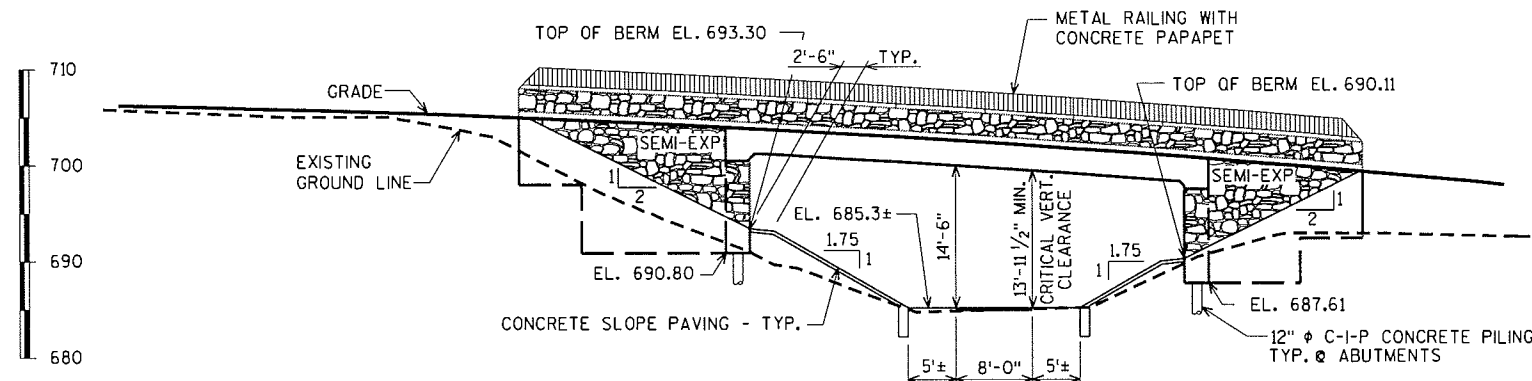


PLAN
SINGLE SPAN CONCRETE FLAT SLAB

○ DENOTES WING NUMBER.



ELEVATION

CONSTRUCTION NOTES

- THE 2005 EDITION OF THE MN/DOT "STANDARD SPECIFICATIONS FOR CONSTRUCTION" SHALL GOVERN.
- DRAWINGS SHALL NOT BE SCALED.
- BAR STEEL REINFORCEMENT SHALL BE EMBEDDED 2" CLEAR UNLESS SHOWN OR NOTED OTHERWISE.
- THE FIRST DIGIT OF A THREE DIGIT BAR NO. AND THE FIRST TWO DIGITS OF A FOUR DIGIT BAR NO. SIGNIFIES THE BAR SIZE.
- THE REINFORCING BARS MARKED WITH AN "X" IN THE BILL OF REINFORCEMENT SHALL BE EPOXY COATED.
- THE CONTRACTOR SHALL MAKE FIELD MEASUREMENTS AS NECESSARY PRIOR TO FABRICATION OF ALL COMPONENTS TO ASSURE PROPER FIT IN THE FINAL WORK.
- CONSTRUCTION FOR EACH ABUTMENT SHALL NOT BE STARTED UNTIL THE APPROACH FILL AT THAT ABUTMENT HAS BEEN CONSTRUCTED TO THE FULL HEIGHT AND CROSS SECTION AND ALLOWED TO SETTLE FOR 3 DAYS. APPROACH FILL AND ROUGH GRADING PROVIDED UNDER BRIDGE APPROACH PORTION OF CONTRACT. FORESLOPE SHALL BE PLACED AND COMPACTED IN SUBSTANTIAL CONFORMANCE WITH ITS FINAL SHAPE BEFORE ABUTMENT IS BACKFILLED.
- AT ABUTMENTS, ALL SPACES NOT OCCUPIED BY THE NEW STRUCTURE SHALL BE BACKFILLED WITH GRANULAR BACKFILL UNLESS OTHERWISE NOTED.
- REINFORCEMENT BAR HOOKS SHALL CONFORM TO THE AASHTO DESIGN SPECIFICATIONS REQUIREMENTS UNLESS NOTED OTHERWISE.
- THE PILE LOADS SHOWN IN THE PLANS AND THE CORRESPONDING NOMINAL PILE BEARING RESISTANCE (R_n) WERE COMPUTED USING LRFD METHODOLOGY. PILE BEARING RESISTANCE DETERMINED IN THE FIELD SHALL INCORPORATE THE METHODS AND/OR FORMULAS DESCRIBED IN THE SPECIAL PROVISIONS.
- SLAB FLASEWORK SHALL BE SUPPORTED ON PILES UNLESS OTHERWISE APPROVED BY THE ENGINEER.
- THE EXISTING GROUNDLINE SHALL BE THE UPPER LIMIT FOR STRUCTURE EXCAVATION ITEM.

DESIGN DATA

2007 AND CURRENT INTERIM AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS
LOAD AND RESISTANCE FACTOR DESIGN METHOD
HL 93 LIVE LOAD
DEAD LOAD INCLUDES 20 POUNDS PER SQUARE FOOT ALLOWANCE FOR FUTURE WEARING COURSE MODIFICATIONS

MATERIAL DESIGN PROPERTIES:
REINFORCED CONCRETE:
 $F'_c = 4$ K.S.I. $N = 8$
 $F_y = 60$ K.S.I. FOR REINFORCEMENT

DECK AREA = 1843 SQ. FT.

LIST OF SHEETS

- B1. GENERAL PLAN & ELEVATION
- B2. TRANSVERSE SECTION AND STATEMENT OF ESTIMATED QUANTITIES
- B3. BRIDGE LAYOUT
- B4. WEST ABUTMENT
- B5. WEST ABUTMENT PILE LAYOUT AND BILL OF REINFORCEMENT
- B6. WEST ABUTMENT WING 1
- B7. WEST ABUTMENT WING 2
- B8. EAST ABUTMENT
- B9. EAST ABUTMENT PILE LAYOUT AND BILL OF REINFORCEMENT
- B10. EAST ABUTMENT WING 3
- B11. EAST ABUTMENT WING 4
- B12. SUPERSTRUCTURE
- B13. SUPERSTRUCTURE PLAN AND BILL OF REINFORCEMENT
- B14. SUPERSTRUCTURE DETAILS
- B15. METAL RAILING FOR BIKEWAYS AND CONCRETE PARAPET
- B16. CONCRETE SLOPE PAVING UNDER BRIDGES
- B17. NAME PLATE AND PILE SPLICE DETAILS
- B18. DRAINAGE SYSTEM
- B19. SOIL BORINGS

MINNESOTA
DEPARTMENT OF TRANSPORTATION
BRIDGE NO. 69697

SPLITDRYSS
SPENTBLSS
SOATES
SFIELS

DES BY	KLW	BOOK NO	XXX
DR BY	JMM	JOB NO	27-0133.00
CHK BY	DNS	DATE	9/14/11

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

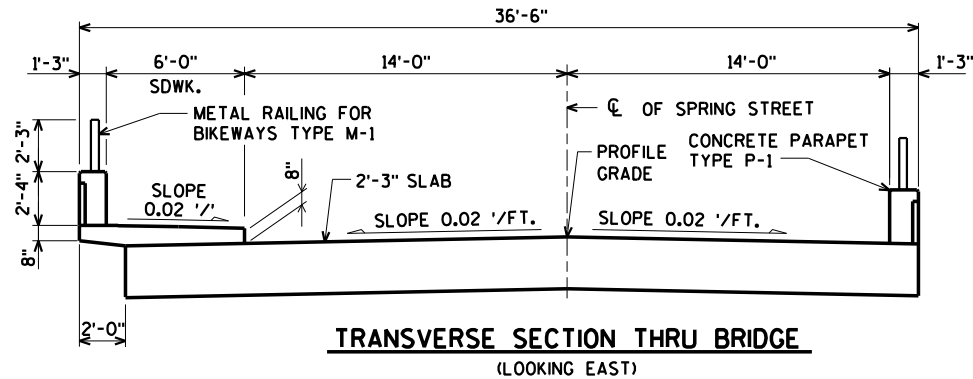
CERTIFIED BY: *Daniel N. Sydow* 9/14/11 45662
DANIEL N. SYDOW DATE LIC. NO.

AVRES
ASSOCIATES
Duluth, Minnesota

RIVERSIDE COMMUNITY IMPROVEMENTS #0699TR
SPRING STREET BRIDGE # 69697
CITY OF DULUTH, MINNESOTA

GENERAL PLAN AND ELEVATION

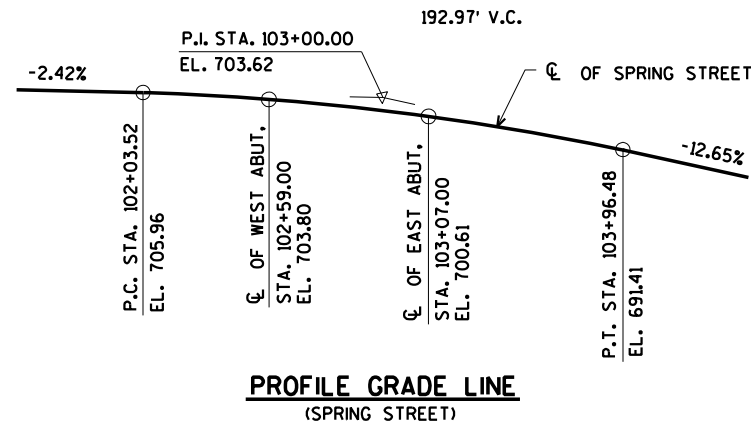
SHEET NO.
B1 OF B19



STATEMENT OF ESTIMATED QUANTITIES FOR ENTIRE BRIDGE

ITEM NUMBER	ITEM	UNIT	W. ABUT.	E. ABUT.	SUPER.	TOTAL
2401.501	STRUCTURAL CONCRETE (3Y43)	CU.YD.	73	60	-----	133
2401.512	BRIDGE SLAB CONCRETE (3Y33)	SO.FT.	-----	-----	1742	1742
2401.513	TYPE P-1 (TL-2) RAILING CONCRETE (3Y46)	LIN.FT.	43	32	101	176
2401.515	SIDEWALK CONCRETE (3Y46)	SO.FT.	-----	-----	366	366
2401.541	REINFORCING BARS (EPOXY COATED)	POUND	6680	5610	27260	39550
2401.601	STRUCTURE EXCAVATION	LUMP SUM	-----	-----	-----	1
2402.603	METAL RAILING FOR BIKEWAYS (DESIGN M-1)	LIN.FT.	43	32	101	176
2411.618	ARCHITECTURAL SURFACE FINISH (MULTI-COLORS)	SO.FT.	625	550	185	1360
2411.618	ARCHITECTURAL CONCRETE TEXTURE (SPLIT STONE)	SO.FT.	625	550	185	1360
2451.503	GRANULAR BACKFILL	CU. YD.	220	220	-----	440
2452.507	C-I-P CONCRETE PILING DELIVERED 12"	LIN.FT.	550	550	-----	1100
2452.508	C-I-P CONCRETE PILING DRIVEN 12"	LIN.FT.	550	550	-----	1100
2452.519	C-I-P CONCRETE TEST PILE 65 FT LONG 12"	EACH	2	2	-----	4
2502.502	DRAINAGE SYSTEM TYPE (B911)	LUMP SUM	-----	-----	-----	1
2514.501	CONCRETE SLOPE PAVING	SO.YD.	85	55	-----	140
	NON-BID ITEMS					
	FILLER	SIZE	-----	-----	-----	1/2" & 3/4"
	MEMBRANE WATERPROOFING	LIN. FT.				

- ① VOLUME IS APPROXIMATELY 151 CU. YD.
② VOLUME IS APPROXIMATELY 19 CU. YD.
③ VOLUME IS APPROXIMATELY 10 CU. YD.
④ 1/2" WALL THICKNESS
⑤ INCIDENTAL TO "STRUCTURAL CONCRETE (3Y43)"



SPLITDRIVE
SPENTRUS
SDATES
SFILEL\$

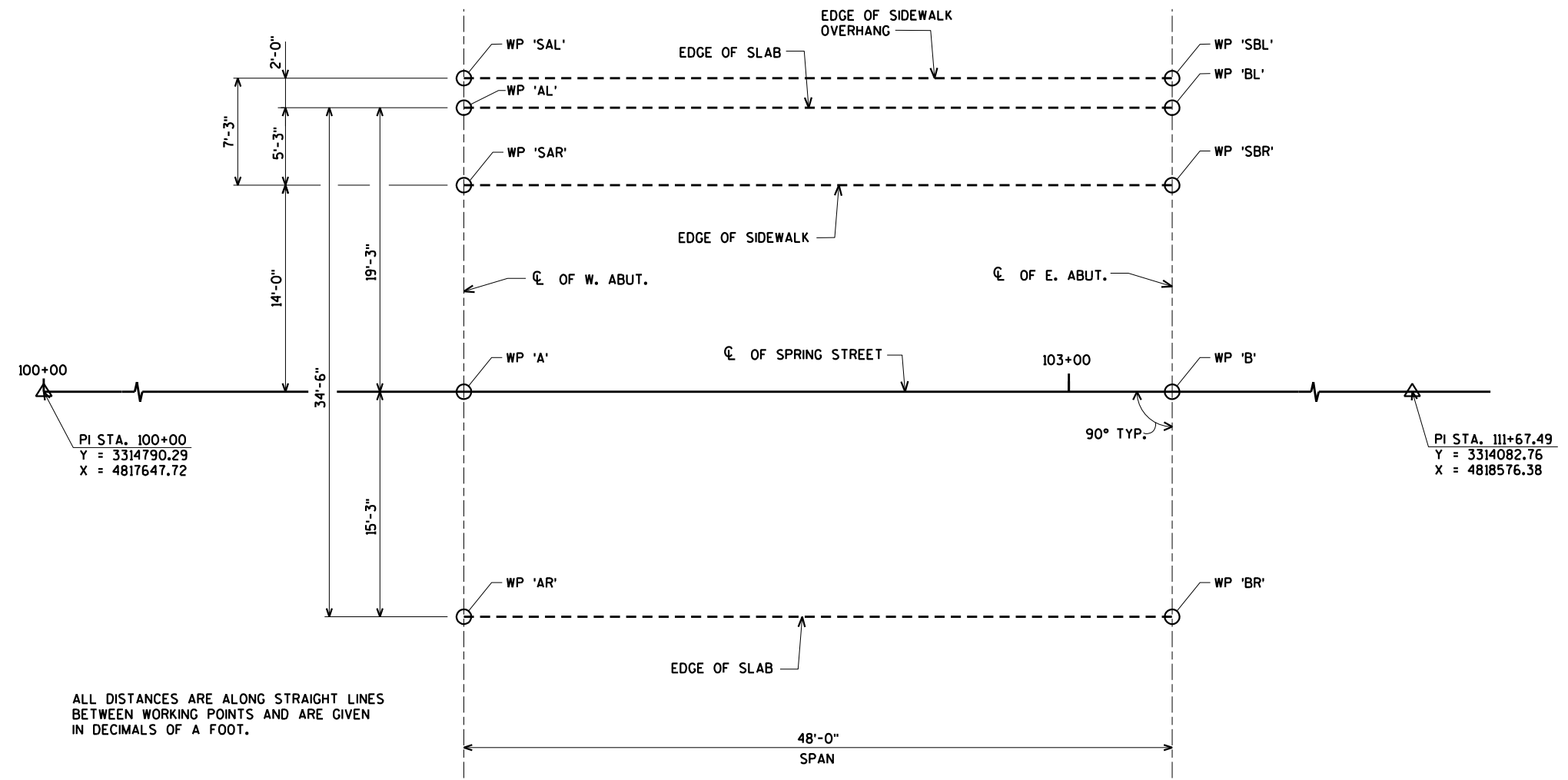
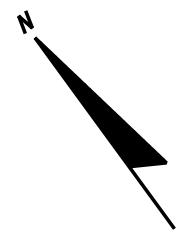
DES BY	KLW	BOOK NO	XXX	I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.		
DR BY	JMM	JOB NO	27-0133.00			
CHK BY	DNS	DATE	9/14/11	CERTIFIED BY:	<i>Daniel N. Sydow</i>	9/14/11 45662
				DANIEL N. SYDOW	DATE	LIC. NO.

AYRES
ASSOCIATES
Duluth, Minnesota

RIVERSIDE COMMUNITY IMPROVEMENTS #0699TR
SPRING STREET BRIDGE # 69697
CITY OF DULUTH, MINNESOTA

TRANSVERSE SECTION AND STATEMENT
OF ESTIMATED QUANTITIES

SHEET NO.
B2 OF B19



WORKING POINT LAYOUT

WORKING POINT CHART
DIMENSIONS BETWEEN WORKING POINTS

POINT	STATION	DIMENSIONS BETWEEN WORKING POINTS										ELEVATIONS		COORDINATES		POINT
		AL	A	AR	BL	B	BR	SAL	SAR	SBL	SBR	TOP OF DECK	TOP OF SIDEWALK	Y-COORD.	X-COORD.	
AL	102+59	---	19.25	34.50	48.00	51.72	59.11	2.00	5.25	48.04	48.29	703.42	704.30	3314648.64	4817865.41	AL
A	102+59	19.25	---	15.25	51.72	48.00	50.36	21.25	14.00	52.49	50.00	703.80	---	3314633.33	4817853.74	A
AR	102+59	34.50	15.25	---	59.11	50.36	48.00	36.50	29.25	60.30	56.21	703.50	---	3314621.20	4817844.50	AR
BL	103+07	48.00	51.72	59.11	---	19.25	34.50	48.04	48.29	2.00	5.25	700.23	701.11	3314619.55	4817903.58	BL
B	103+07	51.72	48.00	50.36	19.25	---	15.25	52.49	50.00	21.25	14.00	700.61	---	3314604.24	4817891.91	B
BR	103+07	59.11	50.36	48.00	34.50	15.25	---	60.30	56.21	36.50	29.25	700.31	---	3314592.11	4817882.67	BR
SAL	102+59	2.00	21.25	36.50	48.04	52.49	60.30	---	7.25	48.00	48.54	---	704.31	3314650.23	4817866.62	SAL
SAR	102+59	5.25	14.00	29.25	48.29	50.00	56.21	7.25	---	48.54	48.00	703.52	704.19	3314644.47	4817862.22	SAR
SBL	103+07	48.04	52.49	60.30	2.00	21.25	36.50	48.00	48.54	---	7.25	---	701.12	3314621.14	4817904.79	SBL
SBR	103+07	48.29	50.00	56.21	5.25	14.00	29.25	48.54	48.00	7.25	---	700.33	701.00	3314615.38	4817900.39	SBR

Elevation view of a bridge deck structure. The drawing shows the top and side profiles of the deck, including the concrete surface, reinforcement bars (A408, A406, A409, A407, A410, A501, A502), and the internal structure (A503 B.F., A505, A504). Key elevations are marked: EL. 703.59, EL. 700.50, EL. 700.80, EL. 704.38, EL. 700.42, EL. 690.80, and EL. 700.80. Dimensions are provided for various components: 4 SPA. @ 1'-0" = 9" (A408), 24 SPA. @ 1'-0" = 24'-0" (A406), 6 SPA. @ 1'-0" = 9" (A408), 1/2" FILLER, 12'-9 1/2" (overall height), 3'-1 1/8" (height of top section), 9'-8 5/8" (height of middle section), 3'-11 1/2" (height of bottom section), 13'-7" (overall width), 9'-7 1/2" (width of middle section), 6" (width of bottom section), 9 SPA. @ 4'-0" MAX. = 35'-6" (A504), 36 SPA. @ 1'-0" MAX. = 35'-6" (A501 E.F., A505 - SPACE TO MISS PILES), and 6" (width of bottom section).

