

PLAN SYMBOLS

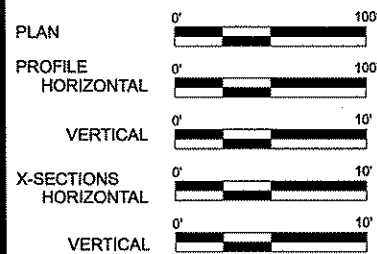
- COUNTY LINE \_\_\_\_\_
- TOWNSHIP OR RANGE LINE \_\_\_\_\_
- SECTION LINE \_\_\_\_\_
- QUARTER LINE \_\_\_\_\_
- SIXTEENTH LINE \_\_\_\_\_
- RIGHT OF WAY LINE \_\_\_\_\_
- SLOPE EASEMENT \_\_\_\_\_
- EXISTING RIGHT OF WAY \_\_\_\_\_
- PROPERTY LINE \_\_\_\_\_
- CORPORATE OR CITY LIMITS \_\_\_\_\_
- RETAINING WALL \_\_\_\_\_
- RAILROAD \_\_\_\_\_
- RAILROAD RIGHT OF WAY \_\_\_\_\_
- RIVER OR CREEK \_\_\_\_\_
- DRAINAGE DITCH \_\_\_\_\_
- CULVERT \_\_\_\_\_
- DROP INLET \_\_\_\_\_
- GUARD RAIL \_\_\_\_\_
- BARBED WIRE FENCE \_\_\_\_\_
- WOVEN WIRE FENCE \_\_\_\_\_
- CHAIN LINK FENCE \_\_\_\_\_
- WOOD FENCE \_\_\_\_\_
- STONE WALL OR FENCE \_\_\_\_\_
- HEDGE \_\_\_\_\_

- LOWLAND \_\_\_\_\_
- TIMBER \_\_\_\_\_
- ORCHARD \_\_\_\_\_
- BRUSH \_\_\_\_\_
- NURSERY \_\_\_\_\_
- CATTLE GUARD \_\_\_\_\_
- OVERPASS (Highway Over) \_\_\_\_\_
- UNDERPASS (Highway Under) \_\_\_\_\_
- BRIDGE \_\_\_\_\_
- BUILDING (One Story Frame) \_\_\_\_\_
- F-FRAME C-CONCRETE \_\_\_\_\_
- S-STONE T-TILE \_\_\_\_\_
- B-BRICK ST-STUCCO \_\_\_\_\_
- RAILROAD CROSSING BELL \_\_\_\_\_
- RAILROAD CROSSING GATE \_\_\_\_\_
- MANHOLE \_\_\_\_\_
- CATCH BASIN \_\_\_\_\_
- FIRE HYDRANT \_\_\_\_\_
- CAST IRON MONUMENT \_\_\_\_\_
- IRON PIN \_\_\_\_\_
- GRAVEL PIT \_\_\_\_\_
- SAND PIT \_\_\_\_\_
- BORROW PIT \_\_\_\_\_
- ROCK QUARRY \_\_\_\_\_

UTILITY SYMBOLS

- POWER POLE LINE \_\_\_\_\_
- TELEPHONE OR TELEGRAPH POLE LINE \_\_\_\_\_
- JOINT TELEPHONE & POWER ON POWER POLES \_\_\_\_\_
- ON TELEPHONE POLES \_\_\_\_\_
- ANCHOR \_\_\_\_\_
- STEEL TOWER \_\_\_\_\_
- STREET LIGHT \_\_\_\_\_
- PEDESTAL (Cable Terminal) \_\_\_\_\_
- GAS MAIN \_\_\_\_\_
- WATERMAIN \_\_\_\_\_
- TELEPHONE CABLE IN CONDUIT \_\_\_\_\_
- ELECTRIC CABLE IN CONDUIT \_\_\_\_\_
- TELEPHONE MANHOLE \_\_\_\_\_
- ELECTRIC MANHOLE \_\_\_\_\_
- BURIED TELEPHONE CABLE \_\_\_\_\_
- BURIED ELECTRIC CABLE \_\_\_\_\_
- SEWER (Sanitary or Storm) \_\_\_\_\_
- SEWER MANHOLE \_\_\_\_\_

SCALES



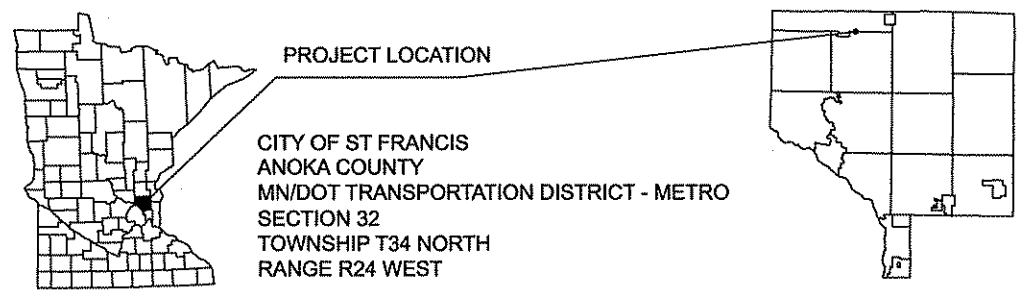
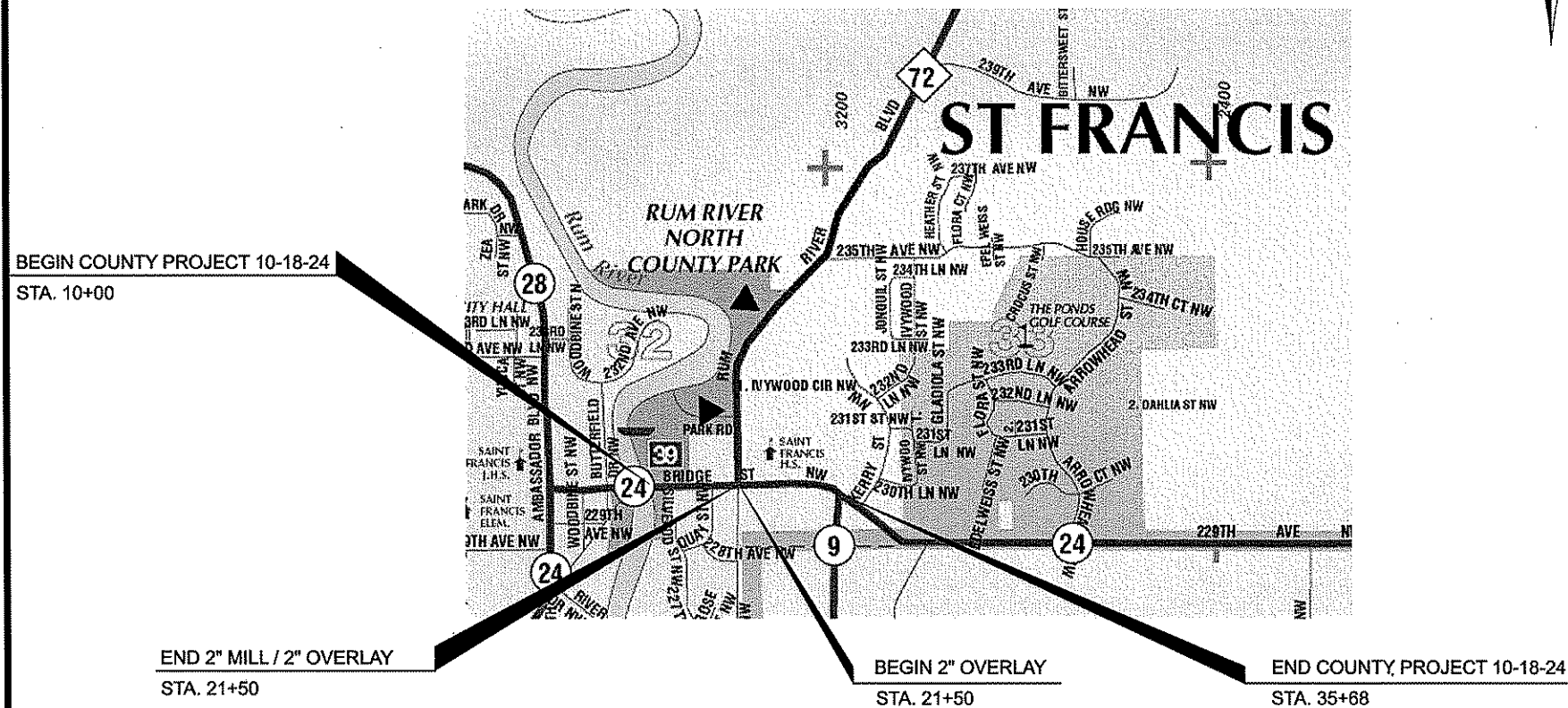
# MINNESOTA DEPARTMENT OF TRANSPORTATION ANOKA COUNTY

CONSTRUCTION PLAN FOR 2" MILL / 2" OVERLAY, 2" OVERLAY, STORM SEWER REPAIRS, SHOULDERING

LOCATED ON CSAH 24 BETWEEN RUM RIVER BRIDGE AND CSAH 9

	10-18-24	
GROSS LENGTH	2568 FEET	0.48 MILES
BRIDGES-LENGTH	0.00 FEET	0.000 MILES
EXCEPTIONS-LENGTH	0.00 FEET	0.000 MILES
NET LENGTH	2568 FEET	0.48 MILES

CITY OF ST FRANCIS



GOVERNING SPECIFICATIONS

THE 2005 EDITION OF THE MINNESOTA DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR CONSTRUCTION" SHALL GOVERN. ALL TRAFFIC CONTROL DEVICES SHALL CONFORM AND BE INSTALLED IN ACCORDANCE TO THE "MINNESOTA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (MNMUTCD), AND PAR VI, "FIELD MANUAL FOR TEMPORARY TRAFFIC CONTROL ZONE LAYOUTS."

INDEX

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	STATEMENT OF ESTIMATED QUANTITIES,
3-4	TYPICAL SECTIONS
5-6	DETAILS
7	CB REPAIR DETAILS
8	PLAN
9	STRIPING PLAN
9A-9C	MISC. SIGNAL PLANS

Approved: 3/26/10 ANOKA COUNTY ENGINEER

NO	DATE	BY	CKD	APPR	REVISION

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

PRINT NAME: CHARLES CADENHEAD

SIGNATURE:

DATE: 3/26/10 LICENSE NO. #40416

DRAWN BY: JF DATE: 3/1/2010

DESIGN BY: JF DATE: 3/1/2010

CHECKED BY: JO DATE: 3/1/2010

ANOKA COUNTY  
HIGHWAY DEPT.

