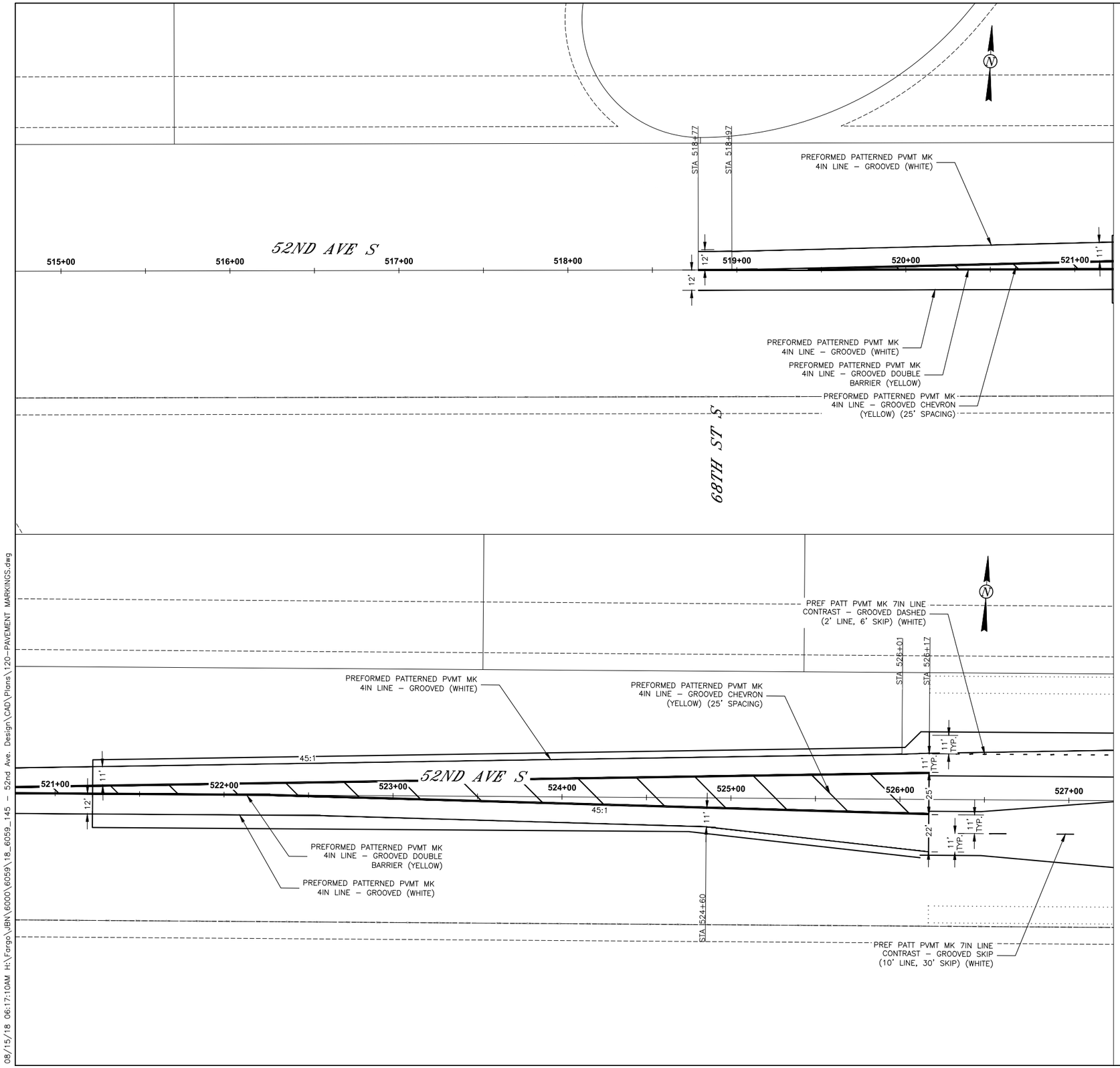
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	120	1



0 30' 60'

SPEC	CODE	BID ITEM	QTY	UNIT
762	1305	PREFORMED PATTERNED PVMT MK 4IN LINE–GROOVED		
		STA 518+77 TO STA 527+00 YELLOW	3095	LF
		STA 518+77 TO STA 527+00 WHITE	1564	LF
		TOTAL	4659	LF
762	1344	PREF PATT PVMT MK 7IN LINE CONTRAST–GROOVED		
		STA 518+77 TO STA 527+00	38	LF

THE CITY OF Fargo FAR MORE

Proj. No. 6059-0145
Houston Engineering Inc.
Ph: 701.237.5065

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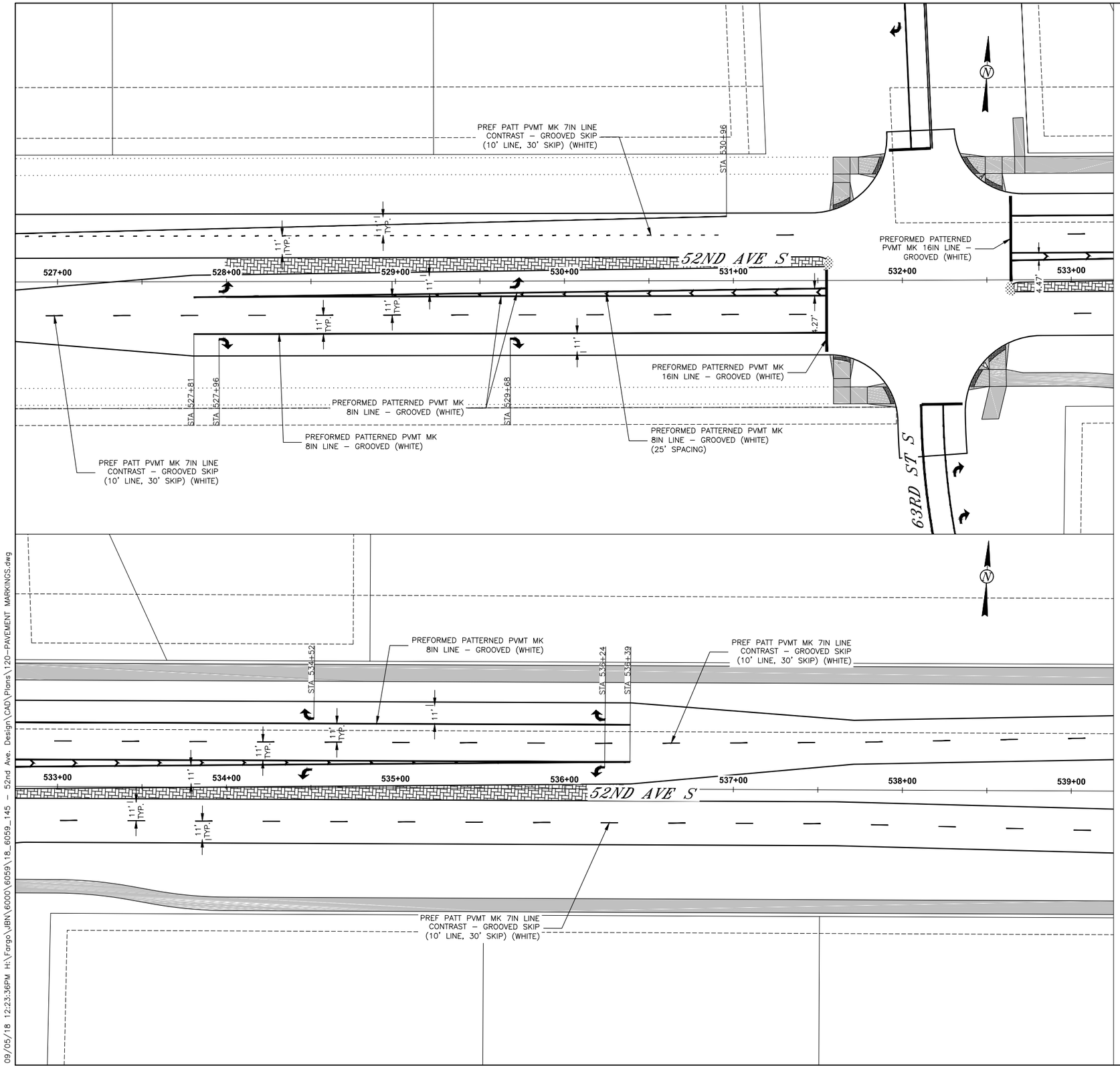
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Pavement Markings

52nd Ave S - West of 63rd St S to 45th St S

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	120	2



0 30' 60'

SPEC	CODE	BID ITEM	QTY	UNIT
762	0122	PREFORMED PATTERNED PVMT MK–MESSAGE (GROOVED) STA 527+00 TO STA 539+00	128	SF
762	1309	PREFORMED PATTERNED PVMT MK 8IN LINE–GROOVED STA 527+00 TO STA 539+00	2294	LF
762	1317	PREFORMED PATTERNED PVMT MK 16IN LINE–GROOVED STA 527+00 TO STA 539+00	99	LF
762	1344	PREF PATT PVMT MK 7IN LINE CONTRAST–GROOVED STA 527+00 TO STA 539+00	518	LF

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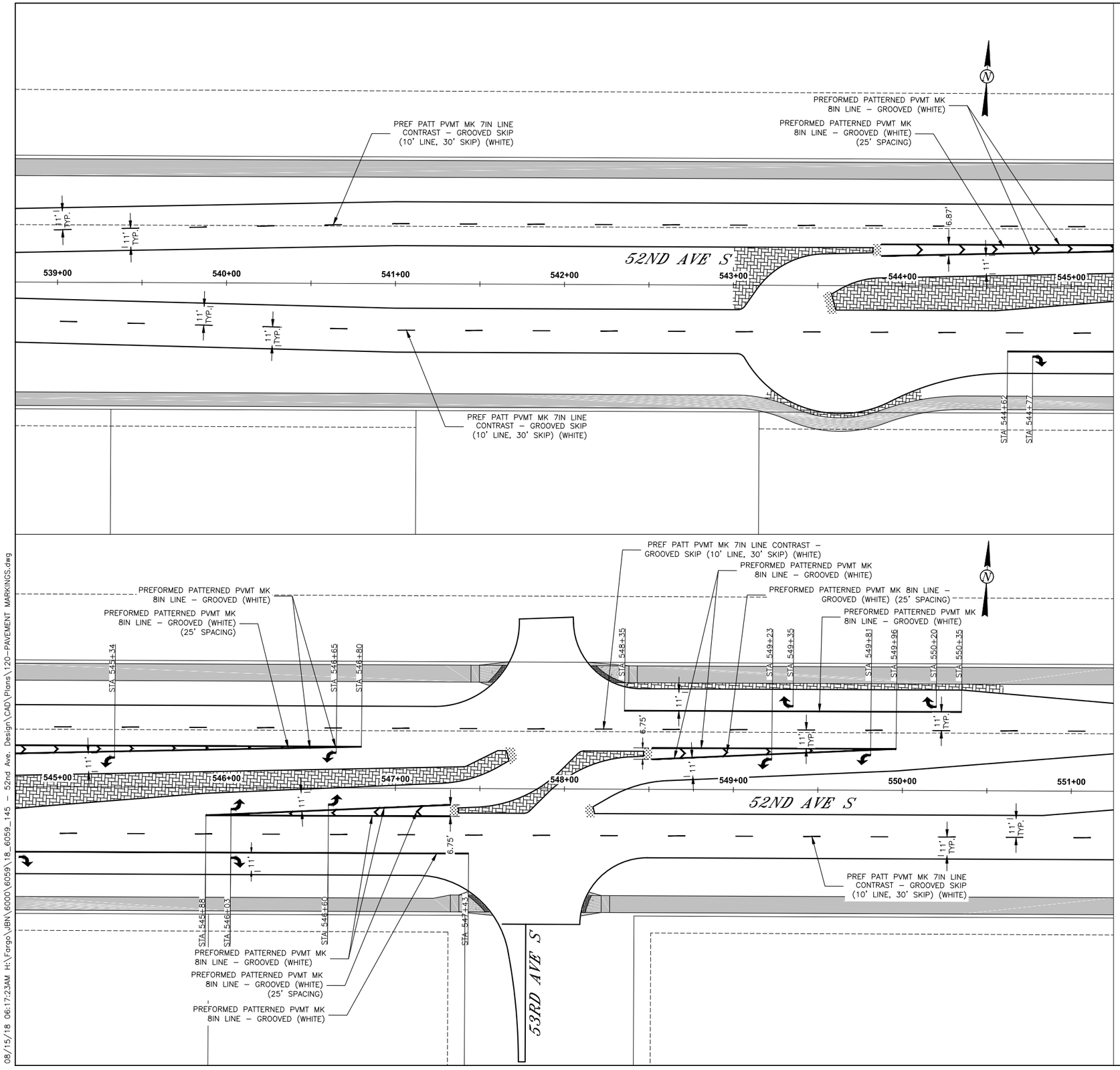
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Pavement Markings

52nd Ave S - West of 63rd St S to 45th St S

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	120	3



0 30' 60'

SPEC	CODE	BID ITEM	QTY	UNIT
762	0122	PREFORMED PATTERNED PVMT MK–MESSAGE (GROOVED)		
		STA 539+00 TO STA 551+00	160	SF
762	1309	PREFORMED PATTERNED PVMT MK 8IN LINE–GROOVED		
		STA 539+00 TO STA 551+00	1752	LF
762	1344	PREF PATT PVMT MK 7IN LINE CONTRAST–GROOVED		
		STA 539+00 TO STA 551+00	600	LF

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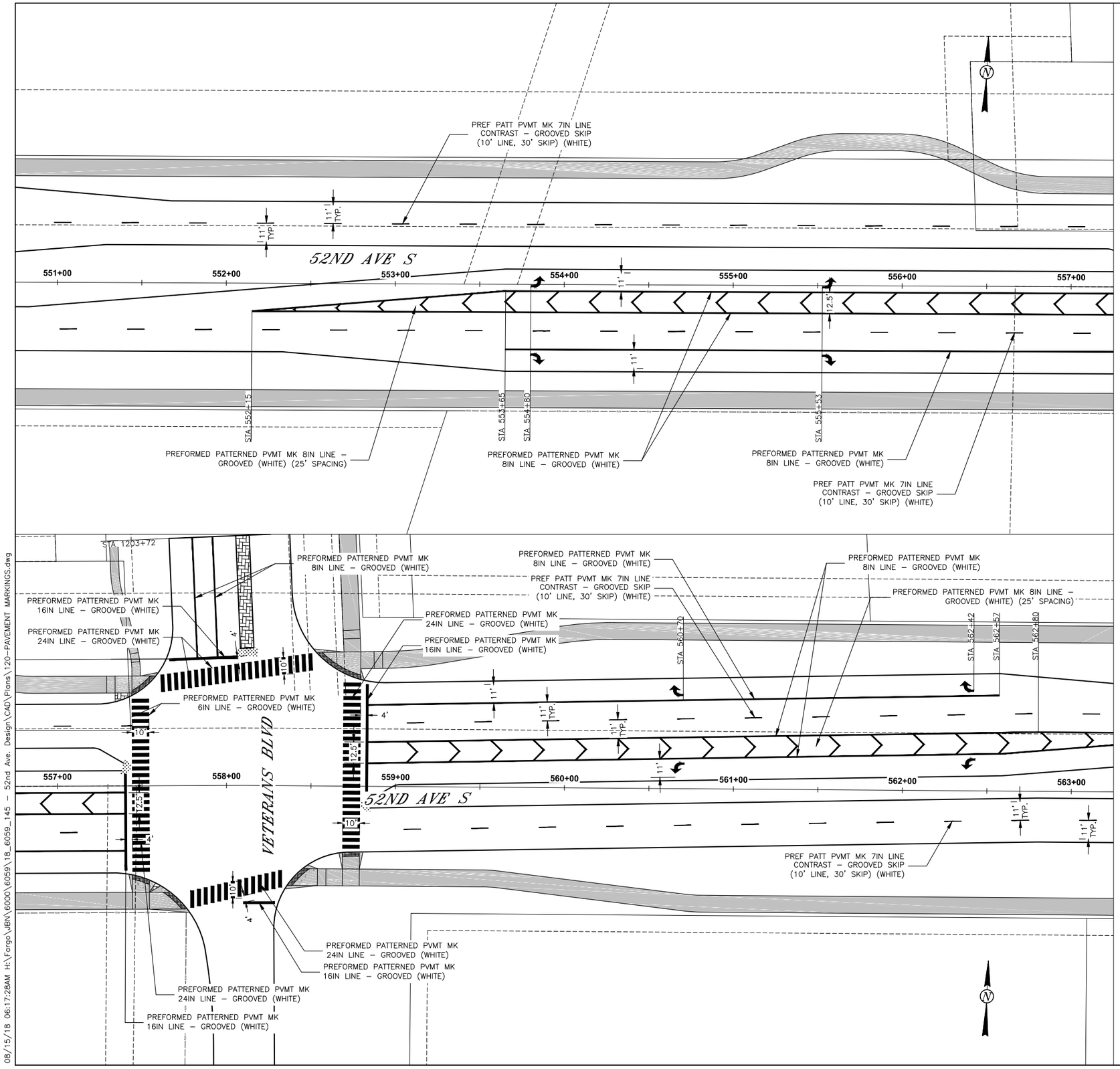
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Pavement Markings

52nd Ave S - West of 63rd St S to 45th St S

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	120	4



0 30' 60'

SPEC	CODE	BID ITEM	QTY	UNIT
762	0122	PREFORMED PATTERNED PVMT MK–MESSAGE (GROOVED) STA 551+00 TO STA 563+00	128	SF
762	1309	PREFORMED PATTERNED PVMT MK 8IN LINE–GROOVED STA 551+00 TO STA 563+00	3370	LF
762	1317	PREFORMED PATTERNED PVMT MK 16IN LINE–GROOVED STA 551+00 TO STA 563+00	183	LF
762	1325	PREFORMED PATTERNED PVMT MK 24IN LINE–GROOVED STA 551+00 TO STA 563+00	880	LF
762	1344	PREF PATT PVMT MK 7IN LINE CONTRAST–GROOVED STA 551+00 TO STA 563+00	526	LF

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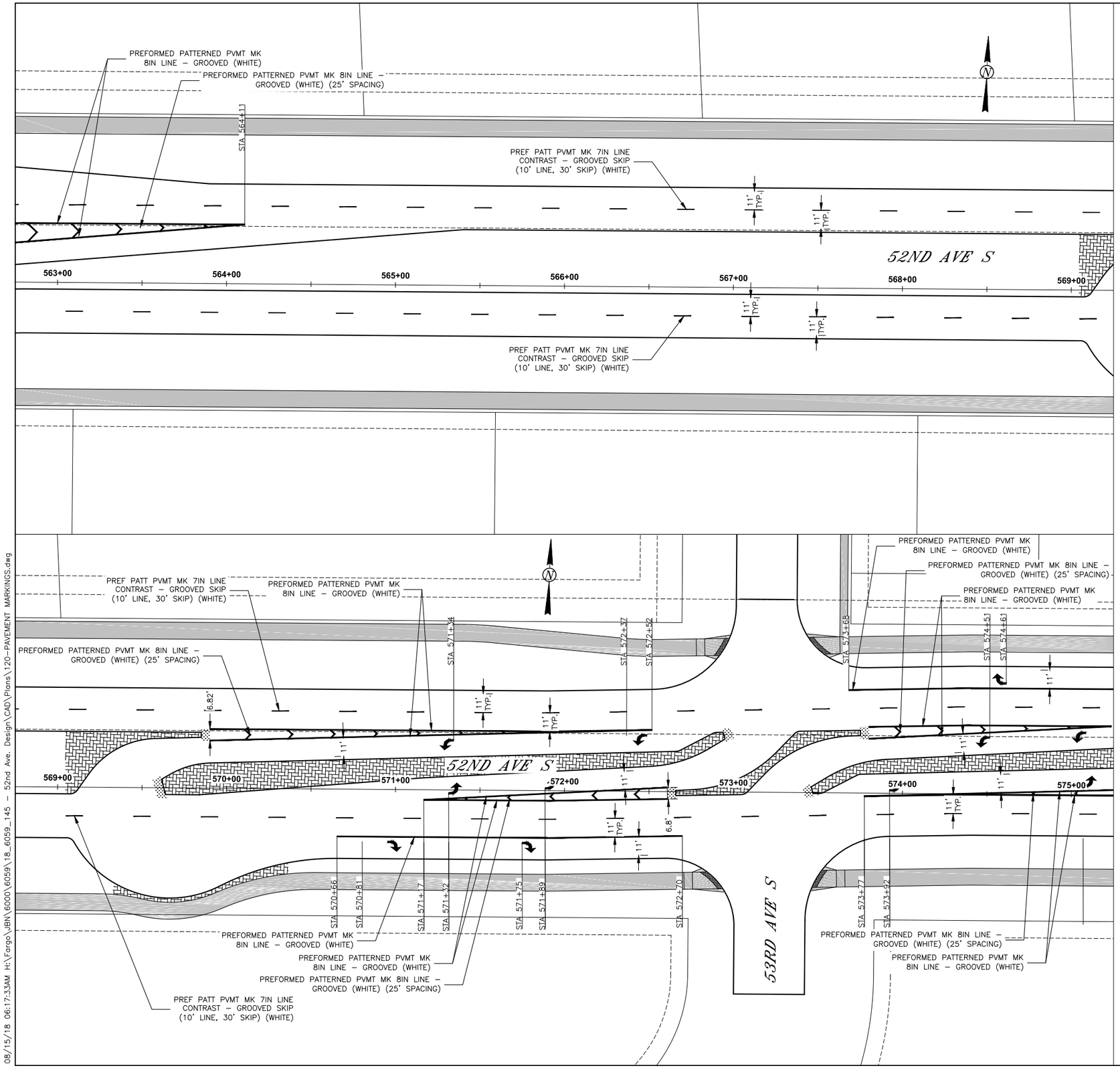
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Pavement Markings

52nd Ave S - West of 63rd St S to 45th St S

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	120	5



0 30' 60'

SPEC	CODE	BID ITEM	QTY	UNIT
762	0122	PREFORMED PATTERNED PVMT MK–MESSAGE (GROOVED)		
		STA 563+00 TO STA 575+00	144	SF
762	1309	PREFORMED PATTERNED PVMT MK 8IN LINE–GROOVED		
		STA 563+00 TO STA 575+00	1986	LF
762	1344	PREF PATT PVMT MK 7IN LINE CONTRAST–GROOVED		
		STA 563+00 TO STA 575+00	600	LF

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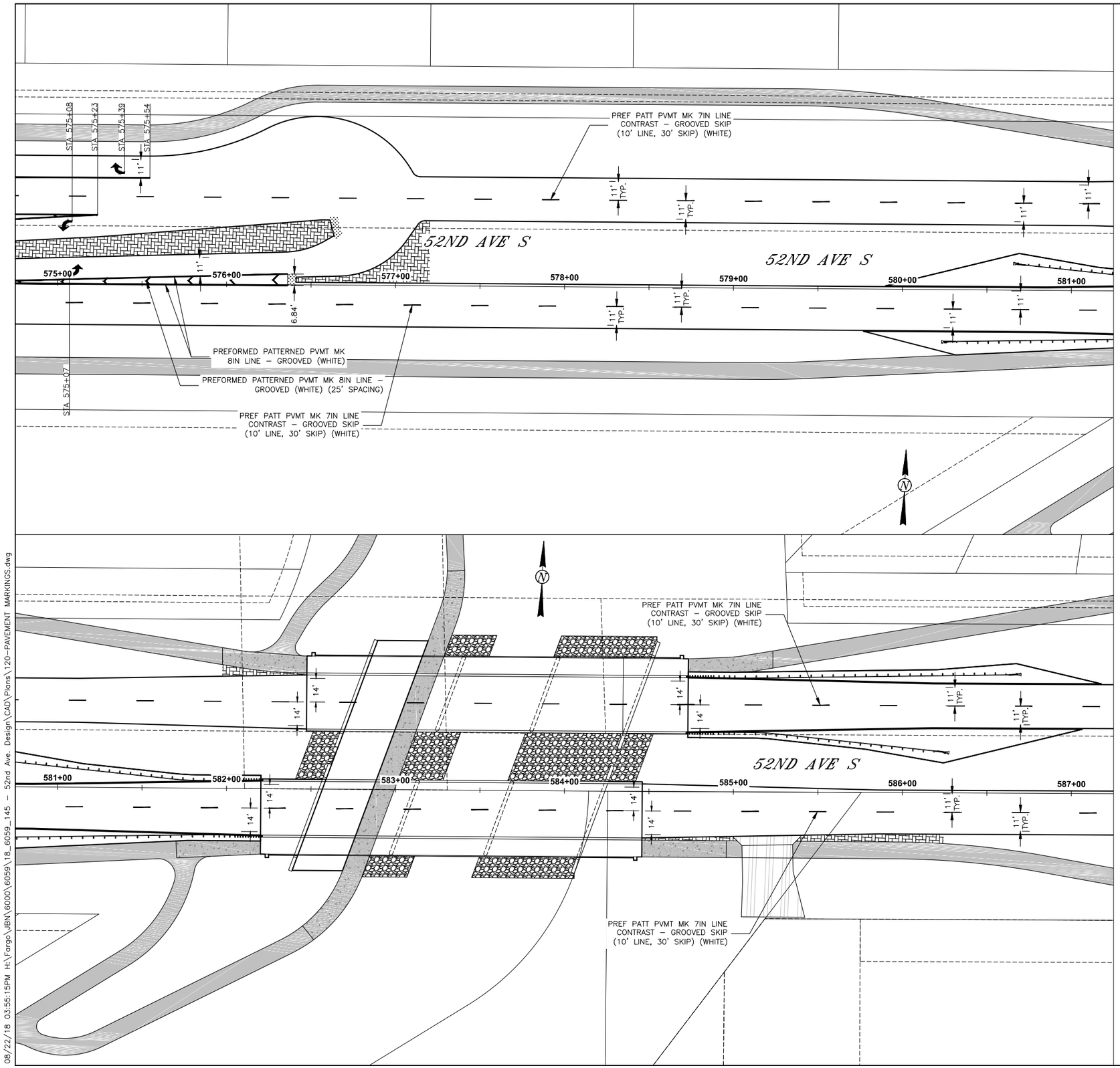
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Pavement Markings

52nd Ave S - West of 63rd St S to 45th St S

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	120	6



0 30' 60'

SPEC	CODE	BID ITEM	QTY	UNIT
762	0122	PREFORMED PATTERNED PVMT MK–MESSAGE (GROOVED) STA 575+00 TO STA 587+00	48	SF
762	1309	PREFORMED PATTERNED PVMT MK 8IN LINE–GROOVED STA 575+00 TO STA 587+00	414	LF
762	1344	PREF PATT PVMT MK 7IN LINE CONTRAST–GROOVED STA 575+00 TO STA 587+00	600	LF

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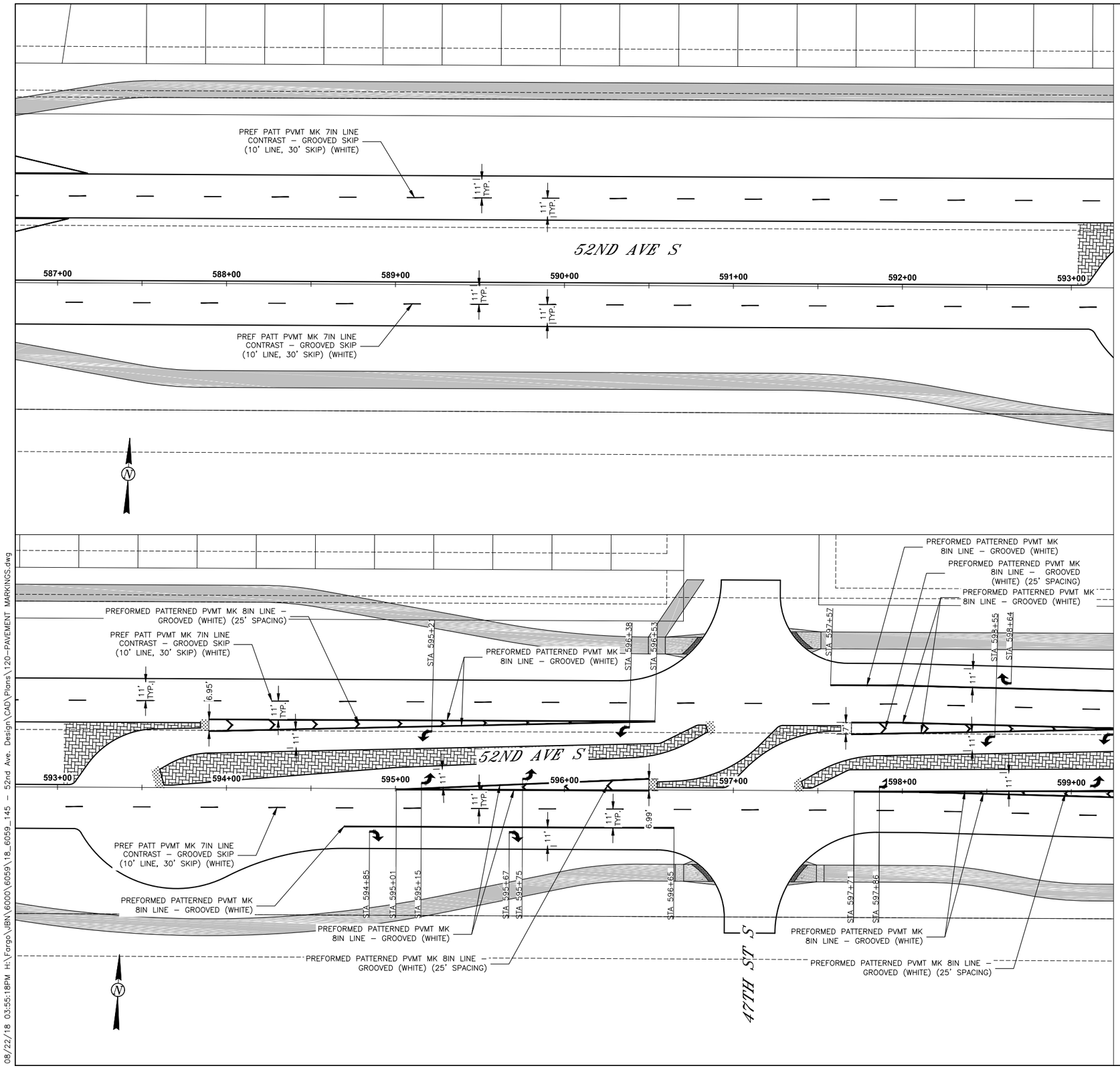
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Pavement Markings

52nd Ave S - West of 63rd St S to 45th St S

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	120	7



0 30' 60'

SPEC	CODE	BID ITEM	QTY	UNIT
762	0122	PREFORMED PATTERNED PVMT MK–MESSAGE (GROOVED) STA 587+00 TO STA 599+00	144	SF
762	1309	PREFORMED PATTERNED PVMT MK 8IN LINE–GROOVED STA 587+00 TO STA 599+00	1801	LF
762	1344	PREF PATT PVMT MK 7IN LINE CONTRAST–GROOVED STA 587+00 TO STA 599+00	600	LF

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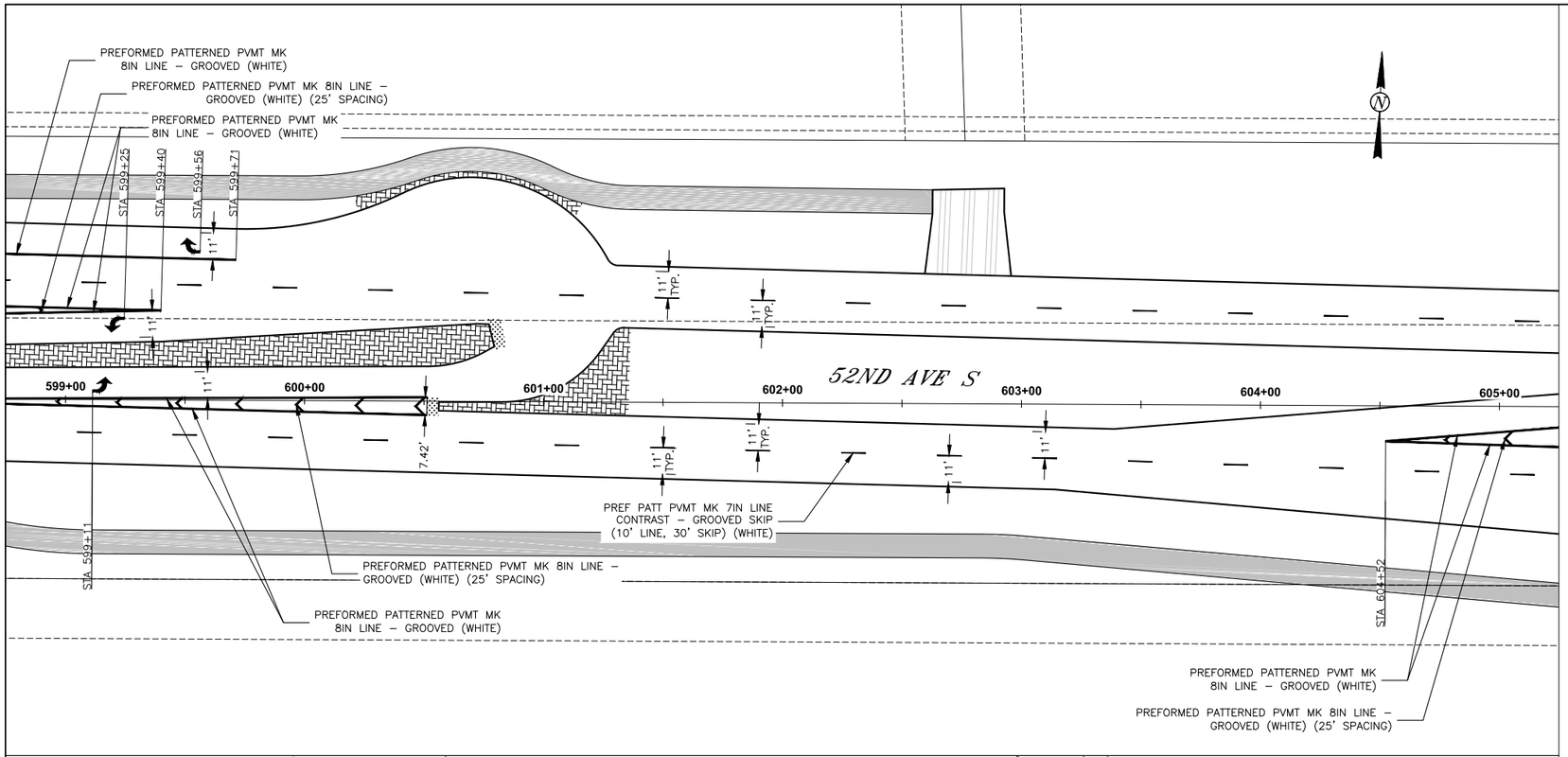
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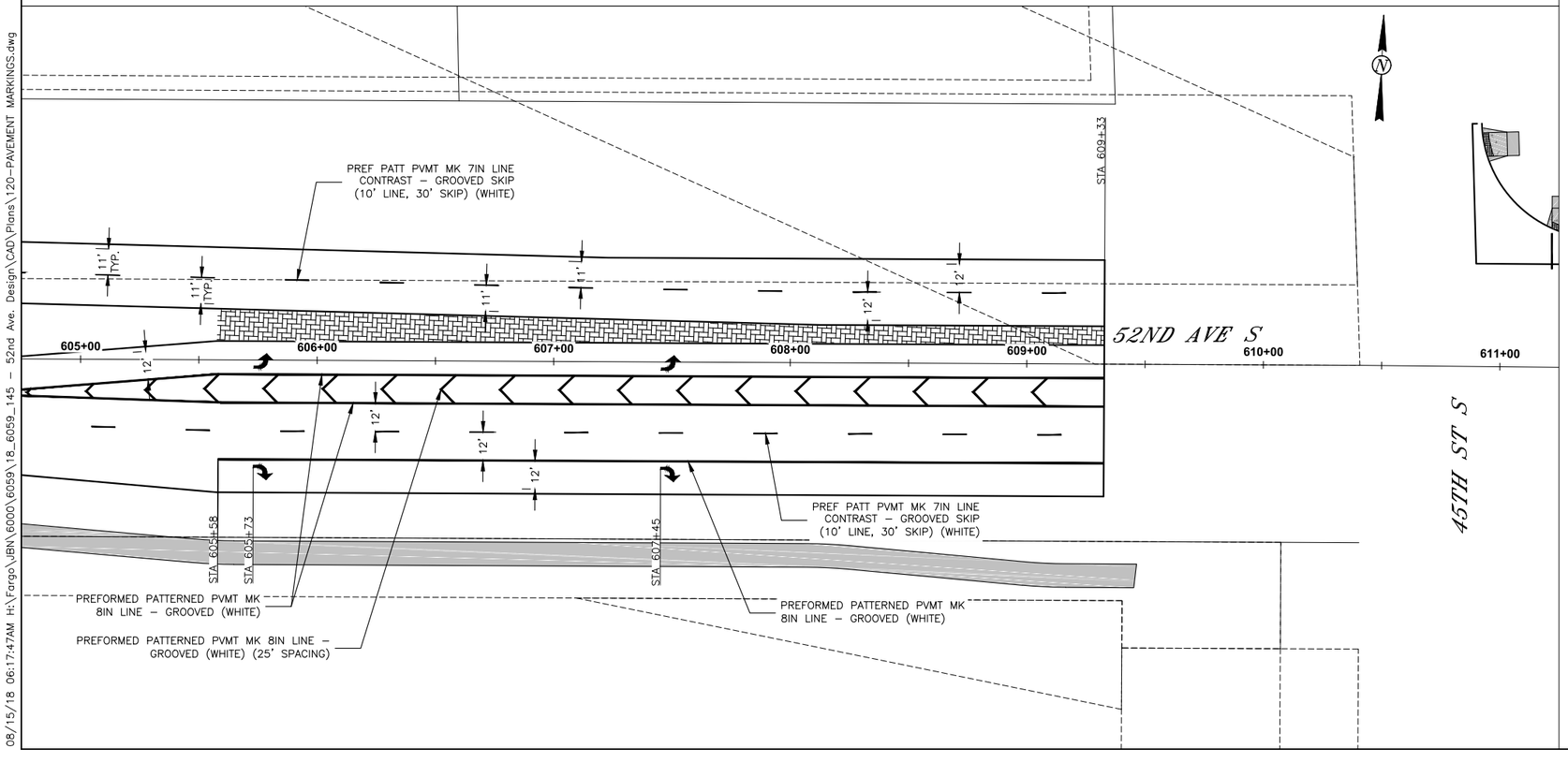
Pavement Markings

52nd Ave S - West of 63rd St S to 45th St S

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	120	8





0 30' 60'

SPEC	CODE	BID ITEM	QTY	UNIT
762	0122	PREFORMED PATTERNED PVMT MK–MESSAGE (GROOVED) STA 599+00 TO STA 609+33	112	SF
762	1309	PREFORMED PATTERNED PVMT MK 8IN LINE–GROOVED STA 599+00 TO STA 609+33	2118	LF
762	1344	PREF PATT PVMT MK 7IN LINE CONTRAST–GROOVED STA 599+00 TO STA 609+33	520	LF

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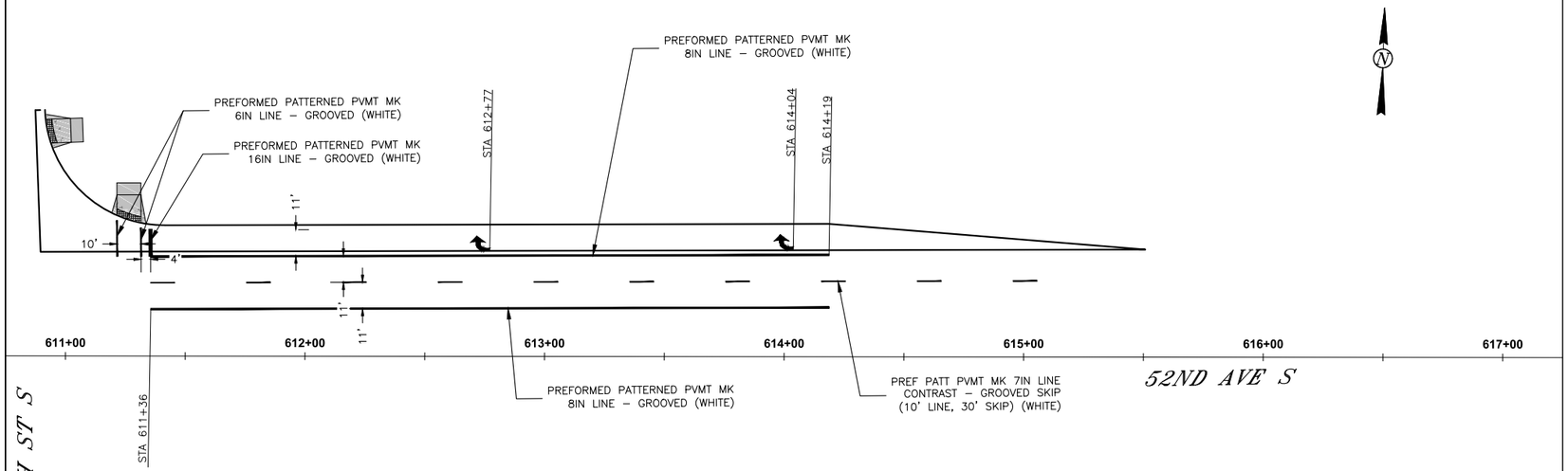
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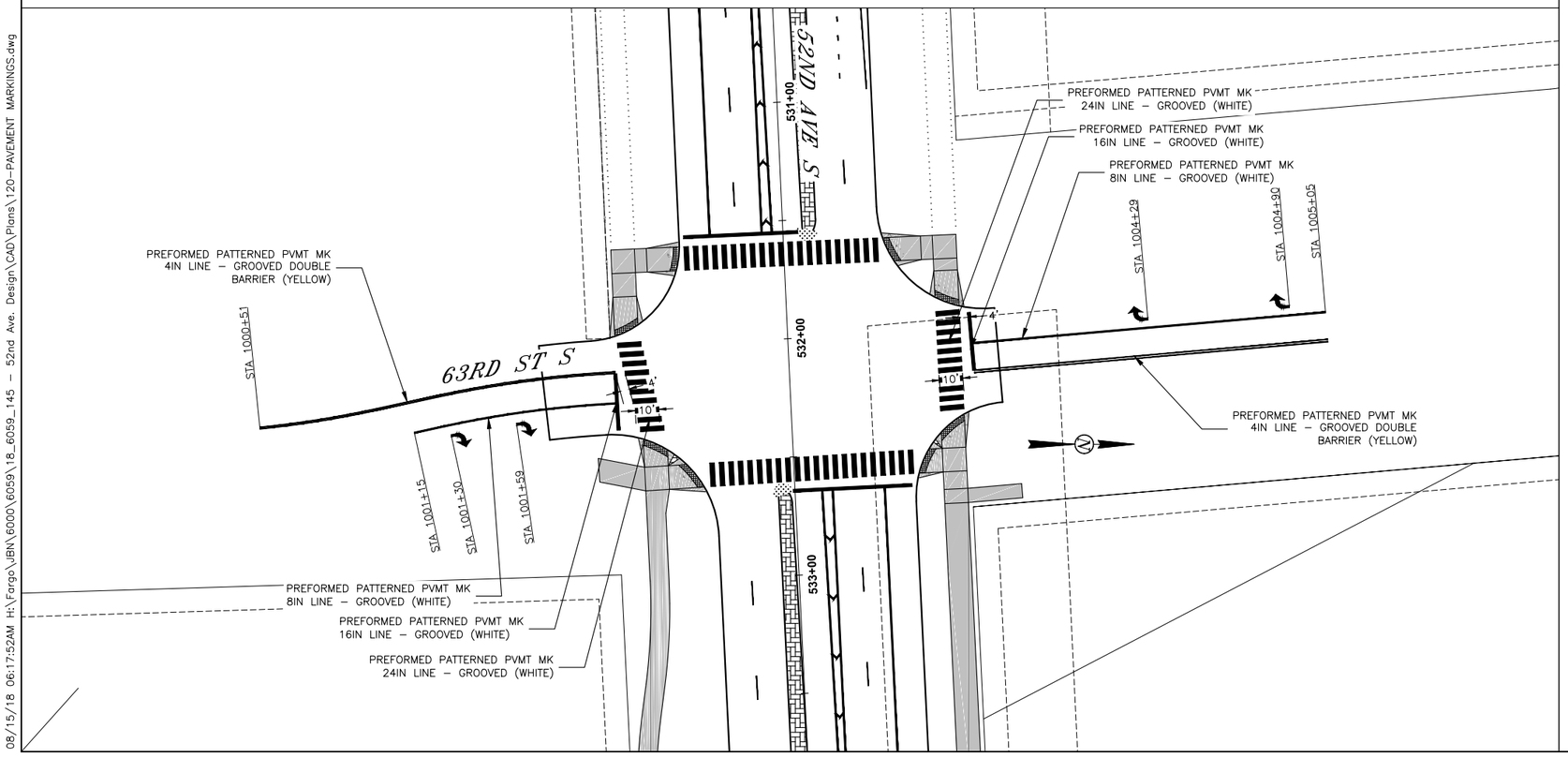
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52nd Ave S - West of 63rd St S to 45th St S

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	120	9





0 30' 60'

SPEC	CODE	BID ITEM	QTY	UNIT
762	0122	PREFORMED PATTERNED PVMT MK–MESSAGE (GROOVED)		
		STA 610+90 TO STA 615+51	32	SF
		STA 1000+51 TO STA 1005+05	64	SF
		TOTAL	96	SF
762	1305	PREFORMED PATTERNED PVMT MK 4IN LINE–GROOVED		
		STA 1000+51 TO STA 1005+05	605	LF
762	1307	PREFORMED PATTERNED PVMT MK 6IN LINE–GROOVED		
		STA 610+90 TO STA 615+51	27	LF
762	1309	PREFORMED PATTERNED PVMT MK 8IN LINE–GROOVED		
		STA 610+90 TO STA 615+51	566	LF
		STA 1000+51 TO STA 1005+05	237	LF
		TOTAL	803	LF
762	1317	PREFORMED PATTERNED PVMT MK 16IN LINE–GROOVED		
		STA 610+90 TO STA 615+51	11	LF
		STA 1000+51 TO STA 1005+05	49	LF
		TOTAL	60	LF
762	1325	PREFORMED PATTERNED PVMT MK 24IN LINE–GROOVED		
		STA 1000+51 TO STA 1005+05	210	LF
762	1344	PREF PATT PVMT MK 7IN LINE CONTRAST–GROOVED		
		STA 610+90 TO STA 615+51	100	LF

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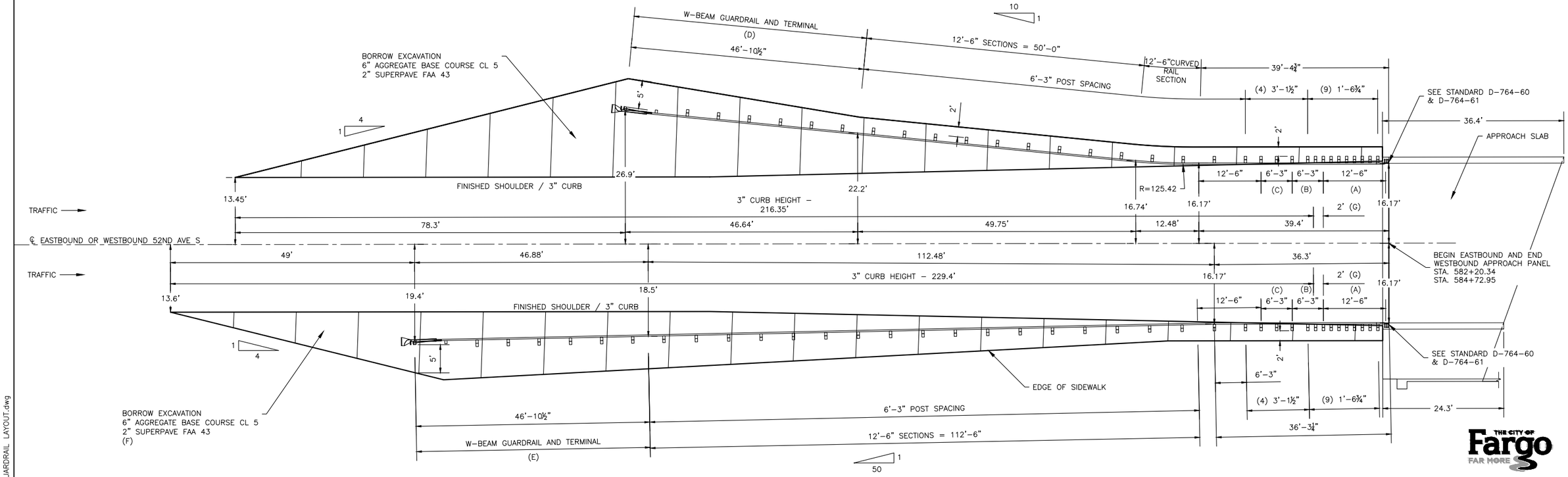
Pavement Markings

52nd Ave S - West of 63rd St S to 45th St S

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23 USC § 409 Documents
NDDOT Reserves All Objections

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	130	1



(A) THRIE BEAM RAIL SECTION (DOUBLE THICKNESS)

(B) THREE BEAM RAIL SECTION

(C) ASYMMETRICAL W-THRIE BEAM TRANSITION SECTION

(D) INSTALL MGS FLARED ENERGY ABSORBING TERMINAL (STANDARD DRAWING D-764-38

(E) INSTALL EITHER MASH SOFTSTOP END TERMINAL (STANDARD DRAWING D-764-50) OR MASH SEQUENTIAL KINKING TERMINAL (STANDARD DRAWING D-764-51)

(F) OUTSIDE GUARDRAIL EMBANKMENT SHOWN FOR EASTBOUND ROADWAY. SEE STANDARD DRAWING 764-48 FOR GRADING OF WESTBOUND ROADWAY

(G) TRANSITION 3" CURB HEIGHT TO 6" CURB HEIGHT

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Thrie - MGS W-Beam Layout

Br No 09-140-30.0R Sta. 582+20.34

Br No 09-140-30.0L Sta. 584+72.95

52nd Ave S - West of 63rd St S to 45th St S

08/22/18 03:56:24PM H:\Fargo\JBN\6000\6059\18_6059_145 - 52nd Ave. Design\CAD\Plans\130-GUARDRAIL LAYOUT.dwg

23 USC § 409 Documents
NDDOT Reserves All Objections

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	130	2

MGS THRIE/W-BEAM GUARDRAIL SUMMARY OF QUANTITIES																
MGS THRIE/W-BEAM GUARDRAIL AT BRIDGE ENDS																
LOCATION	(A) 5/8" Ø x18" LONG GUARD-RAIL BOLT	(A) 6" x 8" x 6'-0" TIMBER POST	(A) 6" x 8" x 7'-0" TIMBER POST	(A) 6" x 8" x 14" TIMBER BLOCK	(A) 6" x 8" x 19" TIMBER BLOCK	(A) 5/8 Ø x 1 1/4" LONG GUARD-RAIL BOLT	(A) 12'-6" STRAIGHT W-BEAM RAIL SECTION	(A) 12'-6" CURVED W-BEAM RAIL SECTION	(A) REFLECTOR-IZED PLATES	(A) 6'-3" W-THRIE BEAM (12 GUAGE)	(A) 6'-3" W-THRIE BEAM TRANSITION (10 GUAGE)	(A) 12'-6" DOUBLE THRIE BEAM SECTION	(A) 2'-6" THRIE BEAM TERM-INAL CON-NECTOR	(A) SINGLE SLOPE TO THRIE BEAM CONNECTOR PLATE	(A) 7/8" Ø x 15" LONG HEX HEAD BOLT	(A) 3/4" Ø x 2-1/2" LONG POST BOLT
	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH
Sta 580+71.61 EB to Sta 582+20.34 EB Rt	53	25	6	13	12	96	10	0	7	1	1	1	1	1	5	2
Sta 581+18.70 EB to Sta 582+20.34 EB Rt Mdn	31	20	6	8	12	72	5	1	5	1	1	1	1	1	5	2
Total	**84**	**45**	**12**	**21**	**24**	**168**	**15**	**1**	**12**	**2**	**2**	**2**	**2**	**2**	**10**	**4**

MGS THRIE/W-BEAM GUARDRAIL SUMMARY OF QUANTITIES																
MGS THRIE/W-BEAM GUARDRAIL AT BRIDGE ENDS																
LOCATION	(A) 5/8" Ø x18" LONG GUARD-RAIL BOLT	(A) 6" x 8" x 6'-0" TIMBER POST	(A) 6" x 8" x 7'-0" TIMBER POST	(A) 6" x 8" x 14" TIMBER BLOCK	(A) 6" x 8" x 19" TIMBER BLOCK	(A) 5/8 Ø x 1 1/4" LONG GUARD-RAIL BOLT	(A) 12'-6" STRAIGHT W-BEAM RAIL SECTION	(A) 12'-6" CURVED W-BEAM RAIL SECTION	(A) REFLECTOR-IZED PLATES	(A) 6'-3" W-THRIE BEAM (12 GUAGE)	(A) 6'-3" W-THRIE BEAM TRANSITION (10 GUAGE)	(A) 12'-6" DOUBLE THRIE BEAM SECTION	(A) 2'-6" THRIE BEAM TERM-INAL CON-NECTOR	(A) SINGLE SLOPE TO THRIE BEAM CONNECTOR PLATE	(A) 7/8" Ø x 15" LONG HEX HEAD BOLT	(A) 3/4" Ø x 2-1/2" LONG POST BOLT
	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH
Sta 584+72.95 WB to Sta 585+74.59 WB Lt Mdn	53	25	6	13	12	96	10	0	7	1	1	1	1	1	5	2
Sta 584+72.95 WB to Sta 586+21.68 WB Lt	31	20	6	8	12	72	5	1	5	1	1	1	1	1	5	2
Total	**84**	**45**	**12**	**21**	**24**	**168**	**15**	**1**	**12**	**2**	**2**	**2**	**2**	**2**	**10**	**4**

SPEC	CODE	BID ITEM	QTY	UNIT
764	0131	W-BEAM GUARDRAIL		
		STA 580+71.61 TO STA 582+20.34 RT	152	LF
		STA 581+18.70 TO STA 582+20.34 RT MDN	102	LF
		STA 584+72.95 TO STA 585+74.59 LT MDN	102	LF
		STA 584+72.95 TO STA 586+21.68 LT	152	LF
		TOTAL	508	LF
764	0145	W-BEAM GUARDRAIL END TERMINAL		
		STA 580+24.73 TO STA 580+71.61 RT	1	EA
		STA 580+72.06 TO STA 581+18.70 RT MDN	1	EA
		STA 585+74.59 TO STA 586+21.23 LT MDN	1	EA
		STA 586+21.68 TO STA 586+68.56 LT	1	EA
		TOTAL	4	EA

(A) INCLUDE THESE ITEMS IN THE PRICE BID FOR "W-BEAM GUARDRAIL".

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Thrie - MGS W-Beam

Br No 09-140-30.0R Sta. 582+20.34

Br No 09-140-30.0L Sta. 584+72.95

52nd Ave S - West of 63rd St S to 45th St S

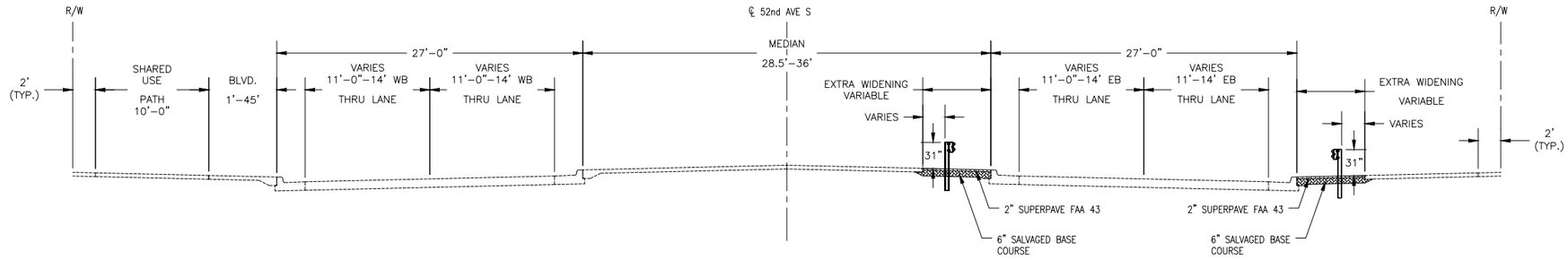
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23 USC § 409 Documents
NDDOT Reserves All Objections

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	130	3

NOTE:

SEE STANDARD DRAWING D-764-48 FOR ADDITIONAL DETAILS



52ND AVE S - STA 579+62.85 TO STA 582+20.34
52ND AVE S - STA 584+72.98 TO STA 587+30.94

NOT TO SCALE

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Guardrail - Typical Section

Br No 09-140-30.0R Sta. 582+20.34

Br No 09-140-30.0L Sta. 584+72.95

52nd Ave S - West of 63rd St S to 45th St S

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	140	1

Light Standards (1)							
No.	Station	Offset	Wattage	Circuit	Mounting	Pole Ht.	Breakaway
L1	526+33	Center in Median	215	A1	Twin	40'	H Base
L2	528+33	Center in Median	215	A1	Twin	40'	H Base
L3	530+33	Center in Median	215	A1	Twin	40'	H Base
L4	531+47	Center in Median	215	A1	Twin	40'	H Base
L5	533+00	Center in Median	215	A2	Twin	40	H Base
L6	534+90	Center in Median	215	A2	Twin	40'	H Base
L7	536+80	Center in Median	215	A2	Twin	40'	H Base
L8	538+70	Center in Median	215	A2	Twin	40'	H Base
L9	540+59	Center in Median	215	A2	Twin	40'	H Base
L10	542+49	Center in Median	215	A2	Twin	40'	H Base

Notes:

(1) The conductor required for street light standards between distribution conductors and luminaires shall consist of No. 12 AWG - USE.

Light Standards - Circuit A1 & A2					
Light Std Number	Station	Conduit Runs		Cable Runs	
		LF	Dia	LF	Type
L1 L2	526+33 to 528+33	232	1.5	722	(3) No. 6 USE
L2 L3	528+33 to 530+33	206	1.5	644	(3) No. 6 USE
L3 L4	530+33 to 531+47	121	1.5	391	(3) No. 6 USE
L4 FP A	531+47 to 532+98-71' rt	125	1.5	413	(3) No. 6 USE
FP A L5	532+98-71' rt to 533+00	73	1.5	257	(3) No. 6 USE
L5 L6	533+00 to 534+90	196	1.5	616	(3) No. 6 USE
L6 L7	534+90 to 536+80	196	1.5	614	(3) No. 6 USE
L7 L8	536+80 to 538+70	196	1.5	614	(3) No. 6 USE
L8 L9	538+70 to 540+59	196	1.5	614	(3) No. 6 USE
L9 L10	540+59 to 542+49	196	1.5	614	(3) No. 6 USE
FP A EX LT	532+98-71' rt to 532+46-90' rt	76	1.5	251	(3) No. 6 USE
L5 EX LT	533+00 to 532+28-117' lt	212	1.5		
L10 L11	542+49 to 544+03	160	1.5		

Lighting Quantites (A)(B)									
Concrete Foundation - Highway Lighting	1.5" Diameter HDPE Conduit	Underground Conductor No. 6 - USE	Conductor No. 12 AWG - USE	Feed Point - Type IV - Pad Mtd	Feed Point Cabinet Foundation Pad	Luminaire Type "A"	Twin Tenon "T" adapter	LT STD 40FT Pole Breakaway H Base	Lighting System A
EA	LF	LF	LF	EA	EA	EA	EA	EA	EA
10	2185	5750	1600	1	1	20	10	10	1

(A) Include the cost for all items tabulated in the unit price bid for "Lighting System A"

(B) Quantities are completed according to NDDOT Specifications.

Description	Footing Depth "D" 24" Diameter
Light Standard 40' Mounting Height (twin head)	7'

THE CITY OF Fargo FAR MORE

WSB WSB PROJECT NO. 012067-000

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LIGHTING

52nd Ave S - West of 63rd St S to 45th St S

9/06/2018 8:00 AM Mallori Fitzpatrick K:\ 012067-000\Cad\Proposed\Lighting

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	140	2

Light Standards (1)							
No.	Station	Offset	Wattage	Circuit	Mounting	Pole Ht.	Breakaway
L11	544+03	Center in Median	215	B1	Twin	40'	H Base
L12	545+58	Center in Median	215	B1	Twin	40'	H Base
L13	547+13	Center in Median	215	B1	Twin	40'	H Base
L14	548+79	Center in Median	215	B1	Twin	40'	H Base
L15	550+45	Center in Median	215	B1	Twin	40'	H Base
L16	552+13	Center in Median	215	B1	Twin	40'	H Base
L17	553+81	Center in Median	215	B1	Twin	40'	H Base
L18	555+48	Center in Median	215	B2	Twin	40'	H Base
L19	557+19	Center in Median	215	B2	Twin	40'	H Base
L20	(2)	(2)	215	B2	Combo std	40'	(2)
L21	(2)	(2)	215	B2	Combo std	40'	(2)
L22	(2)	(2)	215	B2	Combo std	40'	(2)
L23	559+07	Center in Median	215	B2	Twin	40'	H Base
L24	(2)	(2)	215	B2	Combo std	40'	(2)
Existing	574+68	108' rt		Existing	Std	40'	H Base

Notes:

(1) The conductor required for street light standards between distribution conductors and luminaires shall consist of No. 12 AWG - USE.

(2) Install luminaire on combination signal standard light standard extension. refer to section 150.

Lighting Quantites (A)(B)												
Concrete Foundation - Highway Lighting (C)	1.5" Diameter HDPE Conduit	Underground Conductor No. 4 - USE	Underground Conductor No. 6 - USE	Conductor No. 12 AWG - USE	Luminaire Type "A"	Twin Tenon "T" adapter	Straight extension with 1' tenon	LT STD 40FT Pole Breakaway H Base	Remove Concrete Foundation	Salvage Light STD	Install Light STD	Lighting System A
EA	LF	LF	LF	LF	EA	EA	EA	EA	EA	EA	EA	EA
11	3172	5210	3777	2400	28	10	8	10	2	2	1	1

(A) Include the cost for all items tabulated in the unit price bid for "Lighting System A"

(B) Quantities are completed according to NDDOT Specifications.

(C) New foundations for salvaged light shall be 24" x 6'.

Light Standards - Circuit B1 & B2					
Light Std Number	Station	Conduit Runs		Cable Runs	
		LF	Dia	LF	Type
L11 L12	544+03 to 545+58	161	1.5	509	(3) No. 4 USE
L12 L13	545+58 to 547+13	162	1.5	512	(3) No. 4 USE
L13 L14	547+13 to 548+79	172	1.5	542	(3) No. 4 USE
L14 L15	548+79 to 550+45	172	1.5	542	(3) No. 4 USE
L15 L16	550+45 to 552+13	174	1.5	548	(3) No. 4 USE
L16 L17	552+13 to 553+81	174	1.5	548	(3) No. 4 USE
L17 PB 17	553+81 to Signal Pull Box 17	408	1.5	1239	(3) No. 4 USE
PB 17 PB 20	Signal Pull Box 17 to Signal Pull Box 20 to	64	1.5	222	(3) No. 4 USE
PB 20 PB 22	Signal Pull Box 20 to Signal Pull Box 22	65	1.5	225	(3) No. 4 USE
PB 22 PB 24	Signal Pull Box 22 to Signal Pull Box 24	60	1.5	210	(3) No. 4 USE
PB 24 FP B	Signal Pull Box 24 to Combo Cabinet	25	1.5	113	(3) No. 4 USE
L18 L19	555+48 to 557+19	178	1.5	560	(3) No. 6 USE
L19 PB 16	557+19 to Signal Pull Box 16	14	1.5	57	(3) No. 6 USE
PB 16 PB 14	Signal Pull Box 16 to Signal Pull Box 14	77	1.5	261	(3) No. 6 USE
PB 14 L21	Signal Pull Box 14 to Signal Pole 11	25	1.5	165	(6) No. 6 USE
PB 8 L22	Signal Pull Box 8 to Signal Pole 7	36	1.5	231	(6) No. 6 USE
PB 8 PB 6	Signal Pull Box 8 to Signal Pull Box 6	100	1.5	330	(3) No. 6 USE
PB 6 L23	Signal Pull Box 6 to 559+07	18	1.5	82	(3) No. 6 USE
PB 6 PB 4	Signal Pull Box 6 to Signal Pull Box 4	80	1.5	270	(3) No. 6 USE
PB 4 PB 24	Signal Pull Box 4 to Signal Pull Box 24	44	1.5	162	(3) No. 6 USE
PB 24 L24	Signal Pull Box 24 to Signal Pole 23	17	1.5	117	(6) No. 6 USE
PB 24 PB 22	Signal Pull Box 24 to Signal Pull Box 22	60	1.5	210	(3) No. 6 USE
PB 22 PB 20	Signal Pull Box 22 to Signal Pull Box 20 to	65	1.5	225	(3) No. 6 USE
PB 20 PB 17	Signal Pull Box 20 to Signal Pull Box 17	64	1.5	222	(3) No. 6 USE
PB 17 L20	Signal Pull Box 17 to Signal Pole 18	49	1.5	309	(6) No. 6 USE
PB 17 PB 16	Signal Pull Box 17 to Signal Pull Box 16	65	1.5	225	(3) No. 6 USE
PB 4 FP B	Signal Pull Box 4 to Combo Cabinet	38	1.5	152	(3) No. 6 USE
PB 22 EX LT	Signal Pull Box 22 to 557+94- 247' lt	167	1.5		
L23 L25	559+07 to 561+03	202	1.5		
PB 14 PB 8	Signal Pull Box 14 to Signal Pull Box 8 to	174	1.5		
EX LT	547+64-108' rt to 547+64-167' rt	62	1.5	199	(3) No. 6 USE

Description	Footing Depth "D" 24" Diameter
Light Standard 40' Mounting Height (twin head)	7'

THE CITY OF Fargo FAR MORE

WSB WSB PROJECT NO. 012067-000

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LIGHTING

52nd Ave S - West of 63rd St S to 45th St S

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	140	3

Light Standards (1)							
No.	Station	Offset	Wattage	Circuit	Mounting	Pole Ht.	Breakaway
L25	561+03	Center in Median	215	C1	Twin	40'	H Base
L26	562+99	Center in Median	215	C1	Twin	40'	H Base
L27	564+95	Center in Median	215	C1	Twin	40'	H Base
L28	566+90	Center in Median	215	C1	Twin	40'	H Base
L29	568+86	Center in Median	215	C1	Twin	40'	H Base
L30	570+57	Center in Median	215	C1	Twin	40'	H Base
L31	572+28	Center in Median	215	C1	Twin	40'	H Base
L32	573+99	Center in Median	215	C2	Twin	40'	H Base
L33	575+61	Center in Median	215	C2	Twin	40'	H Base
L34	577+23	Center in Median	215	C2	Twin	40'	H Base
L35	578+92	Center in Median	215	C2	Twin	40'	H Base
L36	580+60	Center in Median	215	C2	Twin	40'	H Base
L37	582+28	Center in Median	215	C2	Twin	40'	H Base
L38	582+81	(2)	25	C2	-	-	(2)
L39	582+91	(2)	25	C2	-	-	(2)
L40	583+08	(2)	25	C2	-	-	(2)
L41	583+17	(2)	25	C2	-	-	(2)
Existing	572+97	82' rt		Existing	Std	40'	H Base

Notes:

(1) The conductor required for street light standards between distribution conductors and luminaires shall consist of No. 12 AWG - USE.

(2) See detail.

Lighting Quantites (A)(B)															
Concrete Foundation - Highway Lighting (C)	0.75" Diameter Galvanized Rigid Steel Conduit	1.5" Diameter HDPE Conduit	Underground Conductor No. 6 - USE	Conductor No. 10 AWG - USE	Conductor No. 12 AWG - USE	Feed Point - Type IV - Pad Mtd	Feed Point Cabinet Foundation Pad	Luminaire Type "A"	Twin Tenon "T" adapter	LT STD 40FT Pole Breakaway H Base	Remove Concrete Foundation	Salvage Light STD	Install Light STD	Pull Box	Lighting System A
EA	LF	LF	LF	LF	LF	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA
14	368	2478	7830	1164	2720	1	1	26	13	13	1	1	1	1	1

(A) Include the cost for all items tabulated in the unit price bid for "Lighting System A"

(B) Quantities are completed according to NDDOT Specifications.

(C) New foundations for salvaged light shall be 24" x 6'.

Light Standards - Circuit C1 & C2					
Light Std Number	Station	Conduit Runs		Cable Runs	
		LF	Dia	LF	Type
L25 L26	561+03 to 562+99	202	1.5	632	(3) No. 6 USE
L26 L27	562+99 to 564+95	202	1.5	632	(3) No. 6 USE
L27 L28	564+95 to 566+90	202	1.5	632	(3) No. 6 USE
L28 L29	566+90 to 568+86	202	1.5	632	(3) No. 6 USE
L29 L30	568+86 to 570+57	178	1.5	560	(3) No. 6 USE
L30 L31	570+57 to 572+28	178	1.5	560	(3) No. 6 USE
L31 FP C	572+28 to 573+84-104' lt	248	1.5	780	(3) No. 6 USE
FP C L32	573+84-104' lt to 573+99	94	1.5	318	(3) No. 6 USE
L32 L33	573+99 to 575+61	168	1.5	530	(3) No. 6 USE
L33 L34	575+61 to 577+23	169	1.5	533	(3) No. 6 USE
L34 L35	577+23 to 578+92	175	1.5	551	(3) No. 6 USE
L35 L36	578+92 to 580+60	175	1.5	551	(3) No. 6 USE
L36 L37	580+60 to 582+28	175	1.5	551	(3) No. 6 USE
L37 PB	582+28 to 582+37	16	1.5	220	(12) No. 6 USE
PB L38	582+37 to 582+81-32' rt	94	0.75	297	(3) No. 10 USE
PB L39	582+37 to 582+91-2' rt	63	0.75	204	(3) No. 10 USE
PB L40	582+37 to 583+08-45' lt	90	0.75	285	(3) No. 10 USE
PB L41	582+37 to 583+17-75' lt	121	0.75	378	(3) No. 10 USE
EX LT	572+97-82' rt to 572+97-123' rt	45	1.5	148	(3) No. 6 USE
FP C EX LT	573+84-104' lt to 573+35-133' lt	49	1.5		

Description	Footing Depth "D" 24" Diameter
Light Standard 40' Mounting Height (twin head)	7'

THE CITY OF Fargo FAR MORE

WSB PROJECT NO. 012067-000

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LIGHTING

52nd Ave S - West of 63rd St S to 45th St S

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	140	4

Light Standards (1)							
No.	Station	Offset	Wattage	Circuit	Mounting	Pole Ht.	Breakaway
L42	584+58	Center in Median	215	D1	Twin	40'	H Base
L43	586+50	Center in Median	215	D1	Twin	40'	H Base
L44	588+50	Center in Median	215	D1	Twin	40'	H Base
L45	590+50	Center in Median	215	D1	Twin	40'	H Base
L46	592+50	Center in Median	215	D1	Twin	40'	H Base
L47	594+40	Center in Median	215	D1	Twin	40'	H Base
L48	596+30	Center in Median	215	D1	Twin	40'	H Base
L49	597+90	Center in Median	215	D2	Twin	40'	H Base
L50	599+70	Center in Median	215	D2	Twin	40'	H Base
L51	601+50	Center in Median	215	D2	Twin	40'	H Base
L52	603+45	Center in Median	215	D2	Twin	40'	H Base
L53	605+40	Center in Median	215	D2	Twin	40'	H Base
L54	607+35	Center in Median	215	D2	Twin	40'	H Base
L55	609+30	Center in Median	215	D2	Twin	40'	H Base
L56	(2)	(2)	215	D2	Combo std	40'	(2)
Existing	597+28	85' lt		D4	Std	40'	H Base

Notes:

(1) The conductor required for street light standards between distribution conductors and luminaires shall consist of No. 12 AWG - USE.

(2) Install luminaire on combination signal standard light standard extension. refer to section 150.

Lighting Quantites (A)(B)													
Concrete Foundation - Highway Lighting (C)	1.5" Diameter HDPE Conduit	Underground Conductor No. 6 - USE	Conductor No. 12 AWG - USE	Feed Point - Type IV - Pad Mtd	Feed Point Cabinet Foundation Pad	Luminaire Type "A"	Twin Tenon "T" adapter	Straight extension with 1' tenon	LT STD 40FT Pole Breakaway H Base	Remove Concrete Foundation	Salvage Light STD	Install Light STD	Lighting System A
EA	LF	LF	LF	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA
15	2974	9569	2400	1	1	34	14	6	14	8	8	1	1

(A) Include the cost for all items tabulated in the unit price bid for "Lighting System A"

(B) Quantities are completed according to NDDOT Specifications.

(C) New foundations for salvaged light shall be 24" x 6'.

Light Standards - Circuit D1 & D2					
Light Std Number	Station	Conduit Runs		Cable Runs	
		LF	Dia	LF	Type
L42 L43	584+58 to 586+50	199	1.5	623	(3) No. 6 USE
L43 L44	586+50 to 588+50	206	1.5	644	(3) No. 6 USE
L44 L45	588+50 to 590+50	206	1.5	644	(3) No. 6 USE
L45 L46	590+50 to 592+50	206	1.5	644	(3) No. 6 USE
L46 L47	592+50 to 594+40	196	1.5	614	(3) No. 6 USE
L47 L48	594+40 to 596+30	198	1.5	620	(3) No. 6 USE
L48 FP D	596+30 to 597+82-116' lt	242	1.5	762	(3) No. 6 USE
FP D L49	597+82-116' lt 597+90	106	1.5	354	(3) No. 6 USE
L49 L50	597+90 to 599+70	188	1.5	590	(3) No. 6 USE
L50 L51	599+70 to 601+50	187	1.5	587	(3) No. 6 USE
L51 L52	501+50 to 603+45	202	1.5	632	(3) No. 6 USE
L52 L53	603+45 to 605+40	201	1.5	629	(3) No. 6 USE
L53 L54	605+40 to 607+35	202	1.5	632	(3) No. 6 USE
L54 L55	607+35 to 609+30	202	1.5	632	(3) No. 6 USE
L55 PB 18	609+30 to Signal Pull Box 18	20	1.5	75	(3) No. 6 USE
PB 18 PB 16	Signal Pull Box 18 to Signal Pull Box 16	81	1.5	273	(3) No. 6 USE
PB 16 L56	Signal Pull Box 16 to Signal Pole 14	47	1.5	297	(6) No. 6 USE
FP D EX LT	597+82-116' lt to 597+28-85' lt	60	1.5	216	(3) No. 6 USE
EX LT	597+28-85' lt 597+28-134' lt	25	1.5	101	(3) No. 6 USE

Description	Footing Depth "D" 24" Diameter
Light Standard 40' Mounting Height (twin head)	7'

Light Standards (1)							
No.	Station	Offset	Wattage	Circuit	Mounting	Pole Ht.	Breakaway
L57	(2)	(2)	215	E2	Combo std	40'	(2)
L58	(2)	(2)	215	E1	Combo std	40'	(2)

Notes:

(1) The conductor required for street light standards between distribution conductors and luminaires shall consist of No. 12 AWG - USE.

(2) Install luminaires on combination signal standard light standard 1' extensions. refer to section 150.

Lighting Quantites (A)(B)						
1.5" Diameter HDPE Conduit	Underground Conductor No. 6 - USE	Conductor No. 12 AWG - USE	Luminaire Type "A"	Straight extension with 1' tenon	Remove luminaire	Lighting System B
LF	LF	LF	EA	EA	EA	EA
496	1321	320	4	4	4	1

(A) Include the cost for all items tabulated in the unit price bid for "Lighting System B"

(B) Quantities are completed according to NDDOT Specifications.

Light Standards - Circuit E1, E2, E3, & E4					
Light Std Number	Station	Conduit Runs		Cable Runs	
		LF	Dia	LF	Type
EX PB L57	Existing Signal Pull Box to Signal Pole 27	16	1.5	111	(6) No. 6 USE
EX PB PB 30	Existing Signal Pull Box to Signal Pull Box 30	44	1.5	162	(3) No. 6 USE
PB 30 FP E	Signal Pull Box 30 to Combo Cabinet	42	1.5	164	(3) No. 6 USE
FP E PB 6	Combo Cabinet to Signal Pull Box 6	93	1.5	317	(3) No. 6 USE
PB 6 PB 8	Signal Pull Box 6 to Signal Pull Box 8	56	1.5	198	(3) No. 6 USE
PB 8 L58	Signal Pull Box 8 to Existing Pole	59	1.5	369	(6) No. 6 USE
FP E PB 6	Combo Cabinet to Signal Pull Box 6	93	1.5		
FP E PB 6	Combo Cabinet to Signal Pull Box 6	93	1.5		

THE CITY OF Fargo FAR MORE

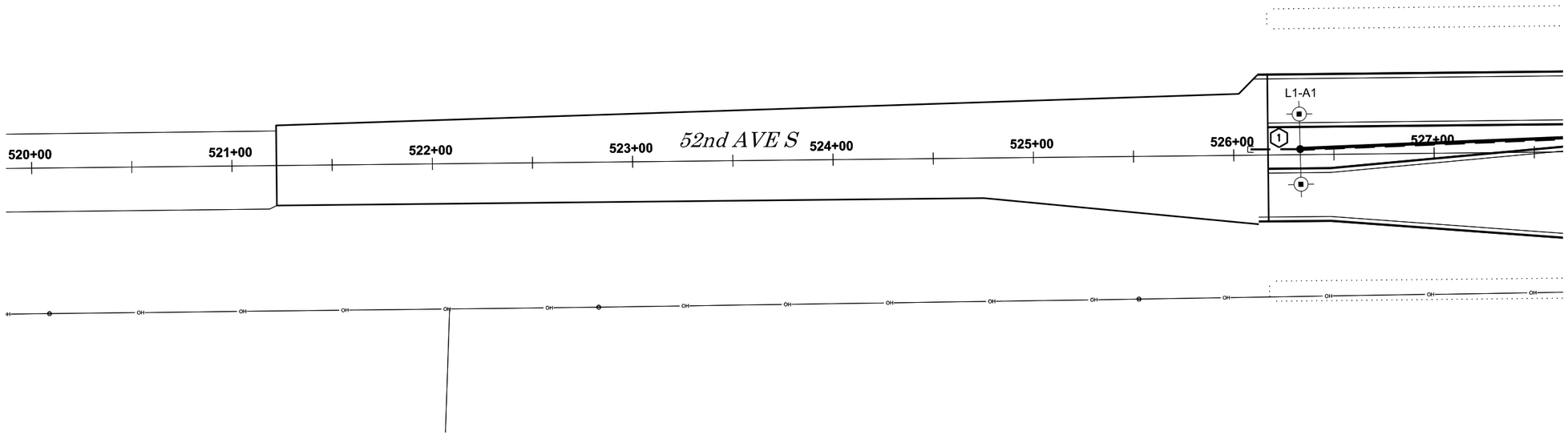
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LIGHTING

52nd Ave S - West of 63rd St S to 45th St S

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	140	5



0 30' 60'

L1-A1 TYPE "A" LED LUM. ON 40' STD WITH LUM NO./CIRCUIT NO.

L9-B1 TYPE "A" LED LUM. ON TRAFFIC EXTENSION WITH LUM NO./CIRCUIT NO.

EXISTING STREET LIGHT

CONDUCTOR

1.5" INNERDUCT

EXISTING CONDUCTOR

EXISTING 1.5" INNERDUCT

PULL BOX

NEW FEED POINT

EXISTING FEED POINT

THE CITY OF Fargo FAR MORE

WSB WSB PROJECT NO. 012067-000

SHEET NOTE:

(1) 25' OF 1.5" INNERDUCT, INSTALL TRACER WIRE & CAP END.

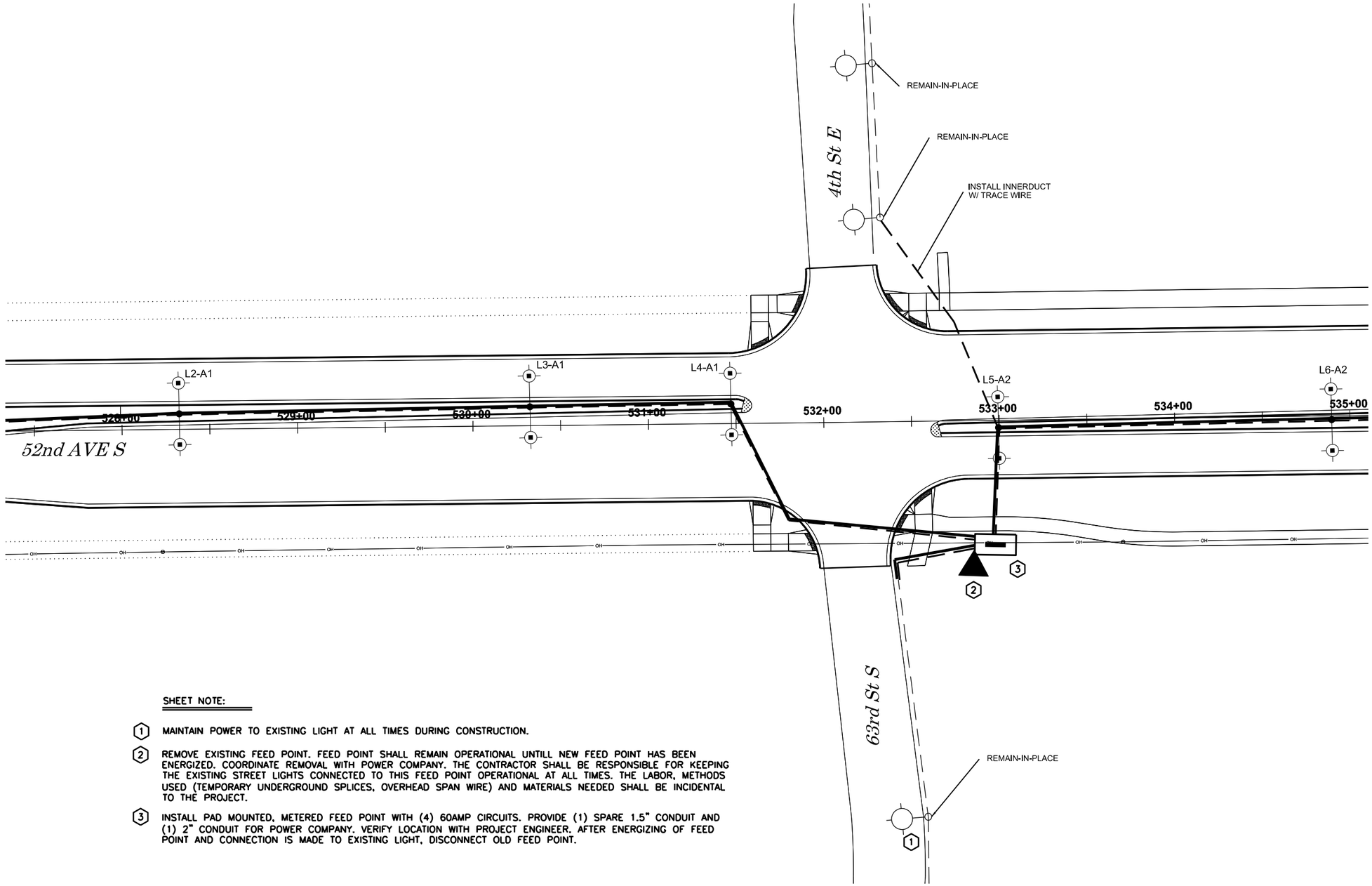
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LIGHTING

52nd Ave S - West of 63rd St S to 45th St S

9/06/2018 8:00 AM Mallori Fitzpatrick K:\ 012067-000\Cad\Proposed\Lighting

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	140	6



SHEET NOTE:

1. MAINTAIN POWER TO EXISTING LIGHT AT ALL TIMES DURING CONSTRUCTION.
2. REMOVE EXISTING FEED POINT. FEED POINT SHALL REMAIN OPERATIONAL UNTILL NEW FEED POINT HAS BEEN ENERGIZED. COORDINATE REMOVAL WITH POWER COMPANY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR KEEPING THE EXISTING STREET LIGHTS CONNECTED TO THIS FEED POINT OPERATIONAL AT ALL TIMES. THE LABOR, METHODS USED (TEMPORARY UNDERGROUND SPLICES, OVERHEAD SPAN WIRE) AND MATERIALS NEEDED SHALL BE INCIDENTAL TO THE PROJECT.
3. INSTALL PAD MOUNTED, METERED FEED POINT WITH (4) 60AMP CIRCUITS. PROVIDE (1) SPARE 1.5" CONDUIT AND (1) 2" CONDUIT FOR POWER COMPANY. VERIFY LOCATION WITH PROJECT ENGINEER. AFTER ENERGIZING OF FEED POINT AND CONNECTION IS MADE TO EXISTING LIGHT, DISCONNECT OLD FEED POINT.

N

0 30' 60'

L1-A1 — TYPE "A" LED LUM. ON 40' STD WITH LUM NO./CIRCUIT NO.

L9-B1 — TYPE "A" LED LUM. ON TRAFFIC EXTENSION WITH LUM NO./CIRCUIT NO.

EXISTING STREET LIGHT

CONDUCTOR

1.5" INNERDUCT

EXISTING CONDUCTOR

EXISTING 1.5" INNERDUCT

PULL BOX

NEW FEED POINT

EXISTING FEED POINT

THE CITY OF Fargo FAR MORE

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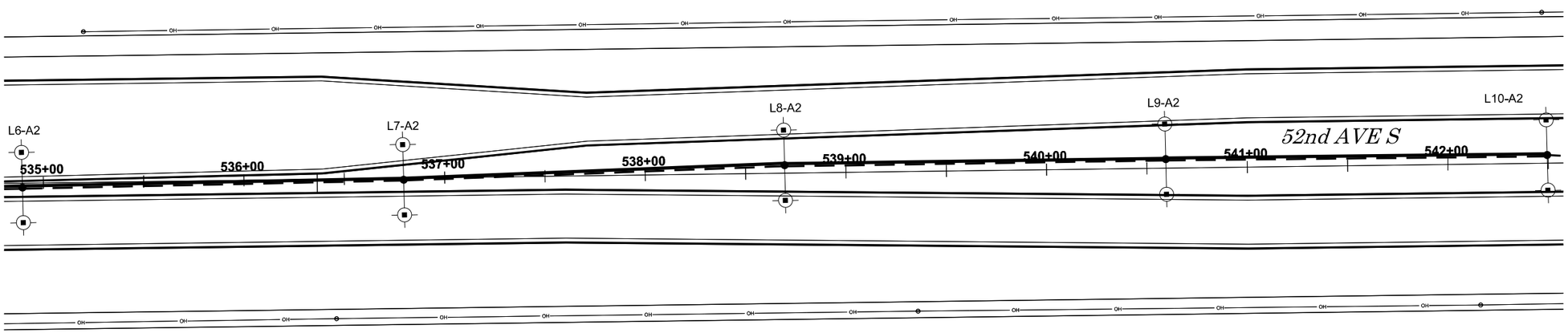
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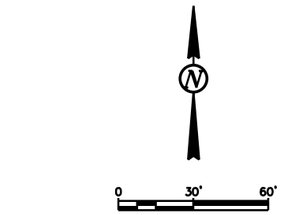
LIGHTING

52nd Ave S - West of 63rd St S to 45th St S

9/06/2018 8:00 AM Mallori Fitzpatrick K:\ 012067-000\Cad\Proposed\Lighting

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	140	7





L1-A1

TYPE "A" LED LUM. ON 40' STD WITH LUM NO./CIRCUIT NO.

L9-B1

TYPE "A" LED LUM. ON TRAFFIC EXTENSION WITH LUM NO./CIRCUIT NO.

EXISTING STREET LIGHT

CONDUCTOR

1.5" INNERDUCT

EXISTING CONDUCTOR

EXISTING 1.5" INNERDUCT

PULL BOX

NEW FEED POINT

EXISTING FEED POINT

THE CITY OF Fargo FAR MORE

WSB PROJECT NO. 012067-000

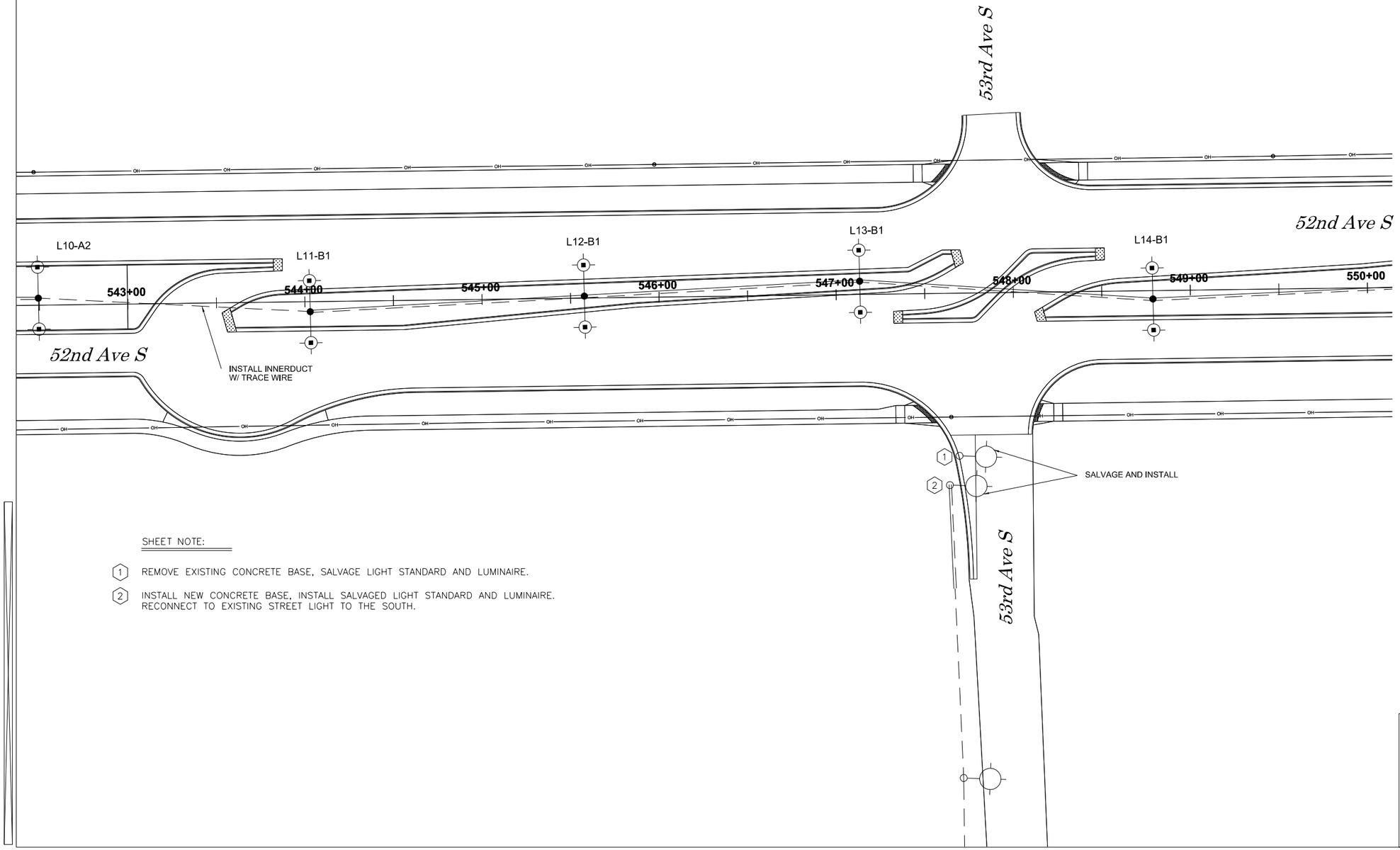
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LIGHTING

52nd Ave S - West of 63rd St S to 45th St S

9/06/2018 8:00 AM Mallori Fitzpatrick K:\ 012067-000\Cad\Proposed\Lighting

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	140	8



SHEET NOTE:

1. REMOVE EXISTING CONCRETE BASE, SALVAGE LIGHT STANDARD AND LUMINAIRE.
2. INSTALL NEW CONCRETE BASE, INSTALL SALVAGED LIGHT STANDARD AND LUMINAIRE. RECONNECT TO EXISTING STREET LIGHT TO THE SOUTH.

N

0 30' 60'

L1-A1 — TYPE "A" LED LUM. ON 40' STD WITH LUM NO./CIRCUIT NO.

L9-B1 — TYPE "A" LED LUM. ON TRAFFIC EXTENSION WITH LUM NO./CIRCUIT NO.