Plan view of the bridge structure showing dimensions and components. The structure is symmetrical about a central vertical axis. Key dimensions include:

- Overall width: 36'-6"
- Overall length: 21'-3"
- Span length: 14'-0"
- Abutment length: 7'-3"
- Spring steel centerline (CL OF SPRING ST.)
- Wing abutment centerline (CL OF W. ABUT.)
- Dimensions for fillers: 1/2" FILLER, 4" x 3/4" FILLER
- Angles: 90°
- Stationing: STA. 102+59.00

CL. OF W. ABUT.

MEMBRANE WATERPROOFING BETW. WINGS

A407 A406

4" x 3/4" FILLER

3/4" BEVEL

A505

3"

F.F. OF ABUTMENT

5" CLR.

A501

TOP OF PILE EL. 698.5

2'-6"

TOP OF BERM EL. 693.30

1.75

1

CONCRETE SLOPE PAVING

2 SPA. @ 3'-3" = 6'-6" A404

8 SPA. @ 1'-1" = 8'-8" A303 B.F.

1'-6"

6"

3" CL.

2'-6"

1'-6"

8 SPA. @ 1'-1" = 8'-8" A502 F.F.

VARIES FROM 9'-7 1/2" TO 10'-0"

TO BE SUPPORTED ON CONCRETE PILING.

EXCAVATE OR FILL TO BOTTOM OF ABUTMENT BEFORE DRIVING PILES.

C/L OF W. ABUT.

MEMBRANE WATERPROOFING BETW. WINGS

1'-3"

1'-6"

A407

A409, A410

4" x 3/4" FILLER

3/4" BEVEL

A408

A903

A505

A402

F.F.

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$PLTDRV$
$PENTBLS$
$DATES$
$FILEL$
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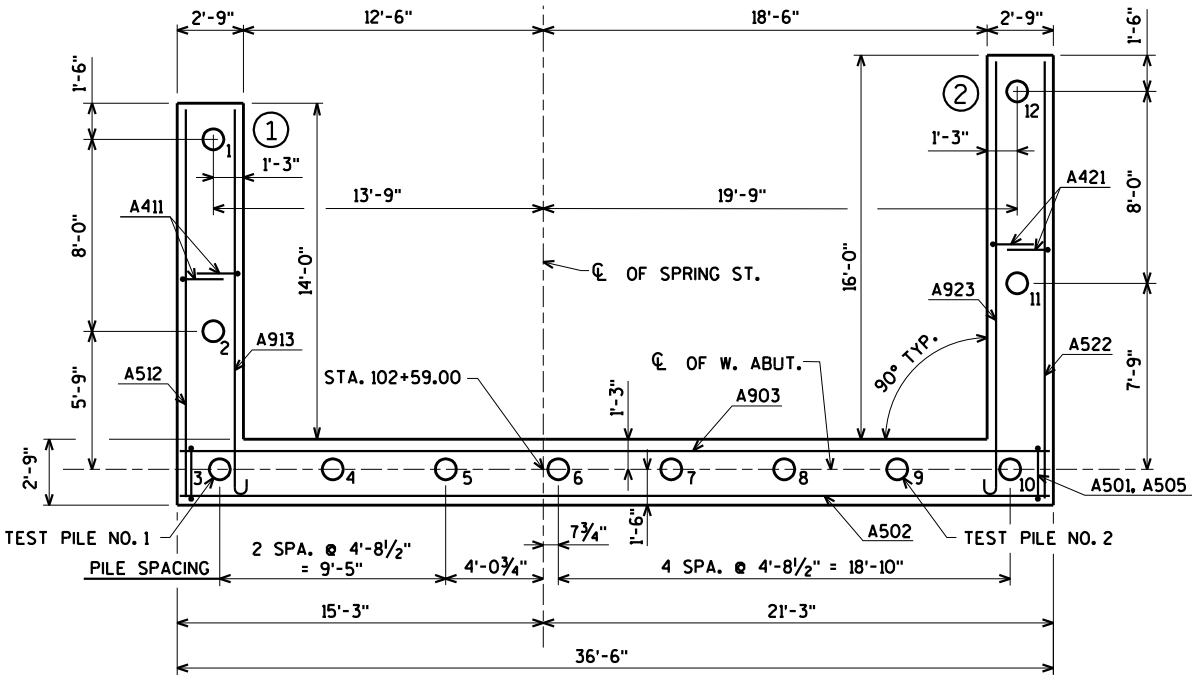
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Duluth, Minnesota

SHEET NO.
B4 OF B19

BILL OF REINFORCEMENT FOR WEST ABUTMENT

BAR NO.	COATED BAR	NO. REQ'D.	LENGTH	BENT BAR	BUNDLED	BAR SERIES	6680 ■ COATED
							LOCATION
A501	X	74	10'-2"	X			BODY VERT. E.F.
A502	X	9	35'-8"				BODY HORIZ. F.F.
A903	X	9	35'-8"				BODY HORIZ. B.F.
A404	X	30	2'-9"	X			BODY TIES
A505	X	37	7'-9"	X			BODY VERT. TOP
A406	X	25	4'-7"	X			BODY VERT. TOP
A407	X	2	35'-8"				BODY HORIZ. TOP
A408	X	12	6'-0"	X			BODY VERT. TOP
A409	X	1	4'-8"				BODY HORIZ. TOP F.F.
A410	X	1	6'-8"				BODY HORIZ. TOP F.F.
A411	X	38	12'-2"	X			WING 1 VERT.
A512	X	9	16'-0"				WING 1 HORIZ. F.F.
A913	X	9	17'-3"	X			WING 1 HORIZ. B.F.
A514	X	28	12'-11"	X			WING 1 VERT. TOP
A415	X	9	20'-0"				WING 1 HORIZ. E.F.
A416	X	7	7'-9"				WING 1 HORIZ. E.F.
A617	X	2	20'-0"				BODY HORIZ. TOP E.F.
A518	X	27	6'-9"	X			WING 1 PARAPET VERT.
A419	X	6	20'-0"				WING 1 PARAPET HORIZ.
A520	X	1	6'-6"	X			WING 1 PARAPET VERT.
A521	X	22	12'-2"	X			WING 2 VERT.
A522	X	9	18'-0"				WING 2 HORIZ. F.F.
A923	X	9	19'-3"	X			WING 2 HORIZ. B.F.
A524	X	31	12'-2"	X			WING 2 VERT. TOP
A425	X	11	22'-0"				WING 2 HORIZ. E.F.
A426	X	5	7'-9"				WING 2 HORIZ. E.F.
A427	X	31	4'-6"	X			WING 2 VERT. TOP
A628	X	2	22'-0"				WING 2 HORIZ. E.F.
A529	X	29	6'-9"	X			WING 2 PARAPET VERT.
A430	X	6	22'-0"				WING 2 PARAPET HORIZ.
A531	X	1	6'-6"	X			WING 2 PARAPET VERT.

BENDING DIMENSIONS ARE OUT TO OUT OF BARS.



PILE LAYOUT

ABUTMENT REQUIRED NOMINAL PILE BEARING RESISTANCE R _n - TONS/PILE		
FIELD CONTROL METHOD	φ dyn	*R _n
MN/DOT NOMINAL RESISTANCE FORMULA	0.40	140.8
PDA	0.65	86.6

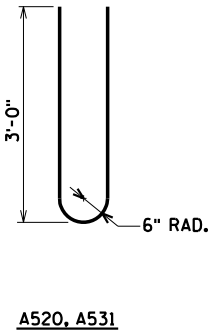
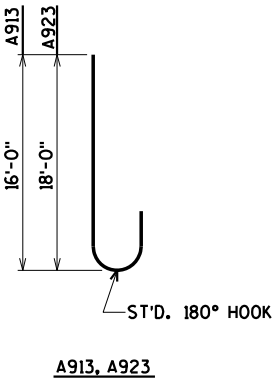
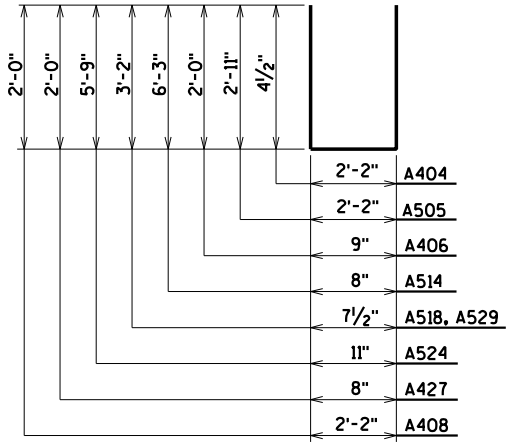
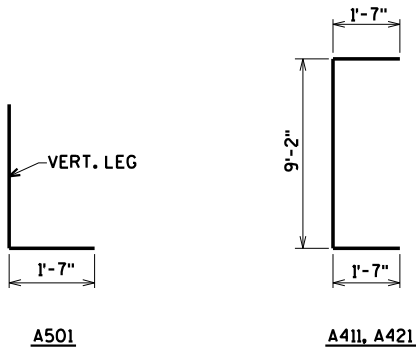
*R_n = (FACTORED DESIGN LOAD) / φ dyn

ABUTMENT COMPUTED PILE LOAD - TONS/PILE	
FACTORED DEAD LOAD + EARTH PRESSURE	39.0
FACTORED LIVE LOAD	17.3
* FACTORED DESIGN LOAD	56.3

* BASED ON STRENGTH I LOAD COMBINATION

WEST ABUTMENT PILE NOTES

2 CAST-IN-PLACE CONC. TEST PILES 65 FT. LONG
10 CAST-IN-PLACE CONC. PILES EST. LENGTH 55 FT.
12 CAST-IN-PLACE CONC. PILES REQ'D. FOR WEST ABUT.
PILES TO HAVE A NOMINAL DIAMETER OF 12".
FOR PILE SPLICE DETAILS SEE SHEET B17.



SPLODVS\$
SPENTBL\$
SDATES\$
\$FILEL\$

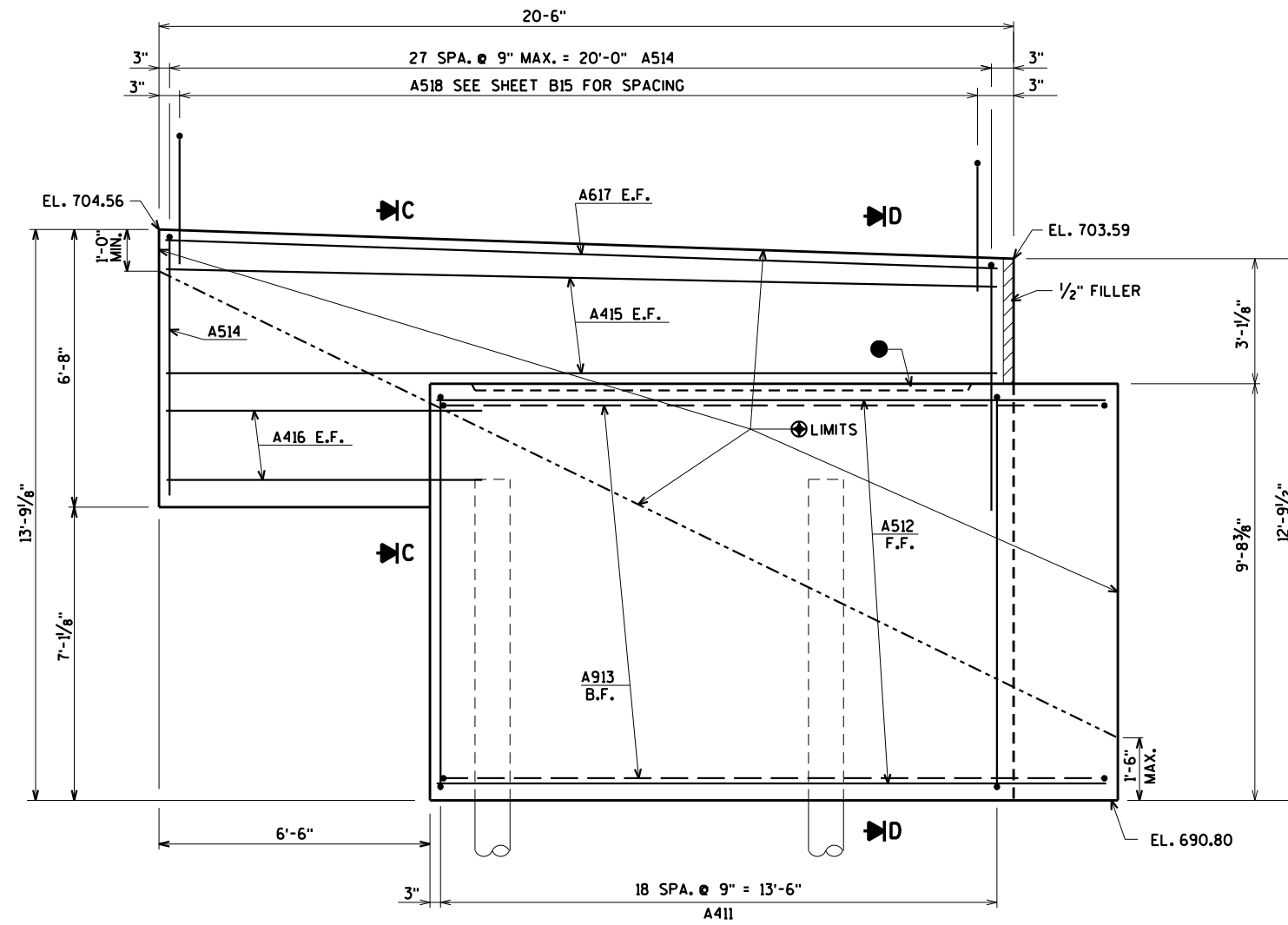
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DR BY	JMM	JOB NO	27-0133.00	CERTIFIED BY: <i>Daniel N. Sydow</i>			
CHK BY	DNS	DATE	9/14/11	9/14/11 45662 LIC. NO.			

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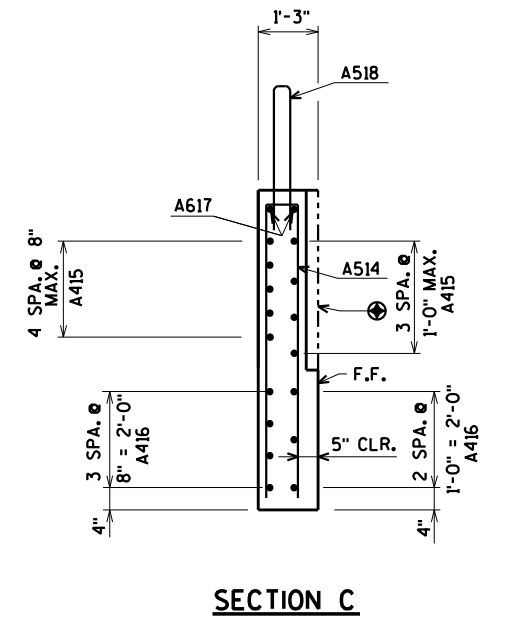
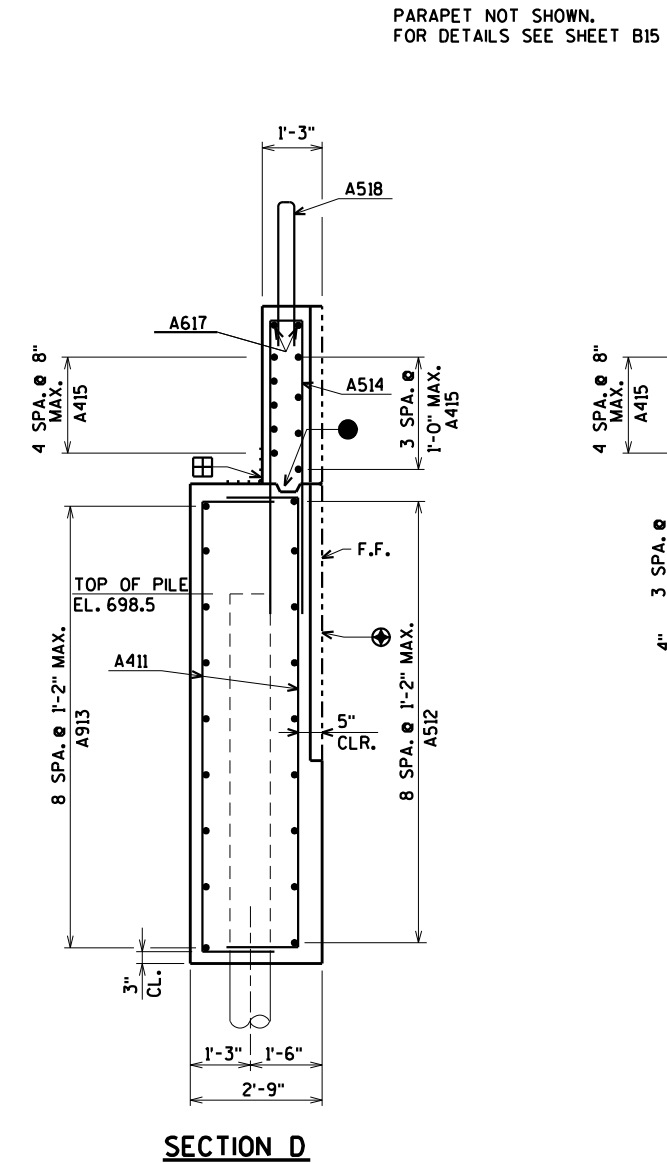
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SPRING STREET BRIDGE # 69697
CITY OF DULUTH, MINNESOTA

WEST ABUTMENT PILE LAYOUT AND
BILL OF REINFORCEMENT

SHEET NO.
B5 OF B19



ELEVATION - WING I



- ⊕ ARCHITECTURAL CONCRETE TEXTURE AND SURFACE FINISH
- OPT. KEYED CONST. JOINT - FORMED BY A SURFACED BEVELED 2" x 6".
- ⊞ MEMBRANE WATERPROOFING ON BACK FACE. NOT REQUIRED IF CONST. JT. IS NOT USED.
- B.F. DENOTES BACK FACE.
- F.F. DENOTES FRONT FACE.
- E.F. DENOTES EACH FACE.

