

**NOTES:**

- 1) LOCATION OF FOUNDATIONS, LOOP DETECTORS, AND HANDHOLES SHALL BE DETERMINED IN THE FIELD BY THE ENGINEER.
- 2) SEE SPECIAL PROVISIONS FOR COUNTY FURNISHED MATERIALS.
- 3) NEW HANDHOLES SHALL BE PVC HANDHOLES WITH METAL FRAMES AND COVERS.
- 4) A 3/4" HALF COUPLING, 3/4" PIPE NIPPLE, AND CONDUIT OUTLET BODY SHALL BE FURNISHED AND INSTALLED 6 FEET FROM THE END OF EACH MAST ARM (FOR EVP).
- 5) THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING THE POWER COMPANY TO ARRANGE FOR THE POWER CONNECTION (CONNEXUS). SEE SPECIAL PROVISIONS.
- 6) SEE SPECIAL PROVISIONS AND DETAILS REGARDING SIGNS TO BE FURNISHED AND INSTALLED BY CONTRACTOR (INCLUDED AS PART OF PAY ITEM FOR "TRAFFIC CONTROL SIGNAL SYSTEM E").
- 7) EACH PEDESTRIAN INDICATION SHALL BE ONE SECTION FILLED COUNTDOWN TIMER "HAND/WALKING PERSON" INDICATION.
- 8) ALL VEHICLE AND PEDESTRIAN SIGNAL INDICATIONS SHALL BE LED.
- 9) EACH SIGNAL FACE SHALL HAVE A BACKGROUND SHIELD.
- 10) SEE DETAILS, SPECIAL PROVISIONS, AND STATEMENT OF ESTIMATED QUANTITIES REGARDING BATTERY BACK-UP SIGNAL SERVICE CABINET TO BE FURNISHED AND INSTALLED BY CONTRACTOR (SEPARATE FROM ITEM NO. 2565 FOR THIS SIGNAL SYSTEM).
- 11) LOOP DETECTOR WIRES SHALL BE CROSS-LINKED POLYETHYLENE (XLP) IN 3/4" N.M.C. SEE SPECIAL PROVISIONS.
- 12) (\*) DENOTES ITEMS TO BE FURNISHED AND INSTALLED BY THE CONTRACTOR UNDER ITEM NO. 2565 (EMERGENCY VEHICLE PREEMPTION SYSTEM "E"). SEE STATEMENT OF ESTIMATED QUANTITIES AND SPECIAL PROVISIONS.

F & I N.M.C. LOOP DETECTORS			
NUMBER	SIZE (FT.)	LOCATION	FUNCTION
D1-1	2-6x6	20' & 50'	1
D1-2	2-6x6	5' & 35'	1
D2-1	6x6	400'	1
D2-2	6x6	400'	1
D4-1	6x6	120'	3,8
D4-2	2-6x6	0' & 15'	7
D4-3	2-6x6	0' & 15'	7
D5-1	2-6x6	20' & 50'	1
D5-2	2-6x6	5' & 35'	1
D6-1	6x6	400'	1
D6-2	6x6	400'	1
D8-1	6x6	120'	3,8
D8-2	2-6x6	0' & 15'	7
D8-3	2-6x6	0' & 15'	7

NOTE: LOCATION=DISTANCE FROM STOP BAR TO FRONT OF LOOP DETECTOR.

H.H.7 TO H.H.8:  
2" R.S.C. - INPLACE  
(\*) 1-3/c#20  
(\*) 1-1/c#6 (INS.GR.)

LOOP DETECTORS FUNCTIONS:  
1) CALL AND EXTEND  
3) EXTEND ONLY  
7) DELAYED CALL, IMMEDIATE EXTEND  
8) CARRY OVER (STRETCH)

H.H.6 TO H.H.7:  
2" R.S.C. - INPLACE (CUT & EXTEND INTO NEW H.H.6)  
1-2/c#14  
(\*) 1-3/c#20  
(\*) 1-1/c#6 (INS.GR.)

H.H.4 TO H.H.5:  
4" CONDUIT  
3-12/c#14  
(\*) 1-3/c#14  
(\*) 2-3/c#20  
6-2/c#14  
1-3/c#14 (LUM)  
1-1/c#6 (INS.GR.)  
(\*) 1-1/c#6 (INS.GR.)

H.H.5 TO H.H.6:  
2" R.S.C.  
4-2/c#14  
(\*) 1-3/c#20  
(\*) 1-1/c#6 (INS.GR.)

H.H.9 TO H.H.12:  
4" CONDUIT  
2-12/c#14  
(\*) 1-3/c#14  
(\*) 1-3/c#20  
4-2/c#14  
1-3/c#14 (LUM)  
1-1/c#6 (INS.GR.)

