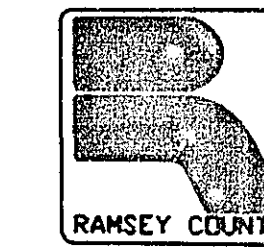


MINNESOTA DEPARTMENT OF TRANSPORTATION



RAMSEY COUNTY
DEPARTMENT OF PUBLIC WORKS

CONSTRUCTION PLAN FOR TRAFFIC CONTROL SIGNAL SYSTEM

S.P. No. 62-688-01

S.P. No. 160-216-13

HIGHWAY 88 & COUNTY ROAD C2SYSTEM A
(C.S.A.H. 88) (M.S.A.H. 216)

SYSTEM A
HIGHWAY 88 & COUNTY RD C2

INDEX

SHEET NO.	DESCRIPTION
1	TITLE
2-3	ESTIMATED QUANTITIES & DETAILS
4-6	SYSTEM A
7	SIGNS
8	UTILITIES INFORMATION & CONSTRUCTION

THIS PLAN CONTAINS 8 SHEETS.

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.

Daniel E. Soler REG. NO. 20452 DATE 5/6/97

SIGNAL DESIGN ENGINEER:
I HEREBY CERTIFY THAT THESE SIGNAL PLANS WERE PREPARED BY ME OR UNDER MY DIRECT SUPERVISION, THAT THIS PLAN CONFORMS TO THE MUTCD (EXCEPT WHERE A VARIANCE HAS BEEN GRANTED), AND THAT I AM A DULY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

Daniel E. Soler REG. NO. 20452 DATE 5/6/97

APPROVED Paul K. Hill COUNTY ENGINEER DATE 5/6/97

APPROVED Susan M. Heigler CHAIR OF THE RAMSEY COUNTY BOARD DATE 5-6-97

APPROVED Karl P. Keel CITY OF ROSEVILLE DATE 5-7-97

APPROVED _____ CITY OF _____ DATE _____

APPROVED _____ CITY OF _____ DATE _____

APPROVED _____ CITY OF _____ DATE _____

APPROVED _____ CITY OF _____ DATE _____

MINNESOTA DEPARTMENT OF TRANSPORTATION

PLAN REVISIONS		
DATE	SHEET NO. & DESCRIPTION	BY
5/5/97	SHEETS 1-8 MN/DOT PLAN REVIEW	RWW

RECOMMENDED FOR APPROVAL John M. O'Neil DATE 5/7/97
METRO-ASST. DIVISION ENGR.-STATE AID

RECOMMENDED FOR APPROVAL _____ DATE _____

APPROVED FOR STATE Patricia S. Murphy DATE 6-2-97
AID DIVISION STATE AID ENGINEER

ROSEVILLE PROJ. No. M-97-09

S.P. No. 160-216-13

S.P. No. 62-688-01

28-181
THIS IS A METRIC PLAN
FOR INFORMATION PURPOSES, SOME INPLACE ITEMS MAY
BE DIMENSIONED IN ENGLISH UNITS.

Sheet No. 1 of 8 Sheets

PLAN SYMBOLS

STATE LINE
COUNTY LINE
TOWNSHIP OR RANGE LINE
SECTION LINE
QUARTER LINE
SIXTEENTH LINE
EXISTING RIGHT OF WAY LINE
PROPOSED RIGHT OF WAY LINE
PROPERTY LINE
CORPORATE OR CITY LIMITS
RETAINING WALL
RAILROAD
RAILROAD RIGHT-OF-WAY

RIVER OF CREEK

CULVERT

GUARDRAIL

BARBED WIRE FENCE

WOVEN WIRE FENCE

CHAIN LINK FENCE

STONE WALL

HEDGE

RAILROAD CROSSING SIGN

CROSSING GATE

MEANDER CORNER

SLOPE EASEMENT (CONST. LIMITS)

MARSH

DECIDUOUS TREE

CONIFEROUS TREE

WOODS

CATCH BASIN

BRIDGE

IRON PIPE OR ROD

MONUMENT (STONE, CONCRETE OR METAL)

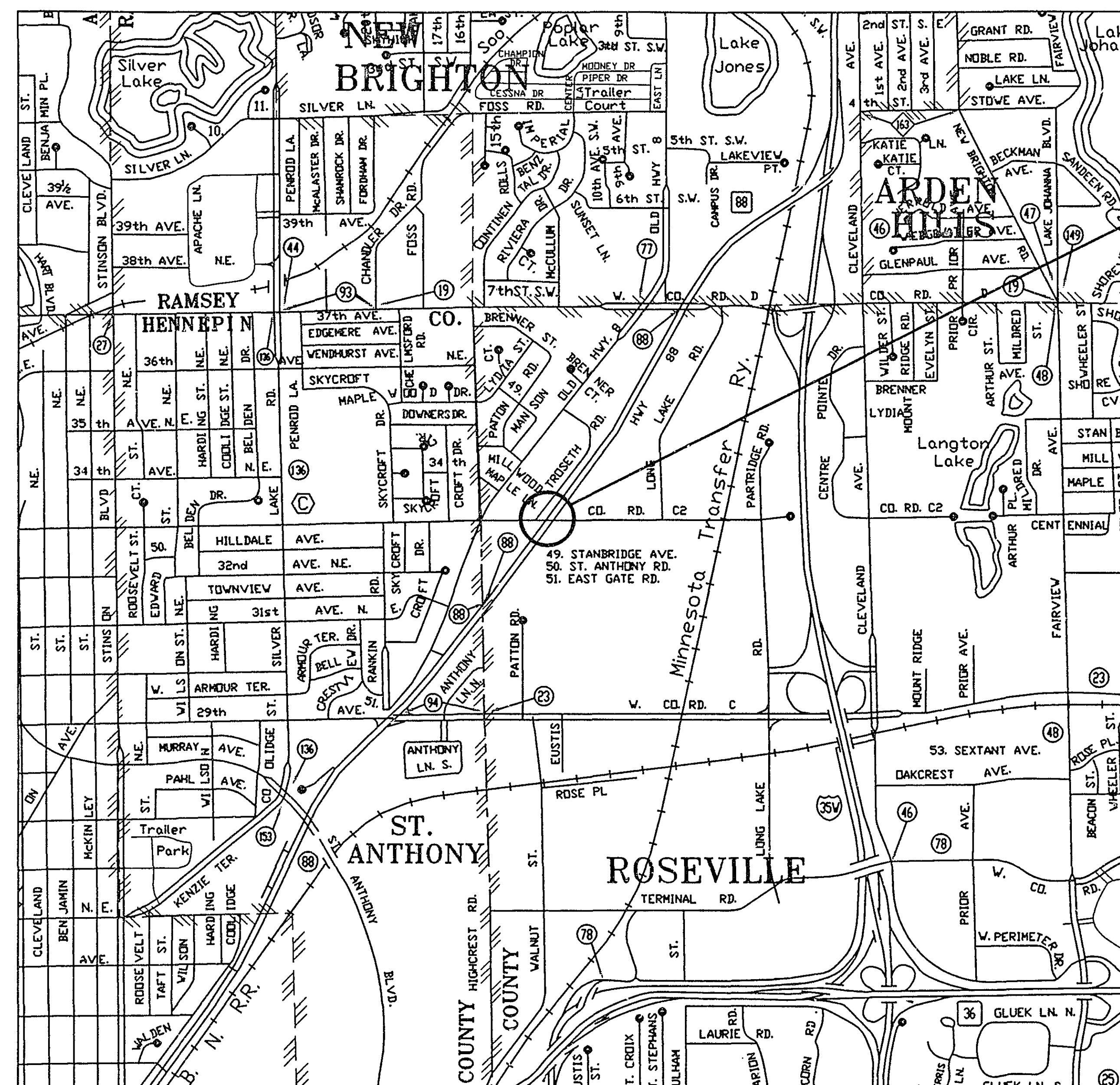
WOODEN HUB

UTILITY SYMBOLS

UTILITY POLE
GUY OR ANCHOR
STREET LIGHT
TELEPHONE PEDESTAL
GAS MAIN
WATER MAIN
TELEPHONE VAULT
ELECTRIC VAULT
BURIED TELEPHONE CABLE
BURIED ELECTRIC CABLE
SEWER (SANITARY OR STORM)
SEWER MANHOLE
GATE VALVE
CONTROLLER CABINET
EXISTING HYDRANT
BURIED TELEPHONE CABLE

FOR PLANS AND UTILITIES SYMBOLS SEE
MN/DOT TECHNICAL MANUAL.

GROSS LENGTH	0 m	0 km
BRIDGE LENGTH	----	----
EXCEPTIONS	----	----
NET LENGTH	0 m	0 km



MAP SCALE (km)
0 0.5 1.0

DESIGN DESIGNATION

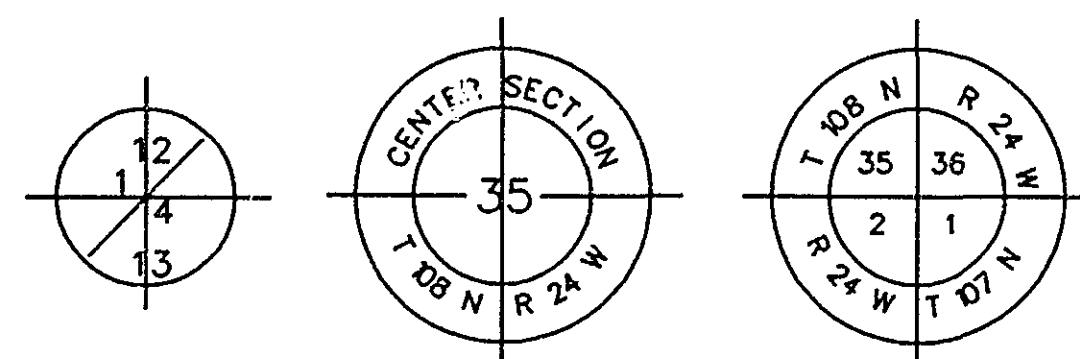
	HIGHWAY 88 (CSAH 88)	COUNTY RD C2 (MSAH 216)
PRESENT ADT (1997)	14,000	2,450
PROJECTED ADT (2017)	19,600	3,675
FUNCTIONAL CLASSIFICATION	MINOR ARTERIAL	URBAN COLLECTOR
TRAFFIC LANES	4	2
PARKING LANES	0	0
DESIGN SPEED	90 km/h (55 mph)	50 km/h (30 mph)