STATE PROJECT NO. 10-18-24

TITLE SHEET

Sheet 1 of 9C Sheets

CSAH 24		STATEMENT OF ESTIMATED QUANTITIES			PROJECT 10-18-24
ITEM NO.	ITEM	NOTE OR TAB NO.	UNIT	TOTAL EST. QUANT.	
2021.501	MOBILIZATION		LUMP SUM	1.0	
2104.505	REMOVE BITUMINOUS PAVEMENT	7	SQ YD	36.0	
2104.511	SAWING CONCRETE CURB (FULL DEPTH)	7	LIN FT	16.0	
2104.513	SAWING BITUMINOUS PAVEMENT (FULL DEPTH)	7	LIN FT	112.0	
2105.525	TOPSOIL BORROW	7	CU YD	5.0	
2221.609	AGGREGATE SHOULDERING CLASS 7 B	8, 9	TON	75.2	
2232.501	MILL BITUMINOUS SURFACE (2") JOINTS		SQ YD	116.1	
2232.501	MILL BITUMINOUS SURFACE (2") MAINLINE	10, 11	SQ YD	5309.0	
2357.502	BITUMINOUS MATERIAL FOR TACK COAT		GALLON	628.7	
2360.501	TYPE SP 12.5 SPWEB440B ( MAIN LINE )	3	TON	1446.0	
2360.501	TYPE SP 12.5 SPWEB440B( ST. APPROACH ,DR.WAYS & PATCHING AROUND CB REPAIRS )	7, 9	TON	66.2	
2504.602	ADJUST GATE VALVE		EACH	1.0	
2506.516	CASTING ASSEMBLY	7	EACH	4.0	
2506.522	ADJUST FRAME RING AND CASTING		EACH	1.0	
2506.503	RECONSTRUCT DRAINAGE STRUCTURE	7, 8, 14, 15	LIN FT	3.2	
2506.602	GROUT CATCH BASIN OR MANHOLE	7	EACH	4.0	
2531.501	CONCRETE CURB AND GUTTER DESIGN B618	7	LIN FT	60.0	
2563.601	TRAFFIC CONTROL	4, 5, 6, 13	LUMP SUM	1.0	
2565.602	LOOP DETECTOR 6' X 6'	1, 2	EACH	8.0	
2575.523	EROSION CONTROL BLANKET CAT 3	12	SQ YD	18.0	
2581.501	REMOVABLE PREFORM PLASTIC MARKINGS	6	LIN FT	410.9	
2582.502	4" SOLID LINE WHITE - EPOXY	4	LIN FT	6966.0	
2582.502	4" SOLID LINE YELLOW-EPOXY	4	LIN FT	1589.0	
2582.502	4" BROKEN LINE YELLOW-EPOXY	4	LIN FT	320.0	
2582.502	4" DOUBLE YELLOW-EPOXY	4	LIN FT	2536.0	
2582.602	LEFT TURN ARROW- PREFORMED THERMOPLASTIC	4	EACH	12.0	
2582.602	THRU / RIGHT TURN ARROW-PREFORMED THERMOPLASTIC	4	EACH	6.0	
2582.603	24" YELLOW PREFORMED-THERMOPLASTIC	4	LIN FT	197.3	
2582.603	24" WHITE-PREFORMED THERMOPLASTIC	4	LIN FT	138.6	
2582.618	3' X 6' THERMOPLASTIC ZEBRA CROSS WALK	4	SQ FT	684.0	

**NOTES:**

- 1 CONTRACTOR SHALL REQUEST LOOPS BE LOCATED BY ANOKA CO 48 HOURS PRIOR TO MILLING. NO MILLING SHALL TAKE PLACE NEAR LOOPS UNTIL MARKED.
- 2 REPLACE ONLY IF DAMAGED DURING MILLING OPERATION. / CONTRACTOR SHALL COORDINATE WITH ANOKA COUNTY SIGNAL DEPT. - IF SIGNAL LOOPS ARE HIT DURING MILLING.
- 3 FINAL MAINLINE PAVING TO TAKE PLACE WITHIN 72 HOURS OF MILLING.
- 4 PERMANENT MARKINGS TO BE IN PLACE WITHIN 72 HOURS OF FINAL MAINLINE PAVING.
- 5 ALL TRAFFIC CONTROL METHODS SHALL CONFORM TO THE MINNESOTA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES ( MMUTCD ).
- 6 TEMP LANE TAPE SHALL BE PLACED ON MILLED MAT / NEW MAT AT END OF EACH MILLING /PAVING DAY.
- 7 ALL CATCH BASIN REPAIRS TO BE COMPLETED PRIOR TO MILLING.
- 8 AGGREGATE SHOULDERING CLASS 7B SHALL BE USED FOR COMPACTING AROUND CB'S PRIOR TO PAVING. ENGINEER SHALL APPROVE
- 9 AGGREGATE SHOULDERING CLASS 7B SHALL BE USED FOR SHOULDERING NON-CURB AREA.
- 10 MAINLINE MILLING INCLUDES DETAIL MILLING AROUND MANHOLES, GATE VALVES, AND ALL STRUCTURES IN BIT. PAVEMENT AREA TO BE MILLED.
- 11 ALL MANHOLES / GV'S MUST BE LOCATED AND PROTECTED AT ALL TIMES DURING MILLING AND PAVING OPERATIONS. CONTRACTORS RESPONSIBILITY.
- 12 INCLUDES SEED AND FERTILIZER, INCIDENTAL TO BLANKET AT CB REPAIRS.
- 13 DO NOT PASS, PASS WITH CARE, STOP HEAR ON RED, NO CENTER STRIPE AND BUMP/BUMP AHEAD SIGNS TO BE INPLACE DURING MILL / PAVING OPERATIONS.
- 14 RECTANGULAR RINGS AND CASTING, TO BE REPLACED SAME AS EXSTING.
- 15 STRUCTURE TO REMAIN INPLACE, PAID AS RECONSTRUCT. TOP OF STRUCTURE TO BOTTOM OF CASTING.

**ITEM NO. BASIS OF PLANNED QUANTITIES**

2221.609	AGGREGATE SHOULDERING CLASS-7B	1 CU = 1.8 TONS (CV)
2357.502	BITUMINOUS MATERIAL FOR TACK COAT	.05 GAL / SQ YD
2360.501	TYPE SP 12.5 SPWEB440B ( MAIN LINE )	(SQ YD * IN. *115 LBS)/2000 = TONS
2360.501	TYPE SP 12.5 SPWEB440B ( ST. APP. / DR. WAYS / PATCHING AROUND CB REPAIRS )	(SQ YD * IN. *115 LBS)/2000 = TONS

**PLATE NO. STANDARD PLATE DETAIL**

4026A	CONCRETE ENCASED CONCRETE ADJUSTING RINGS ( RECTANGLE )
4108-F	ADJUSTING RINGS
R-3249-F	NEENAH CATCH BASIN FRAME , GRATE,CURB BOX ASSEMBLY
7100H	CONCRETE CURB AND GUTTER

NO	DATE	BY	CKD	APPR	REVISION
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3/15/2010 8:38:21 AM					

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.  
 PRINT NAME: CHARLES CADENHEAD  
 SIGNATURE: *Charles Cadenhead*  
 DATE: 3/26/10 LICENSE NO. #40416

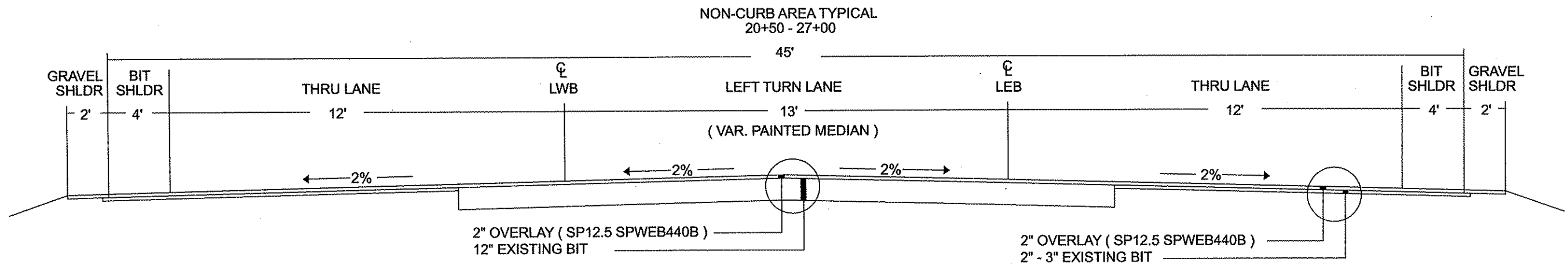
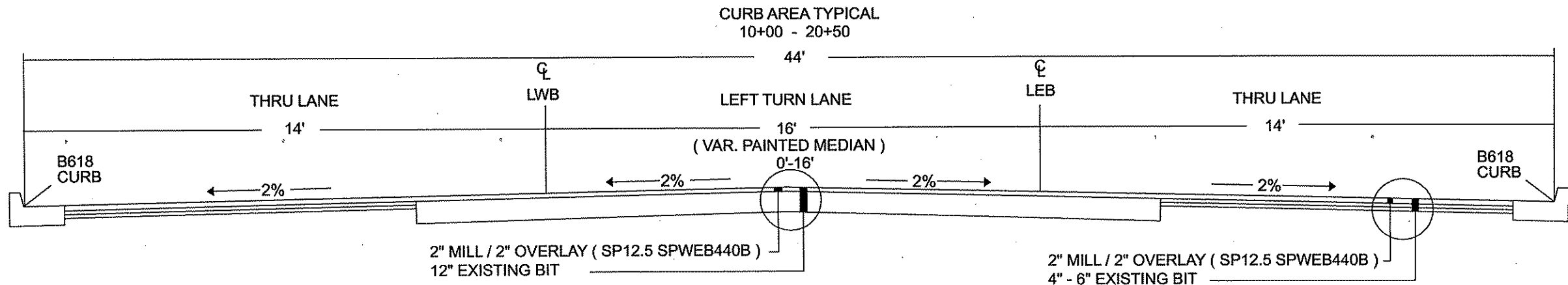
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**ANOKA COUNTY  
HIGHWAY DEPT.**

COUNTY PROJECT NO. 10-18-24

STATEMENT OF ESTIMATED QUANTITIES  
 Sheet 2 of 9C Sheets



NO	DATE	BY	CKD	APPR	REVISION

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

PRINT NAME: CHARLES CADENHEAD  
SIGNATURE: *[Signature]*  
DATE: 3/26/10      LICENSE NO. #40416

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CHECKED BY: JO      DATE: 3/1/2010



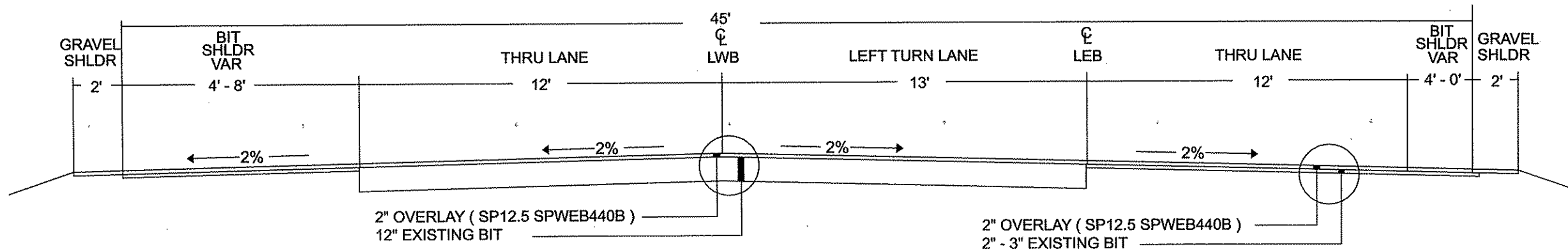
**ANOKA COUNTY**  
**HIGHWAY DEPT.**

COUNTY PROJECT NO. 10-18-24

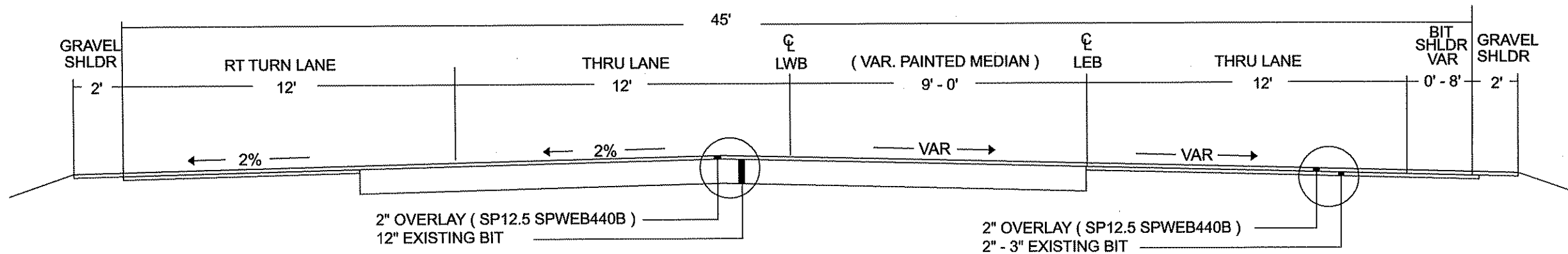
TYPICALS

Sheet 3 of 9C Sheets

NON-CURB AREA TYPICAL  
27+00 - 30+25



NON-CURB AREA TYPICAL  
30+25 - 35+68



NO	DATE	BY	CKD	APPR	REVISION

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 PRINT NAME: CHARLES CADENHEAD  
 SIGNATURE: *Charles Cadenhead*  
 DATE: 3/2/10      LICENSE NO. #40418