H.H.9 TO H.H.10:  
H.H.10 TO H.H.11:  
2" R.S.C.  
2-2/c#14

H.H.1 TO H.H.2:  
H.H.2 TO H.H.3:  
2" R.S.C.  
2-2/c#14  
2" R.S.C.  
(\*\*) 1-6 SM/6 MM FIBER-OPTIC CABLE

H.H.1 TO H.H.4:  
4" CONDUIT  
3-12/c#14  
(\*) 1-3/c#14  
(\*) 2-3/c#20  
8-2/c#14  
1-3/c#14 (LUM)  
1-1/c#6 (INS.GR.)  
(\*) 1-1/c#6 (INS.GR.)

H.H.12 TO H.H.13:  
4" CONDUIT  
2-12/c#14  
(\*) 1-3/c#14  
(\*) 1-3/c#20  
6-2/c#14  
1-3/c#14 (LUM)  
1-1/c#6 (INS.GR.)

H.H.13 TO H.H.107:  
2" R.S.C.  
(\*\*) 1-6 SM/6 MM FIBER-OPTIC CABLE (TO CSAH 14 SIGNAL SYSTEM)

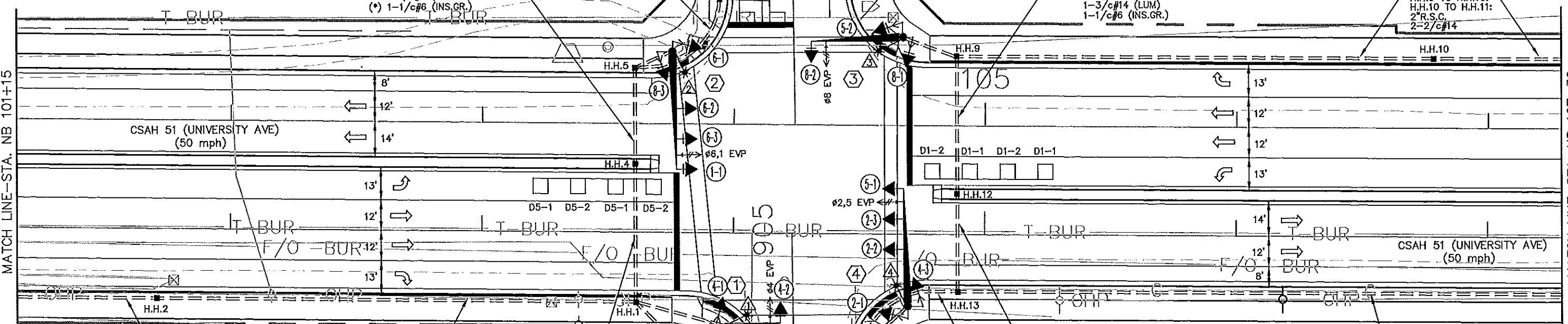
H.H.14 TO H.H.16:  
2-4" CONDUITS  
5-12/c#14  
(\*) 2-3/c#14  
(\*) 2-3/c#20  
11-2/c#14  
2-3/c#14 (LUM)  
2-1/c#6 (INS.GR.)  
2" R.S.C.  
(\*\*) 1-6 SM/6 MM FIBER-OPTIC CABLE

H.H.13 TO H.H.14:  
4" R.S.C.  
2-12/c#14  
(\*) 1-3/c#14  
(\*) 1-3/c#20  
6-2/c#14  
1-3/c#14 (LUM)  
1-1/c#6 (INS.GR.)  
2" R.S.C.  
(\*\*) 1-6 SM/6 MM FIBER-OPTIC CABLE

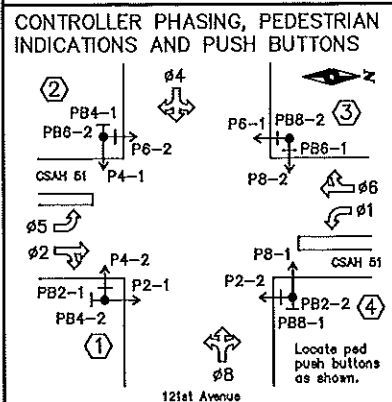
H.H.14 TO H.H.15:  
2" R.S.C. - INPLACE (CUT & EXTEND INTO NEW H.H.14)  
1-2/c#14

