

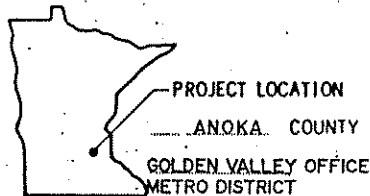
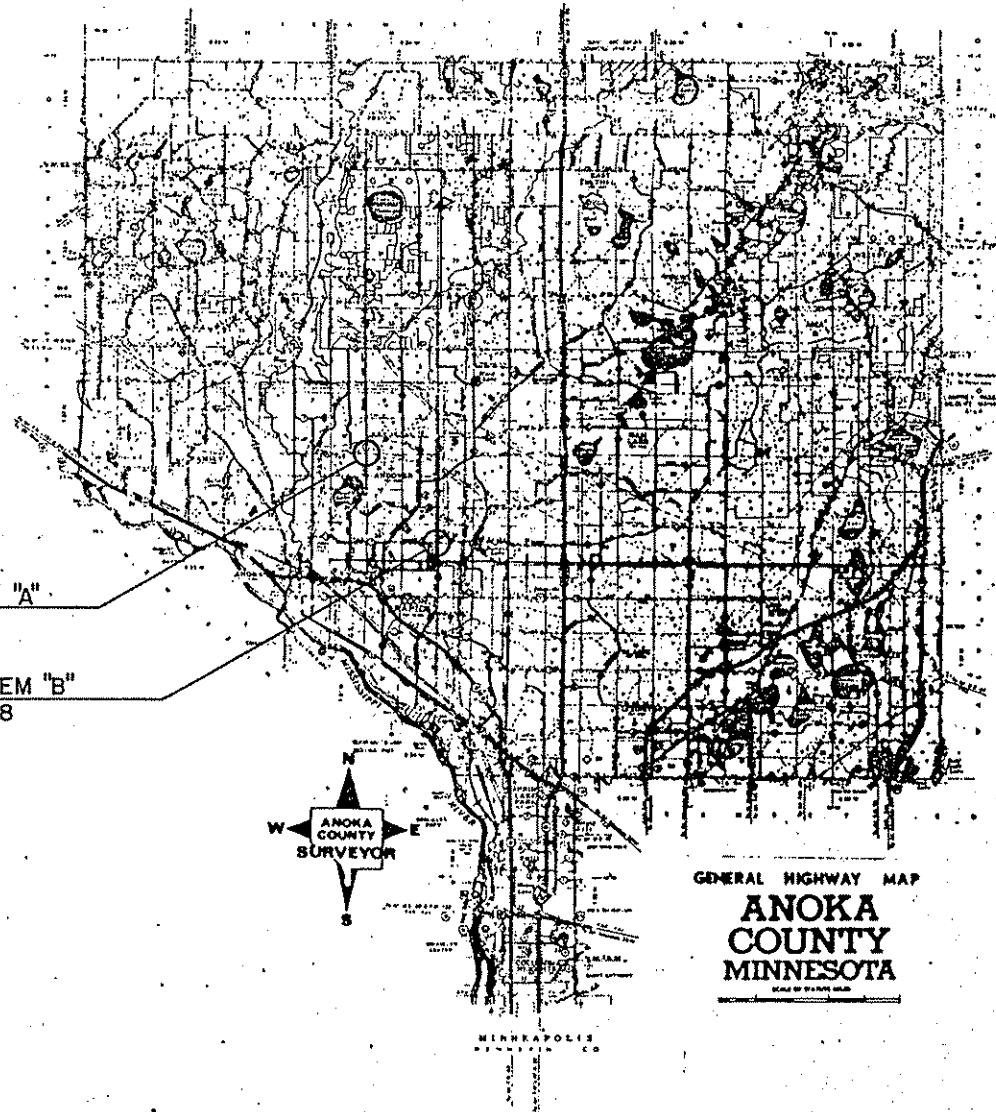
MINNESOTA DEPARTMENT OF TRANSPORTATION

ANOKA COUNTY

CONSTRUCTION PLAN FOR TRAFFIC CONTROL SIGNAL SYSTEMS

LOCATED AT: C.S.A.H. 9 (ROUND LAKE BLVD.) AT C.S.A.H. 20 (157TH AVENUE), SYSTEM "A"
C.S.A.H. 78 (HANSON BLVD.) AT CO. RD. 116 (BUNKER LAKE BLVD.), SYSTEM "B"

INDEX MAP 14,000'
 SIGNAL 30'



MINN. PROJ. NO. _____
 MINN. PROJ. NO. _____

GOVERNING SPECIFICATIONS

THE 1988 EDITION OF THE MINNESOTA DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR CONSTRUCTION" SHALL GOVERN.

SHEET NO.	INDEX	DESCRIPTION
1		TITLE SHEET
2		ESTIMATED QUANTITIES
3-7		INTERSECTION LAYOUT AND WIRING DIAGRAMS
8-10		DETAILS
11-12		UTILITIES

THIS PLAN CONTAINS 12 SHEETS

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.

BRW, Inc.
 DATE 8/30/90 REG. NO. 18095 ENGR. Pete Oruber
 COUNTY ANOKA
 Recommended for Approval James K. Lund 9/10/1990
 Anoka County Engineer
 Recommended for Approval James E. Schwartz 9/10/1990
 City of Andover
 Recommended for Approval C.E. Weeks 9/18/1990
 District State Aid Engineer
 Recommended for Approval Julie Skallman 10/10/1990
 State Aid Plan Review Engineer
 Approved Roy A. Baum 10-11-90
 State Aid Engineer

STATE PROJ. NO. _____ AREA _____ JOB _____


I HEREBY CERTIFY THAT THE FINAL FIELD REVISIONS, IF ANY, OF THIS PLAN WERE MADE 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 _____ REG. NO. _____

STATE AID PROJ. NO. (ANDOVER) 198-020-06

STATE PROJ. NO. _____ SHEET NO. 1 OF 12 SHEETS

ESTIMATED QUANTITIES							
ITEM NO.	ITEM	UNIT	TOTAL ESTIMATED QUANTITIES	90-05-09		90-04-78	
				ANOKA COUNTY	ANDOVER	ANOKA COUNTY	
2105.523	COMMON BORROW (LV)	CU. YD.	12	4.5	7.5		
2211.503	AGGREGATE BASE PLACED, CLASS 5	CU. YD.	10	3.75	6.25		
0331.601	2" THICK BITUMINOUS WEARING COURSE	SQ. YD.	10	3.75	6.25		
0331.601	4-1/2" THICK BITUMINOUS WEARING COURSE	SQ. YD.	100	37.5	62.5		
2565.511	FULL-TRAFFIC-ACTUATED TRAFFIC CONTROL SIGNAL SYSTEM "A"	SIGNAL SYSTEM	1	0.375	0.625		
2565.511	FULL-TRAFFIC-ACTUATED TRAFFIC CONTROL SIGNAL SYSTEM "B"	SIGNAL SYSTEM	1			1	
2575.501	ROADSIDE SEEDING	SQ. YD.	600	75	125	400	
2575.505	SODDING TYPE EROSION	SQ. YD.	100	37.5	62.5		
0565.603	6 PR #19 CABLE (DIRECT BURIAL)	LIN FT	2000			2000	
0565.603	6 PR #19 CABLE IN EXISTING CONDUIT AND OVER HEAD SPAN MTD.	LIN FT	760			760	
0565.603	1-1/2" R.S.C. (PUSHING METHOD)	LIN FT	70			70	

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 State of Minnesota Statutes Sections 326.02 to 326.16. <i>Erik O'Leary</i> Date <u>8/30/88</u> Minn. Reg. No. <u>18095</u>	 BRW <small>BRW, INC.</small> PLANNING TRANSPORTATION ENGINEERING URBAN DESIGN THREESMA SQUARE 700 PARK STREET SOUTH WAPAKONSA, MN 55413 PHONE: (612) 370-2700	ORIGINAL DATE: _____	ESTIMATED QUANTITIES C.P. 90-05-09 C.P. 90-04-78
		REVISIONS: _____	
		DESIGN BY: EOR	
DRAWN BY: RG		SURVEY BOOK	
(ANDOVER) 198-020-06		SHEET <u>2</u> OF <u>12</u>	
		DESIGN FILE No. <u>40-9021</u>	

① 10' PEDESTAL POLE AND BASE
PEDESTAL FOUNDATION
TYPE 2C
2 PEDESTRIAN PUSHBUTTONS AND SIGNS
PEDESTRIAN WALK (SEE DETAIL "A")
FILL AS REQUIRED TO RAISE FOUNDATION
ABOVE STREET GRADE
EXTEND 2" R.S.C. INTO HH 1 WITH:
2-12/C #12
1-3/C #12

② TYPE P90-A-25-D40-9 (DAVIT AT 350°)
P90 POLE FOUNDATION
ONE WAY SIGNAL-OVERHEAD
TYPE IOB POLE MOUNTED AT 90°
TYPE IOA POLE MOUNTED AT 270°
LUMINAIRE-200 WATT H.P.S.
PEDESTRIAN PUSHBUTTON AND SIGN
EXTEND 3" R.S.C. INTO HH 2 WITH:
2-12/C #12
1-3/C #12
2-1/C #10

③ TYPE P90-A-25
P90 POLE FOUNDATION
ONE WAY SIGNAL-OVERHEAD
TYPE IOA POLE MOUNTED AT 90°
TYPE IOB POLE MOUNTED AT 270°
LUMINAIRE-200 WATT H.P.S.
PEDESTRIAN PUSHBUTTON AND SIGN
EXTEND 3" R.S.C. INTO HH 3 WITH:
2-12/C #12
2-3/C #12

