PIPE SLEEVE
- F 90° ELBOW
- G 2-90° ELBOW AND 100mm NON-PERFORATED PIPE (VERTICAL).
- H 45° WYE

CERTIFIED BY: *Robert H. ...*  
REG. NO. 19632 3/6 1997

TITLE:

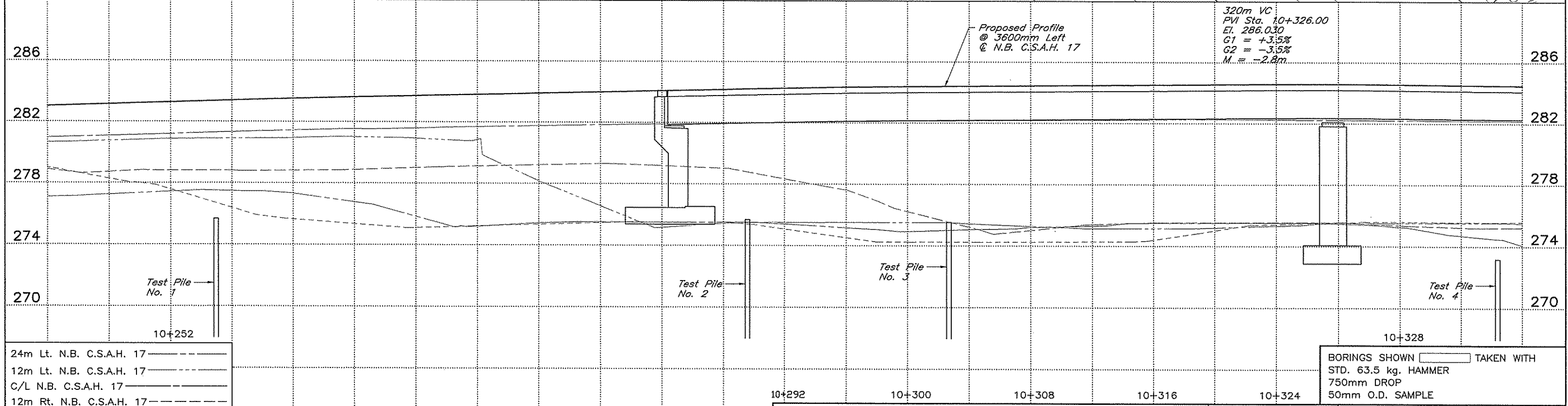
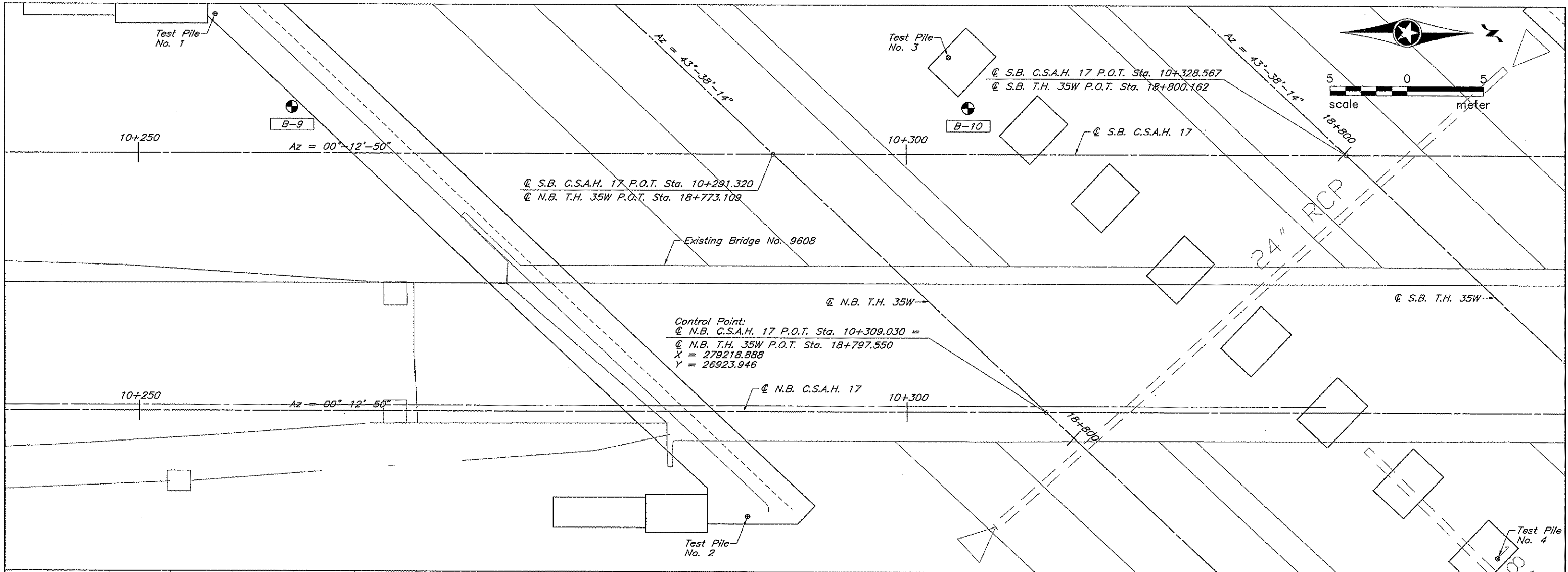
**B-DETAILS**