- (A) INSTALL CONTROLLER AND CABINET (FURNISHED BY COUNTY)  
EQUIPMENT PAD FOUNDATION  
BBU SIGNAL SERVICE CABINET  
BETWEEN CONTROLLER CABINET AND SERVICE CABINET:  
METERED SIGNAL SERVICE  
2" R.S.C.  
3-1/c#6  
CONTROLLER CABINET TO H.H.1:  
4" R.S.C.  
2-12/c#14  
(\*) 1-3/c#14  
(\*) 1-3/c#20  
4-2/c#14  
1-1/c#6 (INS.GR.)  
CONTROLLER CABINET TO H.H.16:  
4" R.S.C.  
3-12/c#14  
(\*) 1-3/c#14  
(\*) 1-3/c#20  
5-2/c#14  
1-1/c#6 (INS.GR.)  
CONTROLLER CABINET TO H.H.1:  
4" R.S.C.  
3-12/c#14  
(\*) 1-3/c#14  
(\*) 2-3/c#20  
8-2/c#14  
(\*) 1-1/c#6 (INS.GR.)  
CONTROLLER CABINET TO H.H.16:  
4" R.S.C.  
2-12/c#14  
(\*) 1-3/c#14  
(\*) 1-3/c#20  
6-2/c#14  
1-1/c#6 (INS.GR.)

- SERVICE CABINET TO H.H.1:  
2" R.S.C.  
UNMETERED STREET LIGHT SERVICE  
2-3/c#14 (LUM)  
SERVICE CABINET TO H.H.16:  
2" R.S.C.  
UNMETERED STREET LIGHT SERVICE  
2-3/c#14 (LUM)  
STUB OUT 1-2" R.S.C. FROM SERVICE CABINET TO SOUTHWEST (FOR POWER CABLES BY CONNEXUS)  
STUB OUT 3" R.S.C. FROM CONTROLLER CABINET TO NORTH (THREAD AND CAP-FOR FUTURE USE)  
STUB OUT 1" R.S.C. FROM CONTROLLER CABINET (FOR FUTURE PHONE LINE BY OTHERS)  
CONTROLLER CABINET TO H.H.1:  
(\*\*) 2" R.S.C.  
(\*\*) 1-6 SM/6 MM FO CABLE  
CONTROLLER CABINET TO H.H.16:  
(\*\*) 2" R.S.C.  
(\*\*) 1-6 SM/6 MM FO CABLE



- 13) (\*\*) DENOTES ITEMS TO BE FURNISHED AND INSTALLED BY THE CONTRACTOR UNDER ITEM NO. 2565 (TRAFFIC CONTROL INTERCONNECTION). SEE STATEMENT OF ESTIMATED QUANTITIES AND SPECIAL PROVISIONS.
- 14) THE CONTRACTOR SHALL REMOVE, SALVAGE AND DISPOSE OF ALL ITEMS OF EXISTING PERMANENT SIGNAL SYSTEM IN ACCORDANCE WITH THE PLANS AND SPECIAL PROVISIONS (INCLUDED AS PART OF PAY ITEM FOR "TRAFFIC CONTROL SIGNAL SYSTEM E").



(B) INPLACE WOOD POLE--TO BE RELOCATED BY OTHERS (S.O.P.) (CONNEXUS)

SIGNAL SYSTEM OPERATIONS:  
- SIGNAL SYSTEM FLASH MODE SHALL BE ALL RED.  
- NORMAL OPERATION SHALL BE 6 PHASE, WITH PHASES 1 & 5 BEING FLASHING YELLOW ARROWS (FLASH BY TIME OF DAY)  
- VEHICLE SIGNAL PHASES 2 AND 6 SHALL OPERATE ON RECALL.

SEE NEXT SHEET FOR DETAILED POLE NOTES

LED SIGNAL FACES  
ALL SIGNAL INDICATIONS SHALL BE 12"

SIGNAL FACE	R	Y	FYA	G
1-1, 1-2	←	←	←	←
2-1, 2-2, 2-3	●	●	●	●
4-1, 4-2, 4-3	●	●	●	●
5-1, 5-2	←	←	←	←
6-1, 6-2, 6-3	●	●	●	●
8-1, 8-2, 8-3	●	●	●	●

FYA = FLASHING YELLOW ARROW.

CONTRACTOR SHALL FURNISH, INSTALL, COIL AND STORE 25' OF 1-2/c#14 IN HANDHOLE 6, AND PROVIDE AN ADDITIONAL 25' OF 1-2/c#14 CABLE IN HANDHOLE 9 AS SHOWN ON FIELD WIRING DIAGRAM (FOR FUTURE PUSH BUTTON INSTALLATION BY OTHERS).