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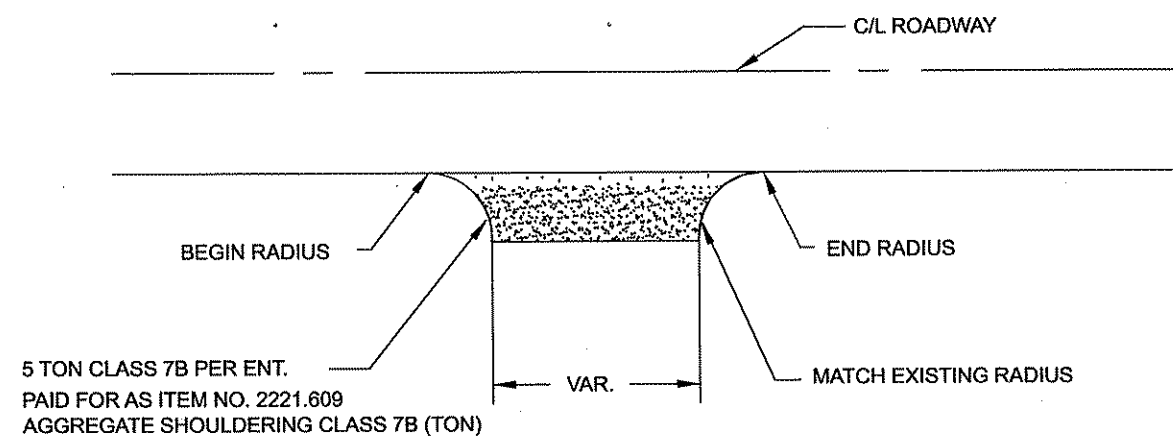


ANOKA COUNTY  
HIGHWAY DEPT.

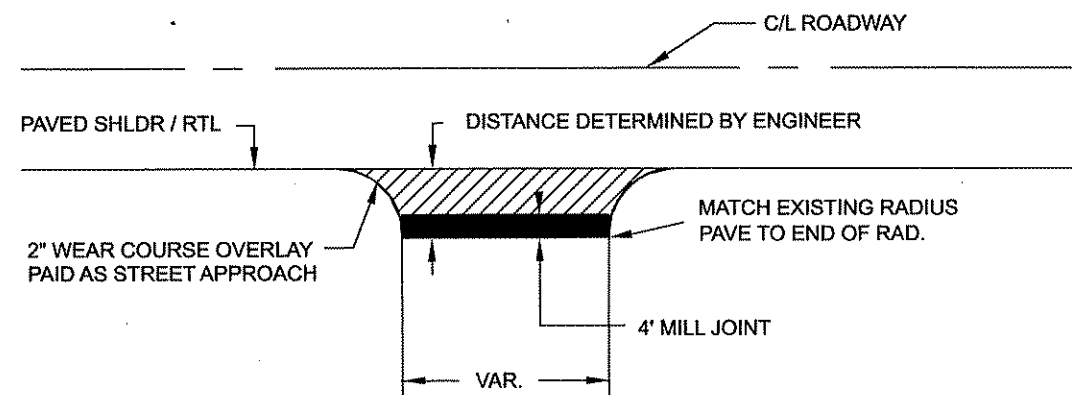
COUNTY PROJECT NO. 10-18-24

TYPICALS  
Sheet 4 of 90 Sheets

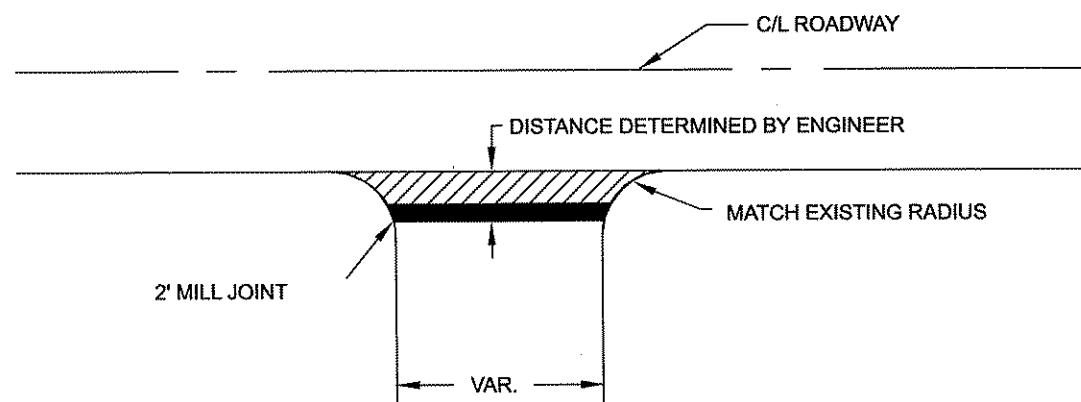
GRAVEL DR. WAYS AND FEILD ENT.



PAVED STREET APPROACHES



PAVED DR. WAYS



DRIVEWAYS TO BE PAVED IN SEPERATE OPERATION THAN MAINLINE WEAR.  
PAID AS STREET APPROACH WEAR

NO	DATE	BY	CKD	APPR	REVISION

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ANOKA COUNTY  
HIGHWAY DEPT.

