

**PLAN SYMBOLS**

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

- LOWLAND
- TIMBER
- ORCHARD
- BRUSH
- NURSERY

- CATTLE GAIRD
- OVERPASS (Highway Over)
- UNDERPASS (Highway Under)
- BRIDGE

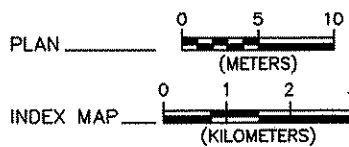
- BUILDING (One Story Frame)
- F-FRAME C-CONCRETE
- S-STONE T-TILE
- B-BRICK ST-STUCCO

- 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
- AERIAL TELEPHONE CABLE
- SEWER (Sanitary or Storm)
- SEWER MANHOLE

**SCALES**



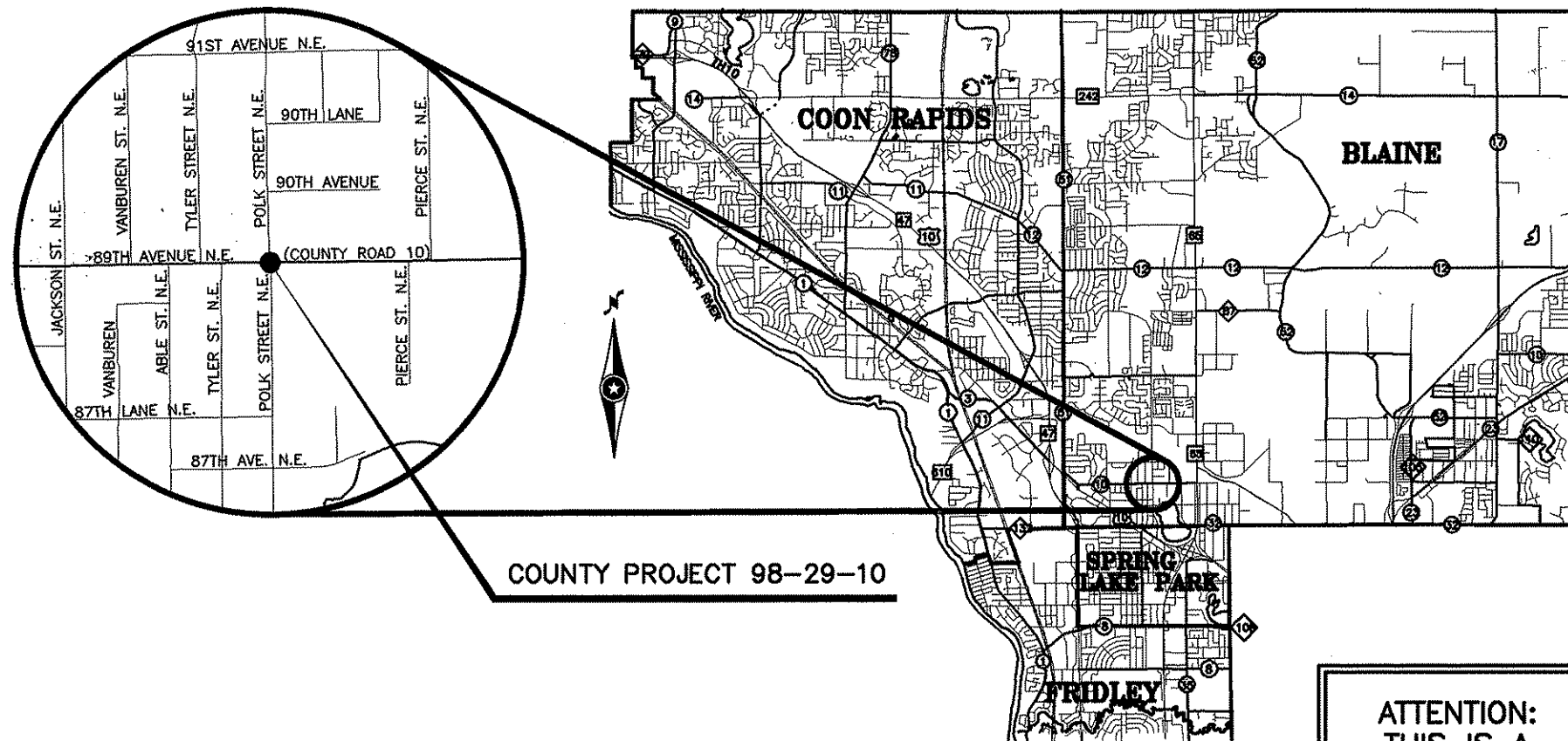
**MINNESOTA DEPARTMENT OF TRANSPORTATION  
ANOKA COUNTY, MINNESOTA  
CITY OF BLAINE**

CONSTRUCTION PLAN FOR ONE SPAN WIRE FULL-TRAFFIC-ACTUATED TRAFFIC CONTROL  
SIGNAL SYSTEM WITH EMERGENCY VEHICLE PREEMPTION

LOCATED ON COUNTY ROAD 10 (89TH AVENUE N.E.) AT POLK STREET N.E.

**ANOKA COUNTY PROJECT NO. 98-29-10**  
**CITY STATE-AID PROJECT NO. - - - - -**

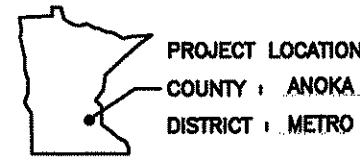
**INDEX MAP**



COUNTY PROJECT 98-29-10

**ATTENTION:  
THIS IS A  
METRIC PLAN**

ITEM NUMBER	ITEM DESCRIPTION	UNIT	TOTAL ESTIMATED QUANTITIES	PARTICIPATION	
				ANOKA COUNTY C.P. 98-29-10	MUNICIPAL S.A.P. - - - - -
2102.501	PAVEMENT MARKING REMOVAL	m2	3		
2102.502	PAVEMENT MARKING REMOVAL	m	900		
2564.531	SIGN PANELS TYPE C	m2	12.51		
2564.602	PAVEMENT MESSAGE (LT ARROW) - PAINT	EACH	3		
2564.603	100 mm SOLID LINE WHITE - PAINT	m	770		
2564.603	100 mm DOUBLE SOLID LINE YELLOW - PAINT	m	625		
2564.603	600 mm SOLID LINE YELLOW - PAINT	m	60		
2564.603	600 mm STOP LINE WHITE - PAINT	m	22		
2564.604	ZEBRA CROSSWALK WHITE - PAINT	m2	55		
2565.511	FULL T ACT T CONTROL SIGNAL SYSTEM	SIG SYS	1		
2565.601	EMERGENCY VEHICLE PREEMPTION SYSTEM	LUMP SUM	1		100 %



FEDERAL PROJECT NO. :

**GOVERNING SPECIFICATIONS**

THE 1995 EDITION OF THE MINNESOTA DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR CONSTRUCTION" SHALL GOVERN.

ALL TRAFFIC CONTROL DEVICES SHALL CONFORM TO THE MINNESOTA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MMUTCD), INCLUDING THE APRIL 1995 EDITION OF THE "FIELD MANUAL FOR TEMPORARY TRAFFIC CONTROL ZONE LAYOUTS."

**INDEX**

SHEET NO.	DESCRIPTION
1	TITLE SHEET AND STATEMENT OF ESTIMATED QUANTITIES
2	DETAILS AND STANDARD PLATES
3	CABINET AND PAD DETAILS
4	SPAN WIRE AND POLE DETAILS
5	INTERSECTION LAYOUT
6	FIELD WIRING DIAGRAM
7	STRIPING PLAN
8	SITE UTILITIES INFORMATION

THIS PLAN SET CONTAINS 8 SHEETS

**PLAN CERTIFICATIONS**

DESIGN ENGINEER: 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.

DATE 7/1/99 REG. NO. 21817  
 APPROVED: Charles J. [Signature] DATE 7/21/99  
 CITY OF BLAINE ENGINEER  
 APPROVED: [Signature] DATE 7/19/99  
 ANOKA COUNTY ENGINEER  
 APPROVED: \_\_\_\_\_ DATE \_\_\_\_\_  
 METRO ASSISTANT DIVISION ENGINEER - STATE AID  
 (REVIEWED FOR COMPLIANCE WITH STATE-AID RULES/POLICY)  
 APPROVED: APPROVED FOR STATE-AID FUNDING DATE \_\_\_\_\_  
 STATE AID ENGINEER  
 APPROVED: \_\_\_\_\_ DATE \_\_\_\_\_  
 APPROVED: \_\_\_\_\_ DATE \_\_\_\_\_

**SIGNAL SYSTEM DESIGN DESCRIPTION**

	89TH AVE. N.E. (CO. RD. 10)	POLK STREET N.E. N. LEG / S. LEG
DESIGN SPEED	60 KPH/35 MPH	50 KPH (30 MPH) / 50 KPH (30 MPH)
EXISTING A.D.T. (1996)	11,100	5000 / 5000
PROJECTED A.D.T. (2015)	15,500	5400 / 5400
FUNCTIONAL CLASSIFICATION	COLLECTOR	COLLECTOR / LOCAL
NO. OF TRAFFIC LANES	3	2 / 2
NO. OF PARKING LANES	0	1 / 0

NO. \_\_\_\_\_ BY \_\_\_\_\_ CKD \_\_\_\_\_ APPR \_\_\_\_\_ REVISION \_\_\_\_\_

**PARSONS**  
Barton-Aschman Associates, Inc.  
A Unit of Parsons Transportation Group Inc.



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.

