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

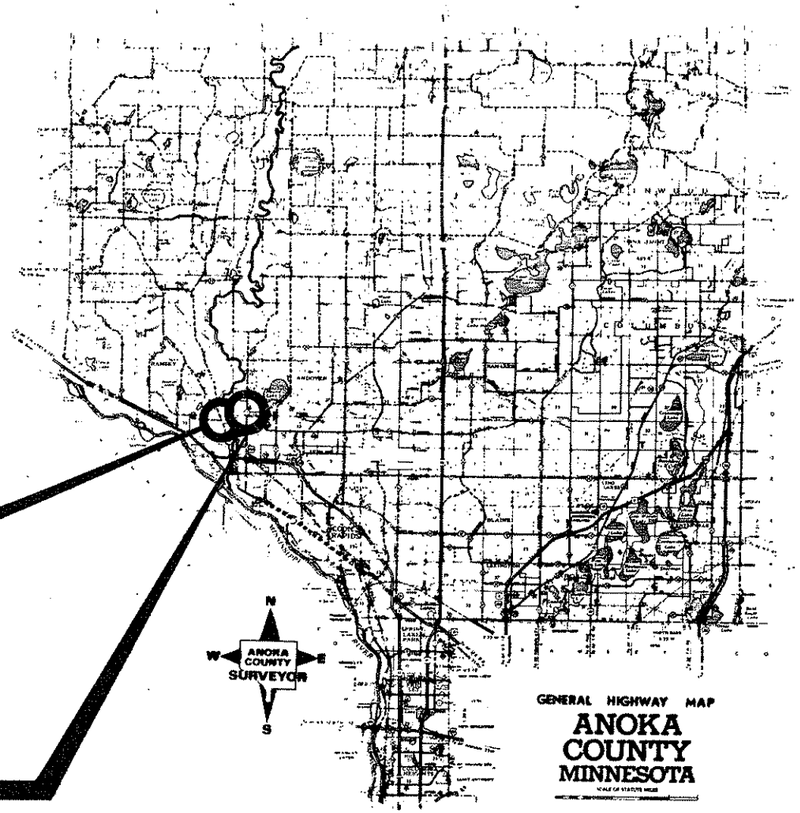
MINNESOTA DEPARTMENT OF TRANSPORTATION

ANOKA COUNTY

CONSTRUCTION PLAN FOR TRAFFIC CONTROL SIGNAL SYSTEMS

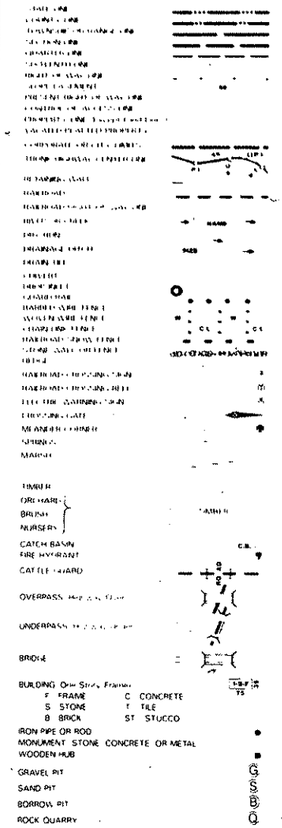
LOCATED ON
- C.S.A.H. 7 (7th AVE) AT COUNTY ROAD 116 IN ANDOVER AND ANOKA, SYSTEM "A", C.P. 90-20-116
- TRUNK HIGHWAY 47 (ST.FRANCIS BLVD NW) AT COUNTY ROAD 116 (INDUSTRY AVE NW) — IN ANOKA AND RAMSEY, SYSTEM "B", C.P. 90-19-116

STATE AID PROJ. NO.			STATE AID PROJ. NO.		
GROSS LENGTH	FEET	MILES	GROSS LENGTH	FEET	MILES
BRIDGES LENGTH	FEET	MILES	BRIDGES LENGTH	FEET	MILES
EXCEPTIONS LENGTH	FEET	MILES	EXCEPTIONS LENGTH	FEET	MILES
NET LENGTH	FEET	MILES	NET LENGTH	FEET	MILES

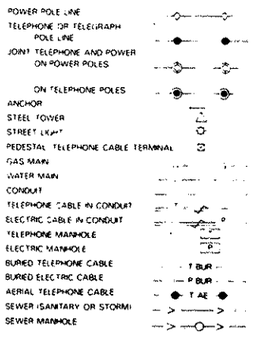


GENERAL HIGHWAY MAP
ANOKA COUNTY
MINNESOTA

PLANS SYMBOLS



UTILITIES SYMBOLS



ESTIMATED QUANTITIES

C.P.	ITEM NO.	ITEM	UNIT	TOTAL ESTIMATED QUANTITIES	FINAL QUANTITIES
90-20-116	0585.601	TEMPORARY TRAFFIC SIGNAL SYSTEM "A"	LUMP SUM	1	
90-19-116	0585.601	TEMPORARY TRAFFIC SIGNAL SYSTEM "B"	LUMP SUM	1	

SCALES

PLAN	N.A.
PROFILE	N.A.
INDEX MAP	2.66 MI
GENERAL LAYOUT	30 FEET

GOVERNING SPECIFICATIONS

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

INDEX

THIS PLAN CONTAINS 9 SHEETS

DESIGN DESIGNATION

$^{S}N18_{20}$
R Value
ADT (19) =
Proj. ADT (19) =
Proj. HCADT (19) =
Soil Factor
Ton Design
Shoulder Width

Design Speed MPH
Based on Sight Distance
Height of eye Height of object
Design Speed not achieved at:
STA. TO STA. MPH
STA. TO STA. MPH
STA. TO STA. MPH

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

DATE Sept 6, 1990 REG. NO. 9089 ENGR. Glen Vanderwarmer

*COUNTY

Recommended for Approval _____ 19__

Right of Way Approval _____ 19__
DIRECTOR, RIGHT OF WAY OPERATIONS

Recommended for Approval _____ 19__
ASSISTANT DISTRICT ENGINEER

Recommended for Approval _____ 19__
DIRECTOR, OFFICE OF TECHNICAL SUPPORT

Recommended for Approval _____ 19__
DESIGN SERVICES DIRECTOR

Recommended for Approval _____ 19__
DIRECTOR, TRAFFIC ENGINEERING

Approved _____ 19__
DEPUTY DIVISION DIRECTOR
TECHNICAL SERVICES DIVISION

STATE AID PROJ. NO.
STATE PROJ. NO. SHEET NO. 1 OF 9 SHEETS

BASE | OVERLAY | DRG NO.

Notes:

1) SEE SPECIAL PROVISIONS FOR CONTRACTOR RESPONSIBILITY FOR THE LOCATION OF UTILITIES.
2) SEE SPECIAL PROVISIONS FOR COUNTY FURNISHED MATERIALS.
3) LUMINAIRE (4) WITH P.E.C.
4) SEE SPECIAL PROVISIONS FOR ANOKA COUNTY SERVICE CABINET DETAILS.
5) ALL HANDHOLES SHALL BE CONCRETE WITH TYPE "C" COVERS.
6) LOOP DETECTOR WIRES SHALL BE CROSS-LINKED POLYETHYLENE (XLP) IN 1"N.M.C. .SEE SPECIAL PROVISIONS AND DETAILS.
7) ALL PEDESTRIAN INDICATIONS SHALL BE FURNISHED BY COUNTY FOR CONTRACTOR TO INSTALL AND SHALL BE 12"x12".
8) SEE SPECIAL PROVISIONS FOR DETAILS ON WOOD POLE SCREW ANCHORS.
9) SEE DETAIL SHEET FOR WOOD POLE, SPAN WIRE MOUNTING AND PEDESTRIAN PUSH BUTTON DETAILS.
10) LOOP DETECTORS D3-1, D8-1, D8-2, D8-3 AND D8-4 ARE INPLACE AND SHALL BE USED AS PART OF SIGNAL SYSTEM "A". CONTRACTOR SHALL FURNISH AND INSTALL LEAD-IN CABLES AND MAKE ALL SPLICES TO MAKE INPLACE LOOP DETECTORS OPERATIONAL.
11) HANDHOLES 1,3,4,5 AND 12 ARE INPLACE AND SHALL BE USED AS PART OF SIGNAL SYSTEM "A".
12) CONTRACTOR SHALL COIL AND STORE SUFFICIENT CABLE AND SPAN WIRE AT EACH POLE LOCATION IN ORDER TO ALLOW FOR FUTURE CONSTRUCTION AND CONTINUED USE OF SIGNAL SYSTEM. SEE SPECIAL PROVISIONS.