EXISTING STREET LIGHT

CONDUCTOR

1.5" INNERDUCT

EXISTING CONDUCTOR

EXISTING 1.5" INNERDUCT

PULL BOX

NEW FEED POINT

EXISTING FEED POINT

THE CITY OF Fargo FAR MORE

WSB PROJECT NO. 012067-000

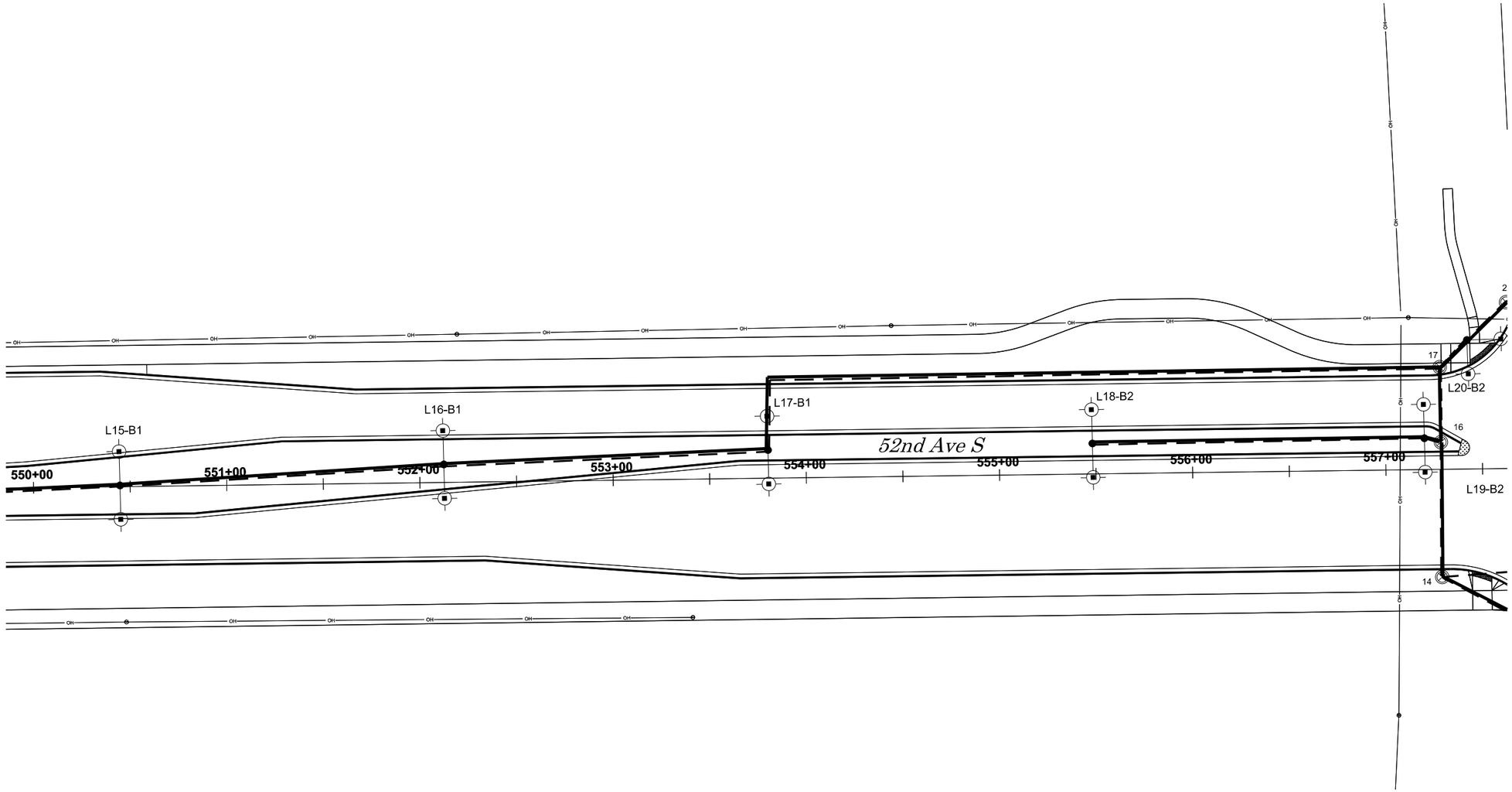
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LIGHTING

52nd Ave S - West of 63rd St S to 45th St S

9/06/2018 8:00 AM Mallori Fitzpatrick K:\ 012067-000\Cad\Proposed\Lighting

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	140	9



N

0 30' 60'

L1-A1
TYPE "A" LED LUM. ON 40' STD WITH LUM NO./CIRCUIT NO.

L9-B1
TYPE "A" LED LUM. ON TRAFFIC EXTENSION WITH LUM NO./CIRCUIT NO.

EXISTING STREET LIGHT

CONDUCTOR

1.5" INNERDUCT

EXISTING CONDUCTOR

EXISTING 1.5" INNERDUCT

PULL BOX

NEW FEED POINT

EXISTING FEED POINT

THE CITY OF Fargo FAR MORE

WSB WSB PROJECT NO. 012067-000

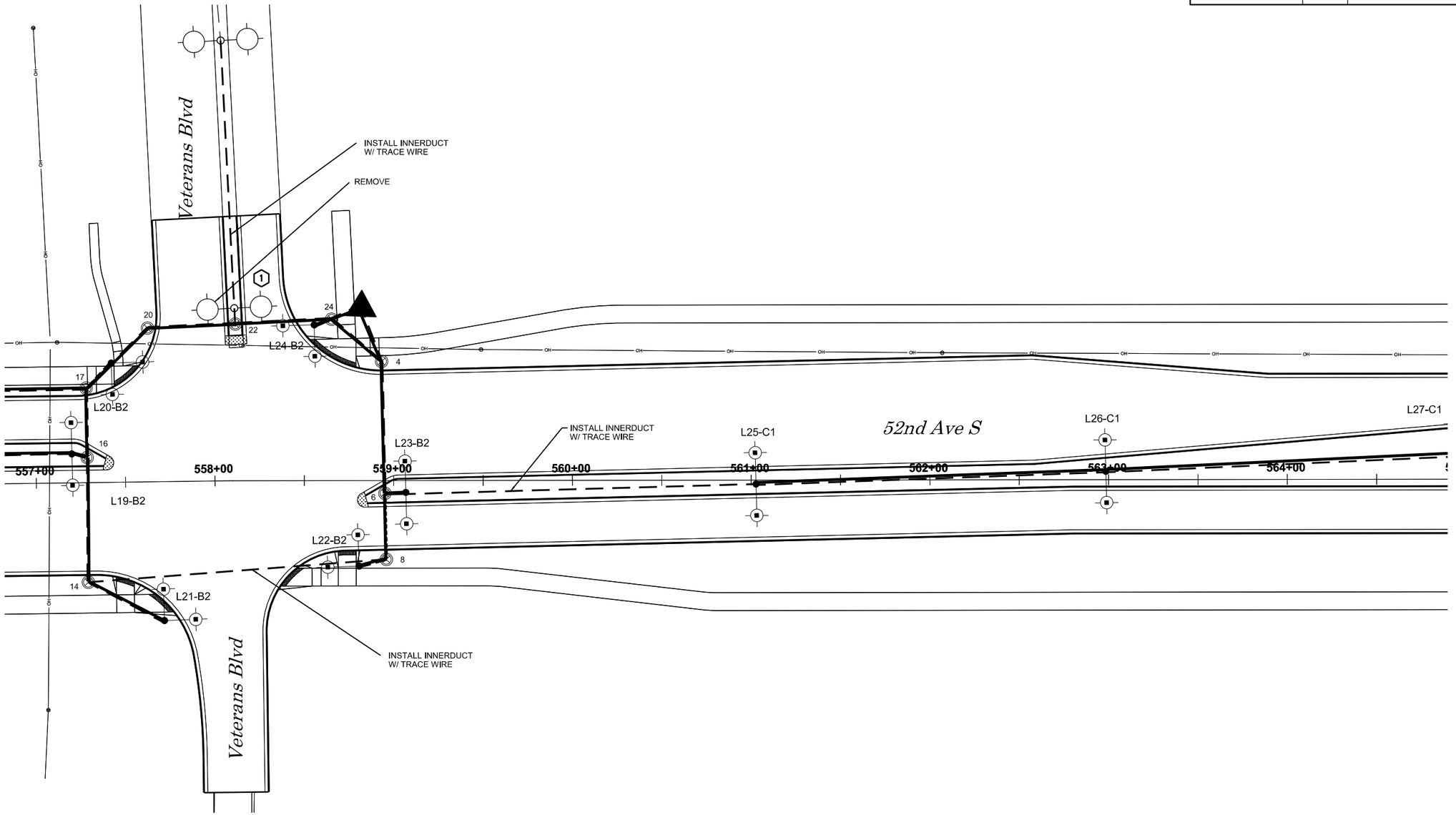
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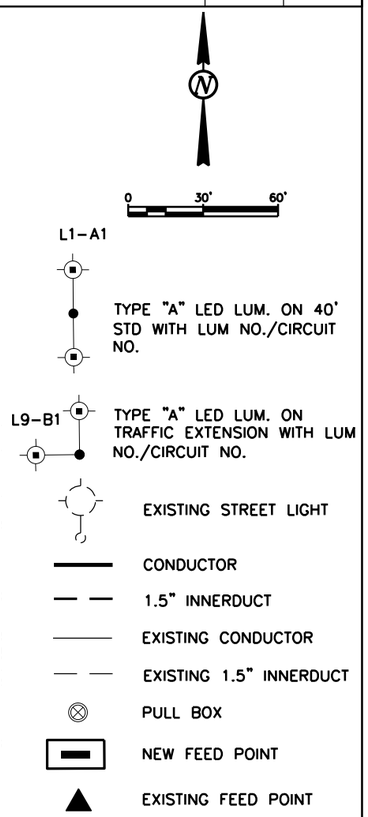
LIGHTING

52nd Ave S - West of 63rd St S to 45th St S

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	140	10





SHEET NOTE:

(1) REMOVE EXISTING CONCRETE BASE, SALVAGE LIGHT STANDARD AND LUMINAIRE BACK TO THE CITY OF FARGO.

THE CITY OF Fargo FAR MORE

WSB PROJECT NO. 012067-000

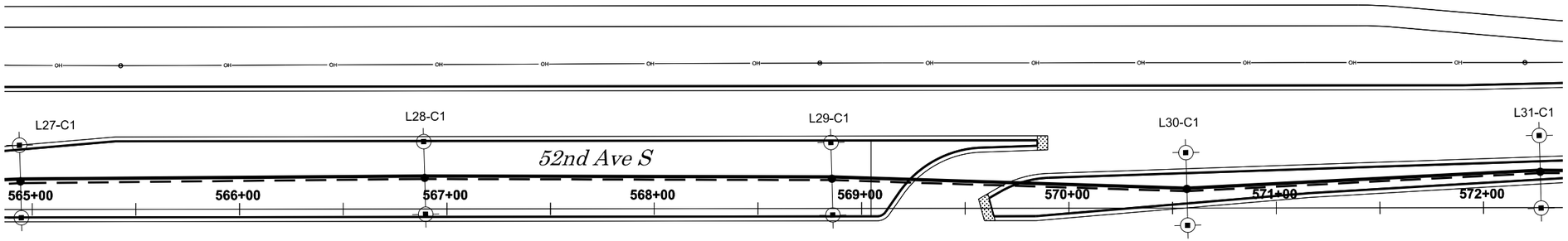
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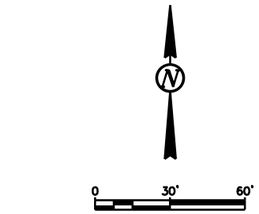
LIGHTING

52nd Ave S - West of 63rd St S to 45th St S

9/06/2018 8:00 AM Mallori Fitzpatrick K:\ 012067-000\Cad\Proposed\Lighting

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	140	11





L1–A1 TYPE "A" LED LUM. ON 40' STD WITH LUM NO./CIRCUIT NO.

L9–B1 TYPE "A" LED LUM. ON TRAFFIC EXTENSION WITH LUM NO./CIRCUIT NO.

EXISTING STREET LIGHT

CONDUCTOR

1.5" INNERDUCT

EXISTING CONDUCTOR

EXISTING 1.5" INNERDUCT

PULL BOX

NEW FEED POINT

EXISTING FEED POINT

THE CITY OF Fargo FAR MORE

WSB WSB PROJECT NO. 012067-000

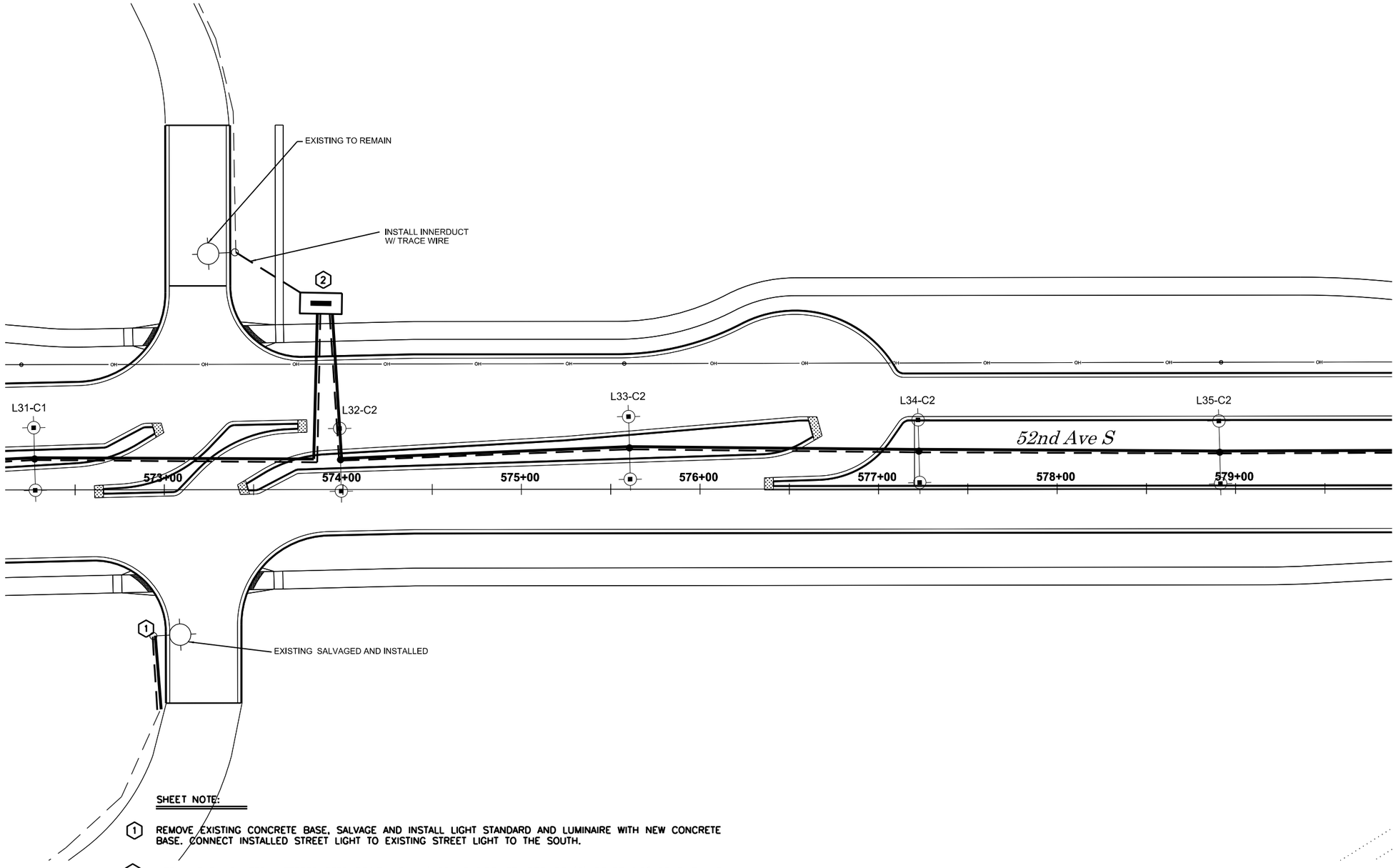
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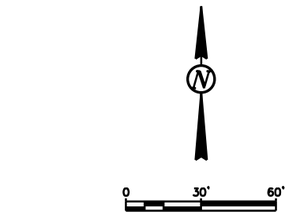
LIGHTING

52nd Ave S - West of 63rd St S to 45th St S

9/06/2018 8:00 AM Mallori Fitzpatrick K:\ 012067-000\Cad\Proposed\Lighting

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	140	12





L1–A1 — TYPE "A" LED LUM. ON 40' STD WITH LUM NO./CIRCUIT NO.

L9–B1 — TYPE "A" LED LUM. ON TRAFFIC EXTENSION WITH LUM NO./CIRCUIT NO.

EXISTING STREET LIGHT

CONDUCTOR

1.5" INNERDUCT

EXISTING CONDUCTOR

EXISTING 1.5" INNERDUCT

PULL BOX

NEW FEED POINT

EXISTING FEED POINT

THE CITY OF Fargo FAR MORE

WSB PROJECT NO. 012067-000

SHEET NOTE:

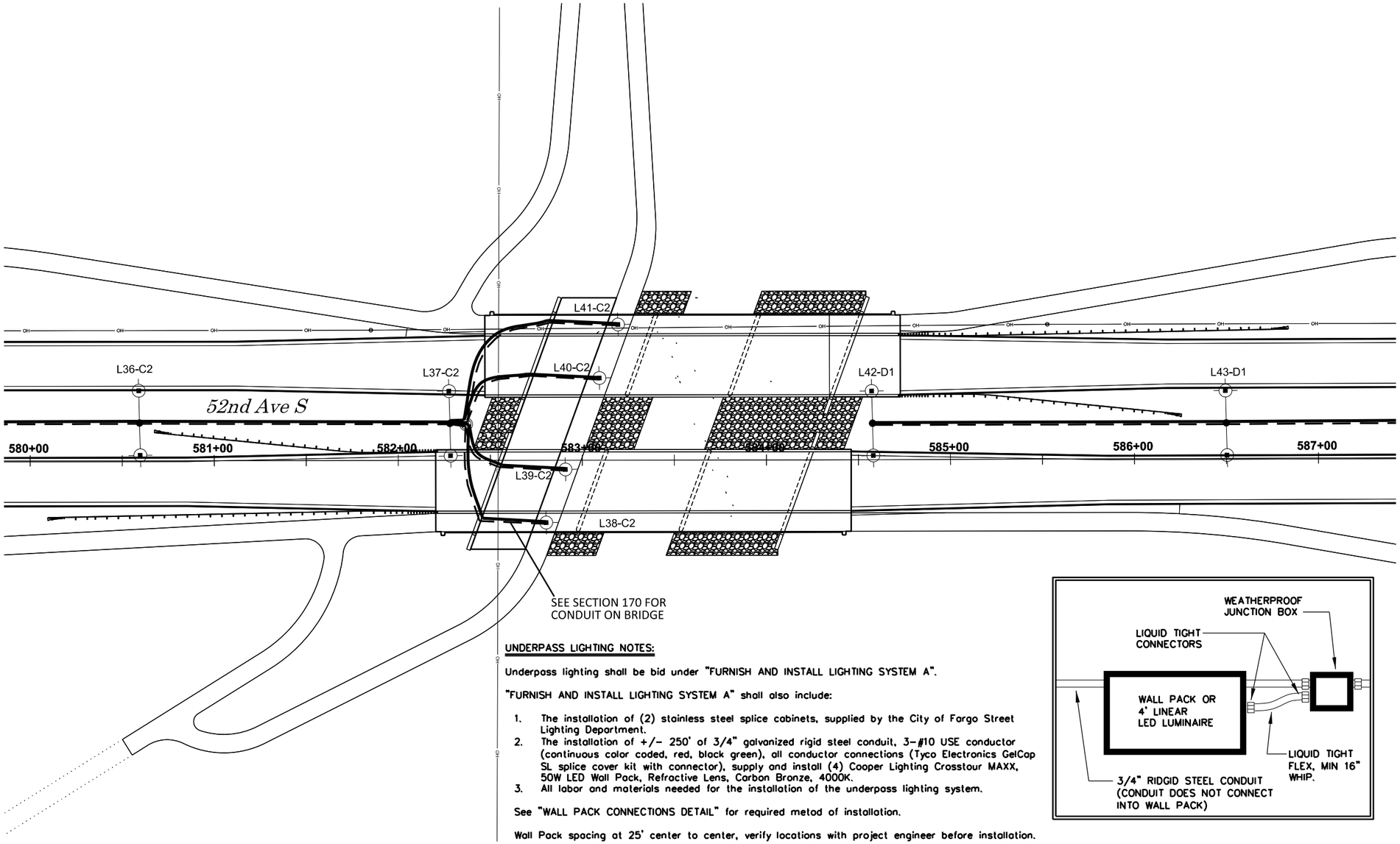
1. REMOVE EXISTING CONCRETE BASE, SALVAGE AND INSTALL LIGHT STANDARD AND LUMINAIRE WITH NEW CONCRETE BASE. CONNECT INSTALLED STREET LIGHT TO EXISTING STREET LIGHT TO THE SOUTH.
2. INSTALL PAD MOUNTED, METERED FEED POINT WITH (4) 60AMP CIRCUITS. PROVIDE (1) SPARE 1.5" CONDUIT AND (1) 2" CONDUIT FOR POWER COMPANY. VERIFY LOCATION WITH PROJECT ENGINEER.

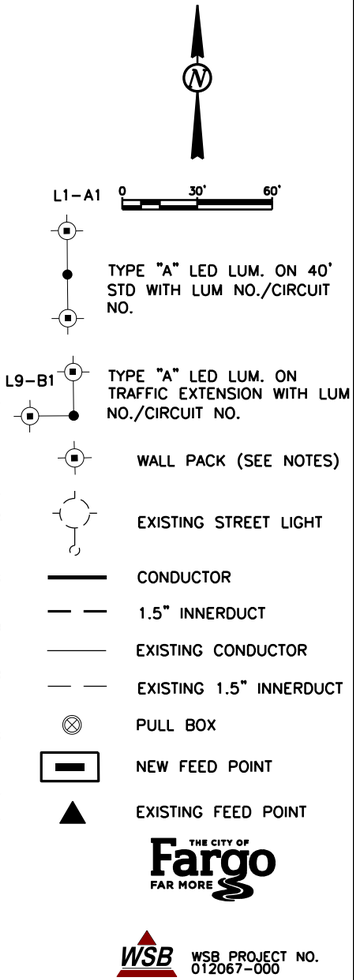
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LIGHTING

52nd Ave S - West of 63rd St S to 45th St S

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	140	13





THE CITY OF Fargo FAR MORE

WSB WSB PROJECT NO. 012067-000

UNDERPASS LIGHTING NOTES:

Underpass lighting shall be bid under "FURNISH AND INSTALL LIGHTING SYSTEM A".

"FURNISH AND INSTALL LIGHTING SYSTEM A" shall also include:

1. The installation of (2) stainless steel splice cabinets, supplied by the City of Fargo Street Lighting Department.
2. The installation of +/- 250' of 3/4" galvanized rigid steel conduit, 3-#10 USE conductor (continuous color coded, red, black green), all conductor connections (Tyco Electronics GelCap SL splice cover kit with connector), supply and install (4) Cooper Lighting Crosstour MAXX, 50W LED Wall Pack, Refractive Lens, Carbon Bronze, 4000K.
3. All labor and materials needed for the installation of the underpass lighting system.

See "WALL PACK CONNECTIONS DETAIL" for required metod of installation.

Wall Pack spacing at 25' center to center, verify locations with project engineer before installation.

WALL PACK CONNECTIONS DETAIL – TYPICAL
NO SCALE

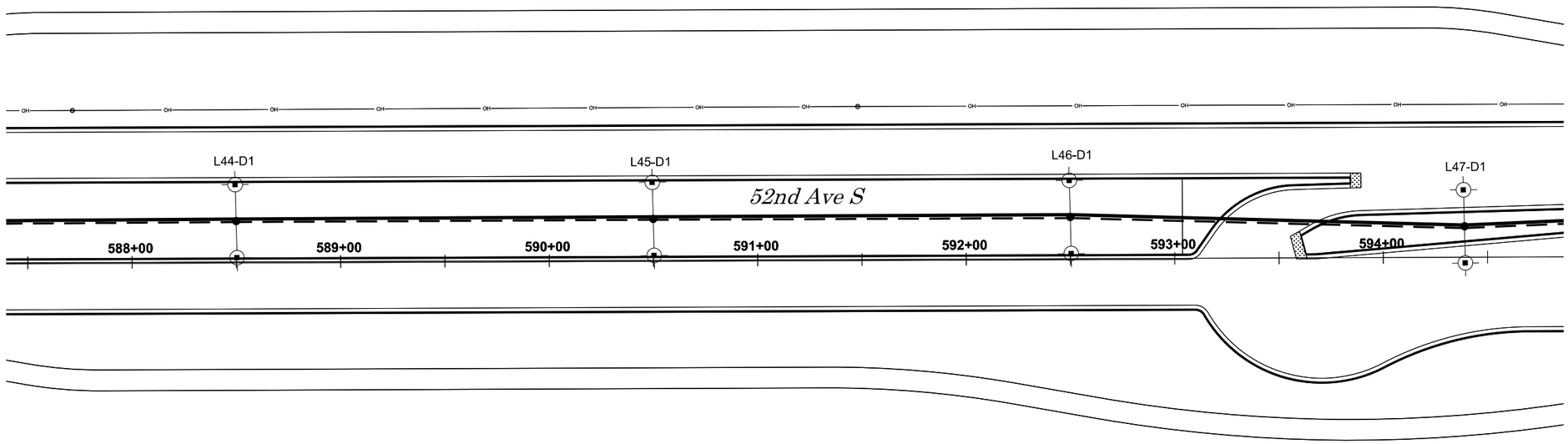
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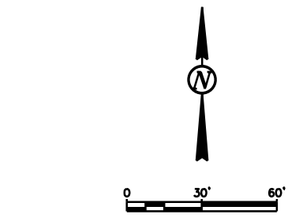
LIGHTING

52nd Ave S - West of 63rd St S to 45th St S

9/06/2018 8:00 AM Mallori Fitzpatrick K:\ 012067-000\Cad\Proposed\Lighting

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	140	14





L1-A1

TYPE "A" LED LUM. ON 40' STD WITH LUM NO./CIRCUIT NO.

L9-B1

TYPE "A" LED LUM. ON TRAFFIC EXTENSION WITH LUM NO./CIRCUIT NO.

EXISTING STREET LIGHT

CONDUCTOR

1.5" INNERDUCT

EXISTING CONDUCTOR

EXISTING 1.5" INNERDUCT

PULL BOX

NEW FEED POINT

EXISTING FEED POINT

THE CITY OF Fargo FAR MORE

WSB PROJECT NO. 012067-000

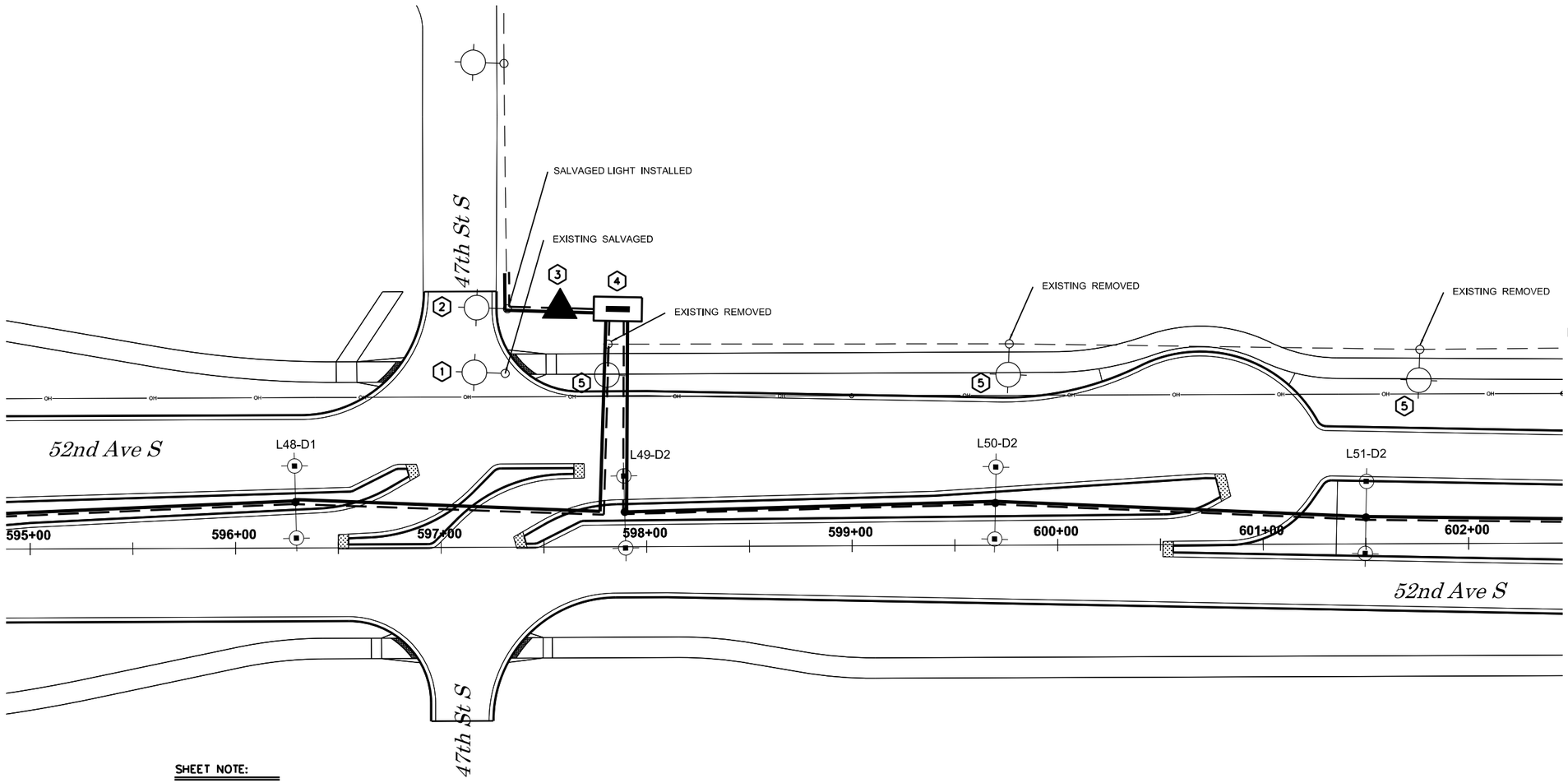
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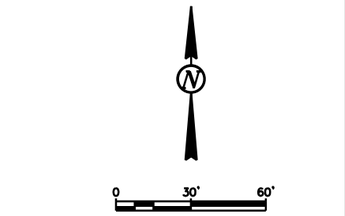
LIGHTING

52nd Ave S - West of 63rd St S to 45th St S

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	140	15





THE CITY OF Fargo FAR MORE

WSB WSB PROJECT NO. 012067-000

SHEET NOTE:

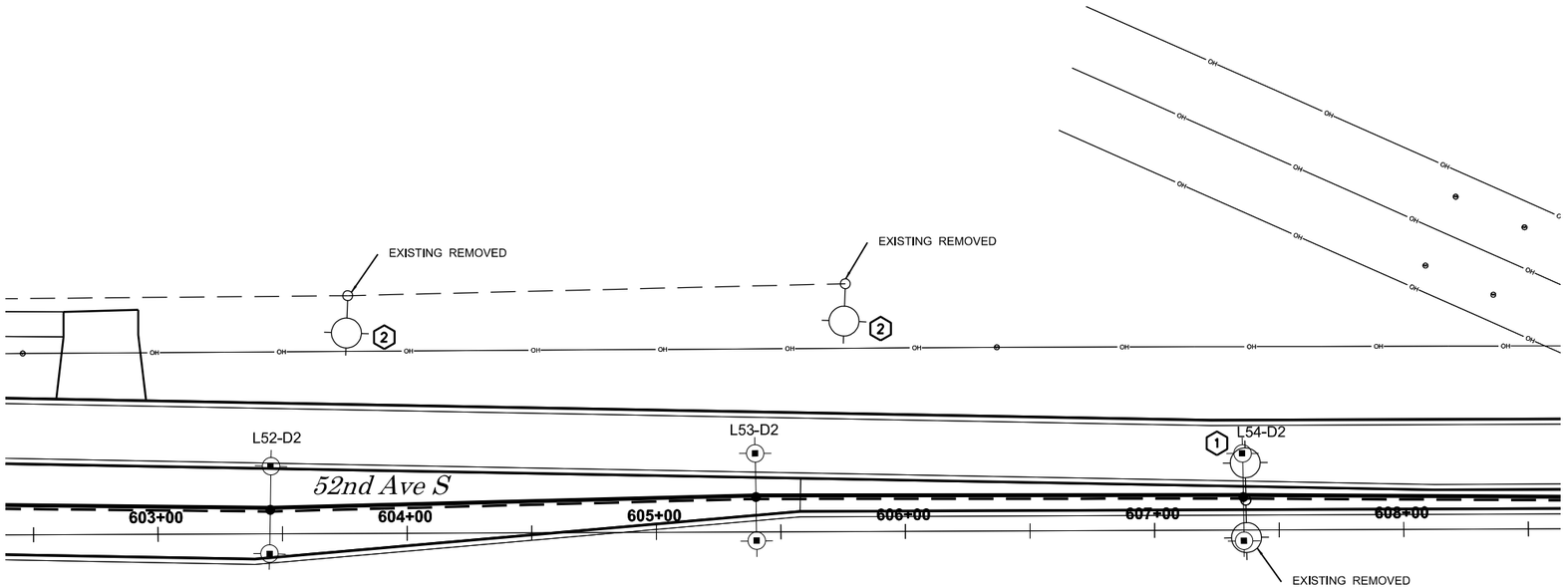
1. REMOVE EXISTING CONCRETE BASE, SALVAGE LIGHT STANDARD AND LUMINAIRE.
2. INSTALL NEW CONCRETE BASE, INSTALL SALVAGED LIGHT STANDARD AND LUMINAIRE.
3. REMOVE EXISTING FEED POINT. FEED POINT SHALL REMAIN OPERATIONAL UNTILL NEW FEED POINT HAS BEEN ENERGIZED. COORDINATE REMOVAL WITH POWER COMPANY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR KEEPING THE EXISTING STREET LIGHTS CONNECTED TO THIS FEED POINT OPERATIONAL AT ALL TIMES. THE LABOR, METHODS USED (TEMPORARY UNDERGROUND SPLICES, OVERHEAD SPAN WIRE) AND MATERIALS NEEDED SHALL BE INCIDENTAL TO THE PROJECT.
4. INSTALL PAD MOUNTED, METERED FEED POINT WITH (4) 60AMP CIRCUITS. PROVIDE (1) SPARE 1.5" CONDUIT AND (1) 2" CONDUIT FOR POWER COMPANY. VERIFY LOCATION WITH PROJECT ENGINEER. AFTER ENERGIZING OF FEED POINT AND CONNECTION IS MADE TO EXISTING LIGHT, DISCONNECT OLD FEED POINT.
5. LIGHTS SHALL REMAIN OPERATIONAL DURING CONSTRUCTION. REMOVE EXISTING BASE AND SALVAGE LIGHT STANDARD AND LUMINAIRE BACK TO THE CITY OF FARGO AFTER NEW SYSTEM IS OPERATIONAL.

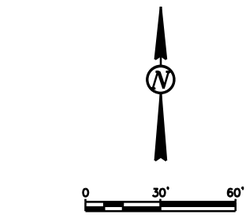
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LIGHTING

52nd Ave S - West of 63rd St S to 45th St S

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	140	16





L1-A1

TYPE "A" LED LUM. ON 40' STD WITH LUM NO./CIRCUIT NO.

L9-B1 TYPE "A" LED LUM. ON TRAFFIC EXTENSION WITH LUM NO./CIRCUIT NO.

EXISTING STREET LIGHT

CONDUCTOR

1.5" INNERDUCT

EXISTING CONDUCTOR

EXISTING 1.5" INNERDUCT

PULL BOX

NEW FEED POINT

EXISTING FEED POINT

THE CITY OF Fargo FAR MORE

WSB PROJECT NO. 012067-000

SHEET NOTE:

1. REMOVE EXISTING CONCRETE BASE, SALVAGE LIGHT STANDARD AND LUMINAIRE BACK TO THE CITY OF FARGO.
2. LIGHTS SHALL REMAIN OPERATIONAL DURING CONSTRUCTION. REMOVE EXISTING BASE AND SALVAGE LIGHT STANDARD AND LUMINAIRE BACK TO THE CITY OF FARGO AFTER NEW SYSTEM IS OPERATIONAL.

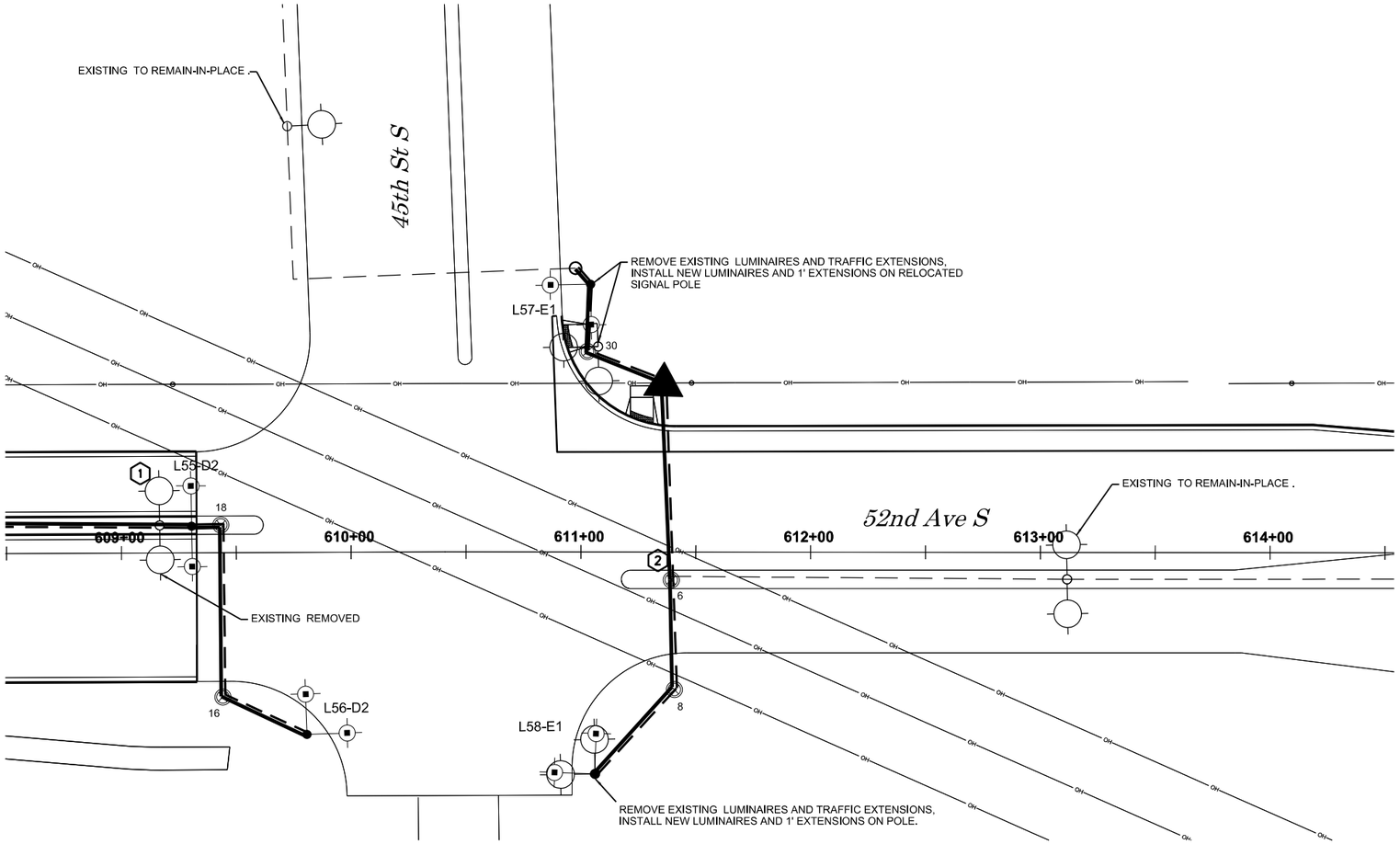
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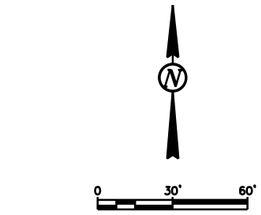
LIGHTING

52nd Ave S - West of 63rd St S to 45th St S

9/06/2018 8:00 AM Mallori Fitzpatrick K:\ 012067-000\Cad\Proposed\Lighting

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	140	17





L1-A1 TYPE "A" LED LUM. ON 40' STD WITH LUM NO./CIRCUIT NO.

L9-B1 TYPE "A" LED LUM. ON TRAFFIC EXTENSION WITH LUM NO./CIRCUIT NO.

EXISTING STREET LIGHT

CONDUCTOR

1.5" INNERDUCT

EXISTING CONDUCTOR

EXISTING 1.5" INNERDUCT

PULL BOX

NEW FEED POINT

EXISTING FEED POINT

THE CITY OF Fargo FAR MORE

WSB WSB PROJECT NO. 012067-000

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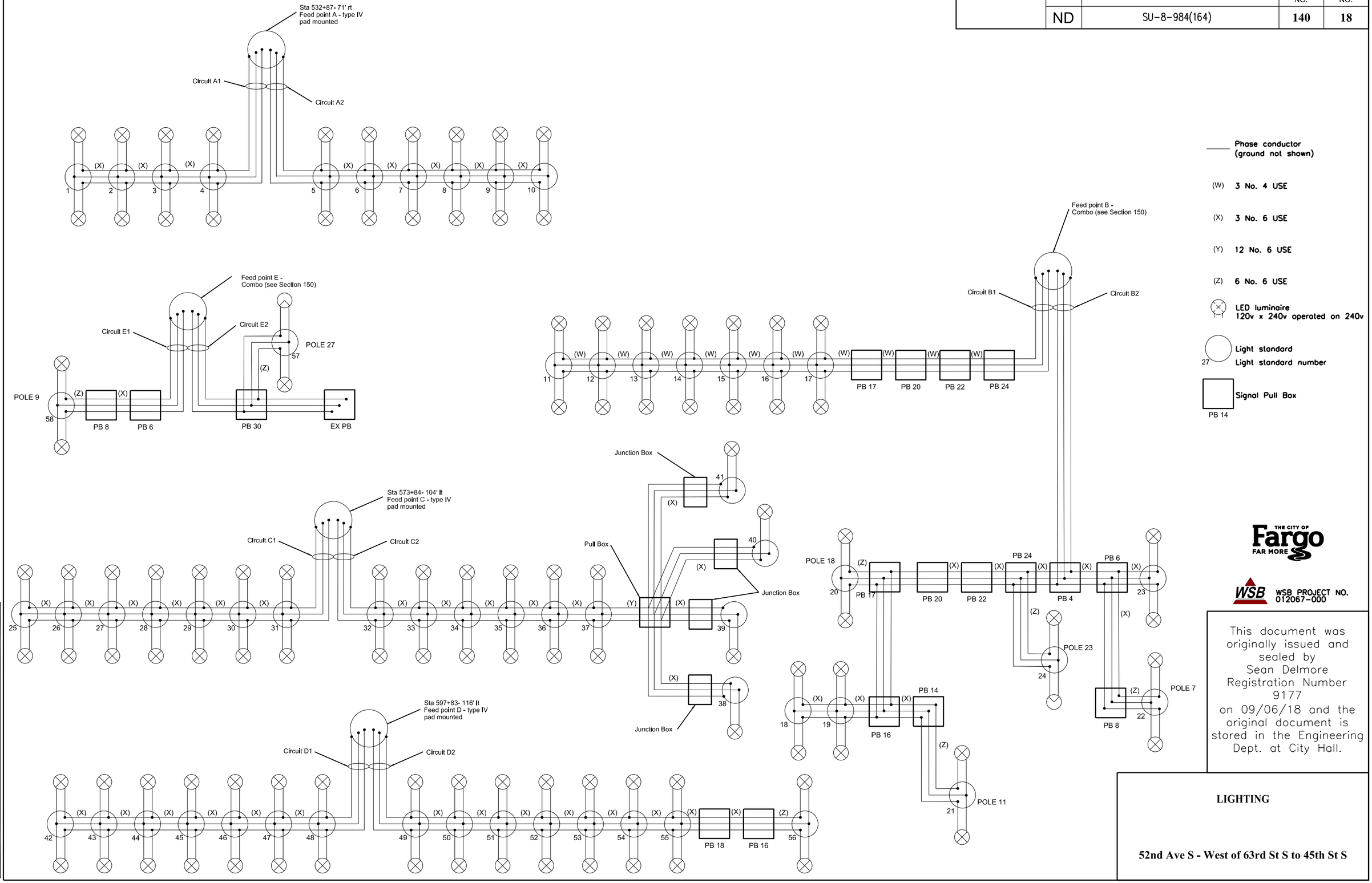
SHEET NOTE:

1. REMOVE EXISTING CONCRETE BASE, SALVAGE LIGHT STANDARD AND LUMINAIRE BACK TO THE CITY OF FARGO.
2. EXISTING LIGHTS TO THE EAST SHALL REMAIN OPERATIONAL DURING CONSTRUCTION. COIL EXISTING CABLE BACK TO THE PULL BOX AND RECONNECT TO COMBO FEEDPOINT.

LIGHTING

52nd Ave S - West of 63rd St S to 45th St S

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	140	18



Phase conductor (ground not shown)

(W) 3 No. 4 USE

(X) 3 No. 6 USE

(Y) 12 No. 6 USE

(Z) 6 No. 6 USE

LED luminaire 120v x 240v operated on 240v

27 Light standard
Light standard number

PB 14 Signal Pull Box

THE CITY OF Fargo FAR MORE

WSB PROJECT NO. 012067-000

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LIGHTING

52nd Ave S - West of 63rd St S to 45th St S

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	140	19

STREET LIGHTING NOTES:

The City of Fargo Standard Specifications for Construction and these notes shall govern the construction of the project. Specifications can be downloaded at http://fargond.gov/city-government/departments/engineering/design-construction/construction-specifications

INNERDUCT: 1.5", Schedule 40 Innerduct, Smooth Outside, Controlled Outside Diameter at 1.900. Inside Diameter of 1.579, Minimum wall thickness of .145 and color RED.
Innerduct will be required as shown on plans and will be connected to stubbed out 1.5" conduit at all concrete base and feed point locations. Installation of Innerduct shall be at a minimum depth of 24" below finished grade. The innerduct will be placed in line with bases behind curb unless contractor gets approval from project engineer to adjust placement. BORING WILL BE THE REQUIRED METHOD OF INSTALLATION IN ALL ESTABLISHED AREAS. Duct Seal all innerduct/conduit entering or exiting foundations, feedpoints and pull boxes.
Innerduct will be measured by the linear foot. Couplings/fittings used at concrete bases and feed points, trace wire and the method of Innerduct installation will not be measured for payment but will be included in the price bid for Innerduct.

CONDUCTOR: All conductor shall be continuous color coded (black, red and green). The conductor between standards shall be, 3-#6 USE, unless otherwise noted. All wiring within standards between distribution conductors and luminaires shall be #12 AWG stranded copper, 600-VOLT, type RHW. All luminaires shall be grounded.
Conductor connections in street light bases shall be Panduit, clear insulated aluminum connector (PCSB4-3S-12Y) or Burndy equal. In pull boxes, Tyco Electronics GelCap SL splice cover kit with connector. All other conductor splices shall be, UL listed, with PowerGel sealant type connections meeting all codes for desired application.

FUSE HOLDERS: All fuse holders shall have 3" of heat shrink at conductor connections.

CONCRETE BASE: Bases shall be 24" x 7' deep (24" x 6' or 18" x 5' for relocated lights). Bolt circle and projection shall be verified with manufacturer specifications.

The contractor shall use Hydro-vac excavation for concrete bases where standard auger method is not possible. Base locations shall be field verified after locates with contractor and City of Fargo project manager. Method of base excavation is incidental to bid.

FURNISH AND INSTALL FEED POINT: Pedestal type, four circuit, stainless steel feed point cabinet, shall be concrete pad mounted (see detail for size of cabinet). Feed Point cabinet shall also include a padlocable lift-off service panel along with a factory installed, interior mounted meter trim which meets the requirements of the local utility company (Cass County Electric Co.). Meter to be provided by the local utility company.
All exposed conduit shall be 2" galvanized steel. Concrete foundation/pad, weather head and riser, 2" conduit and properly sized conductor for connection to CCEC transformer or to closest utility pole as required by CCEC and other miscellaneous items shall be incidental to the price bid for feed point. The feed point will be measured as a complete unit installed and operational. Verify feed point location and elevation with the project engineer before installation.

FEED POINT: Prefabricated feed point enclosure to be assembled by States, UL 508 Listed, Service entrance rated. Or equal.

ANTI-SEIZE: Anti-seize material shall be applied to all threaded bolts and screws. Verify with project engineer type of material.

FURNISH AND INSTALL LIGHTING STANDARD TYPE "A": Millerbernd, SD1 (Davit) Stainless Steel, 40' Mounting Height, Break-away "H" Base, 16 Sided, Frost Finish with 9' Twin Arm Arrangement.

CONTRACTOR SHALL FURNISH AND INSTALL MOUSE GUARD: XCLUDER LIGHT POLE GASKET 2800g, ITEM NO. 162728 INCIDENTAL TO PRICE FOR STANDARD.

FURNISH AND INSTALL LUMINAIRE TYPE "A": Phillips Roadfocus RFL Series, 215 W LED, Type R3S optics, 240V, 4000K, 25,000 lumens, gray. Or approved equal: AEL AUTOBAHN or LEOTEK

FURNISH AND INSTALL LUMINAIRE TYPE "B": Cooper Lighting Crosstour MAXX, 50W LED Wall Pack, Refractive Lens, Carbon Bronze, 4000K.

FURNISH & INSTALL PULL BOX: PVC Pull Box with metal frame and cover, the size shall be 24" dia x 36" deep. 24" of pea rock shall be installed for drainage below the pull box and will extend 6" beyond the outside edge of pull box. The top of pull box shall be flush mounted in concrete areas and 1" above final grade and sloped to match in areas of sod. Provide enough slack to pull conductor and splices a minimum of four feet above finished grade.
The pull box will be measured as a complete unit installed. Pull box, pea rock, and other miscellaneous items required shall be incidental to the cost bid.

REMOVE BASES: The contractor shall be responsible for the removal of existing concrete bases, backfilling with proper compaction and the disposal of concrete bases. The removal, back filling and disposal of bases shall be incidental to the price bid.

EXISTING STREET LIGHTING SYSTEM: The Electrical Contractor shall coordinate with the project manager and general contractor to ensure the operation of all existing street lights adjacent to project limits at all times. The contractor will provide necessary labor and materials needed to maintain the operation of the existing lighting system. These costs shall be incidental to the price bid for the street lighting work.

REMOVE STREET LIGHT: The contractor shall be responsible for the removal and delivery of standards and luminaires to the City of Fargo Street Lighting Department or a location directed by the project engineer. The removal of cables and conduit shall be incidental to the price bid.

THE CITY OF Fargo FAR MORE

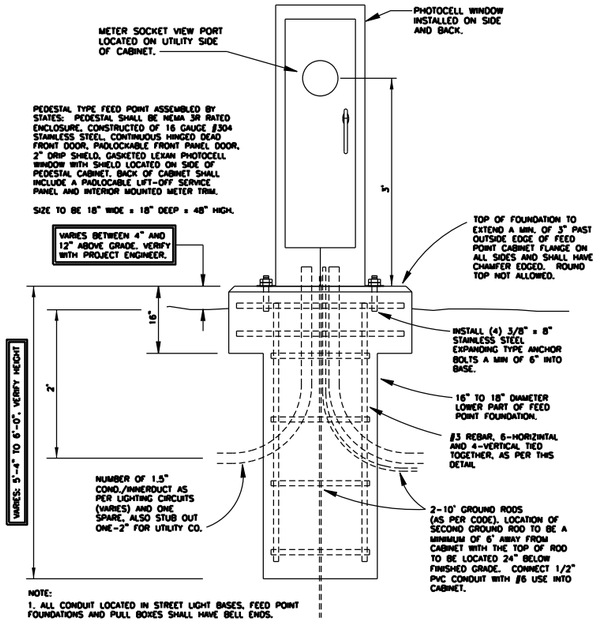
WSB WSB PROJECT NO. 012067-000

This document was originally issued and sealed by Sean Delmore Registration Number 9177 on 09/06/18 and the original document is stored in the Engineering Dept. at City Hall.

LIGHTING

52nd Ave S - West of 63rd St S to 45th St S

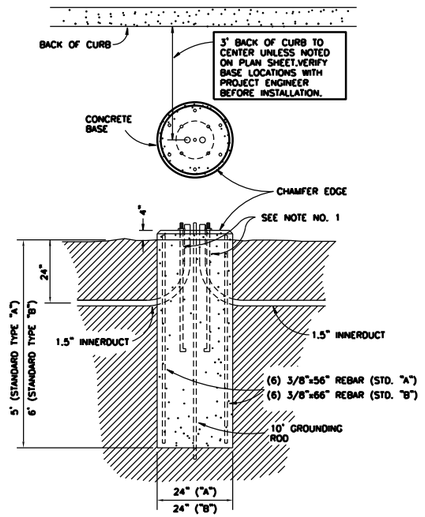
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	140	20



NOTE:
1. ALL CONDUIT LOCATED IN STREET LIGHT BASES, FEED POINT FOUNDATIONS AND PULL BOXES SHALL HAVE BELL ENDS.

FEED POINT ELEVATION

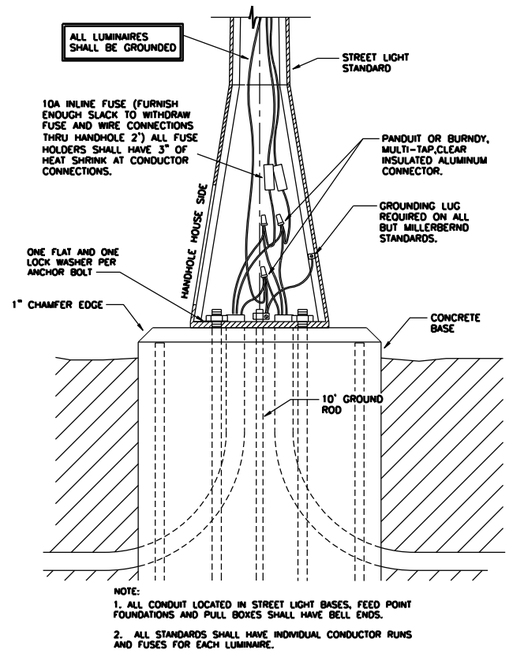
NO SCALE



NOTE:
1. ANCHOR BOLT SIZE, BOLT CIRCLE AND PROJECTION OF ANCHOR BOLTS TO BE VERIFIED WITH MANUFACTURER SPECIFICATIONS.
3. BASES LOCATED AT THE END OF CIRCUIT SHALL HAVE SPARE CONDUIT, CAP END.

5' OR 6' CONCRETE BASE DETAIL

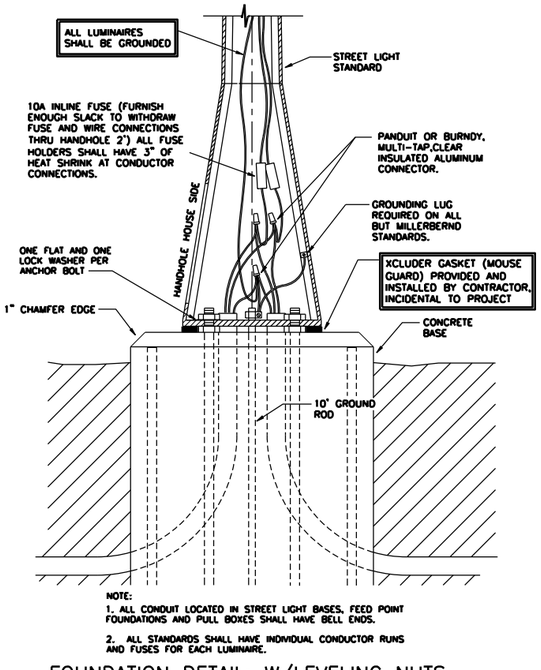
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NOTE:
1. ALL CONDUIT LOCATED IN STREET LIGHT BASES, FEED POINT FOUNDATIONS AND PULL BOXES SHALL HAVE BELL ENDS.
2. ALL STANDARDS SHALL HAVE INDIVIDUAL CONDUCTOR RUNS AND FUSES FOR EACH LUMINAIRE.

FOUNDATION DETAIL: NO LEVELING NUTS

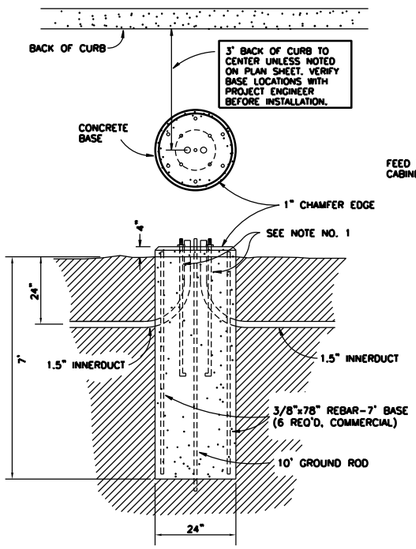
NO SCALE



NOTE:
1. ALL CONDUIT LOCATED IN STREET LIGHT BASES, FEED POINT FOUNDATIONS AND PULL BOXES SHALL HAVE BELL ENDS.
2. ALL STANDARDS SHALL HAVE INDIVIDUAL CONDUCTOR RUNS AND FUSES FOR EACH LUMINAIRE.

FOUNDATION DETAIL: W/LEVELING NUTS

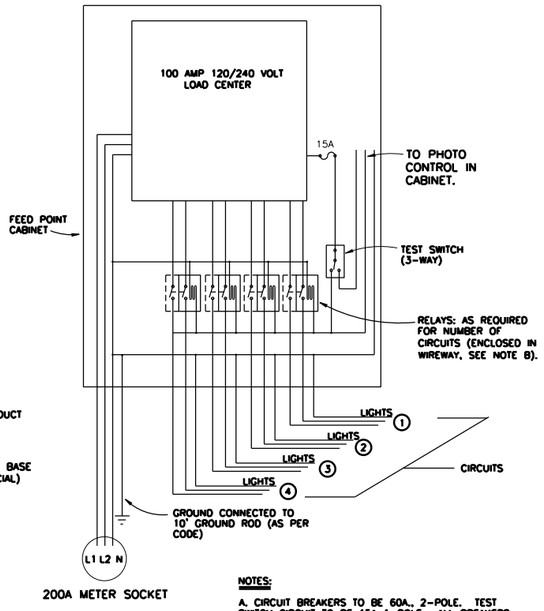
NO SCALE



NOTE:
1. 1"x 40" ANCHOR BOLTS (25'-40' COMMERCIAL POLE)
2. BASES LOCATED AT THE END OF CIRCUIT SHALL HAVE SPARE CONDUIT, CAP END.

7' CONCRETE BASE DETAIL

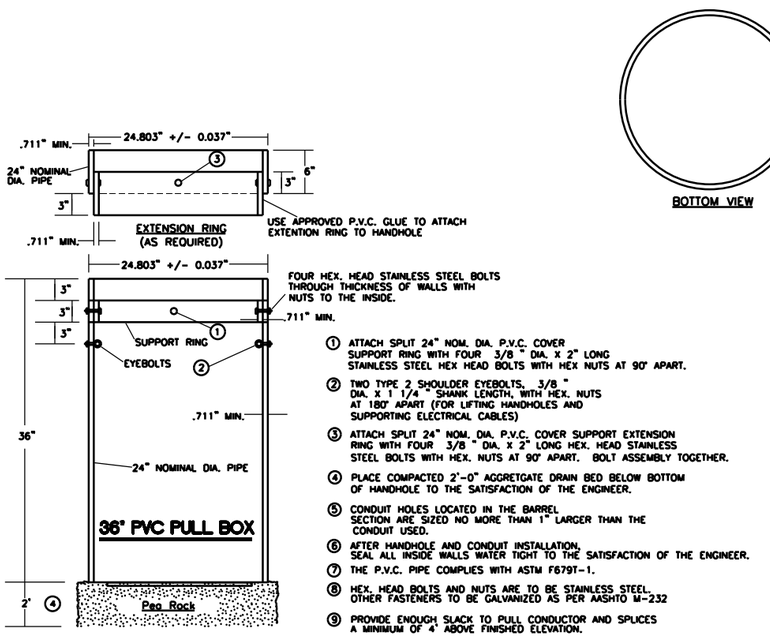
NO SCALE



NOTES:
A. CIRCUIT BREAKERS TO BE 60A., 2-POLE. TEST SWITCH CIRCUIT TO BE 15A 1-POLE. ALL BREAKERS ARE TO BE RATED AT 22,000 AIC.
B. CONTACTORS TO BE NORMAL OPEN TYPE, 60A, 2-POLE, MECHANICAL, 240V TO GROUND. QUANTITY OF RELAYS AS REQUIRED FOR NUMBER OF CIRCUITS.

WIRING SCHEMATIC: MULTI CIRCUIT FEED POINT

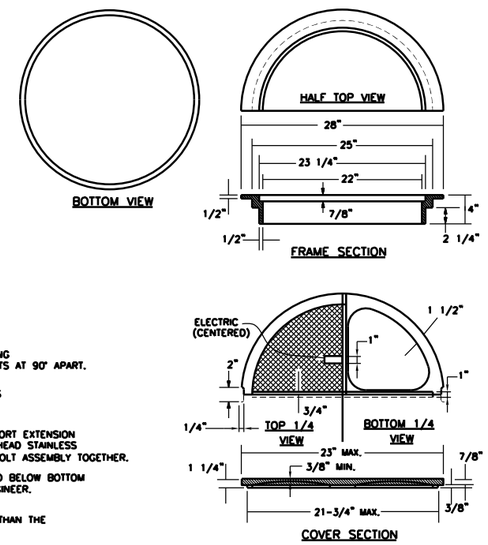
NO SCALE



1. ATTACH SPLIT 24" NOM. DIA. P.V.C. COVER SUPPORT RING WITH FOUR 3/8 " DIA. X 2" LONG STAINLESS STEEL HEX HEAD BOLTS WITH HEX NUTS AT 90° APART.
2. TWO TYPE 2 SHOULDER EYEBOLTS, 3/8 " DIA. X 1 1/4 " SHANK LENGTH, WITH HEX. NUTS AT 180° APART (FOR LIFTING HANDHOLES AND SUPPORTING ELECTRICAL CABLES)
3. ATTACH SPLIT 24" NOM. DIA. P.V.C. COVER SUPPORT EXTENSION RING WITH FOUR 3/8 " DIA. X 2" LONG HEX. HEAD STAINLESS STEEL BOLTS WITH HEX. NUTS AT 90° APART. BOLT ASSEMBLY TOGETHER.
4. PLACE COMPACTED 2'-0" AGGRETGATE DRAIN BED BELOW BOTTOM OF HANDHOLE TO THE SATISFACTION OF THE ENGINEER.
5. CONDUIT HOLES LOCATED IN THE BARREL SECTION ARE SIZED NO MORE THAN 1" LARGER THAN THE CONDUIT USED.
6. AFTER HANDHOLE AND CONDUIT INSTALLATION, SEAL ALL INSIDE WALLS WATER TIGHT TO THE SATISFACTION OF THE ENGINEER.
7. THE P.V.C. PIPE COMPLIES WITH ASTM F679T-1.
8. HEX. HEAD BOLTS AND NUTS ARE TO BE STAINLESS STEEL. OTHER FASTENERS TO BE GALVANIZED AS PER AASHTO M-232
9. PROVIDE ENOUGH SLACK TO PULL CONDUCTOR AND SPLICES A MINIMUM OF 4' ABOVE FINISHED ELEVATION.

PULL BOX, METAL FRAME AND COVER DETAIL

NO SCALE



FRAME AND COVER CASTING

NOTE:
ALL CASTINGS ARE GRAY IRON AS PER SPEC. 3321 CLASS 35B

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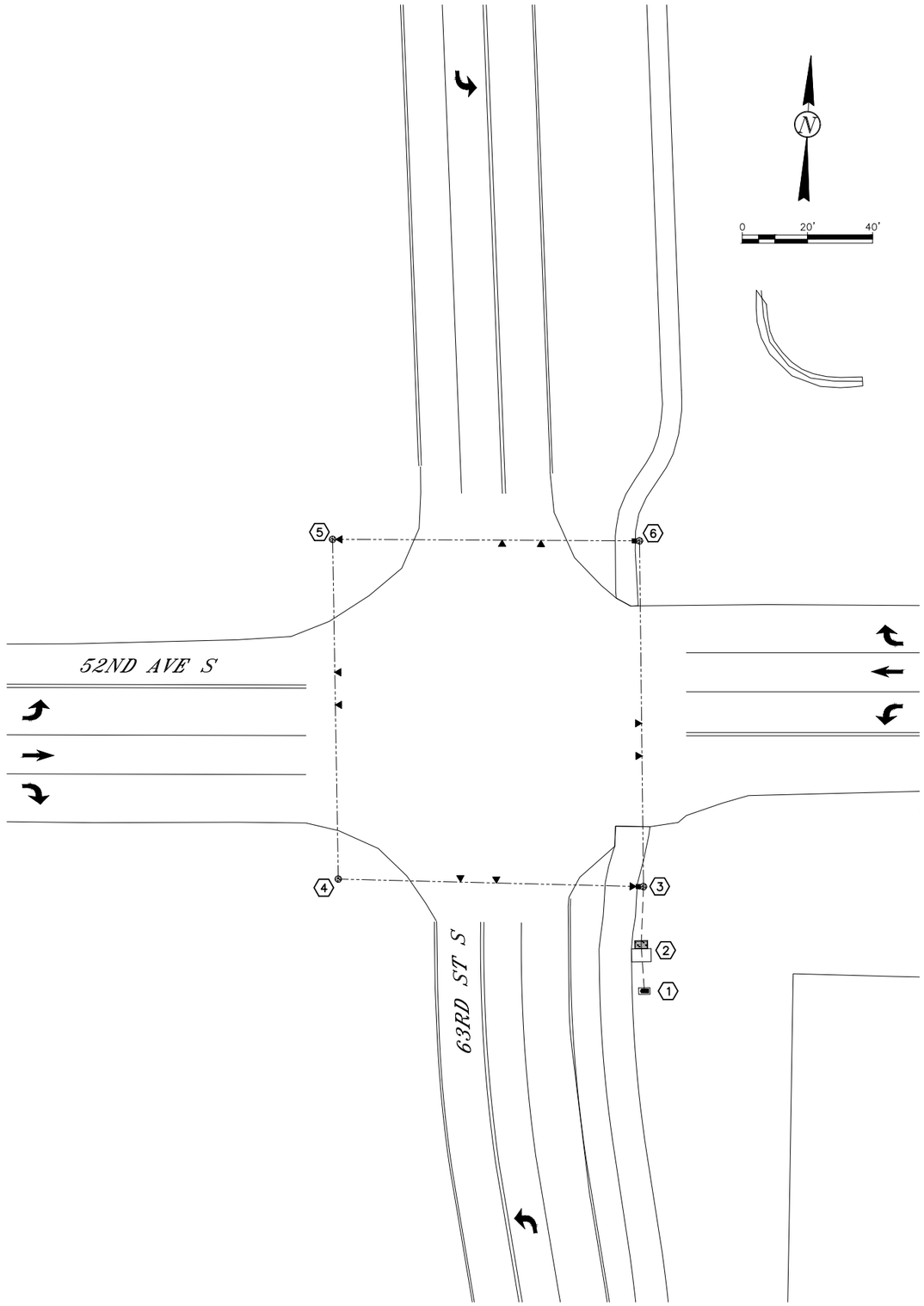
WSB PROJECT NO. 012067-000

This document was originally issued and sealed by Sean Delmore Registration Number 9177 on 09/06/18 and the original document is stored in the Engineering Dept. at City Hall.

LIGHTING

52nd Ave S - West of 63rd St S to 45th St S

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	150	1



1. REMOVE, SALVAGE, AND RELOCATE EXISTING COMBO FEED POINT CABINET AND EQUIPMENT. DISPOSE CONCRETE FOUNDATION.
2. REMOVE AND SALVAGE EXISTING TRAFFIC SIGNAL CONTROLLER CABINET AND EQUIPMENT. DISPOSE CONCRETE FOUNDATION AND WORKING PAD. REMOVE AND SALVAGE EMERGENCY VEHICLE DETECTION SYSTEM.
3. REMOVE AND SALVAGE EXISTING TEMPORARY WOOD POLE WITH GUY WIRE. REMOVE AND SALVAGE ALL LED SECTIONS FROM VEHICLE HEADS. DISPOSE OF REMAINDER OF VEHICLE HEADS. REMOVE AND SALVAGE PEDESTRIAN COUNTDOWN HEAD. REMOVE AND SALVAGE EXISTING PEDESTRIAN PUSH BUTTON. REMOVE AND SALVAGE ALL MOUNTING EQUIPMENT.
4. REMOVE AND SALVAGE EXISTING TEMPORARY WOOD POLE WITH GUY WIRE. REMOVE AND SALVAGE ALL LED SECTIONS FROM VEHICLE HEADS. DISPOSE OF REMAINDER OF VEHICLE HEADS. REMOVE AND SALVAGE ALL MOUNTING EQUIPMENT.
5. REMOVE AND SALVAGE EXISTING TEMPORARY WOOD POLE WITH GUY WIRE. REMOVE AND SALVAGE ALL LED SECTIONS FROM VEHICLE HEADS. DISPOSE OF REMAINDER OF VEHICLE HEADS. REMOVE AND SALVAGE ALL MOUNTING EQUIPMENT.
6. REMOVE AND SALVAGE EXISTING TEMPORARY WOOD POLE WITH GUY WIRE. REMOVE AND SALVAGE ALL LED SECTIONS FROM VEHICLE HEADS. DISPOSE OF REMAINDER OF VEHICLE HEADS. REMOVE AND SALVAGE PEDESTRIAN COUNTDOWN HEAD. REMOVE AND SALVAGE EXISTING PEDESTRIAN PUSH BUTTON. REMOVE AND SALVAGE ALL MOUNTING EQUIPMENT.

NOTE:
1. EXISTING TRAFFIC CONTROL SIGNAL SYSTEM SHOWN BASED OFF EXISTING PLANS. ACTUAL FIELD LOCATION OF SYSTEM COMPONENTS MAY VARY.

- Polymer Concrete Fiber Pull Box
- Detector Loops
- Feed Point
- Controller Cabinet
- Existing Signal Std.
- Existing Pull Box
- New Pull Box
- Ped. Post
- Utility Pole
- New Signal Std.
- Flasher
- Ped. Head
- Vehicle Head
- Conduit
- Existing Conduit
- Signal Fiber Line
- Span Wire

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Proj. No. 6059-0145
Houston Engineering Inc.
Ph: 701.237.5065

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Signals - Removals 63rd St S

52nd Ave S - West of 63rd St S to 45th St S

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	150	2

REMOVAL QUANTITIES (B)														
REMOVE FEED POINT FOUNDATION	REMOVE & SALVAGE COMBO FEED POINT CABINET	REMOVE TRAFFIC SIGNAL CONTROLLER FOUNDATION & WORKING SLAB	REMOVE & SALVAGE TRAFFIC SIGNAL CONTROLLER CABINET	REMOVE & SALVAGE WOOD POLE W/ GUY WIRE	REMOVE & SALVAGE VEHICULAR HEADS	REMOVE & SALVAGE PEDESTRIAN HEADS	REMOVE & SALVAGE PEDESTRIAN PUSH BUTTON	REMOVE & SALVAGE EMERGENCY VEHICLE DETECTION SYSTEM	REMOVE & SALVAGE VEHICULAR & PEDESTRIAN HEAD MOUNTING EQUIPMENT	REMOVE & SALVAGE SPAN & STABILITY WIRE	REMOVE & SALVAGE CONDUCTOR	REMOVE CONDUIT		REMOVE TRAFFIC SIGNAL SYSTEM
EA	EA	EA	EA	EA	EA	EA	EA	EA	LSUM	LSUM	LSUM	LSUM		EA
1	1	1	1	4	10	2	2	1	1	1	1	1		1

(B) TRAFFIC SIGNAL REMOVAL QUANTITIES FOR INFORMATIONAL PURPOSES ONLY.
ALL COSTS SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVE TRAFFIC SIGNAL SYSTEM".
QUANTITIES CALCULATED ACCORDING TO NDDOT SPECIFICATIONS.

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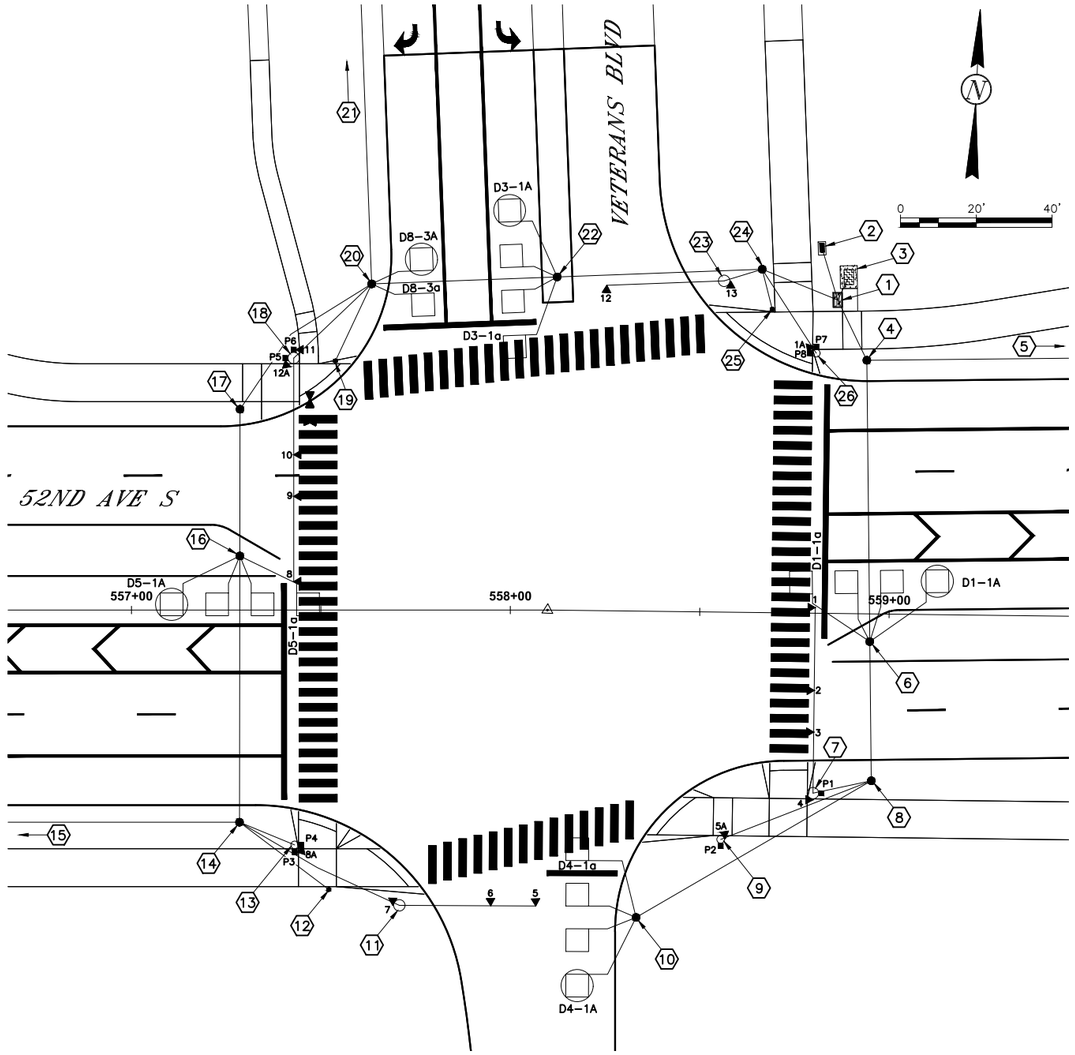
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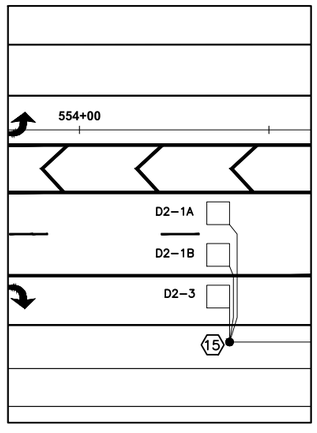
Signals - Quantities 63rd St S

52nd Ave S - West of 63rd St S to 45th St S

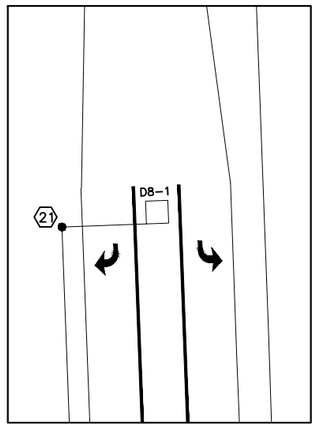
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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	150	3

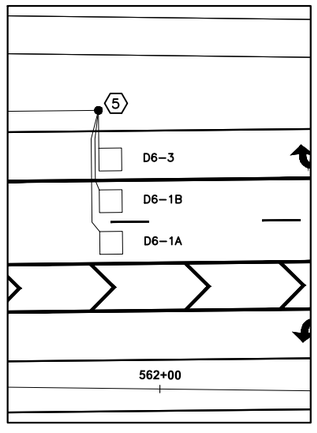




EASTBOUND



SOUTHBOUND



WESTBOUND

(1) INSTALL TRAFFIC SIGNAL CABINET FOUNDATION AND WORKING SLAB. F&I NEW FARGO TYPE B CABINET. INSTALL A SECOND SEPARATE STAND ALONE DETECTOR RACK WITH ITS OWN POWER SUPPLY AND ITS OWN SEPARATE SELF CONTAINED WIRING HARNESS WITH NO JUMPERS BETWEEN THE TWO DETECTOR RACKS. IT SHALL BE LOCATED TO THE RIGHT OF THE STANDARD DETECTOR RACK. INSTALL TWO EXTRA DETECTOR PANELS DIRECTLY ABOVE THE STANDARD FARGO TYPE B CABINET PANELS; THESE SHALL BE CONNECTED TO THE SECOND DETECTOR RACK. PROVIDE TWO PS 2.4 AMP POWER SUPPLIES FOR THE DETECTOR RACKS. PROVIDE 2 SPARE 2" CONDUITS IN THE FOUNDATION STUBBED OUT TO THE WEST. THE CABINET DOOR SHALL FACE EAST AND RIGHT HINGED. PROVIDE 17 – 2–CHANNEL VEHICLE DETECTORS.

(2) INSTALL FEED POINT CABINET FOUNDATION. RELOCATE EXISTING COMBO FEED POINT CABINET AND EQUIPMENT. PROVIDE 2 SPARE 2" CONDUITS IN THE FOUNDATION, 1 EAST AND 1 WEST. THE CABINET DOOR SHALL FACE EAST.

(3) F&I NEW POLYMER CONCRETE FIBER PULL BOX. INSTALL CONCRETE PAD AROUND PULL BOX.

(4) F&I NEW PVC PULL BOX.

(5) F&I NEW PVC PULL BOX. INSTALL 3 – 6'x6' LOOPS(D6–1A/D6–1B/D6–3).

(6) F&I NEW PVC PULL BOX. INSTALL 4 – 6'x6' LOOPS(D1–1A/D1–1a).

(7) F&I NEW CONCRETE TRAFFIC SIGNAL FOUNDATION. F&I NEW TYPE IV/COMBO TRAFFIC SIGNAL STANDARD WITH A 49' MAST ARM. F&I MODEL 722 EVP DETECTOR AND CONFIRMATION LIGHT. F&I NEW PTZ CAMERA. F&I NEW APS PEDESTRIAN PUSH BUTTON FACING WEST WITH A LEFT ARROW.

(8) F&I NEW PVC PULL BOX.

(9) F&I NEW CONCRETE TRAFFIC SIGNAL FOUNDATION. F&I NEW TYPE VI TRAFFIC SIGNAL STANDARD (17.5' HEIGHT). F&I NEW APS PEDESTRIAN PUSH BUTTON FACING NORTH WITH A RIGHT ARROW.

(10) F&I NEW PVC PULL BOX. INSTALL 4 – 6'x6' LOOPS(D4–1A/D4–1a).

(11) F&I NEW CONCRETE TRAFFIC SIGNAL FOUNDATION. F&I NEW TYPE IV/COMBO TRAFFIC SIGNAL STANDARD WITH A 36' MAST ARM. F&I EVP CONFIRMATION LIGHT.

(12) F&I NEW PEDESTRIAN PUSH BUTTON POST WITH NEW APS PEDESTRIAN PUSH BUTTON FACING NORTH WITH A LEFT ARROW.

(13) F&I NEW CONCRETE TRAFFIC SIGNAL FOUNDATION. F&I NEW TYPE VI TRAFFIC SIGNAL STANDARD (17.5' HEIGHT). F&I NEW APS PEDESTRIAN PUSH BUTTON FACING EAST WITH A RIGHT ARROW.

(14) F&I NEW PVC PULL BOX.

(15) F&I NEW PVC PULL BOX. INSTALL 3 – 6'x6' LOOPS(D2–1A/D2–1B/D2–3).

(16) F&I NEW PVC PULL BOX. INSTALL 4 – 6'x6' LOOPS(D5–1A/D5–1a).

(17) F&I NEW PVC PULL BOX.

(18) F&I NEW CONCRETE TRAFFIC SIGNAL FOUNDATION. F&I NEW TYPE IV/COMBO TRAFFIC SIGNAL STANDARD WITH A 59' MAST ARM. F&I EVP CONFIRMATION LIGHT. F&I NEW APS PEDESTRIAN PUSH BUTTON FACING EAST WITH A LEFT ARROW.

(19) F&I NEW PEDESTRIAN PUSH BUTTON POST WITH NEW APS PEDESTRIAN PUSH BUTTON FACING SOUTH WITH A RIGHT ARROW.

(20) F&I NEW PVC PULL BOX. INSTALL 2 – 6'x6' LOOPS(D8–3A/D8–3a).

(21) F&I NEW PVC PULL BOX. INSTALL 1 – 6'x6' LOOP(D8–1).

(22) F&I NEW PVC PULL BOX. INSTALL 4 – 6'x6' LOOPS(D3–1A/D3–1a).

(23) F&I NEW CONCRETE TRAFFIC SIGNAL FOUNDATION. F&I NEW TYPE IV/COMBO TRAFFIC SIGNAL STANDARD WITH A 31' MAST ARM. F&I MODEL 722 EVP DETECTOR AND CONFIRMATION LIGHT.

(24) F&I NEW PVC PULL BOX.

(25) F&I NEW PEDESTRIAN PUSH BUTTON POST WITH NEW APS PEDESTRIAN PUSH BUTTON FACING SOUTH WITH A LEFT ARROW.

(26) F&I NEW CONCRETE TRAFFIC SIGNAL FOUNDATION. F&I NEW TYPE VI TRAFFIC SIGNAL STANDARD (17.5' HEIGHT). F&I NEW APS PEDESTRIAN PUSH BUTTON FACING WEST WITH A RIGHT ARROW.

- Polymer Concrete Fiber Pull Box
- Detector Loops
- Feed Point
- Controller Cabinet
- Existing Signal Std.
- Existing Pull Box
- New Pull Box
- Ped. Post
- Utility Pole
- New Signal Std.
- Flasher
- Ped. Head
- Vehicle Head
- Conduit
- Existing Conduit
- Signal Fiber Line
- Span Wire

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Houston Engineering Inc.
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Signals - Layout Veterans

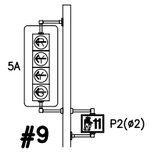
52nd Ave S - West of 63rd St S to 45th St S

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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SU-8-984(164)	150	4

HEAD 5A SHALL BE MOUNTED ON THE EAST SIDE OF THE POLE AND FACE NORTH.

HEAD P2 SHALL BE MOUNTED ON THE SOUTH SIDE OF THE POLE AND FACE WEST.

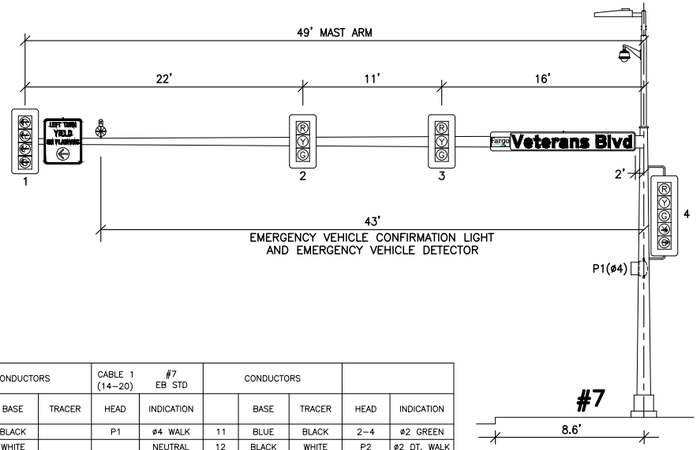


TYPE VI–17.5' HEIGHT
PEDESTAL MOUNTED–VEHICULAR AND PEDESTRIAN HEADS

20'–#14/7	Vehicle Head #5A
18'–#14/3	Ped. Head #P2

ø2 & ø5/OLC EAST–BOUND APPROACH

SEE STREET LIGHTING PLANS FOR TYPE OF LUMINAIRE EXTENSION AND FIXTURES
2 – LUMINAIRES MOUNTED AT 40'



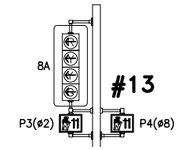
CONDUCTORS			CABLE 1 (14–20)	#7 EB STD	CONDUCTORS				
	BASE	TRACER	HEAD	INDICATION		BASE	TRACER	HEAD	INDICATION
1	BLACK		P1	ø4 WALK	11	BLUE	BLACK	2–4	ø2 GREEN
2	WHITE			NEUTRAL	12	BLACK	WHITE	P2	ø2 DT. WALK
3	RED		5A	← OLB RED	13	RED	WHITE	5A	↙OLB FL YELLOW
4	GREEN			GROUND	14	GREEN	WHITE	EVP	PE2 IND LIGHT
5	ORANGE		5A	↙OLB YELLOW	15	BLUE	WHITE	4	ø4 YELLOW↘
6	BLUE		5A	←ø3 GREEN	16	BLACK	RED	4	ø4 GREEN↘
7	WHITE	BLACK	P1	ø4 DT. WALK	17	WHITE	RED	1	↙OLC FL YELLOW
8	RED	BLACK	2–4	ø2 RED	18	ORANGE	RED	1	↙OLC YELLOW
9	GREEN	BLACK	P2	ø2 WALK	19	BLUE	RED	1	←ø5 GREEN
10	ORANGE	BLACK	2–4	ø2 YELLOW	20	RED	GREEN	1	←OLC RED

79'–#14/7	Vehicle Head #1
57'–#14/5	Vehicle Head #2
46'–#14/5	Vehicle Head #3
20'–#14/7	Vehicle Head #4
18'–#14/3	Ped. Head #P1
86'–#12/2	PE2 Ind Light

HEAD 8A SHALL BE MOUNTED ON THE SOUTH SIDE OF THE POLE AND FACE EAST.

HEAD P3 SHALL BE MOUNTED ON THE SOUTH SIDE OF THE POLE AND FACE EAST.

HEAD P4 SHALL BE MOUNTED ON THE EAST SIDE OF THE POLE AND FACE NORTH.

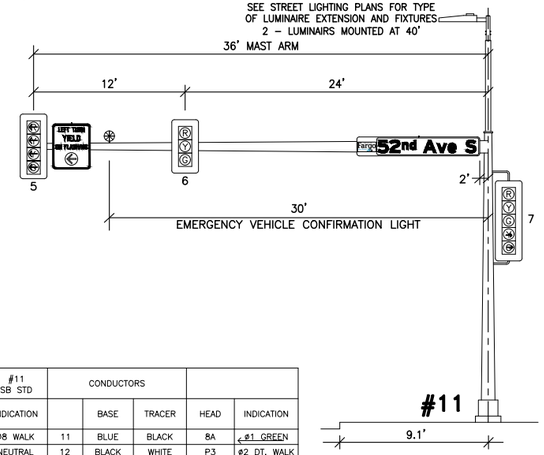


TYPE VI–17.5' HEIGHT
PEDESTAL MOUNTED–VEHICULAR AND PEDESTRIAN HEADS

20'–#14/7	Vehicle Head #8A
18'–#14/3	Ped. Head #P3
18'–#14/3	Ped. Head #P4

ø3/OLB & ø8 SOUTH–BOUND APPROACH

SEE STREET LIGHTING PLANS FOR TYPE OF LUMINAIRE EXTENSION AND FIXTURES
2 – LUMINAIRS MOUNTED AT 40'



CONDUCTORS			CABLE 2 (14–20)	#11 SB STD	CONDUCTORS				
	BASE	TRACER	HEAD	INDICATION		BASE	TRACER	HEAD	INDICATION
1	BLACK		P4	ø8 WALK	11	BLUE	BLACK	8A	←ø1 GREEN
2	WHITE			NEUTRAL	12	BLACK	WHITE	P3	ø2 DT. WALK
3	RED		6–7	ø8 RED	13	RED	WHITE	8A	↙OLA FL YELLOW
4	GREEN			GROUND	14	GREEN	WHITE	EVP	PE3 IND LIGHT
5	ORANGE		6–7	ø8 YELLOW	15	BLUE	WHITE	7	ø5 YELLOW↘
6	BLUE		6–7	ø8 GREEN	16	BLACK	RED	7	ø5 GREEN↘
7	WHITE	BLACK	P4	ø8 DT. WALK	17	WHITE	RED	5	↙OLB FL YELLOW
8	RED	BLACK	8A	←OLA RED	18	ORANGE	RED	5	↙OLB YELLOW
9	GREEN	BLACK	P3	ø2 WALK	19	BLUE	RED	5	←ø3 GREEN
10	ORANGE	BLACK	8A	↙OLA YELLOW	20	RED	GREEN	5	←OLB RED

66'–#14/7	Vehicle Head #5
54'–#14/5	Vehicle Head #6
20'–#14/7	Vehicle Head #7
73'–#12/2	PE3 Ind Light

MAST ARMS AND STANDARDS:
All mast arms and standards shall be design for a windload factor that accounts for the heads and signs shown, replacing the vehicle head at the end of the mast arm with a 5–section cluster head, and an additional 10 square feet of sign area added to the mast arm.

EACH VEHICLE/PEDESTRIAN HEAD CABLE SHALL BE LABELED WITH THE HEAD #.

EACH CABLE FROM THE CONTROLLER CABINET SHALL HAVE A SEPARATE TERMINAL BLOCK INSIDE THE T–BASE FOR TERMINATIONS.

MAST ARM MOUNTED SIGNS SHALL NOT BE PAID FOR SEPARATELY, BUT INCLUDED IN THE PRICE BID FOR TRAFFIC SIGNAL SYSTEM.

THESE POLES SHALL BE GALVANIZED.

HEAD CONDUCTOR ASSIGNMENT

CONDUCTORS			No.14 Awg 3 Ped. Heads	No.14 Awg 5 Veh. Heads	No.14 Awg 7 5–Section Veh. Heads
	BASE	TRACER	INDICATION	INDICATION	INDICATION
1	BLACK		WALK	GREEN	GREEN BALL
2	WHITE		NEUTRAL	NEUTRAL	NEUTRAL
3	RED		DT. WALK	RED	RED
4	GREEN			GROUND	GROUND
5	ORANGE			YELLOW	YELLOW BALL
6	BLUE				GREEN ARRROW
7	WHITE	BLACK			YELLOW ARROW

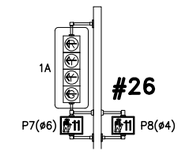
FYA CONDUCTOR ASSIGNMENT

CONDUCTORS			No.14 Awg 7 4–Section Veh. Heads
	BASE	TRACER	INDICATION
1	BLACK		SPARE
2	WHITE		NEUTRAL
3	RED		RED ARROW
4	GREEN		GROUND
5	ORANGE		FLASHING YELLOW ARROW
6	BLUE		GREEN ARRROW
7	WHITE	BLACK	YELLOW ARROW

HEAD 1A SHALL BE MOUNTED ON THE NORTH SIDE OF THE POLE AND FACE WEST.

HEAD P7 SHALL BE MOUNTED ON THE NORTH SIDE OF THE POLE AND FACE WEST.

HEAD P8 SHALL BE MOUNTED ON THE WEST SIDE OF THE POLE AND FACE SOUTH.