DRAWN BY: JMG  
DESIGNER: JMG  
CHECKED BY: JMG

DESIGN TEAM	NO.	BY	DATE

REVISIONS			
NO.	BY	DATE	DESCRIPTION

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

Name: John M. Gray, PE  
Lic. No.: 22457  
Date: December 17, 2013

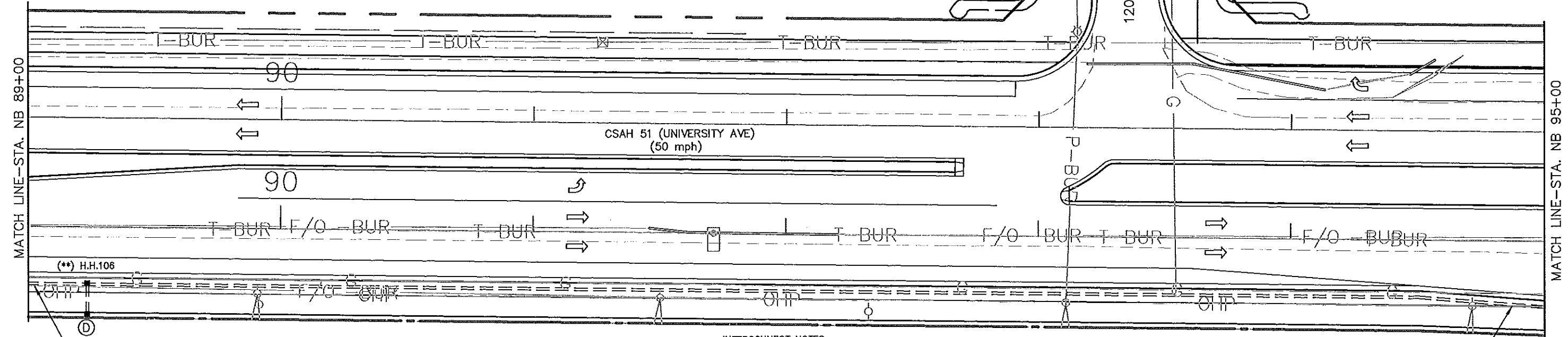
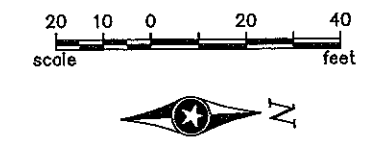
SEH  
PHONE: (651) 490-2000  
3535 VADNAIS CENTER DR.  
ST. PAUL, MN 55110

ANOKA COUNTY  
CITIES OF BLAINE  
AND COON RAPIDS

TRAFFIC SIGNAL SYSTEM 'E'  
INTERSECTION LAYOUT  
CSAH 51 (UNIVERSITY AVE) AT 121ST AVENUE

FILE NO.  
ANOKC 125457  
SIGNAL SHEET  
24 OF 39

S.P. 002-651-007  
S.A.P. 106-020-031  
S.A.P. 114-020-046

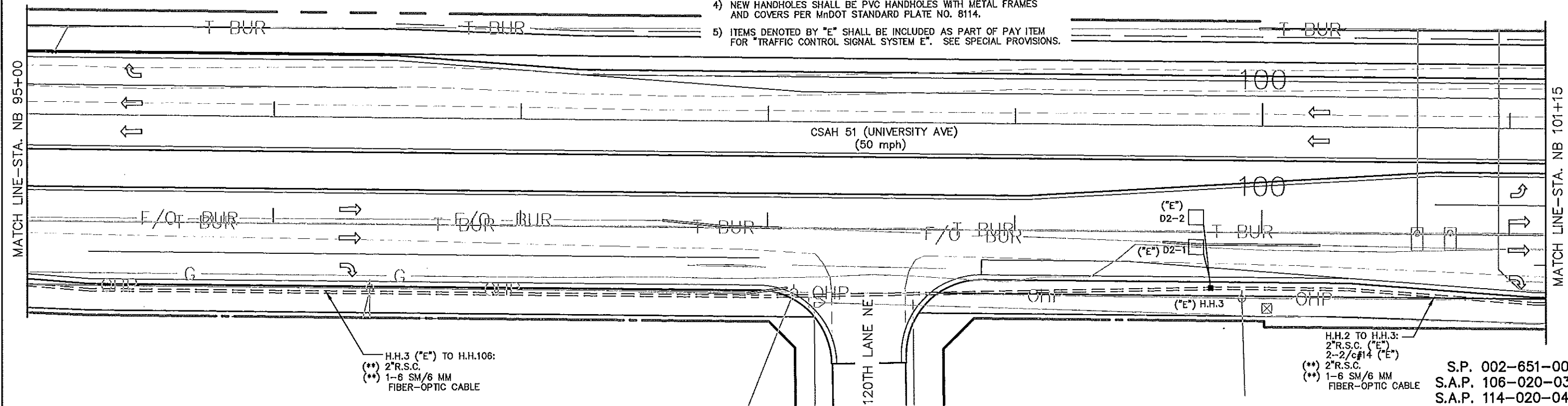


H.H.105 TO H.H.106:  
 (\*\*) 2" R.S.C.  
 (\*\*) 1-6 SM/6 MM FIBER-OPTIC CABLE (TO 117TH AVENUE SIGNAL SYSTEM)