SCALE IN FEET 0 30 60

(1) 45' WOOD POLE-CLASS 2
2-DOWN GUYS, GUY GUARDS AND SCREW ANCHORS
TYPE 10B-WOOD POLE MOUNTED (1-1)
TYPE 10B-WOOD POLE MOUNTED (4-2)
2-PEDESTRIAN PUSH BUTTONS AND SIGNS
METAL JUNCTION BOX
3" R.S.C. RISER AND WEATHERHEAD ABOVE JUNCTION BOX
3-12/c#12
1-3/c#12

(2) 45' WOOD POLE-CLASS 2
2-DOWN GUYS, GUY GUARDS AND SCREW ANCHORS
TYPE 10B-WOOD POLE MOUNTED (3-1)
TYPE 10B-WOOD POLE MOUNTED (6-3)
2-PEDESTRIAN PUSH BUTTONS AND SIGNS
METAL JUNCTION BOX
3" R.S.C. RISER AND WEATHERHEAD ABOVE JUNCTION BOX
3-12/c#12
2-3/c#12

SIGNAL INDICATIONS

FACE	PHASE	FLASH	R	Y	G	RLTA	YLTA	GLTA
1-1	1	R				12	12	12
1-2	1	R				12	12	12
2-1	2	R	12	12	12			
2-2	2	R	12	12	12			
3-1	3	R				12	12	12
3-2	3	R				12	12	12
4-1	4	R	12	12	12			
4-2	4	R	12	12	12			
5-1	5	R				12	12	12
5-2	5	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			
7-1	7	R				12	12	12
7-2	7	R				12	12	12
8-1	8	R	12	12	12			
8-2	8	R	12	12	12			

Note : ALL SIZES ARE IN INCHES.

LOOP DETECTORS

NUMBER	SIZE (FT.)	LOCATION	FUNCTION
D1-1	MULTIPLE	—	1
D2-1	6x6	330'	1
D2-2	6x6	—	2
D2-3	2-6x6	—	5
D3-1	MULTIPLE	—	1
D4-1	2-6x6	400'	1
D4-2	6x6	—	4
D4-3	6x6	—	4
D8-1	MULTIPLE	—	1
D8-1	6x6	330'	1
D8-2	6x6	—	2
D8-3	2-6x6	—	5
D7-1	MULTIPLE	—	1
D8-1	2-6x6	400'	1
D8-2	6x6	—	4
D8-3	6x6	—	4
D8-4	2-6x6	—	6

Note:
LOCATION=DISTANCE FROM STOP BAR TO LOOP DETECTOR.

LOOP DETECTORS 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) CALL AND EXTEND AFTER TIME DELAY

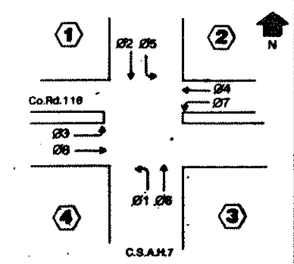
(4) 45' WOOD POLE-CLASS 2
2-DOWN GUYS, GUY GUARDS AND SCREW ANCHORS
TYPE 10B-WOOD POLE MOUNTED (2-2)
TYPE 10B-WOOD POLE MOUNTED (7-1)
LUMINAIRE-250 WATT H.P.S. AND 15' MAST ARM
2-PEDESTRIAN PUSH BUTTONS AND SIGNS
METAL JUNCTION BOX
2"R.S.C. RISER AND WEATHERHEAD ABOVE JUNCTION BOX
2-12/c#12
EXTEND INTO H.H.18:
2"R.S.C. RISER BELOW JUNCTION BOX
2-12/c#12
1-3/c#12
EXTEND INTO H.H.18:
3" R.S.C. RISER AND WEATHERHEAD
4-12/c#12
3-3/c#12
3" R.S.C. RISER AND WEATHERHEAD
2-12/c#12
1-3/c#12
8-2/c#14
2-1/c#10

(A) SERVICE CABINET (SEE SPECIAL PROVISIONS)
CABINET FOUNDATION
STUB OUT 2"R.S.C. (For Service By Others)
EXTEND INTO H.H.17:
METERED SIGNAL SERVICE
1 1/4"R.S.C.
3-1/c#6
EXTEND INTO H.H.18:
UNMETERED STREET LIGHT SERVICE
1 1/4" R.S.C.
2-1/c#10

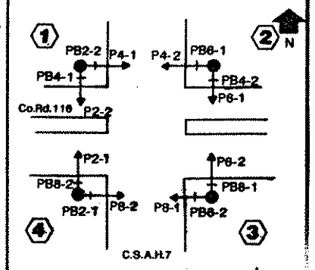
(B) CONTROLLER AND CABINET
CABINET FOUNDATION
EXTEND INTO H.H.17:
METERED SIGNAL SERVICE
1 1/4"R.S.C.
3-1/c#6
EXTEND INTO H.H.1 :
4"R.S.C.
9-2/c#14
EXTEND INTO H.H.18:
4" R.S.C.
4-12/c#12
3-3/c#12
4" R.S.C.
4-12/c#12
2-3/c#12
8-2/c#14

(3) 45' WOOD POLE-CLASS 2
2-DOWN GUYS, GUY GUARDS AND SCREW ANCHORS
TYPE 10B-WOOD POLE MOUNTED (5-1)
TYPE 10B-WOOD POLE MOUNTED (8-2)
2-PEDESTRIAN PUSH BUTTONS AND SIGNS
METAL JUNCTION BOX
3" R.S.C. RISER AND WEATHERHEAD ABOVE JUNCTION BOX
3-12/c#12
1-3/c#12
8-2/c#14
EXTEND INTO H.H.13:
2" R.S.C. RISER BELOW JUNCTION BOX
8-2/c#14

CONTROLLER PHASING



PEDESTRIAN PHASING



NO.	BY	DATE	REVISIONS	ITEM	DESIGN	CHECKED

I hereby certify that this plan was prepared by me or under my direct supervision and that I am a duly Registered Professional Engineer under the laws of the State of Minnesota
Date 7/6/12 Reg No. 9089

SEH ENGINEERS & ARCHITECTS & PLANNERS

ANOKA COUNTY, MINNESOTA
C.P. 90-20-116

TRAFFIC SIGNAL SYSTEM "A"
INTERSECTION LAYOUT
C.S.A.H. 7 AT COUNTY ROAD 116

FILE NO. 91016
DATE 8/30/90
2

BASE | OVERLAY | DRG NO.

CONTROLLER CABINET

1
- RLTA 7-1
- YLTA 7-1
- GLTA 7-1
- NEU 7-1,7-2
- RLTA 7-2
- YLTA 7-2
- GLTA 7-2
- NEU P8-2
- WLK P8-2
- DWK P8-2
- SPR
- EQG

2
- RED 2-2
- YEL 2-2
- GRN 2-2
- NEU 2-2, P2-1
- WLK P2-1
- DWK P2-1
- SPR
- NEU 2-1
- RED 2-1
- YEL 2-1
- GRN 2-1
- EQG

3
- RLTA 5-1
- YLTA 5-1
- GLTA 5-1
- NEU 5-1, 5-2
- RLTA 5-2
- YLTA 5-2
- GLTA 5-2
- NEU P6-2
- WLK P6-2
- DWK P6-2
- SPR
- EQG

4
- RED 8-2
- YEL 8-2
- GRN 8-2
- NEU 8-2, P8-1
- WLK P8-1
- DWK P8-1
- SPR
- NEU 8-1
- RED 8-1
- YEL 8-1
- GRN 8-1
- EQG

5
- RED 4-2
- YEL 4-2
- GRN 4-2
- NEU 4-2, P4-1
- WLK P4-1
- DWK P4-1
- SPR
- NEU 4-1
- RED 4-1
- YEL 4-1
- GRN 4-1
- EQG

6
- RLTA 1-1
- YLTA 1-1
- GLTA 1-1
- NEU 1-1, 1-2
- RLTA 1-2
- YLTA 1-2
- GLTA 1-2
- NEU P2-2
- WLK P2-2
- DWK P2-2
- SPR
- EQG

7
- RED 6-3
- YEL 6-3
- GRN 6-3
- NEU 6-3, P6-1
- WLK P6-1
- DWK P6-1
- SPR
- NEU 6-1
- RED 6-1
- YEL 6-1
- GRN 6-1
- EQG

8
- 3-1 RLTA
- 3-1 YLTA
- 3-1 GLTA
- 3-2, 3-1 NEU
- 3-2 RLTA
- 3-2 YLTA
- 3-2 GLTA
- 6-2 NEU
- 6-2 RED
- 6-2 YEL
- 6-2 GRN
- EQG

9
- PB2-1
- NEU
- PB8-2

10
- PB6-2
- NEU
- PB8-1

11
- PB6-1
- NEU
- PB4-2

12
- PB2-2
- NEU
- PB4-1

13 D1-1
14 D2-1
15 D2-2
16 D2-3
17 D3-1
18 D4-1
19 D4-2
20 D4-3
22 D5-1
23 D6-1
24 D6-2
25 D6-3
26 D7-1
27 D8-1
28 D8-2
29 D8-3
30 D8-4

31
- SIGNAL
- SERVICE

35
- P4-2 WLK
- P4-2 NEU
- P4-2 DWK

SERVICE CABINET

LUMINAIRE ⚠4 (Unmetered) — 32 — 32

31 — 31 — SIGNAL, SERVICE (Metered)

21 — 21 — SIGNALS, NEUTRAL, LIGHTING

21 — S.O.P. — SERVICE BY OTHERS.