DES: RAS DR: JEH APPROVED: 5-1-97  
CHK: LAE CHK: RAS  
SHEET NO. B42 OF B47 SHEETS

BRIDGE NO. 02550

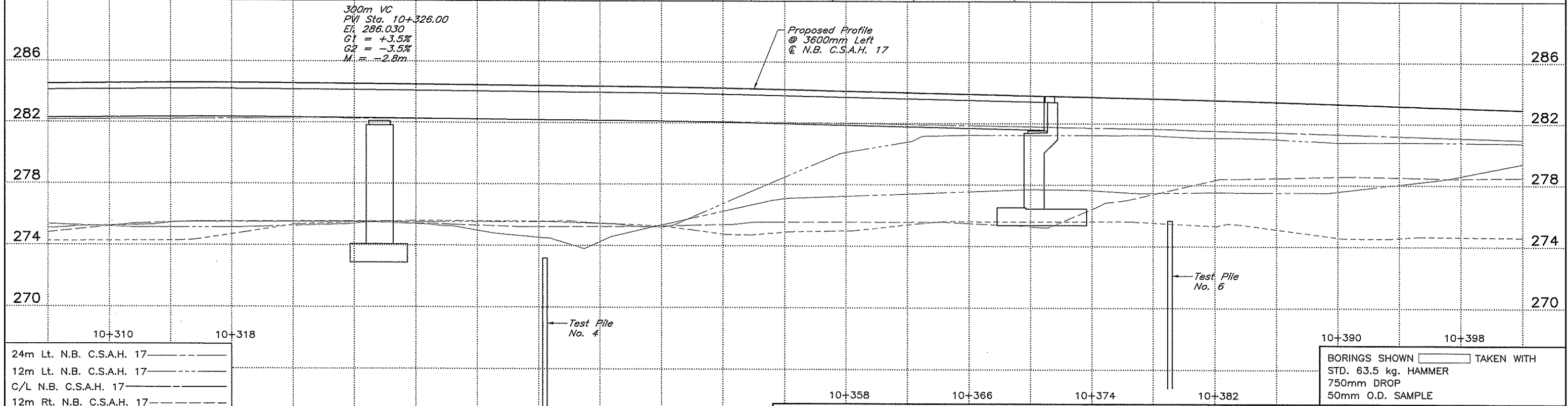
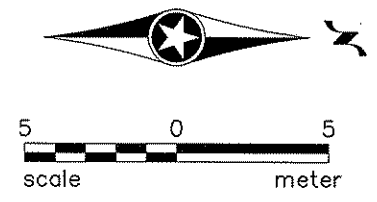
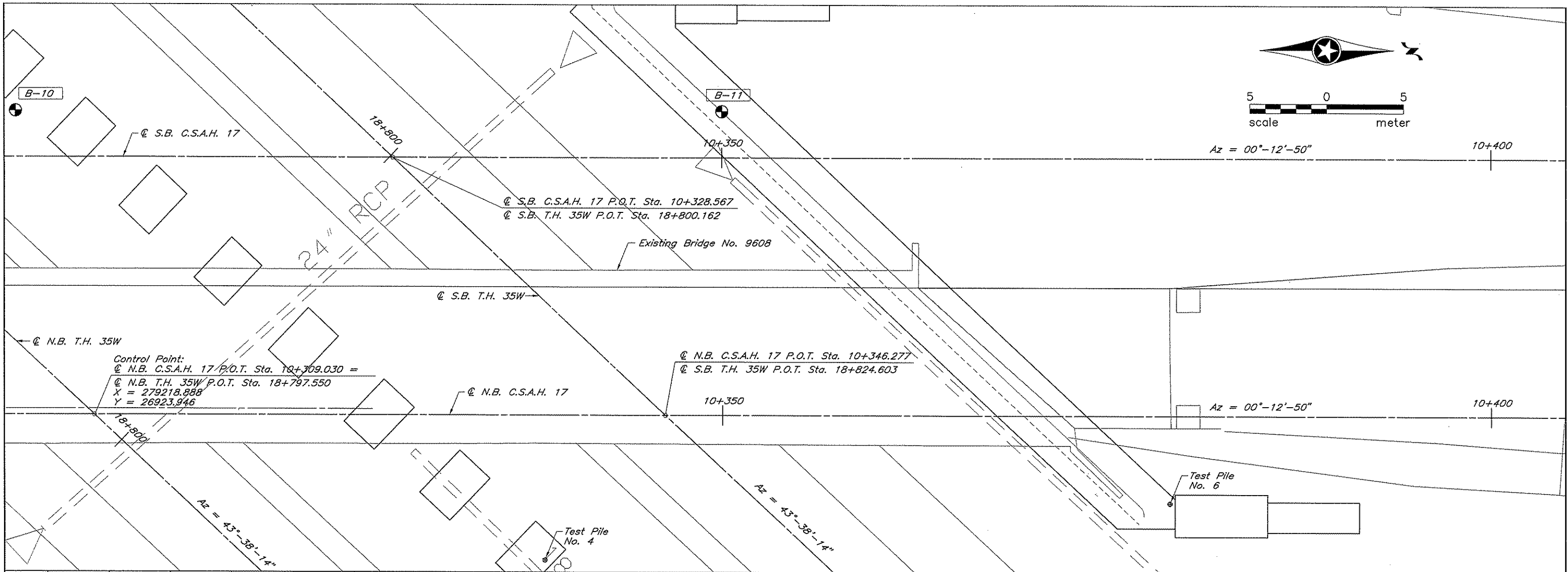






