

PLANS SYMBOLS

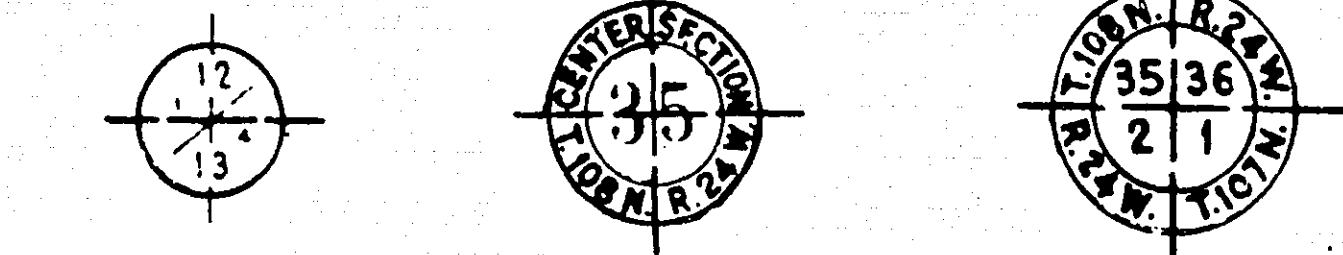
STATE LINE	----
COUNTY LINE	-----
TOWNSHIP OR RANGE LINE	-----
SECTION LINE	-----
QUARTER LINE	-----
SIXTEENTH LINE	-----
RIGHT-OF-WAY LINE	-----
PRESENT RIGHT-OF-WAY LINE	-----
CONTROL OF ACCESS LINE	-----
PROPERTY LINE (Except Land Lines)	-----
VACATED PLATTED PROPERTY	-----
CORPORATE OR CITY LIMITS	-----
TRUNK HIGHWAY CENTER LINE	-----
RETAINING WALL	-----
RAILROAD	-----
RAILROAD RIGHT-OF-WAY LINE	-----
RIVER OR CREEK	-----
DRY RUN	-----
DRAINAGE DITCH	-----
DRAIN TILE	-----
CULVERT	-----
DROP INLET	-----
GUARD RAIL	-----
BARBED WIRE FENCE	-----
WOODEN WIRE FENCE	-----
CHAIN LINK FENCE	-----
RAILROAD SNOW FENCE	-----
STONE WALL OR FENCE	-----
HEDGE	-----
RAILROAD CROSSING SIGN	-----
RAILROAD CROSSING BELL	-----
ELECTRIC WARNING SIGN	-----
CROSSING GATE	-----
MEANDER CORNER	-----

SPRINGS	-----
MARSH	-----
TIMBER	-----
ORCHARD	-----
BRUSH	-----
NURSERY	-----
CATCH BASIN	-----
FIRE HYDRANT	-----
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	-----
IRON PIPE OR ROD	-----
MONUMENT (STONE, CONCRETE, OR METAL)	-----
WOODEN HUB	-----
GRAVEL PIT	-----
SAND PIT	-----
BORROW PIT	-----
ROCK QUARRY	-----

UTILITIES SYMBOLS

POWER POLE LINE	-----
TELEPHONE OR TELEGRAPH POLE LINE	-----
JOINT TELEPHONE AND POWER ON POWER POLES	-----
ON TELEPHONE POLES	-----
ANCHOR	-----
STEEL TOWER	-----
STREET LIGHT	-----
PEDESTAL (TELEPHONE CABLE TERMINAL)	-----
GAS MAIN	-----
WATER MAIN	-----

CONDUIT	-----
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	-----



NOTE SECTION NUMBERS READ FROM "THE SOUTH"

PIT DATA

PIT NO.	Located in
PIT NO.	Dead Haul
PIT NO.	Located in
PIT NO.	Dead Haul

OFFICE OF COUNTY ENGINEER RAMSEY COUNTY

PLAN OF TRAFFIC CONTROL SYSTEM FOR THE INTERSECTION OF
WHITE BEAR AVE. & ORCHARD LANE
S.A.P. 62-665-16



INDEX	
SHEET NO	DESCRIPTION
1	TITLE
2	DETAILS
3	INTERSECTION LAYOUT
4-5	FIELD WIRING DIAGRAM

WHITE BEAR AVE. & ORCHARD LANE
S.A.P. 62-665-16

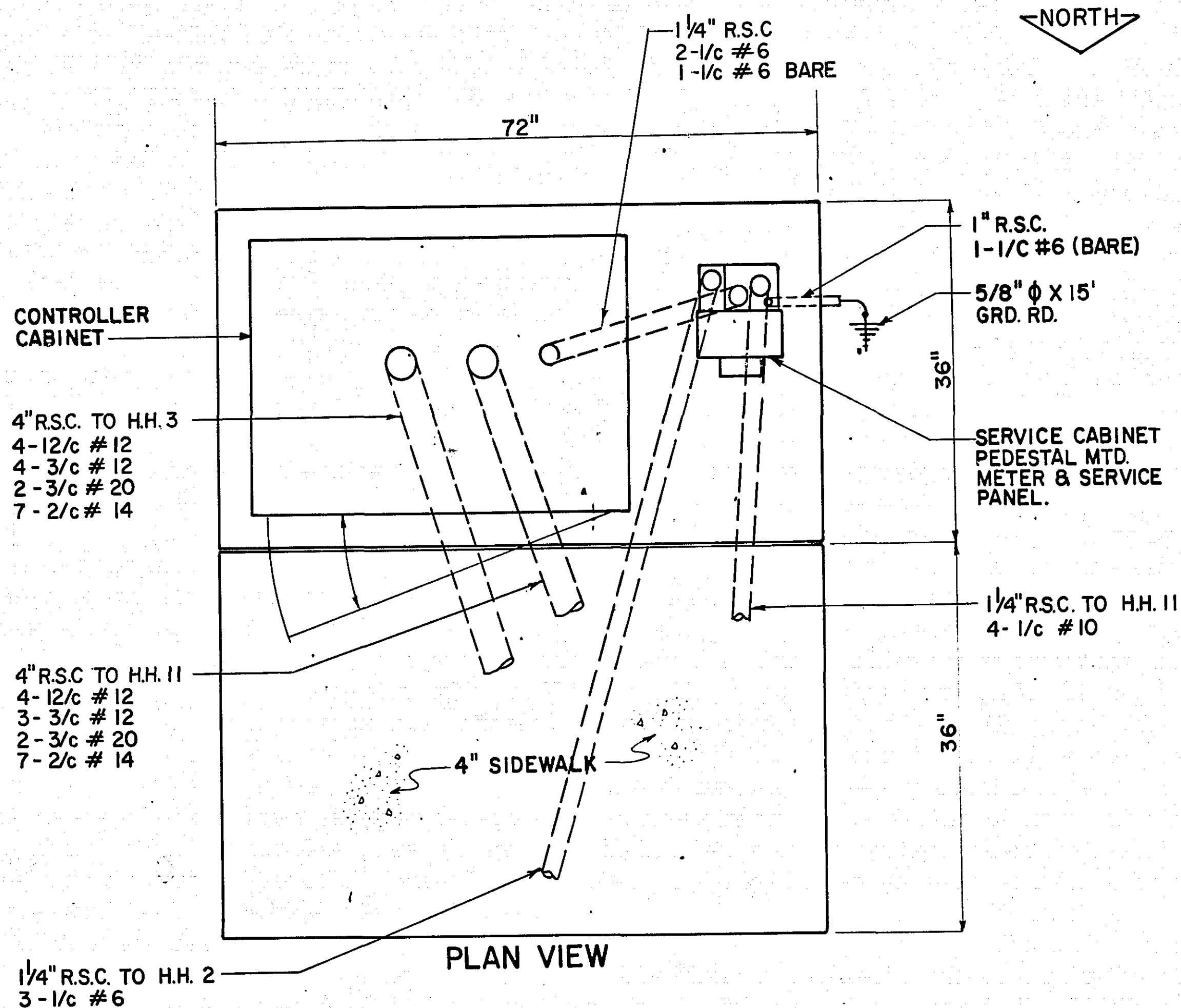
I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Registered Professional Engineer under the laws of the State of Minnesota.
Paul J. Schmidt
Date 10-30-79 Reg. No. 12703

RECOMMENDED FOR APPROVAL *P.V.* DATE 10-30-79
TRAFFIC ENGR.
RECOMMENDED FOR APPROVAL *S.D.* DATE 10/31/79
ENV. ENGR.
RECOMMENDED FOR APPROVAL *M.D.* DATE 10/31/79
MAINT. ENGR.
RECOMMENDED FOR APPROVAL *D.R.* DATE 11-6-79
CONST. ENGR.
RECOMMENDED FOR APPROVAL *A.P.* DATE 11-8-79
PUB. ENGR.
RECOMMENDED FOR APPROVAL *J.P.* DATE 11-1-79
S.W. ENGR.
APPROVED *W.D.* DATE 11-9-79
COORDINATING ENGR.