ⓓ (\*\*) INTERCONNECT SPLICE CABINET (LOOP FIBER-OPTIC CABLE IN AND OUT OF CABINET TO H.H.106)  
 (\*\*) CABINET FOUNDATION EXTEND INTO H.H.106:  
 (\*\*) 2-2" R.S.C.  
 (\*\*) 2-6 SM/6 MM FIBER-OPTIC CABLES

- INTERCONNECT NOTES:**
- 1) IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO UTILIZE THE "ONE CALL EXCAVATION NOTICE SYSTEM" (TELEPHONE NUMBER 651-454-0002) AS REQUIRED BY MINNESOTA STATUTE 2160.
  - 2) DISTANCE OFF SHOULDER OR CURB FOR INTERCONNECT CONDUIT SHALL BE 1-2 FEET.
  - 3) (\*\*) DENOTES ITEMS TO BE FURNISHED AND INSTALLED BY THE CONTRACTOR UNDER ITEM NO. 2565 (TRAFFIC CONTROL INTERCONNECTION). SEE STATEMENT OF ESTIMATED QUANTITIES AND SPECIAL PROVISIONS.
  - 4) NEW HANDHOLES SHALL BE PVC HANDHOLES WITH METAL FRAMES AND COVERS PER MnDOT STANDARD PLATE NO. 8114.
  - 5) ITEMS DENOTED BY "E" SHALL BE INCLUDED AS PART OF PAY ITEM FOR "TRAFFIC CONTROL SIGNAL SYSTEM E". SEE SPECIAL PROVISIONS.

H.H.106 TO H.H.3 ("E"):  
 (\*\*) 2" R.S.C.  
 (\*\*) 1-6 SM/6 MM FIBER-OPTIC CABLE



H.H.3 ("E") TO H.H.106:  
 (\*\*) 2" R.S.C.  
 (\*\*) 1-6 SM/6 MM FIBER-OPTIC CABLE

H.H.2 TO H.H.3:  
 2" R.S.C. ("E")  
 2-2/c#14 ("E")  
 (\*\*) 2" R.S.C.  
 (\*\*) 1-6 SM/6 MM FIBER-OPTIC CABLE

S.P. 002-651-007  
 S.A.P. 106-020-031  
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 DESIGNER: JMG  
 CHECKED BY: JMG

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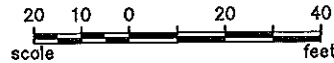
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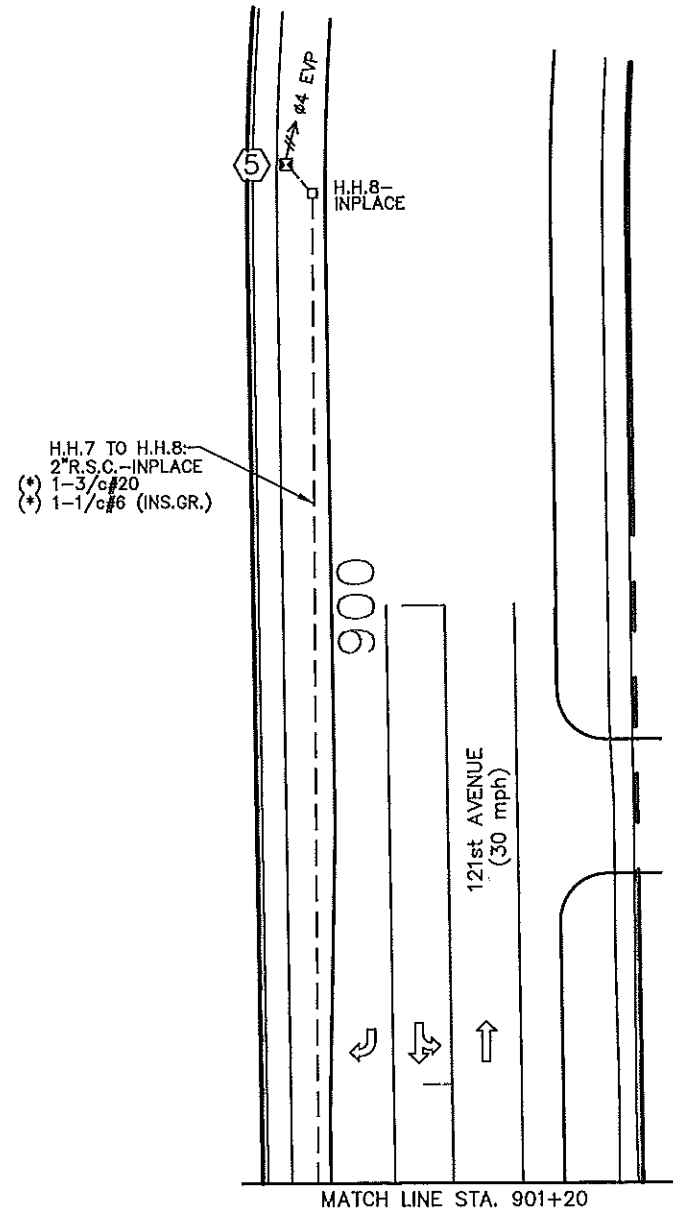
**ANOKA COUNTY**  
**CITIES OF BLAINE**  
**AND COON RAPIDS**