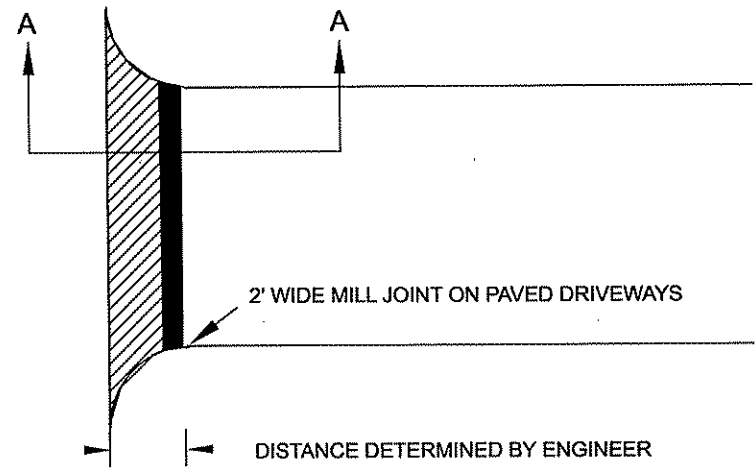
COUNTY PROJECT NO. 10-18-24

DETAILS

Sheet 5 of 90 Sheets

PAVED DRIVEWAYS

JOINT DETAILS

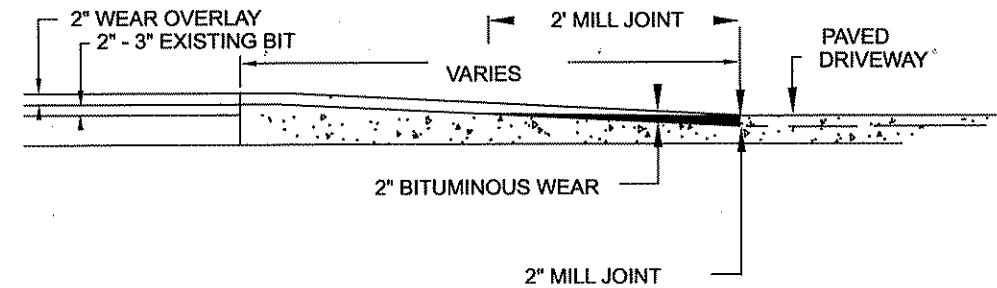


2' WIDE MILL JOINT ON PAVED DRIVEWAYS

DISTANCE DETERMINED BY ENGINEER

DRIVEWAYS TO BE PAVED IN SEPERATE OPERATION THAN MAINLINE WEAR.  
PAID AS STREET APPROACH WEAR

DRIVEWAY JOINT DETAILS A - A



2" WEAR OVERLAY  
2" - 3" EXISTING BIT

VARIES

2" MILL JOINT

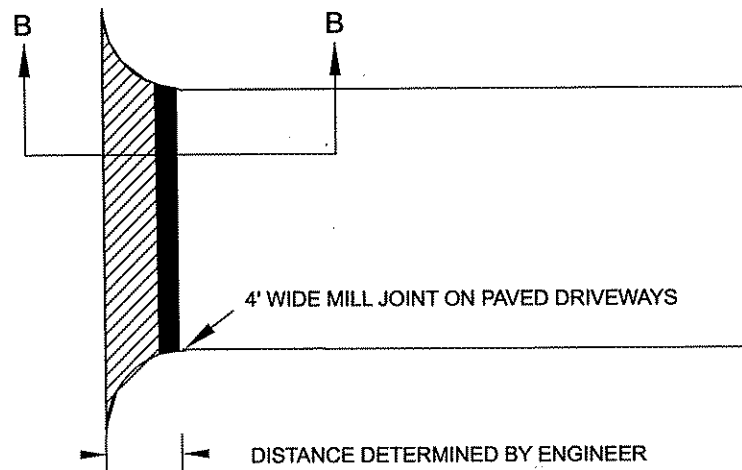
PAVED DRIVEWAY

2" BITUMINOUS WEAR

2" MILL JOINT

PAVED STREETS

JOINT DETAILS

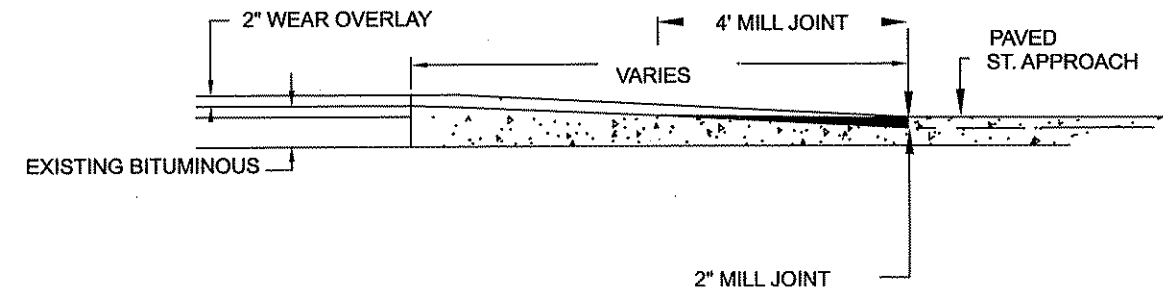


4' WIDE MILL JOINT ON PAVED DRIVEWAYS

DISTANCE DETERMINED BY ENGINEER

OVERLAY EXISTING STEET APPROACH  
PAID AS STREET APPROACH WEAR

STREET APPROACH JOINT DETAILS B - B



2" WEAR OVERLAY

VARIES

4' MILL JOINT

PAVED ST. APPROACH

EXISTING BITUMINOUS

2" MILL JOINT

NO	DATE	BY	CHKD	APPR	REVISION

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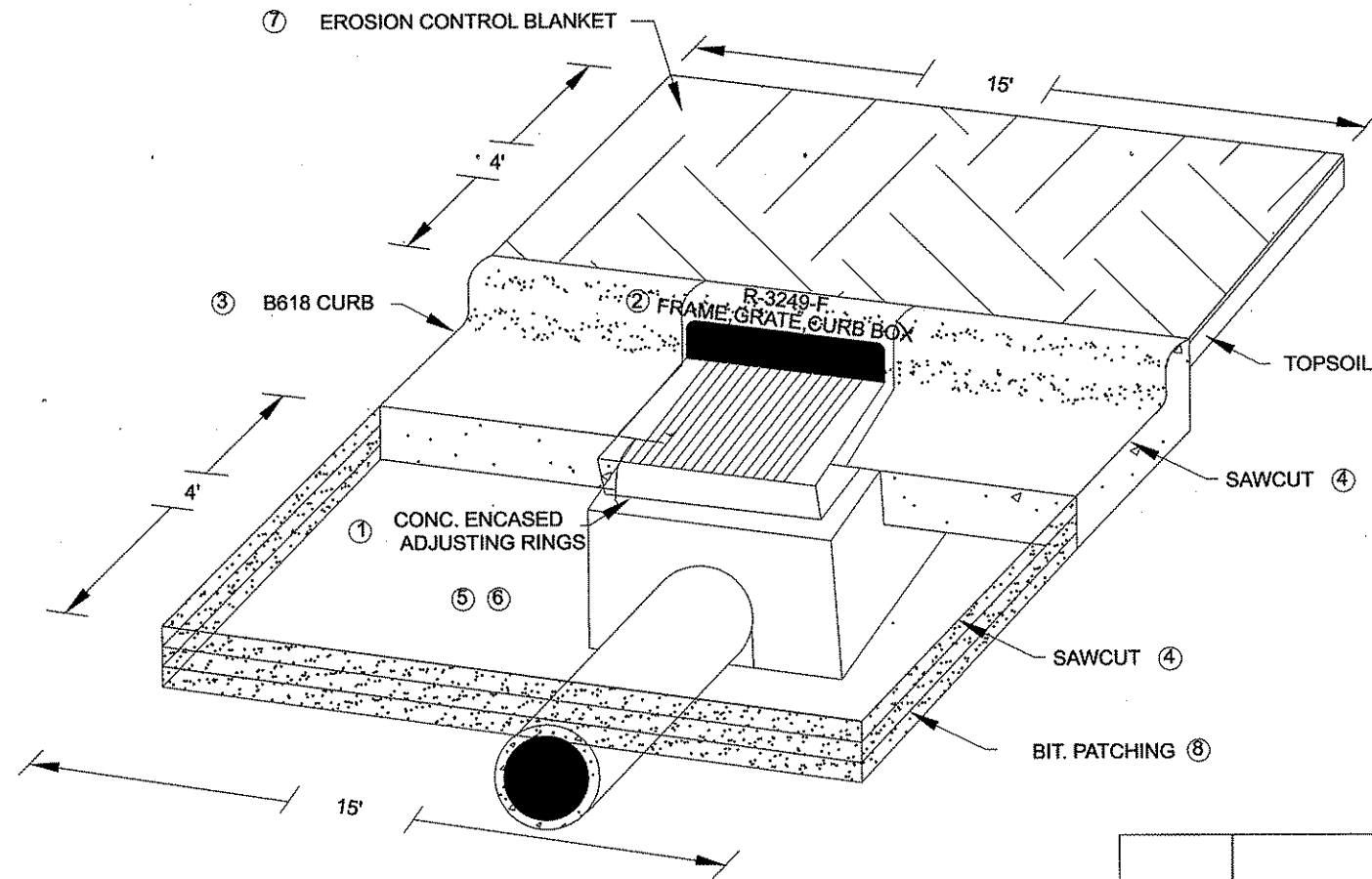


ANOKA COUNTY  
HIGHWAY DEPT.

COUNTY PROJECT NO. 10-18-24

DETAILS  
Sheet 6 of 9C Sheets

### C.B. REPAIR DETAIL



FOR TRAFFIC CONTROL AT CATCH BASIN REPAIRS REFER TO THE MINNESOTA MANUAL ON TEMPORARY TRAFFIC CONTROL ZONE LAYOUTS

**NOTES..**

REFER TO MINNESOTA STANDARD PLATES / NEENAH MANUAL FOR THE FOLLOWING...

- ① CONCRETE ENCASED CONCRETE ADJUSTING RINGS STANDARD PLATE 4026A
- ② NEENAH R-3249-F FRAME, GRATE, CURB BOX
- ③ CONCRETE CURB AND GUTTER DESIGN B STANDARD PLATE 7100G
- ④ SAWCUT BIT. & CONCRETE CURB FULL DEPTH.
- ⑤ ADD AND COMPACT CLASS 7B AROUND REPAIRED STRUCTURE.
- ⑥ REMOVE VAR. DEPTH BITUMINOUS 3"-7" / PATCH 2-LIFTS OF BITUMINOUS.
- ⑦ REPLACE DISPLACED TOPSOIL- SEED & FERT, COVER WITH EROS. BLANKET. SEED, FERT. ARE INCIDENTAL TO BLANKET.
- ⑧ BIT. PATCH PRIOR TO MAINLINE MILL

STORM SEWER REPAIRS																
STRUCTURE	STATION	LEB / LWB	LT / RT	SAW BIT. PAVEMENT		REPLACE BIT. PAVEMENT	SAW CONC. ( CURB )	REMOVE C&G	REPLACE B618 C-&G	ASSEMBLY	CASTING HT.	GROUT	RECONSTRUCT		EROSION CONT. BLANKET	ACTION
				LF	SY								TON	LF		
1	11+10	LEB	RT	23	9	3.58	4	15	15	A-1	6"	1	0.8	4.5		RE-RING / GROUT STRUCTURE
2	11+20	LEB	RT	23	9	3.58	4	15	15	A-1	6"	1	0.8	4.5		RE-RING / GROUT STRUCTURE
3	11+20	LWB	LT	23	9	3.58	4	15	15	A-1	6"	1	0.8	4.5		RE-RING / GROUT STRUCTURE
4	11+10	LWB	LT	23	9	3.58	4	15	15	A-1	6"	1	0.8	4.5		RE-RING / GROUT STRUCTURE
<b>TOTALS</b>				<b>92</b>	<b>36</b>	<b>14.3</b>	<b>16</b>	<b>60</b>	<b>60</b>			<b>4</b>	<b>3.2</b>	<b>18</b>		
NEENAH ASSEMBLY	R-3249-F	A1 =	6"													
PAY HT. = TOP OF STRUCTURE TO BOTTOM OF CASTING																

NO	DATE	BY	CKD	APPR	REVISION

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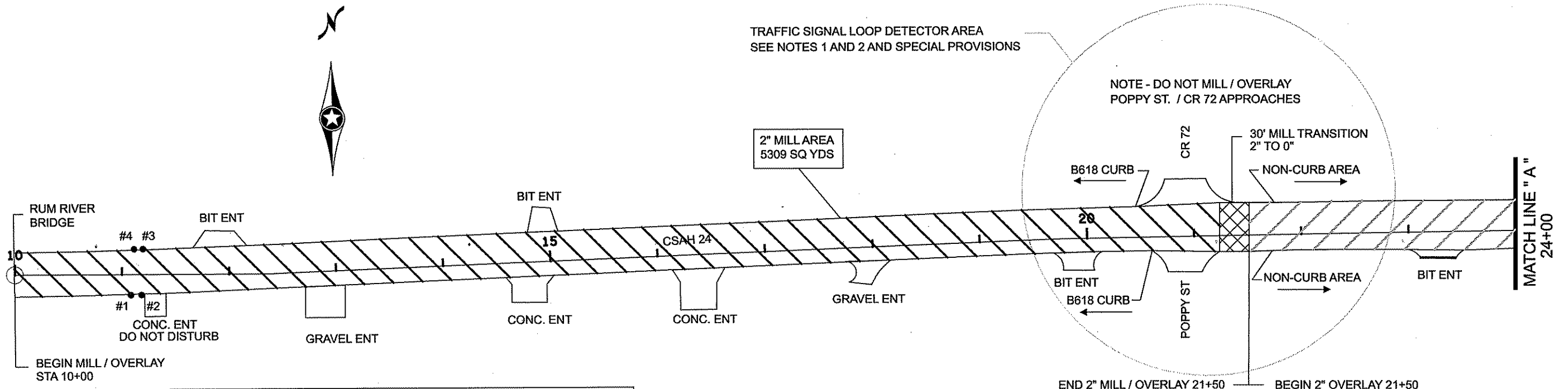
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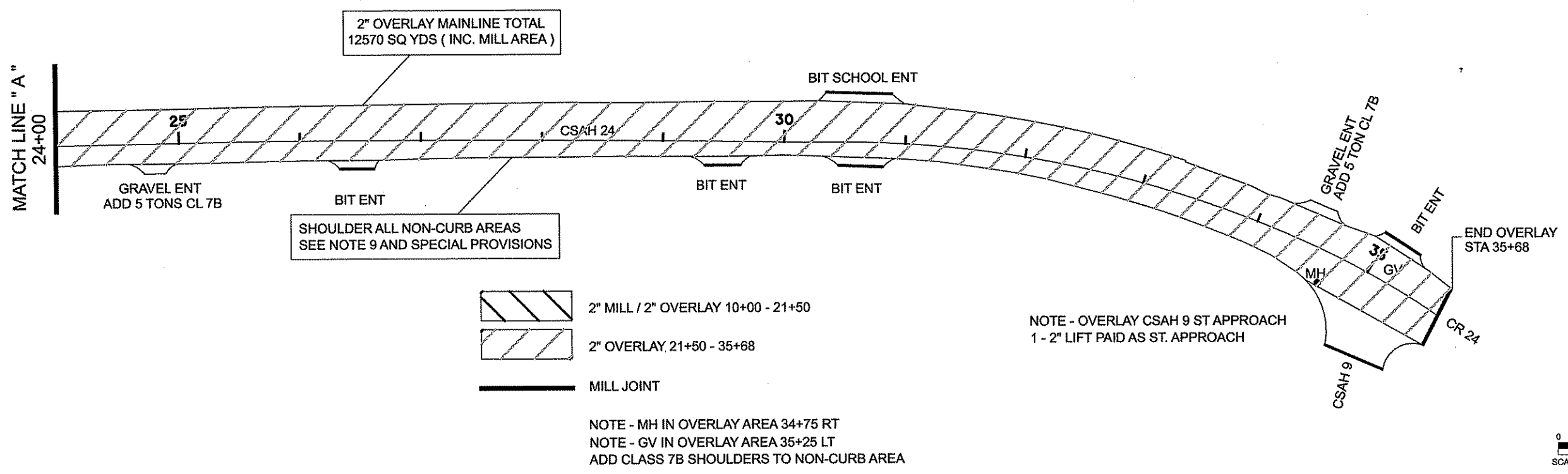
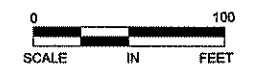
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**ANOKA COUNTY**  
**HIGHWAY DEPT.**