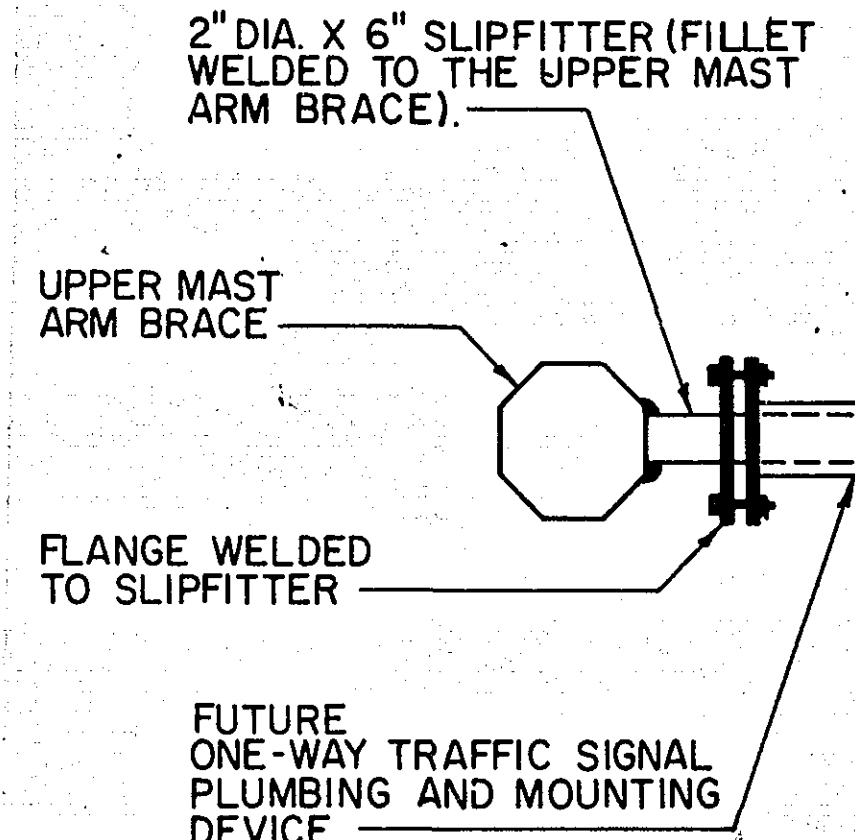
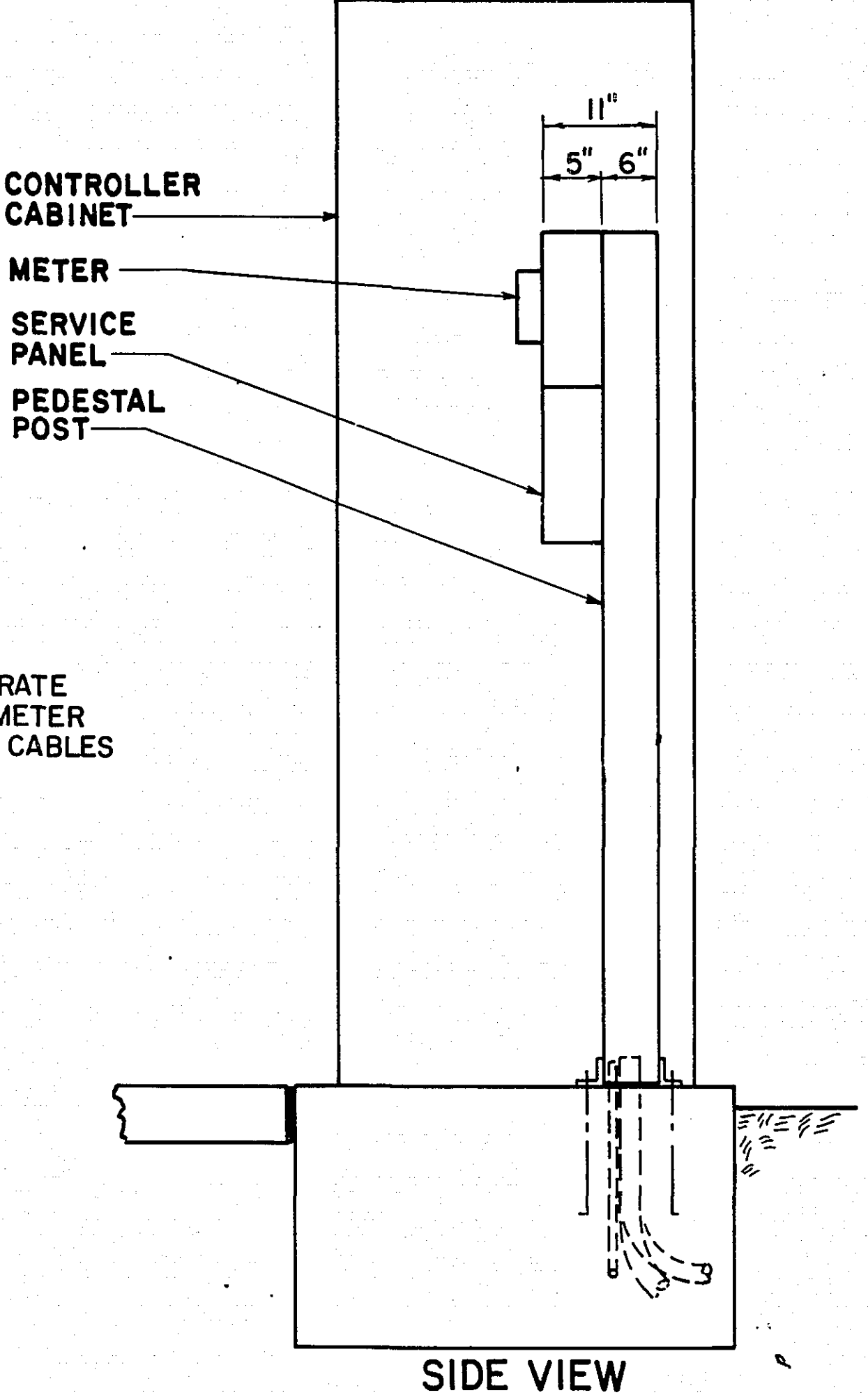
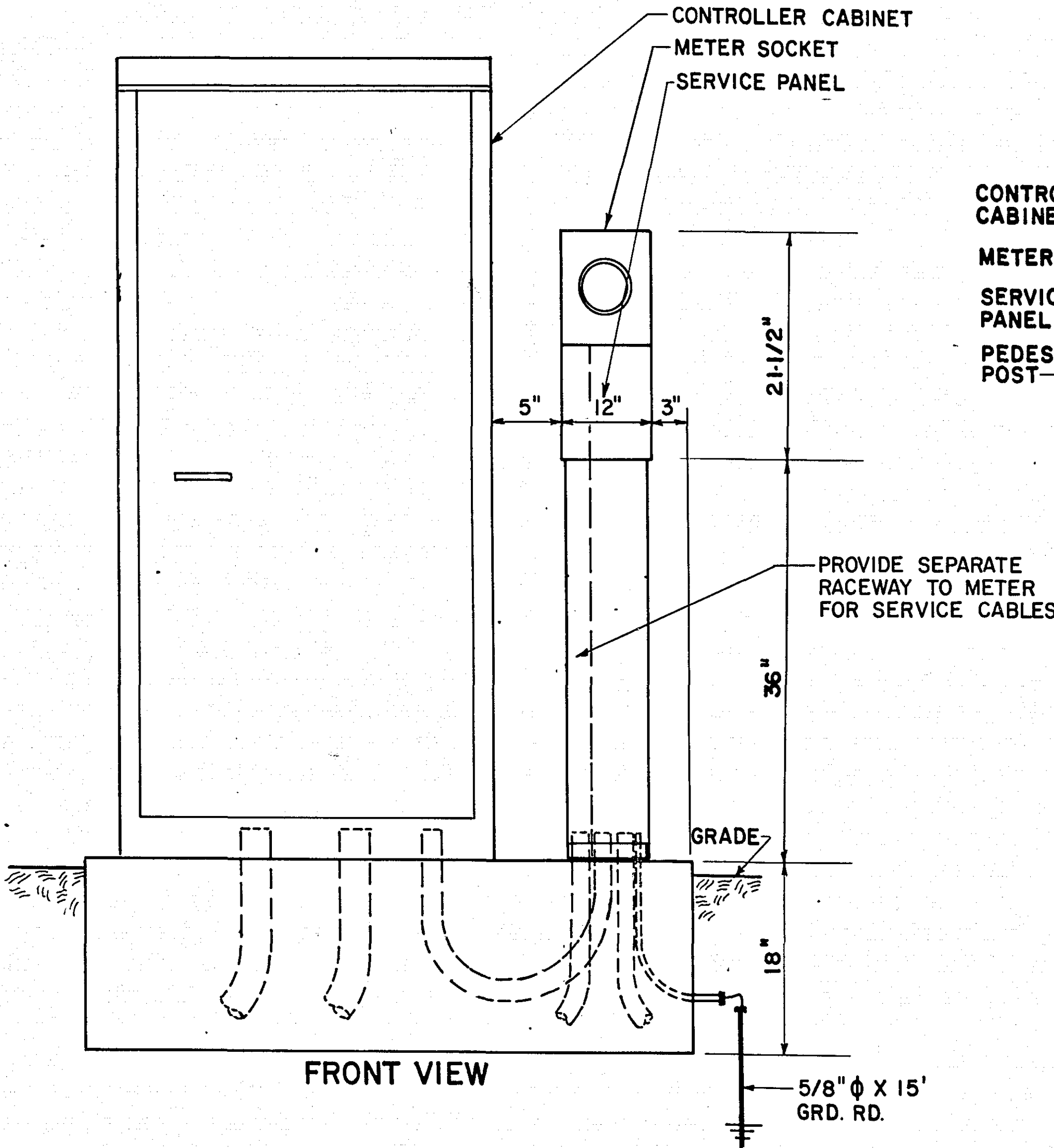
RECOMMENDED FOR APPROVAL *North St. Paul* DATE Nov. 7, 1979
COUNTY ENGINEER
APPROVED *Robert J. Smith* DATE 4-28-80
CHAIRMAN OF THE RAMSEY COUNTY BOARD
APPROVED *Brustein* DATE 1/15/80
MAYOR, CITY OF WHITE BEAR LAKE
APPROVED *Steven D. Lattin* DATE 1/3/80
CITY ENGINEER
MINNESOTA DEPARTMENT OF TRANSPORTATION
RECOMMENDED FOR APPROVAL *Robert C. O'Neil* DATE 3-8-80
DISTRICT STATE AID ENGINEER
RECOMMENDED FOR APPROVAL *Christina* DATE 2/4/80
DISTRICT STATE AID ENGINEER
APPROVAL *Paul J. Schmidt* DATE 2-6-80
DIRECTOR, OFFICE OF STATE AID