SPURDVS\$
SPENTBL\$
SDATES\$
SFILEL\$

DES BY	KLW	BOOK NO	XXX
DR BY	JMM	JOB NO	27-0133.00
CHK BY	DNS	DATE	9/14/11

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CERTIFIED BY: Daniel N. Sydow DATE: 9/14/11

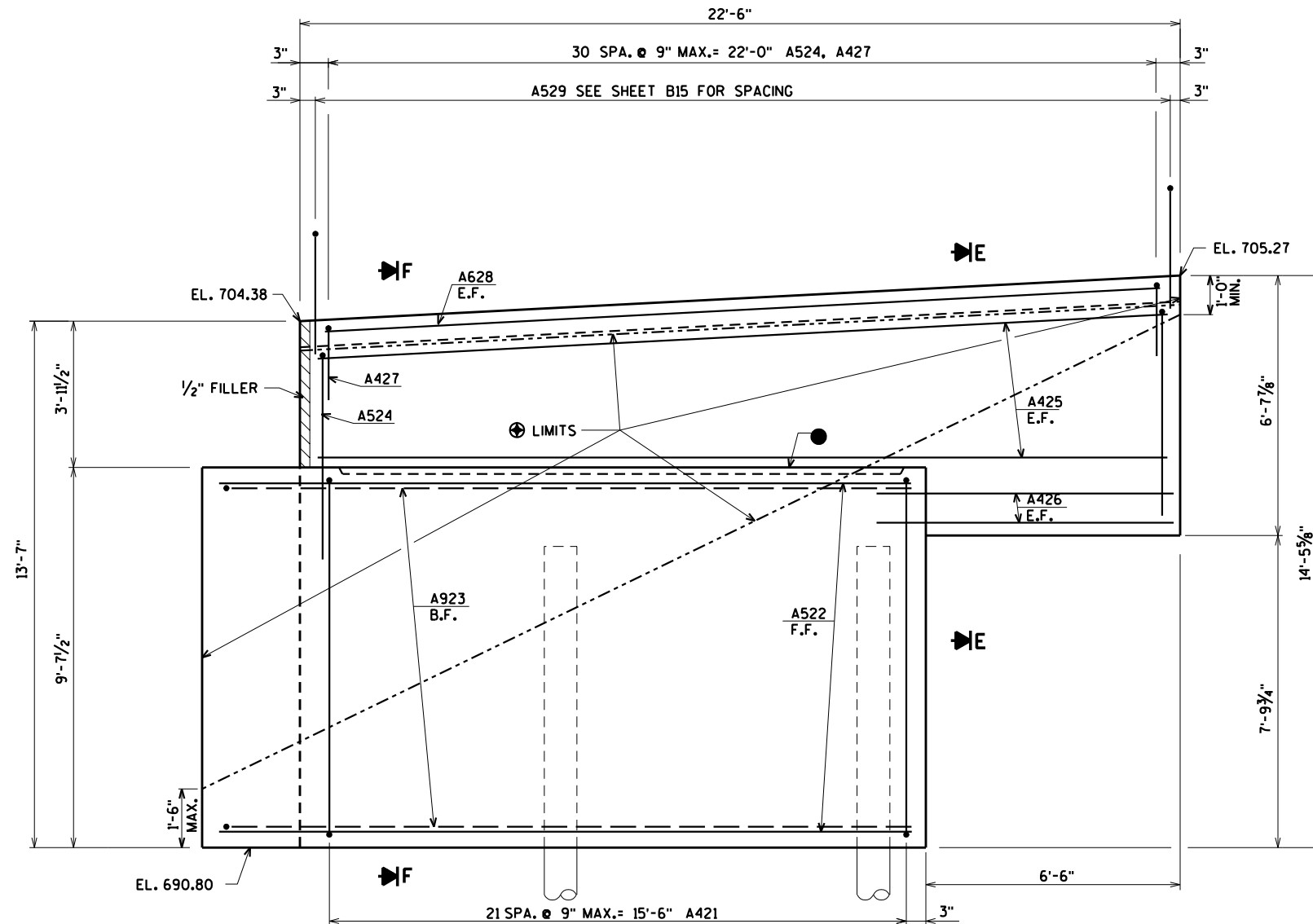
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LIC. NO.

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Duluth, Minnesota

RIVERSIDE COMMUNITY IMPROVEMENTS #0699TR
SPRING STREET BRIDGE # 69697
CITY OF DULUTH, MINNESOTA

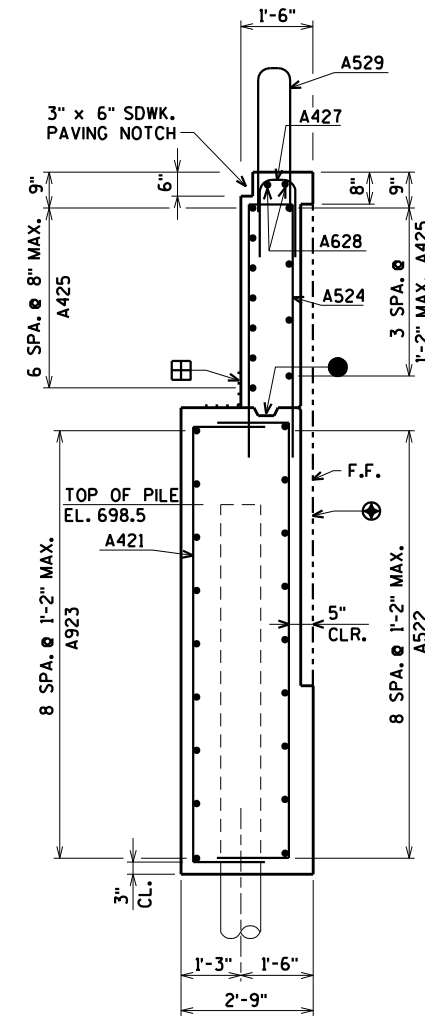
WEST ABUTMENT WING 1

SHEET NO.
B6 OF B19

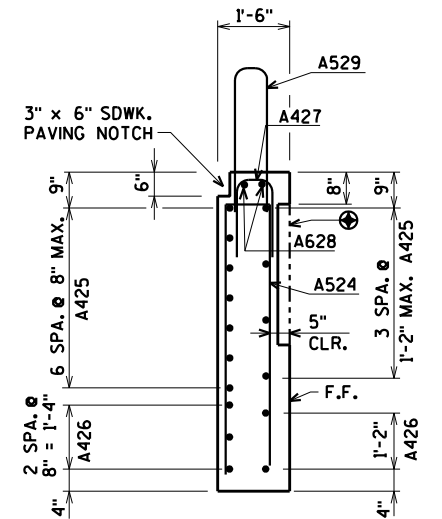


ELEVATION - WING 2

PARAPET NOT SHOWN.
FOR DETAILS SEE SHEET B15



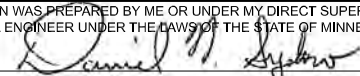
SECTION F



SECTION E

- ⊕ ARCHITECTURAL CONCRETE TEXTURE AND SURFACE FINISH
- OPT. KEYED CONST. JOINT - FORMED BY A SURFACED BEVELED 2" x 6".
- ⊞ MEMBRANE WATERPROOFING ON BACK FACE. NOT REQUIRED IF CONST. JT. IS NOT USED.
- B.F. DENOTES BACK FACE.
- F.F. DENOTES FRONT FACE.
- E.F. DENOTES EACH FACE.

SPLDRAVS
 SPENTBUS
 SDATES
 SFILELS

DES BY	KLW	BOOK NO	XXX	I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.  CERTIFIED BY: DANIEL N. SYDOW			
DR BY	JMM	JOB NO	27-0133.00				
CHK BY	DNS	DATE	9/14/11				
				9/14/11	DATE	45662	LIC. NO.

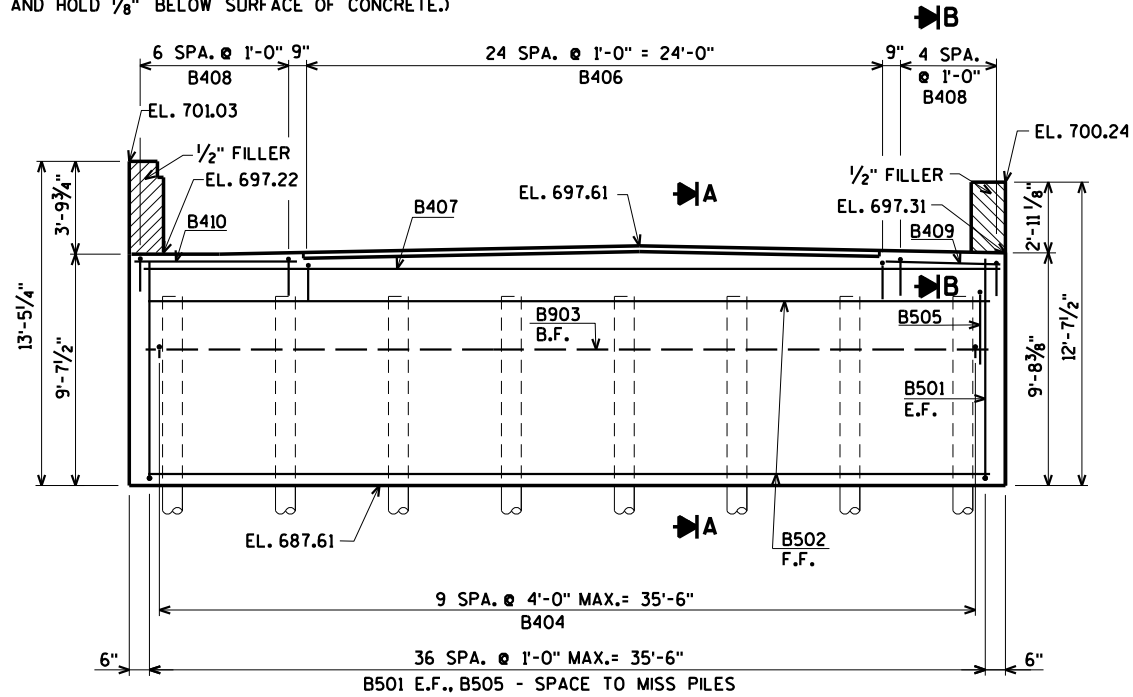
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 SPRING STREET BRIDGE # 69697
 CITY OF DULUTH, MINNESOTA

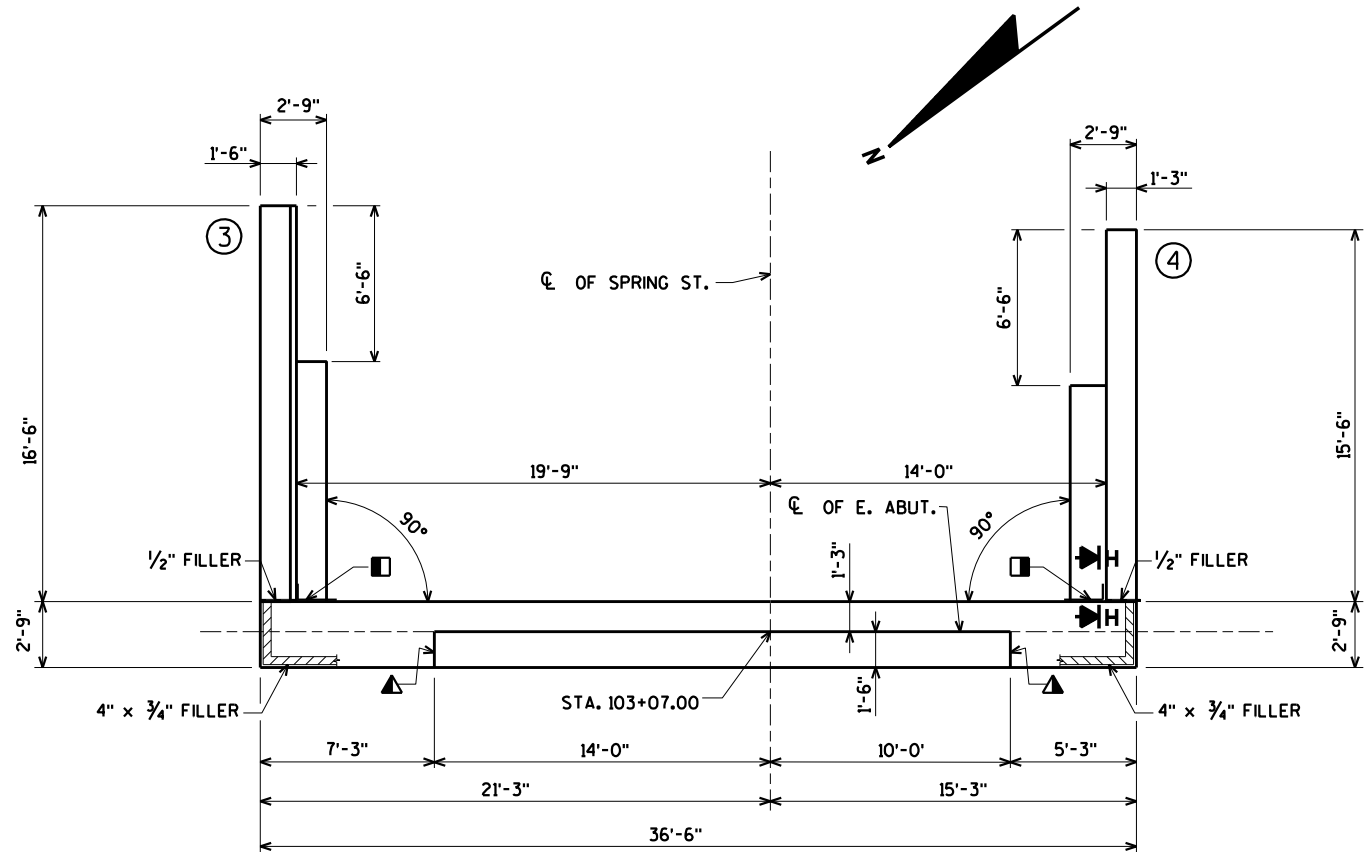
WEST ABUTMENT WING 2

SHEET NO.
B7 OF B19

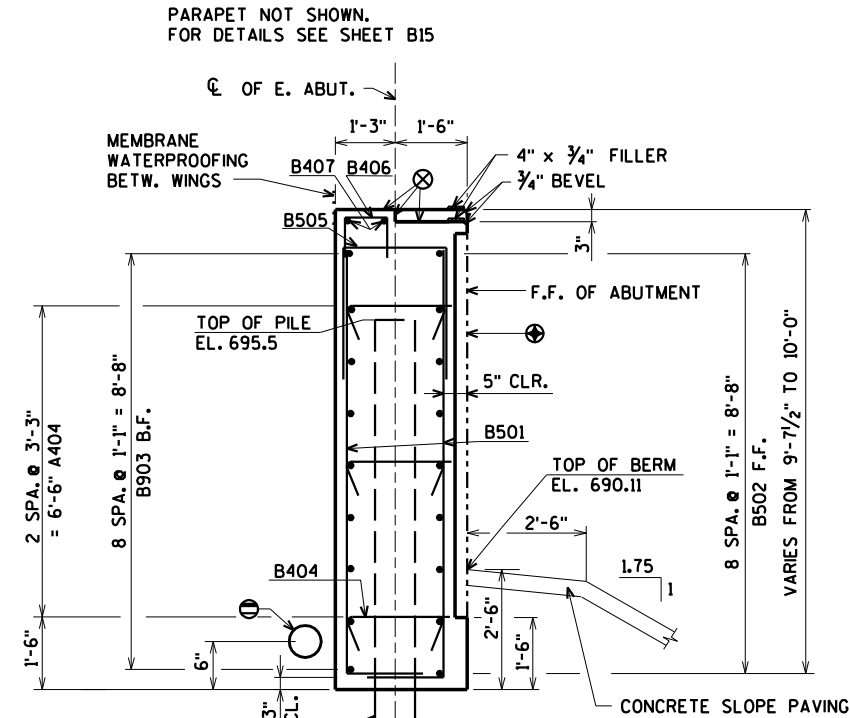
NOTE: SEAL ALL EXPOSED HORIZONTAL AND VERTICAL SURFACES OF
1/2" FILLER WITH NON-STAINING GRAY NON-BITUMINOUS JOINT
SEALER. (1" DEEP AND HOLD 1/8" BELOW SURFACE OF CONCRETE.)