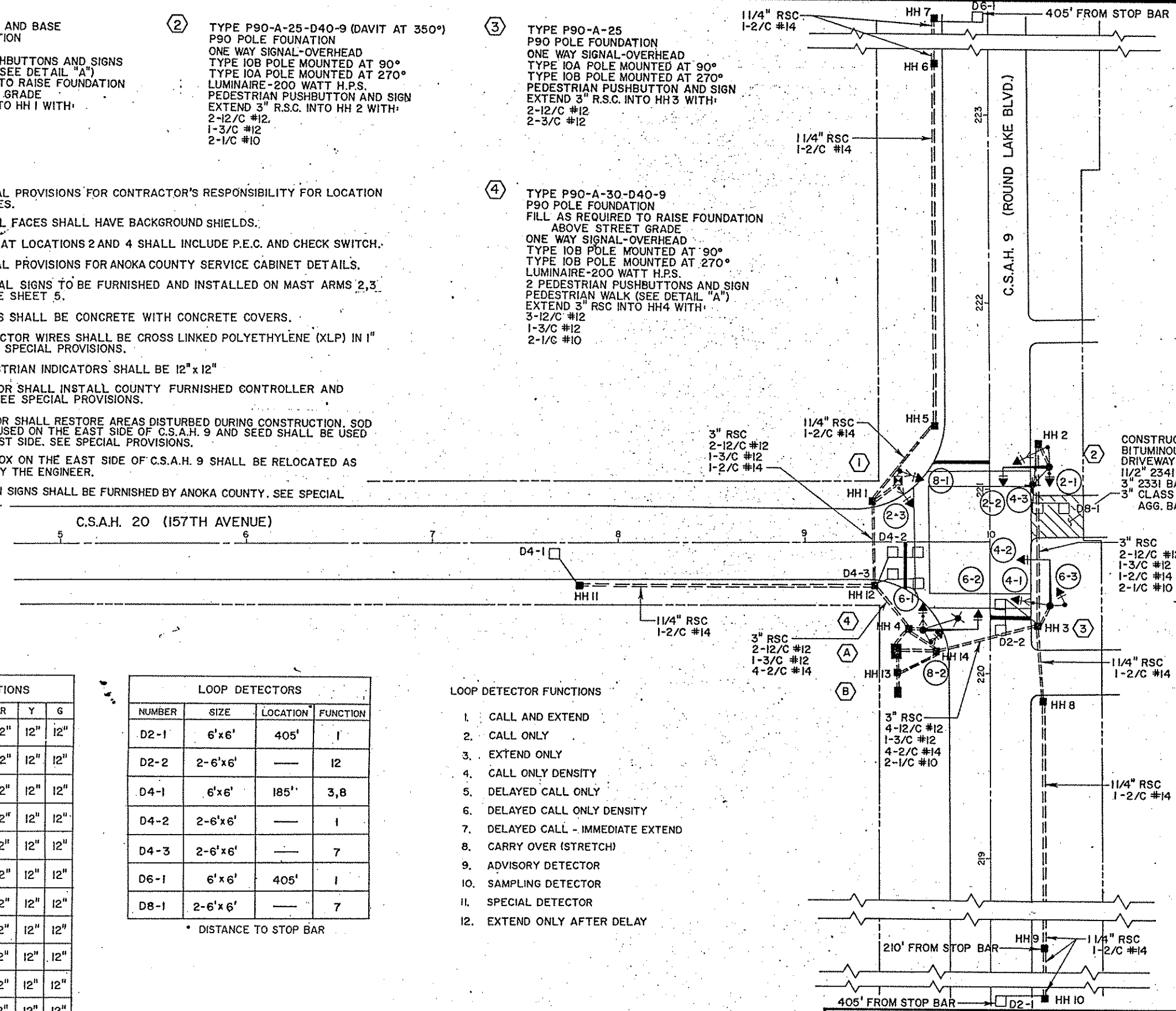
④ TYPE P90-A-30-D40-9
P90 POLE FOUNDATION
FILL AS REQUIRED TO RAISE FOUNDATION
ABOVE STREET GRADE
ONE WAY SIGNAL-OVERHEAD
TYPE IOB POLE MOUNTED AT 90°
TYPE IOB POLE MOUNTED AT 270°
LUMINAIRE-200 WATT H.P.S.
2 PEDESTRIAN PUSHBUTTONS AND SIGN
PEDESTRIAN WALK (SEE DETAIL "A")
EXTEND 3" R.S.C. INTO HH 4 WITH:
3-12/C #12
1-3/C #12
2-1/C #10

Ⓐ CONTROLLER AND CABINET
CABINET FOUNDATION
FILL AS REQUIRED TO RAISE FOUNDATION
ABOVE STREET GRADE
EXTEND INTO HH 13
METERED SIGNAL SERVICE
11/4" RSC
3-1/C #6
EXTEND INTO HH 14
3" RSC
4-12/C #12
1-3/C #12
4-2/C #14
EXTEND INTO HH 4
3" RSC
3-12/C #12
2-3/C #12
4-2/C #14

Ⓑ SERVICE CABINET
CABINET FOUNDATION
FILL AS REQUIRED TO RAISE FOUNDATION
ABOVE STREET GRADE
EXTEND INTO HH 13
METERED SIGNAL SERVICE
11/4" RSC
3-1/C #6
UNMETERED LIGHTING SERVICE
11/4" RSC
4-1/C #10
BETWEEN HH 13 AND HH 14
11/4" RSC
4-1/C #10
BETWEEN HH 14 AND HH 4
11/4" RSC
2-1/C #10
STUB OUT 2" RSC
(FOR SERVICE BY OTHERS)

NOTES:

- 1) SEE SPECIAL PROVISIONS FOR CONTRACTOR'S RESPONSIBILITY FOR LOCATION OF UTILITIES.
- 2) ALL SIGNAL FACES SHALL HAVE BACKGROUND SHIELDS.
- 3) LUMINAIRE AT LOCATIONS 2 AND 4 SHALL INCLUDE P.E.C. AND CHECK SWITCH.
- 4) SEE SPECIAL PROVISIONS FOR ANOKA COUNTY SERVICE CABINET DETAILS.
- 5) DIRECTIONAL SIGNS TO BE FURNISHED AND INSTALLED ON MAST ARMS 2,3 AND 4, SEE SHEET 5.
- 6) HANDHOLES SHALL BE CONCRETE WITH CONCRETE COVERS.
- 7) LOOP DETECTOR WIRES SHALL BE CROSS LINKED POLYETHYLENE (XLP) IN 1" N.M.C. SEE SPECIAL PROVISIONS.
- 8) ALL PEDESTRIAN INDICATORS SHALL BE 12" x 12"
- 9) CONTRACTOR SHALL INSTALL COUNTY FURNISHED CONTROLLER AND CABINET. SEE SPECIAL PROVISIONS.
- 10) CONTRACTOR SHALL RESTORE AREAS DISTURBED DURING CONSTRUCTION. SOD SHALL BE USED ON THE EAST SIDE OF C.S.A.H. 9 AND SEED SHALL BE USED ON THE WEST SIDE. SEE SPECIAL PROVISIONS.
- 11) THE MAILBOX ON THE EAST SIDE OF C.S.A.H. 9 SHALL BE RELOCATED AS DIRECTED BY THE ENGINEER.
- 12) PEDESTRIAN SIGNS SHALL BE FURNISHED BY ANOKA COUNTY. SEE SPECIAL PROVISIONS.



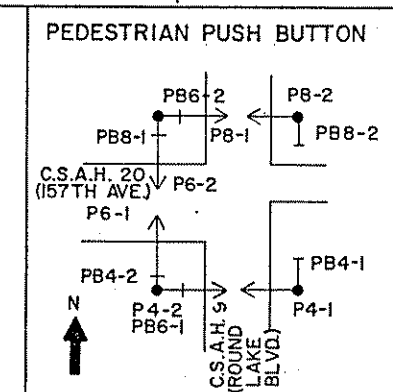
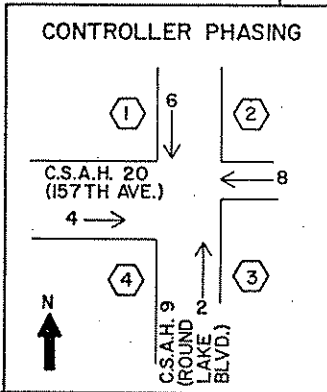
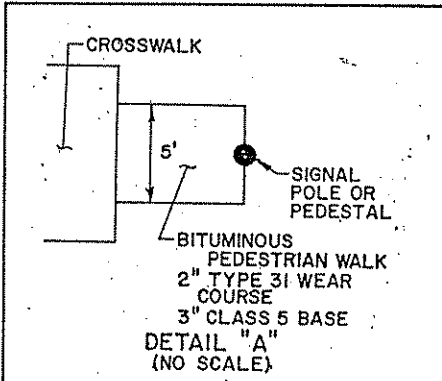
SIGNAL INDICATIONS					
FACE	PHASE	FLASH	R	Y	G
2-1	2	R	12"	12"	12"
2-2	2	R	12"	12"	12"
2-3	2	R	12"	12"	12"
4-1	4	R	12"	12"	12"
4-2	4	R	12"	12"	12"
4-3	4	R	12"	12"	12"
6-1	6	R	12"	12"	12"
6-2	6	R	12"	12"	12"
6-3	6	R	12"	12"	12"
8-1	8	R	12"	12"	12"
8-2	8	R	12"	12"	12"

LOOP DETECTORS			
NUMBER	SIZE	LOCATION	FUNCTION
D2-1	6'x6'	405'	1
D2-2	2-6'x6'	—	12
D4-1	6'x6'	185'	3,8
D4-2	2-6'x6'	—	1
D4-3	2-6'x6'	—	7
D6-1	6'x6'	405'	1
D8-1	2-6'x6'	—	7

* DISTANCE TO STOP BAR

LOOP DETECTOR FUNCTIONS

1. CALL AND EXTEND
2. CALL ONLY
3. EXTEND ONLY
4. CALL ONLY DENSITY
5. DELAYED CALL ONLY
6. DELAYED CALL ONLY DENSITY
7. DELAYED CALL - IMMEDIATE EXTEND
8. CARRY OVER (STRETCH)
9. ADVISORY DETECTOR
10. SAMPLING DETECTOR
11. SPECIAL DETECTOR
12. EXTEND ONLY AFTER DELAY



CAIN
OUSE
ASSOCIATES, INC.

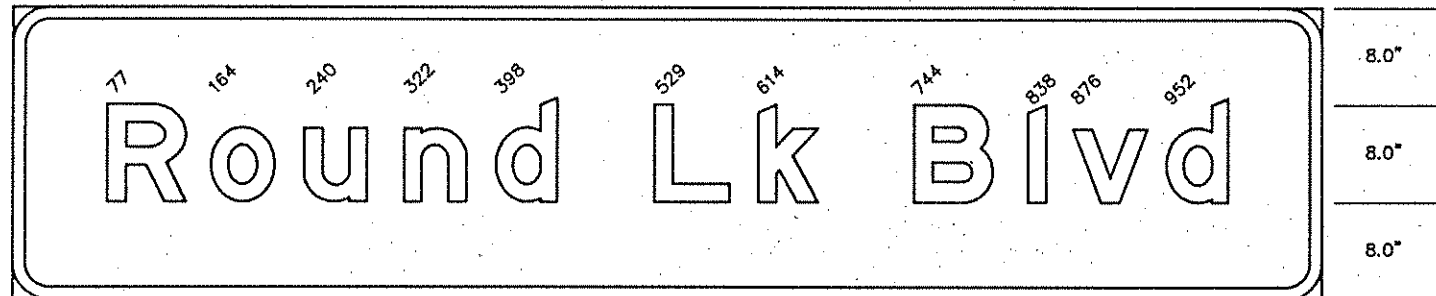
Electrical Engineer's Certification
I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Registered Professional Engineer under the State of Minn. Statutes Sections 326.02 to 326.16.
[Signature]
Date *1/2/20* Minn. Reg. No. *2637*

Civil Engineer's Certification
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 State of Minn. Statutes Sections 326.02 to 326.16.
[Signature]
Date *1/2/20* Minn. Reg. No. *1845*