THE 1978 EDITION OF THE MINNESOTA DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION" SHALL GOVERN.

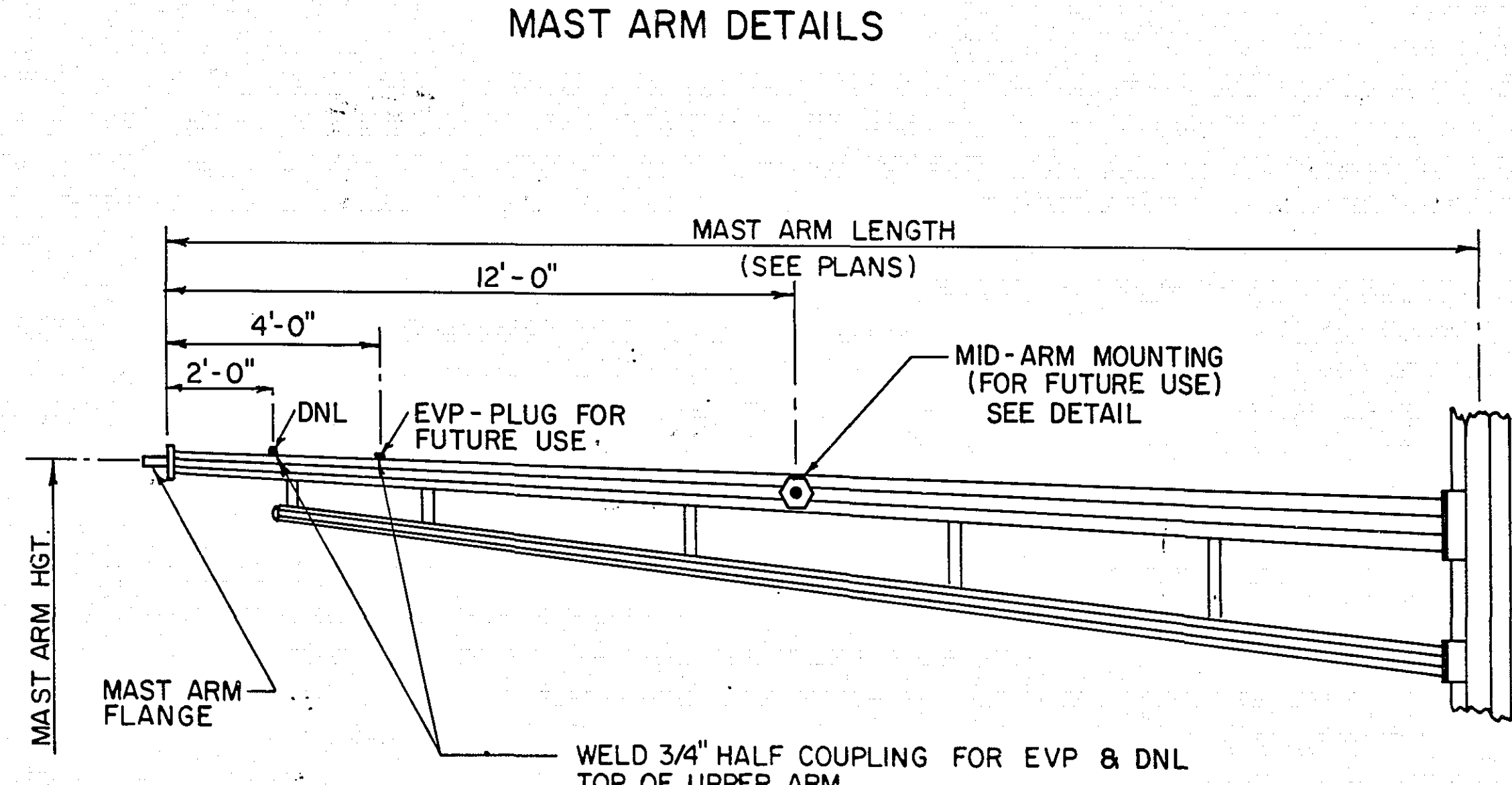
EQUIPMENT PAD DETAILS



1. ANCHOR RODS, NUTS AND WASHERS REQUIRED FOR THE CONTROLLER CABINET SHALL BE FURNISHED TO THE CONTRACTOR BY THE COUNTY.
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 2" ABOVE CONCRETE AND SHALL BE LOCATED INSIDE THE CABINET WHERE DIRECTED BY THE ENGINEER BUT SHALL NOT INTERFERE WITH CABINET FUNCTIONS. (SUPPORTING MEMBERS, ETC.)
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.