BASED ON STOPPING DISTANCE
HEIGHT OF EYE: 1070 mm
HEIGHT OF OBJECT: 150 mm

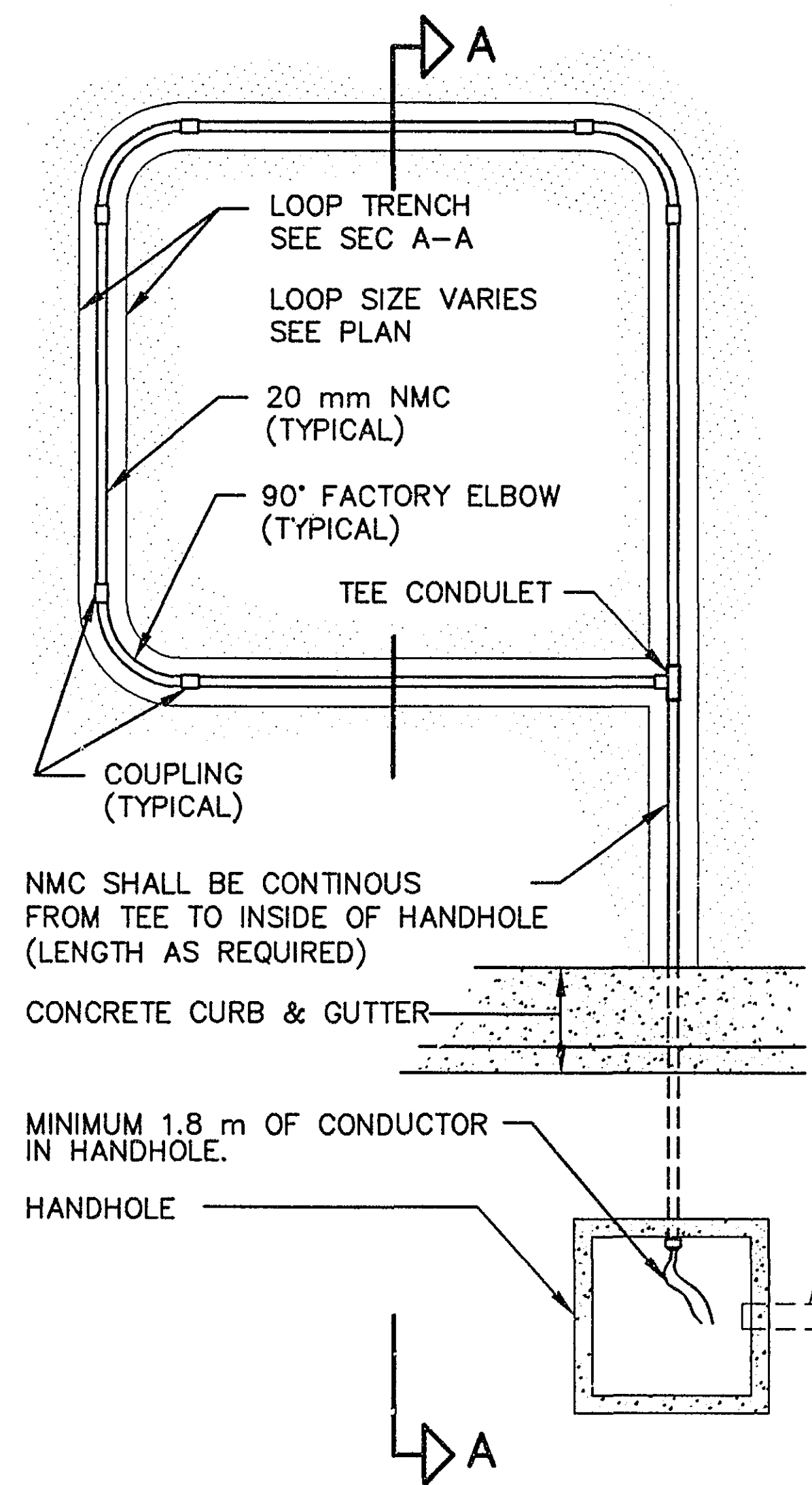
-GOVERNING SPECIFICATIONS-

THE 1995 EDITION OF THE MINNESOTA DEPARTMENT
OF TRANSPORTATION "STANDARD SPECIFICATION FOR
CONSTRUCTION" SHALL APPLY.

THE TRAFFIC CONTROL DEVICES AND SIGNING SHALL
CONFORM TO THE MUTCD, INCLUDING FIELD MANUAL
FOR TEMPORARY TRAFFIC CONTROL ZONE LAYOUTS,
DATED APRIL, 1995.

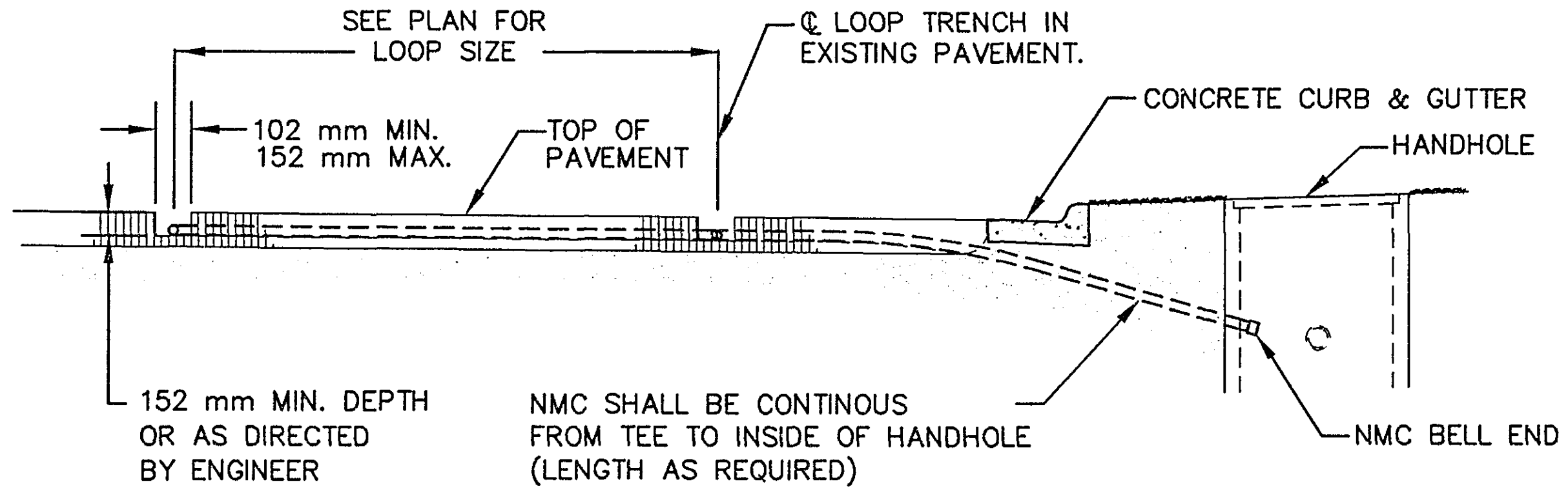


NMC LOOP DETECTOR DETAIL



- NOTES:
1. SEE SPECIAL PROVISIONS FOR REQUIRED CONDUCTORS, SPLICE KITS AND ACCEPTANCE PARAMETERS.
 2. THE NON-METALLIC CONDUIT (NMC) AND FITTINGS SHALL BE SCHEDULE 40 HEAVY WALL RIGID POLYVINYL CHORIDE (PVC), SEE SPEC.
 3. ALL SLACK MUST BE REMOVED FROM LOOP DETECTOR CONDUCTORS WITHIN THE NMC.
 4. LOOP DETECTOR CONDUCTORS (1/C #14) SHALL BE TWISTED THREE TURNS PER FOOT FROM THE NMC TEE CONDULET TO THE HANDHOLE.
 5. ATTACH A FERROUS METAL ITEM TO THE INTERIOR OF THE TEE CONDULET COVER.
 6. ALL CONDUIT SHALL SLOPE TO THE HANDOLE FOR DRAINAGE.
 7. CONDUIT TO THE HANDHOLE MAY BE PLACED WITHIN THE SAME TRENCH.
 8. NO SPLICES ALLOWED IN CONDUIT OR TEE CONDULET.
 9. NUMBER OF TURNS OF LOOP WIRE IN EACH 1.7 X 1.7 m LOOP SHALL BE 4 TURNS.

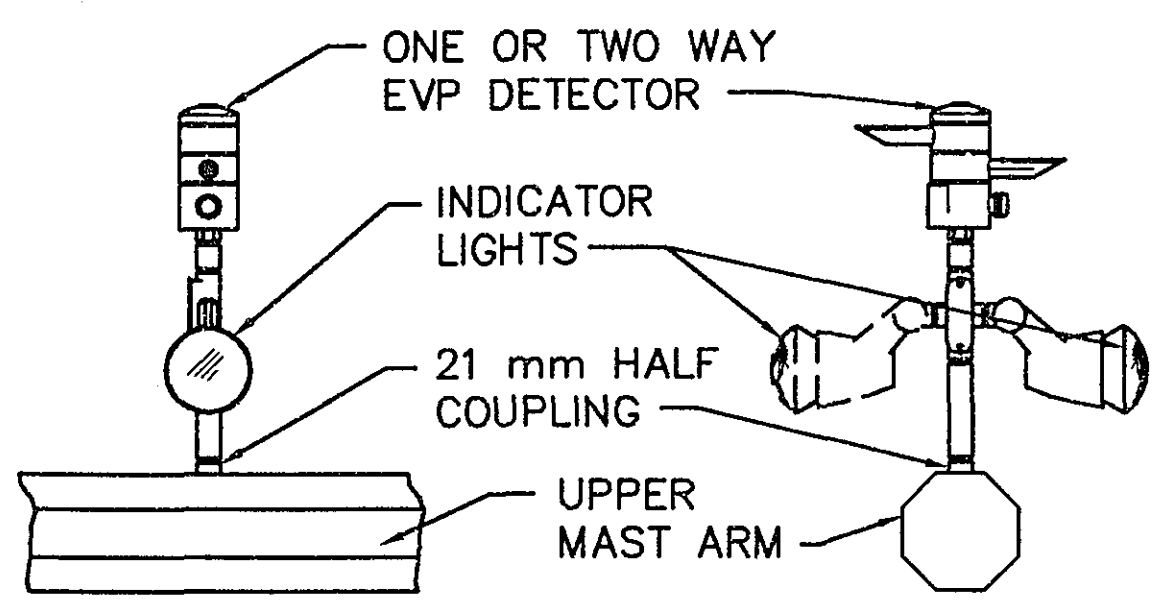
PLAN VIEW



- NOTES:
- THE FOLLOWING NOTES SHALL APPLY WHERE PVC LOOPS ARE INSTALLED IN EXISTING PAVEMENT.
1. ACHIEVE A MINIMUM 50 mm VERTICAL EDGE ON ALL CUTS.
 2. AN AIR COMPRESSOR UNIT IS REQUIRED FOR REMOVING ALL LOOSE MATERIAL FROM THE LOOP TRENCH PRIOR TO TACK COAT.
 3. BOTTOM AND EDGES OF LOOP TRENCH SHALL BE THOROUGHLY COVERED WITH TACK. (EMULSIFIED ASPHALT - MN/DOT SPEC. 2357.2A)
 4. USE TYPE 41 WEARING COURSE FOR LOOP TRENCH BACKFILL. (TYPE 41WEA50055)
 5. DO NOT USE PETROLEUM DISTILLATES AS A RELEASE AGENT.
 6. COMPACTION SHALL BE OBTAINED BY THE ORDINARY COMPACTION METHOD. A MINIMUM OF TWO LIFTS SHALL BE USED TO EXCLUDE DAMAGE TO PVC.
 7. CREATE AN OVERFILL OF 6 to 12 mm OVER EXISTING PAVEMENT SURFACE.
 8. APPLY A COAT OF TACK OVER THE FINAL ROADWAY SURFACE, IF UNDER TRAFFIC, SPRINKLE WITH SAND TO PREVENT TRACKING AND SPRAYING.