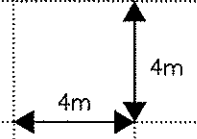
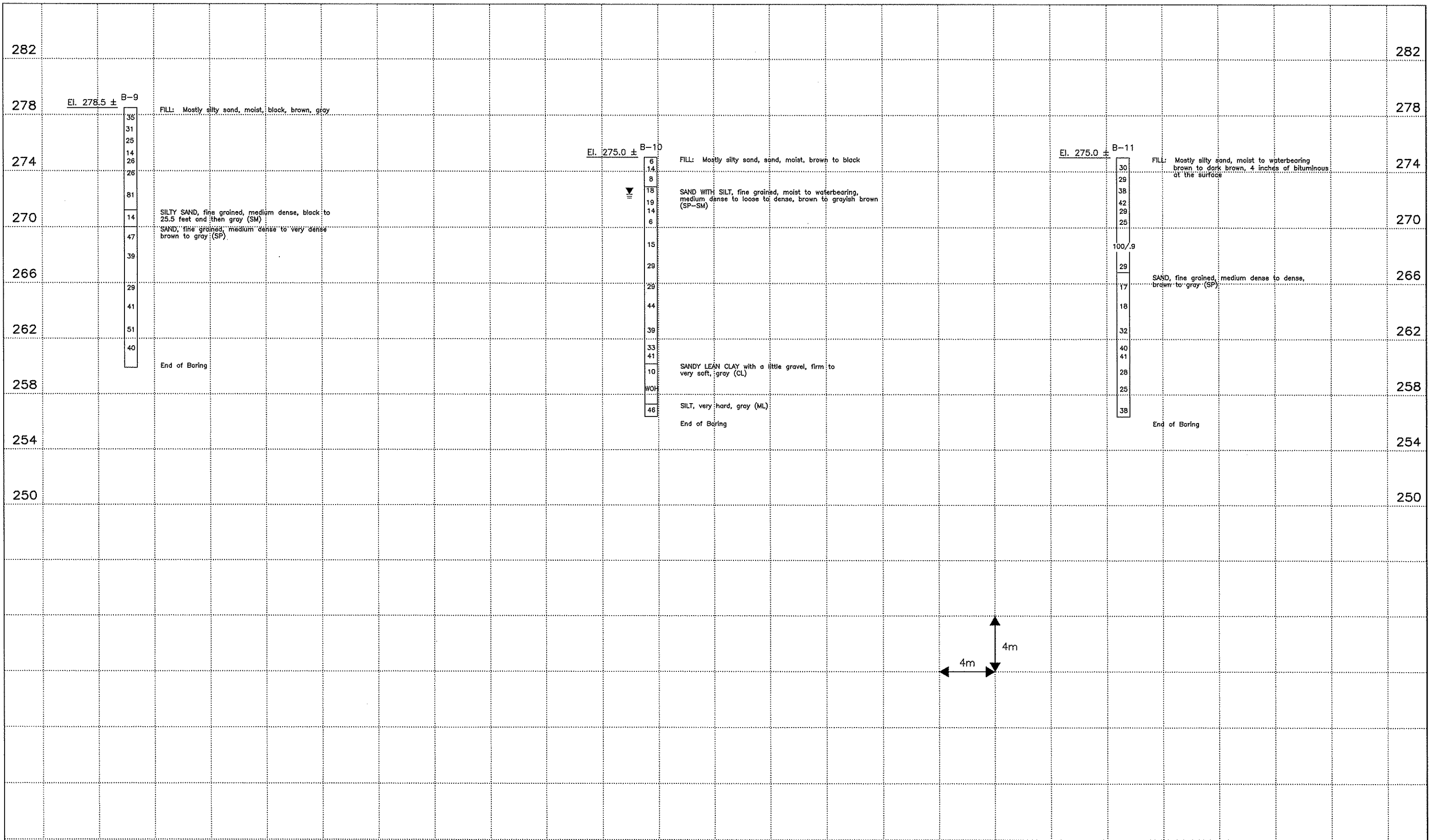
24m Lt. N.B. C.S.A.H. 17	-----
12m Lt. N.B. C.S.A.H. 17	-----
C/L N.B. C.S.A.H. 17	-----
12m Rt. N.B. C.S.A.H. 17	-----
24m Rt. N.B. C.S.A.H. 17	-----