MID-ARM MOUNTING DETAIL



ABBREVIATIONS

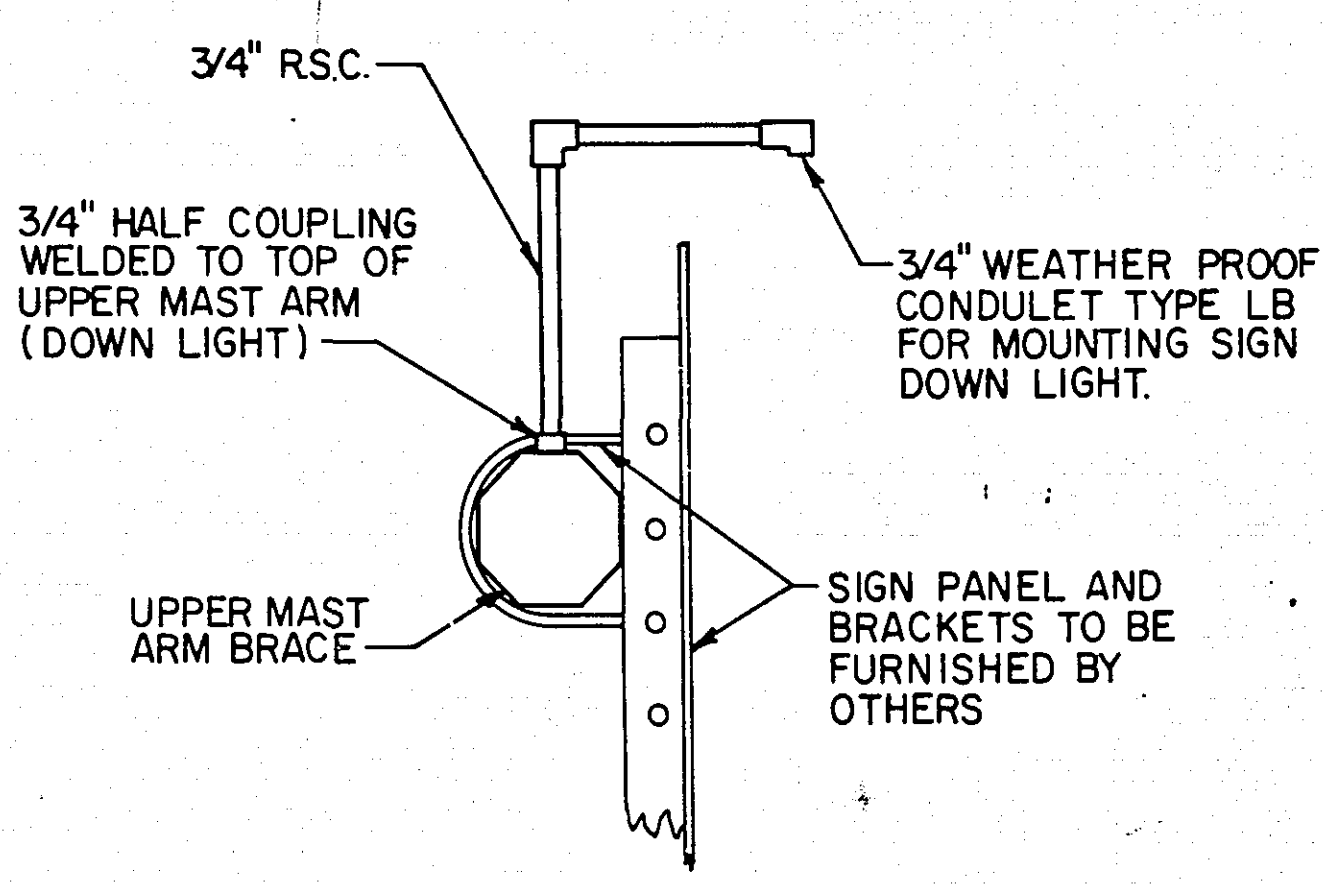
EQUIPMENT & INDICATIONS

- RED - RED
YEL - YELLOW
GRN - GREEN
LTA - LEFT TURN ARROW
THA - THRU ARROW
RTA - RIGHT TURN ARROW
TRA - THRU AND RIGHT ARROW
WLK - WALK
NEU - NEUTRAL
DWK - DON'T WALK
SW - SWITCH
SWD - SWITCHED
LUM - LUMINAIRE
P2-1(eg) - PEDESTRIAN INDICATION - "2" PHASE
PB4-2(eg) - PUSH BUTTON - "4" PHASE
2-2(eg) - SIGNAL HEAD - "2" PHASE
D2-4(eg) - DETECTOR - "2" PHASE
H.H. - HANDHOLE
GR.R. - GROUND ROD
SERV. - SERVICE
EVP - EMERGENCY VEHICLE PRE-EMPTION

- DNL - DOWNLIGHT
PE.C. - PHOTOELECTRIC CELL
ST. LHT. - STREET LIGHT
CH. - CHECK
S.O.P. - SOURCE OF POWER
EQ.G. - EQUIPMENT GROUND
SPR - SPARE CONDUCTOR

COLOR CODING OF CONDUCTOR

- 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



SIGN DOWN LIGHT MOUNTING DETAIL

STANDARD PLATES	
PLATE NO.	TITLE
* 8110C	TRAFFIC SIGNAL BRACKETING (POLE MOUNTED)
* 8111B	TRAFFIC SIGNAL BRACKETING (PEDESTAL MOUNTED)
* 8112C	PEDESTAL FOUNDATION
8113C	MAGNETIC VEHICLE DETECTOR INSTALLATION
* 8115C	PEDESTRIAN PUSH BUTTON INSTALLATION
* 8116C	STEEL GUARD POST
* 8117F	PRECAST CONCRETE HANDHOLE
8118C	SERVICE EQUIPMENT & POLE, TRAFFIC CONTROL SIGNALS
* 8119C	GROUND MOUNTED CABINET FOUNDATION
8120F	MAST ARM POLE FOUNDATION
* 8122C	PEDESTAL AND PEDESTAL BASE
* 8123A	POLE AND MAST ARM (LUMINAIRES AND TRAFFIC LIGHTS)
* 8124C	SIGNAL HEAD MOUNTS
8125A	SWING-AWAY HINGE (FOR TRAFFIC SIGNAL ARM MAST)
* 8126A	A100 MAST ARM POLE FOUNDATION
* 8130D	SAW CUT LOOP DETECTORS