SECTION A-A

EVP DETECTOR & LIGHT MOUNTING DETAIL ON MAST ARM



FRONT VIEW SIDE VIEW

STANDARD PLATES

THE FOLLOWING STANDARD PLATES, APPROVED BY THE FEDERAL HIGHWAY ADMINISTRATION, SHALL APPLY ON THIS PROJECT		
PLATE NO.	DESCRIPTION	
* M7035 J	CONCRETE WALK & CURB RETURNS AT ENTRANCES	
* M7036 D	PEDESTRIAN CURB RAMP	
* M7100 G	CONCRETE CURB AND GUTTERS (DESIGN B & DESIGN V)	
* M8110 D	TRAFFIC SIGNAL BRACKETING (POLE MOUNTED)	
M8111 C	TRAFFIC SIGNAL BRACKETING (PEDESTAL MOUNTED)	
M8112 C	PEDESTAL FOUNDATION	
8113 C	MAGNETIC VEHICLE DETECTOR INSTALLATION	
* M8115 D	PEDESTRIAN PUSH BUTTON INSTALLATION	
* 8117 F	PRECAST CONCRETE HANDHOLE	
M8118 C	SERVICE EQUIPMENT & POLE, TRAFFIC CONTROL SIGNALS	
* M8119 C	GROUND MOUNTED CABINET FOUNDATION	
M8120 K	POLE FOUNDATION (PA85)	
* M8121 D	TRANSFORMER BASE WITH POLE BASE PLATE	
M8222 C	PEDESTAL AND PEDESTAL BASE	
* M8123 D	POLE AND MAST ARM (LUMINAIRE AND TRAFFIC LIGHTS)	
* M8124 E	MAST ARM SIGNAL HEAD MOUNTS	
* M8126 F	POLE FOUNDATION (PA90M AND PA100M)	
* M8130 D	SAW CUT LOOP DETECTORS	

* STANDARD PLATES APPLICABLE TO THIS PROJECT

STATEMENT OF ESTIMATED QUANTITIES

ITEM NO.	ITEM	UNIT	TOTAL ESTIMATED QUANTITY	FEDERAL PARTICIPATING		
				S.P.62-688-01	S.P.160-216-13	ROSEVILLE PROJ. M-97-09
2564.531	F&I SIGN PANELS TYPE D	m2	3.2	3.2	0	0
2565.511	FULL T. ACT. T. CONTROL SIGNAL SYSTEM A	SIG. SYS.	1	0.5	0.5	0
0565.601	EMERGENCY VEHICLE PRE-EMPTION SYSTEM A	L. SUM	1	0	1	0

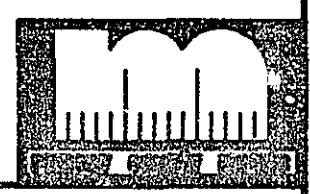
I hereby certify that this plan was prepared by me or under my direct supervision and that I am a duly Registered Professional Engineer under the laws of the State of Minnesota.
Daniel E. Solu
Date 5/6/97 Reg. No. 20452

S.P. No. 160-216-13

S.P. No. 62-688-01

ESTIMATED QUANTITIES AND DETAILS

28-181
Sheet No. 2 of 8 Sheets



EQUIPMENT PAD FOUNDATION

NOTES:

1. ANCHOR RODS, NUTS AND WASHERS PER MN/DOT 3385 OR APPROVED EQUAL SET AS RECOMMENDED BY CABINET MANUFACTURER (NUMBER, SIZE AND LENGTH OF ANCHOR RODS) SHALL BE AS REQUIRED BY THE CABINET (MANUFACTURER).

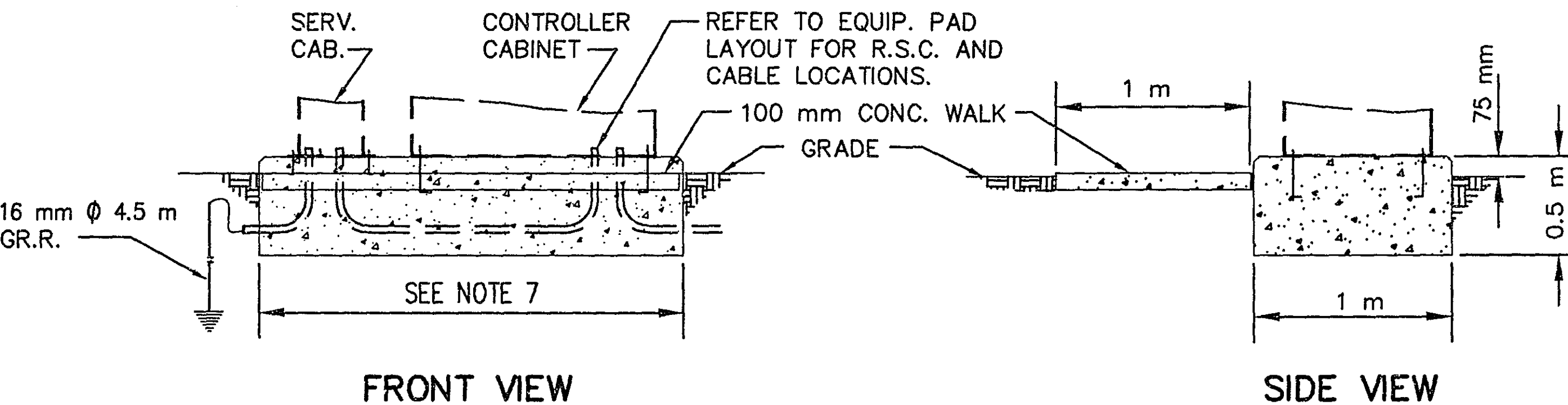
2. UPPER PART OF FOUNDATION SHALL BE BEVELED OR CHAMFERED IN A NEAT MANNER AS DIRECTED BY THE ENGINEER IN THE FIELD.

3. TOP OF CONDUITS SHALL BE THREADED AND CAPPED AFTER INSTALLATION (UNTIL CABLES ARE INSTALLED). CONDUIT SHALL PROJECT A MINIMUM OF 50 mm ABOVE CONCRETE AND SHALL BE LOCATED INSIDE THE CABINET WHERE DIRECTED BY THE ENGINEER BUT SHALL NOT INTERFERE WITH CABINET FUNCTIONS.
4. CONCRETE MIX 3A32 OR EQUAL SHALL BE USED FOR FOUNDATION AND CONCRETE WALK.

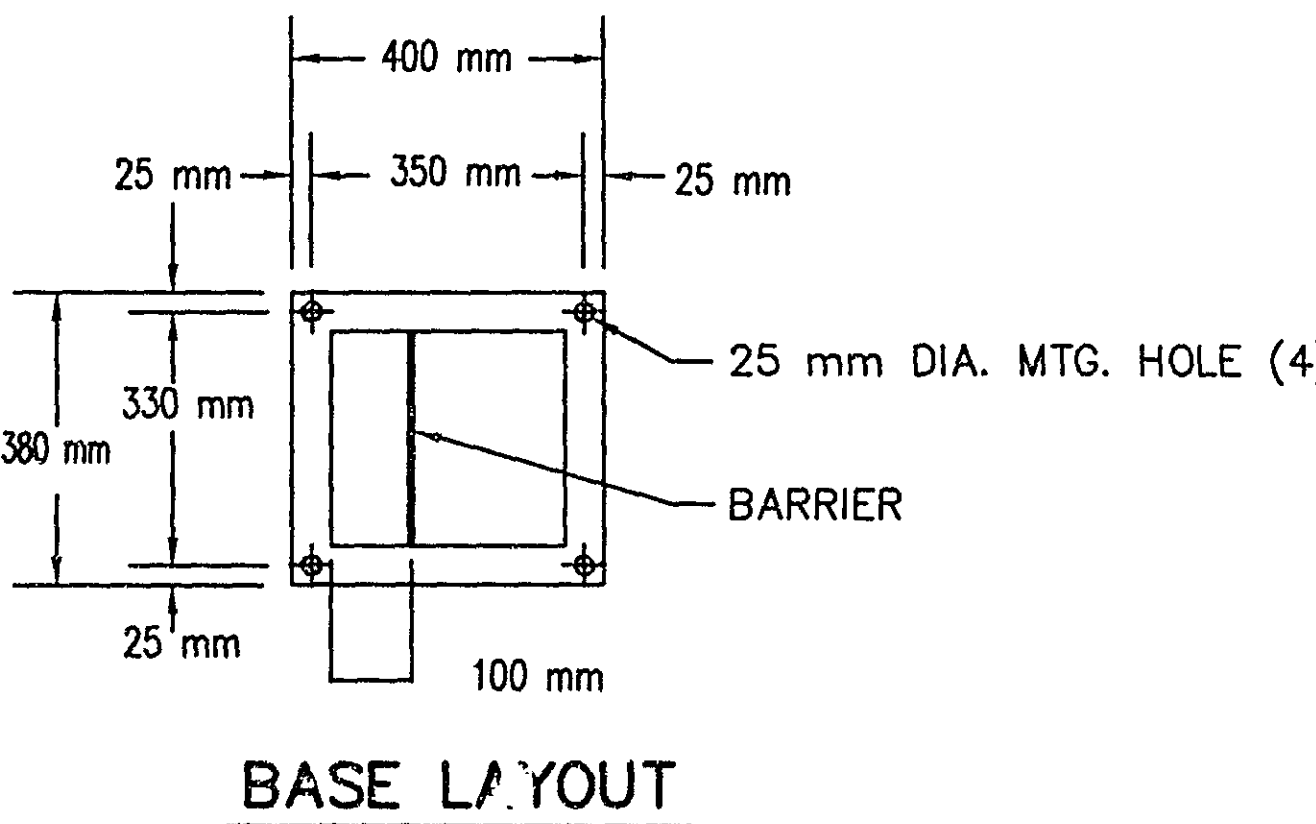
5. CONDUITS WHICH HAVE BOTH ENDS TERMINATING WITHIN THE PAD SHALL NOT BE INSTALLED BELOW THE CONCRETE.

6. EXACT LOCATIONS OF CONDUIT WITHIN THE PAD SHALL BE AS DETERMINED BY THE ENGINEER IN THE FIELD.

7. REFER TO EQUIPMENT PAD LAYOUT OF EACH SYSTEM FOR FOUNDATION SIZE, CONDUIT PLACEMENT AND EQUIPMENT TO BE INSTALLED.



SERVICE CABINET DETAILS



NOTES:

PEDESTAL SHALL BE FABRICATED FROM ALUMINUM, 3 mm THICK WITH WELDED SEAMS FOR USE AS AN OUTDOOR WEATHER PROOF SERVICE EQUIPMENT.

