RAMSEY COUNTY

DEPARTMENT OF PUBLIC WORKS

CONSTRUCTION PLAN FOR TRAFFIC CONTROL SIGNAL SYSTEMS, INTERCONNECT AND MINOR GEOMETRICS

S.A.P. No. 62-619-21
S.A.P. No. 138-020-23

BEAM AVE & KENNARD ST ....SYSTEM A

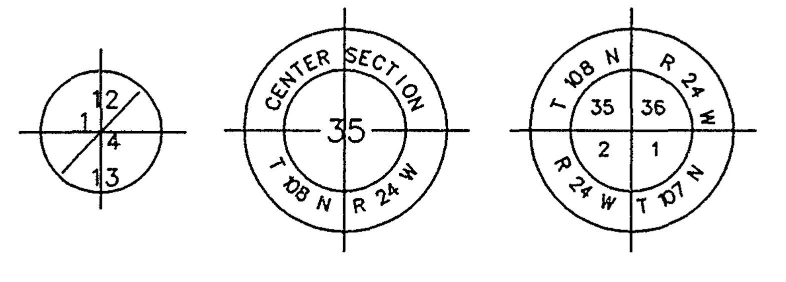
PLAN SYMBOLS

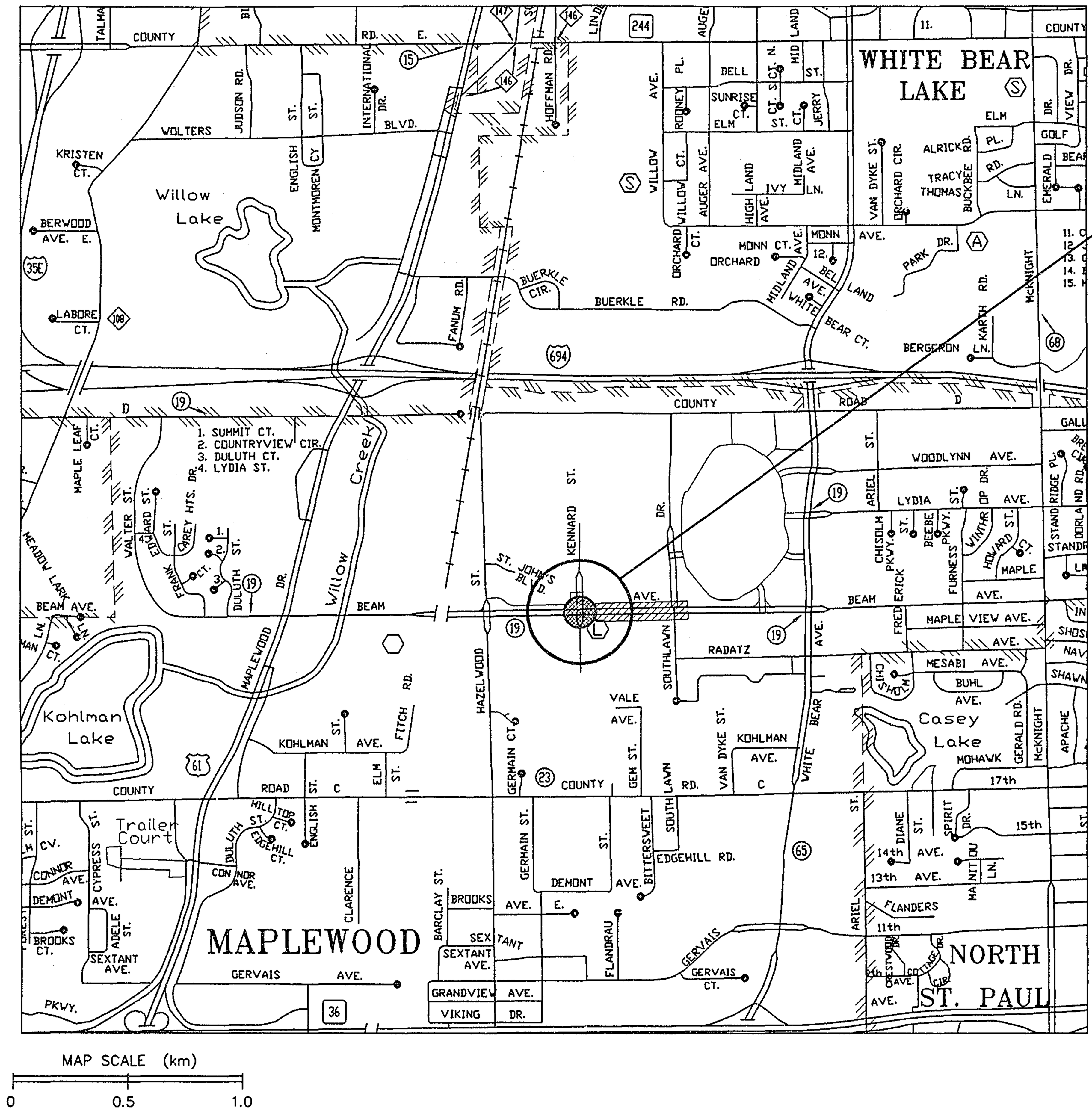
- STATE LINE
- COUNTY LINE
- TOWNSHIP OR RANGE LINE
- SECTION LINE
- QUARTER LINE
- SIXTEENTH LINE
- EXISTING RIGHT OF WAY LINE
- PROPOSED RIGHT OF WAY LINE
- PROPERTY LINE
- CORPORATE OR CITY LIMITS
- RETAINING WALL
- RAILROAD
- RAILROAD RIGHT-OF-WAY
- RIVER OF CREEK
- CULVERT
- GUARDRAIL
- BARBED WIRE FENCE
- WOVEN WIRE FENCE
- CHAIN LINK FENCE
- STONE WALL
- HEDGE
- RAILROAD CROSSING SIGN
- CROSSING GATE
- MEANDER CORNER
- SLOPE EASEMENT (CONST. LIMITS) — SE — SE —
- 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 — G — G —
- WATER MAIN — I — I —
- TELEPHONE VAULT
- ELECTRIC VAULT
- BURIED TELEPHONE CABLE — T-BUR —
- BURIED ELECTRIC CABLE — P-BUR —
- SEWER (SANITARY OR STORM)
- SEWER MANHOLE
- GATE VALVE
- CONTROLLER CABINET
- EXISTING HYDRANT
- BURIED TELEPHONE CABLE — CATV —

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





SYSTEM A
BEAM AVE & KENNARD ST

DENOTES INTERCONNECT
FROM STA 3+840 TO STA 4+200

INDEX

THIS PLAN CONTAINS 14 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 10/2/97

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 MMUTCD (EXCEPT WERE A VARIANCE HAS BEEN GRANTED), AND THAT I AM A DULY REGISTER PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

Daniel E. Soler REG. NO. 20452 DATE 10/2/97

APPROVED Paul Kirkwold DATE 10/8/97
RAMSEY COUNTY ENGINEER

APPROVED DATE 10/29/97
CITY OF MAPLEWOOD ENGINEER

—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 MMUTCD, INCLUDING FIELD MANUAL FOR TEMPORARY TRAFFIC CONTROL ZONE LAYOUTS, DATED APRIL, 1995.

DESIGN DESIGNATION

BEAM AVE. (CSAH 19)

PRESENT ADT (1997)	16,750
PROJECTED ADT (2017)	20,100
FUNCTIONAL CLASSIFICATION	MINOR ARTERIAL
TRAFFIC LANES	4
PARKING LANES	0
DESIGN SPEED	70 km/h (45 mph)

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

PLAN REVISIONS

DATE	SHEET NO. & DESCRIPTION	BY
12/5/97	SHEETS 1 & 4 - METRO STATE AID REVIEW	RWW

MINNESOTA DEPARTMENT OF TRANSPORTATION

Gary M. Gilbertson DATE 12/9/97
for METRO-ASS'T DIVISION ENGR.-STATE AID: REVIEWED FOR COMPLIANCE WITH STATE-AID RULES/POLICY

Gary M. Gilbertson DATE 12/9/97
APPROVED FOR STATE AID FUNDING; STATE AID ENGINEER
for

28-180

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

F:\TRAFFIC\SIGPLAN\BEAM\588TITLE 7/7/97

CONSTRUCTION NOTES

WATER, GAS, ELECTRIC, TELEPHONE, SEWER, AND T.V. CABLE LINES SHOWN ON THE DRAWINGS ARE PLOTTED FROM THE BEST INFORMATION AVAILABLE AT THE TIME OF PLAN PREPARATION, BUT MAY NOT REFLECT ACTUAL LOCATIONS OR ELEVATIONS. THE CONTRACTOR SHALL VERIFY LOCATION OF ALL UTILITIES BEFORE BEGINNING CONSTRUCITON WHICH MAY BE AFFECTED BY A UTILITY CONFLICT. THE CONTRACTOR SHALL GIVE 48 HOURS NOTICE TO THE OWNERS OF ALL KNOWN UTILITIES BEFORE STARTING ANY OPERATIONS AFFECTING THOSE PROPERTIES, OR BEGINNING EXCAVATION IN THE VICINITY OF THOSE PROPERTIES. THE CONTRACTORS ATTENTION IS DIRECTED TO SECTION 1507 IN THE STANDARD SPECIFICATIONS.

UTILITY COMPANIES WILL RELOCATE THEIR FACILITIES CONCURRENTLY WITH THE CONSTRUCTION OPERATIONS UNDER THIS CONTRACT. CONTRACTOR SHALL SCHEDULE CONSTRUCTION IN COOPERATION WITH UTILITY RELOCATION.

PROVIDE FOR REMOVAL AND DISPOSAL (OUTSIDE THE CONSTRUCTION ZONE) OF ALL INPLACE STRUCTURES THAT WILL INTERFERE WITH CONSTRUCTION. DISPOSAL OF ITEMS REMOVED UNDER THIS CONTRACT SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF 2104.303.

EXCESS EXCAVATED AND UNSUITABLE MATERIALS SHALL BE DISPOSED OF IN ACCORDANCE WITH THE REQUIREMENTS OF 2104.303 AND 2105.3D

SODDING QUANTITIES ALONG ROADWAY SLOPES ARE BASED ON SODDING LIMITS FROM THE BACK OF THE CURB TO THE CONSTRUCTION LIMITS.

COMPACTION IN GRADING ITEMS SHALL BE ACCOMPLISHED IN ACCORDANCE WITH SPEC. 2105.3F2 " QUALITY COMPACTION METHOD".

WHEN EXCAVATING ADJACENT TO INPLACE PAVEMENT, NO MATERIAL SHALL BE REMOVED FROM INSIDE AN APPROXIMATE 2:1 SLOPED LINE DRAWN DOWNWARD AND OUTWARD FROM THE BOTTOM OF THE INPLACE PAVEMENT.

WHEN CONNECTION TO EXISTING BITUMINOUS PAVEMENT IS REQUIRED, THE EDGE OF EXISTING PAVEMENT SHALL BE CUT TO A NEAT LINE PRIOR TO CONSTRUCTING ASPHALT SURFACING.

STABILIZING AGGREGATE SHALL BE APPLIED IF NECESSARY TO ACHIEVE SATISFACTORY SURFACE STABILITY AS DETERMINED BY THE ENGINEER. THE MATERIAL SHALL SATISFY THE REQUIREMENTS OF SECTION 3149.2C AND SHALL BE APPLIED IN ACCORDANCE WITH SECTION 2105.3G OF THE STANDARD SPECIFICATIONS.

USE TACK COAT BETWEEN ALL BITUMINOUS LIFTS.
COMPACTION OF ALL BITUMINOUS ITEMS SHALL BE ACCOMPLISHED IN ACCORDANCE WITH THE "QUALITY COMPACTION METHOD".

ALL USES OF THE WORD "INCIDENTAL" IN THESE CONSTRUCTION DOCUMENTS SHALL BE CONSTRUED TO MEAN INCIDENTAL WORK FOR WHICH NO DIRECT COMPENSATION SHALL BE MADE.