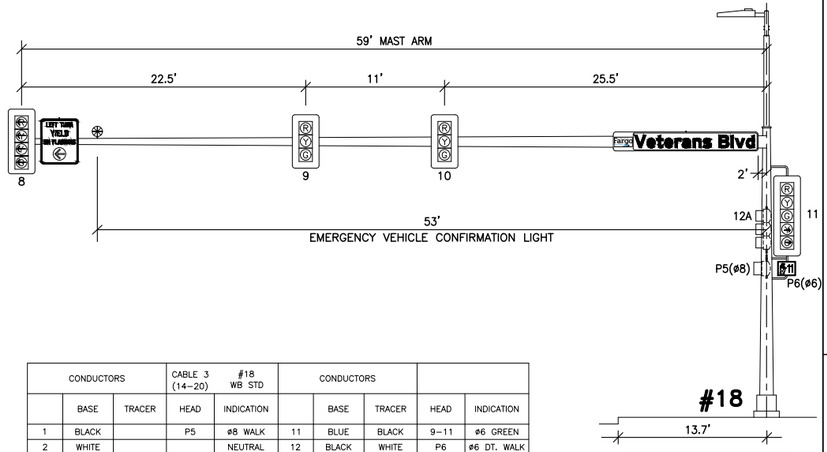


TYPE VI–17.5' HEIGHT
PEDESTAL MOUNTED–VEHICULAR AND PEDESTRIAN HEADS

20'–#14/7	Vehicle Head #1A
18'–#14/3	Ped. Head #P7
18'–#14/3	Ped. Head #P8

ø1/OLA & ø6 WEST–BOUND APPROACH

SEE STREET LIGHTING PLANS FOR TYPE OF LUMINAIRE EXTENSION AND FIXTURES
2 – LUMINAIRES MOUNTED AT 40'

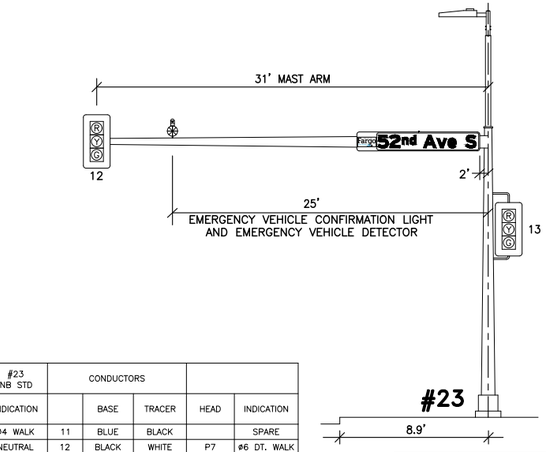


CONDUCTORS			CABLE 3 (14–20)	#18 WB STD	CONDUCTORS				
	BASE	TRACER	HEAD	INDICATION		BASE	TRACER	HEAD	INDICATION
1	BLACK		P5	ø8 WALK	11	BLUE	BLACK	9–11	ø6 GREEN
2	WHITE			NEUTRAL	12	BLACK	WHITE	P6	ø6 DT. WALK
3	RED		12A	ø4 RED	13	RED	WHITE		SPARE
4	GREEN			GROUND	14	GREEN	WHITE	EVP	PE1 IND LIGHT
5	ORANGE		12A	ø4 YELLOW	15	BLUE	WHITE	11	ø3 YELLOW↘
6	BLUE		12A	ø4 GREEN	16	BLACK	RED	11	ø3 GREEN↘
7	WHITE	BLACK	P5	ø8 DT. WALK	17	WHITE	RED	8	↙OLA FL YELLOW
8	RED	BLACK	9–11	ø6 RED	18	ORANGE	RED	8	↙OLA YELLOW
9	GREEN	BLACK	P6	ø6 WALK	19	BLUE	RED	8	←ø1 GREEN
10	ORANGE	BLACK	9–11	ø6 YELLOW	20	RED	GREEN	8	←OLA RED

89'–#14/7	Vehicle Head #8
67'–#14/5	Vehicle Head #9
56'–#14/5	Vehicle Head #10
20'–#14/7	Vehicle Head #11
20'–#14/5	Vehicle Head #12A
18'–#14/3	Ped. Head P5
18'–#14/3	Ped. Head P6
96'–#12/2	PE1 Ind Light

ø4 NORTH–BOUND APPROACH

SEE STREET LIGHTING PLANS FOR TYPE OF LUMINAIRE EXTENSION AND FIXTURES
2 – LUMINAIRES MOUNTED AT 40'



CONDUCTORS			CABLE 4 (14–20)	#23 NB STD	CONDUCTORS				
	BASE	TRACER	HEAD	INDICATION		BASE	TRACER	HEAD	INDICATION
1	BLACK		P8	ø4 WALK	11	BLUE	BLACK		SPARE
2	WHITE			NEUTRAL	12	BLACK	WHITE	P7	ø6 DT. WALK
3	RED		12–13	ø4 RED	13	RED	WHITE		SPARE
4	GREEN			GROUND	14	GREEN	WHITE	EVP	PE4 IND LIGHT
5	ORANGE		12–13	ø4 YELLOW	15	BLUE	WHITE		SPARE
6	BLUE		12–13	ø4 GREEN	16	BLACK	RED		SPARE
7	WHITE	BLACK	P8	ø4 DT. WALK	17	WHITE	RED	1A	↙OLC FL YELLOW
8	RED	BLACK		SPARE	18	ORANGE	RED	1A	↙OLC YELLOW
9	GREEN	BLACK	P7	ø6 WALK	19	BLUE	RED	1A	←ø5 GREEN
10	ORANGE	BLACK		SPARE	20	RED	GREEN	1A	←OLC RED

61'–#14/5	Vehicle Head #12
20'–#14/5	Vehicle Head #13
68'–#12/2	PE4 Ind Light

NOTE: All signal heads shall be SIG Polycarbonate. All back plates shall be lovered .063" thick aluminum.

ALL PEDESTRIAN HEADS
16" x 18" Filled Overlay
L.E.D. PEDESTRIAN HEAD
WITH PEDESTRIAN COUNT DOWN TIMER

ALL L.E.D. SIGNAL HEADS
12" Lenses
VEHICLE HEADS
2,3,6,9,10,12,12A,13

ALL L.E.D. SIGNAL HEADS
12" Lenses
VEHICLE HEADS
1,1A,5,5A,8,8A

ALL L.E.D. SIGNAL HEADS
12" Lenses
VEHICLE HEADS
4,7,11

THE CITY OF Fargo FAR MORE

Proj. No. 6059-0145
Houston Engineering Inc.
Ph: 701.237.5065

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Signals - Signal Standards Veterans

52nd Ave S - West of 63rd St S to 45th St S

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	150	5

Plan Note Number / Symbol

Feed Point
Pedestrian Signal Standard
Traffic Signal Standard
Controller Cabinet
Ped. Push Button Post
Pull Box
Polymer Concrete Fiber Pull Box

169'-2" Conduit
1-Loop Lead-In(21 to 1-323')D8-1

49'-4" Conduit
#14 AWG 20(18)Cable 3
#14 AWG 20(11)Cable 2
#14 AWG 2(19)ø6 Ped.
#14 AWG 2(18)ø8 Ped.
#14 AWG 2(13)ø8 Ped.
#14 AWG 2(12)ø2 Ped.
2-Loop Lead-In(20 to 1-151'*2)
D8-3A/D8-3a
1-Loop Lead-In(21)
2-Loop Lead-In(16)
3-Loop Lead-In(15)

54'-4" Conduit
#14 AWG 20(18)Cable 3
#14 AWG 20(11)Cable 2
#14 AWG 2(19)ø6 Ped.
#14 AWG 2(18)ø8 Ped.
#14 AWG 2(13)ø8 Ped.
#14 AWG 2(12)ø2 Ped.
2-Loop Lead-In (22 to 1-99'*2)
D3-1A/D3-1a
2-Loop Lead-In(20)
1-Loop Lead-In(21)
2-Loop Lead-In(16)
3-Loop Lead-In(15)

22'-4" Conduit
#14 AWG 20(23)Cable 4
#14 AWG 20(18)Cable 3
#14 AWG 20(11)Cable 2
#14 AWG 2(26)ø4 Ped.
#14 AWG 2(25)ø6 Ped.
#14 AWG 2(19)ø6 Ped.
#14 AWG 2(18)ø8 Ped.
#14 AWG 2(13)ø8 Ped.
#14 AWG 2(12)ø2 Ped.
Opticom(23)EVP Detector
2-Loop Lead-In(22)
2-Loop Lead-In(20)
1-Loop Lead-In(21)
2-Loop Lead-In(16)
3-Loop Lead-In(15)

14'-2" Conduit
2-#6 RHW(2 to 1-34'*2)
#6 THW(2 to 1-34')

49'-3" Conduit
#14 AWG 20(11)Cable 2
#14 AWG 2(13)ø8 Ped.
#14 AWG 2(12)ø2 Ped.
2-Loop Lead-In(16)
3-Loop Lead-In(15)

7'-2" Conduit
Fiber Optic Cable
See Section 160

28'-2" Conduit
#14 AWG 20(18 to 1-177')Cable 3
#14 AWG 2(18 to 1-183')ø8 Ped.
#14 AWG 3(10')ø8 Ped. PB to Head P5
#14 AWG 3(18 to 19-78')ø6 Ped. PB to Head P6

18'-3" Conduit
#14 AWG 20(7)Cable 1
#14 AWG 2(7)ø4 Ped.
#14 AWG 2(9)ø2 Ped.
Opticom(7)EVP Detector
3-Loop Lead-In(5)
2-Loop Lead-In(6)
2-Loop Lead-In(10)
#16 AWG 3(7)PTZ Camera
CAT 6 Cable(7)PTZ Camera

11'-2" Conduit
#14 AWG 20(23 to 1-51')Cable 4
Opticom(23 to 1-117')EVP Detector
#14 AWG 7(26)Head 1A
#14 AWG 3(26)Head P7
#14 AWG 3(26)Head P8

23'-1" Conduit
#14 AWG 2(19 to 1-178')ø6 Ped.
#14 AWG 3(18)ø6 Ped. PB to Head P6

290'-2" Conduit
3-Loop Lead-In(5 to 1-331'*3)
D6-1A/D6-1B/D6-3

39'-3" Conduit
#14 AWG 20(11)Cable 2
#14 AWG 2(13)ø8 Ped.
#14 AWG 2(12)ø2 Ped.
2-Loop Lead-In(16 to 1-245'*2)D5-1A/D5-1a
3-Loop Lead-In(15)

11'-1" Conduit
#14 AWG 2(25 to 1-57')ø6 Ped.
#14 AWG 3(26)ø6 Ped. PB to Head P7

26'-2" Conduit
#14 AWG 2(26 to 1-72')ø4 Ped.
#14 AWG 3(10')ø4 Ped. PB to Head P8
#14 AWG 7(26 to 23-50')Head 1A
#14 AWG 3(26 to 23-50')Head P7
#14 AWG 3(26 to 23-50')Head P8
#14 AWG 3(26 to 25-64')ø6 Ped. PB to Head P7

74'-3" Conduit
#14 AWG 20(7)Cable 1
#14 AWG 2(7)ø4 Ped.
#14 AWG 2(9)ø2 Ped.
Opticom(7)EVP Detector
2-Loop Lead-In(6 to 1-115'*2)D1-1A/D1-1a
2-Loop Lead-In(10)
#16 AWG 3(7)PTZ Camera
CAT 6 Cable(7)PTZ Camera

70'-3" Conduit
#14 AWG 20(11)Cable 2
#14 AWG 2(13)ø8 Ped.
#14 AWG 2(12)ø2 Ped.
3-Loop Lead-In(15)

16'-2" Conduit
#14 AWG 2(13 to 1-338')ø8 Ped.
#14 AWG 3(10')ø8 Ped. PB to Head P4
#14 AWG 7(13 to 11-77')Head 8A
#14 AWG 3(13 to 11-77')Head P3
#14 AWG 3(13 to 11-77')Head P4
#14 AWG 3(13 to 12-73')ø2 Ped. PB to Head P3

37'-3" Conduit
#14 AWG 20(7)Cable 1
#14 AWG 2(7)ø4 Ped.
#14 AWG 2(9)ø2 Ped.
Opticom(7)EVP Detector
2-Loop Lead-In(10)
#16 AWG 3(7)PTZ Camera
CAT 6 Cable(7)PTZ Camera

43'-2" Conduit
#14 AWG 2(9 to 1-202')ø2 Ped.
#14 AWG 3(10')ø2 Ped. PB to Head P2
#14 AWG 7(9 to 7-72')Head 5A
#14 AWG 3(9 to 7-72')Head P2

289'-2 Conduit
3-Loop Lead-In(29 to 1-610'*3)
D2-1A/D2-1B/D2-3

16'-2" Conduit
#14 AWG 20(7 to 1-169')Cable 1
#14 AWG 2(7 to 1-175')ø4 Ped.
Opticom(7 to 1-253')EVP Detector
#16 AWG 3(7 to 1-210')PTZ Camera
CAT 6 Cable(7 to 1-210')PTZ Camera
#14 AWG 3(10')ø4 Ped. PB to Head P1
#14 AWG 7(9)Head 5A
#14 AWG 3(9)Head P2

30'-1" Conduit
#14 AWG 2(12 to 1-352')ø2 Ped.
#14 AWG 3(13)ø2 Ped. PB to Head P3

48'-2" Conduit
#14 AWG 20(11 to 1-364')Cable 2
#14 AWG 7(13)Head 8A
#14 AWG 3(13)Head P3
#14 AWG 3(13)Head P4

72'-2" Conduit
2-Loop Lead-In(10 to 1-230'*2)
D4-1A/D4-1a

52ND AVE S

VETERANS BLVD

THE CITY OF Fargo FAR MORE

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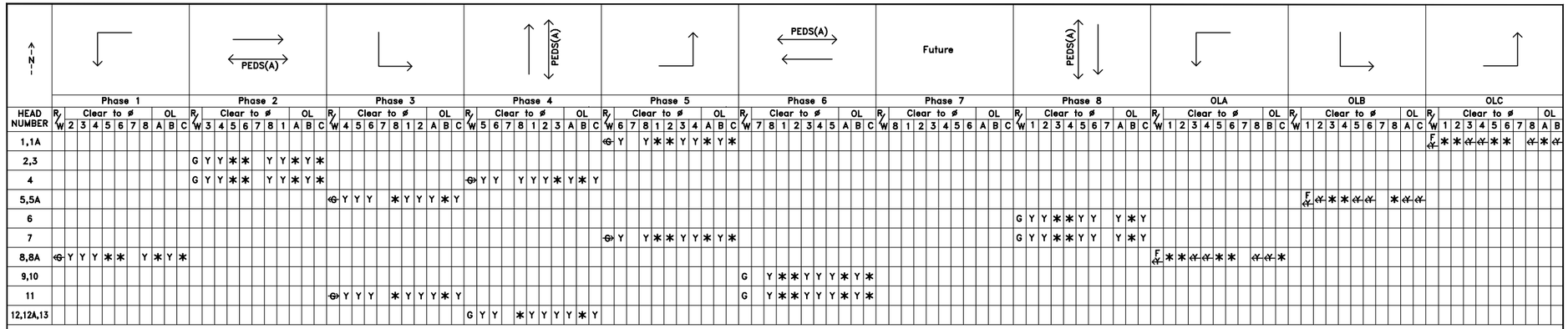
Signals - Wiring Diagram Veterans

52nd Ave S - West of 63rd St S to 45th St S

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	150	6

52nd Ave S & Veterans Blvd



HEAD NUMBER	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8	OLA	OLB	OLC
1,1A					G Y * * * * * *						F * * * * * * *
2,3		G Y Y * * Y Y * * *									
4		G Y Y * * Y Y * * *		Y Y Y Y * * Y							
5,5A			Y Y Y * Y Y Y * Y							F * * * * * * *	
6								G Y Y * * Y Y * * Y			
7					G Y * * * * * * *			G Y Y * * Y Y * * Y			
8,8A	G Y Y Y * * Y * Y *								F * * * * * * *		
9,10						G Y * * Y Y * * *					
11			Y Y Y * Y Y Y * Y			G Y * * Y Y * * *					
12,12A,13				G Y Y * Y Y Y * * Y							

Chart "A"	
On Phase	Non-Conflicting Phase Allowed to Time Concurrently
1	5,6,OLA,OLC
2	5,6,OLA,OLC
3	8,OLB
4	8,OLB
5	1,2,OLA,OLC
6	1,2,OLA,OLC
7	Future
8	3,4,OLB
OLA	1,2,5,6,OLC
OLB	3,4,8
OLC	1,2,5,6,OLA

Blank Squares Denote a Red Indication

(*) When one phase is on alone, any non-conflicting phase may start timing concurrently without a clearance interval. (See Chart "A")

(A) Only upon pedestrian actuation.

THE CITY WILL PROGRAM THE SIGNAL TIMING INTO THE CONTROLLER PRIOR TO START UP.

TRAFFIC CONTROL SYSTEM
Controller Phasing

PHASE-LOOP · DIRECTION · CONTROLLER INPUT LOCATION · LOOP TYPE · WHITE BACKGROUND · BLACK LEGEND & LINES

CH.1		1-1A	WBLT	2-1A	EB	3-1A	SBLT	4-1A	NB	5-1A	EBLT	6-1A	WB			8-1	SB	PE1	WB	PE3	SB		
		VD1	PR	VD2	P	VD3	PR	VD4	PR	VD5	PR	VD6	P	VD7		VD8	P		ø1&ø6		ø3&ø8		
CH.2		1-1a	WBLT	2-1B	EB	3-1a	SBLT	4-1a	NB	5-1a	EBLT	6-1B	WB					PE2	EB	PE4	NB		
		SD1	PR	SD2	P	SD3	PR	SD4	PR	SD5	PR	SD6	P	SD7		SD8			ø2&ø5		ø4		
REF	POWER SUPPLY	DT1		DT2		DT3		DT4		DT5		DT6		DT7		DT8		OD1		OD2			

CH.1				2-3	EBRT							6-3	WBRT			8-3A	SBRT
		VD9		VD10	P	VD11		VD12		VD13		VD14	P	VD15		VD16	PR
CH.2																8-3a	SBRT
		VD17		VD18		VD19		VD20		VD21		VD22		VD23		VD24	PR
REF	POWER SUPPLY	DT1		DT2		DT3		DT4		DT5		DT6		DT7		DT8	

TYPICAL 8 PHASE DETECTOR LABEL

SAME PHASE MULTIPLE LEAD-INS
LETTERS A-D
LANE LOCATION START
"A" ON THE CENTER LINE
TO CURB.

PHASE-LOOP
(N)-1 = (2,4,6,8)-PASSAGE
(N)-1 = (2,4,6,8)-PRESENCE
(N)-2 = (2,4,6,8)-CALLING
(N)-1 = (1,3,5,7)-LEFT TURN
(N)-3 = (2,4,6,8)-RIGHT TURN
(N)-5 = (1,2,3,4,5,6,7,8)- COUNT LOOP

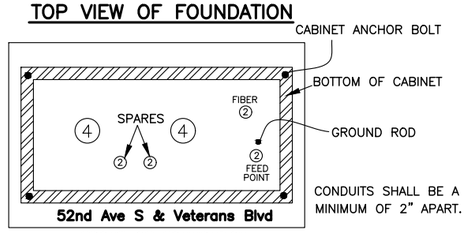
LOOP TYPE
P = PASSAGE
PR = PRESENCE
C = CALLING
LT = LEFT TURN
RT = RIGHT TURN
T = COUNT LOOP

CONTROLLER INPUT LOCATION
VD(#) = VEHICLE DETECTOR (1-8)
SD(#) = SPECIAL DETECTOR (1-8)
PD(#) = PEDESTRIAN DETECTOR (1-8)

EMERGENCY VEHICLE PRE-EMPTION PHASING

ø6 / ø1+OLA	ø5+OLC / ø2	ø8 / ø3+OLB	ø4
WEST BOUND	EAST BOUND	SOUTH BOUND	NORTH BOUND
PREEMPT 1	PREEMPT 2	PREEMPT 3	PREEMPT 4
TOP TUBE/BLUE WIRE	BOTTOM TUBE/YELLOW WIRE	TOP TUBE/BLUE WIRE	BOTTOM TUBE/YELLOW WIRE

CONDUIT PLACEMENT
TOP VIEW OF FOUNDATION



52nd Ave S & Veterans Blvd
FRONT OF FOUNDATION

THE CITY OF Fargo
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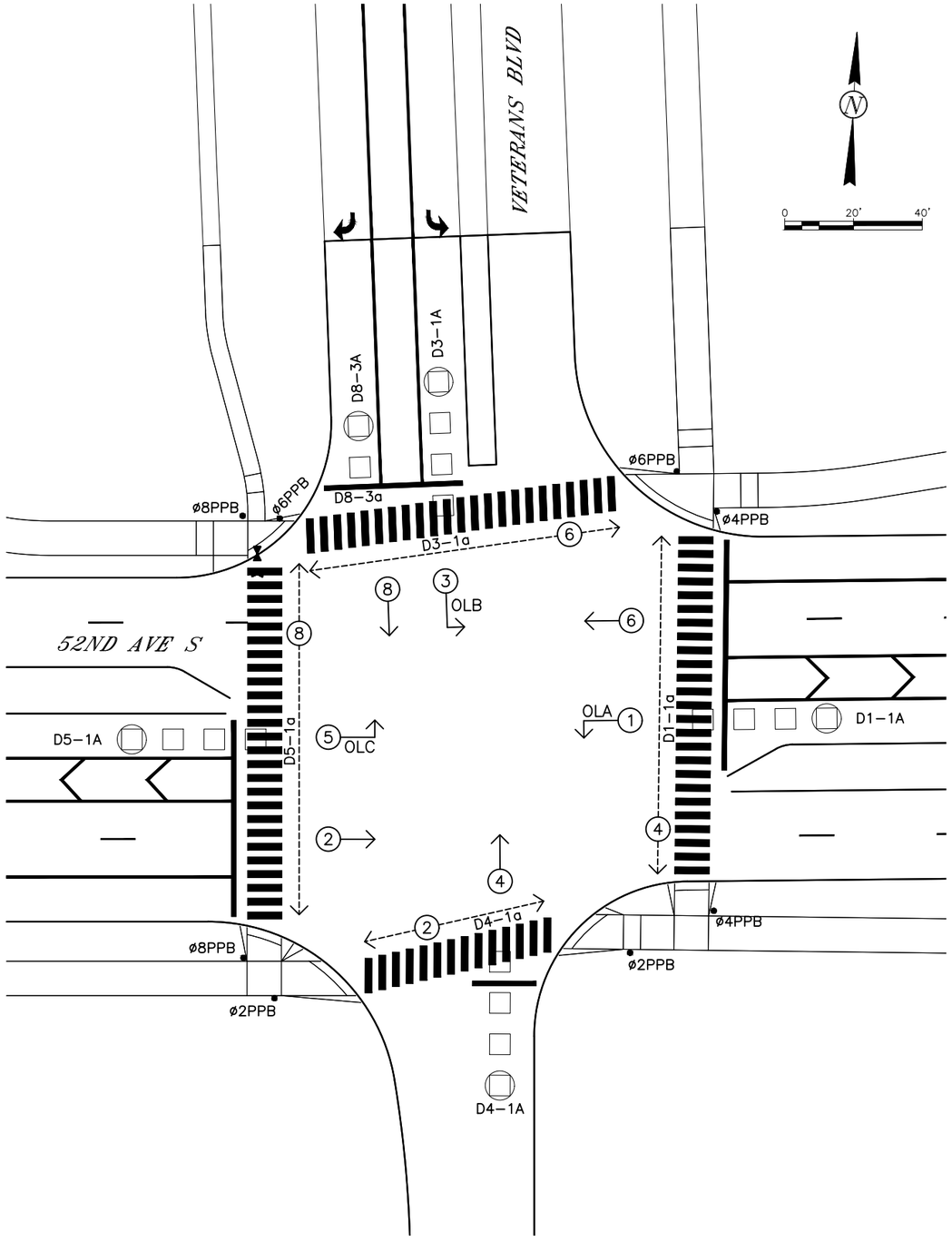
Signals - Controller Phasing Veterans

52nd Ave S - West of 63rd St S to 45th St S

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	150	7

PHASE DESIGNATION DIAGRAM

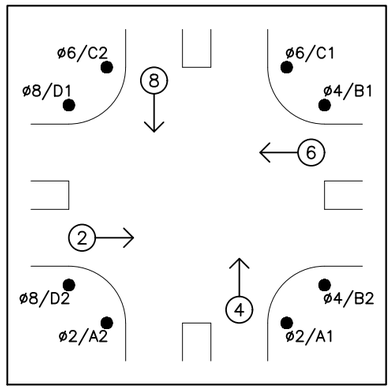


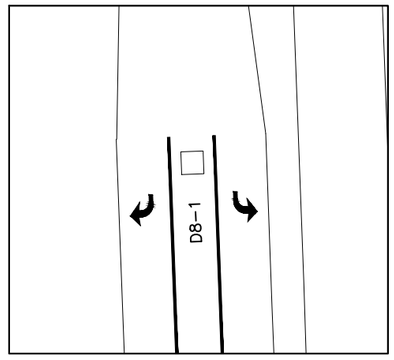
52nd Ave S & Veterans Blvd

DETECTOR LOOP SCHEDULE - 52nd Ave S & Veterans Blvd

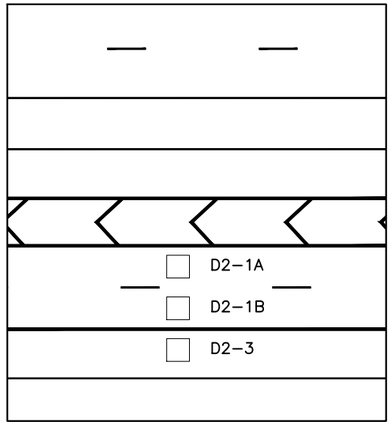
DETECTION ZONE	DETECTION TYPE	NUMBER OF LOOPS	PHASE	SIZE (FEET)	TYPE OF LOOP	NUMBER OF TURNS	CONDUCTOR (LF)	SLAW SLOT (LF)
D1–1A D1–1a	LOOP	4	ø1	6 x 6	PRESENCE	3	424	106
D2–1A D2–1B D2–3	LOOP	3	ø2	6 x 6	PASSAGE	3	338	114
D3–1A D3–1a	LOOP	4	ø3	6 x 6	PRESENCE	3	404	108
D4–1A D4–1a	LOOP	4	ø4	6 x 6	PRESENCE	3	432	120
D5–1A D5–1a	LOOP	4	ø5	6 x 6	PRESENCE	3	404	106
D6–1A D6–1B D6–3	LOOP	3	ø6	6 x 6	PASSAGE	3	416	114
D8–1	LOOP	1	ø8	6 x 6	PASSAGE	3	116	39
D8–3A D8–3a	LOOP	2	ø8	6 x 6	PRESENCE	3	188	56
						TOTAL	2,722	763

PUSHBUTTON ASSIGNMENT

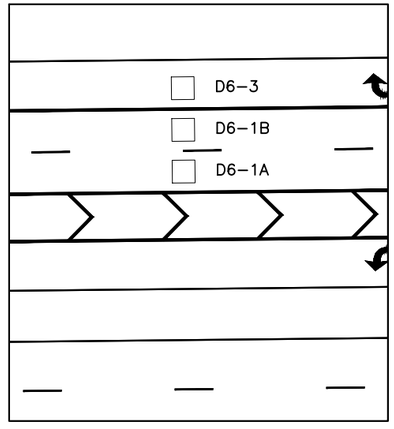




SOUTHBOUND



EASTBOUND



WESTBOUND

THE CITY OF Fargo FAR MORE

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Houston Engineering Inc.
Ph: 701.237.5065

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Signals - Phase Diagram Veterans

52nd Ave S - West of 63rd St S to 45th St S

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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SU-8-984(164)	150	8

TRAFFIC SIGNAL QUANTITIES (A)

LOCATION	CONCRETE FOUNDATION - TRAFFIC SIGNALS	POLYMER CONCRETE FIBER PULL BOX & CONCRETE PAD	PULL BOX	FARGO TYPE B CABINET, FOUNDATION, & WORKING SLAB	1" DIA. RIGID CONDUIT	2" DIA. RIGID CONDUIT	3" DIA. RIGID CONDUIT	4" DIA. RIGID CONDUIT	UNDERGROUND CONDUCTOR NO. 6 - RHW	UNDERGROUND CONDUCTOR NO. 6 - THW	LOOP LEAD-IN CONDUCTOR	LOOP WIRE	EMERGENCY VEHICLE DETECTOR CABLE (OPTICOM)	EMERGENCY VEHICLE INDICATOR CABLE (NO. 12 AWG 2)	NO. 14 AWG 2 CONDUCTOR CABLE	NO. 14 AWG 3 CONDUCTOR CABLE	NO. 14 AWG 5 CONDUCTOR CABLE	NO. 14 AWG 7 CONDUCTOR CABLE	NO. 14 AWG 20 CONDUCTOR CABLE	SAW SLOT	FEED POINT CABINET FOUNDATION	RELOCATE COMBO FEED POINT CABINET	TYPE VI SIGNAL STANDARD	COMBO 40' MH SIGNAL & LIGHT STANDARD - 31' MA	COMBO 40' MH SIGNAL & LIGHT STANDARD - 36' MA	COMBO 40' MH SIGNAL & LIGHT STANDARD - 49' MA	COMBO 40' MH SIGNAL & LIGHT STANDARD - 59' MA	LED LUMINAIRE	1-WAY 3 SEC HEAD W/ 12" LENS - POST MTD.	1-WAY 3 SEC HEAD W/ 12" LENS - MA MTD.	1-WAY 4 SEC HEAD W/ 12" LENS - PEDESTAL MTD.	1-WAY 4 SEC HEAD W/12" LENS - MA MTD.	1-WAY 5 SEC HEAD W/ 12" LENS - POST MTD.	PEDESTRIAN COUNTDOWN SIGNAL HEAD - POST MTD.	PEDESTRIAN COUNTDOWN SIGNAL HEAD - PEDESTAL MTD.	PEDESTRIAN PUSH BUTTON POST	APS PEDESTRIAN PUSH BUTTON & SIGN	EMERGENCY VEHICLE DETECTOR SYSTEM	BATTERY BACKUP SYSTEM	PTZ CAMERA	CAT 6 CABLE	NO. 16 AWG 3 (PTZ CAMERA POWER)	MAST ARM MOUNTED SIGNS		TRAFFIC SIGNAL SYSTEM - SITE 1
	EA	EA	EA	EA	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	LF	LF	LSUM		EA
POLE 7	1																									1		2		2			1	1	1			1								
POLE 9	1																						1							1				1				1								
POLE 11	1																								1			2		1		1	1												
POLE 13	1																						1							1					2			1							
POLE 18	1																									1	2	1	2		1	1	2			1								
POLE 23	1																							1			2	1	1																
POLE 26	1																						1							1					2			1							
VARIOUS LOCATIONS		1	13	1	64	1,022	287	125	68	34	4,826	2,722	370	323	1,557	735	381	553	761	763	1	1																3	3	1	1	1	210	210	1		
TOTAL	7	1	13	1	64	1,022	287	125	68	34	4,826	2,722	370	323	1,557	735	381	553	761	763	1	1	3	1	1	1	1	8	2	6	3	3	3	3	5	3	8	1	1	1	210	210	1		1

(A) TRAFFIC SIGNAL QUANTITIES FOR INFORMATIONAL PURPOSES ONLY. ALL COSTS SHALL BE INCLUDED IN THE BID PRICE FOR "TRAFFIC SIGNAL SYSTEM - SITE 1". QUANTITIES CALCULATED ACCORDING TO NDDOT SPECIFICATIONS.

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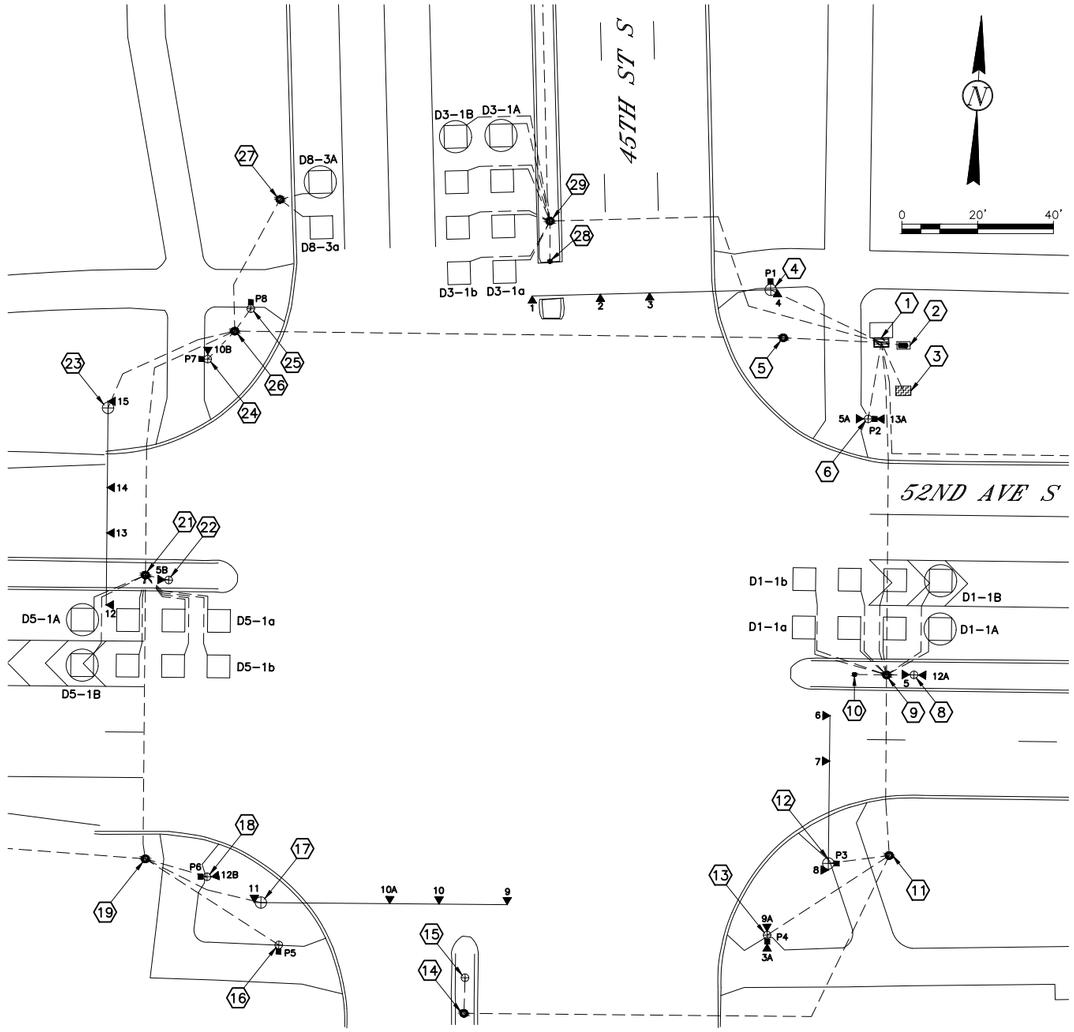
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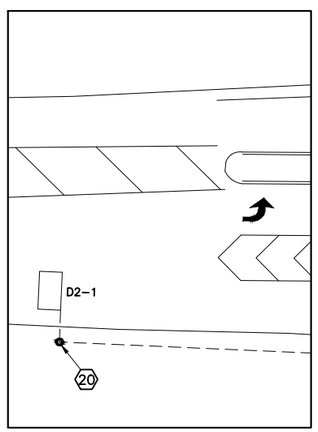
Signals - Quantities Veterans

52nd Ave S - West of 63rd St S to 45th St S

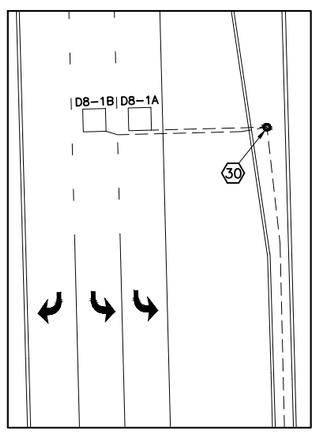
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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	150	9

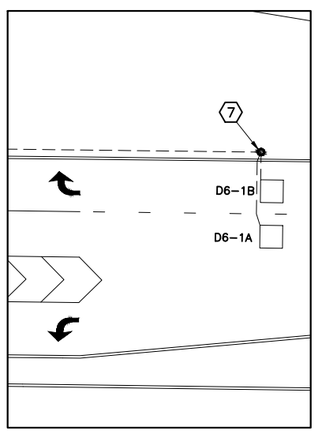




EASTBOUND



SOUTHBOUND



WESTBOUND

(1) EXISTING TRAFFIC SIGNAL CONTROLLER FOUNDATION AND WORKING SLAB TO REMAIN IN PLACE. REMOVE AND SALVAGE EXISTING TRAFFIC SIGNAL CONTROLLER CABINET AND EQUIPMENT.

(2) EXISTING COMBO FEED POINT CABINET TO REMAIN IN PLACE.

(3) EXISTING QUAZITE FIBER OPTIC PULL BOX TO REMAIN IN PLACE.

(4) REMOVE EXISTING TYPE IV/COMBO TRAFFIC SIGNAL STANDARD. SALVAGE TYPE IV/COMBO SIGNAL STANDARD POLE, LUMINAIRE EXTENSION, LUMINAIRES, PEDESTRIAN PUSH BUTTON, EVP DETECTOR, CONFIRMATION LIGHT, AND PTZ CAMERA. DISPOSE CONCRETE FOUNDATION. REMOVE AND SALVAGE ALL LED SECTIONS FROM VEHICLE HEADS. DISPOSE OF REMAINDER OF VEHICLE HEADS. REMOVE AND SALVAGE PEDESTRIAN COUNTDOWN HEAD. REMOVE AND SALVAGE ALL MOUNTING EQUIPMENT.

(5) EXISTING PVC PULL BOX TO REMAIN IN PLACE.

(6) REMOVE EXISTING TYPE VI TRAFFIC SIGNAL STANDARD (17.5' HEIGHT). SALVAGE AND RELOCATE TYPE VI TRAFFIC SIGNAL PEDESTAL POLE. SALVAGE PEDESTRIAN PUSH BUTTON. DISPOSE CONCRETE FOUNDATION. REMOVE AND SALVAGE ALL LED SECTIONS FROM VEHICLE HEADS. DISPOSE OF REMAINDER OF VEHICLE HEADS. REMOVE AND SALVAGE PEDESTRIAN COUNTDOWN HEAD. REMOVE AND SALVAGE ALL MOUNTING EQUIPMENT.

(7) REMOVE AND SALVAGE EXISTING PVC PULL BOX. REMOVE EXISTING LOOP LEAD-INS AND LOOPS(D6-1A/6-1B).

(8) EXISTING TYPE VI TRAFFIC SIGNAL STANDARD (17.5' HEIGHT) TO REMAIN IN PLACE. REMOVE VEHICLE HEADS 5 AND 12A. REMOVE AND SALVAGE ALL LED SECTIONS FROM REMOVED VEHICLE HEADS. DISPOSE OF REMAINDER OF REMOVED VEHICLE HEADS. REMOVE AND SALVAGE MOUNTING EQUIPMENT FOR REMOVED VEHICLE HEADS.

(9) EXISTING PVC PULL BOX TO REMAIN IN PLACE. EXISTING LOOP LEAD-INS AND LOOPS(D1-1A/D1-1a/D1-1B/D1-1b) TO REMAIN IN PLACE.

(10) REMOVE AND SALVAGE EXISTING PEDESTRIAN PUSH BUTTON POST AND BUTTON.

(11) EXISTING PVC PULL BOX TO REMAIN IN PLACE.

(12) EXISTING TYPE IV TRAFFIC SIGNAL STANDARD WITH 39' MAST ARM, PEDESTRIAN PUSH BUTTON, EVP DETECTOR, AND CONFIRMATION LIGHT TO REMAIN IN PLACE.

(13) EXISTING TYPE VI TRAFFIC SIGNAL STANDARD (17.5' HEIGHT) WITH PEDESTRIAN PUSH BUTTON TO REMAIN IN PLACE. REMOVE VEHICLE HEAD 9A. REMOVE AND SALVAGE ALL LED SECTIONS FROM REMOVED VEHICLE HEAD. DISPOSE OF REMAINDER OF REMOVED VEHICLE HEAD. REMOVE AND SALVAGE MOUNTING EQUIPMENT FOR REMOVED VEHICLE HEAD.

(14) EXISTING PVC PULL BOX TO REMAIN IN PLACE.

(15) EXISTING 24" CONCRETE FOUNDATION TO REMAIN IN PLACE.

(16) EXISTING TYPE V TRAFFIC SIGNAL STANDARD (10' HEIGHT) WITH PEDESTRIAN PUSH BUTTON TO REMAIN IN PLACE.

(17) REMOVE EXISTING TYPE IV TRAFFIC SIGNAL STANDARD. SALVAGE TYPE IV TRAFFIC SIGNAL STANDARD POLE AND CONFIRMATION LIGHT. DISPOSE CONCRETE FOUNDATION. REMOVE AND SALVAGE ALL LED SECTIONS FROM VEHICLE HEADS. DISPOSE OF REMAINDER OF REMOVED VEHICLE HEADS. REMOVE AND SALVAGE ALL MOUNTING EQUIPMENT.

(18) EXISTING TYPE VI TRAFFIC SIGNAL STANDARD (17.5' HEIGHT) WITH PEDESTRIAN PUSH BUTTON TO REMAIN IN PLACE. REMOVE VEHICLE HEAD 12B. REMOVE AND SALVAGE ALL LED SECTIONS FROM REMOVED VEHICLE HEAD. DISPOSE OF REMAINDER OF REMOVED VEHICLE HEAD. REMOVE AND SALVAGE MOUNTING EQUIPMENT FOR REMOVED VEHICLE HEAD.

(19) EXISTING PVC PULL BOX TO REMAIN IN PLACE.

(20) REMOVE AND SALVAGE EXISTING PVC PULL BOX. REMOVE EXISTING LOOP LEAD-IN AND LOOP(D2-1).

(21) EXISTING PVC PULL BOX TO REMAIN IN PLACE. EXISTING LOOP LEAD-INS AND LOOPS(D5-1a/D5-1b) TO REMAIN IN PLACE. REMOVE EXISTING LOOPS(D5-1A/D5-1B).

(22) EXISTING TYPE VI TRAFFIC SIGNAL STANDARD (17.5' HEIGHT) TO REMAIN IN PLACE. REMOVE AND SALVAGE PEDESTRIAN PUSH BUTTON. REMOVE VEHICLE HEAD 5B. REMOVE AND SALVAGE ALL LED SECTIONS FROM REMOVED VEHICLE HEAD. DISPOSE OF REMAINDER OF REMOVED VEHICLE HEAD. REMOVE AND SALVAGE MOUNTING EQUIPMENT FOR REMOVED VEHICLE HEAD.

(23) EXISTING TYPE IV TRAFFIC SIGNAL STANDARD WITH 52' MAST ARM AND CONFIRMATION LIGHT TO REMAIN IN PLACE. REMOVE VEHICLE HEADS 12 AND 15. REMOVE AND SALVAGE ALL LED SECTIONS FROM REMOVED VEHICLE HEADS. DISPOSE OF REMAINDER OF REMOVED VEHICLE HEADS. REMOVE AND SALVAGE MOUNTING EQUIPMENT FOR REMOVED VEHICLE HEADS.

(24) EXISTING TYPE V TRAFFIC SIGNAL STANDARD (17.5' HEIGHT) WITH PEDESTRIAN PUSH BUTTON TO REMAIN IN PLACE. REMOVE VEHICLE HEAD 10B. REMOVE AND SALVAGE ALL LED SECTIONS FROM REMOVED VEHICLE HEAD. DISPOSE OF REMAINDER OF VEHICLE HEAD. REMOVE AND SALVAGE MOUNTING EQUIPMENT FOR REMOVED VEHICLE HEAD.

(25) EXISTING TYPE V TRAFFIC SIGNAL STANDARD (10' HEIGHT) WITH PEDESTRIAN PUSH BUTTON TO REMAIN IN PLACE.

(26) EXISTING PVC PULL BOX TO REMAIN IN PLACE.

(27) EXISTING PVC PULL BOX TO REMAIN IN PLACE. EXISTING LOOP LEAD-INS AND LOOPS(D8-3A/D8-3a) TO REMAIN IN PLACE.

(28) REMOVE AND SALVAGE EXISTING PEDESTRIAN PUSH BUTTON POST AND BUTTON.

(29) EXISTING PVC PULL BOX TO REMAIN IN PLACE. EXISTING LOOP LEAD-INS AND LOOPS(D3-1A/D3-1a/D3-1B/D3-1b) TO REMAIN IN PLACE.

(30) EXISTING PVC PULL BOX TO REMAIN IN PLACE. EXISTING LOOP LEAD-INS AND LOOPS(D8-1A/D8-1B) TO REMAIN IN PLACE.

NOTES:
1. EXISTING TRAFFIC CONTROL SIGNAL SYSTEM SHOWN BASED OFF SURVEY AND EXISTING PLANS. ACTUAL FIELD LOCATION OF SYSTEM COMPONENTS MAY VARY.
2. ALL EXISTING PEDESTRIAN COUNTDOWN HEADS AND VEHICLE HEADS SHALL REMAIN IN PLACE UNLESS NOTED OTHERWISE.

- Quazite Fiber Pull Box
- Detector Loops
- Feed Point
- Controller Cabinet
- Existing Signal Std.
- Existing Pull Box
- New Pull Box
- Ped. Post
- Utility Pole
- New Signal Std.
- Flasher
- Ped. Head
- Vehicle Head
- Conduit
- Existing Conduit
- Signal Fiber Line
- Span Wire

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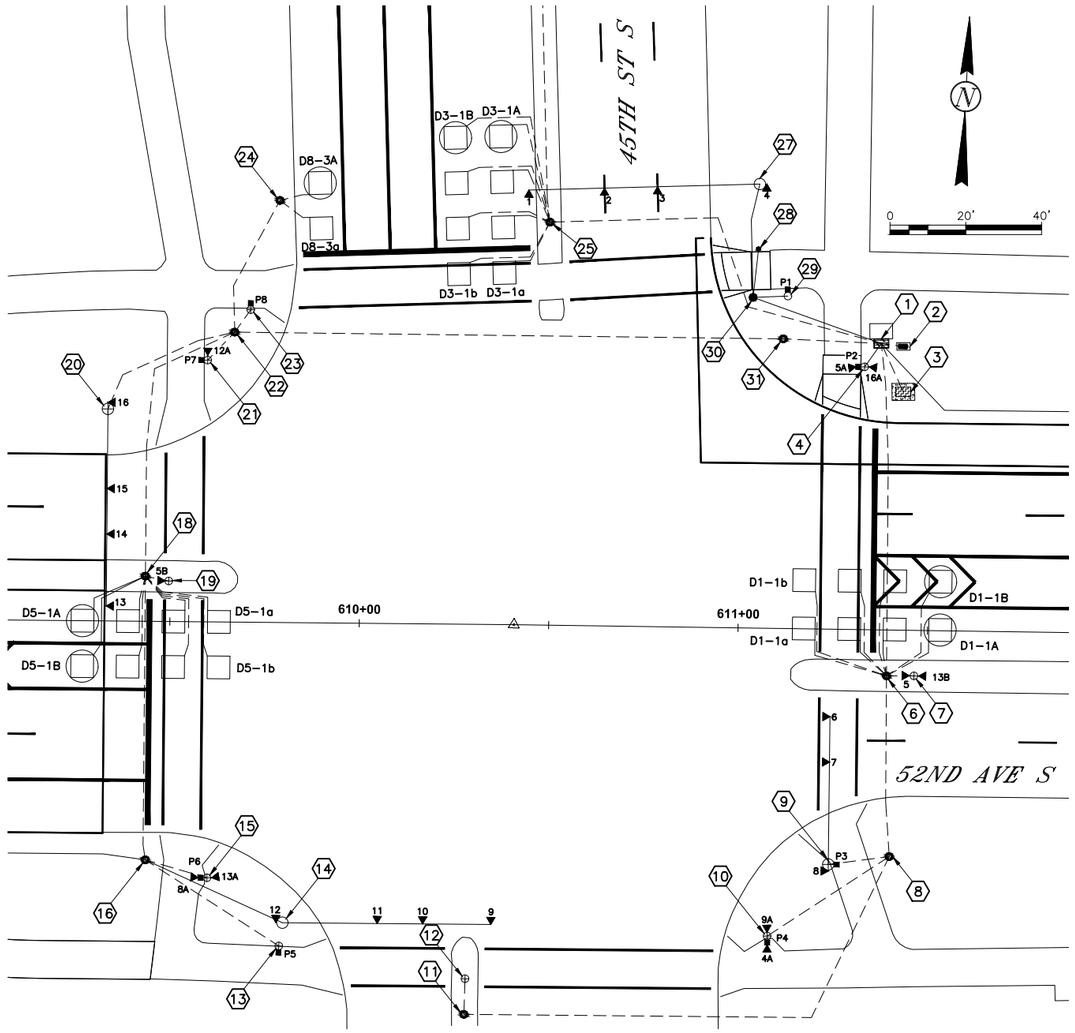
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Signals - Removals 45th St S

52nd Ave S - West of 63rd St S to 45th St S

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	150	10



(1) EXISTING TRAFFIC SIGNAL CONTROLLER FOUNDATION AND WORKING SLAB TO REMAIN IN PLACE. F&I NEW FARGO TYPE B CABINET. INSTALL A SECOND SEPARATE STAND ALONE DETECTOR RACK WITH ITS OWN POWER SUPPLY AND ITS OWN SEPARATE SELF CONTAINED WIRING HARNESS WITH NO JUMPERS BETWEEN THE TWO DETECTOR RACKS. IT SHALL BE LOCATED TO THE RIGHT OF THE STANDARD DETECTOR RACK. INSTALL TWO EXTRA DETECTOR PANELS DIRECTLY ABOVE THE STANDARD FARGO TYPE B CABINET PANELS; THESE SHALL BE CONNECTED TO THE SECOND DETECTOR RACK. PROVIDE TWO PS 2.4 AMP POWER SUPPLIES FOR THE DETECTOR RACKS. THE CABINET DOOR SHALL FACE NORTH AND LEFT HINGED. PROVIDE 20 – 2–CHANNEL VEHICLE DETECTORS.

(2) EXISTING COMBO FEED POINT CABINET TO REMAIN IN PLACE.

(3) EXISTING QUAZITE FIBER OPTIC PULL BOX TO REMAIN IN PLACE. INSTALL CONCRETE PAD AROUND EXISTING PULL BOX.

(4) F&I NEW CONCRETE TRAFFIC SIGNAL FOUNDATION. RELOCATE EXISTING TYPE VI TRAFFIC SIGNAL PEDESTAL POLE (17.5' HEIGHT). F&I NEW VEHICLE AND PEDESTRIAN HEADS. F&I NEW CONDUCTOR AND MOUNTING EQUIPMENT. INSTALL NEW APS PEDESTRIAN PUSH BUTTON FACING WEST WITH A RIGHT ARROW.

(5) F&I NEW PVC PULL BOX. INSTALL 3 – 6'x6' LOOPS(D6–1A/D6–1B/D6–3).

(6) EXISTING PVC PULL BOX TO REMAIN IN PLACE. EXISTING LOOP LEAD–INS AND LOOPS(D1–1A/D1–1a/D1–1B/D1–1b) TO REMAIN IN PLACE.

(7) EXISTING TYPE VI TRAFFIC SIGNAL STANDARD (17.5' HEIGHT) TO REMAIN IN PLACE. F&I NEW VEHICLE HEADS 5 AND 13B. F&I NEW CONDUCTOR AND MOUNTING EQUIPMENT FOR VEHICLE HEADS 5 AND 13B.

(8) EXISTING PVC PULL BOX TO REMAIN IN PLACE.

(9) EXISTING TYPE IV TRAFFIC SIGNAL STANDARD WITH 39' MAST ARM, PEDESTRIAN PUSH BUTTON, EVP DETECTOR, AND CONFIRMATION LIGHT TO REMAIN IN PLACE.

(10) EXISTING TYPE VI TRAFFIC SIGNAL STANDARD (17.5' HEIGHT) WITH PEDESTRIAN PUSH BUTTON TO REMAIN IN PLACE. F&I NEW VEHICLE HEAD 9A. F&I NEW CONDUCTOR AND MOUNTING EQUIPMENT FOR VEHICLE HEAD 9A.

(11) EXISTING PVC PULL BOX TO REMAIN IN PLACE.

(12) EXISTING 24" CONCRETE FOUNDATION TO REMAIN IN PLACE.

(13) EXISTING TYPE V TRAFFIC SIGNAL STANDARD (10' HEIGHT) WITH PEDESTRIAN PUSH BUTTON TO REMAIN IN PLACE.

(14) F&I NEW CONCRETE TRAFFIC SIGNAL FOUNDATION. F&I NEW TYPE IV/COMBO TRAFFIC SIGNAL STANDARD WITH A 55' MAST ARM. F&I EVP CONFIRMATION LIGHT.

(15) EXISTING TYPE VI TRAFFIC SIGNAL STANDARD (17.5' HEIGHT) WITH PEDESTRIAN PUSH BUTTON TO REMAIN IN PLACE. F&I NEW VEHICLE HEADS 8A AND 13A. F&I NEW CONDUCTOR AND MOUNTING EQUIPMENT FOR VEHICLE HEADS 8A AND 13A.

(16) EXISTING PVC PULL BOX TO REMAIN IN PLACE.

(17) F&I NEW PVC PULL BOX. INSTALL 3 – 6'x6' LOOPS(D2–1A/D2–1B/D2–3).

(18) EXISTING PVC PULL BOX TO REMAIN IN PLACE. EXISTING LOOP LEAD–INS AND LOOPS(D5–1a/D5–1b) TO REMAIN IN PLACE. INSTALL 2 – 6'x6' LOOPS(D5–1A/D5–1B).

(19) EXISTING TYPE VI TRAFFIC SIGNAL STANDARD (17.5' HEIGHT) TO REMAIN IN PLACE. F&I NEW VEHICLE HEAD 5B. F&I NEW CONDUCTOR AND MOUNTING EQUIPMENT FOR HEAD 5B.

(20) EXISTING TYPE IV TRAFFIC SIGNAL STANDARD WITH 52' MAST ARM AND CONFIRMATION LIGHT TO REMAIN IN PLACE. F&I NEW VEHICLE HEADS 13 AND 16. F&I NEW CONDUCTOR AND MOUNTING EQUIPMENT FOR VEHICLE HEADS 13 AND 16.

(21) EXISTING TYPE VI TRAFFIC SIGNAL STANDARD (17.5' HEIGHT) WITH PEDESTRIAN PUSH BUTTON TO REMAIN IN PLACE. F&I NEW VEHICLE HEAD 12A. F&I NEW CONDUCTOR AND MOUNTING EQUIPMENT FOR HEAD 12A.

(22) EXISTING PVC PULL BOX TO REMAIN IN PLACE.

(23) EXISTING TYPE V TRAFFIC SIGNAL STANDARD (10' HEIGHT) WITH PEDESTRIAN PUSH BUTTON TO REMAIN IN PLACE.

(24) EXISTING PVC PULL BOX TO REMAIN IN PLACE. EXISTING LOOP LEAD–INS AND LOOPS(D8–3A/D8–3a) TO REMAIN IN PLACE.

(25) EXISTING PVC PULL BOX TO REMAIN IN PLACE. EXISTING LOOP LEAD–INS AND LOOPS (D3–1A/D3–1a/D3–1B/D3–1b) TO REMAIN IN PLACE.

(26) EXISTING PVC PULL BOX TO REMAIN IN PLACE. EXISTING LOOP LEAD–INS AND LOOPS (D8–1A/D8–1B) TO REMAIN IN PLACE.

(27) F&I NEW CONCRETE TRAFFIC SIGNAL FOUNDATION. F&I NEW TYPE IV/COMBO TRAFFIC SIGNAL STANDARD WITH A 61' MAST ARM. F&I MODEL 722 EVP DETECTOR AND CONFIRMATION LIGHT. F&I NEW PTZ CAMERA.

(28) F&I NEW PEDESTRIAN PUSH BUTTON POST WITH NEW APS PEDESTRIAN PUSH BUTTON FACING SOUTH WITH A LEFT ARROW.

(29) F&I NEW CONCRETE TRAFFIC SIGNAL FOUNDATION. F&I NEW TYPE V TRAFFIC SIGNAL STANDARD (10' HEIGHT).

(30) F&I NEW PVC PULL BOX.

(31) EXISTING PVC PULL BOX TO REMAIN IN PLACE.

NOTE:
1. EXISTING TRAFFIC CONTROL SIGNAL SYSTEM FEATURES SHOWN BASED OFF SURVEY AND EXISTING PLANS. ACTUAL FIELD LOCATION OF SYSTEM COMPONENTS MAY VARY.

- Quazite Fiber Pull Box
- Detector Loops
- Feed Point
- Controller Cabinet
- Existing Signal Std.
- Existing Pull Box
- New Pull Box
- Ped. Post
- Utility Pole
- New Signal Std.
- Flasher
- Ped. Head
- Vehicle Head
- Conduit
- Existing Conduit
- Signal Fiber Line
- Span Wire

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Signals - Layout 45th St S

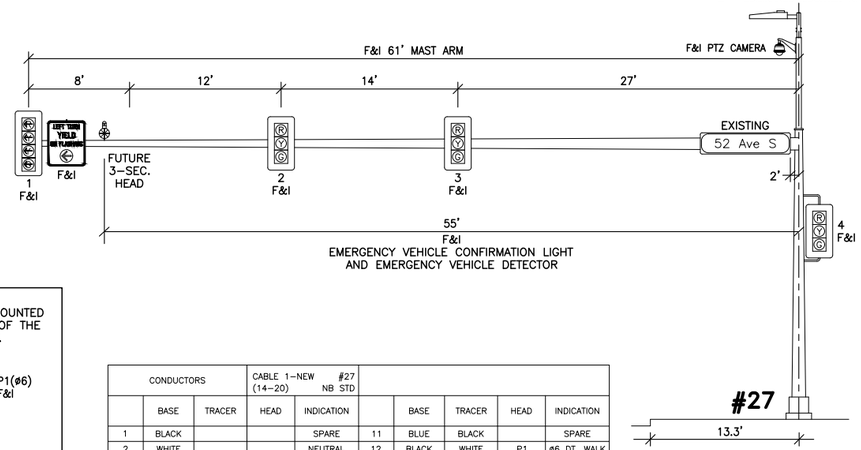
52nd Ave S - West of 63rd St S to 45th St S

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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SU-8-984(164)	150	11

ø4 & ø7/OLD NORTH-BOUND APPROACH

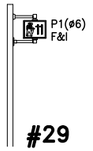
SEE STREET LIGHTING PLANS FOR TYPE OF LUMINAIRE EXTENSION AND FIXTURES
2 - LUMINARES MOUNTED AT 40'



CONDUCTORS			CABLE 1-NEW #27 (14-20) NB STD							
	BASE	TRACER	HEAD	INDICATION		BASE	TRACER	HEAD	INDICATION
1	BLACK			SPARE	11	BLUE	BLACK		SPARE
2	WHITE			NEUTRAL	12	BLACK	WHITE	P1	ø6 DT. WALK
3	RED		2-4	ø4 RED	13	RED	WHITE		SPARE
4	GREEN			GROUND	14	GREEN	WHITE	EVP	PE4 IND LIGHT
5	ORANGE		2-4	ø4 YELLOW	15	BLUE	WHITE		SPARE
6	BLUE		2-4	ø4 GREEN	16	BLACK	RED		SPARE
7	WHITE	BLACK		SPARE	17	WHITE	RED	1	OLD FL YELLOW
8	RED	BLACK		SPARE	18	ORANGE	RED	1	OLD YELLOW
9	GREEN	BLACK	P1	ø6 WALK	19	BLUE	RED	1	ø7 GREEN
10	ORANGE	BLACK		SPARE	20	RED	GREEN	1	OLD RED

91'-#14/7	Vehicle Head #1
71'-#14/5	Vehicle Head #2
57'-#14/5	Vehicle Head #3
20'-#14/5	Vehicle Head #4
98'-#12/2	PE4 Ind Light

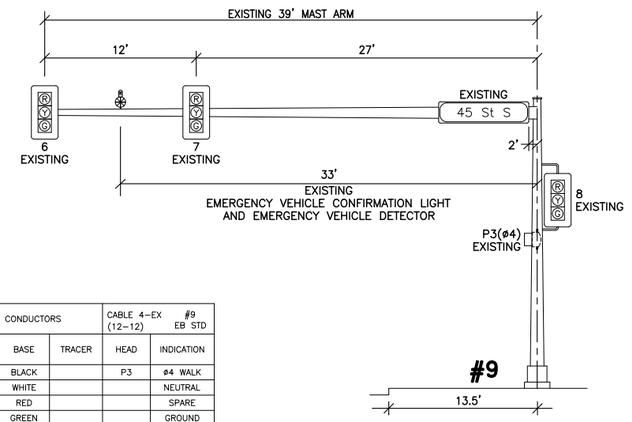
HEAD P1 SHALL BE MOUNTED ON THE NORTH SIDE OF THE POLE AND FACE WEST.



TYPE V-10' HEIGHT
PEDESTAL MOUNTED-
PEDESTRIAN HEADS

18'-#14/3	Ped. Head #P1

ø2 EAST-BOUND APPROACH



CONDUCTORS			CABLE 4-EX #9 (12-12) EB STD	
	BASE	TRACER	HEAD	INDICATION
1	BLACK		P3	ø4 WALK
2	WHITE			NEUTRAL
3	RED			SPARE
4	GREEN			GROUND
5	ORANGE			SPARE
6	BLUE			SPARE
7	WHITE	BLACK	P3	ø4 DT. WALK
8	RED	BLACK	6-8	ø2 RED
9	GREEN	BLACK		SPARE
10	ORANGE	BLACK	6-8	ø2 YELLOW
11	BLUE	BLACK	6-8	ø2 GREEN
12	BLACK	WHITE		SPARE

MAST ARMS AND STANDARDS:
All mast arms and standards shall be design for a windload factor that accounts for the heads and signs shown, replacing the vehicle head at the end of the mast arm with a 5-section cluster head, and an additional 10 square feet of sign area added to the mast arm.

EACH VEHICLE/PEDESTRIAN HEAD CABLE SHALL BE LABELED WITH THE HEAD #.

EACH CABLE FROM THE CONTROLLER CABINET SHALL HAVE A SEPARATE TERMINAL BLOCK INSIDE THE T-BASE FOR TERMINATIONS.

MAST ARM MOUNTED SIGNS SHALL NOT BE PAID FOR SEPARATELY, BUT INCLUDED IN THE PRICE BID FOR TRAFFIC SIGNAL SYSTEM.

HEAD CONDUCTOR ASSIGNMENT

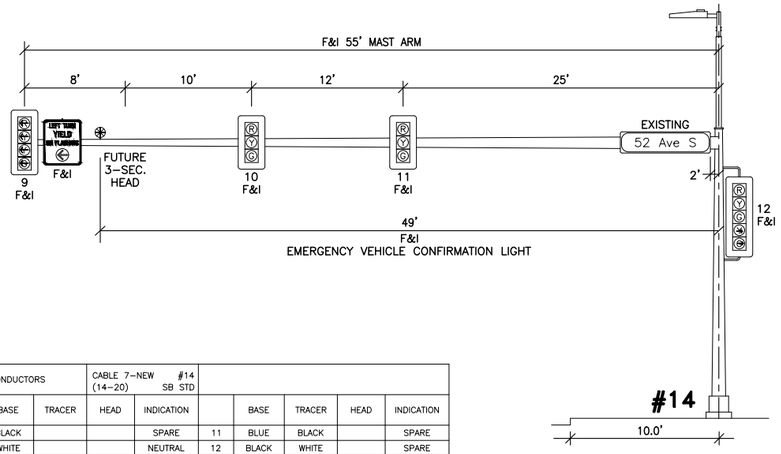
CONDUCTORS			No.14 Awg 3 Ped. Heads	No.14 Awg 5 Veh. Heads	No.14 Awg 7 5-Section Veh. Heads
	BASE	TRACER	INDICATION	INDICATION	INDICATION
1	BLACK		WALK	GREEN	GREEN BALL
2	WHITE		NEUTRAL	NEUTRAL	NEUTRAL
3	RED		DT. WALK	RED	RED
4	GREEN			GROUND	GROUND
5	ORANGE			YELLOW	YELLOW BALL
6	BLUE				GREEN ARRROW
7	WHITE	BLACK			YELLOW ARROW

FYA CONDUCTOR ASSIGNMENT

CONDUCTORS			No.14 Awg 7 4-Section Veh. Heads
	BASE	TRACER	INDICATION
1	BLACK		SPARE
2	WHITE		NEUTRAL
3	RED		RED ARROW
4	GREEN		GROUND
5	ORANGE		FLASHING YELLOW ARROW
6	BLUE		GREEN ARRROW
7	WHITE	BLACK	YELLOW ARROW

ø3/OLB & ø8 SOUTH-BOUND APPROACH

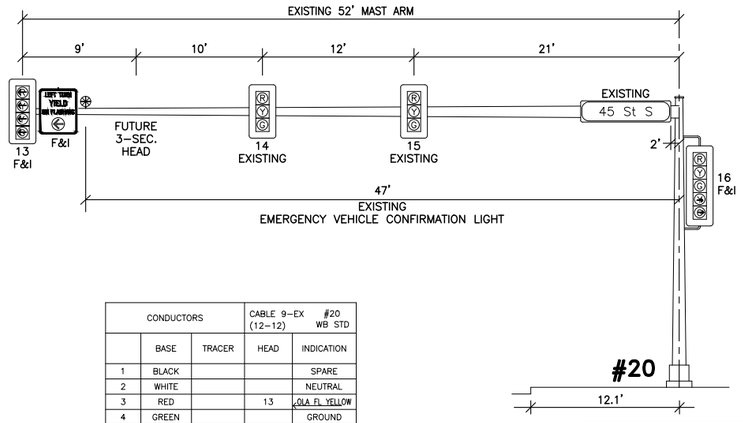
SEE STREET LIGHTING PLANS FOR TYPE OF LUMINAIRE EXTENSION AND FIXTURES
2 - LUMINARES MOUNTED AT 40'



CONDUCTORS			CABLE 7-NEW #14 (14-20) SB STD							
	BASE	TRACER	HEAD	INDICATION		BASE	TRACER	HEAD	INDICATION
1	BLACK			SPARE	11	BLUE	BLACK		SPARE
2	WHITE			NEUTRAL	12	BLACK	WHITE		SPARE
3	RED		10-12	ø8 RED	13	RED	WHITE		SPARE
4	GREEN			GROUND	14	GREEN	WHITE	EVP	PE3 IND LIGHT
5	ORANGE		10-12	ø8 YELLOW	15	BLUE	WHITE	12	ø5 YELLOW
6	BLUE		10-12	ø8 GREEN	16	BLACK	RED	12	ø5 GREEN
7	WHITE	BLACK		SPARE	17	WHITE	RED	9	OLB FL YELLOW
8	RED	BLACK		SPARE	18	ORANGE	RED	9	OLB YELLOW
9	GREEN	BLACK		SPARE	19	BLUE	RED	9	ø3 GREEN
10	ORANGE	BLACK		SPARE	20	RED	GREEN	9	OLB RED

85'-#14/7	Vehicle Head #9
67'-#14/5	Vehicle Head #10
55'-#14/5	Vehicle Head #11
20'-#14/7	Vehicle Head #12
92'-#12/2	PE3 Ind Light

ø1/OLA & ø6 WEST-BOUND APPROACH



CONDUCTORS			CABLE 9-EX #20 (12-12) WB STD	
	BASE	TRACER	HEAD	INDICATION
1	BLACK			SPARE
2	WHITE			NEUTRAL
3	RED		13	OLA FL YELLOW
4	GREEN			GROUND
5	ORANGE		13	OLA YELLOW
6	BLUE		13	ø1 GREEN
7	WHITE	BLACK	13	OLA RED
8	RED	BLACK	14-16	ø6 RED
9	GREEN	BLACK	16	ø3 YELLOW
10	ORANGE	BLACK	14-16	ø6 YELLOW
11	BLUE	BLACK	14-16	ø6 GREEN
12	BLACK	WHITE	16	ø3 GREEN

82'-#14/7	Vehicle Head #13
20'-#14/7	Vehicle Head #16

NOTE: All signal heads shall be SIG Polycarbonate. All back plates shall be lovered .063" thick aluminum.

ALL PEDESTRIAN HEADS
16" x 18" Filled Overlay
L.E.D. PEDESTRIAN HEAD
WITH PEDESTRIAN COUNT DOWN TIMER

ALL L.E.D. SIGNAL HEADS
12" Lenses
VEHICLE HEADS
2,3,4,10,11

ALL L.E.D. SIGNAL HEADS
12" Lenses
VEHICLE HEADS
1,9,13

ALL L.E.D. SIGNAL HEADS
12" Lenses
VEHICLE HEADS
12,16

THE CITY OF Fargo FAR MORE

Proj. No. 6059-0145
Houston Engineering Inc.
Ph: 701.237.5065

This document was originally issued and sealed by Josh N. Hinds Registration Number 8261 on 9/05/18 and the original document is stored in the Engineering Dept. at City Hall.

Signals - Standards 45th St S

52nd Ave S - West of 63rd St S to 45th St S

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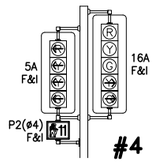
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	150	12

20'–#14/7	Vehicle Head #5A
20'–#14/7	Vehicle Head #16A
18'–#14/3	Ped. Head #P2

HEAD 5A SHALL BE MOUNTED ON THE WEST SIDE OF THE POLE AND FACE WEST.

HEAD 16A SHALL BE MOUNTED ON THE EAST SIDE OF THE POLE AND FACE EAST.

HEAD P2 SHALL BE MOUNTED ON THE WEST SIDE OF THE POLE AND FACE SOUTH.



TYPE VI–17.5' HEIGHT
PEDESTAL MOUNTED–VEHICULAR AND PEDESTRIAN HEADS

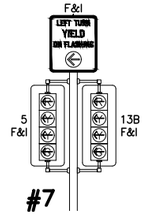
CONDUCTORS			CABLE 2–NEW (14–20) STD #4	
	BASE	TRACER	HEAD	INDICATION
1	BLACK		P2	ø4 WALK
2	WHITE			NEUTRAL
3	RED			SPARE
4	GREEN			GROUND
5	ORANGE			SPARE
6	BLUE			SPARE
7	WHITE	BLACK	P2	ø4 DT. WALK
8	RED	BLACK	16A	ø6 RED
9	GREEN	BLACK		SPARE
10	ORANGE	BLACK	16A	ø6 YELLOW
11	BLUE	BLACK	16A	ø6 GREEN
12	BLACK	WHITE		SPARE
13	RED	WHITE		SPARE
14	GREEN	WHITE		SPARE
15	BLUE	WHITE	16A	ø3 YELLOW
16	BLACK	RED	16A	ø3 GREEN
17	WHITE	RED	5A	OLC FL YELLOW
18	ORANGE	RED	5A	OLC YELLOW
19	BLUE	RED	5A	ø5 GREEN
20	RED	GREEN	5A	OLC RED

HEAD 5 SHALL BE MOUNTED ON THE WEST SIDE OF THE POLE AND FACE WEST.

HEAD 13B SHALL BE MOUNTED ON THE EAST SIDE OF THE POLE AND FACE EAST.

SIGN SHALL BE MOUNTED FACING WEST.

20'–#14/7	Vehicle Head #5
20'–#14/7	Vehicle Head #13B



TYPE VI–17.5' HEIGHT
PEDESTAL MOUNTED–VEHICULAR HEADS

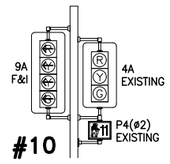
CONDUCTORS			CABLE 3–EX (12–12) STD #7	
	BASE	TRACER	HEAD	INDICATION
1	BLACK			SPARE
2	WHITE			NEUTRAL
3	RED		13B	OLA FL YELLOW
4	GREEN			GROUND
5	ORANGE		13B	OLA YELLOW
6	BLUE		13B	ø1 GREEN
7	WHITE	BLACK		SPARE
8	RED	BLACK	13B	OLA RED
9	GREEN	BLACK	5	OLC FL YELLOW
10	ORANGE	BLACK	5	OLC YELLOW
11	BLUE	BLACK	5	ø5 GREEN
12	BLACK	WHITE	5	OLC RED

HEAD 4A MOUNTED ON THE SOUTH SIDE OF THE POLE AND FACING SOUTH.

HEAD 9A SHALL BE MOUNTED ON THE NORTH SIDE OF THE POLE AND FACE NORTH.

HEAD P4 MOUNTED ON THE SOUTH SIDE OF THE POLE AND FACING WEST.

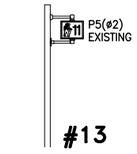
20'–#14/7	Vehicle Head #9A



TYPE VI–17.5' HEIGHT
PEDESTAL MOUNTED–VEHICULAR AND PEDESTRIAN HEADS

CONDUCTORS			CABLE 5–EX (12–12) STD #10	
	BASE	TRACER	HEAD	INDICATION
1	BLACK			SPARE
2	WHITE			NEUTRAL
3	RED		4A	ø4 RED
4	GREEN			GROUND
5	ORANGE		4A	ø4 YELLOW
6	BLUE		4A	ø4 GREEN
7	WHITE	BLACK	9A	OLB FL YELLOW
8	RED	BLACK	9A	OLB YELLOW
9	GREEN	BLACK	P4	ø2 WALK
10	ORANGE	BLACK	9A	ø3 GREEN
11	BLUE	BLACK	9A	OLB RED
12	BLACK	WHITE	P4	ø2 DT. WALK

HEAD P5 MOUNTED ON THE SOUTH SIDE OF THE POLE AND FACING EAST.



TYPE V–10' HEIGHT
PEDESTAL MOUNTED–PEDESTRIAN HEADS

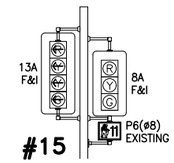
CONDUCTORS			CABLE 6–EX (12–7) STD #13	
	BASE	TRACER	HEAD	INDICATION
1	BLACK			SPARE
2	WHITE			NEUTRAL
3	RED		P5	ø2 WALK
4	GREEN			GROUND
5	ORANGE			SPARE
6	BLUE		P5	ø2 DT. WALK
7	WHITE	BLACK		SPARE

HEAD 8A SHALL BE MOUNTED ON THE WEST SIDE OF THE POLE AND FACE WEST.

HEAD 13A SHALL BE MOUNTED ON THE EAST SIDE OF THE POLE AND FACE EAST.

20'–#14/5	Vehicle Head #8A
20'–#14/7	Vehicle Head #13A

HEAD P6 MOUNTED ON THE WEST SIDE OF THE POLE AND FACING NORTH.



TYPE VI–17.5' HEIGHT
PEDESTAL MOUNTED–VEHICULAR AND PEDESTRIAN HEADS

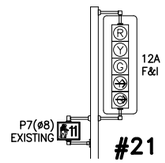
CONDUCTORS			CABLE 8–EX (12–12) STD #15	
	BASE	TRACER	HEAD	INDICATION
1	BLACK		P6	ø8 WALK
2	WHITE			NEUTRAL
3	RED		13A	OLA FL YELLOW
4	GREEN			GROUND
5	ORANGE		13A	OLA YELLOW
6	BLUE		13A	ø1 GREEN
7	WHITE	BLACK	P6	ø8 DT. WALK
8	RED	BLACK	8A	ø2 RED
9	GREEN	BLACK		SPARE
10	ORANGE	BLACK	8A	ø2 YELLOW
11	BLUE	BLACK	8A	ø2 GREEN
12	BLACK	WHITE	13A	OLA RED

HEAD 12A SHALL BE MOUNTED ON THE NORTH SIDE OF THE POLE AND FACE NORTH.

HEAD P7 MOUNTED ON THE WEST SIDE OF THE POLE AND FACING SOUTH.

FUTURE 4–SECTION TO BE MOUNTED ON THE WEST SIDE OF THE POLE AND FACE SOUTH.

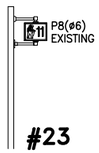
20'–#14/7	Vehicle Head #12A



TYPE VI–17.5' HEIGHT
PEDESTAL MOUNTED–VEHICULAR AND PEDESTRIAN HEADS

CONDUCTORS			CABLE 10–NEW (14–20) STD #21	
	BASE	TRACER	HEAD	INDICATION
1	BLACK		P7	ø8 WALK
2	WHITE			NEUTRAL
3	RED		12A	ø8 RED
4	GREEN			GROUND
5	ORANGE		12A	ø8 YELLOW
6	BLUE		12A	ø8 GREEN
7	WHITE	BLACK	P7	ø8 DT. WALK
8	RED	BLACK		SPARE
9	GREEN	BLACK		SPARE
10	ORANGE	BLACK		SPARE
11	BLUE	BLACK		SPARE
12	BLACK	WHITE		SPARE
13	RED	WHITE		SPARE
14	GREEN	WHITE		SPARE
15	BLUE	WHITE	12A	ø5 YELLOW
16	BLACK	RED	12A	ø5 GREEN
17	WHITE	RED		SPARE
18	ORANGE	RED		SPARE
19	BLUE	RED		SPARE
20	RED	GREEN		SPARE

HEAD P8 MOUNTED ON THE NORTH SIDE OF THE POLE AND FACING EAST.

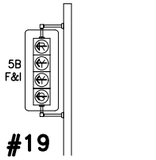


TYPE V–10' HEIGHT
PEDESTAL MOUNTED–PEDESTRIAN HEADS

CONDUCTORS			CABLE 11–EX (12–7) STD #23	
	BASE	TRACER	HEAD	INDICATION
1	BLACK			SPARE
2	WHITE			NEUTRAL
3	RED		P8	ø6 WALK
4	GREEN			GROUND
5	ORANGE			SPARE
6	BLUE		P8	ø6 DT. WALK
7	WHITE	BLACK		SPARE

HEAD 5B SHALL BE MOUNTED ON THE WEST SIDE OF THE POLE AND FACE WEST.

20'–#14/7	Vehicle Head #5B



TYPE VI–17.5' HEIGHT
PEDESTAL MOUNTED–VEHICULAR HEADS

CONDUCTORS			CABLE 12–EX (12–12) STD #19	
	BASE	TRACER	HEAD	INDICATION
1	BLACK			SPARE
2	WHITE			NEUTRAL
3	RED			SPARE
4	GREEN			GROUND
5	ORANGE			SPARE
6	BLUE			SPARE
7	WHITE	BLACK		SPARE
8	RED	BLACK		SPARE
9	GREEN	BLACK	5B	OLC FL YELLOW
10	ORANGE	BLACK	5B	OLC YELLOW
11	BLUE	BLACK	5B	ø5 GREEN
12	BLACK	WHITE	5B	OLC RED

HEAD CONDUCTOR ASSIGNMENT

CONDUCTORS			No.14 Awg 3 Ped. Heads	No.14 Awg 5 Veh. Heads	No.14 Awg 7 5–Section Veh. Heads
	BASE	TRACER	INDICATION	INDICATION	INDICATION
1	BLACK		WALK	GREEN	GREEN BALL
2	WHITE		NEUTRAL	NEUTRAL	NEUTRAL
3	RED		DT. WALK	RED	RED
4	GREEN			GROUND	GROUND
5	ORANGE			YELLOW	YELLOW BALL
6	BLUE				GREEN ARRROW
7	WHITE	BLACK			YELLOW ARROW

FYA CONDUCTOR ASSIGNMENT

CONDUCTORS			No.14 Awg 7 4–Section Veh. Heads
	BASE	TRACER	INDICATION
1	BLACK		SPARE
2	WHITE		NEUTRAL
3	RED		RED ARROW
4	GREEN		GROUND
5	ORANGE		FLASHING YELLOW ARROW
6	BLUE		GREEN ARROW
7	WHITE	BLACK	YELLOW ARROW

EACH VEHICLE/PEDESTRIAN HEAD CABLE SHALL BE LABELED WITH THE HEAD #.

EACH CABLE FROM THE CONTROLLER CABINET SHALL HAVE A SEPARATE TERMINAL BLOCK INSIDE THE T–BASE FOR TERMINATIONS.

SIGN MOUNTED ON PEDESTAL POLE #7 SHALL NOT BE PAID FOR SEPARATELY, BUT INCLUDED IN THE PRICE BID FOR TRAFFIC SIGNAL SYSTEM.

NOTE: All signal heads shall be SIG Polycarbonate. All back plates shall be lovered .063" thick aluminum.

THE CITY OF Fargo FAR MORE

Proj. No. 6059-0145
Houston Engineering Inc.
Ph: 701.237.5065

This document was originally issued and sealed by Josh N. Hinds Registration Number 8261 on 9/05/18 and the original document is stored in the Engineering Dept. at City Hall.

ALL PEDESTRIAN HEADS
16" x 18" Filled Overlay
L.E.D. PEDESTRIAN HEAD
WITH PEDESTRIAN COUNT DOWN TIMER

ALL L.E.D. SIGNAL HEADS
12" Lenses
VEHICLE HEADS
8A

ALL L.E.D. SIGNAL HEADS
12" Lenses
VEHICLE HEADS
5,5A,5B,9A,13A,13B

ALL L.E.D. SIGNAL HEADS
12" Lenses
VEHICLE HEADS
12A,16A

Signals - Standards 45th St S

52nd Ave S - West of 63rd St S to 45th St S

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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SU-8-984(164)	150	13

Plan Note Number
2
Symbol

- Feed Point
- Pedestrian Signal Standard
- Traffic Signal Standard
- Controller Cabinet
- Ped. Push Button Post
- Pull Box
- Quazite Pull Box

45TH ST S

52ND AVE S

EXISTING 251'–2" Conduit
2–Loop Lead–In(26 to 1)D8–1A/D8–1B – Existing

EXISTING 38'–2" Conduit
2–Loop Lead–In(24 to 1)
D8–3A/D8–3a – Existing

EXISTING 7'–2" Conduit
#12 AWG 7(23 to 1)Cable 11 – Existing
#12 AWG 2(23 to 1)ø6 Ped. – Existing

EXISTING 42'–2" Conduit
#12 AWG 12(20 to 1)Cable 9 – Existing
#12 AWG 2(20 to 1)EVP Light – Existing

EXISTING 78'–3" Conduit
4–Loop Lead–In(18 to 1)
D5–1A/D5–1a/D5–1B/D5–1b – Existing
3–Future Camera Wires – Existing

EXISTING 78'–3" Conduit
#14 AWG 20(14)Cable 7 – New
#12 AWG 12(19)Cable 12 – Existing
#12 AWG 12(15)Cable 8 – Existing
#12 AWG 7(13)Cable 6 – Existing
#12 AWG 2(15)ø8 Ped. – Existing
#12 AWG 2(13)ø2 Ped. – Existing
3–Loop Lead–In(17) – New

EXISTING 106'–2" Conduit
4–Loop Lead–In(25 to 1)
D3–1A/D3–1a/D3–1B/D3–1b – Existing
2–Loop Lead–In(26) – Existing

EXISTING 145'–4" Conduit
#14 AWG 20(14)Cable 7 – New
#12 AWG 12(19)Cable 12 – Existing
#12 AWG 12(15)Cable 8 – Existing
#12 AWG 7(13)Cable 6 – Existing
#12 AWG 2(15)ø8 Ped. – Existing
#12 AWG 2(13)ø2 Ped. – Existing
2–Loop Lead–In(24) – Existing
3–Loop Lead–In(17) – New

EXISTING 10'–2" Conduit
#14 AWG 20(21 to 1–202')Cable 10 – New
#12 AWG 2(21 to 1)ø8 Ped. – Existing

EXISTING 6'–2" Conduit
#12 AWG 12(19 to 1)Cable 12 – Existing

EXISTING 6'–2" Spare Conduit

EXISTING 75'–4" Conduit
#14 AWG 20(14)Cable 7 – New
#12 AWG 12(15)Cable 8 – Existing
#12 AWG 7(13)Cable 6 – Existing
#12 AWG 2(15)ø8 Ped. – Existing
#12 AWG 2(13)ø2 Ped. – Existing
3–Loop Lead–In(17) – New

EXISTING 17'–2" Conduit
#12 AWG 12(15 to 1)Cable 8 – Existing
#12 AWG 2(15 to 1)ø8 Ped. – Existing

300'–2" Conduit
3–Loop Lead–In(17 to 1–656'*3)
D2–1A/D2–1B/D2–3 – New

2 EXISTING 10'–2" Spare Conduit
Future Wire in Pull Box #11

40'–2" Conduit
#14 AWG 20(14 to 1–391')Cable 7 – New

EXISTING 42'–2" Conduit
#12 AWG 7(13 to 1)Cable 6 – Existing
#12 AWG 2(13 to 1)ø2 Ped. – Existing

EXISTING 145'–4" Conduit
#14 AWG 20(21)Cable 10 – New
#12 AWG 12(20)Cable 9 – Existing
#12 AWG 7(23)Cable 11 – Existing
#12 AWG 2(23)ø6 Ped. – Existing
#12 AWG 2(21)ø8 Ped. – Existing
#12 AWG 2(20)EVP Light – Existing
4–Loop Lead–In(18) – Existing
3–Future Camera Wires – Existing

EXISTING 139'–3" Conduit
#12 AWG 7(11 to 1)Future Cable – Existing
4–Loop Lead–In (11 to 1)Future Detection Loops – Existing

EXISTING 26'–4" Conduit
#14 AWG 20(14)Cable 7 – New
#12 AWG 12(19)Cable 12 – Existing
#12 AWG 12(15)Cable 8 – Existing
#12 AWG 7(13)Cable 6 – Existing
#12 AWG 2(15)ø8 Ped. – Existing
#12 AWG 2(13)ø2 Ped. – Existing
2–Loop Lead–In(24) – Existing
3–Loop Lead–In(17) – New

EXISTING 26'–4" Conduit
#14 AWG 20(21)Cable 10 – New
#12 AWG 12(20)Cable 9 – Existing
#12 AWG 7(23)Cable 11 – Existing
#12 AWG 2(23)ø6 Ped. – Existing
#12 AWG 2(21)ø8 Ped. – Existing
#12 AWG 2(20)EVP Light – Existing
4–Loop Lead–In(18) – Existing
3–Future Camera Wires – Existing

8'–2" Conduit
#14 AWG 20(4 to 1–23')Cable 2 – New
#14 AWG 2(4 to 1–29')ø4 Ped. – New
#14 AWG 3(10')ø4 Ped. PB to Head P2 – New

EXISTING 16'–2" Conduit
#12 AWG 12(9 to 1)Cable 4 – Existing
#12 AWG 2(9 to 1)ø4 Ped. – Existing
#12 AWG 2(9 to 1)EVP Light – Existing
Opticom(9 to 1)EVP Detector – Existing

EXISTING 38'–2" Conduit
#12 AWG 12(10 to 1)Cable 5 – Existing
#12 AWG 2(10 to 1)ø2 Ped. – Existing

30'–2" Conduit
#14 AWG 20(27 to 1–84')Cable 1 – New
Opticom(27 to 1–180')EVP Detector – New
#16 AWG 3(27 to 1–125')PTZ Camera – New
CAT 6 Cable(27 to 1–125')PTZ Camera – New
#14 AWG 3(29)Head P1 – New

13'–1" Conduit
#14 AWG 2(28 to 1–73')ø6 Ped. – New
#14 AWG 3(29)ø6 Ped. PB to Head P1 – New

9'–2" Conduit
#14 AWG 3(29 to 27–52')Head P1 – New
#14 AWG 3(29 to 28–49')ø6 Ped. PB to Head P1 – New

36'–2" Conduit
#14 AWG 20(27)Cable 1 – New
#14 AWG 2(28)ø6 Ped. – New
Opticom(27)EVP Detector – New
#16 AWG 3(27)PTZ Camera – New
CAT 6 Cable(27)PTZ Camera – New

EXISTING 6'–2" Conduit
2–#6 RHW(2 to 1) – Existing
#6 THW(2 to 1) – Existing

EXISTING 14'–2" Conduit
Fiber Optic Cable
See Section 160

303'–2" Conduit
3–Loop Lead–In(5 to 1–323'*3)
D6–1A/D6–1B/D6–3 – New

EXISTING 88'–4" Conduit
#12 AWG 12(9)Cable 4 – Existing
#12 AWG 12(10)Cable 5 – Existing
#12 AWG 2(9)ø4 Ped. – Existing
#12 AWG 2(10)ø2 Ped. – Existing
#12 AWG 2(9)EVP Light – Existing
Opticom(9)EVP Detector – Existing

EXISTING 88'–4" Conduit
#12 AWG 12(7)Cable 3 – Existing
#12 AWG 7(11)Future Cable – Existing
4–Loop Lead–In(6 to 1)
D1–1A/D1–1a/D1–1B/D1–1b – Existing
4–Loop Lead–In(11) – Existing

EXISTING 7'–2" Conduit
#12 AWG 12(7 to 1)Cable 3 – Existing

EXISTING 7'–2" Spare Conduit

EXISTING 48'–3" Conduit
#12 AWG 12(9)Cable 4 – Existing
#12 AWG 12(10)Cable 5 – Existing
#12 AWG 2(9)ø4 Ped. – Existing
#12 AWG 2(10)ø2 Ped. – Existing
#12 AWG 2(9)EVP Light – Existing
Opticom(9)EVP Detector – Existing

EXISTING 48'–3" Conduit
#12 AWG 7(11)Future Cable – Existing
4–Loop Lead–In(11) – Existing

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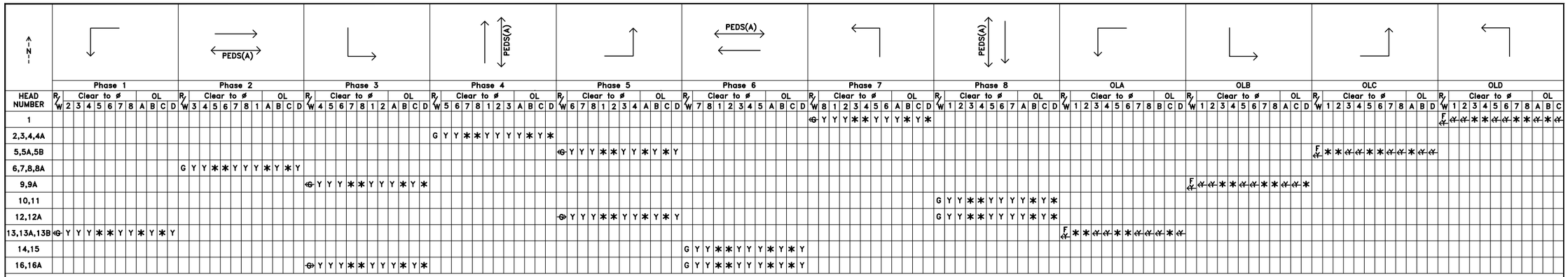
Signals - Wiring Diagram 45th St S

52nd Ave S - West of 63rd St S to 45th St S

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	150	14

52nd Ave S & 45th St S



HEAD NUMBER	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8	OLA	OLB	OLC	OLD
	R/W Clear to ø OL	R/W Clear to ø OL	R/W Clear to ø OL	R/W Clear to ø OL	R/W Clear to ø OL	R/W Clear to ø OL	R/W Clear to ø OL	R/W Clear to ø OL	R/W Clear to ø OL	R/W Clear to ø OL	R/W Clear to ø OL	R/W Clear to ø OL
1							⊖ Y Y Y * * Y Y Y * Y *					F ⊄ ⊄ * * ⊄ ⊄ * * ⊄ ⊄
2,3,4,4A				G Y Y * * Y Y Y Y * Y *								
5,5A,5B					⊖ Y Y Y * * Y Y * Y Y						F ⊄ * ⊄ ⊄ * * ⊄ ⊄ * ⊄ ⊄	
6,7,8,8A		G Y Y * * Y Y Y * Y * Y										
9,9A			⊖ Y Y Y * * Y Y Y * Y *							F ⊄ ⊄ * * ⊄ ⊄ * ⊄ ⊄ *		
10,11								G Y Y * * Y Y Y * Y *				
12,12A					⊖ Y Y Y * * Y Y * Y Y			G Y Y * * Y Y Y * Y *				
13,13A,13B	⊖ Y Y Y * * Y Y * Y * Y								F ⊄ * ⊄ ⊄ * * ⊄ ⊄ * ⊄ ⊄			
14,15						G Y Y * * Y Y Y * Y * Y						
16,16A			⊖ Y Y Y * * Y Y Y * Y *			G Y Y * * Y Y Y * Y * Y						

Chart "A"	
On Phase	Non-Conflicting Phase Allowed to Time Concurrently
1	5,6,OLA,OLC
2	5,6,OLA,OLC
3	7,8,OLB,OLD
4	7,8,OLB,OLD
5	1,2,OLA,OLC
6	1,2,OLA,OLC
7	3,4,OLB,OLD
8	3,4,OLB,OLD
OLA	1,2,5,6,OLC
OLB	3,4,7,8,OLD
OLC	1,2,5,6,OLA
OLD	3,4,7,8,OLB

Blank Squares Denote a Red Indication

(*) When one phase is on alone, any non-conficiting phase may start timing concurrently without a clearance interval. (See Chart "A")

(A) Only upon pedestrian actuation.

THE CITY WILL PROGRAM THE SIGNAL TIMING INTO THE CONTROLLER PRIOR TO START UP.

TRAFFIC CONTROL SYSTEM
Controller Phasing

PHASE-LOOP · DIRECTION · CONTROLLER INPUT LOCATION · LOOP TYPE · WHITE BACKGROUND · BLACK LEGEND & LINES

CH.1		1-1A	WBLT	2-1A	EB	3-1A	SBLT			5-1A	EBLT	6-1A	WB			8-1A	SB	PE1	WB	PE3	SB
		VD1	PR	VD2	P	VD3	PR	VD4		VD5	PR	VD6	P	VD7		VD8	P		ø1&ø6		ø3&ø8
CH.2		1-1B	WBLT	2-1B	EB	3-1B	SBLT			5-1B	EBLT	6-1B	WB			8-1B	SB	PE2	EB	PE4	NB
		SD1	PR	SD2	P	SD3	PR	SD4		SD5	PR	SD6	P	SD7		SD8	P		ø2&ø5		ø4&ø7
REF	POWER SUPPLY	DT1		DT2		DT3		DT4		DT5		DT6		DT7		DT8		OD1		OD2	

CH.1		1-1a	WBLT	2-3	EBRT	3-1a	SBLT			5-1a	EBLT	6-3	WBRT			8-3A	SBRT
		VD9	PR	VD10	P	VD11	PR	VD12		VD13	PR	VD14	P	VD15		VD16	PR
CH.2		1-1b	WBLT			3-1b	SBLT			5-1b	EBLT					8-3a	SBRT
		VD17	PR	VD18		VD19	PR	VD20		VD21	PR	VD22		VD23		VD24	PR
REF	POWER SUPPLY	DT1		DT2		DT3		DT4		DT5		DT6		DT7		DT8	

TYPICAL 8 PHASE DETECTOR LABEL

SAME PHASE MULTIPLE LEAD-INS
LETTERS A-D
LANE LOCATION START
"A" ON THE CENTER LINE
TO CURB.