31 — H.H.17 — 31

31

32 — 32

H.H.18

1,2,3,4,5,6,7,8,9,10,11,12,13,18,19,20,23,24,25,26, 35

32

1,2,3,4,5,6,7,8,9,10,11,12,13,18, 19,20,23,24,25,26,32,35

1A,5,6,7,8,11,12, 35

W.P.4

2A,3,4,10,13,18,19, 20,23,24,25,26

3,4,10,13,18,19,20, 23,24,25,26

3A,4,10,13,18,19, 20,23,24,25,26

W.P.3

13,18,19,20,23,24,25,26

④

LUMINAIRE ⚠4 — 32 — (7-1) P8-2 — 1A — 1 — 2 — P2-1 (2-2) — 2A

PB2-1 — 9 — PB8-2 — 2A

1A

③

(2-1) — 2A

(5-2) — 3 — 3A

(5-1) P8-2 — 3A — 4 — P8-1 (8-2) — 4A

PB8-2 PB8-1 — 10

4A

(8-1) — 4A

CONDUCTOR COLOR CODING

12/C#12:
- R
- O
- BL
- WH
- R/BLK
- O/BLK
- BL/BLK
- WH/BLK
- BLK
- BLK/WH
- G/BLK
- G

BLK — WH — 2-1/C#4, 2-1/C#8, 2-1/C#10

R — W — BLK — 3/C#12

BLK — CLEAR — 2/C#14

R OR O — WH OR YEL — BLK OR BL — 3/C#20

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

①

PB2-2 PB4-1 — 12

(7-2) — 1A — 1A,5, 6,7,8,11,12,35

(4-1) — 5 — 5A — 5,6,7,8,11,12,35

(4-2) P4-1 — 5A — 5A,6,7,8,11, 12,35

(1-1) P2-2 — 6 — 6A — 6A,7,8,11,35

W.P.1

(1-2) — 6A — 7,8,11,35

(6-1) — 7 — 7A — 7A,8,11,35

②

P4-2 — 35

PB6-1 PB4-2 — 11

(6-3) P6-1 — 7A — 8A — 7A,8A, 11,35

(3-1) — 8A — 8B — 8B

(3-2) — 8B

W.P.2

7A,8A,11,35

7A,8,11,35

7A,8A,11,35

H.H.1 — 29 — 30 — D8-3 D8-4

14,15,16,17,22,27,28,29,30

H.H.4 — 17 — 28 — D3-1 D8-2

14,15,16,17,22,28

H.H.5

14,15,16,22

H.H.6 — 15 — 16 — 22 — D2-2 D2-3 D5-1

14,15,16,22

H.H.7

14

H.H.8 — 14 — D2-1

H.H.2

27

H.H.3 — 27 — D8-1

H.H.9 — 19 — 20 — D4-2 D4-3

18,19, 20

H.H.10

18,

H.H.11 — 18 — D4-1

18

H.H.12 — 26 — D7-1

18,19, 20,26

H.H.13

13,18,19,20, 23,24,25,26

13,23,24,25

H.H.14 — 13 — 24 — 25 — D1-1 D6-2 D6-3

H.H.15

23

H.H.16 — 23 — D6-1

(6-2) — 8 — 8A — 7A,8,11,35 — 7A,8A,11,35

NO.	BY	DATE	REVISIONS	ITEM	DESIGN	CHECKED

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

Glen Van Wormer

Date 7/6/90 Reg No. 9089

ENGINEERS & ARCHITECTS & PLANNERS

ANOKA COUNTY, MINNESOTA
C.P.90-20-116

TRAFFIC SIGNAL SYSTEM "A"
FIELD WIRING DIAGRAM
C.S.A.H.7 AT COUNTY ROAD 116

FILE NO. 91016
DATE 8/30/90

3/9

Notes:

1) SEE SPECIAL PROVISIONS FOR CONTRACTOR RESPONSIBILITY FOR THE LOCATION OF UTILITIES.

2) SEE SPECIAL PROVISIONS FOR COUNTY FURNISHED MATERIALS.

3) EACH LUMINAIRE WITH P.E.C.

4) SEE SPECIAL PROVISIONS FOR ANOKA COUNTY SERVICE CABINET DETAILS.

5) ALL HANDHOLES SHALL BE CONCRETE WITH TYPE "C" COVERS.

6) LOOP DETECTOR WIRES FOR LOOP DETECTORS D3-1, D8-1, D8-2 AND D8-3 SHALL BE CROSS-LINKED POLYETHYLENE (XLP) IN 1" N.M.C. SEE SPECIAL PROVISIONS AND DETAILS.

7) ALL PEDESTRIAN INDICATIONS SHALL BE FURNISHED BY COUNTY FOR CONTRACTOR TO INSTALL AND SHALL BE 12"x12", EXCEPT THAT P4-1, P4-2, P8-1 AND P8-2 SHALL BE 9"x9".

8) SEE SPECIAL PROVISIONS FOR DETAILS ON WOOD POLE SCREW ANCHORS.

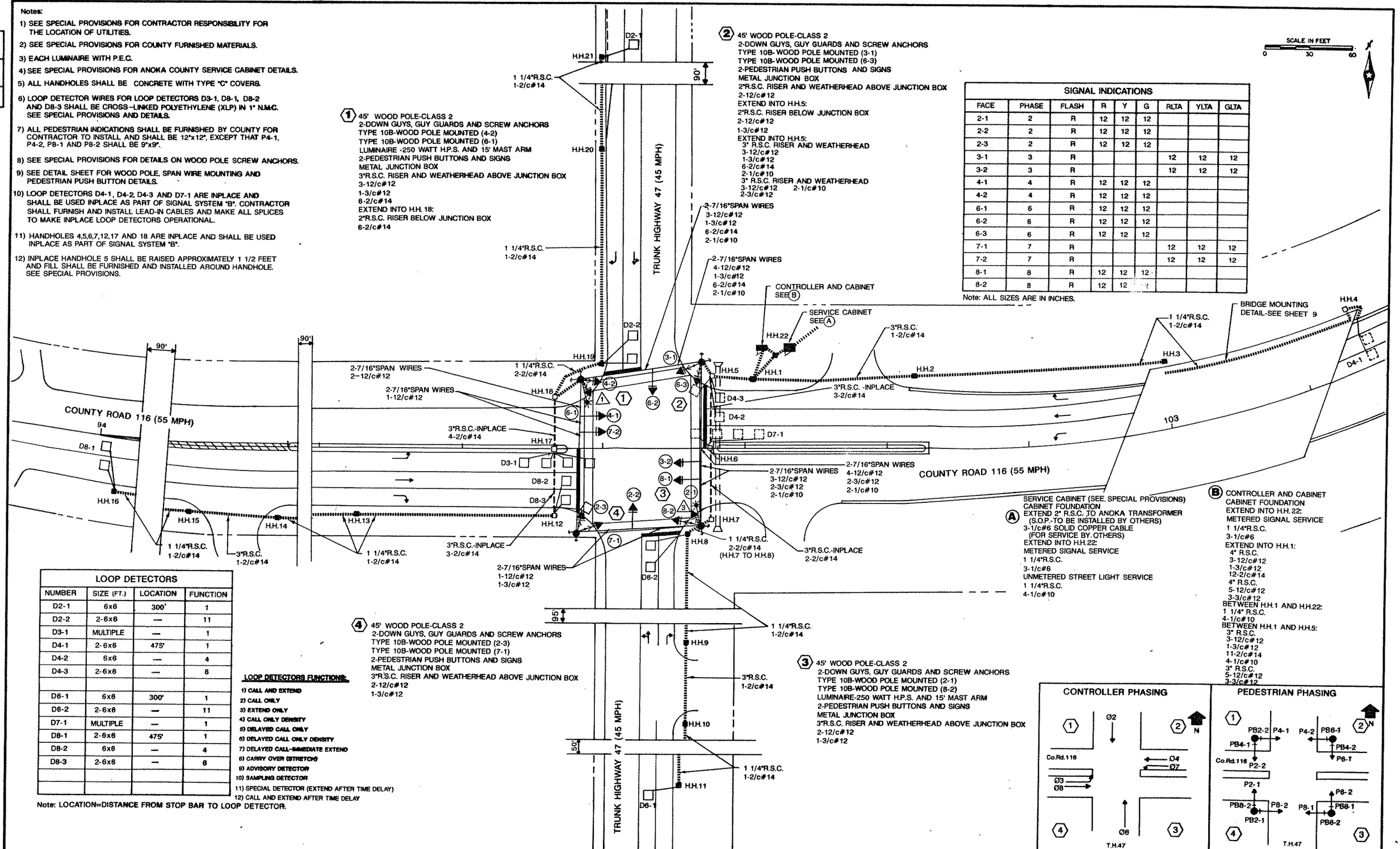
9) SEE DETAIL SHEET FOR WOOD POLE, SPAN WIRE MOUNTING AND PEDESTRIAN PUSH BUTTON DETAILS.