BRW
BRW, INC.
700 THIRD STREET SOUTH
MINNEAPOLIS, MN 55416
PHONE: (612) 370-0700

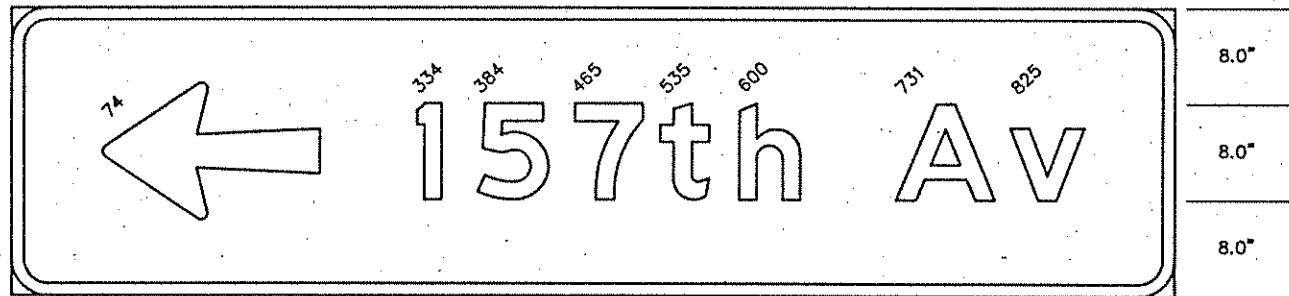
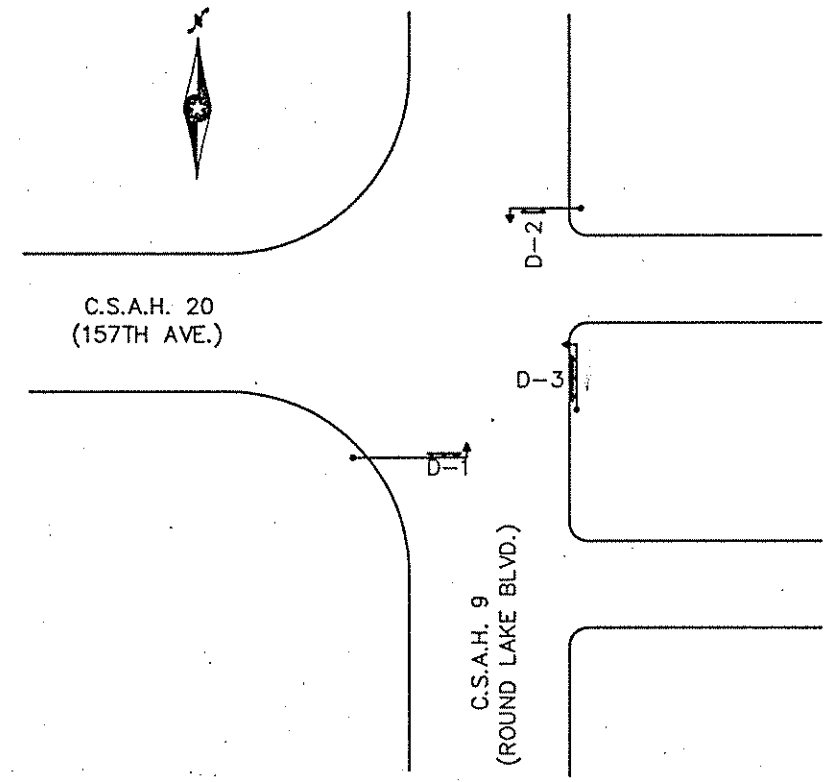
ORIGINAL DATE: _____
REVISIONS: _____
DESIGN BY: _____
DRAWN BY: RJG
SURVEY BK. NO. _____

SIGNAL SYSTEM "A"
INTERSECTION LAYOUT
C.S.A.H. 9 (ROUND LAKE BLVD.)
AT
C.S.A.H. 20 (157TH AVE.)



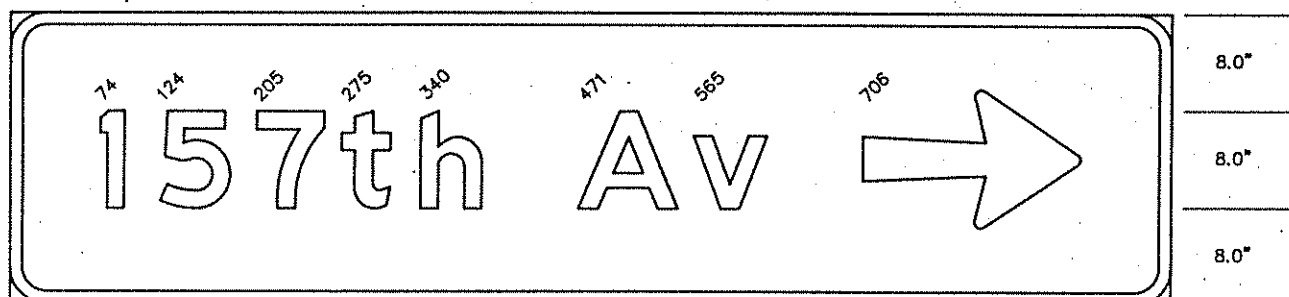
108" x 24" 3" RADIUS 1" BORDER
 LINE 1 92.6: 8" E MOD.

D-3



96" x 24" 3" RADIUS 1" BORDER
 LINE 1 81.1 : 14-18 ARROW, 8" E MOD.

D-2



96" x 24" 3" RADIUS 1" BORDER
 LINE 1 81.1 : 8" E MOD., 14-18 ARROW

D-1

- NOTES: 1. TYPE "D" SIGN PANELS SHALL HAVE WHITE LEGEND ON GREEN BACKGROUND.
 2. CORNERS OF THE SIGN PANELS EXTENDING BEYOND THE BORDER SHALL NOT BE TRIMMED.
 3. SEE STANDARD SIGNS MANUAL FOR ARROW DETAILS.

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 State of Minn. Statutes Sections 326.02 to 326.16. <i>Erik Olesch</i> Date: 8/30/90 Minn. Reg. No. 18095		ORIGINAL DATE 07/05/90 REVISIONS	SIGNAL SYSTEM "A" TYPE "D" SIGNS C.S.A.H. 9 (ROUND LAKE BLVD.) AT C.S.A.H. 20 (157TH AVE.)
		DESIGN BY: FR/ZDM DRAWN BY: TDM CHECKED BY:	
C.P. 90-05-09 ANDOVER 198-020-06		SHEET 5 OF 12 SHEETS	DESIGN FILE No.

① 35' WOOD POLE-CL-2
TYPE IOA POLE MOUNTED AT 90°
TYPE IOA POLE MOUNTED AT 270°
2-DOWN GUY, GUARD, AND ANCHOR
JUNCTION BOX #1
2" RSC RISER AND WEATHERHEAD
2-12/C #12
3-2/C #14
1 1/4" RSC RISER BELOW J.B. 1 EXTENDED
INTO HH 14 WITH:
3-2/C #14

② 35' WOOD POLE-CL-2
TYPE IOA POLE MOUNTED AT 90°
TYPE IOA POLE MOUNTED AT 270°
2-DOWN GUY, GUARD, AND ANCHOR
LUMINAIRE-200 WATT H.P.S.
JUNCTION BOX #2
2-2" RSC RISERS AND WEATHERHEADS
EXTENDED INTO HH 1 WITH:
5-12/C #12
9-2/C #14
2-1/C #10
1-6 PR #19

③ 35' WOOD POLE-CL-2
TYPE IOA POLE MOUNTED AT 90°
TYPE IOA POLE MOUNTED AT 270°
2-DOWN GUY, GUARD, AND ANCHOR
JUNCTION BOX #3
2" RSC RISER AND WEATHERHEAD
1-12/C #12
3-2/C #14
1 1/4" RSC RISER BELOW J.B. 3 EXTENDED
INTO HH 3 WITH:
3-2/C #14

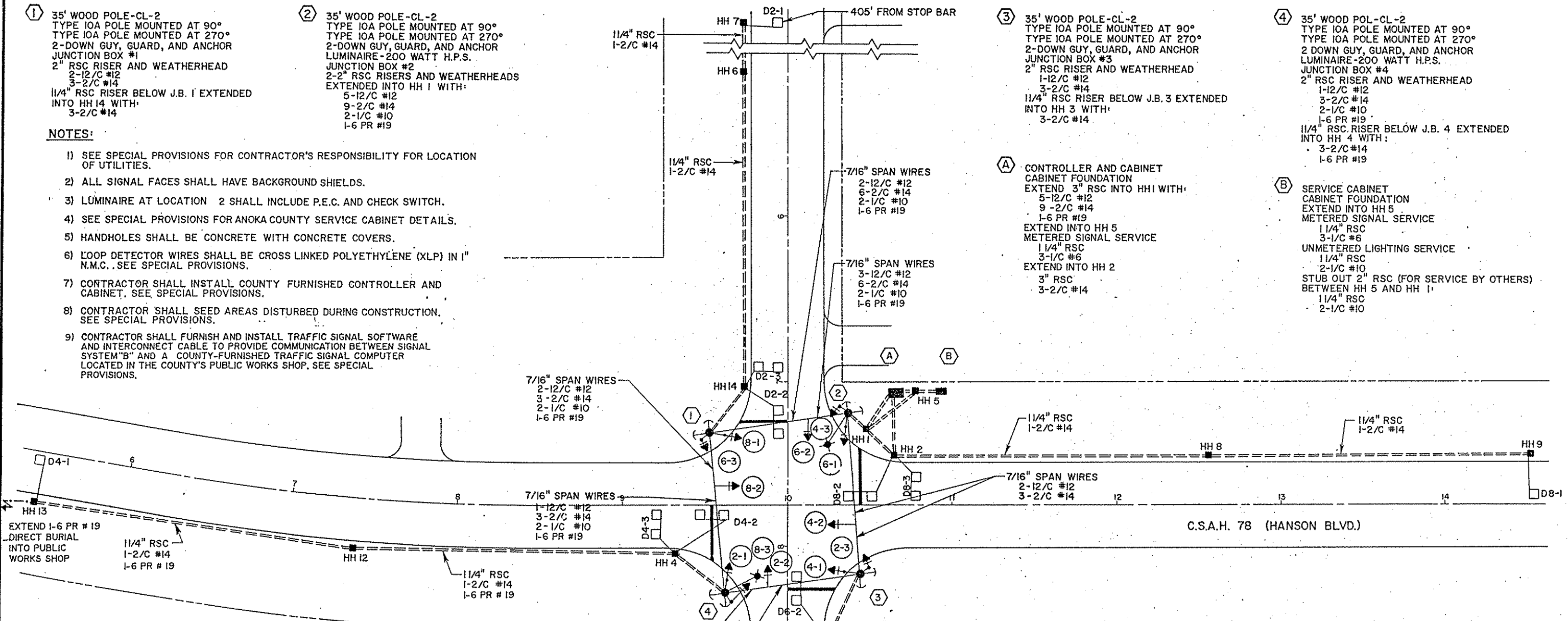
④ 35' WOOD POL-CL-2
TYPE IOA POLE MOUNTED AT 90°
TYPE IOA POLE MOUNTED AT 270°
2 DOWN GUY, GUARD, AND ANCHOR
LUMINAIRE-200 WATT H.P.S.
JUNCTION BOX #4
2" RSC RISER AND WEATHERHEAD
1-12/C #12
3-2/C #14
2-1/C #10
1-6 PR #19
1 1/4" RSC RISER BELOW J.B. 4 EXTENDED
INTO HH 4 WITH:
3-2/C #14
1-6 PR #19