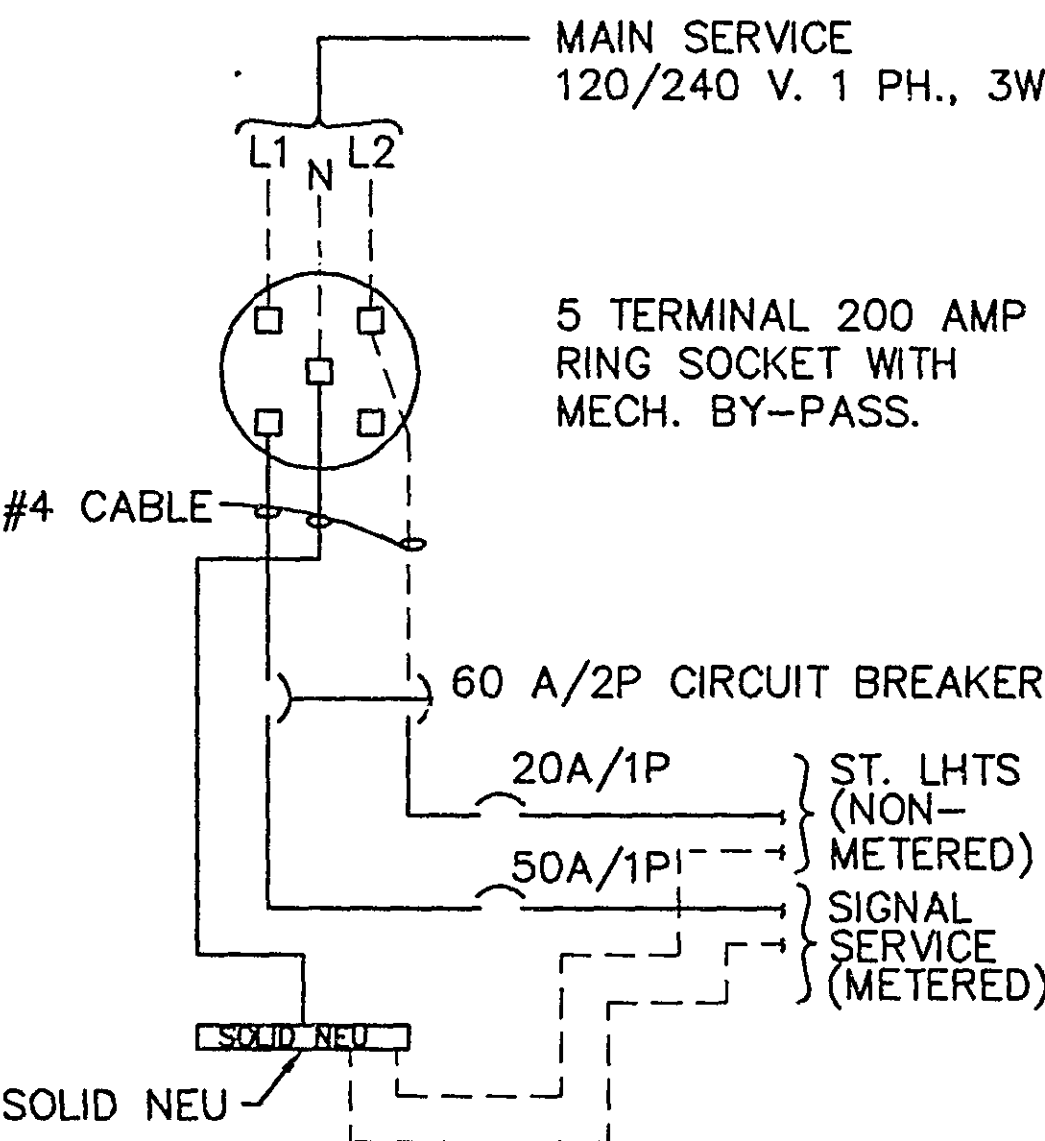
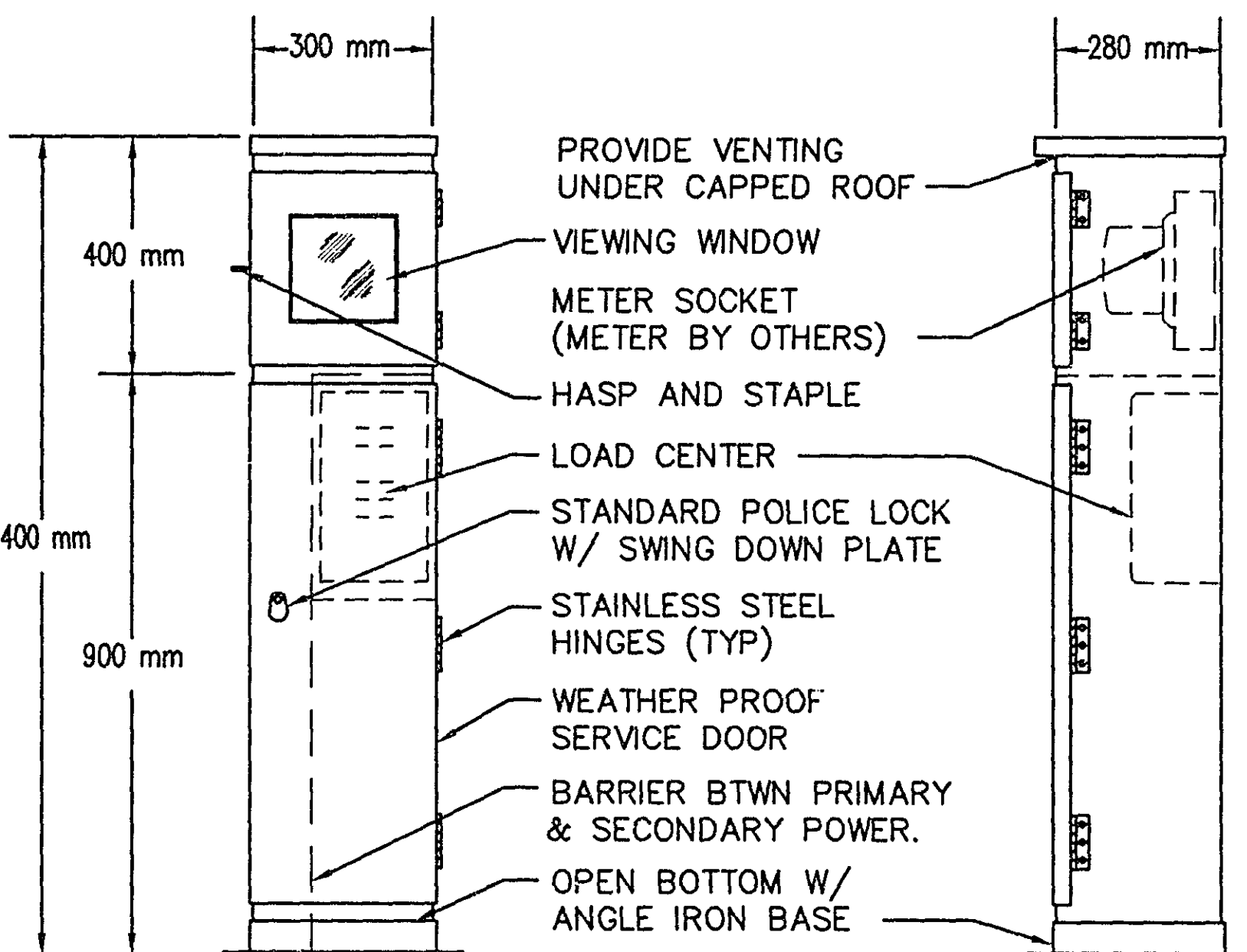
DOOR OPENINGS SHALL BE SEALED WITH NEOPRENE GASKET.

ALL HINGES, HINGE PINS AND LOCKS SHALL BE MADE FROM NON-CORRODING MATERIALS.

THE VIEWING WINDOW SHALL BE LEXAN MATERIAL-175x175mm MIN.

THE PEDESTAL CABINET SHALL BE PROTECTED INSIDE AND OUT WITH A ANODIC COATING. SEE SPECIAL PROVISIONS.

ANCHOR RODS, NUTS & WASHERS - SEE EQUIPMENT PAD NOTE No. 1.

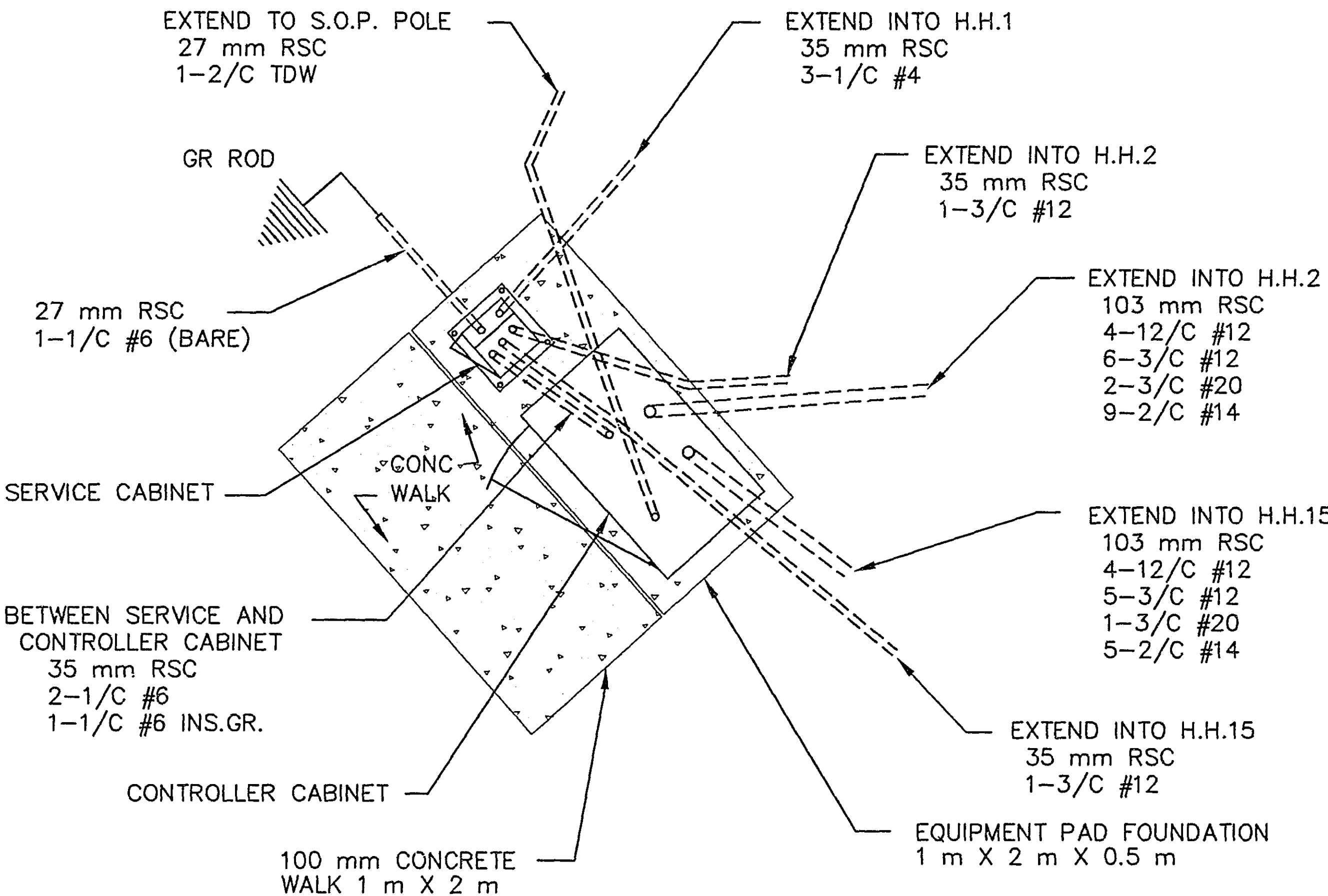


I hereby certify that this plan was prepared by me or under my direct supervision and that I am a duly Registered Professional Engineer under the laws of the State of Minnesota.