ELEVATION
(LOOKING EAST)



PLAN

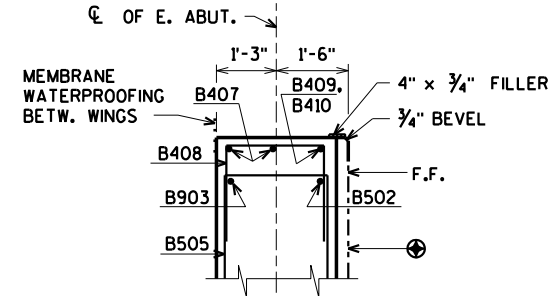


SECTION A

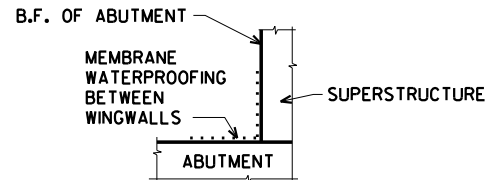
ABUTMENT TO BE SUPPORTED ON
12" C.I.P. CONCRETE PILING.
ESTIMATED LENGTH 55'-0".

EXCAVATE OR FILL TO
BOTTOM OF ABUTMENT
BEFORE DRIVING PILES.

NOTE: DO NOT PLACE FILL ABOVE
THREE FEET FROM BOTTOM OF
ABUTMENT UNTIL SUPERSTRUCTURE
IS IN PLACE.



SECTION B



SECTION H

- ⊕ ARCHITECTURAL CONCRETE TEXTURE AND SURFACE FINISH.
- ⊗ STEEL TROWEL TOP SURFACE OF ABUTMENT. PLACE MULTIPLE LAYERS OF POLYETHELENE SHEETS OVER ENTIRE ABUTMENT TOP BEFORE PLACING FILLER AND SUPERSTRUCTURE. TOTAL THICKNESS OF SHEETS SHALL BE AT LEAST 0.03".
- ⊖ SEE SHEET B18 FOR DRAINAGE SYSTEM DETAILS.
- ▲ 3/4" CORK FILLER ON VERTICAL FACE ONLY.
- VERTICAL MEMBRANE WATERPROOFING TO EXTEND FROM BRIDGE SEAT TO TOP OF WING WALL.

B.F. DENOTES BACK FACE.
F.F. DENOTES FRONT FACE.
E.F. DENOTES EACH FACE.

SPLODVS\$
SPENTRUS\$
SDATES\$
SFILES\$

DES BY	KLW	BOOK NO	XXX	I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.			
DR BY	JMM	JOB NO	27-0133.00				
CHK BY	DNS	DATE	9/14/11	CERTIFIED BY:	<i>Daniel N. Sydow</i>	9/14/11	45662
				DANIEL N. SYDOW			
				DATE			
				LIC. NO.			

AYRES
ASSOCIATES
Duluth, Minnesota

RIVERSIDE COMMUNITY IMPROVEMENTS #0699TR
SPRING STREET BRIDGE # 69697
CITY OF DULUTH, MINNESOTA

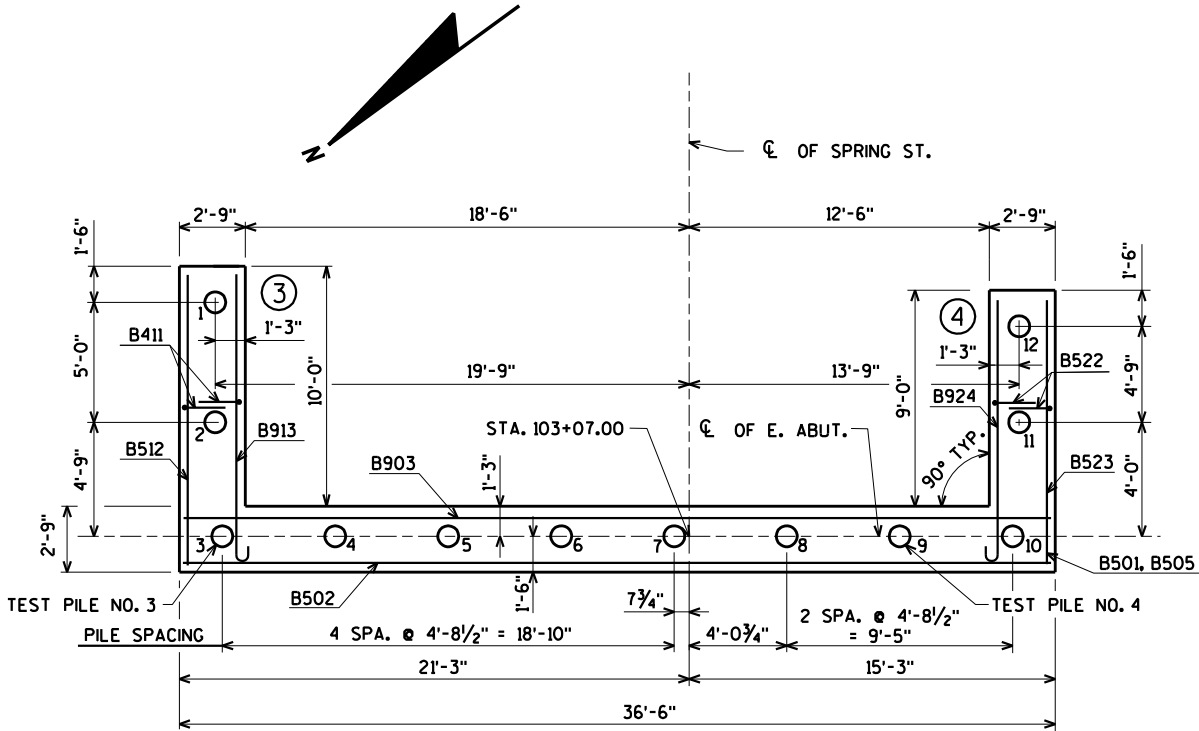
EAST ABUTMENT

SHEET NO.
B8 OF B19

BILL OF REINFORCEMENT FOR EAST ABUTMENT

BAR. NO.	COATED BAR	NO. REQ'D.	LENGTH	BENT BAR	BUNDLED	BAR SERIES	5610* COATED
							LOCATION
B501	X	74	10'-2"	X			BODY VERT. E.F.
B502	X	9	35'-8"				BODY HORIZ. F.F.
B903	X	9	35'-8"				BODY HORIZ. B.F.
B404	X	30	2'-9"	X			BODY TIES
B505	X	37	7'-9"	X			BODY VERT. TOP
B406	X	25	4'-7"	X			BODY VERT. TOP
B407	X	2	35'-8"				BODY HORIZ. TOP
B408	X	12	6'-0"	X			BODY VERT. TOP
B409	X	1	4'-8"				BODY HORIZ. TOP F.F.
B410	X	1	6'-8"				BODY HORIZ. TOP F.F.
B411	X	28	12'-2"	X			WING 3 VERT.
B512	X	9	12'-0"				WING 3 HORIZ. F.F.
B913	X	9	13'-3"	X			WING 3 HORIZ. B.F.
B514	X	23	12'-4"	X			WING 3 VERT. TOP
B415	X	8	16'-0"				WING 3 HORIZ. E.F.
B416	X	11	7'-9"				WING 3 HORIZ. E.F.
B417	X	23	4'-6"	X			WING 3 VERT. TOP
B618	X	2	16'-0"				WING 3 HORIZ. E.F.
B519	X	23	6'-9"	X			WING 3 PARAPET VERT.
B420	X	6	16'-0"				WING 3 PARAPET HORIZ.
B521	X	1	6'-6"	X			WING 3 PARAPET VERT.
B422	X	24	12'-2"	X			WING 4 VERT.
B523	X	9	11'-0"				WING 4 HORIZ. F.F.
B924	X	9	12'-3"	X			WING 4 HORIZ. B.F.
B525	X	21	12'-11"	X			WING 4 VERT. TOP
B426	X	5	15'-0"				WING 4 HORIZ. E.F.
B427	X	12	7'-9"				WING 4 HORIZ. E.F.
B628	X	2	15'-0"				BODY HORIZ. TOP
B529	X	22	6'-9"	X			WING 4 PARAPET VERT.
B430	X	6	15'-0"				WING 4 PARAPET HORIZ.
B531	X	1	6'-6"	X			WING 4 PARAPET VERT.

BENDING DIMENSIONS ARE OUT TO OUT OF BARS.



PILE LAYOUT

ABUTMENT REQUIRED NOMINAL PILE BEARING RESISTANCE R _n - TONS/PILE		
FIELD CONTROL METHOD	φ dyn	*R _n
MN/DOT NOMINAL RESISTANCE FORMULA	0.40	140.8
PDA	0.65	86.6

*R_n = (FACTORED DESIGN LOAD) / φ dyn

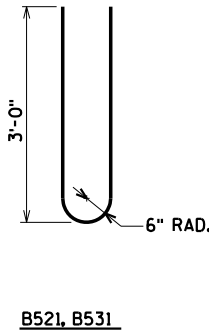
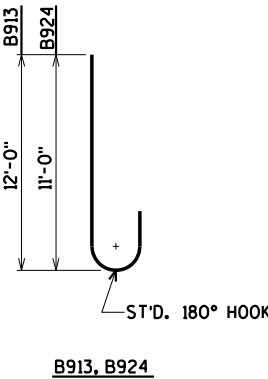
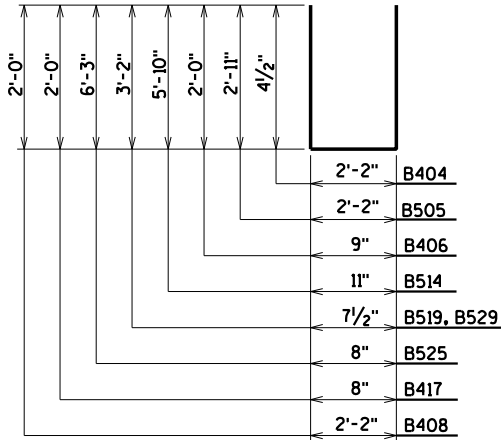
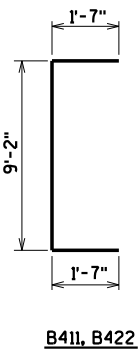
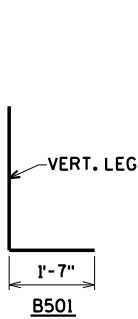
ABUTMENT COMPUTED PILE LOAD - TONS/PILE	
FACTORED DEAD LOAD + EARTH PRESSURE	39.0
FACTORED LIVE LOAD	17.3
* FACTORED DESIGN LOAD	56.3

* BASED ON STRENGTH I LOAD COMBINATION

EAST ABUTMENT PILE NOTES

2 CAST-IN-PLACE CONC. TEST PILES 65 FT. LONG
10 CAST-IN-PLACE CONC. PILES EST. LENGTH 55 FT.
12 CAST-IN-PLACE CONC. PILES REQ'D. FOR EAST ABUT.

PILES TO HAVE A NOMINAL DIAMETER OF 12".
FOR PILE SPLICE DETAILS SEE SHEET B17.



SPLODVS\$
SPENTRUS\$
SDATES\$
SFLEL\$

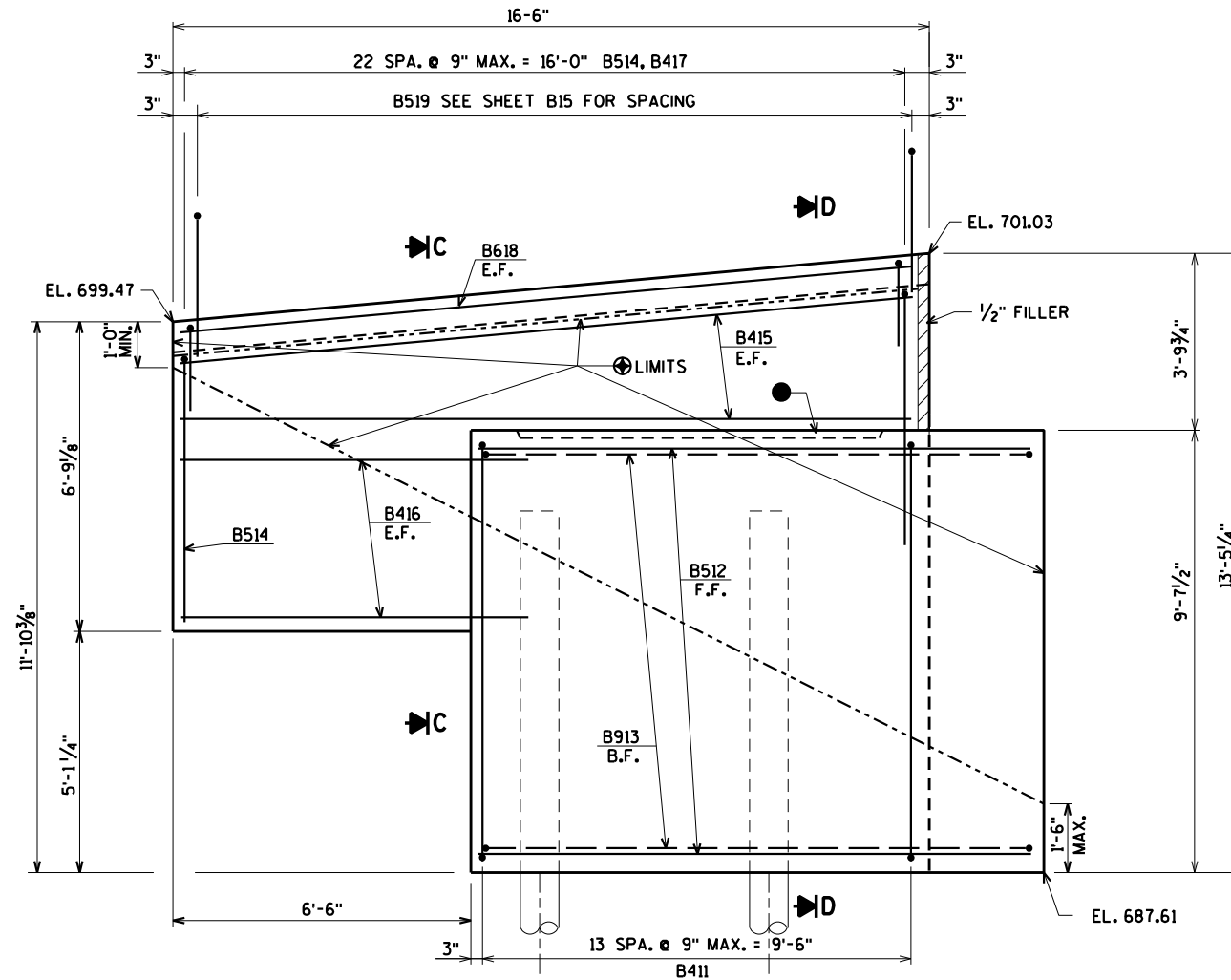
DES BY	KLW	BOOK NO	XXX	I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.			
DR BY	JMM	JOB NO	27-0133.00	CERTIFIED BY: <i>Daniel N. Sydow</i>			
CHK BY	DNS	DATE	9/14/11	DATE	9/14/11	45662	LIC. NO.

AYRES
ASSOCIATES
Duluth, Minnesota

RIVERSIDE COMMUNITY IMPROVEMENTS #0699TR
SPRING STREET BRIDGE # 69697
CITY OF DULUTH, MINNESOTA

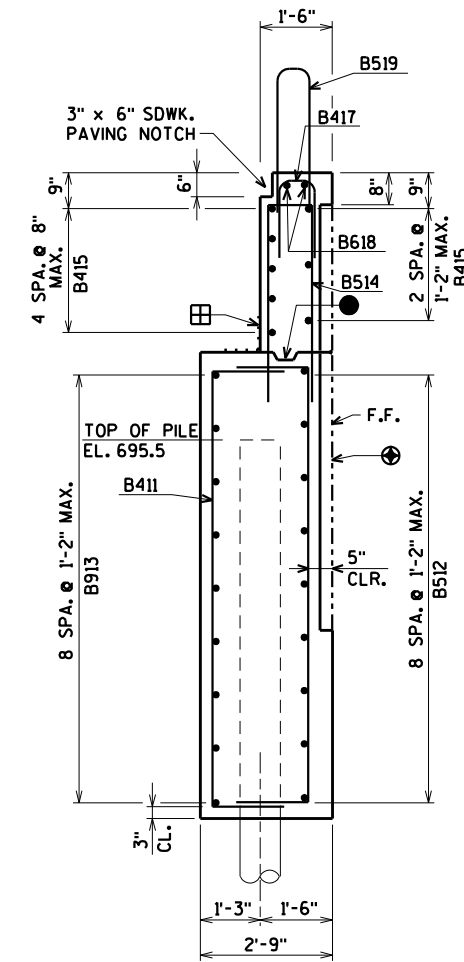
EAST ABUTMENT PILE LAYOUT AND
BILL OF REINFORCEMENT

SHEET NO.
B9 OF B19

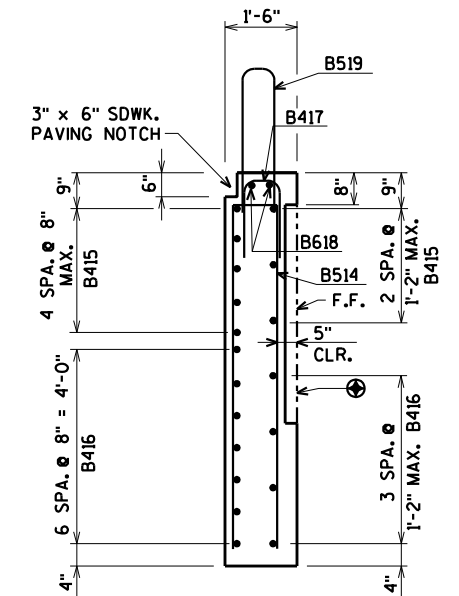


ELEVATION - WING 3

PARAPET NOT SHOWN.
FOR DETAILS SEE SHEET B15



SECTION D



SECTION C

- ⊕ ARCHITECTURAL CONCRETE TEXTURE AND SURFACE FINISH.
- OPT. KEYED CONST. JOINT - FORMED BY A SURFACED BEVELED 2" x 6".
- ⊞ MEMBRANE WATERPROOFING ON BACK FACE. NOT REQUIRED IF CONST. JT. IS NOT USED.
- B.F. DENOTES BACK FACE.
- F.F. DENOTES FRONT FACE.
- E.F. DENOTES EACH FACE.