A CONTROLLER AND CABINET
CABINET FOUNDATION
EXTEND 3" RSC INTO HH1 WITH:
5-12/C #12
9-2/C #14
1-6 PR #19
EXTEND INTO HH 5
METERED SIGNAL SERVICE
1 1/4" RSC
3-1/C #6
EXTEND INTO HH 2
3" RSC
3-2/C #14

B SERVICE CABINET
CABINET FOUNDATION
EXTEND INTO HH 5
METERED SIGNAL SERVICE
1 1/4" RSC
3-1/C #6
UNMETERED LIGHTING SERVICE
1 1/4" RSC
2-1/C #10
STUB OUT 2" RSC (FOR SERVICE BY OTHERS)
BETWEEN HH 5 AND HH 1:
1 1/4" RSC
2-1/C #10

NOTES:

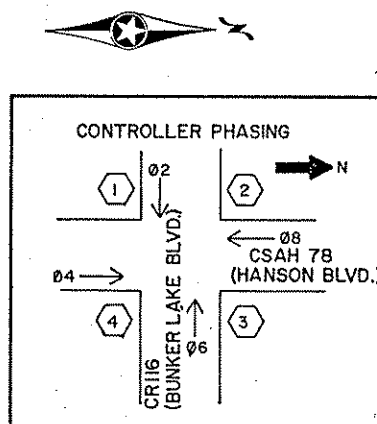
- 1) SEE SPECIAL PROVISIONS FOR CONTRACTOR'S RESPONSIBILITY FOR LOCATION OF UTILITIES.
- 2) ALL SIGNAL FACES SHALL HAVE BACKGROUND SHIELDS.
- 3) LUMINAIRE AT LOCATION 2 SHALL INCLUDE P.E.C. AND CHECK SWITCH.
- 4) SEE SPECIAL PROVISIONS FOR ANOKA COUNTY SERVICE CABINET DETAILS.
- 5) HANDHOLES SHALL BE CONCRETE WITH CONCRETE COVERS.
- 6) LOOP DETECTOR WIRES SHALL BE CROSS LINKED POLYETHYLENE (XLP) IN 1" N.M.C. SEE SPECIAL PROVISIONS.
- 7) CONTRACTOR SHALL INSTALL COUNTY FURNISHED CONTROLLER AND CABINET. SEE SPECIAL PROVISIONS.
- 8) CONTRACTOR SHALL SEED AREAS DISTURBED DURING CONSTRUCTION. SEE SPECIAL PROVISIONS.
- 9) CONTRACTOR SHALL FURNISH AND INSTALL TRAFFIC SIGNAL SOFTWARE AND INTERCONNECT CABLE TO PROVIDE COMMUNICATION BETWEEN SIGNAL SYSTEM "B" AND A COUNTY-FURNISHED TRAFFIC SIGNAL COMPUTER LOCATED IN THE COUNTY'S PUBLIC WORKS SHOP. SEE SPECIAL PROVISIONS.



SIGNAL INDICATIONS					
FACE	PHASE	FLASH	R	Y	G
2-1	2	R	12"	12"	12"
2-2	2	R	12"	12"	12"
2-3	2	R	12"	12"	12"
4-1	4	R	12"	12"	12"
4-2	4	R	12"	12"	12"
4-3	4	R	12"	12"	12"
6-1	6	R	12"	12"	12"
6-2	6	R	12"	12"	12"
6-3	6	R	12"	12"	12"
8-1	8	R	12"	12"	12"
8-2	8	R	12"	12"	12"
8-3	8	R	12"	12"	12"

LOOP DETECTORS			
NUMBER	SIZE	LOCATION	FUNCTION
D2-1	6'x6'	405	1
D2-2	2-6'x6'	---	12
D2-3	2-6'x6'	30	2
D4-1	6'x6'	405	1
D4-2	2-6'x6'	---	12
D4-3	2-6'x6'	30	2
D6-1	6'x6'	405	1
D6-2	2-6'x6'	---	12
D6-3	2-6'x6'	30	2
D8-1	6'x6'	405	1
D8-2	2-6'x6'	---	12
D8-3	2-6'x6'	30	2

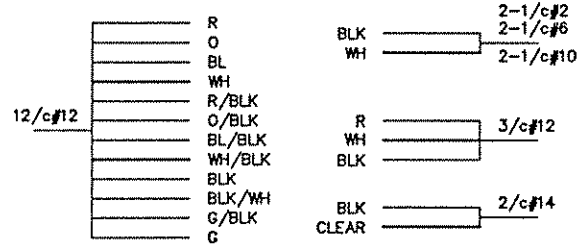
- LOOP DETECTOR FUNCTIONS
1. CALL AND EXTEND
 2. CALL ONLY
 3. EXTEND ONLY
 4. CALL ONLY DENSITY
 5. DELAYED CALL ONLY
 6. DELAYED CALL ONLY DENSITY
 7. DELAYED CALL - IMMEDIATE EXTEND
 8. CARRY OVER (STRETCH)
 9. ADVISORY DETECTOR
 10. SAMPLING DETECTOR
 11. SPECIAL DETECTOR
 12. EXTEND ONLY AFTER DELAY



* DISTANCE TO STOP BAR

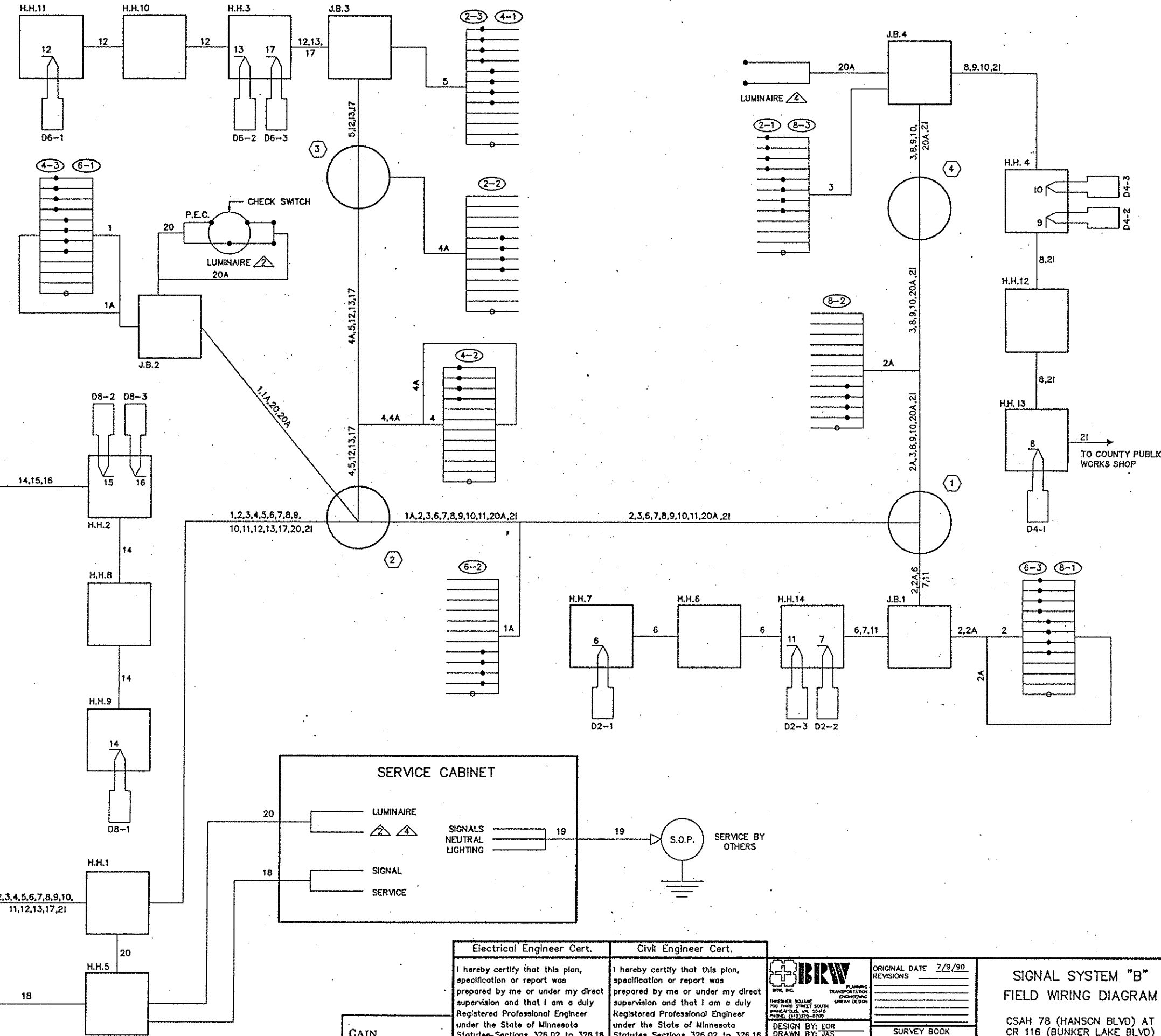
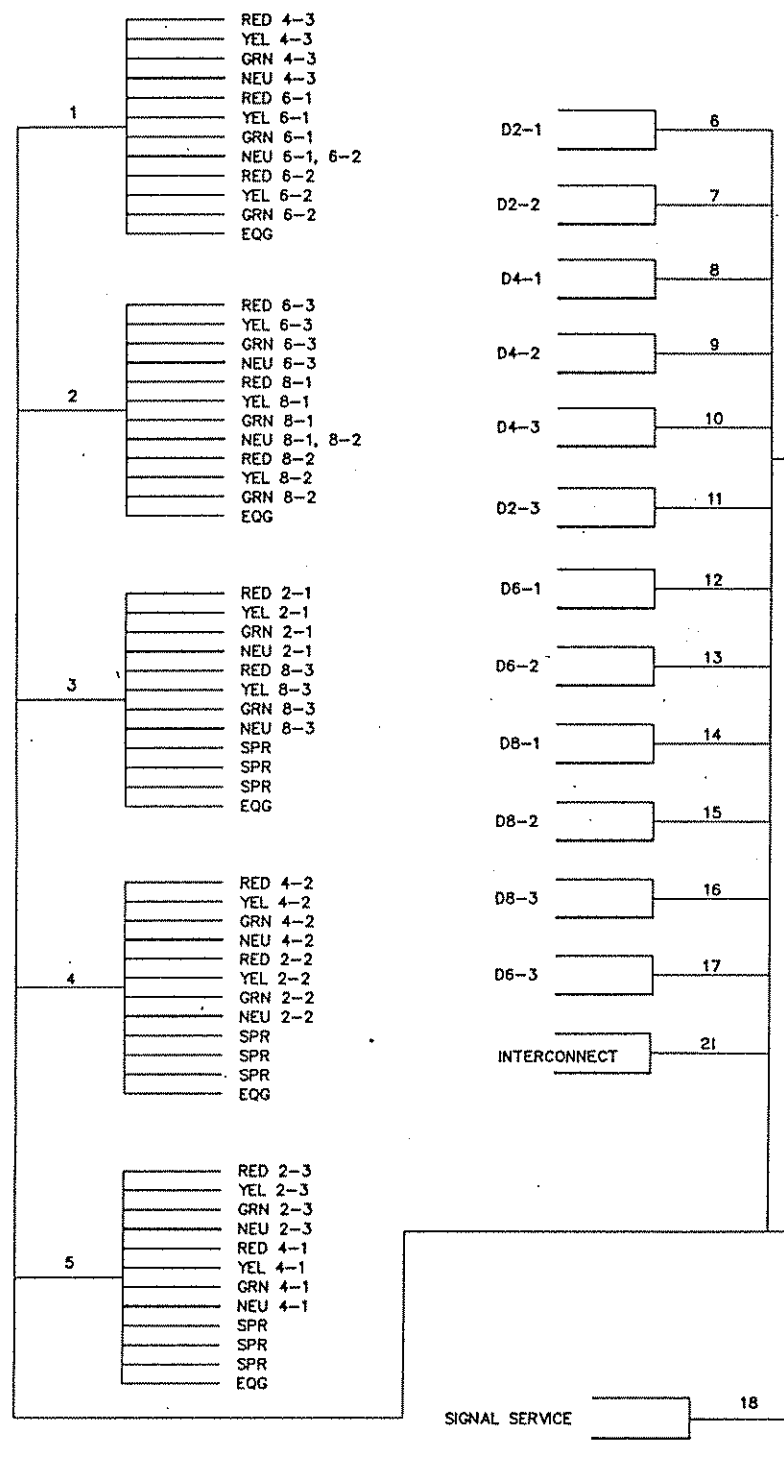
<p>Electrical Engineer's Certification</p> <p>I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Registered Professional Engineer under the State of Minn. Statutes Sections 326.02 to 326.16.</p> <p><i>J. J. C.</i> Date 8/30/90 Minn. Reg. No. 72632</p>	<p>Civil Engineer's Certification</p> <p>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 State of Minn. Statutes Sections 326.02 to 326.16.</p> <p><i>Eric O. P.</i> Date 8/30/90 Minn. Reg. No. 18095</p>	<p>BRW, INC.</p> <p>700 THIRD STREET SOUTH MINNEAPOLIS, MN 55416 PHONE: (612) 370-0700</p> <p>DESIGN BY: ER DRAWN BY: RG</p>	<p>ORIGINAL DATE: _____</p> <p>REVISIONS: _____</p> <p>SURVEY BK. NO. _____</p>	<p>SIGNAL SYSTEM "B" INTERSECTION LAYOUT CSAH 78 (HANSON BLVD.) AT CR 116 (BUNKER LAKE BLVD.)</p>
<p>C.P. 90-04-78 (ANDOVER) 198-020-06 SHEET 6 OF 12</p>			<p>DESIGN FILE No. 49-9021</p>	