BORINGS SHOWN TAKEN WITH  
 STD. 63.5 kg. HAMMER  
 750mm DROP  
 50mm O.D. SAMPLE



24m Lt. N.B. C.S.A.H. 17	-----
12m Lt. N.B. C.S.A.H. 17	-----
C/L N.B. C.S.A.H. 17	-----
12m Rt. N.B. C.S.A.H. 17	-----
24m Rt. N.B. C.S.A.H. 17	-----

BORINGS SHOWN  TAKEN WITH  
 STD. 63.5 kg. HAMMER  
 750mm DROP  
 50mm O.D. SAMPLE



NO	DATE	BY	CKD	APPR	REVISION
NAME: H:\STRUC\003\2413\M13BOR.DWG DATE: MAR 06, 1997 TIME: 11:28 AM					

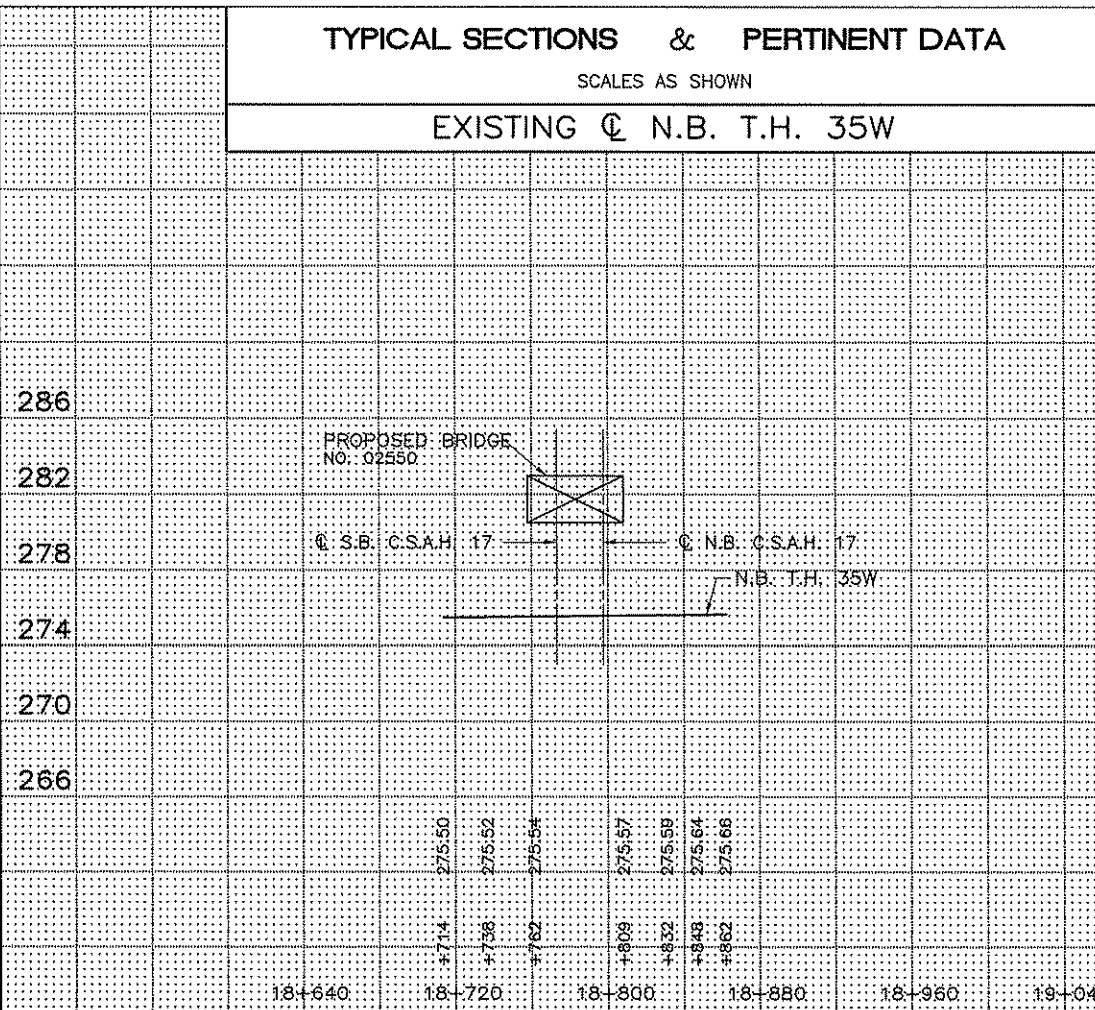
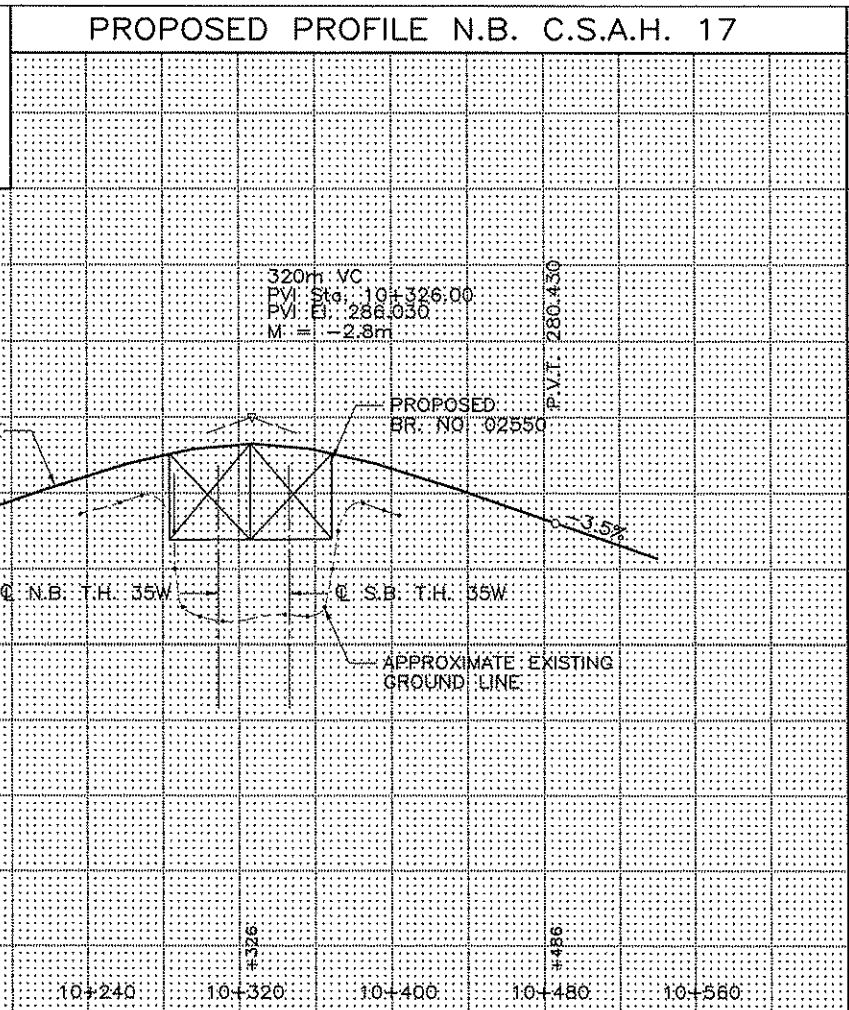
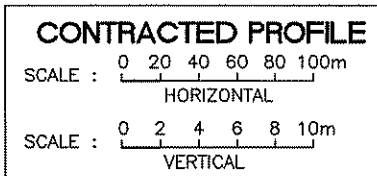
STATE AID PROJ. NO. 02-617-11  
 BRIDGE NO. 02550  
 I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Registered Professional Engineer under the laws of the State of Minnesota.  
*Robert H. Spanjers*  
 Date 3/6/97 Reg. No. 19632