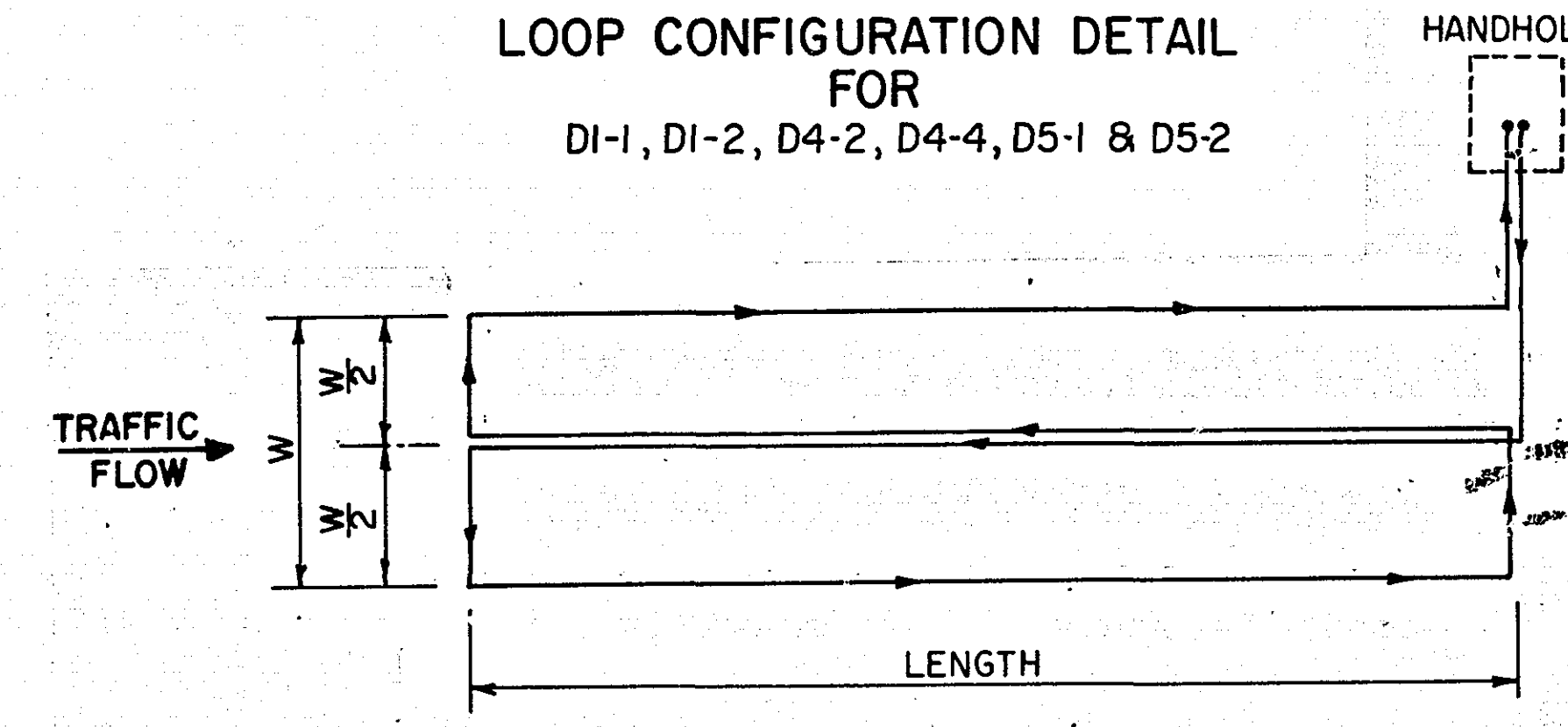
* STANDARD PLATES APPLICABLE TO THIS PROJECT

I hereby certify that this plan, specification, or report 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.

Paul J. Schuchman

Date 10-30-77 Reg. No. 12703

STATEMENT OF ESTIMATED QUANTITIES				
PROJECT NO.	ITEM NO.	ITEM	UNIT	QUANT.
62-665-16	2565.501	FULL TRAFFIC ACTUATED TRAFFIC CONTROL SYSTEM	SIGNAL SYSTEM	1



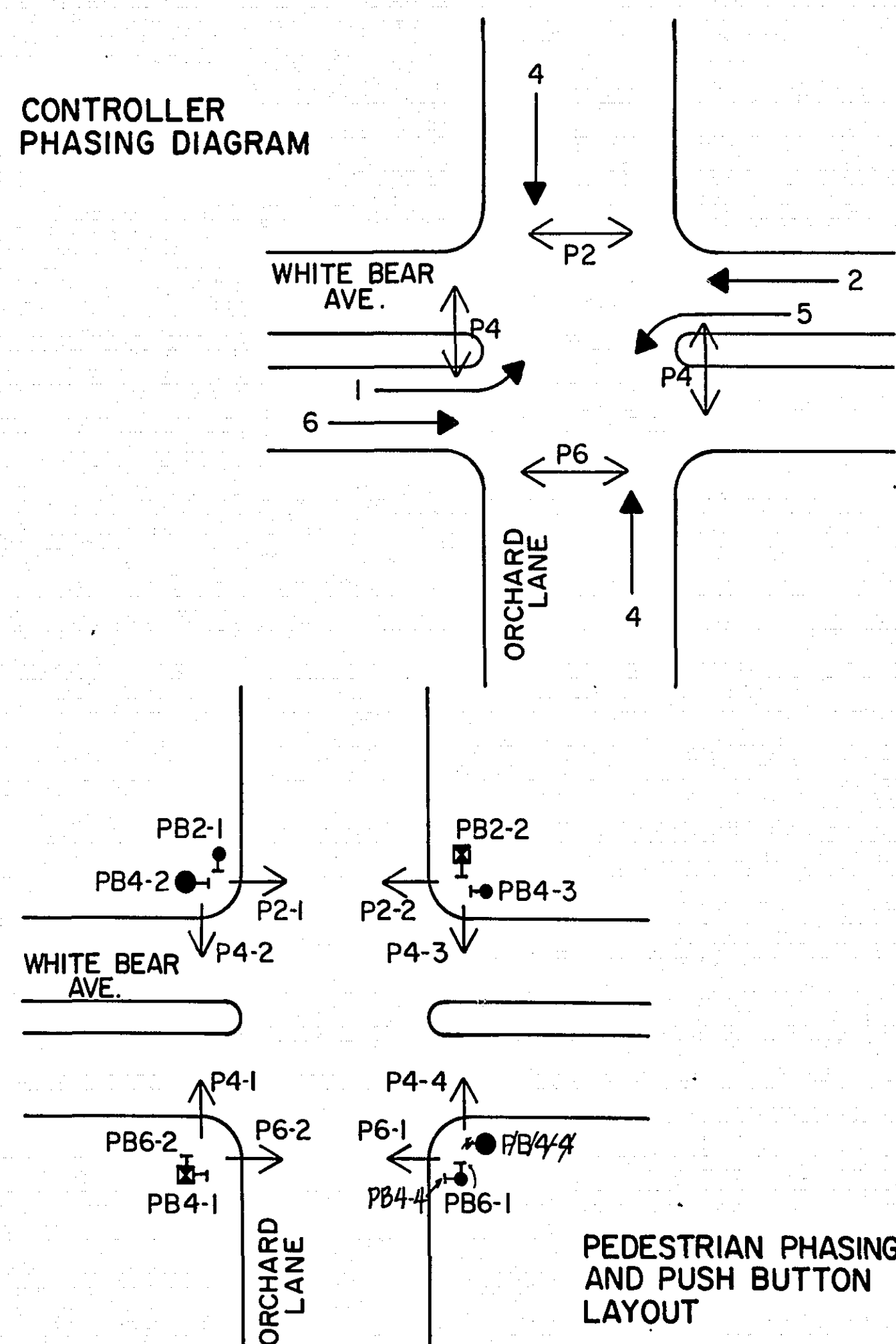
DETAILS

S.A.P. NO. 62-665-16

SHEET NO. 2 OF 5 SHEETS

LEGEND OF SYMBOLS	
SIGNAL BASE No.	5
SIGNAL FACE No.	4-2
CONTROLLER AND CABINET	
CONTROLLER AND CABINET-INPLACE	
HANDHOLE	
HANDHOLE-INPLACE	
RIGID STEEL CONDUIT (R.S.C.)	
RIGID STEEL CONDUIT (R.S.C.)-INPLACE	
SIGNAL FACE	
SIGNAL FACE WITH BACKGROUND SHIELD	
SIGNAL FACE - INPLACE	
PEDESTRIAN INDICATIONS - INPLACE	
PEDESTRIAN PUSH BUTTON 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 - INPLACE	
MAST ARM AND LUMINAIRE	
MAST ARM AND LUMINAIRE - INPLACE	
WOOD POLE	
WOOD POLE - INPLACE	
SOURCE OF POWER	
EMERGENCY VEHICLE PRE-EMPTION DETECTOR LOCATION	