CONDUCTOR COLOR CODING



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

CONTROLLER CABINET



CAIN
OUSE
ASSOCIATES, INC.

<p>Electrical Engineer Cert.</p> <p>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 State of Minnesota Statutes Sections 326.02 to 326.16.</p> <p><i>[Signature]</i> Date: 9/10/90 Minn. Reg. No. 12427</p>	<p>Civil Engineer Cert.</p> <p>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 State of Minnesota Statutes Sections 326.02 to 326.16.</p> <p><i>[Signature]</i> Date: 9/10/90 Minn. Reg. No. 18015</p>
--	---

IBRW
PLANNING
TRANSPORTATION
ENGINEERING
URBAN DESIGN

DESIGN BY: EOR
DRAWN BY: JAS
CHK'D BY:

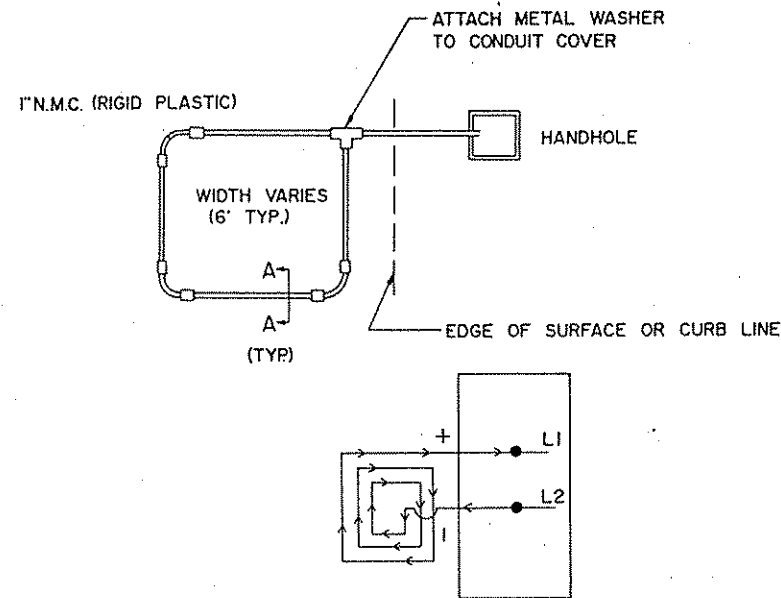
ORIGINAL DATE	7/9/90
REVISIONS	
SURVEY BOOK	

SIGNAL SYSTEM "B"
FIELD WIRING DIAGRAM

CSAH 78 (HANSON BLVD) AT
CR 116 (BUNKER LAKE BLVD)

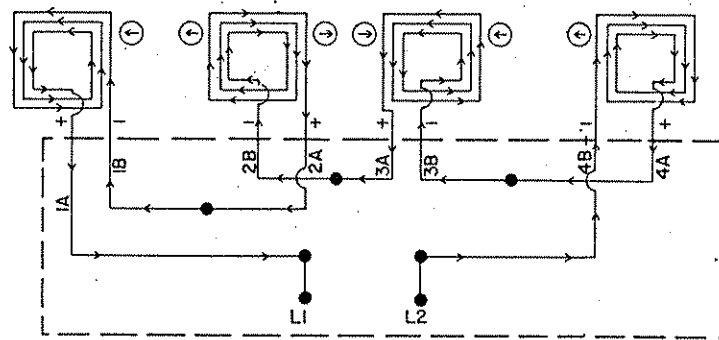
LOOP DETECTOR DETAIL "A"

PLAN VIEW
(NOT TO SCALE)



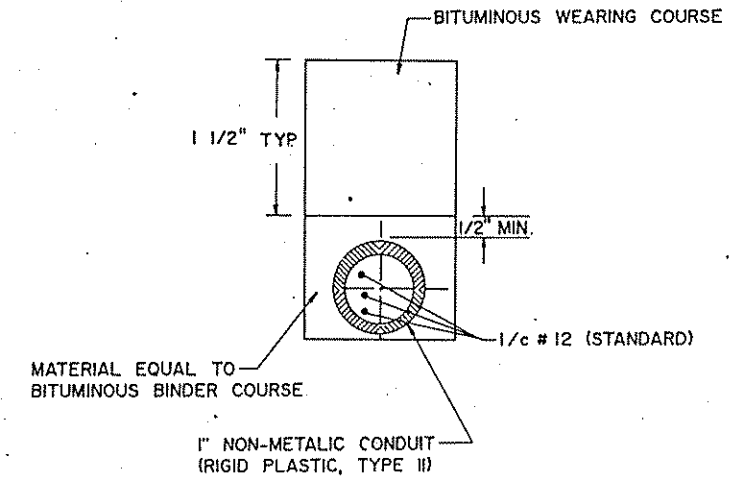
LOOP DETECTOR DETAIL "C"

PLAN VIEW (NOT TO SCALE)
(LOOP PHASING FOR SERIES CONNECTION)



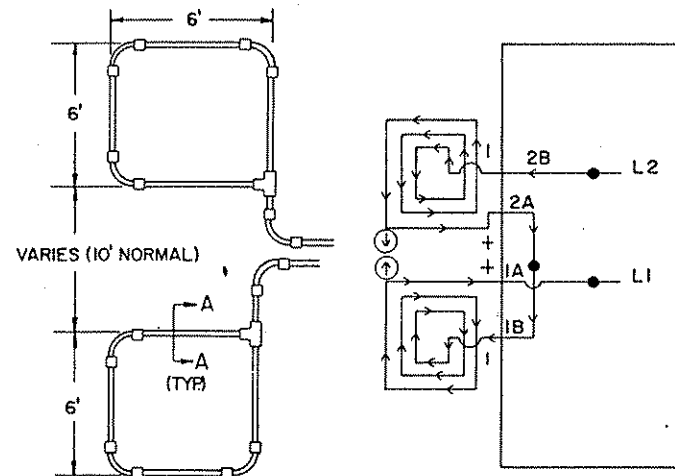
LOOP CONNECTIONS SHALL BE SPLICED IN THE HANDHOLE AS FOLLOWS:
L1 TO 1A, 1B TO 2A, 2B TO 3A, 3B TO 4A, AND 4B TO L2. SPLICE CONTROL CABLE TO L1 & L2 IN HANDHOLE. ALL CONDUCTORS SHALL BE TAGGED IN HANDHOLE (1A, 1B, ETC.)

CROSS SECTION A-A



CONDUIT INSTALLATION DETAIL FOR LOOP DETECTORS

LOOP DETECTOR CONDUITS ARE TO BE INSTALLED IN 3" CUT TRENCHES AS SHOWN ON PLANS. INSTALL EACH COMPLETE DETECTOR ASSEMBLY WITH THE DETECTOR WIRE PULLED THROUGH THE COMPLETE ASSEMBLY TO HANDHOLE. WHERE APPROPRIATE, PLACE DETECTOR CONDUIT IN BITUMINOUS BINDER COURSE PRIOR TO PLACEMENT OF THE WEARING COURSE. THE DEPTH OF THE TRENCH AND THE RESULTANT PLACEMENT OF THE DETECTOR CONDUIT SHALL BE SUCH THAT THE ENTIRE DETECTOR ASSEMBLY DRAINS INTO THE HANDHOLE. BACKFILL AND COMPACT THE TRENCHES WITH MATERIAL EQUIVALENT TO THE MATERIAL REMOVED.