10) LOOP DETECTORS D4-1, D4-2, D4-3 AND D7-1 ARE INPLACE AND SHALL BE USED INPLACE AS PART OF SIGNAL SYSTEM "B". CONTRACTOR SHALL FURNISH AND INSTALL LEAD-IN CABLES AND MAKE ALL SPLICES TO MAKE INPLACE LOOP DETECTORS OPERATIONAL.

11) HANDHOLES 4,5,6,7,12,17 AND 18 ARE INPLACE AND SHALL BE USED INPLACE AS PART OF SIGNAL SYSTEM "B".

12) INPLACE HANDHOLE 5 SHALL BE RAISED APPROXIMATELY 1 1/2 FEET AND FILL SHALL BE FURNISHED AND INSTALLED AROUND HANDHOLE. SEE SPECIAL PROVISIONS.

BASE | OVERLAY | DRIG NO.



(1) 45' WOOD POLE-CLASS 2
2-DOWN GUYS, GUY GUARDS AND SCREW ANCHORS
TYPE 10B-WOOD POLE MOUNTED (4-2)
TYPE 10B-WOOD POLE MOUNTED (6-1)
LUMINAIRE -250 WATT H.P.S. AND 15' MAST ARM
2-PEDESTRIAN PUSH BUTTONS AND SIGNS
METAL JUNCTION BOX
3"R.S.C. RISER AND WEATHERHEAD ABOVE JUNCTION BOX
3-12/c#12
1-3/c#12
6-2/c#14
EXTEND INTO H.H. 18:
2"R.S.C. RISER BELOW JUNCTION BOX
6-2/c#14

(2) 45' WOOD POLE-CLASS 2
2-DOWN GUYS, GUY GUARDS AND SCREW ANCHORS
TYPE 10B-WOOD POLE MOUNTED (3-1)
TYPE 10B-WOOD POLE MOUNTED (6-3)
2-PEDESTRIAN PUSH BUTTONS AND SIGNS
METAL JUNCTION BOX
2"R.S.C. RISER AND WEATHERHEAD ABOVE JUNCTION BOX
2-12/c#12
EXTEND INTO H.H.5:
2"R.S.C. RISER BELOW JUNCTION BOX
2-12/c#12
1-3/c#12
EXTEND INTO H.H.5:
3" R.S.C. RISER AND WEATHERHEAD
3-12/c#12
1-3/c#12
6-2/c#14
2-1/c#10
3" R.S.C. RISER AND WEATHERHEAD
3-12/c#12 2-1/c#10
2-3/c#12

(3) 45' WOOD POLE-CLASS 2
2-DOWN GUYS, GUY GUARDS AND SCREW ANCHORS
TYPE 10B-WOOD POLE MOUNTED (2-1)
TYPE 10B-WOOD POLE MOUNTED (8-2)
LUMINAIRE-250 WATT H.P.S. AND 15' MAST ARM
2-PEDESTRIAN PUSH BUTTONS AND SIGNS
METAL JUNCTION BOX
3"R.S.C. RISER AND WEATHERHEAD ABOVE JUNCTION BOX
2-12/c#12
1-3/c#12

(4) 45' WOOD POLE-CLASS 2
2-DOWN GUYS, GUY GUARDS AND SCREW ANCHORS
TYPE 10B-WOOD POLE MOUNTED (2-3)
TYPE 10B-WOOD POLE MOUNTED (7-1)
2-PEDESTRIAN PUSH BUTTONS AND SIGNS
METAL JUNCTION BOX
3"R.S.C. RISER AND WEATHERHEAD ABOVE JUNCTION BOX
2-12/c#12
1-3/c#12

(A) SERVICE CABINET (SEE SPECIAL PROVISIONS)
CABINET FOUNDATION
EXTEND 2" R.S.C. TO ANOKA TRANSFORMER (S.O.P.-TO BE INSTALLED BY OTHERS)
3-1/c#6 SOLID COPPER CABLE (FOR SERVICE BY OTHERS)
EXTEND INTO H.H.22:
METERED SIGNAL SERVICE
1 1/4"R.S.C.
3-1/c#6
UNMETERED STREET LIGHT SERVICE
1 1/4"R.S.C.
4-1/c#10

(B) CONTROLLER AND CABINET
CABINET FOUNDATION
EXTEND INTO H.H. 22:
METERED SIGNAL SERVICE
1 1/4"R.S.C.
3-1/c#6
EXTEND INTO H.H.1:
4" R.S.C.
3-12/c#12
1-3/c#12
12-2/c#14
4" R.S.C.
5-12/c#12
3-3/c#12
BETWEEN H.H.1 AND H.H.22:
1 1/4" R.S.C.
4-1/c#10
BETWEEN H.H.1 AND H.H.5:
3" R.S.C.
3-12/c#12
1-3/c#12
11-2/c#14
4-1/c#10
3" R.S.C.
5-12/c#12
3-3/c#12

SIGNAL INDICATIONS								
FACE	PHASE	FLASH	R	Y	G	RLTA	YLTA	GLTA
2-1	2	R	12	12	12			
2-2	2	R	12	12	12			
2-3	2	R	12	12	12			
3-1	3	R				12	12	12
3-2	3	R				12	12	12
4-1	4	R	12	12	12			
4-2	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			
7-1	7	R				12	12	12
7-2	7	R				12	12	12
8-1	8	R	12	12	12			
8-2	8	R	12	12	12			

Note: ALL SIZES ARE IN INCHES.

LOOP DETECTORS			
NUMBER	SIZE (FT.)	LOCATION	FUNCTION
D2-1	6x6	300'	1
D2-2	2-6x6	—	11
D3-1	MULTIPLE	—	1
D4-1	2-6x6	475'	1
D4-2	6x6	—	4
D4-3	2-6x6	—	8
D6-1	6x6	300'	1
D6-2	2-6x6	—	11
D7-1	MULTIPLE	—	1
D8-1	2-6x6	475'	1
D8-2	6x6	—	4
D8-3	2-6x6	—	8

Note: LOCATION=DISTANCE FROM STOP BAR TO LOOP DETECTOR.

LOOP DETECTORS 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 (EXTEND AFTER TIME DELAY)
12) CALL AND EXTEND AFTER TIME DELAY

CONTROLLER PHASING

PEDESTRIAN PHASING

NO.	BY	DATE	REVISIONS
1.	JMG	9/6	PER Mn/DOT COMMENTS

ITEM | DESIGN | CHECKED

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
Glen VanDeVenter
Date 9/6/90 Reg No. 9089

SEH ENGINEERS & ARCHITECTS & PLANNERS

ANOKA COUNTY, MINNESOTA
C.P. 90-19-116

TRAFFIC SIGNAL SYSTEM "B"
INTERSECTION LAYOUT
TRUNK HIGHWAY 47 AT COUNTY ROAD 116

FILE NO. 91017
DATE 8/30/90
4/9

BASE | OVERLAY | DRG. NO.