PHASE-LOOP
(N)-1 = (2,4,6,8)-PASSAGE
(N)-1 = (2,4,6,8)-PRESENCE
(N)-2 = (2,4,6,8)-CALLING
(N)-1 = (1,3,5,7)-LEFT TURN
(N)-3 = (2,4,6,8)-RIGHT TURN
(N)-5 = (1,2,3,4,5,6,7,8)- COUNT LOOP

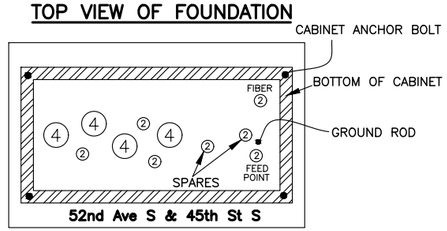
LOOP TYPE
P = PASSAGE
PR = PRESENCE
C = CALLING
LT = LEFT TURN
RT = RIGHT TURN
T = COUNT LOOP

CONTROLLER INPUT LOCATION
VD(#) = VEHICLE DETECTOR (1-8)
SD(#) = SPECIAL DETECTOR (1-8)
PD(#) = PEDESTRIAN DETECTOR (1-8)

EMERGENCY VEHICLE PRE-EMPTION PHASING

ø6 ← ø1+OLA ↓	ø5+OLC ↑ → ø2	ø8 ↓ ø3+OLB	ø7+OLD ← ↑ ø4
WEST BOUND	EAST BOUND	SOUTH BOUND	NORTH BOUND
PREEMPT 1	PREEMPT 2	PREEMPT 3	PREEMPT 4
TOP TUBE/BLUE WIRE	BOTTOM TUBE/YELLOW WIRE	TOP TUBE/BLUE WIRE	BOTTOM TUBE/YELLOW WIRE

EXISTING CONDUIT PLACEMENT
TOP VIEW OF FOUNDATION



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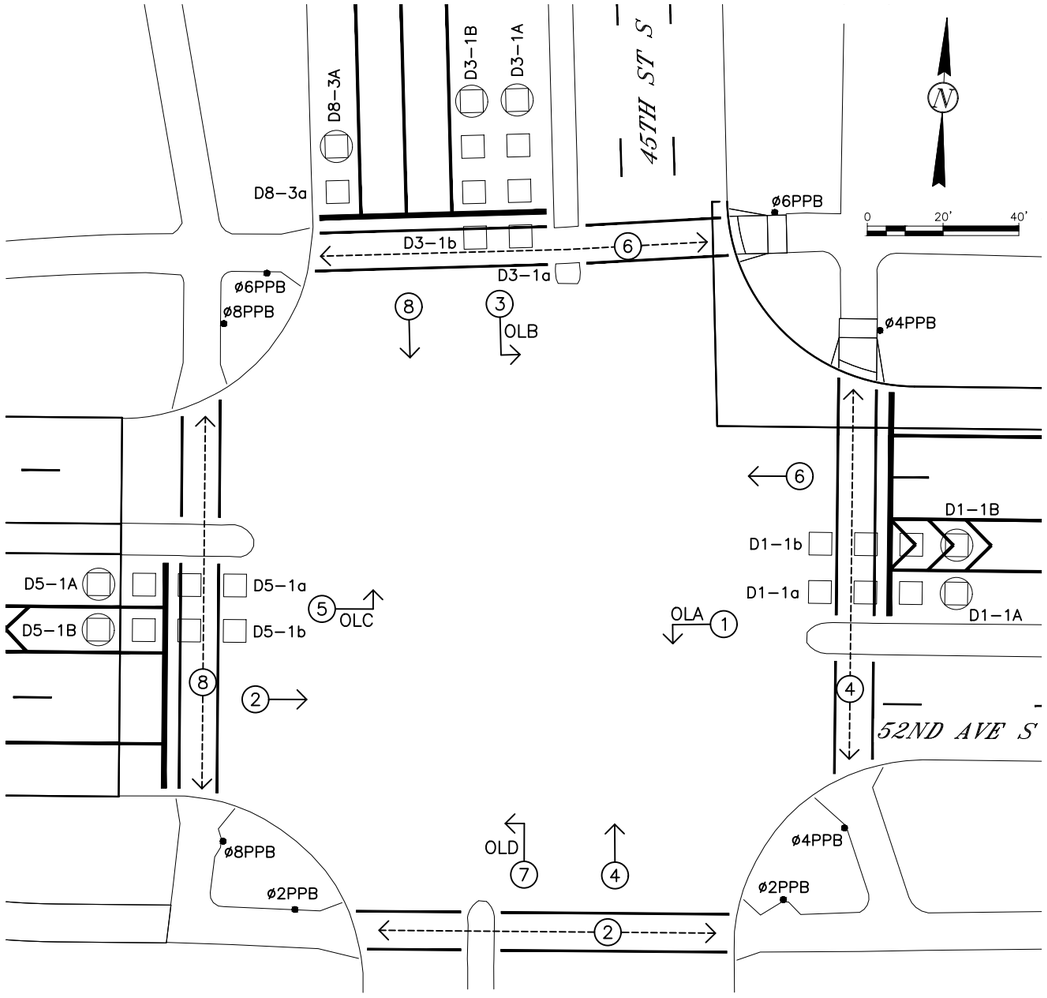
Signals - Controller Phasing 45th St S

52nd Ave S - West of 63rd St S to 45th St S

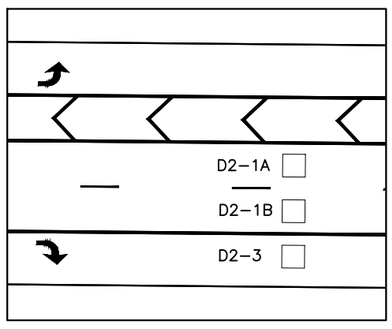
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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	150	15

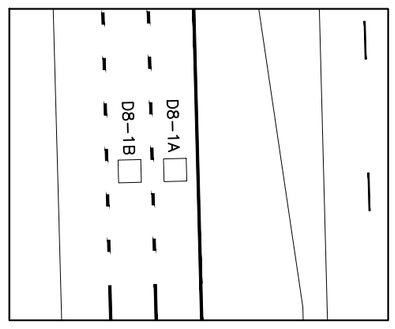
PHASE DESIGNATION DIAGRAM



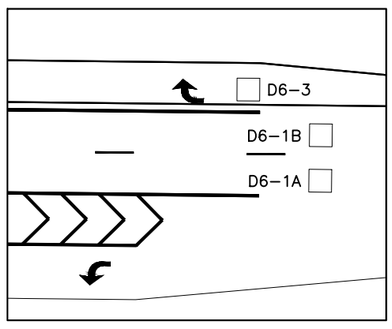
52nd Ave S & 45th St S



EASTBOUND



SOUTHBOUND

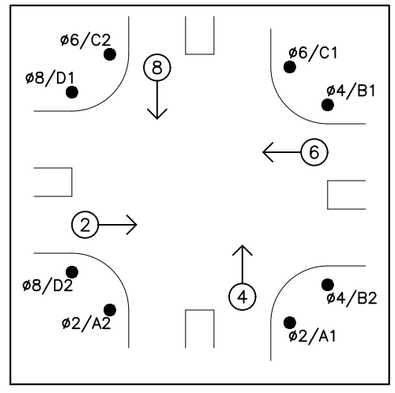


WESTBOUND

DETECTOR LOOP SCHEDULE - 52nd Ave S & 45th St S

DETECTION ZONE	DETECTION TYPE	NUMBER OF LOOPS	PHASE	SIZE (FEET)	TYPE OF LOOP	NUMBER OF TURNS	CONDUCTOR (LF)	SLAW SLOT (LF)
D1–1A D1–1a	LOOP	4	ø1	6 x 6	PRESENCE	3	EXISTING	EXISTING
D1–1B D1–1b	LOOP	4	ø1	6 x 6	PRESENCE	3	EXISTING	EXISTING
D2–1A D2–1B D2–3	LOOP	3	ø2	6 x 6	PASSAGE	3	354	118
D3–1A D3–1a	LOOP	4	ø3	6 x 6	PRESENCE	3	EXISTING	EXISTING
D3–1B D3–1b	LOOP	4	ø3	6 x 6	PRESENCE	3	EXISTING	EXISTING
D5–1A	LOOP	1	ø5	6 x 6	PRESENCE	3	108	27
D5–1a	LOOP	3	ø5	6 x 6	PRESENCE	3	EXISTING	EXISTING
D5–1B	LOOP	1	ø5	6 x 6	PRESENCE	3	130	40
D5–1b	LOOP	3	ø5	6 x 6	PRESENCE	3	EXISTING	EXISTING
D6–1A D6–1B D6–3	LOOP	3	ø6	6 x 6	PASSAGE	3	350	42
D8–1A D8–1B	LOOP	2	ø8	6 x 6	PASSAGE	3	EXISTING	EXISTING
D8–3A D8–3a	LOOP	2	ø8	6 x 6	PRESENCE	3	EXISTING	EXISTING
						TOTAL	942	227

PUSHBUTTON ASSIGNMENT



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Signals - Phase Diagram 45th St S

52nd Ave S - West of 63rd St S to 45th St S

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	150	16

TRAFFIC SIGNAL QUANTITIES (A)

LOCATION	CONCRETE FOUNDATION - TRAFFIC SIGNALS	CONCRETE PAD FOR EXISTING QUAZITE FIBER PULL BOX	PULL BOX	FARGO TYPE B CABINET	1" DIA. RIGID CONDUIT	2" DIA. RIGID CONDUIT	LOOP LEAD-IN CONDUCTOR	LOOP WIRE	EMERGENCY VEHICLE DETECTOR CABLE (OPTICOM)	EMERGENCY VEHICLE INDICATOR CABLE (NO. 12 AWG 2)	NO. 14 AWG 2 CONDUCTOR CABLE	NO. 14 AWG 3 CONDUCTOR CABLE	NO. 14 AWG 5 CONDUCTOR CABLE	NO. 14 AWG 7 CONDUCTOR CABLE	NO. 14 AWG 20 CONDUCTOR CABLE	SAW SLOT	TYPE V SIGNAL STANDARD	RELOCATE TYPE VI SIGNAL STANDARD	COMBO 40' MH SIGNAL & LIGHT STANDARD - 55' MA	COMBO 40' MH SIGNAL & LIGHT STANDARD - 61' MA	LED LUMINAIRE	1-WAY 3 SEC HEAD W/ 12" LENS - POST MTD.	1-WAY 3 SEC HEAD W/ 12" LENS - PEDESTAL MTD.	1-WAY 3 SEC HEAD W/ 12" LENS - MA MTD.	1-WAY 4 SEC HEAD W/ 12" LENS - PEDESTAL MTD.	1-WAY 4 SEC HEAD W/12" LENS - MA MTD.	1-WAY 5 SEC HEAD W/ 12" LENS - POST MTD.	1-WAY 5 SEC HEAD W/ 12" LENS - PEDESTAL MTD.	PEDESTRIAN COUNTDOWN SIGNAL HEAD - PEDESTAL MTD.	PEDESTRIAN PUSH BUTTON POST	APS PEDESTRIAN PUSH BUTTON & SIGN	REVISE EMERGENCY VEHICLE DETECTOR SYSTEM	BATTER BACKUP SYSTEM	PTZ CAMERA	CAT 6 CABLE	NO. 16 AWG 3 (PTZ CAMERA POWER)	MAST ARM MOUNTED SIGNS		REVISE TRAFFIC SIGNAL SYSTEM
	EA	EA	EA	EA	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	LSUM	EA	EA	LF	LF	LSUM		EA
POLE 4	1																	1							1			1	1		1						
POLE 7																									2												
POLE 10																									1												
POLE 14	1																		1		2			2		1	1										
POLE 15																							1		1												
POLE 19																									1												
POLE 20																										1	1										
POLE 21																												1									
POLE 27	1																			1	2	1		2		1											
POLE 29																	1											1									
VARIOUS LOCATIONS		1	3	1	13	726	2,937	942	180	190	102	147	290	458	700	227													1	1	1	1	1	125	125	1		
TOTAL	3	1	3	1	13	726	2,937	942	180	190	102	147	290	458	700	227	1	1	1	1	4	1	1	4	6	3	2	2	2	1	2	1	1	1	125	125	1		1

(A) TRAFFIC SIGNAL QUANTITIES FOR INFORMATIONAL PURPOSES ONLY. ALL COSTS SHALL BE INCLUDED IN THE BID PRICE FOR "REVISE TRAFFIC SIGNAL SYSTEM". QUANTITIES CALCULATED ACCORDING TO NDDOT SPECIFICATIONS.

REMOVAL QUANTITIES (B)

LOCATION	REMOVE CONCRETE FOUNDATION - TRAFFIC SIGNALS	REMOVE & SALVAGE PULL BOX	REMOVE & SALVAGE TRAFFIC SIGNAL CONTROLLER CABINET	REMOVE VEHICLE DETECTION LOOPS	REMOVE & SALVAGE TYPE VI SIGNAL STANDARD	REMOVE & SALVAGE TYPE IV/COMBO SIGNAL STANDARD	REMOVE & SALVAGE LED LUMINAIRE	REMOVE & SALVAGE VEHICULAR HEADS	REMOVE & SALVAGE PEDESTRIAN HEADS	REMOVE & SALVAGE PEDESTRIAN PUSH BUTTON POST	REMOVE & SALVAGE PEDESTRIAN PUSH BUTTON	REMOVE & SALVAGE PTZ CAMERA	REMOVE & SALVAGE VEHICULAR & PEDESTRIAN HEAD MOUNTING EQUIPMENT	REMOVE & SALVAGE CONDUCTOR	REMOVE CONDUIT		REVISE TRAFFIC SIGNAL SYSTEM
	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	LSUM	LSUM	LSUM		EA
POLE 4	1					1	2	4	1		1	1					
POLE 6	1				1			2	1		1						
POLE 8								2									
POLE 13								1									
POLE 17	1					1		4									
POLE 18								1									
POLE 22								1			1						
POLE 23								2									
POLE 24								1									
VARIOUS LOCATIONS		2	1	5						2	2		1	1	1		
TOTAL	3	2	1	5	1	2	2	18	2	2	5	1	1	1	1		1

(B) TRAFFIC SIGNAL QUANTITIES FOR INFORMATIONAL PURPOSES ONLY. ALL COSTS SHALL BE INCLUDED IN THE BID PRICE FOR "REVISE TRAFFIC SIGNAL SYSTEM". QUANTITIES CALCULATED ACCORDING TO NDDOT SPECIFICATIONS.

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Signals - Quantities 45th St S

52nd Ave S - West of 63rd St S to 45th St S

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	150	17

TRAFFIC SIGNAL STANDARD FOUNDATIONS

TRAFFIC SIGNAL STANDARD FOUNDATION SELECTION TABLE				
SIGNAL STANDARD DESCRIPTION	24" DIAMETER FOOTING DEPTH	30" DIAMETER FOOTING DEPTH	36" DIAMETER FOOTING DEPTH	42" DIAMETER FOOTING DEPTH
TYPE I, II, V, VI, VII STANDARD				
10–14' HEIGHT	4'	4'	3'	–
15'–17' HEIGHT	6'	6'	5'	–
TYPE IV SIGNAL STANDARD				
0'–25' MAST ARM	–	11'	11'	11'
26'–30' MAST ARM	–	12'	12'	12'
31'–35' MAST ARM	–	12'	12'	12'
36'–39' MAST ARM	–	13'	13'	13'
40'–45' MAST ARM	–	15'	15'	15'
46'–50' MAST ARM	–	16'	15'	15'
51'–55' MAST ARM	–	16'	16'	16'
56'–60' MAST ARM	–	17'	17'	17'
61'–65' MAST ARM	–	18'	18'	18'
COMBO SIGNAL STANDARD 30' MT HEIGHT				
0'–25' MAST ARM	–	11'	11'	11'
26'–30' MAST ARM	–	12'	12'	12'
31'–35' MAST ARM	–	13'	13'	13'
36'–39' MAST ARM	–	14'	14'	14'
40'–45' MAST ARM	–	16'	15'	15'
46'–50' MAST ARM	–	16'	16'	16'
51'–55' MAST ARM	–	17'	16'	16'
56'–60' MAST ARM	–	18'	17'	17'
61'–65' MAST ARM	–	19'	18'	18'
COMBO SIGNAL STANDARD 40' MT HEIGHT				
0'–25' MAST ARM	–	12'	12'	12'
26'–30' MAST ARM	–	13'	13'	13'
31'–35' MAST ARM	–	13'	13'	13'
36'–39' MAST ARM	–	14'	14'	14'
40'–45' MAST ARM	–	16'	15'	15'
46'–50' MAST ARM	–	16'	16'	16'
51'–55' MAST ARM	–	17'	16'	16'
56'–60' MAST ARM	–	18'	17'	17'
61'–65' MAST ARM	–	19'	18'	18'
COMBO SIGNAL STANDARD 50' MT HEIGHT				
0'–25' MAST ARM	–	12'	12'	12'
26'–30' MAST ARM	–	13'	13'	13'
31'–35' MAST ARM	–	13'	13'	13'
36'–39' MAST ARM	–	14'	14'	14'
40'–45' MAST ARM	–	16'	16'	16'
46'–50' MAST ARM	–	16'	16'	16'
51'–55' MAST ARM	–	17'	17'	17'
56'–60' MAST ARM	–	18'	18'	17'
61'–65' MAST ARM	–	19'	19'	18'

FOUNDATION REINFORCING TABLE	
FOOTING DEPTH	LONGITUDINAL REINFORCING
12' or Less	8 – #5
13'–14'	8 – #6
15'–16'	8 – #7
17'–19'	8 – #8

FOUNDATION NOTES:

1. SEE PLANS FOR CORRECT LOCATION OF FOUNDATION. THE GRADE AND EXACT LOCATION SHALL BE ESTABLISHED BY THE ENGINEER IN THE FIELD.

2. THE FOUDATION SHALL PROVIDE A MINIMUM OF 3" OF CONCRETE COVER FROM THE ANCHOR BOLTS TO THE REBAR CAGE AND A MINIMUM OF 3" OF CONCRETE COVER OVER THE REBAR CAGE TO THE OUTSIDE OF THE FOUNDATION. THE DIAMETER OF THE FOUNDATION SHALL BE INCREASED TO ACCOMODATE A LARGER BOL CIRCLE.

3. AN ANCHOR BOLT CAGE SHALL BE SHOP FABRICATED FROM #6 BAR CIRCLE OR ¾" SQUARE STOCK OR APPROVED EQUAL WELDED TO THE INSIDE OF THE ANCHOR BOLT TO HOLD ALIGNMENT.

4. GROUND ROD SHALL BE PLACED PRIOR TO CONCRETE PLACEMENT. THE ROD SHALL PROJECT 4" ABOVE THE FINISHED FOUNDATION AND SHALL EXTEND 12" BELOW THE FOUNDATION BOTTOM.

5. CONDUIT BENDS SHALL BE 90°. CONDUIT SHALL BE LOCATED 24" MINIMUM BELOW GROUND LEVEL. A SPARE 2" CONDUIT SHALL BE INSTALL IN EACH FOUNDATION WITH BOTH ENDS PLUGED AS PER SPARE CONDUIT SPECIFICATION.

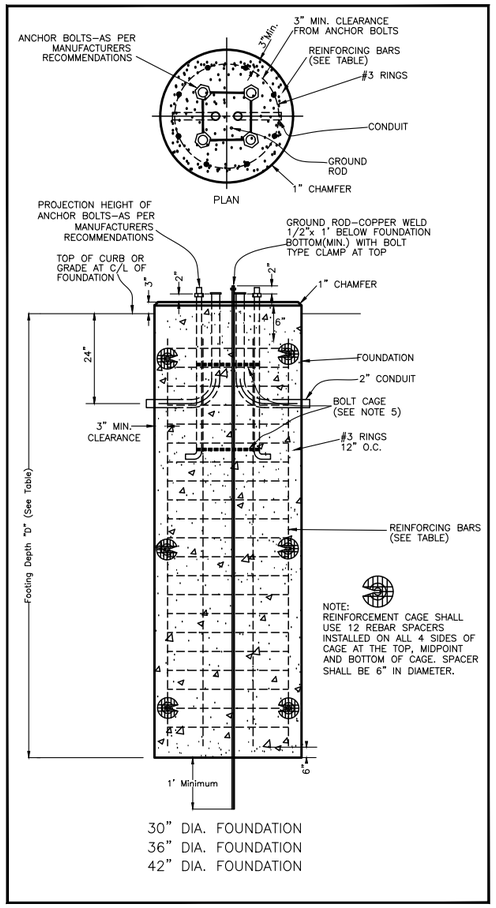
CONCRETE FOUNDATION:

1. CONCRETE USED IN THE WORK SHALL BE CLASS AE PORTLAND CEMENT CONCRETE MIXED AND PROPORTIONED AS SPECIFIED IN SECTION 802 IN ND STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION.

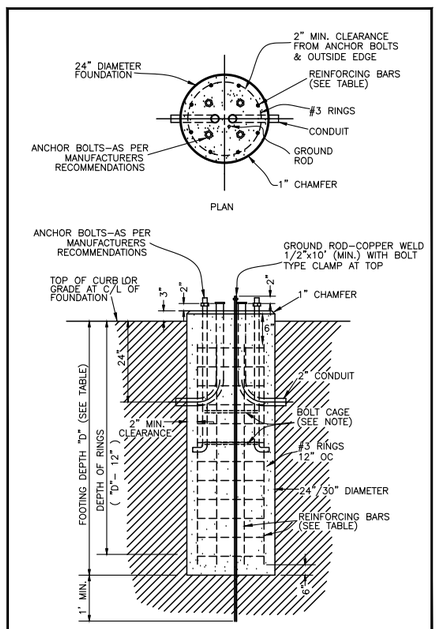
2. CONTRACTOR IS RESPONSIBLE FOR CALLING OR NOTIFYING ENGINEER BEFORE CONCRETE IS ORDERED, NO CONCRETE SHALL BE INSTALLED UNTIL CONCRETE IS TESTED.

3. CONCRETE SHALL MEET THE FOLLOWING TESTS:
   - –AIR CONTENT BETWEEN 5% TO 8%
   - –SLUMP BETWEEN 2" TO 4"
   - –MAX TEMP OF 90 DEGREES

4. CONCRETE SHALL ATTAIN A COMPRESSIVE STRENGTH OF 3000 PSI BEFORE SIGNAL STANDARD IS INSTALLED AND SHALL ATTAIN A COMPRESSIVE STRENGTH OF 4000 PSI BEFORE 28 DAYS TO BE ACCEPTED.



30" DIA. FOUNDATION
36" DIA. FOUNDATION
42" DIA. FOUNDATION



24" DIA. FOUNDATION ①

NOTES:

① NO REINFORCEMENT IS REQUIRED IF THE ANCHOR BOLTS EXTEND TO WITHIN 3" TO 6" ABOVE THE BOTTOM OF THE FOUNDATION FOR THE 24" DIAMETER FOUNDATION.

② ALL REINFORCING STEEL TO BE GRADE 40 OR 60.

③ RINGS SHALL BE SPACED AT EQUAL SPACE TO A MAXIMUM OF 12" OC, STARTING WITH THE FIRST AT THE TOP OF THE LONGITUDINAL REINFORCING AND THE LAST AT THE BOTTOM OF THE LONGITUDINAL REINFORCING. RINGS SHALL HAVE A MIN OF 12" OVERLAP.

④ SEE PLANS FOR CONDUIT SIZE, NUMBER OF BENDS AND CORRECT POSITIONING FOR EACH FOUNDATION.

⑤ THE TOP OF THE FOUNDATION SHALL BE CIRCULAR. IF APPROVED BY THE ENGINEER A SQUARE CASING MAY BE USED. PRIOR TO FINAL GRADING OR SIDEWALK PLACEMENT THE CASING TUBES SHALL BE REMOVED TO A POINT 6" BELOW GRADE.

SECTION NO. 4200	DRAWING NO. 5.1
REV.D. 2016	
TRAFFIC SIGNAL FOUNDATION	
CITY OF FARGO ENGINEERING DEPARTMENT	
APPROVED	DATE

THE CITY OF Fargo FAR MORE

Proj. No. 6059-0145
Houston Engineering Inc.
Ph: 701.237.5065

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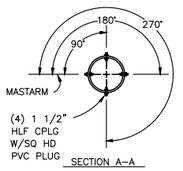
Signals - Details

52nd Ave S - West of 63rd St S to 45th St S

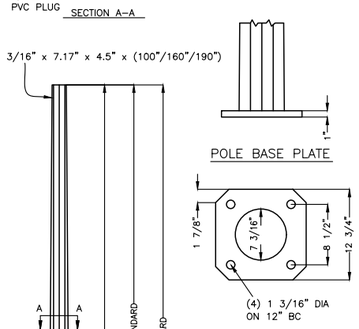
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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	150	18

TYPE V, TYPE V,TYPE VIII SIGNAL STANDARDS



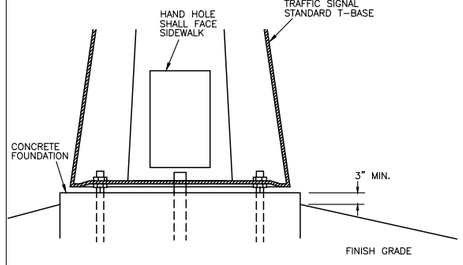
POLES:
ALL TYPE V AND TYPE VI SIGNAL STANDARDS SHALL BE MANUFACTURED BY MILLERBERND MANUFACTURING AND HAVE A T-BASE INSTALLED.



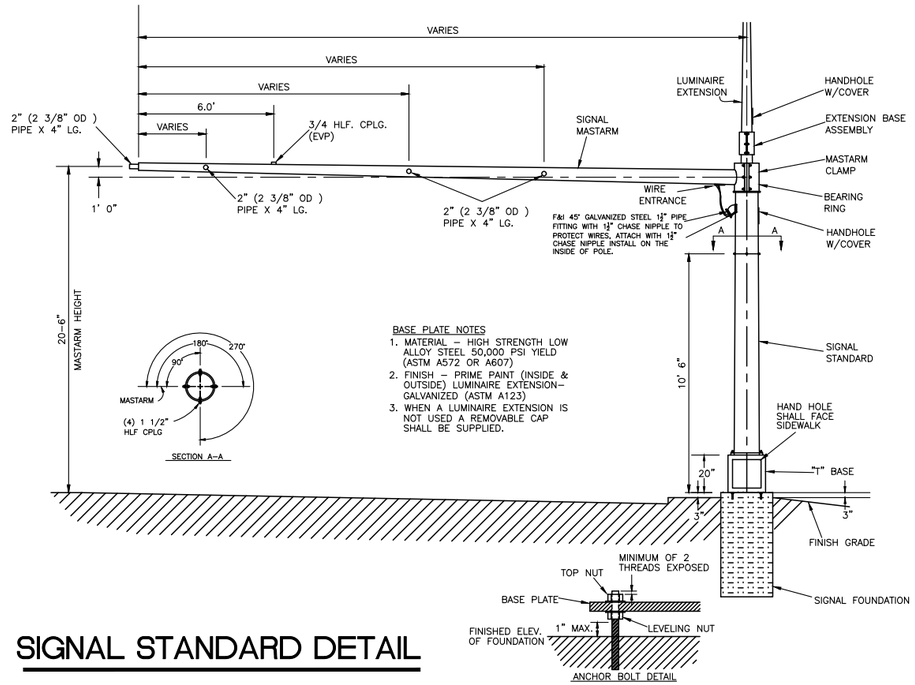
NOTE:
POLE MATERIAL–HIGH STRENGTH LOW ALLOY STEEL 50,000 PSI MIN. YIELD PER ASTM A572 OR A1011(A871 OR A606 IF SELF WEATHERING) BASE PLATE MATERIAL–36,000 PSI MIN. YEILD PER ASTM A36(A588 IF SELF WEATHERING) SHALL BE PAINTED USING THE MILLERBOND I2/ZRU PAINT SYSTEM WITH A TOP CLEAR COAT.

(4) 1–8NC x 3 ½" LG HVY HX HD BOLT, HVY HX NUT & LOCKWASHER (ASTM A325–GV) (INSTALL HD UP)

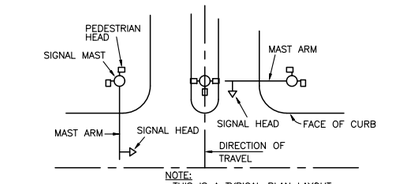
390C66 T–BASE
1" ANCHOR BOLTS ON 15" BC WITH 4" PROJ



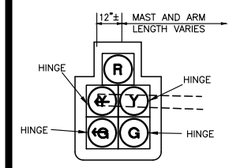
SIGNAL STANDARD DETAIL



SIGNAL MAST ARM HEAD MOUNTING

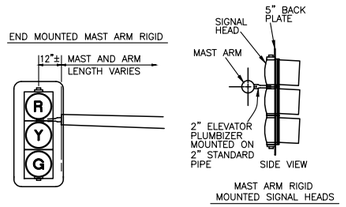


NOTE:
–THIS IS A TYPICAL PLAN LAYOUT
–HEADS SHALL NOT PROTRUDE OVER THE FACE OF THE CURB



NOTE:
5–SECTION CLUSTER HEAD ASTRO BRACKET SHALL BE MOUNTED TO THE MAST ARM AT THE CENTER OF THE YELLOW BALL HEAD.

NOTE:
ALL HINGES SHALL BE ON OUTSIDE OF 5 SECTION CLUSTER

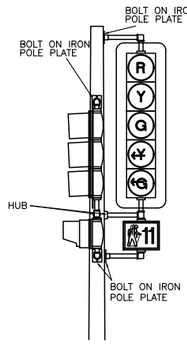


MAST ARM RIGID MOUNTED SIGNAL HEADS

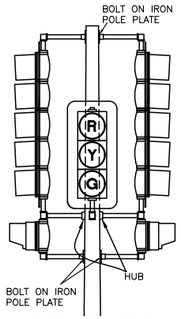
TRAFFIC SIGNAL HEAD MOUNTING

NOTE:
TYPE V,TYPE VI, AND TYPE VIII SIGNAL STANDARDS THAT ARE 15' OR 17.5' IN HEIGHT SHALL USE A 24" CONCRETE SIGNAL FOUNDATION THAT IS 6' IN DEPTH.

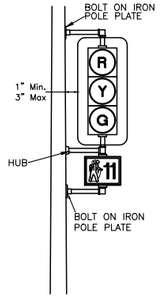
ALL VEHICLE AND PEDESTRIAN MOUNTING HARDWARE SHALL BE STEEL.



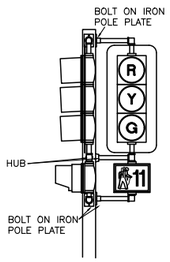
TYPE VI–17.5' HEIGHT
PEDESTAL MOUNTED–VEHICULAR
PEDESTAL MOUNTED–PEDESTRIAN



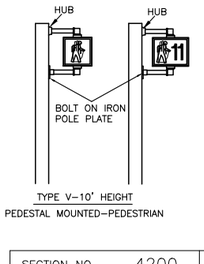
TYPE VIII–17.5' HEIGHT
PEDESTAL MOUNTED–VEHICULAR
PEDESTAL MOUNTED–PEDESTRIAN



TYPE IV
POST MOUNTED–VEHICULAR
POST MOUNTED–PEDESTRIAN



TYPE V–15' HEIGHT
PEDESTAL MOUNTED–VEHICULAR AND PEDESTRIAN HEADS



TYPE V–10' HEIGHT
PEDESTAL MOUNTED–PEDESTRIAN

NOTES:

CLEARANCE
CLEARANCE FROM GROUND LINE OR SIDEWALK TO THE BOTTOM OF POST OF PEDISTAL MOUNTED VEHICULAR SIGNAL HEADS SHALL BE 10 FT. MINIMUM FROM PEDESTRIAN SIGNAL SHALL BE 8 FT. MINIMUM.

SIGNAL HEADS
SHALL BE BLACK(UNLESS NOTED OTHER IN PLANS), SEE TRAFFIC LAYOUT FOR CORRECT MOUNTING POSITION, NUMBER, SIZE, AND ARRANGEMENT OF LENSES.

POLE CLAMPS
A POLE PLATE WITH SUITABLE BANDING MATERIAL AS APPROVED BY ENGINEER SHALL BE USED.

PAINT
SIGNAL HOUSING SHALL BE PAINTED BLACK. SEE PLANS. BACK PLATES SHALL BE PAINTED FLAT BLACK. POLE CLAMPS AND SIGNAL HEAD MOUNTING HARDWARE SHALL BE PAINTED THE SAME COLOR AS THE SIGNAL STANDARD.

SECTION NO. 4200	DRAWING NO. 5.2
REV,D. 2016	

SIGNAL STANARDS & HEAD MOUNTING

CITY OF FARGO
ENGINEERING DEPARTMENT

APPROVED	DATE

THE CITY OF Fargo FAR MORE

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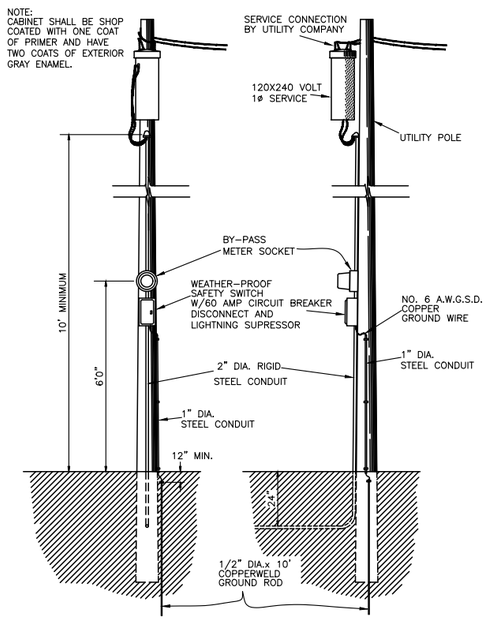
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Signals - Details

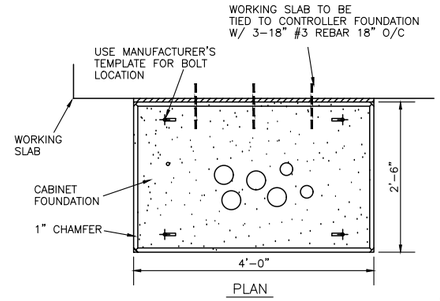
52nd Ave S - West of 63rd St S to 45th St S

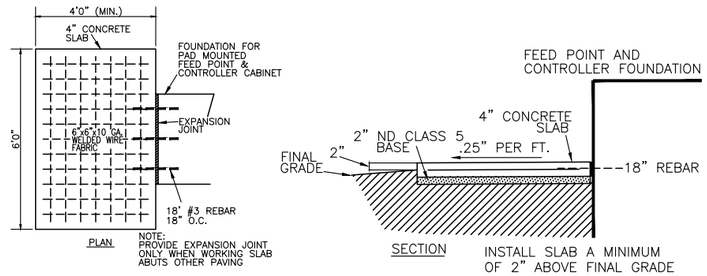
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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	150	19

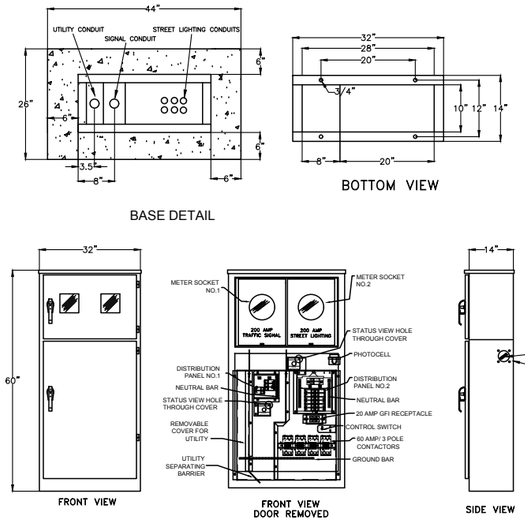


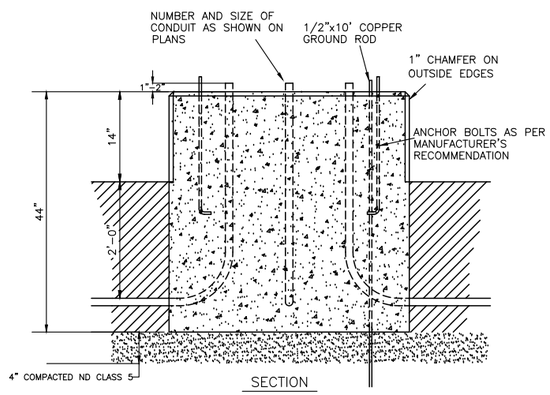
POLE MOUNTED FEED POINT





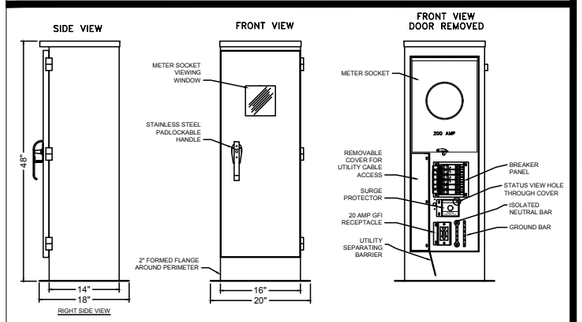
CONTROLLER + FEED POINT WORKING SLAB



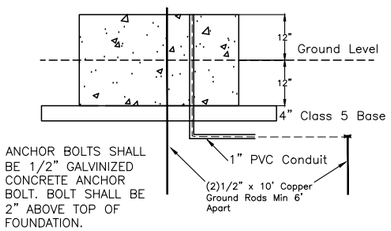


ANCHOR BOLTS MUST BE SET INTO CONTROLLER FOUNDATION WHEN POURED

CONTROLLER CABINET FOUNDATION PAD MOUNT



PAD MOUNTED FEED POINT



COMBO PAD MOUNTED FEED POINT

SECTION NO. 4200		DRAWING NO. 5.3	
REV.D. 2016			
FEED POINT, PED. POST & CABINET FOUNDATION			
CITY OF FARGO ENGINEERING DEPARTMENT			
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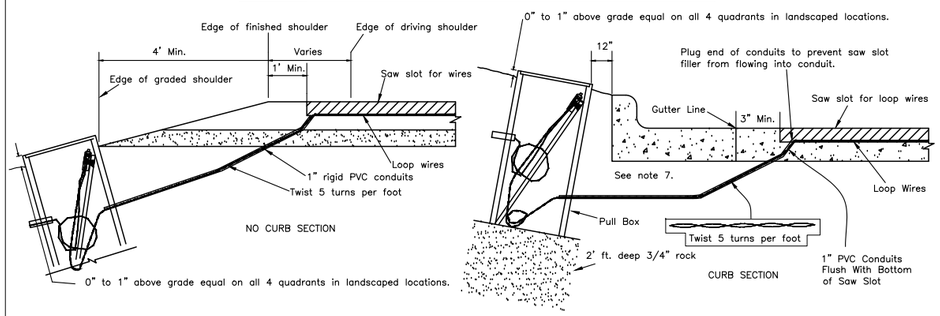
Signals - Details

52nd Ave S - West of 63rd St S to 45th St S

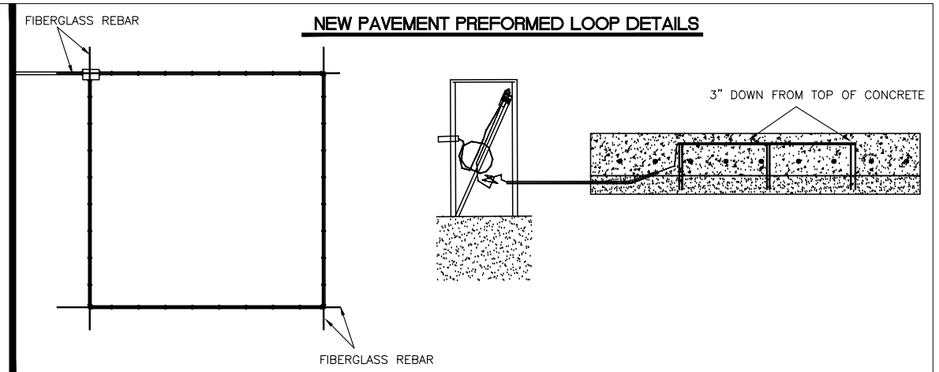
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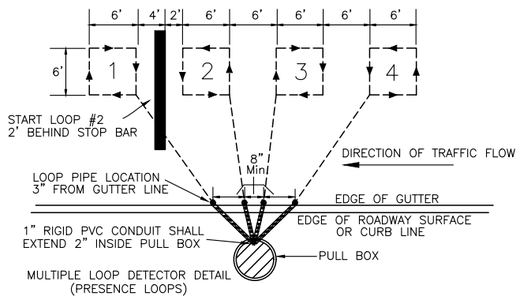
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	150	20

EXISTING PAVEMENT SAW SLOT TO PULL BOX DETAILS



NEW PAVEMENT PREFORMED LOOP DETAILS

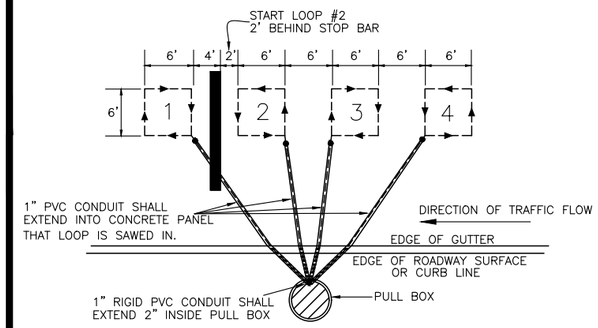




NOTES

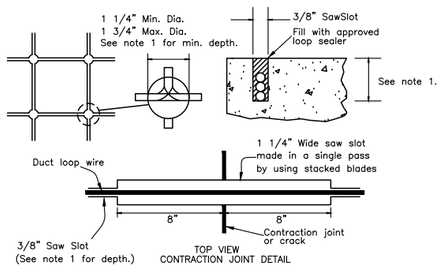
1) Loop saw cut shall be 2" deep in concrete and 3" deep in asphalt, saw depth in asphalt shall be determined by the engineer in the field, depending on road conditions.
2) All contraction joints and cracks crossed by saw slot must use a 1 1/4" wide saw slot. See note 1) for depth. See contraction joint detail. Contraction joint saw slot cut shall be cut in a single pass using stacked blades.
3) Duct type wire shall be used for all loops consisting of a High Density XLPE polyethylene tube and XHHW insulated wire. Provide slack at all drilled corners and contraction and crack joints. Use 1" long pieces of 3/4" backer rod at required intervals, 2' max, in saw cut to prevent wire from floating.
4) Provide 3 turns in all loops.
5) Spacing of lead–in conduits shall be a minimum of 8" at the edge of road way surface or gutter line(on existing pavement). See multiple loop detector detail. Lead–in loop pipe shall not enter gutter section.
6) Provide loop wire slack in J–box such that loop wire will extend a minimum of 6–feet above the top of the J–box.
7) Splices and Conductors in Pull Boxes: There shall be no splices below grade except for loop lead–in conductors. Wire nut together the spliced wires and encapsulate in an UraSeal CK200 epoxy splice kit. Conductors in the splice kit shall not be taped together. Loop lead–in and loop wires shall have sufficient slack to extend a minimum of 6 feet above the pull box opening and be installed in the pull box with the splice kit taped to a length of 1/2 PVC so the splice is secured inside the upper 1/4 of pull box (See Detail). Pull through. Conductors shall have sufficient slack to extend a minimum of 18–inches above the pull box opening.
8) Pull boxes in landscaped areas shall have the top of the box 0 to 1 inches above final grade and sloped to match the slope of the final grade on all four sides. Pull boxes in concrete areas shall be set with the top of the box flush with the final grade at all four sides. See pull box detail.

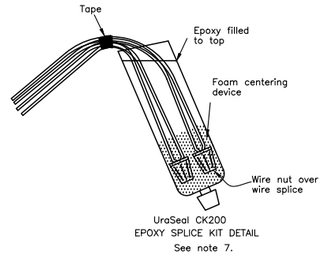
NEW PAVEMENT LOOP PIPE TO PULL BOX DETAILS

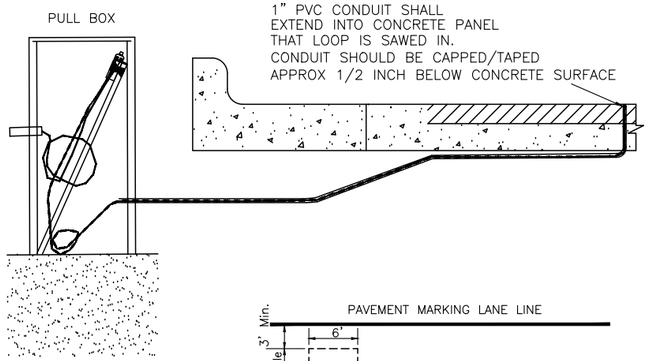


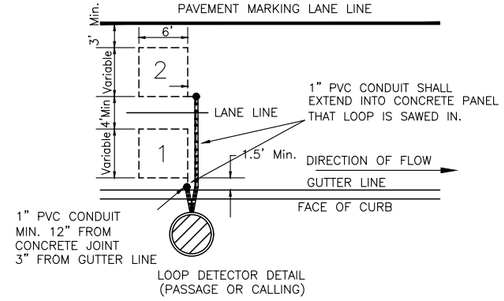
WIRE SHALL BE INSTALLED IN A CLOCKWISE/COUNTER CLOCKWISE ROTATION ON ALL LOOPS AS PER DETAIL.

BOTH ENDS OF THE LOOP SHALL BE LABELED AS PER LOOP DETAIL.









SECTION NO. 4200	DRAWING NO. 5.4
REV,D. 2016	

DETECTOR LOOPS DETAILS

CITY OF FARGO
ENGINEERING DEPARTMENT

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THE CITY OF Fargo FAR MORE

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	150	21

PRE-EMPTION CABLE TERMINATION

TERMINAL T1
PRE-EMPTION 1 AND 2-SHRINK WRAP GROUND WIRE

TERMINAL T2
PRE-EMPTION 1 AND 2-ORANGE WIRE-TOP TUBE

TERMINAL T3
PRE-EMPTION 1-TOP TUBE-BLUE WIRE

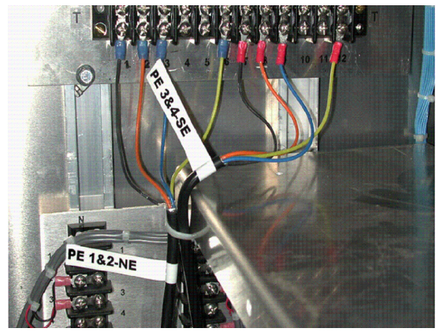
TERMINAL T6
PRE-EMPTION 2-BOTTOM TUBE-YELLOW WIRE

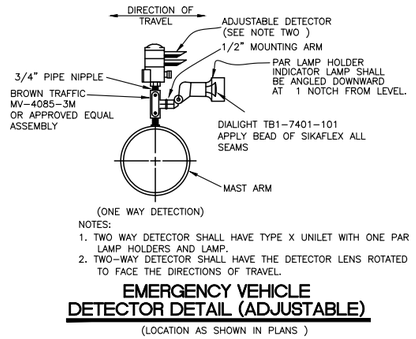
TERMINAL T7
PRE-EMPTION 3 AND 4-SHRINK WRAP GROUND WIRE

TERMINAL T8
PRE-EMPTION 3 AND 4-ORANGE WIRE-BOTTOM TUBE

TERMINAL T9
PRE-EMPTION 3-TOP TUBE-BLUE WIRE

TERMINAL T12
PRE-EMPTION 4-BOTTOM TUBE-YELLOW WIRE



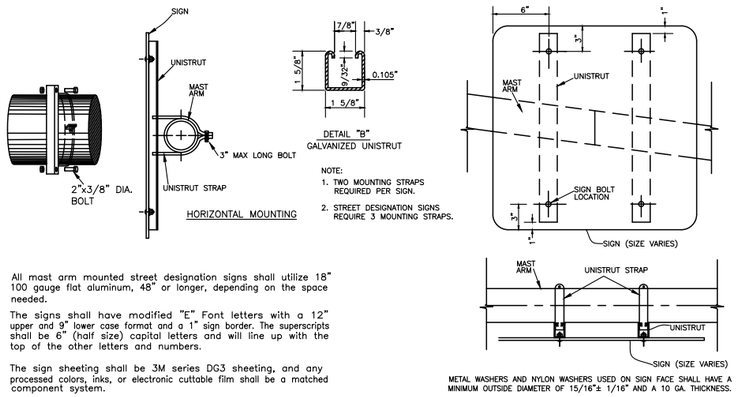


(ONE WAY DETECTION)

NOTES:
1. TWO WAY DETECTOR SHALL HAVE TYPE X UNILET WITH ONE PAR LAMP HOLDERS AND LAMP.
2. TWO-WAY DETECTOR SHALL HAVE THE DETECTOR LENS ROTATED TO FACE THE DIRECTIONS OF TRAVEL.

EMERGENCY VEHICLE DETECTOR DETAIL (ADJUSTABLE)

(LOCATION AS SHOWN IN PLANS)



NOTE:
1. TWO MOUNTING STRAPS REQUIRED PER SIGN.
2. STREET DESIGNATION SIGNS REQUIRE 3 MOUNTING STRAPS.

All mast arm mounted street designation signs shall utilize 18" 100 gauge flat aluminum, 48" or longer, depending on the space needed.

The signs shall have modified "E" Font letters with a 12" upper and 9" lower case format and a 1" sign border. The superscripts shall be 6" (half size) capital letters and will line up with the top of the other letters and numbers.

The sign sheeting shall be 3M series DG3 sheeting, and any processed colors, inks, or electronic cuttable film shall be a matched component system.

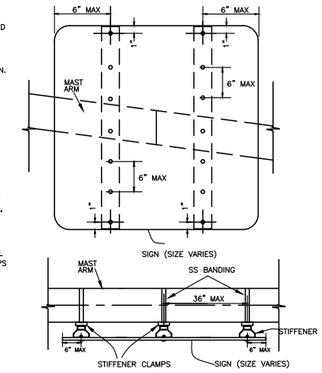
NOTE:
SIGNS MOUNTED ON THE SIGNAL STANDARD VERTICAL POST, EXCLUDING THE MAST ARMS SHALL BE INSTALLED BY DRILLING, TAPPING AND DIE THE POLE AND INSTALLING SIGNS WITH A 3/8" x 1" STAINLESS STEEL HEX BOLT USING A 3/8" STAINLESS STEEL FLAT WASHER AND A NYLON WASHER.

METAL WASHERS AND NYLON WASHERS USED ON SIGN FACE SHALL HAVE A MINIMUM OUTSIDE DIAMETER OF 15/16"± 1/16" AND A 10 GA. THICKNESS.

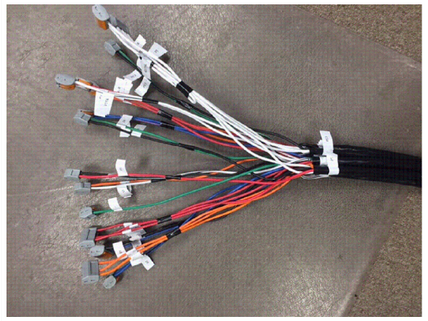
MAST ARM MOUNTED SIGN DETAIL

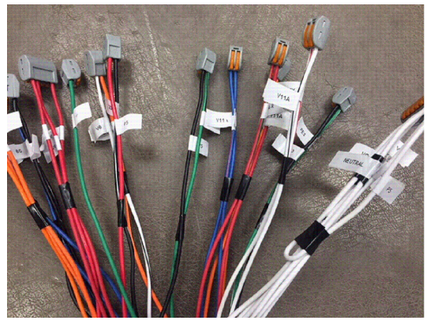
INSTALLATION NOTES:

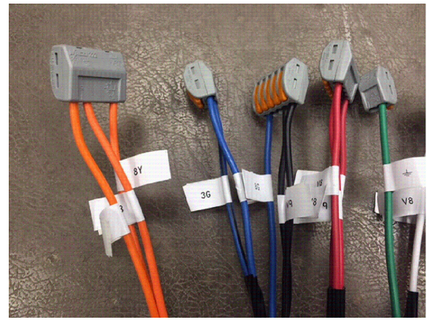
1. SIGNS SHALL BE AFFIXED TO UPPER AND LOWER MAST ARM CHORDS WHENEVER POSSIBLE.
2. POSITION BOTTOM OF SIGN PANEL 17' MINIMUM ABOVE ROAD CENTERLINE ELEVATION.
3. SIGN PANELS SHALL BE MOUNTED PLUMB.
4. HORIZONTAL INSET FROM PANEL EDGE TO STIFFENER SHALL NOT EXCEED 6"
5. HORIZONTAL SPACING BETWEEN STIFFENERS SHALL NOT EXCEED 36".
6. VERTICAL INSET FROM PANEL EDGE TO STIFFENER SHALL BE 0" TO 0.5".
7. RIVETS ATTACHING STIFFENERS TO SIGN PANELS SHALL BE INSTALLED 1" TO CENTER FROM THE TOP AND BOTTOM OF THE PANEL, AND THEN SPACED NO MORE THAN 6" ON CENTER.
8. BANDING SHALL BE ¾"X 0.03" 316 STAINLESS STEEL. BANDING BUCKLES SHALL BE ¾" STAINLESS STEEL. (2) BANDING STRAPS PER MOUNTING BUCKLE. SECOND STRIP NEEDED TO BE INSTALLED DIRECTLY OVER FIRST, TIGHTEN TO MANUFACTURES SPECS.

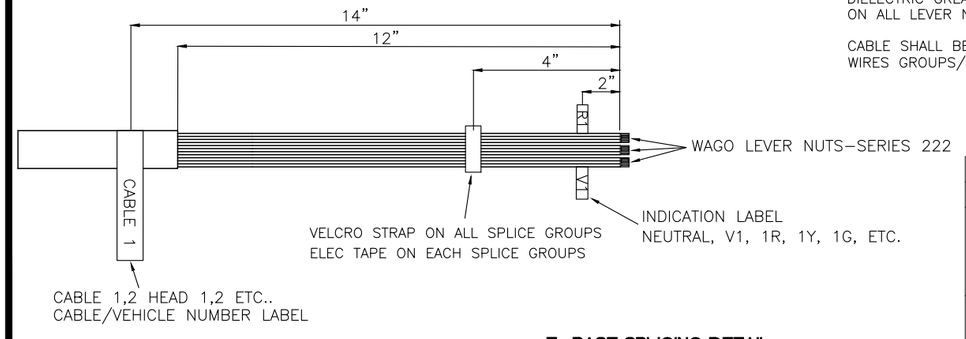


DETAIL "B"
STIFFENER AND BANDING









T- BASE SPLICING DETAIL

NOTE:
DIELECTRIC GREASE SHALL BE INSTALLED IN ALL OPENINGS ON ALL LEVER NUTS BEFORE WIRES ARE INSALLED

CABLE SHALL BE SPLICED IN A NEATLY MANNER, SO NO WIRES GROUPS/PAHSE ARE INTERTWINED WITH EACH OTHER.

SECTION NO. 4200	DRAWING NO. 5.5
REV,D. 2016	

EVP SYSTEM, SIGNING & SPLICING DETAIL

CITY OF FARGO
ENGINEERING DEPARTMENT

APPROVED	DATE

THE CITY OF Fargo FAR MORE

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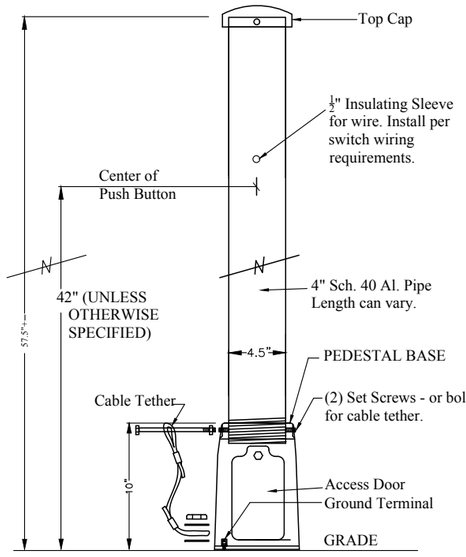
Signals - Details

52nd Ave S - West of 63rd St S to 45th St S

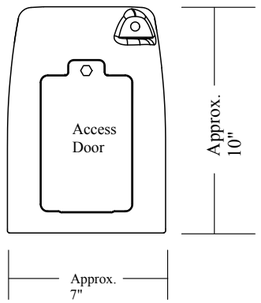
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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	150	22

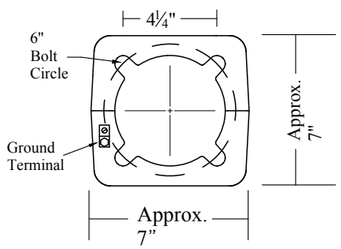
PEDESTRIAN PUSH BUTTON POST DETAILS



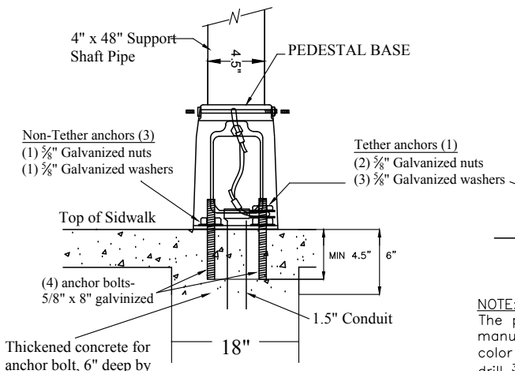
CROSSWALK PEDESTAL ASSEMBLY

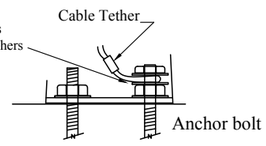


BASE SIDE VIEW



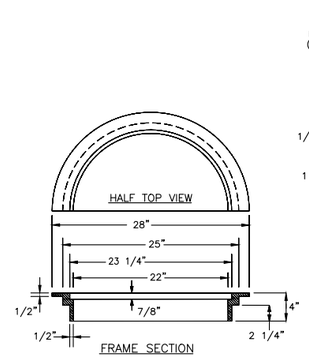
BASE BOTTOM VIEW

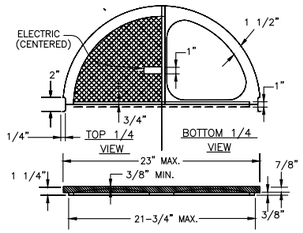


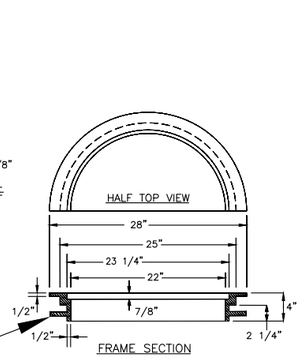


NOTE:
The pedestrian push button post shall be manufactured by Frey Manufacturing and black in color (part number CP6ACT4840TCSS). Shall hammer drill ¾" hole, clean holes of all concrete dust, use approved 2 part epoxy, and install (4) galvanized ⅝"x 8" anchor bolts a minimum of 4.5" into concete.

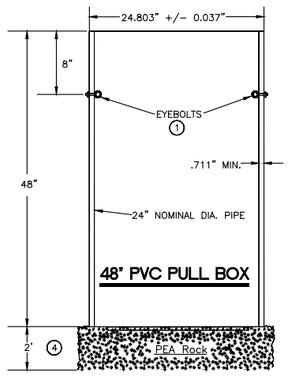
PULL BOX METAL FRAME AND COVER







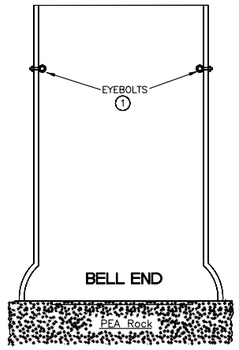
ALL COVERS INSTALLED IN CONCRETE SHALL HAVE LIP ON BOTTOM TO PREVENT HEAVING.



NON-CONCRETE INSTALL

FRAME AND COVER CASTING

NOTE:
ALL CASTINGS ARE GRAY IRON AS PER SPEC. 3321 CLASS 35B



CONCRETE INSTALL

INSTALLLATION NOTES:

1. TWO STAINLESS/GALVINIZED TYPE 2 SHOULDER EYEBOLTS, 3/8" DIA. X 1 1/4 " SHANK LENGTH, WITH HEX. NUTS AT 180° APART (FOR LIFTING HANDHOLES AND SUPPORTING ELECTRICAL CABLES)

2. 4 PLACE COMPACTED 2'–0" AGGRETGATE DRAIN BED(PEA ROCK) BELOW BOTTOM OF HANDHOLE, TO THE SATISFACTION OF THE ENGINEER.

3. CONDUIT HOLES DIAMETER LOCATED IN THE BARREL SECTION ARE SIZED NO MORE THAN 1" LARGER THAN THE CONDUIT OUTSIDE DIAMETER USED.

4. AFTER HANDHOLE AND CONDUIT INSTALLATION, SEAL ALL INSIDE WALLS WATER TIGHT TO THE SATISFACTION OF THE ENGINEER.

5. THE P.V.C. PIPE COMPLIES WITH ASTM F679T–1.

6. ALL CONDUITS SHALL EXTEND A MAXIMUM OF 3" INTO PULL BOX.

SECTION NO. 4200	DRAWING NO. 5.6
REV,D. 2016	

PUSH BUTTON POST & PULLBOX DETAIL

CITY OF FARGO
ENGINEERING DEPARTMENT

APPROVED	DATE

THE CITY OF Fargo FAR MORE

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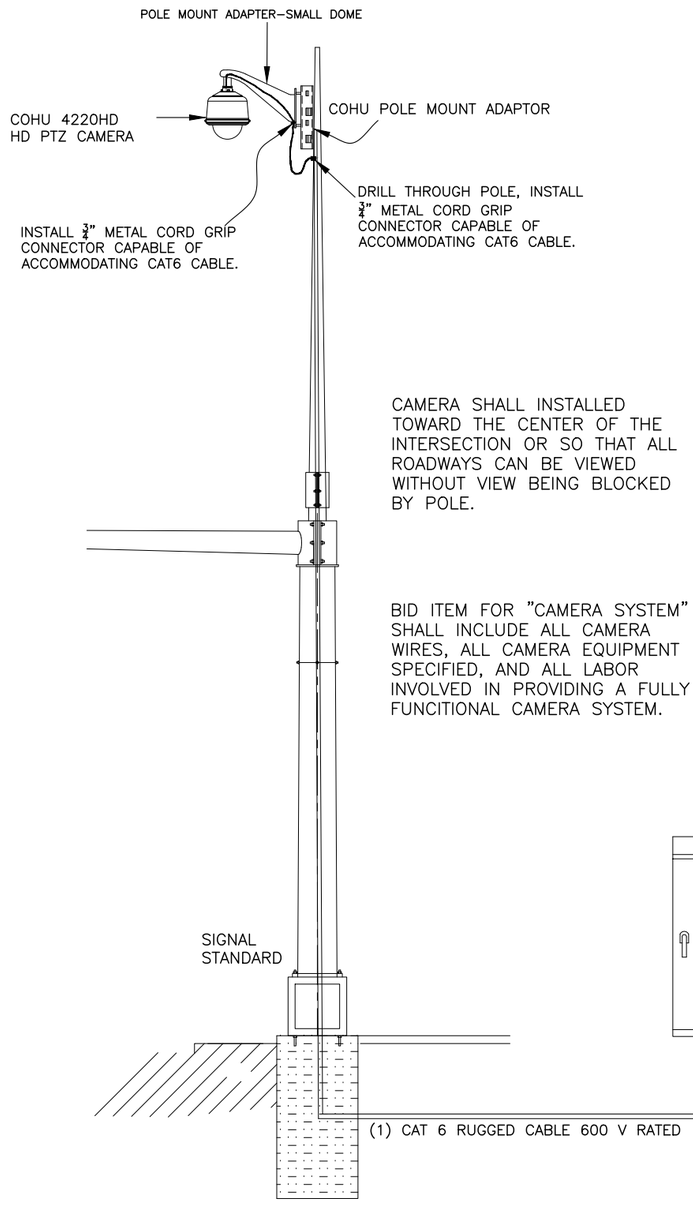
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	ND	SU-8-984(164)	150	23



CAMERA SHALL INSTALLED TOWARD THE CENTER OF THE INTERSECTION OR SO THAT ALL ROADWAYS CAN BE VIEWED WITHOUT VIEW BEING BLOCKED BY POLE.

BID ITEM FOR "CAMERA SYSTEM" SHALL INCLUDE ALL CAMERA WIRES, ALL CAMERA EQUIPMENT SPECIFIED, AND ALL LABOR INVOLVED IN PROVIDING A FULLY FUNCITIONAL CAMERA SYSTEM.

CONTRACTOR SUPPLIED EQUIPMENT:
–ETHERNET SWITCH AS SPECIFIED ON PLAN
–CAT 6 RUGGED CABLE 600 V RATED
–COHU POLE MOUNT PART# PMR09799–003
–POE INJECTOR, 70W PART# PPS08255–003
–COUPLER: RJ45 IP67 PART# PDC09714–004
–COHU CAMERA 4220HD H.264 60W PoE, IP67
PART# PAD09753–008

CAMERA SYSTEM

SECTION NO. 4200	DRAWING NO. 5.9
REV,D. 2016	
TRAFFIC CAMERA DETAIL	
CITY OF FARGO ENGINEERING DEPARTMENT	
APPROVED	DATE

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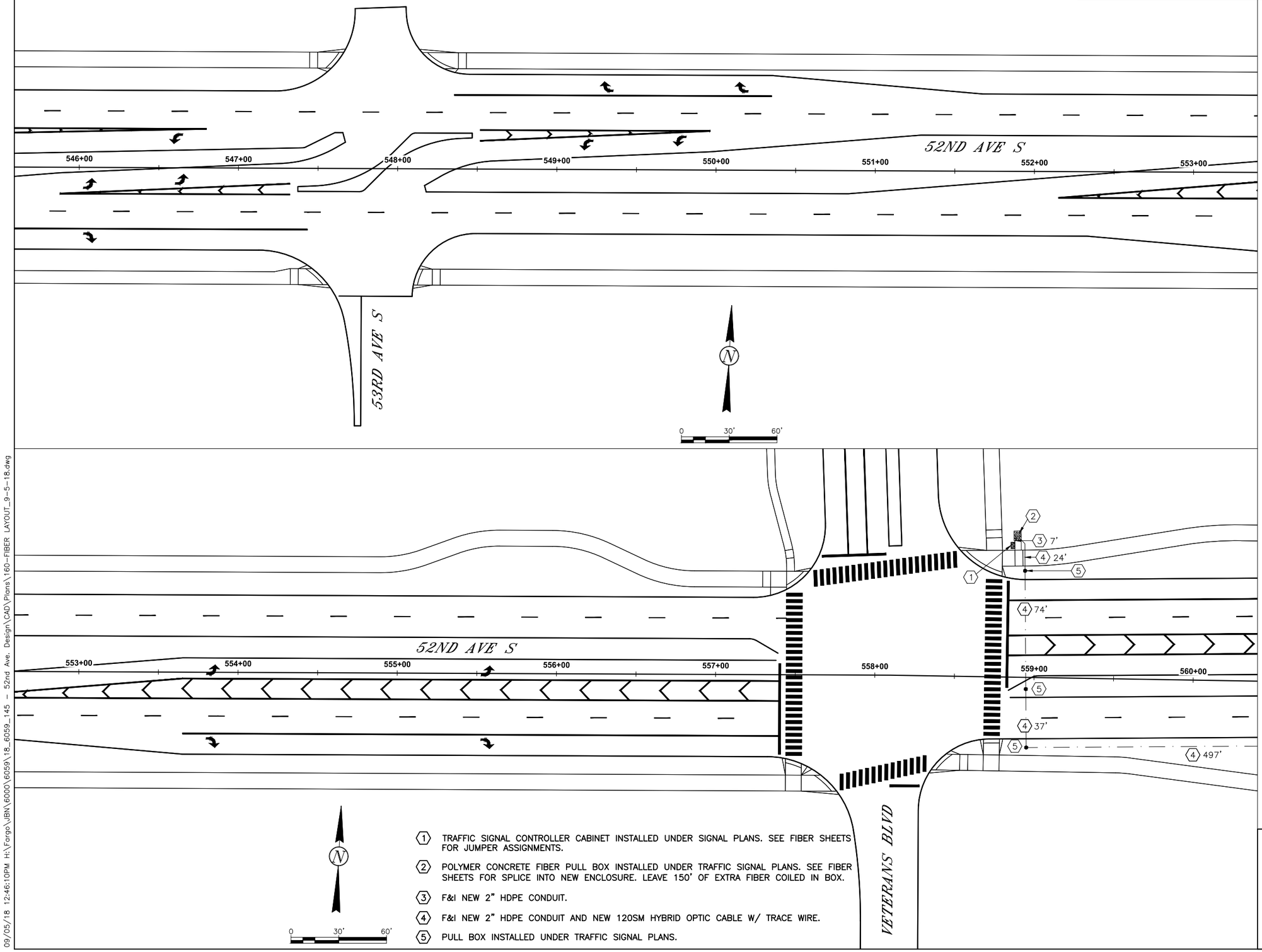
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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	160	1



1. TRAFFIC SIGNAL CONTROLLER CABINET INSTALLED UNDER SIGNAL PLANS. SEE FIBER SHEETS FOR JUMPER ASSIGNMENTS.
2. POLYMER CONCRETE FIBER PULL BOX INSTALLED UNDER TRAFFIC SIGNAL PLANS. SEE FIBER SHEETS FOR SPLICE INTO NEW ENCLOSURE. LEAVE 150' OF EXTRA FIBER COILED IN BOX.
3. F&I NEW 2" HDPE CONDUIT.
4. F&I NEW 2" HDPE CONDUIT AND NEW 120SM HYBRID OPTIC CABLE W/ TRACE WIRE.
5. PULL BOX INSTALLED UNDER TRAFFIC SIGNAL PLANS.

- Polymer Concrete Fiber Pull Box
- Controller Cabinet
- Existing Pull Box
- New Pull Box
- Signal Fiber Line

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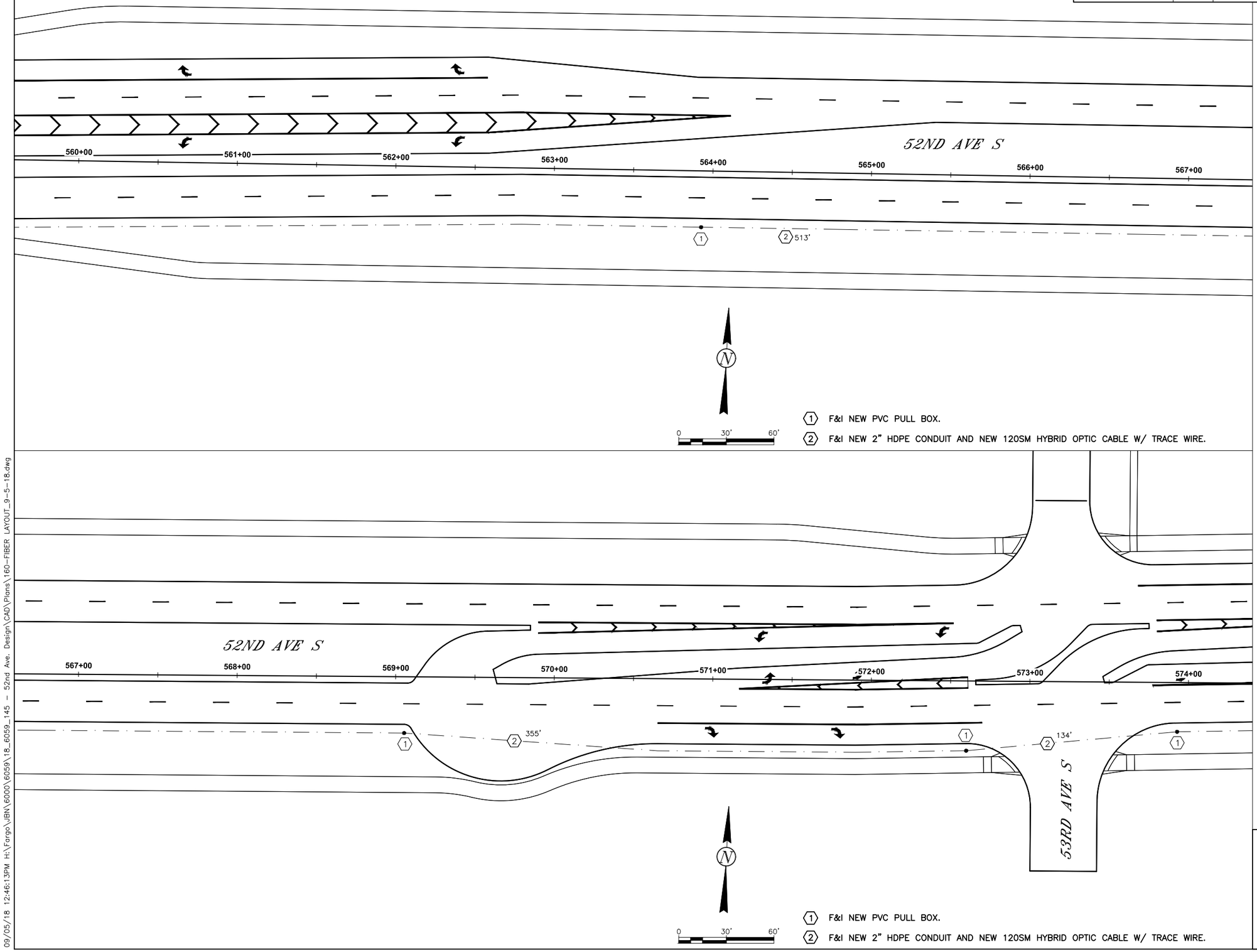
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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	160	2



Polymer Concrete Fiber Pull Box

Controller Cabinet

Existing Pull Box

New Pull Box

Signal Fiber Line

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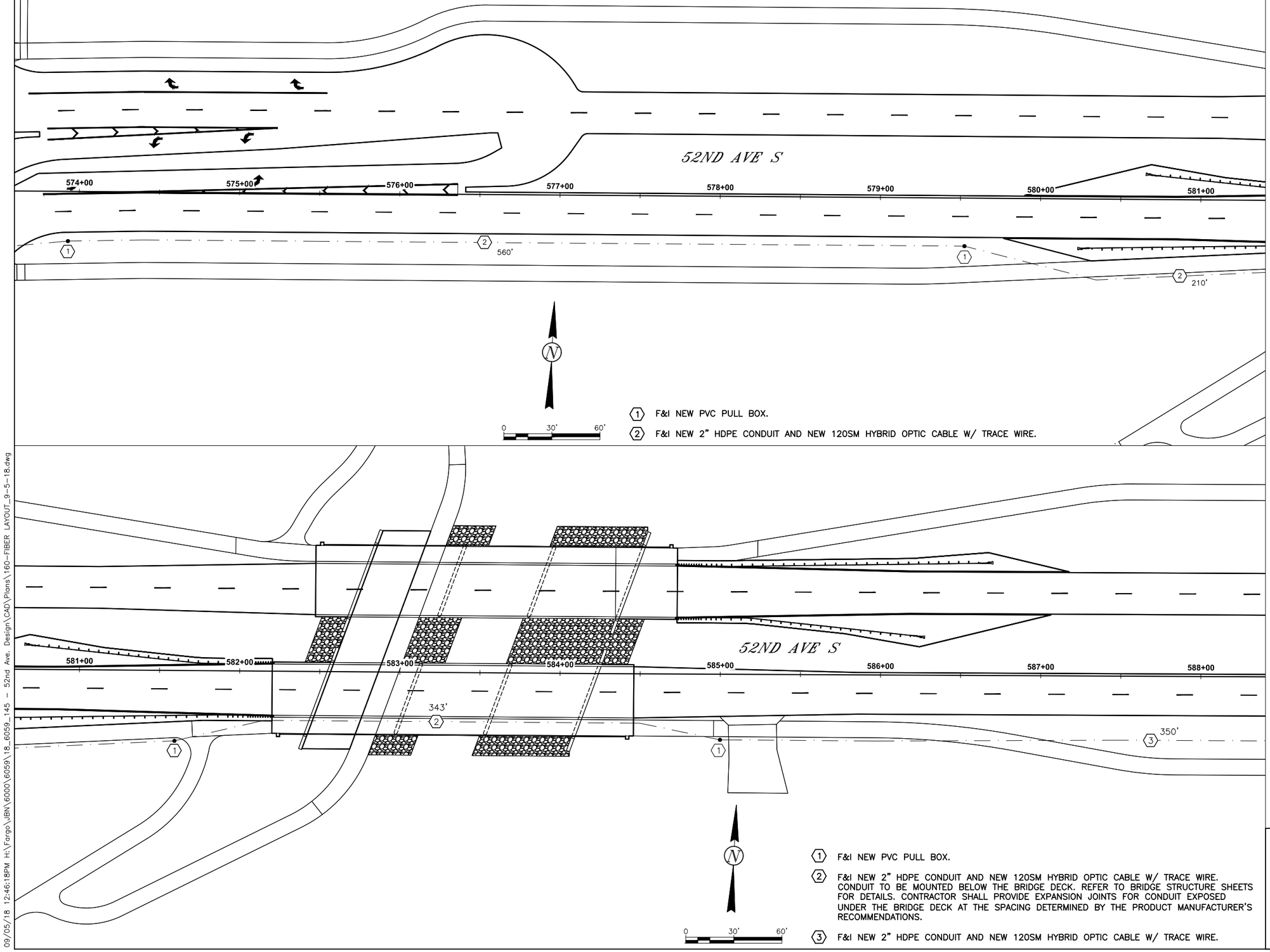
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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	160	3



1. F&I NEW PVC PULL BOX.
2. F&I NEW 2" HDPE CONDUIT AND NEW 120SM HYBRID OPTIC CABLE W/ TRACE WIRE.

1. F&I NEW PVC PULL BOX.
2. F&I NEW 2" HDPE CONDUIT AND NEW 120SM HYBRID OPTIC CABLE W/ TRACE WIRE. CONDUIT TO BE MOUNTED BELOW THE BRIDGE DECK. REFER TO BRIDGE STRUCTURE SHEETS FOR DETAILS. CONTRACTOR SHALL PROVIDE EXPANSION JOINTS FOR CONDUIT EXPOSED UNDER THE BRIDGE DECK AT THE SPACING DETERMINED BY THE PRODUCT MANUFACTURER'S RECOMMENDATIONS.
3. F&I NEW 2" HDPE CONDUIT AND NEW 120SM HYBRID OPTIC CABLE W/ TRACE WIRE.

- Polymer Concrete Fiber Pull Box
- Controller Cabinet
- Existing Pull Box
- New Pull Box
- Signal Fiber Line

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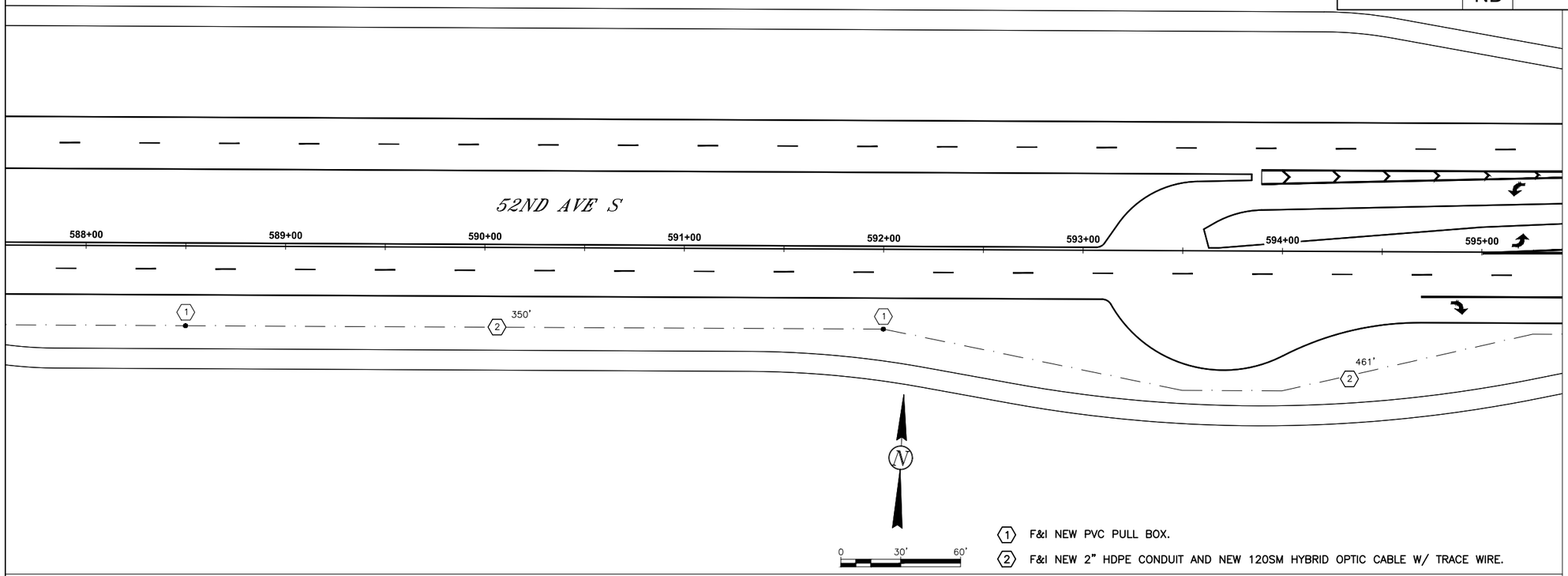
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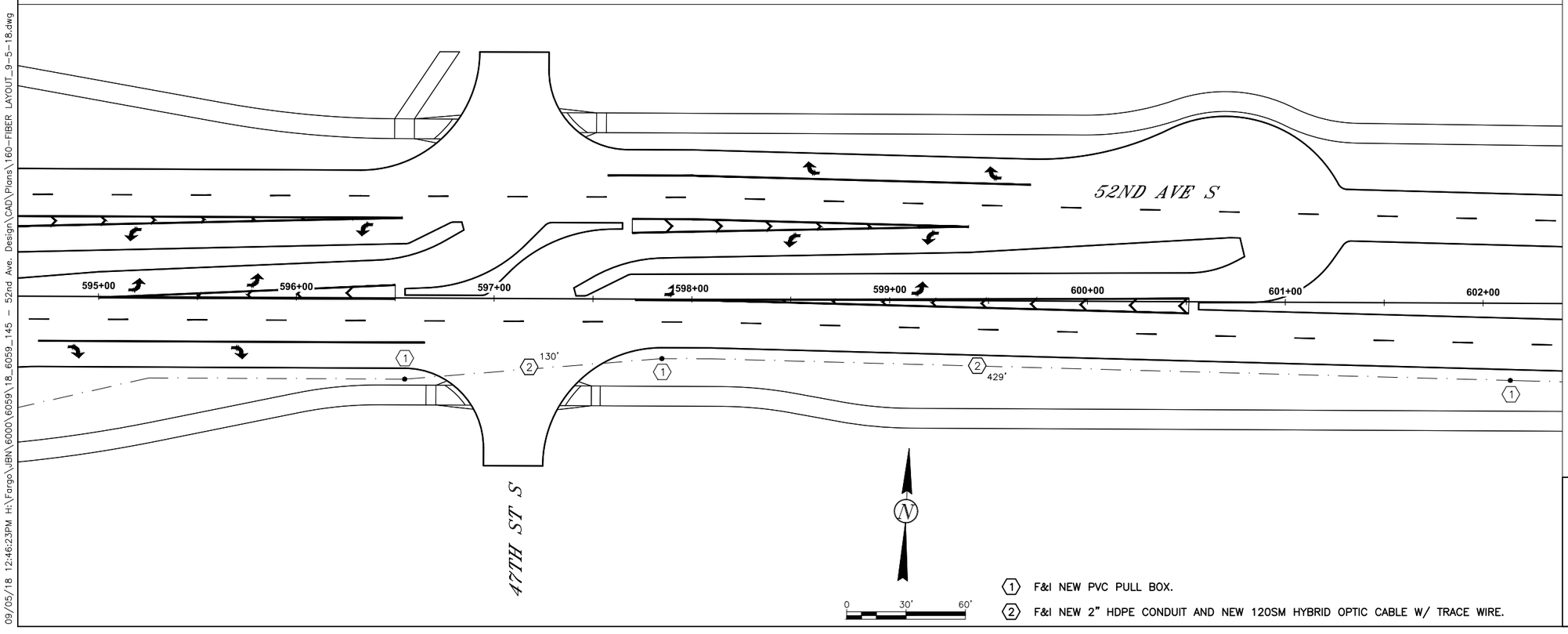
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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SU-8-984(164)	160	4





1. F&I NEW PVC PULL BOX.
2. F&I NEW 2" HDPE CONDUIT AND NEW 120SM HYBRID OPTIC CABLE W/ TRACE WIRE.

Polymer Concrete Fiber Pull Box

Controller Cabinet

Existing Pull Box

New Pull Box

Signal Fiber Line

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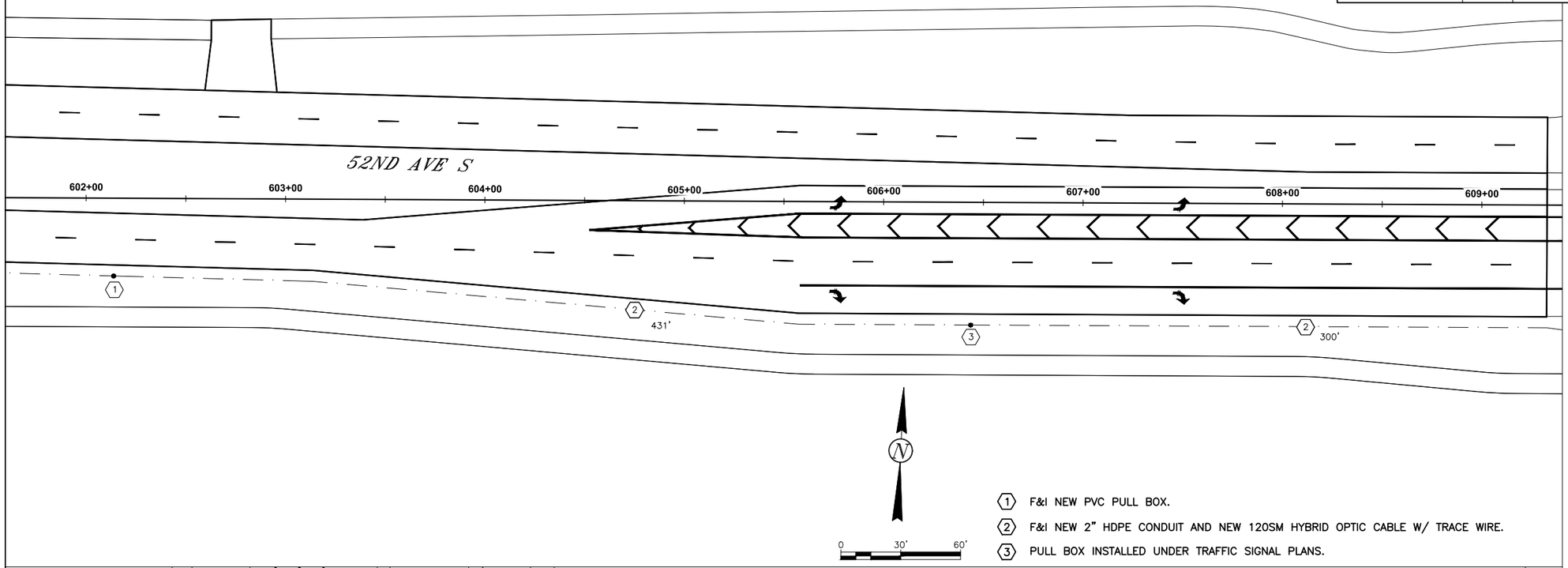
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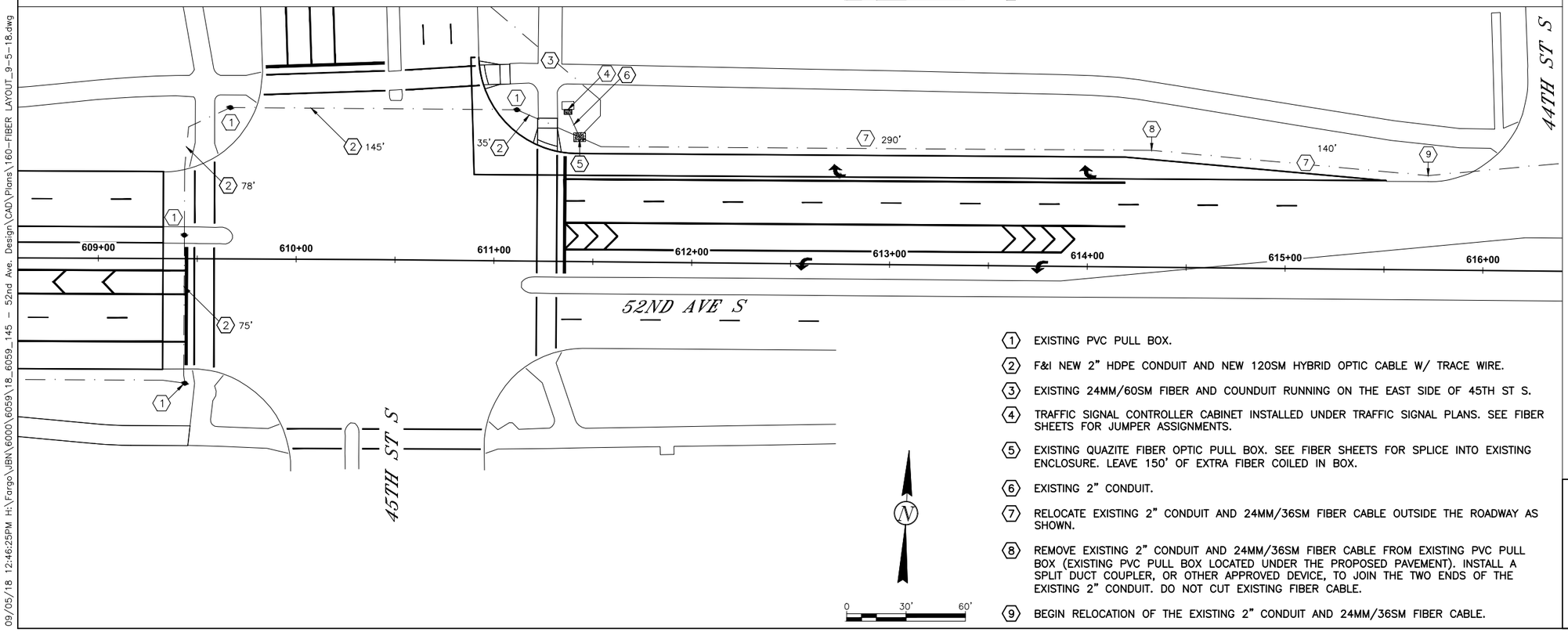
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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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1. F&I NEW PVC PULL BOX.
2. F&I NEW 2" HDPE CONDUIT AND NEW 120SM HYBRID OPTIC CABLE W/ TRACE WIRE.
3. PULL BOX INSTALLED UNDER TRAFFIC SIGNAL PLANS.



1. EXISTING PVC PULL BOX.
2. F&I NEW 2" HDPE CONDUIT AND NEW 120SM HYBRID OPTIC CABLE W/ TRACE WIRE.
3. EXISTING 24MM/60SM FIBER AND COUNDUIT RUNNING ON THE EAST SIDE OF 45TH ST S.
4. TRAFFIC SIGNAL CONTROLLER CABINET INSTALLED UNDER TRAFFIC SIGNAL PLANS. SEE FIBER SHEETS FOR JUMPER ASSIGNMENTS.
5. EXISTING QUAZITE FIBER OPTIC PULL BOX. SEE FIBER SHEETS FOR SPLICE INTO EXISTING ENCLOSURE. LEAVE 150' OF EXTRA FIBER COILED IN BOX.
6. EXISTING 2" CONDUIT.
7. RELOCATE EXISTING 2" CONDUIT AND 24MM/36SM FIBER CABLE OUTSIDE THE ROADWAY AS SHOWN.
8. REMOVE EXISTING 2" CONDUIT AND 24MM/36SM FIBER CABLE FROM EXISTING PVC PULL BOX (EXISTING PVC PULL BOX LOCATED UNDER THE PROPOSED PAVEMENT). INSTALL A SPLIT DUCT COUPLER, OR OTHER APPROVED DEVICE, TO JOIN THE TWO ENDS OF THE EXISTING 2" CONDUIT. DO NOT CUT EXISTING FIBER CABLE.
9. BEGIN RELOCATION OF THE EXISTING 2" CONDUIT AND 24MM/36SM FIBER CABLE.

QUANTITIES (A)						
FIBER OPTIC TERMINATIONS & EQUIPMENT	PULL BOX	2" HDPE CONDUIT	120SM HYBRID OPTIC CABLE W/LOCATE WIRE	RELOCATE EXISTING CONDUIT AND FIBER OPTIC CABLE		IT SYSTEM
LSUM	EA	LF	LF	LF		EA
1	12	5,538	6,431	430		1

(A) QUANTITIES SHOWN FOR INFORMATIONAL PURPOSES ONLY. ALL COSTS SHALL BE INCLUDED IN THE BID PRICE FOR "IT SYSTEM". QUANTITIES CALCULATED ACCORDING TO NDDOT SPECIFICATIONS.