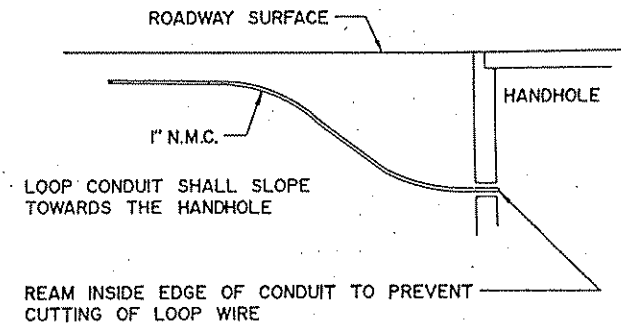
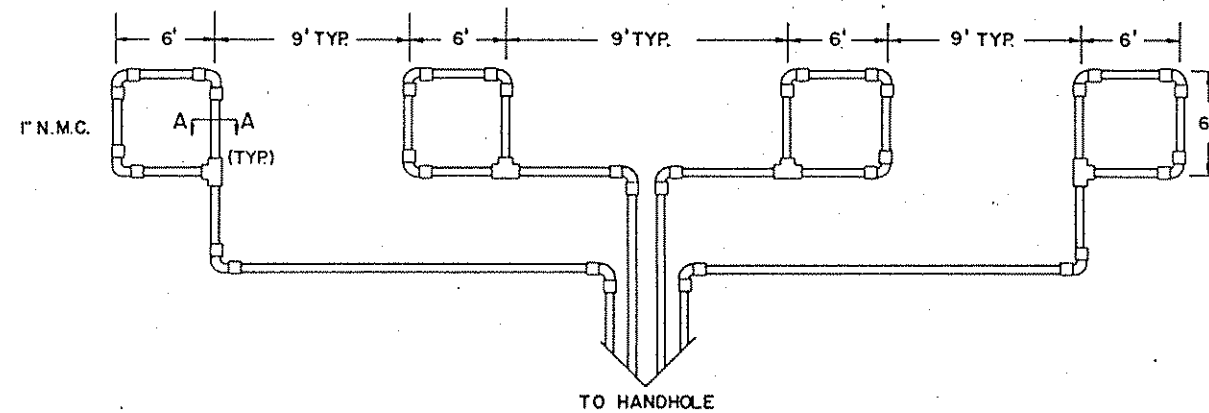
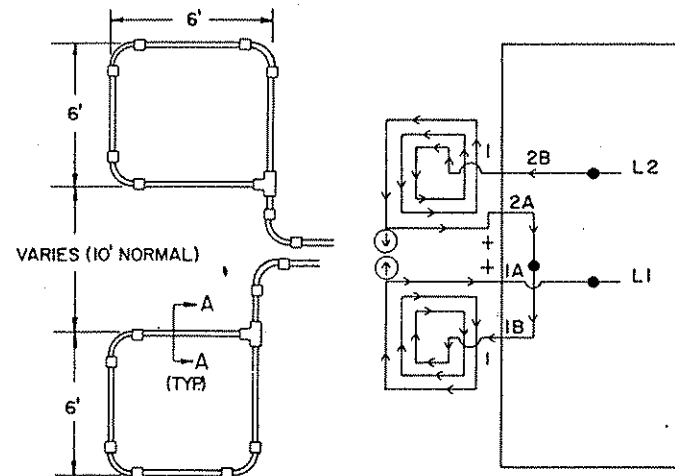


CONDUITS MAY BE PLACED IN COMMON TRENCH.

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

LOOP DETECTOR DETAIL "B"

PLAN VIEW
(NOT TO SCALE)
(TYPICAL)



DRAINAGE DETAILS

- NOTES:
- 1) ALL CORNERS SHALL BE STANDARD 90° CONDUIT BENDS.
 - 2) CONNECT WIRES IN HANDHOLES USING THE SPLICE KIT METHOD. SEE SPECIAL PROVISIONS.
 - 3) LOOP DETECTOR WIRES SHALL BE CROSS LINKED POLYETHYLENE (XLP) SEE SPECIAL PROVISIONS.
 - 4) LOOP WIRES SHALL BE TWISTED A MIN. OF 1 TURN PER 3 FEET FROM THE LOOP TO THE CONDUIT AND 3 TURNS PER FOOT THROUGH THE CONDUIT TO THE HANDHOLE.
 - 5) N.M.C. DESIGNATES NON-METALLIC CONDUIT (SPEC 3803).
 - 6) LOOPS 6'x6' THRU 6'x14' SHALL HAVE THREE (3) TURNS.
 - 7) LOOPS 6'x15' AND LARGER SHALL HAVE TWO (2) TURNS.

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ELEC. ENGR. CERT.	CIVIL ENGR. CERT.
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 State of Minn. Statutes Sections 326.02 to 326.16.	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 State of Minn. Statutes Sections 326.02 to 326.16.
<i>[Signature]</i>	<i>[Signature]</i>
Date 8/19/90 Minn. Reg. No. 11112	Date 8/30/90 Minn. Reg. No. 18015

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PLANNING
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ENGINEERING
URBAN DESIGN
THRESHOLD SQUARE
700 THIRD STREET SOUTH
MINNEAPOLIS, MN 55415
PHONE: (612)370-9700

ORIGINAL DATE: _____	REVISIONS: _____
DESIGN BY: EQR	SURVEY BK. NO. _____
DRAWN BY: KJM	

DETECTOR DETAILS

C.P. 90-05-09
C.P. 90-04-78

(ANDOVER) 198-020-06

SHEET 8 OF 12

DESIGN FILE
No. 40-902L

STANDARD PLATES	
PLATE NO.	DESCRIPTION
* 8110 C	TRAFFIC SIGNAL BRACKETING - POLE MOUNTED
* 8111 B	TRAFFIC SIGNAL BRACKETING - PEDESTAL MOUNTED
* 8112 C	PEDESTAL FOUNDATION
8113 C	MAGNETIC VEHICLE DETECTOR INSTALLATION
* 8115 C	PEDESTRIAN PUSH BUTTON INSTALLATION
* 8117 F	PRECAST CONCRETE HANDHOLE
8118 C	SERVICE EQUIPMENT AND POLE
* 8119 C	GROUND MOUNTED CABINET FOUNDATION
* 8120 H	P-80 AND P-90 POLE FOUNDATION
* 8121 B	TRANSFORMER BASE WITH POLE BASE PLATE
* 8122 C	PEDESTAL AND PEDESTAL BASE
* 8123 B	POLE AND MAST ARM
* 8124 D	SIGNAL HEAD MOUNTS
* 8126 C	P-100 POLE FOUNDATION
8130 D	SAW CUT LOOP DETECTORS

* STANDARD PLATES APPLICABLE TO THIS PLAN

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
W/BLK-WHITE WITH BLACK TRACER
BLK-BLACK
BLK/WH-BLACK WITH WHITE TRACER
G/BLK-GREEN WITH BLACK TRACER
G-GREEN

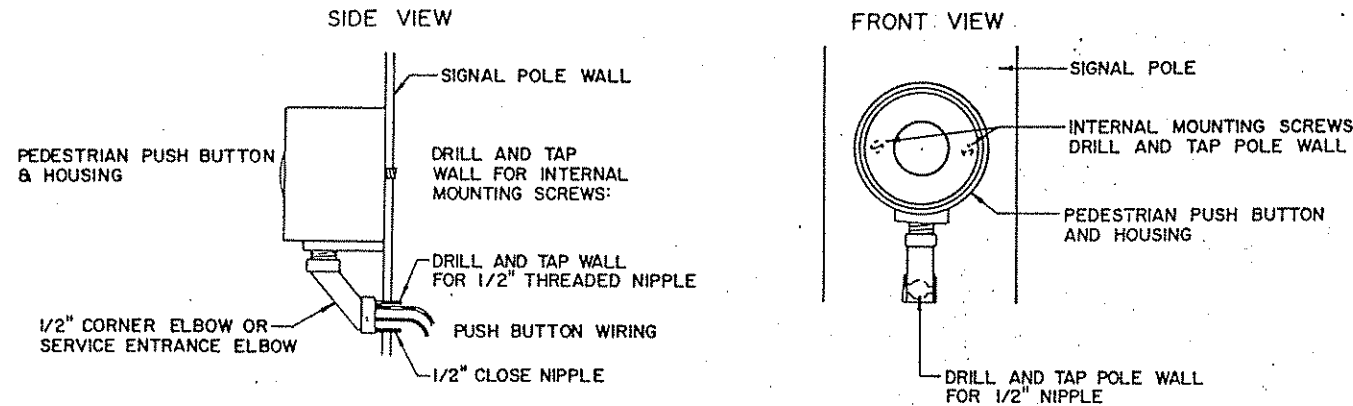
ABBREVIATIONS
EQUIPMENT AND INDICATIONS

R,RED-RED
Y,YEL-YELLOW
G,GRN-GREEN
WLK-WALK
NEU-NEUTRAL
DWK-DON'T WALK
LUM-LUMINAIRE
DNL-DOWNLIGHT
HH-HANDHOLE
EGG-EQUIPMENT GROUND
R.S.C.-RIGID STEEL CONDUIT
GLTA-GREEN LEFT TURN ARROW
YRTA-YELLOW RIGHT TURN ARROW
D2-1(eg)-DETECTOR-PHASE "2"
GR.R-GROUND ROD
SER.-SERVICE
P2-2 PEDESTRIAN INDICATIONS-PHASE "2"
2-1(eg)-SIGNAL HEADS-PHASE "2"
SPR-SPARE CONDUCTORS
N.M.C.-NON METALLIC CONDUIT
E.V.P.-EMERGENCY VEHICLE PRE-EMPTION
J.B.-JUNCTION BOX
W.P.-WOOD POLE
P.E.C.-PHOTOELECTRIC CELL
Br.Gr.-BARE GROUND

LEGEND OF SYMBOLS

CONTROLLER AND SERVICE EQPT. NO'S _____ [Symbol: A in diamond]
 SIGNAL BASE NO. _____ [Symbol: I in diamond]
 SIGNAL FACE NO. _____ [Symbol: H in diamond]
 LUMINAIRE NO. _____ [Symbol: Triangle with A]
 CONTROLLER AND CABINET _____ [Symbol: Rectangle with A]
 CONTROLLER AND CABINET-IN PLACE _____ [Symbol: Rectangle]
 HANDHOLE _____ [Symbol: Square with dot]
 HANDHOLE-IN PLACE _____ [Symbol: Square]
 RIGID STEEL CONDUIT (R.S.C.) _____ [Symbol: Dashed line]
 RIGID STEEL CONDUIT (R.S.C.)-IN PLACE _____ [Symbol: Dashed line with bar]
 SIGNAL FACE WITH BACKGROUND SHIELD _____ [Symbol: Arrow with bar]
 SIGNAL FACE W/O BACKGROUND SHIELD _____ [Symbol: Arrow]
 SIGNAL FACE-IN PLACE _____ [Symbol: Arrow with bar]
 PEDESTRIAN INDICATIONS _____ [Symbol: Arrow with dot]
 PEDESTRIAN INDICATIONS-IN PLACE _____ [Symbol: Arrow with bar]
 PEDESTRIAN PUSH BUTTON ON PEDESTAL OR POLE _____ [Symbol: Square with dot]
 PEDESTRIAN PUSH BUTTON STATION _____ [Symbol: Square with dot and circle]
 TRAFFIC SIGNAL PEDESTAL _____ [Symbol: Square with dot]
 TRAFFIC SIGNAL PEDESTAL-IN PLACE _____ [Symbol: Square with dot and bar]
 TRAFFIC SIGNAL POLE AND MAST ARM _____ [Symbol: Circle with dot]
 TRAFFIC SIGNAL POLE AND MAST ARM-IN PLACE _____ [Symbol: Circle with dot and bar]
 STREET LIGHT POLE AND LUMINAIRE _____ [Symbol: Circle with dot and star]
 STREET LIGHT POLE AND LUMINAIRE-IN PLACE _____ [Symbol: Circle with dot, star, and bar]
 MAST ARM AND LUMINAIRE _____ [Symbol: Circle with dot and star]
 MAST ARM AND LUMINAIRE-IN PLACE _____ [Symbol: Circle with dot, star, and bar]
 WOOD POLE _____ [Symbol: Circle with dot]
 WOOD POLE-IN PLACE _____ [Symbol: Circle with dot and bar]
 SOURCE OF POWER _____ [Symbol: Circle with dot]
 RAILROAD SIGNAL-IN PLACE _____ [Symbol: Circle with dot and bar]
 RIGHT OF WAY LINE _____ [Symbol: Dashed line]
 CENTER LINE _____ [Symbol: Dashed line with bar]
 EDGE OF ROADWAY _____ [Symbol: Dashed line]
 SHOULDER LINE _____ [Symbol: Dashed line]
 CURB LINE _____ [Symbol: Dashed line]
 STOP BAR _____ [Symbol: Dashed line]
 CROSSWALK _____ [Symbol: Dashed line]