PEDESTRIAN CURB RAMPS SHALL BE INSTALLED IN ALL STREET RADII. THE EXACT LOCATION SHALL BE DETERMINED IN THE FIELD BY THE ENGINEER. RAMPS SHALL BE PER STANDARD PLATE M7036 D.

AREA PROPERTY OWNERS, OWN AND MAINTAIN UNDER-GROUND SPRINKLER SYSTEMS ADJACENT TO EXISTING ROADWAYS AND ENTRANCES. THE CONTRACTOR SHALL CONDUCT HIS OPERATIONS TO MINIMIZE DAMAGE THERETO AND SHALL INFORM PROPERTY OWNERS WHEN HIS OPERATIONS WILL AFFECT THEIR SPRINKLER SYSTEMS. THE CONTRACTOR SHALL REPAIR ANY DAMAGED SPRINKLER SYSTEMS CAUSED BY HIS WORK. ALL COSTS WILL BE INCIDENTAL WORK AND NO DIRECT COMPENSATION WILL BE MADE.

QUANTITY NOTES

1. SAWCUT SHALL BE FULL DEPTH
2. SIGNAL TIMING PLANS FOR COORDINATION, SEE SPECIAL PROVISIONS.

STATEMENT OF ESTIMATED QUANTITIES

CHART	NOTE	ITEM NO.	ITEM	UNIT	TOTAL ESTIMATED QUANTITY	PARTICIPATION		
						CSAH	CITY-MAPLEWOOD	
						62-619-21	138-020-23	LOCAL
		2021.501	MOBILIZATION	LUMP SUM	1	0.63	0.37	0
B		2104.501	REMOVE CURB & GUTTER	m	256	256	0	0
B		2104.503	REMOVE CONCRETE SIDEWALK	m2	37	37	0	0
B		2104.503	REMOVE BITUMINOUS SIDEWALK	m2	276	276	0	0
B		2104.503	REMOVE BITUMINOUS PAVEMENT	m2	462	462	0	0
B	1.	2104.513	SAWING BITUMINOUS PAVEMENT (FULL DEPTH)	m	155	155	0	0
		2105.501	COMMON EXCAVATION (EV) (P)	m3	48 (P)	48	0	0
		2105.526	SELECT TOPSOIL BORROW (LV)	m3	64	64	0	0
C		2211.503	AGGREGATE BASE, CLASS 6 (CV) (P)	m3	31 (P)	31	0	0
C		2340.508	TYPE 47 WEARING COURSE MIXTURE	t	40	40	0	0
		2357.502	BITUMINOUS MATERIAL FOR TACK COAT	L	25	25	0	0
		2503.541	375 mm RC PIPE SEWER, DES 3006 CL. II	m	9	9	0	0
		2506.502	CONSTRUCT DRAINAGE STRUCTURE, DES. C OR G	EACH	1	1	0	0
		2506.521	INSTALL CASTING	EACH	1	1	0	0
		2506.522	ADJUST FRAME AND RING CASTING	EACH	1	1	0	0
A		2521.501	100 mm CONCRETE WALK	m2	211	211	0	0
A		2531.501	CONCRETE CURB & GUTTER DES. B624	m	179	179	0	0
A		2531.501	CONCRETE CURB & GUTTER DES. D424	m	53	53	0	0
		2563.601	TRAFFIC CONTROL	LUMP SUM	1	0.63	0.37	0
		2575.505	SODDING, TYPE LAWN	m2	953	953	0	0
		2575.532	COMMERCIAL FERT., ANALYSIS 10-20-20	kg	37	37	0	0
		2564.531	SIGN PANELS TYPE D	m2	3.8	3.8	0	0
		2565.511	FULL T. ACT. T. CONTROL SIGNAL SYSTEM A	SIG. SYS.	1	0.5	0.5	0
		2565.601	EMERGENCY VEHICLE PRE-EMPTION SYSTEM A	L. SUM	1	0	1	0
	2.	2565.601	TRAFFIC CONTROL INTERCONNECTION A	L. SUM	1	1	0	0
		2565.603	12 PAIR #19 (INTERCONNECT)	m	455	455	0	0

BASIS FOR ESTIMATED QUANTITIES

2211.501 – AGGREGATE BASE – 2242.54 kg PER m3
2340.XXX – BITUMINOUS MIXTURES – 59.67 kg PER 25 mm THICKNESS PER m2
2357.502 – BITUMINOUS MATERIAL FOR TACK COAT ESTIMATED AT 0.23 LITRE PER m2 PER APPLICATION
2575.531 – FERTILIZER 392 kg / ha