COUNTY PROJECT NO. 10-18-24



STRUC.	STRUC. COND.	RING COND.	ACTION
#1	FAIR	POOR	RE-RING / GROUT RINGS & DOGHOUSE
#2	FAIR	POOR	RE-RING / GROUT RINGS & DOGHOUSE
#3	FAIR	POOR	RE-RING / GROUT RINGS & DOGHOUSE
#4	FAIR	POOR	RE-RING / GROUT RINGS & DOGHOUSE



- 2" MILL / 2" OVERLAY 10+00 - 21+50
- 2" OVERLAY 21+50 - 35+68
- MILL JOINT

NOTE - MH IN OVERLAY AREA 34+75 RT  
 NOTE - GV IN OVERLAY AREA 35+25 LT  
 ADD CLASS 7B SHOULDERS TO NON-CURB AREA



NO	DATE	BY	CKD	APPR	REVISION	TIME

NAME: P:\10-01-00\CSAH\_24\_(Poppy-LakeGeorge)\Plan3 plan sheet 1.dgn  
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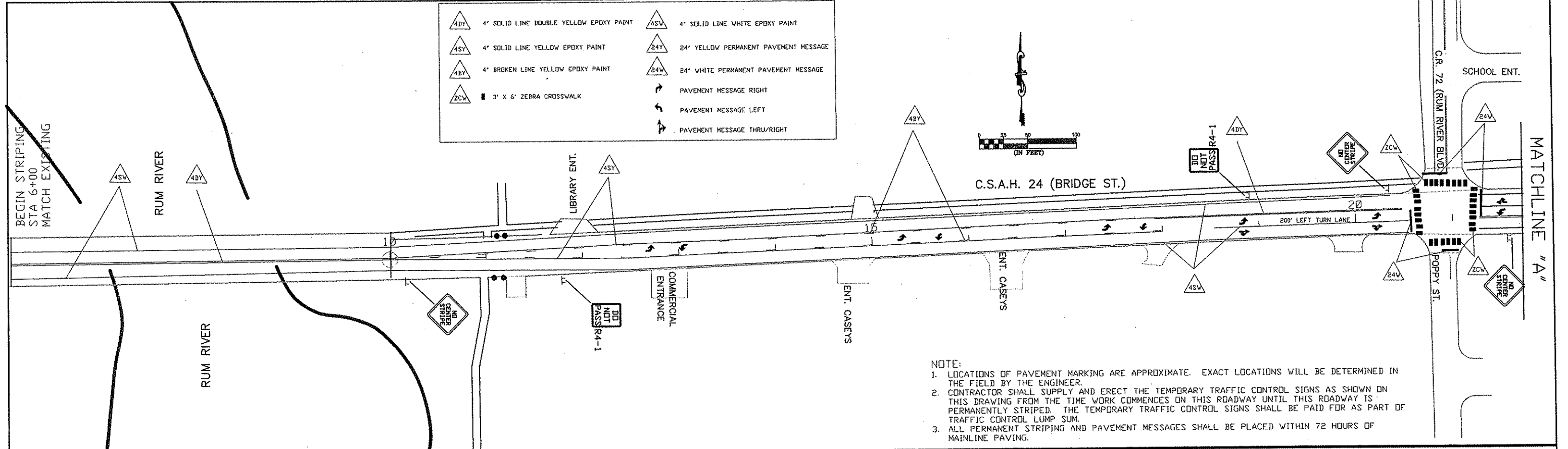
**ANOKA COUNTY**  
**HIGHWAY DEPT.**

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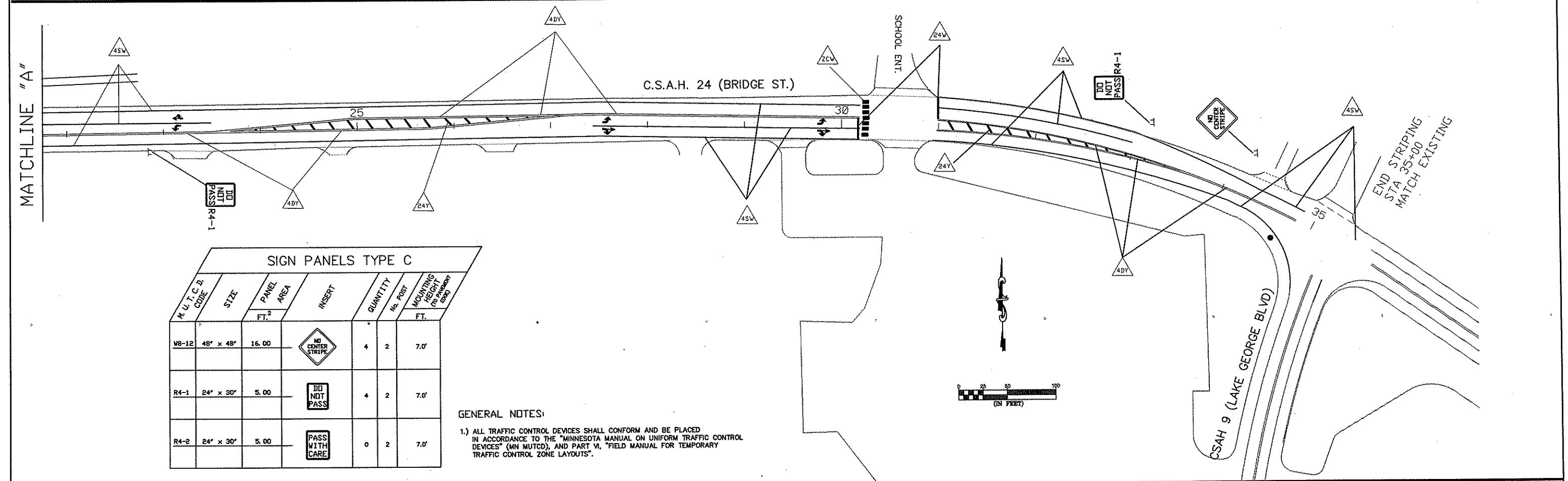
PLAN  
 STA 10+00 TO 35+68  
 Sheet 8 of 9C Sheets



	4' SOLID LINE DOUBLE YELLOW EPOXY PAINT		4' SOLID LINE WHITE EPOXY PAINT
	4' SOLID LINE YELLOW EPOXY PAINT		24" YELLOW PERMANENT PAVEMENT MESSAGE
	4' BROKEN LINE YELLOW EPOXY PAINT		24" WHITE PERMANENT PAVEMENT MESSAGE
	3' X 6' ZEBRA CROSSWALK		PAVEMENT MESSAGE RIGHT
			PAVEMENT MESSAGE LEFT
			PAVEMENT MESSAGE THRU/RIGHT



NOTE:  
 1. LOCATIONS OF PAVEMENT MARKING ARE APPROXIMATE. EXACT LOCATIONS WILL BE DETERMINED IN THE FIELD BY THE ENGINEER.  
 2. CONTRACTOR SHALL SUPPLY AND ERECT THE TEMPORARY TRAFFIC CONTROL SIGNS AS SHOWN ON THIS DRAWING FROM THE TIME WORK COMMENCES ON THIS ROADWAY UNTIL THIS ROADWAY IS PERMANENTLY STRIPED. THE TEMPORARY TRAFFIC CONTROL SIGNS SHALL BE PAID FOR AS PART OF TRAFFIC CONTROL LUMP SUM.  
 3. ALL PERMANENT STRIPING AND PAVEMENT MESSAGES SHALL BE PLACED WITHIN 72 HOURS OF MAINLINE PAVING.



M. U. T. C. D. CODE	SIZE	PANEL AREA FT. <sup>2</sup>	INSERT	QUANTITY	No. POST	MOUNTING HEIGHT (TO PANEL TOP) FT.
W8-12	48" x 48"	16.00		4	2	7.0'
R4-1	24" x 30"	5.00		4	2	7.0'
R4-2	24" x 30"	5.00		0	2	7.0'

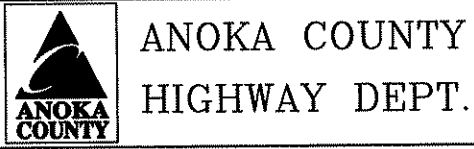
GENERAL NOTES:  
 1.) ALL TRAFFIC CONTROL DEVICES SHALL CONFORM AND BE PLACED IN ACCORDANCE TO THE "MINNESOTA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (MN MUTCD), AND PART VI, "FIELD MANUAL FOR TEMPORARY TRAFFIC CONTROL ZONE LAYOUTS".

NO	DATE	BY	CKD	APPR	REVISION

NAME: T:\Traffic\dwg\CSAH 24 (Norris Lake\_Bridge\_119th\_237th\_Fawn Lake)\From TH 47 to CR 76.dwg

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.  
 PRINT NAME: *Charles Lodenhead*  
 SIGNATURE: *Charles Lodenhead*  
 DATE: *3/26/10* LICENSE NO. *40116*

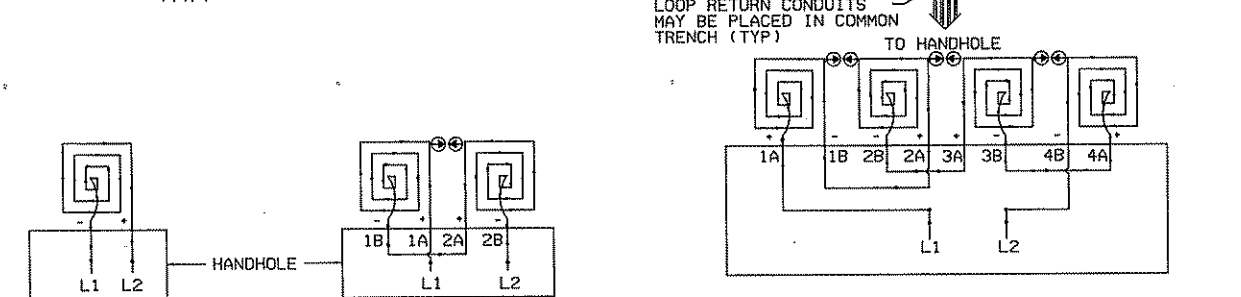
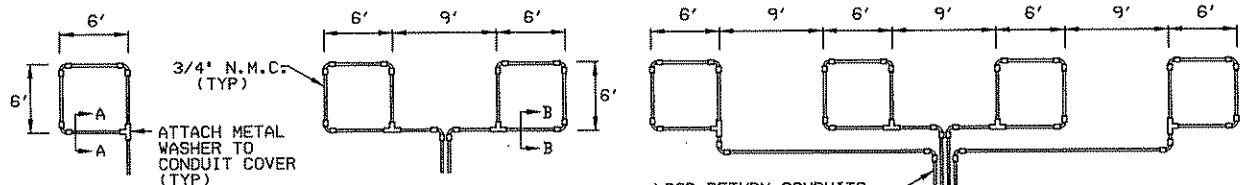
DRAWN BY: MTH DATE: 02/19/10  
 DESIGN BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_



STATE PROJECT NO. \_\_\_\_\_  
 STATE AID PROJECT NO. \_\_\_\_\_  
 CITY PROJECT NO. \_\_\_\_\_  
 COUNTY PROJECT NO. 10-18-24

CSAH 24 (Bridge St)  
 TEMPORARY SIGNING  
 PERMANENT STRIPING  
 AND PAVEMENT MESSAGES  
 Sheet 9 of 9C Sheets

# ANOKA CO. SIGNAL LOOP DETAIL



**LOOP DETECTOR DETAIL 'A'**  
(LOOP PHASING FOR SINGLE CONNECTION)

LOOP CONNECTIONS SHALL BE LABELED AND SPLICED IN THE HANDHOLE AS FOLLOWS:  
L1 TO 1A  
1B TO 2A  
2B TO L2

**LOOP DETECTOR DETAIL 'B'**  
(LOOP PHASING FOR SERIES CONNECTION)

LOOP RETURN CONDUITS MAY BE PLACED IN COMMON TRENCH (TYP.)