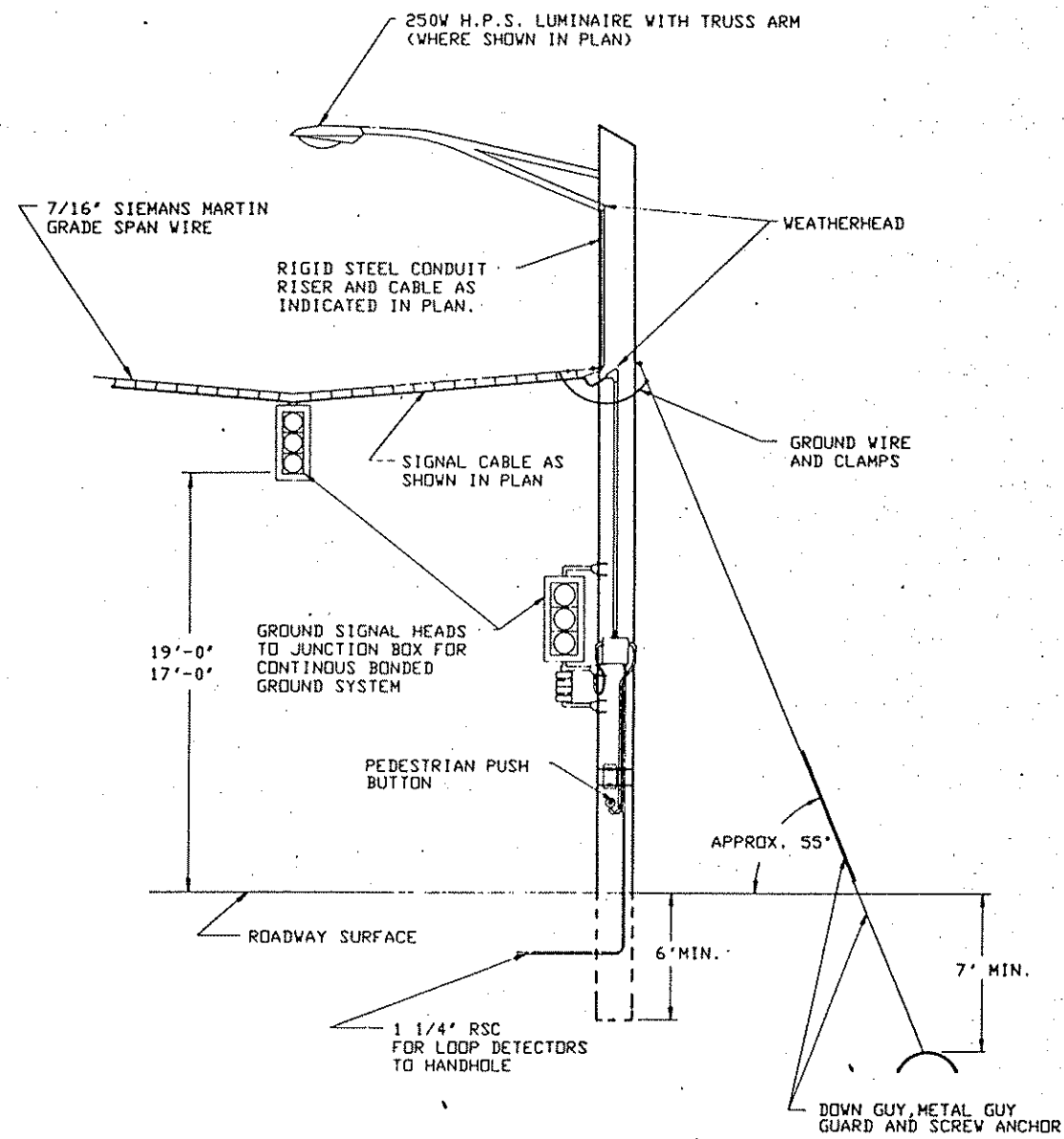
PEDESTRIAN PUSH BUTTON MOUNTING DETAIL



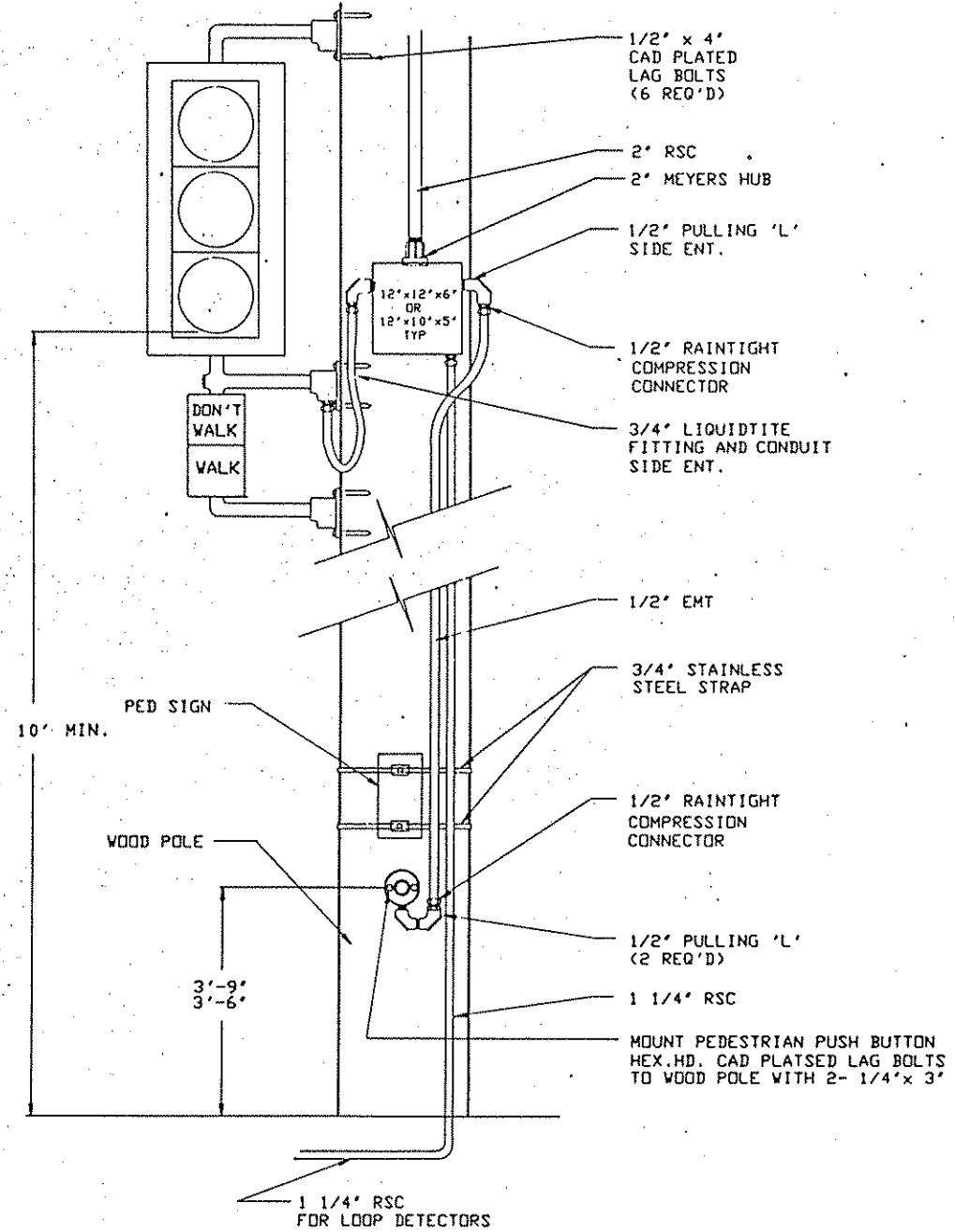
ELEC. ENGR. CERT. I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Registered Professional Engineer under the State of Minn. Statutes Sections 326.02 to 326.16. <i>[Signature]</i> Date <u>8/30/78</u> Minn. Reg. No. <u>12427</u>	CIVIL ENGR. CERT. 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 State of Minn. Statutes Sections 326.02 to 326.16. <i>[Signature]</i> Date <u>8/30/78</u> Minn. Reg. No. <u>18095</u>	 BRW, INC. PLANNING TRANSPORTATION ENGINEERING URBAN DESIGN THRESEMER SQUARE 700 THIRD STREET SOUTH MINNEAPOLIS, MN 55415 PHONE: (612)370-0700	ORIGINAL DATE: _____ REVISIONS: _____ _____ _____ _____	DETAILS & LEGENDS C.P. 90-05-09 C.P. 90-04-78 SURVEY BK. NO. _____
			DESIGN BY: <u>EQR</u> DRAWN BY: <u>KJM</u>	

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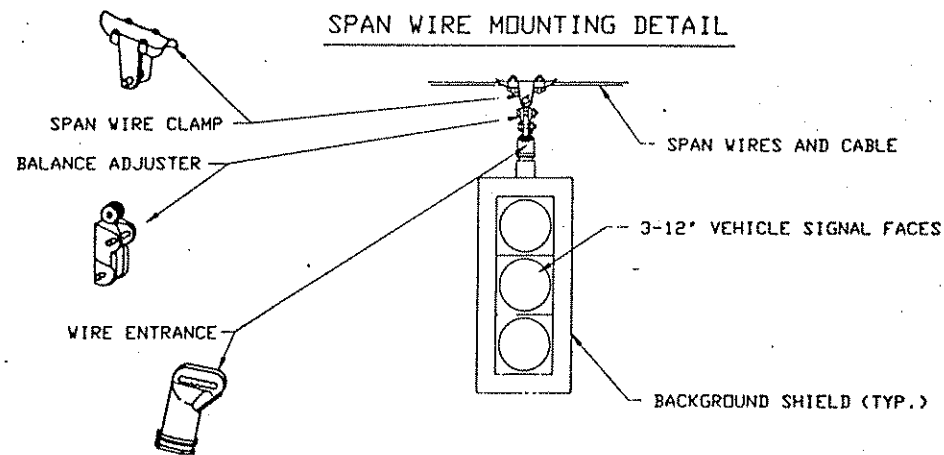
TEMPORARY POLE DETAIL