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 10/28/97 Reg. No. 20452

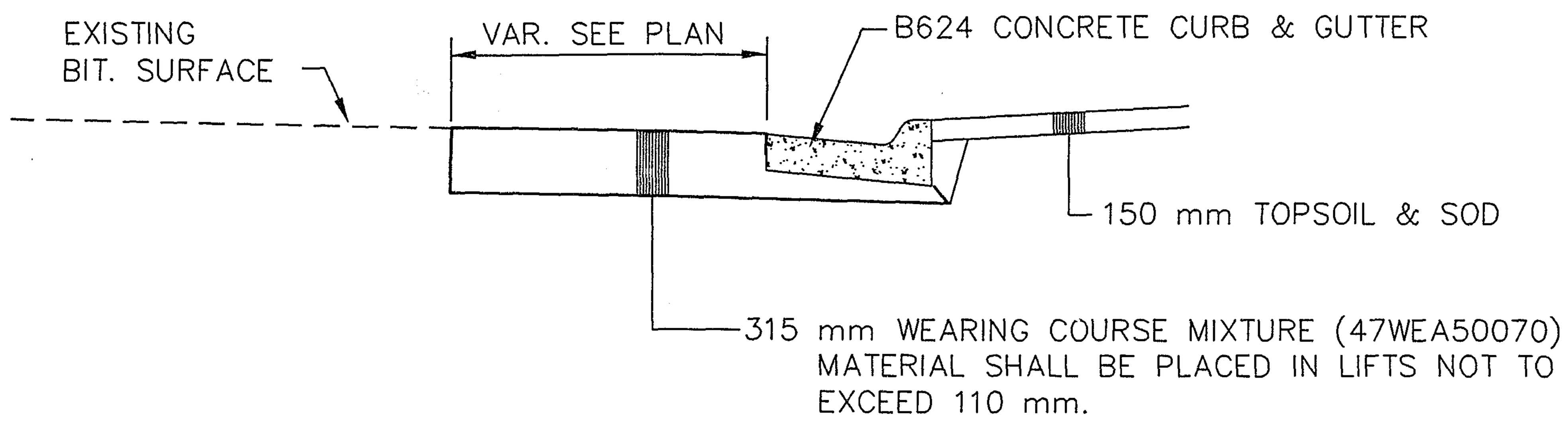
S.A.P. No. 138-020-23

28-180

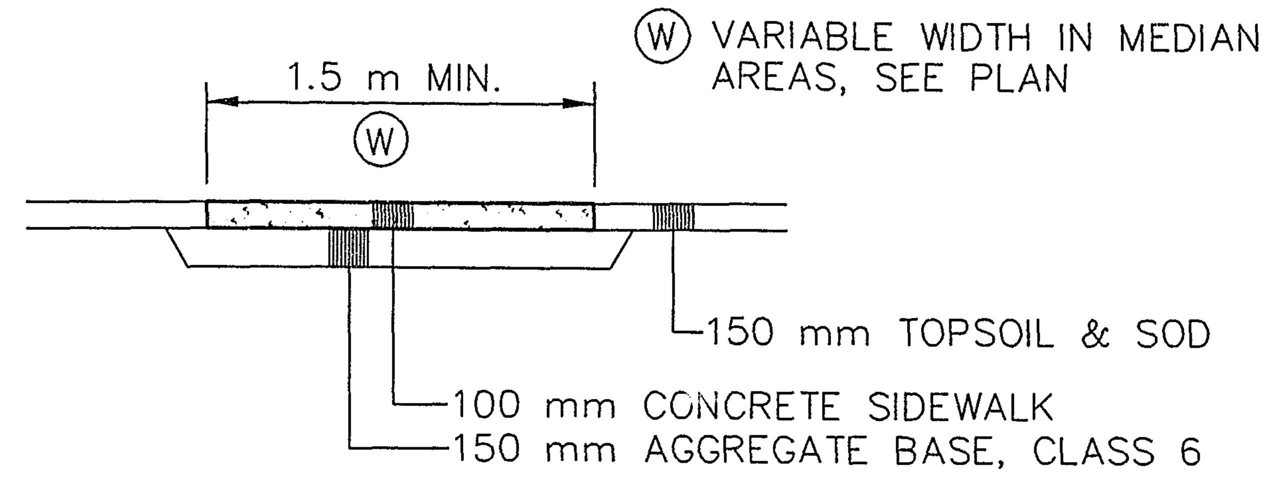
ESTIMATED QUANTITIES

S.A.P. No. 62-619-21

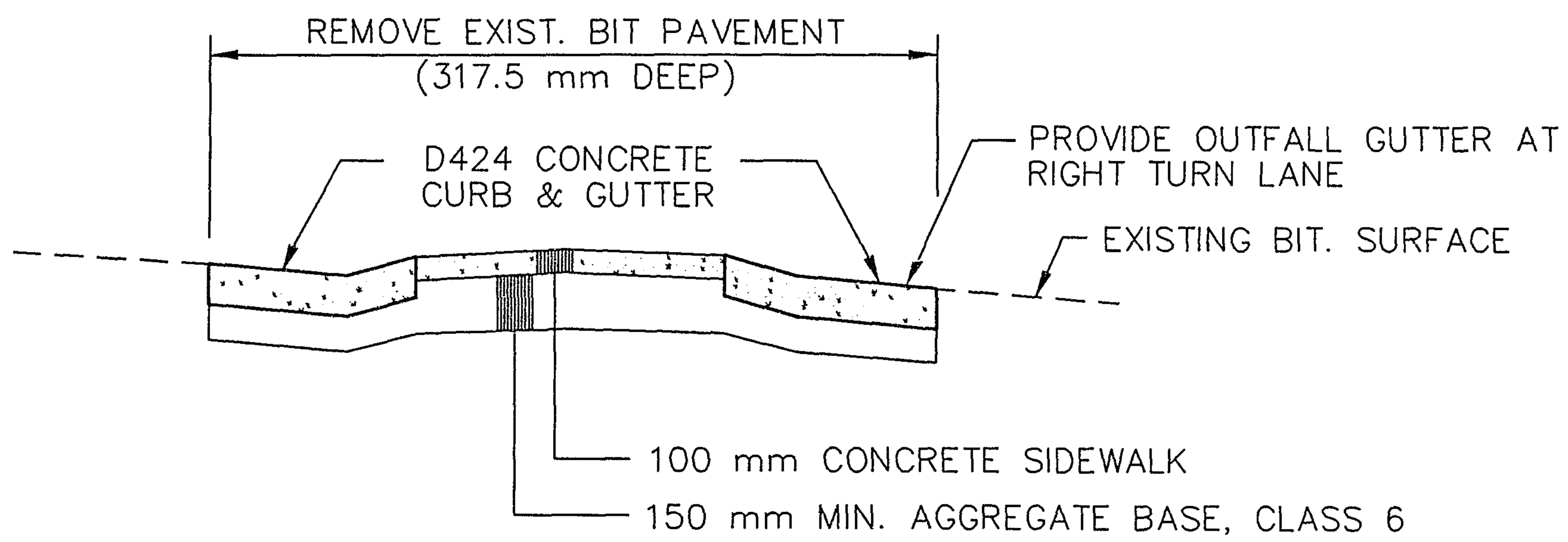
BEAM AVE / KENNARD TYP SECTION



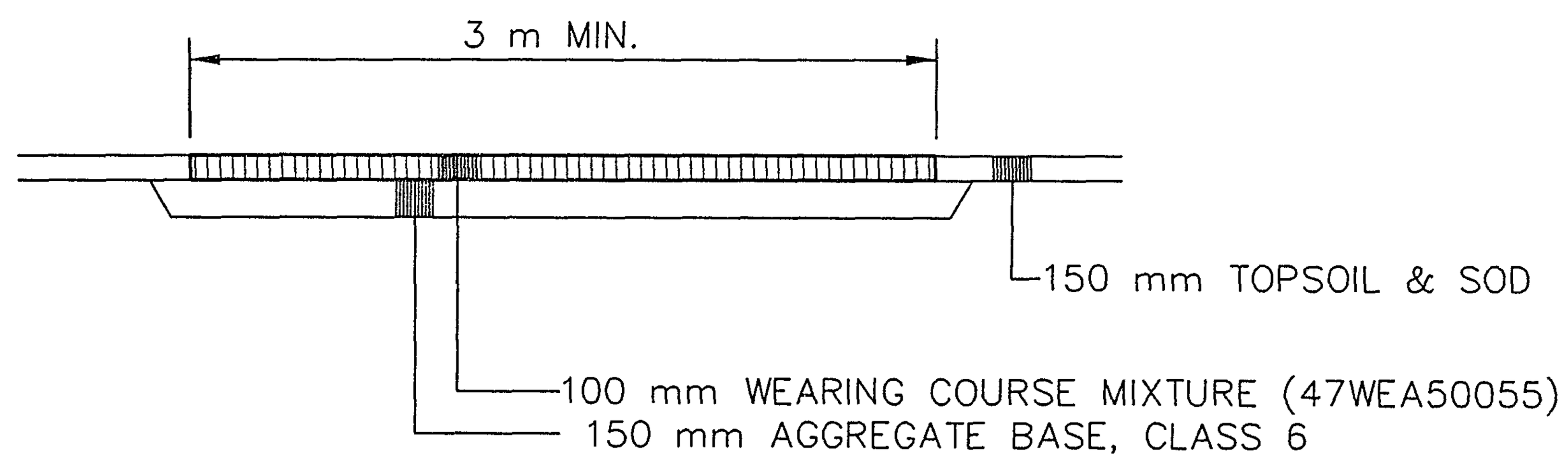
CONCRETE SIDEWALK



MEDIAN
BEAM AVE CENTER & N.E. CORNER



BITUMINOUS SIDEWALK



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Daniel F. Soler

Date 10/2/97 Reg. No. 20452

28-180

BEAM AVE & KENNARD ST.

TYPICAL SECTIONS

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CHART A

CURBS, WALKS AND MISC.								
			CURBS		WALKS		MISC	
ALIGNMENT	STA. – STA	LOCATION RT/LT	CONC C&G DESIGN B624	CONC C&G DESIGN D424	100 mm CONCRETE WALK			PED. RAMP
			(m)	(m)	(m2)			EACH
BEAM AVE	3+789 – 3+815	LT	25.3		38.2			4
BEAM AVE	3+805 – 3+812	RT	10.2		4.5			1
BEAM AVE	3+808 – 3+814	CENTER		13.0	15.8			2
BEAM AVE	3+824 – 3+826	LT	5.7					
BEAM AVE	3+833 – 3+844	LT	8.9	26.8	46.5			4
BEAM AVE	3+835 – 3+841	CENTER		13.3	15.8			2
BEAM AVE	3+830 – 3+915	RT	128.6		89.8			1
PROJECT TOTAL			178.7	52.8	210.6			14

CHART B

MISCELLANEOUS REMOVAL AND SAWING								
			REMOVE				SAWING *	
ALIGNMENT	STA. – STA	LOCATION RT/LT	BITUMINOUS PAVEMENT	CONCRETE C & G	CONCRETE WALK	BITUMINOUS WALK	BITUMINOUS PAVEMENT	BITUMINOUS WALK
			(m^2)	(m)	(m^2)	(m^2)	(m)	(m)
BEAM AVE	3+789 – 3+815	LT		25.3	4.5	81.6		28.1
BEAM AVE	3+808 – 3+814	CENTER		13.0				
BEAM AVE	3+804 – 3+818	RT		10.2	9.0	37.5		5.2
BEAM AVE	3+824 – 3+826	LT		5.7	3.0			
BEAM AVE	3+833 – 3+844	LT	51.9	9.2	15.4		26.5	
BEAM AVE	3+835 – 3+841	CENTER		13.0				
BEAM AVE	3+830 – 3+915	RT	409.7	179.4	5.1	156.8	95.0	
PROJECT TOTAL			461.6	255.8	37.0	275.9	121.5	33.3

* SAWING FULL DEPTH– EXISTING PAVEMENT = 320± mm DEPTH
– EXISTING BIT WALK = 100± mm DEPTH

CHART C

AGGREGATE AND BITUMINOUS SUMMARY								
			AGGREGATE		(1) BITUMINOUS TYPE 47 WEAR			
ALIGNMENT	STA. – STA	LOCATION LT/RT	BASE CLASS 6		BIT. PATH	BIT. PAV. (**)		
			(m^3)		METRIC TON	METRIC TON		
BEAM AVE	3+789 – 3+815	LT	3.7		4.6	1.9		
BEAM AVE	3+808 – 3+814	RT	1.7		1.4	0.8		
BEAM AVE	3+804 – 3+818	CENTER	2.4			1.0		
BEAM AVE	3+833 – 3+844	LT	7.0			2.7		
BEAM AVE	3+835 – 3+841	CENTER	2.4			1.0		
BEAM AVE	3+830 – 3+915	RT	13.5			26.0		
PROJECT TOTAL			30.7		6.0	33.4		

AGGREGATE BASE IS UNDER CONCRETE AND BITUMINOUS WALKS.

(**) INCLUDES PATCHING AT NEW C&G

(1) BITUMINOUS MATERIAL SHALL BE INSTALLED AND COMPACTED IN LIFTS NOT TO EXCEED 110 mm.

STANDARD PLATES

THE FOLLOWING STANDARD PLATES, APPROVED BY THE FEDERAL HIGHWAY ADMINISTRATION, SHALL APPLY ON THIS PROJECT

	PLATE NO.	DESCRIPTION
*	M3000L	REINFORCED CONCRETE PIPE
*	M3006G	GASKET JOINT FOR R.C. PIPE
*	M4002F	MANHOLE OR CATCH BASIN (MASONRY FIELD CONSTRUCTION)
*	M4006L	MANHOLE OR CATCH BASIN (PRECAST)
*	M4010H	CONCRETE SHORT CONE AND ADJUSTING RING
*	M4101D	RING CASTING FOR MANHOLE OR CATCH BASIN
*	M4110F	COVER CASTING FOR MANHOLE
*	M4129G	CATCH BASIN FRAME CASTING
*	M4151B	GRATE CASTING FOR CATCH BASIN (SQUARE TYPE)
*	M4160D	CURB BOX CASTING FOR CATCH BASIN
*	M7035J	CONCRETE WALK & CURB RETURNS AT ENTRANCES
*	M7036D	PEDESTRIAN CURB RAMP
*	M7100G	CONCRETE CURB AND GUTTER (DESIGN B & DESIGN V)
*	M7102I	CONCRETE CURB AND GUTTER (DESIGN BR, DESIGN D & DESIGN S)
*	M7113A	CONCRETE APPROACH NOSE DETAIL
*	M8000I	STANDARD BARRICADE
*	M8110D	TRAFFIC SIGNAL BRACKETING (POLE MOUNTED)
*	M8111C	TRAFFIC SIGNAL BRACKETING (PEDESTAL MOUNTED)
	8113C	MAGNETIC VEHICLE DETECTOR INSTALLATION
*	M8114A	P.V.C. HANDHOLE / PULLBOX
*	M8115D	PEDESTRIAN PUSH BUTTON INSTALLATION
	M8118C	SERVICE EQUIPMENT & POLE, TRAFFIC CONTROL SIGNALS
	M8119C	GROUND MOUNTED CABINET FOUNDATION
	M8120K	POLE FOUNDATION (PA85)
*	M8121D	TRANSFORMER BASE WITH POLE BASE PLATE (PA90M & PA100M)
*	M8122C	PEDESTAL AND PEDESTAL BASE
*	M8123D	POLE AND MAST ARM (LUMINAIRE AND TRAFFIC LIGHTS)
*	M8124E	MAST ARM SIGNAL HEAD MOUNTS
*	M8126F	POLE FOUNDATION (PA90M AND PA100M)
	M8130D	SAW CUT LOOP DETECTORS

* STANDARD PLATES APPLICABLE TO THIS PROJECT

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.
David E. Soler
Date 10/2/97 Reg. No. 20452

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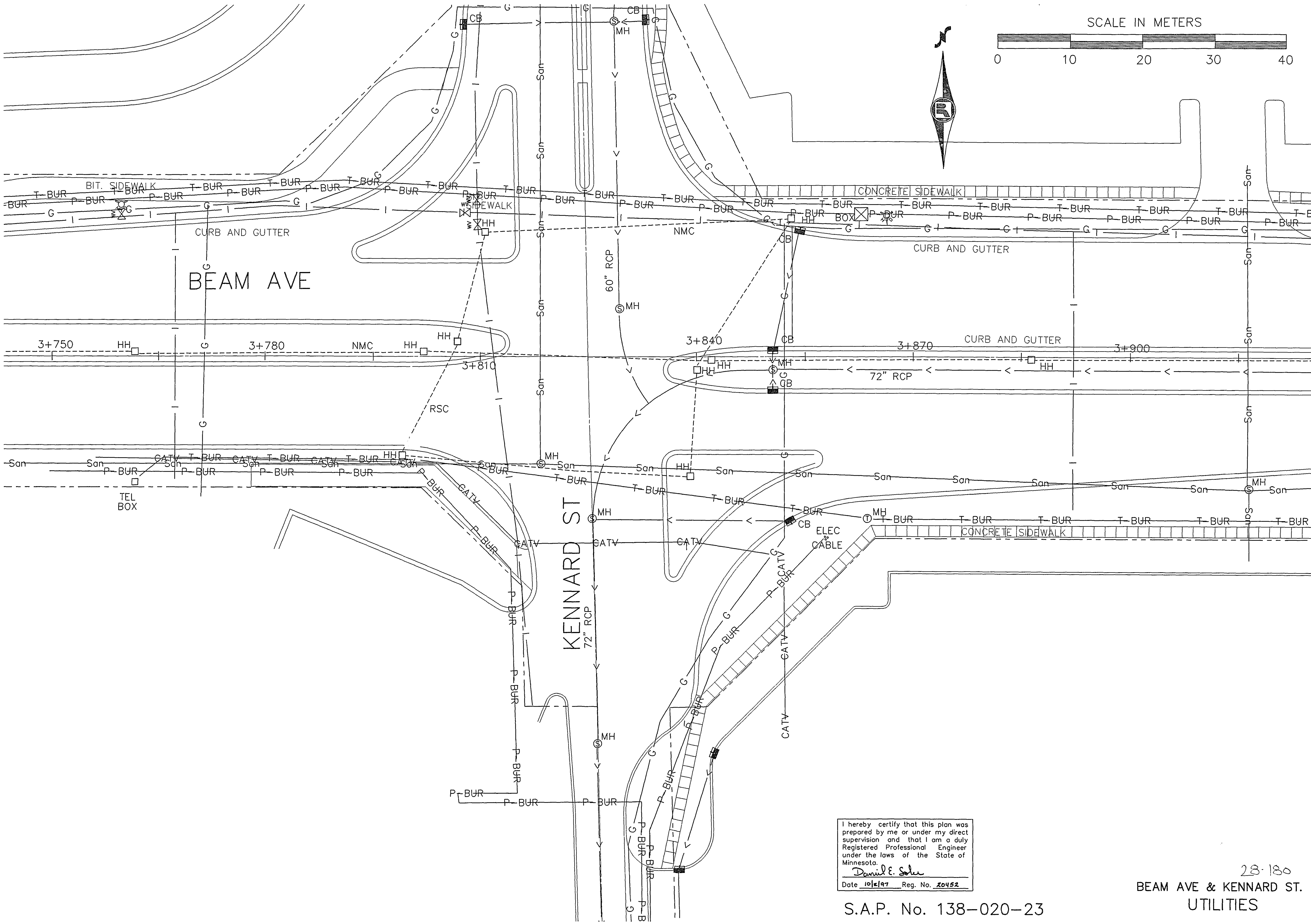
CHARTS & DETAILS

S.A.P. No. 138–020–23

S.A.P. No. 62–619–21



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Daniel E. Soler

Date 10/8/97 Reg. No. 20452

28-180

BEAM AVE & KENNARD ST.