CONTROLLER CABINET

1
- RED 6-3
- YEL 6-3
- GRN 6-3
- NEU 6-3, P6-1
- WLK P6-1
- DWK P6-1
- RED 6-2
- NEU 6-2
- YEL 6-2
- GRN 6-2
- SPR
- EQG

2
- RLTA 3-1
- YLTA 3-1
- GLTA 3-1
- NEU 3-1, 3-2
- RLTA 3-2
- YLTA 3-2
- GLTA 3-2
- NEU P4-2
- WLK P4-2
- DWK P4-2
- SPR
- EQG

3
- RED 8-2
- YEL 8-2
- GRN 8-2
- NEU 8-2, P8-1
- WLK P8-1
- DWK P8-1
- SPR
- NEU 8-1
- RED 8-1
- YEL 8-1
- GRN 8-1
- EQG

4
- RED 2-1
- YEL 2-1
- GRN 2-1
- NEU 2-1
- SPR
- SPR
- SPR
- NEU P6-2
- WLK P6-2
- DWK P6-2
- SPR
- EQG

5
- RED 2-3
- YEL 2-3
- GRN 2-3
- NEU 2-3, P2-1
- WLK P2-1
- DWK P2-1
- RED 2-2
- NEU 2-2
- YEL 2-2
- GRN 2-2
- SPR
- EQG

6
- RED 6-1
- YEL 6-1
- GRN 6-1
- NEU 6-1
- SPR
- SPR
- SPR
- NEU P2-2
- WLK P2-2
- DWK P2-2
- SPR
- EQG

7
- RED 4-2
- YEL 4-2
- GRN 4-2
- NEU 4-2, P4-1
- WLK P4-1
- DWK P4-1
- SPR
- NEU 4-1
- RED 4-1
- YEL 4-1
- GRN 4-1
- EQG

8
- 7-1 RLTA
- 7-1 YLTA
- 7-1 GLTA
- 7-2, 7-1 NEU
- 7-2 RLTA
- 7-2 YLTA
- 7-2 GLTA
- P8-2 NEU
- P8-2 WLK
- P8-2 DWK
- SPR
- EQG

9
- PB6-1
- NEU
- PB4-2

10
- PB6-2
- NEU
- PB8-1

11
- PB2-2
- NEU
- PB4-1

12
- PB2-1
- NEU
- PB8-2

13 D2-1

14 D2-2

15 D3-1

16 D4-1

17 D4-2

18 D4-3

20 D6-1

21 D6-2

22 D7-1

23 D8-1

24 D8-2

25 D8-3

26
- SIGNAL
- SERVICE

CONDUCTOR COLOR CODING

12/C#12
- R
- O
- BL
- WH
- R/BLK
- O/BLK
- BL/BLK
- WH/BLK
- BLK
- BLK/WH
- G/BLK
- G

BLK — 2-1/C#4, 2-1/C#8, 2-1/C#10
WH

R — 3/C#12
W
BLK

BLK — 2/C#14
CLEAR

R OR O — 3/C#20
WH OR YEL
BLK OR BL

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

SERVICE CABINET

- 27 LUMINAIRE 1 (Unmetered)
- 28 LUMINAIRE 3 (Unmetered)
- 26 SIGNAL SERVICE (Metered)
- SIGNALS NEUTRAL LIGHTING — 19 — 19 — (A.E.C.Transformer - By Others) — S.O.P.

W.P.1 — 1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,17,18,20,21,22,23,24,25,27,28
W.P.2 — 1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,23,24,25,27,28
W.P.3 — 3,4,5,10,12,28; 3A,4,5,10,12,28; 5,12
W.P.4 — 5A,12

H.H.1 — 27,28 — 1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,20,21,22,23,24,25
H.H.2 — 16
H.H.3 — 16
H.H.4 — 16
H.H.5 — 17, 18
H.H.6 — 22
H.H.7
H.H.8 — 21
H.H.9
H.H.10
H.H.11 — 20
H.H.12 — 24, 25
H.H.13
H.H.14
H.H.15
H.H.16 — 23
H.H.17 — 15
H.H.18
H.H.19 — 14
H.H.20
H.H.21 — 13
H.H.22 — 26, 27,28

NO.	BY	DATE	REVISIONS
1	JMG	9/6	PER Mn/DOT COMMENTS

ITEM | DESIGN | CHECKED

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Date 9/6/90 Reg No. 9089

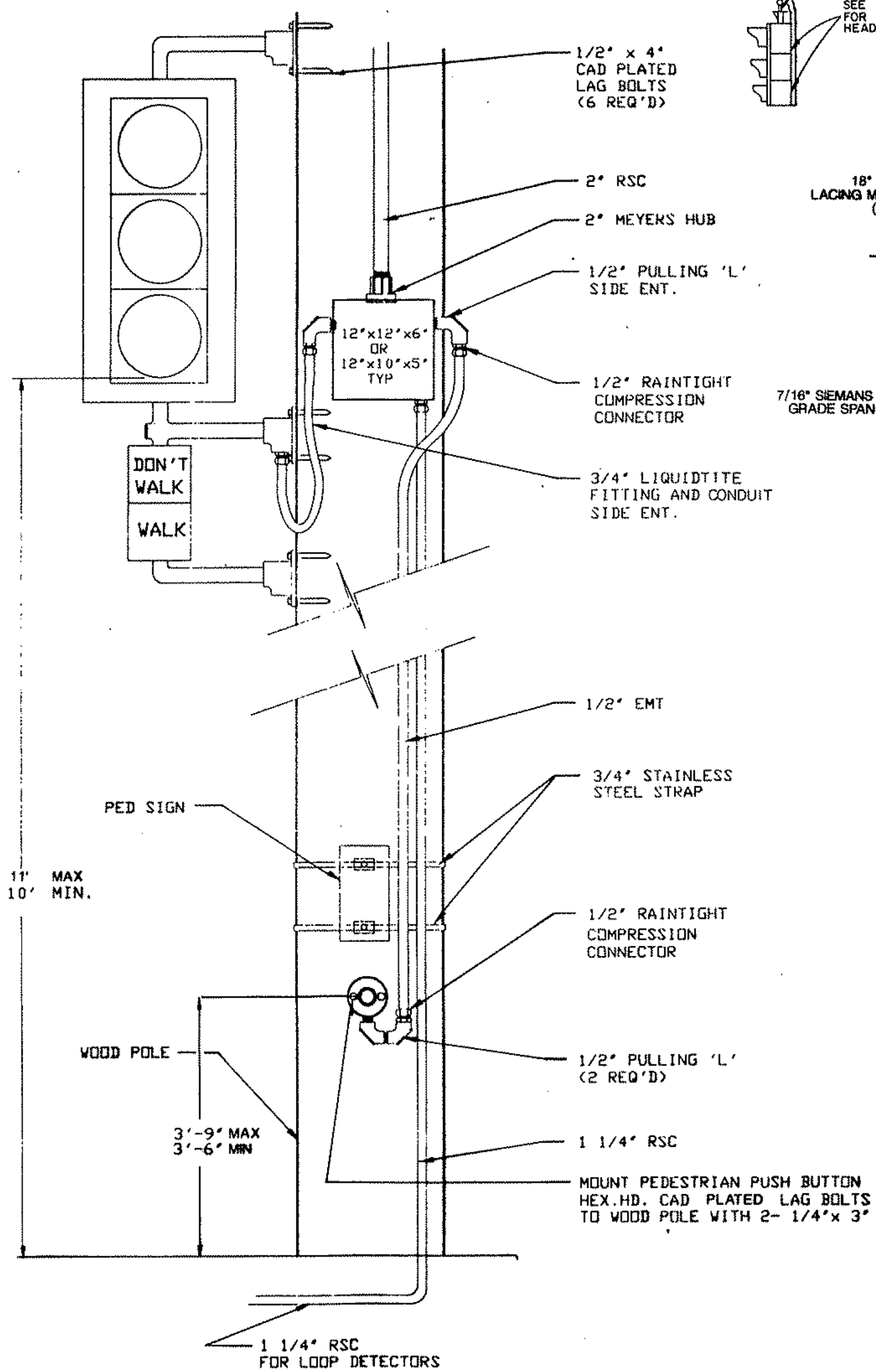
ENGINEERS ■ ARCHITECTS ■ PLANNERS

ANOKA COUNTY, MINNESOTA
C.P.90-19-116

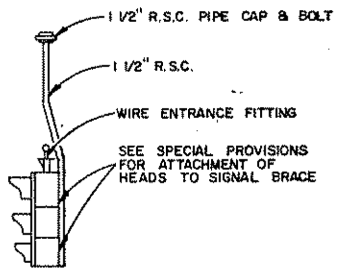
TRAFFIC SIGNAL SYSTEM "B"
FIELD WIRING DIAGRAM
TRUNK HIGHWAY 47 AT COUNTY ROAD 116