Daniel E. Salu

Date 5/6/97 Reg. No. 20452

EQUIPMENT PAD LAYOUT
SYSTEM A
HIGHWAY 88 & COUNTY ROAD C2



ABBREVIATIONS

3-1 (e.g.)	-SIGNAL HEAD, PHASE "3", NO. "1"	NEU	-NEUTRAL
BL	-BLUE	NMC	-NON-METALLIC CONDUIT
BLK	-BLACK	O	-ORANGE
BLK/WH	-BLACK WITH WHITE TRACER	O/BLK	-ORANGE WITH BLACK TRACER
BL/BLK	-BLUE WITH WHITE TRACER	P1-1 (e.g.)	-PEDESTRIAN INDICATION, PHASE "1", NO. "1"
BR. GR.	-BARE GROUND		
CH. SW.	-CHECK SWITCH	PB	-PUSH BUTTON
CLR	-CLEAR	PB2-1 (e.g.)	-PUSH BUTTON, PHASE "2", NO. "1"
D2-1 (e.g.)	-DETECTOR, PHASE "2", NO. "1"	PED	-PEDESTRIAN
DNL	-DOWNLIGHT	P.E.C.	-PHOTOELECTRIC CELL
DWK	-DON'T WALK	R	-RED
EQG	-EQUIPMENT GROUND	R&S	-REMOVE AND SALVAGE
EVP	-EMERGENCY VEHICLE PRE-EMPTION	RSC	-RIGID STEEL CONDUIT
		RTA	-RIGHT TURN ARROW
		R/BLK	-REN WITH BLACK TRACER
F&I	-FURNISH AND INSTALL		
FL	-FLASH/FLASHING	SPR	-SPARE
G	-GREEN	STA	-STATION
GLTA	-GREEN LEFT TURN ARROW	ST. LHT.	-STREET LIGHT
GRN	-GREEN	SW	-SWITCH
GRTA	-GREEN RIGHT TURN ARROW	SWD	-SWITCHED
GR.R.	-GROUND ROD	S.O.P.	-SOURCE OF POWER
GTHA	-GREEN THROUGH ARROW	TDW	-TELEPHONE DROP WIRE
G/BLK	-GREEN WITH BLACK TRACER		
HPS	-HIGH PRESSURE SODIUM	WH	-WHITE
H.H.	-HANDHOLE	WH/BLK	-WHITE WITH BLACK TRACER
		WLK	-WALK
		YEL	-YELLOW
IMC	-INTERMEDIATE METAL CONDUIT	YLTA	-YELLOW LEFT TURN ARROW
J.B.	-JUNCTION BOX	YRTA	-YELLOW RIGHT TURN ARROW
LTA	-LEFT TURN ARROW	YTHA	-YELLOW THROUGH ARROW
LUM	-LUMINAIRE		
MV	-MERCURY VAPOR		

DETAILS

S.P. No. 160-216-13

S.P. No. 62-688-01

Sheet No. 3 of 8 Sheets



SIGNAL INDICATION CHART									
FACE	PHASE	INDICATION SIZE 300mm							
		RED	YELLOW	GREEN	RED	YELLOW	GREEN	RED	YELLOW
1-1	1								
1-2	1								
2-1	2								
2-2	2								
2-3	2								
4-1	4								
4-2	4								
4-3	4								
4-4	4								
5-1	5								
5-2	5								
6-1	6								
6-2	6								
6-3	6								
8-1	8								
8-2	8								
8-3	8								
8-4	8								

→ SPECIAL SIGNAL FACE, SEE NOTE 13.

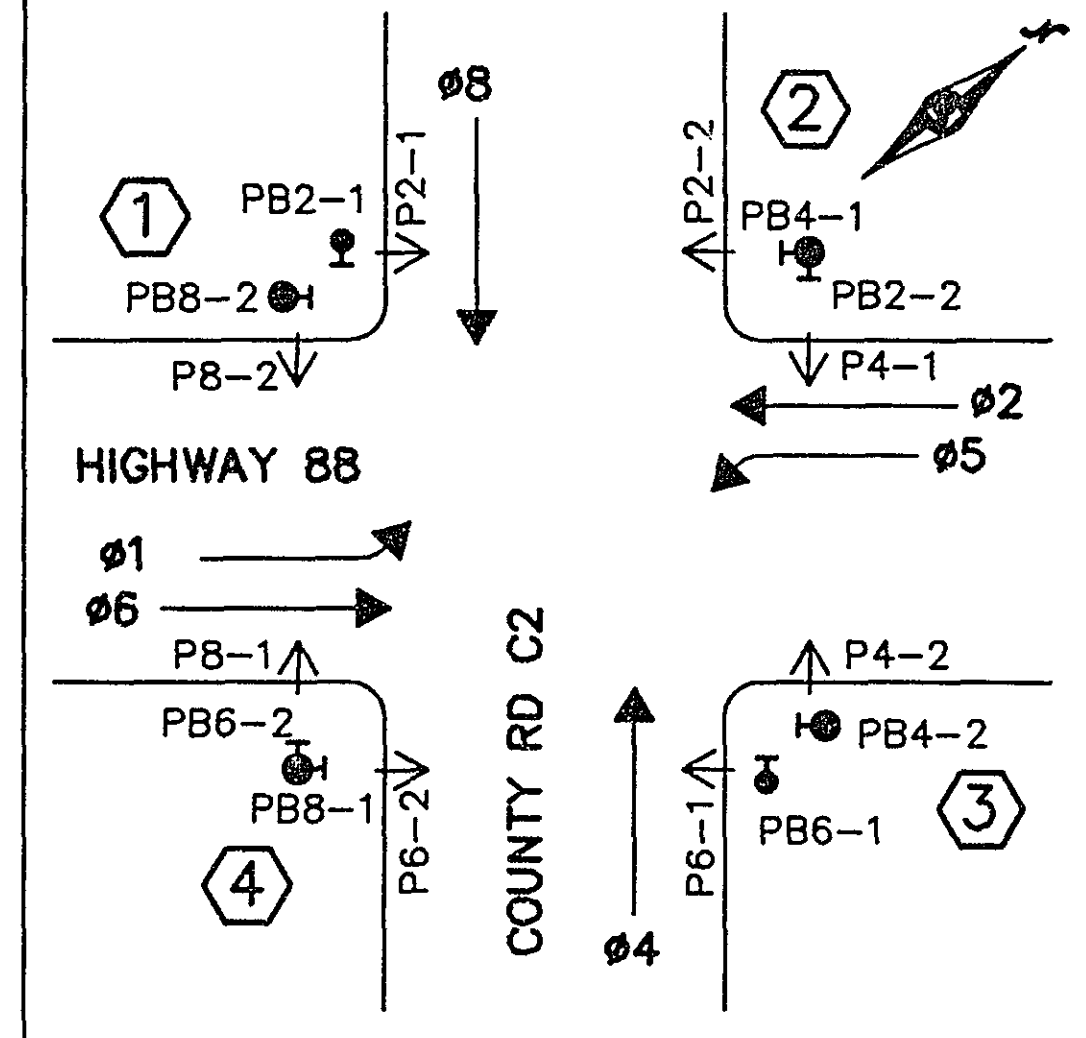
VEHICLE DETECTION				
NO.	SIZE (m)	FUNCTION	LOC (m)	
D1-1	2-1.7 x 1.7	C&E	3, 8	
D1-2	2-1.7 x 1.7	C&E	13, 18	
D2-1	1.7 x 1.7	C&E	145	
D2-2	1.7 x 1.7	C&E	145	
D4-1	1.7 x 1.7	C&E	48	
D4-2	1.7 x 1.7	C&E	20	
D4-3	2-1.7 x 1.7	C&E	0	
D5-1	2-1.7 x 1.7	C&E	3, 8	
D5-2	2-1.7 x 1.7	C&E	13, 18	
D6-1	1.7 x 1.7	C&E	145	
D6-2	1.7 x 1.7	C&E	145	
D8-1	1.7 x 1.7	C&E	48	
D8-2	1.7 x 1.7	C&E	20	
D8-3	2-1.7 x 1.7	C&E	0	

C&E = CALL & EXTEND
* = NMC LOOP (ALL OTHERS SAWCUT)

SIGNING
F&I OVERHEAD TYPE D SIGNS, SEE SHEET 7. (SEPARATE PAY ITEM)
F&I PEDESTRIAN PUSH BUTTON SIGNS, TYPE R10-4b (229x305 mm) WITH SYMBOL MESSAGE ABOVE EACH PUSH BUTTON INSTALLATION.

SIGNAL SYSTEM OPERATION
THE SIGNAL SYSTEM FLASH MODE IS ALL RED. PHASES 1 AND 5 ARE PROTECTED LEFT TURNS. PHASES 4 & 8 ARE NON-LOCK DETECTION/DELAY. PHASES 1, 2, 5 AND 6 ARE LOCK DETECTION. PHASES 2 AND 6 ARE ON VEHICLE RECALL.

CONTROLLER PHASING, PEDESTRIAN INDICATIONS AND PUSH BUTTONS



① PA100-A-15-T12-3 (TRUSS AT 350°)
PA100 POLE FOUNDATION
LUMINAIRE-200 WATT HPS
3-ONE WAY SIGNALS AT 0 m, 4.8 m & 8.5 m
TYPE 20C - POLE MOUNTED 270°
TYPE 10A - POLE MOUNTED 180°
1-PEDESTRIAN PUSH BUTTON AT 225°
ONE WAY EVP DETECTOR AND
LIGHT OVERHEAD
EXTEND INTO H.H. 17
78 mm RSC
2-12/C #12
6-3/C #12
1-3/C #20

S.O.P. - (POWER POLE INPLACE)
35 mm RSC RISER WITH WEATHER HEAD
EXTEND INTO H.H.1
35 mm RSC
3-1/C #4

103 mm RSC
4-12/C #12
6-3/C #12
1-3/C #20
5-2/C #14

3" RSC INPLACE,
EXTEND INTO HH17
78 mm RSC
2-12/C #12
5-3/C #12
1-3/C #20
1-2/C #14

3" RSC INPLACE
2-12/C #12
1-3/C #12
4-2/C #14

35 mm RSC
1-2/C #14
103 mm RSC
4-12/C #12
7-3/C #12
2-3/C #20
7-2/C #14

PEDESTRIAN PUSH BUTTON
STATION (103 mm RSC)
1-PEDESTRIAN PUSH BUTTON
EXTEND INTO H.H.17
35 mm RSC
1-3/C #12

103 mm RSC
4-12/C #12
7-3/C #12
2-3/C #20
7-2/C #14

3" RSC INPLACE
ABANDON UNDER
ROADWAY AS DIRECTED

3" RSC INPLACE
EXTEND INTO HH5
78 mm RSC
2-12/C #12
5-3/C #12
1-3/C #20
7-2/C #14

② PA90-B-9
PA90 POLE FOUNDATION
ONE WAY SIGNAL - OVERHEAD
2-TYPE 10B - POLE MOUNTED 45° & 225°
2-PEDESTRIAN PUSH BUTTON AT 0° & 315°
TWO WAY EVP DETECTOR AND
LIGHTS OVERHEAD
EXTEND INTO H.H. 5
78 mm RSC
2-12/C #12
2-3/C #12
1-3/C #20

3" RSC INPLACE
2-12/C #12
5-3/C #12
1-3/C #20
5-2/C #14

35 mm RSC
1-2/C #14

53 mm RSC
2-2/C #14

④ EQUIPMENT PAD-SEE DETAILS
SERVICE CABINET
EXTEND INTO H.H.1
35 mm RSC
3-1/C #4
EXTEND INTO H.H.2
35 mm RSC
1-3/C #12
EXTEND INTO H.H.15
35 mm RSC
1-3/C #12
CONTROLLER CABINET
EXTEND INTO H.H.2
103 mm RSC
4-12/C #12
6-3/C #12
2-3/C #20
9-2/C #14

EXTEND INTO H.H.15
35 mm RSC
1-3/C #12
CONTROLLER CABINET
EXTEND INTO H.H.2
103 mm RSC
4-12/C #12
6-3/C #12
2-3/C #20
9-2/C #14

EXTEND TO SERVICE POLE
27 mm RSC WITH DRAIN TEE
AND RISER WITH WEATHER
HEAD ON POLE ; 1-2/C TDW

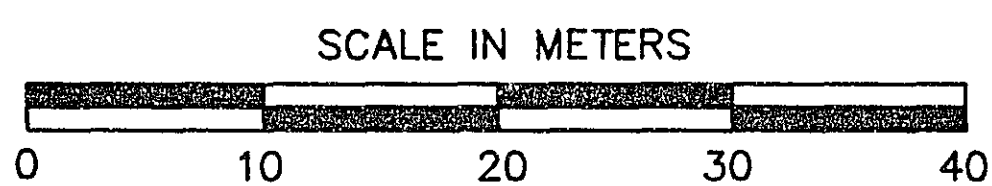
BETWEEN SERVICE AND
CONTROLLER CABINET
35 mm RSC
2-1/C #6
1-1/C #6 INS. GR.