UTILITIES

S.A.P. No. 138-020-23

S.A.P. No. 62-619-21

Sheet No. 5 of 14 Sheets

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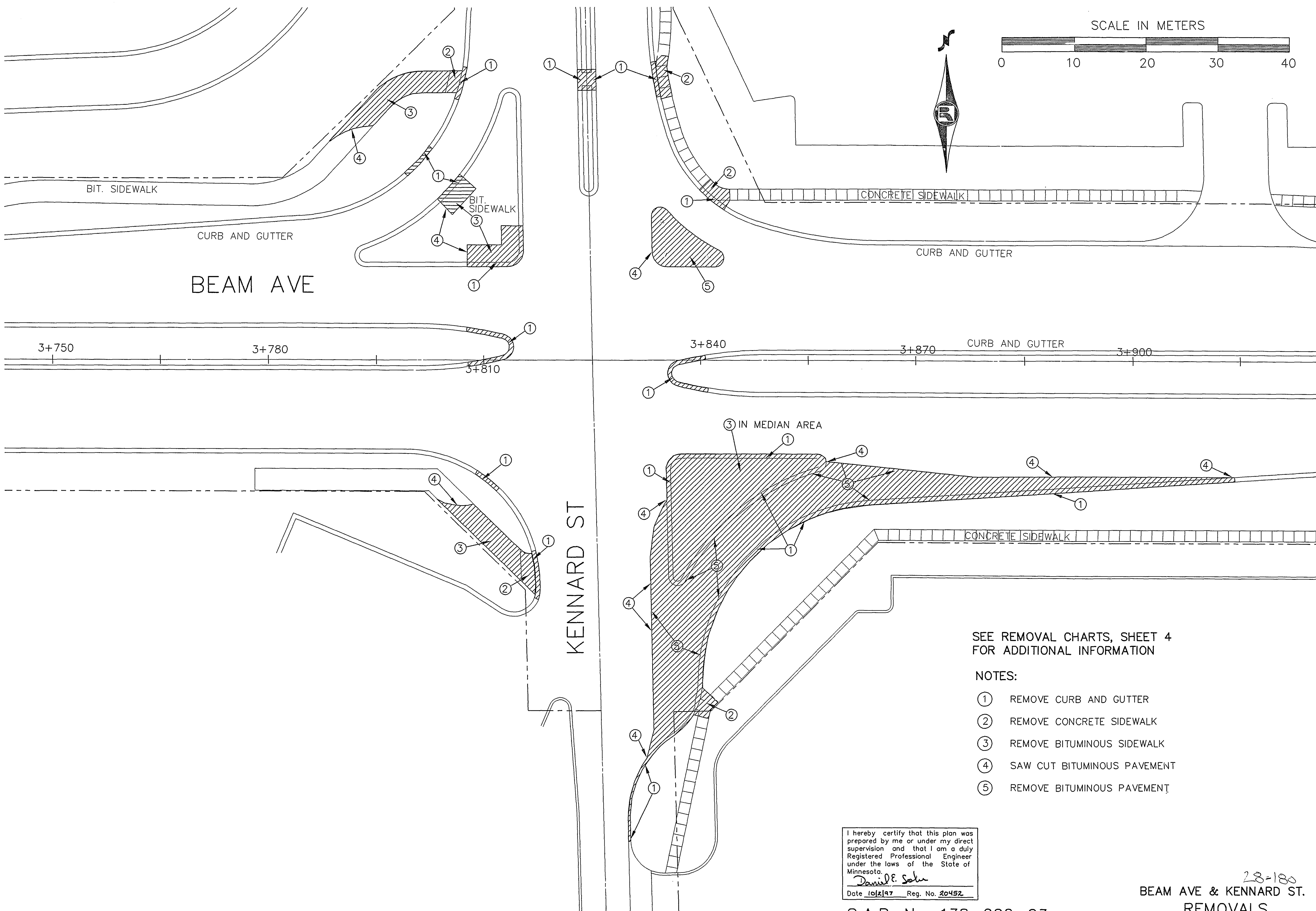

SEE REMOVAL CHARTS, SHEET 4
FOR ADDITIONAL INFORMATION

NOTES:

1. REMOVE CURB AND GUTTER
2. REMOVE CONCRETE SIDEWALK
3. REMOVE BITUMINOUS SIDEWALK
4. SAW CUT BITUMINOUS PAVEMENT
5. REMOVE BITUMINOUS PAVEMENT

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28-180

BEAM AVE & KENNARD ST.

REMOVALS

S.A.P. No. 138-020-23

S.A.P. No. 62-619-21

Sheet No. 6 of 14 Sheets

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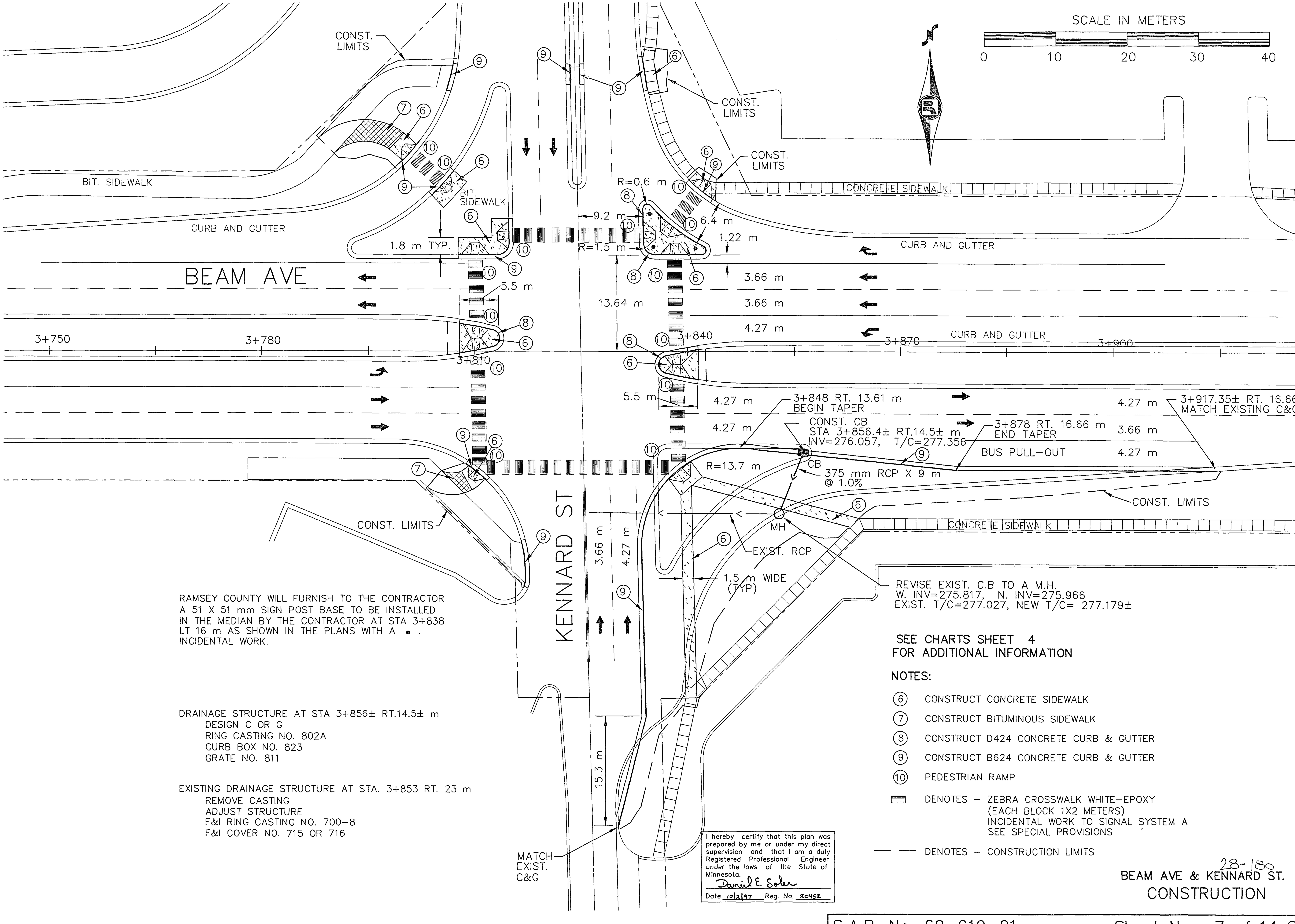

RAMSEY COUNTY WILL FURNISH TO THE CONTRACTOR A 51 X 51 mm SIGN POST BASE TO BE INSTALLED IN THE MEDIAN BY THE CONTRACTOR AT STA 3+838 LT 16 m AS SHOWN IN THE PLANS WITH A ● . INCIDENTAL WORK.

DRAINAGE STRUCTURE AT STA 3+856± RT.14.5± m
DESIGN C OR G
RING CASTING NO. 802A
CURB BOX NO. 823
GRATE NO. 811

EXISTING DRAINAGE STRUCTURE AT STA. 3+853 RT. 23 m
REMOVE CASTING
ADJUST STRUCTURE
F&I RING CASTING NO. 700-8
F&I COVER NO. 715 OR 716

SEE CHARTS SHEET 4
FOR ADDITIONAL INFORMATION

NOTES:

- (6) CONSTRUCT CONCRETE SIDEWALK
- (7) CONSTRUCT BITUMINOUS SIDEWALK
- (8) CONSTRUCT D424 CONCRETE CURB & GUTTER
- (9) CONSTRUCT B624 CONCRETE CURB & GUTTER
- (10) PEDESTRIAN RAMP
- ▬ DENOTES – ZEBRA CROSSWALK WHITE-EPOXY (EACH BLOCK 1X2 METERS) INCIDENTAL WORK TO SIGNAL SYSTEM A SEE SPECIAL PROVISIONS
- — — DENOTES – CONSTRUCTION LIMITS

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Daniel E. Soler
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28-180
BEAM AVE & KENNARD ST.
CONSTRUCTION

S.A.P. No. 62-619-21

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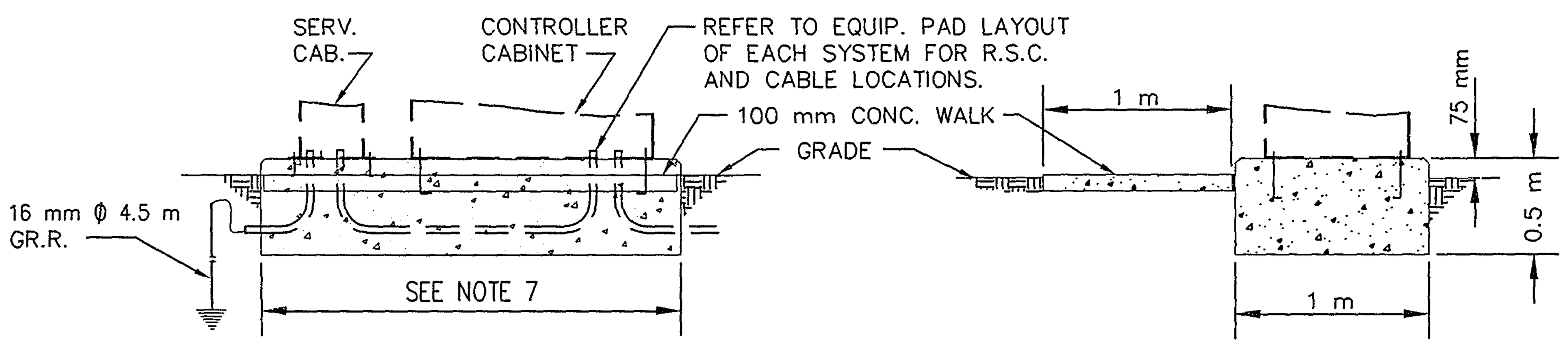
EQUIPMENT PAD FOUNDATION