FILE NO. 91017
DATE 8/30/90
5 / 9

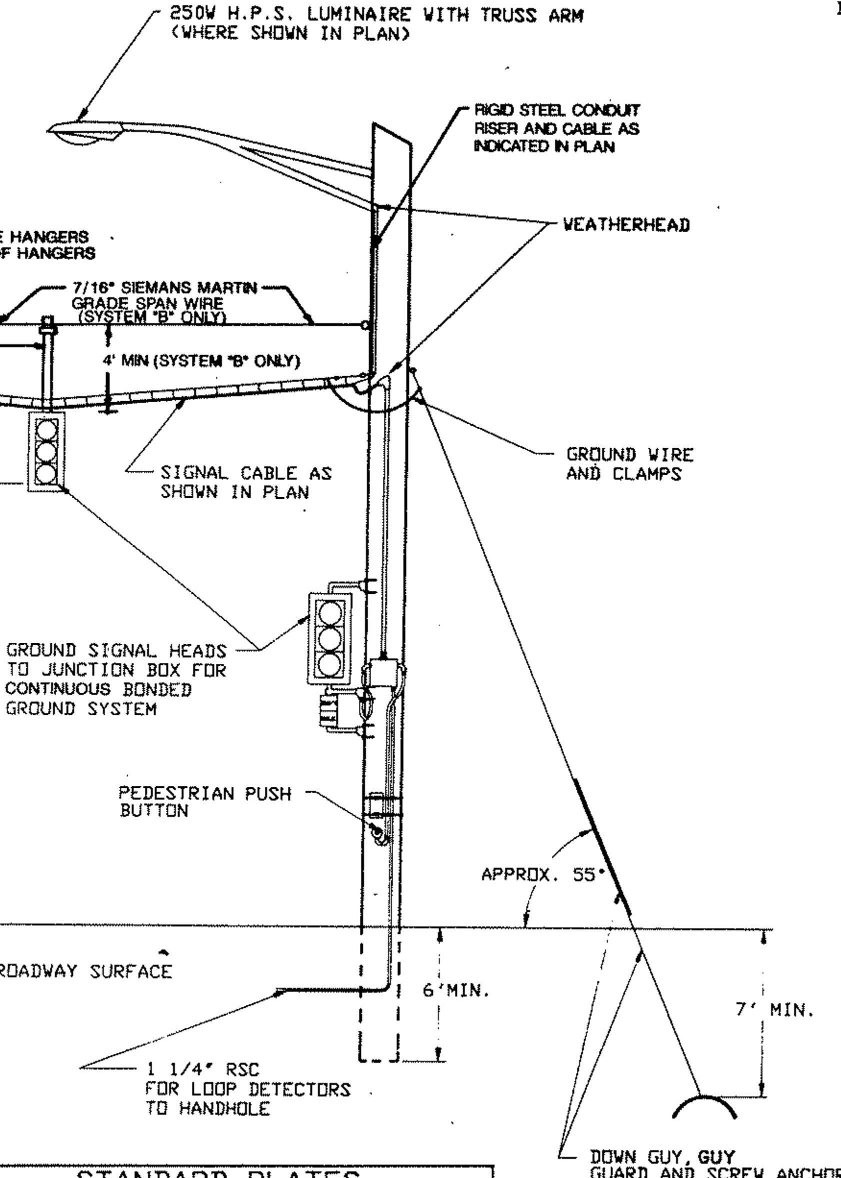
PED BUTTON WIRING DETAIL



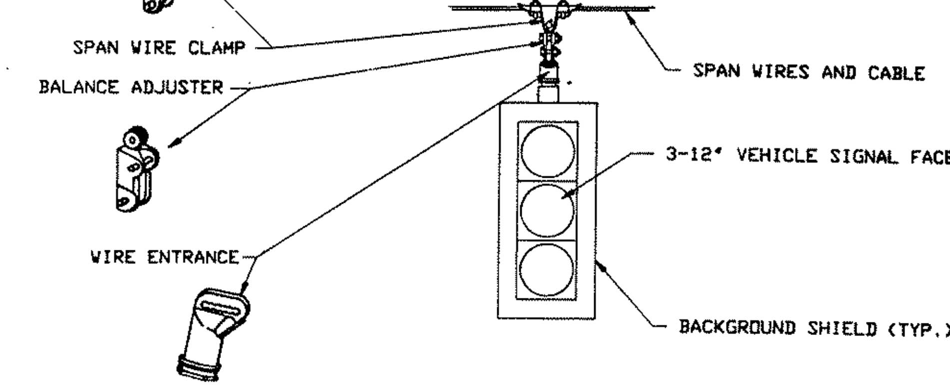
(SYSTEM "B" ONLY)
OVERHEAD SIGNAL BRACE



TEMPORARY POLE DETAIL



SPAN WIRE MOUNTING DETAIL
(SYSTEM "A" ONLY)



LEGEND OF SYMBOLS

- CONTROLLER AND SERVICE EQPT NOs.
- SIGNAL BASE NO.
- SIGNAL FACE NO.
- LUMINAIRE NO.
- CONTROLLER AND CABINET
- CONTROLLER AND CABINET IN PLACE
- HANDHOLE
- HANDHOLE IN PLACE
- RIGID STEEL CONDUIT (R.S.C.)
- RIGID STEEL CONDUIT (R.S.C.) IN PLACE
- SIGNAL FACE WITH BACKGROUND SHIELD
- SIGNAL FACE W/O BACKGROUND SHIELD
- SIGNAL FACE IN PLACE
- PEDESTRIAN INDICATORS
- PEDESTRIAN INDICATORS IN PLACE
- PEDESTRIAN PUSH BUTTONS ON PEDESTAL OR POLE
- PEDESTRIAN PUSH BUTTON STATION
- TRAFFIC SIGNAL PEDESTAL
- TRAFFIC SIGNAL PEDESTAL IN PLACE
- TRAFFIC SIGNAL POLE AND MAST ARM
- TRAFFIC SIGNAL POLE AND MAST ARM IN PLACE
- STREET LIGHT POLE AND LUMINAIRE
- STREET LIGHT POLE AND LUMINAIRE IN PLACE
- MAST ARM AND LUMINAIRE
- MAST ARM AND LUMINAIRE IN PLACE
- WOOD POLE
- WOOD POLE IN PLACE
- SOURCE OF POWER
- RAILROAD SIGNAL IN PLACE
- RIGHT OF WAY LINE
- CENTERLINE
- EDGE OF ROADWAY
- SHOULDERLINE
- CURB LINE
- STOP BAR

STANDARD PLATES

	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 HAND HOLE
	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
*	0004 A	SPECIFICATION REFERENCE
	3124 B	METAL APRON CONNECTION
	3221 C	CORRUGATED STEEL PIPE COUPLING BAND
	7035 J	CONCRETE WALK AND CURB RETURNS AT ENTRANCES
	7100 F	CONCRETE CURB AND GUTTERS

* APPLIES TO THIS PROJECT

CONDUCTOR COLOR CODE

R - RED
O - ORANGE
BL - BLUE
WH - WHITE
R/BLK - RED WITH BLACK TRACER
O/BLK - ORANGE WITH BLACK TRACER
BL/BLK - BLUE WITH BLACK TRACER
WH/BLK - WHITE WITH BLACK TRACER
BLK - BLACK
BLK/WH - BLACK WITH WHITE TRACER
G/BLK - GREEN WITH BLACK TRACER
G - GREEN

ABBREVIATIONS
EQUIPMENT AND INDICATIONS

RED - RED
YEL - YELLOW
GRN - GREEN
WLK - WALK
NEU - NEUTRAL
DWK - DON'T WALK
LUM - LUMINAIRE
DNL - DOWNLIGHT
H.H. - HANDHOLE
EQG - 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
2-1(eg) - SIGNAL HEADS-PHASE"2"
SPR. - SPARE CONNECTORS
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

NO.	BY	DATE	REVISIONS	ITEM	DESIGN	CHECKED
1	JMG	9/6	PER Mn/DOT COMMENTS			

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Glen Van Wormer
Date 9/6/90 Reg No. 9089