LOOP CONNECTIONS SHALL BE LABELED AND SPLICED IN THE HANDHOLE AS FOLLOWS:  
L1 TO 1A    3B TO 4A  
1B TO 2A    4B TO L2  
2B TO 3A

SPLICE CONTROL CABLE TO L1 & L2 IN HANDHOLE. ALL CONDUCTORS SHALL BE TAGGED IN HANDHOLE (1A, 1B, ECT)

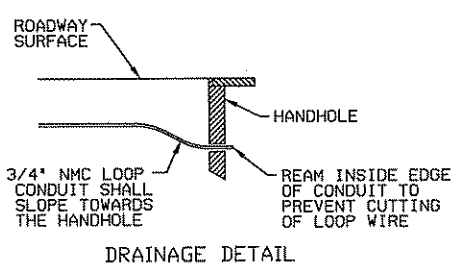
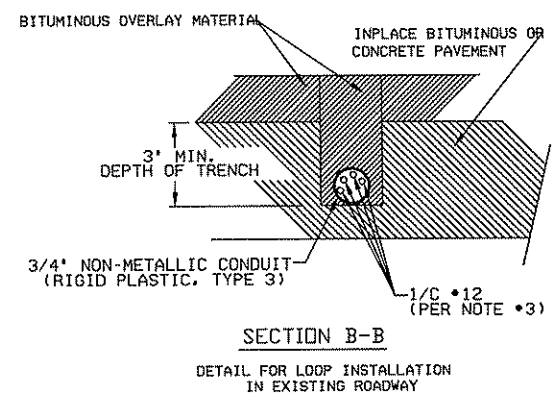
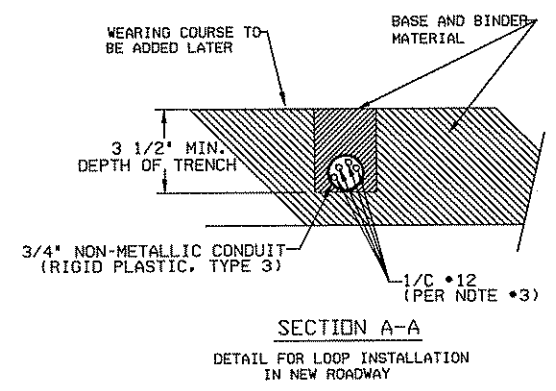
**LOOP DETECTOR DETAIL 'C'**  
(LOOP PHASING FOR SERIES CONNECTION)

ABBREVIATIONS			
3-1(EG)	SIGNAL HEAD PHASE '3' - NO. '1'	P2-1(EG)	PED INDICATION PHASE '2' - NO. '1'
3R GR	BARE GROUND	PB	PUSH BUTTON
CH. SW.	CHECK SWITCH	PB2-1(EG)	PUSH BUTTON PHASE '2' - NO. '1'
CLR	CLEAR	PEC	PHOTOELECTRIC CELL
D2-1(EG)	DETECTOR PHASE '2' - NO. '1'	PED	PEDESTRIAN
DWK	DON'T WALK	R	RED
EGG	EQUIPMENT GROUND	R&S	REMOVE AND SALVAGE
EVP	EMERGENCY VEHICLE PRE-EMPTION	RLTA	RED LEFT TURN ARROW
F&I	FURNISH AND INSTALL	RRTA	RED RIGHT TURN ARROW
FL	FLASH/FLASHING	RSC	RIGID STEEL CONDUIT
G	GREEN	SDP	SOURCE OF POWER
GLTA	GREEN LEFT TURN ARROW	SPR	SPARE
GRN	GREEN	ST. LHT	STREET LIGHT
GR. R	GROUND ROD	STA	STATION
GRTA	GREEN RIGHT TURN ARROW	SW	SWITCH
GTHA	GREEN THRU ARROW	SWJ	SWITCHED
HH	HANDHOLE	S&R	SALVAGE AND REINSTALL
HPS	HIGH PRESSURE SODIUM	T&V	TELEPHONE DROP WIRE
JB	JUNCTION BOX	WLK	WALK
LUM	LUMINAIRE	YEL	YELLOW
NEU	NEUTRAL	YLTA	YELLOW LEFT TURN ARROW
NMC	NONMETALLIC CONDUIT	YRTA	YELLOW RIGHT TURN ARROW
		YTHA	YELLOW THRU ARROW

LEGEND OF SYMBOLS	
CONTROLLER AND SERVICE EQUIP. NO'S	ⓐ
SIGNAL BASE NO.	ⓑ
SIGNAL FACE NO.	ⓒ
LUMINAIRE NO.	ⓓ
CONTROLLER AND CABINET	ⓔ
CONTROLLER AND CABINET - IN PLACE	ⓕ
HANDHOLE	ⓖ
HANDHOLE - IN PLACE	ⓗ
RIGID STEEL CONDUIT (RSC) - IN PLACE	ⓘ
SIGNAL FACE WITH BACKGROUND SHIELD	ⓙ
SIGNAL FACE W/O BACKGROUND SHIELD	ⓚ
SIGNAL FACE - IN PLACE	ⓛ
PEDESTRIAN INDICATORS - IN PLACE	ⓜ
PEDESTRIAN INDICATORS	ⓝ
PEDESTRIAN PUSH BUTTONS ON PEDESTAL OR POLE	ⓞ
PEDESTRIAN PUSH BUTTON STATION	ⓟ
TRAFFIC SIGNAL PEDESTAL	ⓠ
TRAFFIC SIGNAL PEDESTAL - INPLACE	ⓡ
TRAFFIC SIGNAL POLE AND MAST ARM	ⓢ
TRAFFIC SIGNAL POLE AND MAST ARM - IN PLACE	ⓣ
STREET LIGHT POLE AND LUMINAIRE	ⓤ
STREET LIGHT POLE AND LUMINAIRE - IN PLACE	ⓖ
MAST ARM AND LUMINAIRE	ⓗ
MAST ARM AND LUMINAIRE - INPLACE	ⓙ
WOOD POLE	ⓚ
WOOD POLE - IN PLACE	ⓛ
SOURCE OF POWER	ⓜ
RAILROAD SIGNAL - IN PLACE	ⓝ
RIGHT OF WAY LINE	ⓞ
CENTERLINE	ⓟ
EDGE OF ROADWAY	ⓠ
SHOULDERLINE	ⓡ
CURB LINE	ⓢ
STOP BAR	ⓣ
EMERGENCY VEHICLE PREEMPTION DETECTOR	ⓤ

STANDARD PLATES	
THESE STANDARD PLATES AS APPROVED BY FHWA SHALL APPLY:	
7035 L	CONCRETE WALK AND CURB RETURNS AT ENTRANCES
7036 E	PEDESTRIAN CURB RAMP
7100 G	CONCRETE CURB AND GUTTER (DESIGN B)
8110 D	TRAFFIC SIGNAL BRACKETING - POLE MOUNTED
8111 C	TRAFFIC SIGNAL BRACKETING - PEDESTAL MOUNTED
8112 C	PEDESTAL FOUNDATION
8114 A	PVC HANDHOLE/PULLBOX
8115 D	PEDESTRIAN PUSH BUTTON INSTALLATION
8118 C	SERVICE EQUIPMENT AND POLE-TRAFFIC CONTROL SIGNALS
8119 C	GROUND MOUNTED CABINET FOUNDATION
8120 K	P&S POLE FOUNDATION
8121 D	TRANSFORMER BASE AND POLE BASE PLATE
8122 C	PEDESTAL AND PEDESTAL BASE
8123 E	POLE AND MAST ARM
8124 E	MAST ARM SIGNAL HEAD MOUNTS
8126 F	PA90 AND PA100 POLE FOUNDATION

CONDUCTOR COLOR CODE	
R	RED
O	ORANGE
BL	BLUE
WH	WHITE
R/BLK	RED WITH BLACK TRACER
O/BLK	ORANGE WITH BLACK TRACER
BL/BLK	BLUE WITH BLACK TRACER
WH/BLK	WHITE WITH BLACK TRACER
BLK	BLACK
BLK/WH	BLACK WITH WHITE TRACER
G/BLK	GREEN WITH BLACK TRACER
G	GREEN



- LOOP DETECTOR WIRING**
- 1) ALL CORNERS SHALL BE 90° CONDUIT BENDS.
  - 2) CONNECT WIRES IN HANDHOLES USING SPLICE KIT METHOD DESCRIBED IN THE SPECIAL PROVISIONS.
  - 3) LOOP DETECTOR WIRES SHALL BE #12 AWG CROSSED LINKED POLYETHYLENE (XLP). SEE SPECIAL PROVISIONS.
  - 4) LOOP LEAD IN WIRES SHALL BE TWISTED A MIN. OF (5) TURNS PER FOOT THROUGH THE CONDUIT TO THE HANDHOLE.
  - 5) NMC DESIGNATES NON-METALLIC CONDUIT (SPEC. 3003)
  - 6) LOOPS 6' X 6' THRU 6' X 14' SHALL HAVE (4) TURNS.
  - 7) LOOPS 6' X 15' AND LARGER SHALL HAVE (2) TURNS.