NOTES:

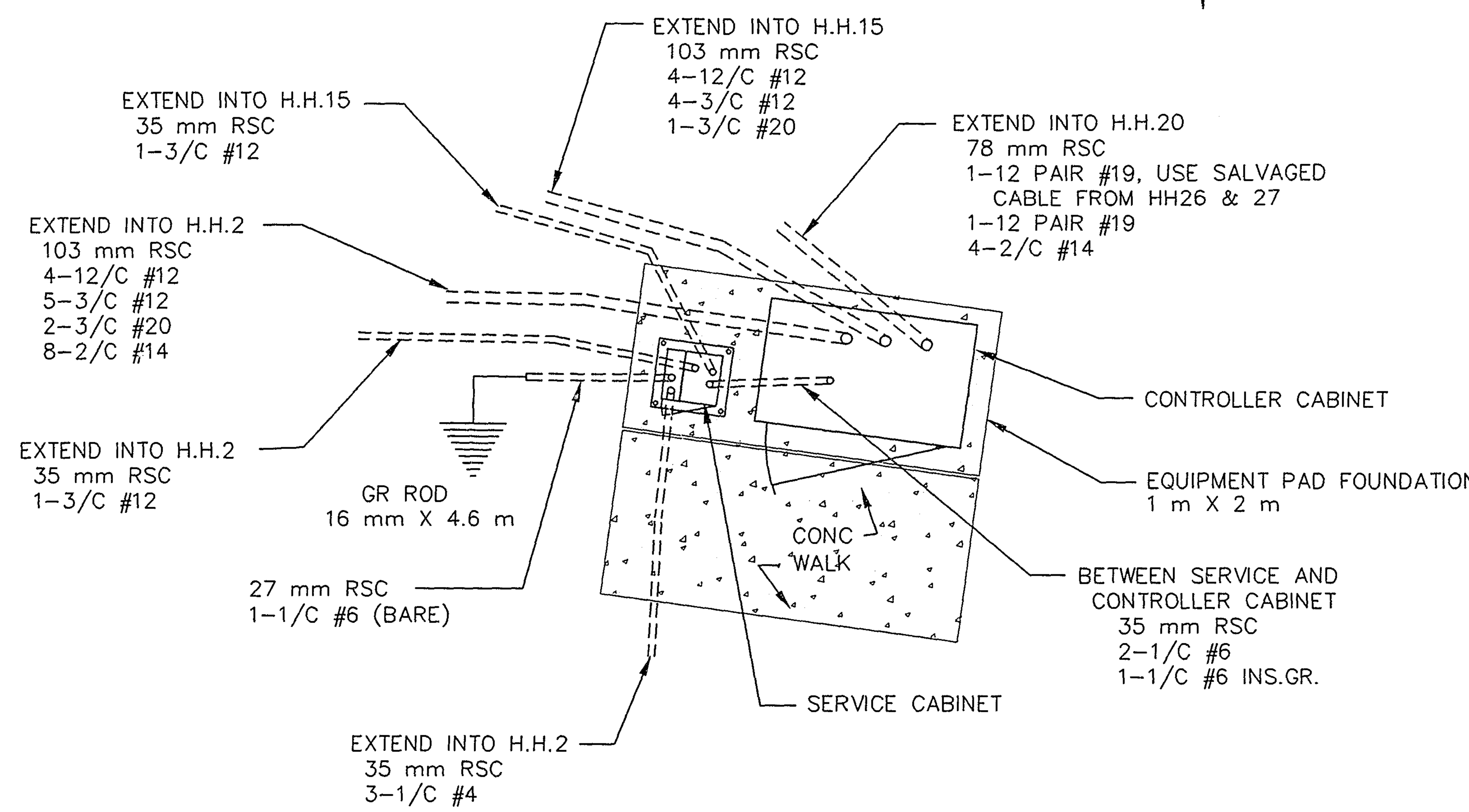
1. ANCHOR RODS, NUTS AND WASHERS PER MN/DOT 3385 OR APPROVED EQUAL SET AS RECOMMENDED BY CABINET MANUFACTURER (NUMBER, SIZE AND LENGTH OF ANCHOR RODS) SHALL BE AS REQUIRED BY THE CABINET (MAN-UFACTURER).
2. UPPER PART OF FOUNDATION SHALL BE BEVELED OR CHAMFERED IN A NEAT MANNER AS DIRECTED BY THE ENGINEER 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.



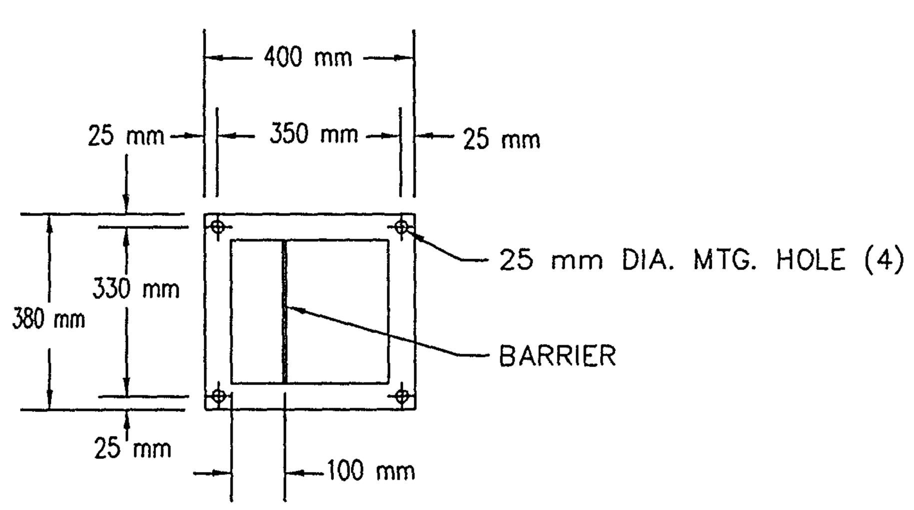
FRONT VIEW

SIDE VIEW

EQUIPMENT PAD LAYOUT
SYSTEM A
BEAM AVE & KENNARD ST



SERVICE CABINET DETAILS



BASE LAYOUT

NOTES:

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

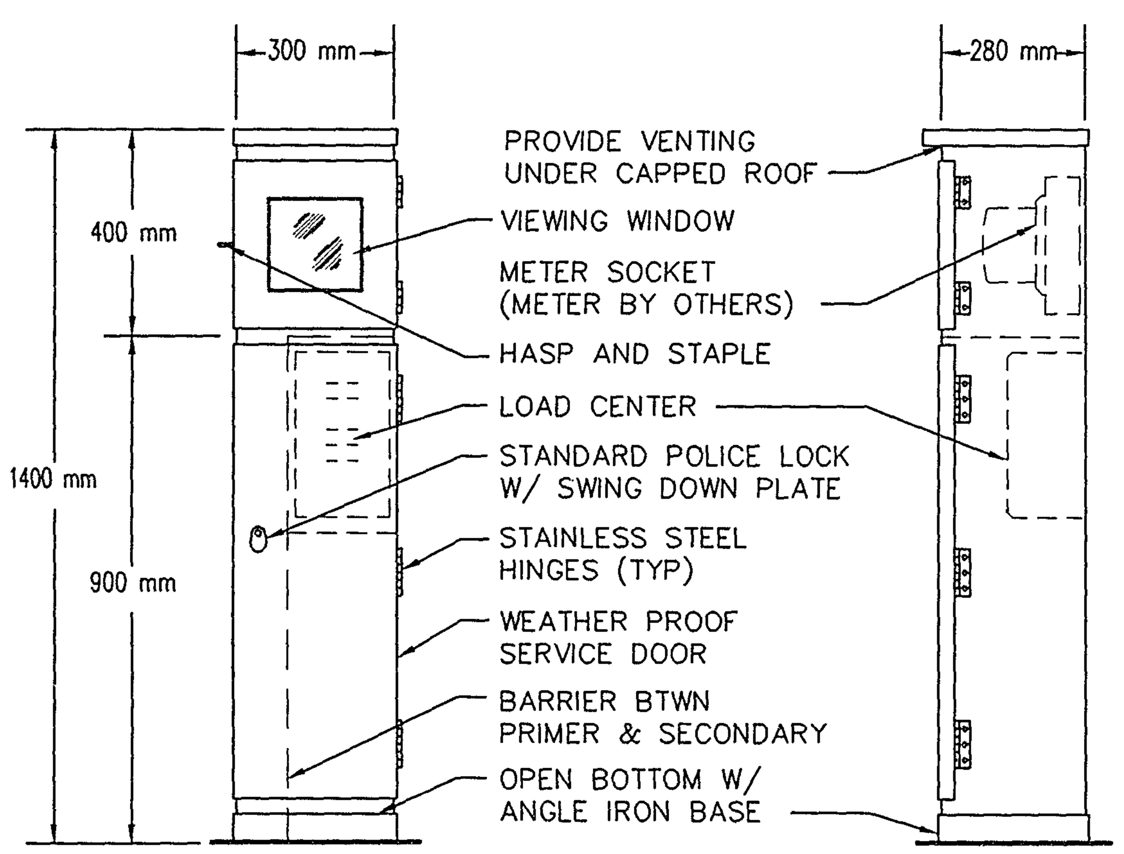
DOOR OPENINGS SHALL BE SEALED WITH NEOPRENE GASKET.

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

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

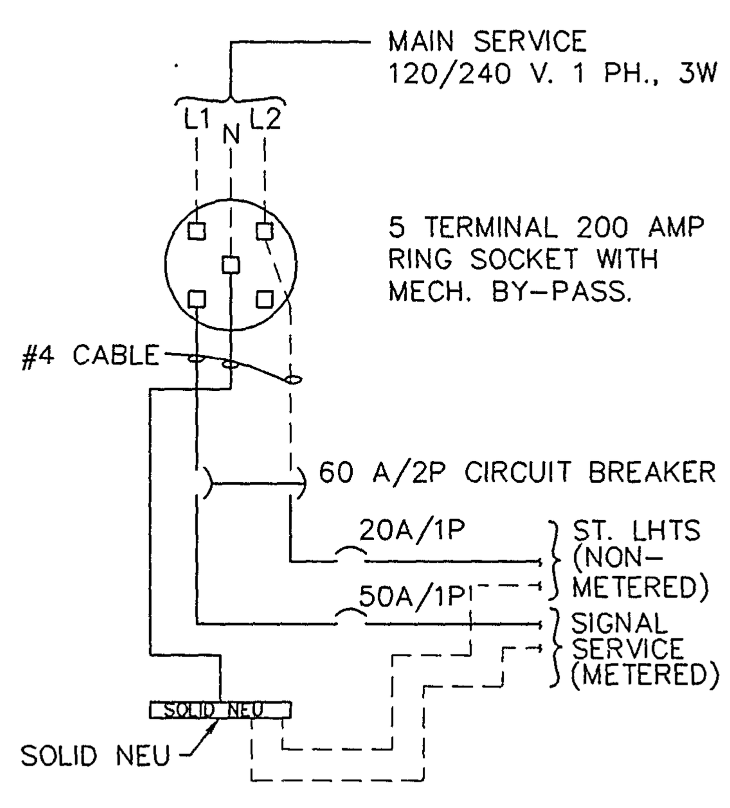
THE PEDESTAL CABINET SHALL BE PROTECTED INSIDE AND OUT WITH A ANODIC COATING. SEE SPECIAL PROVISIONS.