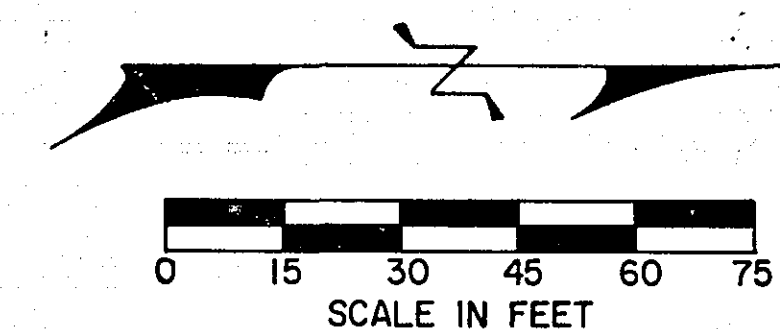
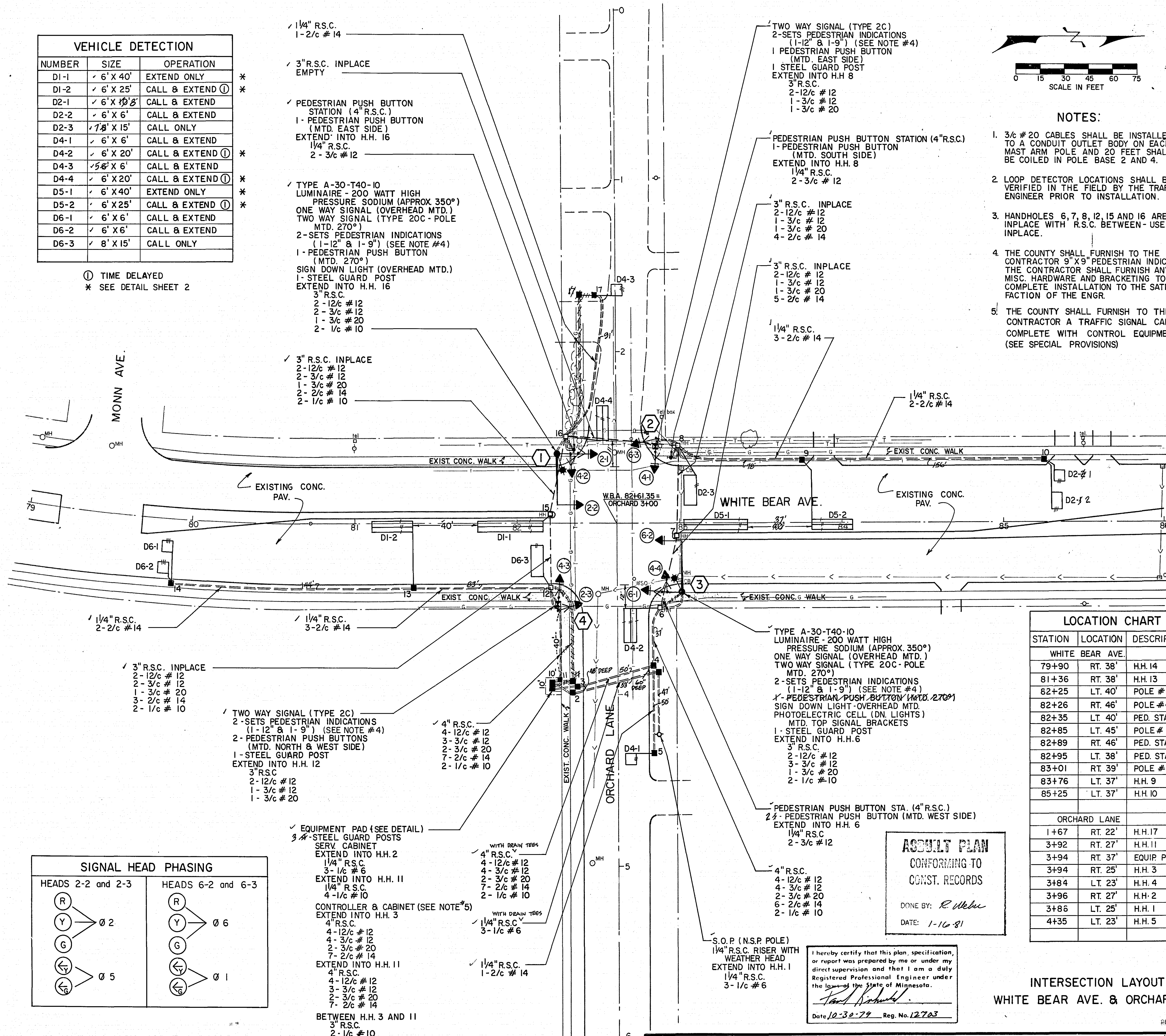
CONTROLLER PHASING DIAGRAM



SIGNAL INDICATION CHART ✓								
FACE	PHASE	FLASH	INDICATION SIZE					
			R	Y	G	←Y	←G	→
2-1	2	Y	12"	12"	12"	—	—	—
2-2	2 and 5	Y	12"	12"	12"	12"	12"	—
2-3	2 and 5	Y	12"	12"	12"	12"	12"	—
4-1	4	R	12"	12"	12"	—	—	—
4-2	4	R	12"	12"	12"	—	—	—
4-3	4	R	12"	12"	12"	—	—	—
4-4	4	R	12"	12"	12"	—	—	—
6-1	6	Y	12"	12"	12"	—	—	—
6-2	6 and 1	Y	12"	12"	12"	12"	12"	—
6-3	6 and 1	Y	12"	12"	12"	12"	12"	—

VEHICLE DETECTION		
NUMBER	SIZE	OPERATION
DI-1	6' X 40'	EXTEND ONLY *
DI-2	6' X 25'	CALL & EXTEND ① *
D2-1	6' X 10' 8"	CALL & EXTEND
D2-2	6' X 6'	CALL & EXTEND
D2-3	1' 8" X 15'	CALL ONLY
D4-1	6' X 6'	CALL & EXTEND
D4-2	6' X 20'	CALL & EXTEND ① *
D4-3	5' 6" X 6'	CALL & EXTEND
D4-4	6' X 20'	CALL & EXTEND ① *
D5-1	6' X 40'	EXTEND ONLY *
D5-2	6' X 25'	CALL & EXTEND ① *
D6-1	6' X 6'	CALL & EXTEND
D6-2	6' X 6'	CALL & EXTEND
D6-3	8' X 15'	CALL ONLY

① TIME DELAYED
* SEE DETAIL SHEET 2



NOTES:

- 3/c # 20 CABLES SHALL BE INSTALLED TO A CONDUIT OUTLET BODY ON EACH MAST ARM POLE AND 20 FEET SHALL BE COILED IN POLE BASE 2 AND 4.
- LOOP DETECTOR LOCATIONS SHALL BE VERIFIED IN THE FIELD BY THE TRAFFIC ENGINEER PRIOR TO INSTALLATION.
- HANDHOLES 6, 7, 8, 12, 15 AND 16 ARE INPLACE WITH R.S.C. BETWEEN - USE INPLACE.
- THE COUNTY SHALL FURNISH TO THE CONTRACTOR 9" X 9" PEDESTRIAN INDICATIONS. THE CONTRACTOR SHALL FURNISH ANY MISC. HARDWARE AND BRACKETING TO COMPLETE INSTALLATION TO THE SATISFACTION OF THE ENGR.
- THE COUNTY SHALL FURNISH TO THE CONTRACTOR A TRAFFIC SIGNAL CABINET COMPLETE WITH CONTROL EQUIPMENT. (SEE SPECIAL PROVISIONS)