PEDESTRIAN PUSH BUTTON
STATION (103 mm RSC)
1-PEDESTRIAN PUSH BUTTON
EXTEND INTO H.H.11
35 mm RSC
1-3/C #12

④ PA90-B-9
PA90 POLE FOUNDATION
ONE WAY SIGNAL - OVERHEAD
2-TYPE 10B - POLE MOUNTED 45° & 225°
2-PEDESTRIAN PUSH BUTTON AT 0° & 315°
EXTEND INTO H.H. 20
78 mm RSC
2-12/C #12
1-3/C #12

③ PA100-A-15-T12-3 (TRUSS AT 350°)
PA100 POLE FOUNDATION
LUMINAIRE-200 WATT HPS
3-ONE WAY SIGNALS AT 0 m, 4.8 m & 8.5 m
TYPE 20C - POLE MOUNTED 270°
1-PEDESTRIAN PUSH BUTTON AT 225°
ONE WAY EVP DETECTOR AND
LIGHT OVERHEAD
EXTEND INTO H.H. 11
78 mm RSC
2-12/C #12
6-3/C #12
1-3/C #20

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.
Daniel E. Schu
Date 5/6/97 Reg. No. 20452



NOTES:

- POLE AND DETECTOR LOCATIONS SHALL BE VERIFIED IN THE FIELD BY THE TRAFFIC ENGINEER PRIOR TO INSTALLATION.
- A 21 mm HALF COUPLING SHALL BE FURNISHED APPROXIMATELY 600 mm AND 1200 mm FROM END OF THE MAST ARM ON EACH POLE PER MN/DOT 3831.2C.
- ALL PEDESTRIAN INDICATIONS SHALL BE ONE-SECTION HAND/WALKING PERSON INDICATION. THE HAND SYMBOL SHALL BE ILLUMINATED WITH PORTLAND ORANGE LED'S. SEE SPECIAL PROVISIONS.
- ALL SIGNAL FACES SHALL HAVE BACK-GROUND SHIELDS EXCEPT SIGNAL FACES 4-3 AND 8-3.
- EACH LUMINAIRE SHALL HAVE A PHOTO ELECTRIC CELL AND STREET LIGHT CHECK SWITCH.
- REMOVE INPLACE CURB AND GUTTER AND CONSTRUCT B624 C&G AND WALKS WITH PEDESTRIAN CURB RAMPS. SEE SHEET 8 FOR ADDITIONAL INFORMATION. WORK TO INCIDENTAL TO SYSTEM A
- HANDHOLES 6, 12, 13, 16, 18, 20, 23, 24 AND 25 ARE INPLACE. REMOVE HANDHOLES 23 AND 24.

NOTES:

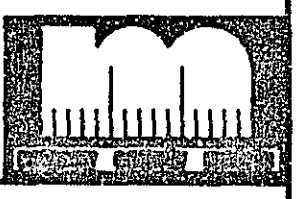
- ALL RED CIRCULAR & ARROW VEHICLE SIGNAL INDICATIONS SHALL BE ILLUMINATED WITH RED LED'S EXCEPT FACES 4-3 & 8-3. SEE SPECIAL PROVISIONS.
- GROUND WATER CONDITIONS WILL REQUIRE ADDITIONAL WORK TO INSTALL MAST ARM POLE FOUNDATIONS. THE CONTRACTOR SHALL CONDUCT HIS OPERATIONS ACCORDINGLY. ALL EXTRA WORK AND MATERIALS SHALL BE CONSIDERED INCIDENTAL WORK.
- ALL LOOPS SHALL BE INSTALLED IN NMC EXCEPT D1-1, D5-1, D2-1, D2-2, D6-1 AND D6-2 SHALL BE SAW CUT. SEE DETAILS FOR NMC TYPE INSTALLATIONS.
- ALL EVP DETECTORS ARE SINGLE CHANNEL.
- FURNISH FILL MATERIAL AT THE EQUIPMENT PAD TO RAISE GRADE TO MATCH BLVD. AS DIRECTED BY THE ENGINEER.
- SPECIAL SIGNAL FACES 4-3 AND 8-3 SHALL BE OPTICALLY PROGRAMMED VEHICLE SIGNAL FACES PER MN/DOT 3834.2B.

INTERSECTION LAYOUT
HIGHWAY 88 & COUNTY ROAD C2
SYSTEM A

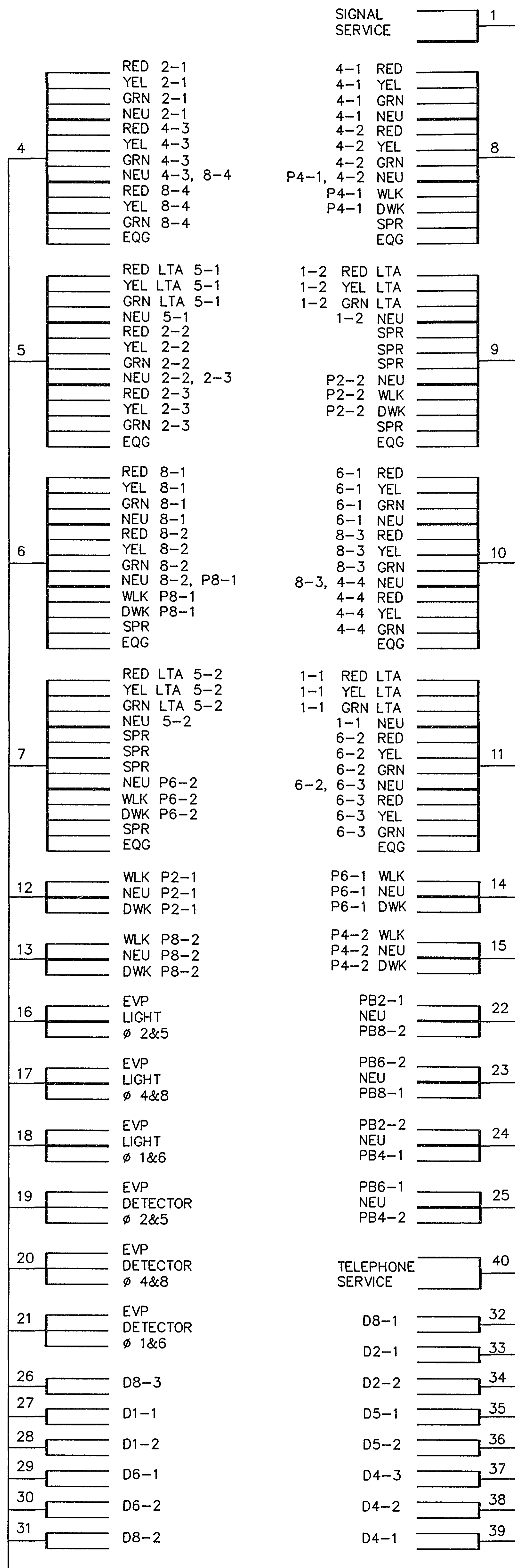
S.P. NO. 160-216-13

S.P. NO. 62-688-01

SHEET NO. 4 OF 8 SHEETS



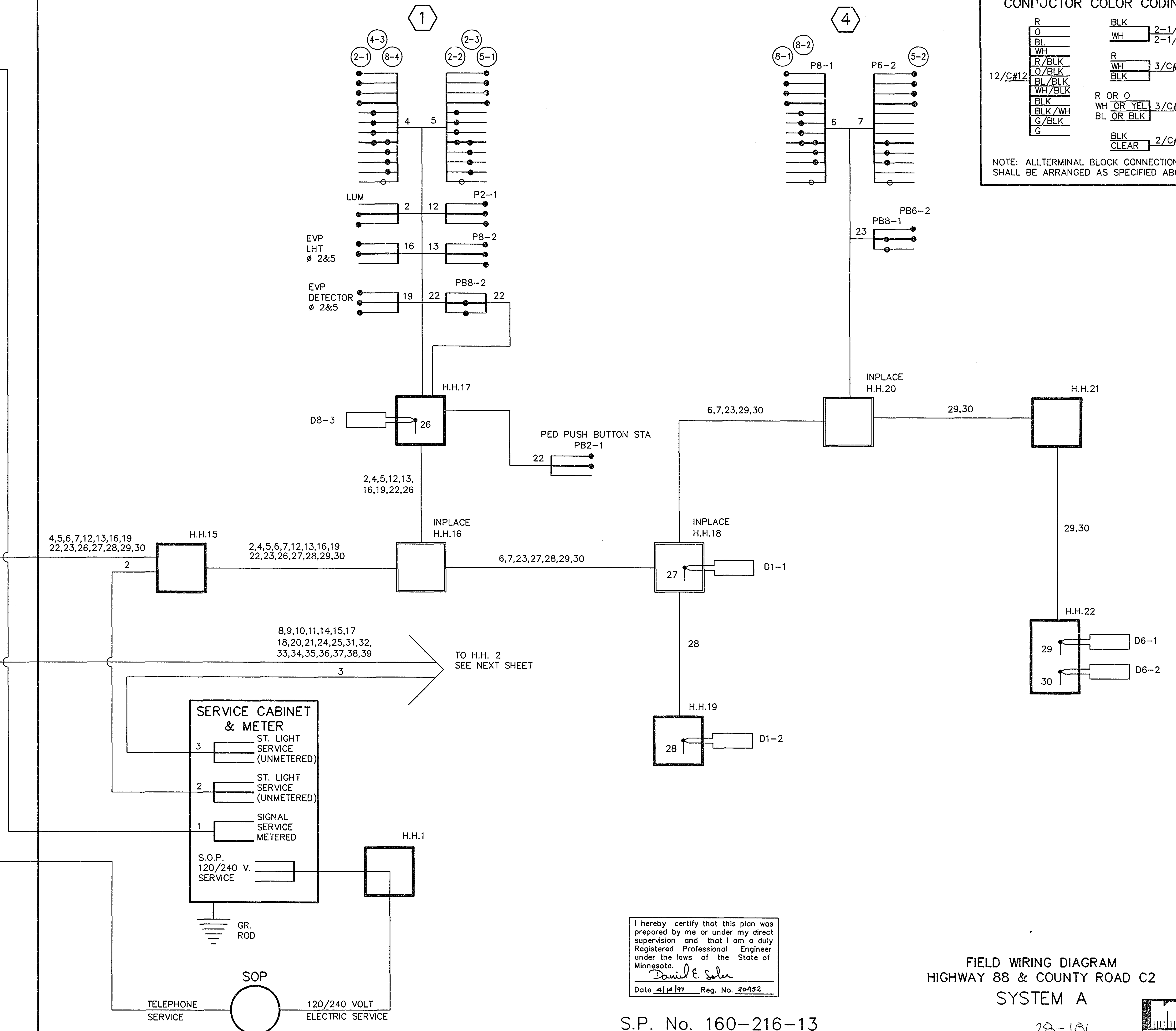
CONTROLLER CABINET



CONDUCTOR COLOR CODING

R	BLK	2-1/C#6
O	WH	2-1/C#10
BL		
WH	R	3/C#12
R/BLK	WH	
O/BLK	BLK	
BL/BLK	R OR O	
WH/BLK	WH OR YEL	3/C#20
BLK/WH	BL OR BLK	
G/BLK		
G	BLK	2/C#14
	CLEAR	