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



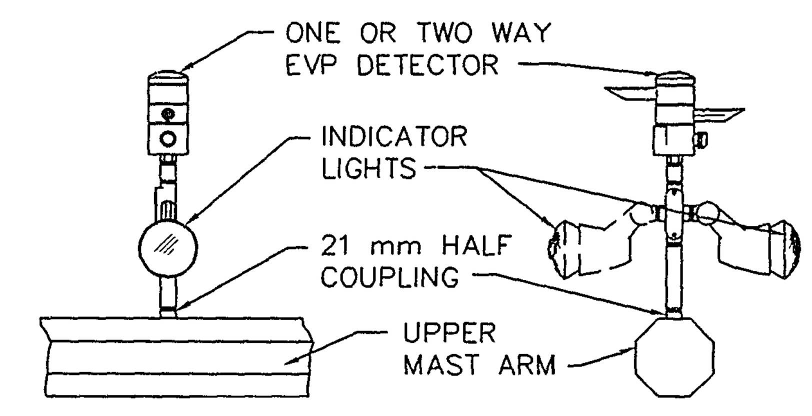
FRONT ELEVATION

SIDE ELEVATION



WIRING DIAGRAM

EVP DETECTOR & LIGHT MOUNTING DETAIL ON MAST ARM



FRONT VIEW

SIDE VIEW

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Daniel F. Soler

Date 10/2/97 Reg. No. 20452

28-180

DETAILS

SYSTEM A

S.A.P. No. 138-020-23

S.A.P. No. 62-619-21

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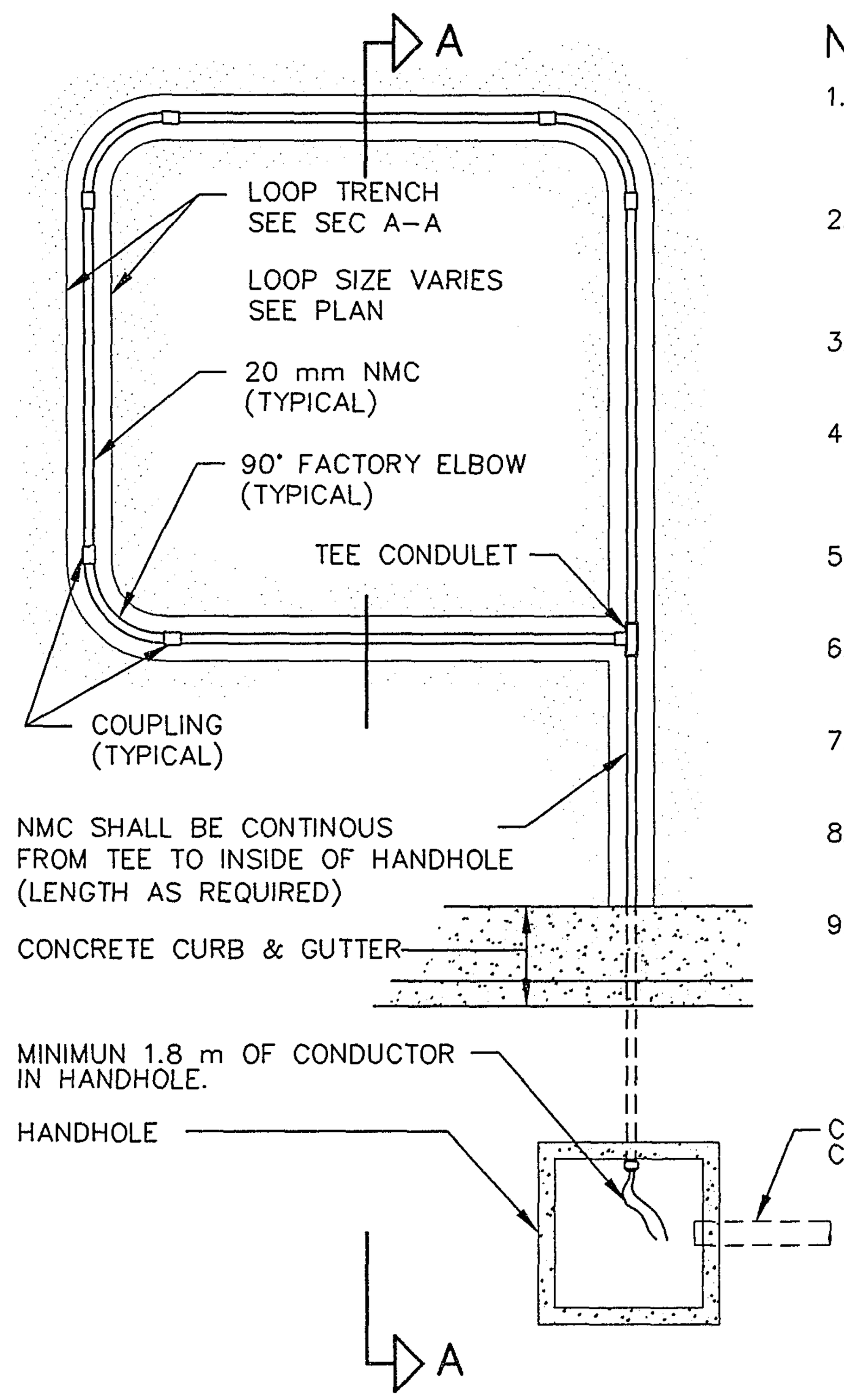
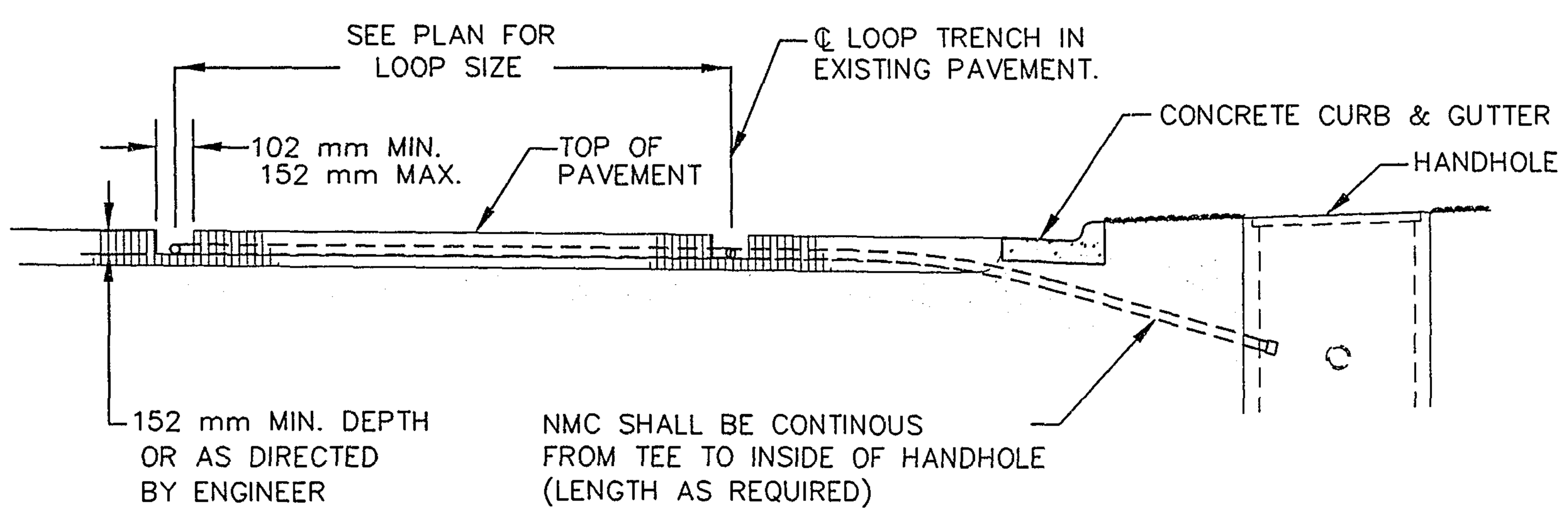
NMC LOOP DETECTOR DETAIL



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. 3803
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 LOOP SHALL BE 4 UNLESS OTHERWISE DIRECTED.

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 41WEA50055X OR Y)
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

ABBREVIATIONS

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

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

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Daniel F. Sohn
Date 10/2/97 Reg. No. 20452

DETAILS
SYSTEM A

28-180

S.A.P. No. 138–020–23

S.A.P. No. 62–619–21 Sheet No. 9 of 14 Sheets

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SIGNAL INDICATION CHART

FACE	PHASE	INDICATION SIZE 300mm R LED	Y	G	←Y	←G
2-1	2	●	●	●		
2-2	2 and 5	●	●	●	←	←
2-3	2 and 5	●	●	●	←	←
2-4	2	●	●	●		
4-1	4	●	●	●		
4-2	4	●	●	●		
4-3	4	●	●	●		
6-1	6	●	●	●		
6-2	1 and 6	●	●	●	←	←
6-3	1 and 6	●	●	●	←	←
6-4	6	●	●	●		
8-1	8	●	●	●		
8-2	8	●	●	●		
8-3	8	●	●	●		

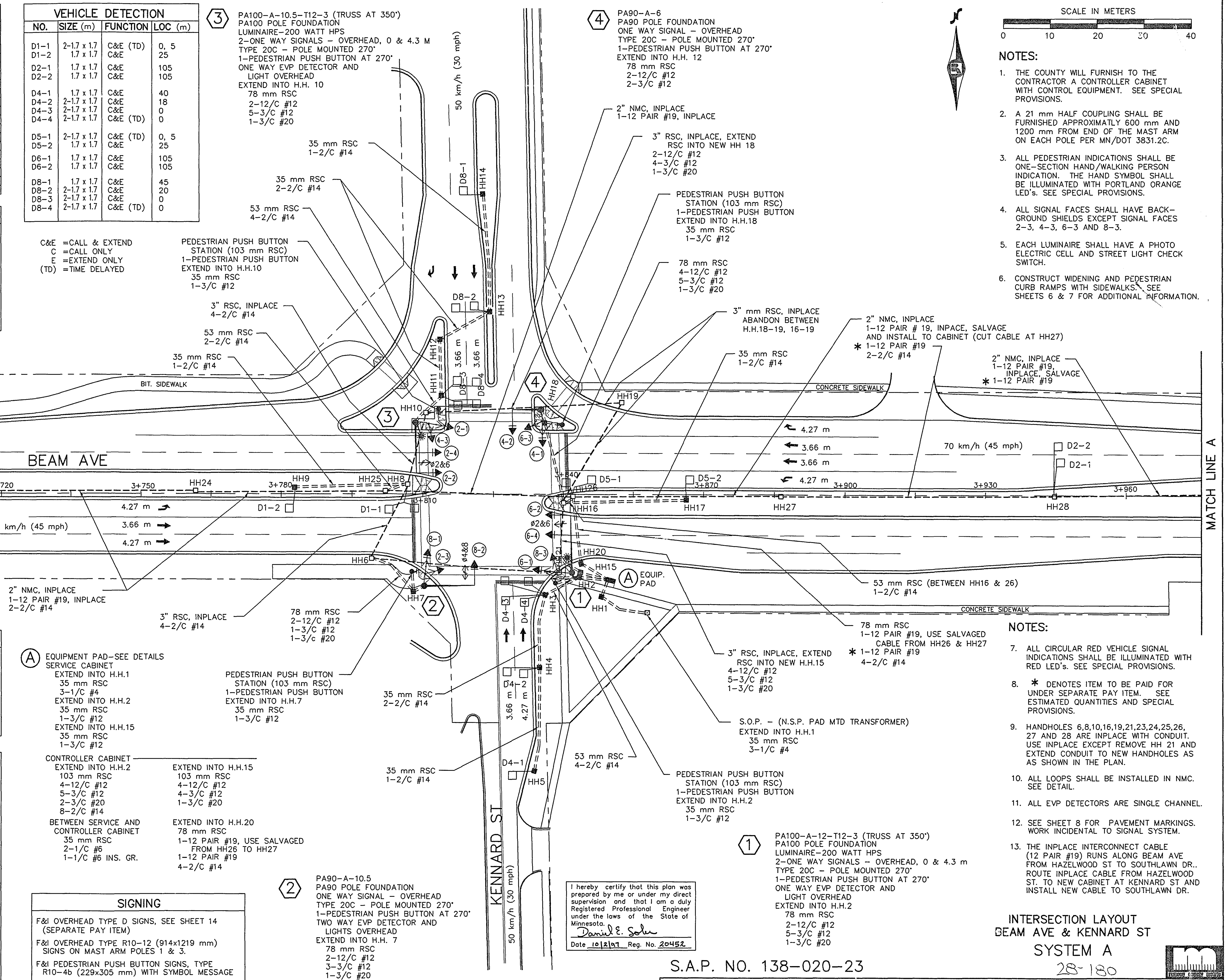
SIGNAL HEAD PHASING

HEADS 2-2 and 2-3	HEADS 6-2 and 6-3
R, Y, G — ø2	R, Y, G — ø6
←Y, ←G — ø5	←Y, ←G — ø1

VEHICLE DETECTION

NO.	SIZE (m)	FUNCTION	LOC (m)
D1-1	2-1.7 x 1.7	C&E (TD)	0, 5
D1-2	1.7 x 1.7	C&E	25
D2-1	1.7 x 1.7	C&E	105
D2-2	1.7 x 1.7	C&E	105
D4-1	1.7 x 1.7	C&E	40
D4-2	2-1.7 x 1.7	C&E	18
D4-3	2-1.7 x 1.7	C&E	0
D4-4	2-1.7 x 1.7	C&E (TD)	0
D5-1	2-1.7 x 1.7	C&E (TD)	0, 5
D5-2	1.7 x 1.7	C&E	25
D6-1	1.7 x 1.7	C&E	105
D6-2	1.7 x 1.7	C&E	105
D8-1	1.7 x 1.7	C&E	45
D8-2	2-1.7 x 1.7	C&E	20
D8-3	2-1.7 x 1.7	C&E	0
D8-4	2-1.7 x 1.7	C&E (TD)	0

C&E = CALL & EXTEND
C = CALL ONLY
E = EXTEND ONLY
(TD) = TIME DELAYED



SIGNAL SYSTEM OPERATION

THE SIGNAL SYSTEM FLASH MODE IS ALL RED.