**SIGNAL SYSTEM 'E'/INTERCONNECT**  
**INTERSECTION LAYOUT**  
**CSAH 51 (UNIVERSITY AVE)**  
**(117TH AVENUE TO 121ST AVENUE)**

FILE NO.  
 ANOKC 125457  
 SIGNAL SHEET  
 23 OF 39



- ⑤ PEDESTAL FOUNDATION-INPLACE
- (\*\*) 10' PEDESTAL POLE AND BASE
- (\*\*) WND COLLAR FOR PEDESTAL POLE
- (\*\*) ONE WAY EVP DETECTOR-MOUNT ATOP
- SLIPFITTER COLLAR (FACING EB TRAFFIC) (ø4)
- EXTENDED INTO H.H.8:
- 2"R.S.C.-INPLACE
- (\*\*) 1-3/c#20
- (\*\*) 1-1/c#6 (INS.GR.)



SIGNAL SYSTEM "E" POLE NOTES

- ① PA85 POLE FOUNDATION
- TYPE PA85-A-20-D40-9 (DAVIT AT 350 DEG.)
- LUMINAIRE-LED COBRAHEAD
- 1-ANGLE MOUNT SIGNAL-OVERHEAD AT 0'
- 2-ANGLE MOUNT SIGNALS-POLE MOUNTED 90 DEG AND 180 DEG
- 2-ANGLE MOUNT C.D. PED INDICATIONS-POLE MOUNTED 90 DEG AND 180 DEG
- 2-PEDESTRIAN PUSH BUTTONS
- TYPE D SIGN PANEL-OVERHEAD (D-12)
- (\*) ONE WAY EVP DETECTOR & CONFIRMATORY LIGHT (ø4)
- EXTEND INTO H.H.1:
- 3"R.S.C.
- 2-12/c#14
- (\*) 1-3/c#14
- (\*) 1-3/c#20
- 2-2/c#14
- 1-3/c#14 (LUM)
- 1-1/c#6 (INS.GR.)

- ③ PA90 POLE FOUNDATION
- TYPE PA90-A-35-D40-9 (DAVIT AT 350 DEG)
- LUMINAIRE-LED COBRAHEAD
- 1-ANGLE MOUNT SIGNAL-OVERHEAD AT 0'
- 2-ANGLE MOUNT SIGNALS-POLE MOUNTED 90 DEG AND 180 DEG
- 2-ANGLE MOUNT C.D. PED INDICATIONS-POLE MOUNTED 90 DEG AND 180 DEG
- 2-PEDESTRIAN PUSH BUTTONS
- TYPE D SIGN PANEL-OVERHEAD (D-14)
- (\*) ONE WAY EVP DETECTOR & CONFIRMATORY LIGHT (ø8)
- EXTEND INTO H.H.9:
- 3"R.S.C.
- 2-12/c#14
- (\*) 1-3/c#14
- (\*) 1-3/c#20
- 2-2/c#14
- 1-3/c#14 (LUM)
- 1-1/c#6 (INS.GR.)

- ② PA100 POLE FOUNDATION
- TYPE PA100-A-45-D40-9 (DAVIT AT 350 DEG)
- LUMINAIRE-LED COBRAHEAD
- 1-ANGLE MOUNT SIGNAL-OVERHEAD AT 0'
- 2-STRAIGHT MOUNT SIGNALS-OVERHEAD AT 11' & 23'
- 2-ANGLE MOUNT SIGNALS-POLE MOUNTED 90 DEG AND 180 DEG
- 2-ANGLE MOUNT C.D. PED INDICATIONS-POLE MOUNTED 90 DEG AND 180 DEG
- 2-PEDESTRIAN PUSH BUTTONS
- 2-R6-1 SIGN PANELS-POLE MOUNTED 0 DEG AND 180 DEG
- R10-X12 SIGN PANEL-ADJACENT TO 1-1
- TYPE D SIGN PANEL-OVERHEAD (D-13)
- (\*) ONE WAY EVP DETECTOR & CONFIRMATORY LIGHT (ø6,1)
- EXTEND INTO H.H.5:
- 3"R.S.C.
- 3-12/c#14
- (\*) 1-3/c#14
- (\*) 1-3/c#20
- 2-2/c#14
- 1-3/c#14 (LUM)
- 1-1/c#6 (INS.GR.)