SPUDRVS\$
SPENTRUS\$
SDATES\$
SFILEL\$

DES BY	KLW	BOOK NO	XXX
DR BY	JMM	JOB NO	27-0133.00
CHK BY	DNS	DATE	9/14/11

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CERTIFIED BY: Daniel N. Sydow DATE: 9/14/11 LIC. NO.: 45662

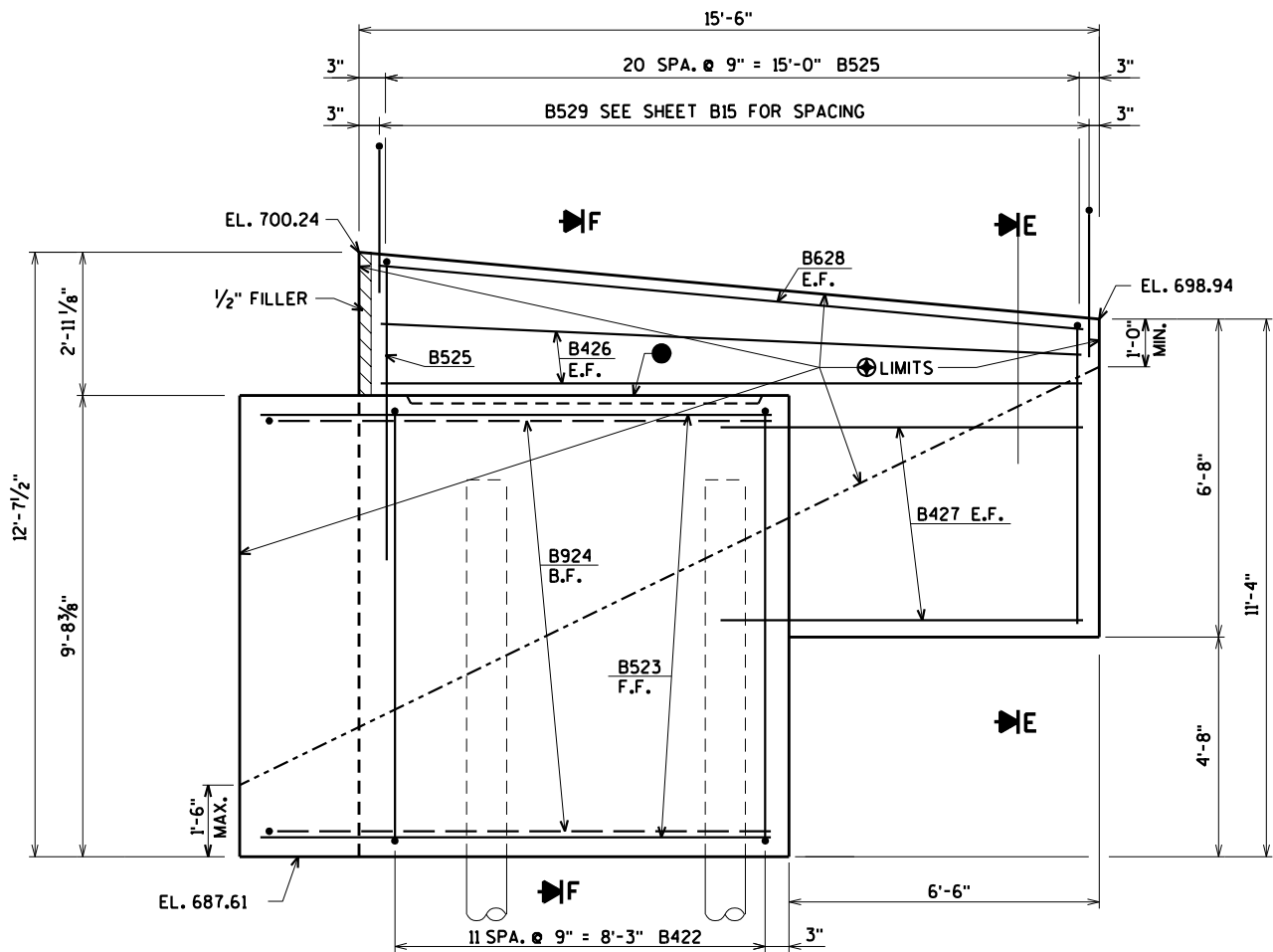
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SPRING STREET BRIDGE # 69697
CITY OF DULUTH, MINNESOTA

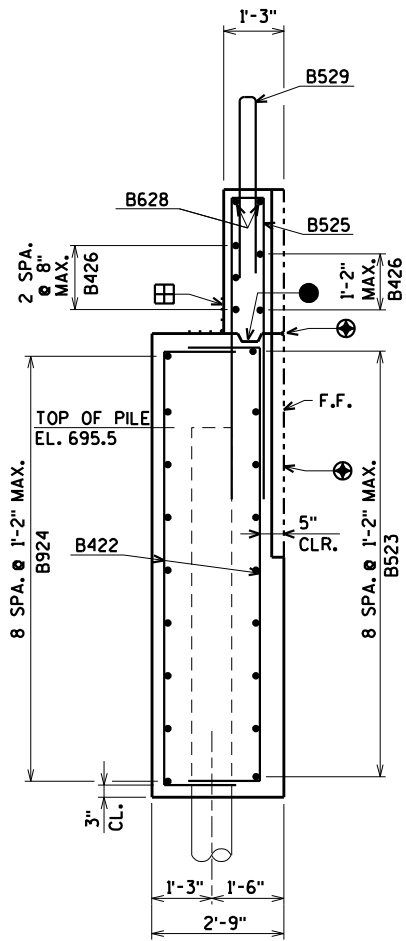
EAST ABUTMENT WING 3

SHEET NO.
B10 OF B19

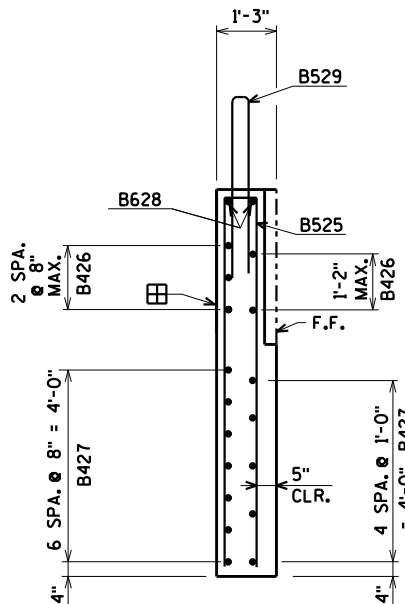
PARAPET NOT SHOWN.
FOR DETAILS SEE SHEET B15



ELEVATION - WING 4



SECTION F



SECTION E

- ⊕ ARCHITECTURAL CONCRETE TEXTURE AND SURFACE FINISH.
- OPT. KEYED CONST. JOINT - FORMED BY A SURFACED BEVELED 2" x 6".
- ⊞ MEMBRANE WATERPROOFING ON BACK FACE. NOT REQUIRED IF CONST. JT. IS NOT USED.
- B.F. DENOTES BACK FACE.
- F.F. DENOTES FRONT FACE.
- E.F. DENOTES EACH FACE.

SPUDRVS
SPENTRUS
SDATES
SFILEL\$

DES BY	KLW	BOOK NO	XXX
DR BY	JMM	JOB NO	27-0133.00
CHK BY	DNS	DATE	9/14/11

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

CERTIFIED BY: *Daniel N. Sydow* 9/14/11 45662

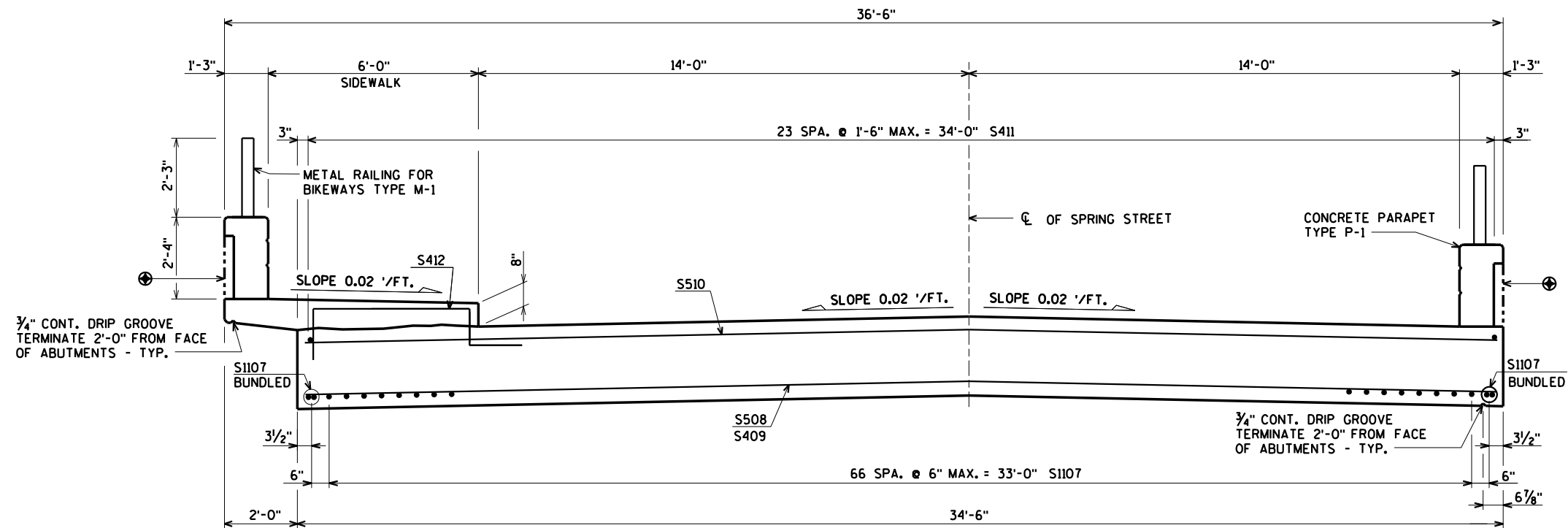
DANIEL N. SYDOW DATE LIC. NO.

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ASSOCIATES
Duluth, Minnesota

RIVERSIDE COMMUNITY IMPROVEMENTS #0699TR
SPRING STREET BRIDGE # 69697
CITY OF DULUTH, MINNESOTA

EAST ABUTMENT WING 4

SHEET NO.
B11 OF B19



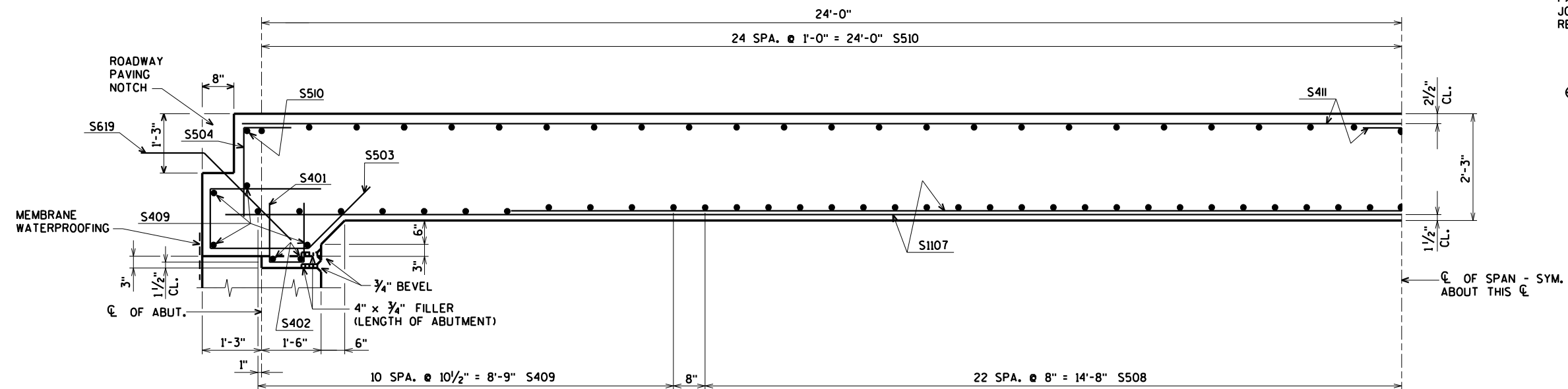
TRANSVERSE SECTION
(LOOKING EAST)

TOP TRANSVERSE BARS IN SLAB SHALL BE SUPPORTED BY INDIVIDUAL BAR CHAIRS AT APPROXIMATELY 3'-0" CENTERS EACH WAY. BOTTOM LONGITUDINAL BARS SHALL BE SUPPORTED BY CONTINUOUS BAR CHAIRS AT APPROXIMATELY 4'-0" CENTERS.

ALL SLAB THICKNESS DIMENSIONS ARE MINIMUM. ANY TOLERANCES NECESSARY TO CORRECT CONSTRUCTION DISCREPANCIES ARE TO BE PLUS (+).

PARAPETS SHOWN ABOVE THE HORIZONTAL CONSTRUCTION JOINT SHALL BE POURED AFTER FALSEWORK HAS BEEN RELEASED.

⊕ ARCHITECTURAL CONCRETE TEXTURE AND SURFACE FINISH



PART LONGITUDINAL SECTION

SPURWAYS
SPENTRUS
SDATES
SFILES

DES BY	KLW	BOOK NO	XXX
DR BY	JMM	JOB NO	27-0133.00
CHK BY	DNS	DATE	9/14/11

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

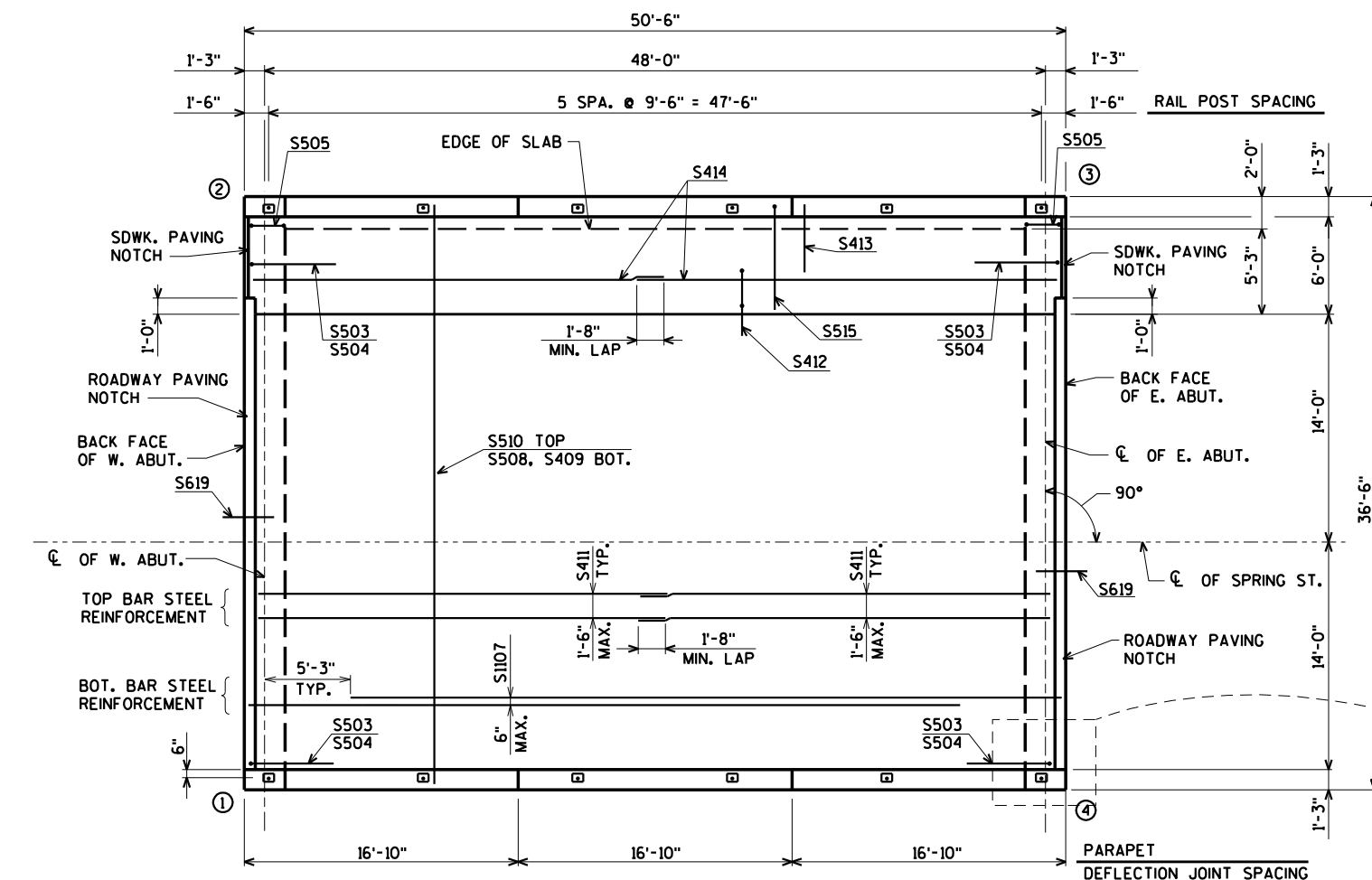
CERTIFIED BY: *Daniel N. Sydow* 9/14/11 45662
DANIEL N. SYDOW DATE LIC. NO.

AYRES
ASSOCIATES
Duluth, Minnesota

RIVERSIDE COMMUNITY IMPROVEMENTS #0699TR
SPRING STREET BRIDGE # 69697
CITY OF DULUTH, MINNESOTA

SUPERSTRUCTURE

SHEET NO.
B12 OF B19



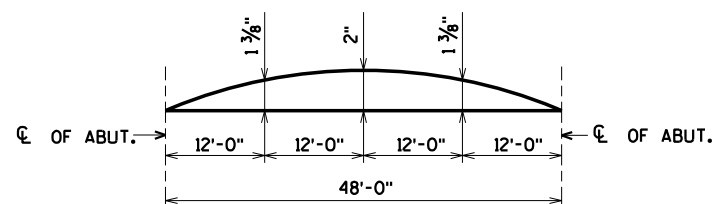
○ DENOTES WING NUMBER.