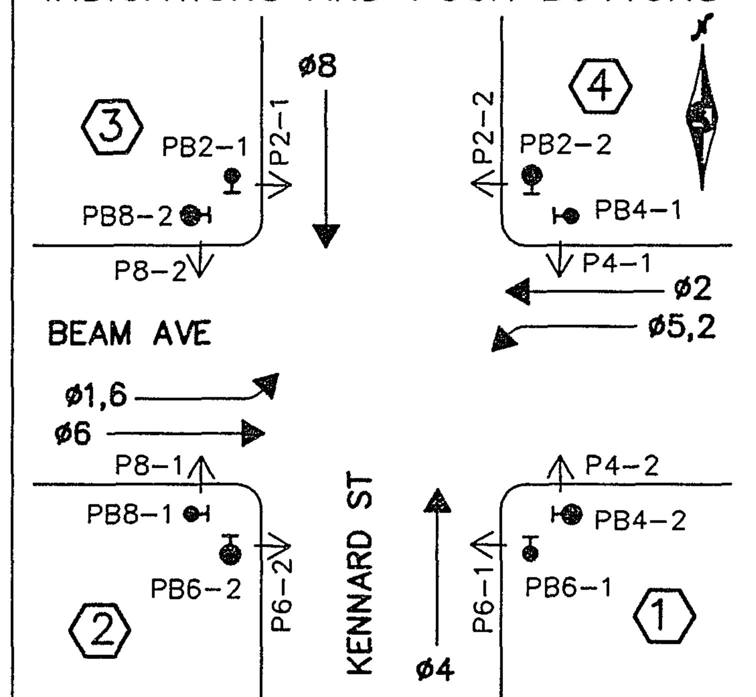
PHASES 1 AND 5 ARE PROTECTED/PERMISSIVE LEFT TURNS.

PHASES 1,4,5 AND 8 ARE NON-LOCK DETECTION.

PHASES 2 AND 6 ARE LOCK DETECTION.

PHASES 2 AND 6 ARE ON VEHICLE RECALL.

CONTROLLER PHASING, PEDESTRIAN INDICATIONS AND PUSH BUTTONS



(A) 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
5-3/C #12
2-3/C #20
8-2/C #14

EXTEND INTO H.H.15
103 mm RSC
4-12/C #12
4-3/C #12
1-3/C #20

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

EXTEND INTO H.H.20
78 mm RSC
1-12 PAIR #19, USE SALVAGED FROM HH26 TO HH27
1-12 PAIR #19
4-2/C #14

SIGNING

F&I OVERHEAD TYPE D SIGNS, SEE SHEET 14 (SEPARATE PAY ITEM)

F&I OVERHEAD TYPE R10-12 (914x1219 mm) SIGNS ON MAST ARM POLES 1 & 3.

F&I PEDESTRIAN PUSH BUTTON SIGNS, TYPE R10-4b (229x305 mm) WITH SYMBOL MESSAGE

SEE SHEET 7 FOR PAVEMENT MARKING WORK.

(2) PA90-A-10.5
PA90 POLE FOUNDATION
ONE WAY SIGNAL - OVERHEAD
TYPE 20C - POLE MOUNTED 270°
1-PEDESTRIAN PUSH BUTTON AT 270°
TWO WAY EVP DETECTOR AND LIGHTS OVERHEAD
EXTEND INTO H.H. 7
78 mm RSC
2-12/C #12
3-3/C #12
1-3/C #20

(1) PA100-A-12-T12-3 (TRUSS AT 350°)
PA100 POLE FOUNDATION
LUMINAIRE-200 WATT HPS
2-ONE WAY SIGNALS - OVERHEAD, 0 & 4.3 m
TYPE 20C - POLE MOUNTED 270°
1-PEDESTRIAN PUSH BUTTON AT 270°
ONE WAY EVP DETECTOR AND LIGHT OVERHEAD
EXTEND INTO H.H.2
78 mm RSC
2-12/C #12
5-3/C #12
1-3/C #20

SCALE IN METERS
0 10 20 30 40

NOTES:

1. THE COUNTY WILL FURNISH TO THE CONTRACTOR A CONTROLLER CABINET WITH CONTROL EQUIPMENT. SEE SPECIAL PROVISIONS.
2. A 21 mm HALF COUPLING SHALL BE FURNISHED APPROXIMATLY 600 mm AND 1200 mm FROM END OF THE MAST ARM ON EACH POLE PER MN/DOT 3831.2C.
3. 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.
4. ALL SIGNAL FACES SHALL HAVE BACK-GROUND SHIELDS EXCEPT SIGNAL FACES 2-3, 4-3, 6-3 AND 8-3.
5. EACH LUMINAIRE SHALL HAVE A PHOTO ELECTRIC CELL AND STREET LIGHT CHECK SWITCH.
6. CONSTRUCT WIDENING AND PEDESTRIAN CURB RAMPS WITH SIDEWALKS. SEE SHEETS 6 & 7 FOR ADDITIONAL INFORMATION.

NOTES:

7. ALL CIRCULAR RED VEHICLE SIGNAL INDICATIONS SHALL BE ILLUMINATED WITH RED LED's. SEE SPECIAL PROVISIONS.
8. * DENOTES ITEM TO BE PAID FOR UNDER SEPARATE PAY ITEM. SEE ESTIMATED QUANTITIES AND SPECIAL PROVISIONS.
9. HANDHOLES 6,8,10,16,19,21,23,24,25,26, 27 AND 28 ARE INPLACE WITH CONDUIT. USE INPLACE EXCEPT REMOVE HH 21 AND EXTEND CONDUIT TO NEW HANDHOLES AS AS SHOWN IN THE PLAN.
10. ALL LOOPS SHALL BE INSTALLED IN NMC. SEE DETAIL.
11. ALL EVP DETECTORS ARE SINGLE CHANNEL.
12. SEE SHEET 8 FOR PAVEMENT MARKINGS. WORK INCIDENTAL TO SIGNAL SYSTEM.
13. THE INPLACE INTERCONNECT CABLE (12 PAIR #19) RUNS ALONG BEAM AVE FROM HAZELWOOD ST TO SOUTHLAWN DR.. ROUTE INPLACE CABLE FROM HAZELWOOD ST. TO NEW CABINET AT KENNARD ST AND INSTALL NEW CABLE TO SOUTHLAWN DR.

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 10/2/97 Reg. No. 20452

METER ADDRESS: 1652 BEAM AVE
RAMSEY COUNTY INTERSECTION I.D. No. TRF 614

INTERSECTION LAYOUT
BEAM AVE & KENNARD ST
SYSTEM A

28-180

S.A.P. NO. 138-020-23

S.A.P. NO. 62-619-21

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FIELD WIRING DIAGRAM
BEAM AVE & KENNARD ST
SYSTEM A

S.A.P. No. 138-020-23

28-180

S.A.P. No. 62-619-21

Sheet No. 11 of 14 Sheets

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FIELD WIRING DIAGRAM
BEAM AVE & KENNARD ST
SYSTEM A

28-180

S.A.P. No. 138-020-23

S.A.P. No. 62-619-21

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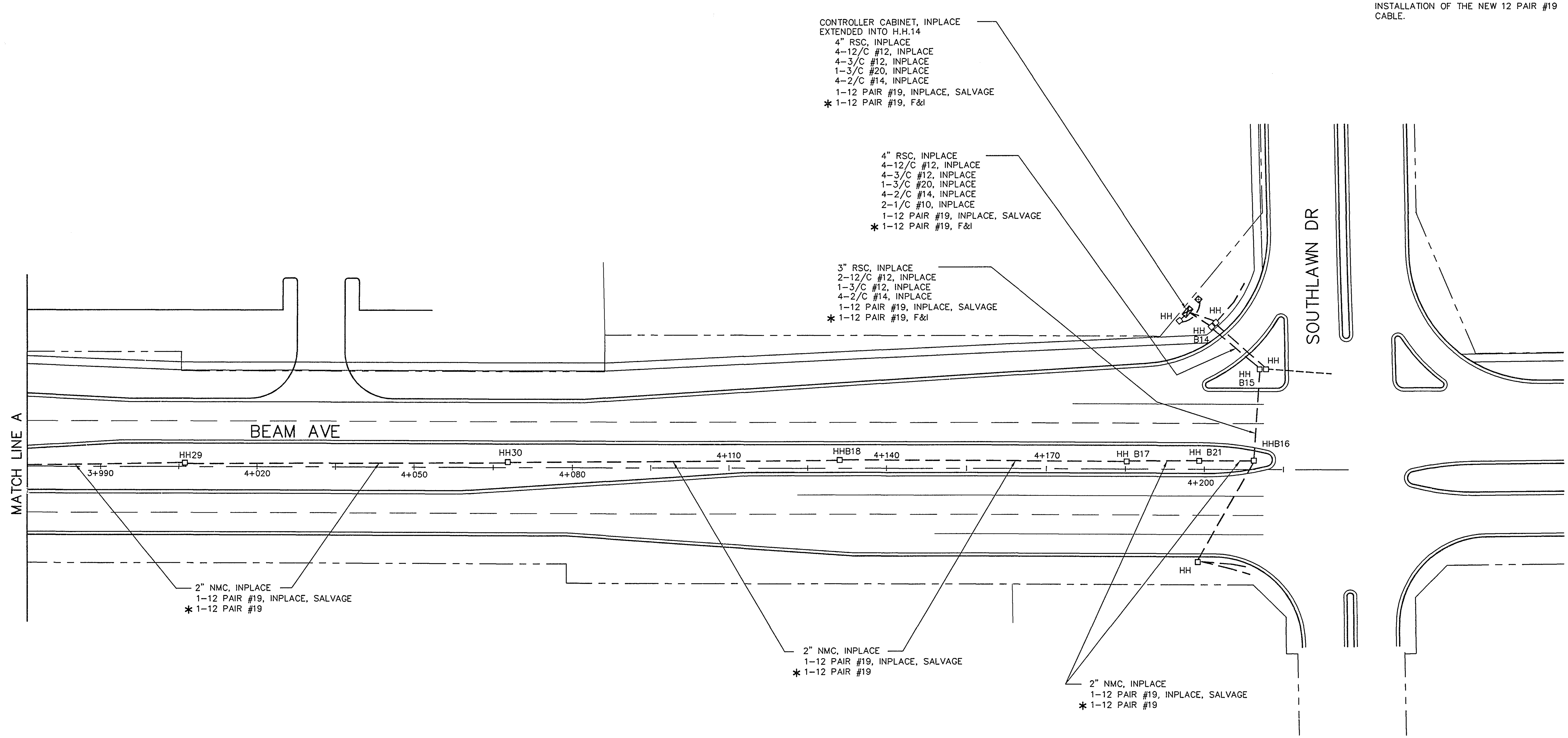
SCALE IN METERS

0 10 20 30 40

NOTES:

1. * DENOTES ITEM TO BE PAID FOR UNDER SEPARATE PAY ITEM. SEE ESTIMATED QUANTITIES AND SPECIAL PROVISIONS.
2. ALL HANDHOLES SHOWN ON THIS SHEET ARE INPLACE.
3. SALVAGING THE INPLACE 12 PAIR #19 CABLE SHALL BE INCIDENTAL TO THE INSTALLATION OF THE NEW 12 PAIR #19 CABLE.