- Quazite Fiber Pull Box
- Controller Cabinet
- Existing Pull Box
- New Pull Box
- Signal Fiber Line

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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TYCO ENCLOSURE FOSC 450 D6

NEW-12 CT SM FIBER DISTRIBUTION BOX-LC

PROVIDE 4-3' SM ST-LC JUMPER CORDS

FIBERS 25-26 = COF CABINET ETHERNET SWITCH
FIBERS 27-28 = SPARE

PG3 FIBERS 25-28
LC CONNECTORS

BLUE 25 SM
ORANGE 26 SM
GREEN 27 SM
BROWN 28 SM

GREEN TUBE PG3
52 Ave S & 45 St S

100' NEW SINGLEMODE Pigtail

BLUE 25 SM
ORANGE 26 SM
GREEN 27 SM
BROWN 28 SM

FIBERS 25-28

PG3
52 Ave S & 45 St S
120SM
NEW FIBER
OPTIC CABLE

12CT SM-BLUE TUBE FIBERS 1-12	FIBERS 1-12 TO REMAIN IN TUBE, LEAVE 3' OF SLACK IN CASE FOR FUTURE SPLICING
12CT SM-ORANGE TUBE FIBERS 13-24	FIBERS 13-24 TO REMAIN IN TUBE, LEAVE 3' OF SLACK IN CASE FOR FUTURE SPLICING
12CT SM-GREEN TUBE FIBERS 25-36	FUSION SPLICE FIBERS 25-28 TO PIGTAIL, FIBERS 29-36 LEAVE 3' OF SLACK IN CASE FOR FUTURE SPLICING
12CT SM-BROWN TUBE FIBERS 37-48	FIBERS 37-48 TO REMAIN IN TUBE, LEAVE 3' OF SLACK IN CASE FOR FUTURE SPLICING
12CT SM-SLATE TUBE FIBERS 49-60	FIBERS 49-60 TO REMAIN IN TUBE, LEAVE 3' OF SLACK IN CASE FOR FUTURE SPLICING
12CT SM-WHITE TUBE FIBERS 61-72	FIBERS 61-72 TO REMAIN IN TUBE, LEAVE 3' OF SLACK IN CASE FOR FUTURE SPLICING
12CT SM-RED TUBE FIBERS 73-84	FIBERS 73-84 TO REMAIN IN TUBE, LEAVE 3' OF SLACK IN CASE FOR FUTURE SPLICING
12CT SM-BLACK TUBE FIBERS 85-96	FIBERS 85-96 TO REMAIN IN TUBE, LEAVE 3' OF SLACK IN CASE FOR FUTURE SPLICING
12CT SM-YELLOW TUBE FIBERS 97-108	FIBERS 97-108 TO REMAIN IN TUBE, LEAVE 3' OF SLACK IN CASE FOR FUTURE SPLICING
12CT SM-VIOLET TUBE FIBERS 109-120	FIBERS 109-120 TO REMAIN IN TUBE, LEAVE 3' OF SLACK IN CASE FOR FUTURE SPLICING

52 Ave S & Veterans Blvd

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ITS - Fiber Diagram Veterans

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PROVIDE 4-3' MM ST-LC JUMPER CORDS
PROVIDE 4-3' SM ST-LC JUMPER CORDS

NEW-12 CT MM FIBER DISTRIBUTION BOX-ST

EXISTING FIBER DISTRIBUTION BOX-LC

EXISTING TYCO ENCLOSURE FOSC 450 B6

PG1 & PG2 FIBERS 25-26
PG3 FIBERS 25-28
LC CONNECTORS

EXISTING

PG1 FIBERS 1-4
EXISTING
ST CONNECTORS

PG2 FIBERS 1-4
EXISTING
ST CONNECTORS

BLUE TUBE PG1
42 St S & 52 Ave S

BLUE TUBE PG2
45 St S & 40 Ave S

EXISTING MULTI MODE PIGTAIL

BLUE 1 MM
ORANGE 2 MM
GREEN 3 MM
BROWN 4 MM
SLATE 1 MM
WHITE 2 MM
RED 3 MM
BLACK 4 MM

EXISTING, DO NOT DISTURB

EXISTING, DO NOT DISTURB

NEW 100' SINGLE MODE PIGTAIL

GREEN TUBE PG1
42 St S & 52 Ave S

GREEN TUBE PG2
45 St S & 40 Ave S

GREEN TUBE PG3
52 Ave S & Vets Blvd

BLUE 25 SM
ORANGE 26 SM
GREEN 27 SM
BROWN 28 SM
SLATE 25 SM
WHITE 26 SM
RED 27 SM
BLACK 28 SM
YELLOW 25 SM
VIOLET 26 SM
ROSE 27 SM
AQUA 28 SM

PG1
42 St S & 52 Ave S
24MM-36SM
EXISTING FIBER
OPTIC CABLE

TRAFFIC FIBERS 1-36
IT FIBERS 37-60

12CT MM-BLUE TUBE FIBERS 1-12	EXISTING FIBERS 1-4 ARE FUSED TO PIGTAIL, FIBERS 5-12 ARE FUSED TO PG2 BLUE TUBE FIBERS 5-12
12CT MM-ORANGE TUBE FIBERS 13-24	EXISTING FIBERS 13-24 ARE FUSED TO PG2 ORANGE TUBE FIBERS 13-24
12CT SM-GREEN TUBE FIBERS 25-36	EXISTING FIBERS 25-26 ARE FUSED TO PIGTAIL, FIBERS 27-36 ARE FUSED TO PG2 GREEN TUBE FIBERS 27-36
12CT SM-BROWN TUBE FIBERS 37-48	EXISTING FIBERS 37-48 ARE FUSED TO PG2 BROWN TUBE FIBERS 37-48
12CT SM-SLATE TUBE FIBERS 49-60	EXISTING FIBERS 49-60 ARE FUSED TO PG2 SLATE TUBE FIBERS 49-60

PG2
45 St S & 40 Ave S
24MM-60SM
EXISTING FIBER
OPTIC CABLE

TRAFFIC FIBERS 1-36
IT FIBERS 37-84

12CT MM-BLUE TUBE FIBERS 1-12	EXISTING FIBERS 1-4 ARE FUSED TO PIGTAIL, FIBERS 5-12 ARE FUSED TO PG1 BLUE TUBE FIBERS 5-12
12CT MM-ORANGE TUBE FIBERS 13-24	EXISTING FIBERS 13-24 ARE FUSED TO PG1 ORANGE TUBE FIBERS 13-24
12CT SM-GREEN TUBE FIBERS 25-36	EXISTING FIBERS 25-26 ARE FUSED TO PIGTAIL, FIBERS 27-36 ARE FUSED TO PG1 GREEN TUBE FIBERS 27-36
12CT SM-BROWN TUBE FIBERS 37-48	EXISTING FIBERS 37-48 ARE FUSED TO PG1 BROWN TUBE FIBERS 37-48
12CT SM-SLATE TUBE FIBERS 49-60	EXISTING FIBERS 49-60 ARE FUSED TO PG1 SLATE TUBE FIBERS 49-60
12CT SM-WHITE TUBE FIBERS 61-72	FIBERS 61-72 TO REMAIN IN TUBE, LEAVE 3' OF SLACK IN CASE FOR FUTURE FUSION SPLICING
12CT SM-RED TUBE FIBERS 73-84	FIBERS 73-84 TO REMIAN IN TUBE , LEAVE 3' OF SLACK IN CASE FOR FUTURE FUSION SPLICING

PG3
52 Ave S & Vets Blvd
120SM
NEW FIBER
OPTIC CABLE

TRAFFIC FIBERS 1-36
IT FIBERS 37-120

12CT SM-BLUE TUBE FIBERS 1-12	FIBERS 1-12 TO REMAIN INTACT, DO NOT CUT
12CT SM-ORANGE TUBE FIBERS 13-24	FIBERS 13-24 TO REMAIN IN TUBE, DO NOT CUT
12CT SM-GREEN TUBE FIBERS 25-36	FUSION SPLICE FIBERS 25-28 TO PIGTAIL, FIBERS 29-36 TO REMAIN INTACT, DO NOT CUT
12CT SM-BROWN TUBE FIBERS 37-48	FIBERS 37-48 TO REMAIN IN TUBE, LEAVE 3' OF SLACK FOR FUTURE SPLICING
12CT SM-SLATE TUBE FIBERS 49-60	FIBERS 49-60 TO REMAIN IN TUBE, LEAVE 3' OF SLACK FOR FUTURE SPLICING
12CT SM-WHITE TUBE FIBERS 61-72	FIBERS 61-72 TO REMAIN IN TUBE, LEAVE 3' OF SLACK FOR FUTURE SPLICING
12CT SM-RED TUBE FIBERS 73-84	FIBERS 73-84 TO REMAIN IN TUBE, LEAVE 3' OF SLACK FOR FUTURE SPLICING
12CT SM-BLACK TUBE FIBERS 85-96	FIBERS 85-96 TO REMAIN IN TUBE, LEAVE 3' OF SLACK FOR FUTURE SPLICING
12CT SM-YELLOW TUBE FIBERS 97-108	FIBERS 97-108 TO REMAIN IN TUBE, LEAVE 3' OF SLACK FOR FUTURE SPLICING
12CT SM-VIOLET TUBE FIBERS 109-120	FIBERS 109-120 TO REMAIN IN TUBE, LEAVE 3' OF SLACK FOR FUTURE SPLICING

45 St & 52 Ave S

THE CITY OF Fargo FAR MORE

Proj. No. 6059-0145
Houston Engineering Inc.
Ph: 701.237.5065

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ITS - Fiber Diagram 45th St S

52nd Ave S - West of 63rd St S to 45th St S

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	160	8

FIBER OPTIC BUFFER TUBE COLOR CODE
SINGLE MODE FIBERS 1–120
1. BLUE
2. ORANGE
3. GREEN
4. BROWN
5. SLATE
6. WHITE
7. RED
8. BLACK
9. YELLOW
10. VIOLET
11. ROSE
12. AQUA

INSTALL FAN OUT KIT ON ALL TERMINATED OR FIBER STRANDS WHEN TERMINATING THE FIBER OPTIC CABLE

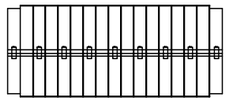
FIBER OPTIC CABLE:
TUBE 1 = BLUE TUBE 1–12 SM FIBERS
TUBE 2 = ORANGE TUBE 13–24 SM FIBERS
TUBE 3 = GREEN TUBE 25–36 SM FIBERS
TUBE 4 = BROWN TUBE 37–48 SM FIBERS
TUBE 5 = SLATE TUBE 49–60 SM FIBERS
TUBE 6 = WHITE TUBE 61–72 SM FIBERS
TUBE 7 = RED TUBE 73–84 SM FIBERS
TUBE 8 = BLACK TUBE 85–96 SM FIBERS
TUBE 9 = YELLOW TUBE 97–108 SM FIBERS
TUBE 10 = VIOLET TUBE 109–120 SM FIBERS

QUAZITE PULL BOX 30" x 48" x 48"



PLACE 2' ROCK DRAIN BED BELOW HANDHOLE.

TYCO ENCLOSURE



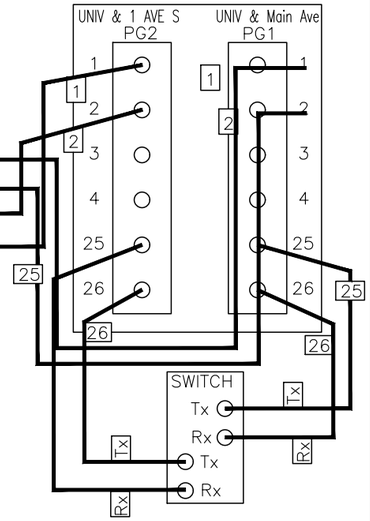
FIBER OPTIC ENCLOSURE SHALL BE A TYCO CLOSURE. FIBER OPTIC CABLES SHALL BE INSTALLED IN THE TYCO AS PER MANUFACTURE'S INSTRUCTIONS AND RECOMMENDATIONS. SEE COMMUNICATION CABLE SPECIFICATION NOTES FOR FURTHER INSTRUCTIONS.

EAGLE EPAC CONTROLLER

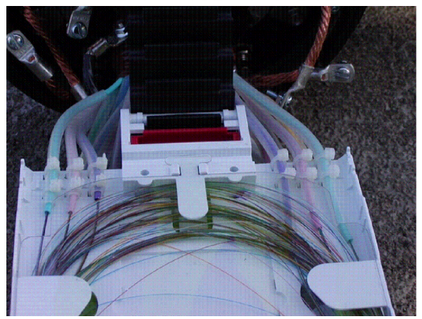


Rx
Tx
Rx
Tx

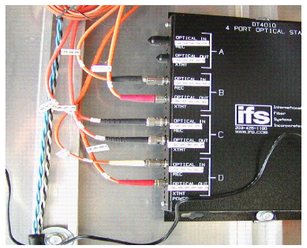
FIBER DISTRIBUTION PANEL



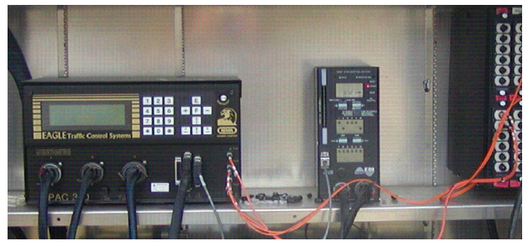
INSTALL PROTECTIVE TUBE SLEEVE AND TIE WRAP EACH TUBE TO SPLICE CASE.

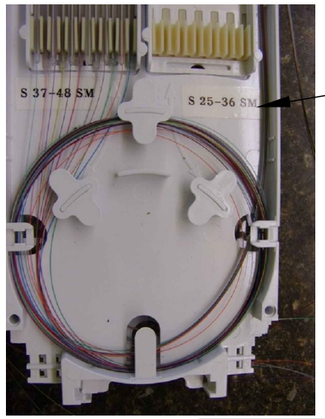


FIBER OPTIC STAR MODEM



LABEL STAR MODEM 1–8.



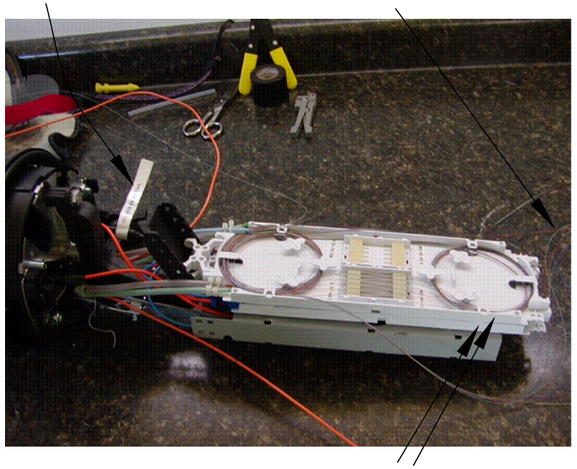


FIBER SHALL BE NEATLY INSTALLED IN SPLICE CASE AND LABELED.

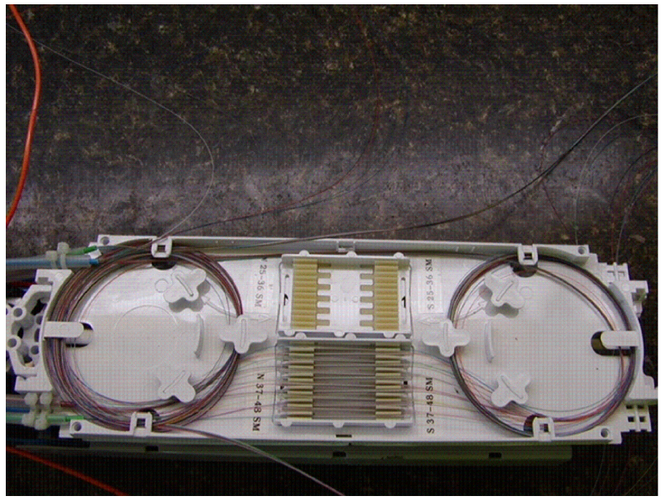
ALL FIBER CABLES SHALL BE LABELED INSIDE AND OUTSIDE THE TYCO CASE AND SHALL BE COLOR CODE AS FOLLOWS:
NORTH=ORANGE
EAST=GREEN
SOUTH=BROWN
WEST=SLATE

LABEL FIBER

3' OF FIBER SLACK



SEPARATE SPLICE TRAY FOR EVERY 2 TUBES OF FIBER INCLUDING NON–SPLICED FIBER TUBES



HEAT TUBE FUSION SPLICE HOLDERS SHALL BE MANUFACTURED BY TYCO ELECTRONICS PART # SMOUV–1120–01–US.

SECTION NO. 4200	DRAWING NO. 5.10
REV,D. 2016	
FIBER OPTIC DETAIL	
CITY OF FARGO ENGINEERING DEPARTMENT	
APPROVED	DATE

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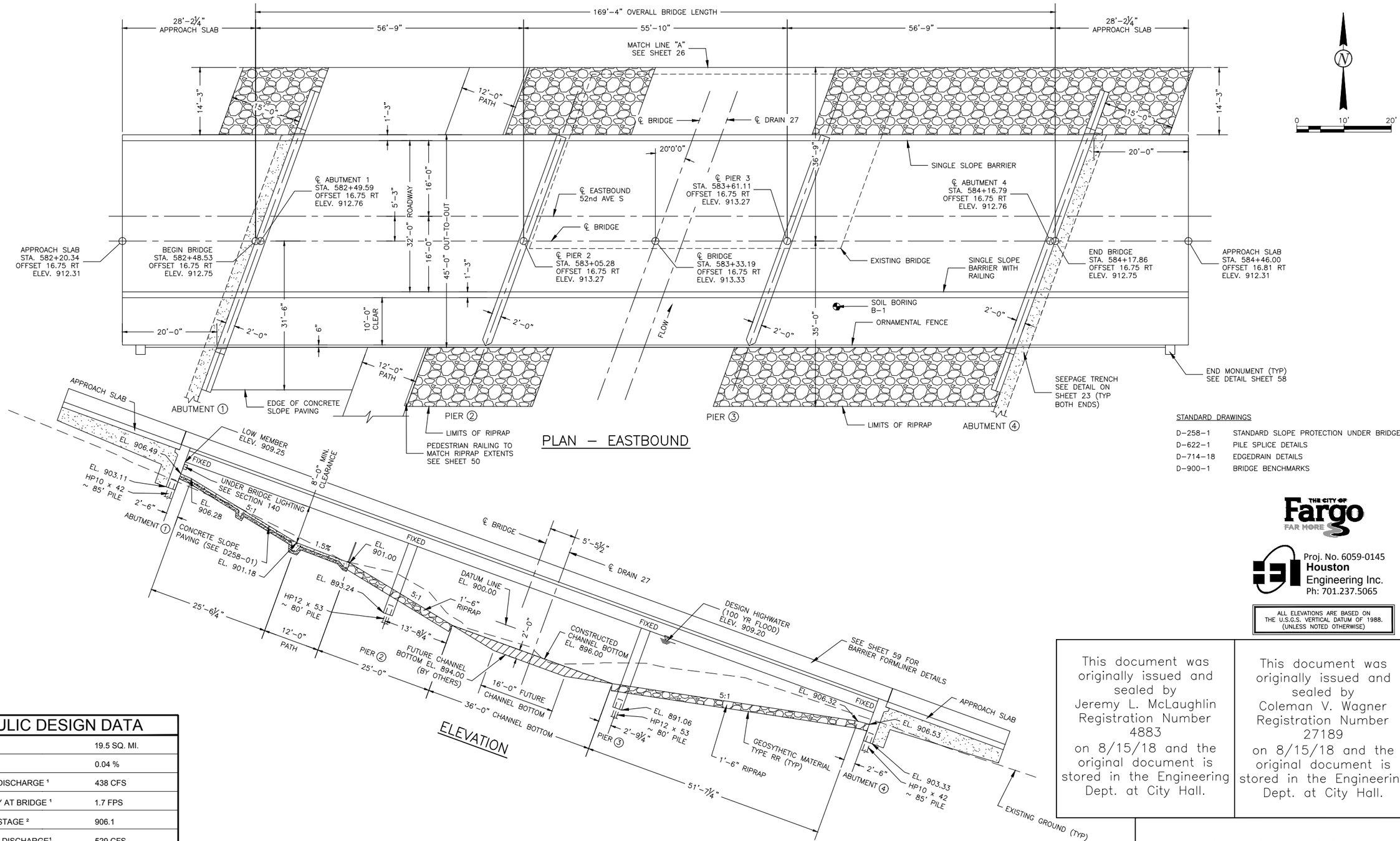
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ITS - Details

52nd Ave S - West of 63rd St S to 45th St S

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	170	1



STANDARD DRAWINGS

D-258-1	STANDARD SLOPE PROTECTION UNDER BRIDGE
D-622-1	PILE SPLICE DETAILS
D-714-18	EDGEDRAIN DETAILS
D-900-1	BRIDGE BENCHMARKS

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ALL ELEVATIONS ARE BASED ON THE U.S.G.S. VERTICAL DATUM OF 1988. (UNLESS NOTED OTHERWISE)

HYDRAULIC DESIGN DATA

DRAINAGE AREA	19.5 SQ. MI.
STREAM GRADIENT	0.04 %
50 YR DRAIN DESIGN DISCHARGE ¹	438 CFS
50 YR MEAN VELOCITY AT BRIDGE ¹	1.7 FPS
50 YR DRAIN DESIGN STAGE ²	906.1
100 YR DRAIN DESIGN DISCHARGE¹	529 CFS
100 YR MEAN VELOCITY AT BRIDGE ¹	1.5 FPS
100 YR DRAIN DESIGN STAGE ²	909.2

¹ LOCAL RUNOFF
² REGIONAL FLOOD
SEE HYDRAULIC REPORT FOR DESRCRIPTIONS OF LOCAL RUNOFF & REGIONAL FLOOD

GIRDER DATA

LENGTH "L"	GIRDER SPACING	THICKNESS OF SLAB BETW. BMS	THICKNESS OF SLAB ON TOP BMS	BOX BEAM DEPTH	LIVE LOAD	FINAL STRESSING FORCES AT MIDSPAN						
						A	KIPS	A	KIPS	A	KIPS	WEIGHT TONS
54'-10"	9'-6"	8"	9"	27"	HL-93	1.5	540.3	1.75	548.0	2.0	555.9	15.2
DETENSIONING STRENGTHS 4,800 PSI						ACCEPTANCE STRENGTH 5,500 PSI						

BENCH MARKS

NO.	DESCRIPTION	LOCATION	ELEV.
1	TOP NUT OF FIRE HYDRANT	STA. 582+06.61 O.S. 119.27' LT	910.48
2	CHISLED SQUARE SE CORNER OF LIFT STATION	STA. 585+29.80 O.S. 132.92' RT	909.37

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52nd Ave S over Drain 27

Eastbound

Bridge Layout

09-140-30.0R-1

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	170	2

100 DESIGN DATA:

Load and Resistance Factor Design

HL-93 Loading

Includes 15 psf for future wearing surface.

100 DESIGN STRENGTHS:

f'c = 3,000 psi ~ Class AE-3 Concrete

f'c = 4,000 psi ~ Class AAE-3 Concrete

f'ci = 4,800 psi ~ Prestressed Beam Concrete

f'c = 5,500 psi ~ Prestressed Beam Concrete

fy = 60,000 psi ~ Reinforcing Steel

100 SCOPE OF WORK: Work at this site consists of building two new 3-span prestressed concrete spread box beam bridges. Each bridge has an overall length of 169'-4" and a clear roadway width of 32'-0" and include a 10'-0" pedestrian path.

100 GENERAL: Include the cost of furnishing and placing preformed expansion joint filler, concrete inserts, rebar couplers, silicone sealant, waterproof membrane, conduit, electrical boxes, and other miscellaneous items in the price bid for Class AE-3 and AAE-3 concrete.

105 WORK DRAWINGS: Submit work drawings for the prestressed concrete box beams, pedestrian railing, railing, and ornamental fence to the Engineer for review.

202 REMOVAL OF STRUCTURE: The existing structure is a single span prestressed concrete spread box beam bridge that is 66' long with a clear roadway width of 36'-8". The substructures are made of concrete and supported on steel piling. There are concrete jersey barriers and safety shape transitions on the bridge. Include all work required to remove the bridge, in the contract unit price for "Removal of Structure."

210 CHANNEL EXCAVATION: Extend typical channel cross section 50 feet beyond centerlines of bridges. Transition to meet existing grade 100 feet south of centerline of the eastbound bridge and 150 feet north of centerline of the westbound bridge. Maintain existing elevations as needed to connect to grades at wingwalls.

210 EXCAVATION: Include the excavation costs at the abutments, as shown in the "Detail at Abutment" in the lump sum bid item, "Class 1 Excavation". Include the excavation costs at the piers in the lump sum bid item, "Class 2 Excavation."

602 DIAPHRAGMS AND ENDWALLS: Place the pier diaphragm and endwall concrete at the same time as the deck concrete.

602 DECK PLACEMENT: Place the deck concrete at a minimum rate of 50 cubic yards per hour.

602 BRIDGE DECK AND APPROACH SLAB CURING: Do not cover the wet cure burlap with a waterproof material such as polyethylene during the curing period.

602 LONGITUDINAL GROOVING: Do not run a metal tine transversely across the deck or approach slab surfaces immediately following the artificial grass drag as per 602.04 D. After the curing of the deck and approach slabs is complete and before the penetrating water repellant is applied, cut in longitudinal grooves into the deck and approach slabs using a mechanical cutting device. Perform any required surface correction grinding to the deck and approach slabs prior to grooving it. Cut grooves that are $\frac{1}{8}$ inch in width ($\pm \frac{1}{64}$ inch) and $\frac{3}{16}$ inch in depth ($\pm \frac{1}{16}$ inch). Space grooves at $\frac{3}{4}$ inch center to center. Stop the grooving 2 feet from the face of the barrier and 6 inches from the beginning and end of the deck and approach slabs. Include the price for grooving in the bid item "Class AAE-3 Concrete."

602 FORM LINERS: Include the cost to provide and install the form liners on the barriers and piers in the price bid for the appropriate concrete items.

Submit to the Engineer a 12" x 12" concrete sample of each type of specialty form liner finish.

602 ARCHITECTURAL CONCRETE: The thickness of the architectural concrete varies with the texture relief. The structural concrete quantities do not include the material required for architectural concrete reliefs. Dimensions shown on the plans are nominal and do not include formliner.

602 BARRIERS: Construct V-grooves that are $\frac{3}{4}$ inch deep in all faces, excluding the form liner areas, of the barriers at the piers and at equal spaces between the piers and abutments at approximately 10-foot spacing.

602 SURFACE FINISH "D": Apply Surface Finish "D" on all exposed substructure surfaces (except those areas with architectural reliefs and patterns as identified on the plans and details), the fascia and bottom surface of the exterior beams, the outside edges of the pier diaphragms, the outside edges of the deck, the underside of the deck overhang, the exposed endwall areas outside of the exterior beams, and on all bridge and approach slab barrier surfaces (except those areas with architectural relief patterns). Extend surface finish on abutment, wingwalls, and piers to 2' below final grade. Use grey surface finish, color number 36424 meeting Federal Standard 595C.

602 SIDEWALK BROOMING: The sidewalk on the bridge and approach slabs shall not be tined. The sidewalk shall be transversely broomed to slightly roughen the surface.

602 PENETRATING WATER REPELLANT TREATMENT: Apply penetrating water repellant solution to the driving surface of the bridge deck and approach slabs after barrier forms have been removed.

Apply penetrating water repellant solution to the front faces and tops of barriers a minimum of 14 days after placement of concrete and 48 hours after completion of final surface finish as required by Section 602.04 I, "Surface Finish." Include costs to treat approach slab, driving surface, and barriers on approach slabs in the price bid for "Concrete Bridge Approach Slab," and the costs to treat barriers on the bridge in the price bid for "Single Slope Barrier."

616 STRUCTURAL STEEL: Use ASTM A36 structural steel for ice noses on piers. Shop drawings for ice noses will not be required unless changes to plan details are proposed. The project requires an estimated total of 2,146 pounds of structural steel (for informational purposes only).

622 PILE DRIVING: Piling shall not be driven between the hours of 10 p.m. and 7 a.m.

622 PILING: Drive piling with a diesel hammer with a rated energy and ram weight (minimum of 3,000 pounds) of at least 43,724 forty-pound-tons computed by the formula:

W(E-14,014) + 0.624E

W = Weight of the ram (tons)
E = Rated hammer energy

Run the hammer at an energy that produces a penetration at bearing between ½" and 3 inches in the last 10 blows.

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52nd Ave S over Drain 27

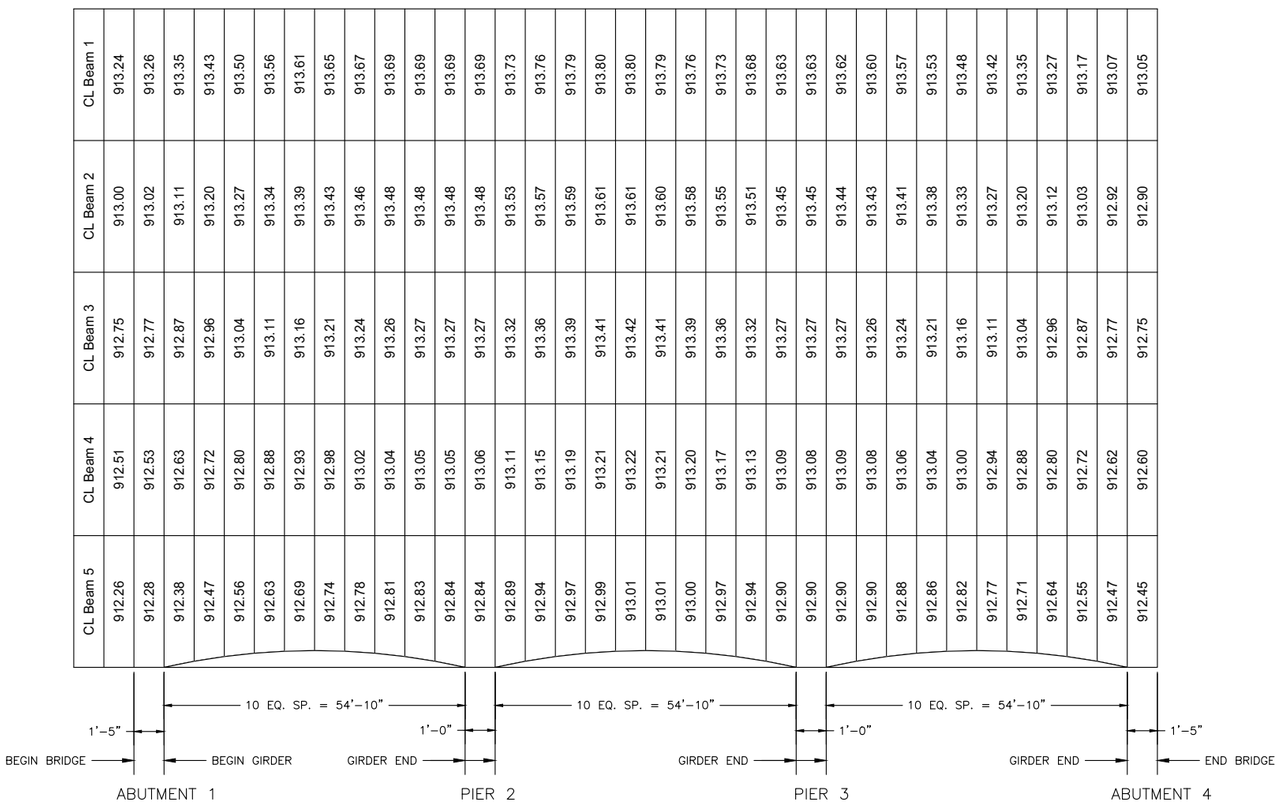
Eastbound

Bridge Notes

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	170	3

	CL Beam 1	CL Beam 2	CL Beam 3	CL Beam 4	CL Beam 5
	913.24	913.00	912.75	912.51	912.26
	913.26	913.02	912.77	912.53	912.28
	913.35	913.11	912.87	912.63	912.38
	913.43	913.20	912.96	912.72	912.47
	913.50	913.27	913.04	912.80	912.56
	913.56	913.34	913.11	912.88	912.63
	913.61	913.39	913.16	912.93	912.69
	913.65	913.43	913.21	912.98	912.74
	913.67	913.46	913.24	913.02	912.78
	913.69	913.48	913.26	913.04	912.81
	913.69	913.48	913.27	913.05	912.83
	913.69	913.48	913.27	913.05	912.84
	913.69	913.48	913.27	913.06	912.84
	913.73	913.53	913.32	913.11	912.89
	913.76	913.57	913.36	913.15	912.94
	913.79	913.59	913.39	913.19	912.97
	913.80	913.61	913.41	913.21	912.99
	913.80	913.61	913.42	913.22	913.01
	913.79	913.60	913.41	913.21	913.01
	913.76	913.58	913.39	913.20	913.00
	913.73	913.55	913.36	913.17	912.97
	913.68	913.51	913.32	913.13	912.94
	913.63	913.45	913.27	913.09	912.90
	913.63	913.45	913.27	913.08	912.90
	913.62	913.44	913.27	913.09	912.90
	913.60	913.43	913.26	913.08	912.90
	913.57	913.41	913.24	913.06	912.88
	913.53	913.38	913.21	913.04	912.86
	913.48	913.33	913.16	913.00	912.82
	913.42	913.27	913.11	912.94	912.77
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	913.17	913.03	912.87	912.72	912.55
	913.07	912.92	912.77	912.62	912.47
	913.05	912.90	912.75	912.60	912.45



SCREED ELEVATIONS – EASTBOUND

NOTES:

1. ELEVATIONS ARE TO TOP OF FINISHED ROADWAY.
2. WEIGHT OF SCREED NOT INCLUDED IN CALCULATION OF DEFLECTIONS.
3. BEAM 1 IS NORTH EXTERIOR BEAM.

BRIDGE BID ITEMS

SPEC	CODE	ITEM DESCRIPTION	UNIT	QUANTITY
202	0105	REMOVAL OF STRUCTURE	L SUM	0.5
210	0099	CLASS 1 EXCAVATION	L SUM	0.5
210	0111	CLASS 2 EXCAVATION	L SUM	0.5
210	0127	CHANNEL EXCAVATION	L SUM	0.5
210	0411	FOUNDATION PREPARATION	L SUM	0.5
256	0200	RIPRAP GRADE II	CY	361
258	0100	CONCRETE SLOPE PROTECTION	SY	226
602	0130	CLASS AAE-3 CONCRETE	CY	224.8
602	1130	CLASS AE-3 CONCRETE	CY	194.8
602	1133	CONCRETE BRIDGE APPROACH SLAB	SY	282.2
602	1220	SINGLE SLOPE BARRIER	LF	337.8
602	1250	PENETRATING WATER REPELLENT TREATMENT	SY	602
604	9610	PRESTRESSED BOX BEAM-27IN	LF	822.5
612	0115	REINFORCING STEEL-GRADE 60	LBS	18,184
612	0116	REINFORCING STEEL-GRADE 60-EPOXY COATED	LBS	46,583
616	5890	STRUCTURAL STEEL	LSUM	0.5
622	0012	STEEL H-PILE TIPS 10 X 42	EA	12
622	0014	STEEL H-PILING POINTS 12 X 53	EA	16
622	0020	STEEL PILING HP 10 X 42	LF	1,020
622	0040	STEEL PILING HP 12 X 53	LF	1,280
624	0123	PEDESTRIAN RAILING	LF	80
624	0151	RAILING	LF	216
709	0155	GEOSYNTHETIC MATERIAL TYPE RR	SY	722
752	0850	ORNAMENTAL FENCE	LF	216
930	3000	BRIDGE BENCH MARKS	SET	0.5
930	9537	ABUTMENT UNDERDRAIN SYSTEM	EA	2

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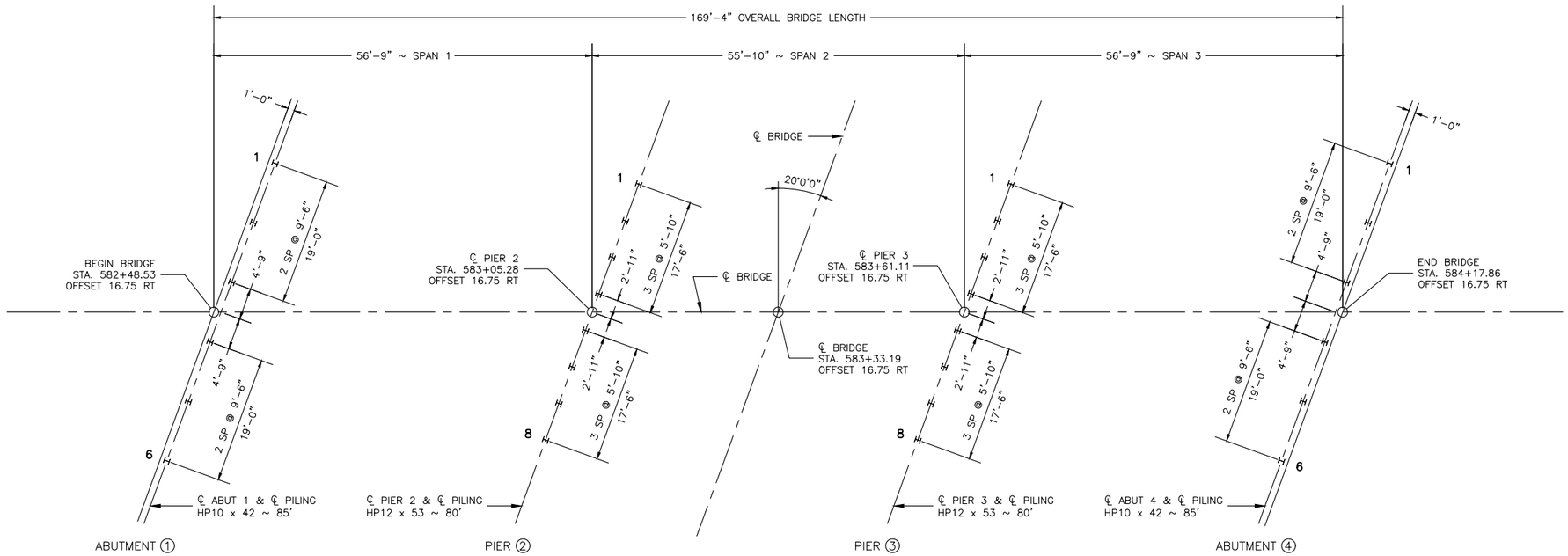
Eastbound

Screed Elevations & Quantities

09-140-30.0R-3

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	170	4



PILING LAYOUT – EASTBOUND

		PILE COORDINATES		
	PILE	NORTHING	EASTING
ABUT 1	1	435,708.13	2,876,716.62
	6	435,662.93	2,876,701.99
PIER 2	1	435,706.97	2,876,771.24
	8	435,668.12	2,876,758.67
PIER 3	1	435,708.98	2,876,827.04
	8	435,670.13	2,876,814.46
ABUT 4	1	435,714.16	2,876,883.71
	6	435,668.97	2,876,869.09

NOTES:

1. FOR DOUBLE OR SINGLE ACTING DIESEL HAMMERS, CALCULATE THE SAFE BEARING VALUE OF THE PILES BY THE FOLLOWING FORMULA:

$$P = \frac{4.5E}{S + 0.2} \times \frac{W + 0.2M}{W + M}$$

WHERE:

P = SAFE BEARING VALUE, IN POUNDS.
W = WEIGHT OF STRIKING PARTS (RAM), IN POUNDS.
M = WEIGHT OF PARTS BEING DRIVEN, IN POUNDS.
INCLUDES PILE WEIGHT, ANVIL (IF ANY), DRIVING CAP, ETC.
E = ENERGY PER BLOW, IN FOOT–POUNDS.
S = AVERAGE PENETRATION OF PILE IN INCHES PER BLOW FOR LAST TEN BLOWS.

FOR SINGLE ACTING HAMMERS, CALCULATE E BY MULTIPLYING OBSERVED STROKE (ft) AND W (lbs).

2. SEE STANDARD DRAWING D–622–1 FOR PILE SPLICE DETAILS.

3. DRIVE PILES TO THE FOLLOWING LOADING:

HP10x42 ~ 105 TONS
HP12X53 ~ 130 TONS

PILE LOADING (TONS)

LOCATION	DEAD LOAD	LIVE LOAD	DESIGN LOAD
ABUTMENT 1	57.6	30.5	88.1
PIER 2	63.0	31.2	94.2
PIER 3	63.0	31.2	94.2
ABUTMENT 4	57.6	30.5	88.1

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52nd Ave S over Drain 27

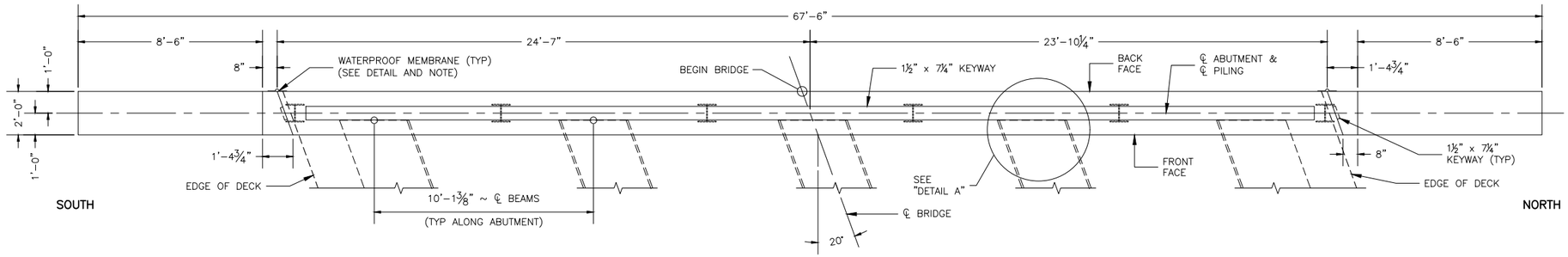
Eastbound

Piling Layout

09-140-30.0R-4

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	170	5



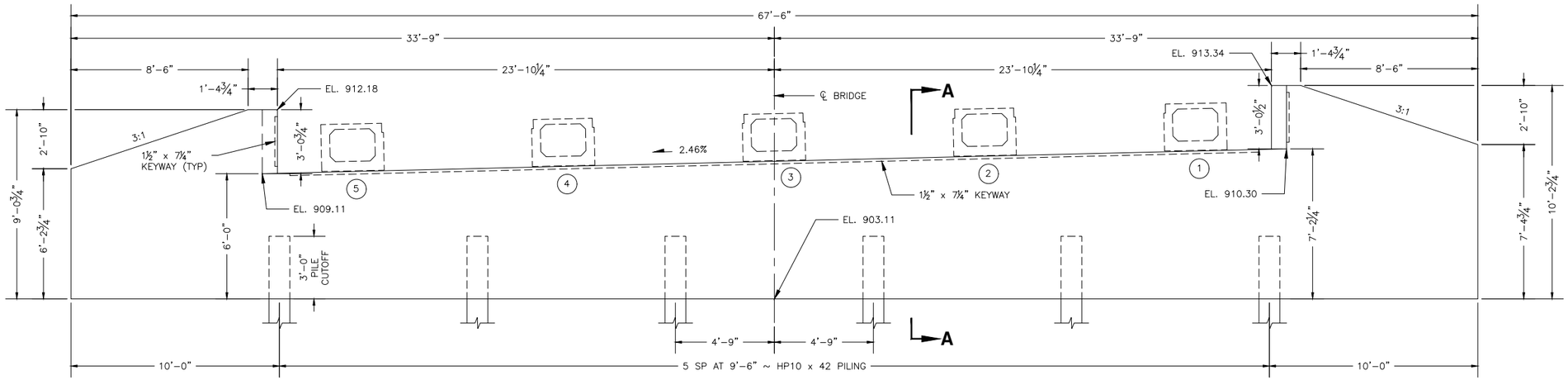
ABUTMENT 1 PLAN – EASTBOUND

SHOWING DIMENSIONS

0 3' 6'

NOTE:

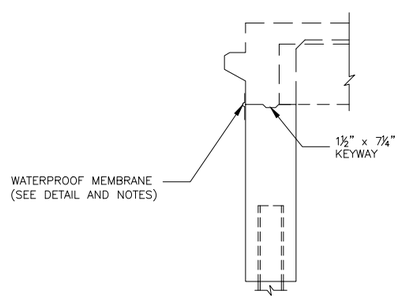
EXTEND SURFACE FINISH ON ABUTMENT AND WINGWALLS TO 2' BELOW FINAL GRADE.



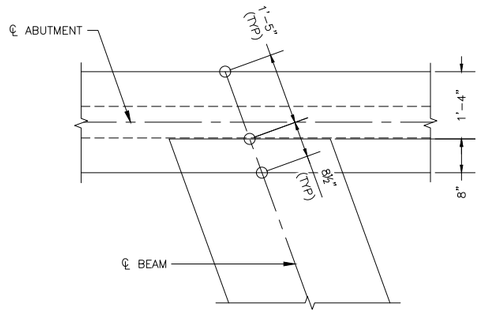
ABUTMENT 1 ELEVATION – EASTBOUND

LOOKING WEST – SHOWING DIMENSIONS

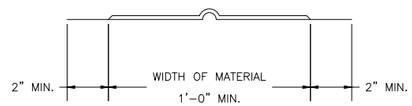
0 3' 6'



SECTION A–A



DETAIL A



NOTE: USE WATERPROOF MEMBRANE THAT MEETS THE REQUIREMENTS OF SECTION 602.03 B. INCLUDE THE COST OF WATERPROOF MEMBRANE IN THE CONTRACT UNIT PRICE FOR "CLASS AE–3 CONCRETE."

WATERPROOF MEMBRANE DETAIL

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52nd Ave S over Drain 27

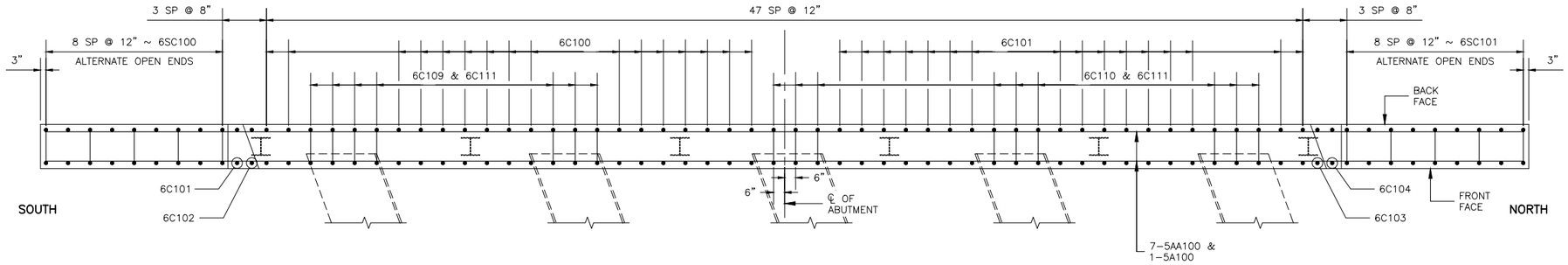
Eastbound

Abutment 1 Geometrics

09-140-30.0R-5

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	170	6



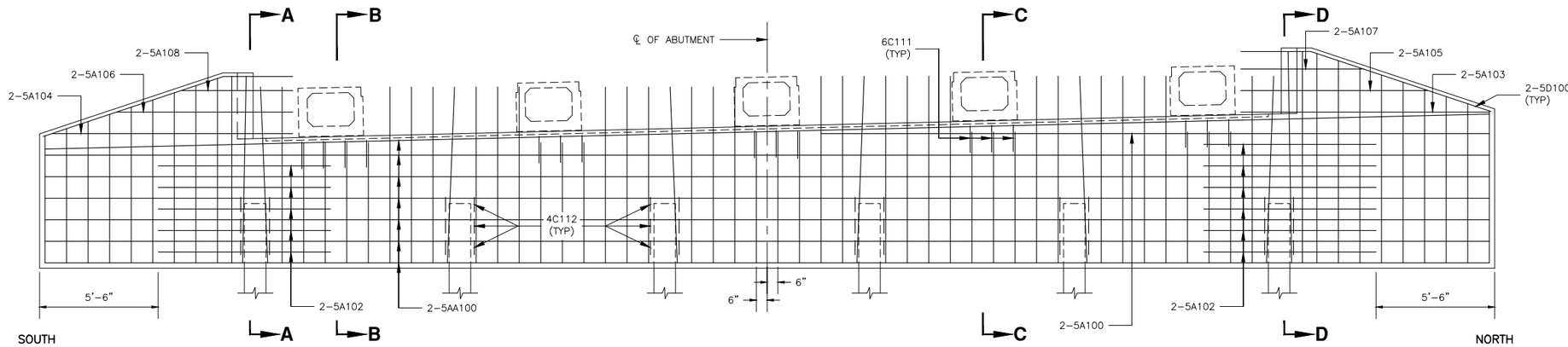
ABUTMENT 1 PLAN – EASTBOUND

SHOWING REINFORCEMENT

0 3' 6'

NOTE:

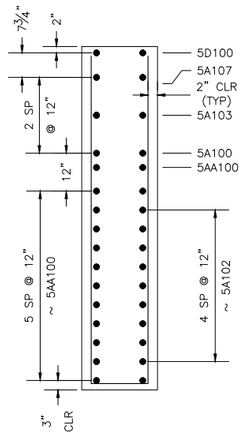
SEE SHEETS 21 & 22 FOR REINFORCING LIST AND BENT BAR DETAILS.



ABUTMENT 1 ELEVATION – EASTBOUND

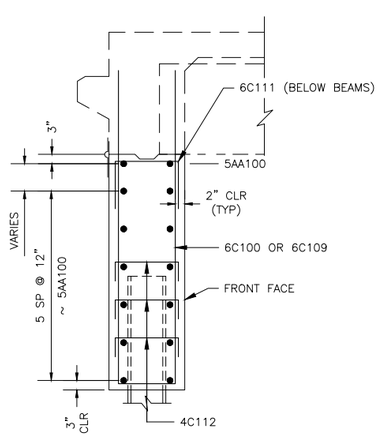
LOOKING WEST – SHOWING REINFORCEMENT

0 3' 6'



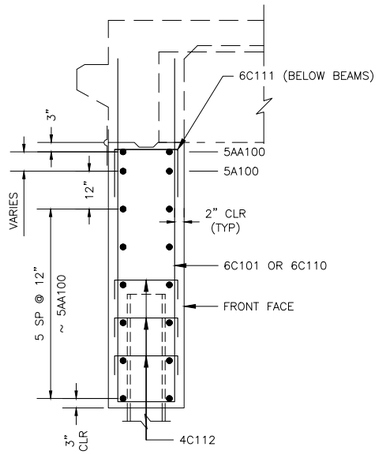
SECTION A–A

NOT TO SCALE



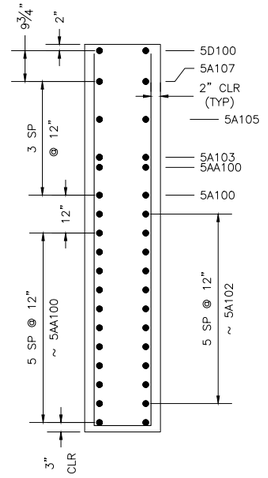
SECTION B–B

NOT TO SCALE



SECTION C–C

NOT TO SCALE



SECTION D–D

NOT TO SCALE

QUANTITIES & PROPERTIES ABUTMENT 1	
CLASS AE-3 CONCRETE	35.2 C.Y.
CONCRETE STRENGTH	3,000 PSI
REINFORCING STEEL	3,433 LBS
REINFORCEMENT STRENGTH	60,000 PSI
PILING (SEE LAYOUT – SHEET 4)	

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52nd Ave S over Drain 27

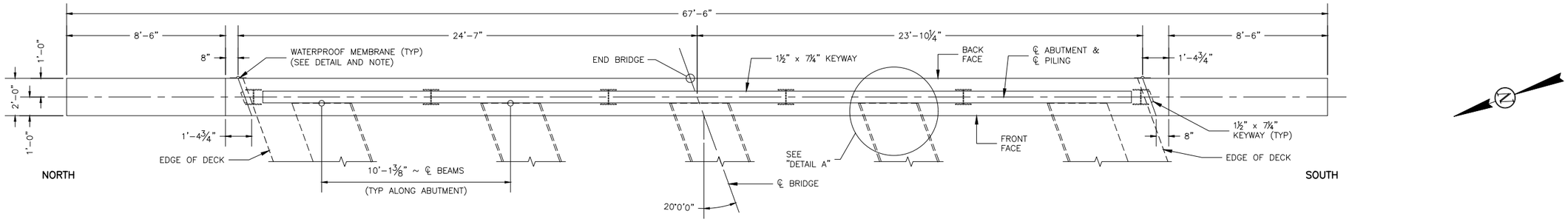
Eastbound

Abutment 1 Reinforcing

09-140-30.0R-6

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	170	7



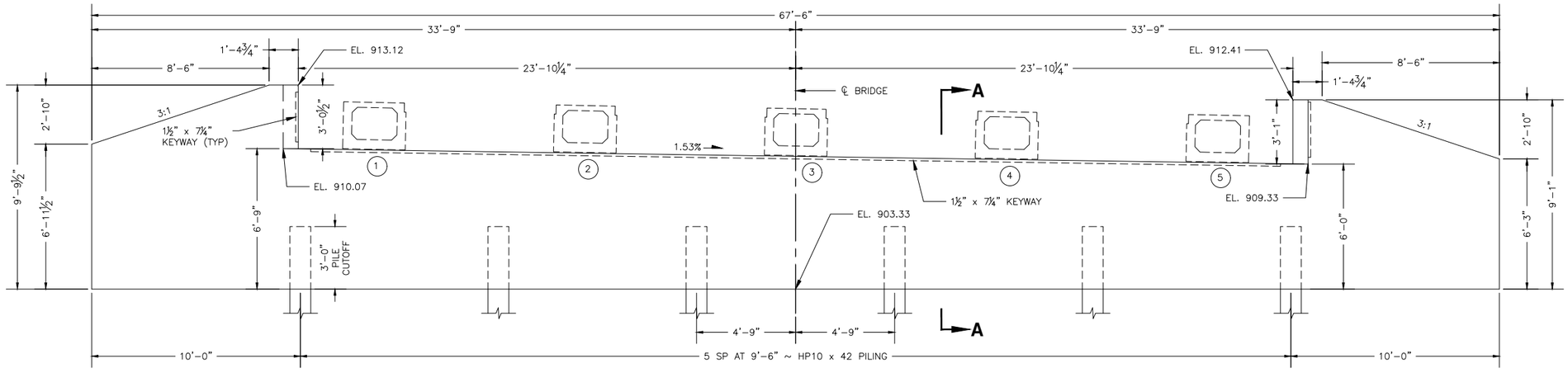
ABUTMENT 4 PLAN – EASTBOUND

SHOWING DIMENSIONS

0 3' 6'

NOTE:

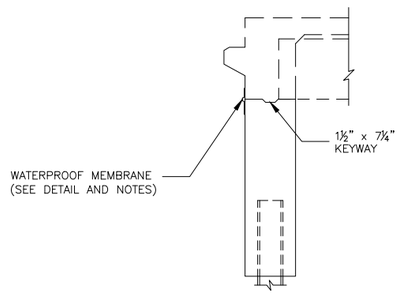
EXTEND SURFACE FINISH ON ABUTMENT AND WINGWALLS TO 2' BELOW FINAL GRADE.



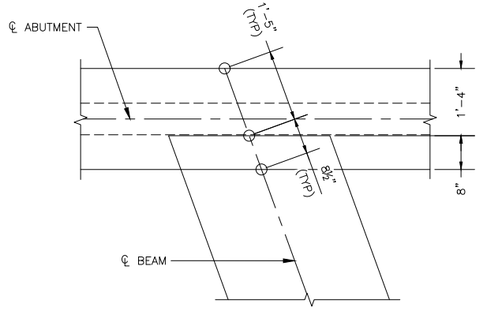
ABUTMENT 4 ELEVATION – EASTBOUND

LOOKING EAST – SHOWING DIMENSIONS

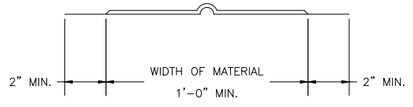
0 3' 6'



SECTION A–A



DETAIL A



NOTE: USE WATERPROOF MEMBRANE THAT MEETS THE REQUIREMENTS OF SECTION 602.03 B. INCLUDE THE COST OF WATERPROOF MEMBRANE IN THE CONTRACT UNIT PRICE FOR "CLASS AE–3 CONCRETE."

WATERPROOF MEMBRANE DETAIL

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52nd Ave S over Drain 27

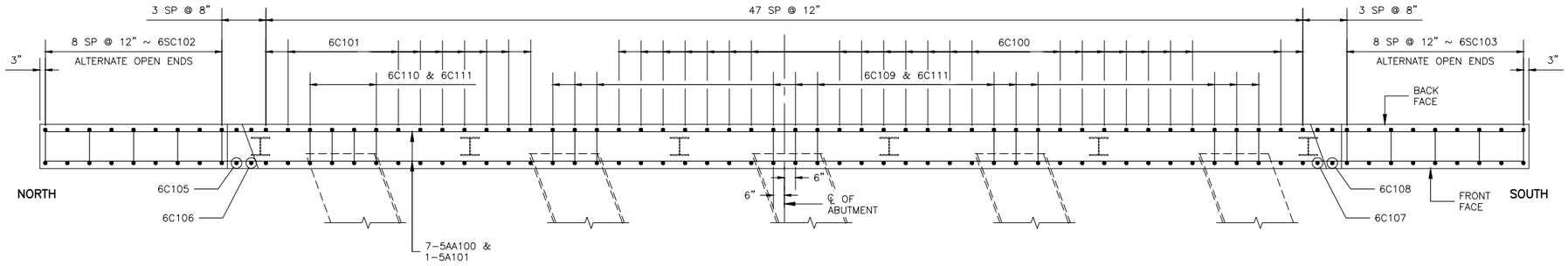
Eastbound

Abutment 4 Geometrics

09-140-30.0R-7

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	170	8



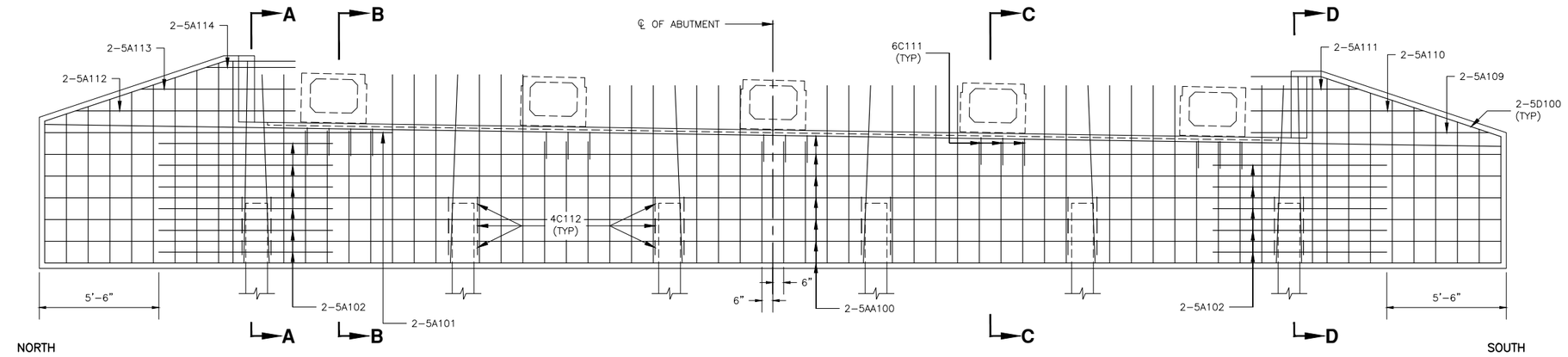
ABUTMENT 4 PLAN – EASTBOUND

SHOWING REINFORCEMENT

0 3' 6'

NOTE:

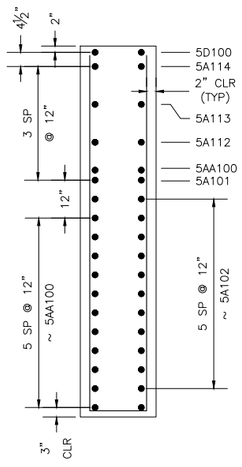
SEE SHEETS 21 & 22 FOR REINFORCING LIST AND BENT BAR DETAILS.



ABUTMENT 4 ELEVATION – EASTBOUND

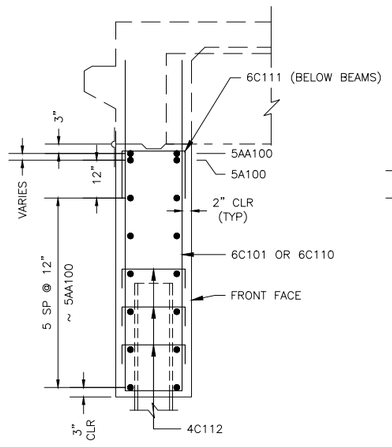
LOOKING EAST – SHOWING REINFORCEMENT

0 3' 6'



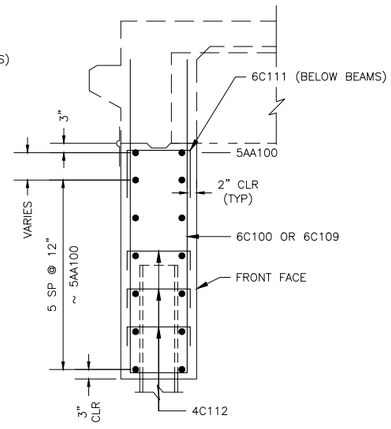
SECTION A–A

NOT TO SCALE



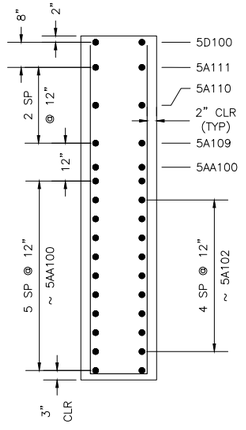
SECTION B–B

NOT TO SCALE



SECTION C–C

NOT TO SCALE



SECTION D–D

NOT TO SCALE

QUANTITIES & PROPERTIES ABUTMENT 4	
CLASS AE-3 CONCRETE	33.9 C.Y.
CONCRETE STRENGTH	3,000 PSI
REINFORCING STEEL	3,352 LBS
REINFORCEMENT STRENGTH	60,000 PSI
PILING (SEE LAYOUT – SHEET 4)	

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52nd Ave S over Drain 27

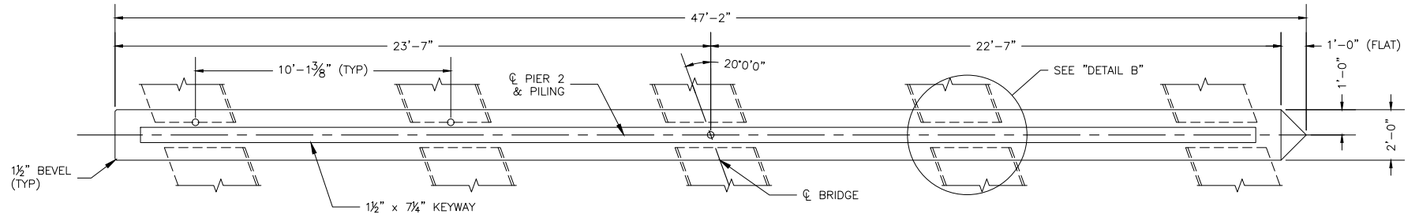
Eastbound

Abutment 4 Reinforcing

09-140-30.0R-8

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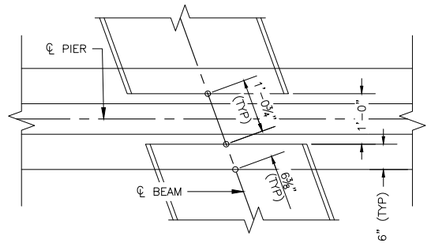
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	170	9



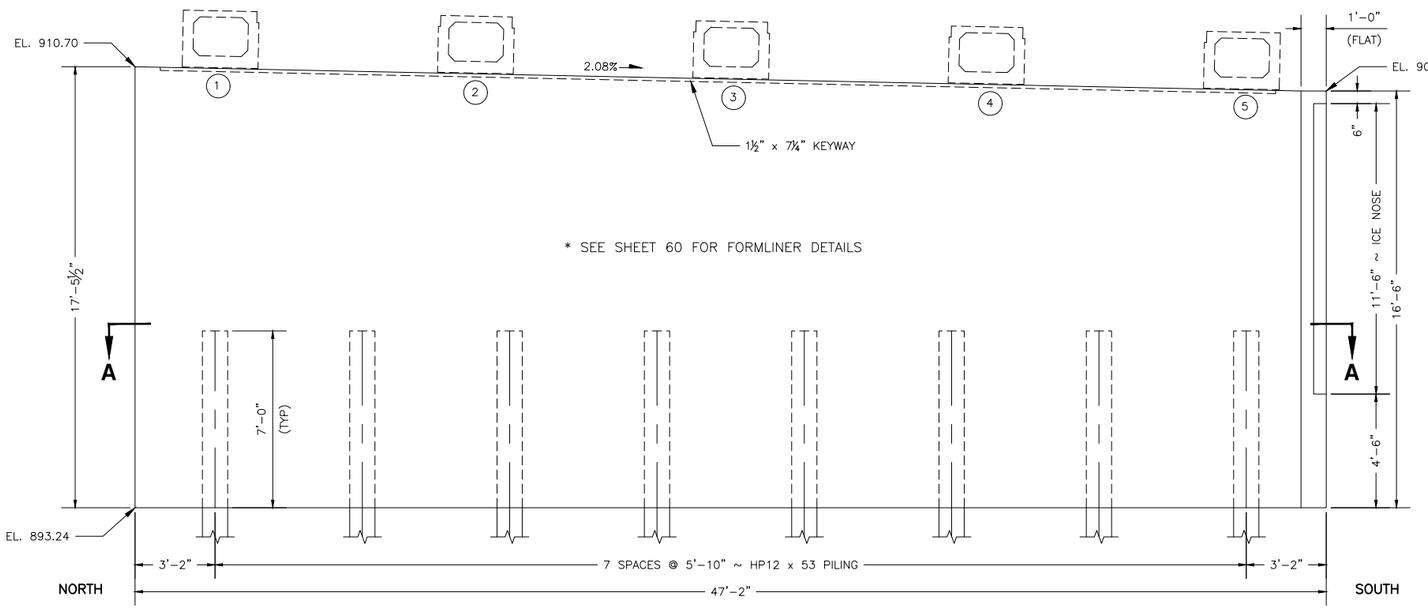
PIER 2 PLAN – EASTBOUND

SHOWING GEOMETRICS

0 3' 6'



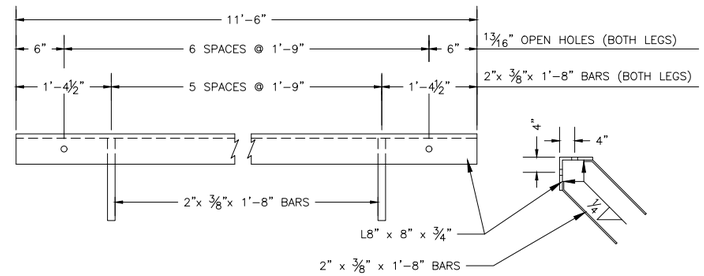
DETAIL B



PIER 2 ELEVATION – EASTBOUND

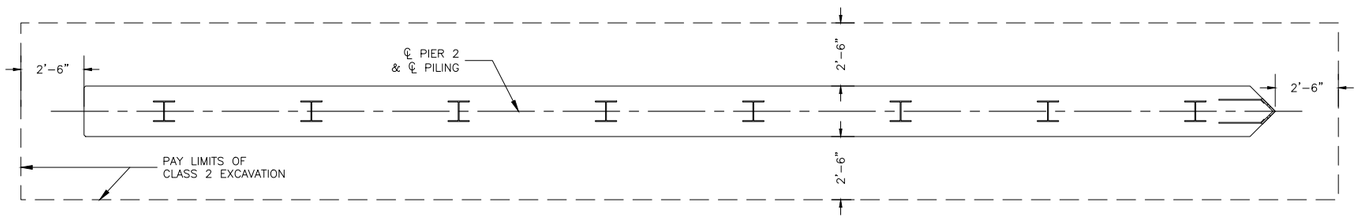
LOOKING EAST – SHOWING GEOMETRICS

0 3' 6'



ICE NOSE DETAIL

NOT TO SCALE



SECTION A–A

NOTES:

1. EXTEND SURFACE FINISH ON PIER TO 2' BELOW FINAL GRADE.
2. 2'–0" THICKNESS SHOWN IS NOMINAL. ADJUST THICKNESS AS NECESSARY TO MAINTAIN CLEARANCE FROM FORMLINER RELIEFS.

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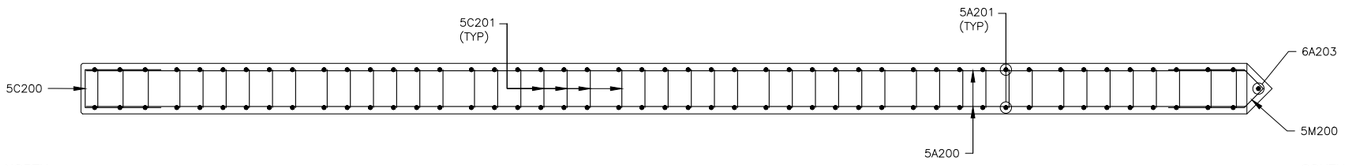
Eastbound

Pier 2 Geometrics

09-140-30.0R-9

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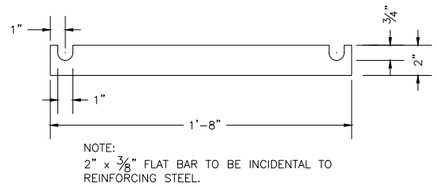
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	170	10



PIER 2 PLAN – EASTBOUND

SHOWING REINFORCING

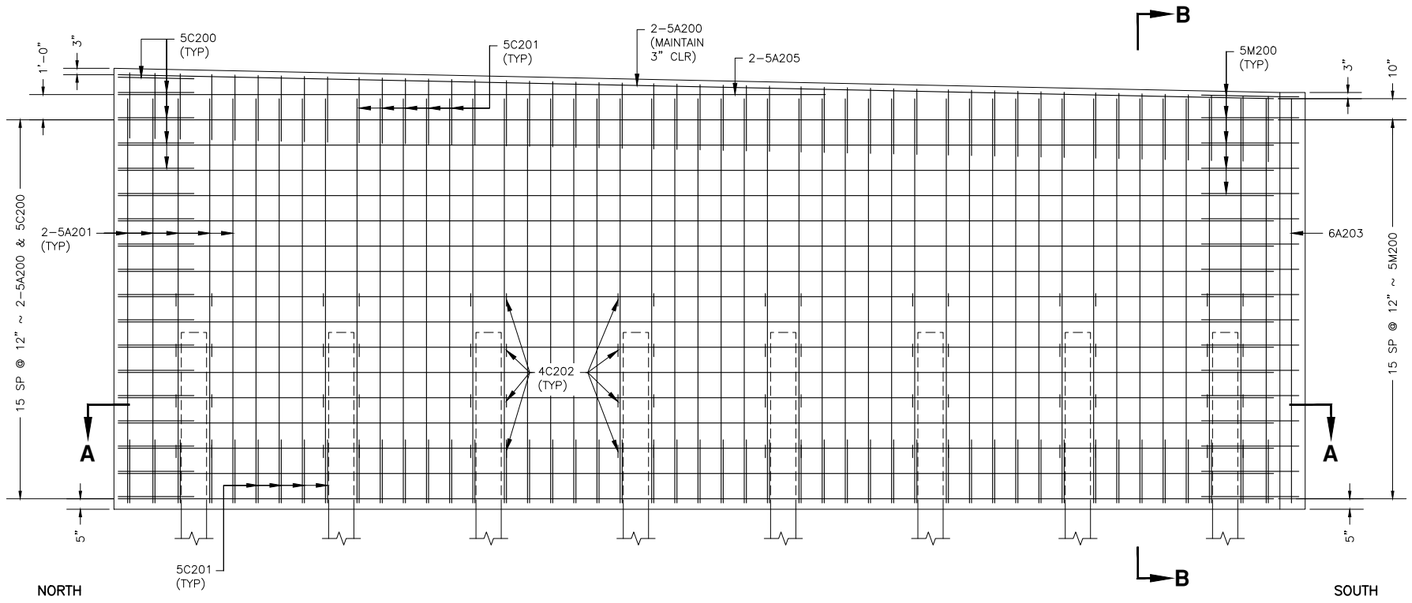
0 3' 6'



NOTE:
2" x 3/8" FLAT BAR TO BE INCIDENTAL TO REINFORCING STEEL.

BAR SUPPORT DETAIL

NOT TO SCALE

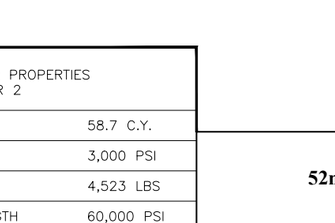


PIER 2 ELEVATION – EASTBOUND

LOOKING EAST – SHOWING REINFORCING

0 3' 6'

SECTION B–B

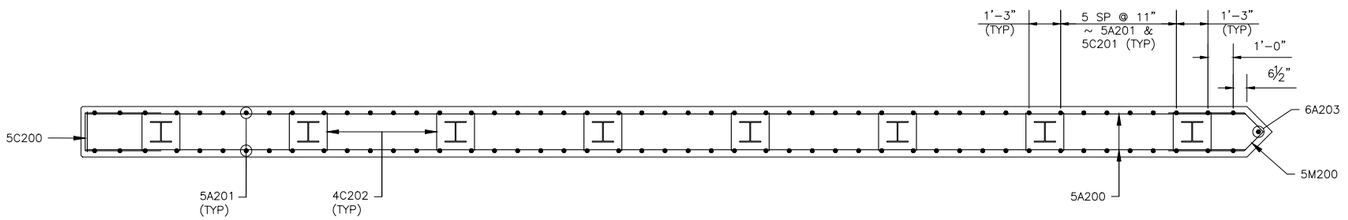


SECTION C–C

NOT TO SCALE

NOTE:

SEE SHEETS 21 & 22 FOR REINFORCING LIST AND BENT BAR DETAILS.



SECTION A–A

QUANTITIES & PROPERTIES PIER 2	
CLASS AE–3 CONCRETE	58.7 C.Y.
CONCRETE STRENGTH	3,000 PSI
REINFORCING STEEL	4,523 LBS
REINFORCEMENT STRENGTH	60,000 PSI
STRUCTURAL STEEL	498 LBS
PILING (SEE LAYOUT – SHEET 4)	

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52nd Ave S over Drain 27

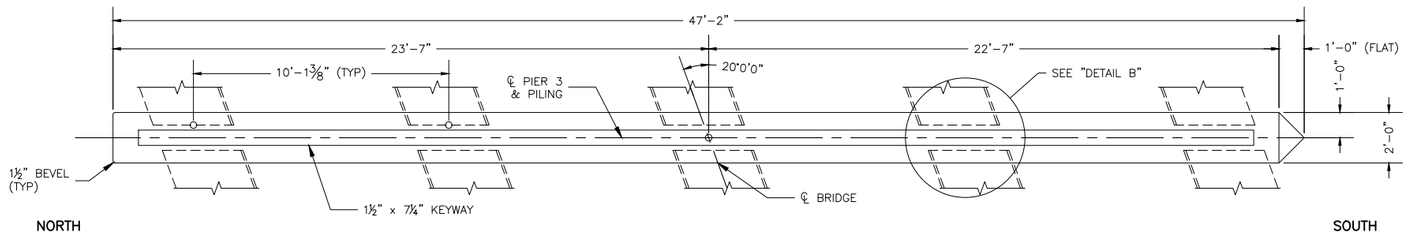
Eastbound

Pier 2 Reinforcing

09-140-30.0R-10

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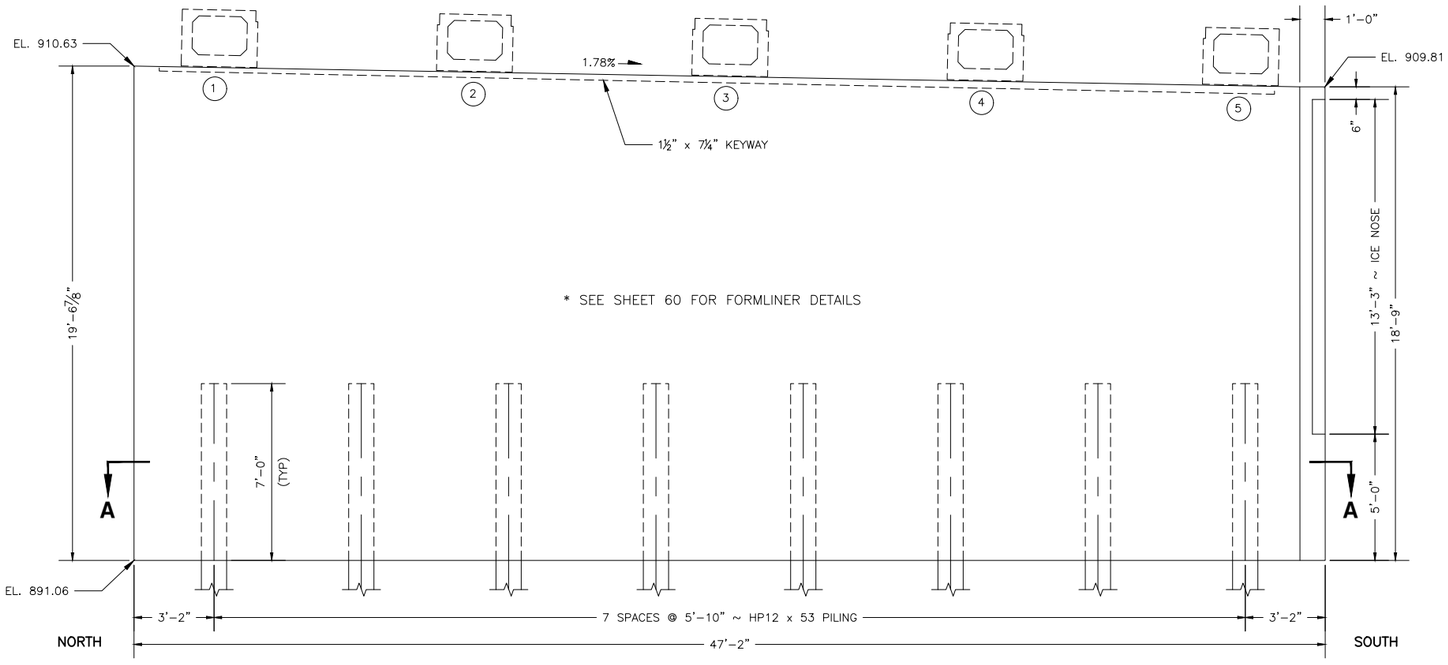
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	170	11



PIER 3 PLAN – EASTBOUND

SHOWING GEOMETRICS

0 3' 6'

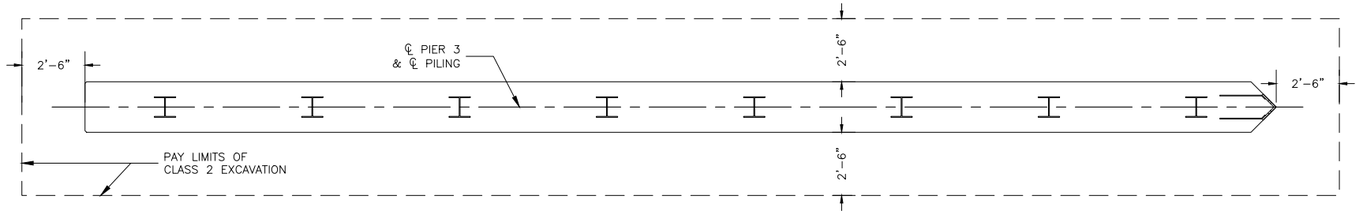


* SEE SHEET 60 FOR FORMLINER DETAILS

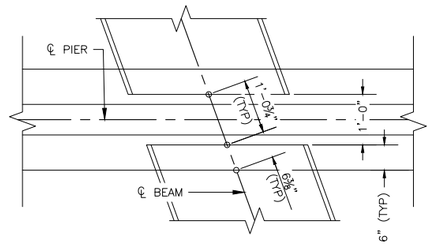
PIER 3 ELEVATION – EASTBOUND

LOOKING EAST – SHOWING GEOMETRICS

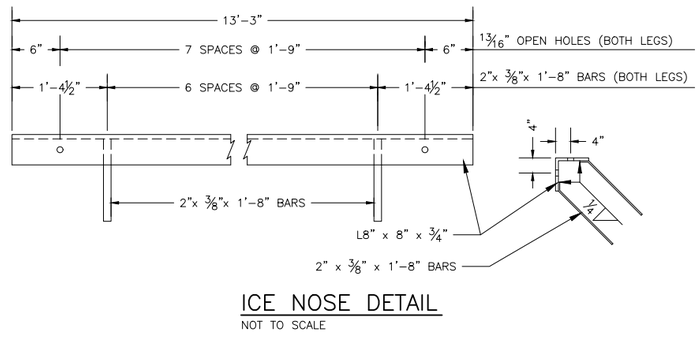
0 3' 6'



SECTION A–A



DETAIL B



ICE NOSE DETAIL

NOT TO SCALE

NOTES:

1. EXTEND SURFACE FINISH ON PIER TO 2' BELOW FINAL GRADE.
2. 2'–0" THICKNESS SHOWN IS NOMINAL. ADJUST THICKNESS AS NECESSARY TO MAINTAIN CLEARANCE FROM FORMLINER RELIEFS.

THE CITY OF Fargo FAR MORE

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52nd Ave S over Drain 27

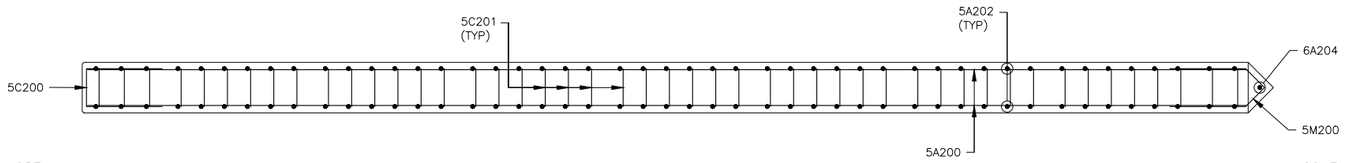
Eastbound

Pier 3 Geometrics

09-140-30.0R-11

08/15/18 06:34:09AM H:\Fargo\JBN\6000\6059\18_6059_145 – 52nd Ave. Design\CAD\Plans\Bridge\Drain 27 Eastbound\Drain 27 Eastbound Pier 3.dwg

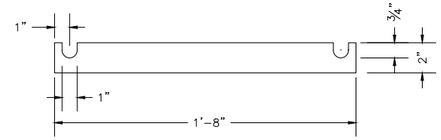
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	170	12



PIER 3 PLAN – EASTBOUND

SHOWING REINFORCING

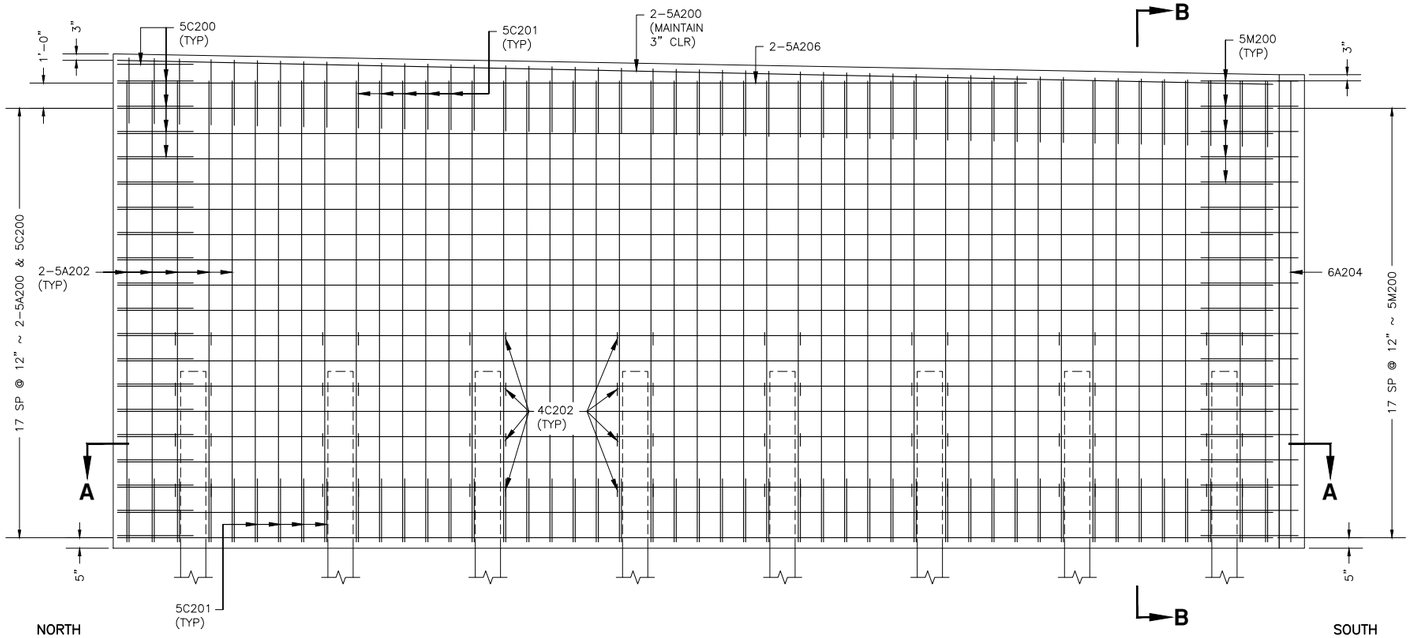
0 3' 6'



NOTE:
2" x 3/4" FLAT BAR TO BE INCIDENTAL TO REINFORCING STEEL.

BAR SUPPORT DETAIL

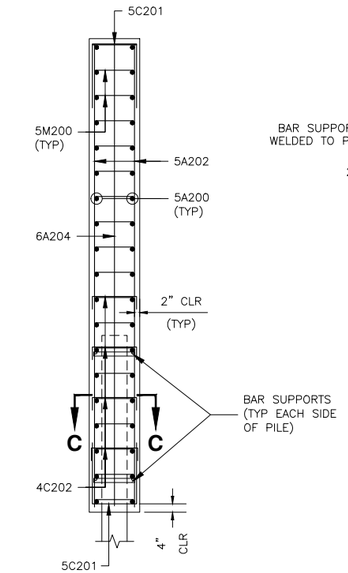
NOT TO SCALE



PIER 3 ELEVATION – EASTBOUND

LOOKING EAST – SHOWING REINFORCING

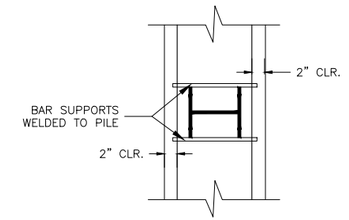
0 3' 6'



SECTION B–B

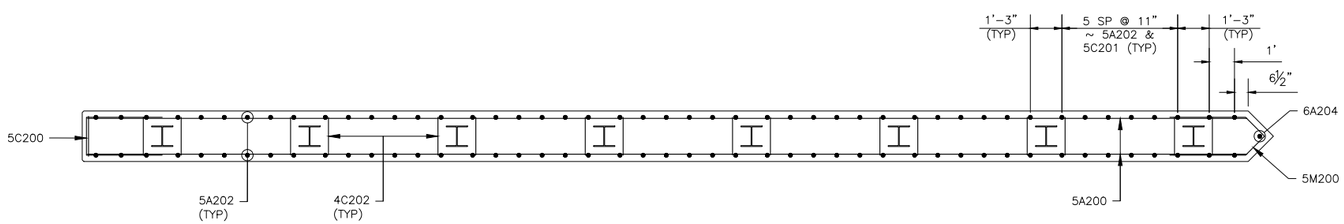
NOTE:

SEE SHEETS 21 & 22 FOR REINFORCING LIST AND BENT BAR DETAILS.



SECTION C–C

NOT TO SCALE



SECTION A–A

QUANTITIES & PROPERTIES PIER 3	
CLASS AE–3 CONCRETE	66.2 C.Y.
CONCRETE STRENGTH	3,000 PSI
REINFORCING STEEL	4,988 LBS
REINFORCEMENT STRENGTH	60,000 PSI
STRUCTURAL STEEL	575 LBS
PILING (SEE LAYOUT – SHEET 4)	

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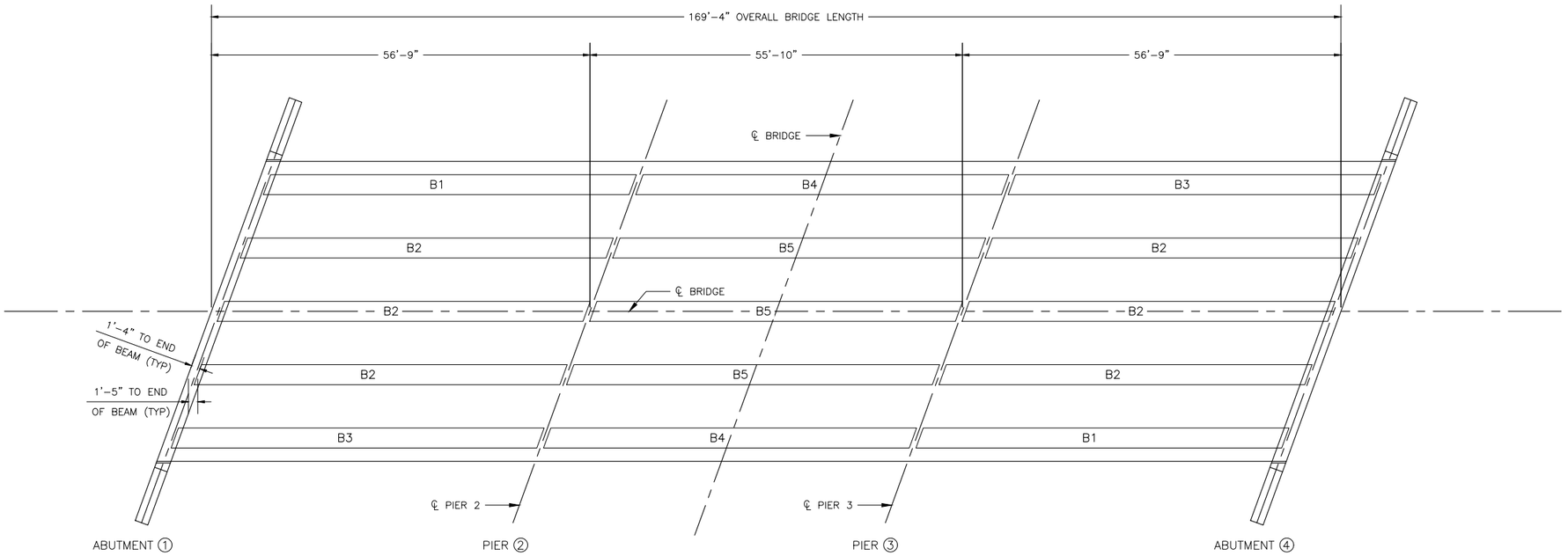
Eastbound

Pier 3 Reinforcing

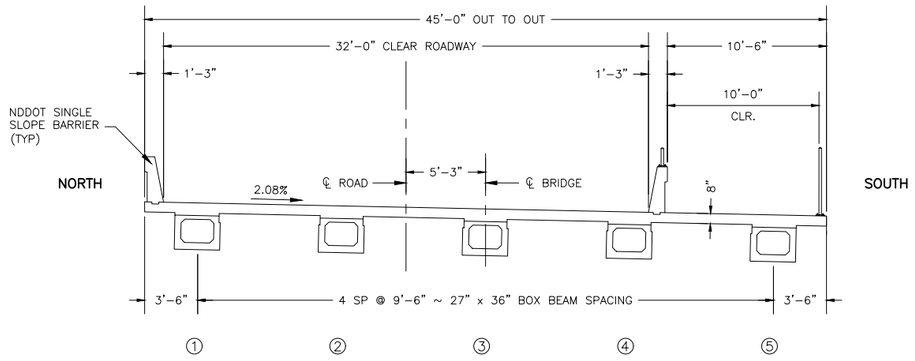
09-140-30.0R-12

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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BEAM FRAMING PLAN – EASTBOUND



DECK SECTION – EASTBOUND

BEARING SEAT ELEVATIONS

GIRDER HT. = 27"		POSI–RISER = 1⅜"		DECK = 8"	
		FILLER = ⅜"		TOTAL = 3.06'	
LOCATION	GIRDER 1	GIRDER 2	GIRDER 3	GIRDER 4	GIRDER 5
ABUTMENT 1	910.20	909.95	909.71	909.46	909.22
PIER 2	910.63	910.42	910.21	910.00	909.78
PIER 3	910.57	910.39	910.21	910.03	909.84
ABUTMENT 4	910.01	909.86	909.71	909.56	909.40

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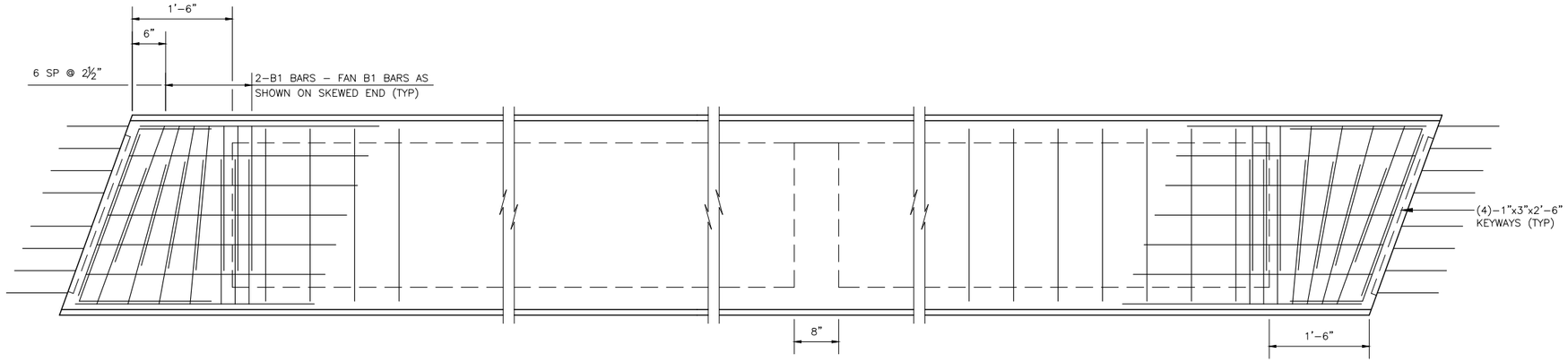
Eastbound

Beam Framing Plan

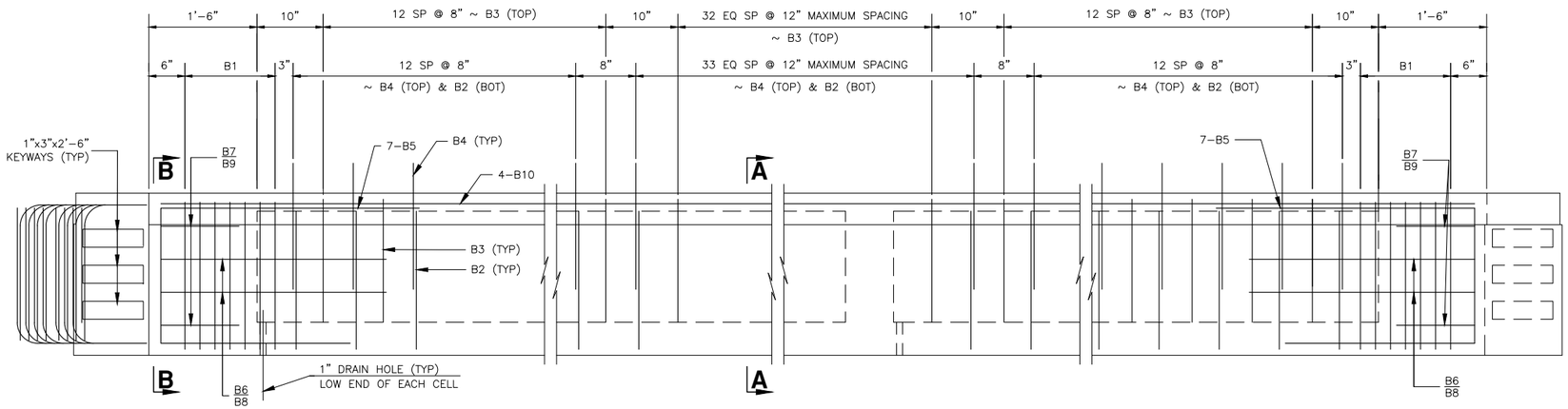
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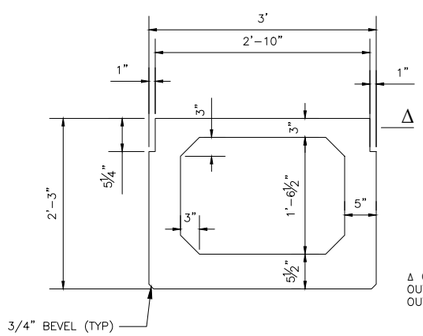
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	170	14



PLAN



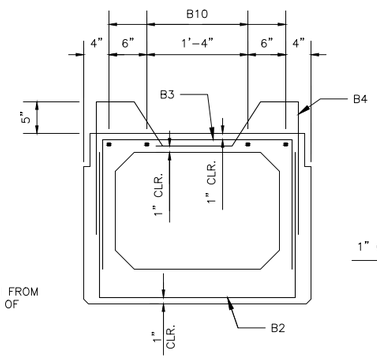
ELEVATION



Δ OMIT NOTCH FROM OUTSIDE FACE OF OUTER BEAM

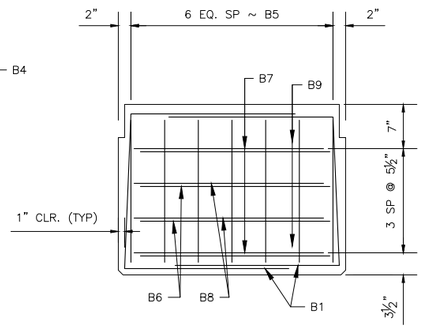
(SHOWING DIMENSIONS)

A – A

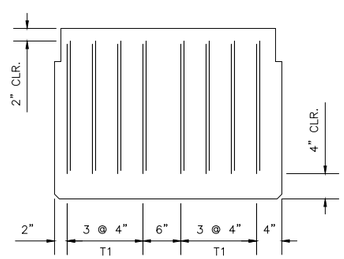


(SHOWING REINFORCING)

A – A



B – B



END VIEW

BEAM SECTION DATA
WT = 536 LBS/FT + 2371 LBS
CROSS SECTIONAL AREA = 498.0 IN²
C.G. (FROM BOTTOM) = 12.12 IN
I = 43,533 IN⁴
SB = 3,592 IN³

SINGLE BEAM

BILL OF REINFORCEMENT

MARK	NO.	SIZE	LENGTH	SHAPE
B1	28	4	6' - 5"	BENT
B2*	60	4	6' - 5"	BENT
B3*	59	4	6' - 0"	BENT
B4	60	4	6' - 9"	BENT
B5	14	5	8' - 1"	BENT
B6	4	4	5' - 9"	BENT
B7	4	4	3' - 9"	BENT
B8	4	4	6' - 8"	BENT
B9	4	4	4' - 8"	BENT
B10	4	4	54' - 6"	STRT.
T1**	32	4	4' - 6"	STRT.