Steven M. [Signature]  
DATE 7/1/99 REG. NO. 21817

DRAWN BY: SNB DATE 6/99  
 DESIGN BY: SNB DATE 6/99  
 CHECKED BY: LEW DATE 6/99

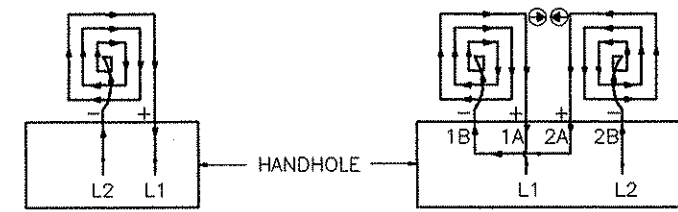
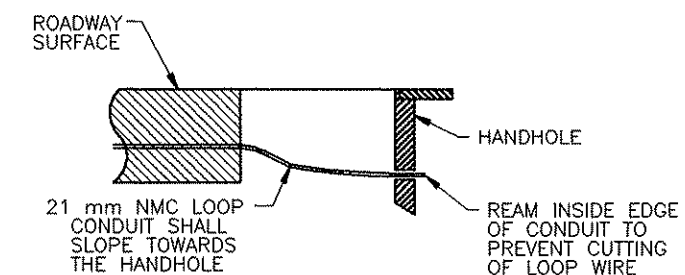
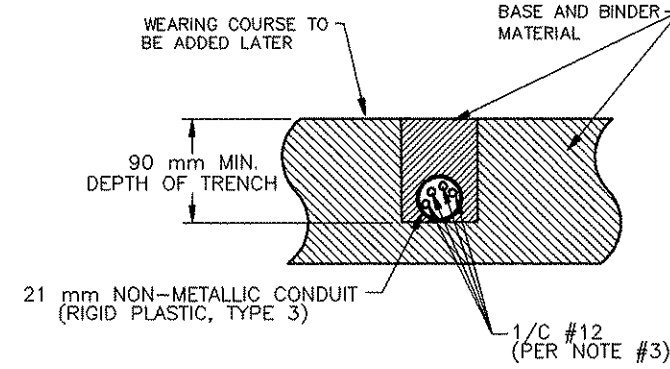
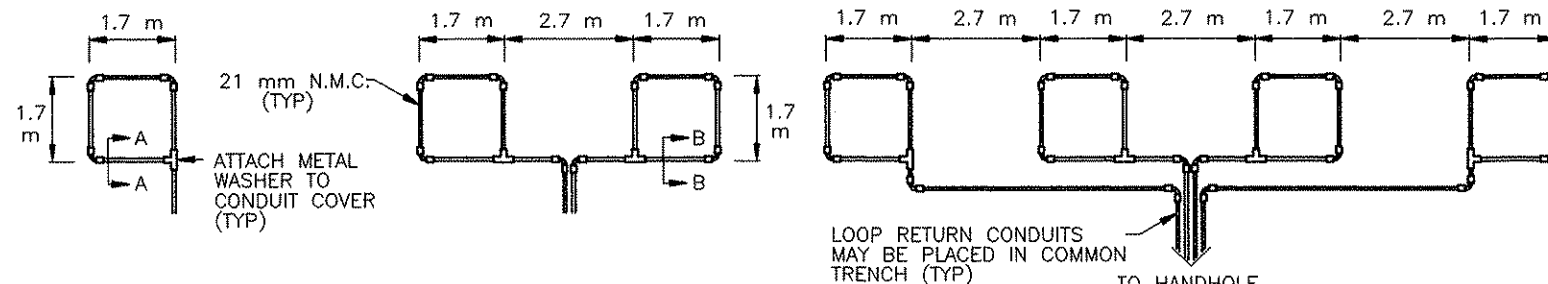
STATE PROJECT NO. \_\_\_\_\_  
 STATE PROJECT NO. \_\_\_\_\_  
 STATE AID PROJECT NO. \_\_\_\_\_  
 COUNTY PROJECT NO. 98-29-10



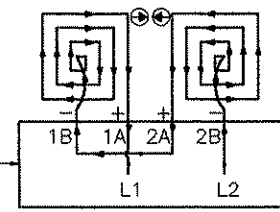
**ANOKA COUNTY  
HIGHWAY DEPT.**

TRAFFIC SIGNAL SYSTEM  
TITLE SHEET AND STATEMENT  
OF ESTIMATED QUANTITIES  
89TH AVE. N.E. @ POLK STREET N.E.

Sheet 1 of 8 Sheets



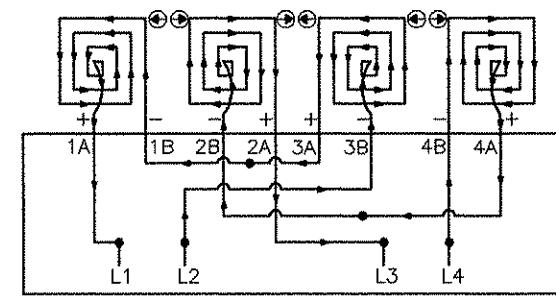
**LOOP DETECTOR DETAIL 'A'**  
(LOOP PHASING FOR SINGLE CONNECTION)



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)



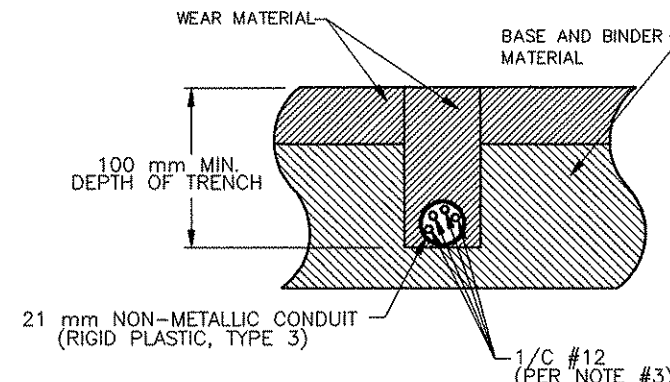
LOOP CONNECTIONS SHALL BE LABELED AND SPLICED IN THE HANDHOLE AS FOLLOWS:

- L1 TO 1A      L3 TO 2A
- 1B TO 3A      2B TO 4A
- 3B TO L2      4B TO L4

ALL SPLICES SHALL BE LOCATED IN THE HANDHOLE. ALL CONDUCTORS SHALL BE TAGGED IN THE HANDHOLE (1A, 1B, ETC.).

**LOOP DETECTOR DETAIL 'C'**

(LOOP PHASING FOR TWO DOUBLE-LOOP DETECTORS EACH WITH SERIES CONNECTION)



**SECTION B-B**

DETAIL FOR LOOP INSTALLATION IN EXISTING ROADWAY

**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 0.3 METER (1 FOOT) THROUGH THE CONDUIT TO THE HANDHOLE.
- ⑤ NMC DESIGNATES NON-METALLIC CONDUIT (SPEC. 3803)
- ⑥ LOOPS 1.7 m x 1.7 m THRU 1.7 m x 4.3 m SHALL HAVE (4) TURNS.
- ⑦ LOOPS 1.7 m x 4.6 m AND LARGER SHALL HAVE (2) TURNS.

**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)	=====
RIGID STEEL CONDUIT (RSC) - IN PLACE	=====
SIGNAL FACE WITH BACKGROUND SHIELD	→
SIGNAL FACE W/O BACKGROUND SHIELD	→
SIGNAL FACE - IN PLACE	→
PEDESTRIAN INDICATORS	→
PEDESTRIAN INDICATORS - IN PLACE	→
PEDESTRIAN PUSH BUTTONS ON PEDESTAL OR POLE	○
PEDESTRIAN PUSH BUTTON STATION	○
TRAFFIC SIGNAL PEDESTAL	■
TRAFFIC SIGNAL PEDESTAL - IN PLACE	■
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 - IN PLACE	○
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	—

STANDARD PLATES	
THESE STANDARD PLATES AS APPROVED BY FHWA SHALL APPLY:	
PLATE NO.	DESCRIPTION
M7036 D	PEDESTRIAN CURB RAMP
* M8110 D	TRAFFIC SIGNAL BRACKETING - POLE MOUNTED
M8111 C	TRAFFIC SIGNAL BRACKETING - PEDESTAL MOUNTED
M8112 C	PEDESTAL FOUNDATION - TRAFFIC CONTROL SIGNALS
* M8114 A	PVC HANDHOLE/PULLBOX
M8115 D	PEDESTRIAN PUSH BUTTON INSTALLATION
M8117 F	PRECAST CONCRETE HANDHOLE (OR PULLBOX)
M8118 C	SERVICE EQUIPMENT AND POLE-TRAFFIC CONTROL SIGNALS
* M8119 C	GROUND MOUNTED CABINET FOUNDATION
M8120 K	PA85 POLE FOUNDATION
M8121 D	TRANSFORMER BASE AND POLE BASE PLATE
M8122 C	PEDESTAL AND PEDESTAL BASE
M8123 D	POLE AND MAST ARM
M8124 E	MAST ARM SIGNAL HEAD MOUNTS
M8126 F	POLE FOUNDATION (PA90 AND PA100)

\* - APPLIES TO THIS PROJECT

**ABBREVIATIONS**

3-1(EG)	SIGNAL HEAD PHASE "3" - NO "1"	P2-1(EG)	PEDESTRIAN INDICATION PHASE "2" - NO. "1"
BR. 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
EQG	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	SOP	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	SWD	SWITCHED
HH	HANDHOLE	S&R	SALVAGE AND REINSTALL
HPS	HIGH PRESSURE SODIUM	TDW	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

**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

NO	DATE	BY	CHKD	APPR	REVISION

**PARSONS**  
Barton-Aschman Associates, Inc.  
A Unit of Parsons Transportation Group Inc.



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.