DRAWN BY J. HAMRE DATE 3/97  
 DESIGNED BY R. SPANJERS 3/97  
 CHECKED BY L. ERICKSON 3/97  
 COMM. NO. 0962413



ANOKA COUNTY  
 C.S.A.H. 17 (LEXINGTON AVE.) OVER T.H. 35W  
 BORINGS

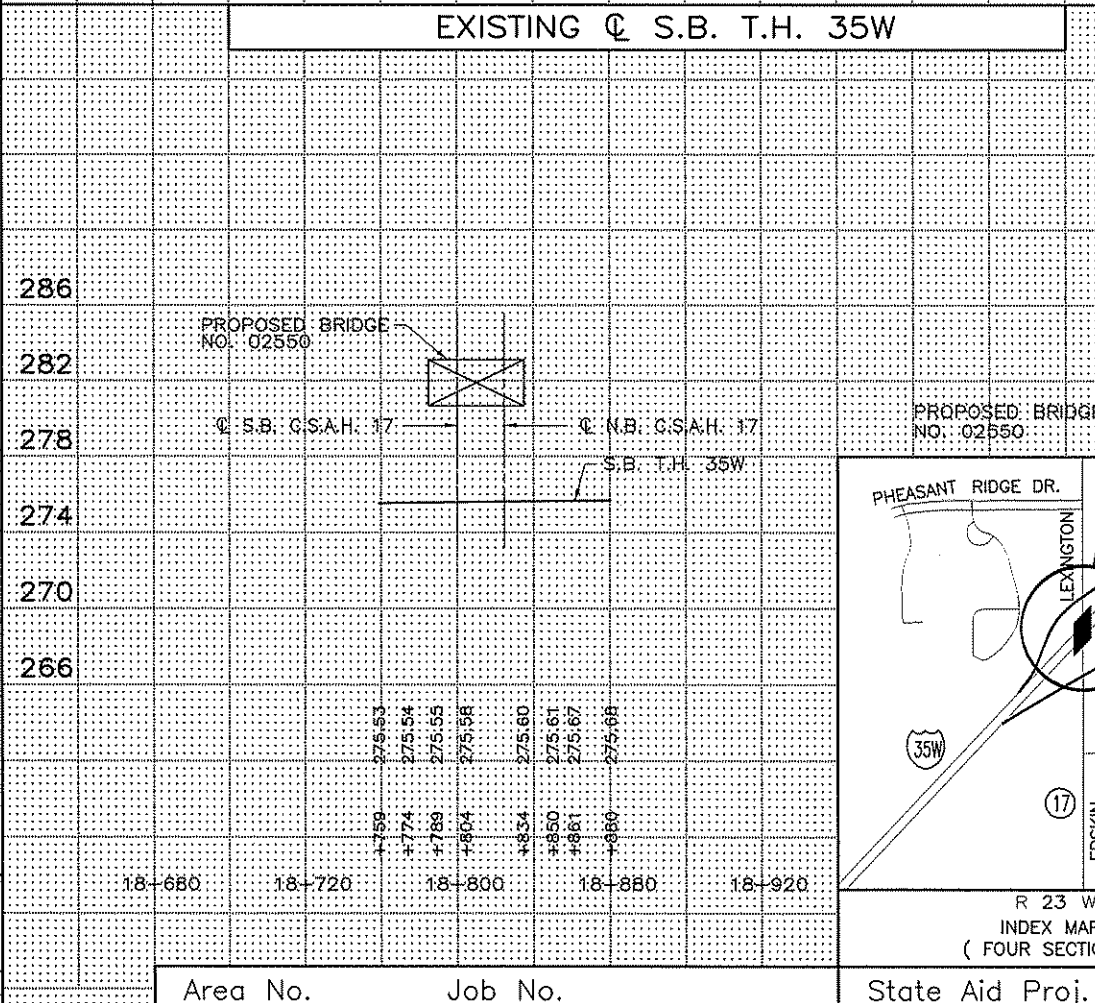
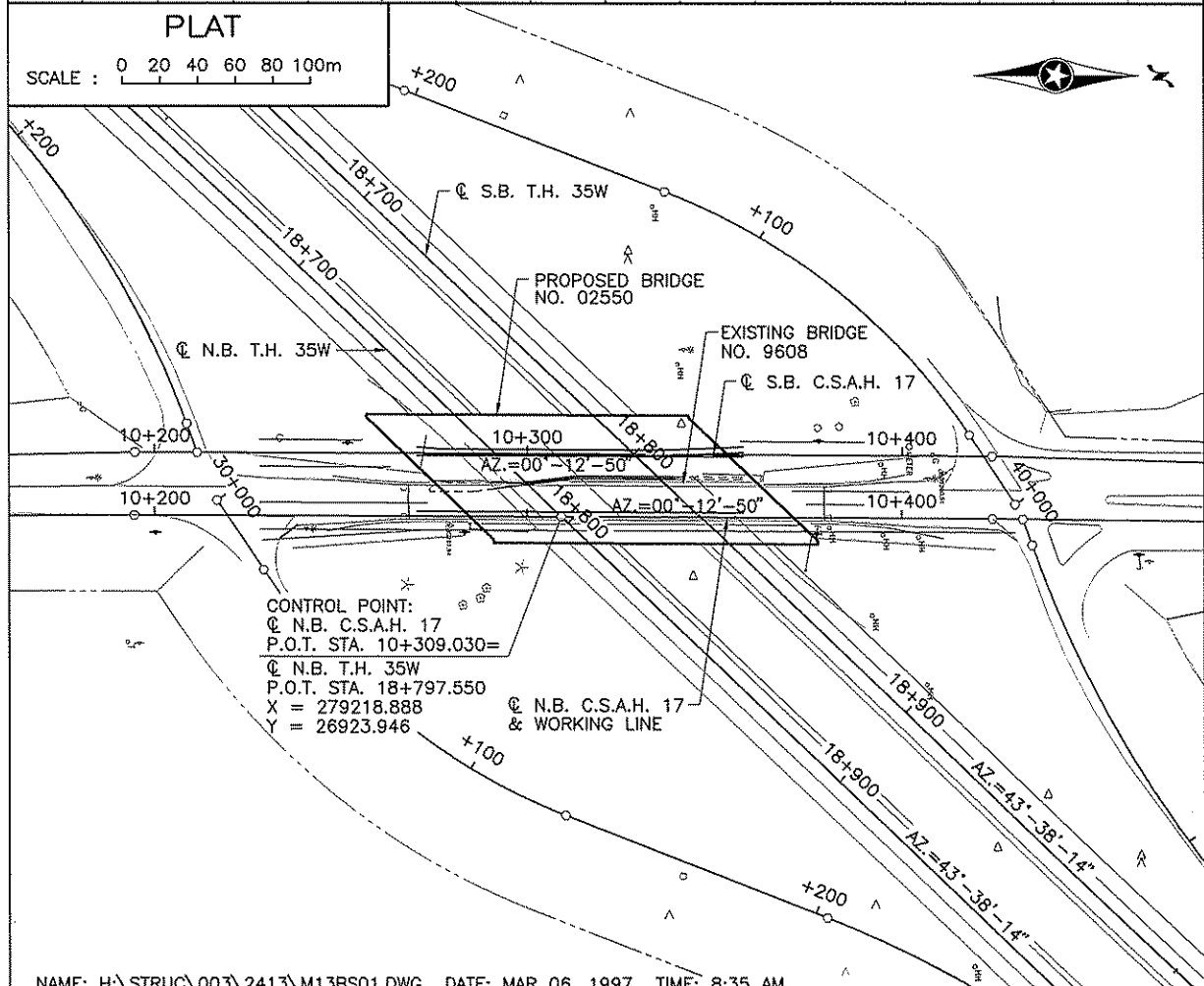
SHEET B46 OF B47