* WELDED WIRE REINFORCING WITH MINIMUM CIRCUMFERENTIAL STEEL AREA OF 0.30 SQ IN PER FT MAY BE SUBSTITUTED FOR B2 AND B3 BARS.

** FIELD BEND AS SHOWN (GRADE 40).

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52nd Ave S over Drain 27

Eastbound

27 Inch Box Beam Details

09-140-30.0R-14

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	170	15

NOTES:

SUBMIT THE WORK DRAWINGS TO THE ENGINEER AT LEAST 14 DAYS PRIOR TO THE FORMING AND POURING OF ANY BEAMS. INCLUDE IN THE WORK DRAWINGS THE TOTAL INITIAL PRESTRESS FORCE AND THE LOSSES IN THE PRESTRESS DUE TO ELASTIC SHORTENING, SHRINKING OR CREEPING OF CONCRETE, AND THE RELAXATION OF STEEL STRESS AS DETERMINED BY THE CONTRACTOR FOR HIS METHOD OF STRESSING.

SHOW STRAND LAYOUT, PULL DOWN LOCATIONS, TENSIONING FORCES, ELONGATION AND ANY PROPOSED CHANGES IN REINFORCING STEEL IN THE WORK DRAWINGS.

SELECT THE FINAL PRESTRESS FORCE (REMAINING AFTER ALL LOSSES HAVE BEEN ACCOUNTED FOR) AND ITS CORRESPONDING CENTER OF GRAVITY, FROM THOSE ON A CURVE DETERMINED BY THE THREE VALUES SHOWN IN THE "PRESTRESSING DATA" TABLE.

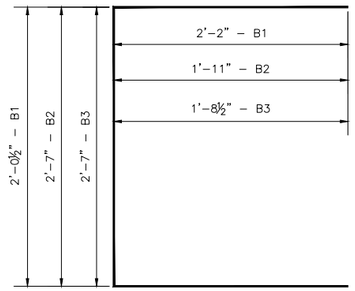
POUR BEAMS IN ALL STEEL FORMS.

ALL REINFORCING STEEL SHALL HAVE A CLEARANCE OF 1" UNLESS OTHERWISE NOTED.

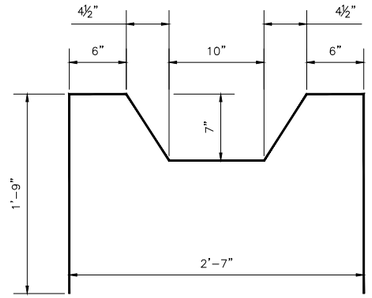
MINOR CHANGES TO THE SHAPE OF THE BEAM AND TO REINFORCING STEEL MAY BE MADE TO ACCOMMODATE THE FORMS OF VARIOUS CONTRACTORS AND THEIR CONSTRUCTION METHODS WITH THE APPROVAL OF THE ENGINEER.

ROUGH FLOAT AND TRANSVERSELY BROOM THE TOP OF THE BEAMS FOR BOND.

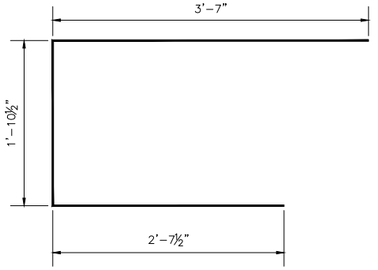
PROVIDE HANDLING HOOKS OR DEVICES AS REQUIRED BY THE CONTRACTOR. INSTALL HOOKS WITHIN 4'–0" OF THE END OF BEAM.



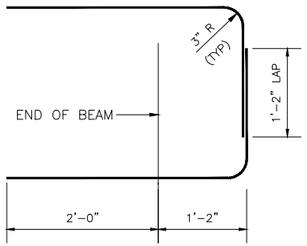
B1, B2, & B3



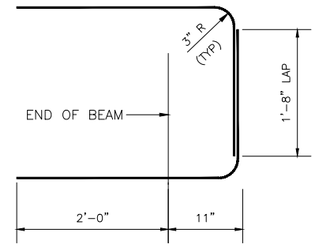
B4



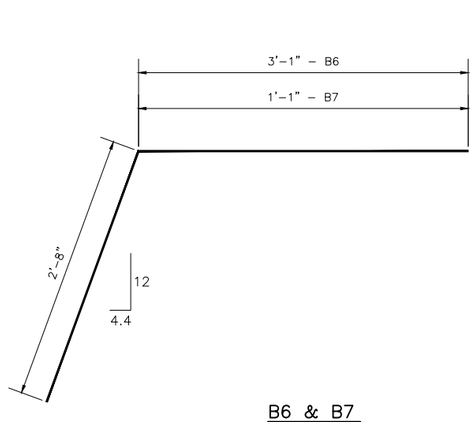
B5



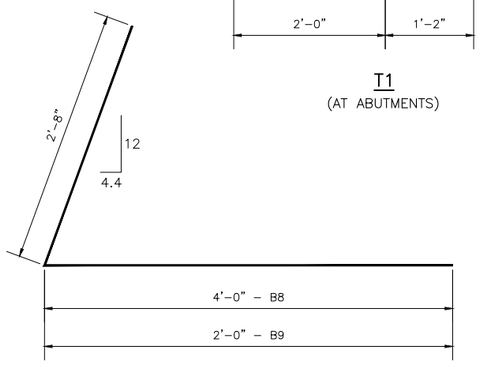
T1
(AT ABUTMENTS)



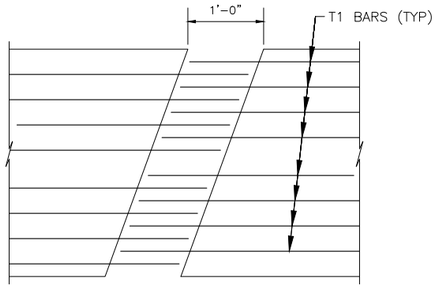
T1
(AT PIERS)



B6 & B7



B8 & B9



BEAM END PLAN AT PIER

BENT BAR DETAILS

(DIMENSIONS SHOWN ARE OUT TO OUT)

PRESTRESSING DATA					
C.G.	FINAL FORCE	DETENSION STRENGTH	ACCEPTANCE STRENGTH	WEIGHT (TONS)	BEAM LENGTH
1.50	540.3 k	4800 psi (Min)	5500 psi (Min)	15.9	54'-10"
1.75	548.0 k				
2.00	555.9 k				

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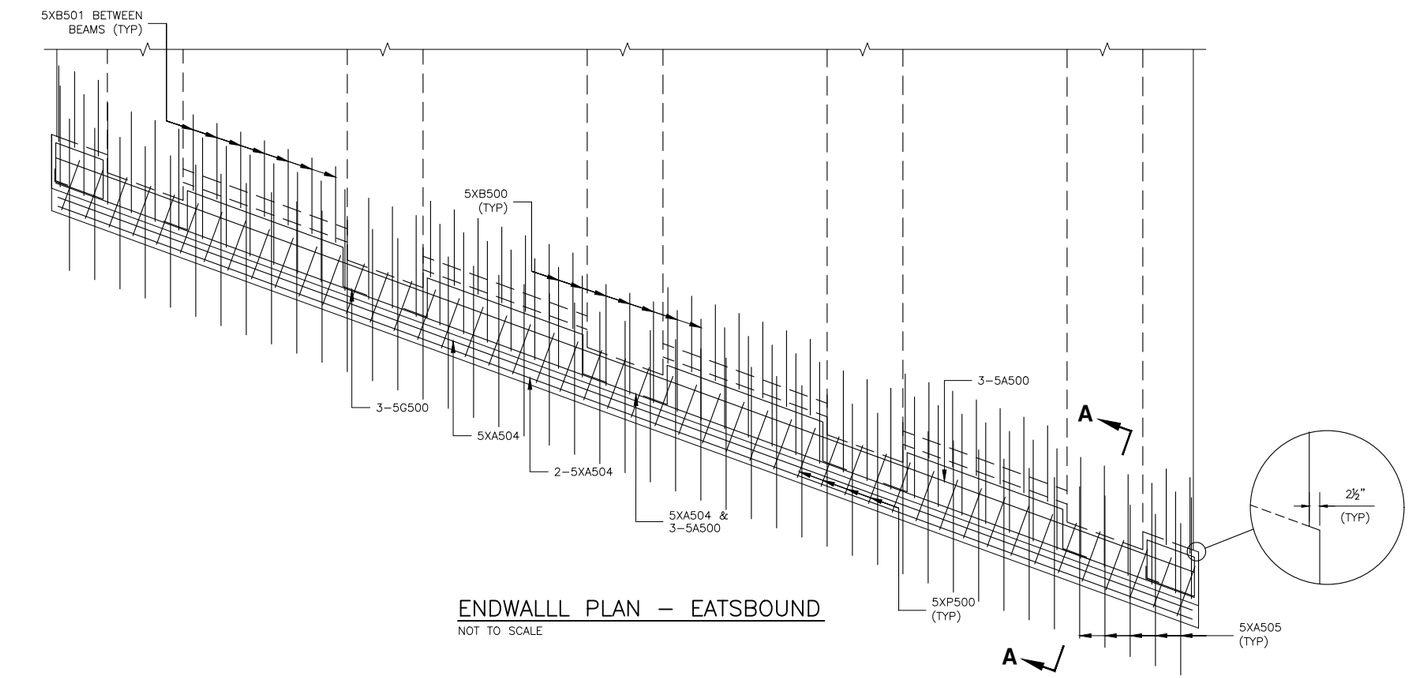
Eastbound

27 Inch Box Beam Details

09-140-30.0R-15

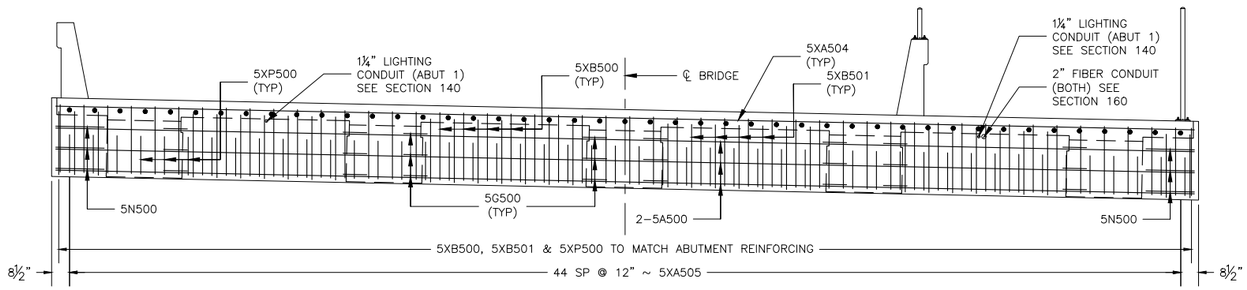
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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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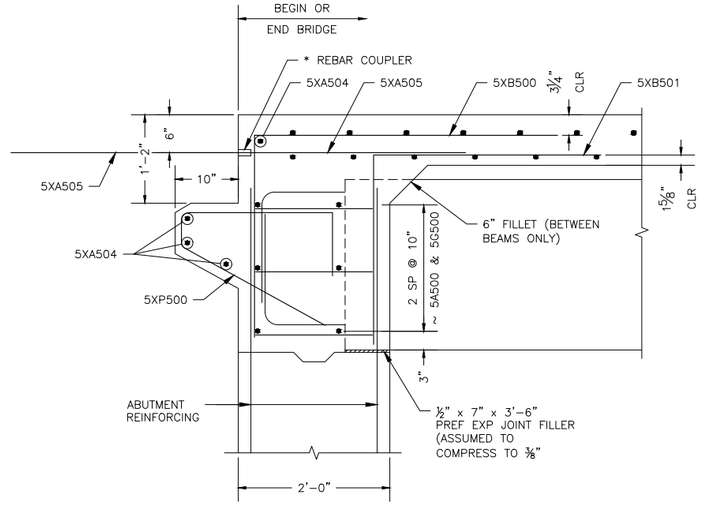
ENDWALLL PLAN – EATSBOUND

NOT TO SCALE



ENDWALL ELEVATION – EASTBOUND

NOT TO SCALE (APPROACH LIP NOT SHOWN)

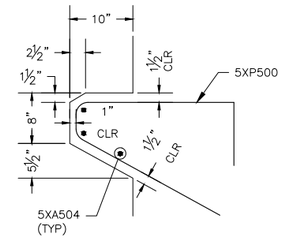


A–A

* USE APPROVED MECHANICAL CONNECTORS FOR THE COUPLERS CAPABLE OF DEVELOPING 125% OF THE REINFORCING STEEL SPECIFIED YIELD STRENGTH. PROVIDE EPOXY COATED COUPLERS ACCORDING TO SECTION 836.02 A AND REPAIR DAMAGED EPOXY COATING ACCORDING TO SECTION 612.04E.

NOTE:

DO NOT INSTALL THE 5XA505 BARS INTO THE APPROACH SLAB UNTIL ALL OF THE FOUNDATION FILL IS IN PLACE.



APPROACH LIP DETAIL

NOTE:

SEE SHEETS 21 & 22 FOR REINFORCING LIST AND BENT BAR DETAILS.

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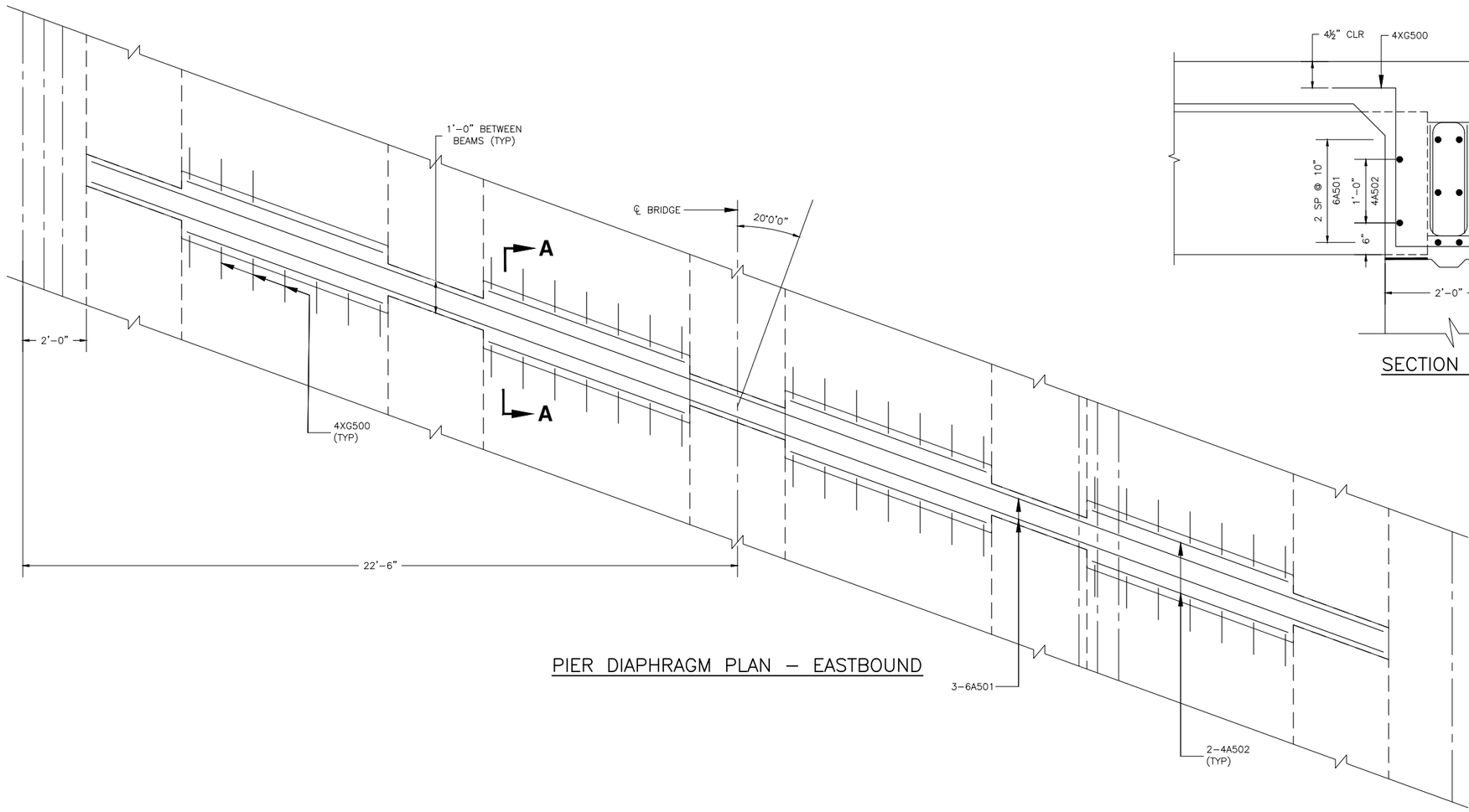
Eastbound

Endwall Details

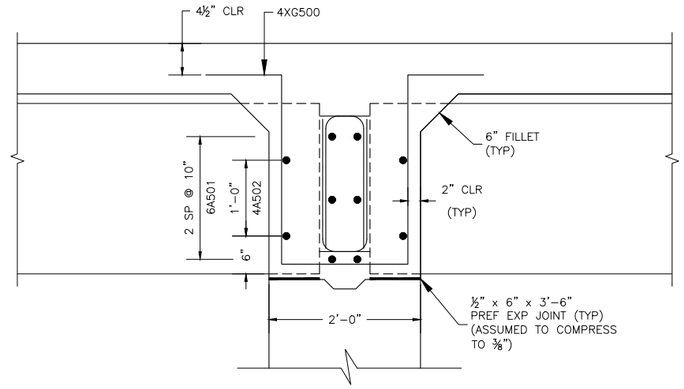
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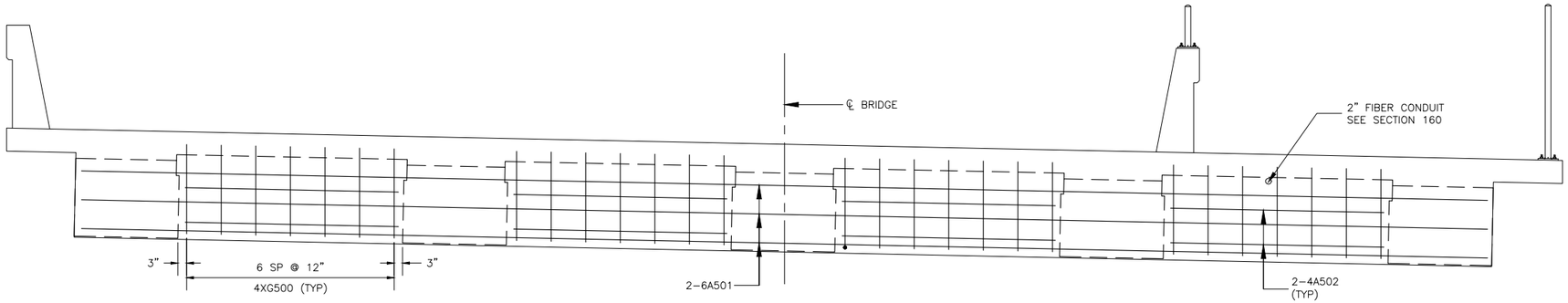
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	170	17



PIER DIAPHRAGM PLAN – EASTBOUND



SECTION A–A



PIER DIAPHRAGM ELEVATION – EASTBOUND

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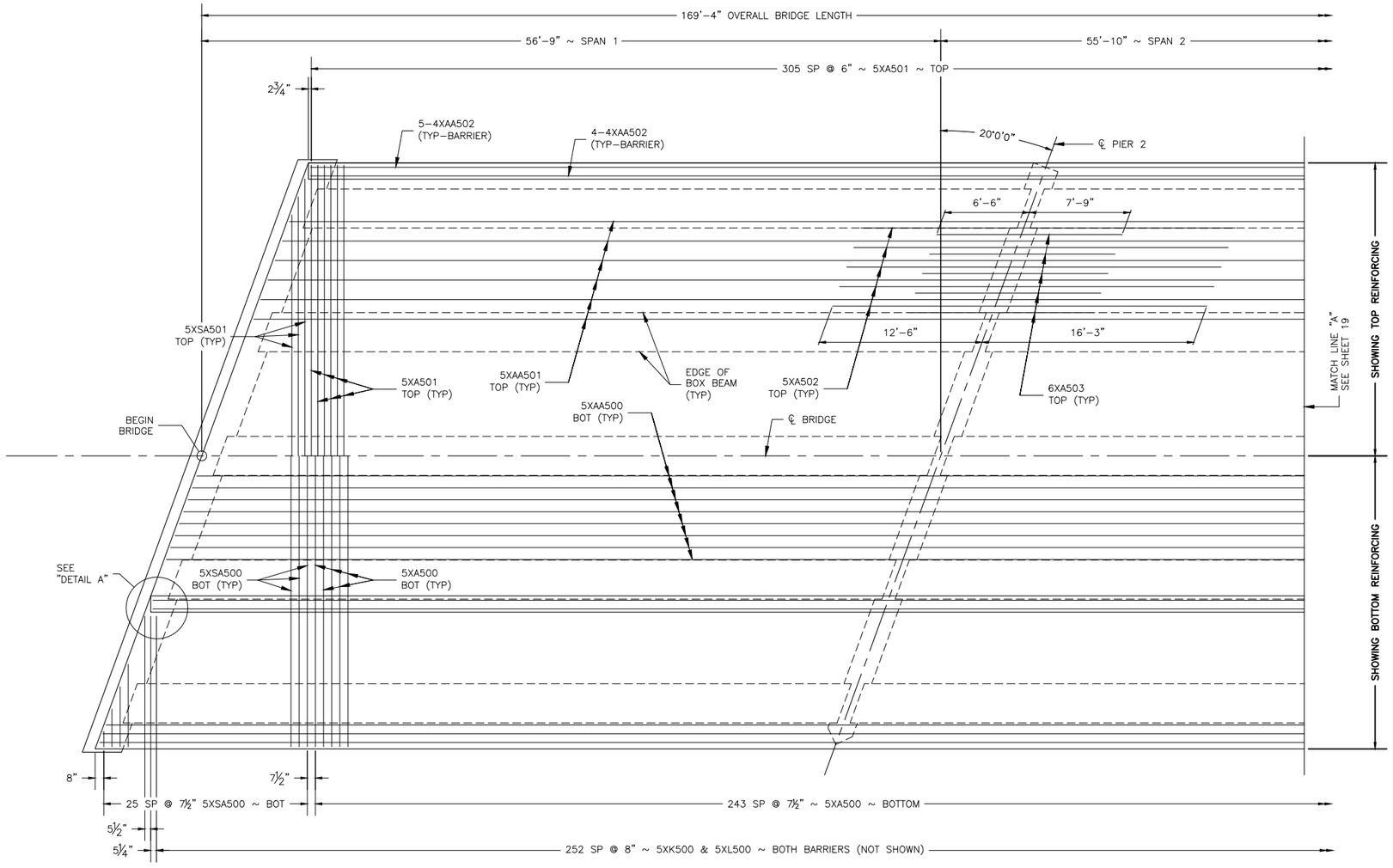
Eastbound

Pier Diaphragm Details

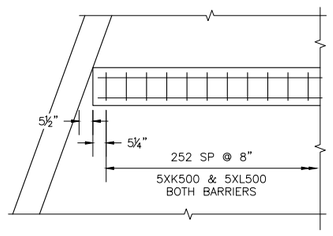
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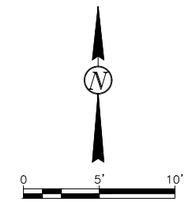
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	170	18



PLAN – EASTBOUND



BARRIER END – DETAIL A



THE CITY OF Fargo FAR MORE

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52nd Ave S over Drain 27

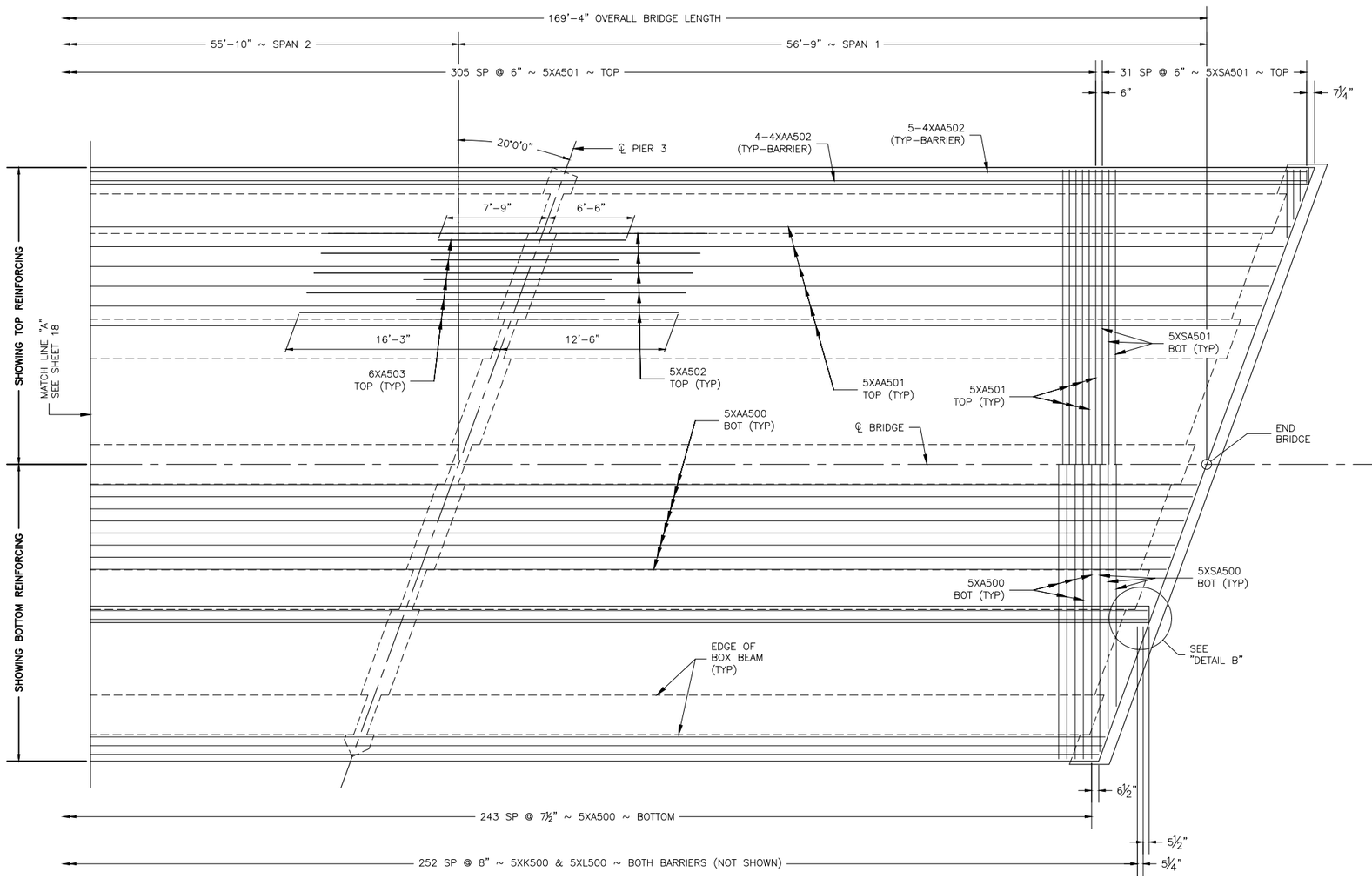
Eastbound

Slab Layout

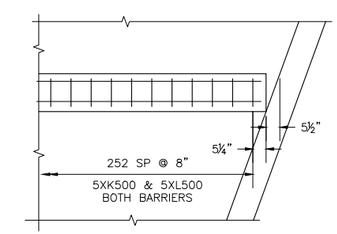
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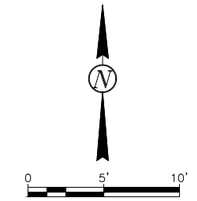
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	170	19



PLAN – EASTBOUND



BARRIER END – DETAIL B



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52nd Ave S over Drain 27

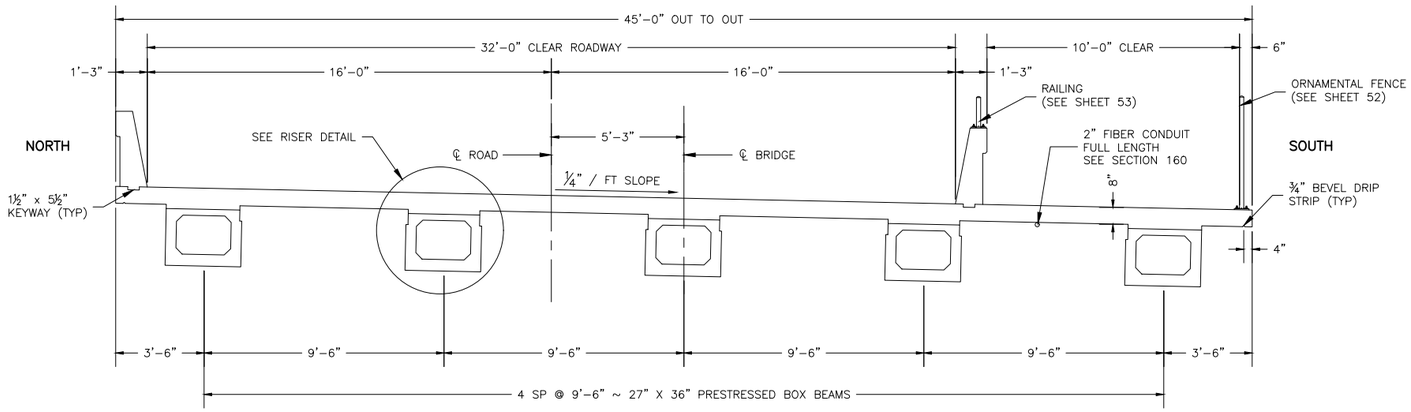
Eastbound

Slab layout

09-140-30.0R-19

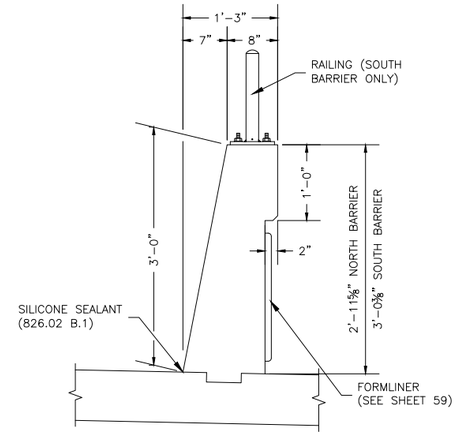
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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	170	20

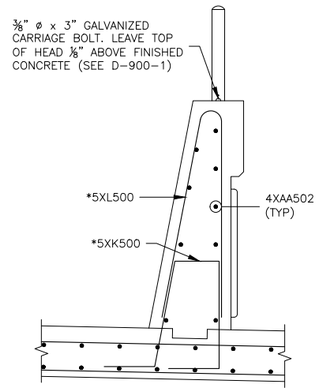


SLAB SECTION – EASTBOUND

LOOKING EAST – SHOWING DIMENSIONS



SHOWING DIMENSIONS

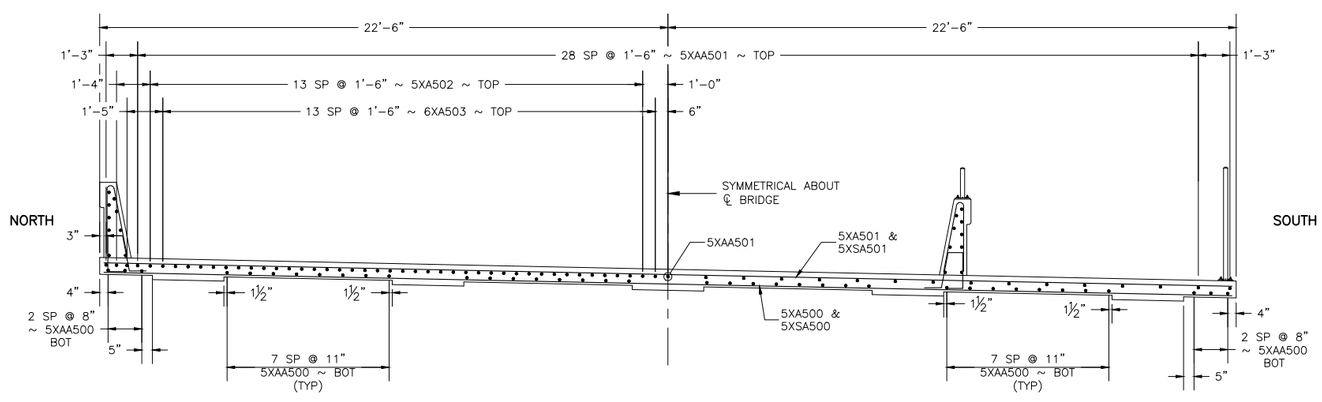


* PROVIDE A 1½" CLEARANCE TO THE BARRIER REINFORCING

SHOWING REINFORCEMENT

BARRIER DETAILS

NOT TO SCALE

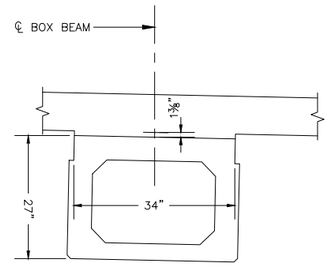


SHOWING REINFORCEMENT OVER PIERS

SHOWING REINFORCEMENT AT MIDSPAN

SLAB SECTION – EASTBOUND

LOOKING EAST – SHOWING REINFORCEMENT



THE 1⅜" DIMENSION SHOWN IS LOCATED AT THE SUPPORTS. THE ANTICIPATED MIDSPAN RISER IS 1". THE RISER SHALL BE ADJUSTED TO MAINTAIN THE 8" SLAB THICKNESS.

RISER DETAIL

NOT TO SCALE

NOTE:

DIMENSIONS SHOWN ARE NOMINAL. ADJUST THICKNESS TO MAINTAIN REQUIRED CLEARANCE FROM FORMLINER RELIEFS.

QUANTITIES & PROPERTIES BOTH BARRIERS (FOR INFORMATIONAL PURPOSES ONLY)	
CLASS AAE-3 CONCRETE	31.9 C.Y.
CONCRETE STRENGTH	4,000 PSI
REINFORCING STEEL-EPOXY COATED	7,616 LBS
REINFORCEMENT STRENGTH	60,000 PSI

QUANTITIES & PROPERTIES SUPERSTRUCTURE	
CLASS AAE-3 CONCRETE	224.8 C.Y.
CONCRETE STRENGTH	4,000 PSI
REINFORCING STEEL	1,888 LBS
REINFORCING STEEL-EPOXY COATED	46,583 LBS
REINFORCEMENT STRENGTH	60,000 PSI

THE CITY OF Fargo FAR MORE

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52nd Ave S over Drain 27

Eastbound

Slab Section

09-140-30.0R-20

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	170	21

BILL OF REINFORCING STEEL, GRADE 60

LETTER PREFIX OF BAR MARK DENOTES SHAPE - SEE BAR DETAILS

LOCATION		SIZE	MARK	NO. EACH /SET	NOMINAL LENGTH	DETAILING DIMENSIONS								
						a	b	c	d	e	f	g	h	k
ABUTMENT 1	REGULAR	5	A100	2	31'-0"		31'-0"							
		5	A102	22	8'-0"		8'-0"							
		5	A103	2	11'-6"		11'-6"							
		5	A104	2	11'-2"		11'-2"							
		5	A105	2	8'-8"		8'-8"							
		5	A106	2	8'-2"		8'-2"							
		5	A107	2	5'-8"		5'-8"							
		5	A108	2	5'-2"		5'-2"							
		6	C100	16	18'-0"		8'-2"	1'-8"	8'-2"					
		6	C101	17	19'-0"		8'-8"	1'-8"	8'-8"					
		6	C102	1	15'-10"		8'-8"	1'-8"	5'-6"					
		6	C103	1	18'-1"		9'-9"	1'-8"	6'-8"					
		6	C104	1	21'-2"		9'-9"	1'-8"	9'-9"					
		6	C109	7	15'-5"		5'-7"	1'-8"	8'-2"					
		6	C110	9	16'-5"		6'-1"	1'-8"	8'-8"					
		6	C111	16	4'-2"		1'-3"	1'-8"	1'-3"					
		4	C112	36	2'-8"		6"	1'-8"	6"					
		5	D100	4	12'-0"		3'-3"	8'-9"					12	4
		5	AA100	14	69'-6"		40'-0"	2'-6"	29'-6"			67'-0"		
		6	SC100	1	144'-9"	1'-8"	5'-10"	8'-7"	1'-8"	8				
		6	SC101	1	165'-9"	1'-8"	7'-0"	9'-9"	1'-8"	8				
ABUTMENT 4	REGULAR	5	A101	2	16'-0"		16'-0"							
		5	A102	22	8'-0"		8'-0"							
		5	A109	2	10'-11"		10'-11"							
		5	A110	2	7'-11"		7'-11"							
		5	A111	2	4'-11"		4'-11"							
		5	A112	2	10'-1"		10'-1"							
		5	A113	2	7'-1"		7'-1"							
		5	A114	2	4'-1"		4'-1"							
		6	C100	23	18'-0"		8'-2"	1'-8"	8'-2"					
		6	C101	9	19'-0"		8'-8"	1'-8"	8'-8"					
		6	C105	1	20'-2"		9'-3"	1'-8"	9'-3"					
		6	C106	1	17'-2"		9'-3"	1'-8"	6'-3"					
		6	C107	1	15'-9"		8'-7"	1'-8"	5'-6"					
		6	C108	1	18'-10"		8'-7"	1'-8"	8'-7"					
		6	C109	12	15'-5"		5'-7"	1'-8"	8'-2"					
		6	C110	4	16'-5"		6'-1"	1'-8"	8'-8"					
		6	C111	16	4'-2"		1'-3"	1'-8"	1'-3"					
		4	C112	36	2'-8"		6"	1'-8"	6"					
		5	D100	4	12'-0"		3'-3"	8'-9"					12	4
		5	AA100	14	69'-6"		40'-0"	2'-6"	29'-6"			67'-0"		
		6	SC102	1	156'-0"	1'-8"	6'-6"	9'-2"	1'-8"	8				
		6	SC103	1	142'-6"	1'-8"	5'-9"	8'-5"	1'-8"	8				

LOCATION		SIZE	MARK	NO. EACH /SET	NOMINAL LENGTH	DETAILING DIMENSIONS								
						a	b	c	d	e	f	g	h	k
PIER 2	REGULAR	5	A200	34	45'-9"		45'-9"							
		5	A201	94	16'-0"		16'-0"							
		6	A203	1	16'-0"		16'-0"							
		5	A205	2	28'-0"		28'-0"							
		5	C200	18	7'-8"		3'-0"	1'-8"	3'-0"					
		5	C201	94	8'-8"		3'-6"	1'-8"	3'-6"					
		4	C202	64	2'-8"		6"	1'-8"	6"					
		5	M200	17	8'-0"	3'-0"	1'-0"	1'-0"	3'-0"				12	12
PIER 3	REGULAR	5	A200	38	45'-9"		45'-9"							
		5	A202	94	18'-3"		18'-3"							
		6	A204	1	18'-3"		18'-3"							
		5	A206	2	36'-0"		36'-0"							
		5	C200	20	7'-8"		3'-0"	1'-8"	3'-0"					
		5	C201	94	8'-8"		3'-6"	1'-8"	3'-6"					
		4	C202	64	2'-8"		6"	1'-8"	6"					
		5	M200	19	8'-0"	3'-0"	1'-0"	1'-0"	3'-0"				12	12

NOTES:

1. VERIFY THE QUANTITY, SIZE, AND SHAPE OF THE BAR REINFORCEMENT AGAINST THE STRUCTURE DRAWINGS AND IMMEDIATELY NOTIFY THE ENGINEER OF ANY DISCREPANCIES. DISCREPANCIES IN THE BAR LIST WILL NOT BE CAUSE FOR ADJUSTMENT OF THE CONTRACT UNIT PRICE.
2. ALL DIMENSIONS ARE OUT TO OUT OF BARS.
3. NOMINAL LENGTH OF EACH BENT BAR OR CUT BAR IS THE SUM TOTAL OF THE DETAILING DIMENSIONS FOR THAT BAR, UNLESS OTHERWISE NOTED.
4. TURN ADJACENT "AA" BARS END FOR END SO THAT THE SPLICE LOCATIONS ARE STAGGERED.

THE CITY OF Fargo FAR MORE

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Houston Engineering Inc.
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52nd Ave S over Drain 27

Eastbound

Reinforcing Bar List

09-140-30.0R-21

08/15/18 06:35:28AM H:\Fargo\JBN\6000\6059\18_6059_145 - 52nd Ave. Design\CAD\Plans\Bridge\Drain 27 Eastbound\Drain 27 EB Reinforcement Schedule.dwg

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	170	22

BILL OF REINFORCING STEEL, GRADE 60

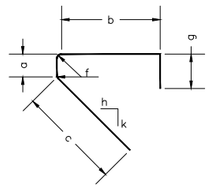
LETTER PREFIX OF BAR MARK DENOTES SHAPE - SEE BAR DETAILS

LOCATION		SIZE	MARK	NO. EACH /SET	NOMINAL LENGTH	DETAILING DIMENSIONS								
						a	b	c	d	e	f	g	h	k
SUPERSTRUCTURE	REGULAR	5	A500	12	47'-9"		47'-9"							
		6	A501	12	43'-3"		43'-3"							
		4	A502	32	6'-6"		6'-6"							
		5	G500	24	10'-9"	1'-7"	6'-6"	1'-7"	1'-0"				12	4.4
		5	N500	12	8'-2"	2'-0"	1'-7"	6"					4.4	12
	EPOXY	5	XA500	244	44'-6"		44'-6"							
		5	XA501	306	44'-6"		44'-6"							
		5	XA502	56	28'-9"		28'-9"							
		6	XA503	56	14'-3"		14'-3"							
		5	XA504	8	47'-9"		47'-9"							
		5	XA505	180	3'-0"		3'-0"							
		5	XB500	98	6'-8"		2'-8"	4'-0"						
		5	XB501	66	5'-6"		2'-6"	3'-0"						
		4	XG500	56	8'-11"	2'-7"	1'-9"	2'-7"	1'-0"				12	0
		5	*XK500	506	4'-11"	1'-6"	7"			10"		8"	2.3"	12
		5	*XL500	506	5'-7"	9"	2'-7"	5"			1.25"		2.3"	12
		5	XP500	96	5'-6"	5"	2'-1"	2'-2"			1.25"	10"	12	6.5
		5	XAA500	38	175'-0"		60'-0"	3'-0"	55'-0"	2		169'-0"		
		5	XAA501	31	174'-0"		60'-0"	2'-6"	54'-0"	2		169'-0"		
		4	*XAA502	18	172'-6"		60'-0"	2'-0"	52'-6"	2		168'-6"		
		5	XSA500	2	588'-3"	1'-2"	44'-1"			25				
		5	XSA501	2	710'-8"	10"	43'-7"			31				

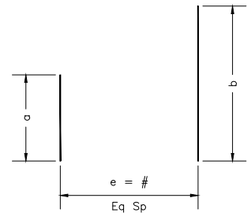
* INCLUDE ALL COSTS ASSOCIATED WITH BARRIER STEEL IN THE PRICE BID FOR "SINGLE SLOPE BARRIER."

NOTES:

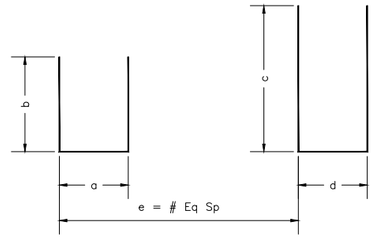
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4. TURN ADJACENT "AA" BARS END FOR END SO THAT THE SPLICE LOCATIONS ARE STAGGERED.
5. THE "f" DIMENSION INDICATES THE INSIDE RADIUS UNLESS OTHERWISE NOTED.
6. AN "X" PRECEEDING A BAR DESIGNATION INDICATES AN EPOXY COATED BAR.



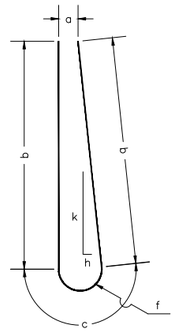
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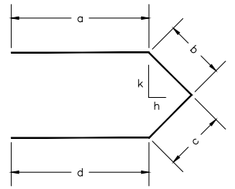
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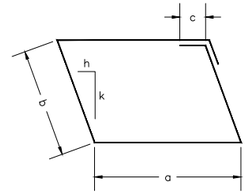
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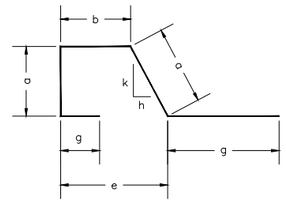
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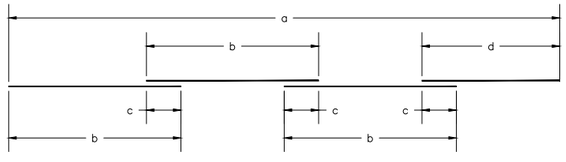
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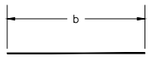


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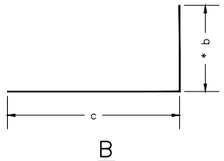


c = Lap Splice (typ)
e = # of "b" Length Pieces in a Set
Total Length per Set = e x b + d

AA

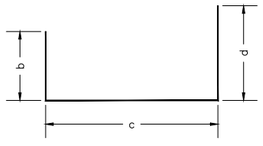


A

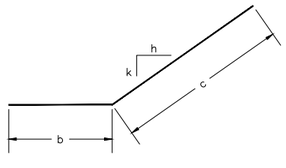


B

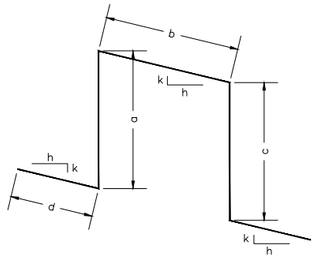
* b = Vertical Leg for XB500 and XB501



C



D



G

THE CITY OF Fargo FAR MORE

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Houston Engineering Inc.
Ph: 701.237.5065

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52nd Ave S over Drain 27

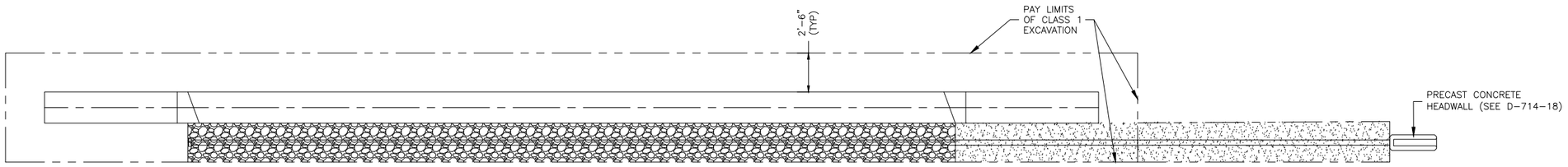
Eastbound

Reinforcing Bar List & Details

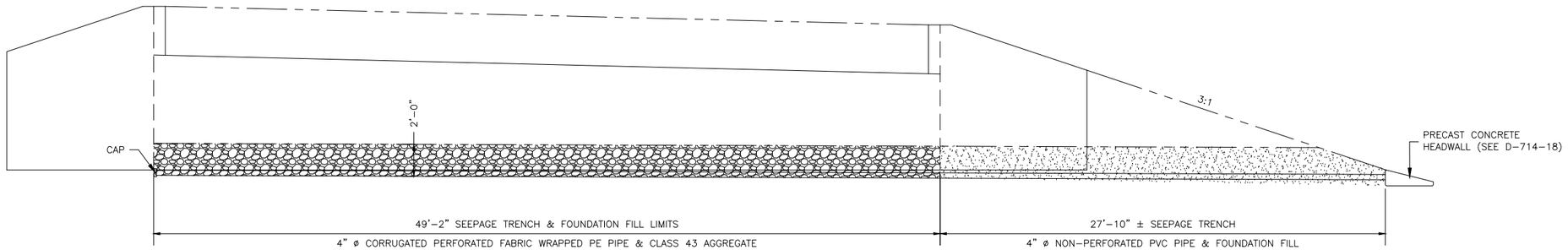
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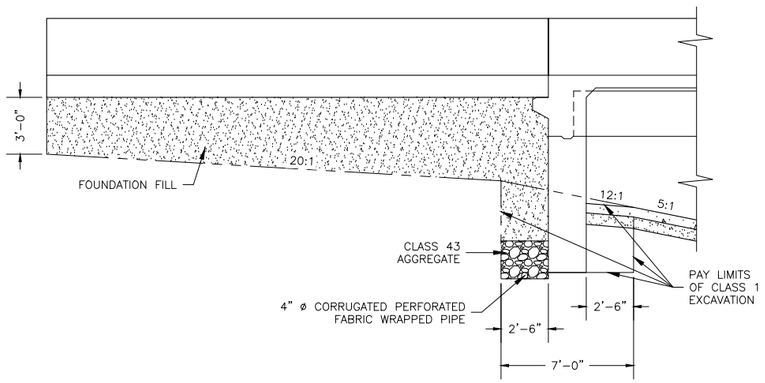
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	170	23



ABUTMENT PLAN



BACK FACE OF ABUTMENT



DETAIL AT ABUTMENT

NOTES:

USE CORRUGATED PERFORATED FABRIC WRAPPED PE PIPE THAT MEETS THE REQUIREMENTS OF SECTION 830.03 A.4. PROVIDE FABRIC WRAPPING FOR THE PIPE THAT MEETS THE REQUIREMENTS OF SECTION 858.01 FOR D3 OR D4 DRAINAGE FABRIC. PROVIDE AGGREGATE FOUNDATION FILL THAT MEETS THE REQUIREMENTS OF SECTION 210.

INCLUDE THE COST TO FURNISH AND PLACE THE FOUNDATION FILL, AGGREGATE, CORRUGATED PERFORATED PIPE AND HEADWALLS IN THE PAY ITEM "ABUTMENT UNDERDRAIN SYSTEM".

ABUTMENT 1 SHOWN. INSTALL UNDERDRAIN SYSTEMS AT BOTH ABUTMENT 1 AND ABUTMENT 4 TO DRAIN TO THE SOUTH.

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52nd Ave S over Drain 27

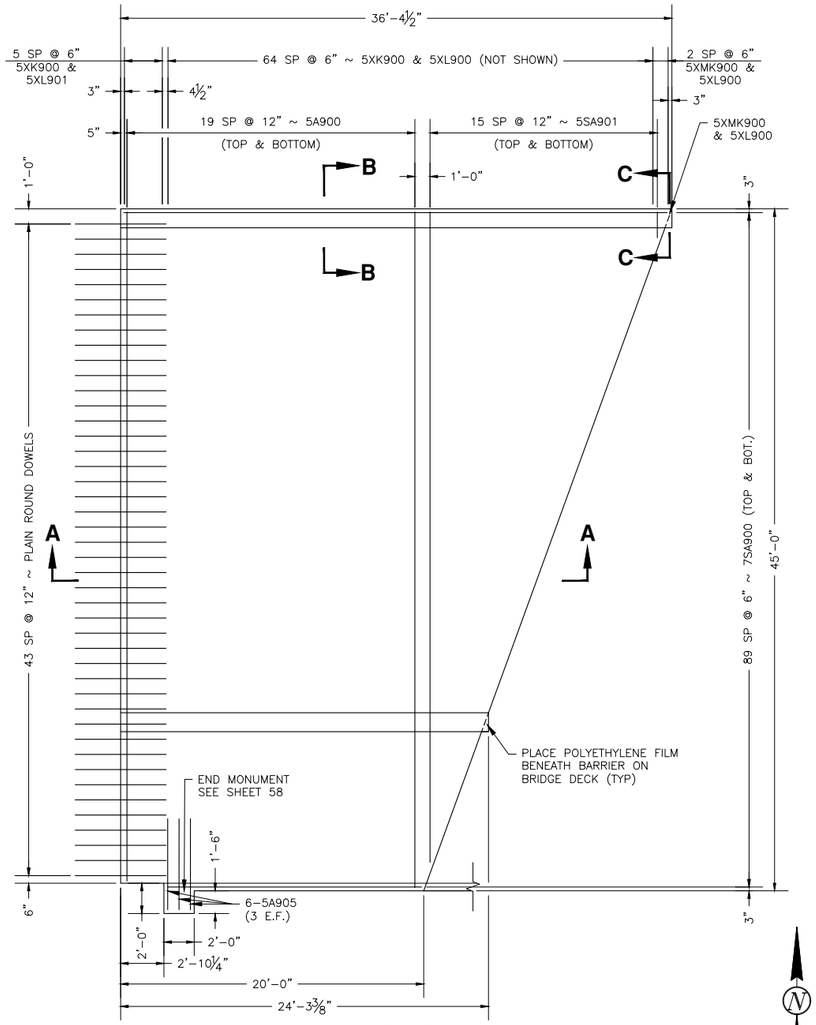
Eastbound

Abutment Underdrain Details

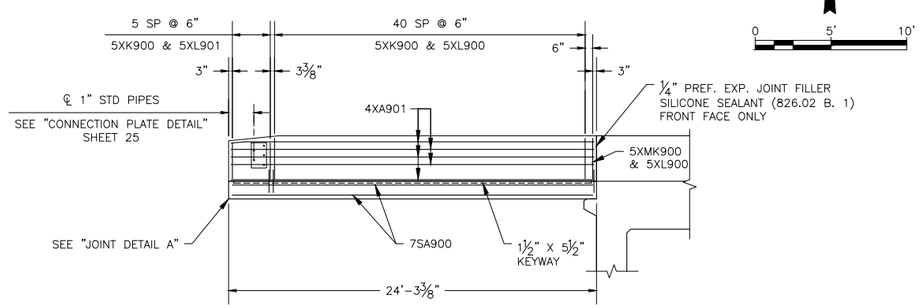
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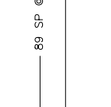
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	ND	SU-8-984(164)	170	24

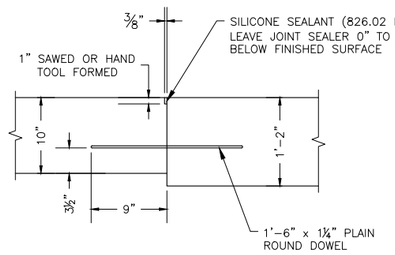


PLAN – WEST APPROACH END

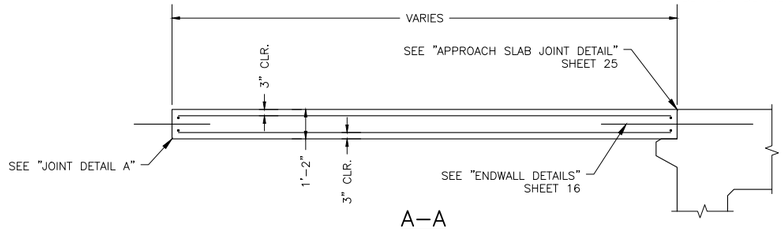


ELEVATION – WEST APPROACH END
(SHOWING SOUTH BARRIER)

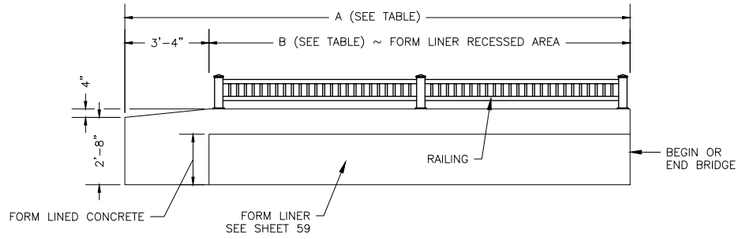




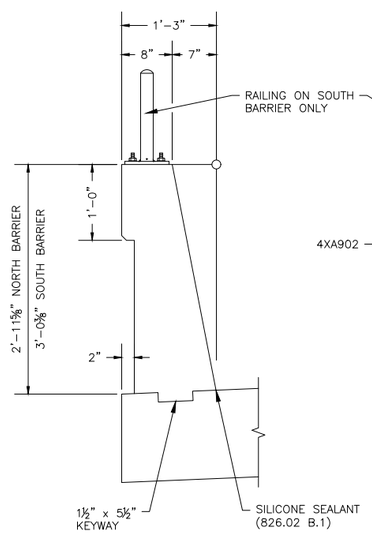
JOINT DETAIL A



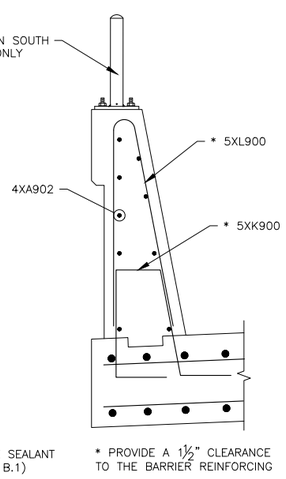
A–A



BARRIER ELEVATION

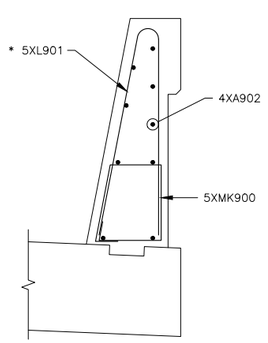


SHOWING DIMENSIONS



SHOWING REINFORCING

B–B



C–C

NOTES:

THE ESTIMATED MATERIAL QUANTITIES SHOWN ARE FOR INFORMATION PURPOSES ONLY. INCLUDE THE CONCRETE, REINFORCING BARS, POLYETHYLENE FILM, PREFORMED JOINT FILLER, POLYSTYRENE, SILICONE SEALANT, CONNECTION PLATES AND PIPES, PENETRATING WATER REPELLANT TREATMENT, AND LABOR REQUIRED TO BUILD THE APPROACH SLABS, BARRIERS, AND END MONUMENTS IN THE PAY ITEM "CONCRETE BRIDGE APPROACH SLAB." INCLUDE THE DOWEL BARS IN THE CONCRETE PAVEMENT PAY ITEM. INCLUDE THE RAILING AND ORNAMENTAL FENCE IN THE PAY ITEMS "RAILING" AND "ORNAMENTAL FENCE." USE CLASS AE-3 CONCRETE AND GRADE 60 REINFORCING STEEL. PROVIDE REINFORCING STEEL THAT MEETS THE REQUIREMENTS OF SECTION 612. USE POLYETHYLENE FILM THAT MEETS THE REQUIREMENTS OF ASTM C171.

THE BAR MARKS BEGINING WITH AN "X" INDICATE AN EPOXY COATED BAR. THE DIMENSIONS SHOWN IN THE "BENT BAR DETAILS" ARE OUT TO OUT.

WEST APPROACH SLAB: SKEW ANGLE = 20°			
BAR LIST			
SIZE	MARK	NO. EACH	NOMINAL LENGTH
5	A900	40	44' - 8"
4	XA901	9	23' - 9"
4	XA902	9	36' - 0"
5	A905	6	6' - 0"
5	XK900	118	5' - 7"
5	XL900	109	5' - 7"
5	XL901	12	4' - 11"
5	XMK900	3	3' - 8"
7	SA900	2	2497' - 6"
5	SA901	2	356' - 8"

ESTIMATED MATERIAL QUANTITIES

Reinforcing Steel (LBS)	Concrete (CY)
14,595	61.3

PAY QUANTITY = 141.1 SY

BARRIER LENGTHS

	A	B
NORTHWEST	36'–4½"	33'–0½"
SOUTHWEST	24'–3⅜"	20'–11⅜"
NORTHEAST	20'–5½"	17'–1½"
SOUTHEAST	32'–6⅝"	29'–3⅝"

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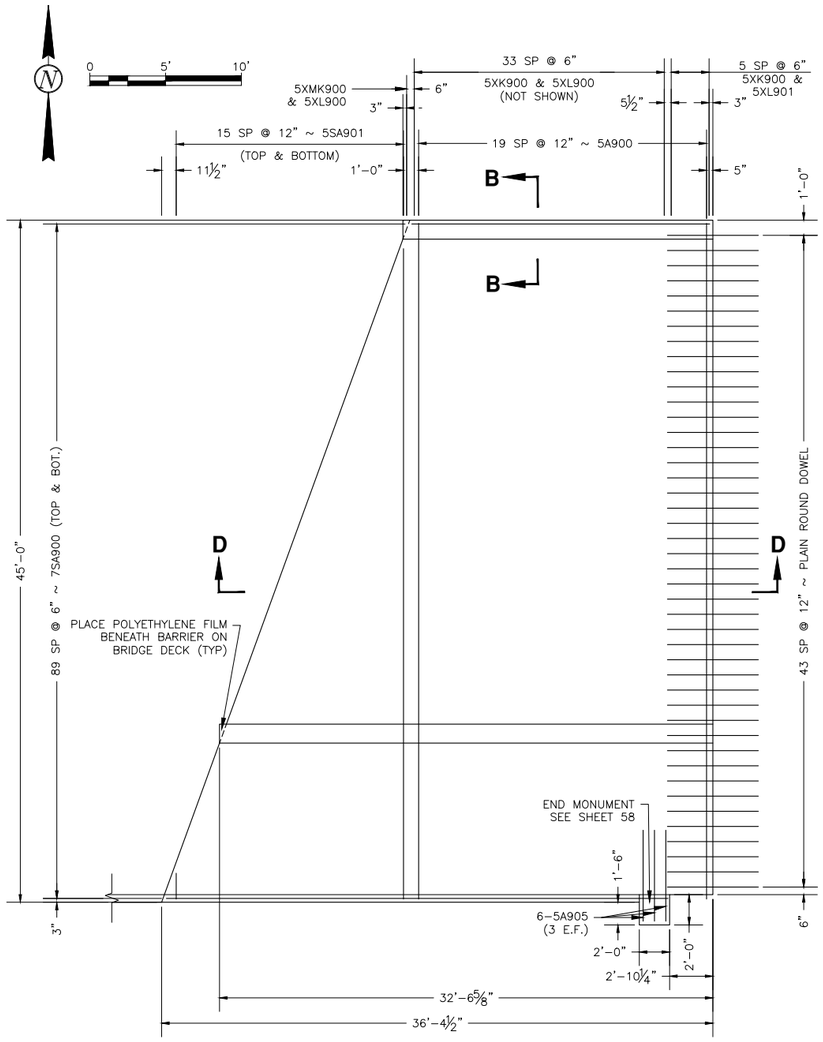
Eastbound

West Approach Slab

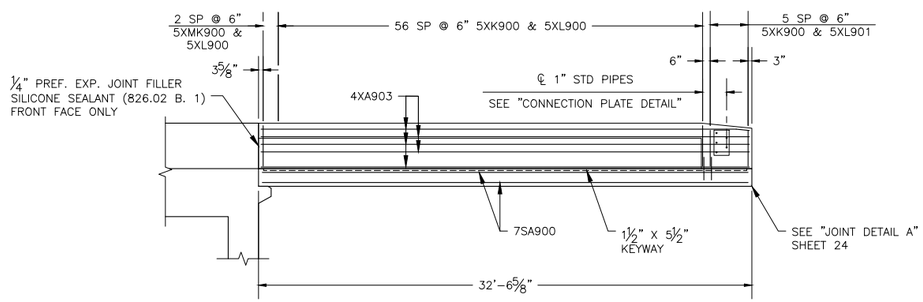
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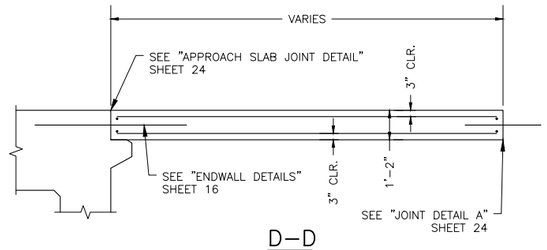
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	170	25



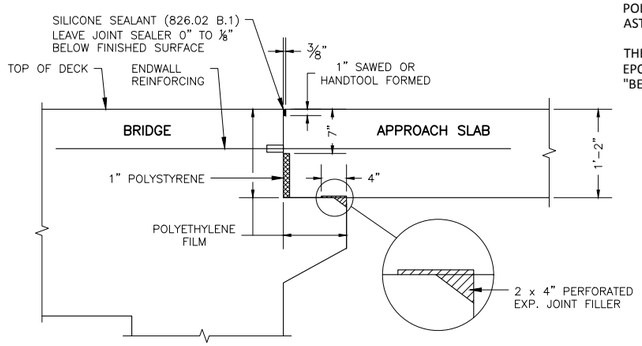
PLAN – EAST EXIT END



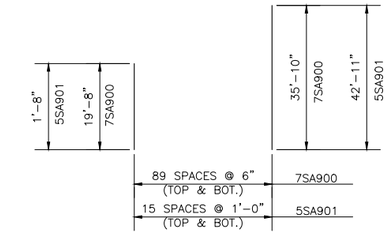
ELEVATION – EAST EXIT END
(SHOWING SOUTH BARRIER)



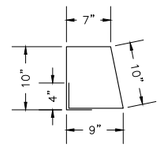
D–D



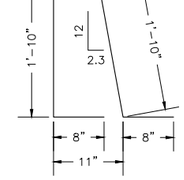
APPROACH SLAB JOINT DETAIL



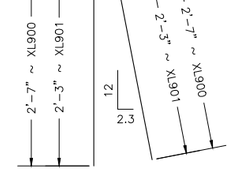
SA900 & SA901



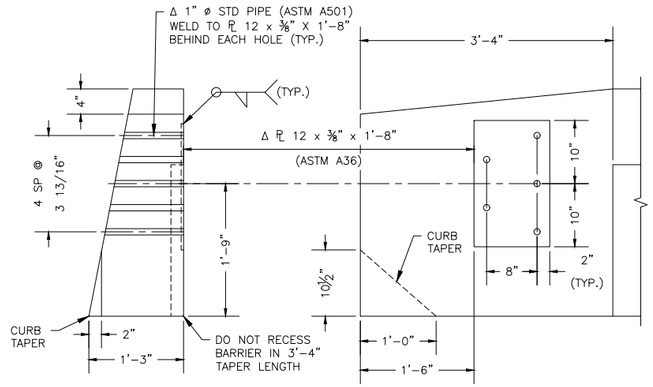
XMK900



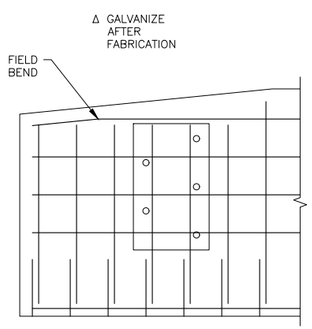
XK900



XL900 & XL901



SHOWING DIMENSIONS



SHOWING REINFORCING

CONNECTION PLATE DETAILS

NOTES:

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EAST APPROACH SLAB: SKEW ANGLE = 20°			
BAR LIST			
SIZE	MARK	NO. EACH	NOMINAL LENGTH
5	A900	40	44' - 8"
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4	XA904	9	20' - 1"
5	A905	6	6' - 0"
5	XK900	103	5' - 7"
5	XL900	94	5' - 7"
5	XL901	12	4' - 11"
5	XMK900	3	3' - 8"
7	SA900	2	2497' - 6"
5	SA901	2	356' - 8"
ESTIMATED MATERIAL QUANTITIES			
Reinforcing Steel (LBS)		Concrete (CY)	
14,376		60.6	
PAY QUANTITY = 141.1 SY			

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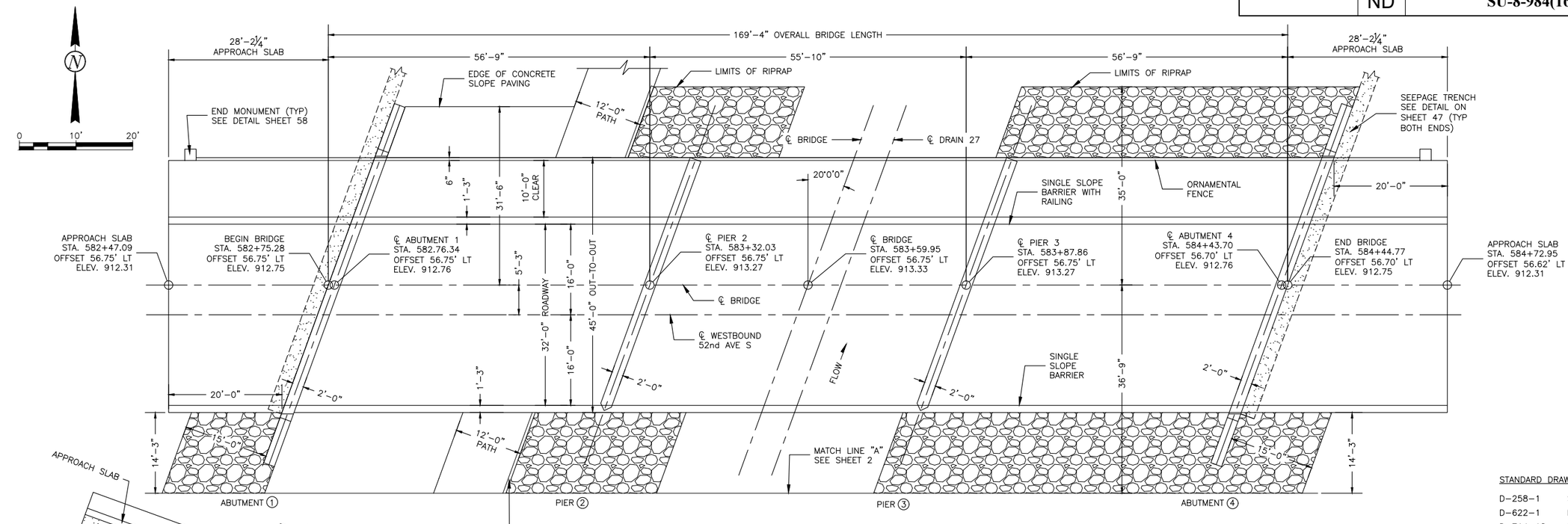
Eastbound

East Approach Slab

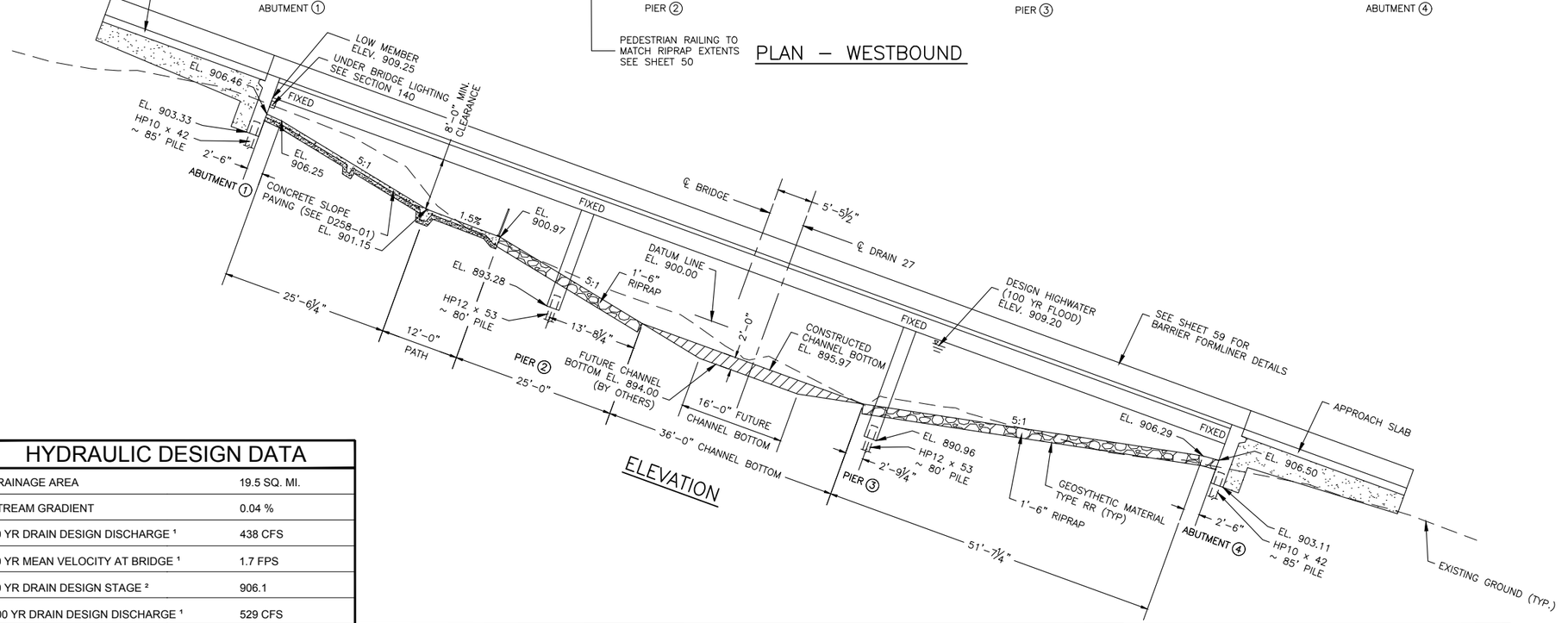
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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	170	26



PLAN – WESTBOUND



ELEVATION

HYDRAULIC DESIGN DATA

DRAINAGE AREA	19.5 SQ. MI.
STREAM GRADIENT	0.04 %
50 YR DRAIN DESIGN DISCHARGE [1]	438 CFS
50 YR MEAN VELOCITY AT BRIDGE [1]	1.7 FPS
50 YR DRAIN DESIGN STAGE [2]	906.1
100 YR DRAIN DESIGN DISCHARGE [1]	529 CFS
100 YR MEAN VELOCITY AT BRIDGE [1]	1.5 FPS
100 YR DRAIN DESIGN STAGE [2]	909.2

[1] LOCAL RUNOFF
[2] REGIONAL FLOOD
SEE HYDRAULIC REPORT FOR DESRCRIPTIONS OF LOCAL RUNOFF & REGIONAL FLOOD

GIRDER DATA

LENGTH "L"	GIRDER SPACING	THICKNESS OF SLAB BETW. BMS	THICKNESS OF SLAB ON TOP BMS	BOX BEAM DEPTH	LIVE LOAD	FINAL STRESSING FORCES AT MIDSPAN						
						A	KIPS	A	KIPS	A	KIPS	WEIGHT TONS
54'-10"	9'-6"	8"	9"	27"	HL-93	1.5	540.3	1.75	548.0	2.0	555.9	15.2
DETENSIONING STRENGTHS 4,800 PSI						ACCEPTANCE STRENGTH 5,500 PSI						

BENCH MARKS

NO.	DESCRIPTION	LOCATION	ELEV.
1	TOP NUT OF FIRE HYDRANT	STA. 582+06.61 O.S. 119.27' LT	910.48
2	CHISLED SQUARE SE CORNER OF LIFT STATION	STA. 585+29.80 O.S. 132.92' RT	909.37

STANDARD DRAWINGS

D-258-1	STANDARD SLOPE PROTECTION UNDER BRIDGE
D-622-1	PILE SPLICE DETAILS
D-714-18	EDGEDRAIN DETAILS
D-900-1	BRIDGE BENCHMARKS

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52nd Ave S over Drain 27

Westbound

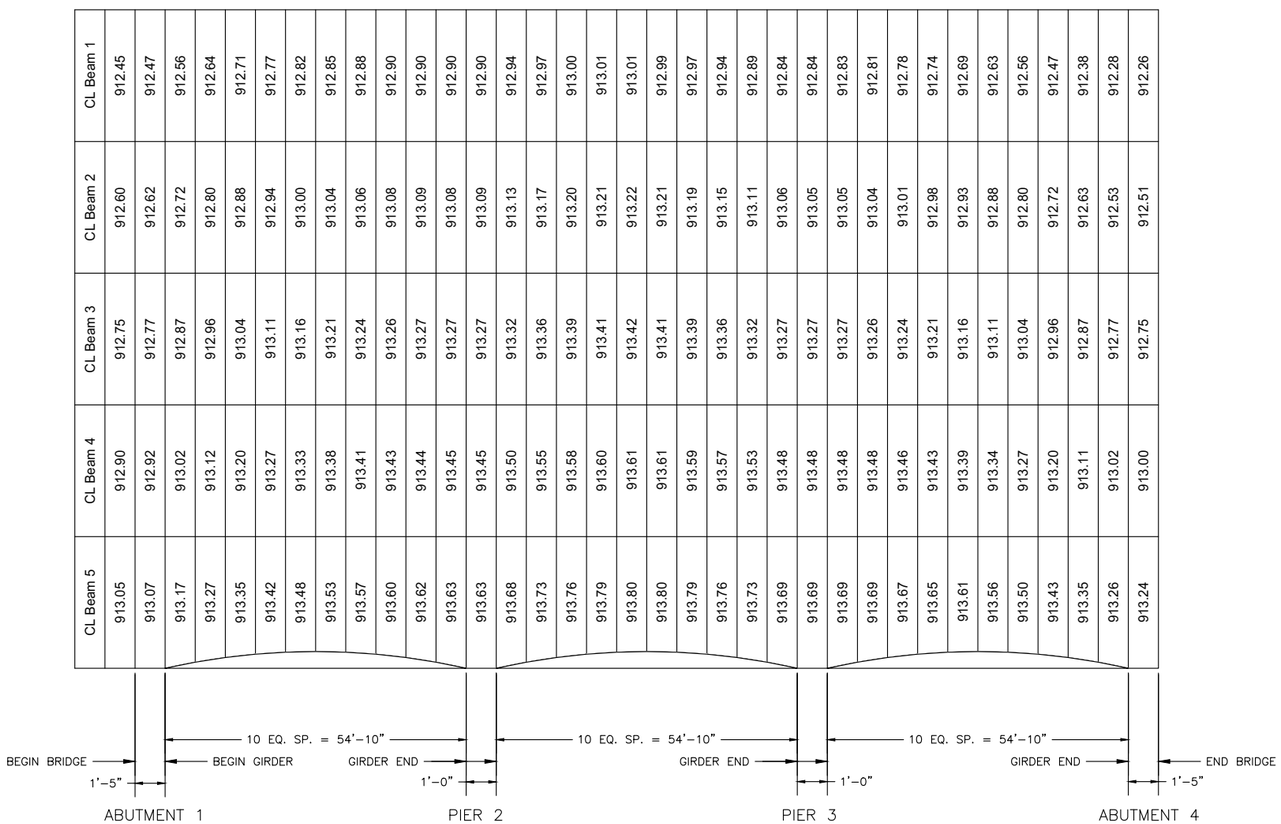
Bridge Layout

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	170	27

	CL Beam 1	CL Beam 2	CL Beam 3	CL Beam 4	CL Beam 5
BEGIN BRIDGE	912.45	912.60	912.75	912.90	913.05
	912.47	912.62	912.77	912.92	913.07
BEGIN GIRDER	912.56	912.72	912.87	913.02	913.17
	912.64	912.80	912.96	913.12	913.27
	912.71	912.88	913.04	913.20	913.35
	912.77	912.94	913.11	913.27	913.42
	912.82	913.00	913.16	913.33	913.48
	912.85	913.04	913.21	913.38	913.53
	912.88	913.06	913.24	913.41	913.57
	912.90	913.08	913.26	913.43	913.60
	912.90	913.09	913.27	913.44	913.62
	912.90	913.08	913.27	913.45	913.63
	912.90	913.09	913.27	913.45	913.63
GIRDER END	912.94	913.13	913.32	913.50	913.68
	912.97	913.17	913.36	913.55	913.73
	913.00	913.20	913.39	913.58	913.76
	913.01	913.21	913.41	913.60	913.79
	913.01	913.22	913.42	913.61	913.80
	912.99	913.21	913.41	913.61	913.80
	912.97	913.19	913.39	913.59	913.79
	912.94	913.15	913.36	913.57	913.76
	912.89	913.11	913.32	913.53	913.73
	912.84	913.06	913.27	913.48	913.69
	912.84	913.05	913.27	913.48	913.69
	912.83	913.05	913.27	913.48	913.69
	912.81	913.04	913.26	913.48	913.69
	912.78	913.01	913.24	913.46	913.67
	912.74	912.98	913.21	913.43	913.65
	912.69	912.93	913.16	913.39	913.61
	912.63	912.88	913.11	913.34	913.56
	912.56	912.80	913.04	913.27	913.50
	912.47	912.72	912.96	913.20	913.43
	912.38	912.63	912.87	913.11	913.35
	912.28	912.53	912.77	913.02	913.26
END BRIDGE	912.26	912.51	912.75	913.00	913.24



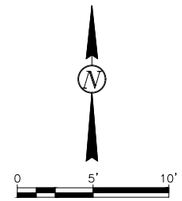
SCREED ELEVATIONS – WESTBOUND

NOTES:

1. ELEVATIONS ARE TO TOP OF FINISHED ROADWAY.
2. WEIGHT OF SCREED NOT INCLUDED IN CALCULATION OF DEFLECTIONS.
3. BEAM 1 IS NORTH EXTERIOR BEAM.

BRIDGE BID ITEMS

SPEC	CODE	ITEM DESCRIPTION	UNIT	QUANTITY
202	0105	REMOVAL OF STRUCTURE	L SUM	0.5
210	0099	CLASS 1 EXCAVATION	L SUM	0.5
210	0111	CLASS 2 EXCAVATION	L SUM	0.5
210	0127	CHANNEL EXCAVATION	L SUM	0.5
210	0411	FOUNDATION PREPARATION	L SUM	0.5
256	0200	RIPRAP GRADE II	CY	361
258	0100	CONCRETE SLOPE PROTECTION	SY	226
602	0130	CLASS AAE-3 CONCRETE	CY	224.8
602	1130	CLASS AE-3 CONCRETE	CY	194.9
602	1133	CONCRETE BRIDGE APPROACH SLAB	SY	282.2
602	1220	SINGLE SLOPE BARRIER	LF	337.8
602	1250	PENETRATING WATER REPELLENT TREATMENT	SY	602
604	9610	PRESTRESSED BOX BEAM-27IN	LF	822.5
612	0115	REINFORCING STEEL-GRADE 60	LBS	18,198
612	0116	REINFORCING STEEL-GRADE 60-EPOXY COATED	LBS	46,583
616	5890	STRUCTURAL STEEL	LSUM	0.5
622	0012	STEEL H-PILE TIPS 10 X 42	EA	12
622	0014	STEEL H-PILING POINTS 12 X 53	EA	16
622	0020	STEEL PILING HP 10 X 42	LF	1,020
622	0040	STEEL PILING HP 12 X 53	LF	1,280
624	0123	PEDESTRIAN RAILING	LF	80
624	0151	RAILING	LF	216
709	0155	GEOSYNTHETIC MATERIAL TYPE RR	SY	722
752	0850	ORNAMENTAL FENCE	LF	216
930	3000	BRIDGE BENCH MARKS	SET	0.5
930	9537	ABUTMENT UNDERDRAIN SYSTEM	EA	2



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52nd Ave S over Drain 27

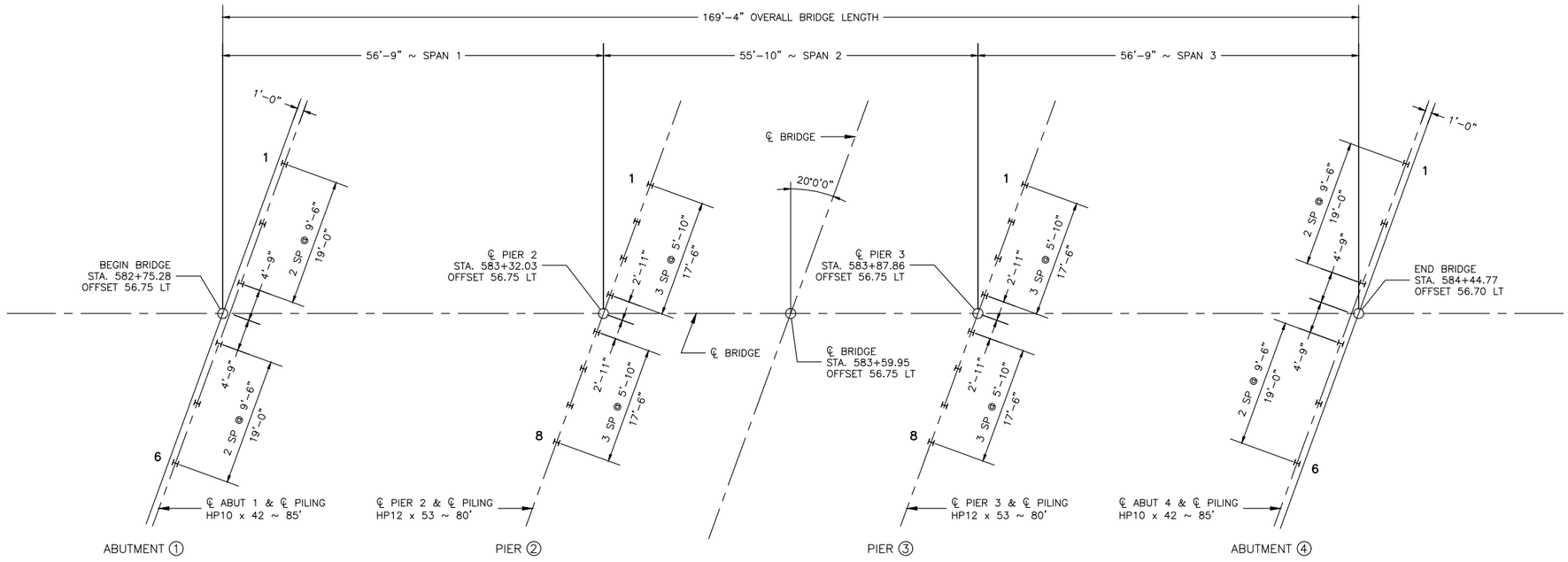
Westbound

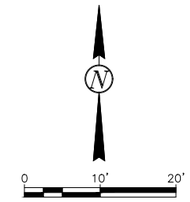
Screed Elevations & Quantities

09-140-30.0L-2

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	170	28





PILING LAYOUT – WESTBOUND

	PILE COORDINATES		
	PILE	NORTHING	EASTING
ABUT 1	1	435,782.54	2,876,740.70
	6	435,737.35	2,876,726.07
PIER 2	1	435,781.38	2,876,795.32
	8	435,742.53	2,876,782.75
PIER 3	1	435,783.40	2,876,851.12
	8	435,744.55	2,876,838.54
ABUT 4	1	435,788.58	2,876,907.79
	6	435,743.39	2,876,893.17

NOTES:

1. FOR DOUBLE OR SINGLE ACTING DIESEL HAMMERS, CALCULATE THE SAFE BEARING VALUE OF THE PILES BY THE FOLLOWING FORMULA:

$$P = \frac{4.5E}{S + 0.2} \times \frac{W + 0.2M}{W + M}$$

WHERE:

P = SAFE BEARING VALUE, IN POUNDS.
W = WEIGHT OF STRIKING PARTS (RAM), IN POUNDS.
M = WEIGHT OF PARTS BEING DRIVEN, IN POUNDS. INCLUDES PILE WEIGHT, ANVIL (IF ANY), DRIVING CAP, ETC.
E = ENERGY PER BLOW, IN FOOT–POUNDS.
S = AVERAGE PENETRATION OF PILE IN INCHES PER BLOW FOR LAST TEN BLOWS.

FOR SINGLE ACTING HAMMERS, CALCULATE E BY MULTIPLYING OBSERVED STROKE (ft) AND W (lbs).

2. SEE STANDARD DRAWING D–622–1 FOR PILE SPLICE DETAILS.
3. DRIVE PILES TO THE FOLLOWING LOADING:

HP10x42 ~ 105 TONS
HP12X53 ~ 130 TONS

PILE LOADING (TONS)			
LOCATION	DEAD LOAD	LIVE LOAD	DESIGN LOAD
ABUTMENT 1	57.6	30.5	88.1
PIER 2	63.0	31.2	94.2
PIER 3	63.0	31.2	94.2
ABUTMENT 4	57.6	30.5	88.1

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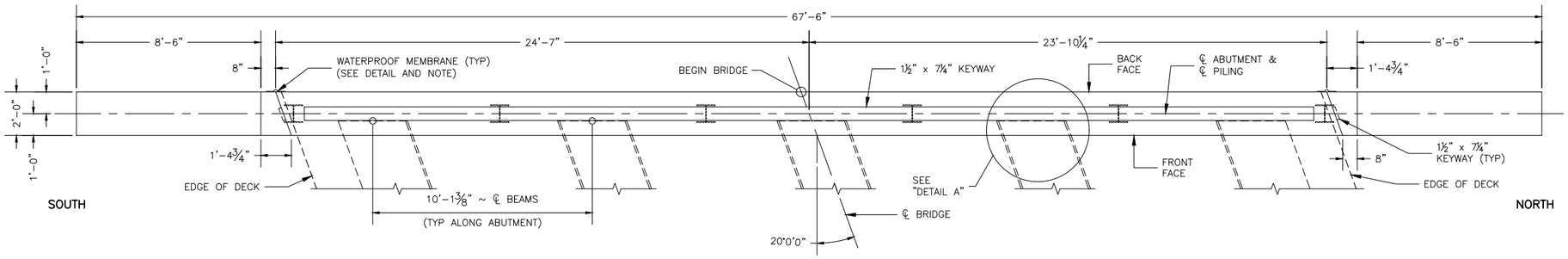
Westbound

Piling Layout

09-140-30.0L-3

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	170	29



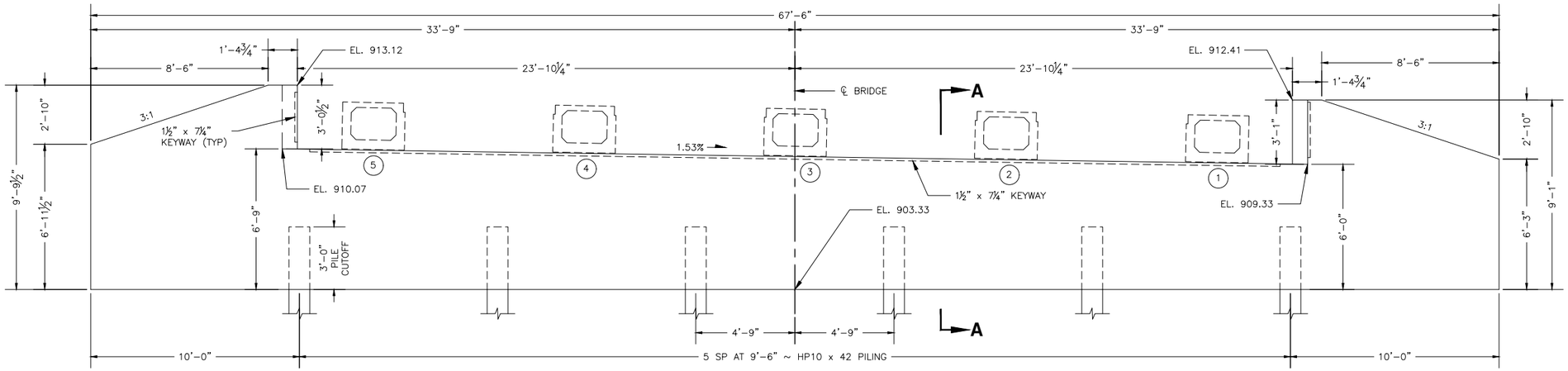
ABUTMENT 1 PLAN – WESTBOUND

SHOWING DIMENSIONS

0 3' 6'

NOTE:

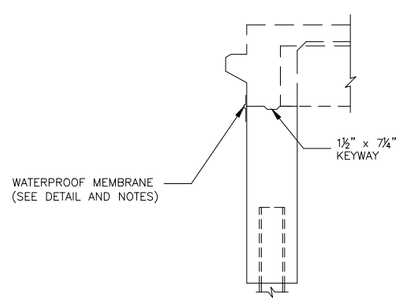
EXTEND SURFACE FINISH ON ABUTMENT AND WINGWALLS TO 2' BELOW FINAL GRADE.