*Steven M. Powers*  
DATE 7/1/99 REG. NO. 21817

DRAWN BY: SNB DATE: 6/99  
DESIGN BY: SNB DATE: 6/99  
CHECKED BY: LEW DATE: 6/99

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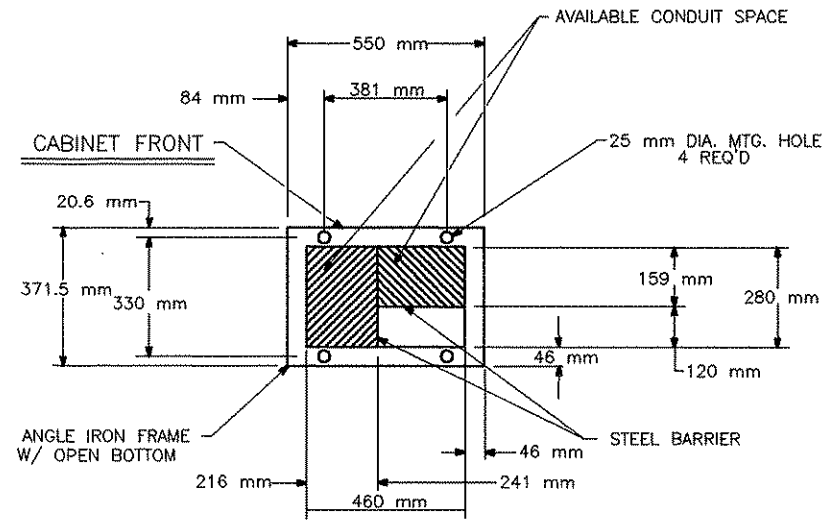
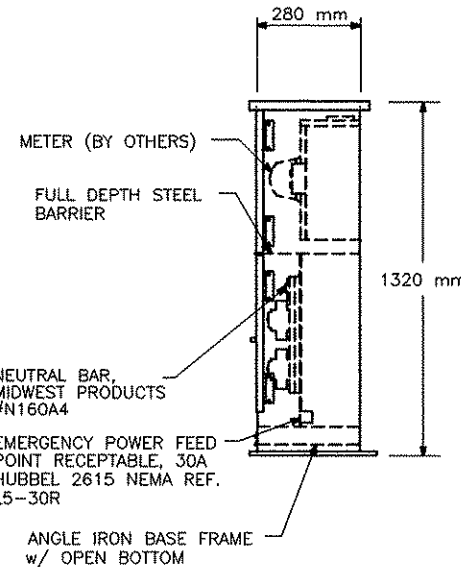
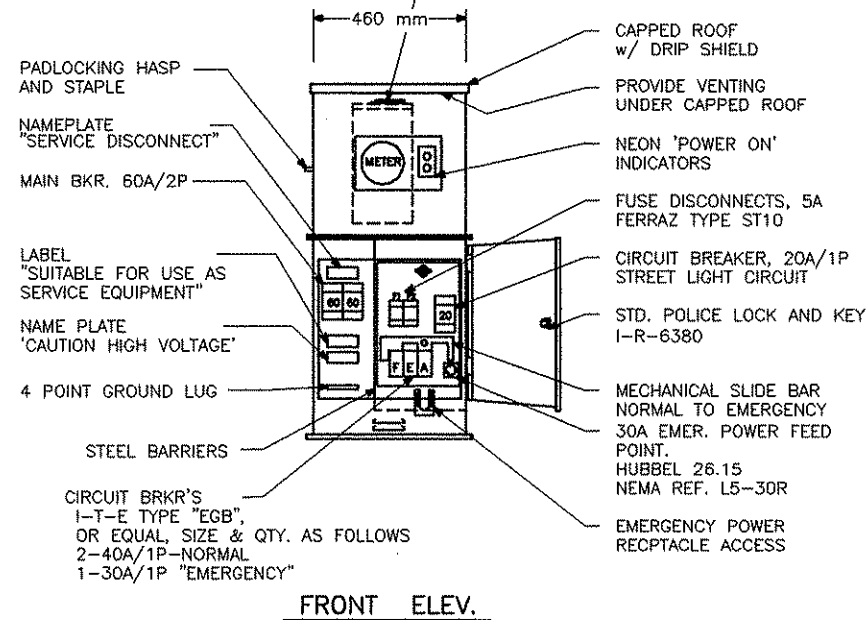


**ANOKA COUNTY**  
**HIGHWAY DEPT.**

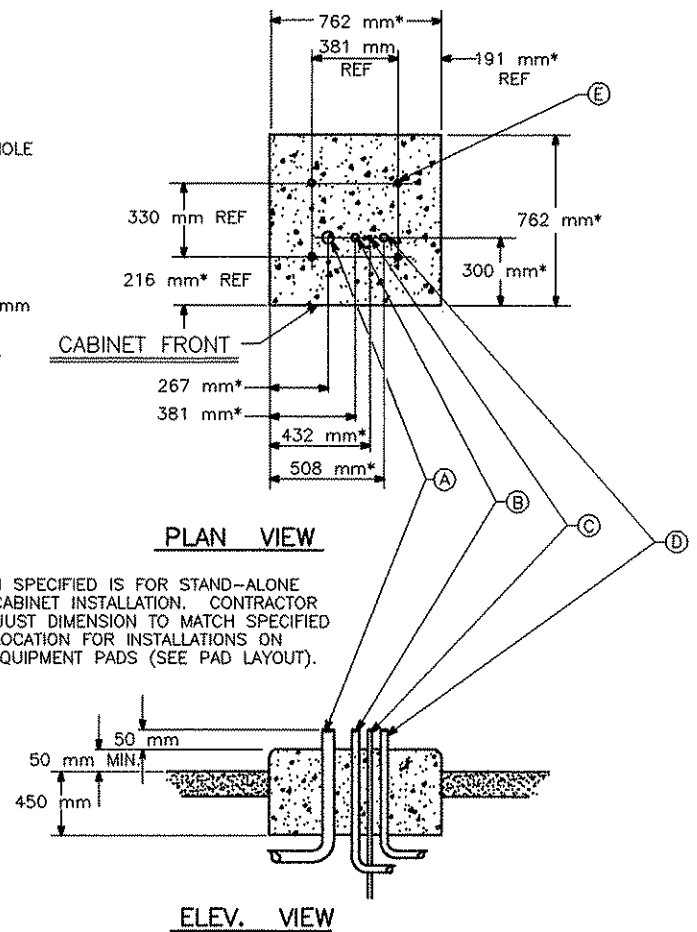
TRAFFIC SIGNAL SYSTEM  
DETAILS AND STANDARD PLATES  
CO. RD. 10 (89TH AVE. N.E.)  
@ POLK STREET N.E.  
Sheet 2 of 8 Sheets

**SIGNAL SERVICE CABINET**

N.S.P. METER SOCKET, 5-TERMINAL  
w/POSTIVE BY-PASS MECHANISM  
MILBANK CAT. No. U-2272-RL.



**SERVICE CABINET FOUNDATION**



\* DIMENSION SPECIFIED IS FOR STAND-ALONE SERVICE CABINET INSTALLATION. CONTRACTOR SHALL ADJUST DIMENSION TO MATCH SPECIFIED CABINET LOCATION FOR INSTALLATIONS ON SHARED EQUIPMENT PADS (SEE PAD LAYOUT).

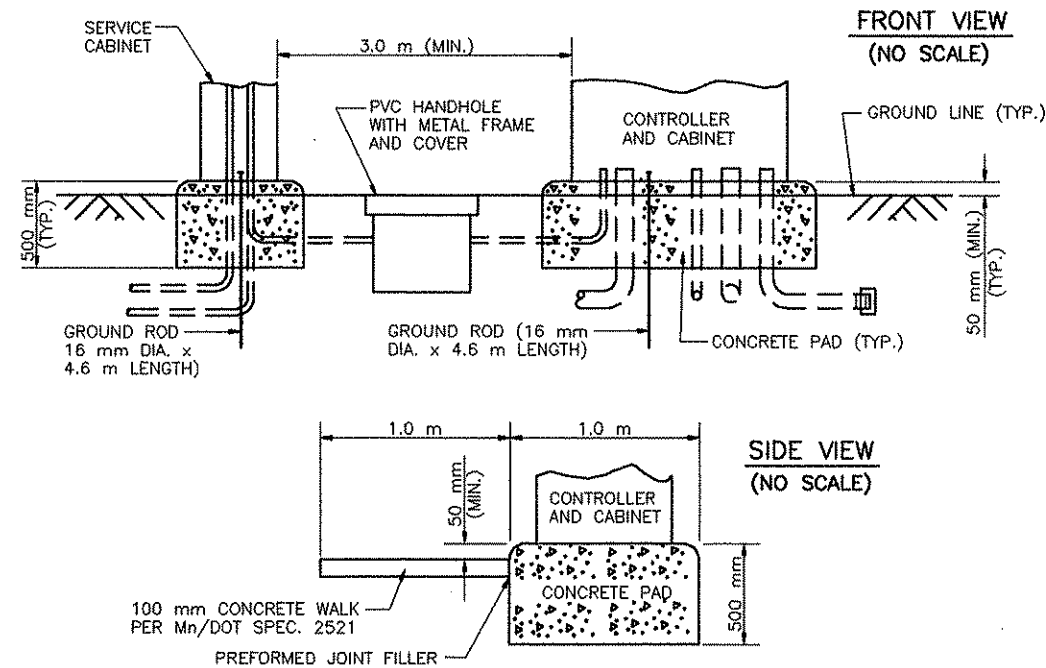
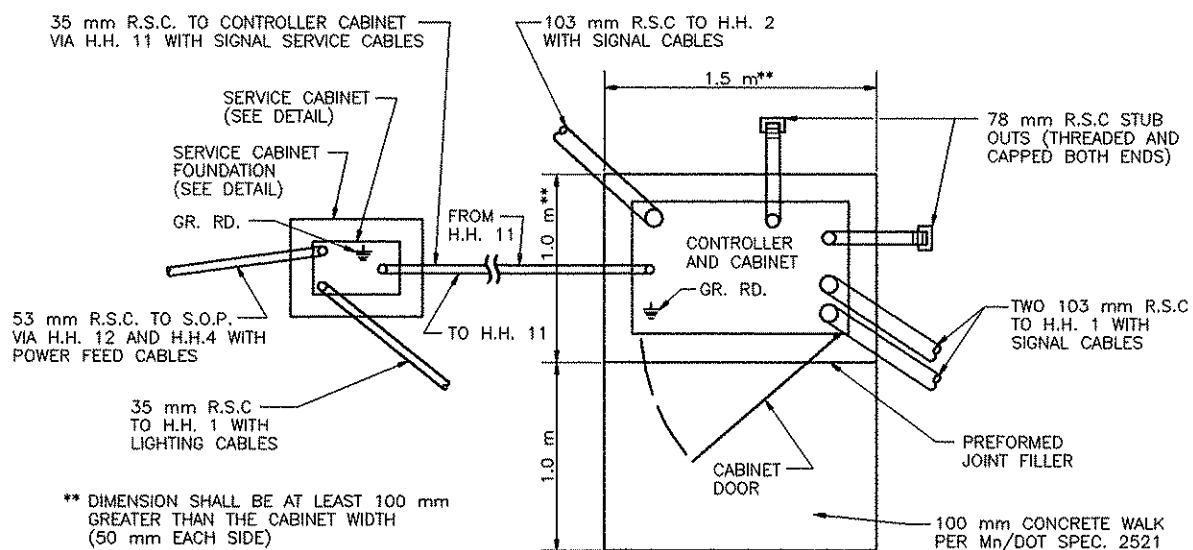
- Ⓐ 53 mm RSC TO S.O.P. (POLE B -- CONNECTION TO BE MADE BY CONNEXUS ENERGY)
- Ⓑ 35 mm RSC TO CONTROLLER CABINET VIA H.H. 11
- Ⓒ GROUNDING ROD
- Ⓓ 35 mm RSC TO HANDHOLE 1 (FOR INTERSECTION LIGHTING)
- Ⓔ ANCHOR BOLT LOCATIONS (4 REQUIRED)

**CONSTRUCTION NOTES**

ENCLOSURE SHALL BE FABRICATED FROM #12 GA. ALL WELDED COLD ROLLED STEEL FOR OUTDOOR WEATHER PROOF SERVICE. DOORS TO BE GASKETED, ALL HINGES, PINS AND LOCKS TO BE OF NON CORRODING CONSTRUCTION. CABINET TO BE PRIMED INSIDE AND OUT WITH RUST INHIBITING PRIMER. FINISH PER MN/DOT #3527.  
ENCLOSURE SHALL BE 'UL' APPROVED