SEH ENGINEERS ■ ARCHITECTS ■ PLANNERS

ANOKA COUNTY, MINNESOTA
C.P. 90-19-116
C.P. 90-20-116

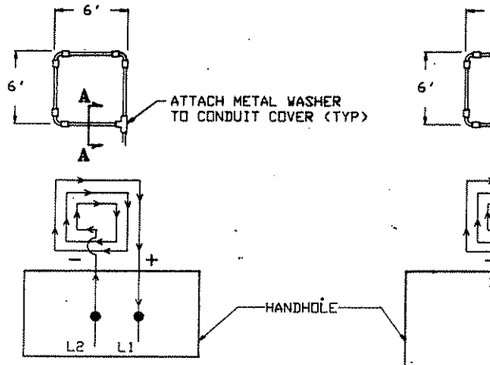
DETAILS

FILE NO. 91016-17
DATE 8/30/90

BASE | OVERLAY | DRG NO

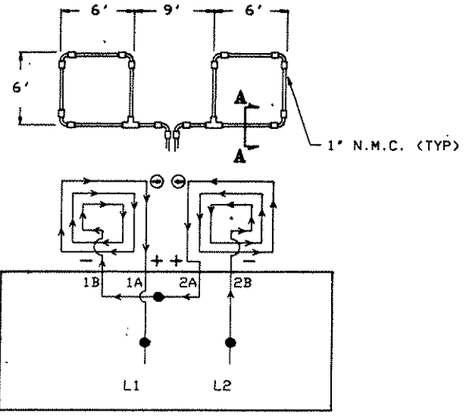
LOOP DETECTOR DETAIL 'A'

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



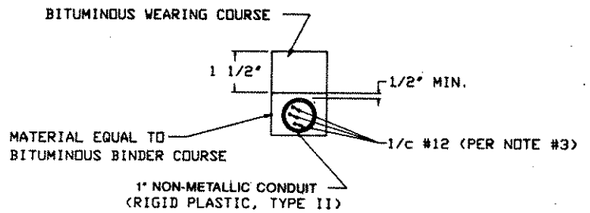
LOOP DETECTOR DETAIL 'B'

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

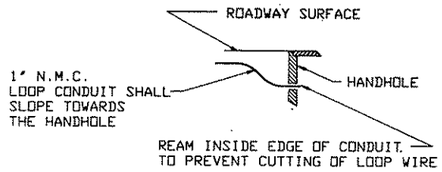


LOOP CONNECTIONS SHALL BE LABELED AND SPLICED IN THE HANDHOLE AS FOLLOWS:
L1 TO 1A, 1B TO 2A, AND 2B TO L2.

CROSS SECTION A-A

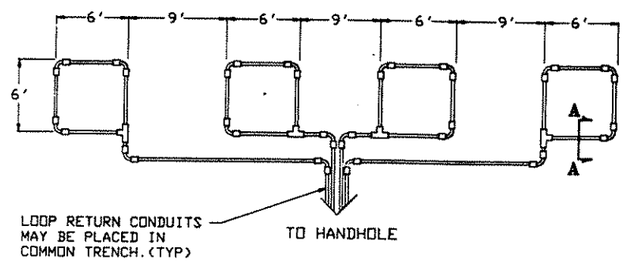


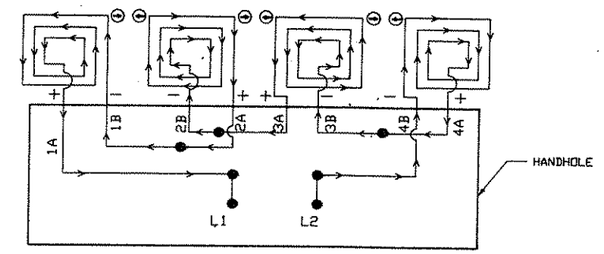
DRAINAGE DETAIL



LOOP DETECTOR DETAIL 'C'

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

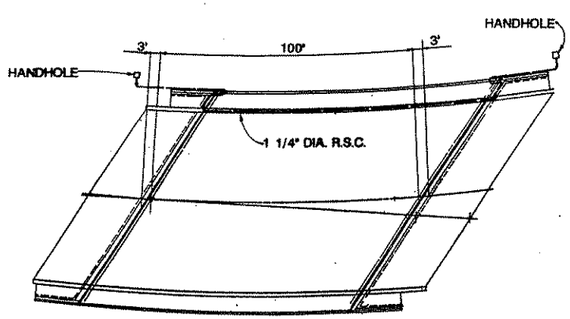




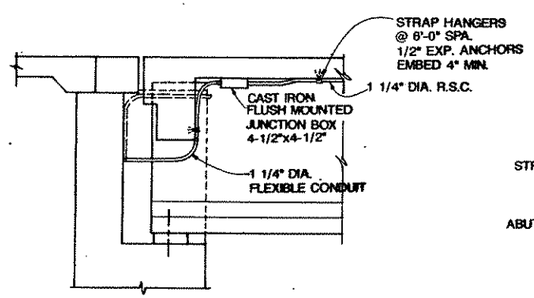
LOOP CONNECTIONS SHALL BE LABELED AND SPLICED IN THE HANDHOLE AS FOLLOWS:
L1 TO 1A, 1B TO 2A, 2B TO 3A, 3B TO 4A AND 4B TO L2 .
SPLICE CONTROL CABLE TO L1 & L2 IN HANDHOLE. ALL CONDUCTORS SHALL BE TAGGED IN HANDHOLE (1A, 1B, ETC.)

DETAIL FOR INSTALLATION AND MOUNTING OF CONDUIT ON BRIDGE

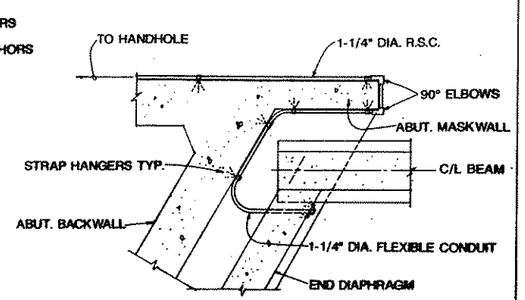
(SYSTEM "B"-T.H.47 AT COUNTY ROAD 116)



PLAN



SECTION
N.T.S.



PLAN SECTION
N.T.S.

LOOP DETECTOR WIRING

NOTES:

1) ALL CORNERS SHALL BE 90° CONDUIT BENDS
2) CONNECT WIRES IN HANDHOLES USING WESTERN UNION SPLICE, SOLDERED, TAPED, & WATERPROOFED.
3) LOOP DETECTOR WIRES SHALL BE # 12 AWG CROSSED LINKED POLYETHYLENE (XLP). SEE SPECIAL PROVISIONS.
4) LOOP LEAD IN WIRES SHALL BE TWISTED A MIN. OF (5) TURNS PER 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 (3) TURNS.
7) LOOPS 6'x15' AND LARGER SHALL HAVE TWO (2) TURNS.
8) A 3/4 INCH FOAM BACKER ROD SHALL BE ATTACHED WITH LAST TURN OF WIRE FOR EACH LOOP DETECTOR INSTALLED IN N.M.C.
9) SEE SPECIAL PROVISIONS FOR DETAILS ON SAW-CUT LOOP DETECTORS (SYSTEM "B" ONLY).

NO.	BY	DATE	REVISIONS
1	JMG	9/6	PER Mn/DOT COMMENTS

ITEM | DESIGN | CHECKED

I hereby certify that this plan was prepared by me or under my direct supervision and that I am a duly Registered Professional Engineer under the laws of the State of Minnesota
Date 9/6/90 Reg No. 9089