PED BUTTON WIRING DETAIL



SPAN WIRE MOUNTING DETAIL



Electrical-Engineer's Certification	Civil Engineer's Certification
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 State of Minn. Statutes Sections 326.02 to 326.16.	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 State of Minn. Statutes Sections 326.02 to 326.16.
<i>[Signature]</i> Date <u>8/21/78</u> Minn. Reg. No. <u>18075</u>	<i>[Signature]</i> Date <u>8/30/78</u> Minn. Reg. No. <u>18075</u>

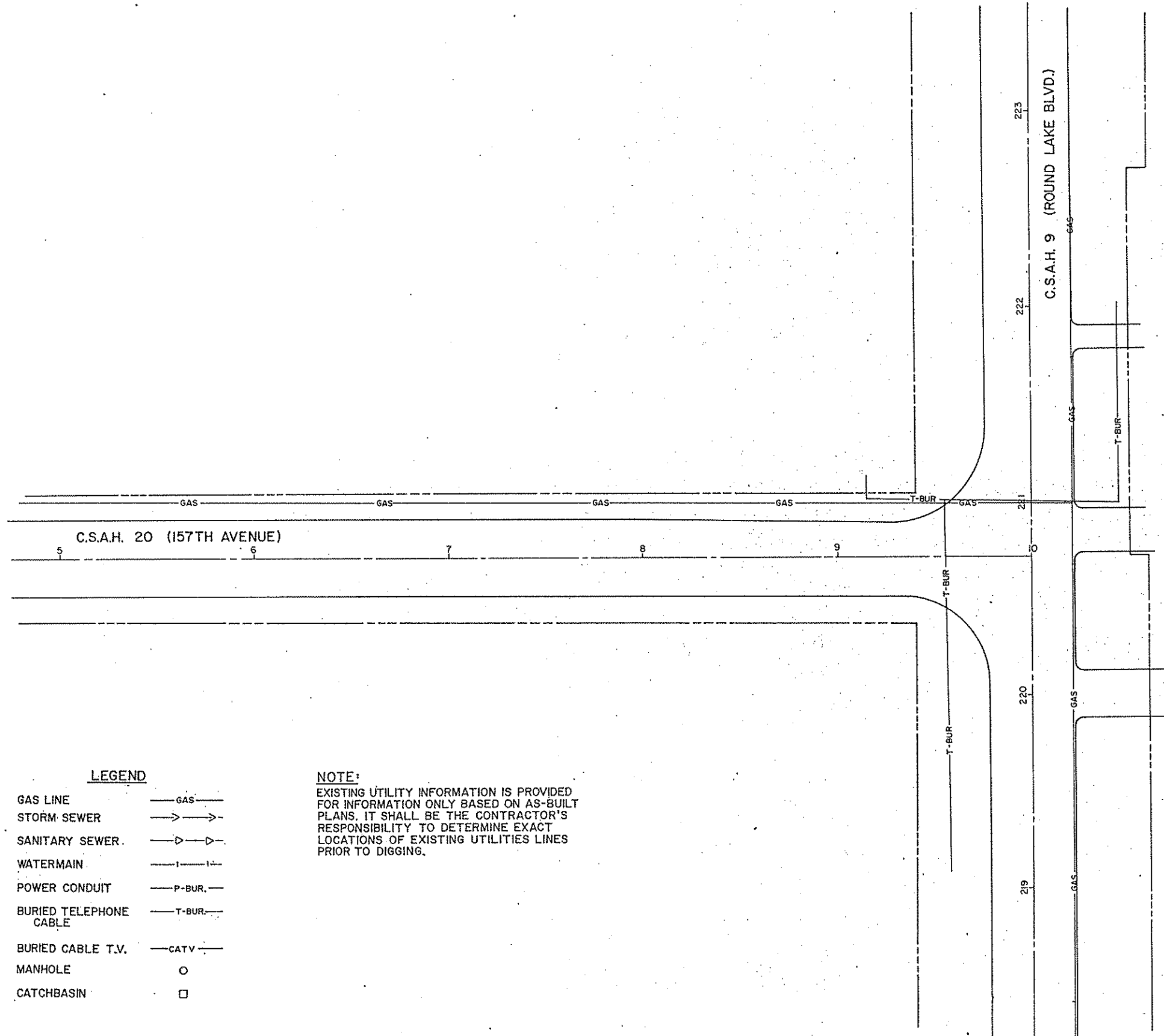
BRW
BRW, INC.
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MINNEAPOLIS, MN 55415
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ORIGINAL DATE	REVISIONS
DESIGN BY	SURVEY BK NO
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TEMPORARY SIGNAL DETAIL

C.P. 90-04-78


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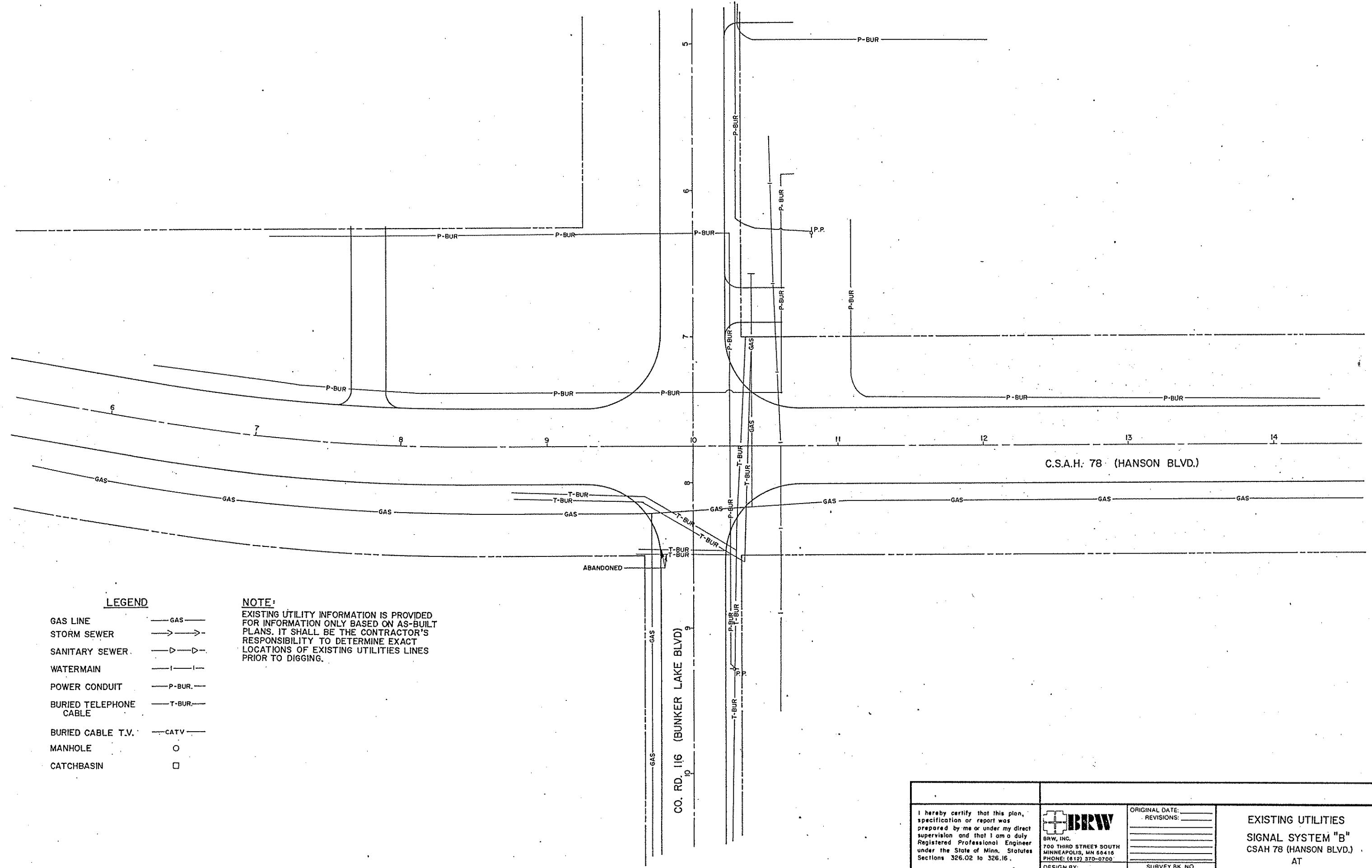


LEGEND

GAS LINE	— GAS —
STORM SEWER	—>—>—
SANITARY SEWER	—▷—▷—
WATERMAIN	— — —
POWER CONDUIT	— P-BUR —
BURIED TELEPHONE CABLE	— T-BUR —
BURIED CABLE T.V.	— CATV —
MANHOLE	○
CATCHBASIN	□

NOTE:
 EXISTING UTILITY INFORMATION IS PROVIDED FOR INFORMATION ONLY BASED ON AS-BUILT PLANS. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE EXACT LOCATIONS OF EXISTING UTILITIES LINES PRIOR TO DIGGING.

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 State of Minn. Statutes Sections 326.02 to 326.16. <i>Erik O. Kuehn</i> Date <u>8/30/92</u> Minn. Reg. No. <u>18015</u>	 BRW, INC. 709 THIRD STREET SOUTH MINNEAPOLIS, MN 55415 PHONE: (612) 370-0700	ORIGINAL DATE: _____ REVISIONS: _____ _____ _____ _____	EXISTING UTILITIES SIGNAL SYSTEM "A" CSAH 9 (ROUND LAKE BLVD.) AT CSAH 20 (157TH AVE.)
		DESIGN BY: _____ DRAWN BY: <u>RG</u>	
C.P. 90-05-09		(ANDOVER) 198-020-06	SHEET <u>11</u> OF <u>12</u>
		DESIGN FILE No. <u>40-9021</u>	



LEGEND

- GAS LINE ——— GAS ———
- STORM SEWER ———>——>——
- SANITARY SEWER ———▷——▷——
- WATERMAIN ———|——|——
- POWER CONDUIT ———P-BUR——
- BURIED TELEPHONE CABLE ———T-BUR——
- BURIED CABLE T.V. ———CATV——
- MANHOLE ○
- CATCHBASIN □

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<p>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 State of Minn. Statutes Sections 326.02 to 326.16.</p> <p style="text-align: right;"><i>Erik Oshelski</i></p> <p>Date <u>9/15/78</u> Minn. Reg. No. <u>18675</u></p>	<p>BRW, INC. 700 THIRD STREET SOUTH MINNEAPOLIS, MN 55415 PHONE: (612) 370-0700</p>	ORIGINAL DATE: _____ REVISIONS: _____ _____ _____	<p>EXISTING UTILITIES SIGNAL SYSTEM "B" CSAH 78 (HANSON BLVD.) AT CO. RD. 116 (BUNKER LAKE BLVD.)</p>	
		DESIGN BY: _____ DRAWN BY: <u>RG</u>		SURVEY BK. NO. _____
C.P. 90-04-78		(ANDOVER) 198-020-06	SHEET <u>12</u> OF <u>12</u>	DESIGN FILE No. 40-9021