**EQUIPMENT PAD LAYOUT--PLAN VIEW**

(SEE INTERSECTION LAYOUT AND WIRING DIAGRAM FOR CABLE INFORMATION)  
(NO SCALE)



**CONSTRUCTION NOTES :**

- ① SEE SPECIAL PROVISIONS FOR COUNTY FURNISHED MATERIALS.
- ② THE UPPER EDGES OF THE EQUIPMENT PAD SHALL BE BEVELLED OR CHAMFERED IN A NEAT MANNER AS DIRECTED BY THE ENGINEER.
- ③ THE TOP OF THE CONDUITS SHALL BE THREADED AND CAPPED AFTER INSTALLATION (UNTIL CABLES ARE INSTALLED).
- ④ ALL CONDUITS SHALL PROJECT A MINIMUM OF 50 mm ABOVE THE CONCRETE AND SHALL BE LOCATED INSIDE THE CABINET WHERE DIRECTED BY THE ENGINEER, BUT SHALL NOT INTERFERE WITH THE CABINET COMPONENTS OR FUNCTION (SUPPORTING MEMBERS, ETC.).
- ⑤ ALL CONCRETE CONSTRUCTION (EQUIPMENT PAD AND SIDEWALK AREAS) SHALL BE MIX 3A32 OR APPROVED EQUAL.
- ⑥ CONDUITS WITH BOTH ENDS TERMINATING WITHIN THE PAD SHALL NOT EXTEND BENEATH THE CONCRETE.
- ⑦ THE EXACT LOCATION OF CONDUITS WITHIN THE PAD SHALL BE DETERMINED BY THE ENGINEER IN THE FIELD.
- ⑧ CONTROLLER CABINET SHALL BE PER Mn/DOT M8119C.

NO	DATE	BY	CKD	APPR	REVISION

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A Unit of Parsons Transportation Group, Inc.



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*Steven M. Bouckert*  
DATE 7/1/99 REG. NO. 21817

DRAWN BY: SNB DATE: 6/99  
DESIGN BY: SNB DATE: 6/99  
CHECKED BY: LEW DATE: 6/99

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ANOKA COUNTY  
HIGHWAY DEPT.

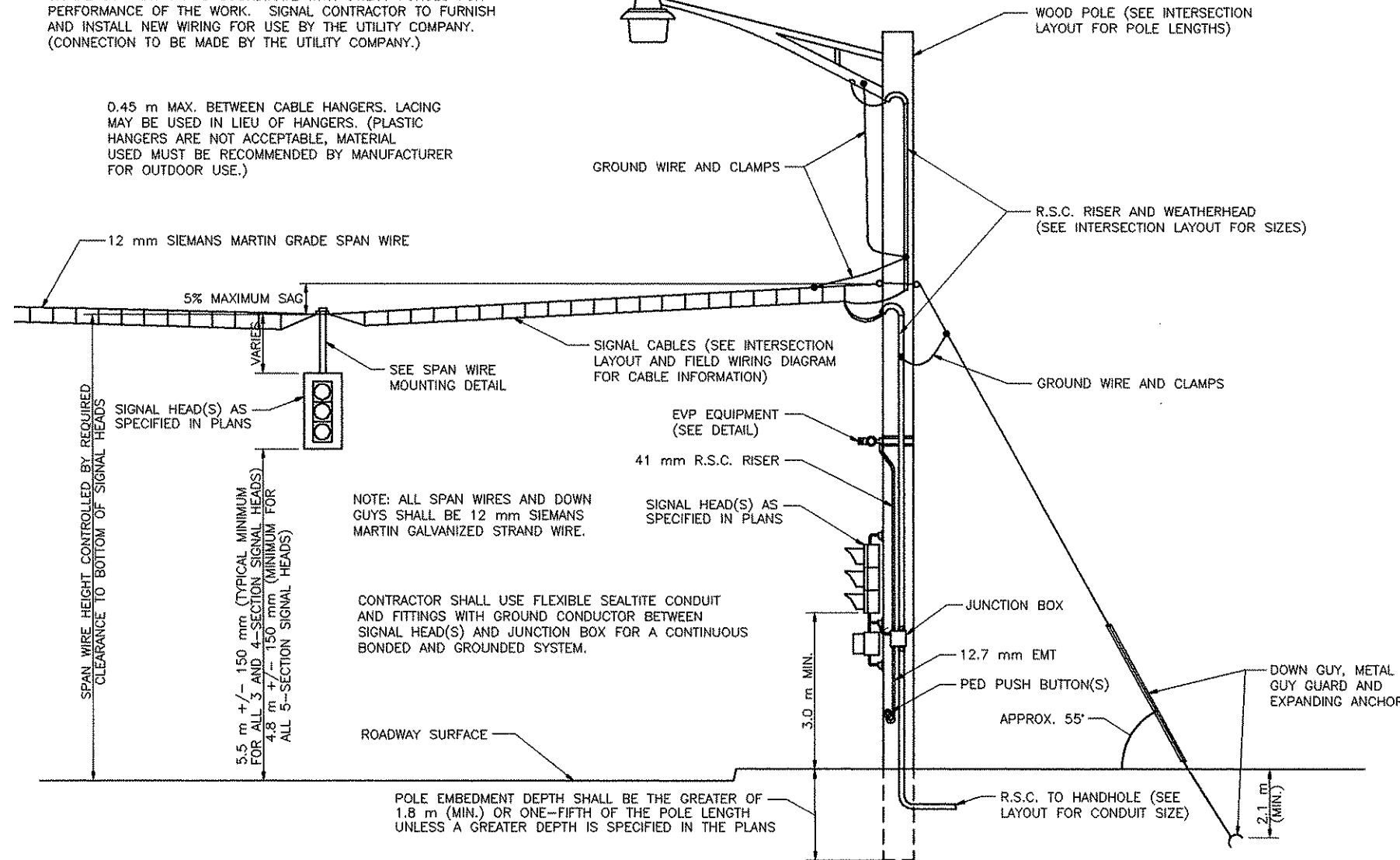
TRAFFIC SIGNAL SYSTEM  
CABINET AND PAD DETAILS  
CO. RD. 10 (89TH AVE. N.E.)  
@ POLK STREET N.E.  
Sheet 3 of 8 Sheets

**TYPICAL WOOD POLE AND SPAN WIRE MOUNTED TRAFFIC SIGNALS**

(NOT TO SCALE)

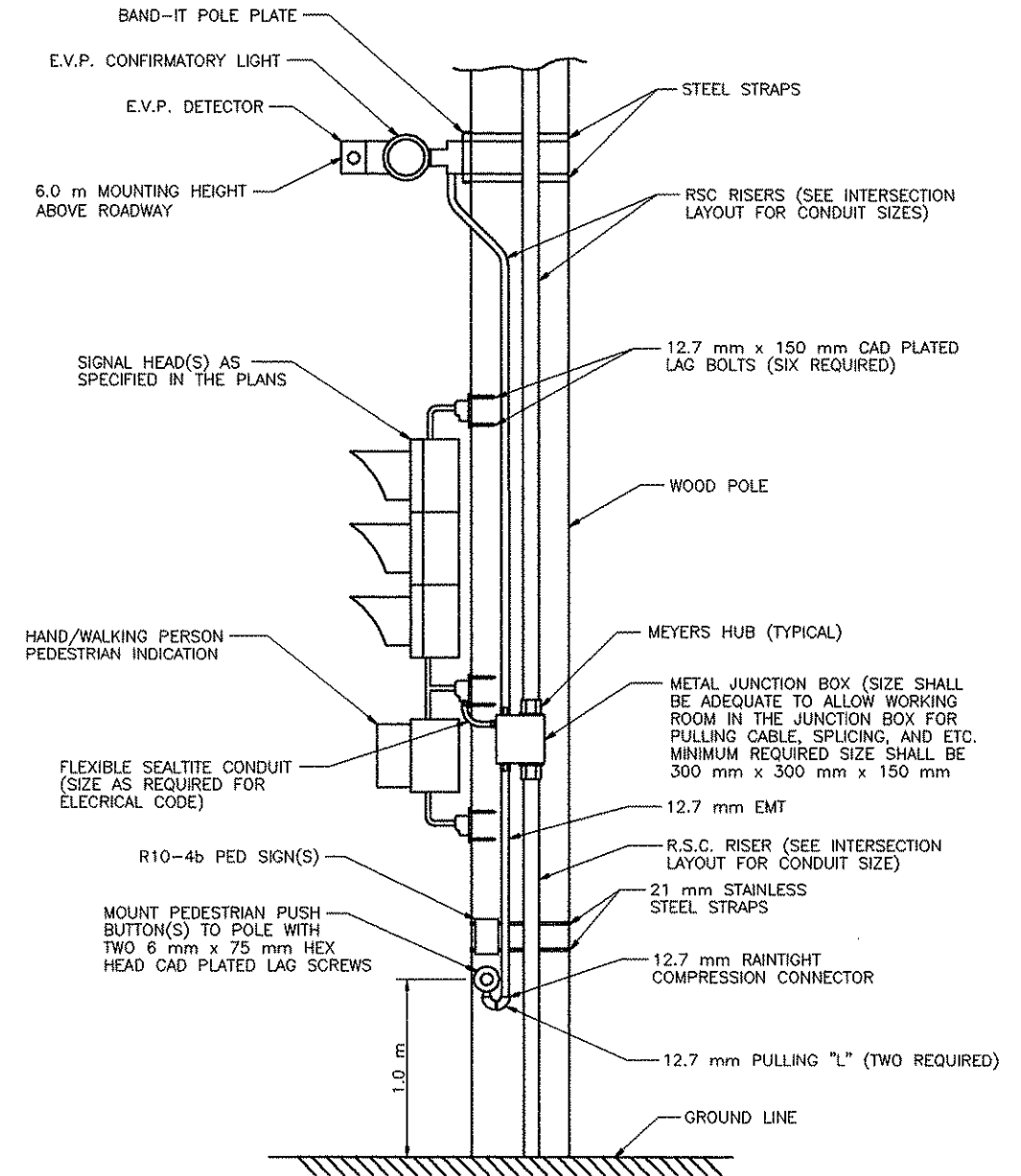
UTILITY COMPANY TO SALVAGE AND RELOCATE EXISTING LUMINAIRE AND MAST ARM AS SPECIFIED ON THE INTERSECTION LAYOUT. SIGNAL CONTRACTOR TO COORDINATE WITH UTILITY FORCES FOR PERFORMANCE OF THE WORK. SIGNAL CONTRACTOR TO FURNISH AND INSTALL NEW WIRING FOR USE BY THE UTILITY COMPANY. (CONNECTION TO BE MADE BY THE UTILITY COMPANY.)