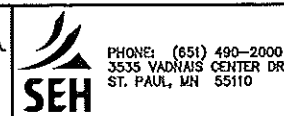
- ④ PA100 POLE FOUNDATION
- TYPE PA100-A-45-D40-9 (DAVIT AT 350 DEG)
- LUMINAIRE-LED COBRAHEAD
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- 2-ANGLE MOUNT SIGNALS-POLE MOUNTED 90 DEG AND 180 DEG
- 2-ANGLE MOUNT C.D. PED INDICATIONS-POLE MOUNTED 90 DEG AND 180 DEG
- 2-PEDESTRIAN PUSH BUTTONS
- 2-R6-1 SIGN PANEL-POLE MOUNTED 0 DEG AND 180 DEG
- R10-X12 SIGN PANEL-ADJACENT TO 5-1
- TYPE D SIGN PANEL-OVERHEAD (D-15)
- (\*) ONE WAY EVP DETECTOR & CONFIRMATORY LIGHT (ø2,5)
- EXTEND INTO H.H.14:
- 3"R.S.C.
- 3-12/c#14
- (\*) 1-3/c#14
- (\*) 1-3/c#20
- 2-2/c#14
- 1-3/c#14 (LUM)
- 1-1/c#6 (INS.GR.)

S.P. 002-651-007  
 S.A.P. 106-020-031  
 S.A.P. 114-020-046

DRAWN BY: JMG				
DESIGNER: JMG				
CHECKED BY: JMG				
DESIGN TEAM	NO.	BY	DATE	REVISIONS

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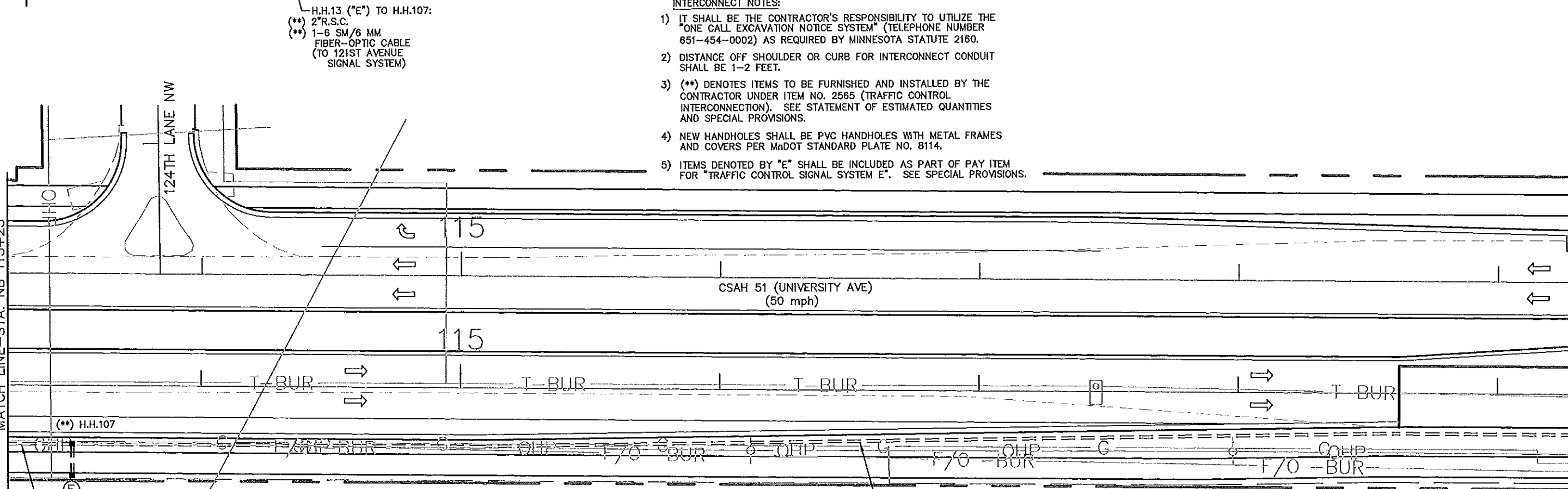
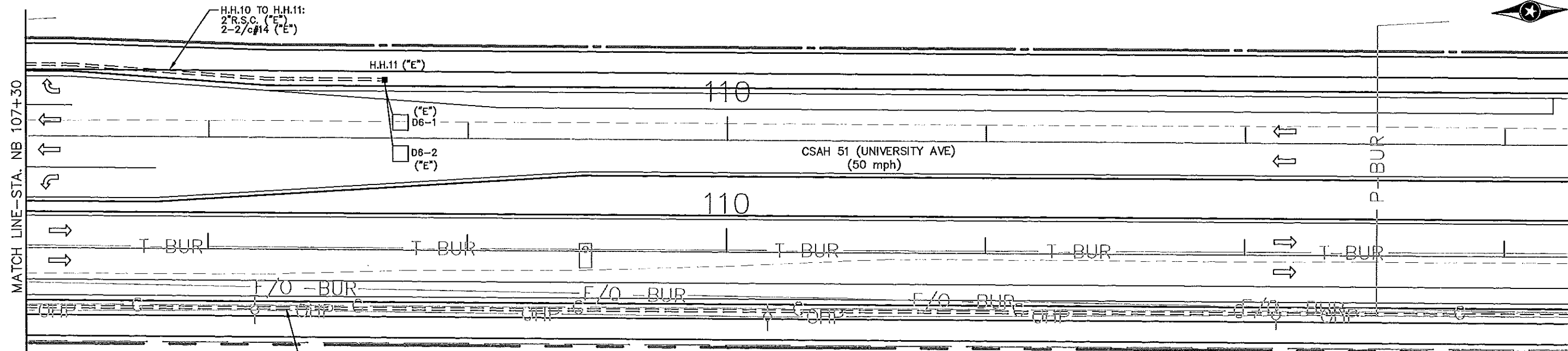
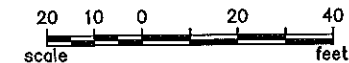
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ANOKA COUNTY  
 CITIES OF BLAINE  
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TRAFFIC SIGNAL SYSTEM "E"  
 INTERSECTION LAYOUT  
 CSAH 51 (UNIVERSITY AVE) AT 121ST AVENUE