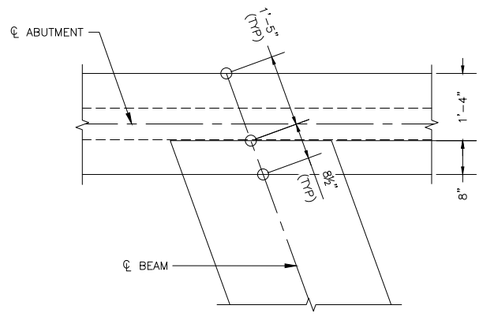
ABUTMENT 1 ELEVATION – WESTBOUND

LOOKING WEST – SHOWING DIMENSIONS

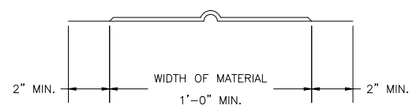
0 3' 6'



SECTION A–A



DETAIL A



NOTE: USE WATERPROOF MEMBRANE THAT MEETS THE REQUIREMENTS OF SECTION 602.03 B. INCLUDE THE COST OF WATERPROOF MEMBRANE IN THE CONTRACT UNIT PRICE FOR "CLASS AE–3 CONCRETE."

WATERPROOF MEMBRANE DETAIL

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Ph: 701.237.5065

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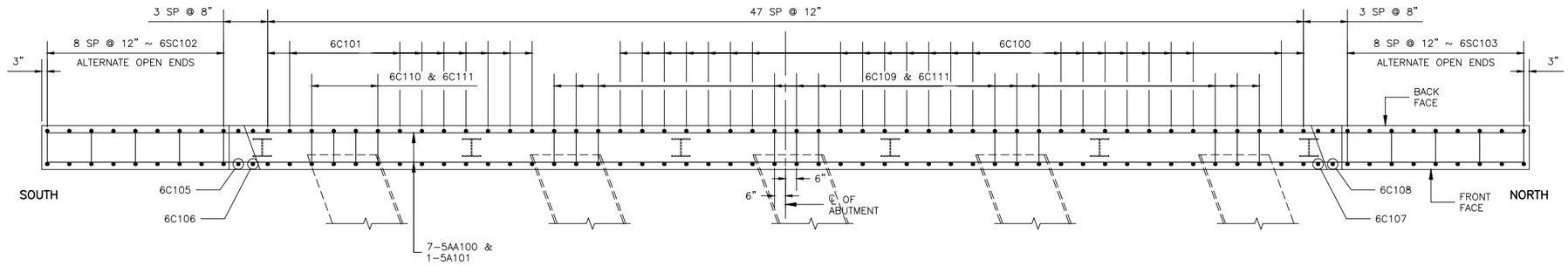
Westbound

Abutment 1 Geometrics

09-140-30.0L-4

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	170	30



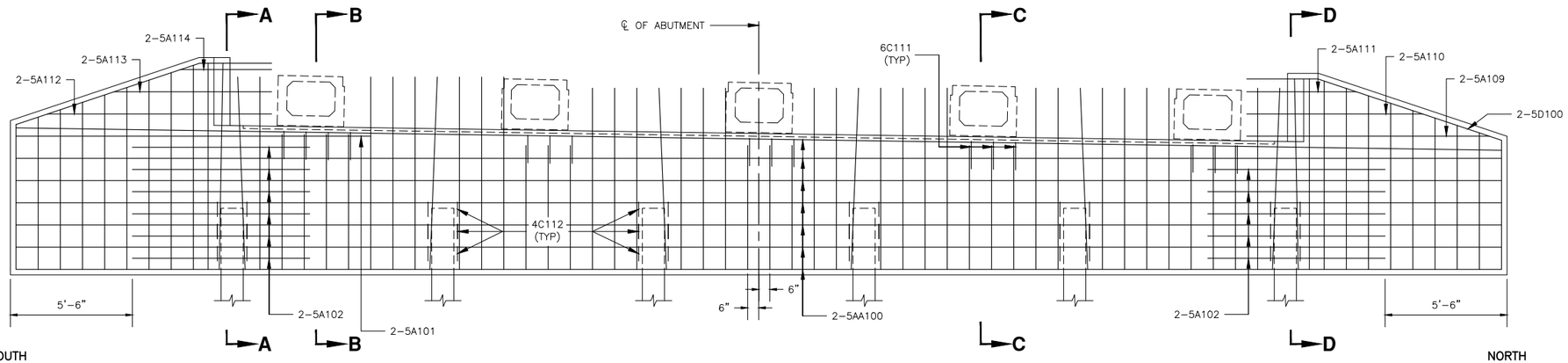
ABUTMENT 1 PLAN – WESTBOUND

SHOWING REINFORCEMENT

0 3' 6'

NOTE:

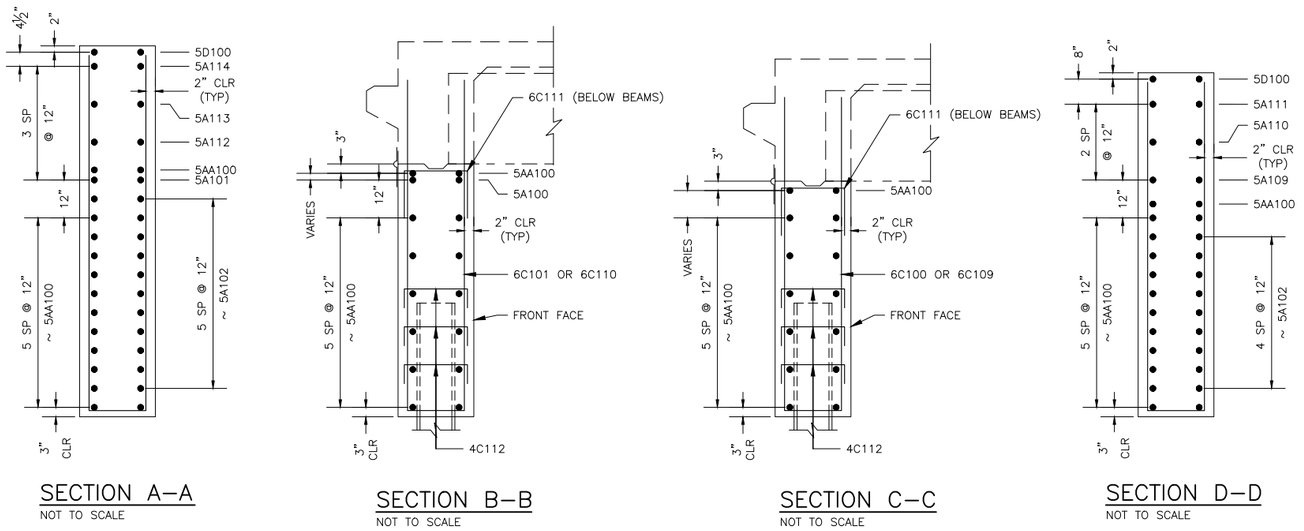
SEE SHEETS 45 & 46 FOR REINFORCING LIST AND BENT BAR DETAILS.



ABUTMENT 1 ELEVATION – WESTBOUND

LOOKING WEST – SHOWING REINFORCEMENT

0 3' 6'



QUANTITIES & PROPERTIES ABUTMENT 1	
CLASS AE–3 CONCRETE	34.4 C.Y.
CONCRETE STRENGTH	3,000 PSI
REINFORCING STEEL	3,352 LBS
REINFORCEMENT STRENGTH	60,000 PSI
PILING (SEE LAYOUT – SHEET 28)	

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52nd Ave S over Drain 27

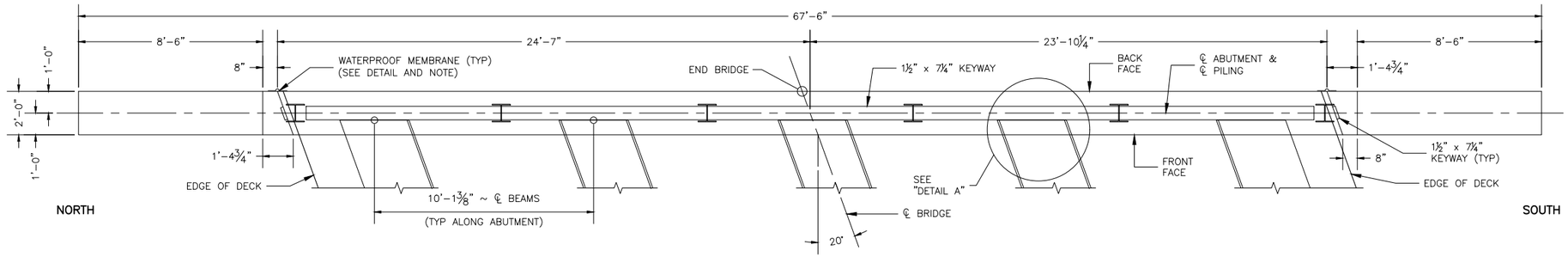
Westbound

Abutment 1 Reinforcing

09-140-30.0L-5

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	170	31



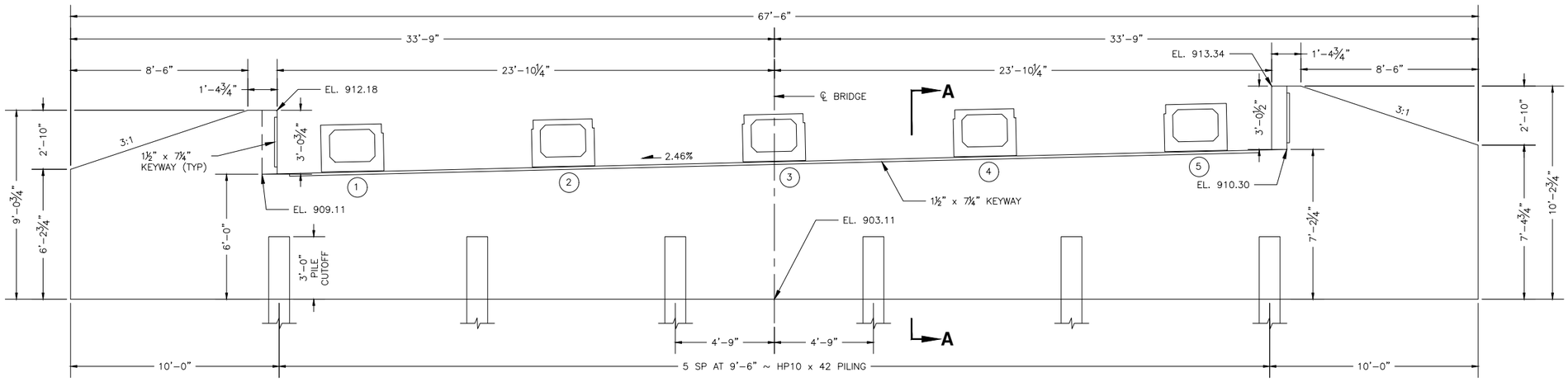
ABUTMENT 4 PLAN – WESTBOUND

SHOWING DIMENSIONS

0 3' 6'

NOTE:

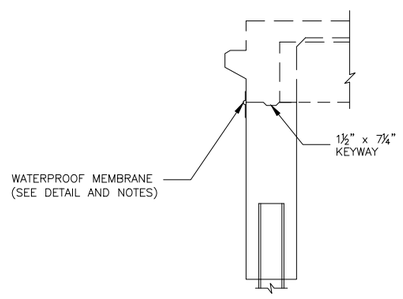
EXTEND SURFACE FINISH ON ABUTMENT AND WINGWALLS TO 2' BELOW FINAL GRADE.



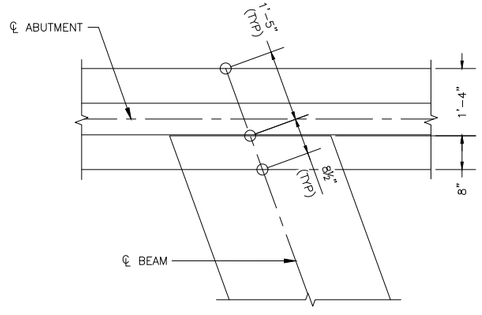
ABUTMENT 4 ELEVATION – WESTBOUND

LOOKING EAST – SHOWING DIMENSIONS

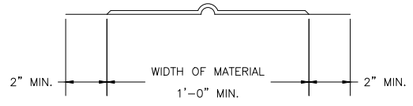
0 3' 6'



SECTION A–A



DETAIL A



NOTE: USE WATERPROOF MEMBRANE THAT MEETS THE REQUIREMENTS OF SECTION 602.03 B. INCLUDE THE COST OF WATERPROOF MEMBRANE IN THE CONTRACT UNIT PRICE FOR "CLASS AE–3 CONCRETE."

WATERPROOF MEMBRANE DETAIL

THE CITY OF Fargo FAR MORE

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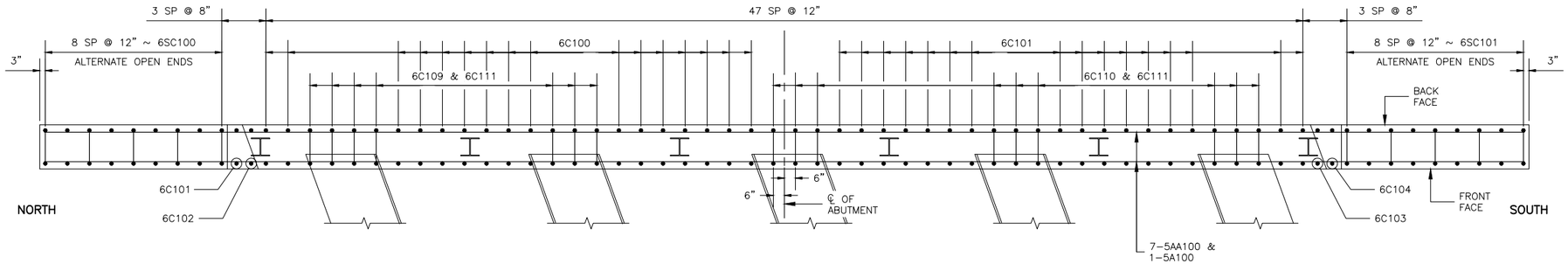
Westbound

Abutment 4 Geometrics

09-140-30.0L-6

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	170	32



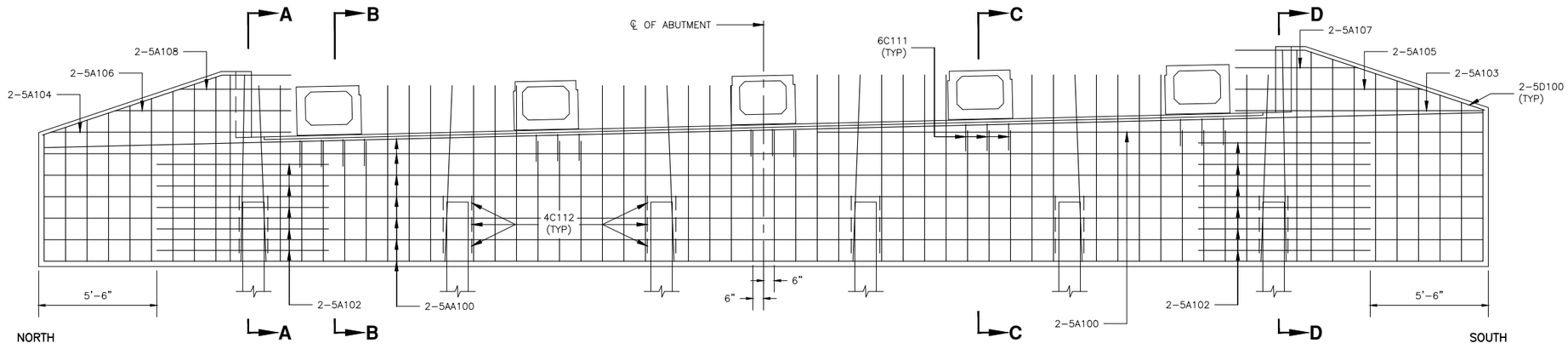
ABUTMENT 4 PLAN – WESTBOUND

SHOWING REINFORCEMENT

0 3' 6'

NOTE:

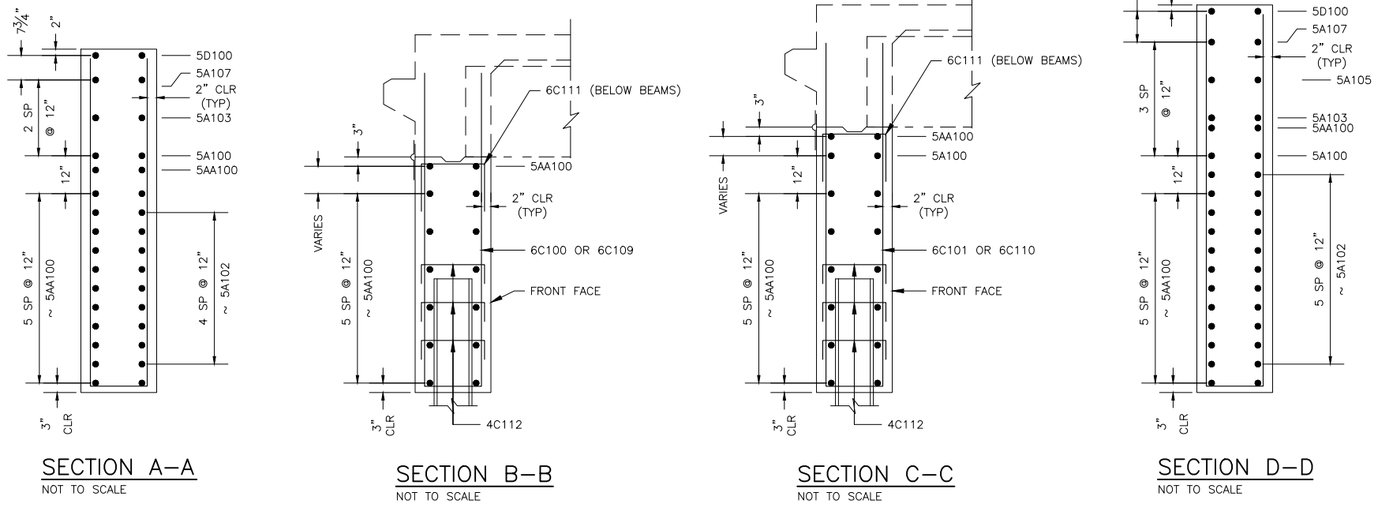
SEE SHEETS 45 & 46 FOR REINFORCING LIST AND BENT BAR DETAILS.



ABUTMENT 4 ELEVATION – WESTBOUND

LOOKING EAST – SHOWING REINFORCEMENT

0 3' 6'



SECTION A–A

NOT TO SCALE

SECTION B–B

NOT TO SCALE

SECTION C–C

NOT TO SCALE

SECTION D–D

NOT TO SCALE

QUANTITIES & PROPERTIES ABUTMENT 4	
CLASS AE-3 CONCRETE	35.5 C.Y.
CONCRETE STRENGTH	3,000 PSI
REINFORCING STEEL	3,433 LBS
REINFORCEMENT STRENGTH	60,000 PSI
PILING (SEE LAYOUT – SHEET 28)	

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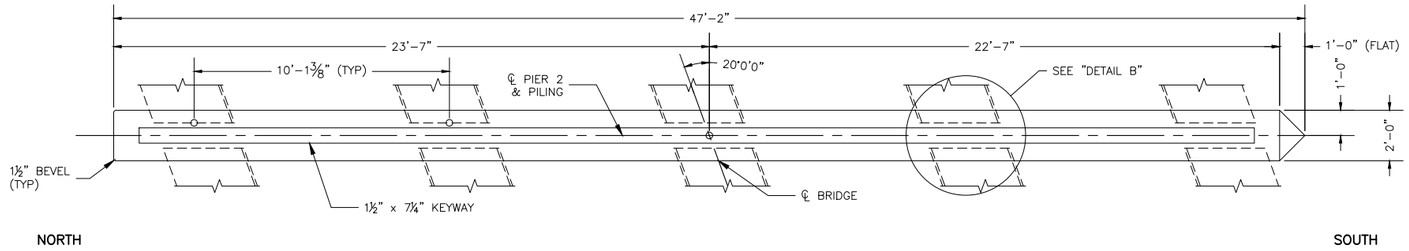
Westbound

Abutment 4 Reinforcing

09-140-30.0L-7

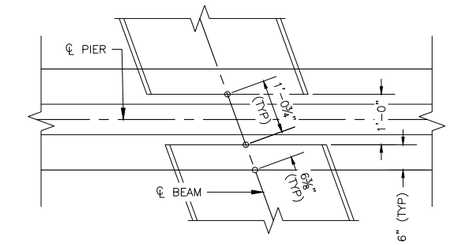
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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	170	33

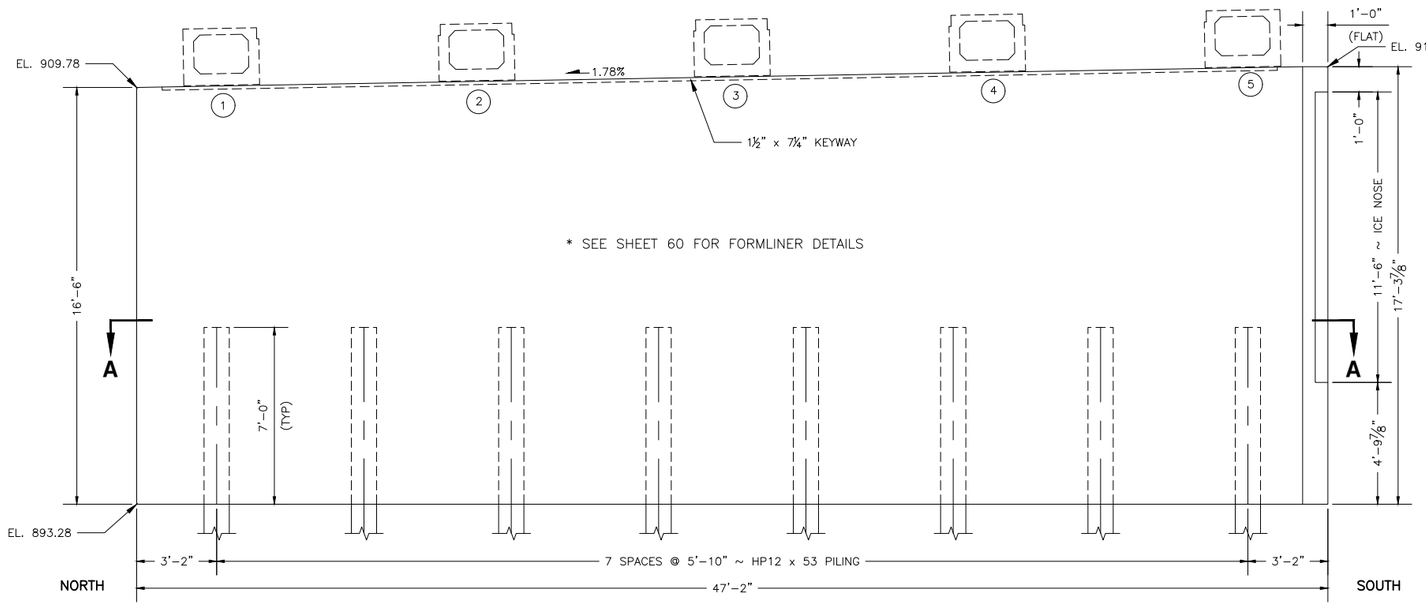


PIER 2 PLAN – WESTBOUND

SHOWING GEOMETRICS 0 3' 6'

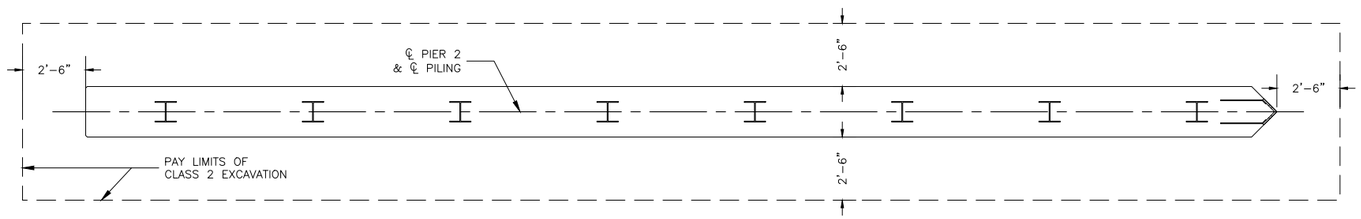


DETAIL B

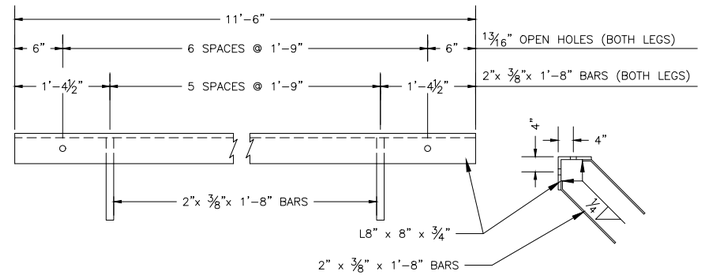


PIER 2 ELEVATION – WESTBOUND

LOOKING EAST – SHOWING GEOMETRICS 0 3' 6'



SECTION A–A



ICE NOSE DETAIL

NOT TO SCALE

NOTES:

1. EXTEND SURFACE FINISH ON PIER TO 2' BELOW FINAL GRADE.
2. 2'–0" THICKNESS SHOWN IS NOMINAL. ADJUST THICKNESS AS NECESSARY TO MAINTAIN CLEARANCE FROM FORMLINER RELIEFS.

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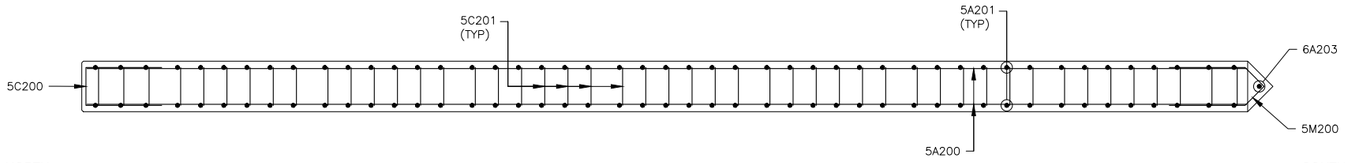
Westbound

Pier 2 Geometrics

09-140-30.0L-8

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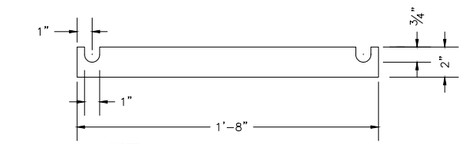
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	170	34



PIER 2 PLAN – WESTBOUND

SHOWING REINFORCING

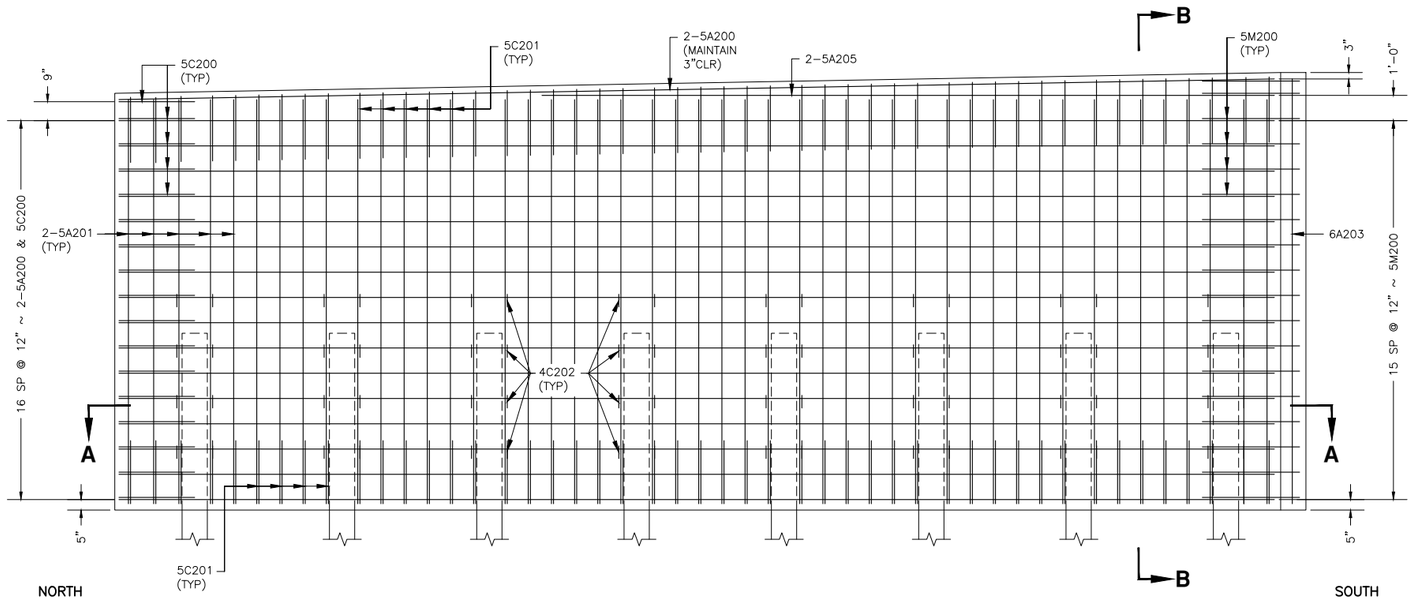
0 3' 6'



NOTE:
2" x ⅜" FLAT BAR TO BE INCIDENTAL TO REINFORCING STEEL.

BAR SUPPORT DETAIL

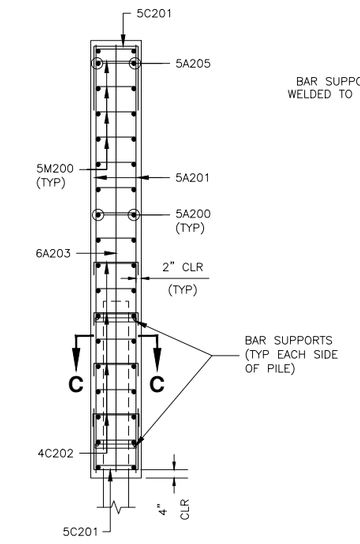
NOT TO SCALE



PIER 2 ELEVATION – WESTBOUND

LOOKING EAST – SHOWING REINFORCING

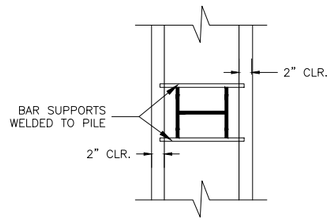
0 3' 6'



SECTION B–B

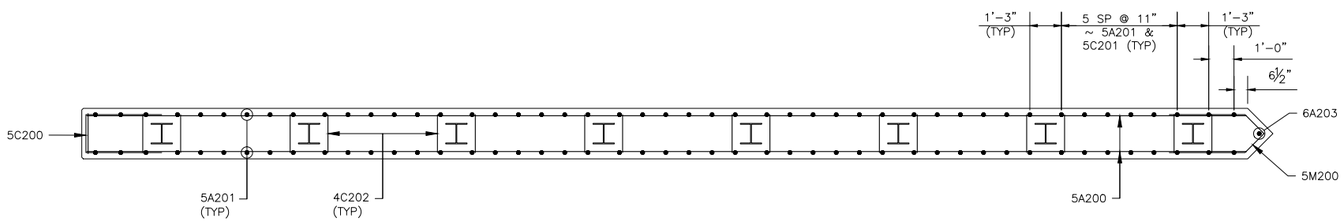
NOTE:

SEE SHEETS 45 & 46 FOR REINFORCING LIST AND BENT BAR DETAILS.



SECTION C–C

NOT TO SCALE



SECTION A–A

QUANTITIES & PROPERTIES PIER 2	
CLASS AE–3 CONCRETE	58.5 C.Y.
CONCRETE STRENGTH	3,000 PSI
REINFORCING STEEL	4,527 LBS
REINFORCEMENT STRENGTH	60,000 PSI
STRUCTURAL STEEL	498 LBS
PILING (SEE LAYOUT – SHEET 28)	

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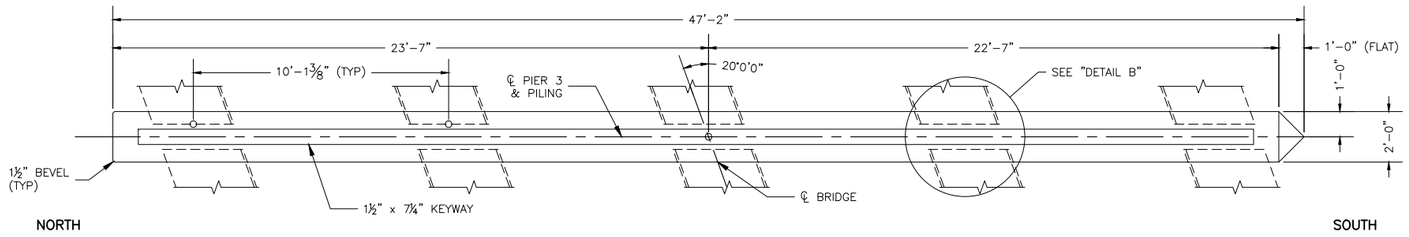
Westbound

Pier 2 Reinforcing

09-140-30.0L-9

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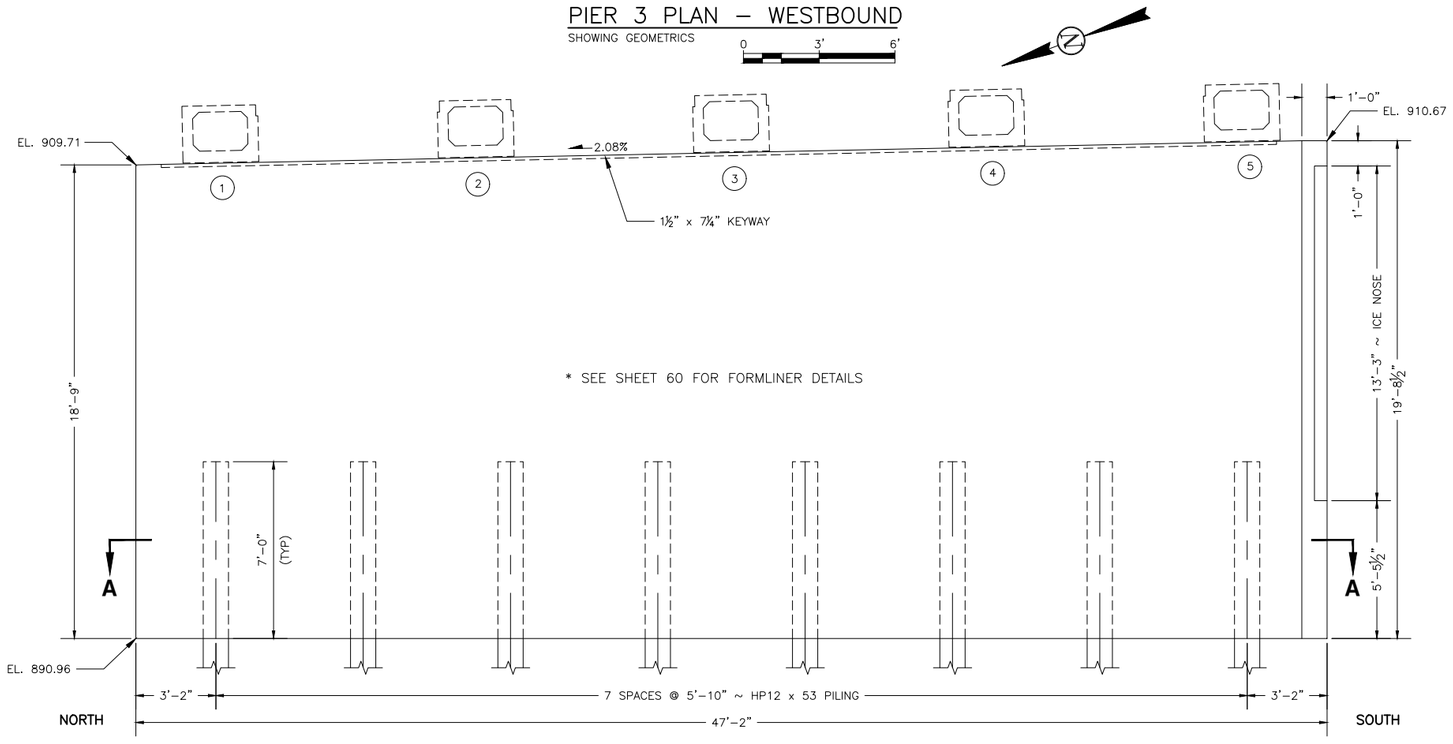
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	170	35



PIER 3 PLAN – WESTBOUND

SHOWING GEOMETRICS

0 3' 6'

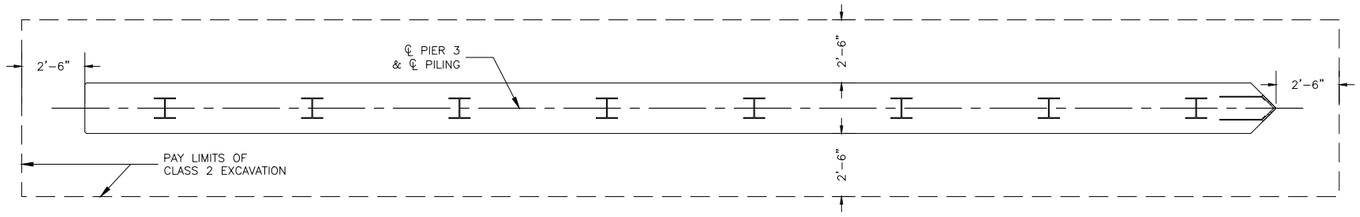


* SEE SHEET 60 FOR FORMLINER DETAILS

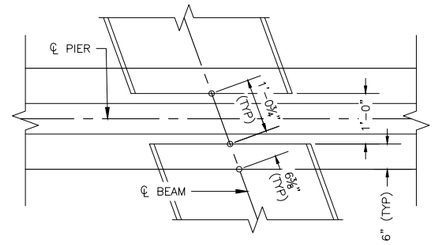
PIER 3 ELEVATION – WESTBOUND

LOOKING EAST – SHOWING GEOMETRICS

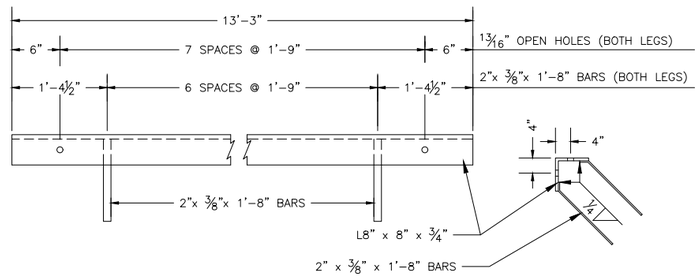
0 3' 6'



SECTION A–A



DETAIL B



ICE NOSE DETAIL

NOT TO SCALE

NOTES:

1. EXTEND SURFACE FINISH ON PIER TO 2' BELOW FINAL GRADE.
2. 2'-0" THICKNESS SHOWN IS NOMINAL. ADJUST THICKNESS AS NECESSARY TO MAINTAIN CLEARANCE FROM FORMLINER RELIEFS.

THE CITY OF Fargo FAR MORE

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Houston Engineering Inc.
Ph: 701.237.5065

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52nd Ave S over Drain 27

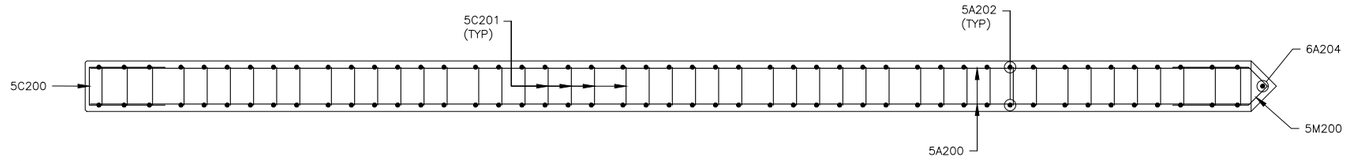
Westbound

Pier 3 Geometrics

09-140-30.0L-10

08/15/18 06:37:23AM H:\Fargo\JBN\6000\6059\18_6059_145 – 52nd Ave. Design\CAD\Plans\Bridge\Drain 27 Westbound\Drain 27 Westbound Pier 3.dwg

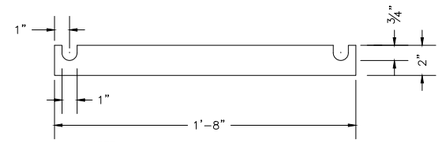
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	170	36



PIER 3 PLAN – WESTBOUND

SHOWING REINFORCING

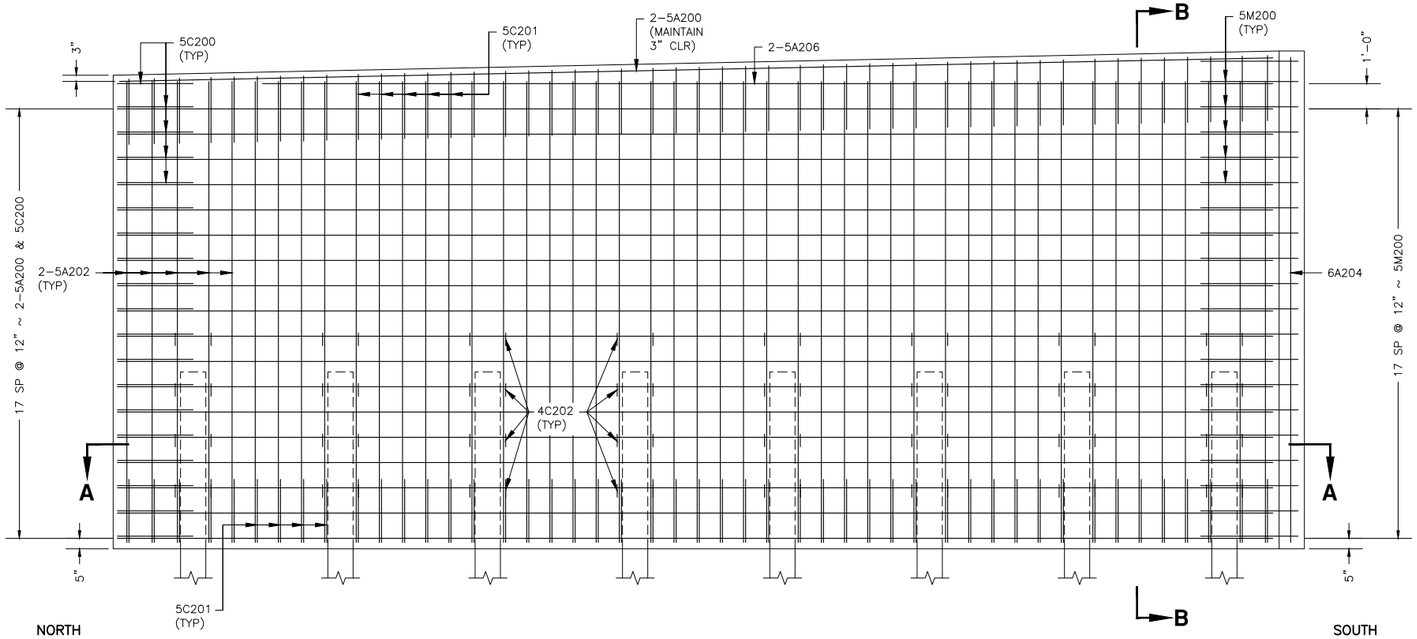
0 3' 6'



NOTE:
2" x 3/8" FLAT BAR TO BE INCIDENTAL TO REINFORCING STEEL.

BAR SUPPORT DETAIL

NOT TO SCALE

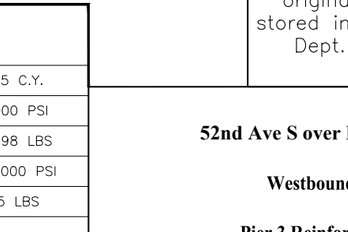


PIER 3 ELEVATION – WESTBOUND

LOOKING EAST – SHOWING REINFORCING

0 3' 6'

SECTION B–B

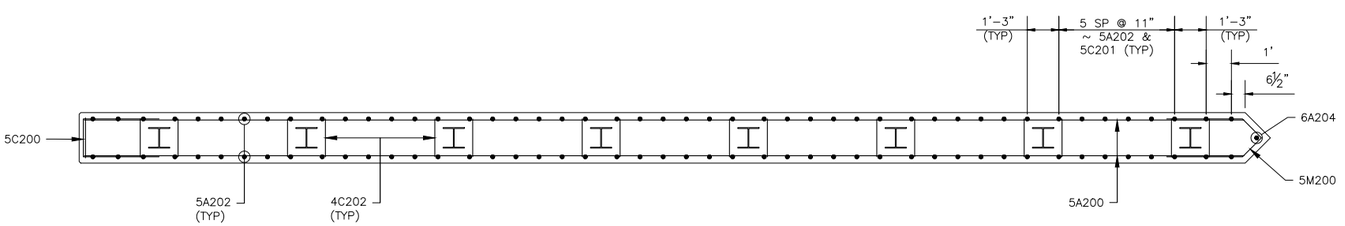


SECTION C–C

NOT TO SCALE

NOTE:

SEE SHEETS 45 & 46 FOR REINFORCING LIST AND BENT BAR DETAILS.



SECTION A–A

QUANTITIES & PROPERTIES PIER 3	
CLASS AE–3 CONCRETE	66.5 C.Y.
CONCRETE STRENGTH	3,000 PSI
REINFORCING STEEL	4,998 LBS
REINFORCEMENT STRENGTH	60,000 PSI
STRUCTURAL STEEL	575 LBS
PILING (SEE LAYOUT – SHEET 28)	

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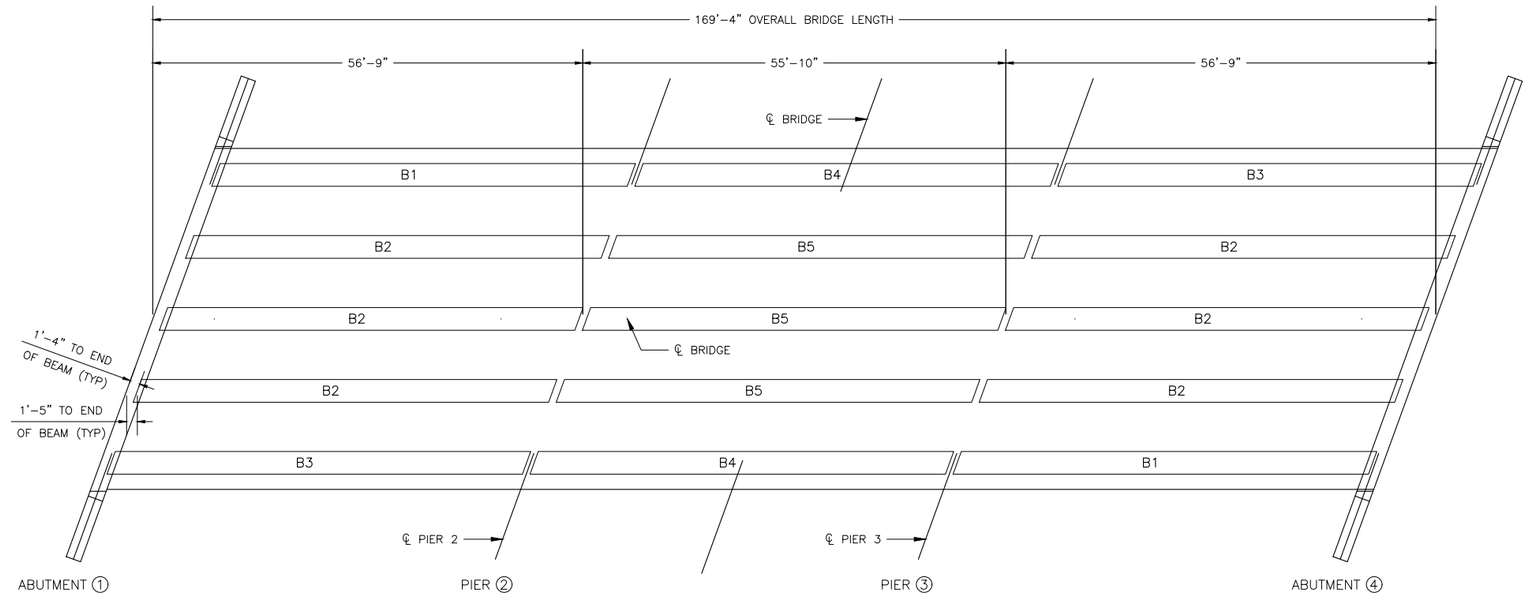
Westbound

Pier 3 Reinforcing

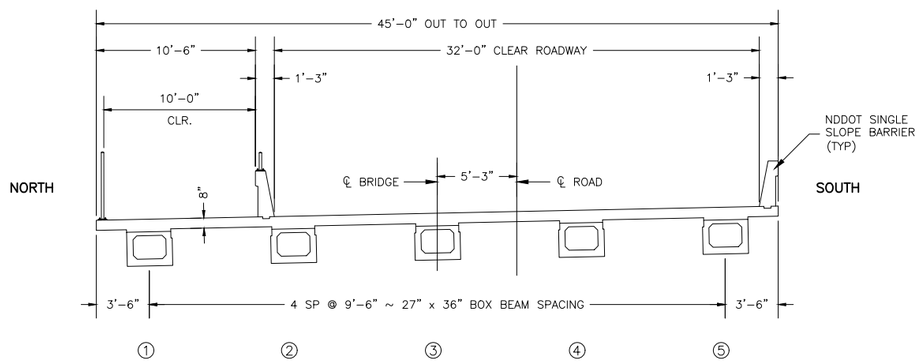
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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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BEAM FRAMING PLAN – WESTBOUND



DECK SECTION – WESTBOUND

BEARING SEAT ELEVATIONS

GIRDER HT. = 27"		POSI–RISER = 1⅜"		DECK = 8"	
		FILLER = ⅜"		TOTAL = 3.06'	
LOCATION	GIRDER 1	GIRDER 2	GIRDER 3	GIRDER 4	GIRDER 5
ABUTMENT 1	909.40	909.56	909.71	909.86	910.01
PIER 2	909.84	910.03	910.21	910.39	910.57
PIER 3	909.78	910.00	910.21	910.42	910.63
ABUTMENT 4	909.22	909.46	909.71	909.95	910.20

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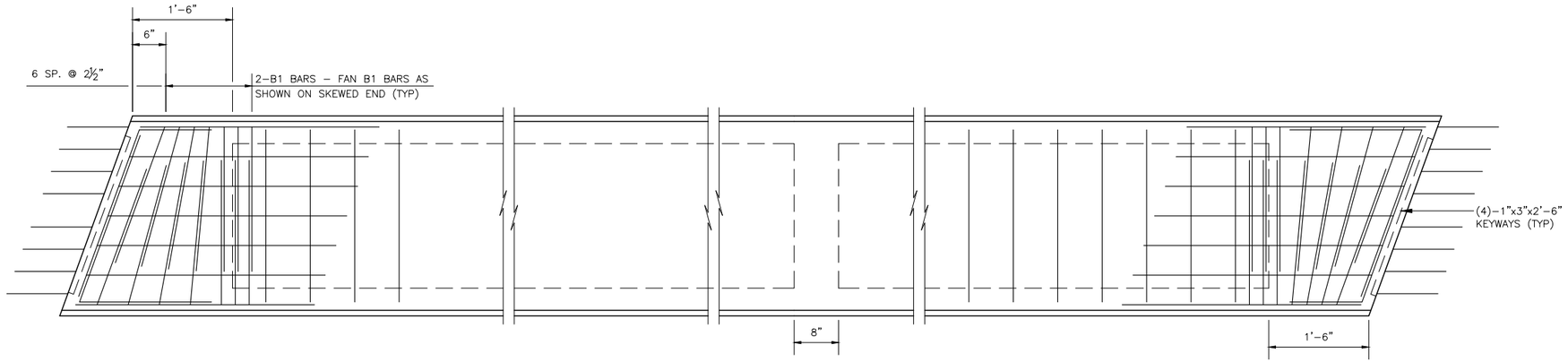
Westbound

Beam Framing Plan

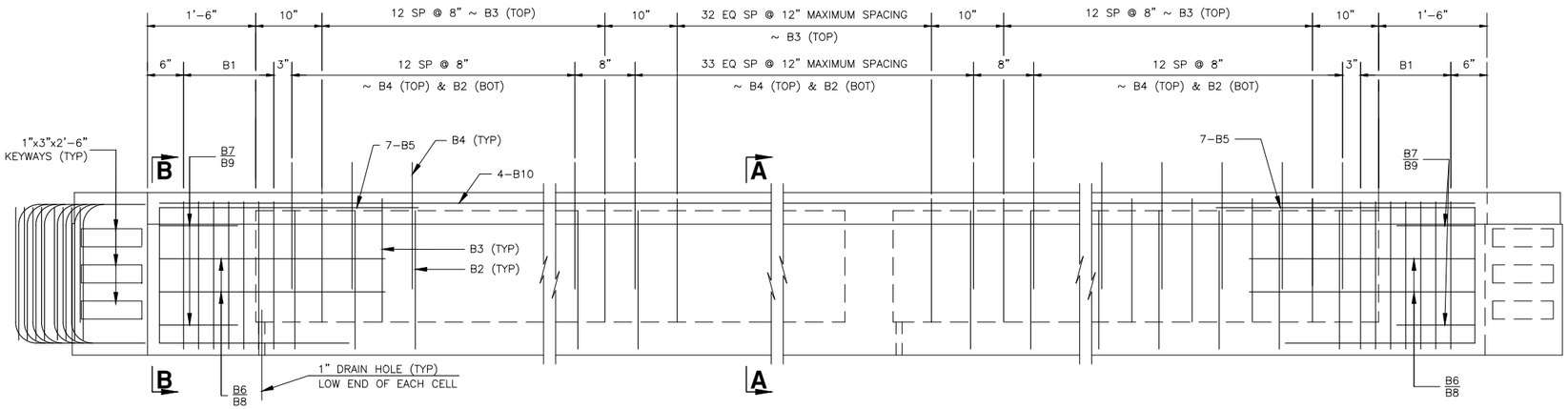
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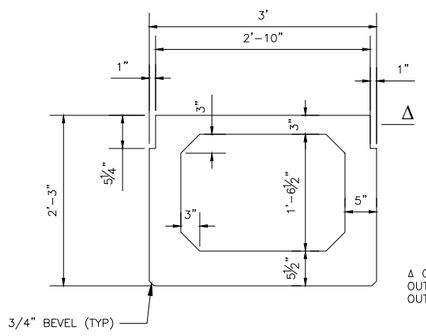
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	170	38



PLAN



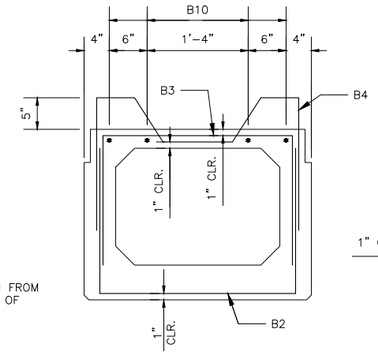
ELEVATION



Δ OMIT NOTCH FROM OUTSIDE FACE OF OUTER BEAM

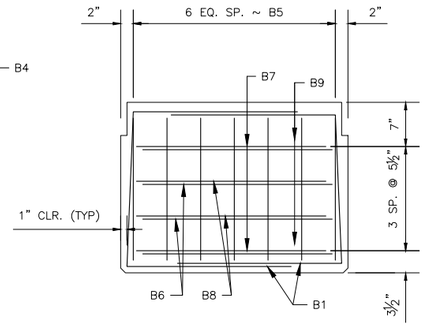
(SHOWING DIMENSIONS)

A – A

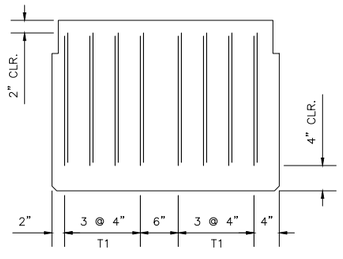


(SHOWING REINFORCING)

A – A



B – B



END VIEW

BEAM SECTION DATA
WT = 536 LBS/FT + 2371 LBS
CROSS SECTIONAL AREA = 498.0 IN^2
C.G. (FROM BOTTOM) = 12.12 IN
I = 43,533 IN^4
SB = 3,592 IN^3

SINGLE BEAM

BILL OF REINFORCEMENT

MARK	NO.	SIZE	LENGTH	SHAPE
B1	28	4	6' - 5"	BENT
B2*	60	4	6' - 5"	BENT
B3*	59	4	6' - 0"	BENT
B4	60	4	6' - 9"	BENT
B5	14	5	8' - 1"	BENT
B6	4	4	5' - 9"	BENT
B7	4	4	3' - 9"	BENT
B8	4	4	6' - 8"	BENT
B9	4	4	4' - 8"	BENT
B10	4	4	54' - 6"	STRT.
T1**	32	4	4' - 6"	STRT.

* WELDED WIRE REINFORCING WITH MINIMUM CIRCUMFERENTIAL STEEL AREA OF 0.30 SQ IN PER FT MAY BE SUBSTITUTED FOR B2 AND B3 BARS.

** FIELD BEND AS SHOWN (GRADE 40).

THE CITY OF Fargo FAR MORE

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52nd Ave S over Drain 27

Westbound

27 Inch Box Beam Details

09-140-30.0L-13

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	170	39

NOTES:

SUBMIT THE WORK DRAWINGS TO THE ENGINEER AT LEAST 14 DAYS PRIOR TO THE FORMING AND POURING OF ANY BEAMS. INCLUDE IN THE WORK DRAWINGS THE TOTAL INITIAL PRESTRESS FORCE AND THE LOSSES IN THE PRESTRESS DUE TO ELASTIC SHORTENING, SHRINKING OR CREEPING OF CONCRETE, AND THE RELAXATION OF STEEL STRESS AS DETERMINED BY THE CONTRACTOR FOR HIS METHOD OF STRESSING.

SHOW STRAND LAYOUT, PULL DOWN LOCATIONS, TENSIONING FORCES, ELONGATION AND ANY PROPOSED CHANGES IN REINFORCING STEEL IN THE WORK DRAWINGS.

SELECT THE FINAL PRESTRESS FORCE (REMAINING AFTER ALL LOSSES HAVE BEEN ACCOUNTED FOR) AND ITS CORRESPONDING CENTER OF GRAVITY, FROM THOSE ON A CURVE DETERMINED BY THE THREE VALUES SHOWN IN THE "PRESTRESSING DATA" TABLE.

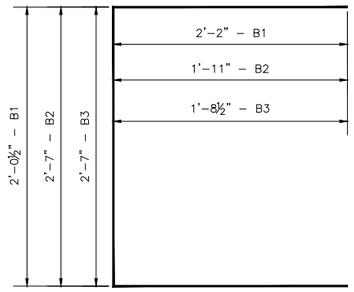
POUR BEAMS IN ALL STEEL FORMS.

ALL REINFORCING STEEL SHALL HAVE A CLEARANCE OF 1" UNLESS OTHERWISE NOTED.

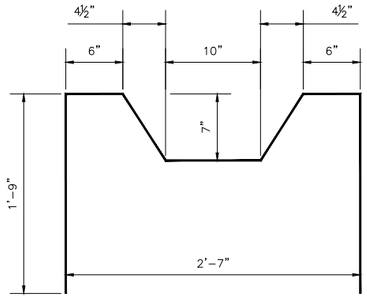
MINOR CHANGES TO THE SHAPE OF THE BEAM AND TO REINFORCING STEEL MAY BE MADE TO ACCOMMODATE THE FORMS OF VARIOUS CONTRACTORS AND THEIR CONSTRUCTION METHODS WITH THE APPROVAL OF THE ENGINEER.

ROUGH FLOAT AND TRANSVERSELY BROOM THE TOP OF THE BEAMS FOR BOND.

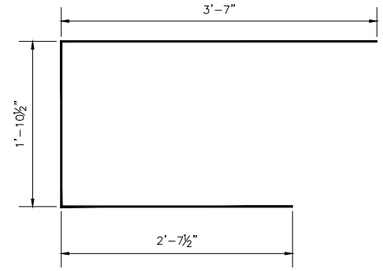
PROVIDE HANDLING HOOKS OR DEVICES AS REQUIRED BY THE CONTRACTOR. INSTALL HOOKS WITH 4'–0" OF THE END OF BEAM.



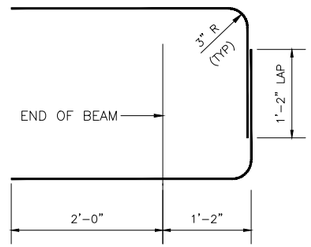
B1, B2, & B3



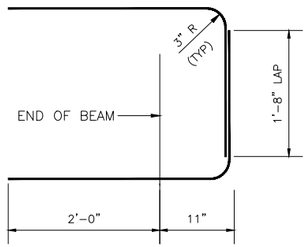
B4



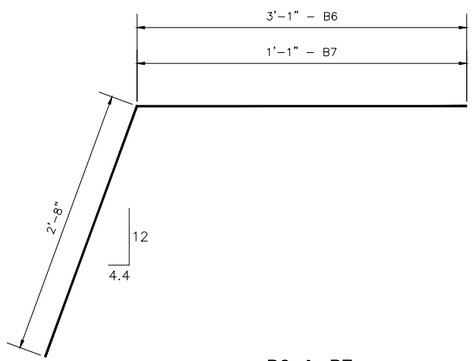
B5



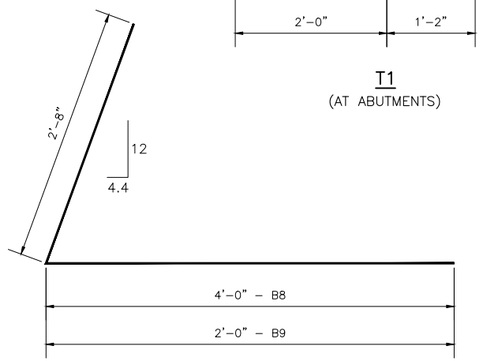
T1
(AT ABUTMENTS)



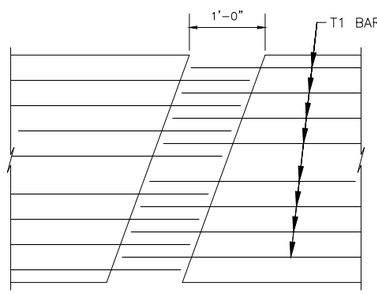
T1
(AT PIERS)



B6 & B7



B8 & B9



BEAM END PLAN AT PIER

BENT BAR DETAILS

(DIMENSIONS SHOWN ARE OUT TO OUT)

PRESTRESSING DATA					
C.G.	FINAL FORCE	DETENSION STRENGTH	ACCEPTANCE STRENGTH	WEIGHT (TONS)	BEAM LENGTH
1.50	540.3 k	4800 psi (Min)	5500 psi (Min)	15.9	54'-10"
1.75	548.0 k				
2.00	555.9 k				

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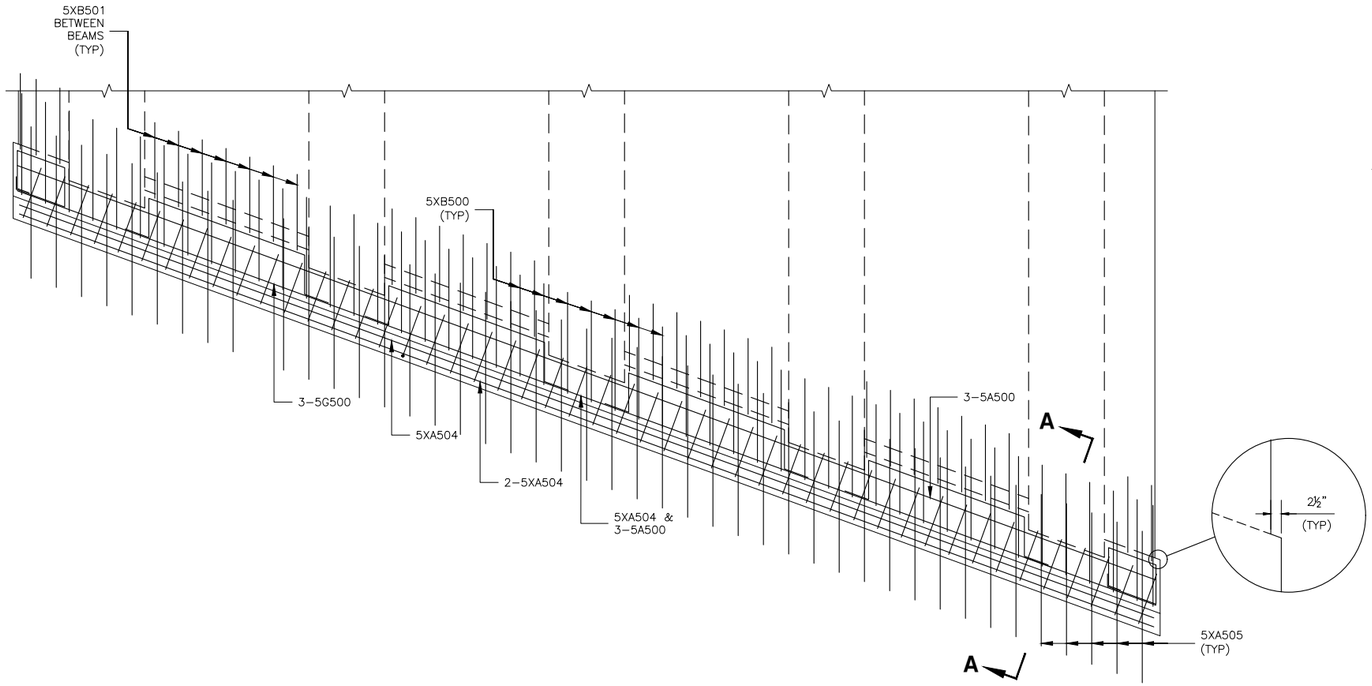
Westbound

27 Inch Box Beam Details

09-140-30.0L-14

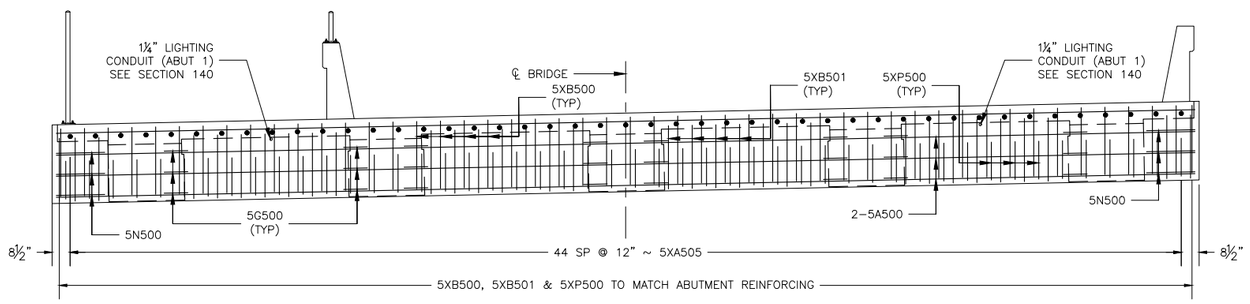
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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	170	40



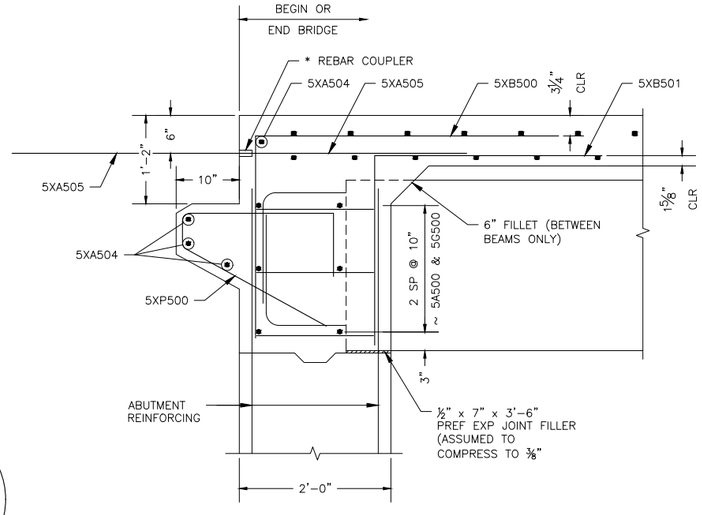
ENDWALL PLAN – WESTBOUND

NOT TO SCALE



ENDWALL ELEVATION – WESTBOUND

NOT TO SCALE (APPROACH LIP NOT SHOWN)

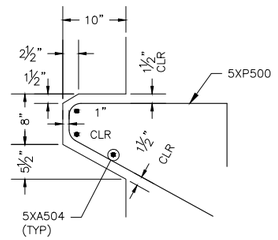


A–A

* USE APPROVED MECHANICAL CONNECTORS FOR THE COUPLERS CAPABLE OF DEVELOPING 125% OF THE REINFORCING STEEL SPECIFIED YIELD STRENGTH. PROVIDE EPOXY COATED COUPLERS ACCORDING TO SECTION 836.02 A AND REPAIR DAMAGED EPOXY COATING ACCORDING TO SECTION 612.04E.

NOTE:

DO NOT INSTALL THE 5XA505 BARS INTO THE APPROACH SLAB UNTIL ALL OF THE FOUNDATION FILL IS IN PLACE.



APPROACH LIP DETAIL

NOTE:

SEE SHEETS 45 & 46 FOR REINFORCING LIST AND BENT BAR DETAILS.

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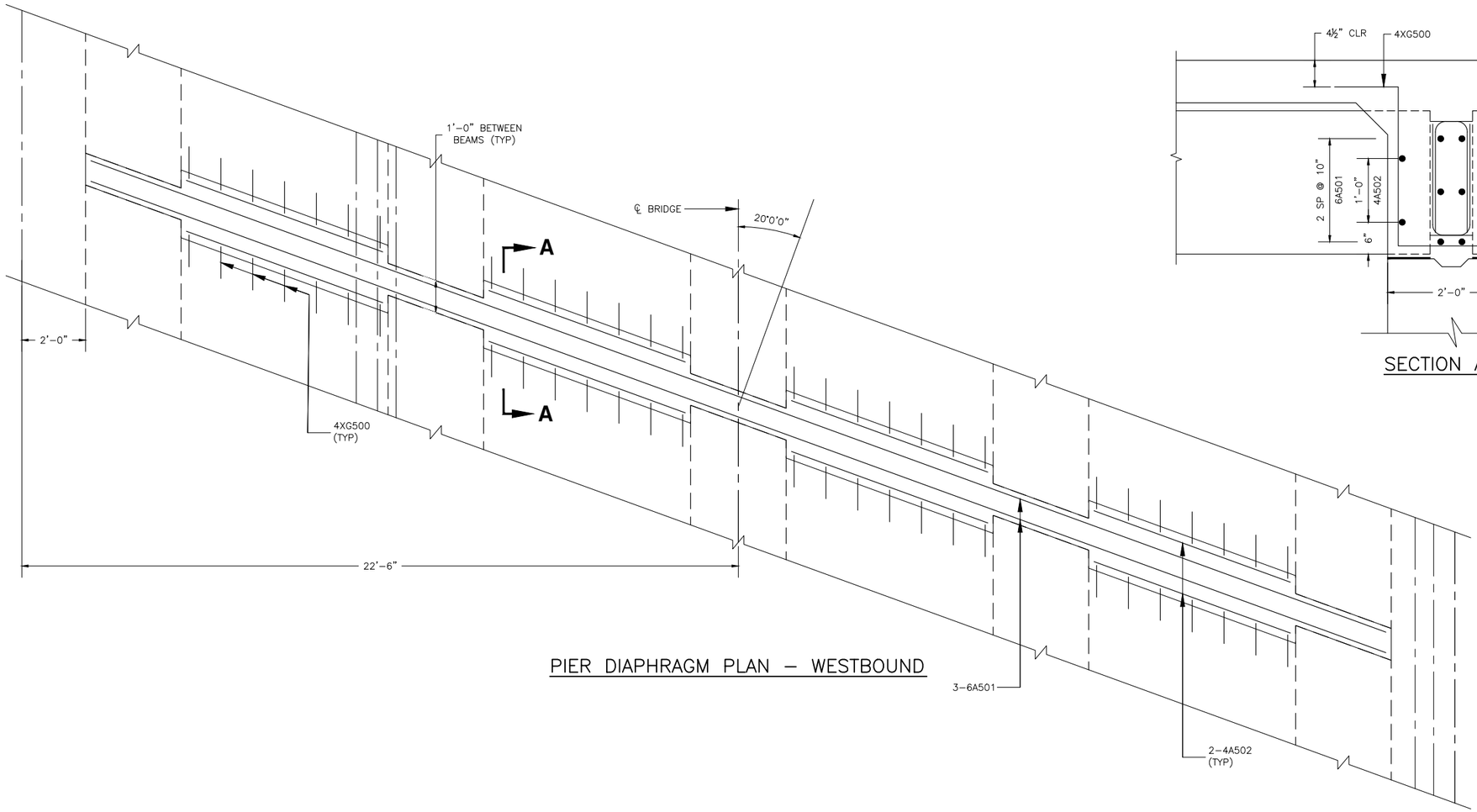
Westbound

Endwall Details

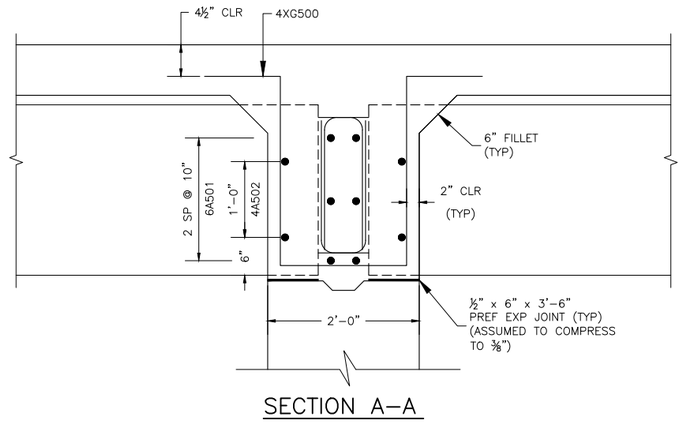
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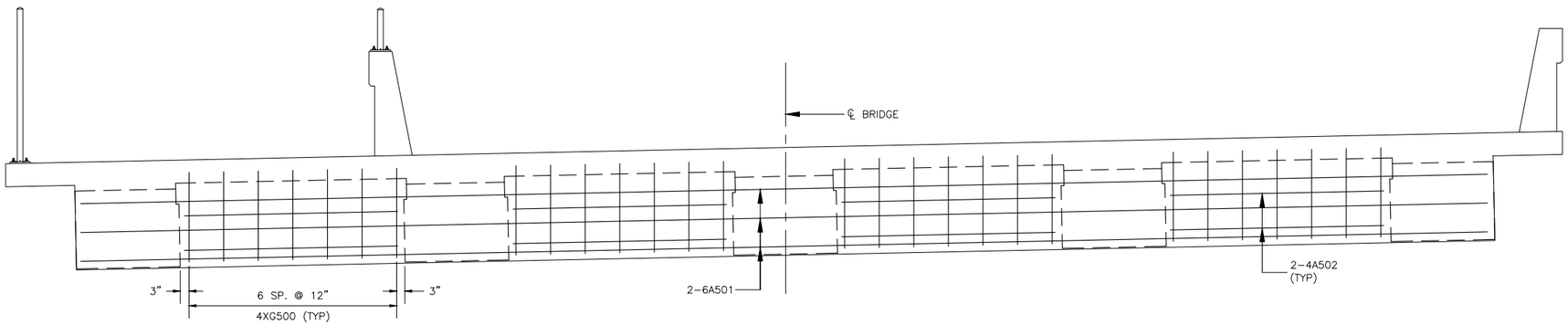
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	170	41



PIER DIAPHRAGM PLAN – WESTBOUND



SECTION A–A



PIER DIAPHRAGM ELEVATION – WESTBOUND

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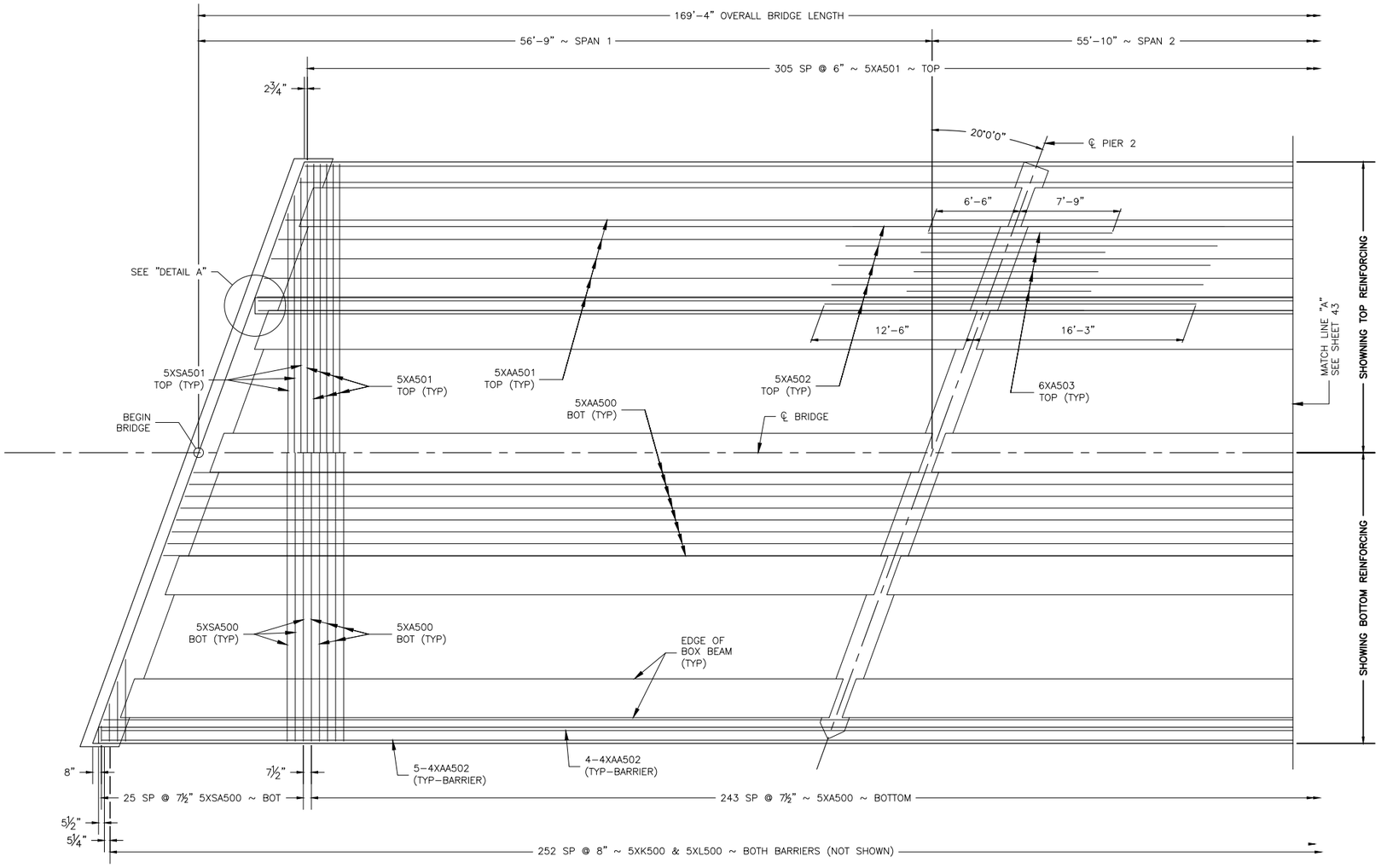
Westbound

Pier Diaphragm Details

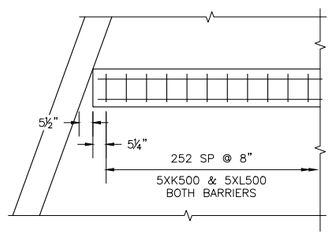
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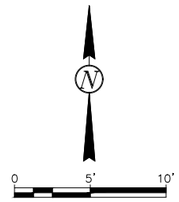
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	170	42



PLAN – WESTBOUND



BARRIER END – DETAIL A



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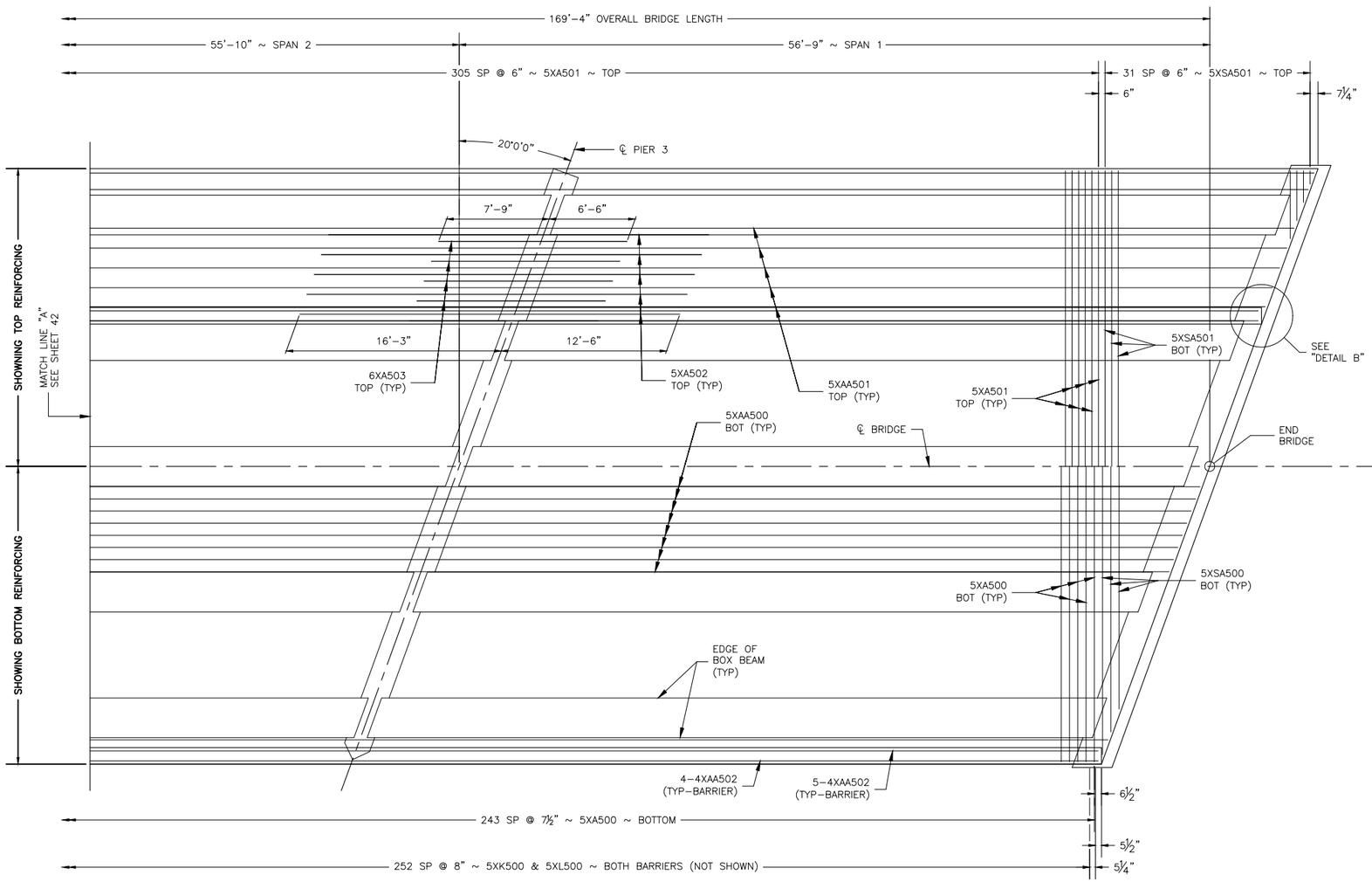
Westbound

Slab Layout

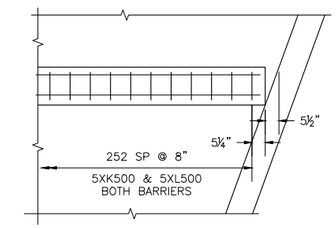
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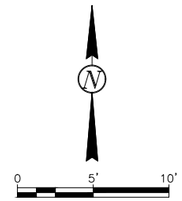
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	170	43



PLAN – WESTBOUND



BARRIER END – DETAIL B



THE CITY OF Fargo FAR MORE

Proj. No. 6059-0145
Houston Engineering Inc.
Ph: 701.237.5065

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52nd Ave S over Drain 27

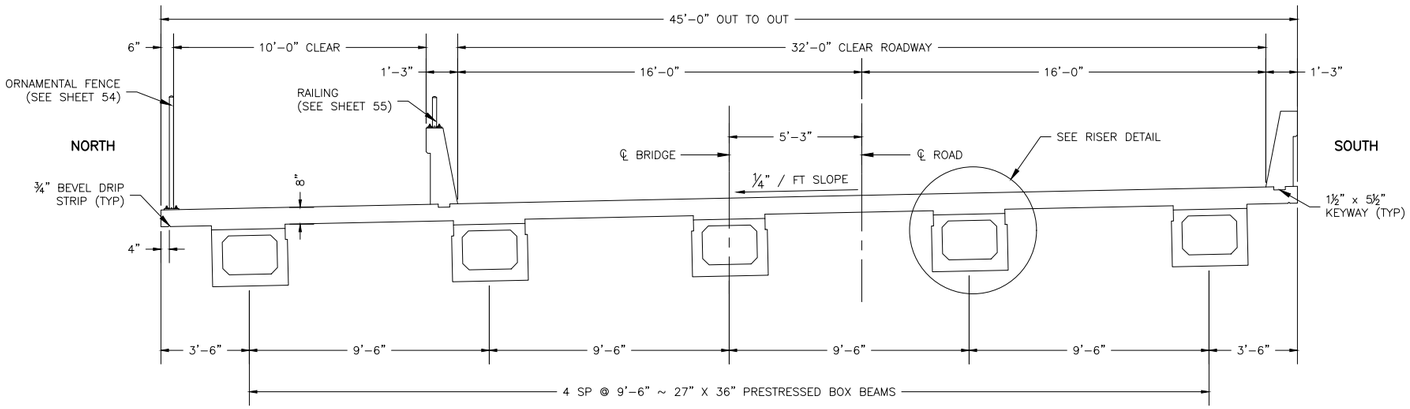
Westbound

Slab Layout

09-140-30.0L-18

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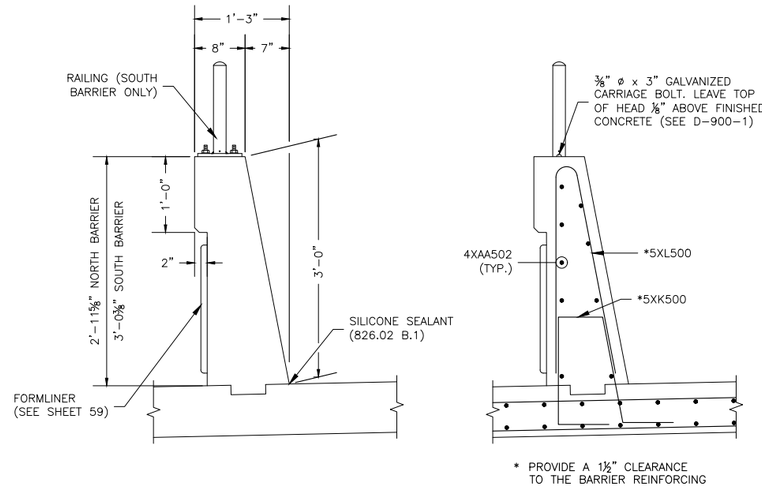
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	170	44



SLAB SECTION – WESTBOUND

LOOKING EAST – SHOWING DIMENSIONS

0 3' 6'



SHOWING DIMENSIONS

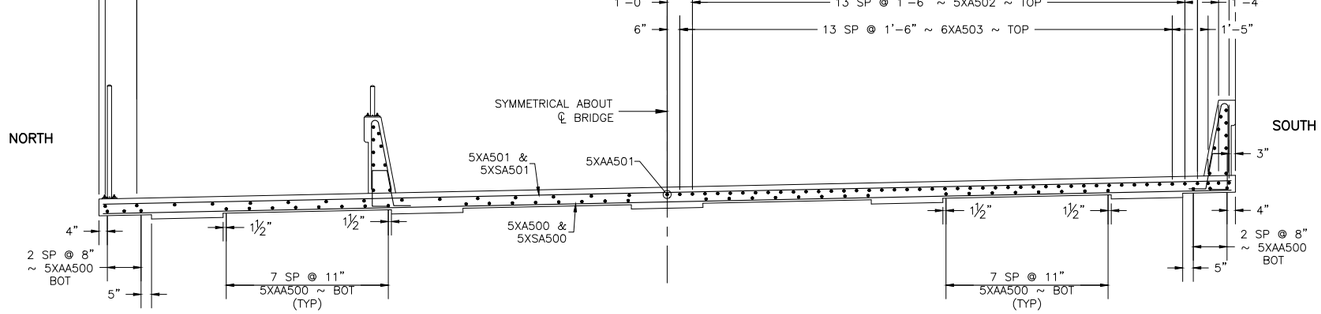
SHOWING REINFORCEMENT

BARRIER DETAILS

NOT TO SCALE

NOTE:

DIMENSIONS SHOWN ARE NOMINAL. ADJUST THICKNESS TO MAINTAIN REQUIRED CLEARANCE FROM FORMLINER RELIEFS.



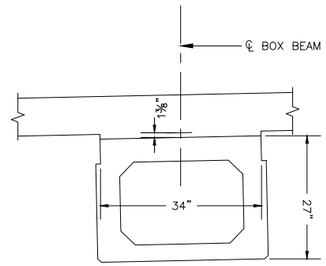
SHOWING REINFORCEMENT AT MIDSPAN

SHOWING REINFORCEMENT OVER PIERS

SLAB SECTION – WESTBOUND

LOOKING EAST – SHOWING REINFORCEMENT

0 3' 6'



THE 1⅜" DIMENSION SHOWN IS LOCATED AT THE SUPPORTS. THE ANTICIPATED MIDSPAN RISER IS 1". THE RISER SHALL BE ADJUSTED TO MAINTAIN THE 8" SLAB THICKNESS.