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



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.
Daniel E. Soler
 Date 4/14/97 Reg. No. 20452

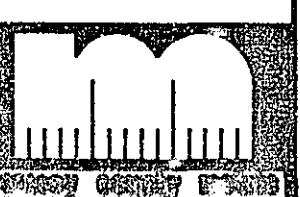
S.P. No. 160-216-13

S.P. No. 62-688-01

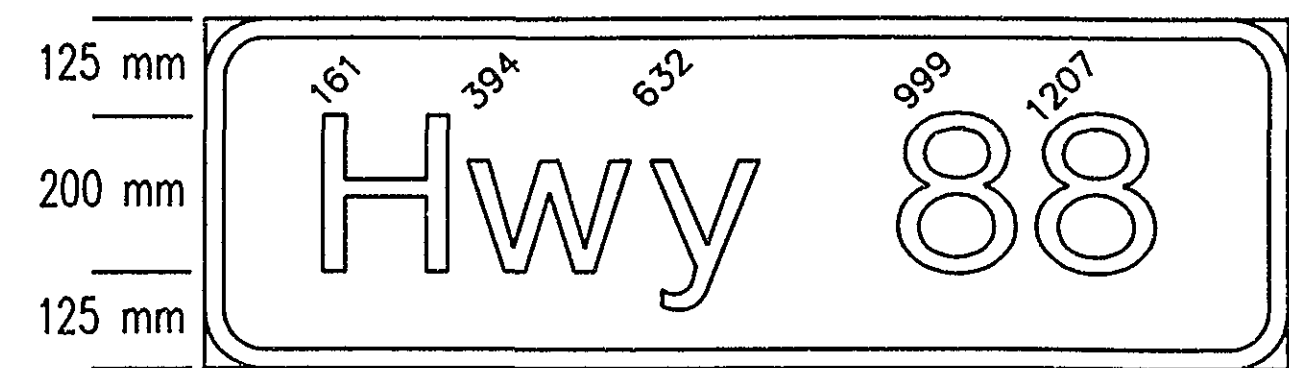
FIELD WIRING DIAGRAM
 HIGHWAY 88 & COUNTY ROAD C2
 SYSTEM A

28-181

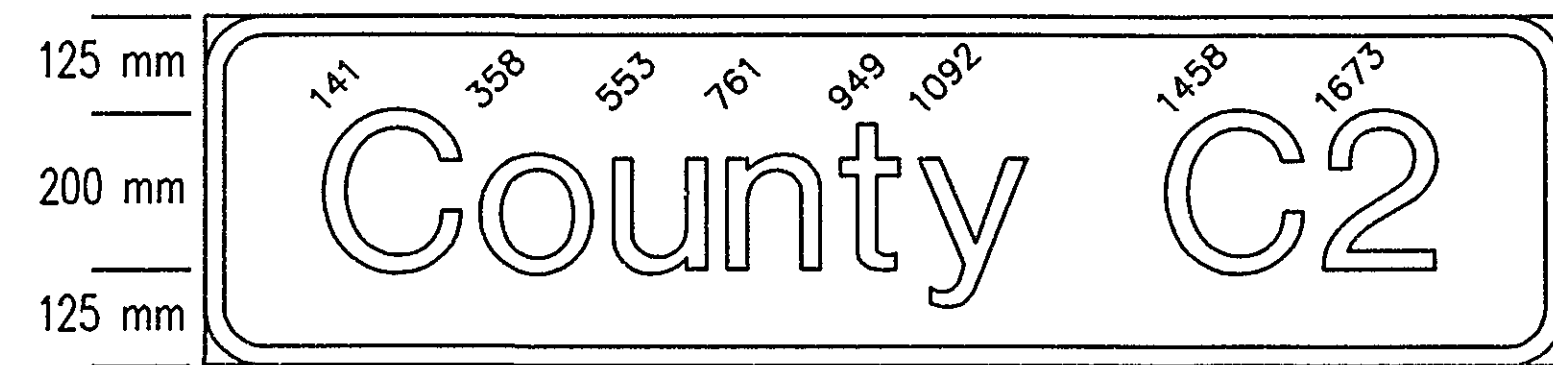
Sheet No. 5 of 8 Sheets



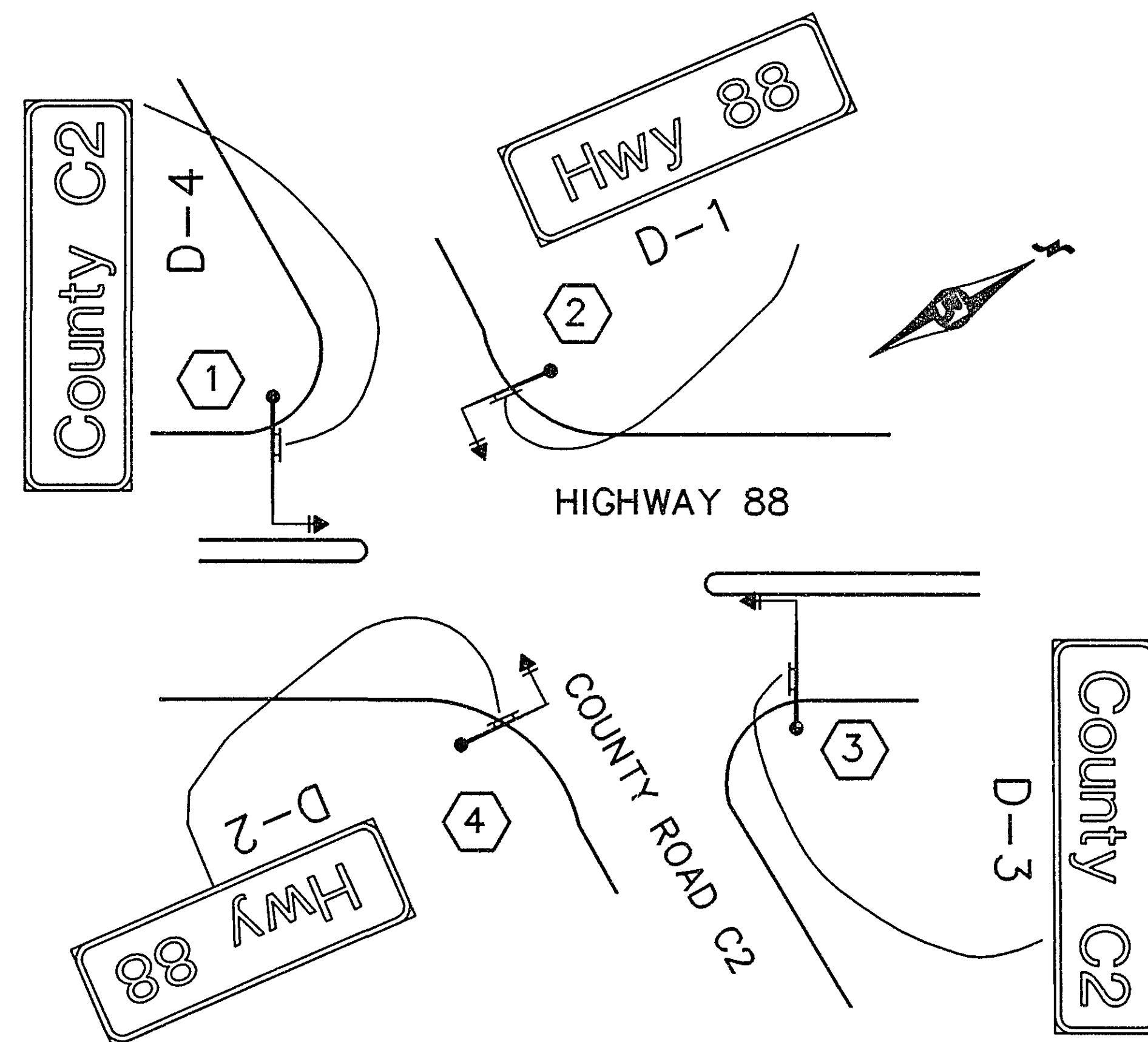
F:\TRAFFIC\SIGPLAN\HWY88-C2\586SIGN.dwg 3/27/97



D-1 & D-2
1520 mm X 450 mm
75 mm R., 25 mm B
LINE 1 = 1200 mm : 200 mm-150 mm "E" MOD.



D-3 & D-4
1980 mm X 450 mm
75 mm R., 25 mm B
LINE 1 = 1700 mm : 200 mm-150 mm "E" MOD.



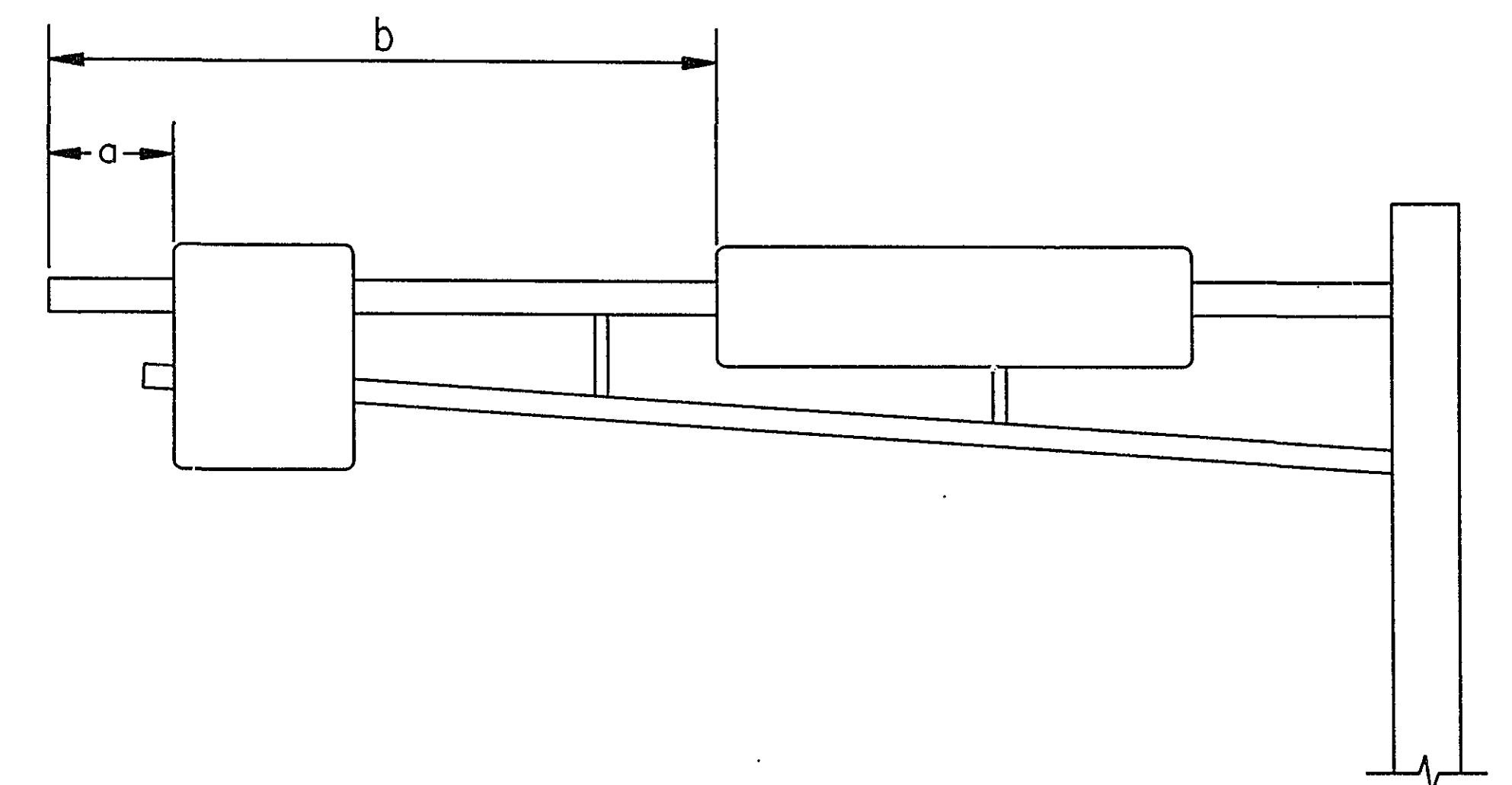
HIGHWAY 88 & COUNTY ROAD C2
(SYSTEM A)