**Fed. Proj. No.**

LOCATION ENGINEER'S OBSERVATION AT BRIDGE SITE

- Special Features: Waterfalls, dams, floods, ice, debris, sliding banks, recreational boating.
- 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.
- Apparent highwater elevation \_\_\_\_\_ Obtained from \_\_\_\_\_
- Other data: Approx. velocity of water at time of survey \_\_\_\_\_



**HYDRAULIC ENGINEER'S RECOMMENDATION**

DATE \_\_\_\_\_

Stream or ditch designation \_\_\_\_\_  
Drainage Area \_\_\_\_\_  
Max. discharge on record \_\_\_\_\_ Design discharge (\_\_\_\_ yr. freq.) \_\_\_\_\_ C.F.S.  
Max. observed highwater elevation \_\_\_\_\_ Design highwater elevation \_\_\_\_\_  
Design Mean Velocity through structure \_\_\_\_\_ F.P.S.  
Low superstructure at or above elevation \_\_\_\_\_  
Flowline elevation \_\_\_\_\_ Skew angle \_\_\_\_\_  
Waterway area req'd below elevation \_\_\_\_\_ = \_\_\_\_\_ Sq. Ft. at Rt. angles to channel

In the interest of flood plain zoning the regional flood (100 yr. freq.) is \_\_\_\_\_ C.F.S. at stage \_\_\_\_\_ and mean velocity of \_\_\_\_\_ F.P.S. with \_\_\_\_\_ Ft. swellhead. The above recommendation will provide a structure of adequate waterway to pass the regional flood within criteria established by the Dept. of Natural Resources.

Pier Scour Elevation \_\_\_\_\_  
Overflow Area \_\_\_\_\_

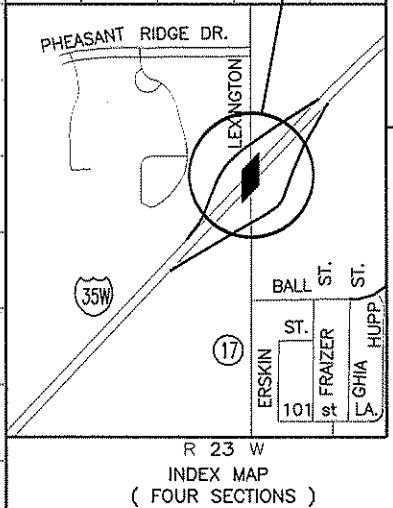
**FOUNDATION ENGINEER'S RECOMMENDATION**

DATE 12/20/96

Geotechnical Evaluation by Maxim Technologies Inc.,  
Recommended C-I-P Concrete Piles With 534 KN/Pile Capacity. Pile Lengths Are Estimated at 11 Meters.

Bridge survey sheets made from: \_\_\_\_\_ Survey by SRF Consulting Group, Inc.

Bench mark elevation: 282.051 (M.S.L. 1929 Adj.)  
Location: Disk N.E. Corner Bridge No. 9608



**ANOKA COUNTY**

**BRIDGE SURVEY**

AT MILE POINT \_\_\_\_\_ ON \_\_\_\_\_

PROPOSED BRIDGE LOCATED \_\_\_\_\_ MILES \_\_\_\_\_ OF  
JCT. OF T.H. 35W

SEC. 23 & 24 TWP. T31N R. R23W  
CITY BLAINE COUNTY ANOKA

BRIDGE NO. 02550