PLAN

TOP OF DECK ELEVATIONS

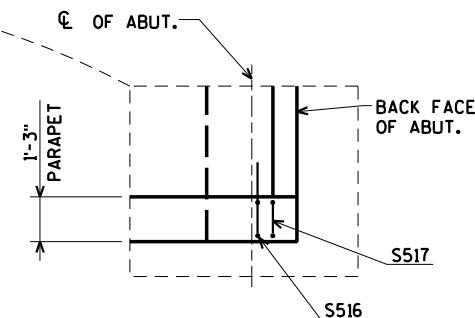
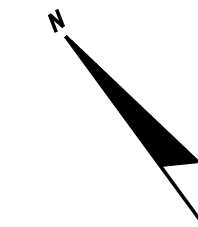
LOCATION	℄ OF W. ABUT.	1/4 PT.	1/2 PT.	3/4 PT.	℄ OF E. ABUT.
N. EDGE OF SLAB	703.42	702.74	701.98	701.14	700.23
℄ OF STRUCTURE	703.80	703.12	702.36	701.52	700.61
S. EDGE OF SLAB	703.50	702.82	702.06	701.22	700.31

ELEVATIONS SHOWN ARE FINISHED DECK AND DO NOT INCLUDE ALLOWANCES OF DEAD LOAD DEFLECTION AND FUTURE CREEP.



CAMBER DIAGRAM

CAMBER SPANS AS SHOWN TO PROVIDE FOR DEAD LOAD DEFLECTION & FUTURE CREEP. CAMBER DOES NOT INCLUDE ALLOWANCE FOR FORM SETTLEMENT.



WING 4 (OTHER WINGS SIMILAR)

WIRE BARS TOGETHER
@ 2'-0" CENTERS

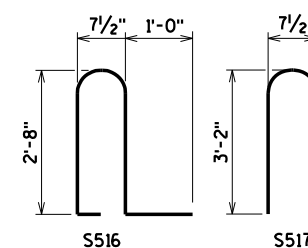
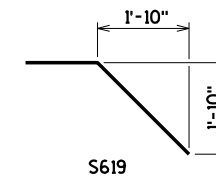
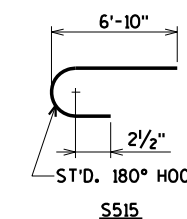
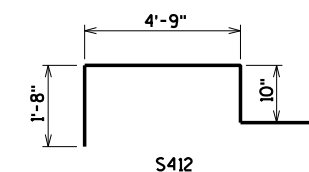
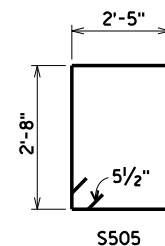
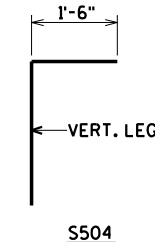
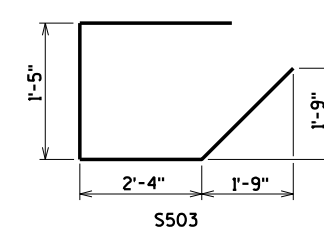
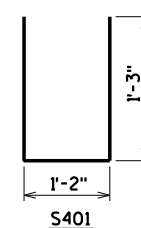


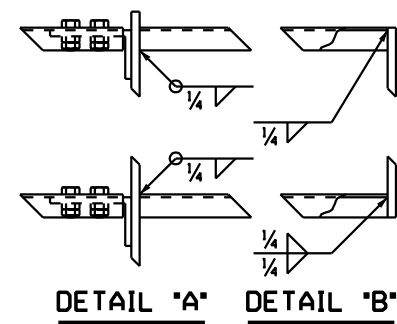
BUNDLING DETAIL

BILL OF REINFORCEMENT FOR SUPERSTRUCTURE

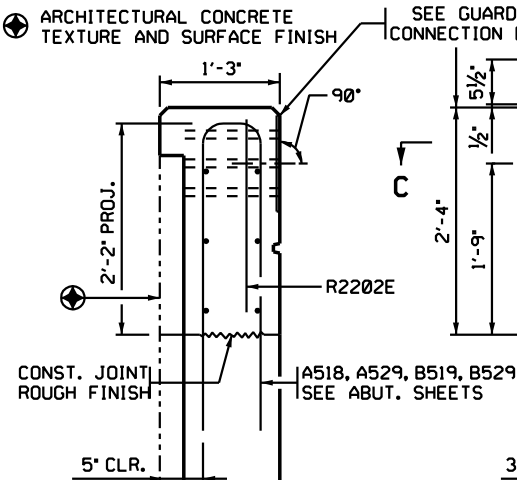
BAR. NO.	COATED BAR	NO. REQ'D.	LENGTH	BENT BAR	BUNDLED BAR SERIES	27,260* COATED
						LOCATION
S401	X	48	3-6	X		SLAB @ ABUT. NOTCH
S402	X	4	23-8			SLAB @ ABUT. NOTCH
S503	X	70	8-3	X		SLAB @ ABUT. @ RDWY.
S504	X	70	3-11			SLAB @ ABUT. @ RDWY.
S505	X	6	10-10	X		SLAB @ ABUT. @ SDWK.
S406	X	12	5-11			SLAB @ ABUT. @ SDWK.
S1107	X	71	43-10	X		SLAB LONG. BOT.
S508	X	45	34-2			SLAB TRANS. BOT.
S409	X	30	34-2			SLAB TRANS. BOT.
S510	X	51	34-2			SLAB TRANS. TOP
S411	X	48	25-11			SLAB LONG. TOP
S412	X	200	8-3	X		SLAB @ SDWK.
S413	X	70	3-0			SDWK. TRANS. BOT.
S414	X	26	26-0			SDWK. LONG. BOT. & TOP
S515	X	200	7-5	X		SDWK. TRANS. TOP
S516	X	122	7-5	X		PARAPET VERT.
S517	X	4	6-9	X		SDWK. @ PARAPET CORNERS VERT.
S418	X	36	16-5			SDWK. @ PARAPET HORIZ.
S619	X	58	4-0	X		SLAB @ PAVING NOTCH

BENDING DIMENSIONS ARE OUT TO OUT OF BARS.

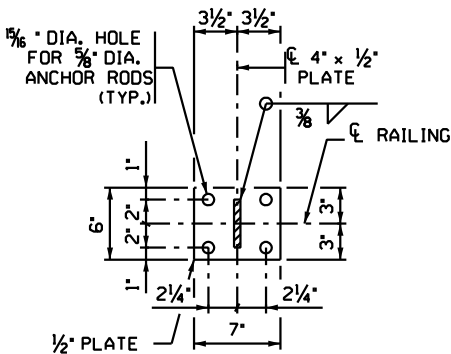




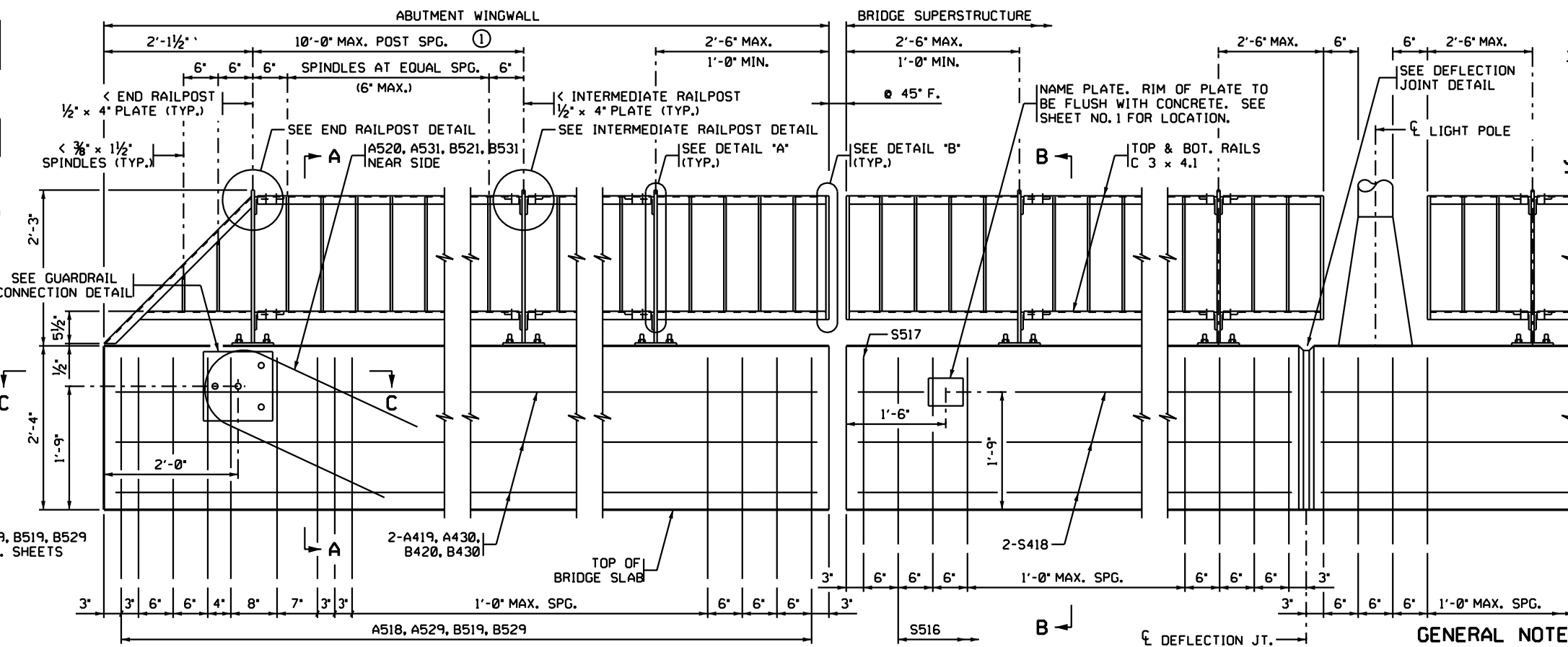
DETAIL 'A' DETAIL 'B'



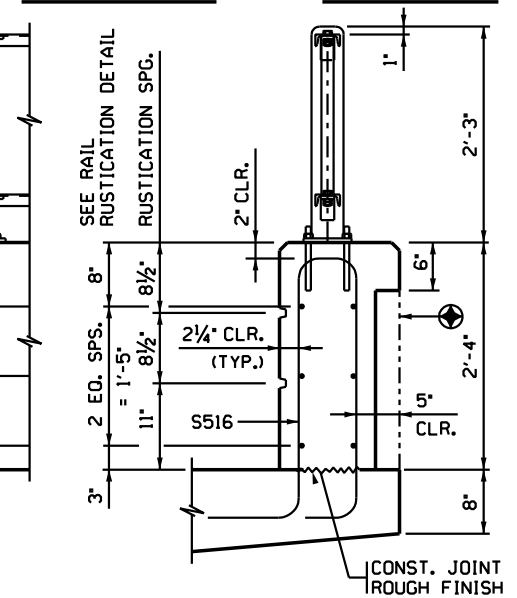
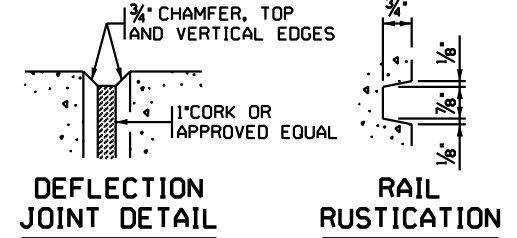
SECTION A-A



RAILPOST BASE PLATE



GENERAL NOTES



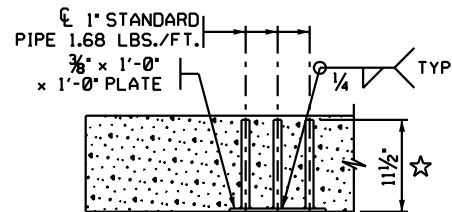
SECTION B-B

EXPANSION JOINT
EXP. DEVICE NOT SHOWN

INSIDE ELEVATION
OF RAILING

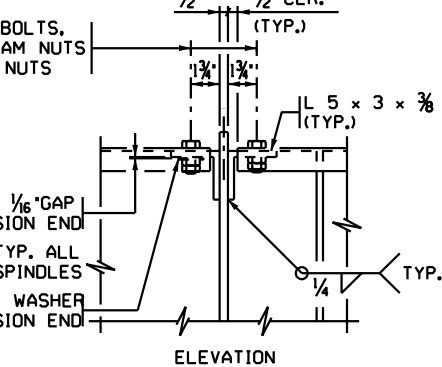
DEFLECTION JOINT

**RAIL MEETS TEST LEVEL 2
REQUIREMENTS OF NCHRP REPORT 350.**
THE RAIL MUST BE USED NEXT TO WALKWAY.
AN F-BARRIER MUST BE USED TO SEPARATE TRAFFIC
FROM THIS RAIL IN THE 45 MPH (OR OVER) SPEED ZONE.



SECTION C-C

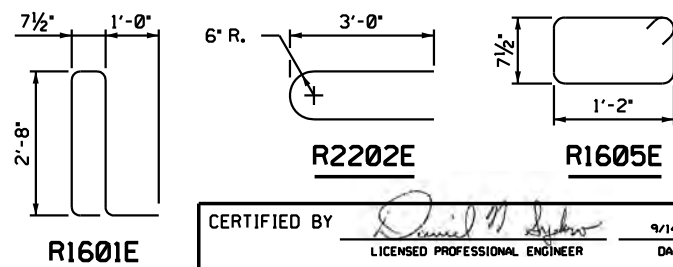
(REINFORCEMENT NOT SHOWN)
★ DIMENSION INCLUDES 3/8" PLATE



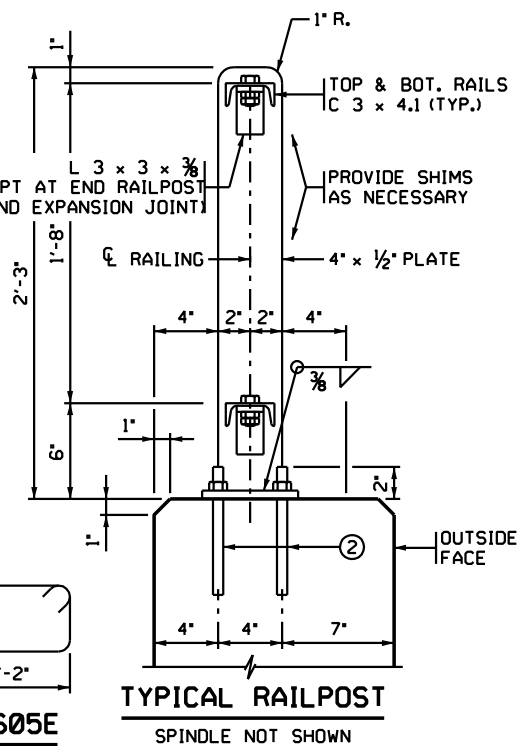
INTERMEDIATE RAILPOST DETAIL
TOP AND BOTTOM RAIL CONNECTIONS SIMILAR

GUARDRAIL CONNECTION DETAIL

GALVANIZE AFTER FABRICATION PER
Mn/DOT SPEC. 3394. ESTIMATED WEIGHT = 22 LBS.



R1601E



TYPICAL RAILPOST
SPINDLE NOT SHOWN

LENGTH OF TYPE P-1 RAILING CONCRETE (3Y46 OR 3Y46A) FOR PAYMENT SHALL BE MEASURED BETWEEN THE OUTSIDE FACES OF THE CONCRETE RAILING.

LENGTH OF METAL RAILING FOR BIKEWAYS, TYPE M-1 FOR PAYMENT SHALL BE MEASURED BETWEEN THE OUTSIDE FACES OF THE CONCRETE RAILING.

CONCRETE PARAPET = 520 LBS./FT. (0.129 CU. YDS./FT.)

FINISH ALL EDGES OF CONCRETE PARAPET WITH 1/2" VEE, EXCEPT WHERE OTHERWISE NOTED.

MAX. SPACING OF CONCRETE DEFLECTION JOINTS SHALL BE 20 FT. SEE SUPERSTRUCTURE SHEET FOR JOINT SPACING.

ANCHORAGES SHALL BE ACCURATELY PLACED TO PROVIDE CORRECT ALIGNMENT OF METAL RAILING. SET NORMAL TO GRADE.

DRILLED IN ANCHORAGES WILL BE PERMITTED IN LIEU OF ANCHORAGE SHOWN.

RAILPOSTS AND SPINDLES SHALL BE NORMAL TO GRADE.

ALL STRUCTURAL STEEL MATERIAL SHALL COMPLY WITH Mn/DOT SPEC. 3306.

GALVANIZE BOLTS, NUTS AND WASHERS PER Mn/DOT SPEC. 3392.

ALL MATERIAL EXCEPT RAILPOST ANCHORAGE SHALL BE PAINTED WITH A THREE COAT ZINC RICH EPOXY SYSTEM. PRIOR TO PAINTING, ALL STEEL RAILING POSTS, SPINDLES, AND RAILS SHALL BE GIVEN A NO. 10 NEAR WHITE BLAST CLEANING BY S.S.P.C. SPECIFICATIONS.

TOUCH-UP PAINTING TO BE DONE AT COMPLETION OF METAL RAILING INSTALLATION TO THE SATISFACTION OF THE ENGINEER AT NO EXTRA COST.

ALL RAILING MEMBERS SHALL BE FLAT AFTER FABRICATION AND PAINTING TO WITHIN 1/8" IN 10 FT. VERTICALLY AND HORIZONTALLY BY MECHANICAL MEANS WITHOUT DAMAGE TO THE PAINT.

GUARDRAIL CONNECTION TO BE INCLUDED IN PRICE BID FOR OTHER ITEMS.

PRICE BID FOR METAL RAILING INCLUDES ANCHORAGES AND ALL MATERIAL ABOVE TOP OF CONCRETE PARAPET.

RAIL QUANTITIES ARE INCLUDED IN SUMMARY OF QUANTITIES FOR SUPERSTRUCTURE.

① SPACE LIGHT AND RAILPOST ANCHORAGE TO CLEAR REINFORCEMENT IN CONCRETE PARAPET.