0.45 m MAX. BETWEEN CABLE HANGERS. LACING MAY BE USED IN LIEU OF HANGERS. (PLASTIC HANGERS ARE NOT ACCEPTABLE, MATERIAL USED MUST BE RECOMMENDED BY MANUFACTURER FOR OUTDOOR USE.)



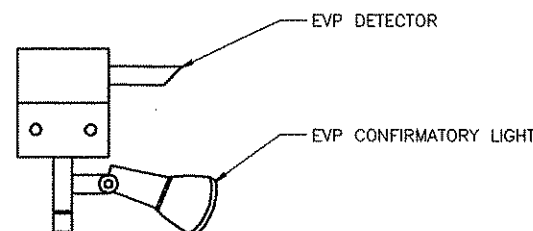
**POLE-MOUNTED EQUIPMENT DETAIL**

(NOT TO SCALE)



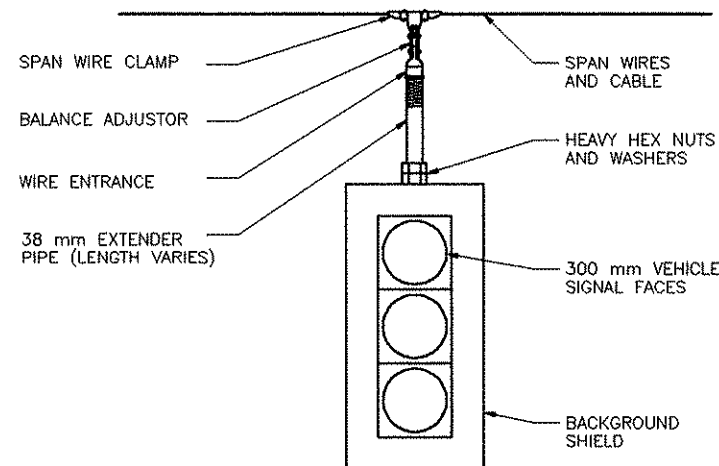
**TYPICAL E.V.P. DETECTOR & CONFIRMATORY LIGHT**

(NOT TO SCALE)



**SPAN WIRE MOUNTING DETAIL**

(NOT TO SCALE)



NO	DATE	BY	CKD	APPR	REVISION

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*Kevin M. Johnson*  
DATE 7/1/99 REG. NO. 21817

DRAWN BY: SNB DATE: 6/99  
DESIGN BY: SNB DATE: 6/99  
CHECKED BY: LEW DATE: 6/99

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**ANOKA COUNTY HIGHWAY DEPT.**

TRAFFIC SIGNAL SYSTEM  
SPAN WIRE AND POLE DETAILS  
CO. RD. 10 (89TH AVE. N.E.)  
@ POLK STREET N.E.  
Sheet 4 of 8 Sheets

**NOTES :**

- LOCATIONS OF POLES, EQUIPMENT PAD, LOOP DETECTORS AND HANDHOLES WILL BE DETERMINED IN THE FIELD BY THE ENGINEER.
- SEE SPECIAL PROVISIONS FOR COUNTY FURNISHED MATERIALS.
- LOOP DETECTOR WIRES SHALL BE CROSS-LINKED POLYETHYLENE (XLP) IN 21 mm N.M.C. (SEE SPECIAL PROVISIONS AND DETAILS.)
- NEW HANDHOLES SHALL BE PVC HANDHOLES WITH METAL FRAMES AND COVERS PER Mn/DOT STANDARD PLATE NO. M8114.
- EACH SIGNAL FACE SHALL HAVE A BACKGROUND SHIELD.
- ALL VEHICLE SIGNAL INDICATIONS AND ALL "HAND" PEDESTRIAN INDICATIONS SHALL BE L.E.D. TYPE. (SEE SPECIAL PROVISIONS.)
- EACH PEDESTRIAN INDICATION SHALL BE A SINGLE SECTION HAND / WALKING PERSON INDICATION. (SEE SPECIAL PROVISIONS.)
- SEE SPECIAL PROVISIONS AND DETAILS REGARDING SIGN PANELS TO BE FURNISHED AND INSTALLED BY THE CONTRACTOR.
- SEE DETAILS FOR WOOD POLE, PEDESTRIAN PUSH BUTTON, EMERGENCY VEHICLE PREEMPTION AND SPAN WIRE DETAILS.
- THE UTILITY COMPANY SHALL SALVAGE THE EXISTING LUMINAIRE AND MAST ARM UNIT ON THE INPLACE UTILITY POLE IN THE SOUTHEAST CORNER OF THE INTERSECTION AND SHALL INSTALL THE SALVAGED LUMINAIRE AND MAST ARM ON NEW WOOD SIGNAL POLE 3. THE SIGNAL CONTRACTOR SHALL COORDINATE WITH UTILITY COMPANY FORCES TO ARRANGE PERFORMANCE OF THE WORK AND SHALL FURNISH AND INSTALL NEW WIRING FOR USE BY THE UTILITY COMPANY. (CONNECTION BY UTILITY COMPANY.)
- FURNISH AND INSTALL ONE R10-12 SIGN PANEL (900 mm x 1200 mm) ADJACENT TO HEAD 2-3 AND HEAD 6-3 (TWO SIGNS TOTAL). EACH PANEL SHALL BE SPAN-WIRE MOUNTED USING APPROPRIATE MOUNTING HARDWARE, TO THE SATISFACTION OF THE ENGINEER.
- FOR PAVEMENT MARKING AND SIGNING INFORMATION, SEE STRIPING PLAN.
- THE CONTRACTOR IS ADVISED THAT CLEARANCES TO OVERHEAD POWER LINES WILL NEED TO BE ESTABLISHED AT A FIELD MEETING WITH COUNTY, CONTRACTOR AND POWER COMPANY REPRESENTATION. THE MEETING AND ANY RESULTANT MINOR ADJUSTMENTS TO THE SIGNAL SYSTEM SHALL BE INCIDENTAL.

- (A) EQUIPMENT PAD (SEE DETAIL)**  
 INSTALL CONTROLLER AND CABINET (TO BE FURNISHED BY THE COUNTY)  
 CONTROLLER CABINET TO SERVICE CABINET VIA H.H. 11:  
 35 mm R.S.C. (METERED SIGNAL SERVICE)  
 2-1/C #4  
 1-1/C #6 BARE GROUND  
 CONTR. CABINET TO H.H. 1:  
 2-103 mm R.S.C.  
 8-12/C #12  
 11-3/C #12  
 8-2/C #14  
 4-3/C #20  
 CONTR. CABINET TO H.H. 2:  
 78 mm R.S.C.  
 2-2/C #14
- (B) SERVICE CABINET (SEE DETAIL)**  
 CABINET FOUNDATION (SEE DETAIL)  
 SERVICE CABINET TO S.O.P. VIA H.H. 12 AND H.H. 4:  
 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. 11:  
 35 mm R.S.C. (METERED SIGNAL SERVICE)  
 2-1/C #4  
 1-1/C #6 BARE GROUND  
 SERVICE CABINET TO H.H. 1:  
 35 mm R.S.C. (UNMETERED LIGHTING SERVICE)  
 1-3/C #12 (LUM.)
- (C) SOURCE OF POWER**  
 EXISTING TRANSFORMER ON EXISTING WOOD POLE (CONNEXUS ENERGY)  
 53 mm R.S.C. RISER AND WEATHERHEAD  
 3-1/C #4 (POWER FEED)  
 (CONNECTION BY CONNEXUS ENERGY)

- (1) 12.2 m WOOD POLE - CLASS 2 (10 FEET BURIED)**  
 1-DOWN GUY AND ANCHOR  
 ONE-WAY EVP DETECTOR AND CONFIRMATORY LIGHT - WOOD POLE MOUNTED (PHASES 1 AND 6)  
 1-TYPE 10B - WOOD POLE MOUNTED AT 90°  
 1-TYPE 10B - WOOD POLE MOUNTED AT 180°  
 2-PEDESTRIAN PUSH BUTTONS AND RISERS (BELOW JUNCTION BOX)  
 METAL JUNCTION BOX (300 x 300 x 150 mm)  
 35 mm R.S.C. RISER - EVP (ABOVE JUNCTION BOX)  
 1-3/C #12  
 1-3/C #20  
 53 mm R.S.C. RISER AND WEATHERHEAD - SIGNALS (ABOVE JUNCTION BOX)  
 2-12/C #12  
 EXTEND INTO HH 1:  
 78 mm R.S.C. (BELOW JUNCTION BOX)  
 2-12/C #12  
 3-3/C #12  
 1-3/C #20  
 2-78 mm R.S.C. RISERS AND WEATHERHEADS (CONDUITS BYPASS JUNCTION BOX)  
 6-12/C #12  
 7-3/C #12  
 1-3/C #12 (LUM.)  
 8-2/C #14  
 3-3/C #20

- (2) 12.2 m WOOD POLE - CLASS 2 (10 FEET BURIED)**  
 1-DOWN GUY AND ANCHOR  
 ONE-WAY EVP DETECTOR AND CONFIRMATORY LIGHT - WOOD POLE MOUNTED (PHASE 4)  
 1-TYPE 10B - WOOD POLE MOUNTED AT 90°  
 1-TYPE 10B - WOOD POLE MOUNTED AT 180°  
 2-PEDESTRIAN PUSH BUTTONS AND RISERS (BELOW JUNCTION BOX)  
 METAL JUNCTION BOX (300 x 300 x 150 mm)  
 35 mm R.S.C. RISER - EVP (ABOVE JUNCTION BOX)  
 1-3/C #12  
 1-3/C #20  
 78 mm R.S.C. RISER AND WEATHERHEAD - SIGNALS (ABOVE JUNCTION BOX)  
 3-12/C #12  
 2-3/C #12  
 3-2/C #14  
 1-3/C #20  
 EXTEND INTO HH 5:  
 53 mm R.S.C. (BELOW JUNCTION BOX)  
 3-2/C #14