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INTERCONNECT

BEAM AVE

KENNARD ST. TO SOUTHLAWN DR.

S.A.P. NO. 138-020-23

28-180

S.A.P. NO. 62-619-21

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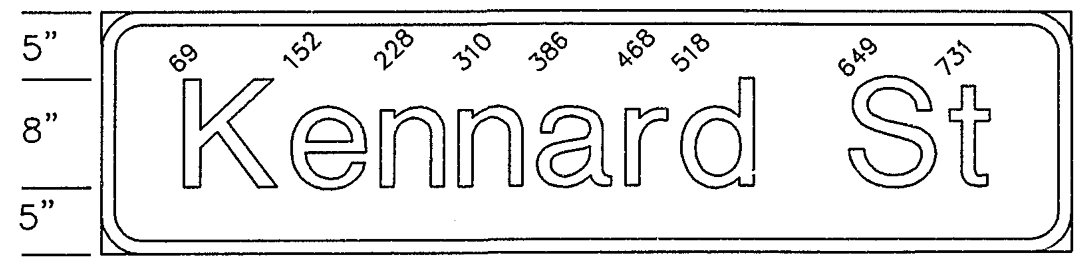
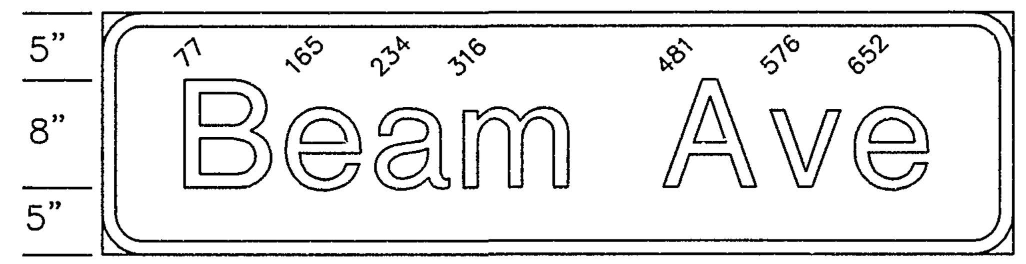


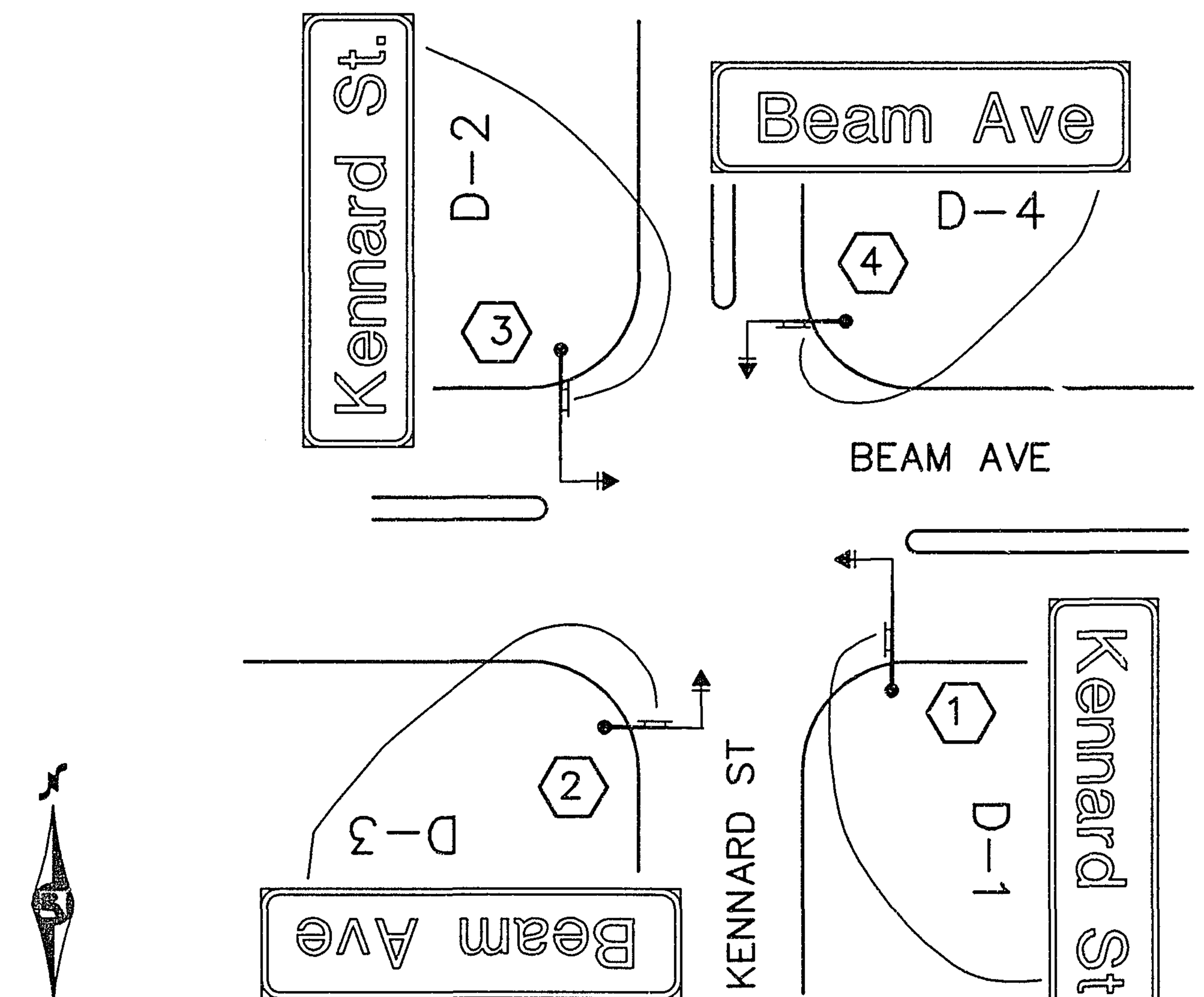
D–1 & D–2
84" X 18"
3" R., 1" B

LINE 1 = 70.3" : 8"–6" "E" MOD.



D–3 & D–4
78" X 18"
3" R., 1" B

LINE 1 = 62.6" : 8"–6" "E" MOD.



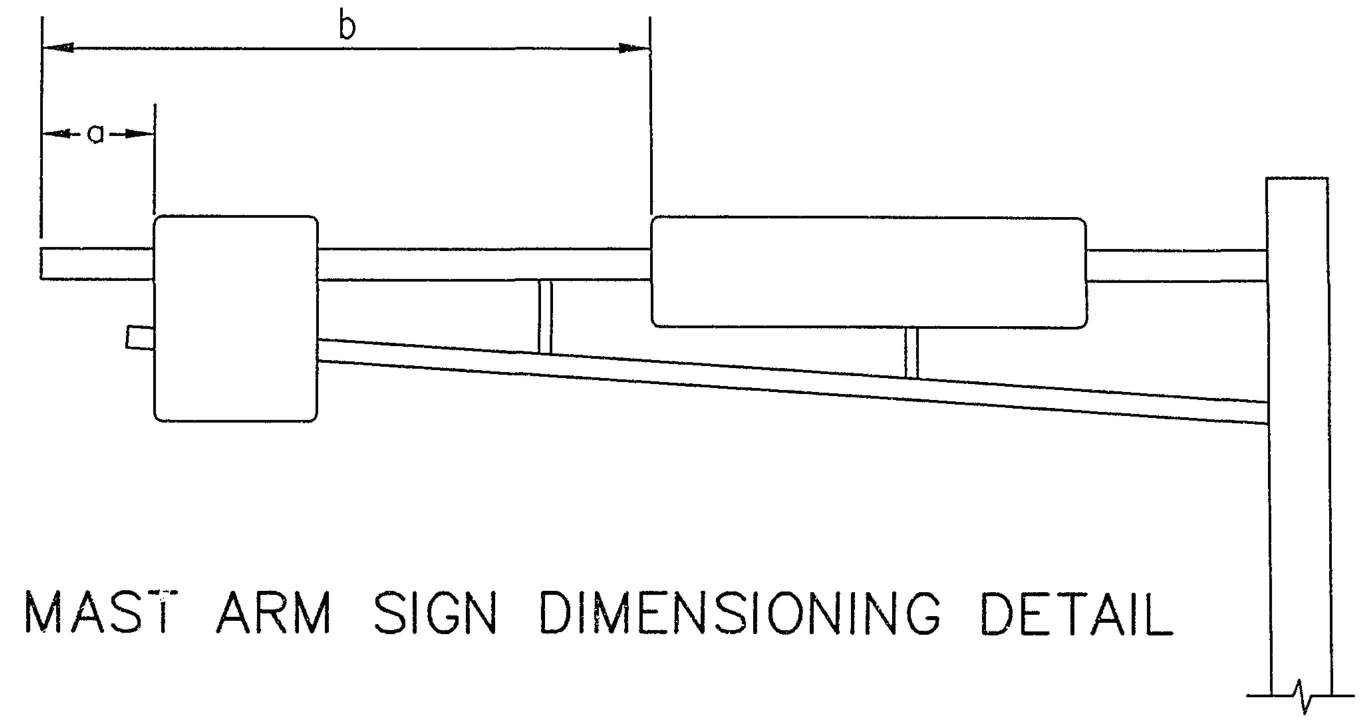
BEAM AVE & KENNARD ST
(SYSTEM A)

TYPE "D" SIGNS – SIGNALS

SIGN PANEL	SIZE	QUANTITY REQUIRED	BRACKETS PER SIGN	BRACKET SPACING	SQUARE FEET PER SIGN	a	b	MAST ARM POLE NUMBER
D–1	84" X 18"	1	2	54"	10.50		21'	(A)1
D–2	84" X 18"	1	2	54"	10.50		21'	(A)3
D–3	78" X 18"	1	2	48"	9.75		8'	(A)2
D–4	78" X 18"	1	2	48"	9.75		8'	(A)4

TOTAL 40.50 SQ.FT.
(3.8 m2)

(A) – SYSTEM A



MAST ARM SIGN DIMENSIONING DETAIL

NOTES:

1. COLOR – WHITE LEGEND AND BORDER ON GREEN BACKGROUND, FULLY REFLECTORIZED WITH PRISMATIC LENS REFLECTIVE SHEETING.
2. CORNERS EXTENDING BEYOND THE BORDER SHALL NOT BE TRIMMED.
3. BOARDERS SHALL BE 1 INCH.
4. SEE STANDARD SIGN MANUAL FOR ARROW DETAILS
5. FOR STRUCTURAL DETAILS, TYPE "D" SIGNS SEE STANDARD SIGNS MANUAL, PAGE 105.
6. FOR TYPE "D" STRINGER AND PANEL – JOINT DETAIL, SEE STANDARD SIGNS MANUAL, PAGE 105.
7. LETTERING STYLE SHALL BE HIGHWAY GOTHIC CONFORMING TO MN/DOT STANDARDS.

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Daniel E. Soler
Date 10/2/97 Reg. No. 20452

MAST ARM SIGNS
SYSTEM A

28-180

THIS SHEET IS IN ENGLISH UNITS

S.A.P. No. 62–619–21 Sheet No. 14 of 14 Sheets

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