② 3/8" DIA. CHEMICAL ANCHOR RODS, Mn/DOT SPEC. 3385, TYPE A, WITH HEX NUTS AND WASHERS. MINIMUM ULTIMATE BOND STRENGTH SHALL BE 20,000 POUNDS, WITH A MINIMUM 5' EMBEDMENT LENGTH.

REVISED:
APPROVED: DECEMBER 18, 2003
Daniel N. Sydow
STATE BRIDGE ENGINEER

END RAILPOST DETAIL
TOP AND BOTTOM
RAIL CONNECTIONS SIMILAR

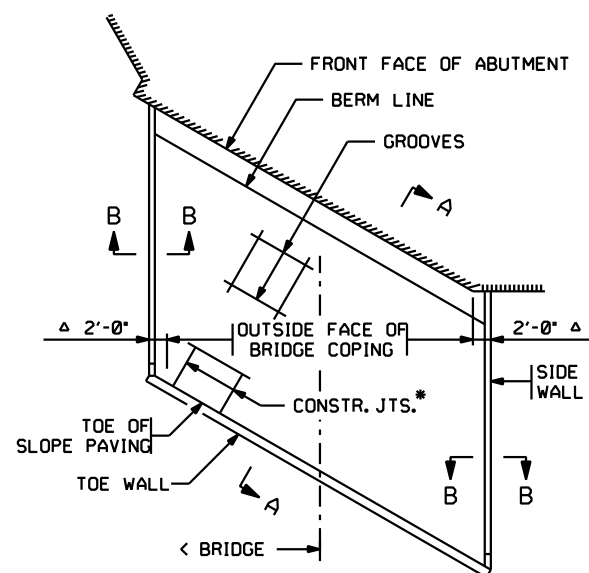
CERTIFIED BY
NAME: DANIEL N. SYDOW
DATE: 9/14/11
LIC. NO. 45662

TITLE: METAL RAILING FOR BIKEWAYS (TYPE M-1)
AND CONCRETE PARAPET (TYPE P-1)
(WITH INTEGRAL END POST)

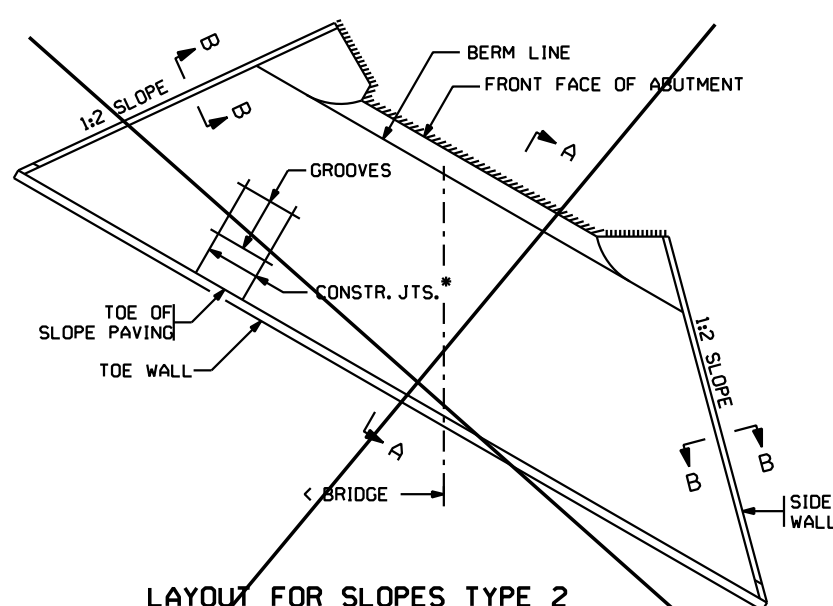
DES: KLV
CHK: DNS
DR: JMM
CHK: DNS
SHEET NO. B15 OF B19 SHEETS

FIG. 5-397.154

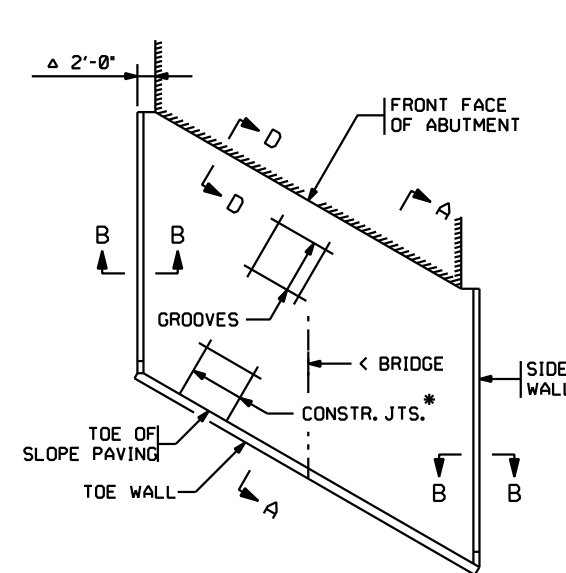
BRIDGE NO.
69697



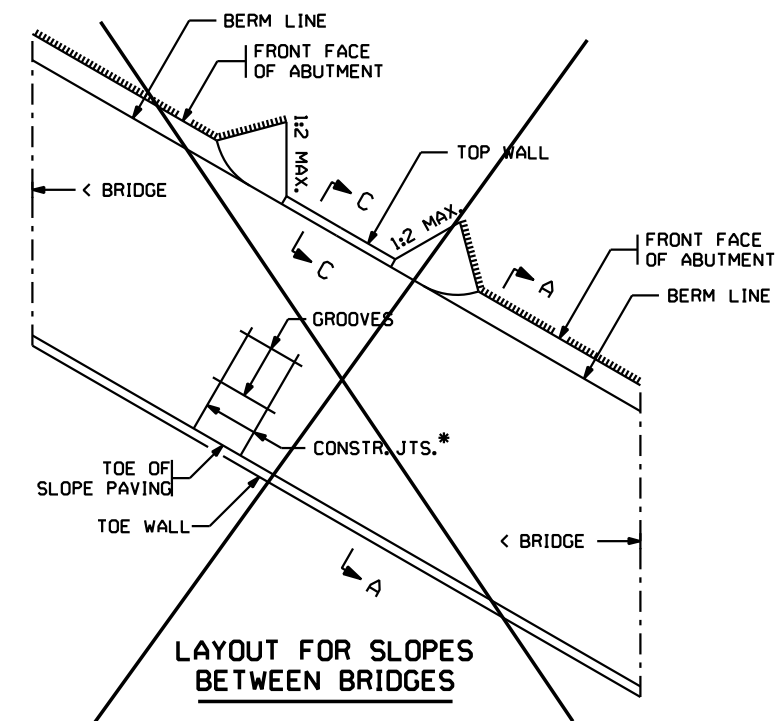
LAYOUT FOR SLOPES TYPE 1



LAYOUT FOR SLOPES TYPE 2



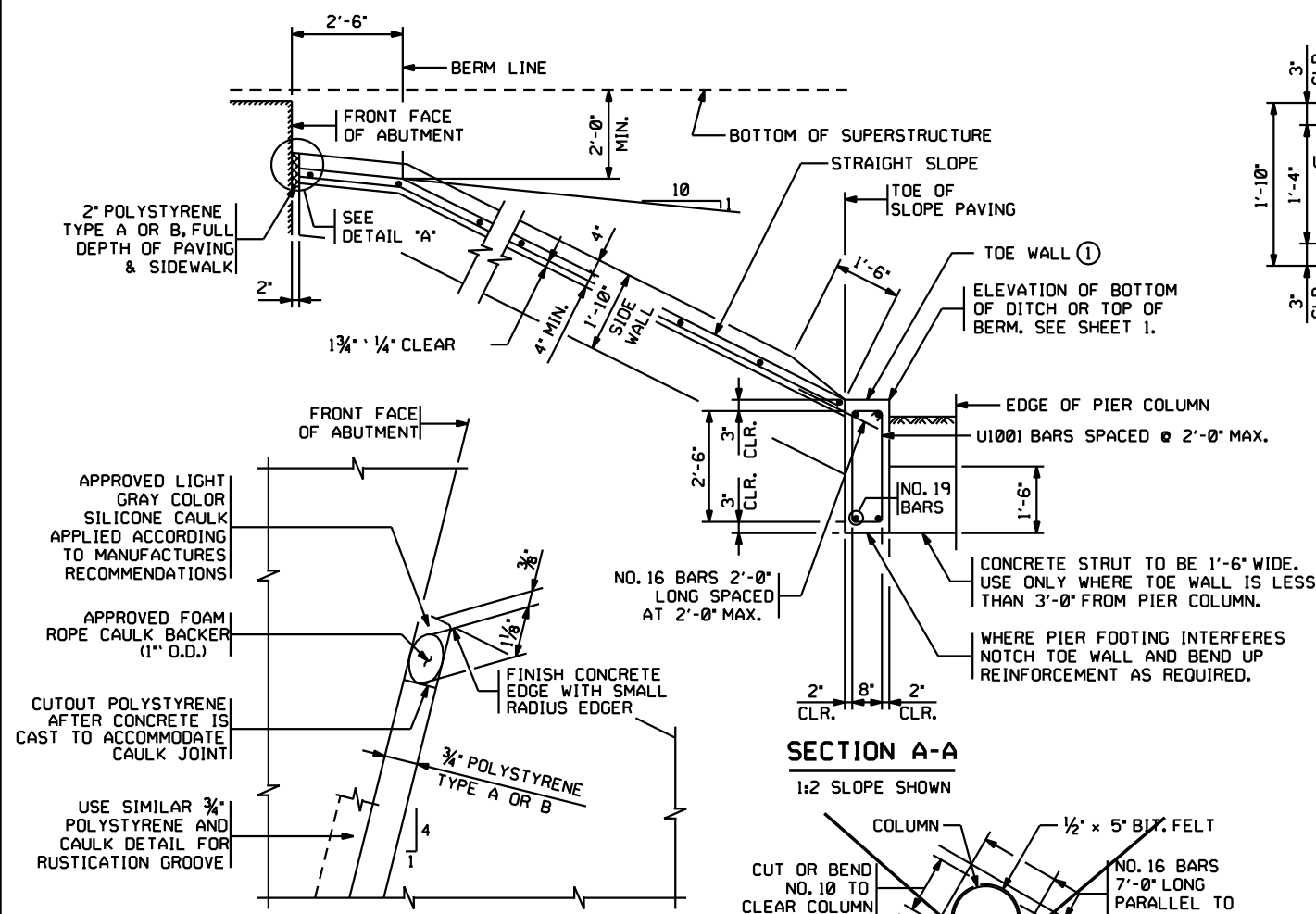
LAYOUT FOR SLOPES AT HIGH ABUTMENTS



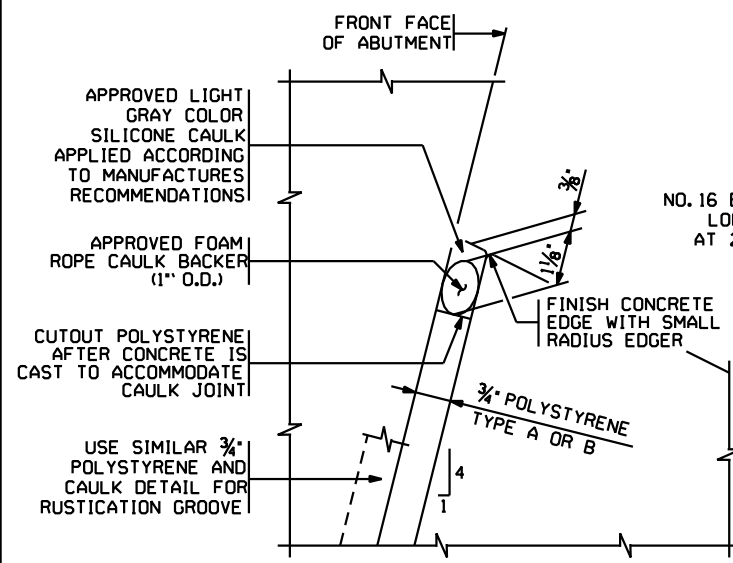
LAYOUT FOR SLOPES BETWEEN BRIDGES

Δ 2'-0" FOR TANGENT BRIDGE SUPERSTRUCTURES. VARIES 2'-0" MINIMUM FOR CURVED BRIDGE SUPERSTRUCTURE.

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

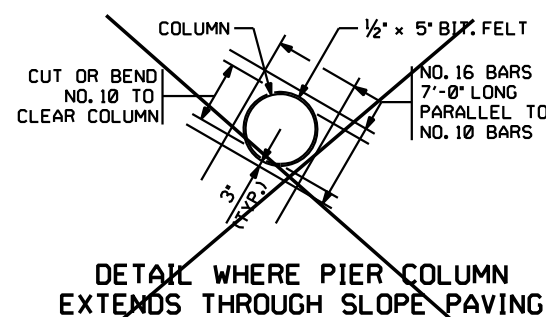


SECTION A-A
1:2 SLOPE SHOWN

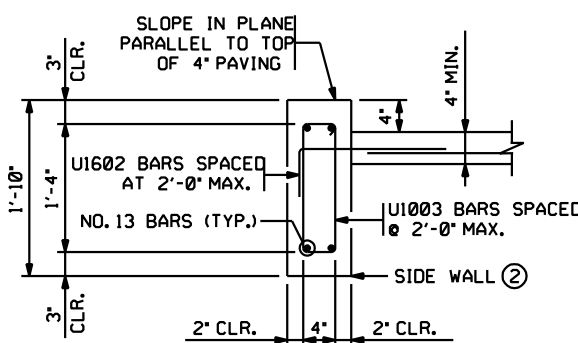


SECTION D-D

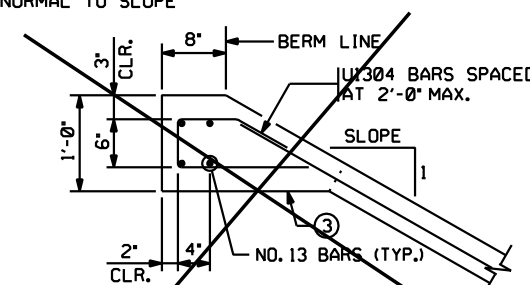
HIGH ABUTMENTS WITH RUSTICATION



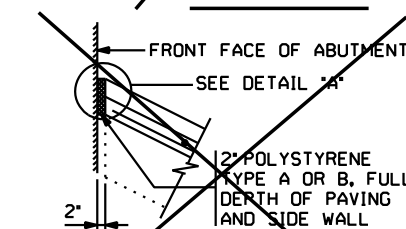
DETAIL WHERE PIER COLUMN EXTENDS THROUGH SLOPE PAVING



SECTION B-B
NORMAL TO SLOPE

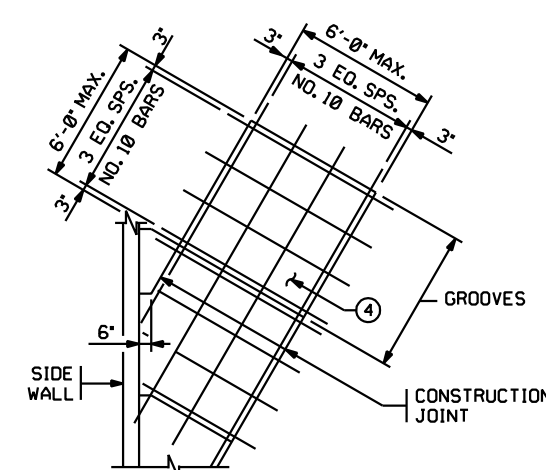


SECTION C-C

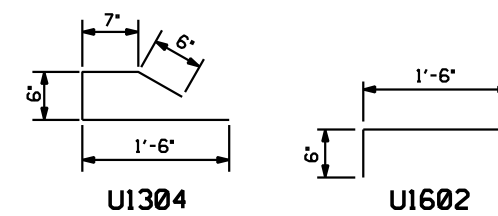


SECTION D-D

HIGH ABUTMENTS WITHOUT RUSTICATION

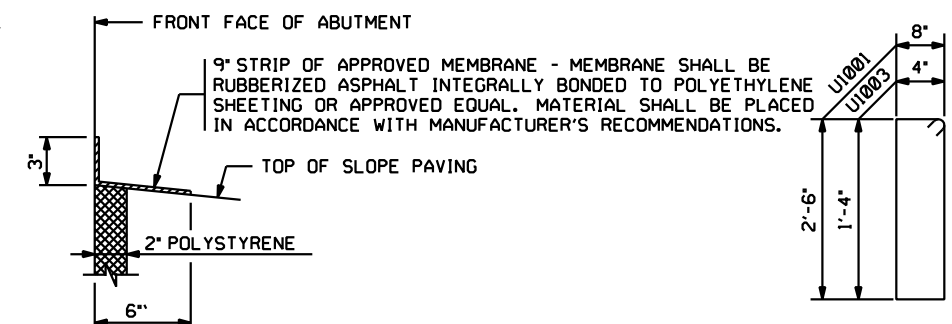


PAVING DETAIL



U1304

U1602



DETAIL 'A'

SLOPE PAVING AS PER Mn/DOT SPEC. 2514.

CONCRETE & REINFORCEMENT UNIT QUANTITIES

- 0.111 CU. YD. OF CONCRETE/LIN. FT.
8.37 LBS. OF REINFORCEMENT/LIN. FT.
- 0.046 CU. YD. OF CONCRETE/LIN. FT.
4.46 LBS. OF REINFORCEMENT/LIN. FT.
- 0.058 CU. YD. OF CONCRETE/LIN. FT.
3.70 LBS. OF REINFORCEMENT/LIN. FT.
BASED ON A SLOPE OF 1:2.
- 0.111 CU. YD. OF CONCRETE/SQ. YD.
4.50 LBS. OF REINFORCEMENT/SQ. YD.