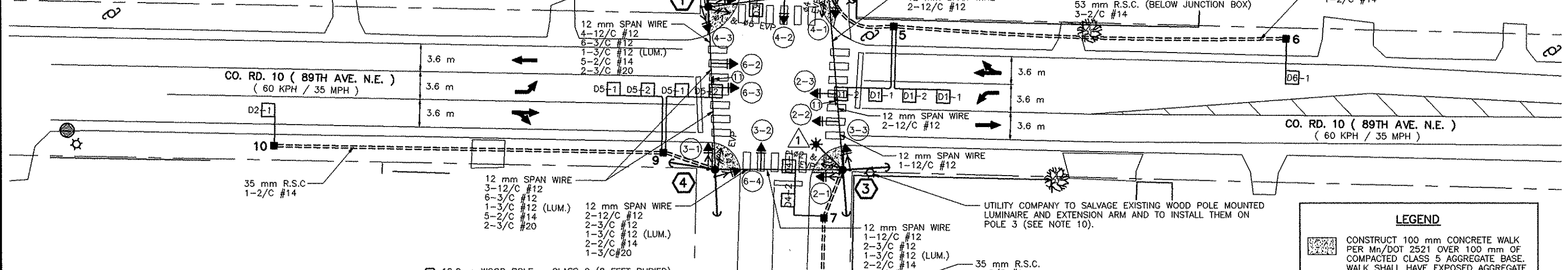
- (4) 12.2 m WOOD POLE - CLASS 2 (8 FEET BURIED)**  
 2-DOWN GUYS AND ANCHORS  
 ONE-WAY EVP DETECTOR AND CONFIRMATORY LIGHT - WOOD POLE MOUNTED (PHASE 3)  
 1-TYPE 10B - WOOD POLE MOUNTED AT 90°  
 1-TYPE 10B - WOOD POLE MOUNTED AT 180°  
 2-PEDESTRIAN PUSH BUTTONS AND RISERS (BELOW JUNCTION BOX)  
 METAL JUNCTION BOX (300 x 300 x 150 mm)  
 35 mm R.S.C. RISER - EVP (ABOVE JUNCTION BOX)  
 1-3/C #12  
 1-3/C #20  
 78 mm R.S.C. RISER AND WEATHERHEAD - SIGNALS (ABOVE JUNCTION BOX)  
 3-12/C #12  
 4-3/C #12  
 3-2/C #14  
 1-3/C #20  
 EXTEND INTO HH 9:  
 53 mm R.S.C. (BELOW JUNCTION BOX)  
 3-2/C #14

- (3) 15.2 m WOOD POLE - CLASS 2 (10 FEET BURIED)**  
 2-DOWN GUYS AND ANCHORS  
 INSTALL SALVAGED LUMINAIRE AND MAST ARM (BY THE UTILITY COMPANY -- SEE NOTE 10)  
 ONE-WAY EVP DETECTOR AND CONFIRMATORY LIGHT - WOOD POLE MOUNTED (PHASES 2 AND 5)  
 1-TYPE 10B - WOOD POLE MOUNTED AT 90°  
 1-TYPE 10B - WOOD POLE MOUNTED AT 180°  
 2-PEDESTRIAN PUSH BUTTONS AND RISERS (BELOW JUNCTION BOX)  
 METAL JUNCTION BOX (300 x 300 x 150 mm)  
 35 mm R.S.C. RISER AND WEATHERHEAD - LUMINAIRE (ABOVE SPAN WIRE)  
 1-3/C #12 (LUM.)  
 35 mm R.S.C. RISER - EVP (ABOVE JUNCTION BOX)  
 1-3/C #12  
 1-3/C #20  
 78 mm R.S.C. RISER AND WEATHERHEAD - SIGNALS (ABOVE JUNCTION BOX)  
 2-12/C #12  
 2-3/C #12  
 2-2/C #14  
 1-3/C #20  
 EXTEND INTO HH 7:  
 53 mm R.S.C. (BELOW JUNCTION BOX)  
 2-2/C #14

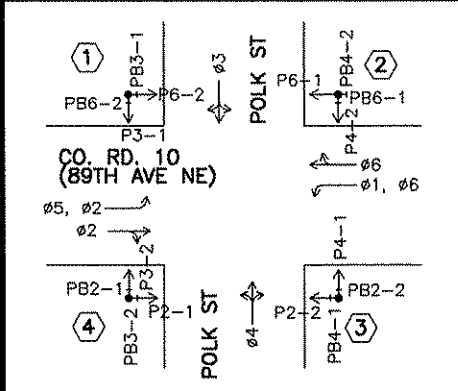
LOOP DETECTORS				
NUMBER	SIZE (m)	FUNCTION	LOCATION m*	TYPE
D1-1	2-1.7x1.7	11	1.3, 10.1	NMC
D1-2	2-1.7x1.7	11	-3.0, 5.7	NMC
D2-1	1.7x1.7	1	55	NMC
D3-1	1.7x1.7	3	37	NMC
D3-2	2-1.7x1.7	2	-3.0, 1.3	NMC
D4-1	1.7x1.7	3	37	NMC
D4-2	2-1.7x1.7	2	-3.0, 1.3	NMC
D5-1	2-1.7x1.7	10	1.3, 10.1	NMC
D5-2	2-1.7x1.7	10	-3.0, 5.7	NMC
D6-1	1.7x1.7	1	55	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 - IMMEDIATE EXTEND  
 7) CARRY OVER (STRETCH)  
 8) ADVISORY DETECTOR  
 9) CALL #5 DURING #3 AND #4, EXTEND #5 AND #2  
 10) CALL #1 DURING #3 AND #4, EXTEND #1 AND #6



**CONTROLLER PHASING, PEDESTRIAN INDICATIONS, AND PUSHBUTTON LAYOUT (NO SCALE)**



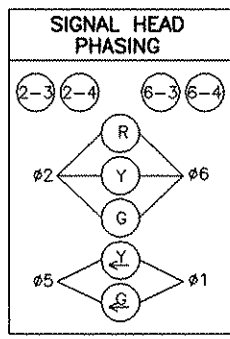
**SIGNAL SYSTEM OPERATION**

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

**LEGEND**

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

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	●	●	●			
3-1	●	●	●			
3-2	●	●	●			
3-3	●	●	●			
4-1	●	●	●			
4-2	●	●	●			
4-3	●	●	●			
6-1	●	●	●			
6-2	●	●	●			
6-3	●	●	●			
6-4	●	●	●			



NO	DATE	BY	CKD	APPR	REVISION

**PARSONS**  
 Barton-Aschman Associates, Inc.  
 A Unit of Parsons Transportation Group Inc.

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.

*Steven M. Bowser*  
 DATE 7/1/99 REG. NO. 21817

DRAWN BY: SNB DATE 6/99  
 DESIGN BY: SNB DATE 6/99  
 CHECKED BY: LEW DATE 6/99

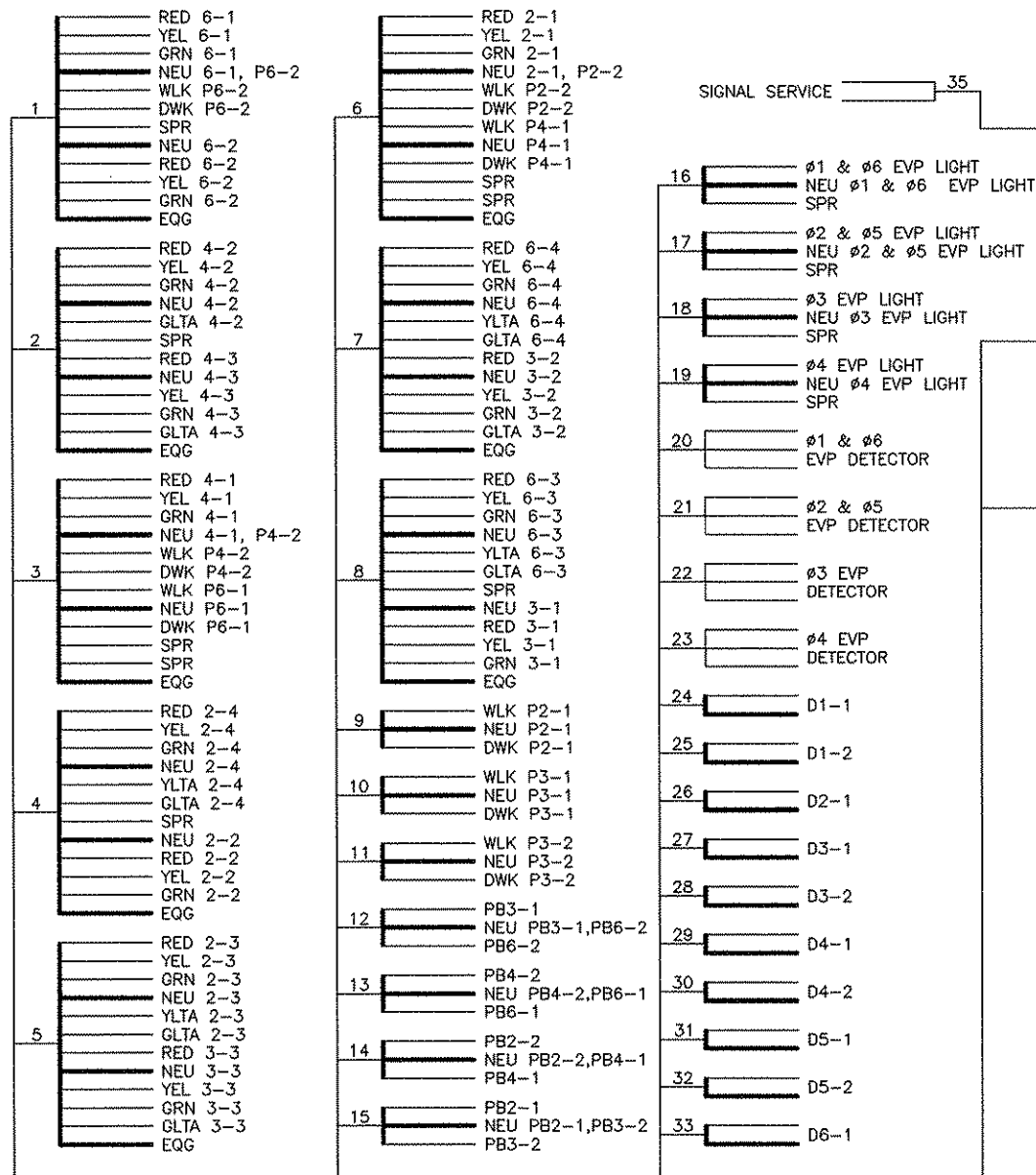
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 STATE PROJECT NO. \_\_\_\_\_  
 STATE AID PROJECT NO. \_\_\_\_\_  
 COUNTY PROJECT NO. 98-29-10