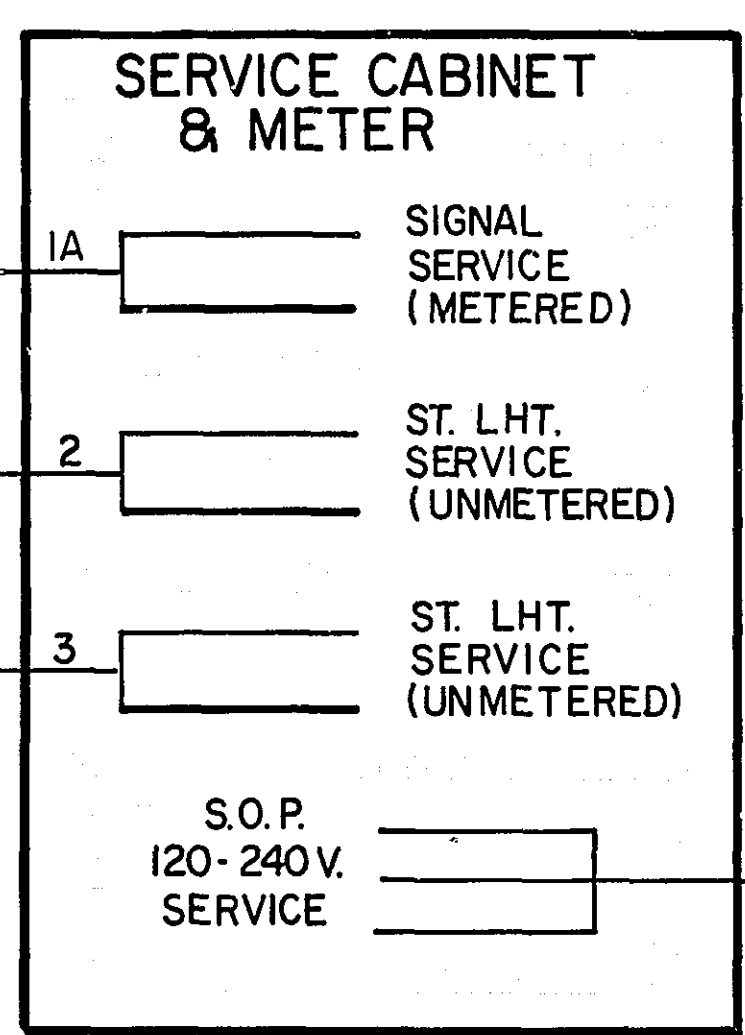
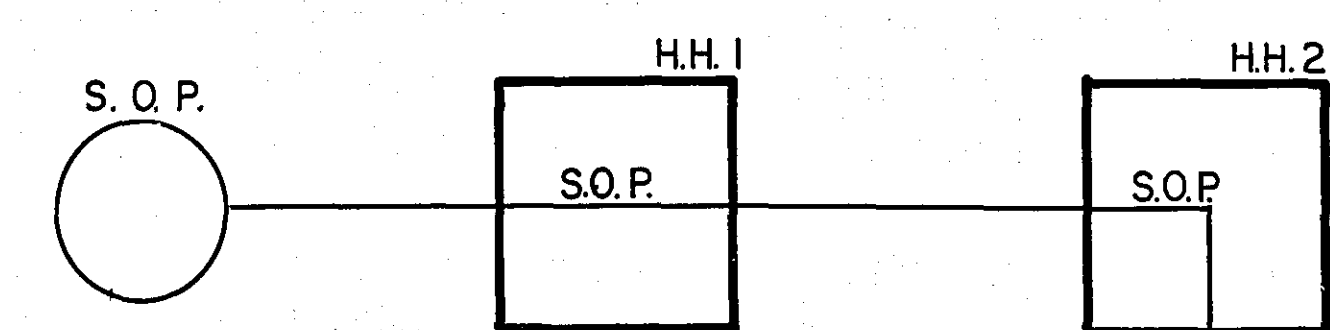
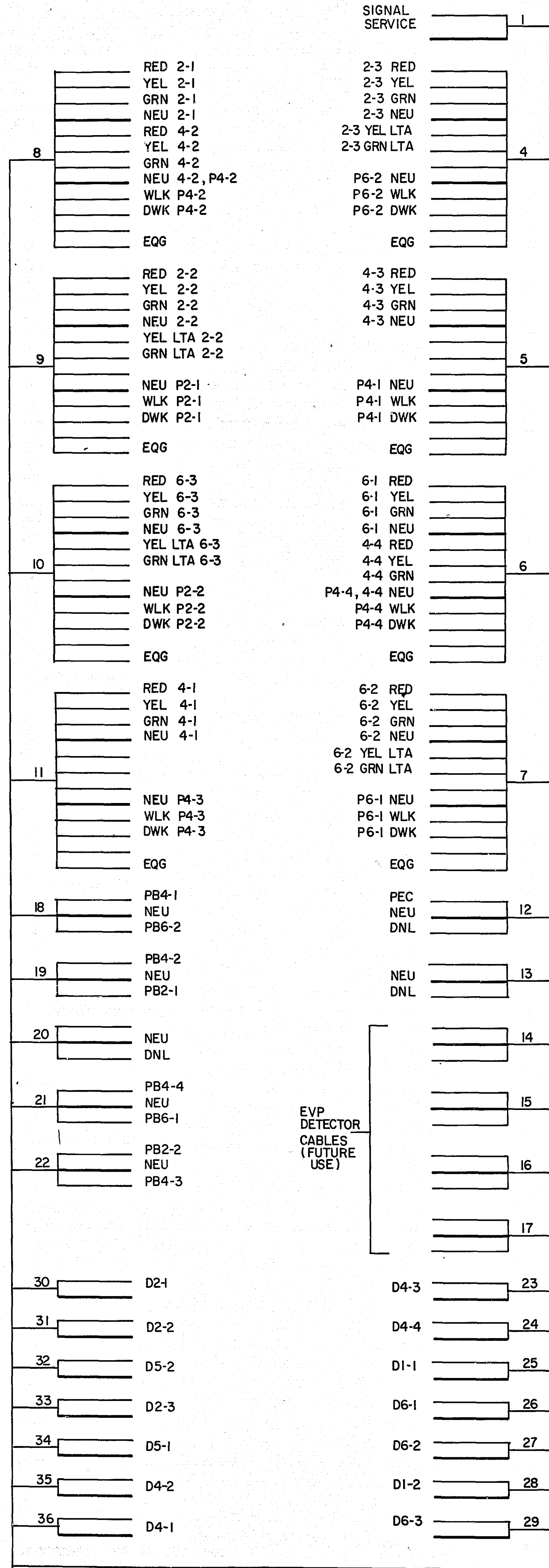
LOCATION CHART		
STATION	LOCATION	DESCRIPTION
WHITE BEAR AVE.		
79+90	RT. 38'	H.H. 14
81+36	RT. 38'	H.H. 13
82+25	LT. 40'	POLE #1
82+26	RT. 46'	POLE #4
82+35	LT. 40'	PED. STA.
82+85	LT. 45'	POLE #2
82+89	RT. 46'	PED. STA.
82+95	LT. 38'	PED. STA.
83+01	RT. 39'	POLE #3
83+76	LT. 37'	H.H. 9
85+25	LT. 37'	H.H. 10
ORCHARD LANE		
1+67	RT. 22'	H.H. 17
3+92	RT. 27'	H.H. 11
3+94	RT. 37'	EQUIP. PAD
3+94	RT. 25'	H.H. 3
3+84	LT. 23'	H.H. 4
3+96	RT. 27'	H.H. 2
3+86	LT. 25'	H.H. 1
4+35	LT. 23'	H.H. 5

ASBUILT PLAN
CONFORMING TO
CONST. RECORDS
DONE BY: R. Nelson
DATE: 1-16-81

I hereby certify that this plan, specification, or report 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: 12-30-79 Reg. No. 12703