GENERAL NOTE

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

REVISION:
APPROVED: SEPTEMBER 26, 2003
Daniel N. Sydow
STATE BRIDGE ENGINEER

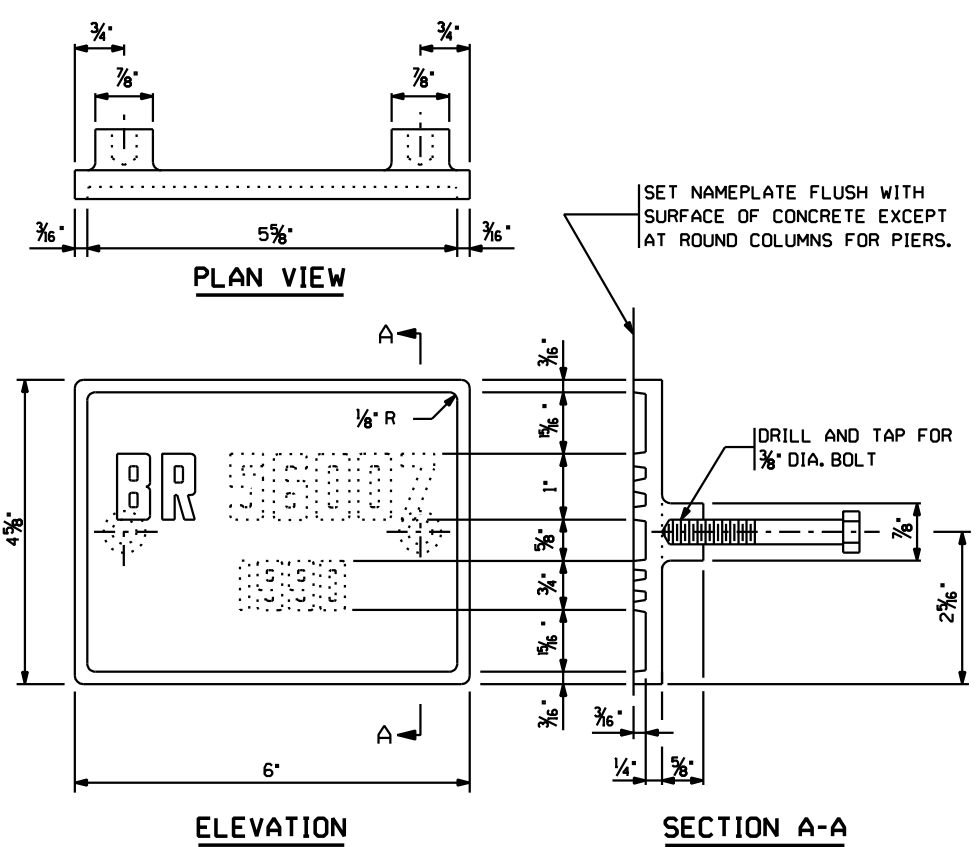
CERTIFIED BY: Daniel N. Sydow
LICENSED PROFESSIONAL ENGINEER
NAME: DANIEL N. SYDOW
DATE: 9/14/11
LIC. NO. 45662

CONCRETE SLOPE PAVING UNDER BRIDGES

DES: KLV
CHK: DNS
DR: JMM
CHK: DNS
APPROVED:
SHEET NO. B16 OF B19 SHEETS

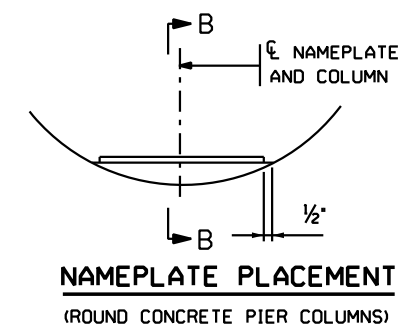
FIG. 5-397.301

BRIDGE NO. 69697

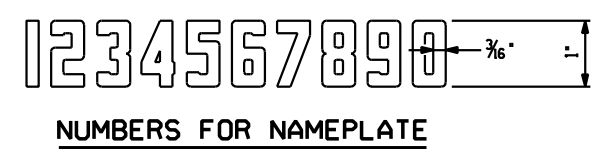


THE DASHED NUMBERS SHOWN ABOVE ARE FOR ILLUSTRATION. DATA TO BE SHOWN ON NAMEPLATE IS AS FOLLOWS:

BRIDGE 69697
YEAR 2011

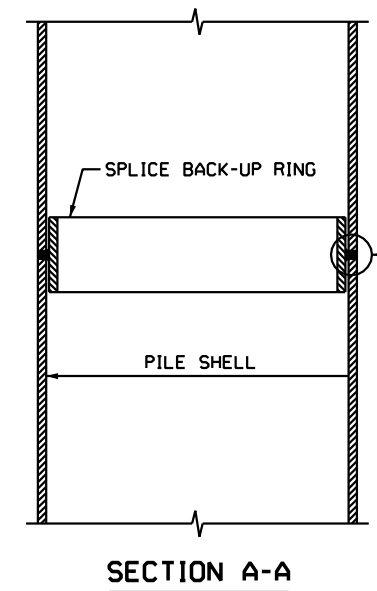
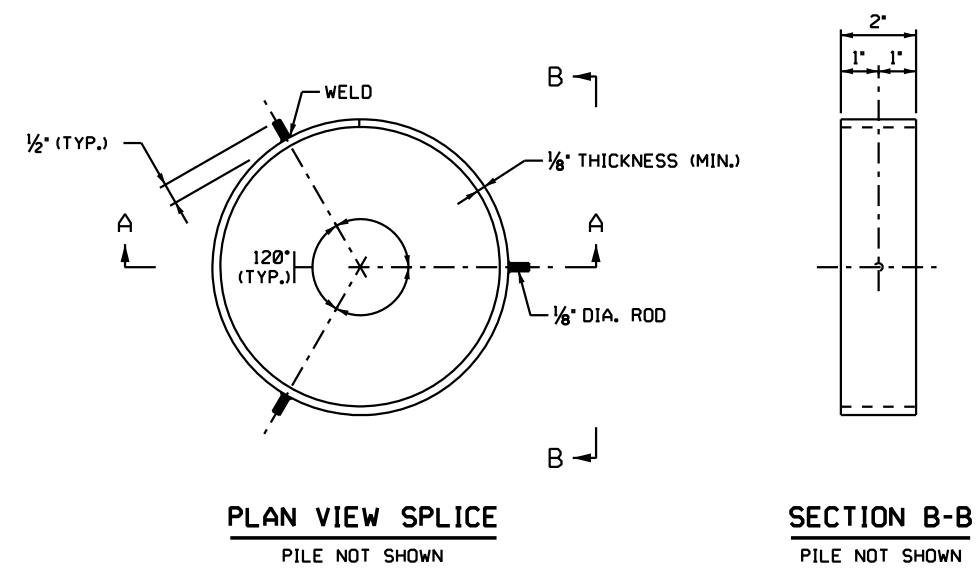


SECTION B-B



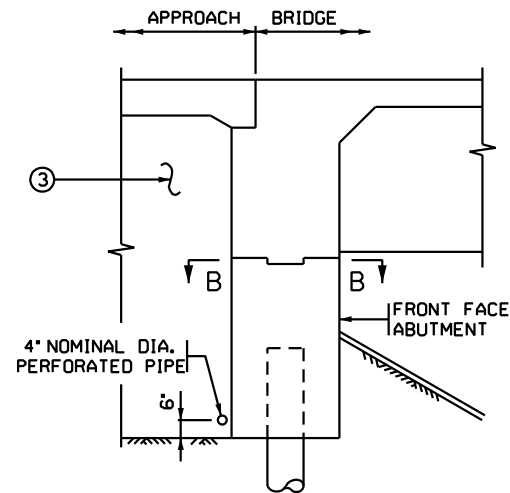
NOTES:
NO SHOP DRAWING REQUIRED.
MATERIAL SHALL COMPLY WITH Mn/DOT SPEC. 3327.
LETTERS AND NUMBERS SHALL CONFORM TO THOSE SHOWN.
DRAFT ON LETTERS AND NUMBERS SHALL NOT BE MORE THAN 3" IN 12".
HORIZONTAL SPACING OF LETTERS AND NUMBERS SHALL PRODUCE A BALANCED LAYOUT IN PROPORTION TO SPACING SHOWN.
TOP SURFACE OF LETTERS, NUMBERS AND FRAMES SHALL BE BURNISHED.
FURNISH 2 STEEL BOLTS 3/8" DIA. x 3" LONG WITH EACH PLATE.
ALL DIMENSIONS FOR 3/4" HIGH LETTERS AND NUMBERS SHALL BE IN DIRECT PROPORTION TO THOSE SHOWN FOR THE 1" HIGH LETTERS AND NUMBERS.

BRIDGE NAMEPLATE
(FOR NEW BRIDGES)



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 ELECTRODES SHALL BE CELLULOSIC TYPE ELECTRODES E-6010 OR E-6011.
ELECTRODES WHICH HAVE BECOME WET, SOILED OR DAMAGED SHALL NOT BE USED.
WELDING SHALL NOT BE DONE WHEN THE AMBIENT TEMPERATURE IS LOWER THAN 0° F. OR WHEN THE PILE IS WET OR EXPOSED TO FALLING RAIN OR SNOW. WHEN THE PILE METAL TEMPERATURE IS BELOW 32° F., THE PILE METAL IN THE AREA OF THE WELD SHALL BE HEATED TO A MINIMUM TEMPERATURE OF 70° F. AND MAINTAINED AT THIS TEMPERATURE DURING WELDING.
① FOR PILE SHELL THICKNESSES GREATER THAN 1/2", USE A B-U4a WELD CONFIGURATION.

PILE SPLICE
(CAST-IN-PLACE CONCRETE PILES)



SECTION THROUGH INTEGRAL ABUTMENT

SUMMARY OF QUANTITIES FOR DRAINAGE SYSTEM		
4" DIA. PERFORATED PIPE	70	LIN. FT.
4" DIA. NON-PERFORATED PIPE	30	LIN. FT.
45° ELBOW	2	EACH
4" DIA. END CAP	2	EACH
4" DIA. COUPLING	2	EACH
PIPE SLEEVE	2	EACH
① PRECAST CONCRETE HEADWALL	2	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.

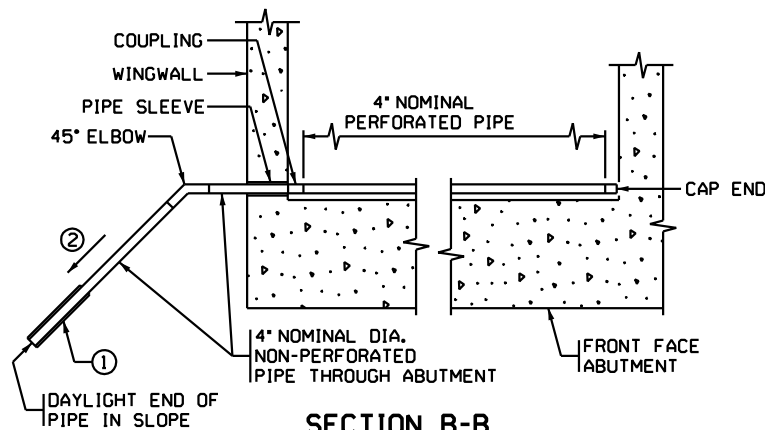
PAYMENT WILL BE INCLUDED IN THE SINGLE LUMP SUM PRICE FOR ITEM 2502.502 "DRAINAGE SYSTEM TYPE (B910)".

NOTES:

ALL PIPE SHALL COMPLY WITH Mn/DOT SPEC. 3245.

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

- ① PRECAST CONCRETE HEADWALL WITH RODENT SCREEN. SEE STANDARD PLATE 3131 FOR DETAILS.
- ② 1/8" PER FT. MINIMUM SLOPE.
- ③ MATERIAL SHALL COMPLY WITH Mn/DOT SPEC. 3149.2B SELECT GRANULAR BORROW, MODIFIED SO THAT NO MORE THAN 10% PASSES A NO. 200 SIEVE. (UNDER GRADING PORTION OF CONTRACT)



SECTION B-B

\$PLTDRVS\$
\$PENTRUS\$
\$DATES\$
\$FILEL\$

DES BY	KLW	BOOK NO	XXX
DR BY	JMM	JOB NO	27-0133.00
CHK BY	DNS	DATE	9/14/11

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

CERTIFIED BY: *Daniel N. Sydow* 9/14/11 45662

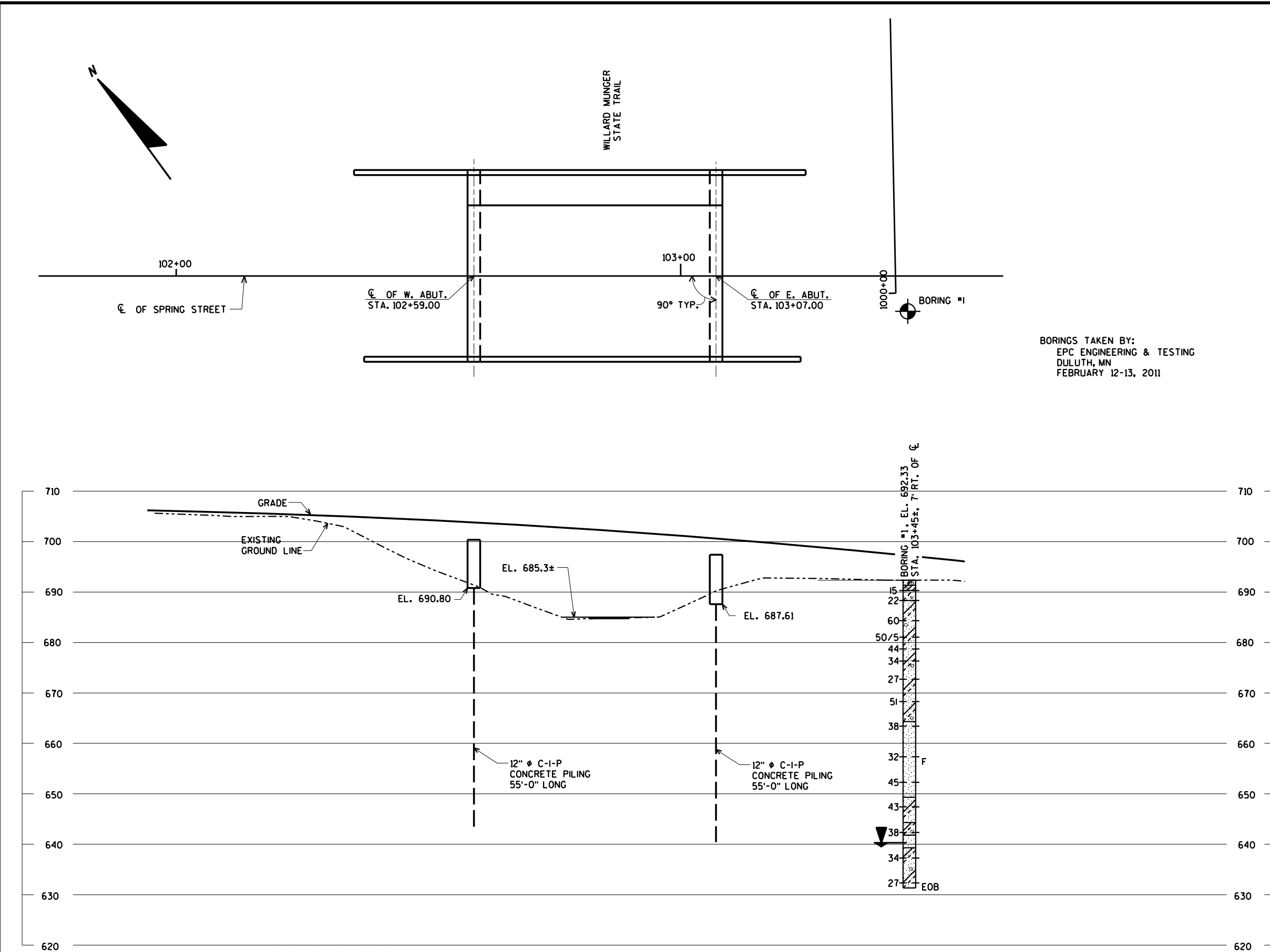
DANIEL N. SYDOW DATE LIC. NO.

AYRES
ASSOCIATES
Duluth, Minnesota

RIVERSIDE COMMUNITY IMPROVEMENTS #0699TR
SPRING STREET BRIDGE # 69697
CITY OF DULUTH, MINNESOTA

DRAINAGE SYSTEM

SHEET NO.
B18 OF B19



ABBREVIATIONS

F — FINE	M — MEDIUM	C — COARSE
WS — WEATHERED	SO — SOUND	

MATERIAL SYMBOLS

TOPSOIL	SILT	SANDSTONE
SAND	PEAT	LIMESTONE
GRAVEL	CLAY	IGNEOUS ROCK

LEGEND OF PROBING

LEGEND OF BORING

UNLESS OTHERWISE SPECIFIED, THE BLOWS PER FOOT AT THE LOCATIONS INDICATED ARE BASED ON DRIVING A 2" O.D. X 1.4" I.D. SPLIT SPOON SAMPLER WITH A 140# HAMMER HAVING A FREE FALL OF 30". THE BLOW COUNT IS TAKEN IN UNDISTURBED SOIL IMMEDIATELY BELOW A CASED OR OPEN HOLE ELIMINATING SIDE FRICTION ON THE DRIVE PIPE.

SUBSURFACE EXPLORATION FOR FOUNDATION DESIGN AND BIDDERS INFORMATION

TO OBTAIN RELATIVE DATA CONCERNING THE CHARACTER OF MATERIAL IN AND UPON WHICH THE FOUNDATION MIGHT BE BUILT, BORINGS AND/OR SOUNDINGS WERE MADE AT POINTS APPROXIMATELY AS INDICATED ON THIS DRAWING. THE DATA PRESENTED HEREIN REPRESENTS THE FINDINGS OF THE SUBSURFACE EXPLORATIONS MADE. HOWEVER, BECAUSE THE DEPTHS INVESTIGATED ARE LIMITED AND THE AREA OF THE BORINGS AND/OR SOUNDINGS IS VERY SMALL IN RELATION TO THE ENTIRE AREA, THE ENGINEER DOES NOT WARRANT CONDITIONS BELOW THE DEPTHS INVESTIGATED OR THAT THE CLASSIFICATION OF MATERIAL ENCOUNTERED IN THESE INVESTIGATIONS IS NECESSARILY TYPICAL OF THE ENTIRE SITE.