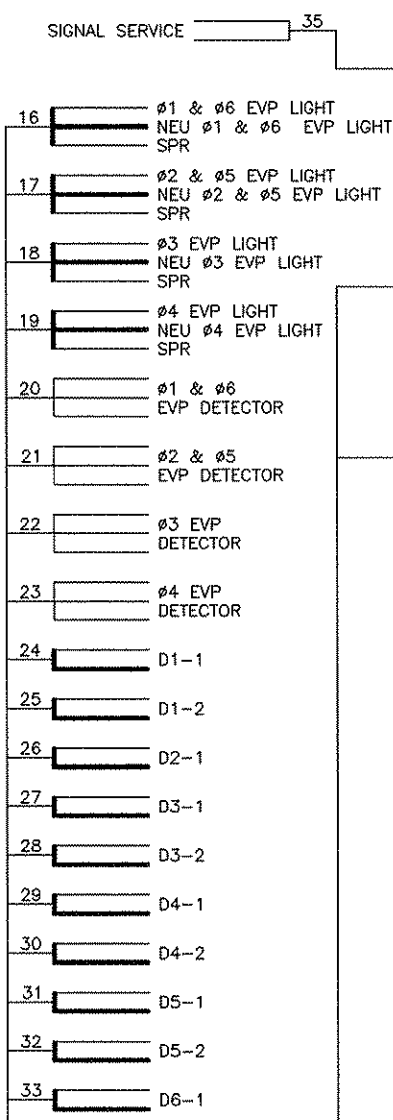
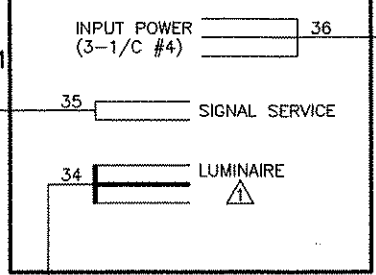
**ANOKA COUNTY  
 HIGHWAY DEPT.**

TRAFFIC SIGNAL SYSTEM  
 INTERSECTION LAYOUT  
 CO. RD. 10 (89TH AVE. N.E.)  
 @ POLK STREET N.E.  
 Sheet 5 of 8 Sheets

**CONTROLLER CABINET**



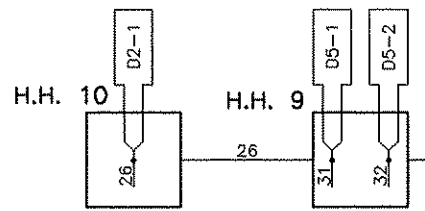
**SERVICE CABINET**



**CONDUCTOR COLOR CODE**

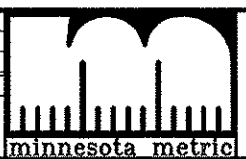
R	3/C#12	R	
O		WH	
BL		BLK	
WH			
R/BLK	3/C#20	R OR O	EVP
O/BLK		WH OR YEL	DETECTOR
BL/BLK		BLK OR BL	
WH/BLK	2/C#14	BLK	
BLK		CLR	
BLK/WH			
G/BLK	2-1/C#4	BLK	SIGNAL SERVICE
G		WH	

NOTE: ALL TERMINAL BLOCK CONNECTIONS SHALL BE ARRANGED AS SPECIFIED ABOVE.



\*\* UTILITY COMPANY TO RELOCATE THE EXISTING LUMINAIRE AND EXTENSION ARM FROM THE EXISTING UTILITY POLE TO NEW SIGNAL POLE 3. SIGNAL CONTRACTOR TO COORDINATE WITH UTILITY COMPANY FORCES TO ARRANGE PERFORMANCE OF THE WORK. SIGNAL CONTRACTOR SHALL FURNISH AND INSTALL NEW WIRING FOR USE BY THE UTILITY COMPANY. (CONNECTION AT LUMINAIRE WILL BE MADE BY THE UTILITY COMPANY.)

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.  
 DATE 7/1/99 REG. NO. 21817

DRAWN BY: SNB DATE: 6/99  
 DESIGN BY: SNB DATE: 6/99  
 CHECKED BY: LEW DATE: 6/99

STATE PROJECT NO. \_\_\_\_\_  
 STATE PROJECT NO. \_\_\_\_\_  
 STATE AID PROJECT NO. \_\_\_\_\_  
 COUNTY PROJECT NO. 98-29-10

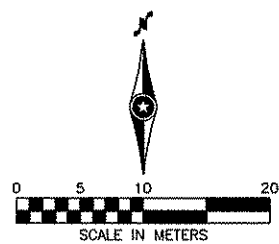
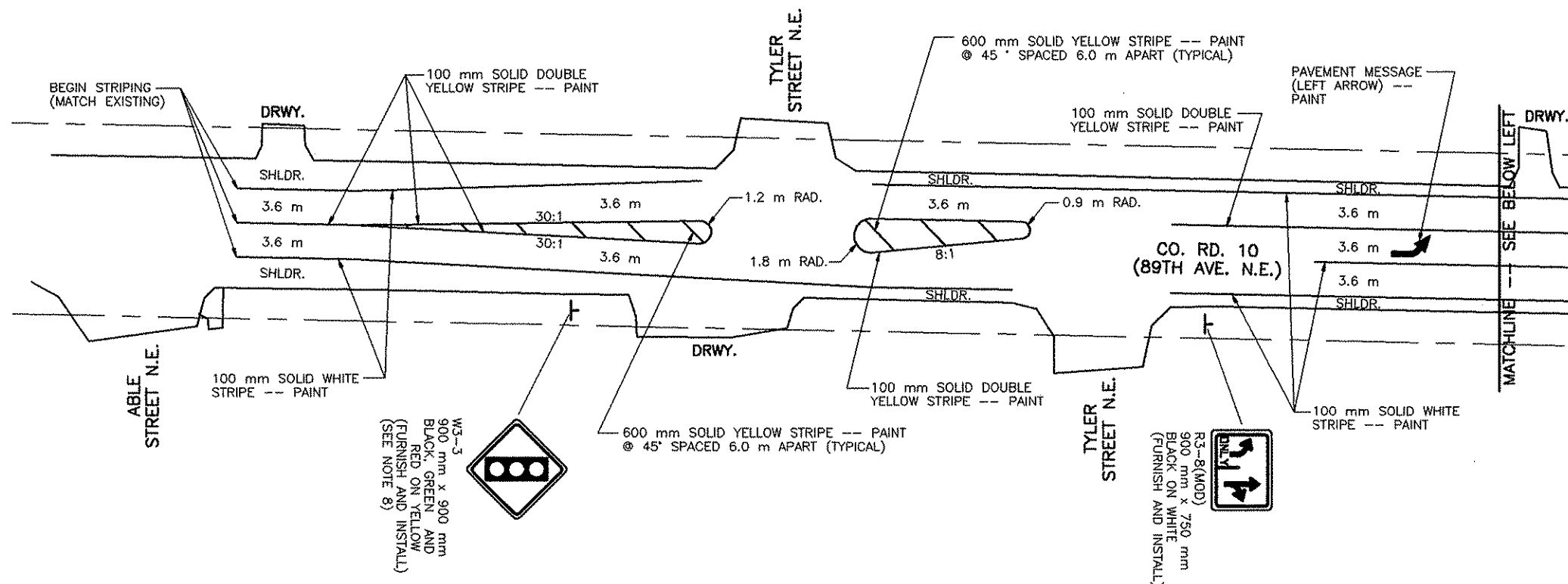


**ANOKA COUNTY HIGHWAY DEPT.**

TRAFFIC SIGNAL SYSTEM FIELD WIRING DIAGRAM  
 CO. RD. 10 (89TH AVE. N.E.)  
 @ POLK STREET N.E.  
 Sheet 6 of 8 Sheets

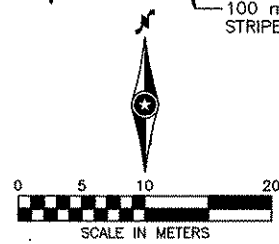
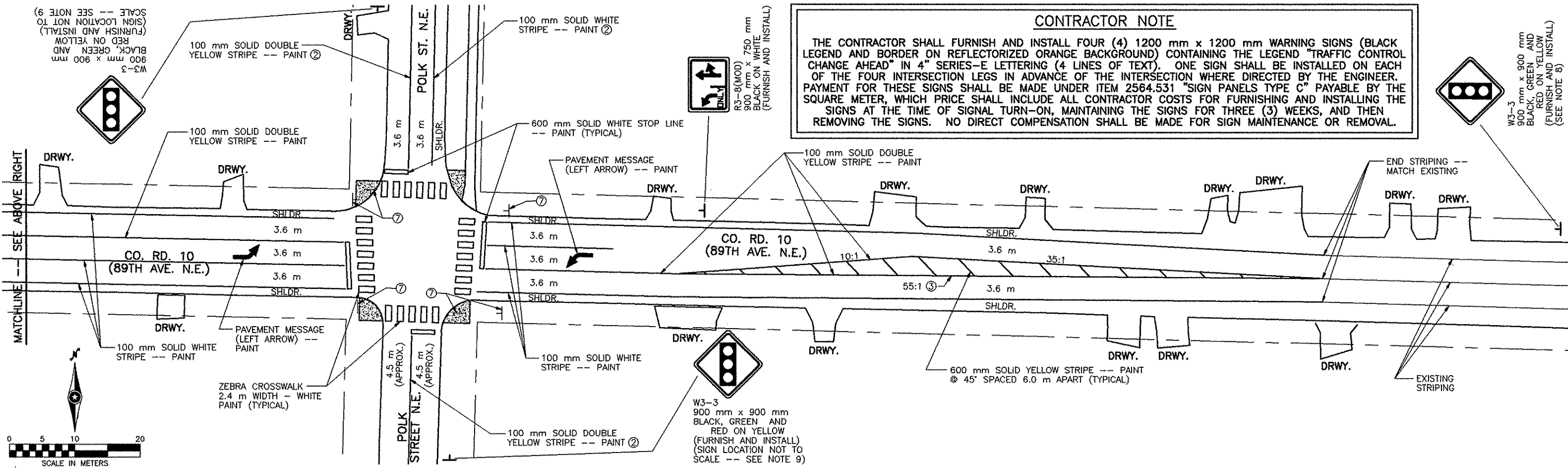
**NOTES :**