RISER DETAIL

NOT TO SCALE

QUANTITIES & PROPERTIES BOTH BARRIERS (FOR INFORMATIONAL PURPOSES ONLY)	
CLASS AAE-3 CONCRETE	31.9 C.Y.
CONCRETE STRENGTH	4,000 PSI
REINFORCING STEEL-EPOXY COATED	7,616 LBS
REINFORCEMENT STRENGTH	60,000 PSI

QUANTITIES & PROPERTIES SUPERSTRUCTURE	
CLASS AAE-3 CONCRETE	224.8 C.Y.
CONCRETE STRENGTH	4,000 PSI
REINFORCING STEEL	1,888 LBS
REINFORCING STEEL-EPOXY COATED	46,583 LBS
REINFORCEMENT STRENGTH	60,000 PSI

THE CITY OF Fargo FAR MORE

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52nd Ave S over Drain 27

Westbound

Slab Section

09-140-30.0L-19

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	170	45

BILL OF REINFORCING STEEL, GRADE 60

LETTER PREFIX OF BAR MARK DENOTES SHAPE - SEE BAR DETAILS

LOCATION		SIZE	MARK	NO. EACH /SET	NOMINAL LENGTH	DETAILING DIMENSIONS								
						a	b	c	d	e	f	g	h	k
ABUTMENT 1	REGULAR	5	A101	2	16'-0"		16'-0"							
		5	A102	22	8'-0"		8'-0"							
		5	A109	2	10'-11"		10'-11"							
		5	A110	2	7'-11"		7'-11"							
		5	A111	2	4'-11"		4'-11"							
		5	A112	2	10'-1"		10'-1"							
		5	A113	2	7'-1"		7'-1"							
		5	A114	2	4'-1"		4'-1"							
		6	C100	23	18'-0"		8'-2"	1'-8"	8'-2"					
		6	C101	9	19'-0"		8'-8"	1'-8"	8'-8"					
		6	C105	1	20'-2"		9'-3"	1'-8"	9'-3"					
		6	C106	1	17'-2"		9'-3"	1'-8"	6'-3"					
		6	C107	1	15'-9"		8'-7"	1'-8"	5'-6"					
		6	C108	1	18'-10"		8'-7"	1'-8"	8'-7"					
		6	C109	12	15'-5"		5'-7"	1'-8"	8'-2"					
		6	C110	4	16'-5"		6'-1"	1'-8"	8'-8"					
		6	C111	16	4'-2"		1'-3"	1'-8"	1'-3"					
		4	C112	36	2'-8"		6"	1'-8"	6"					
		5	D100	4	12'-0"		3'-3"	8'-9"					12	4
		5	AA100	14	69'-6"		40'-0"	2'-6"	29'-6"	1		67'-0"		
		6	SC102	1	156'-0"	1'-8"	6'-6"	9'-2"	1'-8"	8				
		6	SC103	1	142'-6"	1'-8"	5'-9"	8'-5"	1'-8"	8				
ABUTMENT 4	REGULAR	5	A100	2	31'-0"		31'-0"							
		5	A102	22	8'-0"		8'-0"							
		5	A103	2	11'-6"		11'-6"							
		5	A104	2	11'-2"		11'-2"							
		5	A105	2	8'-8"		8'-8"							
		5	A106	2	8'-2"		8'-2"							
		5	A107	2	5'-8"		5'-8"							
		5	A108	2	5'-2"		5'-2"							
		6	C100	16	18'-0"		8'-2"	1'-8"	8'-2"					
		6	C101	17	19'-0"		8'-8"	1'-8"	8'-8"					
		6	C102	1	15'-10"		8'-8"	1'-8"	5'-6"					
		6	C103	1	18'-1"		9'-9"	1'-8"	6'-8"					
		6	C104	1	21'-2"		9'-9"	1'-8"	9'-9"					
		6	C109	7	15'-5"		5'-7"	1'-8"	8'-2"					
		6	C110	9	16'-5"		6'-1"	1'-8"	8'-8"					
		6	C111	16	4'-2"		1'-3"	1'-8"	1'-3"					
		4	C112	36	2'-8"		6"	1'-8"	6"					
		5	D100	4	12'-0"		3'-3"	8'-9"					12	4
		5	AA100	14	69'-6"		40'-0"	2'-6"	29'-6"	1		67'-0"		
		6	SC100	1	144'-9"	1'-8"	5'-10"	8'-7"	1'-8"	8				
		6	SC101	1	165'-9"	1'-8"	7'-0"	9'-9"	1'-8"	8				

LOCATION		SIZE	MARK	NO. EACH /SET	NOMINAL LENGTH	DETAILING DIMENSIONS								
						a	b	c	d	e	f	g	h	k
PIER 2	REGULAR	5	A200	34	45'-9"		45'-9"							
		5	A201	94	16'-0"		16'-0"							
		6	A203	1	16'-10"		16'-10"							
		5	A205	2	29'-0"		29'-0"							
		5	C200	17	7'-8"		3'-0"	1'-8"	3'-0"					
		5	C201	94	8'-8"		3'-6"	1'-8"	3'-6"					
		4	C202	64	2'-8"		6"	1'-8"	6"					
		5	M200	18	8'-0"	3'-0"	1'-0"	1'-0"	3'-0"				12	12
PIER 3	REGULAR	5	A200	38	45'-9"		45'-9"							
		5	A202	94	18'-3"		18'-3"							
		6	A204	1	19'-2"		19'-2"							
		5	A206	2	40'-0"		40'-0"							
		5	C200	19	7'-8"		3'-0"	1'-8"	3'-0"					
		5	C201	94	8'-8"		3'-6"	1'-8"	3'-6"					
		4	C202	64	2'-8"		6"	1'-8"	6"					
		5	M200	20	8'-0"	3'-0"	1'-0"	1'-0"	3'-0"				12	12

NOTES:

1. VERIFY THE QUANTITY, SIZE, AND SHAPE OF THE BAR REINFORCEMENT AGAINST THE STRUCTURE DRAWINGS AND IMMEDIATELY NOTIFY THE ENGINEER OF ANY DISCREPANCIES. DISCREPANCIES IN THE BAR LIST WILL NOT BE CAUSE FOR ADJUSTMENT OF THE CONTRACT UNIT PRICE.
2. ALL DIMENSIONS ARE OUT TO OUT OF BARS.
3. NOMINAL LENGTH OF EACH BENT BAR OR CUT BAR IS THE SUM TOTAL OF THE DETAILING DIMENSIONS FOR THAT BAR, UNLESS OTHERWISE NOTED.
4. TURN ADJACENT "AA" BARS END FOR END SO THAT THE SPLICE LOCATIONS ARE STAGGERED.

THE CITY OF Fargo FAR MORE

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Houston Engineering Inc.
Ph: 701.237.5065

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52nd Ave S over Drain 27

Westbound

Reinforcing Bar List

09-140-30.0L-20

08/15/18 06:38:44AM H:\Fargo\JBN\6000\6059\18_6059_145 - 52nd Ave. Design\CAD\Plans\Bridge\Drain 27 Westbound\Drain 27 WB Reinforcment Schedule.dwg

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SU-8-984(164)	170	46

BILL OF REINFORCING STEEL, GRADE 60

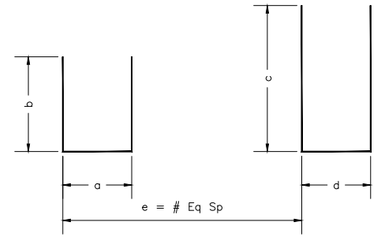
LETTER PREFIX OF BAR MARK DENOTES SHAPE - SEE BAR DETAILS

LOCATION		SIZE	MARK	NO. EACH /SET	NOMINAL LENGTH	DETAILING DIMENSIONS								
						a	b	c	d	e	f	g	h	k
SUPERSTRUCTURE	REGULAR	5	A500	12	47'-9"		47'-9"							
		6	A501	12	43'-3"		43'-3"							
		4	A502	32	6'-6"		6'-6"							
		5	G500	24	10'-9"	1'-7"	6'-6"	1'-7"	1'-0"				12	4.4
		5	N500	12	8'-2"	2'-0"	1'-7"	6"					4.4	12
	EPOXY	5	XA500	244	44'-6"		44'-6"							
		5	XA501	306	44'-6"		44'-6"							
		5	XA502	56	28'-9"		28'-9"							
		6	XA503	56	14'-3"		14'-3"							
		5	XA504	8	47'-9"		47'-9"							
		5	XA505	180	3'-0"		3'-0"							
		5	XB500	98	6'-8"		2'-8"	4'-0"						
		5	XB501	66	5'-6"		2'-6"	3'-0"						
		4	XG500	56	8'-11"	2'-7"	1'-9"	2'-7"	1'-0"				12	0
		5	*XK500	506	4'-11"	1'-6"	7"			10"		8"	2.3"	12
		5	*XL500	506	5'-7"	9"	2'-7"	5"			1.25"		2.3"	12
		5	XP500	96	5'-6"	5"	2'-1"	2'-2"			1.25"	10"	12	6.5
		5	XAA500	38	175'-0"		60'-0"	3'-0"	55'-0"	2		169'-0"		
		5	XAA501	31	174'-0"		60'-0"	2'-6"	54'-0"	2		169'-0"		
		4	*XAA502	18	172'-6"		60'-0"	2'-0"	52'-6"	2		168'-6"		
		5	XSA500	2	588'-3"	1'-2"	44'-1"			25				
		5	XSA501	2	710'-8"	10"	43'-7"			31				

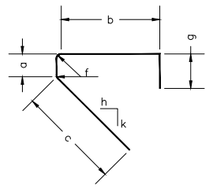
* INCLUDE ALL COSTS ASSOCIATED WITH BARRIER STEEL IN THE PRICE BID FOR "SINGLE SLOPE BARRIER."

NOTES:

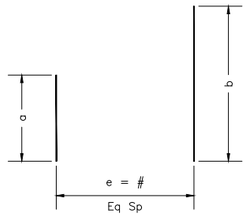
1. VERIFY THE QUANTITY, SIZE, AND SHAPE OF THE BAR REINFORCEMENT AGAINST THE STRUCTURE DRAWINGS AND IMMEDIATELY NOTIFY THE ENGINEER OF ANY DISCREPANCIES. DISCREPANCIES IN THE BAR LIST WILL NOT BE CAUSE FOR ADJUSTMENT OF THE CONTRACT UNIT PRICE.
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4. TURN ADJACENT "AA" BARS END FOR END SO THAT THE SPLICE LOCATIONS ARE STAGGERED.
5. THE "f" DIMENSION INDICATES THE INSIDE RADIUS UNLESS OTHERWISE NOTED.
6. AN "X" PRECEEDING A BAR DESIGNATION INDICATES AN EPOXY COATED BAR.



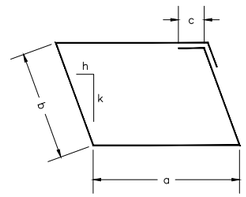
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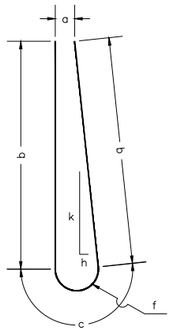
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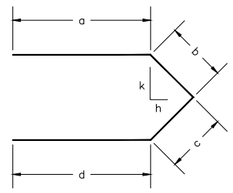
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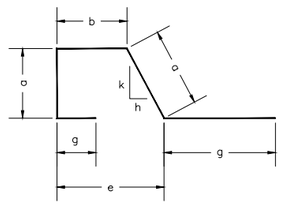
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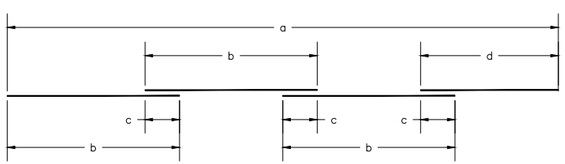
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M

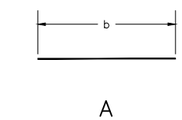


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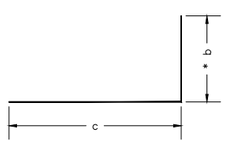


c = Lap Splice (typ)
e = # of "b" Length Pieces in a Set
Total Length per Set = e x b + d

AA

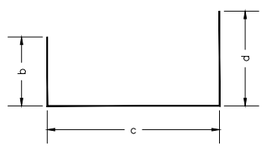


A

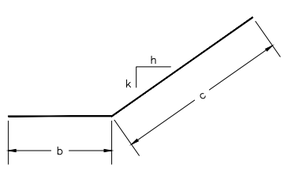


B

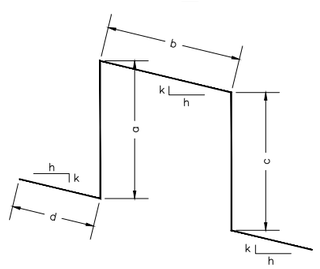
* b = Vertical Leg for XB500 and XB501



C



D



G

THE CITY OF Fargo FAR MORE

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52nd Ave S over Drain 27

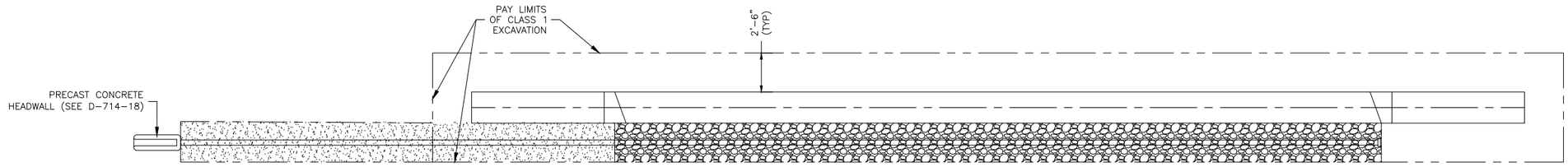
Westbound

Reinforcing Bar List & Details

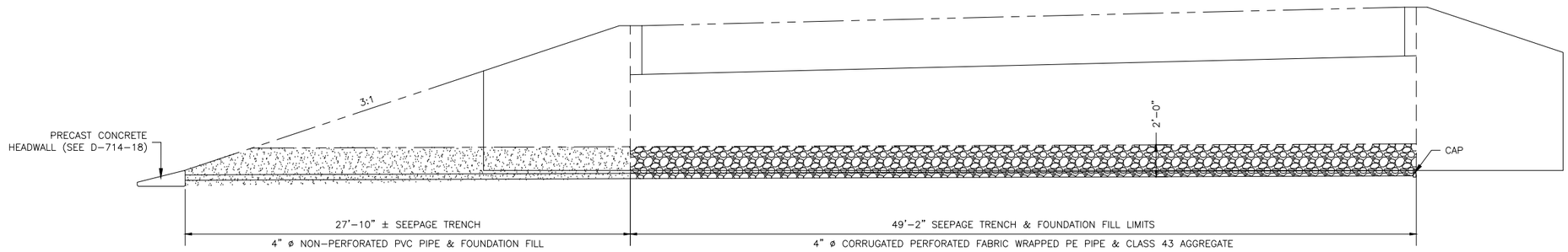
09-140-30.0L-21

08/15/18 06:38:46AM H:\Fargo\JBN\6000\6059\18_6059_145 - 52nd Ave. Design\CAD\Plans\Bridge\Drain 27 Westbound\Drain 27 WB Reinforcment Schedule.dwg

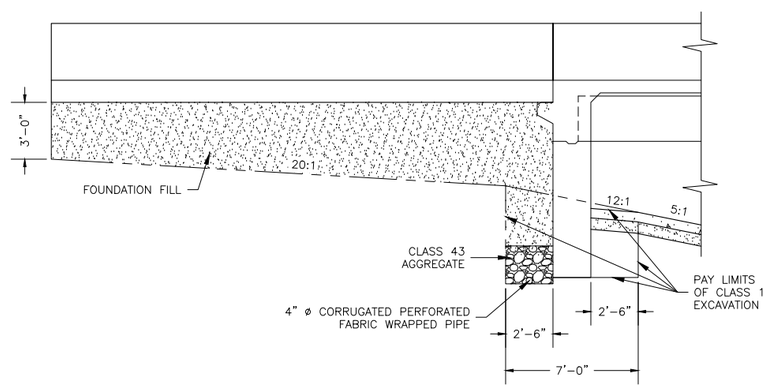
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	170	47



ABUTMENT PLAN



BACK FACE OF ABUTMENT



DETAIL AT ABUTMENT

NOTES:

USE CORRUGATED PERFORATED FABRIC WRAPPED PE PIPE THAT MEETS THE REQUIREMENTS OF SECTION 830.03 A.4. PROVIDE FABRIC WRAPPING FOR THE PIPE THAT MEETS THE REQUIREMENTS OF SECTION 858.01 FOR D3 OR D4 DRAINAGE FABRIC. PROVIDE AGGREGATE FOUNDATION FILL THAT MEETS THE REQUIREMENTS OF SECTION 210.

INCLUDE THE COST TO FURNISH AND PLACE THE FOUNDATION FILL, AGGREGATE, CORRUGATED PERFORATED PIPE AND HEADWALLS IN THE PAY ITEM "ABUTMENT UNDERDRAIN SYSTEM".

ABUTMENT 1 SHOWN. INSTALL UNDERDRAIN SYSTEMS AT BOTH ABUTMENT 1 AND ABUTMENT 4 TO DRAIN TO THE NORTH.

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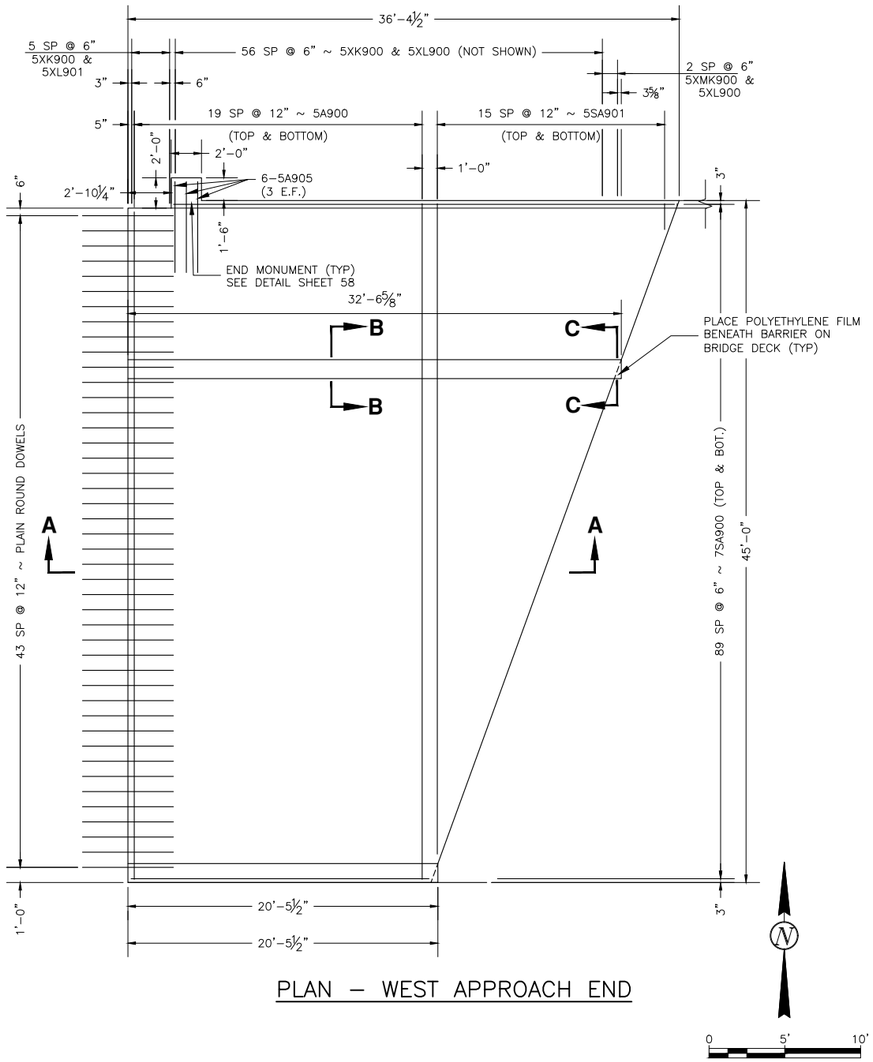
Westbound

Abutment Underdrain Details

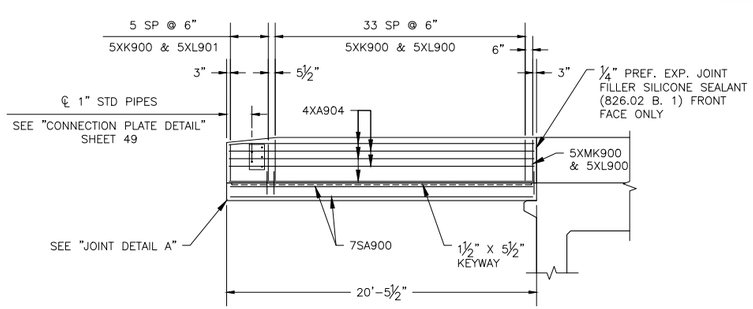
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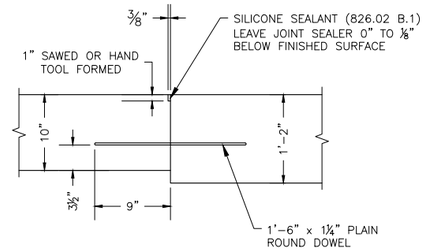
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	ND	SU-8-984(164)	170	48



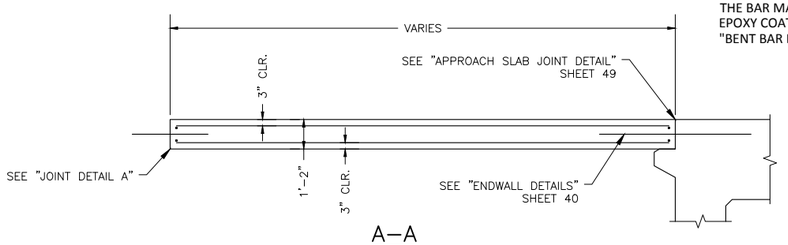
PLAN – WEST APPROACH END



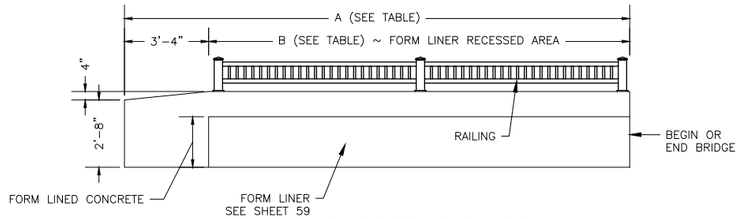
ELEVATION – WEST APPROACH END
(SHOWING SOUTH BARRIER)



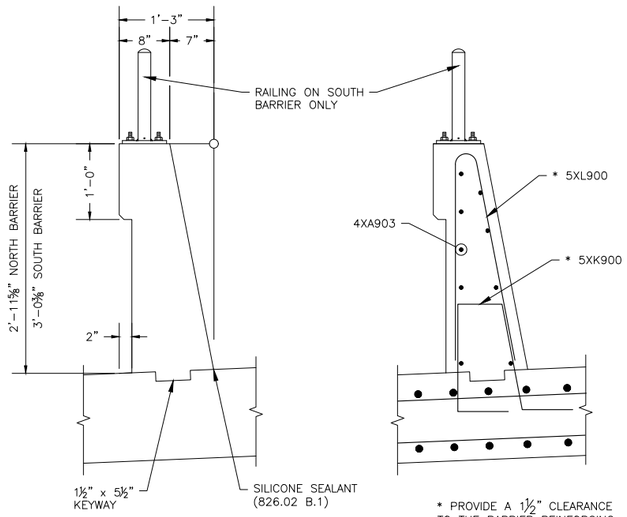
JOINT DETAIL A



A–A

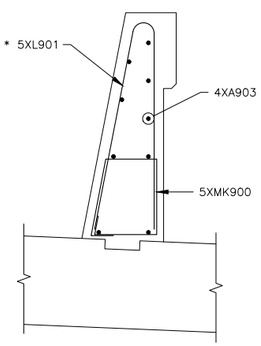


BARRIER ELEVATION



B–B

C–C



NOTES:

THE ESTIMATED MATERIAL QUANTITIES SHOWN ARE FOR INFORMATION PURPOSES ONLY. INCLUDE THE CONCRETE, REINFORCING BARS, POLYETHYLENE FILM, PREFORMED JOINT FILLER, POLYSTYRENE, SILICONE SEALANT, CONNECTION PLATES AND PIPES, PENETRATING WATER REPELLANT TREATMENT, AND LABOR REQUIRED TO BUILD THE APPROACH SLABS, BARRIERS, AND END MONUMENTS IN THE PAY ITEM "CONCRETE BRIDGE APPROACH SLAB." INCLUDE THE DOWEL BARS IN THE CONCRETE PAVEMENT PAY ITEM. INCLUDE THE RAILING AND ORNAMENTAL FENCE IN THE PAY ITEMS "RAILING" AND "ORNAMENTAL FENCE." USE CLASS AE-3 CONCRETE AND GRADE 60 REINFORCING STEEL. PROVIDE REINFORCING STEEL THAT MEETS THE REQUIREMENTS OF SECTION 612. USE POLYETHYLENE FILM THAT MEETS THE REQUIREMENTS OF ASTM C171.

THE BAR MARKS BEGINING WITH AN "X" INDICATE AN EPOXY COATED BAR. THE DIMENSIONS SHOWN IN THE "BENT BAR DETAILS" ARE OUT TO OUT.

WEST APPROACH SLAB: SKEW ANGLE = 20°			
BAR LIST			
SIZE	MARK	NO. EACH	NOMINAL LENGTH
5	A900	40	44' - 8"
4	XA903	9	32' - 2"
4	XA904	9	20' - 1"
5	A905	6	6' - 0"
5	XK900	103	5' - 7"
5	XL900	94	5' - 7"
5	XL901	12	4' - 11"
5	XMK900	3	3' - 8"
7	SA900	2	2497' - 6"
5	SA901	2	356' - 8"
ESTIMATED MATERIAL QUANTITIES			
Reinforcing Steel (LBS)		Concrete (CY)	
14,376		60.6	
PAY QUANTITY = 141.1 SY			

BARRIER LENGTHS

	A	B
NORTHWEST	32'–6⅝"	29'–3⅝"
SOUTHWEST	20'–5½"	17'–1½"
NORTHEAST	24'–3⅜"	20'–11⅜"
SOUTHEAST	36'–4½"	33'–0½"

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52nd Ave S over Drain 27

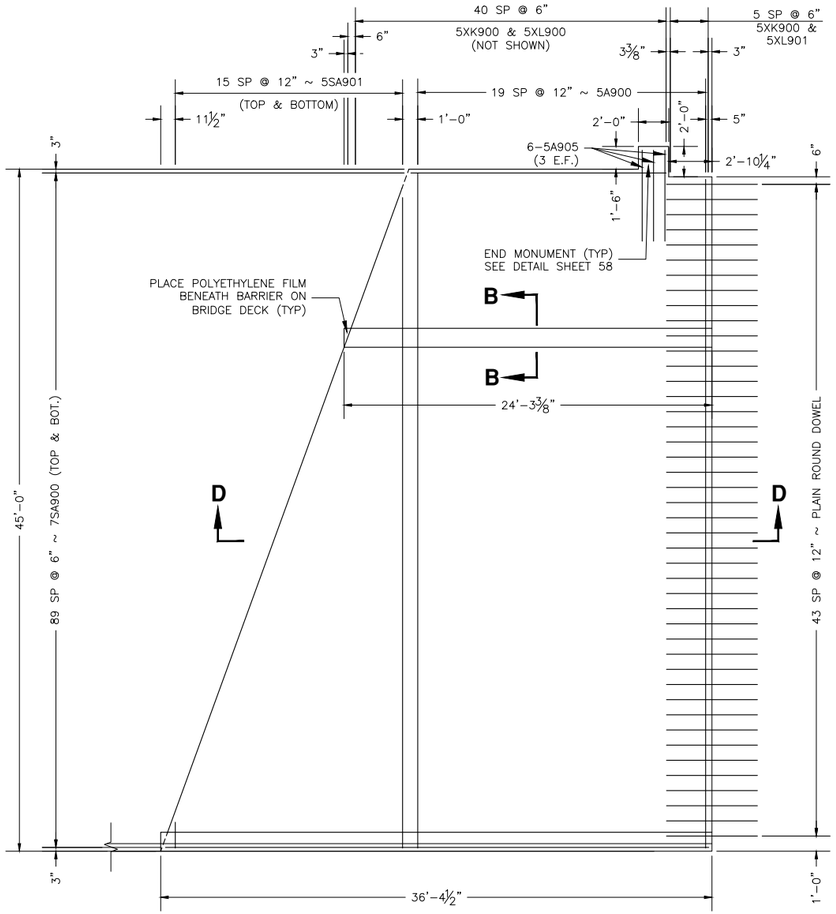
Westbound

West Approach Slab

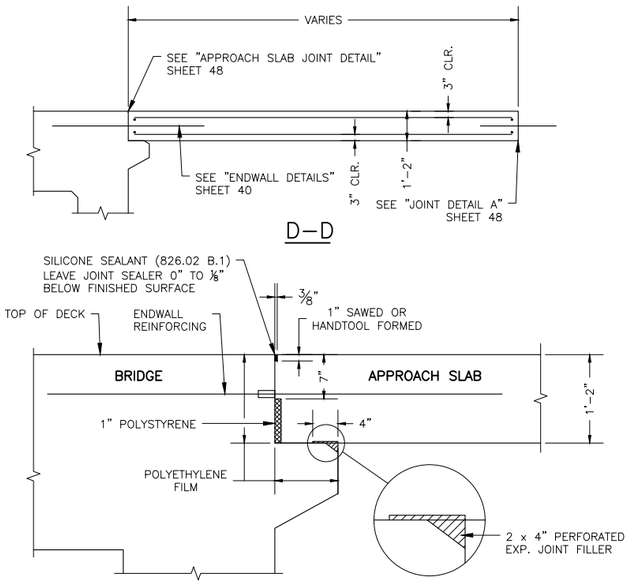
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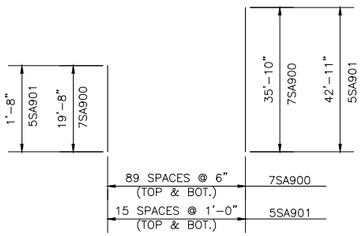
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	ND	SU-8-984(164)	170	49



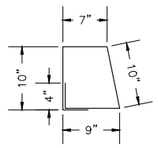
PLAN – EAST EXIT END



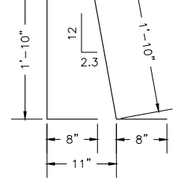
APPROACH SLAB JOINT DETAIL



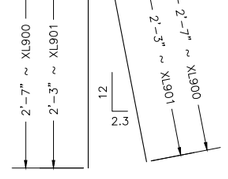
SA900 & SA901



XMK900



XK900



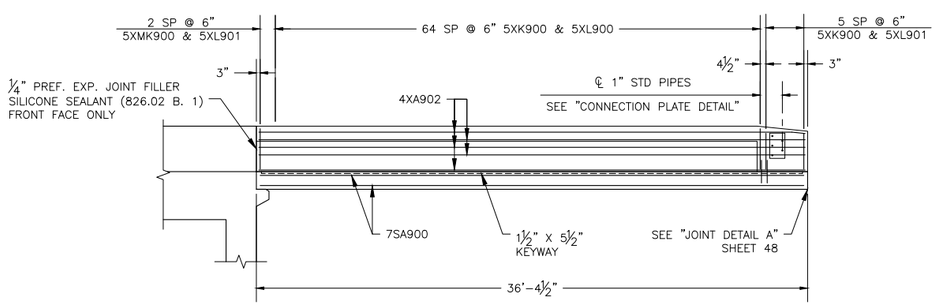
XL900 & XL901

NOTES:

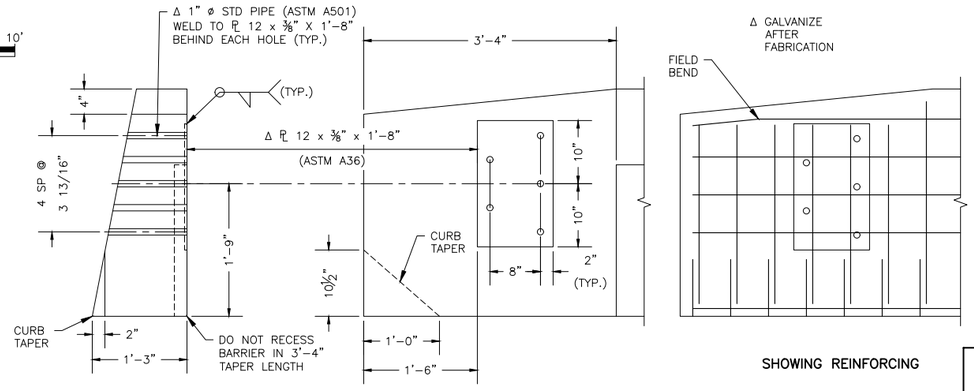
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THE BAR MARKS BEGINING WITH AN "X" INDICATE AN EPOXY COATED BAR. THE DIMENSIONS SHOWN IN THE "BENT BAR DETAILS" ARE OUT TO OUT.

EAST APPROACH SLAB: SKEW ANGLE = 20°			
BAR LIST			
SIZE	MARK	NO. EACH	NOMINAL LENGTH
5	A900	40	44' - 8"
4	XA901	9	23' - 9"
4	XA902	9	36' - 0"
5	A905	6	6' - 0"
5	XK900	118	5' - 7"
5	XL900	109	5' - 7"
5	XL901	12	4' - 11"
5	XMK900	3	3' - 8"
7	SA900	2	2497' - 6"
5	SA901	2	356' - 8"
ESTIMATED MATERIAL QUANTITIES			
Reinforcing Steel (LBS)		Concrete (CY)	
14,595		61.3	
PAY QUANTITY = 141.1 SY			



ELEVATION – EAST EXIT END
(SHOWING SOUTH BARRIER)



CONNECTION PLATE DETAILS

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52nd Ave S over Drain 27

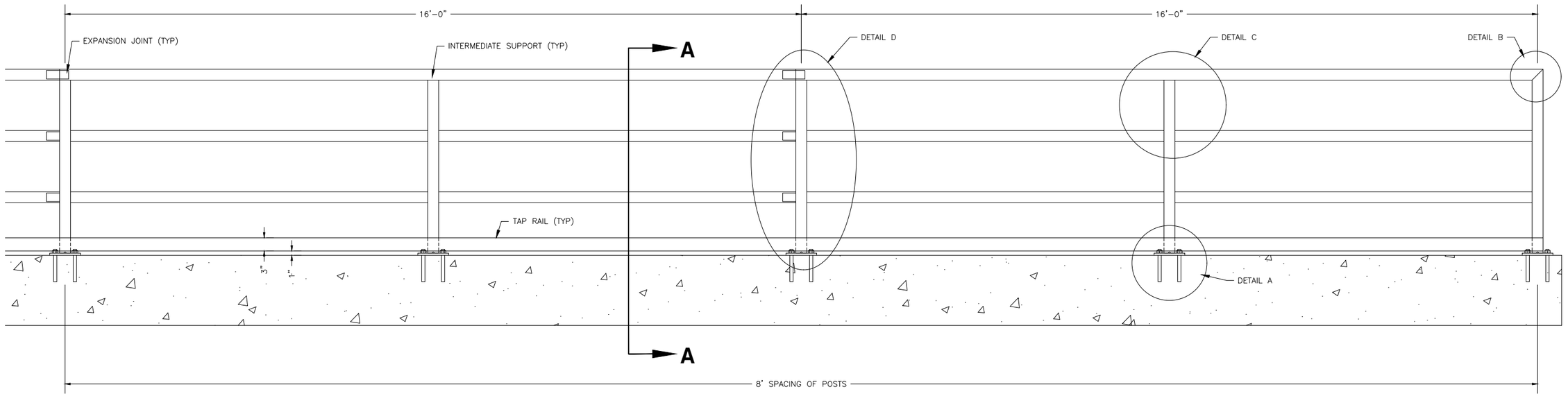
Westbound

East Approach Slab

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	ND	SU-8-984(164)	170	50

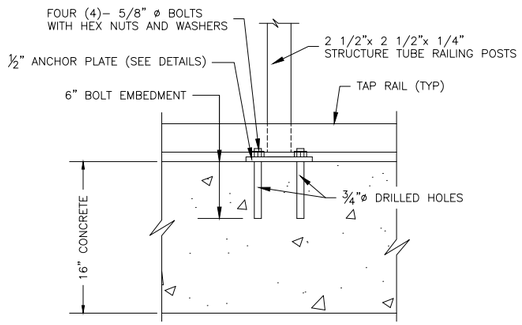


PEDESTRIAN RAILING DETAIL

NOT TO SCALE

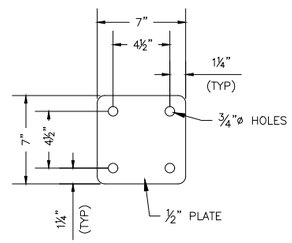
NOTES:

1. USE BOLTS AND NUTS MEETING THE REQUIREMENTS OF A.S.T.M. A307. USE MATERIALS FOR BASE PLATES, ANCHOR BOLT ASSEMBLIES AND RAIL EXPANSION CONFORMING TO A36 STRUCTURAL STEEL.
2. GALVANIZE ALL RAILING COMPONENTS & ANCHORAGE MATERIAL IN ACCORDANCE WITH A.S.T.M. A123. PAINT RAILING BLACK TO MATCH ORNAMENTAL FENCE ON BRIDGE.
3. USE STRUCTURAL TUBING CONFORMING TO A.S.T.M. DESIGNATION A500 OR A501.
4. INSTALL RAIL POSTS VERTICAL. FABRICATE RAILING IN PANEL LENGTHS AS SHOWN WITH EXPANSION JOINTS AT EVERY PANEL.
5. INSTALL ANCHORS WITH A MIN. OF 6" EMBEDMENT WITH A CHEMICAL ANCHORAGE SYSTEM TO PROVIDE 10 KIP PULLOUT STRENGTH. SUBMIT PRODUCTS TO ENGINEER FOR APPROVAL AND INSTALL PER THE MANUFACTURERS RECOMMENDATIONS.
6. CAREFULLY PLACE REINFORCEMENT TO AVOID ANCHORS.
7. INCLUDE THE COST OF ALL MATERIALS AND INSTALLATION OF RAILING IN THE BID PRICE FOR "PEDESTRIAN RAILING".



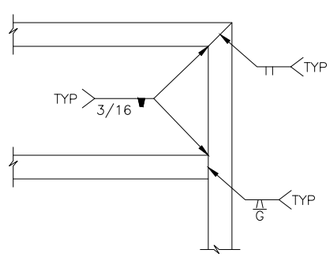
DETAIL "A"

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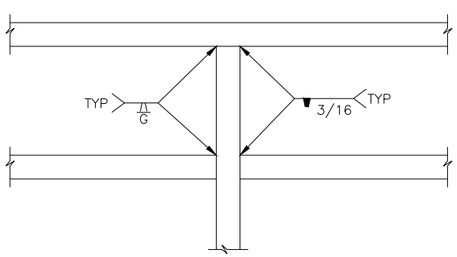
ANCHOR PLATE DETAIL

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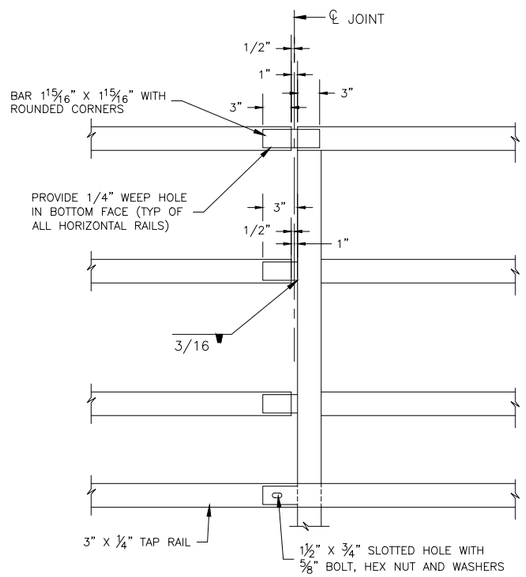
DETAIL "B"

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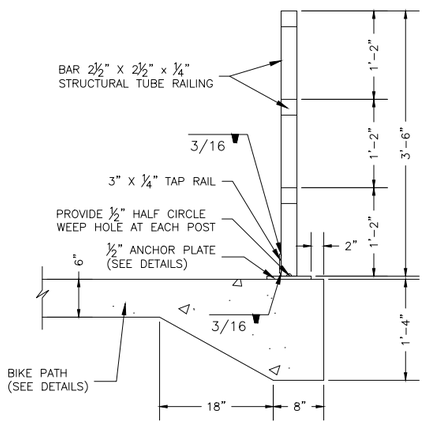
DETAIL "C"

NOT TO SCALE



DETAIL "D"

NOT TO SCALE



SECTION A–A

NOT TO SCALE

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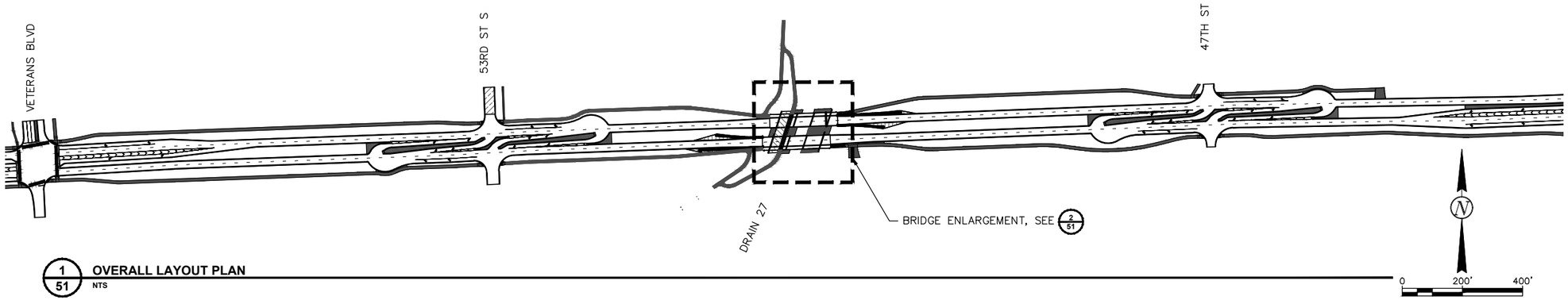
52nd Ave S over Drain 27

Beneath Bridges

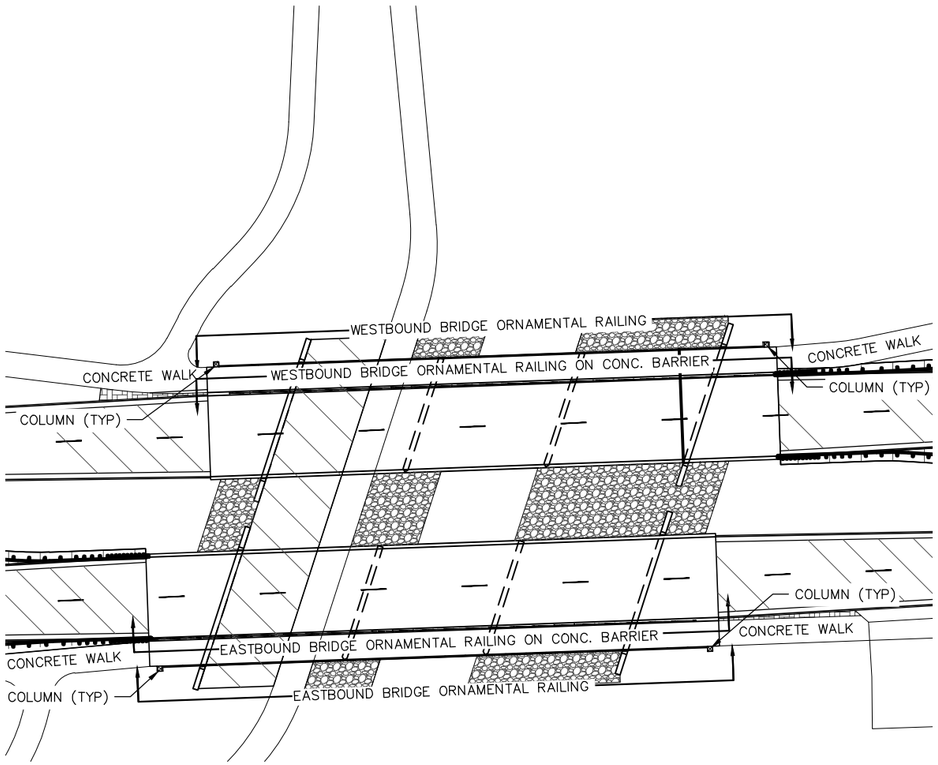
Pedestrian Railing Details

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	170	51



1/51 **OVERALL LAYOUT PLAN**
NTS



2/51 **BRIDGE ENLARGEMENT PLAN**
NTS

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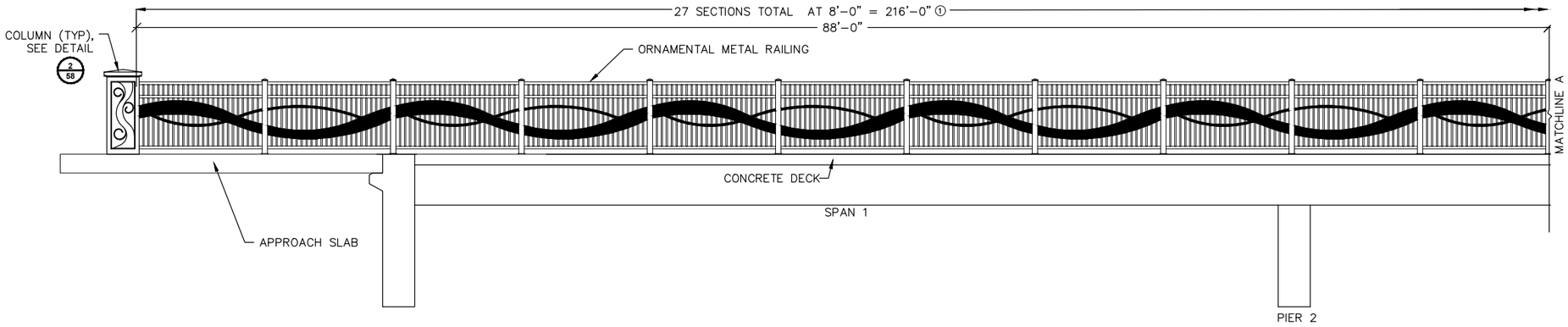
52nd Ave S over Drain 27

Bridge Aesthetics

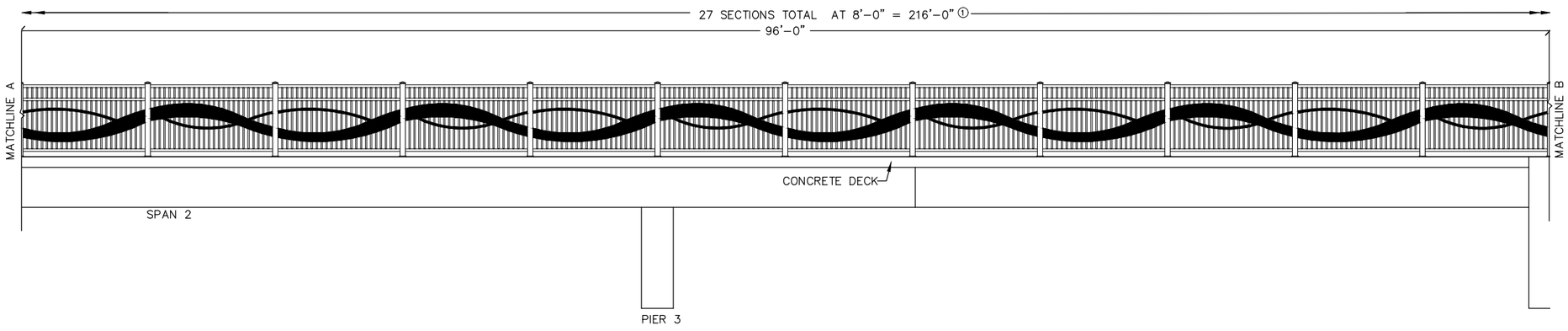
Bridge Layout

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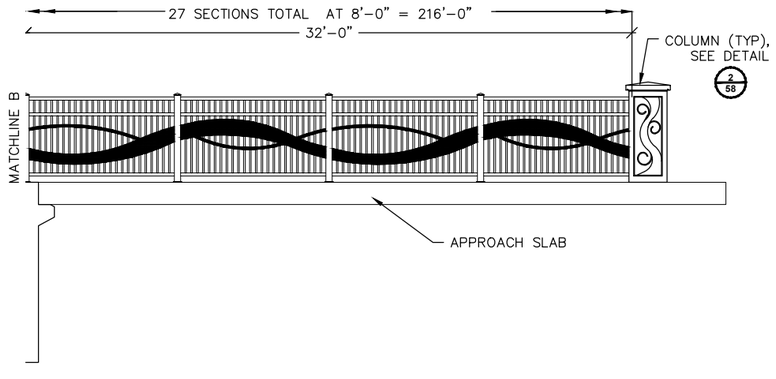
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	170	52



ORNAMENTAL FENCE ELEVATION



ORNAMENTAL FENCE ELEVATION



① LAYOUT POST SPACING AND PROVIDE WORK DRAWINGS PRIOR TO FABRICATION. LOCATE POSTS A MINIMUM OF 12" (MEASURED FROM EDGE OF BASEPLATE TO EDGE OF SLEEVE) FROM FENCE POST SLEEVES.

MAINTAIN 12" (EDGE OF BASEPLATE TO EDGE OF JOINT) MIN. DISTANCE BETWEEN ℄ BASEPLATE AND DECK JOINTS.

0 4' 8'

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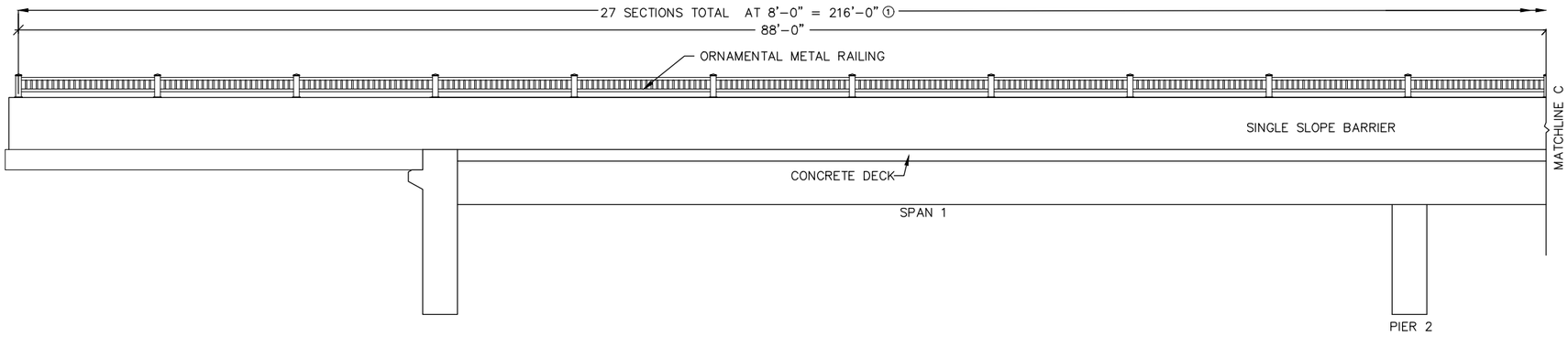
52nd Ave S over Drain 27

Bridge Aesthetics - Eastbound

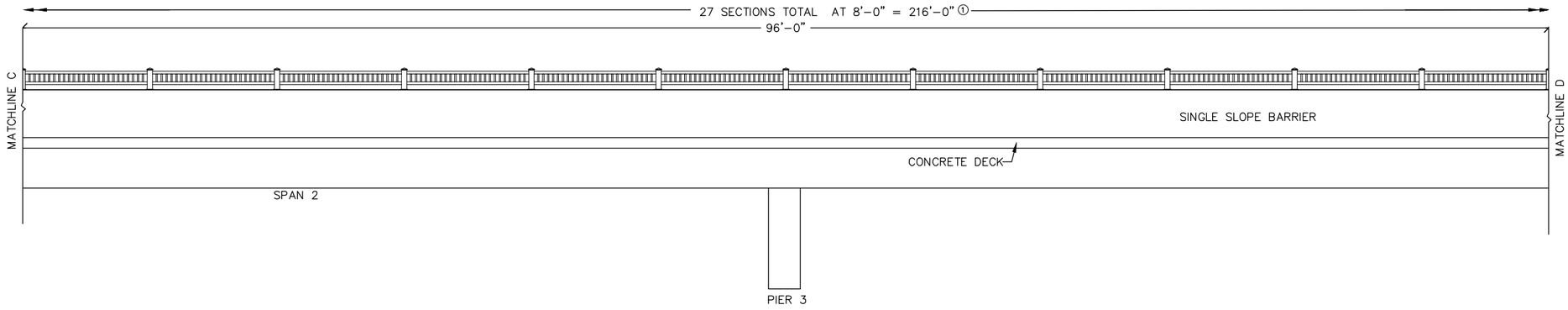
Ornamental Fence Elevation

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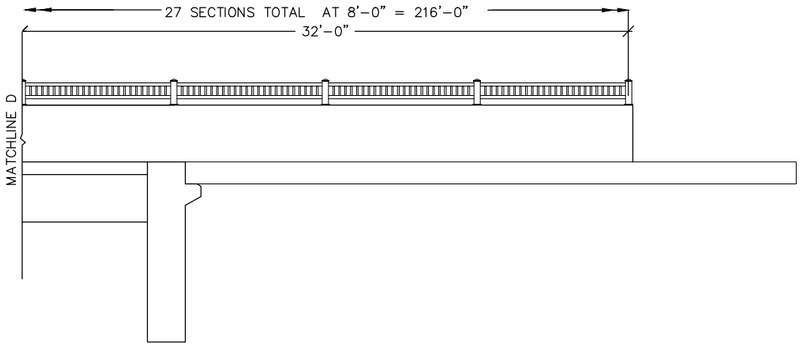
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	170	53



RAILING ELEVATION



RAILING ELEVATION



RAILING ELEVATION

① LAYOUT POST SPACING AND PROVIDE WORK DRAWINGS PRIOR TO FABRICATION. LOCATE POSTS A MINIMUM OF 12" (MEASURED FROM EDGE OF BASEPLATE TO EDGE OF SLEEVE) FROM FENCE POST SLEEVES.

MAINTAIN 12" (EDGE OF BASEPLATE TO EDGE OF JOINT) MIN. DISTANCE BETWEEN ℄ BASEPLATE AND DECK JOINTS.

0 4' 8'

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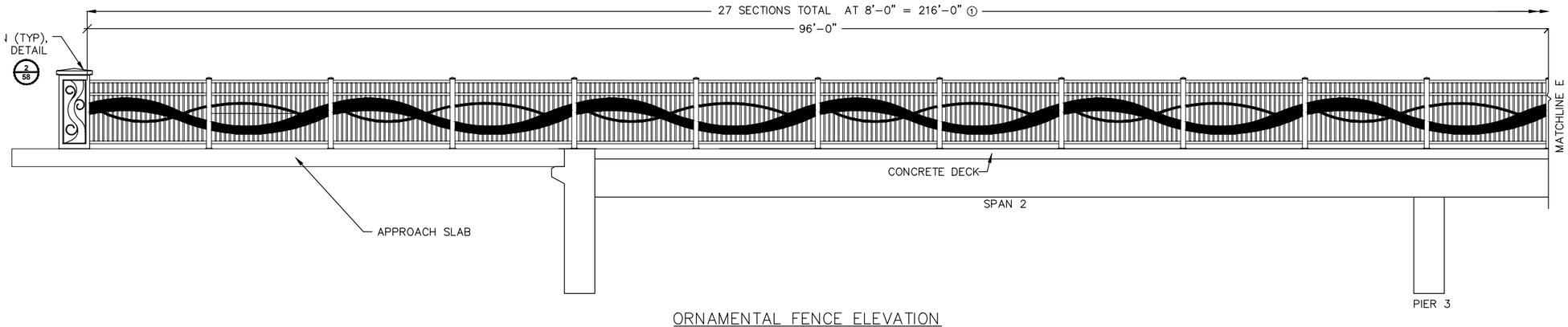
52nd Ave S over Drain 27

Bridge Aesthetics - Eastbound

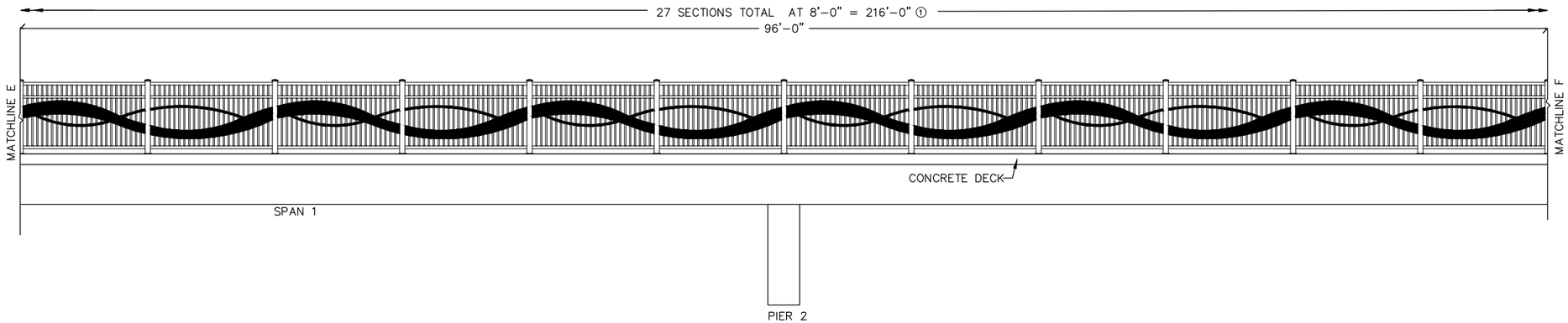
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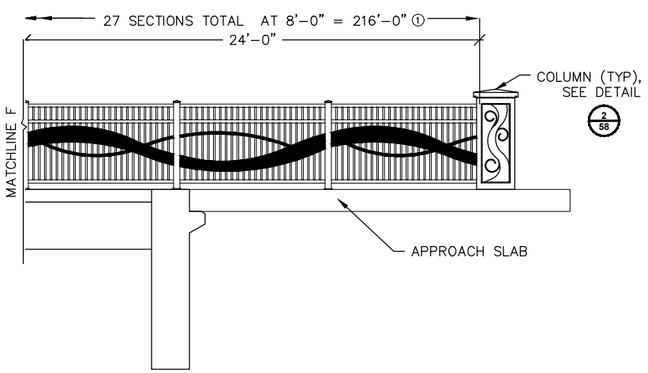
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	ND	SU-8-984(164)	170	54



ORNAMENTAL FENCE ELEVATION



ORNAMENTAL FENCE ELEVATION



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MAINTAIN 12" (EDGE OF BASEPLATE TO EDGE OF JOINT) MIN. DISTANCE BETWEEN ℄ BASEPLATE AND DECK JOINTS.

0 4' 8'

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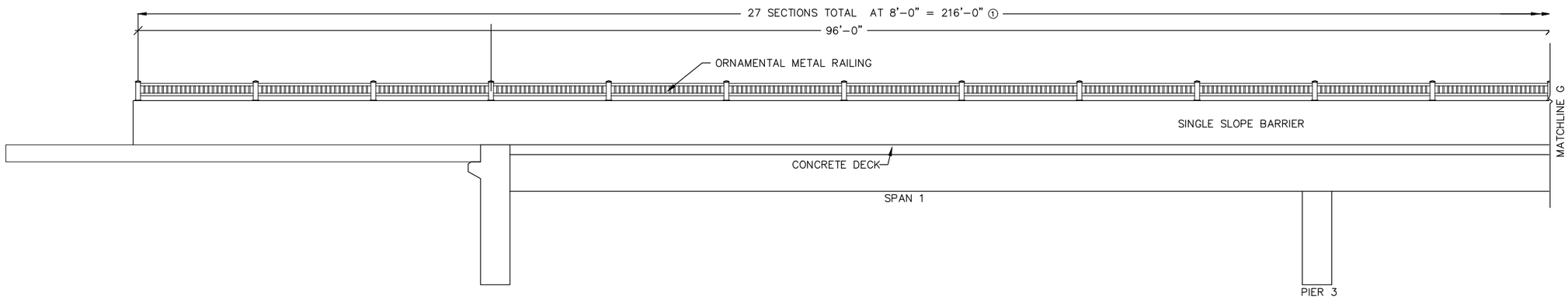
52nd Ave S over Drain 27

Bridge Aesthetics - Westbound

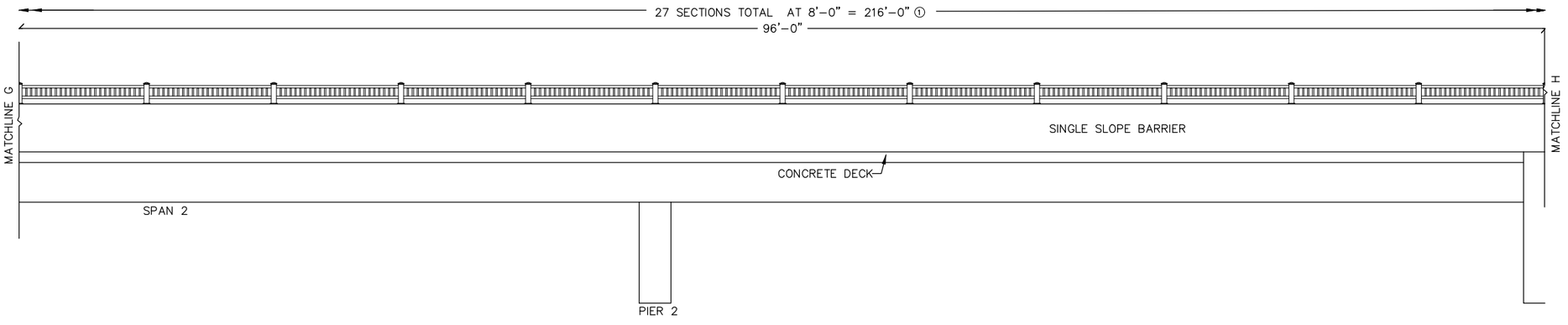
Ornamental Fence Elevation

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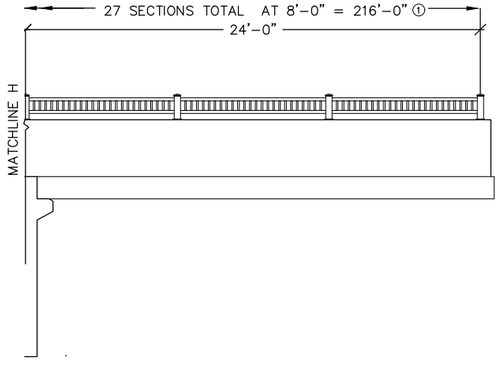
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	170	55



RAILING ELEVATION



RAILING ELEVATION



RAILING ELEVATION

① LAYOUT POST SPACING AND PROVIDE WORK DRAWINGS PRIOR TO FABRICATION. LOCATE POSTS A MINIMUM OF 12" (MEASURED FROM EDGE OF BASEPLATE TO EDGE OF SLEEVE) FROM FENCE POST SLEEVES.

MAINTAIN 12" (EDGE OF BASEPLATE TO EDGE OF JOINT) MIN. DISTANCE BETWEEN ℄ BASEPLATE AND DECK JOINTS.

0 4' 8'

THE CITY OF Fargo FAR MORE

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Houston Engineering Inc.
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WSB PROJECT NO. 012067–000

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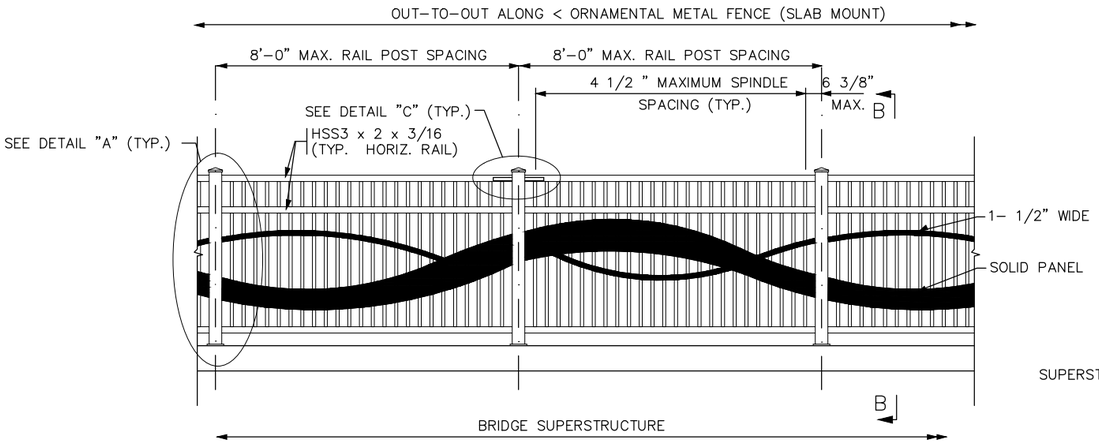
52nd Ave S over Drain 27

Bridge Aesthetics - Westbound

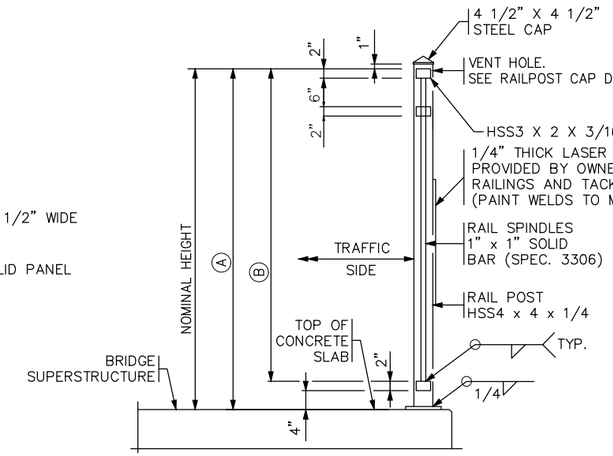
Railing Elevation

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	170	56



INSIDE ELEVATION OF ORNAMENTAL FENCE



SECTION B–B

(4'–6" TALL OPTION SHOWN)

RAILING HEIGHT TABLE			
	NOMINAL HEIGHT	Ⓐ	Ⓑ
TYPE "A"	4'–6"	4'–6"	4'–0"

GENERAL NOTES

CONTINUOUSLY GROUND ALL METAL RAILINGS;

PAYMENT LENGTH SHALL BE MEASURED AS THE OUT TO OUT LENGTH ALONG THE CENTERLINE OF THE RAILING BETWEEN THE OUTSIDE ENDS, WITH DEDUCTIONS FOR THE LENGTH OF CONCRETE POSTS, IF PRESENT.

USE A500, GRADE B STRUCTURAL STEEL TUBING (HSS) IN THE RAIL CONFORMING TO SPEC. 3361. FINIAL CAPS SHALL BE SPEC. 3322. ALL OTHER STEEL SHALL CONFORM TO SPEC. 3306.

GALVANIZE BOLTS, NUTS, WASHERS AND ANCHORS PER SPEC. 3392. GALVANIZE ALL OTHER STRUCTURAL STEEL PER SPEC. 3394, AFTER FABRICATION.

COAT THE GALVANIZED RAILING, BASE PLATES, AND PROTRUDING PORTIONS OF BOLTS, NUTS, ANCHORS, AND WASHERS.

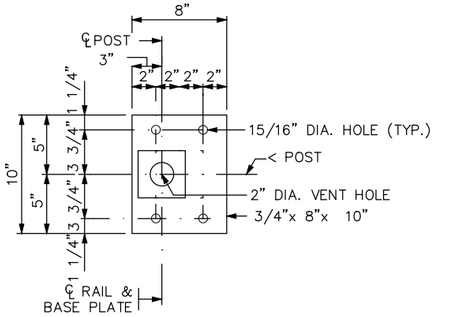
INSTALL RAIL POSTS AND SPINDLES.

CURVE HORIZONTAL RAILS WHERE APPLICABLE AND PLACE RAILS PARALLEL TO THE EDGE OF SIDEWALK PROFILE.

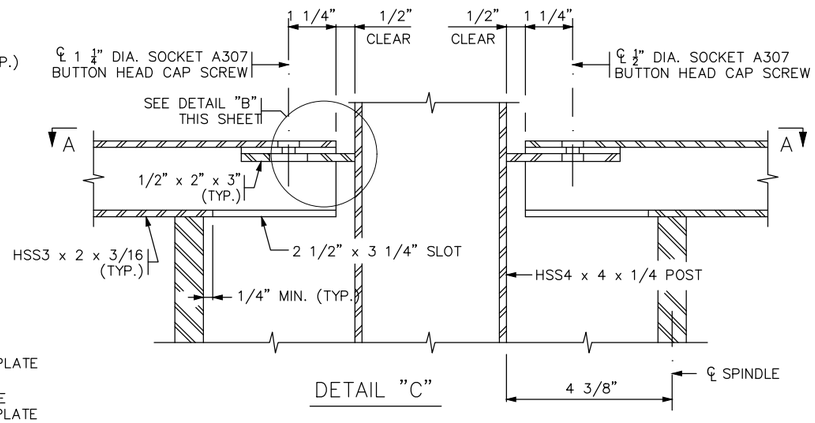
SEE SPECIAL PROVISIONS FOR REQUIREMENTS NOT INCLUDED ON THIS SHEET.

DRILL 1/4" DIA. MAX. VENT HOLES ON THE UNDERSIDE OF RAIL TUBES AS NECESSARY TO FACILITATE GALVANIZING.

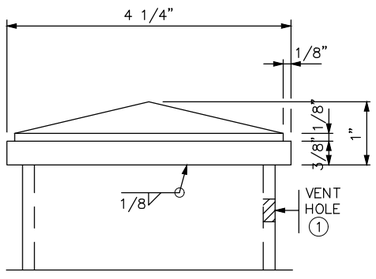
DRILL 1/4" DIA. MAX. WEEP HOLE ON UNDERSIDE OR BOTTOM OF ALL VERTICAL AND HORIZONTAL TUBULAR STEEL MEMBERS



BASE PLATE



DETAIL "C"

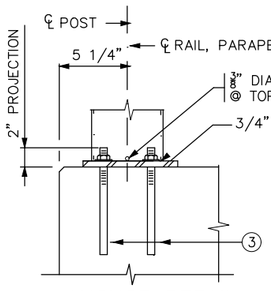


RAILPOST CAP DETAIL ②

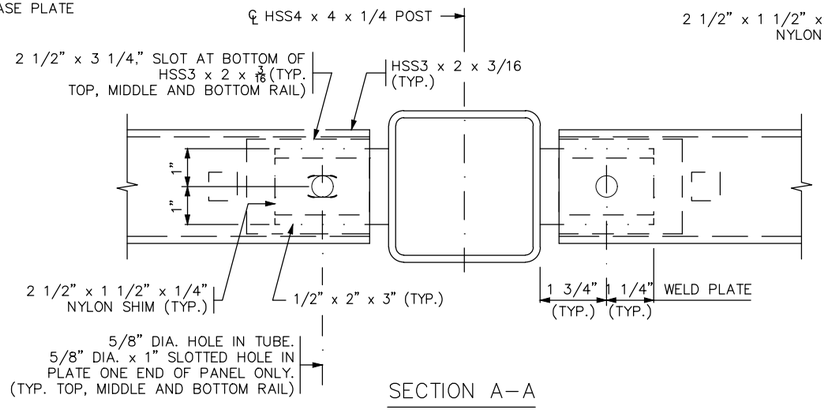
① DRILL VENT HOLE IN THE RAIL POST WITHIN 2" OF THE UNDERSIDE OF THE CAP, ON THE NON–TRAFFIC SIDE OF THE POST AS NECESSARY TO FACILITATE GALVANIZING. MAXIMUM HOLE SIZE IS " DIA.

② PROVIDE A PYRAMID TOP STYLE STEEL CAP WELDED TO TOP OF POST WITH A SURFACE FINISH OF 1000 MICRO–INCH, OR SMOOTHER, PRIOR TO GALVANIZING.

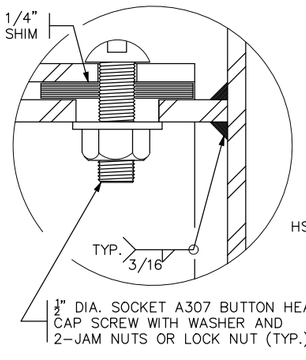
③ 5/8"Ø HIT–HY 200 + HIT–Z ANCHOR SYSTEM WITH 6" EMBEDMENT IN CLEANED HOLE (HOLE CONDITION 2). INSTALL ACCORDING TO MANUFACTURER'S RECOMMENDATIONS. PROOF LOAD TO 7.4 KIPS.



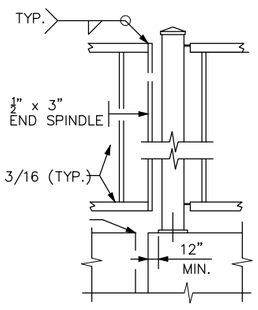
ANCHOR DETAIL



SECTION A–A



DETAIL "B"



DETAIL "A"

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WSB PROJECT NO. 012067–000

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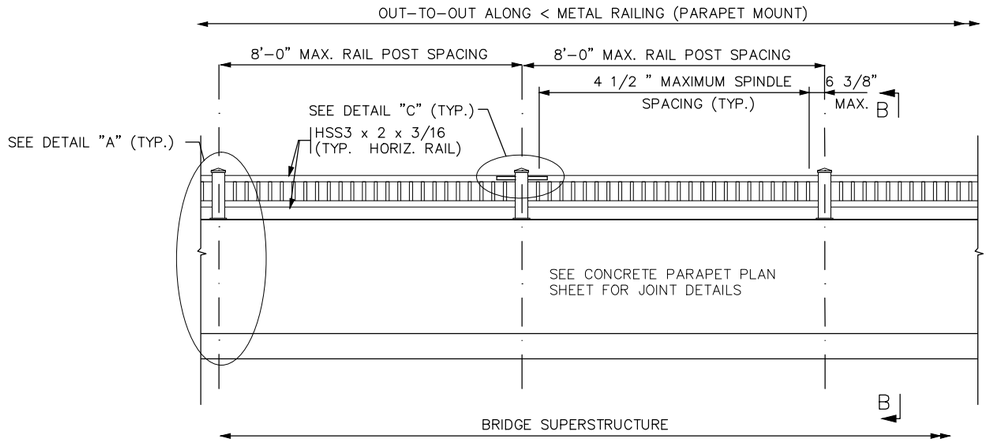
52nd Ave S over Drain 27

Bridge Aesthetics

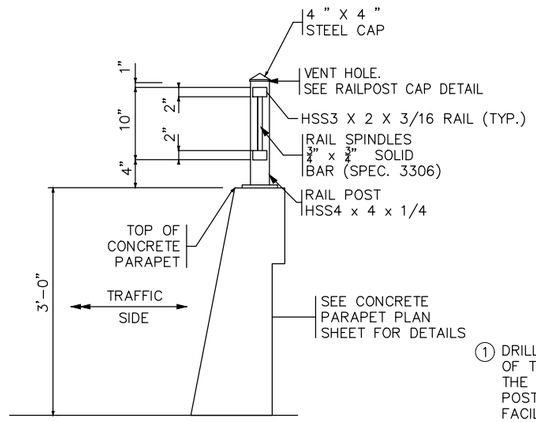
Ornamental Fence Details

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	170	57



INSIDE ELEVATION OF RAILING



SECTION B–B

(6'–0" TALL OPTION SHOWN)

GENERAL NOTES

CONTINUOUSLY GROUND ALL METAL RAILINGS;

PAYMENT LENGTH SHALL BE MEASURED AS THE OUT TO OUT LENGTH
ALONG THE CENTERLINE OF THE RAILING BETWEEN THE OUTSIDE ENDS, WITH DEDUCTIONS FOR THE LENGTH OF CONCRETE POSTS, IF PRESENT.

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COAT THE GALVANIZED RAILING, BASE PLATES, AND PROTRUDING PORTIONS OF BOLTS, NUTS, ANCHORS, AND WASHERS.

INSTALL RAIL POSTS AND SPINDLES.

CURVE HORIZONTAL RAILS WHERE APPLICABLE AND PLACE RAILS PARALLEL
TO THE EDGE OF SIDEWALK PROFILE.

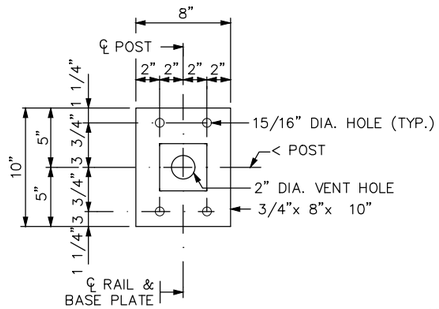
DRILL 1/4" DIA. MAX. VENT HOLES ON THE UNDERSIDE OF RAIL TUBES AS NECESSARY TO FACILITATE GALVANIZING.

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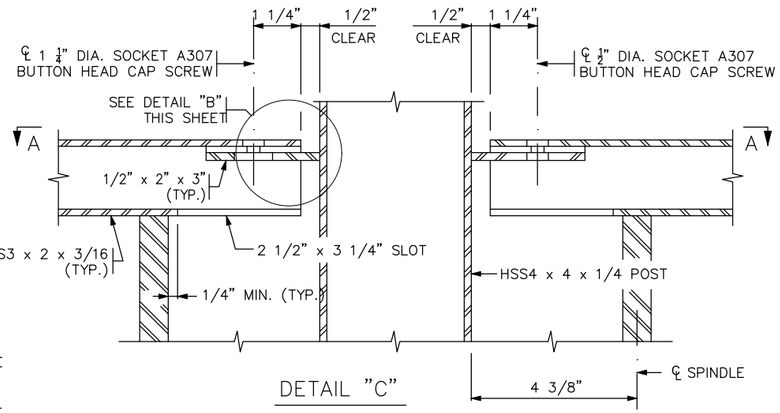
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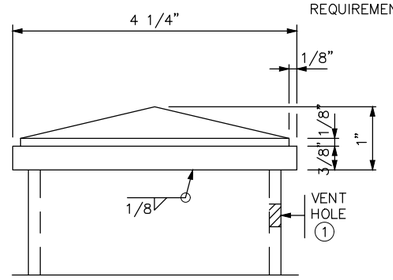
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SEE SPECIAL PROVISIONS FOR ADDITIONAL REQUIREMENTS.



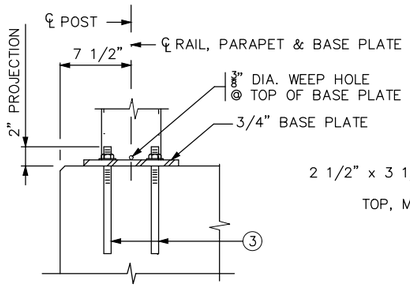
BASE PLATE



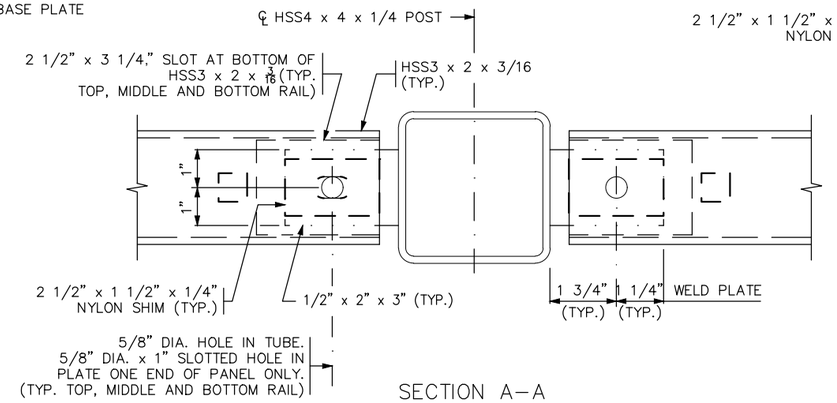
DETAIL "C"



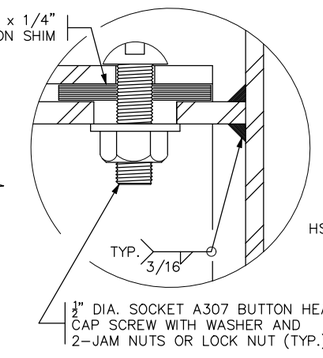
RAILPOST CAP DETAIL ②



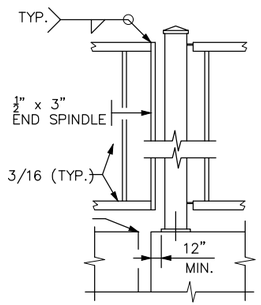
ANCHOR DETAIL



SECTION A–A



DETAIL "B"



DETAIL "A"

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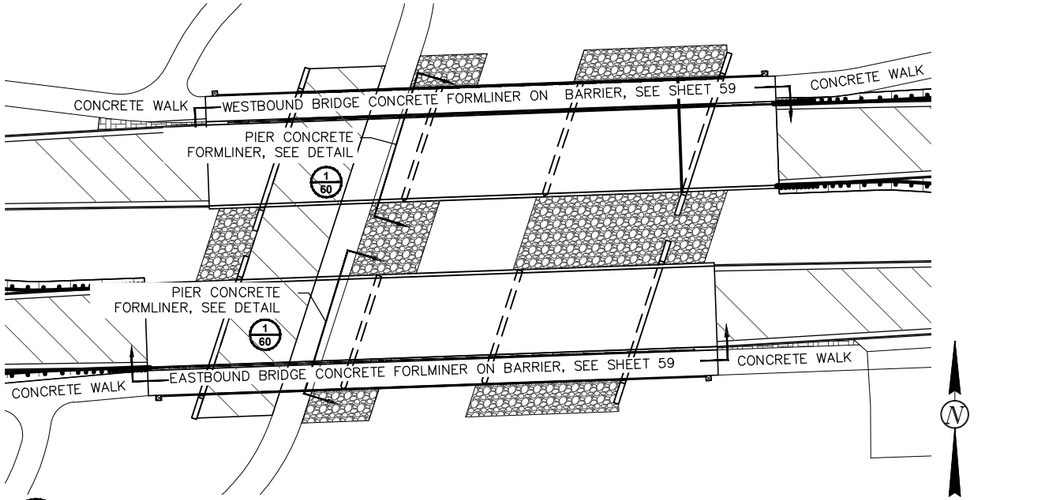
52nd Ave S over Drain 27

Bridge Aesthetics

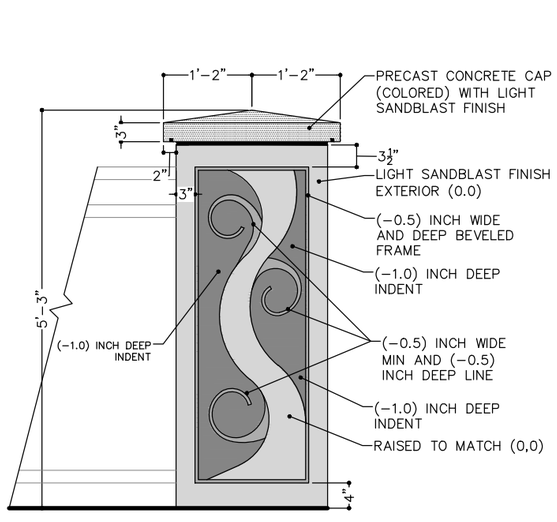
Railing Details

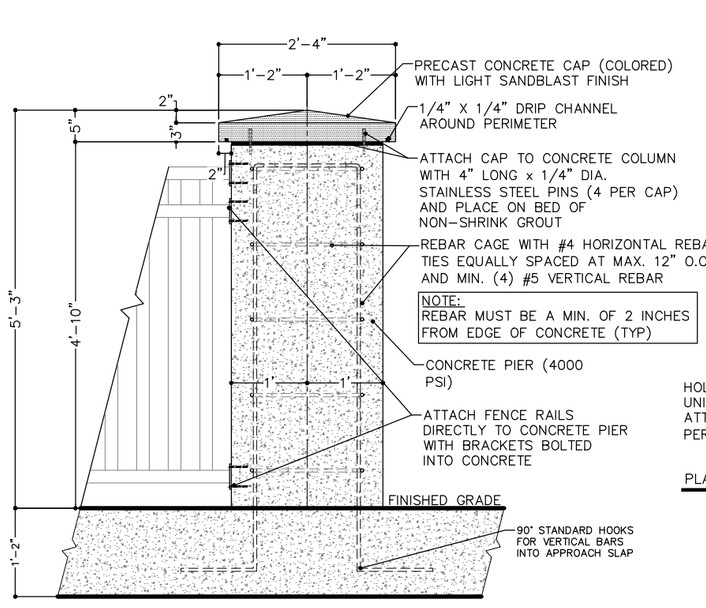
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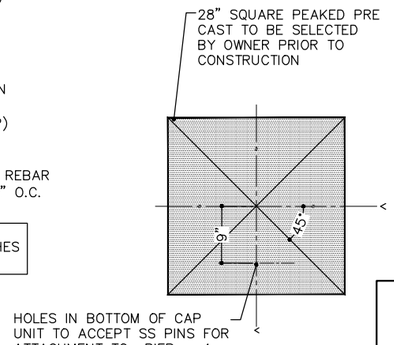
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	170	58



1/58 BRIDGE ENLARGEMENT PLAN
NTS







PLAN VIEW OF PRECAST CAP

2/58 COLUMN DETAILS
NTS

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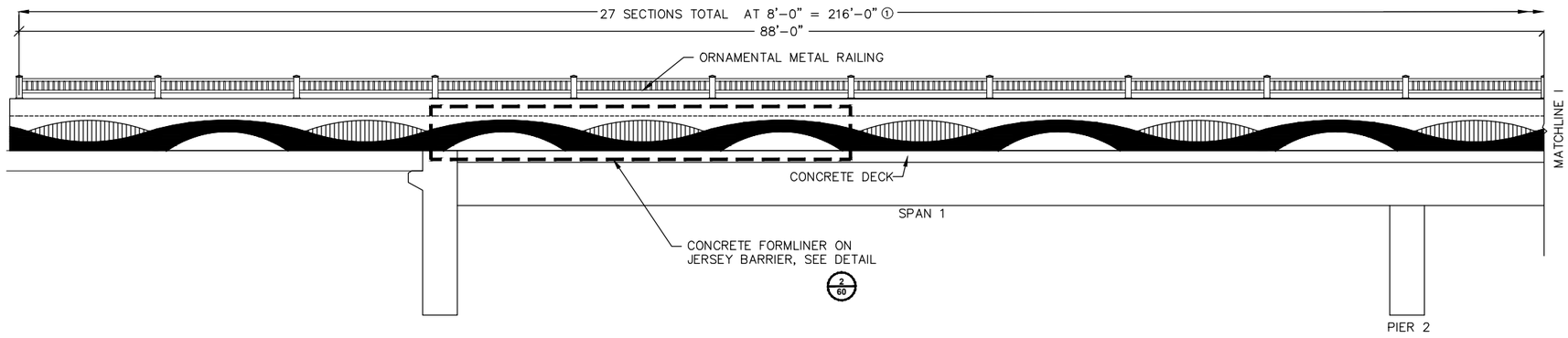
52nd Ave S over Drain 27

Bridge Aesthetics

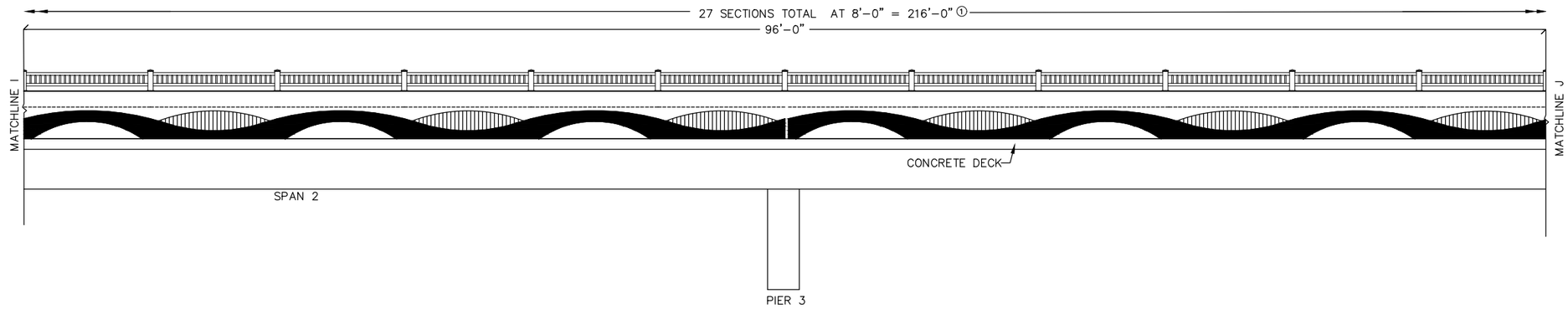
Plan and Details

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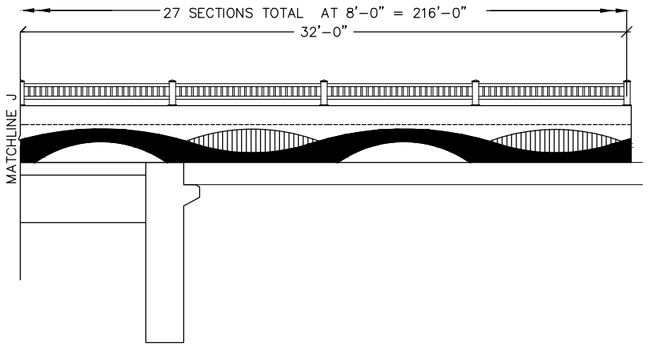
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	170	59



BARRIER WITH FORMLINER ELEVATION



BARRIER WITH FORMLINER ELEVATION



BARRIER WITH FORMLINER ELEVATION

0 4' 8'

THE CITY OF Fargo
FAR MORE

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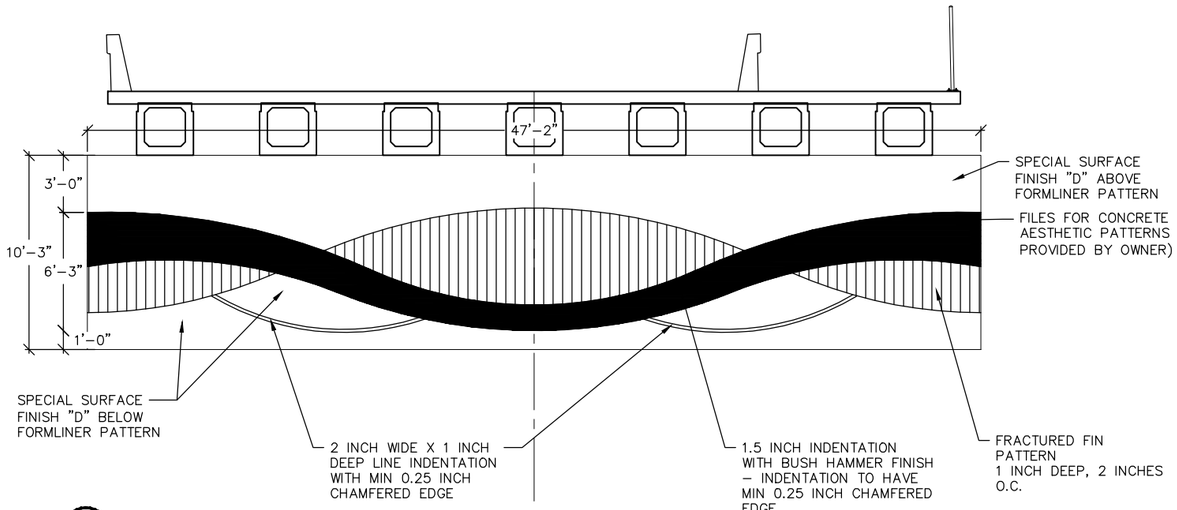
52nd Ave S over Drain 27

Bridge Aesthetics

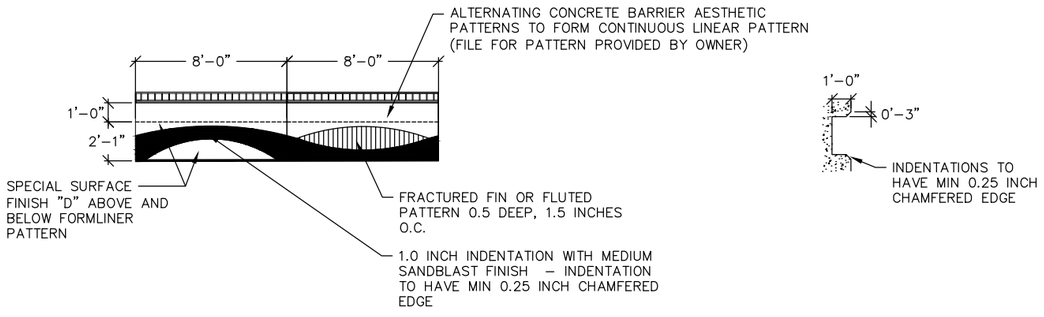
Barrier with Formliner Elevation

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SU-8-984(164)	170	60



1/60 PIER CONCRETE FORMLINER DETAIL
NTS



2/60 JERSEY BARRIER CONCRETE FORMLINER DETAIL
NTS

PLAN NOTES:

1. APPLY FORMLINER TO EAST AND WEST FACES OF ALL PIERS
2. SURFACE FINISH "D": APPLY SURFACE FINISH "D" ON ALL EXPOSED SUBSTRUCTURE (EXCEPT THOSE AREAS WITH ARCHITECTURAL RELIEFS AND PATTERNS AS IDENTIFIED ON THE PLAN AND DETAILS), THE FASCIA AND BOTTOM SURFACE OF THE EXTERIOR BEAMS, THE OUTSIDE EDGES OF THE PIER DIAPHRAGMS, THE OUTSIDE EDGE OF THE DECK, THE UNDERSIDE OF THE DECK OVERHANG, THE EXPOSED ENDWALL AREAS OUTSIDE THE EXTERIOR BEAMS, AND ON ALL BRIDGE AND APPROACH SLAB BARRIER SURFACES (EXCEPT THOSE AREAS WITH ARCHITECTURAL RELIEF PATTERNS). EXTEND SURFACE FINISH ON ABUTMENTS, WINGWALLS, AND PIERS TO 2 FEET BELOW FINAL GRADE. USE GREY SURFACE FINISH COLOR, COLOR NUMBER 36424, MEETING FEDERAL STANDARD 595C.
3. APPLY ANTI–GRAFFITI COATING TO ALL FORMLINED CONCRETE SURFACES AND ALL SURFACES RECEIVING SPECIAL SURFACE FINISH "D". USE AN ANTI–GRAFFITI COATING THAT IS COMPATIBLE WITH ANY OTHER PREVIOUSLY APPLIED SUBSTANCES USED FOR THE ARCHITECTURAL FINISH WORK.
4. USE A CLEAR, MULTI–COAT ANTI–GRAFFITI SYSTEM DESIGNED FOR EXTERIOR ARCHITECTURAL CONCRETE SURFACES. THE SYSTEM MUST BE NON–YELLOWING, UV–RESISTANT, AND WILL NOT REQUIRE REAPPLICATION AFTER GRAFFITI REMOVAL.
5. USE GRAFFITI REMOVAL AGENTS THAT ARE BIODEGRADABLE, NON–TOXIC, AND NON–FLAMMABLE. REMOVAL AGENTS USED MUST NOT MAR, SHADOW, OR ALTER THE EXISTING APPEARANCE OF THE CONCRETE FOLLOWING APPLICATION, AND MUST LEAVE NO TRACES OF GRAFFITI FOLLOWING REMOVAL.
6. SUBMIT THE TYPE OF COATING BEING PROPOSED AS WELL AS A LIST OF SUITABLE PRODUCTS THAT ARE COMPATIBLE WITH THE COATING FOR REMOVING GRAFFITI.
7. COLOR OF SPECIAL SURFACE FINISH "D" TO BE FEDERAL STANDARD #36424 MEDIUM GRAY (TO BE VERIFIED AT TIME OF CONSTRUCTION)

THE CITY OF Fargo FAR MORE
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Houston Engineering Inc.
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52nd Ave S over Drain 27

Bridge Aesthetics

Concrete Formliner Details

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