INTERSECTION LAYOUT
WHITE BEAR AVE. & ORCHARD LANE

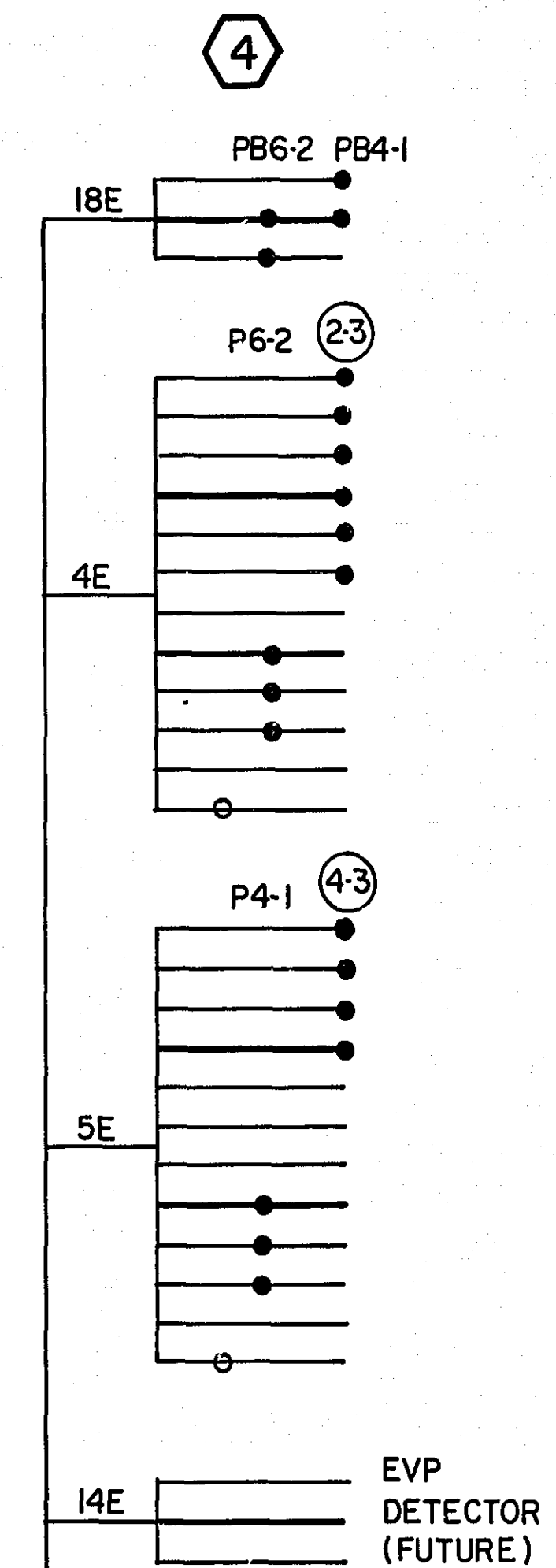
CONTROLLER CABINET



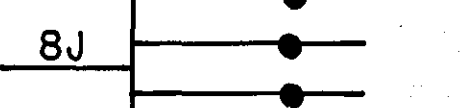
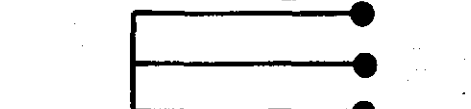
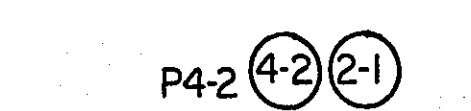
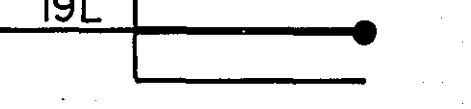
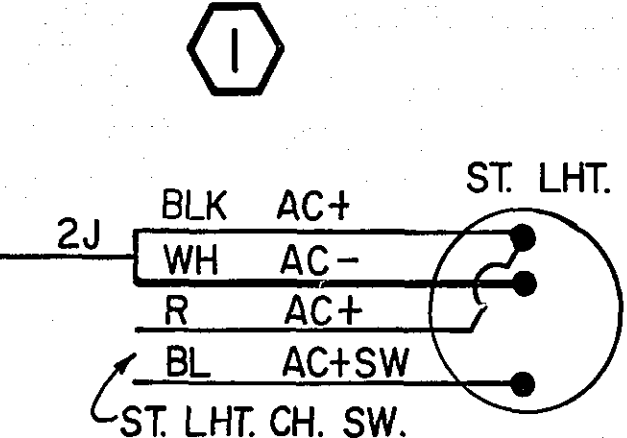
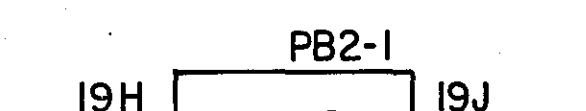
CONDUCTOR COLOR CODING

R	BLK
O	WH
BL	2-1/c #6
WH	2-1/c #10
R/BLK	R
O/BLK	WH
BL/BLK	3/c #12
WH/BLK	BLK
BLK	BLK
BLK/WH	CLEAR
G/BLK	2/c #14
G	

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



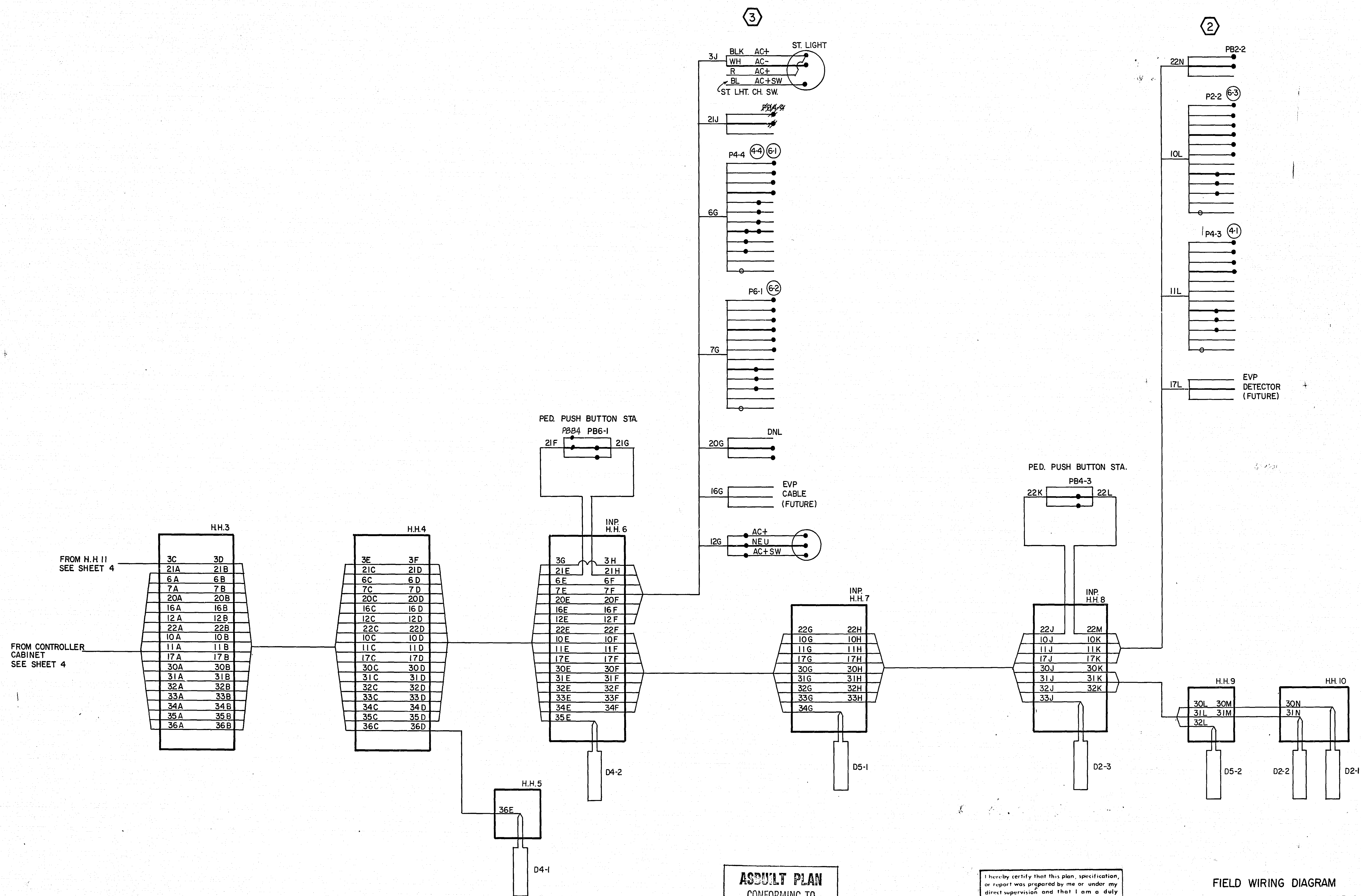
PED. PUSH BUTTON STA.



ASBUILT PLAN
CONFORMING TO
CONST. RECORDS
DONE BY: R. Weber
DATE: 1-16-81

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Date 10-30-77 Reg. No. 12703

FIELD WIRING DIAGRAM
WHITE BEAR AVE & ORCHARD LANE



ASBUILT PLAN
CONFORMING TO
CONST. RECORDS

DONE BY: *R. Nelson*
DATE: 1-16-81

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Paul J. Nelson
Date: 10-30-79 Reg. No. 12703

FIELD WIRING DIAGRAM
WHITE BEAR AVE. & ORCHARD LANE