- ① ALL PAVEMENT MARKING LOCATIONS AND SIGN LOCATIONS SHOWN ARE APPROXIMATE. THE FINAL PAVEMENT MARKING AND SIGN LOCATIONS WILL BE DETERMINED IN THE FIELD BY THE ENGINEER.
- ② STRIPE LENGTH SHALL BE 90 m MEASURED FROM THE STOP LINE.
- ③ TAPER RATE IS CONTROLLED BY THE TWO LEFT TURN LANE DEVELOPMENT TAPERS.
- ④ CONTRACTOR SHALL FURNISH AND INSTALL LANE USE SIGNS AS SPECIFIED ON THE PLAN. SIGN LOCATIONS SHOWN ARE APPROXIMATE. FINAL SIGN LOCATIONS WILL BE DETERMINED IN THE FIELD BY THE ENGINEER.
- ⑤ ANOKA COUNTY FORCES MAY BE REMOVING, SALVAGING OR ADJUSTING THE LOCATIONS OF SOME OF THE EXISTING SIGNS WITHIN THE PROJECT AREA. CONTRACTOR SHALL COORDINATE WITH THE COUNTY.
- ⑥ THE CONTRACTOR SHALL REMOVE ALL CONFLICTING PAVEMENT MARKINGS AS DIRECTED BY THE ENGINEER. PAYMENT TO THE CONTRACTOR FOR THE REMOVAL OF PAVEMENT MARKINGS SHALL BE MADE BY THE LINEAL METER OF 100 mm WIDTH LINE REMOVED (ALL LINES WITH WIDTHS GREATER THAN 100 mm SHALL BE MEASURED AS AN EQUIVALENT LENGTH OF 100 mm WIDTH LINE) OR BY THE SQUARE METER OF PAVEMENT MARKING REMOVED FOR OTHER PAVEMENT MARKINGS.
- ⑦ REMOVE EXISTING STOP SIGN. SIGN REMOVAL SHALL BE INCIDENTAL TO ITEM 2565.511 "TRAFFIC SIGNAL SYSTEM --- LUMP SUM" AND NO DIRECT COMPENSATION SHALL BE MADE.
- ⑧ EXISTING "STOP AHEAD" SIGN STRUCTURE. REMOVE EXISTING "STOP AHEAD" SIGN PANEL AND INSTALL ONE "SIGNAL AHEAD" SIGN PANEL AS SPECIFIED. REMOVAL OF THE EXISTING "STOP AHEAD" SIGN PANEL SHALL BE INCIDENTAL TO THE INSTALLATION OF THE "SIGNAL AHEAD" SIGN PANEL AND NO DIRECT COMPENSATION SHALL BE MADE.
- ⑨ THE "SIGNAL AHEAD" SIGN INSTALLATION LOCATIONS SHOWN ON POLK STREET ARE NOT TO SCALE. THE SIGNS SHALL BE LOCATED APPROXIMATELY 100 m IN ADVANCE OF THE INTERSECTION WHERE DIRECTED BY THE ENGINEER.



**CONTRACTOR NOTE**

THE CONTRACTOR SHALL FURNISH AND INSTALL FOUR (4) 1200 mm x 1200 mm WARNING SIGNS (BLACK LEGEND AND BORDER ON REFLECTORIZED ORANGE BACKGROUND) CONTAINING THE LEGEND "TRAFFIC CONTROL CHANGE AHEAD" IN 4" SERIES-E LETTERING (4 LINES OF TEXT). ONE SIGN SHALL BE INSTALLED ON EACH OF THE FOUR INTERSECTION LEGS IN ADVANCE OF THE INTERSECTION WHERE DIRECTED BY THE ENGINEER. PAYMENT FOR THESE SIGNS SHALL BE MADE UNDER ITEM 2564.531 "SIGN PANELS TYPE C" PAYABLE BY THE SQUARE METER, WHICH PRICE SHALL INCLUDE ALL CONTRACTOR COSTS FOR FURNISHING AND INSTALLING THE SIGNS AT THE TIME OF SIGNAL TURN-ON, MAINTAINING THE SIGNS FOR THREE (3) WEEKS, AND THEN REMOVING THE SIGNS. NO DIRECT COMPENSATION SHALL BE MADE FOR SIGN MAINTENANCE OR REMOVAL.



NO.	DATE	BY	CKD	APPR	REVISION

**PARSONS**  
Barton-Aschman Associates, Inc.  
A Unit of Parsons Transportation Group Inc.

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.

*Kerry M. Bowler*  
DATE 7/1/99 REG. NO. 21817

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DESIGN BY: SNB DATE: 6/99  
CHECKED BY: LEW DATE: 6/99

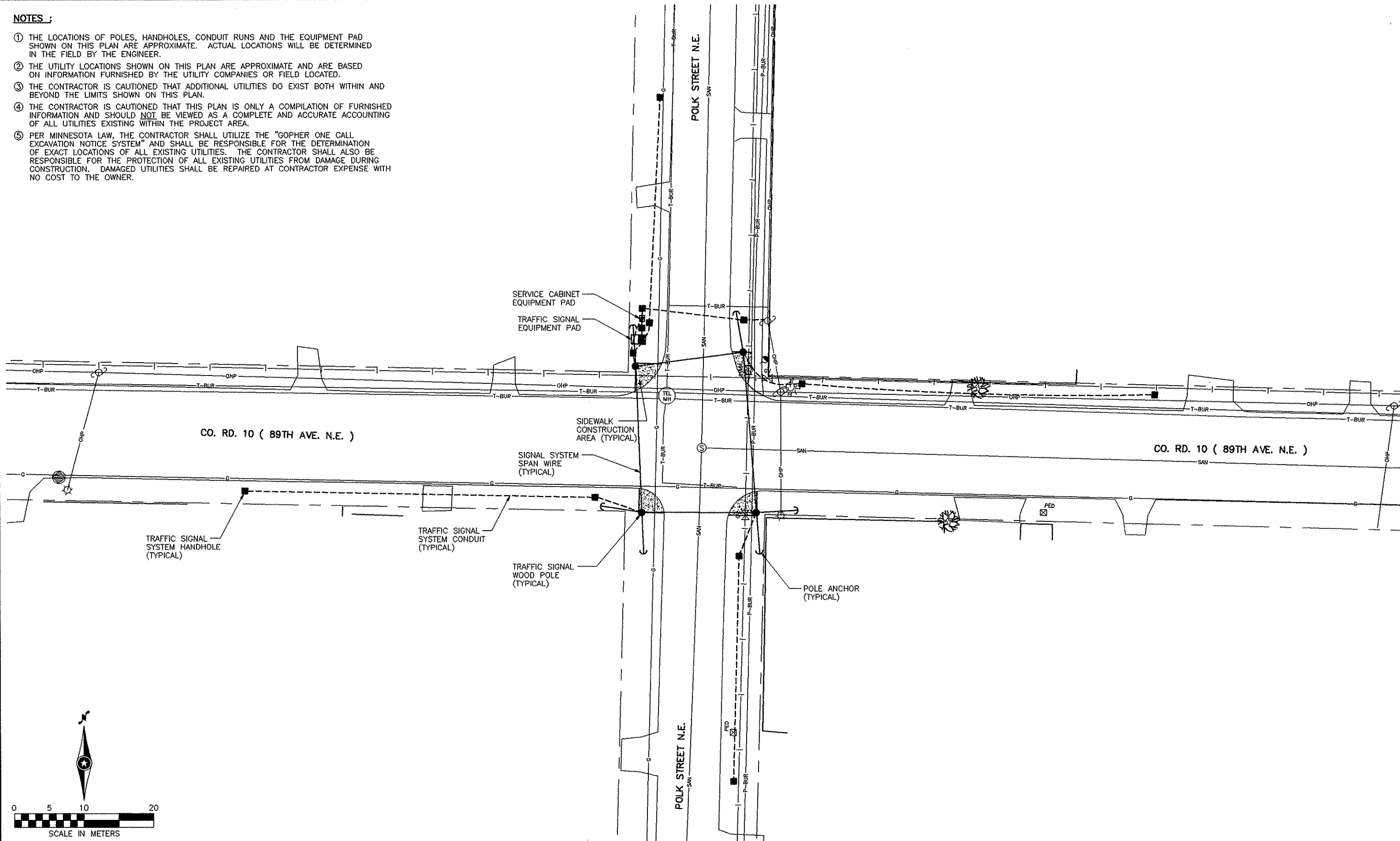
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STATE PROJECT NO. \_\_\_\_\_  
STATE AID PROJECT NO. \_\_\_\_\_  
COUNTY PROJECT NO. 98-29-10

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

TRAFFIC SIGNAL SYSTEM  
STRIPING PLAN  
CO. RD. 10 (89TH AVE. N.E.)  
@ POLK STREET N.E.  
Sheet 7 of 8 Sheets

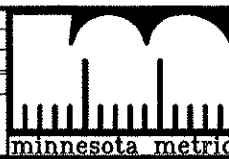
**NOTES :**

- ① THE LOCATIONS OF POLES, HANDHOLES, CONDUIT RUNS AND THE EQUIPMENT PAD SHOWN ON THIS PLAN ARE APPROXIMATE. ACTUAL LOCATIONS WILL BE DETERMINED IN THE FIELD BY THE ENGINEER.
- ② THE UTILITY LOCATIONS SHOWN ON THIS PLAN ARE APPROXIMATE AND ARE BASED ON INFORMATION FURNISHED BY THE UTILITY COMPANIES OR FIELD LOCATED.
- ③ THE CONTRACTOR IS CAUTIONED THAT ADDITIONAL UTILITIES DO EXIST BOTH WITHIN AND BEYOND THE LIMITS SHOWN ON THIS PLAN.
- ④ THE CONTRACTOR IS CAUTIONED THAT THIS PLAN IS ONLY A COMPILATION OF FURNISHED INFORMATION AND SHOULD NOT BE VIEWED AS A COMPLETE AND ACCURATE ACCOUNTING OF ALL UTILITIES EXISTING WITHIN THE PROJECT AREA.
- ⑤ PER MINNESOTA LAW, THE CONTRACTOR SHALL UTILIZE THE "GOPHER ONE CALL EXCAVATION NOTICE SYSTEM" AND SHALL BE RESPONSIBLE FOR THE DETERMINATION OF EXACT LOCATIONS OF ALL EXISTING UTILITIES. THE CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR THE PROTECTION OF ALL EXISTING UTILITIES FROM DAMAGE DURING CONSTRUCTION. DAMAGED UTILITIES SHALL BE REPAIRED AT CONTRACTOR EXPENSE WITH NO COST TO THE OWNER.



NO	DATE	BY	CKD	APPR	REVISION

**PARSONS**  
Barton-Aschman Associates, Inc.  
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*Steven M. Bower*  
DATE 7/1/99 REG. NO. 21817

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COUNTY PROJECT NO. 98-29-10



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

TRAFFIC SIGNAL SYSTEM  
SITE UTILITIES INFORMATION  
CO. RD. 10 (89TH AVE. N.E.)  
@ POLK STREET N.E.  
Sheet 8 of 8 Sheets