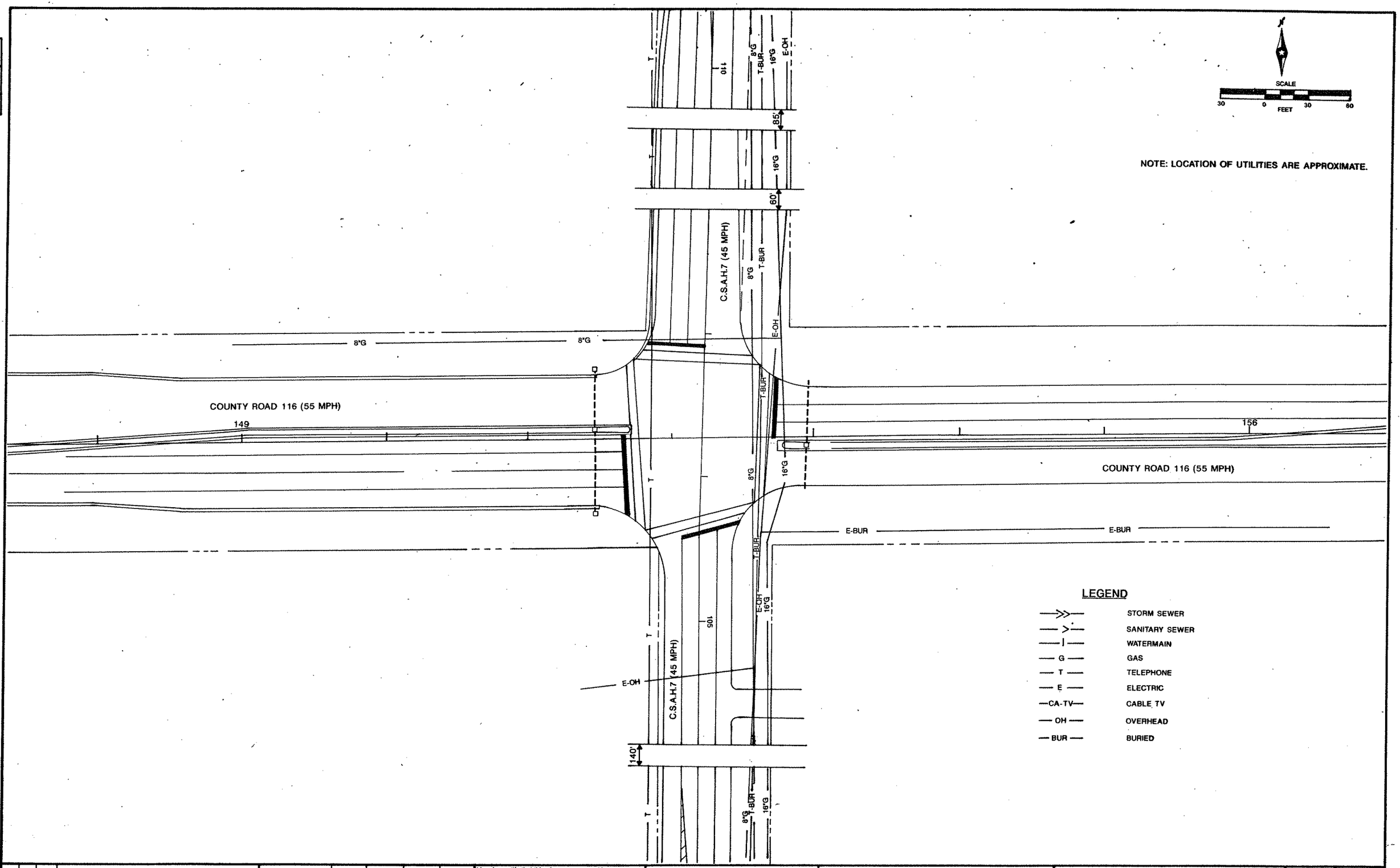
SEH ENGINEERS # ARCHITECTS # PLANNERS

ANOKA COUNTY, MINNESOTA
C.P. 90-19-116
C.P. 90-20-116

LOOP DETECTOR DETAILS

FILE NO. 91016-17
DATE 8/30/90
7/9

BASE | OVERLAY | DRG. NO.



LEGEND

- STORM SEWER
- SANITARY SEWER
- WATERMAIN
- G — GAS
- T — TELEPHONE
- E — ELECTRIC
- CA-TV — CABLE TV
- OH — OVERHEAD
- BUR — BURIED

NO.	BY	DATE	REVISIONS	ITEM	DESIGN	CHECKED

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Date 4/6/90 Reg No. 9089

SEH ENGINEERS ■ ARCHITECTS ■ PLANNERS

ANOKA COUNTY, MINNESOTA
C.P. 90-20-116

TRAFFIC SIGNAL SYSTEM "A"
UTILITIES
C.S.A.H. 7 AT COUNTY ROAD 116

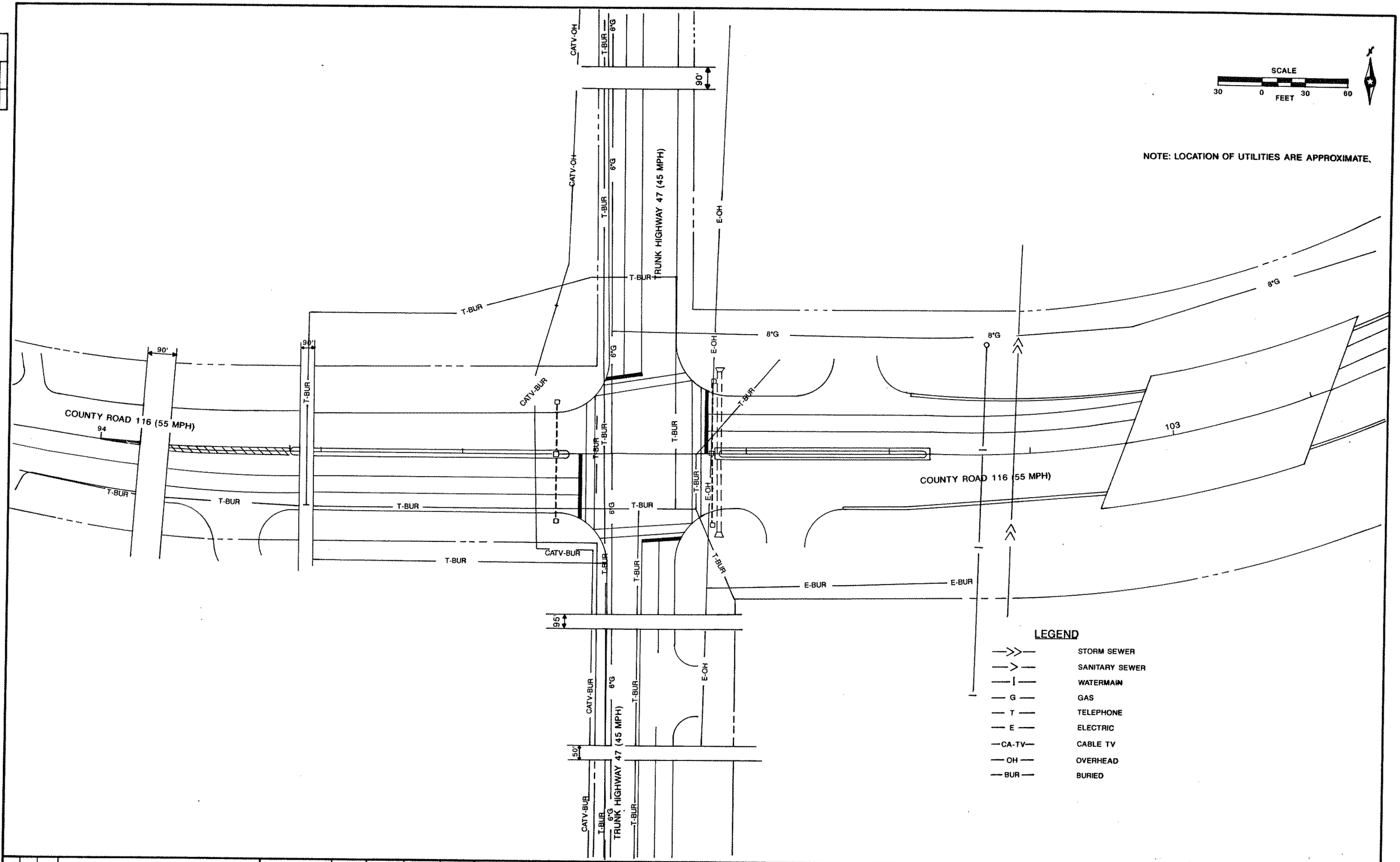
FILE NO. 91016
DATE 8/30/90

8/9

BASE | OVERLAY | DRG. NO.

SCALE
30 0 FEET 30 60

NOTE: LOCATION OF UTILITIES ARE APPROXIMATE.



LEGEND

—>>—	STORM SEWER
—>—	SANITARY SEWER
—I—	WATERMAIN
— G —	GAS
— T —	TELEPHONE
— E —	ELECTRIC
—CA-TV—	CABLE TV
— OH —	OVERHEAD
— BUR —	BURIED

NO.	BY	DATE	REVISIONS	ITEM	DESIGN	CHECKED

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Date 7/6/90 Reg No. 9089

ENGINEERS ■ ARCHITECTS ■ PLANNERS

ANOKA COUNTY, MINNESOTA
C.P. 90-19-116

TRAFFIC SIGNAL SYSTEM "B"
UTILITIES
TRUNK HIGHWAY 47 AT COUNTY ROAD 116

FILE NO. 91017
DATE 8/30/90
9 / 9