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Daniel E. Soler
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TYPE "D" SIGNS - SIGNALS

SIGN PANEL	SIZE (mm)	QUANTITY REQUIRED	BRACKETS PER SIGN	BRACKET SPACING	SQUARE METERS PER SIGN	a (m)	b (m)	MAST ARM POLE NUMBER
D-1	1520 x 450	1	2	1370 mm	0.7		2.9	②
D-2	1520 x 450	1	2	1370 mm	0.7		3.3	④
D-3	1980 x 450	1	2	1370 mm	0.9		8.4	③
D-4	1980 x 450	1	2	1370 mm	0.9		8.4	①

TOTAL 3.2 m2



MAST ARM SIGN DIMENSIONING DETAIL

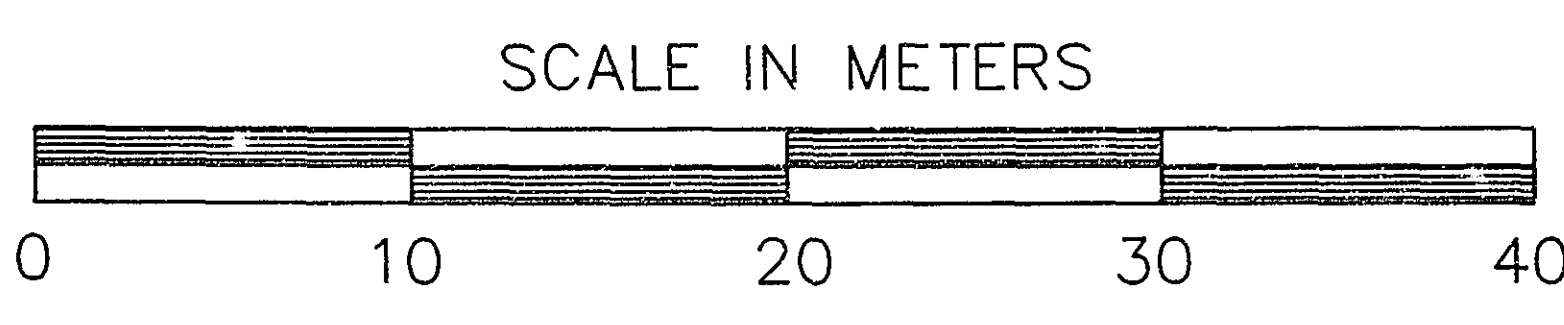
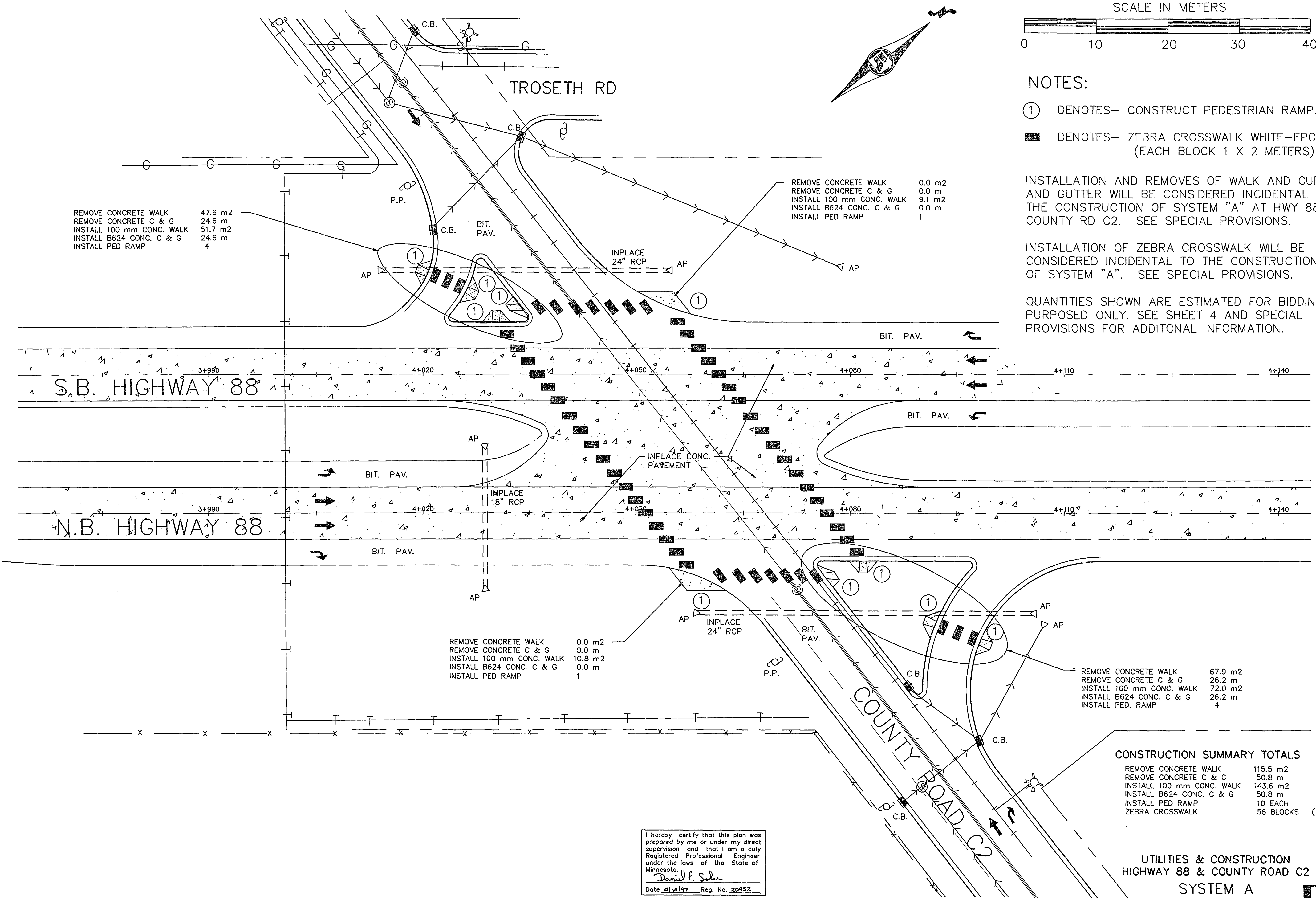
NOTES:

- COLOR - WHITE LEGEND AND BORDER ON GREEN BACKGROUND, FULLY REFLECTORIZED WITH PRISMATIC LENS REFLECTIVE SHEETING.
- CORNERS EXTENDING BEYOND THE BORDER SHALL NOT BE TRIMMED.
- BOARDERS SHALL BE 25 mm.
- SEE STANDARD SIGN MANUAL FOR ARROW DETAILS
- FOR STRUCTURAL DETAILS, TYPE "D" SIGNS SEE STANDARD SIGNS MANUAL, PAGE 105.
- FOR TYPE "D" STRINGER AND PANEL - JOINT DETAIL, SEE STANDARD SIGNS MANUAL, PAGE 105.
- LETTERING STYLE SHALL BE HIGHWAY GOTHIC CONFORMING TO MN/DOT STANDARDS.

MAST ARM SIGNS
SYSTEM A



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- NOTES:
- ① DENOTES- CONSTRUCT PEDESTRIAN RAMP.
 - DENOTES- ZEBRA CROSSWALK WHITE-EPOXY. (EACH BLOCK 1 X 2 METERS)

INSTALLATION AND REMOVES OF WALK AND CURB AND GUTTER WILL BE CONSIDERED INCIDENTAL TO THE CONSTRUCTION OF SYSTEM "A" AT HWY 88 & COUNTY RD C2. SEE SPECIAL PROVISIONS.

INSTALLATION OF ZEBRA CROSSWALK WILL BE CONSIDERED INCIDENTAL TO THE CONSTRUCTION OF SYSTEM "A". SEE SPECIAL PROVISIONS.

QUANTITIES SHOWN ARE ESTIMATED FOR BIDDING PURPOSED ONLY. SEE SHEET 4 AND SPECIAL PROVISIONS FOR ADDITIONAL INFORMATION.

REMOVE CONCRETE WALK 0.0 m2
REMOVE CONCRETE C & G 0.0 m
INSTALL 100 mm CONC. WALK 10.8 m2
INSTALL B624 CONC. C & G 0.0 m
INSTALL PED RAMP 1

REMOVE CONCRETE WALK 0.0 m2
REMOVE CONCRETE C & G 0.0 m
INSTALL 100 mm CONC. WALK 9.1 m2
INSTALL B624 CONC. C & G 0.0 m
INSTALL PED RAMP 1

REMOVE CONCRETE WALK 67.9 m2
REMOVE CONCRETE C & G 26.2 m
INSTALL 100 mm CONC. WALK 72.0 m2
INSTALL B624 CONC. C & G 26.2 m
INSTALL PED. RAMP 4

CONSTRUCTION SUMMARY TOTALS

REMOVE CONCRETE WALK	115.5 m2
REMOVE CONCRETE C & G	50.8 m
INSTALL 100 mm CONC. WALK	143.6 m2
INSTALL B624 CONC. C & G	50.8 m
INSTALL PED RAMP	10 EACH
ZEBRA CROSSWALK	56 BLOCKS (112 m2)

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.
Daniel E. Soler
Date 4/14/97 Reg. No. 20452

S.P. NO. 160-216-13
S.P. NO. 62-688-01

UTILITIES & CONSTRUCTION
HIGHWAY 88 & COUNTY ROAD C2
SYSTEM A
28-121
SHEET NO. 8 OF 8 SHEETS