NO	DATE	BY	CKD	APPR	REVISION

NAME: P:\10-01-00\CSAH\_24\_(Poppy-LakeGeorge)\Plan7 signal loops.dgn      3/2/2010      3:07:11 PM

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

PRINT NAME: CHARLES CADENHEAD  
SIGNATURE: *Charles Cadenhead*  
DATE: 3/2/10      LICENSE NO. # 40416

DRAWN BY: JF      DATE: 3/1/2010  
DESIGN BY: JF      DATE: 3/1/2010  
CHECKED BY: JO      DATE: 3/1/2010

**ANOKA COUNTY**  
**HIGHWAY DEPT.**

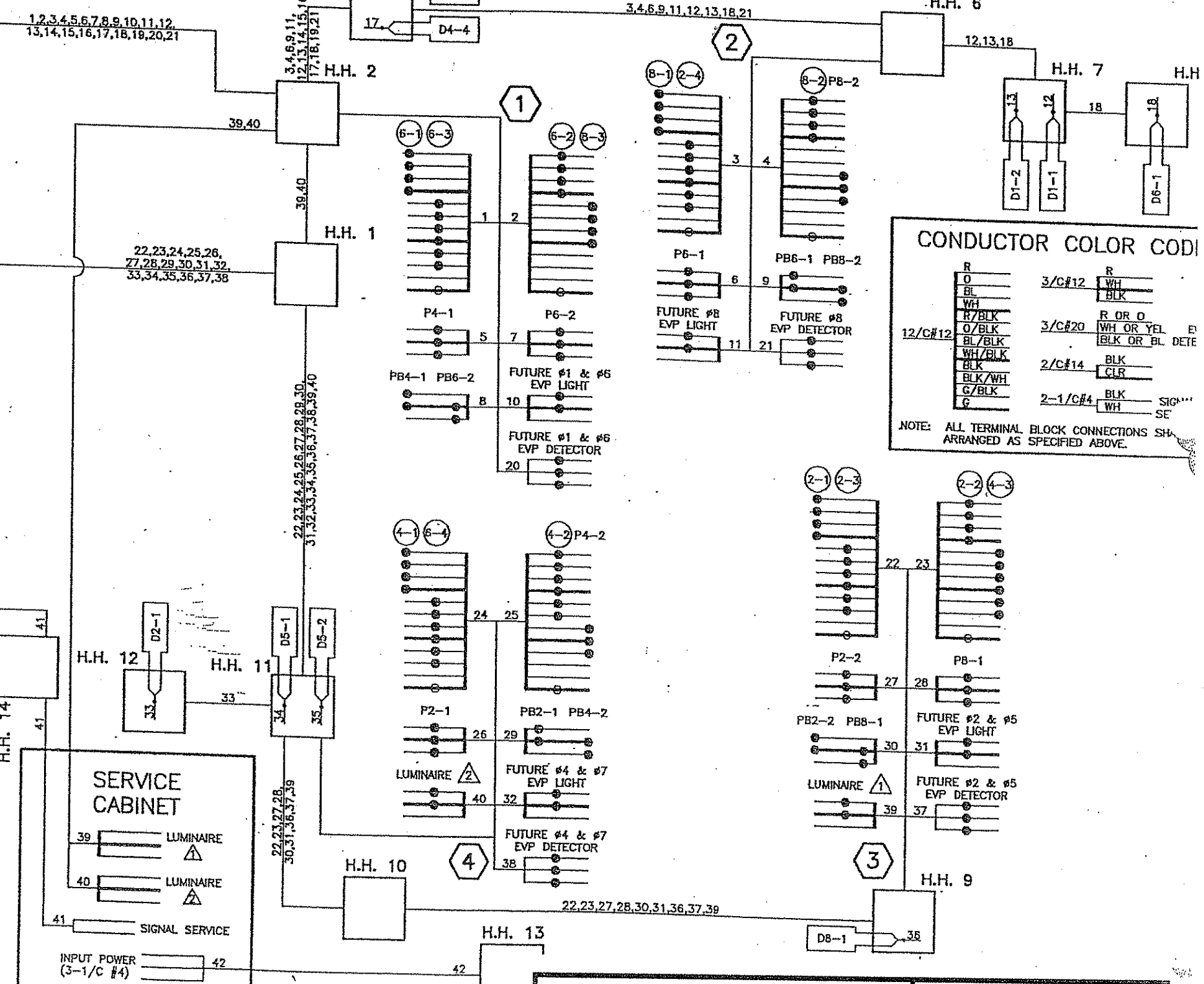
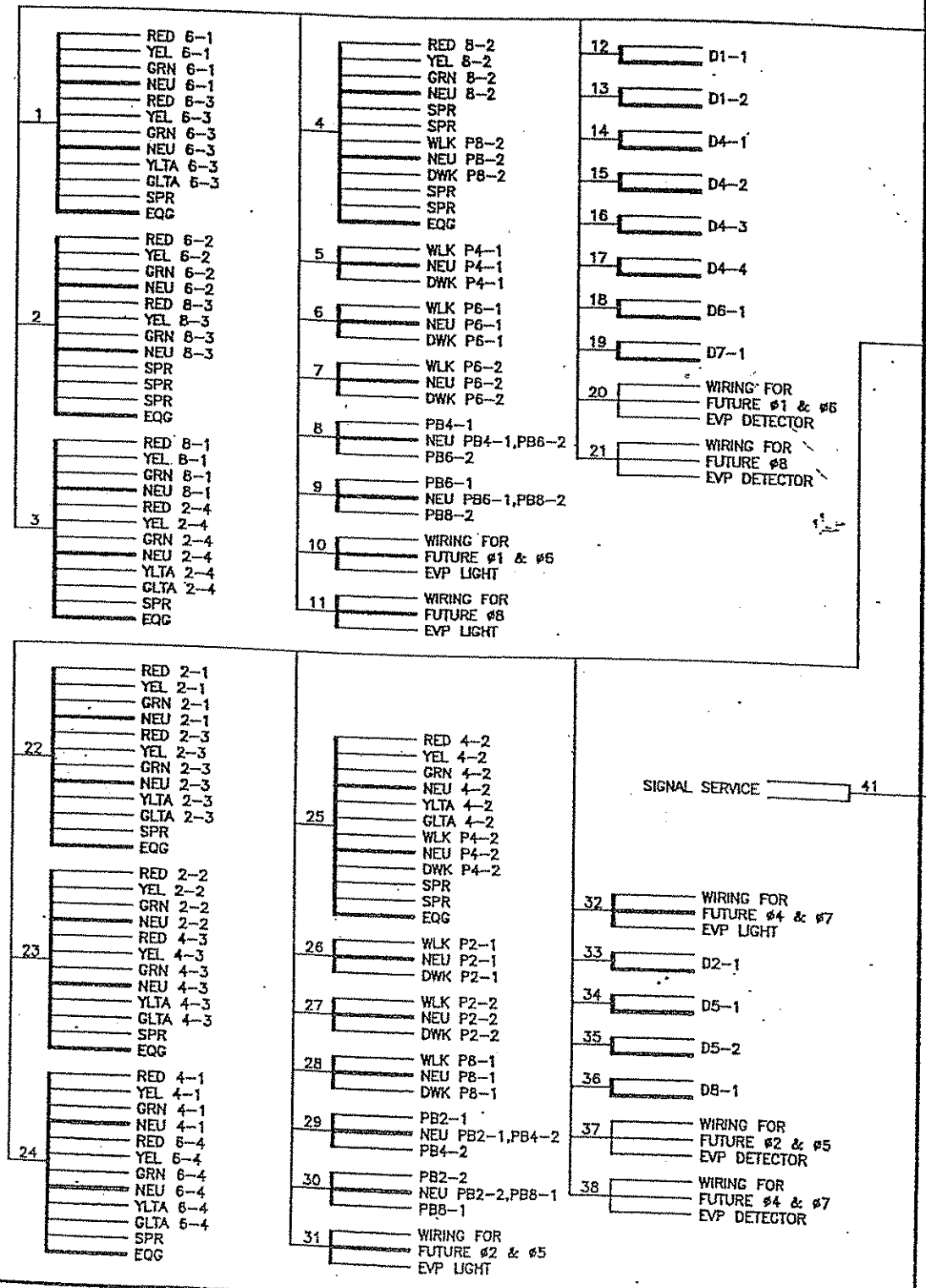
COUNTY PROJECT NO. 10-18-24

MISC. SIGNAL PLANS  
**9A OF 9C**

7203

NOTE: THIS PLAN SHEET IS BEING PROVIDED FOR INFORMATIONAL PURPOSES ONLY

### CONTROLLER CABINET



#### CONDUCTOR COLOR CODE

R	3/C#12	R
0		WH
BL		BLK
WH		R OR D
R/BLK	3/C#20	WH OR YEL
O/BLK		BLK OR BL DETE
BLK/BLK		
WH/BLK	2/C#14	BLK
BLK/WH		CLR
G/BLK	2-1/C#4	BLK
G		WH
		SIGN
		SE

NOTE: ALL TERMINAL BLOCK CONNECTIONS SHOWN ARRANGED AS SPECIFIED ABOVE.

NO	DATE	BY	CKD	APPR	REVISION

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

DRAWN BY: SNB DATE: 6/99

STATE PROJECT NO. \_\_\_\_\_  
STATE PROJECT NO. \_\_\_\_\_

STATE AID PROJECT NO. \_\_\_\_\_  
STATE PROJECT NO. \_\_\_\_\_  
CITY PROJECT NO. \_\_\_\_\_  
COUNTY PROJECT NO. 10-18-24

MISCELLANEOUS SIGNAL SHEETS  
Sheet 9B of 9C Sheets

7203

NOTES:

- ① LOCATIONS OF POLES, EQUIPMENT PAD, LOOP DETECTORS AND HANDHOLES WILL BE DETERMINED IN THE FIELD BY THE ENGINEER.
- ② SEE SPECIAL PROVISIONS FOR COUNTY FURNISHED MATERIALS.
- ③ LOOP DETECTOR WIRES SHALL BE CROSS-LINKED POLYETHYLENE (XLP) IN 21 mm N.M.C. (SEE SPECIAL PROVISIONS AND DETAILS.)
- ④ NEW HANDHOLES SHALL BE PVC HANDHOLES WITH METAL FRAMES AND COVERS PER Mn/DOT STANDARD PLATE NO. MB114.
- ⑤ EACH SIGNAL FACE SHALL HAVE A BACKGROUND SHIELD.
- ⑥ ALL VEHICLE SIGNAL INDICATIONS AND ALL "HAND" PEDESTRIAN INDICATIONS SHALL BE L.E.D. TYPE. (SEE SPECIAL PROVISIONS.)
- ⑦ EACH PEDESTRIAN INDICATION SHALL BE A SINGLE SECTION HAND / WALKING PERSON INDICATION. (SEE SPECIAL PROVISIONS.)
- ⑧ SEE SPECIAL PROVISIONS AND DETAILS REGARDING SIGN PANELS TO BE FURNISHED AND INSTALLED BY THE CONTRACTOR.
- ⑨ THE PAVEMENT MARKINGS AND DIMENSIONS SHOWN ARE APPROXIMATE. PERMANENT PAVEMENT MARKINGS WILL BE FURNISHED AND INSTALLED BY ANOKA COUNTY.
- ⑩ THE POWER LINES ON THE NORTH SIDE OF C.S.A.H. 24 ARE TO BE RAISED BY CONNEXUS ENERGY. CONTRACTOR SHALL COORDINATE WORK WITH CONNEXUS FORCES.
- ⑪ EQUIPMENT PAD SHALL BE CONSTRUCTED ON EARTH FILL AT A MINIMUM ELEVATION OF 0.5 m ABOVE THE EXISTING TOE OF SLOPE ELEVATION. ALL SIDE SLOPES SHALL BE 4:1. ALL GRADING WORK SHALL BE CONSIDERED INCIDENTAL TO THE SIGNAL SYSTEM.

- (A) EQUIPMENT PAD (SEE DETAIL AND NOTE 11)**  
 INSTALL CONTROLLER AND CABINET (TO BE FURNISHED BY ANOKA COUNTY)  
 CONTROLLER CABINET TO SERVICE CABINET VIA H.H. 14:  
 35 mm R.S.C. (METERED SIGNAL SERVICE)  
 2-1/C #4  
 1-1/C #6 BARE GROUND  
 CONTR. CABINET TO H.H. 1:  
 103 mm R.S.C.  
 4-12/C #12  
 7-3/C #12  
 4-2/C #14  
 2-3/C #20  
 CONTR. CABINET TO H.H. 2:  
 103 mm R.S.C.  
 4-12/C #12  
 7-3/C #12  
 8-2/C #14  
 2-3/C #20

- (B) SERVICE CABINET (SEE DETAIL)**  
 CABINET FOUNDATION (SEE DETAIL)  
 SERVICE CABINET TO S.O.P. VIA H.H. 13:  
 53 mm R.S.C. (POWER FEED)  
 3-1/C #4 (CONNECTION AT S.O.P. BY CONNEXUS)  
 SERVICE CABINET TO CONTROLLER CABINET VIA H.H. 14:  
 35 mm R.S.C. (METERED SIGNAL SERVICE)  
 2-1/C #4  
 1-1/C #6 BARE GROUND  
 SERVICE CABINET TO H.H. 2:  
 35 mm R.S.C. (UNMETERED LIGHTING SERVICE)  
 2-3/C #12 (LUM.)