FILE NO. ANOKC 125457
SIGNAL SHEET 25 OF 39



- INTERCONNECT NOTES:**
- 1) IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO UTILIZE THE "ONE CALL EXCAVATION NOTICE SYSTEM" (TELEPHONE NUMBER 651-454-0002) AS REQUIRED BY MINNESOTA STATUTE 2160.
  - 2) DISTANCE OFF SHOULDER OR CURB FOR INTERCONNECT CONDUIT SHALL BE 1-2 FEET.
  - 3) (\*\*) DENOTES ITEMS TO BE FURNISHED AND INSTALLED BY THE CONTRACTOR UNDER ITEM NO. 2565 (TRAFFIC CONTROL INTERCONNECTION). SEE STATEMENT OF ESTIMATED QUANTITIES AND SPECIAL PROVISIONS.
  - 4) NEW HANDHOLES SHALL BE PVC HANDHOLES WITH METAL FRAMES AND COVERS PER MNDOT STANDARD PLATE NO. 8114.
  - 5) ITEMS DENOTED BY "E" SHALL BE INCLUDED AS PART OF PAY ITEM FOR "TRAFFIC CONTROL SIGNAL SYSTEM E". SEE SPECIAL PROVISIONS.

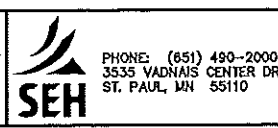
- H.H.10 TO H.H.11:  
2-R.S.C. ("E")  
2-2/c#14 ("E")
- H.H.11 ("E")
- (\*\* E) INTERCONNECT SPlice CABINET (LOOP FIBER-OPTIC CABLE IN AND OUT OF CABINET TO H.H.107)
- (\*\* E) CABINET FOUNDATION EXTEND INTO H.H.107:
- (\*\* E) 2-2-R.S.C.
- (\*\* E) 2-6 SM/6 MM FIBER-OPTIC CABLES
- H.H.13 ("E") TO H.H.107:  
(\*\* E) 2-R.S.C.  
(\*\* E) 1-6 SM/6 MM FIBER-OPTIC CABLE
- H.H.13 ("E") TO H.H.107:  
(\*\* E) 2-R.S.C.  
(\*\* E) 1-6 SM/6 MM FIBER-OPTIC CABLE (TO 121ST AVENUE SIGNAL SYSTEM)
- H.H.107 TO H.H.3 (CSAH 14)  
(\*\* E) 2-R.S.C.  
(\*\* E) 1-6 SM/6 MM FIBER-OPTIC CABLE (TO CSAH 14 SIGNAL SYSTEM)

S.P. 002-651-007  
S.A.P. 106-020-031  
S.A.P. 114-020-046

DRAWN BY: JMG			
DESIGNER: JMG			
CHECKED BY: JMG			
DESIGN TEAM	NO.	BY	DATE
			REVISIONS

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Name: John M. Gray, PE  
Date: December 17, 2013  
Lic. No. 22457



**ANOKA COUNTY**  
CITIES OF BLAINE  
AND COON RAPIDS

**SIGNAL SYSTEM 'E'/INTERCONNECT**  
INTERSECTION LAYOUT  
CSAH 51 (UNIVERSITY AVE)  
(121ST AVENUE TO CSAH 14)

FILE NO.  
ANOKC 125457  
SIGNAL SHEET  
27 OF 39