- (C) SOURCE OF POWER**  
 EXISTING TRANSFORMER ON EXISTING WOOD POLE (CONNECTION TO BE MADE BY CONNEXUS ENERGY)  
 53 mm R.S.C. RISER AND WEATHERHEAD  
 EXTEND INTO H.H. 13:  
 53 mm R.S.C.  
 3-1/C #4 (POWER FEED)

- ① PAS90 POLE FOUNDATION**  
 TYPE PAS90-A-9.1  
 1-ONE WAY SIGNAL OVERHEAD (END MOUNTED)  
 1-ONE WAY SIGNAL OVERHEAD AT 2.9 m  
 1-TYPE 10B POLE MOUNTED AT 0'  
 1-TYPE 10B POLE MOUNTED AT 270'  
 2-PEDESTRIAN PUSH BUTTONS  
 R10-12 SIGN PANEL (900 mm x 1200 mm)  
 MOUNTED OVERHEAD (ADJACENT TO 6-3)  
 TYPE "D" SIGN PANEL (4110 mm x 910 mm)  
 MOUNTED OVERHEAD (D-1)  
 EXTEND INTO HH 2:  
 78 mm R.S.C.  
 2-12/C #12  
 4-3/C #12  
 1-3/C #20

- 78 mm R.S.C.  
 2-12/C #12  
 3-3/C #12  
 3-2/C #14  
 1-3/C #20

- 78 mm R.S.C.  
 2-3/C #12 (LUM.)  
 103 mm R.S.C.  
 4-12/C #12  
 7-3/C #12  
 2-3/C #14 (LUM.)  
 4-2/C #14  
 2-3/C #20

- ④ PAS90 POLE FOUNDATION**  
 TYPE PAS90-A-6.1-D12.2-2.7 (DAVIT AT 350')  
 LUMINAIRE --- 200 WATT H.P.S. WITH PEC AND CHECK SWITCH  
 1-ONE WAY SIGNAL OVERHEAD (END MOUNTED)  
 1-TYPE 10B POLE MOUNTED AT 0'  
 1-TYPE 10B POLE MOUNTED AT 270'  
 2-PEDESTRIAN PUSH BUTTONS  
 R10-12 SIGN PANEL (900 mm x 1200 mm)  
 MOUNTED OVERHEAD (ADJACENT TO 4-2)  
 TYPE "D" SIGN PANEL (3200 mm x 460 mm)  
 MOUNTED OVERHEAD (D-4)  
 EXTEND INTO HH 11:  
 78 mm R.S.C.  
 2-12/C #12  
 3-3/C #12  
 1-2/C #14  
 1-3/C #20

- ③ PAS90 POLE FOUNDATION**  
 TYPE PAS90-A-9.1-D12.2-2.7 (DAVIT AT 350')  
 LUMINAIRE --- 200 WATT H.P.S. WITH PEC AND CHECK SWITCH  
 1-ONE WAY SIGNAL OVERHEAD (END MOUNTED)  
 1-ONE WAY SIGNAL OVERHEAD AT 2.9 m  
 1-TYPE 10B POLE MOUNTED AT 0'  
 1-TYPE 10B POLE MOUNTED AT 270'  
 2-PEDESTRIAN PUSH BUTTONS  
 R10-12 SIGN PANEL (900 mm x 1200 mm)  
 MOUNTED OVERHEAD (ADJACENT TO 2-3)  
 TYPE "D" SIGN PANEL (4110 mm x 910 mm)  
 MOUNTED OVERHEAD (D-3)  
 EXTEND INTO HH 9:  
 78 mm R.S.C.  
 2-12/C #12  
 4-3/C #12  
 1-3/C #14  
 1-3/C #20

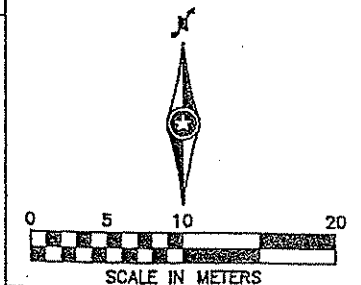
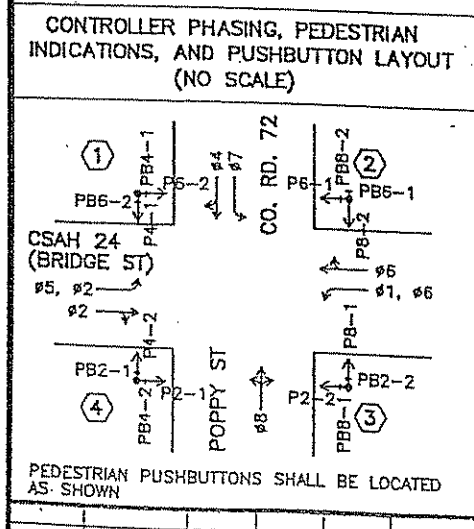
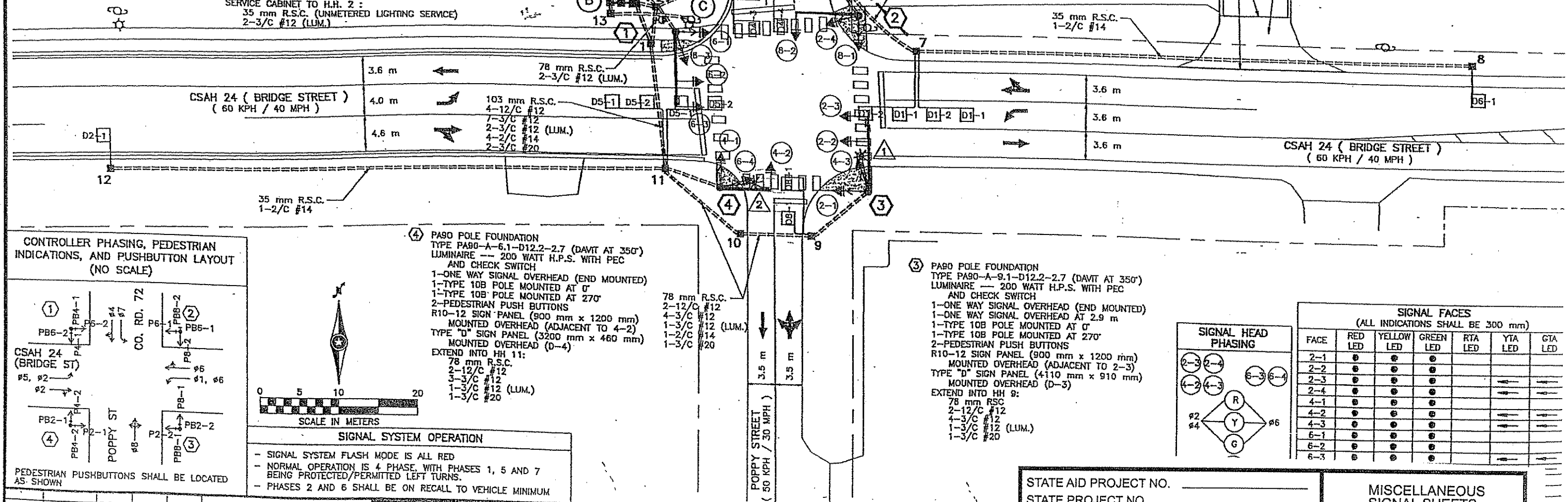
LEGEND

CONSTRUCT 100 mm CONCRETE WALK PER Mn/DOT 2521 OVER 100 mm OF COMPACTED CLASS 5 AGGREGATE BASE (ALL WALK WORK SHALL BE CONSIDERED INCIDENTAL TO THE SIGNAL SYSTEM).

**CONTRACTOR NOTE:**  
 ANOKA COUNTY HIGHWAY DEPARTMENT WILL BE SUPPLYING THE POLES, MAST ARMS AND HEADS FOR INSTALLATION BY THE CONTRACTOR. (SEE SPECIAL PROVISIONS)

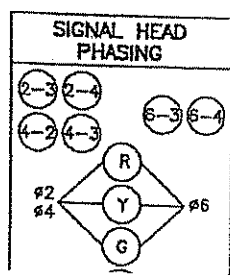
LOOP DETECTORS				
NUMBER	SIZE (m)	FUNCTION	LOCATION m*	TYP
D1-1	2-1.7x1.7	11	1.3, 10.1	NMC
D1-2	2-1.7x1.7	11	-3.0, 5.7	NMC
D2-1	1.7x1.7	1	76	NMC
D4-1	1.7x1.7	3	55	NMC
D4-2	1.7x1.7	3	55	NMC
D4-3	1.7x3.5, 1.7x3.0	1	-3.0, 1.3	NMC
D4-4	2-1.7x1.7	1	-3.0, 1.3	NMC
D5-1	2-1.7x1.7	10	-3.0, 5.7	NMC
D5-2	2-1.7x1.7	10	1.3, 10.1	NMC
D6-1	1.7x1.7	1	76	NMC
D7-1	1.7x3.5	7	15	NMC
D8-1	1.7x3.0, 1.7x1.7	1	-3.0, 1.3	NMC

- \* LOCATION IS DISTANCE FROM STOP BAR TO FRONT OF DETECTOR
- LOOP DETECTOR FUNCTION CODES:  
 1) CALL AND EXTEND  
 2) CALL ONLY  
 3) EXTEND ONLY  
 4) CALL ONLY - DENSITY  
 5) DELAYED CALL ONLY  
 6) DELAYED CALL ONLY - DENSITY  
 7) DELAYED CALL - IMMEDIATE EXTEND  
 8) CARRY OVER (STRETCH)  
 9) ADVISORY DETECTOR  
 10) CALL #5 DURING #4 AND #8, EXTEND #5 AND  
 11) CALL #1 DURING #4 AND #8, EXTEND #1 AND



**SIGNAL SYSTEM OPERATION**

- SIGNAL SYSTEM FLASH MODE IS ALL RED
- NORMAL OPERATION IS 4 PHASE, WITH PHASES 1, 5 AND 7 BEING PROTECTED/PERMITTED LEFT TURNS.
- PHASES 2 AND 6 SHALL BE ON RECALL TO VEHICLE MINIMUM



SIGNAL FACES						
(ALL INDICATIONS SHALL BE 300 mm)						
FACE	RED LED	YELLOW LED	GREEN LED	RTA LED	YTA LED	GTA LED
2-1	●	●	●			
2-2	●	●	●			
2-3	●	●	●			
2-4	●	●	●			
4-1	●	●	●			
4-2	●	●	●			
4-3	●	●	●			
6-1	●	●	●			
6-2	●	●	●			
6-3	●	●	●			

NO.	DATE	BY	CHKD	APPR	REVISION

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

DRAWN BY: SNB DATE: 6/99 STATE PROJECT NO. \_\_\_\_\_  
 STATE PROJECT NO. \_\_\_\_\_

STATE AID PROJECT NO. \_\_\_\_\_  
 STATE PROJECT NO. \_\_\_\_\_  
 CITY PROJECT NO. \_\_\_\_\_  
 COUNTY PROJECT NO. 10-18-24

MISCELLANEOUS SIGNAL SHEETS  
 Sheet 9c of 9e Sheets